PREFA
SOLAR

INSTALLATION MANUAL

PREFALZ SOLAR PANEL 500/650

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PREFA AUSTRIA

PREFA ALUMINIUMPRODUKTE GMBH
WERKSTRASSE 1 · 3182 MARKTL/LILIENFELD

T +43 2762 502-602

kundenservice.at@prefa.com
www.prefa.at

PREFA GERMANY

PREFA GMBH ALU-DÄCHER UND FASSADEN
ALUMINIUMSTRASSE 2 · 98634 WASUNGEN

T +49 36941 785-0

office.de@prefa.com
www.prefa.de

PREFA SWITZERLAND

PREFA SCHWEIZ VERTRIEBS AG
LEENRÜTIMATTWEG 1 · 4704 NIEDERBIPP

T +41 71 952 68 19

office.ch@prefa.com
www.prefa.ch

PREFA UNITED KINGDOM AND REPUBLIC OF IRELAND

PREFA UK LTD
1 CHAPEL STREET, WARWICK, CV34 4HL

T +44 1608 544325

office.uk@prefa.com
uk.prefa.com

PREFA FRANCE

PREFA FRANCE SARL
7F RUE MONTGOLFIER
68127 SAINTE-CROIX-EN-PLAINE

T +33 4 79 44 84 58

office.fr@prefa.com
www.prefa.fr

PREFA ITALY

PREFA ITALIEN GMBH · PREFA ITALIA SRL
VIA-LUIGI-NEGRELLI 25 · 39100 BOZEN | BOLZANO (BZ)

T +39 0471 06 86 80

office.it@prefa.com
www.prefa.it

PREFA NETHERLANDS

PREFA GMBH ALU-DÄCHER UND FASSADEN
ALUMINIUMSTRASSE 2 · 98634 WASUNGEN · GERMANY

T +49 36941 785-0

info.be@prefa.com
www.prefa.com

PREFA DENMARK

PREFA GMBH ALU-DÄCHER UND FASSADEN
ALUMINIUMSTRASSE 2 · 98634 WASUNGEN · GERMANY

T +49 36941 785-0

info.dk@prefa.com
www.prefa.dk

INTRODUCTION

PREFA NORWAY

PREFA GMBH ALU-DÄCHER UND FASSADEN
ALUMINIUMSTRASSE 2 · 98634 WASUNGEN · GERMANY

T +49 36941 785-0

info.no@prefa.com
no.prefa.com

PREFA SWEDEN

PREFA SVERIGE AB
BJÄRE PLATS 13 · 218 45 VINTRIE

T +46 10 498 66 60

office.se@prefa.com
www.prefa.se

PREFA POLAND

PREFA POLSKA SP. Z O.O.
UL. EMALIOWA 28 · 02-295 WARSZAWA

T +48 22 720 62 90

office.pl@prefa.com
pl.prefa.com

PREFA IN THE CZECH REPUBLIC

PREFA ALUMINIUMPRODUKTE S.R.O.
K ZELENČI 2883/14 · 193 00 PRAHA 9 · HORNÍ POČERNICE

T +420 234 496 503

zakaznickyservis@prefa.com
cz.prefa.com

PREFA SLOVAKIA

PREFA SLOVENSKO S.R.O.
ŠTÚROVA 136B · 949 01 NITRA

T +421 915 528 475 (MAREK MESÍK)
T +421 915 247 416 (PETER MESÍK)
T +421 907 646 501 (DENIS FILČÁK)

office.sk@prefa.com
sk.prefa.com

PREFA HUNGARY

PREFA HUNGÁRIA KFT.
BUDAÖRSI IPARI PARK · GYÁR UTCA 2. · 2040 BUDAÖRSI
POSTACÍM: 2058 BUDAÖRS · PF. 80.

T +36 23 511 670

office.hu@prefa.com
www.prefa.hu

PREFA SLOVENIA

PREFA SLOVENJIA
OBRTNIŠKA ULICA 2 · 1292 IG

T +386 51 612 500

office.si@prefa.com

www.prefa.si

PREFA CROATIA

PREFA ALUMINIUMPRODUKTE GMBH
WERKSTRASSE 1 · 3182 MARKTL/LILIENFELD · AUSTRIA

T +385 91 655 55 06 (ZORAN JAKOPOVIĆ)
T +385 99 211 60 01 (FILIP DUBROVSKI)

office.hr@prefa.com
www.prefa.hr

This installation manual contains a set of guidelines for preparing and installing PREFA solar products and is aimed solely at commercial users such as installers, architects or designers. The included sketches provide assistance and information for the usual application. We would like to point out that each construction project must be considered individually and checked for its specific requirements. In particular, the circumstances of individual cases in terms of legal or factual requirements must be taken into account: for example, issues related to the approvability of the project or fire safety regulations to be observed or the checking of external influences that may affect the property (e.g. in exposed locations with strong winds).

Neither this installation manual nor a statement from PREFA should be used to replace or modify the advice or design of an architect/designer responsible for a specific construction project or of the company implementing it: Only the service providers commissioned to supervise the construction project are in a position to decide how PREFA products are to be installed and used, while taking the specific local conditions of the individual case into account.

When drafting this installation manual, we took into account the state of the art and product development at the time of publication of this installation manual. The use of the documents provided by PREFA, particularly this installation manual, does not constitute a contractual or quasi-contractual service on our part; liability for damages and further claims of any kind shall be expressly excluded. This shall not affect any liability arising from intent or gross negligence as well as liability in the event of injury to life, limb or health of a person. Claims under the Product Liability Act shall also remain unaffected.

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NOTE

If you have any questions, please contact PREFA Product Technology's Technical Support.

On our website WWW.PREFA.COM, you can find all the information on our products, as well as a detailed description of our comprehensive range of services for certified specialists.

If you are interested in our installation videos or would like to sign up for the PREFA Academy, please ask your PREFA Advisor for a username and password to access our Login Area.

SAFETY REGULATIONS

1 GENERAL SAFETY INSTRUCTIONS

In-depth expertise is required for the construction, operation, maintenance and repair of a PV system. Therefore, all work may only be performed by appropriately qualified and authorised skilled workers.

Please make sure that you read and understand the instruction manual before installing, commissioning or maintaining the solar panel system.

Failure to follow the safety instructions and accident prevention regulations may result in personal injury and material damage. Ensure that children or vulnerable people are not present when such work is being performed!

The installation manual shows the state of the art and product development at the time of publication and is continuously updated. Please only note the current and updated version of the respective document.

The specialist contractors and the operator of the solar panel system are responsible for the observation and monitoring of all relevant legal regulations, standards, rules and guidelines, including international, national and regional regulations on the installation and operation of solar panel systems and work with direct current.

PERSONNEL QUALIFICATIONS

The operator and the specialist companies are responsible for ensuring that the installation, maintenance, servicing, commissioning and, if necessary, dismantling are only performed by trained and qualified skilled workers.

It is necessary to ensure that personnel:

- has understood this installation manual and can implement it,
- is familiar with the safety regulations,
- uses appropriate protective clothing and equipment,
- takes appropriate measures to prevent accidents as part of a risk assessment.

When dealing with the PREFALZ solar panel, we strongly recommend attending a training course at one of our Academy locations. You will be given specific training for installation, maintenance and commissioning, including a safety briefing.

ELECTRICAL INSTALLATION IN GENERAL

There is a risk of fatal injuries from touching one or both poles. Conductive objects should never be inserted into the openings of plugs and sockets.

Beware of electric arcs within DC-carrying system components!

Do not disconnect the cable during operation (disconnect the system from the mains or use a circuit breaker).

Beware of moisture during the electrical installation!

There is a risk of injuries and damage to the system!

- Roof work should only be performed on dry surfaces.
- Ensure that the solar panel modules, cables, etc., are dry during the installation.

Damaged solar cables or cables with plain aluminium points must be replaced immediately to ensure the safety and proper operation of the system.

Even when there is little sunlight, the entire open-circuit voltage remains.

Even at low temperatures, the maximum permitted system voltage of the solar panel modules must not be exceeded. Adhere to the included installation plan!

Higher voltage than protective extra-low voltage!

Risk of injury due to the increase in voltage when connected in series!

It is essential to ensure that the electrical installation and commissioning is performed by a licensed electrician.

Suitable protective gloves must be worn when working with live solar plugs. Particular attention must be paid to checking the gloves for damage before starting work.

NOTES ON THE PREFALZ SOLAR PANEL

Please note the following:

- The panel must be treated with care and only handled with appropriate work gloves.
- Do not bump the exposed edge of the glass against hard objects or place it on them.
- Be careful when handling sharp tools such as snips, hammers, pliers, shovels, etc.
- Store and secure solar panels and open packing units horizontally.
- Packing units and panels must be transported carefully and protected against the weather and other external influences.
- Solar panels inserted into solar panel clamps must be fastened immediately (risk of falling).

TOOL LIST

- Protective gloves and personal protective equipment
- Tape measure and pencil
- Mason's lacing cord
- Torque wrench (10 Nm / 35 Nm)
- Wrench socket
  - Hexagon (SW 15mm), long version
  - Hexagon (SW 10mm) for equipotential bonding cable
  - Hexagon socket (SW 5mm)

PLANNING

When planning and installing PREFALZ solar panels, both for new buildings and for subsequent installation, building physics requirements such as thermal insulation, moisture protection and fire safety as well as the static structural design for stability must be taken into account.

NOTE

The early involvement of all necessary trades in the planning of the solar panel system enables the timely incorporation of such important topics as roof safety and the snow guard system into the planning.

We recommend consulting an energy consultant or expert for optimal planning and evaluation of the entire building and energy management. For the design and planning of the PREFALZ solar panel, please contact your local PREFA sales representative.

The PREFALZ solar panel is not intended for use as a maintenance route or for similar purposes and thus should not be accessed or walked on.

Appropriate measures must be taken for maintenance and repair work, such as maintenance walkways and fall protection devices.

SNOW GUARD SYSTEM

In principle, the owner of the building is liable for any damage caused by avalanches of snow falling off the roof. If there are paths, entrances, public circulation spaces, or buildings such as canopies, conservatories or balconies under the eaves edge, precautions must be taken to prevent the snow and ice masses from slipping onto them. Signs are not an appropriate safety measure over a longer period of time.

Whenever a structural solution, such as a solar panel, is integrated into a functioning pipe-style snow guard system on the roof, the existing equipment must be adapted and brought up to date with current technology. A snow guard system designed according to the relevant standard may lead to a situation where the roof surface cannot be fully covered with solar panel modules.

A structurally functioning snow guard system on roofs with energy generation systems can be best implemented with linear snow guard systems.

Depending on the building and location, it may be necessary to mount several rows of snow guards. The maximum permissible row spacing is to be calculated depending on the snow load, the roof pitch and the rafter distance. If the calculated constraint length of the snow guard is less than the rafter length, a row of snow guards on the eaves will be insufficient.

ROOF SAFETY

Performing work on roofs is one of the most dangerous construction activities that exists. Work is often performed on roofs in adverse weather conditions which adds to the danger. Be sure to observe the safety measures before starting and during your work. Priority must be given to collective measures over individual measures, for example, the roof protection cover plate over roof hooks and personal protective equipment. Regular monitoring of safety measures is also necessary to ensure their effectiveness.

CLEANING INSTRUCTIONS

Solar panel modules are designed to have a long service life.

Normally, solar panel modules are kept free of dirt such as dust and leaves or similar soiling by wind, rain and snow. However, this natural cleaning effect may not work sufficiently due to soiling such as bird droppings, low pitch, extreme location in industrial or agricultural environments, and it is thus advisable to clean the system regularly in order to achieve the optimal yields and ensure the service life of the system.

- Cleaning should generally be carried out with pure water and a soft cloth or sponge.
- Impurities such as drilling dust or mortar residues on coated or bare aluminium parts must be removed immediately.
- Do not scrape off dirt dry or use harsh cleaning agents.
- Do not use a high-pressure cleaner under any circumstances.
- Do not use materials such as aggressive chemicals, abrasives, blades, steel wool, polishes, etc. They can damage the glass surface. This will void the warranty.
- Subsequent application of water-repellent or dirt-repellent coatings can have a negative impact on the efficiency of the solar panels and thus on the yield.

PREFALZ solar panels should only be cleaned by qualified personnel. The manufacturer's guidelines must be observed.

STRUCTURAL FOUNDATIONS OF ROOF COVERING AND INFORMATION

Double-lock standing seam roofing is to be planned and executed according to structural requirements (relating to building and site).

PREFALZ solar panels 500 and 650 are designed for double-lock standing seam roofing in coil widths of 500mm and 650mm. If PREFA stainless steel fixed clips, PREFA preformed sliding clips, PREFA preformed long sliding clips and PREFALZ solar panel clamps are used professionally in combination with PREFALZ solar panels, the thermally induced change in the length of PREFALZ trays is still guaranteed.

The determined tray width and the statically determined maximum spacing between clips must be taken into account during installation. In order to meet the static requirements of the solar panels clamped to the fold, the following specifications must be observed:

- Maximum spacing between clips: 33cm
- The product is only to be used in combination with a PREFALZ or FALZONAL double-lock standing seam roofing, installed on a fully supported substrate of at least 24mm in accordance with the applicable standards and specialist guidelines, a structurally stable timber sub-structure framework and original PREFA fixing materials.

For more information on double-lock standing seam roofing, see the PREFALZ installation manual.

SHADING

Shadowing can have a significant impact on the performance of a solar panel system. The course of the sun must be carefully considered in the planning phase. The solar panels should not be “in the shade” at any time of the day or year. As part of the projected yield, the PREFA Product Technology department will assist you in designing the system to be as shade-free as possible.

TO WHAT DO YOU NEED TO PAY PARTICULAR ATTENTION AS A RESULT?

Shading of a solar panel system on the roof can be caused by various factors, such as surrounding buildings or trees, chimneys, ventilation pipes, antennas, as well as seasonal changes in the sun’s position and weather conditions such as snow or ice.

In addition to the solar survey form, use drawings, sketches and pictures to record possible roof structures, antennas, chimneys, vents or overhead lines. They will then be taken into account separately and included in the design.

PREFALZ SOLAR PANEL 500/650

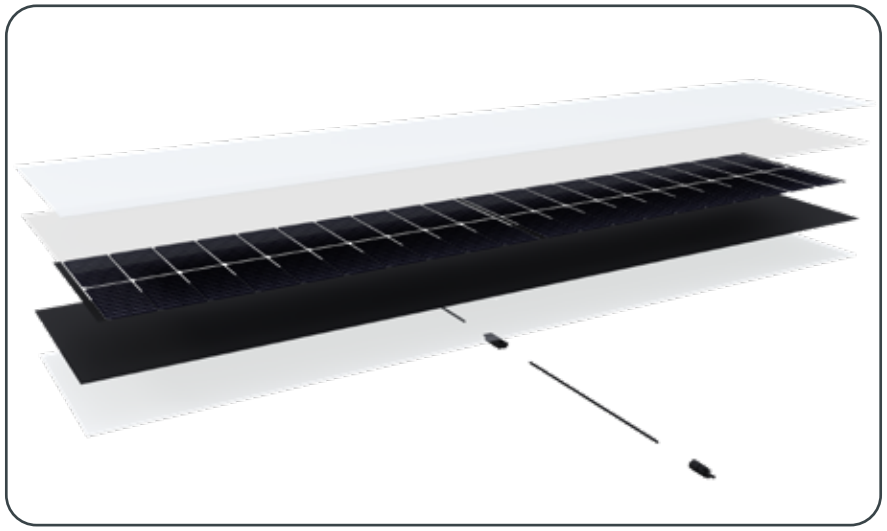


Image 1 · PREFALZ solar panel

Technical data		
	PREFALZ solar panel 500	**PREFALZ solar panel 650**
Performance	150 Wp	150 Wp
Space required per kW_p	5.44 m²	7.44 m²
Dimensions	2000 × 408mm (1.2 pcs./m²)	2000 × 558mm (0.9 pcs/m²)
Weight	15 kg (18 kg/m²)	21 kg (18 kg/m²)
Cell type	TOPCon	
Roof pitch	from 3° (5%)	
Material	Front glass 3.2mm; rear glass 3.2mm	
Plug	Standard MC4 plug/socket	
Fastening	With a solar middle/end clamp PREFALZ 500/650 on a double-lock standing seam (seam height of 25mm). The number of clamps per solar panel varies depending on the roof pitch and location.	

MIDDLE/END CLAMP, PREFALZ 500/650 SOLAR PANEL SAFETY LOCK

Image 2 · PREFALZ 500/650 solar middle clamp

Image 3 · PREFALZ 500/650 solar panel safety lock

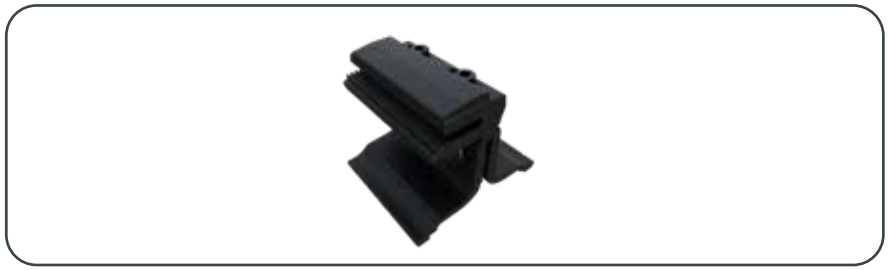


Image 4 · PREFALZ 500/650 solar end clamp

Technical data	
Fastening	Clamping on PREFALZ double-lock standing seam (seam height of 25mm)
Colour	Black anodised
Components	Aluminium clamp base 2 mushroom head bolts A2 M10 x 25 2 hexagon nuts A2 M10 2 fixing screws A2 M6 x 20 (hexagon socket 5mm) Aluminium clamp top EPDM insert

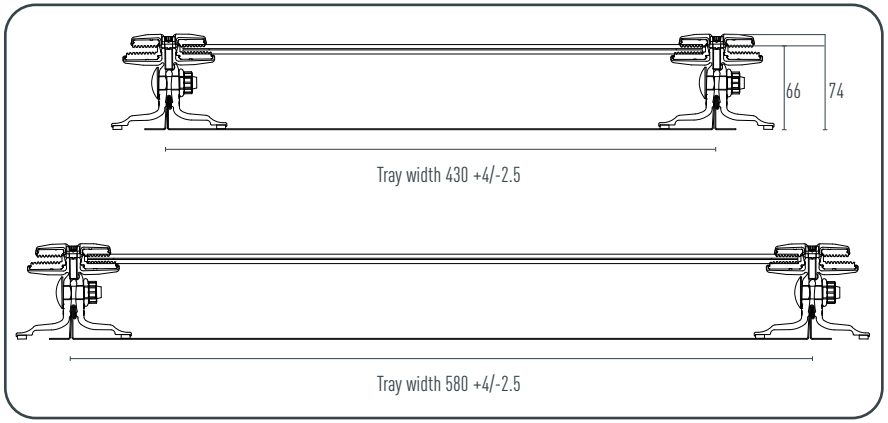


Image 5 · Tray width including tolerances

NOTE

Please note that trays with a double under seam should be trimmed by 10 mm due to less seam loss in order to achieve a tray width of 430/580! Installation on trays with a double over seam is not possible due to the higher seam loss of 10mm.

INSTALLATION OF PREFALZ SOLAR PANEL

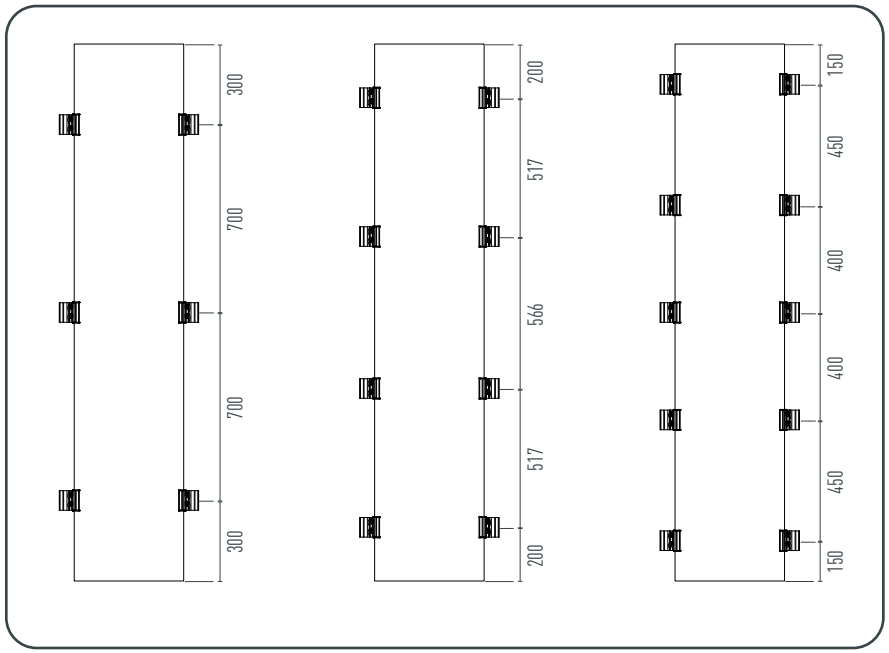


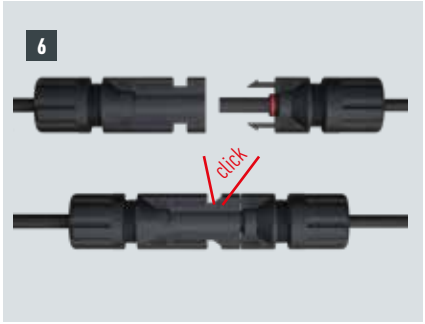
Image 6 · Positioning of the clamps

The sketch (Image 6) shows three different variants for installing the PREFALZ solar panel with 6, 8 or 10 fastening points. The diagram indicates the distance at which the clamps are to be mounted depending on the required variant.

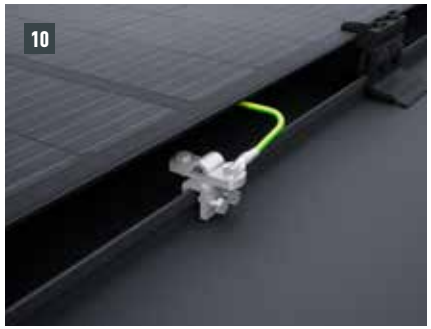
NOTE

The variant to be used depends on local conditions as well as wind and snow loads. For this purpose, PREFA provides a calculation tool, which can be requested via the website or via the respective Product Technology department. office.uk.@prefa.com

- The maximum centre-to-centre spacing between clips must not exceed 33cm (Image 1).
- Care must be taken to ensure that the substrate is clean in the clamp area. Due to the symmetrical clamping jaws, any positioning on the fold is possible (Image 2).
- Position and linear alignment of the clamp bases according to the required number depending on the static design according to the installation plan (Image 3).
- Tighten the two stainless steel nuts with a torque of 35 Nm. Care must always be taken to tighten the left nut first to prevent the clamp from tilting upwards (Image 4).



- Insertion of the solar panels and connection of the connectors according to string planning. Care must be taken to ensure that the solar panels are positioned centrally on the clamp bases and that the EPDM inserts fit properly (Image 5).
- Connection of the solar plugs/sockets (Image 6).



- Position the clamp tops and tighten the hexagon socket screws with a torque of 10 Nm (Image 7).
- Place the solar panel safety locks along the lower panel edge of each row and tighten the hexagon socket screws with 10 Nm (Image 8).
- A snow guard system can be arranged above the solar panels to protect the cabling (Image 9). The snow guard system of the entire roof surface must be considered separately!
- The equipotential bonding cable must be installed for each continuous roof surface (Image 10).

CABLING

A PREFALZ solar panel system requires one supply line and one discharge line for each string. In the following diagram of the cabling, the supply line is shown in blue, the discharge line in red, the equipotential bonding in green, and the solar panel cables in black for easier recognition.

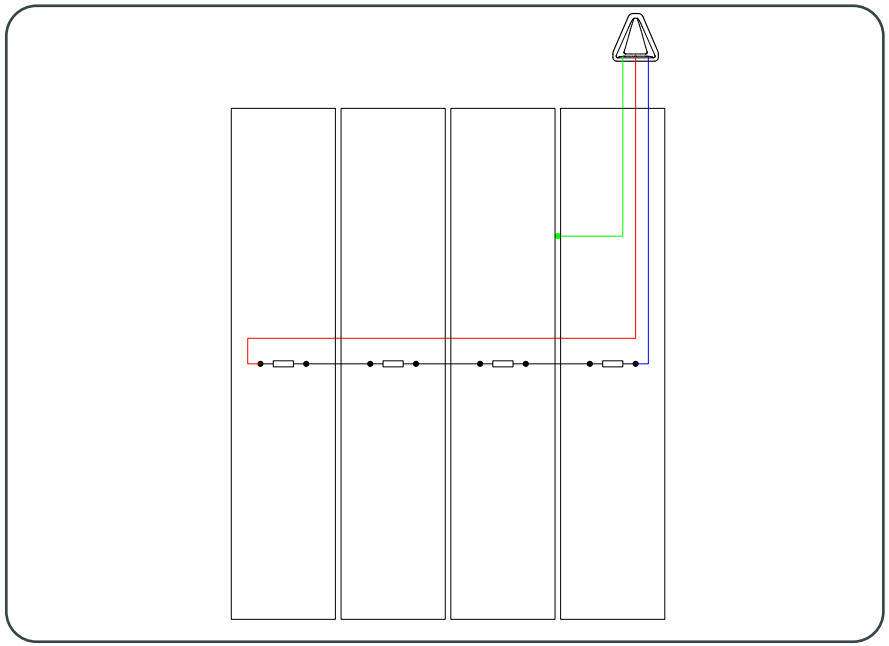


Image 7 · Cabling diagram

Please note that the supply lines and discharge lines, connecting cables and equipotential bonding cables must be routed in a UV-resistant electrical installation pipe. There must be no unprotected cables directly on the roof surface. The corresponding design must be clarified with the electrician performing the work.

ACCESSORIES

1 SOLAR ROOF CONDUIT

PREFA solar roof conduit for installing cables in solar panel systems for PREFA roof coverings.

Solar roof conduit	
Material	aluminium (1.2mm; EN AW 1050 A)
Colour	uncoated or powder-coated in standard colours
Components	1 x feed-through grommet DM 32-35mm 2 x feed-through grommets DM 10mm 1 x pipe collar (connection to separation layer or underlay) bag of talc
Roof pitch	glued from 3° with PREFA special adhesive set

Image 8 · Solar roof conduit

1.1 INSTALLATION

- Positioning and marking the solar roof conduit (Image 1)
- Marking the adhesive area (25mm) and the cut-out of the pipe collar (Image 2)
- Cutting out (Image 3)
- Flaring (Image 4)

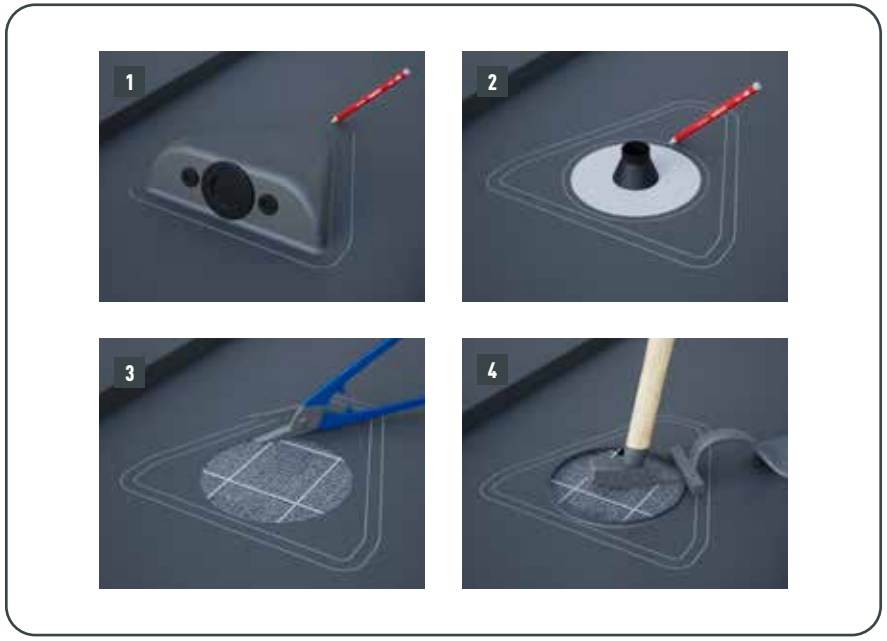


Image 9 · Installing the solar roof conduit

- Drill the hole in the middle, glue on the pipe collar and feed the protective hose through all roof layers into the interior (Image 5)
- Sand the bonding surfaces (Image 6)
- Clean the bonding surfaces and let them dry (Image 7)
- Pierce the feed-through grommet (Image 8)

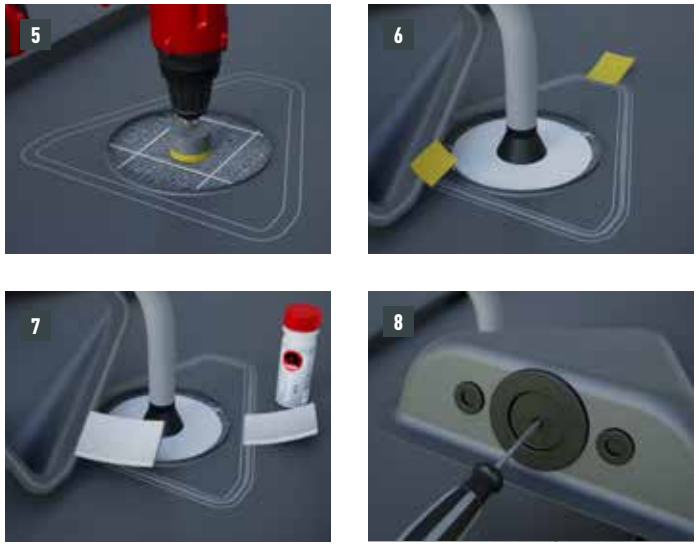


Image 10 · Installing the solar roof conduit

- Apply special adhesive all around it. (Image 9)
- Putting on the solar roof conduit and pressing down on it (Image 10)
- Fully installed solar roof conduit (Image 11)

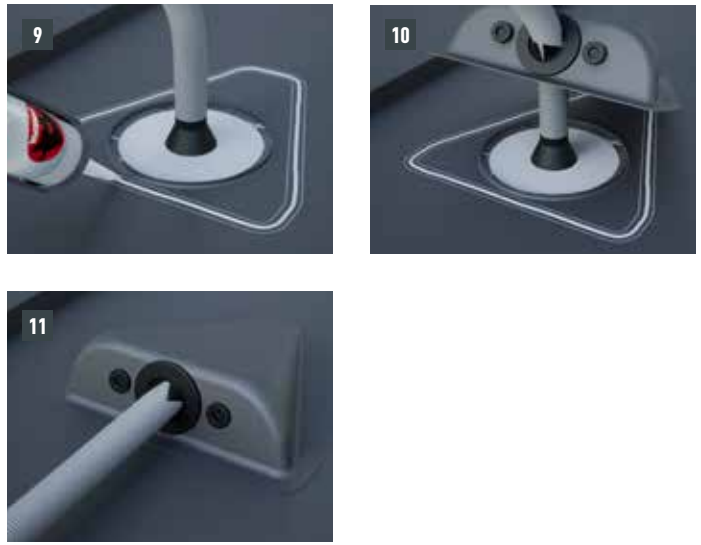


Image 11 · Installing the solar roof conduit

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