

Technical Handbook







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Machine type plate

The *BENOMIC* 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*, please ensure that this information is always readily available.





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The machine is manufactured by:



Berg Hortimotive

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- 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 include the following:
- alterations to the controls
- welding, mechanical works, etc
- extensions to the *BENOMIC* or its controls

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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.

This handbook provides you with information including the safety aspects, a description of the *BENOMIC* 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* should be operated and maintained. By reading this handbook and then using the *BENOMIC*, you, or anyone else, will be assisted in using the *BENOMIC* 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*. 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*. 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 wagon or its accessories, without receiving prior written permission from the manufacturer.

The *BENOMIC* 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* please contact your Berg Hortimotive dealer.



4. Safety

4.1 Explanation of 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 closely followed at all times.

The dangers attached to operating the Pipe Rail Trolley will be greatly increased if the safety instructions are not closely followed at all times, thereby resulting in the possibility of injury.

DANGER!



- Read the user's manual thoroughly. Keep to the operating and safety instructions at all times.
- The BENOMIC is suitable for operating on a pipe rail system that complies with the horticulture sector guidelines, the health and safety catalog in force in the Netherlands (see 7.2).
- Only operate the BENOMIC on the correct pipe rail system. Ensure that the centre to centre measurement of the pipe rails matches precisely with that of the pipe rail trolley see pictogram on the platform.
- Never exceed the maximum loading capacity of 250kg with a standard double scissor model or 450/550kg with the heavy duty double scissor model or 120kg with a 3-4 scissor model.
 - 1 person including load (e.g. harvest container or appliances); see pictogram on platform.
- Never exceed lateral (sideways) manual force of 110N (11kg traction).
 - It is forbidden to carry out maintenance activities using the BENOMIC
- The BENOMIC may only be used for harvesting and tending the plants in the greenhouse.
- It is forbidden to use the BENOMIC with an alignment variation exceeding 2° (lengthwise and/or breadth).
- All loads should be secured and placed in the centre of the work platform.
- It is forbidden to carry more than one (1) person on the platform at the same time.
- It is forbidden to allow people to ride on the trolley chassis.
- It is forbidden to remove the safety rail, unless a container fitted with a rail is in use.
- It is strictly forbidden to increase the lift height by any means whatsoever.
 - Always remain standing on the work platform



- Keep a safe distance from fixed and/or moving parts within the greenhouse as well as cables and ropes.
- It is forbidden to pull (steel) cables or lay screens using the BENOMIC.
- It is forbidden to use the BENOMIC as a crane or hoist.
- It is forbidden for people or pets to enter the track area in which the BENOMIC is in operation. Never operate more than one pipe trolley in the same track!
- While in operation all safety caps and protective covers on the BENOMIC must be fitted and fixed down.
- All optional equipment, fittings and spare parts must be manufactured and/or supplied by Berg Hortimotive
- Harvest containers with sliding racks must be installed in the correct position on the work platform (see 6.6). The container may overhang the sliding rack up to a maximum of 500mm on both the front and rear sides of the BENOMIC.
- Harvest containers should only be filled with lightweight produce such as peppers and up to a maximum weight of 250kg. It is forbidden to use containers on the 3-4 scissor model!

Warning!



- Operating the BENOMIC should only take place provided that there is nobody in the vicinity (except the operator) or standing within a short distance.
- The BENOMIC may only be operated by persons of at least 18 years of age who have received adequate instructions for operating the BENOMIC and have thoroughly read and understood the contents of this manual and are fully aware of the associated dangers.
- The BENOMIC may only be operated once it has been correctly installed on the pipe rail system.
- All personnel working in the area of the BENOMIC should be made familiar with the relevant safety rules and precautions that apply to pipe rail trolley system.
 - Instructions from the employer.
- Repairs to the BENOMIC may only be carried out by staff specially trained by Berg Hortimotive.
- During maintenance activities on the scissors they should always be supported using the scissor wedges (see 9.2).
- Never carry out activities on the BENOMIC while it is being operated by another person.
 Always disconnect the BENOMIC at the main switch and disconnect the charging plug from the trolley before starting maintenance activities.
- Check the BENOMIC daily for defects and carry out maintenance on a regular basis see chapter 9, maintenance.
- Keep the controls and safety symbols clean at all times.
 - operating controls and safety pictograms should always be visible.
- The BENOMIC must always be disconnected at the main switch after use.



- Never leave the BENOMIC unattended.
 - Unless the key has been removed from the main switch.
- It is forbidden to carry out modifications/alterations to the BENOMIC without receiving prior written consent from Berg Hortimotive
- Before travelling along the pipe rail track always check that there are no persons in the immediate vicinity.
- It is forbidden to transport loose cargo with the BENOMIC.
- Stack the loads in such a way that they reach no higher than 40cm above the work platform. All loads should be properly secured.
- Before using a track, ensure that it is clear of obstacles such as plant remains etc.
- Never clean the BENOMIC using a water hose, high pressure spray or steam equipment.
- Other than when on the pipe rails, the scissor should be fully collapsed before moving the BENOMIC.
- Never use the BENOMIC on public roads or paths.
- It is forbidden to step off the equipment before it is in the lowest position.
- Follow the safety instructions for the batteries see Appendix 3.
- Think about your feet and toes when operating the lift on the BENOMIC! The trolley is positioned a few centimetres in front when setting down!
- It is mandatory to wear footwear with steel toe caps (\$1).
- Remove the charging plug before operating the BENOMIC.
- After use, the direction of travel switch should always be set at neutral.

Attention!



- Always keep the working area tidy.
 - An untidy working area can lead to dangerous situations.
- Always concentrate on the task in hand.
 - Remain alert at all times when operating the Pipe Rail Trolley. Do not use the BENOMIC if you re unable to concentrate or are taking medicine that advises against operating machines or driving a motor vehicle.



4.3 Safety symbols

A number of safety symbols are located on the *BENOMIC* for your information. The symbols are designed to warn the operator of possible dangers and also dangerous situations. Always take heed of the warnings and if in doubt about the meaning of a particular symbol, please contact your supplier for further explanation.

Ensure that the symbols are always clearly visible and remain undamaged! The *BENOMIC* operator must thoroughly read and understand the contents of this manual. If the operator does not understand the warnings given on the equipment or in this manual (e.g. they speak another language), then all the instructions, possible dangers, warnings and functions must be fully explained to them by a responsible person so that they are fully understood.



Suitable for the stated pipe diameter with a minimum wall thickness Suitable for the stated centre to centre size of the pipe rail system Maximum lateral (sideways) manual force in Newtons (kg x 10) maximum total load in kg (maximum 1 person + load) Maximum alignment variation 2° Maximum support distance 1250mm Use only indoors (in the greenhouse)

The figures depend on the type of BENOMIC!



Attention! Read the manual before operating! Attention! Disconnect the power supply and consult the manual before carrying out maintenance

Raise = scissor up, lower = scissor down

Main power switch: key vertical= ON, key horizontal = OFF

The Key is to be turned beyond the OFF position in order to extract it.



Attention: Dangerous chemical battery - danger of gas explosion and corrosive battery acid



Watch out when the platform descends!
Always use the scissor wedges when working underneath or on the scissors!



Attention - Danger of getting trapped! Keep your hands clear of the scissors!

4.4 Other risks

Dangers can still arise despite the careful design and the use of safety devices, as well as warnings against possible dangers placed on the machine itself and printed in the manual. Pay attention to the following:

- The danger of fingers, hands, arms and head becoming wedged between the scissors!
- The danger of becoming wedged under the trolley during lowering or raising with a hoist!
- The trolley tipping over resulting from an unsuitable pipe rail system!
- The trolley tipping over resulting from exceeding the maximum load or manual force!



5. Application

5.1 Scope

The *BENOMIC* has been designed for professional use in greenhouses in the horticultural sector.

Operation may only be carried out by one person with a minimum age of 18 years who has received adequate instruction with regard to the *BENOMIC* and who has received a copy of the written (safety) instructions and has read and fully understood the contents of this manual. The *BENOMIC* is a pipe rail trolley that travels along a pipe rail system constructed in accordance with the sector guidelines, -the health and safety catalog in force in the Netherlands - it is designed as an aid for harvesting crops (only the double scissor) and tending and/or maintaining plants growing in a greenhouse. It is forbidden to use the *BENOMIC* for any other purposes. The loading may only consist of a maximum of one person with a secured load which together weight no more than 250kg for the standard 2-scissor model, 450/550kg for the heavy duty 2-scissor model and a maximum of 120kg for the 3-scissor model. The trolley may only be manned once it has been correctly installed on the pipe rail system. Be fully alert when the scissor is lowering thereby ensuring that no persons or objects can become wedged under or between the scissor assembly. The platform must not be entered while on a concrete pathway. Always walk alongside the trolley and never sit or stand on the chassis when travelling on the main pathways.

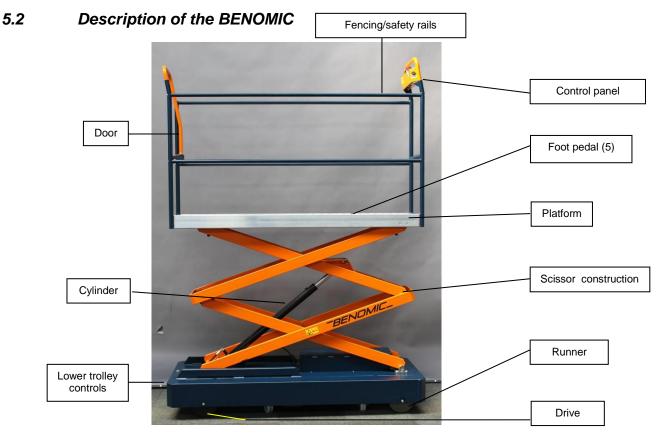
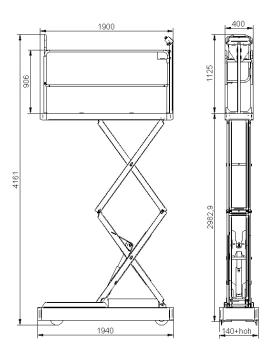


Fig. 3.1 - Names of the parts on the upper construction of the BENOMIC

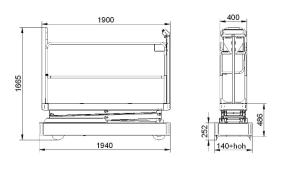


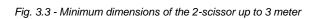


2253 444 1817 180 + hoh

Fig. 3.2 - Maximum dimensions of the 2-scissor up to 3 meter

Fig. 3.4 - Maximum dimensions of the 2-scissor up to 3.5 meter





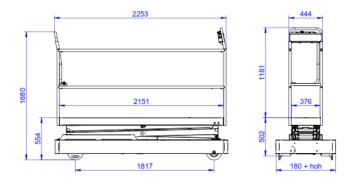


Fig. 3.5 - Minimum dimensions of the 2-scissor up to 3.5 meter



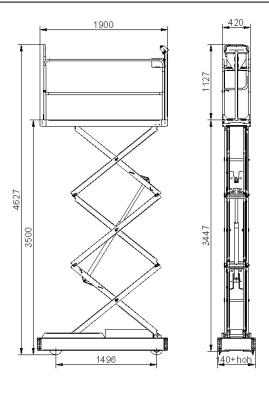


Fig. 3.6 - Maximum dimensions of the 3-scissor model up to 3.5m

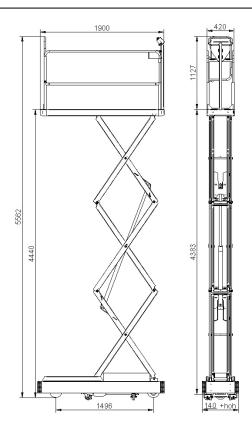


Fig. 3.8 - Maximum dimensions of the 3-scissor model up to 4.4m

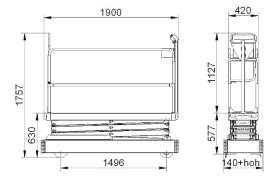


Fig. 3.7 - Minimum dimensions of the 3-scissor model up to 3.5m

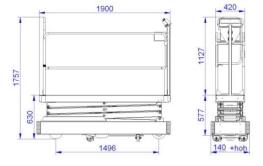


Fig. 3.9 - Minimum dimensions of the 3-scissor model up to $4.4 \mathrm{m}$



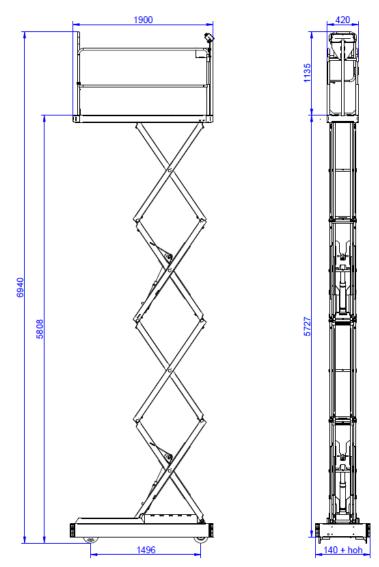


Fig. 4.0 - Maximum dimensions of the 4-scissor model up to 5.7m

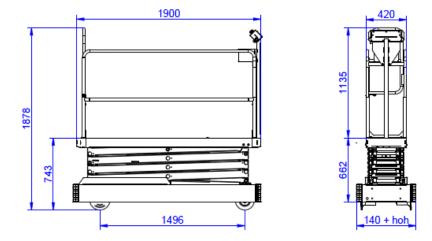


Fig. 4.0 - Minimum dimensions of the 4-scissor model up to 5.7m



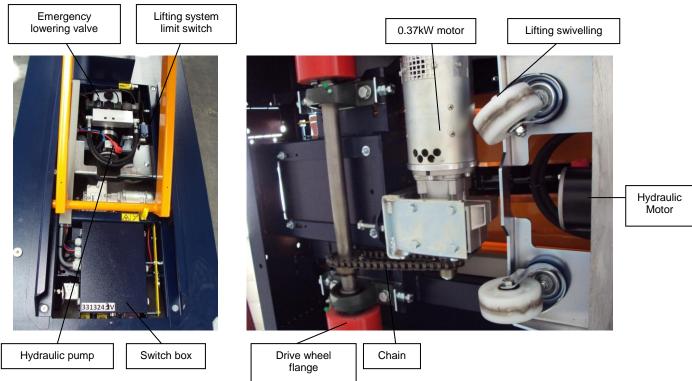


Fig. 4.2 - Names of the parts on the lower construction of the BENOMIC



Fig. 4.3;

Left:

Benomic with heavy duty double scissor, twin controls, sliding rack, hopper and rails.

Right: Benomic 3-scissor model without stabilizers





6. Transport

6.1 External transport

If the BENOMIC has to be moved, please carry it out as follows:

- 1. Collapse the scissor construction completely.
- 2. Pull in the lift wheels so that the trolley is only standing on the flange wheels.
- 3. Set the direction of travel switch to neutral (0) and the speed indicator at 0.
- 4. Switch off the *BENOMIC* at the main switch (rotate the red key at the top end horizontally).
- 5. Secure the *BENOMIC* so that it does not slip, roll away or fall over.
- 6. Ensure that the BENOMIC remains dry and free of frost during transportation.
- 7. On arrival at the destination, the *BENOMIC* should be set up according to the information given at 7.1.

6.2 Internal transport

It is also possible to transport the *BENOMIC* internally in the greenhouse. Preferably it should be driven to its location on its flange wheels (see 8.3), but it can also be moved by way of forklift truck. If moving by forklift truck, please observe the following:

- 1. Collapse the scissor construction completely.
- 2. Pull in the lift wheels so that the trolley is only standing on the flange wheels.
- 3. Switch off the *BENOMIC* at the main switch (rotate the red key at the top end horizontally).
- 4. Move the forks of the forklift truck as far apart as possible and then insert them as far as possible under the middle section of the trolley.
- 5. Check the opposite side to ensure that the forks have been inserted as far as possible under the middle section of the *BENOMIC* machine.
- 6. Secure the BENOMIC to the forklift forks so that it cannot shift or tip over.
- 7. Carefully lift the BENOMIC off the ground until it is just sufficiently clear.

Attention!



- Never lift it higher than is necessary!
- Ensure that the forklift is capable of lifting at least 600kg!
- Remove all unattached parts and harvest containers from the platform before lifting!
- Move slowly and with great care!



7. Putting into operation

The *BENOMIC* has been specially designed to travel on a pipe rail system. All pipe rail trolleys are checked for functionality and safety before leaving the Berg Hortimotive factory. Before starting up the *BENOMIC*, the items described at 7.1 should first be inspected.

The pipe rail system must comply with the requirements laid down by the horticulture sector guidelines. Article 7.3 states the minimum pipe rail specifications with regard to track width, pipe diameter and distances between supports. These minimum requirements are also shown on a symbol (see 4.3) attached to the *BENOMIC* machine.

These pipe rail specifications have been taken from the horticulture sector guidelines for pipe rail systems from the health and safety catalog in force in the Netherlands. For the complete contents of the policy regulation please contact the Ministry of Social Affairs & Employment.

7.1 Inspection prior to putting into operation

The following items should be checked before commissioning the BENOMIC

- Loose electrical connections (proper functioning of all buttons and knobs).
- Damaged cables and/or hydraulic hoses (leaks).
- Drive, runner and lift wheels are not damaged and run freely.
- Batteries are fully charged (see battery condition indicator 8.1 no 4).
- General mechanical damage (particularly on the scissor assembly).
- Damage to and impaired visibility of the controls, symbols and warnings.
- All protective covers and caps are in place.
- The securing of the scissor assembly to the lower trolley and the rails on the scissor (plus any sliding racks or containers).
- Proper functioning of the lifting system
- Stabilizers are properly secured (only with 3-scissor model up to 4,4m and 4-scissor model up to 5,7m).

7.2 Horticulture sector guidelines for pipe rail systems

The *BENOMIC* has been specially designed to travel on a pipe rail system. This means that a set of rails is located in every pathway between the plants which consist of two pipes of the same diameter and having a fixed width between the pipes (centre to centre measurement). The pipes often act as heating pipes and lie on supports having a fixed distance between each other. The pipe rail system must satisfy the most recent requirements of the horticultural sector guidelines for pipe rail systems. Article 7.3 also provides the minimum requirements for pipe rail systems taken from the sector guidelines for pipe rail systems. The pipe rail system on which the *BENOMIC* is intended to be used, must also comply with these requirements. All the abovementioned items should also be checked periodically according to the health and safety catalog in force in the Netherlands. It is absolutely forbidden to use a pipe rail system that does not comply with the sector guidelines/policy regulations. Furthermore, various tests are described in the policy regulation for testing whether it is safe to use a pipe rail trolley on a particular pipe rail system. These tests should be carried out prior to working with the pipe rail trolley on the available pipe rail system.



7.3 Minimum requirements for a pipe rail system

The rails (usually heating pipes) must have an external diameter of between 51mm and 45mm and a wall thickness of at least 2mm. The minimum material specifications for the pipes is as follows: Steel 37 (S235JR). The supports for the pipe rail system must be no greater than 1.25m distance from each other. Where piping with a diameter of 45mm is combined with a track width of 42cm, the distance between the supports should be no greater than one metre. Pipe rail supports are used that correspond with, or are at least equal to the following specifications: steel bottom plate 1.5mm thick with a stiffening profile - minimum bottom plate width of 115mm and a length such that the bottom plate sticks out at least 70mm from the two upright supports that carry the pipes. The centre to centre distance between the pipes should be at least 42cm. The pipes must be stable, accurately installed and level with a maximum slope of no more than 2° either in length or in width. The pipes must also be properly attached to the supports and the concrete track. Loose fitting pipes may not be used! A soil test bore should be carried out using probing equipment (see policy regulation according to the health and safety catalog in force in the Netherlands). It should have a so-called cone value on the top layer of more than 0.4 Mpa (62 psa).

Employing a pipe rail system that is not described in the policy regulation according to the health and safety catalog in force in the Netherlands is permitted provided that a stability test is carried out in accordance with the pipe rail system policy regulation according to the health and safety catalog in force in the Netherlands and where it appears that the combination of pipe rail trolley and pipe rail system in question is in fact stable. Furthermore, the supports for this exceptional pipe rail system must have a maximum spacing of one metre and the alignment variation in both length and breadth must not exceed 2 degrees.

→ The tubes are similar or at least equal to the specifications given in the table below.

The conditions for the axle load stand in the table below.

Cat.	Track- width	Tube- diameter / thickness	Support- distance	Permissible axle load at center to center size			
Cat.	[mm]	[mm]	[mm]	420mm [kg]	500mm [kg]	550mm [kg]	600mm [kg]
1	420 t/m 600	51 / 2,25	max. 1000	507	548	573	593
2	420 t/m 600	51 / 2,25	max. 1250	406	438	458	475
3	420 t/m 600	45 / 2	max. 1000	345	372	372	403
4	420 t/m 600	45 / 2	max. 1250	276	298	276	323

- → Quality steel 37 (St37)
- → Wheelbase between 62.5% and 125% of the support distance.
- → All values for other pipe and tube rail supports should be calculated separately.

Source: The Dutch health and safety catalog in force in the Netherlands https://agroarbo.nl/catalogus/buisrailsysteem/



7.4 Alignment warnings system

The *BENOMIC* is fitted with an alignment indicator with an acoustic warning signal. The alignment indicator provides an acoustic signal when the trolley is out of alignment in excess of 2°. When this occurs all activities must be **stopped immediately**, the **scissor** brought **down** as far as possible - exit the platform then take the *BENOMIC* **back** while walking next to the trolley. The pipe rail system must be reset before the activities can be resumed. First of all test the prepared section of rails with the scissor set at the lowest position and at the slowest speed. If this does not indicate a problem, try it once again with the scissor raised but still at the slowest speed. Resume activities if the problem no longer persists.

Try to find a good, long term solution to improve track alignment!

7.5 Stabilizers

The Benomic 3-scissors and 4-scissors must be carried out with stabilizers if the working height is higher than 3,5 meters. It is important that the stability is ensured in order to be able to work on height. It is not allowed to work at height if the surface is gives not sufficient bearing capacity. For a description of the soil bearing capacity we reference to the Dutch health and safety catalog in force in the Netherlands.

See for the operation of the stabilizers appendix 2!



8. Usage

Make sure that you are familiar with the *BENOMIC* and its controls. Ensure that those using the *BENOMIC* have received instructions and have thoroughly read and understood the safety instructions and have also read and understood this user's manual.

- The *BENOMIC* should only be put into operation when the operator is certain that there is nobody in the immediate vicinity of the Pipe Rail Trolley.
- Always remove plant remains etc and any other obstacles from the pipe rail system.
- Keep the trolley clean and regularly remove any accumulated waste materials. Remove the key from the main switch before carrying out cleaning activities.
- After using the BENOMIC always remove the key from the main switch.
- Service the *BENOMIC* regularly and store it in a dry and frost-free environment if it is out of use over long periods.

Charge the batteries only if the battery condition indicator is in the red area. If the red area is reached during the work process in the day you can continue working. If a acoustic signal gives by repeat 2 signals stop immediately and charge the *BENOMIC*. The charge process should by continuous until the charger shows the indication "end of charge cycle". (after 12 hours or more!) Reed the manual of the charger. Do not charge shortly in coffee and lunch breaks this gives serious damage to the batteries! Avoid charging to early (battery condition indicator is in the green area) unnecessary charging affects the capacity and life of the batteries!



ATTENTION! Injury hazard from batteries:

Avoid skin coming into contact with battery electrolyte, wear safety goggles and gloves as the fluid is highly corrosive. Immediately rinse with soap and water after coming into contact. If the electrolyte comes into contact with the eyes, immediately rinse in running water for at least five minutes and call medical assistance. Always ensure sufficient supplies of soap and water at hand and that there is assistance available within calling distance in the vicinity of the batteries. Avoid short circuits (sparks) and ensure that it is not possible to make a connection between the poles of the batteries. The battery cover should be undamaged. Bare patches or dents can cause short circuits!

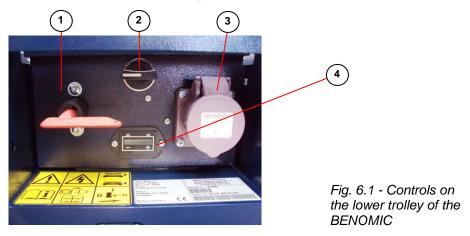
A highly explosive gas is released while batteries are being charged. No sparks, naked flames or smoking nearby. Ensure good ventilation in the areas where batteries are charged and/or stored. Ensure that metal objects cannot fall on top of the batteries as this can lead to short circuits (sparks) and therefore explosions.

Remove any personal objects such as rings, arm bands, necklaces and wrist watches if you are carrying out activities in the vicinity of batteries. The level of current associated with a short circuit is enough to melt a metal finger ring for example, leading to serious burn injuries.



8.1 Operation

8.1.1 Controls located on the lower trolley



1. MAIN SWITCH/ EMERGENCY STOP

The *BENOMIC* can be switched on by way of the main switch. The trolley is ON if the red key is in the direction of travel (vertical), and the trolley is OFF if the red key is at right angles to the direction of travel. Whenever the *BENOMIC* is switched on the battery condition indicator lights up (see this at no 4). Whenever the *BENOMIC* is not in use or being charged the red key should be removed from the switch. The main switch also acts as an emergency stop. As soon as the key is set to the horizontal position the trolley is completely switched off.

2. SERVICE BUTTON FOR OPERATING THE SCISSOR

By using the scissor operation selector switch it is possible to raise and lower the platform without having to stand on it. Rotate the button clockwise (white line upwards) and the scissor rises up for as long as the button is kept in that position. Rotate the button anticlockwise (white line downwards) and the scissor lowers for as long as the button is kept in that position.

Attention!

- Ensure that no person or object can come either under or between the scissor construction while it is being lowered!



- Ensure that there is sufficient space above the BENOMIC to allow the scissor to rise up!
- Do not use this button if there is anybody on the platform!

3. SOCKET FOR THE CHARGER PLUG

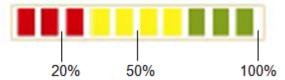
The batteries are charged via this socket. With normal use, charge the batteries three times every week - preferably Tuesday, Thursday and Friday or Saturday evenings - and at least once every week regardless of the level of usage. Make sure that the charger plug has been disconnected before the *BENOMIC* is going to be used! *Always remove the charger plug when carrying out maintenance*. Only use the correct type of charger - see the charger specifications.

If the *BENOMIC* is fitted with an internal battery charger (stated on the socket - see fig. 6.2) then only an extension cable is required.

Fig. 6.2 - Internal battery charger!



4. BATTERY CONDITION INDICATOR



The battery condition indicator provides information about the battery. The battery is full when all the leds are lit - the fewer leds lit up, the lower the state of charge. The leds are coloured green, orange and red. The battery is full (80 - 100%) when the red, orange and green leds are lit - it is half full (40 - 70%) when the orange and red leds are lit - the battery is completely discharged (20 - 30%) when only the red leds are lit. Charge the batteries when the battery indicator is in the red zone. If this occurs while working, there is normally enough power to last until the end of the day. If a acoustic signal gives by repeat 2 signals stop immediately and charge the *BENOMIC*. Switch OFF the *BENOMIC* with the key switch before connection the charger. The charge process should by continuous until the charger shows the indication "end of charge cycle". (after 12 hours or more!) Reed the manual of the charger.

Avoid charging to early (battery condition indicator is in the 50 - 100% area) unnecessary charging affects the capacity and life of the batteries!

Try to charge always when the battery condition indicator is in the 20% area this has the following benefits:

- · Less charge cycles is beneficial for the battery life time
- Less battery water consumption
- · Less energy consumption

A fault has been detected on the *BENOMIC* if all the battery condition indicator leds flash intermittently. In such cases unlock *(pull out)* the emergency stop button (8) and switch the direction switch (6) to neutral, switch OFF and then ON again with the main switch (1).

5. FOOT PEDAL

The foot pedal (5) is mounted in the platform (page 11), the *BENOMIC STAR* will drive in the desired direction as long as the foot pedal is actuated.

8.1.2 Controls located on the platform



Fig. 6.3 - Control panel



6. DIRECTION OF TRAVEL / REVERSE DIRECTION SWITCH

The direction of travel can be chosen by setting the selector switch in the desired position. The neutral position on the switch is at the centre (0). When leaving the *BENOMIC* always put the switch in neutral!

7. SPEED REGULATING SWITCH

0 = stop 10= maximum speed

8. EMERGENCY STOP BUTTON

Only to be used in the case of emergency! Disconnect normally using the main switch (1).

- Press = stop and switch off
- Turn-pull out = release

When automatic travel is stopped via the EMERGENCY STOP BUTTON, the BENOMIC will indicate error status (the battery condition LEDs will flash intermittently). The error status can be reset by putting the main switch to OFF, the direction of travel switch to 0, and then followed by putting the main switch back to ON again. If this does not reset, rotate the speed regulating switch to 0 and then reset to the desired speed.

9. LOWERING RAISING THE WORK PLATFORM SWITCH

The work platform can be lowered by turning the switch to the down position. The platform descends for as long as the switch is held in. Once the scissor has almost fully collapsed, the lowering process slows down in the interests of comfort and also to safeguard the equipment.

Watch out for persons or objects in the vicinity of the scissor assembly while lowering!



The work platform can be raised by turning the switch to the up position. With the double scissor model, the scissor rises up to the maximum height of 3 or 3.5 metres for as long as the switch is held in - this is 3.5 metres for the triple scissor model without using the stabilizers, and 4.4 metres for the triple scissor model with the stabilizers in place, and 5.7 metres for the quad scissor model with the stabilizers in place.

FOR THE OPERATION OF THE STABILIZERS APPENDIX 2!

10 RAISING THE TROLLEY HYDRAULICALLY

By pressing (1x) this button the *BENOMIC* rises to the fully extended position, thereafter it can be manually rotated and put into position.

The button on the right side is for activating the lifting wheels system.

The button at the left side for deactivating.

Attention!

- Only raise the equipment when it is on a flat surface (concrete path or main pathway)
- Never raise it while on the pipes or on a sloping path!
- Lower the platform completely before raising the BENOMIC!
- Think about toes and feet when lowering the BENOMIC!





8.2 Emergency lowering valve

The emergency lowering valve is located below the scissor and under a cover plate. If the scissor refuses to lower via the controls on the platform (9) as well as those at top end on the *BENOMIC* (2), remove the cover by unscrewing the bolt and putting the plate to one side through the scissor legs. The emergency lowering valve can now be pressed used the handle supplied. **Beware of hands, arms or head becoming wedged between the scissor legs or under the platform!**



Fig. 6.5 - Left: unscrew bolt and remove cover. Centre - take out the handle. Right - press the bolt in the gap against the pin on the emergency lowering valve!

Attention! Remove your hands before they become wedged! Only use this function in real emergencies!



8.3 Moving the BENOMIC on the main pathway

There are two methods for moving the *BENOMIC* on the main pathway. Always walk beside the trolley - never in front! The first method is to move it on the flanged wheels. Set the direction of travel and the speed (maximum position 4) and put the pedal function to pedal=accelerator. Press the foot switch and the *BENOMIC* will travel in the desired direction.

The second method is to put the trolley onto its lift wheels. Press button 10 on the right hand side and the *BENOMIC* is raised on its lift wheels. The *BENOMIC* can now be easily rotated and travel along sideways. *Never leave the BENOMIC* on the lift unattended and always walk at its side!

8.4 Out of use

When the *BENOMIC* is not being used please ensure that the scissor is in the lowest position and the lift wheels are fully retracted so that the trolley is standing on its flanged wheels. Disconnect via the main switch and store it **with fully charged batteries** in a dry and frost-free environment. The *BENOMIC* should preferably be connected to a trickle charger. If not, the batteries should be charged at least once a month (even when the *BENOMIC* is out of use over long periods). Ensure that the ground underneath is level. When the *BENOMIC* is being put back into use after a long period in storage, it should be inspected as described in article 7.1 (Inspection prior to putting into operation).



8.5 Cleaning

Remove any plant remains, leaves etc and brush off any sand and dust, on a regular basis. Clean the Pipe Rail Trolley with a dry/damp cloth or soft brush. Provided it is completely dry, the *BENOMIC* can be cleaned using compressed air. Never pour water over the *BENOMIC* or clean it using a steam or high-pressure water cleaner which can lead to serious damage to the electrical circuits!

Every week sand and dirt should be removed from the chassis for the scissor sliding block. See also Appendix 4: Cleaning the powder coating

8.6 Harvest container

As an optional extra for the *BENOMIC* model with the heavy duty double scissor, a harvest container is available that can be put onto the platform in combination with top end controls and a sliding rack. The harvest container along with its accessories (rails/sliding rack, etc) must only be supplied by Berg Hortimotive The harvest container serves as a buffer for harvesting peppers. The maximum load capacity of the platform should be reduced by the weight of the container and the sliding rack. The maximum loading capacity of 450/550kg must never be exceeded!

8.7 Problems, causes and solutions

Problem A: The BENOMIC does not move

Cause : Key switch is OFF

Solution : Turn on the key switch (vertical position)

Emergency stop locked on

Unlock the emergency stop button (pull out)

Batteries flat (red leds 2x flashing on battery condition indicator)

Charge up the batteries with the charger

Speed indicator at 0

Set a speed

Direction of travel at 0 or inconsistent

Set direction of travel (or equivalent)

Error status (leds flashing intermittently)

See no 4 on page 21

Battery terminals making poor contact

Clean and re-tighten battery terminals

Faulty foot switch

Replace foot switch - consult your dealer

Broken cable at foot switch

Repair cable break or replace switch

Lift does not fully collapse or limit switch is defective

Collapse lift system completely (10) or check switch

25 amp safety fuse in 0 position.

Consult your dealer

Other causes.

Consult your dealer



Problem B: The platform will not go up or down

Cause : Lifting system limit switches not connected or defective.

Solution : Completely collapse lift system and check switch

Batteries flat. (red leds 2x flashing on battery condition indicator)

Charge up the batteries with the charger **Battery terminals make bad contact** Clean and re-tighten battery terminals

Key switch is OFF

Turn on the key switch to vertical position **Emergency stop button pressed in** Unlock emergency stop button (pull out)

Overload

Reduce load - maximum 120/250/450/550kg

Hydraulic fluid level too low

Top up hydraulic fluid (scissor raised - information from supplier)

Switch/push-button defective

Try using the scissor control service button (2) next to the main switch

80 amp fuse blown Consult your dealer

Control current 10A fuse is blown

Consult your dealer

Stabilizers not extended (only with 3-scissor and 4-scissor model)

Turn the stabilizers out enough for extra support

Problem C: Speed difficult to regulate

Cause C : Speed regulator switch is faulty

Solution : Consult your dealer

Drive motor regulator is faulty

Consult your dealer

Problem D: BENOMIC has fallen over

Cause D : - Wrongly lifted with forklift truck

Unstable pipe rail systemToo much manual pressure

- Overloaded

- Alignment indicator ignored

- Run into the path next to the pipes

- Lifting on the pipes or ground surface not level

Solution : 1. Switch off the trolley

2. Lift the trolley back into position

3. Remove caps and covers

4. Disconnect batteries

5. Clean the trolley

6. Assess the damage

7. Identify cause and find solution (remove)

8. Carry out checks according to table in chapter 7

9. Carry out checks according to 7.1

!!!Beware of fluids - battery acid is extremely corrosive!!!



8.8 Disposal

If your *BENOMIC* has to be disposed of, for whatever reason, this must be carried out by your supplier or by another company that specialises in dismantling vehicles. On no account should you take your *BENOMIC* to a scrap dealer or to the rubbish tip. The *BENOMIC* should be dismantled and the chemical parts including hydraulic fluids and battery acid removed separately.



Return faulty batteries to your local authority cleansing department or your supplier. Treat oil as a chemical waste.



9. Repairs & maintenance

The *BENOMIC* is a very high quality product. In order to guarantee that the high level of quality remains, it is vital that the maintenance scheme given below is strictly adhered to. Repairs and maintenance activities should be recorded in the maintenance log book (see appendix 1). The employer is also responsible for periodically checking tools and equipment according to the current national regulations covering this subject.

Disconnect the *BENOMIC* by the main switch before starting maintenance:

Maintenance - Check	Tools	Day	Week	Month	Year
Battery sufficiently charged	Battery condition indicator	Х			
Damage to the control equipment	Visual	Х			
Damage to and visibility of the symbols and	Visual	Χ			
stickers					
Foot pedal + platform cleaning	Brush / Damp cloth		X		
Clean control panel	Brush / Damp cloth		Х		
Clean chassis sliding blocks for scissor	Brush / Damp cloth		Х		
Check for leaks and damage to cables and	Visual		Х		
hoses					
Check for waste material or string etc twisted	Visual		Х		
around wheels and chains					
General mechanical damage	Visual		Х		
Check raising and lowering movements for	Hydraulic fluid		Х		
jamming (low hydraulic fluid levels)	ISO Viscosity Grade 46				
Check for height safety without stabilizers	Visual - only the 3-4 scissor model		Х		
Charge batteries when needed or at least once	Battery charger			Х	
a month					
Check battery electrolyte levels (plates covered	Distilled water, protective gloves			X	
1cm depth electrolyte - see Appendix 3)	and safety goggles				
Check the operation of the alignment warning	Test > 2 degrees			Х	
Check hydraulic components under the cover	Tools for removing cover plate bolt			Х	
plate for leakage (pump and valves)					
Grease lift wheels, drive chain and ball	Grease for ball bearings and			Х	
bearings	chains or a universal lubricating				
	grease				
Check chain tension (see 9.5)	Open-ended spanner			Χ	
Fixing caps on the scissor shafts	Visual			X	
Have the motor's carbon brushes cleaned	Compressed air / Visually				X
and those smaller than 1 cm replaced (see					
9.4)					
Grease all hinged parts of the scissor assembly (see 9.2)	Grease gun and grease				Х
Grease all hinged parts in the lift system	Grease gun / WD40 / lubricating				Х
2.23.22 a	grease				
Check the welds on the scissor construction for cracks (hair cracks) and rust.	Visual				Х

If it appears from the above checks that there is a fault with the *BENOMIC*, please contact your *BENOMIC* dealer immediately. Continuing to use the trolley with the identified defects can be very dangerous and is therefore forbidden!



9.1 Specialist maintenance

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

- Activities connected with the electrical system (excluding the exchange of the foot pedals and batteries)
- All work concerning the hydraulic system.
- All work concerning the drive motor with reduction box with the exception of the following: cleaning, resetting or replacing the chain or sprocket wheels.

9.2 Maintenance in and around the scissor assembly

The scissor wedges should be used when working or carrying out maintenance in or around the scissor assembly. Remove the cover plate (picture A). Extend the catch while the scissor is raised allow the scissor to lower (B) until it touches the safety catch. Disconnect the BENOMIC by the main switch.





В

Fig. 7.1 A-B Extending the scissor wedge

The scissor shafts are mounted on bearings by way of bushes. The inner scissor parts are connected to the outside parts by way of a continuous shaft. In order to avoid rust forming on the shafts they

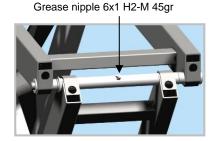


Fig. 7.2 - Location of the scissor shaft grease nipples

should be greased at least once annually using a universal lubricating grease applied with a grease gun. Raise the scissor and put the wedges into place to block them as described (see picture 7.1). Put the grease gun over the grease nipples and pump in the lubricant until it flows out of the outer edges of the bearing bushes.

9.3 Pipe rail system maintenance

The pipe rail system over which the BENOMIC travels requires to be checked periodically. The system should always satisfy the horticulture sector guidelines for pipe rail systems in greenhouses (see 7.2). It is prohibited to use the Pipe Rail Trolley on a pipe rail system that does not satisfy these guidelines. The employer is also responsible for periodically checking tools and equipment according to the current national regulations covering this subject. Always ensure that the pipes have sufficient support and are spaced at no more than 1.25m apart and that the supports are not at an angle and the pipes are firmly in place. Furthermore, the pipes must be attached to a concrete pathway and should not be loose. The welded endstop on the pipes (building wall) should be at least 5cm high - check at each change of season whether the end-stop is still upright and not bent over or split or cracked. The ground under the pipe rail system should be dry, flat and hard. Soft or wet patches should be treated accordingly and any subsidence dealt with permanently.



9.4 Inspection carbon brushes

1. Raise the *BENOMIC STAR* thereby making the motor accessible. 2. Blow the carbon brushes clean with compressed air 3. Unscrew the grill, 4. Pull up the carbon brush, 5. Carbon brushes less than 1 cm long should be replaced - consult your dealer.









Fig. 7.3 - Inspection motor carbon brushes

9.5 Tensioning the chain

The chain tension should be approximately 1cm - if not, carry out the following:

- 1. Switch off the *BENOMIC* at the main switch and remove the key from the slot to avoid the *BENOMIC* being switched on again.
- 2. Lift up the trolley using a forklift truck, for example (see 6.2 Internal transport)
- 3. Unscrew the blocking nut (picture A)
- 4. Tighten the chain by rotating the adjusting bolt (picture B)
- 5. Fix the adjusting bolt in place by fully tightening the blocking nut again (picture A)
 - * ensure that the chain play is approximately 1cm (picture C)

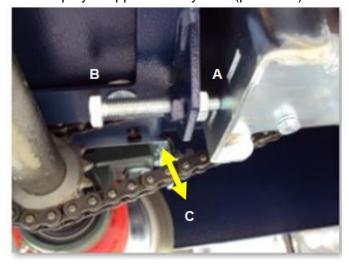


Fig. 7.3 A-B-C - Tensioning the chain



9.6 Charging the Batteries

Charge the batteries according to the status indication of the battery condition indicator between 50 and 20% residual capacity and try to approach this advice as closely as possible to the 20% residual capacity.

BATTERY CONDITION INDICATOR



The battery condition indicator provides information about the battery. The battery is full when all the leds are lit - the fewer leds lit up, the lower the state of charge. The leds are coloured green, orange and red. The battery is full (80 - 100%) when the red, orange and green leds are lit - it is half full (40 - 70%) when the orange and red leds are lit - the battery is completely discharged (20 - 30%) when only the red leds are lit. When the red leds is indicate work the whole day true and recharged at the end of the day! If a acoustic signal gives by repeat 2 signals stop immediately and charge the *BENOMIC*. Switch OFF the *BENOMIC* with the key switch before connection the charger. The charge process should by continuous until the charger shows the indication "end of charge cycle". (after 12 hours or more!) Reed the manual of the charger.

Avoid charging to early (battery condition indicator is in the 50 - 100% area) unnecessary charging affects the capacity and life of the batteries!

Try to charge always when the battery condition indicator is in the 20% area this has the following benefits:

- Less charge cycles is beneficial for the battery life time
- Less battery water consumption
- Less energy consumption

Charge the batteries at least once every month using a suitable charger, regardless the level of usage! Ensure that the batteries are not completely flat before recharging!

See also the instructions of Appendix 3 safety data sheet battery!



10. Technical specifications

BENOMIC pipe rail trolley with hydraulic scissor and lift system type number 51xx.xx.xxxx

Type:	2-scissor	2-scissor	2-scissor	2-scissor
Dimensions[mm]:	3m model	heavy duty	3.5m model	heavy duty
	standard	3m model	standard	3.5m model
centre to centre dimension	420-800	420-800	420-800	420-800
Length	1940	1940	2253	2253
Width	c to c + 180			
Lower trolley step height from concrete	255	255	255	255
Step height to platform at lowest position	537	537	554	554
Height of the control column on platform	1100	1100	1100	1100
Work platform length	1900	1900	2151	2151
Work platform width	420	420	420	420
Maximum work platform height	2990	2990	3524	3524
Maximum Load capacity [kg]	250	450/550	250	450/550
Maximum lateral force [N]	110	110	110	110
Weight [kg] (c. to c. 550)	410	410	480	480
Motor capacity Moving [kW]	0.37	0.37	0.37	0.37
Motor capacity Hydr. [kW]	1.2	1.2	1.2	1.2
Hydr.fluid Visc. 46 [L]	1.5	2.4	1.7	2.4
Max travel speed on pipes [m/min]	57	57	57	57
Max travel speed on concrete [m/min]	112	112	112	112
Lift speed [sec] *	0.13	0.13	0.13	0.13
Lowering speed [sec] * * with load of 80 kg	0.14	0.14	0.14	0.14
Voltage [Volt DC]	24	24	24	24
Battery capacity [Ah]	2x130	2x130	2x130	2x130
Noise level [dB]	<70	<70	<70	<70
Hopper weight [kg]	-	± 90	-	± 90
Sliding rack weight [kg]	-	± 20	-	± 20
Wheelbase [mm]	1496	1496	1817	1817



Type:	3-scissor model	3-scissor model	4-scissor model
Dimensions[mm]:	excl. stabilizers	incl. stabilizers	incl. stabilizers
centre to centre dimension	420-800	420-800	420-800
Length	1940	1940	1940
Width	c to c+180	c to c + 180	c to c + 180
Lower trolley step height from concrete	255	255	255
Step height to platform at lowest position	628	628	755
Height of the control column on platform	1100	1100	1100
Work platform length	1900	1900	1900
Work platform width	420	420	420
Maximum work platform height	3500	4400	5700
Maximum Load capacity [kg]	120	120	120
Maximum lateral force [N]	110	110	110
Weight [kg] (c. to c. 550)	450	470	535
Motor capacity Moving [kW]	0.37	0.37	0.37
Motor capacity Hydr. [kW]	1.2	1.2	1.2
Hydr.fluid Visc. 46 [L]	2.4	2.4	2.4
Max travel speed on pipes [m/min]	57	57	57
Max travel speed on concrete [m/min]	112	112	112
Lift speed [sec] *	0.13	0.13	0.13
Lowering speed [sec] * * with load of 80 kg	0.14	0.14	0.14
Voltage [Volt DC]	24	24	24
Battery capacity [Ah]	2x130	2x130	2x130
Noise level [dB]	<70	<70	<70
Hopper weight [kg]	-	-	-
Sliding rack weight [kg]	-	-	-
Wheelbase [mm]	1496	1496	1496

Physical operating conditions

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

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



11. EC Declaration of Conformity

(according to Appendix IIA of the Machine Guidelines)

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

Hereby declare under their own responsibility that:

- Pipe rail trolley type BENOMIC with double hydraulic scissor and hydraulic lift wheels up to 3 or 3.5 metres in height
- Pipe rail trolley type BENOMIC with double hydraulic scissor for the harvest container (heavy duty finish) up to 3 metres in height
- Pipe rail trolley type BENOMIC with triple scissor and hydraulic lift without stabilizers up to 3.5 metres in height
- Pipe rail trolley type BENOMIC with triple scissor and hydraulic lift with stabilizers up to 4.4 metres in height
- Pipe rail trolley type BENOMIC with fourfold scissor and hydraulic lift with stabilizers up to 5.7 metres in height

Part number:	
Serial number:	-

Meets the requirements of the new Machine Guidelines 2006/42/EG

Is in accordance with the following EG directives:

- Electromagnetic Compatibility Directive (EMC), 2004/180/EG (according to the latest edition)
- Low Voltage Directive 2006/95/EG (according to the latest edition)

Is in accordance with the following harmonisation standards:

- [1] NEN-EN 953:1998+A1Ontw. Draft Machine Safety. General requirements for the design and construction of safety equipment (fixed, moveable), CEN
- [2] NEN-EN 60204-1:2006, Safety of machines Electrical equipment on machines Part 1 : General requirements

Conforms to the Dutch health and safety catalog in force in the Netherlands.

The Netherlands, De Lier, dated
Authorised signatory



Appendix 1: Maintenance log book

Repairs and/or maintenance activities described on the form below.

Date	Description of repair/maintenance Type no: Serial no:	Name of
	Type no: Serial no:	company/engineer



Appendix 2: Operation of the stabilizers

The Benomic 3-scissors and 4-scissors must be carried out with stabilizers if the working height is higher than 3,5 meters. It is important that the stability is ensured in order to be able to. It is not allowed to work at height if the surface is gives not sufficient bearing capacity. For a description of the soil bearing capacity we reference to the policy regulation according to the health and safety catalog in force in the Netherlands.

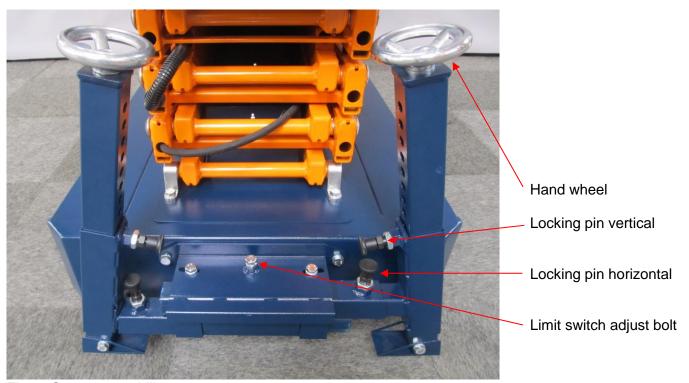


Fig. 1. Summary stabilizers

Drive to the place where you want to work at height and put the direction switch (6) to the neutral position and put also the speed regulator button (7) to zero. Leaf the platform at the lowest position to activate the stabilizers.



Locking horizontal

Release the locking pin by pulling up the knob (Fig. 2). Hold the knob and pull out the stabilizer arm to the maximum position (Fig. 3) Let loose the locking pin knob and be sure that the locking pin is fixed in a locking hole (Fig. 4) If not so move the stabilizer arm until the pin is locked in a locking hole near to the maximum position. Repeat this operation also for the other side.



Fig. 2. Release locking pin

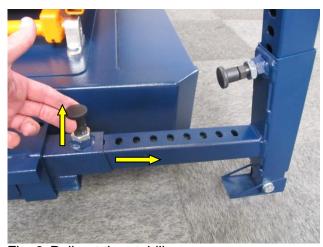


Fig. 3. Pull out the stabilizer arm



Fig. 4. Locked stabilizer arm



WRONG locked



GOOD locked



Locking vertical

Release the locking pin by puling up the knob (Fig. 5). Move the vertical post downwards until it reach the ground. Let loose the locking pin knob and be sure that the locking pin is fixed in a locking hole. Repeat this operation also for the other side!

Turn both hand wheels so that the post is going downwards to the ground (Fig. 6), there should be no movement in the middle of the stabilizer construction after the described action. The limit switch should be switched now and working safely at height is now possible (Fig. 7).

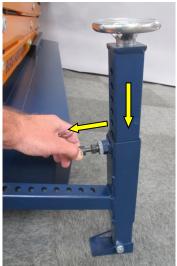




Fig. 5. Locking pin vertical

Fig. 6. Hand wheel



Fig. 7. Ready to use

The Benomic is unable to drive when the stabilizer is forced to the ground!

Make ready for driving

Make all the above steps the opposite way to make the Benomic ready to drive. Be sure that the stabilizer post and arms are maximum inside and locked to provide unintended sliding out of the stabilizer parts.



Appendix 3: Safety data sheet battery

Battery advice

The next chapter provides advice for efficient use, safety and maintenance.

Efficient use of the pipe rail trolley and battery

The following instructions are intended to promote. Efficient use of the pipe rail trolley and the useful life of the batteries.

Basic principles:

- At high speeds, the battery are faster empty.
- A lot of starts and stops giving higher consumption.
- By using the pipe rail trolley the residual capacity and battery voltage drops slowly, the power consumption increases. As a result, there is more heat in engine, speed control when the batteries become more empty.
- Worn rollers or screwed rope and rusty chain (bad maintenance) results in a higher consumption. (See instructions for servicing our site: http://www.berghortimotive.com/service/bsa-film)
- The (too) deep discharge batteries shortens the lifespan.
- Timely loading and proper maintenance will prolong the life of the batteries.
- Timely loading reduces heat generation in motor and speed controller and battery charger.

Efficient use:

- Limit travel speed as well as possible at the pace of work (potentiometer).
- By following the above recommendations will also increase employee productivity.

Safe use of batteries

Below you can find recommendation for the use and maintenance of batteries.

WARNING!

- An explosive gas is given off the batteries while being charged no sparks, and naked flames and smoking are strictly forbidden
- Charging should be carried out in a well ventilated space and only using a suitable battery charger!
- The battery electrolyte levels should be checked every month! The battery electrolyte level should be 1cm above the plates
- Top up only with distilled (demineralised) water wear protective gloves!
- Always fill the batteries after charging and never fill above the marker in the hole of the battery cell. (See also the instruction sheet traction batteries)





Discharge levels of less than 20% capacity can affect the life of the batteries and the charger negatively. Charge the batteries when the battery discharge indicator is in the red area - this will benefit the life of the batteries, the motor and the electrical equipment! Always recharge a flat battery immediately - this increases its lifespan markedly. In connection with this, it is advisable to check the specific gravity of the battery electrolyte every week, minimum every month, using a hydrometer (fig. A+B and table below).

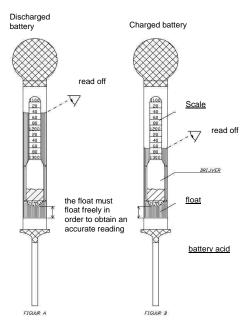
The specific gravity (sg) of the electrolyte of a fully charged battery should be 1280 g/l:

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

Disconnect the *BENOMIC* by the main switch before starting to charge the batteries. When charging batteries always connect up the batteries before switching on the charger. When the batteries are fully charged, first switch off the charger, then disconnect the batteries.

Overcharging batteries can also result in damage to the battery owing to the electrolyte 'boiling off'.

It is advised to use a modern charger equipped with an automatic 'fully charged' cut-out - these are available from Berg Hortimotive Use only chargers suitable for 24V-110Ah - Lead/acid batteries! (see charger instructions)



Do not interrupt the charging process - allow the batteries to become fully charged - check the charger indicator.

During battery charging the *BENOMIC* should not be repaired, cleaned or have any other activities performed on it.

Turn off everything that consumes electricity on the equipment before removing the batteries to avoid sparking.

Disconnect the earth cable (-) first before removing the batteries. When reinstalling the batteries, connect the earth cable (black) last.

WARNING!

Always plus (+ = red) to the positive pole, and minus (- = black) to the negative pole.

Battery electrolyte is highly corrosive therefore you should avoid it coming into contact with clothing, skin and eyes.

If you receive splashes of battery acid on your clothing or skin, this should be washed immediately with soap and water, thereafter rinsed in running cold water.

If acid splashes into the eyes, rinse in running water for at least 5 minutes, thereafter call for medical assistance!



Comment

Check how many battery chargers can be connected to one group. This can be calculated by multiplying the amperage by the voltage. e.g.: 16A*230V = 3680W

Now check the output of the battery charger. Divide this total amount by the output of the battery charger. e.g.: 3680/700=5.25. In this case five battery chargers can be connected.

Also check that the mains voltage at the charger location corresponds with the required voltage stated on each battery charger. Long cables can lead to voltage drop. If this is the case please consult your dealer.

Check whether it is the proper charger for your machine. The type of batteries applicable to the charger in question are stated on the charger itself and the charger manual!



TREM-CARD

UN 2794

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 EW130T:

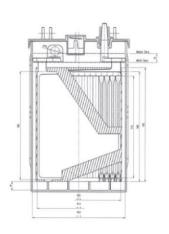
- Only discharge the battery to 80% maximum (Electrolyte level 1130 SG)
- Connect the battery to the charger, switch on charger and charging should start automatically
- Do not disconnect the battery until charge cycle has finished
- When charge cycle has completed make sure charger is switched off before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

Weekly maintenance EW130T:

- 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 charching.





Green is maximum level

Red is minimum level







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



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.
Earth and sand
Glass, string, plastic, elastic, clips, wire hooks, etc.
2x weekly
2x weekly

Glass, string, plastic, elastic, clips, wire hooks, etc.
 Exposure to chemicals
 2x weekly 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.