SUNOVA
FLATROOF SOLAR POWER

Mounting System MCG 1.1
Membrane-Connected Glass

System description

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SUNOVA MCG 1.1 System

Fields of application:

- Newly-built or newly re-roofed flat roofs
- Existing FPO or PVC waterproofing membranes on flat roofs with mechanical fixation
- Flat roofs with 1 to 10 degrees roof slope
- Lightweight roofs – weight-loading about 19 kg/m²
- Frameless glass–glass PV modules

Not suitable for:

(please inquire for other SUNOVA systems)

- Shed roofs, sloping roofs – roof slope > 10°
- Roof areas with water retention up to the connection boxes or connectors
- Existing roofs with bitumen, EPDM, Evalon or other waterproofing membranes
- Fully adhered roof systems
- Framed PV modules

Requirements for mounting on flat roofs

Wind uplift according to DIN 1055 and relevant national standards
In the MCG 1.1 system the wind uplift forces are transmitted to the synthetic waterproofing membrane, which channels these forces through the mechanical fixation into the roof structure. The mechanical fixation and the waterproofing membrane must be laid out according to DIN 1055.

Snow load according to DIN 1055 and relevant national standards
Snow loads must be reliably absorbed by the weight-bearing substructure. To ensure transmission of the load, the thermal insulation must be sufficiently stable under load.

Synthetic waterproofing membrane
The synthetic membrane is an integral component of the system. The selected product must be of sufficient quality and durability.

Roof membrane	New	Existing
Supporting substructure	Structural verification according to DIN 1055, taking into consideration: + 2.0 kg/m² mounting system MCG 1.1 + approx. 17 kg/m² surface load of PV modules	
Vapor barrier	Design according to building construction; no change through the MCG 1.1 system	
Thermal insulation Compressive load at 5 mm compression	Tread-proof $F_p \geq 650$ N (DIN EN 12430)	
Synthetic membrane	Sarnafil TS 77-20 (recommended)	FPO or PVC Other waterproofing methods are not suitable! Expected lifespan > 20 yrs.
Fixation method Synthetic waterproofing membranes	Sika line-fixaton (recommended)	Point- or linefixation
	Design and execution according to DIN 1055 – only mechanical fixation permissible. Do not use fully adhered systems.	
Inclination range flat roof	2° (recommended) …10° 3.5%…17.5%	
PV-modules	Glass–glass laminates Only SUNOVA-approved products	

The SUNOVA MCG system is a lightweight fixation system for lightweight contstruction flat roofs

The glass–glass photovoltaic modules are installed parallel to the roof. Modern thin-film modules with their excellent low-light performance characteristics are specially well suited for this type of orientation.

Standards and regulations

The applicable standards and regulations must be observed.

- Observe the manufacturer's technical documentation and mounting instructions. If this system description differs in certain points from the manufacturer's documentation, these deviations apply only to the SUNOVA system described in this documentation.
- The installer (roofer and electrician) and the planner are responsible for ensuring that the general acknowledged rules of technology and the applicable safety regulations are observed.

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Structural design

The structural layout of the mounting system is determined to a large extent by the wind and snow loads acting on the installation. These outside influences on building components are defined by the DIN 1055 standard. The applied forces must be individually determined for each project and for the layout of the mounting system. For details, refer to the DIN 1055 standard. Please use the relevant standards for snow load and wind uplift in your country.

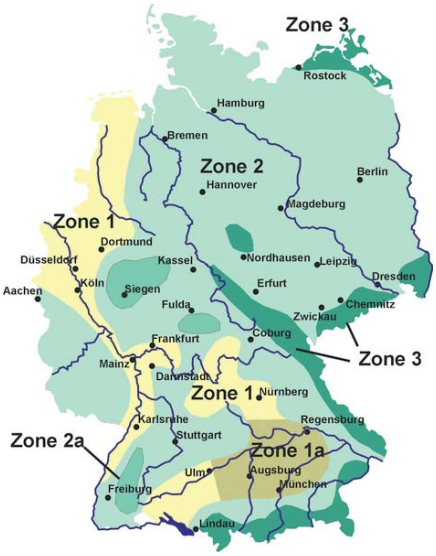
Snow loads

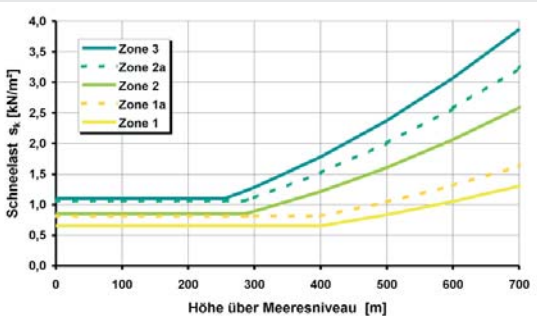
The following factors affect the calculation of snow loads:

- Snow load zone
- Height above sea level
- Roof shape and inclination
- Position (special roof shapes)

The snow load zones for Germany according to DIN are shown in the chart on the right.
The snow load zone for flat roofs also depends on the installation's height above sea level.

Important: For other roof shapes or inclinations the specifications according to DIN apply.





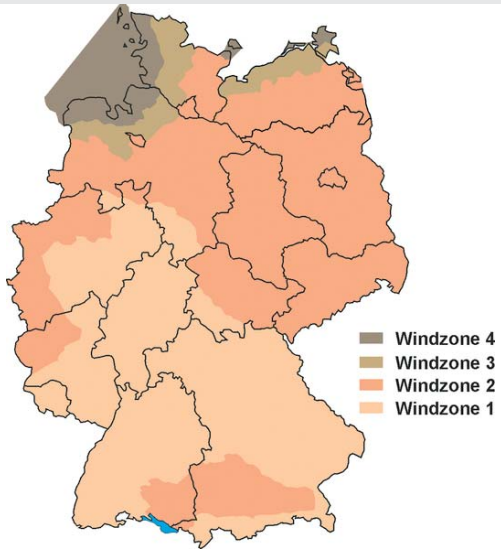
Wind load

The following factors affect the wind forces on the installation:

- Wind zone
- Height above sea level
- Roof shape and inclination
- Position (center/edge of roof)
- Terrain category (surrounding buildings)
- Height of parapet

On request we can support you with specific calculations for the wind suction and thrust forces for your project.

Based on this design analysis, the required number of rail fasteners and their positions are determined.



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Components for fitting the base rail

SUNOVA
profile fastener
FPH-FPO/PPH-PVC

SUNOVA base profile

SUNOVA
profile connector

Pressure plate
30 x 50 M8

Aluminium
sliding block M8

Hexagon
socket screw
M8 V4A

Welding on the rail fasteners and laying the base rail

Tools:

- Hand hot-air welder
- Cleaning kit
- Chalk line
- Allen key, size 6
- Soft-faced mallet

Installation:

Mark the position of the base profiles with a chalk line.

Slide the **base rails** into the **rail fasteners** and position them. Then weld the rail fasteners to the synthetic membrane with hot air. Especially when cleaning the seams of the waterproofing membrane and welding the membrane, observe the manufacturer's instructions.

During the installation a weld inspection with peel test must be performed at least once a day.

At each rail end weld on a 10 cm x 10 cm piece of waterproofing membrane to protect the roof membrane from damage.

The base rails can be extended with **rail connectors**. Two connectors are required for each junction.

To secure the base rail (against sliding out of place) the rail and rail fasteners are fixed with the **pressure plate**.

For each profile retainer, fit a pressure plate centered on the profile retainer.

Fit an aluminium sliding block into the groove of the base profile. Once fitted, the aluminium sliding block can be easily moved to the required position.

Secure the pressure plate with an M8 hexagon socket screw.

Important:

When welding the rail fasteners onto existing synthetic waterproofing membrane, the membrane must be cleaned according to its manufacturer's instructions.

The base rail must always be positioned along the gradient to allow water to drain off!

Do not cut the rails to length on the roof membrane (metal chips).

Fitting the cross rails

Tools:

- Allen key, size 6,5 cm free working area
- Electric screwdriver
- Hacksaw for aluminium rails
- Soft-faced mallet

Important:

The transverse profiles must not be longer than 12 m. Dimension the module tables accordingly.
The distance between transverse profile connections and base profile must not exceed 300 mm.

Installation:
Fit the transverse profiles onto the previously assembled base profiles, first sliding the aluminium sliding blocks into the base profiles and positioning them.

Fine-adjust the spacing between the cross rails when fitting the modules. Do not tighten the cross-tie at this time.

The transverse profiles should be flush with the outer edge of the PV modules to prevent injury on the glass edges.

To extend the cross rails, use two rail connectors per link. To ensure the structure's stability, use cross rail connectors only in the area of the base rails: The distance to the base rail must not exceed 30 cm.

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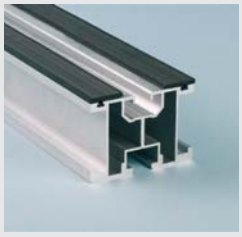
Components for fitting the cross rails



SUNOVA cross rail

SUNOVA
cross connector

SUNOVA rail fastener

Aluminium
sliding block M8

Hexagon
socket screw
M8 V4A

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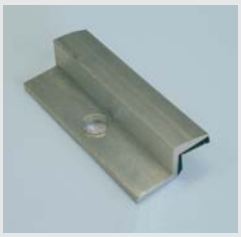
Components for PV module mounting

SUNOVA glass panel center clamp



SUNOVA glass panel end clamp

Aluminium sliding block M8

Hexagon socket screw M8 V4A

Cable ties UV- and temperature-resistant

Installing the PV modules

Tools:

- Allen key, size 6
- Electric screwdriver
- Suction holder
- Cable strippers
- Crimping tool

Important:

Make sure that the plugs are connected correctly, observing the manufacturer's instructions.
Secure the plugs to the cross rails with cable clips. The connectors must be positioned at least 4 cm above the roof sheeting.
The cable ties must not be positioned between transverse profile and module.
Before fitting the PV modules, check that the pressure plate and cross-tie fixing screws are firmly tightened.
Do not place tools or other objects that create a strong shadow onto the modules (for example levels).

Installation:

Slide the **aluminium sliding blocks** into **the transverse profiles** and position them. Place the **PV module** onto the transverse profiles and connect the DC cables according to the string wiring diagram.
Make sure that you connect the plugs correctly. Secure the plugs to the cross rails with cable clips The connectors must be positioned at least 4 cm above the roof membrane.
The cable ties must not be positioned between transverse profile and module.
Then fit the glass panel clamps and tighten the rail cross connector for the cross rail.
The edge-to-edge distance between modules should be 2 cm.