

# SOLA-LITE VCMO 1.8 US

## Operating manual

BJ 2012 ...  
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Manual for the modular pole set  
SOLA-LITE VCMO 1.8 US

en





SET | SINGLE






MADE  
IN  
GERMANY

Cleantecs



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It is **IMPORTANT** that you read this operating manual **CAREFULLY BEFORE USE** and **KEEP IT FOR FUTURE REFERENCE**.

The operating manual is for ...

Modular pole SOLA-LITE VCMO 1.8 US from year of manufacture 2012.



## Components and functions of the modular pole set

In this section you will find information about:  
The components of the cleaner, tools for maintenance, accessories that are important for operation.



Overview of the components of the modular pole set



**Scope of delivery of the modular pole set**



- 1 SOLA\_LITE VCMO 1.8 US with VCMO protection
- 2 SOLA-LITE VCMO 1.8 US
- 3 Transport bag for modular poles
- 4 High-pressure hose DN6 x 25 m
- 5 Gooseneck
- 6 Slide brushes
- 7 Hose holder – VCMO



Spare parts of the modular pole



- 1 Clasp lever set
- 2 Hose holder – VCMO
- 3 Clamp complete for modular pole vcmo
- 4 End cap for modular poles vcmo
- 5 End ring



The listed tools are included in the scope of delivery.

Infobox

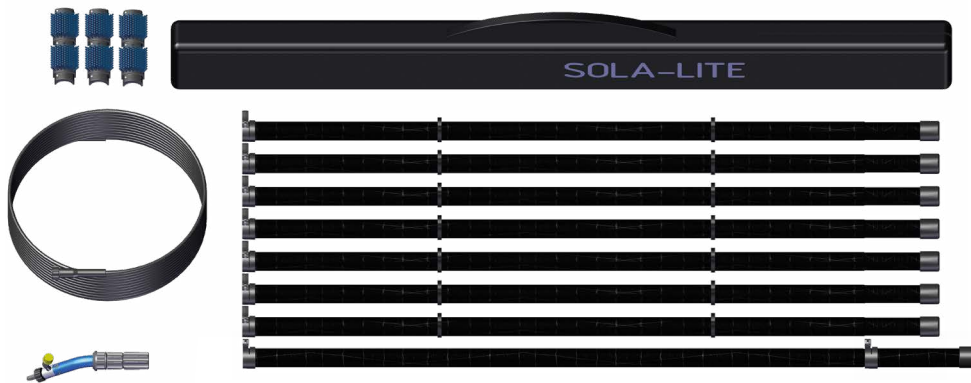


Basics

**Tool kit of the modular pole**

open-end wrench - size 11





#### How does the modular pole work

The SOLA-LITE modular pole system consists of individual carbon poles. The poles can be plugged into each other. An adjustable clamp tensioning system prevents the pole from slipping apart.

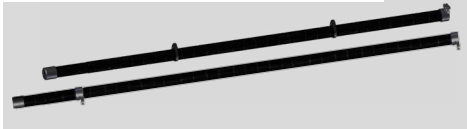
When the desired length has been reached by plugging the module poles together, the upper end of the lance bend is fastened by the clamping system. The lance bend is important for the installation of the cleaners.

For the energy and water supply of the cleaners, a high-pressure water hose is screwed onto the lance bend and attached to the externally mounted hose holders.

With the cleaner mounted and the high-pressure cleaner connected, the cleaning device can then be guided manually on the surface to be cleaned.



Modular pole with VCMO - protection + modular pole



Transport bag



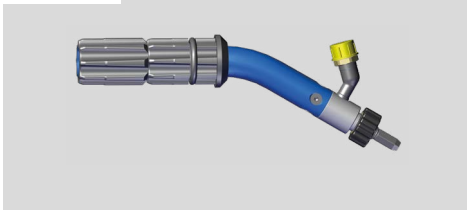
High-pressure hose



Hose holder



Gooseneck



### Components

**The modular bar with the VCMO protection** is always the lowest modular bar. The VCMO - protection protects when placed on the ground.

**The modular pole** can be used individually or plugged together to the maximum length of 12 meters.

**The pole bag** is to transport the entire modular pole set safely.

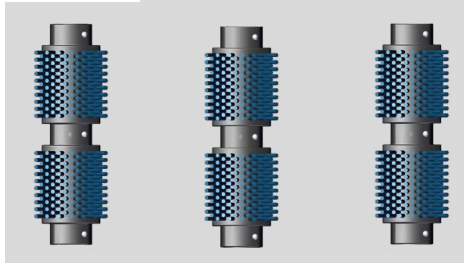
**The basic 25-meter hose** is always the high-pressure supply hose that is connected to the cleaner. Only this hose fits correctly into the hose holder on the modular pole.

**The hose holder** fixes the basic hose to the modular rod.

**The Gooseneck** in the modular pole set serves as the connection for the cleaners. It also increases the contact pressure of the brush roller on the cleaning surface, which increases the cleaning effect.

**The slide brushes** protect the solar panels from being struck during the cleaning process.

Slide brushes





## Intended use

In this section you will find information about:  
The purposes for which the modular pole may be used, where the modular pole may be used, and who may use the modular pole.



### Intended use

The carbon pole system can be assembled by plugging individual modular poles together up to a required length of 12 meters. This pole system is used to manually operate the cleaning devices Sola-Brush and Sola-Tecs C.

### Requirements for the user of the system

**Operator:** The operator has been instructed by the proprietor about the tasks assigned to him and possible dangers in the event of improper handling. The operator may carry out tasks outside the remit of regular operations only if doing so is indicated in these instructions and the proprietor has expressly instructed him to do so.

**Qualified personnel:** Qualified personnel are individuals, who, due to their technical training, knowledge and experience as well as their knowledge of the relevant standards and regulations, are able to carry out the work assigned to them and to independently recognize potential hazards and avoid dangers.

The following groups of people are not authorized to operate the Sola-Tecs C:

- ▶ Persons with limited physical, sensory or mental abilities.

- ▶ Children and adolescents under the age of 18.

- ▶ Non-instructed persons

### Space requirement when working with the modular pole system

- ▶ Safety distance of at least three meters during cleaning work near high-voltage lines or other electrical equipment.

- ▶ During cleaning, space for movement around the user of 5 m<sup>2</sup> is required.

- ▶ There must be a distance of at least 1 m to the next obstacle in the working direction.

- ▶ To prevent accidents, a safety area of 20 meters around the user must be closed off to prevent access by other persons.

### Technical limits of the modular pole

- ▶ Length of individual modular pole: 1.8 meters

- ▶ Permitted maximum length: 12 meters

- ▶ Weight of single pole: 520 grams

- ▶ Weight of 8 poles: 4,500 grams

- ▶ Modular pole system can be loaded with a maximum of 4,954 grams at 12 meters.



## Documentary evidence

Projekt: SOLA-LITE VCMO 1.8 US  
Produkt: SOLA-LITE  
Hersteller: Gardiner Pole Systems Ltd  
Gardiner Pole Systems Ltd is a limited company registered in England and Wales. Registered number 6785633 Registered Office: Trevarrick Mill, Trevarrick Road, St Austell, Cornwall, PL25 5JN.

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# Nachweisdokumentation nach EN ISO 12100

für

**SOLA-LITE VCMO 1.8 US**



## General safety instructions

Important instructions for the safe use of the system and establishing a safe cleaning operation.



### For your own safety

Important instructions for the safe use of the system. This is how you protect yourself and other persons from hazardous situations and from injury.

#### **DANGER**



#### **Danger to life due to thunderstorms**

- ▶ Avoid using the machine during thunderstorms. This protects you from injury caused by lightning and from hypothermia.

#### **DANGER**



#### **Risk of death from electric shock and high-voltage cables**

- ▶ The safety distance from the cleaning device to the high-voltage cable must not be less than **20 meters (65,6 ft)**. Failure to maintain the safety distance puts your life and health at risk.

#### **WARNING**



#### **Risk of injury from falling**

- ▶ Use a fall-arrest system. This will protect you from injuries from falling off the roof.

#### **CAUTION**



#### **Illness and hypothermia caused by bad weather**

- ▶ In bad weather, wear suitable protective clothing. This will protect you from illness caused by hypothermia.





**CAUTION**



**Risk of injury when lifting heavy parts**

- ▶ When lifting the machine, lift it ergonomically correctly. This will protect you from back-strain injuries.

**CAUTION**



**Risk of injury from overloading/strain**

- ▶ Take regular breaks. This will prevent injuries caused by physical and mental overload and fatigue.

**NOTICE**

**Risk of damage due to frost**

- ▶ Prevent the machine from freezing up. Otherwise this could cause damage to the components. This will protect the machine from frost damage.



## Safe cleaning operation

In this section you will find information about:  
The selection of a safe cleaning location  
Sources of danger in the working area  
Sources of danger when working



## Working safely

This section describes how to work safely with the modular pole system.

### Select a safe starting point

- ▶ Basically, the location and accessibility of the site determines the position of the cleaning work.
- ▶ Before setting up the system, carry out an inspection and consider how and where you want to work safely.

### WARNING

#### Risk of injury from falling

- ▶ Use a fall-arrest system. This will protect you from injuries from falling off the roof.

### CAUTION

#### Risk of injury due to slippery surface

- ▶ Check the surface for any situations that may facilitate slipping. This will protect you from falling and injuring yourself.

### CAUTION

#### Risk of injury due to falling

- ▶ Check your working area for unevenness and obstacles. This will protect you from injuries resulting from a fall.

- ▶ The cleaning position must be easily accessible.

### Pay attention to sources of danger in the working area

- ▶ There must be **no high-voltage equipment** (cables, switch cabinets, etc.) in the immediate working environment

### DANGER

#### Risk of death from electric shock and high-voltage cables

- ▶ The safety distance from the cleaning device to the high-voltage cable must not be less than **20 meters (65,6 ft)**. Failure to maintain the safety distance puts your life and health at risk.

### Determine the safety of the modules to be cleaned

- ▶ When inspecting the system, pay attention to any defects in the system.

For example,

- broken / defective solar panel
- exposed lines
- loose fastenings
- ...



**⚠ WARNING**

**Electric shock due to defective photovoltaics**

- ▶ Check the modules for damage (cracks, scratches, leaks, etc.) prior to cleaning. Damaged modules must not be cleaned. There is a risk of injury due to electric shock.

**Safety when cleaning**

- ▶ When cleaning, make sure that you do not damage any components or lines.

**⚠ WARNING**

**Electric shock from photovoltaics**

- ▶ Cables and components of photovoltaic installations are always live during incidence of light. Touching live parts can lead to electric shock and is prohibited.

**Check and prepare high-pressure equipment**

- ▶ Check the high-pressure connections for damage before starting work.
- ▶ Check the high-pressure hose for damage before starting work.

**⚠ CAUTION**

**Risk of injury from defective hoses and connections**

- ▶ Check all high-pressure hoses and connections for damage. This will protect you from being injured by escaping hard water jets.

**⚠ CAUTION**

**Risk of injury due to incorrect installation of the joints**

- ▶ Always hand-tighten and check the joints. This will protect you from injuries caused by uncontrolled flying joints.

**Check the lances for damage**

- ▶ Check the clamp and end ring for damage.
- ▶ Check the carbon rods for damage such as breaks or impact marks.
- ▶ Defective parts must be replaced immediately.

**⚠ WARNING**

**Risk of injury due to incorrect adjustment of the bracket**

- ▶ The bracket must always clamp with sufficient force. This prevents personal injury and damage to property due to uncontrolled falling of parts.



# Assembling the lance

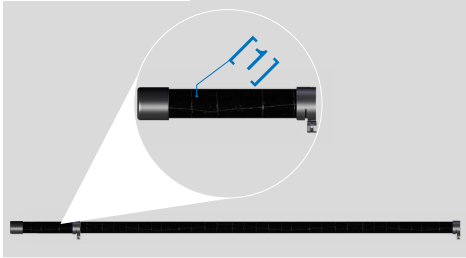
Assembling the SOLA-LITE VCMO 1.8 US



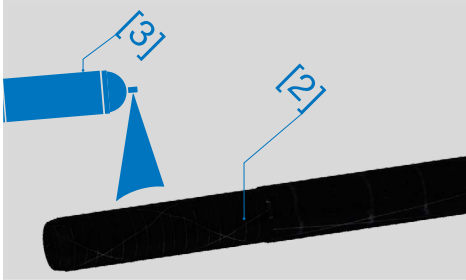
The following tools are required.



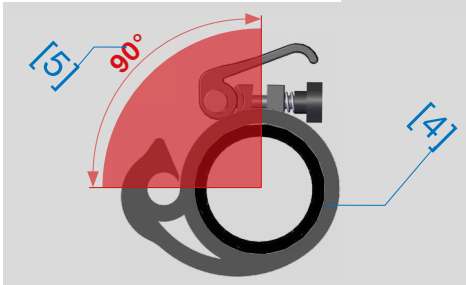
VCMO - Protection



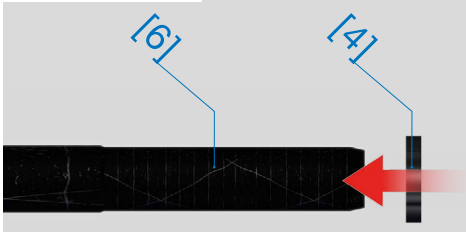
Spray connector



Correct position of the hose holder



Slide on hose holder



## Assembling the modular poles

This step explains how to prepare the modular poles.

### VCMO - Protection

Always use the VCMO - protection [1] always with the lowest lance. The VCMO guard reliably protects the lance from damage when it is placed on the ground.

### Spraying with lubricant

- ▶ Spray the plug-in area [2] of the modular poles with a PTFE spray (GT-85) [3] from a distance of 15-20 cm.

### NOTICE

#### Avoiding damage to the pole

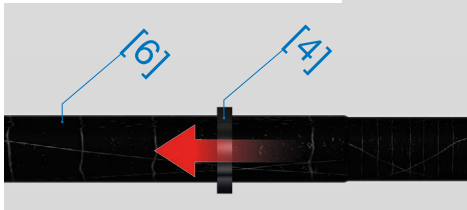
- ▶ Apply a PTFE spray (GT-85) to the connectors once a week and observe the drying times. This will protect the poles from damage to the connectors.

### Mount the first hose holder

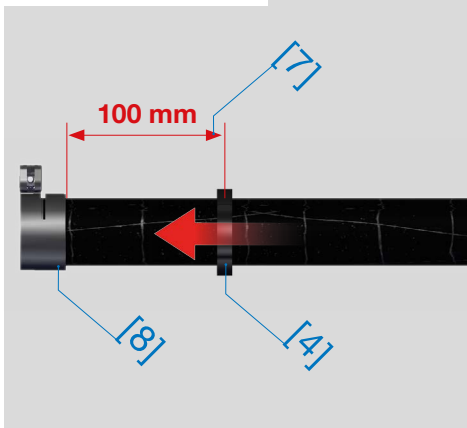
- ▶ Turn the first hose holder [4] into the correct position [5].
- ▶ Thread the hose holder [4] onto the plug-in area [6].



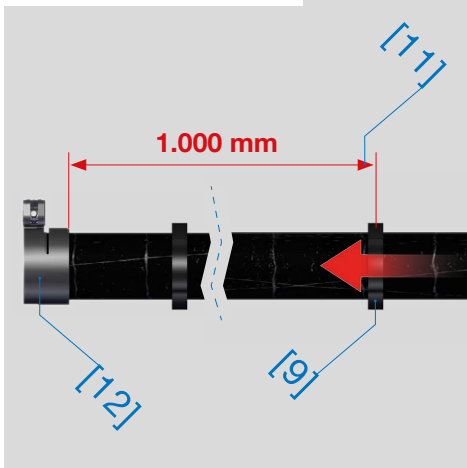
Slide hose holder onto modular rod



Position of first hose holder



Position of second hose holder



- ▶ Slide the hose holder [4] onto the modular rod [7].
- ▶ Slide the hose holder [4] up to approx. 100 mm [7] in front of the clamp [8].
- ▶ Re-align the hose holder.

### Mount second hose holder

- ▶ Take the same initial steps for the second hose holder as for the first.
- ▶ Slide the second hose holder [10] up to approx. 1,000 mm [11] in front of the clamp [12].
- ▶ Re-align the hose holder [10].

**ATTENTION:** The hose holder must not obscure any warning signs.

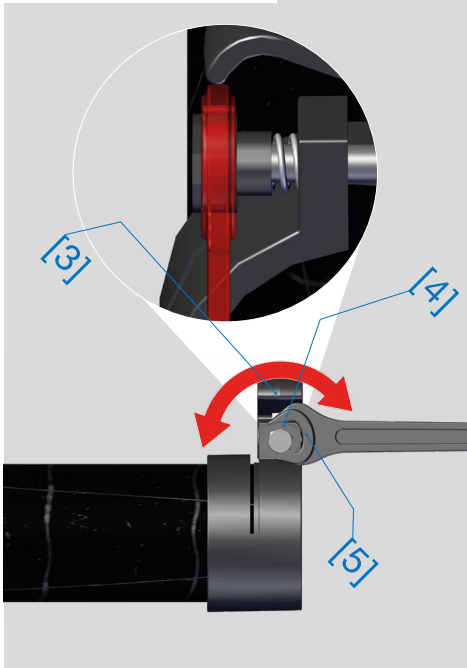
### ⚠ CAUTION

#### Risk of injury during installation

- ▶ Wear gloves during installation. This will protect your skin from abrasions and pinching.



Adjusting the tension clamp



### Adjusting the tension clamp

- ▶ Check the clamp [3] of the individual modular poles and adjust if necessary using the adjusting nut [4].
- ▶ Adjust the clamp [3] so that the poles can no longer be pulled apart.
- ▶ If the adjusting nut [4] is difficult to turn, use the open-end wrench [5] at the rear of the adjusting nut [4] and use it to adjust the clamp [3].

### NOTICE

#### Danger of damage caused by setting too tight

- ▶ Do not set the clamp too tightly. This protects the closure from damage.

Open the clamping lever



### Connecting the poles

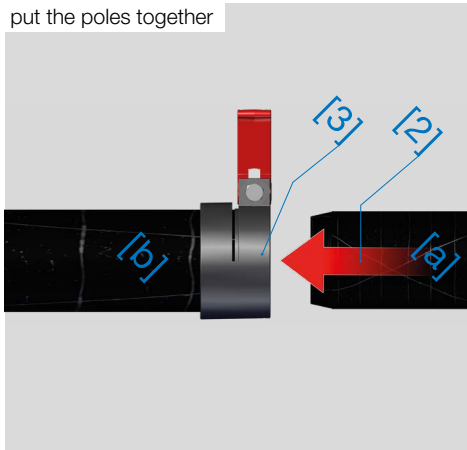
- ▶ Check the plug-in area for impurities such as sand and dust
- ▶ Open the tension clamp [1].





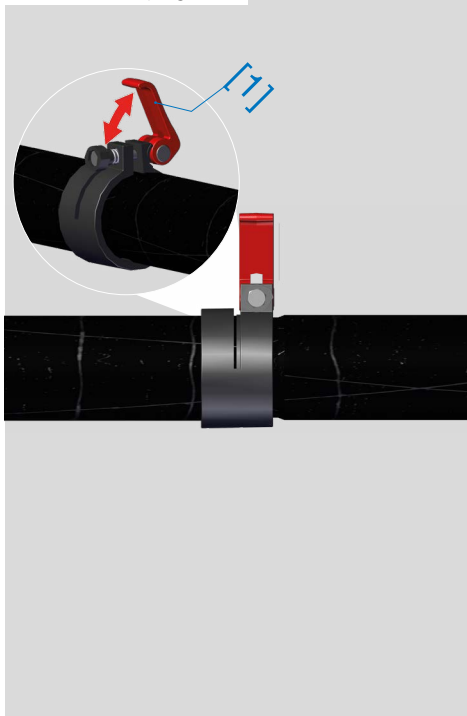
## Assembly

put the poles together



- ▶ Insert the plug-in area [2] of the pole [a] into the end ring [3] of the pole [b].
- ▶ It must be possible to push the poles into each other without exerting great force.
- ▶ Close the tension clamp [1].
- ▶ Repeat the procedure until the desired length is reached or the maximum permitted length of 12 meters is reached.

Close the clamping lever



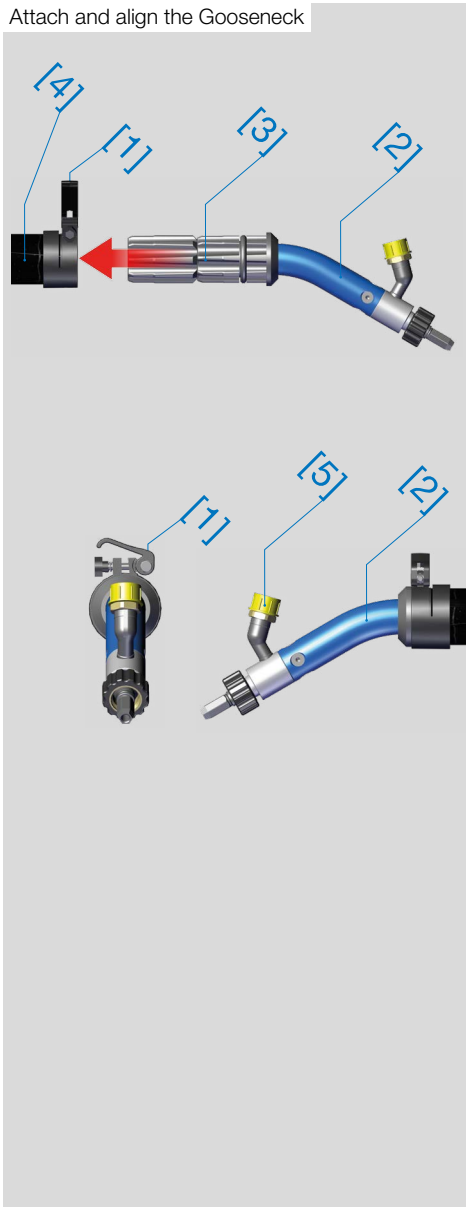
### WARNING

#### **Risk of injury due to incorrect adjustment of the bracket**

- ▶ The bracket must always clamp with sufficient force. This prevents personal injury and damage to property due to uncontrolled falling of parts.



Attach and align the Gooseneck



### Attach the Gooseneck

- ▶ The Gooseneck is fitted in the same way as the individual poles are fitted together (page 26).
- ▶ Open the tension clamp [1] on the rod and push the Gooseneck [2] with the connecting part [3] into the pole [4].
- ▶ Align the Gooseneck [2] as shown in the figure. The connection [5] for the high-pressure hose must be parallel to the tension clamp [1].

### NOTICE

#### Avoiding damage to the tension clamp and photovoltaic panel

- ▶ Align in parallel the tension clamp and the lance bow connection. Aligning them this way protects the tension clamp and the photovoltaic panel from damage.

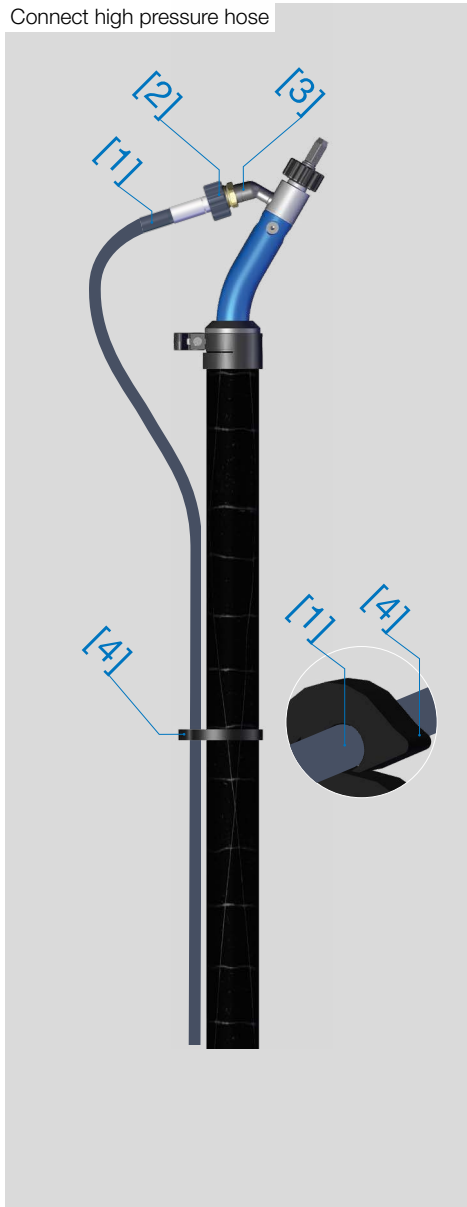
### WARNING

#### Risk of injury due to incorrect adjustment of the bracket

- ▶ The bracket must always clamp with sufficient force. This prevents personal injury and damage to property due to uncontrolled falling of parts.



Connect high pressure hose



### Attach the high-pressure hose

- ▶ Screw the high-pressure hose [1] with the Quick connector [2] to the connection of the lance bend [3].
- ▶ Clamp the high-pressure hose [1] into the hose holder [4] from top to bottom, one after the other.

#### CAUTION

##### Risk of injury from defective hoses and connections

- ▶ Check all high-pressure hoses and connections for damage. This will protect you from being injured by escaping hard water jets.

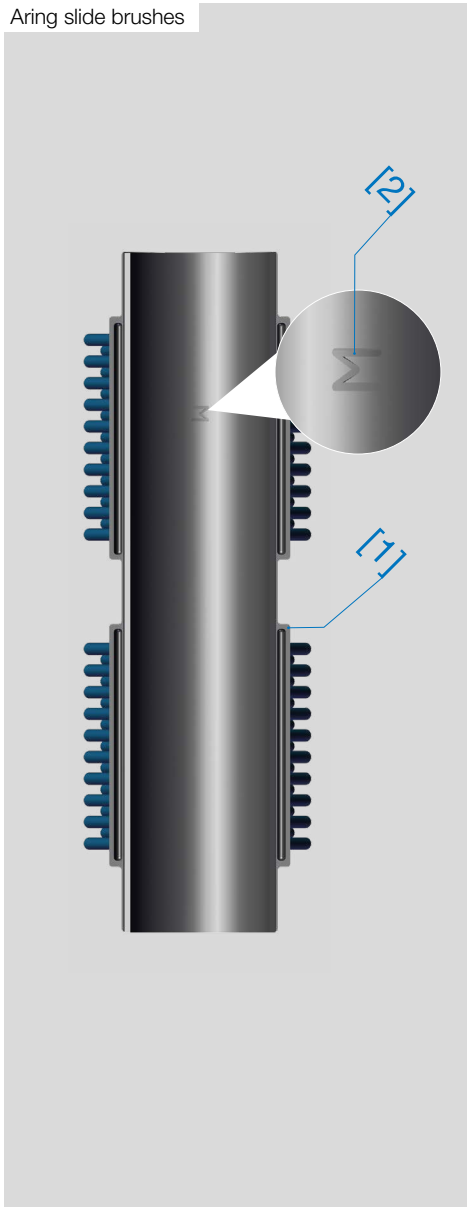
#### CAUTION

##### Risk of injury due to incorrect installation of the joints

- ▶ Always hand-tighten and check the joints. This will protect you from injuries caused by uncontrolled flying joints.



Aring slide brushes



### Aring slide brushes

- ▶ Make sure that the slide brush [1] is intended for the modular pole. There must be an M [2] cut out of the foam rubber on the inside.
- ▶ Open the hook-and-loop tape and check it for damage.

### NOTICE

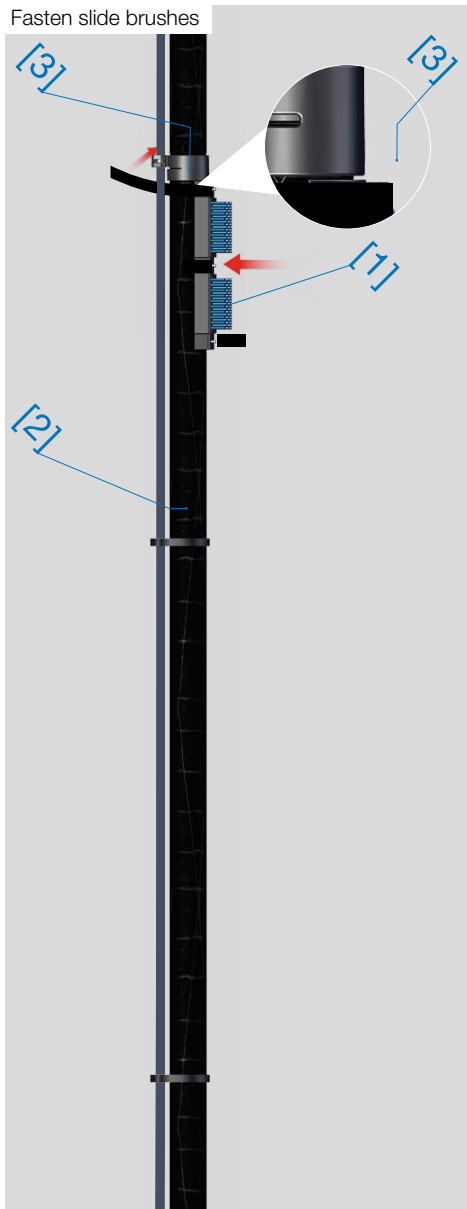
#### Avoiding damage to the pole

- ▶ Apply a PTFE spray (GT-85) to the connectors once a week and observe the drying times. This will protect the poles from damage to the connectors.

### WARNING

#### Risk of injury due to incorrect adjustment of the bracket

- ▶ The bracket must always clamp with sufficient force. This prevents personal injury and damage to property due to uncontrolled falling of parts.



### Fasten slide brushes

- ▶ Mount the slide brushes from the second pole onwards.
- ▶ Place a slide brush [1] on each pole [2].
- ▶ Position the slide brush on the pole, straight onto the clip [3].
- ▶ Firmly press the slide brush onto the modular pole and fasten the hook-and-loop tape by pulling firmly.
- ▶ Check the slide brushes. The slide brush should not be easy to move.
- ▶ If the slide brushes are too loose, the hook-and-loop tape will need to be re-tightened.
- ▶ Repeat these steps for all remaining slide brushes.



### WARNING

#### Risk of injury from falling parts

- ▶ Check the surface to be cleaned for parts that could fall. In this way you will protect yourself and other persons from injury from falling parts.

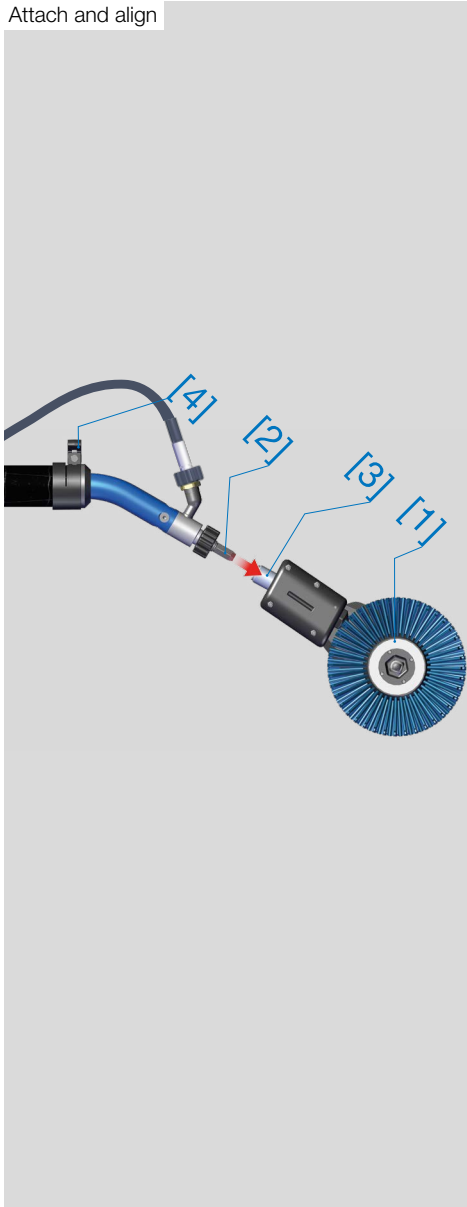


## Working with the lance

In this section you will find information about:  
Preparing the lance with cleaning device  
Working with the lance



Attach and align



## Ready for work

### Attach and align the cleaner

- ▶ Place the Sola-Tecs C [1] on a flat surface.
- ▶ Insert the lance with the hexagon [2] into the connection PIN [3] as far as it will go.
- ▶ Ensure that the clamps [4] point upwards. If the clamps do not point upwards, open the first clamp and turn the lance until the clamp points upwards.

### NOTICE

#### Risk of damage caused by seizing of thread and hexagonal nipple

- ▶ Grease (DIN 51502: KP2G-30) hexagon nipple Lance and thread connection PIN before assembly.

This reduces the risk of seizing and any resulting damage.

### ⚠ CAUTION

#### Risk of injury due to incorrect installation of the joints

- ▶ Always hand-tighten and check the joints.
- This will protect you from injuries caused by uncontrolled flying joints.



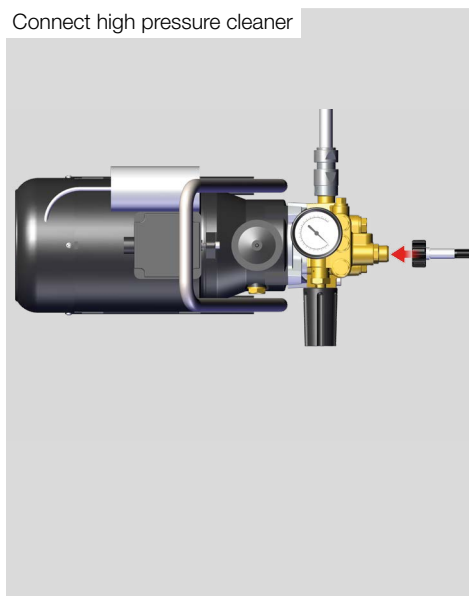
### Fasten the cleaner

- ▶ Screw the Quick connector [5] onto the connection PIN [3] by turning it clockwise. Make sure that the connection PIN slides out of place when screwing it on.
- ▶ Screw on until the Sola-Tecs C [1] is firmly seated.

### NOTICE

#### Preventing damage to the quick connector

- ▶ Tighten the quick-release screw connection hand-tight. Do not use any tools (pliers etc.) for tightening. This will prevent chipping of the plastic and damage to the thread.



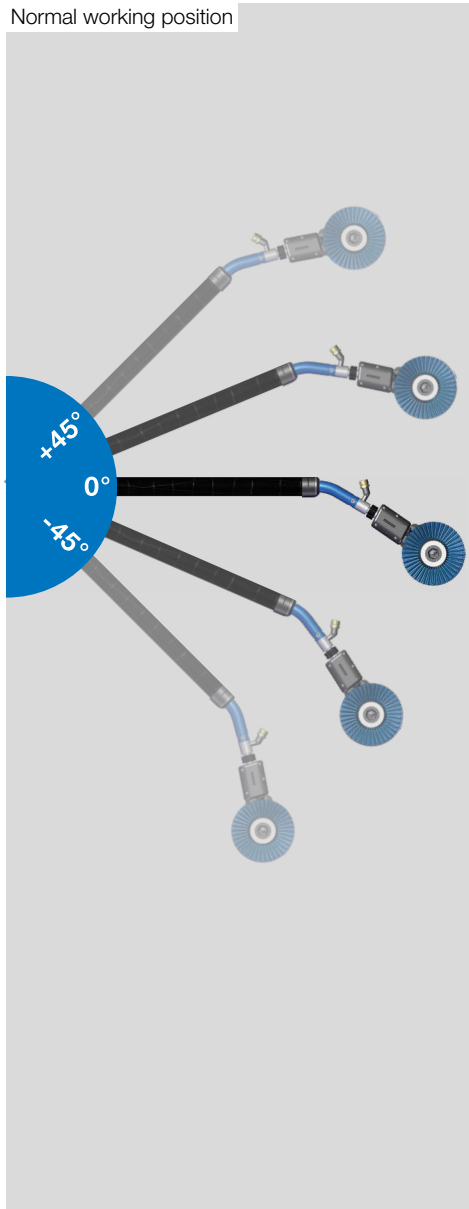
### Connect the high-pressure cleaner

- ▶ For information on how to connect the lance to the high-pressure cleaner, please refer to the operating instructions for the high-pressure cleaner.





Normal working position



## Operating the lance

### Normal working position

- ▶ The cleaning devices are guided horizontally at an angle between  $+45^\circ$  to  $-45^\circ$  over the cleaning level.

### WARNING

#### Danger of injury due to incorrect guidance of the cleaning device

- ▶ Do not move the SOLA brush and SOLA-TECS C vertically upwards or vertically downwards.

This will prevent injuries from a falling cleaning device.

### DANGER

#### Risk of death from electric shock and high-voltage cables

- ▶ The safety distance from the cleaning device to the high-voltage cable must not be less than **20 meters (65,6 ft)**. Failure to maintain the safety distance puts your life and health at risk.



## Proper care and storage of poles

In this section you will find information about:  
The care and storage of the poles



## Care of the poles

### Cleaning the poles

- ▶ Remove coarse dirt from the poles.
- ▶ Use a soft cloth and household detergent to remove any dust and dirt from the poles.
- ▶ Clean the poles once a week.

### Checking for damage

- ▶ Inspect the surface of the poles for damage.
- ▶ Check the clamp and end ring for function and damage.
- ▶ Check the warning labels for damage. *Warning labels must be replaced if they are difficult to read.*
- ▶ Check daily for damage.

### WARNING

#### Risk of injury due to incorrect adjustment of the bracket

- ▶ The bracket must always clamp with sufficient force. This prevents personal injury and damage to property due to uncontrolled falling of parts.

### NOTICE

#### Danger of damage caused by setting too tight

- ▶ Do not set the clamp too tightly. This protects the closure from damage.

### Care of the poles

- ▶ Apply a PTFE spray (GT-85) to the plug-in area to prevent dust and dirt from sticking to the plug-in area.
- ▶ You should apply the PTFE spray (GT-85) once a week.

## Storing the poles

### Transporting the poles

- ▶ Transport the poles such that they are protected from blows and impacts.

### WARNING

#### Risk of injury due to damaged closures and pole tubes

- ▶ Check the closures and the pole tubes daily for function and damage. This will prevent injuries from a falling cleaning device.

### NOTICE

#### Danger due to missing warning labels

- ▶ Make sure that the warning labels on the lance are present, undamaged and clearly legible. This ensures that they can be read by every operator.



## Disposing of the lance

In this section you will find information about:  
The disposal of the product and its components.



## What happens with the waste

### Packaging

▶ The packaging is made of cardboard and can be recycled.

### PTFE spray

▶ Please read the manufacturer's instructions on how to dispose of the PTFE spray.

### Carbon tubes

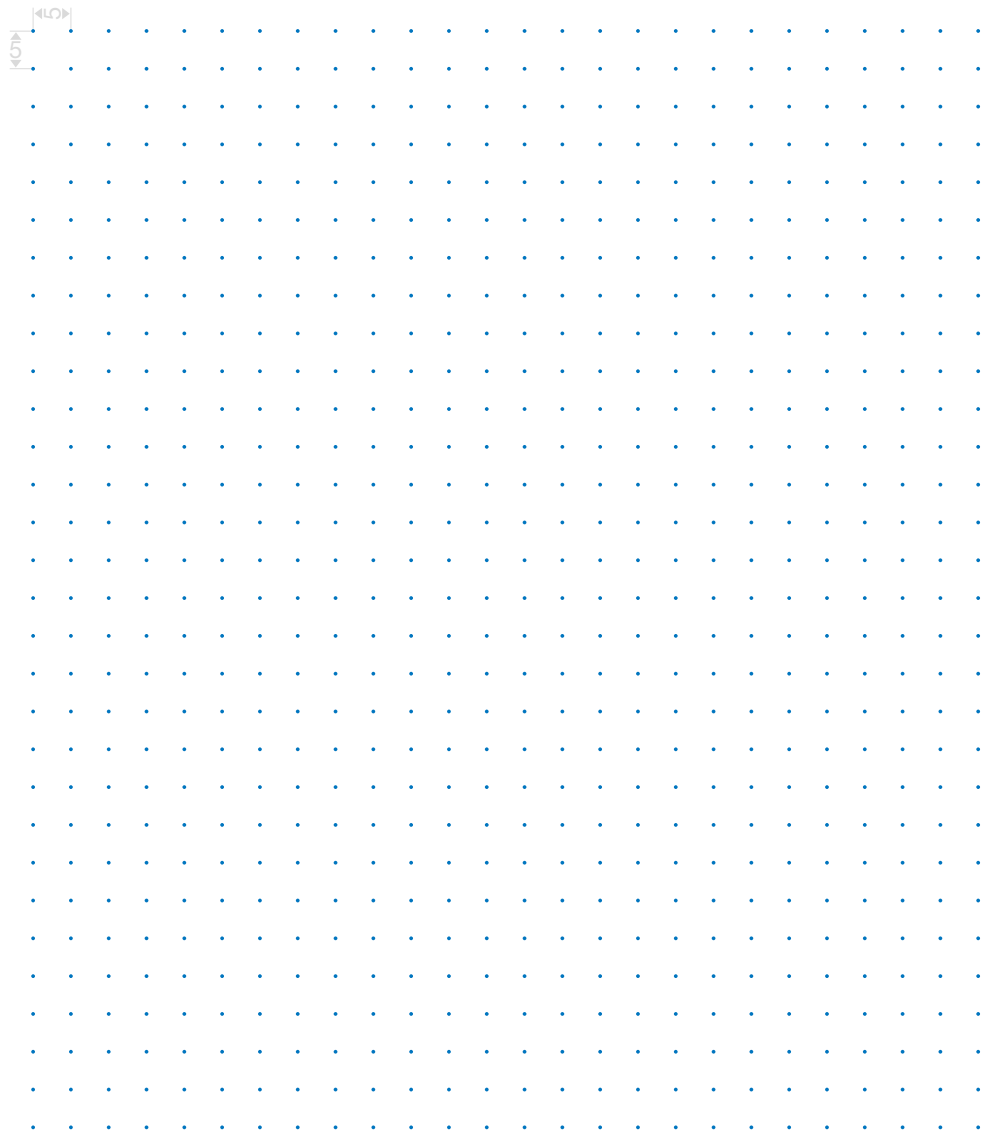
▶ To dispose of the carbon tubes, please contact your local waste disposal company.

### Clamp complete

▶ The tension clamp and the end ring can be disposed of with household waste.

### Lance bend

▶ The lance bend can be disposed of in metal recycling.





Handwriting practice grid with a dotted pattern. The grid is 20 columns wide and 25 rows high. The first row is pre-filled with the letters 'K', 'L', 'O', and 'P' in the first four columns, respectively. The remaining 24 rows are empty for practice.

