



# Centurion

# BOREAS<sup>®</sup> CS

Cold Compression Therapy



## Operation Manual

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## 1. System Information

Congratulations on purchasing your Centurion Boreas cold compression therapy system. For 30 years, Centurion has carefully cultivated a reputation as a world leader and innovator in equine therapy equipment, and the Boreas continues Centurion's tradition of excellence. Boreas has been specifically designed with the comfort and performance of your horse in mind. Guidelines for the safe use and servicing of the equipment are outlined in this manual and it is essential that you read the manual fully prior to operating Boreas for the first time. Keep the manual for future reference and refer to it for safe and efficient use of the equipment.

### **1.1 SYSTEM DEFINITIONS, SYMBOLS, WARNINGS, CAUTIONS AND NOTES**

Please read this section thoroughly before operating your Centurion System. Included below are definitions of terminology and symbols used in this manual and/or used on equipment markings, operational warnings, cautions and notes for the safe operation of the Centurion “BOREAS”.

#### **DEFINITIONS**



#### **WARNING**

- Specific Information provided to the user to advise of situations where the misuse or unlabeled use of the device could present potential harm to the user or horse and/or could result in irreparable damage to the device or property.



#### **CAUTION**

- Specific information provided to the user to prevent misuse of the device that may cause it to malfunction.

#### **NOTES**

- General information provided to the user to further explain or clarify the proper operation of the device and its accessories or applied parts.

## APPLIED PARTS

- “Applied Part” is the term used to refer to any of the applicators that are used to provide the actual treatment session . (i.e.: “Utility Wraps”)

## SYMBOLS

Symbols are contained in the documentation and on the markings on the equipment to alert you to cautions and permit easier comprehension of a marking or indication in a restricted space. The following symbols are used with Centurion Systems.

Symbol	Definition
--------	------------



0454

- \* On Equipment Attention, consult accompanying documents
- \* In Manual Alerts you to a Warning or Caution that you need to read.



5333

- \* Type BF Applied Part



0454

### **WARNINGS - GENERAL**

- Only properly trained personnel should use the system
- Do not splash or expose electric parts of the system to water or moisture. Doing so may permanently damage it.
- The Centurion BOREAS is not suitable for use in the presence of a FLAMMABLE ANAESTHETIC MIXTURE WITH AIR, OXYGEN or NITROUS OXIDE or other explosive gases. Failure to heed this warning may result in fire or explosion.

## 1.2 What is Cold Compression Therapy?

Cold Compression therapy is one of the most highly recommended treatments for recovery from soft tissue injuries and everyday training stress that may lead to more serious athletic injuries.

After sustaining an injury a series of inflammatory responses and an increase in local tissue temperature may lead to additional damage to the tissues, often termed as the “secondary hypoxic injury”. Cold Compression therapy is one of the only direct treatments to avoid this post trauma damage to the tissues. Characteristics of the inflammatory events include increased heat, white blood cell recruitment from nearby blood vessels, and microvascular effusion (edema). In turn, the increased white cell activity can cause additional cellular injury, dysfunction, and necrosis.



**CAUTION.**- In all cases consult your Veterinarian should you have swelling in a horse’s leg..

Rest, ice, compression and elevation (RICE), is a well-accepted mode of treatment for soft tissue injury for all species. The general concept is that RICE will slow down and mediate the inflammatory response; until recently, these mechanisms were not well investigated or well understood. Cryotherapy (tissue cooling i.e. ice) and compression have the potential to enhance the healing process by addressing negative outcomes from the inflammatory responses. By using the combination of Cold and Compression you can substantially decrease the extent of damage in a number of ways.

- Decreases the amount of local bleeding by enhancing vascular flow THROUGH the injury site lessening stagnant edema that contributes to the oxygen “starvation” of the affected tissues.
- Reduces pain by decreasing the transmission of pain signals through the local nerves AND by decreasing the pain ramp up as a result of the inflammatory cascade.
- Reduces the risk of cell death associated with the “secondary hypoxic injury” by decreasing the rate of metabolism in the local tissues and increasing local oxygen tension within the tissues.
- Enhances the effects of antibiotic and NSAID drugs on the treated area.

Compression is used in conjunction with Cryotherapy to provide external pressure on the tissue and prevent excessive swelling. Using the Boreas increases the pressure on the treated area thus stimulating the release of nitric oxide. Vascular flow-through of treated area is improved, allowing more complete removal of the negative metabolites created through the inflammatory process.



**WARNING.**- Any therapy or procedure being used on your animal, should always be in consultation with your Veterinarian.

## 1.3 Why Cold Compression?

- Controls inflammatory response after injury and training.
- Improves blood flow to treated and surrounding tissues.
- Enhances the lymphatic system helping to reduce edema.
- Reduces scar tissue in tendon and ligament injury.
- Reduces pain associated with injury

**Inflammatory mediators are regulated** reducing the acute phase of healing and allowing drug therapies to be more effective. The horse's dis-regulated immune response is modulated, enhancing blood flow without the associated increase in oxidative damage associated with magnified leukocyte recruitment and function.

**Blood flow to the injury site is increased** by both biomechanical and biochemical functions and the associated edema are reduced allowing for greater oxygen delivery to compromised tissues.

**Regeneration of normal tissue becomes possible** by reducing the quantity of granulation tissue required to repair soft tissue damage. Resulting scar tissue is minimized, reducing the chance of re-injury or chronic lameness

## 1.4 The Benefits of Using Boreas

- Reduce Pain
- Reduce Swelling & Inflammation
- To Help With Recovery From Orthopedic Surgery
- To Help Control Muscle Damage
- To Reduce Heat

## 1.5 When should I use Boreas?

In treatment of acute injuries, Boreas should be used immediately after the onset of the injury and as often as possible over the next 24-72 hours. The use of Cold Compression therapy after a hard workout may also help a horse with chronic conditions and accumulated stress as a result of rigorous training.

### Protocols

- The optimal compression setting depends on the nature of the injury, the horse's tolerance, and type of Wrap applied.
- Initially you may start the horse with just cold therapy, without compression.
- After the horse has settled, you may increase the compression to Low and maintain that setting until the horse is comfortable again.
- You may want to have the horse on the highest recommended level of compression as quickly as possible, but this might take a few hours or a few days.
- Once the horse is comfortable with the compression of the Wraps, then pressure may be set to the highest level.

### HOCK INJURIES

Achilles Tendon, Plantar Tarsal Ligament, Torso Metatarsal Ligament, Short Lateral, Long Lateral, Short Medial, and Long Medial are injuries that may be treated with the Boreas CS system. Hocks may be treated once or twice a day for 30 minutes

### POST-OPERATIVE RECOVERY

Use of dry cold and active compression is reported to have a role in reducing post-operative pain and swelling as well as aiding overall recovery. Beginning treatments with no pressure, you may apply the appropriate Boreas Wrap for 30 minutes per treatment, for two to four weeks after surgery.

### PREVENTATIVE MAINTENANCE

Acute injuries are often the result of long term, cumulative damage resulting from rigorous schooling programs and show schedules. Applying any of the Boreas Wraps for 30 minutes after each strenuous workout may help keep horses performing at their peak. The compression setting will depend on the horse's tolerance and the type of Wrap.

### SUSPENSORY DESMITIS

Boreas CS is commonly applied to Suspensory Desmitis every two to three hours for a 30-45 minute treatment session using the Utility Wraps.

### WOUND MANAGEMENT

Reduction of local hemorrhage and swelling will move the wound healing process from the inflammatory phase more quickly to the regeneration phase resulting in quicker wound resolution.



**WARNING.-** Any therapy or procedure being used on your animal, should always be in consultation with your Veterinarian.

## 2. The Equipment - System Contents

- Box 1: 1 Boreas Cold Compression unit
- Box 2: 1 Carrying Bag  
1 Single Hose System  
1 Dual Hose System  
2 Utility Wraps  
2 Full-Length Leg Wraps (1 left, 1 right)  
1 User Manual  
1 Charger / AC-DC power adaptor  
1 Air/water draining tool (to remove excess water and air from your wraps)  
15 Replacement O-Rings

### 2.1 Important Safety Instructions



#### CAUTION

Take the proper steps to ensure the constraint of your horse. Position the Boreas machine and hoses in a way that minimizes the chance of damage to the machine and that does not frighten your horse.

- i. To avoid the risk of electrical shock:
- Do not disassemble the unit as there is no user-serviceable part inside.
  - Always turn off the power switch.. Unplug the AC power linecord from it electrical outlet when not in use or when emptying the tank at the end of the treatment session.
  - Never operate the Boreas with a damaged power cord.
  - Do not use any battery charger / AC-DC power adaptor other than the one provided with the Boreas CS system. Use of other charger/adaptor may result in damages, electrical shocks and will void the Boreas warranty.
  - Do not operate the system without water in the tank. Always maintain at least 1.5 L (50 oz) of water in the tank or the water pump will damage.
  - Do not use hot water in the system. Many part in the equipment are not designed to work with hot water and the use of it will cause damages.
  - Do not operate the system without hoses and wraps connected.
  - To avoid potential damages to the Boreas, do not pick up or hold the unit by the lid. Use the handle.

## 2.2 Boreas Features

The Boreas CS is a cold compression unit, the purpose of which is to reduce swelling by applying a combination of compression and cold to the affected area of your horse. The unit comes equipped with a drain valve (5) located on the left. The output connector for your hose systems is located on the right (6). Each system comes with a charger which allows you to charge the battery when the unit is turned off. You may also use the unit while it is plugged in (2). But remember, the unit will not charge if it is in use (for more information about charging your unit please see the Boreas Power Settings below). The reservoir for the Boreas is stainless steel (4) this will help maintain cold temperatures for longer.

The Boreas System -- Figure #1:



1 - Power Button

2 - DC Input

3 - Control Panel

4 - Lid for Reservoir

5 - Drain Valve (See Inset)

6 - Hose Connector

## 2.3 Control Panel

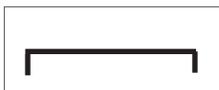
All of the controls to operate the system are located on the front panel of the Boreas unit as per Figure #2:



When powered on, the timer will automatically start at twenty minutes, you can adjust the treatment time using the arrows located below the time display. The Boreas has four compression settings. No compression, continuous compression, light compression and maximum compression. Choose the desired compression setting by pressing the Program Selector button located to the left of the settings panel.



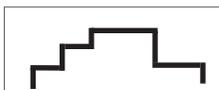
**No Compression** -- The first setting will not use any compression. The unit will still cycle cold water and air through the system for the allotted treatment time..



**Continuous Compression** -- The second setting will compress to a set limit at the beginning of the treatment and remain at that compression level until the allotted time. Maximum pressure 0.5 PSI (pound per square inch)



**Light Compression** -- The third setting will increase the compression in increments leveling to a light preset pressure until reaches 1.0 PS, then decompress. in increments.



**Maximum Compression** -- The fourth setting will increase in increments until it reaches peak compression of 1.5 PSI, then will decompress in increments.

## 3.1 Using Your Boreas

Start out on the lower compression levels and increase the program systematically as your horse becomes tolerant to the therapy.

### 1.- START

- Fill reservoir with 5 to 6 frozen bottles of water. (Fig. 3)
- Fill remaining space with ice.
- Put 1.5 litre (50 oz) of water in the reservoir.
- Be sure to clean all ice debris from the edge of the reservoir. **Do not force the lid down on the ice.** The machine will operate perfectly even if the lid is not perfectly closed.
- Select the utility Leg Wrap or the Full-Length Leg Wrap. (Fig. 4 & 5)
- Select either the Single or Dual Hose (must use two compression wraps). (Fig. 6 & 7)
  - See Fig. 8 for leg wraps application.
  - See Fig. 9 for hose attachment to the leg wrap.
- Turn machine on. By default, the Boreas will run on its internal battery. If it is intended to run on AC Power (plug-in), the provided AC-DC power adaptor needs to be plugged in prior to this step.
- Select compression program.
- Change treatment time as needed.
- Push start button.



Figure 3 - Frozen Water Bottles



Figure 4 - Utility Leg Wraps



Figure 5 - Full-Length Leg Wraps

## 2.- DURING TREATMENT

- While the machine is running, it can be stopped any time by pressing the STAR/STOP button. Compression programs and time can be re-selected if desired.
- Push START/STOP button again to continue with the new selection.
- In the event that the water is not cold enough, the machine will emit a buzzing sound and the display will read "IC". Ice can be added then to maintain the coldness.
- If the water needs to be removed from the tank while in the middle of a program, please use the "Drain Valve" located at the button left side of the machine.
- At the end of the treatment session, turn off the power, disconnect hoses and wraps.



Figure 6 - Utility Leg Wraps



Figure 7 - Hose Connection



Figure 8 - Single Hose



Figure 9 - Dual Hose



Figure 10 - Hose Connection



Figure 11 - Air/Water Draining Tool



Figure 12 - Boreas unit on stall hooks



Figure 13 - Horse receiving treatment

**NOTE 1:** On some occasions the display will show F2 after starting. Turn the machine off, wait for 5 seconds and then turn the machine back on. This means it needs more time to replace air with water..

**NOTE 2:** If the Polar Insert is crumpled in the Leg Wrap – the F1 (**Air flow warning system**) will come on. Just open the zipper, flatten out the Polar Insert and then re-start again.

**NOTE 3:** If wraps are put on too loose on the horse's legs or not wrapped on anything (i.e. laid on ground) the F1 will come on. Use the drain tool to deflate the wraps, put them back on the horse's leg properly then re-start again.

## 3.2 Contraindications

There are very few, if any, contraindications to the use of Cold Compression therapy. If you suspect an injury to your horse, have the area of interest evaluated by your veterinarian before using the Boreas preceding an athletic event.



**CAUTION.-** Remember to **always** contact your veterinarian if:

- The lameness is severe
- Your horse is reluctant to move
- There is an open wound
- Pulmonary edema
- The injured area is warm to the touch
- Your horse have fever
- Your horse has lost his appetite
- There is excessive swelling
- Your horse seems to be in moderate to sever pain

## 3.3 Power Settings

### 1.- AC / DC POWER SUPPLY:

#### MODE:

#### COLOR OF LED ON THE CHARGER AC/DC ADAPTOR:

- |  |  |
|--|--|
| I. Plugged into wall                             | <b>GREEN</b> - charger / AC-DC adaptor is ready                                  |
| II. Plugged into wall and Boreas OFF             | <b>GREEN</b> - battery is fully charged<br><b>RED</b> - battery is being charged |
| III. Plugged into wall with Boreas power ON      | <b>GREEN</b> - Boreas is ready (battery is not being charged)                    |
| IV. Plugged into wall with Boreas ON and running | <b>RED</b> - Boreas is running and powered by AC/DC power supply                 |

If everything is plugged in and machine turned ON, the light will be GREEN. As soon as the "START" button is pressed, the light should turn RED. The light will go back to GREEN when the treatment stops.

### 2.- BATTERY POWER

- I. Boreas can run up to 8 hours with its built-in battery when plug-in is not available.
- ii. Boreas can be fully charged, from empty, in 4 - 5 hours with mode II described above.
- iii. When "LO" appears in display accompanying with short beeps, the battery needs to be recharged soon.

## 3.4 General Operation Check Up

- i. When starting a session and the water or air system fault light come on, check the hose connection, turn machine off, wait 5 seconds, and restart.
- ii. Clean water filter in tank every two weeks by removing foam filter and rinse it.
- iii. Should connections be leaking, check and replace rubber O-rings. Please note that O-rings are supplied with the machine. They can also be purchase at a local hardware store or by calling Centurion at 800-387-8326.
- iv. When the water temperature reaches 41 degrees Fahrenheit, the Ice Fault light, accompanying with audible sound, will come on indicating additional ice is needed.
- v. The Boreas operates with water temperatures between 33 and 40 degrees with an average of 36 degrees. **Boreas is approved for use in FEI.**
- vi. When hose connections become hard (stiff) to connect, check the condition of the valves, especially the O-Rings. Apply vaseline (used as lubricant) to the O-Rings as needed.

## 3.5 STORAGE

- Unplug the charger / AC-DC power adaptor
- For long storage, remove water from tank, wraps and hoses
- Storage temperature: 1° C - 50° C (34° F - 122° F)
- Relative humidity: 10% - 90% non-condensing



**CAUTION.-** Do not store the unit and its accessories in extreme hot (above 50° C or 122° F)

## 4. Service Instructions

It is Centurion Medical Corporation's and its Dealers' policy to, whenever possible, provide service on Centurion equipment, including the Boreas, within 48 hours of the receipt of the equipment. Return shipments will be done by the best available, normal shipping method. If a customer wishes to have a higher level of shipping service, they may arrange to have the equipment picked up by their own shipping service or pay the additional cost above normal shipping costs for overnight service or the best service available. When sending in equipment for servicing, please allow for shipping time.

### 4.1 Warranty

Notify the Service Depot if you wish to receive a quote for service work being performed. If the service required to repair the equipment is not authorized by the customer, there will be an estimate charge based on the time spent to evaluate the service problem. All out of Warranty repairs will be warranted for Thirty (30) Days from the date of shipment to the owner. Your Centurion Boreas has One (1) Year Warranty from the date of purchase or first day of rental. This unconditional warranty covers any and all problems including labor and replacement parts (inbound freight excluded). This product warranty does not apply to any item, which has:

- (i) been wired, repaired or altered by anyone other than Centurion or its authorized service depots (shown at back of manual); or
- (ii) had its serial number or dating altered or removed

In either of these cases, the Warranty will be void immediately.

An extended warranty package is available to cover any problems that may arise after the initial One Year period. This very affordable plan covers all parts and labor (inbound freight excluded).

The Warranty is honored at any of the Service Centers in North America or at any of our Service Centers around the world.

## 4.2 Service Information

### To Obtain Warranty Service

- Follow the Operating Instructions first to try and determine the problem. If the problem remains unresolved, refer to the Troubleshooting section for further guidance to determine what the problem may be.

Phone your nearest Service Depot and provide the following information:

- Model/Type of equipment (i.e.: “Boreas System”)
- Serial number of equipment
- Complete description of problem
- Name, address and contact number of the owner of the system
- Shipping name, address and contact number if different than owners

### To Obtain Out of Warranty Service:

- Follow the Operating Instructions first to try and determine the problem. If the problem remains unresolved, refer to the Troubleshooting section for further guidance to determine what the problem may be.

Phone your nearest Service Depot and provide the following information:

- Model/Type of equipment (i.e.: “Boreas System”)
  - Serial number of equipment
  - Complete description of problem
  - Name, address and contact number of the owner of the system
  - Shipping name, address and contact number if different than owners
- Once authorization for repairs has been received, package the system in its original packing, if available, or package in accordance with good commercial practices. Shipment to and from the Service Depot will be done at the Owner or Renter’s expense.
  - Notify the Service Depot if you wish to receive a quote for service prior to work being performed. If the service required to repair the equipment is not authorized by the customer, there will be an estimate charge based on the time spent to evaluate the service problem.
  - All out of Warranty repairs will be warranted for Thirty (30) Days from the date of shipment to the owner.

## 4.3 End of Life Instructions

Centurion Systems are designed to last for many years as long as the equipment is kept maintained as per the Maintenance Instructions. If, however, the unit becomes irreparable or is no longer required, disposal of the equipment can be made by either returning the equipment to the distributor for disposal, or by complying with your local regulations for the disposal of equipment containing basic electronic parts. This equipment may contain small amounts of materials recognized and regulated as hazardous within the European Union under the WEEE DIRECTIVE. EEC consumers are encouraged to contact their European distributor for instructions in proper end of life disposal

## Section 5

## Troubleshooting

Located on the control panel of the Boreas unit is a list of troubleshooting codes. Each code represents one of the systems required to operate.

Code	SOLUTION
F1 – Air System	<ul style="list-style-type: none"><li>- The air system warning comes on when one of the polar inserts (the bladder inside your wraps) is twisted or bent preventing air from flowing freely. Simply straighten any kinks in your wrap.</li><li>- Hoses and/or wraps are not connected. Connect hoses and wraps.</li><li>- Wraps are not properly applied on the horse's leg. ie: too loose. Use the drain tool to deflate wraps and put them properly on the horse's leg.</li></ul>
F2 – Water System	<ul style="list-style-type: none"><li>- The water system comes on when you have less than 50 ounces of water in the reservoir. Adding more water will correct this.</li><li>- Hoses and/or wraps are not connected to the Boreas. Connect them properly.</li><li>- Water line filter (inside water tank) is not plugged in or clogged. Plug in the filter after cleaning it.</li><li>- The water lines need more time to fill up. Turn off the power, wait 5 seconds, then turn on again.</li></ul>
IC – Temperature	<p>The IC warning appears, accompanying with a buzzing sound, when the temperature in the reservoir is above 9°C (48° F). Add more ice to the reservoir to bring the temperature down.</p>
LO – Low Battery	<p>The low battery warning comes on when you need to charge your unit. The unit can be used when plugged in, but will only charge the battery when the Boreas is powered off.</p>

**NOTE:** When powering off the unit in order to reset a warning, please wait 6 - 10 seconds before powering it on again.

## 6. Regulatory Compliance

The manufacturer (Centurion Medical Corporation) declares that this product has been designed and tested in conformity with the requirements of the following reference standards.

### ***Guideline Electrical Standards***

Canada            CSA 60601.1  
United States    UL 60601-1  
Europe            IEC 60601-1

### ***Electromagnetic Compatibility***

IEC 60601-1-2

Additionally, the equipment is designed and manufactured in a facility operating in accordance with the following guideline standards:

### ***Quality Assurance and Risk Management***

ISO 13485:2003  
ISO 14971:2000

This equipment meets the requirements of, and is declared in conformance with, European Directives 2004/108/EC (Electromagnetic Compatibility) and 73/23/EEC (Low Voltage).

This equipment has been issued a Class 2 Medical Devices License by the Therapeutic Products Directorate of Health Canada.

## 6.1 Equipment Classifications

Class	Class 1 Electrical Equipment (CSA 60601.1)
Degree of protection against Electrical Shock	Type BF Applied Part
Protection against the harmful ingress of liquids	IXPO - (Non-Protected) Ordinary Equipment
Protection against Explosion	Equipment not suitable for use in the presence of a "FLAMMABLE ANAESTHETIC MIXTURE WITH AIR OR WITH OXYGEN OR NITROUS OXIDE"
Mode of Operation	Continuous

## 6.2 Physical Specifications

**Dimensions:**

Unit only:	18" x 13" x 13" / 46 x 33 x 33 cm
Unit Boxed:	21" x 16" x 15" / 53 x 41 x 38 cm
Accessory Box:	24" x 13.5" x 12.5" / 61 x 34 x 32 cm

**Weight:**

Unit only:	17.6 lbs / 8 kg
Unit Boxed:	22 lbs / 10 kg
Accessory Box:	22 lbs / 10 kg
Unit filled with ice & water:	15.5 Kg - 34 lbs

## 6.3 Technical Specifications

Internal Battery

External Battery charger / AC-DC adaptor

Input: 100-240 VAC, 0.8A, 50-60 Hz

Output: 12.6VDC, 2.3A

Maximum Pressure Level

Continuous compression: 0.5 psi (25.9 mm Hg)

Light Compression: 1.0 psi (51.7 mm Hg)

Maximum Compression: 1.5 psa (77.6 mm Hg)

# CONTACT INFORMATION

## SALES AND SERVICE

### CANADA

#### **Elec Western Medical Devices Ltd.**

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## **CENTURION EQUINE SYSTEMS**

are

Designed and Manufactured by:  
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Registered ISO Quality System