



PvSpin

Equipped with a powerful water hydraulic axial piston motor, the PvSpin works on the basis of two durable rubber brushes rotating in opposite directions, removing dirt and other contaminants from module surfaces. In test operations, the PvSpin cleaned 20kW per hour. The device follows the module frames, ensuring that each panel is cleaned completely and effectively.



PvSpin – The practical and easy-to-handle module cleaning device

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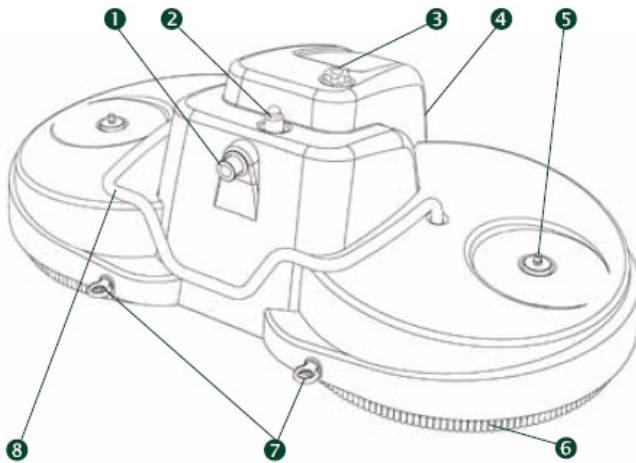


General

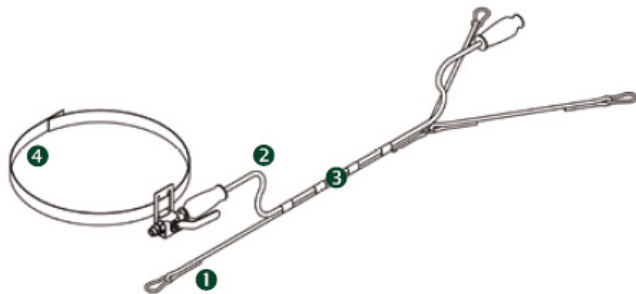
Intended Utilization

The PvSpin is designed exclusively for cleaning the surfaces of solar modules. The device is not suitable for cleaning floor coverings or as a sweeping device, nor is the device suitable as an installed, automatic device of any kind.

System Components



1. Connector for high-pressure hose
2. Fine filter (5 µm)
3. Bypass valve with star handle
4. Ear for hauling rope
5. Water valve
6. Cleaning brushes
7. Receptacles for fastening the safety rope
8. Handle



Use of a safety rope with the high-pressure hose is recommended:

1. Safety rope
2. High-pressure hose
3. Connection of the safety rope to the high-pressure hose
4. Belt



Safety Information

General Precautions

Prior to using the device, please that the device and all accessories are in working order. Do not use the device if a connecting cable or parts of the device are damaged in any way. During operation, the device must be continuously monitored.



Warning – Danger of Falling Off the Roof!

When operating the PvSpin from the ridge of the roof or from any point on or near the roof, there is a danger of falling off the roof. Additionally, if one were to step on modules, there is a danger of sliding. Persons working on roofs should wear a safety harness or a safety scaffold should be installed. Persons working on roofs should never step on the solar modules as this could result in sliding from the roof and/or damage to the modules.



Warning – Danger of Injury!

Fingers can be injured by rotating parts on the device, especially by the disc brushes. Never touch rotating parts.



Warning – Danger of Injury!

Passersby can be injured by components falling off the roof. The cleaning device should be fastened to a stable point on the roof using a safety rope to ensure that it will not fall off the roof. In addition, a safety perimeter around the building should be maintained when the device is in use.



Warning – Danger of Breakage!

Solar modules can be damaged if stepped on or hit with a blunt object. Never step on solar modules.



Warning – Danger of Damage!

Soiled brushes can damage the module surfaces. Always keep the brushes clean and free of dirt and sand.



Warning – Danger of Electrical Shock!

The electrical lines and components of the solar system are current-carrying. Touching the conductive components can lead to electrical shock. Exposure to electrical energy at aerial lines can lead to severe injury or death. Any operations at electrical device points should be carried out by an expert. A sufficient safety distance to electrical components and aerial lines should be kept at all times.



Handling Precautions

This section contains information about water quality and the use of detergents.



Attention – Danger of Damage!

Certain detergents can damage modules. If using a detergent, use only those detergents that have been approved by the module manufacturer. Warranty conditions of the module manufacturer should be observed.



Attention – Danger to the Environment!

Processed water or detergents can be harmful to the environment. Any uncontrolled release of hazardous chemicals into the environment must be avoided. Pay attention to the legal environmental regulations.



Attention – Danger of Damage!

Extremely hot water can damage the hydraulic axial piston motor. The water temperature should not be higher than 122° F.

Cleaning modules with soft brushes (like those in the PvSpin) and clean water without the use of any detergents is acceptable by most module manufacturers.



Please note: The warranty conditions of the module manufacturer should be observed.



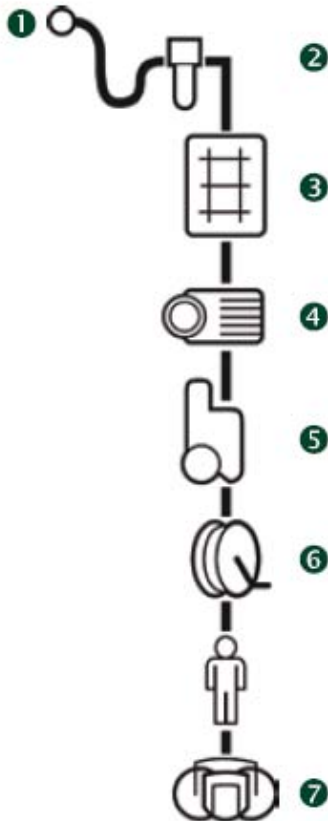
Please note: In the case of high outside temperatures, it is recommended to pre-heat the water used in the PvSpin in order to avoid stress on the modules caused by extreme temperature difference. Always consult the module manufacturer's warranty.



Operation

System Set-Up

The following set-up is recommended for the PvSpin:



1. Standard hose connected to a water inlet valve.
2. Water filtering system with a flow rate capacity of 6.5 cubic feet per hour
3. Buffer tank: To avoid dry running in the high pressure pump of the PvSpin. If there is not sufficient water pressure, utilization of a standard pallet tank with a capacity of 1000 liters is recommended.
If using rain water, always ensure that it is sufficiently pre-filtered
4. Pump: Positioned between the tank and high-pressure cleaner with a minimum flow rate of 2000 l/h. If a self-priming high-pressure cleaner is used, no pump is required.
5. High-pressure cleaner, possibly heatable. Review the safety information for the high-pressure cleaner.
6. Hose reel with crank including rotary water feed-through
7. Inlet pipe to the PvSpin: DN8 high-pressure hose, possibly with extension. Connector M 22x1.5

Device Operation

Please read the safety information on pages 3 – 4 before operating the PvSpin. A sufficient safety perimeter should be established around the building and measures should be taken to ensure the safety of workers on the roof (e.g., safety harnesses). Set up the system per the recommendations in the diagram above.

➔ Operation of the PvSpin can be seen on YouTube: www.youtube.com/user/schletterinc



The assistance of a second person is recommended:

- To guide the loose part of the hose along the roof
- In case of very flat roofs, the PvSpin must be pulled downwards by a second person using a plastic rope attached to the device, with caution

At the edges of the roof, maximum precaution is required.



Device Operation (continued)

1. The PvSpin is operated from the ridge of the roof (figure 1). All components listed under “System Set-Up” on page 5 should remain on the ground with only the operator with the PvSpin at the roof ridge.

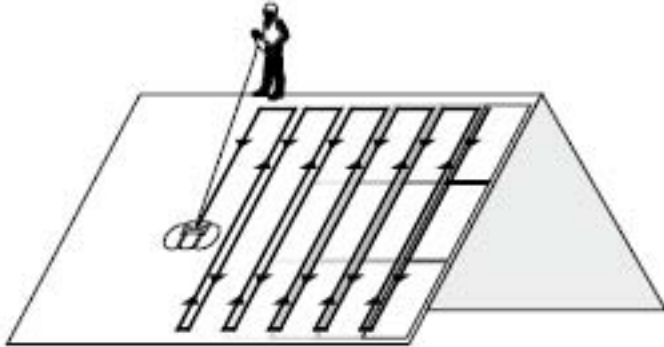


Figure 1

2. Be sure to spray the first row of modules with a hose to ensure that the brush does not scrub on dry surfaces. (When cleaning one row of modules, the water valves on the device spray water onto the row that will be cleaned next in order to loosen the soil and prevent the brush from scrubbing on dry surfaces.)
3. Connect the high-pressure hose to the cutoff connector (figure 2). Connect the high-pressure hose to the hose connection on the PvSpin.
4. Fasten the safety ropes to the receptacles on the PvSpin (figure 3).



Figure 2



Figure 3

5. Place the PvSpin on the first row of modules. Fasten the PvSpin to a stable position on the roof.
6. For smooth operation, the tube must be completely free of air. To evacuate air from the hose, open the bypass valve completely before switching on the high-pressure pump.
7. Next, slowly close the bypass valve to start the device and to set the operating rotational speed. The cleaning brushes are driven by the water pressure.



8. Start the cleaning process by lowering the PvSpin in one track of modules at the outermost edge of the array. Always move the safety rope and the high-pressure hose together (they should be connected).



Warning – Danger of Falling Off the Roof!

Use caution around the rope and hoses! The safety rope and hose could cause operator to stumble if caution is not used. Always lay down the safety rope and the hose diligently to ensure that you are not entangled.

9. Pull back the PvSpin along the same track.
10. Shift the device by one width of the PvSpin to the next track and repeat the cleaning operation until the end of the array is reached.



Warning – Danger of Injury!

Passersby can be injured by debris or components falling off the roof. The cleaning device should be fastened to a stable point on the roof using a safety rope to ensure that it will not fall from the roof. In addition, a safety perimeter around the building should be maintained when the device is in use.

Data

Maintenance and Servicing

- Keep the brushes clean from dirt and sand. Soiled brushes can damage the module surfaces.
- Before every use, ensure that the high-pressure hose is not damaged. If the high-pressure hose is damaged, replace it before using the device.
- Store the device in a dry and frost-proof location. Freezing water can damage the device.
- The integrated fine filter should be replaced as soon as the soiling indicator is red. Please refer to the handling and maintenance instructions for the filter.
- If the driving belt needs to be replaced, take note of the direction the belt is rotating. Put the belt on as show in figure 4. The pulling force of the driving belt must move alongside the protection plate to ensure an unimpeded belt rotation.



Figure 4



Accessories and Spare Parts



Information

Only spare parts and accessories provided by Schletter should be used.

The following spare parts and accessories are available:

Name	Item No.
Brushes for PvSpin:	979000-349
Gear ring	979000-357
Driving belt	979000-358
Exchange filter	990000-288
High pressure hose	979000-354

Other spare parts and accessories or custom accessories are available upon request.

Technical Data

Item No. 182019-001 - PvSpin without accessories

Length:	3.6 ft / 1100 mm
Width:	1.7 ft / 520 mm
Weight:	about 55 lbs
Brush diameter:	1.7 ft / 520 mm
Operating pressure:	min. 130 bar / max. 160 bar
Operating flow rate:	min. 10 l/min / max. 25 l/min