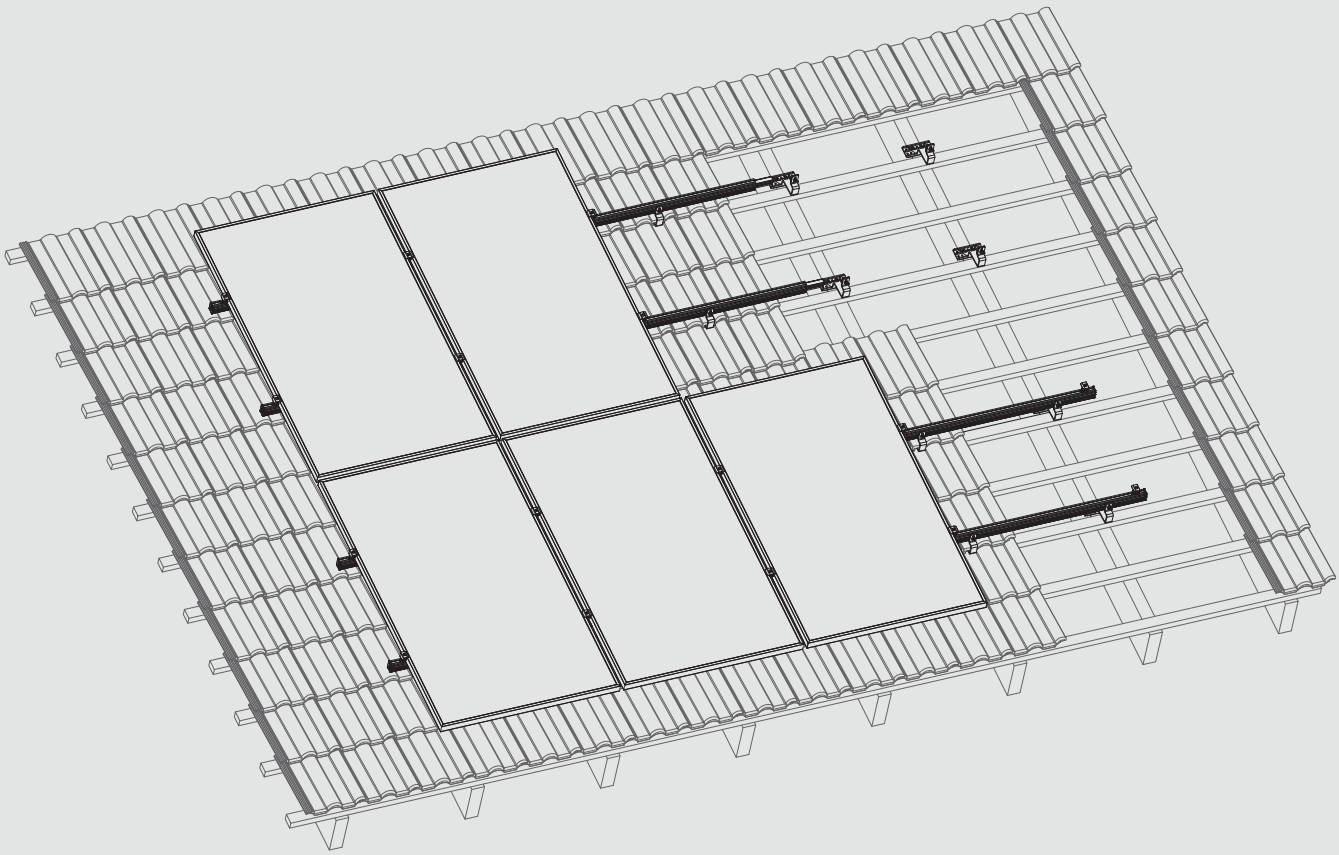
Renusol Europe GmbH

# VS+

EN | Installation instructions



EN | Read these installation instructions carefully before starting the installation!
Only competent, qualified persons are allowed to carry out the installation!

## EN | Usage

Mounting system for the installation of framed PV modules with a frame thickness between 30 and 50 mm on pitched roofs with the following characteristics:

- Roof pitch 5° - 60° (solar fasteners) or 20°-60° (roof hooks).
- For roof pitches below 20° the permissible roof pitch of the used tile type shall apply.
- Various tile roofs (pan tile, flat tile, interlocking tile, shingle tile, etc.) on wood substructure.
- PV assembly in Portrait and Landscape is possible.

A proof of stability of the roof considering the additional loads from the photovoltaic system must be on hand before the assembly.

**Installation guideline**
To compensate the linear expansion of modules and mounting system, an interruption should be planned every 12m.

Please observe the specifications issued by the manufacturers of the modules, the manufacturers of the roofing, as well as the local regulations for woodwork. Do not use the installed roof fixations as stepping aid.

For installation, follow the requirements referring to lightning and overvoltage protection for photovoltaic systems, as well as the requirements on fire protection.

If the installation takes place in a distance of 10 km to the coasts, we advise against the use of galvanised components.

For further information, please contact your sales representative or the Technical Department of Renusol.

**Installation instructions**

Please, carefully read the last version of the installation instructions, before starting the installation. First, familiarise yourself with the system components. Check the condition of the roof construction before starting the installation. This includes quality and thickness of rafters, purlins and the roof sealing. The building structure must be able to safely and durably bear the additional loads of the photovoltaic system. During the installation, in particular while working on the roof, be sure to observe the relevant health and safety regulations and please follow the relevant professional rules.

The figures and texts in the installation instructions correspond to current technology at the time of printing. Printing errors are possible and we reserve the right to make technical changes. The individual installation instructions are merely recommendations in accordance with the current state of the art and are based on the experience of how systems by Renusol can be installed. If any special characteristics of the roof or object need to be considered, please consult specialists such as roofers or structural engineers, if necessary.

Check for the current version of our installation instructions on our website at www.renusol.com. Here, you can also find instructions in additional languages, if required.

**Tests/certificates:**
- TÜV
- MCS012 (IK0197)

**Other applicable documents**

“General installation, maintenance and assembly instructions”

“Safety instructions for installation guide”

“Terms of warranty and exclusion of liability”

These documents are available in: www.renusol.com

**Terms of warranty:**

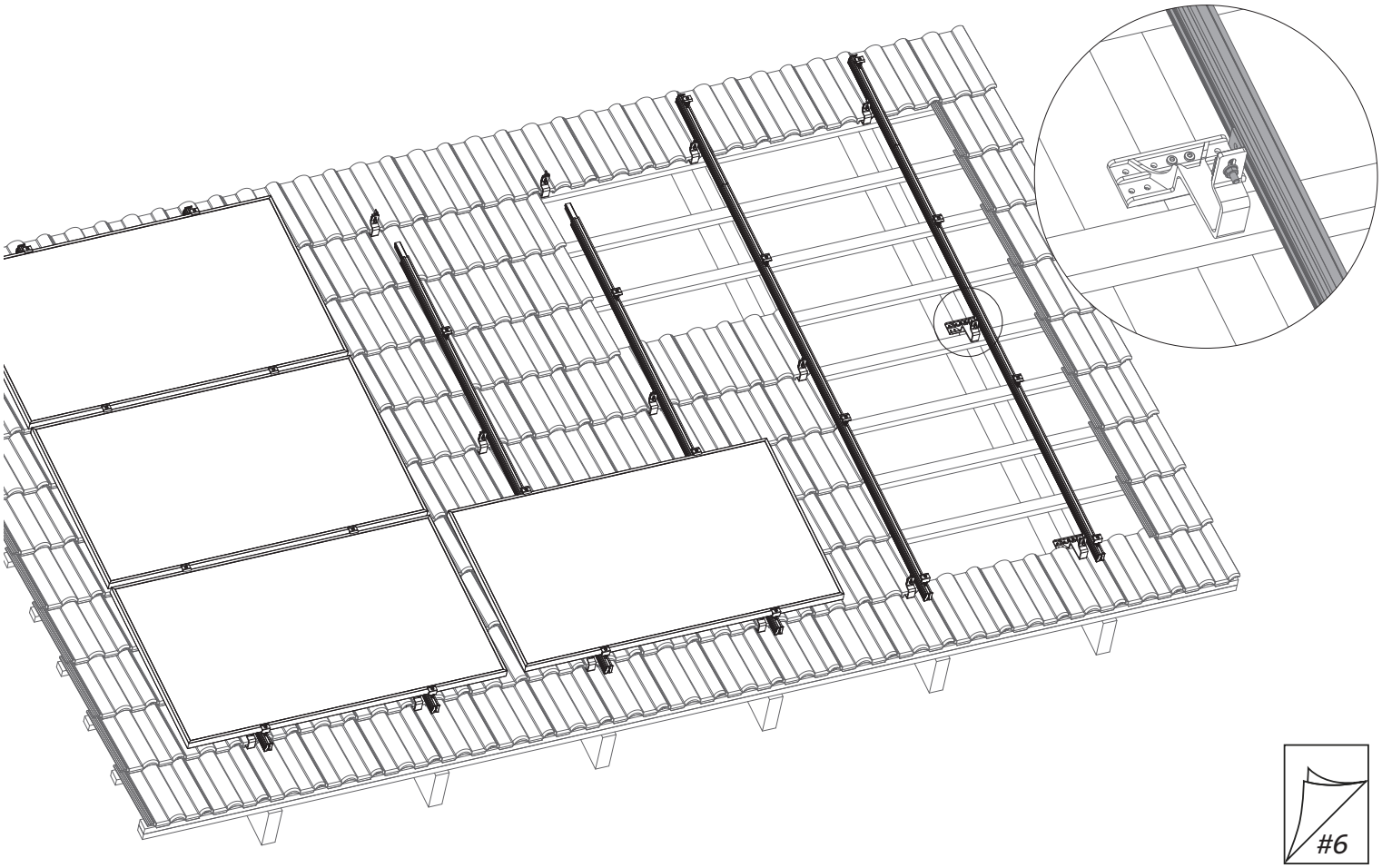
Renusol's warranty only applies if the original, complete Renusol system is used and the terms of warranty are met. For the legally provided liability for defects/warranty, please see the General Terms and Conditions issued by Renusol.

Check the structural loadability of the PV system before starting the installation. The building must be able to bear the additional weight

07/2023 - Creation of installation instructions

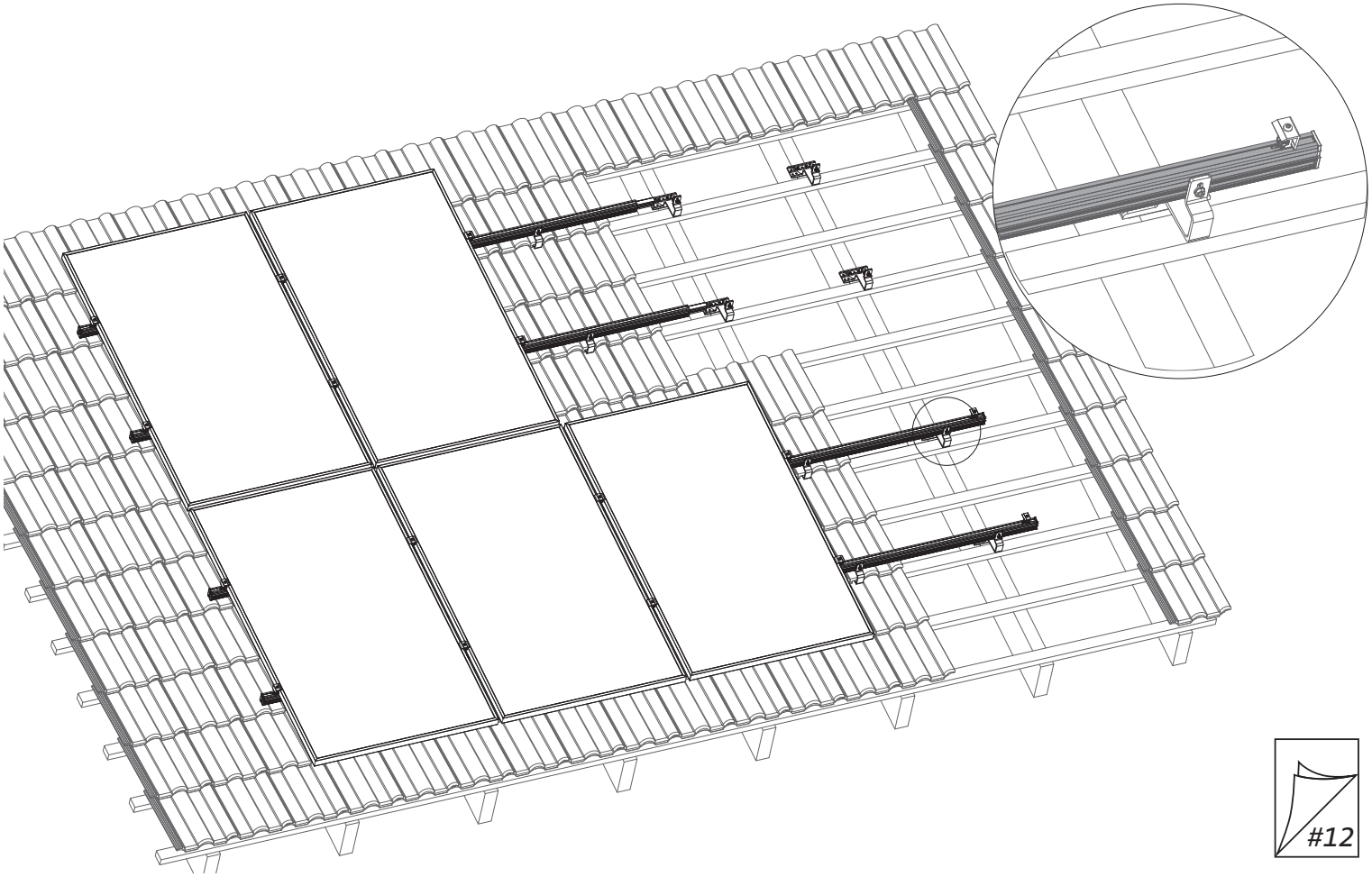
12/2023 - New maintenance article R300000/R900274

## One-layer rail system - horizontal module alignment



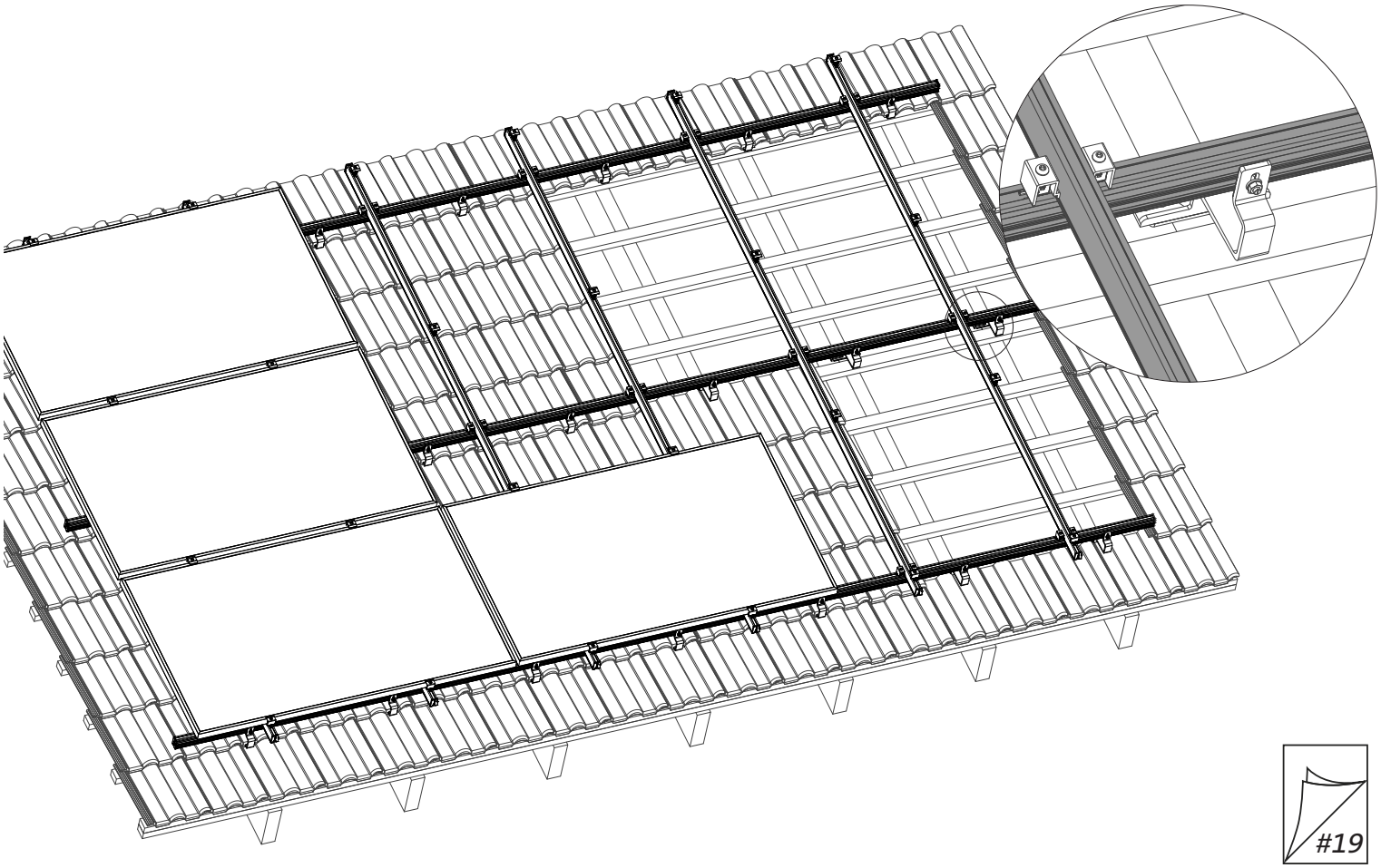
#6

## One-layer rail system - vertical module alignment



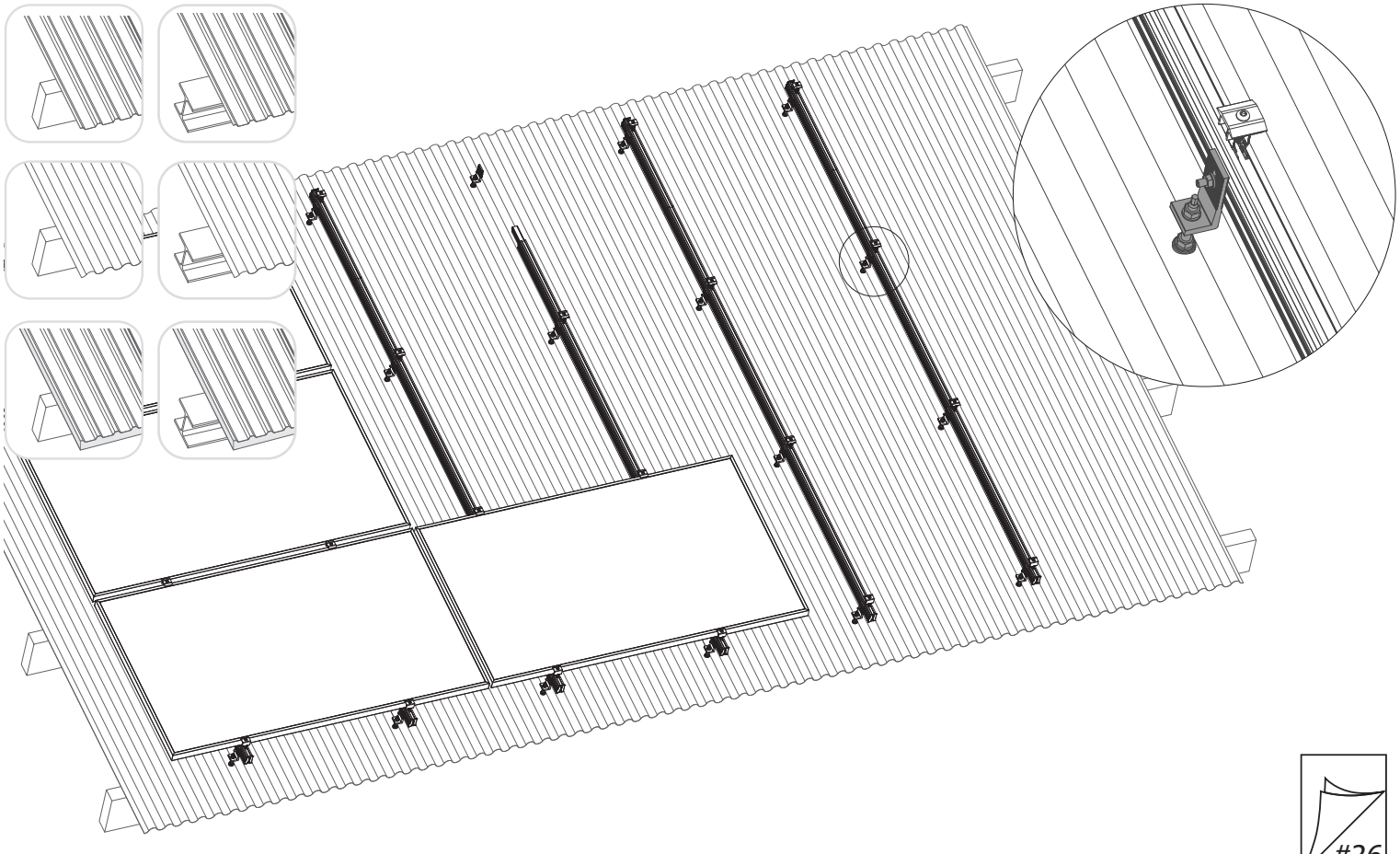
#12

## Two-layer rail system /cross rail system - horizontal module alignment



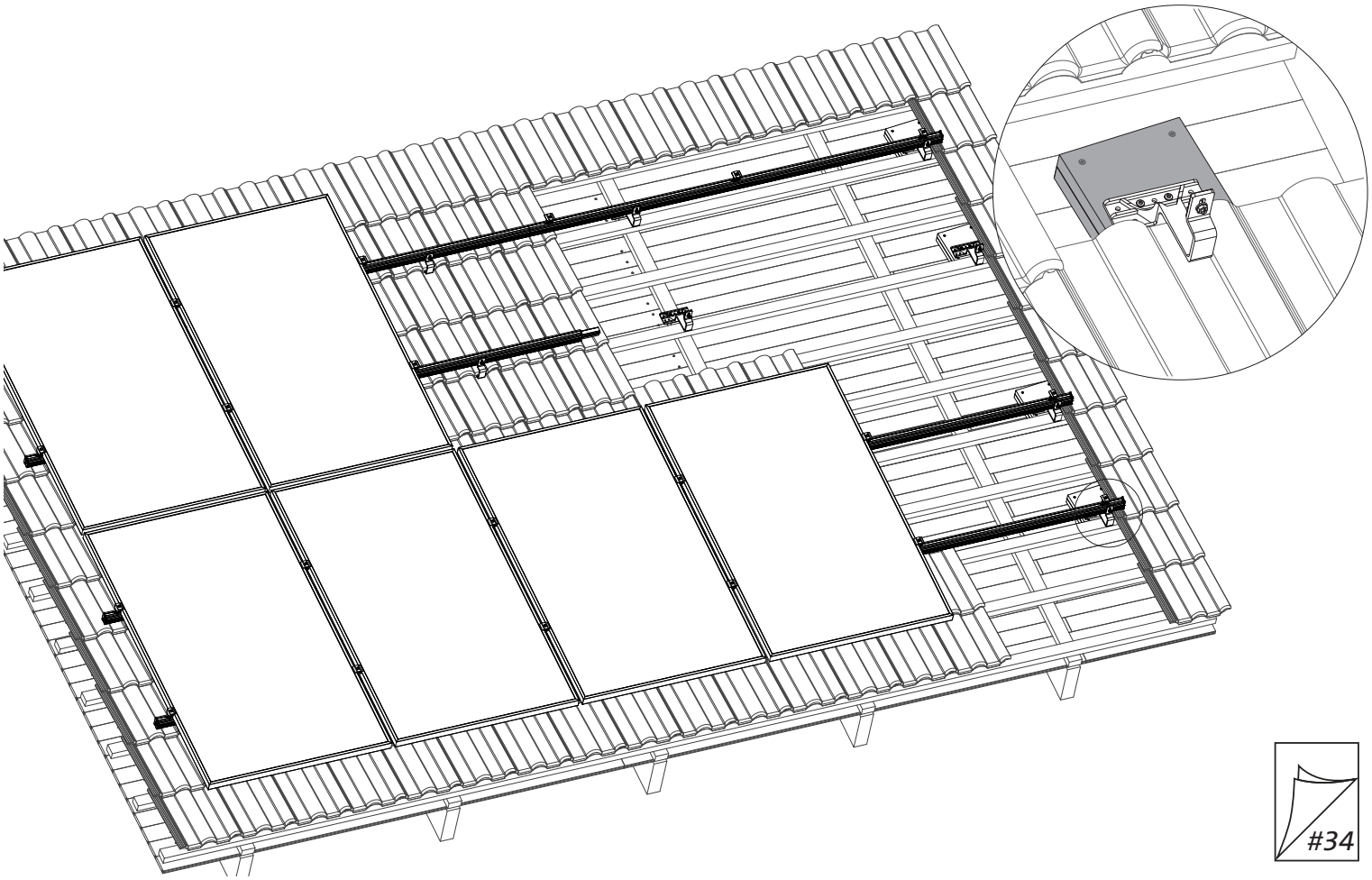
#19

## One-layer rail system with hanger bolts, - connection of solar fasteners - horizontal module alignment



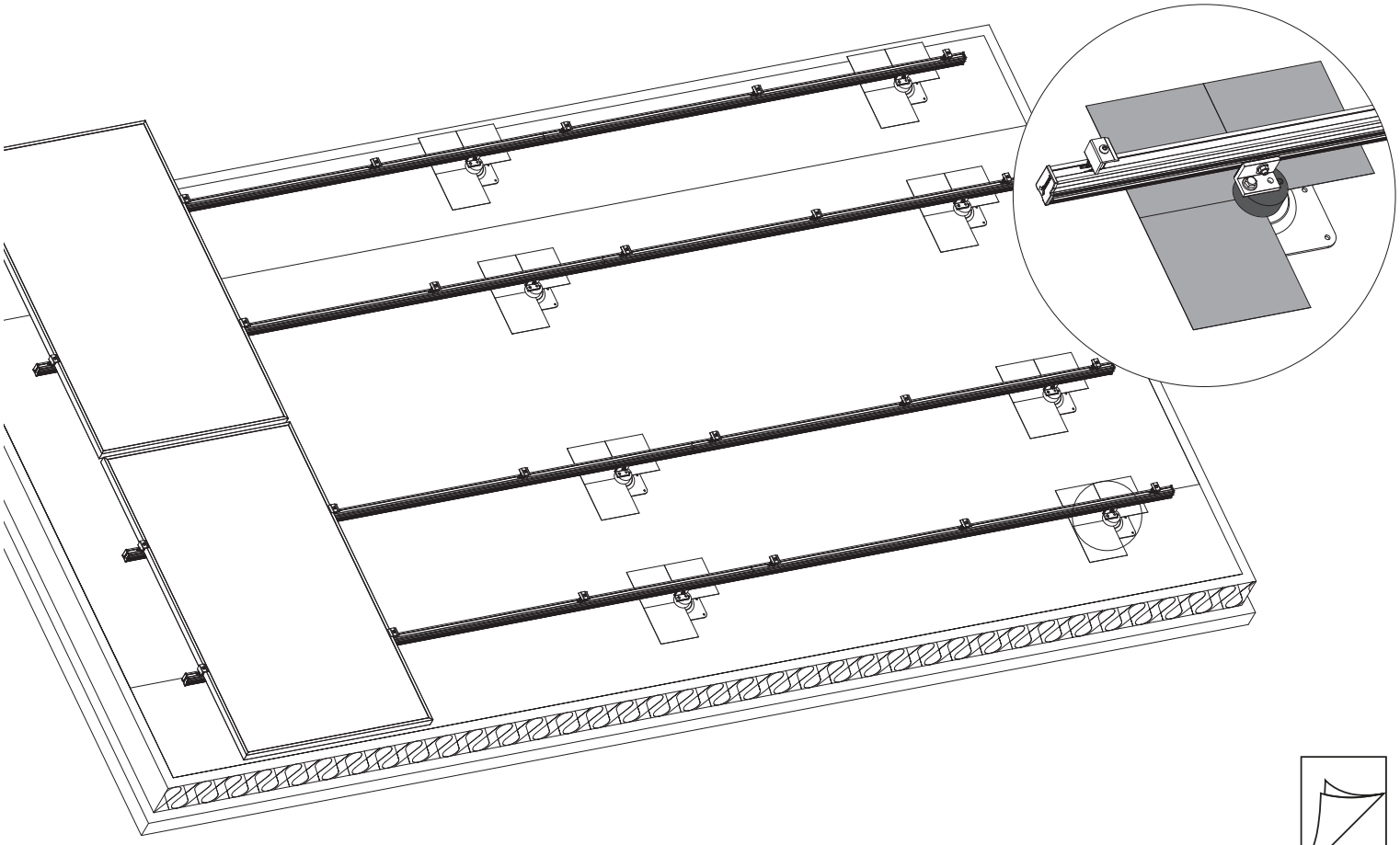
#26

**One-layer rail system on tongue and groove boards fixation - vertical module alignment**



#34

**Connection to alternative fasteners**



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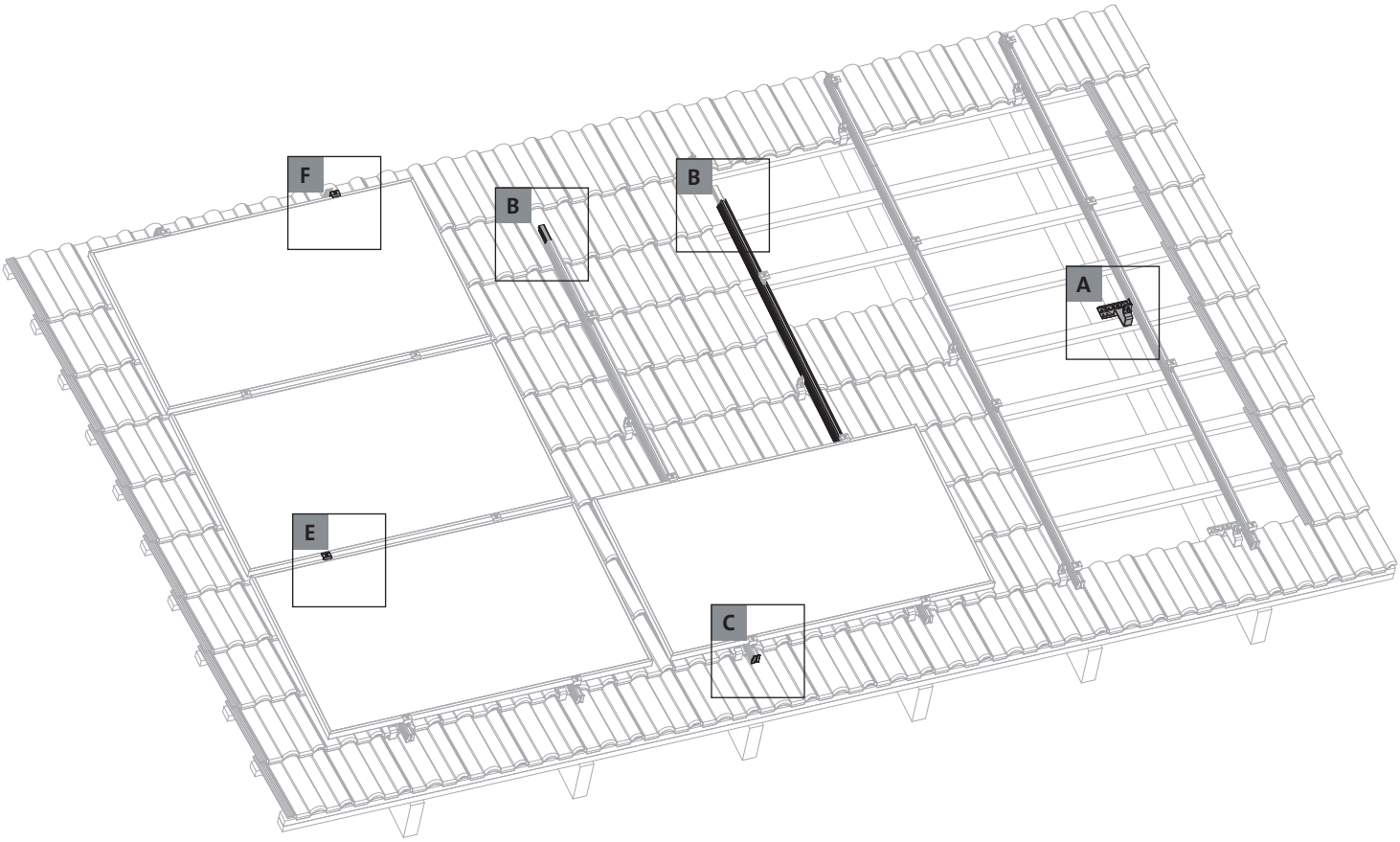
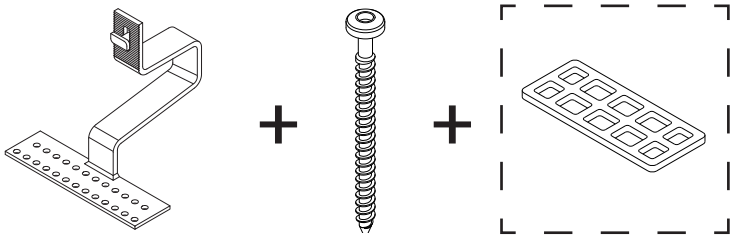
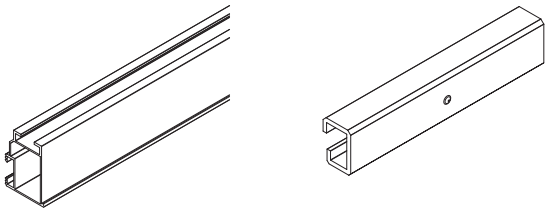


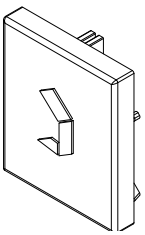

**A**



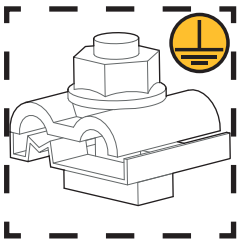
**B**



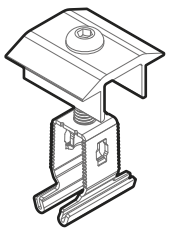
**C**



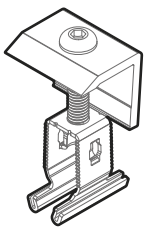
**D**



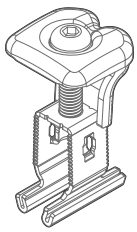
**E**

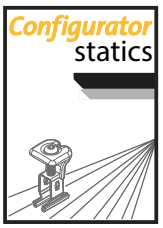


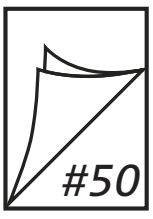
**F**



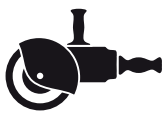
**E + F**





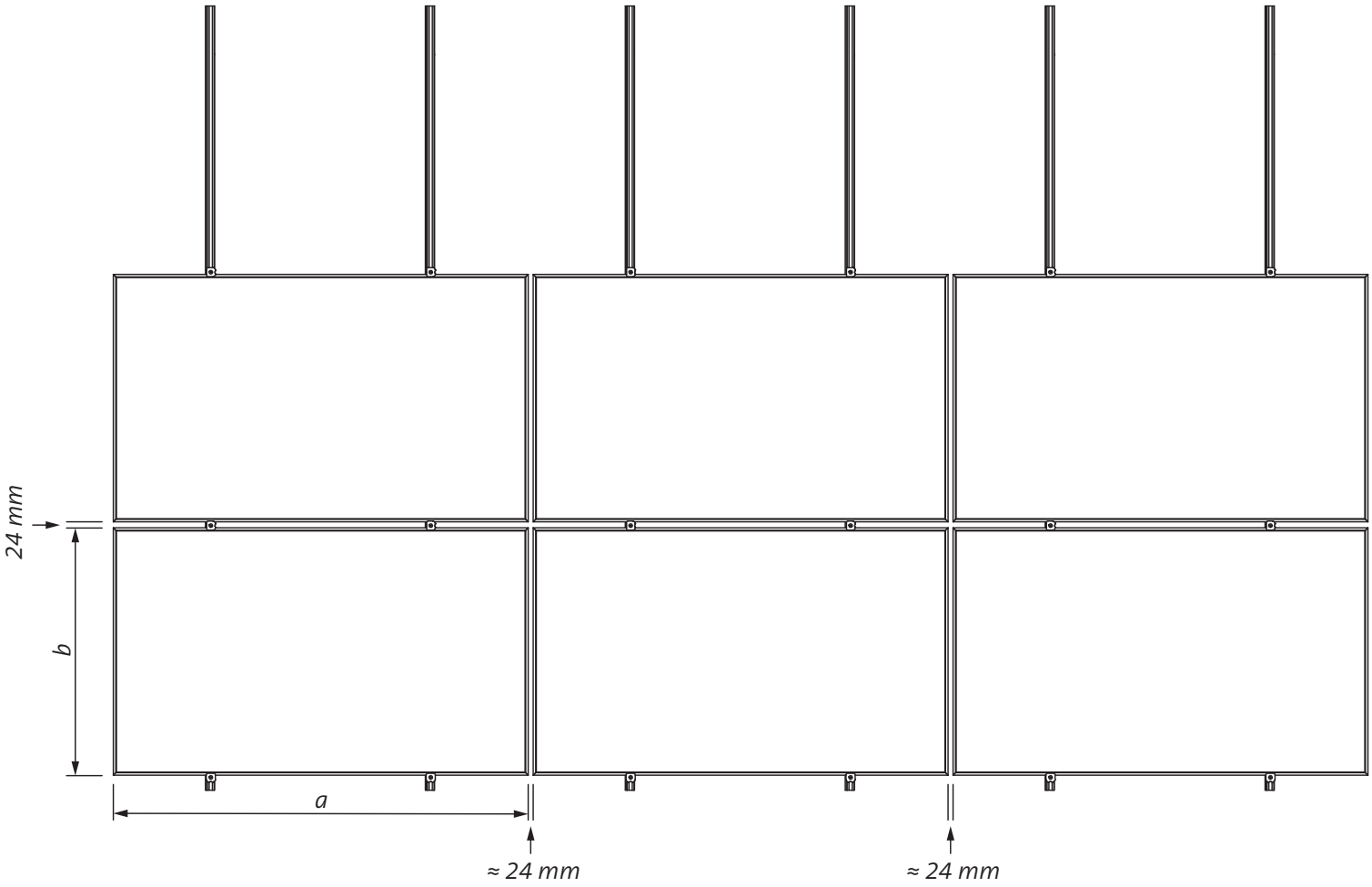

**+**

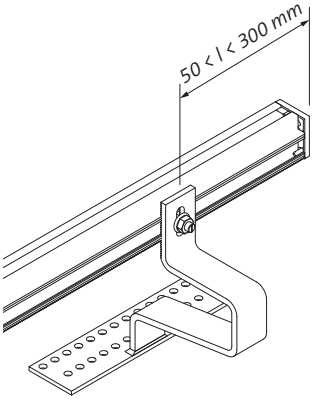


SIT 30
(TX 30)

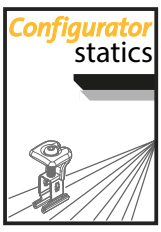
Nm

10mm / 13 mm



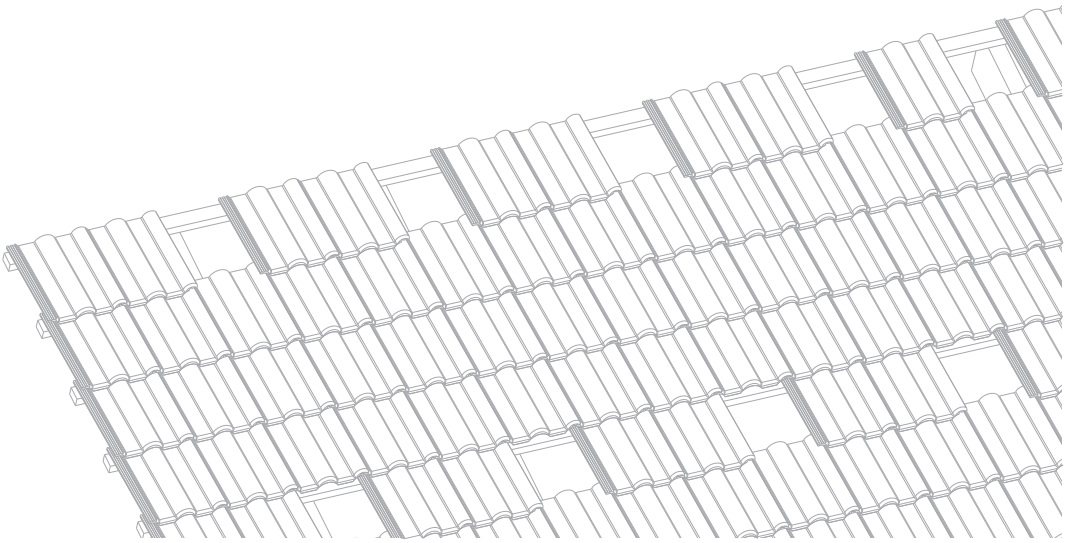

Without a structural analysis by means of the Renusol Configurator the length of the cantilever should not be longer than 300 mm.



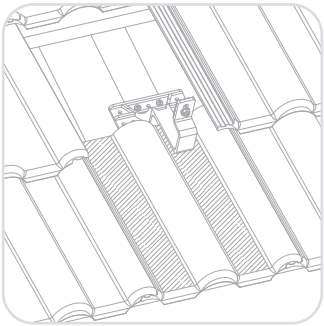

- **General instructions**
- **Static calculations**
- **Technical project overview**

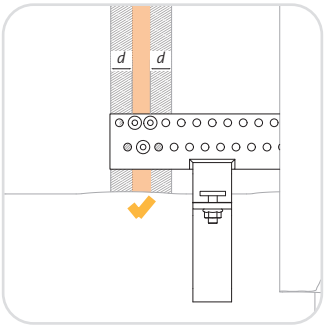
⇨ **www.pv-configurator.com**

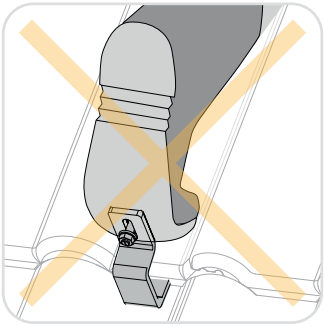
## One-layer rail system - horizontal module alignment

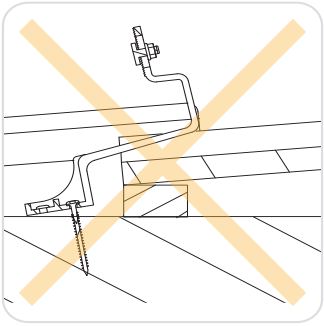


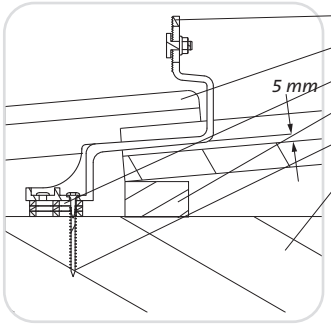
## One-layer rail system - horizontal module alignment



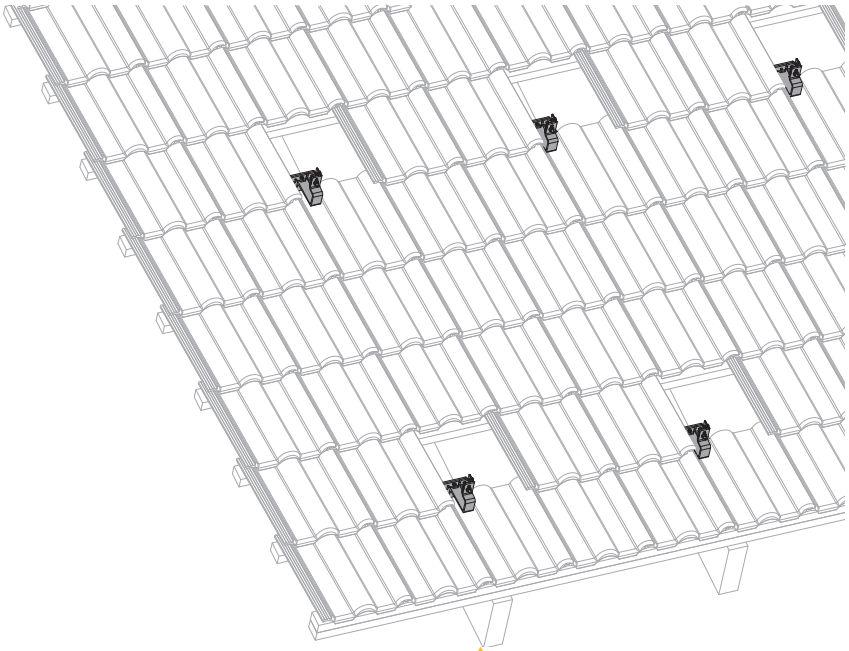







*Roof hooks*
*Roof tiles*
*Distance plate*
*Batten*
*Wood screw*
*Rafter*

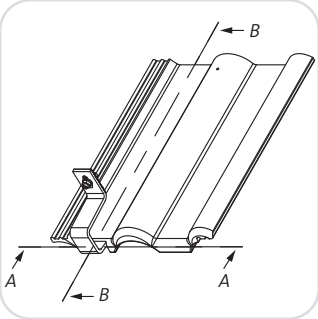


**Warning!**
Use the hole pattern of the roof hook to place the roof hook in the trough area of the tile. Screw the roof hook in the allowed area only. Keep a distance of 3x Ø of the wood screw to the outer edge of the rafter. Do not use the roof hook as step.

When mounted, the cantilever of the roof hook shall have a distance of approx. *5mm* to the roof tile.

Please find the number of screws on *page 51-54*.

## One-layer rail system - horizontal module alignment



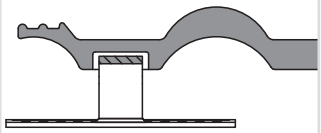

**Warning!**

The following treatment of tiles only applies to grooved tiles.

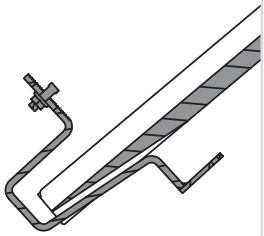
For flat tiles, please look at *page 46-48*.

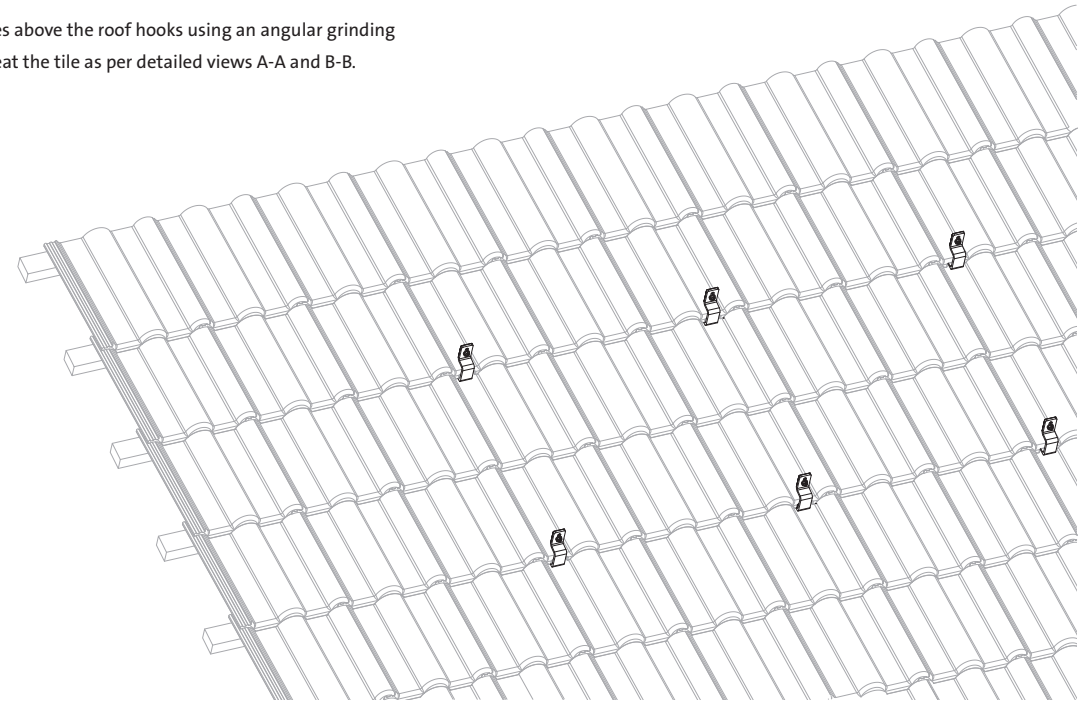
Treat the tiles above the roof hooks using an angular grinding machine. Treat the tile as per detailed views A-A and B-B.

**A-A**

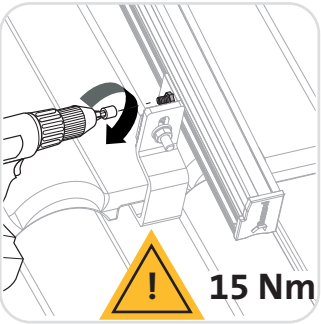


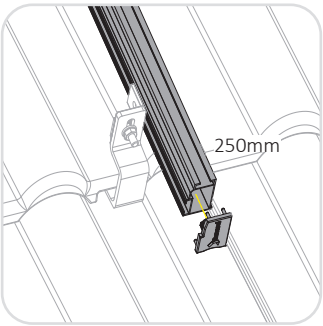
**B-B**

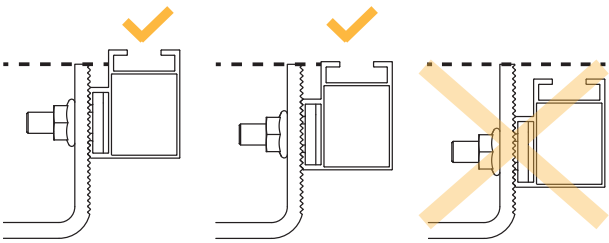


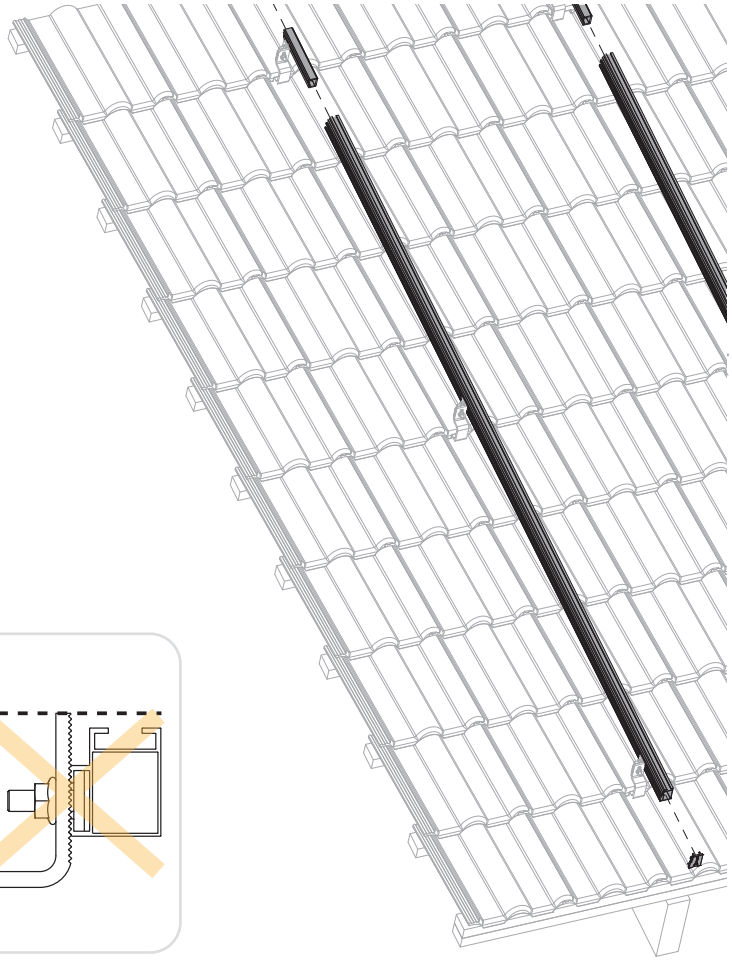


## One-layer rail system - horizontal module alignment

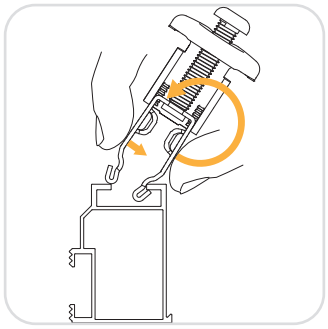


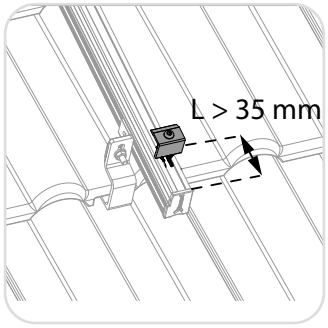


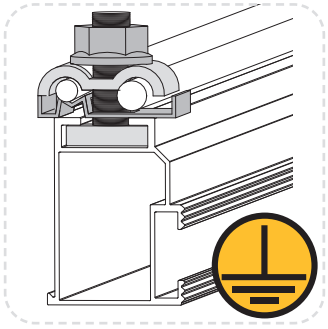



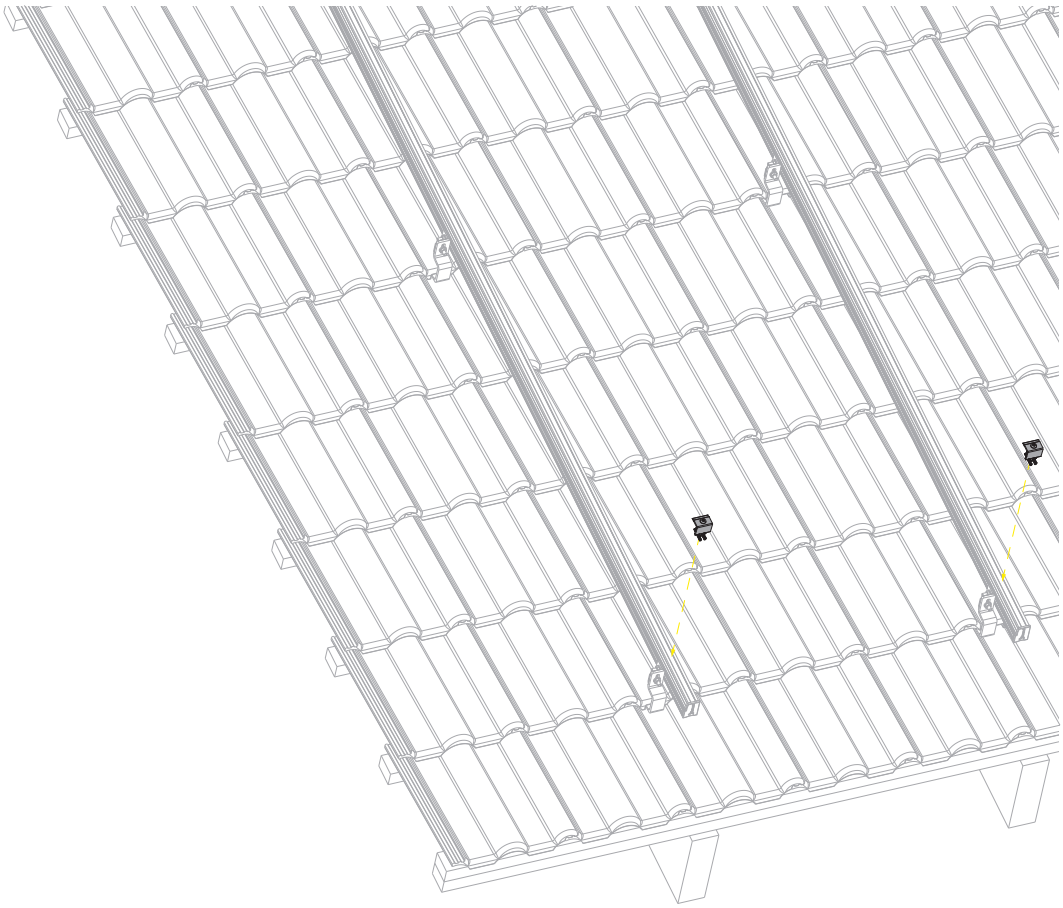


## One-layer rail system - horizontal module alignment

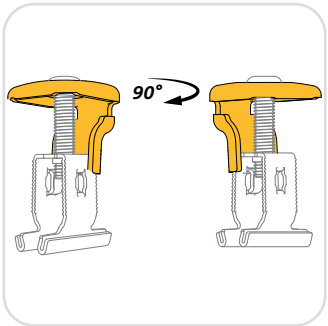


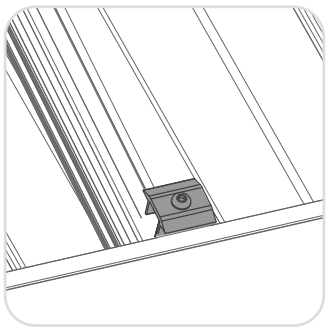


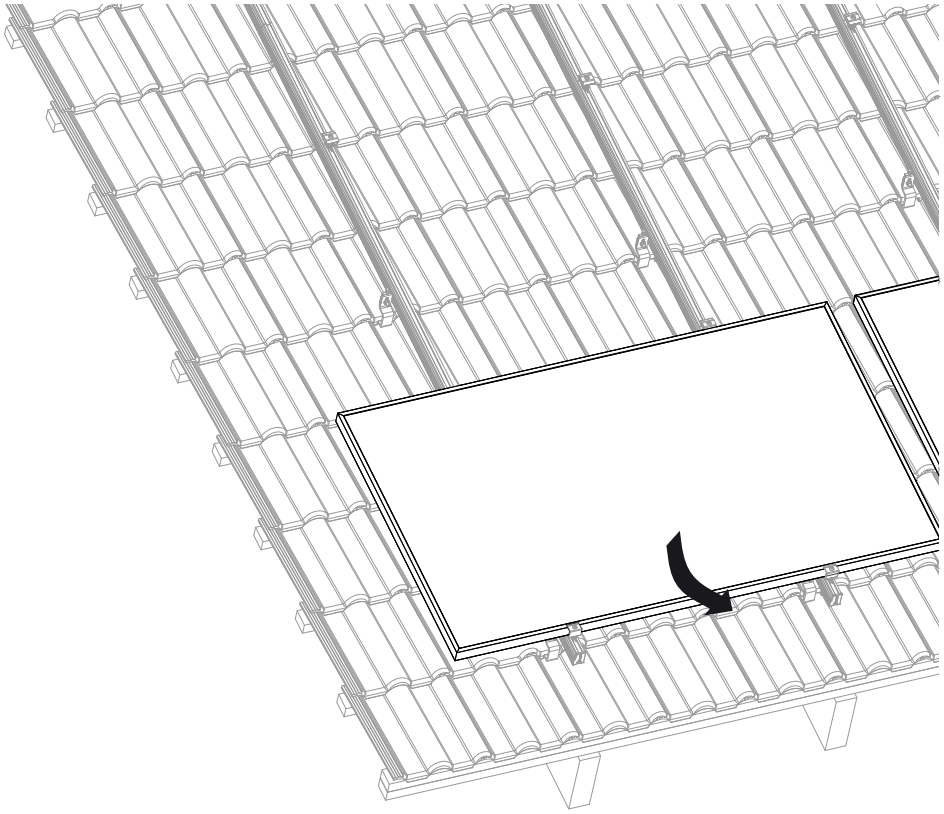



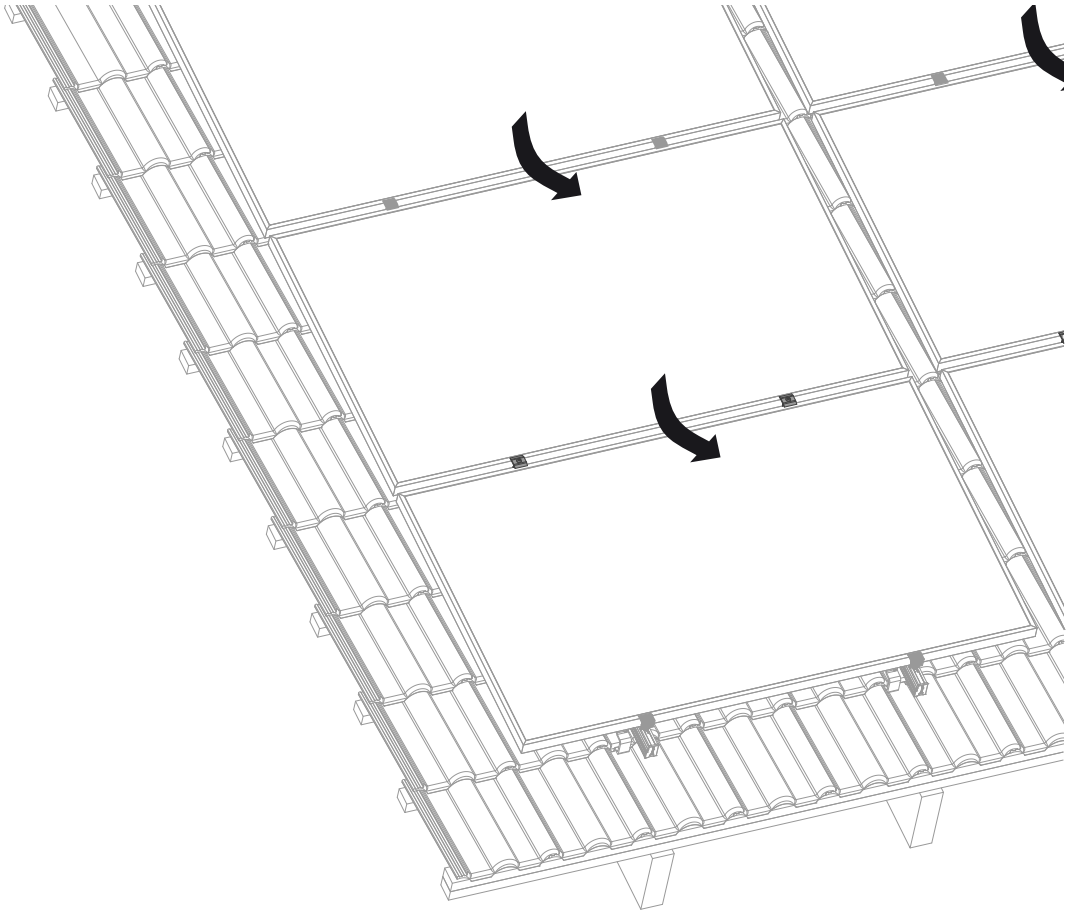


## One-layer rail system - horizontal module alignment



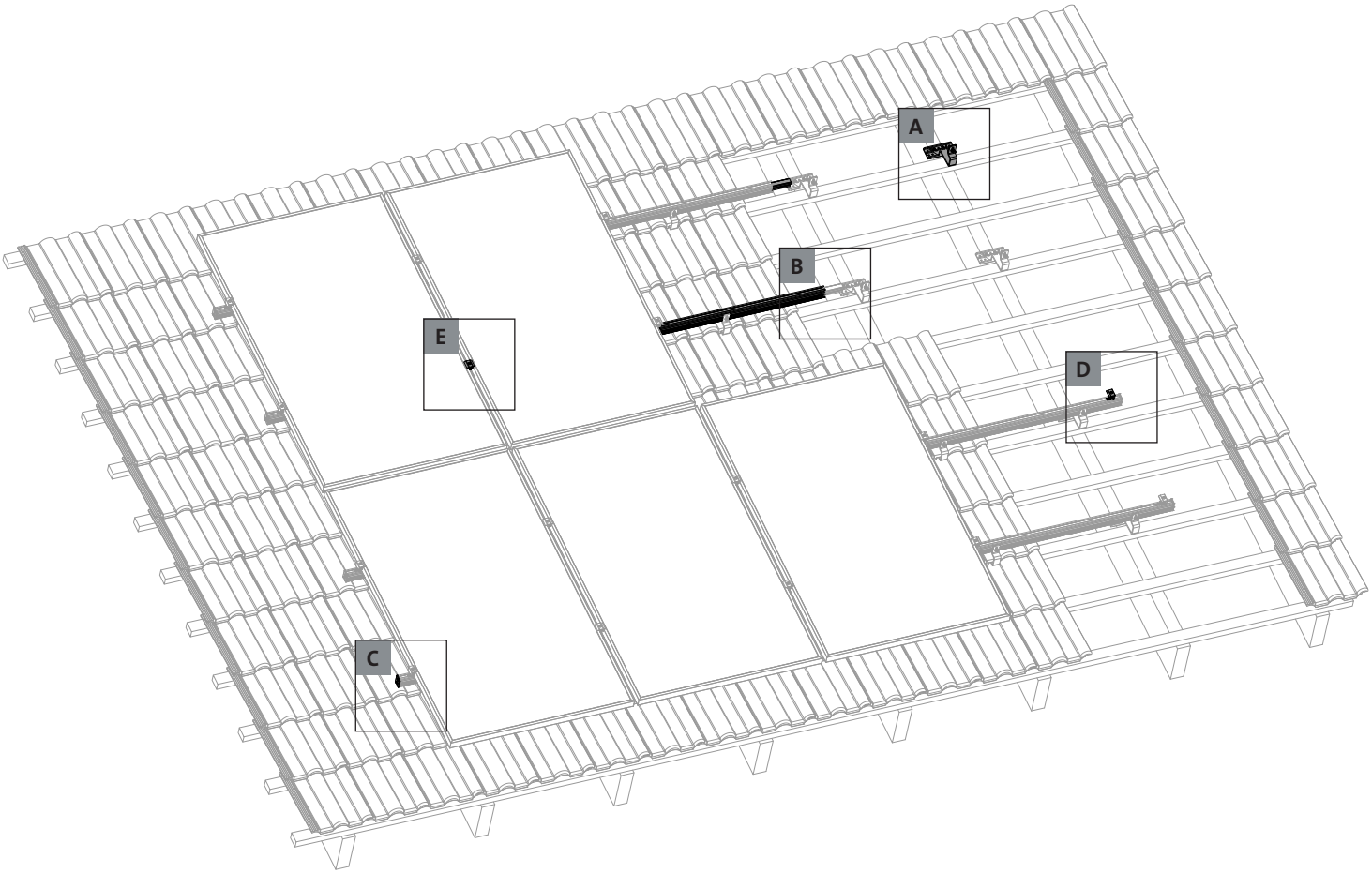




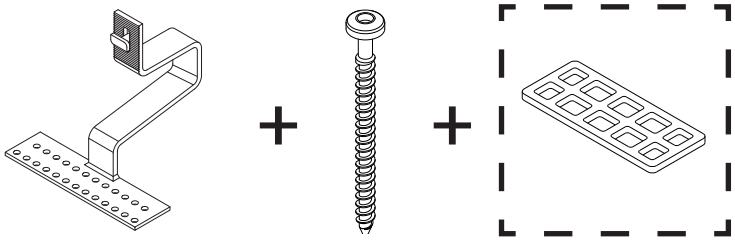


10 Nm

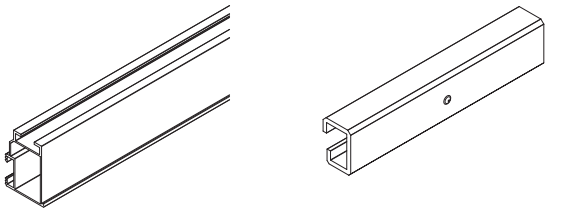
10 Nm



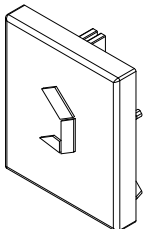

**A**



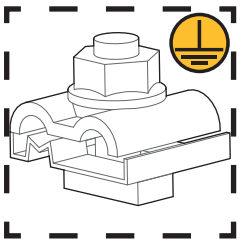
**B**



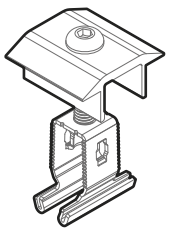
**C**



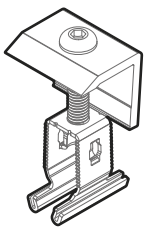
**B**



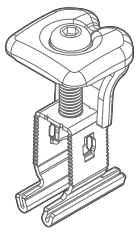
**D**

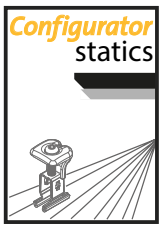


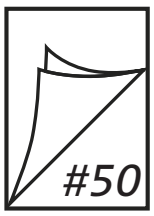
**E**



**D + E**



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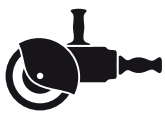
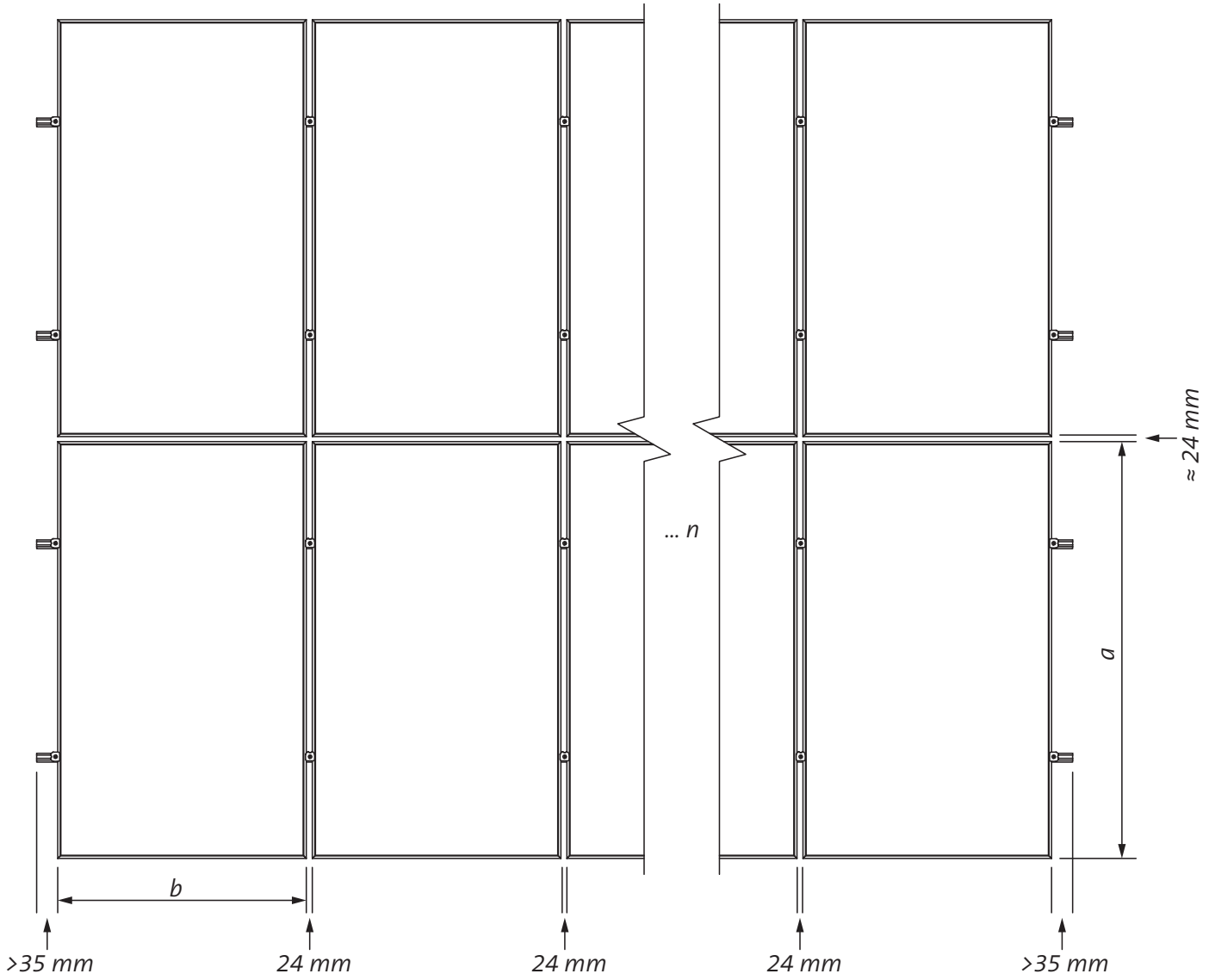
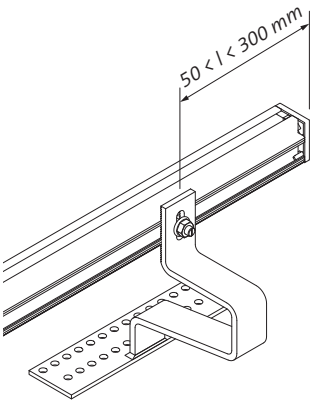


SIT 30
(TX 30)

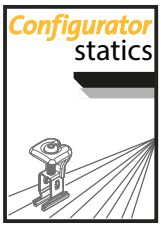
Nm

10mm / 13 mm



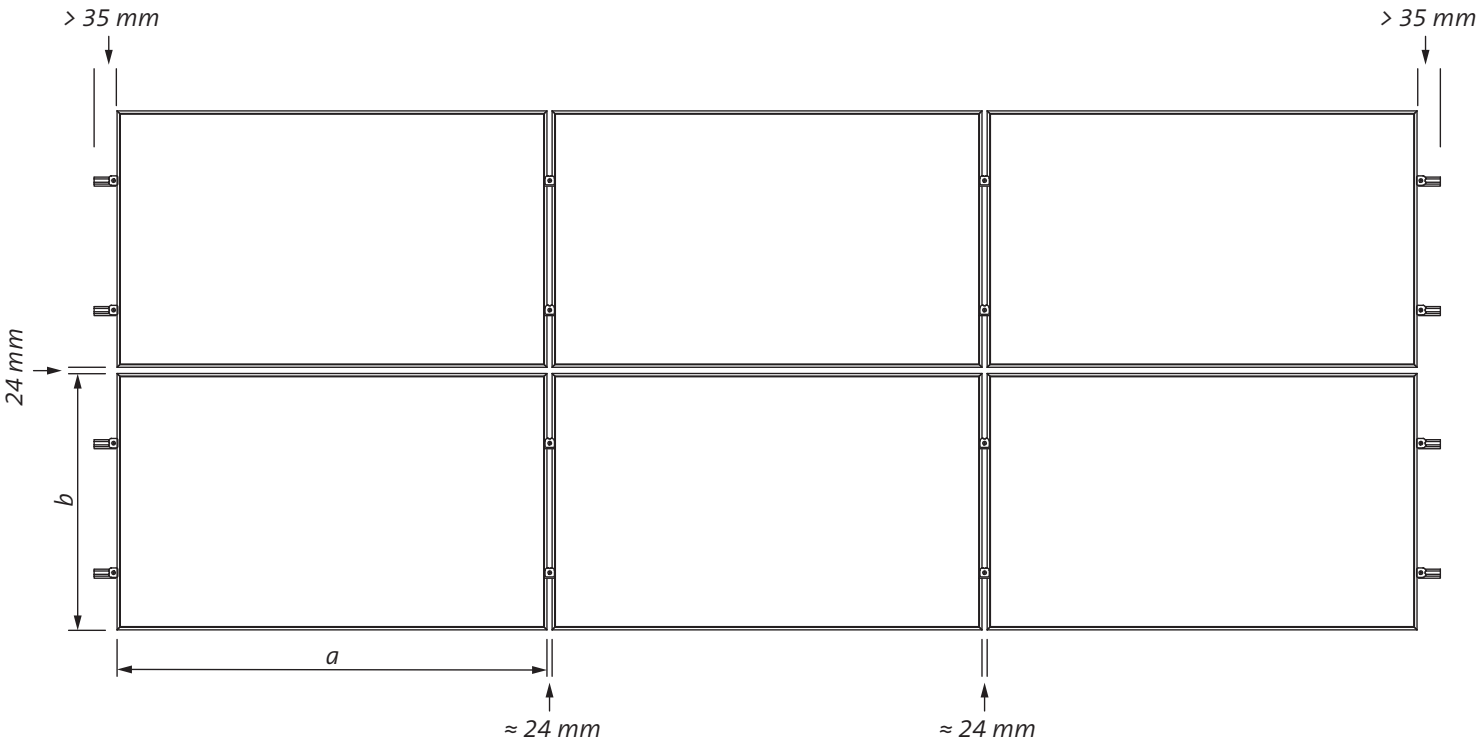



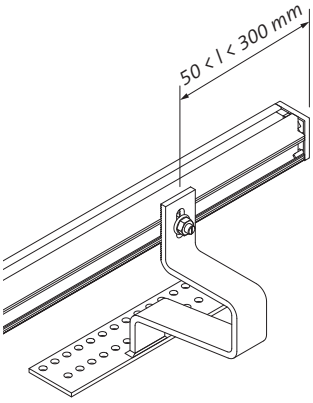

Without a structural analysis by means of the Renusol Configurator the length of the cantilever should not be longer than 300 mm.



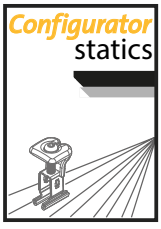

- **General instructions**
- **Static calculations**
- **Technical project overview**

⇨ **www.pv-configurator.com**




Without a structural analysis by means of the Renusol Configurator the length of the cantilever should not be longer than 300 mm.




- **General instructions**
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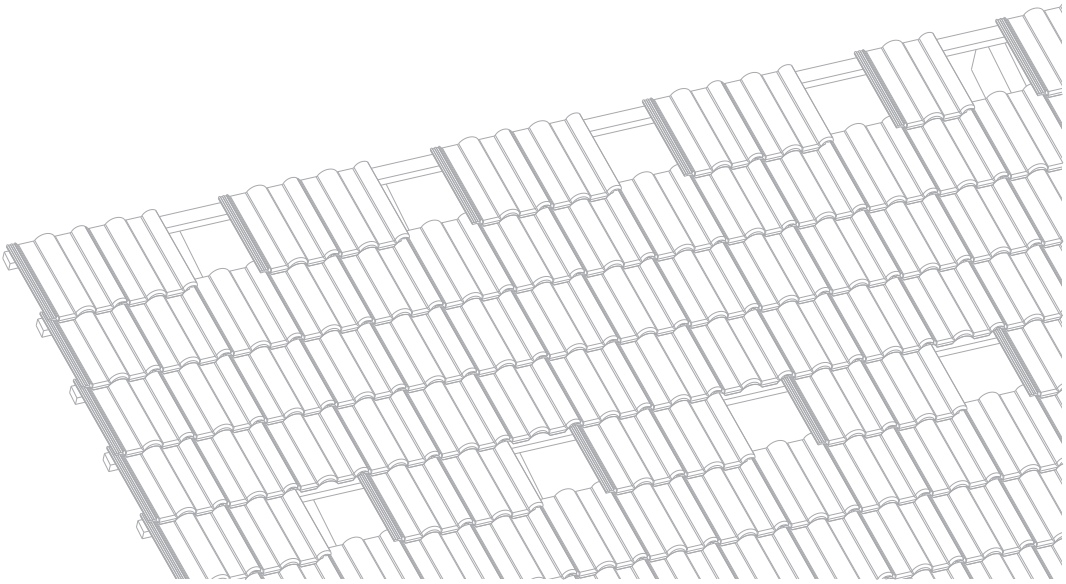
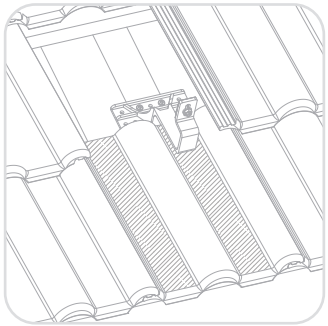
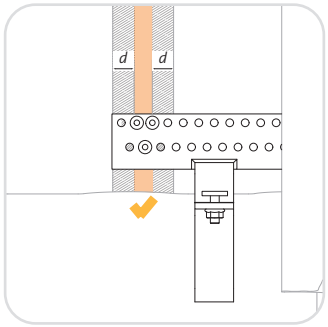
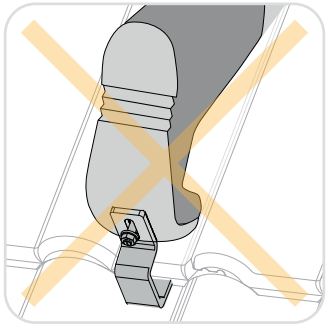
## One-layer rail system - vertical module alignment

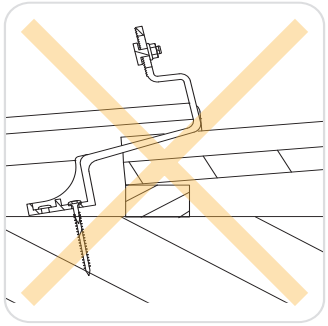


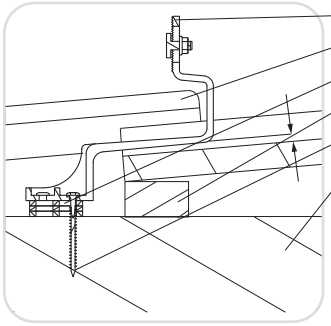
## One-layer rail system - vertical module alignment

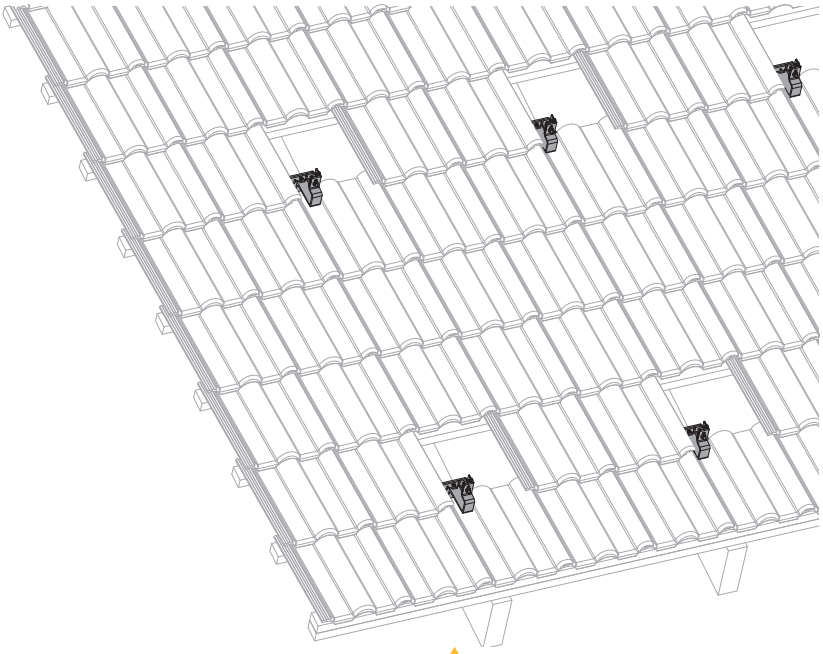








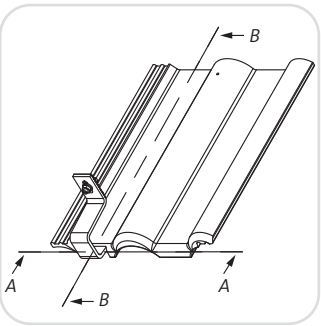



**Warning!**
Use the hole pattern of the roof hook to place the roof hook in the trough area of the tile. Screw the roof hook in the allowed area only. Keep a distance of 3x Ø of the wood screw to the outer edge of the rafter. Do not use the roof hook as step.

When mounted, the cantilever of the roof hook shall have a distance of approx. *5mm* to the roof tile.

Please find the number of screws on *page 51-54*.

## One-layer rail system - vertical module alignment



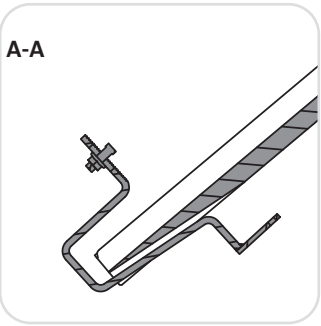

**Warning!**

The following treatment of tiles only applies to grooved tiles.

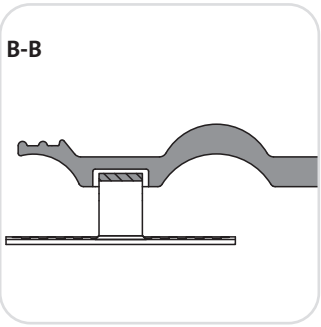
For flat tiles, please look at *page 46-48*.

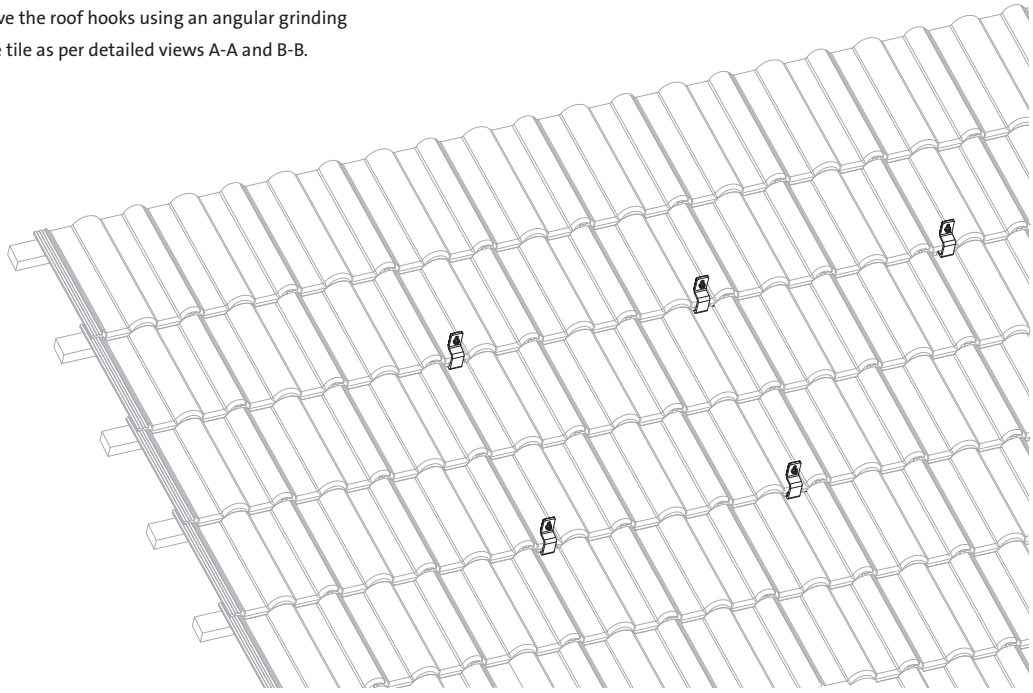
Treat the tiles above the roof hooks using an angular grinding machine. Treat the tile as per detailed views A-A and B-B.

**A-A**

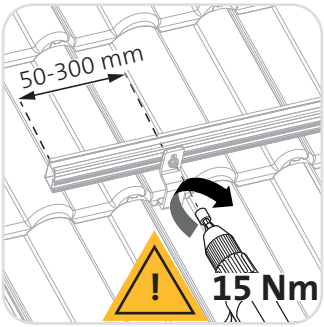


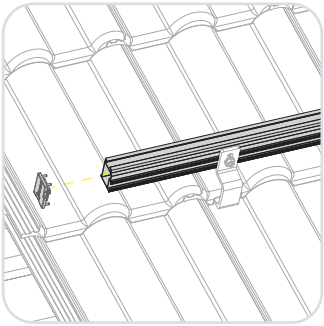
**B-B**

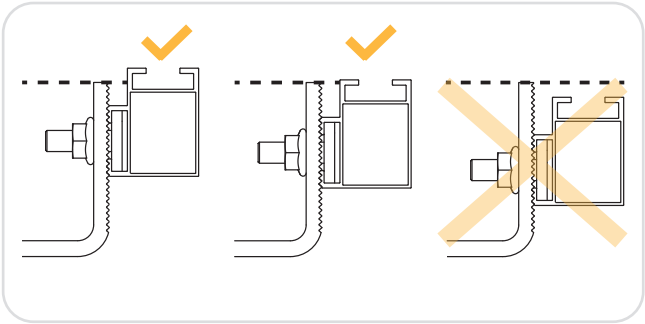


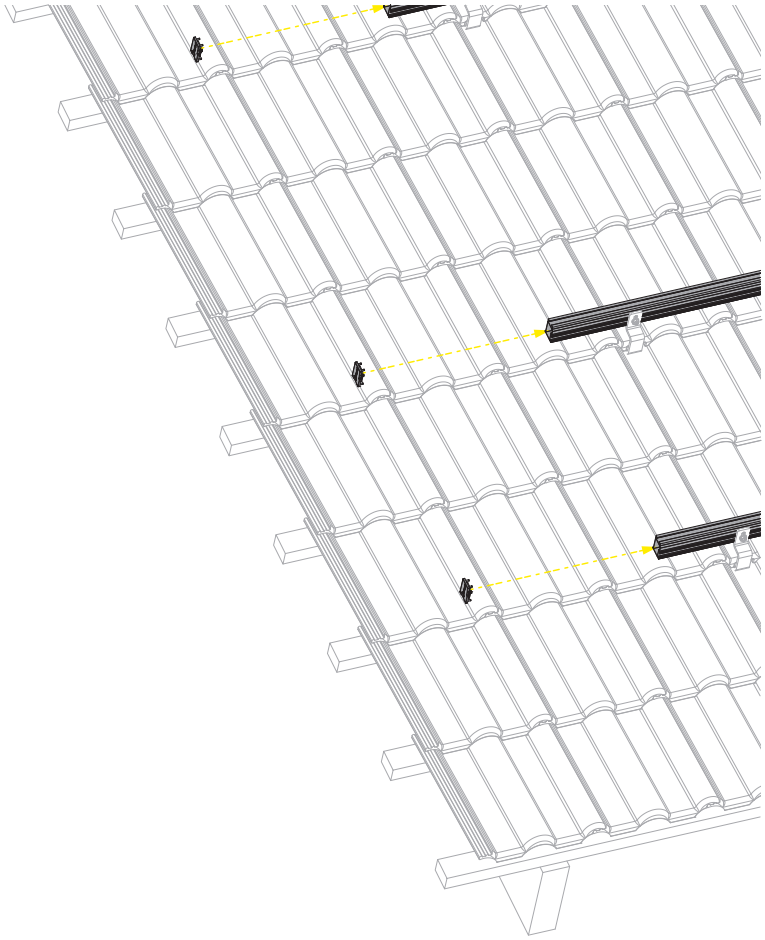


## One-layer rail system - vertical module alignment

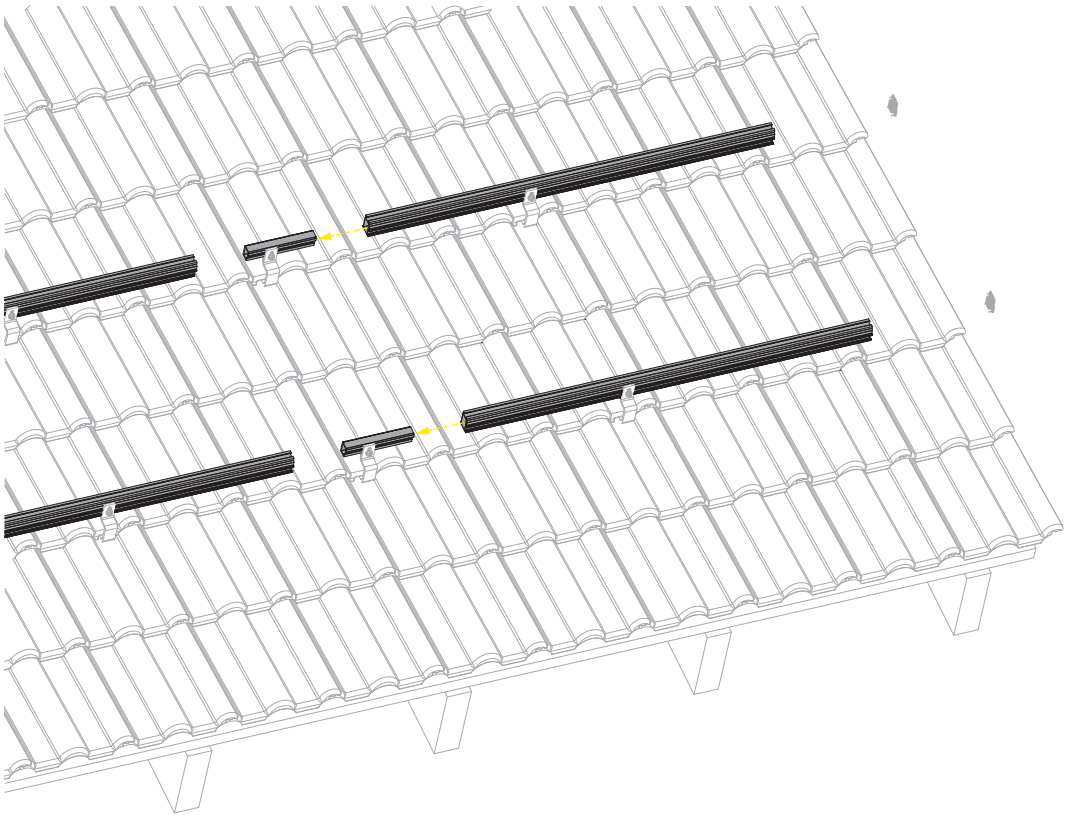


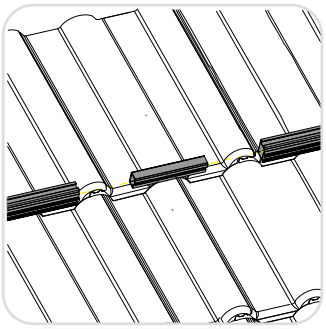



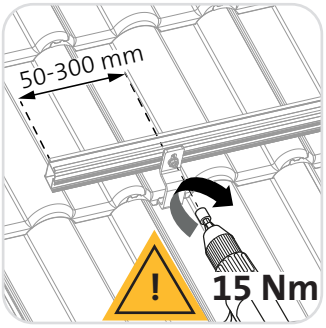


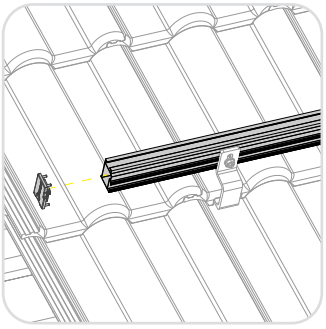


## One-layer rail system - vertical module alignment

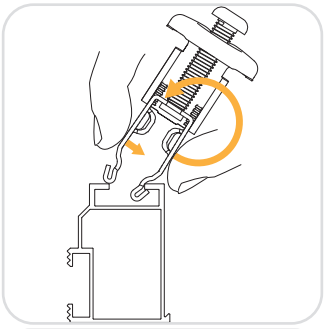


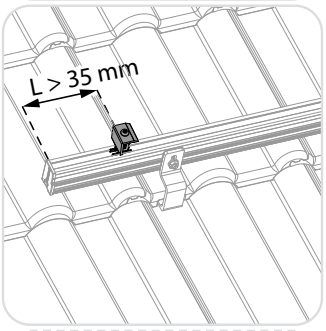


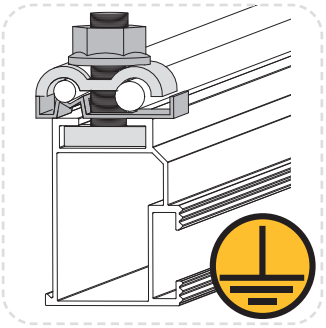


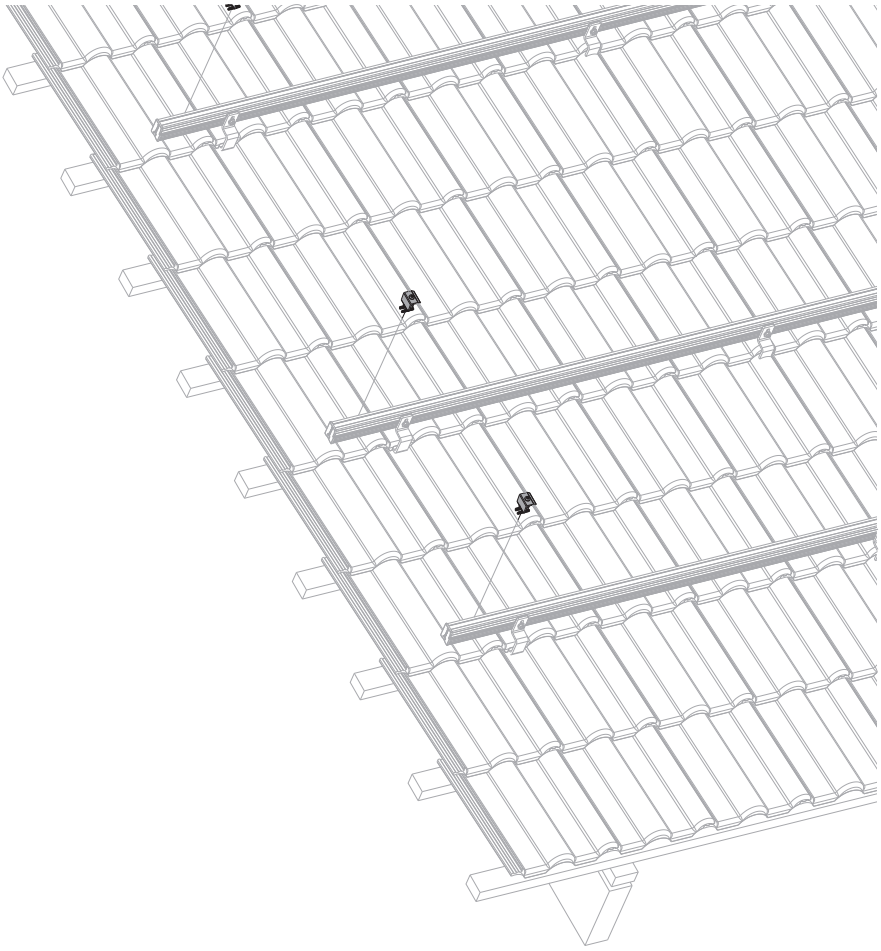



## One-layer rail system - vertical module alignment

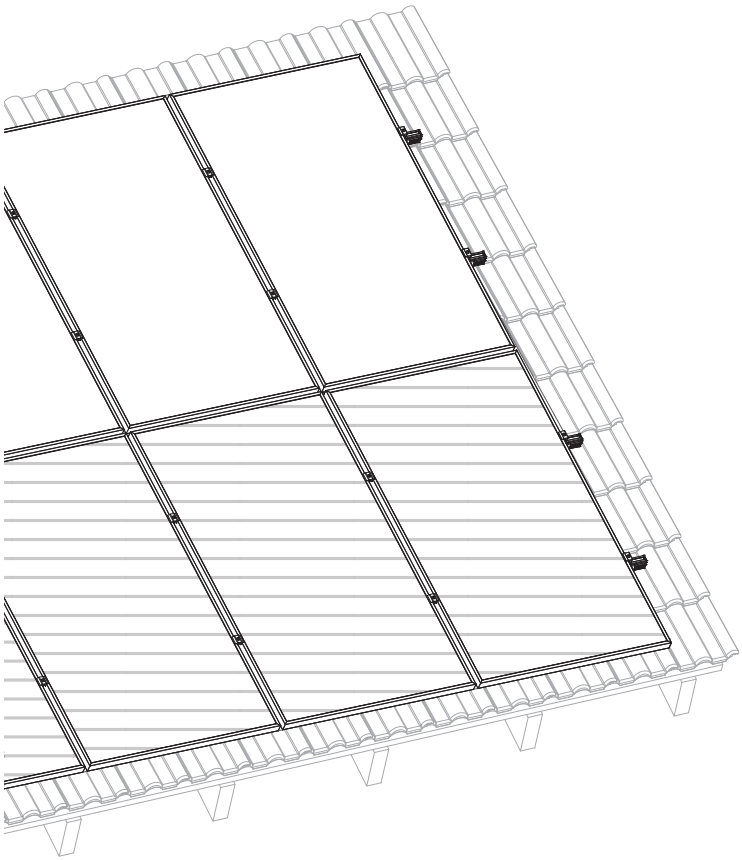






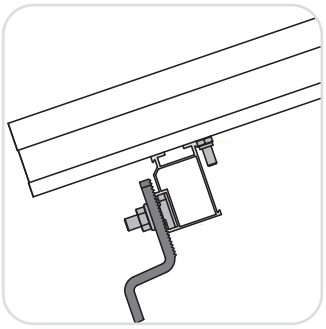
## One-layer rail system - vertical module alignment

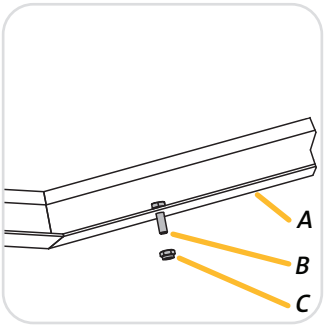


Warning!
Before installing the modules, the modules of the lowest row should be provided with anti-slip protection.

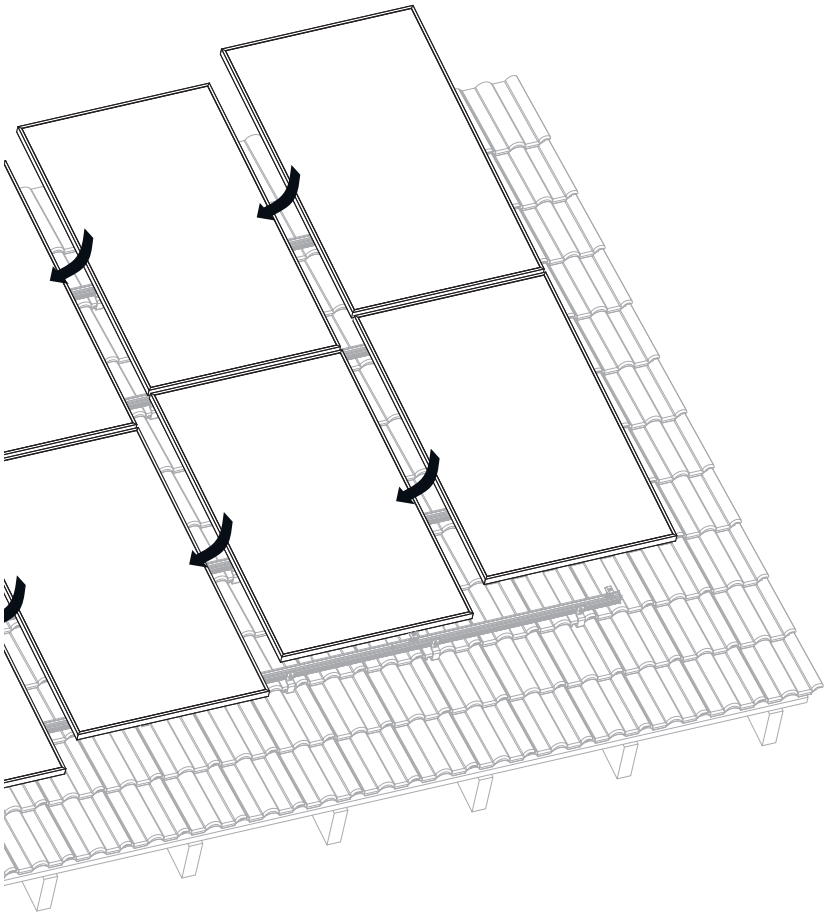
For this purpose fasten the M6x20 mm screws (with the shaft/thread pointing downwards) in the fastening points of the modules using M6 nuts. Place the modules in the lowest row in a way that the anti-slip protection abuts and the edge of the lowest mounting rail (Fig. B) touches.

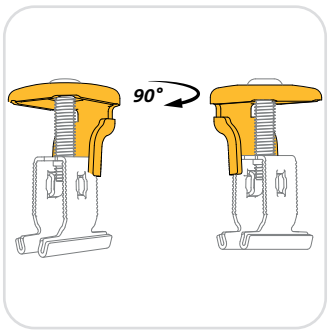
Note: The anti-slip protection can only be used with modules with the appropriate fastening holes.

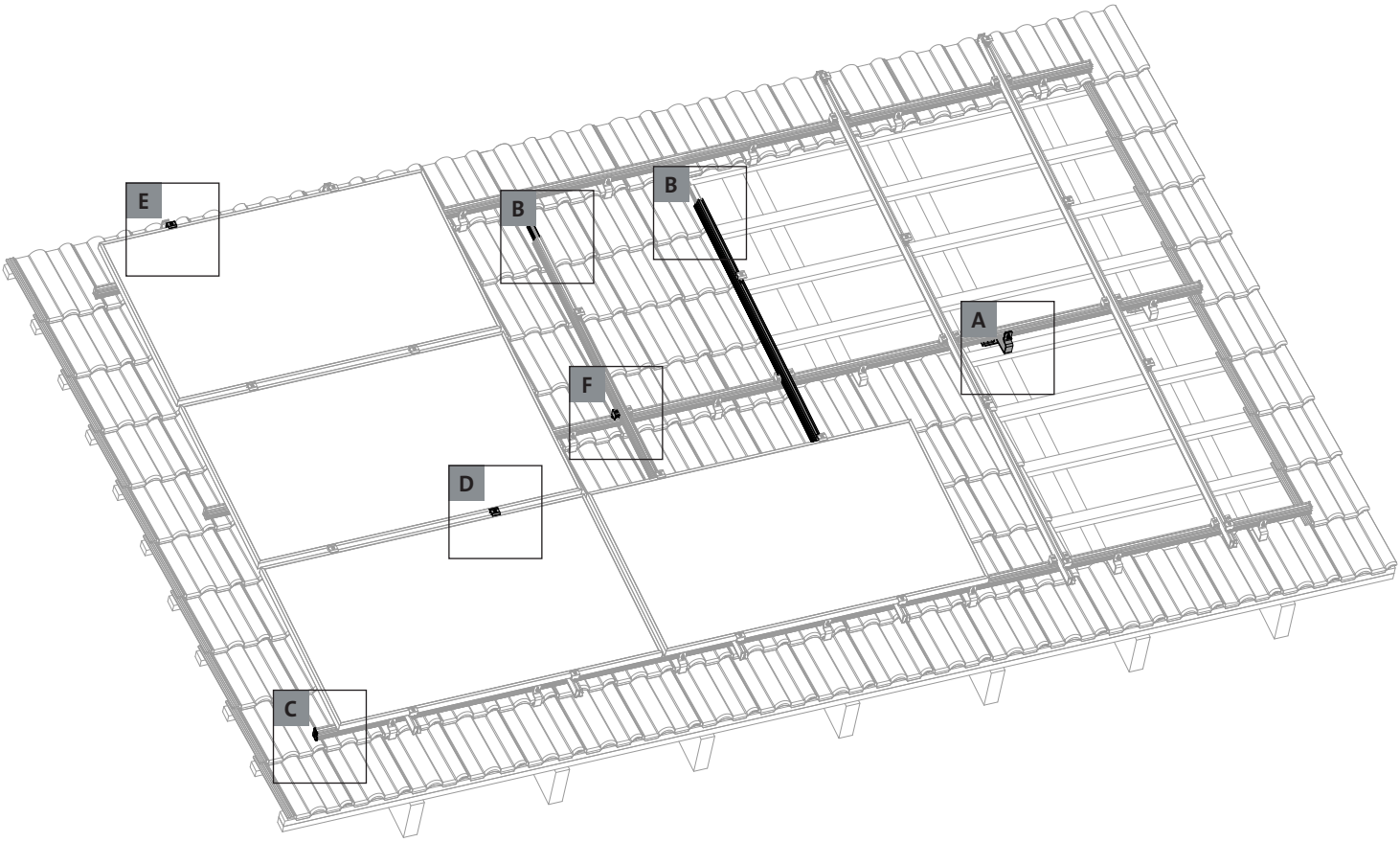




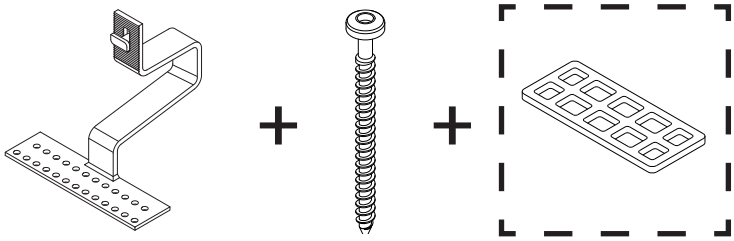

## One-layer rail system - vertical module alignment



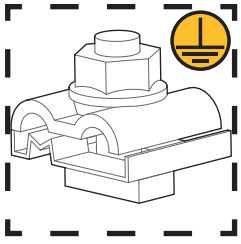




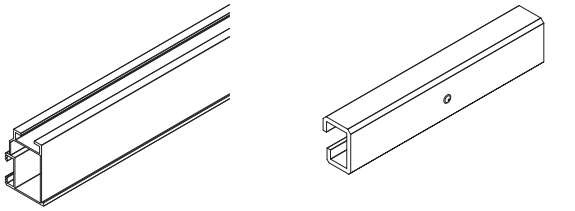

**A**



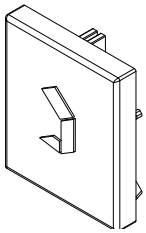
**B**



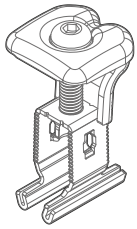
**B**



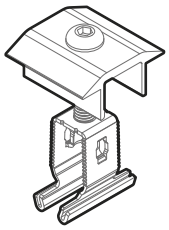
**C**



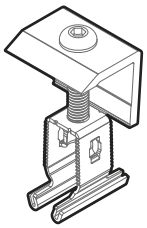
**D + E**



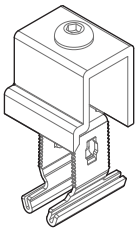
**D**

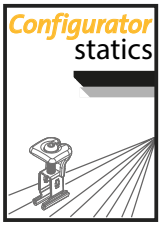


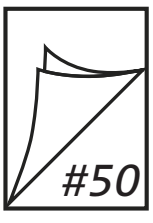
**E**



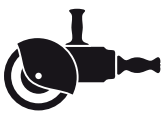
**F**






**+**

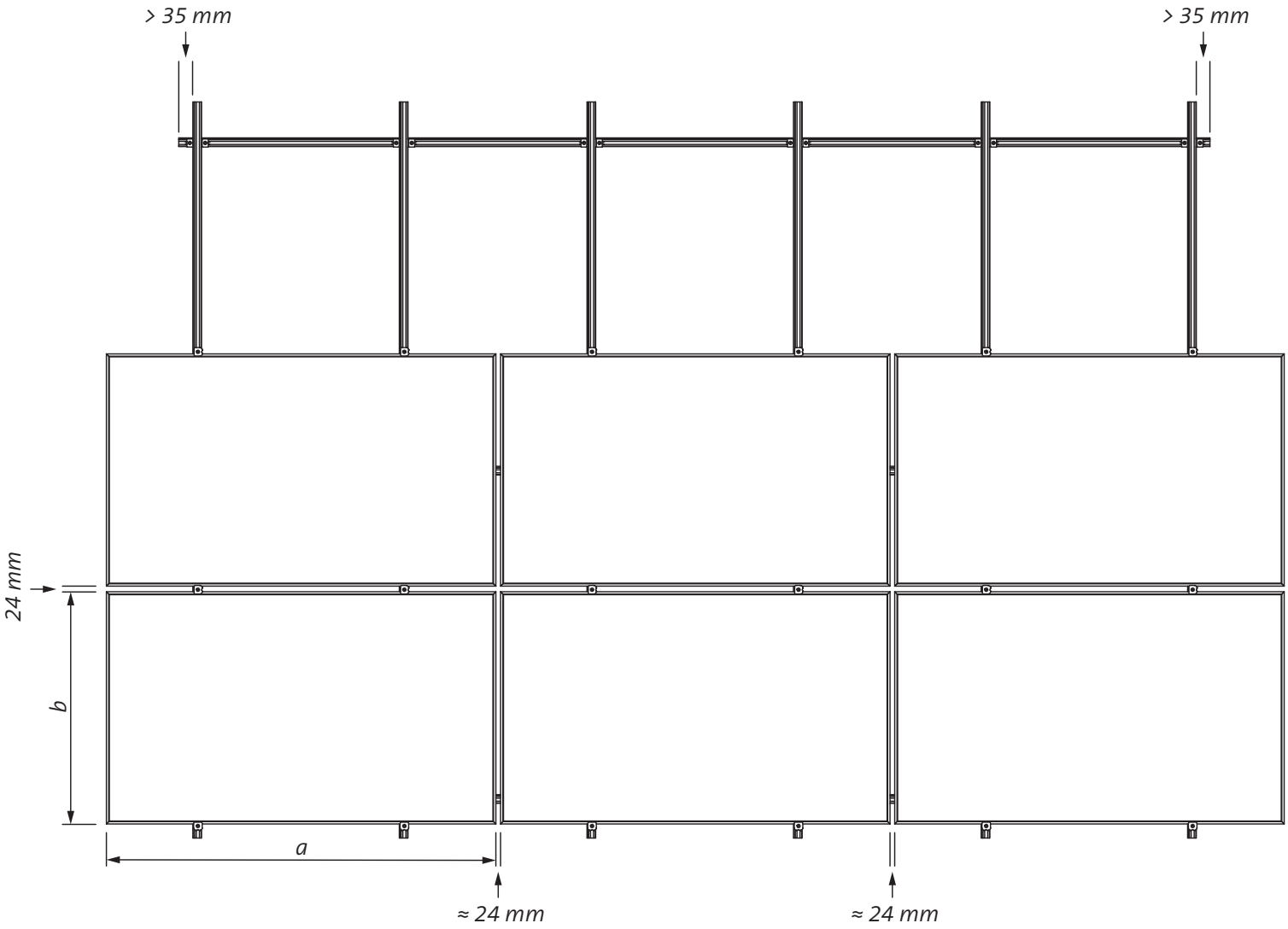


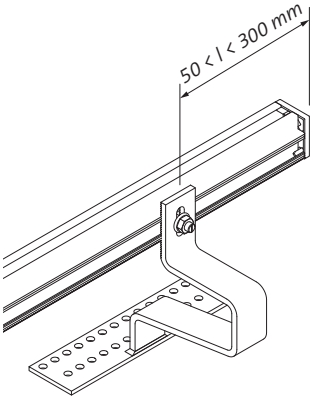
SIT 30
(TX 30)

Nm

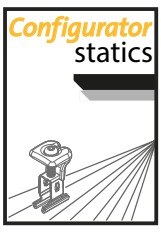
10mm / 13 mm

## Two-layer rail system - horizontal module alignment



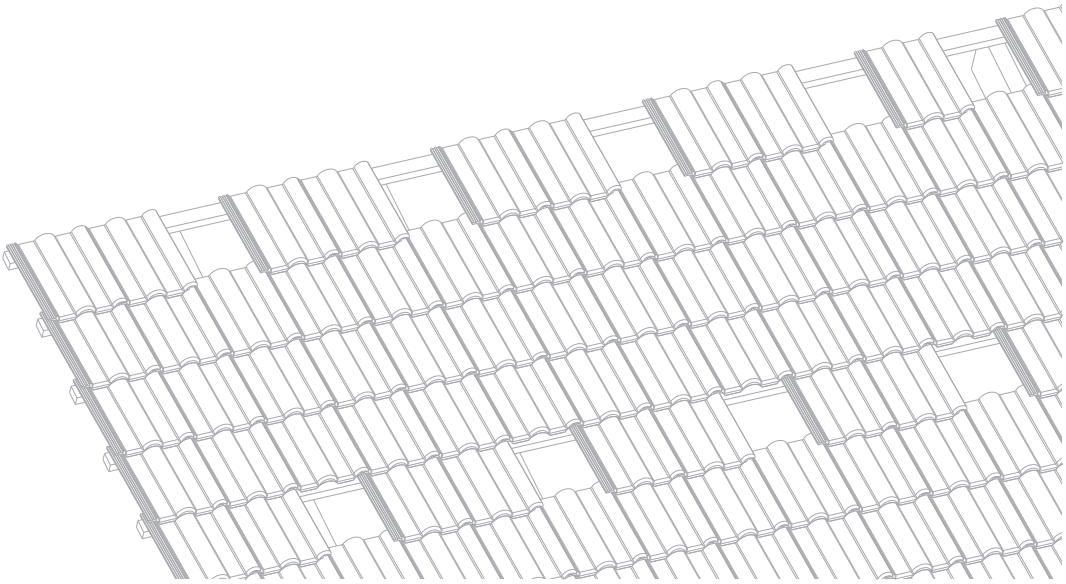

Without a structural analysis by means of the Renusol Configurator the length of the cantilever should not be longer than 300 mm.



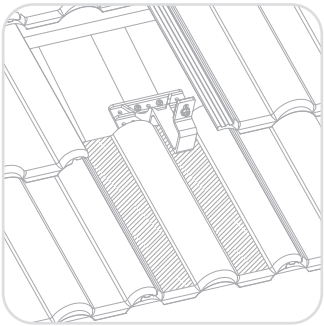

- **General instructions**
- **Static calculations**
- **Technical project overview**

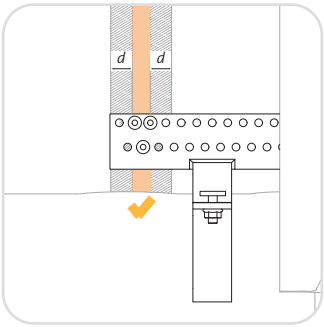
⇨ **www.pv-configurator.com**

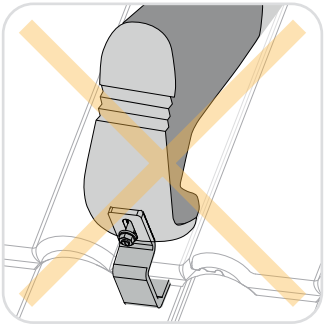
## Two-layer rail system - horizontal module alignment

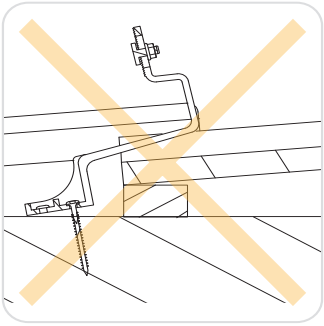


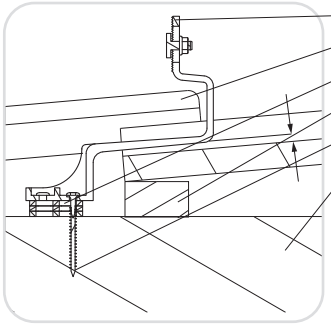
## Two-layer rail system - horizontal module alignment

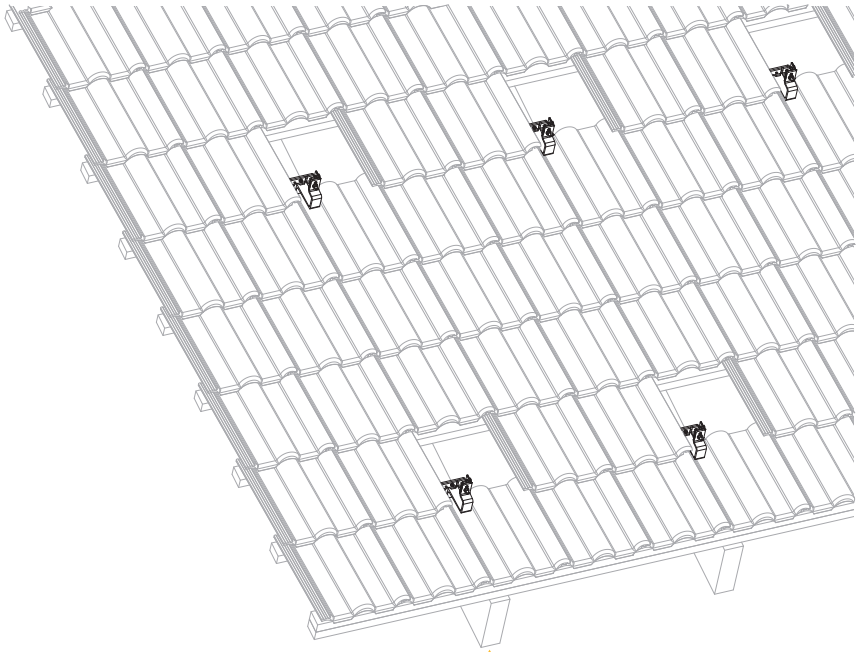








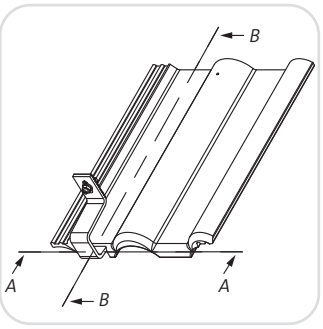



**Warning!**
Use the hole pattern of the roof hook to place the roof hook in the trough area of the tile. Screw the roof hook in the allowed area only. Keep a distance of 3x Ø of the wood screw to the outer edge of the rafter. Do not use the roof hook as step.

When mounted, the cantilever of the roof hook shall have a distance of approx. *5mm* to the roof tile.

Please find the number of screws on *page 51-54*.

## Two-layer rail system - horizontal module alignment



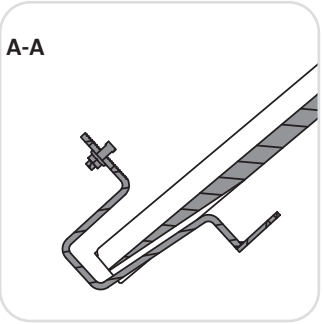

**Warning!**

The following treatment of tiles only applies to grooved tiles.

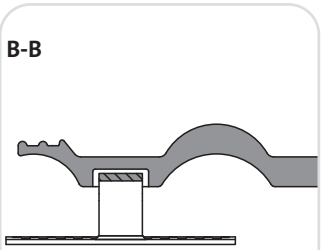
For flat tiles, please look at *page 46-48*.

Treat the tiles above the roof hooks using an angular grinding machine. Treat the tile as per detailed views A-A and B-B.

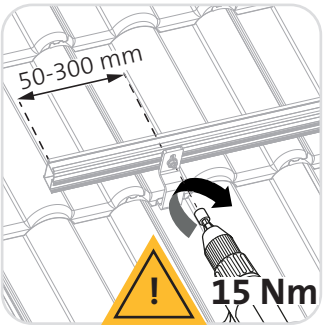
**A-A**

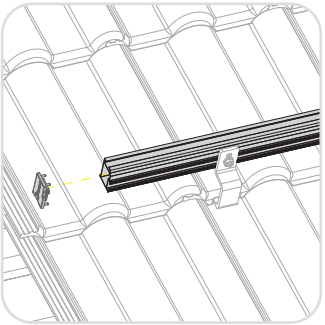


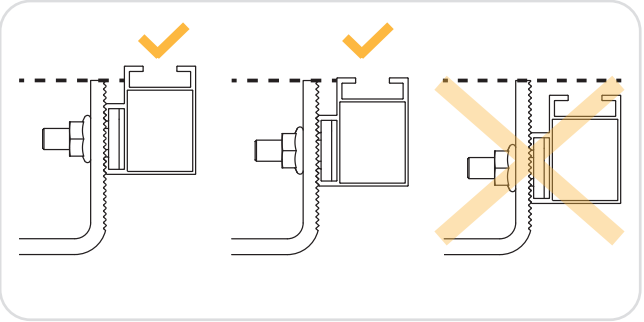
**B-B**

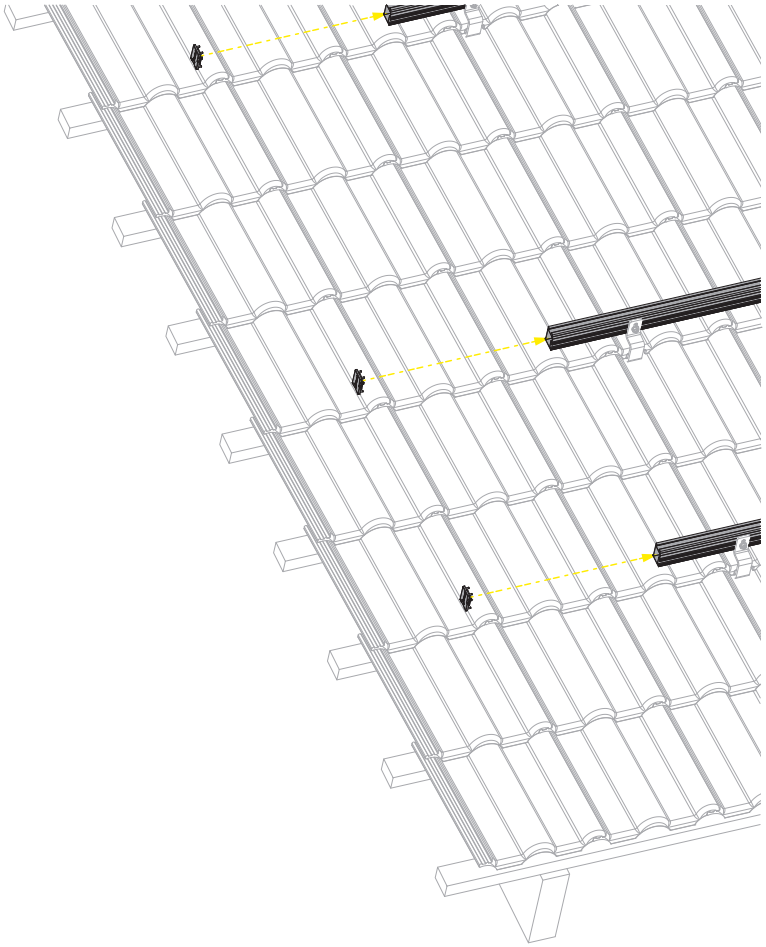


## Two-layer rail system - horizontal module alignment

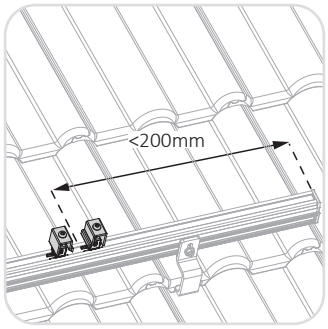


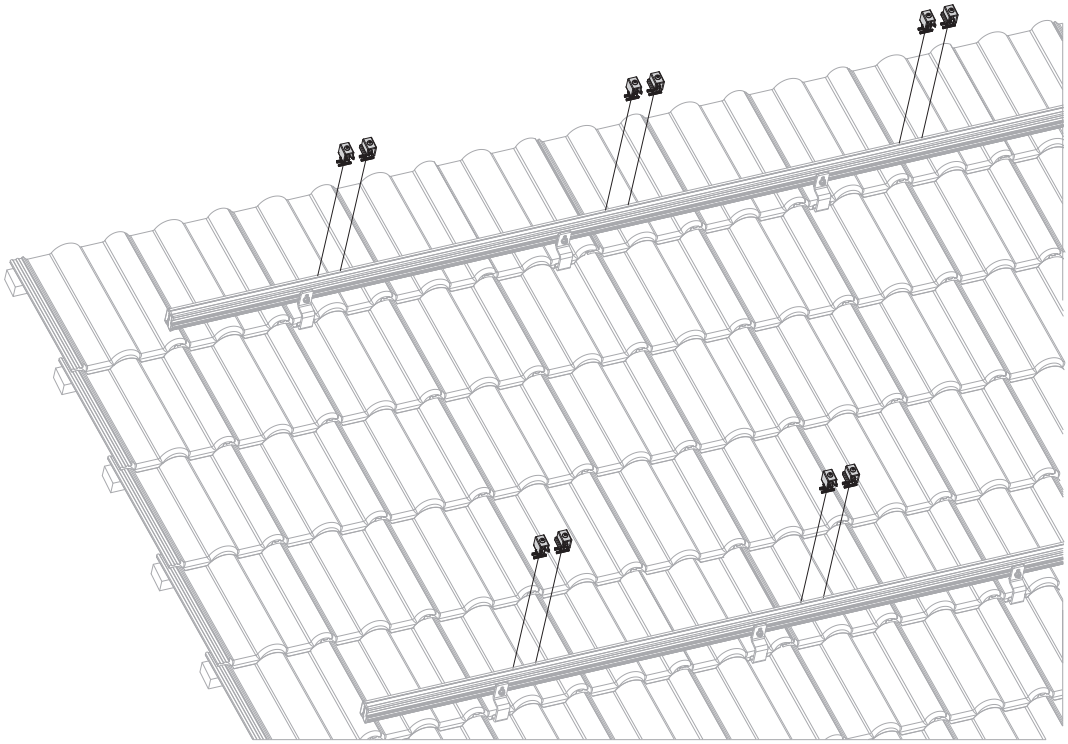





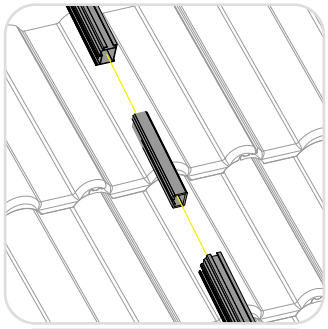


## Two-layer rail system - horizontal module alignment

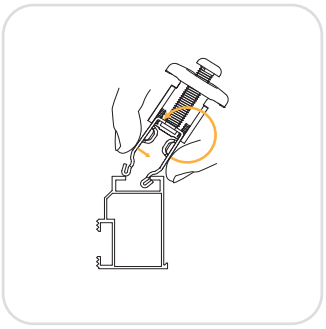


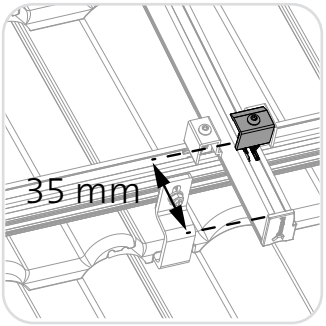



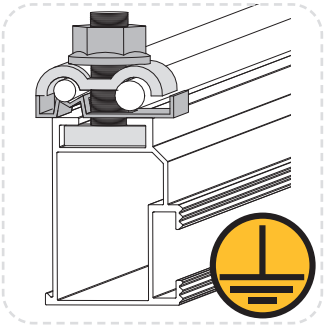
## Two-layer rail system - horizontal module alignment

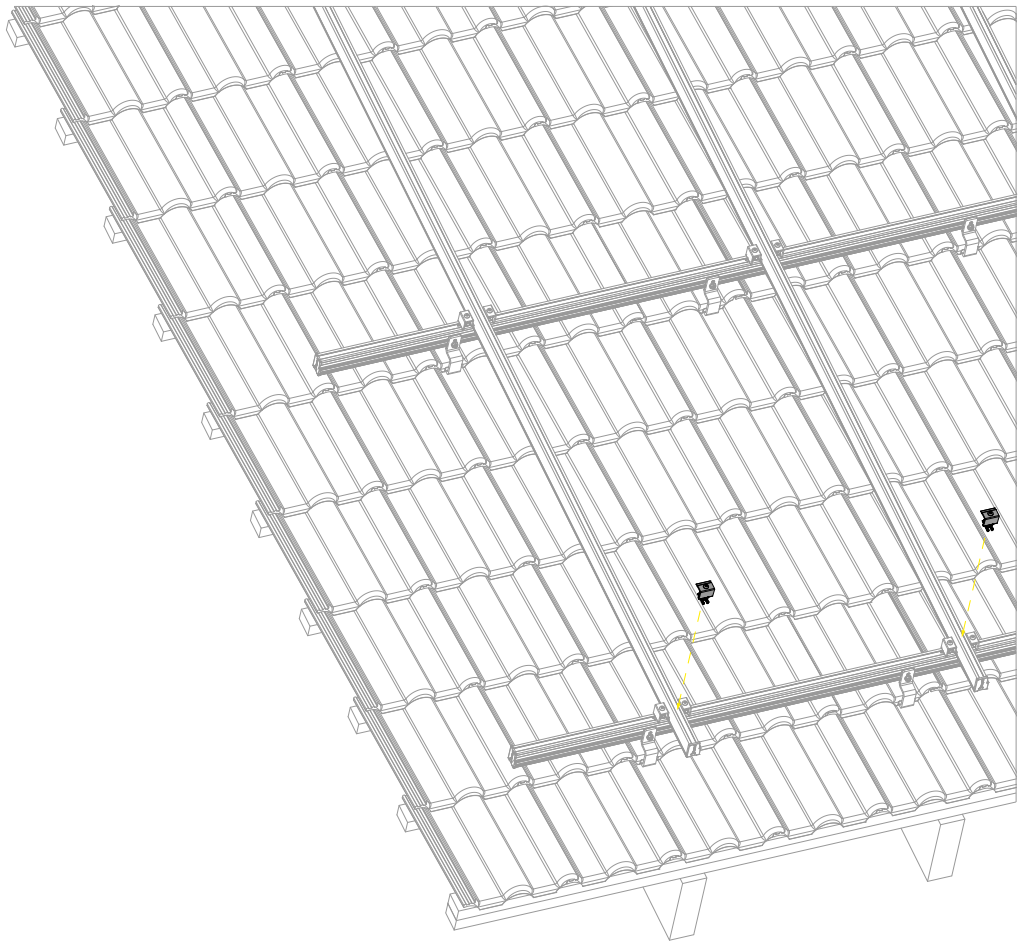


## Two-layer rail system - horizontal module alignment

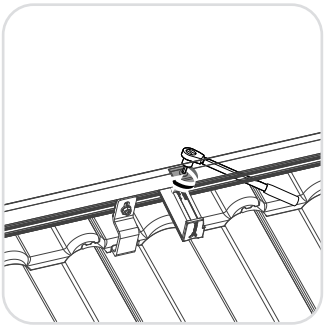


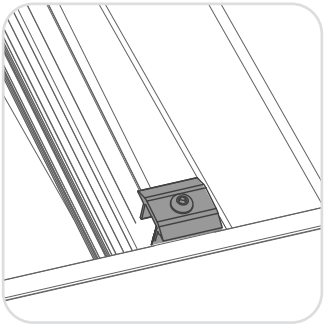


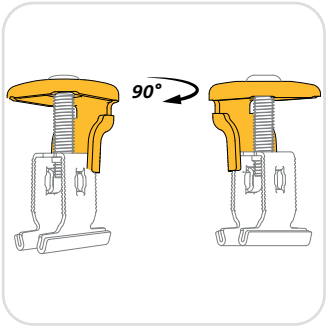



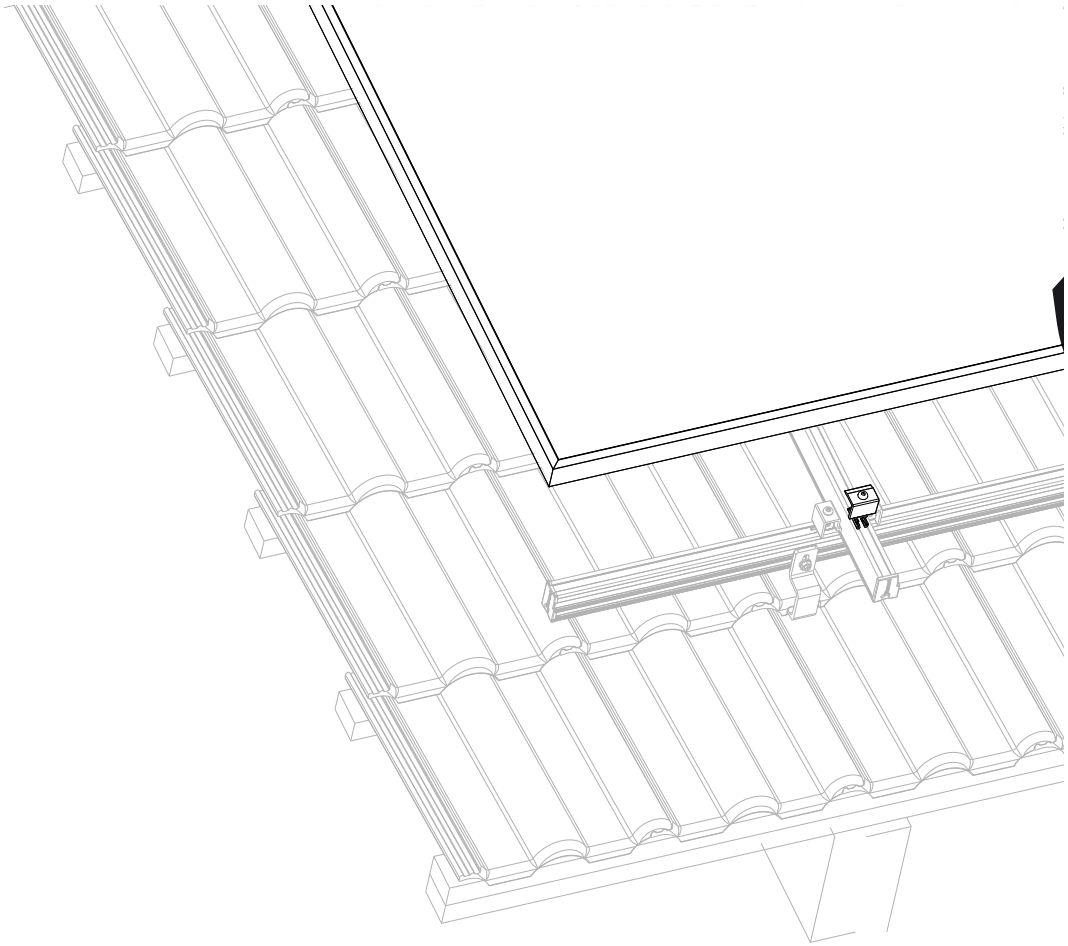


## Two-layer rail system - horizontal module alignment

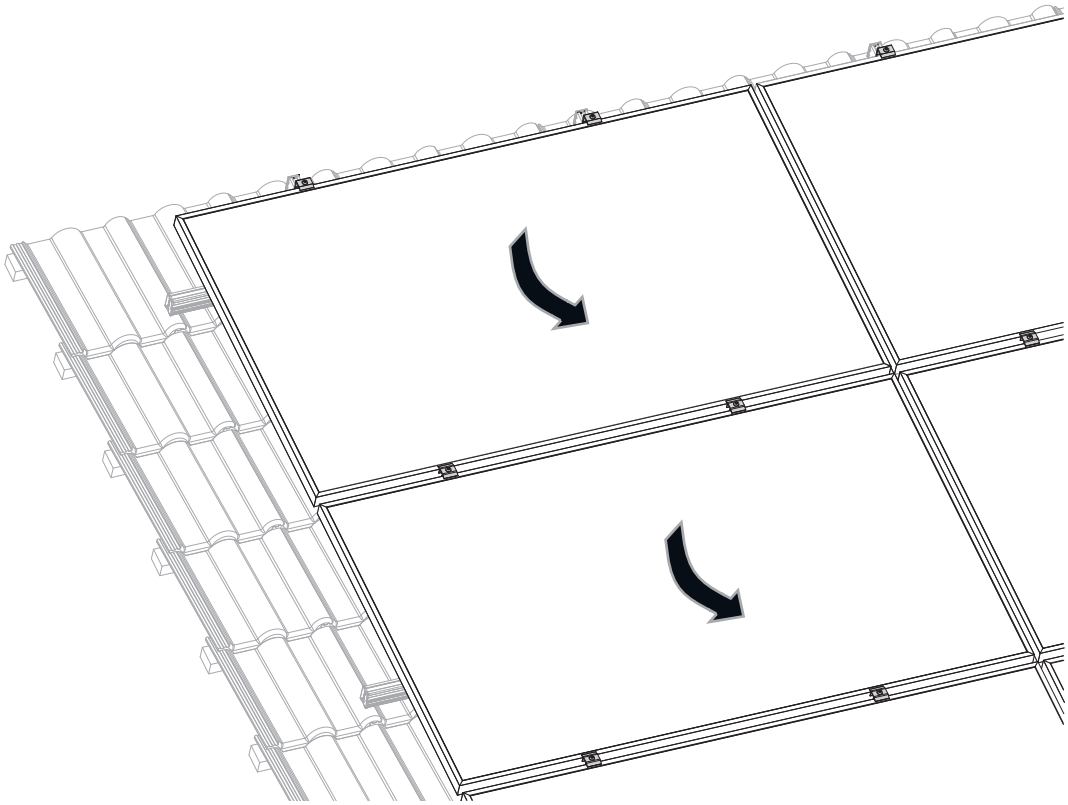


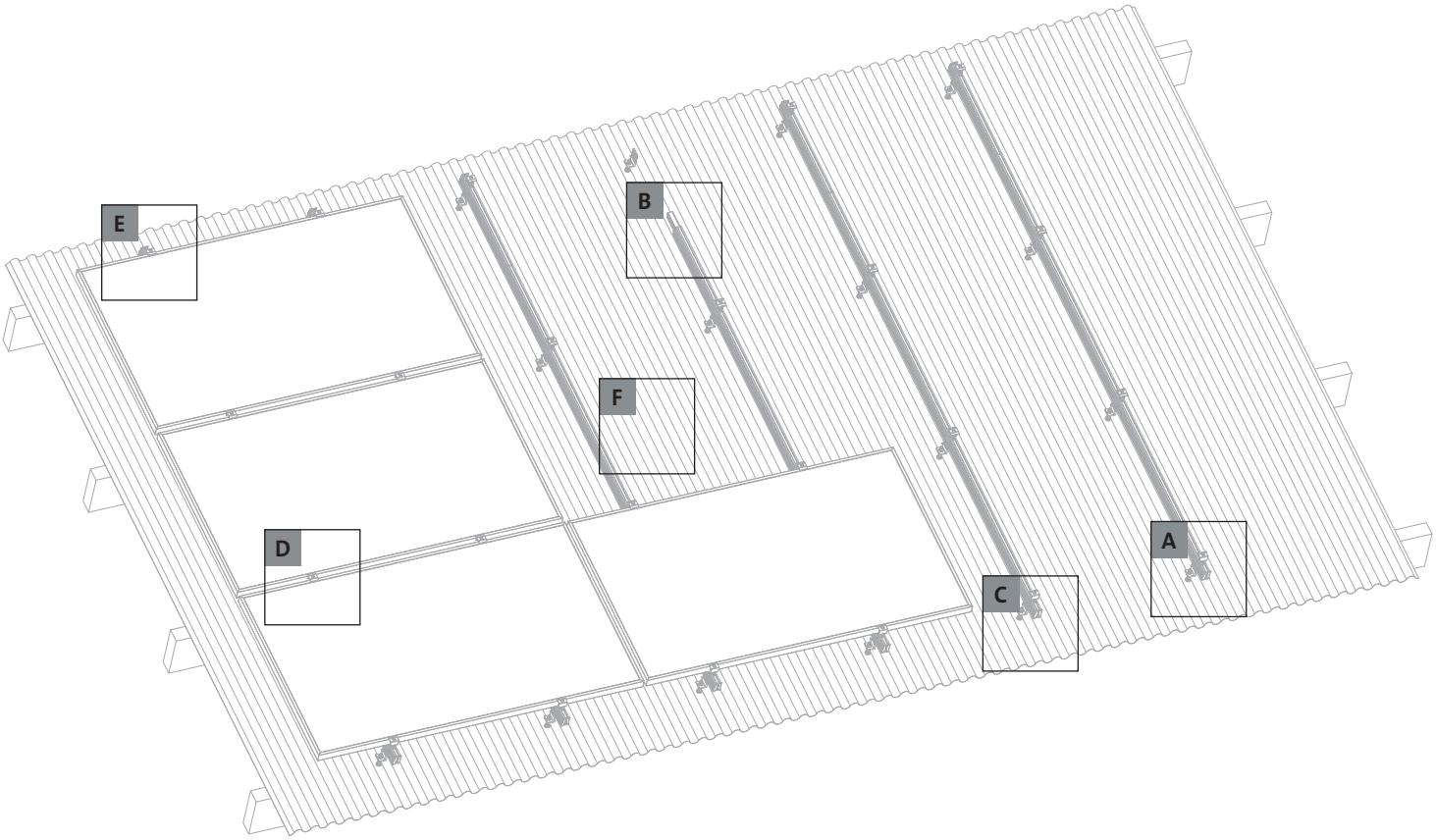




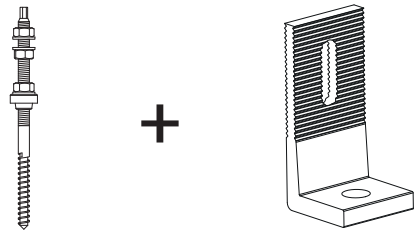



## Two-layer rail system - horizontal module alignment

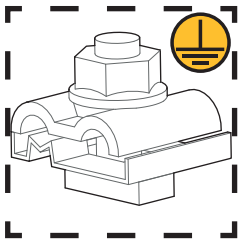




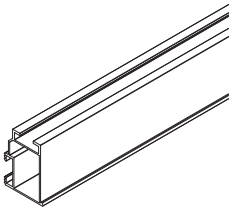

**A**

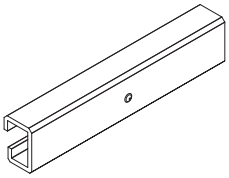


**B**

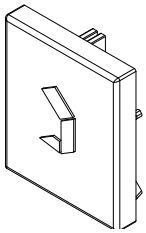


**B**

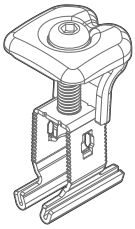




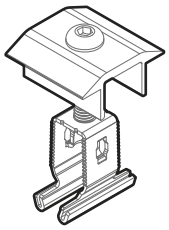
**C**



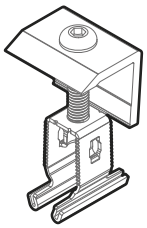
**D** + **E**



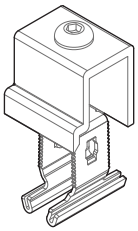
**D**

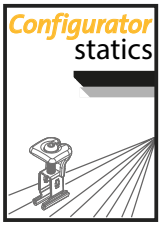


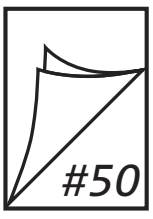
**E**



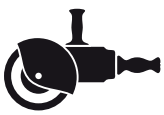
**F**






**+**

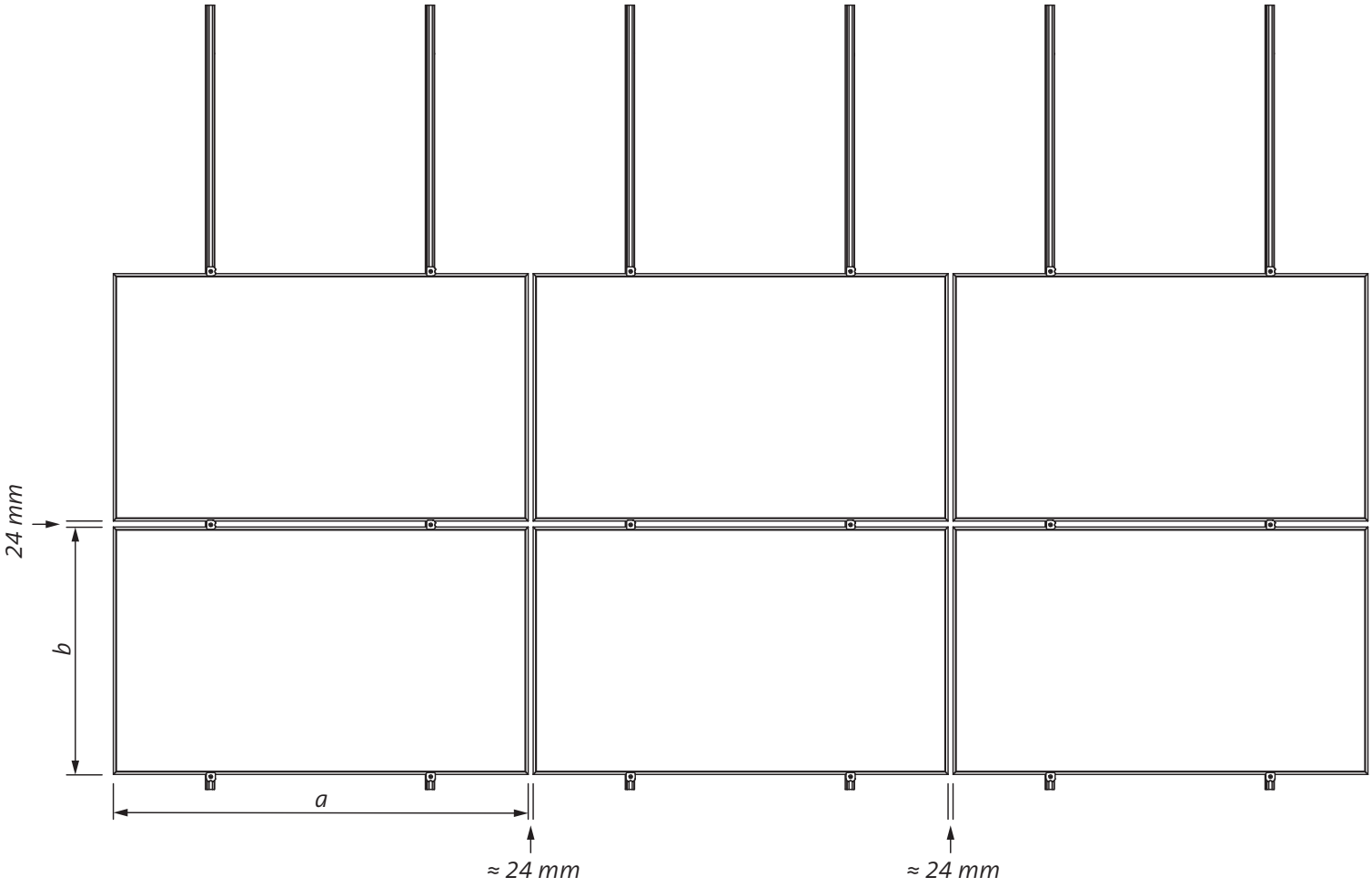


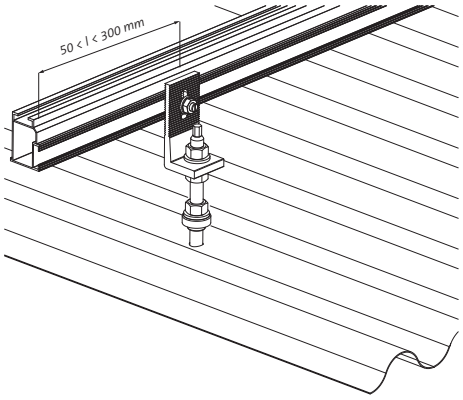
SIT 30
(TX 30)

Nm

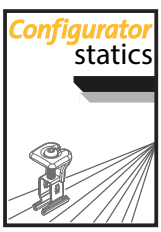
10mm / 13 mm

## Hanger bolts - solar fastener connection - horizontal module alignment




Without a structural analysis by means of the Renusol Configurator the length of the cantilever should not be longer than 300 mm.

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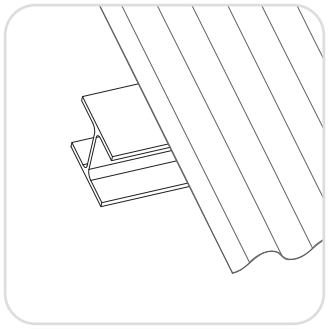
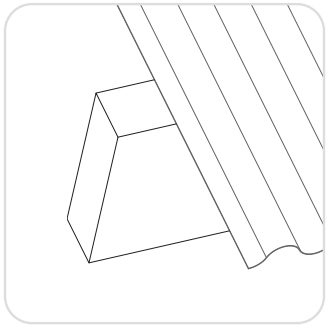
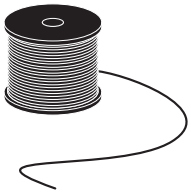
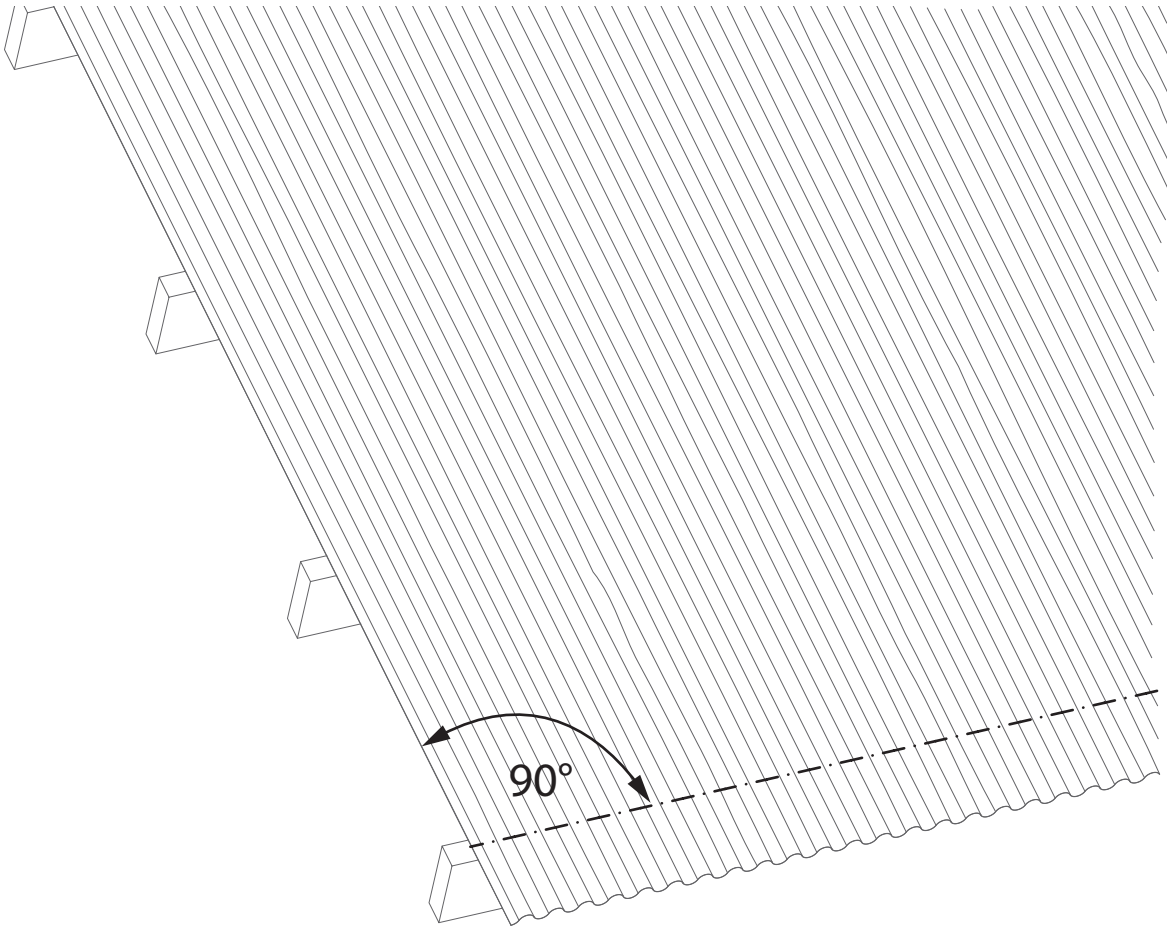
## Hanger bolts - solar fastener connection - horizontal module alignment

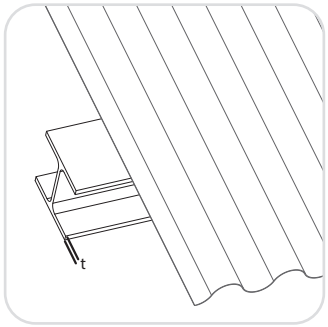


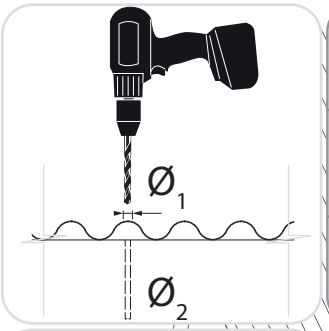




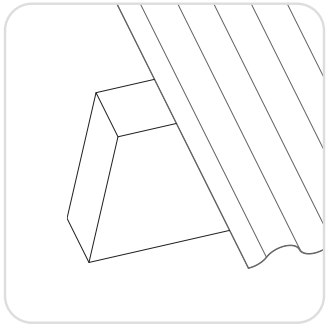



## Hanger bolts - solar fastener connection - horizontal module alignment



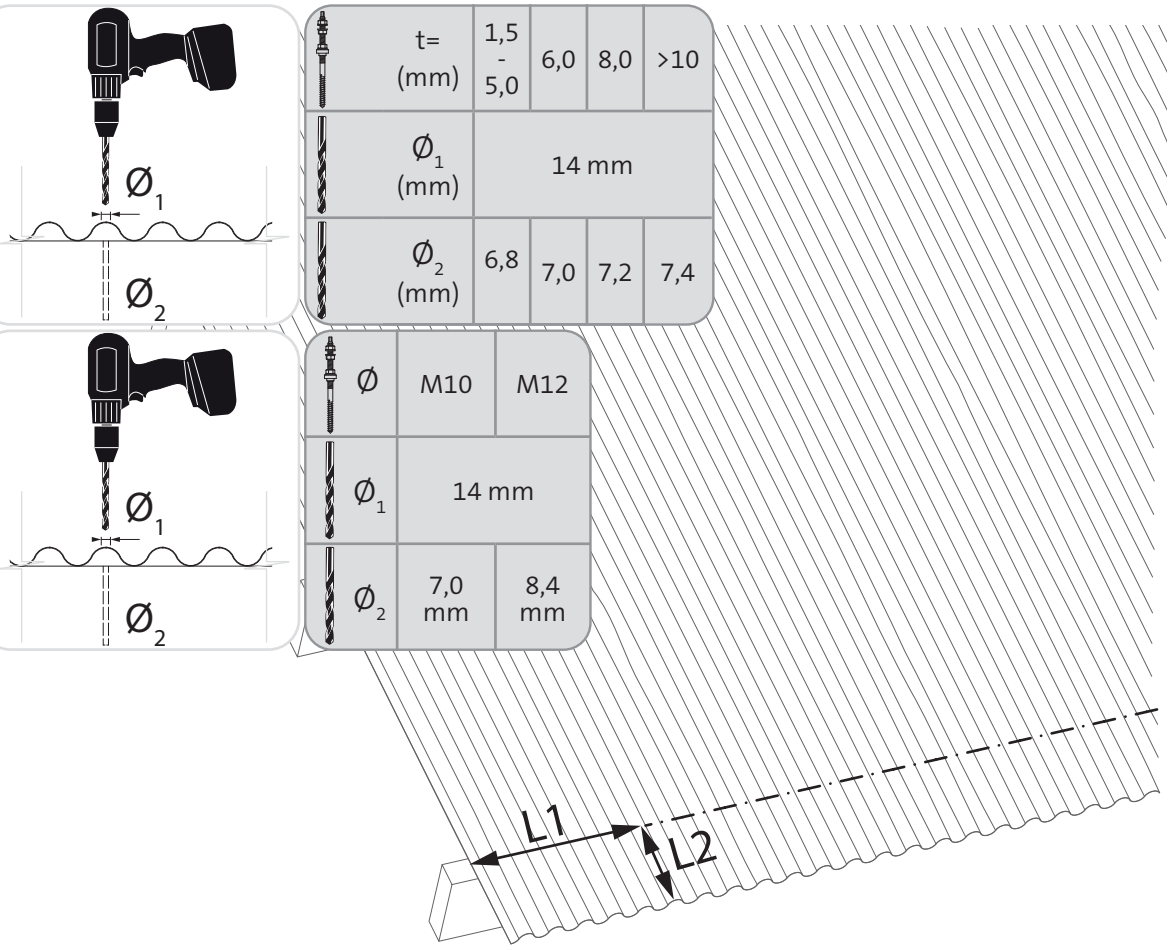




| | | | | |
|---|---|---|---|---|
| t= (mm) | 1,5 - 5,0 | 6,0 | 8,0 | >10 |
| Ø1 (mm) | 14 mm | | | |
| Ø2 (mm) | 6,8 | 7,0 | 7,2 | 7,4 |

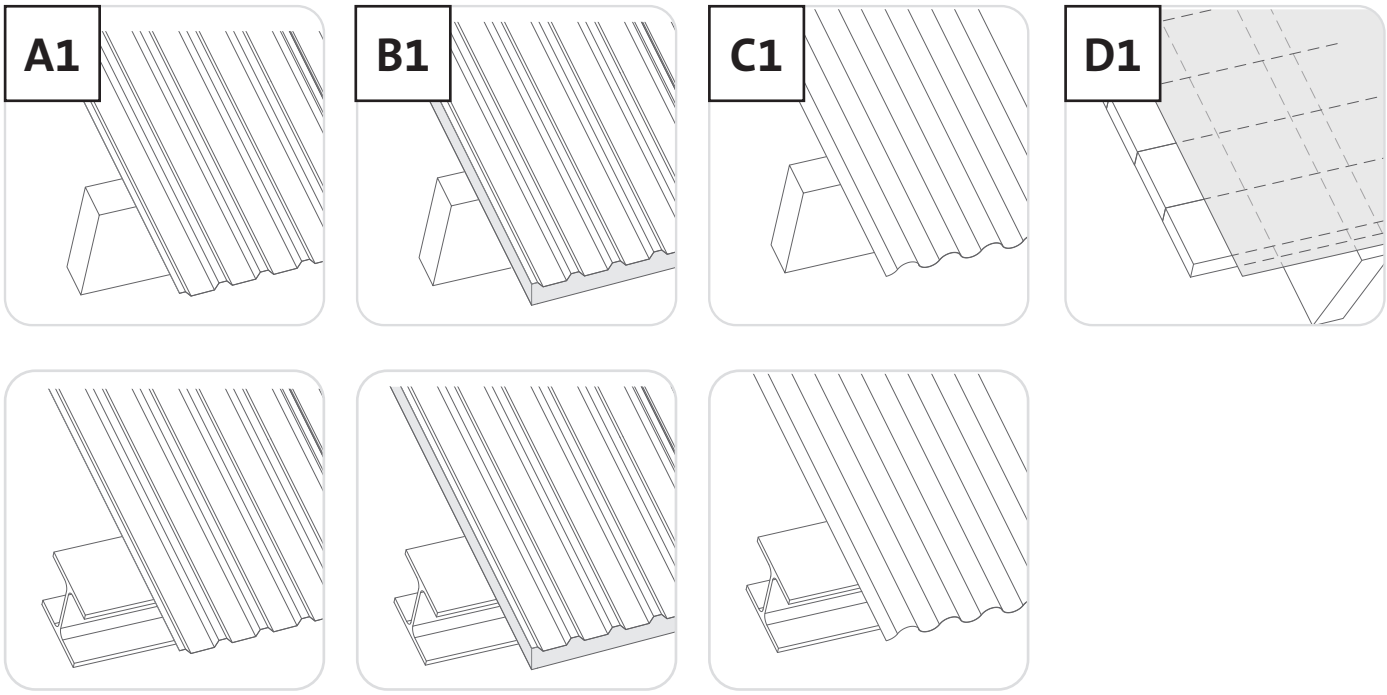


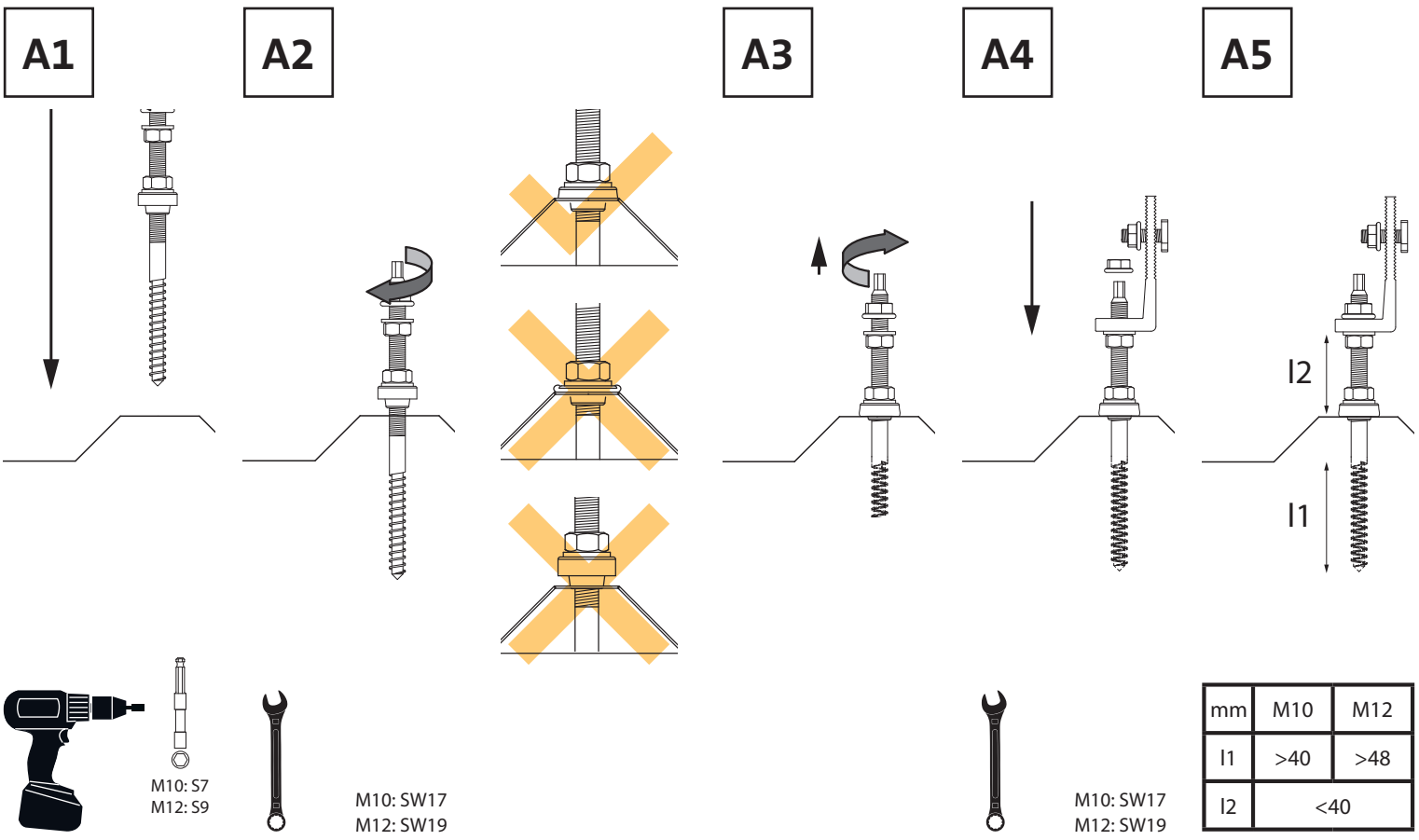



| | | |
|---|---|---|
| Ø | M10 | M12 |
| Ø1 | 14 mm | |
| Ø2 | 7,0 mm | 8,4 mm |

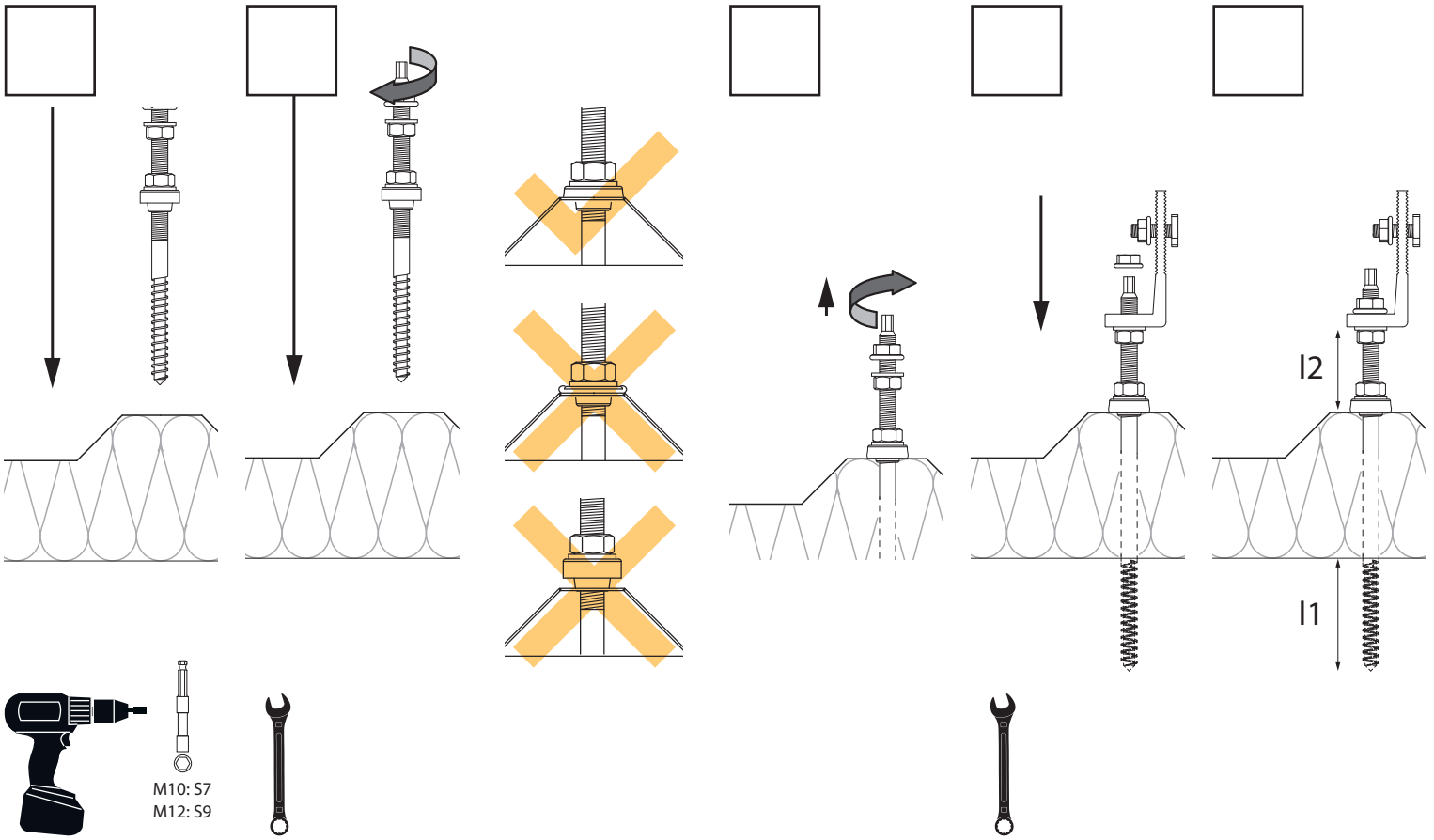


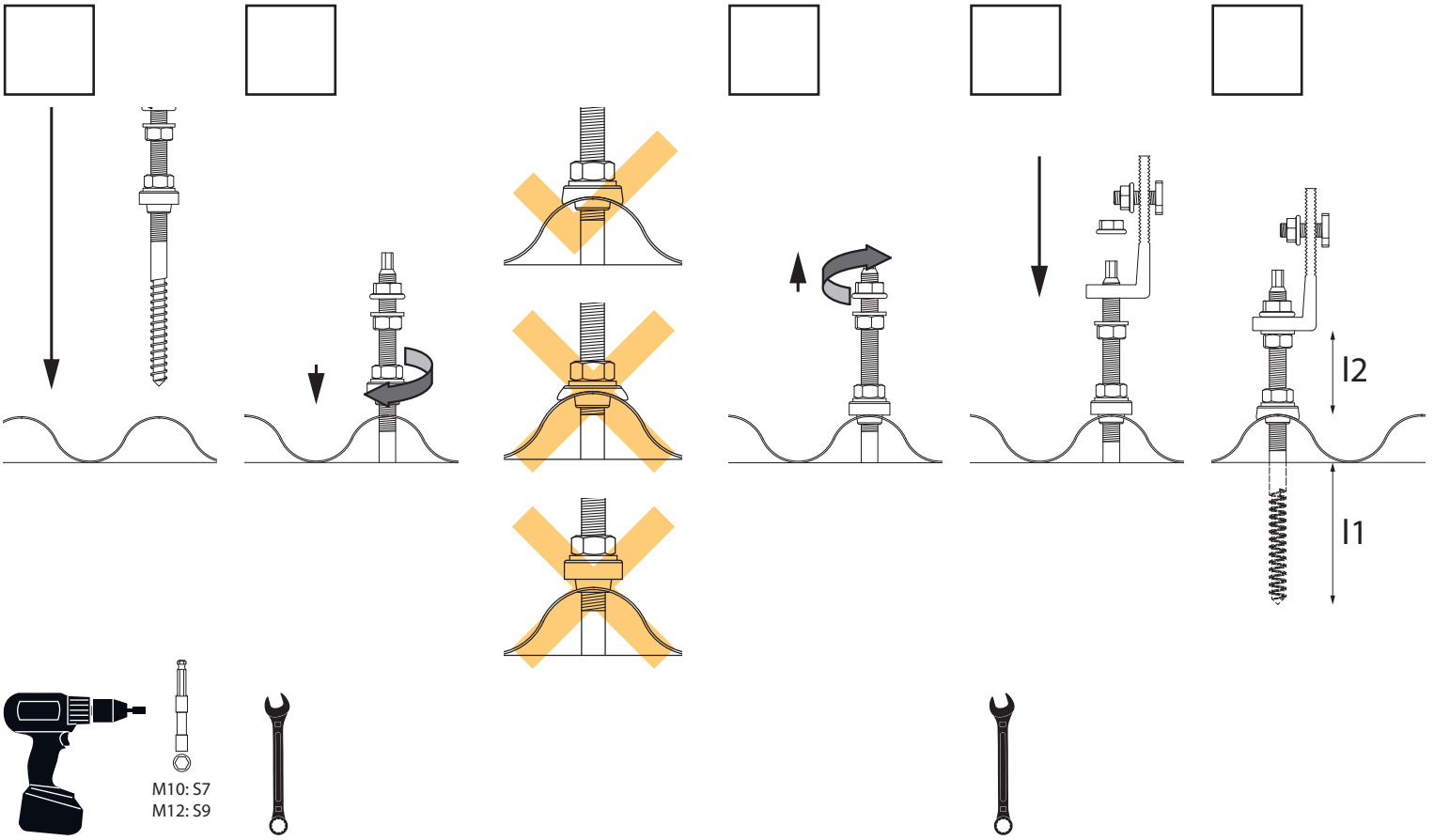
## Hanger bolts - solar fastener connection - horizontal module alignment

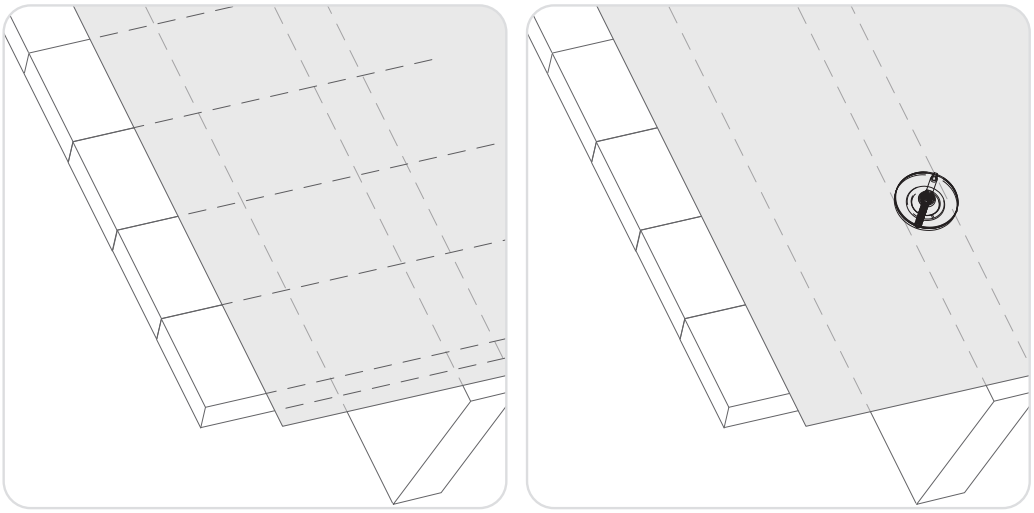


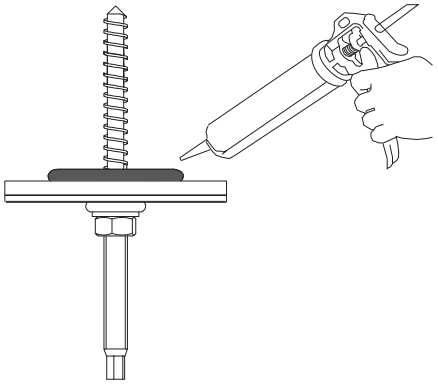




| mm | M10 | M12 |
|---|---|---|
| l1 | >40 | >48 |
| l2 | <40 | |


l2
l1
M10: S7
M12: S9

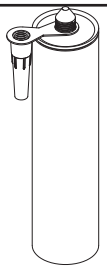

l2
l1
M10: S7
M12: S9



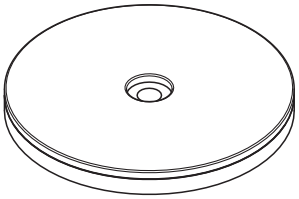


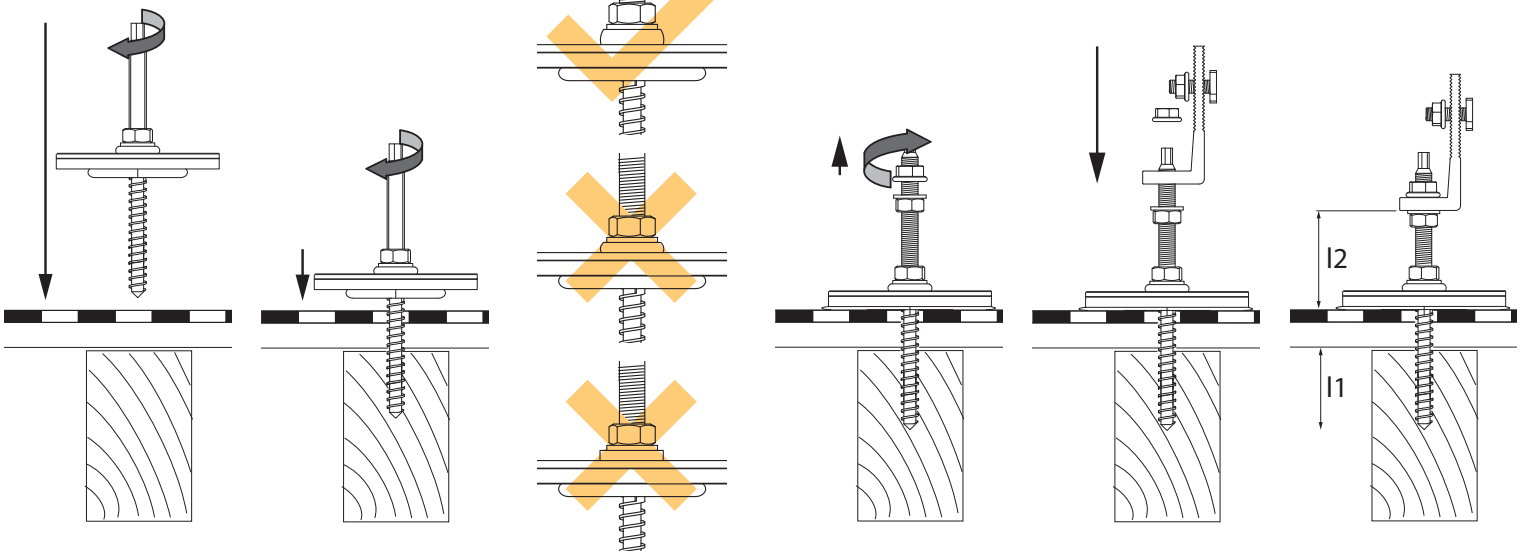
**1x R300000 = 12x R900274**

**R300000**

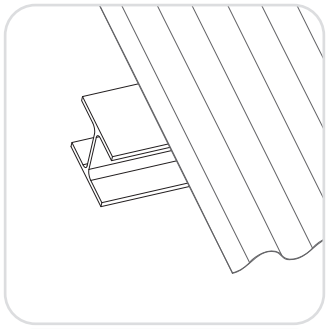


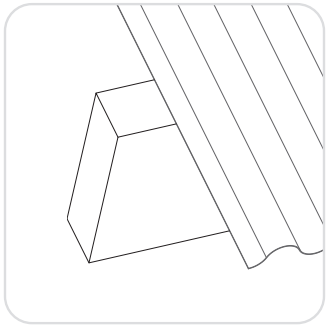
**R900274**

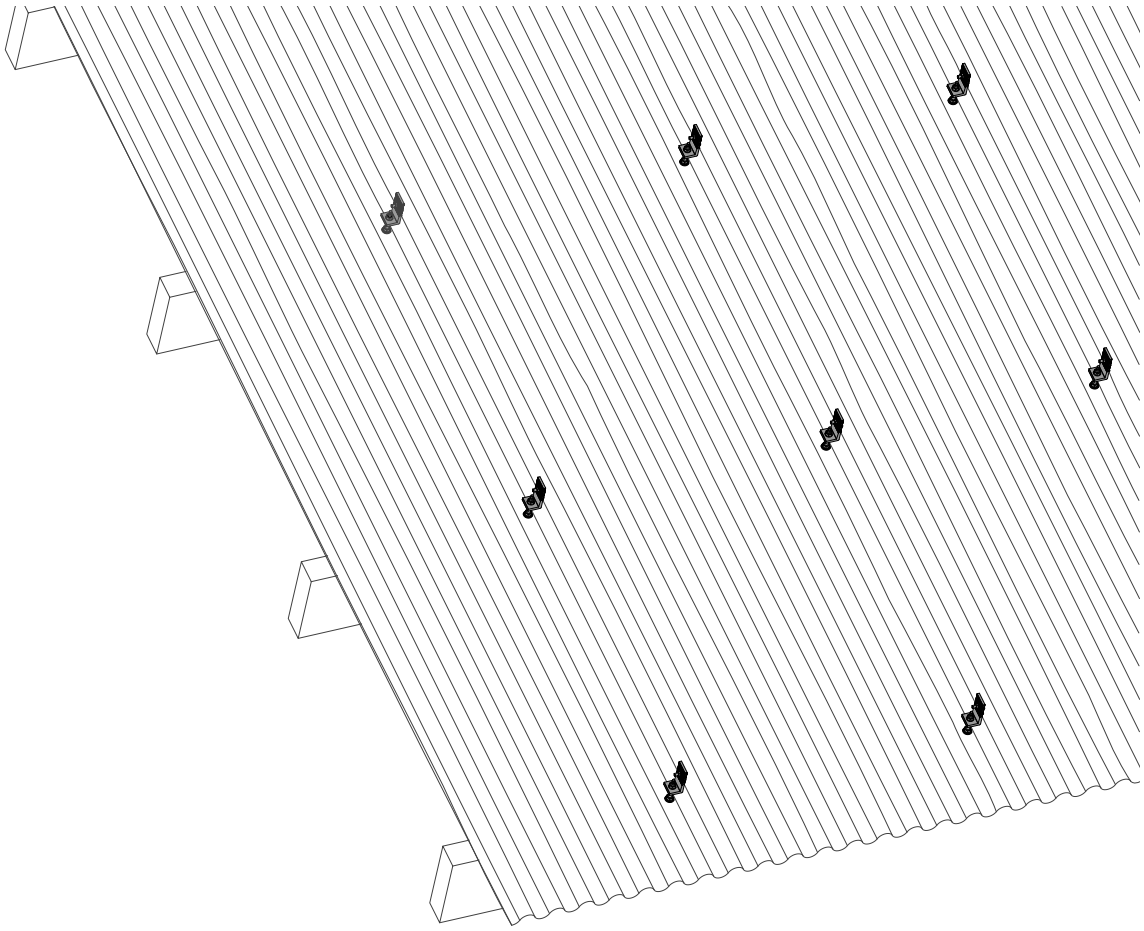




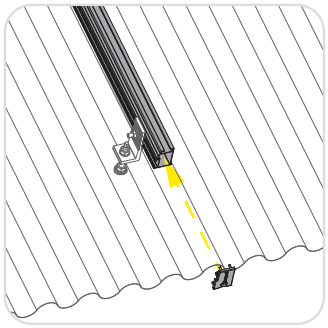
## Hanger bolts - solar fastener connection - horizontal module alignment

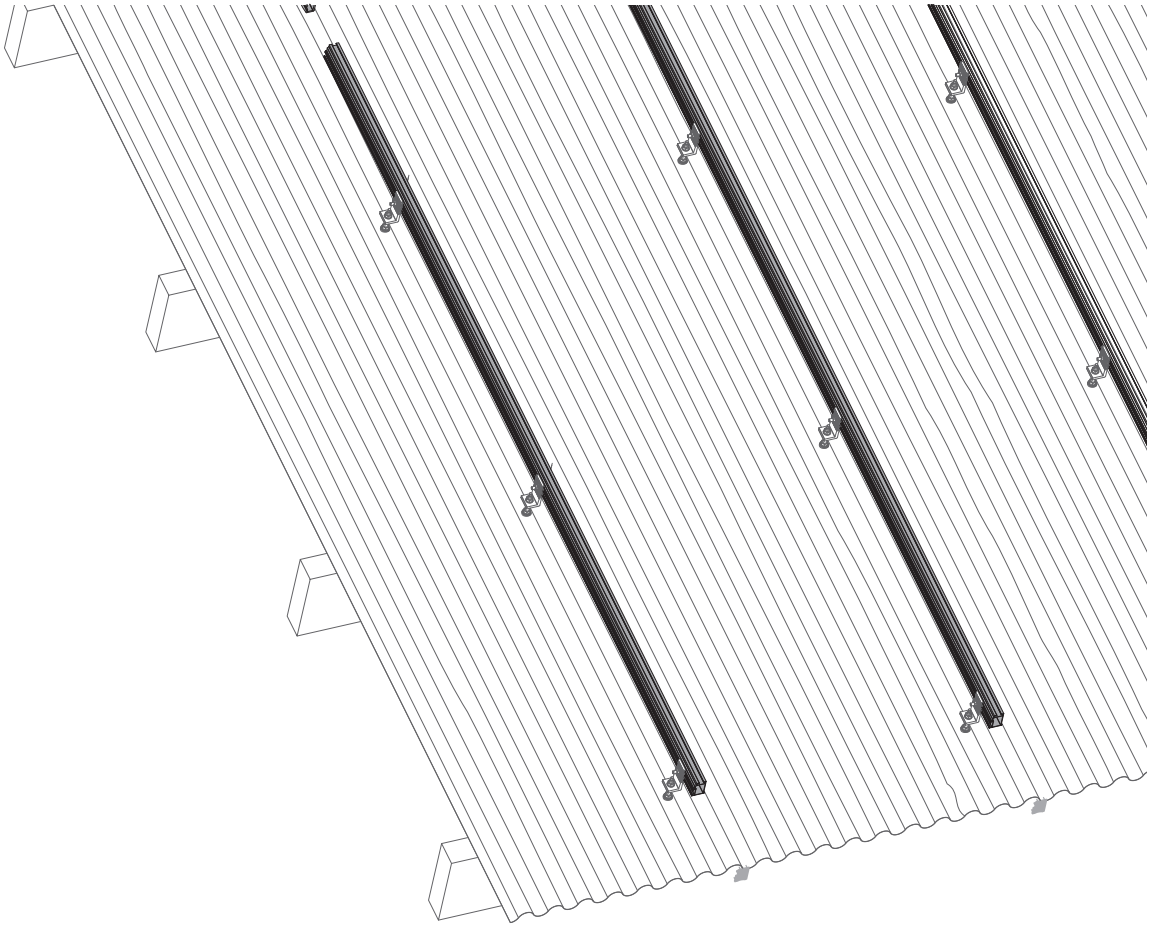




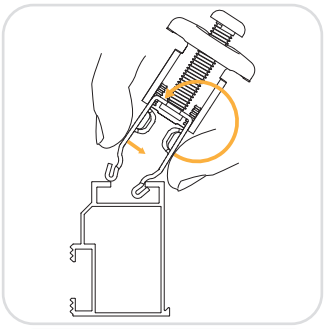


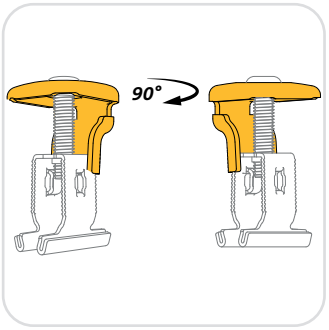
## Hanger bolts - solar fastener connection - horizontal module alignment

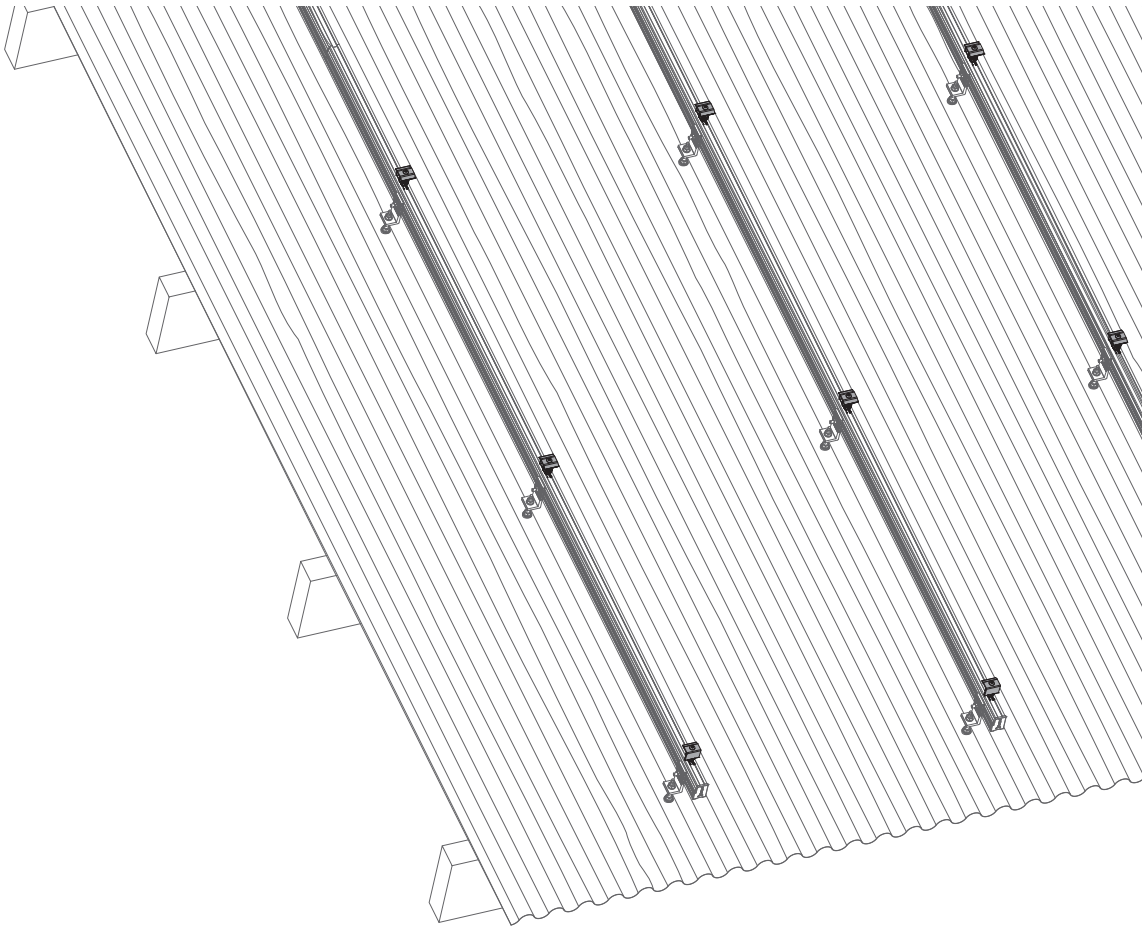




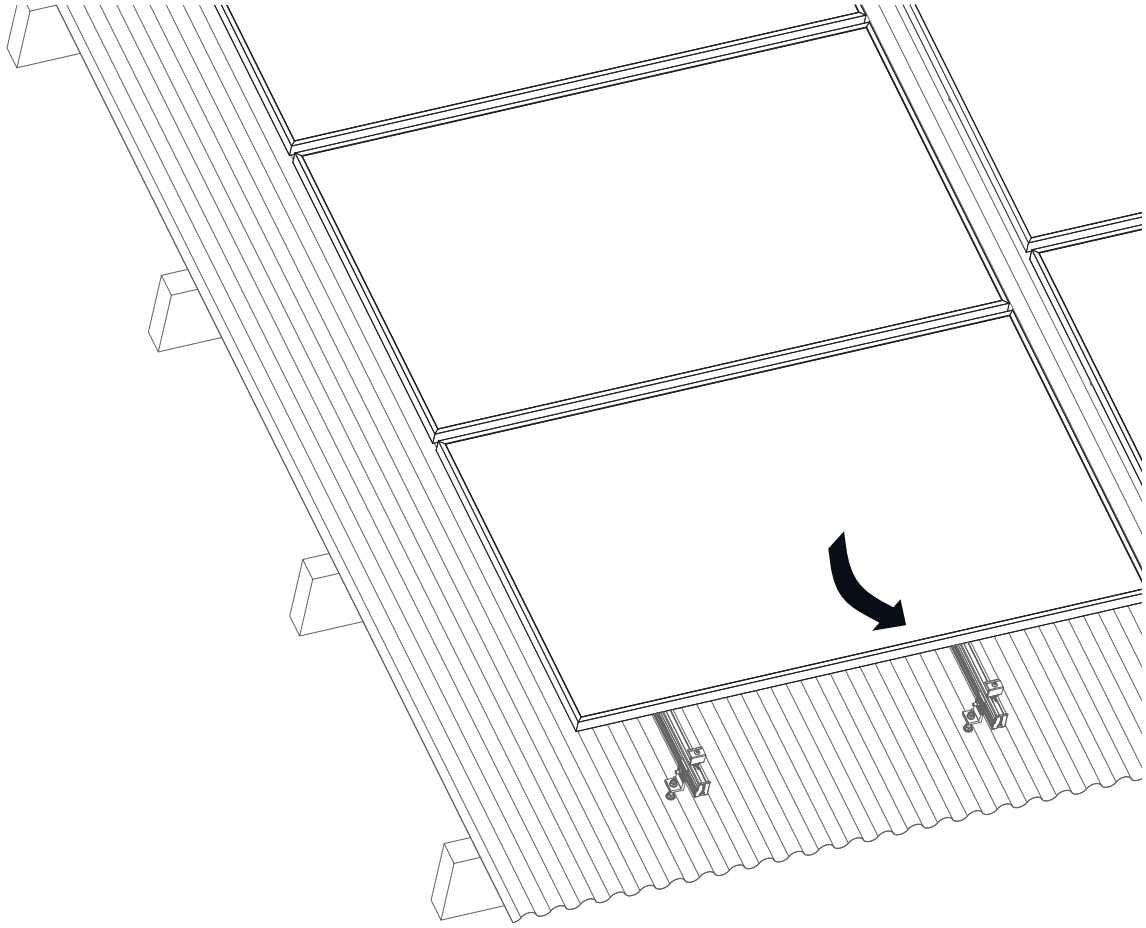
## Hanger bolts - solar fastener connection - horizontal module alignment

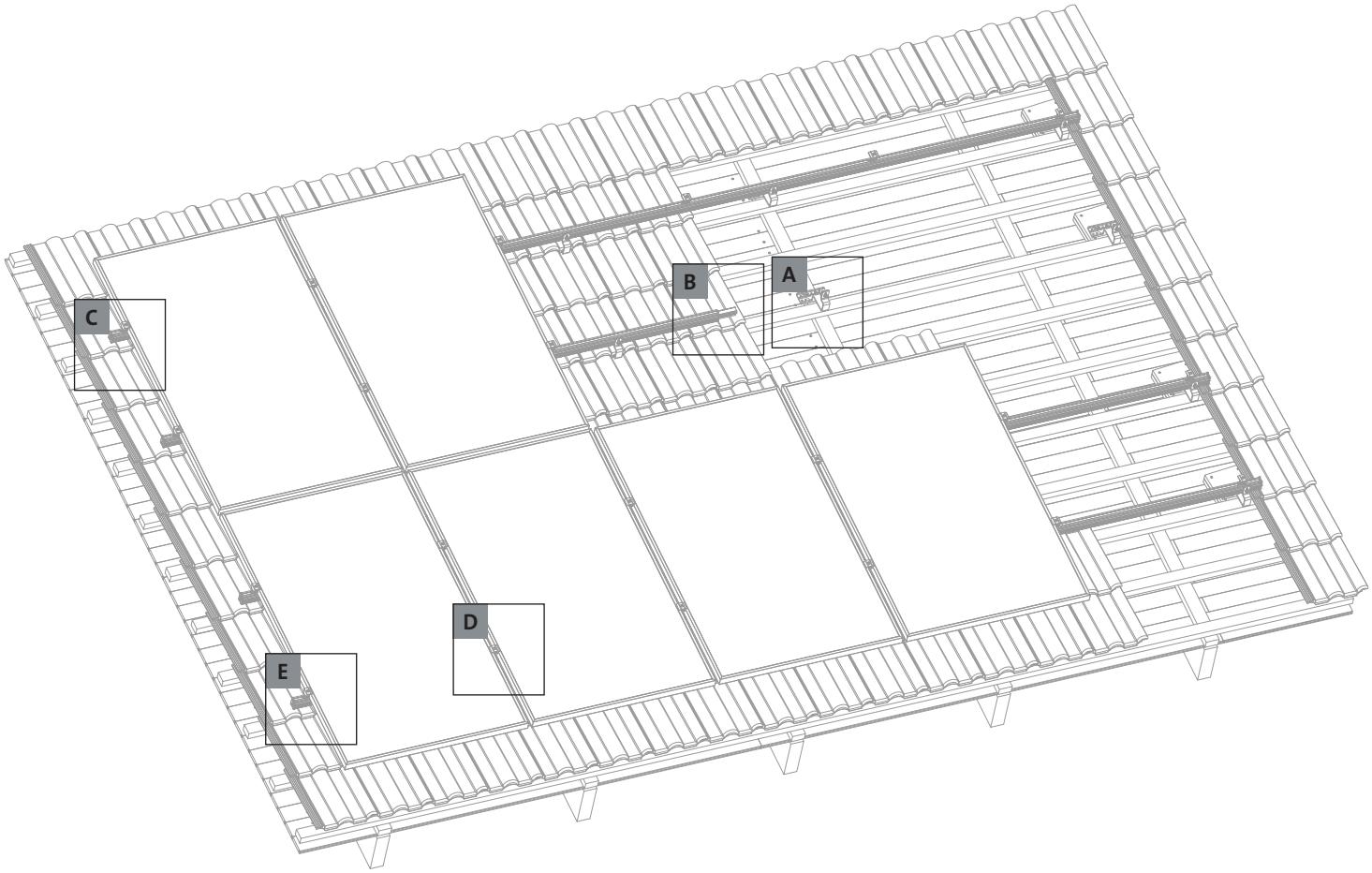




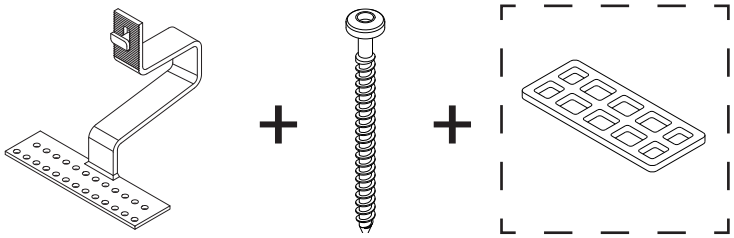



## Hanger bolts - solar fastener connection - horizontal module alignment

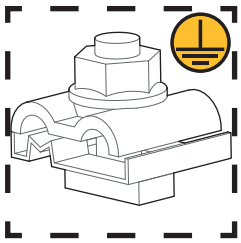




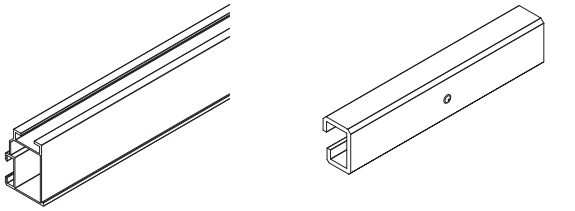

**A**



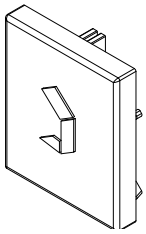
**B**



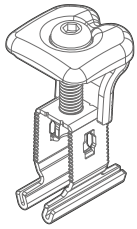
**B**



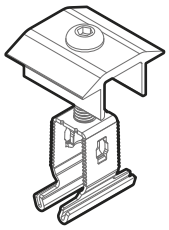
**C**



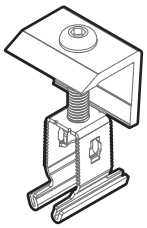
**D + E**



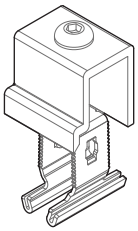
**D**

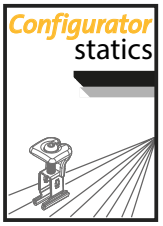


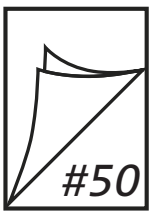
**E**



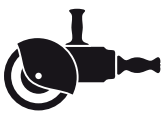
**F**






**+**

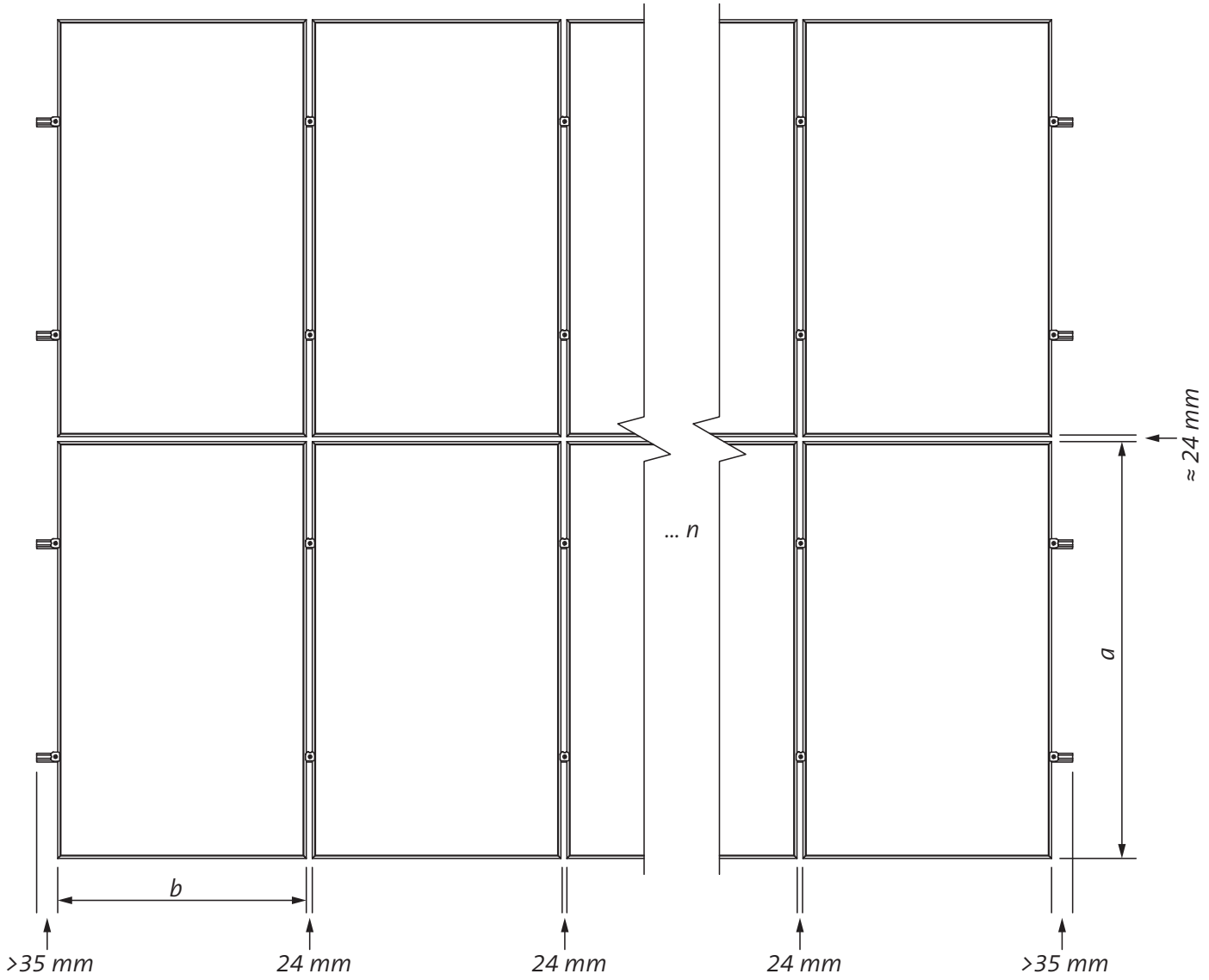


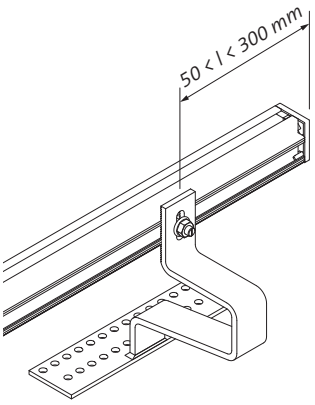
SIT 30
(TX 30)

Nm

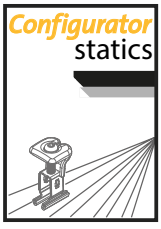
10mm / 13 mm

## One-layer rail system on tongue and groove boards fixation - vertical module alignment




Without a structural analysis by means of the Renusol Configurator the length of the cantilever should not be longer than 300 mm.



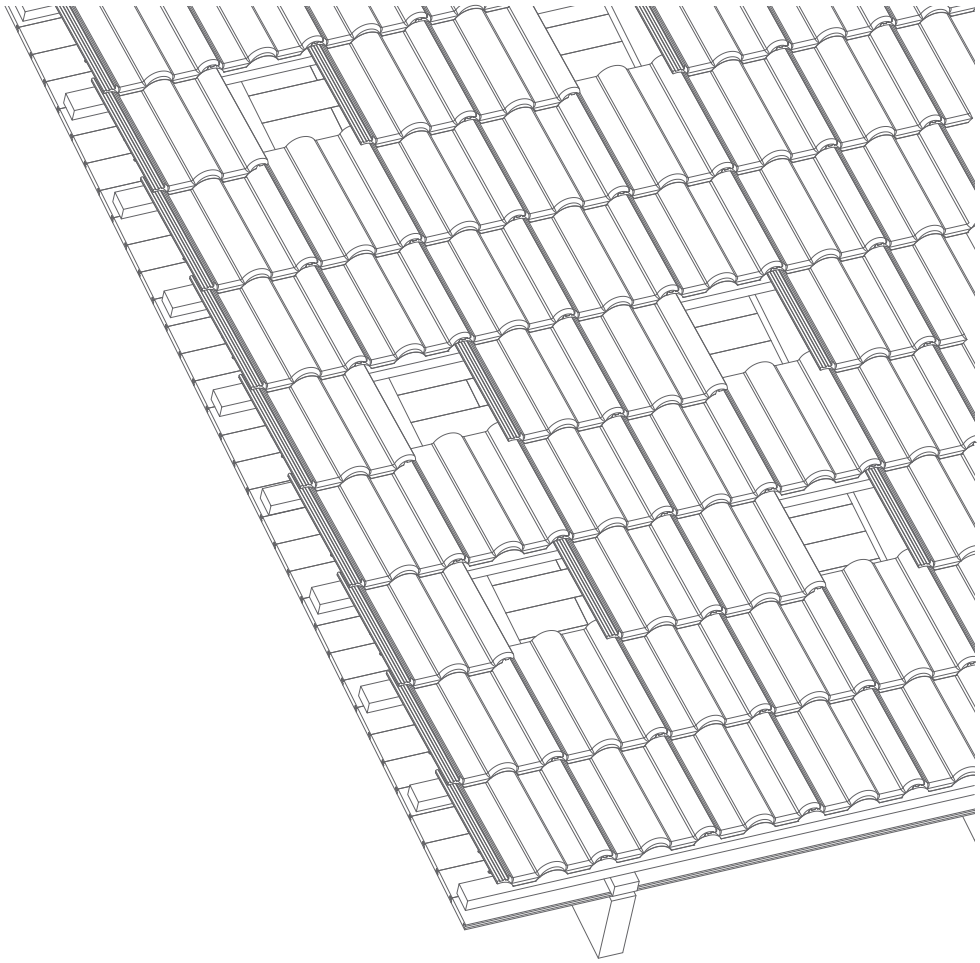

- **General instructions**
- **Static calculations**
- **Technical project overview**

⇨ **www.pv-configurator.com**

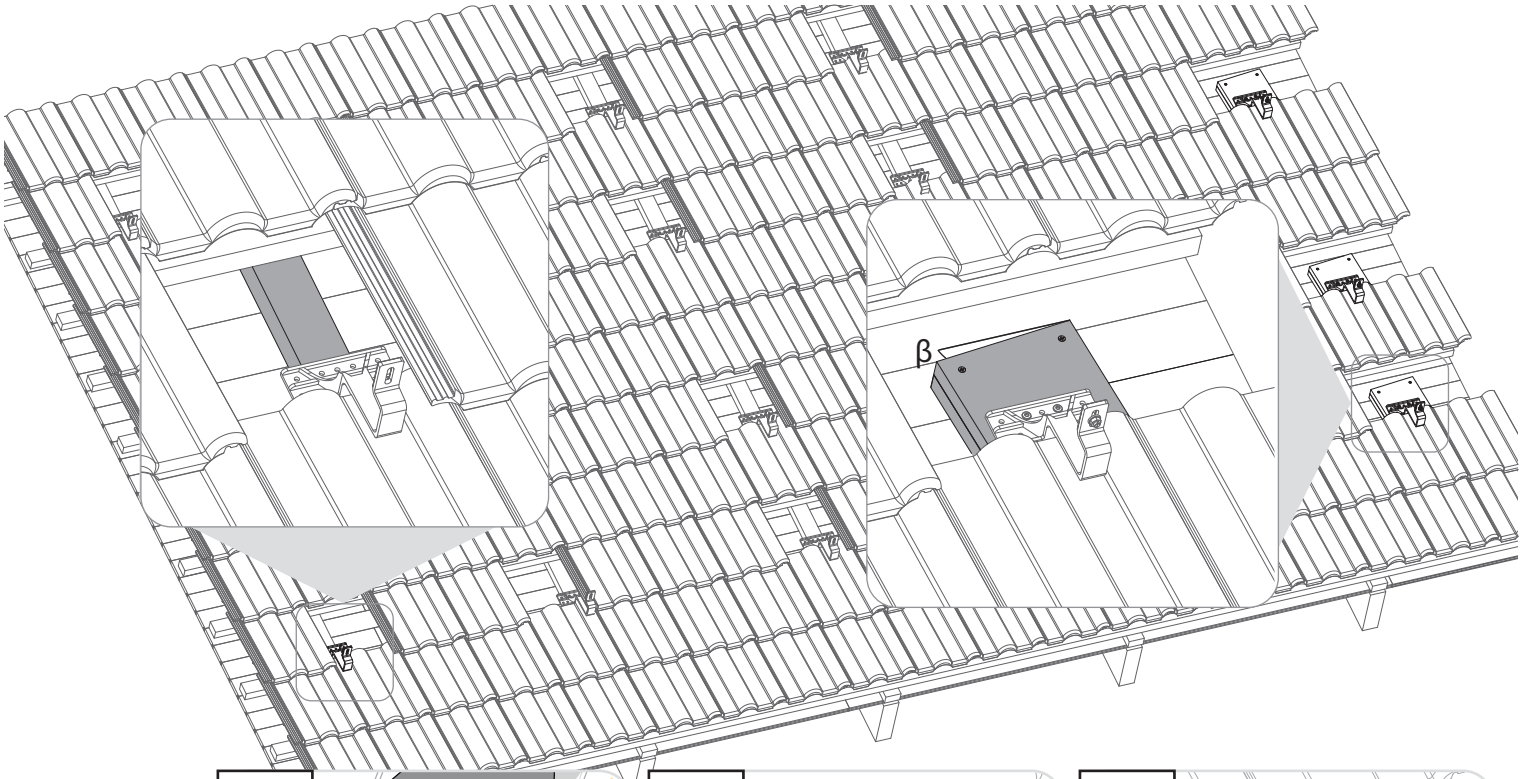
## One-layer rail system on tongue and groove boards fixation - vertical module alignment

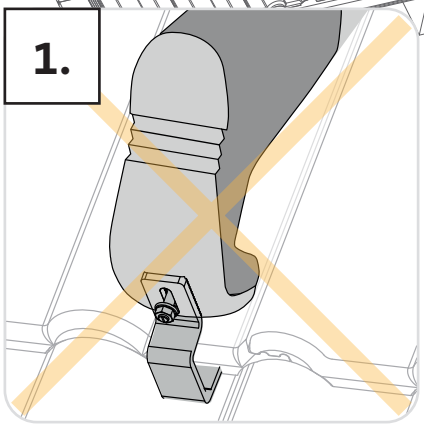
Remove the additional gutter tiles on the top side as per layout to have more work space.

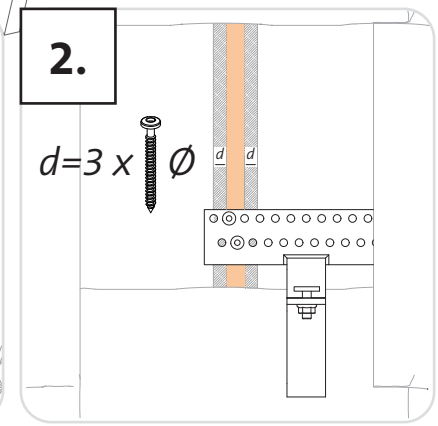
**Warning!**
Check the condition of the roof construction before starting the installation. This includes quality and thickness of rafters, purlins and the roof sealing. The building structure must be able to safely and durably bear the additional loads of the photovoltaic system.

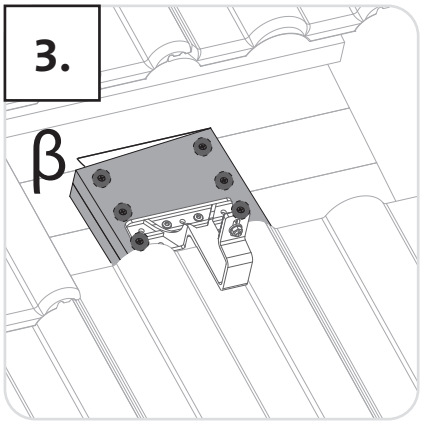


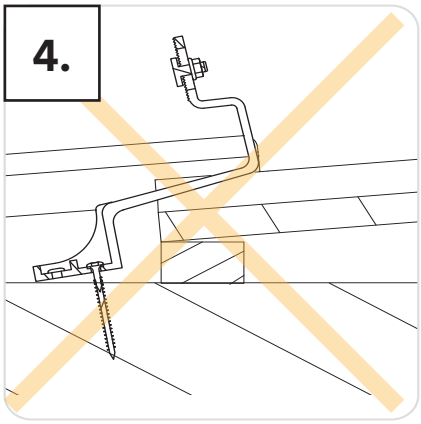
## One-layer rail system on tongue and groove boards fixation - vertical module alignment

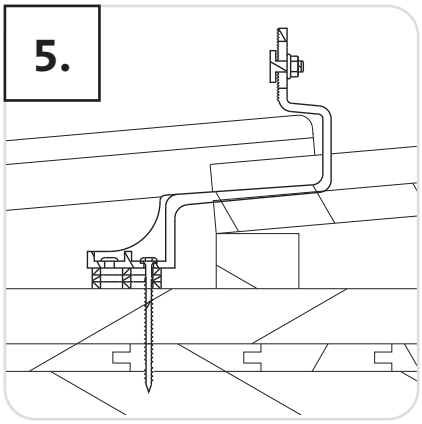


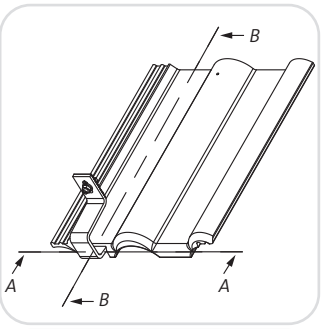




**Warning!**

1. Do not use the roof hook as step
2. Only screw the roof hooks attached to the rafters within the permissible range. Keep a distance of 3x Ø wood screws to the outer edge. The quantity of screws can be found in the annex.
3. avoid the possibility of standing water by twisting or beveling the levelling element at an angle of approx. ß≈5°. We recommend screwing the levelling element with 2 screws each to at least 3 boards to ensure an even load transfer to the substructure.
4. Ensure that the roof hook does not rest on the tile.
5. The roof hook should be screwed through all levelling elements into the boards.

## One-layer rail system on tongue and groove boards fixation - vertical module alignment



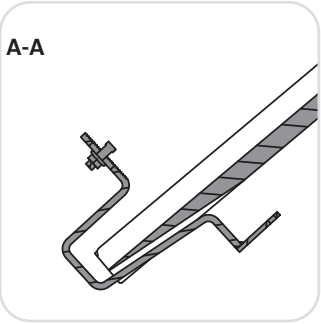

**Warning!**

The following treatment of tiles only applies to grooved tiles.

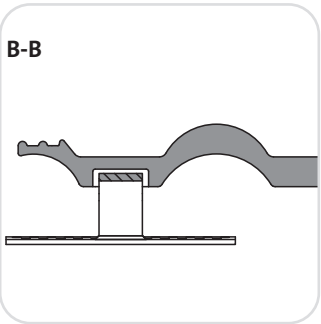
For flat tiles, please look at *page 46-48*.

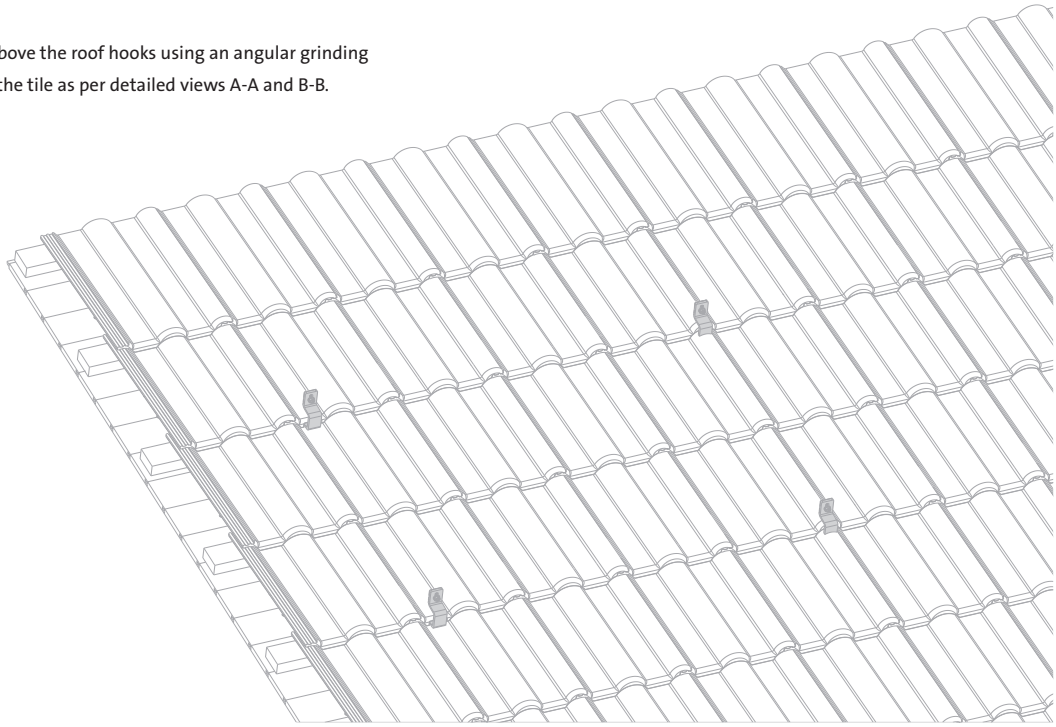
Treat the tiles above the roof hooks using an angular grinding machine. Treat the tile as per detailed views A-A and B-B.

**A-A**

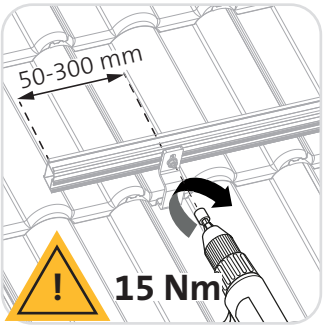


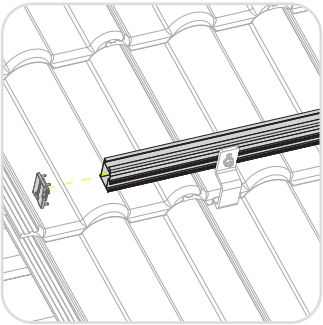
**B-B**

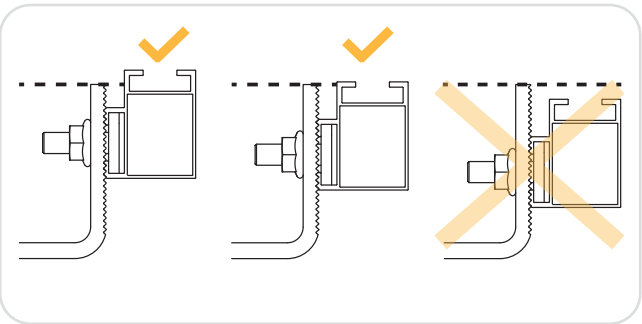


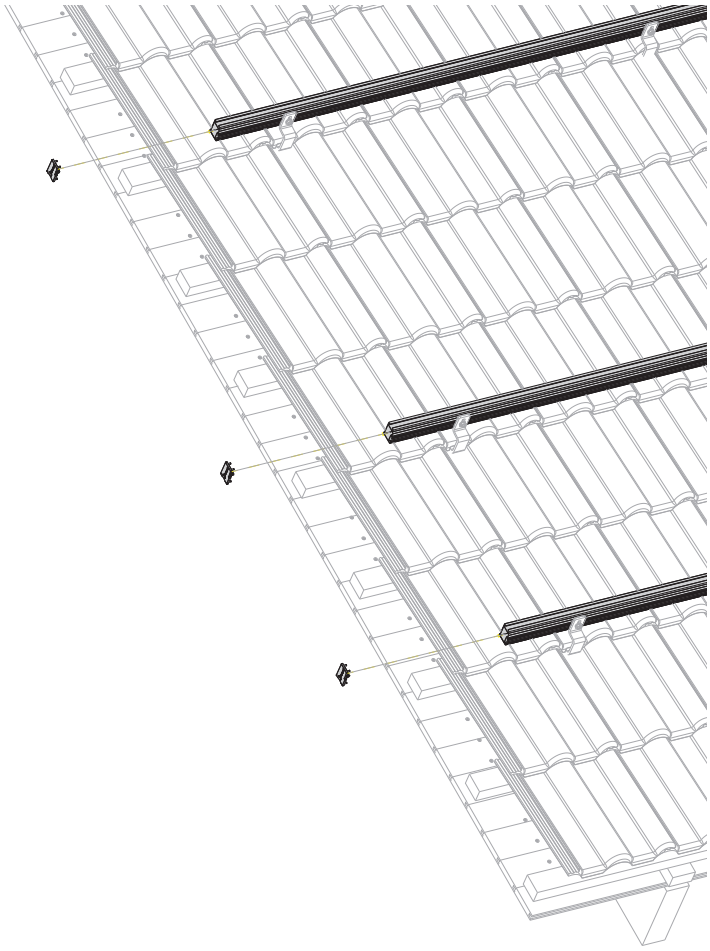


## One-layer rail system on tongue and groove boards fixation - vertical module alignment

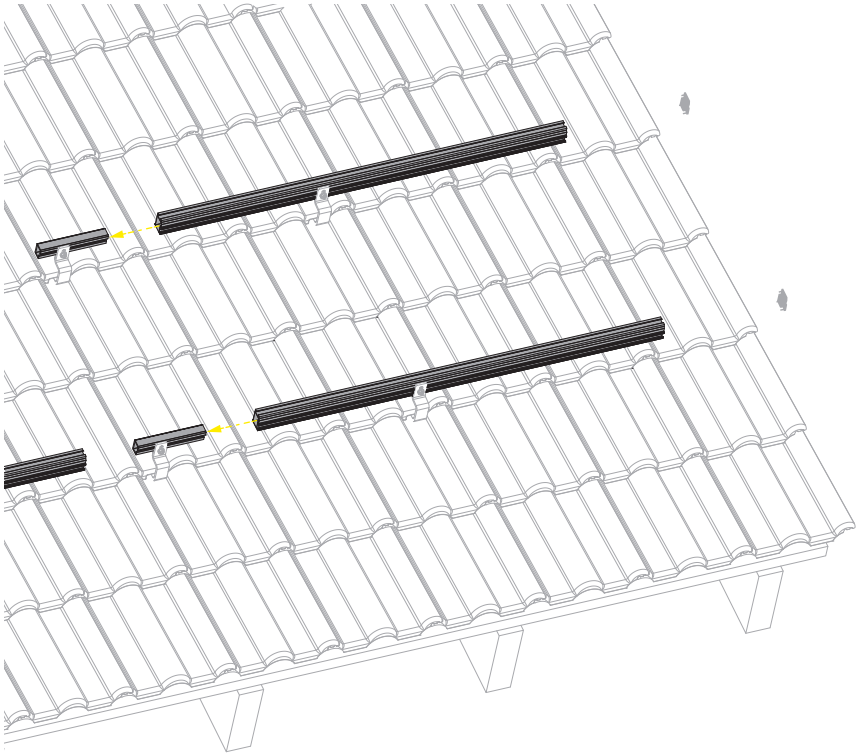


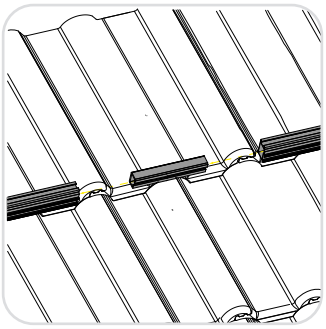



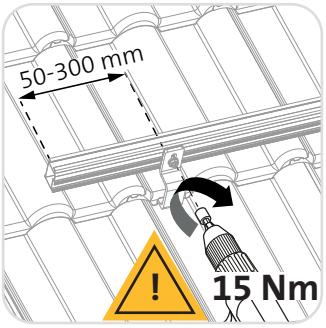


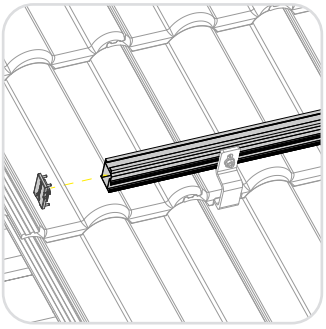


## One-layer rail system on tongue and groove boards fixation - vertical module alignment

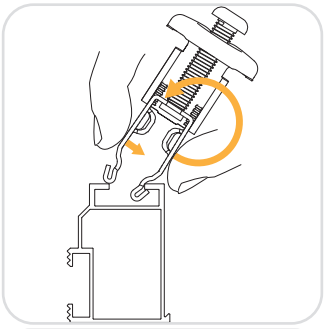


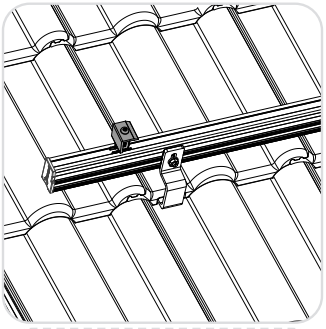


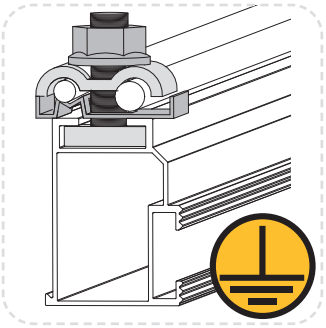


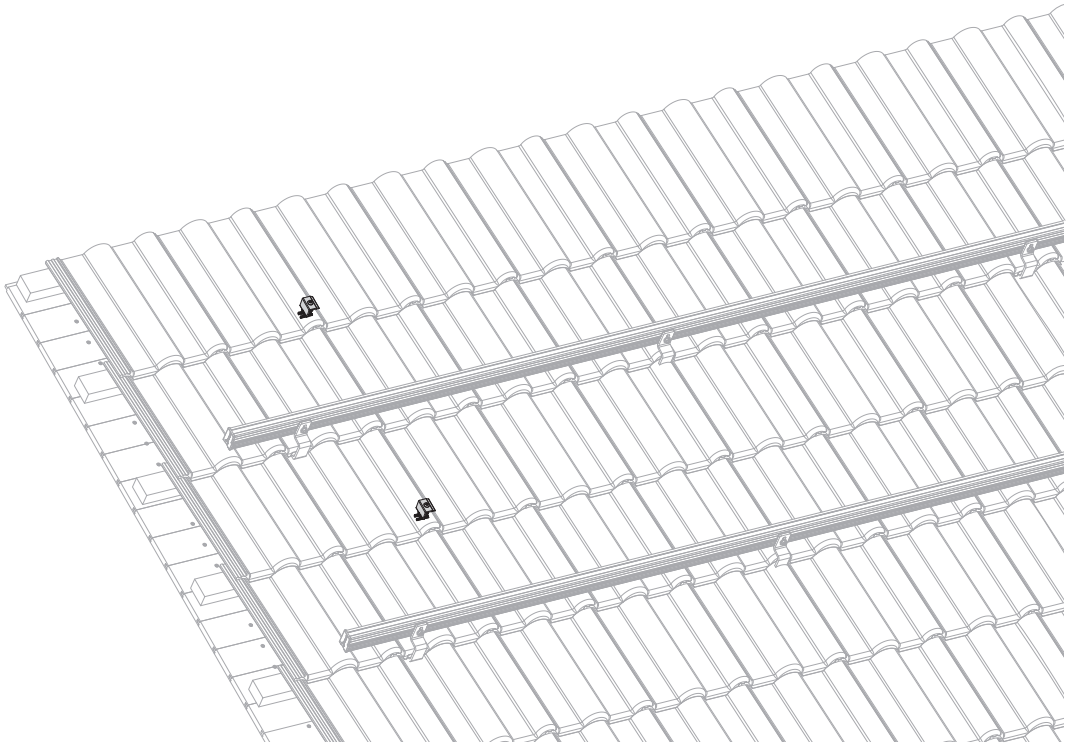



## One-layer rail system on tongue and groove boards fixation - vertical module alignment

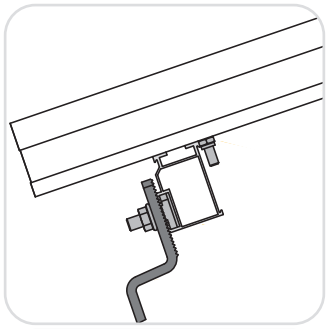


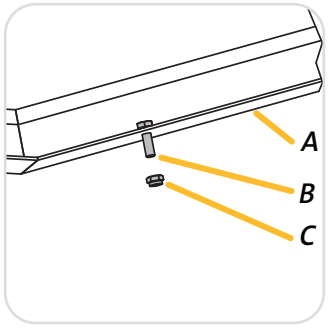






## One-layer rail system on tongue and groove boards fixation - vertical module alignment

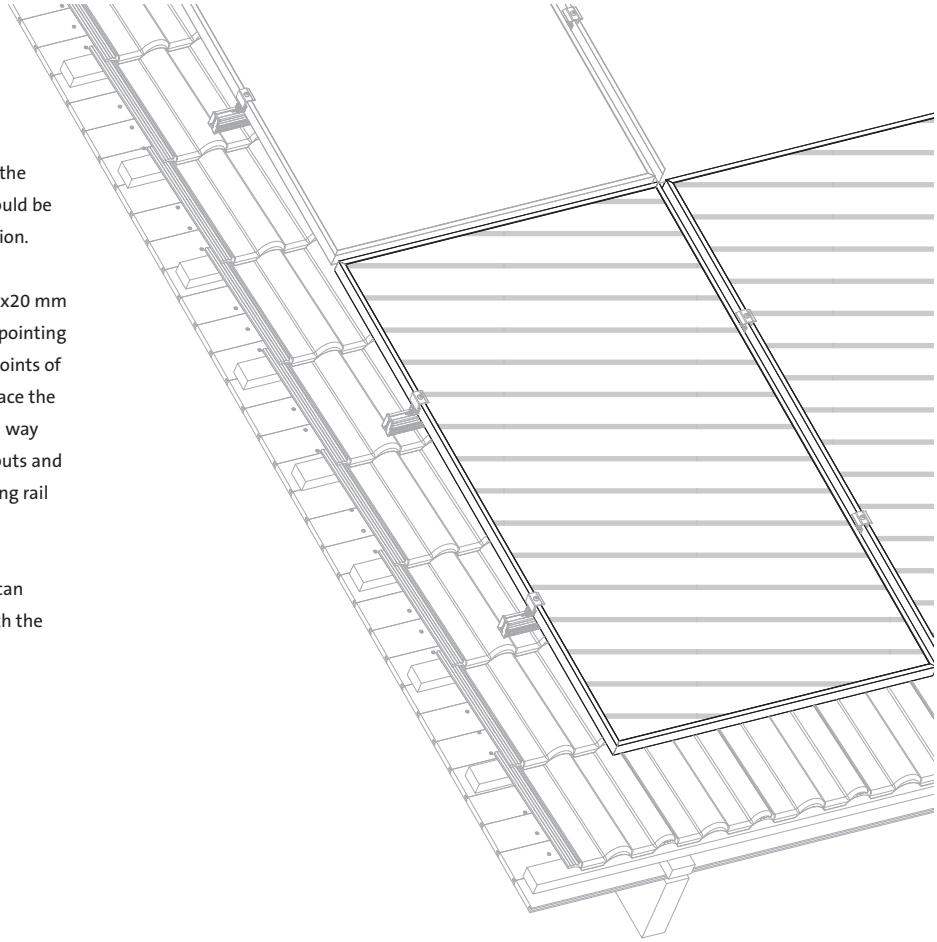




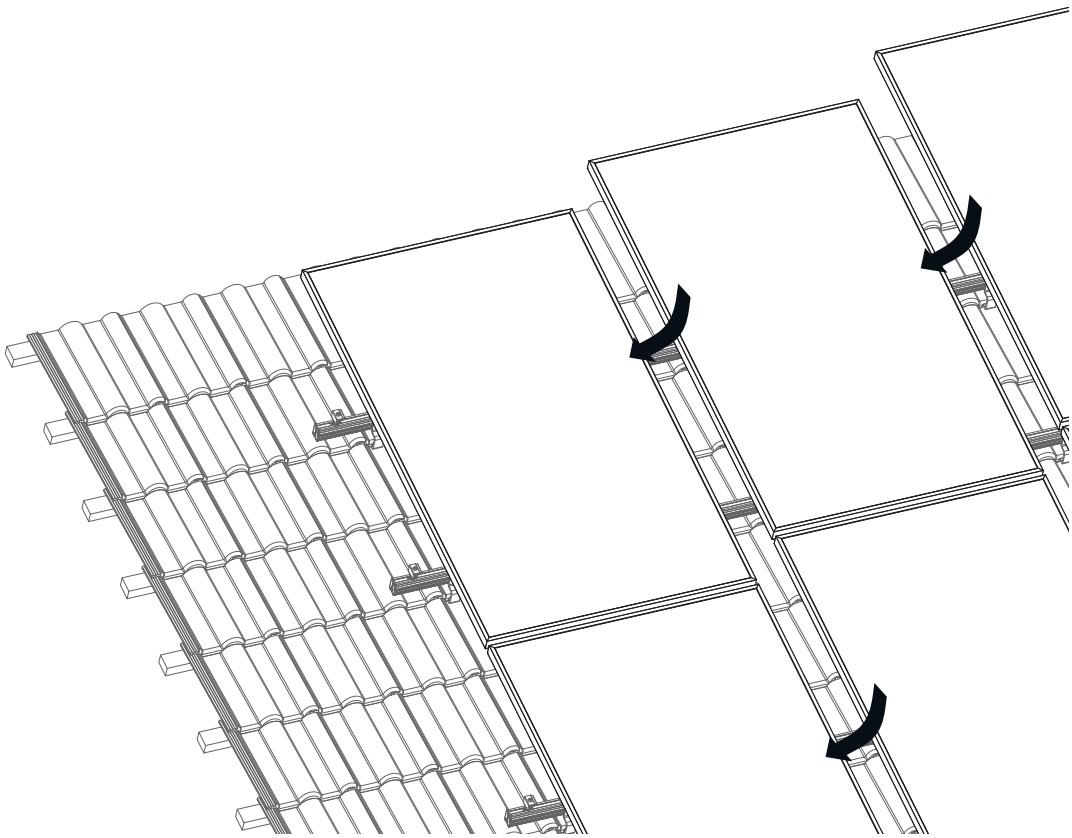

**Warning!**
Before installing the modules, the modules of the lowest row should be provided with anti-slip protection.

For this purpose fasten the M6x20 mm screws (with the shaft/thread pointing downwards) in the fastening points of the modules using M6 nuts. Place the modules in the lowest row in a way that the anti-slip protection abuts and the edge of the lowest mounting rail (Fig. B) touches.

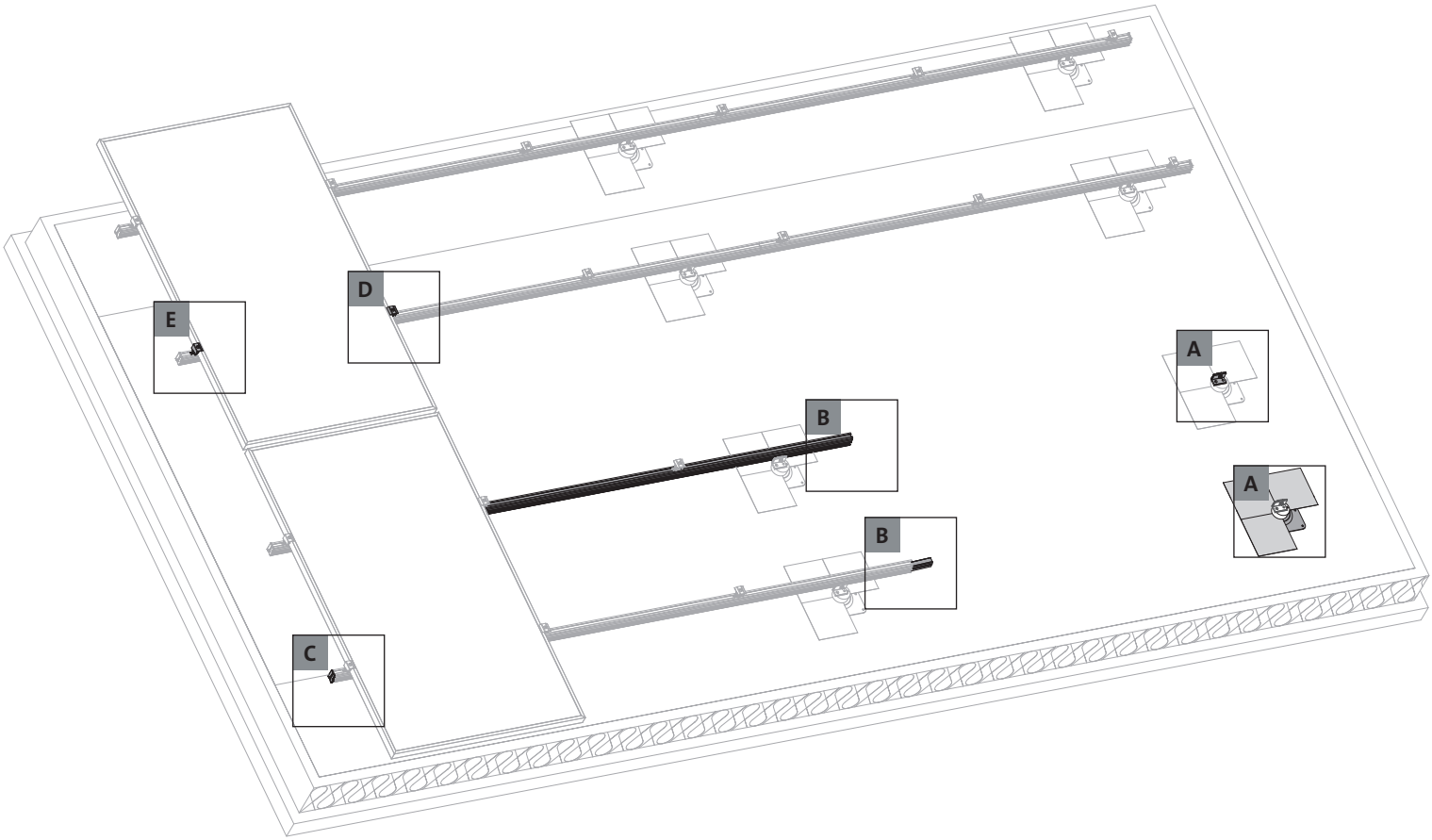
Note: The anti-slip protection can only be used with modules with the appropriate fastening holes.



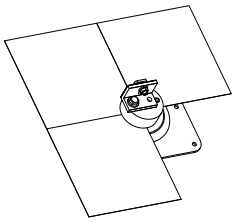
## One-layer rail system on tongue and groove boards fixation - vertical module alignment



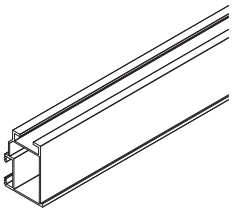
## Connection to alternative fasteners

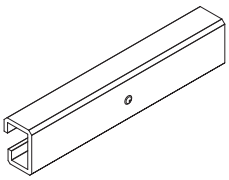



**A**



**B**





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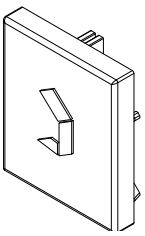
**C**



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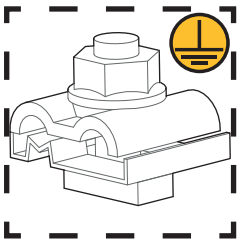
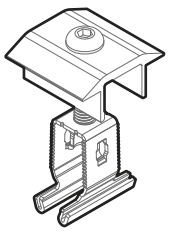
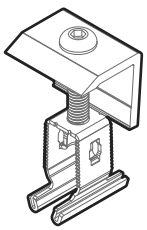
**B**



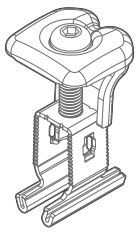
**D**

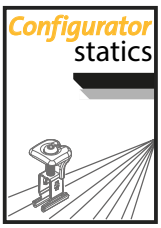


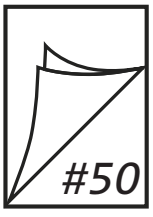
**E**



**D + E**



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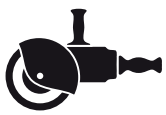
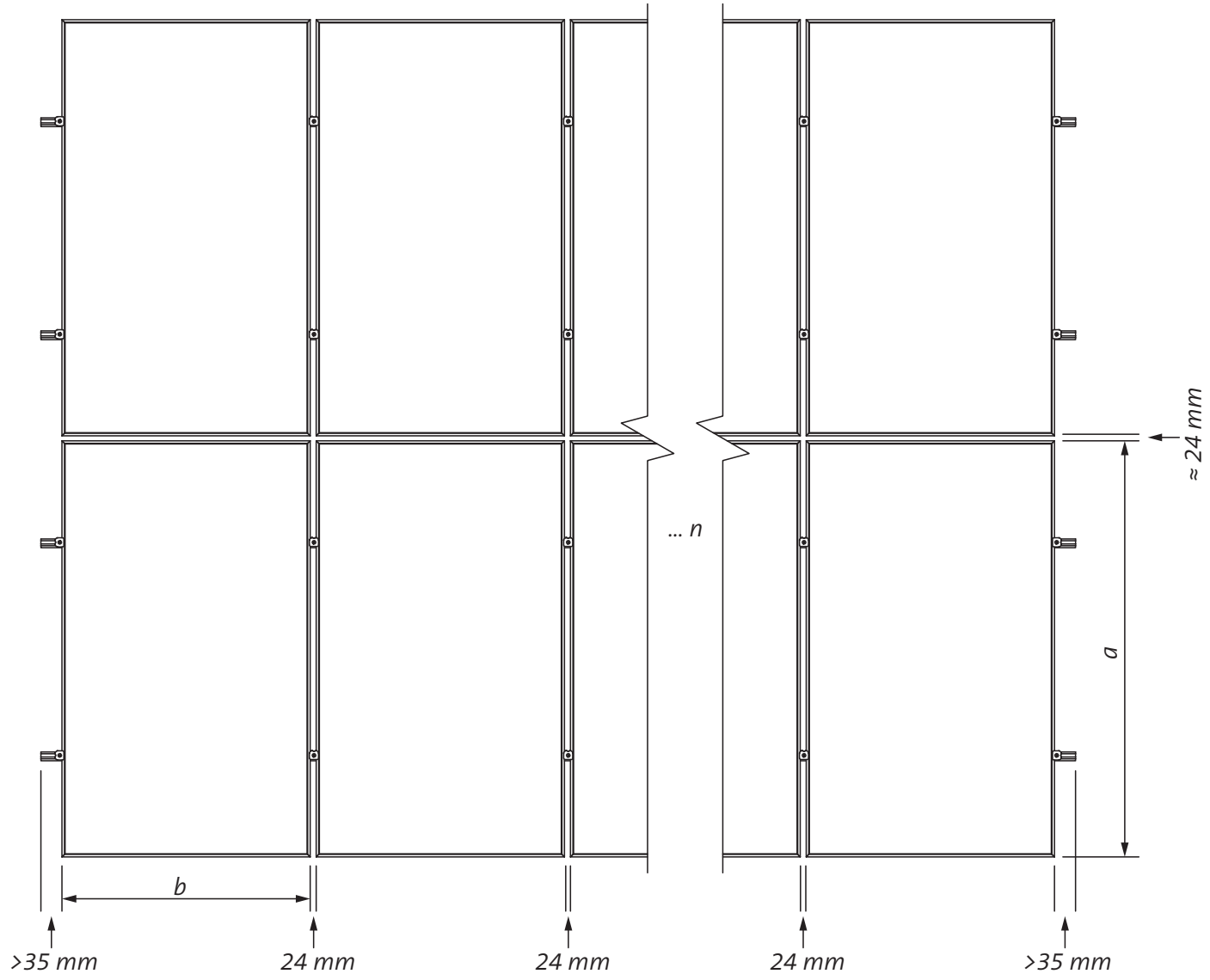
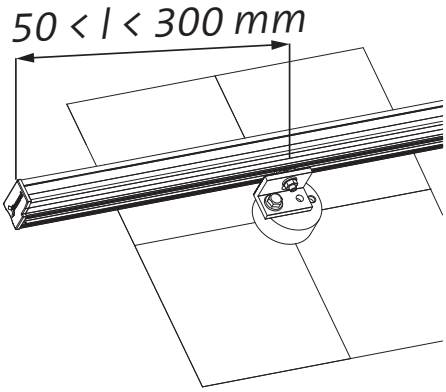
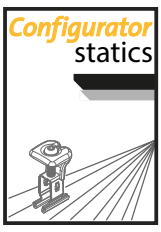


## Connection to alternative fasteners



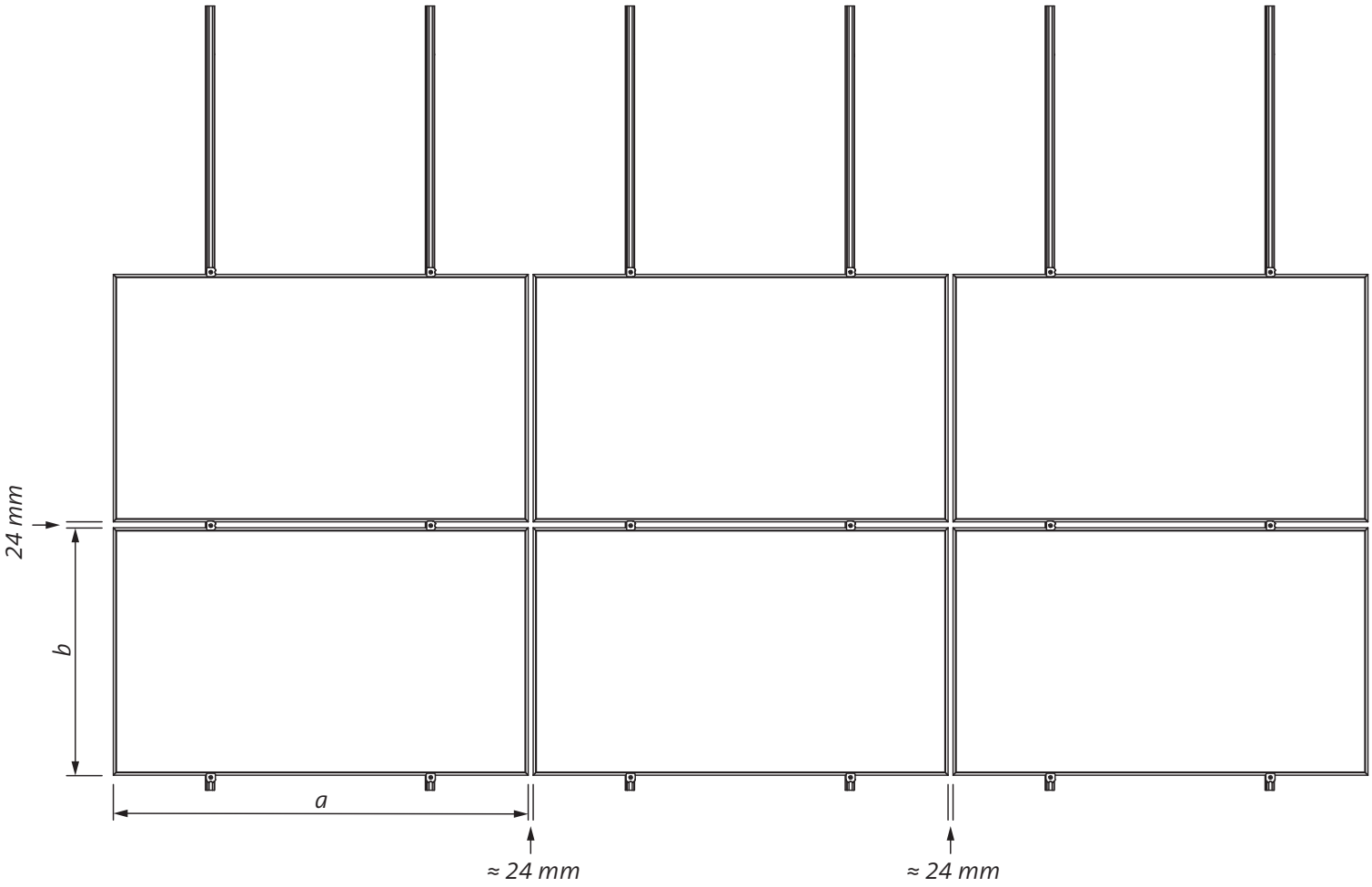

Without a structural analysis by means of the Renusol Configurator the length of the cantilever should not be longer than 300 mm.

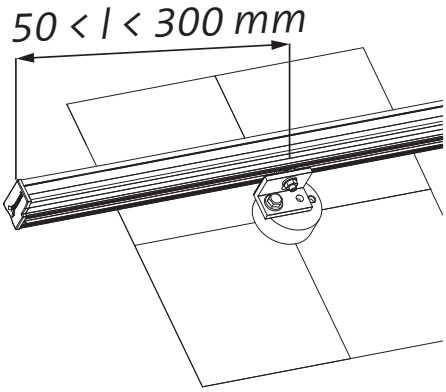



- **General instructions**
- **Static calculations**
- **Technical project overview**

  ⇨ **www.pv-configurator.com**

## Connection to alternative fasteners

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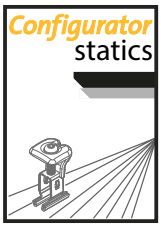


- **General instructions**
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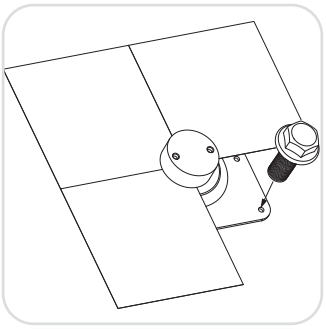
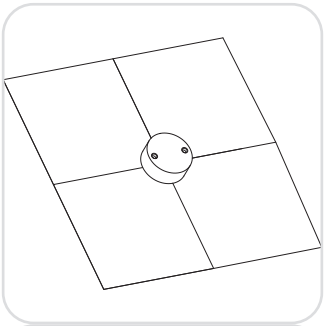
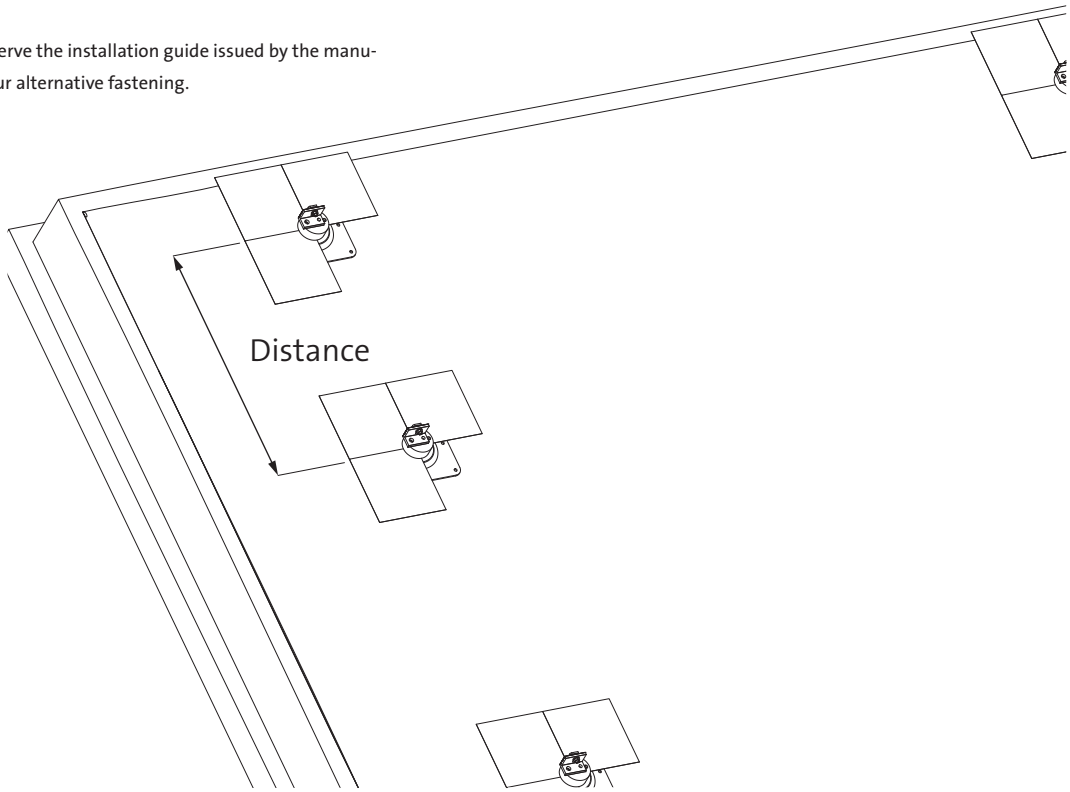
## Connection to alternative fasteners

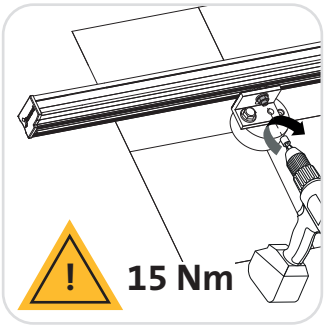


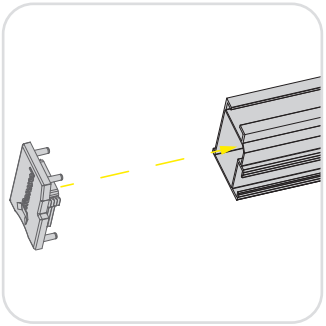
**Warning!**
With this, observe the installation guide issued by the manufacturer of your alternative fastening.

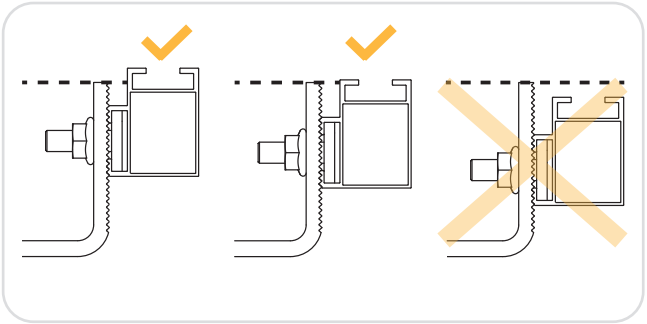


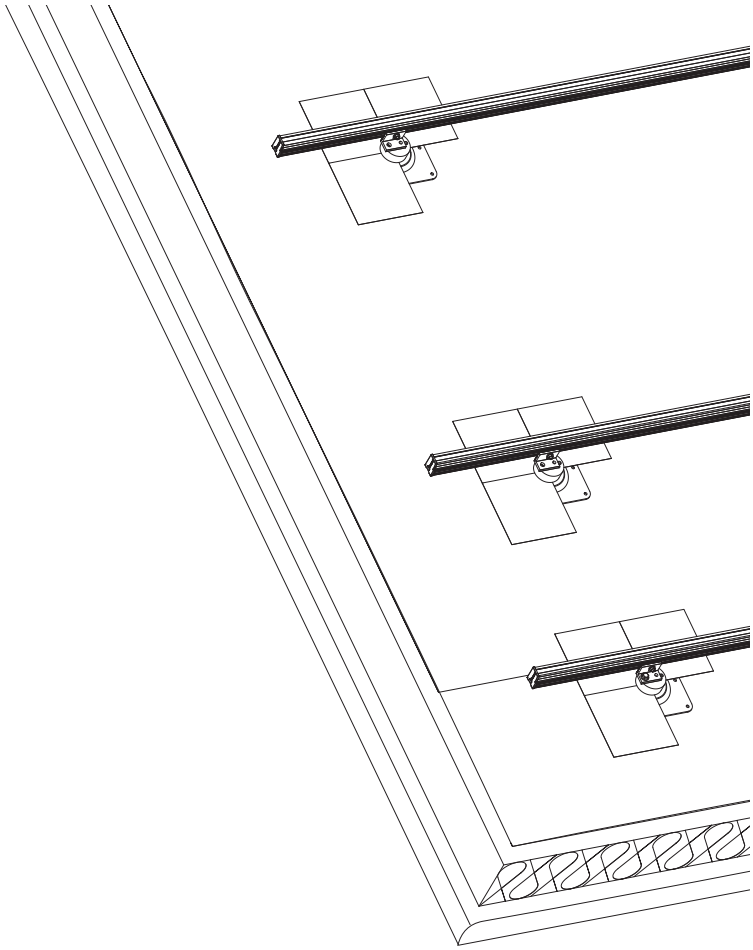



## Connection to alternative fasteners

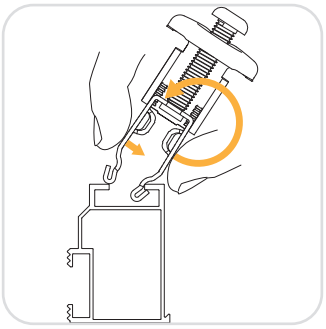


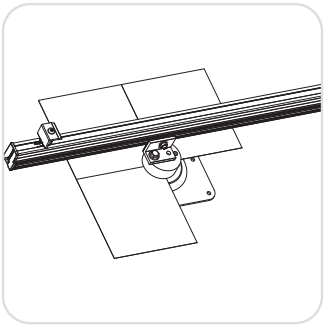



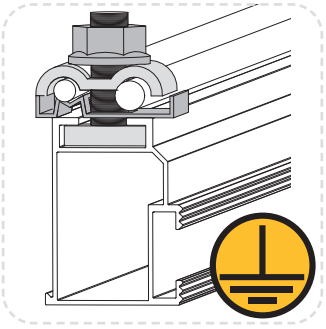


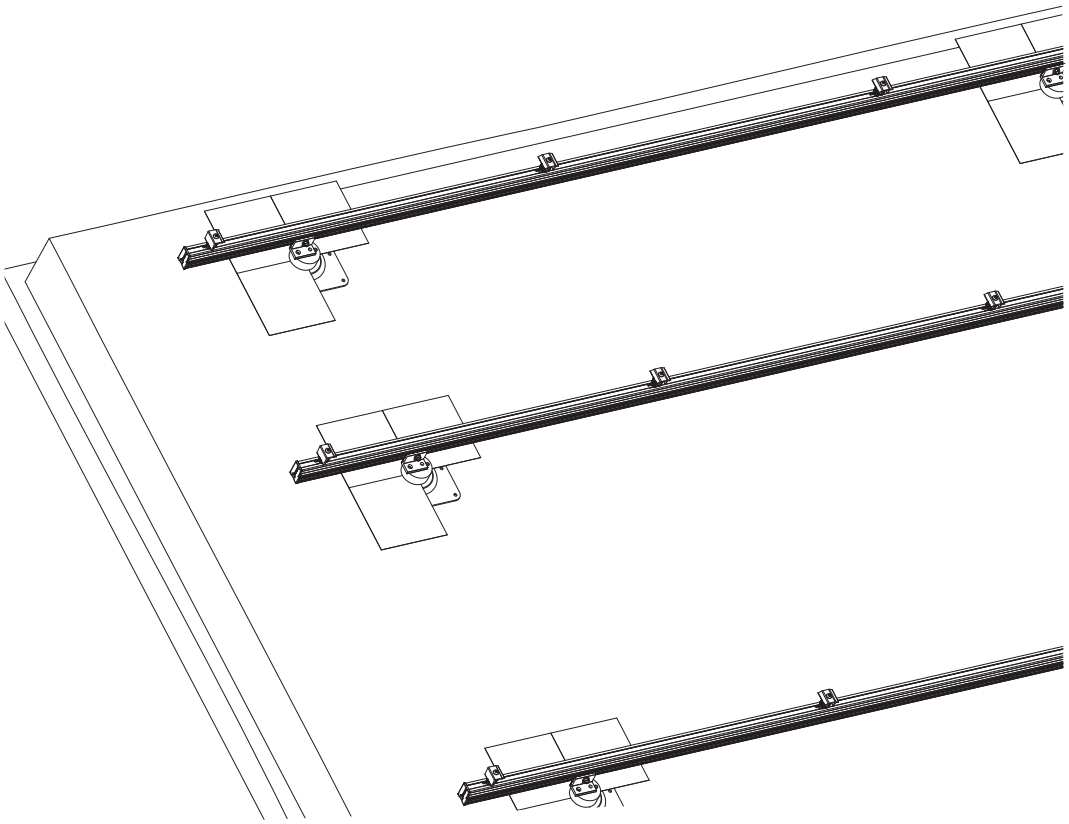


## Connection to alternative fasteners

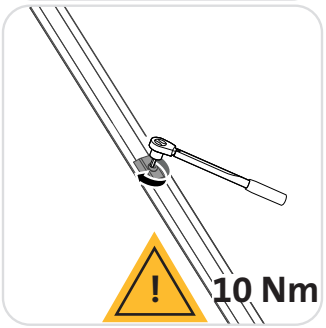


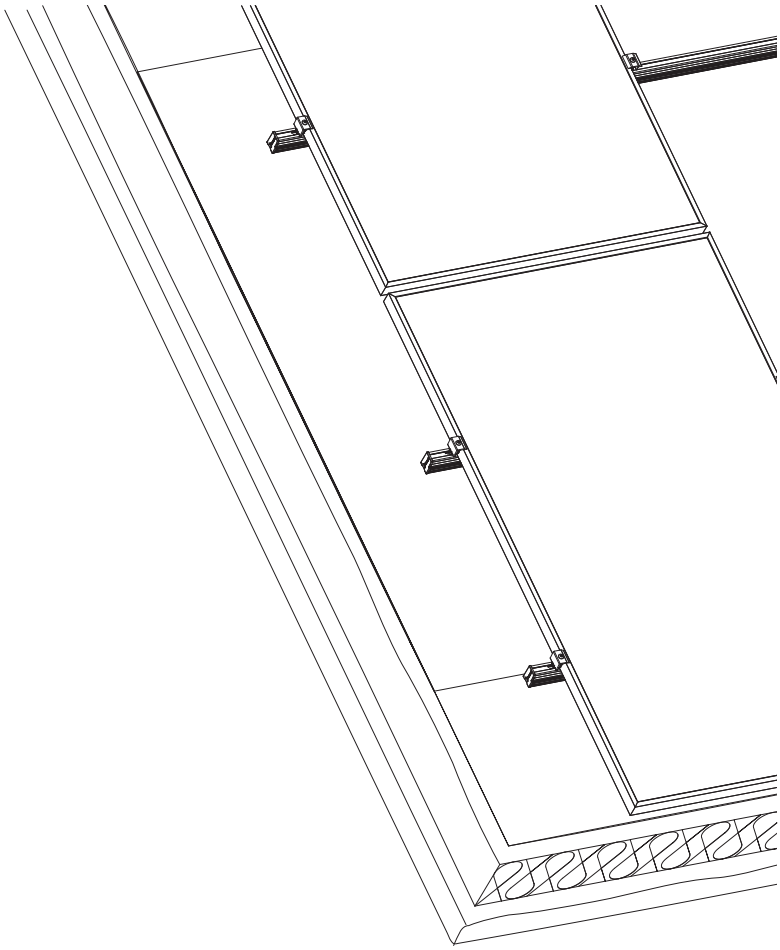




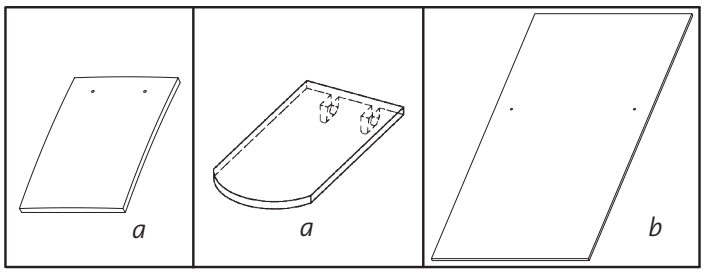
## Connection to alternative fasteners





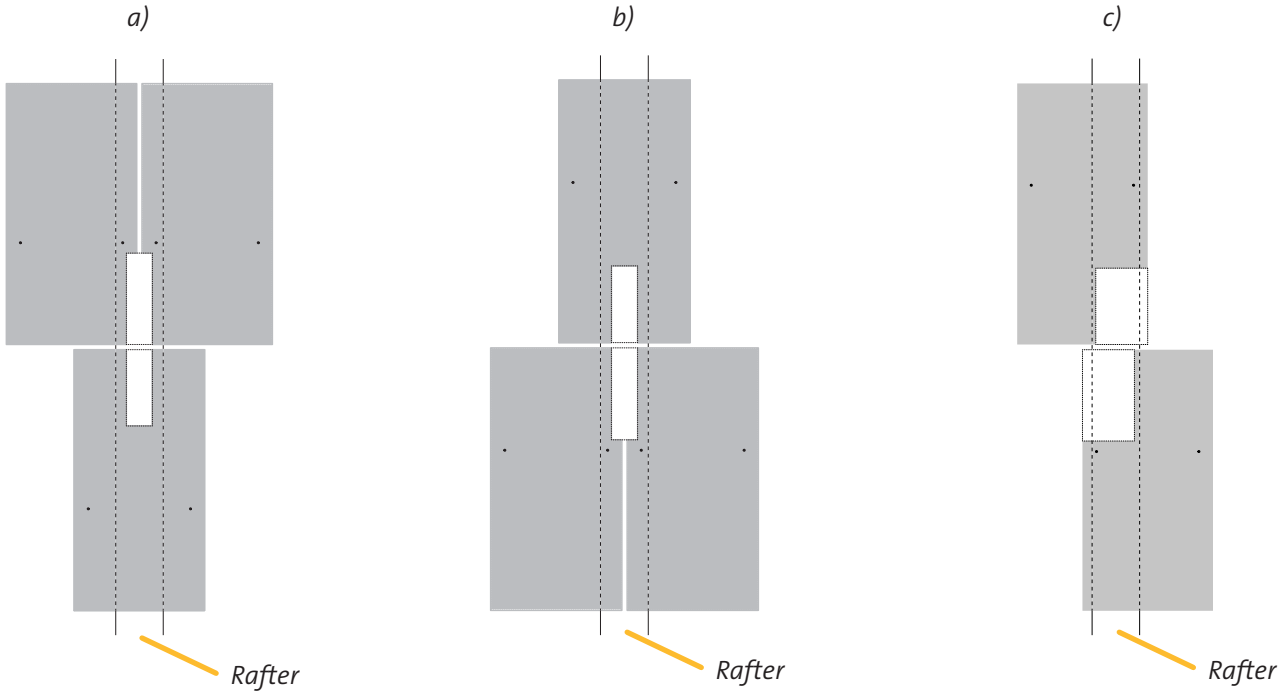
## Annex - flat tile with genius roof solution

**A**

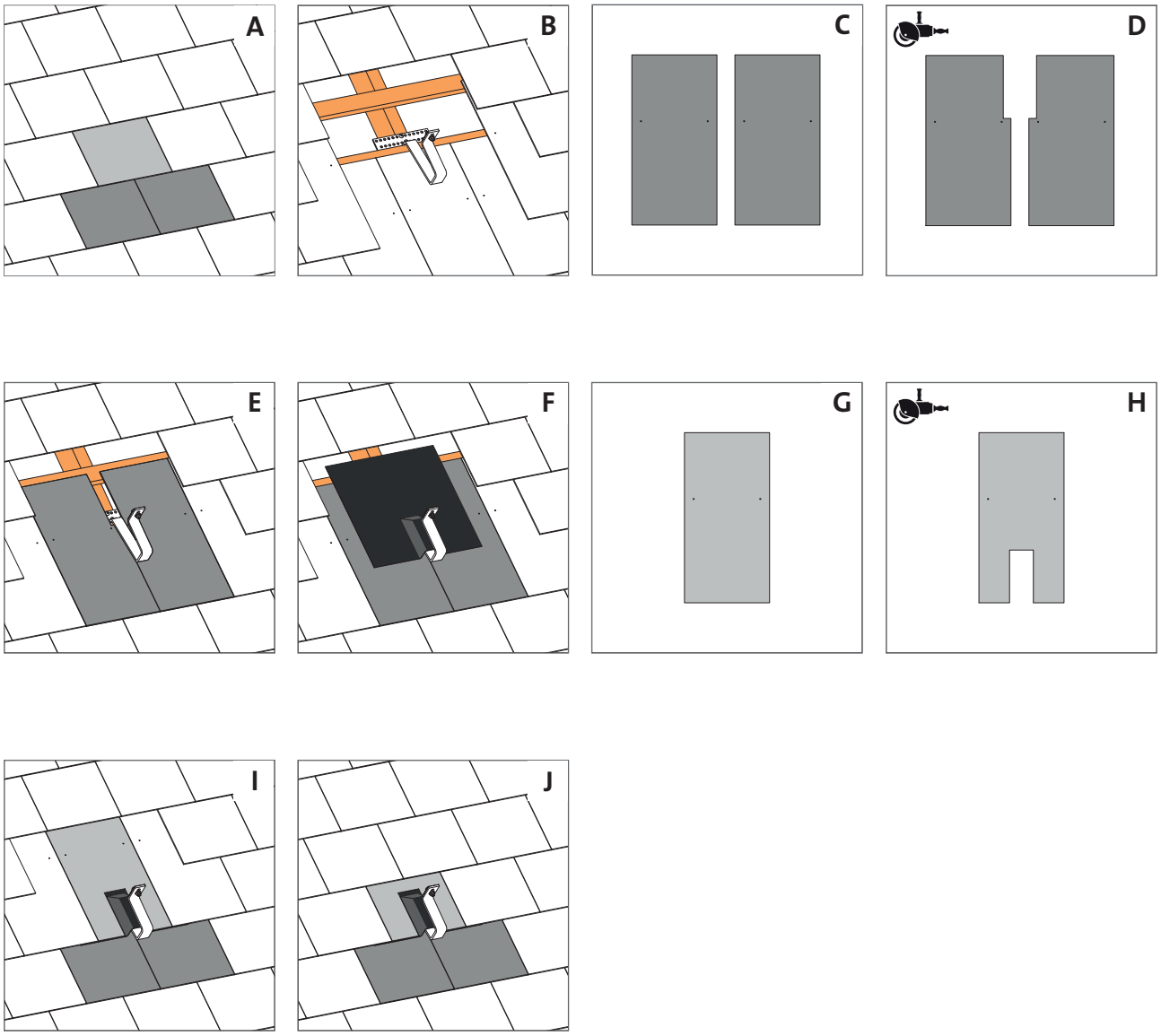



*a Plain Tile*
*b Slate Tile*

**Processing of the bricks**
Use an angle grinder or slate cutter to cut a recess in the tile at the point of insertion of the roof hook, which covers the roof hook so that the tile lies flat. If the roof tiles are grooved, a recess must also be cut in the top of the lower roof tile. Handling from three different positions:



# A

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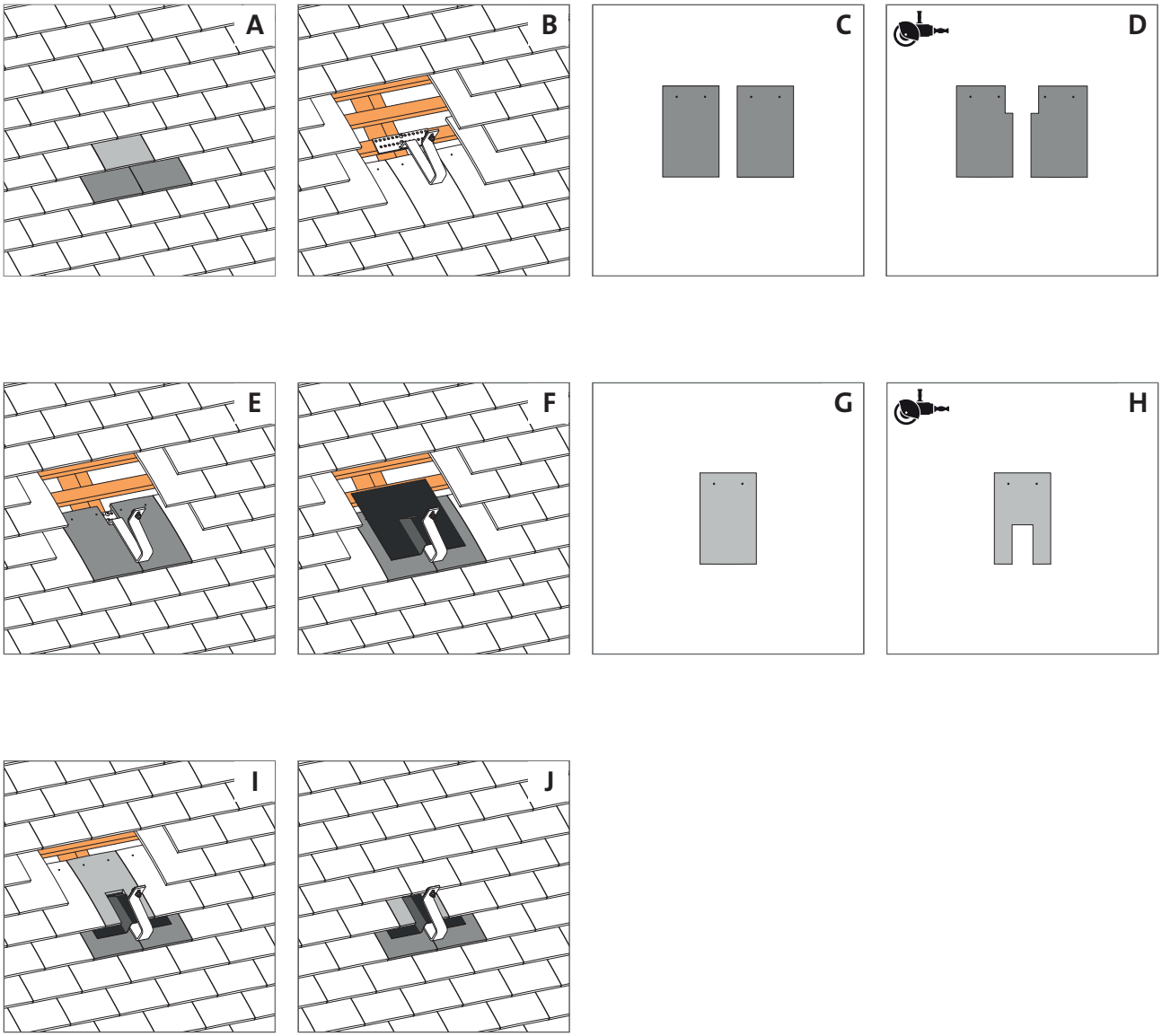
# A

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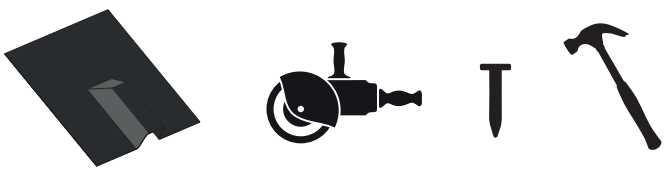
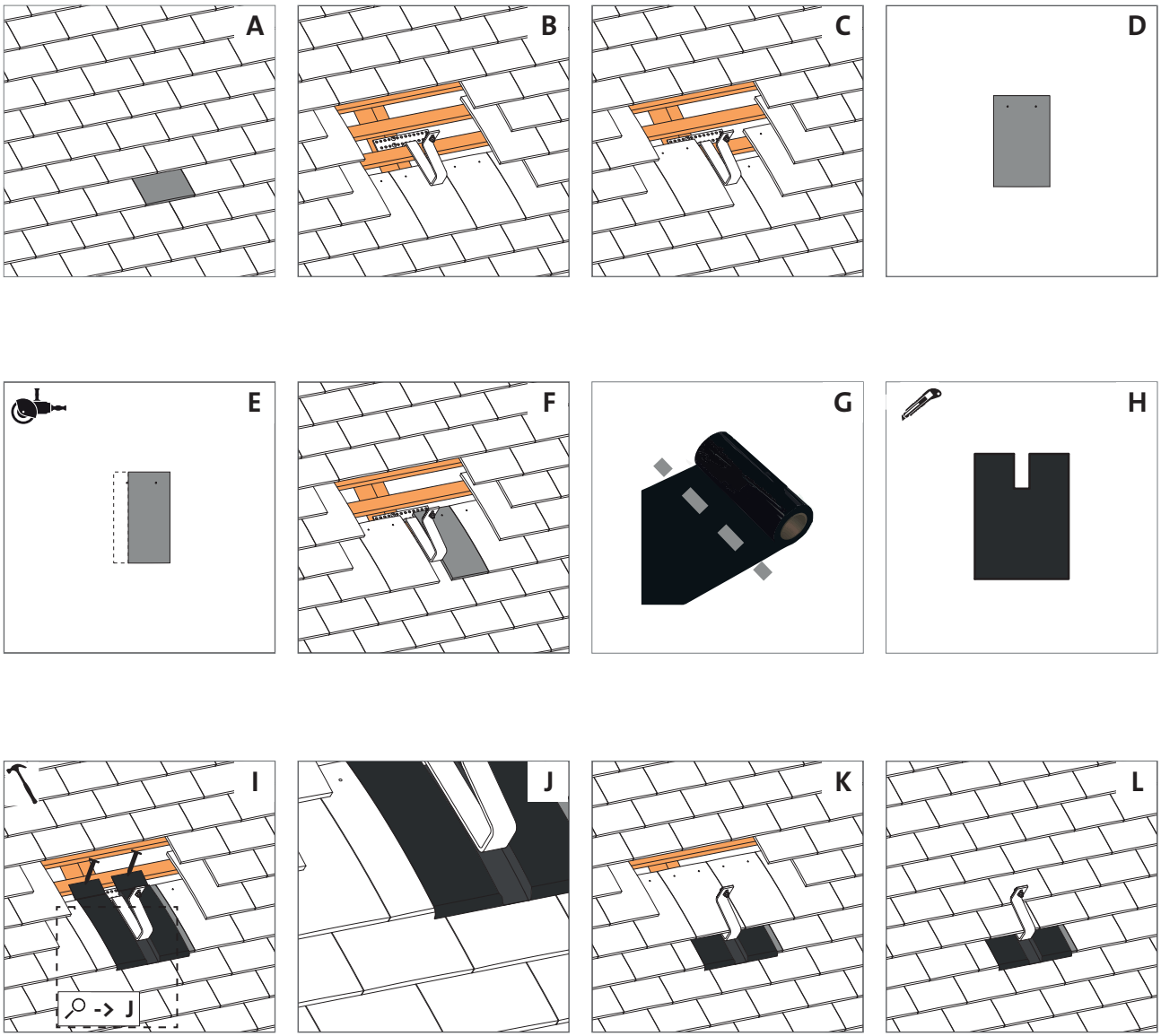


# A

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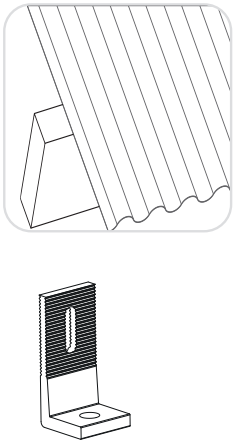
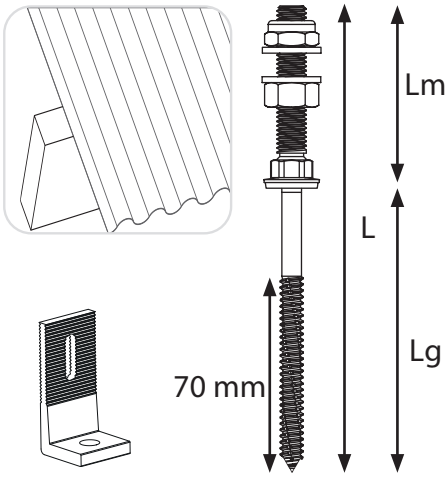
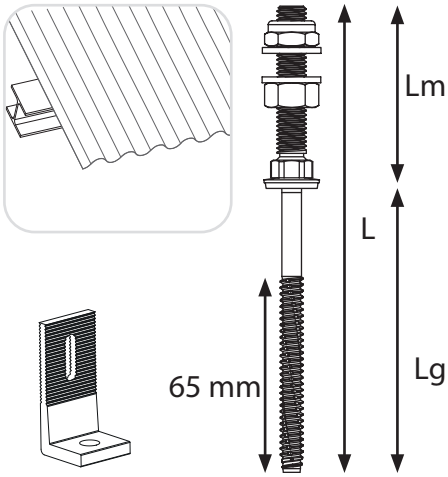
**B**




| | Item No. | a: | b: | c: | |
|---|---|---|---|---|---|
| M10 | 920159 | 160 mm | 71 mm | 65 mm | (Connection offset/ connection) |
| M10 | 860020 | 180 mm | 81 mm | 65 mm | |
| M10 | 920008 | 200 mm | 81 mm | 65 mm | (Connection offset/ connection) |
| M10 | 860006 | 200 mm | 81 mm | 65 mm | |
| M10 | 860022 | 250 mm | 81 mm | 65 mm | (Connection offset/ connection) |
| M10 | 860021 | 250 mm | 81 mm | 65 mm | |
| M12 | 920002 | 250 mm | 91 mm | 100 mm | (Offset connection) |
| M12 | 860007 | 250 mm | 91 mm | 100 mm | |
| M12 | 860017 | 300 mm | 141 mm | 100 mm | |
| M12 | 920136 | 350 mm | 191 mm | 100 mm | |
| M12 | 920137 | 400 mm | 211 mm | 100 mm | |



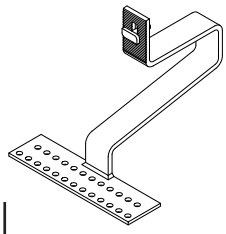

| | Item No. | Lg/Lm: | L | Clamp area |
|---|---|---|---|---|
| M10 | 900187 | 80/50 | 136 mm | 0 - 40 mm |
| M10 | 900188 | 100/50 | 156 mm | 20 - 60 mm |
| M10 | 900189 | 130/50 | 186 mm | 55 - 90 mm |
| M10 | 900190 | 150/50 | 206 mm | 75 - 110 mm |
| M10 | 900191 | 180/50 | 236 mm | 105-140 mm |
| M10 | 900192 | 200/50 | 256 mm | 125 - 160 mm |



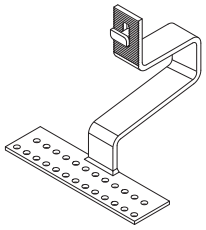

| | Item No. | Lg/Lm: | L | Clamp area |
|---|---|---|---|---|
| M10 | 900181 | 80/50 | 136 mm | 15 - 60 mm |
| M10 | 900182 | 100/50 | 156 mm | 35 - 80 mm |
| M10 | 900183 | 125/50 | 181 mm | 60 - 105 mm |
| M10 | 900184 | 150/50 | 206 mm | 85 - 130 mm |
| M10 | 900185 | 160/50 | 216 mm | 95 -140 mm |
| M10 | 900186 | 200/50 | 256 mm | 135 - 180 mm |

**B**

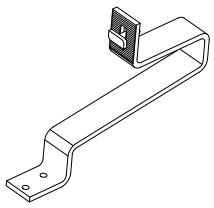
*R420182*
*UK Roof hook,*
*Flexible*



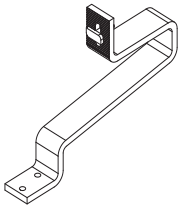
*R420180*
*UK Roof hook,*
*Pantile*



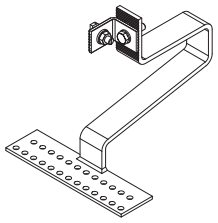
*R420181*
*UK Roof hook,*
*Plain*



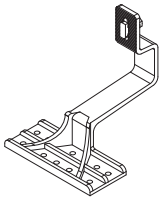
*R420184*
*UK Roof hook,*
*Plain, Heavy Load*



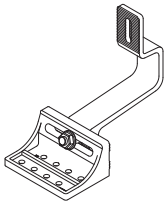
*R420183*
*UK Roof hook 90°,*
*Flexible*



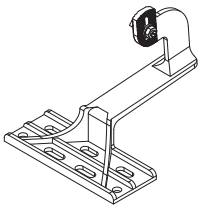
*R420151*
*Roof hook,*
*aluminium, adjustable*



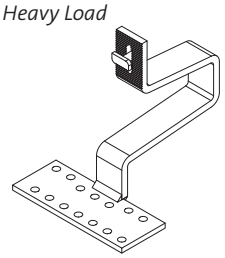
*R420161*
*Roof hook,*
*aluminium, adjustable*



*R920003*
*Roof hook,*
*aluminium, 90°*

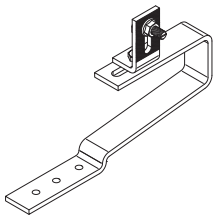


*R420170*
*Roof hook,*
*Heavy Load*

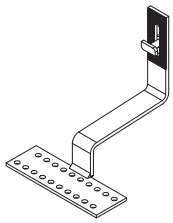


***Galvanised steel as per EN ISO 1461. Suitable for corrosion class C3.***

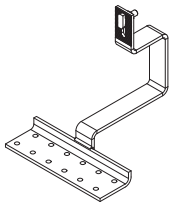
*R420150*
*Roof hooks,*
*On-roof insulation*



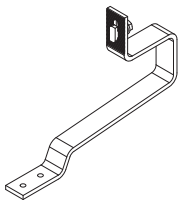
*R420165*
*Roof hook,*
*Eco Basic*



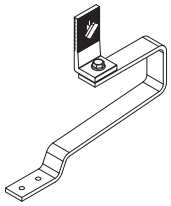
*R420158*
*Roof hook,*
*Stainless steel TP*



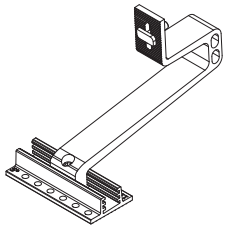
*R420153*
*Plain tile roof hook*



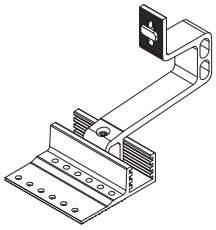
*R420154*
*Plain tile roof hook,*
*90°*



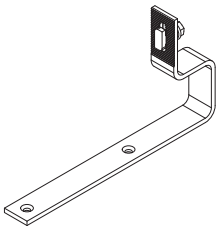
*R420172*
*Roof hook,*
*RH flat*



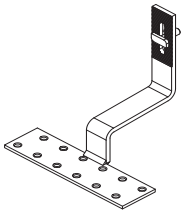
*R420171*
*Roof hook,*
*RH1*



*R420155*
*Slate roof hook*



*R420150*
*Dachhaken,*
*Edelstahl*



*R900050 5x30*

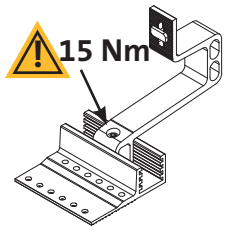
*R900305 6 x 80*

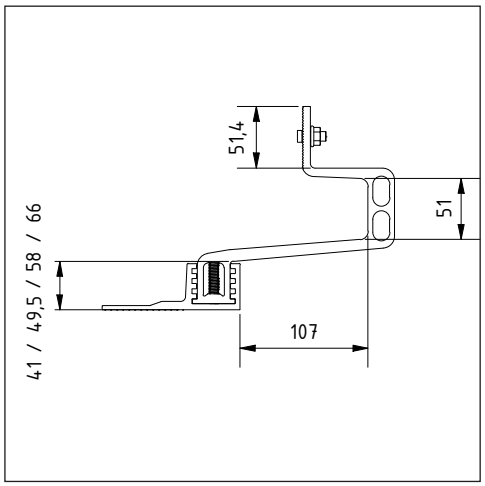
*R900127 6 x 120*
*R900145 6 x 160*
*R900129 8 x 100*

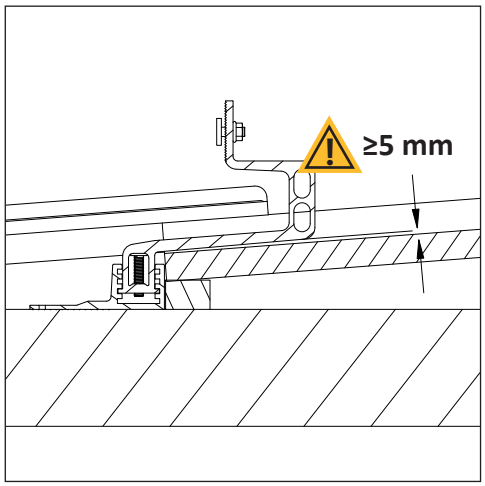
*R900013 6 x 80*

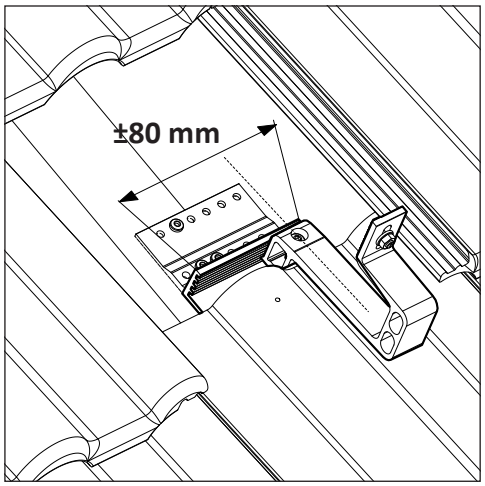
**B**

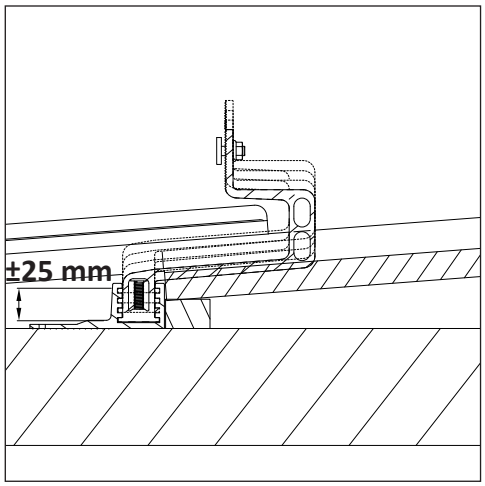
*R420171*
*Roof hook,*
*RH1*



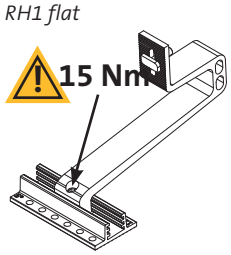



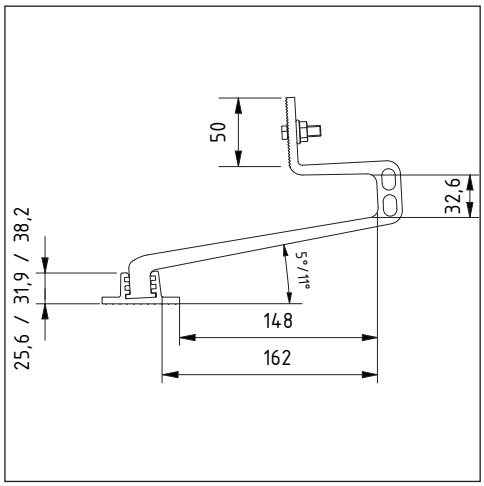



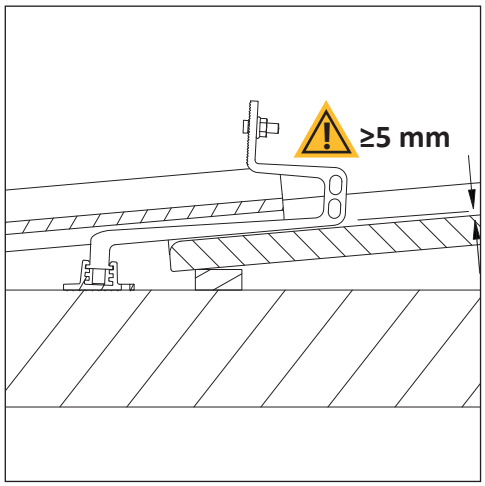



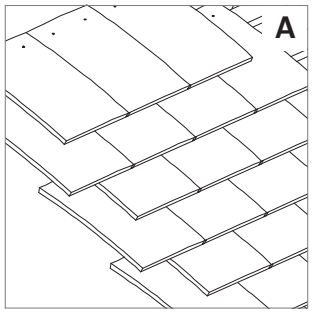
**B**

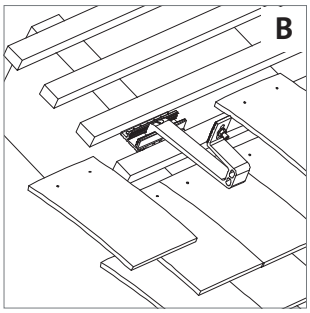
*R420172*
*Roof hook,*
*RH1 flat*

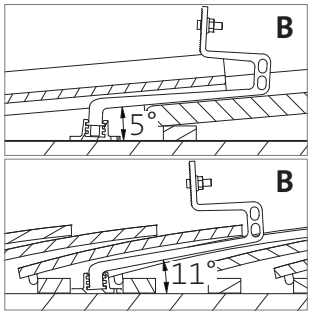


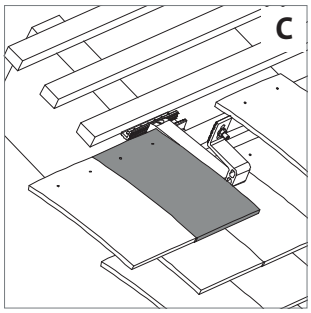



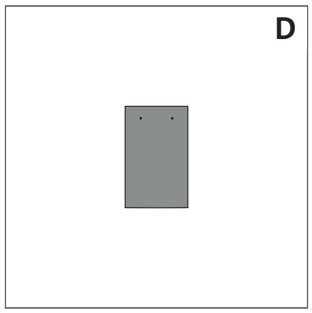



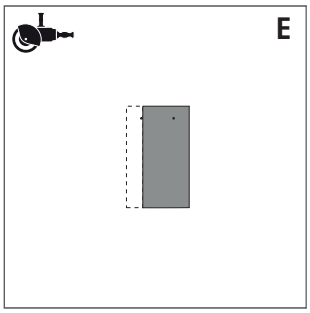



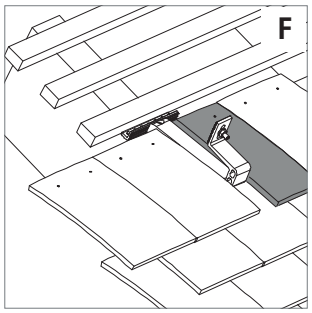



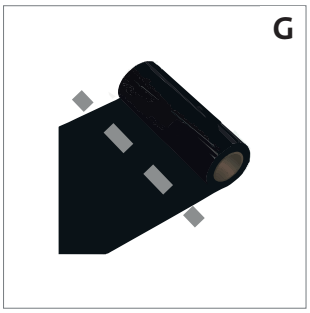



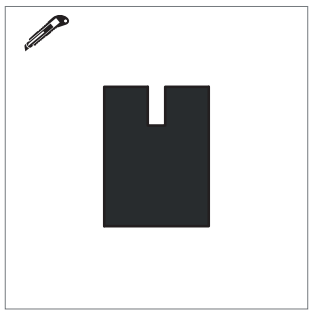



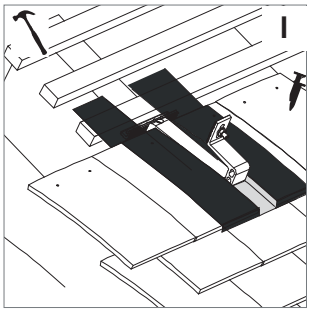



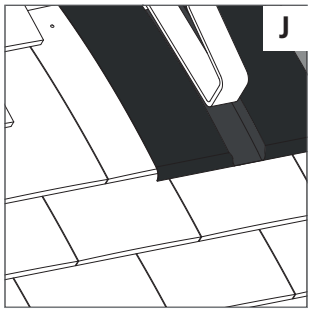



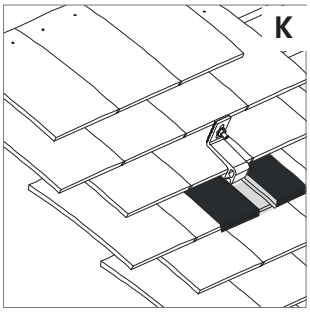





**B**

**1x**

- D Dachhaken
- UK Roof hooks
- F Crochet de toit
- I Staffa
- E Gancho de tejado

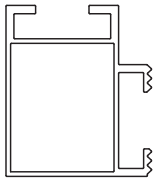
**+ n**

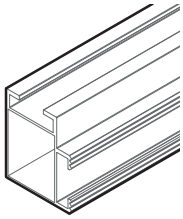
- D Holzschraube
- UK Wood screw
- F Vis a bois
- I Vite da legno
- E Tornillo de madera

| | 900318 | 900013 | 900129 | 900127 | 900145 | 900050 |
|---|---|---|---|---|---|---|
| 420171 | 3x | – | – | 2x | 2x | – |
| 420172 | 2x | – | – | 2x | 2x | – |
| 420151 | 3x | – | – | 2x | 2x | – |
| 420161 | 3x | – | – | 2x | 2x | – |
| 420150 | 3x | – | – | 2x | 2x | – |
| 420153 | 2x | – | – | 2x | 2x | – |
| 420154 | 2x | – | – | 2x | 2x | – |
| 420155 | – | 2x | – | – | – | – |
| 420158 | 3x | | – | 2x | 2x | – |
| 420160 | – | – | – | – | – | 3x |
| 420165 | 3x | – | – | – | – | – |
| 420180 | 2x | – | – | – | – | – |
| 420181 | 2x | – | – | – | – | – |
| 420182 | 2x | – | – | – | – | – |
| 420183 | 2x | – | – | – | – | – |

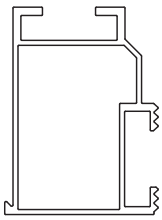
# B

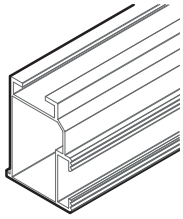
*VS+ mounting rail 41 x 35*



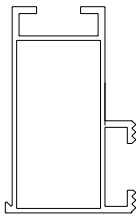


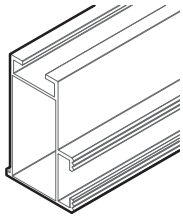
*VS+ mounting rail 50 x 37*



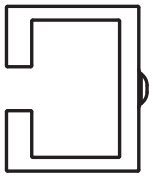


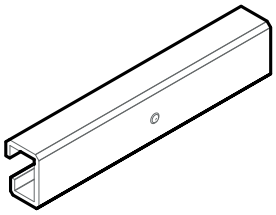
*VS+ mounting rail 60 x 38*



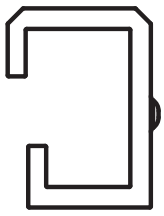


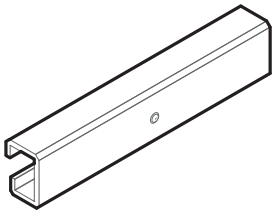
*VS+ rail connector 41 x 35 - R400531*



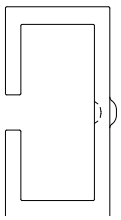


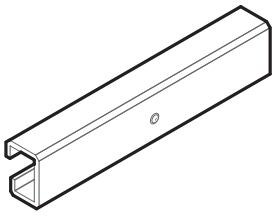
*VS+ rail connector 50 x 37 - R400532*



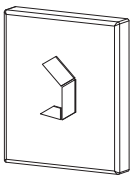


*VS+ rail connector 60 x 38 - R400533*



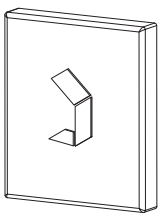


*Cover cap for mounting rail 41 x 35*



| *Item number* | *Colour* |
|---|---|
| *R900245* | *Black* |
| *R900246* | *Blank* |

*Cover cap for mounting rail 50 x 37*



| *Item number* | *Colour* |
|---|---|
| *R920043* | *Black* |
| *R920044* | *Blank* |

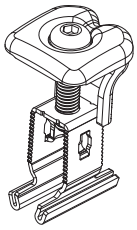
## *Mounting rail*

| *Item number* | *Length* | *Colour* |
|---|---|---|
| *R400523* | *41x35x**2250** mm* | *Blank* |
| *R400523-B* | *41x35x**2250** mm* | *Black* |
| *R400524* | *41x35x**3300** mm* | *Blank* |
| *R400524-B* | *41x35x**3300** mm* | *Black* |
| *R400525* | *41x35x**4400** mm* | *Blank* |
| *R400525-B* | *41x35x**4400** mm* | *Black* |
| *R400513* | *41x35x**6200** mm* | *Blank* |

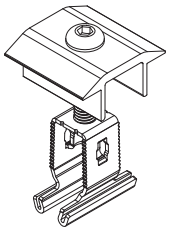
| *Item number* | *Length* | *Colour* |
|---|---|---|
| *R400527* | *50x37x**2250** mm* | *Blank* |
| *R400527-B* | *50x37x**2250** mm* | *Black* |
| *R400528* | *50x37x**3300** mm* | *Blank* |
| *R400528-B* | *50x37x**3300** mm* | *Black* |
| *R400529* | *50x37x**4400** mm* | *Blank* |
| *R400529-B* | *50x37x**4400** mm* | *Black* |
| *R400506* | *50x37x**6200** mm* | *Blank* |

| *Item number* | *Length* | *Colour* |
|---|---|---|
| *R400535* | *60x38x**3300** mm* | *Blank* |

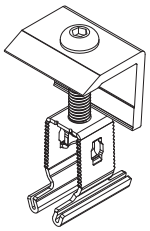
*R420080/ R420080-BE*
*RS1 middle/ end clamp*



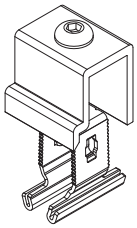
*R420081/ R420081-BE*
*End clamp +*



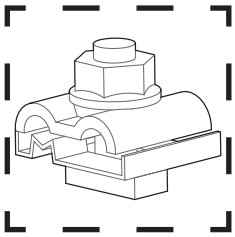
*R420082/ R420082-BE*
*Middle clamp +*



*R420083/ R420083-BE*
*Cross rail connector+*

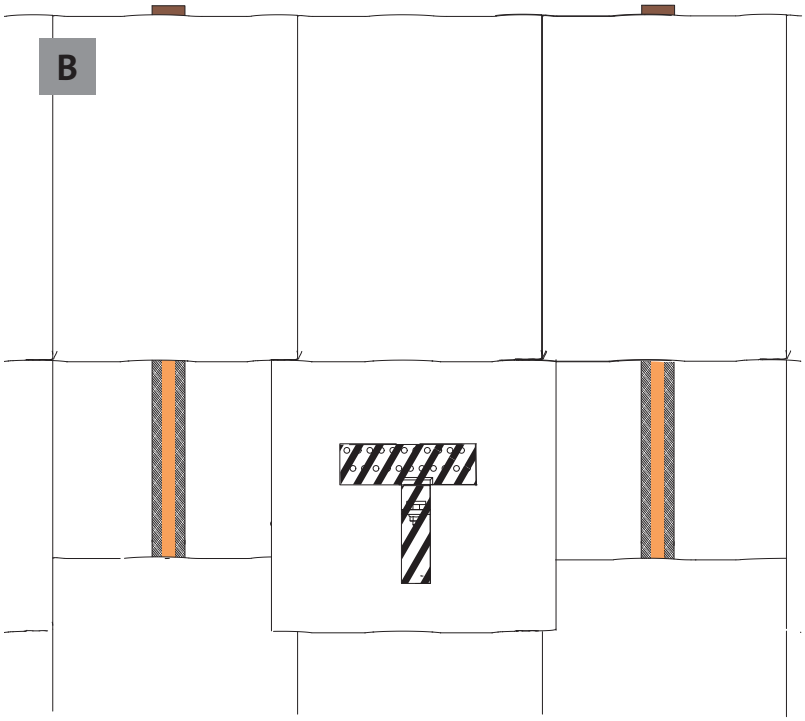


*R900241*
*UNI earth clamp*

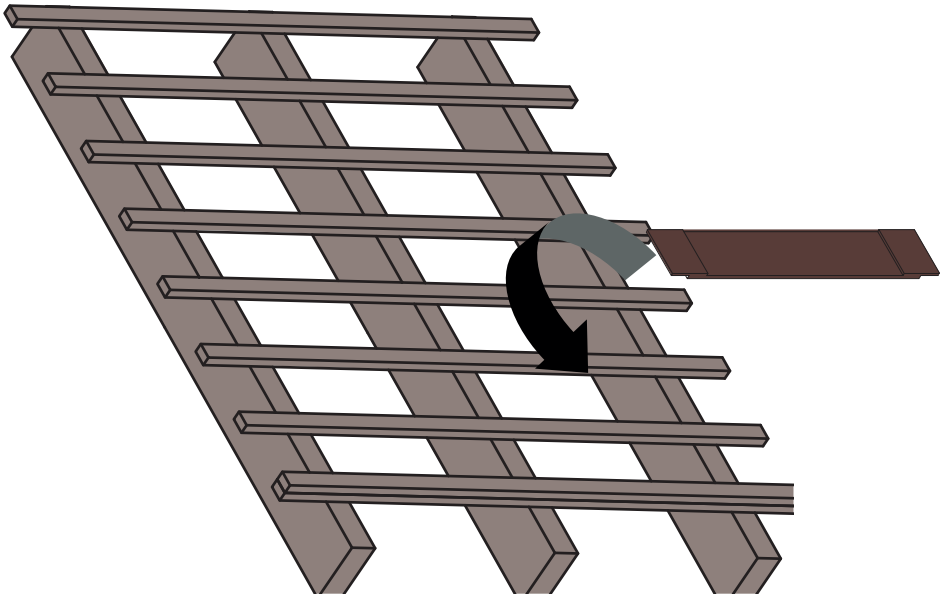


C

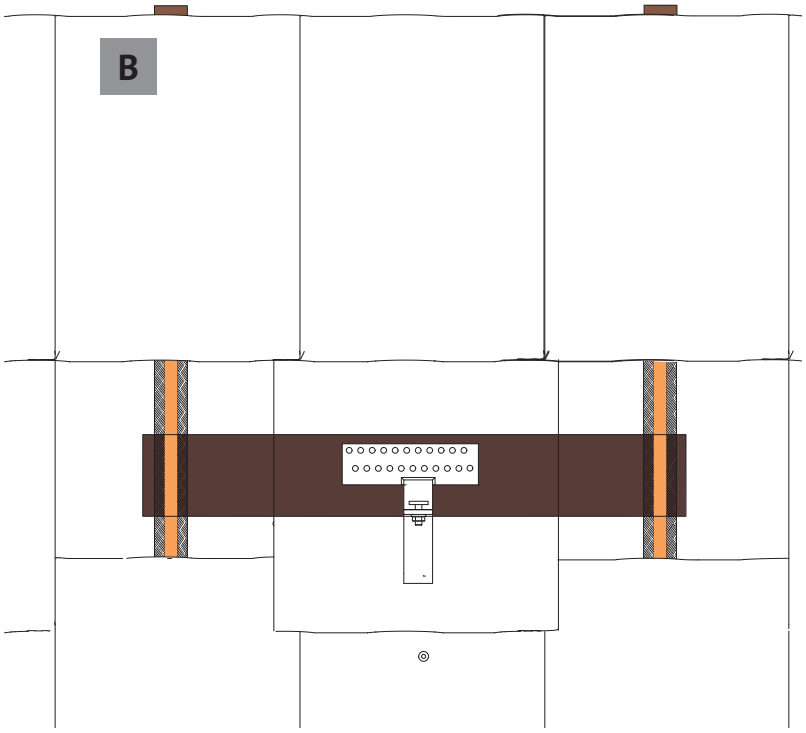
B



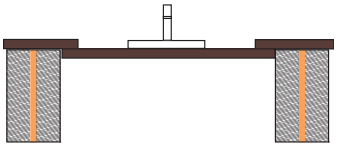
B



**C**





**B**