



## Manual - Body Weight Support System

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### Rehabilitation



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## 1 - Intended Use

A Lode Body Weight Support System (BWSS) is a rehabilitation or training device intended to be used as a device to reduce the body weight acting on a test persons lower limbs in a medical environment. The force to reduce the body weight will be transferred through a harness, worn by the test person, to the Body Weight Support System. The parameter “supported body weight” can be measured (kg).

In combination with other (medical) devices, like a treadmill, the BWSS forms a dedicated rehabilitation or training device for people unable to bear their full bodyweight on the lower limbs.

The BWSS has to be operated under the supervision of well-trained rehabilitation specialists or physiotherapists. The ultimate judgment whether a test person is capable of using the BWSS must be made by the responsible specialist, based on the limitations of each individual, the medical history and all other applicable circumstances. Neither Lode BV nor its distributors can be held responsible for the final use of its equipment.

## 2 - Contra Indication

The BWSS is to be operated by classified personnel only. As stated in the intended use, the BWSS is intended to be used in a medical environment.

## 3 - Maintenance

The BWSS should be calibrated once a year. In case any damage is observed of the BWSS Lode B.V. or his representative should be informed in order to execute the necessary repair(s). Service of the BWSS is restricted to factory-trained personnel only.



## 4 - Precautions



Read this manual before using the device and follow it carefully.



The test subject should not wear loose or dangling clothing while using the device.



Do not unweight until you are sure the vest is properly secured.



Set up and operate the device on a solid level surface.



The test subject shall wear clothes when using the harness or the lanyard belt to prevent skin irritation.



Read this entire manual before using the vest.



Read all warnings posted on the device.



Inspect the device for worn or loose components prior to use. Tighten / replace any loose or worn components prior to use.



Before each use, inspect the vest for damage. Do not use if the integrity is questionable.



Do not release the test person when the system is under tension, unless in an emergency situation.



Not suitable for use in the presence of flammable anaesthetics.



This device should only be sold by, or under the supervision of authorized persons.



## 5 - Introduction

Congratulations on your new Body Weight Support System (hereafter denoted as BWWS)! This device will provide you optimal test and rehab possibilities. Your test subject will feel safe during the therapy because of the dynamic body weight support functionality and the fall stop. The BWSS has standard possibilities for body weight unloaded therapy. The basic BWSS has wheels to ride the system easily over the treadmill. Optional side chairs for the therapist are available which can be mounted on the side bars.

The BWSS is easy to move and can be used in a variety of operating environments. The design is user friendly, for both the test subject and the operator of the system.

Another feature of the BWSS is that it offers possibilities for placement over a range of treadmills.

## 6 - List of symbols used



Locked



Unlocked



On-off Switch: IEC 60417-5010



Potential Equalization Conductor



Supported body weight

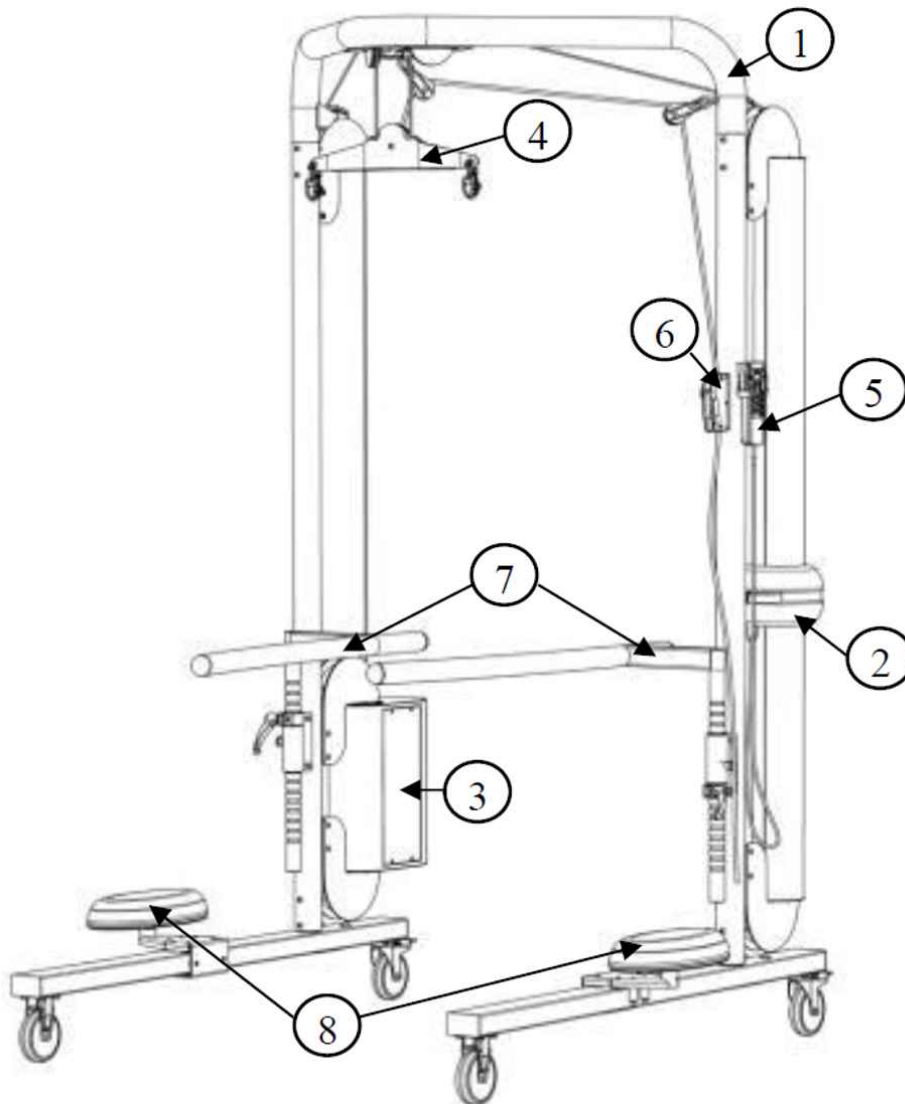


Range from zero up to ....



## 7 - Description of the Body Weight Support System

### 7.1 - Parts



The BWSS is a solid mobile device that can be used to reduce the body weight acting on a test persons lower limbs in a variety of operating environments. The following will be described in this chapter:

- Identification of parts
- Control Unit
- Power supply panel
- Adjustments

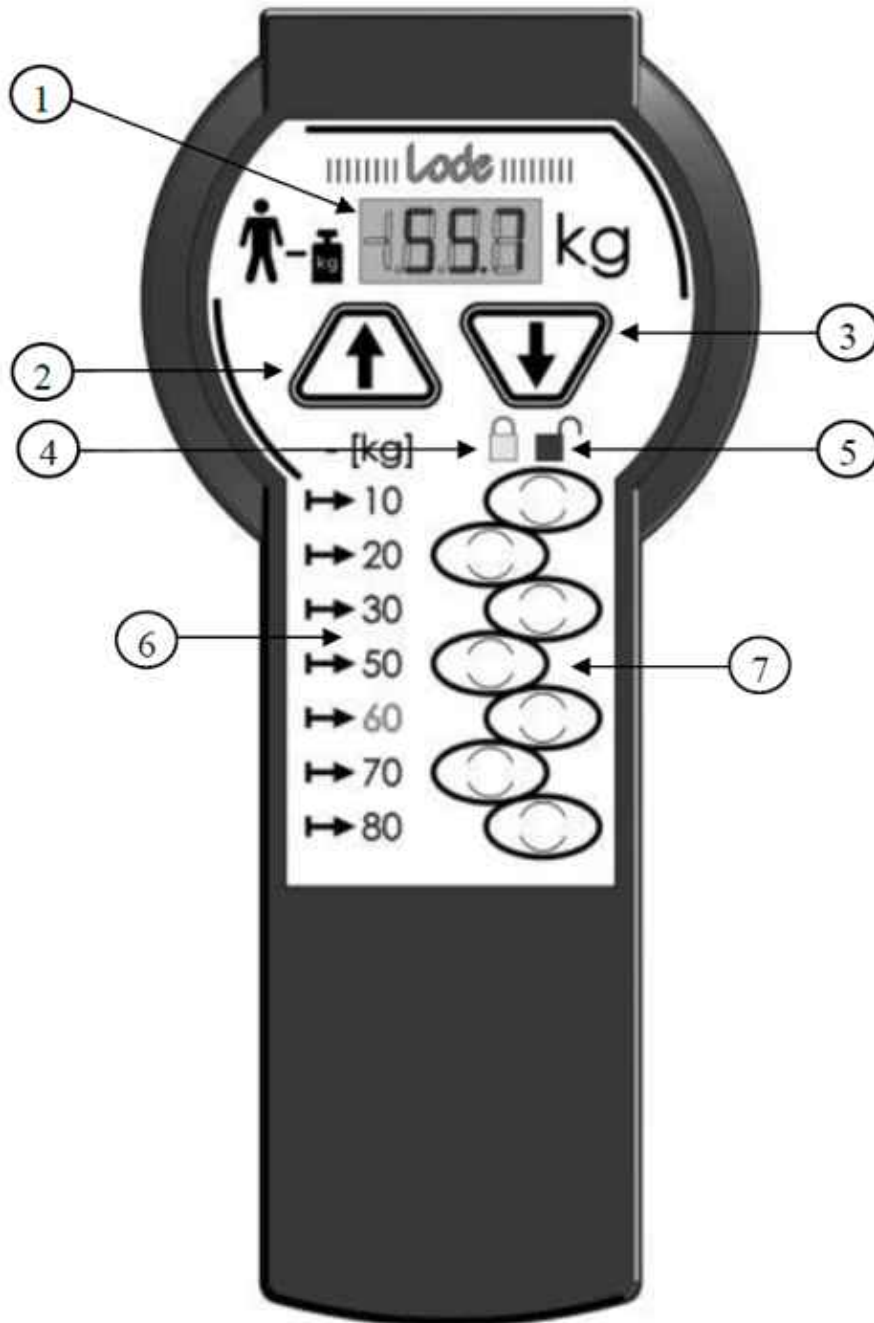
BWSS main parts

1. Mainframe BWSS
2. Unload mechanism.
3. Power supply and lift mechanism.
4. Balancer.
5. Control unit
6. Fall stop system
7. Adjustable handle bars (optional)
8. Adjustable seats (optional)
9. One or more size Harness, depending to your order (Not shown in this Figure)





## 7.2 - Control unit



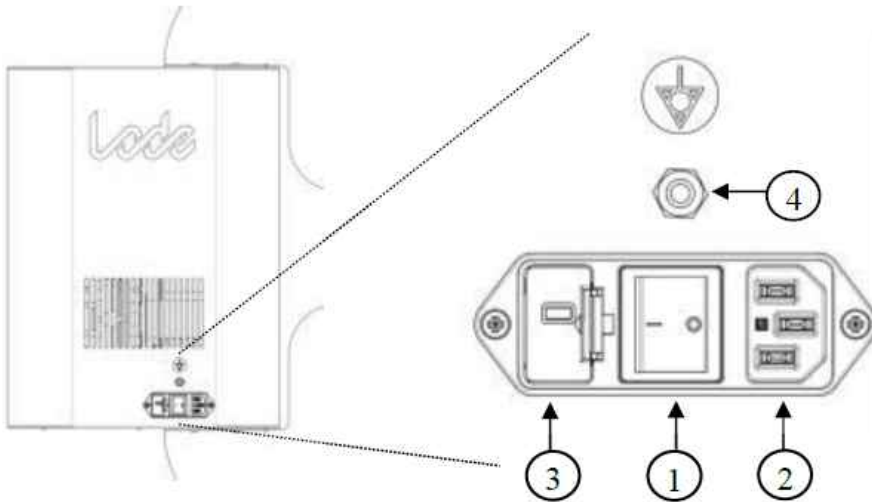
The “Control unit” (part 5) consists of the following elements:

### Control unit BWSS

1. Support weight indication display (Kg)
2. Up button. Increase support weight / Lift a person up
3. Down button. Decrease support weight / Put a person on his feet
4. Lock light. When on, the bodyweight support range selection mechanism is locked
5. Unlock light. When on, the bodyweight support range mechanism is available
6. Bodyweight support range indication lights
7. Bodyweight support range selection buttons



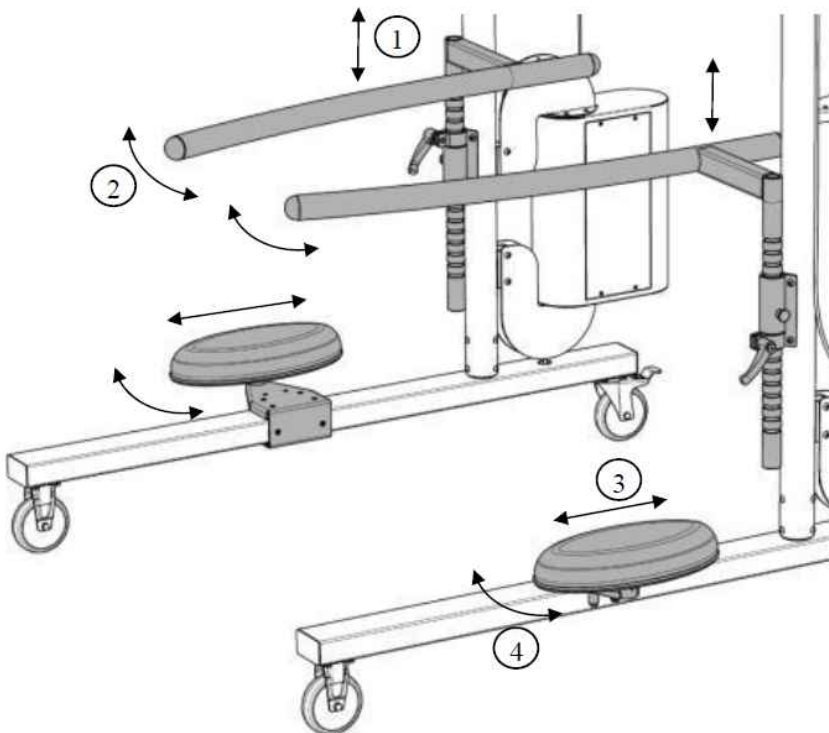
### 7.3 - Power supply panel



The power supply panel contains the following elements:

1. Mains on/off switch
2. Mains connector
3. Fuse box (two fuses inside)
4. Protective Earth connector

### 7.4 - Adjustments



The BWSS can be fitted with optional side handle bars and optional therapist seats. The side handle bars are adjustable for test subjects of all sizes and ages.

1. Handle bars are adjustable in height
2. Handle bars can be rotated to change the width between the handle bars.
3. Seats can be moved along the BWSS frame bars.
4. Seat cushions can be rotated.



## 8 - Using the BWSS

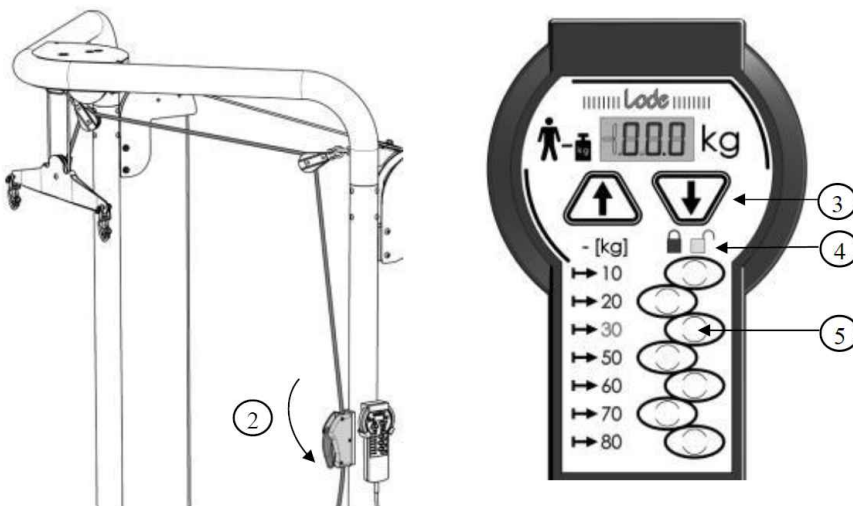
This chapter describes how to use the BWSS. Execute the following steps for performing an bodyweight support test with the BWSS after the BWSS is installed.

### 8.1 - Adjust the Harness

To adjust the harness read the separate harness manual, within the harness

Note: The patients do need to wear appropriate cloths for the training before putting on the harness. Loose fitting clothing will tend to allow the harness to ride up.

### 8.2 - Select the desired bodyweight support range



To accomplish the best dynamic support forces, the Bodyweight support system is fitted with 7 dynamic support ranges. Within each dynamic support range, the supported weight can be accurately set with the up down buttons.

Execute the following steps to select the desired bodyweight support range:

1. Switch the BWSS on.

2. Fix the fall stop rope
3. Lower the balancer,
4. until the unlock light goes on.
5. Select the desired bodyweight support range. We advise to select a range that is the closest above the desired weight to be supported. Example: The desired weight to be supported is 28 kg. The best support range for this example is 30kg.



### 8.3 - Attaching the harness to the balancer

Each shoulder strap at the harness has a D-ring that attaches with quick release hooks to the balancer. Adjust the upright posture of the patient by moving the D-ring back and forth on the straps. With the individual adjustment the patient can be prevented of falling over to the front of the back. Open the Velcro strap underneath the D-ring and adjust it. By moving forth and back. Close the Velcro. For more flexion, slide the D-ring backwards and for more extension, slide the D-ring forward and fasten. Before unweighting anyone, be sure the waist belt is snug and that the safety snaps are closed completely.

The most important thing is, that the patient is feeling comfortable. Be sure that the harness is not wedged into the underarms and that it does not restrict breathing. Be sure that the leg straps are not tight enough to restrict circulation in the legs. Readjust the harness and single straps as necessary.

#### **Correcting Harness Problems**

If the harness rides up under the arms, reweight and pull the harness down. Have the person tighten the abdominal muscles, then re-tighten the waist straps and leg straps. If the chest strap is too tight during exercising, it has to be loosened. If the leg cuffs ride up, the cuff has to be fixed due to placing the front leg strap in the center of the thigh



## 8.4 - Putting on the Harness for Wheelchair Patients

- Put the left side of the cross over chest strap through the D-ring on the inside of the belt, pull back and attach to the Velcro. Pull the right side of the cross over chest strap tightly over to the right, through the D-ring and press securely on the Velcro.
  - While holding the cuff in place (just above the knee) wrap the cuff and strap behind the leg between the legs keeping the cuff taut. Pull on the strap to tighten comfortably. Press down on the Velcro to secure the strap. Repeat the procedure for the right leg. The front strap on the cuff should be centered on the thigh.
  - Buckle up both buckles. Tighten up the top buckle by pulling first on one side of the adjusting strap and then the other, keeping the buckle centered. Next tighten up the second buckle using the same method. You may have to reposition the cross over strap and the first buckle to get a snug tight fit. Do not tighten enough to restrict breathing. Make sure that the back D-ring is at the center back in alignment with the spine.  
Reposition leg straps if necessary after waist has been strapped. The shoulder straps will remain loose until connected to the unweighting bar.
- When strapping the waist area, fit the harness as tightly and as low as possible (have the person lift the shoulders if able).
- The patient is now ready to be unweighted. Before unweighting anyone, be sure the waist belt is snug and that the safety snaps are closed completely.
- Place the wheelchair under the Lode BWSS. For treadmills, you may need to use a ramp to place the person under the system.
  - Pull the bar down and connect the extension with the karabiners to the unweighting bar
  - Unweight the person from the chair and remove the chair. Adjust the extension as needed
- Most of the comfort problems encountered during unweighting are the results of improper adjustment of the harness.



## 8.5 - Lift a Test subject from a wheelchair

A test subject can be lifted from a wheelchair with a total bodyweight up to 160kg. The body weight support system has a dynamic unweighing range up to 80kg. Each of the seven body weight support ranges can be used beyond their maximum dynamic unweighing range. Beyond this range the system loses its dynamic behaviour and becomes a patient lift.

Before becoming a patient lift the system has to go through the selected dynamic unweighing range. This takes more or less time dependent on the selected unweighing range.

Execute the following steps to lift a test person from a wheel chair:

1. Switch the BWSS on
  2. Fix the fall stop rope.
  3. Lower the balancer until the unlock light goes on.
  4. Select the desired bodyweight support range.
  5. Unlock the fall stop rope.
  6. Lower the balancer.
  7. Drive the wheel chair with the test person under the BWSS
  8. Connect the D-rings from the harness shoulder straps to the quick release hooks from the balancer.
  9. Lift the test person from the wheel chair to a position the test person is able to walk.
  10. Fix the fall stop rope.
  11. Remove the wheel chair
- The BWSS is now ready for unloading

## 8.6 - Select the weight to be unloaded during the training

At this point, the test person is wearing the Harness and is connected to the BWSS. The desired body weight support range should have been selected at this point. When the test person was lifted from a wheel chair. The BWSS is still in the patient lift mode! (Full tension!)

1. (Make sure the test person is in an upright position, and able to walk) Unlock the fall stop rope
2. Pull the fall stop rope tight.
3. From the tight position release the fall stop rope approximately 10 cm, to make sure there is enough free vertical movement available.
4. Fix the fall stop rope.
5. Press the up or down button on the control unit until the display shows the desired body support weight.

The test person is now ready for training.

Be sure the Test Subject is ready and is wearing the harness in the correct way. (be aware of long hair during lifting.)

During the training the Test subject is not allowed to be left alone.



## 8.7 - Release a test person from the BWSS

At this point, the test subject is wearing the Harness and is connected to the BWSS. The desired body weight support range should have been selected at this point.

1. Unlock the fall stop rope.
2. Pull the fall stop rope tight.
3. Fix the fall stop rope.
4. Release the tension in the BWSS by pushing the down button, until the unlock light on the control unit goes on.
5. Pull the quick release hooks to release the test person from the balancer.
6. Turn the BWSS off.

## 8.8 - Place the test person from the BWSS into a wheel chair

1. Unlock the fall stop rope.
2. Pull the fall stop rope tight
3. Fix the fall stop rope.
4. Push the up button until the BWSS behaves like patient lift. The BWSS supports the test person's body weight completely.
5. Drive the wheel chair behind the test person.
6. Unlock the fall stop rope.
7. Push the down button until the test patient is able to sit in the wheel chair.
8. Pull the fall stop rope tight.
9. Fix the fall stop rope.
10. Push the down button until the unlock light goes on.
11. Pull the quick release hooks to release the test person from the balancer.
12. Drive the wheel chair away.
13. Turn the BWSS off.



## 8.9 - Emergency release of a test person from the BWSS

In some cases a person must be released from the BWSS immediately.

Execute the following steps to release a test person immediately from the BWSS. You will need at least two persons to execute this procedure:

1. Fix the fall stop rope.
2. Carefully hold back the balancer from the test person when the support rope is cut. (not the fall stop rope)

Caution: the system may still be under tension!

3. Cut the support rope.
4. Hold the test person with one or two persons.
5. Pull the quick release hooks to release the test person from the BWSS.

Caution: After this procedure the system may not be used until a qualified service engineer has checked the BWSS!





## 9 - Problem solving

### 9.1 - The BWSS does not work. The display on the control unit remains blank.

1. Make sure the BWSS is turned on
2. Check if the power cable is properly connected
3. Check if the connectors are properly connected. (read 3 Installing the BWSS)
4. Check if the control unit is properly connected. (read 3 Installing the BWSS)
5. Check the fuses
6. When necessary release the test person from the BWSS. (read chapter "Emergency release a test person from the BWSS")
7. Call a service engineer.

### 9.2 - The lift mechanism does not work. The display on the control unit is on.

1. Turn the system off wait 10 seconds and turn the system back on to reset the internal motor controller.
2. When necessary release the test person from the BWSS. (read 4.9 Emergency release a test person from the BWSS)
3. Call a service engineer.



## 10 - Maintenance

The BWSS is designed mechanically and electronically for durability and accuracy. The load cell in the BWSS needs to be calibrated once a year.

The calibration is performed using calibration equipment specially designed by the manufacturer.

### **Cleaning**

The BWSS can be cleaned with a cloth dampened with non-aggressive liquid.

### **Replacing fuses**

There are two fuses in the power supply unit. Figure 3

Note: make sure that 250V 5A fuses are used

Always disconnect the power cord first!

### **Replacing the springs**

The springs need to be replaced after approximately 2500 trainings.

Replacement of the springs needs to be done by a qualified service engineer.

Always disconnect the power cord first!

Contact your local dealer for a maintenance contract or ask Lode:

LODE BV

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Fax. +31 50 5716746

Service department

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9747 AN GRONINGEN








The Netherlands

Email: [service@lode.nl](mailto:service@lode.nl)

[www.lode.nl](http://www.lode.nl)



## 11 - Accessories

<p><b>BWSS - Operator Chairs</b></p> <p><b>Partnumber: 932828</b></p> <p>Comfort for therapist while providing leg</p>  <p>Optional Operator Chairs for BWSS</p>	<p><b>BWSS - Handrails</b></p> <p><b>Partnumber: 932827</b></p> <p>Support for treadmills without handrails</p>  <p>BWSS - Handrails</p>	<p><b>Harness BWSS Small</b></p> <p><b>Partnumber: 932763</b></p> <p>Harness BWSS Small</p>  <p>Harness BWSS Small</p>	<p><b>Harness BWSS Large</b></p> <p><b>Partnumber: 932765</b></p> <p>Harness BWSS Large</p>  <p>Harness BWSS Large</p>	<p><b>Harness BWSS Medium</b></p> <p><b>Partnumber: 932764</b></p> <p>Comfortable Harness, size Medium for</p>  <p>Harness BWSS Medium, standard supplied with BWSS</p>
<p><b>Height adjustment 18 cm for BWSS / Mobile Fallstop</b></p> <p><b>Partnumber: 932824</b></p> <p>Flexibility for tall patients</p>  <p>Height adjustment BWSS</p>	<p><b>Height adjustment 36 cm for BWSS / Mobile Fallstop</b></p> <p><b>Partnumber: 932833</b></p> <p>Flexibility for tall patients</p>  <p>Height adjustment 36 cm</p>			



## 12 - FAQ

Is Lode recommending special disinfection procedures for the Lode products due to COVID-19?

Yes, Due to the fact that the scientific research on the spread of Covid-19 is not yet conclusive Lode recommends to disinfect and clean all Lode products and their accessories (cuffs, heart rate belts, SpO2 sensors, handgrips/rails, touchscreens etc) that are in contact with the patient and or the medical personnel with a standard disinfectant as used in the hospital before and after every patient, with attention and care!

Since these agents are sometimes aggressive it might be advisable to check the effect on sensitive surfaces, like cushioning on non-visible areas. Lode will not take responsibility for discoloration due to these agents.

## 13 - Science

[Effect of high-speed treadmill training with a body weight support system in a sport acceleration program with female soccer players](#)

Date

2013-06-27

Author(s)

Johnson AW, Eastman CS, Feland JB, Mitchell UH, Mortensen BB, Eggett D.

Source

[Journal of Strength and Conditional Research](#)

[Effects of transcranial direct current stimulation over the supplementary motor area body weight-supported treadmill gait training in hemiparetic patients after stroke](#)

Date

2018-01-15

Author(s)

Atsushi Manji; Kazu Amimoto; Tadamitsu Matsuda; Yoshiaki Wada; Akira Inaba; Sangkyun Ko

Source

[Neuroscience Letters, Volume 662, 1 January 2018, Pages 302-305](#)



## 14 - Specifications

### Accuracy

Weight support steps                      0.1 kg              0.2 lbs

### Comfort

Versatile Multi-Spring Adjustability (VSMA) Min.              0 kg

Versatile Multi-Spring Adjustability (VSMA) Max.              80 kg

Allowed user weight                      160 kg              352.7 lbs

Maximum lifting weight                      160 kg              352.7 lbs

### Dimensions

Product length (cm)                      160 cm              63 inch

Product width (cm)                      142 cm              55.9 inch

Product height                      250 cm              98.4 inch

Product weight                      100 kg              220.5 lbs

Inner width                      110 cm              43.3 inch

Inner width with optional handrails              66 cm              26 inch

Maximum patient height                      215 cm              84.6 inch

### Order info

Partnumber

932822