Technical Manual

BeMatic Meto SW

Berg Hortimotive

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Machine type plate

The *BeMatic Meto SW* 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, and year of construction.

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

Version 8, September 2022

The machine is manufactured by:

Berg Hortimotive

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1. Declaration

1.1 Copyright

Berg Hortimotive
De Lier, 2022

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 *BeMatic Meto SW*, 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 *BeMatic Meto SW* include the following:
- alterations to the controls
- welding, mechanical works, etc
- extensions to the *BeMatic Meto SW* 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 *BeMatic Meto SW* - 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.

1.4 Approval Spraying Installation

Your national or local authorities can oblige you to check and examine your spray installation to minimize the environmental impacts from pesticides or chemicals.
The *BeMatic Meto SW* Automatic Spray Trolley will be approved but must be checked in combination with your liquid supply system such as; airlock, pump and liquid tank. The checks are (for example in England) part of the NSTS (National Sprayer Testing Scheme).

More information about this testing scheme can be found at the Agricultural Engineers Association (England) or the Plant Health and Seed Inspection Service (Poland)

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2. Foreword

This handbook describes the *BeMatic Meto SW*.
This handbook provides you with information including the safety aspects, a description of the *BeMatic Meto SW* 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 *BeMatic Meto SW* should be operated and maintained. By reading this handbook and then using the *BeMatic Meto SW*, you, or anyone else, will be assisted in using the *BeMatic Meto SW* 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 *BeMatic Meto SW*. You are the owner of a 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 *BeMatic Meto SW*. 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 *BeMatic Meto SW* 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 Supplier Information

In the event of breakdowns or defects occurring on the *BeMatic Meto SW* please contact your Berg Hortimotive dealer.

4. Safety

4.1 Explanation of safety terms used

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 regulations

Read the following safety instructions carefully.
After reading the safety instructions they should be strictly observed at all times.
If the *BeMatic Meto SW* safety instructions are not observed while it is being operated, it will become substantially more dangerous and may lead to serious physical injury.

DANGER! 

- ***Read the manual carefully. Observe instructions, safety regulations, etc., at all times.***
- ***De BeMatic Meto SW is only suitable for operating on pipe rail systems that comply with the horticulture sector guidelines, the health and safety catalogue in force in the Netherlands (see 7.2).***
- ***The BeMatic Meto SW 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 wagon correspond, check the pictogram on the trolley.***
- ***It is prohibited to drive on/along the Trolley.***
- ***Only use the Spray Trolley to spray plants and crops in the greenhouse with water (and additives). It is prohibited to use the Reel as a winch for pulling objects!***
- ***Keep at a safe distance from power cables and parts of the greenhouse construction.***
- ***The Spray Trolley should not be used, for drawing steel cables or screens.***
- ***All protective screens and covers should be in place and closed during use.***
- ***When working with the spraying Trolley, wear protective clothing and take the appropriate protective measures, as stipulated in the instructions of the additive (chemicals/pesticides) used.***
- ***It is mandatory to wear shoes with protective toe caps (S1).***
- ***After using the Spray Trolley, the pipes and hoses should be cleared of chemicals and liquids. This is done to prevent the occurrence of Legionella bacteria in the still water. Always clean the hose and the supply-pipe with clear water and empty the hoses***
- ***Never exceed the maximum (valve)pressure of 40 bar!***
- ***The operator must be certified to use toxic chemicals when used as additive.***

- ***The Spray Trolley should only be operated by persons who have received adequate training with regard to the Spray Trolley and who have studied and understand the contents of this manual.***

- ***Never use the Spray Trolley outside!***

- ***It is prohibited to enter a path where spraying activities are carried out!***

- ***It is prohibited to use more than one pipe rail trolleys or machines in one path.***

- ***Only use legally allowed pesticide!***

WARNING! 

- ***Operating the BeMatic Meto SW may only take place when there are no other persons in the vicinity (apart from the operator) of the machine.***

- ***The BeMatic Meto SW may only be operated by persons of 18 years or older who have received thorough instruction about the BeMatic Meto SW, who are fully familiar with this instruction handbook and are completely aware of the dangers associated with operating the machine.***

- ***The BeMatic Meto SW should only be operated if positioned correctly on the pipe rail system or used with a BeMatic Meto SW TRANS manufactured by Berg Hortimotive.***

- ***All personnel working in the vicinity of the Spray Trolley should be fully familiarized with the safety provisions and regulations*** *- Employer's instruction*

- ***The Spray Trolley should only be repaired by specially trained personnel by Berg Hortimotive***

- ***Never carry out maintenance activities to the BeMatic Meto SW when it is being operated.***

- ***Check the BeMatic Meto SW before use for faults, see chapter 9; maintenance.***

- ***Keep operating equipment and safety symbols visible and clean at all times.***

- ***Always turn the Spray Trolley off during maintenance***
  Press the emergency button and disconnect the charger

- ***Do not carry out any modifications to the Spray Trolley without written consent from Berg Hortimotive***

- ***Only use accessories and parts supplied by Berg Hortimotive.***

- ***Remove obstacles, such as plant refuse, from the tracks before entering a path.***

- ***Never clean the Spray Trolley with a water hose or a steam cleaner.***

- ***Observe the safety regulations for the batteries, see Appendix 3.***

- ***Always stand beside the lift bar if the Trolley is raised by using the manual lift system for sideways movements. Hold the lever with one hand while pushing the trolley with the other.***

- ***Connect the Spray Trolley to the trickle charger after use!***

- ***Disconnect the charger before using the Spray Trolley.***

CAUTION!

- ***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 BeMatic Meto SW. Never operate the BeMatic Meto SW 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 symbols

On the *BeMatic Meto SW* 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 *BeMatic Meto SW* 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.

1

2

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No.	Explanation symbols:	Position symbols:
1	Be careful! Read manual before use!	Front side near operation
1	Be careful! Read instruction manual before maintenance!	Front side near operation
1	Be careful! Dangerous chemical battery; battery acid and explosive gases!	Front side near operation
1	Be careful! Risk of impact by movement.	Front side near operation
1	Be careful! Danger for falling; do not ride along!	Front side near operation
1	Pay attention! Correct user conditions!	Front side near operation
2	Be careful! Collision danger by lift lever, take care lifting *BeMatic Meto SW*.	Front side near operation
3	Be careful! In-running danger! Keep hands and fingers away from moving parts!	On hose reel cover
4	Safety signals on batteries: Ventilate sufficient!, Read manual!, Fire and smoking prohibited!, Corrosive acid!, Wear safety glasses!, Explosive gas!, Recycle, do not throw away! Contains lead.	On batteries behind battery cover

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 becoming trapped in rotating parts of the hose reel!
- The danger of becoming trapped while standing under the wagon when depositing or picking up items with lifting system!
- Tipping over of the spray trolley with an unsuitable pipe rail system!
- Risk of impact by movement of the *BeMatic Meto SW* while driving onto the walkway!
- Risk of working with chemicals, take precautions as recommended by the manufacturer of the chemicals.

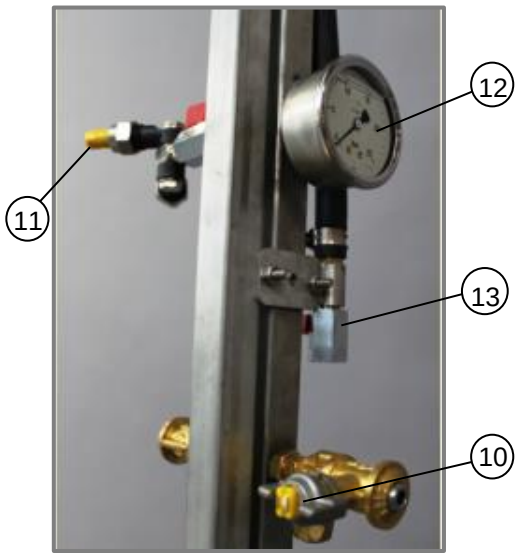
5. Intended application

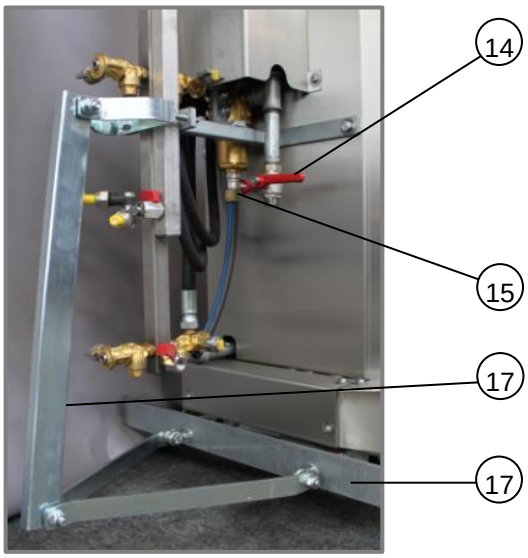
5.1 Area of application

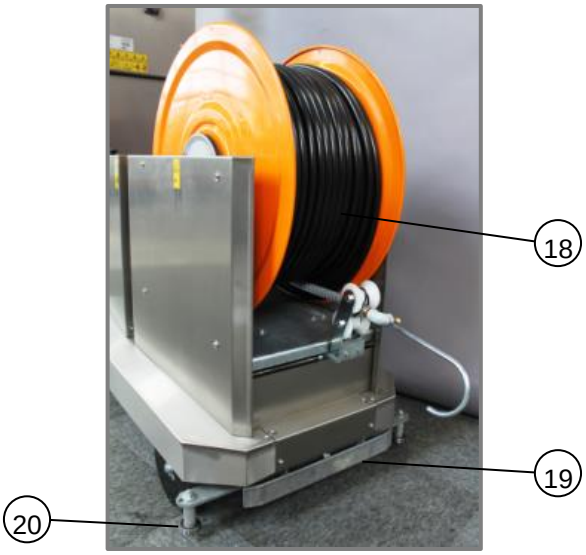
The *BeMatic Meto SW* has been designed for use in the greenhouse horticulture sector. The machine may only be operated by one person with a minimum age of 18 years who has received thorough instruction in the operation of the *BeMatic Meto SW* and who is already familiar with the safety instructions and this handbook, both of which they have fully understood.
The *BeMatic Meto SW* runs on pipe rails which have been installed according to the horticultural sector guidelines.
The *BeMatic Meto SW* Spray Trolley should be installed properly, and the correct parameters must be set in the software of the machine (see 8.1) and its sole purpose is to spray water with additives over crops and/or plants. Do not use the Spray Trolley for applications other than those described.
The *BeMatic Meto SW* is not designed to carry persons and other goods neither to tow things.
Preferably use the Spray Trolley in combination with a Berg Hortimotive *BeMatic Meto SW TRANS* to spray paths automatically. For more information about complete automation of your spraying equipment please contact your Berg Hortimotive dealer.

It is forbidden to use the BeMatic Meto SW Spray Trolley outside or on an inadequate pipe rail system!

5.2 Position and names of the parts







1	Spray boom	11	Glass wall (end) spray nozzle
2	Control panel	12	Pressure meter
3	Charge plug	13	Manual valve for venting
4	Lift system (lever)	14	Manual valve for rinsing
5	Hose reel	15	Press filter
6	Hose guide	16	Spray boom protection
7	Rear flange roll (counting roll)	17	Stop bumper (front)
8	Pipe rail detection	18	Hose
9	Drive roll (front side *BeMatic Meto SW)*	19	Stop bumper (rear)
10	Side spray nozzle	20	Pipe rail guidance

6. Transport

The *BeMatic Meto SW* Spray Trolley will be sent to you in combination with a *BeMatic Meto SW TRANS* Trolley or as a single product. When delivered in a combination, the *BeMatic Meto SW* will be positioned in the *BeMatic Meto SW TRANS* to save space during transportation. Either way the *BeMatic Meto SW* will be put in the same condition.

6.1 External transport

When transporting the *BeMatic Meto SW* be sure the Trolley is conditioned as followed:

- Emergency button is activated (pressed)
- The *BeMatic Meto SW* must stand on its flange wheels on a hard, level surface
- The *BeMatic Meto SW* must be kept dry and frost-free at all times during transportation!
- While transporting the *BeMatic Meto SW* inside the *BeMatic Meto SW TRANS*, the *BeMatic Meto SW* must be secured properly to the *BeMatic Meto SW TRANS* to prevent movement of the *BeMatic Meto SW*
- Make sure the *BeMatic Meto SW* (with *BeMatic Meto SW TRANS*) cannot slide or roll within the transportation space. Secure properly with for example transport straps
- Before use undo all described items above and check the machine as described in 7.1

6.2 Internal transport

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

- Place the forks underneath the lifting wheels (white) of the *BeMatic Meto SW.*
- Check before lifting if the forklift forks are positioned in the right place in order to prevent damage to the *BeMatic Meto SW*.
- **Secure the *BeMatic Meto SW* (before lifting) to the truck to prevent the *BeMatic Meto SW* from falling while transporting with the truck.**
- Never lift higher than necessary and put the *BeMatic Meto SW* down carefully.

Please note!
- Never lift higher than necessary!
- Ensure that the forklift truck can lift at least 500 kg weight!
- Remove anything lying loosely on the platform before lifting!
- Drive slowly and carefully!

7. Commissioning

The *BeMatic Meto SW* Spray Trolley is specifically designed for driving over a pipe rail system. When leaving the Berg Hortimotive factory, the *BeMatic Meto SW* is checked for proper functioning and safety. The Spray Trolley should be inspected on all points outlined in section 7.1 before being put into operation.

The pipe rail system must comply with the requirements as laid down in the horticulture sector guidelines. The minimum specifications are given at Article 7.3 for the track width, pipe diameter and supports. The pipe rail specifications have been taken from the horticulture sector guidelines for pipe rail systems. For the full contents of this policy regulation, we refer you to the Ministry of Social Affairs & Employment.

7.1 Inspection before starting operations

The *BeMatic Meto SW* must be inspected on the following aspects before putting into operation:

- Correct adjustment of the guide bearings (adjust the bearings so the flanges just cannot reach the pipe rail)
- No mechanical damage to *BeMatic Meto SW*, reel, and optional spray boom
- Drive roll (front), count roll (back) and lifting wheels spin supple
- Batteries charged
- No damage to and good visibility of operating controls and safety symbols
- No damage or leakage of hoses, pipes, and couplings
- All protective covers are in place and secured
- Lifting system works properly; relatively easy to lift the *BeMatic Meto SW* with the lever. The *BeMatic Meto SW* must remain on the lifting wheels if the lever is released!
- Correct connection of spray boom, reel, hoses, and electric valves

7.2 Horticulture sector guidelines for pipe rail systems

The *BeMatic Meto SW* has been designed to run on a pipe rail system. This means that there are rails on the paths between the plants which consists of two pipes of the same diameter and having a fixed width between them (centre-to-centre measurement). The pipes are often used as heating pipes and are supported along fixed distances. The pipe rail system must satisfy the most recent requirements of the horticultural sector guidelines for pipe rail systems. In Article 7.3, the minimum requirements are also given for the pipe rail systems which are taken from the sector guidelines for pipe rail systems. The pipe rail system on which the *BeMatic Meto SW* is intended to be used, must also comply with these requirements. All the above-mentioned items should also be checked periodically in accordance with the Working Equipment Guidelines. It is absolutely prohibited to use a pipe rail system that does not comply with the sector guidelines or policy regulations. A number of tests are described in the policy regulations for determining whether it is possible to operate safely with the wagons on the pipe rail system. These tests should be implemented prior to working with the combination of the pipe rail wagon and the available pipe rail system.

7.3 *Minimum requirements for the pipe rail system*

The rails (normally heating pipes) must have an external diameter of either 51 mm or 45 mm and a wall thickness of at least 2 mm. The minimum material specifications for the pipes is as follows: Steel 37 (S235JR). The distance between the pipe rail system supports may not exceed 1.25 metres (centre-to-centre). When combining pipes with a diameter of 45 mm to a track width of 42 cm, the distance between the rail supports should not exceed 1 metre. The pipe rail supports used should be in accordance with, or equivalent to the following specifications: 1.5 mm thick steel base plate with reinforcing profile - base plate width of at least 115 mm - the length should be such that the base plate protrudes at least 70 mm from the two vertical supports which carry the load of the pipes. The centre-to-centre distance between the pipes should be at least 42 cm. The pipes must be properly secured, precisely installed and with a maximum tilt of no more than 2° in both length and in width. The pipes must also be properly attached to the supports and the concrete track. Loose fitting pipes must not be used! A soil test bore should be carried out using probing equipment (see policy regulation). It should have a so-called cone value on the top layer of more than 0.4 Mpa (62 psi).

The use of rail systems not covered by the policy regulations is permitted on the condition that a stabilisation test is carried out in accordance with the policy regulations from which it appears that the pipe rail wagon / pipe rail system combination would be stable. Furthermore, the supports for these other pipe rail systems must be installed no more that 1 metre apart, and the tilt must not exceed 2 degrees in both length and width.

➔ 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 centre to centre 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 Mounting the spray boom

Connect the optional spray boom as described below:

- Remove stainless steel cover at the front side of the *BeMatic Meto SW* (see figure 7.1)
- Connect the boom to the fixation point (A) and the other fixation point positioned higher on the pole
- Connect the front and side spray hoses to the correct supply connections of the spray boom (see labels (B); lower valve is the side spray valve and upper valve the front spray valve)
- The loose hose is meant for clearing the system with water (C)

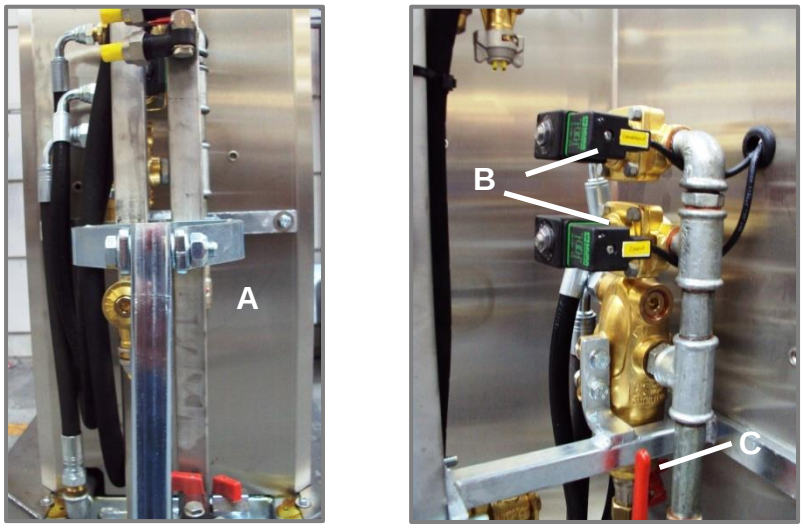


Figure 7.1; Electric valves and hose connections

7.5 Mounting the hose

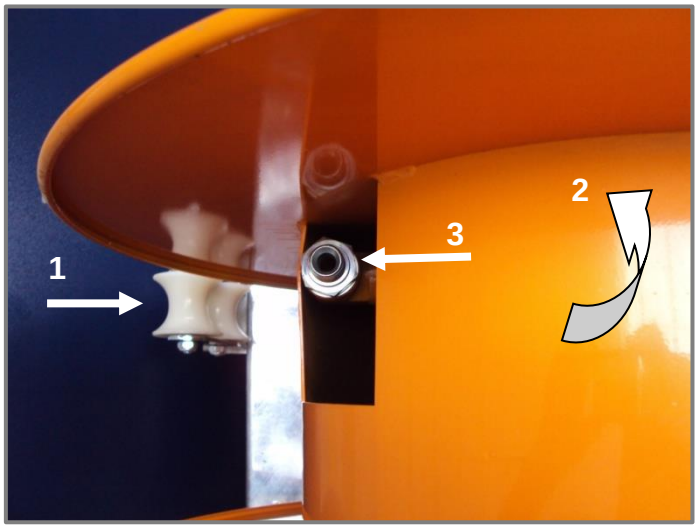


Figure 7.2; Order in which the hose should be mounted to the reel

Connect the supply hose to the reel in the following manner:

- Turn the reel by hand till the hose guide is positioned as far as possible to the side of the reel where the connection point is positioned. The connection point must be in its highest position (as shown in figure 7.2)
- Put the hose through the hose guide (1)
- Direct the hose underneath the reel (2)
- Connect the hose to the reels coupling (3)
- Rewind the hose; Put the *BeMatic Meto SW* on the lifting wheels (drive wheels in the air) and choose ‘drive backward’ in the manual menu and press the START button. Stop until the hose is almost winded completely!

BE CAREFUL!
If the hose is already mounted be sure the hose guide will not be routed in position to the hose connection on the reel. Never turn the reel if the hose is not directed through the hose guide!

8. Operation

Make sure you are familiar with your *BeMatic Meto SW* Spray Trolley and control functions. Ensure that operators have received instructions regarding the Spray Trolley and the safety regulations and have studied and understand this manual.

- The *BeMatic Meto SW* should only be operated if it has been verified that no other people are present in the near vicinity of the Trolley.
- Remove crop refuse and other obstacles from the pipe rail system before use.
- Clean the *BeMatic Meto SW* on a regular basis. Prior to cleaning, switch the *BeMatic Meto SW* off and press the emergency button. Never clean using excessive water or a pressure cleaner.
- The *BeMatic Meto SW* should only be operated if the previous pages have been extensively studied and there are no questions for you.
- Provide an approved spray system according to national legislation, performed by a certified inspection agency for inspection of sprayers (see 1.4).
- After use switch-off the *BeMatic Meto SW* and connect to the supplied trickle charger.
- Keep the *BeMatic Meto SW* in a dry, frost-free storage area if it is expected to be idle for an extended period of time.

Charge the batteries at least every 4 weeks! Less frequent charging will reduce the capacity of the batteries and the lifetime of the batteries, the motor, and the drive control!

CAUTION! DANGER! HANDLING BATTERIES CAN CAUSE INJURY!

Avoid skin contact with battery fluid. Wear safety glasses and gloves. Battery fluid is a strong corrosive acid. Upon contact, immediately wash skin with water and soap. In the event of eye contact rinse with running water for at least 10 minutes and seek medical assistance. When working with or near batteries, ensure that adequate supplies of water and soap are nearby, and that assistance is available within earshot. Avoid short-circuiting (spark formation) and ensure that no (electric) connection is made between the battery poles.

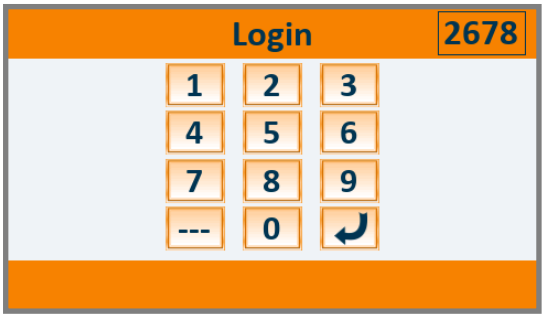
Extremely explosive gas is released during battery recharge. Ensure that no fire or sparks are near the batteries during the recharge. **NO SMOKING!**

Make certain the area is well ventilated during battery recharge or battery storage (more about charging; see chapter maintenance).

Make sure that no metal objects can fall on the battery as this can cause short-circuiting or sparks and, consequently, a fire or explosion. Remove personal items such as bracelets, rings, necklaces, and watches when working near the battery. A short-circuit current is capable of melting a ring and causing severe burns.

8.1 Display

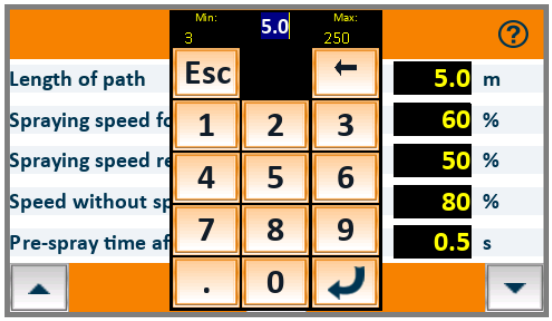
The display provides information about the *BeMatic Meto SW* settings. When switching on, the display always requests the password, enter **2678**, followed by **Enter -** the main menu now appears.
Please note, control the screen only with the fingers and NOT with hard sharp objects!
Attention, the screen has a **screen protection function** and after certain period our logo is shown and turning**, THE *BeMatic Meto SW* HAS NOT BEEN TURNED OFF!**



The main menu offers the following functions:

Touch screen
Various program adjustments and function activations can be carried out via the touch screen. The language selection is made by pressing the flag.

The touch screen can also generate alphanumeric input screens in order to enter variables which apply to your specific greenhouse or plants.



- Numeric keys [0-9]
- [←] key to cancel last entry
- [Ent] key to confirm entry (put into the memory)
- [ESC] key to leave the input screen or go back to previous screen
- [?] key for advice www.berghortimotive.com


step screen up or down


back the main screen


selector key, function now **active**


selector key, function now **inactive**

this function is currently **not possible**

touch sensitive input field, opens **numeric input screen**


shows **last alarm**


shows **battery low alarm**

restart **counting period**

start button or **start photocell** active

automatic **cycle** is ready


hydraulic displacement wheels active


hydraulic displacement wheels retracted


Program for gardens with all the same paths is active


Program for block shaped gardens is active

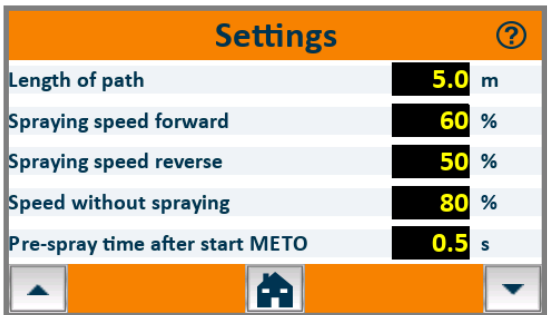

Program for tapered gardens is active

8.2 Controls

Before using the *BeMatic Meto SW* spraying machine you must enter a number of settings so that the desired spraying pattern can be set. If you have a *BeMatic Meto SW* Trans (automatic transfer wagon for the *BeMatic Meto SW*) please consult the handbook that goes with it!

Switch ON the *BeMatic Meto SW* spraying machine, the screen now asks for the password – enter **2678**, the main menu will now appear on the screen.

8.2.1 Adjusting



[LENGTH PATH]
Enter the length of the path.
(For safety's sake, take 3 meters shorter than the actual length, this can be changed later).

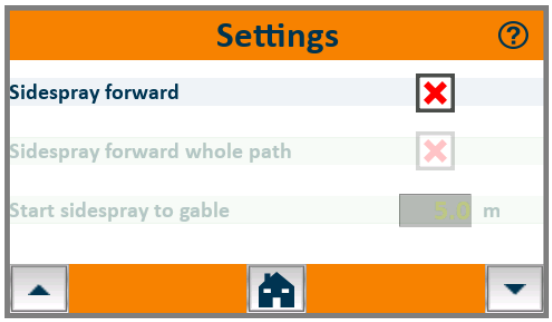
Pay attention! If the pad length is entered too long, large damage can occur!

[SPRAYING SPEED FORWARD]
Enter forward speed for driving to the rear outside wall (gable), this is usually the speed that is set for the correct level of emission of the spraying fluid.

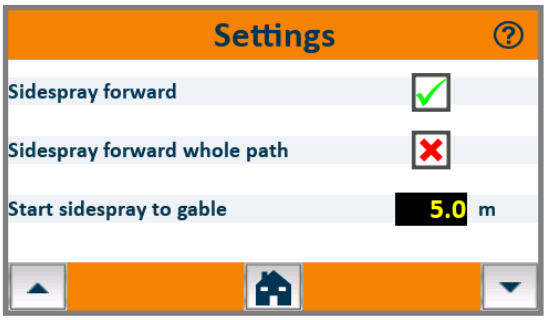
[SPRAYING SPEED REVERSE]
Enter reverse driving speed for driving back to the main path, this is usually the speed that is set for the correct level of emission of the spraying fluid.

[SPEED WITHOUT SPRAYING]
Enter the speed for driving when the spraying valves are shut off, this can be 100% if it gives no harm to the crop.

[PRE-SPRAY TIME AFTER START *BeMatic Meto SW*]
If it is preferred that the *BeMatic Meto SW* unit sprays while driving forward to the gable, this setting can be selected so that spraying comes on before moving.
By default, this setting is **0.5 sec**, increase this value if the first plants in the path do not receive enough spray liquid.

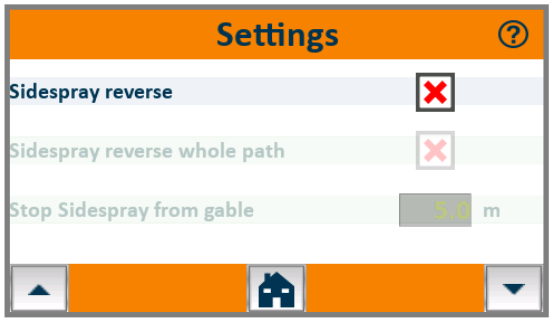


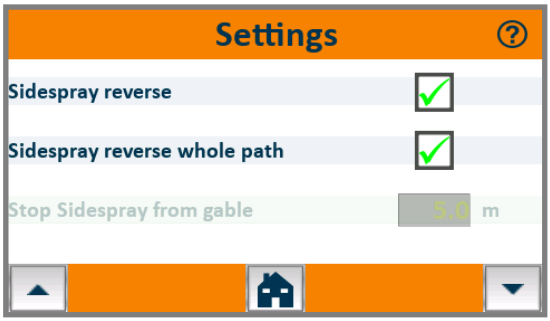
[SIDESPRAY FORWARD]
Choice whether spraying should occur when driving the *BeMatic Meto SW* forward to the gable.



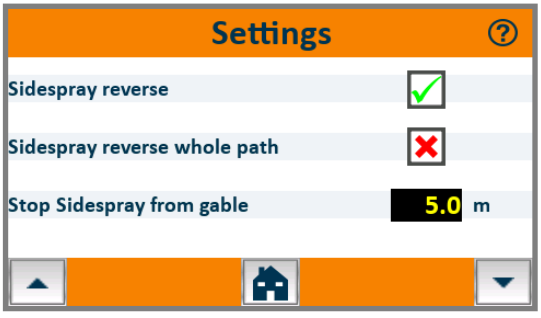
[SIDESPRAY FORWARD WHOLE PATH]
This setting is active as standard so that the entire path is sprayed.
If this setting is **non-active** the *BeMatic Meto SW* will only spray the section at the end of the path according to the settings of the next command.

[START SIDESPRAY TO GABLE]
Enter the number of metres that have to be sprayed at the end of the path.





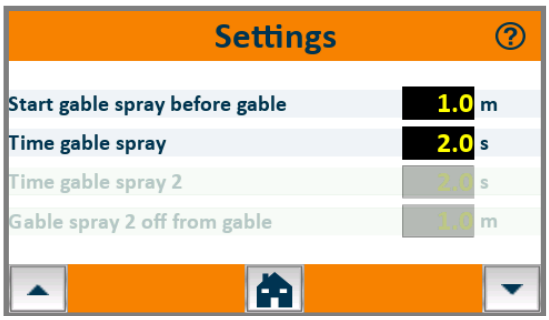
[SIDESPRAY REVERSE]
Select whether spraying must occur when driving the *BeMatic Meto SW* reverse to the main path.



[SIDESPRAY REVERSE WHOLE PATH]
This setting is active as standard so that the entire path is sprayed.
If this setting is **non-active** the *BeMatic Meto SW* will only spray the section at the end of the path according to the settings of the next command.

[STOP SIDESPRAY FROM GABLE]

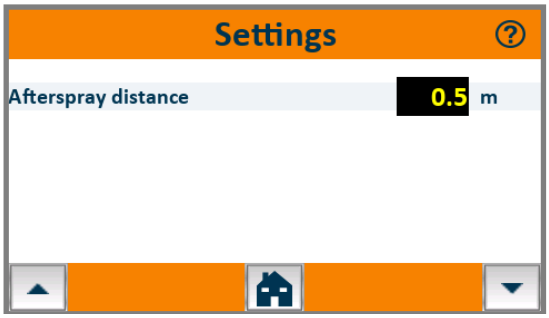
Enter the number of metres that have to be sprayed at the end of the path.



[START GABLE SPRAY BEFORE GABLE]
Enter the number of metres that the wall sprayer starts spraying before the *BeMatic Meto SW* has driven the pre-set number of metres. This function allows to spray extra pesticides at the rear gable.

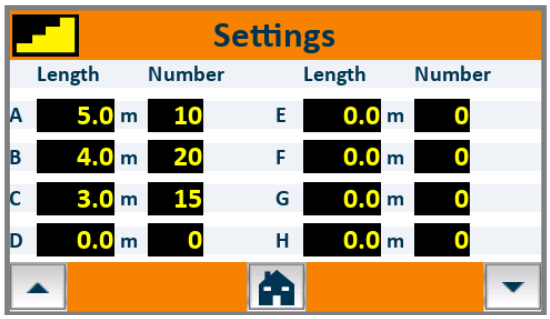
[TIME GABLE SPRAY]
Enter the period (seconds) that the wall spraying boom must spray the gable.

[GABLE SPRAY 2 OFF FROM GABLE]
Enter the number of metres over which wall sprayer 2 (if fitted) must remain spraying after the *BeMatic Meto SW* has reversed in the direction of the main path.



[AFTERSPRAY DISTANCE]
Enter the distance that the *BeMatic Meto SW* must drive (spraying) after leaving the rails on the main path.
Whether the BeMatic Meto SW spraying machine travels onto the main path while spraying depends on option SIDESPRAY BACKWARDS WHOLE PATH *being activated. If this is not activated, then this will be the distance that the BeMatic Meto SW must travel onto the path to come out at the centre.*

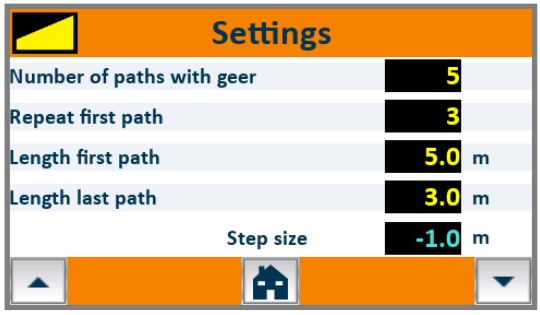
The functions below only appear on the display if they have been set by the service engineer to **"block shaped greenhouse"** in his own menu.
A maximum of 26 sections (blocks) can be set from A to Z.



[PATH LENGTH: SECTION A (to Z)]
Enter the length of the paths per section.

[AMOUNT OF PATHS: IN BLOCK SECTION A (to Z)]
Enter the number of **contiguous** paths of equal length.

The following is only applicable when function **"Tapered garden"** (slanting rear wall) is on (to be set by the service engineer).



[NUMBER OF PATHS WITH GEER]
Enter the total number of paths of the equally long and then paths where the rear gable is sloping.

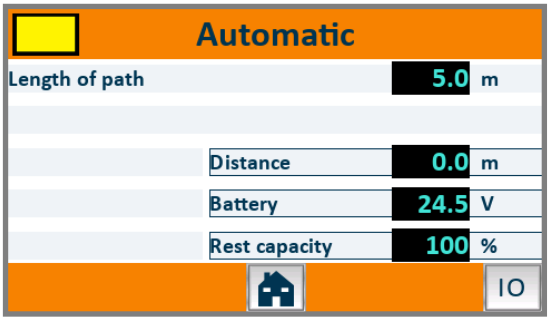
[REPEAT FIRST PATH]
Key in the number of paths whose length is the same as the first path.

[LENGTH FIRST PATH]
Key in the length of the first path from which the rear gable slopes.

[LENGTH LAST PATH]
Key in the length of the last path from which the rear gable slopes.

[STEP SIZE]
Calculated representation of the length difference between the paths where the rear gable is sloping.

8.2.2 Standard Automatic Function



Shows path length that is set.

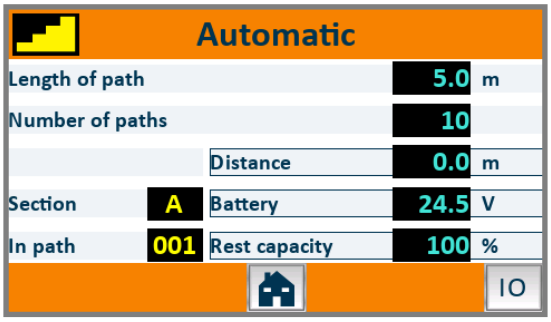
Shows actual driving distance and status of main path at 0 m.
Shows the battery voltage in Volts.
Gives indication of remaining capacity in %.

Drive the *BeMatic Meto SW* spraying machine to the front of the pipe rails. Press the black START button. The *BeMatic Meto SW* spraying machine will now operate automatically in the program selected.

Walk alongside the *BeMatic Meto SW* spraying machine on the path in order to check the distance that was set.
The *BeMatic Meto SW* spraying machine must stop approximately 1.5 metres in front of the wall. Adjust this if required according to the instructions given in the previous pages. Make sure you are properly protected against the chemical agents and keep a safe distance!
We advise that you carry out the tests using plain water!

BATTERY REMAINING CAPACITY 100% is a built-in battery capacity indicator which shows the remaining charge in the batteries.
When there is only about 0 % remaining, the *BeMatic Meto SW* spraying machine will stop the automatic spraying and the message, "Low battery voltage - Please charge battery!" will appear on the screen. The path being sprayed at that time will be completely sprayed.
Charge the *BeMatic Meto SW* batteries!

8.2.3 Block shape Automatic Function



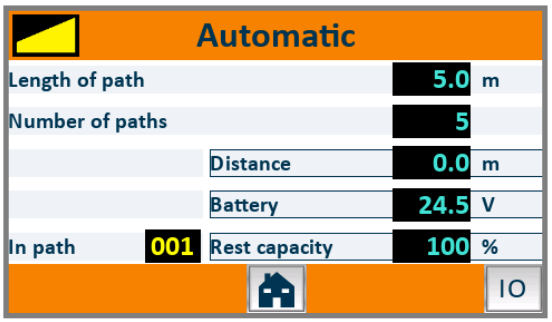
Shows path length that is set.
Shows total number of paths in the Section.

Shows actual driving distance.
SECTION PATH
Shows the actual path in the actual Section.
Gives indication of remaining capacity in %.

Only the contiguously entered Sections will be automatically sprayed in sequence! If there is a Section at "0 paths" in the settings menu, stop the *BeMatic Meto SW* at that Section and the message "READY" will flash on the screen.

Always check the black/blue fields " LENGTH OF PATH " after an ALARM!

8.2.4 Tapered shape Automatic Function



Shows path length that is set.
Shows the total number of paths in the taper.

Shows actual driving distance.
Shows the battery voltage in Volts.
Gives indication of remaining capacity in %.
IN PATH Shows the actual path of the taper.

If after entering the correct data in the settings menu the automatic screen shows the same data ,please recheck whether what is shown corresponds with the path where you want to start spraying.
Changes can be made directly from the automatic screen by touching the black/yellow fields - thereafter always check the " LENGTH OF PATH " field!

If the number of tapered paths are sprayed, the message "READY" flashes on the screen.

Always check the black/yellow and the " LENGTH OF PATH " fields after an ALARM!

8.2.5 Manual Function

Manual functions are selected by pressing ☒ , the button changes to ☑

The selected functions are activated with the black START button.

Can only be activated when the *BeMatic Meto SW* is on the pipe rails!

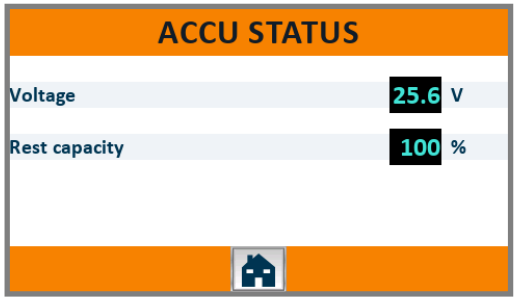
[SPEED & DRIVE FORWARD or REVERSE]
Select the direction to be driven manually when the START button is operated, also set the required speed, **advice suggest no higher than 80%.**

[AUTO REVERSE]
Selection for automatic reverse when the START button is operated. After a **delay period of 5 seconds** the *BeMatic Meto SW* moves until it drives off the pipe rails.

[SPRAYING AND/OR GABLE SPRAY]
Selection for manual spraying when the START button is operated. This enables the operator to check before spraying whether any of the spray nozzles are blocked.

Combinations of functions can also be activated simultaneously in the manual menu.
E.g., manual driving and spraying!

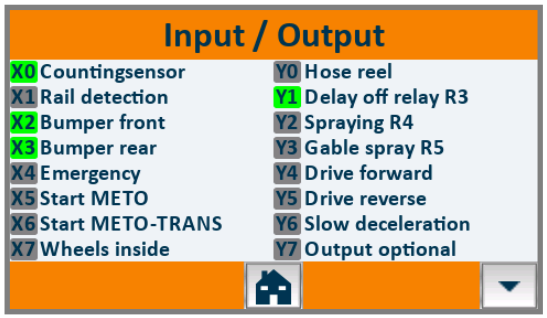
8.2.6 Battery status



The screen shows the battery voltage in Volts and gives an indication of the remaining capacity in %.

Attention! The remaining capacity is not shown as a linear decline and therefore only provides the user with an indication.

8.2.7 I/O screen (input & output)



On the **inputs screen** it is possible to see if inputs are active, or will be, when you operate a switch. This is useful when there is an alarm.

On the **outputs screen** it is possible to see if outputs are active.

8.2.8 Alarm messages

During automatic operation, alarm messages can appear on the screen - reset these messages by holding down the key with the green check mark on it.

ALARM "Error front bumper"
The front bumper touched something while in AUTOMATIC mode.

- Remove the obstacle and then press Reset.
- From the main menu go to [AUTO].
- Check whether there is a value at "PATH LENGTH x.xx M" which is the same as the distance that the *BeMatic Meto SW* has travelled.
- If the distance is correct, the *BeMatic Meto SW* spraying machine can be restarted via START, and then after about 5 seconds it will start moving again.
- If the distance does not correspond, you must reverse the *BeMatic Meto SW* manually [AUTO REVERSE]. After operating the start button, the *BeMatic Meto SW* will reverse off the pipe rails automatically at half speed after 5 seconds have elapsed.
- During the 5 second delay, please step back from the *BeMatic Meto SW* to a safe distance.

ALARM "Error rear bumper"
The rear bumper touched something while in AUTOMATIC mode.
(See the "*BeMatic Meto SW* front bumper" description)

ALARM "Error rail detection forwards or rail detection backwards"
The pipe detection in AUTOMATIC mode has dropped out during driving.
Check if the pipe detector is working properly, consult the supplier if necessary.

ALARM "Error counting"
Counting in AUTOMATIC mode has dropped out.
Check for the proper operation of the measuring wheel sensor (warning lamps lit at each bolt on the plastic disc!). Check whether "speed forwards" and "speed backwards" are both set.

ALARM "Error BeMatic Meto SW has not reached the rail"
The *BeMatic Meto SW* spraying machine in AUTOMATIC mode has not reached the pipes in the pre-set time (normally 4 seconds).

ALARM "Error Tube detection, active at start"
The *BeMatic Meto SW* detects in the AUTOMATIC mode after the START button was pressed that the *BeMatic Meto SW*-spray trolley is already on the rails or that the role is still in the highest position. Check the correct operation of the pipe detection role.

ALARM "Error rail remains detected"
The *BeMatic Meto SW* spraying machine counts in the minus because the tube detection roller remains mechanically high when leaving the tubes.
Check the correct operation of the pipe detection role.

ALARM "BeMatic Meto SW is not good at the BeMatic Meto SW TRANS"
Only applicable if the BeMatic Meto SW Trans is used.
The *BeMatic Meto SW* is no longer in the correct starting position in the *BeMatic Meto SW TRANS*, drive in manual mode the *BeMatic Meto SW* fully rearward in the *BeMatic Meto SW TRANS*.

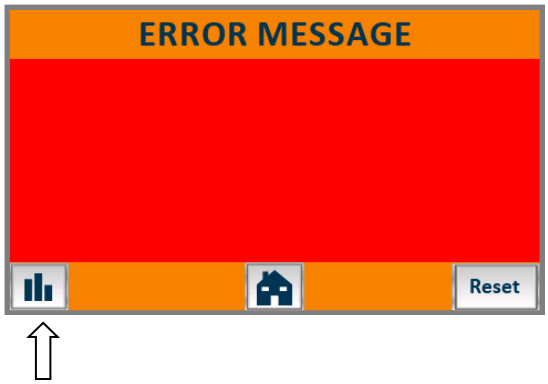
ALARM "low battery voltage - charge battery!"
The *BeMatic Meto SW* spraying machine batteries must be recharged, automatic spraying is no longer possible. The *BeMatic Meto SW* always sprays the path completely if this error occurs.

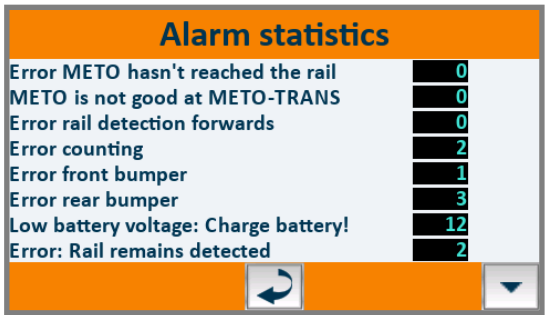
ALARM "Error motor drive "
The drive motor regulator is faulty - switch the *BeMatic Meto SW* off and on, then check if it moves again.

ALARM "Error lifting wheels not maximum inside"
This alarm only operates if the *BeMatic Meto SW* is fitted with a hydraulic hoist - put the hoist wheel further into the frame when this alarm is given.

Other errors or still no result from the above solutions?
Consult your dealer

8.2.9 Alarms





The previous failures are shown on the alarms screen by pressing the statistic button.

8.2.10 EMERGENCY STOP

Via the Emergency Stop button the *BeMatic Meto SW* will be switched off. The button should be pulled out to release this function.

Attention, the screen has a **screen protection function** and after certain period our logo is shown and turning**, THE *BeMatic Meto SW* HAS NOT BEEN TURNED OFF!**

Important! When you finish using the *BeMatic Meto SW* always switch off by pressing the Emergency Stop button which avoids unnecessary consumption of energy. **Also, the batteries must be recharged immediately after use.**

8.2.11 START

Both the automatic and the manual functions can be started with the START button.

8.3 Hydraulic lifter (Option)

Optionally, the *BeMatic Meto SW* can be equipped with a hydraulic lifting system for moving the spray trolley.

Turn the knob to the right to activate the lifting system.
Move the *BeMatic Meto SW* and turn the knob to the left to let the lifting system go in completely until a green arrow is shown on the screen.

hydraulic displacement wheels active

hydraulic displacement wheels retracted

8.4 Out of use

When the *BeMatic Meto SW* is not being used it should be stored with fully charged batteries in a dry and frost-free environment. The batteries should be recharged at least once every 4 weeks. Ensure that the ground underneath is level. When the *BeMatic Meto SW* is not used for longer periods, cover it with a protective tarpaulin. When bringing the *BeMatic Meto SW* back into use after a lengthy period of storage, it is advisable to inspect it as described at 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 *BeMatic Meto SW* with a dry or slightly damp cloth, and never pour water over the *BeMatic Meto SW* 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! After usage, particularly after using chemicals, thoroughly clean the hoses, couplings, and other spraying equipment with plain water (no additives).
Wash after using the filters and nozzles of the spray boom by means of flushing with clean water or after disassembly in clean water.
Some additives will quickly calcify which can lead to blockages when inadequate attention is for maintenance after spraying!
For other maintenance see section 9 *Maintenance & Repairs*.

8.6 Dismantling

When you have to dispose of your *BeMatic Meto SW* you should return it to your dealer or a company that specialises in dismantling vehicles. Never take your *BeMatic Meto SW* to a scrap metal dealer or a waste dump. The *BeMatic Meto SW* 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. Maintenance and Repair

The *BeMatic Meto SW* pipe rail trolley is a product of extremely high quality. In order to safeguard this quality, the maintenance guidelines below should be strictly observed. Repairs and maintenance activities should be recorded in the maintenance logbook (see appendix III). In addition, employers are obliged, at all times, that their means of labour should be in strict conformity with means of labour regulations. To ensure this, means of labour should be inspected periodically. Before doing maintenance switch OFF the *BeMatic Meto SW* with the emergency stop and for models with exchangeable batteries disconnect them by unplugging.

Maintenance - Checks	Tools	Daily	Weekly	Monthly	Yearly
Cleaning directly after using (see 8.7)	See 8.5, 9.8 and Appendix 5	X			
Sufficiently charged battery directly after using	Battery condition meter on display	X			
Damage to control components	Visual	X			
Damage to/visibility of pictograms & stickers	Visual	X			
Cleaning control panel	Damp cloth		X		
Check for leaks and damaged cables, hoses, and valves	Visual		X		
Check for ingrained dirt or string wrapped around wheels and chain (see 9.4)	Visual		X		
General mechanical damage	Visual		X		
Charge batteries after use or at least 1x monthly (see 9.9)	Battery charger			X	
Check battery fluid levels (1 cm fluid covering plates (see Appendix 3)	Distilled water, gloves & safety goggles			X	
Lubricate lift wheels, drive chain and bearings (see 9.4)	Bearing grease, chain grease or other universal lubricants			X	
Check chain tension (see 9.4)	Open-ended spanners			X	
Check V-belt tension (see 9.5)	Open-ended spanners			X	
Lubricate lifting wheels mechanism (see 9.6)	Bearing grease, chain grease or other universal lubricants			6 months	
Replace carbon brushes on the motor if less than 1 cm long (see 9.7)	Visual				X
Check the welds on the construction for (hair)cracks and rust.	Visual				X

If the above checks indicate that there is a fault with the *BeMatic Meto SW*, immediate contact should be made with the *BeMatic Meto SW* 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.
- All work concerning the hydraulic system. (option!)
- All activities to the drive motor excluding: cleaning, readjusting, or replacing the chain or cleaning and inspecting the carbon brushes.

9.2 Maintenance and inspection by the operator

All the work given in the above table that is not excluded at item, 9.1 Specialist Maintenance, must be carried out periodically. Some of the actions are described below. You will find instruction film clips on our website that show how certain maintenance activities should be carried out.

www.berghortimotive.com

9.3 Berg Service Alert

Berg Hortimotive takes customer satisfaction very seriously. A satisfied customer is the best ambassador for our products and company!

No matter how well we manufacture our products, after a period of time they are going to need servicing and maintenance carried out. Like most people, you also know that a good maintenance schedule considerably increases the lifespan of the product. So that we can provide you and our dealers with even better support, Berg Hortimotive has started sending out the “Berg Service Alerts” (BSA).

BSA means that you can expect an email from us periodically that contains a link that takes you to a page with lots of tips and recommendations for maintaining the same Berg Hortimotive products that you own and operate. We include pictures and images as much as possible so that the information is easy to understand and apply.

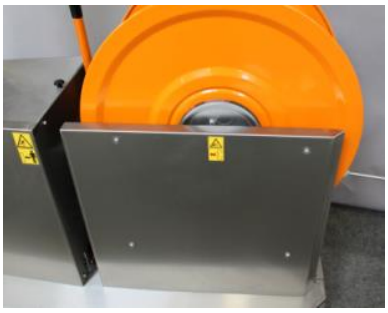
Our tip: Visit our website and subscribe to BSA!

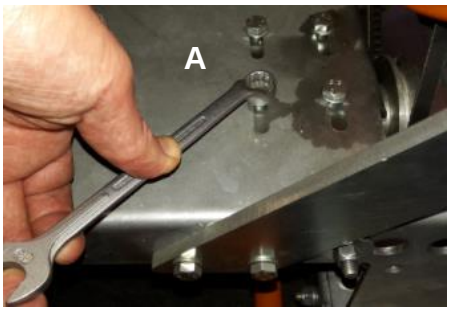
If as a result of these tips and recommendations you come across maintenance work that you are either unable, or do not want to carry out, please consult our extensive dealer network to find assistance. The dealers are trained by us on a regular basis and therefore have the necessary knowledge, experience, and access to the original spare parts for providing you with assistance quickly and efficiently.

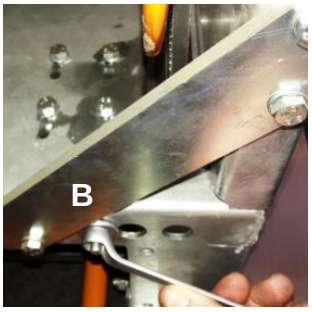
9.4 Maintenance of the drive (see BSA on our site)

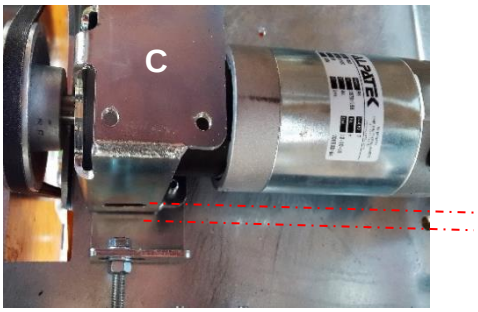
Clean chains, gears and rolls and remove run-in ropes and leaves (when necessary). If necessary, tighten the chain by loosening the engine mounting bolts and tightening the coupling nut. (These are located under the *BeMatic Meto SW*). Do not over-tighten the chain, the minimal sideways tolerance should be approx. 1 cm. Once the correct chain tension has been achieved, retighten the engine mounting bolts again. The chain has been coated by Berg Hortimotive and should be oiled after the first time used (first spraying cycle) when the factory coating is worn out (chain feels dry). Check that the carbon brush nozzles are fixed to the engine.

9.5 Tensioning the V-belt of the hose reel









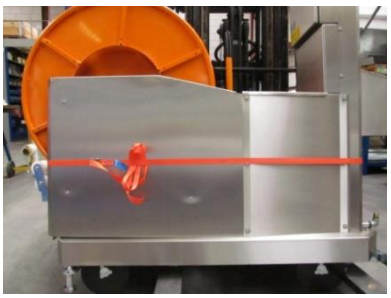
- Remove the stainless-steel panel on the V-belt side.
- Check the condition and tension of the V-belt, when the engine pulley slips when the drum is blocked the belt needs to be tightened. Put to the test the *BeMatic Meto SW* on the lifting wheels and drive manual backwards and hold the reel drum by hand force.
- Loosen the four motor bolts "A" half a turn.
- Turn the lock nut "B" clockwise what so that the V-belt will be placed tighter.
- Make sure the reel motor "C" is aligned before the engine bolts "A" are tightened.

9.6 Maintenance the lift lever (see BSA on our site)

- Clean the wheels regularly
- Adjust the lifting wheel lever nuts in such a way that the lever is stiff but still easy to operate.
- Oil the wheels and rotation points monthly.
- Replace any damaged wheel.

9.7 Inspecting the carbon brushes

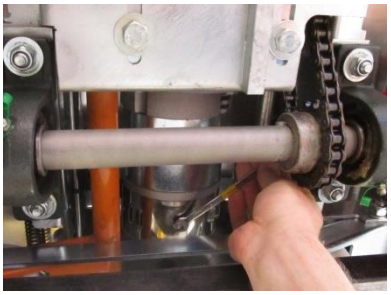




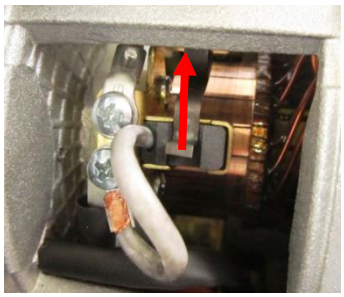
Raise the *BeMatic Meto SW* with a forklift truck as follow:

- Place the forks underneath the lifting wheels (white)
- **Secure the *BeMatic Meto SW* (before lifting) to the forklift to prevent the *BeMatic Meto SW* from falling**
- Never lift higher than necessary and put the *BeMatic Meto SW* down carefully

Lifting the *BeMatic Meto SW* without being properly secured is strictly forbidden! Provide a safe working environment!

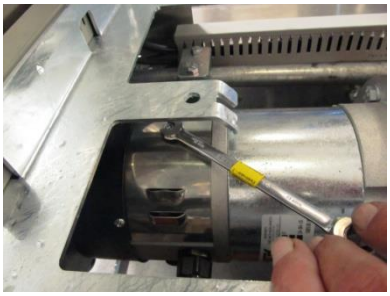


Remove the brush cover with 8mm spanner.


1) Blow the engine clean with (dry) air. 2) release the brush spring 3) and pull the brush at the wire from the holder.

Carbon brushes less than 1 cm long should be replaced, consult your dealer.

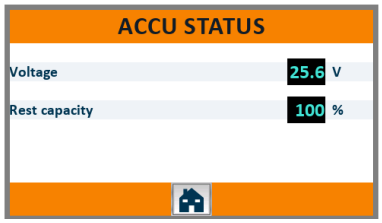

Put the *BeMatic Meto SW* down carefully to the ground, remove the batteries and repeat the above operations for the two brushes at the top of the engine.

9.8 The cleaning

- Clean the above pressure filter with clean water after every spray!
- Clean the sprayer boom according to the recommendations in Appendix 4!
- Clean the *BeMatic Meto SW* Spray Trolley using a soft brush, dampen cloth and/or compressed air
- Never clean the *BeMatic Meto SW* using a high pressure or steam cleaner (this can damage the electrical circuit)
- Clean the spray boom and hoses with pure water after spraying with chemicals
- Remove still water to prevent the formation of Legionella bacteria
- See also Appendix 5

9.9 Charging the batteries

Charge the batteries according to the status indication of the BATTERY STATUS screen between the 50 and 10% remaining capacity and try to approach the 10% as closely as possible according to the following advice.



On the BATTERY STATUS screen, you can check the status of the batteries. At 100%, the batteries are full, the lower the residual capacity the batteries are more discharged. If during automatic driving the alarm message "low battery voltage, Charge battery! " appears on the screen the batteries should directly be charged. Turn off the BeMatic Meto SW with the Emergency Off switch and charge the battery continuously for minimal12 hours or until the charger indicates full. (refer to the user manual of the charger!) Recharge "during operation!" before the BATTERY STATUS screen indicates 50% discharge should be avoided. Always try to match the approximately 10% discharge status. This has the following advantages:

- Less charging cycle, is favourable for the life span
- Reduces water consumption

Charge the batteries every time after using and then at least once a month regardless of use with a suitable charger!! Prevent deep discharge batteries, this gives severe damage and a shorter lifetime!!
See also the instructions in Appendix 3 battery safety sheet!

9.10 Battery exchange set (optional)*

When the *BeMatic Meto SW* is equipped with a battery exchange set, change the batteries as described:

1. Put the *BeMatic Meto SW* on a level surface, lift lever upright and emergency off-switch pushed in.
2. Remove side panel of *BeMatic Meto SW* by unscrewing the black knob. (photo 2)
3. Disconnect the batteries by removing the plug from the socket. (photo 6)
4. Position the battery exchange cart aside the *BeMatic Meto SW.*
5. Unfold the guide rails and make sure they are positioned in the cut-outs. (photo 3)
6. Disengage the block pin (photo 3) and slide the batteries out of the *BeMatic Meto SW* on the cart.
7. Fold in the guide rails and position the cart so that the charged batteries are in front of the opening.
8. Unfold the other guide rails in the same way as before. (photo 5)
9. Reconnect the plug to the battery's socket. (photo 6)
10. Slide the charged battery in the *BeMatic Meto SW* and secure it with the block pin. (photo 7)
11. Fold in the guide rails.
12. Switch on the *BeMatic Meto SW* and check the BATTERY STATUS screen.
13. Reassemble side panel.
14. The *BeMatic Meto SW* is now ready to use again with the fully charged batteries.
15. Charge empty batteries immediately. ***Always use the high frequent trickle charger!***

1

2

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1. Switch off *BeMatic Meto SW* Lock pin
2. Removed side panel
4. Remove empty batteries
5. Put charged batteries in
7. 8. Remove exchange cart

3. De-block pin 6. (De)-Connect plug 9. Install side panel

9.11 Pipe rail system maintenance

The pipe rail system on which the *BeMatic Meto SW* runs should be checked on a regular basis. 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 wagon 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 Working Equipment Guidelines that cover this.
Ensure that all the pipes have sufficient support with a maximum separation distance of 1.25 m in between and that the supports are not out of line with respect to the pipes. Moreover, the pipes on the concrete path should be secured and must not be loose. 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 still functioning properly. 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.

10. Technical specifications

Type: group 1500XXXTS **Dimensions [mm]:**	
Centre-to-centre	420-800
Length	1950
Breadth	h.o.h. + 160
Height of control panel	1740
Weight [kg] (c-to-c 550)	345
Motor power (Drive) [kW]	0.37
Motor power (Hose reel) [kW]	0.15
Motor power (Hydr.) [kW] *option	0.5
Hydraulic system pressure [bar] * option	200
Hydr.fluid Visc. 46 [L] * option	1.5
Maximum speed on rails [m/min]	80
Maximum speed on concrete path [m/min]	80
Maximum fluid pressure [bar]	40
Voltage [Volt DC]	24
Battery capacity [Ah] (5h/20h)	120 / 159
Noise level [dB]	<70

Physical operating conditions

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

(in accordance with Appendix IIA of the Equipment Directive)

Berg Hortimotive.
Burg. Crezeelaan 42a
2678 KZ De Lier – the Netherlands
+31 (0)174 – 51 77 00

Hereby declares to take full responsibility that the following product

***BeMatic Meto SW* Automatic Spray Trolley, touch screen, traction batteries 24V-120Ah, PG motor control, vulkollan wheels. Two electric valves and electric hose reel 24V with automatic hose guide and press filter. Suitable as a tool for spraying liquids inside the greenhouses.**

Type nr.: 1500XXX

Serie nr.: ……

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

Satisfies the following EU Directives:
- Electromagnetic Compatibility Directive (EMC), 2004/180/EG (according to the latest edition)

- Low Voltage Directive 2006/95/EG (according to the latest edition)

Satisfies the following harmonised 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 catalogue in force in the Netherlands.

De Lier, the Netherlands.

Date ……-……..-……

Signature of management or other authorized representative.

……

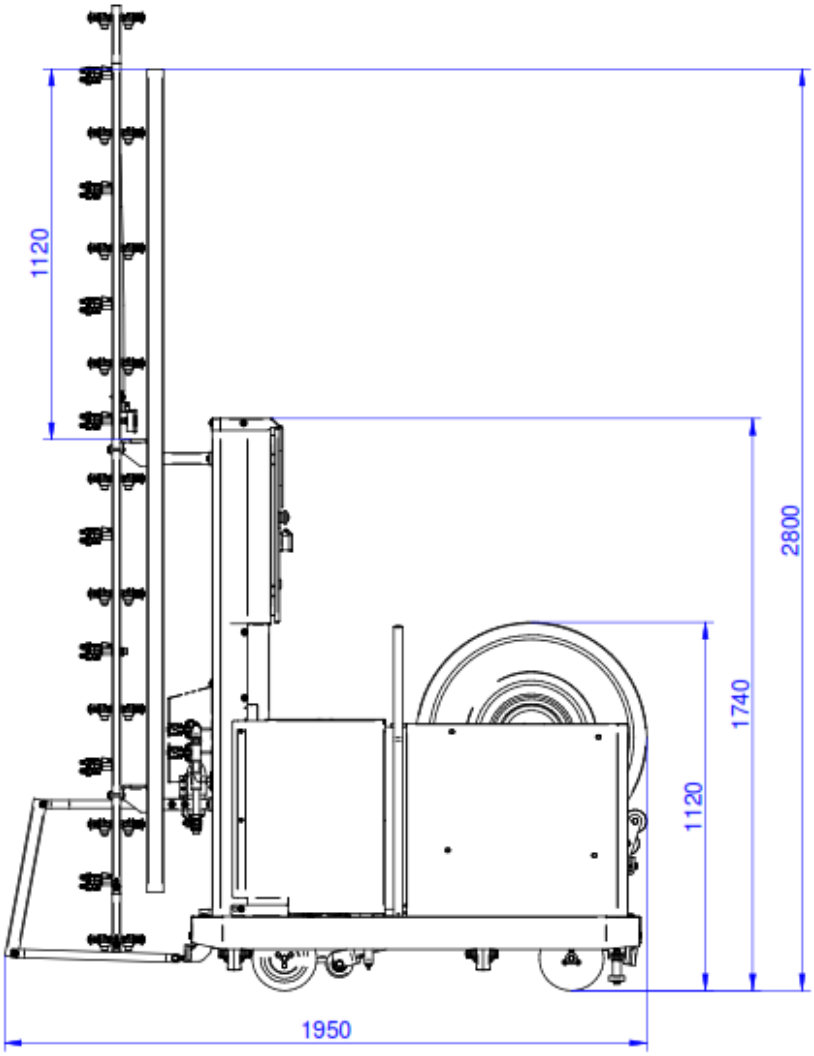
Appendix 1: Maintenance Logbook

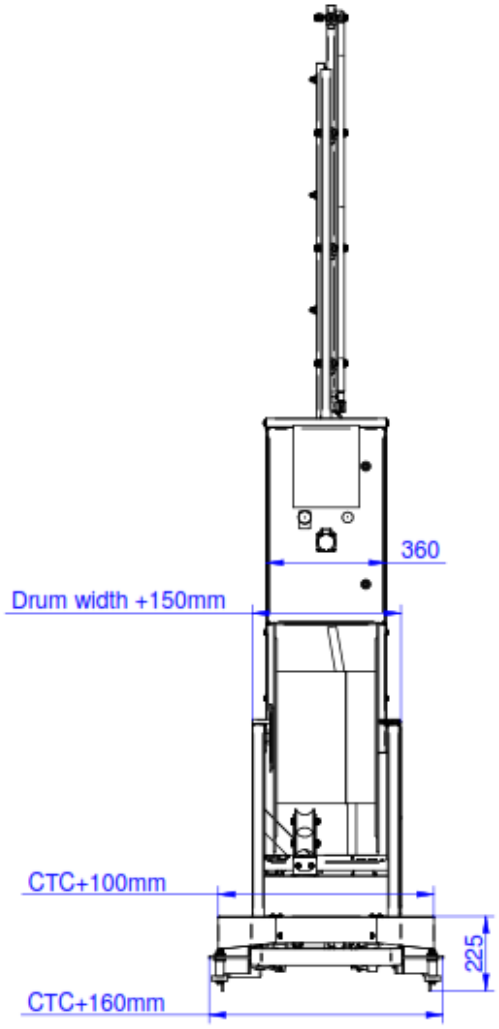
Please outline repairs and/or maintenance carried out on the form below.

Type: 1500XXX	***BeMatic Meto SW* Automatic Spray Trolley touch screen**	**Serial no.: ……..**
Date:	**Description of repairs/maintenance**	**Name company/ technician**

Appendix 2: Technical drawings

Dimensions in mm.





Appendix 3: Battery safety sheet

Battery recommendations
The following chapter provides recommendations for, safety and maintenance.

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)**

Recharge "during operation!" before the BATTERY STATUS screen indicates 50% discharge should be avoided. Always try to match the approximately 10% discharge status. Charge a discharge battery always straight on, this will increase the life span considerably. Therefore, check the acid gravity at least every month with a hydrometer (Fig. A + B and table below).

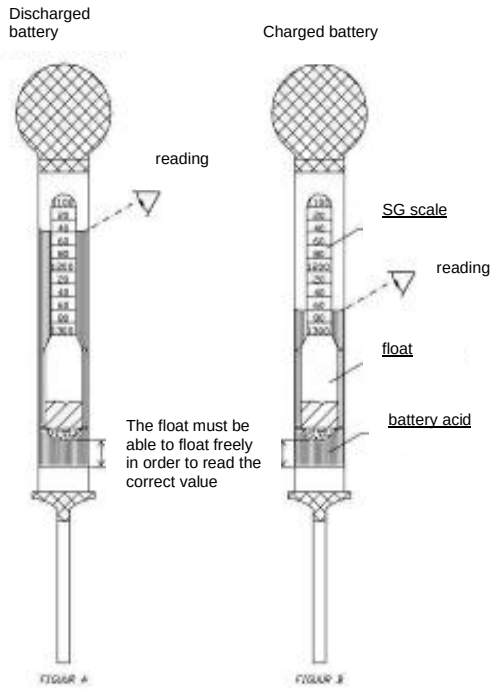
The specific gravity of a fully charged battery should be 1280 g/l:

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

Before charging, switch off the *BeMatic Meto SW* with the emergency 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.



When charging batteries, do not make repairs to the *BeMatic Meto SW,* nor carry out cleaning or any other activities.
Turn off everything that consumes electricity before removing the batteries - this reduces the possibility of creating sparks.
Always disconnect the earth cable (-) first when removing the batteries. When reinstalling the batteries, connect the earth cable (black) last.
WARNING!
Always connect the positive terminal (+ = red) to the positive pole and the negative terminal (- = black) to the negative pole on the battery.

Battery fluid is corrosive - avoid contact with clothing, skin, and eyes.
Wash battery acid splashes on clothing or skin immediately with soap and water - thereafter thoroughly rinse in running water.
Any acid splashes to the eyes must be rinsed for at least 5 minutes in clean water and a doctor consulted immediately!

INSTRUCTIONS TRACTION BLOCKS

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

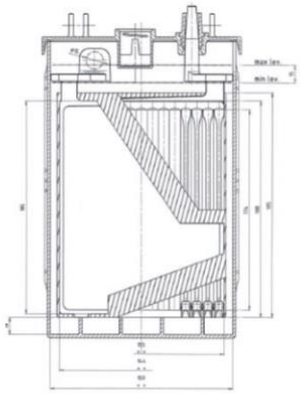
Weekly maintenance EW159T:

- 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 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
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I : www.berghortimotive.nl

MIDAC accumulatori ENERGECO	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.

Appendix 4: Spray nozzle specifications

Cleaning and sent out from the spray nozzles EN-V1

Avoid clogging:
Clean after each spray activity the pipes, filters and nozzles with clean water. The flow and flushing prevents residues accumulate resources. Without rinsing there is a risk of clogging in the cap and precipitate on the outside of the nozzle. This can cause an abnormal spray pattern.

Check before spraying the nozzles with clean water for obstructions.

Maximum pressure on the spray boom is 15 bar!

Spray nozzle table TeeJet

	Pressure	Send out Ltr / min
8001 orange	4	0.46
	5	0.51
	6	0.56
	7	0.60
	10	0.72
	20	1.00
80015 green	4	0.68
	5	0.75
	6	0.82
	7	0.88
	8	0.94
	9	1.00
	10	1.04
	11	1.10
	12	1.15
	13	1.19
	14	1.23
	15	1.28
	16	1.32
8002 yellow	4	0.90
	5	1.01
	6	1.10
	7	1.18
	8	1.26
	9	1.33
	10	1.40
	11	1.47
	12	1.53
	13	1.59
	14	1.65
	15	1.70
	16	1.75
8003 blue	4	1.37
	5	1.52
	6	1.67
	7	1.80
	8	1.93
	9	2.04
	10	2.15
	11	2.25
	12	2.35
	13	2.45
	14	2.54
	15	2.63
	16	2.72

Empas spraying booms

Empas position nozzle with diaphragm valve and normal filter.

Façade nozzle without diaphragm valve, which is why it contains a self-closing filter.

What is the difference between a diaphragm valve in a position nozzle and a self-closing filter in a façade nozzle?

- A position nozzle contains a diaphragm valve. Façade masts do not contain a diaphragm valve but rather a self-closing filter. Both have the same purpose: Both open and close at 0.7 bar to prevent leakage before or after.

Filter cleaning

- Filters behind the nozzles must be cleaned every 10 hours or so (based on contamination) by rinsing them under the tap. The pressure filter must be cleaned every time.

Checking and cleaning nozzles

- Check the nozzles every spray application; check whether the spray pattern is still correct. A poor spray pattern can be corrected by cleaning the nozzles with water and a toothbrush.

Explanation of bayonet fitting on position nozzles

Left nozzle black
Right nozzle chrome

- During normal spray application one first follows the tramline without spraying and then sprays (in reverse) on the way back. The nozzles are positioned so that spraying occurs alternatingly. The tips are rotated 15 degrees so the leaves are lifted, bottom of the leaf first. This way they are not sprayed towards each other and therefore do not affect the spray pattern.

Bleeding air from the spraying boom

- Spraying masts longer than 18 nozzles have an air bleed valve (see figure). Open the valve to bleed out air. On shorter spraying booms the uppermost tip can be opened to bleed air.

Appendix 5: 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 lifespan.
- 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 <u>not</u> do:

- clean the powder coating using an abrasive or burnishing cleaning agent.
- Never use cleaning equipment with an abrasive surface (steel wool, pot scourer, Never 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.