INSTALLATION AND OPERATION OF THE HYPERBARIC CHAMBER
HYPERBARIC CHAMBER

BioBarica Hyperbaric Chamber - Revitalair 430

The hyperbaric chamber is a medical device used to supply oxygen (O2) at greater pressure than normal atmospheric pressure, defined as 1 ATM, thereby increasing the concentration and availability of oxygen in the blood plasma.
Please read the **User Manual** carefully. It will tell you step by step how to operate and maintain this high-technology medical product.
HYPERBARIC CHAMBER INSTALLMENT

Recommendations

- It is not allowed to modify the chamber.
- If this equipment is modified, the manufacturer will not be responsible for its correct operation nor guarantee it.
- If you modify the equipment, you can compromise the user's life. Do not change it for any reason and for any inconvenience consult the manufacturer.
- The equipment must not be used in atmospheres with anesthetic gases, and it is forbidden to use them within the cabin.
- This equipment is used exclusively for the activity described in the manual, not being allowed to develop other task or therapy.
- You can not smoke in the machine's environment nor generate other gases of incomplete combustion.
Other recommendations

- The equipment must be used in an environment where facilities comply with current regulations in the country in terms of electrical safety (Group II with an IT system).
- It is prohibited in the treatment site there are internal combustion engines or gas stoves, to minimize carbon monoxide fumes.
- The camera can only be used with the compressor provided by factory and to pressurize a single cabin.
- You can not enter the team with liquids, gases or volatile substances.
HYPERBARIC CHAMBER COMPONENTS

➔ Components:
  ◆ Cabin pressurization
  ◆ Compressor cabinet
  ◆ Support table
  ◆ BioBarica Support systems

➔ Optional:
  ◆ Removable Stretcher for patients with low mobility.
  ◆ O2 Concentrator.
  ◆ Monitoring System via Web
  ◆ Extended warranty.
Our Hyperbaric Chamber

Data Sheet
Hyperbaric Chamber Revitalair® 430

1. Compressor cabinet
2. Pressure gauge
3. Security valve
4. On/off button
5. Carrying handle
6. Support table
7. Support for chamber door
8. Chamber’s door, one of a kind system
9. Internal and external door handles
10. 10 windows for enhanced vision and brightness
11. Escape valves, internal and external operating system
12. Exhaust valves, 1.4 ATA, 140Ltr per minutes
13. Exclusive and patented aluminum ring system
14. Silicone Seal
15. Vinyl canvas designed for high pressure
16. Removable stretcher for patients with impaired mobility
17. Trolley for stretcher
OXYGEN CONCENTRATOR

BioBarica recommends 3 brands:

- Airsep, Intensity 10 model - High Flow 10 liters per minute.
- NidekMedical - Novo 10 - High Flow 10 liters per minute.
- Hikoneb® OxyBreath 10L - High Flow 10 liters per minute.
OXYGEN MASKS

Oxygen mask with reservoir bag is recommended for maximum therapeutic efficiency.

➢ We recommend using the mask closed and exhaust valves clogged.
➢ This mask delivers 100% O2 available.
➢ The more O2 inspire the most effective treatment will be patient.
➢ Some children do not like to use the mask and you have to place them mustache but this reduces to 50% O2 concentration.
How does the hyperbaric chamber work?

Just as sparkling water, gas bubbles in a closed bottle are undetected until it is opened. Physics explains that gas is diluted in the liquid when it is placed under pressure. The same happens when we breathe O2 in a cabin with at a high pressure: the O2 gas is diluted in the blood plasma.

The hyperbaric chamber was invented over 200 years ago, but a new category of chambers has been introduced to treat many more medical specialties, making the treatment much more accessible and user-friendly. BioBárica specializes in the hyperbaric oxygen therapy. We use Revitalair Hyperbaric chambers with the most advanced technology, and we have the support of various health control national and international agencies certifications.
Hyperbaric Chamber Maintenance
The maintenance is performed by the equipment operator with the instructions mentioned in the BioBarica Global System. The online system alerts the operator of all the necessary maintenance for the equipment to operate properly.

Technical Support
BioBarica offers an extended warranty of up to 4 years (optional), in which case any problem that may arise can be solved with the replacement of the chamber with a new one which will be sent immediately.

Warranty
The chamber includes a one year warranty, except the closure system of the chamber which a lifetime warranty. An optional, extended warranty of up to 4 years can be purchased.
**Treatment pressure**

The pressure of the treatment can be lowered but not augmented. The chamber operates on 1.4 ATM pressure. Only in some cases a doctor might decide to use a lower pressure level. In these cases, the valves may be opened slightly and the internal pressure is stabilized at a value between 1.1 ATM and 1.4 ATM according to the specific indication of the user’s guide.

**What are the differences with the hard-shelled chambers?**

Hard-shelled chambers use with high pressure levels that require high maintenance costs and specialized operators. They also have more safety requirements and the treatment is much more aggressive and stressful for the patient.
What advantages do these chambers have compare to lower pressure?

In the market there are low-pressure chambers that operate on 1.3 ATM, which are offered at a lower price range. The Revitalair 430 is a certified medical device that operates at 1.4 ATM, which is the minimum pressure necessary for hyperbaric treatment. The cheaper models have a zipper and resemble a sleeping bag. This provides very little mobility for the patient and are very uncomfortable. The biggest difference is the effectiveness of the treatment. Our chambers allow the inhalation of higher doses of O2, making our treatment just as effective as the ones provided in expensive, hard-shelled hyperbaric chambers.

Chamber Operation

The device can operate all day. Brief resting periods of only five minutes per hour is sufficient, and it is the same time between patients.
Revitalair 430

- 1.4 ATA*
- 54Kg
- 95% of pathologies

High pressure

- 3 ATA
- +1000 kg
- 100% of pathologies

Low pressure

- 1.3ATA
- 45-60Kg
- - 30% of pathologies

*According to the UHMS of the United States the definition of hyperbaric treatment is from 1.4ATA
Installation: Revitalair 430® cameras are assembled in little time and do not require much space. The minimum measures are 1,70m x 2,80m.

Maintenance: These cameras are easy to maintain and clean by the user.

Portable: simple to assemble in any place.

High-pressure chambers need special space, of greater size and complexity. They also require regular hydraulic testing for maintenance and specialized technicians. These high pressure chambers weigh approximately 1000kg and are dangerous to operate.
The Revitalair 430 hyperbaric chamber has 10 windows that give a 360° vision, greater luminosity and patient control, avoiding claustrophobia.

- The low pressure chambers have only 3 windows
- The high pressure chambers have a single larger window.
Revitalair 430

- The Revitalair 430 hyperbaric chambers are easy to operate by the user without assistance.
- Security: It has increased air flow of air and 4 security valves.
- In these chambers, patients enter with any type of clothing.
- También se puede ingresar con libros y electrónica (celular, Tablet, etc.).

High pressure chamber

- High pressure hyperbaric chambers require a specialized technician to operate.
- Due to their operation in high pressure, they require greater safety measures.
- Patients must enter the chamber with cotton clothing.
- Entering with electronic devices is completely forbidden.
THE REVITALAIR 430 MEDIUM PRESSURE CHAMBERS ARE AS THERAPEUTIC EFFECTIVE AS THE HIGH PRESSURE CHAMBERS.
Revitalair 430 Hyperbaric Chamber

- Patented door locking system (lifetime warranty).
- Removable stretcher. Ease of entry for people with reduced mobility.
- Children can enter the chamber accompanied by an adult.

Low pressure chamber

- Zipper system, less durability and does not achieve complete sealing.
- These chambers are located on the ground, making it difficult for people with reduced mobility to enter. They does not have a stretcher.
- Due to space, only one person per session is allowed.
TECHNICAL FEATURES

Chamber set-up
This technology allows the chamber to be installed in any environment with absolute safety. It is generally installed in medical institutions, in any space that it may fit. We recommend the room has air conditioning, since the pressure inside the chamber can raise the temperature by 2-3 degrees. Air conditioning prevents it from getting too hot.

Air Conditioning
We recommend there be air conditioning in the centres, especially for hot climates because the compression of the air inside cabin makes the temperature rise by 2 or 3 degrees. It is more comfortable for the patient when there is an outside temperature of 23 degrees.
DIMENSIONS NEEDED TO INSTALL THE HYPERBARIC CHAMBER

For the installment and operation of a center, the minimum required space is a room of 4 meters by 2.5 meters.

The chamber can be uninstalled in 15 minutes and ready to carry where needed.
TECHNICAL FEATURES

Energy connection
The chamber is connected to a normal outlet of 110 or 220 volts (as indicated by the model) and it is suitable for a home outlet. No special outlets are necessary.

What if the power goes out in the middle of a session?
There is nothing to worry about. The compressor stops working and the patient or operator can depressurized the chamber normally to eject the air. The door can be opened and the patient may exit. If the session is not complete, there is no problem, but the patient might have to start over with that particular session at some other time.
Incorporation of the BioBarica System

Initial purchase of equipment and supplies

Insurance

Signage

Emails.
INCORPORATION OF BIOBARICA SYSTEM

The Hyperbaric System gives you the tools, the know-how and the support to manage a hyperbaric medical center. One of the most important tasks to be carried out to complete the opening and commencement of operations of a BioBarica center is to adequate the facilities according to the standardized indications of BioBarica. There should be an available space for medical care services.

In many cases, the hyperbaric medicine unit is incorporated to a hospital, clinic or medical center. There should always be a responsible physician and an operator (sometimes, the receptionist is the operator).
INITIAL PURCHASE OF EQUIPMENT AND SUPPLIES

Note that the focus should have all the necessary equipment for the treatment of patients at the time of opening:

- ✓ HYPERBARIC CHAMBER INCLUDING COMPRESSOR AND MATTRESS
- ✓ O2 CONCENTRATOR
- ✓ OXYGEN MASKS
- ✓ ZIPLOC TYPE AIRTIGHT BAGS (TO STORE THE MASKS)
- ✓ LABEL (LABEL FOR THE BAGS USED TO STORE PATIENTS’ MASKS)
- ✓ REMOVABLE MATTRESS FOR PATIENTS WITH REDUCED MOBILITY
- ✓ CLEANING ARTICLES
INSURANCE
You must take out all insurance policies referred to in the Licensing Agreement. To do this, you can reach out to BioBárica so as to be contacted with an insurance broker, or take out a policy with a renowned insurance company. Your insurance payment must be up to date, to protect your assets and the operation of the center.

SIGNAGE
The signage bearing the brand at the entrance of the center must comply with the provisions and instructions of the Licensor. Marquee / corporeal letters may be installed either by your supplier for these type of services, or by the supplier indicated by the Licensor. Yet, in both cases the installation must comply with the guidelines specified by BioBárica.

CORPORATE E-MAIL
Remember you must have multiple e-mail accounts. One will be for the local public and one provided by BioBarica. The account you will be using to communicate with the Licensor shall be reported within 15 calendar days as of the signature of the Licensing Agreement, and it will be the address to receive all BioBarica’s communications.
name.lastname@biobarica.com
Example: marcia.oliveira@biobarica.com
BIOBARICA CENTER

Operational Guideline of a BioBarica center

- Infrastructure
- Air-conditioning
- Cleaning
- BioBarica Global System - Hipermed
IMPORTANT

How many patients can be treated per month?

Consider:
An patient needs 14 sessions average.
It provides service 10 hours a day in 22 days a month.
Availability per month: 220 hours of treatment.
220 Hs. / 1 hour 14 sessions = 15.7 patients per month.

10 minutes time between sessions (plus scheduling problems ) = 20% of the time.

Patients that can be attend per month =

14 patients
You must have physical space and appropriate amenities to carry out technical and administrative tasks safely and efficiently. All renovations carried out should be aimed at improving the welfare and comfort of patients and staff, as well as to adapt spaces to new equipment.

**Waiting room**
A comfortable sitting room and waiting area that promotes socialization, not only among patients but also with their families, thus creating a pleasant environment.

**Reception**
The workstation to address administrative enquires at the center.

**Consulting room**
A space for the doctor’s office.

**Lighting**
The lighting of each space must comply with all regulations concerning quality and environmental systems, as well as with all guidelines included in the Architecture Manual, detailed under the drawings for adequate space layout.
CLIMATE CONTROL

All spaces must be regulated by a central forced ventilation system, air conditioning and heating system. They also need air extraction equipment that purifies continuously the air in the environment.

**IMPORTANT:** THE ROOM TEMPERATURE OF THE SPACE WHERE THE CHAMBERS ARE LOCATED MUST BE AT 23 °C. IT IS SUGGESTED THAT AN ENVIRONMENTAL OZONATOR IS INSTALLED. THIS ROOM MUST BE BRIGHT, USING LOW HEAT LIGHTING.

Treatment Room
The room where the Hyperbaric Chambers are located, must also count with proper storage space for masks (in use / in stock), and elements that provide the patients with a more comfortable experience (pillows and blankets).

Bathrooms
The bathrooms in the reception area are for public use and, therefore, must be in perfect condition, clean and maintained.
They must have containers with antibacterial / antiseptic soap and alcohol hand sanitizer.
Staff should not share bathrooms with the patients.
Hygiene items in-between sessions

IMPORTANT:
• Read the user's manual for proper cleaning guidelines.
• Do not use abrasive products.
• Lysoform should be used for the cleaning of the mattresses on which patients lie,
• To clean masks, spray them with 70% alcohol after each use and before storing them back in their labeled bag.
• Hand sanitizer, to be used before handling the masks for the patient.

Cleaning
• Comply with quality standards approved by the institution.
• Comply with daily cleaning routines.
• Document processes.
• Comply with waste management procedures.
• Use products approved by the institution.
• Follow the procedure for floor cleaning.
• Provide training for cleaning and maintenance personnel.
• Clean compressor and oxygen concentrator equipment.
BIOBARICA GLOBAL SYSTEM

Hipermed

Tickets

Trainings

Blog

Maintenance
PATIENT CARE

Operational Guideline of a BioBarica center

- Forms
- Sessions
- Training
Before the session starts:

- Explain the recommendations to the patient. The poster is available in the training module BGS. (Image)
- Let the patient in without shoes, wearing the corresponding mask. Adjust the mask for the patient and always remember the compensation maneuvers.
- Be considerate as regards patient comfort. Offer elements that may improve comfort, such as blankets and pillows.
- Turn on the compressor and the oxygen concentrator.
- Monitor the patient until the maximum pressure level is reached.
Pressurization Time

Revitalair 430 chamber valves can be adjusted for progressive pressurization. The cabin has a graduation in the circular base of the emptying valves. This graduation is selected by matching a vertex of the hexagon of the drain valve with each mark.

**How to pressurize the cabin gradually**

Closed valves: If you pressurize the cabin keeping the valves closed, the cab will reach 1.4 ATA (Atmospheres) in approximately 4 minutes.
DEPRESSURIZATION TIME

You can choose the speed of emptying your hyperbaric chamber depending on the opening of the valves and the number of color marks of the valve that you decide to open for each of the 2 valves that the cabin has (Fig 2)

**Both drain valves are the same and work indistinctly.**

If you open a single regulated mark on one of the valves, it will only lower the pressure to 1.38 ATM in 1 minute. If you open 2 regulated marks it will drop to 1.3 ATM in about 3 minutes.

To empty the chamber you must open one of the valves by its color mark. There are 4 marks set by each color mark and, if you open a color mark every 15 seconds, the cabin will take 3 to 4 minutes to depressurize.

**It is usual is to accelerate this process of decompression moving 2 marks of color every 15 seconds;** in this case, depressurizing will take 2 minutes and it will be more comfortable for the patient.
HYPERBARIC CHAMBER SESSION

After the session:
- Turn off the compressor and the oxygen concentrator.
- Clean the patient's mask. Store the mask along with its proper identification.
- Arrange an appointment for the next session.
- Say good bye to the patient.
- Sanitize the chamber with 70% alcohol. Spray Lysoform inside the chamber and deodorize its interior.
- Clean the mattress using Lysoform (or a similar product).
BioBarica not only trains you at the beginning of the business relationship and before the opening of the center but it also provides you with ongoing training and assistance to help you achieve your objectives. It is essential in the operation of a BioBarica Center to correctly perform each of the procedures included in the material provided.

**ENJOY THE CONTINUOUS ASSISTANCE PROVIDED BY BIOBÁRICA**

**Online training**

On the Global System to which you have full access immediately after you become a member of the BioBarica network, you will find business, medical and technical training that will help you manage and develop your center.
BIOBARICA GIVES YOU A COMPLETE TECHNICAL AND COMMERCIAL SUPPORT

✓ OUR HYPERBARIC CHAMBERS ARE DESIGNED WITH HIGH QUALITY AND CUTTING EDGE TECHNOLOGY.

✓ ALL THE INFORMATION ABOUT THE INSTALLATION AND OPERATION OF A HYPERBARIC TREATMENT CENTER IS PROVIDED BY BIOBARICA
THANK YOU FOR TRUSTING BIOBARICA