



TRITEC

energy for a better world

TRI-STAND Aero INSTALLATION INSTRUCTIONS

Aerodynamically optimised
photovoltaics mounting system
for large flat roofs

- Quick and easy installation
- Little extra load
- Small shading distances
- Certificated for wind and snow loads
- Tested for statics

Contents

Basics

Notes	4
Load effect	4
Statics	4
Roof condition	5
TRI-DESIGN dimensioning software	5

Installation – Introduction

Tools	6
Installation procedure	6

Installation

Measuring the module field and installing the UP-L profiles	7
Fixing the TS-F brackets and the UP-L profiles	8
Attaching the supports to the UP-L profiles	9
Laying the cables and attaching the wind deflectors	9
Weighting the system	10

BASICS



Notes

For the installation of the TRI-STAND Aero mounting system only products from the range of the TRI-STAND mounting system must be used. Using third-party components can result in adverse effects on the system's stability and in major damages. The system may only be installed by trained and skilled personnel. We do not assume any liability for damages arising from the use of third-party components or from incorrect installation.

These installation instructions describe the proper installation procedure for the TRI-STAND Aero flat roof system. In some situations, it is advisable, however, to have a specialist (e.g. roofer or joiner) check the condition of the roof.



Load effect

In addition to the dead weight of the photovoltaic system, mainly wind and snow loads affect the system components and the substructure. For this reason, each system must be calculated and planned for your individual requirements and external influences, taking into consideration DIN 1055* (Actions on Structures).

The stresses by wind loads depend mainly on the wind zone (according to DIN 1055-4*), the building's height, the shape and slope of the roof and the position of the roof's centre. Weight stresses through snow load are dependent on the snow zone (according to DIN 1055-5*), the building's height, the shape and slope of the roof and the position of the roof's centre.

For each location the wind and snow load zone can be determined, which will determine the design of the system.



Statics

On principle, the structural calculations of all roofs must be checked by authorised experts. The main question to be answered is whether the roof can take the additional stresses caused by the solar system. Since the load bearing capacity of a roof and the load effect of a photovoltaic system are determined by many factors, structural calculations must be made for each roof individually.

* European Standard: EN 1991-1-3



Roof condition

The current condition of the roof must be such, that renovation will not become necessary for a period of at least 20 years. In case of doubt, it is advisable to have the roof checked by an expert. The TRI-STAND Aero mounting system has been optimised for flat roofs with plane surfaces. If the roof is uneven due to aging or other reasons, it is advisable to consult a qualified specialist.



TRI-DESIGN dimensioning software

The TRI-DESIGN dimensioning software calculates and designs the TRI-DESIGN mounting system according to the standards of DIN 1055*. The relevant directives are DIN 1055-4* for wind loads and DIN 1055-5* for snow and ice loads, which affect the photovoltaic system and its substructure.

The dimensioning software calculates all sizes and distances relevant for the installation. In addition, the dimensioning software allows us to design the system optimally for the individual roof and thus to select the best version of the mounting system.

Under the warranty terms and conditions, all TRI-STAND Aero systems must have been dimensioned using the TRI-DESIGN dimensioning software.

INSTALLATION – INTRODUCTION



Tools

- Cordless screwdriver
 - 10 mm socket for electric screwdriver
 - Open-ended spanner 10 mm
 - Open-ended spanner 15 mm
-



Installation procedure

The TRI-STAND Aero flat roof system is installed in five steps:

1. Measuring the module field and installing the UP-L profiles
 2. Fixing the TS-F brackets and the UP-L profiles
 3. Attaching the supports to the UP-L profiles
 4. Laying the cables and attaching the wind deflectors
 5. Weighting the system
-

INSTALLATION



Measuring the module field and installing the UP-L profiles

The size of the module field is determined by the number of modules to be installed. To determine the exact size of the field, we recommend using the TRI-DESIGN software to design the system.

After measuring the module field on the roof, the UP-L profiles used as a sub-structure are installed. Make sure to position the profiles as described in the plan.



The joints of the continuous UP-L bottom profiles are now connected with the UP-C connector. Make sure that the UP-C connectors are screwed in place on one side only and that the following UP-L profile is distanced at 5 mm to minimise friction due to heat expansion.



Please note: The TRI-STAND Aero module field must be at least 0.50 m away from the roof edges!

Before installing the modules, we recommend marking the distances of the TS-F brackets as calculated by the design software. You can use a yard stick or a measuring tape; for larger systems we recommend making your own gauge.

When installing the system on a pebbled flat roof, the substructure of UP-L profiles can be placed directly on the roof. On an unpebbled foil roof, the UP-L profiles can be provided with a protective strip. This will protect the roof from mechanical impact.



Attention: The protective strips should only be provided under the modules and not between the shading areas to ensure drainage of water on the flat roof.

Neither option requires screwing in place on the roof. The roof membrane therefore remains intact.



Fixing the TS-F brackets and the UP-L profiles

To fix the TS-F brackets and UP-L profiles to the module, we recommend placing the modules face down. This makes it easier to fix the brackets.



The TS-F brackets are fixed to the holes on the long side of the module. At the side at which the UP-L profiles are to be attached, the TS-F bracket must be fixed to produce a right angle to the module. The brackets are fixed using the TRI-STAND Aero hexagon set screw M6 x 16 A2 and the TRI-STAND Aero threaded anchor plates A2.



The TS-F brackets on the opposite side of the module are fixed so the right angle rests against the module frame. Again, the brackets are fixed using the TRI-STAND Aero hexagon set screw M6 x 16 A2 and the TRI-STAND Aero threaded anchor plates A2.



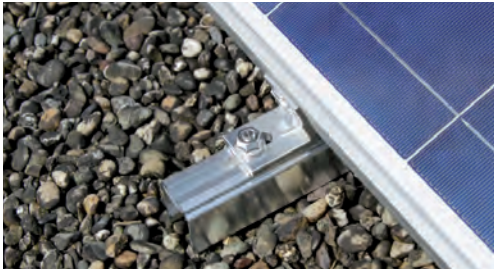
To fix the UP-L profiles, which will be the support, to the module, screw the profiles onto the back end of the TS-F brackets. To do so, insert the hammer head screw into the profile and screw it to the TS-F bracket.



After fixing both UP-L profiles to the module, fit the TS-F brackets as a connector between UP-L (substructure) and UP-L profile (support). Make sure to fix the bracket so the right angle rests against the UP-L profile and points towards the module. Fix the brackets using the serrated lock nut and the hammer head screw.



Fitting the TS-F brackets and the UP-L profiles to the module is now completed. Turn the module around and insert the guide ribs of the TS-F brackets into the UP-L profiles.



Attaching the supports to the UP-L profiles

To attach the support to the substructure, the TS-F brackets are screwed onto the UP-L profiles using a serrated lock nut and a hammer head screw.

We recommend attaching the support at the front first before connecting the UP-L profiles to the substructure. Make sure to keep the distances previously marked.



Laying the cables and attaching the wind deflectors

Lay the cables before attaching the wind deflectors. The cables can be attached to the mounting system using the TRI-STAND cross cable clip block UP-K or the TRI-STAND edge clip TS-EC. The wind deflectors are attached by inserting them at the upper end of the support between UP-L profile and TS-F bracket. The bottom part of the wind deflector rests on the UP-L profile.



Use the hammer head screw with serrated lock nut to connect the substructure (UP-L profile) firmly to the wind deflector. The hammer head screw is inserted in the UP-L profile so it rests against the wind deflector. The screwed-in serrated lock nut clamps the wind deflector in place so it is firmly connected to the substructure.



To attach the wind deflector to the top part of the support, screw the wind deflector in place using the TS-F bracket. Screw the TRI-STAND Aero drilling screw 6.3x25 A2 DS through the TS-F bracket into the metal plate.



To attach the wind deflectors to adjoining modules, the deflectors must overlap by 5cm and be fixed in place using two drilling screws 6.3x25 A2 DS each.

Please note: Do not screw more than 4 wind deflectors together to minimise friction due to heat expansion!



Weighting the system

Finally, the system must be weighted on the roof. Make sure to use the weight established in the plan.

The General Terms and Conditions of TRITEC apply.

Made in Switzerland

© Version 2.0

Subject to technical changes.

info@tritec-energy.com

