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# HELIOS™ Plus & Marathon

## Symbols Glossary

ISO 7000; Graphical symbols for use on equipment—Index and synopsis	
	Read user's manual before operation. Reg. # 1641
	Operating temperature limitation of these units is -10°C to 40°C. Storage temperature limitation range is -40°C to 70°C. Reg. # 0632
	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 colors 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
	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.
UN1073 OXYGEN, REFRIGERATED LIQUID	Refrigerated Liquid, USP; Produced by Air Liquefaction
Internal Symbols	
	Keep unit well ventilated at all times
	Keep away from flammable materials, oil and grease.
	Portable Empty
	Portable Full
	Always keep Portable in one of the following positions: upright, flat on its back, or any position in between.
	Wipe connector with clean dry cloth before filling.
IEC 60417: Graphical Symbols for use on equipment	
	Do not cover unit or carry portable unit under your clothing. These units normally vent oxygen. No. 5641
21 CFR 801.15: Code of Federal Regulations Title 21	
<b>RX ONLY</b>	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	
<b>IPX 1</b>	Drip Proof

## Specifications


- Mode of Operation: Demand and Continuous Flow
- Type of Protection Against Electrical Shock: Internally Powered Equipment
-  Degree of Protection Against Electrical Shock: Type BF Applied Part
- IPX1 Classification According to the Degree of Protection Against Ingress of Water: Drip Proof
-  Equipment not suitable for use in the presence of flammable mixtures


	HELIOS Plus (H300)	HELIOS Marathon (H850)
LOX capacity	0.9 lb (0,41 kg)	2.0 lb (0,91 kg)
Gaseous equivalent capacity	308 L	685 L
Weight, filled	3.6 lb (1,63 kg)	5.6 lb (2,54 kg)
Weight, empty	2.7 lb (1,22 kg)	3.6 lb (1,63 kg)
Height including handle	10.5" (267 mm)	15.0" (381 mm)
Typical use time at 2 LPM demand mode	9 hours	22 hours
Typical use time at 2 LPM continuous mode	N/A	6.1 hours
Operating pressure	22 psi (152 kPa)	22 psi (152 kPa)
Normal evaporation rate	1.0 lb/day (0,45 kg/day)	0.85 lb/day (0,39 kg/day)
Standard flow control range	Continuous: off, .12, .25, .5, .75 Demand: off, 1, 1.5, 2, 2.5, 3, 3.5, 4	Continuous: off, 1,2,3,4,5,6 Demand: off, 1.5, 2, 2.5, 3, 4

## Warning Information

**Important:** Read this manual thoroughly before operating the H300/H850.

RX Only.

	<b>WARNING:</b> This device is not intended for life sustaining use.
	<b>WARNING:</b> If you feel the equipment is not operating properly, call your health care provider. Do not attempt to repair or adjust the unit yourself.
	<b>WARNING:</b> Do not modify this equipment without authorization from the manufacturer.

	<b>Caution:</b> Use the H300/H850 Portable only as directed by your doctor.
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The unit contains liquid oxygen which is extremely cold, almost -300°F. Exposure to such a low temperature can cause severe frostbite.



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



Do not use or store your unit in an area where combustible materials such as oils, greases, aerosol sprays, lotions or solvents are present.



Do not smoke while operating the unit.

Do not use or store your unit within five feet of electrical appliances, especially stoves, heaters, toasters, and hair dryers.



Keep your unit in a well-ventilated area.

Do not carry the portable unit under your clothing.

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 touch frosted parts of any unit.

Do not store the HELIOS portable coupled to your reservoir.

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

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

Applicable EMC information can be found in the Companion Portable Technical Service Manual at [www.CAIREmedical.com](http://www.CAIREmedical.com).

# HELIOS™ Plus & Marathon

## Introduction

A liquid oxygen system is designed to provide supplementary oxygen as prescribed by a physician. Your liquid oxygen system includes a HELiOS portable unit and a stationary reservoir. The reservoir is the larger container that is used to fill your HELiOS portable. This user manual contains only the instructions for using the HELiOS portable. Refer to the user manual supplied with your reservoir unit for information on its operation.

HELiOS portable liquid oxygen units are designed to be an ambulatory source of oxygen for an extended period of time. They are filled with liquid oxygen from a reservoir unit with a compatible fill connector. HELiOS portables are available in two different sizes.

The H300 Plus is primarily a conserving device and holds 0.38 Liters of liquid oxygen. It provides demand (pulse) flow settings 1-4, and limited low dose continuous flow settings at 0.75 LPM and below only.

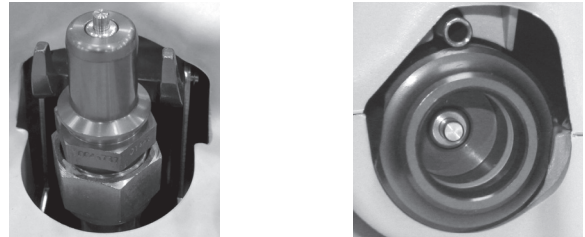
The H850 Marathon can be used as a conserving or continuous flow device and holds 0.84 liters of liquid oxygen. It provides continuous flow from 1-6 LPM and demand flow on settings of 1-4.



H300 and H850 portable units shown.

## Fill Connector Compatibility

The H300 and H850 can be filled from any CAIRE top-fill (TF) reservoir that has a CAIRE-style male fill connector. The compatible male and female connections for the HELiOS portable units are shown here.



CAIRE male (reservoir) and female (H300/H850) fill connectors

## Dual Lumen Cannula

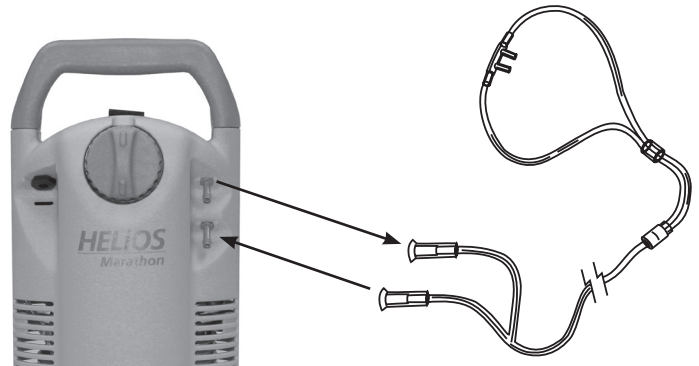
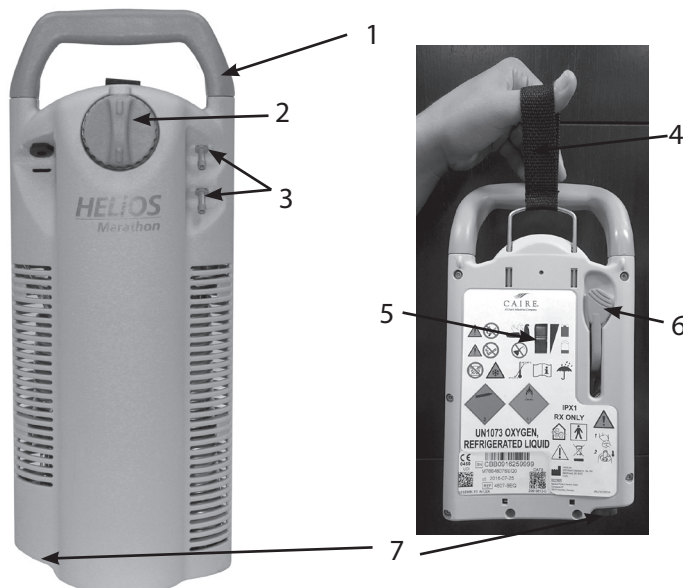
In order to breathe from your H300 or H850, you must do so through a dual lumen nasal cannula. This type of cannula has two connections to the portable unit. One connection is used to detect when you inhale, and the other connection is used to deliver oxygen to your nose.

A single lumen cannula cannot be used on the H300/H850. Your breath through the cannula provides the force necessary to open the flow control valve and deliver oxygen. You must use a dual lumen cannula and inhale through your nose on ALL flow settings to ensure that oxygen is properly delivered.

Note: Oxygen will only be delivered through the top cannula barb.

## Controls

1. Carrying Handle
2. Flow Control Knob
3. Dual Lumen Cannula Barbs
4. Contents Indicator Strap
5. Contents Indicator Window
6. Vent Valve Lever
7. Fill Connector (QDV)



Dual lumen nasal cannula operation: Oxygen is delivered through top port. Breath is detected through bottom port.

## Operating Instructions – Filling

1. Clean the fill connectors on the H300/H850 and the reservoir with a clean, dry, lint-free cloth.

	<b>WARNING:</b> The fill connectors must be clean and dry with a lint-free cloth on both the stationary and portable units to prevent freezing and possible equipment failure.
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2. Turn the flow control knob on the H300/H850 to the off (“0”) position.
3. Hold the H300/H850 with both hands and position its fill connector over the reservoir fill connector.
4. Lower the portable onto the reservoir until you feel the connectors engage.



5. Place one hand on top of the H300/H850 and apply a constant downward force.
6. Open the vent valve by pulling downward on the vent valve lever to begin the filling process. You will hear a hissing sound that is perfectly normal.



7. You may see vapor around the fill connection. This is normal due to the great difference in temperature between the liquid oxygen and the warm surrounding air.
8. Maintain a downward force on the H300/H850 with one hand during the entire filling process and keep the vent valve lever open with the other hand.
9. Approximately 20-30 seconds into the fill, close and re-open the vent valve one or more times. This will prevent the valve from freezing open.
10. The unit is full when the hissing sound changes in tone and a dense

white vapor is seen coming from under the shroud of the reservoir. When this is observed, close the vent valve by raising the vent valve lever. This will terminate the fill.

11. Hold the handle on the H300/H850 and push the release button on the reservoir until the portable separates (release button varies by model of reservoir).



12. Check the contents indicator to verify that the unit is full.



**Caution:** If the H300/H850 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, reattach the H300/H850 to the reservoir immediately. Again, separate the units. If the problem persists, leave the units attached and call your health care provider immediately.

**Caution:** Should there be any liquid leakage from the reservoir after separating the units, immediately place a dry towel over the reservoir. Open windows in the room and call your health care provider immediately.

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



**WARNING:** Do not operate the H300/H850 while attached to the reservoir unit.

**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.



**Caution:** If the H300/H850 is being refilled immediately after a period of use, fill it, and then wait approximately 30 minutes after filling with the flow control knob set to off (“0”) for the pressure to stabilize. Then operate as normal.

**NOTE:** If the HELIOS portable is warm or has not been filled recently, it may take up to 90 seconds to fill an H300 or up to 4 minutes to fill an H850.

# HELiOS™ Plus & Marathon

## Operating Instructions – Breathing From the Portable

1. Attach both ends of a dual-lumen cannula to the connection ports on the H300/H850. Either end of the cannula may be attached to either connection port on the portable.



2. Position the nasal cannula properly on your face so that you will be able to breathe comfortably.

3. Turn the flow control knob until the setting prescribed by your physician is fully visible in the window on top of the H300/H850.



4. Breathe normally, inhaling through your nose. Oxygen delivery will not begin until you inhale through the nasal cannula.

**NOTE:** If the unit is on a demand (pulse) setting, you will notice a small pulse at the beginning of each inhalation. Oxygen is delivered during this pulse, and continues as long as you inhale. Oxygen flow stops when you stop inhaling.

**NOTE:** If the unit is in continuous flow, the H300/H850 will deliver a steady stream of oxygen. You must continue to breathe through the nasal cannula normally to continue receiving continuous flow.

5. You should be receiving oxygen flow now. Verify that you feel oxygen delivery.

6. Use the duration charts available at [www.CAIREmedical.com](http://www.CAIREmedical.com) as a guideline to determine the length of time the H300/H850 will operate.

7. Under certain conditions (especially continuous use when the portable is not moved) the H300/H850 may develop frost on the case. You may reduce this frost by wiping any accumulated frost off the case.

8. To stop the flow of oxygen, turn the flow control knob to the off (0) position.



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

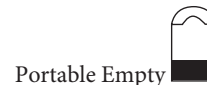
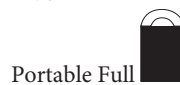


**NOTE:** Do not open the vent valve during normal operation.

**NOTE:** The H300/H850 may be operated in an upright position, flat on its back, or any position in between these two locations.

## Operating Instructions – Level Verification

1. Lift the H300/H850 by the contents indicator strap.
2. Push the bottom backside of the unit forward until it is straight up and down.
3. Observe the green bar in the contents indicator window. The window is completely filled with the green bar when the unit is full of liquid oxygen.



Checking the H300/H850 contents indicator

## User Troubleshooting

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

1. The Portable makes a hissing sound.

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

2. The Portable does not pulse after filling.

If during the filling process, the Portable is disengaged with the vent valve lever down, pressure may be reduced within the Portable causing a delay in the conserving device function. It may require as much as 60 minutes to restore adequate pressure for accurate oxygen flow.

Additionally, improper filling or lower than normal operating pressure in the Reservoir will contribute to the unit not pulsing.

3. The Portable stops pulsing during use.

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

4. The Portable does not fill.

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


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

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

6. 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.


## Cleaning Standard

	<b>WARNING:</b> Clean only after the unit is empty and vented.
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- Clean using either a household glass cleaner or a solution of mild dish washing detergent and water.
- Apply cleaning solution directly to a lint-free cloth. Do not spray cleaners directly on the H300/H850.
- Wipe the outside surface with the lint-free cloth until the outside surface is clean.
- Do not get cleaner on any internal components or valves.
- Allow the unit to dry thoroughly before using.

## WEEE and RoHS

This symbol is to remind the equipment owners to return it to a recycling facility at the end of its life, per Waste Electrical and Electronic Equipment (WEEE) Directive.

 Our products will comply with the restriction of Hazardous Substances (RoHS) directive. They will not contain more than trace amounts of lead or other hazardous material content.

## Transport and Storage

The device should be stored in the upright position well ventilated. Do not allow the device to be tilted forward or laying on its front. Operating temperature range of -10°C to 40°C. Storage temperature ranges from -40°C to 70°C.

## Maintenance

Clean the fill connectors on both the stationary and portable units with a clean, dry, lint-free cloth between each fill to prevent freezing and possible equipment failure.

NOTE: Any additional maintenance needed must be done by a qualified service technician or service provider.

## Accessories

		
Backpack—HELIOS H850 Marathon	Hip pack—HELIOS H300	H850 Cart



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