

Top Cleaner

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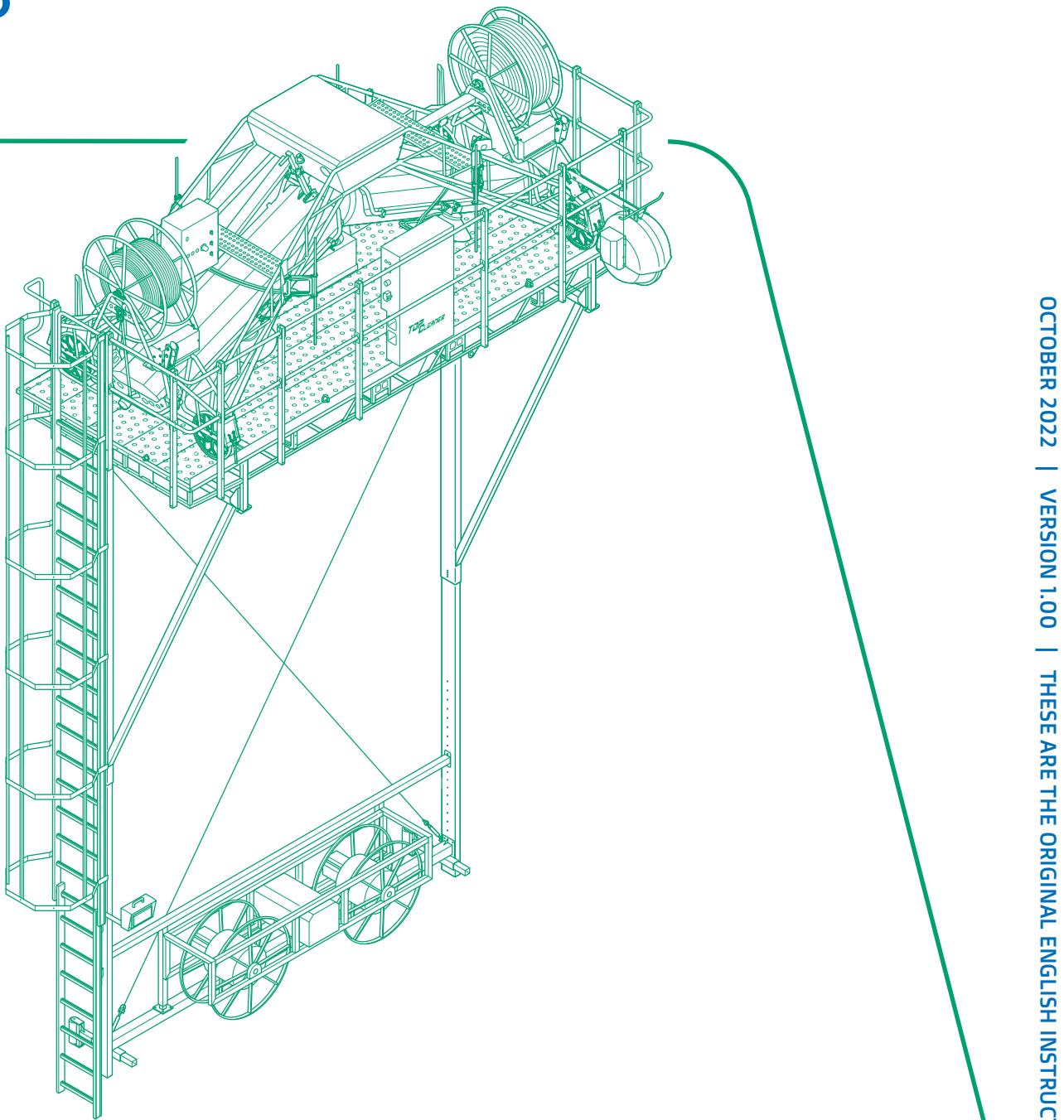


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1 ABOUT THIS HANDBOOK

1.1 DESCRIPTION OF THE USER

These instructions are intended for the end-user of the Top Cleaner. These instructions do not include installation of the machinery. Installation shall only be done by the manufacturer or by a specialist designated by the manufacturer. The end-user can be described as each person who interacts directly with the machinery. The end-user typically includes, but is not limited to:

- Maintenance personnel or technicians
- User
- Dismantling personnel

All use of the machinery shall only be carried out by an authorized and a properly qualified and skilled person of 18 years or older, who:

- Has read and understood this manual
- Is familiar with operating similar equipment
- Knows how to control this machinery
- Is aware of all possible dangers and acts accordingly
- Is trained and authorized to work at heights
- Has a spraying license, if applicable

The required maintenance and/or inspection work as stated in this user manual is allowed by the aforementioned persons, unless clearly indicated when this is not allowed. Exceptions to this are the supplied lifting and climbing materials and personal protective equipment. These shall always be inspected and certified by approved companies/ authorities.

1.2 PURPOSE OF THESE INSTRUCTIONS

Thank you for purchasing this machinery. The purpose of this document is to make you familiar with the installation and use of the Top Cleaner, so that you can safely operate it as an end-user. This documentation should therefore be regarded as an integral part of the machinery.

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Van der Waay nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information that is contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

Furthermore, the manufacturer reserves the right to revise this publication at any time without incurring an obligation to notify any person of the revision. The content of these instructions is constantly monitored and, where necessary, modified. However, inconsistencies between these documents can not be excluded. No guarantee is therefore given with regard to the completeness of these instructions. All images in this document are for illustrative purposes only.

1.3 RETAINING INSTRUCTIONS



IMPORTANT

READ CAREFULLY BEFORE USE

KEEP FOR FUTURE REFERENCE

Read and understand this manual and its safety instructions before using this machinery. Failure to do so can result in serious injury or death.

Follow all the instructions. This will avoid fire, explosions, electric shocks or other hazards that may result in damage to property and/or severe or fatal injuries.

The machinery shall only be used by persons who have fully read and understand the contents of this user manual.

Ensure that each person who uses the machinery has read these warnings and instructions and follows them.

Keep all safety information and instructions for future reference and pass them on to subsequent users of the machinery.

The manufacturer is not liable for cases of material damage or personal injury caused by incorrect handling or non-compliance with the safety instructions. In such cases, the warranty will be voided.

1.4 CONVENTIONS USED IN THIS MANUAL

The following style conventions are used in this document:

Bold

Names of machinery elements, commands, options, programs, processes, services, and utilities

Names of interface elements (such as windows, dialog boxes, buttons, fields, and menus)

Interface elements the user selects, clicks, presses, or types

Italic

Publication titles referenced in text

Emphasis (for example a new term)

Variables

1 ABOUT THIS HANDBOOK

1.5 EXPLANATION OF SAFETY WARNINGS

DANGER

"**DANGER**" indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury

WARNING

"**WARNING**" indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION

"**CAUTION**" indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE

"**NOTICE**" indicates information considered important, but not hazard-related.

1.6 OBTAINING DOCUMENTATION AND INFORMATION

This is the original English user manual. Manuals in other languages are available upon request. The latest version of the documentation as well as spare parts are available at the following address or can be ordered by email:

<https://portal.vdwaay.nl/en/shop> | salesteam@vdwaay.nl

For inquiries, information, technical assistance or any other questions or feedback, please contact us:

Van der Waay B.V.
Finlandlaan 2
2391 PV Hazerswoude
The Netherlands
Tel.: +31 (0) 172 210311
info@vdwaay.nl

1.7 OTHER DOCUMENTATION

Besides this documentation, the below documentation is supplied with the machinery and is available upon request. Always consult these documents as well, before using the machinery.

- *Ixon keepgo manual* - Installation manual for remote access and connection via app.
- *Manual Dosatron D3* - Dosatron dosing pump owner's manual.
- *Comet piston pump user manual* - Comet high pressure pump instructions.
- Installation and user instructions Top Cleaner Spray Boom.

1.8 WARRANTY

The limited warranty covers 24 months after the date of delivery. This warranty is limited to materials only. Any shipping costs are the responsibility of the owner of the machinery.

If requested, the defective part must be sent to the manufacturer within two weeks.

The warranty will be void in the following cases:

- Normal wear
- External force
- Improper maintenance
- Failure to comply with these installation and user instructions
- Unskilled and incorrect usage
- Damage caused by lightning
- Damage caused by freezing
- Damage caused by severe weather
- Modifications that have not been carried out or approved by the manufacturer

2 SAFETY

2.1 SAFETY INSTRUCTIONS

DANGER

Read and understand this manual and its safety instructions before using the machinery.

Failure to do so can result in serious injury or death.

2.1.1 Safety instructions related to the intended use and reasonably foreseeable misuse

- The machinery shall only be used for applications as described by the manufacturer. All other applications are unprofessional and considered dangerous. The manufacturer cannot be held liable for damage resulting from errors, unintended or unprofessional use of the machinery.
- The machinery is not intended for use by persons (including children) with restricted physical, sensory or intellectual capability or lack of experience and/or knowledge.
- Only use the machinery within the specified performance limits as described in these instructions.
- The width of the wheelbase of the machinery shall fit the width between two gutters of the greenhouse it is being used on.

2.1.2 Safety instructions related to personal protective equipment

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.

2.1.3 Safety instructions related to transporting and lifting

- Always make sure that the machinery and any of its parts are fixed during transportation, so there is no possibility of sudden movements or instability.
- Lifting works shall only be carried out by authorized persons.
- When lifting the machinery, use only approved lifting tools with sufficient lifting capacity.
- Always carry out lifting with more than one person, even when using lifting tools.
- Only use a certified four-way webbing lifting sling with a minimum length of 3 meters (10 feet) and a minimum capacity of 4 x 1000 kg (4 x 2200 lbs). Only lift the machinery by the designated lifting points.
- Always use the lifting points when lifting the machinery, to avoid the risk of tilting.
- Make sure that you carry out lifting works on a flat and hardened surface. Apply road plates if necessary.
- Make sure that there are no persons within the turning range of the crane during lifting works.
- Never stand directly underneath the machinery during lifting tasks and always be aware of possible falling objects. Failure to do so can result in serious injury or death.
- Check the lifting tools for damage before lifting. If there is any visible damage, do not lift the machinery.
- Do not lift the machinery with wind speeds above 17 m/s (38 mph).

2.1.4 Installation safety instructions

- Installation and commissioning shall be carried out by a properly qualified and skilled installer with due observance of the applicable rules and legislation. The installer is responsible for employing skilled and qualified personnel.
- Inform yourself properly with respect to the prescribed safety devices on the basis of the EU directives and local regulations on working at heights. All local regulations must be followed.
- Consult available construction reports, certificates, etc. to make sure that the greenhouse rail, gutters and end-gutter protection are of sufficient strength to carry the weight of the machinery and everyone and everything on the machinery. Refer to the type identification plate for the weight of the machinery. Contact your greenhouse builder in case of any doubts.

2.1.5 Electrical safety instructions

- Only a qualified electrician shall carry out the electrical installation and the initial activation.
- Only connect the machinery to a grounded socket with earth leakage protection that is connected in accordance with the legal guidelines.
- Check the machinery and the cables for damage before electrical installation. If there is any visible damage, a strong odor or excessive heating of components, disconnect the power supply immediately and do not use the machinery.
- Protect disconnected plugs against rain and keep them away from moisture.
- Only use extension cords of the same quality as the original ones and with a diameter of at least 4mm² (12 AWG).

2.1.6 Safety instructions prior to the use

- Make sure that the combined weight of the machinery standing in the greenhouse gutters, everyone and everything on the machinery does not exceed the maximum allowed gutter load.
- Make sure that all greenhouse gutters are provided with proper end-gutter protection. If these protections are not present and/or properly attached, the machinery moving in the greenhouse gutters can fall off the greenhouse.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.
- Make sure that the supplied foundation extensions are attached to both side gables of the greenhouse if the greenhouse does not have a bottom rail. If the lower wheels of the platform hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that the bottom rail extends at least 50 cm (20 inch) beyond both side gables of the greenhouse. If the platform's lower wheels hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that there is a minimum of 20 cm (8 inch) of free space between the ground and the bottom of the lower wheels at all times.
- Make sure that the bottom rail is immovably secured along the entire length of the greenhouse gable and is not bent.
- Make sure that the end of rail switches on the left and right side of the platform are adjusted and working correctly (automatic control only).
- Make sure that the machinery can move freely alongside the greenhouse gable. Remove any obstacles that are in its way.
- Make sure that the machinery can move freely inside the greenhouse gutters. Remove any obstacles that are in its way.
- Make sure that all steel beams, angle irons, straps and cable ties that are used as transport protection are removed.
- Make sure that the windows of the greenhouse are closed and remain closed when using the machinery.

2 SAFETY

- Make sure that there is no-one inside the greenhouse where the machinery is in use. Depending on the situation, create a NO GO zone to ensure public safety.
- Before use make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that you know where the emergency stop buttons are located before operating the machinery.
- Make sure that a first aid kit is present on the machinery where people are working.

2.1.7 Safety instructions related to the use

- Do not exceed the maximum load of the machinery. Consult the type identification plate(s) for the maximum load.
- Do not exceed the maximum number of people allowed on the machinery.
- Be vigilant at all times and always be careful what you are doing. Do not use the machinery if you are lacking in concentration or awareness, or are under the influence of drugs, alcohol or medication. Even a moment of inattentiveness can lead to serious accidents and injuries when using the machinery.
- Beware of any moving or hinging parts of the machinery. Do not place any fingers or hands where they can get jammed.
- Never insert body parts between rotating parts of the machinery.
- The machinery is not intended to be used as a device to move persons.
- Do not use the machinery after an earthquake. Keep a safe distance from the greenhouse and machinery until they have been fully inspected by a qualified and trained person.
- Never use the machinery with wind speeds above 11 m/s (25 mph).
- Always anchor the van der Waay platform to the anchor plates when wind speeds above 17 m/s (38 mph) are expected. Remove the roof washer from the platform or securely strap it to the platform by fastening the four lifting points of the roof washer to the lifting points of the platform, with four ratchet straps.

- Never use the machinery at temperatures lower than 0.5 °C (31 °F).
- Do not use the machinery during thunderstorms and extreme weather conditions. Seek shelter in the event of an approaching thunderstorm or sudden weather deterioration.
- Remove accumulating snow on top of the machinery regularly to avoid exceeding the maximum allowed load of the greenhouse rail.
- In case of an accident, stop using the machinery and consult a doctor if necessary.
- Use a bright headlamp when working in the dark.
- When storing the machinery in an area with risks of whirlwinds, make sure that you properly store and/or anchor the machinery.
- Make sure that the anti-climb protection is put and locked on the ladder when there is no authorized personnel nearby.

2.1.8 Safety instructions related to working at heights

- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

2.1.9 Maintenance, repair and modification safety instructions

- All repair and modification tasks shall only be carried out by qualified and skilled persons. Only open or repair parts of the machinery when you know what you are doing. If you have any doubts, contact the manufacturer.
- All cleaning and maintenance tasks shall only be carried out by qualified and skilled persons. To ensure the operational safety of the machinery, regular maintenance shall be carried out by qualified persons in accordance with the manufacturer's instructions.
- Always shut off the machinery according to the LOCK OUT-TAG OUT method before performing any maintenance or repair work.
- Maintenance and inspection should be done on a frequent basis. If there is any visible damage, a strong odor or excessive overheating of components, stop using the machinery. Non-frequent maintenance shortens the activity and life span of the machinery and voids the warranty.
- Use only original accessories and spare parts. You can always order spare parts from the webshop <https://portal.vdwaay.nl/en/shop> or by sending an email to salesteam@vdwaay.nl.
- Alterations to the machinery and technical modifications are not permitted without written permission of the manufacturer. Failure to do so may result in damage to property and/or severe or fatal injuries and it will invalidate the warranty.

2.2 STRENGTH OF THE GREENHOUSE STRUCTURE

DANGER

- Consult available construction reports, certificates, etc. to make sure that the greenhouse rail, gutters and end-gutter protection are of sufficient strength to carry the weight of the machinery and everyone and everything on the machinery. Refer to the type identification plate for the weight of the machinery. Contact your greenhouse builder in case of any doubts.

Van der Waay recommends to only use this machinery on greenhouses of which the transport rail, end-gutter protection and greenhouse gutters are in accordance with the following standards and documentation:

- NEN-EN 13031-1 2020
- TNO report R02366 ppl AVAG rail
- TNO report 2014 R10342 gutter

Contact your greenhouse builder for more information on the structural integrity of your greenhouse.

2.3 ANCHOR POINTS AND FALL ARREST DEVICE

The platform has four anchor points and depending on the version of the machinery, a cage ladder or an open ladder with a fall arrest device is mounted. The roof washer has two anchor points.

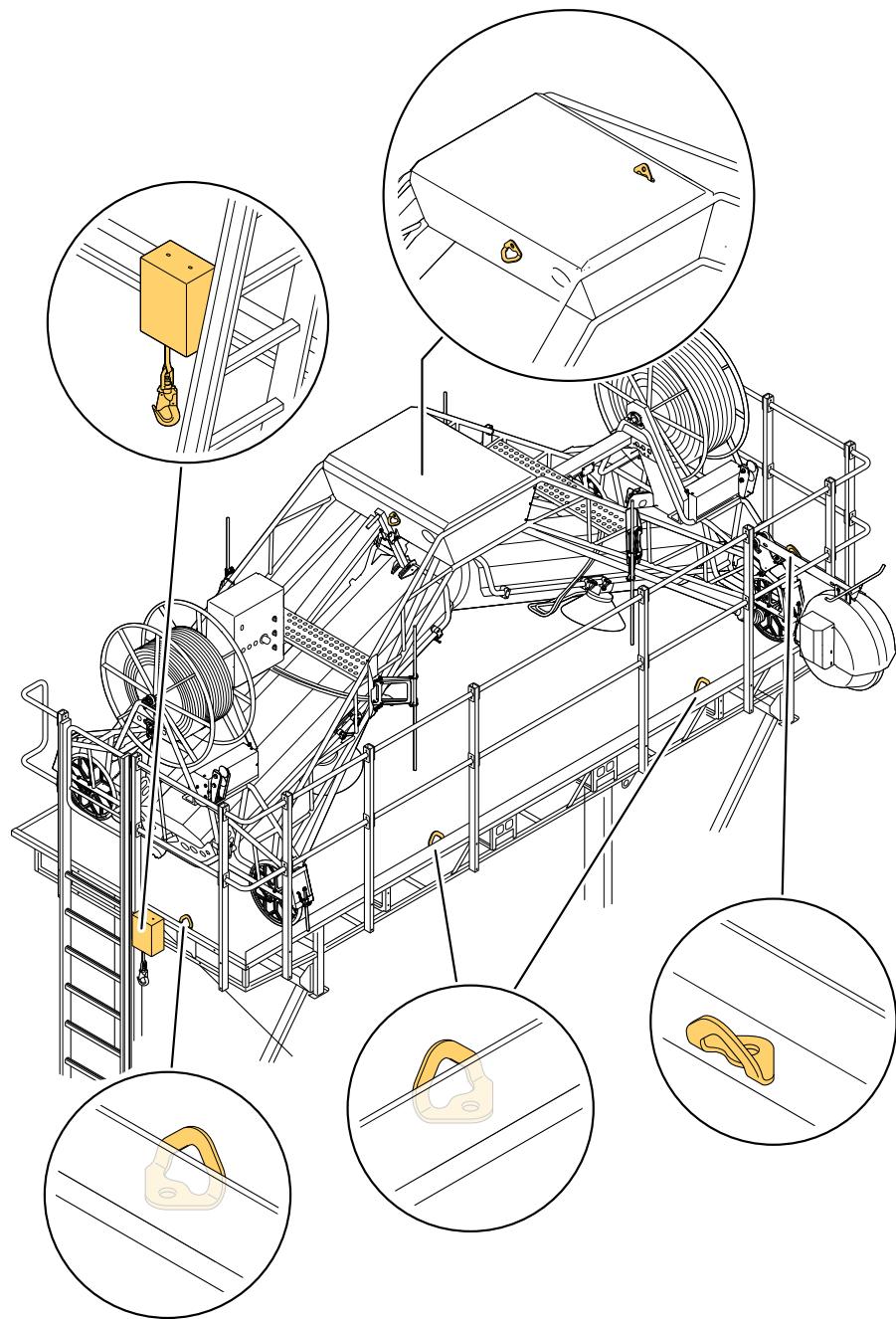


Fig. 1 Fall arrest device anchor points of the roof washer and platform

2.4 PLACING THE ANTI-CLIMB PROTECTION

NOTICE

- Depending on the version of the machinery, the bottom part of the ladder is made detachable. This hook-up ladder shall only be attached when a person needs to climb the platform. When the machinery contains a hook-up ladder the anti-climb protection is obsolete and therefore not included.

The anti-climb protection must be installed on the ladder when the machine is not in use. The anti-climb protection prevents unauthorized persons from entering the platform.

To place the anti-climb protection:

- Put the **anti-climb protection** on the **ladder**.
- Lock the **anti-climb protection** with the padlock.

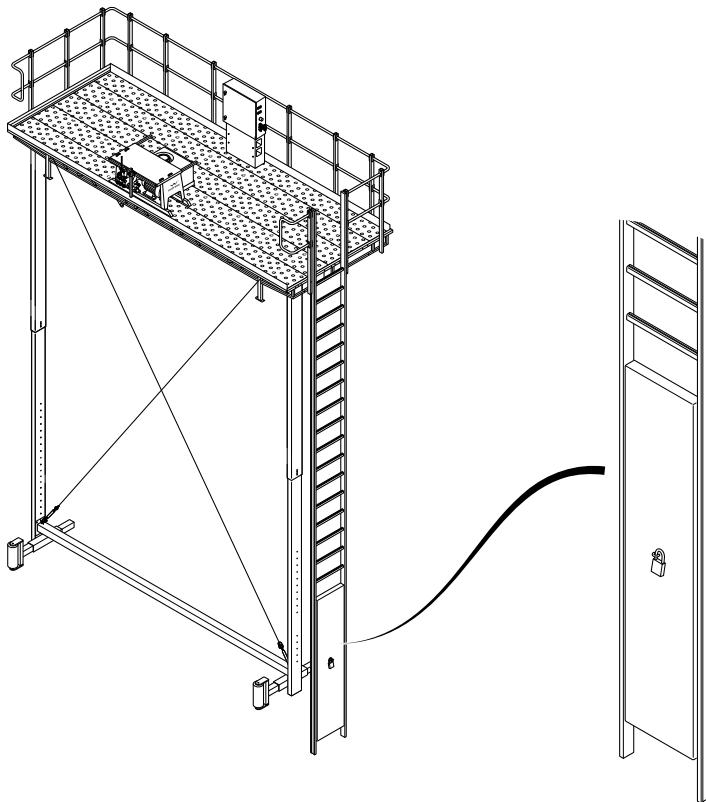


Fig. 2 Placing the anti-climb protection

2.5 STORM ANCHORING

⚠️ WARNING

- Always anchor the van der Waay platform to the anchor plates when wind speeds above 17 m/s (38 mph) are expected. Remove the roof washer from the platform or securely strap it to the platform by fastening the four lifting points of the roof washer to the lifting points of the platform, with four ratchet straps.

When a wind speed above 17 m/s (38 mph) is expected, the platform shall be anchored and remain anchored until the storm has passed.

To anchor the platform:

- Move the **platform** to the location of the anchor plates. Align the **legs** of the platform with the two anchor plates.
- Connect the ratchet strap with one end to an anchor plate and with the other end to the anchor point on one of the **legs** of the **platform**.
- Use the ratchet to tighten the strap until the strap is no longer slack.

NOTICE Make sure to not over tighten the strap to avoid warping of the legs.

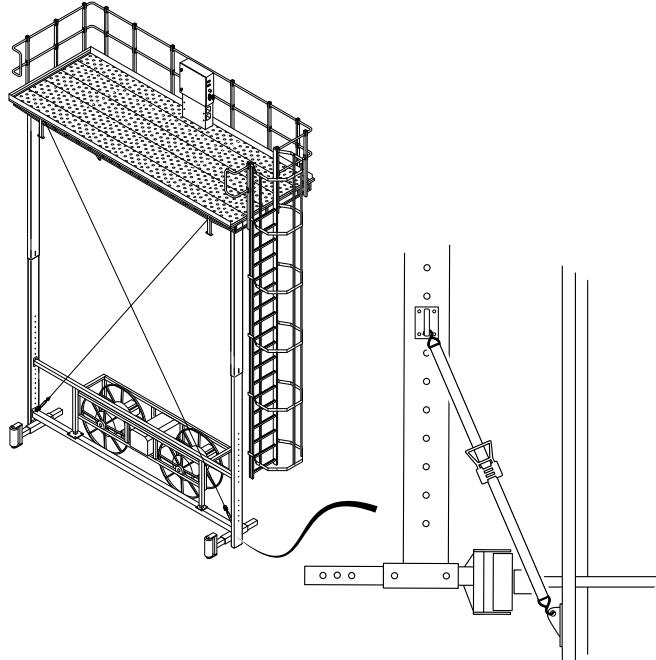


Fig. 3 Anchoring the platform

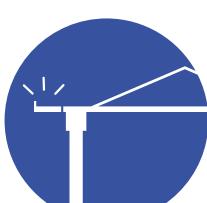
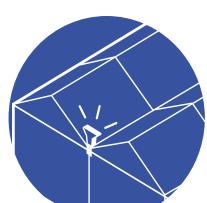
- Do the same with the other anchor plate and **leg** of the **platform**.

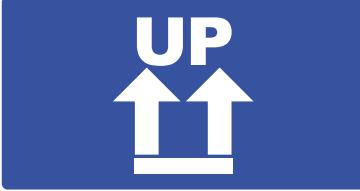
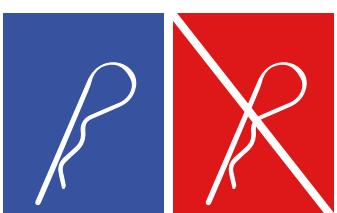
2.6 SYMBOLS AND SAFETY INFORMATION ON THE MACHINERY

Warning stickers are affixed to different parts of the machinery to warn the user about possible dangers when performing certain actions. The meaning of the warning stickers is explained in the table below. Depending on the version of the machinery, some of these stickers may not be present.

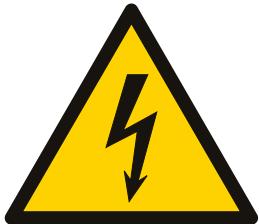
Sticker	Meaning
	Instructs to read the manual before use.
	Instructs to use safety footwear.
	Instructs to use a hard hat.
	Instructs to use an anchor point for one person when working at heights and indicates its location.
	Instructs to use a certified fall arrest device when working at heights.

2 SAFETY

	Instructs to use the lifting point(s) and indicates its location.
	Instructs to use the lifting point(s) and indicates its location.
	Instructs to use the forklift truck lifting points and indicates its location.
	Instructs to install properly mounted end-rail protection on both ends of the upper rail of the greenhouse before using the machinery.
	Instructs to install properly mounted end-gutter protection on all the gutters of the greenhouse before using the machinery.
	Instructs to close the windows before the roof washer enters the greenhouse roof.

	<p>Instructs to lock the anti-climb protection with the padlock.</p>
	<p>Instructs to use the LOCK OUT-TAG OUT procedure during maintenance and/or repair works.</p>
	<p>Instructs to position the lower beam correctly.</p>
	<p>Instructs to secure the lower beam with retaining clips properly.</p>
 Energol SHF-HV 32	<p>Instructs to (re)fill the oil tank of the hydraulic pump with Energol SHF-HV 32 oil only.</p>
	<p>Warns that all steel beams, angle irons, straps and cable ties that are used as transport protection must be removed.</p>

2 SAFETY

	Warns that the machinery can start automatically.
	Warns for high voltage.
	Warns that the platform leg is extended to its maximum length.
	Warns on how the fall protection shall be used safely.
	Warns and instructs that at expected wind speeds above 17 m/s (38 mph), the platform shall be anchored to the greenhouse.
	Forbids to ride on the roof washer.

	<p>Forbids to step on the roller brush cover.</p>
	<p>Forbids unauthorized persons to enter the platform.</p>
 <div data-bbox="420 994 627 1066" style="border: 1px solid black; padding: 5px; text-align: center;"> \downarrow 0.5°C, 31°F </div>	<p>Forbids to use the machinery below 0.5 °C (31 °F).</p>
	<p>Forbids to use the machinery during a thunderstorm.</p>
 <div data-bbox="420 1556 627 1628" style="border: 1px solid black; padding: 5px; text-align: center;"> \uparrow 11 m/s, 25 mph </div>	<p>Forbids to use the machinery at wind speeds above 11 m/s (25 mph).</p>

3 DESCRIPTION OF THE MACHINERY

3.1 INTENDED USE

The Top Cleaner is intended to be used for:

- Mechanically brushing of the outer glass and gutters of greenhouse roofs
- Applying a temporary protective coating to the roof by means of optional Top Cleaner Spray Booms.

The Top Cleaner is not intended to be used:

- As a device to move persons or objects
- To conduct reparations to the greenhouse roof
- As a snowplow
- At temperatures lower than 0.5°C (31°F)
- At wind speeds more than 11 m/s (25 mph)

Only use the machinery within the specified performance limits. The machinery must only be used according to the instructions as described in this manual. All use other than described in this manual is seen as unintended use. The machinery shall be used with original accessories and components only.

3.2 GENERAL DESCRIPTION OF THE MACHINERY

The machinery consists of a platform and roof washer with which the glass and the gutters of greenhouses can be cleaned. The roof washer runs through the greenhouse gutters on its four wheels. The roof washer is driven by a hydraulic pump, which is driven by an electric motor. The electric motor is powered by a cable that is mounted on a reel and automatically rolls up and unrolls.

The roof washer runs automatically to the end of the rooftop, stops and returns to the platform.

The required water is supplied via a water hose, which is mounted on a second reel that automatically rolls up/unrolls.

The roof washer can optionally be equipped with an optional spray boom with which the greenhouse roof can be provided with a temporary protective coating.

3 DESCRIPTION OF THE MACHINE

3.3 MACHINERY ELEMENTS

3.3.1 Main elements

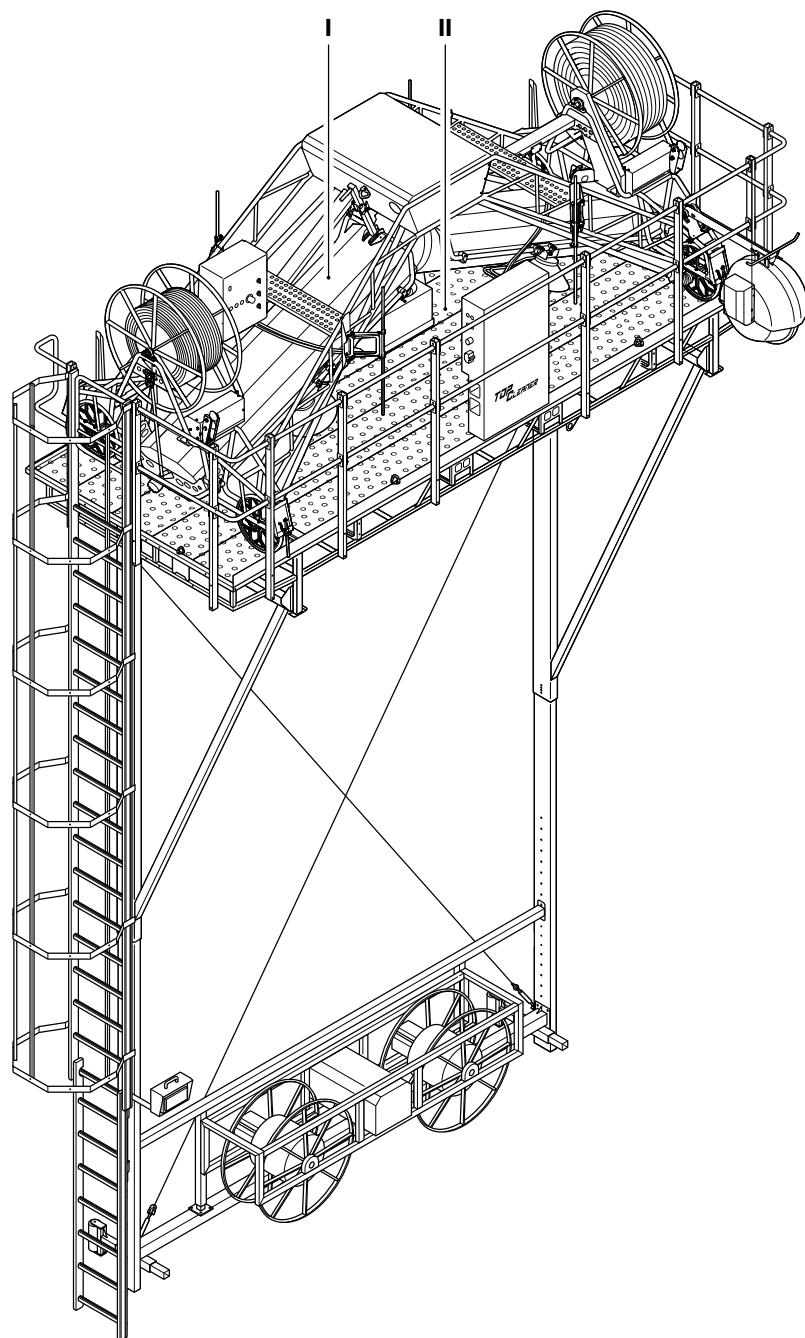


Fig. 4 Main elements Top Cleaner

i. Roof washer

ii. Platform

3.3.2 Important parts of the roof washer (I)

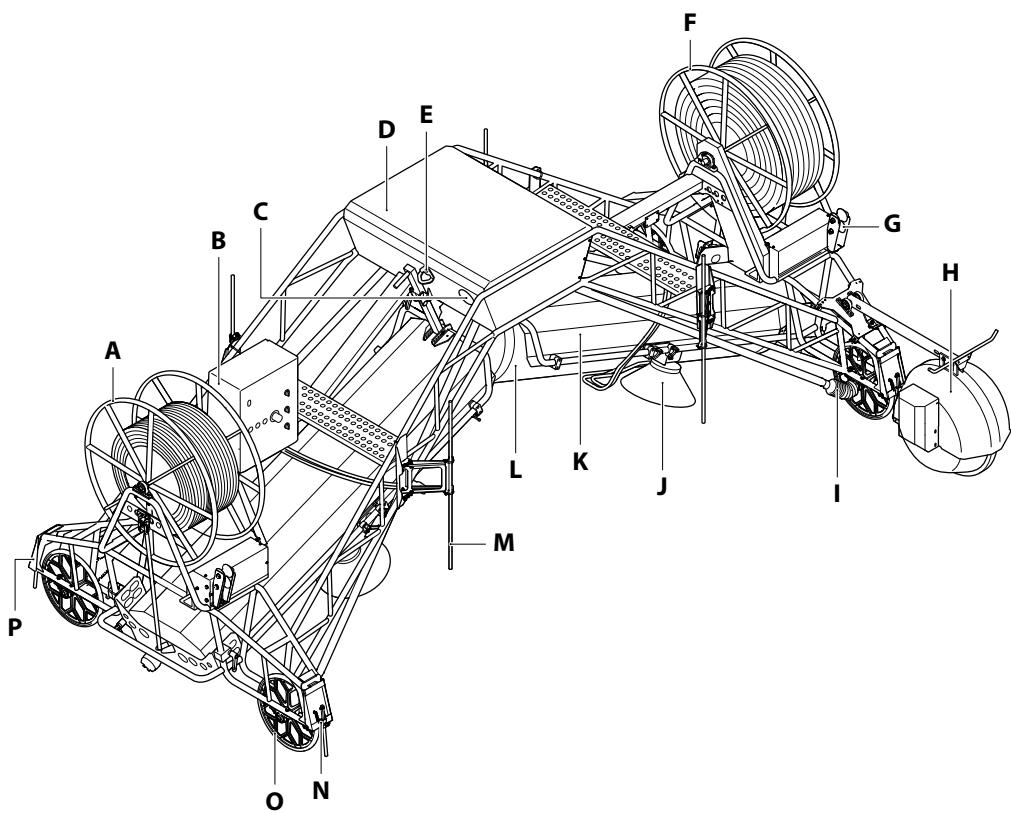


Fig. 5 Important parts roof washer

A. Cable reel	I. Drive shafts
B. Control cabinet roof washer	J. Disc brushes for window edge (optional)
C. LED lamps	K. Roller brush cover (optional)
D. Upper compartment with hydraulic unit	L. Roller brushes
E. Anchor points (yellow)	M. Air vent detection switches (optional)
F. Hose reel	N. Wheel switches rear
G. Reel guides (optional)	O. Aluminum wheels
H. Gutter brush (optional)	P. Wheel switches front

3 DESCRIPTION OF THE MACHINE

3.3.3 Important parts of the platform versions (II)

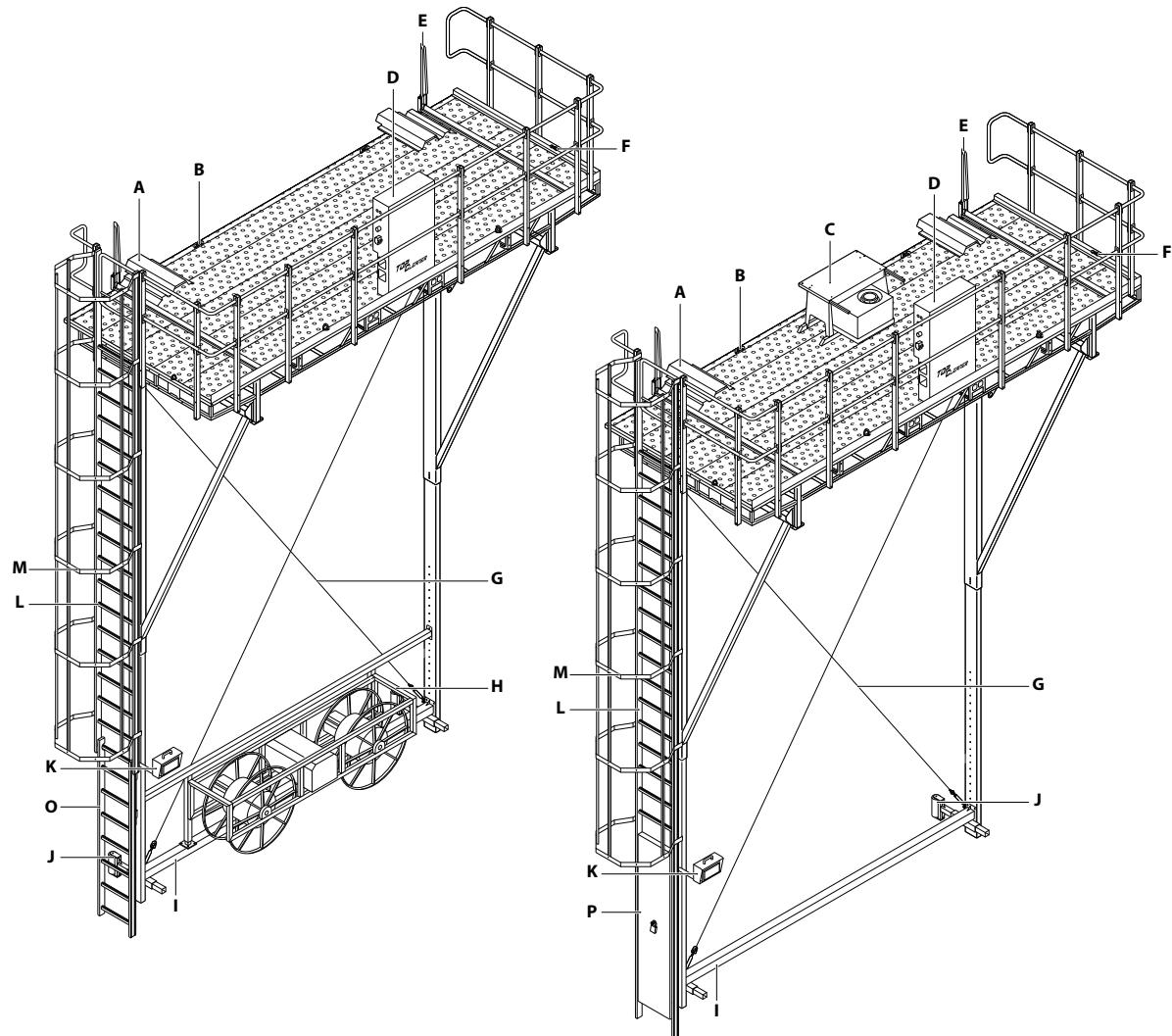
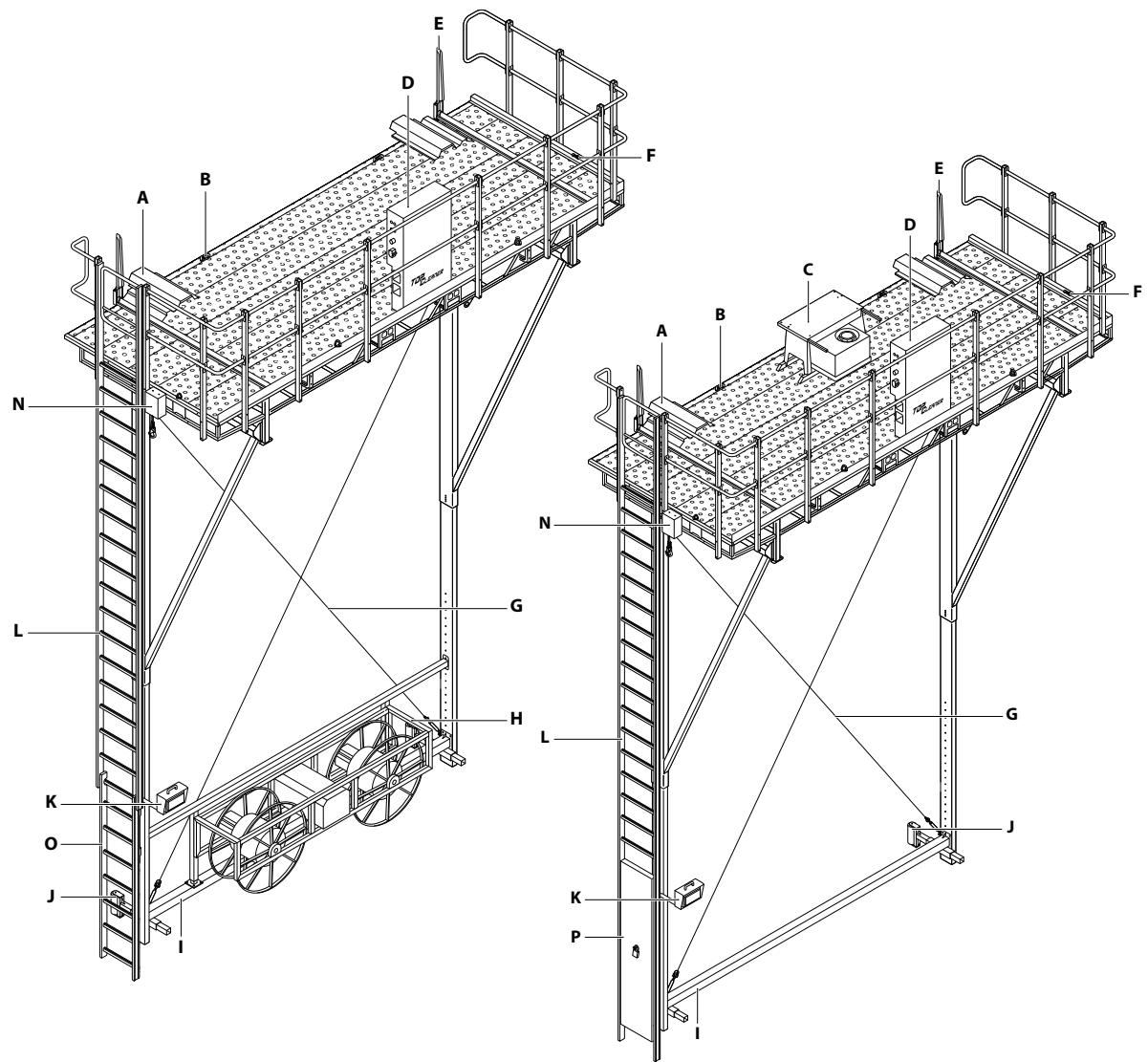


Fig. 6 Important parts platform in four versions

- A. Drive wheels
- B. Lifting points (red)
- C. Water pump with float tank
- D. Control cabinet platform
- E. Platform ramps
- F. Anchor points (yellow)
- G. Cross braces
- H. Hose- and cable reel
- I. Lower beam
- J. Lower wheels
- K. Operation display
(for automatic version only)
- L. Ladder
- M. Cage
- N. Fall arrest device
- O. Hook-up ladder
- P. Anti-climb protection



3 DESCRIPTION OF THE MACHINE

3.4 UNDERSTANDING CONTROLS AND INDICATORS

3.4.1 Remote control roof washer and platform

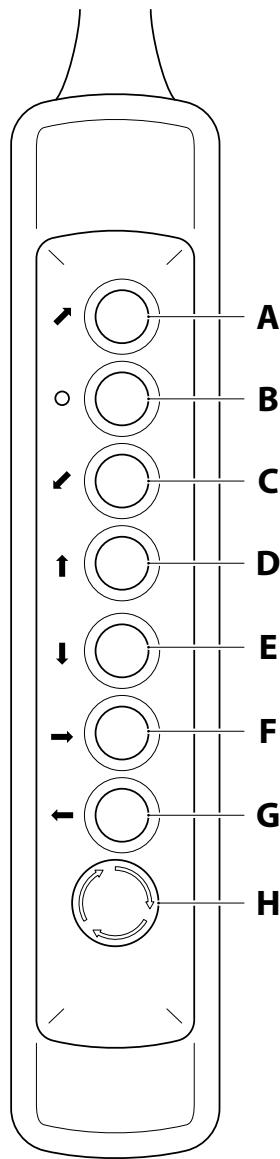


Fig. 7 Remote control roof washer and platform

A. Roof washer forward	E. Platform ramps down
B. Roof washer stop	F. Platform right
C. Roof washer backward	G. Platform left
D. Platform ramps up	H. Emergency stop button

3.4.2 Control cabinet roof washer

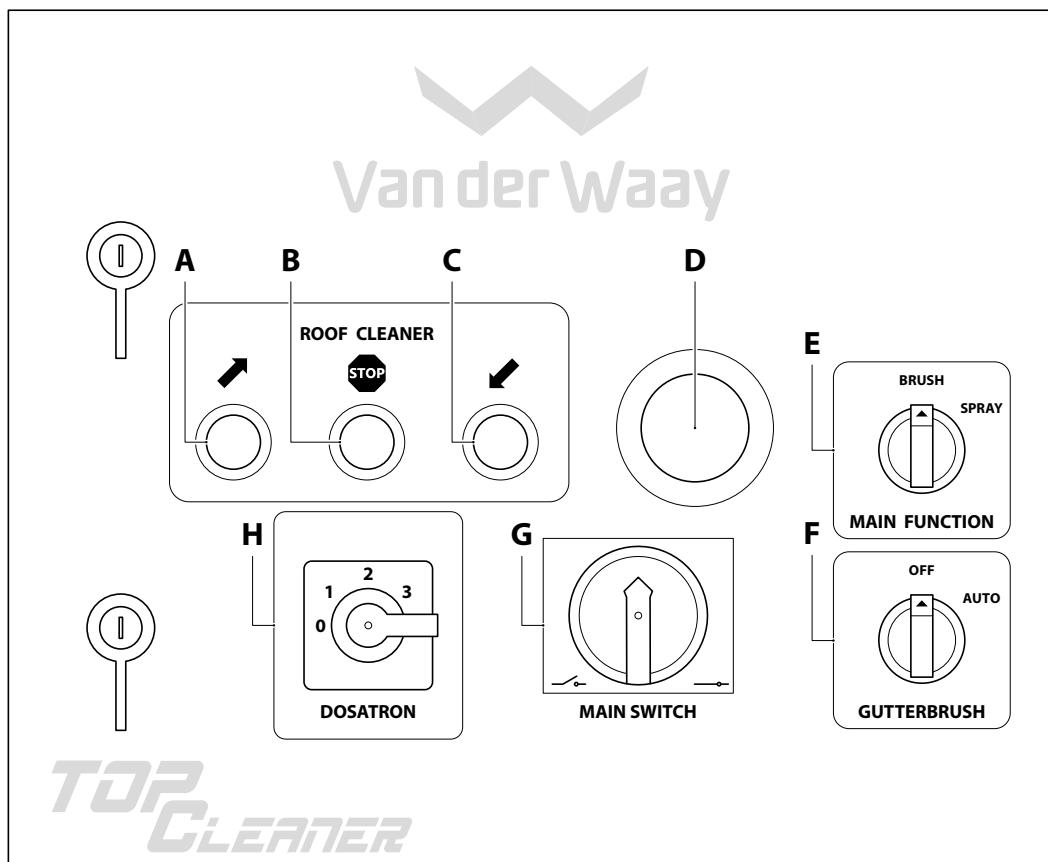


Fig. 8 Controls and indicators of the control cabinet roof washer

A. Roof washer forward	E. Main function
B. Roof washer stop	F. Gutter brush
C. Roof washer backward	G. Main switch
D. Emergency stop button	H. Dosatron settings

3 DESCRIPTION OF THE MACHINE

3.4.3 Control cabinet platform

Depending on the version of the machinery, one out of the following four platform control cabinets has been installed.

3.4.3.1 Control cabinet platform manual EU

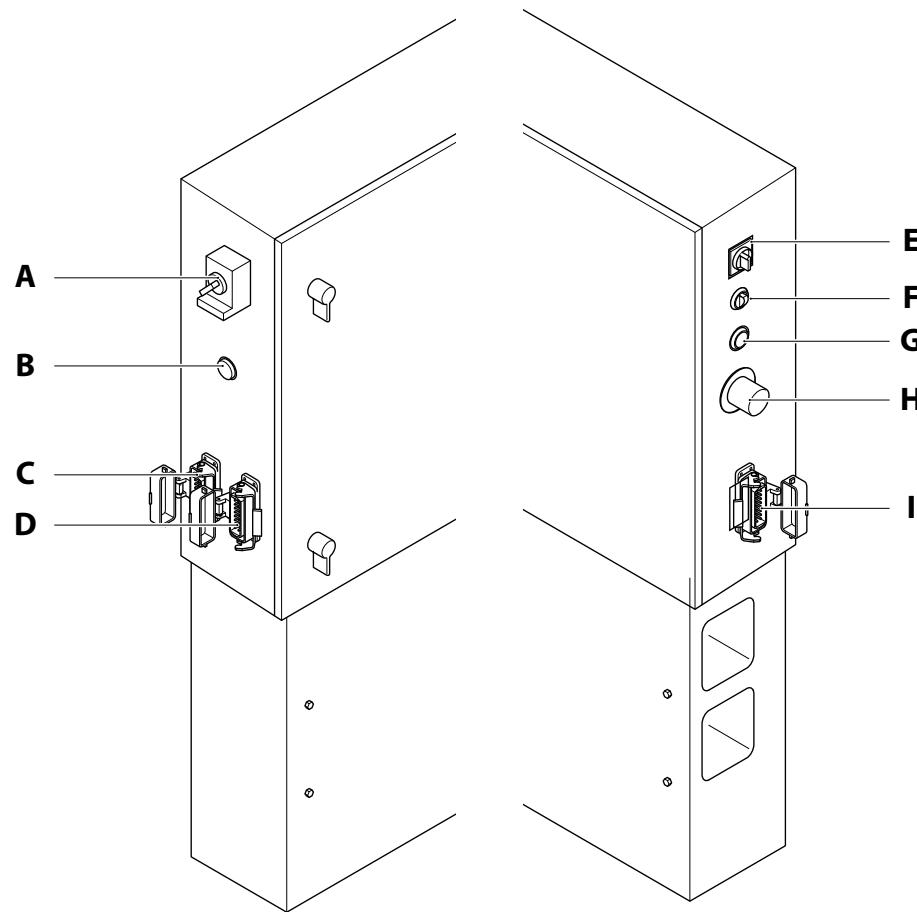


Fig. 9 Controls and indicators of the control cabinet platform manual EU

A. Main switch 1S0	F. Switch 15S3
B. Light 10H5	G. Button / light 12S6/12H2
C. Connector 1X0	H. Emergency button 11S2/1
D. Connector 1X8	I. Connector X5
E. Switch 8S1	

3.4.3.2 Control cabinet platform manual UL/CSA

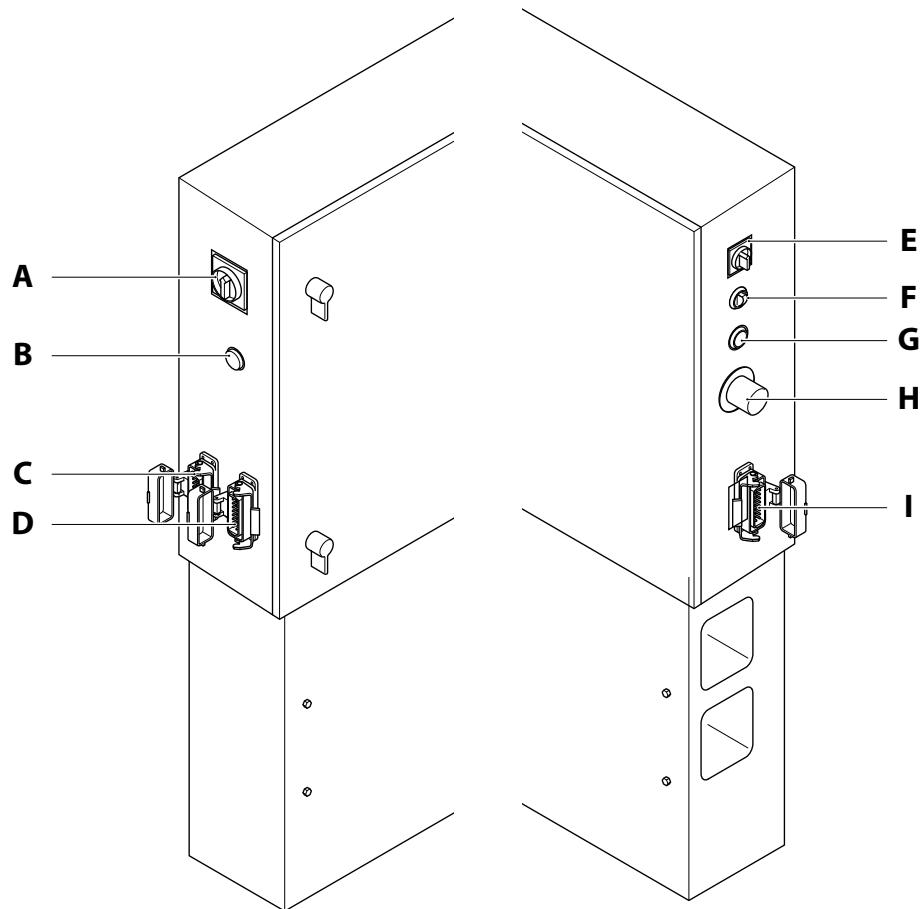


Fig. 10 Controls and indicators of the control cabinet platform manual UL/CSA

A. Main switch 1S0	F. Switch 15S3
B. Light 10H5	G. Button / light 12S6/12H2
C. Connector 1X0	H. Emergency button 11S2/1
D. Connector 1X8	I. Connector X5
E. Switch 8S1	

3 DESCRIPTION OF THE MACHINE

3.4.3.3 Control cabinet platform automatic EU

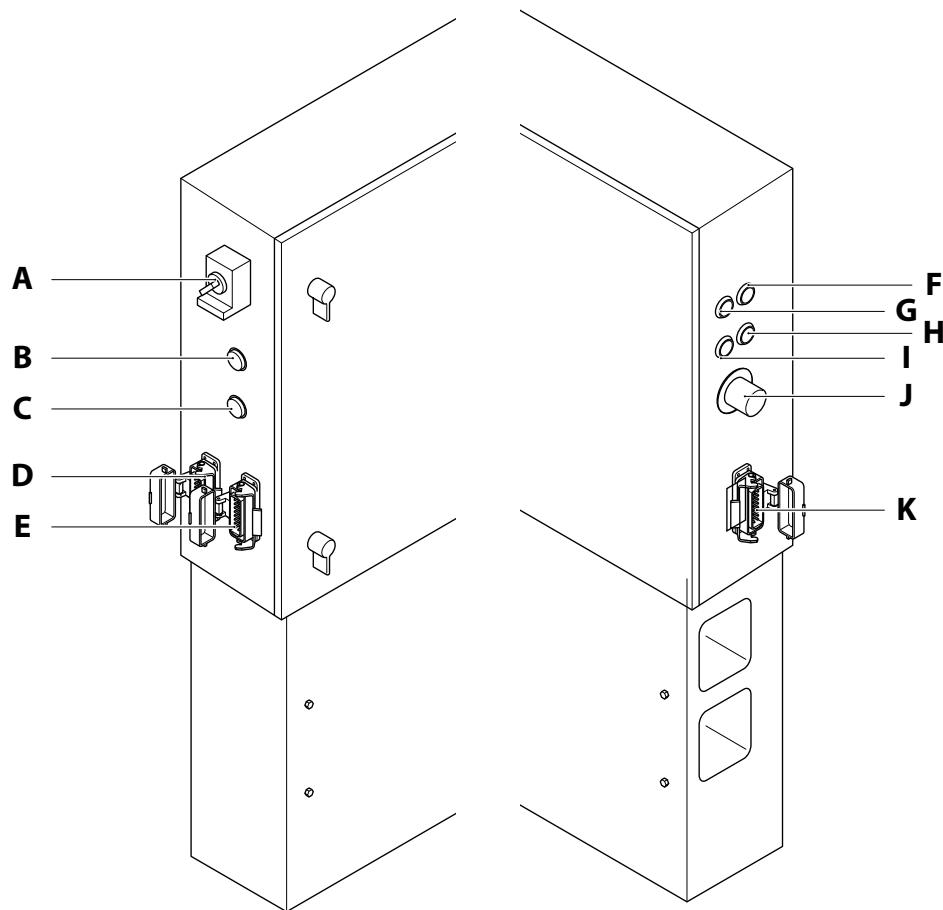


Fig. 11 Controls and indicators of the control cabinet platform automatic EU

A. Main switch 1S0	G. Button / light 16S3/12H2
B. Light 17H9	H. H.Button / light 17S1/17H8
C. Buzzer 15H6	I. Button / light 16S7/17H6
D. Connector 1X0	J. Emergency button 11S2/1
E. Connector 1X8	K. Connector X5
F. Button / light 16S4/12H4	

3.4.3.4 Control cabinet platform automatic UL/CSA

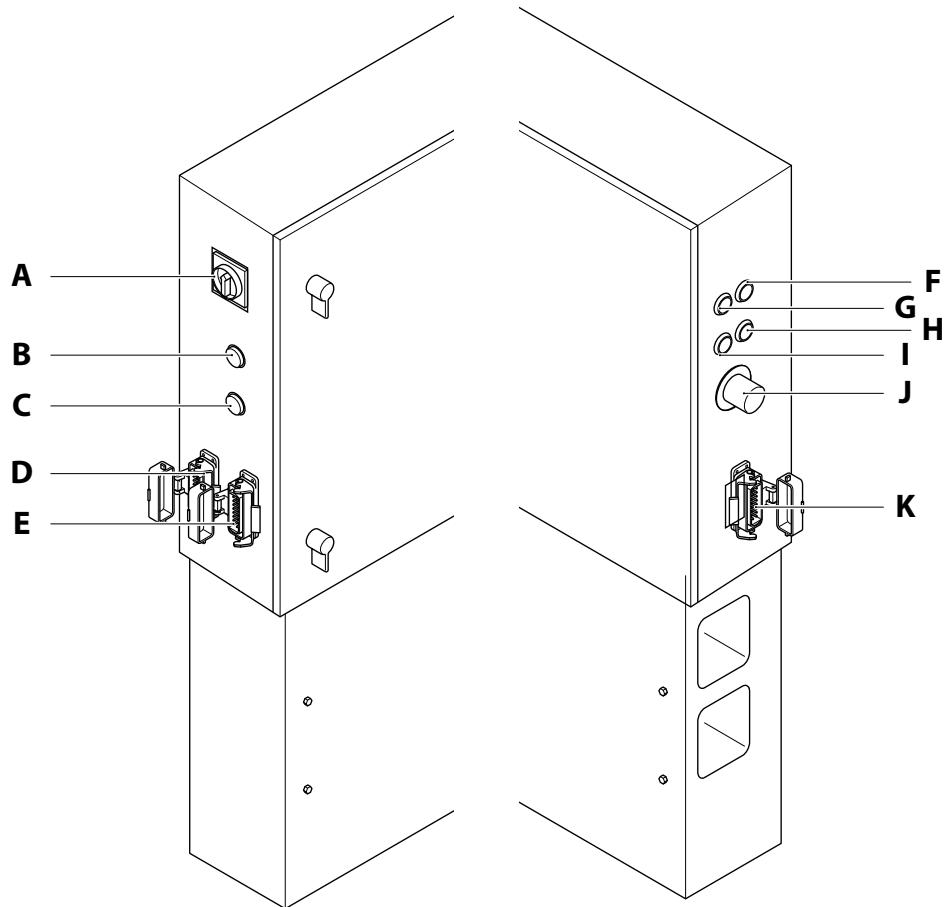


Fig. 12 Controls and indicators of the control cabinet platform automatic UL/CSA

A. Main switch 1S0	G. Button / light 16S3/12H2
B. Light 17H9	H. Button / light 17S1/17H8
C. Buzzer 15H6	I. Button / light 16S7/17H6
D. Connector 1X0	J. Emergency button 11S2/1
E. Connector 1X8	K. Connector X5
F. Button / light 16S4/12H4	

3 DESCRIPTION OF THE MACHINE

3.4.3.5 Interface cabinet

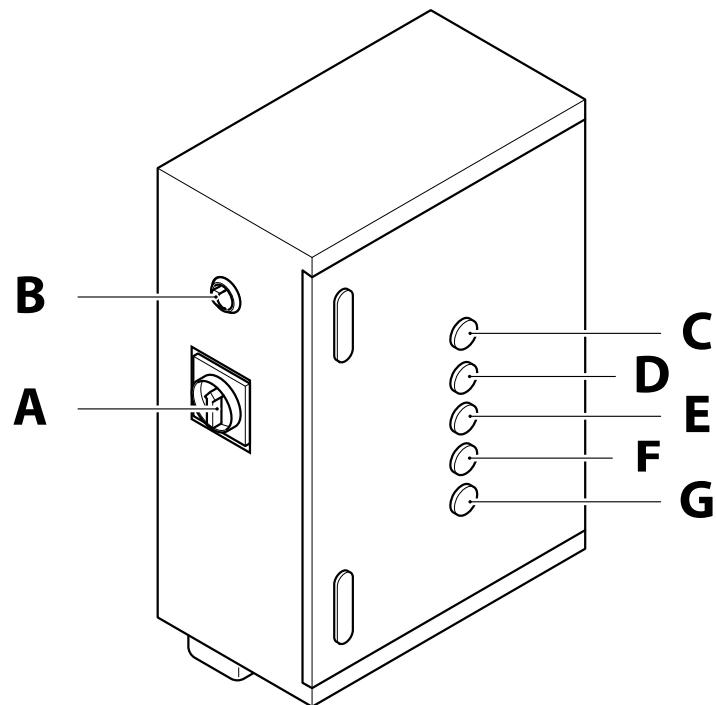


Fig. 13 Controls and indicators of the interface cabinet

A. Main switch 1S1	E. Light 18H6
B. Switch 12S2	F. Light 18H8
C. Light 18H2	G. Light 18BH2
D. Light 18H4	

3.5 EXPLANATION OF VISUAL AND AUDITORY SIGNALS

Ref.	Signal	Meaning
A	Light flashes red	Moving between rooftops. Emergency stop. Machinery in interruption mode. Consult 9.2 <i>Troubleshooting of the manual version or</i> <i>9.4 Troubleshooting of the automatic version</i>
	Lights on green	Roof washer moves forward
	Lights on blue	Roof washer moves backward
B	Light flashes red, between 1 and 12 times	Roof washer or platform failure. Consult 9.2 <i>Troubleshooting of the manual version</i> or 9.4 <i>Troubleshooting of the automatic version</i>
C	Lights on red	Incorrect phase sequence
D	Beeps for 5 seconds	Platform is moving
	Beeps for 30 seconds	Countdown for starting a washing cycle
E	Lights on green	Water pump on MANUAL mode
F	Lights on green	Waterpomp on AUTO mode
G	Lights on green	Main control on MANUAL mode
H	Lights on green	Main control on AUTO mode
I	Lights on red	Thermal fault platform
	Light flashes red, between 1 and 12 times	Roof washer or platform failure. Consult 9.2 <i>Troubleshooting of the manual version</i>
J	Lights on green	Climate computer sent general cleaning task to roof washer
K	Lights on green	Roof washer sent position to climate computer
L	Lights on green	Climate computer sent release signal to roof washer
M	Lights on blue	Roof washer in rest position
N	Lights on red	Roof washer or platform failure. Consult 9.4 <i>Troubleshooting of the automatic version</i>

3 DESCRIPTION OF THE MACHINE

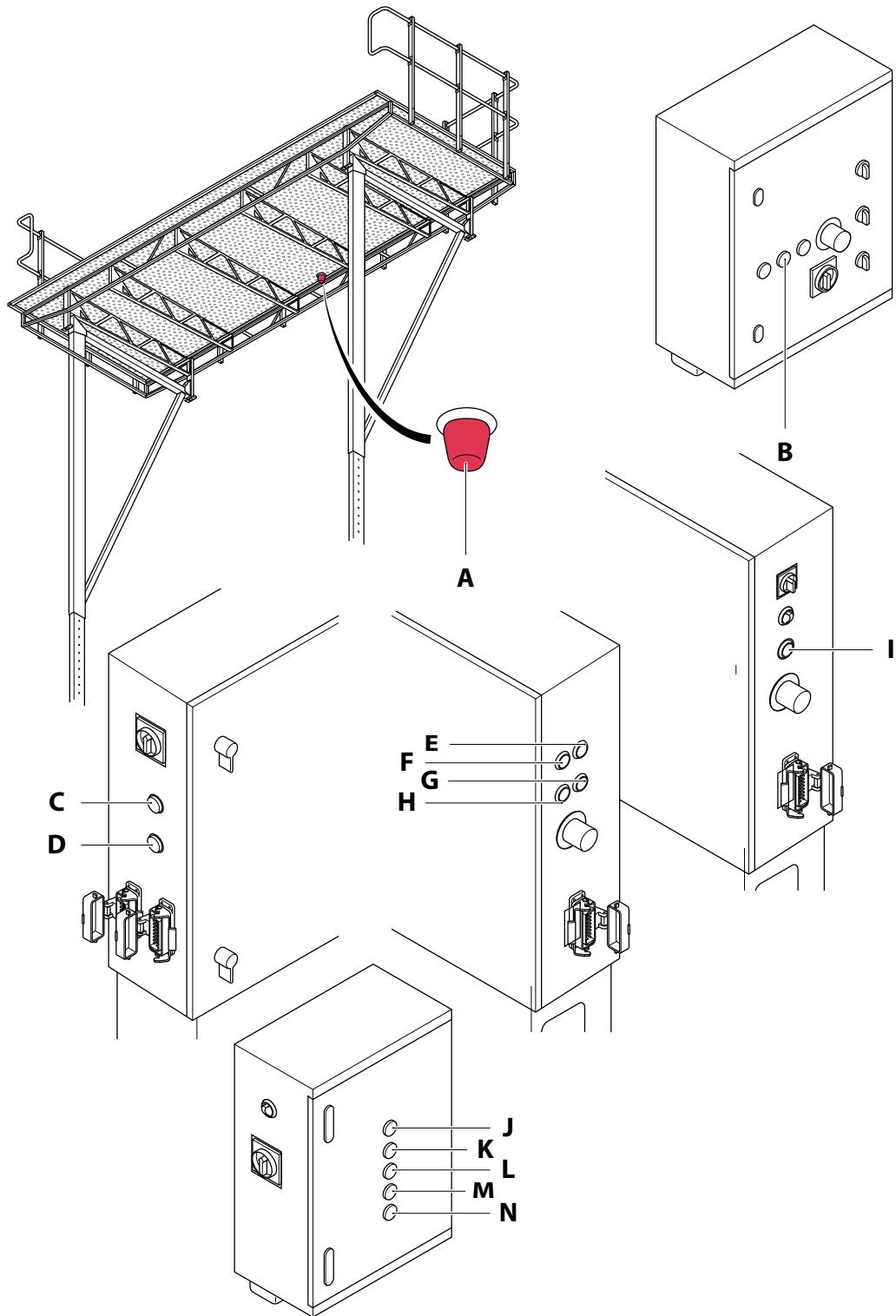


Fig. 14 Visual and auditory signals

3.6 TECHNICAL DATA

3.6.1 Position of the type identification plates

Position of the type identification plate on the roof washer:

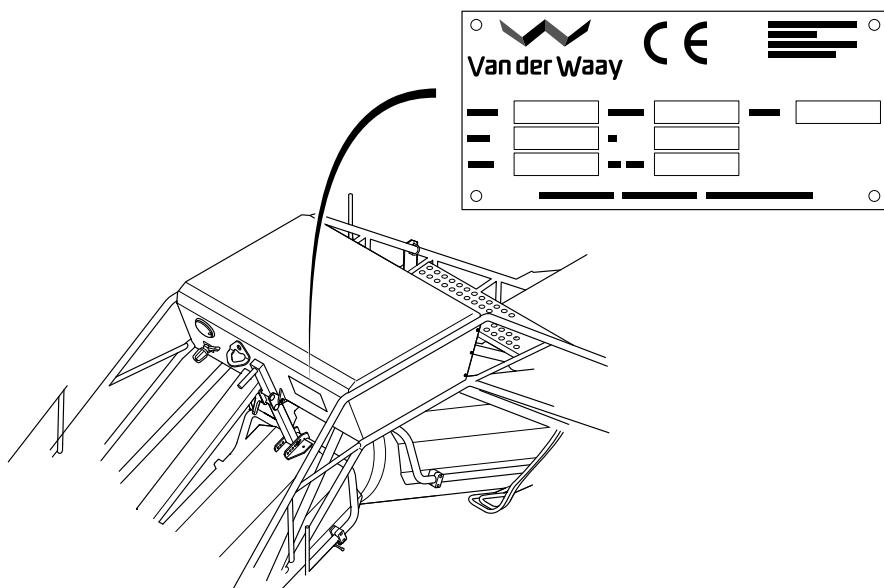


Fig. 15 Position of type identification plate roof washer

Position of the type identification plate on the platform:

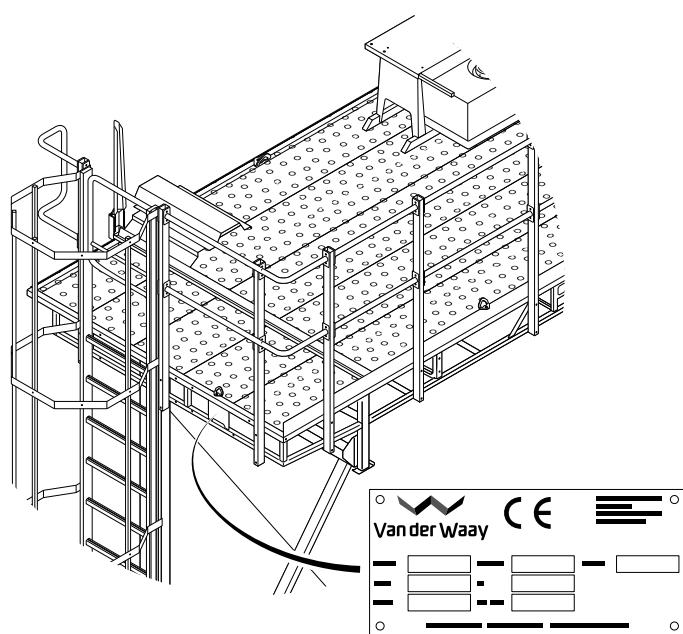


Fig. 16 Position of type identification plate platform

3 DESCRIPTION OF THE MACHINE

3.6.2 General specifications

Top Cleaner	Unit	Value
Designation	-	Greenhouse Roof Washer
Model		Top Cleaner
Manufacturer	-	Van der Waay B.V. Finlandlaan 2, 2391 PV Hazerswoude The Netherlands
Year of construction	-	Refer to type identification plate
Country of manufacture	-	The Netherlands
Technical life span	-	10 years
Number of allowed persons on platform	-	2
Operating temperature	°C (°F)	0.5 ... +49 (33 ... +120)

3.6.3 Technical data of the roof washer

Roof Washer	Unit	Value
Propulsion	-	Electric/Hydraulic
Voltage	V	400/480
Frequency	Hz	50/60
Max. power	kW	4
Max. current	A	10
Velocity	m/min (ft/min)	0 ... +25 (0 ... +82)
Max. hose length	M (ft)	350 (1,150)
Hose diameter	mm (inch)	12.7 (0.5)
Max. cable length	m (ft)	350 (1,150)
Cable diameter	mm ² (AWG)	4 G1.5 (EUR) (4 G14)
Frequency band	MHz	868 (900)

Roof Washer	Unit	Value
Maximum radio-frequency Power transmitted in the Frequency band(s) in which the radio equipment operates	W	0.5
Oil pressure hydraulic system	bar (psi)	150 (2,175)
Hydraulic oil type	-	HV 32
Hydraulic oil volume	l (USgal)	8 (2.11)
Sound level	dB (A)	< 70
Pressure sound emission	dB	< 80
Weight	kg (lbs)	< 600 (1,322) (depending on options; consult type identification plate)

3.6.4 Technical data of the platform

Platform	Unit	Value
Propulsion	-	Electric/Hydraulic
Voltage	V	400/480
Frequency	Hz	50/60
Max. power	kW	1.05
Max. current	A	3
Velocity	m/min (ft/min)	6 (20)
Max. hose length	M (ft)	125 (410)
Hose diameter	mm (inch)	25.4 (1)
Max. cable length	m (ft)	125 (410)
Cable diameter	mm ² (AWG)	4 G4,0 (EUR) (4 G12)

Platform	Unit	Value
Frequency band	MHz	868 (900)
Maximum radio-frequency Power transmitted in the Frequency band(s) in which the radio equipment operates	W	0.5
Sound level	dB (A)	< 70
Pressure sound emission	dB	< 80
Weight	kg (lbs)	< 800 (1,800) (depending on options; consult type identification plate)

3.6.5 Technical data of the water pump

Water Pump	Unit	Value
Propulsion	-	Electric
Voltage	V	400/480
Frequency	Hz	50/60
Max. power	kW	4
Max. current	A	10
Water output	l/min (USg/min)	30 (8)
Max. pressure water pump	bar (psi)	70 (1,015)
Oil type	-	SEA10W-30
Oil volume	l (USgal)	1.1 (0.28)
Sound level	dB (A)	< 70

WARNING

- After the platform is professionally installed, it shall not be removed from the greenhouse by unauthorized persons.

The roof washer can be moved from the platform and transported. This chapter refers only to lifting, handling and transporting of the roof washer and not of the platform.

4.1 DIMENSIONS, MASS AND CENTER OF GRAVITY OF THE ROOF WASHER

4.1.1 Dimensions in mm (inches)

Model	A	B	C
320-150	3752 (147.7)	2011 (79.2)	1693 (66.7)
320-175	3752 (147.7)	2261 (89.0)	1693 (66.7)
400-150	4552 (179.2)	2011 (79.2)	1842 (72.5)
400-175	4552 (179.2)	2261 (89.0)	1842 (72.5)
427-150	4820 (189.8)	2011 (79.2)	1939 (76.3)
427-175	4820 (189.8)	2261 (89.0)	1939 (76.3)
450-150	5052 (198.9)	2011 (79.2)	1949 (76.7)
450-175	5052 (198.9)	2261 (89.0)	1949 (76.7)
480-150	5352 (210.7)	2011 (79.2)	2046 (80.6)
480-175	5352 (210.7)	2261 (89.0)	2046 (80.6)

4 HANDLING, LIFTING AND TRANSPORTING

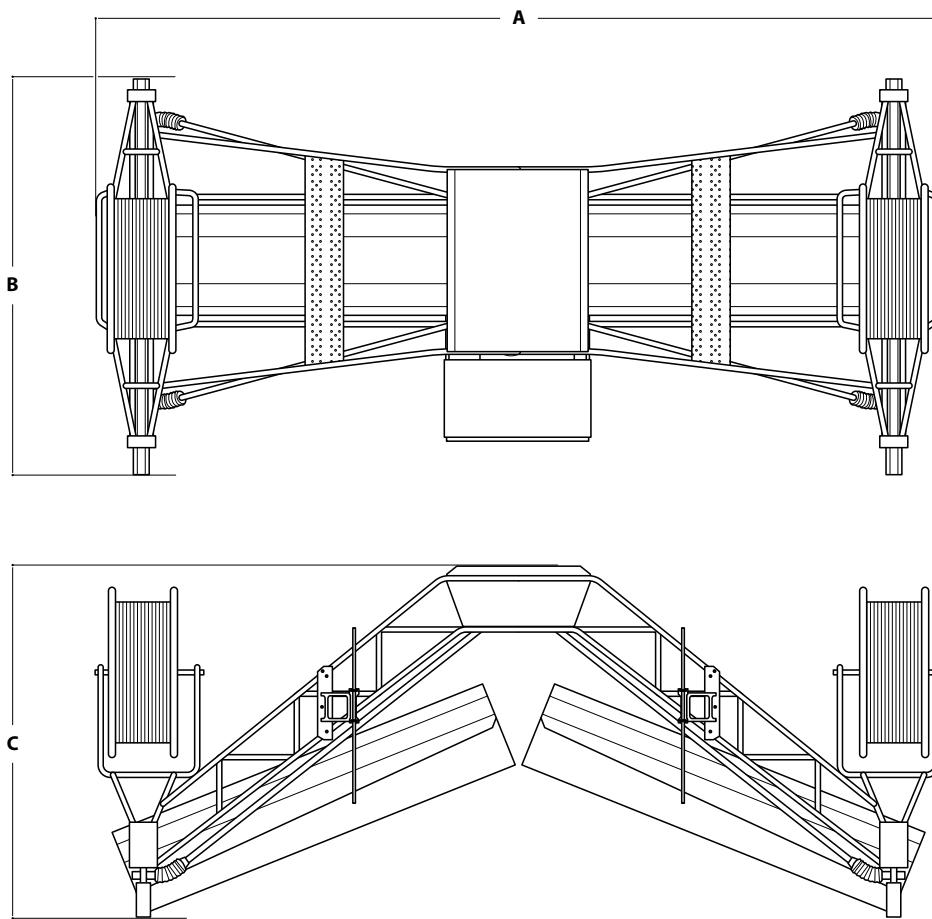


Fig. 17 Dimensions roof washer

4.1.2 Mass

Refer to the type identification plate for the weight of the roof washer.

4.1.3 Center of gravity

⚠️ WARNING

- Always use the lifting points when lifting the machinery, to avoid the risk of tilting.

The roof washer's center of gravity is indicated with a downward pointing arrow in the image below. The lifting points which should be used to lift the machinery are indicated with **A**.

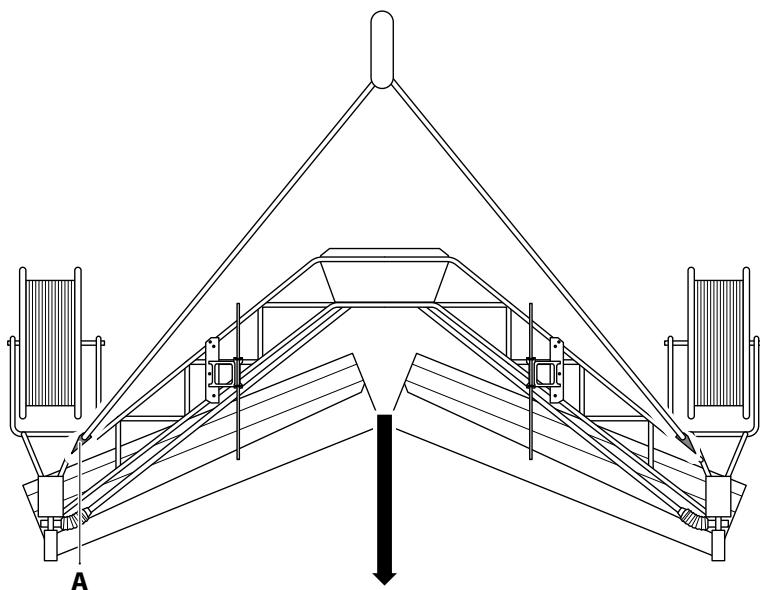
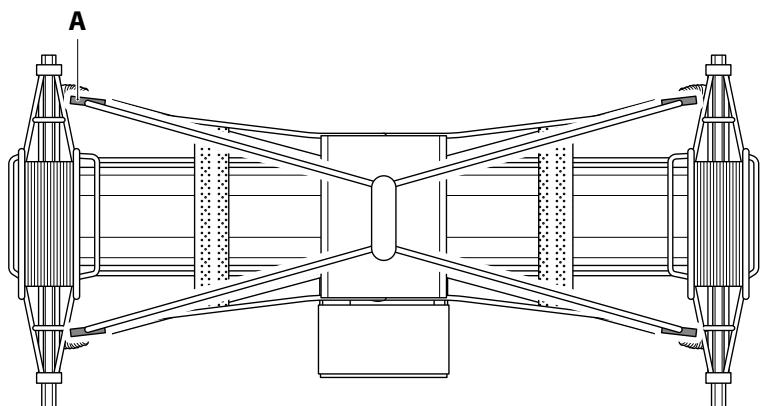


Fig. 18 Center of gravity and location of lifting points of roof washer

4.2 LIFTING AND TRANSPORTING THE ROOF WASHER

DANGER

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Always make sure that the machinery and any of its parts are fixed during transportation, so there is no possibility of sudden movements or instability.
- Lifting works shall only be carried out by authorized persons.

4 HANDLING, LIFTING AND TRANSPORTING

- When lifting the machinery, use only approved lifting tools with sufficient lifting capacity.
- Always carry out lifting with more than one person, even when using lifting tools.
- Only use a certified four-way webbing lifting sling with a minimum length of 3 meters (10 feet) and a minimum capacity of 4 x 1000 kg (4 x 2200 lbs). Only lift the machinery by the designated lifting points.
- Always use the lifting points when lifting the machinery, to avoid the risk of tilting.
- Make sure that you carry out lifting works on a flat and hardened surface. Apply road plates if necessary.
- Make sure that there are no persons within the turning range of the crane during lifting works.
- Never stand directly underneath the machinery during lifting tasks and always be aware of possible falling objects. Failure to do so can result in serious injury or death.
- Check the lifting tools for damage before lifting. If there is any visible damage, do not lift the machinery.
- Do not lift the machinery with wind speeds above 17 m/s (38 mph).
- Protect disconnected plugs against rain and keep them away from moisture.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

Required tools:

- Crane or telehandler

To lift the roof washer from the platform:

1. Make sure one person is standing on the platform to guide the roof washer during lifting. **WARNING!** Always use a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length, while working on heights.
2. Move the roof washer forward until the **gutterbrush** no longer protrudes through the opening of the **railing** of the platform.
3. Disconnect the **power cable A** from the **connector 1X8 B** of the **control cabinet** platform **C**. **NOTICE** Protect disconnected plugs against rain and keep them away from moisture.

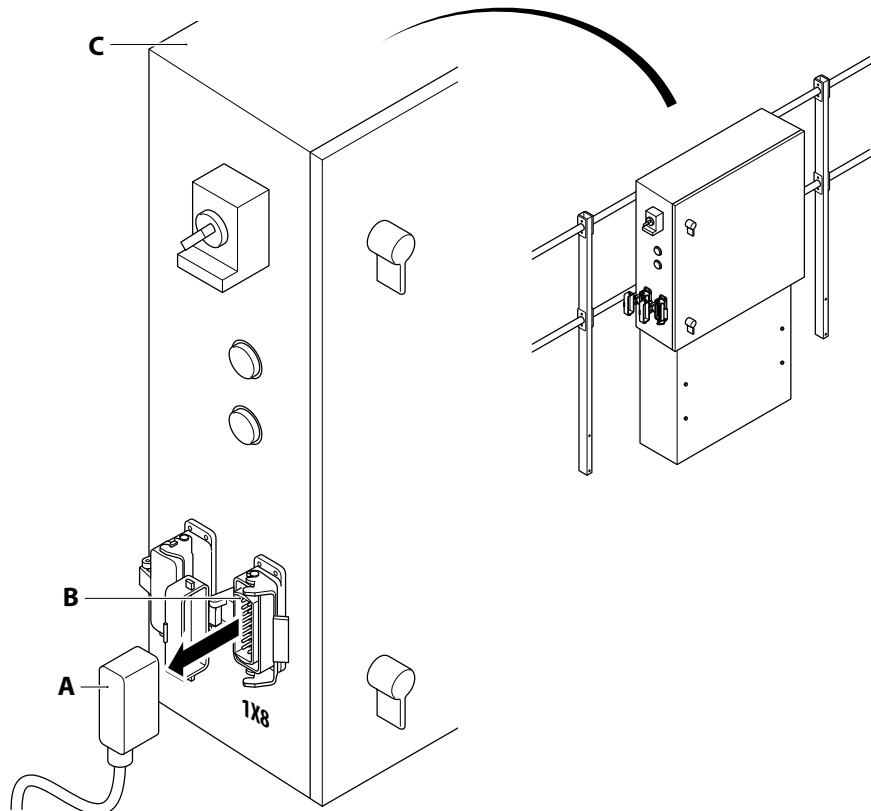


Fig. 19 Disconnect the power cable from the control cabinet platform

4 HANDLING, LIFTING AND TRANSPORTING

4. Disconnect the **water hose** **A** from the **filter** **B** on the hand **railing** of the platform.

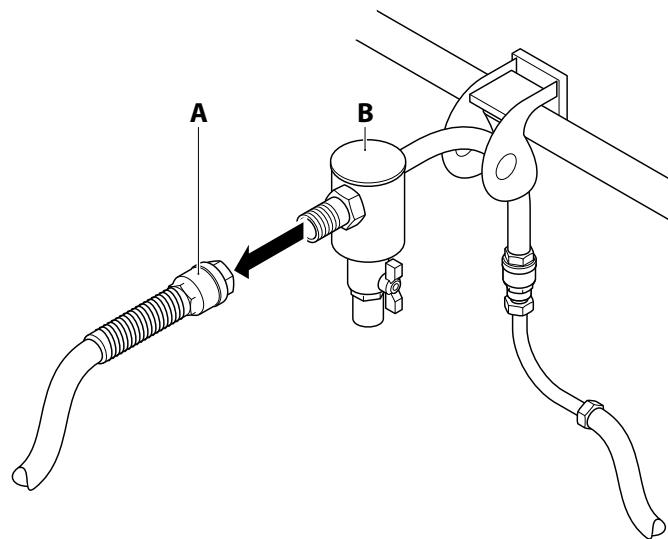


Fig. 20 Disconnect the water hose

5. Turn the **hose and cable reel** on the roof washer by hand, until the **water hose** and **power cable** are rolled up entirely.
6. Attach the four **hooks** of the **four-way webbing sling** to the four **lifting points** **A** on the **roof washer**. **CAUTION!** Make sure to put the legs of the four-way webbing sling **in front** of the **window protection switches**.

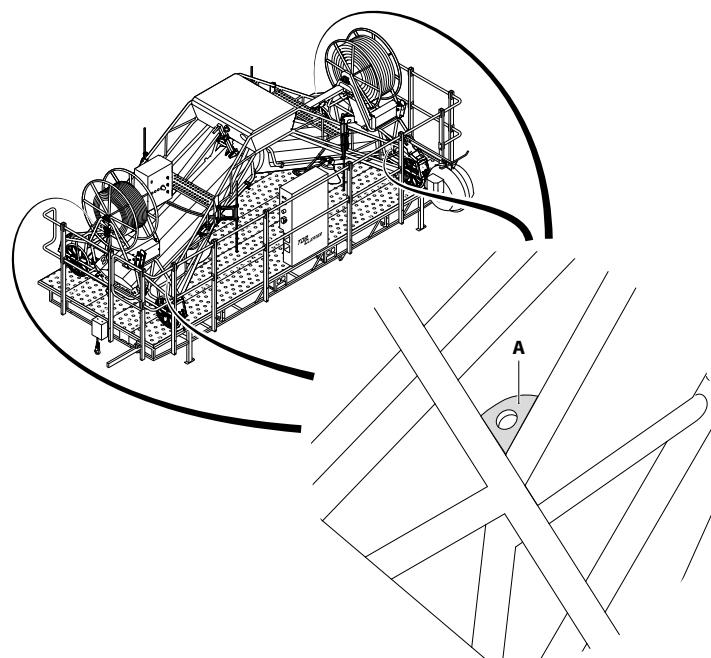


Fig. 21 Attach the four hooks of the four-way webbing sling to the lifting points

7. Attach a **guiding rope** to the **roof washer**, to hold it in position if necessary.
WARNING! Never loop the rope around your hand, arm or body when guiding the load, to avoid being dragged along with the load.
8. Use the **crane** to lift the **roof washer** carefully from the platform.
9. Place the **roof washer** horizontally and on its four **drive wheels** on a trailer with a flat surface and sufficient capacity.
10. Secure the **roof washer** against shocks by fastening the four **lifting points of the roof washer** to the trailer with four ratchet straps. **NOTICE** Make sure there is no possibility of sudden movements and or instability.

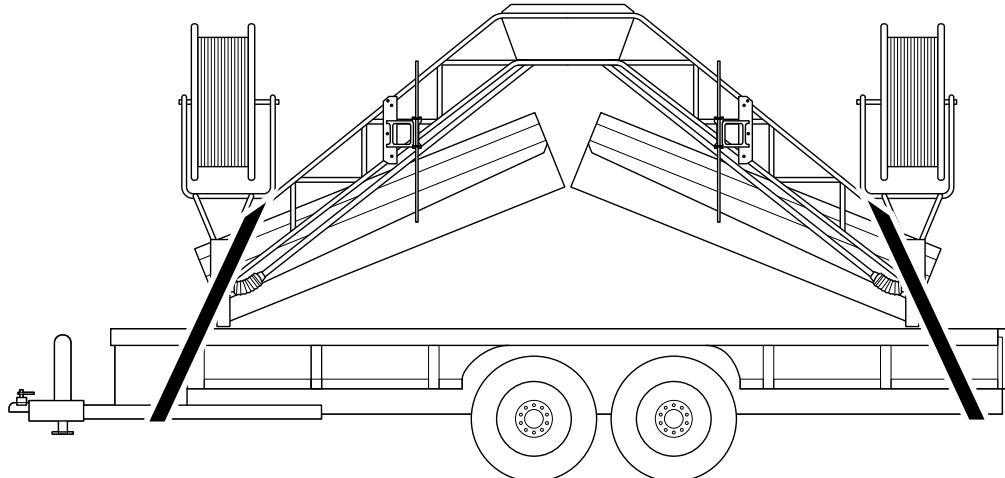


Fig.22 Securing the roof washer with ratchet straps to the trailer

11. Transport the trailer with the roof washer carefully to the desired location.

5 ADJUSTING THE MACHINERY



DANGER

- Make adjustments only when the roof washer is on the platform.
- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- Installation and commissioning shall be carried out by a properly qualified and skilled installer with due observance of the applicable rules and legislation. The installer is responsible for employing skilled and qualified personnel.
- Inform yourself properly with respect to the prescribed safety devices on the basis of the EU directives and local regulations on working at heights. All local regulations must be followed.
- Consult available construction reports, certificates, etc. to make sure that the greenhouse rail, gutters and end-gutter protection are of sufficient strength to carry the weight of the machinery and everyone and everything on the machinery. Refer to the type identification plate for the weight of the machinery. Contact your greenhouse builder in case of any doubts.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

5.1 HOW TO ADJUST THE ROOF WASHER

5.1.1 Adjust the main brushes

1. When the machine contains the optional spray boom, put the **MAIN FUNCTION** switch on **BRUSH**.

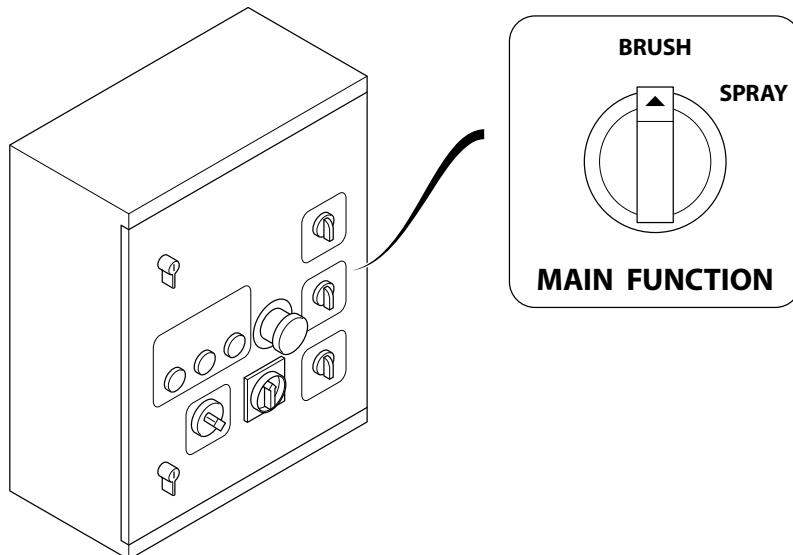


Fig. 23 Main function switch

2. Make sure the **roof washer** is on the greenhouse with all four wheels into the gutters.
3. Visually examine if:
 - a. The **main brush hair points** **A** touch the glass.
 - b. The **main brush** covers the roof from **gutter** **B** to **ridge**.

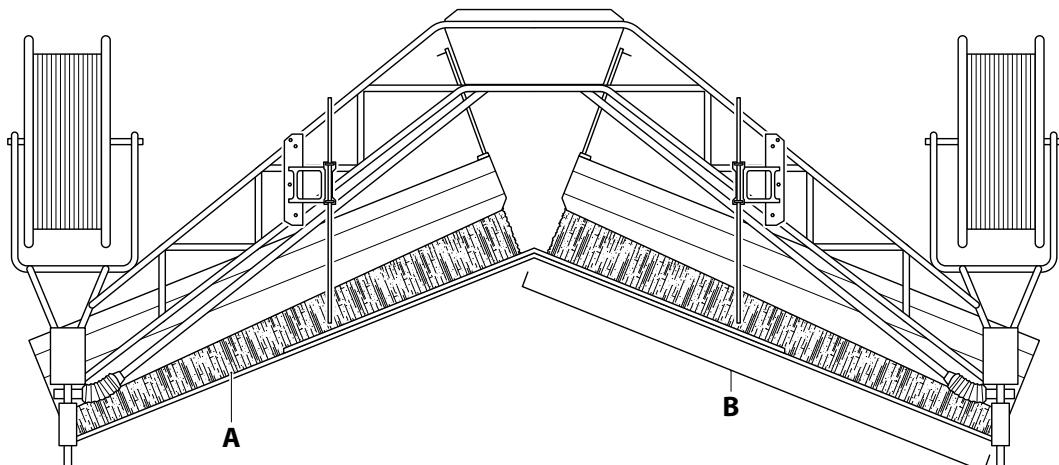


Fig. 24 Adjust main brush.

5 ADJUSTING THE MACHINERY

4. Move the **roof washer** back onto the platform. **NOTICE** when the lower side of the main brush is at the correct height continue to *step 8*.
5. Unlock the **ratchet C**, release the tension of the **security strap A** and lock the **ratchet C**.

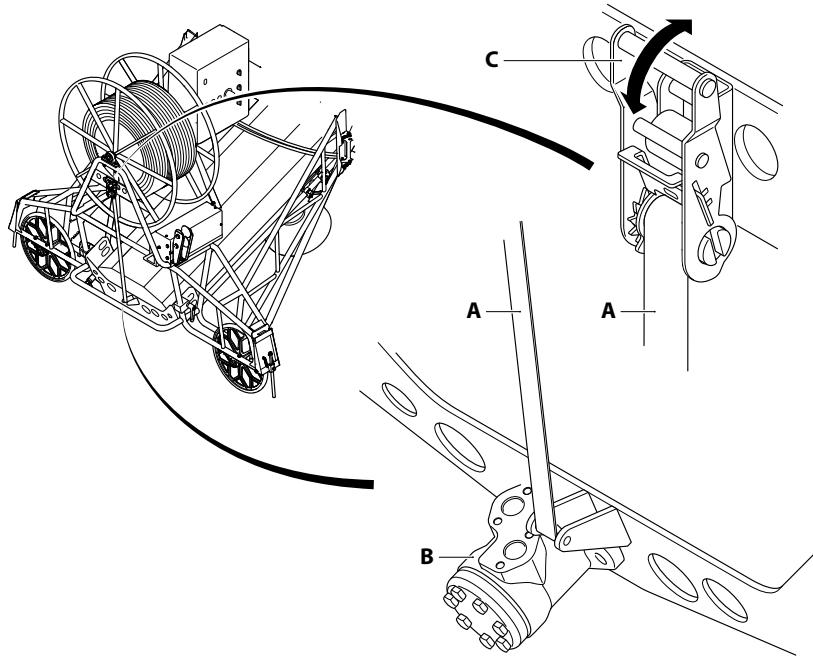


Fig. 25 Adjust the lower side of the main brush

6. Loosen the two **lower main brush clamps A**. Make sure that the **main brush B** moves down and backward until the strap is tensioned again.
7. Tighten the **lower main brush clamps A**.

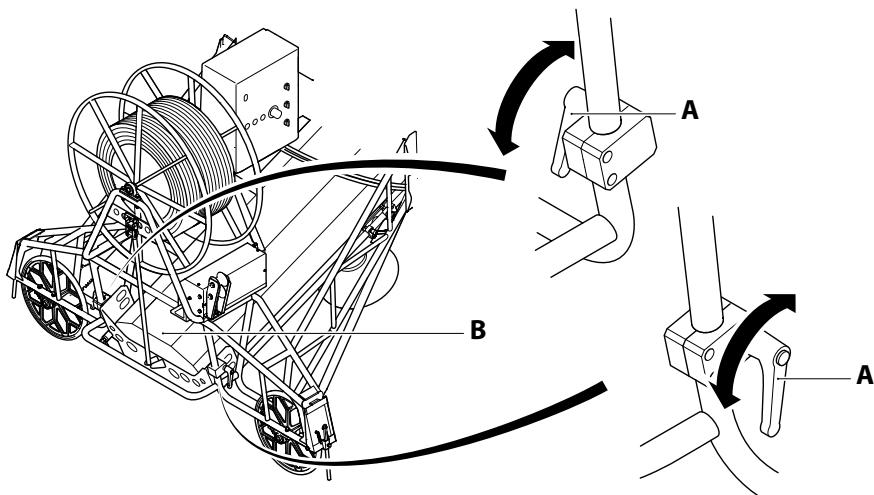


Fig. 26 Tighten the lower main brush clamps

8. Adjust the top side of the **main brush**, if necessary. When the top side of the main brush is at the correct height, continue to *step 10*.
9. Loosen the **upper main brush clamp A**. Adjust the **main brush** height and tighten the **upper main brush clamp A**.

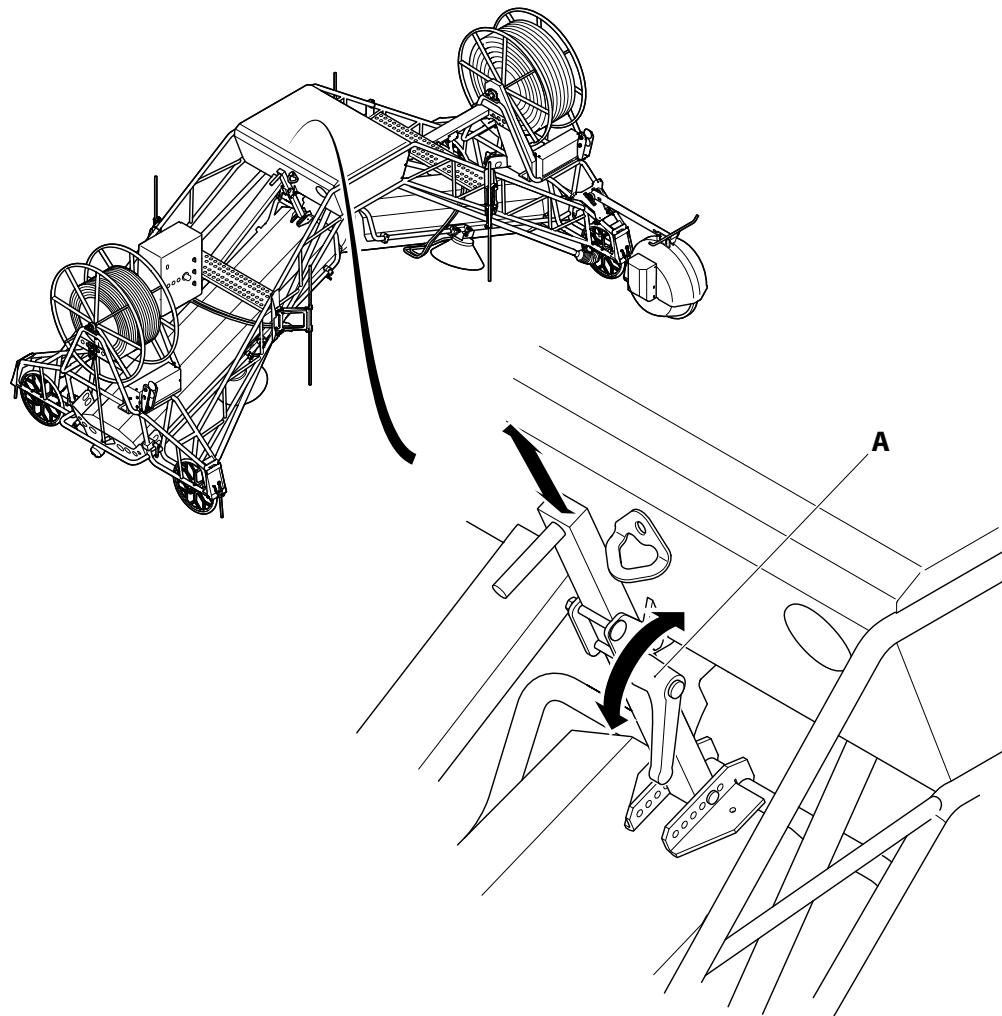


Fig. 27 Adjust height of the top of the main brush

10. Move the main **brush backward** or forward, if necessary. When the main brush is in the correct position, continue to *step 14*.

5 ADJUSTING THE MACHINERY

11. Loosen the two **lower main brush clamps A**.

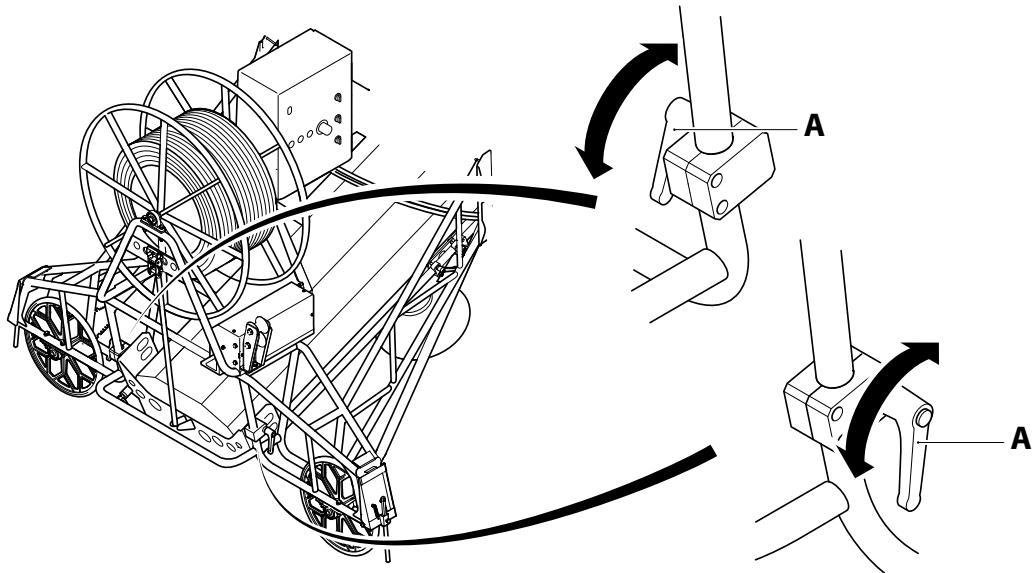


Fig. 28 Loosen the main brush clamps

12. Put the **main brush A** in the correct position so the **hairs of the main brush B** will cover the roof from **gutter C** to ridge.

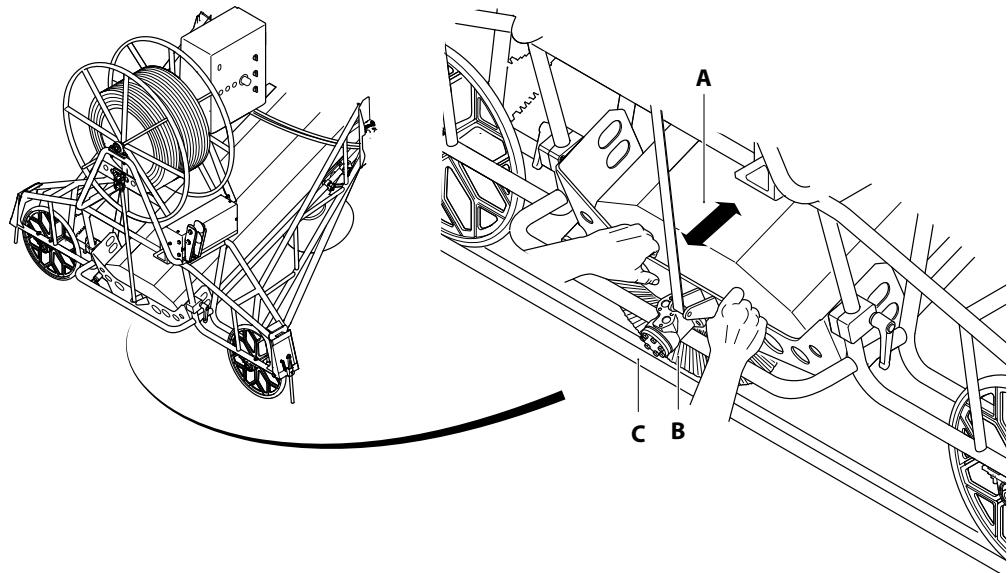


Fig. 29 Position the main brush

13. Tighten the **lower main brush clamps**.
14. Repeat steps 1-13 until the **main brush** is in the correct position.

15. The **second main brush** shall be adjusted identically to the **first main brush**. To adjust the **second main brush**, measure the **horizontal distance A** of the lower side of the **first main brush**.

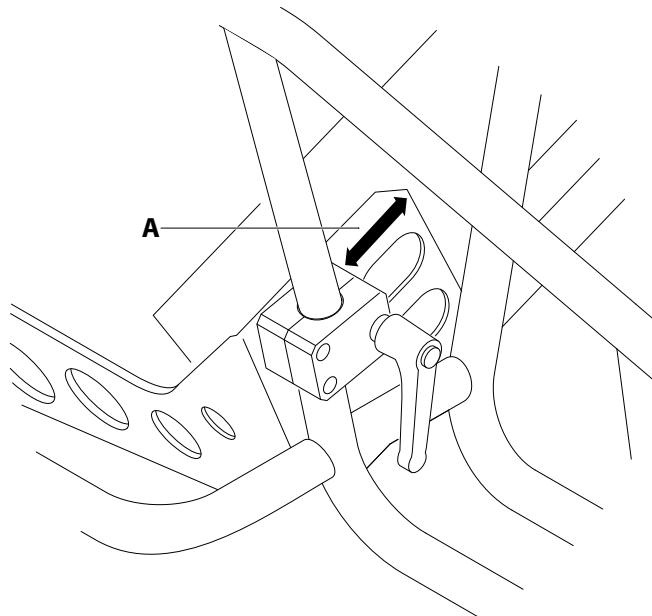


Fig. 30 Measure the lower side of the first main brush horizontally

16. Measure the **vertical distance A** of the lower side of the **first main brush**.

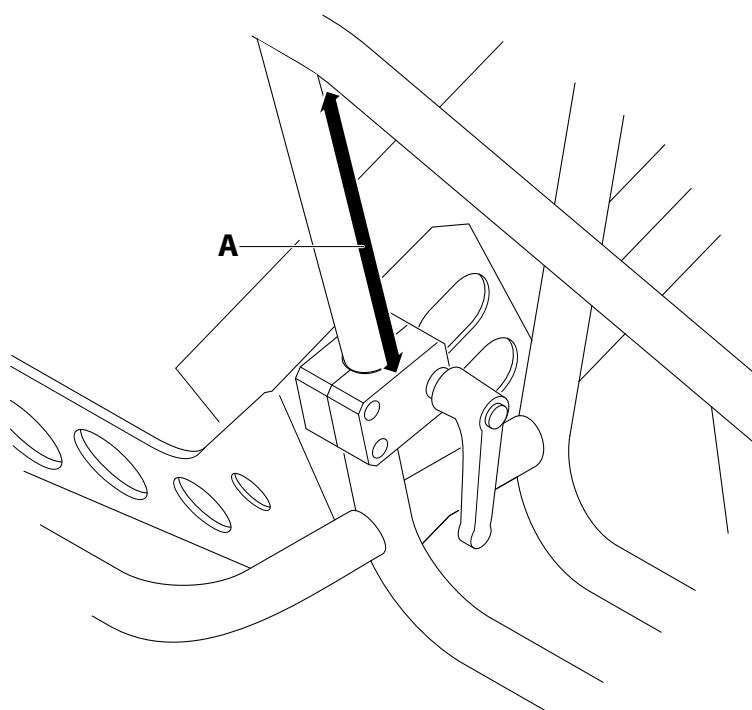


Fig. 31 Measure the lower side of the first main brush vertically

5 ADJUSTING THE MACHINERY

17. Measure the **vertical distance A** of the upper side of the **first main brush**.

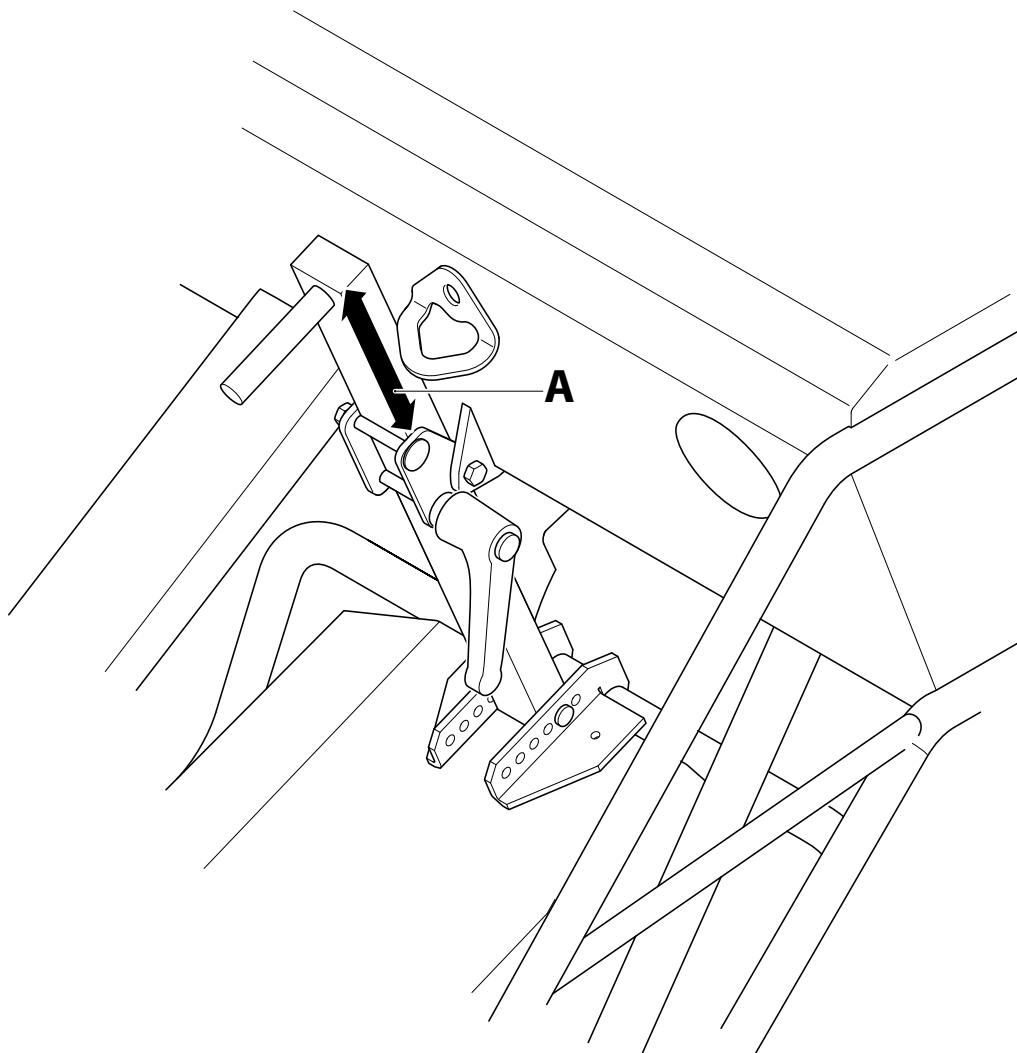


Fig. 32 Measure the upper side of the first main brush

18. Put the **second main brush** to the same position as the **first main brush**, by using the measurements.

5.1.2 Adjust the optional window disk brushes

The optional **window disk brushes** are intended to clean the lower side of the windows.

NOTICE The window disk brushes can optionally also be used to clean the sides of the gutters.

To adjust the optional window disk brushes:

1. To adjust the **first window disk brush**, make sure the **roof washer** is on the greenhouse, positioned above a window.
2. Visually examine if the hairs of the **window disk brush A** just touch the lower side of the **window B**

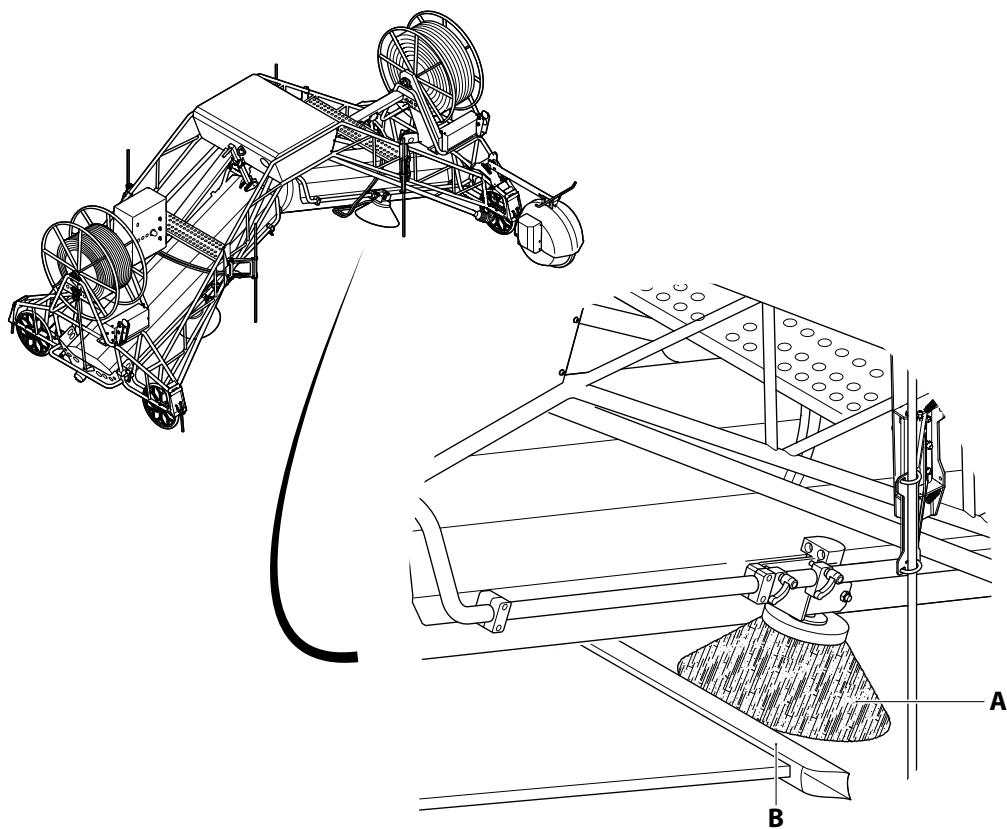


Fig. 33 Visually inspect if the window disk brushes are positioned correctly

3. Move the **roof washer** back onto the platform. **NOTICE** when the lower side of the main brush is at the correct height continue to *step 8*.

5 ADJUSTING THE MACHINERY

4. Loosen the two **clamps A** and/or the two **nuts B** of the **window disk brush C**.

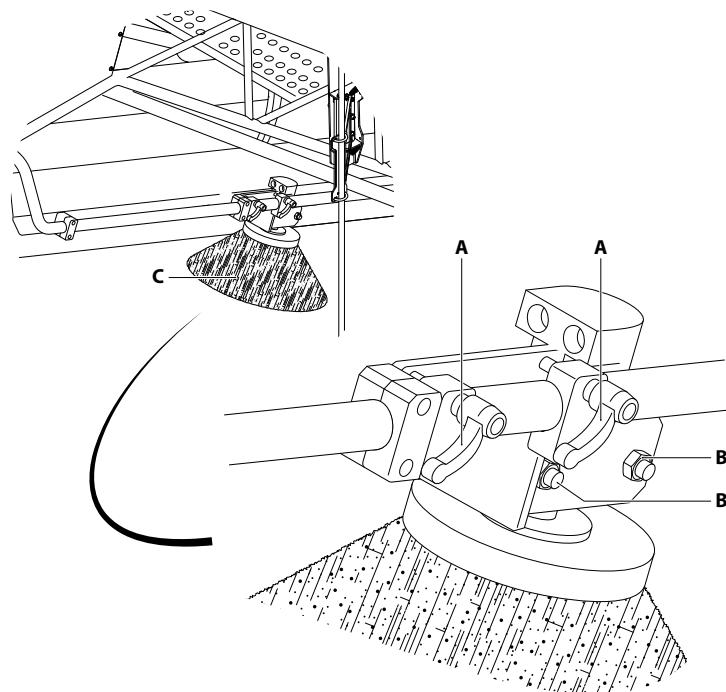


Fig. 34 Loosen the window disk brush clamps and nuts

5. Move the **window disk brush A** to the correct position.

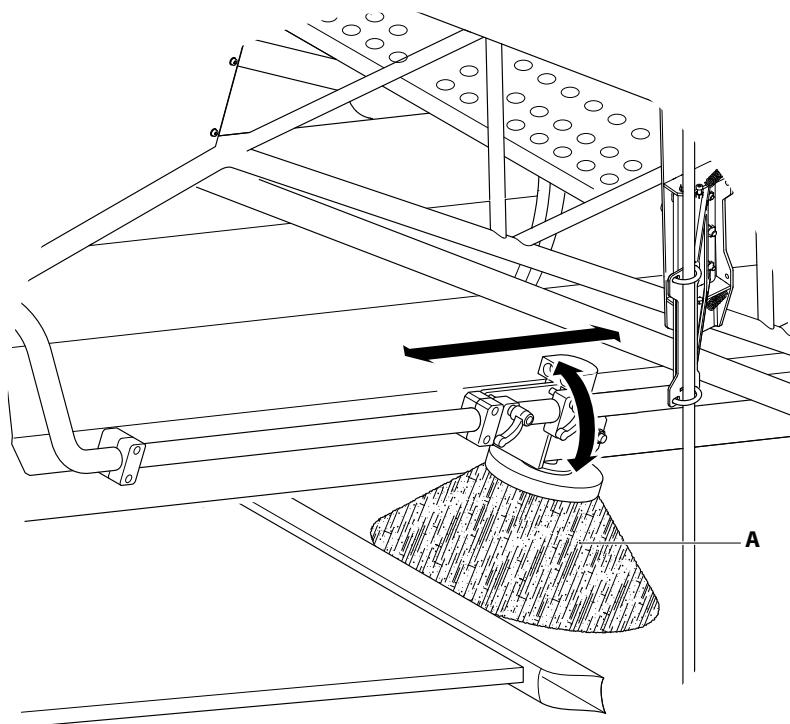


Fig. 35 Move the window disk brush

6. Tighten the two **clamps** and/or the two **nuts** of the **window disk brush**.
7. Repeat *steps 1 to 6* until the **window disk brush** is in the correct position.
8. The **second window disk brush** shall be adjusted identically to the **first window disk brush**. To adjust the **second window disk brush**, measure the distances of the **first window disk brush**. Put the **second window disk brush** to the same position as the **first window disk brush**.

5.1.3 Adjust the optional window protection switches

1. Position the **roof washer** above a **window** and visually examine if the distance between the highest point of the **window A** and the **carbon tube B** is approximately 20 mm (0.8 inch).

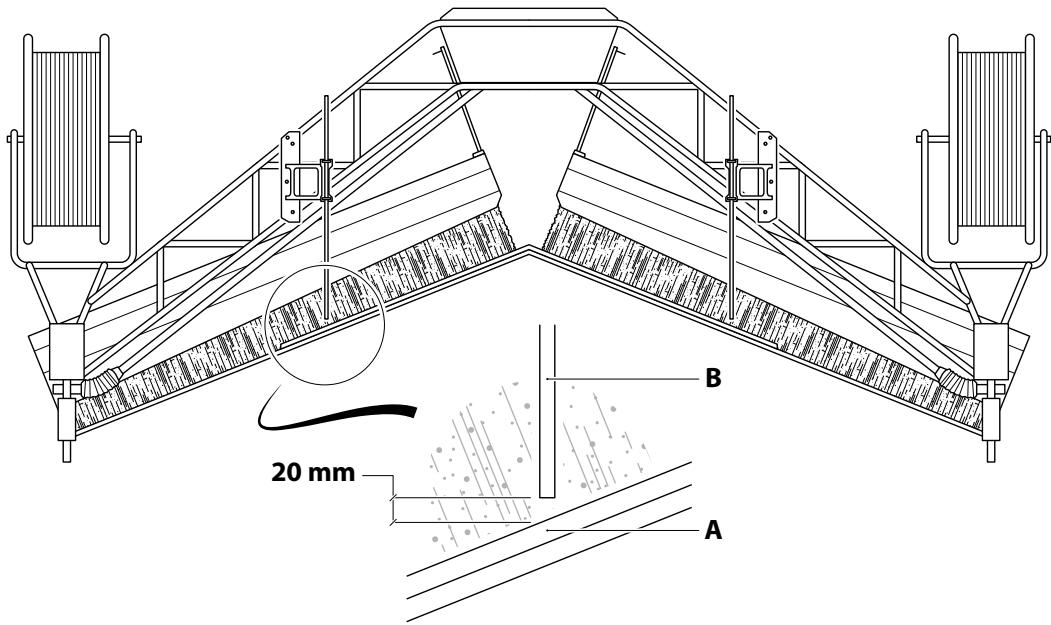


Fig. 36 Adjust the carbon tube

5 ADJUSTING THE MACHINERY

2. Move the **roof washer** back onto the platform.
3. If necessary loosen the **holders A** of the **carbon tube B**. Adjust the height of **carbon tube B** to get the distance between the highest point of the **window A** and the **carbon tube B** to be approximately 20 mm (0.8 inch). Tighten the **holders A**.

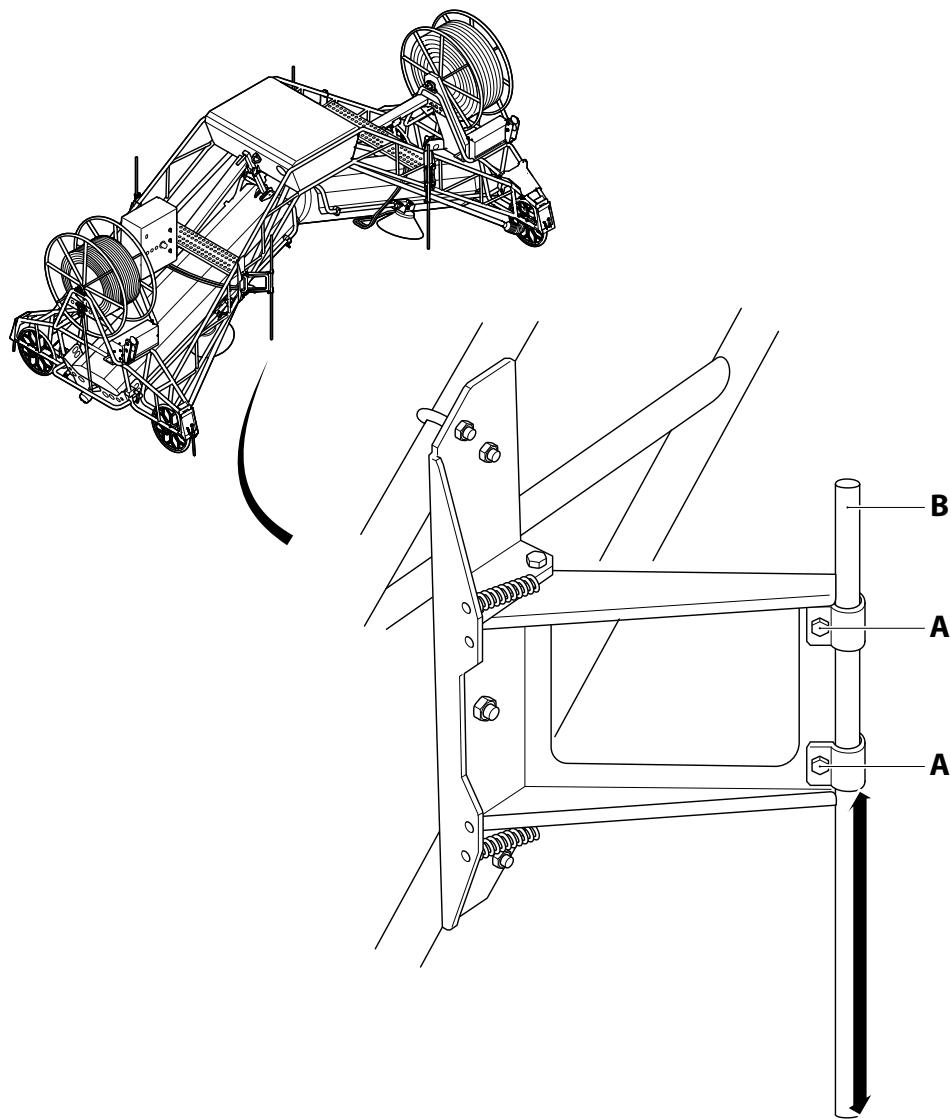


Fig. 37 Adjust the height of the carbon tube

4. Adjust the **other three carbon tubes** to the same height.

5.1.4 Adjust the optional gutter brush

1. Make sure that the **GUTTERBRUSH switch** is put on **AUTO**.

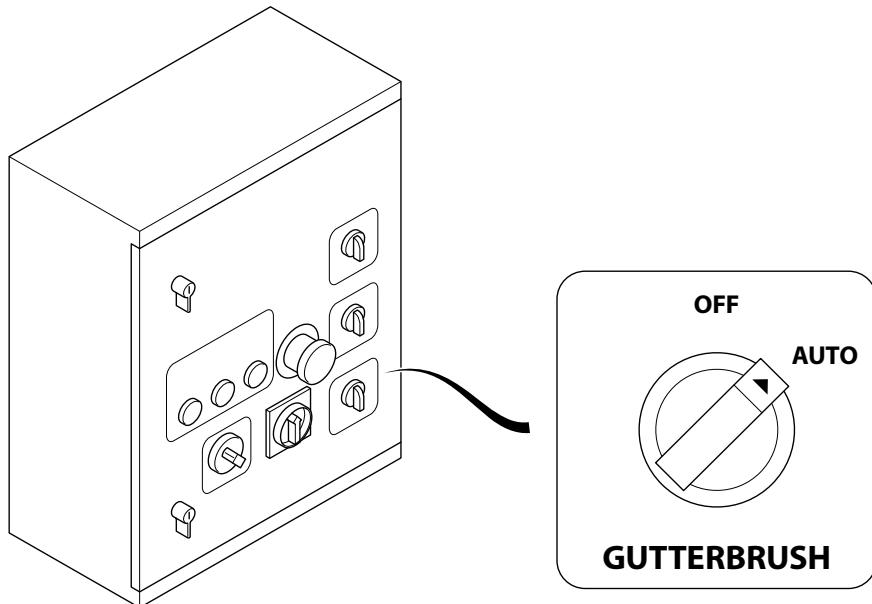


Fig. 38 Put the GUTTERBRUSH switch on AUTO

2. Turn the **adjustment bolt A** to adjust the **gutter brush B** upwards/downwards.

NOTICE When the brush is too low adjusted, it will hit the platform and the machinery may damage!

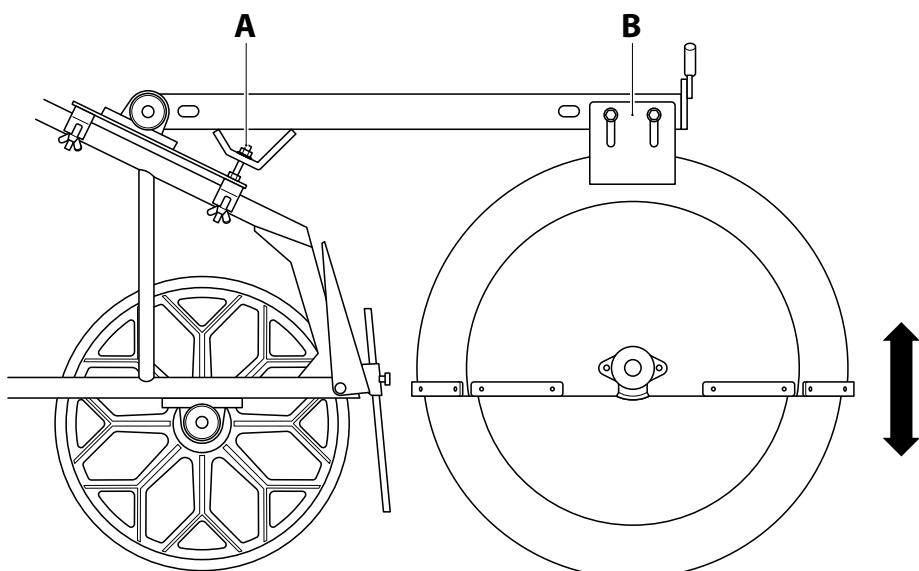


Fig. 39 Adjust the gutter brush height

5.2 HOW TO DETACH OR REPOSITION THE GUTTER BRUSH

1. Disconnect the **power cable A** from the **gutter brush connector B** at the right side or at the bottom of the **control cabinet roof washer C**.

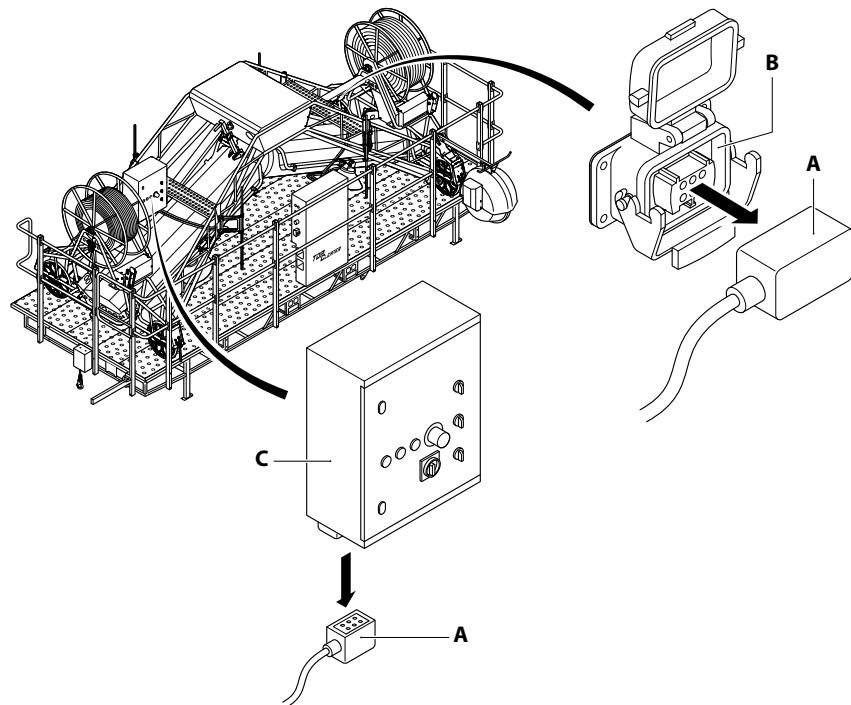


Fig. 40 Disconnect the power cable from the left or right side

2. Loosen the four **scaff clamps A** of the **gutter brush B** to remove the gutter brush from the **roof washer frame C**.

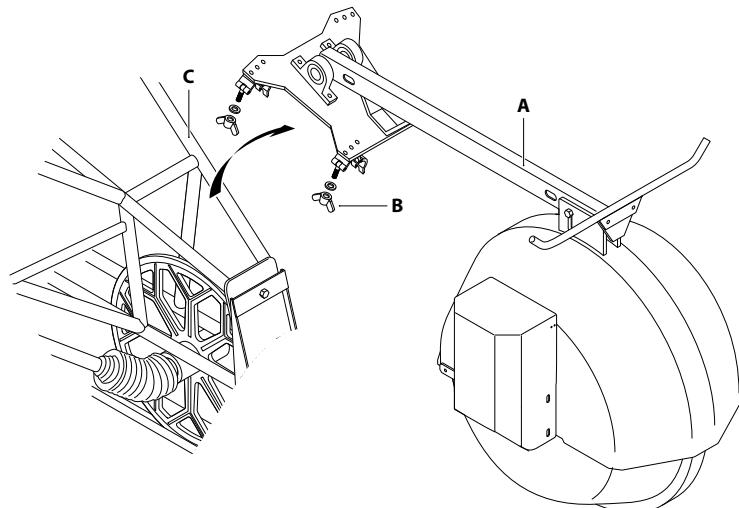


Fig. 41 Detach the gutter brush (optionally)

3. Optionally, attach the **gutter brush A**, with the four **scaff clamps B** to the **roof washer frame C** on the other side. **NOTICE** Remove the **railing D** at the back of the platform at the side where the gutter brush is attached.

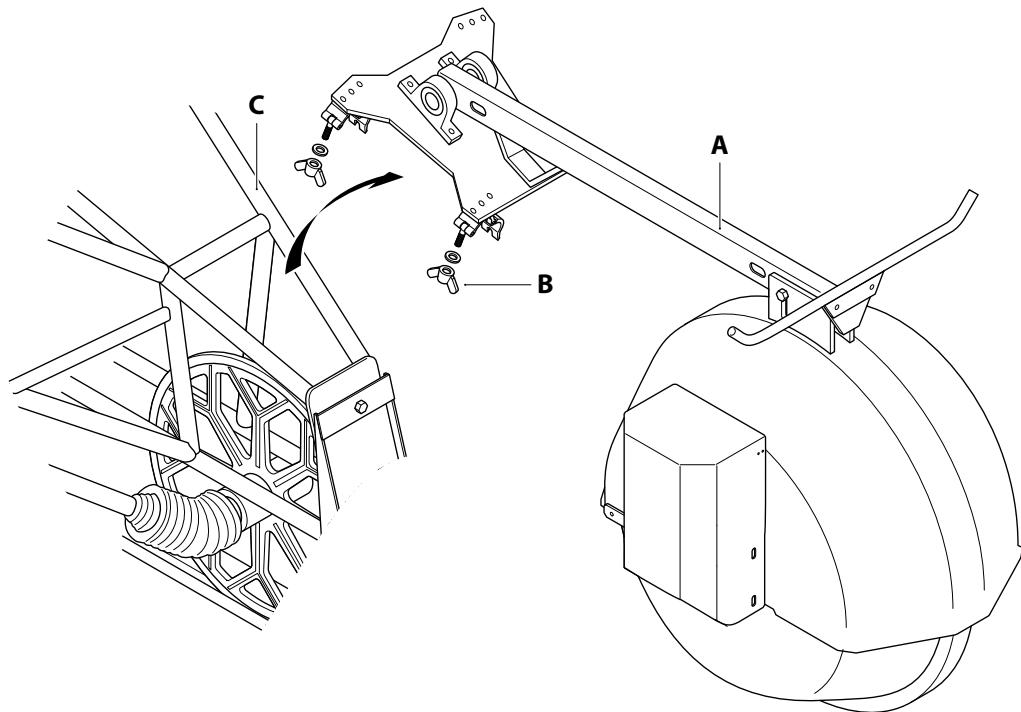


Fig. 42 Attach the gutter brush (optionally)

4. Connect the **power cable**. **NOTICE** Depending on which side the gutterbrush is installed, use either the gutter brush connector at the right side or at the bottom of the control cabinet roof washer.

5.3 HOW TO PROTECT THE MACHINERY FROM FROST

WARNING

- Never use the machinery at temperatures lower than 0.5 °C (31 °F).

If the temperature drops below 0.5 °C (31 °F), the machinery may not be used. All excess water which is left in the water system shall have to be removed to make sure no parts of the machinery will be damaged by frost.

To remove all excess water:

- Disconnect the **water hose** from the water supply at the greenhouse.
- Turn on the **water pump** and let it run until the **float tank** is empty.
Turn off the **water pump** after the **float tank** is empty.
- Remove the **float tank filter** and the **inlet filter** by removing the **filter house lid** and the **filter element** and store it in a place safe from frost.
See *step 1 and 2 of 8.11 How to clean the filters of the water pump*.
- Open all four **drain valves A** at the bottom of the **brush frames** and leave them open.

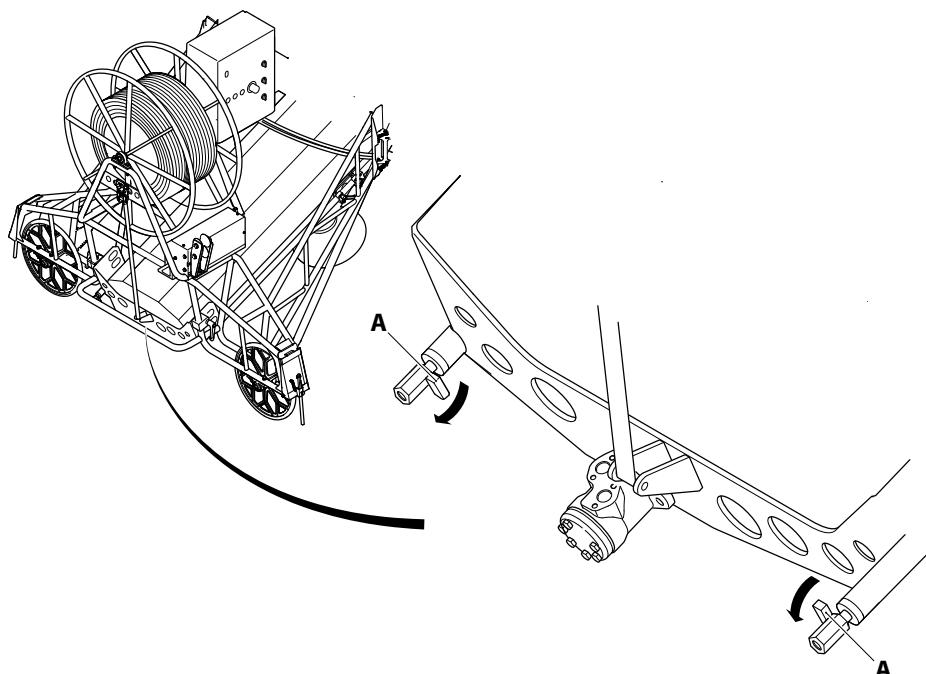


Fig. 43 Open the drain valves

5. Choose one of the following options:
 - a. If there is no filter installed between the **water hose** of the roof washer and the **hand railing** of the platform: Disconnect the **water hose** from the connection on the platform.
 - b. If there is a **filter A** installed between the **water hose** of the roof washer and the **hand railing** of the platform: Open the **drain valve B** at the bottom of the filter and leave it open.

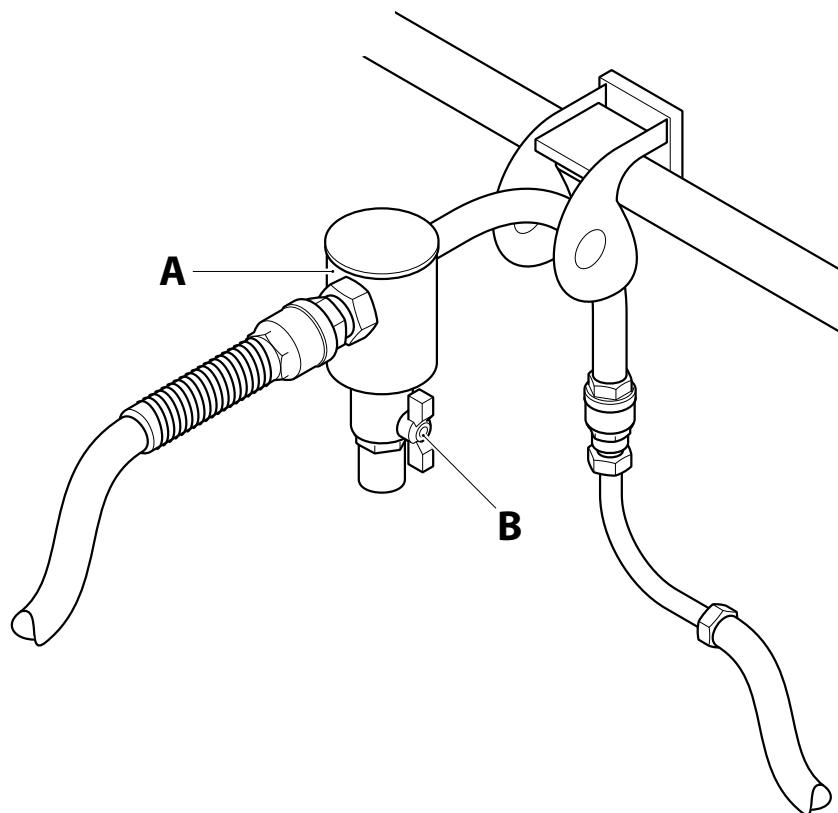


Fig. 44 Open the filter drain valve

6. If applicable, remove all **spray booms**, the **CCB** (Coating Controller Box) and the **Dosing pump** and store them in a place safe from frost. Consult the manual of the spray booms for instructions on how to remove these parts (see *1.7 Other documentation*).

6 OPERATION

DANGER

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- Make sure that the combined weight of the machinery standing in the greenhouse gutters, everyone and everything on the machinery does not exceed the maximum allowed gutter load.
- Make sure that all greenhouse gutters are provided with proper end-gutter protection. If these protections are not present and/or properly attached, the machinery moving in the greenhouse gutters can fall off the greenhouse.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.
- Make sure that there is a minimum of 20 cm (8 inch) of free space between the ground and the bottom of the lower wheels at all times.
- Make sure that the machinery can move freely alongside the greenhouse gable. Remove any obstacles that are in its way.
- Make sure that the machinery can move freely inside the greenhouse gutters. Remove any obstacles that are in its way.
- Make sure that the windows of the greenhouse are closed and remain closed when using the machinery.
- Make sure that there is no-one inside the greenhouse where the machinery is in use. Depending on the situation, create a NO GO zone to ensure public safety.
- Before use make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that you know where the emergency stop buttons are located before operating the machinery.
- Make sure that a first aid kit is present on the machinery where people are working.

- Do not use the machinery after an earthquake. Keep a safe distance from the greenhouse and machinery until they have been fully inspected by a qualified and trained person.
- Never use the machinery with wind speeds above 11 m/s (25 mph).
- Always anchor the van der Waay platform to the anchor plates when wind speeds above 17 m/s (38 mph) are expected. Remove the roof washer from the platform or securely strap it to the platform by fastening the four lifting points of the roof washer to the lifting points of the platform, with four ratchet straps.
- Never use the machinery at temperatures lower than 0.5 °C (31 °F).
- Do not use the machinery during thunderstorms and extreme weather conditions. Seek shelter in the event of an approaching thunderstorm or sudden weather deterioration.
- Remove accumulating snow on top of the machinery regularly to avoid exceeding the maximum allowed load of the greenhouse rail.
- In case of an accident, stop using the machinery and consult a doctor if necessary.
- Use a bright headlamp when working in the dark.
- Make sure that the anti-climb protection is put and locked on the ladder when there is no authorized personnel nearby.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

6 OPERATION

6.1 HOW TO OPERATE THE MANUAL VERSION

1. Make sure that the **front wheel switches** operate correctly. In order to do so, move the roof washer on the platform and activate the wheel switches with your foot. The roof washer should stop and move backward.
2. Make sure that the **water supply hose** and **power supply cable** from greenhouse to platform can move freely and don't get stuck.
3. Push the **platform/left button** on the **remote control roof washer and platform** to move the **platform with the roof washer** in front of a rooftop and the **gutters** until the platform stops automatically and is aligned correctly with the gutters.
4. Push the **platform ramp down button** on the **remote control roof washer and platform** to put the **ramps** in the **gutter**.
5. Put the **WATER PUMP** switch in the ON position on the **control cabinet platform** to start the **water pump**.

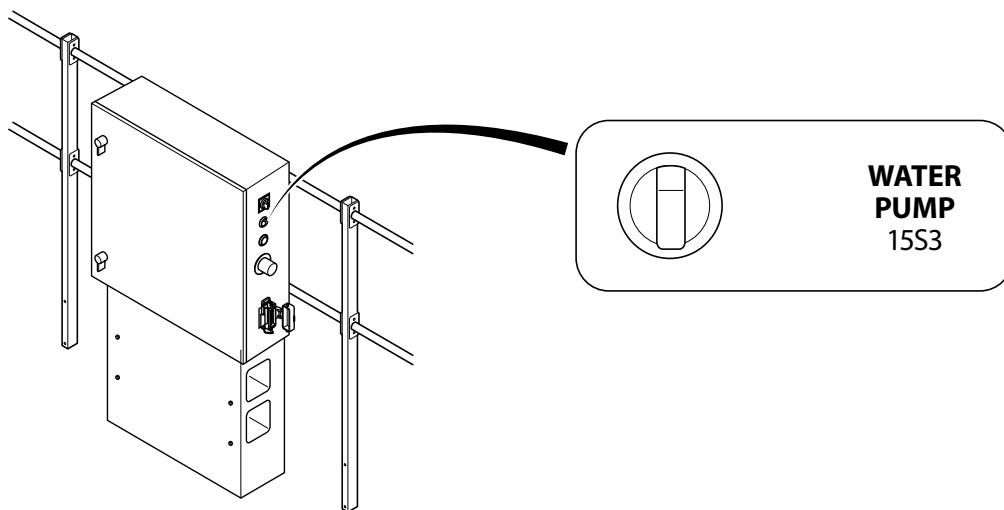


Fig. 45 Start the water pump

6. Push the **roof washer forward button** on the **remote control roof washer and platform**. The **roof washer** moves onto the greenhouse and brushes the roof. The **roof washer** automatically stops at the end of the **gutters**. The water hose and cable reels are activated and the roof washer moves back to the platform. The roof washer automatically stops at the platform.

7. Push the **platform ramp up button** to raise the **ramps**.
8. Move the **platform** and **roof washer** to the next rooftop. Repeat steps 11,12,14,15 until the **greenhouse roof** has been washed completely.
9. Store the **remote control roof washer and platform** and the **remote control undercarriage** when you don't use it in the dedicated **storage slots A**, right underneath the **control cabinet platform**.

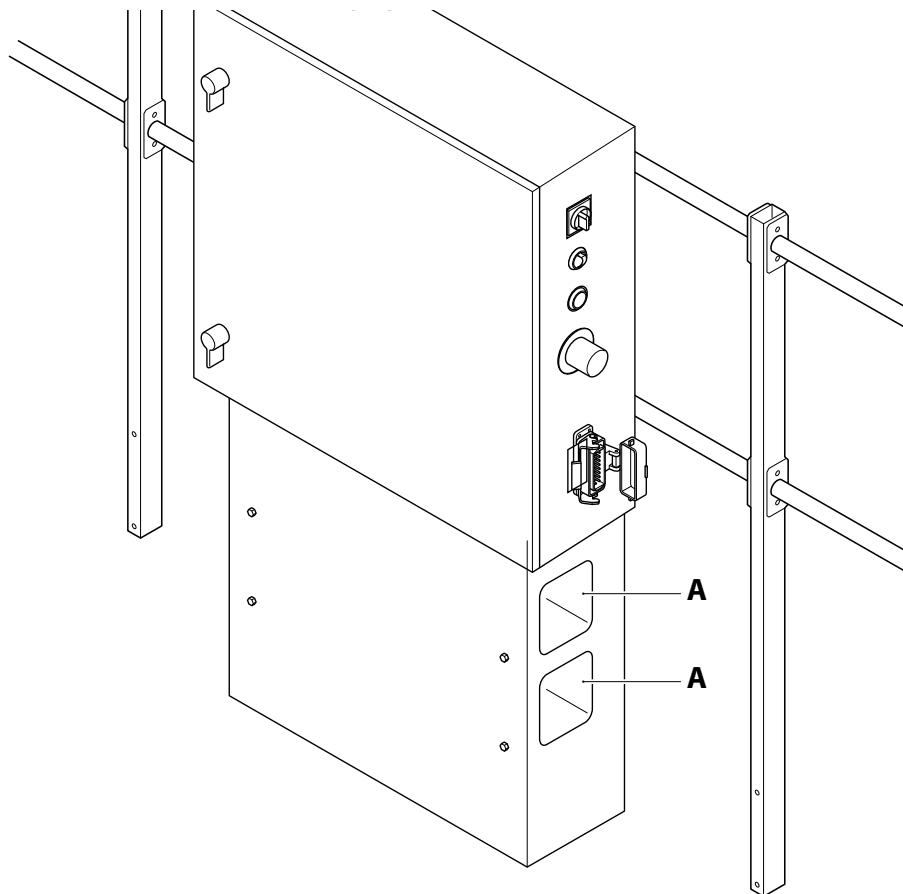


Fig. 46 Remote control storage

6 OPERATION

10. Make sure that the **WATER PUMP switch** is in the OFF position on the **control cabinet platform**.
11. Put the **main switch 1S0 A** of the **control cabinet platform** to the **0 position** (put to the **OFF** position for the North American version).

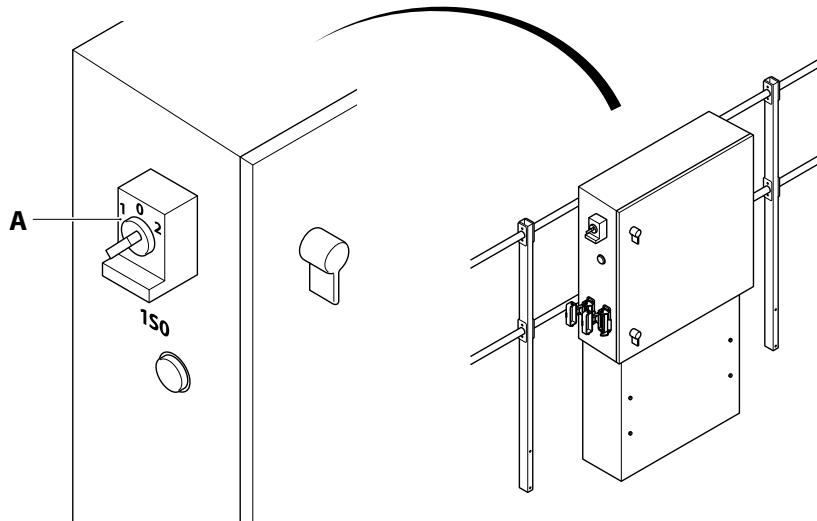


Fig. 47 Turn the control cabinet platform off

6.2 HOW TO OPERATE THE AUTOMATIC VERSION

The **operation display** is used to operate the roof washer and platform automatically.

The machinery can be operated both manually and automatically via the operation display. The **remote control roof washer and platform** can also be used to operate the automatic version manually. Optionally the machinery can be controlled with an app on a mobile device. If this applies to your machine, consult the *Ixon keepgo manual*, see *1.7 Other documentation* on how to install and use the app.

Optionally, the machinery can be controlled by the climate computer. The start and stop parameters are set in the software of the climate computer.

The automatic version will go in standby mode after its washing cycle is done and remains in standby mode until it receives new input.

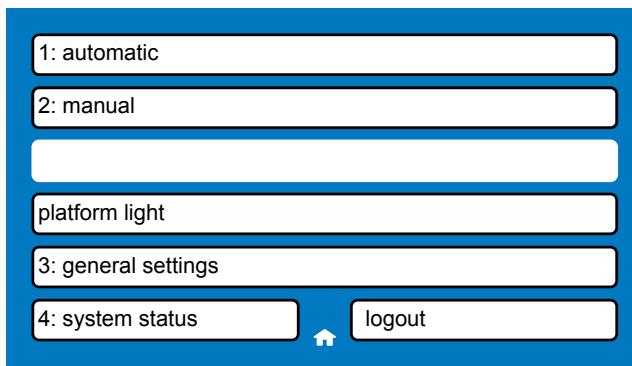
6.2.1 Start an automatic washing cycle

1. Make sure the machinery complies with the following start-conditions, before starting a washing cycle:
 - a. The ramps are in the upwards position.
 - b. The platform is positioned in front of a rooftop.
 - c. The roof washer is parked on the platform.
 - d. The **water supply hose** and **power supply cable** from greenhouse to platform are not stuck.
2. Login on the operation display. The default password for the **user login** is 2011. To change the password, see *6.2.8 Adjust the general settings*. The **Home screen** opens.



Screen 0 Login

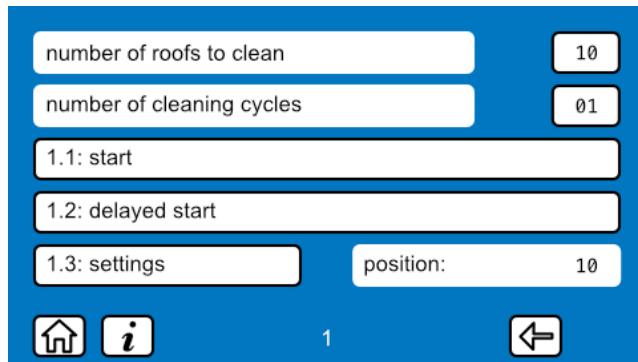
3. On the **HOME screen** tap **1: automatic** to enter the settings for an automatic cleaning cycle.



Screen HOME automatic

6 OPERATION

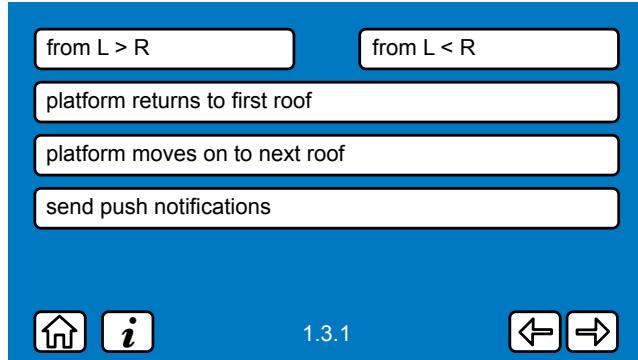
4. For first-time use tap **1.3: settings** to adjust the settings.



Screen 1 automatic cleaning

5. Match the settings to your machine. The amount of settings which can be changed depends on the version of the machinery.

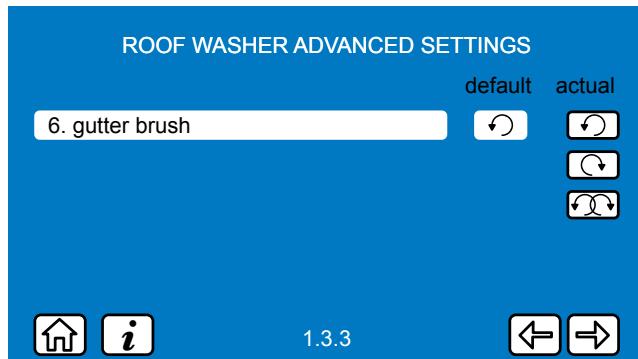
NOTICE tap **i** for more information on the meaning of these settings.



Screen 1.3.1 Machine settings for automatic cleaning

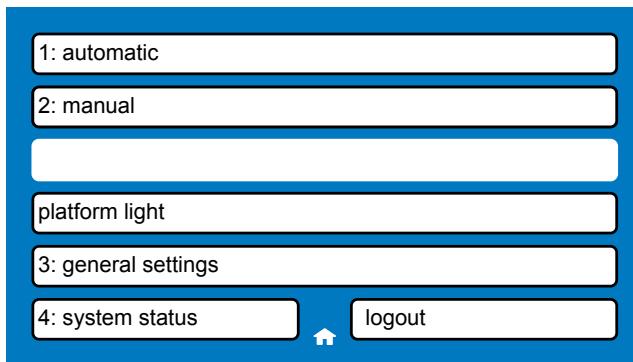
6. Tap **→** to enter the **ADVANCED ROOF WASHER SETTINGS**. Continue tapping **→** and completing all the settings and return to the **HOME screen**.

NOTICE tap **i** for more information on the meaning of these settings.



Screen 1.3.1 Roof washer advanced settings

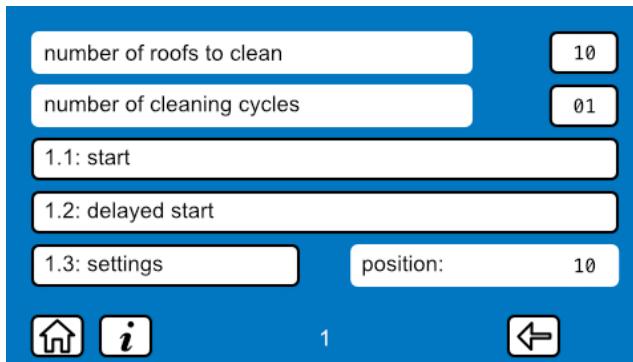
7. On the **HOME** screen tap **1: automatic**.



Screen HOME automatic

8. Enter the **number of rooftops** to be washed, and the **number of times** each rooftop needs to be washed.

NOTICE Tap **i** for more information on the meaning of these settings.

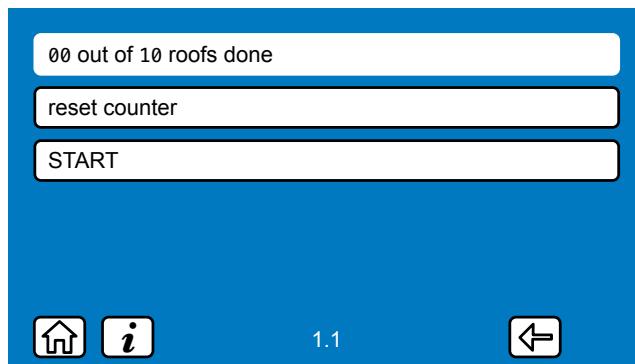


Screen 1 Automatic washing

6 OPERATION

9. Tap **1.1:start**. Tab **reset counter** if you want to start counting again from rooftop 00. Tap **START**. After a countdown of 30 seconds the roof washer will start the washing cycle. **NOTICE** If a warning message appears, the machinery did not comply with the start-conditions of step one. The machinery changes to manual mode, see *6.2.6 Control the machinery with the operation display manually*.

NOTICE Tap  for more information on the meaning of these settings.



Screen 1.1 Start settings

6.2.2 Start an automatic washing cycle with a delayed start

1. Make sure the machinery complies with the following start-conditions, before starting a washing cycle:
 - a. The ramps are in the upwards position.
 - b. The platform is positioned in front of a rooftop.
 - c. The roof washer is parked on the platform.
 - d. The **water supply hose** and **power supply cable** from greenhouse to platform are not stuck.

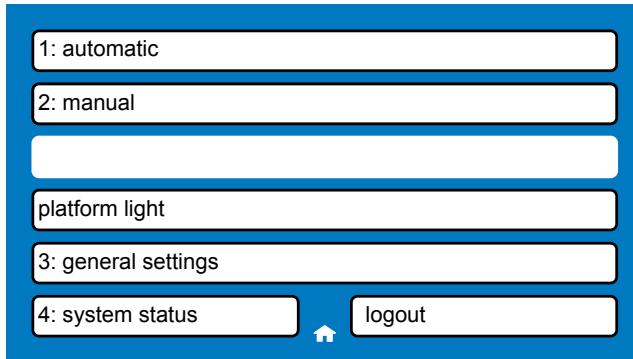
2. Login on the **operation display**. The default password for the **user login** is 2011.

To change the password, see *6.2.8 Adjust the general settings*. The **Home screen** opens.



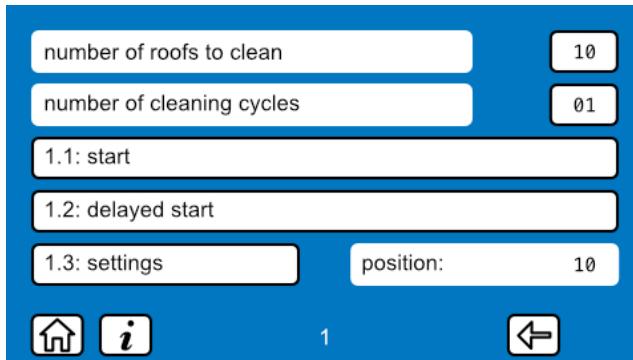
Screen 0 Login

3. On the **HOME screen** tap **1: automatic** to enter the settings for an automatic cleaning cycle.



Screen HOME automatic

4. For first-time use tap **1.3: settings**.

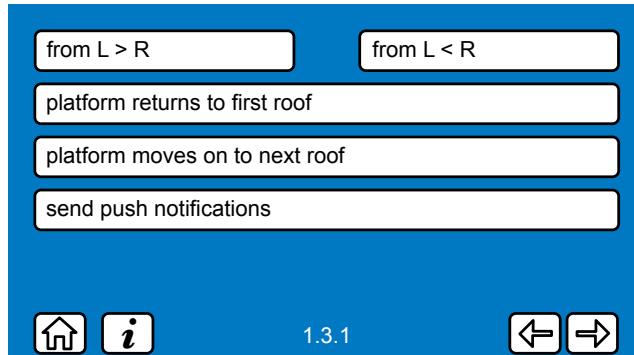


Screen 1 automatic cleaning

6 OPERATION

5. Match the settings to your machine. The amount of settings which can be changed depends on the version of the machinery.

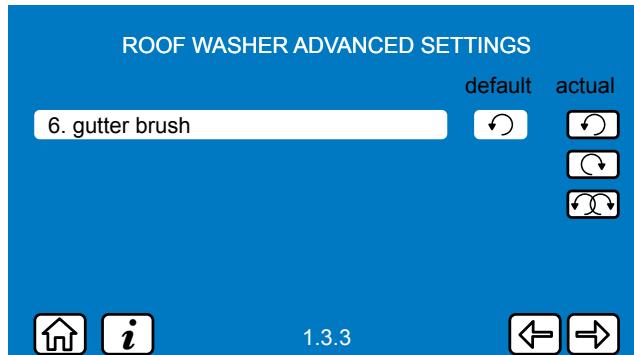
NOTICE tap  for more information on the meaning of these settings.



Screen 1.3.1 Machine settings for automatic cleaning

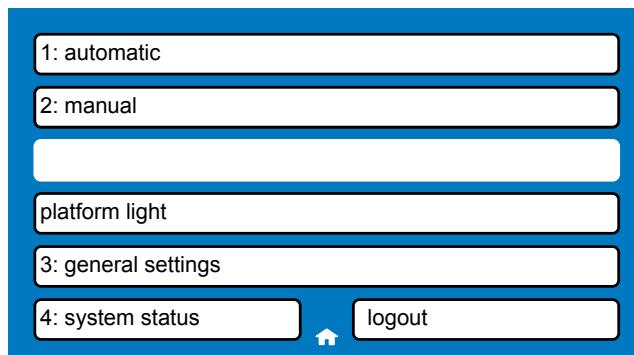
6. Tap  to enter the **ADVANCED ROOF WASHER SETTINGS**. Continue tapping  and completing all the settings and return to the **HOME screen**.

NOTICE tap  for more information on the meaning of these settings.



Screen 1.3.1 Roof washer advanced settings

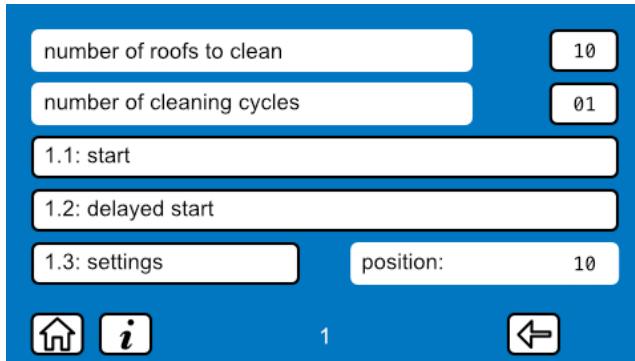
7. On the **HOME screen** tap **1: automatic**.



Screen 1 Automatic washing

8. Enter the **number of rooftops** to be washed, and the **number of times** each rooftop needs to be washed. Tap **1.2: delayed start**

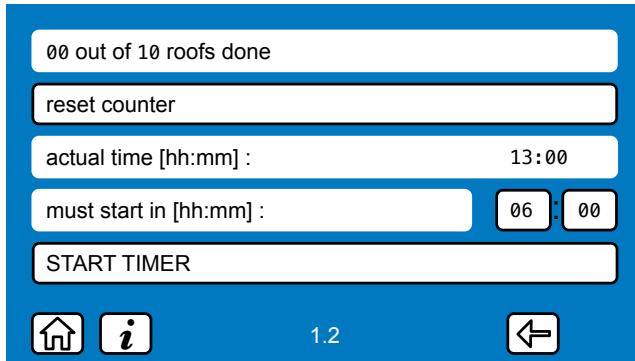
NOTICE Tap **i** for more information on the meaning of these settings



Screen 1 Automatic washing

9. Enter the amount of **hours** and **minutes** before the washing cycle should start.

NOTICE tap **i** for more information on the meaning of these settings.



Screen 1.2 Delayed start settings

10. Tap the **START TIMER** button. A timer will be active up until the point the roof washer will start the washing cycle. **NOTICE** If a warning message appears, the machinery did not comply with the start-conditions of step one. The machinery changes to manual mode, see *6.2.6 Control the machinery with the operation display manually*. **NOTICE** Tap **i** for more information on the meaning of these settings

6.2.3 Start a washing cycle from the climate computer

NOTICE

- These instructions only apply when the Top Cleaner is connected to the climate computer. For problems with, or questions about operating the Top Cleaner from the climate computer, refer to the climate computer manual or contact the installer.

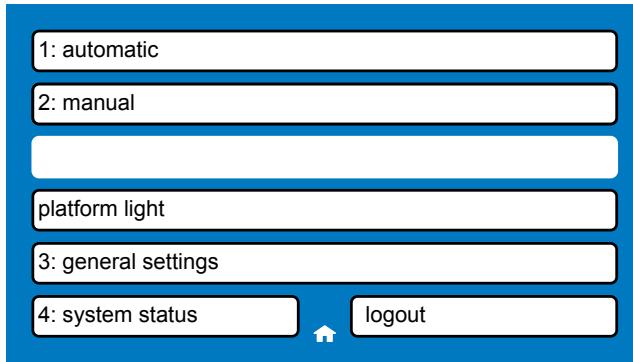
To start a washing cycle from the climate computer:

1. Make sure the machinery complies with the following start-conditions, before starting a washing cycle:
 - a. The ramps are in the upwards position.
 - b. The platform is positioned in front of a rooftop.
 - c. The roof washer is parked on the platform.
 - d. The pump switch 12S2 on the interface cabinet is on AUTO position
 - e. The **water supply hose** and **power supply cable** from greenhouse to platform are not stuck.
2. Login on the **operation display**. The default password for the **user login** is 2011. To change the password, see *6.2.8 Adjust the general settings*. The **Home screen** opens.



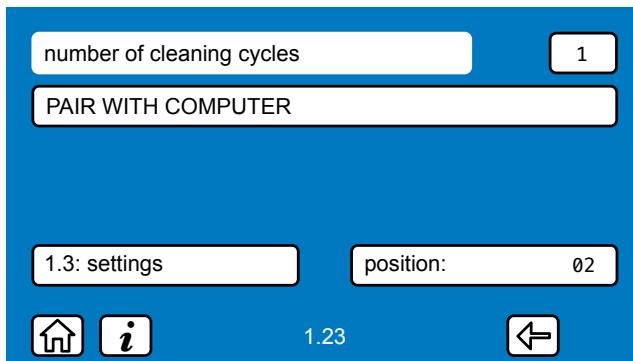
Screen 0 Login

3. On the **HOME screen** tap **1: automatic**.



Screen 1 Automatic washing

4. Enter the **number of times** each rooftop should be cleaned. Press **PAIR WITH COMPUTER**. **NOTICE** tap **i** for more information on the meaning of these settings.



Scherm 1.23 Pair with climate computer

5. When the Top Cleaner is correctly paired with the climate computer, the screen below will appear.



Scherm 1.24 Waiting for computer-start

6. Start the Top Cleaner from the climate computer. **NOTICE** Refer to the climate computer manual or contact your installer if necessary.

6.2.4 Switch from fully automatic mode to semi automatic mode

When it is not possible to start the Top Cleaner in fully automatic mode (climate computer), it can temporarily be controlled in semi automatic mode, from the operation display of the Top Cleaner.

To switch to semi automatic mode:

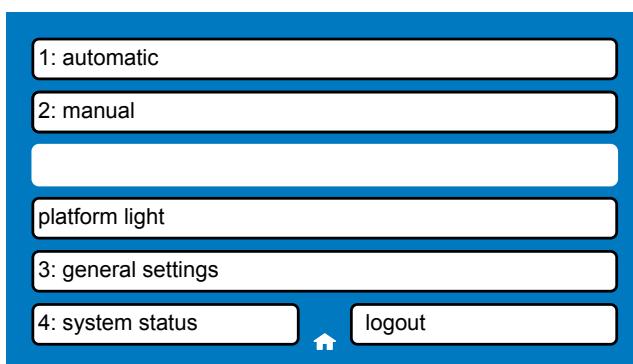
1. Login on the **operation display**. The default password for the user login is 2011.

To change the password, see *6.2.8 Adjust the general settings*. The **Home screen** opens.



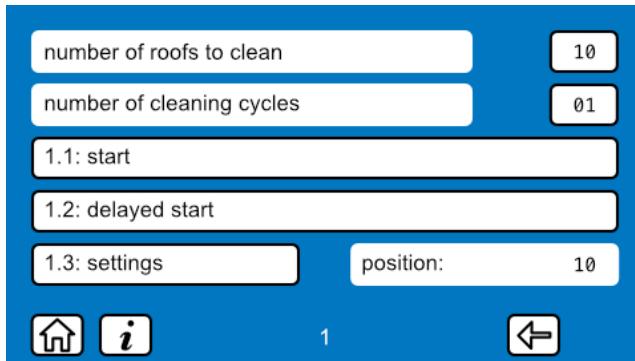
Screen 0 Login

2. On the **HOME screen** tap **1: automatic**



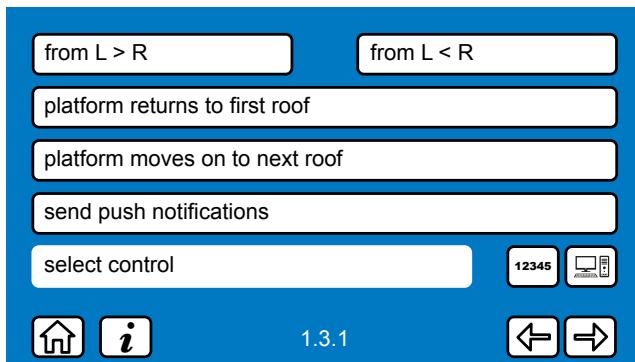
Screen HOME automatic

3. Tap **1.3: settings**.



Screen 1 automatic cleaning

4. At **select control** tap  to **select semi automatic mode**



Screen 1.3.1

5. Tap 
6. Tap **1: automatic**
7. Follow the instructions as from steps 8 in paragraph *6.2.1 Start an automatic washing cycle* or *6.2.2 Start an automatic washing cycle with a delayed start*

6 OPERATION

6.2.5 Switch from semi automatic mode to fully automatic mode

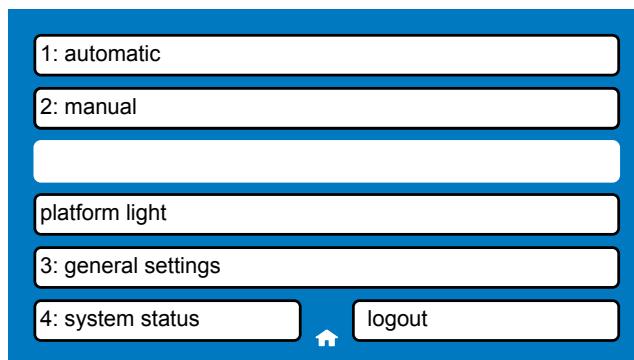
1. Login on the **operation display**. The default password for the **user login** is 2011.

To change the password, see *6.2.8 Adjust the general settings*. The **Home screen** opens.



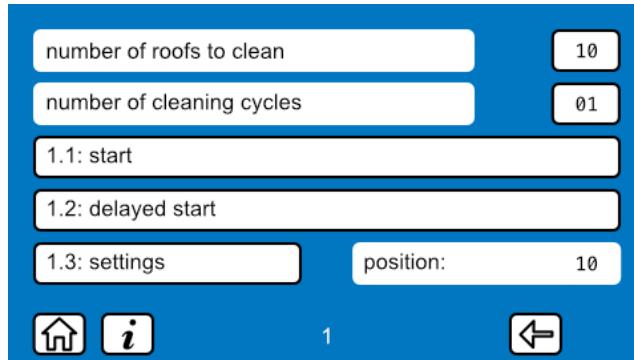
Screen 0 Login

2. On the **HOME screen** tap **1: automatic**



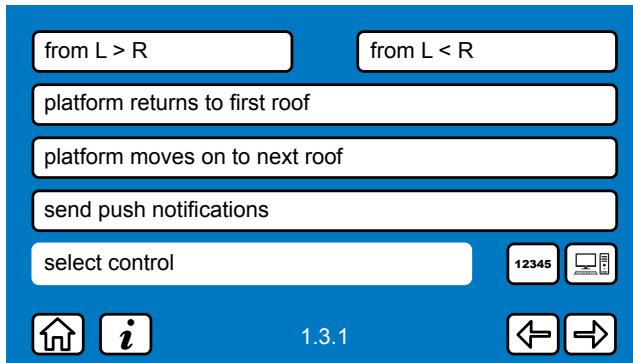
Screen HOME automatic

3. Tap **1.3: settings**.



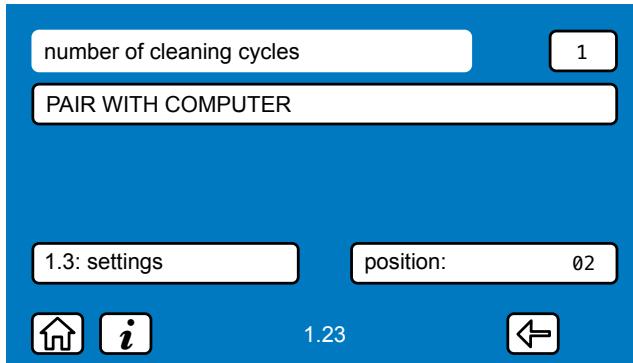
Screen 1 automatic cleaning

4. At **select control** tap  to select **fully automatic mode**



Scherm 1.3.1

5. Enter the **number of times** each rooftop should be cleaned. Press **PAIR WITH COMPUTER**. **NOTICE** tap  for more information on the meaning of these settings.



Scherm 1.23 Pair with climate computer

6. When the Top Cleaner is correctly paired with the climate computer, the screen below will appear.



Scherm 1.24 Waiting for computer-start

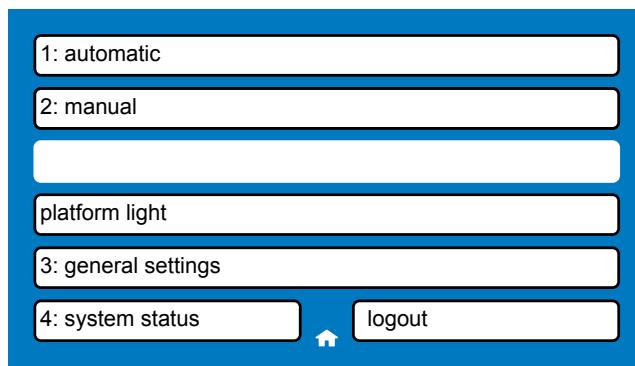
7. Start the Top Cleaner from the climate computer. **NOTICE** Refer to the climate computer manual or contact your installer if necessary.

6.2.6 Control the machinery with the operation display manually

It is also possible to manually control an automatic version. This is generally done while testing and adjusting the machinery or when an error occurs during an automatic washing cycle.

To manually control the automatic version:

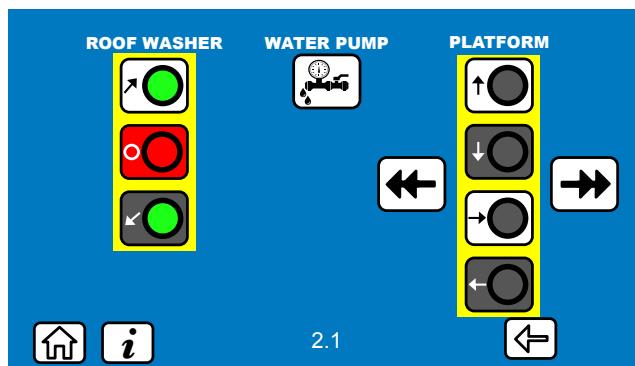
1. Go to the **Home screen** .
2. Tap **2: manual button**.



Screen HOME manual

3. Control the roof washer, the platform and the water pump manually to wash the greenhouse.

NOTICE tap  for more information on the use of the buttons.

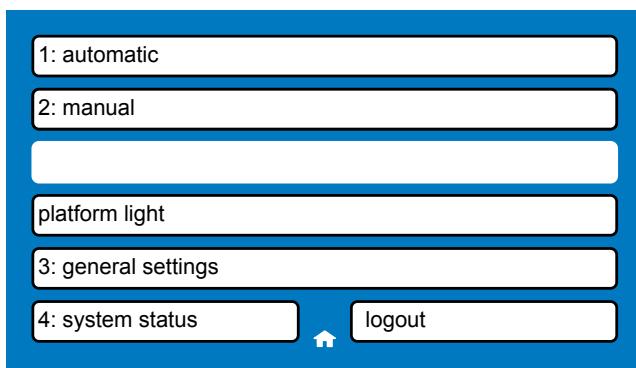


Screen 2.1 manual operation

6.2.7 Turn the platform light on or off

1. Go to the **Home screen** .
2. Tap the **platform light** to turn the light on or off.

NOTICE When the Platform light button is white, the light is off. When the Platform light button is green, the light is on. After turning off the platform light, the light will switch off after three minutes.

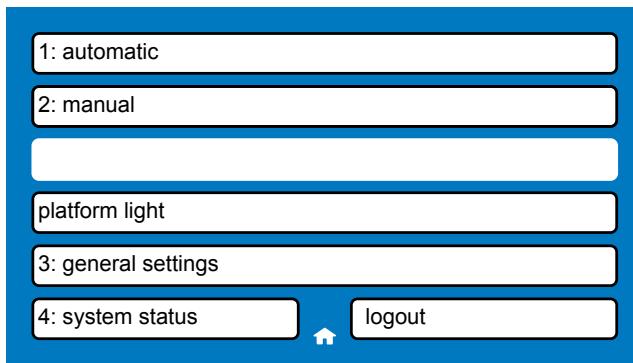


Screen *HOME platform light*

6.2.8 Adjust the general settings

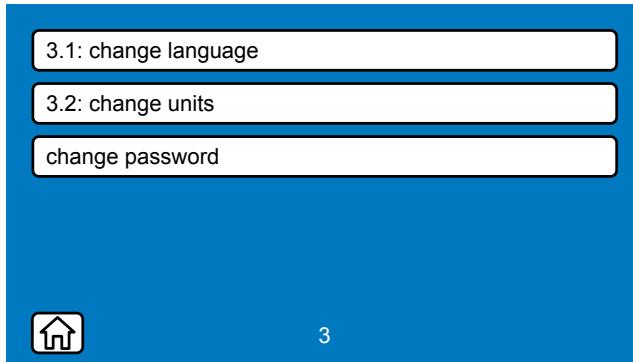
In the general settings the language, time, date and password can be changed.

1. Go to the **Home screen** .
2. Tap **3: general settings button**.



Screen HOME general settings

3. Change any of the language, time, date or password settings you wish to change by tapping on the button and entering the settings accordingly.



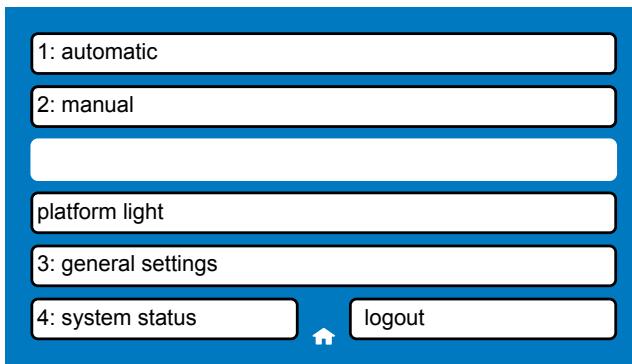
Screen 3 general settings

6.2.9 Check the status of the machinery

Whenever there is a warning or an error screen and the machine does not want to start or when it suddenly stops, the **system status** can provide information. The **system status** shows where the problem is occurring by showing which sensors are active and inactive.

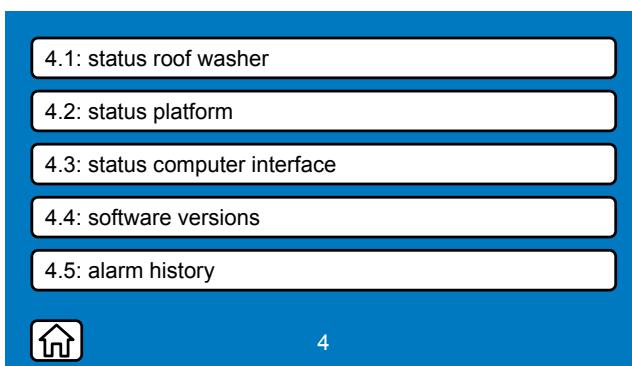
To view the status of the machinery:

1. Go to the **Home screen** .
2. Tap **4:system status**.



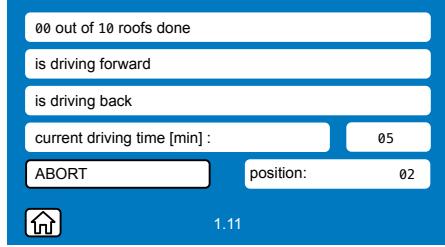
Screen *HOME* system status

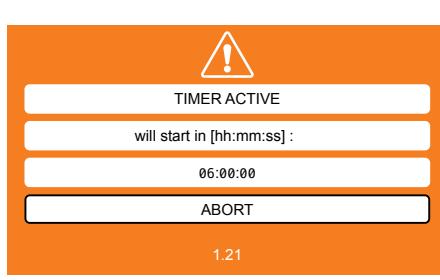
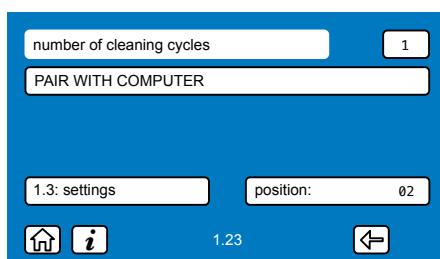
3. Tap the button of the roof washer, platform, interface software, or alarm history to get the status of that part of the machinery.

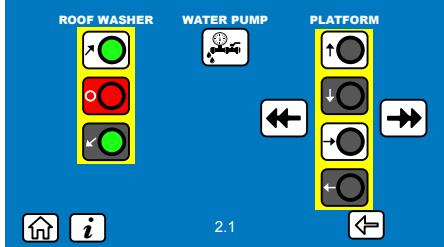
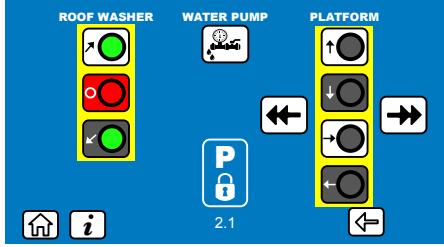


Screen 4 System status

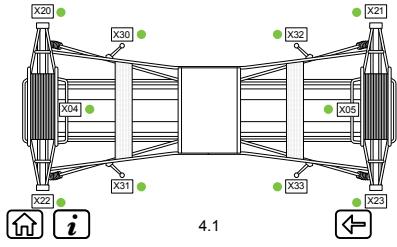
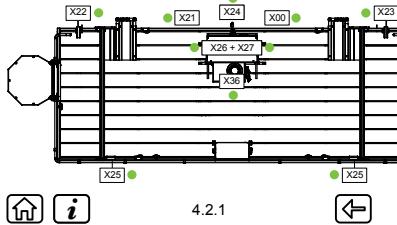
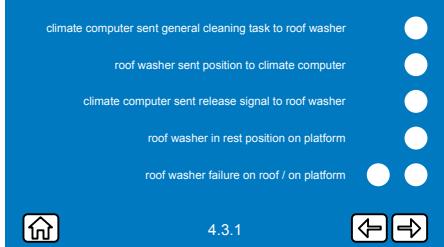
6.2.10 Explanation of additional screens

Level	Screen	Meaning
		<ul style="list-style-type: none"> Instructions to work safely.
1.10		<ul style="list-style-type: none"> For safety reasons the machinery starts after a delay of 30 seconds. An acoustic warning sounds at the same time. Abort the automatic washing cycle. The machinery will not start and should be programmed again.
1.11		<ul style="list-style-type: none"> Indicates how many rooftops were already washed. Indicates if the roof washer is driving forward or backward. Indicates how many minutes the roof washer is driving on the current rooftop. Abort the automatic washing cycle. The roof washer will finish the rooftop and once back on the platform it stops and shuts down. Indicates the actual position (rooftop No.).

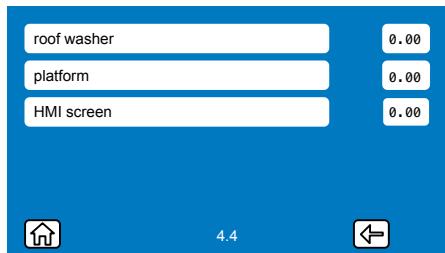
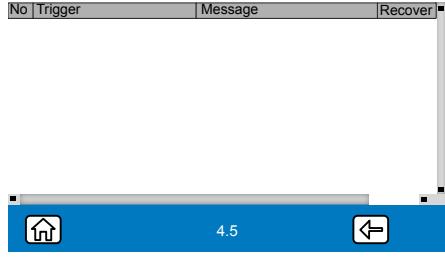
Level	Screen	Meaning
		<ul style="list-style-type: none"> Indicates that all set rooftops were washed without any interruptions.
1.21		<ul style="list-style-type: none"> Indicates there is a timer active. Indicates that the machinery is waiting to start when the counter reaches zero. Indicates the actual time. Aborts the automatic washing cycle.
1.23		<ul style="list-style-type: none"> Set how many times to wash each rooftop. Pair with the climate computer to put the machinery in standby, waiting for a release signal from the climate computer. Go to machine settings. Indicates the actual position (rooftop No.).
1.25		<ul style="list-style-type: none"> Indicates if the roof washer is driving forward or backward. Indicates how many minutes the roof washer is driving on the current rooftop. Abort the automatic washing cycle. The roof washer will finish the rooftop and once back on the platform it stops and shuts down. Indicates the actual position (rooftop No.).

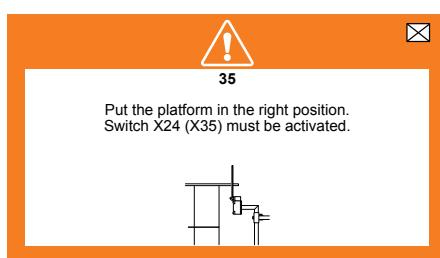
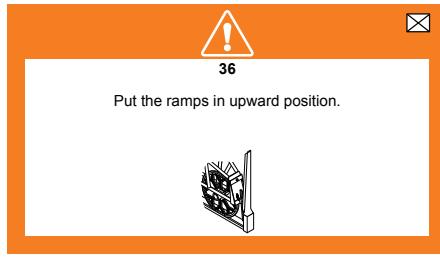
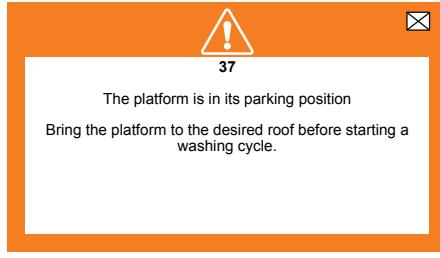
Level	Screen	Meaning
2.1	 <p>2.1</p>	<ul style="list-style-type: none"> Roof washer control. Water pump on/off. Platform control.
2.1	 <p>2.1</p>	FOR PLATFORMS WITH REELS AND ACTIVATED PARK FUNCTION ONLY. <ul style="list-style-type: none"> Roof washer control. Water pump on/off. Move platform to park position. Platform control.
1.50	 <p>1.50</p>	FOR PLATFORMS WITH REELS AND ACTIVATED PARK FUNCTION ONLY. <ul style="list-style-type: none"> Indicates that the platform is driving to the park position. Abort will stop the platform immediately.
1.51	 <p>1.51</p>	<ul style="list-style-type: none"> Indicates that the platform is driving to the leftmost rooftop without stopping. Abort will stop the platform immediately.
1.52	 <p>1.52</p>	<ul style="list-style-type: none"> Indicates that the platform is driving to the rightmost rooftop without stopping. Abort will stop the platform immediately.

6 OPERATION

Level	Screen	Meaning																																										
4.1	 <p>4.1</p>	<ul style="list-style-type: none"> Indicates the status of all roof washer switches/sensors. A green dot means that the switch/sensor is active. A gray dot means that the switch/sensor is not active. 																																										
4.2.1	 <p>4.2.1</p>	<ul style="list-style-type: none"> Indicates the status of all platform switches/sensors. A green dot means that the switch/sensor is active. A gray dot means that the switch/sensor is not active. 																																										
4.3.1	 <p>4.3.1</p> <ul style="list-style-type: none"> climate computer sent general cleaning task to roof washer roof washer sent position to climate computer climate computer sent release signal to roof washer roof washer in rest position on platform roof washer failure on roof / on platform 	<ul style="list-style-type: none"> Indicates the status of the communication between the platform and the climate computer. 																																										
4.3.2	 <p>4.3.2</p> <table border="1"> <thead> <tr> <th></th> <th>position</th> <th>release</th> <th></th> <th>position</th> <th>release</th> </tr> </thead> <tbody> <tr><td>section 01</td><td>●</td><td>●</td><td>section 07</td><td>●</td><td>●</td></tr> <tr><td>section 02</td><td>●</td><td>●</td><td>section 08</td><td>●</td><td>●</td></tr> <tr><td>section 03</td><td>●</td><td>●</td><td>section 09</td><td>●</td><td>●</td></tr> <tr><td>section 04</td><td>●</td><td>●</td><td>section 10</td><td>●</td><td>●</td></tr> <tr><td>section 05</td><td>●</td><td>●</td><td>section 11</td><td>●</td><td>●</td></tr> <tr><td>section 06</td><td>●</td><td>●</td><td>section 12</td><td>●</td><td>●</td></tr> </tbody> </table>		position	release		position	release	section 01	●	●	section 07	●	●	section 02	●	●	section 08	●	●	section 03	●	●	section 09	●	●	section 04	●	●	section 10	●	●	section 05	●	●	section 11	●	●	section 06	●	●	section 12	●	●	<ul style="list-style-type: none"> Indicates in which wash section the platform is. Indicates if the climate computer sent a release signal to the platform or not.
	position	release		position	release																																							
section 01	●	●	section 07	●	●																																							
section 02	●	●	section 08	●	●																																							
section 03	●	●	section 09	●	●																																							
section 04	●	●	section 10	●	●																																							
section 05	●	●	section 11	●	●																																							
section 06	●	●	section 12	●	●																																							

6 OPERATION

Level	Screen	Meaning
4.4		<ul style="list-style-type: none"> Indicates the present software version for the roof washer control. Indicates the present software version for the platform control. Indicates the present software version for the operation display control. Indicates the present software version for the climate computer interface control.
4.5		<ul style="list-style-type: none"> Displays a summary of all previous alarms including the date/time that an alarm occurred, and was recovered.
34		<ul style="list-style-type: none"> Warning 34 instructs the operator to put the roof washer in the right position on the platform before an automatic washing cycle can be started. Both switches X25 must be active. After closing this screen, the display automatically jumps to the manual operation screen, No 2.

Level	Screen	Meaning
35	 <p>35</p> <p>Put the platform in the right position. Switch X24 (X35) must be activated.</p>	<ul style="list-style-type: none"> Warning 35 instructs the operator to put the platform in the right position before an automatic washing cycle can be started. Switch X35 must be active. After closing this screen, the display automatically jumps to the manual operation screen, No 2.
36	 <p>36</p> <p>Put the ramps in upward position.</p>	<ul style="list-style-type: none"> Warning 36 instructs the operator to put the ramps of the platform in vertical up position before an automatic washing cycle can be started. After closing this screen, the display automatically jumps to the manual operation screen, No 2.
37	 <p>37</p> <p>The platform is in its parking position Bring the platform to the desired roof before starting a washing cycle.</p>	<p>FOR PLATFORMS WITH REELS AND ACTIVATED PARK FUNCTION ONLY.</p> <ul style="list-style-type: none"> Warning 37 warns the operator to move the platform to the desired rooftop before pairing the machinery with the climate computer. After closing this screen, the display automatically jumps to the manual operation screen, No 2.

6.3 HOW TO DECOMMISSION THE MACHINERY

- Put the main **switch 1S0 A** of the **control cabinet platform** to the **0 position** or put to the **OFF B** position for the North American version.

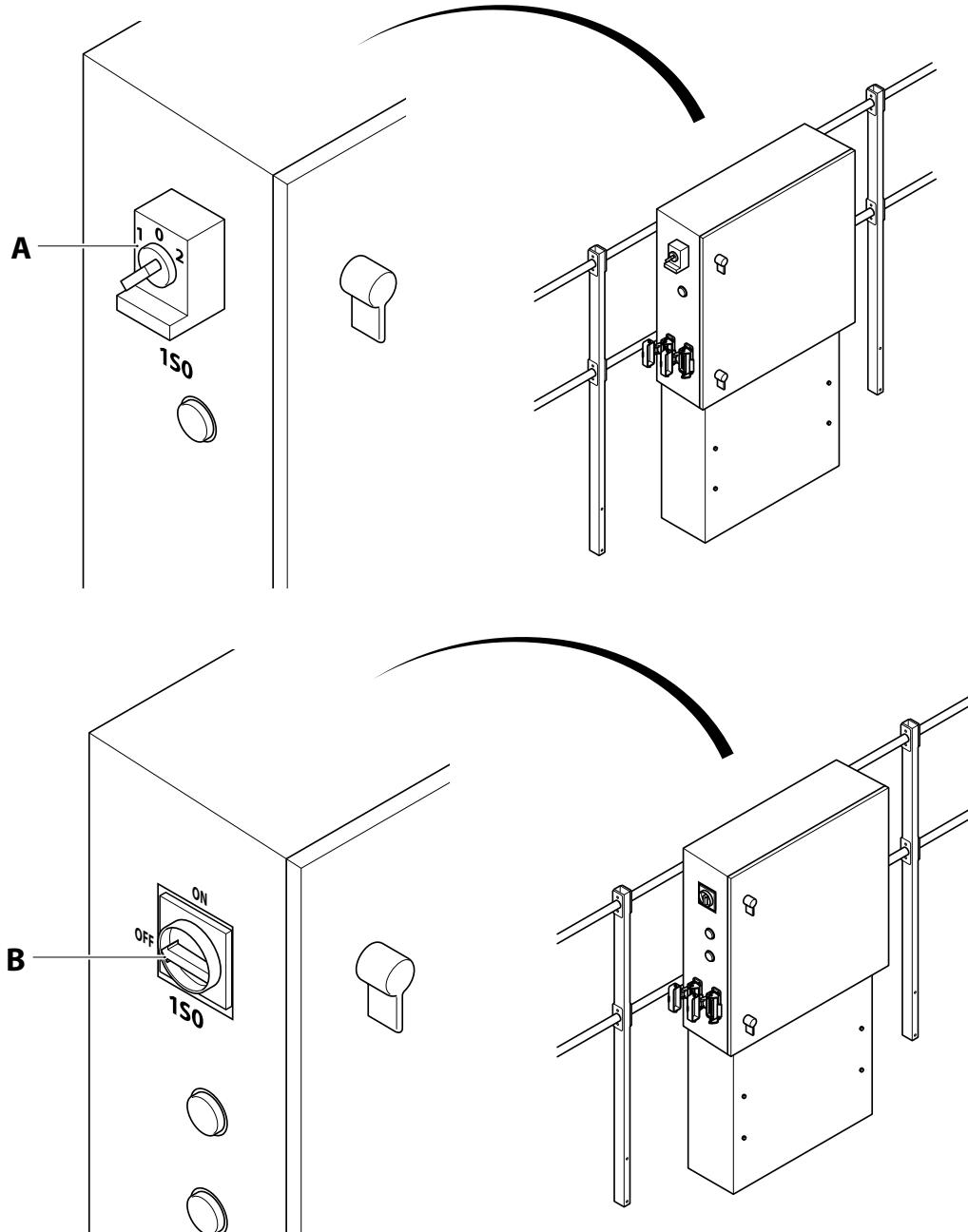


Fig. 48 Turn the control cabinet platform off

- Put the **main switch 1S1 A** of the **interface cabinet** to the **OFF position**.

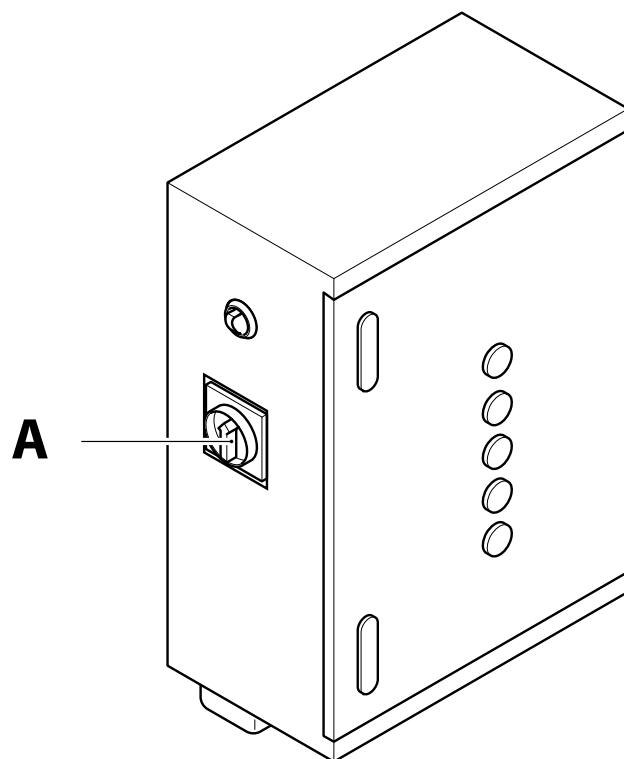


Fig. 49 Turn the interface cabinet off

6.4 WHAT TO DO IN AN EMERGENCY AND EXCEPTIONAL SITUATION

The machinery is equipped with multiple emergency stop buttons that the user can activate by pushing the red button whenever there is an emergency situation. All activities of the machinery are then aborted. A reset must be done after pushing an emergency stop button. Before doing a reset, pull out an activated (pressed) emergency stop button. For doing a reset, see *6.5 How to reset the machinery*.

Location of the emergency stop buttons:

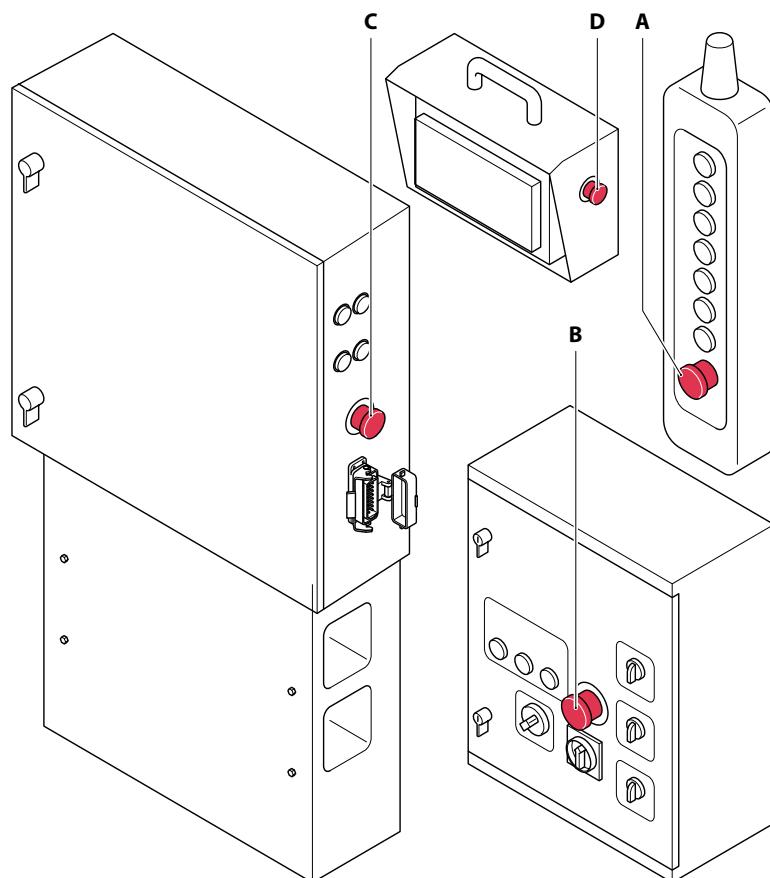


Fig. 50 Locations of emergency buttons.

- A. Emergency stop button on the remote control roof washer and platform
- B. Emergency stop button on the control cabinet roof washer
- C. Emergency stop button at the side of the control cabinet platform
- D. Emergency stop button at the side of the display of the operation display
(for automatic version only)

6.5 HOW TO RESET THE MACHINERY

6.5.1 Reset after an emergency stop or interruption with manual version

1. Do the troubleshooting procedure to find the cause of the malfunction. Find a solution for the malfunction. See *9.2 Troubleshooting of the manual version*.
2. Make sure that all activated (pressed) emergency stop buttons are pulled out.
3. Push the **failure/reset button 12S6** on the **control cabinet platform** until the red light turns off.

6.5.2 Reset after an emergency stop or interruption with automatic version

1. Look at the error message on the **operation display** to find the cause of the malfunction. Find a solution for the malfunction. See *9.4 Troubleshooting of the automatic version*.
2. Make sure that all activated (pressed) emergency stop buttons are pulled out.
3. Tap **RESET** on the **operation display** or close the error message to reset the machine. The **MANUAL OPERATION** screen will open automatically.
4. Put the machine back into position.
5. Go back to the **HOME** screen.

7 APPLYING A COATING WITH THE SPRAY BOOM

DANGER

- Always follow the instructions with regard to storing and transporting dangerous substances.
- Make sure that safety sheets of the relevant substances are available. Read and understand the safety sheets before using the substances.
- Ensure that each person who uses the machinery has read the safety sheets. Keep all safety sheets for future reference and pass them on to subsequent users of the machinery.
- Always conduct the instructions in this section by a minimum of two authorized persons: one person is near the chalking pump on the ground and one person is on the platform.
- Make sure to have eyewash available in the vicinity of the activities.
- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Installation and commissioning shall be carried out by a properly qualified and skilled installer with due observance of the applicable rules and legislation. The installer is responsible for employing skilled and qualified personnel.
- In the event that you have to do installation tasks for which you need to move yourself on the machinery, make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that the combined weight of the machinery standing in the greenhouse gutters, everyone and everything on the machinery does not exceed the maximum allowed gutter load.
- Make sure that all greenhouse gutters are provided with proper end-gutter protection. If these protections are not present and/or properly attached, the machinery moving in the greenhouse gutters can fall off the greenhouse.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.
- Make sure that the windows of the greenhouse are closed and remain closed when using the machinery.

- Make sure that there is no-one inside the greenhouse where the machinery is in use. Depending on the situation, create a NO GO zone to ensure public safety.
- Before use make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that you know where the emergency stop buttons are located before operating the machinery.
- Do not exceed the maximum load of the machinery. Consult the type identification plate(s) for the maximum load.
- Do not exceed the maximum number of people allowed on the machinery.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

Depending on your order the spray boom is connected to the roof washer or not.

Consult the Top Cleaner Spray Boom manual on how to install and use the spray boom (see *1.7 Other documentation*).

8 INSPECTION, MAINTENANCE AND CLEANING



DANGER

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- Do not exceed the maximum load of the machinery. Consult the type identification plate(s) for the maximum load.
- Do not exceed the maximum number of people allowed on the machinery.
- Beware of any moving or hinging parts of the machinery. Do not place any fingers or hands where they can get jammed.
- Never insert body parts between rotating parts of the machinery.
- The machinery is not intended to be used as a device to move persons.
- Use a bright headlamp when working in the dark.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.
- All repair and modification tasks shall only be carried out by qualified and skilled persons. Only open or repair parts of the machinery when you know what you are doing. If you have any doubts, contact the manufacturer.
- All cleaning and maintenance tasks shall only be carried out by qualified and skilled persons. To ensure the operational safety of the machinery, regular maintenance shall be carried out by qualified persons in accordance with the manufacturer's instructions.

- Always shut off the machinery according to the LOCK OUT-TAG OUT method before performing any maintenance or repair work.
- Maintenance and inspection should be done on a frequent basis. If there is any visible damage, a strong odor or excessive overheating of components, stop using the machinery. Non-frequent maintenance shortens the activity and life span of the machinery and voids the warranty.
- Use only original accessories and spare parts. You can always order spare parts from the webshop <https://portal.vdwaay.nl/en/shop> or by sending an email to salesteam@vdwaay.nl.
- Alterations to the machinery and technical modifications are not permitted without written permission of the manufacturer. Failure to do so may result in damage to property and/or severe or fatal injuries and it will invalidate the warranty.

8.1 TECHNICAL ASSISTANCE

For technical assistance please contact:

Van der Waay B.V.
 Finlandlaan 2
 2391 PV Hazerswoude
 The Netherlands
 Tel.: +31 (0) 172 210311
info@vdwaay.nl

For ordering spare parts visit <https://portal.vdwaay.nl/en/shop>

8 INSPECTION, MAINTENANCE AND CLEANING

8.2 MAINTENANCE AND INSPECTION SCHEDULE

Required tools and supplies:

- Several tools that can be found in the supplied tool box.
- Manual oil change sump pump [SKU number Van der Waay 9547]
- Grease gun with water resistant lubrication
- Chain spray
- Lubricating spray

8.2.1 Before every use

Task	Notice
Check running hours in the LOGIN screen (for automatic version only).	If the amount of running hours is >50 hours, perform the maintenance tasks as described in section <i>8.2.3 Inspection and maintenance every month or every 50 running hours</i>
Check running hours on the hour counter inside the control cabinet roof washer (for manual version only)	

8.2.2 After every use

Task	Notice
Clean the roof washer and platform.	See section <i>8.12 How to clean the machinery</i>
Make sure that the wheels of the roof washer do not have a damaged rubber surface.	<ol style="list-style-type: none">1. Carefully remove any glass, screws, etc. that protrude the rubber.2. Replace the wheels if the rubber surface is severely damaged, loose or worn.

8.2.3 Inspection and maintenance every month or every 50 running hours

NOTICE

- An incorrect assembly of the drive shafts after replacing wheels, wheel bearings and/or universal joints, has a negative effect on the activity of the roof washer. Make sure that both the upper and lower universal joints are aligned with each other.

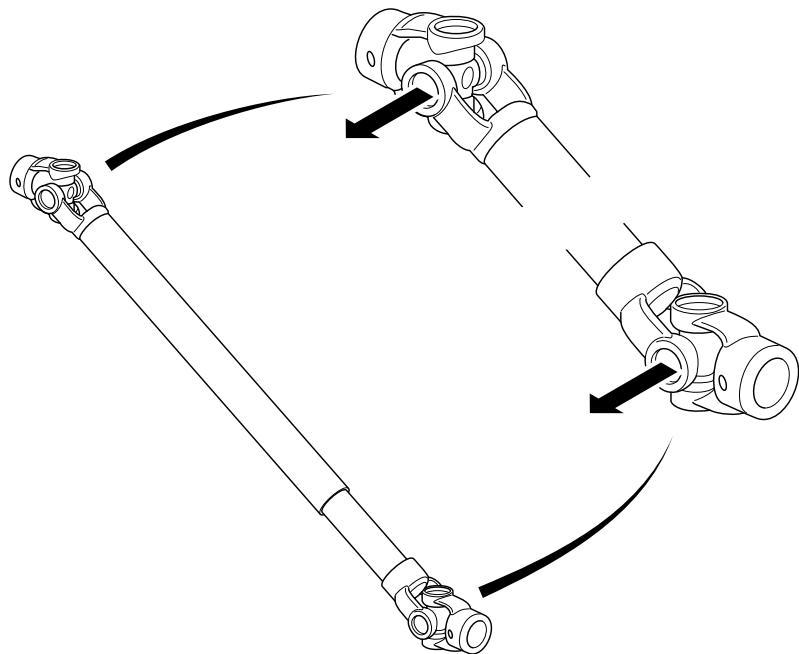


Fig. 51 Alignment of universal joints

8 INSPECTION, MAINTENANCE AND CLEANING

Task	Notice
Make sure that the oil tank of the hydraulics pump of the roof washer is filled for 2/3l.	Fill the oil tank if necessary up to 2/3. There may be a leak in the hydraulics system when you have to fill oil regularly. Consult the manufacturer if necessary. NOTICE Only use HV 32 oil!
Make sure that the oil level of the water pump is between the min. and max. level	See <i>8.8 How to check the water pump oil level and change the oil of the water pump</i>
Make the first oil change of the water pump (for the first 50 running hours only!)	See <i>8.8 How to check the water pump oil level and change the oil of the water pump</i>
Make sure that the wheel bearings of the roof washer have no wear and/or play.	Make sure that the wheel bearings of the roof washer have no play by trying to move the wheels sideways by hand. The wheel bearings are worn if you can move the wheels sideways.
Make sure that the wheels of the roof washer do not have a damaged rubber surface.	<ol style="list-style-type: none"> 1. Carefully remove any glass, screws, etc. that protrude from the rubber. 2. Replace the wheels if the rubber surface is severely damaged, loose or worn.
Make sure that the universal joints of the roof washer have no wear and/or play.	Make sure that the universal joints of the roof washer have no play by trying to move the drive shafts by hand. The universal joints are worn if you can move the drive shafts. Replace the universal joints when they have play/are worn.
Lubricate the universal joints and driveshafts of the roof washer.	See <i>8.3 How to lubricate the universal joints of the roof washer</i>
Lubricate the wheel bearings of the roof washer.	See <i>8.4 How to lubricate the wheel bearings of the roof washer</i>
Lubricate and possibly tighten the reel chains on the roof washer.	See <i>8.5 How to lubricate and tighten the reel chains</i>
Make sure that the chains of the hose and cable reel have no excessive wear.	Replace the chains of the cable and hose reel if necessary.

Task	Notice
Make sure that the adjustment of the brushes is correct.	Adjust the brushes if necessary. See 5.1 How to adjust the roof washer
Make sure that the brushes have no excessive wear.	Replace the brushes if the brushing result becomes less good and/or when they cannot be adjusted any more.
Lubricate the wheel set bearings on the platform.	See 8.6 How to lubricate the wheel set bearings of the platform
Lubricate the hinges of the platform ramps on the platform.	See 8.7 How to lubricate the hinges of the platform ramps
Make sure that the platform undercarriage cross braces are not damaged or loose.	<ol style="list-style-type: none"> 1. Tighten the cross braces if necessary. 2. Replace the cross braces if damaged.
Make sure that the supply cable and water hose are not damaged.	Replace the supply cable and water hose if necessary.
Clean the filters.	See 8.11 How to clean the filters of the water pump
Make sure that the water pressure of the water pump is between 50 and 70 bar.	Adjust the water pressure if necessary.
Make sure that the following safety devices operate correctly and are not broken: <ul style="list-style-type: none"> • Air vent switches • Wheel switches • End of rail switches on the platform 	Replace the safety devices if necessary

8.2.4 Inspection and maintenance every two years

Inspection task	Required action
Replace the wheel bearings of the roof washer.	Replace the wheel bearings only when the roof washer is on the ground.

8 INSPECTION, MAINTENANCE AND CLEANING

8.2.5 Inspection and maintenance every 500 running hours

Inspection task	Required action
Change the oil of the water pump.	See <i>8.8 How to check the water pump oil level and change the oil of the water pump</i> .
Change the hydraulic oil of the roof washer.	See <i>8.9 How to change the hydraulic oil of the roof washer</i> NOTICE Only use HV 32 oil!
Change the hydraulic oil of the platform reels.	See <i>8.10 How to change the hydraulic oil of the platform reels</i> NOTICE Only use HV 32 oil!

8.3 HOW TO LUBRICATE THE UNIVERSAL JOINTS OF THE ROOF WASHER

The eight universal joints, and the four drive shafts are each equipped with a grease fitting.

NOTICE Do not use too much lubrication and remove excess lubrication.

To lubricate the universal joints and drive shafts:

1. Remove the **lid of the top tray** **A** to reach the **upper universal joints** **B**. Lubricate the four **grease fittings** **C** on the **universal joints**.

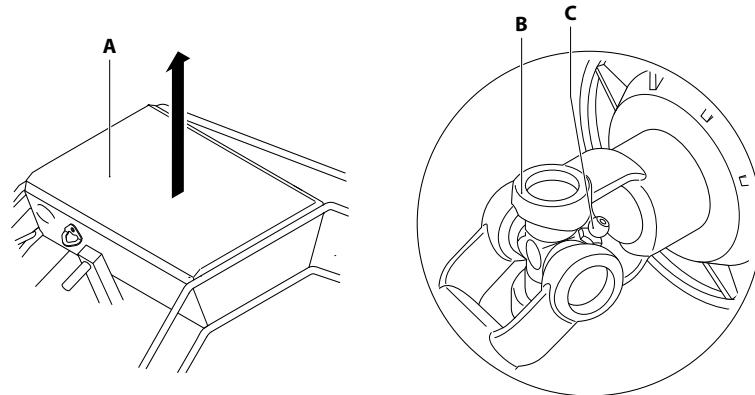


Fig. 52 Remove the lid of the top tray

2. Carefully remove the **covers** **A** at the side of the wheels to reach the **lower universal joints** **B**. Lubricate the four **grease fittings** on the **universal joints**.

NOTICE There is another grease fitting on each **drive shaft**, above the cover.

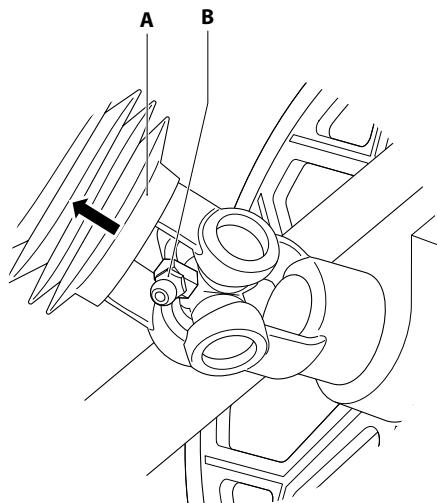


Fig. 53 Lubricate the grease fittings of the lower universal joints

8.4 HOW TO LUBRICATE THE WHEEL BEARINGS OF THE ROOF WASHER

This paragraph only applies to those roof washers which have grease fittings on the wheel bearings. Do not use too much lubrication and remove excess lubrication.

To lubricate the wheel bearings:

- Carefully lubricate the two **grease fittings A** on the **wheel bearings** of each wheel.

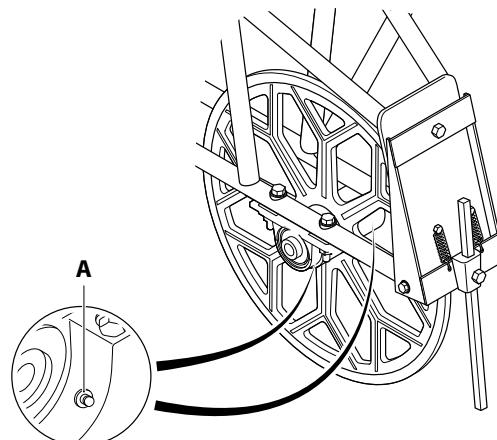


Fig. 54 Grease fittings of the wheel bearings.

8.5 HOW TO LUBRICATE AND TIGHTEN THE REEL CHAINS

1. Use a marker to indicate the position of the **roll holder A**. Disassemble the **roll holder A**.

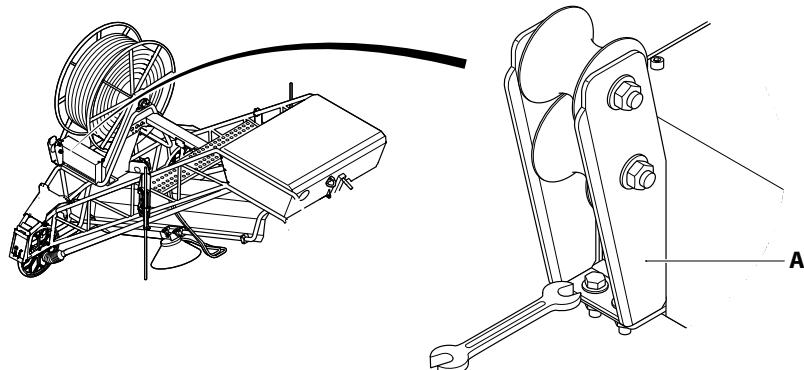


Fig. 55 Disassemble the roll holder

2. Remove the **aluminum cover A** of the **guide B**. Remove the **reel chain guard C**.

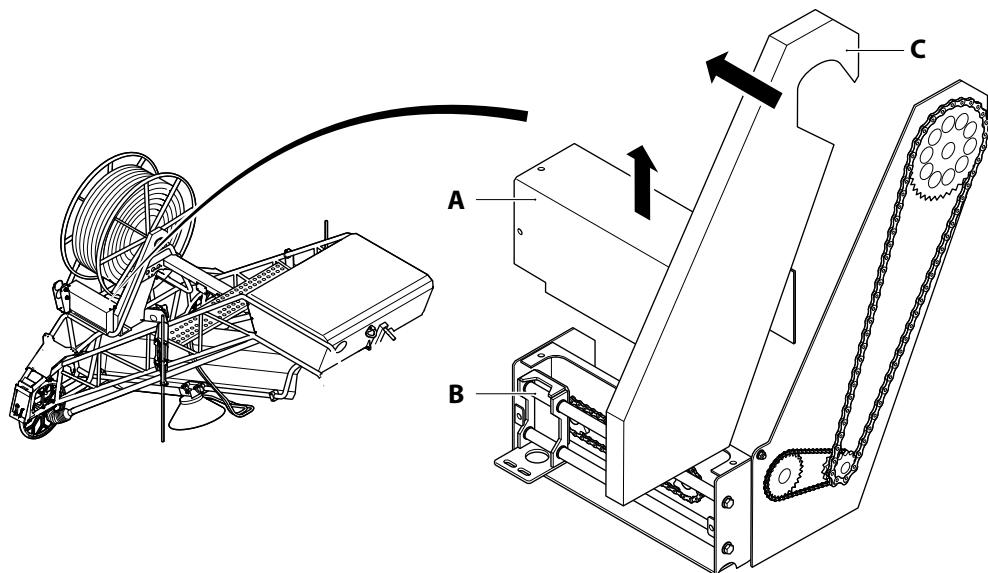


Fig. 56 Remove the reel chain guards

3. Make sure that the tension of the **guide chain A** is sufficient by moving the **guide chain** between thumb and index finger. The play shall be approximately 10 mm (0.4 inch).

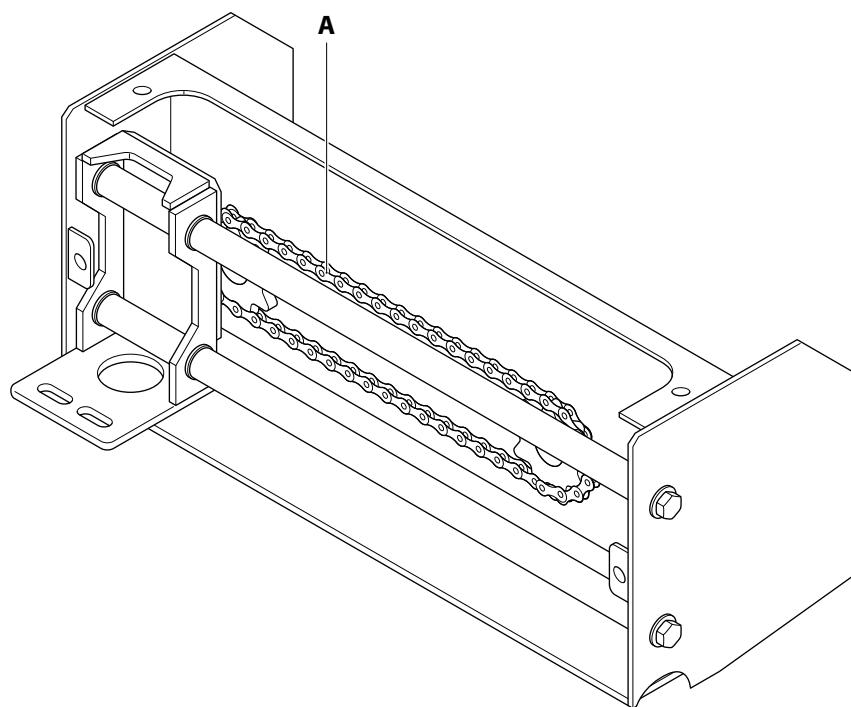


Fig. 57 Check the play of the guide chain

8 INSPECTION, MAINTENANCE AND CLEANING

4. Tighten the **guide chain** **A** with the **adjusting bolt** **B** at the side of the **guard** **C**.

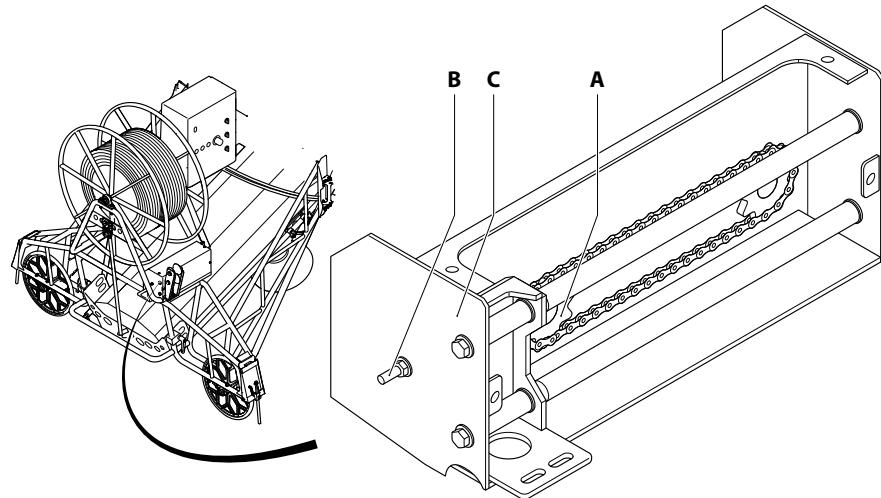


Fig. 58 Tighten the guide chain

5. Make sure that the tension of the **short drive chain** **A** is sufficient by moving the **short drive chain** between thumb and index finger. The play shall be approximately 10 mm (0.4 inch).
6. Make sure that the tension of the **long drive chain** **B** is sufficient by moving the long drive chain between thumb and index finger. The play shall be approximately 20 mm (0.8 inch). **NOTICE** Turn the reel by hand till the chain is tensioned the most before measuring the play.

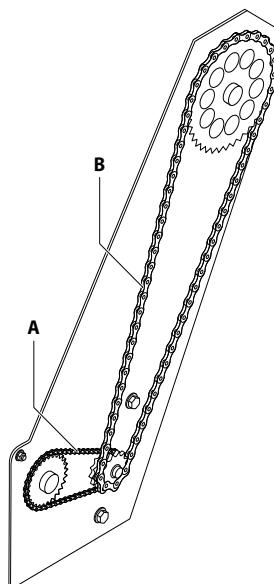


Fig. 59 Check the play on the long drive chain

7. If necessary, tighten the two **drive chains** **C** by adjusting the **hydraulic motor** **B** downwards, by Loosening the two **bolts** **A**. Moving the **hydraulic motor** **B** down by hand until both **drive chains** **A** have the right tension. Tightening the two **bolts** **A**.

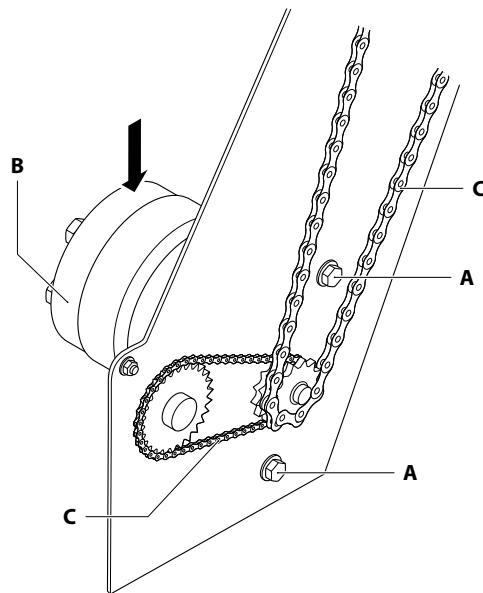


Fig. 60 Tighten the drive chains

8. Carefully clean both **guide rods** **B** with a cloth. Spray the **guide chain** **A** with chain spray.

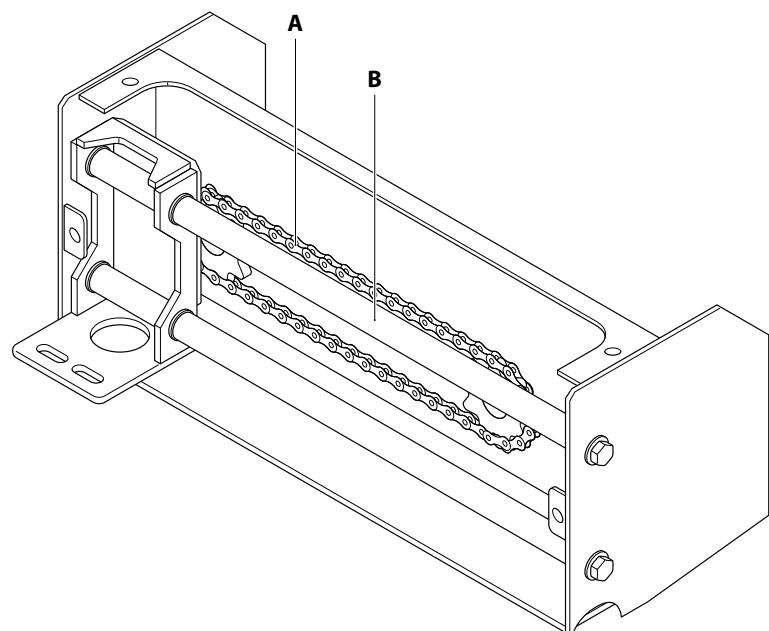


Fig. 61 Clean both guide rods

8 INSPECTION, MAINTENANCE AND CLEANING

9. Lubricate the two **drive chains** **A** **B**.

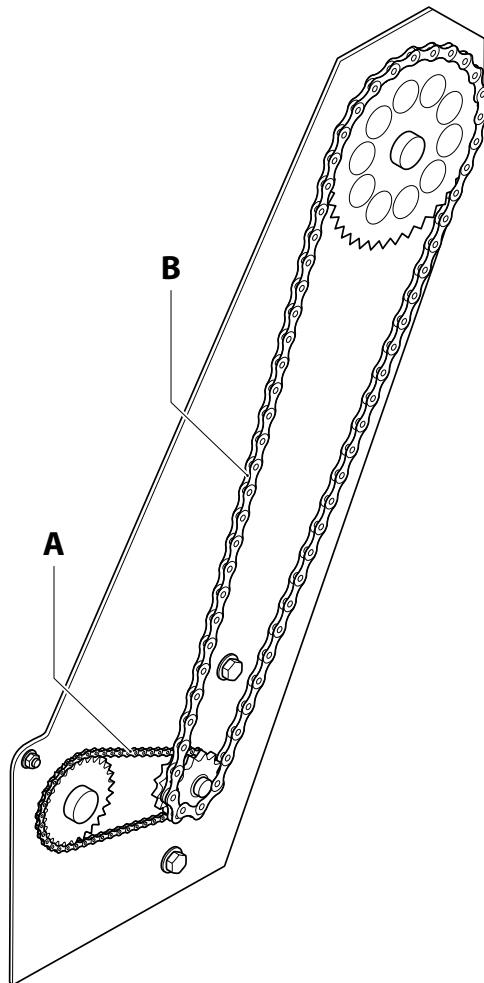


Fig. 62 Lubricate both drive chains

8.6 HOW TO LUBRICATE THE WHEEL SET BEARINGS OF THE PLATFORM

There are two bearings with grease fittings on each wheel set.

NOTICE Do not use too much lubrication and remove excess grease.

To lubricate the wheel set bearing:

- Lubricate the **wheel set bearings A** with water resistant lubrication.

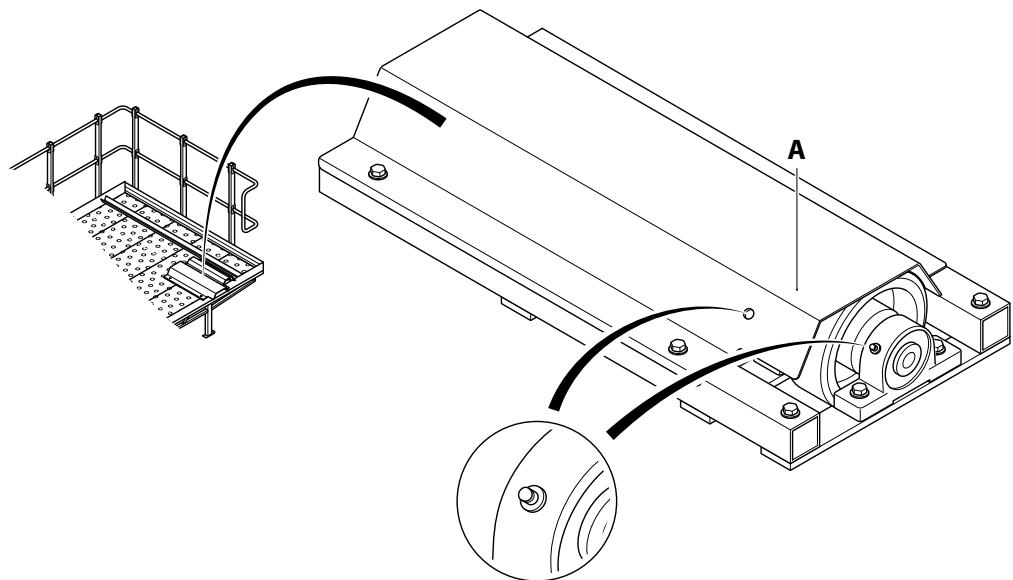


Fig. 63 Lubricate the wheel set bearings

8.7 HOW TO LUBRICATE THE HINGES OF THE PLATFORM RAMPS

There are three hinges for every platform ramp.

To lubricate the hinges of the platform ramps:

- Lubricate the **hinges A** with lubricating spray.

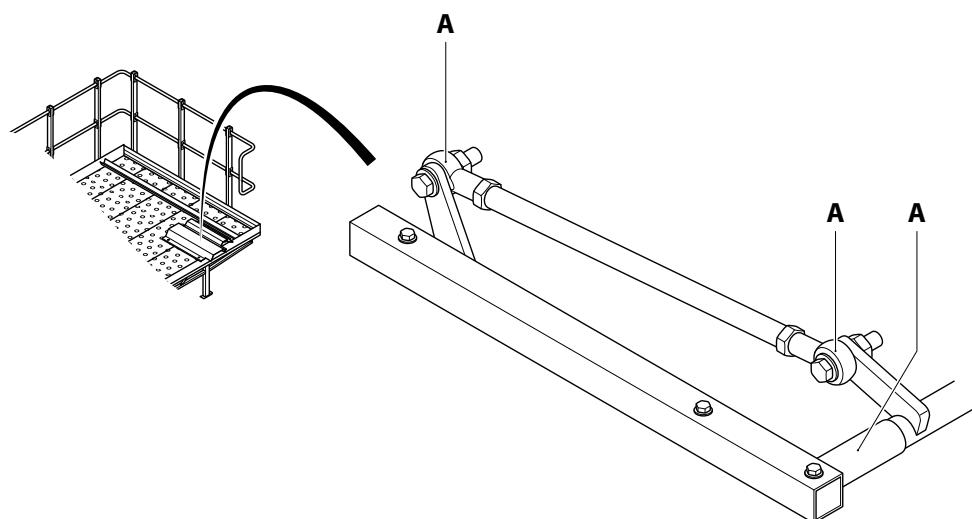


Fig. 64 Lubricate the hinges

8.8 HOW TO CHECK THE WATER PUMP OIL LEVEL AND CHANGE THE OIL OF THE WATER PUMP

⚠️ WARNING

- Make sure that you have read and understood the documentation of the water pump before working with the product.

8.8.1 Check the water pump oil level

- Loosen the **oil dipstick with indicator A** and make sure that the oil level is in between the min and max indicator.

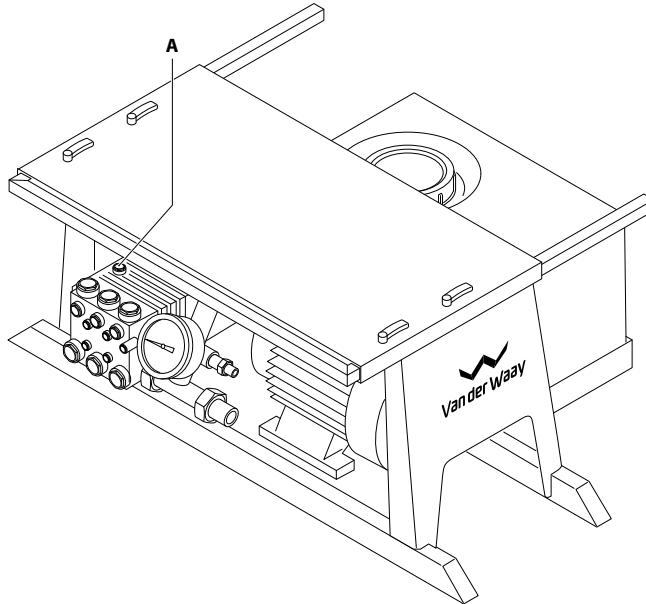


Fig. 65 The oil dipstick

8.8.2 Change the water pump oil

1. Remove the **oil dipstick with indicator**.
2. Get the oil out of the pump housing using a **manual oil change sump pump**.
This pump is available in the webshop <https://portal.vdwaay.nl/shop>.
3. Fill the pump housing with new oil until the oil level is between the min - max marks on the dipstick. **NOTICE** Use only SAE-10W30 oil.

8.9 HOW TO CHANGE THE HYDRAULIC OIL OF THE ROOF WASHER

1. Remove the **lid of the top tray** **A** to reach the **hydraulics tank** **B** and remove **screw cap** **C**.

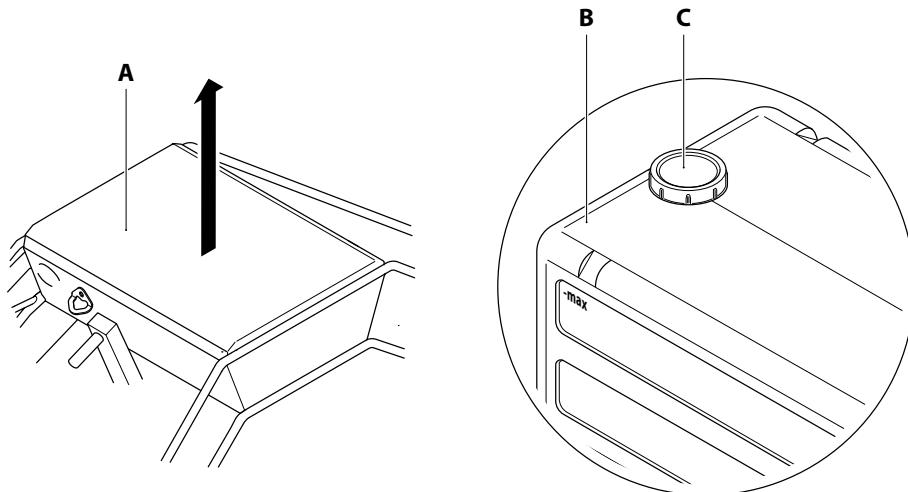


Fig. 66 Remove the screw cap of the hydraulics tank

2. Get the oil out of the hydraulic tank using a **manual oil change sump pump**. This pump is available in the webshop <https://portal.vdwaay.nl/shop>.
3. Fill the hydraulic tank with new oil until the oil level is 1 cm (0.4 inch) **below** the **MAX mark** **A** on the tank. **NOTICE** Use Energol SHF-HV 32 oil only. Do not overfill the tank. This will cause oil leakage.

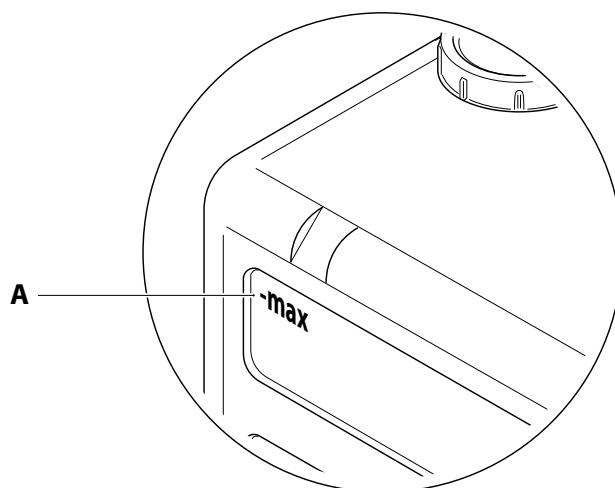


Fig. 67 The MAX mark on the hydraulics tank

8.10 HOW TO CHANGE THE HYDRAULIC OIL OF THE PLATFORM REELS

1. Remove the **lid of the tray A** in between both reels, to reach the **hydraulics tank B** and remove **screw cap C**.

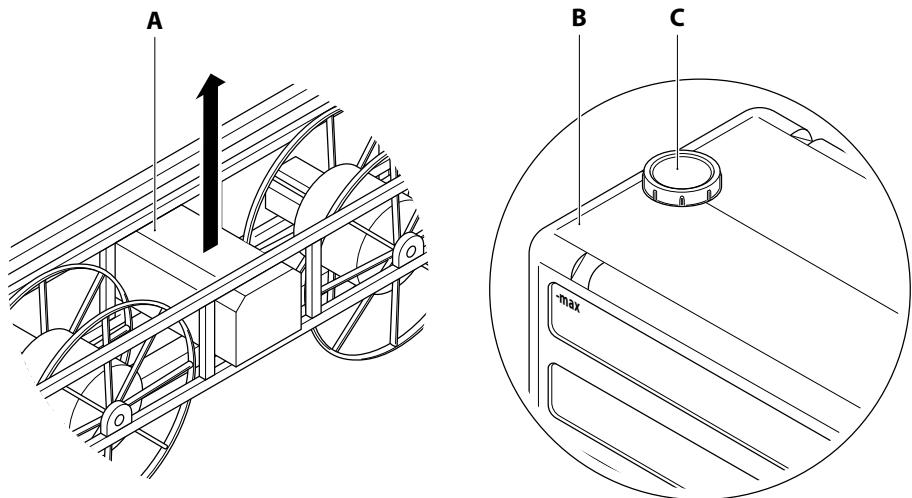


Fig. 68 Remove the screw cap of the hydraulics tank

2. Get the oil out of the hydraulic tank using a **manual oil change sump pump**. This pump is available in the webshop <https://portal.vdwaay.nl/shop>.
3. Fill the hydraulic tank with new oil until the oil level is 1 cm (0.4 inch) **below** the **MAX mark A** on the tank. **NOTICE** Use Energol SHF-HV 32 oil only. Do not overfill the tank. This will cause oil leakage.

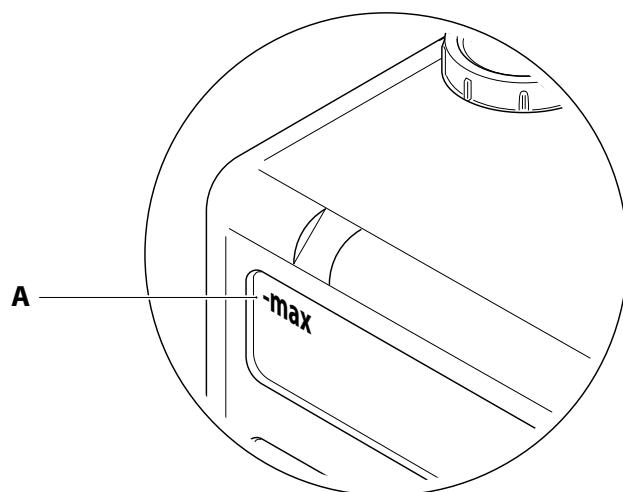


Fig. 69 The MAX mark on the hydraulics tank

8.11 HOW TO CLEAN THE FILTERS OF THE WATER PUMP

NOTICE

- The waterpump is either attached to the platform or on the inside of the greenhouse to the greenhouse gable. This depends on the version of the machinery.

To clean the filters of the water pump:

1. Remove both **filter house lids A**. **NOTICE** There are two filters on the water pump; at the pump inlet and on the float tank.
2. Remove both **filter elements B**.
3. Clean both **filter elements B** and **filter house lids A** under running water.
4. Place both **filter elements B** back into **the filter house lids A**.

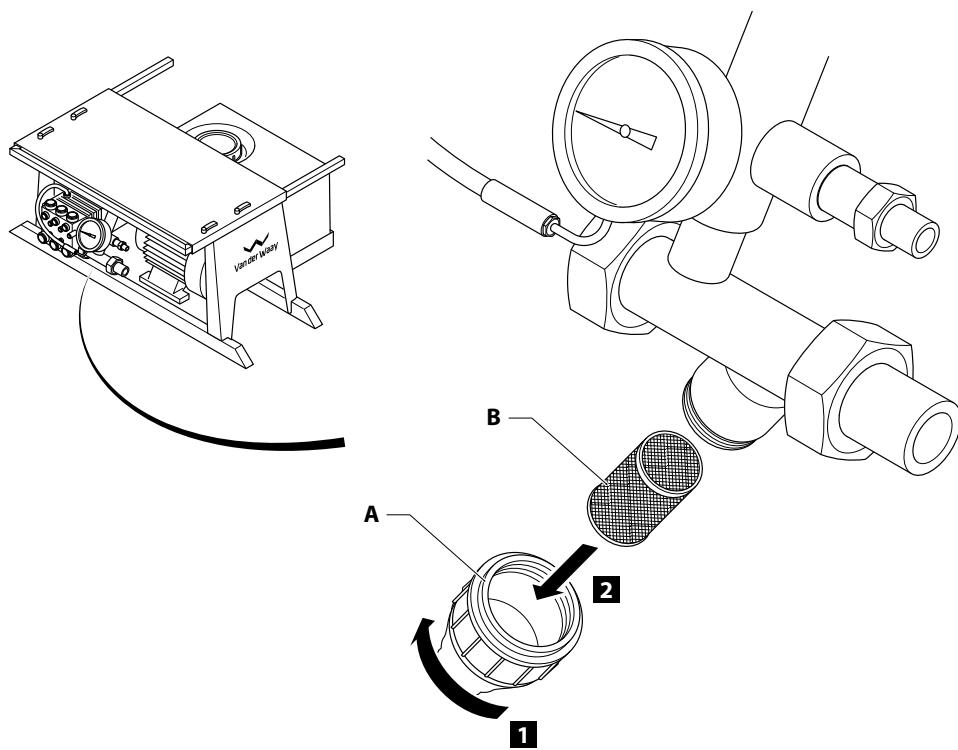


Fig. 70 Pump inlet filter

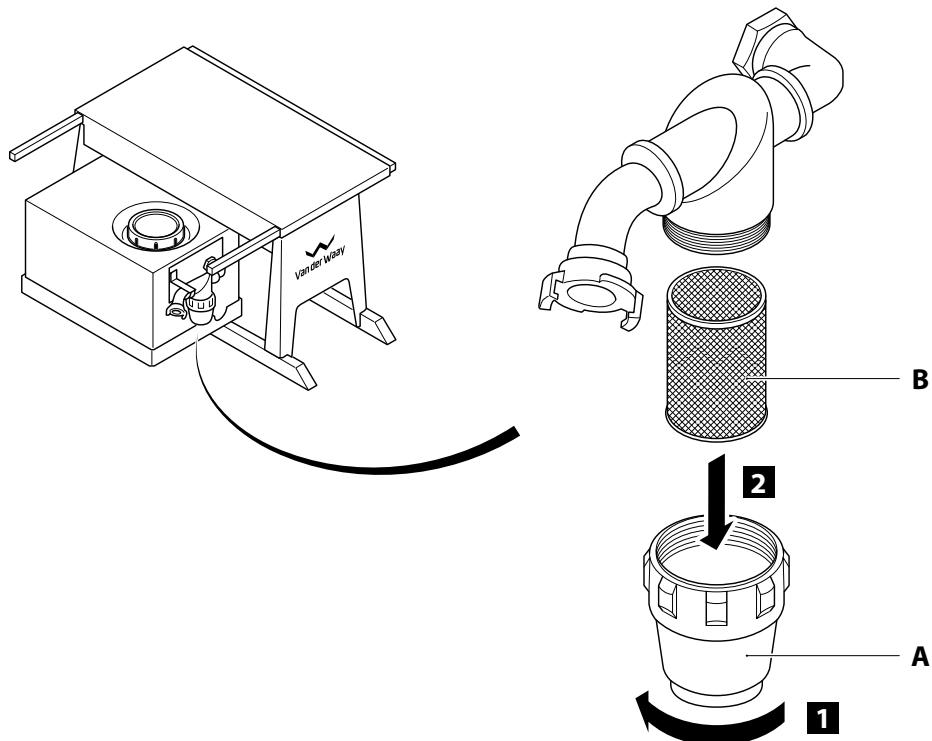


Fig. 71 Float tank filter

8.12 HOW TO CLEAN THE MACHINERY

For a longer life span of the machinery, the roof washer and platform shall be cleaned thoroughly frequently with a non-aggressive cleansing agent and water.

To clean the roof washer and platform:

1. Spray the roof washer and platform with cold tap water to remove coarse dirt.
NOTICE No direct water beams should be directed towards control cabinets, control panels, switches and drive motors. The power of the water can remove oil and grease out of rotating or moving parts. There is also the risk that water enters the electrical system, which may lead to short-circuiting.
2. Apply a neutral non-aggressive cleaning agent (pH value of between 6 and 8).
3. Allow the cleaning agent to work sufficiently in accordance with the relevant product information.
4. Rinse the roof washer and platform thoroughly with tap water.

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

WARNING

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

9.1 HOW TO IDENTIFY AND SOLVE PROBLEMS OF THE MANUAL VERSION

Error messages and malfunctioning of the machinery are indicated by the following:

- **Button/illumination 12S6-12H2 A** on **control cabinet roof washer**
(will blink in case of error).
- **Button/illumination 12S6-12H2 B** on **control cabinet platform**
(will blink in case of error).
- **Illumination 10H5 C** on **control cabinet platform**

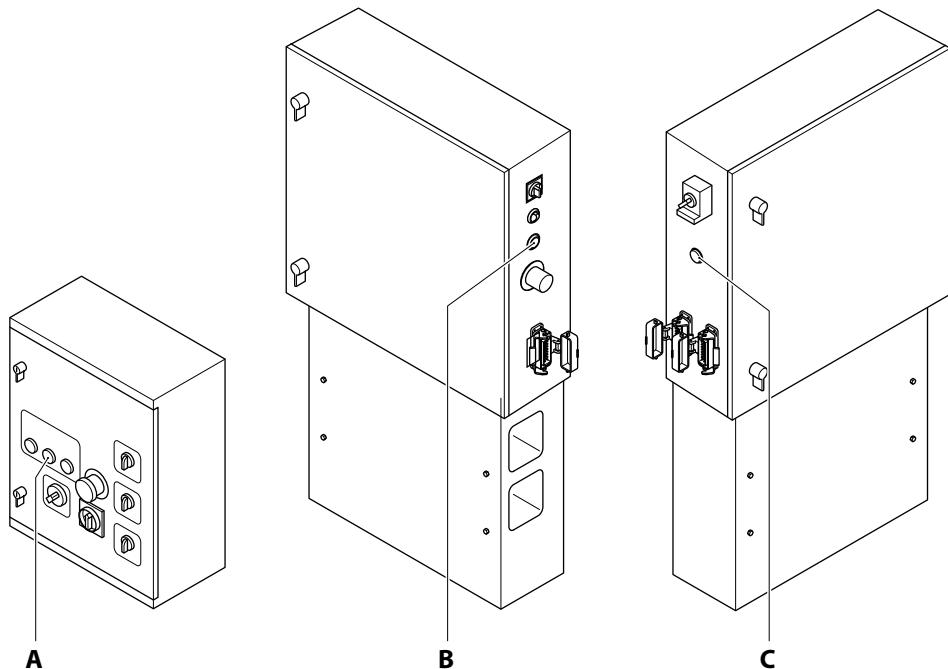


Fig. 72 Error messages and malfunctioning indicators manual version

9.2 TROUBLESHOOTING OF THE MANUAL VERSION

Error Message	Possible cause	Solution
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 1 x.	The air vent detection switch is stuck. Roof washer has hit an open window while moving forwards.	Inspect and/or adjust the air vent detection switches on the front. Close and lock all windows.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 2 x.	Roof washer has hit an open window while moving backwards.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 3 x.	The wheel switch lever on the left-front side was activated while the roof washer was moving backwards.	
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 4 x.	The wheel switch lever on the right-front side was activated while the roof washer was moving backwards.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 5 x.	The wheel switch lever on the left-rear side was activated while the roof washer was moving forwards.	When the error message recurs, check the wheel switch levers and gutter.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 6 x.	The wheel switch lever on the right-rear side was activated while the roof washer was moving forwards.	
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 7 x.	The cable is stuck on the reel, roller brushes or wheels.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. When the error message recurs, check the cable reel.
	The reel drive chain is tightened too much.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Check the chain tension.
	The hydraulic oil pressure is too high.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Contact the manufacturer.

Error Message	Possible cause	Solution
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 8 x .	The hose is stuck on the reel, roller brushes or wheels.	<p>Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.</p> <p>Check the reel when the error message recurs.</p>
	The reel drive chain is tightened too much.	<p>Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.</p> <p>Move the roof washer back to the platform.</p> <p>Check the chain tension.</p>
	The hydraulic oil pressure is too high.	<p>Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.</p> <p>Move the roof washer back to the platform.</p> <p>Contact the manufacturer.</p>
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 9 x .	The roller brush pressure on the glass is too high.	<p>The hydraulic pump motor relay automatically resets after 20 minutes. Do not turn off the power, and wait 20 minutes.</p> <p>Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.</p> <p>Move the roof washer back to the platform.</p> <p>Readjust the roller brushes.</p>
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 10 x .	The gutter brush motor is overburdened.	<p>Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.</p> <p>Move the roof washer back to the platform.</p> <p>Check the adjustment of the gutter brush and reset relay 3A1 on the control cabinet roof washer.</p>
	The gearbox of the gutter brush motor is broken.	Replace the gearbox of the gutterbrush motor.
	The gutter brush motor is burned-out.	Replace the gutter brush motor.
	Defected relay of the gutter brush motor.	Replace relay 3A1 in the control cabinet roof washer.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 11 x .	See fault indication on the display of the frequency controller.	<p>Wait 3 minutes and turn the power back on using the main switch. The frequency controller resets automatically.</p> <p>Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.</p> <p>Contact the manufacturer when the error message recurs.</p>

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution
12S6-12H2 on control cabinet platform lights up continuously .	Left or right platform driving motor has too much resistance while moving along the rails due to, for example, uneven rail profiles.	Reset relay 2A1 or 3A1 on the control cabinet platform. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
	The gearbox of the platform driving motor is broken.	Replace the gearbox of the driving motor.
	The platform driving motor is burned-out.	Replace the driving motor.
	Defected relay of the driving motor.	Replace relay 2A1 or 3A1 on the control cabinet platform.
	The ramp motor is overburdened, because ramps are jammed in the gutter.	Reset relay 4A1 on the control cabinet platform. Make sure the ramps function correctly. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
	Defected relay of the ramps motor.	Replace relay 4A1 on the control cabinet platform.
	Left or right platform undercarriage motor turned off due to trapped cross braces.	Reset relay 20A1 or 21A1 on the control cabinet platform. Check the cross braces. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
	The emergency stop buttons on the control cabinet of the platform, roof washer or remote control is activated.	Make sure the emergency stop buttons on the control cabinet of the platform, roof washer and remote control are pulled out. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
	10H5 on control cabinet platform lights up continuously .	Phase sequence error. Set the main switch from position 1 to 2 or from 2 to 1 until red light 10H5 is off.
ONLY EU VERSION.	One or more phases are missing.	Make sure all 3 phases are present.
10H5 on control cabinet platform lights up continuously .	Phase sequence error.	Swap two phase wires in the plug of the power cable from greenhouse to platform until lamp 10H5 is off.
	One or more phases are missing.	Make sure all 3 phases are present.

9.3 HOW TO IDENTIFY AND SOLVE PROBLEMS OF THE AUTOMATIC VERSION

Error messages and malfunctioning of the machinery are indicated by the following:

- **Button/illumination 12S6-12H2 A** on **control cabinet roof washer** (will blink in case of error).
- **Illumination 17H9 B** on **control cabinet platform**.
- **Text on operation display C**.
- **Illumination 18BH2 D** on **Interface cabinet**

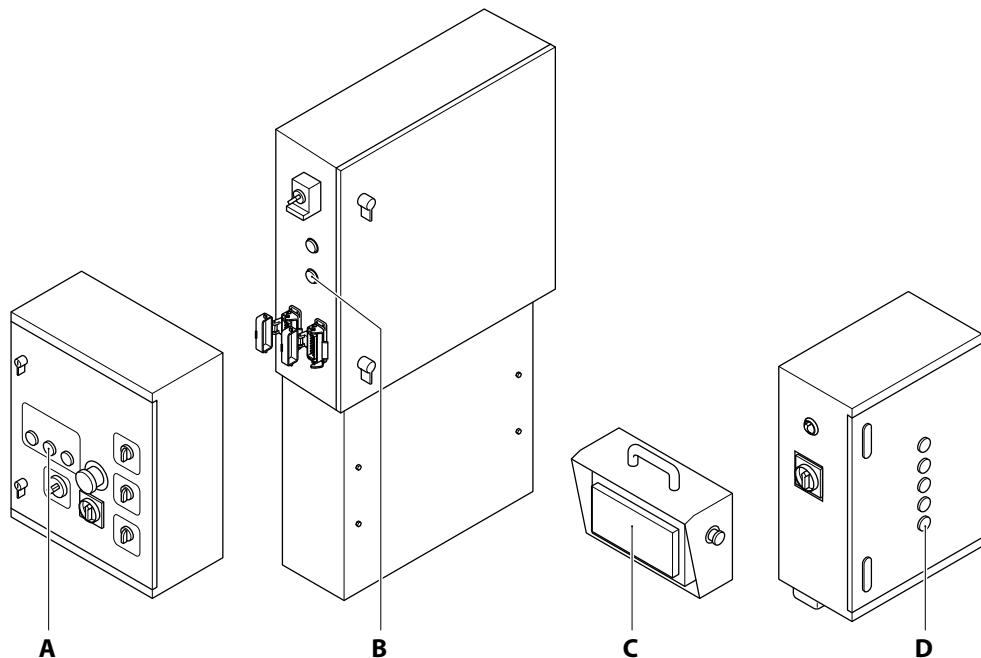
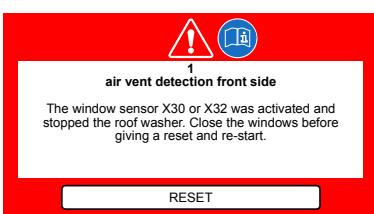
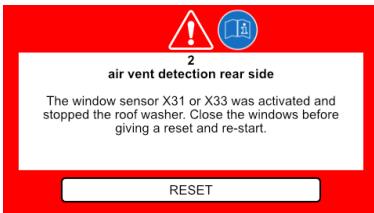
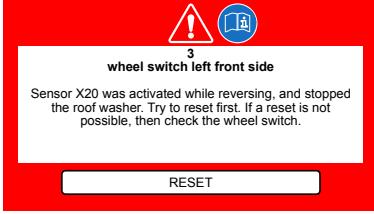
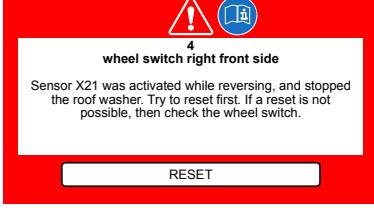
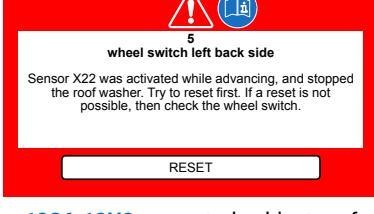
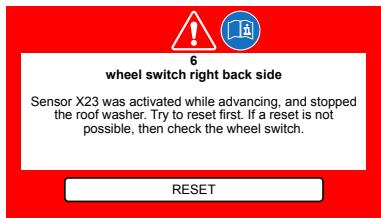
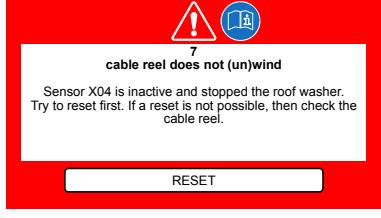


Fig. 73 Error messages and malfunctioning indicators

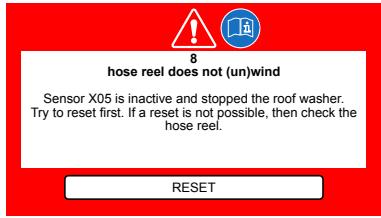
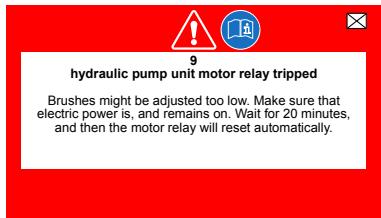
9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

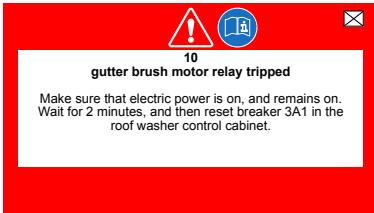
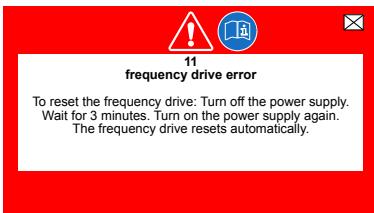
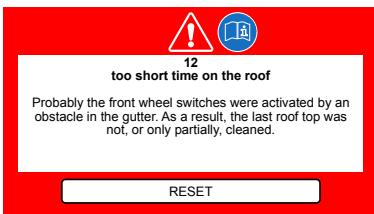
9.4 TROUBLESHOOTING OF THE AUTOMATIC VERSION

Error Message	Possible cause	Solution
 <p>12S6-12H2 on control cabinet roof washer blinks 1 x.</p>	The air vent detection switch is stuck.	Inspect and/or adjust the air vent detection switches on the front.
 <p>12S6-12H2 on control cabinet roof washer blinks 2 x.</p>	Roof washer has hit an open window while moving forwards.	<p>Close and lock all windows.</p> <p>Press RESET on the operation display to reset the control.</p> <p>Control the roof washer from the manual operation screen.</p> <p>Any automatic washing cycle is aborted.</p>
 <p>12S6-12H2 on control cabinet roof washer blinks 3 x.</p>	The wheel switch lever on the left-front side was activated while the roof washer was moving backwards.	<p>Press RESET on the operation display to reset the control.</p>
 <p>12S6-12H2 on control cabinet roof washer blinks 4 x.</p>	The wheel switch lever on the right-front side was activated while the roof washer was moving backwards.	<p>Any automatic washing cycle is aborted.</p> <p>Control the roof washer from the manual operation screen.</p> <p>When the error message recurs, check the wheel switch levers and gutter.</p>
 <p>12S6-12H2 on control cabinet roof washer blinks 5 x.</p>	The wheel switch lever on the left-rear side was activated while the roof washer was moving forwards.	

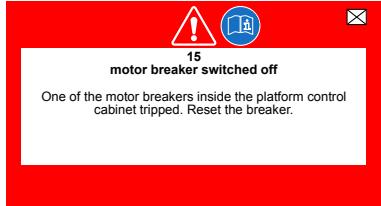
Error Message	Possible cause	Solution
 <p>12S6-12H2 on control cabinet roof washer blinks 6 x.</p>	<p>The wheel switch lever on the right-rear side was activated while the roof washer was moving forwards.</p>	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Control the roof washer from the manual operation screen.</p> <p>When the error message recurs, check the wheel switch levers and gutter.</p>
	<p>The cable is stuck on the reel, roller brushes or wheels.</p>	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Control the roof washer from the manual operation screen.</p> <p>When the error message recurs, check the cable reel.</p>
 <p>12S6-12H2 on control cabinet roof washer blinks 7 x.</p>	<p>The reel drive chain is tightened too much.</p>	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Check the chain tension.</p>
	<p>The hydraulic oil pressure is too high.</p>	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Contact the manufacturer.</p>

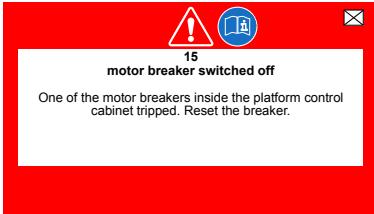
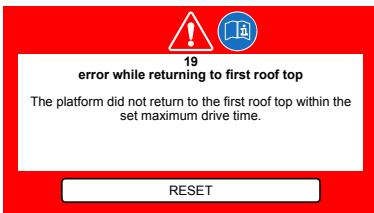
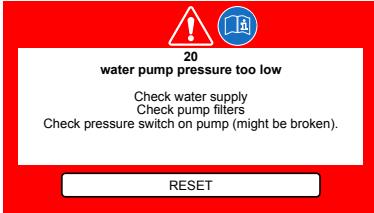
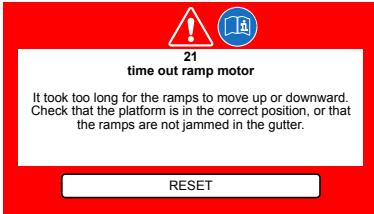
9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution
	The hose is stuck on the reel, roller brushes or wheels.	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Control the roof washer from the manual operation screen.</p> <p>When the error message recurs, check the cable reel.</p>
12S6-12H2 on control cabinet roof washer blinks 8 x .	The reel drive chain is tightened too much.	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Check the chain tension.</p>
	The hydraulic oil pressure is too high.	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Contact the manufacturer.</p>
12S6-12H2 on control cabinet roof washer blinks 9 x .	The roller brush pressure on the glass is too high.	<p>The hydraulic pump motor relay automatically resets after 20 minutes. Do not turn off the power, and wait 20 minutes.</p> <p>Tab  on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p> <p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Readjust the roller brushes.</p>

Error Message	Possible cause	Solution
 <p>12S6-12H2 on control cabinet roof washer blinks 10 x.</p>	<p>The gutter brush motor is overburdened.</p>	<p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Check the adjustment of the gutter brush and reset relay 3A1 on the control cabinet roof washer.</p> <p>Tab <input type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
 <p>12S6-12H2 on control cabinet roof washer blinks 11 x.</p>	<p>The gearbox of the gutter brush motor is broken.</p> <p>The gutter brush motor is burned-out.</p> <p>Defected relay of the gutter brush motor.</p>	<p>Replace the gearbox of the gutterbrush motor.</p> <p>Replace the gutter brush motor.</p> <p>Replace relay 3A1 in the control cabinet roof washer.</p>
	<p>See fault indication on the display of the frequency controller.</p>	<p>Put the main switch 1S0 on the control cabinet platform on 0 (or on OFF for the UL/CSA version).</p> <p>Wait 3 minutes and turn the power back on using the main switch. The frequency controller resets automatically.</p> <p>Tab <input type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p> <p>Contact the manufacturer when the error message recurs.</p>
	<p>Weeds or some other obstacle in the greenhouse gutters caused the roof washer to drive back to the platform. The roof top was not completely cleaned.</p>	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Try washing the roof top again. If the problem recurs then check the gutters.</p>

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution
	Roof detection switch X24 is not adjusted correctly.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Adjust the roof detection switch X24 again.
	The roof ridge is too short, causing the sensor to fail.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Extend the ridge rod.
	Left or right platform driving motor has too much resistance while moving along the rails due to, for example, uneven rail profiles.	Reset relay 2A1 or 3A1 on the control cabinet platform. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted.
	The gearbox of the platform driving motor is broken.	Replace the gearbox of the driving motor.
	The platform driving motor is burned-out.	Replace the driving motor.
	Defected relay of the driving motor.	Replace relay 2A1 or 3A1 on the control cabinet platform.
	The ramp motor is overburdened, because ramps are jammed in the gutter.	Reset relay 4A1 on the control cabinet platform. Make sure the ramps function correctly. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted.
	Defected relay of the ramps motor.	Replace relay 4A1 on the control cabinet platform.
	Left or right platform undercarriage motor turned off due to trapped cross braces.	Reset relay 20A1 or 21A1 on the control cabinet platform. Check the cross braces. Tab <input checked="" type="checkbox"/> on the operation display to close the error message.

Error Message	Possible cause	Solution
	The water pump motor has turned off.	<p>Reset relay 6F1 on the control cabinet platform.</p> <p>Check that the water pressure does not exceed 70 bar.</p> <p>Tab <input checked="" type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
	The platform has encountered an obstacle while driving back to the first roof top, or the feed hose or power cable has gotten caught behind something.	<p>Press RESET on the operation display to reset the control.</p> <p>Check the greenhouse gable.</p>
	<p>There is not enough water supply from the greenhouse to the pump.</p> <p>Water pump filter is polluted.</p> <p>Defective water pump.</p> <p>Defective pressure sensor.</p>	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Check that there is sufficient water supply, or that the supply hose is not kinked.</p> <p>Clean the filters.</p> <p>Repair or replace the water pump.</p> <p>Replace the pressure sensor.</p>
	The ramp motor is overburdened, because ramps are jammed in the gutter.	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Make sure the ramps function correctly.</p>
	The emergency stop buttons on the control cabinet of the platform, roof washer or remote control is activated.	<p>Make sure the emergency stop buttons on the control cabinet of the platform, roof washer and remote control are pulled out.</p> <p>Tab <input checked="" type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution
<p>ONLY EU VERSION.</p>	<p>Phase sequence error.</p>	<p>Set the main switch from position 1 to 2 or from 2 to 1 until red light 17H9 is off.</p> <p>Tab <input type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
	<p>One or more phases are missing.</p>	<p>Make sure all 3 phases are present.</p> <p>Tab <input type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
<p>ONLY UL/CSA VERSION.</p>	<p>Phase sequence error.</p>	<p>Swap two phase wires in the plug of the power cable from greenhouse to platform until lamp 10H5 is off.</p> <p>Tab <input type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
	<p>One or more phases are missing.</p>	<p>Make sure all 3 phases are present.</p> <p>Tab <input type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>

9.5 TROUBLESHOOTING FOR THE AUTOMATIC VERSION, CONTROLLED BY THE CLIMATE COMPUTER

To understand the indicators on the climate computer, it is important to know what happens when the Top Cleaner is started from the climate computer.

The process of starting the Top Cleaner from the climate computer:

1. The climate computer will put the Top Cleaner into standby mode. **Lamp A** will light up green.
2. The Top Cleaner requests a wash cycle for a particular wash section (current rooftop number). **Lamp B** will light up **green**.
3. The climate computer evaluates whether the Top Cleaner may start. This depends on the set starting conditions (climate parameters). **Lamp C** will light up **green** when the roof washer is allowed to start.
4. The roof washer automatically drives to the end of the rooftop, stops and returns to the platform. When the roof washer is on the platform, **Lamp D** will light up **blue**.
5. The platform automatically drives to the next rooftop and positions itself. **Lamp A** lights up **green**, **Lamp B** lights up **green**, **Lamp D** lights up **blue**.
6. The climate computer reassesses whether the Top Cleaner may start again. When the starting conditions (climate parameters) are met, the roof washer starts again. **Lamp C** lights up **green** and **Lamp D** turns **off**.

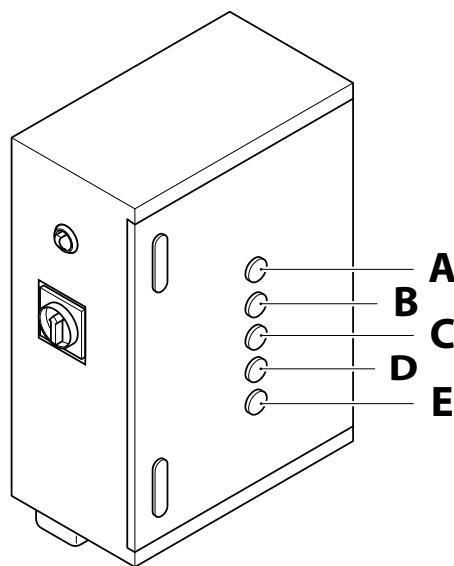


Fig. 74 indicators of the interface cabinet

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error	Possible cause	Solution
The Top Cleaner won't (re)start.	The Top Cleaner is in semi automatic mode.	Switch the operating mode to fully automatic. See 6.2.5 Switch from semi automatic mode to fully automatic mode
	The Top Cleaner is not paired with the climate computer.	Pair the Top Cleaner with the climate computer. See 6.2.3 Start a washing cycle from the climate computer
	The climate computer did not put the Top Cleaner on standby. Lamp A is off.	Check the climate computer settings. Contact the installer of the climate computer to check the starting conditions (climate parameters).
	The Top Cleaner does not request a wash cycle from the climate computer. Lamp A is on, but Lamp B is off.	Check that the platform is correctly positioned. Check that the displayed position (roof top number) matches the actual position.
	The climate computer has not sent a start signal to the Top Cleaner. Because the vents are not yet closed, for example. Lamp C is off.	Wait patiently. The Top Cleaner will only start when all set starting conditions (climate parameters) are met.
	The platform is not positioned correctly. Lamp D is off.	Position the platform in front of the rooftop. Lamp D must turn on. See 6.2.10 Explanation of additional screens
	The roof washer is not positioned correctly on the platform. Lamp D is off.	Make sure the roof washer is positioned correctly. Lamp D must turn on. See 6.2.10 Explanation of additional screens
	The platform ramps are not upright. Lamp D is off.	Put the platform ramps down. Lamp D must turn on. See 6.2.10 Explanation of additional screens
	There is an error with the roof washer or the platform. Lamp E turns on red .	Refer to the error message in the Top Cleaner display. Go to 9.4 Troubleshooting of the automatic version

9.6 HOW TO REPAIR THE MACHINERY

WARNING

- All repair and modification tasks shall only be carried out by qualified and skilled persons. Only open or repair parts of the machinery when you know what you are doing. If you have any doubts, contact the manufacturer.
- Always shut off the machinery according to the LOCK OUT-TAG OUT method before performing any maintenance or repair work.
- Use only original accessories and spare parts. You can always order spare parts from the webshop <https://portal.vdwaay.nl/en/shop> or by sending an email to salesteam@vdwaay.nl.
- Alterations to the machinery and technical modifications are not permitted without written permission of the manufacturer. Failure to do so may result in damage to property and/or severe or fatal injuries and it will invalidate the warranty.

10 DISPOSAL

WARNING

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.

10.1 DISABLING

1. Make sure that the roof washer is on the platform.
2. Make sure that the **main switch** is put in the **0 position** (or to the **OFF position** for the North American version).

10.2 DISMANTLING

1. Disconnect all **power cables**.
2. Disconnect **water supply**.
3. Disconnect and remove **hoses** and **cables**.
4. Disconnect and remove **remote controls**.
5. Remove the roof washer from the platform, see *4.2 Lifting and transporting the roof washer*.
6. Contact the manufacturer on how to remove the platform from the greenhouse.
7. Disassemble large parts and options.
8. Dispose/Scrap the machinery according to the instructions in paragraph *10.3 Scrapping and disposal*.

10.3 SCRAPPING AND DISPOSAL

Old or worn parts have to be disposed of in the most environmentally friendly way, for example by bringing them to an acknowledged recycling center.

Familiarize yourself with the national and local regulations with respect to environmentally friendly disposal of harmful substances such as oil and lubrication agents, parts and materials.

It is not allowed to dispose of parts, options and components with unsorted municipal waste. Electric and electronic components and parts have to be recycled separately in an environmentally friendly way and with due respect of the applicable legislation.

If certain chemicals have been used for cleaning, you have to dispose of these in an environmentally friendly way. Also think of cloths and such that have become filthy with lubrication agents or oil. Consult the instructions for the chemicals for more information.

By disposing of the device in the proper manner, you help to avoid possible hazards for the environment and public health that could otherwise be caused by improper treatment of waste equipment. The recycling of materials contributes to the conservation of natural resources.

A – DECLARATION OF CONFORMITY (DOC) OF THE MACHINERY

Declaration according to Directive 2006/42/EC, as amended (hereafter called Machinery Directive).

This language version of the declaration is verified by the manufacturer (original declaration).

We (manufacturer):

Business name: Van der Waay B.V.
Address: Finlandlaan 2, 2391PV
Hazerswoude
Country: The Netherlands

Declare under our sole responsibility for the following machinery:

Generic denomination: Greenhouse roof washer
Function: Cleaning and/or spraying of greenhouse roof
Model: Top Cleaner
Type: 320/400/427/450/480
Serial numbers: KDR-XXX-YYY and VPD-XXX-YYY
(XXX = working width, YYY = reference number 100-999)
Commercial Name: Top Cleaner

that all the relevant provisions of the Machinery Directive are fulfilled;

that the machinery also complies with the provisions of the following

European Directives:

- DIRECTIVE 2014/30/EU relating to electromagnetic compatibility
- DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical equipment.
- DIRECTIVE 2014/53/EU relating to radio equipment
- DIRECTIVE 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors

that the machinery is in conformity with the following standards and/or other normative documents:

- EN ISO 12100:2010, Safety of machinery - General principles for design - Risk assessment and risk reduction
- EN 280:2013 Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests, which supersedes EN 280:2001+A2:2009 on 31 January 2015
- EN 1953:2013 Atomising and spraying equipment for coating materials - Safety requirements, which supersedes EN 1953:1998+A1:2009 on 31 March 2014
- EN 349:1993+A1:2008 Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
- EN 60947-5-5:1997 Low-voltage switchgear and control gear - Part 5-5: Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function.
- EN ISO 14982:2009 Agricultural and forestry machinery - Electromagnetic compatibility - Test methods and acceptance criteria
- EN 60034-1:2010 Rotating electrical machines - Part 1: Rating and performance
- EN 1990: Basis of structural design.
- EN 1991: Actions on structures
- EN 1993: Design of steel structures
- Loadings acc. ASCE/SEI -7-10
- International Building Code 2015
- Steel construction manual (Thirteenth edition)

APPENDICES

that the following natural or legal person established in the Community is mandated in writing to perform all or part of the obligations and formalities connected with the Machinery Directive:

Business name: Van der Waay B.V.
Address: Finlandlaan 2, 2391PV, Hazerswoude
Country: Netherlands
Name: M. Koolmees
Position: Director

and that the following natural or legal person established in the Community is authorized to compile the technical file:

Business name: Van der Waay B.V.
Address: Finlandlaan 2, 2391PV, Hazerswoude
Country: Netherlands
Name: M. Koolmees
Position: Director

Place and date of issue (of this DoC):

1 July 2019

Signed by or for the manufacturer:

A blue ink signature of the name "M. Koolmees" is written in a cursive, flowing style. It is positioned above a horizontal dotted line.

Name: M. Koolmees
Title: Director



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