

November 2023 Med Tips

Don't miss out on our upcoming Virtual Service Schools!

CAIRE Service School Trainings and Webinars 2023

CAIRE offers In-person and Virtual Service Schools covering both LOX and Concentrator lines.

Each class is a comprehensive program that focuses on the technical and service aspects of the CAIRE family products. Class time is divided between lecture and hands-on workshops. The seminars will help the student develop a better understanding of how liquid oxygen equipment or concentrators work, how to identify the symptoms and causes of potential problems and how to use the technical information that is available in the Technical Manuals. Registration for CAIRE's Service Schools is mandatory. Registration forms must be received two weeks prior to the start of the class in order to guarantee availability and materials.

Table 1 - Details of upcoming training.

Type	Language	Location	Training Dates	Registration by	Training Type
Conc Europe**	English	Toulouse, France	21-22 November	open	Remote
LOX Europe**	English	Toulouse, France	23 November	open	Remote

*We reserve the right to cancel training seminars at short notice. Customers should ensure that they take necessary precautions to ensure costs are covered in case of cancellation.

** Training will be in the form of a Webinar.

Concentrator Service School Topics include:

- Concentrator hazards and safety precautions
- Principles of pressure, flow, and saturation
- Functions of the major components of a portable/stationary concentrator
- Theory of operation
- Set up and use of test equipment
- Troubleshooting, repair and performance verification/testing procedures

LOX Service School Topics include:

- Liquid oxygen (LOX) hazards and safety precautions
- Principles of pressure, flow and liquid oxygen saturation
- Functions of the major components of a liquid oxygen system
- HELIOS™ system theory of operation
- Reservoir and portable filling procedures
- Set up and use of test equipment

Please submit your registration forms no later than the dates in Table 1 above. If you are interested in the service schools mentioned above, and it is past the registration date, please reach out to the registration emails below. Please note that as travel restrictions, and Covid-related guidelines evolve, we intend to restore CAIRE Service School to in person.

To register for Service School, please email:

Techservice.global@caireinc.com for USA Training or jim.gibson@caireinc.com for European Training.

PRODUCT UPDATES

Companion® Reservoirs and Portables End of Service Life - REMINDER

CAIRE® would like to remind our valued customers the end of Service Life for the Companion range is the 12/31/2018. CAIRE will provide parts and service for the Companion C31/C41 Oxygen Reservoirs and Companion C1000/C1000T until 12/31/2023. After this date CAIRE may continue to provide parts and service at the company's discretion.

For stationary oxygen Reservoirs, customers can use the Liberator Reservoirs, these are available in a wide variety of sizes and have the benefit of allowing flow rates up to 15 LPM. The C1000/C1000T portables will be replaced by the Stroller/High Flow Stroller models giving customers the added option of being able to choose our side fill systems.

For further information please contact the Technical Service Team. Service bulletin 21285171.

CAIRE® POC battery lithium content

The table below details the battery lithium content of the CAIRE's Portable Oxygen Concentrator.

A Material Safety Data Sheet is available for the batteries upon request to Techservice.global@caireinc.com, this document is required by the Airlines when transporting a Portable Oxygen Concentrator on board.

Product	Battery Part Number	Battery Output Voltage	Battery Capacity	Weight of Lithium contained in Battery
Saros	9723-SEQ	14.8 VDC	88 W-hours	7.20 grams
Eclipse	7082-SEQ	14.8 VDC	2 x 97.5 W-hours	2 x 7.92 grams (15.84 grams Total)
eQuinox 12 cell	4823-SEQ	14.8 VDC	89 W-hours	7.38 grams
eQuinox 24 cell	4972-SEQ	14.8 VDC	2 x 95 W-hours	2 x 7.92 grams (15.84 grams Total)
FreeStyle Comfort 8 cell	BT034-1S	14.4 VDC	96.5 W-hours	7.68 grams
FreeStyle Comfort 16 cell	BT035-1S	14.4 VDC	2 x 96.5 W-hours	2 x 7.68 grams (15.36 grams Total)
FreeStyle 3 with Internal Battery	BT018-1S	14.8 VDC	59.2 W-hours	4.8 grams
FreeStyle 5 with Internal Battery	BT021-1S	14.8 VDC	76.96 W-hours	5.68 grams
FreeStyle 3/5 with External Battery	BT033-1	14.4 VDC	96.5 W-hours	7.92 grams
Focus	BT023-1	14.8 VDC	38.48 W-hours	3.14 grams

For further information please contact the Technical Service Team.

Helpful Hints & FAQs

Calculating LOX Reservoir Capacity

HOW TO CALCULATE LITERS OF LIQUID OXYGEN IN A RESERVOIR

STEP 1: Weigh the empty reservoir and record the weight (kg/lb)

STEP 2: Fill the unit with properly saturated liquid oxygen (follow the proper filling procedure of a CAIRE LOX reservoir referenced in service bulletin 20925207)

STEP 3: Weigh the full reservoir and record the weight (kg/lb)

STEP 4: Subtract the empty reservoir weight (STEP 1) from the full reservoir weight (STEP 3) to determine the weight of liquid oxygen that is inside of the reservoir

STEP 5: Take the weight of liquid oxygen (calculated in STEP 4) and divide it by the LOX density to calculate the liters of liquid oxygen in the reservoir

For further information please contact the Technical Service Team. Service bulletin 20937021

Med Tips Distribution!

The CAIRE team is asking all current subscribers to CAIRE's Med Tips Newsletter to register in order to continue receiving this monthly communication.

Please click this link - <http://go.pardot.com/l/710913/2022-01-17/2pgcj9> - and provide us with your current information. Thank you and we appreciate your support.

CONTACT: For technical questions or concerns, contact Technical Service:

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For ordering information or general inquires, contact Customer Service:

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Please consult the applicable product instructions for use for product indications, contraindications, warnings, precautions, and detailed safety information.



SERVICE BULLETIN

PN: 21285171

RELEASE DATE: May 31, 2018

REVISION DATE(S): February 27, 2019 (rev B), May 27, 2019 (rev C)

MODEL: 2018 Companion C31/C41 Oxygen Reservoirs and Companion C1000/C1000T Portables.

ISSUE: Advanced Notice of Discontinuation - Companion C31/C41 Oxygen Reservoirs and C1000/C1000T Portables.

NOTES: The Companion C31/C41 Reservoirs and C1000/C1000T Portables are due to be made obsolete on 12/31/2018. These LOX Products will be made obsolete due to low sales volume and due to the redundancy with the newly enhanced Liberator Reservoir Product Line. Until this discontinuation date, current service, sales and parts needs for all models will still be fulfilled.

For stationary oxygen Reservoirs, customers can use the Liberator Reservoirs, these are available in a wide variety of sizes and have the benefit of allowing flow rates up to 15 LPM. The C1000/C1000T portables will be replaced by the Stroller/High Flow Stroller models giving customers the added option of being able to choose our side fill systems.

C31 / C41 Reservoir and C1000 / C1000T Portables will be available for sale during the rest of 2018 and will be effectively discontinued after December 31, 2018. CAIRE will provide parts and service for the Companion C31/C41 Oxygen Reservoirs and Companion C1000/C1000T until 12/31/2023. After this date CAIRE may continue to provide parts and service at the company's discretion.

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SERVICE BULLETIN

PN: 20925207

RELEASE DATE: May 29, 2015

REVISION DATE(S): March 20, 2019 (Rev B)

MODEL: All Companion, Helios, and Liberator Liquid Oxygen Reservoirs

ISSUE: Standardization of Fill Procedure and Preventative Maintenance Interval

NOTES: Effective immediately the fill and maintenance procedures for all CAIRE liquid oxygen reservoirs are as follows:

Filling

NOTE: The fill source should have the correct fitting (5/8" x 45° male flare) to connect to transfer line.

WARNING: Filling must be performed in a well-ventilated area to prevent development of an oxygen-enriched atmosphere.

WARNING: Wear insulated gloves and eye protection whenever working with liquid oxygen.

1. Fill Source Preparation

- a. Ensure the source contains a sufficient amount of liquid oxygen to completely fill the reservoir.
- b. Ensure the liquid oxygen in the fill source is saturated at 2,4-3,4 bar (35-50 psig).

NOTE: Proper saturation is critical when filling a CAIRE reservoir. If the fill source is not properly saturated, the unit will not function correctly, resulting in inaccurate flow rates and excessive boil off of liquid oxygen. This will cause portable units which are filled off the reservoir to act in the same manner. Please refer to the Saturation Principles section to learn more about the importance of proper saturation.

2. Fill Procedure

a. Required Equipment:

- Fill source as outlined above
- Liquid oxygen transfer line
- Appropriate transfer line fill adapter
- Appropriate vent valve wrench
- Eye protection
- Pressure gauge (for reservoirs not equipped with an internal pressure gauge)
- Erie liter meter
- Insulated gloves

- b. If refilling a partially filled reservoir, verify prescribed flow rate(s) is/are within tolerance specification(s) using an Erie liter meter before filling.

NOTE: Only refill a partially filled reservoir in accordance with local regulations. If step 2.b is performed prior to filling, then step 2.p can be omitted after filling.

- c. Weigh reservoir as required by local and federal standards.

- d. Verify that the liquid level meter is operating properly.

NOTE: If flow rates are out of specifications or liquid level meter operates improperly, refer to Troubleshooting section of the corresponding technical manual.

- e. Connect transfer line to fill source. Connect proper transfer line adapter to transfer line.

- f. Fully open liquid valve on fill source.

- g. Purge transfer line for a minimum of 5 seconds ensuring gas is safely piped away from operator:

- i. Connect transfer hose fill adapter to a securely mounted mating QDV.

-OR-

- ii. If the transfer hose fill adapter is equipped with a male QDV, push the adapter poppet against an unpainted stainless steel surface.
- h. Wipe both reservoir and transfer line adapter fill connectors with lint free rag to remove residual moisture.

NOTE: Purge the transfer line any time fill source valve has been closed.

- i. Using vent valve wrench, fully open reservoir vent valve.
 - j. Connect transfer line to reservoir to begin fill.
 - k. While filling, throttle the vent valve with the vent valve wrench as needed to keep the reservoir pressure at approximately 1,2-1,7 bar (18-24 psig). Monitor the pressure using one of the following techniques:
 - i. Monitor the internal pressure gauge if equipped.
- OR-
- ii. For reservoirs that are not equipped with an internal pressure gauge, connect a pressure gauge to the oxygen outlet and open the FCV to 2 LPM or greater.
- OR-
- iii. Attach a flowmeter to the oxygen outlet, set the FCV to 2 LPM, and then throttle the vent valve to maintain a flow of 2 LPM. This is equivalent to using a pressure gauge.
- l. When liquid spurts from the vent outlet, terminate the fill by disconnecting the transfer line fill adapter from the reservoir.
 - m. Close reservoir vent valve immediately after disconnecting the transfer line from the reservoir.
 - n. Disconnect the pressure gauge or flow meter (if used) from the oxygen outlet and turn off flow control valve.

CAUTION: Do not allow excessive venting of liquid oxygen through the vent valve. Prolonged exposure may freeze the vent valve in the open position.

- o. Replace protective cover on the QDV adapter. Close the liquid valve on the fill source and properly store the transfer line and fill adapter.

- p. Verify that prescribed flow rate(s) is/are within tolerance specification(s) using an Erie liter meter and verify that the liquid level meter indicates full.

NOTE: The liquid level indicating system is only accurate after the vent valve is closed, and the oxygen has stabilized for five minutes.

Maintenance

Schedule A – Biennial

A. Introduction

Routine maintenance is a series of steps used to assure that equipment is functioning properly.

1. If a unit fails a given test, one of two actions may be taken:
 - a. Refer to the Troubleshooting section of the corresponding technical manual

-OR-

 - b. Return the unit to CAIRE, Inc. for repair.
2. Schedule – maximum of two years between routine maintenance testing. Unit should be tested whenever a problem is suspected.

B. Procedure

Follow the steps in order listed. If the unit fails any step, refer to Troubleshooting section of the corresponding technical manual.

NOTE: See the Troubleshooting and Repair section of the corresponding technical manual on the detailed procedures for the tests mentioned below.

1. Visual Inspection:
 - a. Remove any LOX prior to maintenance.
 - b. Look for damaged or missing parts.
 - c. Verify the meter reads empty. For reservoirs equipped with electronic level gauges, verify the low battery LED is not lit and no error codes appear on the meter.
2. Component Test:
 - a. Remove shroud.

- b. Perform Leak Test.
 - c. Perform PRV Test.
 - d. Perform SRV Test.
 - e. Pressure Retention Test.
 - f. Replace shroud.
 - g. Liquid Contents/Level Indicator Test. For Liberator reservoirs perform the liquid level indicator calibration for this step.
 - h. Flow Rate Test.
3. Check Efficiency of Unit:
- a. Inspect unit for cold or sweaty condition and for excessive venting from relief valve (some venting is normal).
 - b. Perform NER test.
4. Prepare for Use:
- a. Empty contents.
 - b. Clean and/or disinfect outside of unit following instructions set forth in the Operation section of the corresponding technical manual.

Schedule B – Continuous

A. Introduction

Continuous maintenance is a set of tests and inspections done periodically to ensure equipment is functioning properly. It can be performed by drivers or other personnel while the equipment is in service.

1. If a unit fails a given test, it should be taken out of service and sent to the Repair Center/Department for further inspection.
2. Schedule - Scheduled intervals should be determined by the equipment service provider.

B. Pre-Fill Procedure

1. Visually inspect for:
 - 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, which would indicate poor vacuum.
 - g. Visible dirt or contaminants inside and outside of the upper shroud, as well as inside and outside of the condensate collector
 - h. Vent valve functionality (all parts are present and the valve functions as intended)
2. If refilling a partially filled reservoir, verify that prescribed flow rate(s) is/are within tolerance specification(s) using an Erie liter meter.

C. Post-Fill Procedure

1. Visually verify:
- a. QDV poppet is closed and not leaking
 - b. Vent valve is not leaking
 - c. No heavy frost or condensation is present on the exterior of the vessel of the reservoir
 - d. Liquid level indicator reads accurate amount
 - e. Pressure gauge is reading accurate pressure (if equipped)

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