

Guide

Mounting systems

The perfect solution for every roof!

Certificates



CE labelling

The factory production control fulfils the prescribed requirements of EN 1090-1:2009+A1:2011:

- Annex ZA serves as the basis for CE labelling in accordance with EU Regulation No. 305/2011 (Construction Products Regulation - CPR).
- The design complies with EN 1090-2 or EN 1090-3, EXC1.

General building authority approvals

from the German Institute for Building Technology:



- Z-14.4-716: Connections for PV mounting systems
- Z-14.4-723: Rail connectors and base profile
- Z-14.4-735: Module fastenings, module supports, crossbar connectors
- Z-14.4-741: Roof hooks, hanger bolts, fastenings on the rail floor

TÜV Rheinland Certificate

- The reliability and quality of the installation system have been certified.
- The certification test catalogue includes building law and technical details.
- Guarantee that our photovoltaic mounting systems are manufactured using the same materials and processes as the tested systems.



Certificate ISO 9001:2015

- Well-designed workflows and customer-orientated processes contribute to the quality of the assembly system.
- A monitoring audit by TÜV SÜD confirmed the successful implementation of the quality management system.














Certificate ISO 14001:2015

- The company is intensively involved with sustainability.
- Sustainability plays an omnipresent role in everyday work and business processes.
- TÜV SÜD has confirmed the implementation of sustainability management confirmed.











Pitched roof Overview mounting systems

Roof type	Tile roof & beavertail roof	Corrugated & sandwich roof	Seamed metal roof	Trapezoidal metal roof	Bitumen & metal tile roof
Roof attachment	 <p>Roof hooks side-fix</p>	 <p>Roof hooks top-fix</p>	 <p>Seam clamps CS</p>	 <p>Seam clamps IS</p>	 <p>Short profiles</p>
Profile rail	 <p>C-N-rail black & blank</p>	 <p>C-rail black & blank</p>			
Module attachment	 <p>Clamping & insertion system black & blank</p>	 <p>Clamping & insertion system black & blank</p>	 <p>Insertion system black & blank</p>	 <p>Clamping System black & blank</p>	



Requirements	
Roof pitch	0-60°
Roof covering	Concrete roof tiles, seam tiles, beavertail
Max. rail length	13 m without expansion joint; 40m with expansion joint
Maximum cantilever of the rail	Depending on the planning documents
Max. tile overlap	95 mm – 135 mm (RH long)

Advantages/features	
+ 3-way adjustable roof hook (levelling of uneven roofs, for different battens and tile thicknesses)	
+ Centric load distribution, does not tip over	
+ Einfache und schnelle Montage von oben	
+ Quick and easy installation from above	
+ Large overhang of the base profile on rafters possible without additional lateral relining	
+ Cross and vertical rails possible with the same components	
+ Unmistakable look: almost invisible hooks and flush-fitting clamps	

Roof hook variants			
			
ZD 30/40	ZD 30/40 long	flex 18/30/40	BS 30 M12
			
Double ZD 30/40	Double ZD 30/40 long	Double flex 18/30/40	Double BS 30 M12

The C-rail	
+ Different lengths and heights, depending on requirements (C38 / 47 / 71 / 95)	
+ Cross mounting or insertion system also possible in a cross rail system	
+ Quick and easy installation from above	
+ C-rail also serves as a cable channel	
+ Step-resistant during assembly (from C47)	

Tile roof side-fix



Requirements	
Roof pitch	0-60°
Roof covering	Concrete roof tiles, seam tiles
Max. rail length	13 m without expansion joint; 40 m with expansion joint
Maximum cantilever of the rail	Depending on the planning documents
Max. Ziegelüberdeckung	110 mm

Advantages/features	
+ Quick roof hook installation thanks to click technology (ZD 30 N35)	
+ Robust cast aluminium hook without weld seam (ZD 533/544/633)	
+ Lateral rail mounting with a view of the mounting point	
+ Height-adjustable rail connection	
+ Small distance between the substructure and the roof covering	

Roof hook variants			
			
ZD 633 vertical	ZD 533 vertical	ZD 544 horizontal	ZD 30 N35 v+h

The CN-rail	
+ Rail in aluminium blank or black anodised	
+ Can be used as a modular support rail or as a cross rail	
+ C-N rail also serves as a cable channel	
+ C-N 60 rail for heavy loads	

Notes::

Roof hook Overview



Seamed tiles	ZD 30 M12		ZD 40 M12		ZD 30 M12 long		ZD 40 M12 long	
Beaver tail	-		+		-		+	
Concrete roof tile	+		+		-		+	
Cross rail	+		+		+		+	
Vertical rail	+		+		+		+	
Load capacity	+		+		+		+	
Height adjustment base profile	43-49 mm	57-63 mm	43-49 mm	57-63 mm	42-48 mm	35 mm	48 mm	36 mm
Height-adjustable rail connection	35 mm		-		35 mm		-	
Tile covering [mm]	95 mm		135 mm		-		36 mm	
min. rafter width [mm]	48 mm		+		-		-	
Rafter insulation	+		+		-		-	
flex 18 M10	flex 30 M10		flex 30 M12		flex 40 M10			
28-48 mm	40-52 mm		50-62 mm		-		36 mm	
	30 mm		95 mm		-		36 mm	
	30 mm		95 mm		-		36 mm	
ZD 30 N35	ZD 544 horizontal		ZD 533 vertical		ZD 633 vertical			
	-		+		-		+	
	+		-		+		+	
	+		+		+		+	
	+		+		+		+	
	ab 45 mm + Unterlegplatten		41-56 mm		20 mm		110 mm	
	26 mm		56 mm		100 mm		46 mm	
	100 mm		46 mm		-		-	

+ excellent

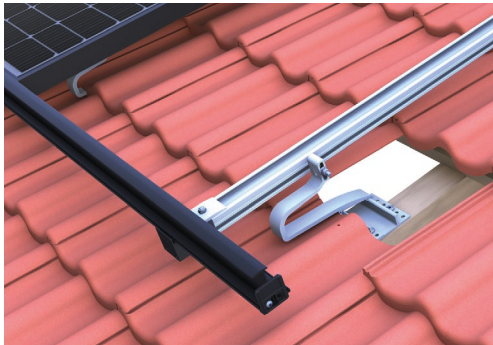
+ very good

Insertion vs. clamping system



Insertion system

- + Installation of vertical rails with subsequent installation of transverse insertion rails in a cross connection
- + Landscape or portrait module mounting possible
- + Fast, gentle installation - modules can be inserted without tools
- + Stress-free fastening of the modules over the entire length of the frame instead of punctual clamping
- + Individual modules can be replaced without dismantling neighbouring modules



Notes:

Clamping system

- + Material-saving - 1-layer structure for upright installation
- + Cross rails are mounted directly onto the roof hooks
- + Fastening the modules via module clamps
- + Flexible - cross-mounting in cross-connection possible
- + Additional vertical rails are mounted on the cross rails using cross connectors
- + Quarter-point mounting also possible with modules installed in landscape direction



Notes:

Trapezoidal metal roof Clamping system



Requirements	
Place of use	Trapezoidal metal roofs
Roof pitch	Up to 60°
Elevation	Yes (3 - 40°)
Module mounting	Landscape/portrait
Module size	Module width: max 1.34 m
Module frame heights	30-42mm / 43-52mm
Roof fastening	With building authority-approved thin sheet screws; sheet thicknesses: from 0.4 mm (sheet steel) or 0.5 mm (sheet aluminium); on sheet aluminium, use is recommended from a sheet thickness of 0.7 mm!
Tensile strength	Steel roof: 360 N/mm ² (corresponds to 360 kg) Aluminium roof: 195 N/mm ² (corresponds to 195 kg)

Advantages/features
+ Three different profile heights available (C24, C47, C71)
+ Very good rear ventilation of the modules (C47, C71)
+ Quick installation from above with easy-to-grip components
+ Fully pre-assembled short profile with EPDM
+ Fastening with building authority-approved thin sheet metal screws - generally only 2 required per short profile
+ Rail sections with simultaneous cable duct
+ Module portrait and module landscape mounting

Notes:

Short profiles		
		
C24 125mm	C47 200mm	C71 200mm
		
C24 385mm	C47 385mm	C71 385mm

Trapezoidal metal roof Insertion system



Requirements	
Place of use	Trapezoidal metal roofs
Roof pitch	Up to 60°
Elevation	No
Module mounting	Landscape/portrait
Module size	Module width: max 1.34 m
Module frame heights	30-42mm / 43-52mm
Roof fastening	With building authority-approved thin sheet screws; sheet thicknesses: from 0.4 mm (sheet steel) or 0.5 mm (sheet aluminium); on sheet aluminium, use is recommended from a sheet thickness of 0.7 mm!
Tensile strength	Steel roof: 360 N/mm ² (corresponds to 360 kg) Aluminium roof: 195 N/mm ² (corresponds to 195 kg)

Advantages/features
+ Fastening with building authority-approved thin sheet metal screws
+ Attractive and distinctive look
+ Three different profile heights available (C24, C47, C71)
+ Module portrait and module landscape mounting
+ Insertion rails for frame heights from 30-50 mm
+ Quick assembly with completely pre-assembled components

Notes:

Short profiles vs. trapezoidal brackets

Short profiles		
Trapezoidal brackets		

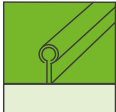
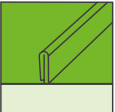
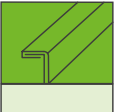






Seamed metal roof CS/IS



Requirements	
Place of use	Seamed metal roofs
Roof pitch	Up to 60°
Elevation	No
Module mounting	Landscape/portrait
Module size	Module width: max 1.34 m
Module frame heights	30-42mm / 43-52mm
Roof fastening	Clamp
Tensile strength	Steel roof: 360 N/mm ² (corresponds to 360 kg) Aluminium roof: 195 N/mm ² (corresponds to 195 kg)

Advantages/features
+ Very good rear ventilation
+ Module clamps with locking function for a secure hold in the rail
+ Clamps for various folds
+ Centric load application - no leverage effect on the rebate clamp
+ Few components, completely pre-assembled
+ Mounting from above with easy-to-grip components
+ Clamping technology with clamping points on the rebate flanging
+ Optionally with VA saddle for standing seam copper roofs
+ IS: Completely pre-assembled rebate clamp with connector for the insertion rail
+ ES: Kostenoptimiertes einlagiges System

Notes:

Seam type / clamp			
Seam type			
	Round seam	Standing seam	Snap & angle fold
Clamping system			
Insertion system			



Corrugated & sandwich roof CS/IS



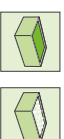
Voraussetzungen	
Place of use	corrugated fibre cement and sandwich roofs
Roof pitch	Up to 60°
Elevation	No
Module mounting	Landscape/portrait
Module size	Module width: max 1.34 m
Module frame heights	30-42mm / 43-52mm
Roof fastening	Stock screw
Tensile strength	Rm,min trapezoidal sheets: steel 360 N/mm ² (corresponds to 360 kg) ; aluminium 195 N/mm ² (corresponds to 195 kg)













Advantages/features
+ Mounting modules in portrait or in landscape
+ Can be locked in C-rail, 2 clamps for all common module frame heights, available in natural aluminium and black
+ High-quality system optics and excellent rear ventilation of the modules
+ Centric load distribution
+ Quick installation from above with easy-to-grip components
+ High flexibility possible due to large overhang
+ Rail also functions as cable channel – tidy and without loose cables, with sufficient space for plugs
+ Floating and tension-free module installation (insertion system)

Notes:

Type of mounting
 <p>Stock screw set, wooden purlins</p>
 <p>Stock screw set, steel purlins</p>

Flat roof Overview mounting systems



Module fastening	Module supports	Roof fastening	System
 <p>Middle- & end clamp schwarz & blank</p>	 <p>Module support 10°</p>	 <p>Base profiles</p>	<p>"the shortcut" System III [3]</p>
 <p>Module fastener</p>	 <p>Module support 10°</p>	 <p>Base profiles</p>	<p>"Lange Seite" System III [3]</p>
 <p>Module fastener</p>	 <p>Module support 13°</p>	 <p>Base profiles</p>	<p>"the allrounder" System II [2]</p>
 <p>Module fastener</p>	 <p>Module support 13°</p>	 <p>Base profiles</p>	<p>"the rocker" System I [1]</p>

Flat roof III "the shortcut"



Requirements	
Place of use:	Flat roofs with and without parapet
Roof pitch:	Up to 5°
Orientation:	East / West
Elevation:	10°
Module mounting:	Quer
Edge distance:	Anlagenabstand zum Dachrand (ohne Attika): 500 mm Anlagenabstand zur Attika (Innenkante): 500 mm
Module size:	Modulbreite: 995 mm – 1145 mm Modullänge: max. 2280 mm
Row distance:	2230 mm – 2483 mm (abhängig von der Modulbreite)
Module field size:	Max. 40 Meter Schienenlänge Max. Modulfeldbreite von 21 Meter

Advantages/features
+ Logistics: 1 double pallet = 80 modules, 1 lorry = 1 MW
+ Quick and easy installation: 4 men 300 kWp per day
+ High degree of prefabrication of the system components
+ Short and handy system components with plug-in connection: Max. component length 240 cm (suitable for 1 double pallet)
+ No calibration of the module supports
+ Use of the C-clamps
+ High system rigidity due to cross beams

Notes:

System overview



Base trough

+ Base trough east-west 690mm, compatible for module widths 995 -1070 mm
+ Base trough east-west 840mm, compatible for module widths 1071 -1145mm
+ For clicking in the module supports and connecting the connector and edge closure sets

Flat roof III "Long side"




Requirements	
Place of use:	Flat roofs with and without parapet
Roof pitch:	Up to 5°
Orientation:	East / West
Elevation:	10°
Module mounting:	Landscape
Edge distance:	System distance to roof edge (without parapet): 500 mm System distance to the parapet (inner edge): 500 mm
Module size:	Module width: 995 mm - 1145 mm Module length: max. 2600 mm
Row distance:	2230 mm - 2483 mm (depending on the module width)
Module field size:	Max. 40 metre track length Max. Module field width of 21 m


Advantages/features
+ Logistics: 2 lorries = 1 MW
+ Short & handy system components with plug-in connection: Max. component length 240 cm (suitable for 1 double pallet)
+ High system rigidity due to cross bar
+ Higher wind and snow loads possible
+ Use of large modules (up to 2.6 m) possible
+ Optimum clamping range, corresponding to the clamping range described by the module manufacturer, no module approvals required
+ Low load on the roof cladding due to optimised support pressure (more rails = more support)
+ Rails need to be aligned less precisely

Notes:


System overview




Base trough




Connector set east-west




Edge closure set 970



Support brace



Module support 10°



Module bracket




Flat roof II "the allrounder"

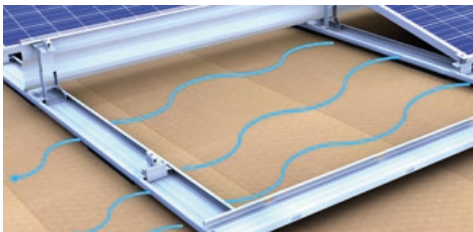


Requirements	
Place of use:	Flat roofs with and without parapet
Roof pitch:	Up to 5°
Orientation:	East / West, South
Elevation:	13° (for modules with a width of approx. 1 m), mounting angle changes slightly with increasing module width
Edge distance:	System distance to roof edge (without parapet): 500 mm System distance to the parapet (inner edge): 500 mm
Module size:	Module width: 920 mm - 1200 mm Module length: maximum 2180 mm (south)
Row distance:	flexible, see planning software Solar-Planit

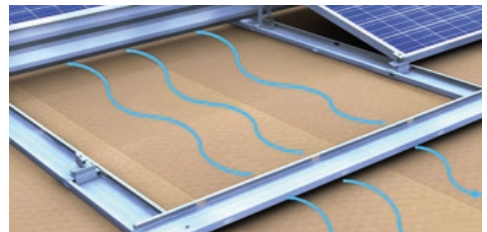
Advantages/features
+ Wide rails - large contact surface
+ Flexible row spacing
+ Quick and easy installation
+ Rail doubles as cable channel - tidy and without loose cables, sufficient space for plugs and sockets
+ Suitable for gravel roofs
+ Different base rails: Unglued, with PE separating layer 6 mm or with PE pads for cross drainage
+ Suitable for module widths 920-1140mm

Notes:

Selecting the base trough			
Rail	 Base trough (BT)	 BT protection layer	 BT Cross drainage
Bitumen roof	-	+	+
Foil roof (EPDM, PVC, TPO, FPO)	-	+	+
Gravel roof	+	+	+



Cross drainage



Protection layer

Green roof

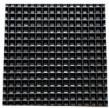


Requirements	
Place of use:	Flat roofs with and without parapet
Roof pitch:	Up to 5°
Orientation:	East / West, South, Butterfly
Elevation:	10°
Module mounting:	Hochkant
Edge distance:	System distance to roof edge (without parapet): 500 mm System distance to the parapet (inner edge): 500 mm
Module size:	Module width: maximum 1340 mm Module length: maximum 1850 mm
Row distance:	see planning documents

Advantages/features
+ Large substrate plates provide sufficient space for ballasting
+ Laying out mats without measuring
+ Sufficient distance from the roof surface for plant growth and sliding snow
+ Quick and easy installation thanks to connected fields
+ Different layouts possible with the same components: east-west, south-facing, butterfly
+ Sustainable production through the use of recycled materials
+ Efficient space utilisation thanks to 10° module inclination and portrait mounting

Notes:

Roof attachment



Substrate plate



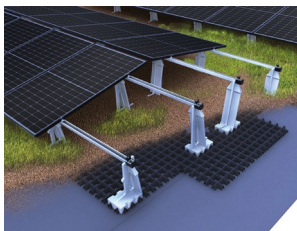
Substrate plate 1/2



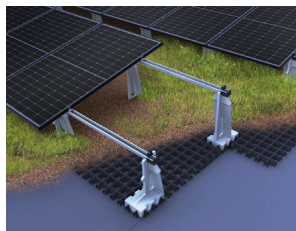
Module support high



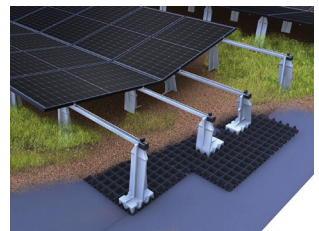
Module support low



East/West



South



Butterfly

Sheet metal façade Insertion system



Requirements	
Place of use:	Inclined façade with trapezoidal sheet metal cladding
Inclination:	60° – 90°
Elevation:	No
Module mounting:	Landscape/portrait
Module size:	Module width: max 1.34 m
Module frame heights:	30mm/35mm
Attachment:	With building authority-approved thin sheet screws; sheet thicknesses: from 0.4 mm (sheet steel) or 0.5 mm (sheet aluminium); on sheet aluminium, use is recommended from 0.7 mm sheet thickness!
Tensile strength:	Steel roof: 360 N/mm ² (corresponds to 360 kg) Aluminium roof: 195 N/mm ² (corresponds to 195 kg)

Advantages/features
+ Module landscape or portrait mounting
+ Fast installation with pre-assembled components
+ Suitable insertion rails for all standard frame heights
+ Attractive and distinctive look
+ Trapezoidal bracket: Small number of components
+ Short profile: Two different profile heights available (C47, C71)
+ Short profile: Very good rear ventilation of the modules

Notes:



Short profile



Trapezoidal bracket

Notes:



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