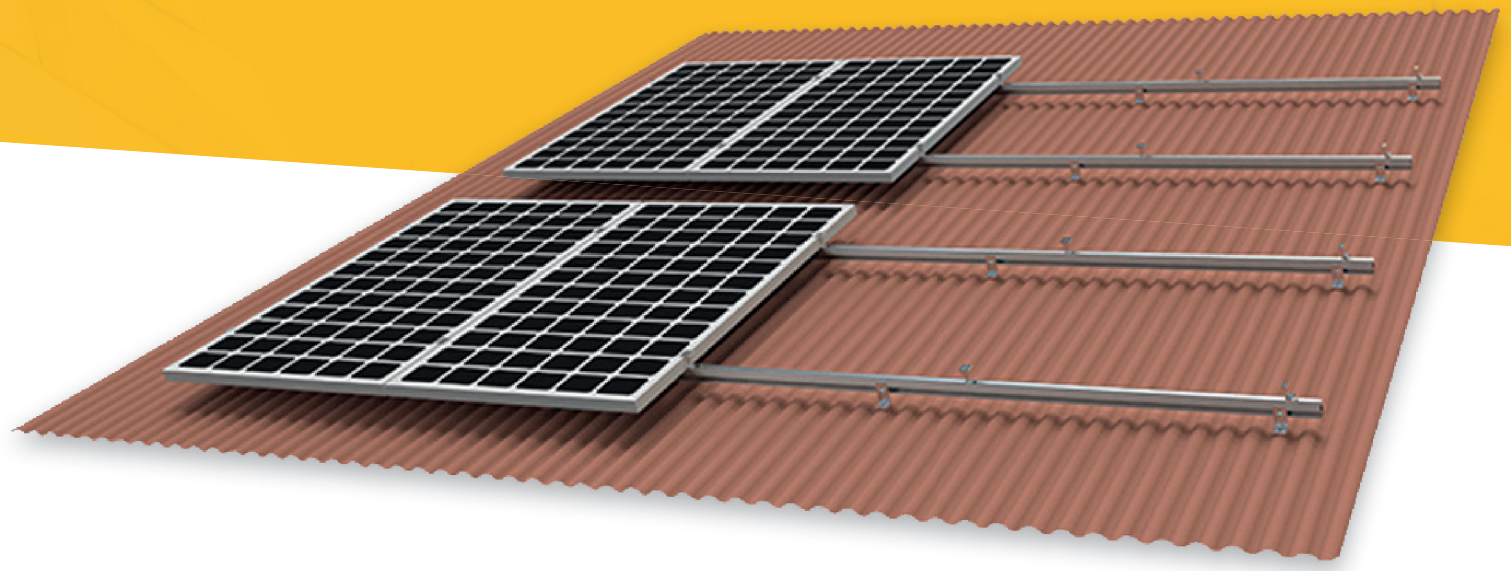
Vertical Coplanar Anodised

ACL-TS-D2-AMX Series (maximum width 1150mm)



Kit system

Coplanar structures (ACL/ACL-AMX) and inclined (AIR) vertical structures

With the modular kit system, it is possible to create any combination of rows of modules, regardless of their size. **Solitia structures are designed to support all conceivable possibilities**, bearing in mind that it is recommended to combine up to a maximum of 20 photovoltaic modules.

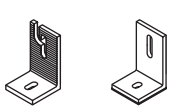
This system makes **the process of selecting and creating projects easier and faster**.

Module kits

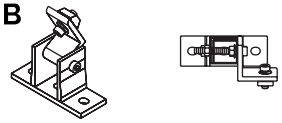
All kits include profiles, profile joints, and omega and zeta fasteners for the panels.

Depending on the kit, surface fastenings can be L-shaped (coplanar[A]) or with legs (vertically inclined[B]).

A

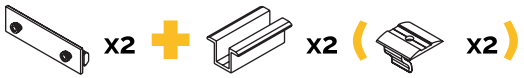


B



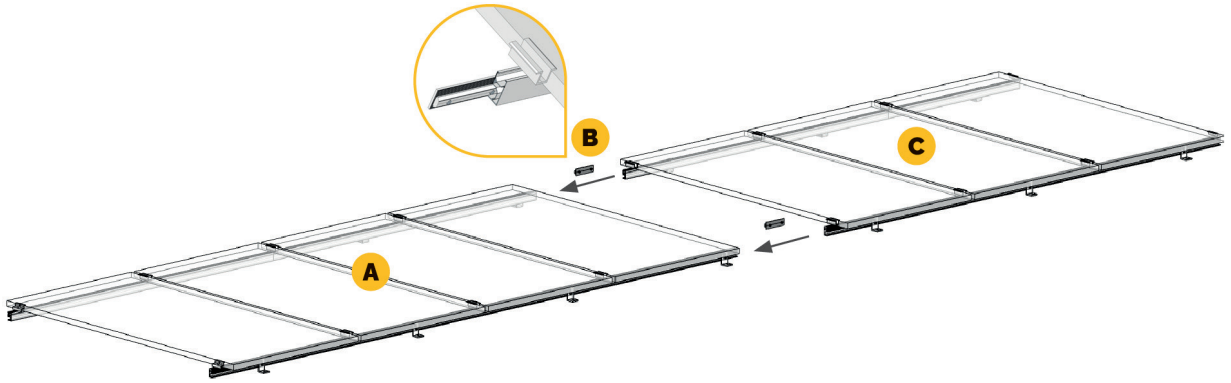
Joining kits

Profile joint (x2) and universal omega brackets or clamps (x2).



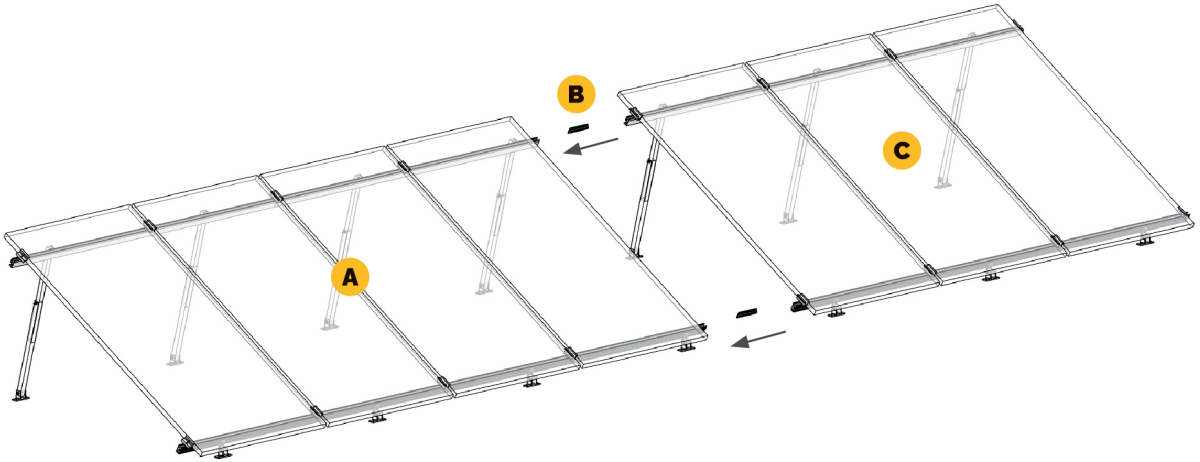
Example of vertical coplanar structure for 7 modules (ACL04-TS-D2 + ACL03-TS-D2)

A 4-module kit + B Joining kit + C 3-module kit



Example of vertical sloping structure for 7 modules (AIR04-TS-D2 + AIR03-TS-D2)

A 4-module kit + B Joining kit + C 3-module kit



INSTRUCTIONS

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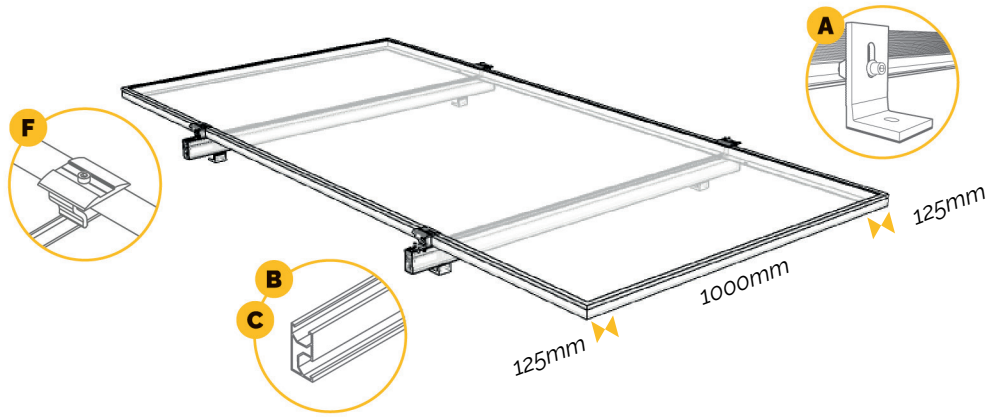

X1

Vertical coplanar anodised

ACL01-TS-D2-AMX

DESCRIPTION	A Roof anchorage	B Profile 2380 mm	C Profile 1250 mm	D Side cover	E Profile joining	F AMX fastening	G Earthing connector
REFERENCE	STR034	-	-	STR2300	STR012	TS-TZ01-AP-30-35-DMX	STR040
UNITS	4	0	2	4	0	4	1

INSTRUCTIONS

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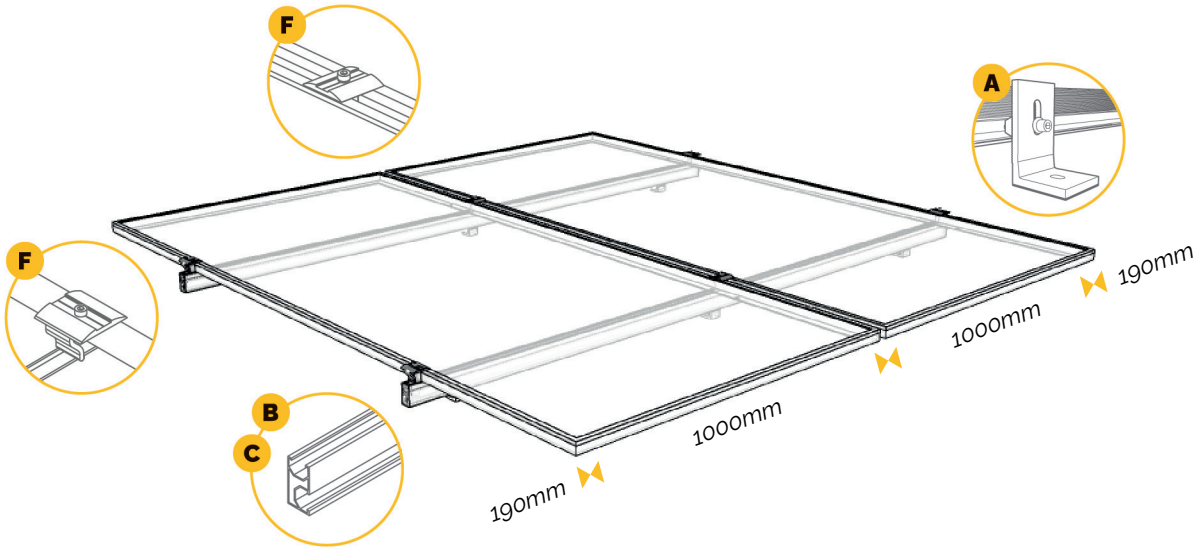

x2

Vertical coplanar anodised

ACL02-TS-D2-AMX

DESCRIPTION	A Roof anchorage	B Profile 2380 mm	C Profile 1250 mm	D Side cover	E Profile joining	F AMX fastening	G Earthing connector
REFERENCE	STR034	-	-	STR2300	STR012	TS-TZ01-AP-30-35-DMX	STR040
UNITS	6	2	0	4	0	6	1

INSTRUCTIONS

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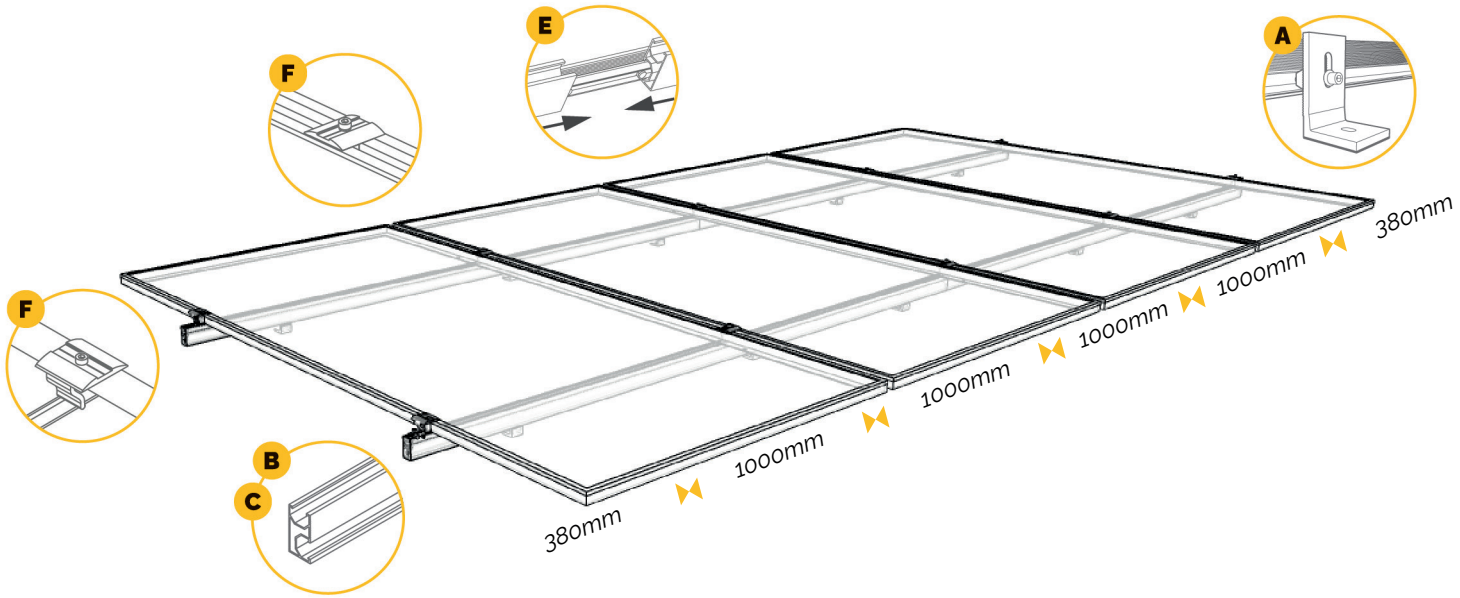

x4

Vertical coplanar anodised

ACL04-TS-D2-AMX

DESCRIPTION	A Roof anchorage	B Profile 2380 mm	C Profile 1250 mm	D Side cover	E Profile joining	F AMX fastening	G Earthing connector
REFERENCE	STR034	-	-	STR2300	STR012	TS-TZ01-AP-30-35-DMX	STR040
UNITS	10	4	0	4	2	10	1

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Vertical coplanar anodised + Joining kits

Anchor distribution: 315mm ⋈ 1000mm (x3) ⋈ 315mm

ACL03-TS-D2-AMX — Includes ACL01-TS-D2-AMX (1unit), ACL02-TS-D2-AMX (1unit) y ACL-KU-TS-D2-AMX (1unit)

DESCRIPTION	A Roof anchorage	B Profile 2380 mm	C Profile 1250 mm	D Side cover	E Profile joining	F AMX fastening	G Earthing connector
REFERENCE	STR034	-	-	STR2300	STR012	TS-TZ01-AP-30-35-DMX	STR040
UNITS	10	2	2	8	2	12	2

Anchor distribution: 380mm ⋈ 1050mm (x5) ⋈ 380mm

ACL05-TS-D2-AMX — Includes ACL01-TS-D2-AMX (1unit), ACL04-TS-D2-AMX (1unit) y ACL-KU-TS-D2-AMX (1unit)

DESCRIPTION	A Roof anchorage	B Profile 2380 mm	C Profile 1250 mm	D Side cover	E Profile joining	F AMX fastening	G Earthing connector
REFERENCE	STR034	-	-	STR2300	STR012	TS-TZ01-AP-30-35-DMX	STR040
UNITS	14	4	2	8	4	16	2

Anchor distribution: 390mm ⋈ 1060mm (x6) ⋈ 390mm

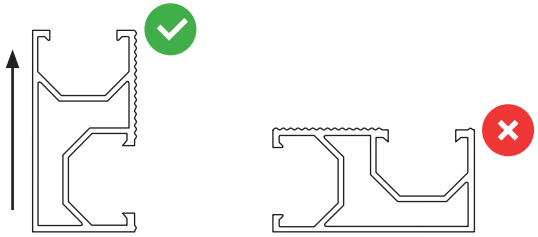
ACL06-TS-D2-AMX — Includes ACL02-TS-D2-AMX (1unit), ACL04-TS-D2-AMX (1ud.) y ACL-KU-TS-D2-AMX (1unit)

DESCRIPTION	A Roof anchorage	B Profile 2380 mm	C Profile 1250 mm	D Side cover	E Profile joining	F AMX fastening	G Earthing connector
REFERENCE	STR034	-	-	STR2300	STR012	TS-TZ01-AP-30-35-DMX	STR040
UNITS	16	6	0	8	4	18	2

Assembly instructions

Coplanar (ACL/ACL-AMX) and inclined (AIR) structures TS-D2 range in vertical position with panels up to 1150 mm

The profiles are placed vertically, with the narrow side where the omegas and zetas are located at the top, and the wider side on the side where the profile joints are placed.

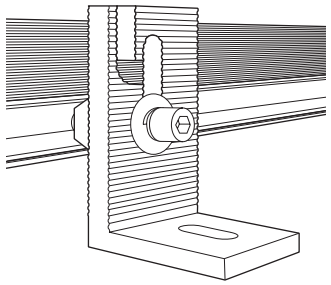


STEP 01

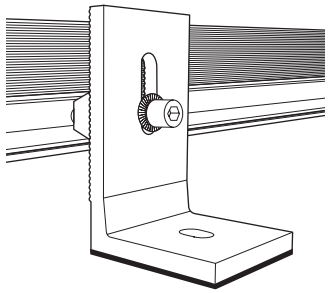
Surface-mounted profile fasteners.

Assemble **L-shaped** anchors to profiles (TS-D2) for coplanar structures..

L-shaped anchor (STR087)



L-shaped anchor (STR034)



STEP 02

Profile layout

E.g.: For 6 panels, arrange **3 front profiles** and **3 rear profiles** measuring **2380mm**.

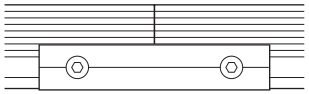
2380mm	+	2380mm	+	2380mm
2380mm	+	2380mm	+	2380mm

STEP 03

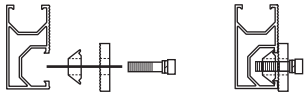
Profile joining

Join profiles together using the appropriate profile joints..

Front view



Side view

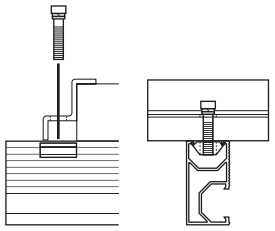


STEP 04

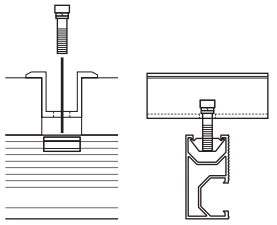
Panel fixing

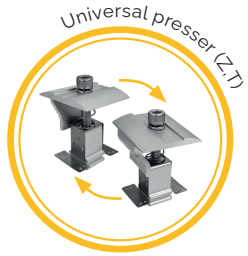
Fix panels to profiles with the corresponding number of universal fasteners/clamps according to the frame height. The **zeta-shaped** clamps will be placed at the end of the panel assembly and the **omega-shaped** clamps between them. Depending on its position, the **universal clamp** will serve as both a central (omega) and end (Z) fastener.

Front/side view of the zeta (Z)



Front/view view of the omega (T)



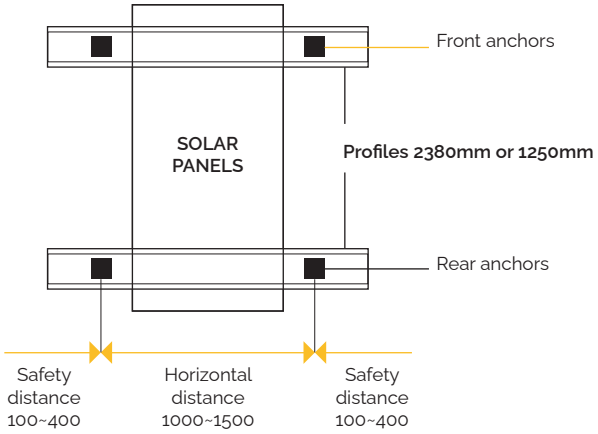


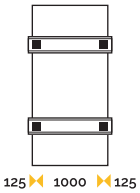
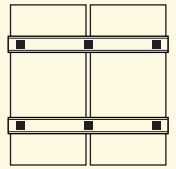
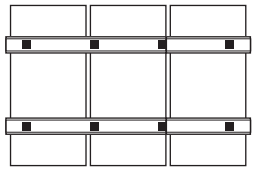
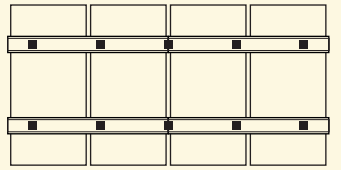
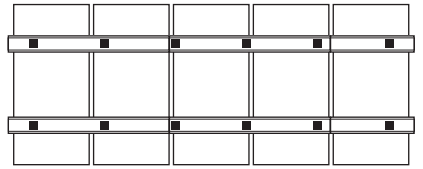
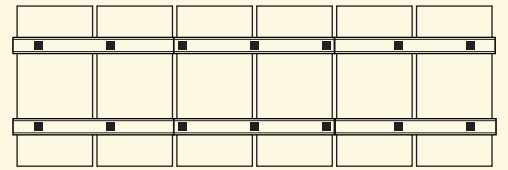
ANCHOR DISTRIBUTION

Depending on the number of panels to be installed, the distance between front anchors, and consequently rear anchors, varies.

It is recommended and established that the safety distance from the end of the profile for profiles of 2390 mm, 2380 mm, 1250 mm, and 1192 mm should be 100–400 mm. Below is an example showing the horizontal distances between L-shaped anchors for 1 to 6 panels.

Nº PANELES	1	2	3	4	5	6
Profiles 2390mm	-	2	2	4	4	6
Profiles 1192mm	2	-	2	-	2	-
Profiles 2380mm	-	2	2	4	4	6
Profiles 1250mm	2	-	2	-	2	-
Horizontal distance (mm)	1000~1500					
Safety distance (mm)	100~400					



No. of panels	Distances for ACL-TS-D2-AMX series profiles
x1	 125 1000 125
x2	 190 1000 1000 190
x3	 315 1000 1000 1000 315
x4	 380 1000 1000 1000 1000 380
x5	 380 1050 1050 1050 1050 1050 380
x6	 390 1060 1060 1060 1060 1060 1060 390

Dimensioning of structures

Coplanar (ACL/ACL-AMX) and inclined (AIR) structures TS-D2 vertical range

When sizing a vertical structure, whether coplanar or inclined, we will follow some simple guidelines to calculate the material we will need to use.
We can classify the components of photovoltaic structures as follows:

Profiles
Panel support profile; the series determines the rest of the compatible elements and accessories.

Profile joints
They allow profiles to be joined together to extend them.

Central pressers
Also called omegas, they join the panels centrally.

End pressers
Also known as side pressers or zetas, they finish each row of panels by securing the ends.

Universal pressers
By adjusting their position with a 90° turn, they are suitable for use as central and end pressers.

Surface mountings for coplanar
Also known as eles, they allow you to attach to surfaces.

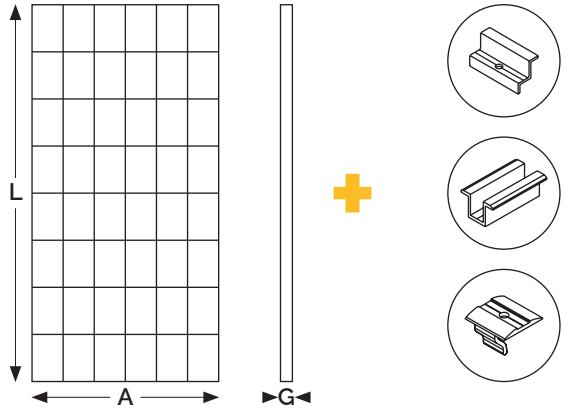
Surface mountings for inclined
They consist of front and rear legs, and attach to the surface while providing inclination.

The TS-D2 series profiles use the D fastening system, consisting of an Allen screw and D-type nut that allows for a perfect fit to the profile tabs. Therefore, all components used must be compatible to allow the use of this nut.

STEP 01

The first thing we need to know before starting to calculate our vertical structure is what size solar panels we want to install, both in terms of length and width as well as frame thickness; and the measurements of the components that make it up. This will tell us the length of the set of profiles we need for it.
Every structure will consist of an upper and lower support row, and the number of profiles to be used will always be even.

What measurements are needed to calculate the structure?



Length, width and thickness Pressure measurements

STEP 02

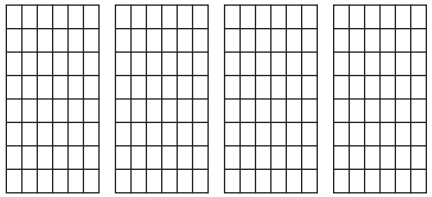
Once we know this, the next question we must ask ourselves is:

How many panels do we want to install on our structure?

Calculating the width of all of them together with the space occupied by the central and end pressers we use and the established safety measure will enable us to determine the number and size of the profiles we need and the total length of the top and bottom rows, which will always have the same measurements as they are identical.

How many panels are we going to install?

Example: Let us imagine that we want to place 4 panels along our structure and that these measure 2102 x 1040 x 35mm. Let us multiply their width by the total number of panels.



1040 x 4 = 4160mm

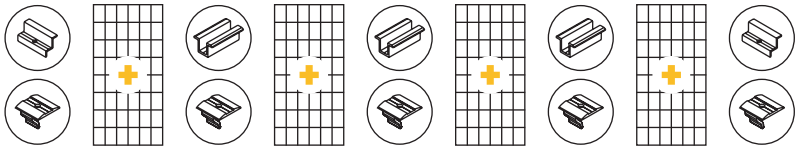
STEP 03

Once the previous step has been completed, we need to know how many central, end or universal clamps per row we need to use and how much space they will occupy.

The number of central clamps per row of profiles will always be the total number of panels available minus one. The number of end clamps per row will always be two. If using universal clamps, we must add the central clamps (the total number of panels minus one) and the two end clamps.

How many central and side pressers do we need?

Example: For 4 panels, we will need 3 central clamps and 2 end clamps, or 5 universal clamps per row, which we will multiply by 2, as a structure consists of a lower and upper row.



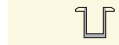
x2

Let us now examine the space occupied by these pressers along the length of the row.

The internal size of the central clamps (TS-T01) is **25mm** between panels.
The size of the end pressers (TS-Z01) will be **21mm** (panels with a 35 mm frame) or **26mm** (panels with a 30mm frame) at the end of each row of panels.
The size of the universal pressers is **28mm** as omega and **34mm** as zeta.

How much space do our presses take up?

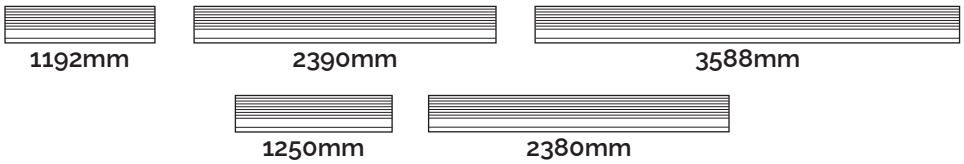
Example: The space per row for the three central clamps and two end clamps for four panels will be given by the sum of all of them. It should be noted that for panels with a thickness of 30mm, the end clamp will measure 26mm(1), and for panels with a thickness of 35mm, it will occupy 21mm(2). If universal pressers are chosen, the thickness of the panel (30–35mm) does not affect the space, but it does change depending on the profile: 34 mm(4) for zeta (Z) and 28mm(3) for omega (T).

		
21/26mm	25mm	34/28mm
26 x 2 = 52mm(1) **21 x 2 = 42mm(2)**	**25 x 3 = 75mm**	**34 x 2 = 52mm(1)** **28 x 3 = 84mm(2)**

We must leave a **safety margin** of **10 mm** on each side of the rows of our structure to prevent assembly problems.

STEP 04

Once we have the total measurements of the set of panels and components that will be arranged in our structure, the next step is to choose the size of the TS-D2 profiles we want to use. The profiles are sold in various sizes:

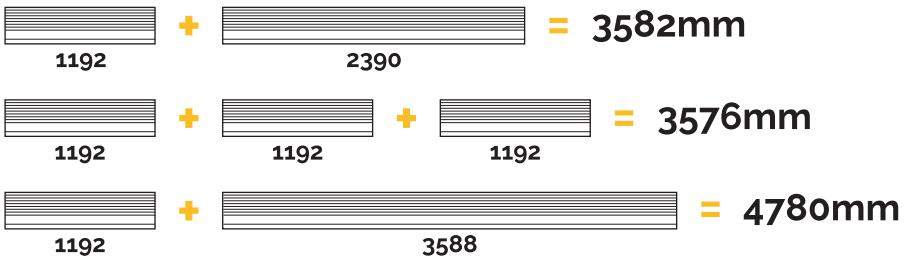


To achieve the required size obtained after completing the previous steps, remember that we must take into account the number of panels, central, end or universal pressers and the safety measure; we simply need to combine the different profiles according to the parameters we consider appropriate.

Which profiles should you choose?

Example: If we add 4160+75+42+20, the result will be 4297mm. Therefore, each of our rows with their profiles will have to measure at least that amount.

To save material, assembly time, or transport time, it is best to study the most suitable combination for the characteristics of each project.

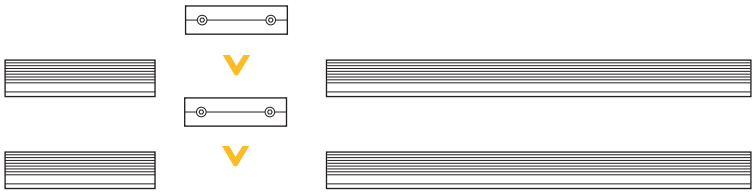


STEP 05

Connections between profiles are necessary to keep them together in the same row, while also reducing the number of surface fixings required. The quantity to be chosen will depend on the number of profiles selected for the structure and will always be obtained by subtracting two from the total number of profiles.

How many profile joints do we need?

Example: If we have decided to use two 1192mm profiles and two 3588mm profiles for our four-panel structure, the number of joints required will be two (4 profiles - 2 = 2 units), one for the top row and one for the bottom row.



STEP 06

The final step in dimensioning the structure is to calculate the number of surface fixings required, the total quantity of which is determined by the spacing between the profiles along the row. We recommend a distance of between **1000mm**, which provides excellent fixation, and **1500mm** for coplanar structures, and **1400mm** for inclined structures.

The surface fastening must always be at a **maximum distance of between 100 and 400mm from the ends of the profile**.

How many surface fixings will we need??

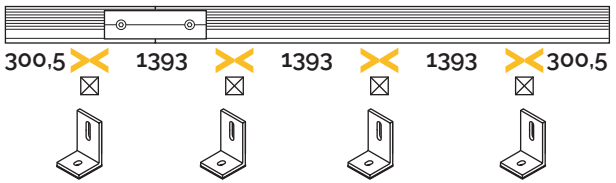
Example: Given that the sum of the profiles is 4780mm and we must respect a distance from the end of the profile of between 100 and 400mm on each side, we see that if we wanted to place only three surface fixings per row, the distance between legs, 2090 mm, would not be adequate. Let us look at the following calculation:

4780 – (300 x 2) / 2 = 2090mm

In this case, it is divided between two, bearing in mind that we would have three surface fixings per row..

4780 – (300 x 2) / 3 = 1393mm

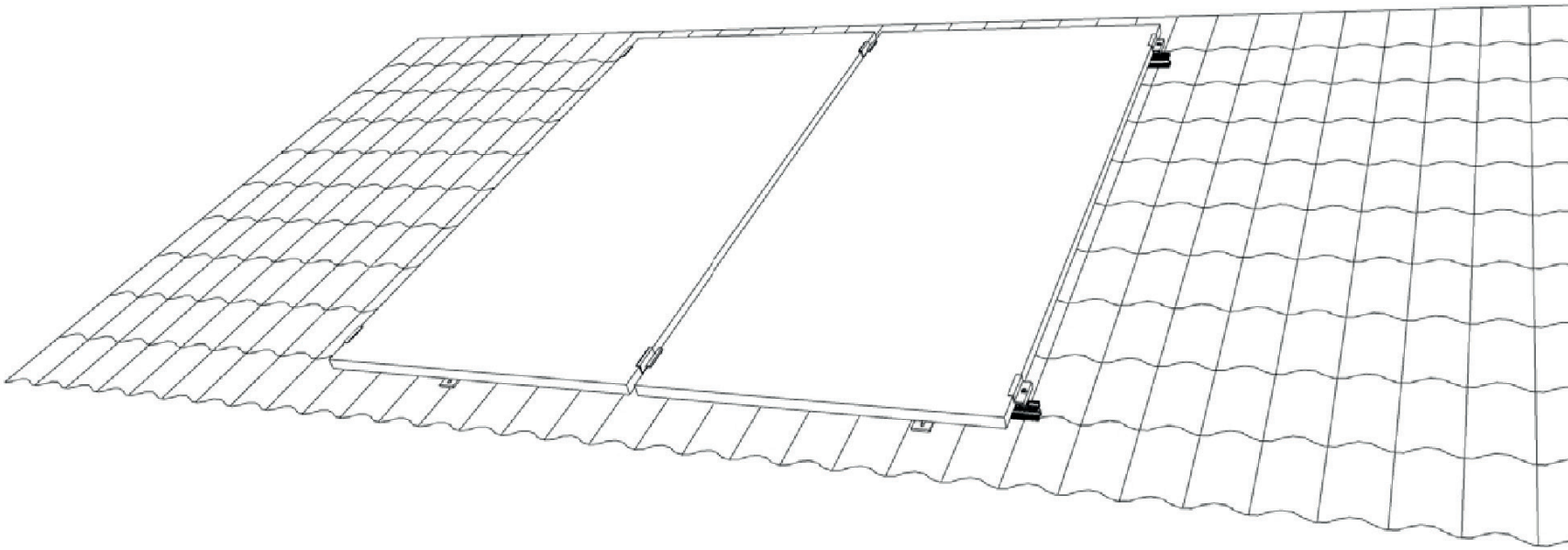
Having four surface fixings per row would be the optimal option.



For our 4-panel structure, given that we will always have even rows,
we need a total of 8 surface fixings, 4 for the top row and 4 for the bottom row.

STEP 07

The final step, once the distances between the rows of our structure have been established, is to determine the **vertical** distance at which the fixings should be placed on the surface. This will be determined by the distance between the profile fastenings to the panel and the angle of inclination, if any. These will be given by the range of distances and pressure points defined by the manufacturer, as well as those necessary to achieve the desired angle of inclination.



General safety information

To increase safety during the installation process and ensure greater stability of the PV modules, please read these recommendations and information carefully.

Before installation:

+ Upon arrival of the material, check that you have the correct quantities of each item.
+ Check that the installation site is suitable. Ensure that the ceilings are clean and dry, and that they are flat and free of irregularities.
+ The installation and handling of structural elements must be carried out by qualified personnel.

During installation:

+ Equip yourself with the appropriate equipment and follow safety regulations and occupational risk prevention guidelines to avoid accidents.
+ Follow general lightning protection advice. It is advisable to consult a specialist and check the weather before installation.
+ It is advisable to carry out the assembly with at least two people for greater safety in case of emergency.
+ Consult the photovoltaic module manufacturer's instructions regarding the assembly of solar panels on structures.
+ Leave a distance of at least 500 mm between the edges of the roof or other objects and the installation.
+ It is recommended not to install more than 20 panels in a continuous row. A small gap between adjacent rows will prevent expansion problems.

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