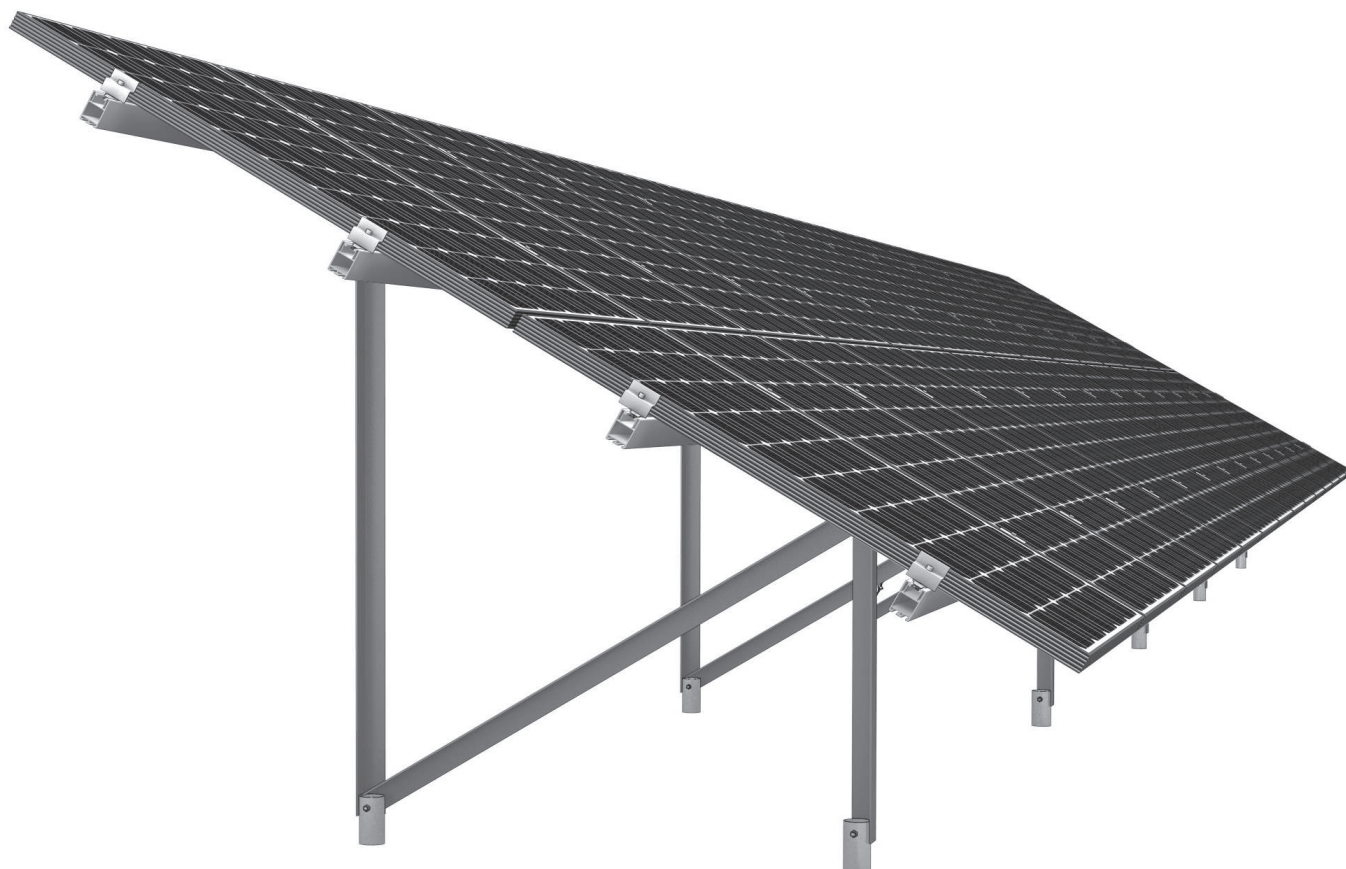


Mounting systems for solar technology



ASSEMBLY INSTRUCTIONS
GROUND MOUNTED SYSTEM N-RACK
SCREW-IN FOUNDATION

GB

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PARTNER WITH A SYSTEM

With sophisticated, fully developed product ideas and obvious customer-orientation, K2 Systems is your friendly partner in the field of mounting systems for solar technology.

International customers appreciate the tried and tested designs for use on roofs or facades and in outdoor and individual solutions.

Mounting systems from K2 Systems impress with appealing design and many clever details. High grade materials and quality workmanship guarantee outstanding functionality and durability.

Our products consist of few yet perfectly matching components - this reduces the amount of material used, simplifies assembly while saving time and money.

As a young company, and in keeping with the times, we benefit from cooperation as partners in order to ensure the dynamic development of our company. The experiences from the personal dialogue with our customers forms the basis for permanent optimisation of our range of products.

The team of K2 Systems looks forward to a successful cooperation with you.

TESTED QUALITY - CERTIFIED FOUR TIMES

K2 Systems stands for secure connection, highest quality and precision. Our customers and business partners have already known that for a long time. And three independent institutes have tested, confirmed and certified our capabilities and components.



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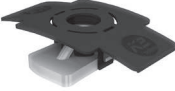

Please be aware that our General Assembly Regulations must be adhered to.
These can be seen at www.k2-systems.de/english/downloads/customer-area.html.

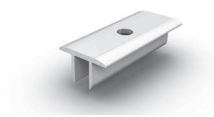
In general, the following applies:

- Systems may only be installed and put into use by people who can ensure the proper carrying-out of the work due to their technical suitability (e.g. training or occupation) and/or experience.
- Before assembly, it must be checked that the product meets the local static requirements. For roof systems, the load-bearing capacity of the roof is also to be checked.
- National and local building regulations, standards and environmental regulations are always to be adhered to.
- Work safety and accident prevention regulations, corresponding standards and regulations of occupational associations are to be adhered to! In particular, it is to be ensured that:
 - Safety clothing is worn (especially safety helmets, work shoes and gloves).
 - For work on roofs, the regulations for working on roofs are to be adhered to (e.g. use of anti-fall guards, scaffolding with arrestor equipment from an eaves height of 3m etc.).
 - Presence of two people is vital for the entire course of the assembly, so that swift help can be ensured in the case of an accident.
- K2 mounting systems are constantly being developed further. Because of this, assembly procedures can change. Therefore, before assembly, always check that the assembly instructions are up-to-date under www.k2-systems.de/english/downloads/customer-area.html. We can also send you the latest version on request.
- The assembly instructions of the module manufacturer are to be adhered to.
- Earthing must be ensured; use lightning arrestor clamp if necessary.
- During the entirety of the assembly time it is to be ensured that at least one copy of the assembly instructions is available on site.
- In the event of non-adherence to our General Safety Instructions and competitor's parts are built in or attached, K2 Systems GmbH reserves the right to refuse liability.
- If all safety instructions are adhered to and the system is correctly installed, there is a guarantee entitlement of 12 years! Please read out Terms and Conditions of Warranty which can be viewed under www.k2-systems.de/deutsch/downloads. We can also send them to you on request.
- The dismantling of the system takes place according to the assembly steps, in reverse order.

ESSENTIAL: THE MATERIALS REQUIRED

All system components listed in the following are essential for assembling the K2 Systems ground mounted system N. The piece quantities are calculated on the basis of the respective requirements. The listed item numbers facilitate the comparison of items.

	Alpin mounting rail item number system-specific Material: aluminium EN AW-6063 T66 Alternativ: Solid LS mounting rail
	Alpin Rail Connector Set P1004109 Material: aluminium EN AW-6063 T66 Alternativ: Solid LS Connector Set
	Self-tapping Screw P1001051 5.5 x 25 for connecting elements Material: stainless steel
	Rack item number system-specific (L-Profil as support, U-profil as cross beam)
	Screw Foundation item number system-specific Material: galvanised steel
	For alternativ version with adapter tube: Adapter Tuberohr for Screw Foundation item number system-specific Material: galvanised steel, length: 0,4 m
	M K2 slot nut with clip P1001643 Material: stainless steel, plastic Alternatively, a slot nut made of galvanised steel can be used.
	XS Module End Clamp P1002271 Material: aluminium Alternativ: Module End Clamp Standard



XS Module Middle Clamp

| P1001892

Material: aluminium

Alternativ: module end clamp standard

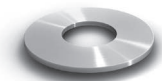


Wind Brace

| item number system-specific

(steel rope + tightener + cable eye stiffener + clamps + ring nuts)

Material: stainless steel



Washer DIN 9240 M12, 5 x 30

| P1000064

Material: stainless steel A2



Lock Nut DIN 985 M12

| P1002633

Material: stainless steel coated, locks due to incorporated plastic ring



Self-Locking Nut M12

| P1000043

Material: stainless steel A2, SW: 18 mm



Allen Bolt DIN 912 M 12 x 30

| P1001110

Material: stainless steel A2, drive: HW 108



Allen Bolt DIN 912 M 8

| item number system-specific

Material: stainless steel, Antrieb: HW 6



Allen Bolt DIN 912 M 12 x 100

| P1001232

Material: stainless steel, drive: HW 10



For alternative version with adapter tube:

Allen Bolt DIN 912 M 12 x 40

| P1002552

Material: stainless steel, drive: HW 10



Hexagon Bolt M16 x 35

| P1002465

Material: stainless steel, SW: 24 mm



T-Bolt M 10 x 30

| P1000041

Material: stainless steel A2 1.4301, head shape 28/15

AT A GLANCE: OVERVIEW OF THE TOOLS

K2 Systems mounting systems are designed to ensure effortless assembly. Only the tools that are required are not included in the scope of supply. Here we have listed them together for ease of reference.



Cordless Screwdriver

Mit Aufsatz für HW 10, WAF 8



Torque Wrench

With attachment for WAF 8, WAF 15, WAF 18 and WAF 24
(WAF: width across flats)



Torque Wrench

With attachment for WAF 6



Surveyor' Level



Digger



Rotating Head



Screwdriver



Percussion drill

With 8 mm diameter drill bit



Chalk line



Measuring tape



Drill

GROUND MOUNTED SYSTEM N ASSEMBLY: STEP BY STEP

GENERAL INSTRUCTION:

- The General Mounting Regulations absolutely must be adhered to. You will find these instructions under: **www.k2-systems.de/english/downloads/customer-area.html**
If you don't already have them, you can obtain access data for our customer area on request.

Please carefully read through all the steps first to ensure safe and correct assembly of the system. The required material is listed for each step. Should you have any problems during assembly or questions relating to the system please contact us on our

SERVICE-HOTLINE: +49 (0) 7152-3560-0

IMPORTANT:

- The General Installation Instructions must be observed. You will find these instructions under: **<http://www.k2-systems.de/english/downloads/customer-area.html>**.
If you don't already have them, you can obtain access data for our customer area on request.

GROUND MOUNTED SYSTEM N ASSEMBLY: STEP BY STEP



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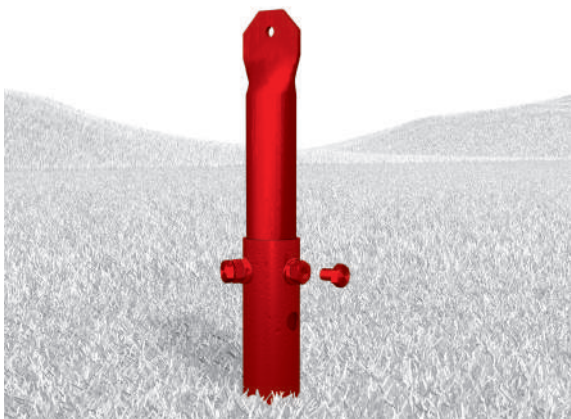
SETTING SCREW-IN FOUNDATIONS

Following the foundation plan, the screw-in foundations are driven into the ground with the aid of a digger and a rotation head. The protruding height of the foundations should be checked with a levelling instrument to ensure a height of 10 – 15 cm above the ground is maintained.

Additional information:

- Unless the ground is very stony it is generally not necessary to predrill the holes. If predrilling is necessary, the drilled hole should be filled with gravel to provide a secure hold for the screw-in foundation.
- The wall thickness and screw-in depth of the screw-in foundations depend on the ground survey report.
- Due to the soft condition of the ground, screw-in foundations cannot be used in ground class 1. Pull-out tests should be carried out for ground class 2 to establish whether screw-in foundations can be used. Ground classes 3 – 7 are well suited for the use of screw-in foundations, predrilling may be necessary.
- The ground is compacted by the helical tip of the screw-in foundation, thus making it possible to withstand tensile and compressive forces.
- 150 – 200 screw-in foundations can be sunk per day with the hydraulic rotation motor.

Required materials: Screw-in foundation



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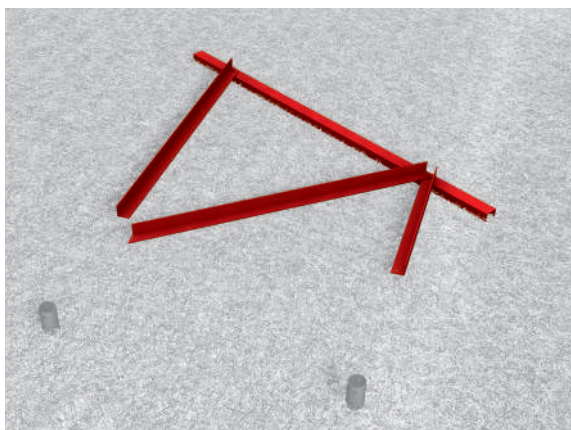
ALTERNATIVE FOUNDATION CONNECTION SECURING ADAPTER TUBES

The adapter tubes are inserted in the sunk foundations and secured with three M16 x 35 hexagon head bolts. Separate nuts are not required as the bolts are screwed into the M16 nuts already welded on to the screw-in foundation.

Additional information:

- The three hexagon head bolts should be tightened evenly. They must be tightened to a torque of 50 – 60 Nm.
- The maximum height of the adapter tubes above the ground must be calculated and determined by a structural engineer.

Required materials: Adapter tube, M16 x 35 hexagon bolt



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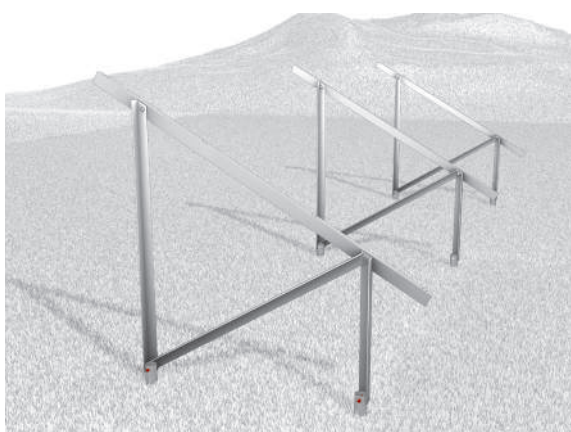
ASSEMBLING N-RACK FOR DIRECT FOUNDATION CONNECTION

The aluminium L-struts of the rack and the aluminium U-section are built up in accordance with the assembly drawing and secured with M12 x 30 bolts as well as M12 serrated lock nuts. We recommend using washers with all M12 bolts.

Additional information:

- The bolts are not fully tightened to their final torque in this step but rather only tightened.
- The rack should be built up separately, i.e. not assembled directly on the foundations.

Required materials: L-profile support, U-profile
DIN 912 M12 x 30 bolt, M12 self locking nut, DIN 9240 M12 washer



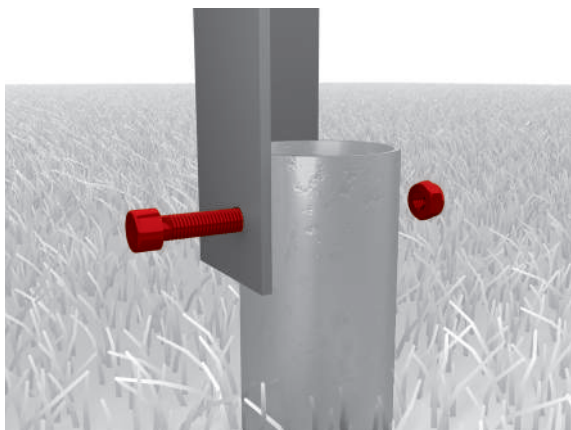
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SECURING RACK TO FOUNDATION

The struts of the preassembled rack are secured to the screw-in foundations by means of M12 x 100 bolts and lock nuts. Alternatively, a serrated lock nut can be used. The threads are secured with the aid of a manual curing system. As the bolts were only loosely fitted in the previous step, it is still possible to align the system as required. After mounting on the foundation, the remaining bolts of the struts and supports should be tightened to the specified torque of 56 Nm.

Important: If adapter tubes are used, M12 x 40 bolts and lock nuts or rings nuts should be used to secure the rack to the adapter.

Required materials: DIN912 M12 x 100 bolt, M12 lock nut

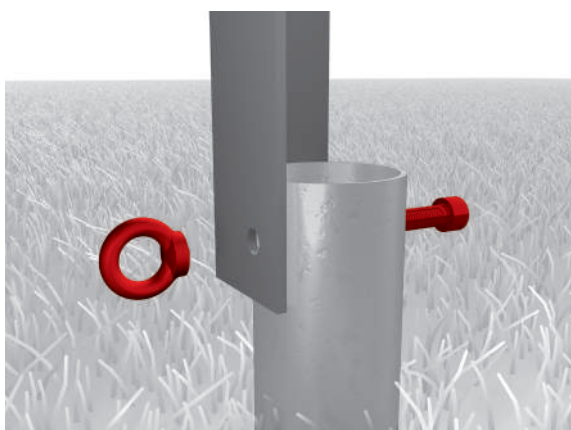


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SECURING FOUNDATION CONNECTIONS

Secure all screw-in foundation connections without wind brace connections with a hexagon socket head cap screw and lock nut.

Required materials: DIN 912 M12 x 100 hexagon socket head cap screw, M12 lock nut

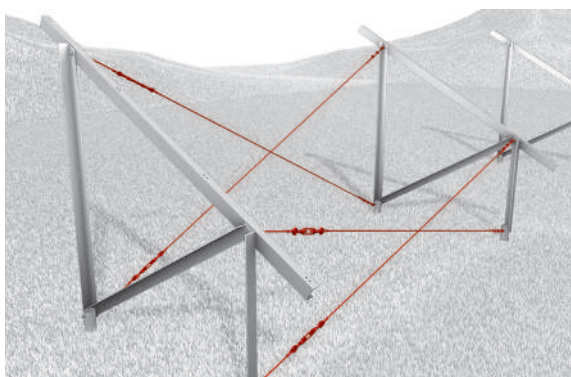


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FOR WIND BRACE: USE RING NUTS

On structures with a wind brace, the lock nuts/serrated lock nuts are replaced by the M12 ring nuts of the wind brace.

Required materials: DIN 912 M12 x 100 hexagon socket head cap screw, M12 ring nut



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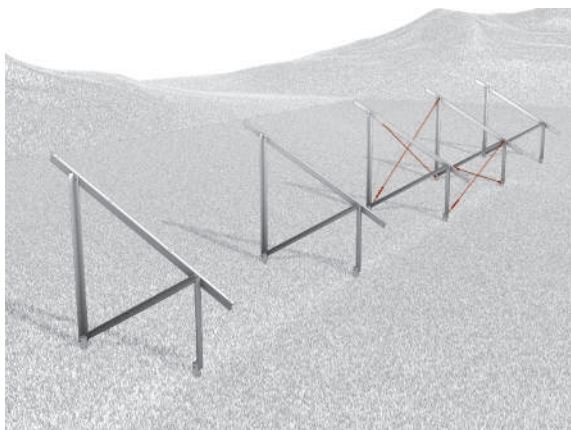
WINDVERBÄNDE MONTIEREN

The cable eye stiffeners are inserted in the ring of the ring nut and clamped together. The steel cable is then placed over the cable eye stiffeners, passed through the ring nut and secured with three cable clamps – each with two M5 nuts – at the overlapping end of the steel cable. The clamps should be evenly distributed. The first clamp should be secured as close as possible to the cable eye stiffener. The wind braces are now pulled taut with the aid of the turnbuckle and a screwdriver.

Additional information:

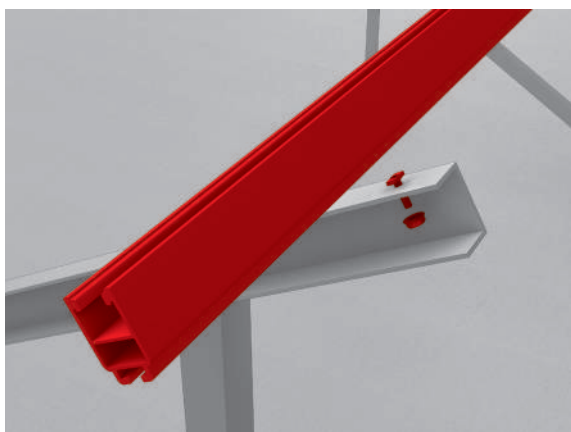
- Tighten the screws of the clamps to max. 4 Nm.
- To ensure the steel cables can be retightened, a sufficient number of thread turns should be available in the turnbuckle after tightening.

Required materials: Wind brace



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GENERAL LAYOUT OF RACKS

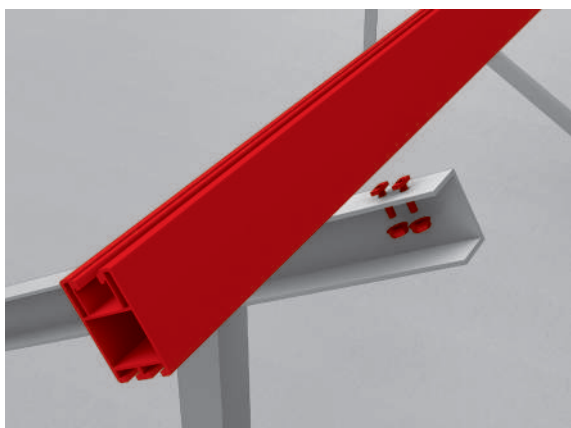


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INSTALLING K2 MODULE MOUNTING RAILS ALPIN

The K2 mounting rails are each secured at the predrilled hole with 1 T-bolt turned by 90° in anticlockwise direction and 1 serrated lock nut per rack. The tightening torque is 32 Nm.

Required materials: Alpin mounting rail, T-bolt M10x30, serrated lock nut M10

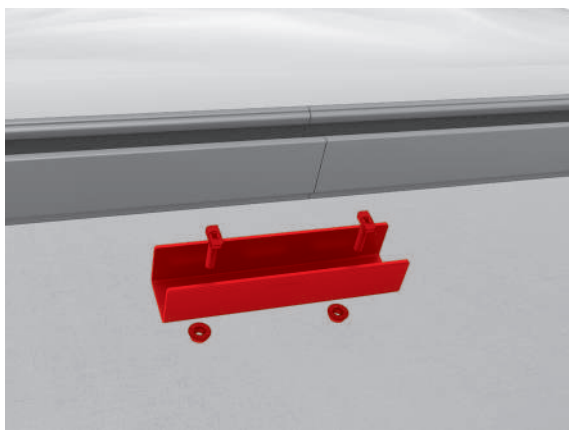


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INSTALLING K2 MODULE MOUNTING RAILS SOLID

For connecting two rails, the connector is inserted halfway into the hollow chamber provided for this purpose in the first rail section and secured on one side with two drilling screws. Tighten to a torque of 32 Nm. screws.

Required materials: Solid mounting rail, T-bolt M10x30, serrated lock nut M10

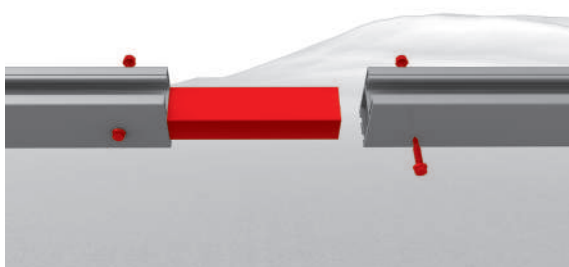


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SECURING ALPIN RAIL CONNECTOR

Install rails such that they make a butt joint and connect with the aid of the rail connector and the 2 T-bolts and serrated lock washers. The rail joint must not be in the area of the rack. Tightening torque 35 Nm

Required materials: Connector Set Alpin

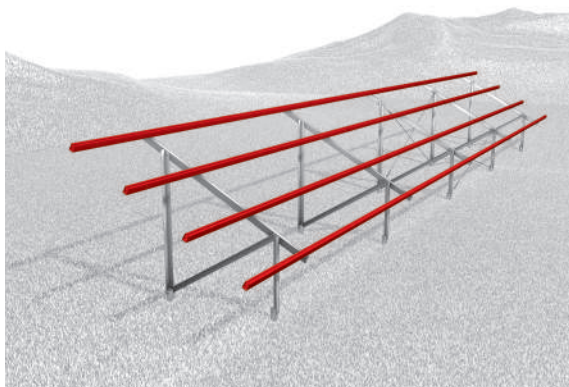


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FIX RAIL CONNECTOR SOLID LS WITH DRILL SCREWS

When connecting two K2 rails, the connector is inserted up to half into the provided hollow chamber of the first profile and fastened with one drill screw each on both sides. The drill screws must be placed in the micro nut on side of the profiles. The end-stop tightening torque is 5 Nm. Thereafter, the second K2 mounting rail is pushed over the connector. When both rails touch, the second profile is screwed to the connector.

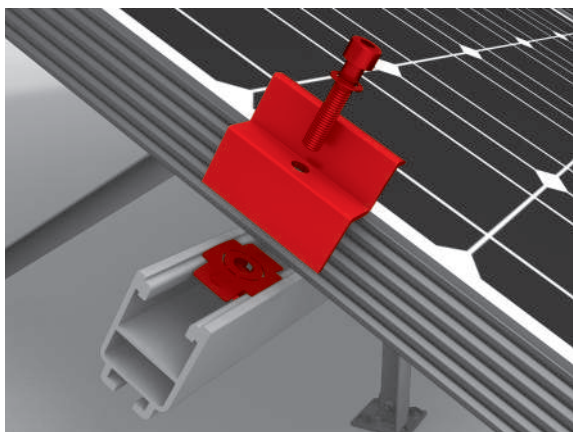
Required materials: Connector Set Solid



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INSTALLING ALL REMAINING RAILS

Important: The racks must always be vertical even on sloping terrain.



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FITTING END CLAMP

First insert the M K2 slot nut in the Solid rail and turn by 90° in clockwise direction. If the end and middle clamps come as a set, fit the entire set on the rail. Secure the solar panels on the mounting rails according to the manufacturer's instructions and fix with end clamps, DIN 912 M8 hexagon socket head cap screws and slot nuts at the ends of the rows. Tightening torque 14 Nm

Required materials: M K2 slot nut, end clamps, DIN 912 M8 hexagon socket head cap screw



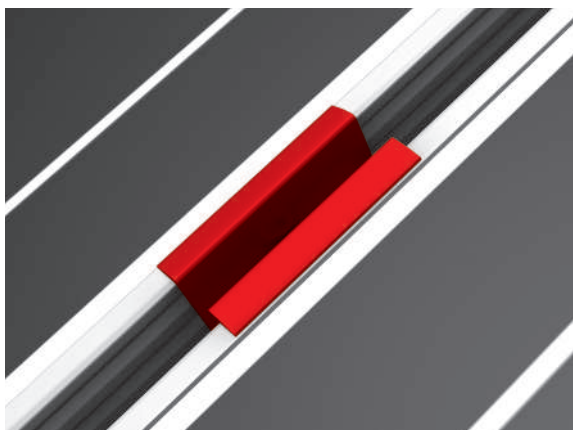
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FIXING SPACING BETWEEN PANELS

Fixing with XS middle clamp

Use two XS middle clamps between two solar panels and screw into the slotted nuts (DIN 912 M8 screws). Longer screws are required for the XS middle clamp than for the Standard middle clamp. Tightening torque 14 Nm

Required materials: Slot nut, XS middle clamp, M8 screw

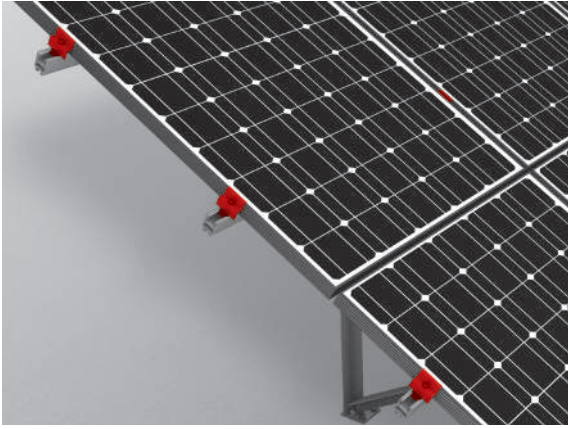


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Fixing with Standard middle clamp

Use two Standard middle clamps between two solar panels and screw into the slotted nuts (DIN 912 M8 screws). Tightening torque 14 Nm

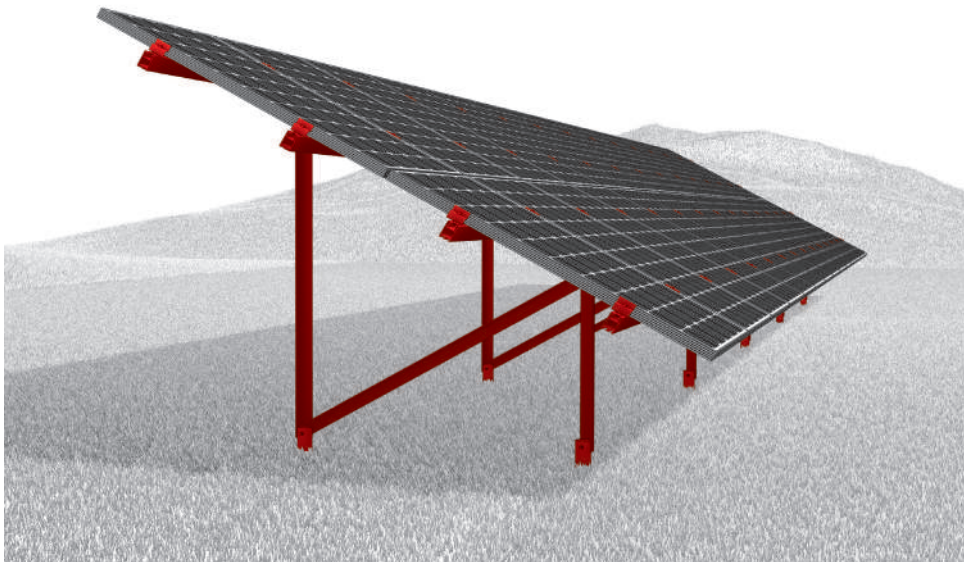
Required materials: Slot nut, Standard middle clamp, M8 screw



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IMPORTANT POINTS FOR ASSEMBLY

- Avoid fitting slotted nuts at rail joints!
- Do not position middle or end clamps directly at rail joints or ends of rails!



Ready!

THANK YOU FOR DECIDING TO PURCHASE A K2 MOUNTING SYSTEM.

Systems from K2 Systems are fast and simple to install. We hope these instructions assisted you during the installation of this system. Please contact us if you have any questions or suggestions for improvements.

We look forward to your call on the

Service-Hotline +49 (0) 7152-3560-0

TERMS AND CONDITIONS

§ 1 Ambit, contractual item

1. Our General Business Terms and Conditions apply to the delivery of moveable merchandise in accordance with the contract concluded between us and the customer. These therefore also apply for all future business relations, even where they have not been expressly agreed upon once again.
2. Our General Business Terms and Conditions apply exclusively. We do not recognise customer conditions contradictory to or deviating from our General Business Terms and Conditions, unless we have expressly approved their validity in writing. Our General Business Terms and Conditions also apply if, in circumstances where we are aware of customer conditions contradictory to or deviating from our General Business Terms and Conditions, we realise the delivery without any reservation.

§ 2 Offer, documentation at conclusion of contract

1. The customer's order represents a binding offer which we can accept within four weeks by forwarding an order confirmation or through delivery of the merchandise. Offers submitted by us in advance are non-binding.
2. We reserve rights of ownership and copyright to all illustrations, drawings, calculations and other documents. This also applies to those written documents designated as "confidential". The customer requires our express written permission prior to their transfer to third parties.
3. Drawings, illustrations, dimensions, weights or other performance data are only binding when this is expressly agreed in writing.

§ 3 Prices and payment conditions

1. The agreed remuneration must be paid. In cases where the price has increased at the time of performance of service as a result of a change in the market price or an increase in remuneration paid to third parties involved in performance of service, the higher price applies. The customer is entitled to withdraw from the contract if the higher price is twenty percent or more greater than the agreed price. This right must be exercised immediately on communication of the increased price.
2. Prices should be understood with the addition of the mandatory turnover tax (VAT) valid on the day of invoicing.
3. The complete remuneration should be paid within 14 days after receipt of the merchandise and without any discount, provided no other agreement has been reached. Statutory regulations governing the consequences relating to arrears of payments apply.
4. The customer is only entitled to offset payment if his counterclaims have been determined to be valid, indisputable or are recognised by us. The customer is only entitled to exercise a right of retention if his counterclaim relates to the same contractual relationship.

§ 4 Time of performance, transfer of risk

1. Delivery deadlines or delivery times which can be agreed upon as binding or non-binding require the written form.
2. Even where agreed and binding periods and deadlines are involved, we are not obliged to answer for delays in delivery and performance due to force majeure and due to events which render delivery by us considerably difficult for a period that is not only temporary, or render delivery impossible, these including in particular strikes, lockouts, official ordinances, etc. We are also not obliged to answer for these if our suppliers or their contractors are affected by the same. They entitle us to delay the delivery or service for the duration of the obstruction and an appropriate start-up period, or to withdraw completely or partially from the contract because of the unfulfilled part of the same.
3. Where the obstruction lasts for longer than three months, the purchaser is, after an appropriate additional period of time, entitled to withdraw from the contract with regard to the unfulfilled part of same. In the event of the delivery duration being extended or where we are freed of our obligations, the purchaser is not entitled to claim any compensation on the basis of these circumstances. We can only invoke the circumstances mentioned if we inform the purchaser immediately.
4. Insofar as we must answer for the failure to honour agreed periods and deadlines, or where we find ourselves in arrears, the purchaser is entitled to claim compensation for the delay to the value of a half a percent of the invoice value for each complete week of default, but only to a maximum of up to five percent of the invoice value of the deliveries and services affected by the delay. Claims above and beyond this are excluded, unless the delay can be at least traced back to gross negligence.
5. We are entitled to make partial deliveries and perform partial services at any time, unless the purchaser is not interested in the partial delivery or performance of the partial service.
6. Observance of delivery and performance obligations depends on the timely and correct fulfilment of the purchaser's obligations.
7. In the event of a delay in acceptance on the part of the purchaser, we are entitled to demand compensation for the damages accrued. The risk of accidental deterioration and accidental loss is transferred to the purchaser as soon as a delay in acceptance occurs.
8. Delivery ex works is agreed, provided no other arrangements are stipulated in the order confirmation.

§ 5 Packaging

1. Packaging is invoiced separately.
2. The packaging arrangement stipulates that transportation and all other packaging will not be taken back. The purchaser is obliged to bear the costs for disposal of packaging himself.

§ 6 Rights of purchaser in case of deficiency or defects

1. Products are delivered free of manufacturing and material defects or deficiencies. The duration for asserting warranty claims is one year after delivery of the products.
2. Claims relating to product deficiencies are excluded if operating or maintenance instructions supplied by the seller are not followed, modifications to the products are realised, parts are changed or consumable materials utilised that do not conform to the original specification and the purchaser cannot refute an appropriately-substantiated allegation that only one of the above circumstances has caused the deficiencies in question.
3. We reserve the right to choose the manner of subsequent fulfilment in the event of a deficiency occurring.
4. Any liability for normal wear is excluded.
5. Claims relating to deficiencies made against the seller can only be made by the immediate purchaser and cannot be transferred.

§ 7 Liability for damages

1. Our liability for breaches of contractual obligation and breaches arising from an offence is limited to intent and gross negligence. This does not apply to injury to the life, limb and health of the customer, claims relating to breach of contractual obligations and compensation for damages relating to delay (§ 286 BGB – Civil Code). We will bear liability for every degree of responsibility in this respect.
2. Also excluded is any liability in the case of claims for the loss of earnings relating to the PV system.
3. The afore-mentioned exclusion of liability also applies to minor negligent breaches of obligation by our vicarious agents.
4. Insofar as liability for damages for minor negligence not relating to injury to the life, limb or health of the customer is not excluded, such claims lapse within a year, commencing with the assertion of the claim or, in the case of compensation claims relating to a deficiency, from the time of transfer of the merchandise.
5. Insofar as liability for compensation is excluded and limited on our part, this also applies with regard to personal liability for compensation on the part of our employees, workers, personnel, representatives and vicarious agents.

§ 8 Retention of title

1. Until fulfilment of all demands (including all demands relating to the current account balance) which the seller is entitled for any legal reason to exercise now or in future against the purchaser, the seller is granted the following securities which will be released by him on demand and freely selected at his discretion, provided their value exceeds the demands on a sustained level by more than 20 %.
2. The merchandise remains the property of the seller. Processing or transformation is realised in all cases for the seller as manufacturer, but without any obligation on the part of the seller. Where the (co-) ownership of the seller expires through adjunction, an agreement will be concluded now that the (co-) ownership of the purchaser of the uniform object will be transferred proportionally according to value (invoice value) to the seller. The purchaser will take safe custody of the (common) property of the seller free of charge. Merchandise to which the seller is entitled to (co-) ownership will be referred to as reserved merchandise in the provisions below.
3. The purchaser is entitled to process and dispose of the reserved merchandise through orderly business channels, provided he is not in default. Assignments or transfers of ownership by way of security are not permitted. The purchaser will transfer all demands in full relating to the reserved merchandise arising from resale or other legal reasons (insurance, impermissible actions), including all demands relating to the current account balance, to the seller with immediate effect. The seller empowers him precariously to collect the transferred demands for his invoice in his own name. This authorisation to collect can only be rescinded if the purchaser fails to honour his payment obligations in an orderly fashion.
4. In the event of seizure of the reserved merchandise by third parties, particularly under warrants of execution (fieri facias), the purchaser will indicate the property of the seller and inform him immediately so that the seller can exercise his rights of ownership. Insofar as the third party is incapable of recompensing the seller for any legal or extra-judicial costs accrued in this context, the purchaser will bear liability for these.
5. The seller is entitled to withdraw from the contract and reclaim the reserved merchandise in the event of breach of contract on the part of the purchaser, particularly default of payment.

§ 9 Statute of limitation on own demands

Our demands for payment lapse in deviation to § 195 BGB (Civil Code) in five years. § 199 BGB (Civil Code) applies with regard to commencement of the period of limitation.

§ 10 Form of declarations

Legally-relevant declarations and notifications made by the customer to us or a third party require the written form.

§ 11 Place of fulfilment, choice of prevailing law, place of litigation

1. The place of fulfilment and payment is our seat of business, provided no other provisions are made in the contract.
2. The law of the Federal Republic of Germany applies to this contract. The validity of the United Nations Convention on Contracts for the International Sale of Goods (CISG) is excluded.
3. Insofar as the purchaser is a merchant, legal person as defined in public law or special fund as defined in public law, Leonberg is the exclusive place of litigation for all disputes arising directly or indirectly from the contractual relationship.
4. In the event of a provision in these business conditions or a provision in the context of other agreements proving to be or becoming ineffective, the effectiveness of all other provision or agreements remains unaffected.

Valid as of September 2009

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Mounting systems for solar technology



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