



Technical Handbook

BENOMIC S 350



Berg Hortimotive

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The Netherlands**

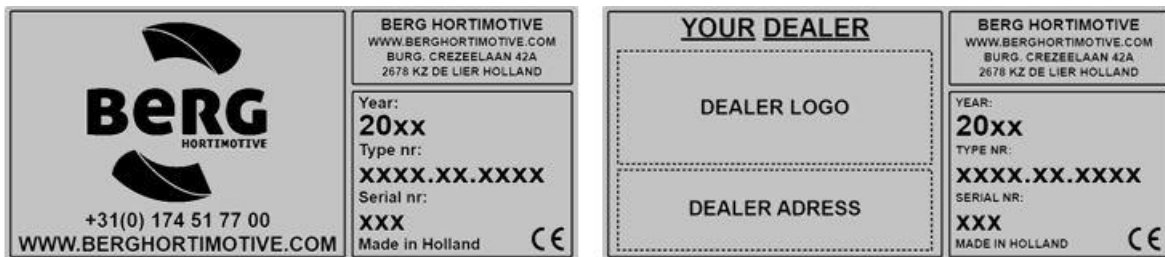
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Machine type plate

The *BENOMIC S* is fitted with a machine type plate which contains the following information: address details for Berg Hortimotive, CE mark, serial and type reference, serial number, year of construction.

If you would like to contact Berg Hortimotive, or one of their dealers with respect to this *BENOMIC S*, please ensure that this information is always readily available.



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The machine is manufactured by:



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1. Declarations

1.1 Copyright

Berg Hortimotive
De Lier, 2020

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1.2 Liability

Berg Hortimotive does not accept liability for dangerous situations, accidents and damage that occur as a result of ignoring warnings or instructions, such as those shown on the *BENOMIC S*, or contained in this documentation - for example:

- inexperienced or incorrect usage or maintenance
- being used for applications other than those for which it was designed, or in circumstances other than those given in this documentation
- the use of components or spare parts which are not prescribed
- repairs carried without the consent of Berg Hortimotive and/or a certified dealer
- changes to the *BENOMIC S* include the following:
 - alterations to the controls
 - welding, mechanical works, etc
 - extensions to the *BENOMIC S* or its controls

Berg Hortimotive does not accept liability when:

- customers do not meet their obligations with respect to Berg Hortimotive (financial or otherwise)
- consequential damage is caused by defects on the *BENOMIC S* - e.g. interruption of business, delays, etc.

1.3 **Guarantee**

For a period of 6 months after delivery, Berg Hortimotive gives the client a warranty on material and manufacturing defects that occur during normal use. This warranty does not apply if the defects are caused by improper use or causes other than by material and manufacture, if Berg Hortimotive - following consultation with the client - delivers used material or used goods or if the cause of the defects cannot be demonstrated clearly. The warranty provisions are set out in the METAALUNIE CONDITIONS as they read according to the most recent relevant text. The terms and conditions of delivery are available on request.

The warranty given by Berg Hortimotive for all goods and materials not manufactured by Berg Hortimotive will never be more than that given by its supplier. The warranty is ex works. Faulty machines and/or parts must be sent postage paid.

When it is not possible to send out machines or systems, any travel and subsistence expenses will be payable by the client.

Sold and delivered goods with manufacturer's, importer's or wholesaler's warranties are subject only to the warranty provisions set by the suppliers.

Hydraulic pumps are subject only to the manufacturer's warranty, provided the pump comes with an undamaged safety seal from the supplier.

Berg Hortimotive accepts responsibility for the availability of replacement parts, provided they are available from its suppliers at reasonable conditions.

2. **Foreword**

This handbook describes the *BENOMIC S*.

This handbook provides you with information including the safety aspects, a description of the *BENOMIC S* together with the working principles, as well as the operating instructions and maintenance of the machine.

Potentially dangerous situations are indicated together with recommendations for avoiding them.

It is important that this handbook is carefully read in order to learn how the *BENOMIC S* should be operated and maintained. By reading this handbook and then using the *BENOMIC S*, you, or anyone else, will be assisted in using the *BENOMIC S* in the correct manner thereby helping to avoid personal injury as well as damage to the machine.

Berg Hortimotive produces safe machines. The machines are designed to meet the latest standards and are manufactured in accordance with the latest CE approval markings. The user remains responsible for the proper operation and for carrying out maintenance on the machine.

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3. Introduction

3.1 General

You have made a good choice by purchasing the Berg Hortimotive *BENOMIC S*. You are the owner of an first class piece of equipment that has been manufactured with great care. You will gain the most advantage from the equipment provided that you carefully follow the instructions given in this handbook with regard to safety, operating and maintenance.

Please study this user's handbook carefully before starting to use the *BENOMIC S*. Always follow the safety instructions and recommendations given in this handbook.

Berg Hortimotive does not accept liability for damage or indirect damage resulting from not following the operating and safety instructions contained in this handbook.

Neither does Berg Hortimotive accept liability whenever you or a third party make modifications to the pipe rail trolley or its accessories, without receiving prior written permission from the manufacturer.

The *BENOMIC S* is supplied in accordance with the conditions of sale of the Dutch METAALUNIE, as determined by the registrar of the law court of Rotterdam and in accordance with the most recent text contained therein. A copy of the terms and conditions of supply can be provided on request. You can also contact the Koninklijke Metaalunie, PO Box 2600, 3430 GA Nieuwegein, the Netherlands.





3.2 Suppliers information

In the event of breakdowns or defects occurring on the *BENOMIC S* please contact your Berg Hortimotive dealer.

4. Safety

4.1 Explanation of the safety terminology

Safety terminology:

- Danger**  : Indicates serious or even fatal injury may occur if the instructions in the handbook are ignored.
- Warning**  : Indicates injury if the instructions described in this handbook are ignored.
- Caution**  : Indicates damage may occur to the equipment if the instructions described in this handbook are ignored.
- Warning**  : Indicates possible problems if the instructions described in this handbook are ignored.

4.2 Safety instructions

Read the following safety instructions carefully.


After reading the safety instructions they should be strictly observed at all times.

If the Pipe rail trolley safety instructions are not observed while it is being operated, it will become substantially more dangerous and may lead to serious physical injury.

DANGER! 

- **Carefully read all of the user's handbook. Observe the operating and safety instructions at all times.**
- **The BENOMIC S is suitable for running on a stable pipe rail system.**
- **The BENOMIC S should only be used on the correct type of pipe rail system. Check that the centre-to-centre measurement of the rails and the pipe rail trolley correspond - see the pictogram on the platform.**
- **Never exceed the maximum load of 250 kg.* (for restrictions, see 10.1!)**
 - 1 person including load (e.g. tools); see pictogram on the platform.
- **Never exceed lateral (sideways) manual force of 110N (11 kg traction).**
- **Use the BENOMIC S only for harvesting and crop maintenance in a greenhouse.**
- **Using the BENOMIC S when it is tilting more than 2° from the vertical (lengthwise and/or crosswise) is strictly forbidden.**
- **All loads should be secured and placed at the centre of the work platform.**
- **Only one person is permitted to stand on the platform at any time.**
- **Persons are not permitted to ride with/on the chassis.**
- **It is prohibited to remove the safety rail.**
- **The use of the optional safety rail raiser is mandatory if the user is taller than 1.90 metres. Only use an original approved Berg Hortimotive safety rail raiser!**

- **Increasing the lifting height in any way whatsoever is strictly forbidden.**
 - *Always remain standing on the work platform*
- **Keep a safe distance from fixed and/or moving parts of the greenhouse structure, live electric wiring, and cables and ropes.**
- **It is prohibited to pull steel cables or lay screens using the BENOMIC S.**
- **It is forbidden to use the BENOMIC S as a crane.**
- **It is forbidden for either people or animals to enter the path on which the BENOMIC S is being operated. Never operate more than one pipe rail trolley on the same path!**
- **When using the BENOMIC S all the protective screens and covers and caps must be fitted and secured.**
- **Additional options, accessories and spares must be ordered and supplied exclusively by the manufacturer, Berg Hortimotive.**

Warning! 

- **Operating the BENOMIC S may only take place when there are no other persons in the vicinity (apart from the operator) of the machine.**
- **The BENOMIC S may only be operated by persons of 18 years or older who have received thorough instruction about the BENOMIC S, who are fully familiar with this instruction handbook and are completely aware of the dangers associated with operating the machine.**
- **The BENOMIC S may only be operated once it has been correctly installed on the pipe rail system.**
- **All personnel working in the area of the BENOMIC S should be made familiar with relevant safety rules and precautions that apply to the pipe rail system.**
 - *Instructions from the employer.*
- **Repairs to the BENOMIC S may only be carried out by personnel who have received specific training from Berg Hortimotive.**
- **When carrying out maintenance on the scissor mechanism, the scissor blocks must always be put in place before starting (see 9.2).**
- **Never carry out repairs to the BENOMIC S if it is already being operated by someone else. Always switch it off via the main switch before carrying maintenance activities and remove the charging plug from the trolley.**
- **Check the BENOMIC S daily for defects and carry out maintenance frequently - see chapter 9: maintenance.**
- **Keep the operating controls and safety pictograms clean.**
 - *operating controls and safety pictograms should always be clearly visible.*
- **Once you have finished working with the BENOMIC S always turn off the main switch.**
- **Never leave the BENOMIC S unattended.**
 - *Only when you have removed the key from the main switch.*
- **It is forbidden to carry out modifications or make alterations to the BENOMIC S without prior written permission from Berg Hortimotive.**

- ***When leaving a path, you must first stop and check whether anybody is standing in the direct vicinity before continuing on the main path.***
- ***It is forbidden to transport loose cargo with the BENOMIC S.***
- ***When stacking loads ensure that they do not protrude more than 40 cm above the working platform. All loads should be properly secured.***
- ***Before entering a path, ensure that there are no obstacles such as plant remains, etc lying on it.***
- ***Never clean the BENOMIC S with a water hose or steam cleaner.***
- ***When moving the BENOMIC S when not on the rails, the scissor mechanism should be fully collapsed.***
- ***Never use the BENOMIC S on the public highway.***
- ***It is forbidden to step off the equipment before it has reached the lowest position.***
- ***Observe the safety instructions for batteries - see Appendix 3.***
- ***Always watch out for feet and toes when operating the lift on the BENOMIC S! The trolley is moved a few centimetres forward when put into position!***
- ***It is mandatory to wear shoes with protective toe caps (S1).***
- ***Remove the charging plug before using the BENOMIC S.***

Please note! 

- ***Always keep the workplace tidy.***
 - *An untidy working area can lead to dangerous situations.*
- ***Always concentrate on the task in hand.***
 - *Always keep your wits about you when operating the Pipe rail trolley. Never operate the BENOMIC S when you are unable to concentrate properly or when taking medicine whereby it is not advisable to operate machines or drive in traffic.*

4.3 Safety pictograms

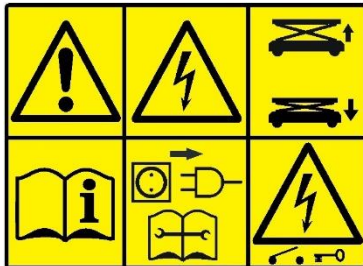
On the *BENOMIC S* a number of safety pictograms have been applied. These pictograms warn the operator about possible dangers or dangerous situations. Always observe the warnings and contact your suppliers whenever the actual danger illustrated by the pictogram is not clear. Always make sure that the pictograms are visible and undamaged!

The *BENOMIC S* operator must have read and fully understood this handbook. When the operator does not understand the warnings given in either this handbook or on the machine (e.g. they speak another language), all the instructions, potential dangers, warnings and functions must be fully explained to them by a responsible person so that they can fully understand them.



Only to be used indoors (in greenhouse)
 Mass of the machine (KG)
 Suitable for the pipe diameter stated with minimum thickness
 Suitable for the centre-to-centre pipe rail system measurement
 Maximum tilted position 2°
 Maximum sideways manual force in Newtons (kg x10)
 Maximum support distance 1250 mm
 Maximum total load in kg (maximum 1x person + secured load)

The values depend on the type of *BENOMIC S*!



Beware! Read the handbook before using!
 Beware! Disconnect the power supply and consult the handbook when carrying out maintenance
 Upwards = scissor up, downwards = scissor down
 Main power switch: key vertical = ON, key horizontal = OFF
 Key can be removed by rotating further in the off position.

4.4 Residual risks

Despite the best possible design and the use of risk-reducing devices and the warnings about the dangers given in the handbook and applied to the machine itself, it is still possible that dangerous situations can arise. Beware of the following:

- Danger of hands, fingers, arms and head becoming trapped in the scissor mechanism!
- The danger of becoming trapped while standing under the trolley when depositing or picking up items with lifting system!
- The trolley falling over because of an incorrect pipe rail system!
- The trolley falling over because the maximum weight or manual force has been exceeded!
- Users taller than 1.90 metres losing their balance if they do not use the obligatory optional safety rail raiser!



Beware: Dangerous chemical battery - corrosive battery acid and explosive gasses



Beware of the platform lowering!
 Always use the scissor blocks when working under or on the scissor mechanism!



Beware: Danger of becoming trapped!
 Keep hands away from the scissor parts!

5. Intended application

5.1 Area of application

The *BENOMIC S* has been designed for use in the greenhouse horticulture sector. The machine may only be operated by one person with a minimum age of 18 years who has received thorough instruction in the operation of the *BENOMIC S* and who is already familiar with the safety instructions and this handbook, both of which they have fully understood.

The *BENOMIC S* is a pipe rail trolley, which runs on a pipe rail system that meets the minimum requirements of paragraph 7.3 and is intended as an aid in harvesting, caring for and/or maintaining the crops in a greenhouse. Use of the *BENOMIC S* for any other purposes is strictly forbidden. The maximum loading may consist of one person plus a secured load which together should not exceed 250 kg in weight*. The trolley may only be operated once it has been correctly installed on the pipe rail system. Pay extra attention when the scissor mechanism is descending ensuring that no people or objects can become trapped under or between the scissor mechanism. The platform may not be entered while the machine is on the concrete path. Always walk alongside the machine, therefore not on the chassis when transporting it over the main path.

* Stability tests have shown that with unfavourable combinations of tube type and the support distance of the pipe rail system, constraints must be applied for the maximum permissible load. See 10.1 Explanation of the technical specifications.

5.1.1 Physical operating conditions

Ambient temperature;	
Transport & Storage	: 5 to +40 degrees Celsius
Working	: 5 to +40 degrees Celsius
Rel. Humidity (RH)	: 0% to 90%, <u>not condensing</u>
Lighting	: Normal ambient lighting.

The machine is not designed to be used outdoors.
The machine is not suitable for operating in explosive atmospheres.

5.2 Safety systems

The *BENOMIC S* series is equipped with the following safety systems, which will be described in chapter 7 (Commissioning) and chapter 8.1 (Operation).

- Running and lifting restriction when tilted (see 7.4)
- Load limiter measurement system (see 7.5)
- Load-holding function (see 7.6)
- Scissors-blocking device (see 7.7)
- Emergency lowering control (see 7.8)
- Pipe detection sensor (see 7.9)
- Speed limiter on the concrete path (see 7.10)
- Pipe – concrete path transition (see 7.11)
- Emergency stop (see 8.1.2)
- Lowering the platform (see 8.1.2)
- Two-handed control (see 8.1.2)
- Inadvertent foot pedal operation (8.1.1)

Manipulation of safety systems is strictly prohibited!



5.3 Signalling systems

In order to alert the user to a changing status of the *BENOMIC S* during use, a multi-colour indicator (11) and horn is used.

5.3.1 The multi-colour indicator (11)

The multi-colour indicator (11) is located on the platform control, for this refer to chapter 8.1.2.

The visual signalling is divided into five indication levels:

- | | |
|--|------------------------|
| 1. Safe & alert status | colour green or orange |
| 2. Acute danger | colour red |
| 3. Indirect danger | colour red-orange |
| 4. Function monitoring (sensors) | colour red-blue |
| 5. Support feet position notification (if any) or disinfection | colour blue |

Safe & alert status

The indicator displays a status or flash pattern in the colour green, orange or blue

Flash pattern Green:	Safety status:	Limitation:	Solution:
Off	Benomic S is off	Is off	
On	Benomic S is on	None	
2x	Start-up / standby, flash indicates the number of scissors	Is on standby	Press horn / reset button (10)
3x	Start-up / standby, flash indicates the number of scissors	Is on standby	Press horn / reset button (10)
4x	Start-up / standby, flash indicates the number of scissors	Is on standby	Press horn / reset button (10)

Flash pattern Orange:	Safety status:	Limitation:	Solution:
Flashing slowly	Tilt (>1.5°)	Speed (higher than 250cm)	Lay pipes level
Flashing slowly + bleeping	Tilt (>1.8°)	Speed (higher than 250cm)	Lay pipes level

Flash pattern Blue:	Action or Safety status:	Limitation:	Solution:
On	Disinfection * advance notice	None	Disinfect hands
Flashing slowly	Disinfection * time elapsed	Running stops	Disinfect hands

* A disinfectant fluid container for the hands can be supplied as an option for the *BENOMIC S*, ask your dealer for the possibilities.

Acute danger

The indicator displays a red blinking pattern:

Flash pattern Red:	Safety status:	Limitation:	Solution:
On, short	Starting up	Wait 1 sec.	Turns itself off
On & Bleeping	Tilt (>2°) with high platform	Platform raised Running stops	Lower platform Lay pipes level
1x & Bleeping	Emergency stop used	Operation stopped	Unlock if danger averted
2x & Bleeping	Batteries empty	Platform raised Lift wheels Speed reduction	Fully charge batteries
3x	Tilt (>2°) with low platform	Platform raised	Lay pipes level
4x	Load limiter	Platform raised Run with platform high	Reduce load Lower platform height
5x	Pipe sensor malfunction	Platform raised Lift wheels Run with platform high Speed reduction	Consult your dealer

Indirect danger

The indicator displays a red-orange blinking pattern:

This blinking pattern consists of two colours.

Flash pattern Red Orange:	Safety status:	Limitation:	Solution:
1x	Speed too high	Running stops	Switch Benomic S off and on, Consult your dealer
2x	Tilt sensor signal is absent with low platform	Run with platform raised	Lower platform completely, Consult your dealer
3x	Height sensor signal absent	Platform raised Platform down only slowly	Lower platform completely, Consult your dealer
4x	Load limiter in combination with platform height	Running stopped	Reduce load <150 kg, Lower platform <2.5 m
5x	Load sensor signal absent	Platform raised Run with platform high	Consult your dealer
6x	Speed limiter (running pulses absent)	Running stops Speed reduction	Speed reduction active on restarting Consult your dealer

Function monitoring (sensors)

The indicator displays a red-blue blinking pattern:
This blinking pattern consists of two colours.

Flash pattern Red Blue:	Safety status:	Limitation:	Solution:
1x	Both sensors of wheel lift system active	Platform raised Running stops	Consult your dealer
2x	Wheel lift system time too long	Platform raised Running stops	Operate wheel lift system again, Consult your dealer
3x	Wheel lift system sensors status spontaneously changed	Platform raised Running stops	Operate wheel lift system again, Consult your dealer
4x	Lift time too long / platform lowers	Platform stops	Operate again

5.3.2 The horn

The acoustic warning gives the user feedback on the action that is being performed, or a changing safety status.

Horn signal:	Action or Safety status:	Limitation:	Status or Solution:
1x bleep	Turning on with the main switch (1)	None	The Benomic S is on standby
1x bleep	Press horn / reset button (10)	None	The Benomic S is on and ready for use
bleep tone	Press horn / reset button (10)	None	Horn is active while being pressed
1x bleep per 4 sec	Emergency stop used	Operation stopped	Unlock if danger averted
2x bleep per 4 sec	Batteries empty	Platform raised, Lift wheels, Speed	Fully charge batteries
5x short bleep	Incorrect operation, function not possible	The required action will not be executed	Execute an operation that is possible (safe). (E.g. platform down)
1x bleep per 0.5 sec	At the start, platform down slowly in the bottom metre	Platform down only slowly	Plateau is lower than 1 metre, Beware of entrapment
Fast bleeping	Tilt (>2°) with high platform	Platform raised Running stops	Lower platform, Lay pipes level
Slow bleeping	Tilt (>1.8°) with high platform	Speed (higher than 250cm)	Lay pipes level

5.4 Main components of the BENOMIC S

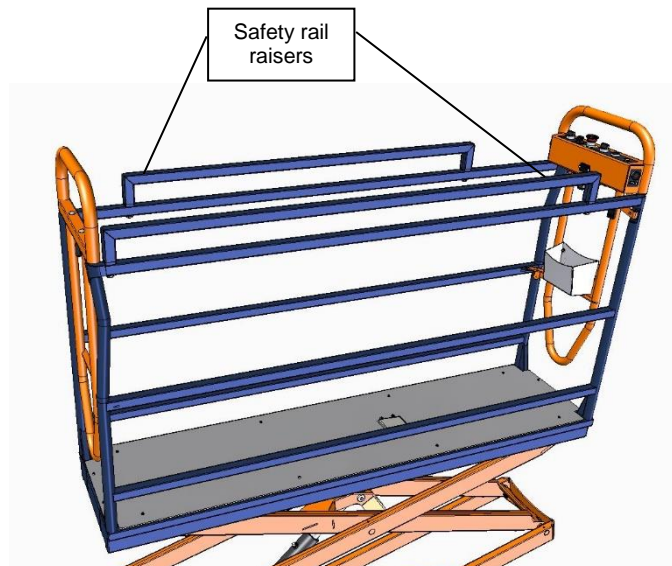
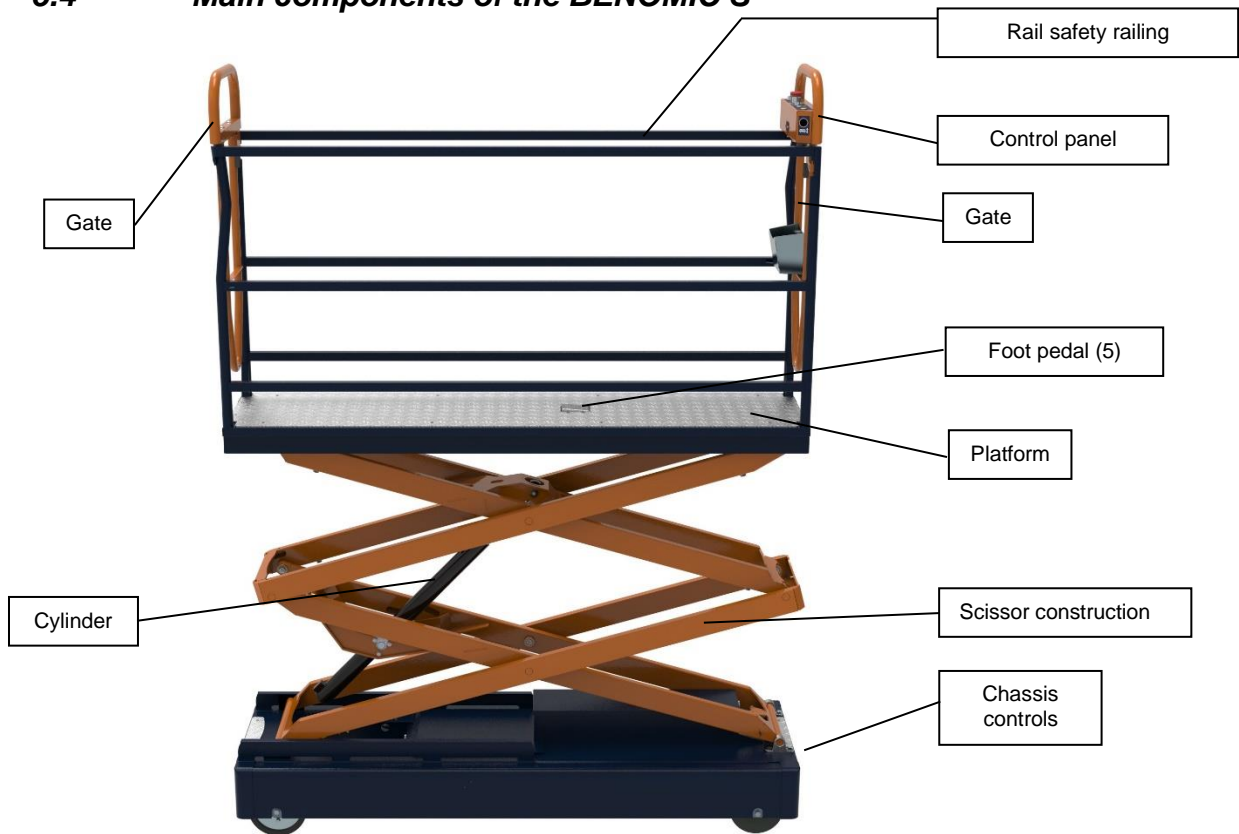


Figure 5.1; Names of the components on the upper part of the BENOMIC S

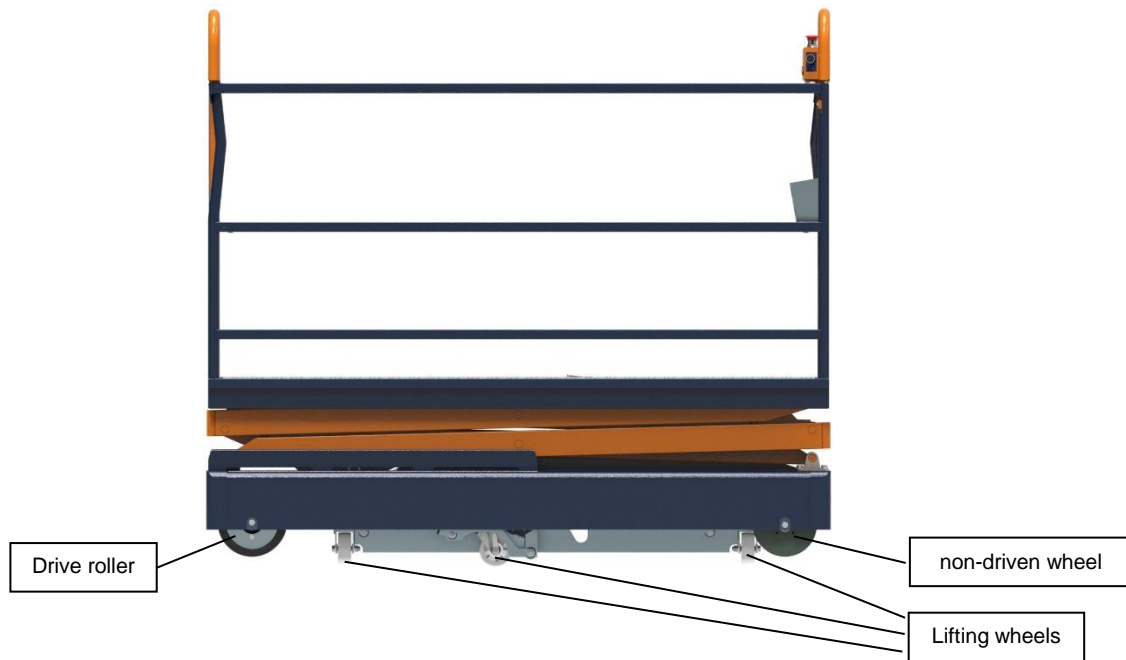


Figure 5.2; Names of the components on the lower part of the BENOMIC S

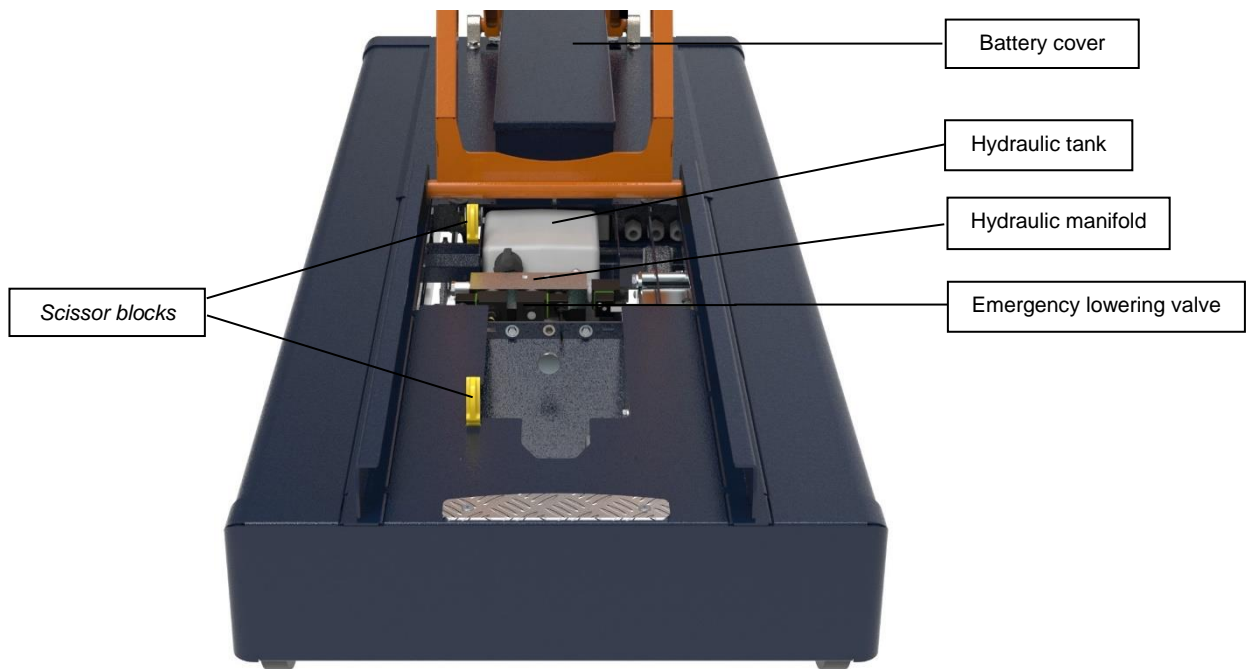


Figure 5.3; Names of the components on the inside of the BENOMIC S

6. Transportation

6.1 External transport

When the *BENOMIC S* has to be transported, please do as follows:

1. Close the scissor mechanism fully.
2. Retract the lift wheels so that the trolley stands on the flanged rollers.
3. Set the speed regulator to speed 0.
4. Switch off the *BENOMIC S* via the main switch (rotate the top of the red key to the horizontal position).
5. Secure the *BENOMIC S* properly so that it cannot move about, roll forward or tilt over.
6. Ensure that the *BENOMIC S* remains dry and frost-free during transportation.
7. When arriving at its destination, the *BENOMIC S* should be set up in accordance with the points described at chapter 7.1.

6.2 Internal transport

It is also possible to transport the *BENOMIC S* internally (in the greenhouse). It is preferred that the trolley is moved on the flange rollers and lift wheels (see 8.2), but it can also be moved by forklift truck for example. Moving with a forklift truck is done as follows:

1. Close the scissor mechanism fully.
2. Retract the lift wheels so that the trolley stands on the flanged rollers.
3. Switch off the *BENOMIC S* via the main switch (rotate the red key to a horizontal position).
4. Put the forklift truck forks as far apart as possible then push them under the trolley as far as possible.
5. Check the other side to see whether the forks stick out and are positioned at the centre of the *BENOMIC S*.
6. Secure the *BENOMIC S* to the elongation of the forks on the forklift truck so that the trolley cannot move or slide off.
7. Lift the *BENOMIC S* carefully from the ground and no higher than is necessary.

Please note!

- **Secure the *BENOMIC S* to the rack of the forklift truck with a strap!**
- **Never lift higher than necessary!**
- **Ensure that the forklift truck can lift at least 600 kg weight!**
- **Remove anything lying loosely on the platform before lifting!**
- **Drive slowly and carefully!**



7. Commissioning

The *BENOMIC S* has been specially designed for running on a stable pipe rail system (see 7.2 and 7.3). Berg Hortimotive checked the pipe rail trolley for proper functioning and safety before leaving the factory. The items described in article 7.1 must be inspected prior to taking the *BENOMIC S* into service.

7.1 *Inspection before starting operations*

The following points should be checked before starting up the *BENOMIC S*

- There are no loose electrical connections (all the functions and buttons work properly).
- No damaged cables and/or hydraulic hoses leaks.
- The drive roller, non-driven wheel and lift wheels are not damaged and run freely.
- The batteries are charged (see battery indicator 8.1.2, no 13).
- There is no general damage (specifically the scissor mechanism).
- There is no impairment to the visibility of the control components, pictograms and symbols.
- All the screens and protective caps and covers are firmly in place.
- The scissor mechanism is secured on the chassis and the safety railing to the scissor.
- Mounted safety rail raiser for users taller than 1.90 metres.
- The lifting system working properly.
- Indicator and horn operation as described in Signalling systems (5.3) and Controls (8.1)
- Special attention should be paid to the periodic checks stated in the following paragraphs of this chapter. These checks should be carried out at least monthly or yearly!

7.2 *Pipe rail system in horticulture*

The *BENOMIC S* has been designed to run on a stable pipe rail system. This means that each path between the crops has a track that consists of two pipes of the same diameter with a fixed width between them (centre-to-centre/c to c size). The pipes are often used as heating pipes and are supported along fixed distances.

Stability tests have shown that with unfavourable combinations of tube type and the support distance of the pipe rail system, constraints must be applied for the maximum permissible load. See 10.1 Explanation of the technical specifications.

7.3 *Minimum requirements for the pipe rail system*

We refer to chapter 10.1, this is leading.

Additional information can be found in the health and safety catalogue that is applicable in the Netherlands.

7.4 Tilt indication

The *BENOMIC S* is equipped with a tilt meter for both the length and width, with a visual warning signal, which may be supplemented with an acoustic warning signal. For a complete overview of the visual and acoustic warning signals, refer to chapter 5.3.

The operation of the tilt indication should be checked monthly.

Put the *BENOMIC S* on a flat concrete floor, and operate the platform upwards to about 120 cm, with the scissors control service button (3), as described in 8.1.1. Then put a pallet jack on one side under the spoiler of the *BENOMIC S*, increasing the tilt step by step. During this test, the following acoustic signals should be heard:

- Slow bleeping, the tilt is now greater than 1.8°
- Rapid bleeping, the tilt is now greater than 2°

Establish whether the acoustic signals can be heard during this check, the tilt indication is thus approved.

It is forbidden to work with the *BENOMIC S* if the tilt indication is not working!

Consult your dealer if the tilt indication does not pass the periodic inspection!

The *BENOMIC S* reacts in the following steps if the pipes are not properly horizontal:

Step 1: tilt more than 1.5° reached (only at higher than 250cm!), orange light (11) flashes slowly and the running speed is reduced.

Step 2: tilt more than 1.8° reached (at higher than 120cm), orange light (11) flashes slowly, the horn will beep slowly and the running speed is reduced (only at higher than 250cm!).

Running with high work platform is possible, be extra careful!

Step 3a: tilt more than 2° reached with work platform high, red light (11) burns, the horn beeps rapidly and running stops (at higher than 120cm).

Step 3b: tilt more than 2° reached with work platform low, red light (11) flashes 3 times cyclically, the horn stops beeping and running is possible.

Lower the work platform if running with the work platform high is no longer possible. If the work platform is in a lower position, with a tilt greater than 2° the indicator (11) will give a red alarm code, 3x blinks without acoustic signal. Running is possible again, but follow the recommendations below immediately.

Follow-up action after exceeding the tilt:

The pipe rail system should be laid horizontally before work may be resumed. First test out the prepared section of rail by running over it with the scissors in the lowest position at low speed. If this does not pose a problem, test a second time with the scissors raised at a minimal speed. If there are still no problems, resume the activities.

Ensure a sound and sustainable solution for resolving the misalignment of the rails!

7.5 Load limiter measurement system

The *BENOMIC S* series is equipped with a load limiting system that prevents the work platform from being used when too heavily loaded. If the load exceeds that indicated on the safety sticker (4.3), the work platform will not go up and the indicator (11) will flash the red alarm code 4x. Running is only possible in the low position.

The operation of the load limiting system should be checked monthly. Put the *BENOMIC S* on a flat concrete floor, and operate the platform upwards with the scissors control service button (3), as described in 8.1.1. The platform will go up. Lower the platform again and put a weight of >50 kg on the platform. Then operate the platform upwards with the scissors control service button (3) and establish that the platform stops rising within 50 cm, after which five short bleep tones will be heard. The load limiting system is thus approved.

It is forbidden to work with the *BENOMIC S* if the platform does not stop as described above!

Consult your dealer if the load limiting system does not pass this periodic inspection!

7.6 Load-holding function

If the hydraulic hose is punctured when using the work platform in the raised position, the 'load-holding function' will immediately operate. The work platform stops lowering, after which the user has to drive back to the main path slowly. Stay calm, get help, and contact your dealer.

7.7 Scissors-blocking device

In order to be able to perform work and maintenance safely when the work platform is raised, the scissors-blocking device must always be activated. For this, see chapter 9.2.

7.8 Emergency lowering valve

The emergency lowering valve is located under the cover plate, which is under the scissors structure at the location of the yellow sticker shown below. If the scissors no longer go down with the controls on the platform (9) and not with the controls at the leading edge of the *BENOMIC S* (2 & 3), the emergency lowering valve lever must be put in the direction of the arrow.

Beware of trapping your hands, arms or head between the scissors parts or under the platform!

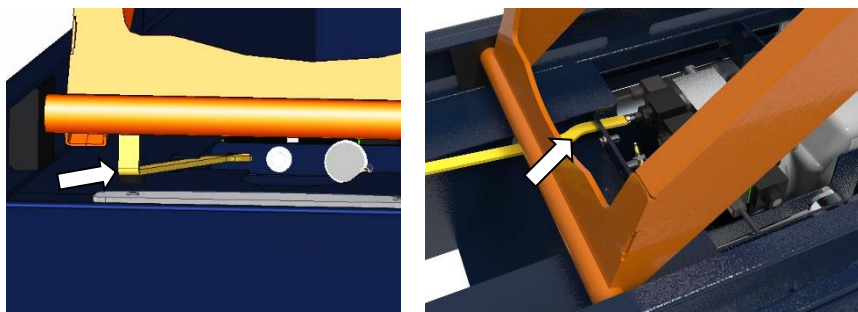


Fig. 7.1; Illustration of the emergency lowering valve control

Attention!

Beware of trapping your hands, arms and head between the scissors parts or under the platform! Use this function only in an emergency!



7.9 Pipe detection sensor

To protect the user against incorrect use, the *BENOMIC S* is fitted with a pipe detection sensor. Depending on where the *BENOMIC S* is located, functions are automatically limited on the pipes in a harvesting path or on the concrete path. See 7.10, 7.11 and 8.3.1 & 8.3.2.

The operation of the pipe detection sensor is automatically tested when the *BENOMIC S* is turned on.

7.10 Speed limiter on the concrete path

The speed on the concrete path is limited to 83 m/min., it is however advisable to set a lower speed with the speed control knob (7).

7.11 Pipe - concrete path transition

With the pipe (harvesting path) to concrete path transition, the *BENOMIC S* automatically stops running when the pipe sensor (in the middle of the trolley) no longer detects a pipe. However, it is recommended that the user knows when the concrete path is approached in order to reduce the speed and stop in time. See also 8.3.2.

8. Use

Ensure that you are familiar with the *BENOMIC S* and its control devices. Ensure that those using the *BENOMIC S* have received instruction for Pipe rail trolleys and have read and thoroughly understand the safety instructions and have read this handbook.

- The *BENOMIC S* should only be used when the operator is certain that there is nobody in the nearby vicinity of the Pipe rail system.
- Always remove plant remains etc, and any other obstacles from the pipe rail system.
- Keep the trolley clean and regularly remove any waste materials. Before cleaning the trolley, switch it off by removing the keys from the contact.
- After using the *BENOMIC S* always remove the key from the contact.
- Service the *BENOMIC S* regularly and store it in a dry and frost-free environment if it is out of use over long periods.

Charge the batteries if only 1-2 orange LEDs light up on the battery status indicator. If this area is reached during work activities, then work can usually continue until the end of the day. If an acoustic signal repeatedly gives two bleeps, the *BENOMIC S* should immediately be recharged. Charging must not be interrupted until the charge indicates fully charged, after approx. 12 hours. (for this see the battery charger manual). Brief charging during coffee and lunch breaks must be avoided as this can cause serious damage to the batteries. Charging too soon (when the battery status indicator has more than three orange LEDs) will result in a shorter battery lifespan because the batteries wear with each charging cycle, avoid unnecessary charging!



Explosive gas is released when the batteries are being charged. Keep sparks, naked flames or cigarettes away from batteries. Ensure that the place where batteries are charged and/or stored is well ventilated. Ensure that no metal objects can fall on top of the batteries as this could cause short circuits or sparks which in their turn could lead to an explosion.

8.1 Controls

8.1.1 Controls on the chassis

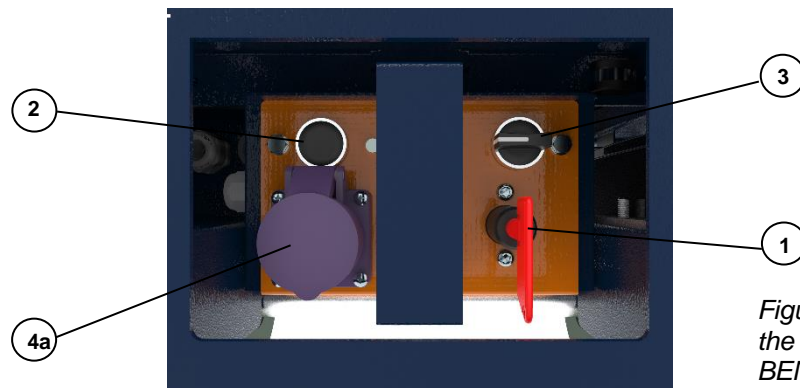


Figure 8.1; Controls on the chassis of the BENOMIC S

1. MAIN SWITCH / EMERGENCY STOP

The *BENOMIC S* can be switched on and off with the main switch. If the red key is in the running direction (vertical), then the trolley is ON, if the red key is perpendicular to the running direction (horizontal), then the trolley is OFF. When the *BENOMIC S* is switched on, a bleep signal will sound and the indicator will flash red once and then light up/blink green, the battery status indicator will also start up (see Controls on platform 8.1.2). When the *BENOMIC S* is not being used or charged, the red key should be taken out of the ignition. The main switch also serves as an emergency stop. If the key is put horizontally, the trolley is completely switched off.

2. SCISSORS CONTROL RELEASE BUTTON

The release button (2) releases the service button (3) for use, this button must be pressed continuously during the upward or downward movement.

3. SCISSORS CONTROL SERVICE BUTTON

The scissors control selector switch allows the platform to be raised or lowered without standing on the platform. The *BENOMIC S* should not be on the pipes for this operation! Keep the release button (2) pressed and turn the service button (3) clockwise (white stripe up) and the platform will rise as long as the buttons are operated. Keep the release button (2) pressed and turn the service button (3) anticlockwise (white stripe down) and the platform will drop as long as the button is operated.

Attention!

- **Ensure that no persons or objects can get under or between the scissors construction while lowering!**
- **An acoustic signal will sound when the platform slowly falls in the last bit!**
- **Provide adequate space above the BENOMIC S to allow the scissors to go up!**
- **Do not use the buttons if anyone is on the platform!**



4a. CHARGING PLUG SOCKET

You can use this socket to charge the batteries. Make sure the plug is removed before the *BENOMIC S* is put into operation! *Always remove the charging plug with maintenance.* Only a suitable charger should be used - see the specifications on the charger.

4b. CHARGING PLUG SOCKET (option!)

This charging plug socket is mounted only when the *BENOMIC S* features an internal battery charger. A 230 V extension cable should be connected to this if the batteries need charging.

5. FOOT PEDAL

A foot pedal (5) is mounted in the platform (page 11), the *BENOMIC S* will run in the desired direction - after a short pulse - and as long as the foot pedal remains operated for the second time. This feature is intended to protect the operator against accidental running activation.

8.1.2 Controls on the platform

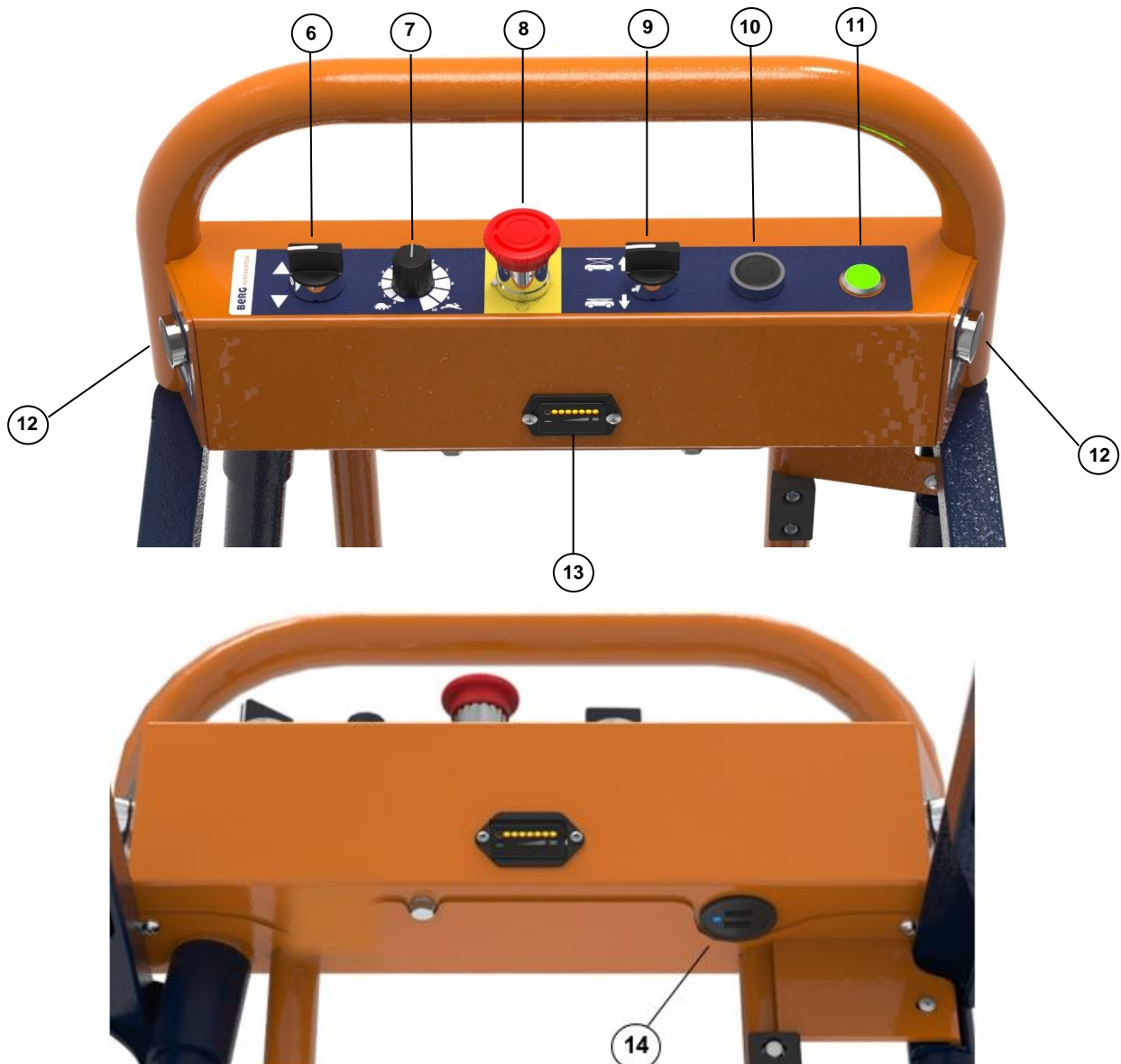


Figure 8.2; Top and bottom control consoles

6. DIRECTION OF TRAVEL REVERSE SWITCH

The direction of travel selected is determined by setting the selector to the desired direction.

7. SPEED CONTROL KNOB

0 = idle 10 = maximum speed

8. EMERGENCY STOP

Only use in case of emergency! The main switch (1) must be used for switching off.

- Press = stop
- Turn-pull out = release

With an active emergency stop, an acoustic signal will sound consisting of one bleep every four seconds and the red indicator will blink slowly.

Starting up after engaging the emergency stop



Never release an emergency stop (reset) if you do not know who engaged the emergency stop and why.

Release the emergency stop only when the dangerous situation has been averted!

Then press the HORN/RESET button (10) to activate the *BENOMIC S* for use.

9. WORK PLATFORM DOWN/UP, ROTARY SWITCH

The rotary switch can be used to lower or raise the work platform when the pipe rail trolley is completely on the pipe rail system. The platform drops while the button is turned down anticlockwise, and will drop the last bit slower.

***Beware of people or objects in the vicinity of the scissors while lowering!
An acoustic signal will sound when the platform slowly falls in the last bit!***



The scissors will rise to a maximum platform height as long as the button is turned up clockwise. The maximum height is 3.5 metres with double scissors. Release the button as soon as the work platform has reached the maximum height!

10. HORN / RESET

Use the horn if you want to warn someone, an acoustic signal is audible as long as the push-button is pressed.

Use the horn / reset button (10) to activate the *BENOMIC S*, 'reset' after using the main switch (1) or the emergency stop (8). After this operation, the indicator (11) will light up green continuously when the *BENOMIC S* is in a safe status, it is then ready for use.

The horn 'beeper' also gives a feedback to the user if the safety status of the *BENOMIC S* changes. For this, see 5.3.2.

11. THE MULTI-COLOUR INDICATOR

The indicator indicates the current status of the *BENOMIC S*, and is also a feedback to the user if the safety status of the *BENOMIC S* changes. For this, see 5.3.1.

12. HYDRAULIC LIFTING OF THE TROLLEY

Pressing this button (once) will result in the complete lifting up or putting down of the *BENOMIC S*, after which it can be manually rotated and moved.

Attention!

- **Only lift up on a flat surface (on the concrete floor or on the main path), never lift up standing on the pipe rail system or on a concrete floor with a slope!**
- **Fully lower the platform before lifting up the *BENOMIC S*!**
- **Beware of toes and feet when putting down the *BENOMIC S*!**



13. BATTERY STATUS INDICATOR



You can read off the status of the batteries on the battery status indicator. If all LEDs light up, then the battery is fully charged, the battery charge is proportional to the number of LEDs that light up. The LEDs are coloured orange and red. When all the orange LEDs are on, the batteries are charged 90 to 100%, for each orange LED that goes out, approx. 10% battery power has been consumed. Charge the batteries if only 1-2 orange LEDs light up on the battery status indicator. If this area is reached during work activities, then work can usually continue until the end of the day. When the last orange LED starts flashing, the battery empty status is about to come into operation, complete the work in the harvesting path and follow the advice for battery charging given below. If an acoustic signal repeatedly gives two bleeps and the red LED lights up, the *BENOMIC S* should immediately be recharged. The speed is automatically reduced and raising the work platform and lifting up on the displacement wheels is now no longer possible. Switch the *BENOMIC S* off with the main switch and charge the battery without interruptions for at least 12 hours until the battery charger indicates full. (consult the battery charger's user manual!)

Avoid charging before the battery status indicator indicates 50% discharge. Always try to equal approx. 20% discharge. This has the following advantages:

- Reduced number of charging cycles, improves the service life
- Less water use
- Less energy use

If the battery status indicator LEDs flash, then the *BENOMIC S* is being recharged without it being switched off using the main switch. Turn off the *BENOMIC S* and wait until the battery charger automatically stops charging, the batteries are then fully charged!

Regardless of the level of usage, charge the batteries at least once a month using a suitable charger! Avoid deep discharge of the batteries, this causes severe damage and shortens the life!

See also the instructions contained in Appendix 3 Battery safety sheet!

14. USB CONNECTION

The USB power connector serves to charge and/or power original USB accessories with a maximum consumption of 2.1 A per connection.

8.2 *Moving the BENOMIC S on the main path*

There are two methods for moving the *BENOMIC S* along the main path. Always walk next to the trolley, never in front of it!

The first option is on the flange rollers. Select a direction of travel and speed (up to position 4). Press the foot pedal (remember to double press!) and the *BENOMIC S* will move in the selected direction.

The second option is to put the trolley on its lifting wheels. Press button (12), the *BENOMIC S* is now on the lifting wheels. The *BENOMIC S* is easy to turn and move sideways.

Attention!

- ***Never leave the BENOMIC S unattended on its lifting wheels.***
- ***Always walk next to/behind the trolley!***
- ***Take care with ramps and trenches, reduce the speed!***



8.3 *Moving the BENOMIC S on the harvesting path*

The speed selected on the harvesting path is one that best suits the work. (See Appendix 3 *Efficient use of the Pipe rail trolley*)

The *BENOMIC S* will run in the desired direction - after a short pulse - and as long as the foot pedal remains operated for the second time. This feature is intended to protect the operator against accidental running activation.

While driving, keep an eye on the position relative to the beginning and end of the harvesting path, moderate the speed and stop in time!

8.3.1 *Driving into the harvesting path*

Position the *BENOMIC S* straight in front of a harvesting path and drive it fully onto the pipes with the work platform in the lowest position. Once the trolley is fully on the pipes, the work platform may be brought up to working height with the turning knob (9).

8.3.2 *Driving out of the harvesting path*

On returning to the concrete path, the *BENOMIC S* automatically stops running when the pipe sensor (in the middle of the trolley) no longer detects a pipe. Lower the work platform completely and activate the foot pedal as described at foot pedal (5) in chapter 8.1.1.

Crossing the main path is only possible in the lowest position.

Cross over or move the *BENOMIC S* to another harvesting path as described in chapter (8.2).

8.4 Out of use

When the *BENOMIC S* is not being used, please ensure that the scissor is in the lowest position and the lift wheels are retracted so that it is sitting on the flanged rollers. Switch it off via the main switch and store it in a dry and frost-free area **with fully charged batteries**. It is recommended to connect the batteries on the *BENOMIC S* to a trickle charger. If this is not possible, the batteries should be charged at least every month (also when the *BENOMIC S* is stored for longer periods. Ensure that the ground underneath is level. If after a long period the *BENOMIC S* is put back into operation, it should first be inspected as described at chapter 7.1 (Inspection before starting up).

8.5 Cleaning

Regularly remove any remains of plants, leaves, etc, and brush off any sand and dust. Clean the Pipe rail trolley with a dry/damp cloth and soft brush. It is also possible to clean the *BENOMIC S* using compressed air, provided that it is dry. Never pour water over the *BENOMIC S* or clean it using a steam or high-pressure water cleaner which can lead to serious damage being caused to the electrical circuits in the equipment. Every week remove all sand and dirt from the chassis for the scissor sliding blocks. See also *Appendix 4: Cleaning the powder coating*

8.6 Problems, causes & solutions

The *BENOMIC S* is equipped with various safety systems that can temporarily block the intended functions, for example through incorrect operation. In order to alert the user to a changing status or incorrect operation of the *BENOMIC S* during use, a multi-colour indicator (11) and horn is used. For the situations below, first always refer to chapters 5.3.1 and 5.3.2!

Problem A : The *BENOMIC S* does not run.

Cause	:	Key switch is disabled
Solution	:	<i>Enable key switch (vertical)</i>
		Emergency stop locked
		<i>Release emergency stop (turn / pull out)</i>
		Speed potentiometer at 0
		<i>Set a speed</i>
		Motor controller fault
		<i>Switch off and on again with the main switch</i>
		<i>Consult your dealer</i>
		Battery terminals make poor contact
		<i>Clean the battery terminals, remount the clamps</i>
		Defective foot pedal
		<i>Replace foot pedal, consult your dealer</i>
		Lifter not withdrawn far enough or sensor defective
		<i>Withdraw lifter (system) fully (12) or check sensor</i>
		25A circuit breaker in 0-position
		<i>Consult your dealer</i>
		6.3 A control circuit fuse defective.
		<i>Consult your dealer</i>

Problem B : Speed can be poorly adjusted.

- Cause B :** **Speed control button is defective.**
Solution : Consult your dealer
Pipe sensor is defective (only runs slowly)
Consult your dealer
Drive motor control is defective
Consult your dealer

Problem C : The work platform will not raise/lower.

- Cause C :** **Pipe rail trolley is not completely on the pipes**
Solution : Drive the pipe rail trolley fully onto the pipes or use the service control
Lifter system sensor not activated/defective
Withdraw lifter system fully or check sensor
Batteries empty (Red LEDs on battery status indicator and 2x cyclic bleeps)
Charge batteries
Battery terminals make poor contact
Clean the battery terminals, remount the terminals
Key switch is off
Enable key switch (set vertical)
Emergency stop pressed
Release emergency stop (turn / pull out)
Overloaded
Reduce load. (see 10. Specifications)
Too little hydraulic oil
Replenish hydraulic oil (scissors up, supplier information)
Switch/button faulty
Try the scissors control service button next to the main switch
80 A fuse defective.
Consult your dealer
6.3 A control circuit fuse defective.
Consult your dealer

Problem D : The lifter system won't go out/in.

- Cause D :** **The work platform is too high**
Solution : Lower the work platform to the lowest position
The BENOMIC S is on the pipes
Drive the trolley off of the pipes
Batteries empty (Red LEDs on battery status indicator and 2x cyclic bleeps)
Charge batteries
Battery terminals make poor contact
Clean the battery terminals, remount the terminals
Key switch is off
Enable key switch (set vertical)
Emergency stop pressed
Release emergency stop (turn / pull out)
Too little hydraulic oil
Replenish hydraulic oil (scissors up, supplier information)
Switch/button faulty
Try the scissors control service button next to the main switch
80 A fuse defective.
Consult your dealer

6.3 A control circuit fuse defective.

Consult your dealer

Problem E : The *BENOMIC S* has overturned.

Cause E :

- **Carelessness with the forklift truck**
- **Unstable pipe rail system**
- **Too much manual force**
- **Overloaded**
- **Tilt detector ignored**
- **Have run into a path next to the pipes**
- **Lifting on uneven surface**

Solution :

1. Switch the trolley off
2. Set the trolley upright
3. Remove covers
4. Disconnect the batteries
5. Clean the trolley
6. Observe the damage
7. Find the cause and provide a sustainable solution
8. Check according to chapter 7

!!!BEWARE of liquids, battery acid is very corrosive!!!

8.7 Dismantling

When you have to dispose of your *BENOMIC S* you should return it to your dealer or a company that specialises in dismantling vehicles. Never take your *BENOMIC S* to a scrap metal dealer or a waste dump. The *BENOMIC S* should be dismantled and the chemical components removed (hydraulic oil and batteries).

Faulty batteries should be handed into the local authority or your supplier.
Oil should be handed in as chemical waste.



9. Repairs & maintenance

The *BENOMIC S* is a very high quality product. In order to guarantee that the high quality remains, it is vital that the maintenance schedule given below is strictly adhered to. Repairs and maintenance activities should be recorded in the maintenance logbook - see Appendix 1. The employer is also responsible for periodically checking tools and equipment according to the current Working Equipment Guidelines that cover this. Switch off the *BENOMIC S* at the main switch before starting maintenance:

Maintenance - Checks	Tools	Daily	Weekly	Monthly	Yearly
Sufficiently charged battery (see 8.1.2 (13))	Battery condition meter	X			
Damage to control components	Visually	X			
Damage to/visibility of pictograms & stickers	Visually	X			
Foot pedals + platform cleaning	Brush / damp cloth		X		
Cleaning control panel	Soft brush / damp cloth		X		
Clean the scissor sliding blocks on chassis	Brush / damp cloth		X		
Check for leaks and damaged cables and hoses	Visually		X		
Check for ingrained dirt or string wrapped around wheels and chain	Visually		X		
General mechanical damage	Visual		X		
Check the lifting gear in both directions for sticking (low hydraulic fluid level)	Hydraulic fluid ISO Viscosity Grade 46		X		
Charge batteries if necessary or at least 1x monthly (see 8.1.2 (13))	Battery charger			X	
Check battery fluid levels (1 cm fluid covering plates - see Appendix 3)	Distilled water, gloves & safety goggles			X	
Check operation of the tilt indicator	Testing > 2 degrees			X	
Check hydraulic components under the cover for leaks (pump/valves)	Tool for removing bolt from cover			X	
Check pipe rail wheel wear (see 9.5)	Visual			X	
Lubricate lift wheels, drive chain and bearings	Bearing grease, chain grease or other universal lubricants			X	
Check chain tension (see 9.4)	Open-ended spanners			X	
Locking ring mounting on the scissor shafts	Visually			X	
Lubricate hinged components on the scissor mechanism (see 9.2)	Grease gun and grease				X
Lubricated hinged parts on lifting system	Grease gun / grease				X
Check the welds on the scissor construction for (hair)cracks and rust.	Visually				X

If the above checks indicate that there is a fault with the *BENOMIC S*, immediate contact should be made with the *BENOMIC S* dealer. Continuing to use the machine after identifying defects could lead to dangerous situations and is therefore forbidden!

9.1 Specialist maintenance

Maintenance and repairs to the items listed below may only be carried out by qualified specialists appointed by Berg Hortimotive:

- Work on electrical components and wiring (except replacing foot pedal).
- All work concerning the hydraulic system.
- All activities to the drive motor excluding: cleaning, readjusting or replacing the chain or chain sprockets.

9.2 Maintenance in and around the scissor mechanism

For maintenance work on, below or between the scissors construction, the scissors-blocking device should be unfolded. Remove the cover plate (Figure A). Fold out the catch with the scissors up. Lower the scissors (B) until it is against the safety catch. Now switch off the *BENOMIC S* by means of the main switch.

After maintenance, turn on the *BENOMIC S* with the main switch.

By subsequently pressing the release button (2) for 5 seconds (audible bleep) and keeping it pressed, the service key (3) will be released for use. Send the work platform slightly up, after which the blocking catch can be folded. Then operate the platform completely down.

Now use the horn / reset button (10) to activate the *BENOMIC S*, 'reset' after using the main switch (1) or the emergency stop (8). After this operation, the indicator (11) will light up green continuously when the *BENOMIC S* is in a safe status, it is then ready for use.

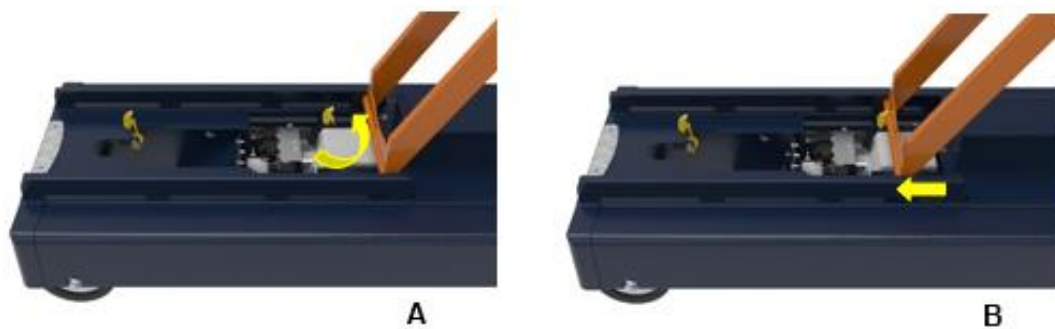


Figure 9.1 A-B; Unlocking the scissor blocks

The scissor shafts are fitted with bush bearings. The inner scissor components are connected to the outer components by a shaft. To prevent the shafts becoming rusted, they should be lubricated at least once a year using a universal grease and grease gun. Raise the scissor and then block it as described at scissor blocking (see illustration 9.1). Put the grease gun over the nipples and pump in the grease until it comes out at the sides of the bush.



Figure 9.2; Location of the grease nipples for the scissor and cylinder shafts

9.3 Pipe rail system maintenance

The pipe rail system on which the *BENOMIC S* runs should be checked on a regular basis. The *BENOMIC S* has been designed to run on a stable pipe rail system. This means that each path between the crops has a track that consists of two pipes of the same diameter with a fixed width between them (centre-to-centre/c to c size). The pipes are often used as heating pipes and are supported along fixed distances.

Stability tests have shown that with unfavourable combinations of tube type and the support distance of the pipe rail system, constraints must be applied for the maximum permissible load. See 10.1 Explanation of the technical specifications.

Moreover, the pipes on the concrete path should be secured and must not be loose. Regardless of the pipe rail system, our requirement is that a maximum support distance of 1 metre is applied in the last 10 meters! At the pipe ends (in front of the wall) there should be an end-stop welded on that is at least 5 cm high - at the end of each season check whether the stops are not flat, folded, crooked or broken. The ground under the pipe rail system should be dry, flat and hard. Soft or damp spots should be repaired and surface indentations permanently repaired.

Additional information can be found in the health and safety catalogue that is applicable in the Netherlands.

9.4 Chain tensioning

The chain tension should allow approximately 1 cm of play - if this is not the case, please do the following:

1. Turn off the *BENOMIC S* with the main switch and remove the key from the ignition to prevent the *BENOMIC S* from being enabled.
2. Loosen the three motor mounting screws (A) a little
3. Tension the chain by tightening the adjustable lock nut (B) *
4. Tighten the three motor mounting bolts (A) again firmly

* Allow chain slack of about 1 cm.

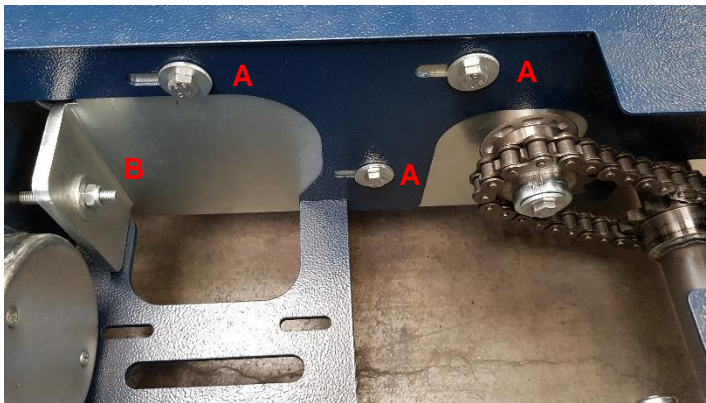


Figure 9.5; Tensioning the chain

9.5 Check pipe rail wheel wear

Every running surface of any material is subject to wear.

The material of the flange rollers has the following favourable characteristics:

- Flange rollers are silent
- Rolling resistance is low
- Lower load for the heating pipes
- Acceptable durability

With this information we want to indicate when it is time to proceed with replacing the flange rollers.



Wear is approx. 1 mm, the rollers have been in use for some time.

Normal maintenance, inspection for run-in string.



Wear is 2-3 mm, the rollers are still fine.

Normal maintenance, inspection for run-in string.
Roller replacement not yet necessary.



Wear is 5 mm or more. The roller has flat sides and has been blocked.

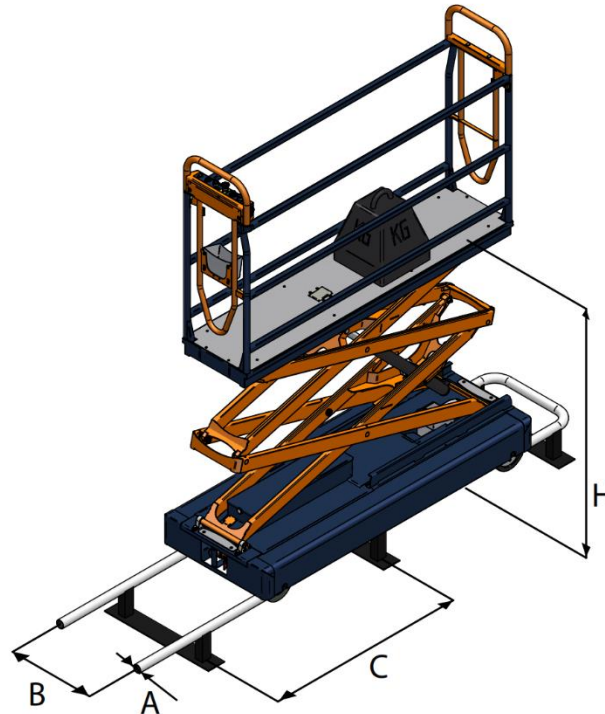
Replacement is now necessary!
Consult your dealer.

10. Technical specifications

Type:	xxxx.xx.xxxx
Dimensions [mm]:	2- scissor S350
Centre-to-centre*	425
Length	1910
Breadth	c to c + 186
Chassis step-up height from concrete path	1630
Length	257
Step-up height to platform in lowest position of chassis step	273
Height of control panel from platform	1007
Length of work platform	1900
Width of work platform	460
Maximum work platform height *	3500
Max. Load capacity [kg] *	250
Maximum lateral pressure [N]	110
Weight [kg] (c-to-c 420)	415
Motor power Moving [kW]	0.25
Hydraulic motor capacity [kW]	1.2
Hydraulic system pressure [bar]	200
Hydraulic fluid Viscosity 46 [L]	2.9
Maximum speed on rails [m/min]	60
Maximum speed on concrete path [m/min]	83
Min. lifting speed [m/sec.] #	0.13
Min. lowering speed [m/sec] # # with a load of 80 kg	0.14
Voltage [Volt DC]	24
Battery capacity [Ah] (5h/20h)	120 / 159
USB connection 2x [Volt/Ampère]	5V/2,1A
Vibration level [m/sec ²]	<0.5
Noise level [dB]	<70

10.1 * Explanation of the technical specifications

Stability tests have shown that the following restrictions must be applied with unfavourable combinations of: tube type and support distance of the pipe rail system.



A = 45 mm			
B =		≤ 52 cm	> 52 cm
C =		Max. 1,25 meter	
H =	2,5	X	150 kg
	3,0	X	
	3,5	X	
Not recommended by Berg Hortimotive			

A = 45 mm			
B =		≤ 52 cm	> 52 cm
C =		Max. 1 meter	
H =	2,5	250 kg	250 kg
	3,0	120 kg	
	3,5	X	

A = 51 mm			
B =		<52 cm	≥ 52 cm
C =		Max. 1,25 meter	
H =	2,5	250 kg	250 kg
	3,0	120 kg	
	3,5	X	

Regardless of the pipe rail system above, our requirement is that a maximum support distance of 1 metre is applied in the last 10 meters!

11. EC Declaration of Conformity

(according to Supplement IIA of the Machinery Directive)

Berg Hortimotive
Burg. Crezeelaan 42a
2678 KZ De Lier – the Netherlands
T: +31 (0)174 – 517700
www.berghortimotive.nl

While taking full responsibility, hereby declares that the product:

- ***Pipe rail trolley type BENOMIC S with double hydraulic scissors and hydraulic lifting wheels to 3.5 metres height***

Article number:

Serial number:

- Meets the requirements of the Machinery Directive 2006/42/EC

Satisfies the following other EC directives:

- Electromagnetic Compatibility Directive (EMC) 2004/180/EC (as recently amended)

EC type examination TÜV Netherlands no. 2400-B-528

The Netherlands, De Lier, date-.....-.....

Signature of managing board or authorised signatory.

Appendix 2: Technical drawings

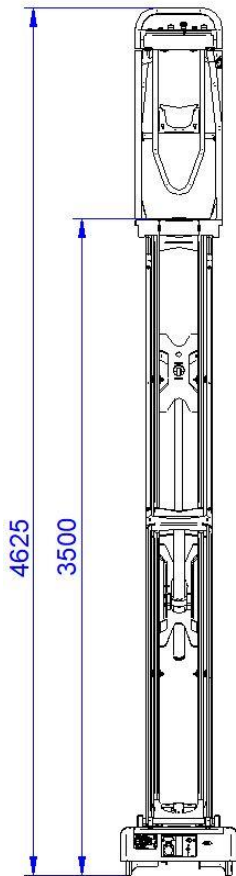


Fig. 2.2; Maximum height dimensions in mm, 2 scissors

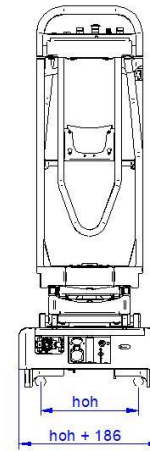


Fig. 2.1; Width dimensions in mm, 2 scissors

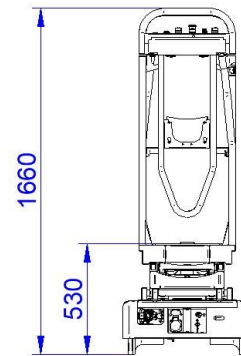


Fig. 2.3; Minimum height dimensions in mm, 2 scissors

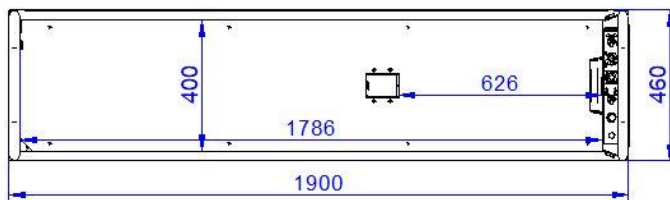


Fig. 2.4; Platform dimensions in mm, 2 scissors

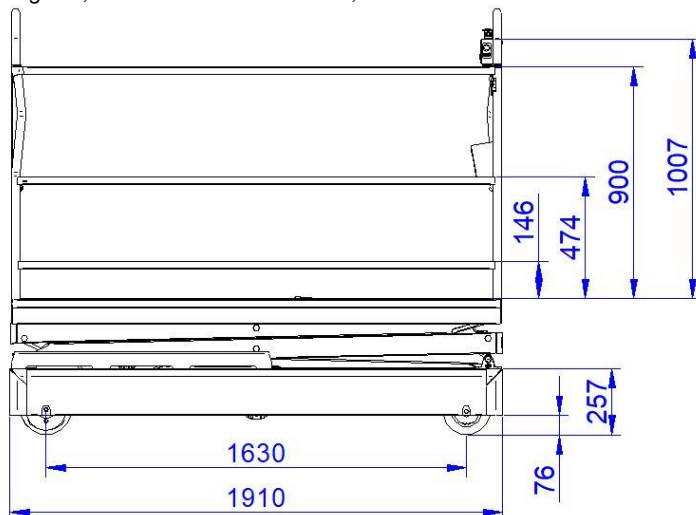


Fig. 2.5; Length dimensions in mm, 2 scissors

Appendix 3: Battery safety sheet

Battery recommendations

The following chapter provides recommendations for efficient usage, safety and maintenance.

Efficient use of the pipe rail trolley and the batteries

The following recommendations are aimed at facilitating the efficient use of the pipe rail trolley and to improve the life-cycle of the batteries.

Basic principles:

- The battery goes flat sooner when running at higher speeds.
- High levels of starting and stopping also increase electrical energy consumption.
- Through using the pipe rail trolley, the remaining capacity and battery voltage gradually reduces, while simultaneously the current consumption increases. This results in increasing heat generation from the motor and speed regulator as the batteries gradually lose their charge.
- Worn rollers, string around wheels, etc, and rusty chains (poor maintenance) all result in higher energy consumption. (for maintenance instructions, see website: <http://www.berghortimotive.com/service/bsa-film>)
- Allowing batteries to go completely flat also reduces the life-span.
- Charging when required and good maintenance help to increase the life-cycle of the batteries.
- Charging when required also lowers the generation of heat in the motor and speed regulator, as well as the battery charger.

Efficient usage:

- Try to match the speed as closely as possible with the work tempo (potentiometer).
- By following the above recommendations, the productivity of the workers will increase.

Safe use of batteries

Below are recommendations for usage and maintenance.

BEWARE!

- **Explosive gas is created while the batteries are being charged, therefore no fires, naked flames or smoking are permitted!**
- **Charging should only take place in well ventilated spaces!**
- **The battery fluid levels must be checked at least once a month! The battery fluid must be at least 1 cm above the level of the plates**
- **Top up batteries with distilled water (demineralised) only - always wear gloves!**
- **Always top up the batteries AFTER charging and never fill higher than the level marker in the cell opening. (see also the instruction sheet for traction batteries)**



Discharging the battery to less than 20% of its capacity has a negative effect on both the battery and the charger. Only charge the batteries when the battery condition meter is in the red zone, this is beneficial for the lifecycle of the batteries, electric motor and the drive regulators! Always recharge a flat battery immediately, as this increases the life-cycle substantially. It is important to check the specific gravity of the battery acid at least once a week, though it should certainly be done each month using a hydrometer (fig. A+B and table below).

The specific gravity of a fully charged battery should be 1280 g/l:

100%	sm 1280	g/l	=	12.7	volt
80%	1240			12.5	
60%	1210			12.3	
40%	1170			12.1	
20%	1140			11.9	

Before charging, disconnect the *pipe rail trolley* at the main switch. When charging batteries, always connect them to the charger before switching it on. After the batteries have been charged, switch off the charger first, then disconnect the batteries.

Overcharging can cause damage to the batteries through boiling the battery acid dry.

It is advisable to use a modern battery charger with an automatic cut-off - these are available from Berg Hortimotive. **Only use a charger type that is suitable for the batteries being charged! (see charger instructions)**

The charging process should never be interrupted - charging should be completed - see the charge indicator.

WARNING! Danger of injury with the batteries:

Avoid the battery fluid (electrolyte) coming into contact with skin, wear safety goggles and gloves as battery acid is highly corrosive. Wash with soap and water if contact is made. If it comes into contact with the eyes, immediately rinse in running water for a period of at least five minutes and call for medical assistance. Always ensure there is sufficient soap and water in the vicinity and that assistance is within calling distance when people have to work near batteries. Avoid short circuits (sparks), and ensure that there is no electrical connection between the battery poles. The battery cover must be free of damage. Bare patches or dents can cause short circuits!

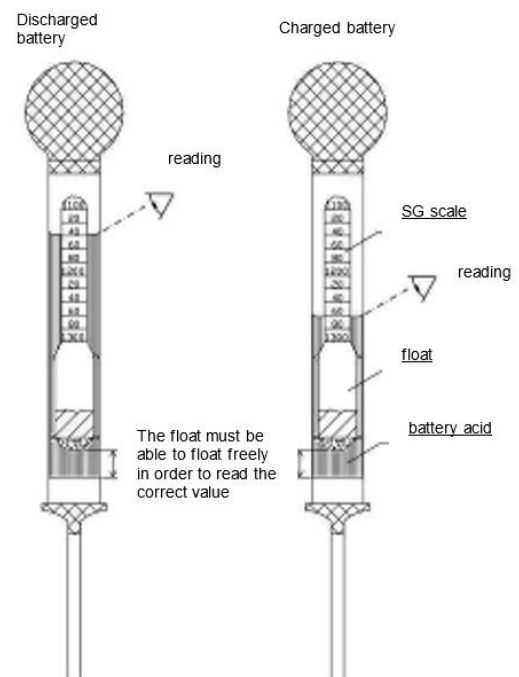
Explosive gas is released when the batteries are being charged. Keep sparks, naked flames or cigarettes away from batteries.

Do not repair, clean or carry out other activities on the Pipe rail trolley while charging.

To dismantling the batteries, always switch off all the current consumers, due to sparks.

Ensure that the place where batteries are charged and/or stored is well ventilated. Ensure that no metal objects can fall on the batteries as this could cause short circuits or sparks which in their turn could lead to an explosion.

Remove all personal objects including rings, bracelets, necklaces and wristwatches when working in the vicinity of batteries. For example, a short circuit could melt a ring resulting in serious burns.



When dismantling the battery, first disconnect the earth cable (-). When mounting, connect the earth cable (black) last of all.

WARNING!

Always connect the plus (+ = red) to the plus terminal and minus (- = blue) to the negative terminal.


Remark

Check how many battery chargers you can connect to one circuit. You can check this by multiplying the number of amperes of the fuse with the voltage. E.g.: $16\text{ A} \cdot 230\text{ V} = 3680\text{ W}$

Subsequently check the battery charger power rating. Divide the total power by the battery charger's power. E.g.: $3680/500 = 7.36$. In this case, seven battery chargers can be connected.

Also check that the voltage at the charging location corresponds with the voltage indicated on the battery charger. There may be voltage loss with long cables. If this is the case, you should consult your installer.

Check that it is the correct charger for your machine. The battery specifications that can be used with the charger are indicated on the charger or in the user manual!

	TREM-CARD	UN 2794
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Substance Batteries wet, filled with acid, electric storage

UN Number 27

HIN 80

ADR Label 8

ADR Class 8

Packing group -

Emergency Response Information

CORROSIVE SUBSTANCE

1. Characteristics

- Corrosive, causing damage to skin, eyes and air passages
- Not flammable

2. Hazards

- Heating of container(s) will cause pressure rise with risk of bursting and subsequent explosion (BLEVE).
- Gives off corrosive and irritant fumes, also when burning
- May attack metals and produce hydrogen gas which may form explosive mixture with air
- The vapour may be invisible and is heavier than air. It spreads along the ground and may enter sewers and basements



3. Personal protection

- Chemical protection suit.
- Respiratory mask equipped with ABEKP1 filter

4. Intervention actions

4.1 General

- Keep upwind. Put on protective equipment before entering danger area.

4.2 Spillage

- Stop leaks if possible.
- Dilute spillage with water spray as far as necessary to reduce hazard. Contain run off by any means available.
- If substance has entered a water course or sewer, inform the responsible authority.
- Ventilate sewers and basements where there is no risk to personnel or public

4.3 Fire (involving the substance)

- Keep container(s) cool with water
- Extinguish with water fog (spray)
- Do not use water jet to extinguish
- Use water spray to knock down fire fumes if possible
- Avoid unnecessary run-off of extinguishing media which may cause pollution.

5. First aid

- If substance has got into eyes, wash out with water for at least 15 minutes and seek immediate medical attention.
- Remove contaminated clothing immediately and drench affected skin with plenty of water.
- Persons who have been in contact with the substance or have inhaled fumes should get immediate medical attention. Pass on all available product information.
- Mouth to mouth resuscitation should be avoided. Use alternative methods, preferably with oxygen or compressed air driven apparatus

6. Essential precautions for product recovery

- Use acid resistant equipment
- Recover spilled product in vented container fitted with absorption filter

7. Precautions after intervention

7.1 Undressing

- Drench contaminated suit and breathing apparatus with water before removing facemask and suit.
- Use chemical protection suit and self-contained breathing apparatus while undressing contaminated co-workers or handling contaminated equipment.

7.2 Equipment clean up

- Drench with water before transporting from incident.



INSTRUCTIONS TRACTIONBLOCKS



Daily maintenance EW159T:

- Only discharge the battery to 80% maximum (Electrolyte level 1130 SG)
- Connect the battery to the charger, switch on charger and charging should start automatically
- Do not disconnect the battery until charge cycle has finished
- When charge cycle has completed make sure charger is switched off before disconnecting the DC plug

Weekly maintenance EW159T:

- Check the level of the Electrolyte on the battery
Only top up battery with demineralised water
- Only top up after charge cycle has completed
- The battery should only need topping up every 2 weeks
- If required more frequently please contact the manufacturer
- Check for signs of corrosion on cables or bolts clean as required
- The battery tops should be kept clean and dry
No smoking or naked flames to be in the area of charging

Only top up the battery after the charging cycle has been completed to avoid electrolyte spilling from the battery!
No smoking or naked flames to be in the area of charging.



Always follow the manufactures instructions



No smoking or naked flames



Electrical Hazard



Danger risk of explosion



Always wear the correct PPE



Avoid contact of skin and eyes



Room must be well ventilated



Pb
All disused batteries must be recycled

Berg Hortimotive BV
Burg. Crezeelaan 42a 2678 KZ DE LIER

T : 0174- 517700
F : 0174- 516958

E : info@berghortimotive.nl
I : www.berghortimotive.nl

Appendix 4: Cleaning the powder coating

The importance of cleaning and maintenance:

- It retains the appearance and image of the product over a longer period.
- It extends the life-span.
- It prevents corrosion.
- It helps prevent the spread of plant diseases.
- It stimulates employees to operate the machines with care.

Removing contamination periodically prevents any chemical substances that may be present from affecting the powder coating. The protective layers are vulnerable to acids, salts and corrosive substances which cause premature aging. Moreover, thick layers of dirt and contamination absorb more moisture which increases the effects of corrosion on the protective layers.

The cleaning frequency depends on the following factors:

- The level of contamination depends on what is being grown.
- Type of product, or usage between the crops or, e.g. usage only on concrete tracks.
- Exposure to chemical fluids (spraying equipment).
- Exposure to chemical vapours or mists (treating the air space in the greenhouses).
- Exposure to sunlight and UV rays.
- Humidity in the air and condensation.

The above results in a load factor that depends on the type of usage, and where applicable, the following cleaning schedule should be followed.

When to clean:

- | | |
|--|------------------------------|
| • Plant and product residues. | daily |
| • Earth and sand | 2x weekly |
| • Glass, string, plastic, elastic, clips, wire hooks, etc. | 2x weekly |
| • Exposure to chemicals | immediately after use |
| • Dullness or contamination on the top layer | periodically after detection |

How to clean:

- Remove dirt or contamination on the top layer using a soft brush or cloth, or a compressed air line (<6 bar).
- Chemical contamination should be removed using a coarse sponge or soft cloth drenched in tap water.
- Clean a dull or contaminated top layer using a neutral cleaning agent with a pH value between 5 and 8 (check the label on the packaging) and a sponge or soft cloth.
- **Tip**, when a cleaning agent is used for the first time it is recommended to initially test the agent on a small section of the top layer before continuing.

What you must not do:



- Never clean the powder coating using an abrasive or burnishing cleaning agent.
- Never use cleaning equipment with an abrasive surface (steel wool, pot scourer, etc).
- Pressing down, polishing or scrubbing, etc, is not permitted.
- Never use organic cleaning solutions for cleaning or maintaining the powder coating.
- Pouring over water, using a water hose or high pressure cleaner can cause damage.

After cleaning:

- Ensure that the cleaned surfaces are properly dry and temporarily remove overlapping protective covers and screens.
- All pivots and hinges, etc, that have been in contact with cleaning agents should be lubricated according to the recommendations given in the maintenance schedule in the user manual.
- Treat any damaged areas on the powder coating layer with lacquer or paint.

Please note:

The above are only **recommendations** and therefore responsibility for the proper cleaning remains with the person carrying it out. Please contact the manufacturer if you have any queries regarding the appropriate cleaning products to be used.

Appendix 5: Quick Start Guide

Quick Start Guide



Benomic S-Line Control panel



1. Off / On switch



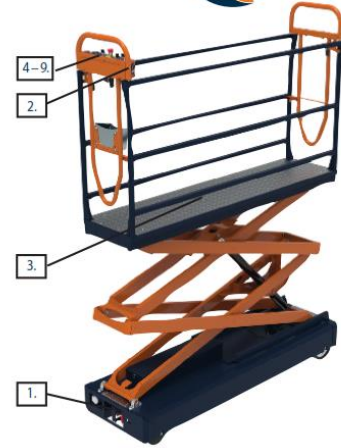
2. Button to lift wheels



3. Gas pedal

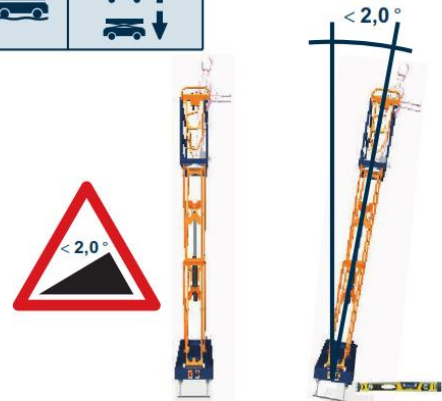


4. Direction button 5. Speed button 6. Emergency button 7. Platform button 8. Claxon 9. Status light



Turn on	Lift wheels	Set direction	Drive speed	Drive	Lift platform
Turn switch [1] vertical and push the claxon button [8]	Push button [2]	Turn button [4] in the right direction	Set button [5]	Push the gas pedal [3] 2 times to drive	Turn button [7] to lift platform

Tilt indication and follow up			
0° / < 1,5°	> 1,5° / < 1,8°	> 1,8° / < 2,0°	> 2,0°



Safety			
Emergency stop	Batteries empty	Weight overload	Wrong operation

Daily maintenance (end of the day)		
Battery check	Batteries empty	Cleaning