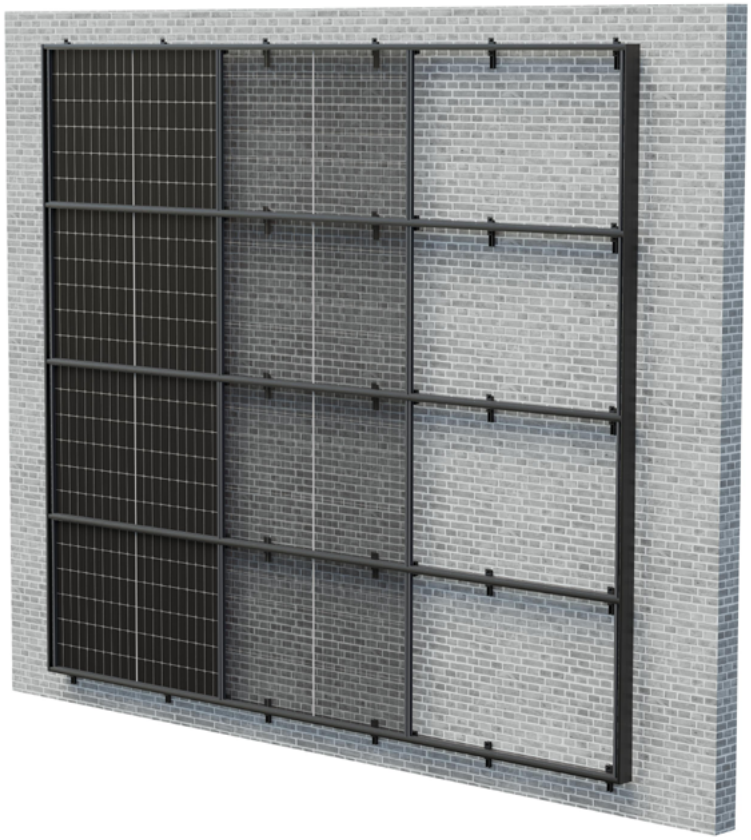
Assembly Instructions

S:FLEX Insert System ELS

PV mounting system for facades and pitched roofs



Read these installation instructions carefully before installing the S:FLEX mounting system and retain them for future reference! These installation instructions are only complete with the project-specific implementation plans (project report)!

1.1 Intended use

The PV mounting system S:FLEX insertion system ELS for facades and pitched roofs is a frame system for mounting PV modules with frame thicknesses of 25-45 mm in floating mounting. It is designed exclusively for mounting framed PV modules. With the ELS insertion system, PV systems can be installed on pitched roofs and facades. The system is designed for upright and transverse mounting of the modules. The variable components enable the use of almost all commercially available framed modules. The ELS insertion system is suitable for simple installation on the following pitched roof types: tiled roof, trapezoidal sheet metal roof, sheet metal seam as well as on the following facade types: uninsulated masonry, uninsulated concrete walls, sandwich facades, thermal insulation composite systems and as part of a rear-ventilated facade.

Any use that deviates from this, must be considered improper. In particular, compliance with the information in these installation instructions is part of the intended use. S:FLEX GmbH is not liable for damage resulting from non-compliance with the installation instructions or from misuse or improper use of the product.

1.2 About this document

These installation instructions describe the installation of the ELS insertion system on facades with an angle of inclination of 90° and on pitched roofs with a maximum angle of inclination of 75°. It must be ensured that only the current and complete installation instructions are used for installation.

1.3 Warnings

The warnings provided in these installation guidelines relay safety-related information.
They consist of:

Unless observed, there is a major risk of injury as well as a risk of death.

Failure to observe this may lead to property damage.

1.4 General information – standards and guidelines

Each photovoltaic system must be installed in accordance with the specifications in these installation instructions and the project report. These installation instructions are based on the state of the art and many years of experience of how our systems can be installed on site. It must be ensured that only up-to-date and complete installation instructions are used for installation and that a printout of the installation instructions is kept in the immediate vicinity of the system. S:FLEX GmbH reserves the right to make technical changes.

The project report is part of the installation instructions and is created on a project-specific basis. All information in the project report must be adhered to. In the project report, the structural calculations are carried out on a site-specific basis. The design and planning of the S:FLEX mounting systems must be carried out using the S:FLEX planning tool.

As individual project-related features must be taken into account for each roof and facade, expert clarification must always be carried out before installation. Before installation, the PV system installer must ensure that the roof covering, roof substructure and facade construction are designed for the additional loads that will occur. The installer must check the condition and maximum load-bearing capacity of the substructure and the quality of the roof covering.

Contact a specialist installer or structural engineer directly on site.

When installing the PV systems, always ensure that the module manufacturer‘s installation instructions are followed. In particular, it must be checked whether the module manufacturer‘s specifications regarding the module clamping specifications (number of clamping points, clamping surface and clamping area on the module) are adhered to. If this is not the case, the module manufacturer‘s declaration of consent must be obtained on site before installation or the frame must be adapted to the module manufacturer‘s specifications.

The requirements for lightning and surge protection of mounting systems for PV plants must be ensured in accordance with DIN and VDE regulations. The specifications of the responsible energy supply company must be complied with.

Care must be taken to ensure that the PV system to be installed does not impair the effect of the existing lightning protection system. Care must also be taken to ensure that the PV system is designed in such a way, that it can be included in the protection area of the building's lightning protection system. Separation distances between the PV system and the lightning protection system must be taken from the relevant regulations and complied with.

The applicable fire protection regulations must be observed during installation. Fire protection walls must not be built over, fire protection sections must be observed and appropriate spacing rules must be adhered to.

The manufacturer's instructions must be observed when making changes to the roof covering and the facade construction. During and after installation, the frame parts must not be walked on or used as a climbing aid. There is a risk of falling and the roof covering underneath could be damaged.

Before installation, the installer of the photovoltaic system must ensure that the installation is carried out strictly in accordance with national and site-specific building regulations, occupational safety and accident prevention regulations, standards and environmental protection regulations.

Every person who installs S:FLEX PV mounting systems is obliged to independently inform themselves about all rules and regulations for technically correct planning and installation and to comply with them during installation. This also includes obtaining the current status of the rules and regulations. The PV system may only be installed by appropriately trained specialists.

All system components must be checked for damage before installation. Damaged components must not be used!

The S:FLEX substructure and the PV system may only be installed by appropriately trained specialists. System components must not be used as stepladders; the modules must not be stepped on. There is a risk of falling and falling through when working on the roof. There is a risk of injury or death in the event of a fall. Suitable access and fall protection (e.g. scaffolding) and protection against falling parts must be provided.

Before installation, check the building statics and structure/condition of the roof substructure. The specifications in the installation instructions and the project report must be observed during installation. Failure to observe the specifications in the installation instructions and the project report may result in damage to the PV system and the building.

2 Description of the system

The S:FLEX insert system offers suitable solutions for different requirements

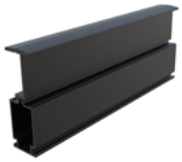
2.1 System properties

Usage:	Facades and pitched roofs with roof tiles/roof tiles, metal roofs
Connection:	Facade: on site Pitched roof: parallel to the roof, compatible with all S:FLEX connections for tiled and metal roofs
Module type:	Framed modules
Module size:	all standard sizes
Module alignment:	vertical/crosswise
Installation:	Cross connection
Building height:	up to 25 m, maximum building height for facade systems 20 m
Wind load:	up to 2,4 kN/m^2
Snow load:	up to 5,4 kN/m^2
Materials:	EN AW-6063 T6, Stainless steel
Color:	Natural, press finish, black anodized

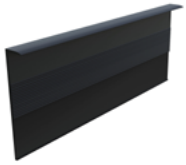
The module manufacturer's installation instructions must always be observed. All specifications of the roof and facade manufacturer for installation on the roof or facade cladding must be complied with.

2.2 Article overview

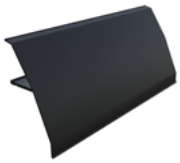
ELS insert rail black



ELS side panel black

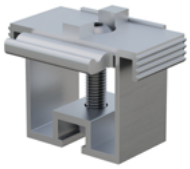


ELS eaves panelling black

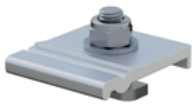


weitere Schienenlängen auf Anfrage

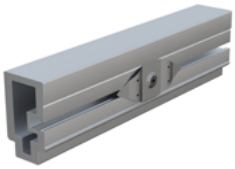
ELS Fix clamp 25-45



ELS crossbar adapter

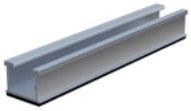


ELS grounding connector

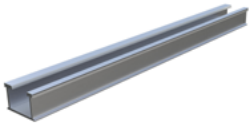


Hexagon head drilling screw A2 4.8x22 with painted head

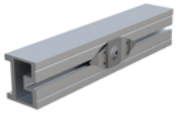
HS rail HK 125/172



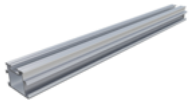
HS rail HK l=3300 mm



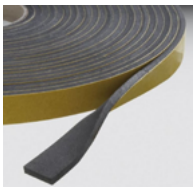
FD ridge connector type 750 II



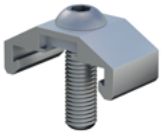
FD ridge rail FS 9/40



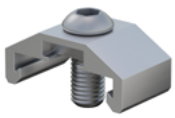
EPDM-Sealing tape



Locking clip XL A



Locking clip AK



2.3 Required tools

Drill driver

Allen wrench

Hexagon socket SW13

Torquewrench 5-25 Nm

Whipping cord

Pen

Folding ruler

Flex

3 Installation Facade

3.1 Variants of facade connection

Installation: Animation

Assembly with FD ridge rail FS 9/40 with two crossbar adapter. No Slider lock required.

Assembly with HS rail HK 125 or 172 with two crossbar adapter. Sliderlock XL required in the middle of the field (1).

Assembly with HS rail HK 3300 with two crossbar adapter . Slider lock XL required in the middle of the field (1).

The choice of facade screws (connection component to the facade) is a service provided by the customer. For further information, please contact S:FLEX Support.

3.2 Installation steps ELS facade

3.2.1 Installation of ELS substructure on a cold facade

The brackets 60 mm, M12 are attached to the facade in the grid of the project report (in horizontal and vertical direction) using suitable fastening components. Fasteners and dowels must be dimensioned and installed on site using the project documents.

Vertical base rails are fitted to the brackets on the hammerhead channel. Check the alignment of the hammerhead bolts. The hammerhead bolt is only fitted correctly if the notch of the hammerhead bolt is visible vertically. Tighten the lock nut of the hammerhead bolt to a **torque of 15 Nm**.

Position the first ELS insertion rail (structure from bottom to top) a maximum of 50 mm above the bottom edge of the base rail. To fasten the ELS insertion rail, two opposing cross rail adapters are fastened in the hammerhead channel of the vertical base rail using hammerhead bolts and lock nuts. Tighten the lock nut of the hammerhead bolt to a **torque of 15 Nm**.

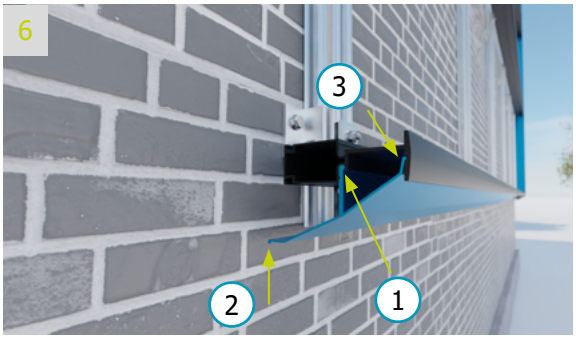
Maintain the spacing of the ELS insertion rail according to the project report. The distance between the ELS insertion rails varies depending on the alignment of the modules and the module dimensions:

Module orientation vertical: module length + 14 mm
Module orientation crosswise: module width + 14 mm

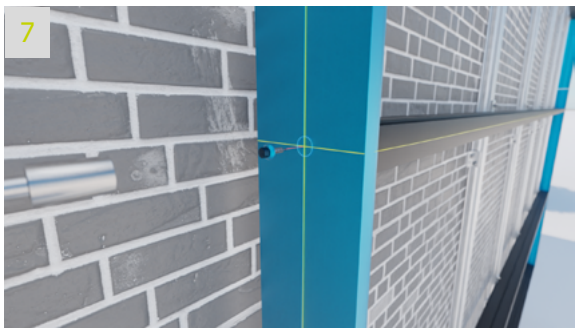
Jump dimension is module length + 16.5mm (see assembly description).

3.2.2 Installation of side and eaves cladding

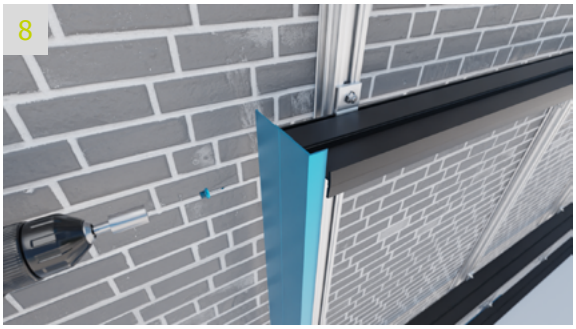
To connect several ELS insertion rails, the ELS connector, which has the same static values as the ELS insertion rail, is pushed halfway into the already installed ELS insertion rail. Then slide the other ELS insertion rail onto the connector and push together flush with pressure. The connection is complete.



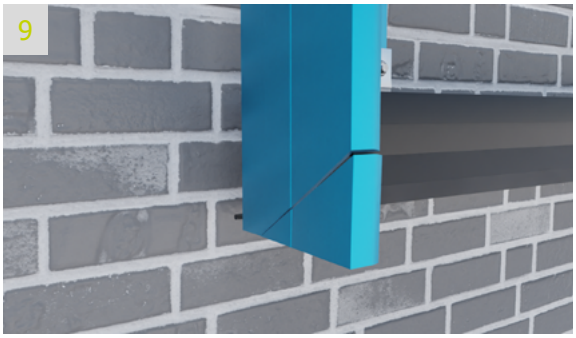
The ELS eaves cladding is fitted to the lowest ELS insertion rail and cut to length accordingly. Place the ELS eaves cladding on the ELS rail and click in the center bar (1). Press lightly on the lower part of the eaves cladding (2) so that the eaves plate snaps into the groove in the upper part of the ELS insertion rail (3). **Caution:** the eaves flashing must be fitted before the modules are fitted.



Position the first ELS side panel (starting with the top ELS side panel downwards). Pre-drill at the intersection of the ELS side panel center groove and the ELS insertion rail center groove using a 6 mm drill bit. Then use the self-tapping screw to attach the side panel to the ELS insertion rail.



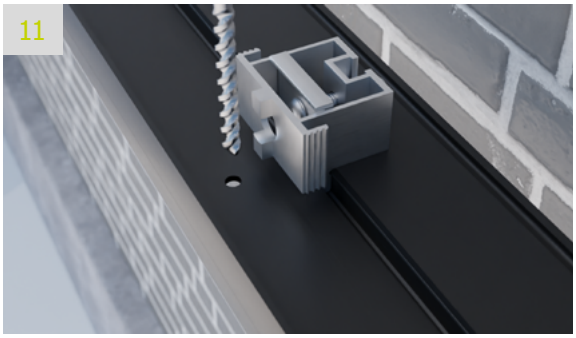
Connect the subsequent ELS side panel to the already attached ELS side panel using the ELS side panel connector (see project report) and connect it to the ELS insertion rail using another drilling screw (see previous installation step).



Mark the lowest ELS side trim on the ELS eaves trim, cut to size and attach to the ELS insertion rail (see previous installation step).

Place the ELS Fix clamps in the groove of the ELS insertion rail so that the toothing of the first and last ELS Fix clamp engages in the toothing of the ELS side cladding. Position the ELS Fix clamps at the beginning and end of the module row and in the module joint.

Fix clamps are approved for one-off installation.



To ensure water drainage, 8 mm holes must be drilled on site below each ELS Fix clamp.

3.2.3 Module installation

Insert the first PV module from bottom to top into the upper ELS insertion rail at a slight angle. Place the module parallel to the wall, position it in the lower insertion rail and connect flush against the first ELS Fix clamp.

3.2.4 Installation of side and eaves cladding

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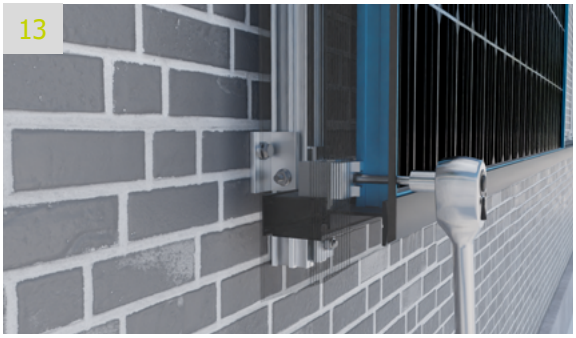

Tighten the ELS Fix clamp. **Important: At the edge of the module** field, the screws of the ELS Fix clamps are tightened to a **torque of 10 Nm**. Within the **module field**, the screws of the ELS Fix clamps are tightened to a **torque of 5 Nm**.

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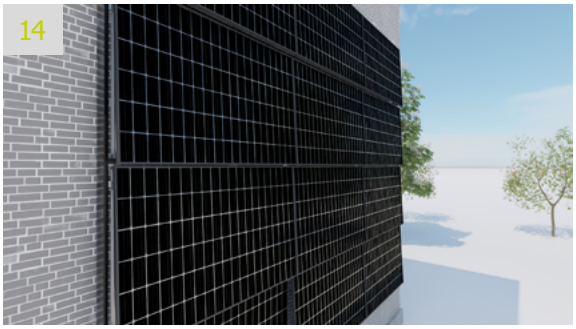
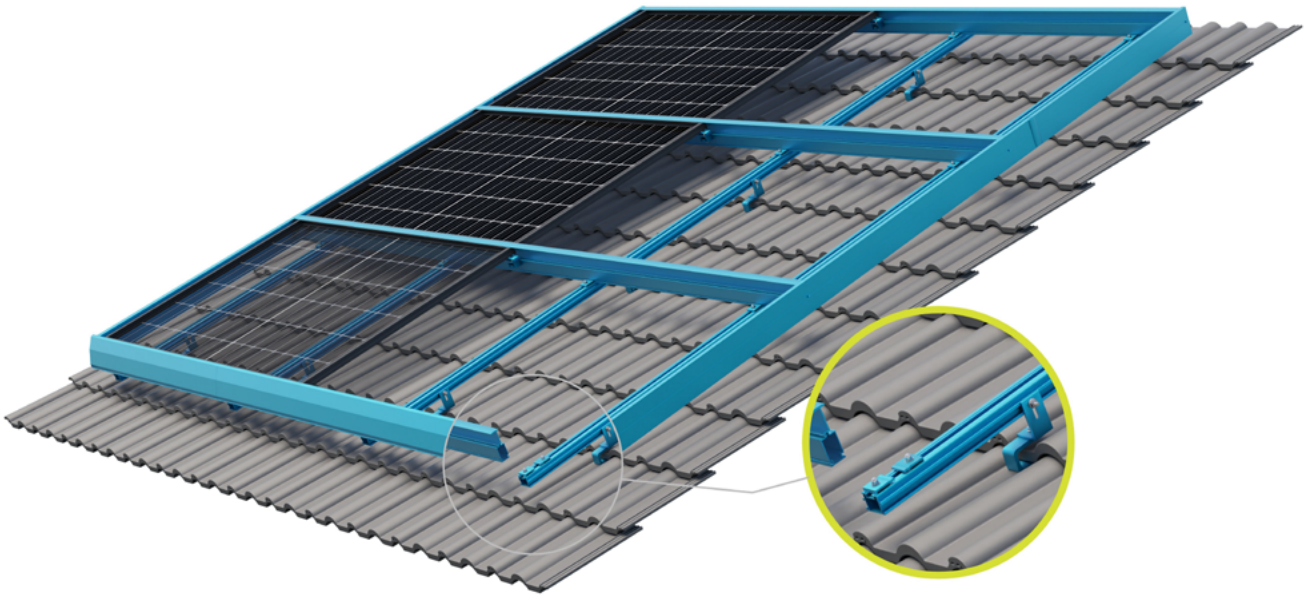


Repeat the previous assembly steps for all other modules.

4 Installation ELS pitched roof - Installation variants pitched roof

4.1 Installation ELS tile roof system



Note: The installation steps for the roof connection can be found in the installation instructions “S:FLEX installation instructions for pitched roof systems”.

Caution: Always use a base rail with a hammerhead channel!

All further installation steps from the base rail onwards, can be found in this present document from page 9.

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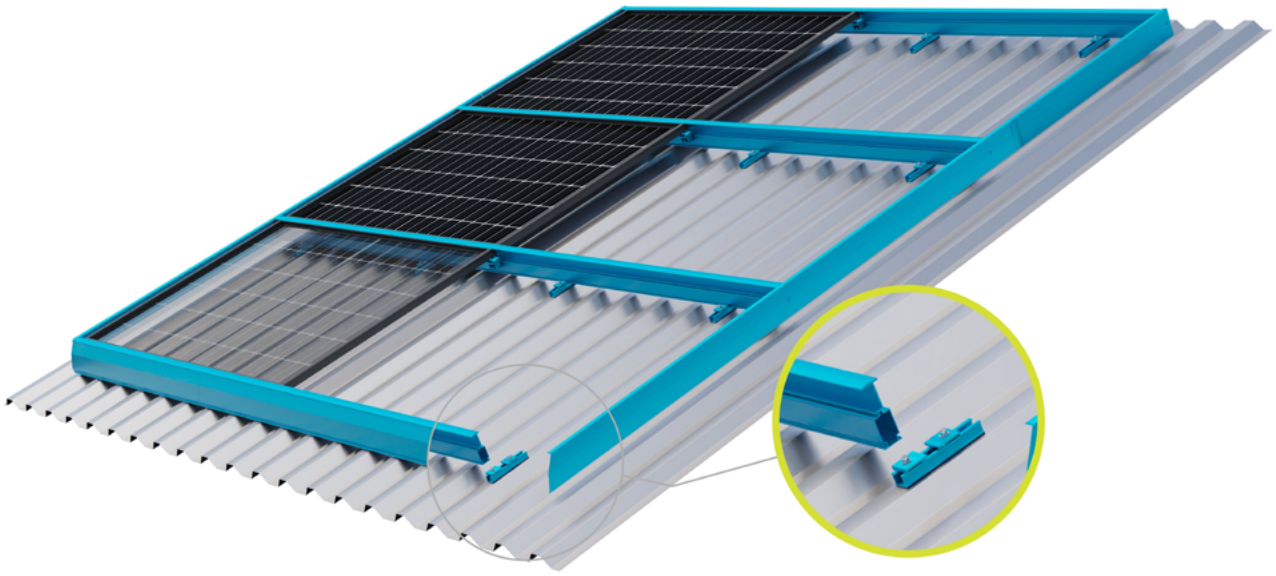
4.2 Installation of ELS trapezoidal sheet metal system



Note: The installation steps for the roof connection can be found in the installation instructions “S:FLEX installation instructions HSS HK 125/172 (AK)”.

Caution: Always use a base rail with a hammerhead channel!

All further installation steps from the base rail onwards, can be found in this present document from page 9.

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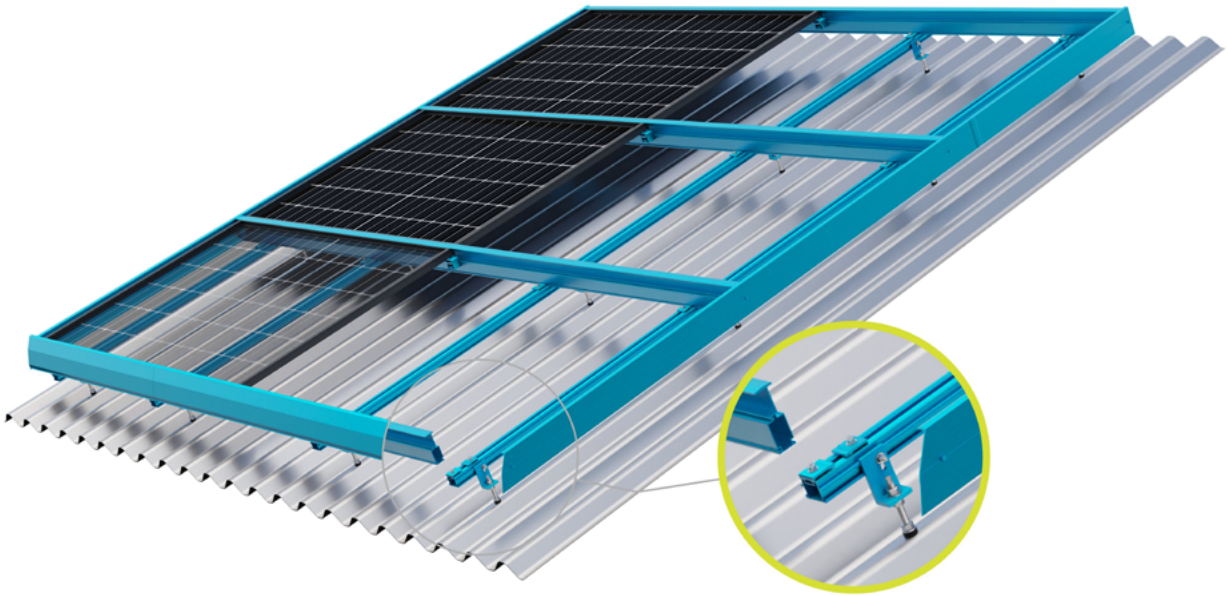
4.3 Installation instructions for corrugated and pantile sheet metal roofs, corrugated fiber cement panels and sandwich elements



Note: The installation steps for the roof connection can be found in the installation instructions “Hanger bolt/solar fastener for trapezoidal sheet metal, corrugated fiber cement, sandwich elements”.

Caution: Always use a base rail with a hammerhead channel!

All further installation steps from the base rail onwards, can be found in this present document from page 9.

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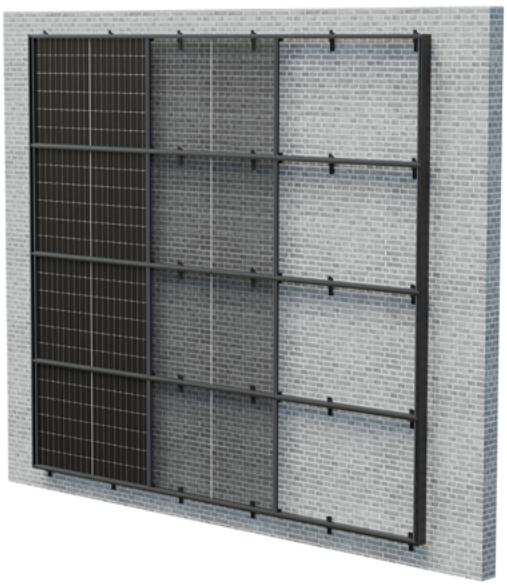
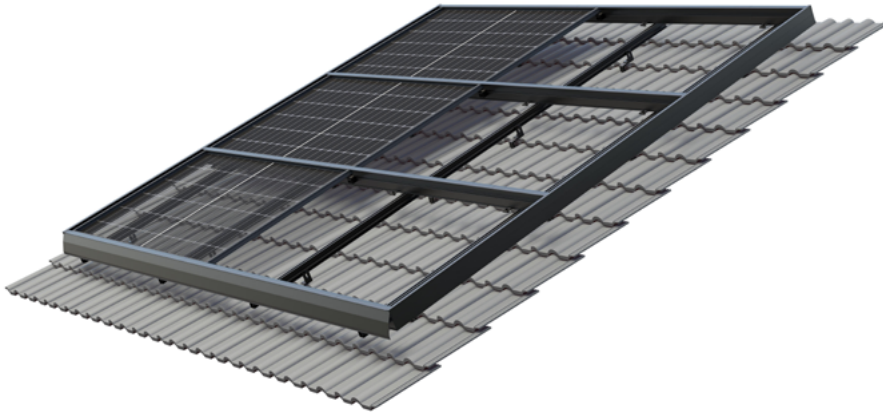
5. Final inspection





Check whether the entire system and ALL components have been installed according to the planning documents and that there are no deviations.

Check that all screws have been tightened to the torque specified in the installation instructions.

CAUTION! This is important for safety reasons and can lead to considerable damage if not adhered to!

6.1 Disassembly

Disassembly of the S:FLEX mounting system may only be carried out by trained specialist personnel. Observe the same safety instructions, standards and guidelines as provided for the installation. In general, disassembly is carried out in reverse order to the described installation.

Before disassembly, disconnect the PV modules from the mains network. Disconnect all of the PV modules' electrical cables (string lines and plug connectors) and remove them from the frame system.

Then remove the modules and store them safely. Improper disassembly can lead to damage to the modules.

Disassemble frame system and safely store all of the parts.
Any holes in the roof must be sealed by a specialist.

6.2 Disposal

The S:FLEX mounting system is made from aluminium, stainless steel and steel components. These materials can be recycled after disassembly. The frame system must only be disposed of by a specialist waste management company. Observe the applicable national standards and guidelines.

7.1 User agreement for the S:FLEX insert system

We would like to point out that the assembly system is sold as part of a sales contract. Assembly / processing or purchase by third parties is not carried out in the name of or on behalf of S:FLEX GmbH. It must be carried out by qualified specialist personnel strictly in accordance with the assembly instructions.

The system must be designed and planned using the S:FLEX planning software. S:FLEX GmbH is not responsible for the project-related statics of the roof structure, for obtaining and documenting the approval of the roof manufacturer, for the installation of the corresponding fasteners on the respective roof (in terms of warranties) or for the professional execution.

Errors and damage as well as limited or insufficient functionality of the system due to incorrect assembly and/or assembly deviating from the assembly instructions and/or the project report, shall exclude a material defect for which S:FLEX GmbH is responsible. In the event of improper processing, the rights of the buyer due to a material defect shall lapse.

The system guarantee is only valid if all system components are purchased from S:FLEX GmbH.

7.2 Warranty / disclaimer

The information regarding dimensioning provided in these instructions, is merely suggested values based on prior experience. Binding structural analyses for installation frames can be created using the S:FLEX planning software.

As an installation company, you are responsible for the correct execution of the installation. S:FLEX GmbH is not liable for the dimensional information contained in commercial system quotations.

As an installation company, you are responsible for the mechanical durability of the interface connections mounted on the building's structure. In particular, this includes ensuring that these are leak-tight. The components supplied by the company S:FLEX GmbH are designed for the expected loads and in accordance with the currently available technology. In this context, you must provide S:FLEX GmbH with information about all general technical conditions in writing via the project data collection sheet (information about the supporting structure, snow load zone, building heights, wind loads, etc.).

S:FLEX GmbH is not liable if the installed components are not properly handled. Any use close to the sea, needs to be clarified with S:FLEX GmbH directly on a case-by-case basis due to the increased risk of corrosion. Given that the system is handled properly and dimensioned according to the structural conditions and normal environmental and ambient conditions, S:FLEX GmbH provides a warranty from transfer of risk to the warranty holder, which guarantees that the metallic components of the racks will remain free from defects with regard to material and workmanship for a period of 10 years. This warranty does not apply to wear parts. For additional information, please refer to the separate warranty provisions.

This applies within the context of the generally prevalent weather and environmental conditions.