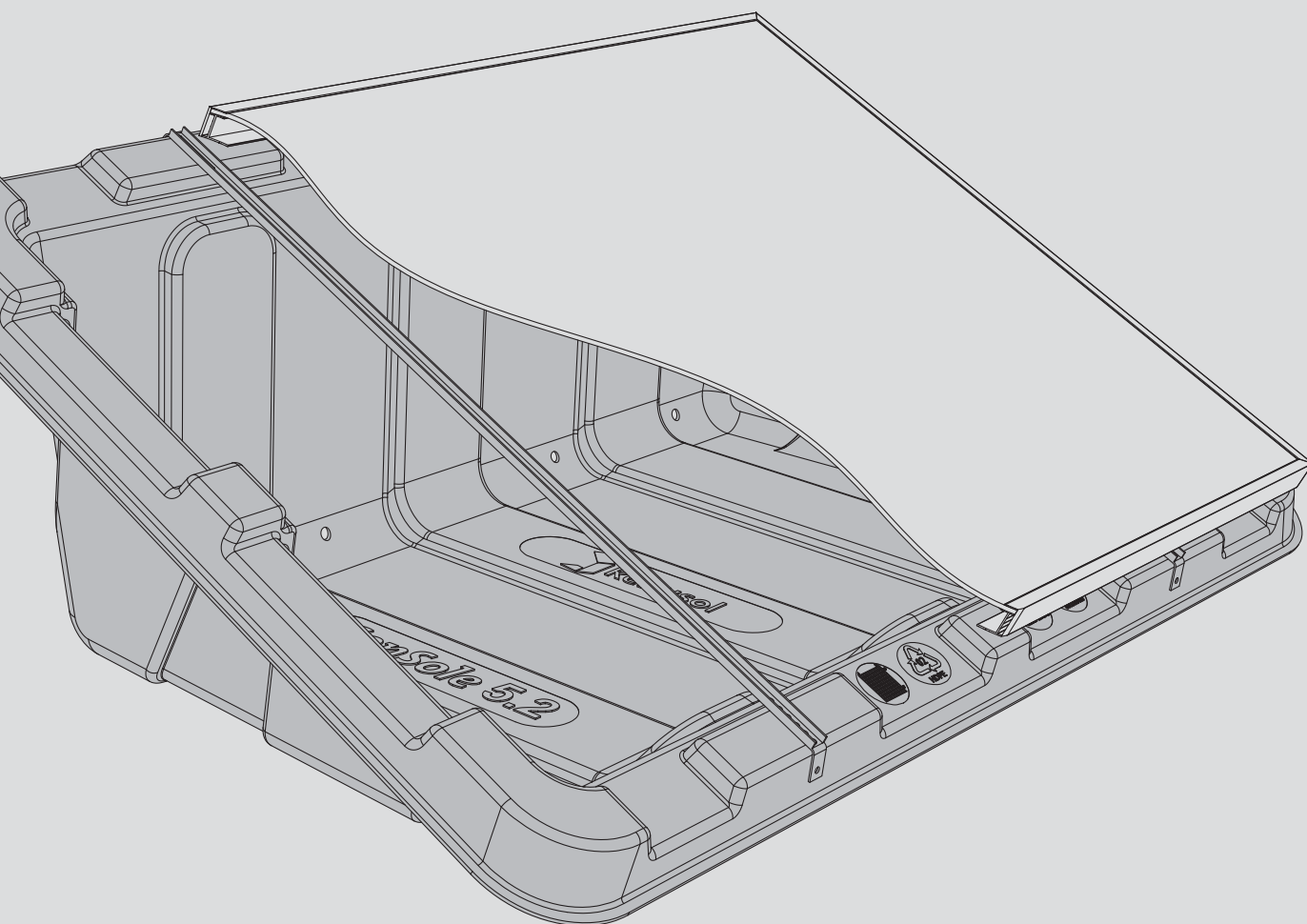


ConSole

Installation instructions



Product Information

The ConSole assembly system is the ideal solution for installing PV modules on flat roofs with pitch of up to 5° without roof penetration. Most commercially available framed standard PV modules fit on the ConSole.

The ConSole is weighed down with ballast (gravel, paving slabs, etc.) in order to resist the wind loads. The necessary weight of the ballast depends on the height of the building, its location and condition of the ground and the wind and snow loads. Reference values for the necessary ballast are contained in "Preparing the assembly— point 2." in the table on page 5 above.

The ConSole is made from 100% recycled chlorine-free polyethylene (HDPE). The material of the ConSole satisfies the fire prevention measures of DIN 4102 class B2. The energy amortization time of the ConSole is shorter than one year.

A ConSole weighs 5 –7.2 kg depending on the type and can be stacked with up to 40 ConSoles per pallet. The circular assembly edge will facilitate a fast installation. Generously sized ventilation channels ensure efficient air circulation. The boreholes on the ground of the ConSole are conducive for drainage.

We wish to point out that work must be carried out according to current safety regulations (e.g., VBG37) in order to prevent accidents. Please carry out the respective safety measures.

Warranty

Our warranty only applies if an original ConSole complete system is used. In order to adjust the system optimally for the local conditions and to fulfil all applicable regulations, we recommend an expert report be prepared if in any doubt. The installation should be carried out by skilled and trained personnel. If you have questions concerning training, please contact Renusol.

Installation instruction

Please read these installation instructions carefully before starting installation. First, familiarize yourself with the system components. The ConSole can be stored and used at temperatures of between -40° C and +85° C. We recommend the ConSoles be assembled at plus temperatures. The roof area must in any case be free of snow and ice.

During the installation and, in particular, while working on the roof, be sure to observe the relevant health and safety provisions and please follow the current rules and regulations.

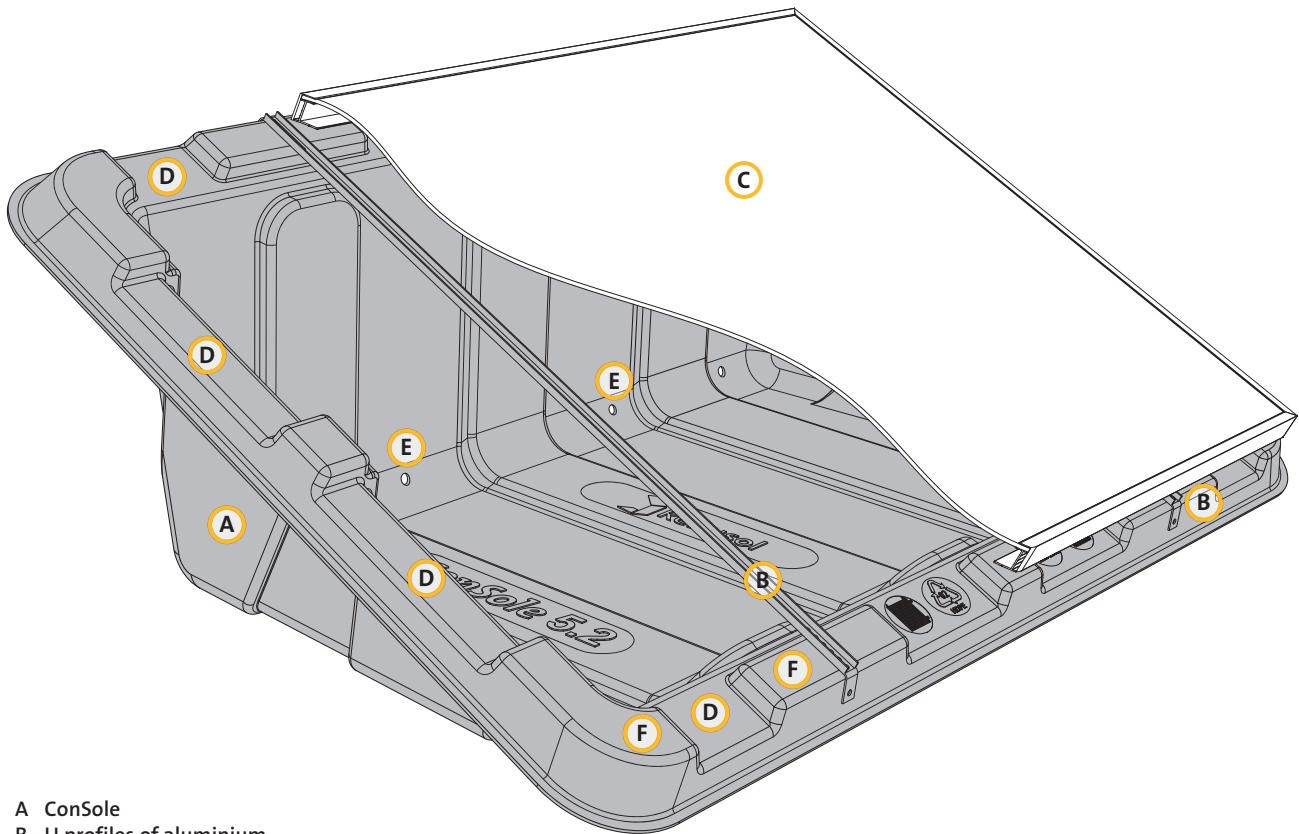
Please also check the current version of our installation instructions on our website at www.renusol.com. Here, you can also find instructions in other languages, if required. The figures and texts in the installation instructions correspond to current technology at the time of printing. We reserve the right to make changes.

The installation instructions merely contain recommendations in accordance with current technology and are based on the experience of how systems made by Renusol can be installed. If any roof or object-specific characteristics are to be considered, please, if necessary, involve specialists such as roofers or structural engineers for the purposes of explanation.

The Renusol team wishes you a successful installation.

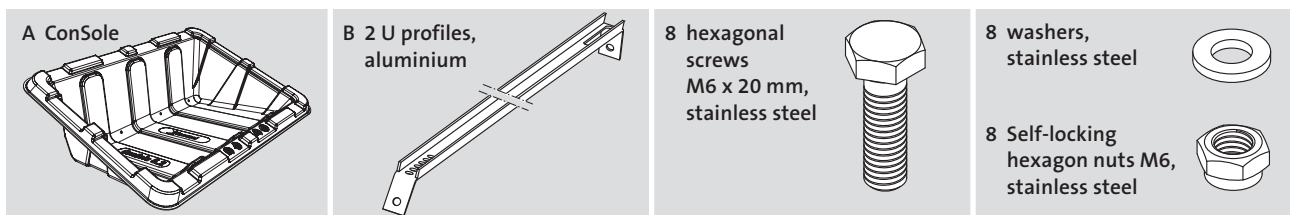


SYSTEM OVERVIEW



- A ConSole
- B U profiles of aluminium
- C PV module
- D Generously sized Ventilation channels
- E Boreholes for draining the ConSole
- F Circular assembly edge

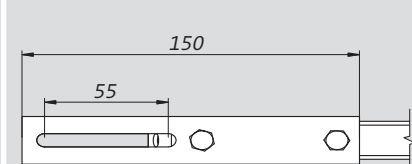
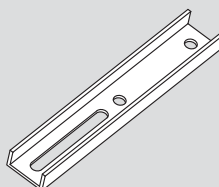
SYSTEM OVERVIEW OF COMPONENTS



OPTIONAL EXTENSION RAILS

ConSole set of extension rails consisting of:

- 2 ConSole extension rails, aluminium
- 4 hexagonal screws M6 x 20 mm, stainless steel
- 4 washers, stainless steel
- 4 self-locking hexagon nuts M6, stainless steel



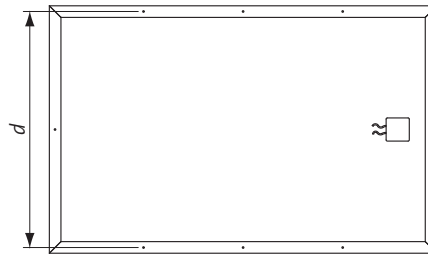
TOOLS REQUIRED (not included in delivery)

- Cordless screwdriver with hexagonal insert for 10-mm screw
- 7-mm drill
- 10-mm open end or ring spanner

ASSEMBLY PREPARATION

1.

PV module bottom view



Decide on the correct ConSole for the module

First measure the distance "d" of the assembly boreholes on the rear of the module. Then calculate based on the table which ConSole fits the width of the module.

Indicate any extension rails required as a separate position in the order.

If there are several possibilities, select the ConSole that best suits the length of the current module.

Measurement "A" of the ConSole should correspond roughly to the length of the module. Overlapping modules require more ballast due to the larger area exposed to the wind.

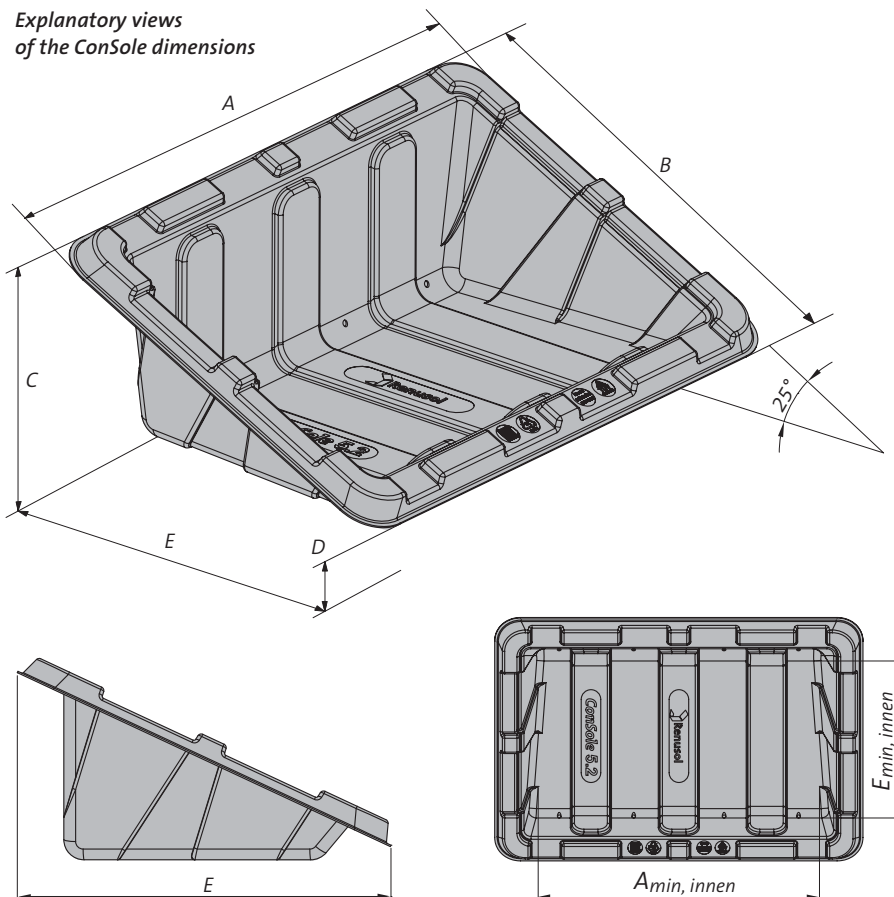
Always select the ConSole on which the module surface overlaps the assembly edge of the ConSole as little as possible. The maximum overlap of length "A" per side should not be over 12 cm.

Table for calculating the suitable combination ConSole/PV module

Hole spacing d = mm	4.1	4.2	5.2	6.2
661– 700	●			
701– 720	●			
721– 780	●			
781– 840	○			
841– 850	○			
851– 894				
895– 910		●	●	●
911–1014		●	●	●
1015–1085		○	○	○

○ = only with extension rail

Explanatory views of the ConSole dimensions



Recommended measurement of ConSole/PV module

Measurement	A mm	B mm	C mm	D mm	E mm	A _{min, interior} x E _{min, interior} mm	Installation surface m ²	Building protection mat mm
ConSole 4.1	1680	840	400	50	740	1300 x 400	0,62	cca. 1400 x 500
ConSole 4.2	1240	1090	530	50	960	890 x 490	0,47	cca. 1000 x 700
ConSole 5.2	1520	1080	500	40	960	1140 x 630	0,76	cca. 1300 x 700
ConSole 6.2	1740	1070	500	50	970	1380 x 630	0,84	cca. 1500 x 700

Recommended ballast values for ConSoles in kg in terrace systems*

	Up to 8 meters		Building height Up to 12 meters		Up to 16 meters	
	interior	exterior	interior	exterior	interior	exterior
ConSole 4.1	62	99	73	115	82	128
ConSole 4.2	58	94	68	110	77	122
ConSole 5.2	63	106	75	123	84	137
ConSole 6.2	83	134	98	156	110	173

Calculation basis

The ballast values are calculated for wind load zone 1 for Germany according to DIN 1055-4:2005-03 and for terrain category III: Suburbs, industrial or commercial zones and forests.

*The system weight is not included in the recommended ballast values.

Additional ballast

In a higher wind load zone: 30% more ballast per level.

When using extension rails: 10% more ballast.

In case of excess length of the modules on the side:

additional ballast in proportion to the excess length.

Calculating the amount of ballast for the ConSole

The wind loads acting on the ConSole require it to be weighed down with ballast. Gravel, stones, plates and similar materials are suitable as ballast.

The table opposite can serve as a guide for the required ballast. These values are calculated according to DIN 1055-4:2005-03 and Eurocode. Several years experience confirm the reliability of the system.

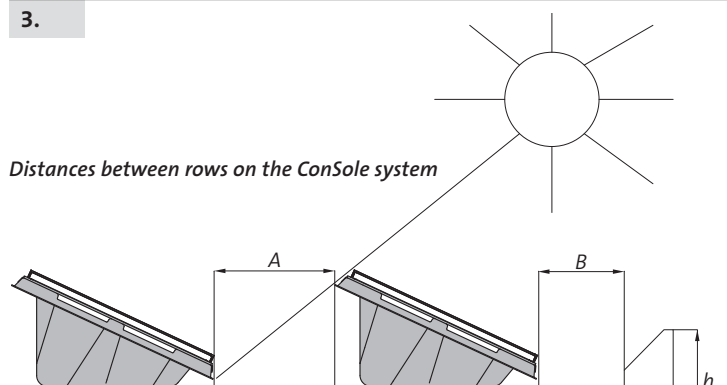
The exterior module series and column require more ballast according to the table.

The values indicated prevent the ConSoles from tipping over, sliding or being lifted-ConSoles.

In order to ensure safety against sliding, the coefficient of friction between the roofing and the ConSole must be greater than 0.6.

This can be established using a spring scale. A ConSole filled with 100 kg of ballast should only move from the spring scale under a horizontal tensile force of over 60 kg.

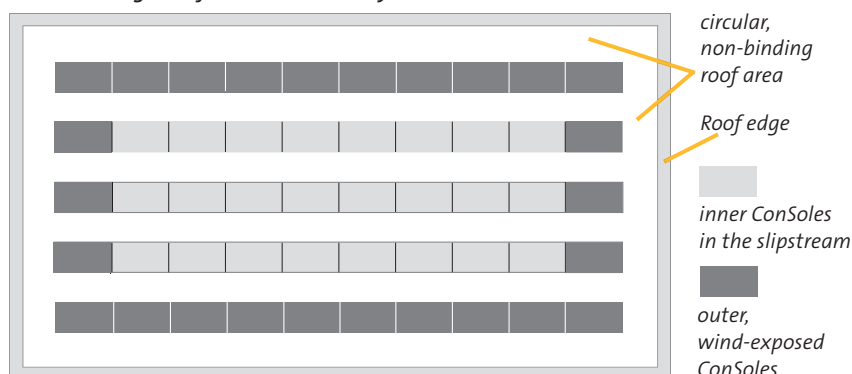
Distances between rows on the ConSole system



A = minimum distance of the ConSolen series:
ConSole 4.1 >1.2 m
ConSole 4.2/5.2/6.2 >1.5 m

B = minimum
roof edge > 1/5 h
h = Building height

Schematic diagram of a ConSole terrace system



Positioning the ConSoles

Check whether the installation surface (e.g., the roof) is enough for the additional roof load.

The surface must be level, clean and not too slippery. With slippery surfaces, e.g., with PVC roof membranes, an anti-slip mat should be used, e.g., a building protection mat.

Place the ConSole with the opening facing south. A minimum distance of a fifth of the building height "h" should be maintained from the side of the roof. Building height 10 metres => minimum distance 2 metres.

The minimum distance between the ConSoles is clear from the schematic diagram.

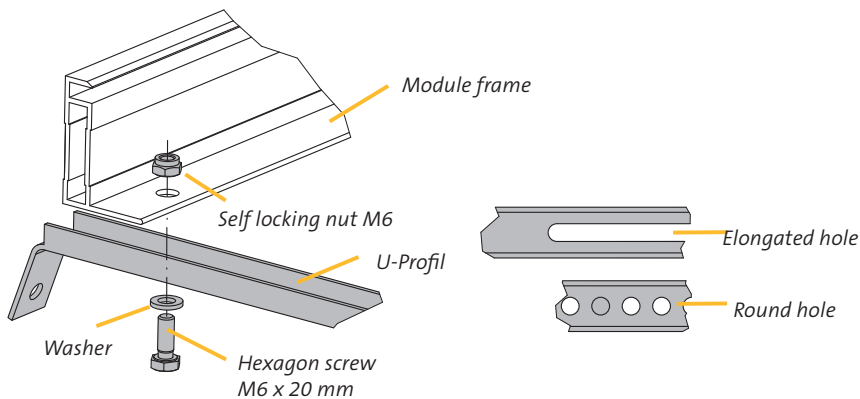
Filling ballast

Now fill in the correct ballast. Reference values here are contained in the table "Recommended ballast values" at the top of this page.

Ballast diagrams for all ConSole types are available on our website www.renusal.com/download as a PDF file.

ASSEMBLY

4.



Assembling the U profiles onto the PV module

Assembly step 1:

Now fasten the U profiles to the module. Ensure that the slotted hole is on the higher side of the ConSole and the smaller round holes are on lower side. Only ever use the fastening material supplied. Tighten the M6 screws with a maximum torque of 10 Nm.

Assembly step 2:

The cabling of the PV modules should be carried out by trained specialists.

Assembly step 3:

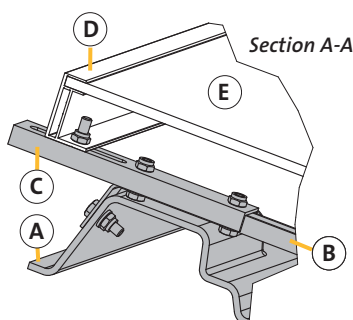
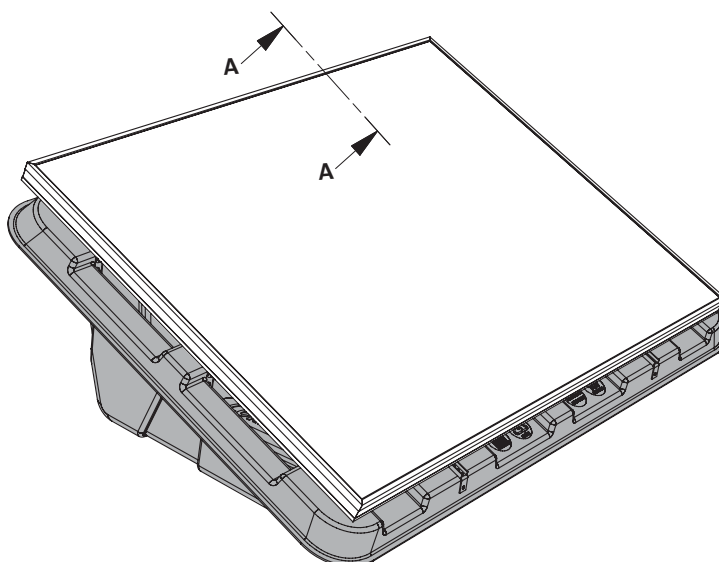
Lay the PV module symmetrically onto the ConSole. When seated correctly, the clips on the U profiles prevent from module from slipping.

Important!

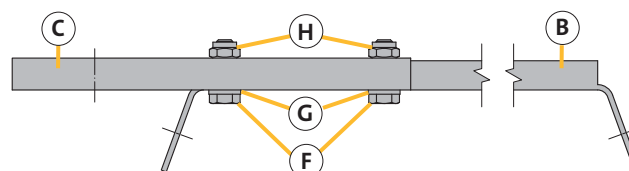
Regarding lightening, advice from specialist companies is generally recommended. It should be explained in the planning phase of the PV installation on a building as to what requirements are stipulated here by the property insurer on the subject of lightening and overvoltage protection.

The notes and regulations from the manufacturer of the modules and inverters should be observed when carrying out (functional) earthing.

5. OPTIONAL EXTENSION RAILS



- | | |
|------------------|----------------------------|
| A ConSole | E PV module |
| B U profile | F Hexagon screw M6 x 20 mm |
| C Extension rail | G Washer |
| D Module frame | H Self locking nut M6 |



Assembling optional extension rails end clamps

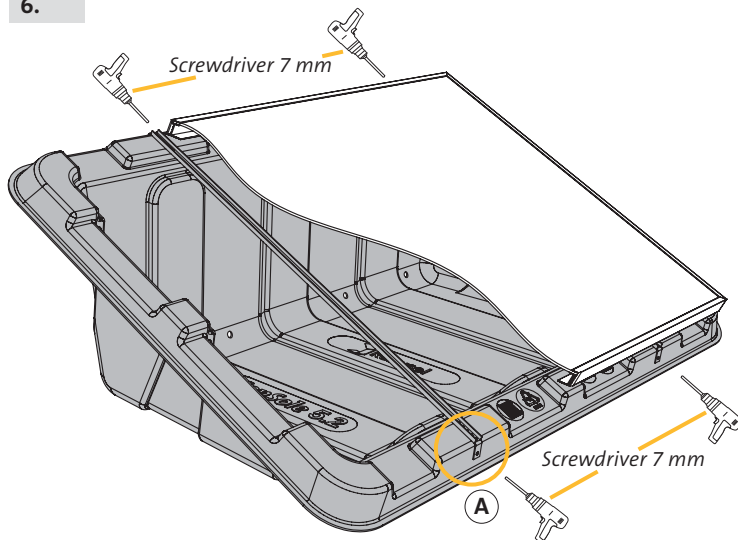
The optional extension rail should be assembled on the slotted hole of the U profile on the upper side of the ConSole. Only use the screws, washers and nuts supplied for fastening the installation.

Note:

The extension rail is only for optimal assembly of the PV module on the corresponding ConSoles.

ASSEMBLY

6.



Fasten the PV module with U profile on the ConSole mounting rails

Drill a hole 7 mm wide in the edge of the ConSole through the holes on the clips of the U profiles (fig. A).

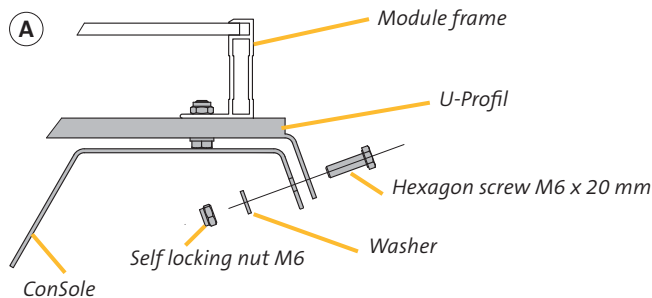
Now fasten the profiles using the supplied fastening material to the ConSole mounting rails. Ensure that the washer is between the nut and the ConSole.

Note:

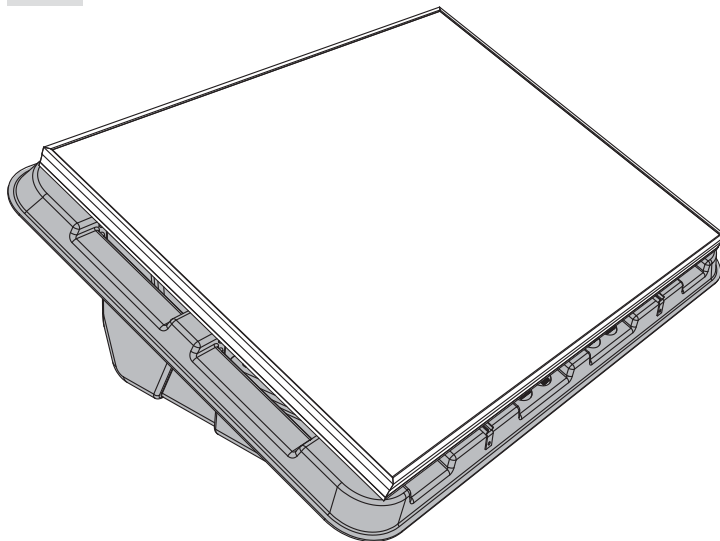
Start by fastening the U profiles to the lower side of the ConSole.

Important!

Tighten the 4 M6 screws with a maximum torque of 10 Nm.



7.



Assembly completed

Installation result: PV module ready assembled on the ConSole.

Congratulations,

You have assembled ConSole, the ideal solution for an installation of PV modules on flat roofs as the perfect aesthetic solution, ready to use.

We are pleased that you have completed a beautiful reference object. If you have any photographs of the assembly and the result, please send us the digital reference photographs, the object data and the address of the property by e-mail to: info@renusol.com.

We regularly award prizes for the most beautiful reference photos and present them together with the company logo of the respective specialized company on our website.

Thank you very much for your trust in Renusol.

