



Plug in Solar Mounting Kits 2.0

Assembly Instructions



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1 Product Introduction

1.1 Product Overview

The Fastensol Plug in Solar Mounting Kit 2.0 is a lightweight and durable solar mounting solution designed for residential balcony, wall, ground and floor-mounted PV applications.

The system enables PV modules to be securely installed on balcony railings without requiring extensive structural modification.

The mounting system adopts high-strength aluminum alloy profiles combined with stainless steel fasteners, providing excellent corrosion resistance and long-term outdoor durability.

The system is designed for quick installation, reliable fixing and compatibility with mainstream PV modules.

1.2 Product Features

- High mechanical strength
- Excellent corrosion resistance
- All the hardware in one box makes for an efficient install.
- For mounting of solar modules and micro inverters.

2 Technical Specifications

➤ **Compatible with mainstream framed solar modules:**

- Maximum module size:

2384 × 1134 mm

- Maximum module weight:

35 kg

➤ **Flexible Installation**

- Balcony railings
 - Circular Railings
 - Maximum diameter: $\varnothing 72$ mm
- Brick walls
- Concrete walls
- Other structurally approved mounting surfaces

➤ **Balcony railing**

- Stable structure
- No visible corrosion
- No cracks or deformation

Recommended railing:

- Steel railing
- Aluminum railing
- Concrete balcony structure

➤ Installation Limitations

- Standard Installation: $\leq 15\text{m}$ for balcony and $\leq 2\text{m}$ for ground
- Maximum site altitude : $A \leq 100\text{ m}$ above sea level
- Maximum installation wind zone: Zone 4
- Excluded locations: Exposed coasts, Western Isles, Shetland



Forbidden Mounting Surfaces

- Hollow bricks
- Plasterboard
- External thermal insulation walls
- Hollow tiled walls
- Lightweight partition panels



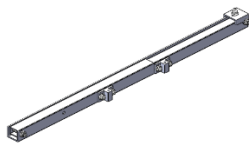
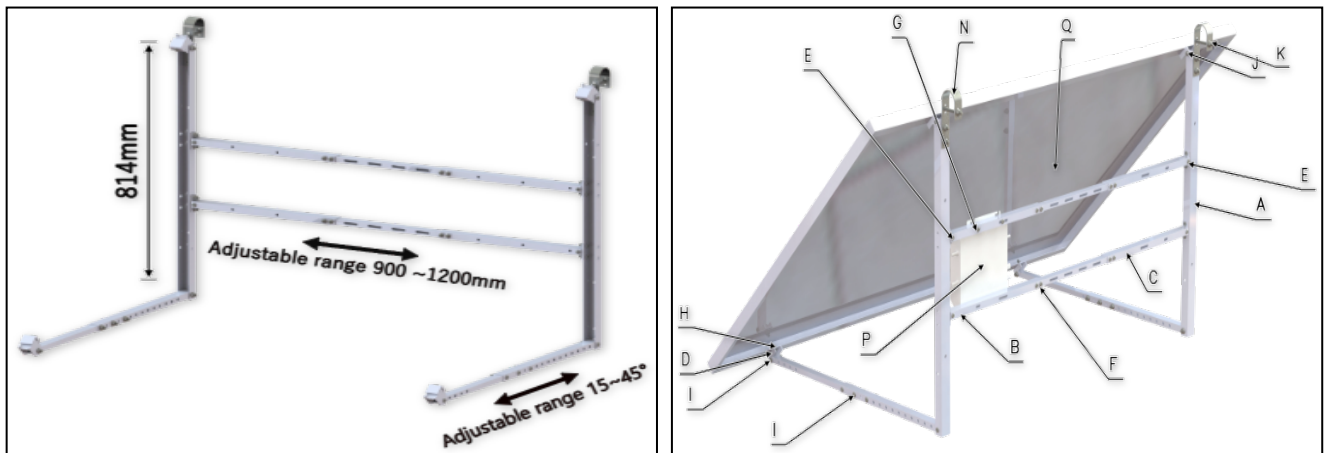
HIGH-RISE CONDITIONS

Additional engineering verification is required for buildings with any of the following conditions

- Buildings higher than 15 m
- Exposed coastal locations
- Tall isolated structures
- Sites with unusually high wind exposure

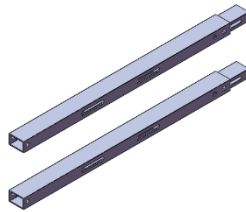
Plug in Solar Mounting Kits 2.0

3 System Components



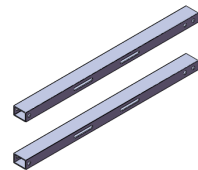
A

Brackets × 2



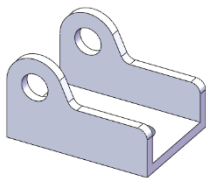
B

Cross Beam a × 2



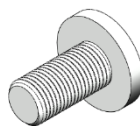
C

Cross Beam b × 2



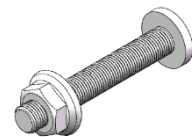
D

Block × 2



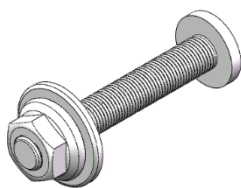
E

Hex Socket Cap Screw
× 8 (M6×12)



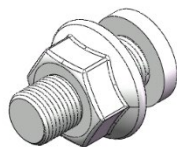
F

Hex Socket Cap Screw/nut
× 8 (M6×40)



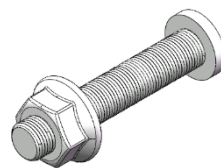
G

Hex Socket Cap Screw/flat washer/nut × 2 (M6×50)



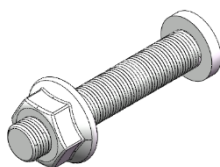
H

Hex Socket Cap Screw/nut × 8 (M8×20)



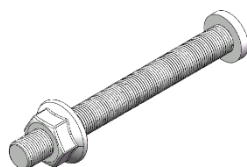
I

Hex Socket Cap Screw/nut × 8 (M8×45)



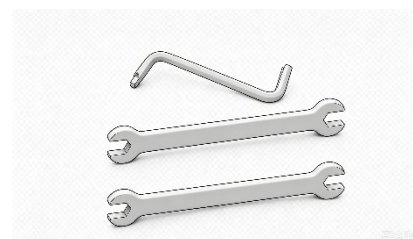
J

Hex Socket Cap Screw/nut × 2 (M8×55)



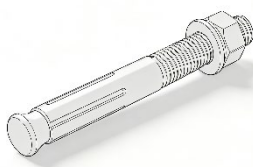
K

Hex Socket Cap Screw/nut × 2 (M8×95)



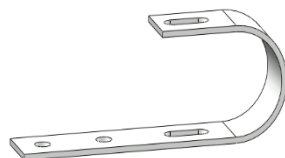
L

Allen wrench/Open-end wrench × 1



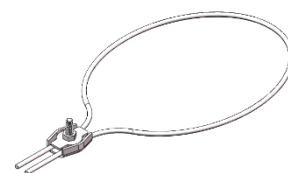
M

Expansion Bolt × 4 (M8×80)



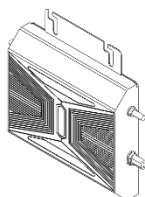
N

Round hook × 2



O

Wire rope × 2



P

Micro-inverter



Q

Solar panels

4 Required Tools



Open-end spanners
(Inside box)



M6/M8 hex key set



Torque wrench



Dual-bubble spirit level



Tape measure



Marker pen



Light-duty hammer drill



M8 drill bit

5 Safety Instructions

Please read this manual carefully before installation.

Incorrect installation may result in:

- Structural failure
- PV module damage
- Personal injury
- Property damage

Before installation

- Check balcony structure condition
- Confirm railing load capacity
- Check installation environment
- Ensure all components are complete

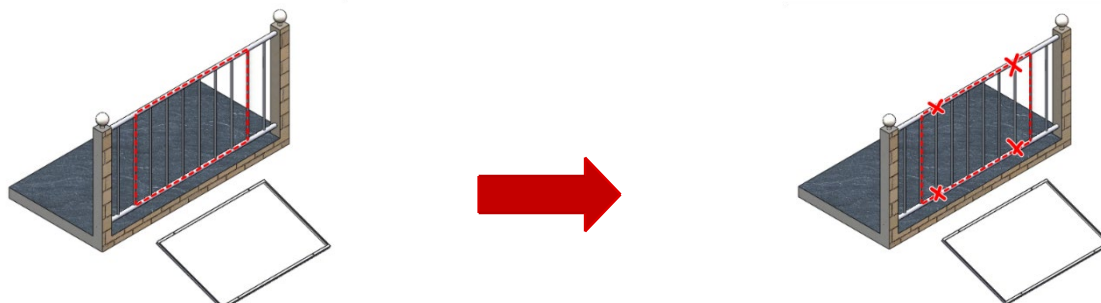


DO NOT install

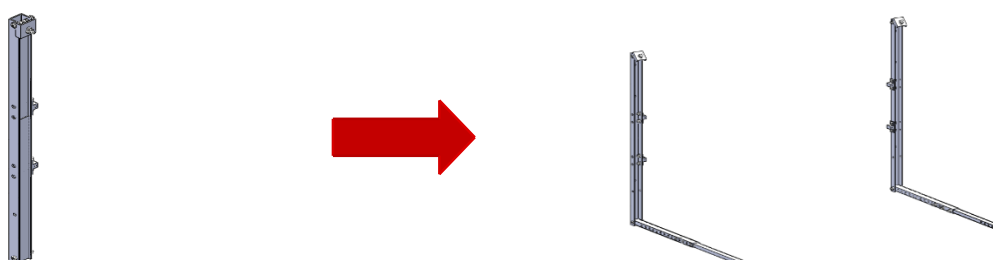
- On damaged balcony structures
- On unstable railings
- In extreme weather conditions
- Without proper fixing components

6 Installation Guide

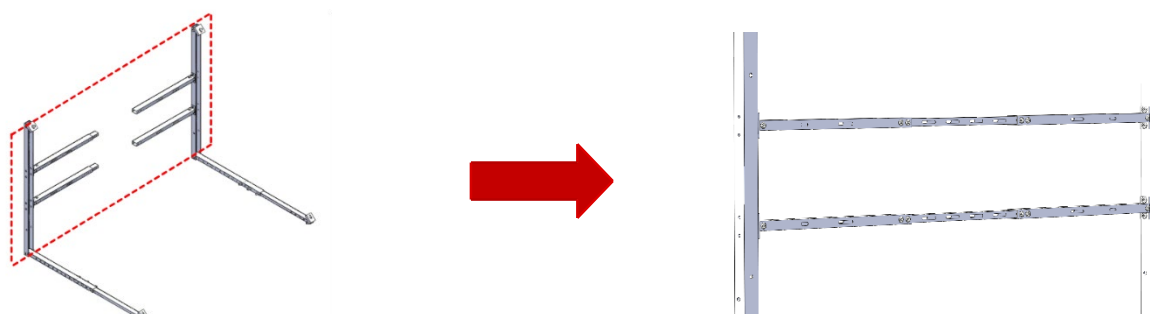
6.1 Balcony Scenario



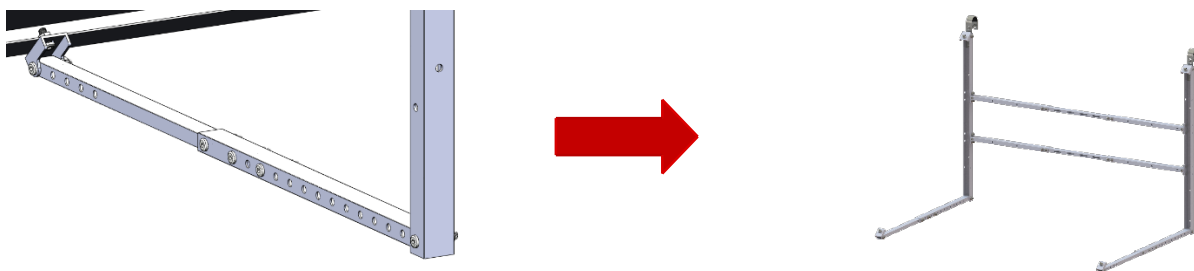
Use PV module dimensions to determine installation position and fixing points, mark the installation positions of hook brackets, fixing ropes on the railing.



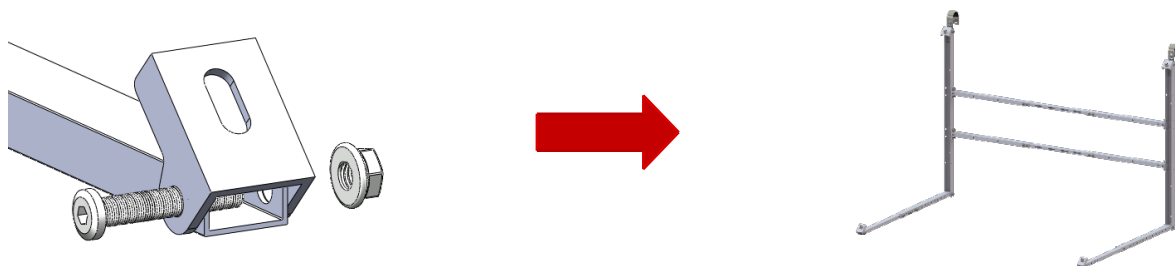
Unfold the brackets from the packaging, place on a stable surface and pre-assembled before final adjustment.



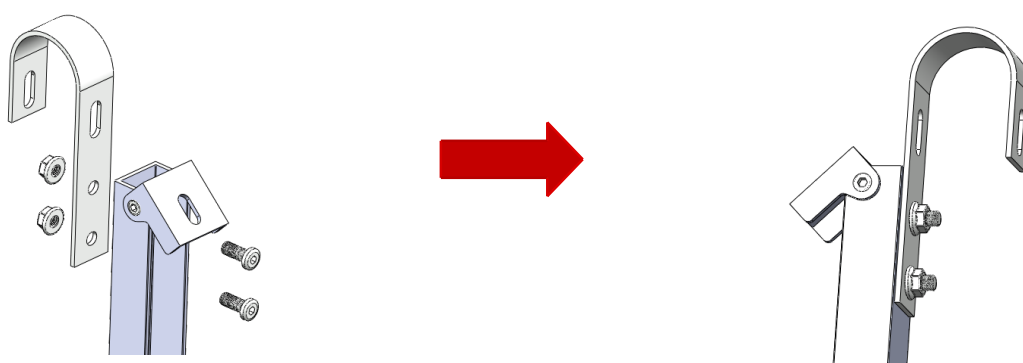
Adjust the cross beam according to the PV module mounting hole positions, ensure the mounting holes are correctly aligned with the PV module fixing points and then tighten the 8pcs M6×40 bolts.



Adjust the bottom brackets according to the required installation angle and secure with 3pcs M8×45 bolts.



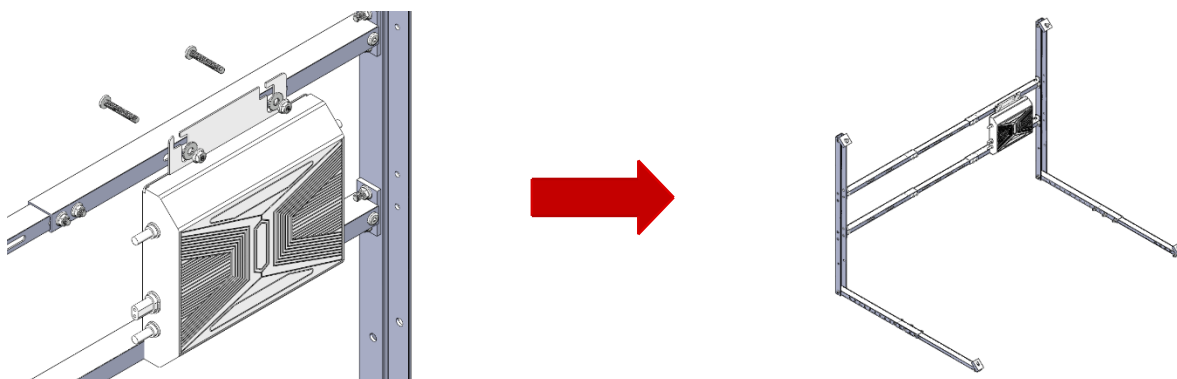
Install bottom blocks with M8×45 bolts to the brackets.



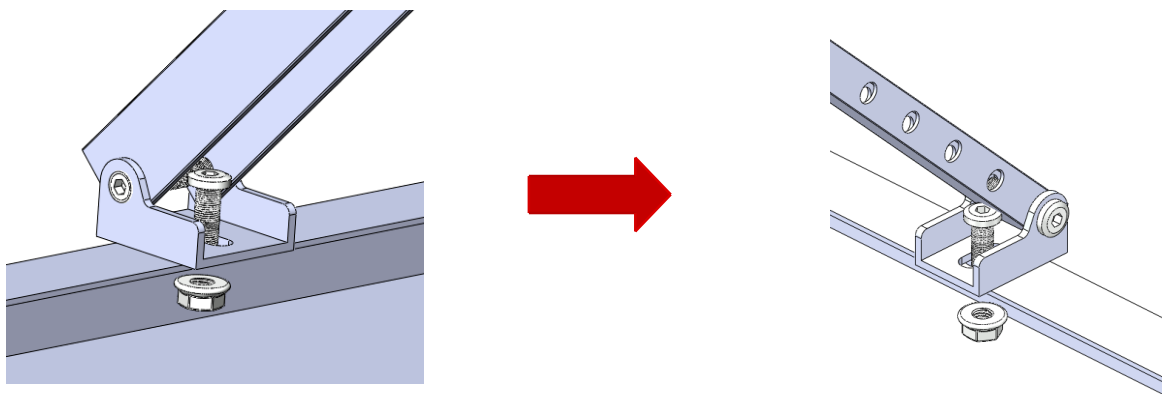
Select the proper hooks according to the balcony railings, install the hooks onto the brackets.



The hooks must be installed prior to the module assembly.



Adjust the fixing position on the cross beam according to the inverter's dimensions and secure with M6×50 bolts.



Align the module frame with the pre-adjusted mounting positions and secure the PV module with M8×20 bolts.

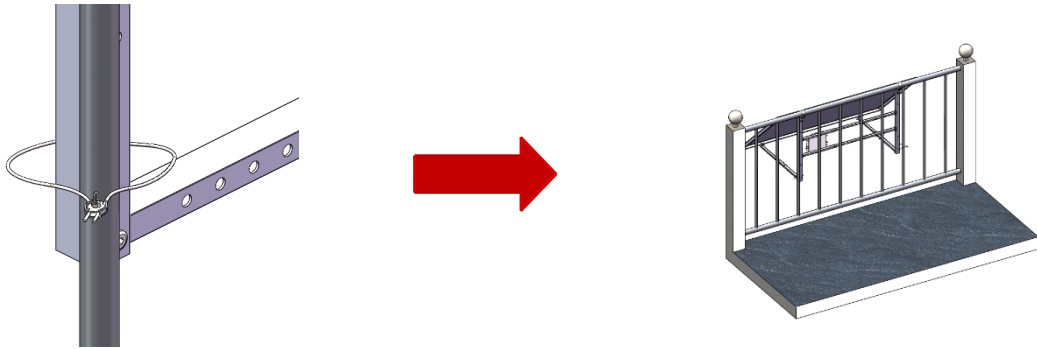


Lift and position the assembled mounting system onto the designated railing position, engage hooks with M8×95 bolts.

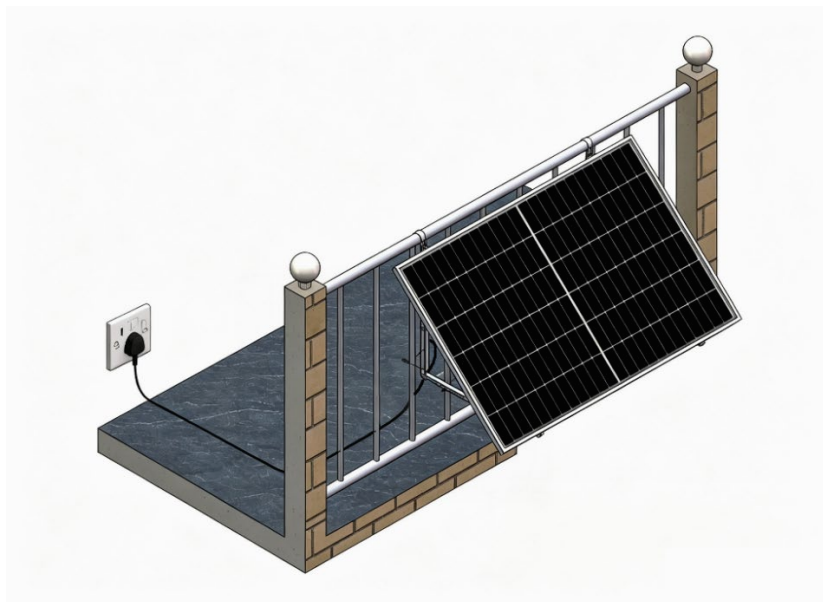
Plug in Solar Mounting Kits 2.0

 A minimum of **two people** is required for lifting and positioning the assembled PV mounting system.

 Do not attempt installation alone.

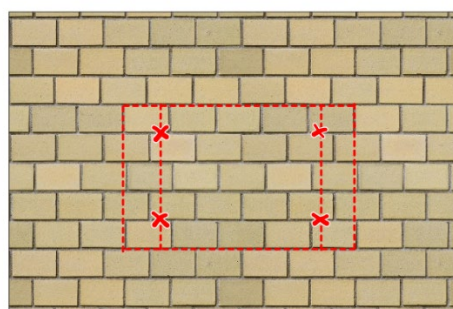
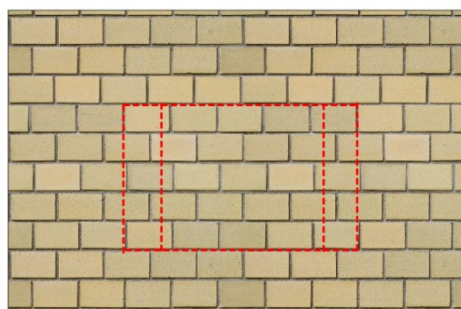


Connect the safety fixing ropes to the predetermined fixing points, check that the complete structure is stable before releasing support.

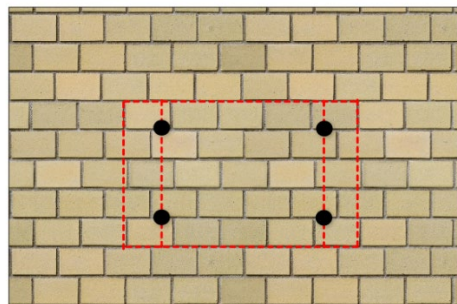
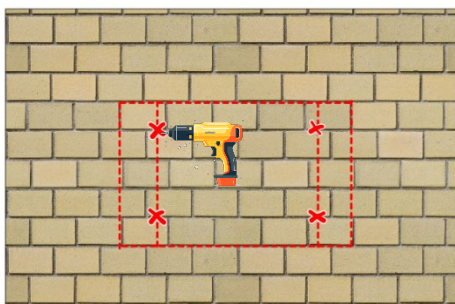


Once the plug in system installed, connect to the micro inverter, plug the output end into the socket and activate the system according to the micro inverter manufacturer's instructions. Minimum module to module and module to obstruction spacing is 10mm.

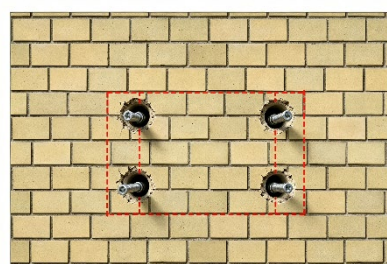
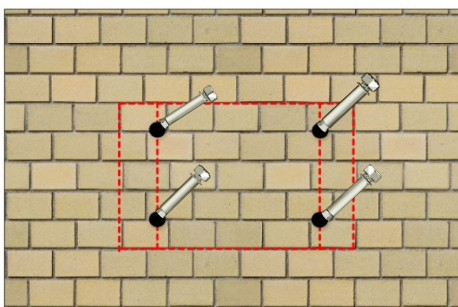
6.2 Wall Scenario



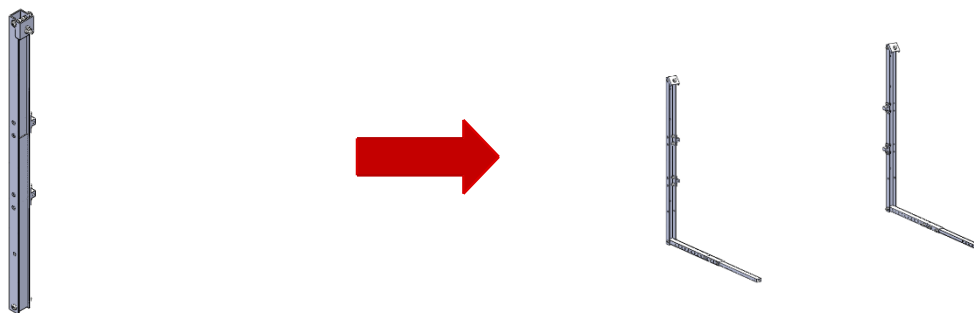
Use PV module dimensions to determine installation position and fixing points, mark the installation positions of expansion bolts on the wall.



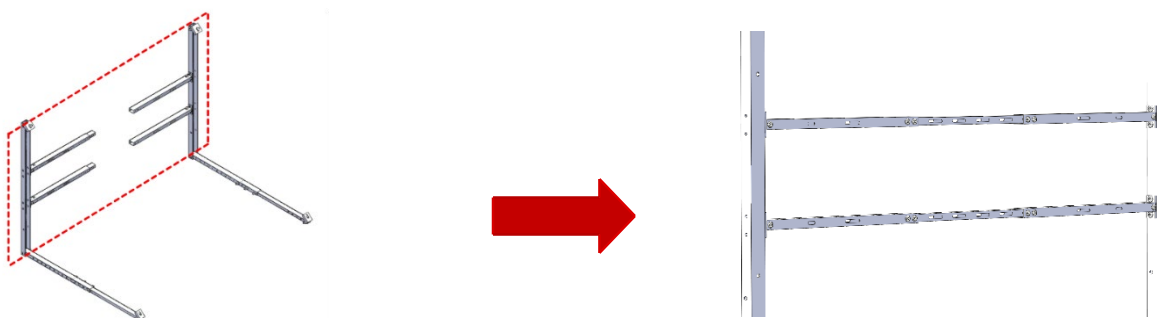
Drill vertically into the wall with an M8 drill bit to a depth of 80mm and fully clean dust and debris from all holes.



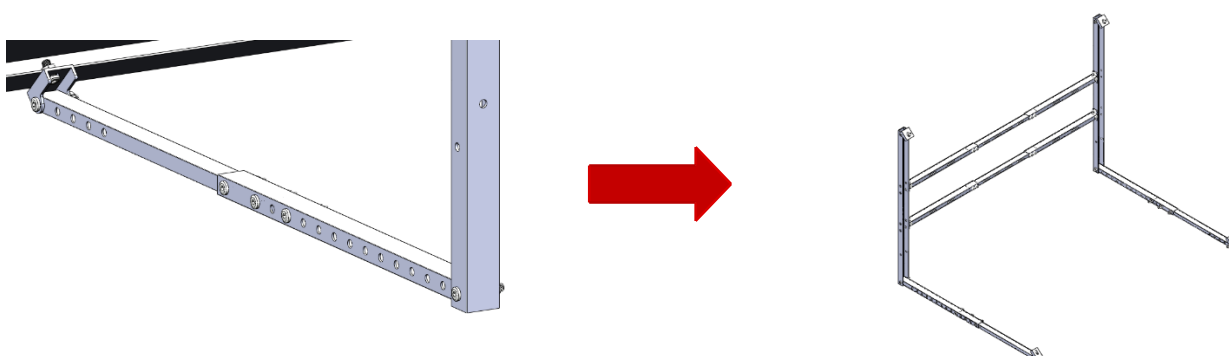
Hammer M8 expansion anchors fully into holes until sleeves are completely embedded with no looseness.



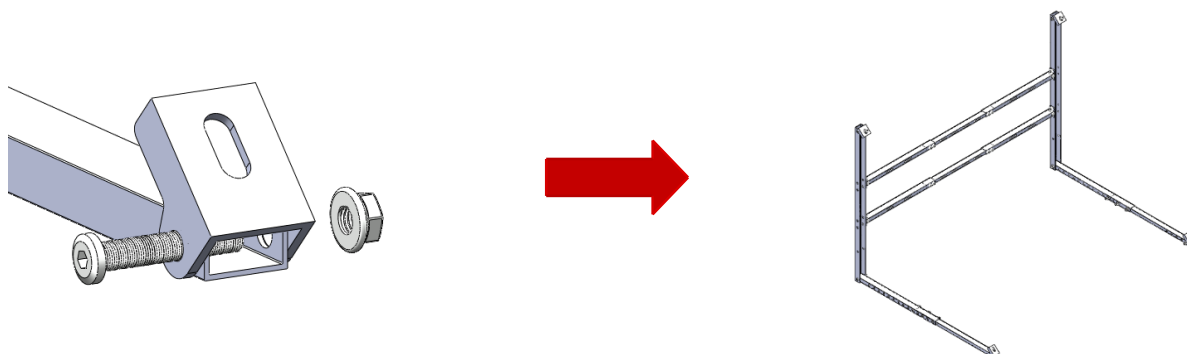
Unfold the brackets from the packaging, place on a stable surface and pre-assembled before final adjustment.



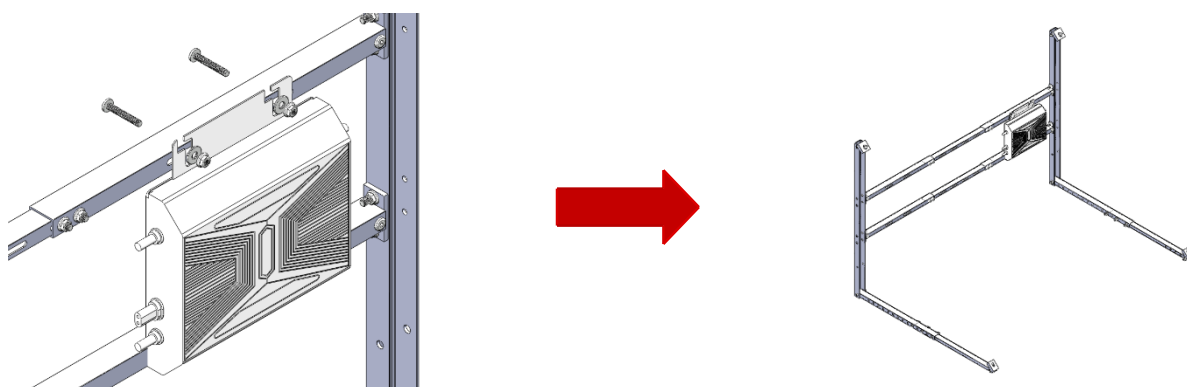
Align and adjust the cross beam according to the fixing anchoring positions, and then tighten the 2pcs M6×40 bolts



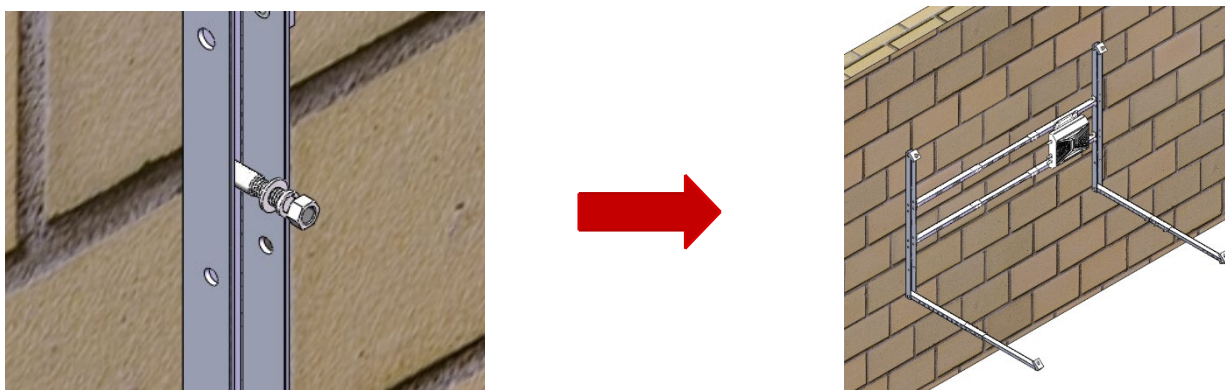
Adjust the bottom brackets according to the required installation angle and secure with 3pcs M8×45 bolts.



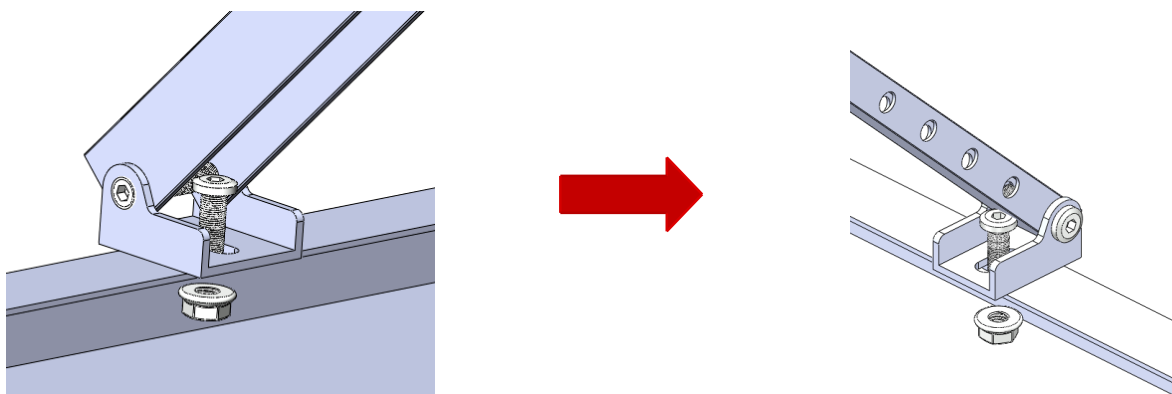
Install bottom blocks with M8×45 bolts to the brackets.



Adjust the fixing position on the cross beam according to the inverter's dimensions and secure with M6×50 bolts.



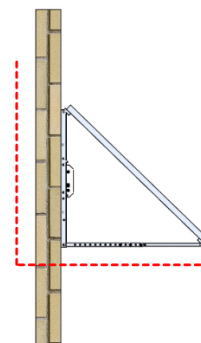
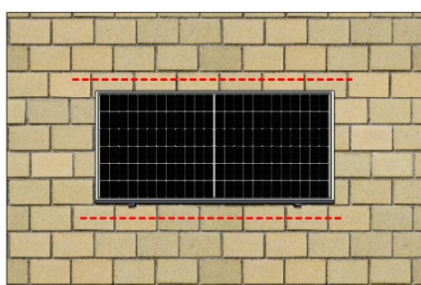
Align back bracket with anchors, fit flat washers and spring lock washers, align and fix the bracket in position.



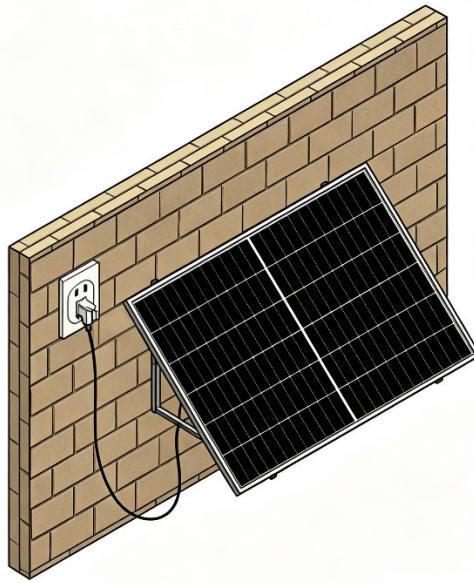
Align the module frame with the pre-adjusted mounting positions and secure the PV module with M8×20 bolts.

⚠ A minimum of **two people** is required for lifting and positioning the assembled PV mounting system.

⚠ Do not attempt installation alone.

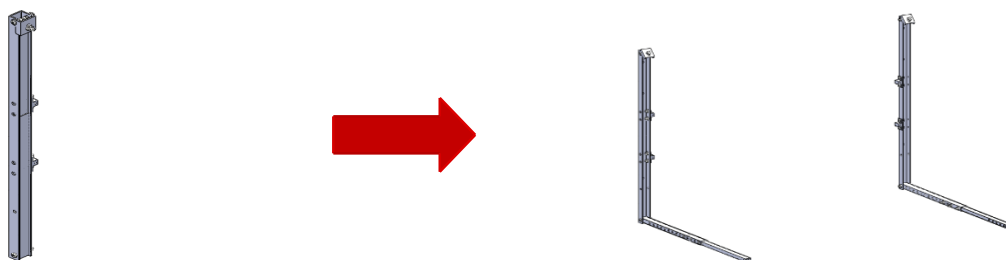


Confirm panels sit flat with no tilting or suspended edges.

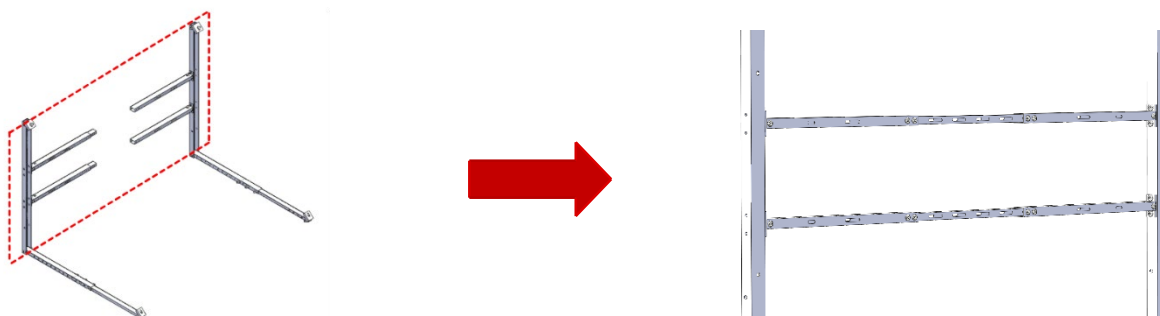


Once the plug in system installed, connect all series to the micro inverter, plug the output end of the micro inverter into the socket and activate the system. Minimum module to module and module to obstruction spacing is 10mm.

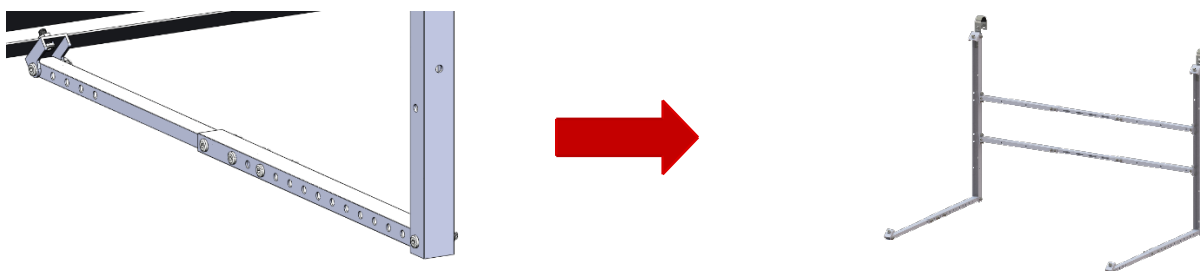
6.3 Ground/Floor Scenario



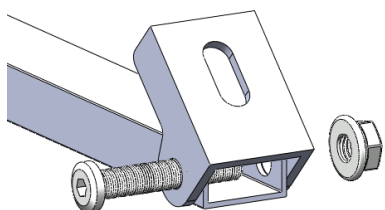
Unfold the brackets from the packaging, place on a stable surface and pre-assembled before final adjustment.



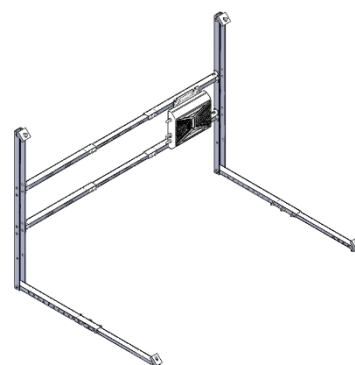
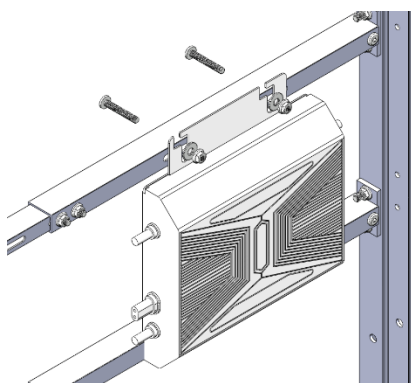
Adjust the cross beam according to the PV module mounting hole positions, ensure the mounting holes are correctly aligned with the PV module fixing points and then tighten the 8pcs M6×40 bolts.



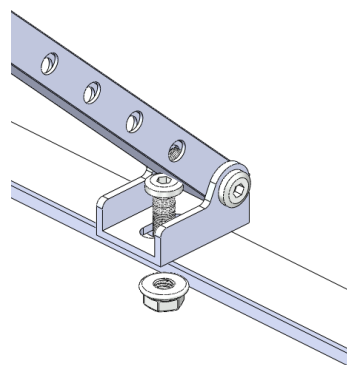
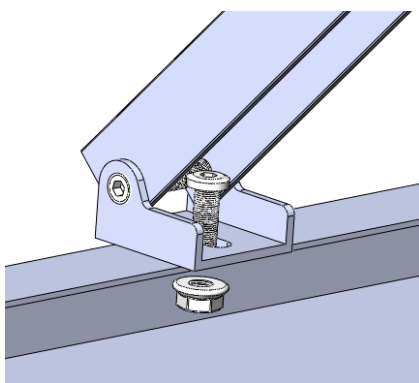
Adjust the bottom brackets according to the required installation angle and secure with 3pcs M8×45 bolts.



Install bottom blocks with M8×45 bolts to the brackets.



Adjust the fixing position on the cross beam according to the inverter's dimensions and secure with M6×50 bolts.



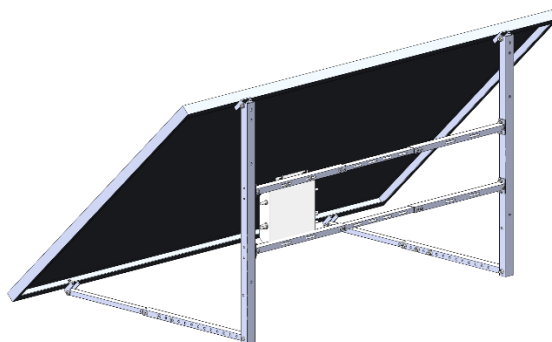
Align the module frame with the pre-adjusted mounting positions and secure the PV module with M8×20 bolts.

 The complete mounting system shall be inspected before proceeding to the next step.

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6.3.1 Direct Placement

The fully assembled mounting system may be directly placed on a suitable ground or floor surface, subject to the applicable structural and wind-load requirements.



- ☞ Select a suitable, stable and level installation surface, place the fully assembled mounting system in the planned position.
- ☞ Confirm that the mounting structure is stable and fully supported by the ground or floor surface.

 Direct placement shall only be used where permitted by the applicable project design and environmental conditions.

 The installer shall verify that the system has sufficient resistance to movement, sliding, overturning and other environmental loads.

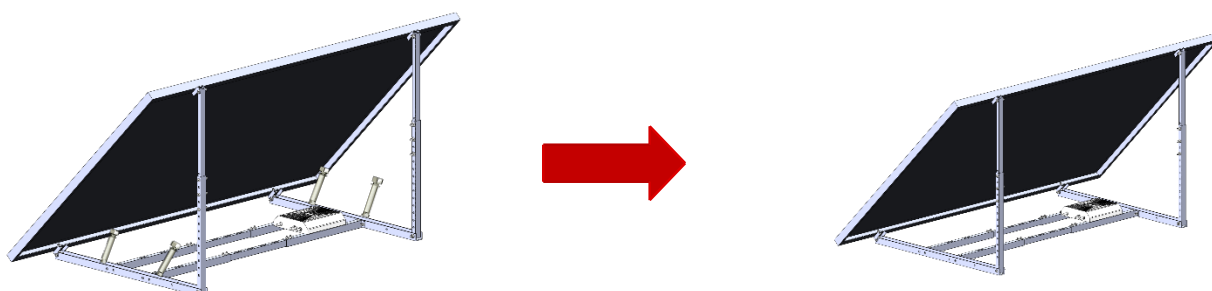
6.3.2 Reverse Placement

For installations requiring mechanical fixing, the mounting structure can be installed in a reversed orientation so that the back support structure is positioned directly on the ground or floor.

The mounting system shall not use the same fixing method for all surfaces. The installer shall select the appropriate method according to the actual substrate.

6.3.2.1 Concrete or paving surface

The support structure is then mechanically fixed to the substrate using suitable expansion bolts.

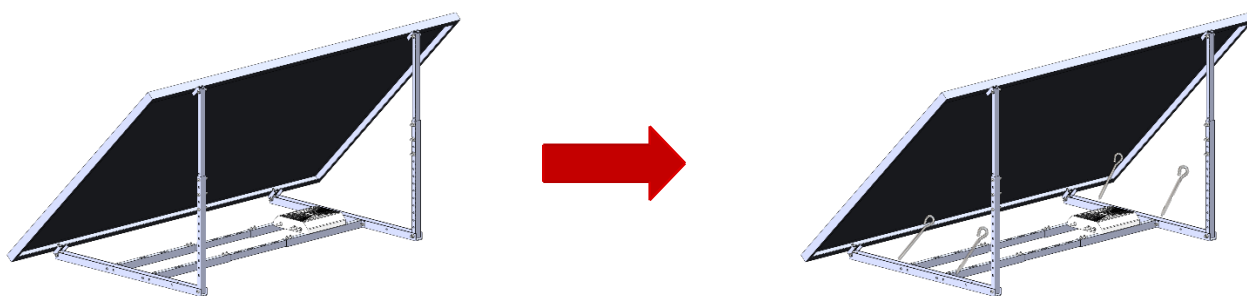


- ✎ In the planned position of ground/floor surface, position the fully assembled mounting system at the required location.
- ✎ Carefully reverse the mounting structure so that the back bracket is positioned against the ground or floor.
- ✎ Mark the expansion bolts positions through the fixing holes and drill the M8 anchor holes.
- ✎ Mounting structures, align and install all expansion bolts.
- ✎ Check that the mounting structure is securely fixed to the substrate.

 The expansion bolt embedment depth and installation method shall be determined according to the substrate conditions.

6.3.2.2 Grass or soil surface

The support structure is then mechanically fixed to the substrate using suitable ground pegs/screws.



-  In the planned position of ground surface, position the fully assembled mounting system at the required location.
-  Carefully reverse the mounting structure so that the back bracket is positioned against the ground or floor.
-  Use the designated anchor holes on the back bracket to determine the anchor positions.
-  Install the selected ground pegs / screws ($\phi \leq 9\text{mm}$, length $> 500\text{mm}$) through the designated fixing points.
-  Check that the mounting structure is securely fixed to the substrate.

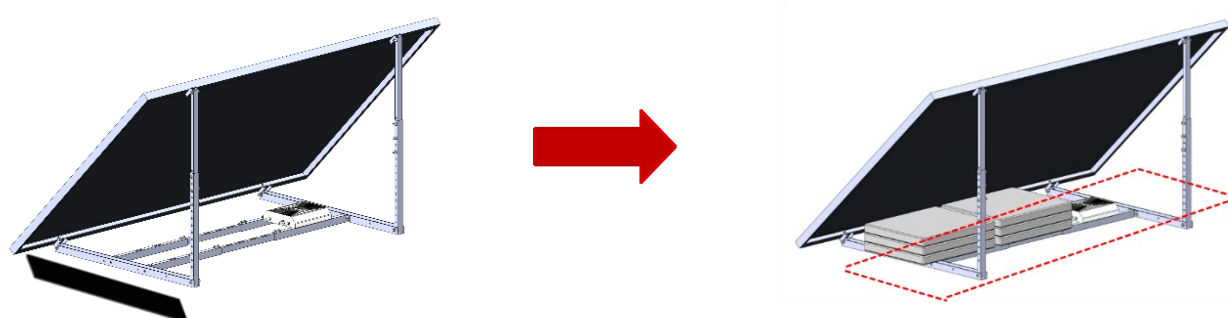
 The ground pegs / screws embedment depth and installation method shall be determined according to the substrate conditions.

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6.3.3 Reverse Placement with Ballast

Where mechanical penetration of the ground or floor is not permitted, the mounting structure may be installed in the reversed orientation and secured using suitable ballast.

This method may be suitable for certain concrete, paved or other surfaces where drilling or permanent anchoring is undesirable.



- ✎ In the planed position of ground/floor surface, position the fully assembled mounting system at the required location.
- ✎ Cut the EPDM rubber pads (814×37×2.0mm) to the required length and stick to the back bracket.
- ✎ Carefully reverse the mounting structure so that the back bracket is positioned against the ground or floor.
- ✎ Distribute the specified ballast evenly and symmetrically on the cross beams and as close as practicable on the rear structure supporting areas. Minimum ballast weight shall be provided for each mounting system to provide the required resistance.

Panel tilt	15°	20°	25°
Minimum ballast weight (kg)	185	180	170

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- ☞ Secure the ballast to the cross beam using steel wire rope. The ballast may be divided into multiple individual ballast blocks, confirm that all the ballast is securely positioned and cannot move.

⚠ The recommended ballast shall be a solid, durable and weather-resistant ballast block, suitable for permanent outdoor installation.

⚠ The preferred ballast type is: Concrete ballast blocks / precast concrete blocks

⚠ Do not use an arbitrary ballast weight.

⚠ The ballast system shall be designed or verified to prevent sliding, overturning and displacement under the applicable environmental loads.

Once the plug in system installed, connect all series to the micro inverter, plug the output end of the micro inverter into the socket and activate the system. Minimum module to module and module to obstruction spacing is 10mm.

Click on this QR code if installing in the United Kingdom



7 Post-Installation Acceptance Standards

The system can only be connected to grid power if all items below are fully satisfied:

- ☐ All bolts tightened
- ☐ Module securely fixed
- ☐ Safety rope installed
- ☐ No loose components
- ☐ Module alignment correct

8 Inspection & Maintenance

Regular inspection is recommended

Every 12 months

- Bolt tightness
- Aluminum corrosion
- Safety wire condition
- Module fixing status

After extreme weather

Inspect immediately

- Storm
- Heavy snow
- Strong wind

9 Troubleshooting for Common Issues

Trouble	Cause	Solution
Minor bracket wobble	Insufficient bolt torque	Loosen all nuts and retighten
Left-right tilt of bracket	Uneven tightening force	Re-calibrate with spirit level and fasten evenly
Horizontal sliding of panels	Missing anti-slip stops	Fit anti-slip stops

10 Warranty

1. Warranty Period: 12-year warranty for brackets.
2. Warranty Coverage: Free replacement of defective components for material cracking, anodising delamination and factory component defects under compliant installation and normal usage.
3. Fastensol shall not be responsible for
 - Unauthorised cutting, welding or structural modification of brackets
 - Bracket damage or falling caused by non-compliant mounting substrates (hollow walls, hollow tiled walls)
 - Deformation from overloading, man-made impact or drop damage
 - Damage caused by force majeure such as typhoons, floods and earthquakes



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