INSTALLATION INSTRUCTION
AEROCOMPACT® S10 / S15
Flat-roof mount for PV installations
AEROCOMPACT®
the unbeatable flat-roof solution

YOUR BIG ADVANTAGE

+ 25 years product warranty
+ Best price value available
+ The fastest installation in the industry
+ Incl. protection pads with aluminum sheet
+ Optimum water drainage
+ Optimized wind suction, therefore less ballasting than other systems
+ Suitable for roof edge zones
+ ETL certified, conforms to UL 2703
+ Wind tunnel tested for up to 150 mph
+ Patent pending
+ Without roof penetration
+ Optimum module ventilation
+ Complimentary ballast calculation incl. roof layout
  from our unique online software Aerotool
INTRODUCTION

We recommend you read the following information carefully because it is very important in dealing with the product.

The installation system AEROCOMPACT S® is a robust rack system for mounting PV modules on flat roofs. It consists of prefabricated aluminum retaining brackets with glued on protective made including plasticizer barrier, deflector plates and all required small parts that assure a safe installation. This installation system allows installation on flat roofs with large surfaces and without roof penetration. This innovative system uses the frame structure and aerodynamic effects to ensure stability.

AEROCOMPACT S® is designed for systems facing south with an inclination of 15°. It can be used for most framed PV modules of leading manufacturers with following dimension:

AEROCOMPACT S®  module width  x  module length
37 - 41 inch  x  64 - 78 inch

The AEROCOMPACT S5, S10, S15 system is designed for maximum snow loads of 50 psf. The Alpine AEROCOMPACT S15 system is designed for maximum snow loads of 113 psf. Therefore, check the snow load zone of your location beforehand.

The System is wind-tunnel tested and conforms to UL 2703.

Minimum installation size: 2 rows per 3 modules
Max. permissible roof slope: 5 degrees
Max. permissible building height: 82 ft

Can be used for the following flat-roof coverings:
foul roof, bitumen roof, gravel roof, green roof.

AEROCOMPACT® offers the AeroTool software to design the mounting system including ballast weights. The programme creates a project report with the statistically calculation, ballast weights and system parts list.

If you can any other questions, make use of AEROCOMPACT®’s professional and comprehensive consulting service. Our competent engineers will be happy to help.

PLEASE MAINTAIN THE FOLLOWING TORQUES WHEN INSTALLING SCREWS:

15 NM  
M8 (A2-70 or A4-70)

REQUIRED TOOLS

Cordless screwdriver  T40 Torx screw driver
SAFETY INFORMATION

It is imperative that you install person-independent fall arrest systems or reception system according to country-specific safety regulations.

If person-independent fall arrest systems or reception systems are not available for work-related reasons then safety harnesses must be used!

Use only safety harnesses (harnesses and catching belts, connecting ropes/belts, fall absorber, rope cutter) marked and tested by authorized testing laboratories.

If person-independent fall arrest systems or reception systems are not available and safety harnesses are not used, it can result in falls from great heights and therefore to severe or deadly injuries!

Leaning ladders can cause dangerous falls, if the ladder caves in, slips, or falls over!

Work in close proximity of live, electrical overhead power lines, with which you can come in contact, only if
- power is turned off and that condition is guaranteed for the time of the work
- the parts under power are protected through covers or barriers.
- the safety distances are not too short.

Radius of voltage:
1 m in 1,000 Volt of voltage
3 m in 1,000 to 11,000 Volts of voltage
4 m in 11,000 to 22,000 Volts of voltage
5 m in 22,000 to 38,000 Volts of voltage
> 5 m if the voltage is unknown

The manufacturer hereby agrees to take back for recycling all products that are marked with the eco-label as well as all materials used herein. Only the approved heat transfer medium may be used!

If at all possible, the safety harness must be fastened above the user. Fasten safety harnesses only on building elements or fastening points that can carry the load!

Do not use defective ladders, e.g. cracked steps and rails of wooden ladders, bent and kinked metal ladders. Do not fix partially broken steps, rails and braces!

Safely place a leaning ladder. Make sure the installation angle is correct (68° - 75°). Secure leaning ladders against sliding, falling, slipping and sinking e.g. by using enlarged bases, feet, braces of ladders that are adapted to the ground, fastening devices.

Lean ladders only against secure support points. Secure ladders in traffic areas with barriers.

Touching live electrical overhead lines can result in death.

Wear safety goggles when drilling!

Wear safety shoes for the installation!

Wear cut-proof work gloves when installing the collectors!

Wear a helmet during installation!
SCOPE OF DELIVERY

AEROCOMPACT S® Front Bracket
AEROCOMPACT S® Connector Bracket
AEROCOMPACT S® Back Bracket

AEROCOMPACT S® Aerosheet
AEROCOMPACT S® High Ballast Sheet
Concrete Block

Mid Clamp pre-mounted
End Clamp pre-mounted
Hexagon Socket Screw M8x20 for Aerosheet

Washer 8,4 for Aerosheet
Connector Clip for Aerosheet
Cable Tie incl. clips function for cable management

Assembling Example AEROCOMPACT S® (Overview of components)

Alpine Version only available at S15:

AEROCOMPACT S® Alpin Snow Load Bracket
AEROCOMPACT S® Alpin Snow Load Sheet
1. Measure the roof’s surface

Prior to starting the installation, the roof’s surface must be measured in accordance with the planning documents and the first fastening point is determined. It is recommended to mark the front base line with the chalk line and then measure the bordering line on the side in a 90 degree angle and mark it accordingly.

Warning: There should be a maximum of 100 modules set up in a connected generator field. No more than a maximum of 12 transverse modules may be connected to each other in a row. A new generator field must then be started in every direction.

2. Measure forward clearance

After the entire surface of the system is determined, mark the distance to the front fastening supports (AEROCOMPACT S® initial part), position them and apply ballast. A mat to protect the roof must be placed under the concrete slab to the right and to the left of the initial part. The distance between the initial parts is the same as the length of the module used.
3. **Center fastening supports (AEROCOMPACT S® Connector Bracket)**

Remove fastening supports and measure the distance between the initial parts (depends on the version, see diagrams). These fastening supports can still be moved during the installation of the modules. Then position the next connector at a distance equal to the module length.

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**Note for the Alpine version:**
If the installation has been designed or planned for increased wind or snow loads, additional snow load supports (AEROCOMPACT S® Alpine Snow Load Supports) need to be positioned the centre of the module. Similarly, the AEROCOMPACT S® Alpine Snow Load Sheet needs to be placed on the fastening supports at the top end of the module (connector or final component). The snow load sheet for the next module needs to be installed now so as to be overlapping. See picture.
4. **Fastening module**

Place the module horizontally on the fastening supports and align them flush to the AEROCOMPACT S® Connector or final component at the top and bottom.

In order to make it easier to align the modules, there are notches for the lower module edge on the initial components and connectors. The notches suitable for the corresponding module width can be determined from the table below. The lower module edge must be attached to the appropriate notch!

Place the end and centre clips on the shorter side of the module and attach them gently with M8 screws. Do not tighten yet!

Starting with the second module, the cables are connected with the plug connections (+/-) prior to placing the module and these are fastening with the previously installed cable tie clips, see picture A and B.

The end and centre clips on the preceding module can then tightened and another module placed on top. An end clip is also attached at the end of the row and tightened once the last module has been aligned.

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### Note for the Alpine version:

When using the Alpine version with AERO-COMPACT S® Alpine Snow Load Supports and Snow Load Sheet, the modules need to be installed once notch higher. The module is fastened in the middle of the lower long side of the module with an end clip on the snow load support.

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### Notch Module width

<table>
<thead>
<tr>
<th>Notch</th>
<th>Module width (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom notch:</td>
<td>41.3</td>
</tr>
<tr>
<td>2. notch:</td>
<td>38.6</td>
</tr>
<tr>
<td>3. notch:</td>
<td>38.2</td>
</tr>
<tr>
<td>4. notch:</td>
<td>37.8</td>
</tr>
<tr>
<td>5. notch:</td>
<td>37.4</td>
</tr>
<tr>
<td>6. notch:</td>
<td>39.8</td>
</tr>
<tr>
<td>7. notch:</td>
<td>39.4</td>
</tr>
<tr>
<td>8. notch:</td>
<td>39</td>
</tr>
<tr>
<td>9. notch:</td>
<td>38.2</td>
</tr>
<tr>
<td>10. notch:</td>
<td>37.8</td>
</tr>
<tr>
<td>Top notch:</td>
<td>37.4</td>
</tr>
</tbody>
</table>

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![Picture A](image1)

Click the cable-tie on the module frame

![Picture B](image2)
5. Install the Aerosheet

The Aerosheet is installed and overlapped on the centre fastening support and it is fastened manually using the M8 screws with washers, which are included in the delivery. These screws are tightened once the respective row has been fully installed.

There are two types of Aerosheets for the various module sizes:

<table>
<thead>
<tr>
<th>Prod.Nr.</th>
<th>Item</th>
<th>Module width x</th>
<th>Module length</th>
</tr>
</thead>
<tbody>
<tr>
<td>17048</td>
<td>Aerosheet 1775</td>
<td>37.4 – 41.3 inch</td>
<td>64.2 – 78 inch</td>
</tr>
<tr>
<td>17141</td>
<td>Aerosheet 2075</td>
<td>37.4 – 41.3 inch</td>
<td>74 – 78 inch</td>
</tr>
</tbody>
</table>

High Ballast Sheet

The AEROCOMPACT® High Ballast Sheet is used as soon as a certain number of Ballast Blocks per module is exceeded. These Modules are marked with a red circle in the project specific static plan.

The High Ballast Sheet is also used in seismic regions where the Ballast needs to sit in a Tray, therefor the Ballast can not move. The High Ballast Sheet can also be used for roofs with a low point load, therefor the Ballast is evenly distributed over the whole module length.
6. **Connector clip**

   At the overlap of the Windsheet, a connector clip is attached to connect the sheets.

7. **Additional rows**

   Repeat from point 3 onwards to install additional rows.

8. **Last row**

   When installing the last row, the AEROCOMPACT® End Part is used instead of the AEROCOMPACT S® Connector.
   The end part should be weighed down with a stone to make it easier to install the modules.

   The modules and Aerosheets are installed in the same way as before.

9. **Completion of system**

   Put down all of the required ballast stones according to the ballasting calculation on the front, end and connector bracket. Please place the stones as shown in diagrams A and B on the following picture so that the modules can produce electricity without any shade and that the ballast is evenly distributed.

   If the ballast stones are mounted like the sketch A, it is required to place protection pads left and right underneath the ballast stones. The first three ballast stones on the connector need to be placed parallel to the bracket. In this case no additional protection pads are needed. See sketch B.
10. Ground method of the System

After the completion of the installation, the entire system must be grounded and connected to the on-site lightning protection system. To do this, the centre clops must be fitted with the grounding plates available as accessories when installing the module. The potential equalisation connection can be done using the M8 screw on the Aerosheet. When installation the potential equalisation, care must be taken to ensure that no contact corrosion occurs between the installation system and grounding unit. AEROCOMPACT® accepts no responsibility for any damage incurred as a result of lightning strikes or grounding problems.

11. Fastening in earthquake region

In seismic areas the law requires penetration points for the array and to attach the ballasting to the AEROCOMPACT® brackets.

CAUTION: The pictures shown below are just a mounting recommendation. AEROCOMPACT® is not liable for array and ballasting movements.

Finished!
SAFETY INFORMATION AND WARNINGS

PLEASE FOLLOW THESE INSTRUCTIONS!

We recommend you read the following information carefully because it is very important in dealing with the product. Please inform yourself about the safety requirements of other system components.

The AEROCOMPACT® flat-roof system is only designed to hold PV modules. Any other use is considered improper. Proper use also means adhering to the contents of this installation manual. AEROCOMPACT® accepts no responsibility for damage incurred as a result of noncompliance with the installation instructions or of using the product improperly.

> Approval from the module manufacturer is required to use PV modules with the AEROCOMPACT® system. AEROCOMPACT® will not do this.
> AEROCOMPACT® accepts no responsibility for performance degradation or damage to the module of any kind whatsoever.

We require the use of a roof insulation with a high load capacity of the Type DAA-ds.

When any work is done on the PV installation, these instructions should be followed exactly. The modules may only be installed, started, serviced and repaired by people who are properly trained and authorised.

Please observe the applicable regulations and safety advice.

These accident prevention guidelines must be adhered to:

> BGV A 1 – General rules
> BGV A 2 – Electrical installations and equipment
> BGV C 22 – Construction work (individual protective equipment to prevent falls)
> Trade association rules for health and safety at work BGR 203 (working on roofs) and DIN EN 516 (equipment for accessing roofs)
> Work clothes and industrial safety regulations pursuant to the rules of the trade association

The following Country specific norms must be complied with:

> Country specific – General rules for all types of building work
> Country specific – Roof covering and roof sealing work
> Country specific – Steelwork and locksmith work
> Country specific – Fire behaviour of building materials and structural elements

Work on AEROCOMPACT® systems may only be carried out by authorised persons. The operator of the installation has the following safety obligations:

> Carry out servicing regularly once a year: e.g. checking the cables, screw connections or the roof surface.
> The mounting frame may only be installed by people with the appropriate training, skills and knowledge of mechanics.
> The operator must ensure that contracted persons are able to judge the tasks assigned to them and recognize any potential dangers.
> The operator must ensure that the installation instructions are available during installation. The installation instructions are an integral part of the product.
> The operator must ensure that the installation instructions and particularly the warnings were read and understood by the engaged personnel prior to installation.
> The local health and safety at work regulations and codes of practice must be observed.
> Suitable lifting equipment and ladders are to be used for installation. No freestanding ladders may be used.
> It is necessary to arrange for a qualified construction engineer to assess the building’s existing static loading characteristics with regard to the additional loads of a PV system.
> Any general load reduction measures specified by AEROCOMPACT® (e.g. the need to clear snow, so as to limit the snow load) are to be observed.
IMPORTANT NOTES

Warranty / Product Liability (Exclusion)

The information on sizes provided in these instructions is only information from daily practice. We can provide binding structural frame installation date with the program AeroTool.

As installer, you are responsible for the precise execution of the installation. AEROCOMPACT® is not liable for the size information contained in the system offers.

As installer, you are responsible for the mechanical durability of the interface connections mounted on the building’s structure. In particular, this includes that these are leak-tight. The components of AEROCOMPACT® are designed for the expected loads and they are in compliance with the effective state of the art. For this purpose, you have to specify in writing all general technical framework conditions in the project documentation form (information on the support structure, snow load zone, building heights, wind loads, etc.) when requesting information/ordering from AEROCOMPACT®.

AEROCOMPACT® is not liable if the installed components are not properly handled.

Any use close to the sea is excluded because of the increased risk of corrosion.

If the components are properly handled, the sizes comply with the structural framework conditions and normal environmental conditions and normal conditions of the surroundings, and then AEROCOMPACT® grants a 2-year product warranty on the service life and durability of the frame system. This applies within the framework of generally prevalent weather and environmental conditions.

Warranty on material and workmanship: AEROCOMPACT® grants a warranty of 10 years on material and workmanship. For additional information, please consult the Warranty Terms and Conditions.

Notes on electrical installation

Only if you are a qualified electrician, may you perform any electrical work. The applicable Country specific standards, regulations, guidelines, accident prevention regulations and the regulations of the local utility company must be applied.
IMPORTANT NOTES

Important warnings

Solar modules produce electricity as soon as they are subjected to light and are always energised. Although touch protection is provided in the form of the fully insulated plug contacts, you must take be aware of the following when handling solar modules:

> Do not insert any conductive parts into the sockets and connectors.
> Do not install solar modules and cables with wet sockets and connectors.
> Perform any work on cabling with extreme caution.
> Do not perform any electrical installation work in damp conditions.
> Even if there is only little light, very high direct voltages arise at the series connection of modules, which can be life life-threatening in case of direct contact. Especially the danger of secondary damage in case of electric shocks has to be considered.

Even when the unit is switched off, high contact voltages may still be present inside the inverter:

> Be particularly careful when working on the inverter and the cables.
> After switching off the inverter, it is essential to wait for the time interval specified by the manufacturer before beginning any further work to allow the high-voltage components to discharge.
> Please also observe the installation guidelines provided by the inverter manufacturer.

When breaking a connected string of modules (e.g. when disconnecting the DC line from the inverter under load), a lethally strong arc can occur:

> Never disconnect the solar generator from the inverter as long as it is connected to the mains.

Notes on frame installation

When mounting on a roof, you must adhered to the applicable structural engineering rules, in particular the requirements set out in the Country specific rules and regulations of the roofing trade.

> Check to see if all screw connections are tightened correctly.
> Keep to the specified torques.
> Notwithstanding a verifiable static equilibrium, it is your responsibility to ensure before every installation that the product meets the local static requirements.
> Weight and surface loads of building materials, components and support materials, Wind loads, Snow and ice load, Basis of design, safety concept and design rules.
> The mounting frame is designed in accordance with DIN 4113 “Aluminum constructions under predominantly static loading” and DIN 18800 “Steel structures; design and construction” or the corresponding US code ASCE 7-05 and ASCE 7-10
> Ensure that the substructure, support structure and other affected layers (such as an insulation layer) have adequate load capacity (based on dimensions, condition and suitable material properties).
> Make sure that the runoff of rainwater is not impeded.
> Consider structural aspects (e.g. possible condensation if insulation layers are penetrated).
Norms and guidelines

All of the norms and guidelines listed here are published for and applicable to Germany. They are to be complied with in their current version. Outside of Germany, please also observe the corresponding national norms and guidelines.

Product liability

Technical documentation is part of the project to be supplied. AEROCOMPACT® accepts no responsibility for damage incurred as a result of noncompliance with the installation instructions or of using products improperly. Furthermore, the general terms and conditions available at www.aerocompact.com also apply.