



Professional solar mounting systems
Roof and facade



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Our company is certified according to

DIN EN ISO 9001:2008

DIN EN ISO 3834 part 2
Comprehensive quality requirements
regarding welding operations

DIN EN 15085-2
Certification level CL1

DIN 6700-2 component class C2

Manufacturer qualification acc. to
DIN 18800-7:2002-09 class E

Manufacturer qualification acc. to
DIN V 4113-3 class C aluminum



1. General

1.1 General information

The Schletter PV-mounting system is designed **as a modular unit assembly system** with universally applicable **high-value components** (aluminum / high-quality steel), and usually enables the installer **to install any module in almost any mounting situation**. The system is made up of numerous system components that have been well-proven for many years and is permanently completed with newly developed components.

Besides the modularity and the selection of high-value materials, we especially focus on supporting the installer with instructions, calculation programs, etc., which help **to save valuable time and to avoid mistakes**.

According to your wishes, you will receive single components or completely compiled mounting sets according to the individual module arrangement.

Complete system structural analyses in the form of charts and programs are available for the whole system, which give mounting guidelines and protect the installer from any liability claims in case of damage. Besides the the main components (roof hooks, crossbeams, etc.), the system structural analysis also includes special fastening elements and is also constantly updated.

State-of-the-art production procedures grant efficient manufacturing of standard components as well as quick and flexible realization of special constructions on customers' request.

Our welding procedures are certified according to DIN 18.800 (welding standard for supporting structures).

The quality supervision is carried out according to DIN ISO 9001:2000. Being a founding member of the RAL-Solar, we also promote a company-independent and overall further development of quality standards as well as a professional separation of the areas of competence and responsibility.

We grant a voluntary 10-year warranty on our system components.



Important hints:

- In this brochure, each system component is briefly described. Further information about the single components can be found in the component overview.
- Further information on the different systems is summed up in product sheets and application hints:

➞ This sign always hints to further relevant documents.

1.2 System design

Usually, two horizontal cross beams carry one module row. The cross beams are connected to the substructure respectively to the roof cladding by means of fastening elements. The modules are fastened to the cross beams by means of middle and end clamps. Usually, the modules are mounted vertically. Accessories are available for the most different kinds of applications.



1.3 Fastening elements

A wide range of roof hooks and special fastening elements and fastening systems allows mounting on almost any roof construction. According charts of the system structural analysis indicate the number of fastening elements that have to be installed under certain edge conditions.

Roof hooks

Roof hooks are available for most forms of tiles and pantiles. The economically priced welded hook designs are available in the most different thicknesses starting from EcoG up to VaMaX (reinforced design for especially heavy snow loads).

Optional:

Design **KlickTop**

Design **Rapid²⁺**

for convenient mounting from above.

All hooks are made of VA 1.4301 quality steel. Our welding procedures are certified according to DIN 18.800 (welding standard for supporting structures).

➔ **Component overview: Roof hooks**

Special roof hooks for numerous kinds of roof covering complete the roof hook standard program. Starting from hooks for slate or tegalit up to a complete program for plain tile coverings (also including a special sheet metal tile), most forms are available.

➔ **Biberschwanz (plain tile) product sheet** ➔ **Creton Domino product sheet**

➔ **PP (Pfette Pfanne/ purlin pan) product sheet** and others ...

Roof hook Moench/Nonne (Spanish tile) - Southern Italy, Spain and Southern France are the home of the so-called Spanish tile. Laid onto the most different kinds of substructures (wood, bricks or concrete), these tiles make the use of fastening elements difficult. The Moench/Nonne system provides a special roof hook design for this problem.

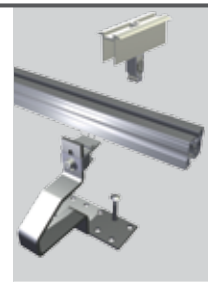
➔ **Spanish tile product sheet**

Iso07 - For roofs with on-roof insulation, conventional roof hook designs can be combined with longer screws and distance tubes. Please consider that the design has to be adapted to the existing on-roof insulation by the installer, and that only a reduced load can be applied per hook.

➔ **Iso07 product sheet**

The extra angle **Eco90** allows a structurally verified mounting with screwing to the sides of laminated wood girders. This angle can be used with all Schletter roof hooks.

➔ **Eco90 product sheet**



Standard design



with KlickTop



System hook Rapid²⁺



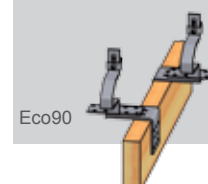
Biberschwanz
(plain tile)



Mönch Nonne
(Spanish tile)



Iso07



Eco90

Corrugated roof fastening

In case of eternit roofings or also trapezoidal sheet metal roofings as well as with slate roofings, usually the fastening kit for corrugated roofs is applied. A special hanger bolt is screwed into the substructure through the roof cladding and bears the cross beam by means of an adapter plate. An UV-resistant EPDM-sealing with sealing cone and support collar is counterscrewed with a third mounting nut and safely seals the drilling. Please consider that in case of purlin roofs it might be recommendable to mount only vertical rails and to arrange the modules horizontally on them.

KlickTop design: Optimum mounting time and improved structural analysis values at the same time ➔ [KlickTop fastening kit for corrugated roofs product sheet](#)

FixW-1876

The advantage of this fastener is that snow loads are distributed on two corrugation tops, which leads to an optimum load distribution on the corrugated profile. In contrast, wind suction loads do not load the corrugated profile, as these loads are directly transmitted into the substructure. Both wooden and steel substructures can be used for fastening.

➔ [FixW-1876 product sheet](#)

Standing seam clamps

On sheet metal roofs with standing seams, so-called standing seam clamps are applied. They are clamped onto the standing seams and bear the cross beam profile. The structural safety of the roof cladding has to be considered, the sheet metal fastening must be able to stand the arising suction forces! The application on titanium-zink sheet metal roofs is not recommendable, because these roofs are very brittle at subzero temperatures which easily leads to crack formation. (A reasonable alternative for such cases is the FixPlan system).

No matter if a roof is made by KalZip or BEMO, Zambelli or Fischer Klip-Tec, we offer clamps for the vast majority of sheet metal roofing types. And if your sheet metal roof is not on the list, we will possibly be able to produce a customized clamp design on short notice. ➔ [Component overview: Sheet metal roof clamps](#)

Fix2000

Fix2000 is a 10.000 - times proven fastening element for trapezoidal sheet metal roofs and sandwich elements. The Fix2000 clamp is manufactured customizedly for the individual trapezoidal sheet metal form and is mounted with 4 self-drilling screws.

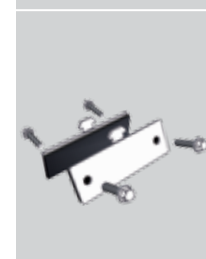
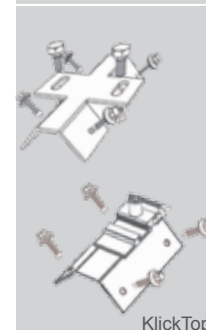
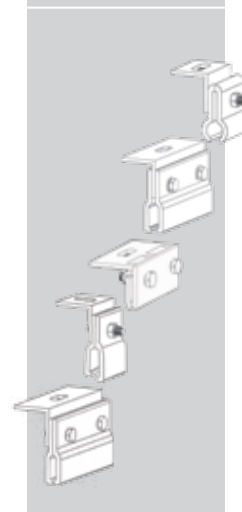
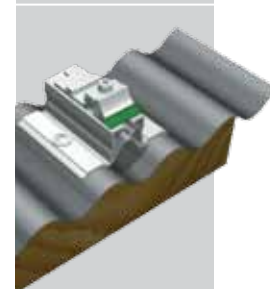
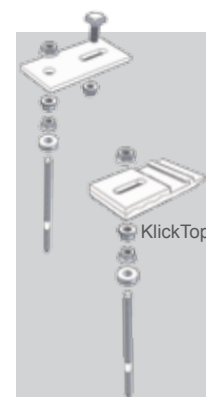
The alternative to Fix2000 standard; Mounting from above in even less time.

➔ [Fix2000/Fix2000 KlickTop product sheet](#) ➔ [Fix2000 measurement check list](#)

VarioFix-V

The VarioFix-V system is made up of a combination of Schletter Standard rails with SingleFix-V fasteners and is intended for vertical mounting.

➔ [VarioFix-V product sheet](#)



SingleFix-V

SingleFix-V by Schletter is a safe fastening solution for vertical module mounting with a considerably reduced need for material. SingleFix-V has a system structural analysis and is mounted using special screws with design approval and structurally verified holding forces. Well-arranged charts will show you how to distribute the fasteners and what loads are permissible!

➔ [SingleFix-V product sheet](#)

SingleFix-H

SingleFix-H by Schletter is a safe fastening solution for horizontal module mounting with a considerably reduced need for material. The system is especially suitable for the completion of modules fields with single modules in horizontal mounting. SingleFix-H has a system structural analysis and is mounted using special screws with design approval and structurally verified holding forces. Well-arranged charts will show you how to distribute the fasteners and what loads are permissible!

➔ [SingleFix-H product sheet](#)

FixPlan

The fastening system FixPlan serves for the fastening on flat sheet metal roofs of different kinds and also on standing seam roofs. This system grants the advantage of a safe anchoring in the substructure and the tolerance towards thermal length changes of the sheet metal roofing.

➔ [FixPlan KlickTop product sheet](#)

StandOff

The optimized elevation system for roofs with little remaining load-bearing capacity. Due to the fastening to the trapezoidal sheet metal (roof cladding), you do not depend on the girders and you can choose the grid dimensionings freely, which brings about big advantages. The fastening is carried out using design-approved screws so that the system is structurally verified in terms of the generally recognized rules of practice.

➔ [StandOff product sheet](#)

Fastening system FixT / FixE

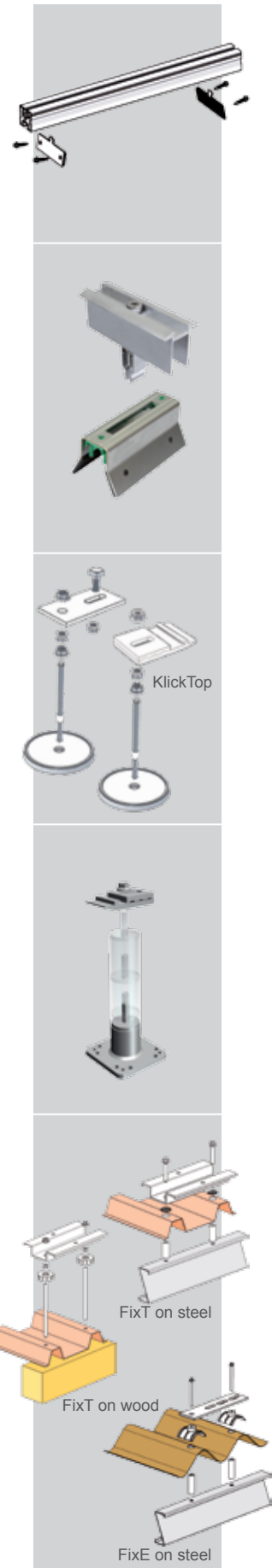
With the Schletter fastening system **FixT**, the load is transferred from the PV-bearing construction into the substructure by means of distance tubes in case of steel purlins, respectively with hanger bolts in case of wooden purlins. The system is applicable on single-layer trapezoidal sheet metal roofs and also on sandwich roofs. Special support elements made of aluminium grant an optimum connection to the most different kinds of roof coverings..

The Schletter fastening system **FixE** has been developed especially for eternit roofings on steel and sheet metal purlins. The sealing is carried out by means of a **special EPDM-form piece** which perfectly adapts to the shape of the eternit plate and thereby grants optimum tightness. In case of wooden purlins, also alternative fastenings with normal hanger bolts respectively combinations are possible.

➔ [FixT/FixE product sheet](#)

➔ [FixT/FixE check list](#)

➔ [CompactVario product sheet](#)



Cross beam profiles

The cross beam profiles Eco05, Solo05 and Profi05 are the standard components of the different fastening systems.

A variety of other profile forms complete the system to a complete unit assembly system for almost all cases of application. For example, the standard profiles are completed by the ProfiPlus and the wide spanning profile series GP1 to GP3

The profiles of the DN series are suitable as continuous beams for substructures and load distribution beams. Dimensioning programs for every profile design help to pick the right profiles and to apply them professionally.

➔ [Component overview: Profile series](#)

The Klick system / the module clamping system Rapid²⁺

The Klick system for the fastening of modules onto the cross beam rails grants optimum security and short mounting times at the same time, and therefore is integrated both in standard and in special load-bearing profiles.

- Quick and simple mounting
- Secure fastening with quality steel thread
- Application of standard components

The module clamping system Rapid²⁺ serves for the mounting in the cross beam, incl. pre-packaged clamps.

➔ [Component overview: Accessories, module clamps](#)

Clamping systems

Middle and end clamps made of aluminium for framed modules are available for virtually all framed module types. Schletter still prefers the stable design that distributes the load in a material-friendly manner onto the module frames and thereby avoids tensions in the glass!

For laminated modules, the design series LaminatEco is suitable for determined module thicknesses, the design series LaminatProfi is universally applicable for different module thicknesses. In case of vertical mounting, VA quality steel safety hooks are recommended as anti-sliding devices.

The design series LaminatGS has been optimized especially for scaled mounting.

➔ [Component overview: Module clamps](#) ➔ [Potential equalization product sheet](#)

➔ [Laminate mounting - general hints](#)



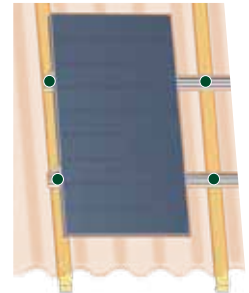
2. Pitched roof systems

2.1 System overview

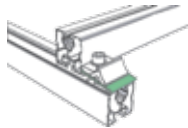
Schletter Standard

Generally, two horizontal cross beams carry one module row. The cross beams are connected to the substructure respectively to the roof cladding by means of roof hooks or special fastening elements. The modules are fastened to the cross beams by means of middle and end clamps. Usually, the modules are mounted vertically.

➔ [Product Sheet Schletter Standard](#)



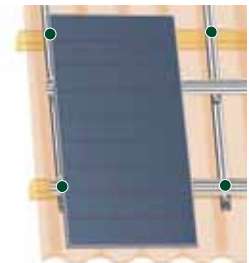
GridNorm system (cross rail)



The cross rail system **GridNorm** is made up of standard rails. Especially in case of own storage it can be assembled faster and easier. In this case of application, the KlickTop component is a fast, cheap and stable cross rail connector.

➔ [GridNorm product sheet](#)

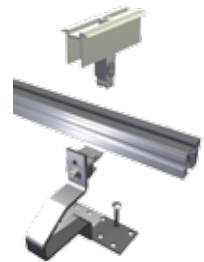
➔ [KlickTop product sheet](#)



Pitched roof mounting system Rapid²⁺

- Optimized for tiled roofs
- Mounting from above
- All assembly steps can be carried out with only one tool
- Convenient height adjustability
- Only 3 components - completely pre-assembled

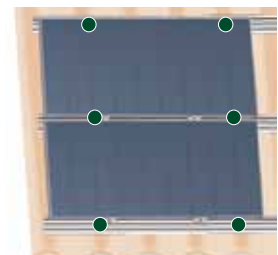
➔ [Rapid²⁺ product sheet](#)



LaQ07

With the **LaQ07** system, the modules are arranged horizontally and are fastened on joint bearing rails. In combination with the suitable module clamps, the optimum fastening geometry and a minimized need for components can be achieved at the same time, which results in very favourable system prices!

➔ [LaQ07 Product sheet](#)



In-roof system BiPv 2-11 (second half-year 2011)

The real in-roof system for unframed modules. The uninterrupted sealing makes an extra sealing layer underneath the modules redundant.



In-roof system Plandach5



Schletter **Plandach5** combines the advantages and the modularity of on-roof systems with the characteristics you expect from really good in-roof systems!

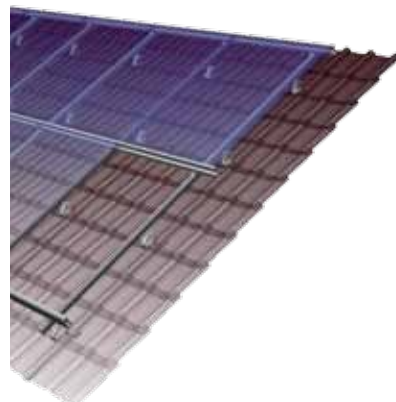
- ➔ [Plandach5 product sheet](#)
- ➔ [Plandach5 mounting instruction](#)



Inlay-system RoofIn

In any case it has to be taken into account that inlay systems should only be used with modules that have an accordant certification, because otherwise the module guarantee will become invalid. The inlay fastening technique itself always safeguards that the modules will not fall off the roof.

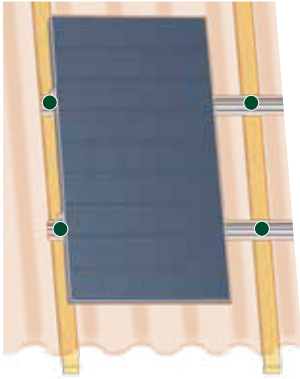
- ➔ [RoofIn product sheet](#)



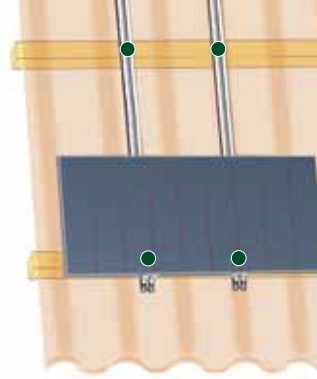
2.2 Different kinds of mounting

One-layered

In most cases it is recommendable to mount the rails vertically to the substructure.



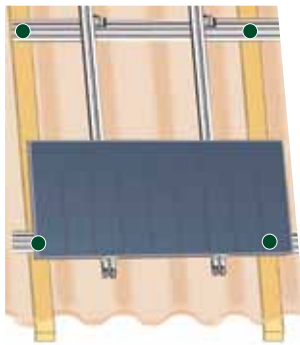
Vertical to the substructure - rafter



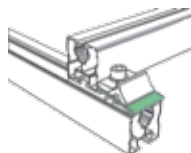
Vertical to the substructure - purlin

Cross rail

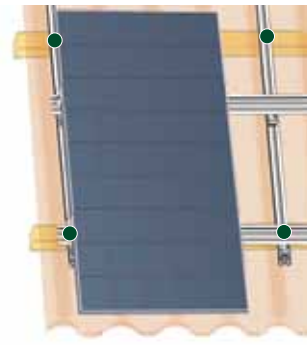
Cross rail mounting is highly recommendable if the substructure does not feature suitable fastening spots.



Cross rail 1 - rafter



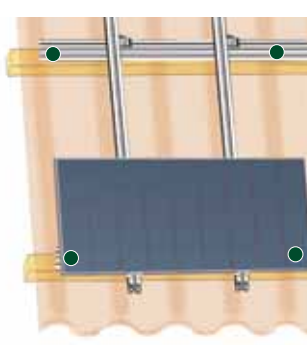
GridNorm



Cross rail 1 - purlin



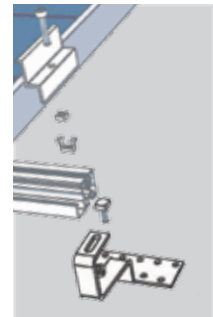
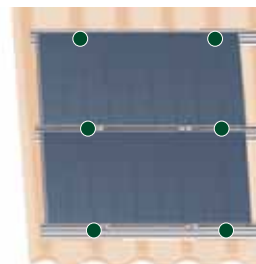
Cross rail 2 - rafter



Cross rail 2 - purlin

Linear support

Especially for horizontal mounting, only possible if the cross beams can be positioned as desired (cross rail, Fix2000, standing seam clamp, etc.).



● Standard connectors



Roof hook
also with KlickTop



Corrugated roof kit



Standing seam
clamps



Trapezoidal clamp
Fix2000 / Fix2000

KlickTop



Special fastening
on sheet metal roofs
FixPlan

and others ...

3. Elevation systems

During the project planning of an elevation system, the professional approach is to choose the suitable systems and components from a wide variety of parts of a modular system considering the respective situation and apply them according to the current guidelines.

This document informs about different kinds of flat roof systems, but also about system components that can also be used in other systems.

Generally, the following two cases have to be distinguished:

- a) Fastening systems with roof penetration and
- b) Loading solutions.

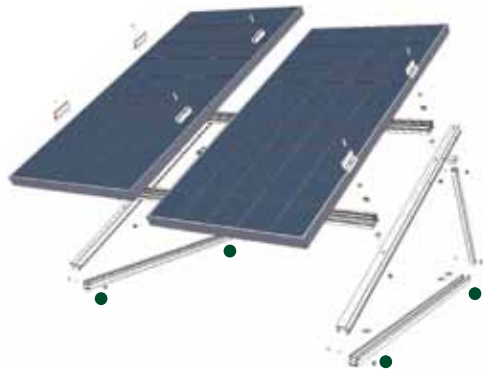
Loading solutions should not be chosen or offered without previous thorough examinations, because an insufficient load bearing capacity of the roof can possibly rule out this option in the first place! Particularly the load calculation according to the new guidelines (wind loads acc. to DIN 1055, part 4 (03/2005) and Euro-code 1 (06/2002)) has to be considered carefully, because very heavy loads for fastening could be required that might exceed the load carrying capacity of the roof. Schletter offers complex calculation software according to the latest norms! By choosing an sophisticated construction variant, the required loads can possibly be reduced to a fraction. We offer professional advice on the subject. Please also pay regard to our general hints for the dimensioning of flat roof fastenings and loadings:

➔ Mounting on flat roofs - general hints

		
System-related connectors	Loading	Standard accessories
 Hanger bolt kit	 SolRack	 Klick-Top
 FixPlan	 SolTub	 More than 20 different Profiles
 FixT on steel	 SolCube	 Connectors
 FixT on wood	 Loading kit	 Module clamps
 FixE on steel	 Dowel clamp	 Cross rail GridNorm
 Trapezoidal clamps Fix2000 Fix2000 KlickTop	 Windsafe	 AluLight
 Standing seam clamps and others	 AluGrid and others ...	 Wide range of support designs

3.1 System structure

With pitched roof systems, usually two horizontal cross beam profiles bear one module row. The cross beams are mounted onto supports that are fastened with loading systems or fastening elements.



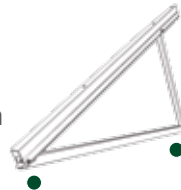
The modules are fastened to the cross beams by means of middle and end clamps. Usually, the modules are mounted vertically.

Single supports

With systems on single supports, mostly one module row is fastened to cross beams which rest on single supports. The individual supports can be fastened to the roof or loaded individually.

Support series light

Very light support profiles, especially for cross mounting and vertical mounting with narrow spans. The standard angle is 30 degrees - customized angles are available on demand.



Support series Profi

Economically priced angle support, structurally suitable for upright mounting and wider spans. Standard angle 30 degrees, customized angles on request. ➔ [Support program 07 product sheet](#)

Stütze FlexXXL

Completely pre-compiled support kit with a span of 5.2 meters for a space-saving arrangement of one-part high power module racks.

➔ [FlexXXL product sheet](#)

Supports for bigger support distances or for multi-row mounting on request.

Vegetated roof system

The special vegetated roof support allows a mounting at a distance to the ground, for example in case of vegetated roofs.

➔ [Vegetated roof product sheet](#)



VarioTop

The VarioTop system offers a simple and low-priced tracking system for both summer and winter operation. The VarioTop support is especially suitable for flat roof plants on schools, community projects, shareholding projects etc.. The economic efficiency calculation of a plant is considerably enhanced by the additional yield of 10%. ➔ [VarioTop product sheet](#)



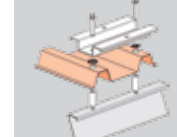
System-related connectors



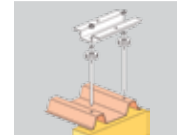
Hanger bolt kit



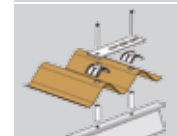
FixPlan



FixT on steel



FixT on wood



FixE on steel

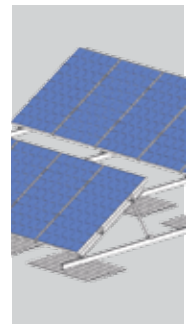


Trapezoidal clamps
Fix2000 KlickTop

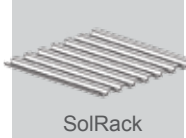


Standing seam clamps

and others



Loading



SolRack



SolTub



SolCube



Loading kit



Dowel clamp



Windsafe



Standing seam clamps

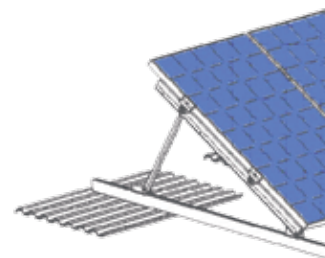
and others ...

3.2 Loading options

SolRack

Plates made of UV-resistant recycled plastic material can be combined with the current angle supports. SolRack uses the gravel that is already on the roof for the loading of the supports and thereby spares additional superimposed load.

➔ [SolRack product sheet](#)



SolTub

These aluminium gravel trays simplify a modular construction and allow an optimum loading solution.

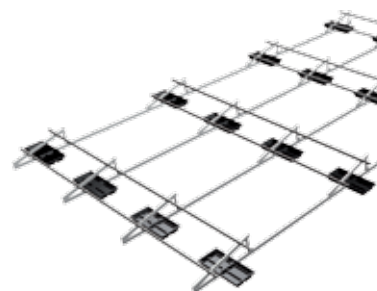
➔ [SolTub product sheet](#)



SolCube

- Loading with gravel or concrete blocks
- Optimum load distribution
- Reliable and swift loading with only few screwings
- Can be loaded later on
- Modular design
- Also applicable for roof-parallel mounting

➔ [SolCube product sheet](#)



Loading kit

A loading kit includes two aluminium profiles with special EPDM-profiles. The profiles are unfolded at right angle to the support, screwed with one screw each and loaded with concrete corner stones or the like. The special EPDM-profile evenly distributes the loads onto the roof cladding. A surface protection mat is not required.

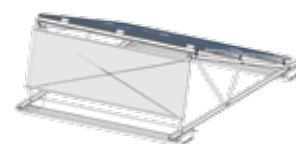
➔ [Loading kit product sheet](#)



Windsafe

The modular system Windsafe with a special and additional wind deflector grants stability of the plant with considerably less load compared to a conventional construction. Excellent in combination with SolTub.

➔ [Windsafe product sheet](#)



3.3 Combined support designs

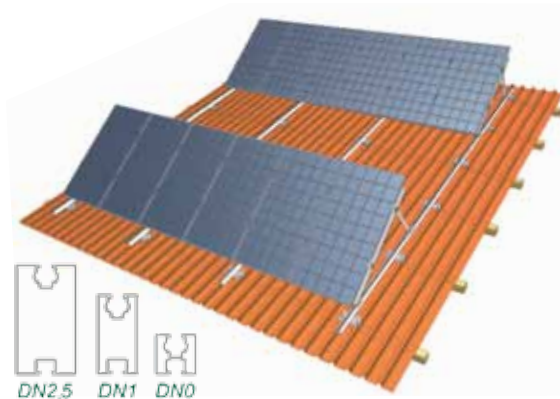
In contrast to single supports, combined support designs grant essential system advantages.

- The row arrangement is independent from the grid of the roof substructure
- Considerably less extra load is necessary for loading solutions
- Loads are evenly distributed into the roof construction

➔ Mounting on flat roofs - general hints

CompactVario - fastening to the substructure

CompactVario is a very flexible elevation system for flat and pitched roofs, especially for bridging big distances between purlins. There is a complete series of double-groove profiles (DN) which can be used as distribution beams in north-south direction. Therefore, the most economic solution can be compiled for any mounting application respectively for any span.



The construction is arranged in such a manner that no drillings at all have to be made on the construction site! Support top parts (made up of module girder plus rear support) are mounted onto the double-groove profiles using fitting kits. Instead of being installed as an elevated systems, the CompactVario system can also be mounted parallel to the roof. In this case, the support top parts are simply replaced by special cross connector plates.

In combination with the different fastening elements (for example FixT, FixE) the elevation system CompactVario is a very universal system, which allows elevations on almost all kinds of purlin roofs!

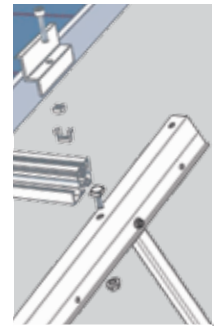
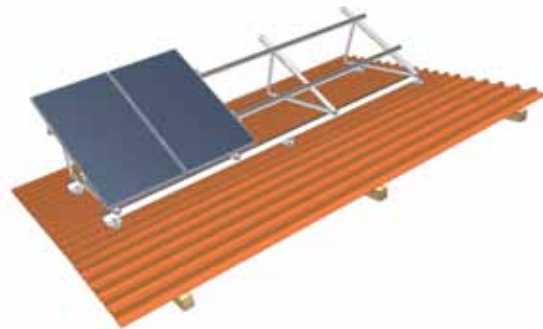
The structural plant dimensioning of all vertical and horizontal spans and the respectively applied fastening elements is carried out by means of a special structural dimensioning program.

➔ [CompactVario product sheet](#)

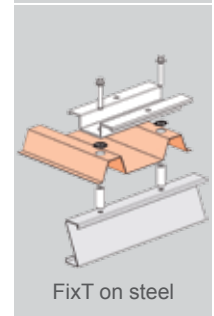
CompactGrid - fastening to the substructure

In many cases, there are parts of the roof substructure running in north-south direction which are suitable for the fixation of module elevations. In these cases a fastening similar to CompactVario, but with horizontal continuous beams can be used. The system is also reasonable if the necessary number of fastening points on the roof cannot be reached by means of supports or if a better distribution of the fastening points is necessary because of a limited firmness of the roof covering (for example on sheet metal roofs).

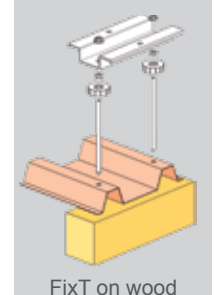
➔ [CompactGrid product sheet](#)



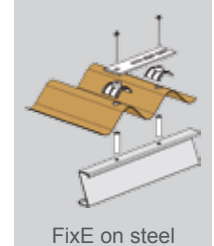
Connectors



FixT on steel



FixT on wood

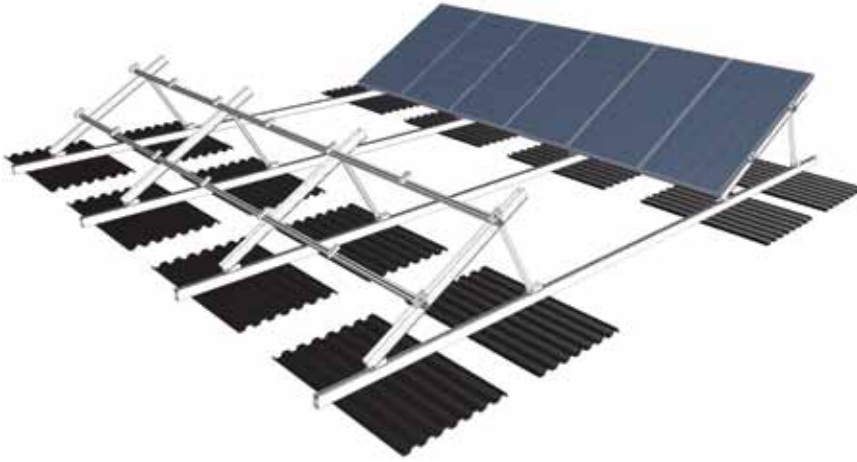


FixE on steel

and others ...
➔ [FixE/T overview](#)

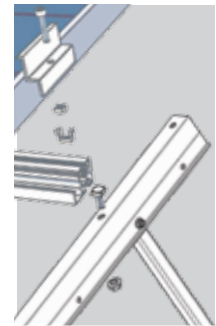
Fastening is also possible on standard fasteners

CompactVario - fastening by loading

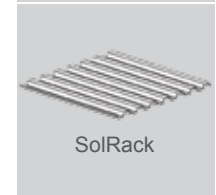


Flat roof plants that are designed without perforations of the roof cladding have to be secured against wind suction, tilting and sliding by means of sufficient superimposed loads. The CompactVario system also grants essential advantages in this respect, as only considerably lower superimposed loads are required due to the favourable geometry compared to an arrangement in single rows. The advantages are listed on the previous pages.

➔ [CompactVario product sheet](#)



Connectors



SolRack



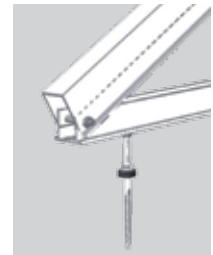
Dowel clamp

3.4 Special systems

CompactDirect

Under certain conditions it is possible to mount the flat roof support to the substructure of the building by means of a suitable connector (for example hanger bolt kit).

➔ [CompactDirect product sheet](#)



z.B. Stockschrauben

FixZ-7

A roof-parallel module mounting is not optimal on flat trapezoidal sheet metal roofs with less than 10 degree inclination because of the low yields and the insufficient self cleaning. A usual elevation with supports in most cases is not profitable. Only little elevation angles from 5 to 7 degrees are desired in most of these cases. The Schletter **FixZ-7** offers the solution for these problematic cases.

➔ [FixZ-7 product sheet](#)



Standard fasteners

FixZ-15 (second half-year 2011)

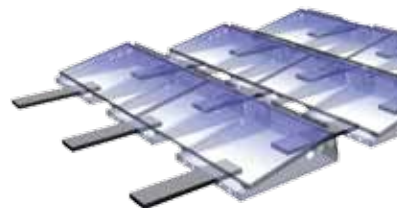
A further development of the well proven trapezoidal sheet metal system FixZ-7 with an even steeper module angle.



AluLight

The AluLight is a further system for the fastening of modules with a fixed elevation angle of 12° and completely closed rows on flat roofs using only minimal superimposed loads. Concrete blocks are used for loading.

➔ [AluLight product sheet](#)



Concrete blocks

AluLight TF

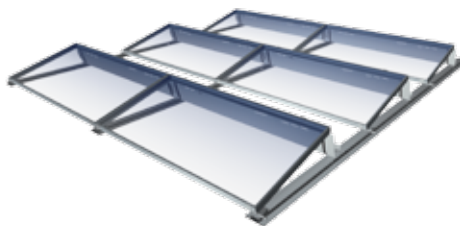
The AluLight system is now also available for thin film-modules.

➔ [AluLight TF product sheet](#)



AluGrid (second half-year 2011)

- Aluminum continuous beam with integrated surface-protection coating
- Aluminum wind deflector with integrated load-bearing function
- Loading is possible with several kinds of price-efficient materials (gravel, concrete plates)
- Optimum distribution of the superimposed loads according to the accordant structural guidelines
- Maximum mounting speed due to the smallest possible number of unmistakable individual components
- Mainly tool-free mounting
- A completely new way of module clamping



Gravel,
concrete plates

IsoTop

Membrane roofs of industrial buildings are often made of a substructure with big girder distances (5 to 8 meters) and a relatively soft roof covering. The structural dimensioning of the roofs and also the allowed pressure load of the insulation are often so small that loading solutions for module fastening are ruled out in the first place.



IsoTop is a modular construction kit with details and solutions for supporting constructions on membrane roofs of industrial buildings. IsoTop offers suitable solution approaches for any roof – depending on the object either made up of components from the standard system construction kit up to complete special solutions. In the offer-creation stage, we provide individual consulting service for planning the supporting structure in order to find the most economic solution for the respective roof. In general, the construction will be optimized in such a manner that only a few penetration points in big distances are required. Those can be reliably welded by a roofer at a low price. Thereby, the areas of competence resp. warranty are clearly separated. The system can also be designed with thermal separation for warm roofs.

➔ [IsoTop product sheet](#)

➔ [IsoTop check list](#)

Penetration without
thermal separation
(cold penetration)



Penetration with
thermal separation
(warm penetration)



4. Facade systems

The facade fastening represents a special case of module mounting onto usually vertical walls. For plants in visible areas, also fastening elements with optional surfaces and colour designs (for example anodized or powder-coated) can be delivered.

Porch system

The porch system is a special form of facade mounting. Porch supports are mounted to vertical walls or facades (therefore, they are often also called facade supports) and bear the cross beam profiles with the module rows.

Concerning “overhead glazing”, please by all means pay regard to:

- ➔ Facade support product sheet
- ➔ Facade mounting General hints



Connectors

Dowels and screws

Parallel to the facade

In certain cases, standard components can be used for mounting unframed modules or laminated modules to vertical walls or facades (bearing rails, module clamps, and screw anchor brackets for wall mounting).

Concerning “overhead glazing”, please by all means pay regard to:

- ➔ Facade mounting - general hints



Dowel clamp, dowels and screws

5. Accessories

Lightning protection and potential equalization

The lightning protection clamp can be screwed from below to the cross beam profiles and allows a direct connection to lightning protection round wires that have a diameter of 8mm or 10mm. Please note that a direct connection of the rack to the lightning protection system only makes sense if the separation distance cannot be kept. For the earthing of anodized module frames, we recommend our special earthing shims in combination with the usual middle clamps and end clamps. The module is connected in a conductive manner to the mounting rack at several spots and so is integrated in the potential equalization. Moreover, the earthing middle clamp (with earthing pin) grants the possibility to make the module part of the earthing directly from above.

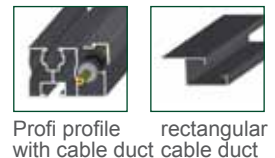
➔ [Hints on lightning protection](#) ➔ [Potential equalization product sheet](#)



Cable duct systems

A professional cable routing can have a decisive influence on the end user's qualitative overall impression of the quality of a plant. The standard profiles (Profi 05) of the Schletter system offer the possibility of cable routing. The module plugs can also be clicked into the cable duct and give the wiring additional hold. The duct can be supplemented with a lid. Furthermore, there also is an additional cable duct available for retrofitting. The so-called rectangular cable duct can be fastened to the cross beams at right angle and is screwed from below. If extended wiring is required, we offer the cable duct system MaxK. Different system components and even an extendable universal duct are available. In all cases in which a cable duct would be too much of an effort or additional cables have to be fastened, our ProKlips can simply be inserted in the Klick-grooves of the profiles.

➔ [Component overview MaxK](#) ➔ [Cable clips product sheet](#)



Profi profile with cable duct rectangular cable duct



Cable duct system MaxK ProKlip-S

PvSpin – module cleaning device

- Can be operated from the ridge
- Light and stable construction
- Guidance along the module frames
- Cleaning performance about 20 kW/h *
- Material-protecting cleaning
- The patent grant procedure at the European Patent Office is already going on

*In this exemplary case, a cleaning performance of a module surface area equivalent to 20 kW could be achieved per hour. Warning: Any kind of roof work may only be carried out using approved scaffoldings or fall-arresting devices. Pay regard to the warranty conditions by the module producer.

➔ [PvSpin product sheet](#)



SecuFix/SecuFix2

SecuFix is a very simple anti-theft device that can be combined with all systems and can also be retrofitted at any time. The socket head screws of the module clamps are simply secured against unauthorized opening by a special high-grade steel ball which is punched into the screw head. We recommend our SecuFix-applicator for mounting.

SecuFix2 is the consequent further development of the SecuFix system.

An additional "lateral protection" at the ends of the module rows again considerably increases theft proofness. SecuFix2 has to be regarded as an additional securing device for the module clamp connections and of course can be combined in an advantageous manner with further concepts (electronic plant surveillance, etc.)

➔ [SecuFix/SecuFix2 product sheet](#)



SecuFix-applicator



6. Service

Not only the suitable components and systems for the respective case of fastening, but especially universal planning aids and competent advice are becoming more and more important for the professional project planning and dimensioning of mounting systems! You have to be logged in on our website to use the following services.

Autocalculator

The auto-calculator software grants a complete program-supported rack dimensioning and calculation and helps the installer or dealer in the process of technical project planning and especially in creating offers. Complex price calculations are carried out within seconds. Alternatives and variations can be looked up swiftly.

- ➔ [Autocalculator \(.xlt\)](#)
- ➔ [Autocalculator Readme](#)



Autocalculator – schematic pictures

The editing of the plant project plan as a CAD image is too painstaking in many cases and often not even necessary.

The autocalculator creates schematic pictures without any additional effort. In many cases, these schematic pictures make further illustrations redundant.



PvComfort

This convenient roof occupation software allows a complete graphically-aided system project planning for pitched roofs.

In contrast to the Autocalculator, the functional range is limited to simple system compilations, but on the other hand this program provides a convenient graphical user guidance incl. optimization of the module occupation on the roof.



Shade calculation

The shade calculation helps the installer in the planning of flat roof plants. A minimum row distance is recommended according to the plant geometry and can be documented in a clearly arranged sketch.

The latest version is available on demand or in the download section of our website. This program is multilingual and features several country maps.

- ➔ [Shade calculation \(.xls\)](#)



Delivery status

With us, fast packing and delivery go without saying! Nevertheless, a tracking of the shipments is often helpful to the customer. The delivery status can be checked on the internet at any time and makes inquiries by phone redundant.

➔ www.schletter.eu/versandstatus



Sending of delivery notes

If your email address is registered in our system, you will receive an e-mail simultaneously to the handing-over of your merchandize to the shipping company.

International load determination online

The determination of local wind and snow loads is very difficult to do only based on the survey maps according to the new DIN 1055.

Our regular customers get access to a convenient load determination program on the internet, which was programmed on the basis of postal codes.

➔ www.schletter.eu/lastermittlung



Calculation of superimposed load

Roof height, basis width, terrain category, wind load zone... all these parameters are required for the calculation of superimposed load for flat roofs!

On demand, we will perform these calculations for you within the framework of plant calculation using a special system software.

➔ Mounting on flat roofs - general hints



System structural analyses

The system structural analysis gives exact guidelines for the application of all system components and for different configurations. Thereby, both safety and economic efficiency by optimum utilization of the components are granted. Enclosing the system structural analysis and building documents to the plant documentation does normally replace a complete individual structural analysis and protects the installer from subsequent warranty claims.

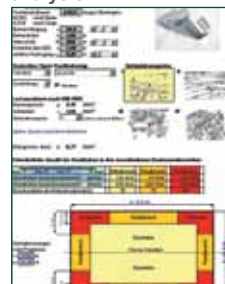
General hints and guidelines, load calculation and project planning charts are available for free for our customers. Complex software programs for all components and systems enable us to create complete individual structural analyses in-house, which we provide as part of the calculations.

➔ System structural analysis

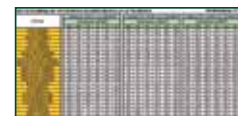
➔ Individual structural analysis charts



System structural analysis



Project planning software for roof hook application



Project planning chart for roof hoofs



Project planning software for Compact-Vario systems

Mounting instructions

The mounting instructions are permanently being completed and contain important information for the installer. A clearly arranged and well illustrated description gives a quick overview even to inexperienced users. In case of special systems, the general instruction is completed with system-related instructions and application hints.

- ➔ Mounting and project planning
- ➔ System-specific mounting



Sample case and module rack

The sample case contains samples of the most important standard components and gives an impression of the products and the modularity of the system.

- ➔ Sample case product sheet



The module stand for trade fairs and other presentational purposes. In the basic version 400650, the rack features two wooden beams which represent the rafters of a pitched roof. On these rafters, roof hooks, mounting rails, and the module are fastened. The 400650-alu design is a module stand and therefore a mere presentational stand for the module. The bearing rails of this design feature an anodized aluminium look.

Delivery with complete fixation kit for 1 module incl. roof hooks, screws, etc. - please specify the module type when placing an order.

- ➔ Module stand product sheet

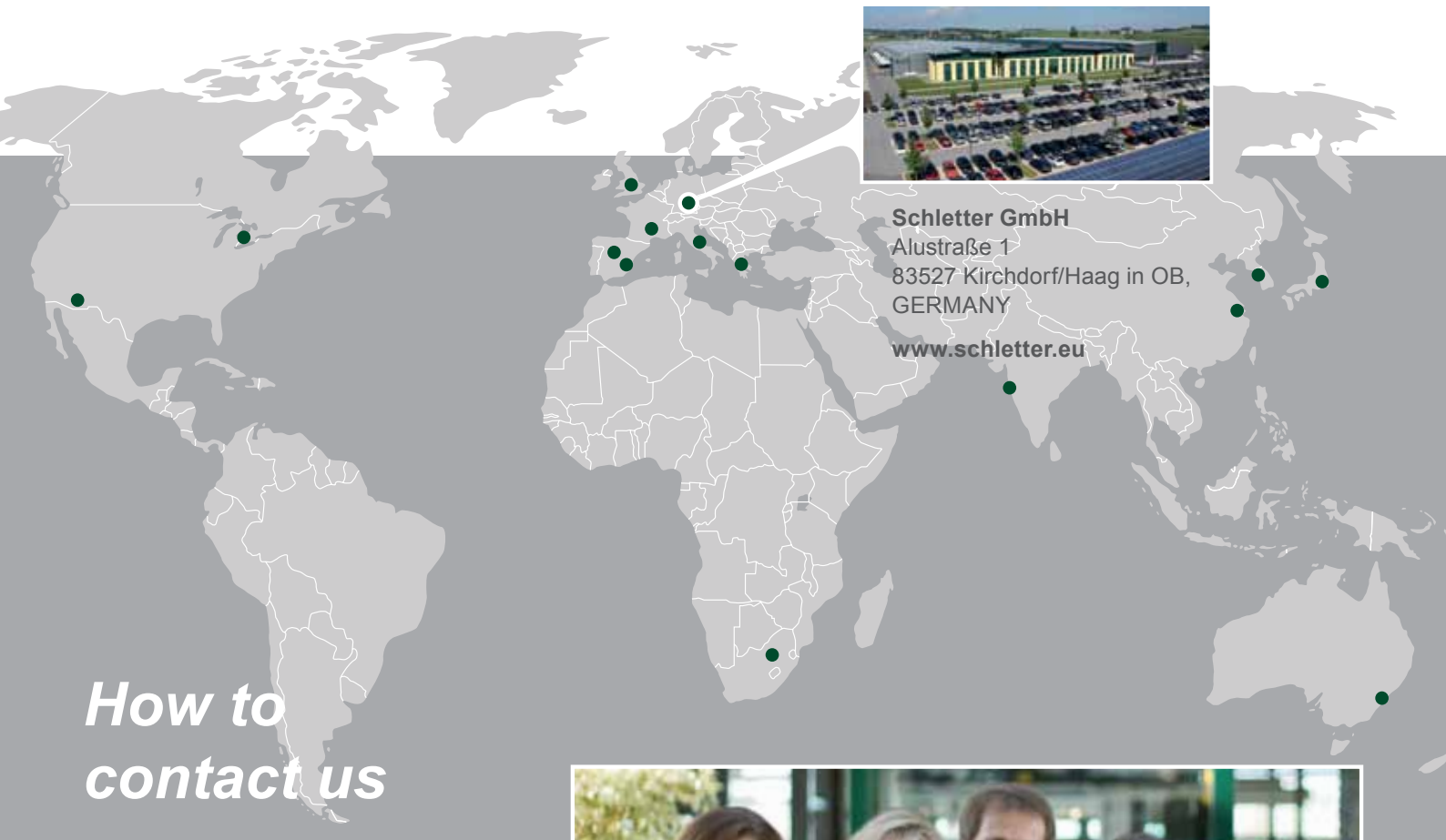


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