

# Mounting instructions

Magic PV Flat Glue photovoltaic mounting systems for flat roofs

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*Mounting instructions*

## Table of contents

<b>1</b>	<b>About these instructions</b>	<b>4</b>
1.1	Target group	4
1.2	Relevance of these instructions	4
1.3	Types of warning information	4
1.4	Basic standards and regulations	4
1.5	Applicable documents	5
<b>2</b>	<b>Intended use</b>	<b>5</b>
<b>3</b>	<b>Safety</b>	<b>5</b>
3.1	General safety information	5
3.2	Personal protective equipment	6
3.3	Storage	6
<b>4</b>	<b>Necessary tools</b>	<b>6</b>
<b>5</b>	<b>System overview</b>	<b>7</b>
<b>6</b>	<b>Mount the system</b>	<b>9</b>
6.1	Positioning the stands with sleeves	9
6.2	Inserting adapters for the truss profile	11
6.3	Shortening truss profiles	12
6.4	Using a truss profile	13
6.5	Welding on the sleeve	14
6.6	Fastening the PV module with universal clamps	15
6.6.1	Fastening the PV module with universal clamp as end clamp, left	16
6.6.2	Fastening the PV module with universal clamp as a intermediate clamp	18
6.6.3	Fastening the PV module with universal clamp as an end clamp, right	19
6.7	Fastening the PV module with end/intermediate clamps with springs	21
6.7.1	Fastening PV module with end clamp with springs, left	22
6.7.2	Fastening PV module with intermediate clamp with springs	23
6.7.3	Fastening the PV module with end clamps with springs, right	24
6.8	Mounting the protective cap	25
6.9	Replacing the PV module	25
6.10	Integrating the system into the equipotential bonding and/or lightning protection system	27
6.11	Connect truss profiles in a lengthwise manner	29
6.12	Connecting truss profiles transversely	30
<b>7</b>	<b>Maintaining the system</b>	<b>31</b>
<b>8</b>	<b>Dismantling the system</b>	<b>32</b>
<b>9</b>	<b>Disposing of the system</b>	<b>32</b>
<b>10</b>	<b>Technical data</b>	<b>33</b>

# 1 About these instructions

## 1.1 Target group



These instructions are intended for specialists and/or instructed technical personnel (e.g. roofers, solar panel installers, engineers, architects, construction managers, mounting engineers, installation engineers), who have been trained in the mounting of photovoltaic systems and have been charged with the mounting of PV mounting systems.

Only have electrical work, such as the connection and earthing of the systems, carried out by specialist personnel with electrical training.

## 1.2 Relevance of these instructions



These instructions are based on the standards valid at the time of compilation (November 2025).

Please read the instructions carefully before commencing mounting. We will not accept any warranty claims for damage and liability caused through non-observance of these instructions.

Any images are intended merely as examples. Mounting results may look different.

## 1.3 Types of warning information



### Type of risk!

Shows a risky situation. If the warning information is not observed, then serious or fatal injuries may occur.



### Type of risk!

Shows a risky situation. If the warning information is not observed, then medium or minor injuries may occur.

**ATTENTION**

### Type of risk!

Shows a risky situation. If the warning information is not observed, then damage to the product or the surroundings may occur.

### Note!

*Indicates important information or assistance.*

## 1.4 Basic standards and regulations

- EN 62305 (VDE 0185-305)
- DIN VDE 0100-712
- EN 61643-32

## 1.5 Applicable documents

The declarations of conformity are linked to the products at [www.obo-bettermann.com](http://www.obo-bettermann.com).

## 2 Intended use

The Magic PV Flat Glue photovoltaic mounting systems for flat roofs are used for the mounting of photovoltaic modules with a height of 30–50 mm on flat roofs with a bitumen seal or sealing with plastic membranes. The roof slope must be  $\leq 3^\circ$  for roofs with bitumen covering and  $\leq 10^\circ$  for roofs with plastic covering. With roofs with an inclination of  $> 3^\circ$  or  $> 10^\circ$ , an individual case study is essential. The systems are suitable for accepting modules with widths of 992–1,134 mm and lengths of 1,640–2,112 mm. The modules are routed parallel to the roof surface. The truss profiles for the PV modules can be connected up to a maximum length of 20 m, in order to guarantee thermal separation. The mounting systems are not intended for securing people with belts or ropes during roofing work.

The mounting systems are not designed for any purpose other than the one described here. If the photovoltaic mounting systems are used for another purpose, any liability, warranty or damage claims shall be rendered null and void.

## 3 Safety

### 3.1 General safety information

Observe the following general safety information:

- It must be ensured that the planned PV system is intended for the load capacity of the roof. If necessary, consult a statics expert.
- The PV system must be matched to the local wind and snow load zones. Design only according to the planning using the OBO Construct app or a technical planner.
- Before commencing mounting, ensure that the materials such as the roof skin and insulation materials of the roof surface are suitable for accepting a PV system.
- The construction site must be protected against falling objects.
- Mounting must be carried out by at least two people.
- The people working must be protected as there is a risk of falling when working high above the ground.
- When working on the roof, care must be taken to avoid damaging the roof skin and insulation of the roof.

- Contact with electrical current can lead to an electric shock. Electrical work may only be performed by qualified specialists.
- Protective clothing must be worn as there is a danger of cutting from sharp profile edges and a risk of injuries to the eyes from flying chips when working with the angle grinder.

### 3.2 Personal protective equipment

List of personal protective equipment to be used:



Use hand protection



Wear safety shoes



Wear eye protection



Use catch protection

### 3.3 Storage

During storage, UniBase Glue sleeves FPO and BIT must be protected from sunlight, heat and moisture. During the cold season, the material must be stored at  $> 5^{\circ}\text{C}$  for at least 12 hours before processing.

## 4 Necessary tools

List of tools to be used:

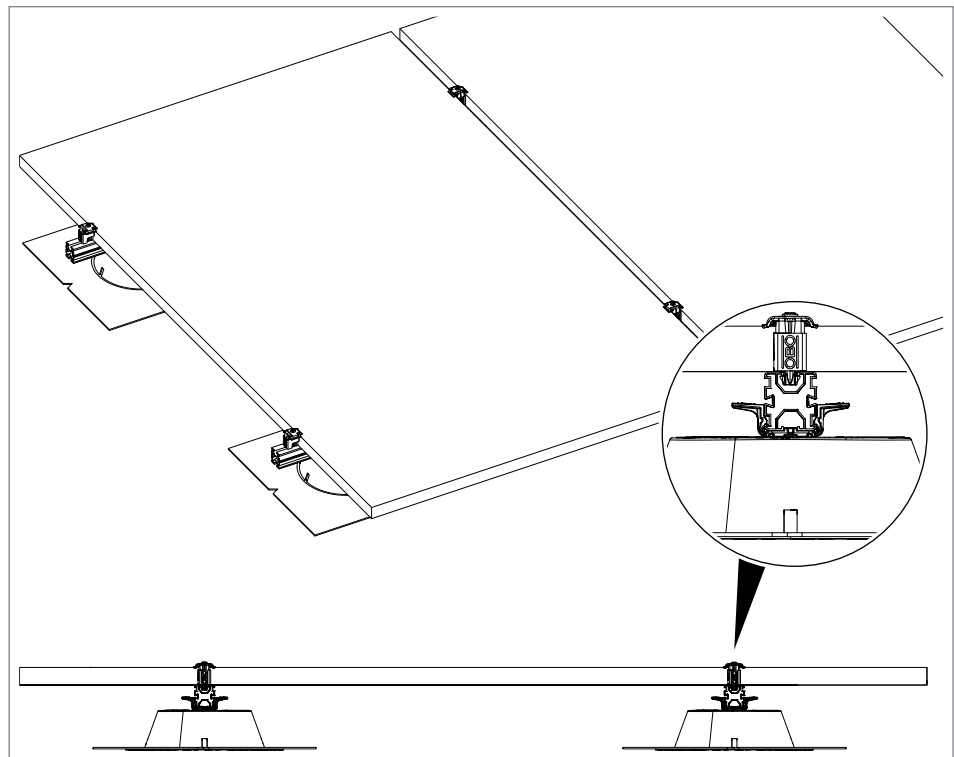
- Folding ruler/tape measure
- Chalk line
- Angle grinder
- Battery-operated screwdriver (Torx 30/40)
- Torque spanner (WAF 13)
- Screwdriver (Torx 30/40)
- Welding torch or a hot-air blower or automatic welding device (depending on whether it is a bitumen or plastic roof skin)
- Pressing roller

## 5 System overview

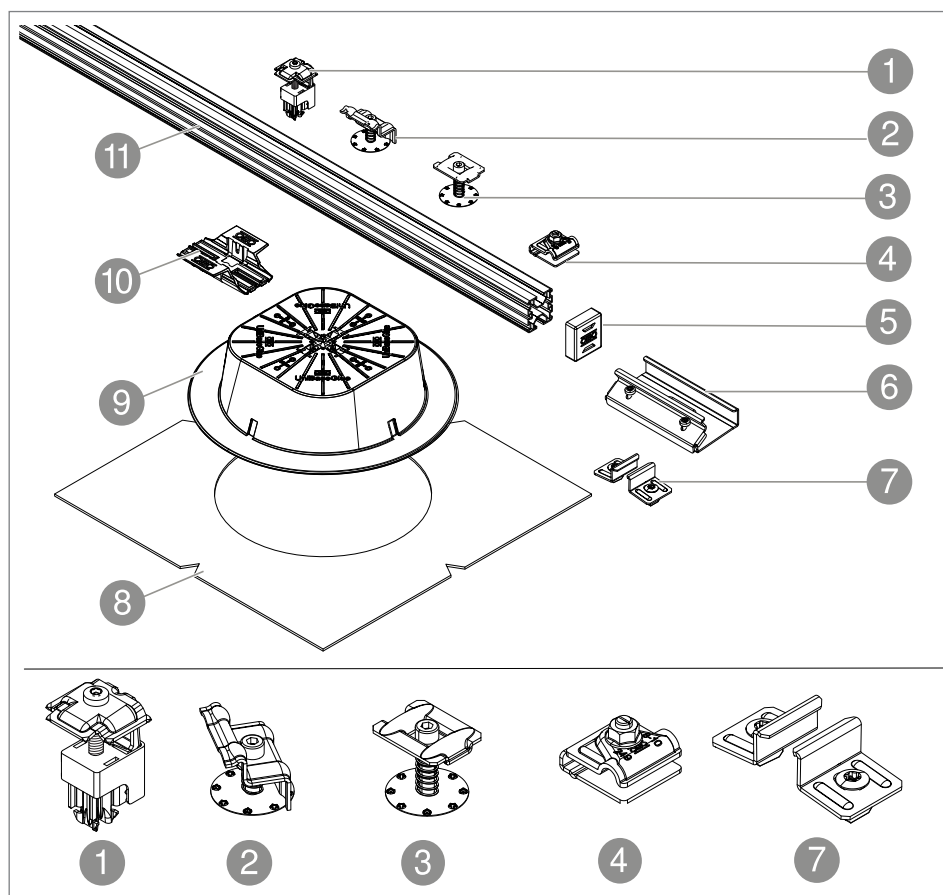
The Magic PV Flat Glue photovoltaic mounting systems (PV mounting systems) for flat roofs consist of:

- UniBase Glue universal stands (non-degassing, UV-resistant)
- Sleeves made of bitumen or plastic
- Aluminium truss profiles
- Universal clamps as end or intermediate clamps, or
- End and intermediate clamps with springs for higher load zones.

The stands are fixed to the roof using bitumen sleeves or plastic films that are welded on. The truss profiles are snapped onto the stands without screws using adapters and can be connected with straight or cross connectors. The PV modules are placed on the truss profiles. The PV modules are fastened with the universal clamps or end/intermediate clamps with springs. Fastening is done on the side at the long edges of the module as quarter-point mounting.



**Fig. 1:** Overview, system structure



**Fig. 2:** Magic PV Flat Glue system overview

	Designation	Type	Function
1	Universal clamp	KLU A2/KLU A2 S	Fastening of PV modules on truss profiles
2	End clamp with spring	KLE F 25 A2 KLE F 30 A2 KLE F 35 A2 KLE F 40 A2	Fastening of PV modules on truss profiles, suitable for high-load zones
3	Intermediate clamp with spring	KLZ F 25 A2 KLZ F 30 A2 KLZ F 35 A2 KLZ F 40 A2	Fastening of PV modules on truss profiles, suitable for high loads
4	Universal earthing terminal PV	249 PV10 6-50V2A	Creation of equipotential bonding
5	End cap	EK 45 G/ EK 45 G S	Protection against injuries and ingress of dirt
6	Straight connector	LV 45 DD	Straight connection of truss profiles
7	Cross connectors	KV 45 DD	Cross-connection of truss profiles
8	Sleeve (bitumen or plastic)	UniBase Glue Bit UniBase Glue FPO	Fixing of UniBase Glue
9	Universal base, gluing	UniBase Glue	Base for gluing for mounting systems, to support UniBase TMP adapter
10	Adapter for truss profile	UniBase TMP	Connection between stand and truss profile
11	Truss profile	TP 45/4700 ALU TP 45/4700 ALU S	Truss and mounting rail for PV modules

**Tab. 1:** Magic PV Flat Glue system overview

## 6 Mount the system

### ATTENTION

#### **Danger of breakage and function loss!**

PV modules can be lifted from below through the effect of wind. There is the danger of breakage and function loss. Maintain the spacings between the modules, as intended in the planning, along with the planned number of stands and clamps.

### 6.1 Positioning the stands with sleeves

The number and spacing of the UniBase Glue stands and the number of PV modules are specified by the roof assignment plan from the planner/statics engineer and/or the OBO Construct planning app.

The UniBase Glue stand is not bonded directly with the roof membrane, but is held in position using a welded sleeve. Depending on the roof skin, a plastic sleeve or a bitumen sleeve of a rectangular shape is welded on.

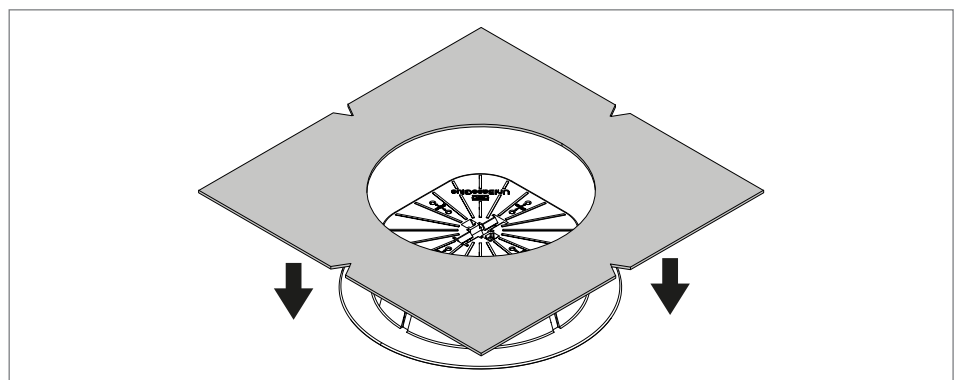
#### **Note!**

*When processing plastic sleeves, stripping and shearing tests must be carried out when starting work and the temperature, welding temperature and processing speed logged.*

1. Clean the substrate thoroughly.
2. If necessary, clean the plastic films with an appropriate cleaner, in order to remove substances impairing adhesion.
3. If necessary, grind the substrate.

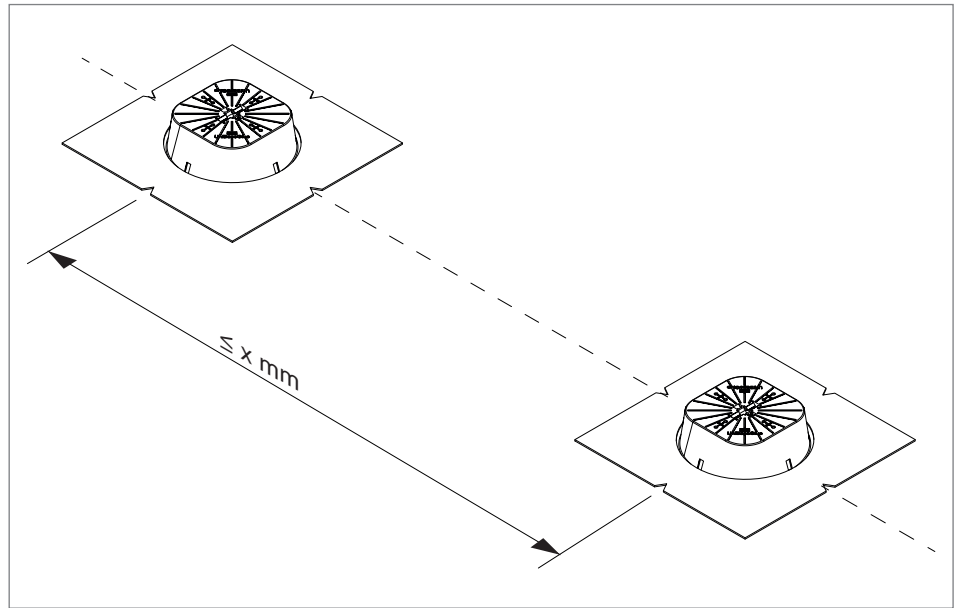
#### **Note!**

*The sleeve possesses notches, in order to align them exactly with a marked line, which can be created with a chalk line or laser, for example.*



**Fig. 3:** Attaching the sleeve

4. Place the sleeve around the stand.



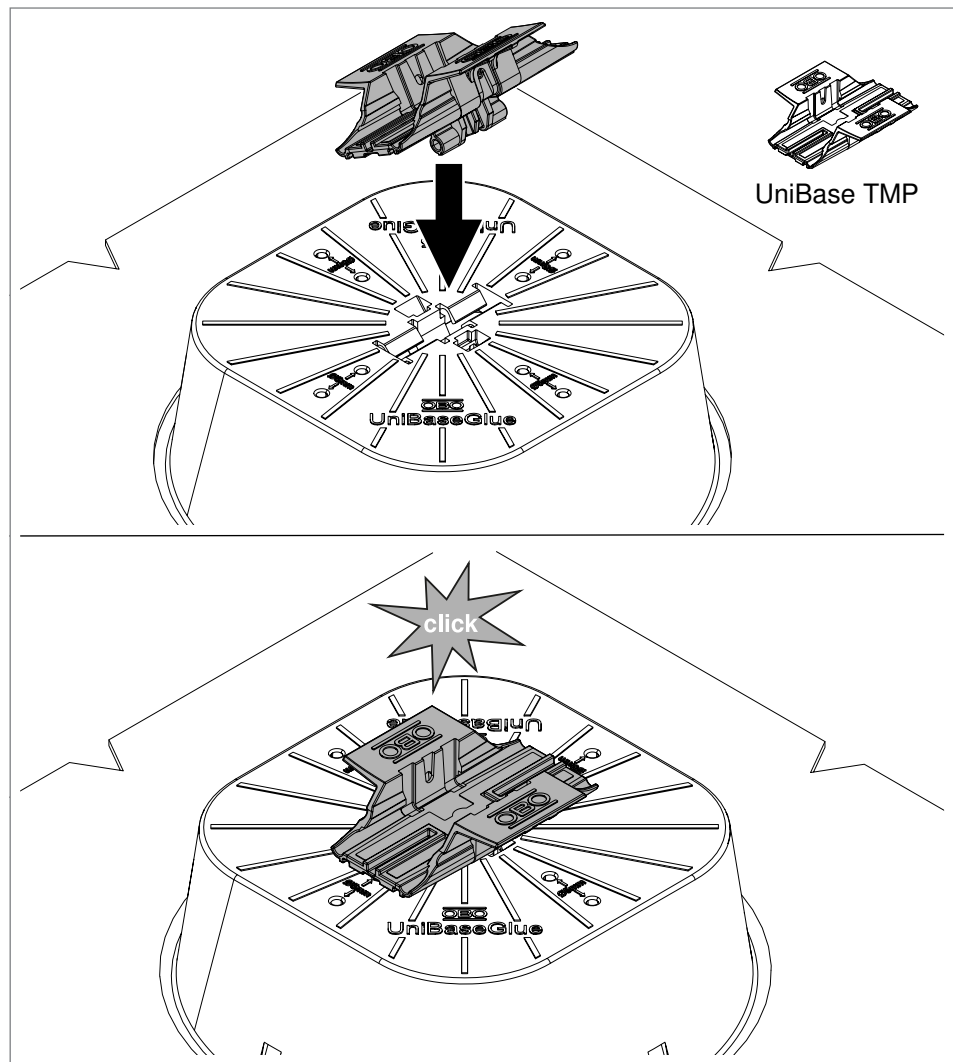
**Fig. 4:** Aligning the UniBase Glue with sleeve

5. Align stands using the notches on the sleeve and create spacings  $x$  according to roof assignment plan.

**Note!**

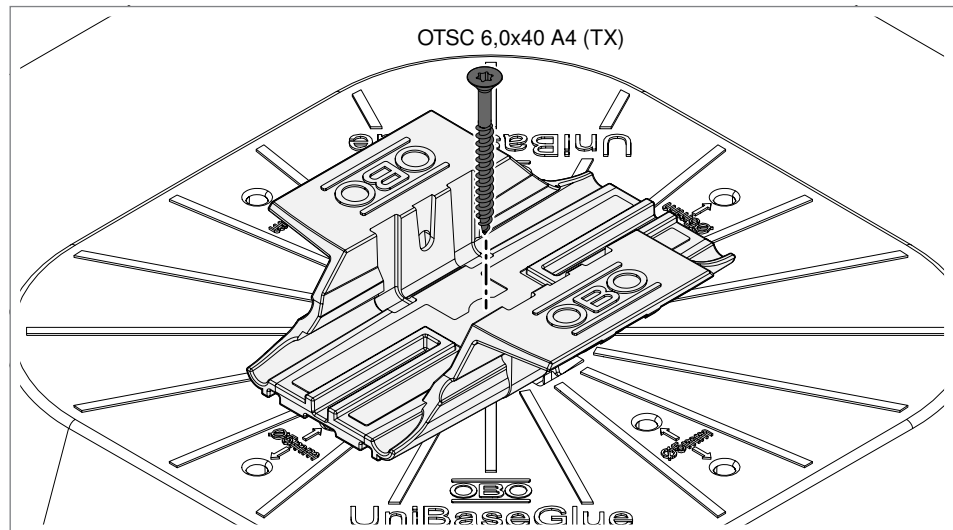
*To be able to adjust the alignment of the mounting system if necessary, the sleeves may only be welded on after the truss profiles are mounted but before the PV modules are fastened (see „6.5 Welding on the sleeve“ on page 14).*

## 6.2 Inserting adapters for the truss profile



**Fig. 5:** Inserting adapters

1. Engage the UniBase TMP adapter in the seat of the UniBase stand.
2. Engage adapters in all the other stands.



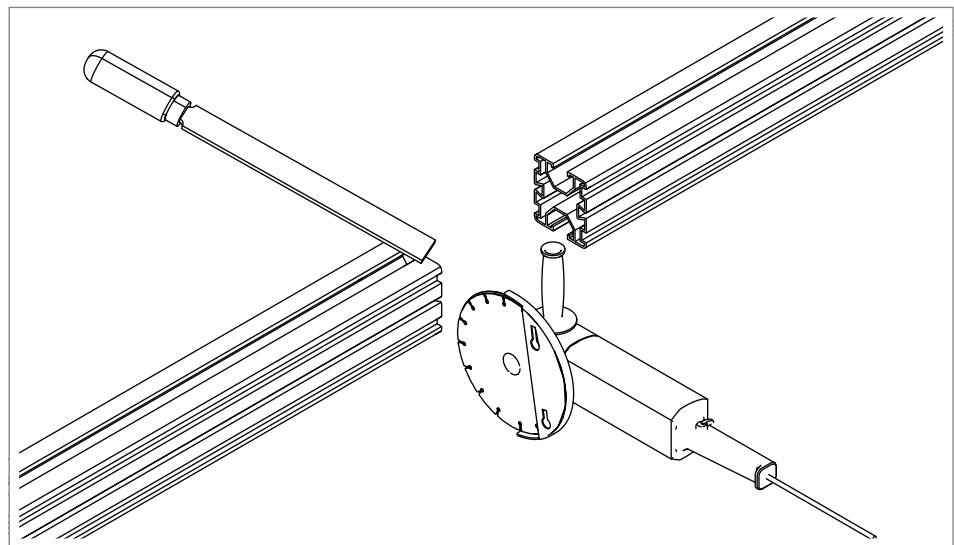
**Fig. 6:** Screwing on the adapter

3. Screw on all adapters with countersunk head screws 6.0x40, tightening torque 2 Nm.

### 6.3 Shortening truss profiles

The number and lengths of the truss profiles are specified by the roof assignment plan from the planner/statics engineer and/or the OBO Construct planning app.

It may be necessary to shorten truss profiles.

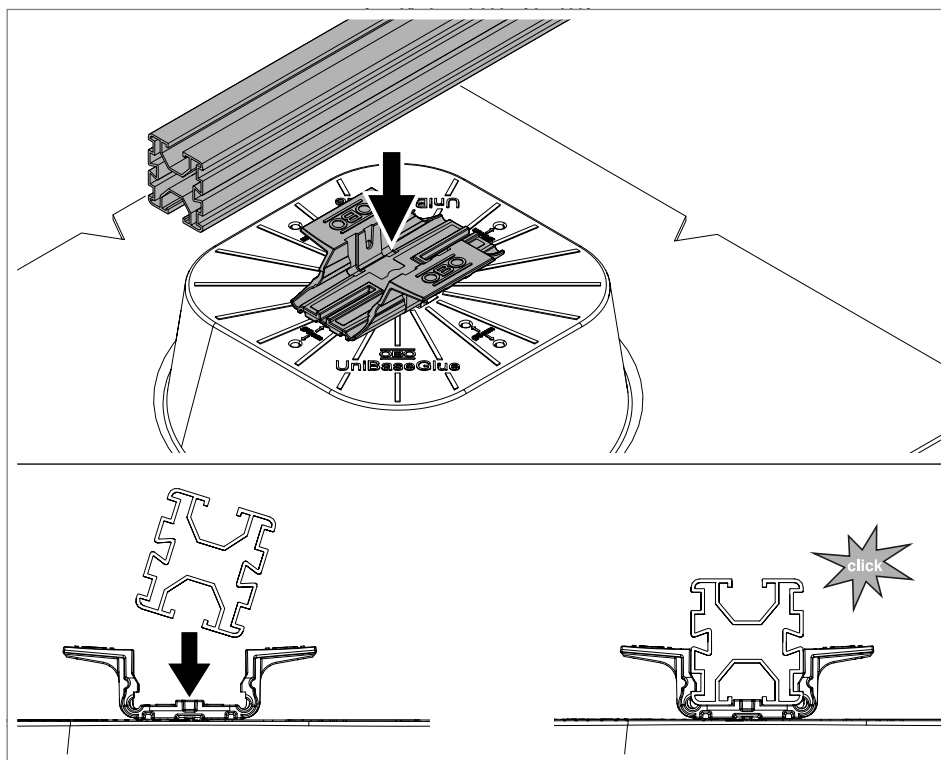


**Fig. 7:** Shortening truss profiles

1. Using an angle grinder, shorten the truss profile to the prescribed length.
2. Deburr cut edges.

## 6.4 Using a truss profile

**Note!** Before insertion, the truss profile must be positioned correctly in the straight direction, as the integrated anti-slip device in the adapter means that it can then only be moved with great difficulty.



**Fig. 8:** Using a truss profile

1. Insert the truss profile into the seat of the adapter at a slight angle and push it horizontally into the necessary position.
2. Engage the truss profile in the adapter.
3. Insert all the remaining truss profiles.
4. Connect the truss profiles at joints with straight connectors (see Chapter „6.11 Connect truss profiles in a lengthwise manner“ on page 28.

## 6.5 Welding on the sleeve

The plastic sleeve is welded on using a hot-air blower and pressing roller or with an automatic welding device. The bitumen sleeve is welded on with a welding torch and pressing roller. The following section only shows mounting with the welding torch.



**WARNING**

### Risk of fire!

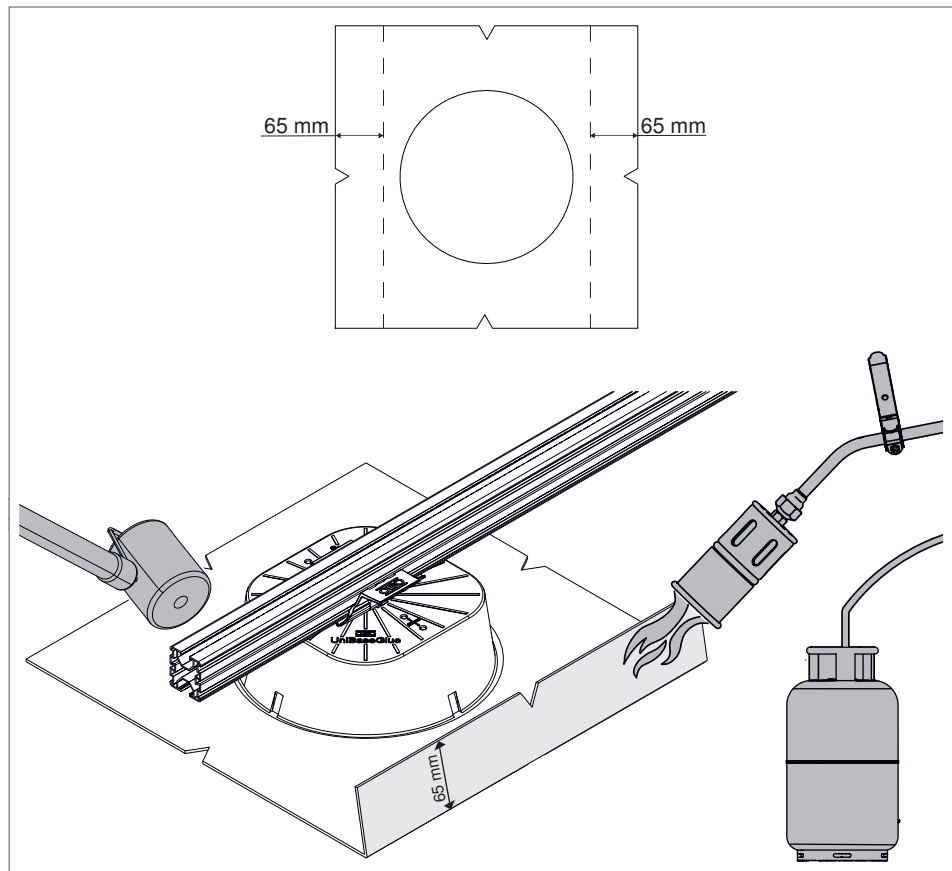
When the sleeve is welded, there is the risk of igniting the roof. Only use materials and devices suitable for the purpose and follow the manufacturer's instructions for laying and use.

### Note!

*When processing plastic sleeves, stripping and shearing tests must be carried out when starting work and the temperature, welding temperature and processing speed logged.*

### Note!

*If the statistical calculation requires, the bitumen sleeve and the plastic sleeve must be welded all-around up to the edge of the UniBase Glue. In all other cases, welding as is shown in „Fig. 9: Welding on the bitumen sleeve“ on page 14 is sufficient.*



**Fig. 9:** Welding on the bitumen sleeve

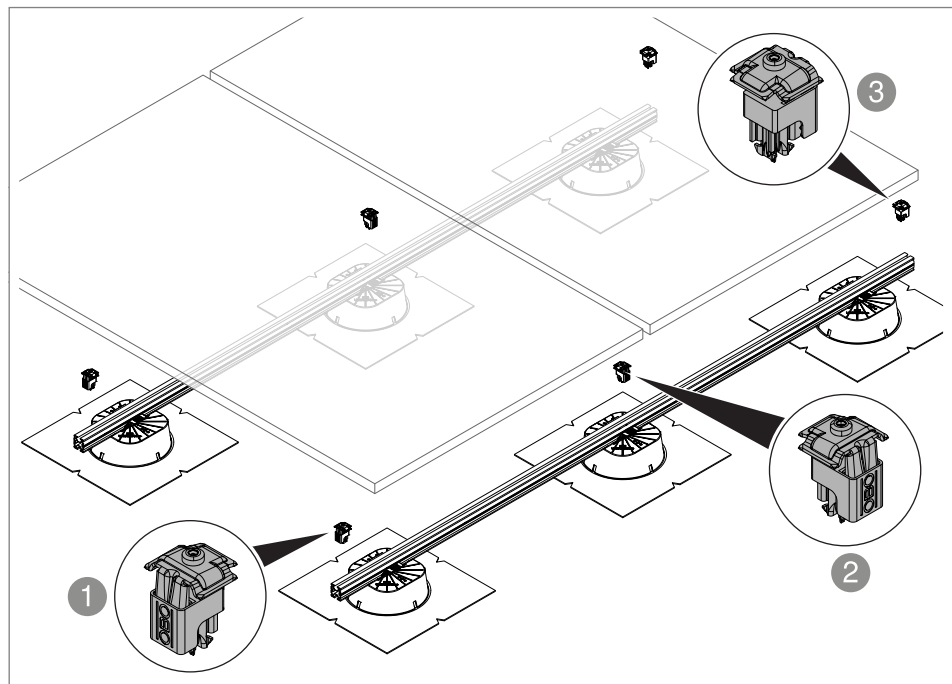
1. If necessary, align the stands with the truss profiles again.
2. Melt the underside of the sleeve to a width of 65 mm on both sides,

parallel to the truss profile, and press with a pressing roller.

3. Weld on all further sleeves.

## 6.6 Fastening the PV module with universal clamps

The PV modules are clamped at the long edges of the module with at least four universal clamps. With larger modules, six clamping points may be required, depending on the specifications of the module manufacturer. The universal clamps can be used as end clamps or as intermediate clamps between 2 modules placed next to one another.



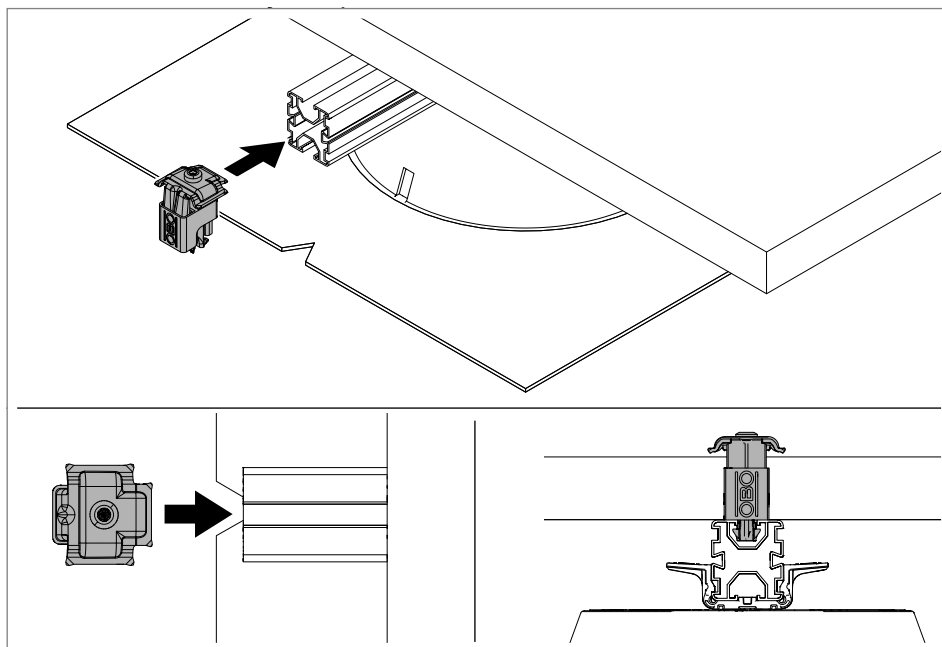
**Fig. 10:** Universal clamp uses and alignment

- 1 End clamp left
- 2 Intermediate clamp
- 3 End clamp right

## 6.6.1 Fastening the PV module with universal clamp as end clamp, left

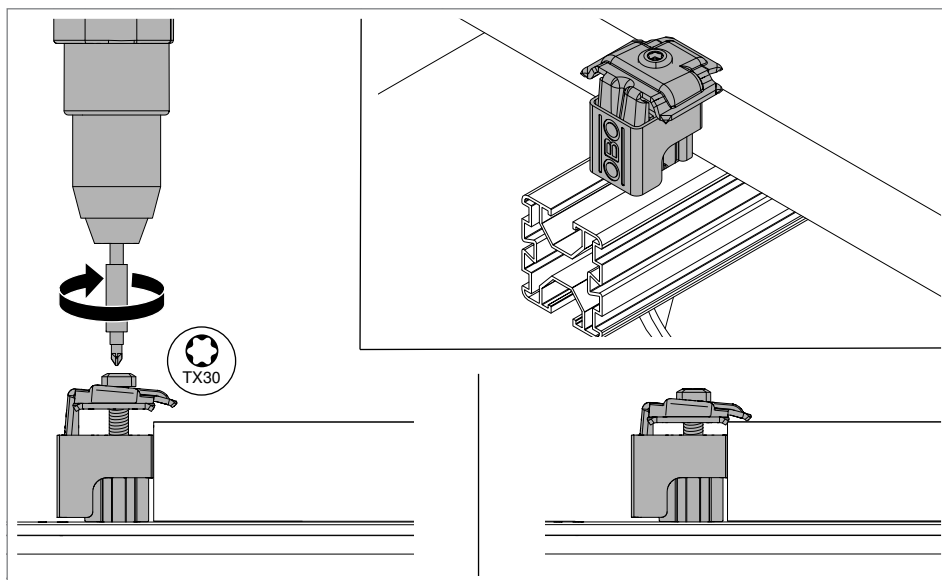
There are 2 ways to insert the universal clamp into the truss profile from the left:

### Variant 1: Slide the universal clamp into the truss profile from the left



**Fig. 11:** Sliding in the universal clamp as an end clamp from the left

1. Slide the universal clamp into the truss profile from the left. The “OBO” label points outward.

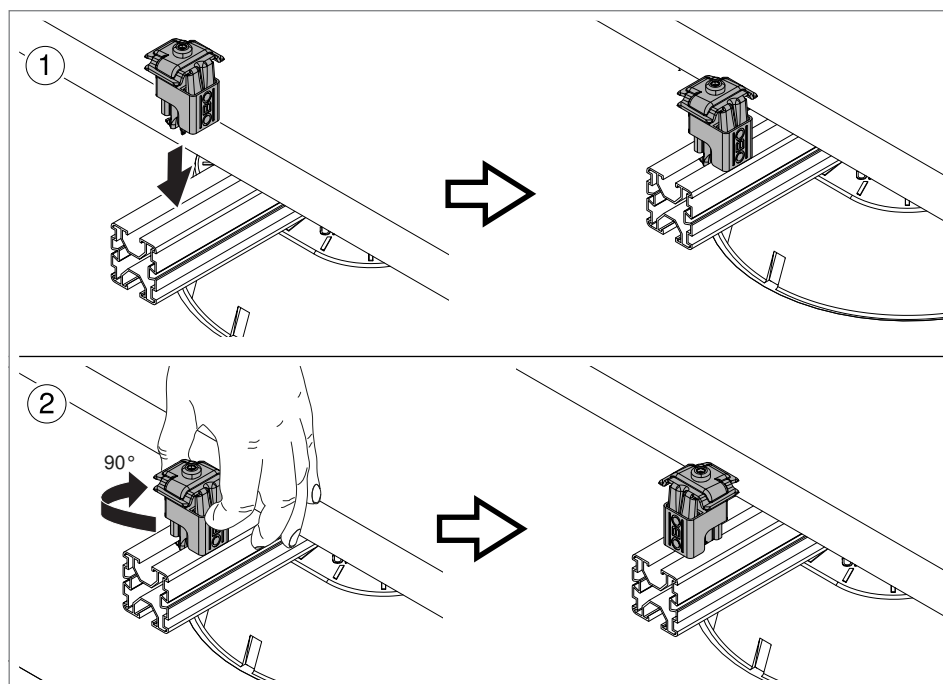


**Fig. 12:** Screwing in the universal clamp as an end clamp on the left

2. Place the PV module on the truss profiles and push it up to the universal clamp.
3. Screw the universal clamp to the outer edge of the module with 8 Nm.

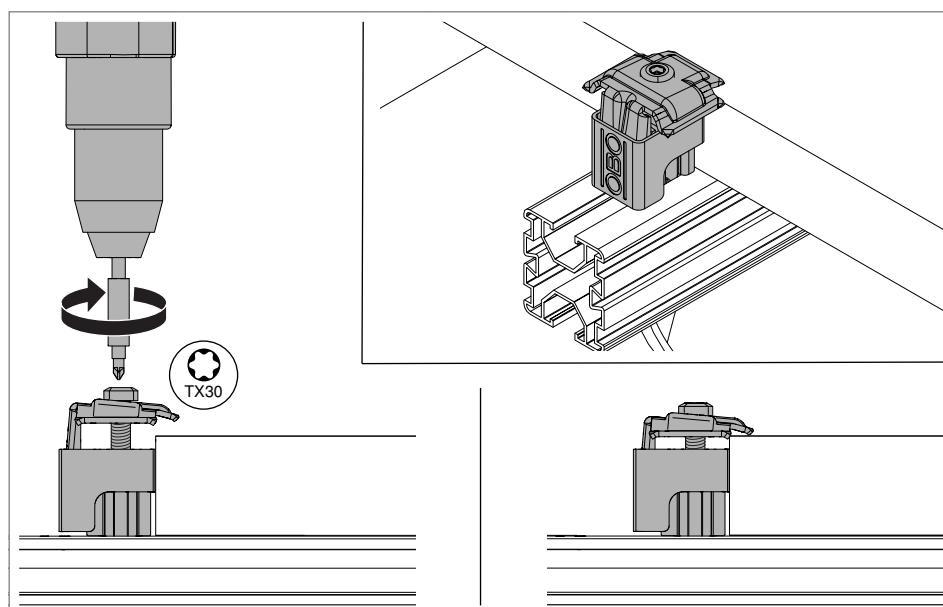
**Variant 2: Engage the universal clamp into the truss profile on the left****Note!**

*The clamps are easier to grasp and turn when wearing work gloves.*



**Fig. 13:** Engaging the universal clamp as an end clamp on the left

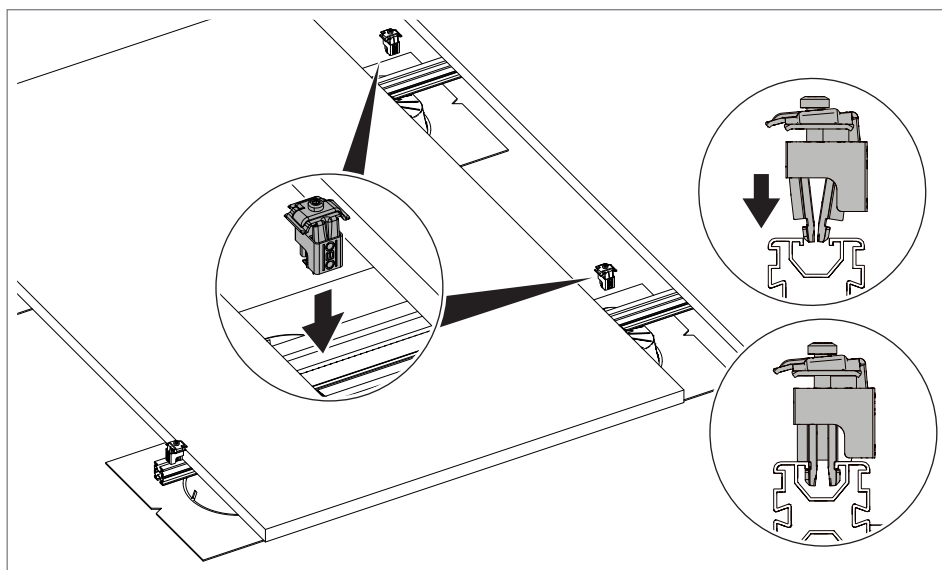
1. Engage the universal clamp into the truss profile from above. The “OBO” label points to the top or bottom edge of the module ①.
2. Rotate the universal clamp by 90° in the truss profile. The “OBO” label points outward ②.



**Fig. 14:** Screwing in the universal clamp as an end clamp on the left

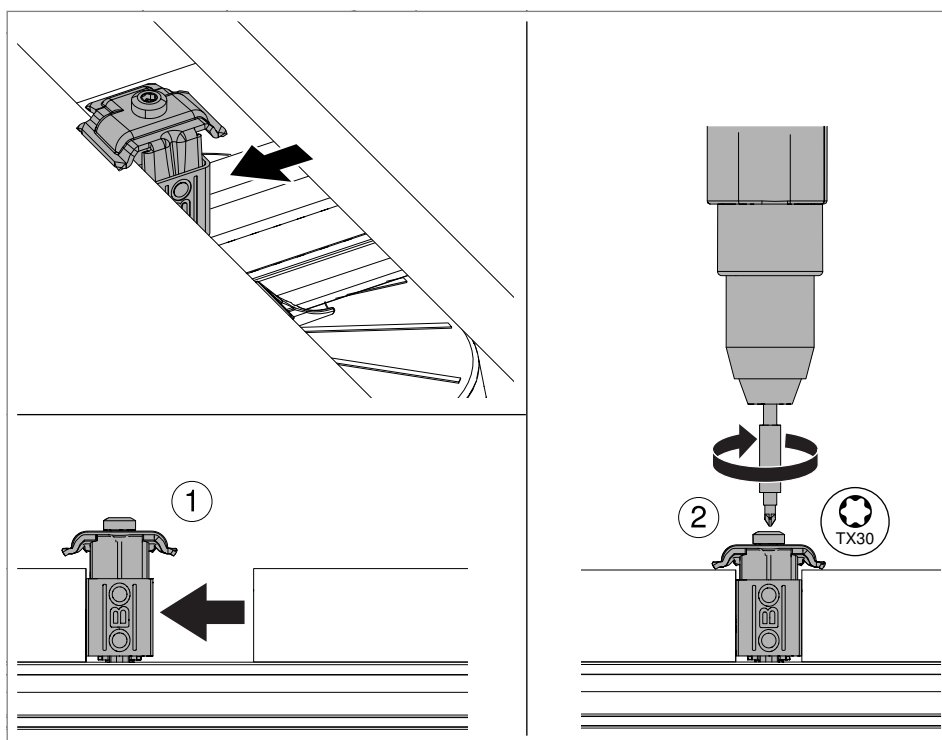
3. Place the PV module on the truss profiles and push it up to the universal clamp.
4. Screw the universal clamp to the outer edge of the module with 8 Nm.

## 6.6.2 Fastening the PV module with universal clamp as a intermediate clamp



**Fig. 15:** Inserting the universal clamp as a intermediate clamp

1. Engage the universal clamp into the truss profile from above. The “OBO” label points to the top or bottom edge of the module.
2. Push the universal clamp up to the first PV module.



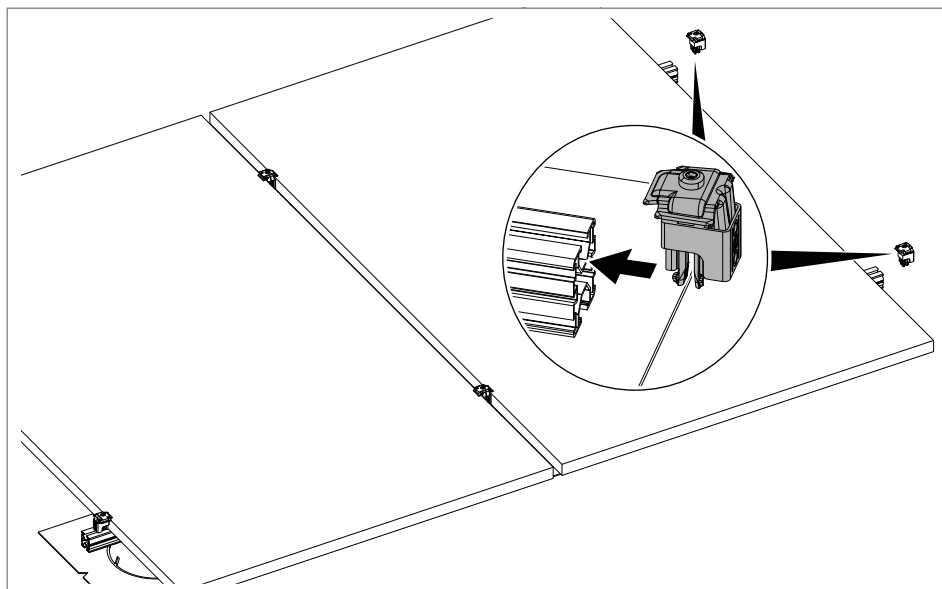
**Fig. 16:** Screwing in the universal clamp as a intermediate clamp

3. Push a second PV module up to the universal clamp ①.
4. Screw the universal clamp on with 10 Nm ②.

### 6.6.3 Fastening the PV module with universal clamp as an end clamp, right

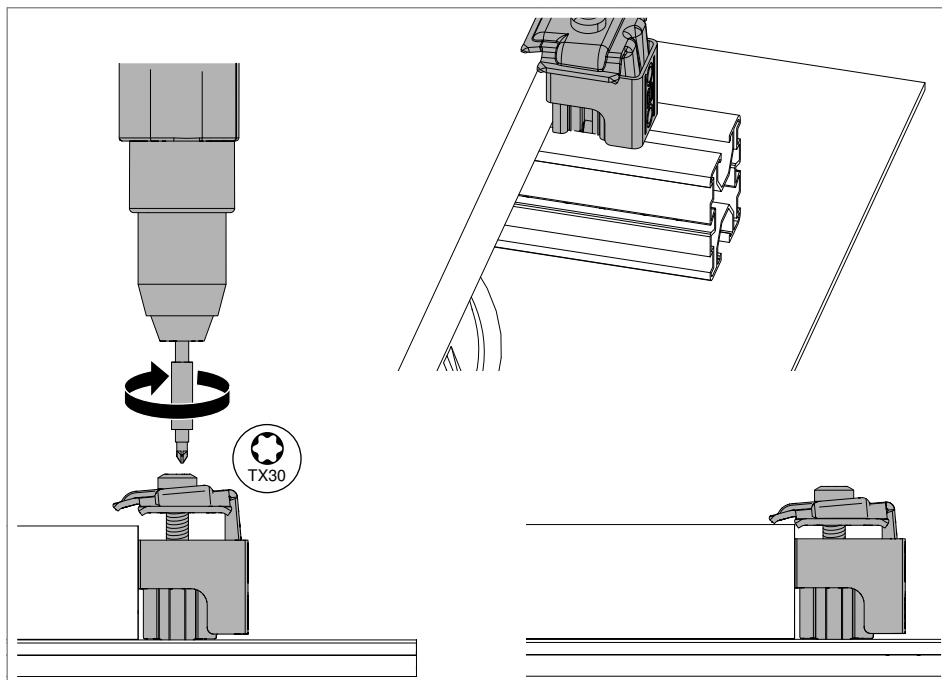
There are 2 ways to insert the universal clamp into the truss profile from the right:

#### Variant 1: Slide the universal clamp into the truss profile from the right



**Fig. 17:** Sliding in the universal clamp as an end clamp from the right

1. Slide the universal clamp into the truss profile from the right. The “OBO” label points outward.



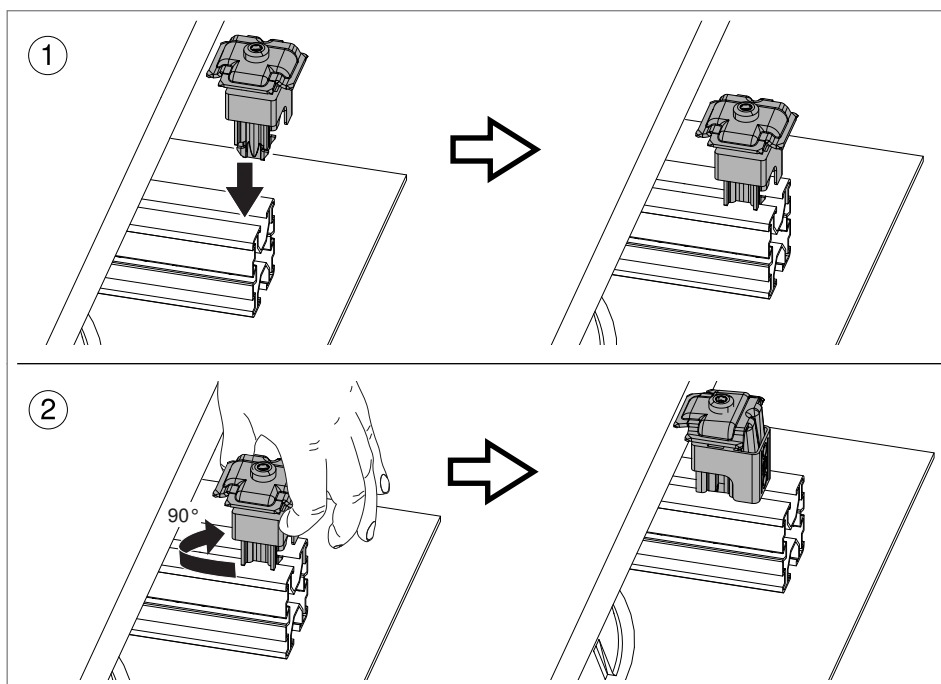
**Fig. 18:** Screwing in the universal clamp as an end clamp on the right

2. Place the PV module on the truss profiles and push it up to the universal clamp.
3. Screw the universal clamp to the outer edge of the module with 8 Nm.

### Variant 2: Engage the universal clamp into the truss profile on the right

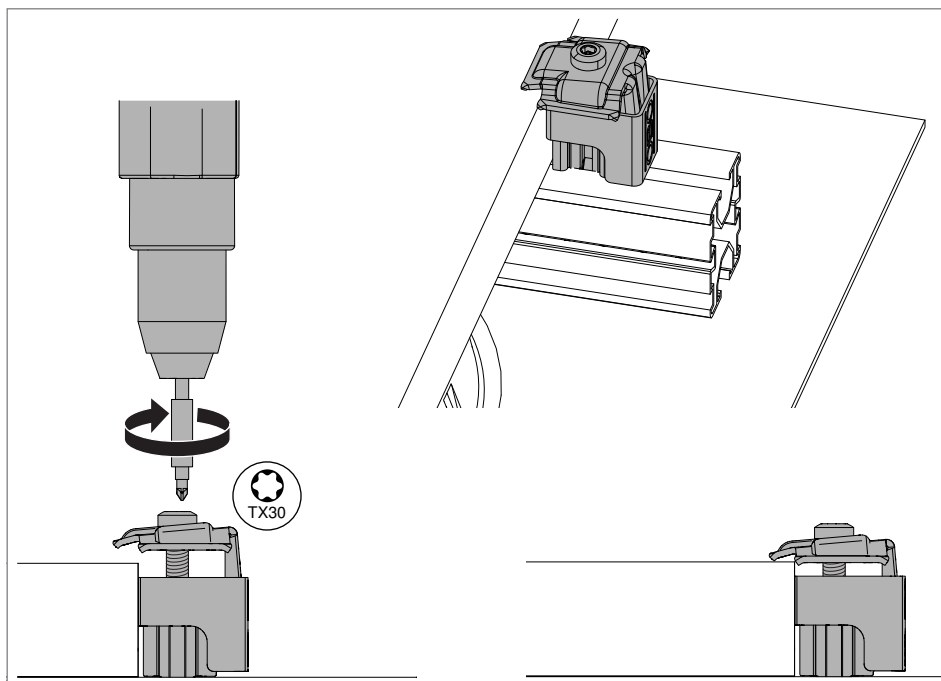
**Note!**

*The clamps are easier to grasp and turn when wearing work gloves.*



**Fig. 19:** Engaging the universal clamp as an end clamp on the right

1. Engage the universal clamp into the truss profile from above. The “OBO” label points to the top or bottom edge of the module ①.
2. Rotate the universal clamp by 90° in the truss profile. The “OBO” label points outward ②.



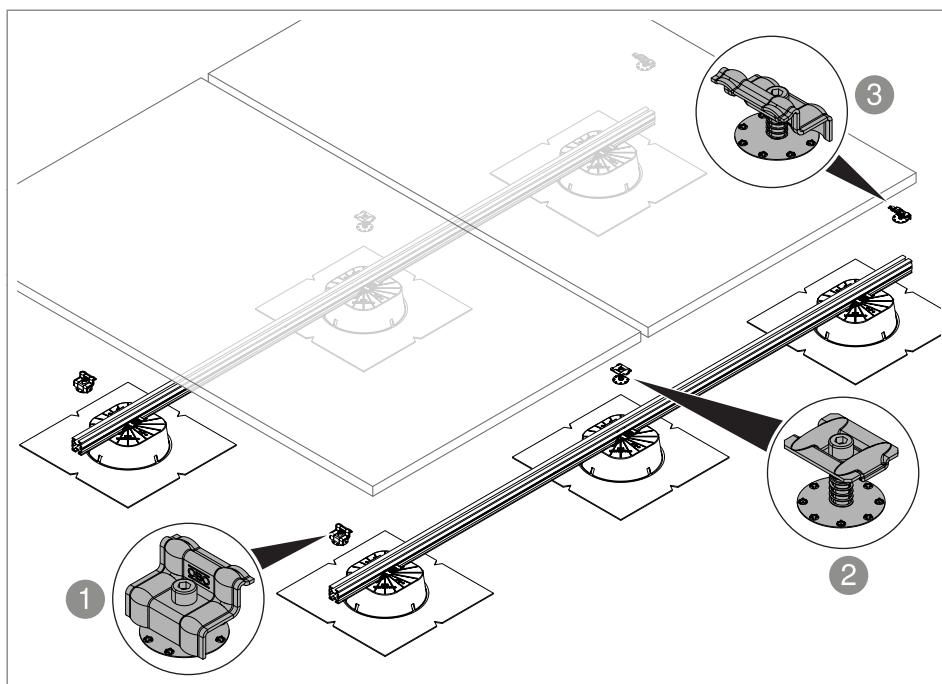
**Fig. 20:** Screwing in the universal clamp as an end clamp on the right

3. Place the PV module on the truss profiles and push it up to the universal clamp.

4. Screw the universal clamp to the outer edge of the module with 8 Nm.

## 6.7 Fastening the PV module with end/intermediate clamps with springs

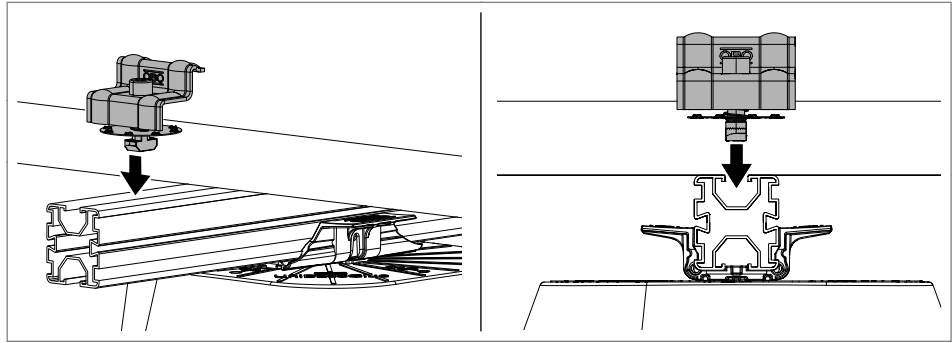
The end clamps and intermediate clamps with springs offer a higher pressure surface and are used for higher snow and wind loads. The finished teeth on the connection plate press into the aluminium frame of the PV module, offering additional support. The PV modules are clamped at the long edges of the module with at least four clamps with springs. The clamps have slide nuts that are inserted in the truss profiles and engaged. With larger modules, six clamping points may be required, depending on the specifications of the module manufacturer.



**Fig. 21:** Uses, clamps with springs

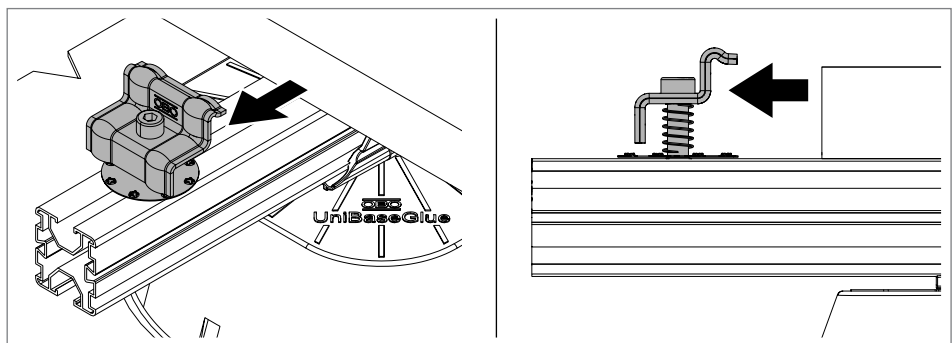
- ① End clamp with spring left
- ② Intermediate clamp with spring
- ③ End clamp with spring right

### 6.7.1 Fastening PV module with end clamp with springs, left



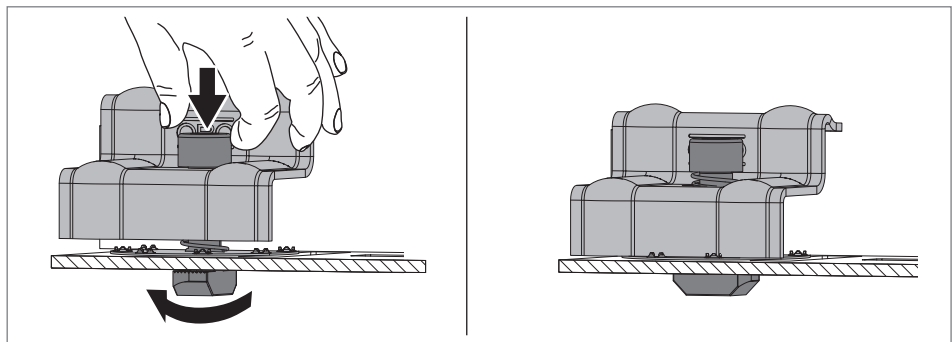
**Fig. 22:** Inserting the end clamp in the truss profile

1. Insert the slide nuts of the end clamp into the truss profile.



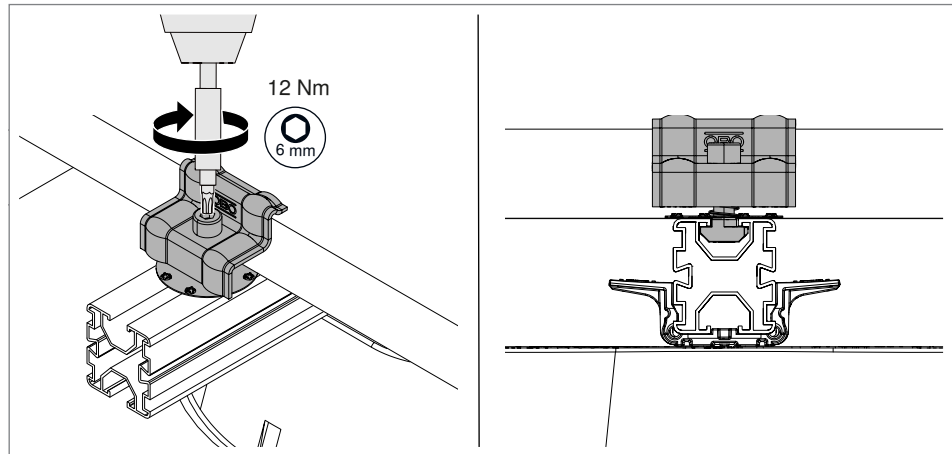
**Fig. 23:** Pushing module up to the end clamps

2. Push the PV module up to the end clamp.



**Fig. 24:** Engaging the slide nut

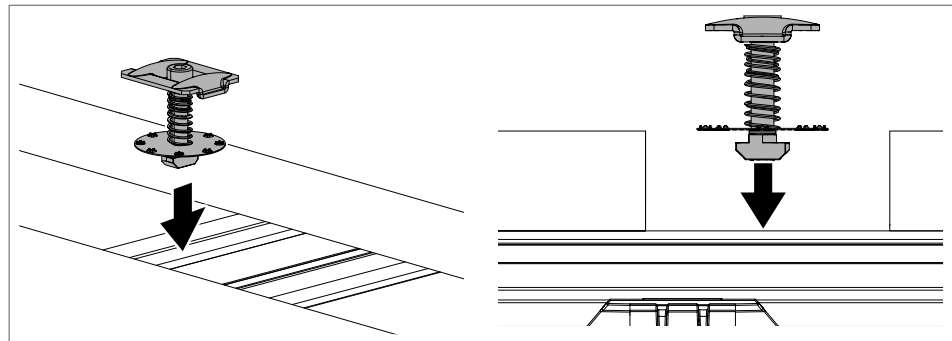
3. Press down lightly on the screw with spring and turn until the slide nut engages.



**Fig. 25:** Tightening the end clamp screw

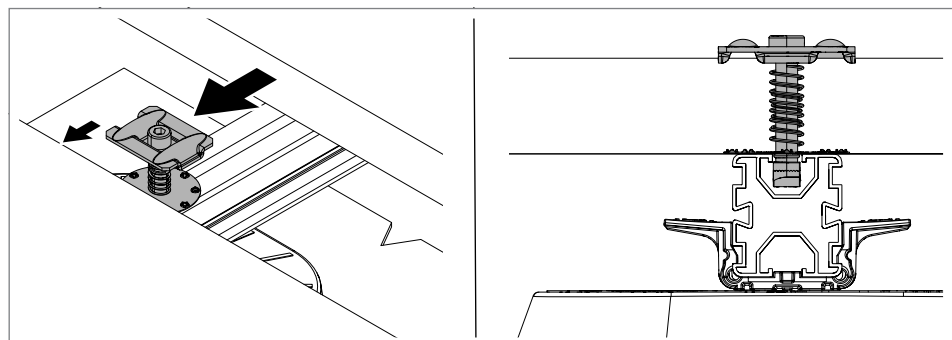
4. Tighten the screw with 12 Nm.

### 6.7.2 Fastening PV module with intermediate clamp with springs



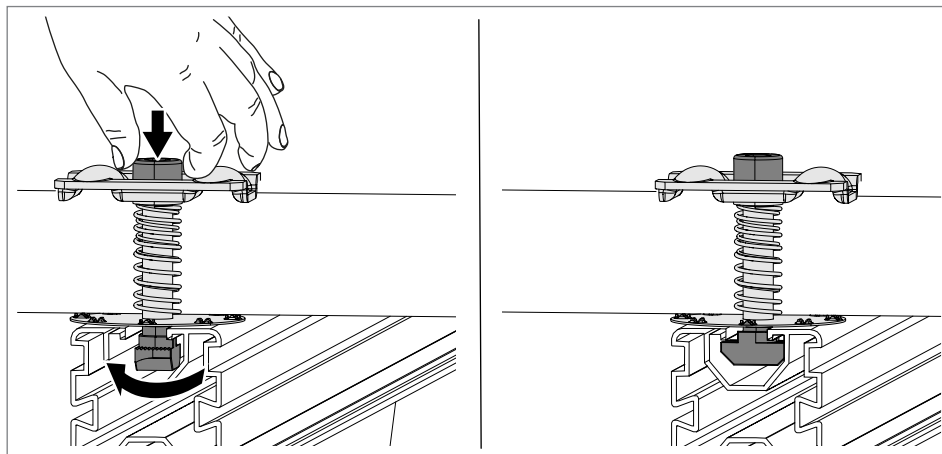
**Fig. 26:** Inserting the intermediate clamp into the truss profile

1. Insert the slide nuts of the intermediate clamp into the truss profile.



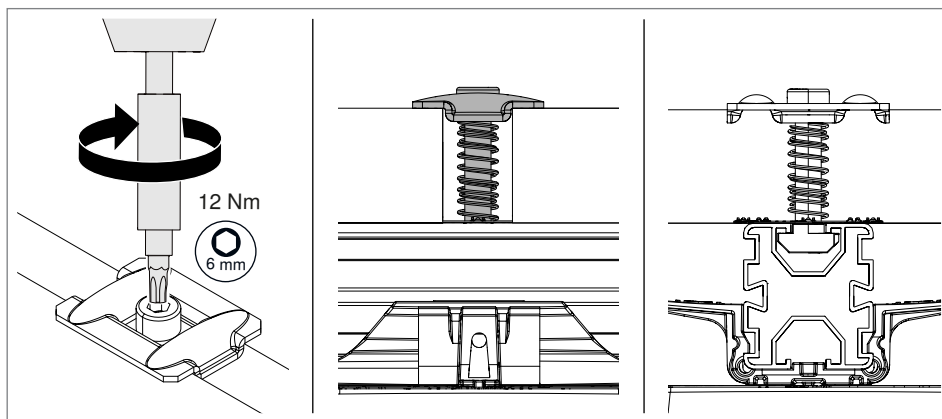
**Fig. 27:** Pushing module up to the intermediate clamps

2. Push the intermediate clamp up to the first module.
3. Push additional PV module up to the intermediate clamp.



**Fig. 28:** Engaging the slide nut

4. Press down lightly on the screw with spring and turn until the slide nut engages.



**Fig. 29:** Tightening the intermediate clamp screw

5. Tighten the screw with 12 Nm.

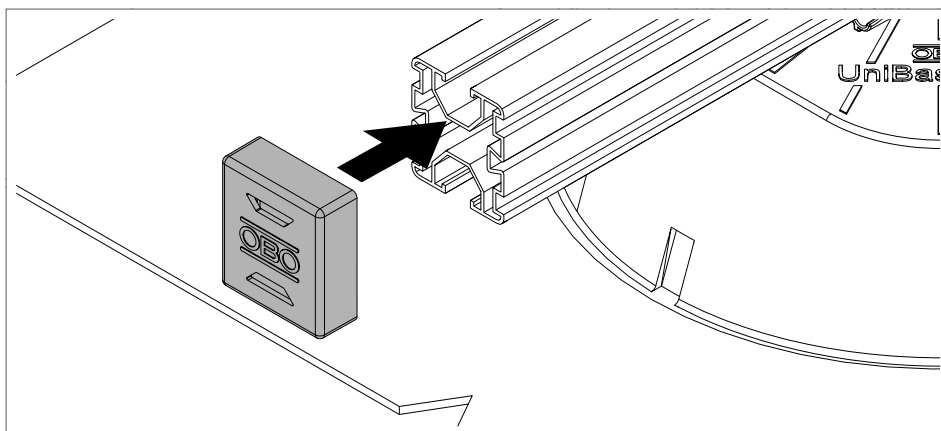
### 6.7.3 Fastening the PV module with end clamps with springs, right

See also chapter „6.7.1 Fastening PV module with end clamp with springs, left“ on page 22.

1. Insert the end clamp into the truss profile.
2. Push the end clamp up to the module.
3. Press down lightly on the screw with spring and turn until the slide nut engages.
4. Tighten the screw with 12 Nm.

## 6.8 Mounting the protective cap

As protection against injuries and the ingress of dirt, the ends of the truss profiles are closed off with protective caps.

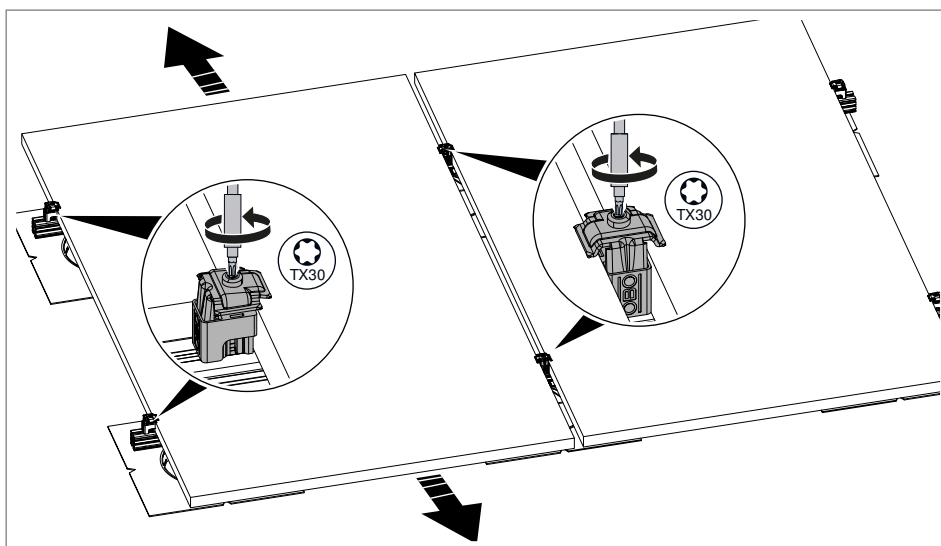


**Fig. 30:** Mounting the protective cap

1. Attach the protective cap at the open end of the truss profile and press it in.

## 6.9 Replacing the PV module

The following only shows the replacing of the PV module fastened with universal clamps. If the modules are fastened with end/intermediate clamps with springs, the screws of the clamps are unscrewed in the same way and the PV module removed accordingly.



**Fig. 31:** Replacing the PV module

1. Loosen the clamps slightly.
2. Slide the PV module forward or back to replace it.
3. Push in the new PV module.
4. Fasten the clamps with the specified tightening torque again.

## 6.10 Integrating the system into the equipotential bonding and/or lightning protection system

To ensure the safety of the PV system, it must be integrated into the equipotential bonding system. If the risk analysis according to DIN EN 62305-2 requires an external lightning protection system for the building, and if the separation distance between the PV system and the lightning protection system cannot be maintained, then both of these systems must be interconnected so that they can carry lightning current.

The universal earthing clamp can be used for both applications. The individual truss profiles must be interconnected, in order to guarantee continuous, low-ohmic equipotential bonding.

A round conductor of  $\varnothing 8\text{--}10\text{ mm}$  and/or an equipotential bonding conductor of  $6\text{--}50\text{ mm}^2$  can be mounted on the universal earthing clamp.

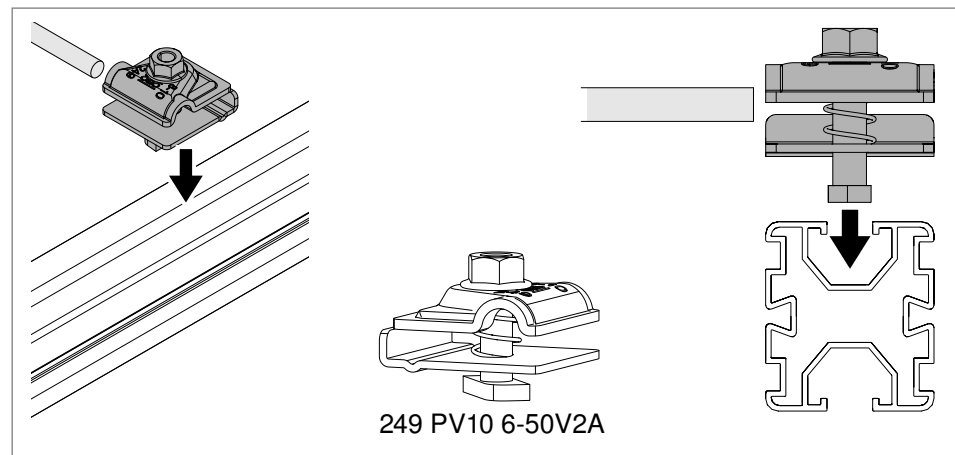


**WARNING**

### Risk of electric shock!

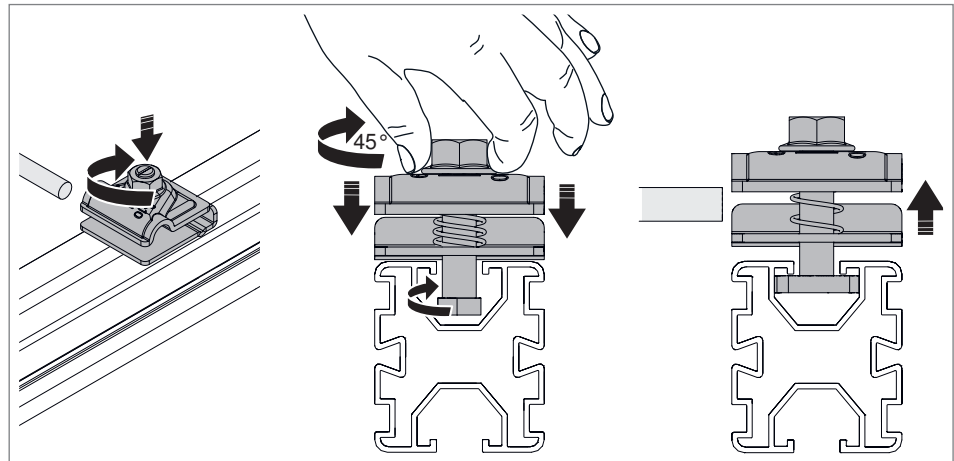
In the event of a lightning strike in the lightning protection system, lethal voltages can occur in the system. Do not work on the lightning protection system during a thunderstorm or if there is the risk of one.

1. If the truss profile is anodised, then the anodisation must be scratched off in the area of the universal earthing clamp, so that a low-ohmic contact between the truss profile and the earthing clamp is guaranteed.



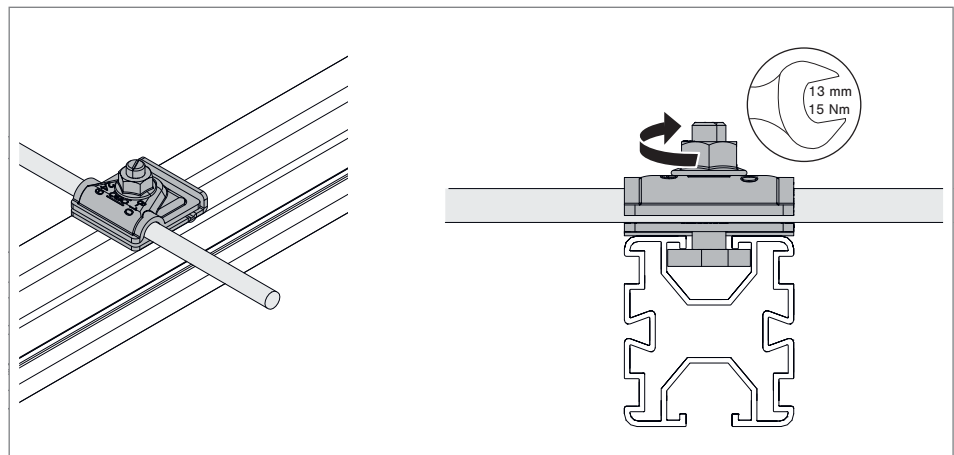
**Fig. 32:** Inserting the universal earthing clamp in the truss profile

2. Insert the hammerhead bolt of the universal earthing clamp in the truss profile.



**Fig. 33:** Engaging the hammerhead bolt in the truss profile

3. Push the hammerhead bolt with spring downwards, turn it through 45° and release it. In so doing, ensure that the hammerhead is firmly engaged in the truss profile.



**Fig. 34:** Mounting the conductor in the universal earthing clamp

4. Insert the round conductor and/or equipotential bonding conductor.
5. Tighten the nut of the clamp with 15 Nm.

## 6.11 Connect truss profiles in a lengthwise manner

Truss profiles can be connected lengthwise using straight connectors of type LV 45 DD.

### ATTENTION

#### Risk of damage due to thermal expansion!

If too many truss profiles are connected lengthwise, this may result in excessive thermal expansion of the profiles. In turn, this may result in system instability and damage to the roof skin.

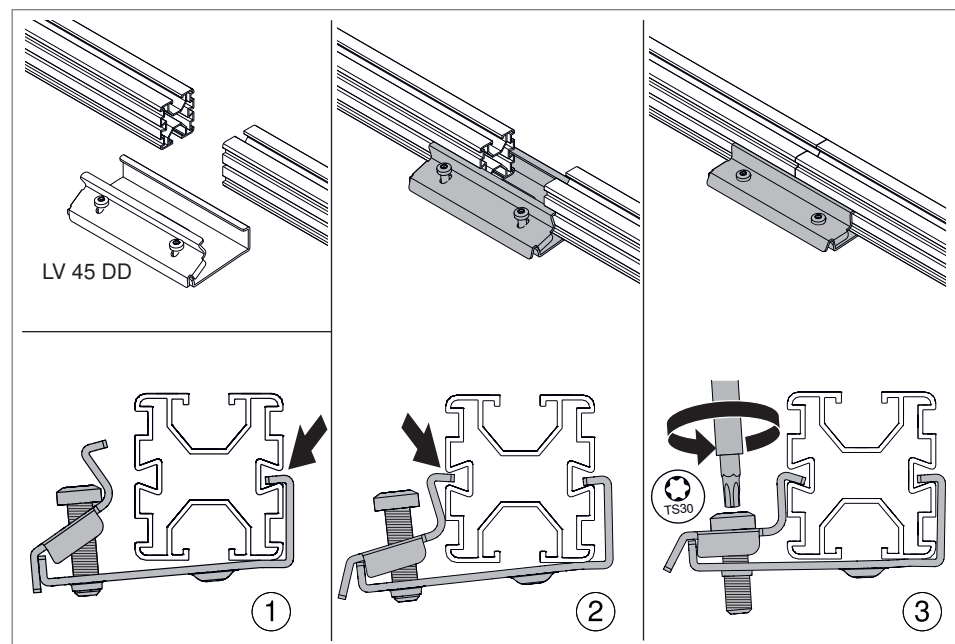
- Only connect truss profiles up to a maximum length of 20 m.
- Maintain minimum distance of 50 mm between 2 truss profiles that are not connected lengthwise.

#### Note!

*Straight connectors may not be mounted in the area of the stands, to avoid obstruction of the correct insertion of the truss profile in the adapter.*

#### Note!

*Truss profiles must have at least 2 support points, even if they are connected using straight connectors.*



**Fig. 35:** Mounting a straight connector

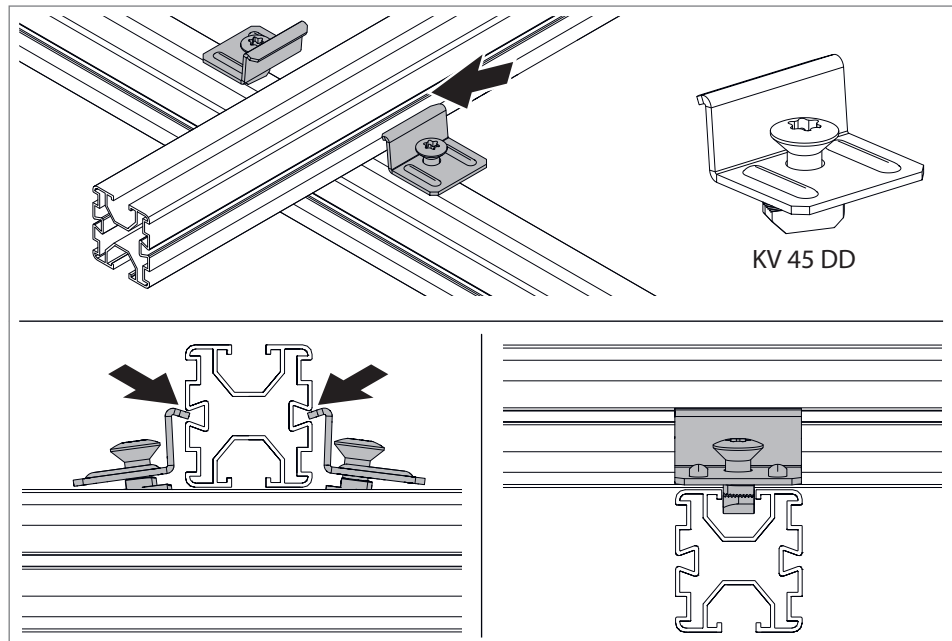
1. Insert straight connectors in the groove on one side of the truss profiles ①. The butt of the truss profile must be located in the centre of the straight connector.
2. Hook the variable piece of the straight connector into the truss profiles ②.
3. Tighten the screws on the straight connector with 6 Nm ③.

#### Note!

*Alternatively, the truss profiles can also be pushed into the straight connectors and the screws then tightened.*

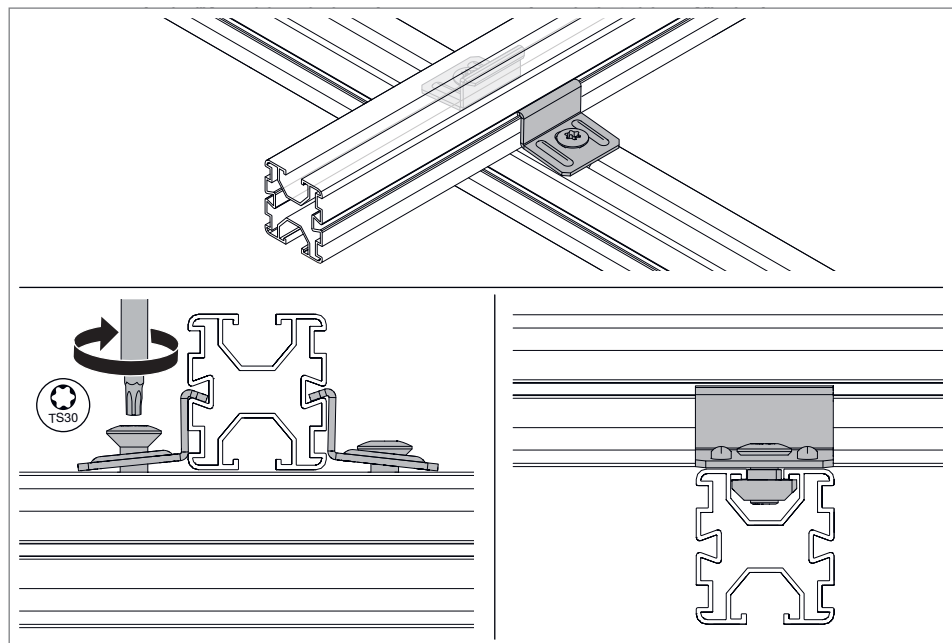
## 6.12 Connecting truss profiles transversely

Truss profiles can be connected transversely using cross connectors of type KV 45 DD.



**Fig. 36:** Inserting cross connectors

1. Insert cross connectors with slide nuts into the lower truss profile.
2. Hook the cross connectors into the transverse truss profile.



**Fig. 37:** Screwing on the cross connectors

1. Tighten the screws on the cross connectors with 6 Nm.

# 7 Maintaining the system

The PV mounting systems must be maintained once a year. Maintenance includes a visual inspection as well as the testing of different system components, repairing damage and removing impurities. Cleaning has to be performed more frequently, see “Clean the system”.

### Visual inspection of the system

- Repair any obvious damage such as corrosion, deformations or cracks.
- Tighten the module fastenings, such as loose screws or clamps.
- Repair or replace worn materials, e.g. seals or fastenings.

### Check the fastening system

- Check the stability and secure positioning of the support structure and repair if necessary.
- Check the tightening torque of screws, nuts and connection elements and tighten if necessary.
- Check the wind and snow load protection and repair or replace if necessary.

### Check the seals and corrosion protection

- Check the roof seal in the area of the fastening points and repair or replace if necessary.
- Identify any potential water entry points and seal if necessary.
- Check corrosion protection and repair if necessary.

### Check the electrical components

- Perform a visual inspection of the cable paths and plug connections and repair if necessary.
- Repair any damage due to UV radiation, animals or mechanical loads.
- Ensure proper earthing of the mounting system.

### Clean the system

- Eliminate any impurities from the modules that can negatively affect performance at least 2x per year. In industrial areas, on busy roads or in locations with high levels of dust, leaves or bird activity, the modules have to be cleaned up to 4x a year.
- If necessary, remove dirt and leaves from the support structure.

## 8 Dismantling the system

The PV mounting systems are generally dismantled in the reverse order to the mounting. The following has to be considered:

- The universal clamp can be removed from the side of the truss profile.
- The truss profile can be removed from the UniBase TMP adapter by bending the wing on one side of the adapter.
- The UniBase TMP adapter cannot be dismantled.
- To remove the stand, the sleeve has to be cut open. The roof skin must not be damaged in the process.
- The welded-on sleeve cannot be dismantled.

## 9 Disposing of the system



Comply with the local waste disposal regulations.

- Metal parts: As scrap metal
- Plastic parts/accessories: As plastic
- Packaging: As household waste/as metal (depending on packaging type)

## 10 Technical data

Designation	Type	Dimension mm	Material/surface	Item number
Truss profile, for flat-/pitched-roof system	TP 45/4700 ALU	40 x 45 x 4,700	Aluminium	5900410
Truss profile, for flat-/pitched-roof system	TP 45/4700 ALU S	40 x 45 x 4,700	Aluminium, black	5900412
Universal base, gluing	UniBase Glue	Ø 314 x 79	Acrylnitrile-styrene-acrylate (ASA)	5403395
Adapter for truss profile	UniBase TMP	110 x 90 x 41	Acrylnitrile-styrene-acrylate (ASA)	5403397
Universal clamp, for flat-/pitched-roof system	KLU A2	41 x 42 x 79	Stainless steel A2	5901010
Universal clamp, for flat-/pitched-roof system	KLU A2 S	41 x 42 x 79	Stainless steel A2 black	5901012
End clamp with spring	KLE F 25 A2	56x46x48	Stainless steel A2	5901092
	KLE F 30 A2	56x46x53		5901093
	KLE F 35 A2	56x46x58		5901094
	KLE F 40 A2	56x46x63		5901095
Intermediate clamp with spring	KLZ F 25 A2	50x40x48	Stainless steel A2	5901062
	KLZ F 30 A2	50x40x53		5901063
	KLZ F 35 A2	50x40x58		5901064
	KLZ F 40 A2	50x40x63		5901065
Universal earthing terminal PV	249 PV10 6-50V2A	43 x 40 x 34	Stainless steel A2	5051520
End cap for truss profile	EK 45 G	44 x 49 x 16	Polyethylene grey	5901722
End cap for truss profile	EK 45 S	44 x 49 x 16	Polyethylene black	5901720
Straight connector for truss profile	LV 45 DD	40 x 69 x 150	Steel double dip	5901210
Cross connector for truss profiles	KV 45 DD	30 x 40 x 40	Steel double dip	5901250
Bitumen sleeve	UniBase Glue Bit	444 x 444	Bitumen	5403410
Plastic sleeve	UniBase Glue FPO	444 x 444	Flexible Polyolefin (FPO)	5403412
Chipboard screw, Torx, countersunk head	OTSC 6.0x40 A4	6 x 40	Stainless steel	3191082



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**Building Connections**

