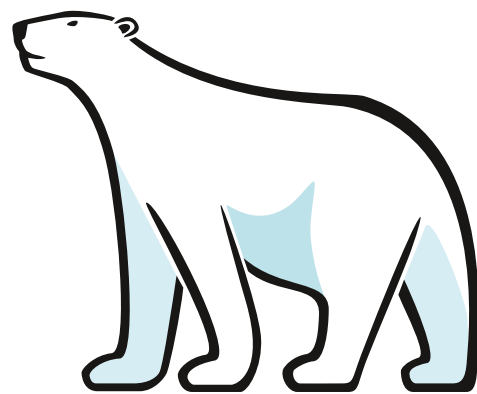


# Cryo Local Polar Bear

User Manual

08/2021





Cryo Polar Bear

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# 1. DESCRIPTION AND PRINCIPLES OF OPERATION

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## Description

Cryo Polar Bear is a modern, mobile cryogenic apparatus equipped with 50 litre cylinder for liquid nitrogen for cryotherapy / local cryostimulation.

The device is recommended for clinics, hospitals, spas, as well as rehabilitation, physiotherapy, and cosmetic rooms. It is easy to transport and may operate in several places: near the patient's bed, in gyms, as well as rehabilitation and physiotherapy rooms.

Cryo Polar Bear is an innovative device which measures the patient's skin surface temperature during cryotherapy treatments. A sensor located in the blowing nozzle allows the therapist to control the temperature of the body area subjected to cold cryogenic blow. As a result, it is easier for the therapist to check whether the cryostimulation is carried out evenly and efficiently, and a light signal informs him or her about excessive skin cooling and risk of frostbites.

The apparatus is controlled using a remote and a large touch panel with LCD screen, which displays the treatment parameters. Smoothly adjusted blowing force allows to select optimal treatment parameters, adapted to the size of the area subjected to cryotherapy.

Cryotherapy is one of the oldest physiotherapy methods. Cold treatment has been known already in Middle Ages, when ice and snow were used as anesthetics. This is an efficient form of treatment that allows to restore physical fitness and improve health.

Local cryotherapy has a wide range of applications. This is one of the reasons for its huge popularity.

Local cryotherapy treatment uses a blow of mixture of liquid nitrogen vapours and cooled air. A physiotherapist, by making circular movements, sweeps area subjected to treatment with frosty air. A single treatment most often lasts from several dozen seconds to 30 minutes.

This method is more and more commonly used, also in cosmetics. In case of problems with cellulite, erythema, nevi, expanded blood vessels or other skin imperfections, it is a good idea to visit a beauty salon and indulge yourself in this treatment.

Cryotherapy is also used in face and body plastic surgery, in cellulite and overweight treatment and in prevention of skin aging process. Local cryotherapy treatment in the area of operation field of plastic surgeries and liposuction, after application of sutures and before putting a tourniquet on, significantly reduces the post-surgery edema and accelerates skin healing processes.

Local cryotherapy oxygenates the skin, and thus makes it more firm and bright. Cryotherapy also helps to remove wrinkles, since cryotherapy treatment involves application of anti-wrinkle and moisturising cosmetics on the skin. Skin stimulated with cold more efficiently absorbs cosmetic preparations, which, due to low temperature, may reach the deeper epidermis layers. This improves the oval of the face, smooths out wrinkles, and stimulates regeneration of epidermis.

Cryotherapy is used not only to treat face, but also cleavage, stomach, breasts, neck, buttocks and shoulders. Low-temperature treatments are carried out to reduce stretch marks, edema or spider veins, as well as to make the skin more flexible and firm.

Cold therapy in sport brings about numerous, confirmed with researches, positive effects in terms of injuries treatment, it is also a necessary element for efficient preparation and regeneration of a player.

Local cryotherapy is used by the top athletes both in Poland and all over the world. Above all, cryotherapy in sport accelerates body recovery after training, it has analgesic, antioedematous and anti-inflammatory effects, thus supporting the treatment of various types of injuries and musculoskeletal system injuries.

## Results and recommendation

### What are the results of the treatment?

- Limitation of blood circulation in a given place
- Slowing down of metabolism
- Reduction of muscle tension and reduction of pain by triggering
- internal analgesic reaction
- Improvement of blood flow and absorption of oxygen in tissues
- Stimulation of cold receptors
- Decrease of activity of heat receptors
- Vasomotor lesions
- Inhibition of inflammation
- More oxygenated skin – more firm and flexible
- Smoothing wrinkles
- Improvement of face oval
- Faster epidermis regeneration
- Reduction or regression of edemaw

### When to use the treatment?

- Treatment of joints and muscles
- Injuries of joints and soft tissue e.g. sprains, dislocations
- All rheumatoid and rheumatic diseases of motor organs e.g. rheumatoid
- arthritis
- Ankylosing spondylitis
- Psoriatic arthritis
- Joints diseases associated with metabolic disorders (gout)
- Periarticular inflammation
- Spondyloarthritis
- Burns - removal of thermal shock
- Discopathies
- Enthesopathy
- Myalgia
- Tendon diseases, muscles and elbow ligament tearing
- Osteoporosis prophylaxis
- Multiple sclerosis
- Edema, bruises, post-traumatic hematomas

## Safety rules

1. Before installing the device, check the packaging for damage.
2. Before starting assembly, read the instruction manual.
3. Make sure that the device is connected to power supply of voltage 110 V - 250 V, 50/60 Hz, pay attention to never touch the main plug and socket with wet hands.
4. To avoid the risk of electric shock, the device must be connected to a socket with grounding. In case of danger or risk immediately turn off the power supply by pressing red button "E-Stop";
5. Disconnect the device from a socket when the device is not used. The device should be installed in accordance with the instruction manual supplied with the device;
6. Before commencing, check the connection and make sure that the liquid nitrogen installation and electrical elements work properly.
7. Before cleaning or dismantling components, disconnect the device from power supply and connected steam source (liquid nitrogen vessel).
8. Never open doors of the device and do not touch the instruments inside when the device is operating.
9. Do not touch the end of the nitrogen vapour nozzle located at the end of handle when using the device or immediately after stopping its operation.
10. Do not put any items inside the nitrogen installation
11. Do not use damaged device;
12. Do not in any way change or modify the device without consulting the manufacturer.

## **Risk and preventive measures**

The room in which the device operates should be equipped with appropriate alarm system and proper ventilation. If the level

of oxygen in the room drops below 17%, and the ventilation system fails to provide sufficient air circulation, stop the operation and leave the room. After rising appropriate level of oxygen in the room, you may use the device again.

Cryotherapy process with the use of cold nitrogen vapours should not take place without a functioning alarm system. This is a significant aspect that ensures safety of clients and persons operating the device.

Due to low temperature of liquid nitrogen, its vapour may damage skin as well as cause burns.

Unprotected body parts in contact with uninsulated cold parts may adhere to each other, and the tissue may be detached when you try to separate this part from the skin.

Cold vapours, as well as the liquid nitrogen itself, may lead to frostbites when unsecured parts of body are exposed to low temperature for a long time. Attempt to heat body parts may cause strong pain and shock. In order to provide first aid, loose the clothing that may impede appropriate blood flow, and the victim should be immediately taken to hospital, with an exclusion of completely superficial wounds. Damaged body parts should not be exposed to high temperatures and, if possible, should be immersed in lukewarm water.

Short-term exposure to very cold gas causes breathing problems and may induce an asthma attack in case of persons prone to it. Long-term inhalation of cold gas normally does not cause lungs damage. If the vapours are very cold, frostbites may appear in the mouth or nose.



Hypothermia may take place in various conditions, in which temperature is lower than 10°C, but susceptibility to it depends on several factors.

Among others, time spent in such conditions, air temperature, age of the person (elderly people are more susceptible) and the type of clothing.

**Hypothermia symptoms:**

- Slower physical and mental reactions;
- Unusual behaviour or hyperactivity;
- Speech and eyesight problems;
- Contractions and chills.

A person with visible symptoms of hypothermia should be covered with a warm blanket and moved to a warm location, and immediately subjected to medical attention. Do not use direct heating methods, unless qualified persons recommend otherwise.

Every person working with liquid nitrogen or systems that utilise liquid nitrogen should be instructed about the risk associated with damage, injuries caused by colds, frostbites or hypothermia. Pay special attention to malicious nature of possible hazard arising due to operator's lack awareness of occurring dangers. Carry out practical trainings related to risk limitation methods and actions that should be taken in case of danger.

## Principles for handling liquid nitrogen

### Physical properties of liquid nitrogen

- Boiling point LN2: -195.8°C (-383 F)
- Evaporation heat: 198.97 J/g
- 1 litre of liquid nitrogen changes into 693 litres of vapour
- Weight of one litre of liquid nitrogen: 0.808 kg

Due to temperature of liquid nitrogen, body should always be appropriately protected. Protect eyes using goggles, since even a minimum contact with such a low temperature may damage the delicate eye tissue. The skin is a little bit less susceptible, but an excessively long contact with liquid nitrogen may cause frostbites.

Users should exercise particular caution when working with liquid nitrogen. Observe the following requirements:

- Each work with liquid nitrogen must be carried out in a presence of another person.
- Operators working with liquid nitrogen should be equipped with appropriate personal safety equipment:
  - Protective goggles;
  - Protective gloves;
  - Protective apron;
- Any works associated with installation of the device must also be carried out with protective gloves on.

Protective clothing is only used to protect the operator working at cold equipment against liquid gas or parts in contact with it. When servicing parts in contact with liquid nitrogen, always wear protective leather gloves. Gloves should be loosely fitted to ensure that they can be easily removed when they are poured with liquid or the liquid penetrates inside the gloves. Wear protective goggles or a protective mask to secure eyes and face in places in which liquid nitrogen may splash.

Used clothing should not have any open pockets and cuffs in which liquid may accumulate. Moreover, for the same reason, tuck your pants into shoes. If your clothing is covered with liquid nitrogen, this may lead to frostbites. In such a case, use clean water to clean the clothes that should be changed.

Suffocation due to lack of oxygen often happens fast and without any warning signals for the victim. The main symptoms that may occur in case of insufficient amount of oxygen are described below. However, keep in mind that reactions may be different depending on a person, and symptoms may differ from those described in the table.

**15 - 19%**

Limitation of capability to carry out tasks, possibility of symptoms associated with circulatory system in heart, lungs and blood;

**12 - 15%**

Deep breath, fast pulse, poor coordination;

**10 - 12%**

Dizziness, slightly sinusoidal lips;

**8 - 10%**

Nausea, vomiting, loss of consciousness, blue face, fainting; 6 - 8% Death within 8 minutes, possible immediate resuscitation;

**0 - 4%**

Death, permanent brain damage

If any of those symptoms occur - fast and heavy breathing, sudden fatigue, nausea, vomiting, collapse or lack of movement or unusual behaviour - react as fast as possible and alarm paramedics. If use of specialised equipment is impossible, such a person should be immediately moved into fresh air.

Each attempt to save the victim should be carried out by qualified persons, trained in use of medical breathing equipment and entering closed spaces with small amount of oxygen inside.

## 2. INSTALLATION AND PREPARATION FOR OPERATION

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## **Preparation of the vessel for filling with liquid nitrogen.**

The first stage after unpacking the machine is preparation of the tank to be filled with liquid nitrogen.

Open the back door cover and then disconnect the electrical connection from the head. Then, gently pull the liquid nitrogen tank out.

Wear protective gloves and goggles when you carry out those operations. Do not touch the cables and the head right after the tank has been filled. Wait until the entire element reaches room temperature.

## **Device installation.**

A filled nitrogen tank should be gently placed in the housing of the device again. Make sure that the position of the tank fasteners is parallel to the base of the device. If the aforementioned activities have been carried out correctly, connect the wiring harness between the head and the device and close and lock the door.



### 3. COMMISSIONING AND OPERATION

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## Commissioning

Make sure that the nitrogen tank is properly mounted in the device. Check proper connection of the electrical installation.

Connect Cryo Polar Bear to power supply.

Remember to use a grounded socket.

Activate the device by pressing the green button under the display. After activating the device, a start screen appears.



The device automatically informs about nitrogen level in the tank.

The nitrogen level is displayed in the upper right corner of the screen.



## Operation of Cryo Polar Bear

Cryo Polar Bear operates on the basis of two main programs.



## 1. PROGRAMS

These are programs that were specially designed for a specific body part. Programs have specified treatment duration and assigned nitrogen dosing power.



### FACE

Cryotherapy treatments carried out on the face and neck. The treatments are mainly based on cryogenesis: skin collagen strengthening, reduction of wrinkles, skin rejuvenation, opening skin pores, improvement of skin flexibility.

### BODY

Cryotherapy treatments carried out on the general body parts. Those treatments are based on rehabilitation and beautification properties: reduction of cellulite, skin collagen strengthening, skin flexibility improvement, loss of body weight.

### TOP BODY

Cryotherapy treatments for precise areas of the upper body parts. Recommended during rehabilitation and for sportsmen.

### BOTTOM BODY

Cryotherapy treatments for precise areas of the bottom body parts. Recommended during rehabilitation and for sportsmen.

## Face program



## Body program



## TOP BODY program



## BOTTOM BODY program



After selecting the type of the program, press **NEXT** button



After a short period of time, a nitrogen fumes start to emit from the remote, then press **START** button and start the treatment.

**Important!**

**Wait with treatment until vapor appears from remote and after that press START to begin session for the patient**

For the entire duration of the treatment, the screen displays patient skin temperature, time remaining until the end of the treatment, the laser option, fumes blowing power.



When the progress bar is full, the cryotherapy treatment ends. You can stop the treatment at any time by pressing **PAUSE** button.

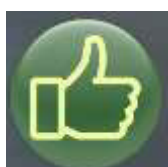
During the treatment, the screen displays current patient's skin temperature.



Too low skin temperature, change the nitrogen flow direction to another area of the part of the skin or stop the treatment due to too low temperature of the patient's skin



Appropriate patient's skin temperature



Excessive patient's skin temperature, gently approach the direction of fumes to the patient's skin

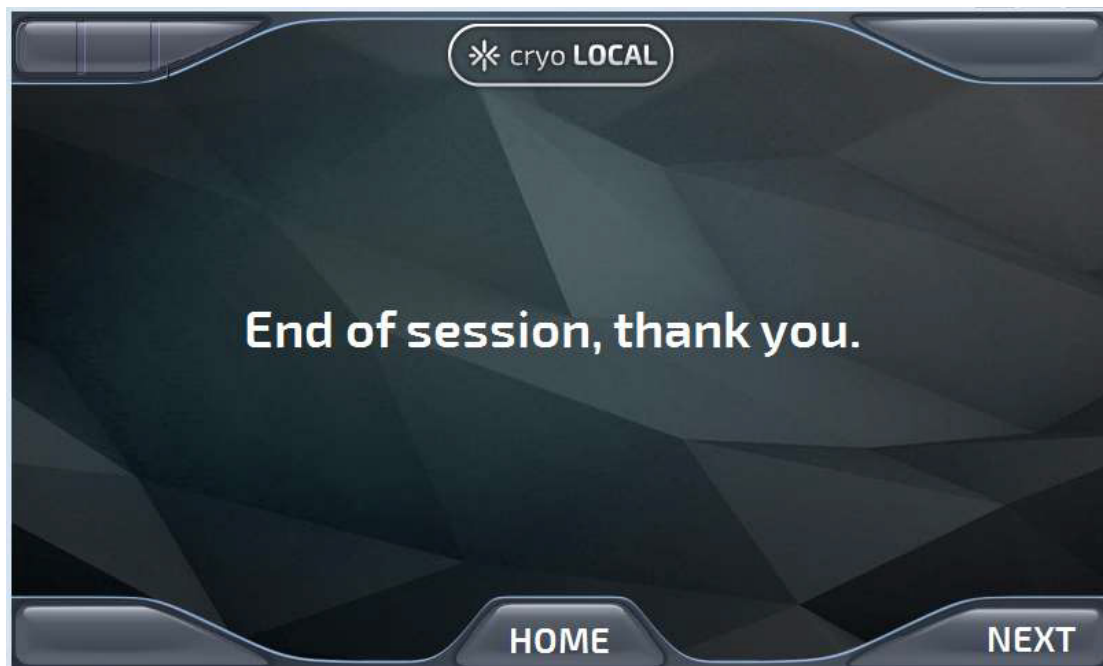


Pressing **PAUSE** button during treatment stops the treatment and allows to continue the process or finish it.

Pressing **STOP** button ends the treatment.



After stopping the treatment, an end screen appears.



## 2. MANUAL PROGRAM

In this mode the operator independently specifies the duration of the treatment, the amount of provided cold nitrogen fumes, operation of the directional laser.



### FLOW

“+” and “-” symbols specify the amount of cold nitrogen fumes that will be used during treatment

### TIME

“+” and “-” symbols specify the duration of the treatment

### LASER ON / LASER OFF

specifies activation or deactivation of laser function during treatment

After setting the treatment option, press **NEXT** button to automatically start the treatment.

**START, PAUSE, STOP** have the same functions in both **PROGRAMS** and **MANUAL PROGRAM**.

## REMOTE BUTTONS DESCRIPTION

Cryo Polar Bear is equipped with an innovative control system. Operation of the device during treatment is carried out not only via touch screen, but also using a remote.



Four LEDs indicate the intensity of nitrogen steam flow during treatment.



### **MINUS button**

Decreases nitrogen steam flow rate during treatment



### **PLUS button**

Increases nitrogen steam flow rate during treatment



### **START/PAUSE button**

Activation or deactivation of a treatment session

Red lasers allow to maintain safe and even distance from the skin surface. In appropriate distance, two beams form a single dot. By default, the lasers are deactivated in case of face treatments as a safety measure for eyes. However, they can be activated by the operator in settings.

Skin surface temperature sensor allows to execute treatments with constant performance.

RGB light shows optimal skin surface temperature. During treatment, the skin temperature significantly drops, which is signalled by a bright colour:

**GREEN light**

Means that the skin temperature is too high, and the skin should be additionally cooled.

**BLUE light**

The skin temperature is perfect.

**RED light**

The skin temperature is too low, and the patient might get burned, immediately

In case of danger or failure of the device during treatment, quickly press the emergency button located at the top of the device.



After pressing the button, the screen displays a message that informs that **EMERGENCY STOP** button is pressed.



To reactivate the device, unlock it by pressing the button again.

When commissioning the device and during treatments, pay special attention to the level of nitrogen in the tank. An icon informs us about it in a graphical form.



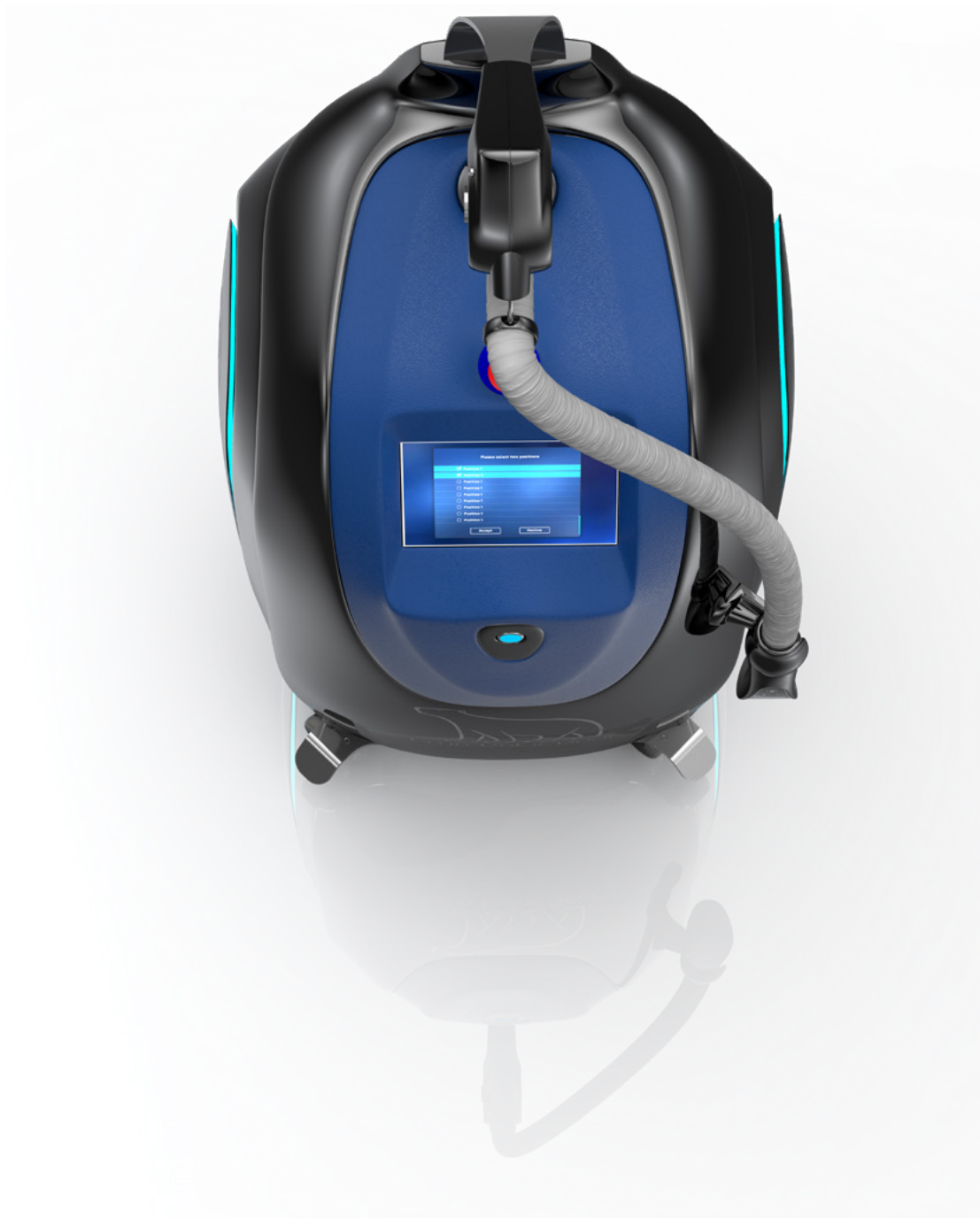
Do not activate the device when the nitrogen tank is empty. When the entire nitrogen is used, the main screen shows a message.



Before next activation, fill the tank with liquid nitrogen.

## 4. SPECIFICATION AND MAINTENANCE

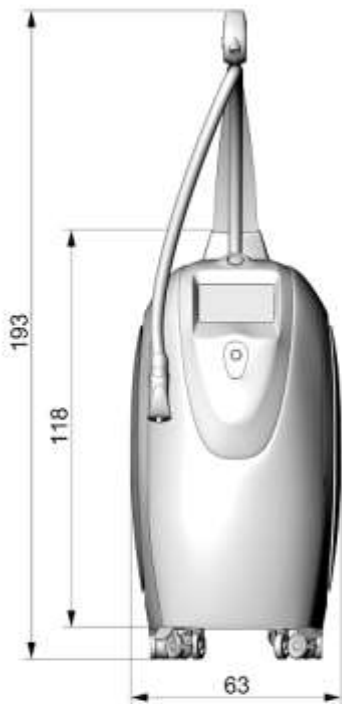
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## Specification of Cryo Polar Bear

Position	Value
Power supply	230 V or 110 V
Liquid nitrogen tank	50L
Device with a trolley with a single brake	✓
Hose length	2m
Liquid nitrogen level sensors in the tank	✓
Touch LCD display	10-inch
Full body programs + Free program	✓
Nitrogen steam temperature at the nozzle outlet up to	-160°C
Control of the device via LCD display and a remote at the nozzle	✓
Smooth nitrogen blow	4 settings
Emergency button	✓
Temperature sensor with LED indicator	✓
Fixing lasers	✓





## Maintenance

The device contains non-replaceable components that may be repaired only by a factory service. Never attempt to repair the device on your own. Always commission a repair to a qualified person.

### Device cleaning:

1. Deactivate the device.
2. Disconnect the device from electric and gas installation.
3. Wait until each part of the device heats up (each element reaches safe ambient temperature) before starting cleaning.
4. Wipe the control screen surface with a cloth and screen cleaning agent. Do not spill water / liquid on the surface of the control screen and never use corrosive chemicals.
5. Clean / wipe laminated surfaces using standard disinfecting cleaning agent. Never use aggressive chemicals.
6. Gently clean the dosing hose and the handle so to not damage the surrounding hose insulation.
7. Do not fill the liquid nitrogen tank and do not replace the tank on your own. Those operation must be carried out by a qualified person.

## Disposal

In accordance with agreement on commercial waste (official collection 2001.62.628) and EU Directive 91/689/EEC, uncontrollable disposal of electrical devices is prohibited.

Responsibility for transport of equipment or components to professional electronic recycling services is always borne by the client.

## Contact

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**VacuActiv**

### Contact

[contact@vacuactiv.com](mailto:contact@vacuactiv.com)

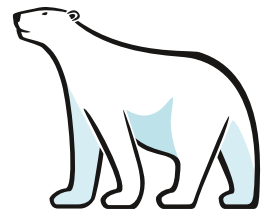
#### Available at

Central European Time 9am - 5pm  
Monday - Friday

### Technical support

[support@vacuactiv.com](mailto:support@vacuactiv.com)  
**+48 501 186 938**

Modrzewiowa 1 Street, 7  
6-251 Losino, POLAND  
Phone +48 59 843 43 43



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