AEROCOMPACT®



ASSEMBLY INSTRUCTION

COMPACTFLAT GS10 PLUS

VERSION: 3.2 LANGUAGE: ENGLISH

IMPORTANT! READ CAREFULLY BEFORE INSTALLATION!



LEGAL NOTICE

Subject to change due to technical modifications! These assembly instructions correspond to the technical status of the delivered product and not to the current development status at the manufacturer. If pages or parts of the assembly instructions are missing, please contact the manufacturer's address given below. The original language of these assembly instructions is German. Any assembly instructions in another language are a translation of the assembly instructions in German. Therefore, in case of doubt or contradiction, the authentic German version shall prevail. The assembly instructions are protected by copyright. The assembly instructions may not be copied, reproduced, microfilmed, translated or converted for storage and processing in EDP systems, either in part or in full, without the written permission of the company AEROCOMPACT Europe GmbH.

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CREATION DATE

11/2023

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GENERAL

These assembly instructions describe the assembly procedure and must be strictly observed. Read these assembly instructions carefully before starting the assembly. The personnel must have carefully read and understood these instructions before starting any work. The basic prerequisite for safe working is compliance with all the safety notes and handling instructions given in these assembly instructions. Furthermore, the local accident prevention regulations and general safety regulations for the product's area of application apply. Illustrations in this manual are for basic understanding and may differ from the actual design.

APPLICABLE DOCUMENTS

In addition to this manual, you have received an AEROTOOL project report, planning documents and drawings. Always comply with the instructions and notes contained therein.

LIMITATION OF LIABILITY

All information and notes in these installation instructions have been compiled taking into account the applicable standards and regulations, the state of the art and our many years of knowledge and experience. Liability provisions are stated in our GTC and can be found at www.aerocompact.com/downloads.

EXPLANATION OF SYMBOLS

SYMBOLS FOR INSTRUCTIONS



Prerequisites for action instruction



Results of action steps



60)

Step by step action instruction



Visual inspection

Observe right angle

This note provides useful information for proper

SYMBOLS IN ILLUSTRATIONS - ACTIVITIES



Consult AEROTOOL project report or planning documents



Activity by hand



Optional component, optional mounting variation

SYMBOLS IN ILLUSTRATIONS - TOOLS



Measuring tape, measure



Pencil, mark



Chalk line



Scissors, tin snips, cut to size

Cordless screwdriver, screwdriver



Use a torque wrench, Observe torque



SAFETY

The following list serves as an indication of the most common safety hazards that can occur when installing these products. There is no liability for the completeness of the risks presented. A concrete check of the necessary safety measures is to be carried out by an entrusted specialist company prior to installation.

APPROPRIATE USE

The CompactFLAT GS ground-mounted system is designed for installing PV modules on flat roofs. The inclination may be max. 5° (ballasting with ballast stones). A project specific clarification is required for a inclination of more than 5°. The system must be properly installed in accordance with these installation instructions and the planning documents supplied. PV modules used with the CompactFLAT GS-system should be approved by the module manufacturer. AEROCOMPACT accepts no liability for loss of performance or damage of any kind to the PV modules. Any other use of the CompactFLAT GS system is considered improper. The roof protection pad included in the scope of delivery is matched to the roof surface defined in the project. Due to the many available roof surfaces on the market, the responsible designer should ensure the compatibility of and the coefficient of static friction between the protection pad and the roof surface of the building used in the design. The friction value can be determined during the planning process with a coefficient of friction test.

REQUIREMENTS OF PERSONNEL

Installation may only be carried out by a specialist company and must be carried out strictly in accordance with the specifications in the installation instructions, the project report and the planning documents. A specialized company is one that is familiar with the installation and maintenance of photovoltaic systems as part of its normal business operations. National and site-specific building codes, standards and environmental protection must be strictly adhered to. The assembly personnel must never be under the influence of medication, alcohol, drugs or in any other condition that impairs consciousness (e.g. overtiredness). Trainee personnel may only perform work under the instruction and supervision of skilled personnel who are authorized to train personnel.

WORKING SAFELY

The contractual partner shall ensure that the necessary safety measures and the relevant provisions of labor law and occupational health and safety law are observed during the assembly of products from AEROCOMPACT Europe GmbH. References by AEROCOMPACT Europe GmbH to the necessity of compliance with security measures are made without guarantee and without claim to completeness and serve only to support the contractual partner. The contractual partner is obliged to inform himself about all relevant regulations concerning occupational safety and to comply with them. AEROCOMPACT Europe GmbH expressly assumes no responsibility here and consequently no liability. Areas below the roof on which work is being carried out must be protected from any falling objects. Where this fails, the affected areas shall be closed to the public and to unauthorized personnel. In case of unsuitable weather conditions, work on the roof must not be continued any longer than necessary - or not started at all. Never carry out assembly work in strong winds. Strong wind exerts enormous forces on the large-area PV modules. There is a risk that a module could be torn off the roof and people could be injured. Never work in wet conditions or at temperatures below the freezing point. Depending on the roof pitch there is a risk of slipping. Only use suitable, intact and tested ladders. Set up and secure ladders according to instructions. Separate rules apply to mechanical climbing aids (elevators, cherry pickers, etc.). Never use the PV mounting system as a climbing aid. Keep sufficient distance from overhead electrical lines. Equipotential bonding between the individual system parts must be carried out in accordance with the respective country-specific regulations. When cutting materials, make sure that there are no burrs, especially at edges and corners, as there is a risk of injury.

BREAKTHROUGH PROTECTION

Skylights, skylights, large vents, etc. usually cannot withstand the weight or impact of a person. Such objects must be secured in a similar way as the edge of the roof. Corrugated fibre cement roofs can be prone to breakthrough over the entire surface. Define walking routes and secure them with load distribution measures. On roofing or roof structures that do not have sufficient load-bearing capacity (e.g. thin sheets, corrugated fibre cement), always work with load distribution aids.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment is used to protect persons from impairment of safety and health at work. Personnel must wear personal protective equipment during assembly. Personal protective equipment is explained below:



Wear cut-resistant work gloves during assembly.



Use fall protection.

SYSTEM OVERVIEW

BASIC COMPONENTS GS10 PLUS



- 3 GS10plusMB Middle bracket GS10 PLUS
- 5 CLMG10-XX Middle clamp for frame height 30 - 50 mm
- 4 GS10plusFB Front and end bracket GS10 PLUS

SYSTEM ACCESSORIES



MA-BR

Mounting bracket for MLPE



CP-430 | CP-620 | CP-840

Cable pipe



Bracket for cable pipe

ACCESSORIES BALLASTING



SCS8x20

Thread rolling combination screw M8x20

BT-880

Ballast tray short 880 mm

MODULE ACCESSORIES



CLP-U

Cable clip universal



PP200 Duilding proto

Building protection pad for ballast stones and ballast tray



BT-1800 | BT-2050 | BT-2300

Ballast tray long



Cable tie clip module

CompactFLAT GS10 PLUS

ASSEMBLY

ASSEMBLY PREPARATION

Required tools for assembly

I Before starting the assembly, make sure that the assembly personnel are familiar with the proper use of the listed tools.



ATTACH ROOF PROTECTION PAD (OPTIONAL)



- The protection pad can be used for all roof coverings with the **exception of green roofs**. It is essential to ensure that the underside of the front bracket, middle brackets, connectors and end bracket are clean, dry, free of grease and dust.
- Remove protective paper.
- $\ensuremath{\triangleright}$ Attach the adhesive surface to the underside.



FRONT AND END BRACKET



Ensure that the protection pad protrudes over the edge in each case: A = 10 mm.



MIDDLE BRACKETS AND CONNECTORS



- Place the structural protection pad by the middle brackets and connectors.
- > For the middle bracket make sure that the protection pad protrudes over the edge in each case: A = 10 mm.

PRE-INSTALL THE CLAMPS

U When **pre-assembling** the end and middle clamps, it is important to ensure that the front brackets, middle brackets, connectors and end brackets are correctly **assigned**. For more information, see "Measure the module field" on the next page.

END CLAMPS (NORTH AND SOUTH SIDE)



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Attach the end clamps to the front brackets, middle brackets, connectors and end brackets - 2 to 3 threads, do not screw tight.

END CLAMPS AND MIDDLE CLAMPS



Attach the end clamps and middle clamps to the front brackets, middle brackets, connectors and end brackets - 2 to 3 threads, do not screw tight.

MEASURE THE MODULE FIELD

 \blacksquare The exact dimensions can be found in the attached planning documents.



- \blacktriangleright Measure the length (1) and width (2) of the entire module field and mark the line.
- Neasure individual module rows (3) and mark line.
- Distribute the front brackets, middle brackets, connectors and end brackets. in the module field in accordance with the planning documents.

I When distributing, ensure that the **middle clamps** and **end clamps** are placed in the correct position.

INSTALLING THE MODULES

Assembly sequence of the modules

The following illustration is an example and may show a different number of modules and ballast trays depending on the project. The module assembly sequence remains constant. The **assembly sequence** is crucial in order to avoid deformation of the front brackets, middle brackets, connectors and end brackets.



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 ${\ensuremath{\blacktriangleright}}$ The modules must be installed in ascending order from 1 to 12.

i Important information on ballasting

The screws of the ballast trays may **only be tightened** until the module assembly is complete (2 to 3 threads). Ballasting is also only permitted after the module assembly has been completed.

Install the first module row



Position the module (1) on the front brackets and middle brackets.





- Position the end clamps (1) flush with the module and then tighten.
- Position the end clamps (2) flush with the module and then tighten.
- Position the following module (3) on the front brackets and middle brackets.





- Position the end and middle clamps (1) flush with the module and then tighten.
- Position the end and middle clamps (2) flush with the module and then tighten.
- Position the following module (3) on the front brackets and middle brackets.





- Desition the end and middle clamps (1) flush with the module and then tighten.
- Position the end and middle clamps (2) flush with the module and then tighten.



Install the second module row

i Ballast trough recommendation for middle brackets:

It is recommended that ballast trays, which are used for middle brackets, are prepared **during module assembly**. Detailed information on this can be found in the chapter "Ballasting GS10 PLUS" on page 17.



- Position the end clamps (1) flush with the module and then tighten.
- Position the end clamps (2) flush with the module and then tighten.
- Position the following module (3) on the middle brackets and connectors.





- Position the end clamps (1) flush with the module and then tighten.
- Position the end clamps (2) flush with the module and then tighten.
- Position the following module (3) on the middle brackets and connectors.





- Position the end and middle clamps (1) flush with the module and then tighten.
- Position the end and middle clamps (2) flush with the module and then tighten.
- Position the following module (3) on the middle brackets and connectors.





- Position the end and middle clamps (1) flush with the module and then tighten.
- Position the end and middle clamps (2) flush with the module and then tighten.
- Position the end clamps (3) flush with the module and then tighten.
- Position the end clamps (4) flush with the module and then tighten.



I Mount the other module rows in the same sequence.





Tighten all end clamps (1) and middle clamps (2) in series A to a torque of 20 Nm or 14.57 lb-ft.
Repeat the process in ascending alphabetical order from B to H - make sure you follow the order!

BALLASTING GS10 PLUS

The ballasting of the system varies depending on the given conditions. The following section describes the three variants. Important: The ballast trays may only be hand-tightened until the module assembly is complete.

Short ballast tray



- Protection pads (1) are position to the right and left of the edge of the ballast tray.
- Place the ballast tray (2) in the center of the front bracket, connector or end bracket.
- The exact **number** and **position** of the ballast troughs can be found in the planning documents.





The short ballast tray can be fitted in the following positions:

- 1 GS10plusFB Front and end bracket GS10 PLUS
- 3 GS10plusFB Front and end bracket GS10 PLUS
- 2 GS10plusCN

Connector GS10 PLUS





Screw the ballast tray (1) to the foot or connector with the screw (2).

Tighten the screw (2) hand-tight - do not screw it tight!

Long ballast tray



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The long ballast tray can be fitted in the following positions:

1 GS10plusFB

Front and end bracket GS10 PLUS

3 GS10plusCN Connector GS10 PLUS

2 GS10plusMB Middle bracket GS10 PLUS

4 GS10plusFB Front and end bracket GS10 PLUS

PLACING THE ROOF PROTECTION PADS

Depending on the length of the ballast tray, a different number of protection pads are required per ballast tray: Length 1800 mm: **3** roof protection pads per ballast tray Length 2050 mm: **4** roof protection pads per ballast tray Length 2300 mm: **5** roof protection pads per ballast tray

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- When positioning the protection pads, ensure that the drainage holes on the roof are **not covered**.
- Distribute roof protection pads evenly under the ballast trays.



INSTALLING A LONG BALLAST TRAY WITH OVERLAP



- The ballast trays (1) must be designed so that they overlap at the front and end brackets, connectors and middle brackets.
- Tighten the screws (2) hand-tight do not screw them tight!



MOUNT LONG BALLAST TRAY WITH MIDDLE BRACKETS



- Place the ballast tray (1) under the middle bracket.
- Tighten the screws (2) hand-tight do not screw them tight!



PREPARING BALLAST STONES FOR MIDDLE BRACKETS

i Recommendation:

Ballast stones (2) for ballast trays (1) that are mounted on middle brackets should be prepared and placed to the side. Ballasting is only permitted after the module installation has **been completed**.



Direct ballasting

U With this ballasting variant, **ballast stones** are placed directly on the front brackets, connectors, middle brackets, end brackets. **Attention!** The ballast stones may only be laid after the module assembly has been completed.



i Recommendation:

To minimize maintenance, the structural protection mats should be bonded to the ballast stones. For this purpose, it is recommended to use a weather-resistant construction adhesive.

- Desition the protection pats (1) to the right and left of the feet or connector.
- Place the ballast stone (2) on top.
- The exact **number** and **position** of the ballast stones can be found in the planning documents.



Tighten the ballast trays with torque.





Tighten all screws (1) on the ballast trays to a torque of 15 Nm or 11 lb-ft.

> Then place the ballast stones or insert them into the ballast trays.

ASSEMBLE MLPE

 \blacksquare The MLPE is mounted below the module on a foot or on a support.



D Mount the MLPE on the bracket according to the manufacturer's specifications.

In the next step, place the MLPE (2) below the module (1).

Attach MLPE (2) to the support or foot (3) and hand-tighten the Allen screw (4).

INSTALL CABLE PIPES (OPTIONAL)

The cable conduits are mounted along the lateral edge of the module field. Depending on the specific conditions, the cable conduits are attached either using the brackets provided or to the long ballast tray.

Cable conduit assembly ballast tray



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Insert the cable pipe (1) on the ballast tray.

Attach the plastic caps (2) to the end of each cable pipe.

Cable conduit mounting bracket



- Attach the brackets to the cable pipe (1).
- Attach the plastic caps (2) to the end of each cable pipe.
- Tighten the bracket for cable pipe on the connector brackets or on the bracket (3) each with a tapping combi screw.
- Tighten the screws with a torque of 15 Nm or 11 ft lb.

INSTALLING THE MECHANICAL ATTACHMENTS

■ The roof anchors must be provided by the customer and are not included in the scope of delivery of AEROCOMPACT Europe GmbH. For the installation of the roof anchor connection, the roof anchors must be equipped on site with a threaded rod with a maximum size of M12 (7/16 inch). The number and positions of the roof anchors can be found in the planning documents.

Position the Mechanical Attachments



I AEROTOOL marks only the components on which the mechanical attachments are mounted.

Determine the exact position of the mechanical attachment according to the following dimensions/tolerances: A: 218 mm / 8.58 inch

A1: 0 - 30 mm / 0 - 1.18 inch A2: 64 mm / 2.52 inch B: 66 - 89 mm / 2.60 - 3.50 inch B1: 28 mm / 1.10 inch C: 74 mm / 2.91 inch

Connect system with mechanical attachments

It is possible to install the roof anchor in combination with the wind deflectors and/or ballast trays.



- The hexagon nut (1) is not included in the scope of delivery and must be provided by the customer.
- Place washer (4), bracket (3) and spacer (2) on the on-site screw of the anchor.
- I Make sure that the tab of the spacer (2) faces outwards.
- Screw the components hand-tight with the hexagon nut (1).





- E For chip-free mounting of the anchor point attachment, use the bracket / connector bracket (S...-TF...) with additional holes and a thin sheet metal screw.
- Attach the angle connection (2) to the connector or foot.
- \blacktriangleright Make sure that the tab (1) is positioned on the side of the connector or foot.
- If necessary, move the wind deflector so that the tab (1) protrudes through the slotted hole of the wind deflector. The wind deflector and the angle connection (2) must be placed flush on the bracket/ connector bracket.
- Exact the angle connection (2) to the connector/foot with the furrow screw (3) and the thin sheet screw (4).
- Remove metal chips of the thin sheet screw (4) from the roof covering.



- Position the angle connection (2) and the bracket (3) flush against each other.
- Connect the angle connector (2) and the bracket (3) to each other at the slotted holes using the thread-forming screws (1) and hexagon nuts (4).
- Tighten the hexagon nuts (4) and (5) each to a torque of 15 Nm or 11 ft-lb.



POTENTIAL EQUALIZATION AND LIGHTNING PROTECTION

POTENTIAL EQUALIZATION





The grounding / potential equalization is attached to the edge of a module field at a foot with a thread-forming screw (STS 8x16).

Loosen and remove screw (3).

Connect ground wire (2) firmly to cable lug (4).

Attach washer (1) and cable lug (4) in the order shown with the screw (3).

Tighten the screw (3).

LIGHTNING PROTECTION

When incorporating lightning protection or in projects where the system takes over parts of the external lightning protection.

🔟 If there is no continuous connection in the form of ballast trays or wind deflectors, a cross connection is required.



LPS - Lightning Protection System

POTENTIAL EQUALIZATION DURING MAINTENANCE WORK



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i Heads up!

To ensure that the connection between the remaining modules and the equipotential bonding is guaranteed, additional grounding clamps and grounding wire must be attached when a module is removed.

MAINTENANCE, DEMOUNTING AND DISPOSAL

MAINTENANCE

To prevent personal injury and property damage, the system must be inspected regularly by qualified personnel; an annual visual inspection is recommended for this purpose.

- Check all components of the system for damage. In case of damage, replace the affected component as soon as possible.
- Check all screw connections. Tighten loose screw connections, observing the tightening torque according to the assembly instructions.
- Inspect all components for damage from weather, animals, dirt, debris, buildup, vegetation, roof penetrations, waterproofing, stability, corrosion. In case of damage, clean, repair or replace the affected component.

DISASSEMBLY

DISMOUNTING CLAMPS (EXAMPLE)



For demounting the system, carry out the assembly steps in reverse order.

- Dunscrew screw (1) on the clamp completely.
- When reusing the clamps, make sure that the O-ring (2) is not lost.

Ⅱ If the components are reused, it must be noted that these are wearing parts. Therefore, the AEROCOMPACT Europe GmbH cannot assume any responsibility for checking the degree of wear. For this reason, any liability or warranty of AEROCOMPACT Europe GmbH in case of reuse is excluded and reuse is at the installer's own responsibility.



DISPOSAL

Unless a take-back or disposal agreement has been made, disassembled components should be recycled:

- · Give metals and plastic elements for recycling.
- Dispose of remaining components sorted according to material composition.

Incorrect disposal may result in hazards to the environment. In case of doubt, obtain information on environmentally sound disposal from the local municipal authority or from specialized disposal companies.

APPENDIX

DECLARATION OF CONFORMITY GS10 PLUS | GS15

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Manufacturer: Designation: AEROCOMPACT Europe GmbH

CompactFLAT GS system for flat roofs

Identification code: GS

Applied standard: EN 1090-1

Certification body: 2397-CPR-65/2511



For the declaration of performance

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