

# Q.MOUNT INSTALLATION INSTRUCTIONS CORRUGATED SHEET METAL BRIDGE HORIZONTAL/VERTICAL



Please carefully read the safety information contained in these installation instructions before starting the installation. Ensure that you are using the current installation instructions before starting the installation.

The design and planning of the mounting system should be carried out using the Q CELLS ROOFTOP PLANNER software. Please refer to the project report you receive from Q CELLS ROOFTOP PLANNER or from your Q CELLS Q.PARTNER for details of the required materials, positions and the arrangement of the individual components. This data is statically calculated and is of great importance for the safe and proper functioning of the system.

Before installation, the manufacturer of the photovoltaic system must ensure that the given roof substructure is designed for the additional loads that will occur. To check this, contact structural engineers directly on site. Each photovoltaic system must be installed in accordance with the structural requirements of the location and the installation situation, taking into account the specifications of the existing installation recommendation.

These installation instructions explain the installation procedures for the Q.MOUNT corrugated sheet metal bridges, their attachment to the roof substructure and the installation of the girder profiles and modules.

The corrugated sheet metal bridges must always be fixed to the stable roof substructure.

Normally, the PV modules are mounted in portrait format so that the mounting profiles are parallel to the ridge. Two mounting profiles per module row are used as standard. In strong wind and/or snow loads, a third mounting profile may have to be used.

The Q.MOUNT corrugated sheet metal bridge system is exclusively designed for PV modules. Any other use is considered improper.

The installation may only be carried out by trained specialists. In particular, work on the roofing should be carried out by a roofer.

If you have any further questions, take advantage of the professional and comprehensive consulting service offered by Q CELLS. Our expert civil engineers and construction technicians will be pleased to help you.

You should follow these instructions exactly for all work on the PV system. Installation, commissioning, maintenance and repair may only be carried out by appropriately qualified and authorised personnel.

Please observe the valid regulations and safety instructions.

### You must comply with these accident prevention regulations:

- BGV A 1 – General regulations
- BGV A 3 – Electrical installations and equipment
- BGV C 22 – Construction work (personal protective equipment against falls from a height)
- BGV D 36 – Ladders and steps
- Employer's liability insurance association rules for safety and health at work BGR 203 (roof work) and DIN EN 516 Equipment for walking on roofs
- Work clothing and work safety regulations in accordance with the regulations of the professional association

### You must comply with the following DIN standards:

- DIN 18299 – General regulations for construction works of any kind
- DIN 18338 – Roofing and roof sealing works
- DIN 18360 – Metal construction work, locksmith work
- DIN 4102 – Fire behaviour of building materials and components



Work on the systems may only be carried out by authorised personnel. The operator of the system has the following safety-related obligations:

We assume that at least once a year an inspection and maintenance of the installed pitched roof system components and the roof cladding is carried out. At least the following points should be checked:

- all mechanical connections for correct fit and strength
- the position of the system on the roof and the system itself with regard to deformations
- the cabling must be checked for integrity
- the PV modules must be checked for damage
- The assembly of the frame may only be carried out by personnel with appropriate qualifications, manual skills and basic knowledge of mechanics.
- It must be ensured that the assigned personnel are able to assess the work assigned to them and identify possible hazards.
- The installation instructions are part of the product and must be available during assembly.
- It must be ensured that the installation instructions – and in particular the safety instructions – are read and understood by the assigned personnel prior to assembly.
- The regulations of the employer's liability insurance association, the local industrial safety regulations and the rules of technology must be observed.
- Suitable lifting equipment and ladders must be used for the installation. No lean-to ladders may be used.
- It is necessary to have the existing building statics checked by a competent civil engineer with regard to the additional loads from a PV system.
- Possible general load limitations imposed by Hanwha Q CELLS GmbH (e.g. the necessity of snow removal to limit the snow load) must be taken into account.



## WARRANTY/PRODUCT LIABILITY (EXCLUSION)

The dimensioning notes contained in this manual are merely practical tips. Binding assembly rack statics can be created using the program **Q CELLS ROOFTOP PLANNER**.

As an installation company, you are responsible for the correct execution of the installation. **Hanwha Q CELLS GmbH** is not liable for the dimensioning information contained in commercial plant quotations.



As an installation company, you are responsible for the mechanical durability of the mounted interface connections on the building envelope, and especially for their tightness.

The components supplied by **Hanwha Q CELLS GmbH** are designed for this purpose in accordance with the expected loads and the current state of the art. In this context, you must specify all general technical conditions in writing in the project registration form (details of the supporting structure, snow load zone, building heights, wind loads, etc.) within the framework of the inquiry/order sent to **Hanwha Q CELLS GmbH**.

**Hanwha Q CELLS GmbH** is not liable for improper handling of the installed parts.

Use of the components near the sea is not permitted due to the risk of corrosion.

If handled properly and dimensioned in accordance with the static framework conditions and normal environmental and ambient conditions, **Hanwha Q CELLS GmbH** provides a 2-year product warranty for the service life and durability of its mounting systems. This applies in the context of the generally prevailing weather and environmental conditions.

Material and processing warranty: **Hanwha Q CELLS GmbH** provides a material and processing warranty of 10 years for the materials used. For more detailed information, please refer to the separate warranty conditions.



## NOTES ON ELECTRICAL INSTALLATION

You may only carry out electrical work if you are a qualified electrician. The applicable DIN standards, VDE regulations, VDEW guidelines, VDN guidelines, accident prevention regulations and the regulations of the local electricity supply companies (EVU) are decisive in this context.

- DIN VDE 0100 (Erection of power installations with nominal voltages up to 1000 V)
- VDEW guideline for the parallel operation of in-house generation plants on the low-voltage grid of the power supply company
- VDI 6012 Guideline for decentralised energy systems in buildings: Photovoltaics
- Leaflet on the VDEW Guideline "Distributed power generating plants connected to the low-voltage grid"
- VDN guideline "Distributed power generating plants connected to the low-voltage grid"
- DIN/VDE regulations, DIN/VDE 0100 "Erection of power installations with rated voltages up to 1000 V", in particular VDE 0100 Part 410 "Protection against direct and indirect contact" (DC voltages > 120 V, < 1000 V DC) and the "Accident prevention regulations of the industrial employers' liability insurance associations" VBG4 "Electrical installations and operating equipment"
- DIN VDE 0100-540 Selection and installation – Earthing, protective conductors and equipotential bonding conductors
- VDE 0185 Establishment of a lightning protection system and VDS 2010



Solar modules generate electricity as soon as they are exposed to light, so they are always live. Although the fully insulated plug contacts provide protection against accidental contact, you must pay attention to the following when handling the solar modules:

- Do not insert electrically conductive parts into the plugs and sockets.
- Do not mount solar modules and cables with wet plugs and sockets.
- Perform all work on the lines with extreme caution.
- Do not carry out any electrical installation work in damp conditions.
- Even with low illumination, very high direct voltages are generated at the series connection of solar modules, which are life-threatening if touched. Pay particular attention to the possibility of secondary damage from electric shock. DIN VDE 0100-540 Selection and erection of electrical equipment - Earthing arrangements and protective conductors.



High contact voltages can occur in the inverter even when it is disconnected:

- Be especially careful when working on the inverter and the cables.
- After switching off the inverter and carrying out other work, it is essential to observe the time intervals specified by the manufacturer to allow the high-voltage components to discharge.
- Please also observe the installation instructions provided by the inverter manufacturer.



Opening a closed string (e.g. when disconnecting the DC line from the inverter under load) can cause a lethal electric arc:

- Never disconnect the solar generator from the inverter while it is connected to the grid.

## NOTES ON RACK INSTALLATION



For installation in the roof area, you must observe the currently valid rules of construction engineering, in particular the requirements formulated in the DIN standards and in the regulations of the German roofing trade ("Regelwerk des Deutschen Dachdeckerhandwerks").

- Check that all screw connections are tight.
- Observe the specified torques.
- Irrespective of verifiable statics, you must ensure in advance of each installation that the product meets the static requirements on site in accordance with DIN EN 1991.
- DIN standard EN 1991 "Actions on structures" – and all related national application documents  
Part 1-1: Weights, dead weight and payloads in building construction  
Part 1-3: Snow loads  
Part 1-4: Wind loads
- DIN standard EN 1990: "Basis of structural design" – and all related national application documents.
- The design of the assembly rack is carried out in accordance with DIN EN 1993 "Design of steel structures" and DIN EN 1999 "Design of aluminium structures".
- Ensure that the substructure is suitable in terms of load-bearing capacity (dimensioning, state of preservation, suitable material characteristics), load-bearing structure and other layers affected by this (e.g. insulation layer).
- Make sure that the drainage of rainwater is not hindered.
- Take into account aspects of building physics (e.g. possible condensation when penetrating insulation layers).



## STANDARDS AND GUIDELINES

All listed standards and guidelines have been issued and are applicable in Germany. They must be taken into account by referring to the latest valid version as amended. Outside Germany, please also observe the relevant national standards and guidelines.

## PRODUCT LIABILITY

The technical documentation is part of the product. Hanwha Q CELLS GmbH is not liable for damages resulting from non-observance of the installation instructions, in particular the safety information, and/or from misuse of the products.

# REQUIRED TOOLS



Cordless screwdriver with bits, WS8, hexagon 6



Torque wrench



Measuring tape



Chalk line

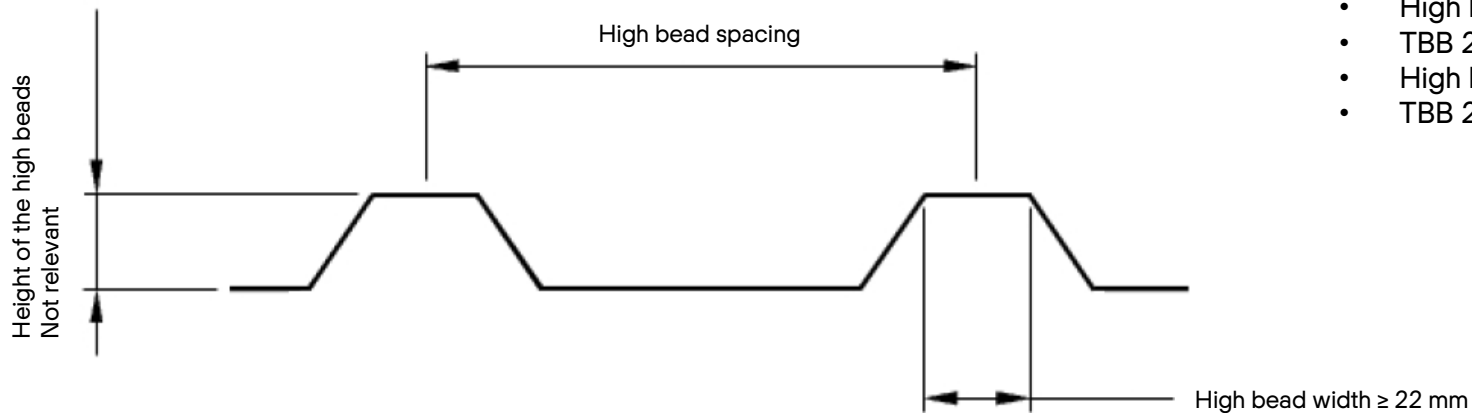


Spirit level

- Roof pitch: 5°–35°
- Minimum sheet thickness, aluminium: 0.5 mm
- Minimum sheet thickness, steel: 0.4 mm
- Minimum width of the high bead: 22 mm (25 mm recommended)
- Use: corrugated sheet metal plate
- Module type: framed modules
- Module orientation: vertical/portrait
- Max. module field length: 12 m
- Connection: thin sheet metal screws
- Material: aluminium EN AW-6063/stainless steel/EPC
- Surface: plate-finished

## General requirements for the installation of corrugated sheet metal components

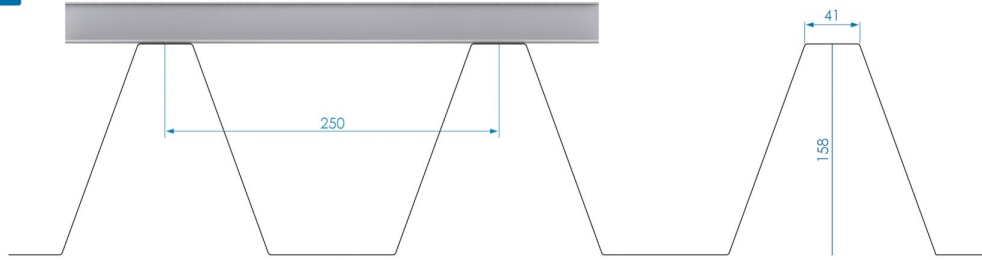
- The high bead width should be at least 22 mm for all corrugated sheet metal components. The best and simplest installation starts with a high bead width of 25 mm.
- The high bead spacing is only relevant for the selection of the corrugated sheet metal bridge 2.1 S (L = 250 mm) or TBB 2.1 (L = 400 mm).
- The height of the high bead is not relevant for the installation of the corrugated sheet metal components.
- After a maximum module field length of 12 m, thermal separation of the substructure parts must take place.



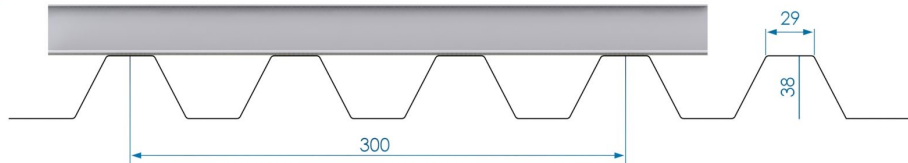
- High bead spacing 100–333 mm:
- TBB 2.1 (L = 400 mm)/TBB PLUS (L = 400 mm)
- High bead spacing 100–207 mm:
- TBB 2.1 S (L = 250 mm)

# CORRUGATED SHEET METAL PLATE TYPES, EXPLANATION OF NAMES

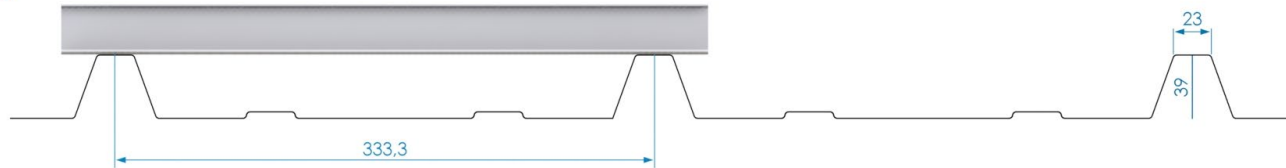
158/250



38/300



39/333,3







Q.MOUNT  
corrugated sheet metal  
bridge 2.1 (400 mm)

20004774



Q.MOUNT  
corrugated sheet metal  
bridge 2.1 S (250 mm)

20004786



Q.MOUNT  
Click middle clamp

20005060



Q.MOUNT  
Click terminal clamp

20005860



Q.MOUNT  
Click middle clamp with  
PIN

20005080



Q.MOUNT  
Click terminal clamp  
with PIN

20005861



Q.MOUNT  
corrugated sheet metal  
bridge plus 400 mm

20005198



Q.MOUNT wire clamp  
8-10

20005061



Q.MOUNT  
Round wire 8 mm / 148 m

20005064



## PRODUCT DETAILS

### Applications

Attachment of components and holding elements for PV systems to thin-walled metal profiles:

- » Bolting of corrugated sheet metal shoes, clamping roof holders (clips) or pre-punched retaining strips to thin-walled steel substructures (e.g. profiled sheets)
- » Attachment of wind deflector plates to profile elements

### Features

- » Stainless steel A2 with hardened steel tip
- » Sealing washer made of stainless steel
- » Pre-assembled, captive sealing washer
- » Non-slip attachment
- » Non-cutting screw connection
- » Very good holding properties

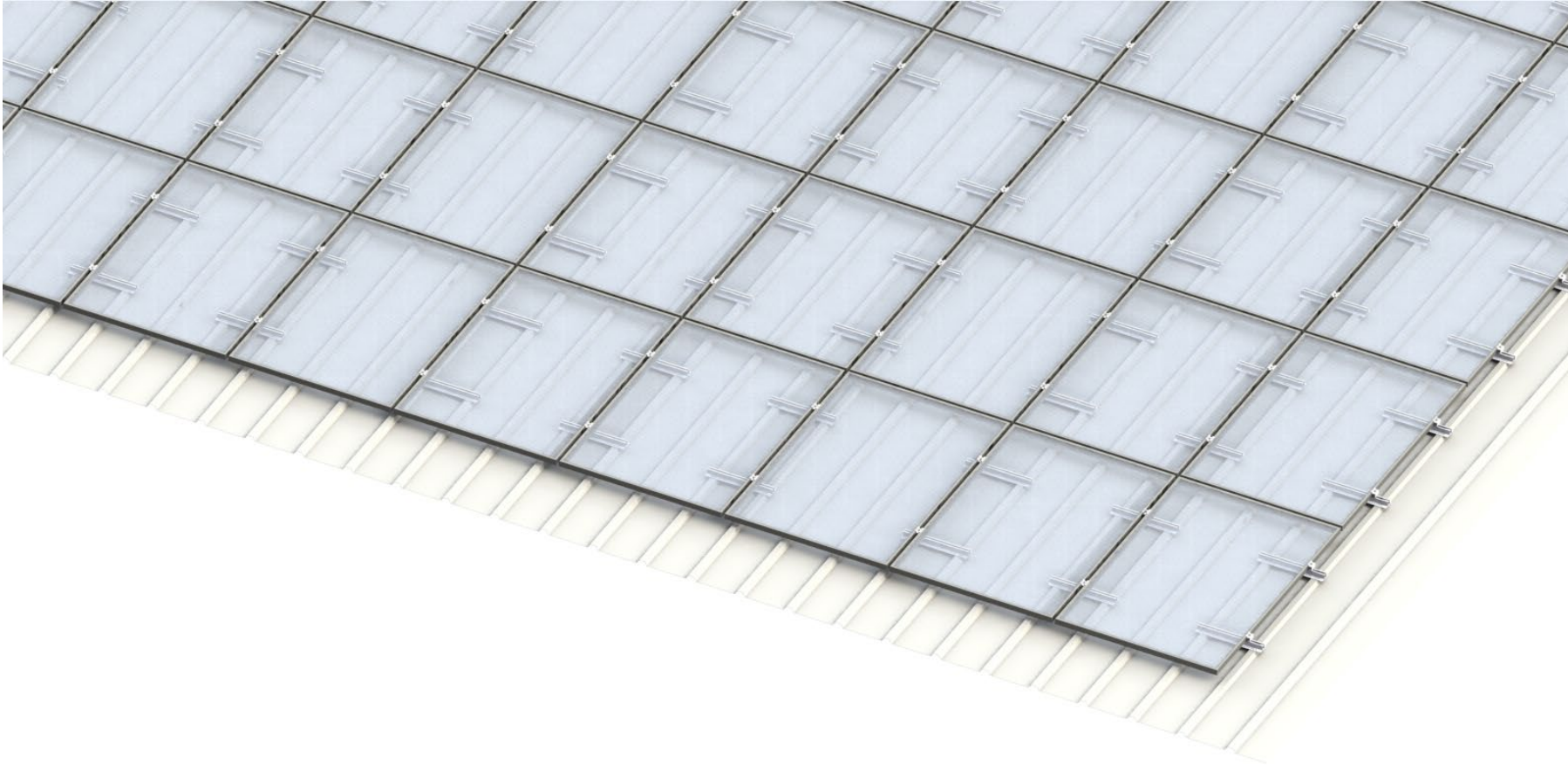
### Technical data

- » Diameter: 5.5 mm
- » Drilling capacity  $t_1 + t_2$ : 1.0 + 1.0 mm
- » Drive: hexagon SW8
- » Screw-in speed: max. 1800 1/min

Q.MOUNT self-drilling screw / thin-metal-sheet screw E16	Q.MOUNT self-dri.screw/thin-metal-sheet E16
SAP#	20004787
Self-drilling screw / thin sheet metal screw 5.5 x 25 with sealing washer E16 JF3-2-5.5x25 E16 hardened steel tip; incl. sealing washer: D=16; non-cutting, self-tapping for sheet steel; drive SW8	<b>Q.MOUNT Self-dri.screw/thin-metal-sheet E16</b>
DRAWING NUMBER: MATERIAL: WEIGHT: PACKAGING UNIT:	800649-1 A2-70 with hardened steel point 0.870 kg/100 pcs. 100 pcs.



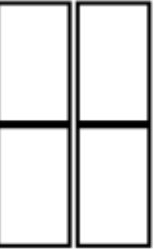
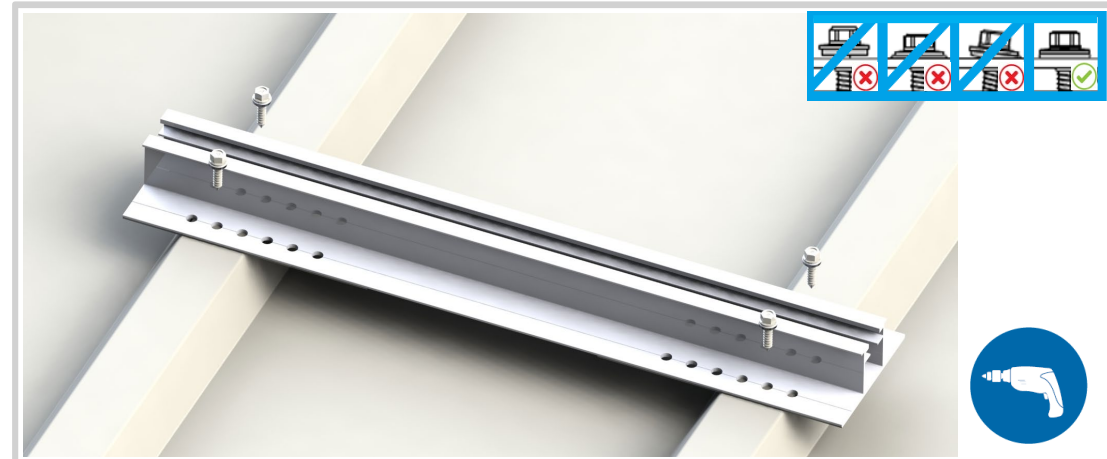
# CORRUGATED SHEET METAL BRIDGE, VERTICAL MODULE



**Note:**

For the clamping ranges and the resulting loads, please refer to the installation instructions for the solar modules being installed.

# NOTES ON THE THIN SHEET METAL SCREWS



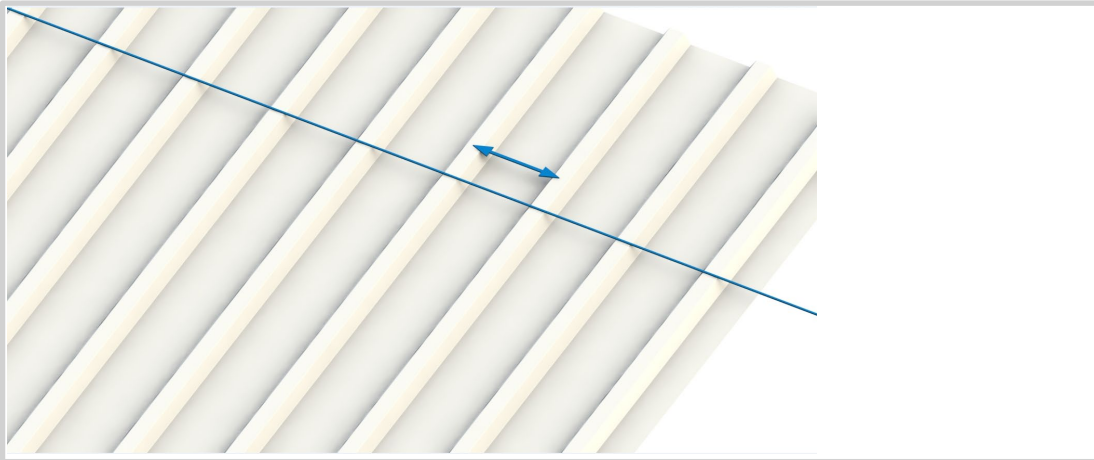
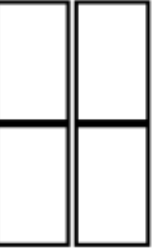
Screw the corrugated sheet metal bridge with 4 thin sheet metal screws centrally on two high beads. Make sure that the EPDM gaskets under the corrugated sheet metal bridge and under the sealing washer of the thin sheet metal screw are not compressed by more than 50 %. Also ensure that the thin sheet metal screws are screwed in correctly.



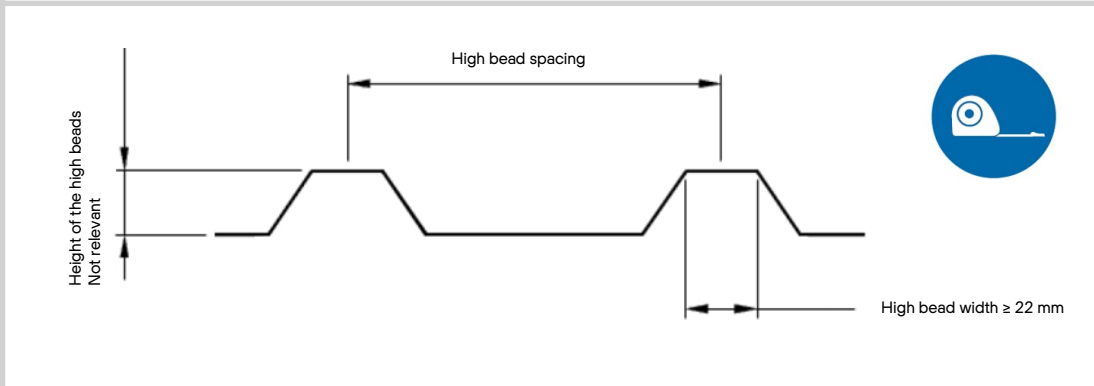
Place each screw with the tip in the centre of the hole in the rail base and screw it in slowly. Depending on the material (steel, aluminium) and the thickness of the sheet metal, the screw must be pressed firmly until the tip penetrates. Then immediately reduce the speed and the contact pressure and slowly screw in further until the rail base rests on the roof and resistance occurs.

Screw the corrugated sheet metal bridge with 4 thin sheet metal screws slowly onto the high beads, in a controlled manner and with low torque, so as not to overtighten the screw or destroy the sheet metal. Continue to screw in the screws only until the EPDM sheet under the rail is reduced to approx. 50 % of its original thickness. Further rotations will not increase the strength of the connection, but only the risk of failure.

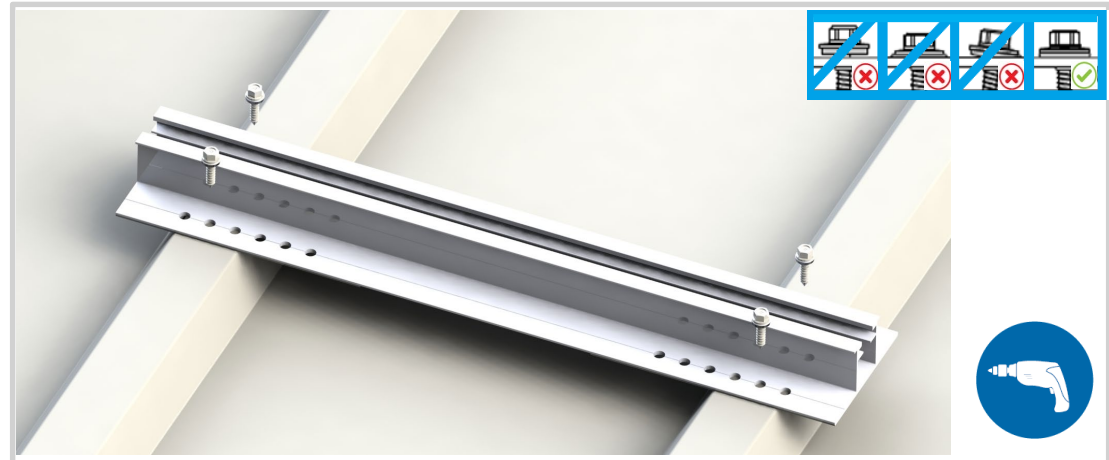
# MEASURE THE HIGH BEAD AND ATTACH THE CORRUGATED SHEET METAL BRIDGE



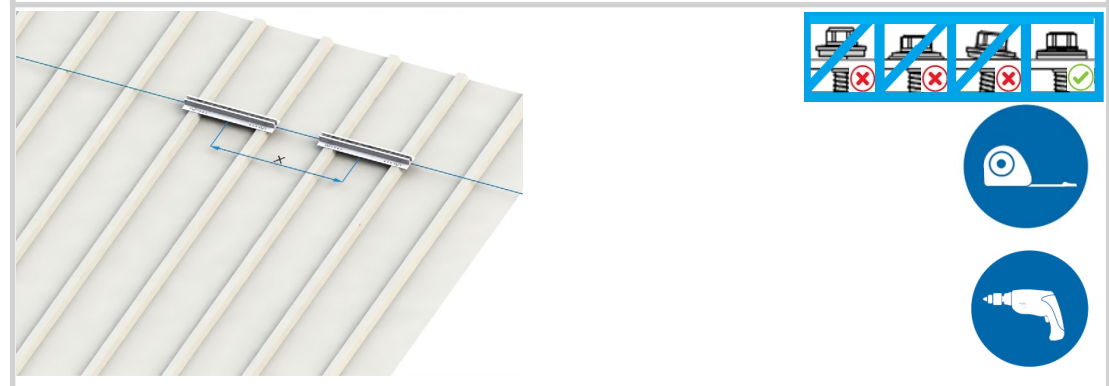
Measure the high bead spacing  
Measure the high bead width



If the high bead spacing is 100–333 mm, use the corrugated sheet metal bridge 2.1 L = 400 mm (20004774) or corrugated sheet metal bridge Plus L = 400 mm (20005198)  
If the high bead spacing is 100–207 mm, use the corrugated sheet metal bridge 2.1 S L = 250 mm (20004786)



Screw the corrugated sheet metal bridge with 4 thin sheet metal screws in the middle and at right angles to two high beads. Make sure that the EPDM gaskets under the corrugated sheet metal bridge and under the sealing washer of the thin sheet metal screw are not compressed by more than 50%. Also ensure that the thin sheet metal screws are screwed in correctly.

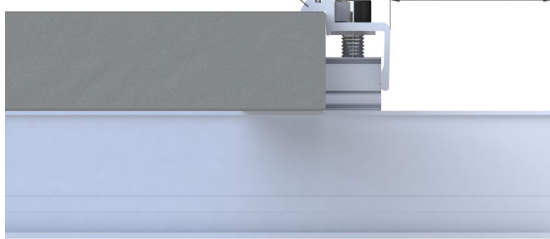


Place the next corrugated sheet metal bridge on the following high bead so that the distance x is maintained. The distance x is: module width (1000 mm or 1030 mm) + clamp width (20 mm).

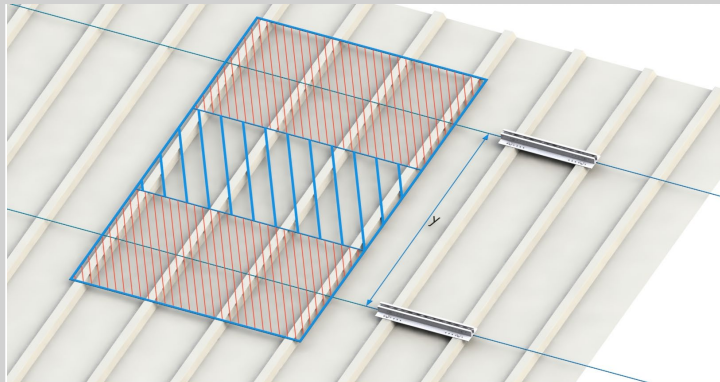
# MEASURE THE HIGH BEAD AND ATTACH THE CORRUGATED SHEET METAL BRIDGE

Middle/end clamp

min. 20 mm



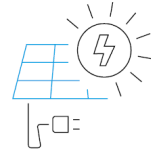
**Note:** The middle/terminal clamps must be installed at least 20 mm from the end of the corresponding short rail.



Place the next corrugated sheet metal bridge on the following high bead so that the distance  $y$  is maintained. The vertical distance between the corrugated sheet metal bridges  $y$  is determined by the selected module clamping area (red hatched area) and is: module length (1670 mm / 1685 mm or 1740 mm) – selected clamping area x 2

## INSTALLATIONS- UND BETRIEBSANLEITUNG

DUO-G5.X Solarmodul Serie



### 2.3 MONTAGEVARIANTEN

Abb. 3: Montagevarianten für einzelne Q CELLS Module. Alle Maße in mm. Beachten Sie zusätzlich die Spezifikation der zulässigen maximalen statischen Belastung und Klammernbreite auf der Folie. Die angegebenen Montagevarianten gelten für die Installation in Hoch- und Querform.

INSTALLATIONS-ART	MODUL-TYP	BEFESTIGUNG	LEITEN-ANLEGERUNG
INSTALLATION MIT KLEMMSTREIFEN	Q CELLS DUO-G5.X 1670x1670 mm	PS1	[Diagram]
	Q CELLS DUO-G5.X 1685x1685 mm	PS1	[Diagram]
	Q CELLS DUO-G5.X 1740x1740 mm	PS1	[Diagram]
INSTALLATION MIT KLEMMSTREIFEN	Q CELLS DUO-G5.X 1670x1670 mm	PS2	[Diagram]
	Q CELLS DUO-G5.X 1685x1685 mm	PS2	[Diagram]
INSTALLATION MIT KLEMMSTREIFEN	Q CELLS DUO-G5.X 1670x1670 mm	PS1	[Diagram]
	Q CELLS DUO-G5.X 1685x1685 mm	PS1	[Diagram]

### 2.3 MONTAGEVARIANTEN

MODULTYP	MODUL-TYP	KLEMMSTREIFEN-TYP	TESTLAST (N/mm²)	KLAMMERSCHWARTZ (mm)	SCHWARTZTIEFE (mm)
Q CELLS DUO-G5.X 1670x1670 mm	PS1	250-400	5400/6000	3600/2670	-
	PS2	360-5	-	-	1,5
	PS1	0-250 / 450-550	-	-	-
Q CELLS DUO-G5.X 1685x1685 mm	PS1	250-400	3000/3600	1600/1600	-
	PS2	360-5	-	-	1,5
	PS1	0-250 / 450-550	-	-	-
Q CELLS DUO-G5.X 1740x1740 mm	PS1	250-400	4000/4000	2670/2670	-
	PS2	360-5	-	-	1,5

Die folgenden Montagevarianten sind für vorgegebene Bedingungen möglich.

Die Klammernbreite entspricht der Klammernbreite von den Solarmodulen her. Klammernbreite = 60 mm und Klammernlänge = 15 mm. Die Klammernbreite und die Klammernlänge sind für die Dimensionierung der Unterstruktur zu berücksichtigen.

Beachten Sie, dass die Unterstruktur der Hochdruckeisen nicht hoch genug über der Unterstruktur ist. Stellen Sie sicher, dass die Klammern nicht über die Unterstruktur der Unterstruktur hinausragen.

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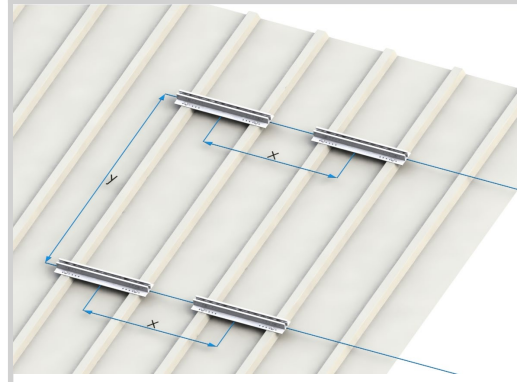
**ACHTUNG:** Die in der Tabelle angegebenen Lasten beziehen sich auf die mechanische Festigkeit der Klammern. Die mechanische Festigkeit der Unterstruktur entspricht der Klammernbreite von den Solarmodulen her. Klammernbreite = 60 mm und Klammernlänge = 15 mm. Die Klammernbreite und die Klammernlänge sind für die Dimensionierung der Unterstruktur zu berücksichtigen.

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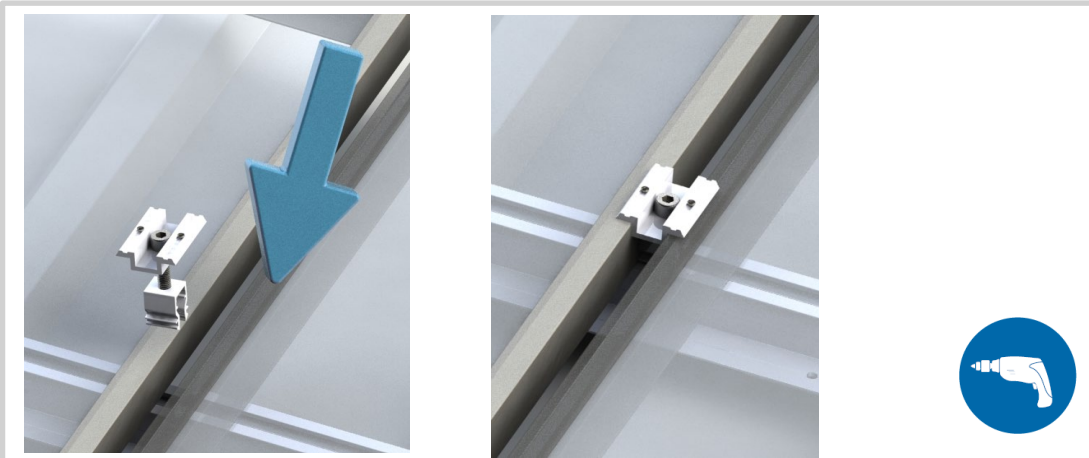
**Note:** Please refer to the relevant module clamping areas and the associated static loads in the corresponding installation instructions for the solar modules being installed.



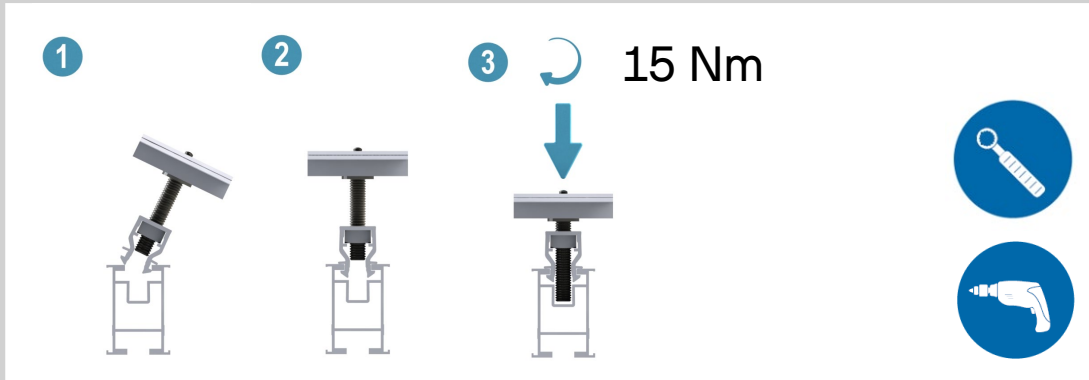
Position the next corrugated sheet metal bridge analogously to the horizontal and vertical spacing.

**Note:** Fasten the corrugated sheet metal bridges only in the middle of the high bead on the corrugated sheet metal.

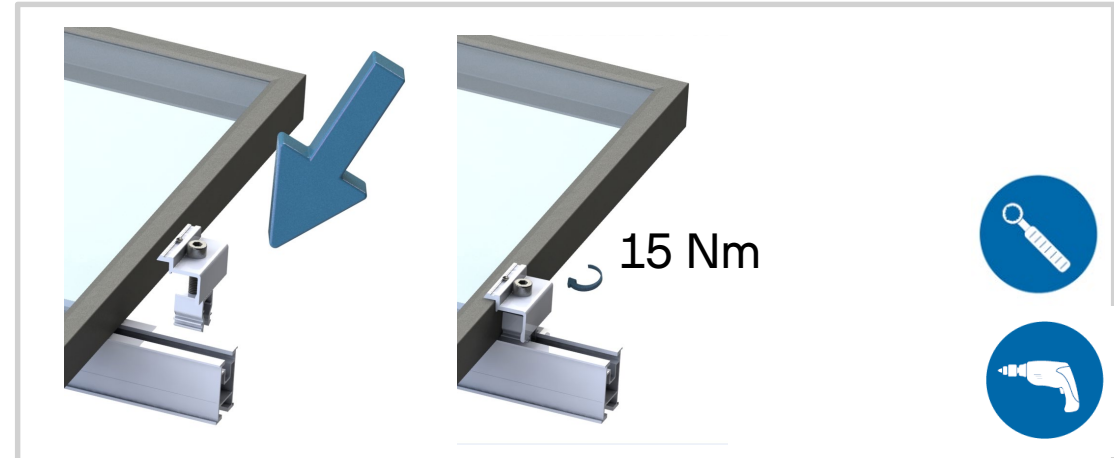
# MOUNTING SOLAR MODULES



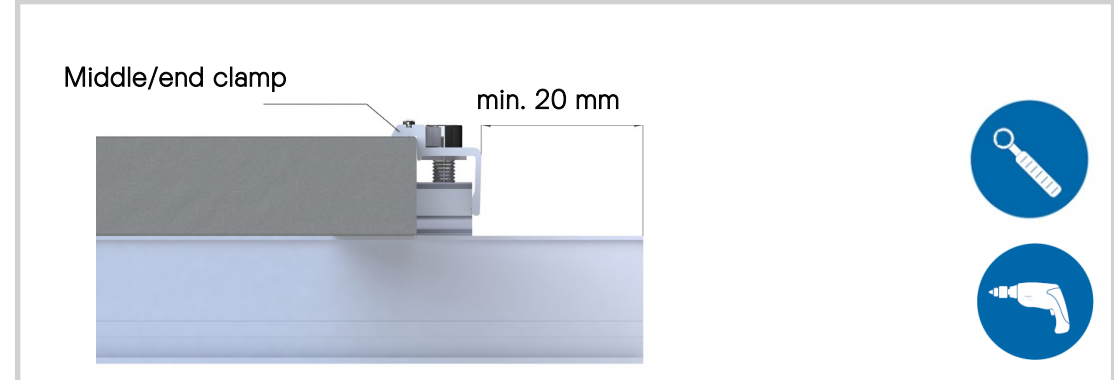
Start in the lowest module row by placing the first solar module on the corrugated sheet metal bridge and aligning it. Place the middle clamp on the module frame and click it into the corrugated sheet metal bridge. Place the next module on the corrugated sheet metal bridge and push it towards the middle clamp.



Click the clamps into the girder profile at a slight angle as shown and push the middle clamp up to the module frame. When the clamp and the second module are in the correct position, tighten the clamp. Tighten the screw on the middle clamp with a torque of **15 Nm**.



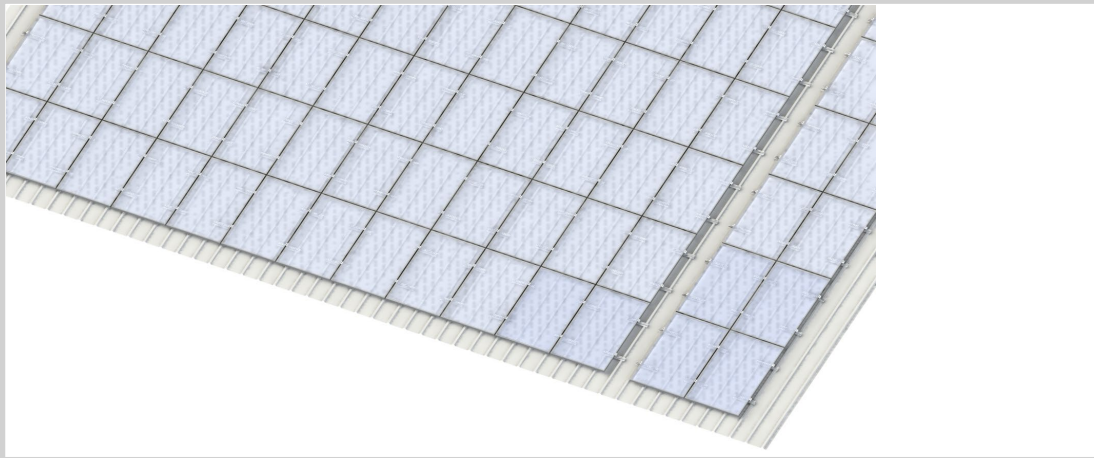
Click the terminal clamps into the corrugated sheet metal bridge at a slight angle as shown and push the terminal clamp up to the module frame. When the clamp is in the correct position, tighten the clamp. Tighten the screw on the clamp with a torque of **15 Nm**.



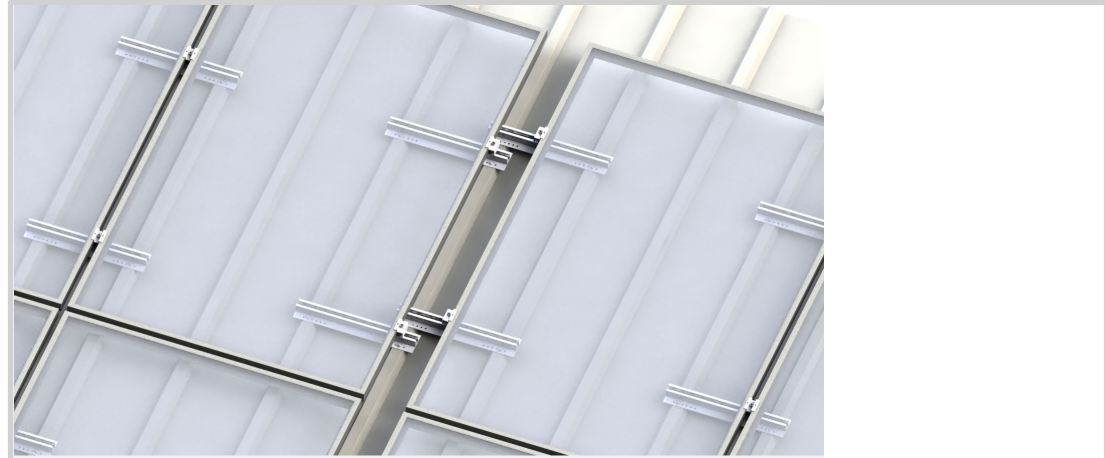
**Note:** The middle/terminal clamps must be installed at least 20 mm from the end of the corresponding corrugated sheet metal bridge.



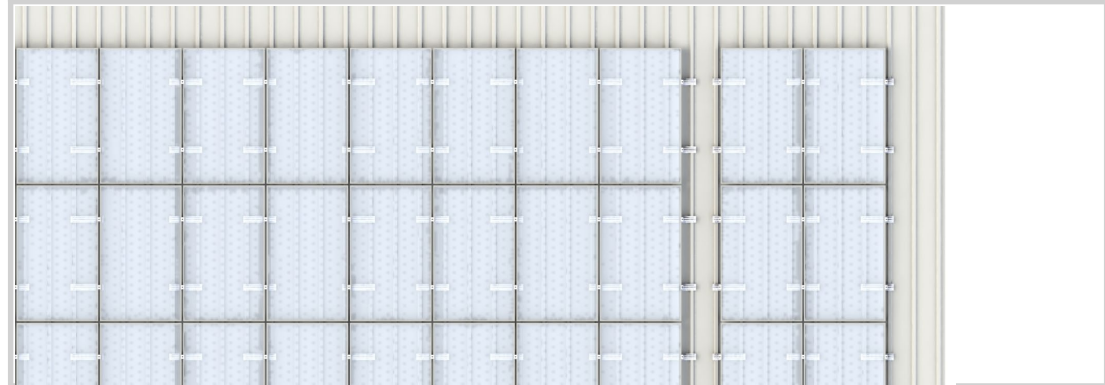
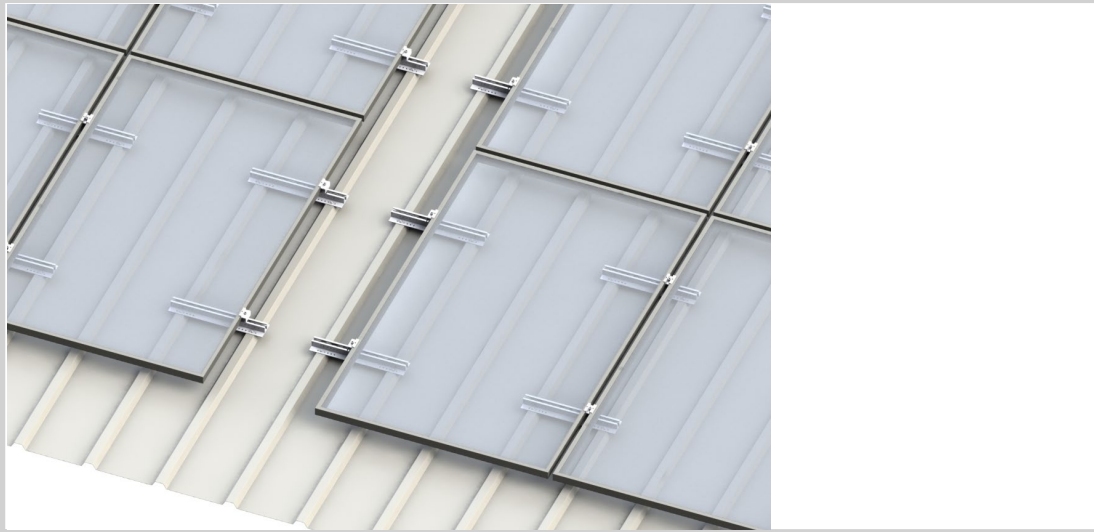
# THERMAL SEPARATION AND MAINTENANCE OPERATIONS



Please note the maximum module field length of 12 m. Beyond this length, the modules must be thermally separated.



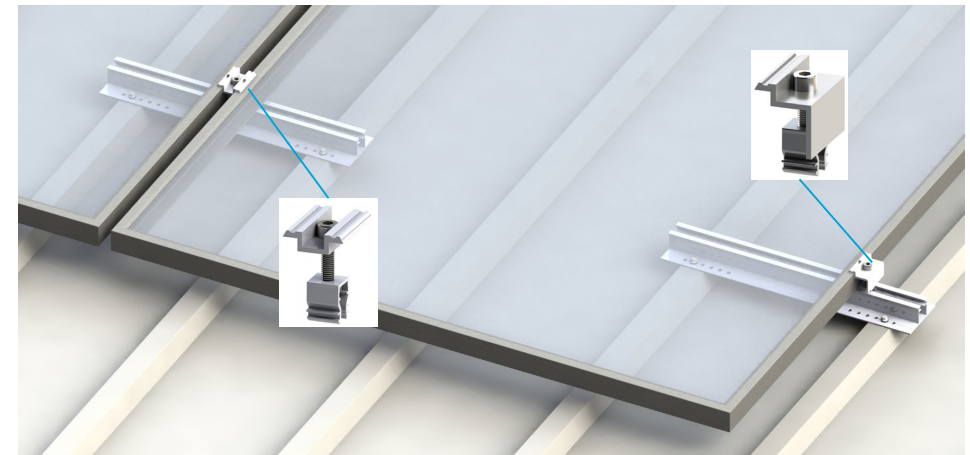
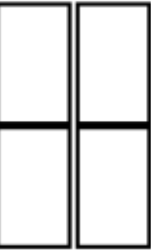
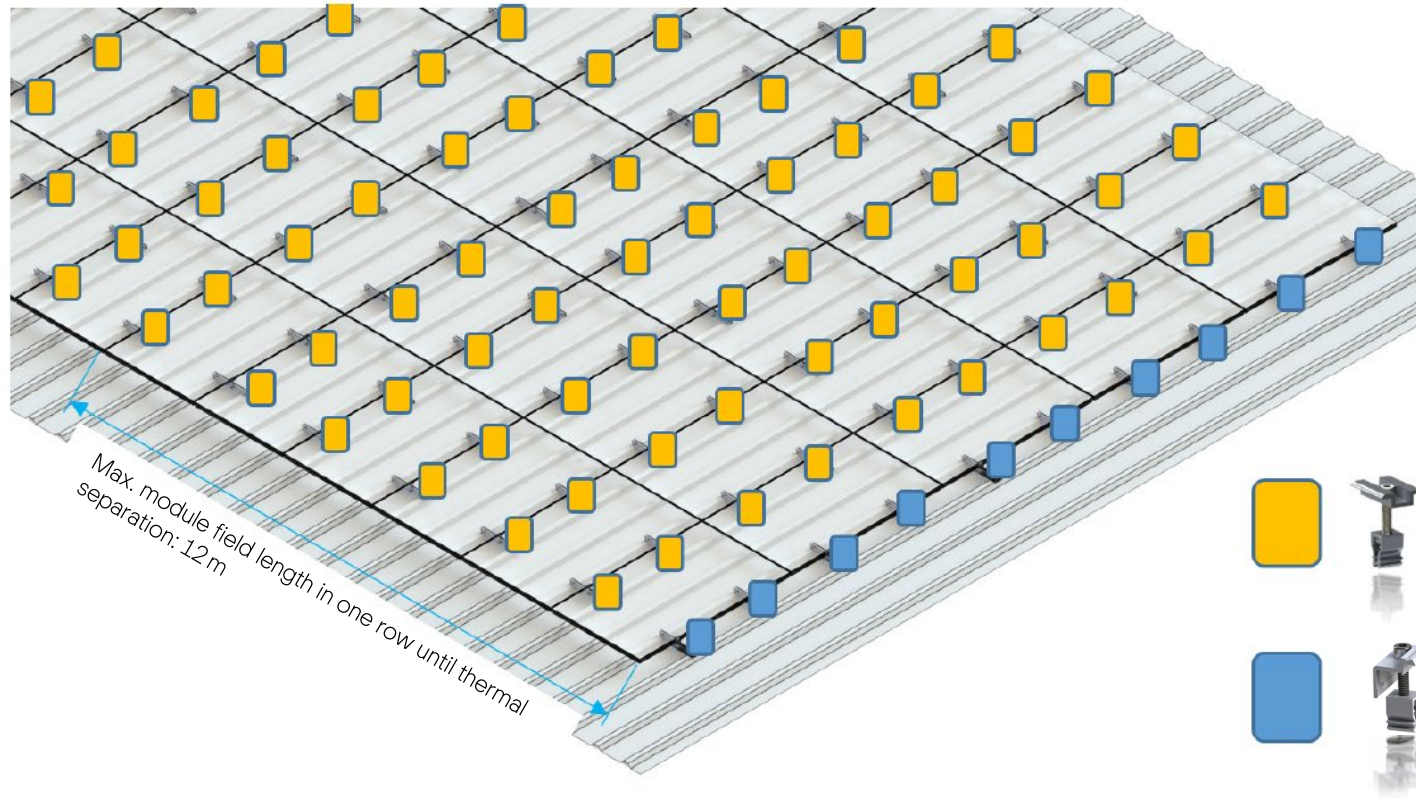
Please note the maximum horizontal module field length of 12 m. Beyond this length, the modules must be thermally separated. If the clamping area of the module and the distance between the high beads allow it, the next corrugated sheet metal bridge can also be attached to the adjacent high beads for the purpose of thermal separation.



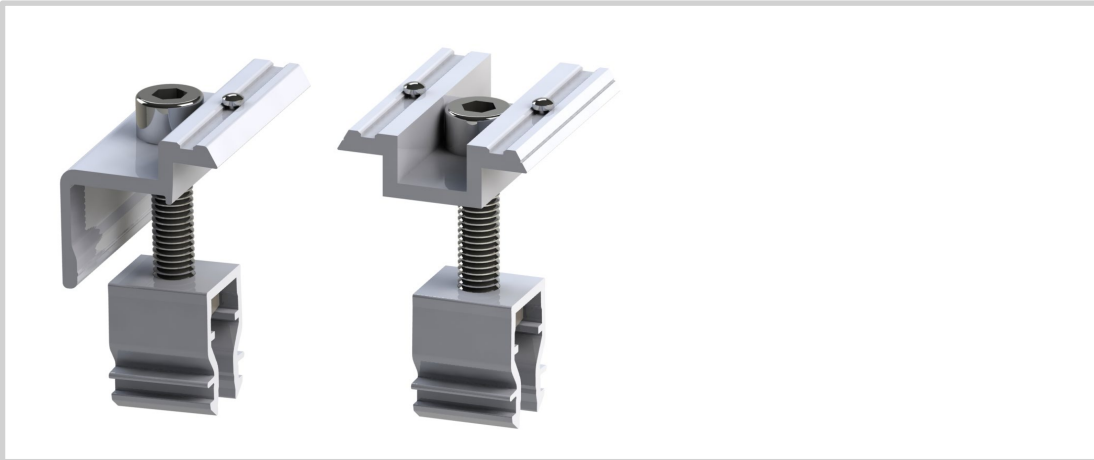
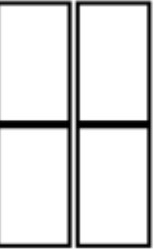
**Note:** For larger systems, create sufficient maintenance aisles in the horizontal direction.



# END AND MIDDLE CLAMPS



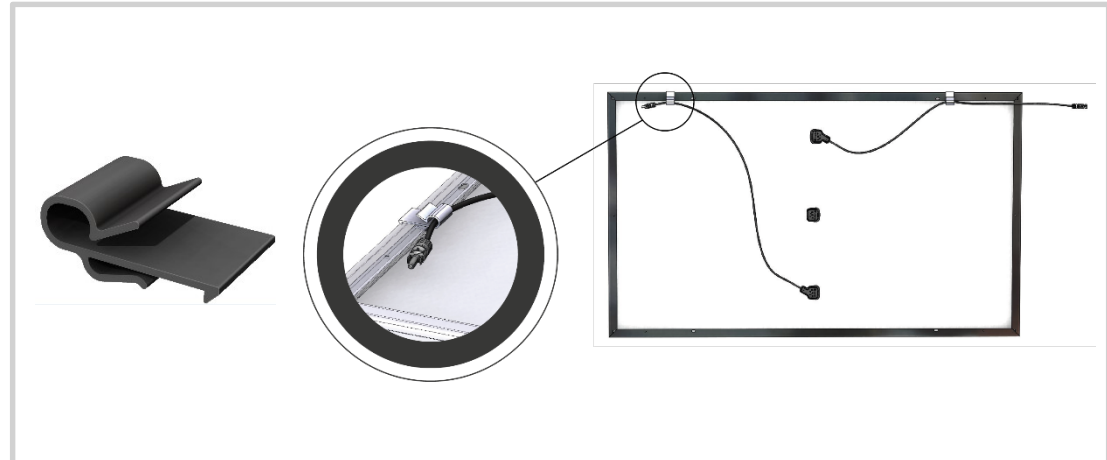
# POTENTIAL EQUALISATION AND CABLE MANAGEMENT



To integrate the modules into the potential equalisation, you can use the end and middle clamp with pin. The pins are located between the clamps and module frames and thus conductively interconnect all module rows in a module field.



Insert a wire clamp into the profile channel of the corrugated sheet metal bridges at the first or last corrugated sheet metal bridges of each module row. Insert the aluminium wire into the wire clamp and fix it by tightening the screw. In this way, all module rows of a module field are conductively interconnected.

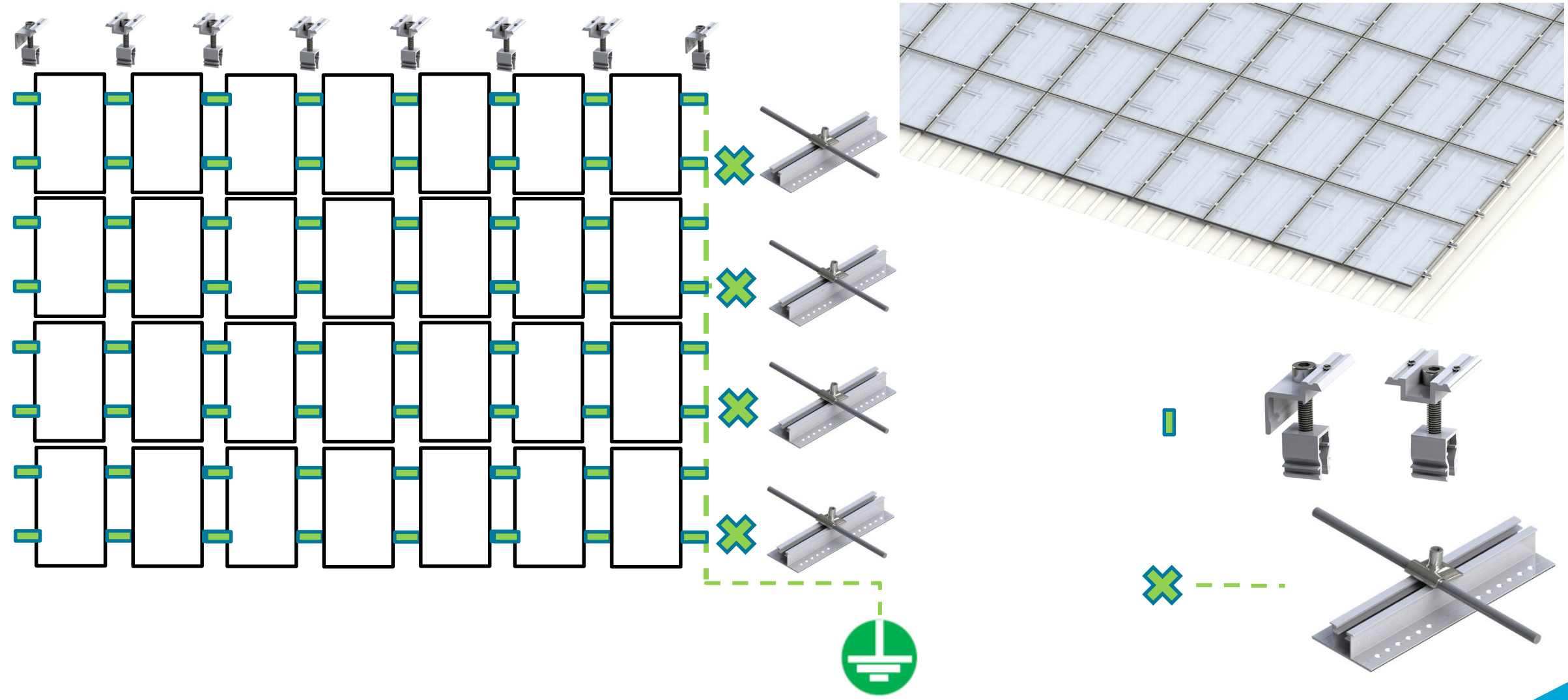


To properly secure the module cables to the frame sides, you can use the available cable clips to ensure that the connectors do not touch the roof cladding. Select the position of the cable clips so that the cable plugs do not rest on the water-bearing layer.

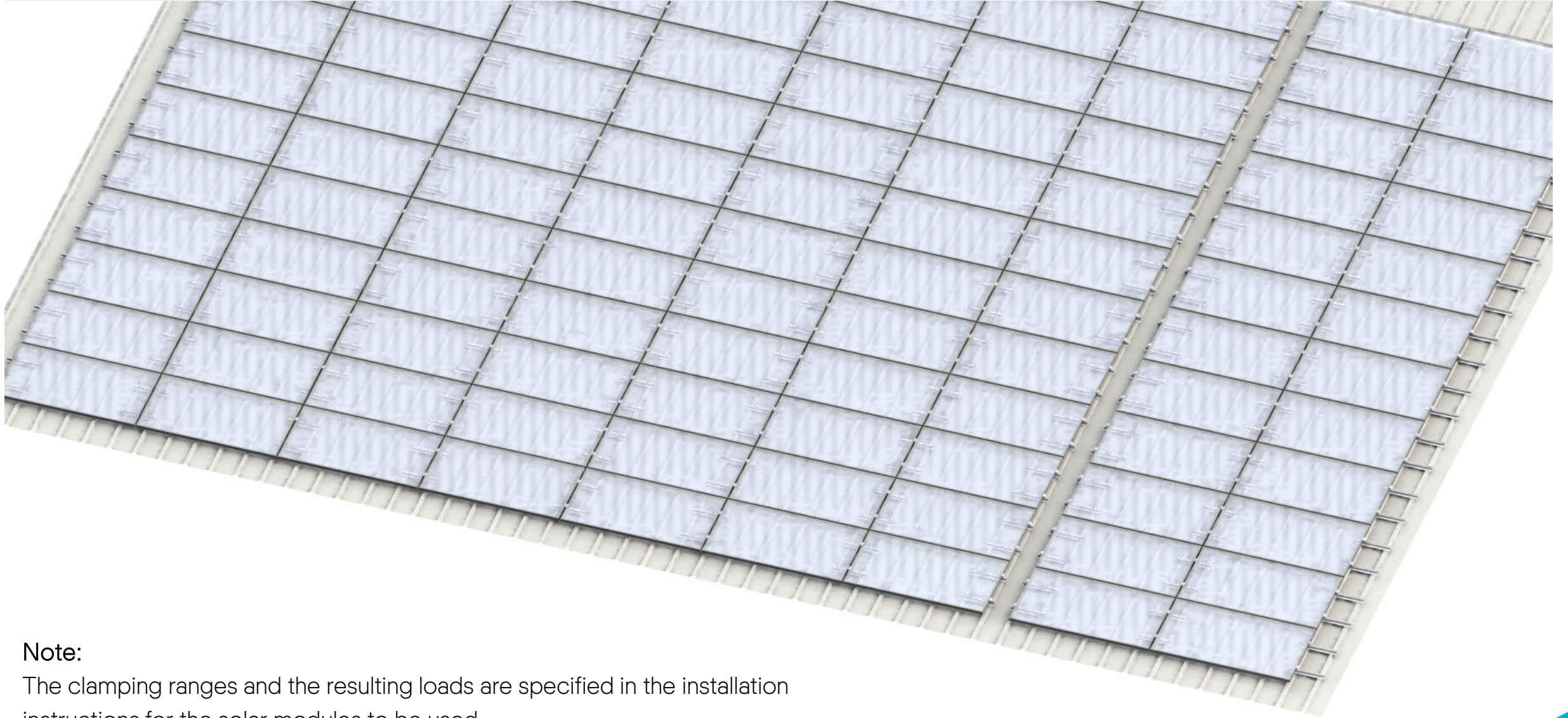


To properly attach the module cables either to the frame sides or to the corrugated sheet metal bridges, you can use the available edge clips to ensure that the connectors do not touch the roof cladding. Select the position of the edge clips so that the plugs of the cables do not rest on the water-bearing layer.

# POTENTIAL EQUALISATION OPTIONS FOR CORRUGATED SHEET METAL BRIDGE



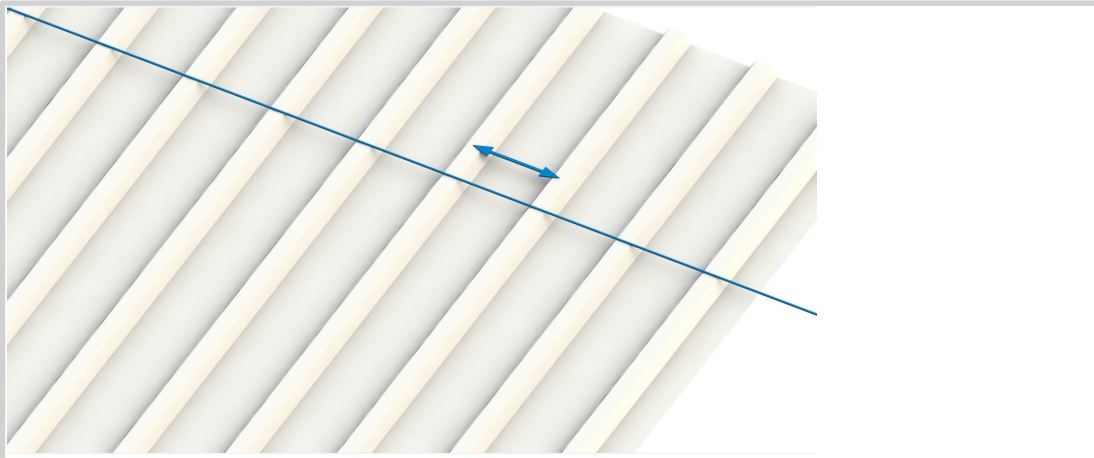
# CORRUGATED SHEET METAL BRIDGE, HORIZONTAL MODULES



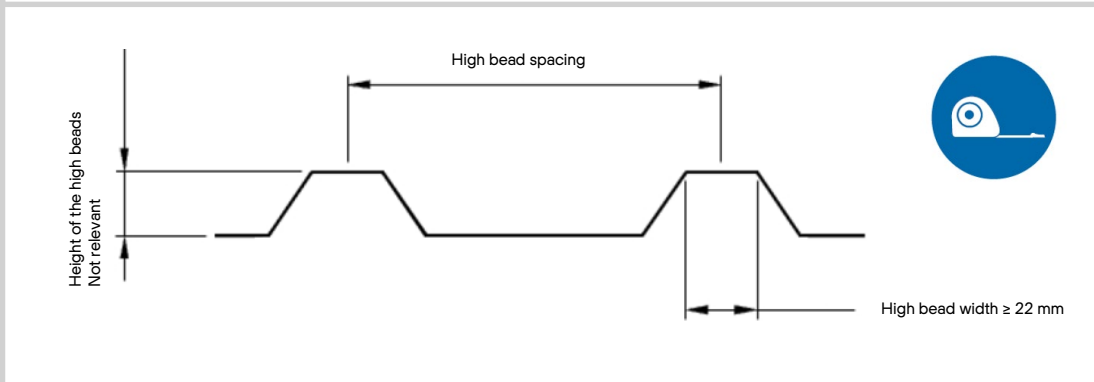
**Note:**

The clamping ranges and the resulting loads are specified in the installation instructions for the solar modules to be used.

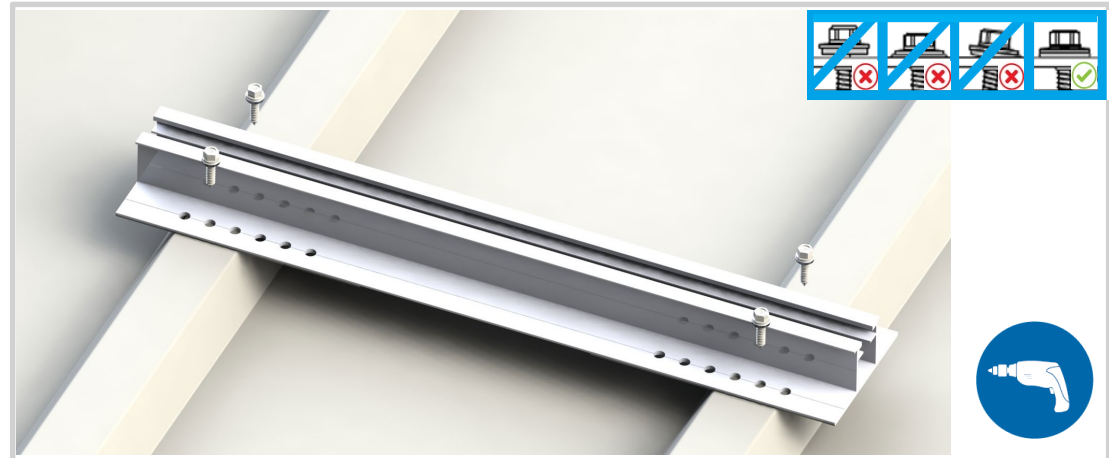
# MEASURE THE HIGH BEAD AND ATTACH THE CORRUGATED SHEET METAL BRIDGE



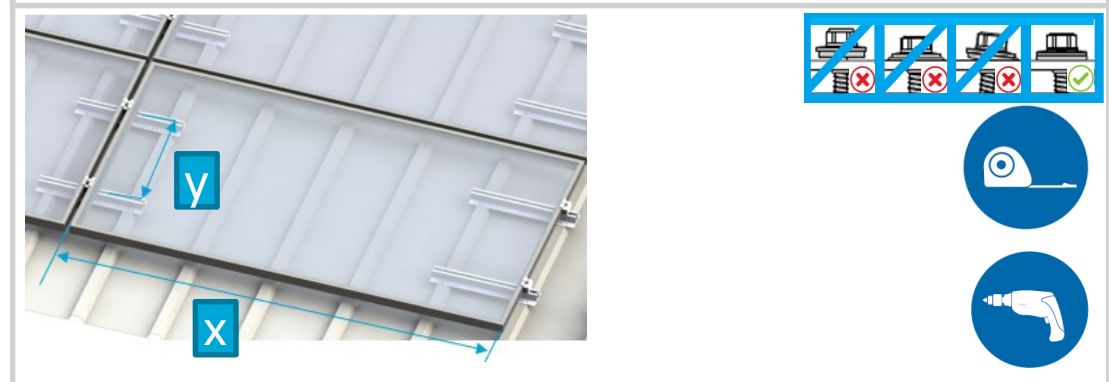
Measure the high bead distance  
Measure the high bead width



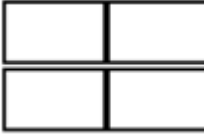
If the high bead spacing is 100–333 mm, use the corrugated sheet metal bridge 2.1 L = 400 mm (20004774) or corrugated sheet metal bridge Plus L = 400 mm (20005198)  
If the high bead spacing is 100–207 mm, use the corrugated sheet metal bridge 2.1 S L = 250 mm (20004786)



Screw the corrugated sheet metal bridge with 4 thin sheet metal screws in the middle and at right angles to two high beads. Make sure that the EPDM gaskets under the corrugated sheet metal bridge and under the sealing washer of the thin sheet metal screw are not compressed by more than 50%. Also ensure that the thin sheet metal screws are screwed in correctly.



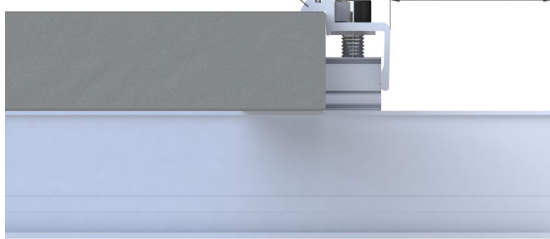
Place the next corrugated sheet metal bridge on the following high bead so that the distance x is maintained. The distance x is: Module length (1670 mm / 1685 mm or 1740 mm) + clamp width (20 mm).



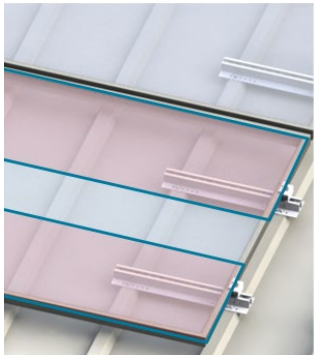
# MEASURE THE HIGH BEAD AND ATTACH THE CORRUGATED SHEET METAL BRIDGE

Middle/end clamp

min. 20 mm



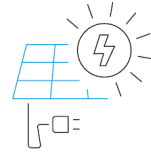
**Note:** The middle/terminal clamps must be installed at least 20 mm from the end of the corresponding short rail.



Place the next corrugated sheet metal bridge on the following high bead so that the distance  $y$  is maintained. The vertical distance between the corrugated sheet metal bridges  $y$  is determined by the selected module clamping area (red hatched area) and is: Module width (1000 mm or 1030 mm) – selected clamping area x 2

## INSTALLATIONS- UND BETRIEBSANLEITUNG

DUO-G6.X Solarmodul Serie



### 2.3 MONTAGEVARIANTEN

Abb. 3: Montagevarianten für einzelne Q CELLS Module. Alle Maße in mm. Beachten Sie zusätzlich die Spezifikation der zugehörigen mechanischen Befestigung und Klammertypen auf der Folie. Die angegebenen Montagevarianten gelten für die Installation in Hoch- und Querform.

INSTALLATIONS-ART	MODUL-ABMESSUNG	BEFESTIGUNG	LEISTUNGSLEISTUNG
INSTALLATION MIT KLAMMERN	Q CELLS DUO-G6.X Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK	PK1 PK2	PK1 PK2
INSTALLATION MIT KLAMMERN	Q CELLS DUO-G6.X Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK	PK1 PK2	PK1 PK2
INSTALLATION MIT KLAMMERN	Q CELLS DUO-G6.X Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK	PK1 PK2	PK1 PK2
INSTALLATION MIT KLAMMERN	Q CELLS DUO-G6.X Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK Q CELLS DUO-BE-DEK	PK1 PK2	PK1 PK2

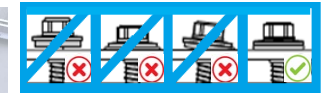
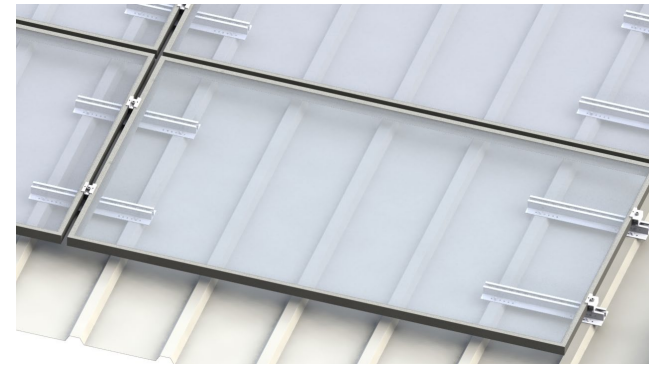
### 2.3 MONTAGEVARIANTEN

Spezifikation	MODULTYP	MODUL-ABMESSUNG	KLAMMERBREITE	TESTLAST (DIN EN 12201)	KLAMMERABSTAND (DIN EN 12201)	SCHRIEBREITZ (DIN EN 12201)
PK1	Q CELLS DUO-G6.X	1000x1030	250-400	5400/6000	800/2070	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	5400/6000	800/2070	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	5400/6000	800/2070	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	5400/6000	800/2070	1,5
PK2	Q CELLS DUO-G6.X	1000x1030	250-400	3000/3600	1600/1600	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	3000/3600	1600/1600	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	3000/3600	1600/1600	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	3000/3600	1600/1600	1,5

Spezifikation	MODULTYP	MODUL-ABMESSUNG	KLAMMERBREITE	TESTLAST (DIN EN 12201)	KLAMMERABSTAND (DIN EN 12201)	SCHRIEBREITZ (DIN EN 12201)
PK1	Q CELLS DUO-G6.X	1000x1030	250-400	5400/6000	800/2070	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	5400/6000	800/2070	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	5400/6000	800/2070	1,5
	Q CELLS DUO-BE-DEK	1000x1030	250-400	5400/6000	800/2070	1,5

**ACHTUNG:** Die in der Tabelle angegebenen Lasten beziehen sich auf die mechanische Festigkeit der Solarmodule. Die mechanische Festigkeit der Solarmodule entspricht der Normenreihe von dem Systemanbieter. Folgende Parameter wurden für die aufgeführten Q CELLS Produkte verwendet: Klammertypen - 60mm und Klammertypen - 120mm. Die Systemanbieter sind für die Bestimmung der entsprechenden Lastenabmessungen zuständig. Beachten Sie, dass die Unterbrecher der Hochspannung nicht hoch über der Montagefläche stehen dürfen, sondern nur auf der Montagefläche der Hochspannung stehen dürfen. Achten Sie auf eine Mindesthöhe der Tragkonstruktion von 20mm auf der Rückseite des Moduls für PK1, PK2, CL2, CL3, CL4 und CL5. Achten Sie auf eine Mindesthöhe der Tragkonstruktion von 20mm auf der Vorderseite des Moduls für PK1 und PK2. CL1, CL2 und CL3 sind Schienen. Stellen Sie sicher, dass der Rückhalter nicht auf der Schiene der Unterbrecher beruht. In jedem Abstandhalter zwischen Modul und Unterbrecher einlagern. Das Modul verlagert sich bei Belastung. Aus diesem Grund dürfen keine Schrauben (z. B. Schrauben) in der Nähe der Rückseite des Moduls eingeklebt werden. Verwenden Sie korrosionsbeständige M8-Schrauben und Unterlegscheiben (Durchmesser  $\geq 16,8$  mm oder  $\geq 16,224$ ) für PK1- und PK2-Details.

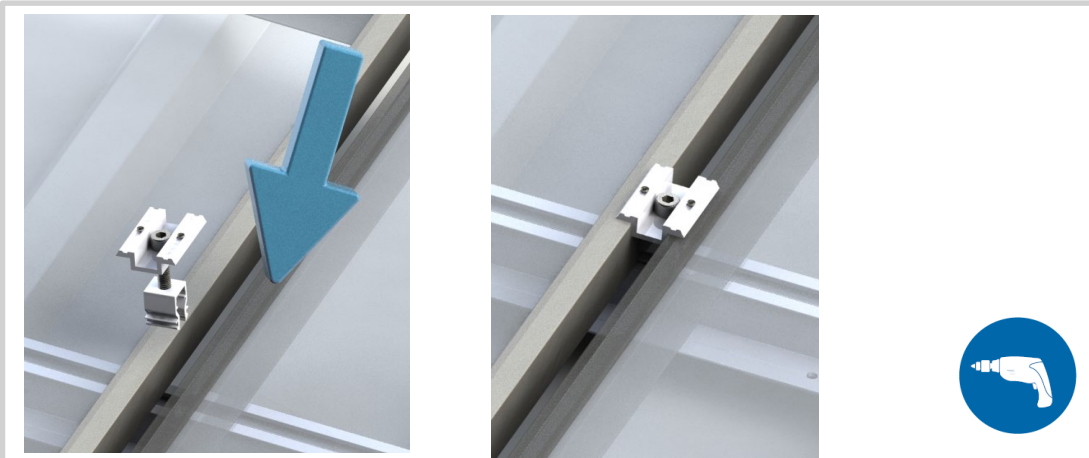
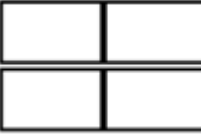
**Note:** Please refer to the relevant module clamping areas and the associated static loads in the corresponding installation instructions for the solar modules being installed.



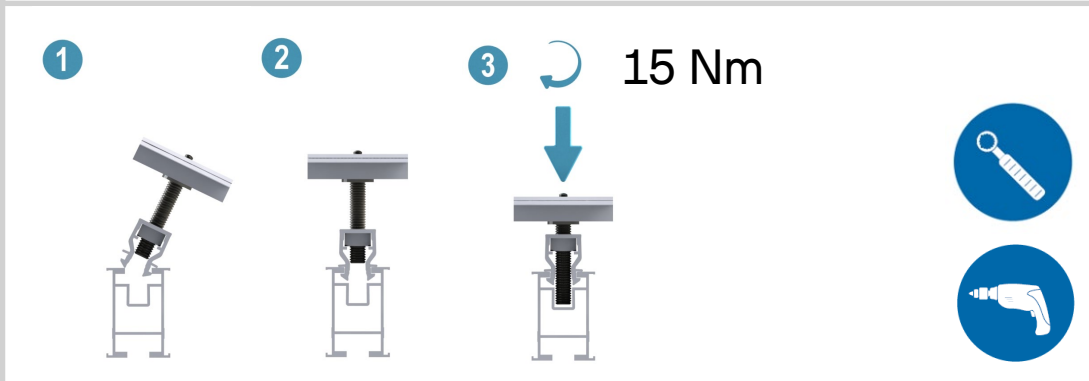
Position the next corrugated sheet metal bridge analogously to the horizontal and vertical spacing.

**Note:** Fasten the corrugated sheet metal bridges only in the middle of the high bead on the corrugated sheet metal.

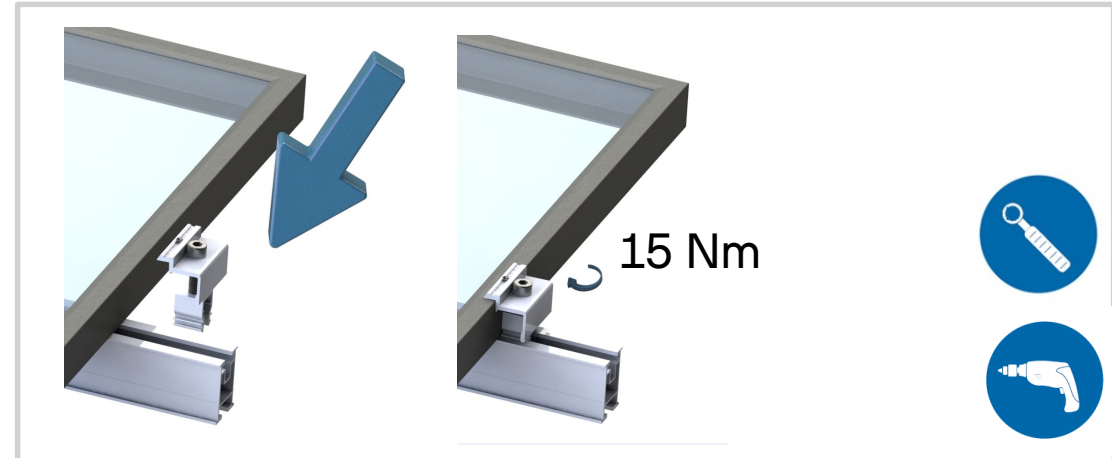
# MOUNTING SOLAR MODULES



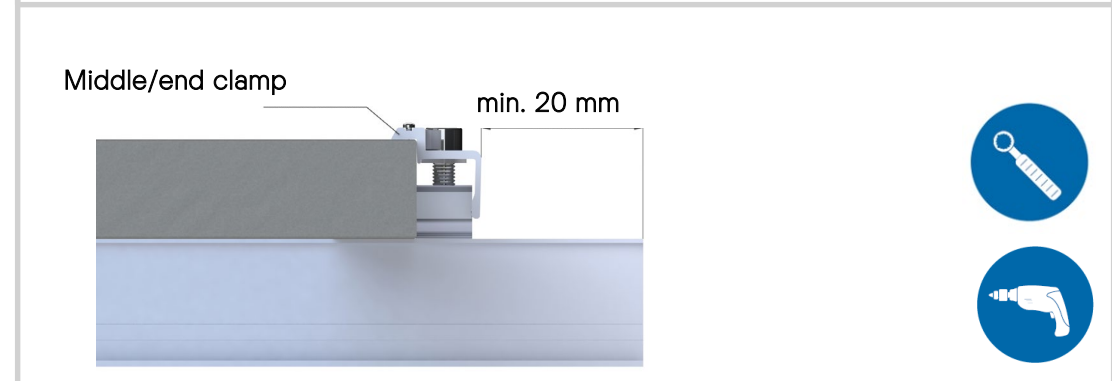
Start in the lowest module row by placing the first solar module on the corrugated sheet metal bridge and aligning it. Place the middle clamp on the module frame and click it into the corrugated sheet metal bridge. Place the next module on the corrugated sheet metal bridge and push it towards the middle clamp.



Click the clamps into the corrugated sheet metal bridge at a slight angle as shown and push the middle clamp up to the module frame. When the clamp and the second module are in the correct position, tighten the clamp. Tighten the screw on the middle clamp with a torque of **15 Nm**.

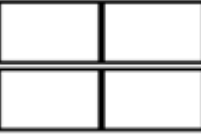


Click the terminal clamps into the corrugated sheet metal bridge at a slight angle as shown and push the terminal clamp up to the module frame. When the clamp is in the correct position, tighten the clamp. Tighten the screw on the clamp with a torque of **15 Nm**.

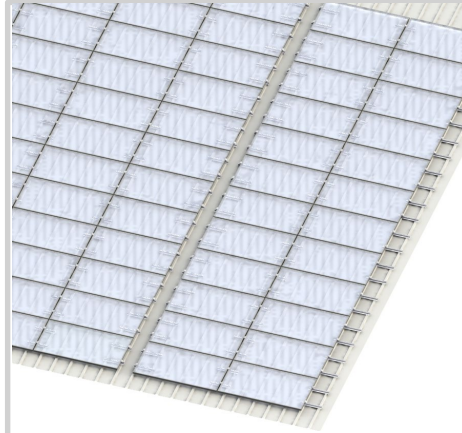
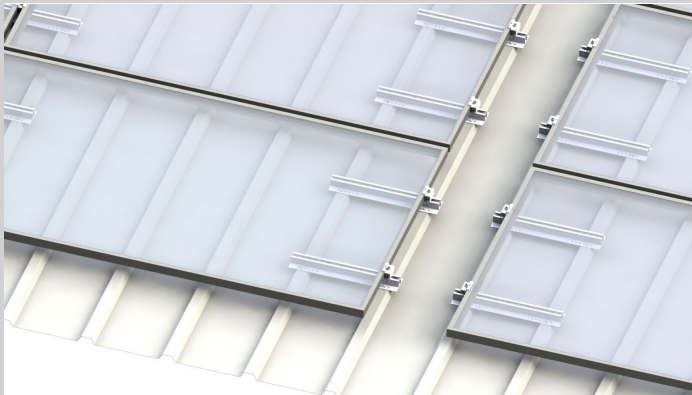


**Note:** The middle/terminal clamps must be installed at least 20 mm from the end of the corresponding short rail.

# THERMAL SEPARATION AND MAINTENANCE OPERATIONS



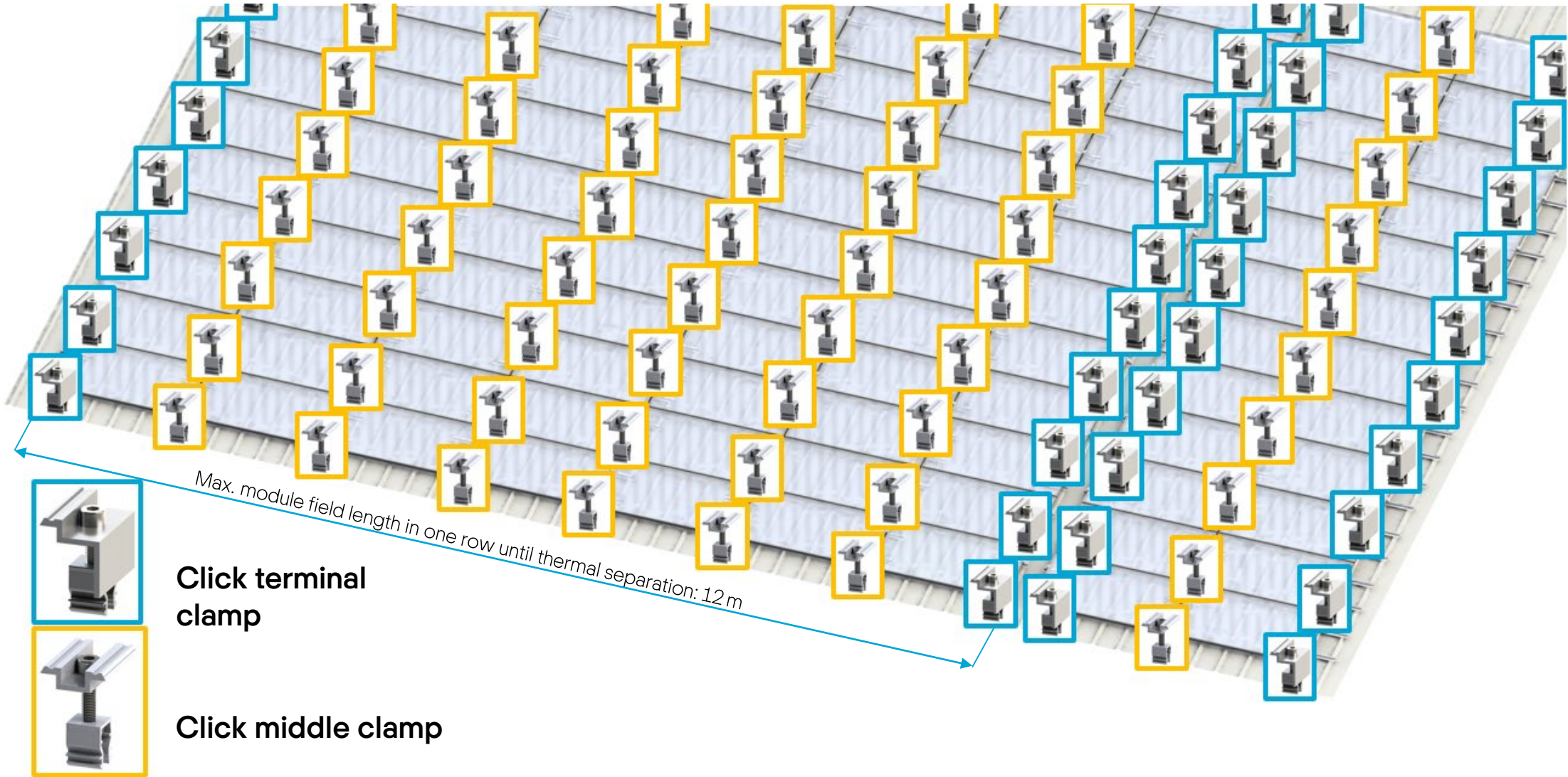
Please note the maximum module field length of 12 m. Beyond this length, the modules must be thermally separated.



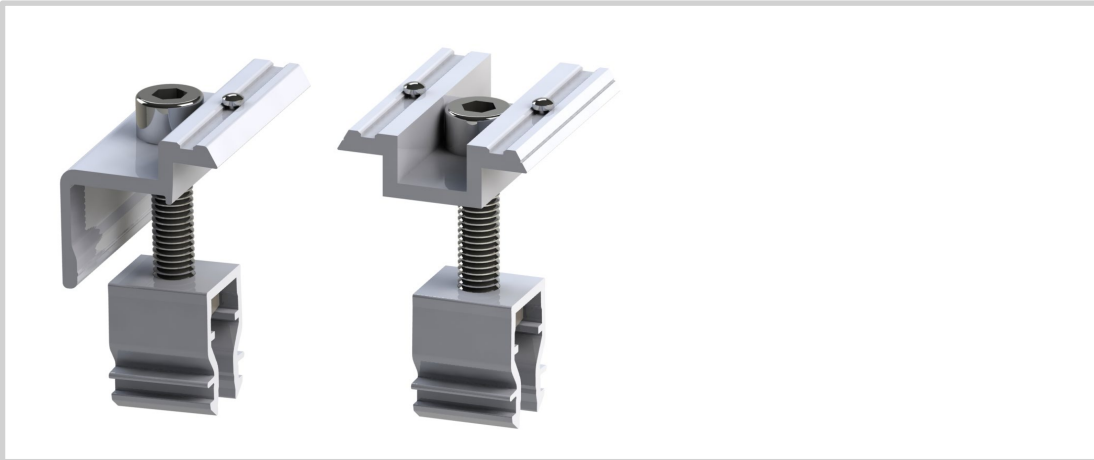
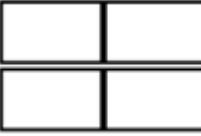
For larger systems, create sufficient maintenance aisles in the horizontal direction.



# END AND MIDDLE CLAMPS



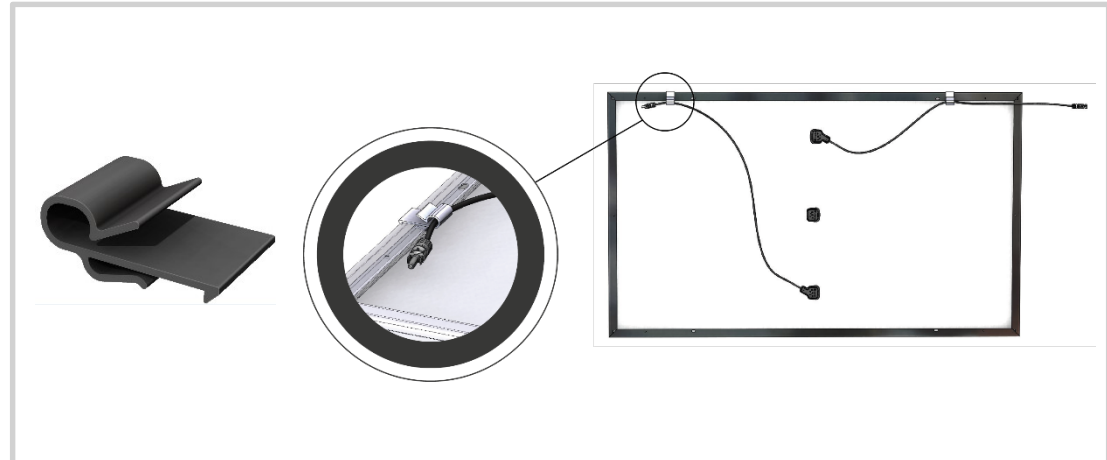
# POTENTIAL EQUALISATION AND CABLE MANAGEMENT



To integrate the modules into the potential equalisation, you can use the end and middle clamp with pin. The pins are located between the clamps and module frames and thus conductively interconnect all module rows in a module field.



Insert a wire clamp into the profile channel of the corrugated sheet metal bridges at the first or last corrugated sheet metal bridges of each module row. Insert the aluminium wire into the wire clamp and fix it by tightening the screw. In this way, all module rows of a module field are conductively interconnected.

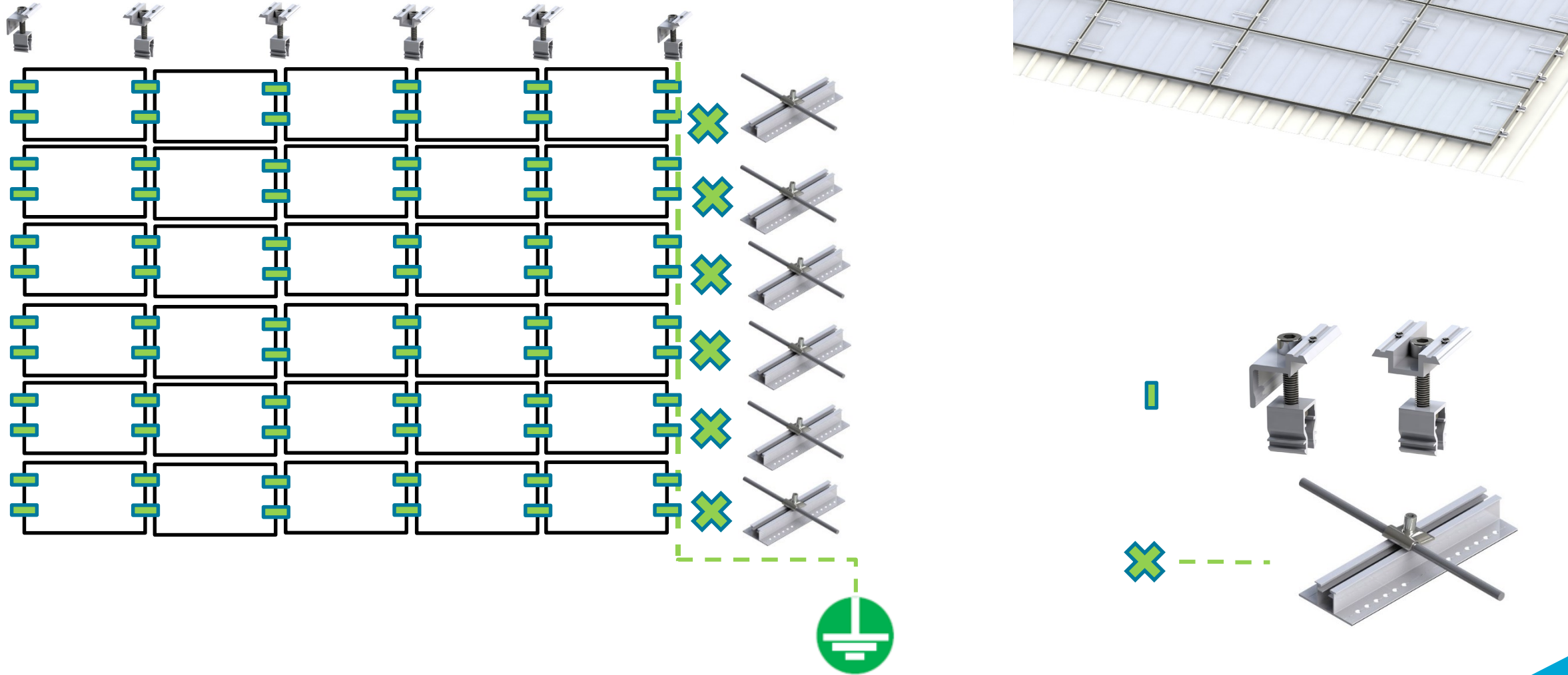


To properly secure the module cables to the frame sides, you can use the available cable clips to ensure that the connectors do not touch the roof cladding. Select the position of the cable clips so that the cable plugs do not rest on the water-bearing layer.



To properly attach the module cables either to the frame sides or to the corrugated sheet metal bridges, you can use the available edge clips to ensure that the connectors do not touch the roof cladding. Select the position of the edge clips so that the plugs of the cables do not rest on the water-bearing layer.

# POTENTIAL EQUALISATION OPTIONS FOR CORRUGATED SHEET METAL BRIDGE



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