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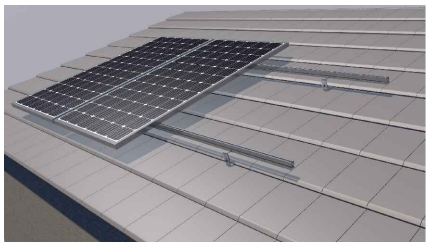
Solar Mounting Systems

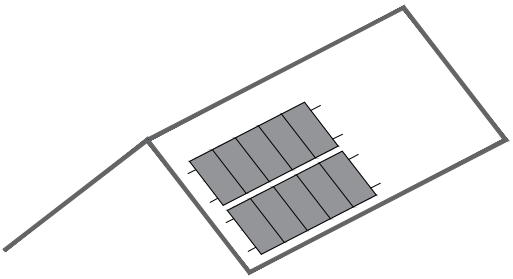
# 02.4V-EN

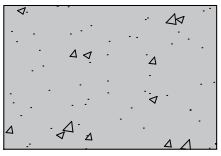
# Installations



**Select**

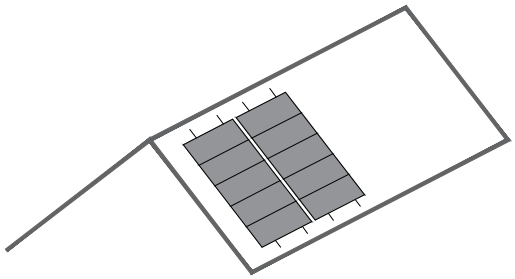
## Portrait

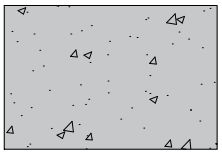




Concrete slab

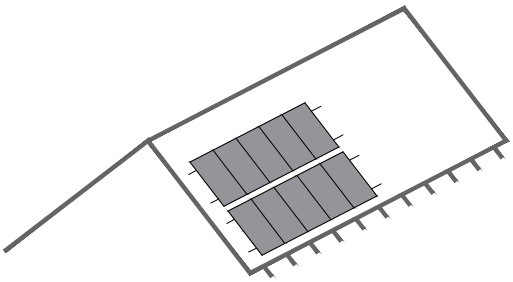
## Landscape





Concrete slab

## Portrait



Wooden beam

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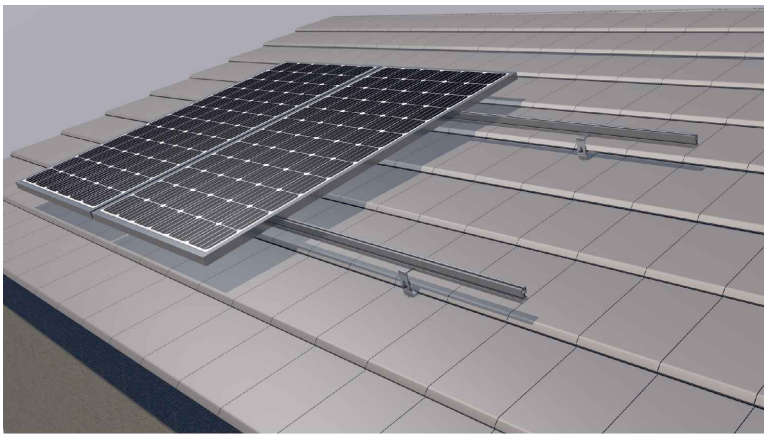

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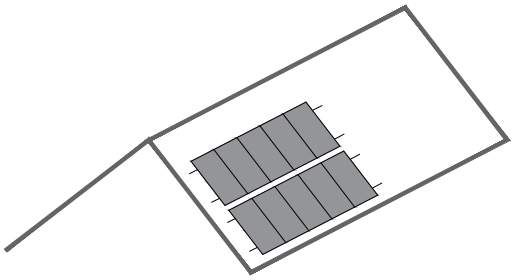

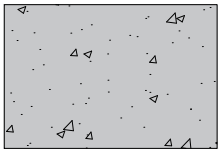

Concrete slab

Return

**Sunfer Estructuras, S.L.U.**
Camino de la Dula s/n
Albalat de la Ribera - 46687 (Valencia) Spain

100% ES19/86524 CE

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# Contents

1. General information
2. Kit contents
3. Portrait assembly
4. Anchoring technical information
5. Maximum loads and reactions
6. Installation area
7. Installation Video
8. Certifications and guarantees



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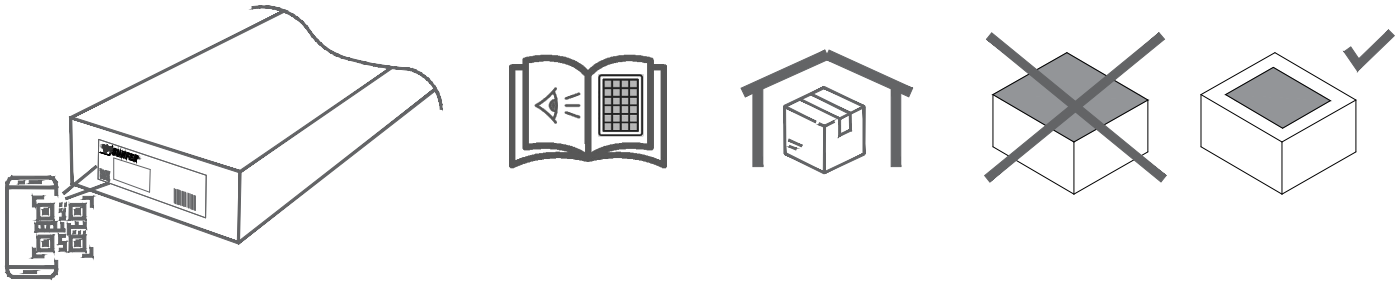
## General Information and Recommendations ENG

- All installation instructions and product specifications provided must be adhered to.
- Check the condition of the roof covering and the carrying capacity of the same. The management overseeing installation is responsible for verifying that the substructure of the roof as well as the static structure of the building itself is capable of supporting additional loads before any installation is carried out.
- The mounting must always be anchored to the structure of the roof.
- The surface of the roof covering must be clean and dry. Any major irregularities of the roof must be corrected or eliminated.
- To avoid turbulence from wind a minimum security distance (defined by regulations) must be maintained between the photovoltaic installations and roof edges, as well as other obstacles such as chimneys or vents.
- In the case of chimneys or other features which may need future maintenance, a minimum distance must be maintained in order to facilitate said maintenance or to extinguish fires. This distance shall be either 1m or that suggested by the relevant authority, whichever is greater.
- Place solar panels such that they are distributed symmetrically along the support, leaving equal overhangs at each end.
- Clamps must not be tightened using impact drivers.
- Check the weathertightness of the mount once fastened.
- Check that the support attachment points are compatible with the solar panel manufacturer's specifications.
- Uninstallation must be carried out in the reverse order from the installation.
- We reserve the right to make changes to our products at any moment without prior warning if, from our point of view, the changes are necessary for the improvement of the product. All illustrations in plans and catalogues are for example only and therefore may differ from the actual product provided.
- During the shipping of products take extreme care to maintain the integrity of the packaging. Store in a dry, well-ventilated area. Minimize exposure to large temperature differences and humidity. Avoid outdoor storage. Avoid sources of dripping water, puddles, splashing, or any other contact with water in the storage area. If the product becomes wet, immediately dry and clean as well as possible. Do not leave the product directly on the floor or ground where it may attract moisture. Store on the shipment's origninal pallet or on shelves.



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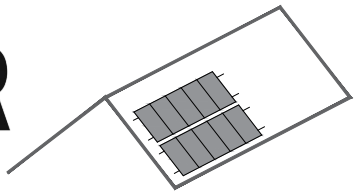
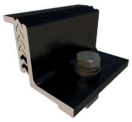


# 02.4V-EN
## Kit Contents


S02.4-EN


S10B-EN


S11B-EN


UG1-EN

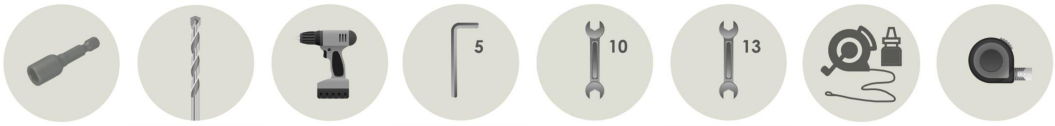

G1-EN-1230


G1-EN-1800

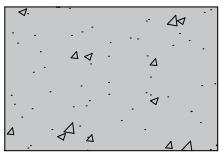

TG1

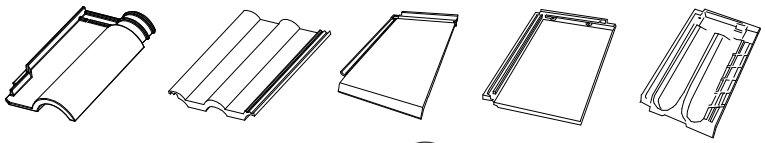

S13

| | S02.4-EN | S10B-EN | S11B-EN | UG1-EN | G1-EN-1230 | G1-EN-1800 | TG1 | S13 |
|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 4 | - | - | 2 | - | 4 | 2 |
| 2 | 4 | 4 | 2 | 2 | 4 | - | 4 | 3 |
| 2 R | 6 | 4 | 2 | 2 | 4 | - | 4 | 3 |
| 3 | 6 | 4 | 4 | 2 | - | 4 | 4 | 4 |
| 3 R | 8 | 4 | 4 | 2 | - | 4 | 4 | 4 |
| 4 | 8 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |
| 4 R | 10 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |
| 4 RR | 12 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |



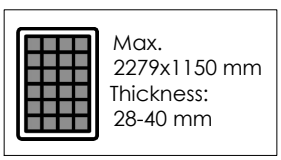

Anchoring surfaces:

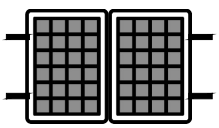

Concrete slab



alu Aluminium profiles of **EN AW 6005A T6**

A Fasteners of **A2-70 stainless steel**



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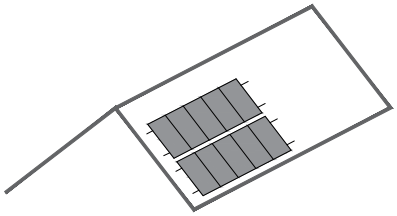
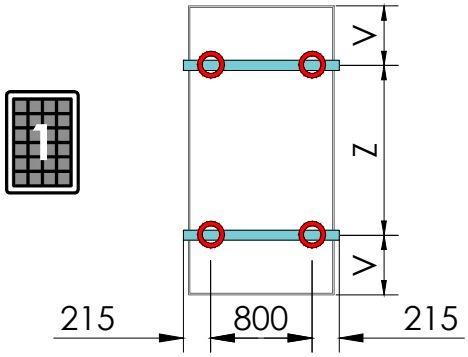
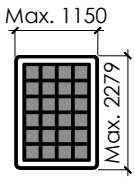
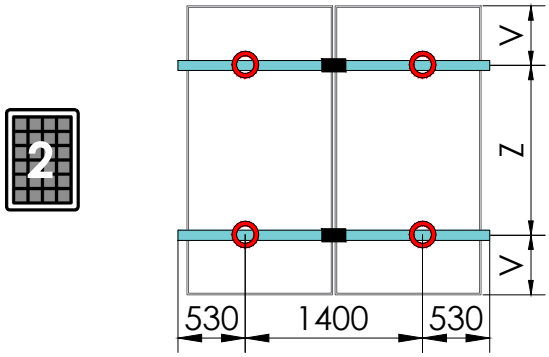
# 02.4V-EN
## Anchoring distances

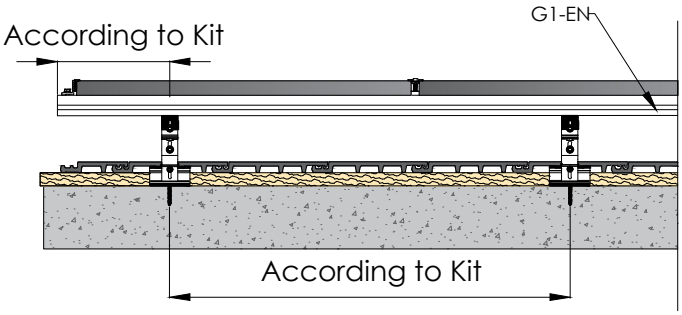
### Portrait

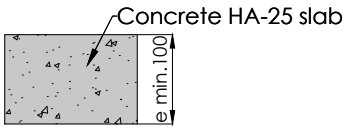


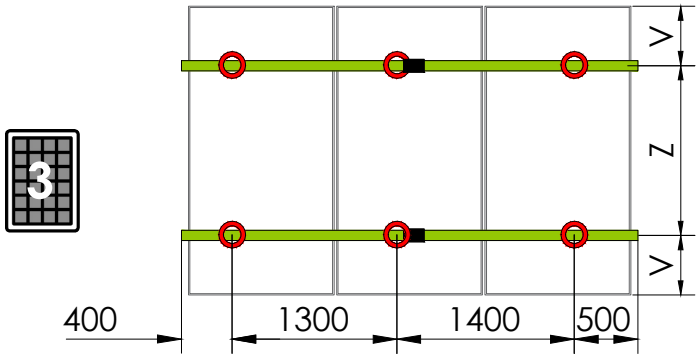


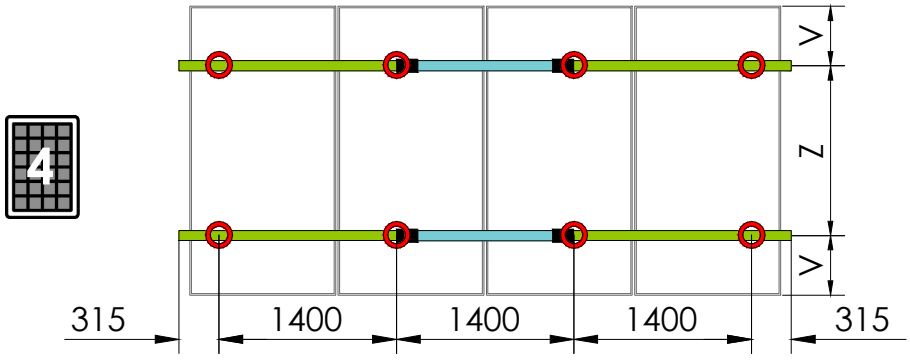



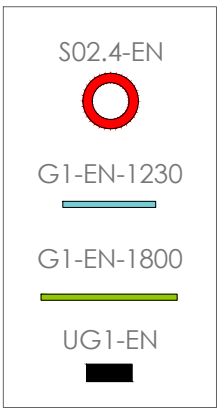




The maximum distance "Z" between profiles and the overhang distance "V" should be determined by consulting the technical datasheets of the solar panel manufacturer.

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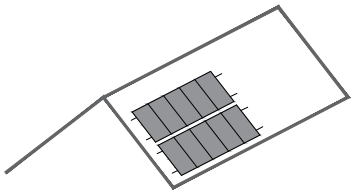
**Portrait**

# 02.4V-EN
## Anchoring distances



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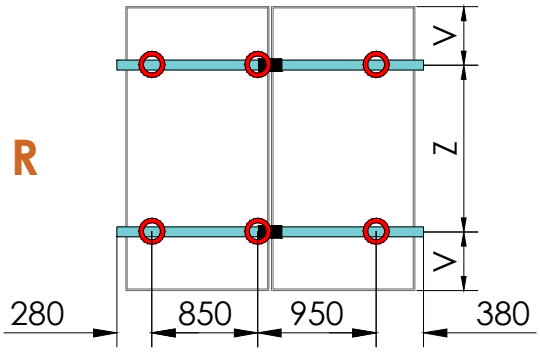


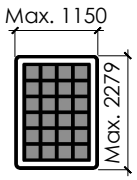


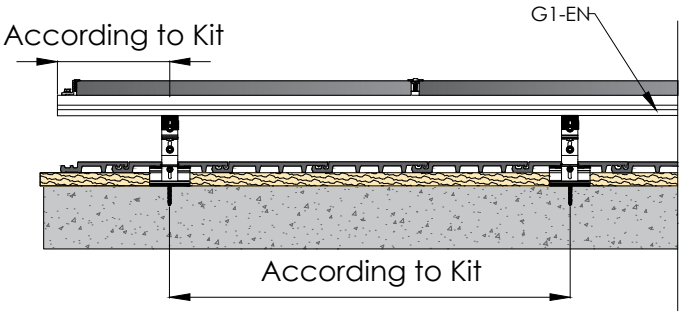


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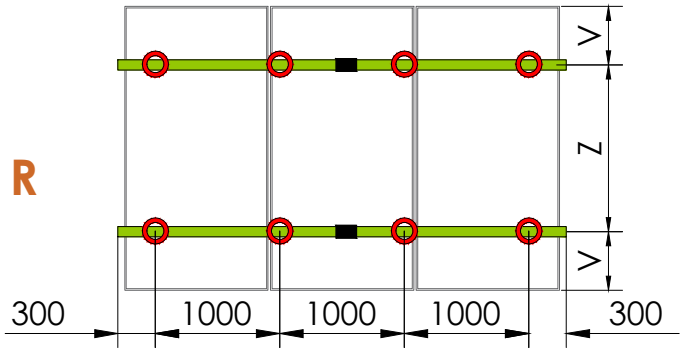


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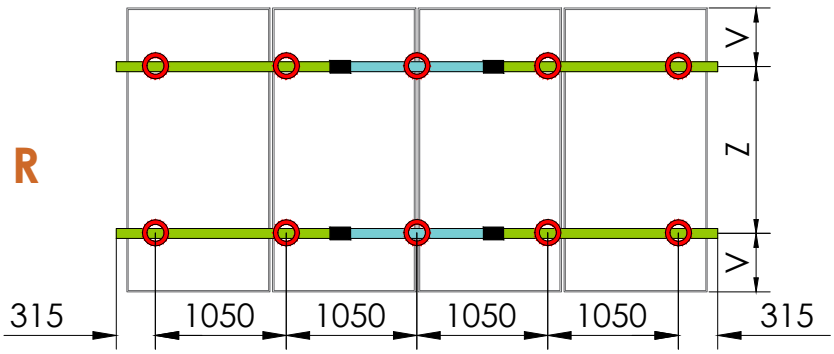


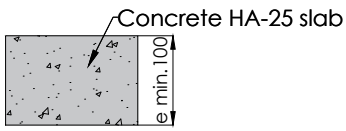


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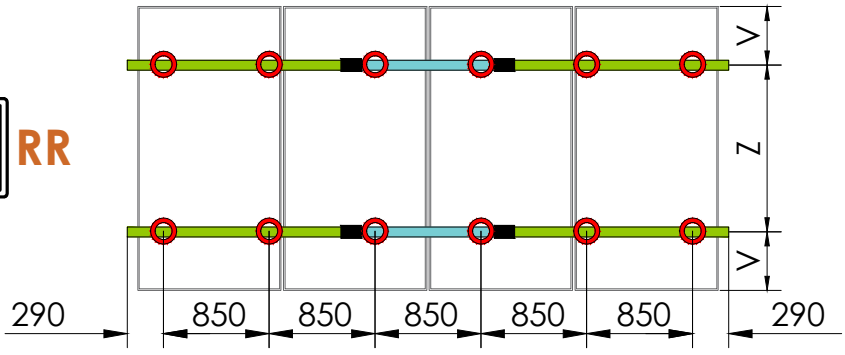


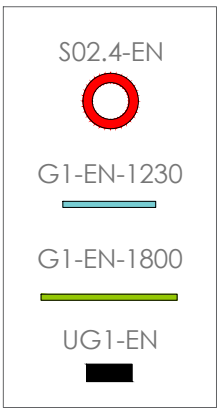


The maximum distance "Z" between profiles and the overhang distance "V" should be determined by consulting the technical datasheets of the solar panel manufacturer.

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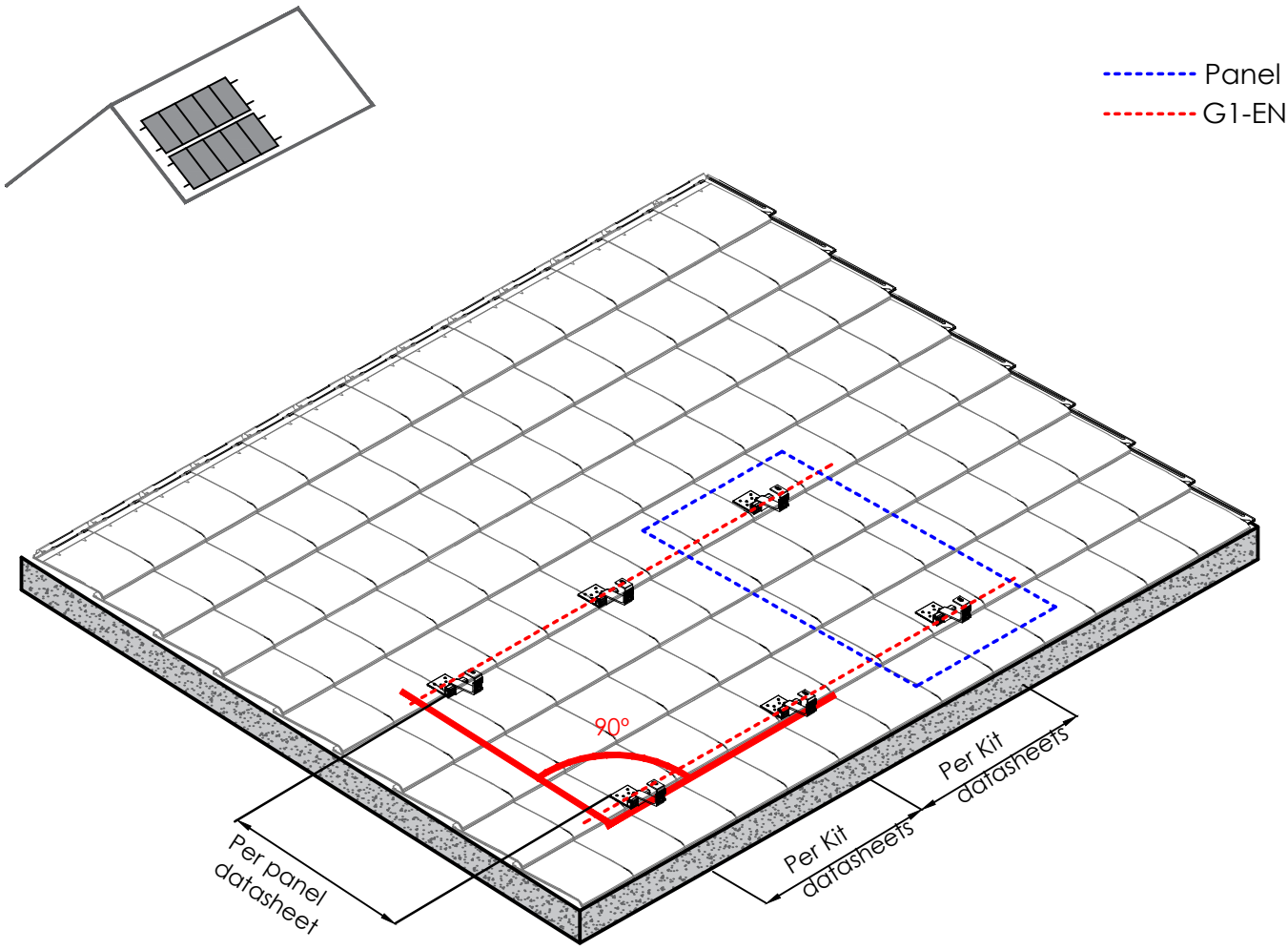
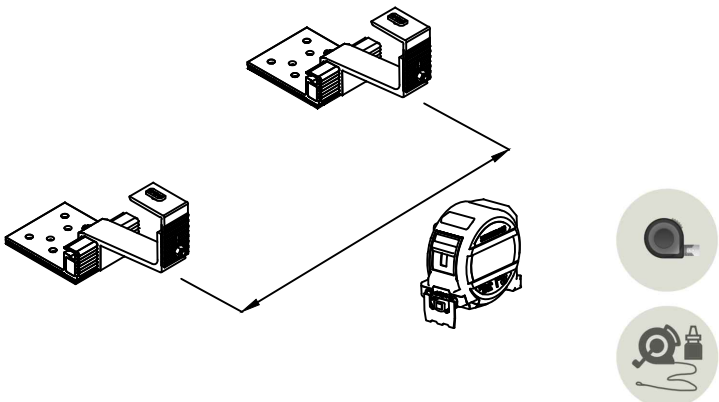
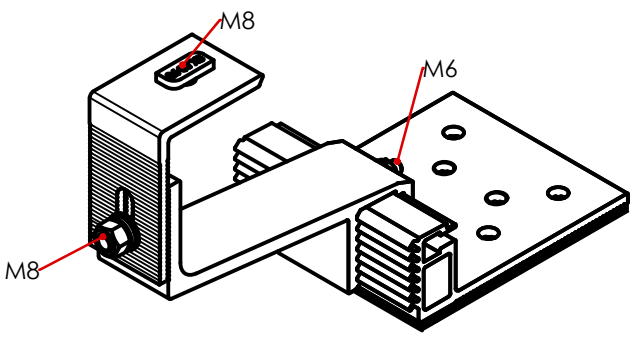
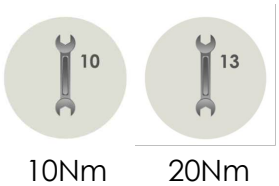
# 02.4V-EN
## Structure mounting






10Nm 20Nm

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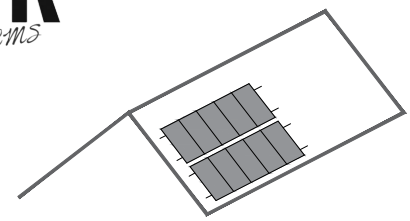
# 02.4V-EN



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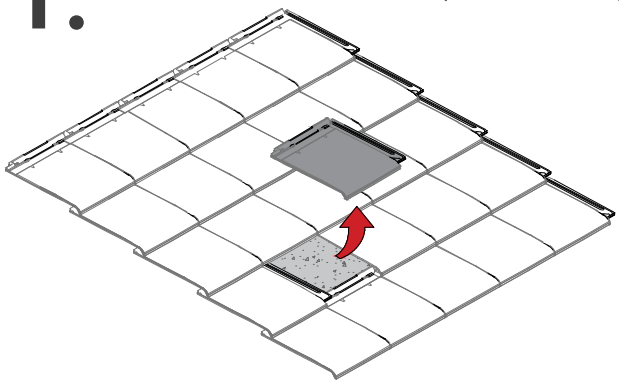
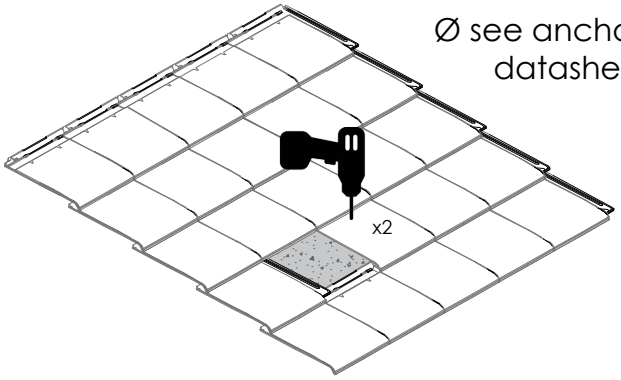
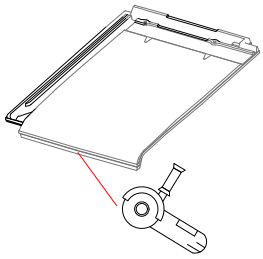
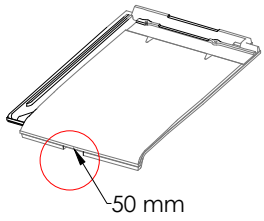


## 2.

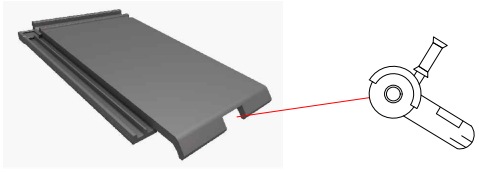
Ø see ancho datasheet






To correctly install the mount, it may be necessary to notch the tile as shown



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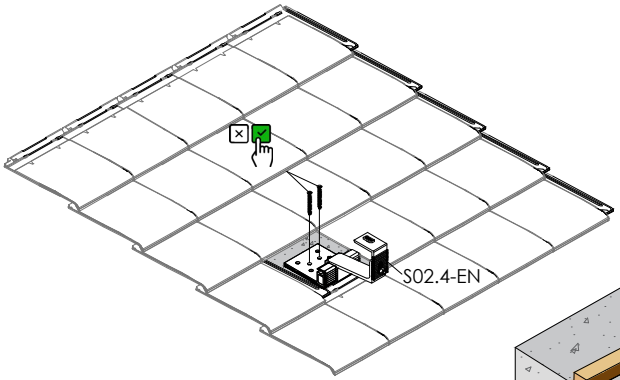


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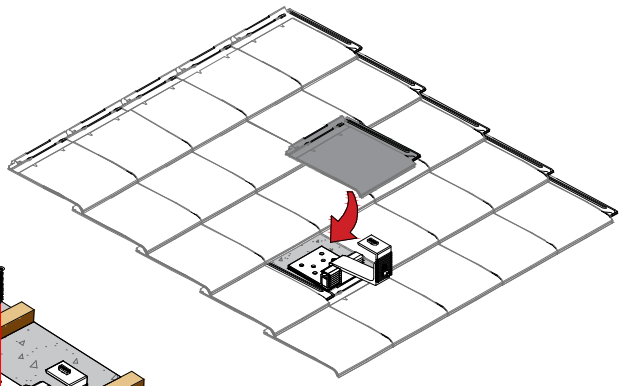

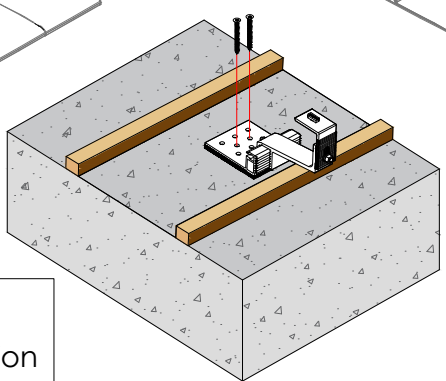

See possible assemblies in anchoring's technical information

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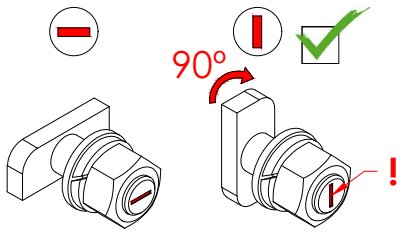
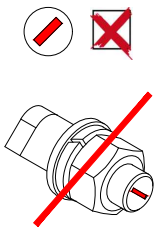
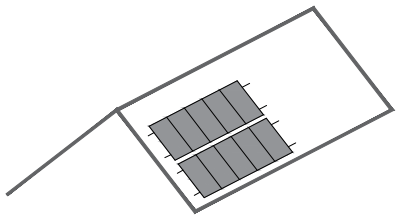
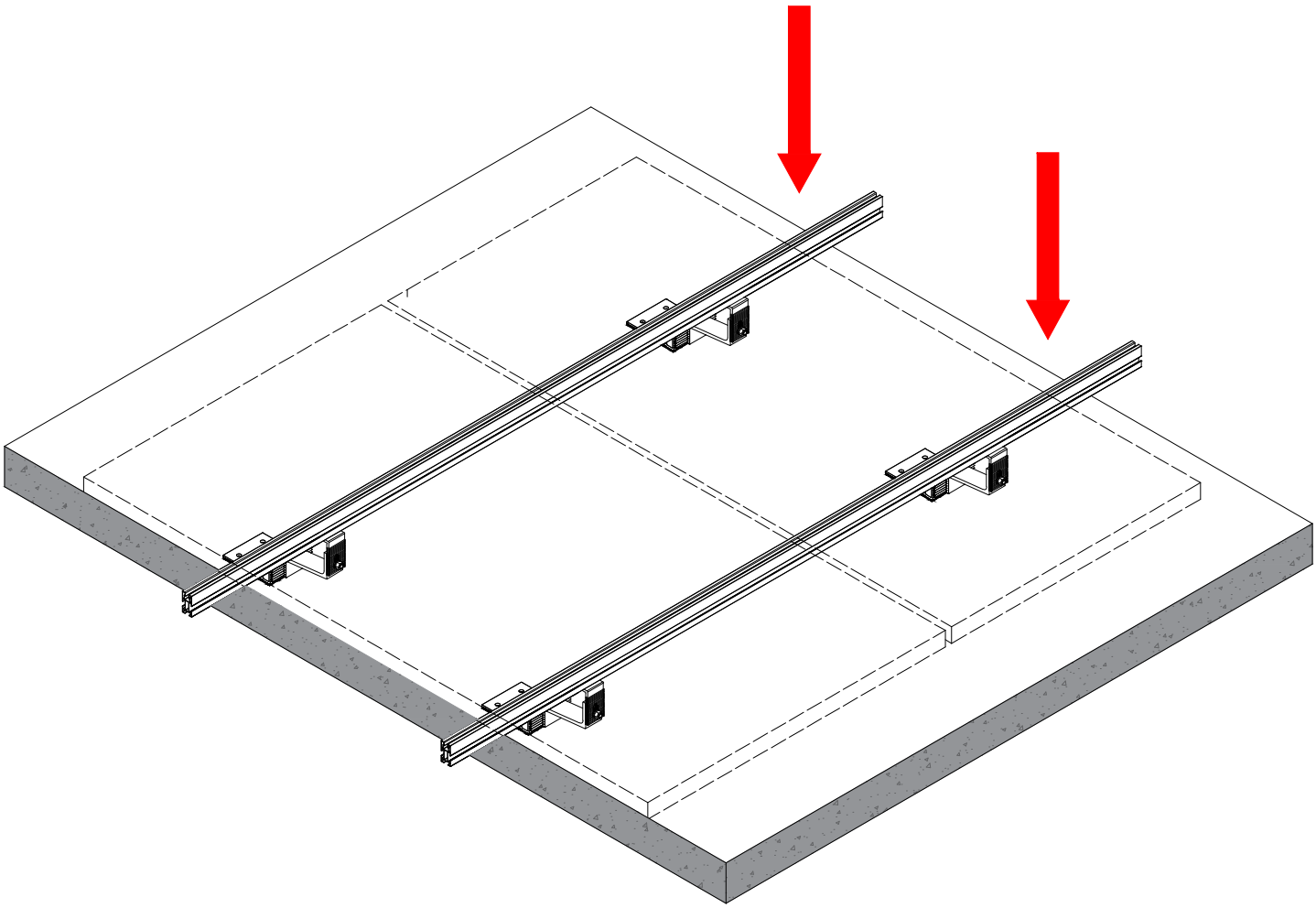
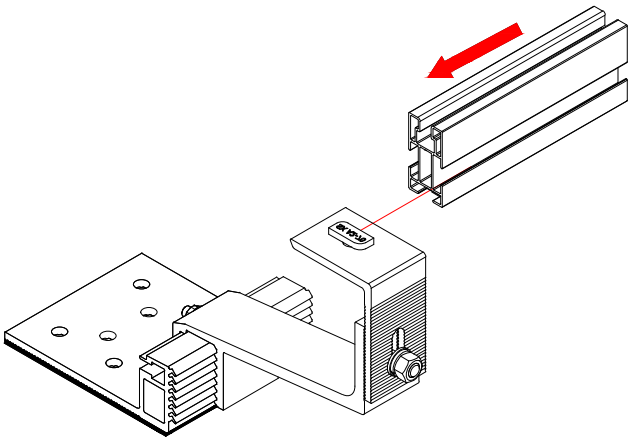



20 Nm







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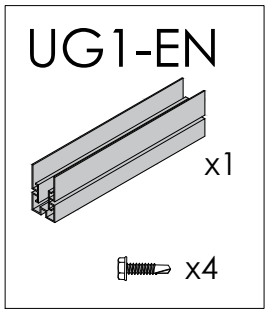
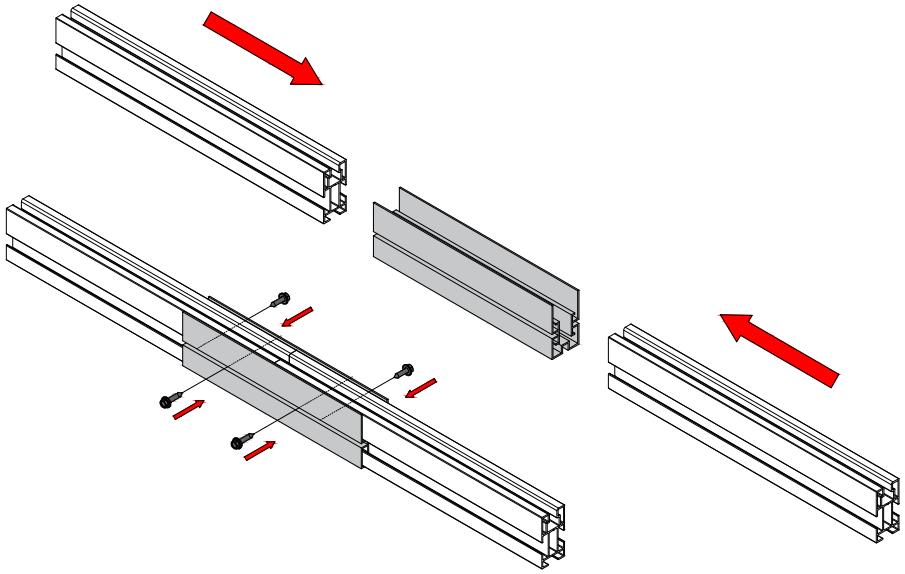
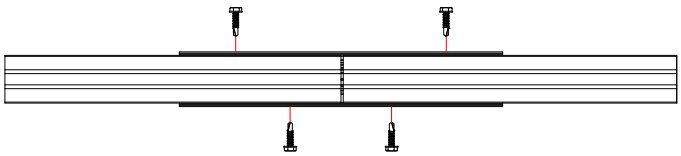
# 02.4V-EN

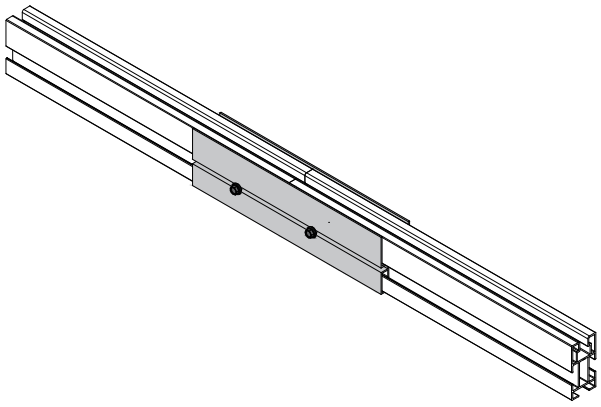

6 Nm




(x4)







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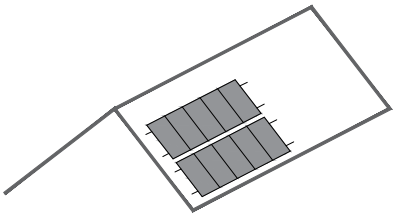
Solar Mounting Systems

# 02.4V-EN
## Module mounting



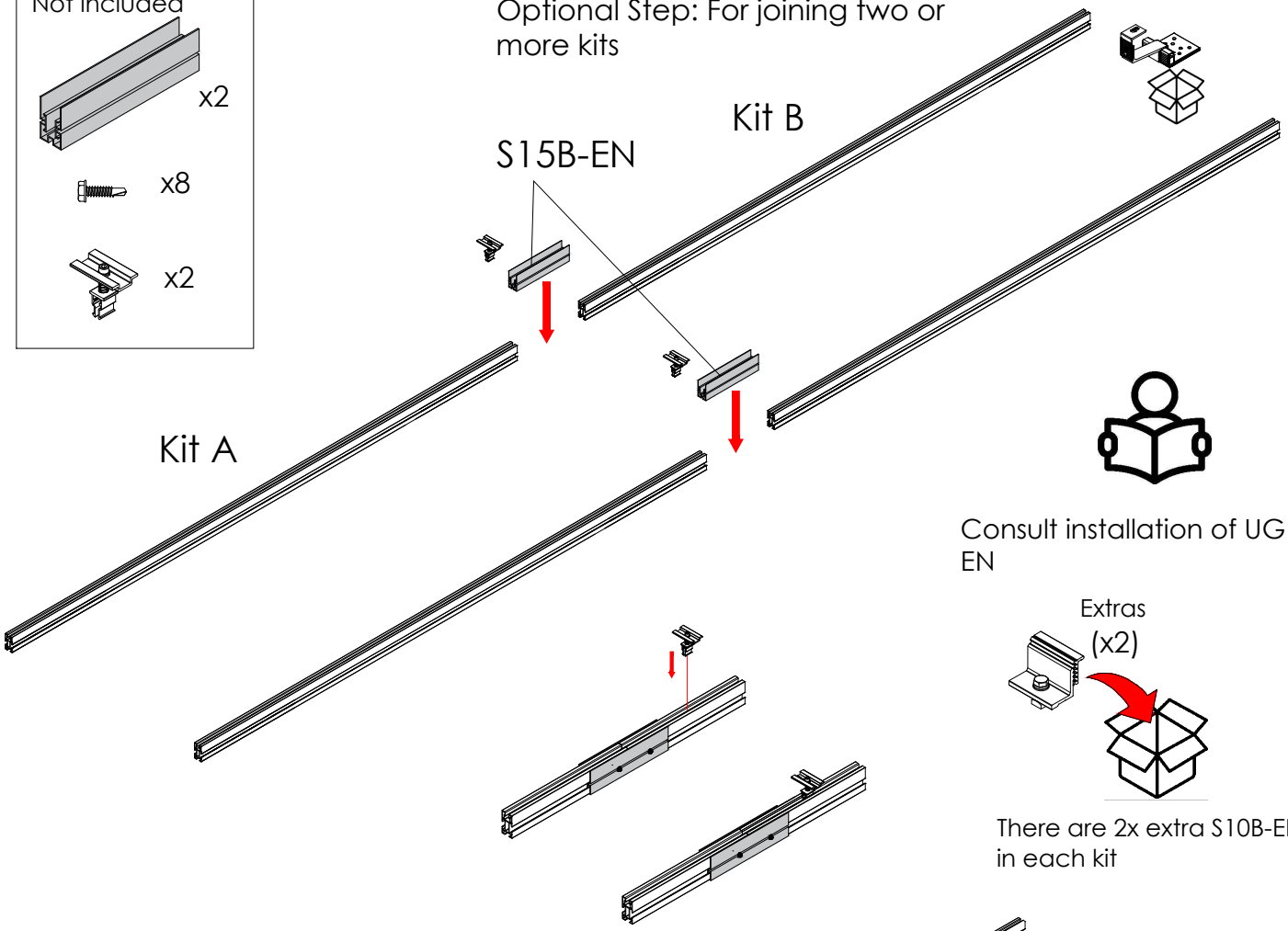
S15B-EN
Not included


x2


x8


x2

**Union Kit**
Optional Step: For joining two or more kits





Consult installation of UG1-EN

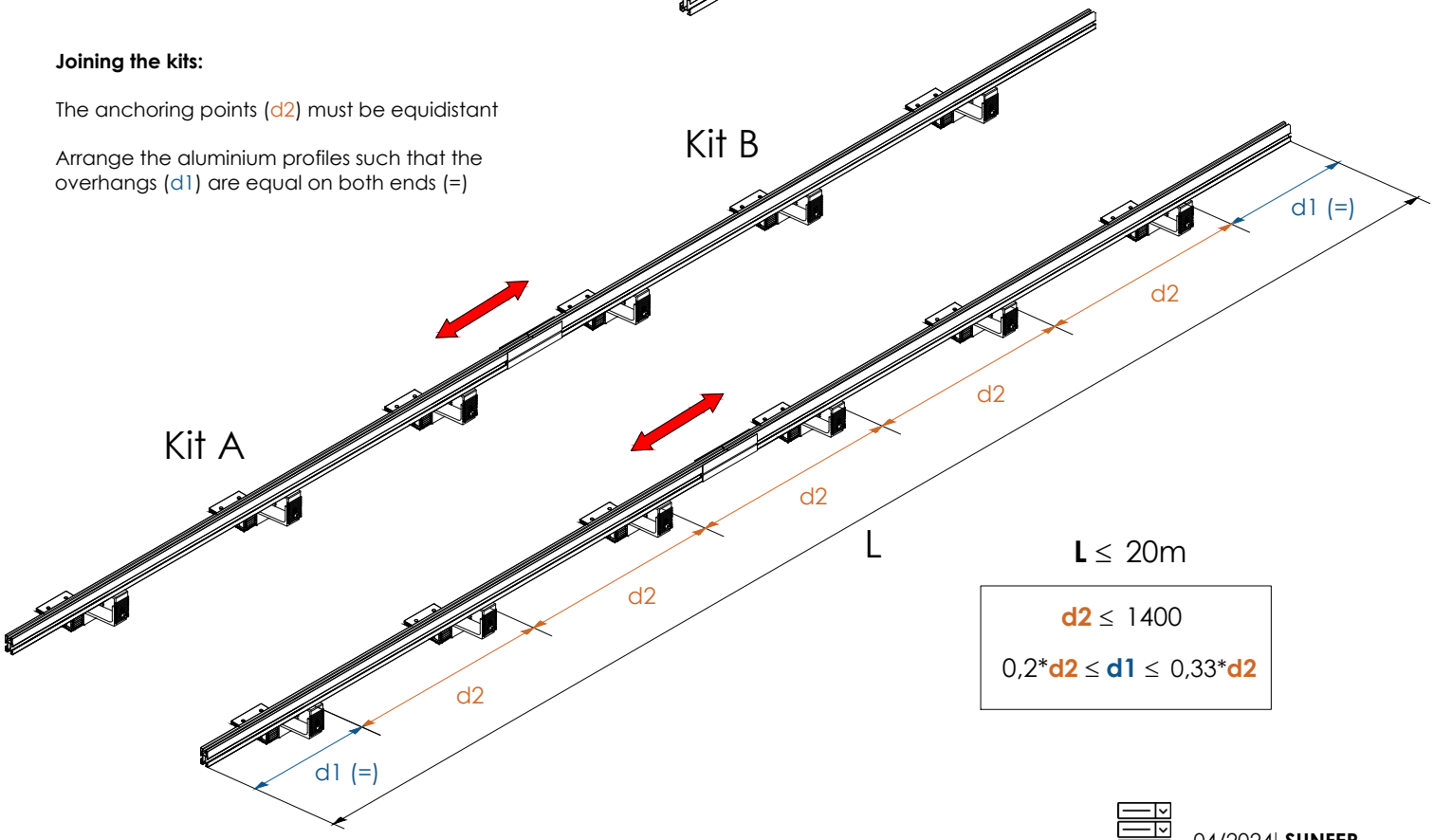
Extras
(x2)


There are 2x extra S10B-EN in each kit

**Joining the kits:**

The anchoring points (d2) must be equidistant

Arrange the aluminium profiles such that the overhangs (d1) are equal on both ends (=)




**L** ≤ 20m

**d2** ≤ 1400

0,2***d2*** ≤ **d1** ≤ 0,33***d2***

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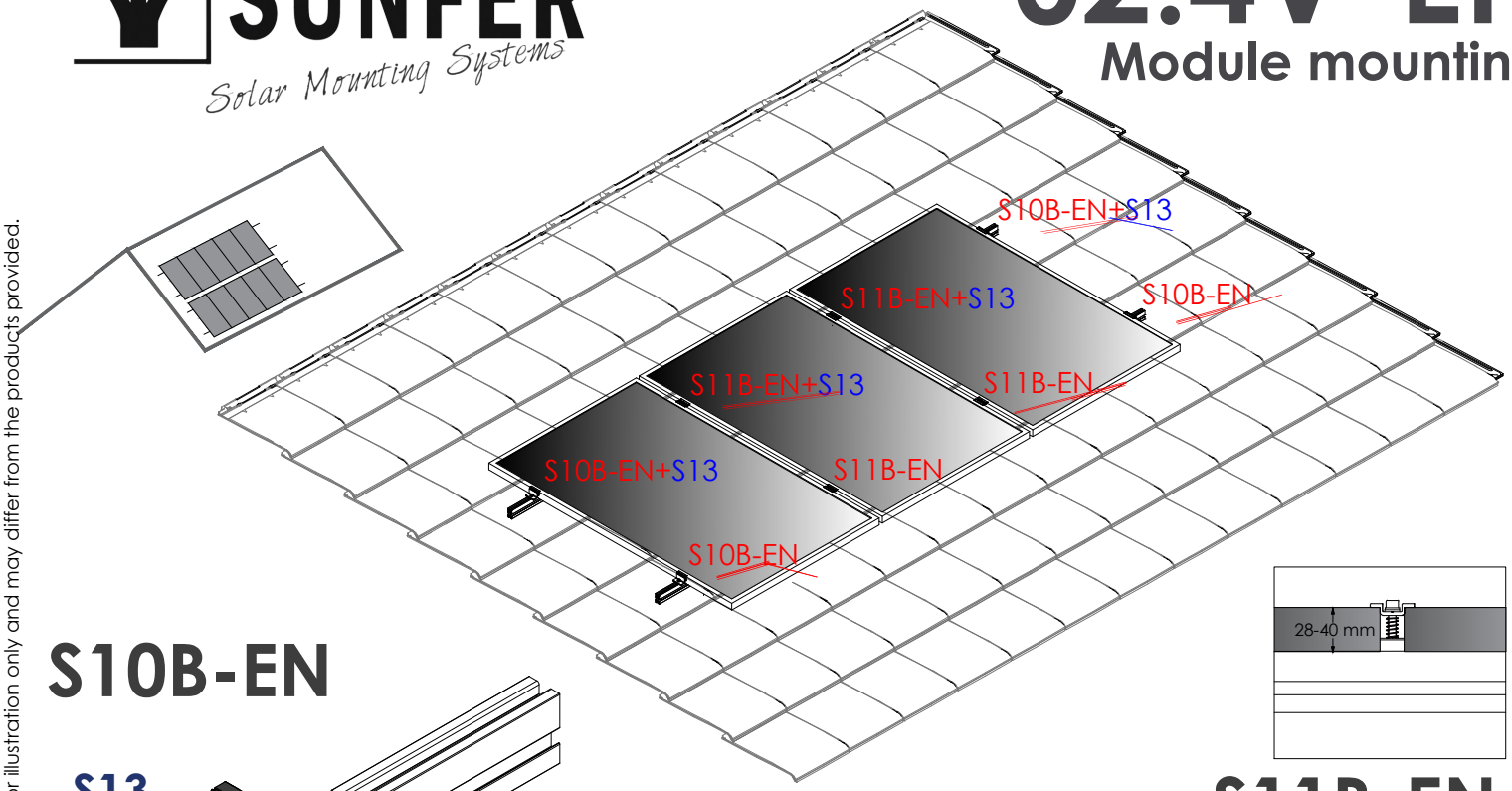
# 02.4V-EN
## Module mounting

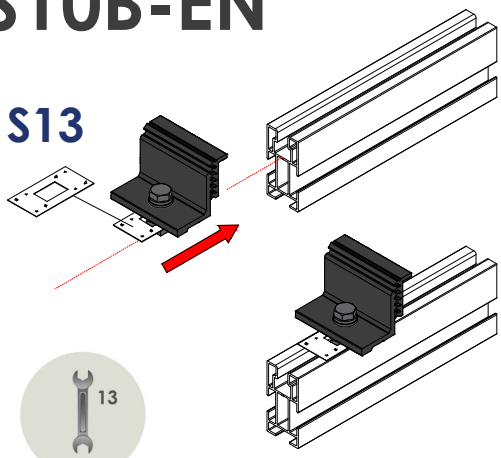






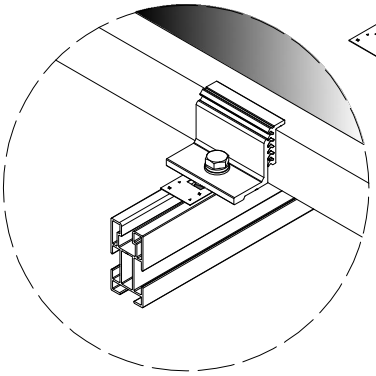
## S10B-EN

### S13



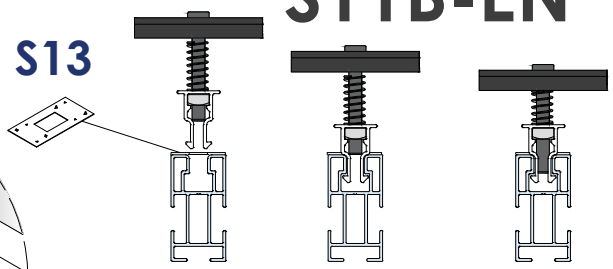



7 Nm



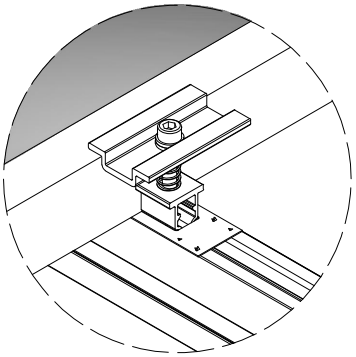
## S11B-EN

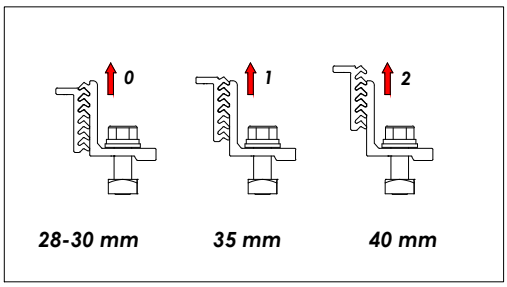
### S13

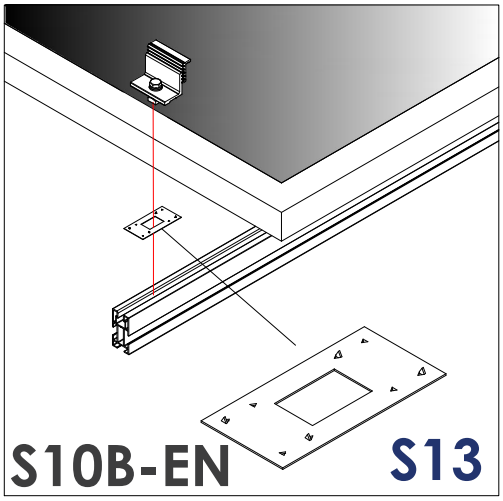


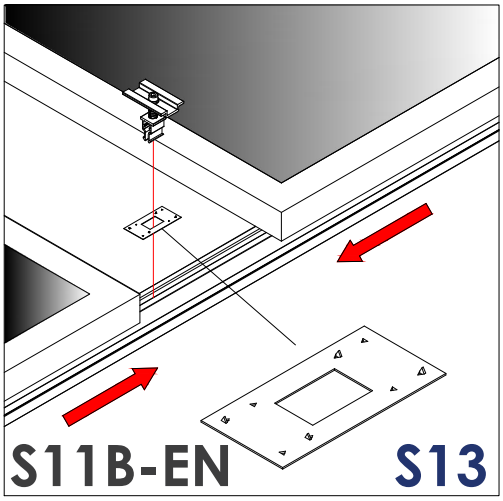


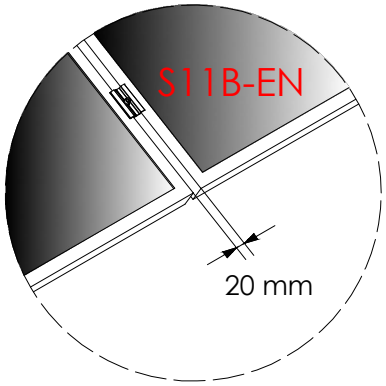
7 Nm





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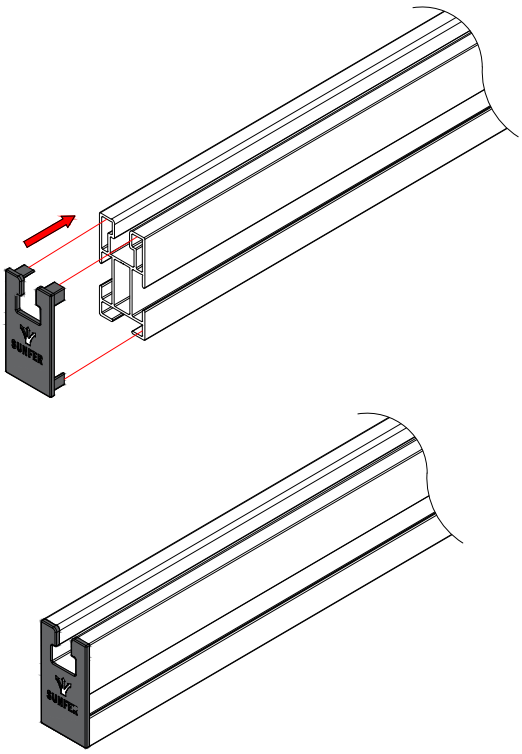
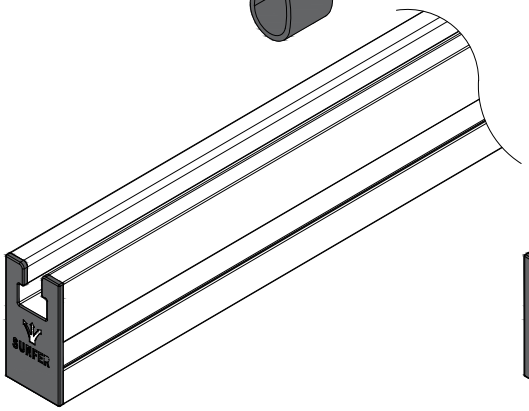
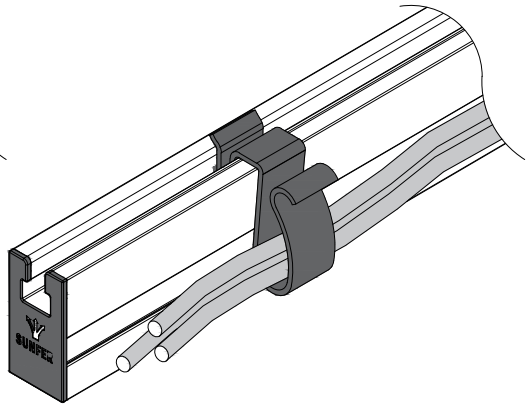
Solar Mounting Systems

# 02.4V-EN



**Optional cable clip**
(Not included)





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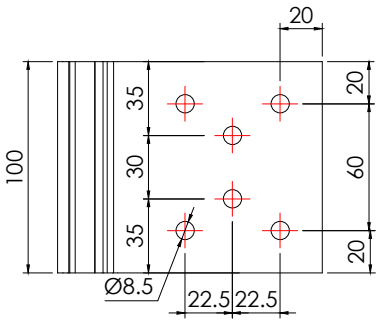
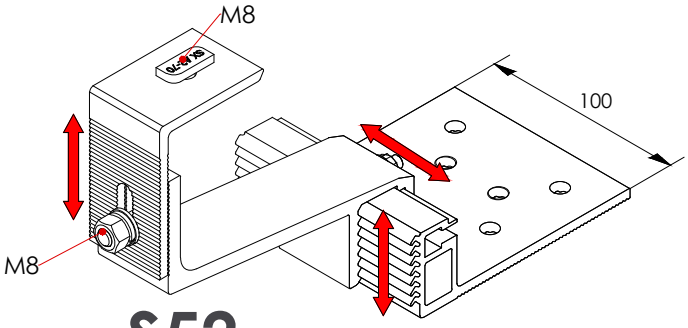
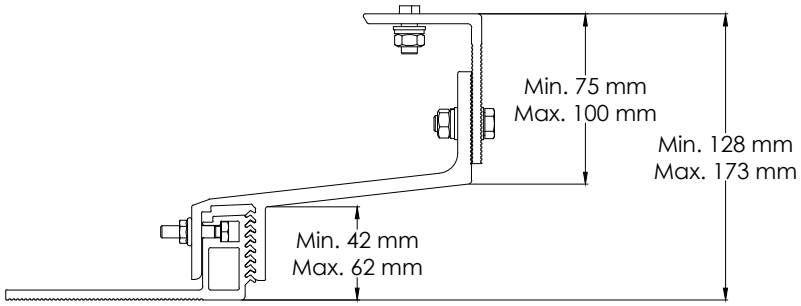
# 02.4V-EN
# S02.4-EN

## Anchoring technical information

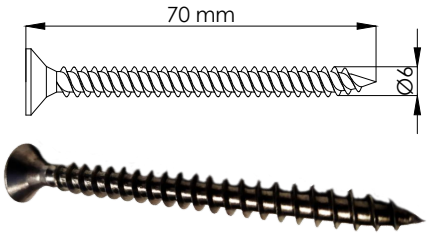



## S52

**Characteristics**
Flat head screw.
A2 AISI 304 Stainless Steel
Anchoring surface:
Wood of class C24 or better

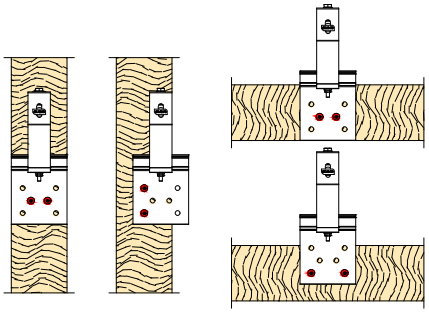



**Technical Specifications:**
Screw length: 70 mm.
Screw diameter: 6 mm.
Pre-drill diameter 4 mm
Suggested torque: 6 Nm

**Screw Fastening Strength :**

| **Metric** | **Pull-out [KN]** |
|---|---|
| 6 | 7.1 |

## Assemblies



| | |
|---|---|
| Description | Coplanar support |
| Panel arrangement | Portrait/Landscape |
| Format | KIT of 1 to 4 panels |
| Union kit | S15-EN not included (optional) |
| Application | Tile roof |
| Anchoring material | Wooden beams |
| Type of fasteners | Screwed - S52 coarse flathead screw |
| Mount/hook | S02.4-EN |
| Profile | G1-EN |
| Earthing ground | S13 |
| Maximum panel dimensions | 2279x1150 mm |
| Panel thickness | from 28 to 40 mm |
| Materials | Fasteners: A2-70 stainless steel<br>Profiles: Raw or anodized EN AW 6005A T6 aluminium<br>Foam rubber weather seal |
| Maximum load | According to configuration |
| Structural calculations | Model checked and simulated per EUROCODE 9 "STRUCTURES OF ALUMINIUM" |

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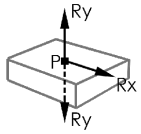
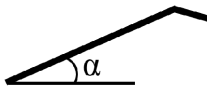
Solar Mounting Systems

# 02.4V-EN
## Loads and reactions




## Maximum admissible loads and their reactions




**5° Pitch**

**10° Pitch**

**15° Pitch**

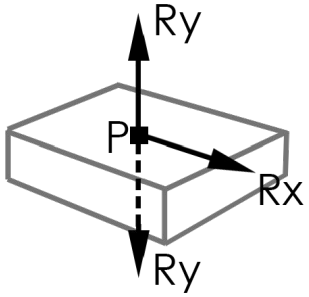
**20° Pitch**

**25° Pitch**

**30° Pitch**

**35° Pitch**

**40° Pitch**




- P: Mount Point
- Rx: Shear generated at anchor
- Ry: Tension generated at anchor, compression applied to roof

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Solar Mounting Systems

# 02.4V-EN
## Loads and reactions

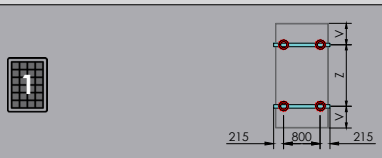
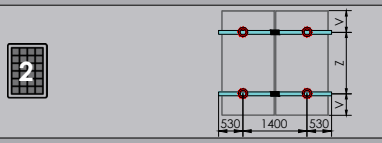
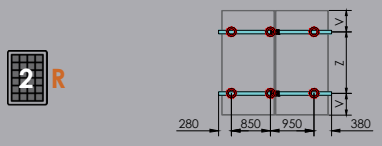
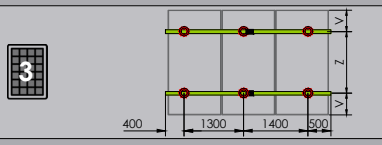
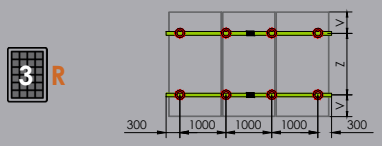
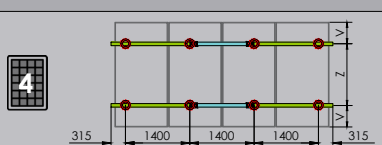
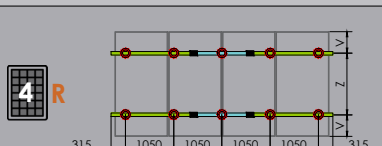
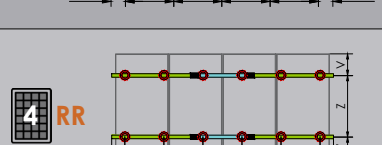
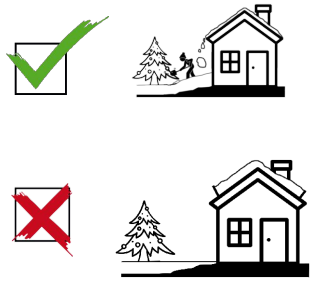
| Maximum Admissible Loads and Their Reactions | | | | | 5° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
|  1 | 110 | 263 | 0.32 | 0.00 | 1.85 |
| | 130 | 265 | 0.26 | 0.03 | 1.53 |
| | 150 | 265 | 0.26 | 0.10 | 1.54 |
| | 180 | 265 | 0.26 | 0.22 | 1.57 |
| | 210 | 265 | 0.26 | 0.36 | 1.60 |
| | 250 | 265 | 0.26 | 0.58 | 1.65 |
|  2 | 110 | 122 | 0.31 | 0.00 | 1.85 |
| | 130 | 150 | 0.31 | 0.06 | 1.85 |
| | 150 | 147 | 0.30 | 0.20 | 1.85 |
| | 180 | 142 | 0.29 | 0.43 | 1.85 |
| | 210 | 136 | 0.28 | 0.71 | 1.86 |
|  2 R | 110 | 165 | 0.25 | 0.00 | 1.85 |
| | 130 | 204 | 0.25 | 0.04 | 1.85 |
| | 150 | 201 | 0.25 | 0.12 | 1.85 |
| | 180 | 196 | 0.24 | 0.27 | 1.85 |
| | 210 | 189 | 0.23 | 0.44 | 1.85 |
| | 250 | 179 | 0.22 | 0.72 | 1.85 |
|  3 | 110 | 97 | 0.26 | 0.00 | 1.86 |
| | 130 | 119 | 0.26 | 0.07 | 1.86 |
| | 150 | 116 | 0.25 | 0.20 | 1.86 |
| | 180 | 110 | 0.24 | 0.45 | 1.85 |
| | 210 | 104 | 0.23 | 0.73 | 1.85 |
|  3 R | 110 | 143 | 0.22 | 0.00 | 1.85 |
| | 130 | 176 | 0.22 | 0.04 | 1.85 |
| | 150 | 173 | 0.21 | 0.12 | 1.85 |
| | 180 | 168 | 0.21 | 0.27 | 1.85 |
| | 210 | 162 | 0.20 | 0.44 | 1.85 |
| | 250 | 152 | 0.19 | 0.71 | 1.85 |
|  4 | 110 | 95 | 0.22 | 0.00 | 1.86 |
| | 130 | 116 | 0.22 | 0.06 | 1.85 |
| | 150 | 113 | 0.21 | 0.18 | 1.85 |
| | 180 | 108 | 0.21 | 0.39 | 1.86 |
| | 210 | 101 | 0.20 | 0.64 | 1.85 |
|  4 R | 110 | 134 | 0.20 | 0.00 | 1.85 |
| | 130 | 166 | 0.20 | 0.04 | 1.85 |
| | 150 | 163 | 0.20 | 0.12 | 1.85 |
| | 180 | 157 | 0.19 | 0.26 | 1.85 |
| | 210 | 151 | 0.18 | 0.43 | 1.85 |
| | 250 | 141 | 0.17 | 0.69 | 1.85 |
|  4 RR | 110 | 172 | 0.19 | 0.00 | 1.85 |
| | 130 | 213 | 0.19 | 0.03 | 1.85 |
| | 150 | 210 | 0.19 | 0.09 | 1.85 |
| | 180 | 205 | 0.18 | 0.20 | 1.85 |
| | 210 | 198 | 0.18 | 0.32 | 1.85 |
| | 250 | 188 | 0.17 | 0.52 | 1.85 |

**Table 1** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

SUNFER
Solar Mounting Systems

# 02.4V-EN
## Loads and reactions

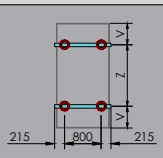
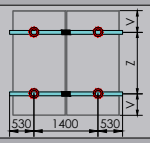
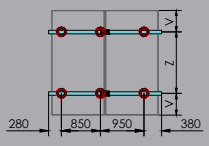
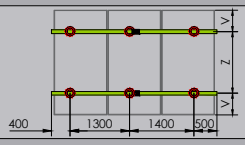
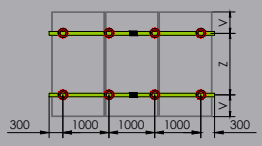
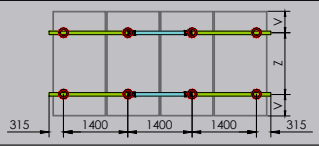
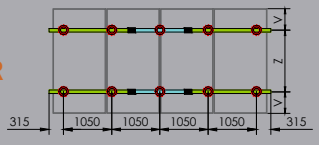
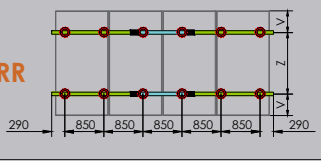
| Maximum Admissible Loads and Their Reactions | | | | | 10° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1   | 110 | 265 | 0.63 | 0.00 | 1.82 |
| | 130 | 265 | 0.51 | 0.03 | 1.49 |
| | 150 | 265 | 0.51 | 0.10 | 1.51 |
| | 180 | 265 | 0.51 | 0.22 | 1.54 |
| | 210 | 265 | 0.51 | 0.36 | 1.57 |
| | 250 | 265 | 0.51 | 0.58 | 1.62 |
| 2   | 110 | 125 | 0.63 | 0.00 | 1.85 |
| | 130 | 154 | 0.62 | 0.07 | 1.85 |
| | 150 | 151 | 0.61 | 0.20 | 1.85 |
| | 180 | 145 | 0.59 | 0.44 | 1.85 |
| | 210 | 139 | 0.57 | 0.72 | 1.85 |
| 2 R   | 110 | 169 | 0.51 | 0.00 | 1.85 |
| | 130 | 209 | 0.51 | 0.04 | 1.85 |
| | 150 | 206 | 0.50 | 0.13 | 1.85 |
| | 180 | 200 | 0.49 | 0.27 | 1.85 |
| | 210 | 194 | 0.47 | 0.45 | 1.85 |
| | 250 | 184 | 0.45 | 0.72 | 1.85 |
| 3   | 110 | 99 | 0.52 | 0.00 | 1.85 |
| | 130 | 122 | 0.52 | 0.07 | 1.86 |
| | 150 | 118 | 0.50 | 0.21 | 1.85 |
| | 180 | 113 | 0.48 | 0.45 | 1.85 |
| | 210 | 107 | 0.46 | 0.74 | 1.86 |
| 3 R   | 110 | 146 | 0.44 | 0.00 | 1.85 |
| | 130 | 180 | 0.44 | 0.04 | 1.85 |
| | 150 | 177 | 0.43 | 0.12 | 1.85 |
| | 180 | 172 | 0.42 | 0.27 | 1.85 |
| | 210 | 165 | 0.40 | 0.44 | 1.85 |
| | 250 | 155 | 0.38 | 0.71 | 1.85 |
| 4   | 110 | 97 | 0.45 | 0.00 | 1.85 |
| | 130 | 119 | 0.44 | 0.06 | 1.85 |
| | 150 | 116 | 0.43 | 0.18 | 1.85 |
| | 180 | 110 | 0.41 | 0.39 | 1.85 |
| | 210 | 104 | 0.39 | 0.65 | 1.85 |
| 4 R   | 110 | 138 | 0.41 | 0.00 | 1.85 |
| | 130 | 170 | 0.40 | 0.04 | 1.85 |
| | 150 | 167 | 0.40 | 0.12 | 1.85 |
| | 180 | 161 | 0.38 | 0.26 | 1.85 |
| | 210 | 155 | 0.37 | 0.43 | 1.85 |
| | 250 | 145 | 0.35 | 0.69 | 1.85 |
| 4 RR   | 110 | 177 | 0.39 | 0.00 | 1.85 |
| | 130 | 218 | 0.38 | 0.03 | 1.85 |
| | 150 | 215 | 0.38 | 0.09 | 1.85 |
| | 180 | 210 | 0.37 | 0.20 | 1.85 |
| | 210 | 203 | 0.36 | 0.32 | 1.85 |
| | 250 | 193 | 0.34 | 0.52 | 1.85 |

**Table 2** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | | 15° |
|---|---|---|---|---|---|---|
| Kit | Loads | | | | | |
| | (Km/h) | (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) | |
| 1 | 110 | 265 | 0.92 | 0.02 | 1.78 | |
| | 130 | 265 | 0.75 | 0.09 | 1.47 | |
| | 150 | 265 | 0.75 | 0.18 | 1.50 | |
| | 180 | 265 | 0.75 | 0.33 | 1.55 | |
| | 210 | 265 | 0.75 | 0.51 | 1.61 | |
| | 250 | 265 | 0.75 | 0.80 | 1.70 | |
| 2 | 110 | 126 | 0.93 | 0.04 | 1.85 | |
| | 130 | 153 | 0.90 | 0.19 | 1.85 | |
| | 150 | 148 | 0.88 | 0.36 | 1.85 | |
| | 180 | 138 | 0.82 | 0.67 | 1.85 | |
| 2 R | 110 | 172 | 0.76 | 0.03 | 1.85 | |
| | 130 | 211 | 0.75 | 0.12 | 1.85 | |
| | 150 | 205 | 0.73 | 0.22 | 1.85 | |
| | 180 | 195 | 0.70 | 0.41 | 1.85 | |
| | 210 | 184 | 0.66 | 0.64 | 1.85 | |
| 3 | 110 | 99 | 0.77 | 0.04 | 1.85 | |
| | 130 | 120 | 0.75 | 0.19 | 1.86 | |
| | 150 | 114 | 0.71 | 0.37 | 1.85 | |
| | 180 | 104 | 0.66 | 0.68 | 1.85 | |
| 3 R | 110 | 148 | 0.66 | 0.03 | 1.85 | |
| | 130 | 181 | 0.64 | 0.12 | 1.85 | |
| | 150 | 175 | 0.63 | 0.22 | 1.85 | |
| | 180 | 166 | 0.60 | 0.41 | 1.85 | |
| | 210 | 154 | 0.56 | 0.63 | 1.85 | |
| 4 | 110 | 97 | 0.66 | 0.04 | 1.85 | |
| | 130 | 117 | 0.64 | 0.17 | 1.85 | |
| | 150 | 111 | 0.61 | 0.33 | 1.85 | |
| | 180 | 102 | 0.57 | 0.60 | 1.86 | |
| 4 R | 110 | 139 | 0.60 | 0.03 | 1.85 | |
| | 130 | 170 | 0.59 | 0.11 | 1.85 | |
| | 150 | 164 | 0.57 | 0.22 | 1.85 | |
| | 180 | 154 | 0.54 | 0.40 | 1.85 | |
| | 210 | 143 | 0.51 | 0.61 | 1.85 | |
| 4 RR | 110 | 180 | 0.58 | 0.02 | 1.85 | |
| | 130 | 220 | 0.57 | 0.09 | 1.85 | |
| | 150 | 215 | 0.56 | 0.16 | 1.85 | |
| | 180 | 205 | 0.53 | 0.30 | 1.85 | |
| | 210 | 193 | 0.50 | 0.46 | 1.85 | |
| | 250 | 175 | 0.46 | 0.72 | 1.85 | |

**Table 3** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 20° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 232 | 1.05 | 0.03 | 1.50 |
| | 130 | 265 | 0.96 | 0.10 | 1.40 |
| | 150 | 265 | 0.96 | 0.19 | 1.43 |
| | 180 | 265 | 0.96 | 0.34 | 1.48 |
| | 210 | 265 | 0.96 | 0.52 | 1.53 |
| | 250 | 265 | 0.96 | 0.80 | 1.62 |
| 2 | 110 | 109 | 1.05 | 0.05 | 1.56 |
| | 130 | 136 | 1.05 | 0.20 | 1.60 |
| | 150 | 136 | 1.05 | 0.37 | 1.66 |
| | 180 | 136 | 1.05 | 0.67 | 1.75 |
| 2 R | 110 | 182 | 1.04 | 0.03 | 1.85 |
| | 130 | 223 | 1.02 | 0.12 | 1.85 |
| | 150 | 217 | 0.99 | 0.23 | 1.85 |
| | 180 | 207 | 0.95 | 0.42 | 1.85 |
| | 210 | 195 | 0.90 | 0.64 | 1.85 |
| 3 | 110 | 105 | 1.04 | 0.05 | 1.85 |
| | 130 | 127 | 1.01 | 0.20 | 1.85 |
| | 150 | 121 | 0.97 | 0.38 | 1.85 |
| | 180 | 111 | 0.90 | 0.69 | 1.85 |
| 3 R | 110 | 157 | 0.90 | 0.03 | 1.85 |
| | 130 | 192 | 0.88 | 0.12 | 1.85 |
| | 150 | 186 | 0.85 | 0.23 | 1.85 |
| | 180 | 175 | 0.81 | 0.41 | 1.85 |
| | 210 | 163 | 0.76 | 0.64 | 1.85 |
| 4 | 110 | 103 | 0.90 | 0.05 | 1.85 |
| | 130 | 124 | 0.87 | 0.18 | 1.85 |
| | 150 | 118 | 0.83 | 0.33 | 1.85 |
| | 180 | 108 | 0.77 | 0.61 | 1.85 |
| 4 R | 110 | 148 | 0.82 | 0.03 | 1.85 |
| | 130 | 180 | 0.80 | 0.12 | 1.85 |
| | 150 | 174 | 0.78 | 0.22 | 1.85 |
| | 180 | 164 | 0.74 | 0.40 | 1.85 |
| | 210 | 151 | 0.69 | 0.62 | 1.85 |
| 4 RR | 110 | 190 | 0.79 | 0.02 | 1.85 |
| | 130 | 233 | 0.77 | 0.09 | 1.85 |
| | 150 | 227 | 0.75 | 0.17 | 1.85 |
| | 180 | 217 | 0.72 | 0.31 | 1.85 |
| | 210 | 205 | 0.68 | 0.47 | 1.85 |
| | 250 | 185 | 0.62 | 0.72 | 1.85 |

**Table 4** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

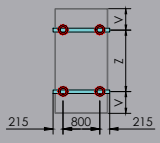
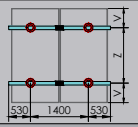
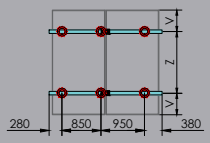
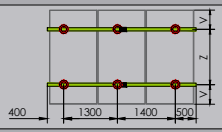
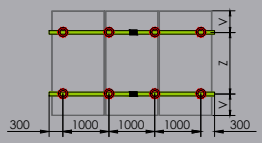
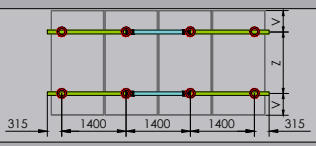
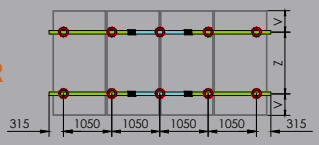
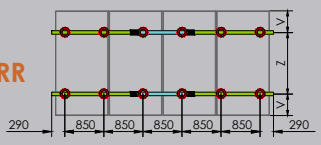
| Maximum Admissible Loads and Their Reactions | | | | | 25° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1  | 110 | 192 | 1.05 | 0.03 | 1.18 |
| | 130 | 240 | 1.05 | 0.11 | 1.20 |
| | 150 | 240 | 1.05 | 0.19 | 1.23 |
| | 180 | 240 | 1.05 | 0.34 | 1.28 |
| | 210 | 240 | 1.05 | 0.52 | 1.34 |
| | 250 | 240 | 1.05 | 0.81 | 1.43 |
| 2  | 110 | 88 | 1.05 | 0.06 | 1.24 |
| | 130 | 111 | 1.05 | 0.21 | 1.29 |
| | 150 | 111 | 1.05 | 0.38 | 1.35 |
| | 180 | 111 | 1.05 | 0.69 | 1.44 |
| 2 R  | 110 | 152 | 1.05 | 0.04 | 1.48 |
| | 130 | 190 | 1.05 | 0.13 | 1.51 |
| | 150 | 190 | 1.05 | 0.24 | 1.56 |
| | 180 | 190 | 1.05 | 0.43 | 1.63 |
| | 210 | 190 | 1.05 | 0.65 | 1.72 |
| 3  | 110 | 86 | 1.05 | 0.06 | 1.48 |
| | 130 | 107 | 1.05 | 0.22 | 1.53 |
| | 150 | 107 | 1.05 | 0.39 | 1.60 |
| | 180 | 107 | 1.05 | 0.70 | 1.72 |
| 3 R  | 110 | 153 | 1.05 | 0.04 | 1.69 |
| | 130 | 192 | 1.05 | 0.13 | 1.74 |
| | 150 | 192 | 1.05 | 0.23 | 1.78 |
| | 180 | 189 | 1.03 | 0.42 | 1.85 |
| | 210 | 176 | 0.97 | 0.64 | 1.85 |
| 4  | 110 | 100 | 1.05 | 0.06 | 1.70 |
| | 130 | 125 | 1.05 | 0.19 | 1.75 |
| | 150 | 125 | 1.05 | 0.34 | 1.82 |
| | 180 | 117 | 0.99 | 0.62 | 1.85 |
| 4 R  | 110 | 158 | 1.05 | 0.04 | 1.84 |
| | 130 | 194 | 1.03 | 0.13 | 1.85 |
| | 150 | 188 | 1.00 | 0.23 | 1.85 |
| | 180 | 177 | 0.95 | 0.41 | 1.85 |
| | 210 | 163 | 0.88 | 0.62 | 1.85 |
| 4 RR  | 110 | 205 | 1.01 | 0.03 | 1.85 |
| | 130 | 251 | 0.99 | 0.10 | 1.85 |
| | 150 | 245 | 0.96 | 0.17 | 1.85 |
| | 180 | 234 | 0.92 | 0.31 | 1.85 |
| | 210 | 221 | 0.88 | 0.47 | 1.85 |
| | 250 | 200 | 0.80 | 0.73 | 1.85 |

**Table 5** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

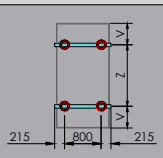
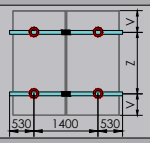
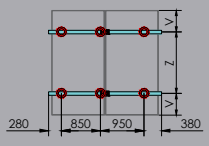
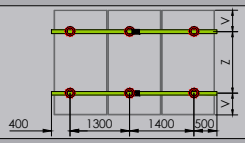
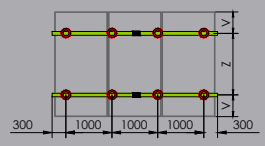
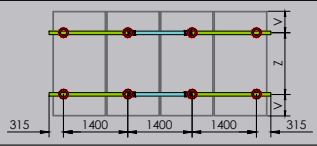
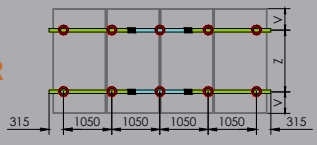
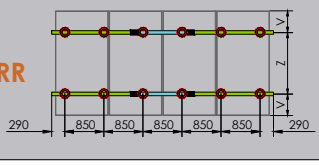
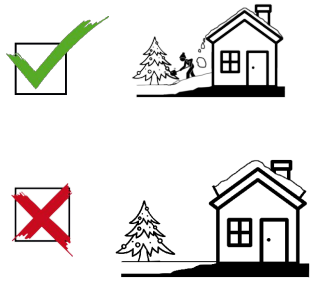
| Maximum Admissible Loads and Their Reactions | | | | | 30° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1   | 110 | 167 | 1.05 | 0.00 | 1.00 |
| | 130 | 209 | 1.05 | 0.00 | 1.04 |
| | 150 | 209 | 1.05 | 0.04 | 1.08 |
| | 180 | 209 | 1.05 | 0.13 | 1.15 |
| | 210 | 209 | 1.05 | 0.23 | 1.24 |
| | 250 | 209 | 1.05 | 0.39 | 1.39 |
| 2   | 110 | 76 | 1.05 | 0.00 | 1.10 |
| | 130 | 95 | 1.05 | 0.00 | 1.17 |
| | 150 | 95 | 1.05 | 0.09 | 1.26 |
| | 180 | 95 | 1.05 | 0.26 | 1.41 |
| | 210 | 95 | 1.05 | 0.46 | 1.66 |
| 2 R   | 110 | 132 | 1.05 | 0.00 | 1.27 |
| | 130 | 165 | 1.05 | 0.00 | 1.32 |
| | 150 | 165 | 1.05 | 0.06 | 1.39 |
| | 180 | 165 | 1.05 | 0.16 | 1.50 |
| | 210 | 165 | 1.05 | 0.28 | 1.64 |
| | 250 | 164 | 1.04 | 0.48 | 1.85 |
| 3   | 110 | 73 | 1.05 | 0.00 | 1.30 |
| | 130 | 92 | 1.05 | 0.00 | 1.40 |
| | 150 | 92 | 1.05 | 0.09 | 1.50 |
| | 180 | 92 | 1.05 | 0.26 | 1.69 |
| | 210 | 59 | 0.74 | 0.47 | 1.85 |
| 3 R   | 110 | 133 | 1.05 | 0.00 | 1.45 |
| | 130 | 167 | 1.05 | 0.00 | 1.52 |
| | 150 | 167 | 1.05 | 0.05 | 1.59 |
| | 180 | 167 | 1.05 | 0.16 | 1.72 |
| | 210 | 162 | 1.02 | 0.28 | 1.85 |
| | 250 | 92 | 0.63 | 0.47 | 1.85 |
| 4   | 110 | 86 | 1.05 | 0.00 | 1.48 |
| | 130 | 108 | 1.05 | 0.00 | 1.58 |
| | 150 | 108 | 1.05 | 0.08 | 1.68 |
| | 180 | 106 | 1.03 | 0.23 | 1.85 |
| | 210 | 52 | 0.59 | 0.41 | 1.85 |
| 4 R   | 110 | 138 | 1.05 | 0.00 | 1.57 |
| | 130 | 172 | 1.05 | 0.00 | 1.64 |
| | 150 | 172 | 1.05 | 0.05 | 1.71 |
| | 180 | 171 | 1.04 | 0.15 | 1.85 |
| | 210 | 149 | 0.92 | 0.27 | 1.85 |
| | 250 | 64 | 0.46 | 0.46 | 1.85 |
| 4 RR   | 110 | 187 | 1.05 | 0.00 | 1.62 |
| | 130 | 234 | 1.05 | 0.00 | 1.67 |
| | 150 | 234 | 1.05 | 0.04 | 1.74 |
| | 180 | 234 | 1.05 | 0.12 | 1.85 |
| | 210 | 211 | 0.95 | 0.21 | 1.85 |
| | 250 | 175 | 0.81 | 0.35 | 1.85 |

**Table 6** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

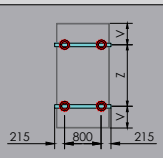
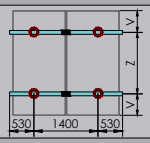
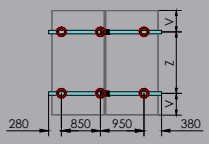
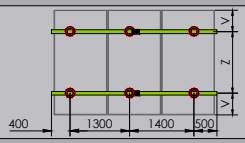
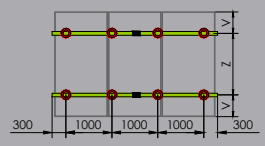
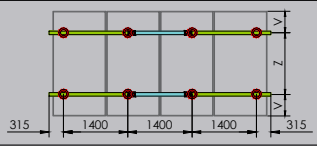
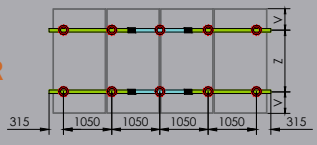
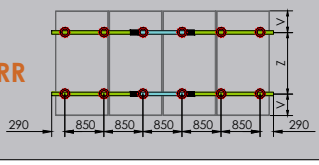
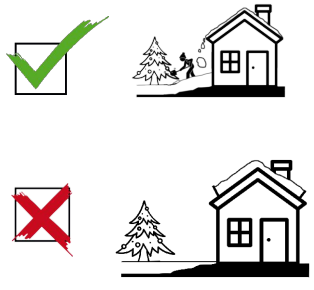
| Maximum Admissible Loads and Their Reactions | | | | | 35° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1   | 110 | 183 | 1.05 | 0.00 | 0.84 |
| | 130 | 228 | 1.05 | 0.00 | 0.88 |
| | 150 | 228 | 1.05 | 0.05 | 0.92 |
| | 180 | 228 | 1.05 | 0.14 | 0.99 |
| | 210 | 228 | 1.05 | 0.24 | 1.08 |
| | 250 | 228 | 1.05 | 0.39 | 1.23 |
| 2   | 110 | 81 | 1.05 | 0.00 | 0.93 |
| | 130 | 102 | 1.05 | 0.01 | 1.01 |
| | 150 | 102 | 1.05 | 0.10 | 1.10 |
| | 180 | 102 | 1.05 | 0.27 | 1.28 |
| | 210 | 102 | 1.05 | 0.47 | 1.58 |
| 2 R   | 110 | 143 | 1.05 | 0.00 | 1.06 |
| | 130 | 179 | 1.05 | 0.01 | 1.12 |
| | 150 | 179 | 1.05 | 0.07 | 1.19 |
| | 180 | 179 | 1.05 | 0.17 | 1.30 |
| | 210 | 179 | 1.05 | 0.29 | 1.44 |
| | 250 | 179 | 1.05 | 0.49 | 1.74 |
| 3   | 110 | 79 | 1.05 | 0.00 | 1.12 |
| | 130 | 99 | 1.05 | 0.01 | 1.21 |
| | 150 | 99 | 1.05 | 0.11 | 1.31 |
| | 180 | 99 | 1.05 | 0.28 | 1.54 |
| | 210 | 82 | 0.91 | 0.49 | 1.85 |
| 3 R   | 110 | 145 | 1.05 | 0.00 | 1.22 |
| | 130 | 181 | 1.05 | 0.01 | 1.29 |
| | 150 | 181 | 1.05 | 0.06 | 1.36 |
| | 180 | 181 | 1.05 | 0.17 | 1.49 |
| | 210 | 181 | 1.05 | 0.29 | 1.65 |
| | 250 | 126 | 0.77 | 0.48 | 1.85 |
| 4   | 110 | 93 | 1.05 | 0.00 | 1.27 |
| | 130 | 116 | 1.05 | 0.01 | 1.35 |
| | 150 | 116 | 1.05 | 0.09 | 1.46 |
| | 180 | 116 | 1.05 | 0.25 | 1.65 |
| | 210 | 72 | 0.72 | 0.43 | 1.85 |
| 4 R   | 110 | 150 | 1.05 | 0.00 | 1.33 |
| | 130 | 187 | 1.05 | 0.01 | 1.39 |
| | 150 | 187 | 1.05 | 0.06 | 1.47 |
| | 180 | 187 | 1.05 | 0.16 | 1.61 |
| | 210 | 187 | 1.05 | 0.28 | 1.77 |
| | 250 | 89 | 0.56 | 0.47 | 1.85 |
| 4 RR   | 110 | 204 | 1.05 | 0.00 | 1.36 |
| | 130 | 255 | 1.05 | 0.00 | 1.41 |
| | 150 | 255 | 1.05 | 0.05 | 1.47 |
| | 180 | 255 | 1.05 | 0.12 | 1.59 |
| | 210 | 255 | 1.05 | 0.21 | 1.72 |
| | 250 | 237 | 0.98 | 0.36 | 1.85 |

**Table 7** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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# 02.4V-EN

## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 40° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 215 | 1.05 | 0.00 | 0.71 |
| | 130 | 265 | 1.03 | 0.01 | 0.74 |
| | 150 | 265 | 1.03 | 0.06 | 0.78 |
| | 180 | 265 | 1.03 | 0.15 | 0.85 |
| | 210 | 265 | 1.03 | 0.25 | 0.93 |
| | 250 | 265 | 1.03 | 0.40 | 1.09 |
| 2 | 110 | 94 | 1.05 | 0.00 | 0.80 |
| | 130 | 118 | 1.05 | 0.03 | 0.87 |
| | 150 | 118 | 1.05 | 0.12 | 0.95 |
| | 180 | 118 | 1.05 | 0.29 | 1.15 |
| | 210 | 118 | 1.05 | 0.49 | 1.43 |
| 2 R | 110 | 168 | 1.05 | 0.00 | 0.90 |
| | 130 | 210 | 1.05 | 0.02 | 0.95 |
| | 150 | 210 | 1.05 | 0.08 | 1.02 |
| | 180 | 210 | 1.05 | 0.18 | 1.13 |
| | 210 | 210 | 1.05 | 0.31 | 1.25 |
| | 250 | 210 | 1.05 | 0.50 | 1.58 |
| 3 | 110 | 91 | 1.05 | 0.00 | 0.95 |
| | 130 | 114 | 1.05 | 0.03 | 1.04 |
| | 150 | 114 | 1.05 | 0.13 | 1.13 |
| | 180 | 114 | 1.05 | 0.30 | 1.40 |
| | 210 | 114 | 1.05 | 0.50 | 1.74 |
| 3 R | 110 | 170 | 1.05 | 0.00 | 1.04 |
| | 130 | 213 | 1.05 | 0.02 | 1.10 |
| | 150 | 213 | 1.05 | 0.08 | 1.17 |
| | 180 | 213 | 1.05 | 0.18 | 1.29 |
| | 210 | 213 | 1.05 | 0.30 | 1.44 |
| | 250 | 213 | 1.05 | 0.49 | 1.80 |
| 4 | 110 | 108 | 1.05 | 0.00 | 1.08 |
| | 130 | 135 | 1.05 | 0.02 | 1.16 |
| | 150 | 135 | 1.05 | 0.11 | 1.26 |
| | 180 | 135 | 1.05 | 0.26 | 1.47 |
| | 210 | 135 | 1.05 | 0.44 | 1.82 |
| 4 R | 110 | 176 | 1.05 | 0.00 | 1.12 |
| | 130 | 198 | 0.96 | 0.02 | 1.10 |
| | 150 | 198 | 0.96 | 0.07 | 1.17 |
| | 180 | 198 | 0.96 | 0.17 | 1.30 |
| | 210 | 198 | 0.96 | 0.29 | 1.47 |
| | 250 | 183 | 0.89 | 0.48 | 1.85 |
| 4 RR | 110 | 241 | 1.05 | 0.00 | 1.15 |
| | 130 | 265 | 0.93 | 0.01 | 1.09 |
| | 150 | 265 | 0.93 | 0.06 | 1.15 |
| | 180 | 265 | 0.93 | 0.13 | 1.25 |
| | 210 | 265 | 0.93 | 0.22 | 1.37 |
| | 250 | 265 | 0.93 | 0.36 | 1.60 |

**Table 8** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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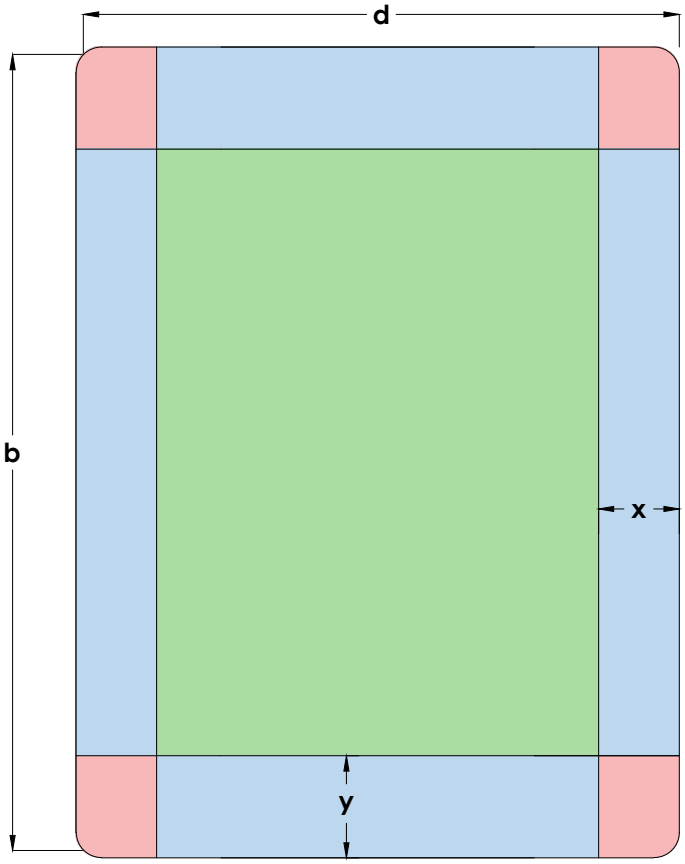
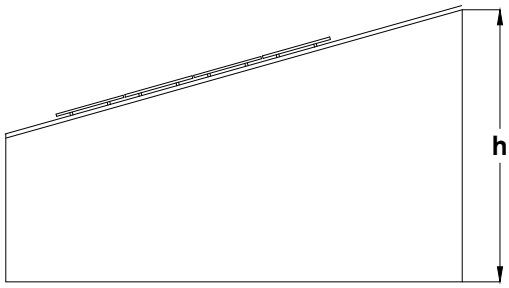
# 02.4V-EN
## Installation Zone




e= min [b,2h]

x = Max [e/10 , 0.5m]
y = Max [e/4 , 0.5m]




Installation safe zone

Turbulent zone

Extremely turbulent zone

To avoid turbulence and other unwanted natural effects, it is strongly recommended to install photovoltaic panels inside of the green zone.

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# 02.4V-EN

## Installation video

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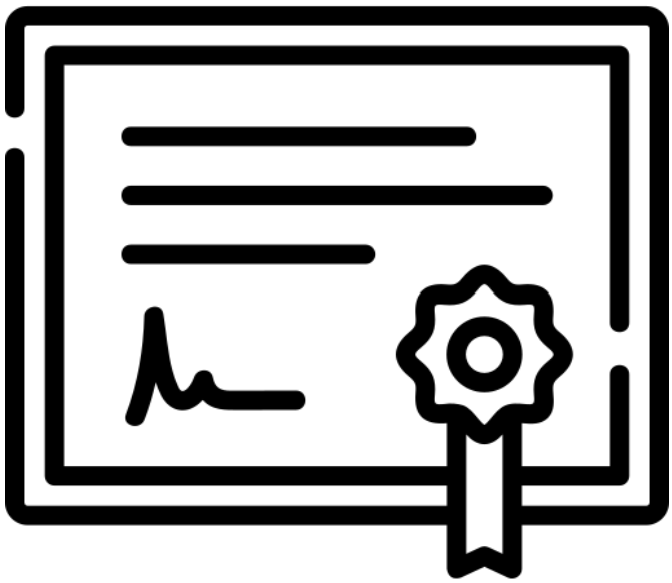
# 02.4V-EN
## Certifications and guarantees



- ISO 9001 Certified
- ISO 14001 Certified
- CE Marking
- Guaranteed

This is a translation of the certificate ES13/13899

The management system of

# SUNFER ESTRUCTURAS, S.L.U.

Camí de la Dula, s/n, 46687 Albalat de la Ribera, Valencia

has been assessed and certified as meeting the requirements of

## ISO 9001:2015

For the following activities
Design, manufacture and sale of solar energy structures.

This certificate is valid from 19 May 2023 until 8 April 2025 and remains valid subject to satisfactory surveillance audits.

Issue 6. Certified with SGS since 8 April 2013

Last certificate expiry date 8 April 2022
Recertification audit date 31 March 2022

Authorised by

SGS International Certification Services Iberica, S.A.U.
C/Trespaderne, 29. 28042 Madrid. España
t +34 91 313 8115 - www.sgs.com

This is a translation of the certificate ES22/211172

The management system of

# SUNFER ESTRUCTURAS, S.L.U.

Camí de la Dula, s/n, 46687 Albalat de la Ribera, Valencia

has been assessed and certified as meeting the requirements of

## ISO 14001:2015

For the following activities
Design, manufacture and sale of solar energy structures.

This certificate is valid from 19 May 2023 until 22 April 2025 and remains valid subject to satisfactory surveillance audits.

Issue 2. Certified with SGS since 22 April 2022

Authorised by

SGS International Certification Services Iberica, S.A.U.
C/Trespaderne, 29. 28042 Madrid. España
t +34 91 313 8115 - www.sgs.com

SUNFER

CE

**IDENTIFICATION NUMBER OF NOTIFIED ORGANISM:**

*1181*

---

**NUMBER AND REGISTERED ADDRESS OF MANUFACTURERS. INSTALLATION LOCATION:**

Business name: *SUNFER ESTRUCTURAS, S.L.U.*

Address: *Camí de la Dula s/n*

Postal Code: *46687*

Location: *Albalat de la Ribera*

City: *Valencia*

Country: *España*

**TWO LAST DIGITS OF THE YEAR THAT THE MARKING WAS FIXED:**

*19*

*ES19/86524*

---

**EN 1090-1**

Description of product: ***02.4V-EN***

---

| | |
|---|---|
| **TOLERANCES IN GEOMETRIC INFORMATION:** | *EN 1090-3* |
| **WELDABILITY:** | *--* |
| **FRACTURE RESISTANCE:** | *--* |
| **FIRE REACTION:** | *Classified material A1* |
| **CADMIUM EMISSION:** | *N/A* |
| **RADIACTIVITY EMISSION:** | *N/A* |
| **DURABILITY:** | *N/A* |

**STRUCTURAL CHARACTERISTICS:**

- **Carrying capacity:** *See product instructions and data sheet*
- **Fatigue resistance:** *N/A*
- **Fire resistance:** *N/A*
- **Manufacturing:** *According to the component specification and EN1090-3. Execution class EXC1*

| | |
|---|---|
| DECLARATION OF PERFORMANCE NUMBER: | P-0120 |

**1. PRODUCT DESCRIPTION.**

| | |
|---|---|
| UNIQUE IDENTIFICATION CODE OF THE PRODUCT TYPE: | 02.4V-EN |

**2. NAME AND ADDRESS OF MANUFACTURER.**

| | |
|---|---|
| NAME: | SUNFER ESTRUCTURAS, S.L.U. |
| COMERCIAL NAME (if exists): | -- |
| ADDRESS: | CAMI DE LA DULA S/N |
| CITY AND PC: | 46687 ALBALAT DE LA RIBERA -- COMUNIDAD VALENCIANA (SPAIN) |

**3. INTENDED USE(S) OF THE PRODUCT:**
ALUMINUM STRUCTURE TO SUPPORT PHOTOVOLTAIC PANELS.

**4. SYSTEM OF EVALUATION AND VERIFICATION OF CONSTANCY OF PERFORMANCE:**
System 2+

**5. HARMONIZED STANDARD:**
This product complies with the provisions of Annex ZA of the European standard **UNE-EN 1090-1:2011 + A1:2012**

**6. NOTIFIED ORGANISM:**

| | |
|---|---|
| NAME: | **SGS ICS IBÉRICA. S.A.** |
| Notified Organism Number: | **NB1181** |

**7. DECLARED PERFORMANCES:**

| Essential Characteristics | Performances | Harmonised technical specifications |
|---|---|---|
| Tolerances in geometric information | Conforms to limits for essential tolerances□ | EN 1090-3 |
| Weldability | Not applicable because there is no welding in the structure | ---- |
| Fracture Tenacity | Not required for aluminum components | ----- |
| Carrying Capacity | N/A | |
| Fatigue Resistance | N/A | |
| Fire Resistance | N/A | |
| Fire reaction | Class A1 | EN 13501-1 |
| Emission of cadmium and its compounds | OK | |
| Emission of radioactivity | OK | |
| Durability | N/A | |
| Structural features<br>- Carrying capacity<br>- Fatigue resistance: N/A<br>- Fire resistance: N/A<br>- Manufacturing | See product data sheet<br>N/A<br>N/A<br>According to the component specification.<br>Execution class EXC1 | UNE EN 1999-1-1<br><br><br>UNE EN 1090-3 |

- The performance of the product identified above is in accordance with all the declared performance.
- This declaration of performance is issued in accordance with Regulation (EN) No. 305/2011 under the responsibility of the manufacturer identified above.

Manufacturer's Name: Voro Gómez Nacher
Date of issue: 02/08/2023
Signature:

# Guarantee Terms and Conditions

## Structural and Anticorrosion Guarantee

All SUNFER mounting systems are manufactured under strict production control in our factory, as are our raw materials, which are periodically tested to ensure quality. It is for these reasons we are able to offer the following guarantee for our products:

25 year Structural Gurantee

Anticorrosion Guarantee per the below table

| Materials | NON-HARSH environment (1)<br>Distance to coastline<br>greater than 5 Km | HARSH or MARINE environment<br>Distance to coastline<br>less than 5 Km |
|---|---|---|
| Raw Aluminum | Fifteen (15) years | Five (5) years |
| Anodized Aluminum | Twenty-five (25) years | Twenty-five (25) years |

Table 1.

**(1)** Non-exhaustive list of zones considered to be harsh environments:

a. Industrial zones with emissions that include: sulphur dioxide, nitrogen oxides, sulphuric acid, sulphuric compounds, chlorine, or other volatile gases; 5 km safety distance.
b. Electric generating stations that use the following fuels: coal, natural gas, petroleum; 5 km safety distance.
c. Petrochemical plants; 5 km safety distance.
d. Cellulose factories; 5 km safety distance
e. Wastewater treatment facilities: 500 m safety distance.

In these zones it is always necessary to utilize anodized aluminum if inside of the minimum safety radius indicated above.

The warranty of the adhesive in reference 07.1H and S07.1 is ten (10) years. The warranty of the 2-sided adhesive tape of the S07.1 anchor covers the product supplied by Sunfer and can be applied provided that the breakage is caused by the tearing off of the profile with respect to the adhesive tape, in the event that the breakage is caused by the tearing off of the adhesive tape from the roofing, it will be considered a faulty assembly on site.

Mixed galvanised steel and raw aluminium supports such as, for example: Elevated, Monopoles, Car parks:
Environments C3 fifteen (15) years guarantee.
Environments C4-C5 five (5) years.

Mixed galvanised steel and anodised aluminium supports, such as: Elevated, Monopoles, Car parks:
Environments C3 guarantee twenty-five (25) years.
Environments C4-C5 fifteen (15) years.

This guarantee applies to orders supplied from 3rd January, 2023 on. Orders delivered before this date shall be governed by the guarantee that was in force at the time that the order was supplied.

The guarantee covers the final installation, and applies directly to the end user of the structure. Guarantees are managed between SUNFER and commercial distributors, so if an end user needs to invoke a guarantee, they must contact the distributor that supplied the material, and the distributor will coordinate with SUNFER Customer Service. The period of coverage of the guarantee begins upon the date that the delivery of the material is received by the end user, but will be repealed if the client does not comply with the payment terms stated in the invoice.

To invoke the guarantee, the following documentation must be produced:

- Sales invoice.
- Date system was put in service.
- Information of end user (name, address, distributor, etc).
- General photographs showing the entire system as installed.
- Installer's final work plans/drawings.
- Detailed photos of:
  - Fastening of the system to the roof, which shows the distance between mounting points.
  - The structure mounted without panels attached.
  - A rear view of the structure (from roof ridge if coplanar).

ES22/211172 ES13/13899

Marcado CE ES19/86524


- Plan/drawing of the affected area which shows distances between mounting points.

## Coverage and Exclusions

### Coverage

This guarantee covers the replacement and shipping of the defective components or of the entire system if necessary, with no charge. In the case of a replacement not being available, a suitably similar replacement will be provided.

The guarantee is limited to replacement of defective products. The following costs, indirectly associated with the return process, will not be compensated: disassembly or any consequential, supplementary, or related damages, including lost profits or other indirect costs.

The guarantee covers all metallic elements included in a SUNFER structure.

### Exclusions

Any issues or defects caused by or related to the following shall be excluded from the guarantee:

- Inadequate installations which did not follow the installation instructions provided by SUNFER.
- Incorrect fastener tightening torques (overtight or undertight).
- Modifications or installations other than those recommended by SUNFER.
- Installation of additional homemade or third-party elements to the structures supplied by SUNFER.
- Inadequate handling of products during the installation.
- Damage to the product after delivery, or from improper storage of the product.
- Any defect which is purely aesthetic in nature and which does not affect the structural safety of the product.
- Installations in areas whose wind and snow loads exceed those indicated in the datasheets of the product.
- Structures installed outside of the safe zone indicated in the installation manual.
- Inadequate maintenance. See the Maintenance Manual.
- Fires or exposure to temperatures above 110 °C.
- Problems or defects caused by corrosive agents not initially considered (1).
- Natural disasters such as earthquakes, hurricanes, floods, tornados, cyclones, mudslides, avalanches, or volcanic eruptions.

For structures not provided with a method of fastening to a surface, SUNFER denies responsiblity in the event of collapse or failure due to insufficient fastening or poor installation.

### Guarantor, Execution of guarantee

The guarantor is SUNFER ESTRUCTURAS S.L.U. located at Camino de la Dula s/n 46687, Albalat de la Ribera, Valencia, Spain.

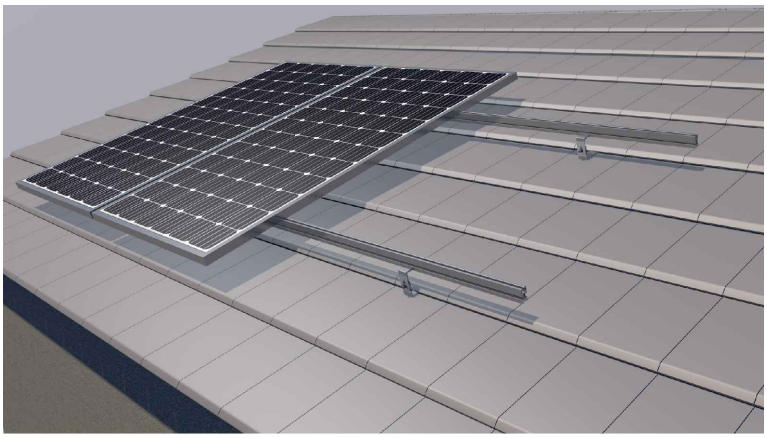
The entitlements afforded by this guarantee are non-transferable to third parties.

Regarding the guarantee and any disputes related to it, the law currently in force in Spain shall apply.

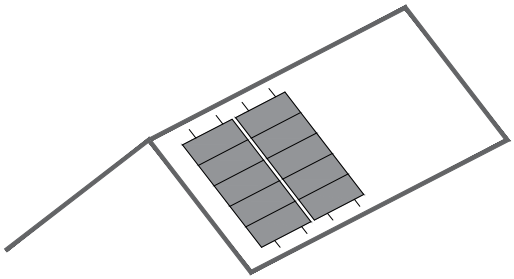
SUNFER

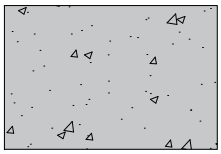
Solar Mounting Systems

# 02.4V-EN



# Landscape





Concrete slab

Return

**Sunfer Estructuras, S.L.U.**
Camino de la Dula s/n
Albalat de la Ribera - 46687 (Valencia) Spain

100% ES19/86524 CE

SUNFER
Solar Mounting Systems

# Contents

1. General information
2. Kit contents
3. Landscape assembly
4. Anchoring technical information
5. Maximum loads and reactions
6. Installation area
7. Installation Video
8. Certifications and guarantees



Return

SUNFER
Solar Mounting Systems

# 02.4V-EN

## General Information and Recommendations ENG

- All installation instructions and product specifications provided must be adhered to.
- Check the condition of the roof covering and the carrying capacity of the same. The management overseeing installation is responsible for verifying that the substructure of the roof as well as the static structure of the building itself is capable of supporting additional loads before any installation is carried out.
- The mounting must always be anchored to the structure of the roof.
- The surface of the roof covering must be clean and dry. Any major irregularities of the roof must be corrected or eliminated.
- To avoid turbulence from wind a minimum security distance (defined by regulations) must be maintained between the photovoltaic installations and roof edges, as well as other obstacles such as chimneys or vents.
- In the case of chimneys or other features which may need future maintenance, a minimum distance must be maintained in order to facilitate said maintenance or to extinguish fires. This distance shall be either 1m or that suggested by the relevant authority, whichever is greater.
- Place solar panels such that they are distributed symmetrically along the support, leaving equal overhangs at each end.
- Clamps must not be tightened using impact drivers.
- Check the weathertightness of the mount once fastened.
- Check that the support attachment points are compatible with the solar panel manufacturer's specifications.
- Uninstallation must be carried out in the reverse order from the installation.
- We reserve the right to make changes to our products at any moment without prior warning if, from our point of view, the changes are necessary for the improvement of the product. All illustrations in plans and catalogues are for example only and therefore may differ from the actual product provided.
- During the shipping of products take extreme care to maintain the integrity of the packaging. Store in a dry, well-ventilated area. Minimize exposure to large temperature differences and humidity. Avoid outdoor storage. Avoid sources of dripping water, puddles, splashing, or any other contact with water in the storage area. If the product becomes wet, immediately dry and clean as well as possible. Do not leave the product directly on the floor or ground where it may attract moisture. Store on the shipment's origninal pallet or on shelves.

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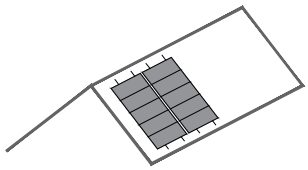
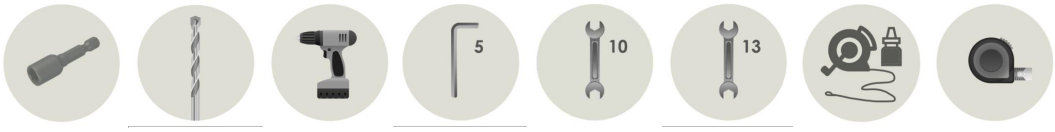
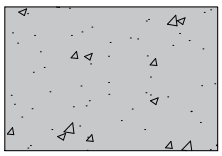


# 02.4V-EN
## Kit Contents

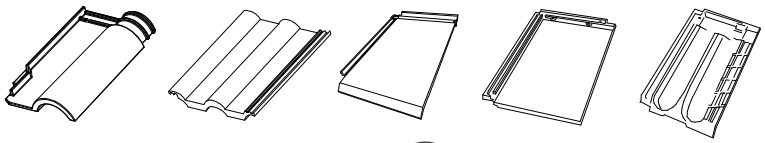
| | S02.4-EN | S10B-EN | S11B-EN | UG1-EN | G1-EN-1230 | G1-EN-1800 | TG1 | S13 |
|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 4 | - | - | 2 | - | 4 | 2 |
| 2 | 4 | 4 | 2 | 2 | 4 | - | 4 | 3 |
| 2 R | 6 | 4 | 2 | 2 | 4 | - | 4 | 3 |
| 3 | 6 | 4 | 4 | 2 | - | 4 | 4 | 4 |
| 3 R | 8 | 4 | 4 | 2 | - | 4 | 4 | 4 |
| 4 | 8 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |
| 4 R | 10 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |
| 4 RR | 12 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |




Anchoring surfaces:

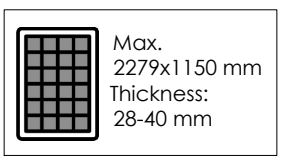


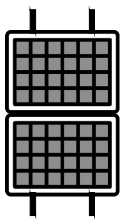
Concrete slab



alu Aluminium profiles of **EN AW 6005A T6**

A Fasteners of **A2-70 stainless steel**



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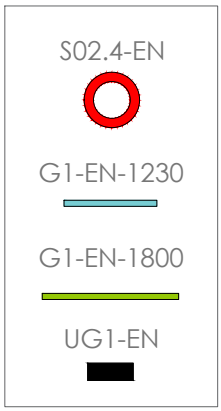
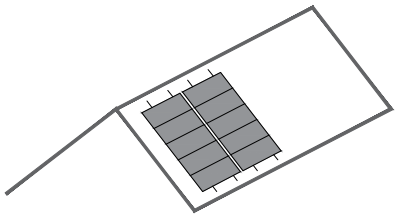
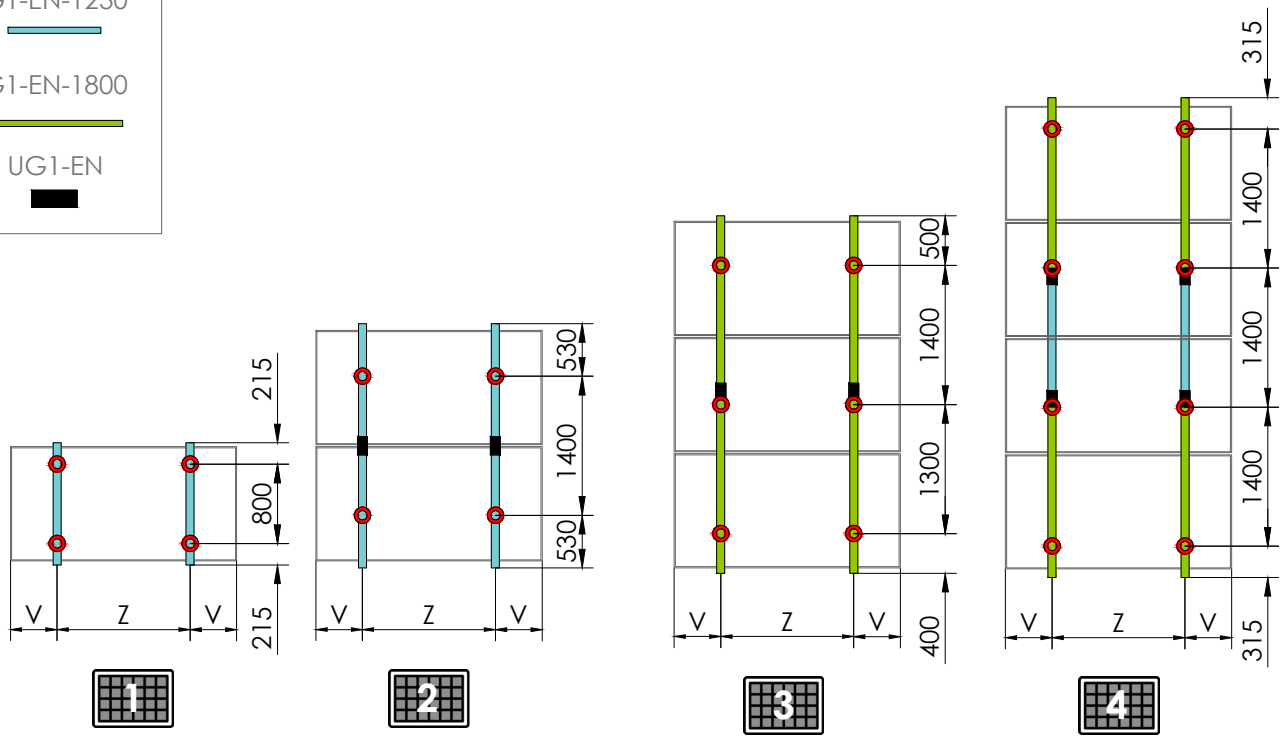
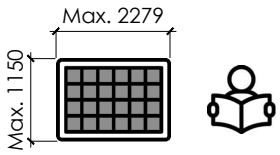
# Landscape

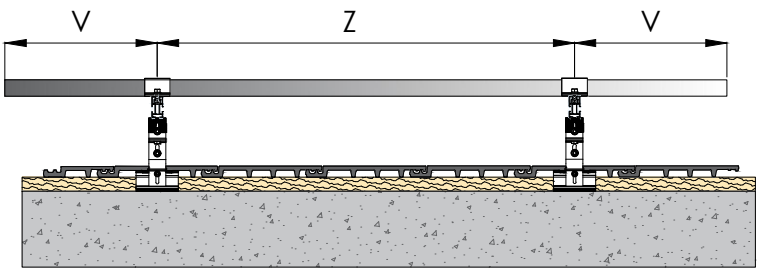
# 02.4V-EN
## Anchoring distances

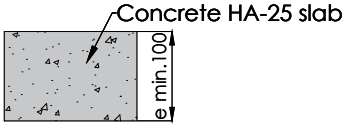





The maximum distance "Z" between profiles and the overhang distance "V" should be determined by consulting the technical datasheets of the solar panel manufacturer.

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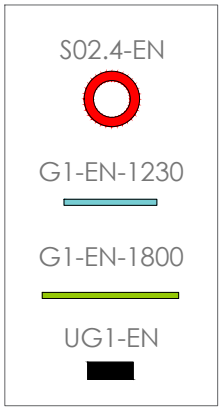
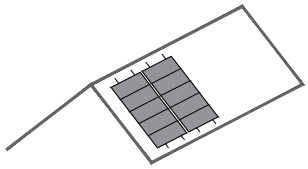
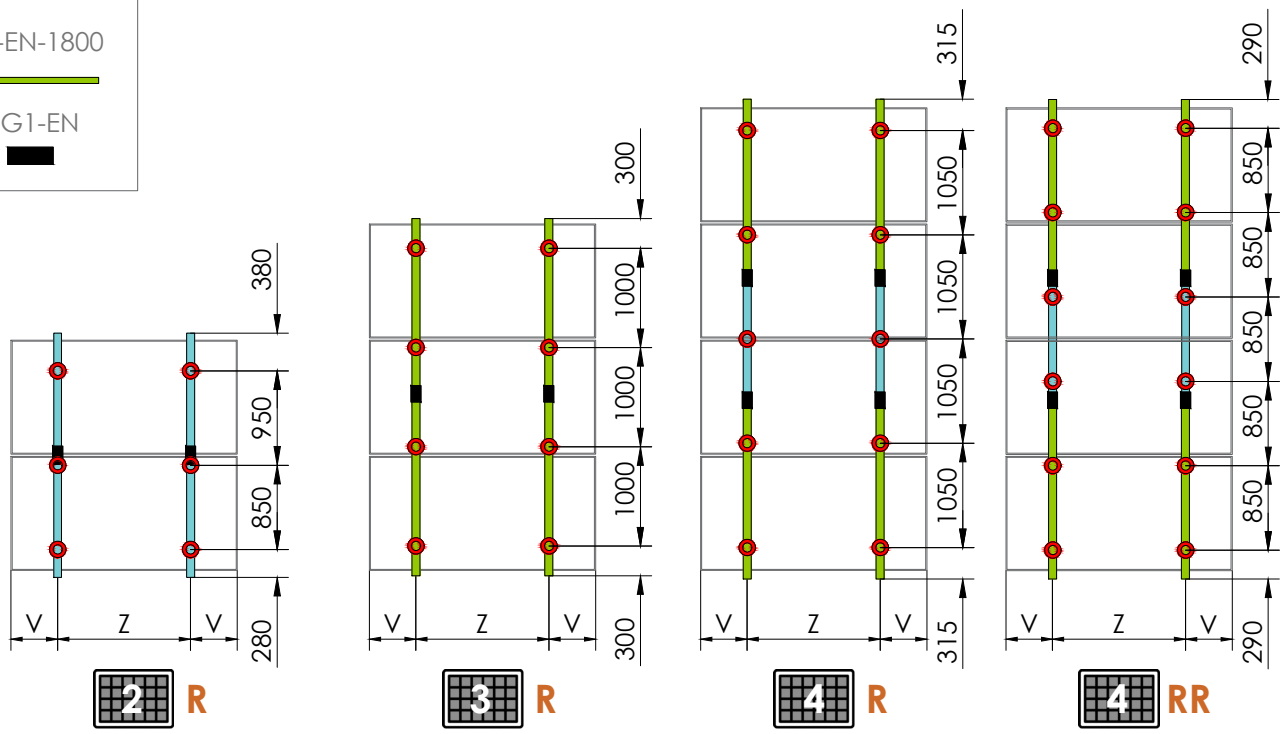
# 02.4V-EN

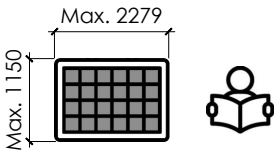
## Landscape

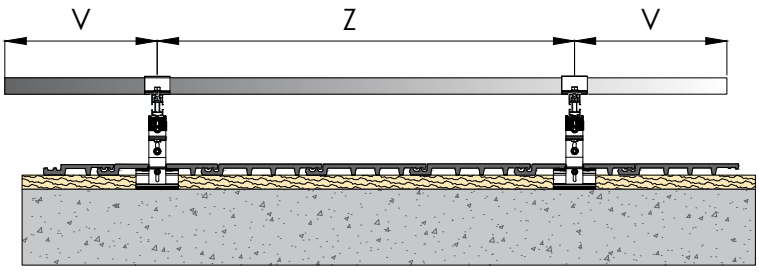
## Anchoring distances

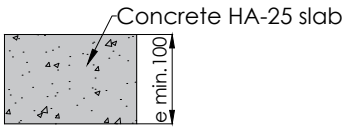





The maximum distance "Z" between profiles and the overhang distance "V" should be determined by consulting the technical datasheets of the solar panel manufacturer.

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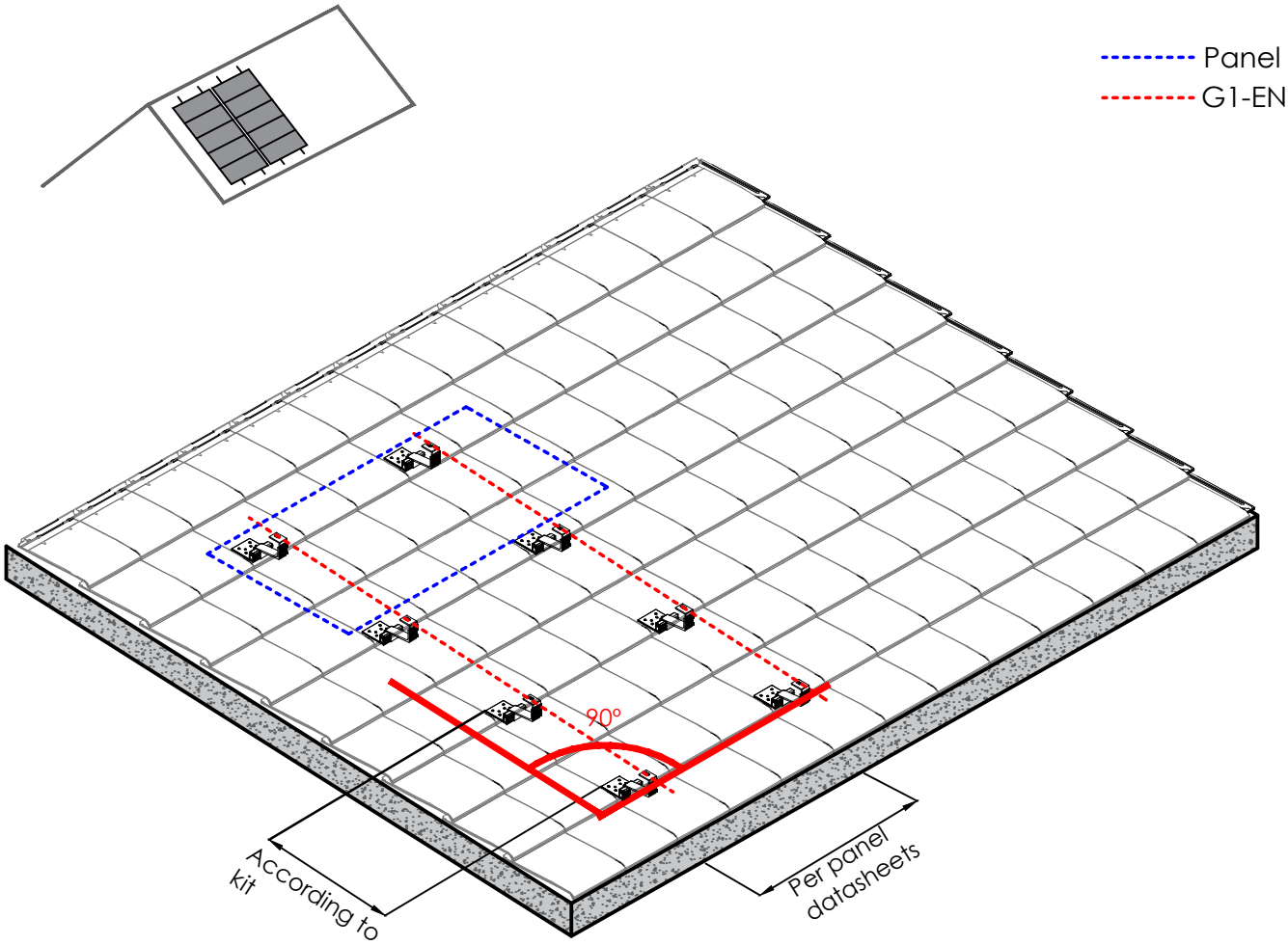
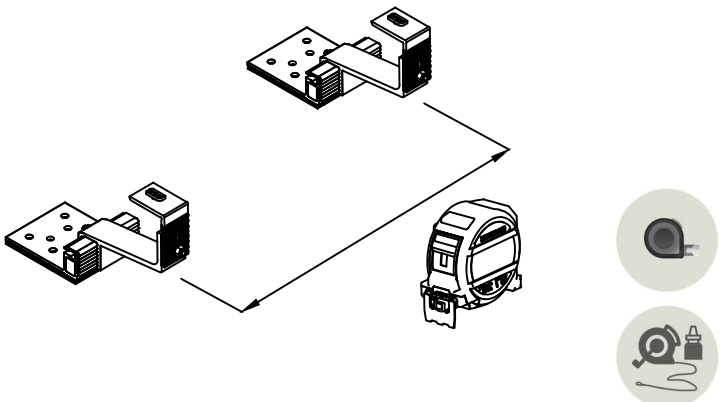
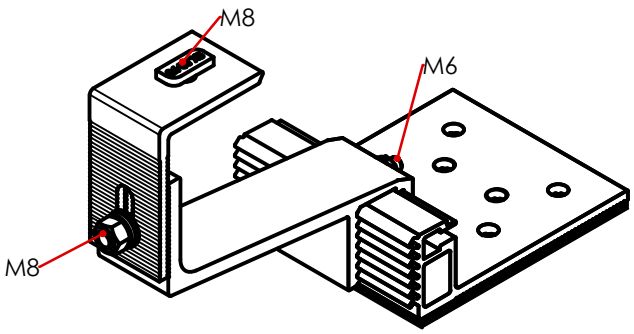
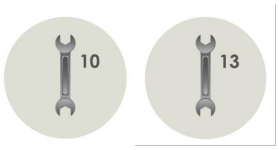
# 02.4V-EN
## Structure mounting






10Nm 20Nm

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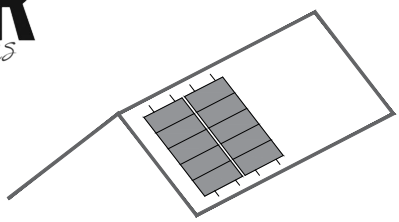
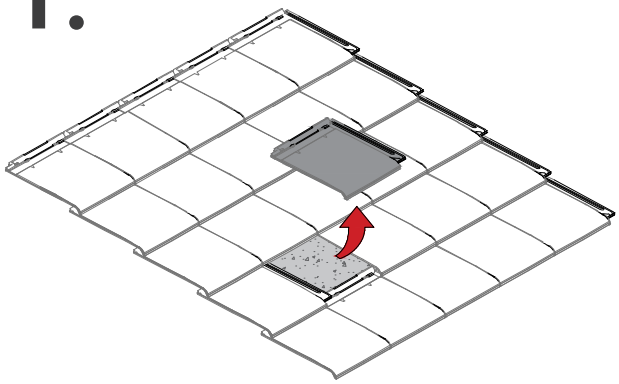
# 02.4V-EN

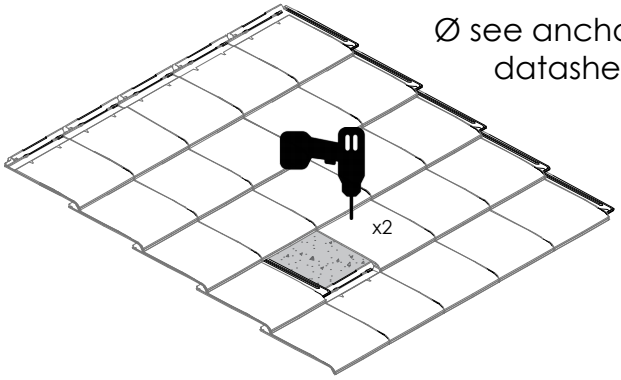


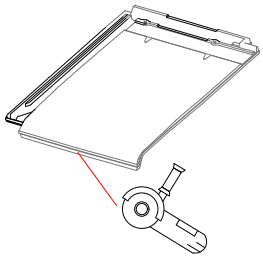
## 1.

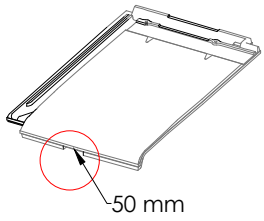


## 2.

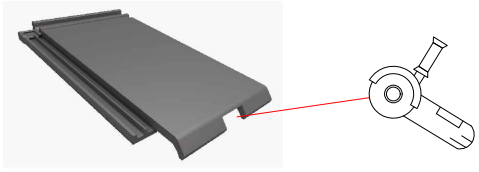
Ø see ancho datasheet



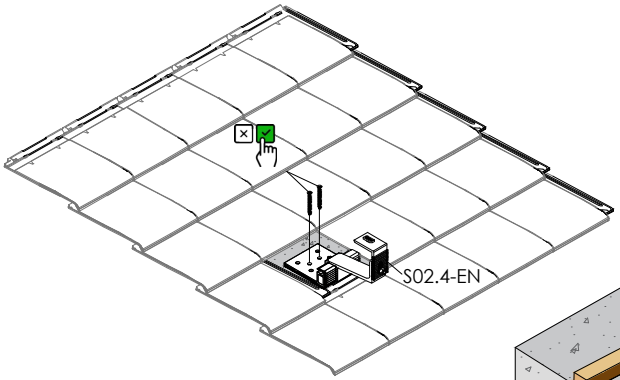





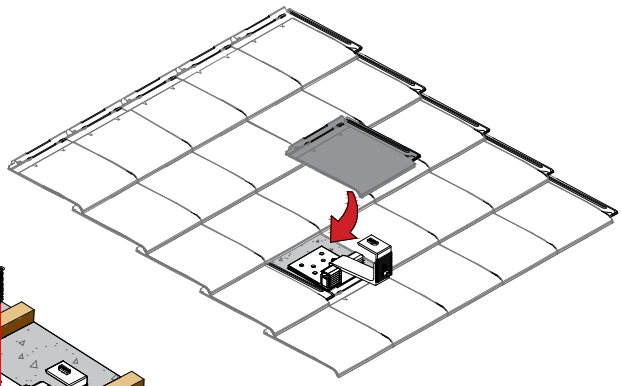

To correctly install the mount, it may be necessary to notch the tile as shown

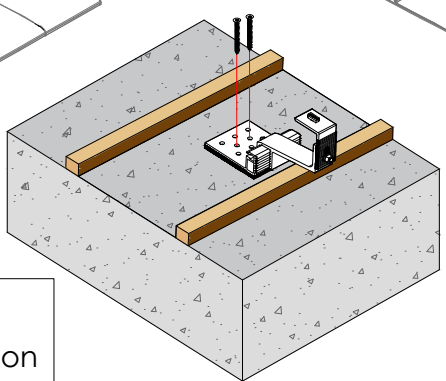


## 3.




## 4.





See possible assemblies in anchoring's technical information

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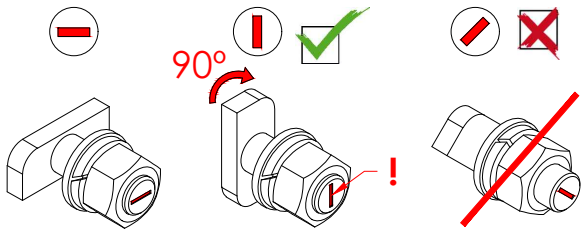
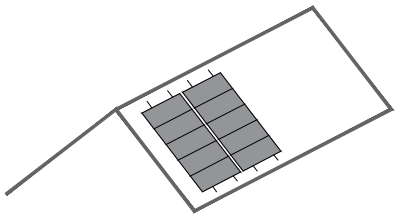
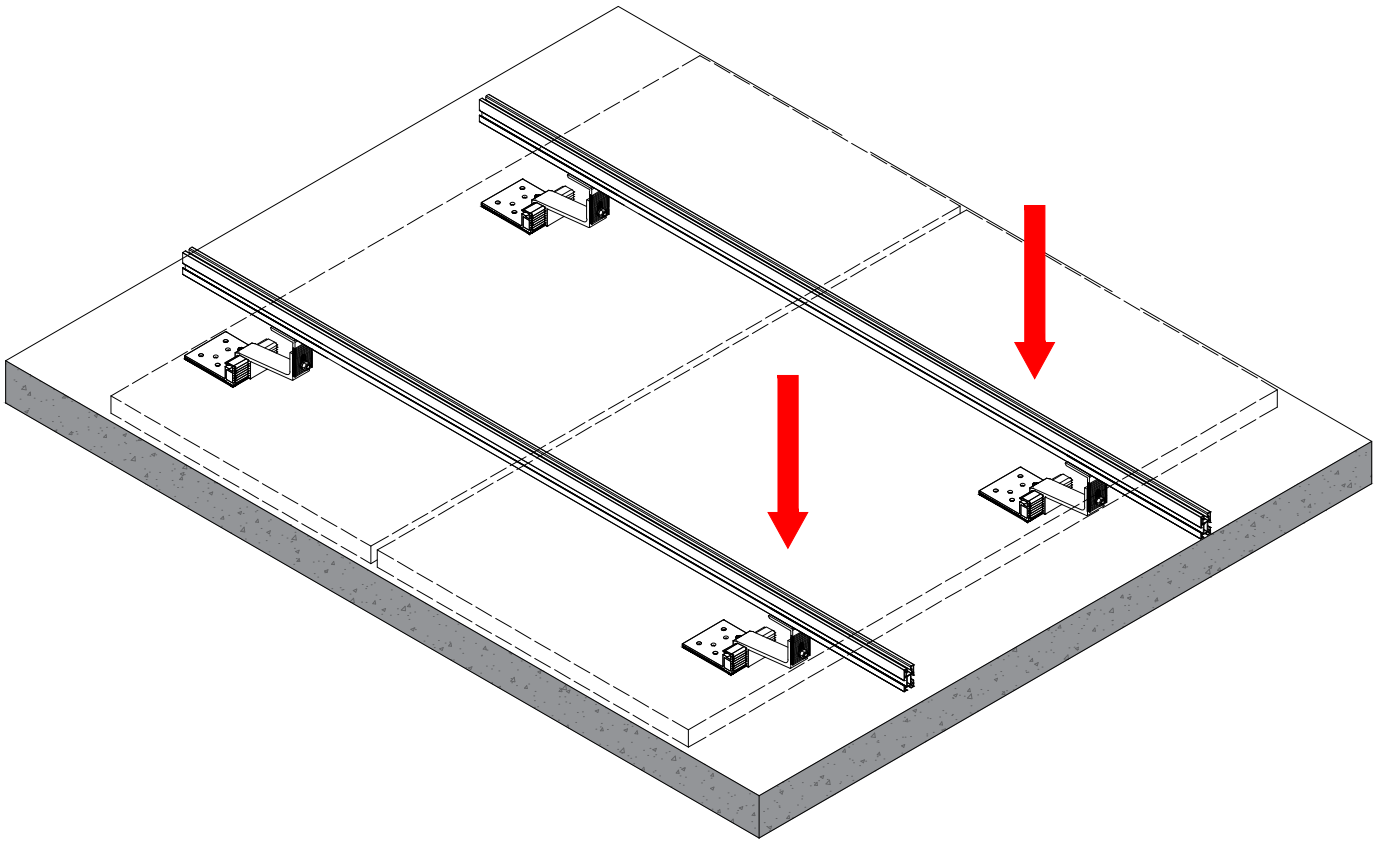
# 02.4V-EN

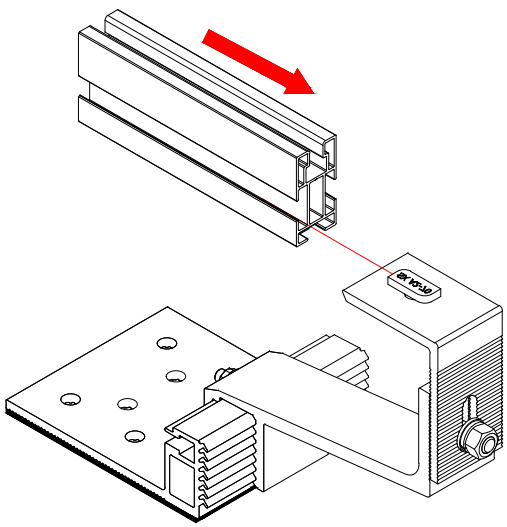




20 Nm







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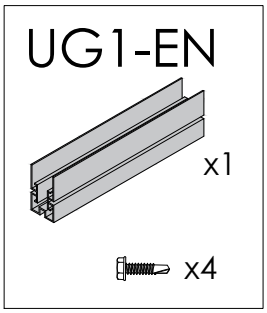
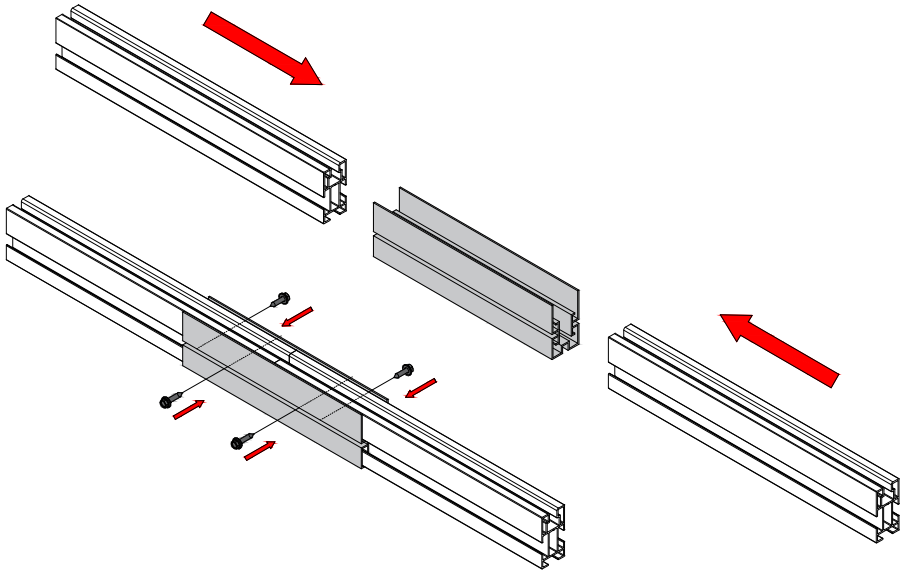
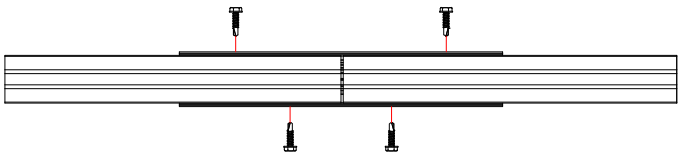
# 02.4V-EN

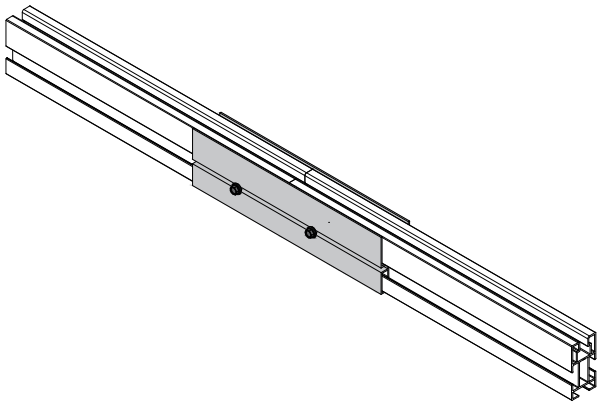

6 Nm




(x4)







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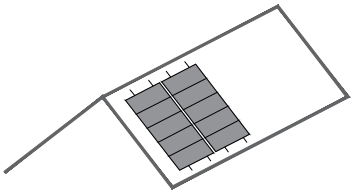


# 02.4V-EN
## Module mounting

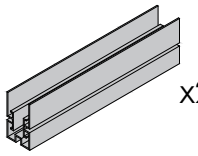
**Union Kit**
Optional Step: For joining two or more kits

Kit A

S15B-EN

Kit B

S15B-EN
Not included

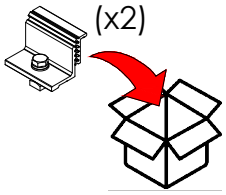

x2


x8

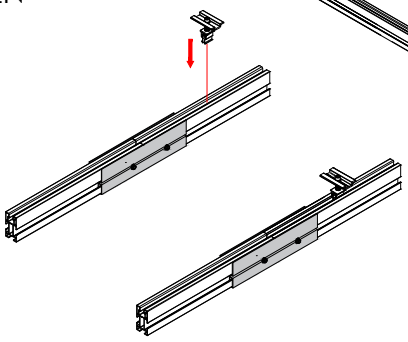

x2

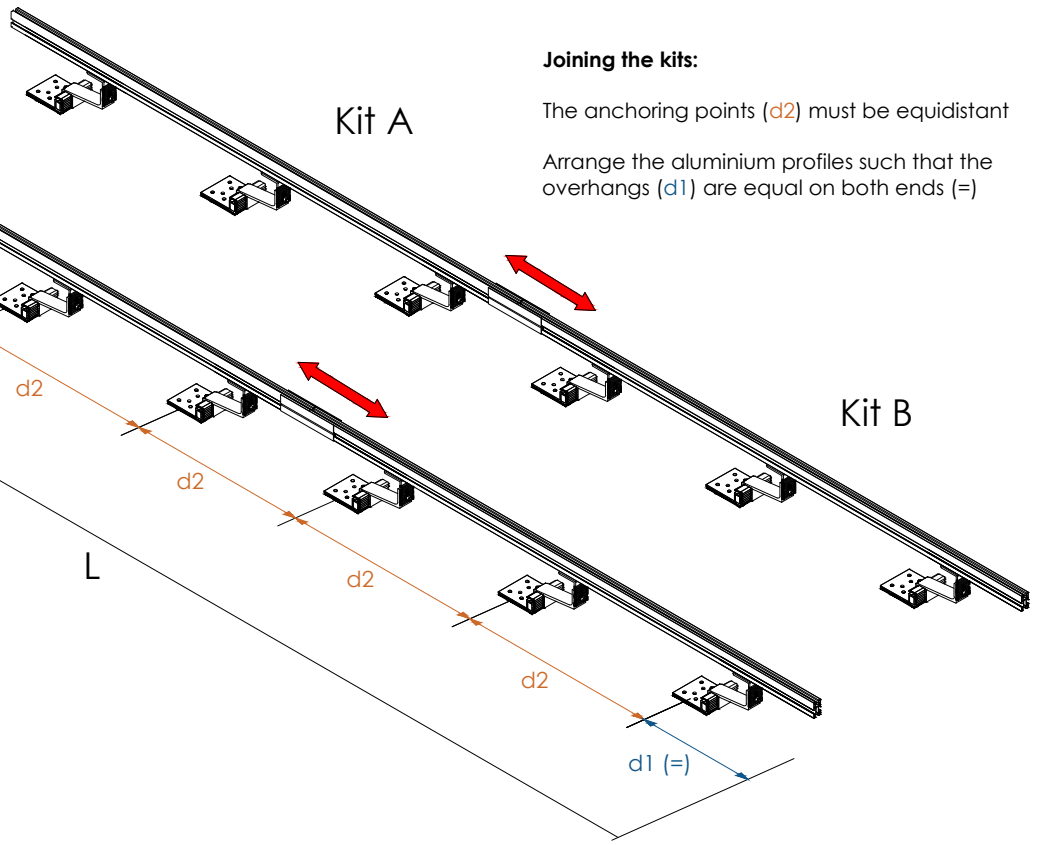
Consult installation of UG1-EN

Extra
(x2)



There are 2x extra S10B-EN in each kit






**Joining the kits:**

The anchoring points (d2) must be equidistant

Arrange the aluminium profiles such that the overhangs (d1) are equal on both ends (=)

**L** ≤ 20m

**d2** ≤ 1770

0,2***d2** ≤ **d1** ≤ 0,33***d2**

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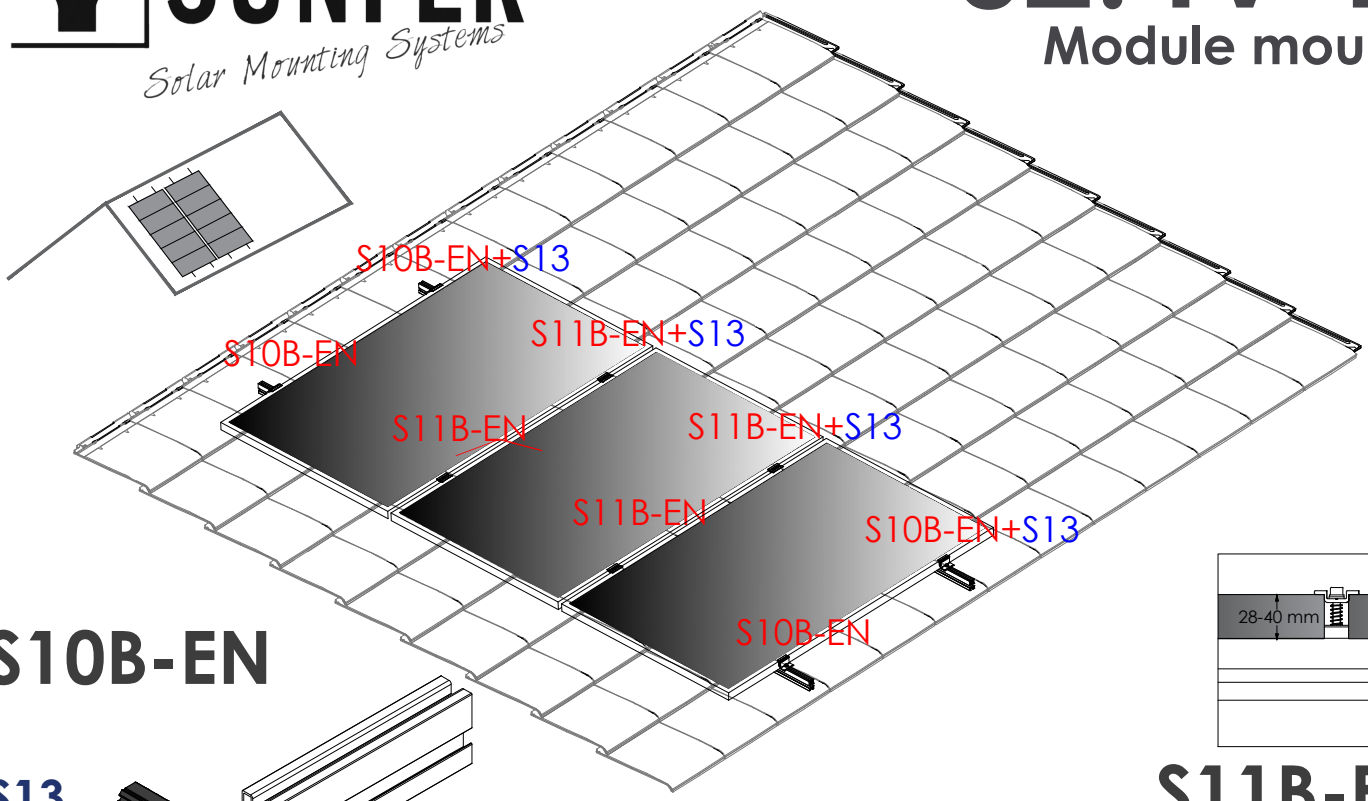
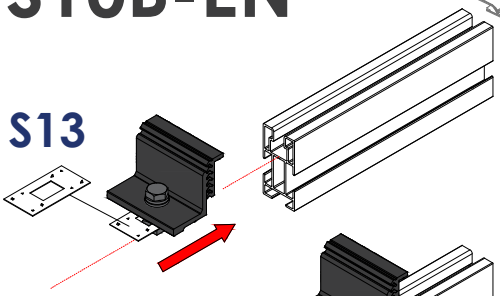
# 02.4V-EN
## Module mounting

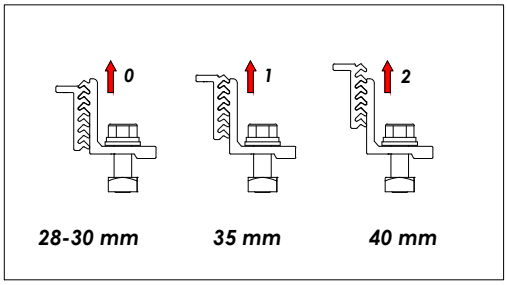


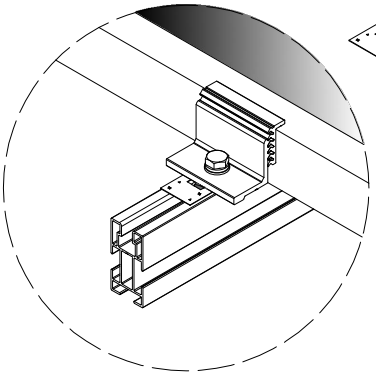

## S10B-EN



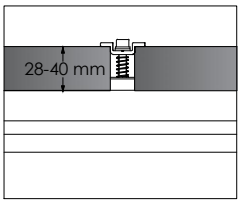


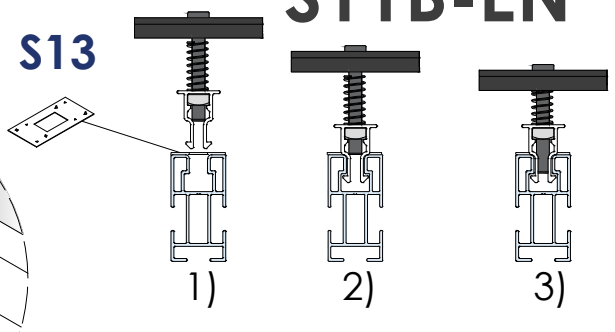
7 Nm



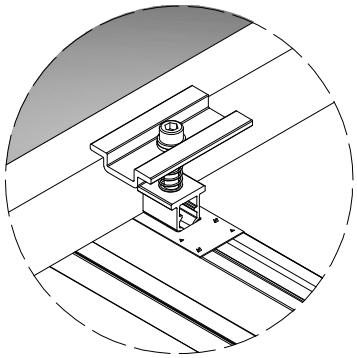
## S11B-EN

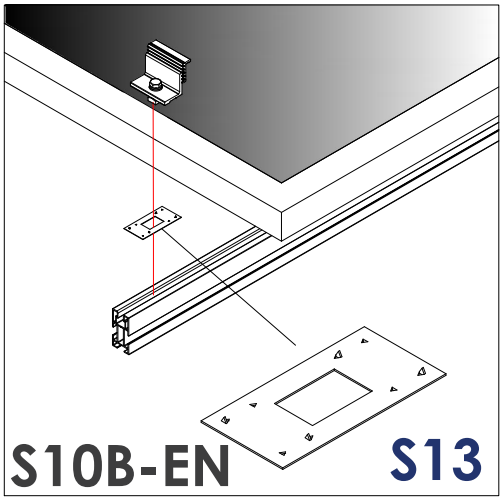


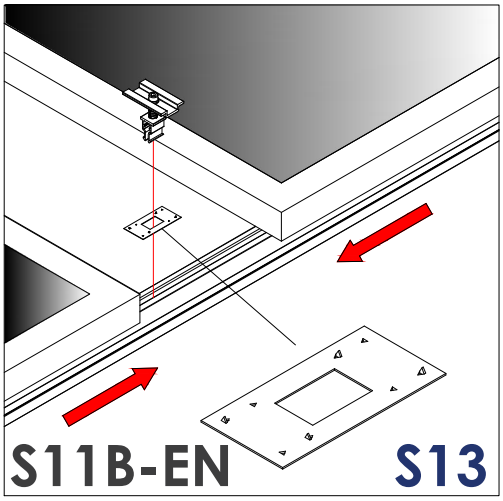



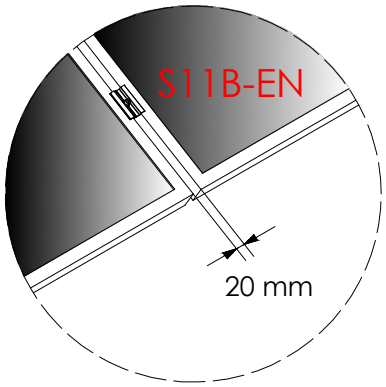


7 Nm





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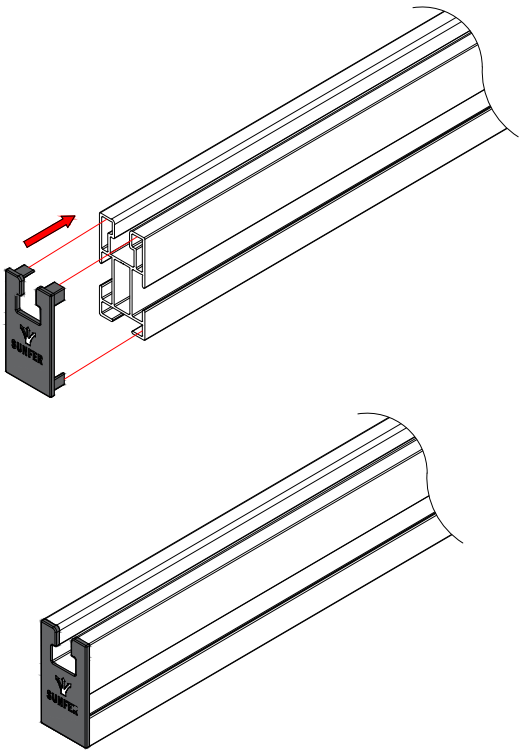
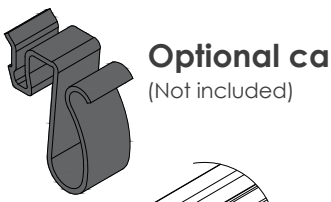
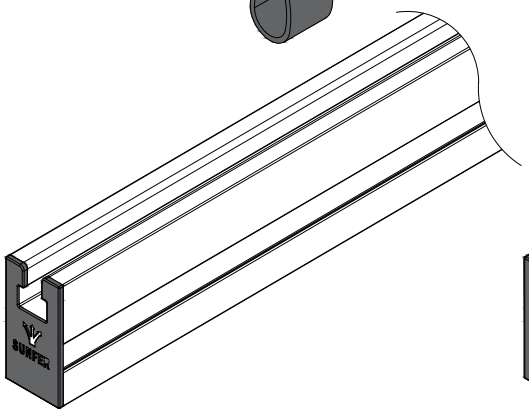
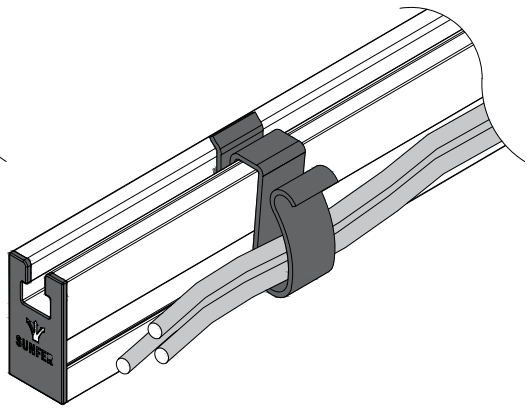
# 02.4V-EN





**Optional cable clip**
(Not included)





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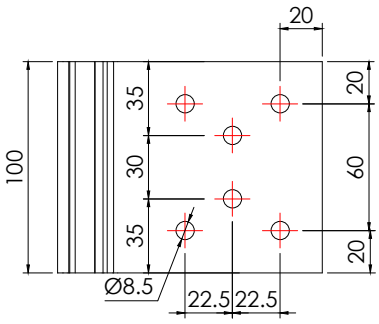
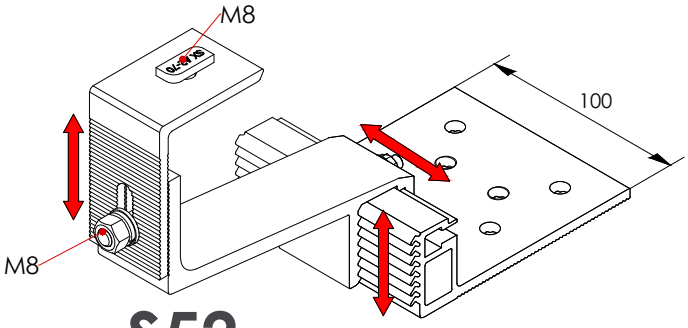
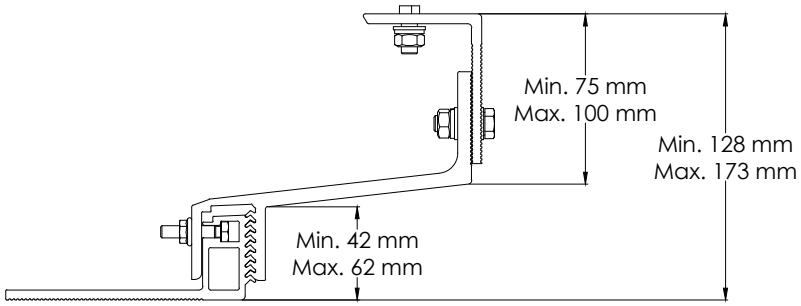
# 02.4V-EN
# S02.4-EN

## Anchoring technical information

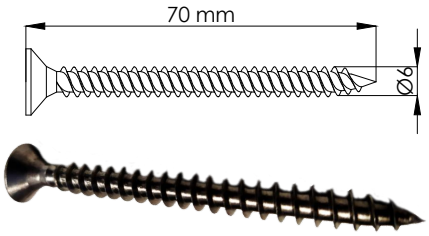



## S52

**Characteristics**
Flat head screw.
A2 AISI 304 Stainless Steel
Anchoring surface:
Wood of class C24 or better

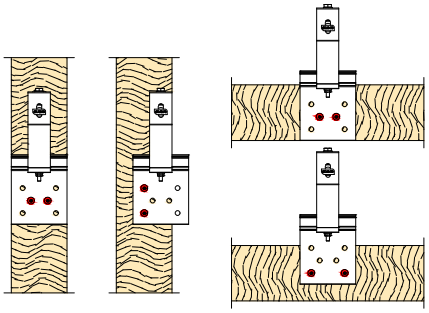



**Technical Specifications:**
Screw length: 70 mm.
Screw diameter: 6 mm.
Pre-drill diameter 4 mm
Suggested torque: 6 Nm

**Screw Fastening Strength :**

| **Metric** | **Pull-out [KN]** |
|---|---|
| 6 | 7.1 |

## Assemblies



| | |
|---|---|
| Description | Coplanar support |
| Panel arrangement | Portrait/Landscape |
| Format | KIT of 1 to 4 panels |
| Union kit | S15-EN not included (optional) |
| Application | Tile roof |
| Anchoring material | Wooden beams |
| Type of fasteners | Screwed - S52 coarse flathead screw |
| Mount/hook | S02.4-EN |
| Profile | G1-EN |
| Earthing ground | S13 |
| Maximum panel dimensions | 2279x1150 mm |
| Panel thickness | from 28 to 40 mm |
| Materials | Fasteners: A2-70 stainless steel<br>Profiles: Raw or anodized EN AW 6005A T6 aluminium<br>Foam rubber weather seal |
| Maximum load | According to configuration |
| Structural calculations | Model checked and simulated per EUROCODE 9 "STRUCTURES OF ALUMINIUM" |

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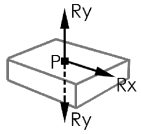
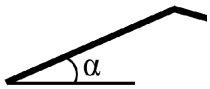
# 02.4V-EN
## Loads and reactions




## Maximum admissible loads and their reactions




**5° Pitch**

**10° Pitch**

**15° Pitch**

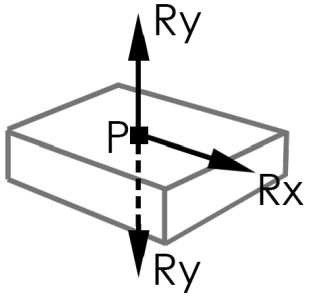
**20° Pitch**

**25° Pitch**

**30° Pitch**

**35° Pitch**

**40° Pitch**




- P: Mount Point
- Rx: Shear generated at anchor
- Ry: Tension generated at anchor, compression applied to roof

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# 02.4V-EN
## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 5° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 263 | 0.32 | 0.00 | 1.85 |
| | 130 | 265 | 0.26 | 0.03 | 1.53 |
| | 150 | 265 | 0.26 | 0.10 | 1.54 |
| | 180 | 265 | 0.26 | 0.22 | 1.57 |
| | 210 | 265 | 0.26 | 0.36 | 1.60 |
| | 250 | 265 | 0.26 | 0.58 | 1.65 |
| 2 | 110 | 122 | 0.31 | 0.00 | 1.85 |
| | 130 | 150 | 0.31 | 0.06 | 1.85 |
| | 150 | 147 | 0.30 | 0.20 | 1.85 |
| | 180 | 142 | 0.29 | 0.43 | 1.85 |
| | 210 | 136 | 0.28 | 0.71 | 1.86 |
| 2 R | 110 | 165 | 0.25 | 0.00 | 1.85 |
| | 130 | 204 | 0.25 | 0.04 | 1.85 |
| | 150 | 201 | 0.25 | 0.12 | 1.85 |
| | 180 | 196 | 0.24 | 0.27 | 1.85 |
| | 210 | 189 | 0.23 | 0.44 | 1.85 |
| | 250 | 179 | 0.22 | 0.72 | 1.85 |
| 3 | 110 | 97 | 0.26 | 0.00 | 1.86 |
| | 130 | 119 | 0.26 | 0.07 | 1.86 |
| | 150 | 116 | 0.25 | 0.20 | 1.86 |
| | 180 | 110 | 0.24 | 0.45 | 1.85 |
| | 210 | 104 | 0.23 | 0.73 | 1.85 |
| 3 R | 110 | 143 | 0.22 | 0.00 | 1.85 |
| | 130 | 176 | 0.22 | 0.04 | 1.85 |
| | 150 | 173 | 0.21 | 0.12 | 1.85 |
| | 180 | 168 | 0.21 | 0.27 | 1.85 |
| | 210 | 162 | 0.20 | 0.44 | 1.85 |
| | 250 | 152 | 0.19 | 0.71 | 1.85 |
| 4 | 110 | 95 | 0.22 | 0.00 | 1.86 |
| | 130 | 116 | 0.22 | 0.06 | 1.85 |
| | 150 | 113 | 0.21 | 0.18 | 1.85 |
| | 180 | 108 | 0.21 | 0.39 | 1.86 |
| | 210 | 101 | 0.20 | 0.64 | 1.85 |
| 4 R | 110 | 134 | 0.20 | 0.00 | 1.85 |
| | 130 | 166 | 0.20 | 0.04 | 1.85 |
| | 150 | 163 | 0.20 | 0.12 | 1.85 |
| | 180 | 157 | 0.19 | 0.26 | 1.85 |
| | 210 | 151 | 0.18 | 0.43 | 1.85 |
| | 250 | 141 | 0.17 | 0.69 | 1.85 |
| 4 RR | 110 | 172 | 0.19 | 0.00 | 1.85 |
| | 130 | 213 | 0.19 | 0.03 | 1.85 |
| | 150 | 210 | 0.19 | 0.09 | 1.85 |
| | 180 | 205 | 0.18 | 0.20 | 1.85 |
| | 210 | 198 | 0.18 | 0.32 | 1.85 |
| | 250 | 188 | 0.17 | 0.52 | 1.85 |

**Table 1** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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# 02.4V-EN
## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 10° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 265 | 0.63 | 0.00 | 1.82 |
| | 130 | 265 | 0.51 | 0.03 | 1.49 |
| | 150 | 265 | 0.51 | 0.10 | 1.51 |
| | 180 | 265 | 0.51 | 0.22 | 1.54 |
| | 210 | 265 | 0.51 | 0.36 | 1.57 |
| | 250 | 265 | 0.51 | 0.58 | 1.62 |
| 2 | 110 | 125 | 0.63 | 0.00 | 1.85 |
| | 130 | 154 | 0.62 | 0.07 | 1.85 |
| | 150 | 151 | 0.61 | 0.20 | 1.85 |
| | 180 | 145 | 0.59 | 0.44 | 1.85 |
| | 210 | 139 | 0.57 | 0.72 | 1.85 |
| 2 R | 110 | 169 | 0.51 | 0.00 | 1.85 |
| | 130 | 209 | 0.51 | 0.04 | 1.85 |
| | 150 | 206 | 0.50 | 0.13 | 1.85 |
| | 180 | 200 | 0.49 | 0.27 | 1.85 |
| | 210 | 194 | 0.47 | 0.45 | 1.85 |
| | 250 | 184 | 0.45 | 0.72 | 1.85 |
| 3 | 110 | 99 | 0.52 | 0.00 | 1.85 |
| | 130 | 122 | 0.52 | 0.07 | 1.86 |
| | 150 | 118 | 0.50 | 0.21 | 1.85 |
| | 180 | 113 | 0.48 | 0.45 | 1.85 |
| | 210 | 107 | 0.46 | 0.74 | 1.86 |
| 3 R | 110 | 146 | 0.44 | 0.00 | 1.85 |
| | 130 | 180 | 0.44 | 0.04 | 1.85 |
| | 150 | 177 | 0.43 | 0.12 | 1.85 |
| | 180 | 172 | 0.42 | 0.27 | 1.85 |
| | 210 | 165 | 0.40 | 0.44 | 1.85 |
| | 250 | 155 | 0.38 | 0.71 | 1.85 |
| 4 | 110 | 97 | 0.45 | 0.00 | 1.85 |
| | 130 | 119 | 0.44 | 0.06 | 1.85 |
| | 150 | 116 | 0.43 | 0.18 | 1.85 |
| | 180 | 110 | 0.41 | 0.39 | 1.85 |
| | 210 | 104 | 0.39 | 0.65 | 1.85 |
| 4 R | 110 | 138 | 0.41 | 0.00 | 1.85 |
| | 130 | 170 | 0.40 | 0.04 | 1.85 |
| | 150 | 167 | 0.40 | 0.12 | 1.85 |
| | 180 | 161 | 0.38 | 0.26 | 1.85 |
| | 210 | 155 | 0.37 | 0.43 | 1.85 |
| | 250 | 145 | 0.35 | 0.69 | 1.85 |
| 4 RR | 110 | 177 | 0.39 | 0.00 | 1.85 |
| | 130 | 218 | 0.38 | 0.03 | 1.85 |
| | 150 | 215 | 0.38 | 0.09 | 1.85 |
| | 180 | 210 | 0.37 | 0.20 | 1.85 |
| | 210 | 203 | 0.36 | 0.32 | 1.85 |
| | 250 | 193 | 0.34 | 0.52 | 1.85 |

**Table 2** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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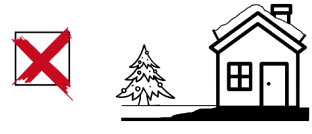
# 02.4V-EN

## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | | 15° |
|---|---|---|---|---|---|---|
| Kit | Loads | | | | | |
| | (Km/h) | (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) | |
| 1 | 110 | 265 | 0.92 | 0.02 | 1.78 | |
| | 130 | 265 | 0.75 | 0.09 | 1.47 | |
| | 150 | 265 | 0.75 | 0.18 | 1.50 | |
| | 180 | 265 | 0.75 | 0.33 | 1.55 | |
| | 210 | 265 | 0.75 | 0.51 | 1.61 | |
| | 250 | 265 | 0.75 | 0.80 | 1.70 | |
| 2 | 110 | 126 | 0.93 | 0.04 | 1.85 | |
| | 130 | 153 | 0.90 | 0.19 | 1.85 | |
| | 150 | 148 | 0.88 | 0.36 | 1.85 | |
| | 180 | 138 | 0.82 | 0.67 | 1.85 | |
| 2 R | 110 | 172 | 0.76 | 0.03 | 1.85 | |
| | 130 | 211 | 0.75 | 0.12 | 1.85 | |
| | 150 | 205 | 0.73 | 0.22 | 1.85 | |
| | 180 | 195 | 0.70 | 0.41 | 1.85 | |
| | 210 | 184 | 0.66 | 0.64 | 1.85 | |
| 3 | 110 | 99 | 0.77 | 0.04 | 1.85 | |
| | 130 | 120 | 0.75 | 0.19 | 1.86 | |
| | 150 | 114 | 0.71 | 0.37 | 1.85 | |
| | 180 | 104 | 0.66 | 0.68 | 1.85 | |
| 3 R | 110 | 148 | 0.66 | 0.03 | 1.85 | |
| | 130 | 181 | 0.64 | 0.12 | 1.85 | |
| | 150 | 175 | 0.63 | 0.22 | 1.85 | |
| | 180 | 166 | 0.60 | 0.41 | 1.85 | |
| | 210 | 154 | 0.56 | 0.63 | 1.85 | |
| 4 | 110 | 97 | 0.66 | 0.04 | 1.85 | |
| | 130 | 117 | 0.64 | 0.17 | 1.85 | |
| | 150 | 111 | 0.61 | 0.33 | 1.85 | |
| | 180 | 102 | 0.57 | 0.60 | 1.86 | |
| 4 R | 110 | 139 | 0.60 | 0.03 | 1.85 | |
| | 130 | 170 | 0.59 | 0.11 | 1.85 | |
| | 150 | 164 | 0.57 | 0.22 | 1.85 | |
| | 180 | 154 | 0.54 | 0.40 | 1.85 | |
| | 210 | 143 | 0.51 | 0.61 | 1.85 | |
| 4 RR | 110 | 180 | 0.58 | 0.02 | 1.85 | |
| | 130 | 220 | 0.57 | 0.09 | 1.85 | |
| | 150 | 215 | 0.56 | 0.16 | 1.85 | |
| | 180 | 205 | 0.53 | 0.30 | 1.85 | |
| | 210 | 193 | 0.50 | 0.46 | 1.85 | |
| | 250 | 175 | 0.46 | 0.72 | 1.85 | |

**Table 3** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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# 02.4V-EN

## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 20° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 232 | 1.05 | 0.03 | 1.50 |
| | 130 | 265 | 0.96 | 0.10 | 1.40 |
| | 150 | 265 | 0.96 | 0.19 | 1.43 |
| | 180 | 265 | 0.96 | 0.34 | 1.48 |
| | 210 | 265 | 0.96 | 0.52 | 1.53 |
| | 250 | 265 | 0.96 | 0.80 | 1.62 |
| 2 | 110 | 109 | 1.05 | 0.05 | 1.56 |
| | 130 | 136 | 1.05 | 0.20 | 1.60 |
| | 150 | 136 | 1.05 | 0.37 | 1.66 |
| | 180 | 136 | 1.05 | 0.67 | 1.75 |
| 2 R | 110 | 182 | 1.04 | 0.03 | 1.85 |
| | 130 | 223 | 1.02 | 0.12 | 1.85 |
| | 150 | 217 | 0.99 | 0.23 | 1.85 |
| | 180 | 207 | 0.95 | 0.42 | 1.85 |
| | 210 | 195 | 0.90 | 0.64 | 1.85 |
| 3 | 110 | 105 | 1.04 | 0.05 | 1.85 |
| | 130 | 127 | 1.01 | 0.20 | 1.85 |
| | 150 | 121 | 0.97 | 0.38 | 1.85 |
| | 180 | 111 | 0.90 | 0.69 | 1.85 |
| 3 R | 110 | 157 | 0.90 | 0.03 | 1.85 |
| | 130 | 192 | 0.88 | 0.12 | 1.85 |
| | 150 | 186 | 0.85 | 0.23 | 1.85 |
| | 180 | 175 | 0.81 | 0.41 | 1.85 |
| | 210 | 163 | 0.76 | 0.64 | 1.85 |
| 4 | 110 | 103 | 0.90 | 0.05 | 1.85 |
| | 130 | 124 | 0.87 | 0.18 | 1.85 |
| | 150 | 118 | 0.83 | 0.33 | 1.85 |
| | 180 | 108 | 0.77 | 0.61 | 1.85 |
| 4 R | 110 | 148 | 0.82 | 0.03 | 1.85 |
| | 130 | 180 | 0.80 | 0.12 | 1.85 |
| | 150 | 174 | 0.78 | 0.22 | 1.85 |
| | 180 | 164 | 0.74 | 0.40 | 1.85 |
| | 210 | 151 | 0.69 | 0.62 | 1.85 |
| 4 RR | 110 | 190 | 0.79 | 0.02 | 1.85 |
| | 130 | 233 | 0.77 | 0.09 | 1.85 |
| | 150 | 227 | 0.75 | 0.17 | 1.85 |
| | 180 | 217 | 0.72 | 0.31 | 1.85 |
| | 210 | 205 | 0.68 | 0.47 | 1.85 |
| | 250 | 185 | 0.62 | 0.72 | 1.85 |

**Table 4** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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Solar Mounting Systems

# 02.4V-EN

## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 25° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 192 | 1.05 | 0.03 | 1.18 |
| | 130 | 240 | 1.05 | 0.11 | 1.20 |
| | 150 | 240 | 1.05 | 0.19 | 1.23 |
| | 180 | 240 | 1.05 | 0.34 | 1.28 |
| | 210 | 240 | 1.05 | 0.52 | 1.34 |
| | 250 | 240 | 1.05 | 0.81 | 1.43 |
| 2 | 110 | 88 | 1.05 | 0.06 | 1.24 |
| | 130 | 111 | 1.05 | 0.21 | 1.29 |
| | 150 | 111 | 1.05 | 0.38 | 1.35 |
| | 180 | 111 | 1.05 | 0.69 | 1.44 |
| 2 R | 110 | 152 | 1.05 | 0.04 | 1.48 |
| | 130 | 190 | 1.05 | 0.13 | 1.51 |
| | 150 | 190 | 1.05 | 0.24 | 1.56 |
| | 180 | 190 | 1.05 | 0.43 | 1.63 |
| | 210 | 190 | 1.05 | 0.65 | 1.72 |
| 3 | 110 | 86 | 1.05 | 0.06 | 1.48 |
| | 130 | 107 | 1.05 | 0.22 | 1.53 |
| | 150 | 107 | 1.05 | 0.39 | 1.60 |
| | 180 | 107 | 1.05 | 0.70 | 1.72 |
| 3 R | 110 | 153 | 1.05 | 0.04 | 1.69 |
| | 130 | 192 | 1.05 | 0.13 | 1.74 |
| | 150 | 192 | 1.05 | 0.23 | 1.78 |
| | 180 | 189 | 1.03 | 0.42 | 1.85 |
| | 210 | 176 | 0.97 | 0.64 | 1.85 |
| 4 | 110 | 100 | 1.05 | 0.06 | 1.70 |
| | 130 | 125 | 1.05 | 0.19 | 1.75 |
| | 150 | 125 | 1.05 | 0.34 | 1.82 |
| | 180 | 117 | 0.99 | 0.62 | 1.85 |
| 4 R | 110 | 158 | 1.05 | 0.04 | 1.84 |
| | 130 | 194 | 1.03 | 0.13 | 1.85 |
| | 150 | 188 | 1.00 | 0.23 | 1.85 |
| | 180 | 177 | 0.95 | 0.41 | 1.85 |
| | 210 | 163 | 0.88 | 0.62 | 1.85 |
| 4 RR | 110 | 205 | 1.01 | 0.03 | 1.85 |
| | 130 | 251 | 0.99 | 0.10 | 1.85 |
| | 150 | 245 | 0.96 | 0.17 | 1.85 |
| | 180 | 234 | 0.92 | 0.31 | 1.85 |
| | 210 | 221 | 0.88 | 0.47 | 1.85 |
| | 250 | 200 | 0.80 | 0.73 | 1.85 |

**Table 5** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

SUNFER
Solar Mounting Systems

# 02.4V-EN

## Loads and reactions

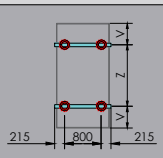
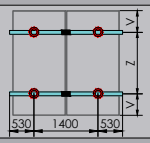
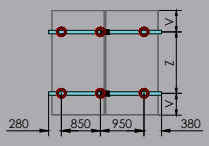
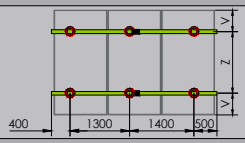
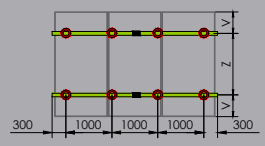
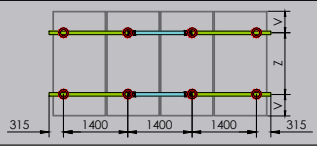
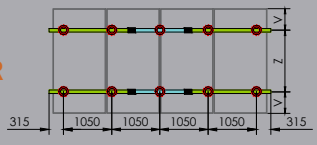
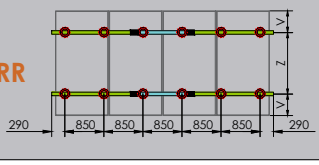
| Maximum Admissible Loads and Their Reactions | | | | | 30° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1   | 110 | 167 | 1.05 | 0.00 | 1.00 |
| | 130 | 209 | 1.05 | 0.00 | 1.04 |
| | 150 | 209 | 1.05 | 0.04 | 1.08 |
| | 180 | 209 | 1.05 | 0.13 | 1.15 |
| | 210 | 209 | 1.05 | 0.23 | 1.24 |
| | 250 | 209 | 1.05 | 0.39 | 1.39 |
| 2   | 110 | 76 | 1.05 | 0.00 | 1.10 |
| | 130 | 95 | 1.05 | 0.00 | 1.17 |
| | 150 | 95 | 1.05 | 0.09 | 1.26 |
| | 180 | 95 | 1.05 | 0.26 | 1.41 |
| | 210 | 95 | 1.05 | 0.46 | 1.66 |
| 2 R   | 110 | 132 | 1.05 | 0.00 | 1.27 |
| | 130 | 165 | 1.05 | 0.00 | 1.32 |
| | 150 | 165 | 1.05 | 0.06 | 1.39 |
| | 180 | 165 | 1.05 | 0.16 | 1.50 |
| | 210 | 165 | 1.05 | 0.28 | 1.64 |
| | 250 | 164 | 1.04 | 0.48 | 1.85 |
| 3   | 110 | 73 | 1.05 | 0.00 | 1.30 |
| | 130 | 92 | 1.05 | 0.00 | 1.40 |
| | 150 | 92 | 1.05 | 0.09 | 1.50 |
| | 180 | 92 | 1.05 | 0.26 | 1.69 |
| | 210 | 59 | 0.74 | 0.47 | 1.85 |
| 3 R   | 110 | 133 | 1.05 | 0.00 | 1.45 |
| | 130 | 167 | 1.05 | 0.00 | 1.52 |
| | 150 | 167 | 1.05 | 0.05 | 1.59 |
| | 180 | 167 | 1.05 | 0.16 | 1.72 |
| | 210 | 162 | 1.02 | 0.28 | 1.85 |
| | 250 | 92 | 0.63 | 0.47 | 1.85 |
| 4   | 110 | 86 | 1.05 | 0.00 | 1.48 |
| | 130 | 108 | 1.05 | 0.00 | 1.58 |
| | 150 | 108 | 1.05 | 0.08 | 1.68 |
| | 180 | 106 | 1.03 | 0.23 | 1.85 |
| | 210 | 52 | 0.59 | 0.41 | 1.85 |
| 4 R   | 110 | 138 | 1.05 | 0.00 | 1.57 |
| | 130 | 172 | 1.05 | 0.00 | 1.64 |
| | 150 | 172 | 1.05 | 0.05 | 1.71 |
| | 180 | 171 | 1.04 | 0.15 | 1.85 |
| | 210 | 149 | 0.92 | 0.27 | 1.85 |
| | 250 | 64 | 0.46 | 0.46 | 1.85 |
| 4 RR   | 110 | 187 | 1.05 | 0.00 | 1.62 |
| | 130 | 234 | 1.05 | 0.00 | 1.67 |
| | 150 | 234 | 1.05 | 0.04 | 1.74 |
| | 180 | 234 | 1.05 | 0.12 | 1.85 |
| | 210 | 211 | 0.95 | 0.21 | 1.85 |
| | 250 | 175 | 0.81 | 0.35 | 1.85 |

**Table 6** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

SUNFER
Solar Mounting Systems

# 02.4V-EN

## Loads and reactions

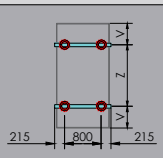
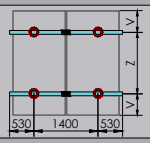
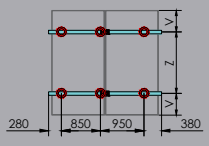
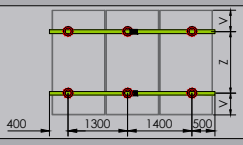
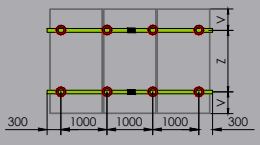
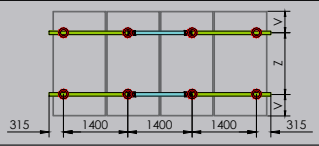
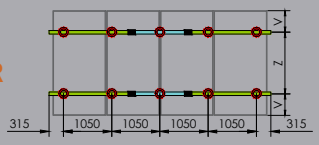
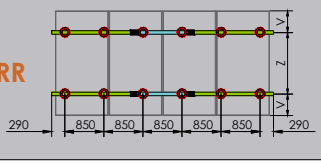
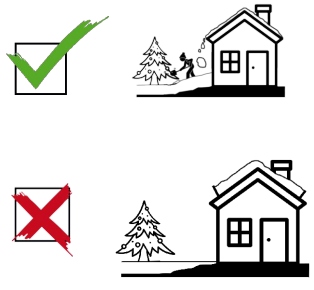
| Maximum Admissible Loads and Their Reactions | | | | | 35° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1  | 110 | 183 | 1.05 | 0.00 | 0.84 |
| | 130 | 228 | 1.05 | 0.00 | 0.88 |
| | 150 | 228 | 1.05 | 0.05 | 0.92 |
| | 180 | 228 | 1.05 | 0.14 | 0.99 |
| | 210 | 228 | 1.05 | 0.24 | 1.08 |
| | 250 | 228 | 1.05 | 0.39 | 1.23 |
| 2  | 110 | 81 | 1.05 | 0.00 | 0.93 |
| | 130 | 102 | 1.05 | 0.01 | 1.01 |
| | 150 | 102 | 1.05 | 0.10 | 1.10 |
| | 180 | 102 | 1.05 | 0.27 | 1.28 |
| | 210 | 102 | 1.05 | 0.47 | 1.58 |
| 2 R  | 110 | 143 | 1.05 | 0.00 | 1.06 |
| | 130 | 179 | 1.05 | 0.01 | 1.12 |
| | 150 | 179 | 1.05 | 0.07 | 1.19 |
| | 180 | 179 | 1.05 | 0.17 | 1.30 |
| | 210 | 179 | 1.05 | 0.29 | 1.44 |
| | 250 | 179 | 1.05 | 0.49 | 1.74 |
| 3  | 110 | 79 | 1.05 | 0.00 | 1.12 |
| | 130 | 99 | 1.05 | 0.01 | 1.21 |
| | 150 | 99 | 1.05 | 0.11 | 1.31 |
| | 180 | 99 | 1.05 | 0.28 | 1.54 |
| | 210 | 82 | 0.91 | 0.49 | 1.85 |
| 3 R  | 110 | 145 | 1.05 | 0.00 | 1.22 |
| | 130 | 181 | 1.05 | 0.01 | 1.29 |
| | 150 | 181 | 1.05 | 0.06 | 1.36 |
| | 180 | 181 | 1.05 | 0.17 | 1.49 |
| | 210 | 181 | 1.05 | 0.29 | 1.65 |
| | 250 | 126 | 0.77 | 0.48 | 1.85 |
| 4  | 110 | 93 | 1.05 | 0.00 | 1.27 |
| | 130 | 116 | 1.05 | 0.01 | 1.35 |
| | 150 | 116 | 1.05 | 0.09 | 1.46 |
| | 180 | 116 | 1.05 | 0.25 | 1.65 |
| | 210 | 72 | 0.72 | 0.43 | 1.85 |
| 4 R  | 110 | 150 | 1.05 | 0.00 | 1.33 |
| | 130 | 187 | 1.05 | 0.01 | 1.39 |
| | 150 | 187 | 1.05 | 0.06 | 1.47 |
| | 180 | 187 | 1.05 | 0.16 | 1.61 |
| | 210 | 187 | 1.05 | 0.28 | 1.77 |
| | 250 | 89 | 0.56 | 0.47 | 1.85 |
| 4 RR  | 110 | 204 | 1.05 | 0.00 | 1.36 |
| | 130 | 255 | 1.05 | 0.00 | 1.41 |
| | 150 | 255 | 1.05 | 0.05 | 1.47 |
| | 180 | 255 | 1.05 | 0.12 | 1.59 |
| | 210 | 255 | 1.05 | 0.21 | 1.72 |
| | 250 | 237 | 0.98 | 0.36 | 1.85 |

**Table 7** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

SUNFER
Solar Mounting Systems

# 02.4V-EN

## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 40° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 215 | 1.05 | 0.00 | 0.71 |
| | 130 | 265 | 1.03 | 0.01 | 0.74 |
| | 150 | 265 | 1.03 | 0.06 | 0.78 |
| | 180 | 265 | 1.03 | 0.15 | 0.85 |
| | 210 | 265 | 1.03 | 0.25 | 0.93 |
| | 250 | 265 | 1.03 | 0.40 | 1.09 |
| 2 | 110 | 94 | 1.05 | 0.00 | 0.80 |
| | 130 | 118 | 1.05 | 0.03 | 0.87 |
| | 150 | 118 | 1.05 | 0.12 | 0.95 |
| | 180 | 118 | 1.05 | 0.29 | 1.15 |
| | 210 | 118 | 1.05 | 0.49 | 1.43 |
| 2 R | 110 | 168 | 1.05 | 0.00 | 0.90 |
| | 130 | 210 | 1.05 | 0.02 | 0.95 |
| | 150 | 210 | 1.05 | 0.08 | 1.02 |
| | 180 | 210 | 1.05 | 0.18 | 1.13 |
| | 210 | 210 | 1.05 | 0.31 | 1.25 |
| | 250 | 210 | 1.05 | 0.50 | 1.58 |
| 3 | 110 | 91 | 1.05 | 0.00 | 0.95 |
| | 130 | 114 | 1.05 | 0.03 | 1.04 |
| | 150 | 114 | 1.05 | 0.13 | 1.13 |
| | 180 | 114 | 1.05 | 0.30 | 1.40 |
| | 210 | 114 | 1.05 | 0.50 | 1.74 |
| 3 R | 110 | 170 | 1.05 | 0.00 | 1.04 |
| | 130 | 213 | 1.05 | 0.02 | 1.10 |
| | 150 | 213 | 1.05 | 0.08 | 1.17 |
| | 180 | 213 | 1.05 | 0.18 | 1.29 |
| | 210 | 213 | 1.05 | 0.30 | 1.44 |
| | 250 | 213 | 1.05 | 0.49 | 1.80 |
| 4 | 110 | 108 | 1.05 | 0.00 | 1.08 |
| | 130 | 135 | 1.05 | 0.02 | 1.16 |
| | 150 | 135 | 1.05 | 0.11 | 1.26 |
| | 180 | 135 | 1.05 | 0.26 | 1.47 |
| | 210 | 135 | 1.05 | 0.44 | 1.82 |
| 4 R | 110 | 176 | 1.05 | 0.00 | 1.12 |
| | 130 | 198 | 0.96 | 0.02 | 1.10 |
| | 150 | 198 | 0.96 | 0.07 | 1.17 |
| | 180 | 198 | 0.96 | 0.17 | 1.30 |
| | 210 | 198 | 0.96 | 0.29 | 1.47 |
| | 250 | 183 | 0.89 | 0.48 | 1.85 |
| 4 RR | 110 | 241 | 1.05 | 0.00 | 1.15 |
| | 130 | 265 | 0.93 | 0.01 | 1.09 |
| | 150 | 265 | 0.93 | 0.06 | 1.15 |
| | 180 | 265 | 0.93 | 0.13 | 1.25 |
| | 210 | 265 | 0.93 | 0.22 | 1.37 |
| | 250 | 265 | 0.93 | 0.36 | 1.60 |

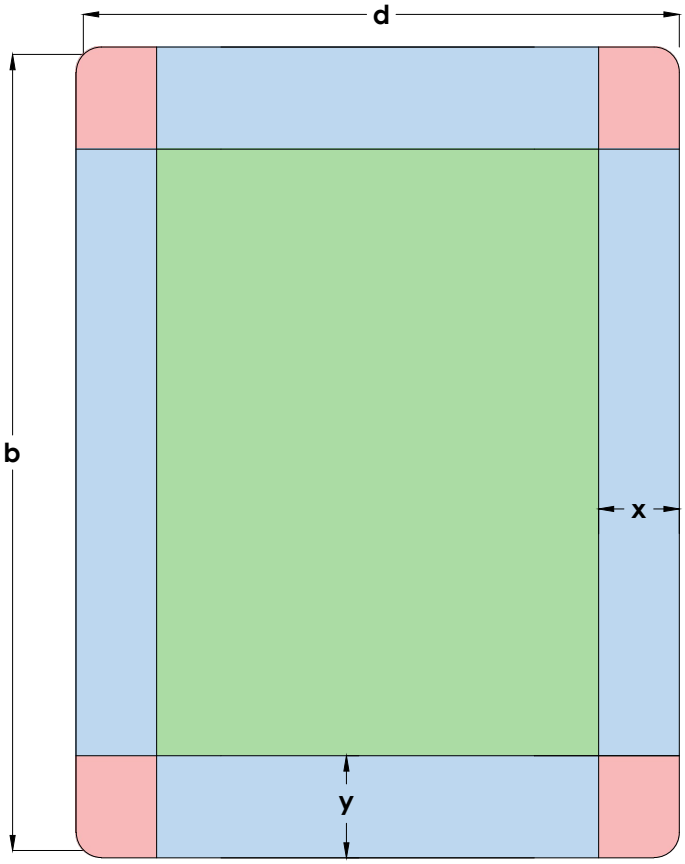
**Table 8** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

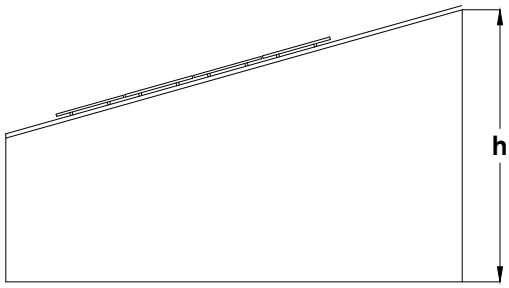
SUNFER
Solar Mounting Systems

# 02.4V-EN
## Installation Zone




e= min [b,2h]

x = Max [e/10 , 0.5m]
y = Max [e/4 , 0.5m]




Installation safe zone

Turbulent zone

Extremely turbulent zone

To avoid turbulence and other unwanted natural effects, it is strongly recommended to install photovoltaic panels inside of the green zone.

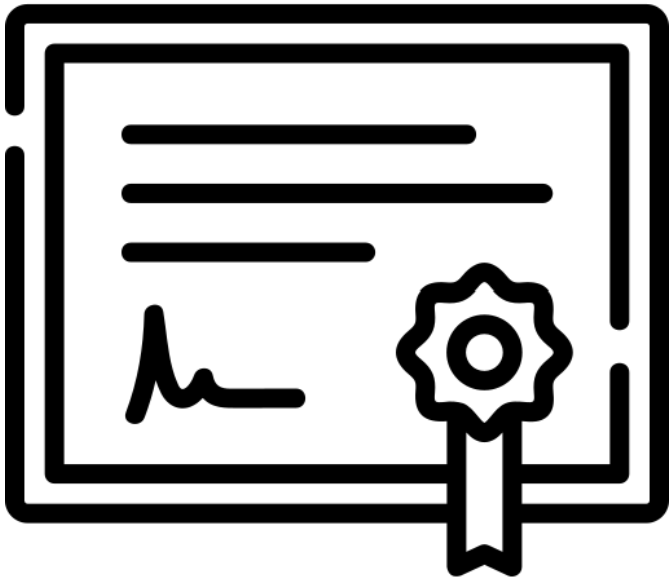
SUNFER
Solar Mounting Systems

# 02.4V-EN

## Installation video

SUNFER
Solar Mounting Systems

# 02.4V-EN
## Certifications and guarantees



- ISO 9001 Certified
- ISO 14001 Certified
- CE Marking
- Guaranteed

This is a translation of the certificate ES13/13899

The management system of

# SUNFER ESTRUCTURAS, S.L.U.

Camí de la Dula, s/n, 46687 Albalat de la Ribera, Valencia

has been assessed and certified as meeting the requirements of

## ISO 9001:2015

For the following activities
Design, manufacture and sale of solar energy structures.

This certificate is valid from 19 May 2023 until 8 April 2025 and remains valid subject to satisfactory surveillance audits.

Issue 6. Certified with SGS since 8 April 2013

Last certificate expiry date 8 April 2022
Recertification audit date 31 March 2022

Authorised by

SGS International Certification Services Iberica, S.A.U.
C/Trespaderne, 29. 28042 Madrid. España
t +34 91 313 8115 - www.sgs.com

This is a translation of the certificate ES22/211172

The management system of

# SUNFER ESTRUCTURAS, S.L.U.

Camí de la Dula, s/n, 46687 Albalat de la Ribera, Valencia

has been assessed and certified as meeting the requirements of

## ISO 14001:2015

For the following activities
Design, manufacture and sale of solar energy structures.

This certificate is valid from 19 May 2023 until 22 April 2025 and remains valid subject to satisfactory surveillance audits.

Issue 2. Certified with SGS since 22 April 2022

Authorised by

SGS International Certification Services Iberica, S.A.U.
C/Trespaderne, 29. 28042 Madrid. España
t +34 91 313 8115 - www.sgs.com

SUNFER

CE

**IDENTIFICATION NUMBER OF NOTIFIED ORGANISM:**

*1181*

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**NUMBER AND REGISTERED ADDRESS OF MANUFACTURERS. INSTALLATION LOCATION:**

Business name: *SUNFER ESTRUCTURAS, S.L.U.*

Address: *Camí de la Dula s/n*

Postal Code: *46687*

Location: *Albalat de la Ribera*

City: *Valencia*

Country: *España*

**TWO LAST DIGITS OF THE YEAR THAT THE MARKING WAS FIXED:**

*19*

*ES19/86524*

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**EN 1090-1**

Description of product: ***02.4V-EN***

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| | |
|---|---|
| **TOLERANCES IN GEOMETRIC INFORMATION:** | *EN 1090-3* |
| **WELDABILITY:** | *--* |
| **FRACTURE RESISTANCE:** | *--* |
| **FIRE REACTION:** | *Classified material A1* |
| **CADMIUM EMISSION:** | *N/A* |
| **RADIACTIVITY EMISSION:** | *N/A* |
| **DURABILITY:** | *N/A* |

**STRUCTURAL CHARACTERISTICS:**

- **Carrying capacity:** *See product instructions and data sheet*
- **Fatigue resistance:** *N/A*
- **Fire resistance:** *N/A*
- **Manufacturing:** *According to the component specification and EN1090-3. Execution class EXC1*

| | |
|---|---|
| DECLARATION OF PERFORMANCE NUMBER: | P-0120 |

**1. PRODUCT DESCRIPTION.**

| | |
|---|---|
| UNIQUE IDENTIFICATION CODE OF THE PRODUCT TYPE: | 02.4V-EN |

**2. NAME AND ADDRESS OF MANUFACTURER.**

| | |
|---|---|
| NAME: | SUNFER ESTRUCTURAS, S.L.U. |
| COMERCIAL NAME (if exists): | -- |
| ADDRESS: | CAMI DE LA DULA S/N |
| CITY AND PC: | 46687 ALBALAT DE LA RIBERA -- COMUNIDAD VALENCIANA (SPAIN) |

**3. INTENDED USE(S) OF THE PRODUCT:**
ALUMINUM STRUCTURE TO SUPPORT PHOTOVOLTAIC PANELS.

**4. SYSTEM OF EVALUATION AND VERIFICATION OF CONSTANCY OF PERFORMANCE:**
System 2+

**5. HARMONIZED STANDARD:**
This product complies with the provisions of Annex ZA of the European standard **UNE-EN 1090-1:2011 + A1:2012**

**6. NOTIFIED ORGANISM:**

| | |
|---|---|
| NAME: | **SGS ICS IBÉRICA. S.A.** |
| Notified Organism Number: | **NB1181** |

**7. DECLARED PERFORMANCES:**

| Essential Characteristics | Performances | Harmonised technical specifications |
|---|---|---|
| Tolerances in geometric information | Conforms to limits for essential tolerances□ | EN 1090-3 |
| Weldability | Not applicable because there is no welding in the structure | ---- |
| Fracture Tenacity | Not required for aluminum components | ----- |
| Carrying Capacity | N/A | |
| Fatigue Resistance | N/A | |
| Fire Resistance | N/A | |
| Fire reaction | Class A1 | EN 13501-1 |
| Emission of cadmium and its compounds | OK | |
| Emission of radioactivity | OK | |
| Durability | N/A | |
| Structural features<br>- Carrying capacity<br>- Fatigue resistance: N/A<br>- Fire resistance: N/A<br>- Manufacturing | See product data sheet<br>N/A<br>N/A<br>According to the component specification.<br>Execution class EXC1 | UNE EN 1999-1-1<br><br><br>UNE EN 1090-3 |

- The performance of the product identified above is in accordance with all the declared performance.
- This declaration of performance is issued in accordance with Regulation (EN) No. 305/2011 under the responsibility of the manufacturer identified above.

Manufacturer's Name: Voro Gómez Nacher
Date of issue: 02/08/2023
Signature:

# Guarantee Terms and Conditions

## Structural and Anticorrosion Guarantee

All SUNFER mounting systems are manufactured under strict production control in our factory, as are our raw materials, which are periodically tested to ensure quality. It is for these reasons we are able to offer the following guarantee for our products:

25 year Structural Gurantee

Anticorrosion Guarantee per the below table

| Materials | NON-HARSH environment (1)<br>Distance to coastline<br>greater than 5 Km | HARSH or MARINE environment<br>Distance to coastline<br>less than 5 Km |
|---|---|---|
| Raw Aluminum | Fifteen (15) years | Five (5) years |
| Anodized Aluminum | Twenty-five (25) years | Twenty-five (25) years |

Table 1.

**(1)** Non-exhaustive list of zones considered to be harsh environments:

a. Industrial zones with emissions that include: sulphur dioxide, nitrogen oxides, sulphuric acid, sulphuric compounds, chlorine, or other volatile gases; 5 km safety distance.
b. Electric generating stations that use the following fuels: coal, natural gas, petroleum; 5 km safety distance.
c. Petrochemical plants; 5 km safety distance.
d. Cellulose factories; 5 km safety distance
e. Wastewater treatment facilities: 500 m safety distance.

In these zones it is always necessary to utilize anodized aluminum if inside of the minimum safety radius indicated above.

The warranty of the adhesive in reference 07.1H and S07.1 is ten (10) years. The warranty of the 2-sided adhesive tape of the S07.1 anchor covers the product supplied by Sunfer and can be applied provided that the breakage is caused by the tearing off of the profile with respect to the adhesive tape, in the event that the breakage is caused by the tearing off of the adhesive tape from the roofing, it will be considered a faulty assembly on site.

Mixed galvanised steel and raw aluminium supports such as, for example: Elevated, Monopoles, Car parks:
Environments C3 fifteen (15) years guarantee.
Environments C4-C5 five (5) years.

Mixed galvanised steel and anodised aluminium supports, such as: Elevated, Monopoles, Car parks:
Environments C3 guarantee twenty-five (25) years.
Environments C4-C5 fifteen (15) years.

This guarantee applies to orders supplied from 3rd January, 2023 on. Orders delivered before this date shall be governed by the guarantee that was in force at the time that the order was supplied.

The guarantee covers the final installation, and applies directly to the end user of the structure. Guarantees are managed between SUNFER and commercial distributors, so if an end user needs to invoke a guarantee, they must contact the distributor that supplied the material, and the distributor will coordinate with SUNFER Customer Service. The period of coverage of the guarantee begins upon the date that the delivery of the material is received by the end user, but will be repealed if the client does not comply with the payment terms stated in the invoice.

To invoke the guarantee, the following documentation must be produced:

- Sales invoice.
- Date system was put in service.
- Information of end user (name, address, distributor, etc).
- General photographs showing the entire system as installed.
- Installer's final work plans/drawings.
- Detailed photos of:
  - Fastening of the system to the roof, which shows the distance between mounting points.
  - The structure mounted without panels attached.
  - A rear view of the structure (from roof ridge if coplanar).

ES22/211172 ES13/13899

Marcado CE ES19/86524


- Plan/drawing of the affected area which shows distances between mounting points.

## Coverage and Exclusions

### Coverage

This guarantee covers the replacement and shipping of the defective components or of the entire system if necessary, with no charge. In the case of a replacement not being available, a suitably similar replacement will be provided.

The guarantee is limited to replacement of defective products. The following costs, indirectly associated with the return process, will not be compensated: disassembly or any consequential, supplementary, or related damages, including lost profits or other indirect costs.

The guarantee covers all metallic elements included in a SUNFER structure.

### Exclusions

Any issues or defects caused by or related to the following shall be excluded from the guarantee:

- Inadequate installations which did not follow the installation instructions provided by SUNFER.
- Incorrect fastener tightening torques (overtight or undertight).
- Modifications or installations other than those recommended by SUNFER.
- Installation of additional homemade or third-party elements to the structures supplied by SUNFER.
- Inadequate handling of products during the installation.
- Damage to the product after delivery, or from improper storage of the product.
- Any defect which is purely aesthetic in nature and which does not affect the structural safety of the product.
- Installations in areas whose wind and snow loads exceed those indicated in the datasheets of the product.
- Structures installed outside of the safe zone indicated in the installation manual.
- Inadequate maintenance. See the Maintenance Manual.
- Fires or exposure to temperatures above 110 °C.
- Problems or defects caused by corrosive agents not initially considered (1).
- Natural disasters such as earthquakes, hurricanes, floods, tornados, cyclones, mudslides, avalanches, or volcanic eruptions.

For structures not provided with a method of fastening to a surface, SUNFER denies responsiblity in the event of collapse or failure due to insufficient fastening or poor installation.

### Guarantor, Execution of guarantee

The guarantor is SUNFER ESTRUCTURAS S.L.U. located at Camino de la Dula s/n 46687, Albalat de la Ribera, Valencia, Spain.

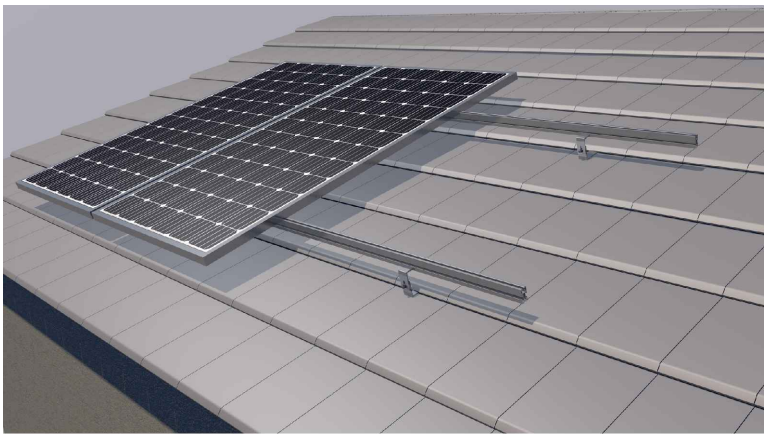
The entitlements afforded by this guarantee are non-transferable to third parties.

Regarding the guarantee and any disputes related to it, the law currently in force in Spain shall apply.

SUNFER

Solar Mounting Systems

# 02.4V-EN



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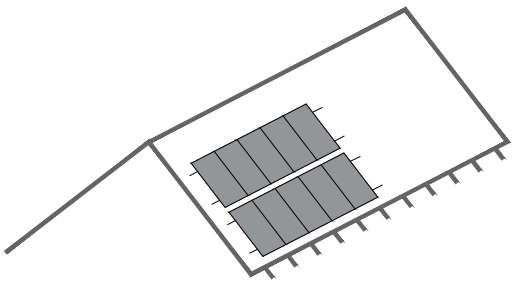

Wooden beam

Return

**Sunfer Estructuras, S.L.U.**
Camino de la Dula s/n
Albalat de la Ribera - 46687 (Valencia) Spain

100% ES19/86524 CE

SUNFER
Solar Mounting Systems

# Contents

1. General information
2. Kit contents
3. Portrait assembly
4. Anchoring technical information
5. Maximum loads and reactions
6. Installation area
7. Installation Video
8. Certifications and guarantees



Return

SUNFER
Solar Mounting Systems

# 02.4V-EN

## General Information and Recommendations ENG

- All installation instructions and product specifications provided must be adhered to.
- Check the condition of the roof covering and the carrying capacity of the same. The management overseeing installation is responsible for verifying that the substructure of the roof as well as the static structure of the building itself is capable of supporting additional loads before any installation is carried out.
- The mounting must always be anchored to the structure of the roof.
- The surface of the roof covering must be clean and dry. Any major irregularities of the roof must be corrected or eliminated.
- To avoid turbulence from wind a minimum security distance (defined by regulations) must be maintained between the photovoltaic installations and roof edges, as well as other obstacles such as chimneys or vents.
- In the case of chimneys or other features which may need future maintenance, a minimum distance must be maintained in order to facilitate said maintenance or to extinguish fires. This distance shall be either 1m or that suggested by the relevant authority, whichever is greater.
- Place solar panels such that they are distributed symmetrically along the support, leaving equal overhangs at each end.
- Clamps must not be tightened using impact drivers.
- Check the weathertightness of the mount once fastened.
- Check that the support attachment points are compatible with the solar panel manufacturer's specifications.
- Uninstallation must be carried out in the reverse order from the installation.
- We reserve the right to make changes to our products at any moment without prior warning if, from our point of view, the changes are necessary for the improvement of the product. All illustrations in plans and catalogues are for example only and therefore may differ from the actual product provided.
- During the shipping of products take extreme care to maintain the integrity of the packaging. Store in a dry, well-ventilated area. Minimize exposure to large temperature differences and humidity. Avoid outdoor storage. Avoid sources of dripping water, puddles, splashing, or any other contact with water in the storage area. If the product becomes wet, immediately dry and clean as well as possible. Do not leave the product directly on the floor or ground where it may attract moisture. Store on the shipment's origninal pallet or on shelves.

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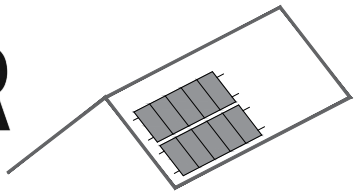
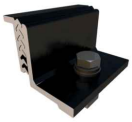


# 02.4V-EN
## Kit Contents


S02.4-EN


S10B-EN


S11B-EN


UG1-EN

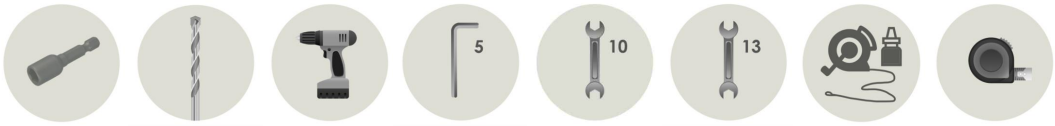

G1-EN-1230


G1-EN-1800


TG1

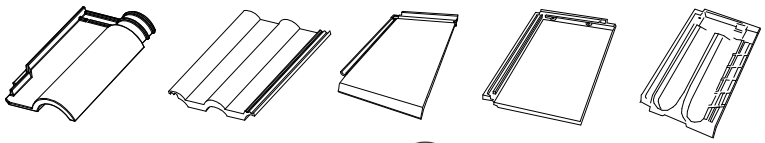

S13

| | S02.4-EN | S10B-EN | S11B-EN | UG1-EN | G1-EN-1230 | G1-EN-1800 | TG1 | S13 |
|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 4 | - | - | 2 | - | 4 | 2 |
| 2 | 4 | 4 | 2 | 2 | 4 | - | 4 | 3 |
| 2 R | 6 | 4 | 2 | 2 | 4 | - | 4 | 3 |
| 3 | 6 | 4 | 4 | 2 | - | 4 | 4 | 4 |
| 3 R | 8 | 4 | 4 | 2 | - | 4 | 4 | 4 |
| 4 | 8 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |
| 4 R | 10 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |
| 4 RR | 12 | 4 | 6 | 4 | 2 | 4 | 4 | 5 |



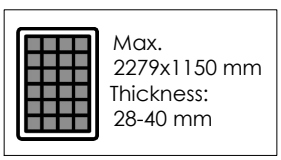

Anchoring surfaces:

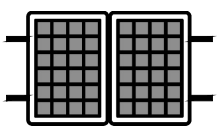

Wooden beam



alu Aluminium profiles of **EN AW 6005A T6**

A Fasteners of **A2-70 stainless steel**



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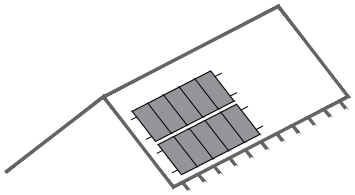
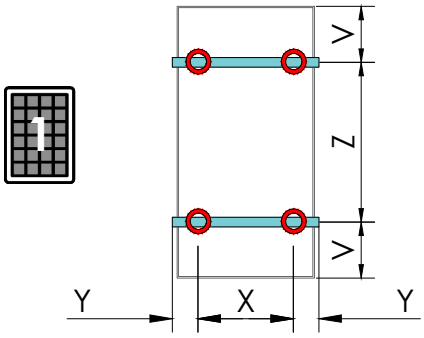
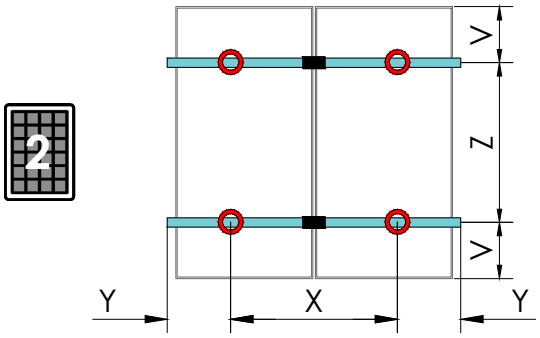
Solar Mounting Systems

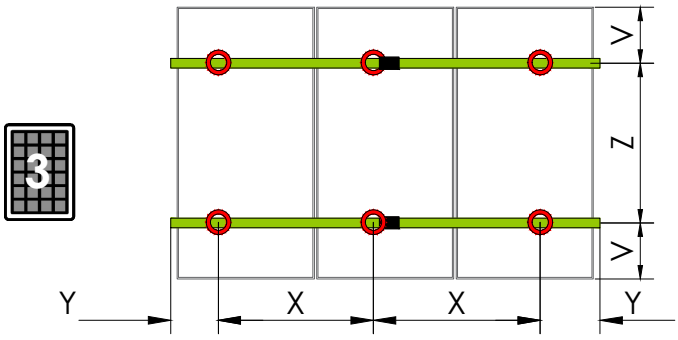
# 02.4V-EN
## Anchoring distances

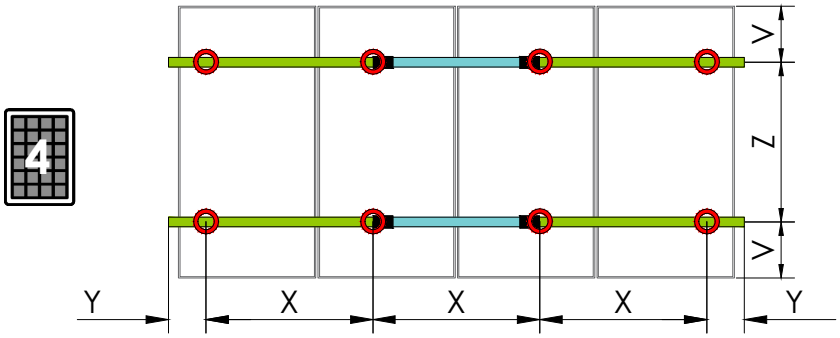
## Portrait

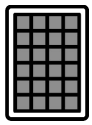


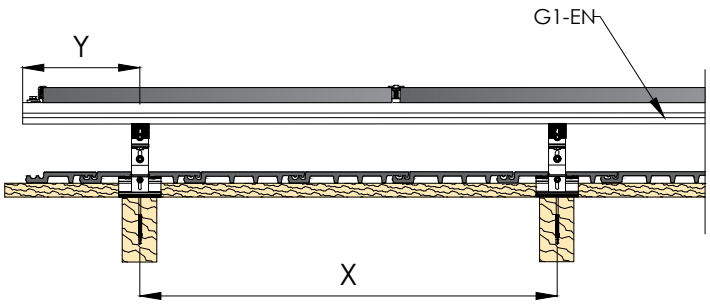


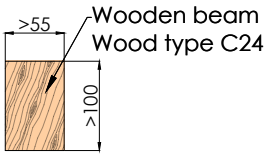






**X** ≤ 1400

0,2* X≤ **Y** ≤ 0,33* X

S02.4-EN

G1-EN-1230

G1-EN-1800

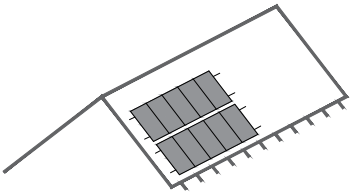
UG1-EN

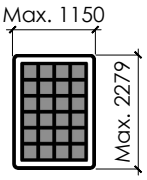
The maximum distance "Z" between profiles and the overhang distance "V" should be determined by consulting the technical datasheets of the solar panel manufacturer.

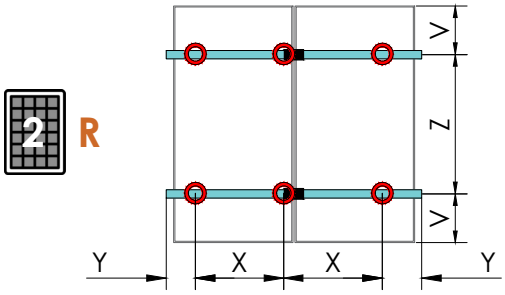
SUNFER
Solar Mounting Systems

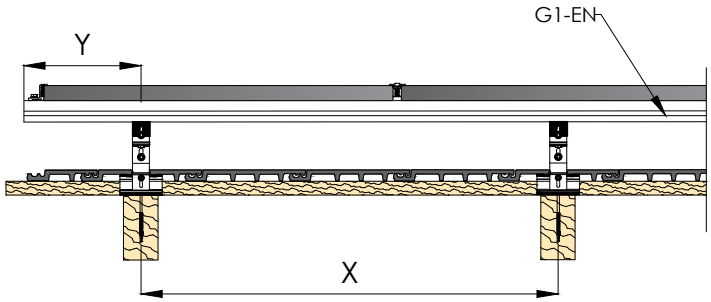
# 02.4V-EN
## Anchoring distances

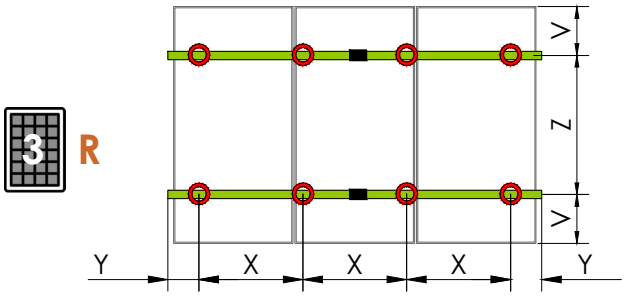
## Portrait

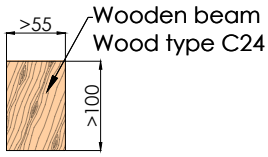


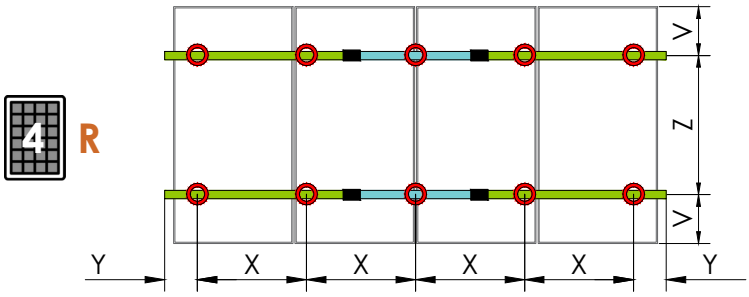


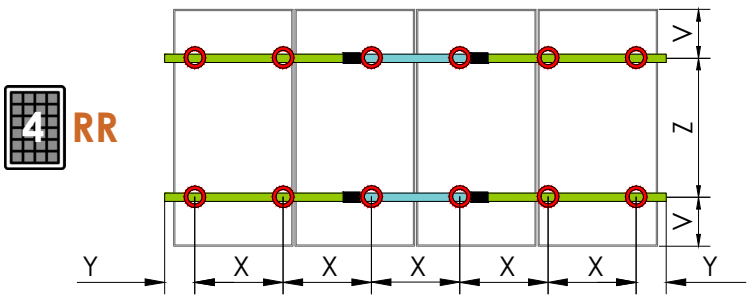




**X** ≤ 1050

0,2* X≤ **Y** ≤ 0,33* X

S02.4-EN

G1-EN-1230

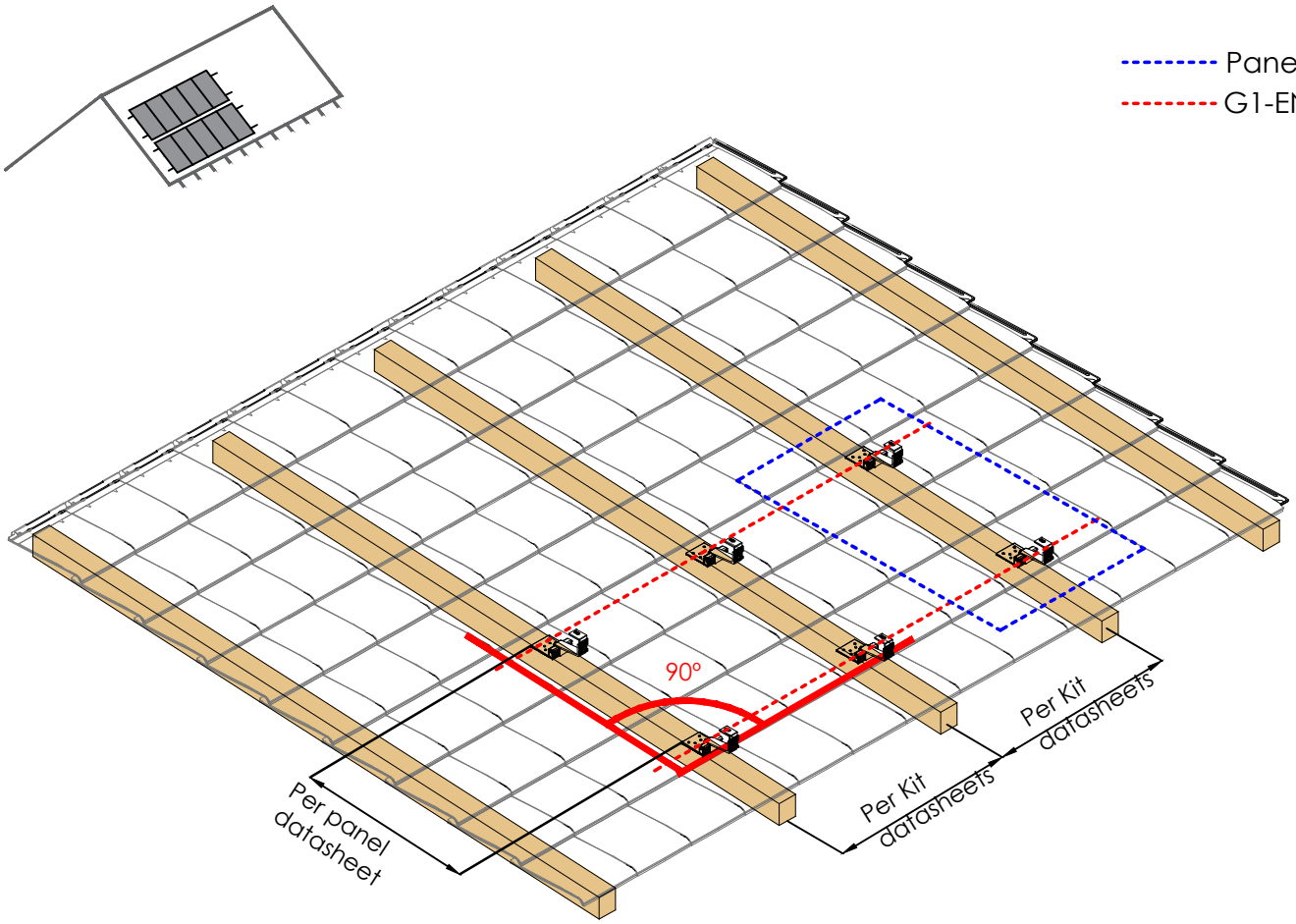
G1-EN-1800

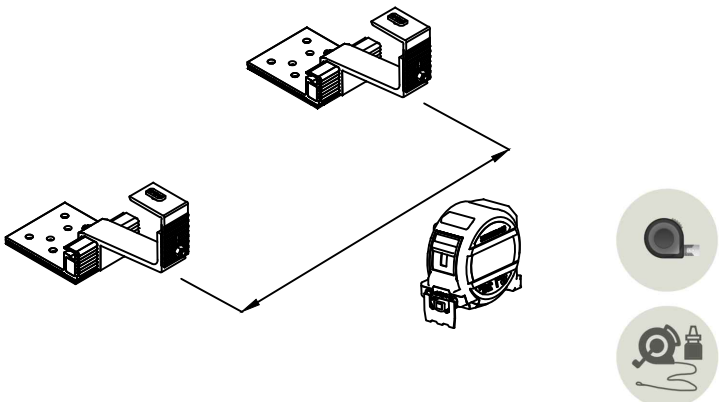
UG1-EN

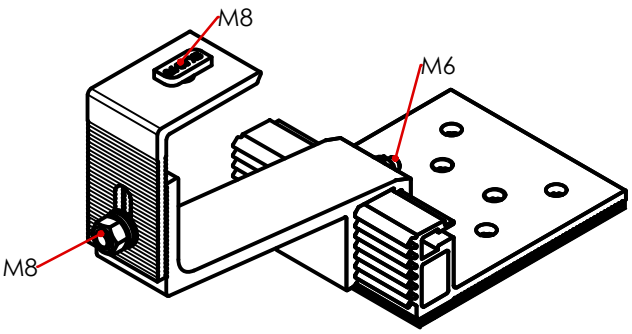
The maximum distance "Z" between profiles and the overhang distance "V" should be determined by consulting the technical datasheets of the solar panel manufacturer.

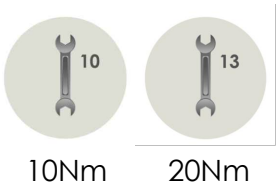
SUNFER
Solar Mounting Systems

# 02.4V-EN
## Structure mounting



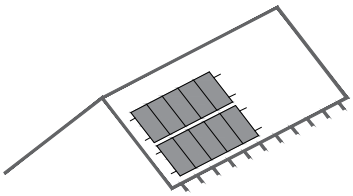



10Nm 20Nm

SUNFER
Solar Mounting Systems

# 02.4V-EN



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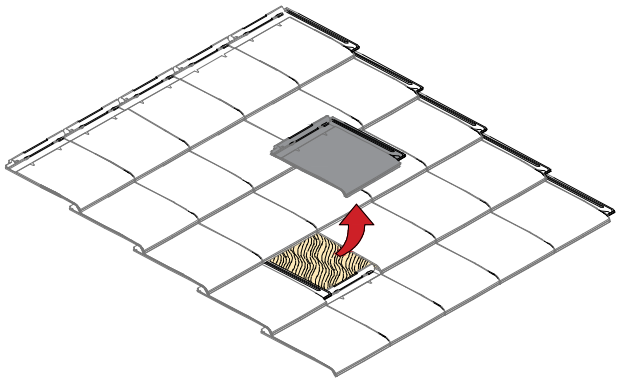
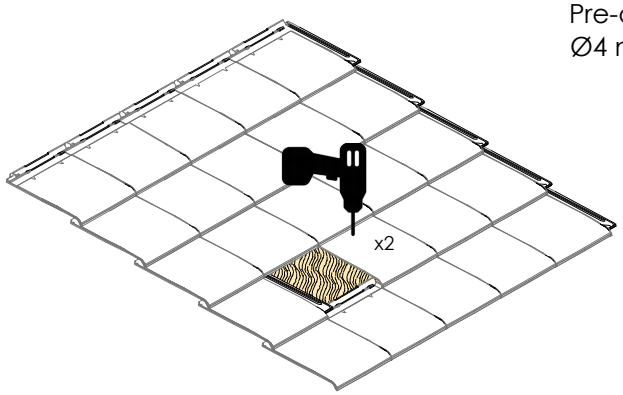
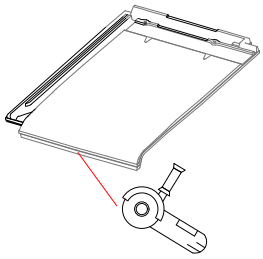
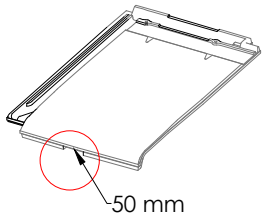


## 2.

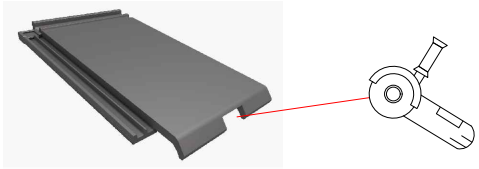
Pre-drill
Ø4 mm



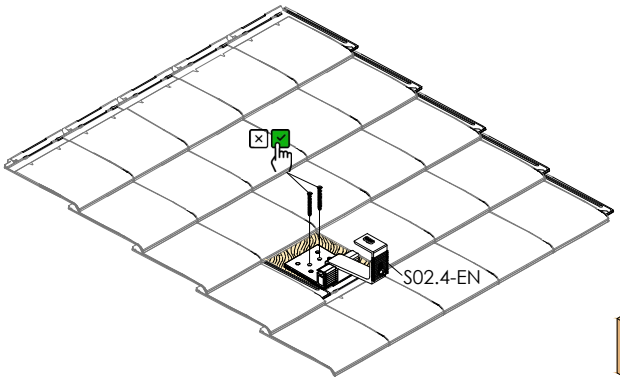





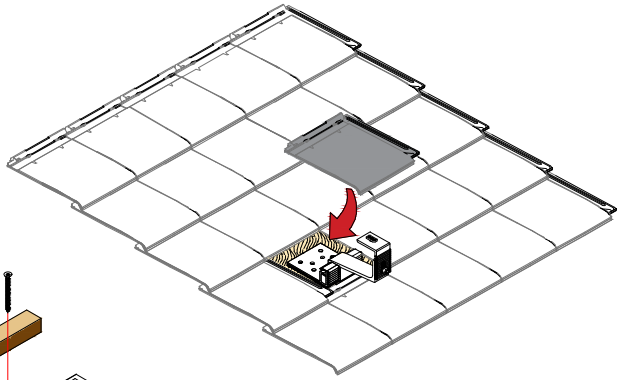

To correctly install the mount, it may be necessary to notch the tile as shown

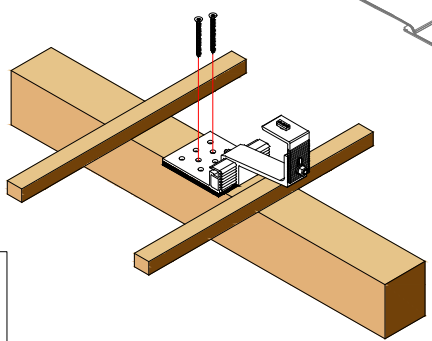


## 3.




## 4.

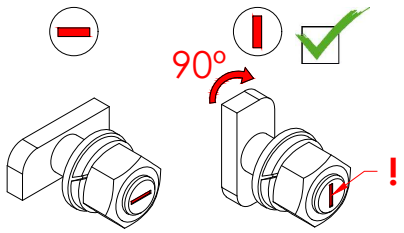


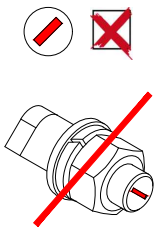


See possible assemblies in anchoring's technical information

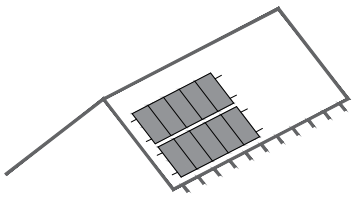
SUNFER
Solar Mounting Systems

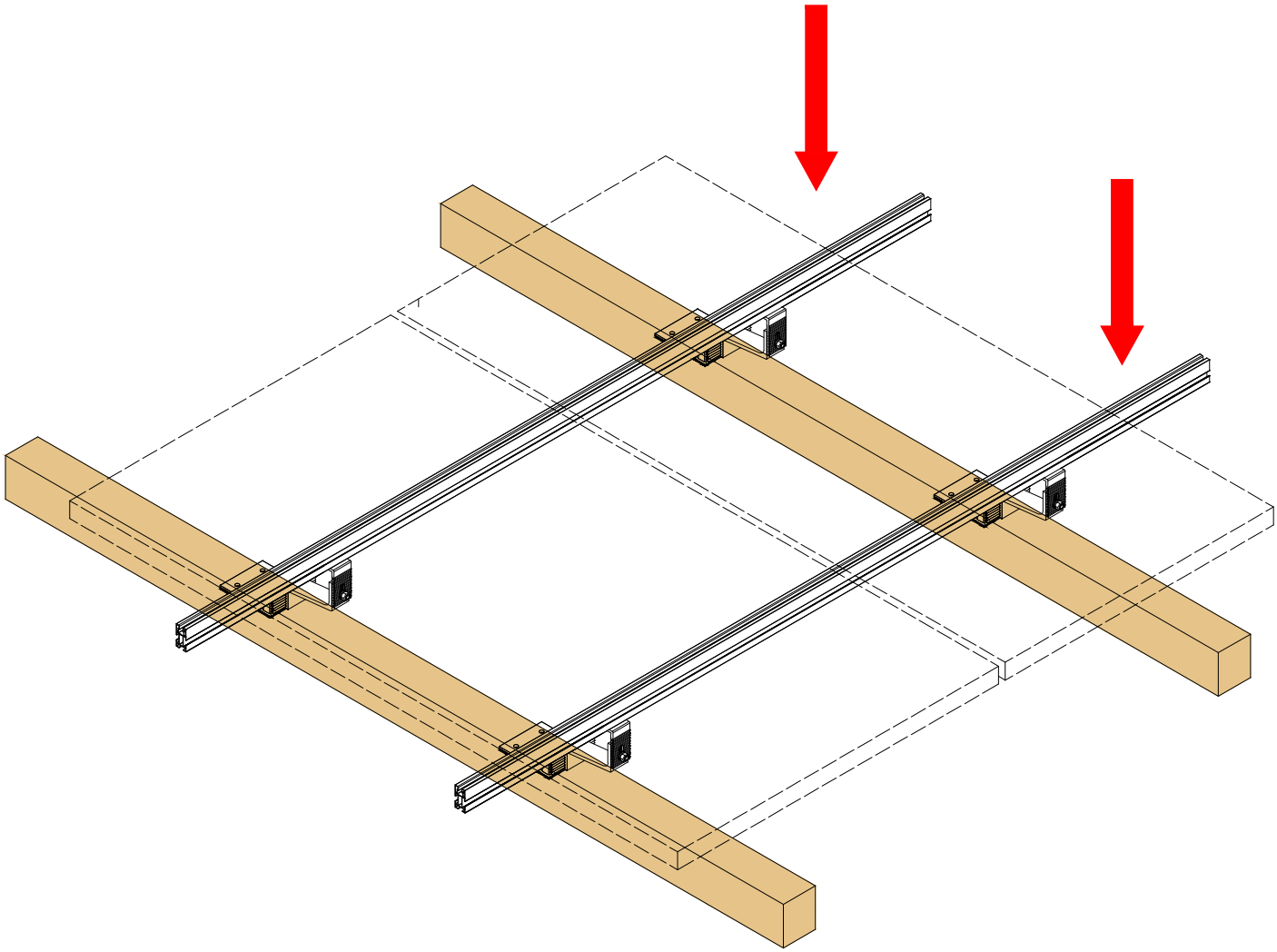
# 02.4V-EN

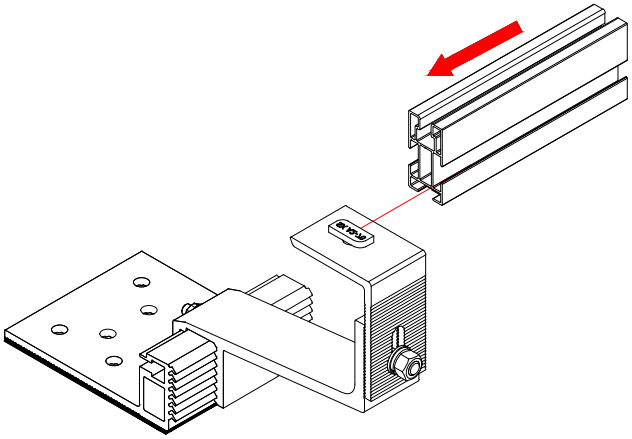



20 Nm







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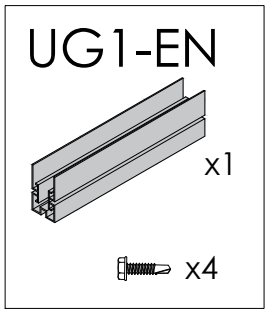
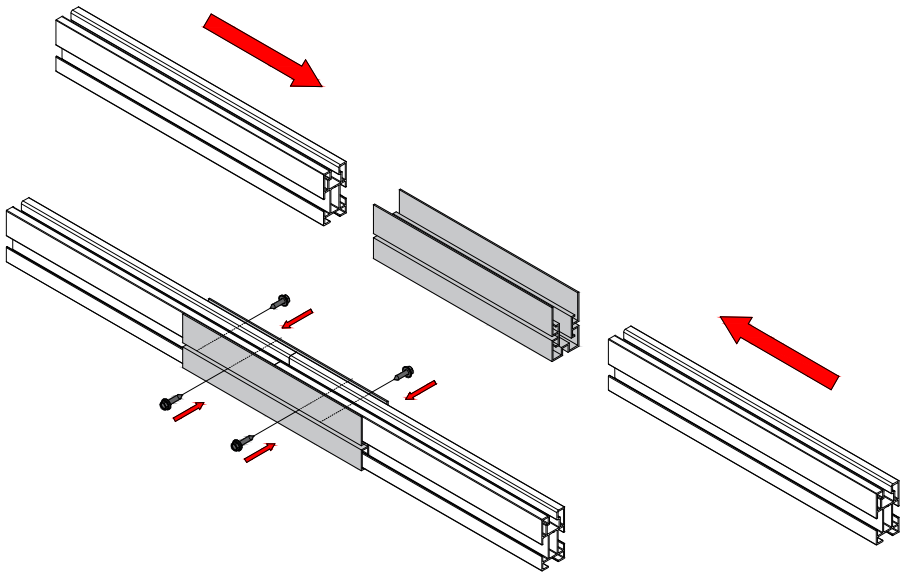
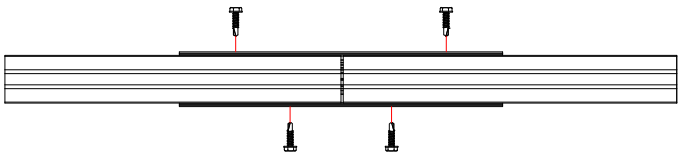
# 02.4V-EN

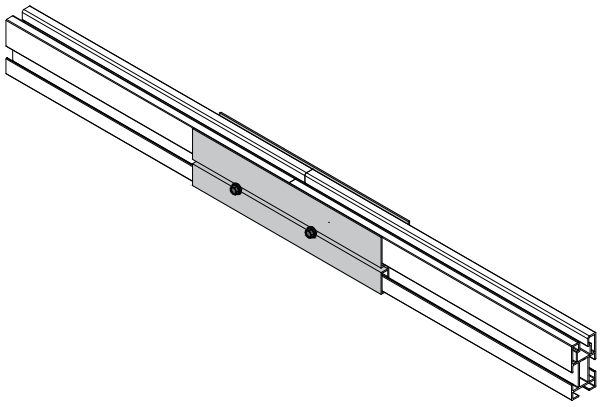

6 Nm




(x4)







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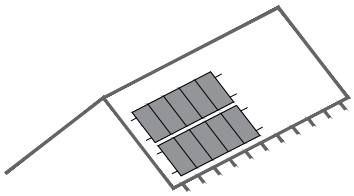


# 02.4V-EN
## Module mounting

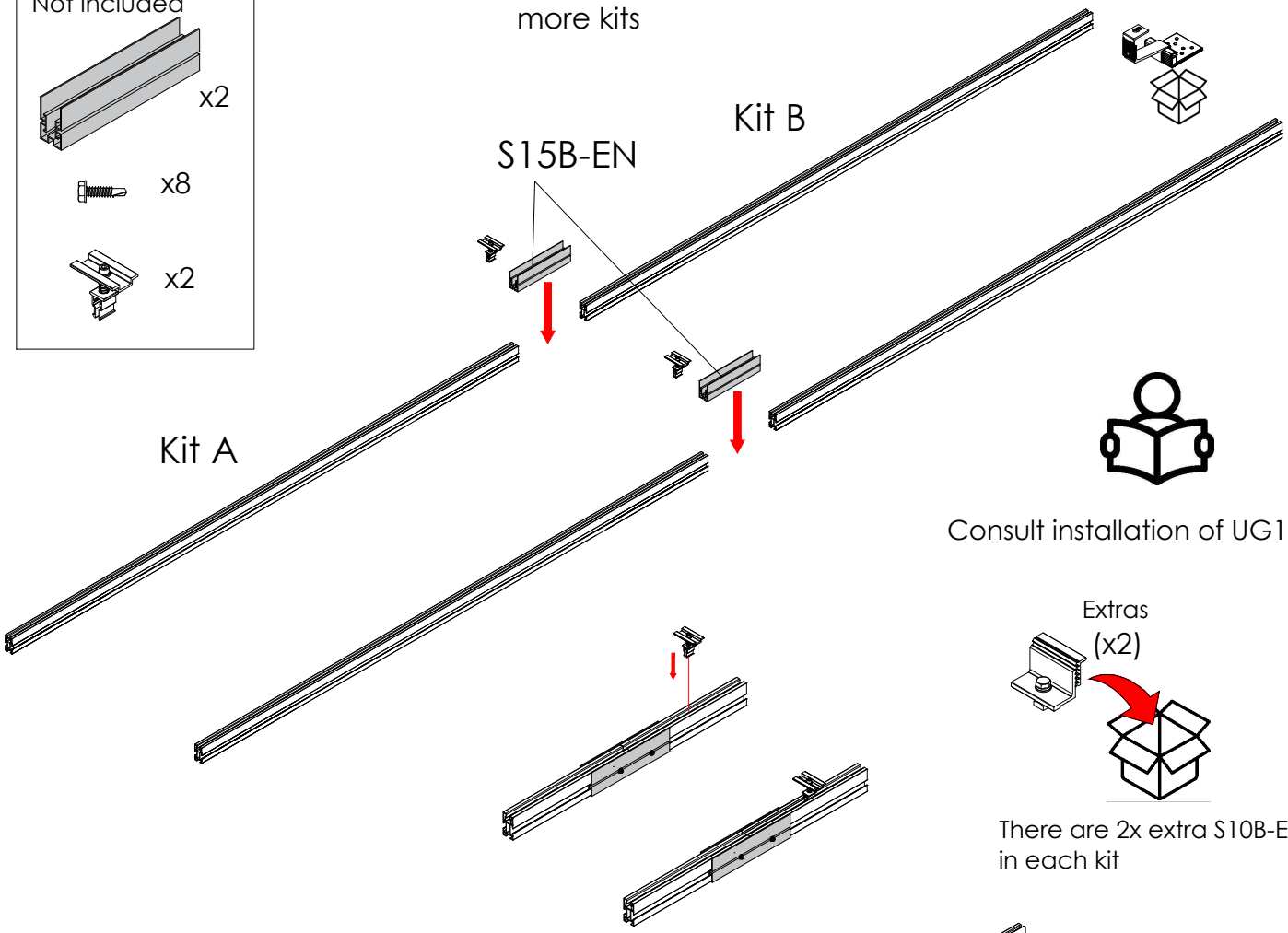
S15B-EN
Not included


x2


x8


x2

**Union Kit**
Optional Step: For joining two or more kits





Consult installation of UG1-EN

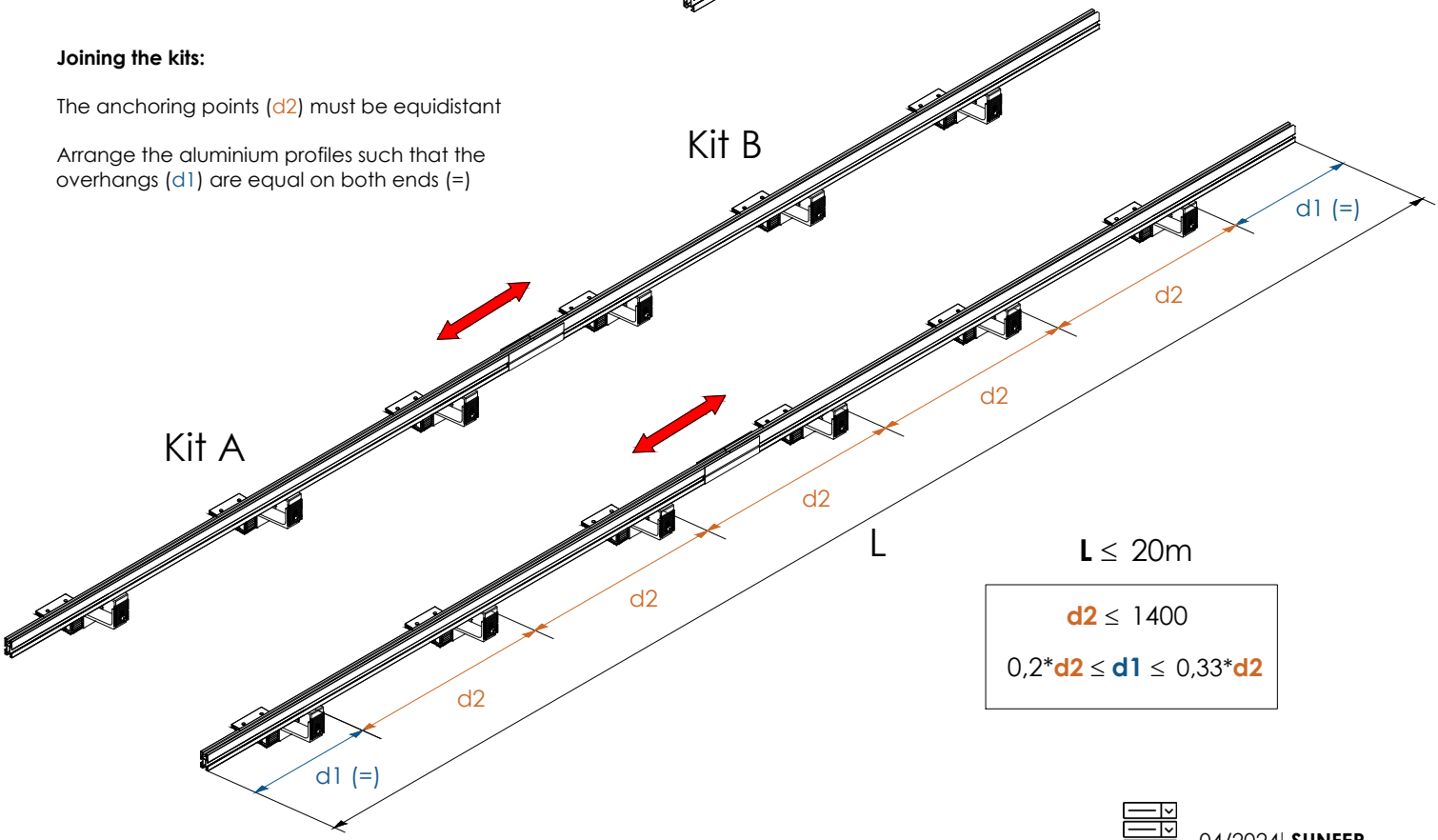
Extras
(x2)


There are 2x extra S10B-EN in each kit

**Joining the kits:**

The anchoring points (d2) must be equidistant

Arrange the aluminium profiles such that the overhangs (d1) are equal on both ends (=)




**L** ≤ 20m

**d2** ≤ 1400

0,2***d2*** ≤ **d1** ≤ 0,33***d2***

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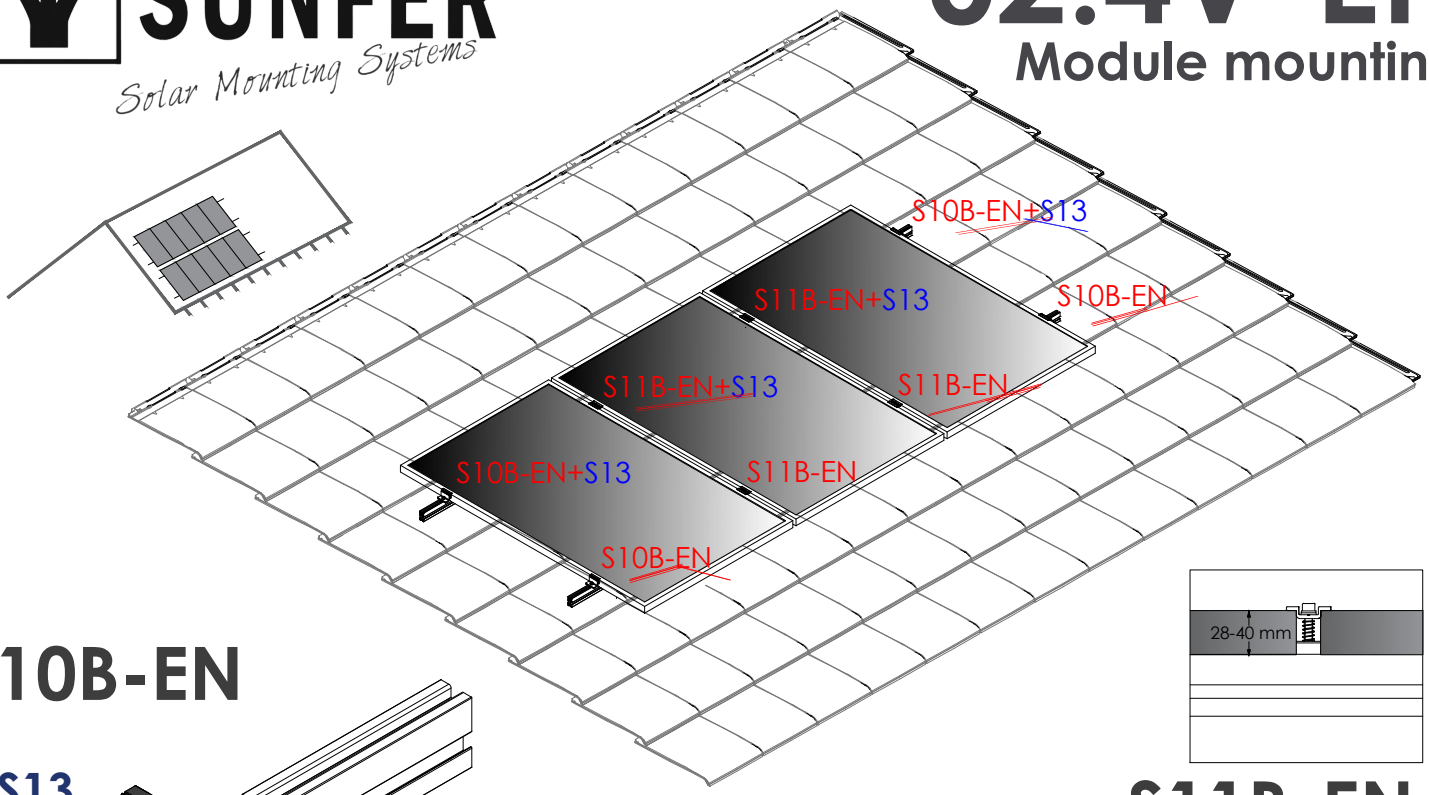
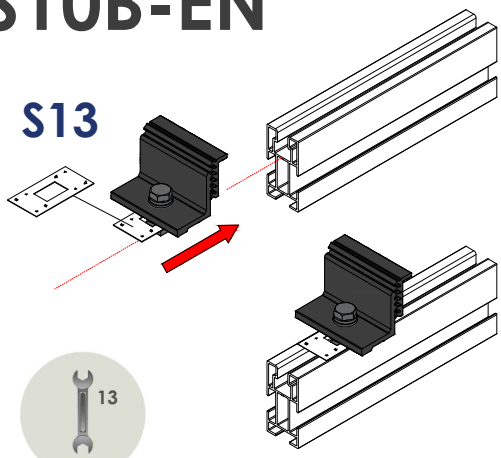
# 02.4V-EN
## Module mounting



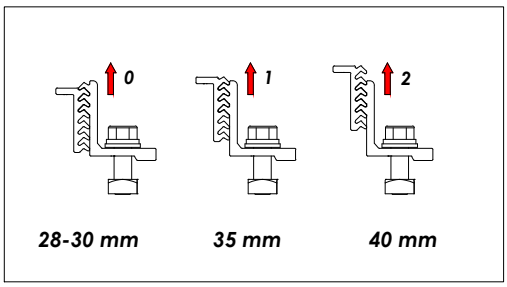

## S10B-EN







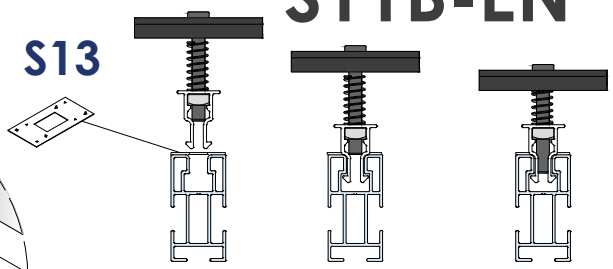
7 Nm

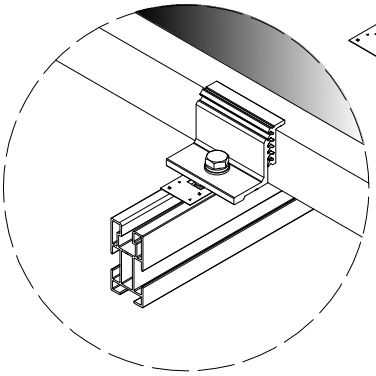




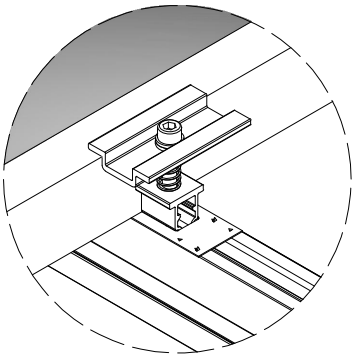


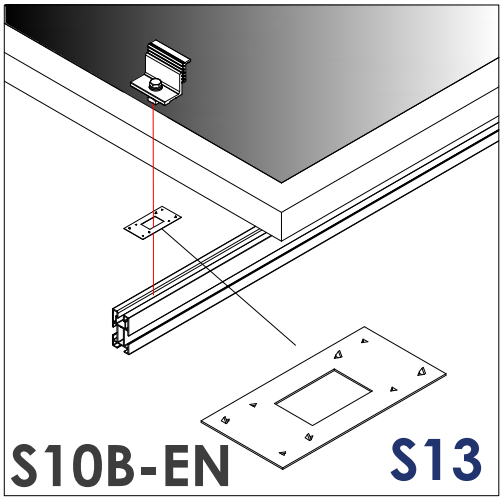
## S11B-EN

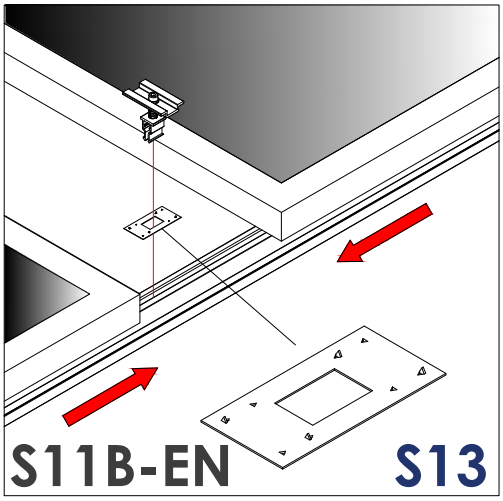


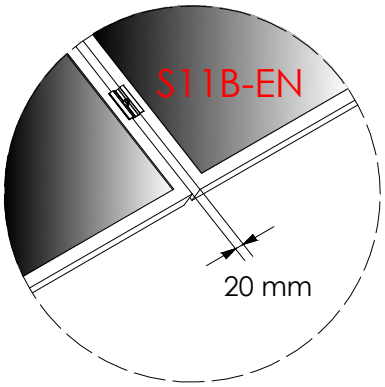




7 Nm





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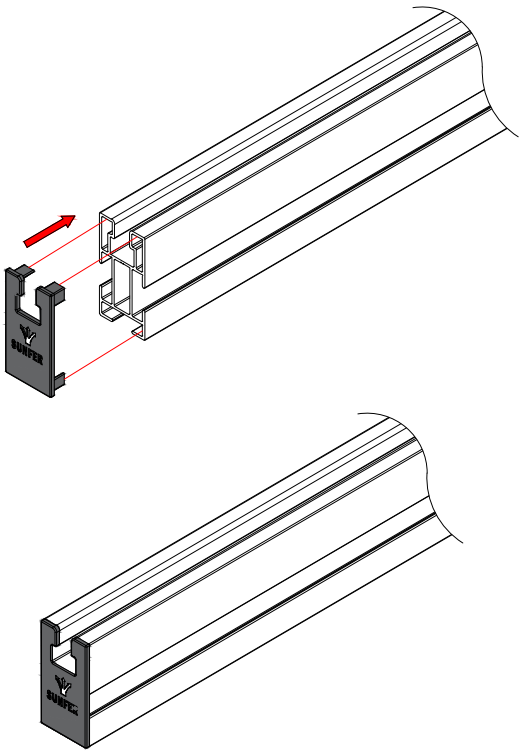
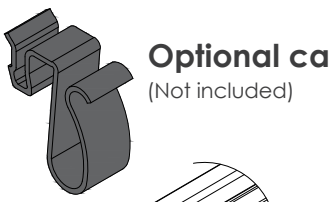
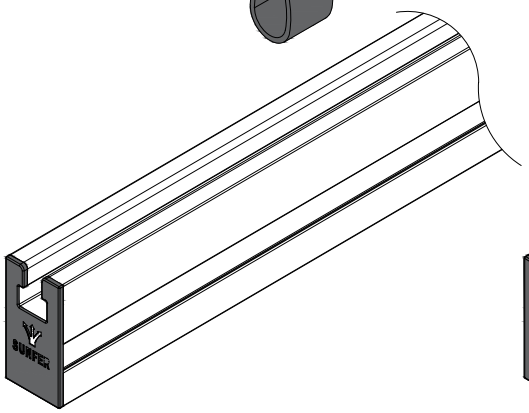
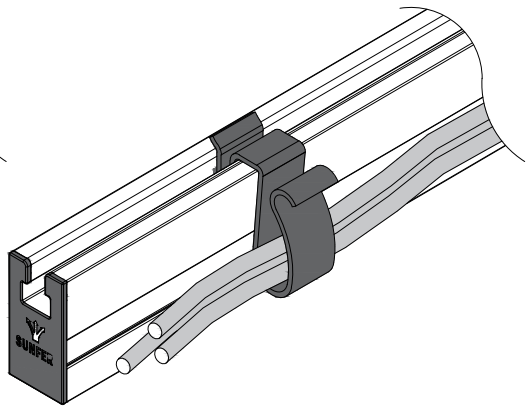
# 02.4V-EN





**Optional cable clip**
(Not included)





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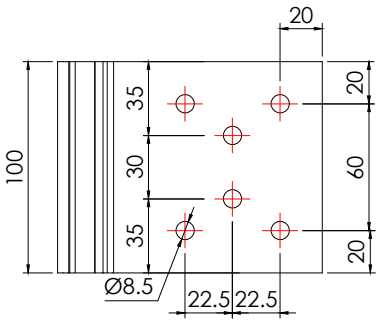
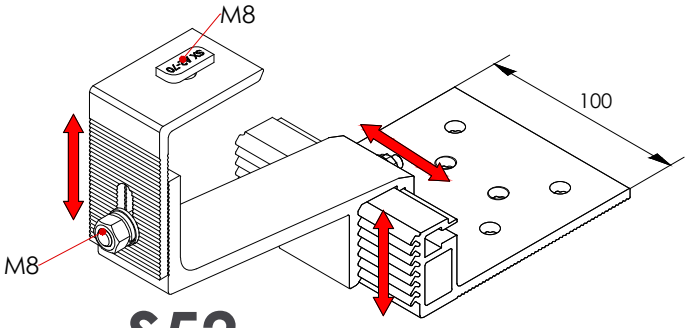
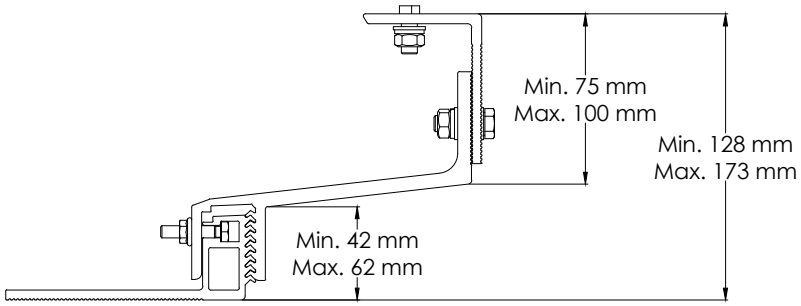
Solar Mounting Systems

# 02.4V-EN
# S02.4-EN

## Anchoring technical information

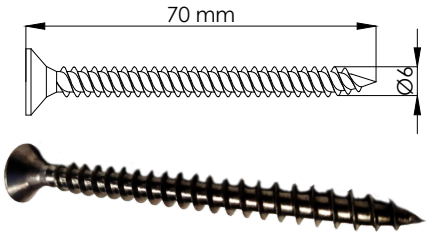



## S52

**Characteristics**
Flat head screw.
A2 AISI 304 Stainless Steel
Anchoring surface:
Wood of class C24 or better

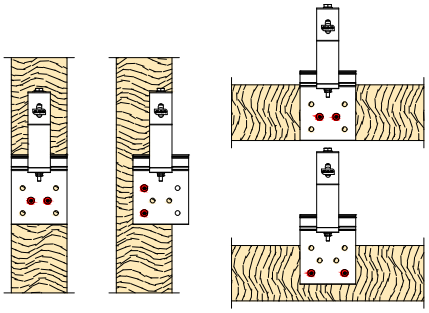



**Technical Specifications:**
Screw length: 70 mm.
Screw diameter: 6 mm.
Pre-drill diameter 4 mm
Suggested torque: 6 Nm

**Screw Fastening Strength :**

| **Metric** | **Pull-out [KN]** |
|---|---|
| 6 | 7.1 |

## Assemblies



| | |
|---|---|
| Description | Coplanar support |
| Panel arrangement | Portrait/Landscape |
| Format | KIT of 1 to 4 panels |
| Union kit | S15-EN not included (optional) |
| Application | Tile roof |
| Anchoring material | Wooden beams |
| Type of fasteners | Screwed - S52 coarse flathead screw |
| Mount/hook | S02.4-EN |
| Profile | G1-EN |
| Earthing ground | S13 |
| Maximum panel dimensions | 2279x1150 mm |
| Panel thickness | from 28 to 40 mm |
| Materials | Fasteners: A2-70 stainless steel<br>Profiles: Raw or anodized EN AW 6005A T6 aluminium<br>Foam rubber weather seal |
| Maximum load | According to configuration |
| Structural calculations | Model checked and simulated per EUROCODE 9 "STRUCTURES OF ALUMINIUM" |

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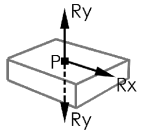
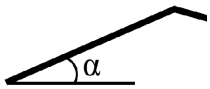
# 02.4V-EN
## Loads and reactions




## Maximum admissible loads and their reactions




**5° Pitch**

**10° Pitch**

**15° Pitch**

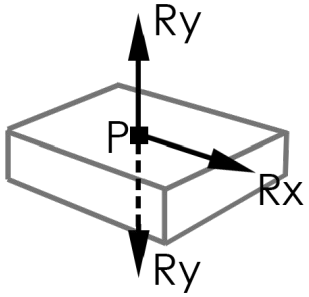
**20° Pitch**

**25° Pitch**

**30° Pitch**

**35° Pitch**

**40° Pitch**




- P: Mount Point
- Rx: Shear generated at anchor
- Ry: Tension generated at anchor, compression applied to roof

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Solar Mounting Systems

# 02.4V-EN
## Loads and reactions

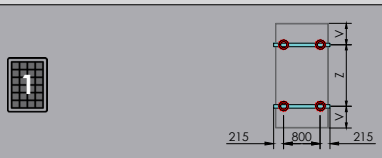
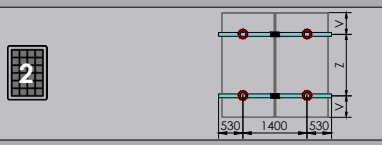
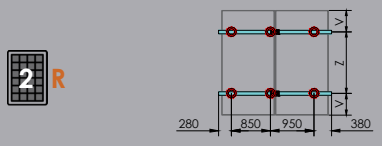
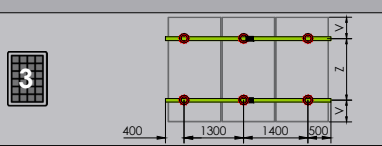
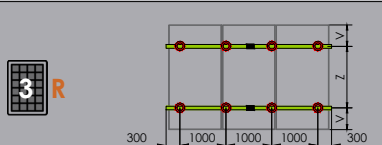
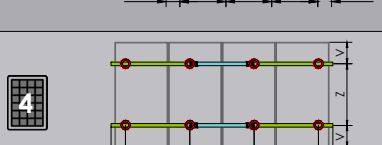
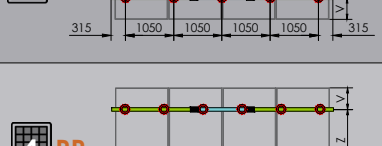
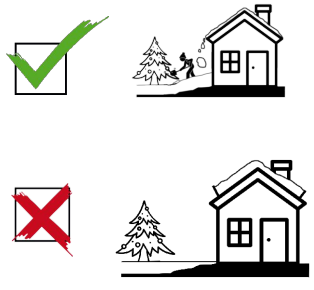
| Maximum Admissible Loads and Their Reactions | | | | | 5° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
|  1 | 110 | 263 | 0.32 | 0.00 | 1.85 |
| | 130 | 265 | 0.26 | 0.03 | 1.53 |
| | 150 | 265 | 0.26 | 0.10 | 1.54 |
| | 180 | 265 | 0.26 | 0.22 | 1.57 |
| | 210 | 265 | 0.26 | 0.36 | 1.60 |
| | 250 | 265 | 0.26 | 0.58 | 1.65 |
|  2 | 110 | 122 | 0.31 | 0.00 | 1.85 |
| | 130 | 150 | 0.31 | 0.06 | 1.85 |
| | 150 | 147 | 0.30 | 0.20 | 1.85 |
| | 180 | 142 | 0.29 | 0.43 | 1.85 |
| | 210 | 136 | 0.28 | 0.71 | 1.86 |
|  2 R | 110 | 165 | 0.25 | 0.00 | 1.85 |
| | 130 | 204 | 0.25 | 0.04 | 1.85 |
| | 150 | 201 | 0.25 | 0.12 | 1.85 |
| | 180 | 196 | 0.24 | 0.27 | 1.85 |
| | 210 | 189 | 0.23 | 0.44 | 1.85 |
| | 250 | 179 | 0.22 | 0.72 | 1.85 |
|  3 | 110 | 97 | 0.26 | 0.00 | 1.86 |
| | 130 | 119 | 0.26 | 0.07 | 1.86 |
| | 150 | 116 | 0.25 | 0.20 | 1.86 |
| | 180 | 110 | 0.24 | 0.45 | 1.85 |
| | 210 | 104 | 0.23 | 0.73 | 1.85 |
|  3 R | 110 | 143 | 0.22 | 0.00 | 1.85 |
| | 130 | 176 | 0.22 | 0.04 | 1.85 |
| | 150 | 173 | 0.21 | 0.12 | 1.85 |
| | 180 | 168 | 0.21 | 0.27 | 1.85 |
| | 210 | 162 | 0.20 | 0.44 | 1.85 |
| | 250 | 152 | 0.19 | 0.71 | 1.85 |
|  4 | 110 | 95 | 0.22 | 0.00 | 1.86 |
| | 130 | 116 | 0.22 | 0.06 | 1.85 |
| | 150 | 113 | 0.21 | 0.18 | 1.85 |
| | 180 | 108 | 0.21 | 0.39 | 1.86 |
| | 210 | 101 | 0.20 | 0.64 | 1.85 |
|  4 R | 110 | 134 | 0.20 | 0.00 | 1.85 |
| | 130 | 166 | 0.20 | 0.04 | 1.85 |
| | 150 | 163 | 0.20 | 0.12 | 1.85 |
| | 180 | 157 | 0.19 | 0.26 | 1.85 |
| | 210 | 151 | 0.18 | 0.43 | 1.85 |
| | 250 | 141 | 0.17 | 0.69 | 1.85 |
|  4 RR | 110 | 172 | 0.19 | 0.00 | 1.85 |
| | 130 | 213 | 0.19 | 0.03 | 1.85 |
| | 150 | 210 | 0.19 | 0.09 | 1.85 |
| | 180 | 205 | 0.18 | 0.20 | 1.85 |
| | 210 | 198 | 0.18 | 0.32 | 1.85 |
| | 250 | 188 | 0.17 | 0.52 | 1.85 |

**Table 1** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

SUNFER
Solar Mounting Systems

# 02.4V-EN
## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 10° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 265 | 0.63 | 0.00 | 1.82 |
| | 130 | 265 | 0.51 | 0.03 | 1.49 |
| | 150 | 265 | 0.51 | 0.10 | 1.51 |
| | 180 | 265 | 0.51 | 0.22 | 1.54 |
| | 210 | 265 | 0.51 | 0.36 | 1.57 |
| | 250 | 265 | 0.51 | 0.58 | 1.62 |
| 2 | 110 | 125 | 0.63 | 0.00 | 1.85 |
| | 130 | 154 | 0.62 | 0.07 | 1.85 |
| | 150 | 151 | 0.61 | 0.20 | 1.85 |
| | 180 | 145 | 0.59 | 0.44 | 1.85 |
| | 210 | 139 | 0.57 | 0.72 | 1.85 |
| 2 R | 110 | 169 | 0.51 | 0.00 | 1.85 |
| | 130 | 209 | 0.51 | 0.04 | 1.85 |
| | 150 | 206 | 0.50 | 0.13 | 1.85 |
| | 180 | 200 | 0.49 | 0.27 | 1.85 |
| | 210 | 194 | 0.47 | 0.45 | 1.85 |
| | 250 | 184 | 0.45 | 0.72 | 1.85 |
| 3 | 110 | 99 | 0.52 | 0.00 | 1.85 |
| | 130 | 122 | 0.52 | 0.07 | 1.86 |
| | 150 | 118 | 0.50 | 0.21 | 1.85 |
| | 180 | 113 | 0.48 | 0.45 | 1.85 |
| | 210 | 107 | 0.46 | 0.74 | 1.86 |
| 3 R | 110 | 146 | 0.44 | 0.00 | 1.85 |
| | 130 | 180 | 0.44 | 0.04 | 1.85 |
| | 150 | 177 | 0.43 | 0.12 | 1.85 |
| | 180 | 172 | 0.42 | 0.27 | 1.85 |
| | 210 | 165 | 0.40 | 0.44 | 1.85 |
| | 250 | 155 | 0.38 | 0.71 | 1.85 |
| 4 | 110 | 97 | 0.45 | 0.00 | 1.85 |
| | 130 | 119 | 0.44 | 0.06 | 1.85 |
| | 150 | 116 | 0.43 | 0.18 | 1.85 |
| | 180 | 110 | 0.41 | 0.39 | 1.85 |
| | 210 | 104 | 0.39 | 0.65 | 1.85 |
| 4 R | 110 | 138 | 0.41 | 0.00 | 1.85 |
| | 130 | 170 | 0.40 | 0.04 | 1.85 |
| | 150 | 167 | 0.40 | 0.12 | 1.85 |
| | 180 | 161 | 0.38 | 0.26 | 1.85 |
| | 210 | 155 | 0.37 | 0.43 | 1.85 |
| | 250 | 145 | 0.35 | 0.69 | 1.85 |
| 4 RR | 110 | 177 | 0.39 | 0.00 | 1.85 |
| | 130 | 218 | 0.38 | 0.03 | 1.85 |
| | 150 | 215 | 0.38 | 0.09 | 1.85 |
| | 180 | 210 | 0.37 | 0.20 | 1.85 |
| | 210 | 203 | 0.36 | 0.32 | 1.85 |
| | 250 | 193 | 0.34 | 0.52 | 1.85 |

**Table 2** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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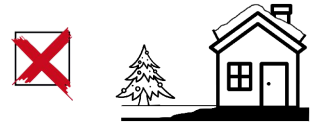
## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | | 15° |
|---|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 265 | 0.92 | 0.02 | 1.78 |
| | 130 | 265 | 0.75 | 0.09 | 1.47 |
| | 150 | 265 | 0.75 | 0.18 | 1.50 |
| | 180 | 265 | 0.75 | 0.33 | 1.55 |
| | 210 | 265 | 0.75 | 0.51 | 1.61 |
| | 250 | 265 | 0.75 | 0.80 | 1.70 |
| 2 | 110 | 126 | 0.93 | 0.04 | 1.85 |
| | 130 | 153 | 0.90 | 0.19 | 1.85 |
| | 150 | 148 | 0.88 | 0.36 | 1.85 |
| | 180 | 138 | 0.82 | 0.67 | 1.85 |
| 2 R | 110 | 172 | 0.76 | 0.03 | 1.85 |
| | 130 | 211 | 0.75 | 0.12 | 1.85 |
| | 150 | 205 | 0.73 | 0.22 | 1.85 |
| | 180 | 195 | 0.70 | 0.41 | 1.85 |
| | 210 | 184 | 0.66 | 0.64 | 1.85 |
| 3 | 110 | 99 | 0.77 | 0.04 | 1.85 |
| | 130 | 120 | 0.75 | 0.19 | 1.86 |
| | 150 | 114 | 0.71 | 0.37 | 1.85 |
| | 180 | 104 | 0.66 | 0.68 | 1.85 |
| 3 R | 110 | 148 | 0.66 | 0.03 | 1.85 |
| | 130 | 181 | 0.64 | 0.12 | 1.85 |
| | 150 | 175 | 0.63 | 0.22 | 1.85 |
| | 180 | 166 | 0.60 | 0.41 | 1.85 |
| | 210 | 154 | 0.56 | 0.63 | 1.85 |
| 4 | 110 | 97 | 0.66 | 0.04 | 1.85 |
| | 130 | 117 | 0.64 | 0.17 | 1.85 |
| | 150 | 111 | 0.61 | 0.33 | 1.85 |
| | 180 | 102 | 0.57 | 0.60 | 1.86 |
| 4 R | 110 | 139 | 0.60 | 0.03 | 1.85 |
| | 130 | 170 | 0.59 | 0.11 | 1.85 |
| | 150 | 164 | 0.57 | 0.22 | 1.85 |
| | 180 | 154 | 0.54 | 0.40 | 1.85 |
| | 210 | 143 | 0.51 | 0.61 | 1.85 |
| 4 RR | 110 | 180 | 0.58 | 0.02 | 1.85 |
| | 130 | 220 | 0.57 | 0.09 | 1.85 |
| | 150 | 215 | 0.56 | 0.16 | 1.85 |
| | 180 | 205 | 0.53 | 0.30 | 1.85 |
| | 210 | 193 | 0.50 | 0.46 | 1.85 |
| | 250 | 175 | 0.46 | 0.72 | 1.85 |

**Table 3** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/



Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 20° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 232 | 1.05 | 0.03 | 1.50 |
| | 130 | 265 | 0.96 | 0.10 | 1.40 |
| | 150 | 265 | 0.96 | 0.19 | 1.43 |
| | 180 | 265 | 0.96 | 0.34 | 1.48 |
| | 210 | 265 | 0.96 | 0.52 | 1.53 |
| | 250 | 265 | 0.96 | 0.80 | 1.62 |
| 2 | 110 | 109 | 1.05 | 0.05 | 1.56 |
| | 130 | 136 | 1.05 | 0.20 | 1.60 |
| | 150 | 136 | 1.05 | 0.37 | 1.66 |
| | 180 | 136 | 1.05 | 0.67 | 1.75 |
| 2 R | 110 | 182 | 1.04 | 0.03 | 1.85 |
| | 130 | 223 | 1.02 | 0.12 | 1.85 |
| | 150 | 217 | 0.99 | 0.23 | 1.85 |
| | 180 | 207 | 0.95 | 0.42 | 1.85 |
| | 210 | 195 | 0.90 | 0.64 | 1.85 |
| 3 | 110 | 105 | 1.04 | 0.05 | 1.85 |
| | 130 | 127 | 1.01 | 0.20 | 1.85 |
| | 150 | 121 | 0.97 | 0.38 | 1.85 |
| | 180 | 111 | 0.90 | 0.69 | 1.85 |
| 3 R | 110 | 157 | 0.90 | 0.03 | 1.85 |
| | 130 | 192 | 0.88 | 0.12 | 1.85 |
| | 150 | 186 | 0.85 | 0.23 | 1.85 |
| | 180 | 175 | 0.81 | 0.41 | 1.85 |
| | 210 | 163 | 0.76 | 0.64 | 1.85 |
| 4 | 110 | 103 | 0.90 | 0.05 | 1.85 |
| | 130 | 124 | 0.87 | 0.18 | 1.85 |
| | 150 | 118 | 0.83 | 0.33 | 1.85 |
| | 180 | 108 | 0.77 | 0.61 | 1.85 |
| 4 R | 110 | 148 | 0.82 | 0.03 | 1.85 |
| | 130 | 180 | 0.80 | 0.12 | 1.85 |
| | 150 | 174 | 0.78 | 0.22 | 1.85 |
| | 180 | 164 | 0.74 | 0.40 | 1.85 |
| | 210 | 151 | 0.69 | 0.62 | 1.85 |
| 4 RR | 110 | 190 | 0.79 | 0.02 | 1.85 |
| | 130 | 233 | 0.77 | 0.09 | 1.85 |
| | 150 | 227 | 0.75 | 0.17 | 1.85 |
| | 180 | 217 | 0.72 | 0.31 | 1.85 |
| | 210 | 205 | 0.68 | 0.47 | 1.85 |
| | 250 | 185 | 0.62 | 0.72 | 1.85 |

**Table 4** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 25° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 192 | 1.05 | 0.03 | 1.18 |
| | 130 | 240 | 1.05 | 0.11 | 1.20 |
| | 150 | 240 | 1.05 | 0.19 | 1.23 |
| | 180 | 240 | 1.05 | 0.34 | 1.28 |
| | 210 | 240 | 1.05 | 0.52 | 1.34 |
| | 250 | 240 | 1.05 | 0.81 | 1.43 |
| 2 | 110 | 88 | 1.05 | 0.06 | 1.24 |
| | 130 | 111 | 1.05 | 0.21 | 1.29 |
| | 150 | 111 | 1.05 | 0.38 | 1.35 |
| | 180 | 111 | 1.05 | 0.69 | 1.44 |
| 2 R | 110 | 152 | 1.05 | 0.04 | 1.48 |
| | 130 | 190 | 1.05 | 0.13 | 1.51 |
| | 150 | 190 | 1.05 | 0.24 | 1.56 |
| | 180 | 190 | 1.05 | 0.43 | 1.63 |
| | 210 | 190 | 1.05 | 0.65 | 1.72 |
| 3 | 110 | 86 | 1.05 | 0.06 | 1.48 |
| | 130 | 107 | 1.05 | 0.22 | 1.53 |
| | 150 | 107 | 1.05 | 0.39 | 1.60 |
| | 180 | 107 | 1.05 | 0.70 | 1.72 |
| 3 R | 110 | 153 | 1.05 | 0.04 | 1.69 |
| | 130 | 192 | 1.05 | 0.13 | 1.74 |
| | 150 | 192 | 1.05 | 0.23 | 1.78 |
| | 180 | 189 | 1.03 | 0.42 | 1.85 |
| | 210 | 176 | 0.97 | 0.64 | 1.85 |
| 4 | 110 | 100 | 1.05 | 0.06 | 1.70 |
| | 130 | 125 | 1.05 | 0.19 | 1.75 |
| | 150 | 125 | 1.05 | 0.34 | 1.82 |
| | 180 | 117 | 0.99 | 0.62 | 1.85 |
| 4 R | 110 | 158 | 1.05 | 0.04 | 1.84 |
| | 130 | 194 | 1.03 | 0.13 | 1.85 |
| | 150 | 188 | 1.00 | 0.23 | 1.85 |
| | 180 | 177 | 0.95 | 0.41 | 1.85 |
| | 210 | 163 | 0.88 | 0.62 | 1.85 |
| 4 RR | 110 | 205 | 1.01 | 0.03 | 1.85 |
| | 130 | 251 | 0.99 | 0.10 | 1.85 |
| | 150 | 245 | 0.96 | 0.17 | 1.85 |
| | 180 | 234 | 0.92 | 0.31 | 1.85 |
| | 210 | 221 | 0.88 | 0.47 | 1.85 |
| | 250 | 200 | 0.80 | 0.73 | 1.85 |

**Table 5** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

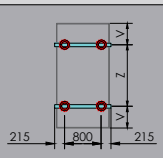
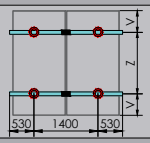
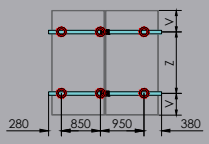
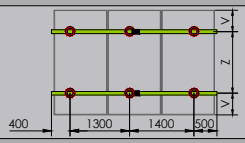
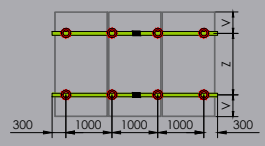
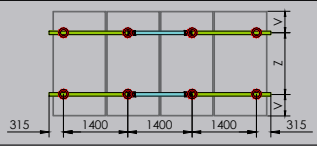
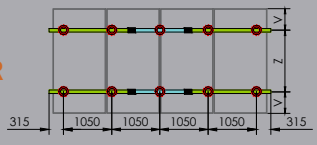
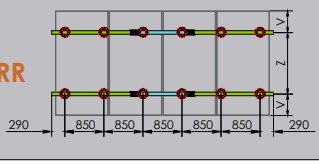
| Maximum Admissible Loads and Their Reactions | | | | | 30° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1   | 110 | 167 | 1.05 | 0.00 | 1.00 |
| | 130 | 209 | 1.05 | 0.00 | 1.04 |
| | 150 | 209 | 1.05 | 0.04 | 1.08 |
| | 180 | 209 | 1.05 | 0.13 | 1.15 |
| | 210 | 209 | 1.05 | 0.23 | 1.24 |
| | 250 | 209 | 1.05 | 0.39 | 1.39 |
| 2   | 110 | 76 | 1.05 | 0.00 | 1.10 |
| | 130 | 95 | 1.05 | 0.00 | 1.17 |
| | 150 | 95 | 1.05 | 0.09 | 1.26 |
| | 180 | 95 | 1.05 | 0.26 | 1.41 |
| | 210 | 95 | 1.05 | 0.46 | 1.66 |
| 2 R   | 110 | 132 | 1.05 | 0.00 | 1.27 |
| | 130 | 165 | 1.05 | 0.00 | 1.32 |
| | 150 | 165 | 1.05 | 0.06 | 1.39 |
| | 180 | 165 | 1.05 | 0.16 | 1.50 |
| | 210 | 165 | 1.05 | 0.28 | 1.64 |
| | 250 | 164 | 1.04 | 0.48 | 1.85 |
| 3   | 110 | 73 | 1.05 | 0.00 | 1.30 |
| | 130 | 92 | 1.05 | 0.00 | 1.40 |
| | 150 | 92 | 1.05 | 0.09 | 1.50 |
| | 180 | 92 | 1.05 | 0.26 | 1.69 |
| | 210 | 59 | 0.74 | 0.47 | 1.85 |
| 3 R   | 110 | 133 | 1.05 | 0.00 | 1.45 |
| | 130 | 167 | 1.05 | 0.00 | 1.52 |
| | 150 | 167 | 1.05 | 0.05 | 1.59 |
| | 180 | 167 | 1.05 | 0.16 | 1.72 |
| | 210 | 162 | 1.02 | 0.28 | 1.85 |
| | 250 | 92 | 0.63 | 0.47 | 1.85 |
| 4   | 110 | 86 | 1.05 | 0.00 | 1.48 |
| | 130 | 108 | 1.05 | 0.00 | 1.58 |
| | 150 | 108 | 1.05 | 0.08 | 1.68 |
| | 180 | 106 | 1.03 | 0.23 | 1.85 |
| | 210 | 52 | 0.59 | 0.41 | 1.85 |
| 4 R   | 110 | 138 | 1.05 | 0.00 | 1.57 |
| | 130 | 172 | 1.05 | 0.00 | 1.64 |
| | 150 | 172 | 1.05 | 0.05 | 1.71 |
| | 180 | 171 | 1.04 | 0.15 | 1.85 |
| | 210 | 149 | 0.92 | 0.27 | 1.85 |
| | 250 | 64 | 0.46 | 0.46 | 1.85 |
| 4 RR   | 110 | 187 | 1.05 | 0.00 | 1.62 |
| | 130 | 234 | 1.05 | 0.00 | 1.67 |
| | 150 | 234 | 1.05 | 0.04 | 1.74 |
| | 180 | 234 | 1.05 | 0.12 | 1.85 |
| | 210 | 211 | 0.95 | 0.21 | 1.85 |
| | 250 | 175 | 0.81 | 0.35 | 1.85 |

**Table 6** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 35° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 183 | 1.05 | 0.00 | 0.84 |
| | 130 | 228 | 1.05 | 0.00 | 0.88 |
| | 150 | 228 | 1.05 | 0.05 | 0.92 |
| | 180 | 228 | 1.05 | 0.14 | 0.99 |
| | 210 | 228 | 1.05 | 0.24 | 1.08 |
| | 250 | 228 | 1.05 | 0.39 | 1.23 |
| 2 | 110 | 81 | 1.05 | 0.00 | 0.93 |
| | 130 | 102 | 1.05 | 0.01 | 1.01 |
| | 150 | 102 | 1.05 | 0.10 | 1.10 |
| | 180 | 102 | 1.05 | 0.27 | 1.28 |
| | 210 | 102 | 1.05 | 0.47 | 1.58 |
| 2 R | 110 | 143 | 1.05 | 0.00 | 1.06 |
| | 130 | 179 | 1.05 | 0.01 | 1.12 |
| | 150 | 179 | 1.05 | 0.07 | 1.19 |
| | 180 | 179 | 1.05 | 0.17 | 1.30 |
| | 210 | 179 | 1.05 | 0.29 | 1.44 |
| | 250 | 179 | 1.05 | 0.49 | 1.74 |
| 3 | 110 | 79 | 1.05 | 0.00 | 1.12 |
| | 130 | 99 | 1.05 | 0.01 | 1.21 |
| | 150 | 99 | 1.05 | 0.11 | 1.31 |
| | 180 | 99 | 1.05 | 0.28 | 1.54 |
| | 210 | 82 | 0.91 | 0.49 | 1.85 |
| 3 R | 110 | 145 | 1.05 | 0.00 | 1.22 |
| | 130 | 181 | 1.05 | 0.01 | 1.29 |
| | 150 | 181 | 1.05 | 0.06 | 1.36 |
| | 180 | 181 | 1.05 | 0.17 | 1.49 |
| | 210 | 181 | 1.05 | 0.29 | 1.65 |
| | 250 | 126 | 0.77 | 0.48 | 1.85 |
| 4 | 110 | 93 | 1.05 | 0.00 | 1.27 |
| | 130 | 116 | 1.05 | 0.01 | 1.35 |
| | 150 | 116 | 1.05 | 0.09 | 1.46 |
| | 180 | 116 | 1.05 | 0.25 | 1.65 |
| | 210 | 72 | 0.72 | 0.43 | 1.85 |
| 4 R | 110 | 150 | 1.05 | 0.00 | 1.33 |
| | 130 | 187 | 1.05 | 0.01 | 1.39 |
| | 150 | 187 | 1.05 | 0.06 | 1.47 |
| | 180 | 187 | 1.05 | 0.16 | 1.61 |
| | 210 | 187 | 1.05 | 0.28 | 1.77 |
| | 250 | 89 | 0.56 | 0.47 | 1.85 |
| 4 RR | 110 | 204 | 1.05 | 0.00 | 1.36 |
| | 130 | 255 | 1.05 | 0.00 | 1.41 |
| | 150 | 255 | 1.05 | 0.05 | 1.47 |
| | 180 | 255 | 1.05 | 0.12 | 1.59 |
| | 210 | 255 | 1.05 | 0.21 | 1.72 |
| | 250 | 237 | 0.98 | 0.36 | 1.85 |

**Table 7** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

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## Loads and reactions

| Maximum Admissible Loads and Their Reactions | | | | | 40° |
|---|---|---|---|---|---|
| Kit | Loads (Km/h) | Loads (Kg/m2) | (kN/mount) | (kN/mount) | (kN/mount) |
| 1 | 110 | 215 | 1.05 | 0.00 | 0.71 |
| | 130 | 265 | 1.03 | 0.01 | 0.74 |
| | 150 | 265 | 1.03 | 0.06 | 0.78 |
| | 180 | 265 | 1.03 | 0.15 | 0.85 |
| | 210 | 265 | 1.03 | 0.25 | 0.93 |
| | 250 | 265 | 1.03 | 0.40 | 1.09 |
| 2 | 110 | 94 | 1.05 | 0.00 | 0.80 |
| | 130 | 118 | 1.05 | 0.03 | 0.87 |
| | 150 | 118 | 1.05 | 0.12 | 0.95 |
| | 180 | 118 | 1.05 | 0.29 | 1.15 |
| | 210 | 118 | 1.05 | 0.49 | 1.43 |
| 2 R | 110 | 168 | 1.05 | 0.00 | 0.90 |
| | 130 | 210 | 1.05 | 0.02 | 0.95 |
| | 150 | 210 | 1.05 | 0.08 | 1.02 |
| | 180 | 210 | 1.05 | 0.18 | 1.13 |
| | 210 | 210 | 1.05 | 0.31 | 1.25 |
| | 250 | 210 | 1.05 | 0.50 | 1.58 |
| 3 | 110 | 91 | 1.05 | 0.00 | 0.95 |
| | 130 | 114 | 1.05 | 0.03 | 1.04 |
| | 150 | 114 | 1.05 | 0.13 | 1.13 |
| | 180 | 114 | 1.05 | 0.30 | 1.40 |
| | 210 | 114 | 1.05 | 0.50 | 1.74 |
| 3 R | 110 | 170 | 1.05 | 0.00 | 1.04 |
| | 130 | 213 | 1.05 | 0.02 | 1.10 |
| | 150 | 213 | 1.05 | 0.08 | 1.17 |
| | 180 | 213 | 1.05 | 0.18 | 1.29 |
| | 210 | 213 | 1.05 | 0.30 | 1.44 |
| | 250 | 213 | 1.05 | 0.49 | 1.80 |
| 4 | 110 | 108 | 1.05 | 0.00 | 1.08 |
| | 130 | 135 | 1.05 | 0.02 | 1.16 |
| | 150 | 135 | 1.05 | 0.11 | 1.26 |
| | 180 | 135 | 1.05 | 0.26 | 1.47 |
| | 210 | 135 | 1.05 | 0.44 | 1.82 |
| 4 R | 110 | 176 | 1.05 | 0.00 | 1.12 |
| | 130 | 198 | 0.96 | 0.02 | 1.10 |
| | 150 | 198 | 0.96 | 0.07 | 1.17 |
| | 180 | 198 | 0.96 | 0.17 | 1.30 |
| | 210 | 198 | 0.96 | 0.29 | 1.47 |
| | 250 | 183 | 0.89 | 0.48 | 1.85 |
| 4 RR | 110 | 241 | 1.05 | 0.00 | 1.15 |
| | 130 | 265 | 0.93 | 0.01 | 1.09 |
| | 150 | 265 | 0.93 | 0.06 | 1.15 |
| | 180 | 265 | 0.93 | 0.13 | 1.25 |
| | 210 | 265 | 0.93 | 0.22 | 1.37 |
| | 250 | 265 | 0.93 | 0.36 | 1.60 |

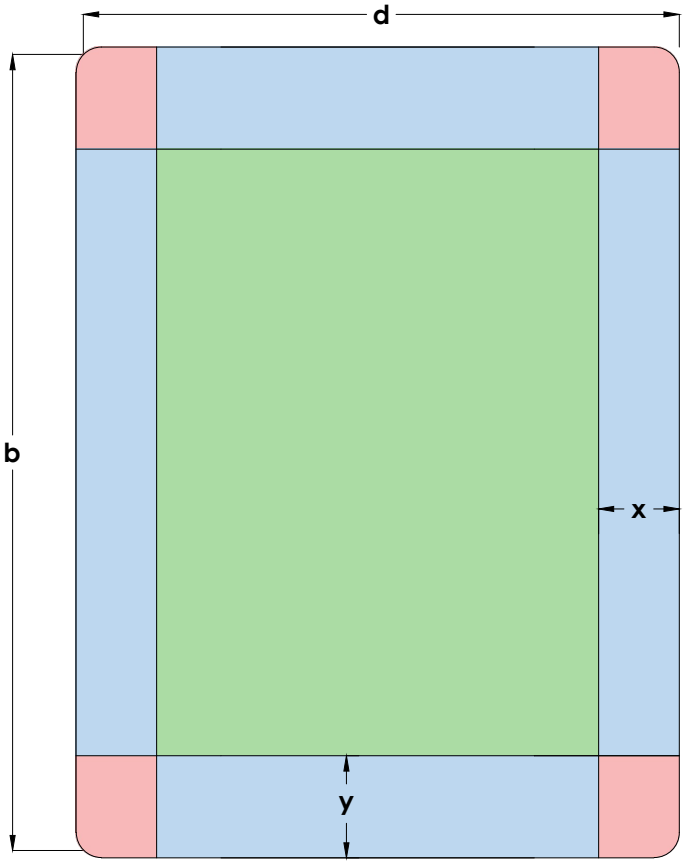
**Table 8** - *Maximum admissible loads and their reactions*

Characteristic snow load at ground level: The tabulated snow load is the characteristic snow load at ground level, which corresponds to a load value with an annual probability of being exceeded of 0.02, excluding exceptional snow actions, according to 1.6.1 EN1991-1-3.
The characteristic value of the snow load on the roof is obtained according to Chapter 5 Section 5.2 Point 3a) of EN 1991-1-3.
The thermal coefficient is considered to be equal to 1. The shape coefficient of the snow load is obtained from Chapter 5 Section 5.3.2 Point 2) Table 5.2 (μ1) of EN 1991-1-3. For the consideration of the exposure coefficient, "Normal Topography" is established for winds below 125 km/h and "Topography Exposed to wind" for higher wind speeds, with the value of the exposure coefficient being calculated according to Chapter 5 Section 5.2 Table 5.1 of EN 1991-1-3.
The tabulated values are admissible for single and gable roofs that do not present any obstruction to snow sliding on the roof. If the roof has any obstruction to snow sliding, the SUNFER KEY SOFTWARE should be consulted: https://sunferkey.sunferenergy.com/

Loads and reactions were obtained for the kit distances delimited in the table.
For other arrangements, consult SUNFER.

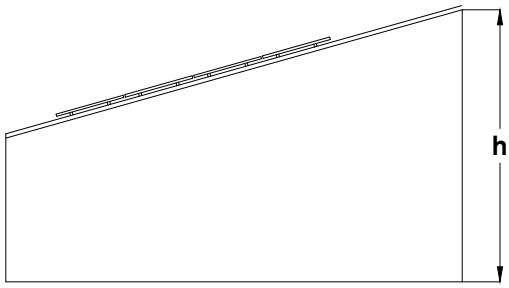
SUNFER
Solar Mounting Systems

# 02.4V-EN
## Installation Zone




e= min [b,2h]

x = Max [e/10 , 0.5m]
y = Max [e/4 , 0.5m]




Installation safe zone

Turbulent zone

Extremely turbulent zone

To avoid turbulence and other unwanted natural effects, it is strongly recommended to install photovoltaic panels inside of the green zone.

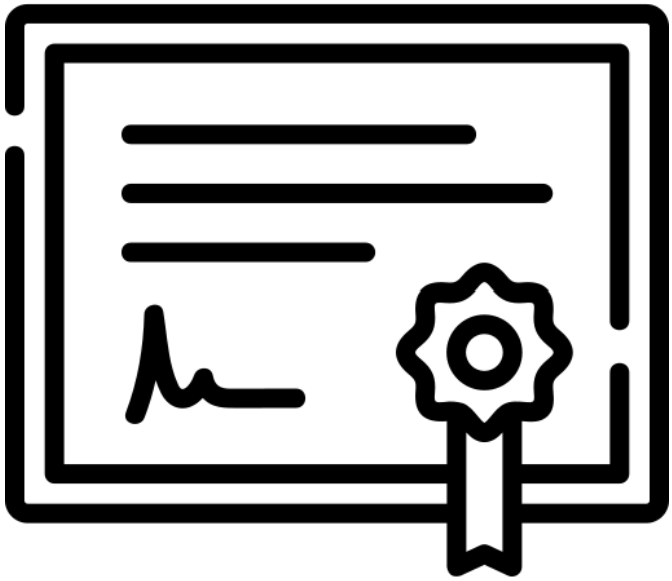
SUNFER
Solar Mounting Systems

# 02.4V-EN

## Installation video

SUNFER
Solar Mounting Systems

# 02.4V-EN
## Certifications and guarantees



- ISO 9001 Certified
- ISO 14001 Certified
- CE Marking
- Guaranteed

This is a translation of the certificate ES13/13899

The management system of

# SUNFER ESTRUCTURAS, S.L.U.

Camí de la Dula, s/n, 46687 Albalat de la Ribera, Valencia

has been assessed and certified as meeting the requirements of

## ISO 9001:2015

For the following activities
Design, manufacture and sale of solar energy structures.

This certificate is valid from 19 May 2023 until 8 April 2025 and remains valid subject to satisfactory surveillance audits.

Issue 6. Certified with SGS since 8 April 2013

Last certificate expiry date 8 April 2022
Recertification audit date 31 March 2022

Authorised by

SGS International Certification Services Iberica, S.A.U.
C/Trespaderne, 29. 28042 Madrid. España
t +34 91 313 8115 - www.sgs.com

This is a translation of the certificate ES22/211172

The management system of

# SUNFER ESTRUCTURAS, S.L.U.

Camí de la Dula, s/n, 46687 Albalat de la Ribera, Valencia

has been assessed and certified as meeting the requirements of

## ISO 14001:2015

For the following activities
Design, manufacture and sale of solar energy structures.

This certificate is valid from 19 May 2023 until 22 April 2025 and remains valid subject to satisfactory surveillance audits.

Issue 2. Certified with SGS since 22 April 2022

Authorised by

SGS International Certification Services Iberica, S.A.U.
C/Trespaderne, 29. 28042 Madrid. España
t +34 91 313 8115 - www.sgs.com

SUNFER

CE

**IDENTIFICATION NUMBER OF NOTIFIED ORGANISM:**

*1181*

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**NUMBER AND REGISTERED ADDRESS OF MANUFACTURERS. INSTALLATION LOCATION:**

Business name: *SUNFER ESTRUCTURAS, S.L.U.*

Address: *Camí de la Dula s/n*

Postal Code: *46687*

Location: *Albalat de la Ribera*

City: *Valencia*

Country: *España*

**TWO LAST DIGITS OF THE YEAR THAT THE MARKING WAS FIXED:**

*19*

*ES19/86524*

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**EN 1090-1**

Description of product: ***02.4V-EN***

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| | |
|---|---|
| **TOLERANCES IN GEOMETRIC INFORMATION:** | *EN 1090-3* |
| **WELDABILITY:** | *--* |
| **FRACTURE RESISTANCE:** | *--* |
| **FIRE REACTION:** | *Classified material A1* |
| **CADMIUM EMISSION:** | *N/A* |
| **RADIACTIVITY EMISSION:** | *N/A* |
| **DURABILITY:** | *N/A* |

**STRUCTURAL CHARACTERISTICS:**

- **Carrying capacity:** *See product instructions and data sheet*
- **Fatigue resistance:** *N/A*
- **Fire resistance:** *N/A*
- **Manufacturing:** *According to the component specification and EN1090-3. Execution class EXC1*

| | |
|---|---|
| DECLARATION OF PERFORMANCE NUMBER: | P-0120 |

**1. PRODUCT DESCRIPTION.**

| | |
|---|---|
| UNIQUE IDENTIFICATION CODE OF THE PRODUCT TYPE: | 02.4V-EN |

**2. NAME AND ADDRESS OF MANUFACTURER.**

| | |
|---|---|
| NAME: | SUNFER ESTRUCTURAS, S.L.U. |
| COMERCIAL NAME (if exists): | -- |
| ADDRESS: | CAMI DE LA DULA S/N |
| CITY AND PC: | 46687 ALBALAT DE LA RIBERA -- COMUNIDAD VALENCIANA (SPAIN) |

**3. INTENDED USE(S) OF THE PRODUCT:**
ALUMINUM STRUCTURE TO SUPPORT PHOTOVOLTAIC PANELS.

**4. SYSTEM OF EVALUATION AND VERIFICATION OF CONSTANCY OF PERFORMANCE:**
System 2+

**5. HARMONIZED STANDARD:**
This product complies with the provisions of Annex ZA of the European standard **UNE-EN 1090-1:2011 + A1:2012**

**6. NOTIFIED ORGANISM:**

| | |
|---|---|
| NAME: | **SGS ICS IBÉRICA. S.A.** |
| Notified Organism Number: | **NB1181** |

**7. DECLARED PERFORMANCES:**

| Essential Characteristics | Performances | Harmonised technical specifications |
|---|---|---|
| Tolerances in geometric information | Conforms to limits for essential tolerances□ | EN 1090-3 |
| Weldability | Not applicable because there is no welding in the structure | ---- |
| Fracture Tenacity | Not required for aluminum components | ----- |
| Carrying Capacity | N/A | |
| Fatigue Resistance | N/A | |
| Fire Resistance | N/A | |
| Fire reaction | Class A1 | EN 13501-1 |
| Emission of cadmium and its compounds | OK | |
| Emission of radioactivity | OK | |
| Durability | N/A | |
| Structural features<br>- Carrying capacity<br>- Fatigue resistance: N/A<br>- Fire resistance: N/A<br>- Manufacturing | See product data sheet<br>N/A<br>N/A<br>According to the component specification.<br>Execution class EXC1 | UNE EN 1999-1-1<br><br><br>UNE EN 1090-3 |

- The performance of the product identified above is in accordance with all the declared performance.
- This declaration of performance is issued in accordance with Regulation (EN) No. 305/2011 under the responsibility of the manufacturer identified above.

Manufacturer's Name: Voro Gómez Nacher
Date of issue: 02/08/2023
Signature:

# Guarantee Terms and Conditions

## Structural and Anticorrosion Guarantee

All SUNFER mounting systems are manufactured under strict production control in our factory, as are our raw materials, which are periodically tested to ensure quality. It is for these reasons we are able to offer the following guarantee for our products:

25 year Structural Gurantee

Anticorrosion Guarantee per the below table

| Materials | NON-HARSH environment (1)<br>Distance to coastline<br>greater than 5 Km | HARSH or MARINE environment<br>Distance to coastline<br>less than 5 Km |
|---|---|---|
| Raw Aluminum | Fifteen (15) years | Five (5) years |
| Anodized Aluminum | Twenty-five (25) years | Twenty-five (25) years |

Table 1.

**(1)** Non-exhaustive list of zones considered to be harsh environments:

a. Industrial zones with emissions that include: sulphur dioxide, nitrogen oxides, sulphuric acid, sulphuric compounds, chlorine, or other volatile gases; 5 km safety distance.
b. Electric generating stations that use the following fuels: coal, natural gas, petroleum; 5 km safety distance.
c. Petrochemical plants; 5 km safety distance.
d. Cellulose factories; 5 km safety distance
e. Wastewater treatment facilities: 500 m safety distance.

In these zones it is always necessary to utilize anodized aluminum if inside of the minimum safety radius indicated above.

The warranty of the adhesive in reference 07.1H and S07.1 is ten (10) years. The warranty of the 2-sided adhesive tape of the S07.1 anchor covers the product supplied by Sunfer and can be applied provided that the breakage is caused by the tearing off of the profile with respect to the adhesive tape, in the event that the breakage is caused by the tearing off of the adhesive tape from the roofing, it will be considered a faulty assembly on site.

Mixed galvanised steel and raw aluminium supports such as, for example: Elevated, Monopoles, Car parks:
Environments C3 fifteen (15) years guarantee.
Environments C4-C5 five (5) years.

Mixed galvanised steel and anodised aluminium supports, such as: Elevated, Monopoles, Car parks:
Environments C3 guarantee twenty-five (25) years.
Environments C4-C5 fifteen (15) years.

This guarantee applies to orders supplied from 3rd January, 2023 on. Orders delivered before this date shall be governed by the guarantee that was in force at the time that the order was supplied.

The guarantee covers the final installation, and applies directly to the end user of the structure. Guarantees are managed between SUNFER and commercial distributors, so if an end user needs to invoke a guarantee, they must contact the distributor that supplied the material, and the distributor will coordinate with SUNFER Customer Service. The period of coverage of the guarantee begins upon the date that the delivery of the material is received by the end user, but will be repealed if the client does not comply with the payment terms stated in the invoice.

To invoke the guarantee, the following documentation must be produced:

- Sales invoice.
- Date system was put in service.
- Information of end user (name, address, distributor, etc).
- General photographs showing the entire system as installed.
- Installer's final work plans/drawings.
- Detailed photos of:
  - Fastening of the system to the roof, which shows the distance between mounting points.
  - The structure mounted without panels attached.
  - A rear view of the structure (from roof ridge if coplanar).

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- Plan/drawing of the affected area which shows distances between mounting points.

## Coverage and Exclusions

### Coverage

This guarantee covers the replacement and shipping of the defective components or of the entire system if necessary, with no charge. In the case of a replacement not being available, a suitably similar replacement will be provided.

The guarantee is limited to replacement of defective products. The following costs, indirectly associated with the return process, will not be compensated: disassembly or any consequential, supplementary, or related damages, including lost profits or other indirect costs.

The guarantee covers all metallic elements included in a SUNFER structure.

### Exclusions

Any issues or defects caused by or related to the following shall be excluded from the guarantee:

- Inadequate installations which did not follow the installation instructions provided by SUNFER.
- Incorrect fastener tightening torques (overtight or undertight).
- Modifications or installations other than those recommended by SUNFER.
- Installation of additional homemade or third-party elements to the structures supplied by SUNFER.
- Inadequate handling of products during the installation.
- Damage to the product after delivery, or from improper storage of the product.
- Any defect which is purely aesthetic in nature and which does not affect the structural safety of the product.
- Installations in areas whose wind and snow loads exceed those indicated in the datasheets of the product.
- Structures installed outside of the safe zone indicated in the installation manual.
- Inadequate maintenance. See the Maintenance Manual.
- Fires or exposure to temperatures above 110 °C.
- Problems or defects caused by corrosive agents not initially considered (1).
- Natural disasters such as earthquakes, hurricanes, floods, tornados, cyclones, mudslides, avalanches, or volcanic eruptions.

For structures not provided with a method of fastening to a surface, SUNFER denies responsiblity in the event of collapse or failure due to insufficient fastening or poor installation.

### Guarantor, Execution of guarantee

The guarantor is SUNFER ESTRUCTURAS S.L.U. located at Camino de la Dula s/n 46687, Albalat de la Ribera, Valencia, Spain.

The entitlements afforded by this guarantee are non-transferable to third parties.

Regarding the guarantee and any disputes related to it, the law currently in force in Spain shall apply.