ST-PTC

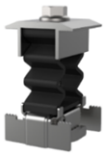
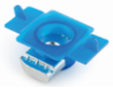
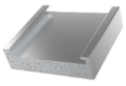
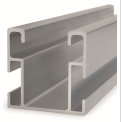
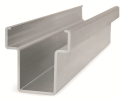
SYSTEM DESCRIPTION

Closed triangular aluminium system with fixed inclination

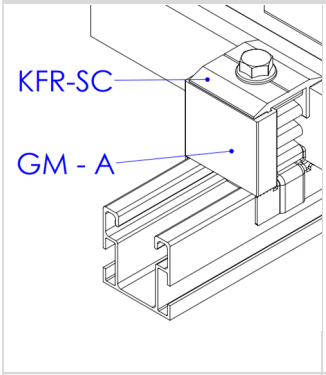
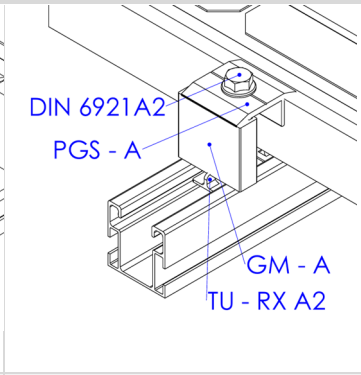
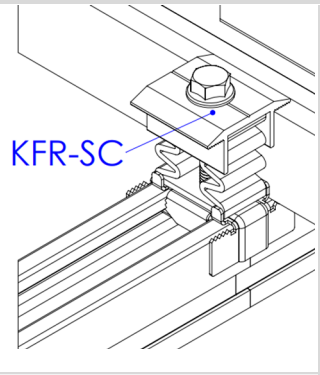
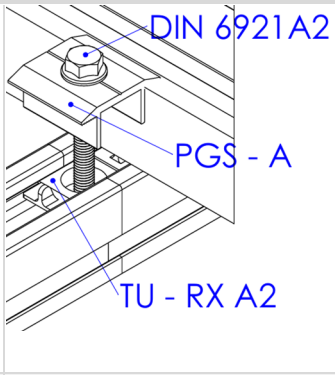
1. CHARACTERISTICS

Description:	Closed triangular mounting system with fixed inclination on tile roof.
System inclination:	Triangular mounting on open, pre-assembled aluminium triangles, consult available angles.
System orientation:	SOUTH, EAST or WEST orientation, according to orientation of roof.
System materials:	Aluminium, Stainless Steel and EPDM.
Guarantee:	Up to 10 years according to environmental conditions (excluding environments exposed to hydrogen sulphide). The guarantee is only valid if the full ST-PTC system is used.
Homologation	CE according to EN 1090-1:2009+A1:2011
Compatible solar panels:	
Panel type:	Solar panels with frame height of between 30mm and 40mm.
Orientation of panels:	Portrait (vertical) mounting orientation of panels
Size of panels:	Module width less than 1150mm
Application area:	
Application area:	Flat and low-slope roofs.
Wind load:	Up to 240 km/h. The structure and fixing should be calculated according to local conditions and the roof itself.
Snow load:	Up to 2 kN/m². The structure and fixing should be calculated according to local conditions and the roof itself.

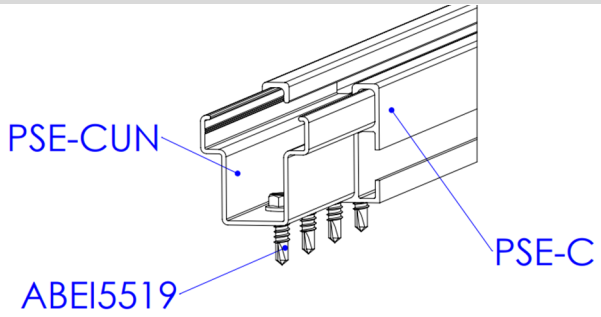
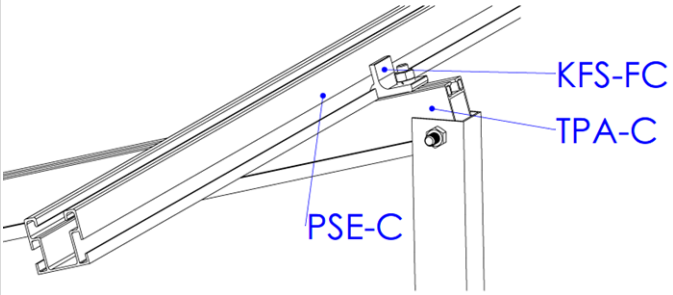
2. COMPONENTS

Quick fixation clamp	Clamp profile	INDEXTRUT quick nut	Frame clamp	Profile for assembled fixing	Profile joint PSE-A	Closed aluminium triangle	Interior fixing connector	Cross connector for lateral fixing
								
KFR-SC	PGS-A	TU-RXA2	GM-A	PSE-C	PSE-CUN	TPA-C	KFS-FL	KFS-FC

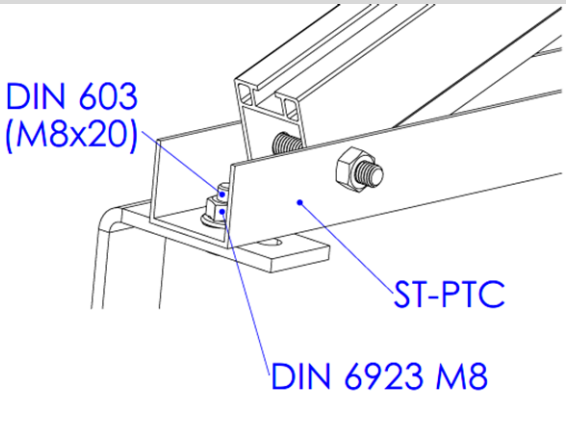
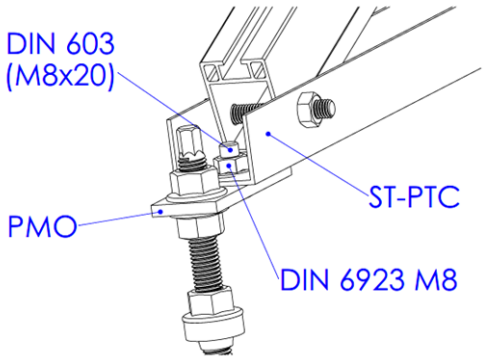
2.1 Components: Clamps for panel mounting

Side clamp		Middle clamp	
			
Option 1: Quick clamp	Option 2: Single clamp	Option 1: Quick clamp	Option 2: Single clamp

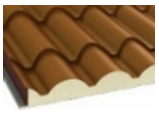
2.2 Components: Profiles, joints, guides and connection pieces for support structure

Longitudinal connection of profiles	Profile joint to open triangle
	

2.3 Components: Mounting connectors for fixing accessories.

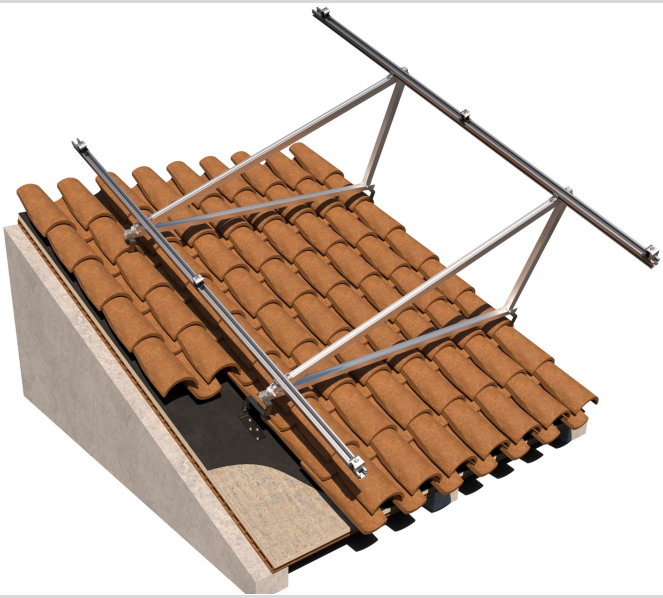
Lower connection	
	
Fixing from roof protector	Fixing from threaded rod

3. FIXING TYPES

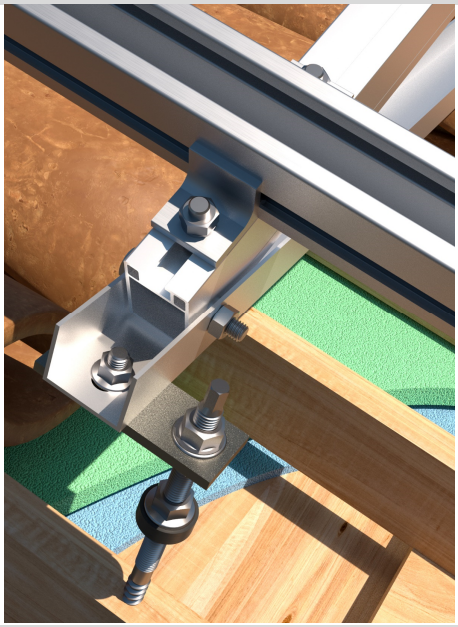
	ROOF	SUBSTRUCTURE	FIXING COMPLEMENTS			
TYPE 1	 TILE	 CONCRETE  HOLLOW CONCRETE  HOLLOW BRICK	 PMO Mounting plate	 KFS-RV Threaded rod kit for chemical fixing	 Chemical plug	 MO-TM Metal sleeve for chemical plug MO-TL Sleeve for chemical plug
TYPE 2	 TILE	 WOOD	 PMO Mounting plate	 KFS-MA Double threaded screw kit for wood		
TYPE 3	 TILE	 WOOD  CONCRETE  HOLLOW CONCRETE  HOLLOW BRICK	 GS-TC Roof hook for curved tiles  GS-TU Roof hook for universal tiles	 GS-TP Roof hook for flat tiles  GS-PI Roof hook for slate	 DIN-571 A2 A2 stainless steel hexagonal-head screw for wood  TP A2 A2 stainless steel chipboard screw with countersunk head EQ-A2 Stud bolts for chemical fixing. Stainless steel A2  HE + ARVUL Screw mounted with steel-EPDM vulcanised washer	 TN4S Nylon 4-way expansion plug  Chemical plug MO-TN Sleeve for chemical plug

4. APPLICATION EXAMPLES

Example 1: Curved tile roof with masonry substructure / Fixing with GS-TC roof hook



Example 2: Curved tile roof with wood substructure / Fixing with KFS-MA double threaded screw



5. INSTALLATION MANUAL

ST-PSC	Closed aluminium triangular system

Read these installation instructions before starting the assembly and familiarise yourself with the system components.

Assembly should only be carried out by expert and qualified personnel.

Installation guidelines:

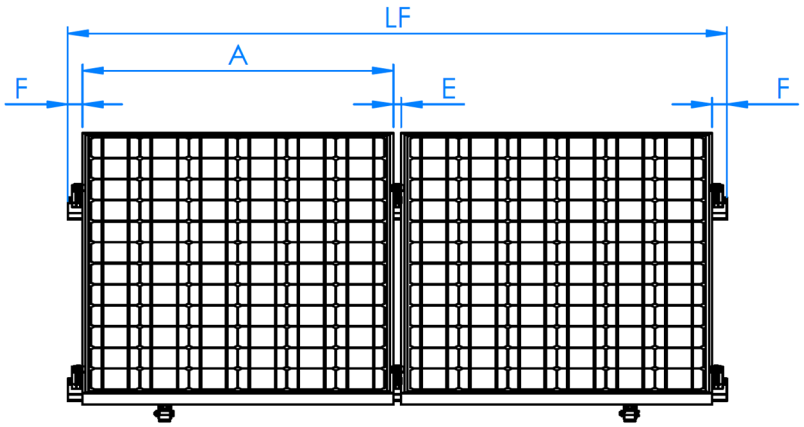
- Ensure that the roof construction is suitable for inserting force at the fixing points and their subsequent transmission. The building must be able to safely withstand additional loads.
- A structural calculation should be carried out according to the local conditions of the installation site.
- The distribution of the fixing points should be planned and adapted to the needs of both the system and the roof.
- To compensate for thermal expansion, make sure to include a separation every 12m when planning the photovoltaic system.
- Solar modules must be installed according to the manufacturer's instructions.
- Follow your local building regulations.
- Be sure to work in accordance with the safety and hygiene standards in place in your region, during installation and particularly during roof work.
- Do not use the system or fixings as a ladder.

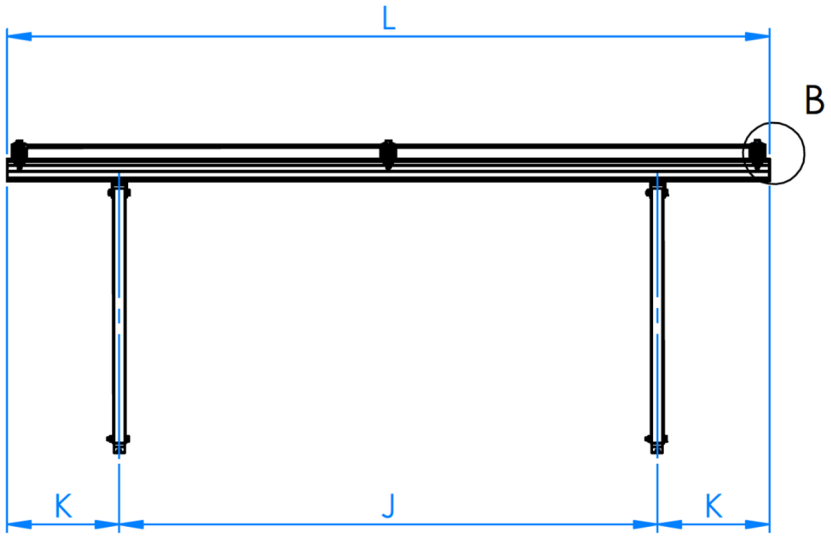
INSTALLATION PROCESS:

STEP 1.- Consult the installation drawing

Consult the drawing for installation on a roof, where the distribution of the modules is defined along with the structures that support them and their fixing points.

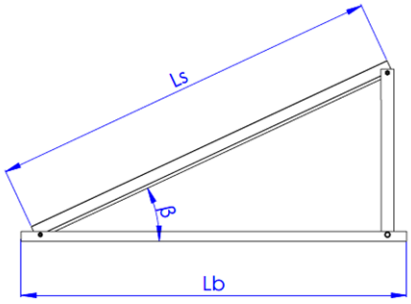
A. Plan view of ST-PSC system with vertical orientation of modules (picture frame type).



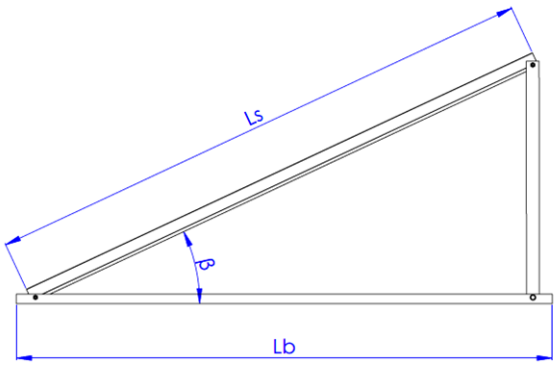


A (mm)	**E** (mm)	**F** (mm)	**J** (mm)	**K** (mm)	**LF**
≤ 1150	26	≥ 35	1400 ÷ 1600	(LF-J) / 2	(n*B) + ((n-1) *E) + (2*F)
n: number of modules in the row.					

B. ST-PTC system profile view



OPCIÓN 1



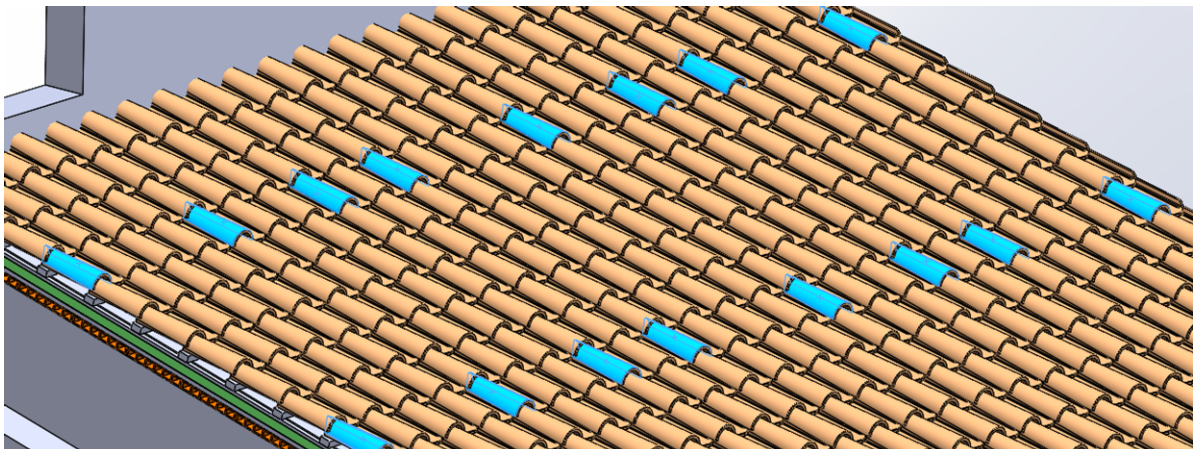
OPCIÓN 2

Option 1			Option 2		
β (°C)	**Ls** (mm)	**Lb** (mm)	**β** (°C)	**Ls** (mm)	**Lb** (mm)
5	1230	1275	5	1750	1795
10	1230	1260	10	1750	1775
15	1230	1240	15	1750	1740
20	1230	1210	20	1750	1695
25	1230	1170	25	1750	1640
30	1230	1120	30	1750	1570
35	1230	1065	35	1750	1490

The type of fixing system and the location of its installation points must be adapted to the needs of the support structures and also to the needs of the roofs where they are going to be installed.

STEP 2.- Carry out layout on roof

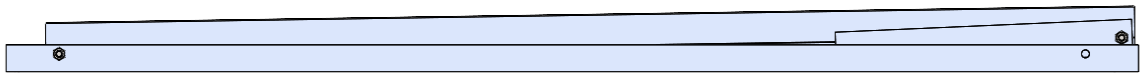
Carry out a layout of the fixing points of each structure on the roof, checking the installation feasibility of each one depending on the chosen fixing system and the characteristics of the roof itself.



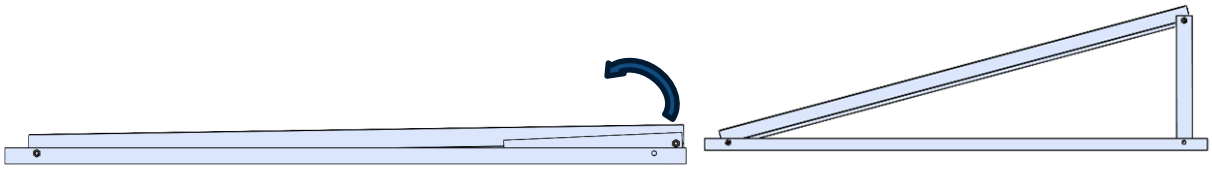
STEP 3.- Assembling the triangles

The triangles come pre-assembled, to complete their assembly, the lower profile needs to be joined to the upper profile at the back, with the incorporated components.

1. The triangle comes pre-assembled, with the lower profile separated at one point and its components in a bag.

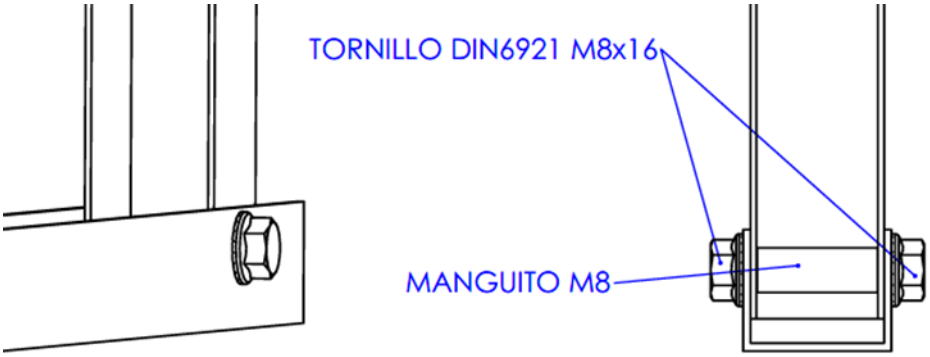


2. It needs to be unfolded

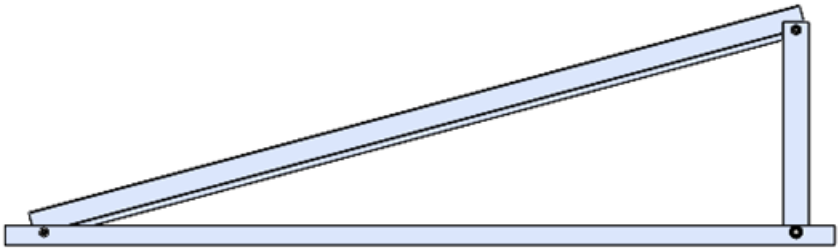


3. Attach the bottom rear profile with the components found in the bag.

JOINING THE LOWER PROFILE AND THE SUPPORT

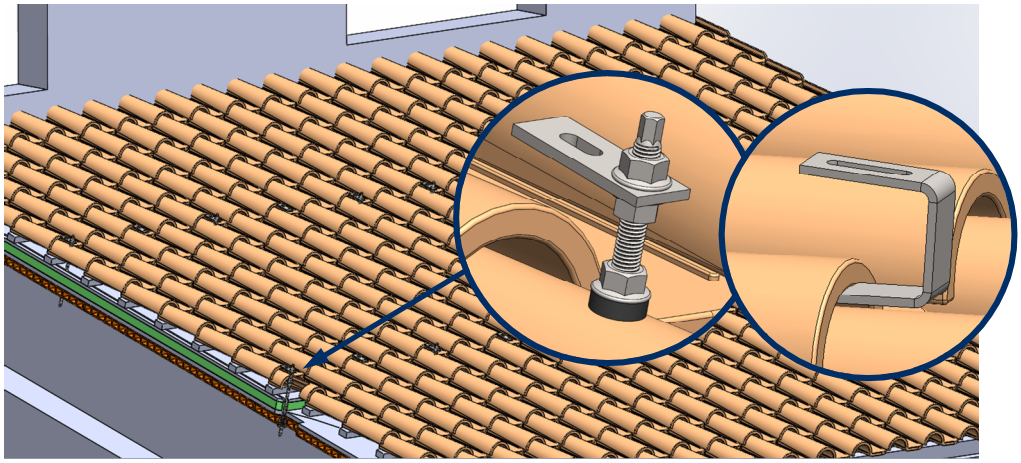


4. To fix its position correctly, a torque of 15 Nm must be used.



STEP 4.- Installing the fixings

Install the fixings following the installation instructions on their corresponding technical data sheets

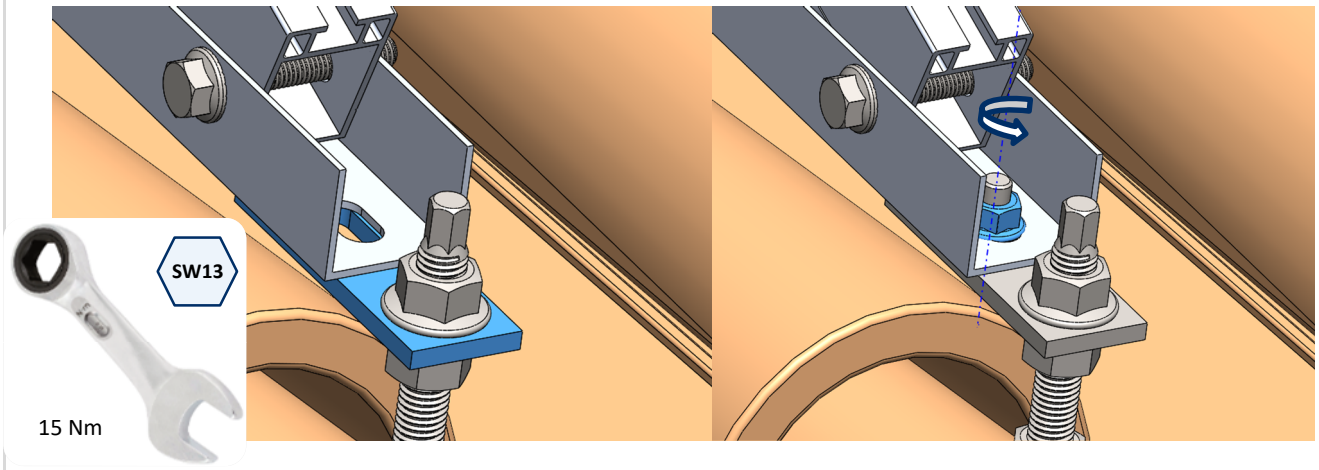


 **PMO** Mounting plate	 **KFS-RV** Threaded rod kit for chemical fixing	 **KFS-MA** Double threaded screw kit for wood	 **GS-TC** Roof hook for curved tiles	 **GS-TU** Roof hook for universal tiles	 **GS-TP** Roof hook for flat tiles	 **GS-PI** Roof hook for slate
Technical sheet	Technical sheet	Technical sheet	Technical sheet	Technical sheet	Technical sheet	Technical sheet

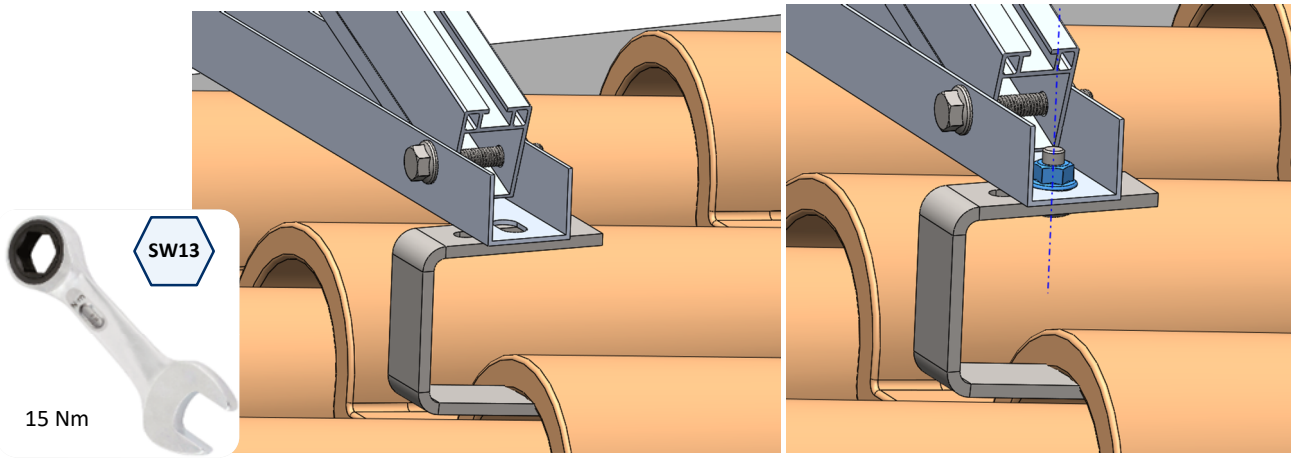
STEP 5.- Installation of the triangles

For installation on tiles, it can be fixed in two ways, through the tile or with a roof protector

- **Option 1**. Fix the lower profile of the triangle to the PMO plate using DIN 603 (M8x20) screws and DIN 6923 M8 nuts. Apply a maximum torque of 15 Nm with a SW-13 hexagonal key.



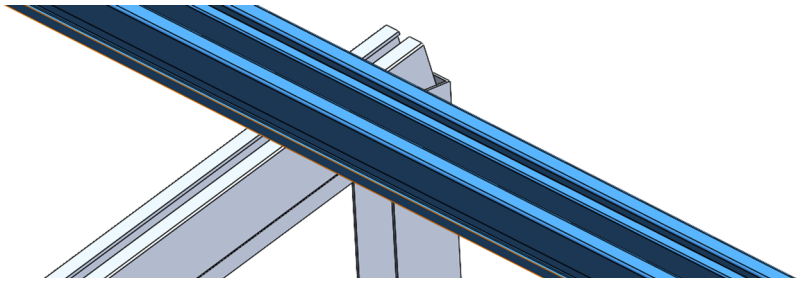
- **Option 2.** Fix the lower profile of the triangle to the roof protector using DIN 603 (M8x20) screws and DIN 6923 M8 nuts. Apply a maximum torque of 15 Nm with a SW-13 hexagonal key



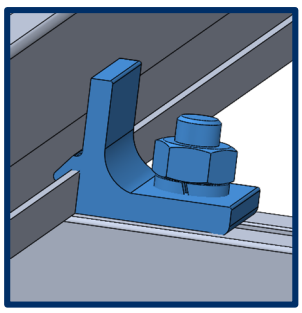
* In the next steps, assembly is explained regardless of the roof fixing selected, therefore only one fixing example is shown.

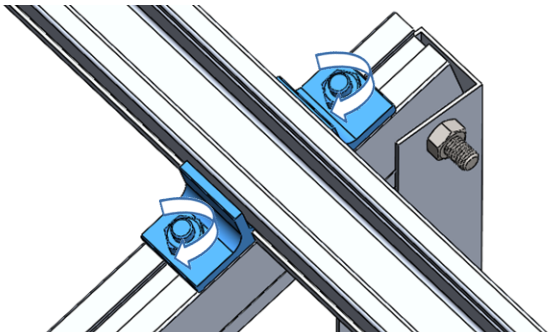
STEP 6.- Installing profiles on the triangles

A. Place the PSE-C aluminium profiles in the right position for attaching the panels.



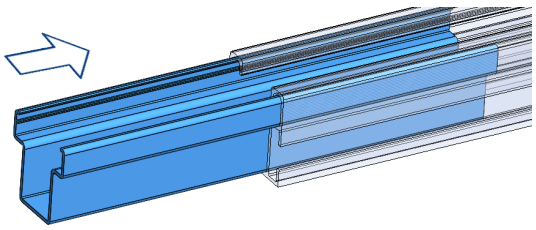
B. Fix the position using the KFS-FC connector, fitting two, one on each side of the PSE-C profile. Apply a maximum torque of 15 Nm with a SW-13 hexagonal key. The KFS-FC connector has a notch on the back to assist in mounting and coupling with the PSE-C profile.



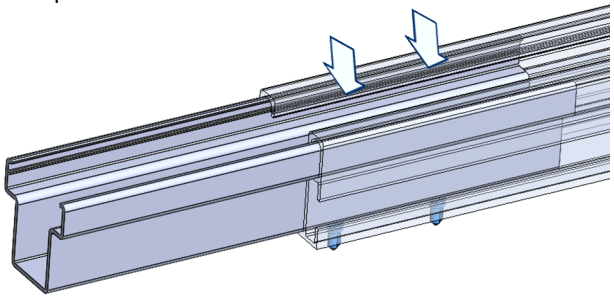


STEP 7.- Longitudinal connection between guides

A. Assemble the PSE-CUN connection by inserting half of its length into one of the two PSE-C profiles.

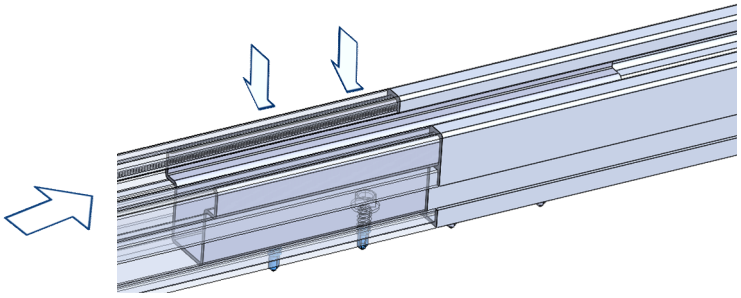


B. Fix the PSE-CUN connection to the first PSE-C profile by installing 2 ABEI5519 stainless steel self-drilling screws. The screws must be installed in the lower part of the profile, at a distance of between 50 and 70 mm from the end of the profile. An electric screwdriver equipped with a SW-8 hex socket is required to install the ABEI5519 screws, and an installation speed of 1800 rpm is recommended.

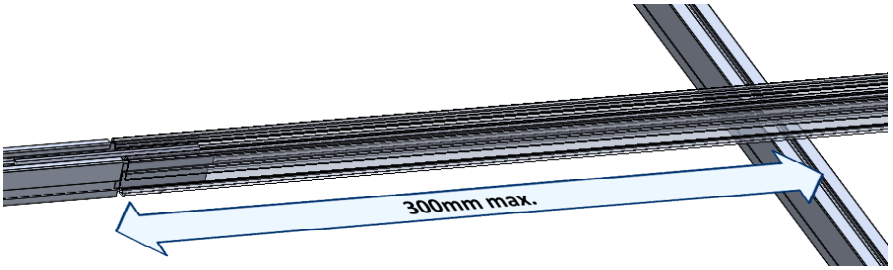


C. Insert the free end of the PSE-CUN connection into the second PSE-C profile.

- **Option 1**, if a rigid connection is required: Insert the protruding part of the PSE-CUN connection into the second PSE-C profile until it touches the first profile, and then fix the connection to this second profile by installing 2 ABEI5519 stainless steel self-drilling screws, as previously carried out with the first profile.



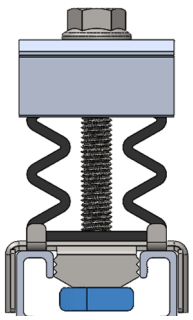
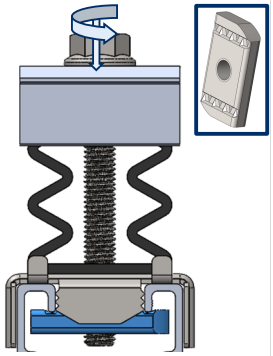
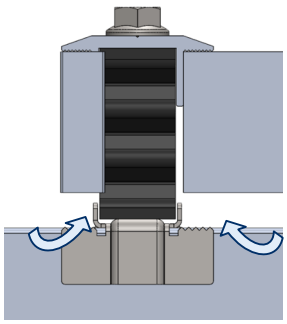
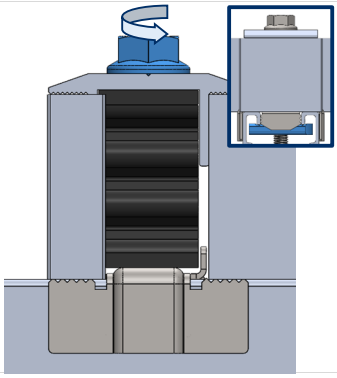
- **Option 2**, if the connection needs to act as a expansion joint: Insert the protruding part of the PSE-CUN connection into the second PSE-C profile, leaving a gap between the ends of both profiles of between 4 and 6mm, in this case, the screws should not be installed so as to allow longitudinal displacements between both profiles.



A maximum distance to the nearest fixing point of 300mm is recommended for this type of connection.

STEP 8.- Pre-installation of clamps on profiles

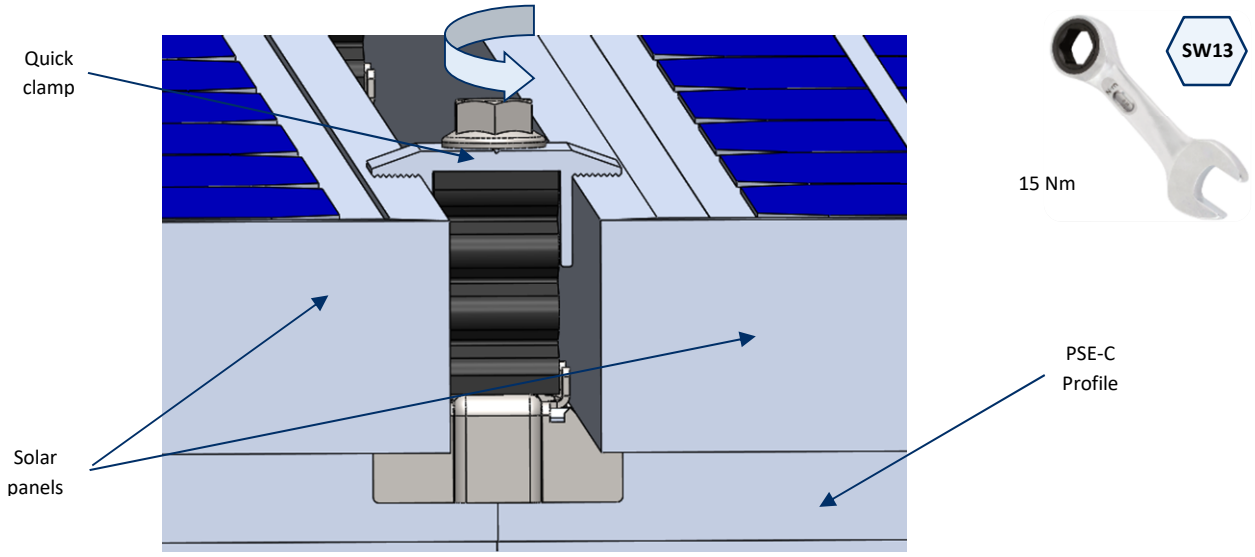
To install the clamp on the profiles, you must follow these steps:

			
1. Place the clamp on the profiles with the lower head parallel to the guide.	**2.** To fix the clamp to the profile, you must rotate the lower head into a position that is perpendicular to the profile using the screw, pressing the screw head and turning. The nut has a serrated profile to ensure fixation.	**3.** Insert the corresponding elements, two panels if using a middle clamp or panel and clamp if it's an end clamp.	**4.** To fix the inserted elements, you need to rotate the screw until they come into contact with the profile. Check that the lower head is still perpendicular to the profile.

Clamp type depending on its position:

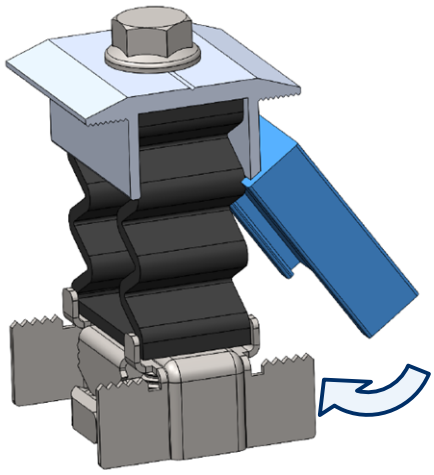
A. Middle clamp

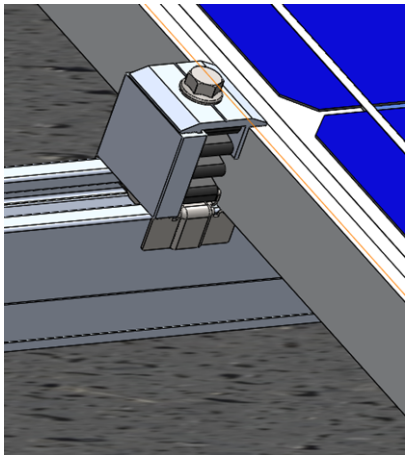
- The middle clamp is used when passing one module to another within the same row, attaching both panels to the structure. This assembly is carried out using the screw that comes with the clamp. A torque of 15 Nm should be applied



B. End clamp

- Prepare 4 KFRSC3050 quick clamps to be assembled at the ends of each row of panels. Each of these clamps is fitted with a GM-A clamp, assembled as shown in the diagram:





The measurement of clamps chosen should be equal to the frame height of the solar panels being installed.