

# **PV Module Support (Standard A-Shaped Support 3.0)**

## **Quick Guide**

**Issue: 01**

**Part Number: 21540480, 21540481**

**Date: 2022-04-30**

**Huawei Technologies Co., Ltd.**



# Safety Precautions

## ■ Safety Precautions

When installing, operating, and maintaining the equipment, observe all the safety instructions on the equipment and in this document to prevent personal injury and equipment damage. The "WARNING", "CAUTION", "NOTICE", and "NOTE" statements in this document do not cover all the safety instructions. They are only supplements to the safety instructions. Follow all the safety precautions and instructions provided by Huawei. Huawei will not be liable for the consequences that are caused by the violation of the safety operation regulations and design, production, and usage standards.

## ■ Local Laws and Regulations

When operating the equipment, comply with local laws and regulations.

## ■ Personnel Requirements

Personnel who plan to install or maintain Huawei equipment must be qualified electricians who receive thorough product training, understand all necessary safety precautions, and are able to correctly perform all operations.

## ■ Symbol Conventions

---

### NOTICE

Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.

---

### NOTE

Supplements the important information in the main text.

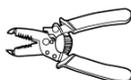
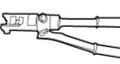
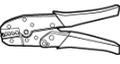
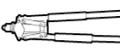
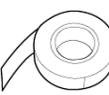
---

## ■ Personal Safety

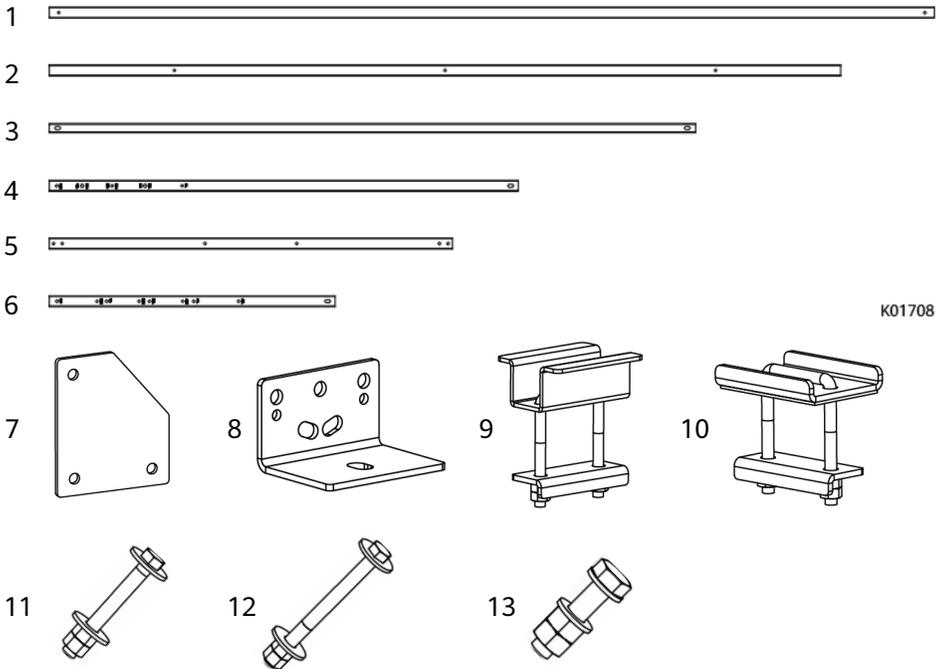
To prevent electric shocks, use insulated tools and wear insulation gloves when connecting cables.

To prevent personal injury, wear protective shoes when moving heavy objects.

# Preparing Tools

 Protective gloves	 Insulated gloves	 Work shoes	 Safety helmet	 Compass	 Steel measuring tape
 Falsework	 Ladder	 Power cable cutter	 Wire stripper	 Hydraulic pliers	 Crimping tool
 Diagonal pliers	 Needle-nose pliers	 Adjustable torque wrench	 Insulated socket wrench	 Adjustable wrench	 Inner hex key
 Marker	 Level	 Insulated torque screwdriver	 Heat gun	 Rivet gun	 Hammer drill
 Heat shrink tubing	 Cloth insulation tape				

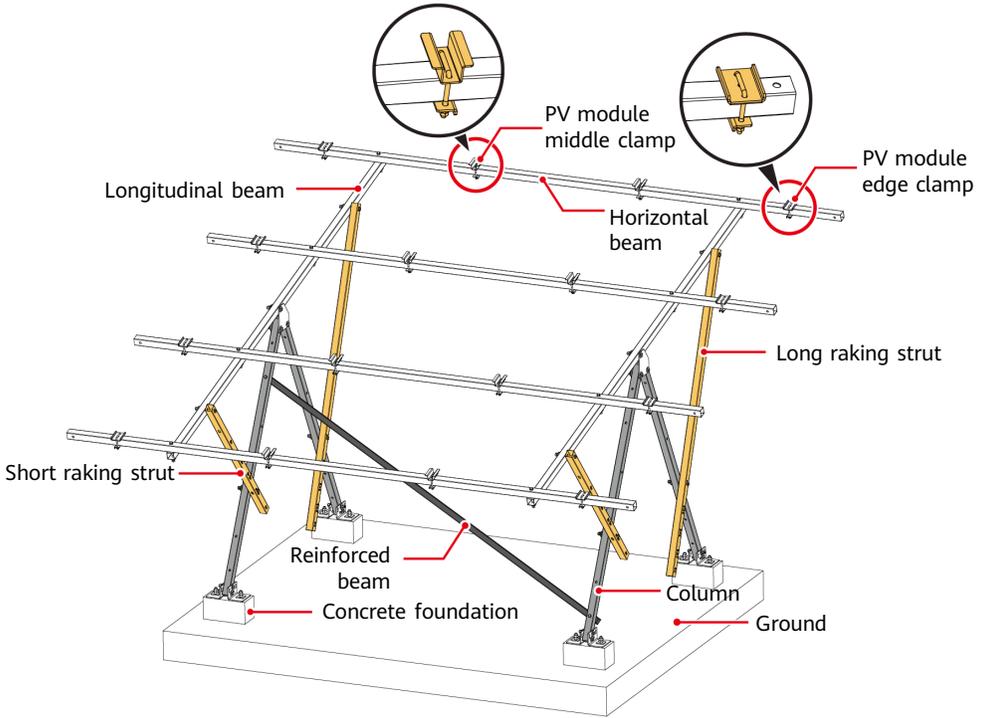
## Components of a Standard A-Shaped Support (Low Support)



K01708

No.	Item	Length (mm)	Quantity (PCS)
1	Horizontal beam	4089	4
2	Longitudinal beam	3656	2
3	Reinforced beam	2986	1
4	Long raking strut	2165	2
5	Column	1862	4
6	Short raking strut	1321	2
7	Column bracket	/	4
8	Anchor bracket	/	8
9	PV module middle clamp	/	9 (including one spare part)
10	PV module edge clamp	/	9 (including one spare part)
11	M12x100 bolt	/	15 (including one spare part)
12	M12x140 bolt	/	19 (including one spare part)
13	M8x35 bolt	/	2 (including one spare part)

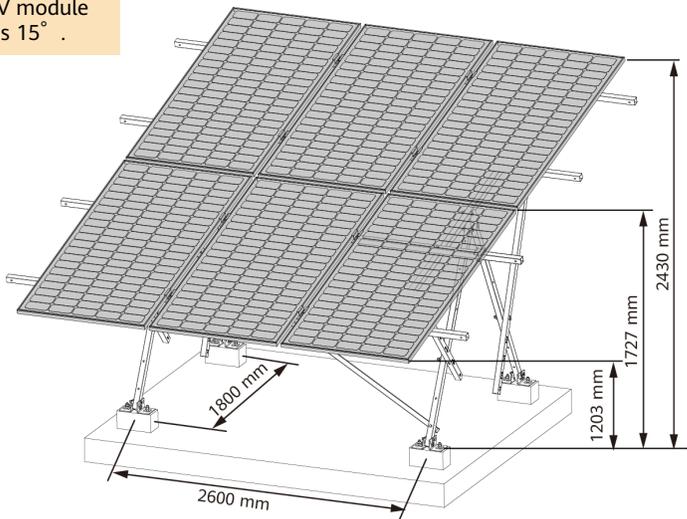
# Installed Standard A-Shaped Support (Low Support)



K01400

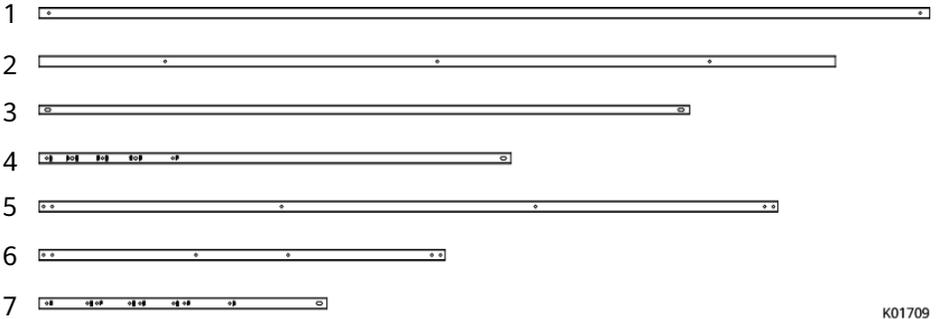
**NOTE**

In the figure, the PV module (540 W) tilt angle is 15°.

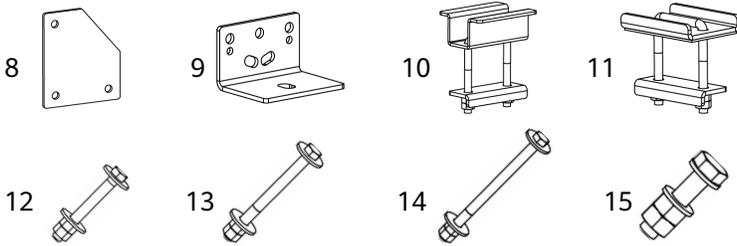


K01401

# Components of a Standard A-Shaped Support (High Support)

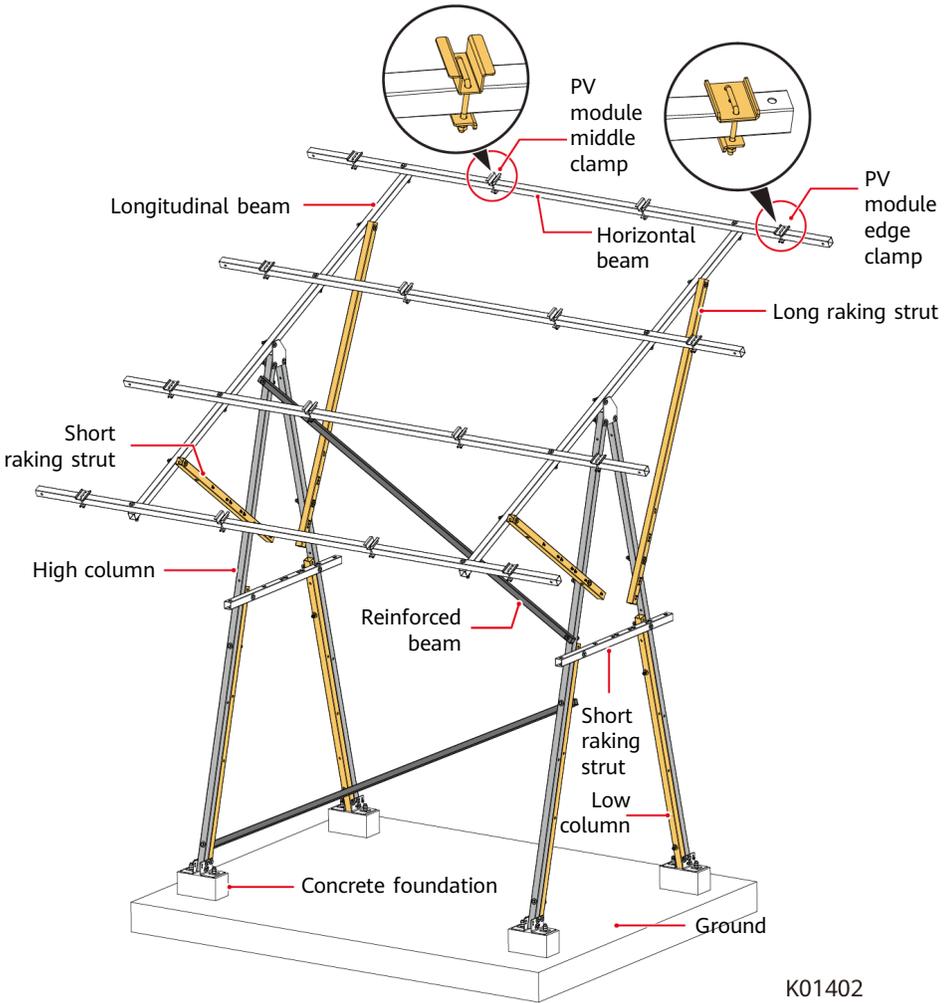


K01709



No.	Item	Length (mm)	Quantity (PCS)
1	Horizontal beam	4089	4
2	Longitudinal beam	3656	2
3	Reinforced beam	2986	2
4	Long raking strut	2165	2
5	High column	3391	4
6	Low column	1862	4
7	Short raking strut	1321	4
8	Column bracket	/	4
9	Anchor bracket	/	8
10	PV module middle clamp	/	9 (including one spare part)
11	PV module edge clamp	/	9 (including one spare part)
12	M12x100 bolt	/	19 (including one spare part)
13	M12x140 bolt	/	29 (including one spare part)
14	M12x180 bolt	/	3 (including one spare part)
15	M8x35 bolt	/	2 (including one spare part)

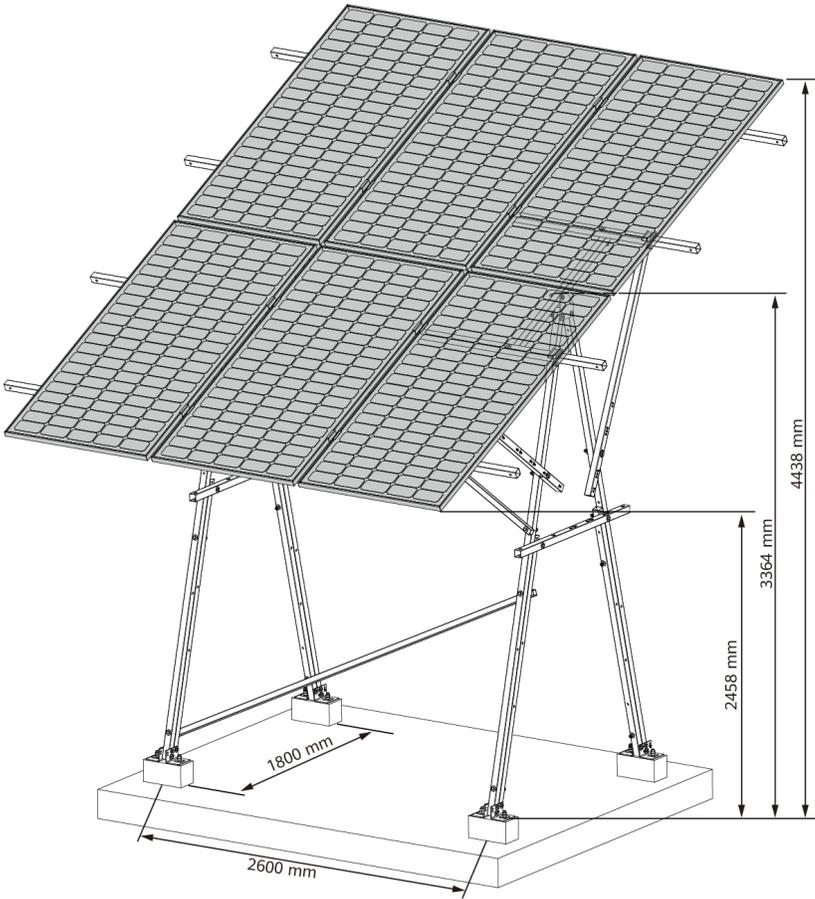
# Installed Standard A-Shaped Support (High Support)



K01402

NOTE

In the figure, the PV module (540 W) tilt angle is  $25^\circ$  .



K01403

# Standard A-Shaped Support (Low Support)

## 1 Installing a PV Module Support

### 1.1 Determining the Direction and Tilt Angle of PV Modules

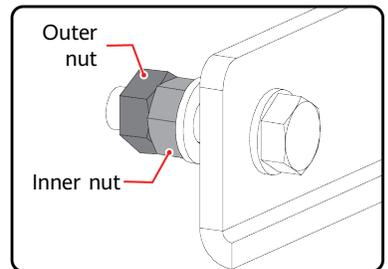
Determine the orientation of PV modules based on design requirements. In the northern hemisphere, PV modules face south. In the southern hemisphere, PV modules face north. The following table lists the tilt angle design specifications.

Site Latitude (Degree)	0–15	16–25	26–30	31–45
PV Module Tilt Angle (Degree)	15	25	35	45

### 1.2 Installing a PV Module Support

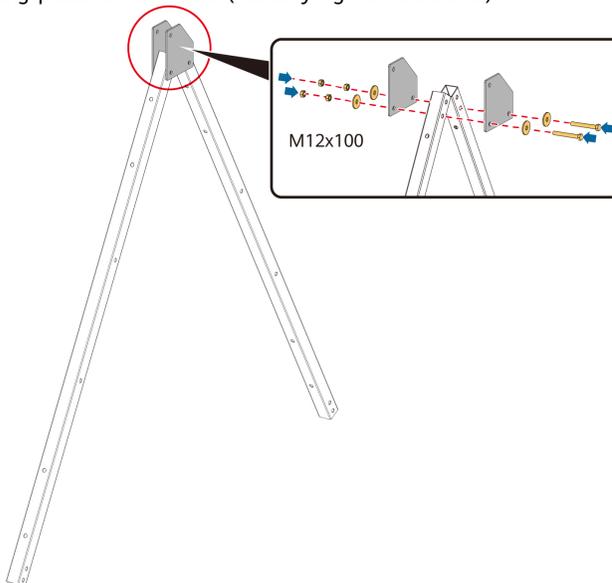
#### NOTICE

- The PV module support can be mounted with 540 W PV modules or iPV540-M1A.
- When installing mechanical parts, use two nuts to secure the bolts. Tighten the inner nut first and then the outer nut. After the nuts are tightened, ensure that the flats on the two nuts are not aligned. (Use a wrench to secure the inner nut and use another wrench to tighten the outer nut.)
- When installing a support, use a marker to mark each bolt after tightening.
- In steps 1 to 4, partially tighten the bolts to reserve space for adjustment. Then, tighten the bolts in step 6.



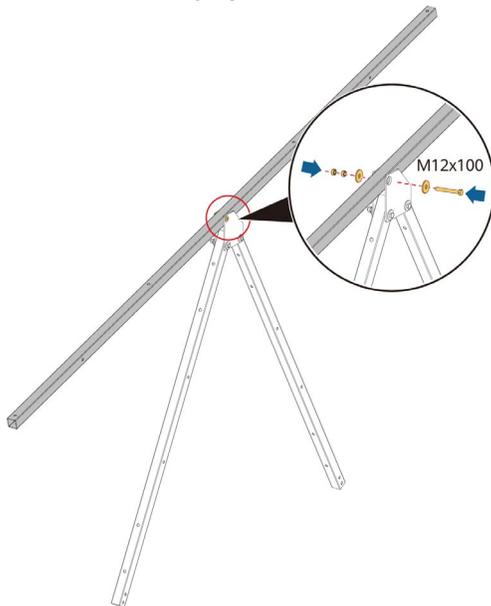
K01043

1. Install connecting plates on columns. (Partially tighten the bolts.)



K01605

2. Install a longitudinal beam. (Partially tighten the bolts.)



K01604

3. Install a long raking strut and short raking strut. (Partially tighten the bolts.)

**NOTICE**

- The short raking strut needs to be installed on the lower side of a PV module support, and the long raking strut needs to be installed on the higher side of a PV module support.
- When installing raking struts, partially tighten them first. After anchor bolts are installed, tighten the raking struts.
- The holes in the long and short raking struts are silkscreened. Determine the holes for mounting based on the tilt angle of PV modules and support type. The following figure uses the installation of raking struts for a low support for 45° PV modules as an example. In this case, the raking struts need to be mounted through the holes marked with 45L.

Raking strut mounting hole for a low support for 45° PV modules

Raking strut mounting hole for a low support for 35° PV modules

Raking strut mounting hole for a low support for 25° PV modules

Raking strut mounting hole for a low support for 15° PV modules



Raking strut mounting hole for a low support for 15° PV modules

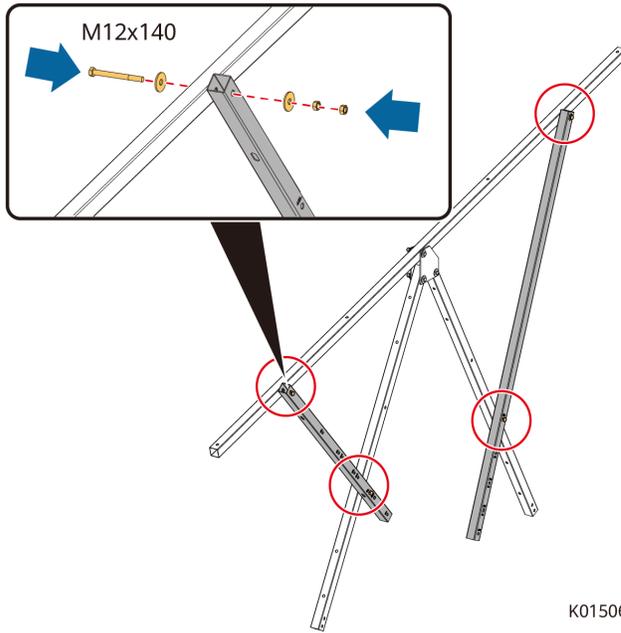
Raking strut mounting hole for a low support for 25° PV modules

Raking strut mounting hole for a low support for 35° PV modules

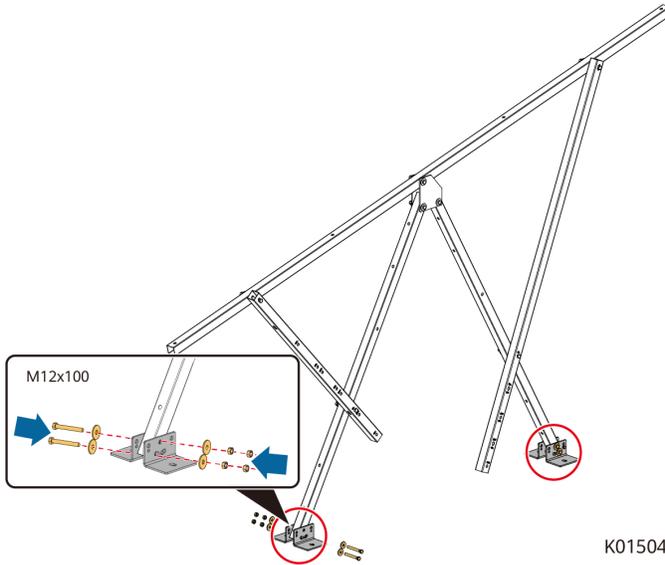
Raking strut mounting hole for a low support for 45° PV modules

K01607

Short raking strut      Long raking strut



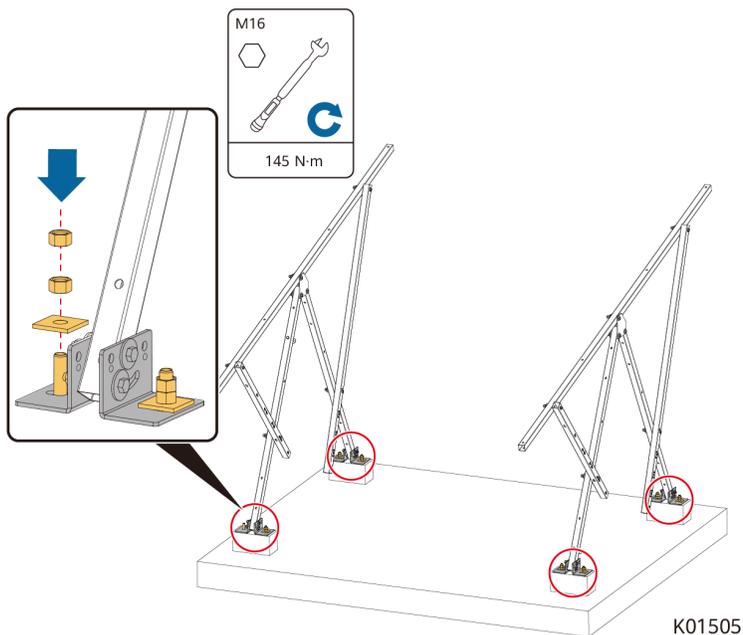
4. Install anchor brackets. (Partially tighten the bolts.)



5. Loosen the washers and nuts of the anchor bolts, fix the support assemblies to the foundation, and tighten the anchor bolts.

**NOTICE**

- Ensure that lower edge of the longitudinal beam faces the equator.
- When installing anchor bolts, secure each bolt using two nuts.

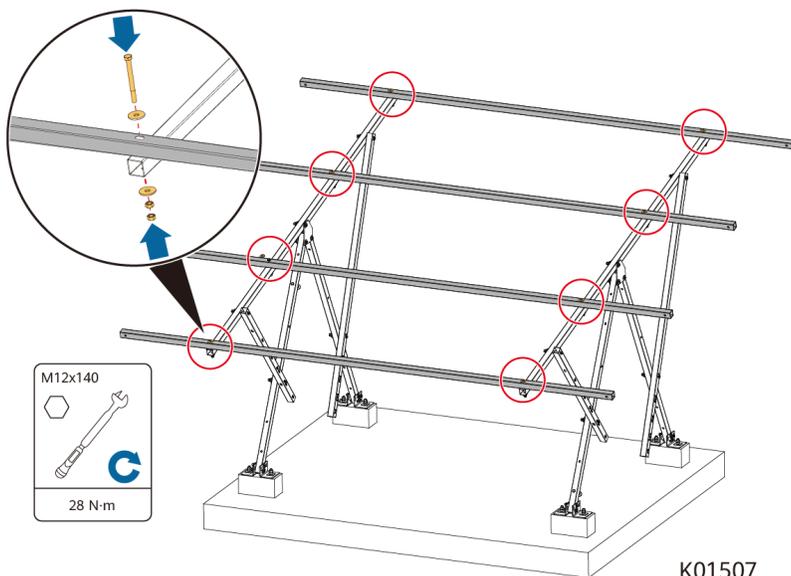


K01505

6. Tighten all bolts partially tightened on the support assemblies to 45 N-m.
7. Install horizontal beams.

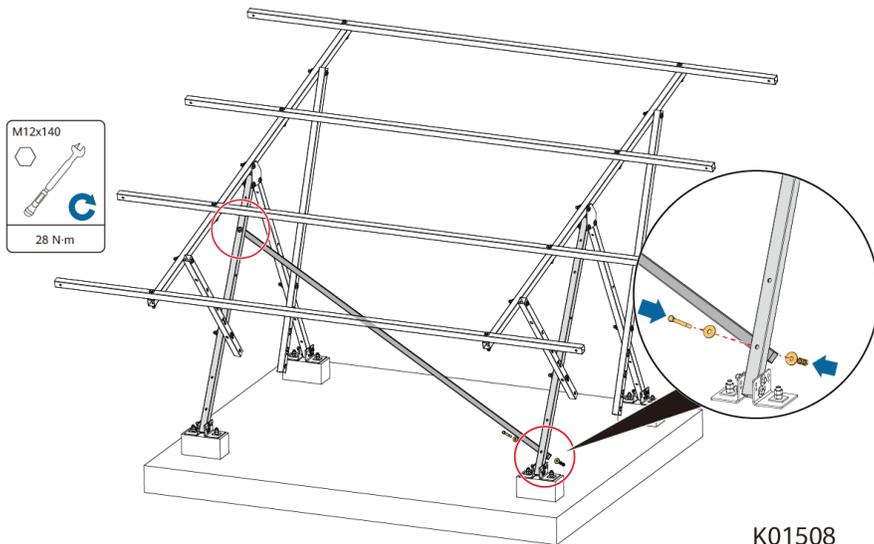
**NOTE**

Ensure that the bolts are inserted from the front side of the beam.



K01507

8. Install reinforced beams.

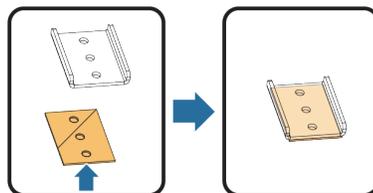


K01508

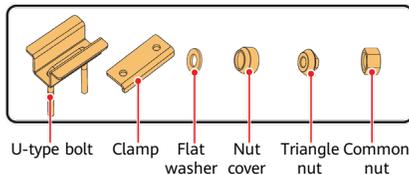
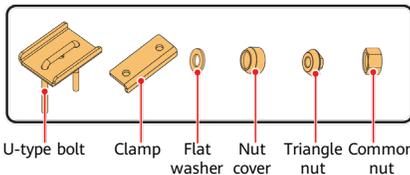
9. Install edge clamps and middle clamps for PV modules.

**NOTICE**

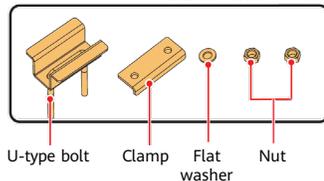
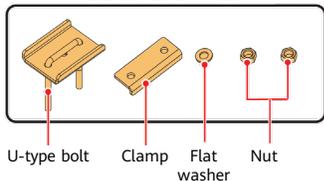
- Partially tighten all the clamps.
- When installing the rubber pad, ensure that the adhesive side faces upwards. Remove the adhesive sticker and press the rubber pad to ensure that it is firmly attached.
- The nuts for securing PV module clamps are classified into common nuts and antitheft nuts. Select nuts based on the actual configuration.
- Use an antitheft nut wrench to partially tighten antitheft nuts.



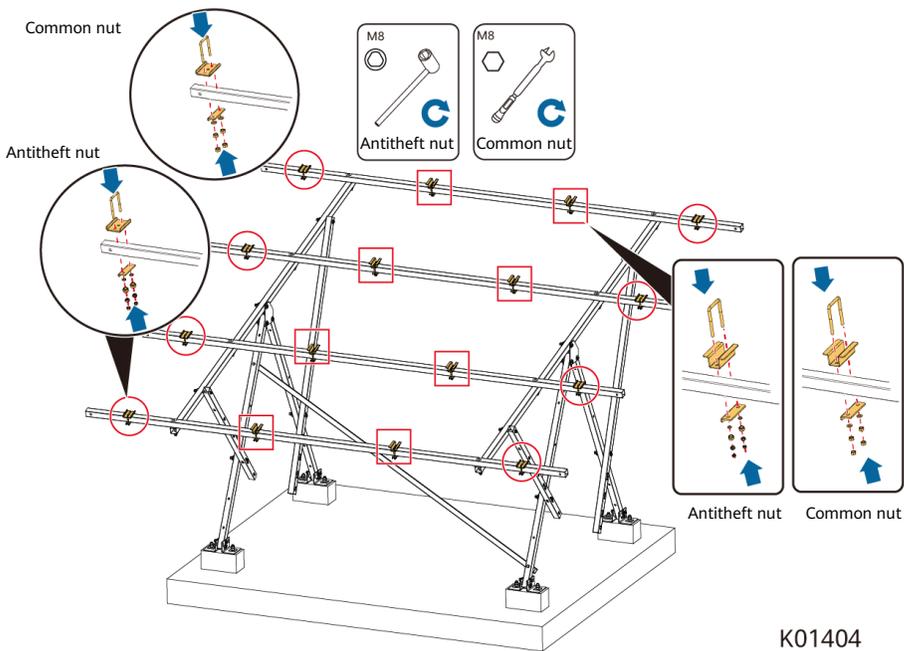
Antitheft nut



Common nut



K01039



K01404

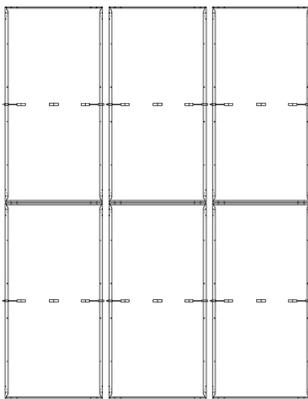
10. Install PV modules.

**NOTICE**

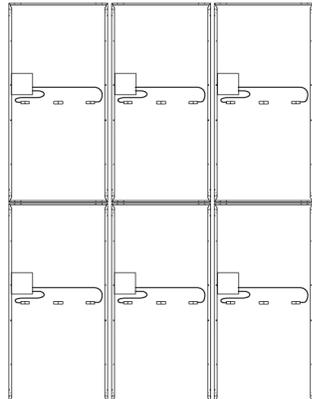
- When installing PV modules, ensure that the distances between the PV module edges and the two ends of the support horizontal beam are the same.
- When installing PV modules, ensure that the control boxes behind PV modules face the same direction.
- The following table lists the dimensions of PV modules that can be mounted on a support.

PV Module Specifications	Dimensions (mm)		
	Length	Width	Thickness
540 W/iPV540-M1A	2256-2285	1133-1134	35

**Applicable to 540 W PV Modules**



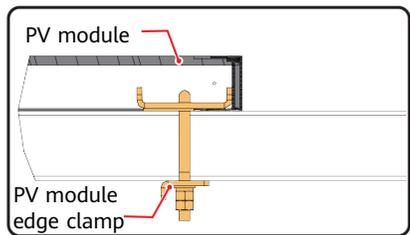
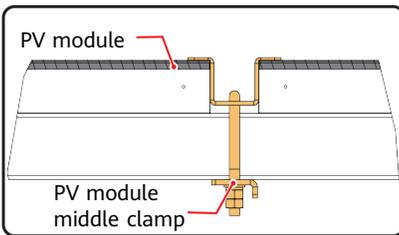
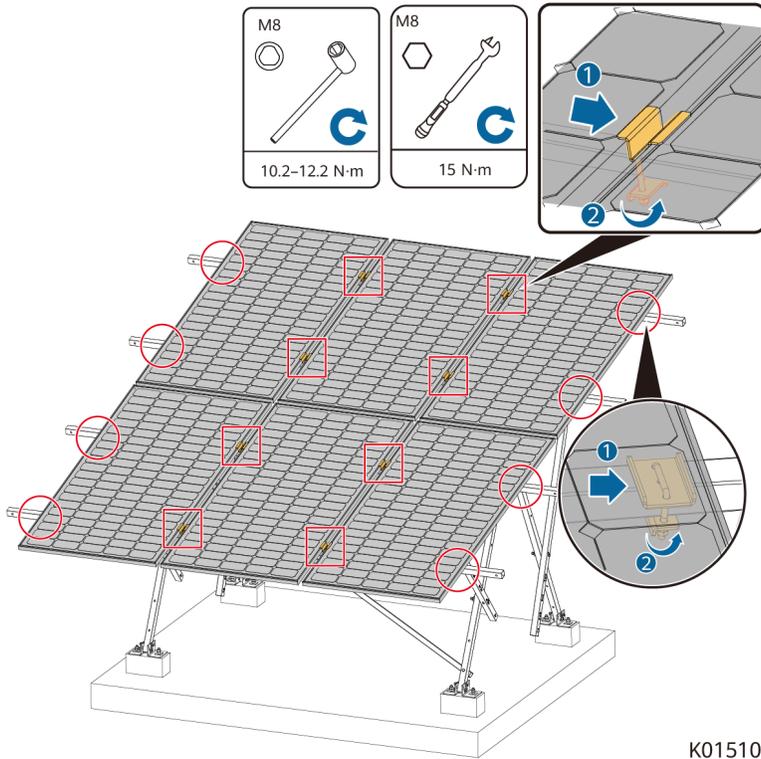
**Applicable to iPV540-M1A PV Modules**



11. Adjust the positions of clamps to secure the PV modules. Then tighten the screws.

**NOTICE**

When fixing PV modules, ensure that the edge clamps and the middle clamps are tightly attached to the inner and outer sides of the PV modules, respectively.



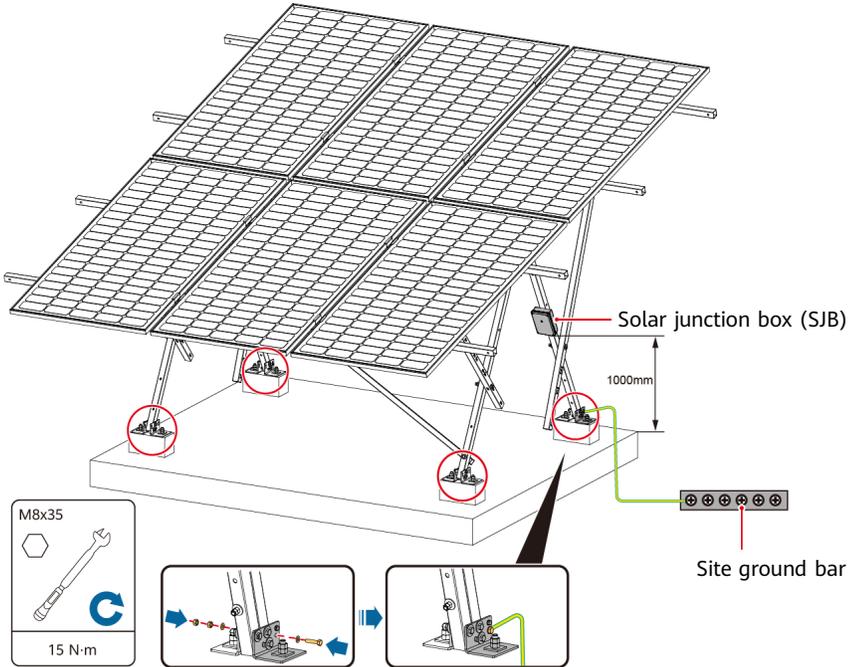
K01040

## 2 Installing Cables for PV Modules

1. Install ground screws and a ground cable for PV modules.

### NOTE

Install ground screws near the ground bar.



K01509

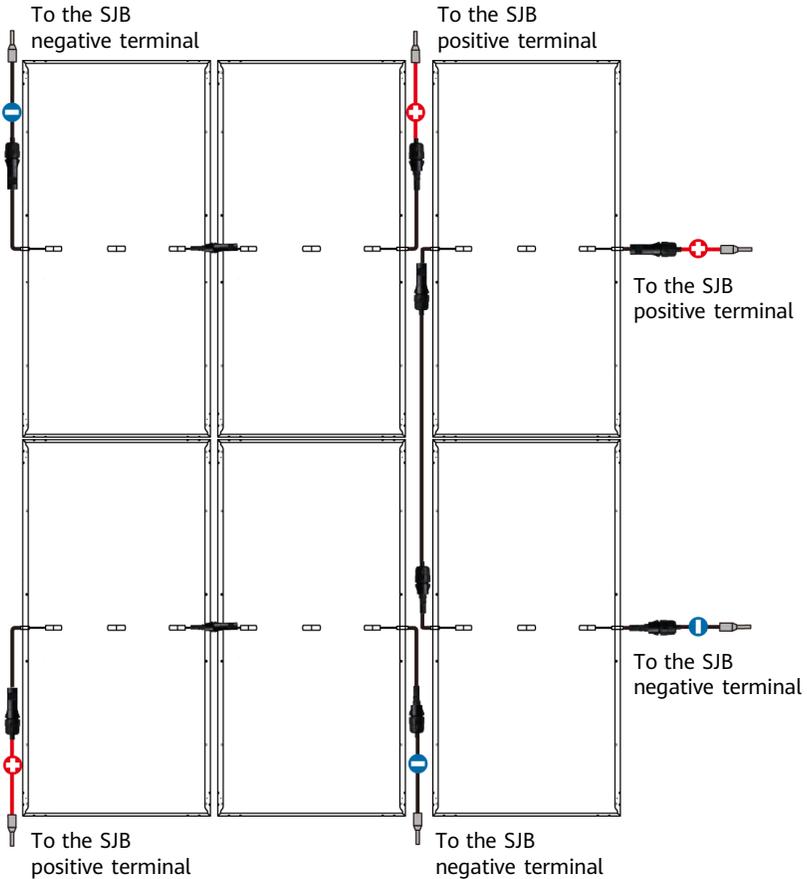
2. Install DC power cables for PV modules.

**NOTICE**

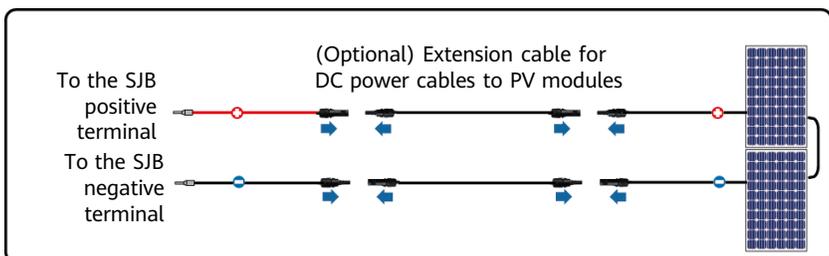
If the DC power cables to PV modules are not long enough, connect the extension cables.

**Installing 540 W PV Modules (Connecting to an SJB)**

Connect two PV modules in series as a route and connect the route to the SJB.



K01701



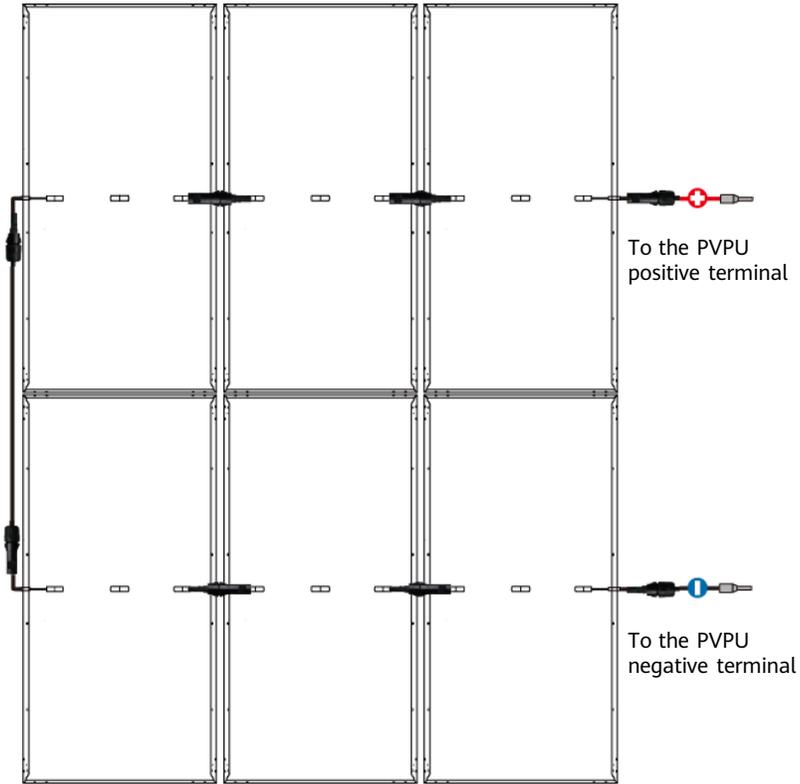
K01706

## Installing 540 W PV Modules (Connecting to a PVPU)

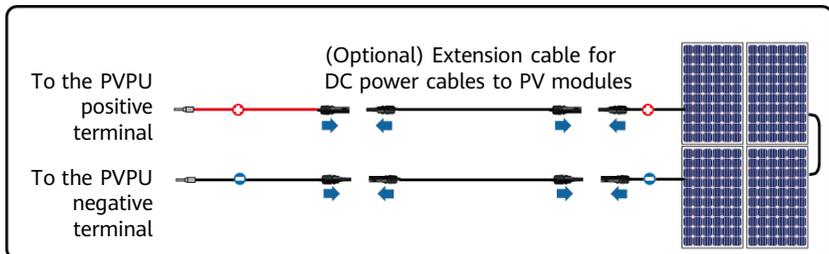
Connect all PV modules in series and then connect them to the photovoltaic power unit (PVPU).

### NOTICE

Three to eight PV modules can be connected in series. The following shows how to connect six PV modules in series.



K01704



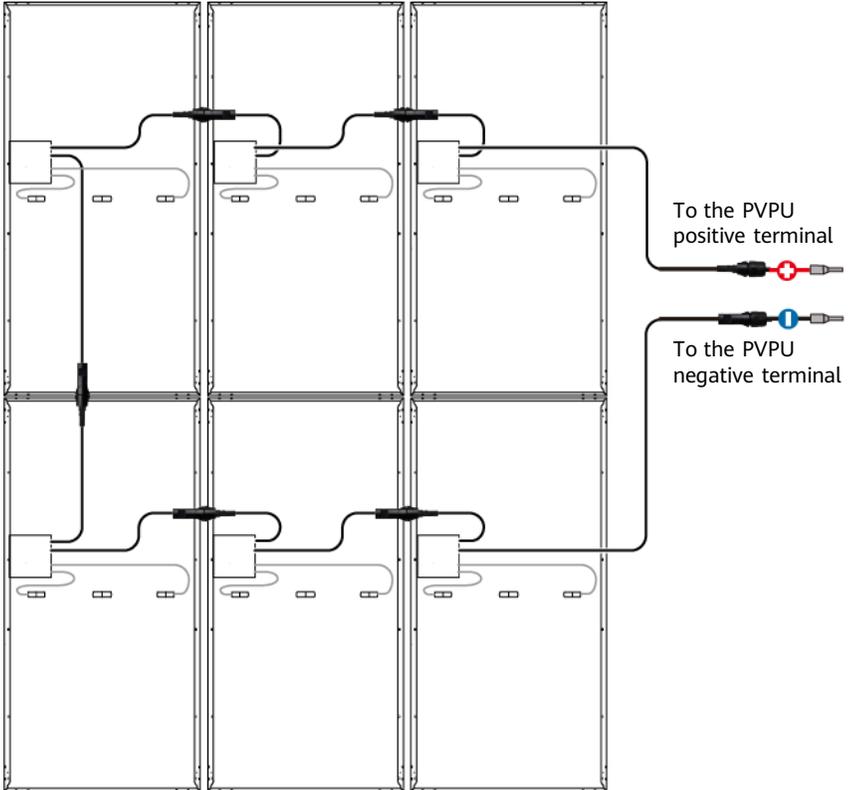
K01703

## Installing iPV540-M1A PV Modules

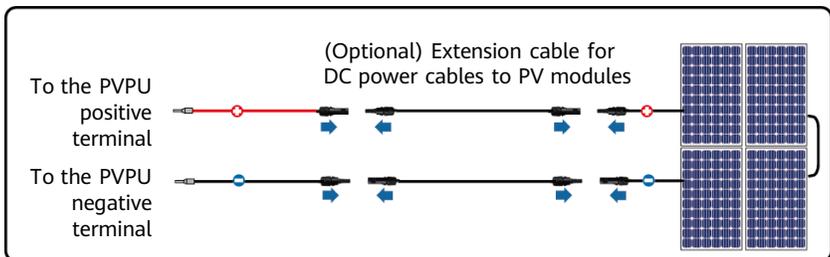
When installing the iPV540-M1A, connect all PV modules in series and then connect them to the PVPU.

### NOTICE

Three to eight PV modules can be connected in series. The following shows how to connect six PV modules in series.



K01705



K01703

# Standard A-Shaped Support (High Support)

## 1 Installing a PV Module Support

### 1.1 Determining the Direction and Tilt Angle of PV Modules

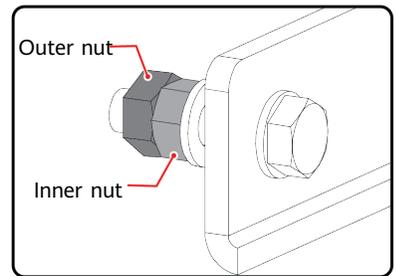
Determine the orientation of PV modules based on design requirements. In the northern hemisphere, PV modules face south. In the southern hemisphere, PV modules face north. The following table lists the tilt angle design specifications.

Site Latitude (Degree)	0-15	16-25	26-30	31-45
PV Module Tilt Angle (Degree)	15	25	35	45

### 1.2 Installing a PV Module Support

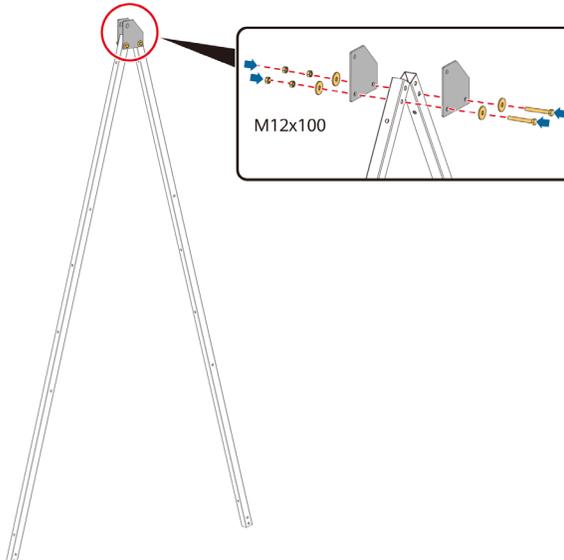
#### NOTICE

- The PV module support can be mounted with 540 W PV modules or iPV540-M1A.
- When installing mechanical parts, use two nuts to secure the bolts. Tighten the inner nut first and then the outer nut. After the nuts are tightened, ensure that the flats on the two nuts are not aligned. (Use a wrench to secure the inner nut and use another wrench to tighten the outer nut.)
- When installing a support, use a marker to mark each bolt after tightening.
- In steps 1 to 4, partially tighten the bolts to reserve space for adjustment. Then, tighten the bolts in step 6.



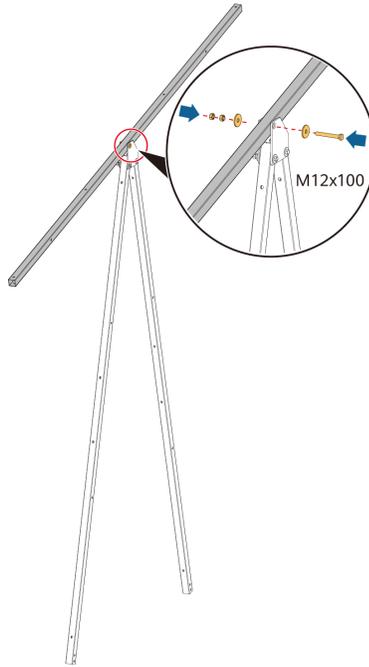
K01043

1. Install connecting plates on high columns. (Partially tighten the bolts.)



K01606

2. Install a longitudinal beam.  
(Partially tighten the bolts.)



K01603

3. Install a long raking strut and short raking strut. (Partially tighten the bolts.)

**NOTICE**

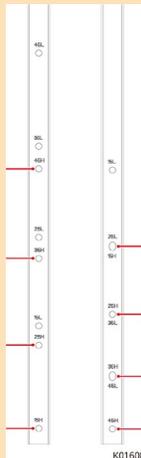
- The short raking strut needs to be installed on the lower side of a PV module support, and the long raking strut needs to be installed on the higher side of a PV module support.
- When installing raking struts, partially tighten them first. After anchor bolts are installed, tighten the raking struts.
- The holes in the long and short raking struts are silkscreened. Determine the holes for mounting based on the tilt angle of PV modules and support type. The following figure uses the installation of raking struts for a high support for 45° PV modules as an example. In this case, the raking struts need to be mounted through the holes marked with 45H.

Raking strut mounting hole for a high support for 45° PV modules

Raking strut mounting hole for a high support for 35° PV modules

Raking strut mounting hole for a high support for 25° PV modules

Raking strut mounting hole for a high support for 15° PV modules



K01608

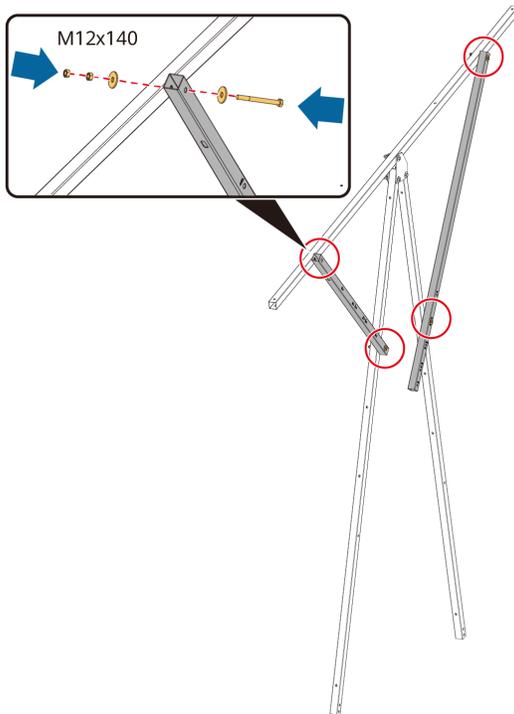
Raking strut mounting hole for a high support for 15° PV modules

Raking strut mounting hole for a high support for 25° PV modules

Raking strut mounting hole for a high support for 35° PV modules

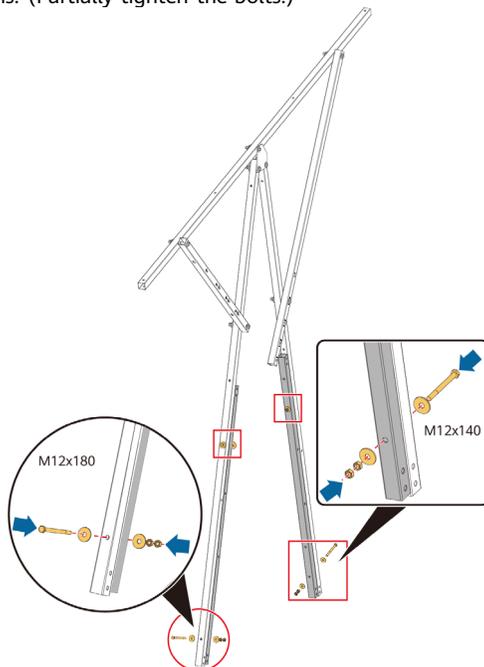
Raking strut mounting hole for a high support for 45° PV modules

Short raking strut Long raking strut



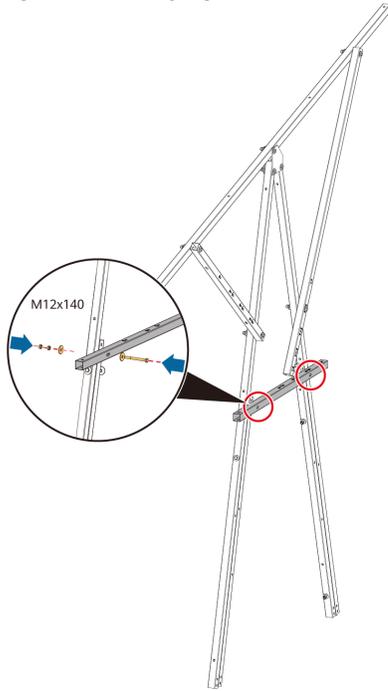
K01602

4. Install low columns. (Partially tighten the bolts.)



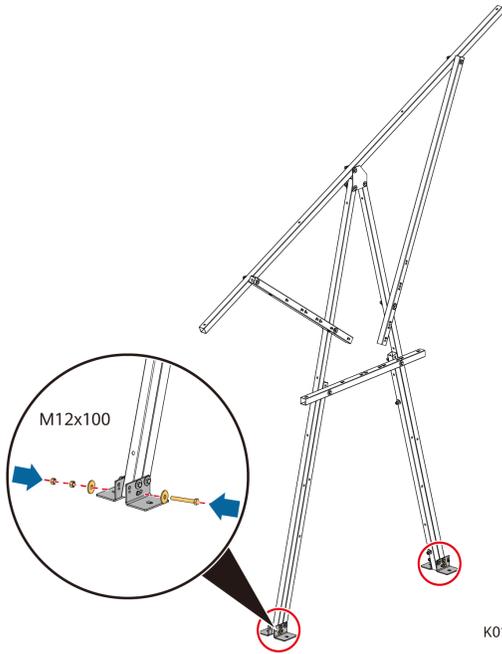
K01601

5. Install a short raking strut. (Partially tighten the bolts.)



K01514

6. Install anchor brackets. (Partially tighten the bolts.)

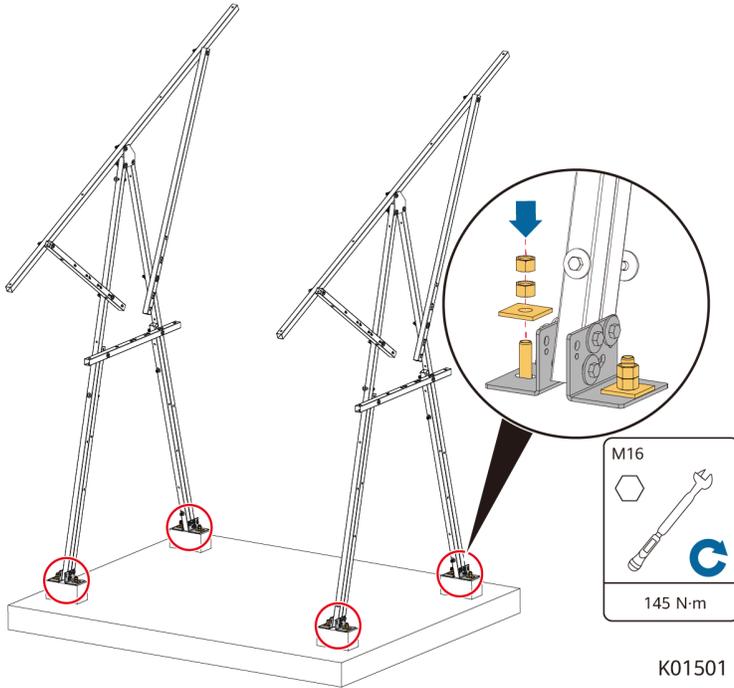


K01405

- Loosen the washers and nuts of the anchor bolts, fix the support assemblies to the foundation, and tighten the anchor bolts.

**NOTICE**

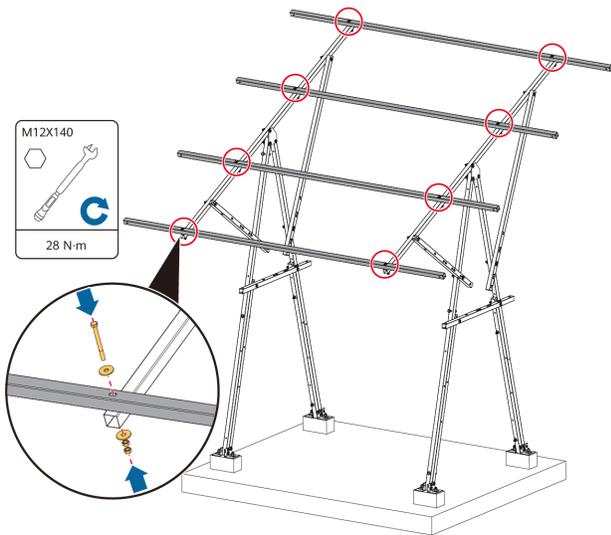
- Ensure that lower edge of the longitudinal beam faces the equator.
- When installing anchor bolts, secure each bolt using two nuts.



- Tighten all bolts partially tightened on the support assemblies to 45 N-m.
- Install horizontal beams.

**NOTICE**

Ensure that the bolts are inserted from the front side of the beam.

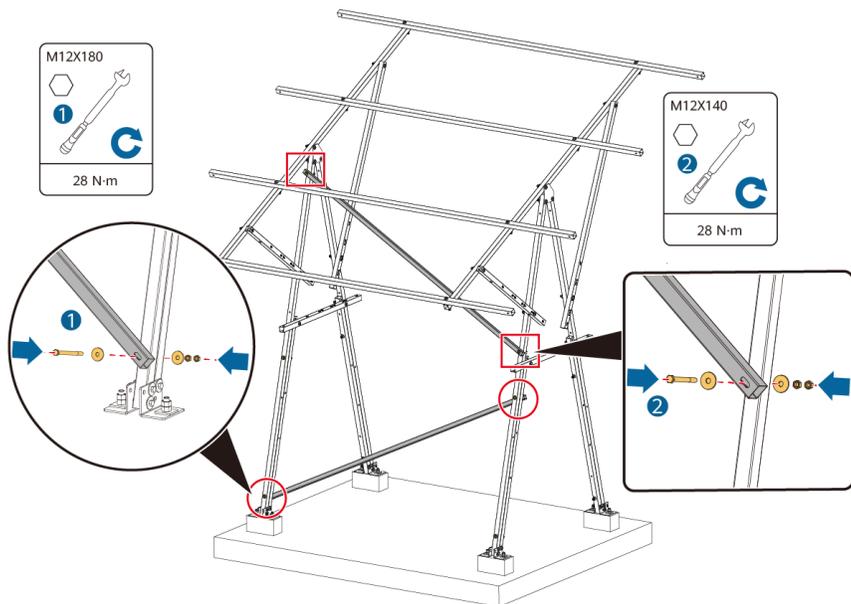


K01502

10. Install reinforced beams.

**NOTE**

Loosen the M12x180 bolts that are partially tightened before installing reinforced beams.

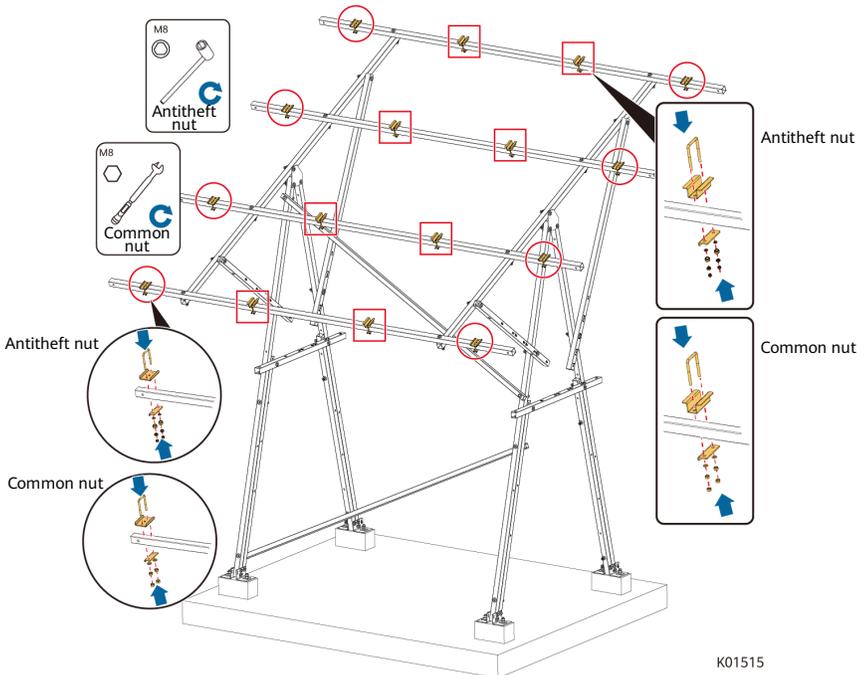
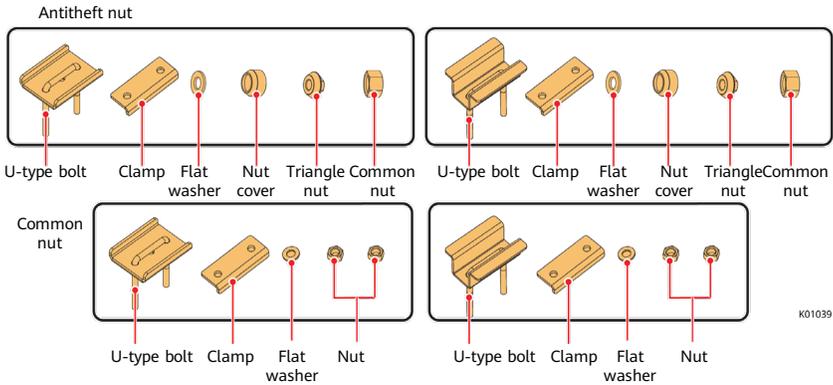
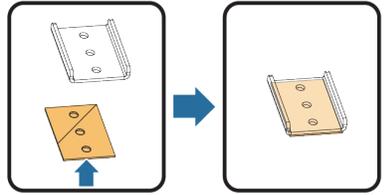


K01503

## 11. Install edge clamps and middle clamps for PV modules.

### NOTICE

- Partially tighten all the clamps.
- When installing the rubber pad, ensure that the adhesive side faces upwards. Remove the adhesive sticker and press the rubber pad to ensure that it is firmly attached.
- The nuts for securing PV module clamps are classified into common nuts and antitheft nuts. Select nuts based on the actual configuration.
- Use an antitheft nut wrench to partially tighten antitheft nuts.



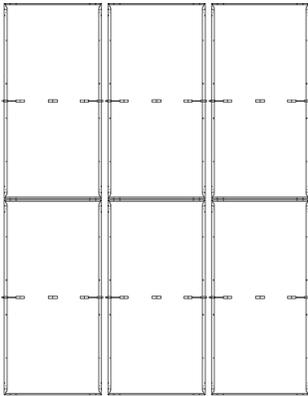
12. Install PV modules.

**NOTICE**

- When installing PV modules, ensure that the distances between the PV module edges and the two ends of the support horizontal beam are the same.
- When installing PV modules, ensure that the control boxes behind PV modules face the same direction.
- The following table lists the dimensions of PV modules that can be mounted on a support.

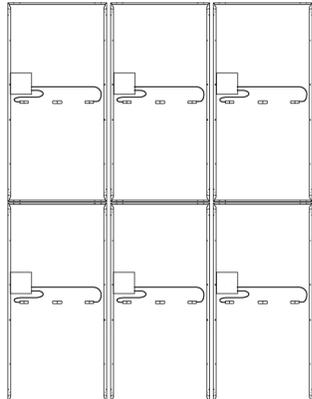
PV Module Specifications	Dimensions (mm)		
	Length	Width	Thickness
540 W/iPV540-M1A	2256-2285	1133-1134	35

**Applicable to 540 W PV Modules**



K01702

**Applicable to iPV540-M1A PV Modules**

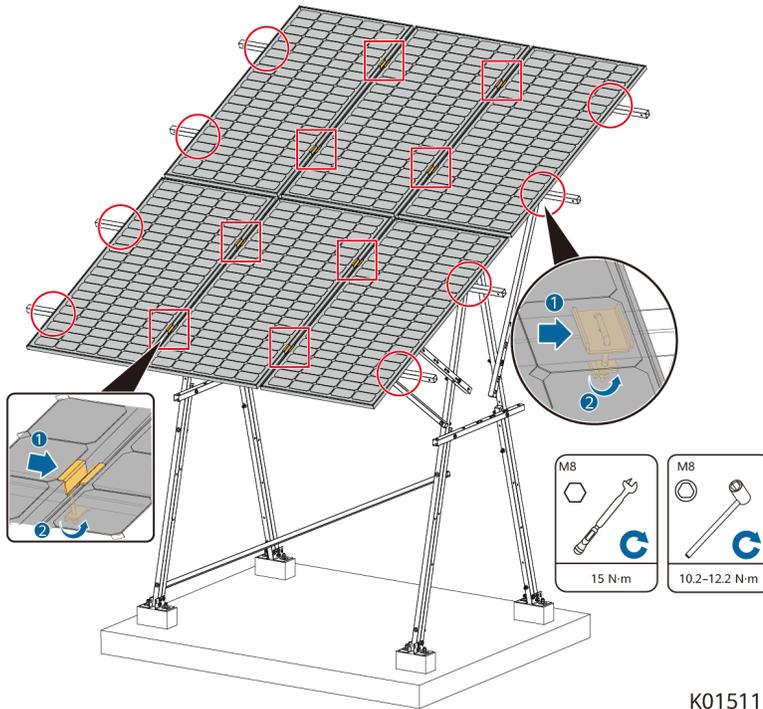


K01702

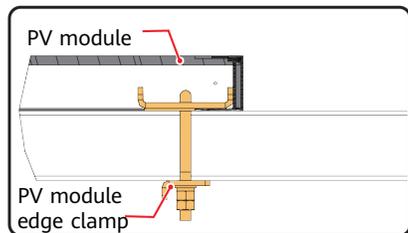
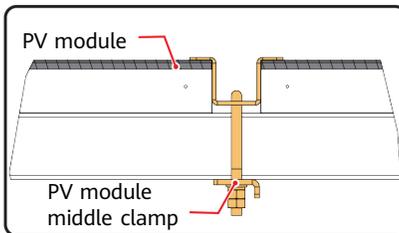
13. Adjust the positions of clamps to secure the PV modules. Then tighten the screws.

**NOTE**

When fixing PV modules, ensure that the edge clamps and the middle clamps are tightly attached to the inner and outer sides of the PV modules, respectively.



K01511



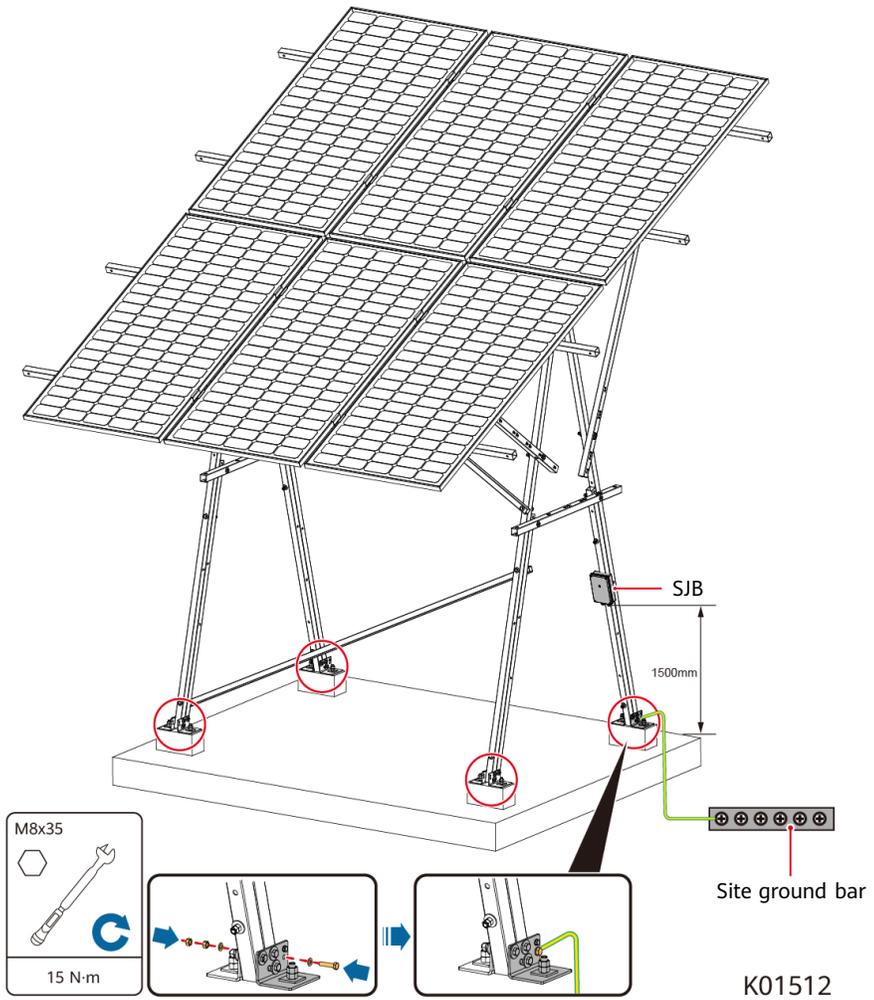
K01040

## 2 Installing Cables for PV Modules

1. Install ground screws and a ground cable for PV modules.

### NOTICE

Install ground screws near the ground bar.



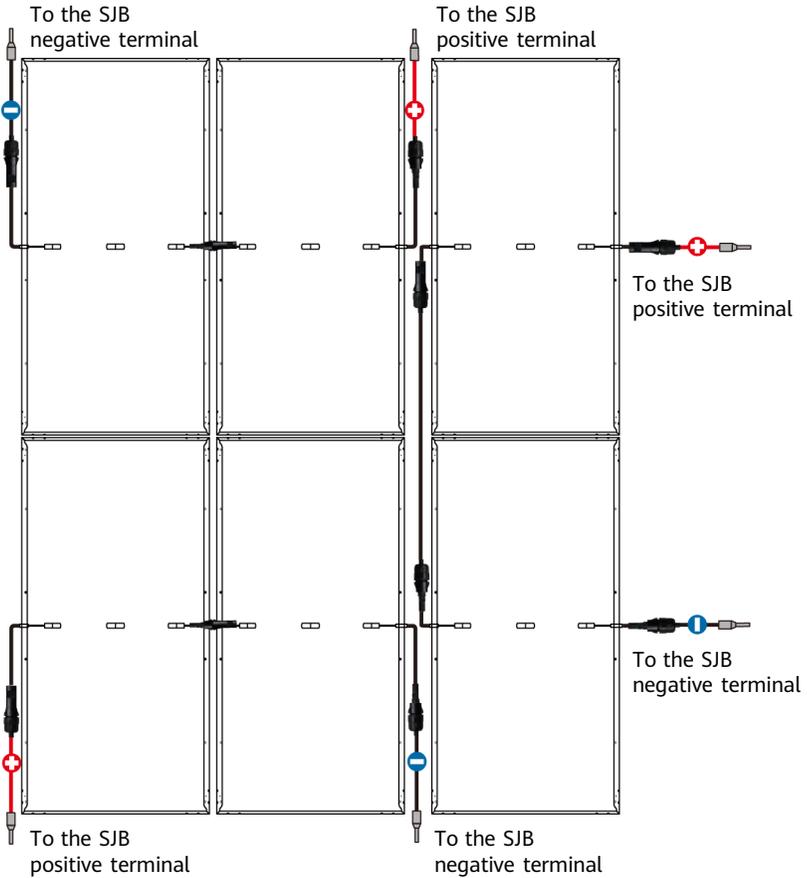
2. Install DC power cables for PV modules.

**NOTICE**

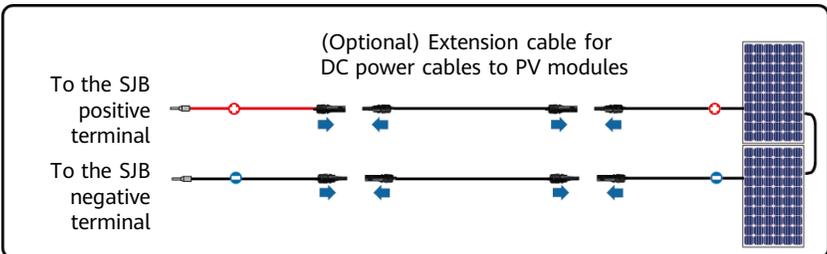
If the DC power cables to PV modules are not long enough, connect the extension cables.

**Installing 540 W PV Modules (Connecting to an SJB)**

Connect two PV modules in series as a route and connect the route to the SJB.



K01701



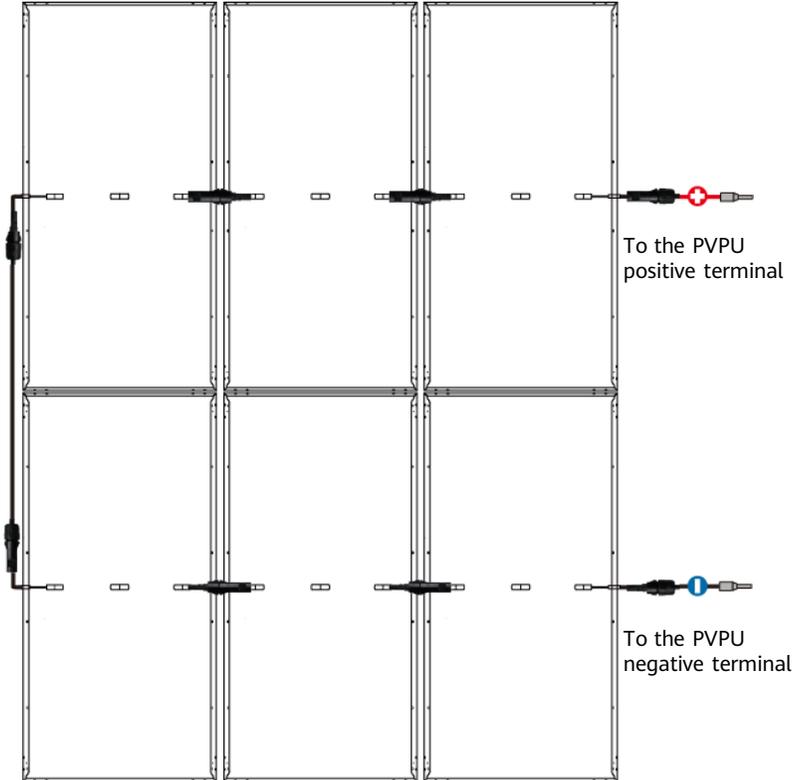
K01706

## Installing 540 W PV Modules (Connecting to a PVPU)

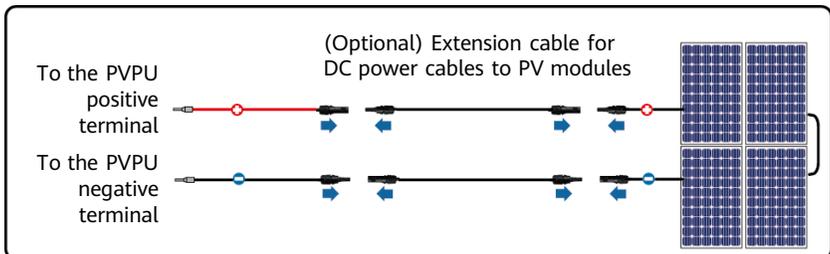
Connect all PV modules in series and then connect them to the PVPU.

### NOTICE

Three to eight PV modules can be connected in series. The following shows how to connect six PV modules in series.



K01704



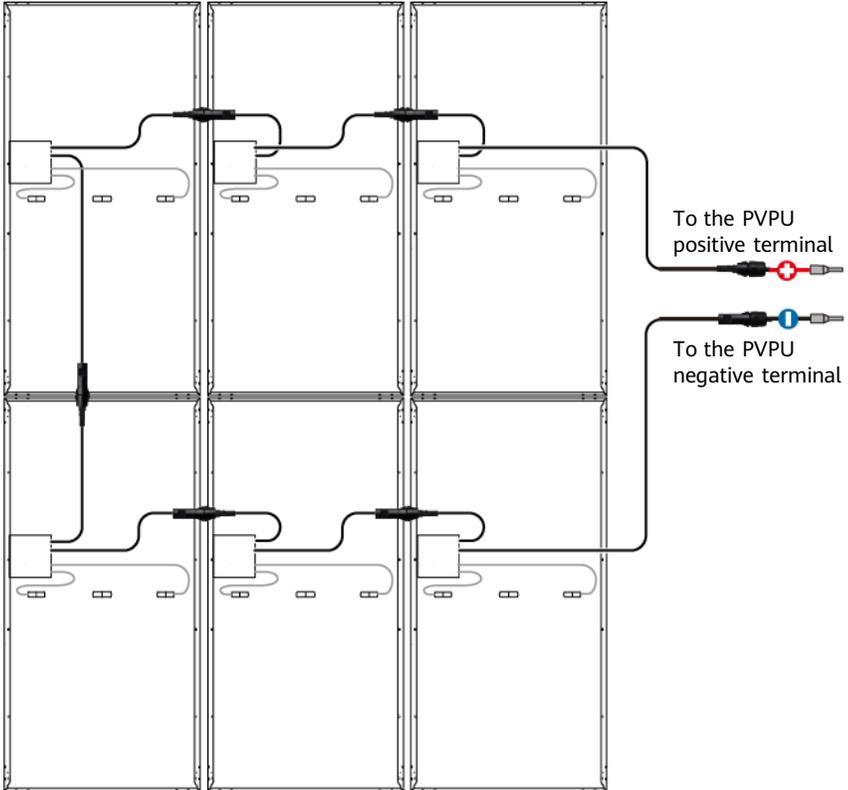
K01703

## Installing iPV540-M1A PV Modules

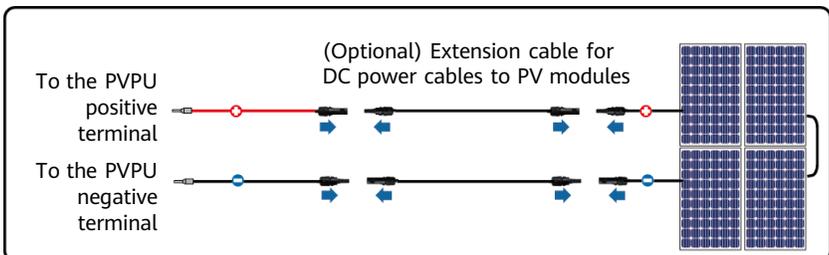
When installing the iPV540-M1A, connect all PV modules in series and then connect them to the PVPU.

### NOTICE

Three to eight PV modules can be connected in series. The following shows how to connect six PV modules in series.



K01705

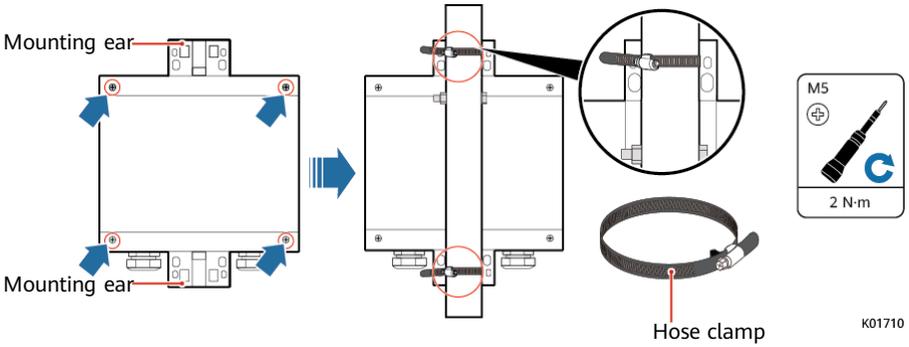


K01703

# Appendix

## 1 (Optional) Installing a Standard SJB

1. Install an SJB.

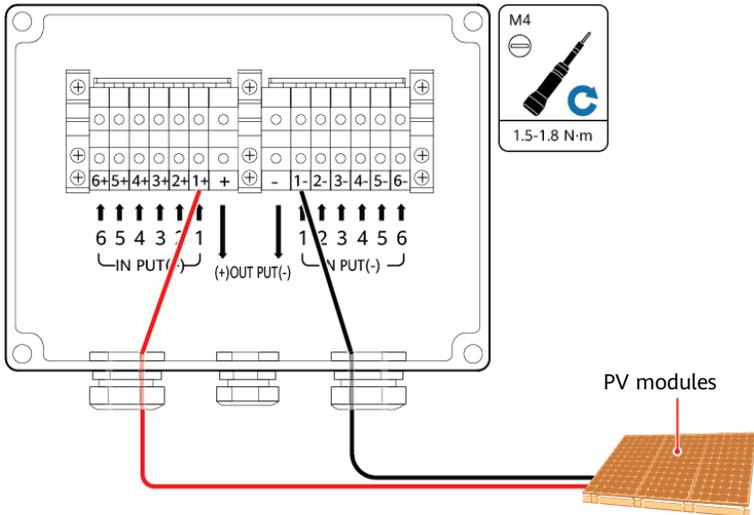


2. Install cables between PV modules and the SJB.

PV Module Type	Installation mode	Maximum Routes Connected to the SJB
540 W PV module	Every two PV modules are connected in series as one route.	4 (if configured with a 4 kW SSU) 3 (if configured with a 3 kW SSU)

### NOTE

The figure shows how to connect one route to the SJB.

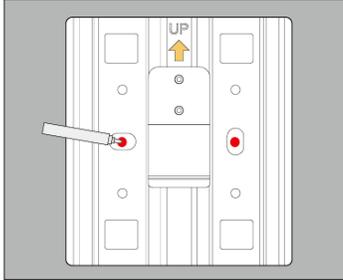


## 2 (Optional) Installing an SJB-0601A

### 1. Install a metal base.

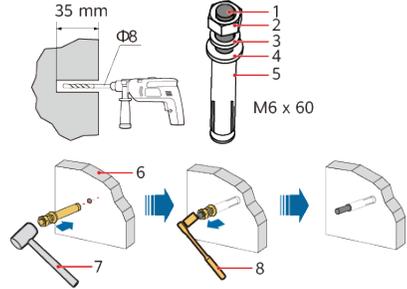
#### Securing with Screws

- ① Mark mounting holes in an appropriate area on the wall.



PC00H0038

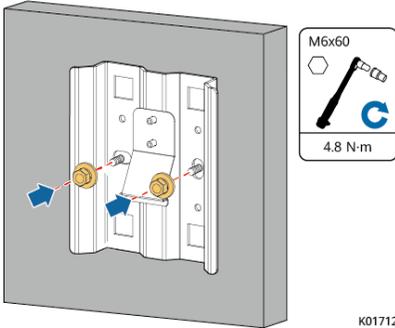
- ② Drill holes in the marked positions.



PO01HC0549

- (1) Expansion anchor bolt (2) M6 nut (3) Spring washer (4) Flat washer (5) Expansion sleeve (6) Wall (7) Rubber mallet (8) Socket wrench

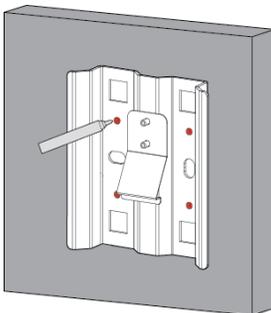
- ③ Secure the base.



K01712

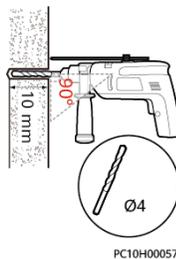
#### Securing with Rivets

- ① Mark mounting holes in an appropriate area on the wall.



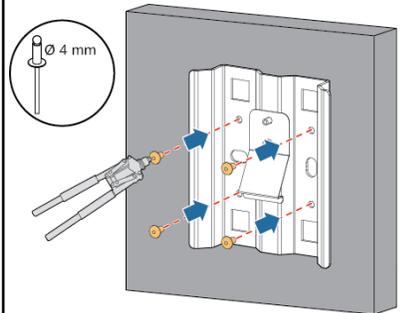
PC00H00114

- ② Drill holes in the marked positions.



PC10H00057

- ③ Secure the base.



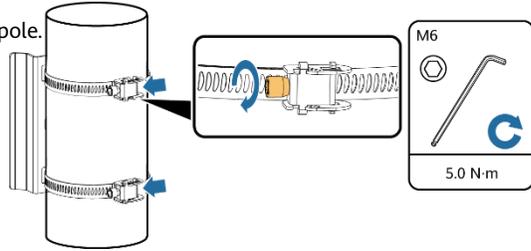
PC00H00039

## Securing with Hose Clamps

- ① Secure the base to an appropriate position on the pole.

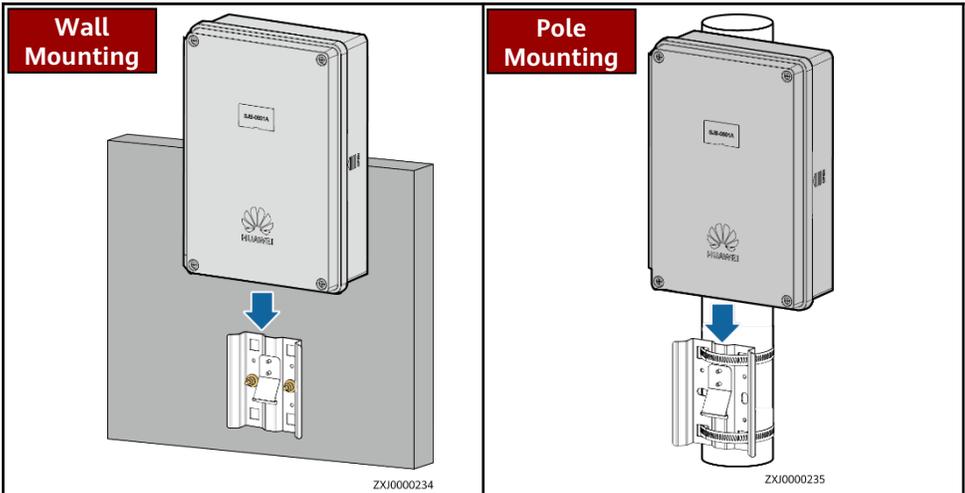
### NOTE

Hose clamps support a pole with a diameter of 48–114 mm.

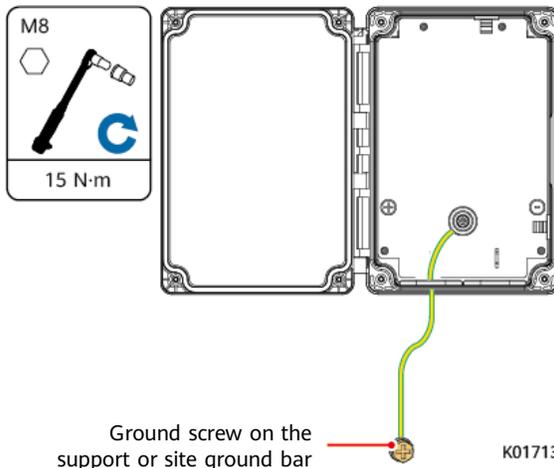


PC00H00094

2. Install an SJB.



3. Install an SJB ground cable.

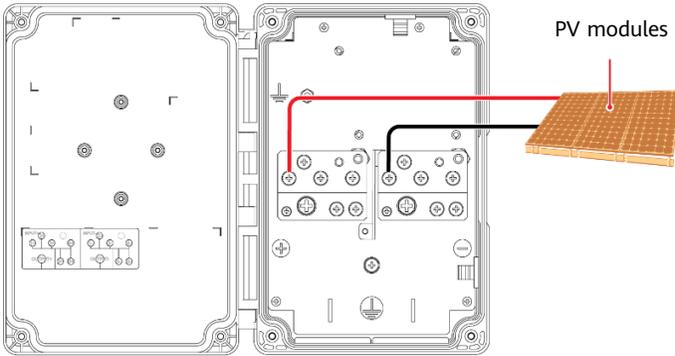


4. Install cables between PV modules and the SJB.

PV Module Type	Installation mode	Maximum Routes Connected to the SJB
540 W PV module	Every two PV modules are connected in series as one route.	4 (if configured with a 4 kW SSU)
		3 (if configured with a 3 kW SSU)

**NOTE**

The figure shows how to connect one route to the SJB.



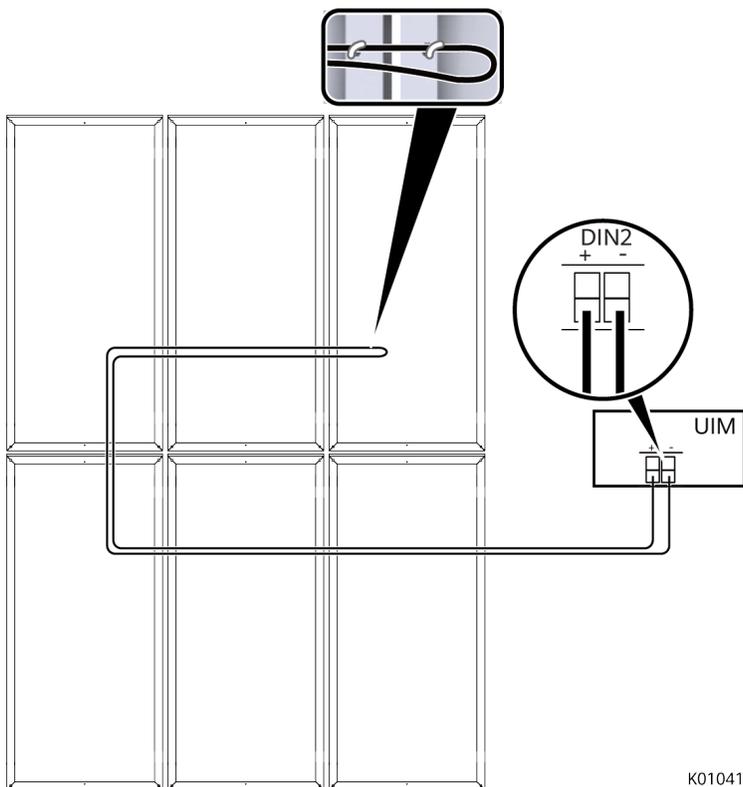
ZXJ0000266

### 3 (Optional) Installing a Signal Cable for Reporting PV Module Thefts

1. Route the cable through the holes on the rear of PV modules in sequence and bind the cable using cable ties.
2. Connect the cable to the DIN port on the user interface module (UIM). The following figure uses the DIN2 port as an example.

#### NOTICE

- If the signal cable is a two-core cable, select a color and ensure that the cables connected to the dry contacts are of the same color.
- If the cable is connected to a dry contact that reports an alarm when closed, set the dry contact to report an alarm when open.
- If the cable is connected to a multiplexing port and is an ALM output port, set it to a DIN port.



K01041

**Huawei Technologies Co., Ltd.**  
Huawei Industrial Base, Bantian, Longgang  
Shenzhen 518129 People's Republic of China  
Postal code: 518129  
[www.huawei.com](http://www.huawei.com)