IMS-SOLAR

PASSION FOR INNOVATIONS

SIMPLE, RELIABLE AND EASY TO INSTALL

Technical manual for mounting IMS-Solar on a tile roof.

CORRUGATED | STEEL | ROOF TILE

IMS-SOLAR.COM

Simple, reliable and easy to install in 6 steps on a tile roof

1. Installing roof hooks
2. Installing BP mounting profiles
3. Mounting IP-fix
4. Click IP profiles
5. Click cable bracket and optimizer bracket
6. Insert solar panels

Index

This extensive manual describes the installation of the mounting system for solar panels on a tile roof. Follow these instructions carefully and perform the actions in the correct order. If you lose the manual, you can always download it from www.ims-solar.com.

1. General installation conditions

General information

All information, data and advises from this manual are binding. IMS-Solar remains the right to revise the manual based at developments or experiences of everyone involved.

Should you not comply to the rules stated in this document may cause all warranty and product liability claims to become void.

Stability and conditions of the roof

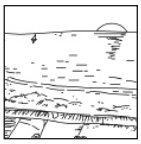
It's important to check the conditions of the roof upfront. The roof should be in good condition and should have enough strength to bear the weight of the solar panels including additional materials. In addition, the roof must also meet the standards for wind and snow load. Please note that the load reserve of the roof is not exceeded anywhere. Check the stability of the roof and adjust if necessary. If in doubt, contact a specialist.

Safety warnings

- Installation should be carried out by qualified technical constructors.
- Before starting installation the roof should be clean, dry etc.
- Should installation take place at a slanted roof please make sure to use fall protection materials such as edge protection and safety nets.
- If the surface of the roof is slippery due to rain or there is a strong wind, please avoid installation!
- It is recommended to follow the drawings in detail. Omitting or adding parts at your discretion may negatively affect the functioning of the mounting system and is therefore strongly discouraged!
- Place rubber fuses at the top between the panels if the slope of the panels is less than 10 degrees. With less slope, the pressure underneath is less; this prevents movement.
- Always wear appropriate protective shoes and clothing.
- Always wear work gloves for protection but also to avoid damage to the solar panels; don't hold them without gloves.
- Never stand in a gutter!
- Use a lifting aid/lift installation to move materials.
- Use of a ladder should always take place on a solid surface and should be placed at an angle of 75 degrees, about one meter sticking out above the roof edge. Secure the top of the ladder by using a rope or fastener if possible.
- Please make sure to be informed about the last developments by checking the most recent version of the manual and guarantees.

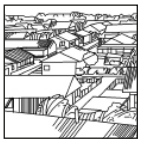
Coverage of application in the Netherlands

- Solar panels: of all brands and models with a frame height of 30 or 35 mm.
- Wind zones: 1 to 3, terrain category II en III (NEN 1991-1-4).
- Roof height: 3 - 15 m. Should the roof be higher please contact your supplier.
- Type of roof: corrugated roof.
- Slope of the roof: between 15 - 60 degrees (35 degrees will be optimal).



Terrain category 0
Sea or coastal area with winds coming over the open sea.

Terrain category II
Area with low vegetation such as grass and freestanding obstacles (trees, buildings) with a spacing of at least20 obstacle heights.



Terrain category III
Area with regular vegetation or buildings or isolated obstacles with spacing of no more than 20 obstacle heights (such as villages, suburban terrain, permanent forest).

Windload

Due to the influence of the wind, the distance of the solar panels to the top and bottom of the roof is at least 30 cm. The same applies for the distance of the solar panels to both sides of the roof. Please do not place solar panels partly or entirely within this area! Also think about sufficient room to move for maintenance work.

Standards, regulations and legislation in the Netherlands

To prevent accidents it's important to follow the mounting manual and regulations. Please pay attention to the below norms, regulations and legislation.

- **NEN 7250:2014** Constructive aspects solar-energy systems
- **NEN-EN 1990** Basis of the constructive design
- **NEN-EN 1991-1-3** General weight: snow
- **NEN-EN 1991-1-4** General weight: wind
- **NEN 1010:2015** Electrical installations for low voltage (HD-IEC 60364)
- **NEN-EN-IEC 62305** Lightning protection
- **Arbowet en Arboregeling** Safety labour and social affairs
- **NEN 3140** Safety management low voltage installations
- **Checklist VCA** Safe operation at location
- **Regulations scaffolds and ladders**

Removal and disassembly

Removal of the products accordingly to local laws and regulations

Warranty

Warranty according to the general conditions of IMS-Solar BV can be found at www.ims-solar.com.

Liability

IMS-Solar BV shall not be held liable for any damage or injury caused by a failure to not (strictly) comply with our safety regulations and instructions in this manual or due to negligence during installation our product and/or any involved accessories.

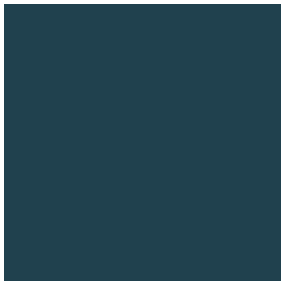
2. Parts overview

Afbeeldingen volgen

3. Installing IMS-Solar

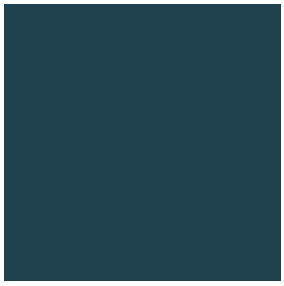
Tools required

Afbeeldingen volgen



Name tool

Name tool



Name tool

Name tool

Installation

Before installing the mounting materials the roof needs to be cleaned with a brush. Remove algae, moss etc. to reduce unevenness during the installation. The position of the roof compared to the sun is essential to receive optimal results. Surrounding buildings or trees can create shade, which will have a negative effect on the result and efficiency of the solar panels. Therefore, check the surroundings in advance.

This manual is only suitable for tiled roofs that use roof hooks.

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Step 1. Installing roof hooks

As indicated earlier, it is important that the distance of the solar panels to the top and bottom of the roof is at least 30 cm. The same applies for the distance of the solar panels to both sides of the roof.

The roof tiles must be pushed up horizontally at the first attachment point. The first wooden strip (754 x 95 mm) is screwed horizontally onto the wooden vertical beams. Then mount any other strips needed. Take into account a maximum vertical distance of 135 cm.

Check the outcome of the IMS calculation program; the maximum distance between the roof hooks plus the required amount is displayed.

The next step is to mount the roof hooks in the valley of the wave of the roof tile. If necessary, cut some space out of the roof tile so that the roof hook is free. When all hooks have been mounted, the roof tiles can be slid back again.

Place the roof hooks all at the same height. Stretch a string horizontally between the two outer roof hooks and then easily adjust the rest to the correct height.

Step 2. Installing BP mounting profiles

Now the BP mounting profiles can be attached to the roof hook bracket. Insert the hammer head bolts with the threads through the upright part of the roof hook and place the head in the slot of the profile. Tighten the flare nut clockwise.

It is important that the head of the bolt is properly placed in the slot and that the groove in the head is vertical.

If the installation is higher than 6 meters, the BP mounting profiles need to be connected with the BP-C profile connector. Insert the hammer head bolt of the connector into the slot of the base profile, then tighten the flare nut clockwise.

Now the plastic BP-E end corner base profiles can be installed. These are simply pushed into the header of the profile.

AFBEELDING

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Step 3. Mounting IP-fix

In preparation it is important to determine the vertical positions of the IP-fix on the BP profile with the intermediate size of the solar panel + 17.7 mm (module size from hole to hole). One other calculation method can be; the exact vertical interior space between the IP fix. This is the size of the solar panel -/- 52.3 mm.

Secure the IP-fix in the correct position with the metal spring pointing upwards. For mounting the IP-fix, the hammer head bolts are used, which are placed in the groove of the profile and tighened clockwise with a flare nut. The head of the bolt must be properly seated in the groove after tightening with the groove in the head vertical.

Step 4. Click IP profiles

When all IP-fix are mounted, the horizontal IP profiles can easily be clicked into place from top to bottom with the wider part of the front always pointing downwards.

If the setup is wider than 6 meters, the IP profiles must be connected to each other with the IP-C profile connector. This is pushed in from the side halfway between the raised edges in the already mounted profile. This must then be secured on one side by making the correct movement upwards with the mounting tool (make sure that this lock is on the same side in all connections).

The next IP profile slides over the protruding part of the IP-C profile connector in such a way that a space of at least 5 mm between the two profiles remains open. This allows the IP profile to expand with heat and contract with cold. The system can continue to carry the load of the module without too much stress being applied.

Prevent the rails from sliding due to heat or cold by securing the IP-fix in the IP profile. Use the mounting tool to bend the IP profile, both left and right of the IP-fix, by moving downwards.

Then the IP-E end corner insertion profiles can be mounted. Slide it in from the side between the raised edges until it can go no further. Secure the IP-E end corner insertion profiles by moving the mounting tool upwards.

Connect the electrical earthing clamps and clip them onto the underside of the profile. Connect all terminals with a grounding cable and reconnect it to the inverter.

Step 5. Mounting cable bracket and optimizer bracket

Install cable bracket

- Click the cable bracket onto the IP profile by first hooking it onto the back and then clicking it upwards at the front.
- Slide the cables into the conductor, the 'plus' into one and the 'minus' into the other. Fasten with the ty-raps.

Install optimizer bracket

- Click the optimizer bracket onto the IP profile by first hooking it to the back and then clicking it upwards at the front.
- Click the optimizer onto the bracket.
- Connect the optimizer.

Stap 6. Insert solar panels

When all IP rails are attached, the solar panels can be inserted. Make sure that one ground terminal is slid onto the system per panel and that the terminals are interconnected.

Insert the solar panel into the upper IP profile and then lower it into the lower part. Slide the module downwards so that the solar panel is located both above and below in the profile. This way they are held in place by gravity and therefore do not need to be secured further. If the angle is less than 10 degrees, place a rubber fuse at the top between the panels. The next panel can now be slid in and installed, right next to the panel that is already there.

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