

VAN DER VALK



Installation manual



ValkElevated

Version: v1.0.0
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Disclaimer

This installation manual needs to be stored for future use. For project specific guidelines and recommendation it is required to use this document in conjunction with the "Project report" generated by the ValkPVplanner. The instructions provided in this Project Report must be strictly observed at all times.

The content of this installation manual has been carefully compiled. Van der Valk Solar Systems does not accept any liability for the correct use of this document. Van der Valk Solar Systems hold the right to update the content of this document without further notice. Please check the website of Van der Valk Solar Systems (www.valksolarsystems.com) for the most recent version of this document.

For the warranty conditions of your installation, please contact your supplier. Further we refer to our General Terms and Conditions, that are available upon request.

General installation guidelines

General

- During installation of the solar mounting system, the instructions and safety precautions presented in this installation manual must be followed carefully. As also stated in the General terms and Conditions of sale and delivery of Van der Valk Solar Systems B.V., non-compliance with the installation guidelines in this document means that the customer can no longer invoke any warranty and Van der Valk is no longer liable for any form of damage.
- The information, comments and advice in this document are binding. Van der Valk Solar Systems reserves the right to update this document without further notice.

Safety

- The installation of the mounting system must be carried out by qualified technical personnel.
- Omitting parts may negatively affect performance and is therefore not allowed.
- Avoid carrying out installation work during bad weather conditions, especially in case of strong winds and a wet (slippery) roof surface.
- During installation work on the roof, always use fall protection and, if necessary, work with safety nets and roof edge protection.
- Always wear appropriate protective clothing and gloves when carrying out the installation work.
- Follow the guidelines in the publication "Health & safety in roof work".

Environmental factors

- High neighbouring buildings or objects, such as windmills, can affect the wind pressure. In these cases, advice should always be obtained from Van der Valk Solar Systems before installation can take place.
- If during the installation it is determined that the project data and/or environmental factors do not fully correspond to the project report, the project must always be re-calculated first.
- In coastal areas, the system should be placed at least 500 meters from open water to prevent accelerated corrosion by the action of salt water. When buildings are present between the open water and the roof, a minimum distance of 250 meters from open water may be maintained.

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Standards and regulations

- For correct and safe installation and use of the solar mounting system, always observe the applicable standards and regulations:
 - EN 1990: Basis of structural design
 - EN 1991-1-3: General actions: snow loads
 - EN 1991-1-4: General actions: wind loads
 - IEC 60364: Electrical Installations for Buildings
 - IEC 62305: Protection against lightnings
 - EN 50110: Operation of electrical installations
 - Working Conditions Act and Safe Working Conditions Regulation

Stability and condition of the roof and roof covering

- The roof pitch should be less than 5 degrees for flat roof systems and between 5 degrees to 75 degrees for pitched roof systems.
- The condition of the roof must be checked upfront for sufficient strength to bear the weight of the mounting system including PV panels ballast and wind and snow loads. Make sure that the load reserve of the roof is not exceeded anywhere.
- Check the stability of the roof and adjust the roof/construction where necessary.
- Check prior to installation whether the roof covering and/or insulation is suitable for the pressure and thermal expansion of the solar mounting system. The maximum pressure is shown in the project report of the ValkPVplanner or can be requested at Van der Valk Solar Systems.
- Bulging of the roof membrane should be prevented. This can lift the solar mounting system and can cause displacement of the mounting system or ballast. It is the installer's responsibility to prevent the roof membrane from bulging.
- Factors such as overhead cranes, seismic activity and others that affect the stability of the roof and/or building can affect the installed solar mounting system. Van der Valk Solar Systems does not take these factors into account, unless confirmed in writing.
- The roof surface on which the solar mounting system is to be installed must be clean, dry and flat.
- The roof height may not exceed 25 meters in case the project has been calculated in the ValkPVplanner must be corresponding to the roof height in the project report. For installations on roofs higher than 25 meters, Van der Valk Solar Systems should always be contacted in advance.

Roof zones

- When installing the solar mounting system, always take the applicable roof zones according to EN1991-1-4 into account. Placing solar panels in the edge zone of the roof (the distance measured from the roof edge, which is equal to 1/5 of the building height) is only possible if this has been explicitly taken into account in the calculation.
- It is possible to position panels in the edge zone of the roof in the ValkPVplanner (calculation software), on the basis of which the required additional ballast or fixation points are automatically calculated. This can only be done using "Satellite" or "White Map" design mode. The edge zone is automatically calculated by the ValkPVplanner, based on the roof height and building circumference, in accordance with the applicable regulations. In case the design mode "Simple mode" is used, the calculation always assumes that the solar panels are in the middle zone of the roof only.
- In case solar panels on the ValkPro+ system are fully or partially placed in the edge zone of the roof, it is mandatory to use side plates.
- ValkKITS (ValkBox3, ValkDouble, ValkTriple, ValkQuattro) can only be placed in the middle zone of the roof. Placing these systems in the edge zone of the roof is not allowed.

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Ballast

- After installation of the solar mounting system, it must be carefully checked whether the ballast has been placed in accordance with the ballast drawing. Ballast tiles must be neatly stacked, so that they are sufficiently supported by the tile carriers, mass carriers and/or ballast wings.

Dilatations

- The maximum allowed dimensions of a coupled mounting system is a 30 meters in the aluminium direction and 60 meters in the steel direction. The maximum dimensions are based on the thermal expansion in case of a maximum temperature difference (Delta T) of 70 degrees Celsius.
- The coupled mounting system must not be placed over a gutter or ridge. In the mounting system is place over a gutter or ridge, the system must be split (dilatation).
- When using the extra wide panel support feet for ValkPro+ with ballast, different dilatation rules apply: in such installations the coupled system may be a maximum of 30 meters in the steel/roof carrier direction and 15 meters in the aluminium direction.

Solar panels

- It is the responsibility of the installer to determine in advance whether the selected solar panel is suitable for the mounting system in terms of dimensions and pressure loads. The calculated loads on the solar panel are shown in the project report of the ValkPVplanner or are available on request at Van der Valk Solar Systems.

Cable management

- In order to create a sound and durable electrical connection between the solar panels, it must be ensured that the cables from the junction box have sufficient length and thus do not cause any mechanical stress on the cable glands. Take into account thermal expansion and contraction of cables and the mounting system.
- Cables and connectors must be kept away from sharp and/or abrasive parts and the roof surface by using sufficient and appropriate cable clamps and cable baskets.

Disassembly and Removal

- Components of the solar mounting system can be easily and completely disassembled at the end of their service life and separated for recycling. The systems only contain nut and bolt, screw and click connections, so nothing is glued or welded. All materials are fully recyclable. Disposal of the components always in accordance with the locally applicable laws and regulations.

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Specific installation guidelines ValkElevated

In order to ensure a safe installation and use of the The ValkElevated system, the following specific installation guidelines must be respected:

- ValkElevated can only be placed on roofs with an inclination between 0° and 30°.
- Side plates are mandatory.
- Back plates are mandatory in case of a “South” system.

Suitable panel dimensions:

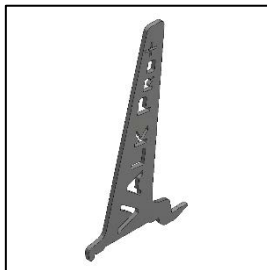
- Length 1520 - 2320 mm
- Width 977 - 1200 mm
- Frame height 28 - 50 mm

These specific installation guidelines are complementary to the “General installation guidelines” on page 1-3.

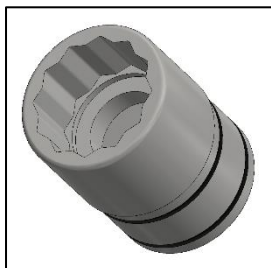
Required tools for installing ValkElevated



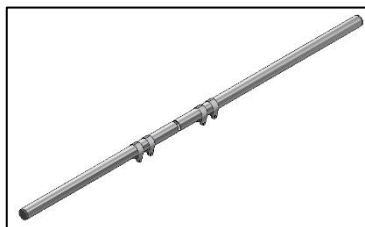
Cordless drill



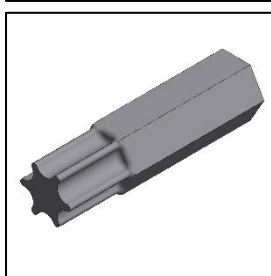
Disassembly key for feet
743000



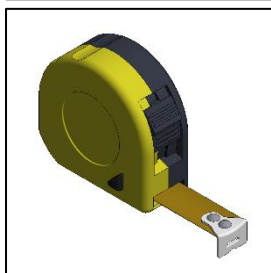
Socket 13 mm
Wrench 13 mm



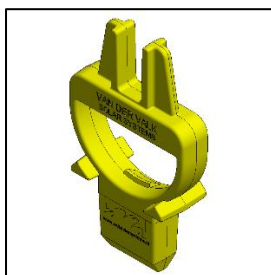
Adjustable alignment set for
roof carriers
743220



Torx bit T-30
(789530)



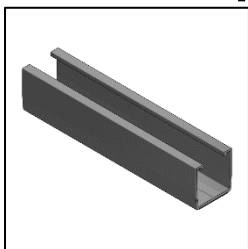
Measuring tape



Alignment key for roof carriers
739010

Basic materials for installing ValkElevated

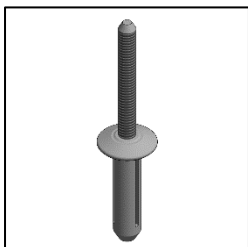
Materials for trapezoidal roofs:



Trapezoidal profile
7269 -----

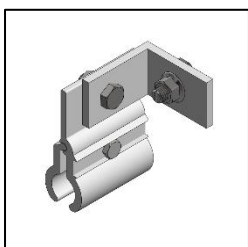


Thin sheet screw M6x25 mm
773225

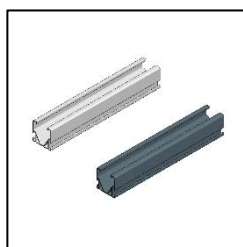


Rivet 6,3x23,4 mm
779223

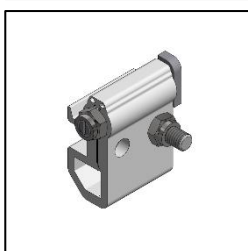
Materials for standing seam roofs:



Kalzip clamp (round seam)
727796



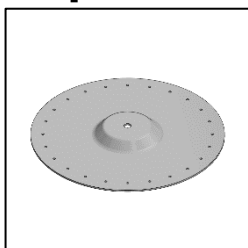
Side++ profile
7017 -----*
See table



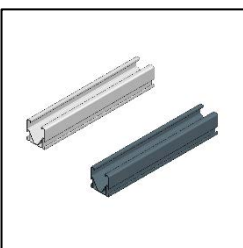
Standing seam clamp (straight seam)
727800

Profile length	Art. no.
1086 mm	701701086
2113 mm	701702113
3140 mm	701703140
4167 mm	701704167
5194 mm	701705194
6347 mm	701706347

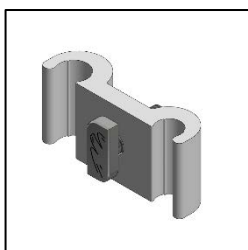
Components for ValkSolarFix:



ValkSolarfix console
747600



Side++ profile
7017 -----*
See table

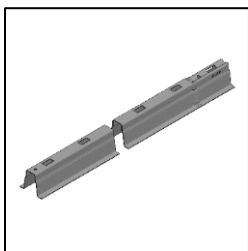


Hangerbolt clamp
721100

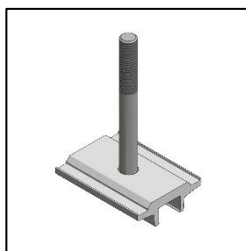
Profile length	Art. no.
1086 mm	701701086
2113 mm	701702113
3140 mm	701703140
4167 mm	701704167
5194 mm	701705194
6347 mm	701706347

For the preferred fixation of the ValkSolarfix check the ValkSolarfix manual

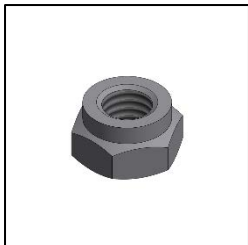
Materials for ValkPro+ system



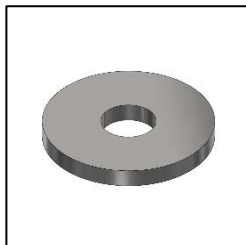
Roof carrier profile
7418 -----



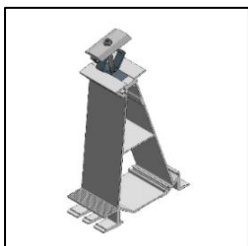
Counter plate elevated system
724075



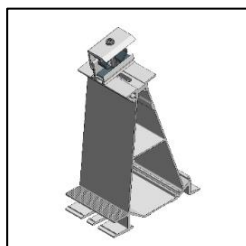
Lock nut M8
774005



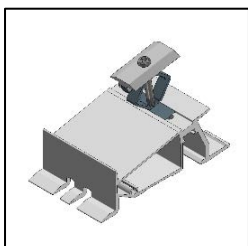
Washer M8
774009



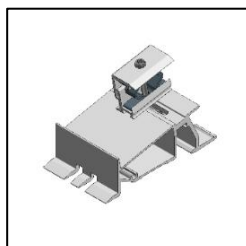
Back foot middle
724650



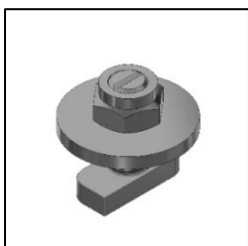
Back foot side
724651



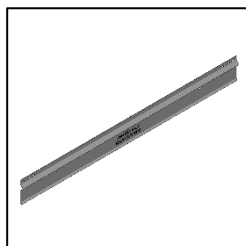
Front foot middle
724660



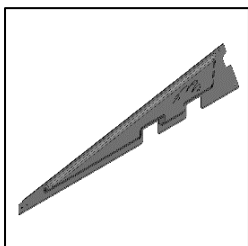
Front foot side
724661



Coupling set
774221



Back plate (for south systems)
742510 - [for panel length 1520-1720mm]
742512 - [for panel length 1720-1920mm]
742515 - [for panel length 1920-2120mm]
742516 - [for panel length 2120-2320mm]



Side plate (can be used for left
and right side of the system)
742540

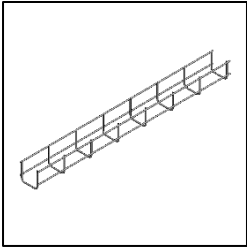


Thread forming bolt M6x10 mm for
fixation of side and back plates
773310

For the 'optional' materials, see next page.

Optional materials:

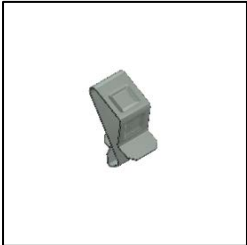
The optional materials can be used to optimize the system to specific situations and wishes.



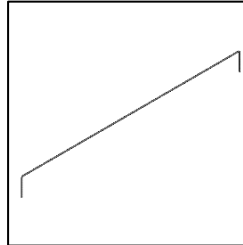
Cable basket 50 x 60 mm,
length 3000 mm
(76010050603000)



Cable clamp for feet
732011



Cable clamp
732001 (small)
732005 (big)



Dilatation wire
732020



Multi-cable and connector clip
for roof carrier
732012

Aligning aluminium baseprofiles

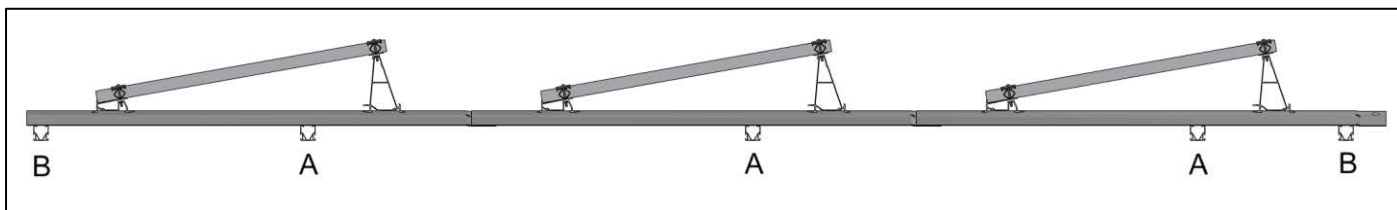
The aluminium base profiles can be mounted in three different methods.

- Fixation on trapezoidal roofs
- Fixation on standing seam roofs
- Fixation on ValkSolarFix

The aluminium base profiles are the support for the ValkPro+ frame. It is therefore important that the base profiles are correctly positioned. The aluminium base profiles are to be positioned where the foundation points of the ValkPro+ system are normally located.

South system:

For a “South” orientated system, one aluminum base profile for every PV-panel is required. The outer rows of the system are to be fitted with one extra profile.

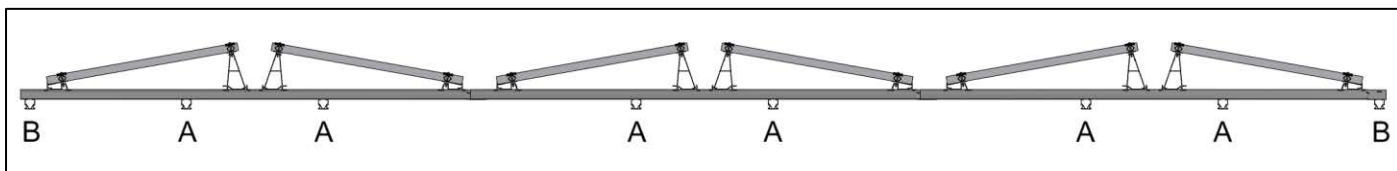


A: Standard position base profile

B: Position for extra profiles outer rows

East-west systems:

For an “East-West” orientated system, two aluminium base profiles are required per peak. The outer rows of the system are to be fitted with one extra profile.



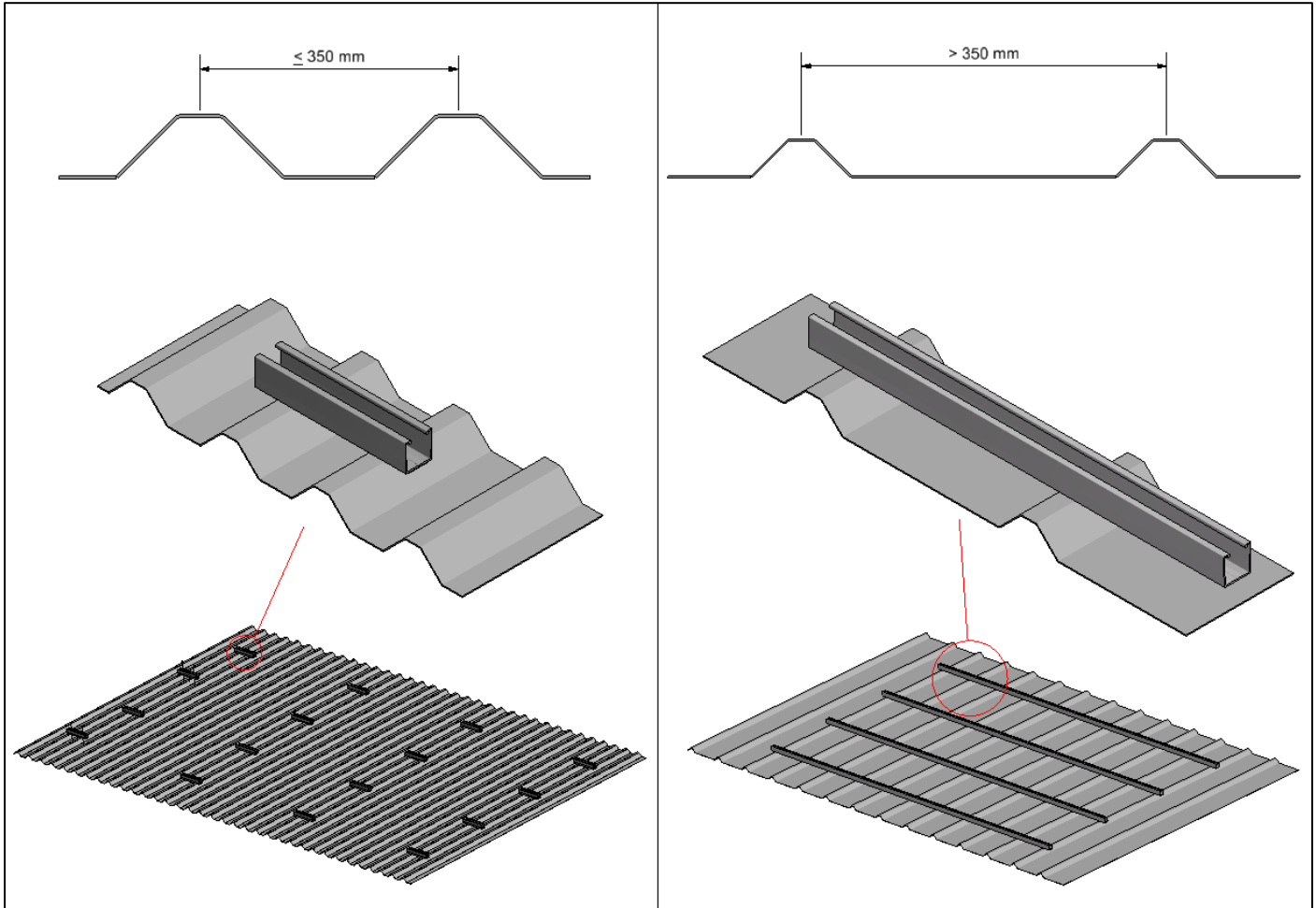
A: Standard position base profile

B: Position for extra profiles outer rows

Mounting of base profiles on a trapezoidal roof

The ValkElevated system can be mounted on a trapezoidal roof by fixing a frame of base profiles for trapezoidal roofs (7269xxxx).

For roofs with a CTC distance between the crowns smaller than 350mm, short trapezoidal profiles can be used (in case the calculated loads allow this). For roofs with a CTC distance of 350mm or more, long aluminium trapezoidal profiles are required.



The trapezoidal profiles can be fixed to the roof by using thin sheet screws (773225) or rivets (779223). Please note: a minimum width of 25 mm for the crown is required in case rivets are used.

Thin sheet screws:

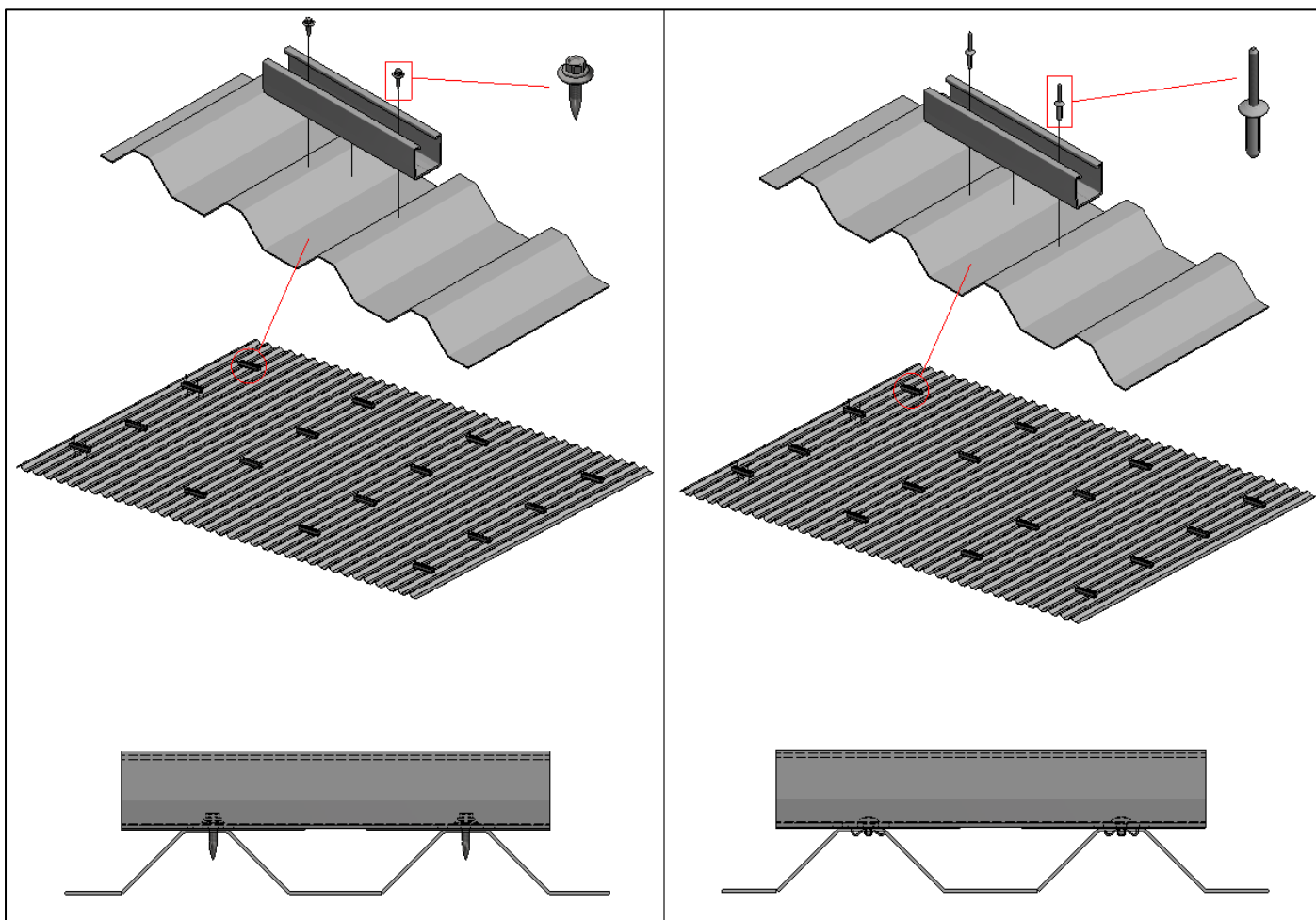
The thin sheets screws can be fixed to the roof without pre-drilling. It is important to not use too much torque. The recommended torque for the thin sheets screw is shown below:

Steel plate	> 0,8 mm	= 3 Nm
Steel plate	< 0,8 mm	= 1 Nm
Aluminium plate	> 0,8 mm	= 1 Nm
Aluminium plate	< 0,8 mm	= 0,5 Nm

Rivets:

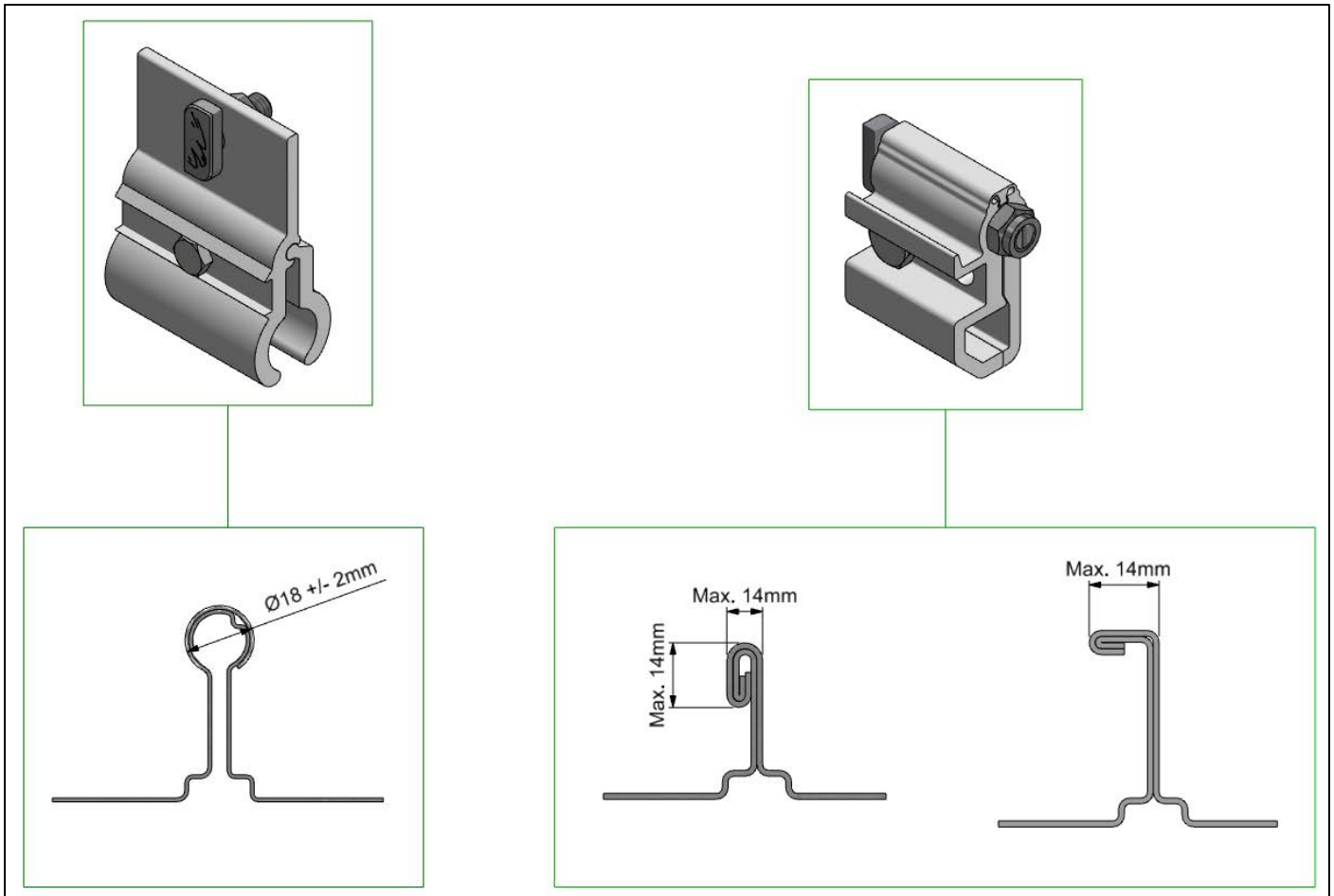
When using rivets it is required to pre-drill holes of 6,5 mm in the crowns of the roof. In case the aluminium profile does not have a punched hole in the correct position, also here a hole needs to be drilled manually.

When the pre-drilled holes are made, the profile can be fixed to the roof with rivets.

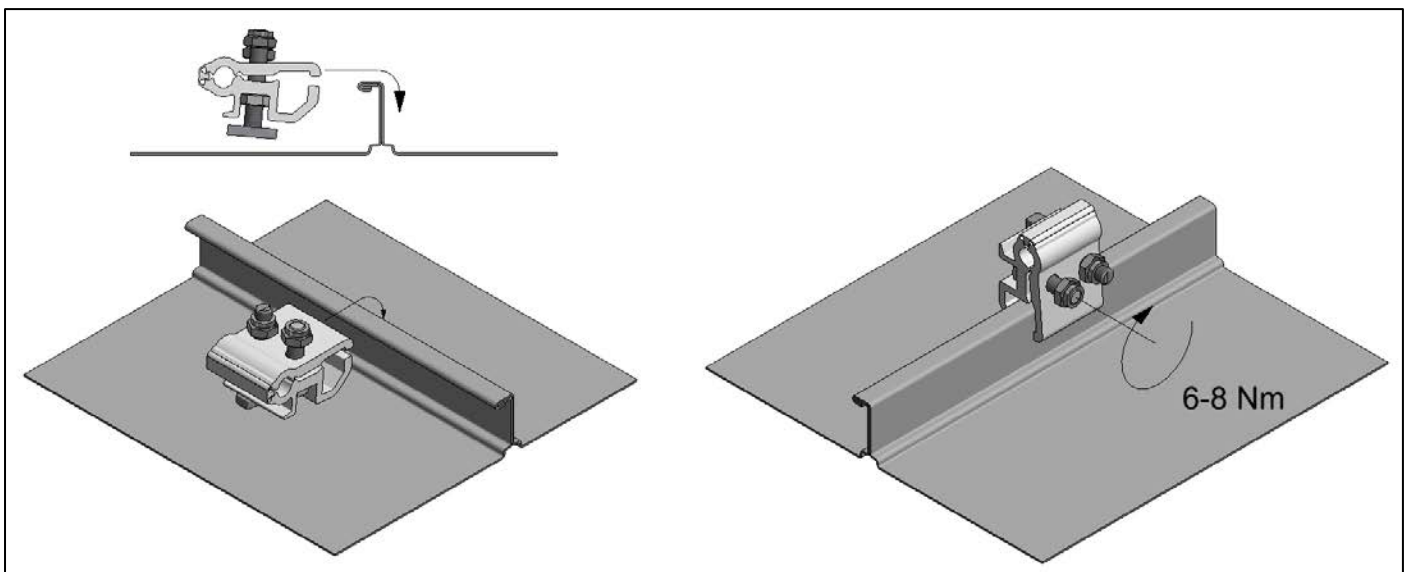
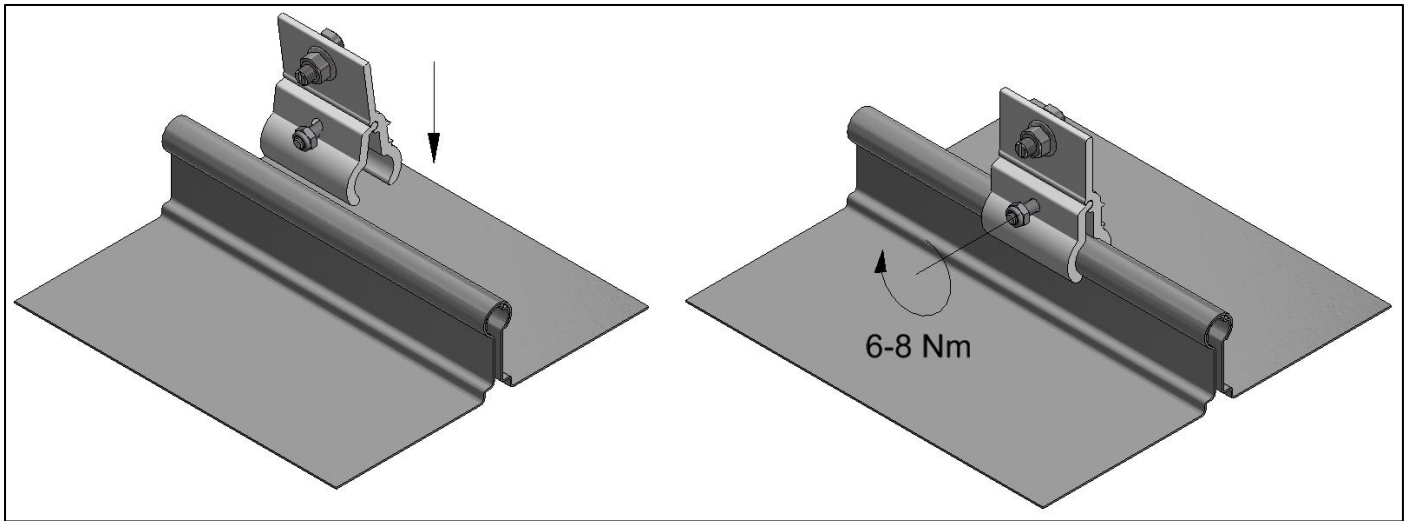


Mounting of base profiles on a standing seam roof

The ValkElevated system can be mounted on a standing seam roof by making a base frame of aluminium Side++ profiles (7017xxxxx). The base profiles can be fixed to the roof using standing seam clamps. Basically there are two types of clamps: for round seams and for straight seams (see images below). In case the size or shape of the seam does not correspond with the images below, please contact Van der Valk Solar Systems for specific advice. Placing the standing seam clamps on a copper roof is not allowed.

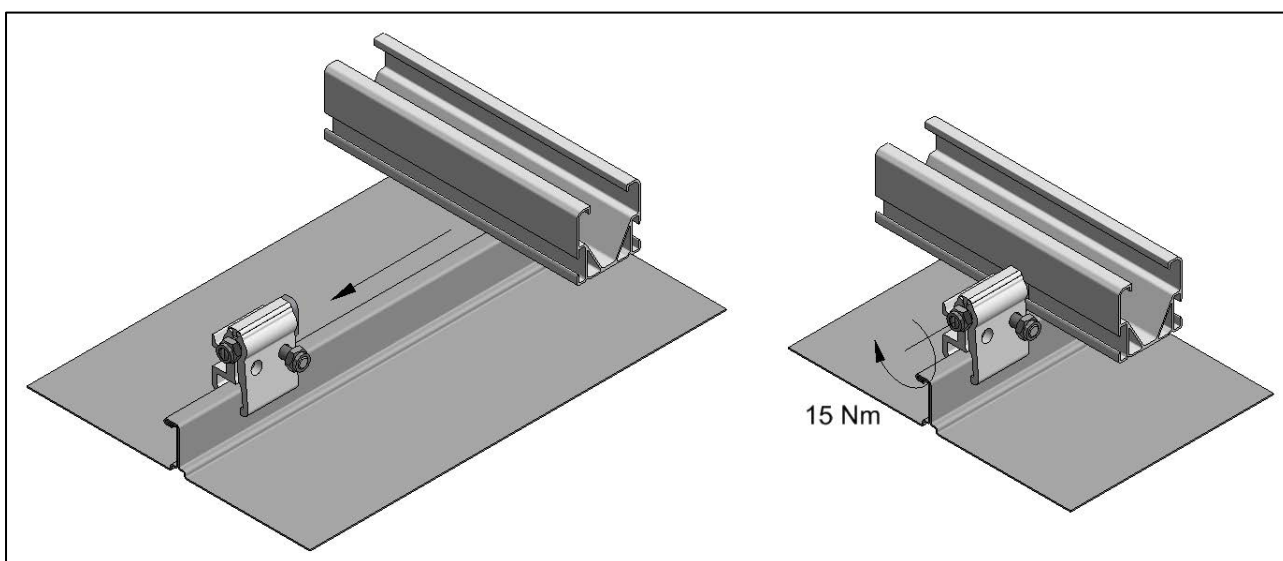
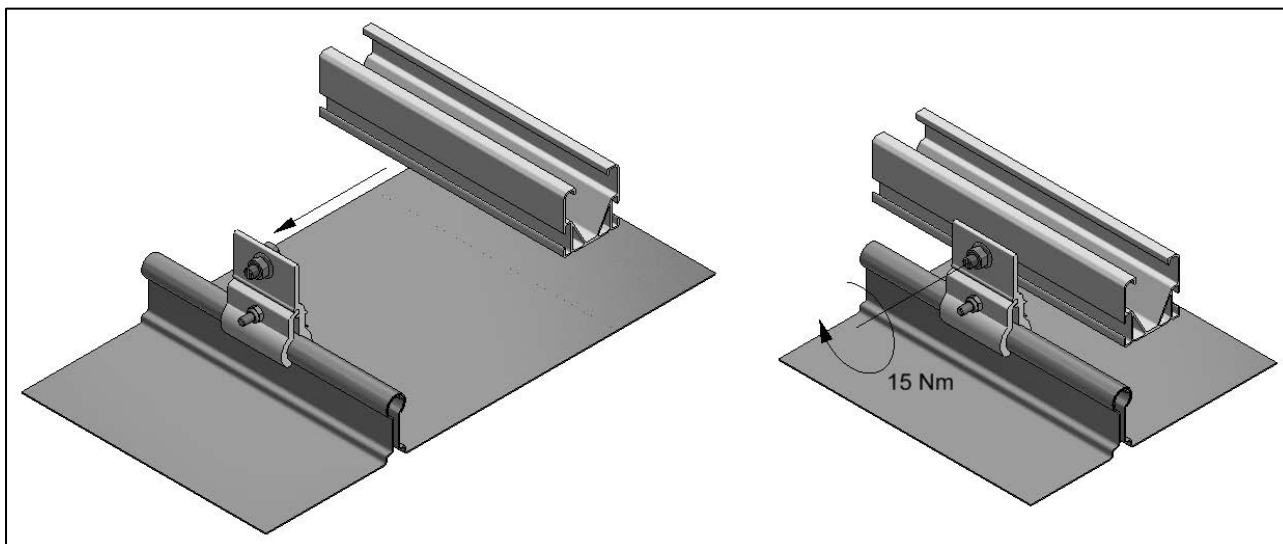


The standing seam clamp is fixed to the seam by tightening the locking nut.

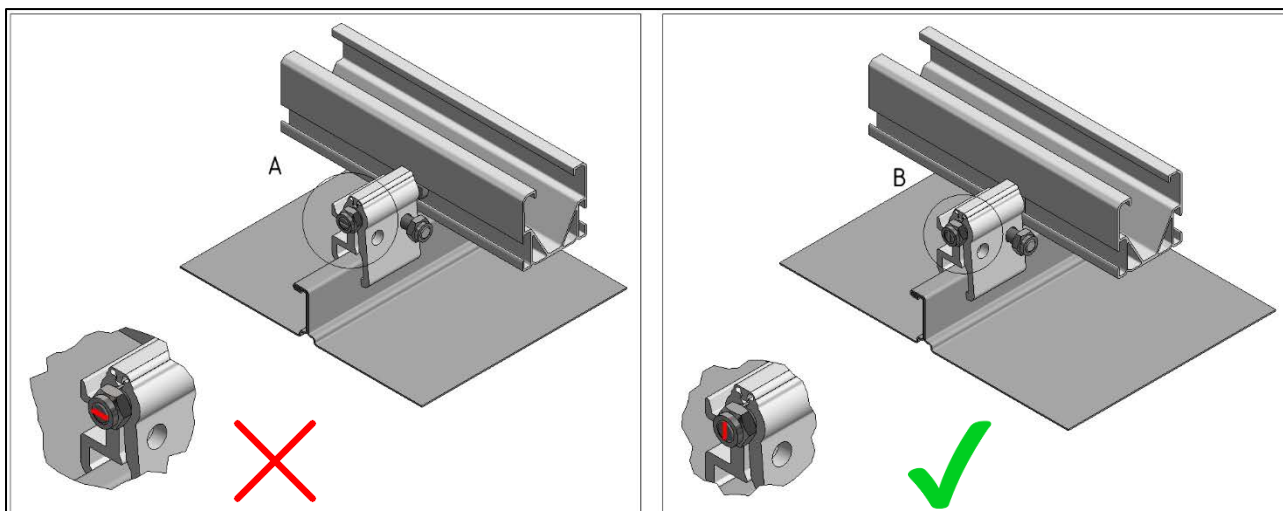


The correct pitch between the standing seam clamps is calculated in the ValkPVplanner and is shown in the project report of the ValkPVplanner or the customized calculation made by Van der Valk Solar Systems.

When all standing seam clamps are fastened, the Side++ profiles can be fixed to the clamps.



When fixing the Side++ profiles to the clamps, it is important that the hammerhead bolt has the correct orientation. The correct orientation of the bolt can be recognized by the marking on the underside of the hammerhead bolt (see image).

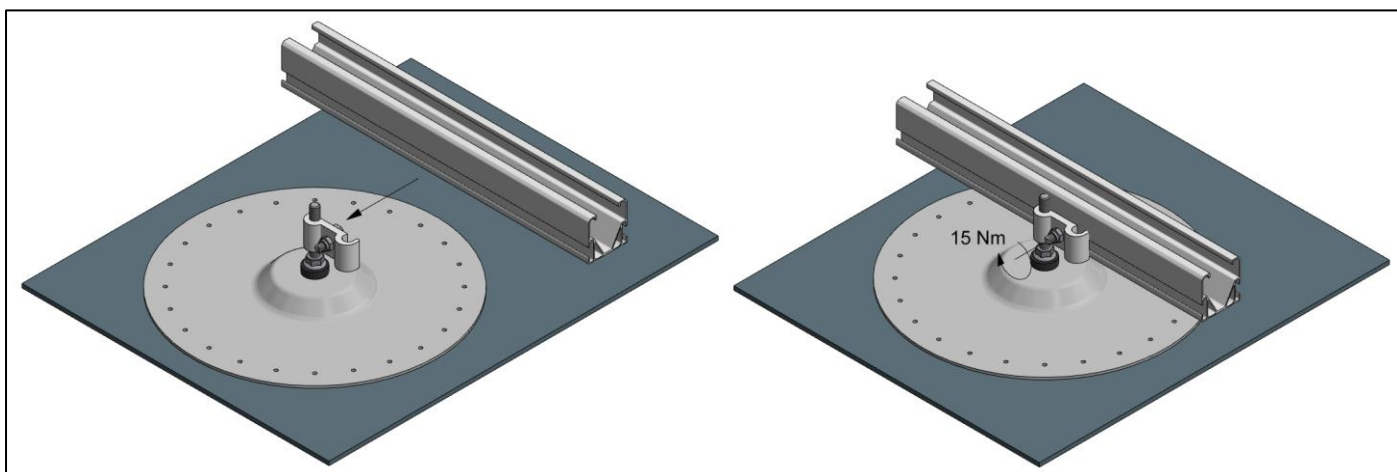


Mounting of base profiles on ValkSolarFix

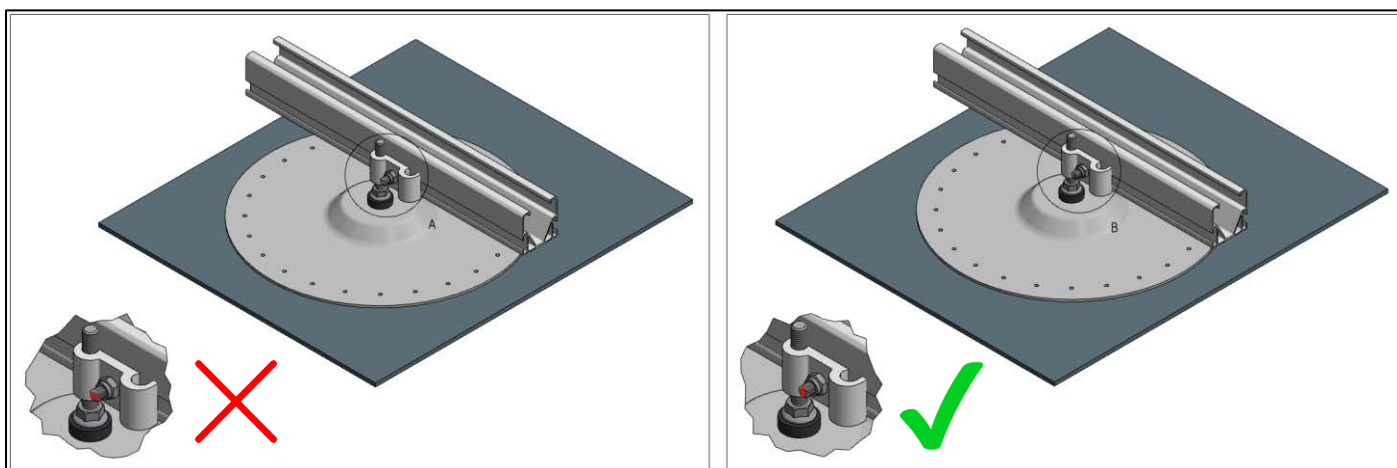
The ValkElevated system can be mounted on pitched roofs that are covered with a roof membrane by using a frame of Side++ base profiles (7017xxxxx), fixed to ValkSolarFix consoles (747600). The consoles are to be mounted fixed to the roof, using one of the following options:

- Toggle anchors (747620 / 747621)
- Concrete anchors (747610 / 747611)
- Roof screws for fixation in wood (74763x + 747604)
- Roof screws for fixation in steel (74764x + 747604)
- Roof screws for fixation in aerated concrete (74765x + 747604)

For the detailed mounting of a specific ValkSolarFix anchor, please refer to the manuals that can be downloaded from our website: <http://www.valksolarsystems.com/>



The Side++ profiles can be fixed to the threaded rod of the ValkSolarFix using a hanger bolt clamp (721100). When fixing the Side++ profiles to the clamps, it is important that the hammerhead bolt has the correct orientation. The correct orientation of the bolt can be recognized by the marking on the underside of the hammerhead bolt (see image).



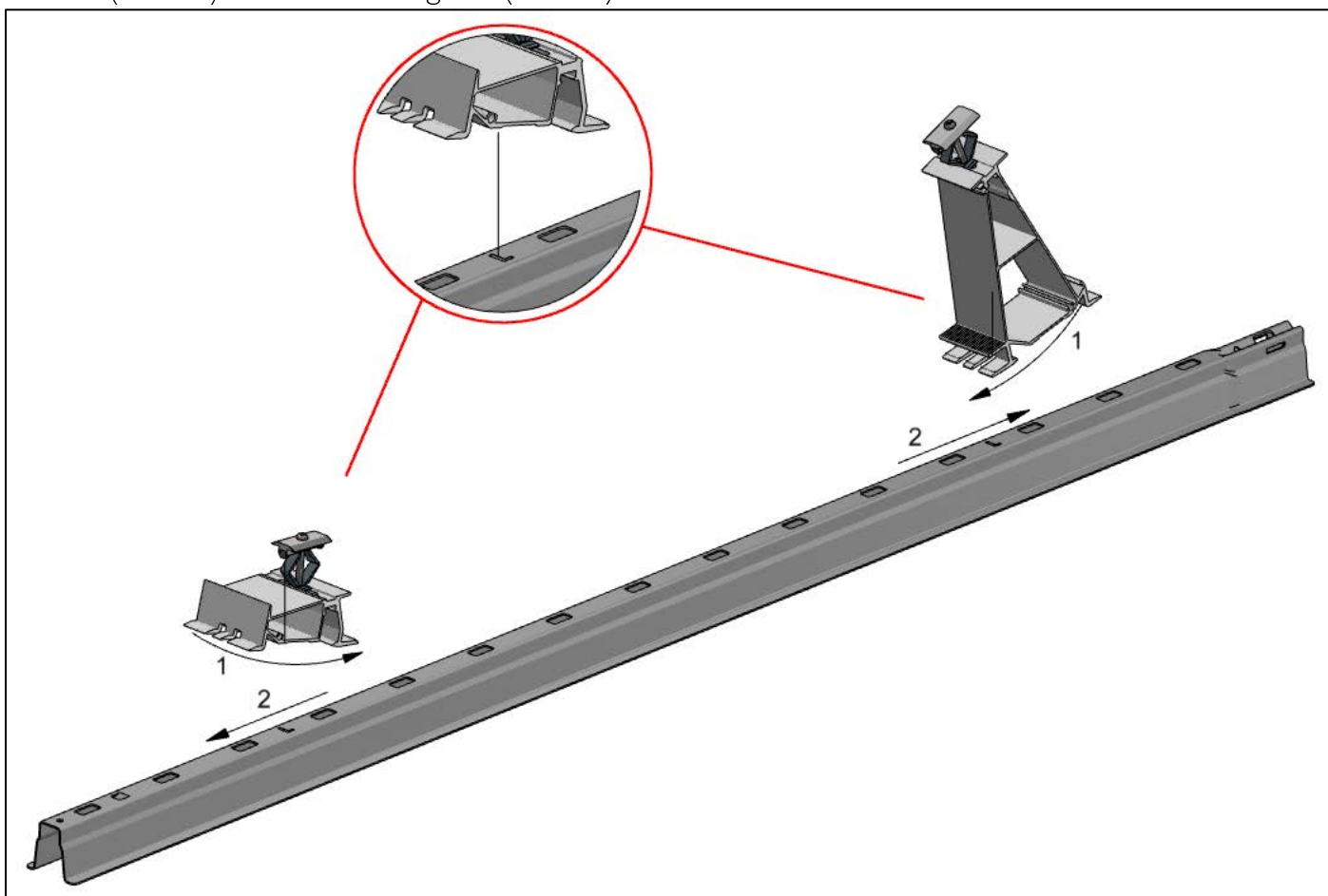
Installation of the ValkPro+ system

The installation of the ValkPro+ system on the aluminium base profiles is the same for each roof type. Hence for the drawings and images in the remaining part of this manual, the standing seam roof is used as an example, but are also applicable for the other roof types.

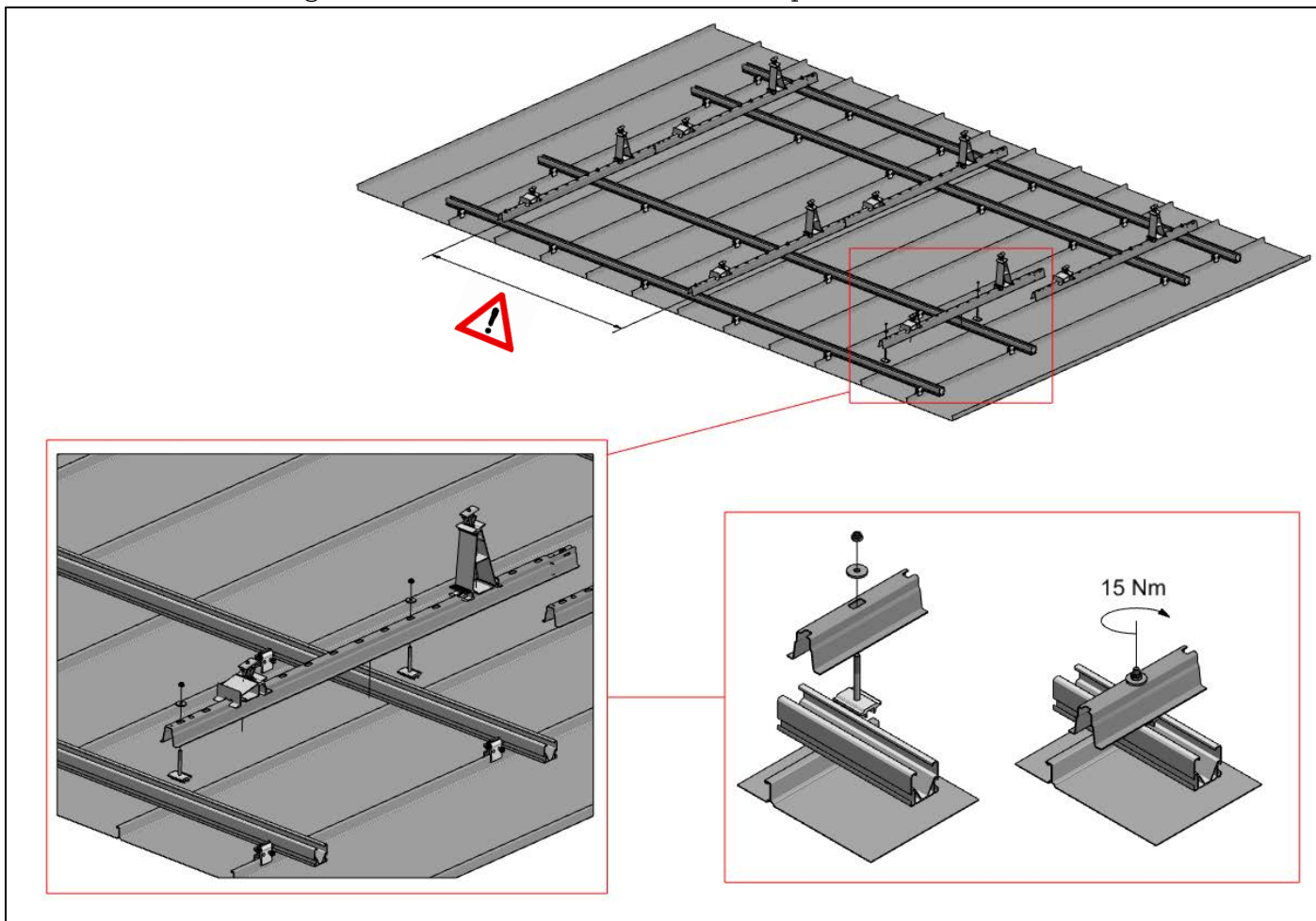
Pre-assembly of roof carriers sets

Best practice for fast and convenient installation of ValkPro+ is clicking the aluminium feet (7246xx) on the roof carriers (74180xxxx) prior to placing the roof carriers on the roof. This method saves time. The aluminium feet are to be placed in the position where the letter “L” is marked on top of the roof carrier.

The roof carriers can be fastened to the aluminium base profiles using a contra plate (724075), washer (774009) and self-locking nut (774005).



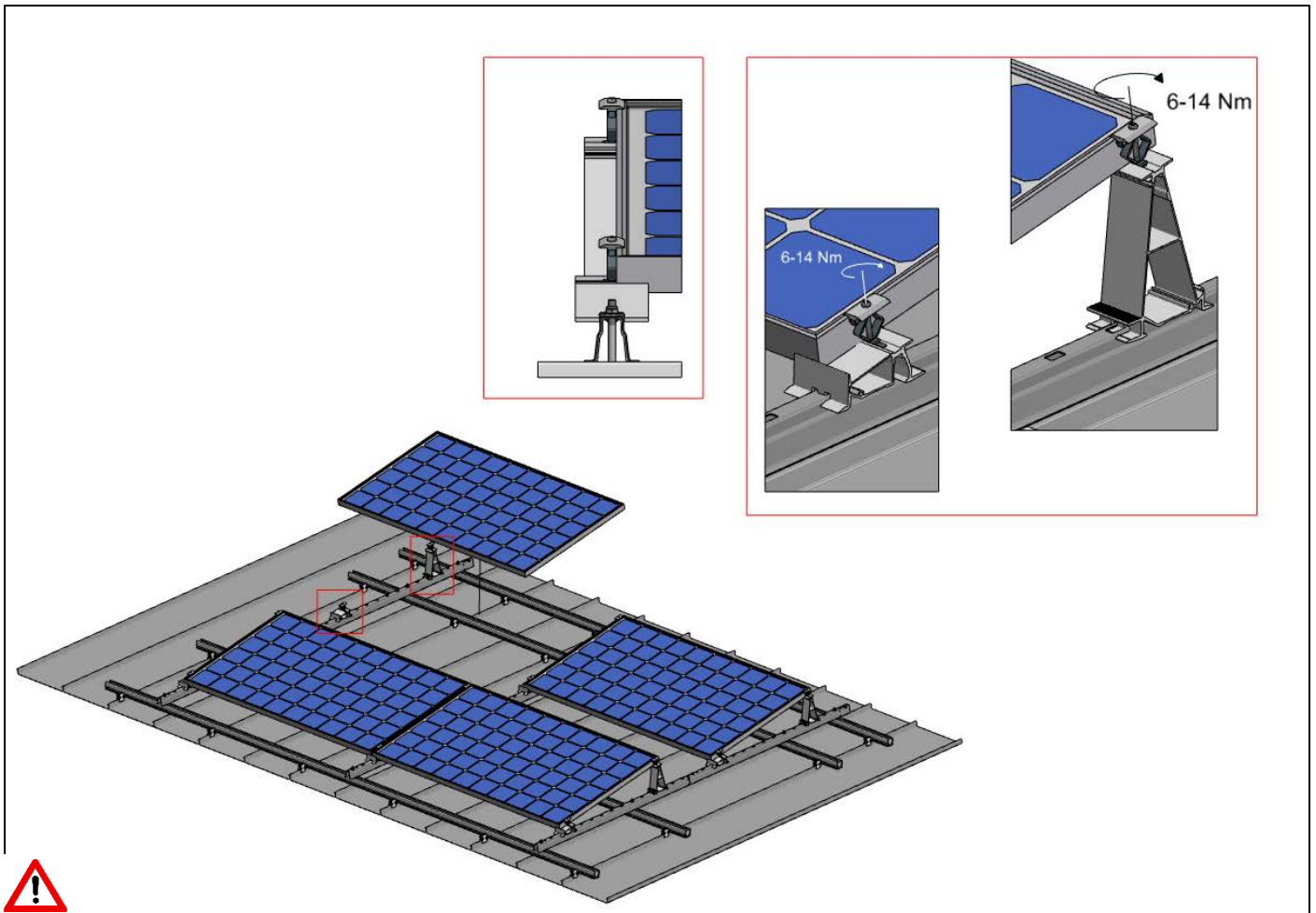
The roof carriers are to be fastened to the aluminium base profiles in the positions where, in a normal ballasted configuration, the rubber tile carriers are placed.



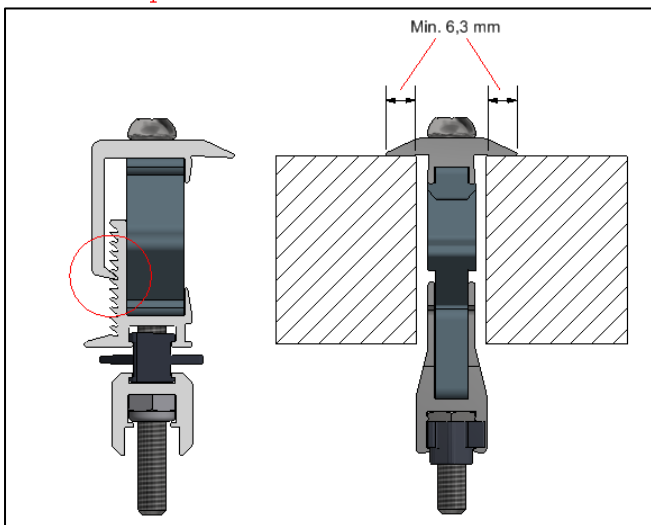
 The pitch between the rows of steel roof carriers determined by the length of the solar panel. The correct pitch can be calculated using this rule: Panel length + 10mm

PV-panelen plaatsen

Position the solar panels under the clamps and make sure ALL the panel clamps are securely fastened.



Make sure the end clamps are placed in the correct height slot corresponding with the panel frame thickness, before they are fastened. All clamps must have an overlap of at least 6,3 mm with each panel frame, in order to ensure full clamping force.

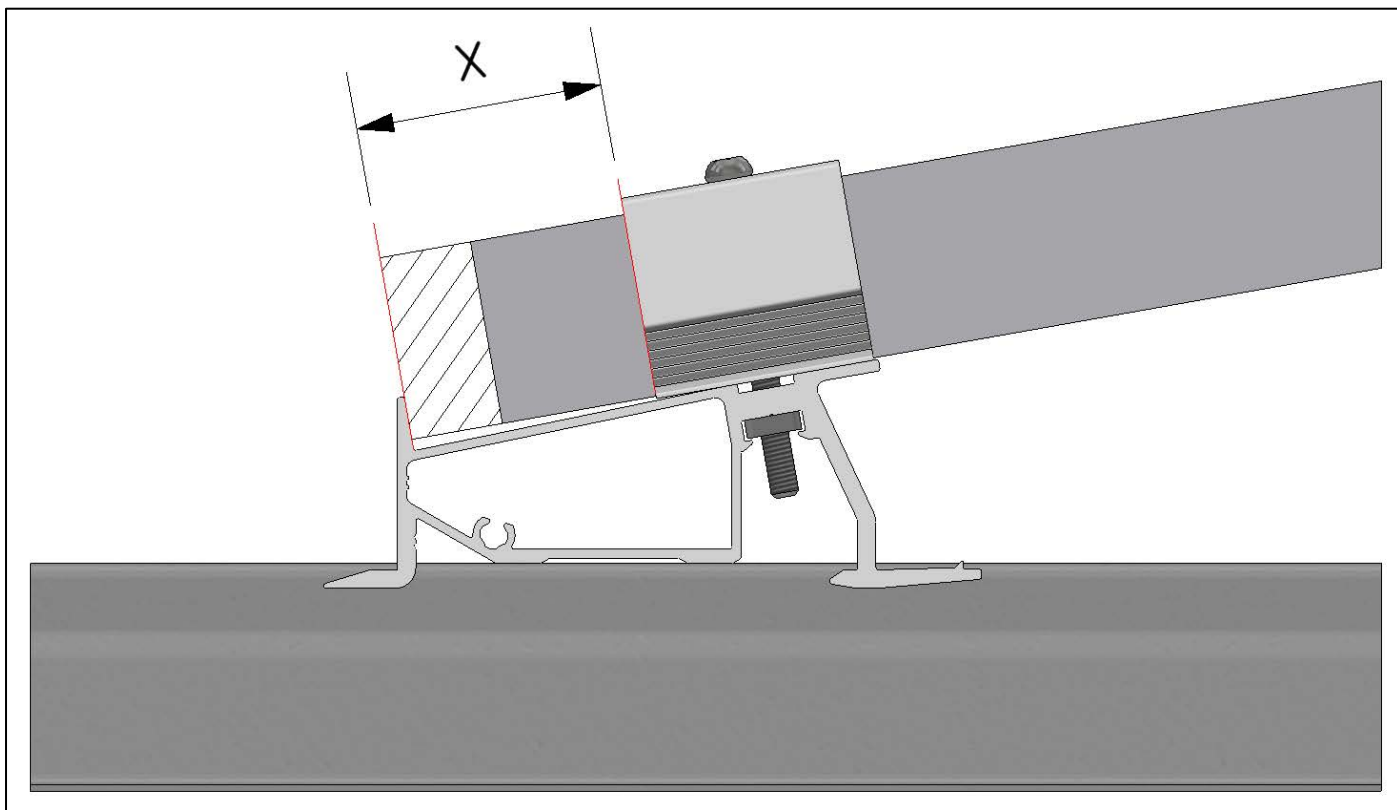


VAN DER VALK



Van der Valk Solar Systems BV
Installation manual – ValkElevated v1.0.0

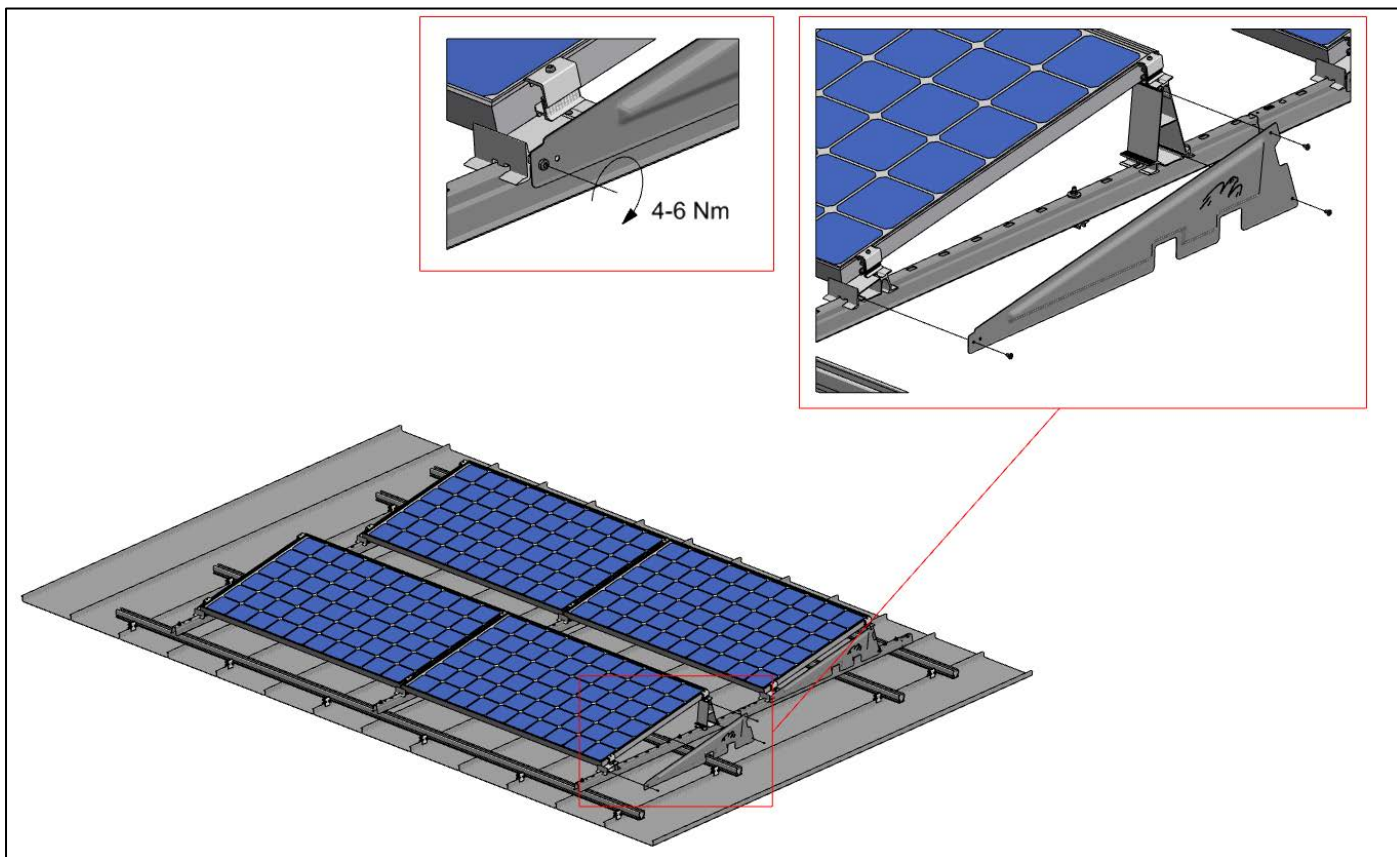
The front foot is designed with an upstanding edge, which makes it easy to align the solar panels, when the frames are placed against this edge. This is not mandatory however. In case it is not possible to place the panels against the edge, it is ok as long as the side of the frame is still positioned in range X. The ValkPro+ system will then still apply enough clamping force on the panels.



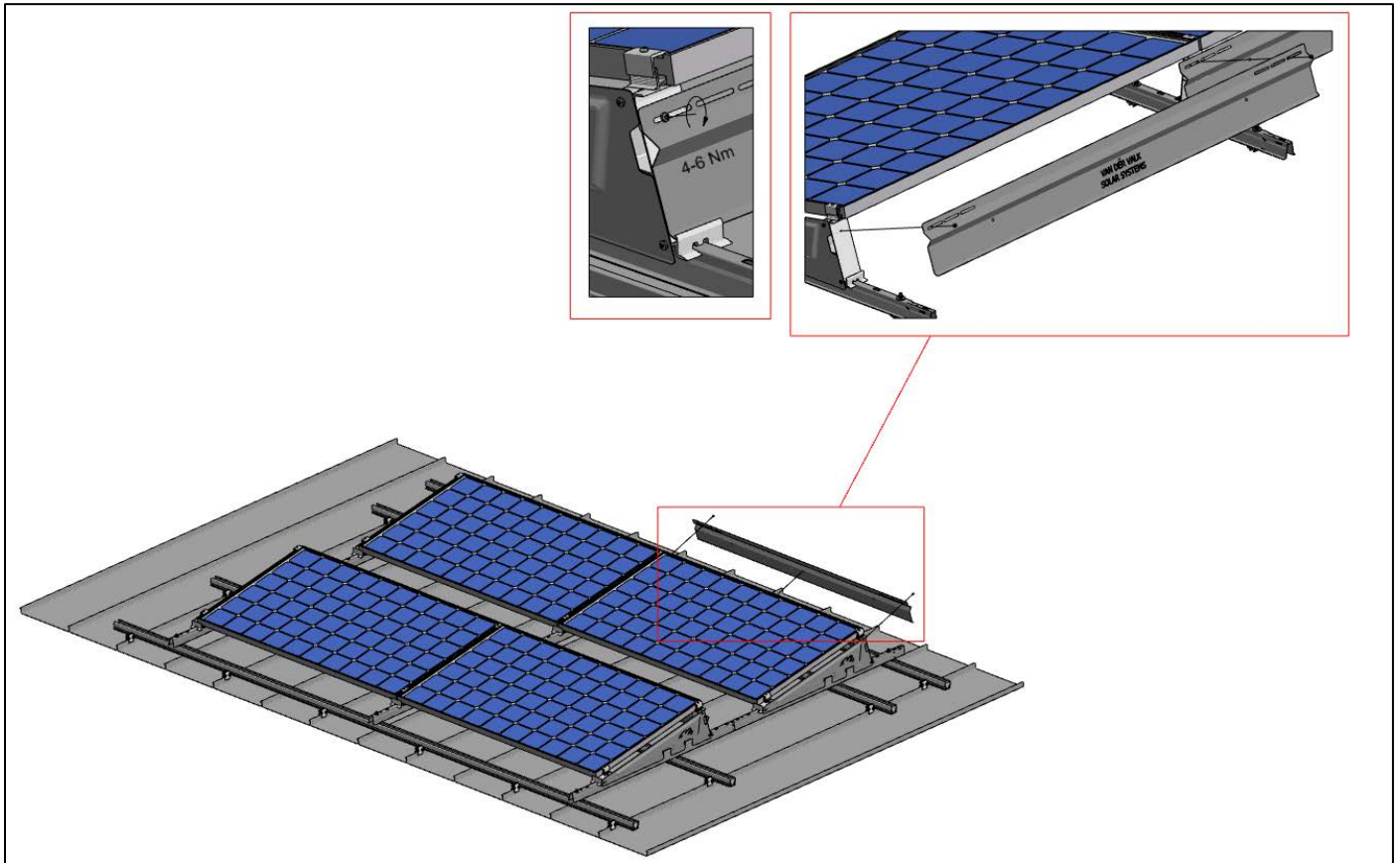
Mounting side plates / back plates

The ValkElevated system always requires side plates to be installed for each configuration. In case of a “South” system, back plates are also mandatory for each solar panel.

The side plate is fixed to the aluminium feet using three thread forming bolts M6 x 10 mm (773310).

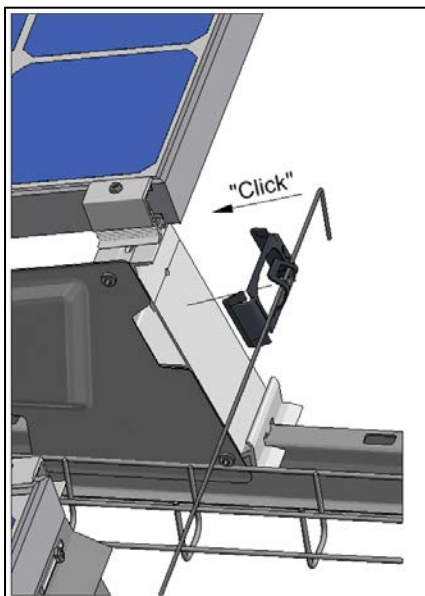


The back plate is placed in the back feet and fastened with the thread forming bolts M6 x 10 mm (773310) in the top. The overlapping back plates can be fastened with a single thread forming bolt.



Cable management

The ValkPro+ system offers various options to handle the electrical cables and connectors in a safe and neat way. The first option is to use plastic cable clamps (Art. 732011) that are mounted on the aluminium back feet. The cable clamps are simply “clicked” on the aluminium feet and the cable can be placed (see image 7.1)



The cable clamp provides space for:
5 cables - Ø6mm
4 cables - Ø7mm
3 cables - Ø9mm

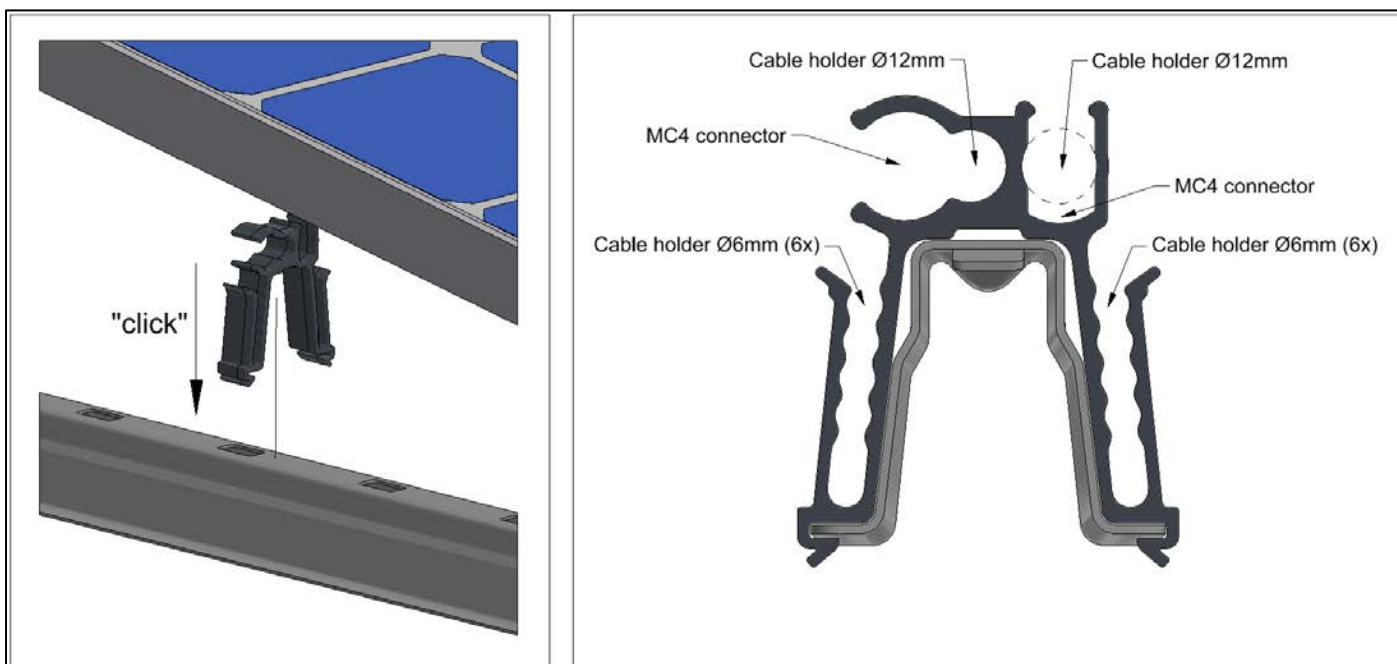
Multi-cable and connector clip (Art. 732012)

This clip can be placed over the roof carrier in any desired location. It has multiple options to hold various MC4 connectors and cables:

2 x MC4 connector holder

2 x Cable holder Ø12 mm (DC/AC)

12 x Cable holder Ø6 mm



Van der Valk Solar Systems

Van der Valk Solar Systems is since 2009 one of the fastest growing companies in the solar industry and focuses entirely on the development and production of solar mounting systems for pitched roofs, flat roofs and open fields. Van der Valk Solar Systems also has an office and warehouse in the UK, offices in Sweden and Spain and is currently active in 13 countries.

Our mounting systems are developed and produced in our own factory in the Netherlands and stand out thanks to their broad area of application, the very short time in which they can be installed, and the high quality. They are developed according to the latest Eurocodes and therefore comply with the requirements defined for solar systems by banks and insurance companies.

Van der Valk Solar Systems is part of family-owned company Van der Valk Systemen, which has been a household name in the field of moving systems and mounting components since 1963.

Our shared industrial complex consists of 20,000m² of offices and factory spaces. Here we use modern machinery and the latest technologies to quickly and accurately develop, manufacture, and test products and systems.



Solar mounting systems & cable management



Flat roofs



Pitched roofs



Cable management

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