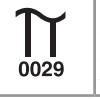
Spirit®

User Manual (US)

CAIRE®

User Controls & System Status Indicators

ISO 7000	
	Read user's manual before operation. Reg. # 1641
	Keep away from rain, keep dry. Reg. # 0626
	Stacking limit by number. Reg. #2403
	Name and address of manufacturer. Reg. # 3082
	The country and date of manufacture. The "CC" identifies the two letter country code of the country of manufacture. The date of manufacture is in YYYY-MM-DD format. Reg. # 6049
	Caution, consult accompanying documents. Reg. # 0434A
	Catalog Number. Reg. # 2493
	Serial Number. Reg. # 2498
	Storage or operating temperature range. Reg. # 0632
	Storage humidity range Reg. # 2620
	Atmospheric pressure limitation. Reg. # 2621
	This way up. Reg. # 0623
	Fragile, handle with care. Reg. # 0621
	Contains hazardous substances. Reg. # 3723
	Importer. Reg. # 3725
ISO 7010	
	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	
	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	
	Non-toxic gas.
	Hazard Oxidizing substances: fire intensifying risk. Oxidizing agents cause fires to burn more vigorously.
	Refrigerated Liquid, USP; Produced by Air Liquefaction
Additional Symbols	
	Keep unit well ventilated at all times
	Keep away from flammable materials, oil and grease.
	Authorized representative in Switzerland.
	If the device bears the UKCA mark as shown with UKCA#### indicating the notified body number, this device complies with UKCA regulations.

IEC 60417	
	Do not cover unit or carry portable unit under your clothing. These units normally vent oxygen. No. 5641
21 CFR 801.15	
RX ONLY	Federal law restricts this device to sale by or on the order of a physician.
IEC 60601-1	
IP22	Drip Proof IP22
Council Directive 2012/19/EU	
	WEEE 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.

ISO 15223-1	
MD	Medical Device. Reg. # 5.7.7
UDI	Unique device identifier # 5.7.10

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

- Mode of Operation: Demand/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			
	Spirit 300	**Spirit 600**	**Spirit 1200**
LOX capacity	0.8 lb (0,36 kg)	1.5 lb (0,68 kg)	3.0 lb (1,36 kg)
Gaseous equivalent capacity	275 L	516 L	1026 L
Weight, empty	3.5 lb (1,6 kg)	4.1 lb (1,86 kg)	5.0 lb (2,27 kg)
Weight, filled	4.3 lb (1,95 kg)	5.6 lb (2,54 kg)	8 lb (3,63 kg)
Height	8.8 in. (223 mm)	11.5 in. (292 mm)	14.0 in. (335 mm)
Typical use time at 20 BPM demand mode	8 hours	16.1 hours	30.4 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	Demand: Off 1,1.5, 2, 3, 4, 5 Continuous: 2 LPM	Demand: Off 1,1.5, 2, 3, 4, 5 Continuous: 2 LPM	Demand: Off 1,1.5, 2, 3, 4, 5 Continuous: 2 LPM

Warning Information

Important: Read this manual thoroughly before operating the Spirit.
RX Only.

WARNING: THIS DEVICE IS NOT INTENDED FOR LIFE SUSTAINING USE. GERIATRIC, PEDIATRIC, OR ANY OTHER PATIENT UNABLE TO COMMUNICATE DISCOMFORT CAN REQUIRE ADDITIONAL MONITORING TO AVOID HARM.

WARNING: IF YOU FEEL THE EQUIPMENT IS NOT OPERATING PROPERLY, CALL YOUR HEALTH CARE 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: PATIENT OR OTHERS MAY BE ENTANGLED IN CANNULA OR OTHER TUBING CAUSING ASPHYXIATION.

WARNING: TO ENSURE RECEIVING THE THERAPEUTIC AMOUNT OF OXYGEN DELIVERY ACCORDING TO YOUR MEDICAL CONDITION, THE SPIRIT MUST BE USED ONLY AFTER ONE OR MORE SETTINGS HAVE BEEN INDIVIDUALLY PRESCRIBED FOR YOU AT YOUR SPECIFIC ACTIVITY LEVEL AND BE USED WITH THE SPECIFIC COMBINATION OF PARTS AND ACCESSORIES THAT ARE IN LINE WITH THE SPECIFICATION OF THE OXYGEN CONSERVER MANUFACTURER AND THAT WERE USED WHILE YOUR SETTINGS WERE DETERMINED.

WARNING: USE ONLY WATER BASED LOTIONS OR SALVES THAT ARE OXYGEN COMPATIBLE DURING SETUP OR USE DURING OXYGEN THERAPY. NEVER USE PETROLEUM OR OIL-BASED LOTIONS OR SALVES TO AVOID THE RISK OF FIRE AND BURNS.

WARNING: USE OF THIS DEVICE AT AN ALTITUDE ABOVE 10,000 FEET OR OUTSIDE A TEMPERATURE OF -10º C TO 40º C IS EXPECTED TO ADVERSELY AFFECT THE QUALITY OF THE THERAPY.

WARNING: IF YOU FEEL DISCOMFORT OR ARE EXPERIENCING A MEDICAL EMERGENCY, SEEK MEDICAL ASSISTANCE IMMEDIATELY TO AVOID HARM.

WARNING: DO NOT LUBRICATE REPLACABLE FITTINGS, CONNECTIONS, TUBING OR OTHER ACCESSORIES OF THE OXYGEN CONSERVER TO AVOID THE RISK OF FIRE AND BURNS

WARNING: WIND OR STRONG DRAUGHTS CAN ADVERSELY AFFECT ACCURATE DELIVERY OF OXYGEN THERAPY

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 REOCCURRENCE OF THE INCIDENT. THE USER CAN ALSO REPORT THE INCIDENT TO THE COMPETENT AUTHORITY IN THE COUNTRY WHERE THE INCIDENT OCCURRED.

Caution: Use the Spirit only as directed by your doctor.

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

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

Note: 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.

Note: 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.

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

WARNING: OXYGEN MAKES IT EASIER FOR A FIRE TO STARTAND SPREAD. DO NOT LEAVE THE NASAL CANNULA ON CLOTHING, SOFAS, BED COVERINGS OR CHAIR CUSHIONS, IF THE OXYGEN CONSERVER IS TURNED ON, BUT NOT IN USE; THE OXYGEN WILL MAKE THE MATERIALS FLAMMABLE. TURN THE OXYGEN CONSERVER OFF WHEN NOT IN USE.

WARNING: SMOKING DURING OXYGEN THERAPY IS DANGEROUS AND IS LIKELY TO RESULT IN FACIAL BURNS OR DEATH. DO NOT ALLOW SMOKING OR OPEN FLAMES WITHIN THE SAME ROOM OF THE OXYGEN CONSERVER OR ANY OXYGEN CARRYING ACCESSORIES. IF YOU SMOKE, YOU MUST ALWAYS TURN THE OXYGEN CONSERVER OFF, REMOVE THE CANNULA AND LEAVE THE ROOM WHERE EITHER THE CANNULA OR THE OXYGEN CONSERVER IS LOCATED. IF UNABLE TO LEAVE THE ROOM, YOU MUST WAIT 10 MINUTES AFTER THE FLOW OF OXYGEN HAS BEEN STOPPED.

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 stationary unit.

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.

Note: To Equipment Provider: The following oxygen administration accessories are recommended for use with the Spirit:

- Nasal Cannula: CAIRE Part Number 5408-SEQ
- Firebreak: CAIRE Part Number 21126636

A firebreak is recommended for use with any cannula.

- CAIRE offers a firebreak intended to be used in conjunction with the oxygen portable. The firebreak is a thermal fuse to stop the flow of gas in the event that the downstream cannula or oxygen tubing is ignited and burns to the firebreak. It is placed in-line with the nasal cannula or oxygen tubing between the patient and the oxygen outlet of the Spirit. For proper use of the firebreak, always refer to the manufacturer's instructions (included with each firebreak kit).
- Additional recommended accessories information is available online at www.caireinc.com.

Intended Use

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

The Spirit Portable provides an ambulatory source of oxygen for an extended period of time. You fill the Spirit from a liquid oxygen stationary unit. The compact, lightweight Spirit was developed to increase mobility and improve comfort of the typical supplemental oxygen user.

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

The Spirit Portables 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 device is not intended for life support nor does it provide any patient monitoring capabilities. The device is not for use with tracheotomised patients. 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 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 Spirit Portables. The provider trains the user.

Spirit 600

Controls

1. Contents Indicator
2. Flow Rate Selection Knob
3. Oxygen Outlet Connector
4. Fill Connections
   (See next page for QDV Identification)
5. Vent Valve
6. Batteries (2) C-Cell (inside case)

Quick Disconnect Valve (QDV) Identification

Portable Connector	Stationary Connector	QDV Style	
		CAIRE Side Fill	SF Locking
		LIFE-OX	TF Locking
		PENOX	
		TAEMA	TF Push-On
		PB	

Operating Instructions

To Fill the Top Fill Spirit

1. Clean the fill connectors on both the stationary and the Spirit with a clean, dry, lint-free cloth.

WARNING: THE FILL CONNECTORS MUST BE DRY, BECAUSE MOISTURE CAN CAUSE YOUR SPIRIT AND STATIONARY UNIT TO FREEZE TOGETHER.

WARNING: DO NOT LEAVE UNITS UNATTENDED WHILE FILLING.

2. Make sure the flow control knob on the Spirit is in the off (0) position.

3. Position the fill connector in the upright position over the stationary unit's connector.

4. a. If your connector is a push-on: Lower the Spirit unit on to the stationary until you feel the connector engage.

b. If the connector is a Penox, Life-Ox, or Lincare: Rotate Spirit until you feel the connector engage. Then, carefully and firmly, rotate the Spirit clockwise (↻) while pressing downward.

5. Now the units are locked together

To Fill the Side Fill Spirit

1. Clean the fill connectors on both the stationary and the Spirit with a clean, dry, lint-free cloth.

WARNING: THE FILL CONNECTORS MUST BE DRY, BECAUSE MOISTURE CAN CAUSE YOUR SPIRIT AND STATIONARY UNIT TO FREEZE TOGETHER.

WARNING: DO NOT LEAVE UNITS UNATTENDED WHILE FILLING.

2. Make sure the flow control knob on theSpirit is in the off (0) position.
3. Mate the Spirit fill connector in the upright position to the stationary connector.

4. Rotate the Spirit counterclockwise (↺) until you feel the pin and slot engage.

5. Carefully and firmly rotate the Spirit back to the upright position. Now the units are locked together.

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

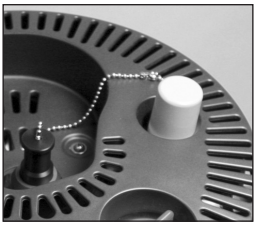
6. Open the vent valve to begin filling your Spirit. You should hear some oxygen escaping; do not worry. The hissing sound you hear is perfectly normal.

7. You may also see vapor around the connection. This is normal and is due to the great difference in temperature between the liquid oxygen and the warm air surrounding the units.
8. 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 Spirit most completely, but wastes some liquid oxygen.

Note: Closing the valve at the first sign of liquid discharge does not fill the Spirit as completely, but saves liquid oxygen.

9. 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.



Portable Release Button (push-on style only)

WARNING: DO NOT OPERATE SPIRIT WHILE ATTACHED TO THE STATIONARY UNIT.

WARNING: IF LARGE AMOUNTS OF VAPOR ARE ISSUING FROM THE UNITS DURING FILLING, STOP FILLING, LEAVE THE ROOM AND CALL YOUR HEALTH CARE PROVIDER.

WARNING: IF PROLONGED HISSING IS HEARD, STOP USE AND CONTACT YOUR HEALTH CARE PROVIDER IMMEDIATELY

WARNING: LIQUID OR COLD GASEOUS OXYGEN CAN FROSTBITE THE SKIN. OXYGEN WILL RESULT IN INCREASED FIRE HAZARD.

WARNING: IF THE SPIRIT DOES NOT SEPARATE EASILY, DO NOT USE FORCE. THE UNITS MAY BE FROZEN TOGETHER. LEAVE THE UNITS CONNECTED AND WAIT UNTIL THE UNITS WARM UP—THEN THEY WILL SEPARATE EASILY. DO NOT TOUCH ANY FROSTED PARTS.

Caution: Should there be any liquid leakage from the stationary unit or Spirit separating the units, set the Spirit aside, ensuring it remains vertical, leave the room, and call your health care provider immediately.

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

Caution: If the Spirit is being refilled immediately after a period of use, fill the Spirit and then wait 10 minutes after filling with the flow rate selection knob set at zero for the pressure to stabilize. Then operate as normal.

Operating Instructions

1. Push the cannula breathing tube firmly onto the oxygen tube connector.

Cannula is not included.

2. Adjust the cannula breathing tube to the proper position so that you will be able to breathe the oxygen comfortably.

Note: Ensure the cannula is fully inserted and secure. During inhalation, you should hear or feel oxygen flow to the prongs of the nasal cannula. The proper placement and positioning of the prongs of the nasal cannula in your nose is critical to the amount of oxygen delivered to the respiratory system of the end user.

3. Turn the flow rate selection knob on top of the Spirit clockwise until the prescribed flow rate (numeral) is visible in the knob "window" and a positive detent is felt.

4. With each breath, you should now be receiving a set dosage of oxygen gas. The LED will illuminate green with each breath, signaling that the Spirit delivery system is being triggered. When the LED illuminates red with each breath, it is time to replace the batteries.

Note: Make sure that the flow selector knob fully engages at the selected setting. If the knob is between settings, the unit will turn off and then back on and deliver a prolonged burst of O2 as it powers up.

Note: The Spirit delivery system is designed for a maximum breathing rate of 30 BPM. With breathing rates greater than 30 BPM oxygen dosage may not be delivered with each breath.

Note: When turning the flow control knob from either (0) or (CF) to a flow setting, there will be a prolonged burst of O2 delivered through the cannula. Please do not be alarmed as this is normal operation.

Note: The LED will illuminate green with each detected breath, regardless of the liquid oxygen contents, even if the Spirit has no liquid oxygen left.

5. To stop the oxygen delivery system, turn the flow rate selection knob counterclockwise back to the off position.

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

6. The Spirit delivery system is powered by (2) C-Cell alkaline batteries. When the LED illuminates red, it is time to replace the batteries. As long as the red LED illuminates, the Spirit will deliver oxygen unless it is empty.

7. To replace the batteries, unzip the side zipper, as shown in the picture.

WARNING: USING THE SPIRIT IN THE CONTINUOUS FLOW (CF) MODE WILL CONSUME THE OXYGEN AT A FASTER RATE. MONITOR THE CONTENTS INDICATOR, SO YOU DO NOT RUN OUT OF OXYGEN.

WARNING: REMOVE THE BATTERIES FROM THE SPIRIT IF THE PORTABLE UNIT IS NOT LIKELY TO BE USED FOR SOME TIME.

Note: If replacement batteries are not readily available, turn the flow rate selection knob to the furthest clockwise position labeled (CF). The Spirit will now deliver a continuous flow rate of 2 liters per minute (LPM).

Note: The continuous flow (CF) mode is not powered by the batteries, so it can be used whether the low battery LED is on or not.

Note: When using the Spirit in continuous flow, the LED will NOT illuminate green or red with each breath.

8. Use the following chart as a guideline to determine the length of time the Spirit will operate:

Flow Rate Setting	Model		
	Spirit 300	Spirit 600	Spirit 1200
	Nominal	Nominal	Nominal
Off	16.0	32.0	64.0
1.0	15.1	30.3	57.4
1.5	10.7	21.4	40.5
2.0	8.0	16.1	30.4
3.0	5.4	10.7	20.3
4.0	4.0	8.0	15.2
5.0	3.2	6.4	12.2
CF	2.4	4.8	9.2

Note: Times are in hours.

Note: The “Nominal” times are for ideal conditions, i.e. maximum fill, exact flow rates, good loss rate, unit not being moved, a breath rate of 20 bpm, etc.These times are the maximum expected.

Note: Your individual results will vary.

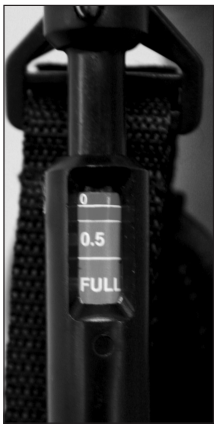
Spirit Flow Test* for 300, 600, and 1200	
Setting	**Volume**
Off	-0-
1 (Pulse)	12 to 18 mL
1.5 (Pulse)	18 to 26 mL
2 (Pulse)	26 to 34 mL
3 (Pulse)	40 to 50 mL
4 (Pulse)	54 to 66 mL**
5 (Pulse)	67 to 83 mL***
CF (Continous)	1.70 to 2.30 LPM

* Trigger Level: -0.21 ± 0.11 cm H2O; Tolerance is +/- 15%; Flow Meter Accuracy: 2% of reading or .005 SLPM; Resolution .01 LPM; Volumetric Accuracy: 2% of reading
** The volume delivered in the 1st .40 sec @ 30 BPM is 42mL.
*** The volume delivered in the 1st .48 sec @ 25 BPM is 58.6 mL and that delivered in the 1st .40 sec @ 30 BPM is 44mL.

WARNING: THE SETTINGS OF OTHER MODELS OR BRANDS OF OXYGEN THERAPY EQUIPMENT DO NOT CORRESPOND WITH THE SETTINGS OF THE SPIRIT.

9. To verify the level of liquid oxygen in unit with the contents indicator:
   - Support the unit directly above the black contents indicator spring scale chamber.
   - Allow the unit to stabilize (i.e. not bounce up and down), then read the exposed colored scale for approximate liquid oxygen contents.

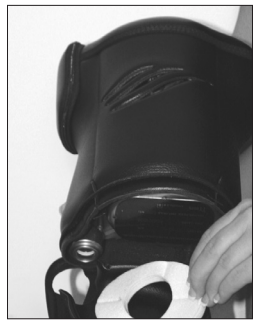
Note: If the unit is empty, only the red colored band of the scale will be exposed. If this is the case, the unit must be filled prior to use.



Condensate Pad

1. Under certain environmental conditions, especially with continuous flow and little movement, the Spirit may develop excess 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.
2. After the Spirit is empty and has warmed up to room temperature, remove any moisture from the condensation pad.

- Unzip the zipper at the base of the unit to access the condensation pad.
- Remove the pad and wring out any absorbed moisture. Allow the pad to dry completely before replacing it back in the unit.
- Place dry pad back in the unit. Make sure to completely rezip the zipper.



Troubleshooting

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

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 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 long 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.
The Portable stops pulsing during use.	• Ensure that cannula is firmly attached to the Oxygen Outlet barb • 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. • Check the contents indicator/level gauge and fill the portable if needed. • With the cannula on, close your mouth and breathe only through your nose to verify that the Portable has stopped pulsing.
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. • 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.

Cleaning Standard

WARNING: CLEAN ONLY AFTER THE UNIT IS EMPTY.

- Clean using a solution of mild dish washing detergent and water.
- Apply cleaning solution directly to a lint-free cloth. Approved cleaners include HydroPure and HydroKlean. Do not spray cleaners directly on the Spirit.
- Wipe the outside surface with the lint-free cloth until the outside surface is clean.

Caution: Do not use high temperature and high pressure washing equipment to clean these units.

- Do not get cleaner on any internal components or valves.
- Allow the unit to dry thoroughly before using.

Note: Note to health care provider – for reprocessing procedures, see applicable service manual.

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.

Disposal

Always return Spirit, including all components, to your homecare provider for proper disposal. You can also contact your local city or town offices for instructions on proper disposal of the battery.

Transport and Storage

The device should be stored in the upright position, and be well ventilated. Do not allow the device to lie on its side.

WARNING: DURING TRANSPORT, DO NOT TIP MORE THAN 5°.

Humidity up to 95% noncondensing. Temperatures range from -40°F to 158°F (-40°C to 70°C).

Operating temperature ranges from 14°F to 104°F (-10°C to 40°C). Relative humidity range from 30% to 75% noncondensing.

Note: The atmospheric pressure range is 700 hPa to 1060 hPa (elevation of 10,000 Ft. to -1,000 Ft.).

Maintenance

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

The condensate pad and battery replacement are the only user-serviceable parts. No other parts are user-serviceable.

The expected service life is a minimum of five years.

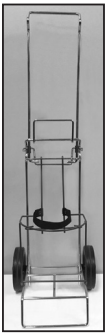
Clean the fill connectors on both the stationary and portable units with a clean, dry, lint-free cloth between each fill to prevent freezing and possible equipment failure.

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

Accessories

WARNING: THE USE OF SOME OXYGEN ADMINISTRATING ACCESSORIES NOT SPECIFIED FOR THIS OXYGEN CONCENTRATOR MAY IMPAIR ITS PERFORMANCE. RECOMMENDED ACCESSORIES ARE REFERENCED BELOW.

Nasal Cannula with 7 feet (2.1 m) of tubing: PN 5408-SEQ



Carrying Cart PN 20765565

Note: Ensure the portable unit is properly secured to the carrying cart.

Padded Belt Pack: Fits waist sizes 28”–45”

Dual Function Waist Extension: Fits waist sizes 45”–69”; allows conversion into backpack

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 SPIRIT, 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.

Caution: The Spirit should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the Spirit should be observed to verify normal operation in the configuration in which it will be used.

Table 1

Guidance and Manufacturer's declaration—electromagnetic emissions

The Spirit is intended for use in the electromagnetic environment specified below. The customer or the user of the Spirit should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment—guidance
RF emissions CISPR 11	Group 1	The Spirit uses RF energy only for internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emission CISPR 11	Class B	
Harmonic emissions IEC 61000-3-2	Not applicable	The Spirit is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Not applicable	

Table 2*: Recommended separation distances between portable and mobile RF communications equipment and the Spirit

The Spirit is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Spirit can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Spirit as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	from 150 kHz to 80 MHz d=1.2 √P	from 80 MHz to 800 MHz d=1.2 √P	from 800 MHz to 2,5 GHz d=2.3 √P
0,01	0.12 m	0.12 m	0.23 m
0,1	0.38 m	0.38 m	0.73 m
1	1.2 m	1.2 m	2.3 m
10	3.8 m	3.8 m	7.3 m
100	12 m	12 m	23 m

For transmitters rated at a maximum output power not listed above, the recommended separation distance (d) in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.
NOTE 1 at 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

* This table is included as a standard requirement for equipment which has been tested to specific test levels and over specific frequency ranges and been found compliant with regulations.

Table 3: Guidance and Manufacturer's Declaration—Electromagnetic Immunity

The Spirit is intended for use in the electromagnetic environment specified below. The customer or the user of the Spirit should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV Contact ±2 kV, ±4 kV, ±8 kV, ±15kV air	±8 kV Contact ±2 kV, ±4 kV, ±8 kV, ±15kV air	Floors should be wood, concrete or ceramic tile. If floors are synthetic, the relative humidity should be at least 30 %.**
Electrical fast transient/ burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	Not applicable DC powered device Not applicable No data input/output lines	Not applicable
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Not applicable DC powered device	Not applicable
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	Not applicable DC powered device	Not applicable
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A / m 50/60 Hz	3 A / m 50/60 Hz	Power frequency magnetic fields should be that of a typical commercial or hospital environment.

NOTE U_T is the A.C. mains voltage prior to application of the test level.

** This statement indicates that the required testing was performed in a controlled environment and the Spirit are found to be compliant with regulations.

Table 4
Guidance and Manufacturer's Declaration—Immunity ME Equipment and ME Systems

Guidance and Manufacturer's Declaration—Immunity			
The Spirit is intended for use in the electromagnetic environment specified below. The customer or user of the Spirit should ensure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment—Guidance**
Conducted RF IEC 61000-4-6	3 Vrms 6 Vrms (In ISM Bands) 150 kHz to 80 MHz	Not applicable Battery powered device, No SIP/SOP	Portable and mobile RF communications equipment should be used no closer to any part of the Spirit, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1,2 \sqrt{P}$ $d = 1,2 \sqrt{P}$ $d = 2,3 \sqrt{P}$ where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b]. Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	80 MHz to 2.7 GHz	10 V/m 80 MHz—2,7 GHz 80 % AM at 1 kHz	

Test frequency (MHz)	Band[a)] (MHz)	Service[a)]	Modulation[b)]	Maximum power (W)	Distance (m)	Immunity Test Level (V/m)
385	380–390	TETRA 400	Pulse modulation[b)] 18 Hz	1.8	0.3	27
450	430–470	GMRS 460, FRS 460	FM[C)] ±5 kHz deviation 1 kHz sine	2	0.3	28
710	704–787	LTE Band 13, 17	Pulse modulation[b)] 217 Hz	0.2	0.3	9
745						
780						
810	800–960	GSM 800/900, TETRA 800, IDEN 820, CDMA 850, LTE Band 5	Pulse modulation[b)] 18 Hz	2	0.3	28
870						
930						
1720	1700–1900	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation[b)] 217 Hz	2	0.3	28
1845						
1970						
2450	2400–2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation[b)] 217 Hz	2	0.3	28
5240	5100–5800	WLAN 802.11 a/n	Pulse modulation[b)] 217 Hz	0.2	0.3	9
5500						
5785						

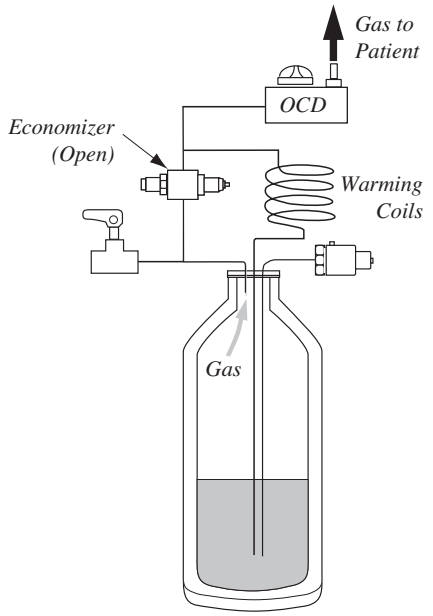
Note: If necessary to achieve the IMMUNITY TEST LEVEL, the distance between the transmitting antenna and the Spirit may be reduced to 1m. The 1m test distance is permitted by IEC 61000-4-3.

[a] For some services, only the uplink frequencies are included.
[b] The carrier shall be modulated using a 50% duty cycle square wave signal.
[c] As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

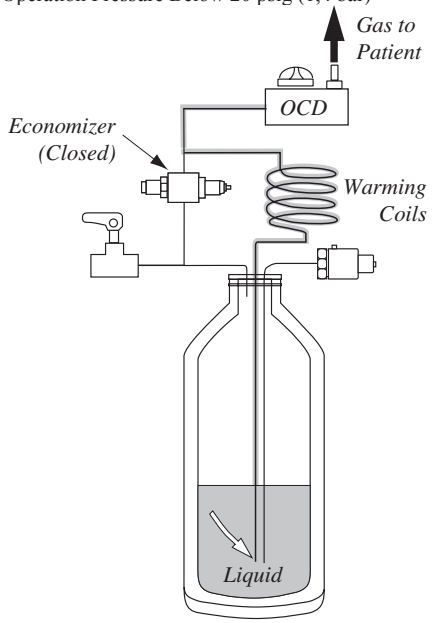
Reference

The following are pneumatic diagrams of the Spirit.

Operation Pressure Above 20 psig (1,4 bar)



Operation Pressure Below 20 psig (1,4 bar)



NOTES

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