

Manual

LIV[®] IQ BOC Integrated Valve with digital display – portable delivery system for Medical Oxygen.



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Manual – LIV® IQ Oxygen

This manual covers the essential information for the proper use of the LIV® IQ therapy device.

1. Introduction.



Please read these instructions carefully before using your LIV® IQ medical oxygen therapy device for the first time!

2. Device Description.

The LIV IQ therapy device is an integrated, portable gas delivery system. The whole package is maintained by BOC Healthcare as the owner of this product.

The LIV IQ therapy device is fitted with:

- A valve with an integrated pressure regulator, flow outlet and digital display
- Pressurised gas cylinder filled with medical oxygen

	Order code	Nominal content	Nominal pressure	Water capacity
LIV IQ X	101-IQX	2000 litres	200 bar	10 litre



The above components are permanently fitted to the therapy device and must not under any circumstances be removed by the user. Contains high pressure gas. Risk of severe injury or damage to persons or property.

3. Intended Use.

The LIV IQ therapy device is suitable for use in all healthcare settings including, but not limited to, hospital, outpatient, imaging centre and ambulatory healthcare. The integrated pressure regulator is designed to reduce the gas pressure so that it can be used to connect medical devices via the Schrader quick-connector or for the direct administration to patients via the flow connector.



4. Safety Requirements.



Cylinders with integrated valves must only be used for the purposes defined in the intended use. Before using the LIV IQ therapy device, you must read the instructions for use and understand how to handle it safely.

Medical Oxygen should only be used following your healthcare facility's protocols and as described in the BOC medical oxygen Summary of Product Characteristics (SPC). This can be found within the Medical Gas Data Sheet (copies located at www.bochealthcare.co.uk).

Important for Safety – when handling the LIV® IQX

Warning

- Read and follow the medical oxygen Medical Gas Data Sheet (MGDS) before use.
- All personnel handling Compressed Medical Oxygen cylinders should have adequate knowledge of:
 - properties of the gas
 - correct operating procedures for the cylinder
 - precautions and actions to be taken in the event of an emergency.
- Do not store or use medical gas cylinders near naked flames, sources of ignition or combustible materials.
- Do not use oil or grease (or any oil-based products which includes hand creams) in the vicinity of an oxygen cylinder.
- May cause or intensify fire; oxidiser. Contains gas under pressure; may explode if heated.
- In case of fire: Stop flow if safe to do so.
- Use only with visibly clean equipment approved for use with Oxygen.
- Open valve slowly. Close valve after each use and when empty.
- Protect from sunlight when ambient temperature exceeds 50 °C.
- Do not expose to higher temperature than +65 °C. If at risk of fire, move to a safe place.
- Do not use or store outside operating temperature range -20 °C to +45 °C.

- Do not expose to corrosive substances e.g. ammonia.
- The LIV IQ package is not compatible with MRI use. Do not use in MRI environments.

Caution

- Store medical gas cylinders separately from industrial and other non-medical cylinders in a well ventilated area that is clean and dry, preferably inside.
- Store with valves closed.
- Transport with valves closed, unless in use.
- Ensure oxygen cylinders are stored in a safe and secure area where they cannot fall over and cause injury.

Additional Information

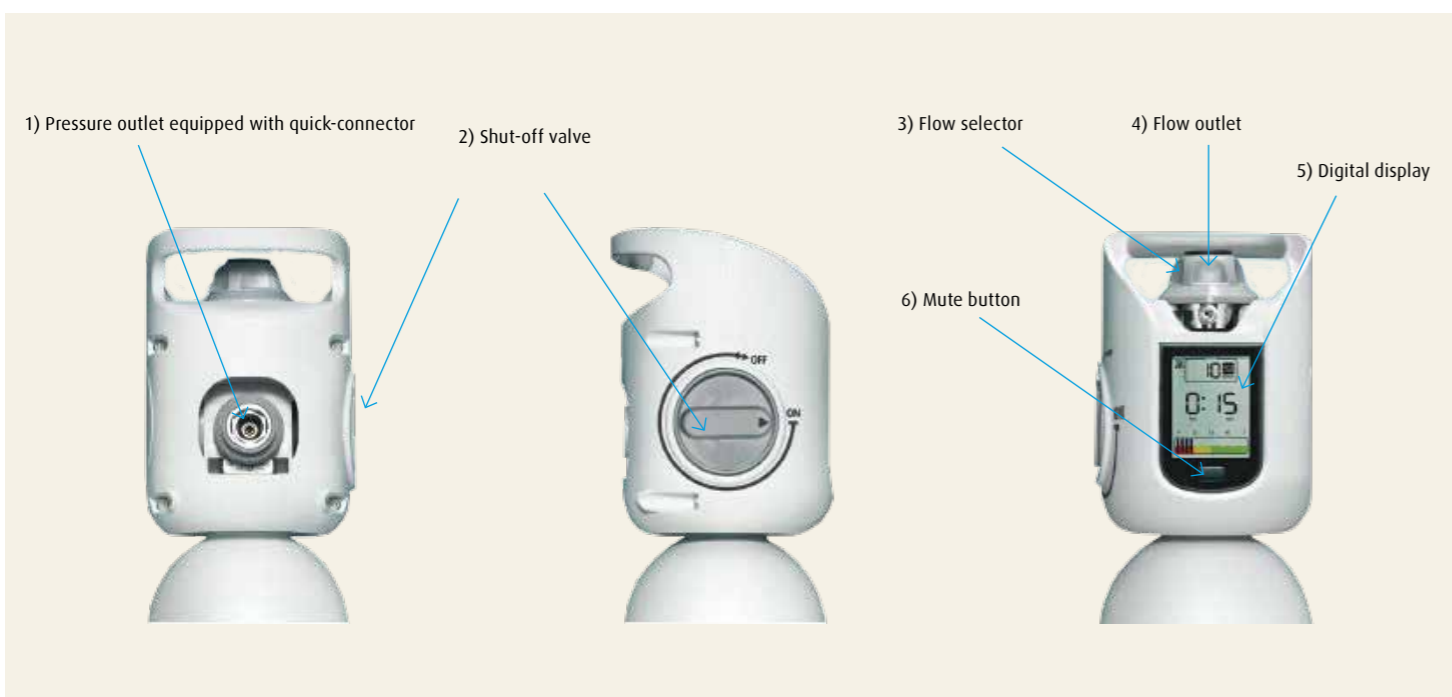
- If you suspect there may be electro-magnetic interference between the LIV IQ and other electrical devices, move the LIV IQ away from those devices.
- Do not attempt to disassemble the package.
- Do not attempt to refill the therapy device.
- Do not alter the markings or labels on the LIV IQ package.
- In the event of leakage, defective cylinder package or any adverse event, close the valve, mark as "defective", put the product in a well-ventilated area and contact BOC Healthcare, and in the case of an adverse event, the competent authority. See section 11, Contact information.
- Using the pressure outlet and the flow outlet at the same time may result in a lower-than indicated flow rate, and may activate a high flow ("HI FLO") alert. It is not recommended that both outlets are used simultaneously. To silence the alert and continue using both outlets at the same time, press and hold the mute button for three seconds.
- In the event of extreme temperature changes, the low flow and high flow alerts may be temporarily unavailable.

5. Operating Instructions.

General instructions for use

All personnel handling LIV IQ medical oxygen therapy devices should be trained in their correct use as detailed in these Instructions for Use.

- Operating temperature -20°C to +45°C
- Only use with devices intended for oxygen administration.
- Prepare to change the therapy device when the digital display contents indicator shows only segments in the red area.
- To ensure the correct, prescribed flow rate, always make sure that the flow selector is positioned on a numbered flow setting, not between flow settings.



Before Use

- Make sure that the digital display (5) contents indicator shows there is enough content for intended use.
- Make sure that the flow selector (3) is set to zero.
- Connect the delivery device to outlet (1 or 4), see below.
- Slowly turn the shut-off valve (2) anticlockwise to open the LIV IQ fully.
- If a delivery device is connected to the flow outlet (4), turn flow selector (3) stepwise up through flow settings to select flow.
- The patient can now be connected to the delivery device.

Pressure outlet, 1) – additional connection information

The pressure outlet is equipped with a quick-connector and allows connection to a medical device. The output pressure is 4.5 bar nominal. The flow selector does not control the flow from the pressure outlet.

To connect a delivery device to the quick-connector (pressure outlet):

- Make sure the probe connector is compatible with medical oxygen.
- Insert the probe into the quick-connector so that it engages. Pull on the connector to make sure that it is sitting correctly.

This quick-connector does not have a function to retain the inserted probe. Therefore, do not disconnect the connector until the valve is closed and depressurised



A faulty connection can result in leaks and/or the ejection of the connector, with potential for injuries/damage.

After use

At conclusion of treatment or at exchange of an empty therapy device:

- Remove the delivery device from the patient.
- Turn flow selector (3) stepwise down through flow settings to zero.
- Turn the shut-off valve (2) clockwise to close the LIV IQ.
- Turn the flow selector (3) fully to vent the equipment.
- Turn the flow selector (3) back to zero.
- Disconnect the delivery device from outlet (1 or 4).

Flow outlet, 4) – additional connection information

To connect a delivery device to the flow outlet, make sure that:

- The patient is not connected to the delivery device.
- The dimension of the delivery device hose fits the flow outlet of the valve (6 mm outer diameter).
- The delivery device hose is firmly attached. Push the delivery device hose onto the flow outlet of the LIV IQ therapy device and make sure it is firmly attached before opening the shut-off valve.
- The flow selector dial has been engaged.
- An audible alert and the words "Set FLO" will appear on the display if the flow selector is between settings



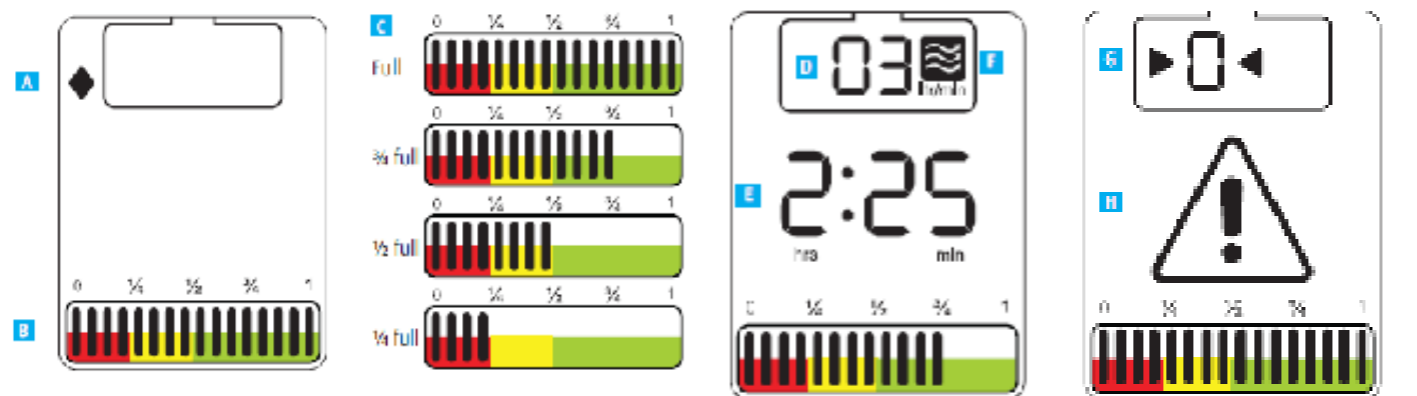
Make sure that the flow selector dial has been engaged and is not in between two settings. Otherwise, the flow regulator will not allow the required volumetric flow rate for the medical gas.



Digital display – additional information

If no lines or numbers are visible around the content indicator, do not use the product. Mark it as defective and contact BOC Healthcare.

The digital display has a number of elements and audible alerts which communicate the status of the LIV IQ:



A) New, full therapy device (diamond).

B) Content indicator.

C) As gas is consumed, the black vertical segments of the contents indicator will disappear. Prepare to change the device when the contents indicator shows only segments in the red area.

D) Current set flow rate.

E) Therapy time remaining at selected flow setting.

F) Flow is active.

G) Set flow selector to zero before opening shut-off valve.

H) Warning triangle.



Therapy device is too hot – do not use



Therapy device is too cold – do not use



Low battery



Low flow

The device has detected that the flow from the cylinder is lower than the selected flow



HI/FLO

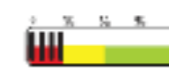
High flow

The device has detected that the flow from the cylinder is higher than the selected flow



Strong magnetic field
The device has detected a strong magnetic field. Gas flow continues unaffected, but the digital display and audible alerts will not work while in this field. Removal of the device from the magnetic field recovers its normal functionality.

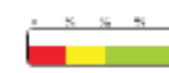
An audible signal sounds in the following cases:



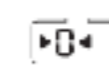
Gas Contents Low (Contents Bars 4 & 3)



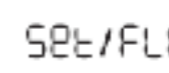
Gas Contents Very Low (Contents Bars 2 & 1)



Gas Contents Empty



Incorrect Use (Flow selector set with Shut-off valve closed)



Incorrect use (Flow selector is between two settings)



Has the mute button been pressed?

Yes – An active alert has been muted

No – Due to a rapid change in temperature, the low flow or high flow alert is temporarily disabled

For further information on the actions to take if a warning sign appears please refer to the Fault – Cause – Remedy table, in section 8 of this manual.

The mute button can be pressed to silence audible alerts.

When an active alert is muted, the icon will appear in the upper-left corner of the display.

A single short press of the button will mute the active alert for one minute. A single long press of three seconds will mute the active alert until the alert condition disappears or until the next alert condition occurs.



Mute button



6. Cleaning.

The user is not expected to clean the LIV IQ therapy device routinely. The LIV IQ therapy device is a multi-use device and maintenance and cleanliness is managed by BOC Healthcare.

The customer is recommended to keep the therapy device clean, dry and free from oil and grease as most malfunctions are caused by the intrusion of particles, dust or other contamination.

If the outside surface of the therapy device must be cleaned, use only a soft cloth. The cloth may be dry or damp (with clean water).

If local disinfection procedures require that the LIV IQ must be cleaned, the cleaning solutions used must be compatible with: brass, plastic, component materials (including labels) and oxygen.

- Do not use cleaning solutions containing ammonia.
- Do not immerse the product in water or any other liquids.
- Do not expose the product to temperatures higher than +65 °C (e.g. autoclave).
- Do not pour any liquids into the user outlets.
- When using the product in a hospital, the standards and practices of the hospital's hygiene plan must be applied accordingly.



Do not use any cleaning solutions containing alcohol, aldehyde, ammonia or peroxide compounds.

7. Service and Maintenance.

The serial number of the product can be found on the back of the valve, beneath the pressure outlet (if fitted) or blanking cap (if no pressure outlet is fitted). The serial number consists of the year and month of valve manufacture, two letters and five numeric digits.













In the event of leakage or suspected defective LIV IQ therapy device, close the valve, return to cylinder store, label appropriately, and contact BOC Healthcare.

Non-certified repair and maintenance irrevocably leads to loss of the liability from the manufacturer for the safety and functionality of the product.





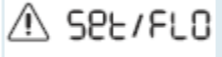



If a leak occurs, never try to tighten individual components or to stop the leak.

8. Fault – Cause – Remedy.

Fault / error	Cause	Remedy
Digital display content indicator has no segments illuminated. An audible signal sounds. 	Therapy device is empty.	Use alternative therapy device.
No gas coming from flow outlet	<ol style="list-style-type: none"> Shut-off valve is closed Flow selector dial set to "0" position Flow selector not correctly engaged Therapy device is empty 	<ol style="list-style-type: none"> Return the flow selector to zero, open the shut-off valve and set the flow selector to the desired flow. Set the flow selector to the desired flow. Set the flow selector to the desired flow and make sure that it has engaged properly. Use alternative therapy device
Shut-off valve is difficult to turn and cannot be opened/closed without applying significant force In combination with no flow of gas and an audible signal	Valve too firmly opened or closed	Verify direction of rotation using a flow test. If there is a flow, turn hand wheel to "OFF". Alternatively, contact BOC Healthcare
 	<ol style="list-style-type: none"> Shut-off valve is closed Malfunction 	<ol style="list-style-type: none"> Return the flow selector to zero, open the shut-off valve and set the flow selector to the desired flow. Make sure that the flow selector is set at zero, close the shut-off valve, return to cylinder store, label appropriately and contact BOC Healthcare.
 	Battery is low.	Use alternative therapy device. Close the shut-off valve, return to cylinder store, label appropriately and contact BOC Healthcare.
   	Therapy device is too hot (sunshine) or too cold (snowflake).	Do not use the therapy device at this time. Store the therapy device within the temperature range -20 °C to +45 °C. The warning symbols will disappear when the therapy device is at a usable temperature.
 	The therapy device is in an area with a strong magnetic field.	Gas delivery is not interrupted and will be delivered at the rate chosen on the flow selector. The therapy device will not be able to display therapy time remaining, the current set flow rate or the remaining content.
	<ol style="list-style-type: none"> The mute button was pressed by the user, muting the active alert The therapy device is changing temperature rapidly. The HI FLO or low flow alerts are temporarily disabled while this symbol is shown. 	<ol style="list-style-type: none"> The active alert will remain muted for one minute (short press) or until the next alert event occurs (pressed for three seconds) Continue to use the therapy device, but ensure the patient's tube is not blocked. The symbol will automatically clear when the therapy device has acclimatised.

8. Fault – Cause – Remedy.

Fault / error	Cause	Remedy
An audible signal sounds and the bars flash 	Gas contents low.	Consider changing to an alternative therapy device.
An audible signal sounds and the bars flash. 	Gas contents very low.	Change to an alternative therapy device.
An audible signal sounds. 	The flow from the therapy device is different from the selected flow. This could be caused by a restriction in the flow of the gas.	Check the tube and medical device connected to the flow outlet. The warning symbols will disappear a short time after the restriction has been cleared. If no restriction is found, make sure that the flow selector is set at zero, close the shut-off valve, return to cylinder store, label appropriately and contact BOC Healthcare.
An audible signal sounds. 	<ol style="list-style-type: none"> Two devices draw gas simultaneously. One device draws gas. 	<ol style="list-style-type: none"> Press and hold the mute button for three seconds. Make sure that the flow selector is set at zero, close the shut-off valve, return to cylinder store, label appropriately and contact BOC Healthcare.
An audible signal sounds. 	Flow selector is between two settings.	Check that the flow selector is set to a flow setting and is not between flow settings.
and a number or letters alternating in the flow rate area of the display. In some cases an audible signal sounds. 	Digital component or software malfunctioning	Make sure that the flow selector is set at zero, close the shut-off valve, return to cylinder store, label appropriately and contact BOC Healthcare.



9. Storage and Refilling.

The LIV IQ therapy device must be stored and transported in a secured position, and kept in dry and clean conditions.

Do not stack LIV IQ therapy devices on top of each other as this can cause damage to the valve or the handling device.

Storage temperature range: -40 °C to +65 °C.

Never store gas cylinders near a heat source (see Safety Requirements).

Do not use medical oxygen after its expiry date (see product label).

Warning notices prohibiting smoking and naked lights must be posted clearly in the cylinder storage area and the Emergency Services should be advised of the location of the cylinder store.

The LIV IQ therapy device should be returned to BOC Healthcare for refilling.

10. Contact Information.

BOC Healthcare
Customer Service Centre:
Priestley Road, Worsley, Manchester M28 2UT
e-mail: bochealthcare-uk@boc.com
phone/fax: 0800 111 333 / 0800 111 555

LIV® IQ manufactured by:
Linde Healthcare AB
SE 181 81 Lidingö
Sweden



Notes

July 2023 revision to update front cover branding image.

BOC Healthcare

Customer Service Centre, Priestley Road, Worsley, Manchester M28 2UT, United Kingdom
Tel 0800 111 333, Fax 0800 111 555, Email bohealthcare-uk@boc.com, boonline.co.uk

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