

Liquid Oxygen Systems User **Guide**



Oxygen Hazards



Cold Embrittlement*

Tel: 1800 24 02 02
Open 24 hours for urgent
technical assistance

 **Air Liquide**
HEALTHCARE

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Liquid Oxygen Safety

Before using your prescribed liquid oxygen system (LOX) it is important that you read this guide and the Home Oxygen User Guide also provided. If you have any questions please ask your LOX specialist technician or contact our customer service team.

For more detailed instructions on how to use your liquid oxygen system refer to section Equipment Filling Guides for all LOX options included in this booklet. The liquid oxygen system consists of a base unit (Dewar/Mother Unit) and a separate portable unit(s) based on your medical prescription. Liquid oxygen is stored in the insulated stainless steel base unit and will be located safely at your home. Our technician will ask a series of questions and visit your home to assess.

The portable unit can be refilled easily from the base unit to give you flexibility to fill your portable oxygen system when you need it, to allow you freedom to get out and about. Follow the advice and safety information given by your technician. Full training will be given to you on how to use and fill your LOX system.

Liquid Oxygen Safety

Prior to the delivery of your new LOX system, your prescriber will have asked you a series of questions regarding your home and access and safety considerations for your oxygen equipment. Our LOX technician will also complete a risk assessment onsite and determine the most appropriate location for your LOX dewar. You will be given a demonstration of the equipment and an opportunity to practice and ask questions. The temperature of liquid oxygen is -183°C and can cause 'cold' burns if it comes into contact with your skin. It is therefore important that you follow the instructions provided to you by your technician and remember:

- **NEVER** allow the unit to be used in the presence of any naked flames or electrical items, appliances or chargers that can cause a spark. **DO NOT** sit in front or near an open fire
- **NEVER** store gaseous oxygen cylinders in the same room as Liquid Oxygen LBUs
- **NEVER** touch the blue connectors on either the base or portable unit after filling as they are very cold and can cause burns
- **NEVER** move your base unit from where your technician has safely installed it
- **NEVER** use your portable unit whilst it is attached to the base unit
- **NEVER** check the liquid level gauge when the vent valve is open
- **NEVER** use physical force or tools to separate the portable unit from the base unit. Doing so can cause serious damage to the equipment and increase the risk of sustaining a cold burn
- **NEVER** smoke/vape or allow those near you to smoke/vape while you are using your LOX system as to do so can cause serious injury. Smoking while using LOX may cause catastrophic injury or even death
- **ALWAYS** store and use your portable unit in an upright position

In the event of accidental liquid oxygen contact with the skin DO NOT rub. Remove any clothing if necessary and gently apply slightly warm water for at least 15 minutes and then seek medical advice.

Reordering Liquid Oxygen

To order a replacement liquid oxygen base unit you will need to call our customer service on 1800 24 02 02 providing advance notice in order to guarantee delivery. Please bear in mind that deliveries can only be made Monday - Friday.

We recommend that you place an order as soon as there are only 2 green lights left on your base unit to ensure a delivery can be made before it is empty.

Cleaning and Maintenance

Before filling your portable unit, wipe the blue connectors on the base and portable unit using disposable paper. Keeping these connectors clean reduces the risk of them freezing or sticking together. This should be done before every fill.

ALWAYS use a damp cloth to clean the outer case of your portable unit.

NEVER use detergents or abrasive cloths. If any sign of damage or leaking, please notify us immediately.

REFER to full safety information given in your Home Oxygen User Guide.



Specification and User Manuals

Liberator Symbols Glossary



ISO 7000; Graphical symbols for use on equipment – Index and synopsis.	
	Storage or operating temperature range. Reg. # 0632.
	Storage humidity range. Reg. # 2620.
	Atmospheric pressure limitation. Reg. # 2621.
	Keep away from rain, keep dry. Reg. # 0626.
	Name and address of manufacturer. Reg. # 3082.
	Caution, consult accompanying documents. Reg. # 0434A.
	Catalogue Number. Reg. # 2493.
	Serial Number. Reg. # 2498.
	This way up. Reg. # 0623.
	Fragile, handle with care. Reg. # 0621.
	Stacking limit by number. Reg. # 2403.
ISO 7010: Graphical symbols – Safety colours and safety signs – Registered safety signs.	
	Frostbite may occur on contact with cold liquid or gaseous oxygen, or frosted parts. Warning low temperature. To warn of low temperature or freezing conditions. Reg. # W010.
	The instruction manual must be read. Reg. # M002.
	Keep away from open flame, fire, sparks. Open ignition source and smoking prohibited. Reg. # P003.
	Do not smoke near unit or while operating unit. Reg. # P002.
	Type BF applied part (degree of protection against electric shock). Reg. # 5333.
	Warning. Reg. # W001.
Council Directive 93/42/EEC; concerning medical devices.	
	Authorized representative in the European Community.

	If the product unique device identifier (UDI) label has the CE#### symbol on it, the device complies with the requirements of Directive 93/42/EEC concerning medical devices. The CE#### symbol indicates notified body number.
	This device complies with the requirements of Directive 2010/35/EU concerning medical devices. It bears the pi marking as shown.
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.	
	Non-toxic gas.
	Hazard Oxidizing substances: fire intensifying risk.
	Refrigerated Liquid, USP; Produced by Air Liquefaction.
Internal Symbols.	
	Keep unit well ventilated at all times.
	Keep away from flammable materials, oil and grease.
	Wipe connector with clean dry cloth before filling.
IEC 60417: Graphical Symbols for use on equipment.	
	Do not cover unit. These units normally vent oxygen. No. 5641.
21 CFR 801.15: Code of Federal Regulations Title 21.	
	Federal law restricts this device to sale by or on the order of a physician.
Council Directive 2012/19/EU: waste electrical and electronic equipment (WEEE).	
	WEEE.
IEC 60601-1: Medical electrical equipment Part 1 General requirements for basic safety and essential performance.	
	Drip Proof

This product may be covered by one or more patents, US and international. Please visit our website below for the listing of applicable patents.
Pat.: www.caireinc.com/corporate/patents/.

Specifications

- Type of Protection Against Electrical Shock: Internally Powered Equipment
- Degree of Protection Against Electrical Shock: Type BF Applied Part
- IP21 Classification According to the Degree of Protection Against Ingress of Water: Internal protection against ingress of solid foreign objects greater than or equal to 12.5 mm in diameter and ingress of vertically dripping water.
- Equipment not suitable for use in the presence of flammable mixtures

Product Specifications	
	Liberator 30
LOX Capacity	31.0 L 74.8 lb (33.9 kg)
Gaseous Equivalent Capacity	25,580 L
Weight, Empty	48.6 lb (22.04 kg)
Weight, Filled	123.36 lb (55.94 kg)
Height	29.5 in. (750 mm)
Diameter	14 in. (356 mm)
Typical use time at 2 LPM	8.9 days
Operating Pressure	20 psi (137 kPa)
Normal Evaporation Rate	1.6 lb/ day (0.73 kg/day)
Standard Flow Control Range	Off, .25, .5, .75, 1, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10, 12, 15 LPM
Flow Rate Accuracy*	+/- 10%

* This accuracy is only at 70F and 14.7 psig and with a calibrated accurate mass flow meter.

Warning Information

IMPORTANT: Read this manual thoroughly before operating the Liberator. RX Only.



WARNING: This device is not intended for life sustaining use.

WARNING: Patient or others may be entangled in cannula or other tubing causing asphyxiation.

WARNING: If you feel the equipment is not operating properly, call your healthcare provider. Do not attempt to repair or adjust the unit yourself.

WARNING: Do not modify this equipment without authorization from the manufacturer.

WARNING: If continuity of oxygen supply is required, ensure that an adequate supply of oxygen and/or a secondary oxygen supply is available at all times during therapy.

WARNING: Do not allow smoking, candles, or open flames within 10 feet (3 meters) of the device, or closer than 8 inches (20 cm) from any source of ignition.

WARNING: Keep your unit in a well-ventilated area.



WARNING: 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: This product can expose you to chemicals including nickel, which is known to the state of California to cause cancer. For more information, go to www.p65warnings.ca.gov.

WARNING: In the event there is a serious incident occurring with this device, the user should immediately report the incident to the provider and/or the manufacturer. A serious incident is defined as an injury, death, or potential to cause injury/death should there be a re-occurrence of the incident. The user can also report the incident to the competent authority in the country where the incident occurred.



CAUTION: Use the liberator only as directed by your doctor.

CAUTION: The unit contains liquid oxygen which is extremely cold, almost 300°F (-184°C). Exposure to such a low temperature can cause severe frostbite.

CAUTION: Liquid and gaseous oxygen, though non-flammable, cause other materials to burn faster than normal. This hazard, along with the low temperature of liquid oxygen, warrants certain safety precautions.

CAUTION: Keep flammable materials away from this equipment. Aerosol sprays, oils and grease, including facial creams and petroleum jelly, ignite easily and may burn rapidly in the presence of oxygen.

CAUTION: Smoking while wearing an oxygen cannula can cause facial burns and possibly result in death.

CAUTION: Removing the cannula and placing it on clothing, bedding, sofas, or other cushion material will cause a flash fire when exposed to a cigarette, heat source, spark or flame.

CAUTION: If you smoke please: (1) turn off the portable, (2) take off the cannula, and (3) leave the room where the device is located.

CAUTION: In the event of an accidental tip-over, immediately but cautiously return the unit into an upright position if possible. If any liquid oxygen is escaping, leave the area immediately and call your healthcare provider. Do not attempt to move the unit or stop the liquid oxygen from escaping.

NOTE: Do not touch frosted parts of any unit.

NOTE: Do not store or operate the portable coupled to the Liberator.

NOTE: Do not allow untrained personnel to handle or operate this device.

NOTE: Use of this device is prohibited on commercial passenger and cargo air flights by the Federal Aviation Administration.

Intended Use

The CAIRE Liberator Oxygen unit is intended for the administration of supplemental oxygen. The device is not intended for life support nor does it provide any patient monitoring capabilities.

Introduction

The Liberator reservoir is intended for the administration of supplemental oxygen to the patient in the end user's home and can also be used in institutions such as nursing homes or sub-acute care facilities.

The device is not intended for life support nor does it provide any patient monitoring capabilities. It is recommended to have an alternate source of supplemental oxygen in the event of mechanical failure.

The device is used by COPD patients or those with diminished breathing capacity. The device is prescribed to the patient. The device is sold to a provider that is trained to operate and service the Liberator reservoir. The provider trains the user.

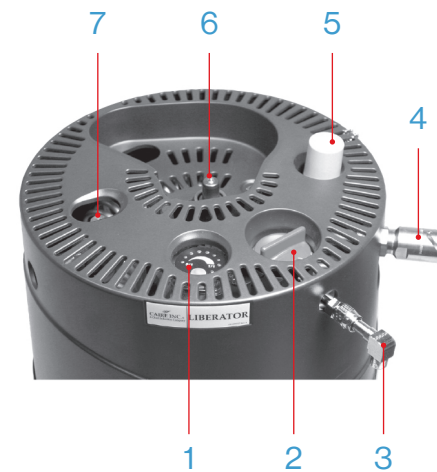
The liquid oxygen system includes the Liberator and a portable unit, which provides you with supplementary oxygen as prescribed by your physician. This user manual contains the instructions for using the Liberator. Refer to the user manual supplied with the portable unit for its operation.

Your base unit will be used solely for filling portable flasks. The Liberator is intended for stationary use. Your static oxygen requirements will be delivered via an oxygen concentrator (see user manual). The Liberator is offered as a top fill model or a dual top fill and side fill unit. We are supplying the top fill systems only. They are filled by your healthcare provider. The portable flask provides an ambulatory source of oxygen for an extended period of time. It is filled from the Liberator.

NOTE: The service provider will assist with the initial setup and instruct proper handling and usage of the unit.

Controls

1. Gen 4 Meter Liquid Level Gauge.
2. Flow Control Knob.
3. DISS Connection.
4. Liberator Side Fill connector (Strictly not applicable in Ireland).
5. Liberator Release Button (Top Fill push-on style only).
6. Liberator Top Fill Connections (QDV).
7. Vent Valve.



Dual Fill Liberator shown.

Operating Instructions

1. To verify the level of liquid oxygen in the unit, refer to the contents gauge.
2. Clean the fill connectors on both the Liberator and portable unit with clean, dry, disposable paper between each fill to prevent freezing and possible equipment failure.



WARNING: The connection must be dry, because moisture can cause the equipment to freeze together and may cause leakage in the fill connectors.

WARNING: Clean the fill connections on the liberator and portable unit with clean, dry, disposable paper.

WARNING: Do not depress or disturb the metal poppet on the fill connector when drying it. This can cause leakage of liquid oxygen. If a leak occurs, leave the room and call your healthcare provider.

WARNING: Should leakage be excessive to the point that a stream of liquid is present, leave the area and call your health care provider immediately.

WARNING: If large amounts of vapour are being released from the units during filling, Stop. Leave the room and call your healthcare provider.

WARNING: If prolonged hissing is heard, stop use and contact your healthcare provider immediately.

3. Turn the Liberator flow control knob to the off (0) position.
4. Follow the filling instructions provided for the portable unit.



WARNING: If the portable does not separate easily, do not use force. The units may be frozen together. Leave the units connected and wait until they warm up – then they will separate easily. Do not touch any frosted parts.



CAUTION: Should there be any liquid leakage from the portable after separating the units, set the portable aside, ensuring it remains vertical, leave the room, and call your healthcare provider immediately.

CAUTION: Should there be any liquid leakage from the reservoir after separating the units, open windows in the room, leave the room and call your healthcare provider immediately.

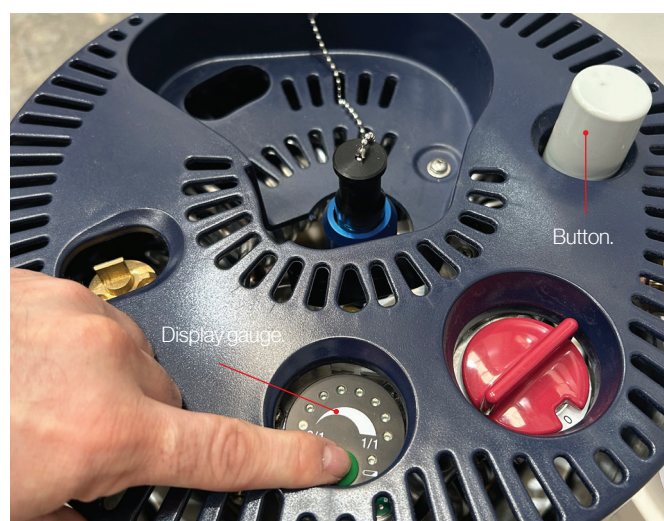
CAUTION: Check the liquid level only after the vent valve is closed.

1. Verify functionality of the gauge
 - Depress button to display level. If level is displayed and Low Battery Indicator is not illuminated, battery level is acceptable
2. To verify the level of liquid oxygen in the unit with the liquid level gauge:
 - Depress the push button on top of the unit for two seconds minimum. Read the LED to indicate contents level



CAUTION: The Liberator is empty if only the first red LED is lit.

- If the Low Battery Indicator lights up when the button is depressed, inform your health care provider the next time your Liberator is filled



Gen 4 Meter.



CAUTION: Always turn the flow control knob to off (0 position) when not in use, or when the unit is empty. **The unit will always be set at 0 when being used for filling.**



To Defrost the Unit

1. Fill a Portable so that you can continue to receive oxygen while the Liberator defrosts.
2. Set the Liberator flow control knob to 0 and allow the unit to warm to room temperature, as indicated by the melting of all ice from the unit.
3. Check the condensation collection bottle frequently during defrosting and empty as required.
4. If the Portable runs low before the Liberator is fully defrosted, you may refill it as needed.

Battery Care and Maintenance

- **Depress button to display level. If level is displayed and Low Battery Indicator is not illuminated, battery level is acceptable.**
- If the Low Battery Indicator lights up when the contents button is depressed, call your Service Provider to replace the battery.

Portable Filling and Operating Instructions

Prior to filling any portable unit, visually verify for any signs of damage or loss of functionality.

- a. Broken shroud or shroud components
- b. QDV deformation
- c. Level indicator functionality
- d. Presence of all required labels
- e. Cryogenic reservoir damage (dents, dings)
- f. If LOX is still present in the unit, inspect for heavy frost or condensation on the exterior of the unit.

Please reference the user manual of your portable liquid oxygen device for specific filling and operating instructions.



WARNING: If the portable unit is not compatible with the liberator, do not attempt to fill or use the portable unit.

Maintenance

Clean the fill connectors on both the stationary and portable units with clean, dry, disposable paper between each fill to prevent freezing and possible equipment failure.

There are no user-serviceable parts in the Liberators.

Your service provider is responsible for any maintenance that may be required per the technical manual of this device. Call your service provider for any maintenance requirements.

The expected service life is a minimum of five years.

Troubleshooting

Issue	Solution
Inadequate Flow.	- When using for filling purposes, the control knob should always be set OFF/ 0 - Verify liquid oxygen is in unit - Verify if cannula is kinked or pinched - Verify if cannula is properly connected
The liquid level meter does not work or is not accurate.	The battery may need to be replaced or the meter re-calibrated. Contact service provider for assistance
The low battery LED illuminated on liquid level meter.	Contact service provider for assistance
There is frosting on tank or side of Liberator.	Frosting on outside of tank is abnormal; contact service provider for assistance
There is a hissing sound emanating from Liberator.	- During normal operation the unit's primary relief valve will open from time to time to relieve excess pressure, especially soon after filling - If hissing is persistent or abnormal, this could indicate excess pressure being vented off or a leak in the system. Contact service provider for assistance
Liquid Oxygen evacuating from blue QDV.	- The QDV may have frozen open. Open windows if possible and evacuate area immediately. Contact service provider - To prevent frozen QDV, be sure to wipe QDV with disposable paper before and after filling your portable
Condensation or water pooling up on floor.	As the frost melts on the coils, water may accumulate on the floor if the condensate bottle is not used or is full. Verify that condensate bottle is installed properly and emptied as needed
Portable takes a long time to fill.	- It could take several minutes to fill portable device if the portable device is warm or hasn't been used recently - Consult user manual for your portable liquid oxygen device
Portable not filling.	- Ensure reservoir tank has sufficient liquid to fill your portable device. Ensure portable device is pushed onto QDV correctly and the portable vent valve lever is held in the open position - Consult user manual for your portable liquid oxygen device

Flasks Manuals and User Guides



Sprint/Stroller/Hi Flow Stroller

Symbols Glossary

ISO 7000; Graphical symbols for use on equipment – Index and synopsis.	
	Operating temperature limitation of these units is -10°C to 40°C. Storage temperature limitation range is -40°C to 70°C. Reg. # 0632.
	Portable humidity range is 15 to 95%. Base humidity range is 30 to 75%. Reg. # 2620.
	Keep away from rain, keep dry. Reg. # 0626.
	Name and address of manufacturer. Reg. # 3082.
	Caution, consult accompanying documents. Reg. # 0434A.
	Catalog Number. Reg. # 2493.
	Serial Number. Reg. # 2498.
	This way up. Reg. # 0623.
	Fragile, handle with care. Reg. # 0621.
ISO 7010: Graphical symbols – Safety colours and safety signs – Registered safety signs.	
	Frostbite may occur on contact with cold liquid or gaseous oxygen, or frosted parts. Warning low temperature. To warn of low temperature or freezing conditions. Reg. # W010.
	The instruction manual must be read. Reg. # M002.
	Keep away from open flame, fire, sparks. Open ignition source and smoking prohibited. Reg. # P003.
	Do not smoke near unit or while operating unit. Reg. # P002
	Type BF applied part (degree of protection against electric shock). Reg. # 5333.
	Warning. Reg. # W001.
Council Directive 93/42/EEC; concerning medical devices.	
	Authorized representative in the European Community.

	This device complies with the requirements of Directive 93/42/EEC concerning medical devices. It bears the CE marking as shown.
	This device complies with the requirements of Directive 2010/35/EU concerning medical devices. It bears the pi marking as shown.
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.	
	Non-toxic gas.
	Hazard Oxidizing substances: fire intensifying risk.
	Refrigerated Liquid, USP; Produced by Air Liquefaction.
Internal Symbols.	
	Keep unit well ventilated at all times.
	Keep away from flammable materials, oil and grease.
IEC 60417: Graphical Symbols for use on equipment.	
	Do not cover unit. These units normally vent oxygen. No. 5641.
21 CFR 801.15: Code of Federal Regulations Title 21.	
	Federal law restricts this device to sale by or on the order of a physician.
Council Directive 2012/19/EU: waste electrical and electronic equipment (WEEE).	
	WEEE.
IEC 60601-1: Medical electrical equipment Part 1 General requirements for basic safety and essential performance.	
	Drip Proof

This product may be covered by one or more patents, US and international. Please visit our website, Pat.: www.caireinc.com/corporate/patents/ for listing of applicable patents.

Specifications

- Mode of Operation: Continuous Flow
- Type of Protection Against Electrical Shock: Internally Powered Equipment
- Degree of Protection Against Electrical Shock:  Type BF Applied Part
- Classification According to the Degree of Protection Against Ingress of Water: IP22 – Ordinary Equipment
- Equipment not suitable for use in the presence of flammable mixtures 

Product Specifications			
	Sprint - used for low flow users	Stroller	Hi Flow Stroller
LOX Capacity	1.5 lb (0.68 kg)	3.0 lb (1.36 kg)	3.0 lb (1.36 kg)
Gaseous Equivalent Capacity	513 L	1026 L	1025 L
Weight, Empty	4.5 lb (2.04 kg)	5.0 lb (2.27 kg)	5.5 lb (2.49 kg)
Weight, Filled	6.0 lb (2.72 kg)	8.0 lb (3.63 kg)	8.5 lb (3.86 kg)
Height	11.75 in. (298 mm)	13.5 in. (343 mm)	13.5 in. (343 mm)
Dimensions	5-7/8" (149mm) D x 7.5" (191mm) W	5-7/8" (149mm) D x 7.5" (191mm) W	5.875" (149 mm) D x 7.5" (191 mm) W
Typical use time at 2 LPM	4.3 hours	8.0 hours	8.0 hours
Operating Pressure	20 psi (137 kPa)	20 psi (137 kPa)	20 psi (137 kPa)
Normal Evaporation Rate	1.3 lb/ day (0.57 kg/ day)	1.3 lb/ day (0.57 kg/ day)	1.3 lb/ day (0.57 kg/ day)
Standard Flow Control Range	Off, .25, .5, .75, 1, 1.5, 2, 2.5, 3, 4, 5, 6 LPM	Off, .5, 1, 1.5, 2, 3, 4, 5, 6, 8, 10, 15 LPM	Off, .5, 1, 2, 2.5, 3, 4, 6, 8, 10, 12, 15 LPM
Flow Rate Accuracy*	+/- 10%	+/- 10%	+/- 10%

* This accuracy is only at 70F and 14.7 psig and with a calibrated accurate mass flow meter.

Warning Information

IMPORTANT: Read this manual thoroughly before operating the Sprint/Stroller/Hi Flow Stroller.
RX Only.



WARNING: This device is not intended for life sustaining use.

WARNING: If you feel the equipment is not operating properly, call your healthcare provider. Do not attempt to repair or adjust the unit yourself.

WARNING: Do not modify this equipment without authorization from the manufacturer.

WARNING: If continuity of oxygen supply is required, ensure that an adequate supply of oxygen and/or a secondary oxygen supply is available at all times during therapy.



WARNING: Do not allow smoking, candles, or open flames within 10 feet (3 meters) of the device, or closer than 8 inches (20 cm) from any source of ignition.



WARNING: Keep your unit in a well ventilated area.



WARNING: 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: This product can expose you to chemicals including nickel, which is known to the state of California to cause cancer. For more information, go to www.p65warnings.ca.gov.



CAUTION: Use the Sprint/Stroller/Hi Flow Stroller only as directed by your doctor.

CAUTION: Federal law restricts this device to sale by or on the order of a physician.



The unit contains liquid oxygen which is extremely cold, almost -300°F (-184°C). Exposure to such a low temperature can cause severe frostbite.



Liquid and gaseous oxygen, though non-flammable, cause other materials to burn faster than normal. This hazard, along with the low temperature of liquid oxygen, warrants certain safety precautions.



Keep flammable materials away from this equipment. Aerosol sprays, oils and grease, including facial creams and petroleum jelly, ignite easily and may burn rapidly in the presence of oxygen.



Smoking while wearing an oxygen cannula can cause facial burns and possibly result in death.

Removing the cannula and placing it on clothing, bedding, sofas, or other cushion material will cause a flash fire when exposed to a cigarette, heat source, spark or flame.

If you smoke please: (1) turn off the portable, (2) take off the cannula, and (3) leave the room where the device is located.

In the event of an accidental tip-over, immediately but cautiously return the unit into an upright position if possible.

If any liquid oxygen is escaping, leave the area immediately and call your healthcare provider. Do not attempt to move the unit or stop the liquid oxygen from escaping.



Do not touch frosted parts of any unit.

Do not store or operate the portable coupled to the stationary unit.

Do not allow untrained personnel to handle or operate this device.

Use of this device is prohibited on commercial passenger and cargo air flights by the Federal Aviation Administration.

Introduction

The Sprint, Stroller, and Hi Flow Stroller are intended for the administration of supplemental oxygen to the patient in the end user's home and can also be used in institutions such as nursing homes or sub-acute care facilities. The Sprint/Stroller/Hi Flow Stroller provide an ambulatory source of oxygen for an extended period of time.

The device is used by COPD patients or those with diminished breathing capacity. The device is prescribed to the patient. The device is sold to a provider that is trained to operate and service the Sprint/Stroller/Hi Flow Stroller. The provider trains the user.

The device is not intended for life support nor does it provide any patient monitoring capabilities. It is recommended to have an alternate source of supplemental oxygen in the event of mechanical failure. These portable devices also have a quick disconnect valve that can be coupled with a reservoir lox device for transfilling the portable device. The reservoir unit is filled by your healthcare provider.

This user manual contains the instructions for using the Sprint/Stroller/Hi Flow Stroller. Refer to the user manual supplied with the stationary unit for its operation.

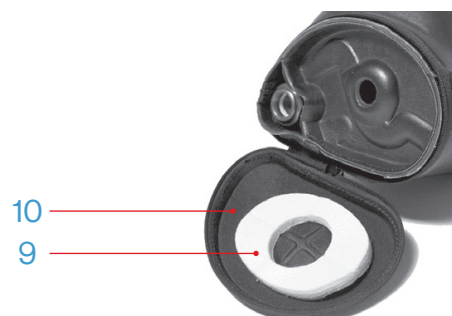
NOTE: The service provider will assist with the initial setup and instruct proper handling and usage of the unit.



Sprint, Stroller and Hi Flow Stroller units.

Controls

1. Electronic Liquid Level Gauge.
2. Electronic Liquid Level Switch.
3. Mechanical Liquid Level Gauge.
4. Flow Control Knob.
5. Oxygen Tube Connector.
6. Vent Valve.
7. Fill Connections (see next page for QDV Identification) for side fill only (NOT APPLICABLE).
8. Carrying Strap with Shoulder Pad.
9. Condensation Pad.
10. Condensation Cup.



Operating Instructions

To Fill the Top Fill Sprint/Stroller/Hi Flow Stroller

1. Clean the fill connectors on both the stationary and the Stroller/Spirit/Hi Flow Stroller with clean, dry, disposable paper.



CAUTION: The fill connectors must be dry, because moisture can cause your Sprint/Stroller/Hi Flow Stroller and stationary unit to freeze together.

2. Make sure the flow control knobs on both the Sprint/Stroller/Hi Flow Stroller and reservoir are in the off (0) position.
3. Position the fill connector in the upright position over the stationary unit's connector.



- 4a. If your connector is a push-on:
Lower the Sprint/Stroller/Hi Flow Stroller unit on to the stationary until you feel the connector engage.



- 4b. If the connector is a Penox or Life-Ox:
Rotate Sprint/Stroller/Hi Flow Stroller until you feel the connector engage. Then, carefully and firmly, rotate the Sprint/Stroller/Hi Flow Stroller clockwise (↻) while pressing downward.



NOTE: Continued on step 6 in To Fill the Side Fill Sprint/Stroller/Hi Flow Stroller.

Operating Instructions



(Cannula is not included.)

- 1. Push the cannula breathing tube firmly on to the oxygen tube connector.
- 2. Adjust your cannula breathing tube to the proper position so that you will be able to breathe the oxygen comfortably.
- 3. Turn the flow control knob on top of the Sprint/Stroller/Hi Flow Stroller clockwise until the prescribed flow rate (numeral) is visible in the knob 'window' and a positive detent is felt.

CAUTION: Out-of-specification oxygen flow will result if the flow control knob is set between flow rates.

- 4. You should be receiving oxygen now. To stop flow of oxygen, turn the flow control knob counter clockwise to the off (0) position.

CAUTION: Always turn the flow control knob off (0) when not in use.



Control knob sets the flow rate - the example shows a set flow rate of 15lpm. Set the flow rate prescribed for you when your device is in use. When you are finished or not using your device set to 0/OFF.

- 5. Use the following chart as a guideline to determine the length of time the Sprint/Stroller/Hi Flow Stroller will operate:

FCV Setting			
Model	Sprint	Stroller	Hi Flow Stroller
	Nominal	Nominal	
FCV Pos.	Sprint	Stroller	Hi Flow Stroller
Off	30:00	60:00	71:00
0.25	18:00	30:00	NA
0.5	12:12	23:00	32:00
0.75	9:18	17:24	NA
1	7:30	14:06	16:00
1.5	5:30	10:12	NA
2	4:18	8:00	8:00
2.5	3:36	6:36	6:20
3	3:06	5:36	5:20
4	2:24	4:24	4:00
5	2:00	3:36	NA
6	1:42	3:00	2:40
8	N/A	2:18	2:00
10	N/A	1:54	1:40
12	N/A	1:36	1:2-
15	N/A	1:24	1:00

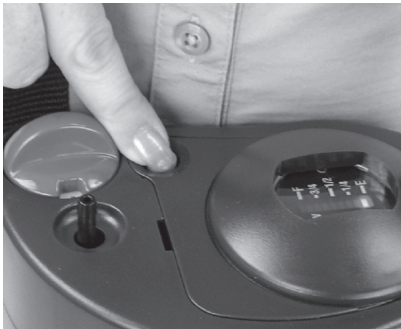
NOTE: Times are in hours and minutes (format 00:00).

NOTE: The 'Nominal' times are for ideal conditions, i.e. maximum fill, exact flow rates, good loss rate, unit not being moved, etc.

These times are the maximum expected.

NOTE: Your individual results will vary.

6. To verify the level of liquid oxygen in the unit with the electronic liquid level gauge:
- **Gen 3 Gauge:** Depress the push button (liquid level switch) on top of the unit for two seconds minimum. Read across the top of the light bar to indicate contents level



- **Gen 4 Gauge:** Press the green operate button on the face of the gauge. Read the arc of LEDs, which indicates content level



CAUTION: The Sprint/Stroller/Hi Flow Stroller/Hi Flow Stroller is empty if only the last segment of the light bar is lit.

If the Low Battery indicator lights up when the button is depressed, notify your healthcare provider.

NOTE: The Sprint/Stroller/Hi Flow Stroller/Hi Flow Stroller will continue to supply oxygen even if the Low Battery Indicator lights up, as long as there is liquid oxygen in the unit.

NOTE: If the unit is empty, only the red colored band of the scale will be exposed. If this is the case, the unit must be filled prior to use.

7. Under certain environmental conditions, with continuous use, and especially with the portable not being moved, it may develop excessive frost around the vaporizer coil and on the case. You may reduce this frost by tapping the unit and/or wiping any accumulated frost off the case.

Condensate Pad Maintenance

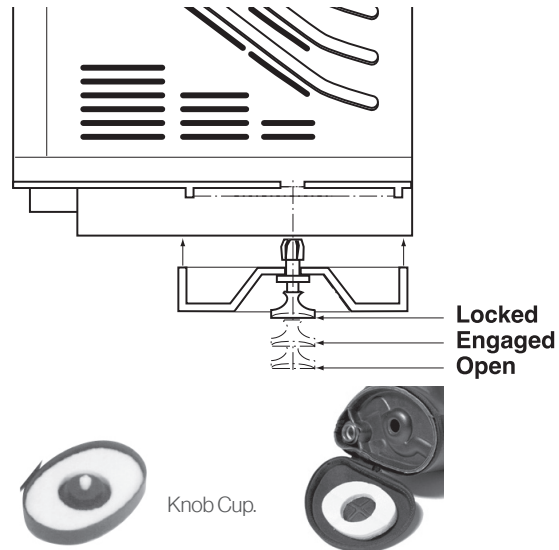
After the unit is empty and has warmed up to room temperature, remove any moisture from the condensation cup:

For hard case

- Tilt the unit to one side. Grasp the knob at the center of the condensation cup (at the bottom of the unit) and pull straight out. This will release the cup

NOTE: If heavily soiled, the pad can be machine washed (with bleach to disinfect).

- To replace the cup, center it over the round opening at the bottom of the unit and press the knob in one click to engage the cup and then a second click to lock the cup in place.



NOTE: If the knob will not push in and engage the cup, hold the cup and pull the knob out until it clicks into the open position. Now replace the cup as previously described.

For soft case

- Unzip the bottom zipper and pull back the bottom cover
- Remove the pad from the cup and wring out any absorbed moisture. Allow the pad to dry completely before replacing it in the cup

NOTE: If heavily soiled, the pad can be machine washed (with bleach to disinfect).

- To replace, simply insert pad into bottom cover and rezip the bottom zipper.

NOTE: If the knob will not push in and engage the cup, hold the cup and pull the knob out until it clicks into the open position. Now replace the cup as previously described.

Frost Reduction

Under certain environmental conditions, with continuous use, and especially with the portable not being moved, it may develop excessive frost around the vaporizer coil and on the case. You may reduce this frost by tapping the unit and/or wiping any accumulated frost off the case.



WARNING: Due to the possibility of excessive moisture / ice build up it is recommended that the Hi Flow Stroller remain idle for 1 hour after use to decrease moisture buildup.



Due to the higher flow rates associated with the Hi Flow Stroller, condensation and some frosting will occur on the unit, particularly on flow settings of 10 LPM and higher.

It is recommended that the unit be allowed at least 1 hour of inactivity after use to decrease the possibility of excessive build up due to continuous usage.

Troubleshooting

The following information is intended to help you troubleshoot and solve simple operational problems that you may experience when using your Sprint/Stroller/Hi Flow Stroller.

Issue	Solution
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. ● If the portable has been laid in an improper position return the portable to an upright position and allow several minutes for the unit to stabilize
The Portable flow stops during use.	● Ensure that the cannula is firmly attached to the Oxygen Outlet ● Ensure that the cannula is not kinked ● Check the contents indicator/level gauge and fill the portable if needed ● Ensure the flow control knob is not in the off ("0") position
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
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
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.

Safety



WARNING: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Sprint/Stroller/Hi Flow Stroller, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

WARNING: Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

WARNING: Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.



CAUTION: Medical Electrical Equipment needs special precautions regarding Electromagnetic compatibility (EMC) and needs to be installed and put into service according to the EMC information provided in this manual.

CAUTION: Portable and mobile radio frequency (RF) communications equipment can affect Medical Electrical Equipment.

Caire®/Chart® Adult Stroller Liquid Oxygen Portable Unit

How does the unit work?

- 1.25 litres of liquid oxygen is contained in an insulated portable unit at a temperature of -183°C
- The portable unit should be refilled from the base unit 20 minutes before use
- When the liquid warms in the portable unit, gaseous oxygen is produced
- Even if the portable unit is not used, the liquid will convert to gas and evaporate (this is known as venting)

Typical patient profile for the unit

- The portable unit will deliver flow rates between 0.25 – 6 litres per minute on a continuous flow
- Liquid oxygen systems are ideal for patients who may need to get out and about and don't want to rely on cylinder replenishments
- The portable unit is typically used for adults

Why choose this unit?

- The portable unit weighs about the same as a portable cylinder but lasts longer
- The liquid oxygen portable unit is a flexible solution allowing patients to manage their own ambulatory oxygen requirements without having to wait in for cylinders

Technical Data Caire®/Chart® Adult Stroller

Specification		Caire®/Chart® Adult Stroller
Dimensions (H)		34.3 cm
Weight	Empty:	2.3 kg
	Full:	3.6 kg
Litres of Liquid O ₂		1.25 ltr
Gaseous Litres		1026 ltr
Normal Evaporation Rate (NER) Typical:		0.57 kg/day
Fill Time (Warm Container)		2 minutes

Source: PN 10662631 Rev 1 – Sprint/Stroller Service Manual



Anticipated Flow Rate & Durations

Flow Rate Setting L/MIN	Duration (HH:MM)
0.250	41:40
0.500	25:55
0.750	18:45
1.00	14:45
1.50	10:20
2.00	8:00
2.50	6:25
3.00	5:25
4.00	4:05
5.00	3:20
6.00	2:45

Source: 13138009 Rev F – Sprint/Stroller Operating Instructions

Note: All durations listed above are approximate and times will vary according to usage and atmospheric conditions such as temperature and storage location of both the base unit and portable unit.

It is important to note that once the portable unit is filled, it **MUST** be allowed to stand for 20 minutes prior to use, this allows the unit to warm up to room temperature and helps to convert the liquid oxygen in to a gaseous form.

Caire®/Chart® Stroller™ Liquid Oxygen Portable

Anticipated Flow Rate & Durations

Flow Rate Setting L/MIN	Duration (HH:MM)
0.250	41:40
0.500	25:55
0.750	18:45
1.00	14:45
1.50	10:20
2.00	8:00
2.50	6:25
3.00	5:25
4.00	4:05
5.00	3:20
6.00	2:45

Source: 13138009 Rev F – Sprint/Stroller Operating Instructions

Note: All durations listed above are approximate and times will vary according to usage and atmospheric conditions such as temperature and storage location of both the base unit and portable unit.



Caire®/Chart®
Adult Stroller

To fill the Top Fill Stroller



Fig. 1



Fig. 2



Fig. 3



CAUTION

The fill connectors must be dry, because moisture can cause your Stroller and stationary unit to freeze together.

1. Clean the fill connectors on both the stationary and the Stroller using a disposable paper.
2. Make sure the flow control knobs on both the Stroller and reservoir are in the off (0) position.
3. Position the fill connector in the upright position over the stationary unit's connector (Fig. 1).
4. If your connector is a push-on: Lower the Stroller unit on to the stationary until you feel the connector engage (Fig. 2).

Note: For push-on style connector, hold the unit in place throughout the fill.

5. Open the vent valve to begin filling your Stroller. You should hear some oxygen escaping; do not worry. The hissing sound you hear is perfectly normal (Fig. 3).

Note: Liquid level gauge readings are most accurate 30 seconds or more after the Stroller is filled.

6. You may also see vapor around the connection. This is normal and is due to the large difference in temperature between the liquid oxygen and the warm air surrounding the units.
7. When the unit is full, close the vent valve. You can tell that the unit is full when the hissing sound changes in tone, and some liquid comes out of the vent line.

Note: Closing the valve after a nearly continuous stream of liquid is discharging fills the Stroller most completely, but wastes some liquid oxygen. Closing the valve at the first sign of liquid discharge does not fill the Stroller completely but it does save some liquid oxygen.

8. For the push-on style connectors, push the release button down until the units separate. For all other connectors rotate the unit until it separates from the stationary unit (Fig. 4).

Note: If the Stroller is being refilled immediately after a period of use, fill it, and then wait 10 minutes after filling with the FCV set at zero for the pressure to stabilize. Then operate as normal.



Fig. 4

Portable Release Button (push-on style only)

Caire®/Chart® Hi Flow Stroller

How does the Unit work?

- 1.25 litres of liquid oxygen is contained in an insulated portable unit at a temperature of -183°C
- The portable unit should be filled from the base unit 20 minutes before use
- When the liquid warms in the portable unit, gaseous oxygen is produced
- Even if the portable unit is not used, the liquid will convert to gas and evaporate (this is known as venting)

Typical patient profile for the Unit

- The portable unit will deliver flow rates between 0.50 - 15 litres per minute on a continuous flow
- Liquid oxygen systems are ideal for patients who may need to get out and about and don't want to rely on cylinder replenishments

Why choose this Unit?

- The portable unit is typically used for adults on high flow rates
- The portable unit weighs about the same as a portable cylinder but lasts longer
- The liquid oxygen portable unit is a flexible solution allowing patients to manage their own ambulatory oxygen requirements without having to wait in for cylinders

Technical Data Caire®/Chart® Hi Flow Stroller

Specification		Caire®/Chart® Hi Flow Stroller
Dimensions (H)		34.2 cm
Weight	Empty:	2.49 kg
	Full:	3.86 kg
Litres of Liquid O ₂		1.25 ltr
Gaseous Litres		1025 ltr
Normal Evaporation Rate (NER) Typical:		0.57 kg/day
Fill Time (Warm Container)		2 minutes

Source: CAIRE A Chart Industries Company ML-LOX0015 Rev E.



Anticipated Flow Rate & Durations

Flow Rate Setting L/MIN	Duration (HH:MM)
0.50	32:00
1.00	16:00
2.00	8:00
2.50	6:20
3.00	5:20
4.00	4:00
6.00	2:40
8.00	2:00
10.00	1:40
12.00	1:20
15.00	1:00

Source: CAIRE A Chart Industries Company Patient Operating Instructions Ref 14123888 Rev D 5/16

Note: It is very important not to unzip the outer casing of the unit to explore the internal contents as this may result in damage to the equipment or personal injury.

All durations listed above are approximate and times will vary according to usage and atmospheric conditions such as temperature and storage location of both the base unit and portable unit.

It is important to note that once the portable unit is filled, it **MUST** be allowed to stand for 20 minutes prior to use, this allows the unit to warm up to room temperature and helps to convert the liquid oxygen into a gaseous form.

Caire®/Chart® Paediatric Sprint Liquid Oxygen Portable Unit

How does the unit work?

- 0.63 litres of liquid oxygen is contained in an insulated portable unit at a temperature of -183°C
- The portable unit should be refilled from the base unit 20 minutes before use
- When the liquid warms in the portable unit, gaseous oxygen is produced
- Even if the portable unit is not used, the liquid will convert to gas and evaporate (this is known as venting)

Typical patient profile for the unit

- The portable unit will deliver flow rates between 0.03 – 2 litres per minute on a continuous flow
- Liquid oxygen systems are ideal for patients who may need to get out and about and don't want to rely on cylinder replenishments
- The portable unit is typically used for paediatrics

Why choose this unit?

- The portable unit is lighter than a portable cylinder
- The liquid oxygen portable unit is a flexible solution allowing patients to manage their own ambulatory oxygen requirements without having to wait in for cylinders

Technical Data Caire®/Chart® Paediatric Sprint

Specification		Caire® /Chart® Paediatric Sprint
Dimensions (H)		29.9 cm
Weight	Empty:	2.0 kg
	Full:	2.7 kg
Litres of Liquid O ₂		0.63 ltr
Gaseous Litres		513 ltr
Normal Evaporation Rate (NER) Typical:		0.57 kg/day
Fill Time (Warm Container)		1.5 minutes

Source: PN 10662631 Rev 1 – Sprint/Stroller Service Manual



Anticipated Flow Rate & Durations

Flow Rate Setting L/MIN	Duration (HH:MM)
0.031	30:00
0.063	30:00
0.125	30:00
0.250	20:50
0.375	15:40
0.500	12:55
0.625	10:50
0.750	9:25
1.0	7:20
1.5	5:10
2.0	4:00

Source: 13138009 Rev A – Sprint/Stroller Operating Instructions

Note: All durations listed above are approximate and times will vary according to usage and atmospheric conditions such as temperature and storage location of both the base unit and portable unit.

It is important to note that once the portable unit is filled, it **MUST** be allowed to stand for 20 minutes prior to use, this allows the unit to warm up to room temperature and helps to convert the liquid oxygen into a gaseous form.

Caire®/Chart® Sprint Liquid Oxygen Portable

Anticipated Flow Rate & Durations

Flow Rate Setting L/MIN	Duration (HH:MM)
0.250	41:40
0.500	25:55
0.750	18:45
1.00	14:45
1.50	10:20
2.00	8:00
2.50	6:25
3.00	5:25
4.00	4:05
5.00	3:20
6.00	2:45

Source: 13138009 Rev F – Sprint/Stroller Operating Instructions

Note: All durations listed above are approximate and times will vary according to usage and atmospheric conditions such as temperature and storage location of both the base unit and portable unit.



Caire®/Chart® Adult Stroller.

To fill the Top Fill Stroller



Fig. 1



Fig. 2



Fig. 3



CAUTION

The fill connectors must be dry, because moisture can cause your Sprint and stationary unit to freeze together.

1. Clean the fill connectors on both the stationary and the Sprint using disposable paper.
2. Make sure the flow control knobs on both the Sprint and reservoir are in the off (0) position.
3. Position the fill connector in the upright position over the stationary unit's connector (Fig. 1).
4. If your connector is a push-on: Lower the Sprint unit on to the stationary until you feel the connector engage (Fig. 2).

Note: For push-on style connector, hold the unit in place throughout the fill.

5. Open the vent valve to begin filling your Sprint. You should hear some oxygen escaping; do not worry. The hissing sound you hear is perfectly normal (Fig. 3).

Note: Liquid level gauge readings are most accurate 30 seconds or more after the Sprint is filled.

6. You may also see vapor around the connection. This is normal and is due to the large difference in temperature between the liquid oxygen and the warm air surrounding the units.
7. When the unit is full, close the vent valve. You can tell that the unit is full when the hissing sound changes in tone, and some liquid comes out of the vent line.

Note: Closing the valve after a nearly continuous stream of liquid is discharging fills the Sprint most completely, but wastes some liquid oxygen. Closing the valve at the first sign of liquid discharge does not fill the Sprint completely but it does save some liquid oxygen.

8. For the push-on style connectors, push the release button down until the units separate. For all other connectors rotate the unit until it separates from the stationary unit (Fig. 4).

Note: If the Sprint is being refilled immediately after a period of use, fill it, and then wait 10 minutes after filling with the FCV set at zero for the pressure to stabilize. Then operate as normal.



Fig. 4

Portable Release Button (push-on style only)

HELiOS® Marathon™ H850

Liquid Oxygen Portable Unit

How does the unit work?

- 0.84 litres of liquid oxygen is contained in an insulated lightweight portable unit at a temperature of -183°C
- The lightweight portable unit should be refilled from the base unit 20 minutes before use
- When the liquid warms in the unit, gaseous oxygen is produced
- The lightweight portable unit has the potential of delivering 18.5 hours of oxygen at a 2 litre per minute equivalency
- Even if the lightweight portable unit is not used, the liquid will convert to gas and evaporate (this is known as venting)

Typical patient profile for the unit

- The lightweight portable unit has a combination of continuous flow rates of 1 – 6 litres per minute, and on demand delivery settings of 1.5 – 4 litres per minute equivalency
- Liquid oxygen systems are ideal for patients who may need to get out and about and don't want to rely on cylinder replenishments
- The lightweight portable unit is typically used for adults only

Why choose this unit?

- The lightweight portable unit is lighter than a portable cylinder and lasts longer
- The liquid oxygen portable unit is a flexible solution allowing patients to manage their own ambulatory oxygen requirements without having to wait in for cylinders

Technical Data HELiOS® Marathon™ H850

Specification		HELiOS® Marathon™ H850
Dimensions (H)		38.6 cm
Weight	Empty:	1.63 kg
	Full:	2.54 kg
Litres of Liquid O ₂		0.836 ltr
Gaseous Litres		685 ltr
Normal Evaporation Rate (NER) Typical:		0.45 kg/day
Fill Time (Warm Container)		60 seconds
Flow Range Settings		
Continuous Mode:		1, 2, 3, 4, 5, 6
Demand Mode:		1.5, 2, 2.5, 3, 4

Source: 068820 H850 Service Manual



Anticipated Flow Rate & Durations

Flow Rate Setting L/MIN	Demand Flow Settings Duration (Hours)	Continuous Flow Settings Duration (Hours)
1.00	Not available	10.5
1.50	22.5	Not available
2.00	18.5	5.5
2.50	16	Not available
3.00	11.5	3.5
4.00	9.5	2.5
5.00	Not available	2.0
6.00	Not available	1.5

Source: 10002321H850 Operating Instructions

Note: All durations listed above are approximate and times will vary according to usage and atmospheric conditions such as temperature and storage location of both the base unit and portable unit.

It is important to note that once the portable unit is filled, it **MUST** be allowed to stand for 20 minutes prior to use, this allows the unit to warm up to room temperature and helps to convert the liquid oxygen into a gaseous form.

HELiOS® Marathon™ H850 Liquid Oxygen Portable Unit

Overview

This section contains information on how to use your HELiOS® Marathon™ H850 portable oxygen unit. Read all instructions before using the unit. Pay particular attention to safety and unit position.

Filling the Portable Oxygen Unit



WARNING

Extreme cold hazard. Do not press or disturb the plastic poppet (Fig. 1) in the center of the fill connector on the reservoir. This will cause a release of liquid oxygen from the fill connector.



WARNING

Do not leave the portable oxygen unit unattended during the filling operation.

Fill the portable oxygen unit from the reservoir using the following sequence of procedures.

- 1. Checking reservoir contents** – 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, fill the portable oxygen unit, then inform your oxygen supply company your reservoir unit needs refilling.
- 2. Cleaning and drying connectors** – Use a clean, dry, disposable paper to wipe the fill connectors dry on both the reservoir unit and the portable oxygen unit.
- 3. Properly positioning** – Position the portable oxygen unit over the recessed area in the top of the reservoir unit (Fig. 2).
- 4. Lowering into place** – Carefully lower the portable oxygen unit into place, ensuring alignment of the fill connectors.



Fig. 1 Location of Plastic Poppet

5. **Pressing straight down** – Place one or both hands on top of the portable oxygen unit and press straight down directly over the fill connector, being careful not to depress the release button on the reservoir when engaging. See Holding the Vent Valve Lever, (Fig. 3). This will lower the portable oxygen unit approximately $\frac{3}{8}$ inch (10mm). Continue to apply downward force to ensure the fill connectors remain engaged.

A Pressing continuously downward while holding, Step 5

B Pulling down and holding the vent valve lever open, Step 6



Fig. 2 Positioning for Filling



Fig. 3 Holding the Vent Valve Lever



WARNING

Do not open the vent valve during non-fill use. Excessive discharge of liquid oxygen could create a fire hazard and/or cause personal injury.

6. **Pulling down and holding vent valve lever** – While holding the portable oxygen unit in the fill position, pull down and hold the vent valve lever in the open position (90° from the normal **OFF** position). Listen for a hissing noise. Maintain a constant downward pressure on the portable oxygen unit with the hand on top to keep the portable oxygen unit steady, and maintain proper filling position. See Holding the Vent Valve Lever, (Fig. 3).



CAUTION

Do not allow the portable oxygen unit to move upward until fill is complete.

Note: When the portable oxygen unit is empty, it may take as long as four minutes to fill. The amount of time to fill the portable oxygen unit depends on the amount of oxygen remaining in the portable oxygen unit and on the pressure in the reservoir.

7. **Closing the valve** – When the sound of venting gas changes, and a dense, white vapor begins forming around the reservoir cover, close the portable oxygen unit 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 oxygen unit by pressing the portable oxygen unit release button on the reservoir. Keep the portable oxygen unit upright and do not tip at all during this time. The portable oxygen unit will stop venting in a few minutes. Allow the portable oxygen unit to warm until you can close the vent valve. The portable oxygen unit may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow. If necessary, use an alternate source of oxygen.



WARNING

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.



WARNING

Keep clear. Do not stand so any body parts extend directly over the reservoir fill connector when disengaging the portable oxygen unit. Contact with liquid oxygen can cause personal injury.



WARNING

If a major liquid oxygen leak from the reservoir fill connector occurs when you disengage the portable oxygen unit — that is, a steady stream of liquid oxygen — step away from the reservoir and notify your oxygen supplier immediately. Ventilate the room by opening windows and/or doors. Shut off stoves, heaters, and any potential source of heat, flame, or sparks. Stay away from the reservoir until your supplier ensures that it is safe.

8. Disengaging the portable oxygen unit –

Disengage from the reservoir by holding the carrying handle and pressing the release button. See Disengaging the Portable Oxygen Unit, (Fig. 4). Always hold the portable oxygen unit with at least one hand while disengaging it.



- A Pressing the release button
- B Lifting portable oxygen unit up and off the reservoir

Fig. 4 Disengaging the Portable Oxygen Unit



CAUTION

If the portable oxygen unit will not easily disengage from the reservoir, it may have become frozen. Do not use force. Simply allow a few minutes for the frozen parts to warm, then disengage the portable oxygen unit after the ice melts.



CAUTION

If a minor liquid oxygen leak from the reservoir fill connector occurs when you disengage the portable oxygen unit, re-engage and disengage the portable to help dislodge any ice or other obstruction. Ventilate the room by opening windows and/or doors. Shut off stoves, heaters, and any potential source of heat, flame, or sparks. If the liquid oxygen leak persists, notify your oxygen supplier.



CAUTION

If the hissing sound from the portable oxygen unit does not stop within ten minutes after a fill, and excessive visible frosting develops on the portable oxygen unit, see Troubleshooting.

Note: Immediately after filling, you may hear a slight hissing sound from the portable oxygen unit. This is normal and will stop after a few minutes.

9. **Checking the oxygen contents indicator** – Make sure the portable oxygen unit is full. The amount of liquid oxygen contained in the portable oxygen unit is measured by a built-in internal scale. To operate the contents indicator follow the listed steps.
- Lift the portable oxygen unit by the contents indicator strap.
 - Push the bottom backside of the portable oxygen unit so that it is straight up and down.
 - Observe the green bar that displays the liquid oxygen contents level inside the clear window.
- See Checking Portable Oxygen Level, (Fig. 5).



Lifting by Strap

Pushing Straight

Checking Indicator

Fig. 5 Checking Portable Oxygen Level



WARNING

Do not overfill the portable oxygen unit. After you hear a change in the sound of venting gas and see the cloud of white vapor, the portable oxygen unit is full. Attempts to overfill may cause drops of liquid oxygen to spray from the bottom of the portable oxygen unit and cause injury.



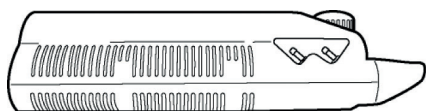
CAUTION

Recommended reservoirs for your portable oxygen unit:

- Companion™ C21, C31, or C41 liquid oxygen system.
- Companion™ Low Loss C31LL liquid oxygen system.
- HELiOS™ H36 or H46 personal oxygen system.
- HELiOS™ U36 or U46 universal reservoir.

Filling the portable oxygen unit may take up to four minutes. Filling it from a reservoir other than a H36 or H46 may take a wait time up to 30 minutes after fill for accurate oxygen flow. Lay the portable oxygen unit on its back and set the Flow Control knob to **OFF** during the wait time.

Note: After each fill, wait for at least 30 minutes before refilling the portable oxygen unit again. This will prevent potential freezing of the vent valve and minimise wasted oxygen. The frequency required to fill or top off the portable oxygen unit varies, based on breath rate and prescribed oxygen rate setting. Additionally, excess moisture or extreme temperatures may reduce oxygen duration.



Laying portable oxygen unit on its back



Setting Flow Control knob to **OFF**

Fig. 6 Positioning for Wait Time After Fill

HELiOS Marathon™ H850 Portable Oxygen Unit

Home Use Guide

HELiOS is a trademark of CAIRE Inc.

To obtain information about a warranty, if any, contact CAIRE Inc. Technical Services Department, or your local representative.

This device is intended only for the delivery of medical grade oxygen as prescribed by your physician. If you have questions about the operation of the equipment, please contact your oxygen supplier.

Safety Information

Overview

This section contains important safety information related to general use of the HELiOS MARATHON™ H850 portable oxygen system, which consists of the portable oxygen unit and a liquid oxygen reservoir.

Other important safety information appears with its relevant material throughout the manual. Read all text surrounding precautionary information.

Before use, carefully read this manual and all precautionary information in boldface type, as well as the product specifications.

Warnings



WARNINGS are identified by the WARNING symbol shown left or other relevant symbols, as shown on the following pages. Warnings alert the user to potential serious outcomes (death, injury, or adverse events) to the patient or user.



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.



WARNING: Where the prescribing healthcare professional has determined that an interruption in the supply of oxygen, for any reason, may have serious consequences to the user, an alternate source of oxygen should be available for immediate use.





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



WARNING: 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.



WARNING: 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.



WARNING: At higher flow rates, the exterior of the portable may become extremely cold. Avoid skin contact. Do not touch frosted parts.



WARNING: Always keep the reservoir in an upright position.



WARNING: Always keep the H850 portable oxygen unit in one of the following positions: upright, flat on its back or angled at some position in between.



WARNING: When transporting the H850 portable oxygen unit, position the H850 horizontally, flat side down, to ensure it does not tip over. Tipping over and falling off a transport surface could damage the H850 portable oxygen unit or cause personal injury.



WARNING: Keep this equipment away from electrical appliances. Use and store reservoir and H850 portable oxygen unit at least five feet from electrical appliances that may cause heat or sparks.



WARNING: Keep oxygen equipment away from open flames. Use and store reservoir and H850 portable oxygen unit at least five feet away from equipment such as furnaces, water heaters, and stoves that may contain open flames.



WARNING: Keep equipment in a well-ventilated area at all times. The reservoir and H850 portable oxygen unit 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 H850 portable oxygen unit under your clothing. The reservoir and H850 portable oxygen unit normally vent oxygen. Wearing a H850 portable oxygen 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.



WARNING: Keep dry.



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



WARNING: As with all medical equipment, carefully route patient tubing to reduce the possibility of patient entanglement or strangulation. Always keep tubing or oxygen supply line away from path of walking to avoid potential trip or fall.



WARNING: Use only with recommended supply line. Connecting the H850 portable oxygen unit to a wrong gas source could cause inhalation of hazardous substances.



WARNING: Do not open the vent valve during non-fill use, or put it into any position other than the closed, upright, or vertical position.

 **CAUTIONS** are identified by the CAUTION symbol shown left. Cautions alert the user to exercise care necessary for the safe and effective use of the HELiOS Marathon H850 portable oxygen unit.

 **CAUTION:** If there is any indication or suspicion the equipment is not working properly, immediately contact your healthcare provider.

 **CAUTION:** Keep the fill connectors on both the portable oxygen unit and the HELiOS reservoir dry.

 **CAUTION:** Use the nose cannula specified by your healthcare provider or caregiver appropriate to the situation (rest, exercise, sleep). Differences in nasal cannula design may vary the ability to trigger the conserving device used in the H850.

 **CAUTION:** Return all used or faulty components under warranty to the manufacturer. Dispose of old components in compliance with environmental standards for your country.

 **CAUTION:** Remove the 9 volt battery from the reservoir contents indicator if it will not be used for some time. See Replacing the Reservoir Battery, page 39. If the battery is dead, dispose of the battery from the reservoir contents indicator in compliance with environmental standards for your country.

Notes

 **NOTES** are identified by the NOTE symbol shown left. Notes are listed before or after procedural steps or information and provide additional guidelines or information on the subject being described.

Definition of Symbols

Symbol	Definition
	Reservoir Full
	Reservoir Empty
	Portable Full
	Portable Half Full
	Portable Empty
	Low Battery
IPX 1	Drip Proof
	Type BF (Electrical Safety)



Name and address of manufacturer.



Authorised representation in the European Community.

Portable Oxygen Unit Safety Label

The label on the HELiOS MARATHON™ H850 portable oxygen unit provides basic safety information. Adhere to all safety guidelines listed on the label.



Introduction



WARNING: At higher flow rates, the exterior of the portable may become extremely cold. Avoid skin contact. Do not touch frosted parts.

Your HELiOS MARATHON™ H850 portable oxygen unit is designed to store and deliver oxygen at a prescribed rate. The HELiOS Marathon H850 portable oxygen system is LATEX-FREE and consists of the portable oxygen unit and a reservoir.

The portable oxygen unit delivers continuous flow oxygen, based on the selected flow setting. See Breathing from a Portable Oxygen Unit, page 62, for details on setting flow rates.



CAUTION: Use the nose cannula specified by your healthcare provider or caregiver appropriate to the situation (rest, exercise, sleep). Differences in nasal cannula design may vary the ability to trigger the conserving device used in the H850 portable oxygen unit.

Breathe through your nose and not your mouth, since the HELiOS Marathon H850 portable oxygen unit is designed to sense nasal cannula breathing. Breathe only the prescribed oxygen rate from the portable oxygen unit. There are two different means of obtaining the oxygen you need using the HELiOS Marathon H850 portable oxygen unit.

- Portable Mode**—Fill the portable with liquid oxygen and move freely about your home or leave your home for extended periods. The HELiOS Marathon H850 portable unit was designed to maximize freedom of movement. Fill the portable with liquid oxygen from the reservoir every day to use as far from the reservoir as desired.
- Tandem Mode**—You can connect the portable to the reservoir. See Connecting the Portable Oxygen Unit to the HELiOS Reservoir, page 66. When at home and not moving about, connect the portable oxygen unit to your reservoir with an oxygen supply line. When the HELiOS Marathon H850 portable oxygen unit is connected to a HELiOS reservoir in this manner, the reservoir supplies oxygen, rather than the portable oxygen unit.



CAUTION: The oxygen supply line should only be used when the H850 flow control knob is set to a demand mode setting.

Have your oxygen supplier or homecare provider refill your reservoir periodically, depending on your oxygen use rate.

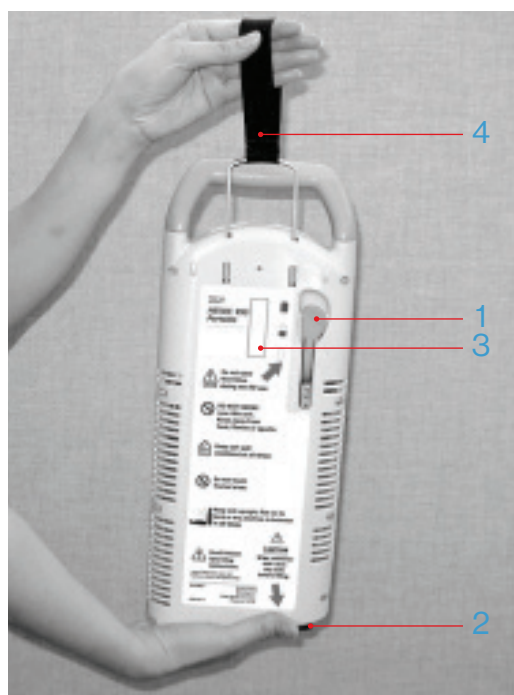
Figure 1. HELiOS Marathon H850 Portable Oxygen Unit - Front View.



5. **Oxygen Inlet Connector** – Attach oxygen supply line to supply H850 portable oxygen unit with oxygen from the reservoir.
6. **Carrying Handle.**

1. **Flow Control Knob** – Use adjustable, rotary valve to control the rate of oxygen delivery and to select either continuous flow or demand flow.
2. **Oxygen Delivery Connector** – Use a dual-lumen cannula at all times in the size(s) prescribed by your physician to receive oxygen from the portable oxygen unit. It must be a dual-lumen cannula for the portable oxygen unit to function properly.
3. **Sense Connector** – Attach the dual-lumen cannula to control the oxygen flow with each breath.
4. **Liquid Oxygen Fill Connector** – Use connector located on the bottom of the unit for attaching H850 portable oxygen unit to reservoir during the filling process.

Figure 2. HELiOS Marathon H850 Portable Oxygen Unit- Rear View.



1. **Vent Valve** – Used to start and stop the filling process.
2. **Liquid Oxygen Fill Connector** – Used to fill the H850 portable oxygen unit with liquid oxygen.
3. **Contents Indicator** – Used to display the amount of liquid oxygen in the H850 portable oxygen unit.
4. **Contents Indicator Strap** – Used to lift the H850 portable oxygen unit to measure the amount of oxygen it contains.

Figure 3. Portable Oxygen Unit Accessories.



**Dual-lumen
Cannula**



**Carrier
(Backpack
option)**



**Carrier
(Shoulder
strap option)**

Using Your HELiOS Marathon H850 Portable Oxygen Unit

Overview

This section contains information on how to use your HELiOS MARATHON™ H850 portable oxygen unit. Read all instructions before using the unit. Pay particular attention to safety and unit position.

Filling the Portable Oxygen Unit



WARNING: 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.



WARNING: Do not leave the portable oxygen unit unattended during the filling operation.



Figure 5. Location of Plastic Poppet.

Fill the portable oxygen unit from the reservoir using the following sequence of procedures.

1. **Checking reservoir contents** – 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, fill the portable oxygen unit, then inform your oxygen supply company your reservoir unit needs refilling.



WARNING: Use a clean, dry, disposable paper to wipe the fill connector dry on both the reservoir and HELiOS Marathon H850 portable oxygen unit before filling to prevent freezing and possible equipment failure.

2. **Cleaning and drying connectors** – Use clean, dry, disposable paper to wipe the fill connectors dry on both the reservoir unit and the portable oxygen unit.
3. **Properly positioning** – Position the portable oxygen unit over the recessed area in the top of the reservoir unit.



Figure 6. Positioning for Filling.

4. **Lowering into place** – Carefully lower the portable oxygen unit into place, ensuring alignment of the fill connectors.

5. **Pressing straight down** – Place one or both hands on top of the portable oxygen unit and press straight down directly over the fill connector, being careful not to depress the release button on the reservoir when engaging.

See Holding the Vent Valve Lever, Figure 7. This will lower the portable oxygen unit approximately 3/8 inch (10 mm). Continue to apply downward force to ensure the fill connectors remain engaged.

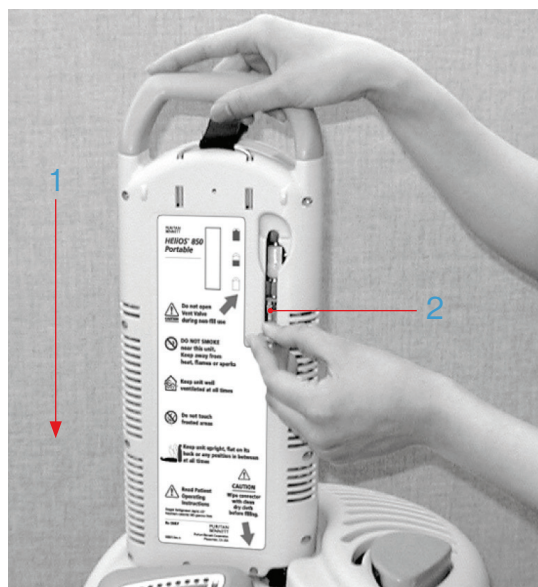


Figure 7. Holding the Vent Valve Lever.

1. Pressing continuously downward while holding, Step 5.
2. Pulling down and holding the vent valve lever open, Step 6.



WARNING: Do not open the vent valve during non-fill use. Excessive discharge of liquid oxygen could create a fire hazard and/or cause personal injury.

6. **Pulling down and holding vent valve lever** - While holding the portable oxygen unit in the fill position, pull down and hold the vent valve lever in the open position (90° from the normal OFF position). Listen for a hissing noise.

Maintain a constant downward pressure on the portable oxygen unit with the hand on top to keep the portable oxygen unit steady, and maintain proper filling position. See Holding the Vent Valve Lever, Figure 7.



CAUTION: Do not allow the portable oxygen unit to move upward until fill is complete.



NOTE: When the portable oxygen unit is empty, it may take as long as four minutes to fill. The amount of time to fill the portable oxygen unit depends on the amount of oxygen remaining in the portable oxygen unit and on the pressure in the reservoir.

7. **Closing the valve** – When the sound of venting gas changes, and a dense, white vapor begins forming around the reservoir cover, close the portable oxygen unit 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 oxygen unit by pressing the portable oxygen unit release button on the reservoir. Keep the portable oxygen unit upright and do not tip at all during this time. The portable oxygen unit will stop venting in a few minutes. Allow the portable oxygen unit to warm until you can close the vent valve. The portable oxygen unit may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow. If necessary, use an alternate source of oxygen such as an external flow control device, B-701655-00. See Accessories, page 72.



WARNING: 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.



WARNING: Keep clear. Do not stand so any body parts extend directly over the reservoir fill connector when disengaging the portable oxygen unit. Contact with liquid oxygen can cause personal injury.



WARNING: If a major liquid oxygen leak from the reservoir fill connector occurs when you disengage the portable oxygen unit — that is, a steady stream of liquid oxygen — step away from the reservoir and notify your oxygen supplier immediately. Ventilate the room by opening windows and/or doors. Shut off stoves, heaters, and any potential source of heat, flame, or sparks. Stay away from the reservoir until your supplier ensures that it is safe.

8. **Disengaging the portable oxygen unit —**
Disengage from the reservoir by holding the carrying handle and pressing the release button. See Disengaging the Portable Oxygen Unit, Figure 8. Always hold the portable oxygen unit with at least one hand while disengaging it.

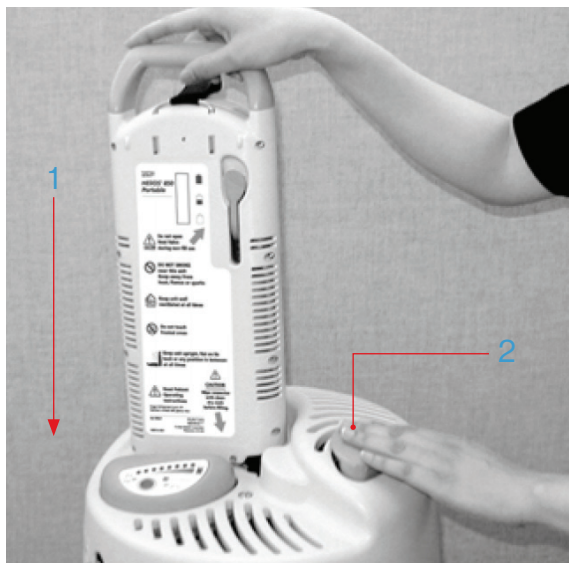


Figure 8. Disengaging the Portable Oxygen Unit.

1. Pressing the release button.
2. Lifting portable oxygen unit up and off the reservoir.



CAUTION: If the portable oxygen unit will not easily disengage from the reservoir, it may have become frozen. Do not use force. Simply allow a few minutes for the frozen parts to warm, then disengage the portable oxygen unit after the ice melts.



CAUTION: If a minor liquid oxygen leak from the reservoir fill connector occurs when you disengage the portable oxygen unit, re-engage and disengage the portable to help dislodge any ice or other obstruction. Ventilate the room by opening windows and/or doors. Shut off stoves, heaters, and any potential source of heat, flame, or sparks. If the liquid oxygen leak persists, notify your oxygen supplier.

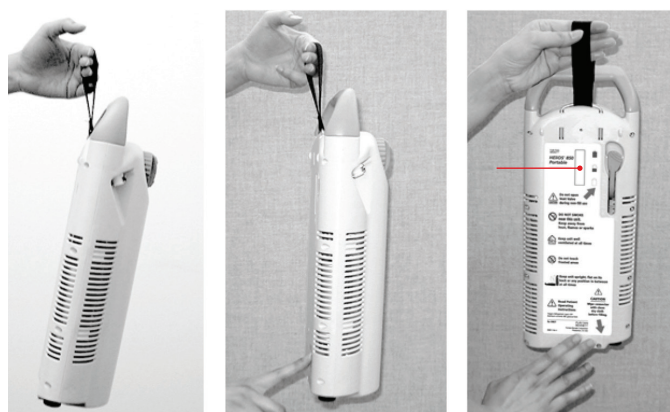


CAUTION: If the hissing sound from the portable oxygen unit does not stop within ten minutes after a fill, and excessive visible frosting develops on the portable oxygen unit, see Troubleshooting, page 70.



NOTE: Immediately after filling, you may hear a slight hissing sound from the portable oxygen unit. This is normal and will stop after a few minutes.

9. **Checking the oxygen contents indicator**
– Make sure the portable oxygen unit is full. The amount of liquid oxygen contained in the portable oxygen unit is measured by a built-in internal scale. To operate the contents indicator follow the listed steps.
 - a. Lift the portable oxygen unit by the contents indicator strap.
 - b. Push the bottom backside of the portable oxygen unit so that it is straight up and down.
 - c. Observe the green bar that displays the liquid oxygen contents level inside the clear window. See Checking Portable Oxygen Level, Figure 9.



Lifting by Strap Pushing Straight Checking Indicator

Figure 9. Checking Portable Oxygen Level.



WARNING: Do not overfill the portable oxygen unit. After you hear a change in the sound of venting gas and see the cloud of white vapor, the portable oxygen unit is full. Attempts to overfill may cause drops of liquid oxygen to spray from the bottom of the portable oxygen unit and cause injury.



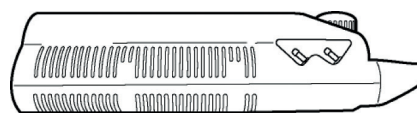
CAUTION: Recommended reservoirs for your portable oxygen unit:

- COMPANION™ C21, C31, or C41 liquid oxygen system.
- COMPANION™ Low Loss C31LL liquid oxygen system.
- HELIOS™ H36 or H46 personal oxygen system.
- HELIOS™ U36 or U46 universal reservoir.

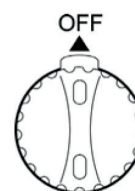
Filling the portable oxygen unit may take up to four minutes. Filling it from a reservoir other than a H36 or H46 may take a wait time up to 30 minutes after fill for accurate oxygen flow. Lay the portable oxygen unit on its back and set the Flow Control knob to OFF during the wait time.



NOTE: After each fill, wait for at least 30 minutes before refilling the portable oxygen unit again. This will prevent potential freezing of the vent valve and minimize wasted oxygen. The frequency required to fill or top off the portable oxygen unit varies, based on breath rate and prescribed oxygen rate setting. Additionally, excess moisture or extreme temperatures may reduce oxygen duration.



Laying portable oxygen unit on its back



Setting Flow Control knob to **OFF**

Figure 10. Positioning for Wait Time After Fill.

Breathing from a Portable Oxygen Unit

Use a **dual-lumen nasal cannula** with your portable oxygen unit. The nasal cannula has two connections at the portable oxygen unit. One connection is used to sense when you inhale, the other connection is used to supply oxygen into your nose.



NOTE: Currently, there are two dual-lumen cannula designs available for use with the H850. One cannula provides sensing and delivery of oxygen in each nostril. This is the best one to use with a blocked nasal passage. The other provides oxygen only to one side of the nose and senses when to provide oxygen on the other. Also, the tips are slightly smaller and softer.

1. **Attaching the dual-lumen cannula** – Attach both ends of the dual-lumen cannula to the portable oxygen unit. See Attaching to Dual-Lumen Cannula Barbs, Figure 11. Either end of the dual-lumen cannula may be attached to either connector on the portable oxygen unit.



NOTE: Separate or pull apart the connector ends of the dual-lumen cannula a minimum of five inches to prevent the cannula from kinking while attaching the cannula connectors to the barbs on the unit.



NOTE: The lower connector is used to sense when you inhale. The upper connector is used to supply oxygen to your nose.

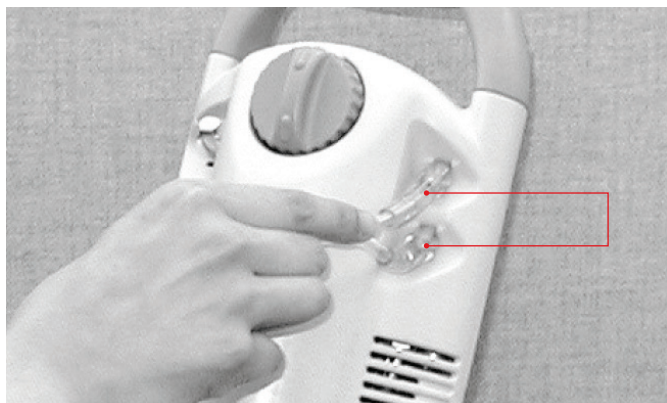


Figure 11. Attaching to Dual-Lumen Cannula Barbs.

2. **Setting the oxygen flow rate** – The portable oxygen unit has two delivery modes to help you control the rate of oxygen that flows to you through the dual-lumen nasal cannula: continuous mode and demand mode. The rate of oxygen you need for when you are resting may be different than the rate you need when you are moving about. Set your rate to the setting prescribed by your physician.
 - a. **Continuous Mode** – Oxygen will flow at a continuous, steady rate. Turn the flow control knob on the top of the portable oxygen unit counterclockwise for continuous flow rates of 1, 2, 3, 4, 5, 6 liters per minute (lpm) on the 'C' settings from C1 through C6, respectively. See Flow setting options, Figure 12.
 - b. **Demand Mode** – Oxygen will flow only while you inhale through your nose. 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. Turn the flow control knob on the top of the portable oxygen unit clockwise for demand flow rates of D1.5, D2, D2.5, D3 and D4.

These settings do not necessarily correspond to liters per minute (lpm). Patients who use these settings should do so only after their healthcare provider determines the appropriate setting. See Flow setting options, Figure 12.

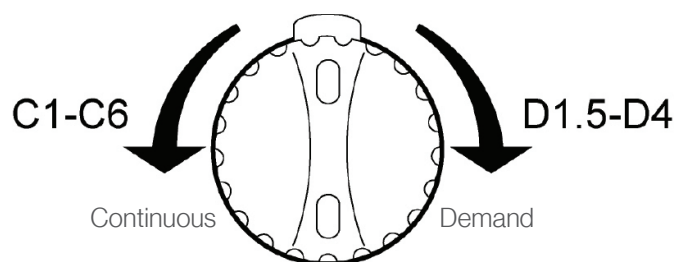


Figure 12. Flow setting options.

The flow setting value should be clearly visible in the center of the window. See Setting the Flow Rate, Figure 13.



Figure 13. Setting the Flow Rate.

Approximate use times for your portable oxygen unit after it has been completely filled may vary slightly. The usage values shown reflect a breathing pattern typical for oxygen patients.

Table 1. Approximate Use Times for Full Unit.

Flow Control Setting	Duration in Hours
Continuous Flow	
C1	10.5
C2	5.5
C3	3.5
C4	2.5
C5	2.0
C6	1.5
Demand Flow	
D1.5	22.5
D2	18.5
D2.5	16.0
D3	11.5
D4	9.5

CAUTION: Times may vary. If you use the portable oxygen unit in the horizontal position on its back, use times may also be reduced.

CAUTION: The portable oxygen unit will not deliver oxygen to you if the flow control knob is set between flow settings.

CAUTION: You must use a 7-foot length or shorter dual-lumen cannula to ensure proper oxygen delivery from the portable oxygen unit. See Accessories, page 72. Verify both connections of the dual-lumen cannula are firmly attached to the portable oxygen unit oxygen outlet and sensor connectors.

NOTE: Your use time may vary substantially from the use times listed in the table. You should learn through experience how long the portable oxygen unit will last given your particular breathing patterns and activity level.

3. Positioning the dual-lumen cannula –

With the tips of the cannula and lip rest pointing downward and toward you, place the two tips into your nostrils.

- Standard position** – Run the tubing over your ears and then slide the sleeve up under your chin until the cannula feels comfortable. Then breathe normally. See Standard Cannula Placement (Under Chin), Figure 14 below.
- Alternate position** – Bring the cannula over your head from behind and run the tubing over your ears. Leave the sleeve loose and allow the tubing to fall down your back or over your shoulder and around to the portable oxygen unit. Then breathe normally. See Alternate Cannula Placement (Behind Neck), Figure 15 on page 65.



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



NOTE: Occasionally water droplets from condensed exhalations 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.

Figure 14. Standard Cannula Placement (Under Chin).





Figure 15. Alternate Cannula Placement (Behind Neck).

4. **Monitoring the oxygen contents indicator** – The contents indicator registers approximately how much liquid oxygen remains in the portable oxygen unit. To ensure you have enough oxygen to meet your needs, check the indicator periodically.



CAUTION: When checking contents, remove any carry accessories and ensure your nasal cannula is not pulling on the portable oxygen unit.

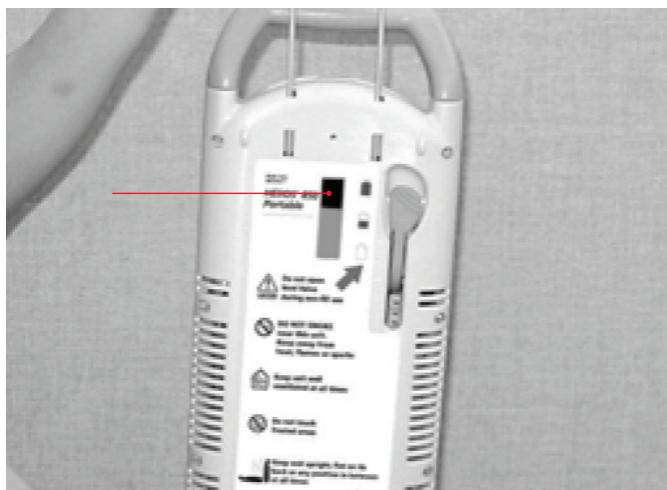


Figure 16. Locating Contents Indicator.

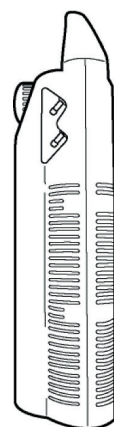
Positioning the Portable Oxygen Unit during use



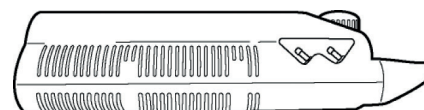
WARNING: Always keep the portable oxygen unit in one of the following positions: upright, flat on its back or angled at a position in between the two. Do not place the unit on its face. Doing so could cause the device to malfunction and release liquid oxygen. Such leaks increase the risk of frostbite and shorten the time you can be away from the reservoir.

The portable oxygen unit design allows it to operate in a variety of positions. Always keep the portable oxygen unit in one of these positions or liquid oxygen may escape.

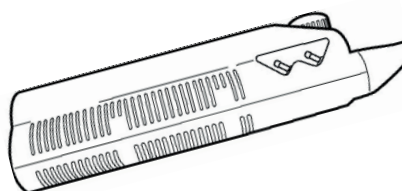
1. Sitting upright.
2. Lying flat on its back, but not on its face.
3. Angled, anywhere in between upright and flat on its back.



Placing Upright



Placing Flat on Back



Placing Angled Between Upright and Flat on Back

Figure 17. Acceptable Positions for Portable.

Do not place the portable oxygen unit in any unacceptable position.



WARNING: If your portable oxygen unit is in an unacceptable position for more than five minutes, check the contents level to see how much oxygen remains, and set the portable oxygen unit in an acceptable position for at least 15 minutes before attempting to fill it. Unacceptable positions may cause loss of oxygen, freeze or chill the vent valve lever and prevent filling, or create the risk of frostbite.

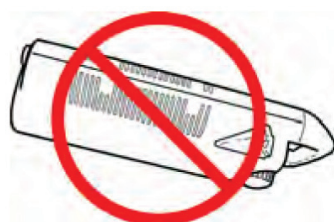
1. Lying on its back with the handle lower than the bottom of the portable oxygen unit.
2. Lying on its front or edge.
3. Lying on its front with the handle lower than the bottom of the portable oxygen unit.



Placing Tipped On Back with Handle Lower than Bottom



Placing Flat on Face or Edge



Placing Tipped on Face with Handle Lower than Bottom

Figure 18. Unacceptable Positions for Portable

Travelling with the Portable Oxygen Unit

Travelling by Car

Map out the route you will take before you leave. Determine whether your oxygen supply will suffice. If the distance and time spent on the road is greater than the portable oxygen unit can manage, plan appropriate stops along the way where oxygen services are available to refill it. Contact your oxygen supplier for alternate suppliers along your route or have them contact suppliers and arrange to have the oxygen ready when you arrive.

Travelling by Bus

Contact the bus company ahead of time for restrictions or policies regarding the use of supplemental oxygen on board their bus lines.

Travelling by Plane

Many airlines prevent clientele from using a personal portable oxygen unit. Rather, clientele must use oxygen supplied by the airline and there may be a supplemental charge for this service.

In addition, many airlines require a prescription from your physician before providing oxygen during flight. For this reason, non-stop flights are optimal, since there is no need to arrange for oxygen between flights, for layovers or flight delays.

Contact your oxygen supplier, who may assist you with making appropriate pre-boarding, in-flight, and post-landing arrangements for oxygen.

Travelling by Train

Contact the railway line ahead of time for restrictions or policies regarding the use of supplemental oxygen on board their trains.

Travelling by Cruise Line

Notify your travel agent or cruise line of your supplemental oxygen needs. Some cruise lines provide oxygen, while others do not. If they do not, provide your oxygen supplier plenty of advance notice to deliver adequate oxygen supply to the ship prior to departure and for refills at ports of call along the way.

In addition, many airlines require a prescription from your physician before providing oxygen during flight. For this reason, non-stop flights are optimal, since there is no need to arrange for oxygen between flights, for layovers or flight delays.

Contact your oxygen supplier, who may assist you with making appropriate pre-boarding, in-flight, and post-landing arrangements for oxygen.

Troubleshooting

Overview

The following information is intended to help you troubleshoot and solve simple operational problems with your HELiOS MARATHON™ H850 portable oxygen unit.

Potential Problems

Identify the problem you are having and take the listed corrective action. If your problem persists, contact your service provider or your CAIRE, Inc. Technical Support at 1.800.482.2473.

1. The portable oxygen unit does not pulse after filling.

If during the filling process, the portable oxygen unit is disengaged with the vent valve lever open, pressure may be reduced within the portable oxygen unit and cause a delay in its function. It may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow. Additionally, the portable oxygen unit will not pulse properly when improper filling lowers normal operating pressures.

2. The portable oxygen unit makes a hissing sound.

The portable oxygen unit is most likely to hiss after filling or with a change in the position of the portable oxygen unit or when the flow control valve is at a low setting. Hissing can last for approximately ten minutes after filling. Hissing can be evidence of a leak or normally occur to correct the internal operating pressure of the unit.

3. Excessive frost and hissing.



WARNING: 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.

- a. Some hissing and frosting on the portable oxygen unit is normal. If, however, the hissing continues after a fill or anytime during usage and there is excessive frosting on the portable oxygen unit, stop using the portable oxygen unit and contact your homecare provider for service.
 - b. Excessive frost formation on the portable oxygen unit 30 minutes after a fill while the Flow Control knob is in the OFF position may be a result of possible system malfunction. Stop using the portable oxygen unit and contact your homecare provider for service.
- ### 4. Portable oxygen unit stops pulsing during use.
- a. Verify there is sufficient oxygen in the portable oxygen unit.
 - b. Check your flow setting and make sure it is set to a Demand Mode (D1.5 to D4) setting.
 - c. Ensure both connections of the dual-lumen cannula are firmly attached to the oxygen outlet and sensor connectors.
 - d. Change the cannula if excessive water droplets are present, since this reduces oxygen flow. Replace the cannula with a dry one, which should enable the portable oxygen unit to pulse.
 - e. Verify the cannula is not kinked or pinched.
 - f. Check the cannula. Ensure the cannula tips remain in your nostrils and do not slide to one side. With the cannula on, close your mouth and breathe only through your nose to verify that the portable oxygen unit has stopped pulsing.

5. **The portable oxygen unit does not fill.**

- Verify there is oxygen in the reservoir. If the reservoir has a pounds-per-square-inch (psi) pressure gauge, make sure it reads between 20 psi and 48 psi.
- Ensure the portable oxygen unit and reservoir fill connectors are fully engaged throughout the filling process.

6. **The portable oxygen unit vent valve does not close properly at the end of the filling process.**



WARNING: 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.

If the vent valve fails to close and the hissing sound and oxygen vapor cloud continue, carefully remove the portable oxygen unit by pressing the release button on the reservoir. Venting from the bottom of the portable oxygen unit should stop in a few minutes. Keep the portable oxygen unit upright, allowing it to warm until you can close the vent valve. The portable oxygen unit may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow. While waiting for the portable oxygen unit, use an alternate source of oxygen such as an external flow control device, B-701655-00. See Accessories, page 72.

7. **Frost forms on the oxygen supply line connected to the reservoir.**



WARNING: 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.

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 homecare provider.

8. **The portable oxygen unit does not disengage easily from the reservoir after filling.**



WARNING: 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.



WARNING: Keep clear. Do not stand so any body parts extend directly over the reservoir fill connector when disengaging the portable oxygen unit. Contact with liquid oxygen can cause personal injury.

The portable oxygen unit and reservoir fill connectors may have become frozen. Do not use force. Allow a few minutes for the frozen parts to warm. After the ice melts, disengage the portable oxygen unit. To prevent the reservoir and portable oxygen unit from freezing together, always wipe the male fill connector on the reservoir and the female fill connector on the portable oxygen unit with clean, dry, disposable paper before filling.

9. **The portable has been removed from the reservoir and the reservoir is leaking a large amount of liquid oxygen.**



WARNING: 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.

- a. Do not attempt to reconnect the portable oxygen unit to the reservoir.
- b. Stay away from the reservoir.
- c. Open windows and doors to ventilate the area.
- d. Shut off stoves, heaters, and any other potential source of flame or heat.
- e. Immediately contact your homecare provider or the company that fills your reservoir.
- f. Do not, under any circumstances, use any heat source, such as a hair dryer, to try to melt ice build up on the portable oxygen unit or the reservoir.
- g. Do not use hot or cold water to try to melt ice build up. The water may freeze at the site of the leak, holding the valve open and prevent the connector from closing.
- h. Do not walk on areas exposed to liquid oxygen for 60 minutes after frost disappears.



NOTE: Providers, if a major liquid oxygen discharge (steady stream) occurs, open the vent valve on the reservoir to vent the pressure and halt the flow of liquid oxygen. If unable to safely open the vent valve, remove all persons from the area and ventilate the area by opening windows and doors. Do not walk on areas exposed to liquid oxygen for 60 minutes after frost disappears.

Product Specifications

Operating Environmental Specification

-20 °C to 40 °C (-4 °F to 104 °F).
95% maximum relative humidity.

Storage Environmental Specification

-40 °C to 70 °C (-40 °F to 158 °F).
95% maximum relative humidity.

Important Information Record About Your Prescription

Your name:

Doctor's name:

Doctor's phone number:

Date your H850 portable oxygen unit was received:

Prescribed oxygen flow settings:

During sleep _____

At rest _____

During exercise _____

Home care company's name:

Home care company's phone number:

Emergency contact's name:

Emergency contact's phone number:

Special Instructions:

Troubleshooting

My base unit hisses occasionally, what does this mean?

This is normal and is due to the base unit releasing pressure that has built up inside it. There is no need to be worried about this. Your base unit is always recommended to be situated in a well ventilated part of the home or outbuilding.

My portable unit is stuck on the base unit, what should I do?

The units may be frozen together. It is important not to try to force the units apart as this may damage the connectors. Close the vent valve handle on the portable unit and leave it attached to the base unit. Wait until it warms up, they should then separate easily. Remember not to touch any frosted parts. This is the reason why you should clean the fill ports before each filling session.

My base unit is spitting out after I have filled the portable unit and removed it, what should I do?

Engage the portable with the base unit again. Engaging and disengaging it can help dislodge any ice crystals that may be present. If the spitting does not stop, engage the portable with the base unit again, then you should immediately leave the area and call our customer service team.

There is a constant stream of liquid escaping from my base unit after I have filled the portable unit and removed it, what should I do?

Do not attempt to connect the portable unit again. You should immediately leave the area. The base unit and portable should not be moved and the portable should remain upright. If it is safe and you are able to do so, open a window and close the door before leaving. The leak should stop on its own once any ice has melted. Call our customer service team.

My portable unit is spitting out after I have filled it, what should I do?

Leave the portable unit in a ventilated area until this stops. If this happens on more than one occasion call our customer service team.

All the lights on my base unit have suddenly gone out or they are flashing, what does this mean?

This may mean that there is a fault with the gauge. You should call our customer service team.

My portable unit is not lasting, is there a fault with it?

Even if you do not use your portable unit after filling, the liquid will convert to gas and evaporate over time (this is known as venting). You should refer to the equipment filling guide provided for your equipment for an estimated portable unit duration. If you have any concerns call our customer service team.

ALWAYS fill your portable unit 30 minutes prior to use as this allows the LOX to stabilise and achieve its optimum operating pressure. If you fill it too far in advance, the LOX will evaporate resulting in a shorter duration and/or becoming empty more quickly. Refer to your user manual.

My portable unit is not releasing any oxygen, is it faulty?

This may be caused by one or more of the following:

1. The portable could be empty. Check the contents gauge to ensure the portable contains LOX.
2. The flow selector could be set to 0 (zero). Check that it is on and set to the prescribed flow rate.
3. The nasal cannula or mask tubing could be kinked or disconnected. Check the connections and positioning to ensure flow is unobstructed.
4. You may be trying to use the portable too soon after filling. Please wait 30 minutes after filling to allow the LOX to evaporate and convert to gas which will pressurise the portable.
5. **Please note, HELiOS portables are unique in that they are designed in a way that continuous flow will stop if no breath is detected. Please ensure that both trumpet ends of the dual lumen nasal cannula are firmly attached to the outlets on the portable and that the cannula remains fitted inside your nostrils. Please take a deliberate breath through your nose to initiate constant flow.**

If you have any further questions please either ask your technician or call our customer service team or view our LOX video on our website
www.airliquidehealthcare.ie



Filling the Portable Oxygen Unit

The contents gauge will indicate how much liquid oxygen is in your portable unit.

You should fill the portable unit at least 30 minutes before you want to use it. Our LOX technician will spend time demonstrating this to you and will allow you the opportunity to complete a fill while we are present.

Filling your portable is straightforward once you know how, please follow the steps below and refer to your specific filling guide for your portable model.

1. Wash your hands before handling the oxygen equipment.
2. Wipe both blue filling connectors using disposable paper. Take care to keep the portable unit upright to prevent any LOX escaping and do not disturb the poppet at the centre of the fill connector.
3. Ensure the flow rate selector on your portable unit is turned to 0 (zero).
4. Locate the vent valve lever on the portable unit. Position yourself beside the base unit so that when you connect the portable unit you are standing on the opposite side to the vent valve lever.
5. Hold the portable unit with both hands ensuring the blue fill connectors are positioned in line with each other (one on the base unit and one on the portable unit). Press down firmly.
6. Begin filling the portable unit by pressing down the vent valve handle to the open position for 20-30 seconds at a time, then release. Do this one or more times to prevent the valves from freezing open. The hissing sound and vapour is completely normal. Continue to apply downward pressure on the portable unit to maintain a connection. This is an important step as it stops ice crystals forming and prevents the portable unit from freezing to the base unit. Please note that this will require a certain degree of strength.
7. The portable unit is full when the hissing sound changes in tone and a dense white vapour is seen around the base unit. When a 'spitting' sound is observed, close the vent valve by raising the vent valve lever to stop the fill.
8. Always hold the top of the portable unit with one hand. Press the release button on the base unit until the portable unit separates and lift it up and off the base unit. If this does not work, allow the units a few minutes to warm up and they should separate easily. **NEVER** attempt to speed up the melting process by applying heat (such as hairdryer or warm water) of any description due to the risk of fire.
9. Check the portable unit contents indicator to verify the unit is full. Please speak with your technician if you are unsure about how to do this.
10. Set the unit aside to settle for 30 minutes.

Using your Portable Liquid Oxygen Unit

After you have waited 30 minutes, your portable LOX unit is ready to use:

1. Connect the specific LOX cannula to the oxygen outlet. Only use the cannula provided by our team.
2. Turn the flow rate selector (on the top or front of the portable unit) to the flow rate prescribed by your healthcare professional. Take care that the flow rate selector has been set accurately to your prescribed flow rate

ALWAYS check that your LOX unit is turned off/flow rate turned to 0 (zero) when finished using or when you are not using your portable unit. Once filled the oxygen should be used. The oxygen evaporates over a short period of time and will decrease if not used. Only fill your flask when you intend to use your oxygen.

Please return any empty dewars or portable flasks that are not being used. Please notify us if you have been admitted to Hospital so we can reschedule your replenishment.

Travelling with LOX

Liquid oxygen flasks should be stored upright behind the passenger seat of the car. **NEVER** allow the flask to lie on the passenger seat, back seat or footwell of the car. It is advisable that you contact your vehicle insurance company to inform them of your requirement to carry liquid oxygen.



Notes

Notes

Contact:
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Dublin 15, D15 PEC4.
Email: healthie@airliquide.ie
Tel: 1800 24 02 02
www.airliquidehealthcare.ie



Air Liquide Healthcare is a world leader in medical gases, home healthcare, hygiene products and healthcare specialty ingredients. It aims to provide customers in the continuum of care from hospital to home with medical products, specialty ingredients and services that contribute to protecting vulnerable lives.

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