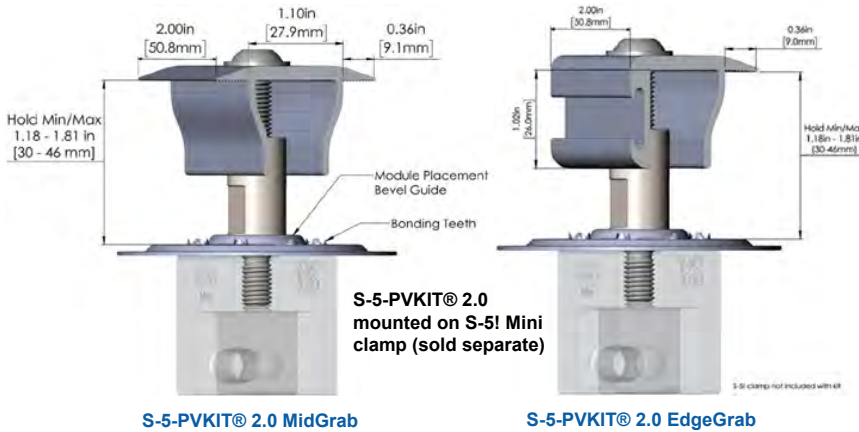


With the S-5!® PVKIT® 2.0 and the S-5!® Mini clamps, framed PV modules with frame heights of 30mm to 46mm can be mounted directly on standing seam roofs without complex and heavy rail systems. The S-5-PVKIT® 2.0 is supplied with MidGrab or EdgeGrab module clamps made of aluminium, pre-assembled with stainless steel threaded rod and a stainless steel module support disc. **PU: S-5-PVKIT® 2.0 MidGrab and EdgeGrab: 60 pieces per box.**



The S-5-PVKIT® 2.0 is mounted with the S-5!® Mini clamps suitable for the respective standing seam. The stainless steel module support disc of the S-5-PVKIT® 2.0 has optimized teeth which enable the grounding of the modules. Therefore, no straps or wires are required, except for connecting one module column to another and grounding the complete system (UL 2703 Listed).

The essential and economic advantages of installations with the S-5-PVKIT® 2.0:

- Direct mounting of PV modules – without costly rail systems.
- Easy transport, no cuttings or unusable remains.
- Pre-assembled module clamp saves time and money.
- MidGrab-module clamp can be used as middle and end clamp
- Flat screw head provides a smooth and clean surface.
- Less wind loads due to roof-parallel mounting of the modules.
- Only one module is fixed crosswise to the seams – therefore less cross-movements and stresses for the metal roof.
- Up to 80% weight saving compared to conventional rail systems.



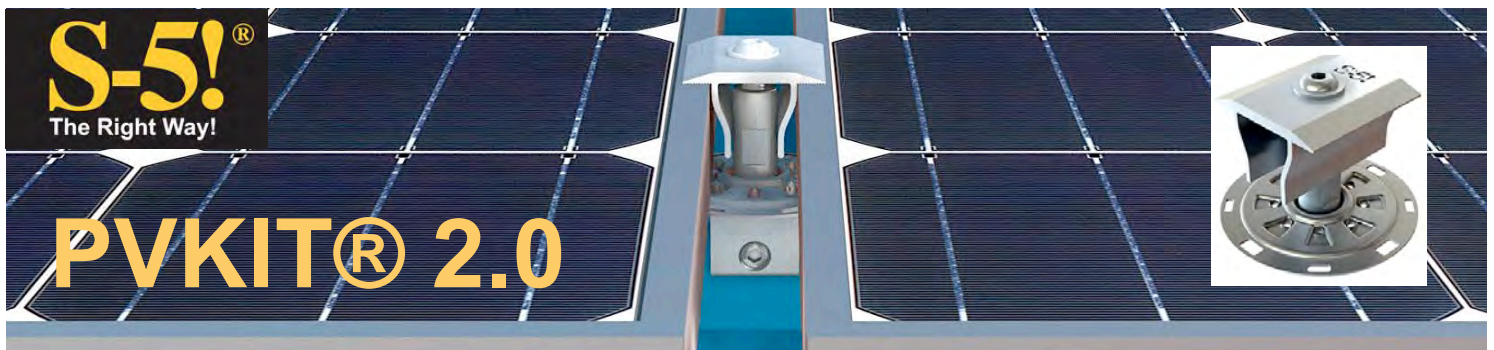
The S-5-PVKIT® 2.0 is mounted on the S-5!®-Mini-Clamp suitable for the seam type or on the trapezoidal holder MTH



Please do not hesitate to contact us for further information, the S-5-PVKIT® 2.0 Solar Manual or advice on a project.

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Installation Instructions:

Due to the mounting recommendations of most module manufacturers, the modules should be installed at right angles to the seam. The clamping range of the modules must be observed. Therefore, please also observe the specifications and installation instructions of the respective module manufacturer and the following general instructions for planning and installation.

Wind dynamics and statics are complex. RoofTech GmbH and S-5! therefore recommends that the planned PV installation be checked by a qualified professional who is responsible for wind influences and the planning and construction of and on metal roofs.

The MidGrab module clamp can be used as middle and end clamp. Please take this into account in the following installation steps:

- At the beginning a first row of S-5! Mini clamps must be pre-assembled parallel to the eaves in a straight line per module manufacturer's mounting zones. The S-5! Mini clamps, that are suitable for the respective seam type, must be mounted on the seam according to their installation instructions (with a tightening force of 15 – 17 Nm. For roofing made of galvanized sheet steel with a thickness of more than 0.7 mm with 18 – 20 Nm) **(1)**.
- Then fix the module support disc on the Mini-clamp with the stud of the pre-assembled MidGrab module clamp. Screw in until disk is seated firmly on clamp but leave the grab open to receive the module **(2)**.
- Position the modules on the module support disc at the central elevation **(3a)**.
- Then pre-assemble the next row of Mini clamps and MidGrab-module clamps on the other edge of the modules towards the ridge for the first column (both not yet tightened) **(5)**.
- Then fix the edge module clamps of the first row with a tightening force of 14-15 Nm on the Mini-clamps flush with the module frame **(3b, 3c + 4)**.
- And then fasten the S-5! Mini clamps on the other edge of the module according to their installation instructions to the seam (with a tightening force of 15 – 17 Nm. For roofing made of galvanized sheet steel with a thickness of more than 0.7 mm with 18 – 20 Nm) **(5 + 6)**.
- Repeat steps 3 – 6 for further assembly of the modules in the first column.
- After the first column is complete repeat the above points 1-6 to build each column in the array.

There should be no more than 10 modules per column in the PV array to prevent accumulation of thermal movement. After the 10th module a gap should be provided before starting the next row with enough room to accommodate for the PVKIT edge grabs between the rows. A gap of at least 10 mm must also be maintained between the module rows in the horizontal direction.

Please note in general: (Please also note the S-5! installation instructions that are included in every S-5! product box)

Please note also the installation instructions of the respective S-5!® clamps and the other products used! Installation with our products should only be carried out by specialists and specialist companies with qualifications for the respective installation and with experience in working on roofs and installing solar-systems. During installation, the warranties of all trades and the roof as well as the regulations for work on roofs (e.g. the use of fall protection, safety catches from an eaves height of 3m, accident prevention, building regulations, etc.) must be observed.

In the event of non-observance of our installation instructions, when installing or assembling our products with components of the competition and when using and combining further components that were not purchased from us, we shall not accept any liability for any resulting defects and damage. The warranty is excluded in this respect.

Please make sure that the load coming into the clamp will be taken by the structure of the roof. Assumption is that the determination has been made that the roof to which the S-5! clamps will be attached is structurally adequate. Any loads imposed on the S-5! clamps will be transferred to the panels. Panel seams must have sufficient flexural strength to carry these loads. Panels must also be adequately attached to the building structure, and the structure must be sufficient to carry these loads. In particular, the snow and wind loads, the additional loads from the installations attached to the clamps, as well as the increased loads in the edge and corner areas of the roof construction must be considered.

A sufficient number of clamps must be provided. For statically relevant clamps, a distance of at least 500mm from the end of the standing seam profile must be maintained. RoofTech and the makers of the S-5! clamps make no representations with respect to these variables. It is the responsibility of the user to verify this information. In case of doubt, we recommend seek assistance from a qualified design professional or stress analyst.

Responsible for the stability of a building structure is the building owner or the owner or operator. The installer of the system is responsible not only for the system but also for the roof on which the system is installed. Whoever installs a system on an existing roof without having checked the stability beforehand, violates existing law! For critical installations, inquire for specific test data of ultimate tensile load on specific panel materials and seam types. The sufficient holding force of the roofing to the supporting or substructure must always be ensured. The sufficient holding force of the roofing on the supporting or substructure must always be guaranteed. Proof must be provided by the customer or installer. In cases of doubt, a structural engineer must be consulted to determine the necessary number of clamps, the loads and its effects.

In the case of handcrafted metal roofing on wooden formwork, the edge and corner areas should not be covered with modules due to the limited load-bearing capacity of the roofing and the adhesives. In the central area, skipping of seams is generally not possible. Therefore we recommend to install clamps on each seam. The installation of PV systems represents a punctual load entry, therefore we recommend reduced adhesive distances and screwed clips. The installation and fastening of the clamp should be carried out between the clamps in order to achieve an optimal load distribution.

The material properties of the respective metals, the combination with each other as well as the installation instructions and regulations of all manufacturers involved (including those of the metal roof) must be observed. Deformations due to thermally induced elongation must be limited (lengthwise and horizontal).

When installing a PV system, the grounding / equipotential bonding must be carried out according to the national and locally applicable standards and directives (in Germany, among others, according to VDE 0100). The recommendations and installation instructions of the module manufacturers must also be observed. The commissioning of a PV system and the connection to the power grid must be carried out by an authorized electrician or by the grid operator and is its responsibility.

It must be ensured by the planner and the specialist company responsible for the installation that the planning and installation are carried out strictly in accordance with the national and site-specific building regulations, occupational safety and accident prevention regulations, standards and environmental protection regulations. Every person who plans and installs with our products is obliged to inform himself independently about all rules and regulations for technically correct planning and installation and to observe them. This also includes obtaining the current status of the necessary rules and regulations.

*S-5! clamps are not suitable for use as fall protection or guardrails. The S-5! clamps may only be used for this purpose in a certified and approved fall protection system. The respective system provider for fall protection is responsible for this and must provide proof of this.

The user and/or installer of all our products is responsible for all necessary engineering and design to ensure that the S-5! clamps and other products has been properly spaced and configured. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional or stress analyst, if necessary. RoofTech GmbH and S-5!® - Metal Roof Innovations Ltd. make no representations with respect to these variables.

The suitability of our products for the intended use is checked by the planner and user himself. If technical details are not described separately, this does not release the executing company from checking in individual cases and prior clarification of a technically correct issue. As a matter of principle, RoofTech GmbH, S-5!-Metal Roof Innovations Ltd. and our producers do not accept any responsibility for the installation, suitability and applications. S-5! products are protected by international patents of Metal Roof Innovations, Ltd.

