

Medical oxygen. Integral valve cylinders (CD, ZD, HX, ZX).

Introduction

All cylinders supplied by BOC are designed to be as user friendly as possible making access to medical gases simple and straight forward, and allowing the user to spend more time on patient care.

Golden rules

1. Before using the cylinder check the gauge for cylinder content.
This ensures there is enough gas for patient treatment.
2. Never use oil or grease in the vicinity of an oxygen cylinder or delivery equipment.
Oils and greases can automatically ignite when in the presence of oxygen at high temperatures.
3. Always open and close the cylinder valve hand wheel slowly.
Opening the valve quickly can cause the gas to become hot, which may lead to an external fire. Although oxygen is non-flammable it will strongly support combustion once a fire has started.
4. Always set up cylinders away from patients before use with the outlets facing away from yourself and the patient.
It is important to make sure the cylinder is functioning correctly before administering the gas to the patient.
5. Report any issues you have when using the cylinder to BOC. If the patient has been affected by the administration of gas, also report the incident to the regulatory authorities (MHRA or HPRA).
It is important that BOC is made aware of any issues experienced by users so that we can check the cylinder before it is supplied to the next customer and provide advice on correct use where appropriate.

Integral valve cylinders

Integral valve cylinders were introduced to improve how medical gases could be administered to patients. There are a number of benefits to this type of package which include:

- **Constantly live content gauge.**
This shows gas levels, even when the cylinder is switched off.
- **Clear product labelling.**
Ensure this is read before use, it contains information relevant to administration.
- **Improved manual handling.**
To minimise the risk of injury.
- **Flat, stable base and carry handle.**
Making storage and handling easier.
- **Built in regulator.**
Eliminating the cost of buying and maintaining separate regulators.
- **Tamper-evident covers.**
Demonstrates the cylinder has not been used, is uncontaminated and safe for patient use. Ensure you remove the tamper evident cover before use.
- **Easy to use handwheel.**
Turn the handwheel anti clockwise to open.
- **Simple push fit connection to save time.**
This outlet allows a standard flowmeter to be fitted if it is essential that the flowrate is visible.
- **Easy to view flow selector.**
When the cylinder is turned on this is the flowrate delivered.

With BOC as your provider, you can be sure to benefit from leading edge technology.



Instructions for use.

1. Initial safety checks

Before handling cylinders ensure your hands are clean. If you have been using alcohol based gel or liquids to decontaminate your hands make sure the alcohol has totally evaporated.

When selecting the cylinder for use, check that the cylinder is clean and free from any damage. Ensure the cylinder, particularly the Schrader and firtree outlets, are not contaminated with oil or grease.

2. Preparing a new cylinder for use



2.1 Check the cylinder label to ensure you have the correct medical gas.



2.2 Check the expiry date on the batch label.
The gas should not be used after this date and the cylinder returned to BOC.



2.3 Check the gauge to confirm the cylinder contents.
For new cylinders the needle should be in the green zone.



2.4 To determine there is enough gas in the cylinder check the duration chart for the required flow.
If the needle is in the red zone consider selecting a new cylinder.



2.5 Pull the tear ring to remove the tamper evident handwheel cover.
Discard the cover.
Note: If it is not fitted, it means the cylinder has been used before.



2.6 The cylinder should be set up away from the patient, with the outlets facing away from yourself and the patient.
Never place the cylinder near the patient until it has been set up.



2.7 Ensure the flow selector on top of the cylinder is set to zero and the cylinder valve hand wheel is turned off before connecting any equipment.



2.8 Lower the hinged grey outlet cover to enable equipment connection.
Ensure you do not remove the cover as it must be refitted after use to keep the outlets clean.

3. Setting up the cylinder using the firtree



3.1 Attach the tubing from mask or nasal cannula to the 6mm firtree outlet.
Ensure the tubing is pushed on securely.



3.2 To turn on the cylinder slowly rotate the cylinder valve hand wheel anticlockwise at least one complete turn.
Do not use excessive force. You may hear a click when opening the valve.



3.3 Once the cylinder valve hand wheel is open, rotate the flow selector clockwise to the prescribed flow.
Ensure that the correct flow rate number is clearly visible in the flow selector window.



3.4 Check the cylinder for leaks⁽¹⁾ before placing near the patient.
Leaks may be indicated by a hissing sound.

4. Setting up the cylinder using the Schrader outlet



4.1 To turn on the cylinder, slowly rotate the cylinder valve hand wheel anticlockwise at least one complete turn.
Do not use excessive force. You may hear a click when opening the valve.



4.2 Ensure the probe is clean before use.
Insert the oxygen probe into the BS 5682 Schrader outlet applying moderate force until it clicks securely into position.



4.3 Check the cylinder for leaks⁽¹⁾ before placing near the patient.
Leaks may be indicated by a hissing sound.

Note:

⁽¹⁾ If you suspect that you have a leak, turn off the cylinder and reconnect the equipment to ensure it is properly connected. Turn on the cylinder and re-check for leaks. If the leak continues, turn off and quarantine the cylinder and contact BOC Healthcare.

Where the cylinder is being used to supply gas to a medical device, ensure you follow the device manufacturers instructions for use.

5. Monitoring during use



5.1 Keep the cylinder upright and facing away from the patient by using a suitable cylinder holder.
Avoid placing the cylinder on the patient's bed. If there is no alternative, ensure the cylinder is turned on and leak checked before placing on the bed.



5.2 Fit the oxygen delivery device to patient. Regularly check the patients clinical condition during therapy to ensure it remains satisfactory.
If using a mask ensure it is a good fit.



5.3 Use pulse oximetry where appropriate.



5.4 Check the contents gauge at regular intervals, to ensure there is sufficient gas.
To determine there is enough gas in the cylinder check the duration chart for the required flow.

6. After use



6.1 When administration is complete, remove the mask or nasal cannula from the patient.



6.2 Turn off the cylinder by rotating the cylinder valve hand wheel clockwise until it comes to a stop.
Do not use excessive force.



6.3 Disconnect equipment from the firtree.
Remove the tubing by firmly pulling the tube whilst holding the cylinder handle.



6.4 Disconnect equipment from the Schrader.
If the Schrader is fitted with a ring, push the outer ring to release the probe.



6.5 Disconnect equipment from the Schrader.
If the Schrader is fitted with a capstan, release the probe by twisting the capstan clockwise.



6.6 Select a flow to ensure gas within the regulator is vented and then turn the flow selector to zero.



6.7 Protect the outlets by replacing the grey hinged outlet cover.



6.8 Check the remaining cylinder contents using the gauge. If there is sufficient gas for further treatment, return cylinder to designated in use store. If the needle is in the red section return to the empty storage area.

Safety information and general precautions for using medical oxygen

- Oxygen is non-flammable but strongly supports combustion. Things that are not normally combustible may burn in oxygen.
- Do not store or use medical gas cylinders near naked flames, sources of ignition or combustible materials. These conditions increase the risk of a fire occurring.
- Store Oxygen cylinders securely in a safe area. To avoid cylinders falling over and causing injury.
- Clearly identify storage areas with appropriate signage and ensure separation of full and empty cylinders. This ensures staff select the correct cylinder for use.
- Store medical cylinders separately from other non-medical cylinders using appropriate signage. This ensures the correct medical gas is used for patient treatment.
- Storage areas should be well ventilated, clean and dry, preferably inside. This will ensure cylinders are suitable for patient use.
- Smoking should not be permitted in the vicinity where cylinders are used or stored.
- A lit cigarette will burn violently in the presence of oxygen potentially causing harm to the smoker.
- Ensure labels remain clearly visible at all times and not removed or covered. Unauthorised labels/tags must not be fitted. This ensures the user has the correct information available to them when using the cylinder.
- Use a suitable trolley to transport large cylinders. To aide with manual handling.
- Any stationary trolley should be fixed in place. This will prevent it falling over and potentially causing injury.
- Always use an appropriately designed cylinder support to hold the cylinder whilst in use adjacent to the patient. To avoid cylinders falling over and causing injury.
- Set up and test the cylinder before placing near patient. It's important to make sure the cylinder is functioning correctly before connecting to the patient by following the instructions for use.
- Do not place the cylinder on the patient's bed unless there is no suitable alternative for retaining the cylinder. Bedding and clothing enriched with oxygen, will burn violently.
- Do not use oil or grease (or any oil-based products which includes hand creams) in the vicinity of an oxygen cylinder. Oils and grease can spontaneously ignite in the presence of oxygen in high temperature conditions.
- If you need to clean the cylinder do not use any materials which contain ammonium or chloride compounds. Ammonium and chloride compounds could cause corrosion of the brass valve which may result in problems with medical gas delivery.
- Do not refill or tamper with the cylinder package. It is important that the cylinder is not contaminated during use as this may cause problems when refilled.

Oxygen cylinder data summary

Cylinder order code	101-CD	101-ZD	101-HX	101-ZX
Nominal contents (litres)	460	605	2300	3040
Nominal cylinder pressure (bar)	230	300	230	300
Nominal outlet pressure (bar)	4	4	4	4
Firtree flow-rate (litres/min)	1-15	1-15	1-15	1-15
Dimensions (inc. valve) L x D (mm)	520 x 100	525 x 101	930 x 140	930 x 143
Water capacity (litres)	2.0	2.0	10.0	10.0
Nominal weight full (kg)	3.5	4.1	19.0	14.0

Cylinder duration versus selected flowrate (based on nominal flowrate and normal cylinder contents)

Size	Gauge contents Flowrate (ltr/min)	Full (100%)		Half (50%)		Low (25%)	
		(hr.min)	(mins)	(hr.min)	(mins)	(hr.min)	(mins)
CD oxygen (460 ltrs)	15	0.30	30	0.15	15	0.07	7
	10	0.46	46	0.23	23	0.11	11
	4	1.55	115	0.57	57	0.28	28
	2	3.50	230	1.55	115	0.57	57
ZD oxygen (605 ltrs)	15	0.40	40	0.20	20	0.10	10
	10	1.00	60	0.30	30	0.15	15
	4	2.30	150	1.15	75	0.37	37
	2	5.00	300	2.30	150	1.15	75
HX oxygen (2300 ltrs)	15	2.33	153	1.16	76	0.38	38
	10	3.50	230	1.55	115	0.57	57
	4	9.35	575	4.47	287	2.23	143
	2	19.10	1150	9.35	575	4.47	287
ZX oxygen (3040 ltrs)	15	3.22	202	1.41	101	0.50	50
	10	5.04	304	2.32	152	1.16	76
	4	12.40	760	6.20	380	3.10	190
	2	25.20	1520	12.40	760	6.20	380

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