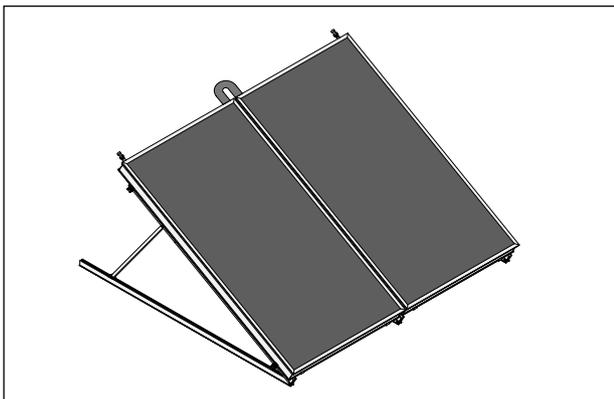


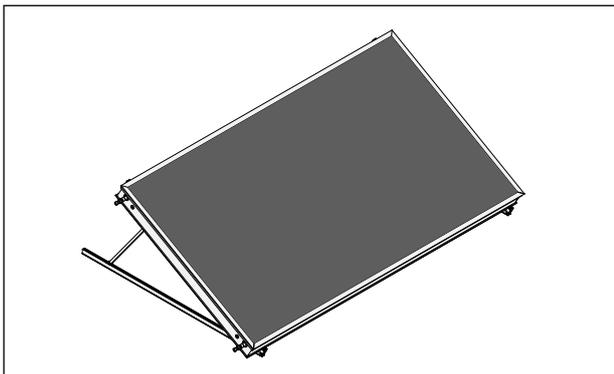
OKF – Freestanding installation, vertical, basic set:
item no. 136 12 86

OKF – Freestanding installation, vertical, extension set:
item no. 136 12 87

OKF – Freestanding installation, horizontal:
item no. 136 13 86



Vertical installation



Horizontal installation

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Read installation and operating instructions carefully before installing the collector.

The installation and operating instructions have to remain with the user of the system.

1 General information

1.1. Information regarding operating instructions

These installation instructions give important advice as to the handling of the collectors. The observance of all mentioned safety notes and instructions is paramount for safe working conditions. These operating instructions are to be read carefully before working at or with the collector, especially before initial operation! The instructions should remain with the Regusol station or the storage cylinder so that they are always at hand.

1.2 Symbol explanation

Safety guidelines are displayed by symbols. These guidelines are to be observed to prevent accidents, damage to property and malfunctions.



WARNING!

Signalizes that nonobservance of guidelines may result in injuries or death.



ATTENTION!

Emphasises danger which may cause damage to the appliance.



NOTE!

Emphasises suggestions and other useful information of operating instructions.

1.3 Liability

The manufacturer does not accept liability for damages or malfunctions caused by nonobservance of the operating instructions.

1.4 Copyright

The operating instructions are confidential. They are exclusively for persons dealing with the collector. Transfer of the operating instructions to a third person without written approval of the manufacturer is inadmissible.

2 Safety notes

At the time of its development, the flat-plate collector was developed and manufactured according to the valid, approved rules of technology and is of high functional reliability. The application of the collector may, however, involve certain dangers if it is not used properly or correctly.

2.1 Correct use / Initial operation

The safety in operation is only guaranteed if the collector is used correctly.

Installation and initial operation may only be carried out by a qualified tradesman. The approved rules of technology are valid for practical use and suitable measures for the prevention of accidents have to be taken during installation on the roof.

Any other use of the collector is prohibited and not compliant. Claims against the manufacturer and/or his authorized representatives regarding damages resulting from incorrect use of the collector will not be accepted.

2.2 Personnel

Installation, maintenance and repair may only be carried out by a qualified tradesman.



WARNING!

Risk of injury!

Improper use may lead to extensive injuries to persons and damage to property.

For this reason:

- Any work may only be carried out by qualified persons.

Due to his professional training, knowledge and experience as well as his knowledge of the relevant standards and regulations, the **qualified gas and water specialist** is in a position to carry out any work at heating installations (solar plants) and to recognize possible dangers.

Due to his professional training, knowledge and experience as well as his knowledge of the relevant standards and regulations, the **qualified electrician** is in a position to carry out any work at electrical installations and to recognize possible dangers.

Due to his professional training, knowledge and experience as well as his knowledge of the relevant standards and regulations, the **qualified roofer** is in a position to carry out any work at the roof construction/roofing and to recognize possible dangers.

2.3 Specific risks

The safety notes shown here as well as the warning notes in other chapters of the instructions are to be observed in order to reduce health risks and avoid dangerous situations.

2.4 Other valid documents

Apart from the operating instructions for the collector, the below mentioned operating instructions of the complete solar plant should be observed. Notes including these instructions – especially the safety notes – must be observed!

- BDH information sheet no. 17 “Thermal solar plants” parts 1, 2 and 3
- BDH information sheet no. 27 “Solar heating support” parts 1 and 2
- Pump operating instructions
- Controller operating and installation instructions
- Controller general functional description
- Controller hydronic schemes
- Storage cylinder operating and installation instructions
- Diaphragm expansion tank operating and installation instructions
- Operating and installation instructions of other components of the heating system
- Further information on the internet:
www.oventrop.de
www.bdh-koeln.de

2.5 Important standards, rules and EC directives for the installation of solar collectors

- *DIN EN 12975-1* Thermal solar plants and their components – Collectors – Part 1: General specification
 - *DIN EN 12976-1* Thermal solar plants and their components – Preassembled plants – Part 1: General specification
 - *DIN V ENV 12977-1* Thermal solar plants and their components – Customized plants – Part 1: General specification
 - *DIN 1055-4* Impacts on structural framework – Part 4: Wind load stressing
 - *DIN 1055-5* Impacts on structural framework – Part 5: Snow and ice load stressing
 - *DIN 18421* Insulation of technical plants
 - *DIN 18382* Electrical cabling in buildings
 - *DIN VDE 0185* Lightning protection plants
 - *DIN VDE 0100* Installation of power plants up to 1000V
 - *DIN 18338* Roof tiling and roof insulation work
 - *DIN 18339* Plumbing
- Current standards and guidelines must be observed.

3 Transport and handling

• Information regarding storage of collectors in open air

Lay down collectors with the pane facing upwards. Please don't cover the solar panels when they are placed outside. Glas corrosion may occur because of condensation water (e.g. unter a foil). Avoid direct ground contact (put timber beams underneath). Avoid scratches on the panes by separating the collectors with spacers (e.g. wood battens). When leaning the collectors against walls or similar, please keep a minimum inclination angle of 15° and use spacers. Do not use cardboard as intermediate layer. In case of improper storage, humidity may penetrate through the vent holes.

• Range and limits of application

The collector is designed for use in thermal solar installations for hot water supply and support of the heating system. Water (Attention: Risk of frost!) or a water and glycol mixture are to be used as operating medium in a closed circuit. Operational conditions leading to a long-term reduction of the dew point in the collector are inadmissible. This can be the case if collectors are directly integrated into the solar circuit of a heat pump.

• Thermal protection

To avoid damage to the solar circuit, the technical information “Thermal solar plant – Construction, initial operation and maintenance“ (www.oventrop.de) must be observed for installations with 4 or more OKF collectors with antireflective glass as well as for central roof heating.

• Frost damage

Collectors cannot be drained off completely after having pressurised and flushed the system. Do not leave pure water in the collector in case of risk of frost!

• Mounted, unfilled collector

Completed mounted and unfilled collectors must only be exposed to the sun for a few days to avoid damage to the seals. Alternatively only install seals before filling.

• Diffusion of vapour for integrated roof installations

In case of roof integration, the area below the collector field must be protected from rising humidity and airlocks (foil with vapour diffusion barrier, sufficient aeration of the roof underneath the collectors).

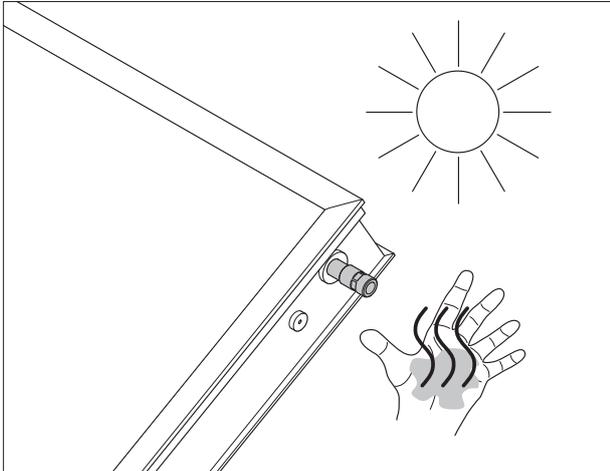
• Disposal:

The collector contains hazardous waste. Dismounted collectors can be returned to the manufacturer Oventrop. They will be disposed of professionally.

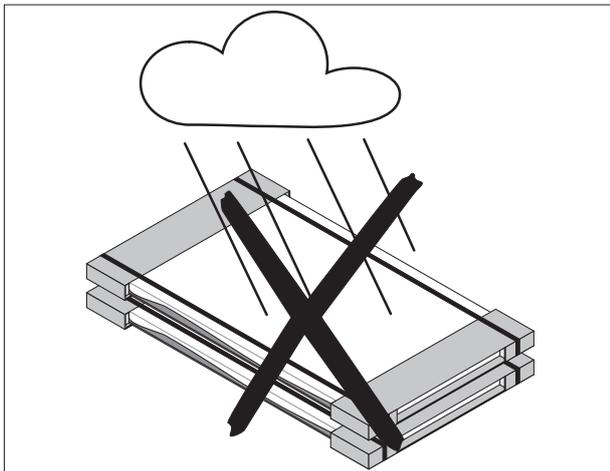
3.1 Advice before installation



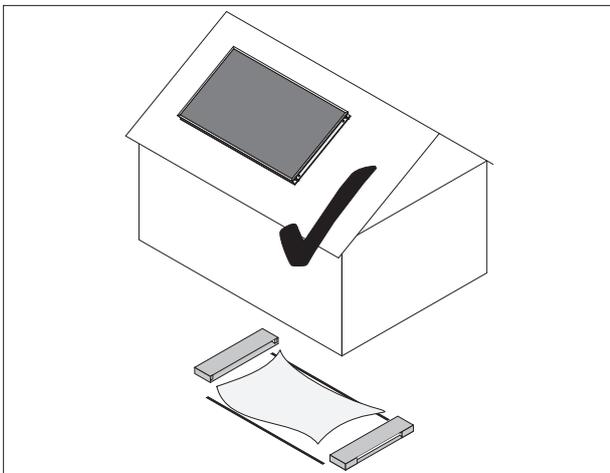
- Risk of scalding at the collector connection as soon as the uncovered collector is exposed to sunlight.
- Remove protection caps from the connections as soon as the collector is exposed to sunlight. Risk of melting!
- Collectors must not be installed with the protective foil



Collector connections get hot during sunshine

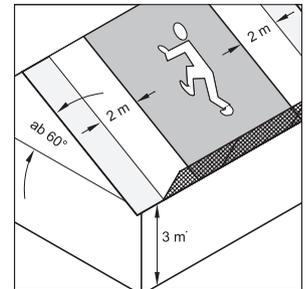
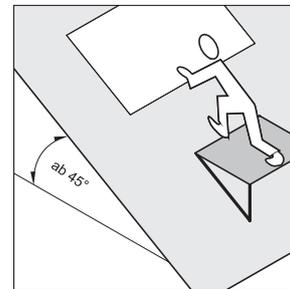
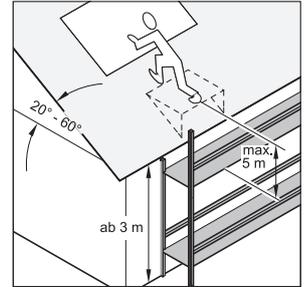
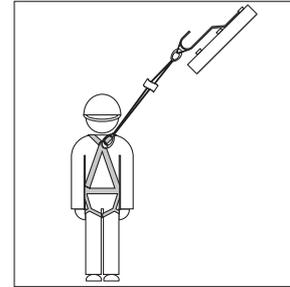
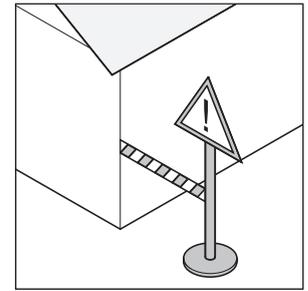
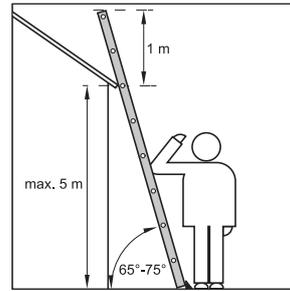


Do not expose the collector with foil to rain



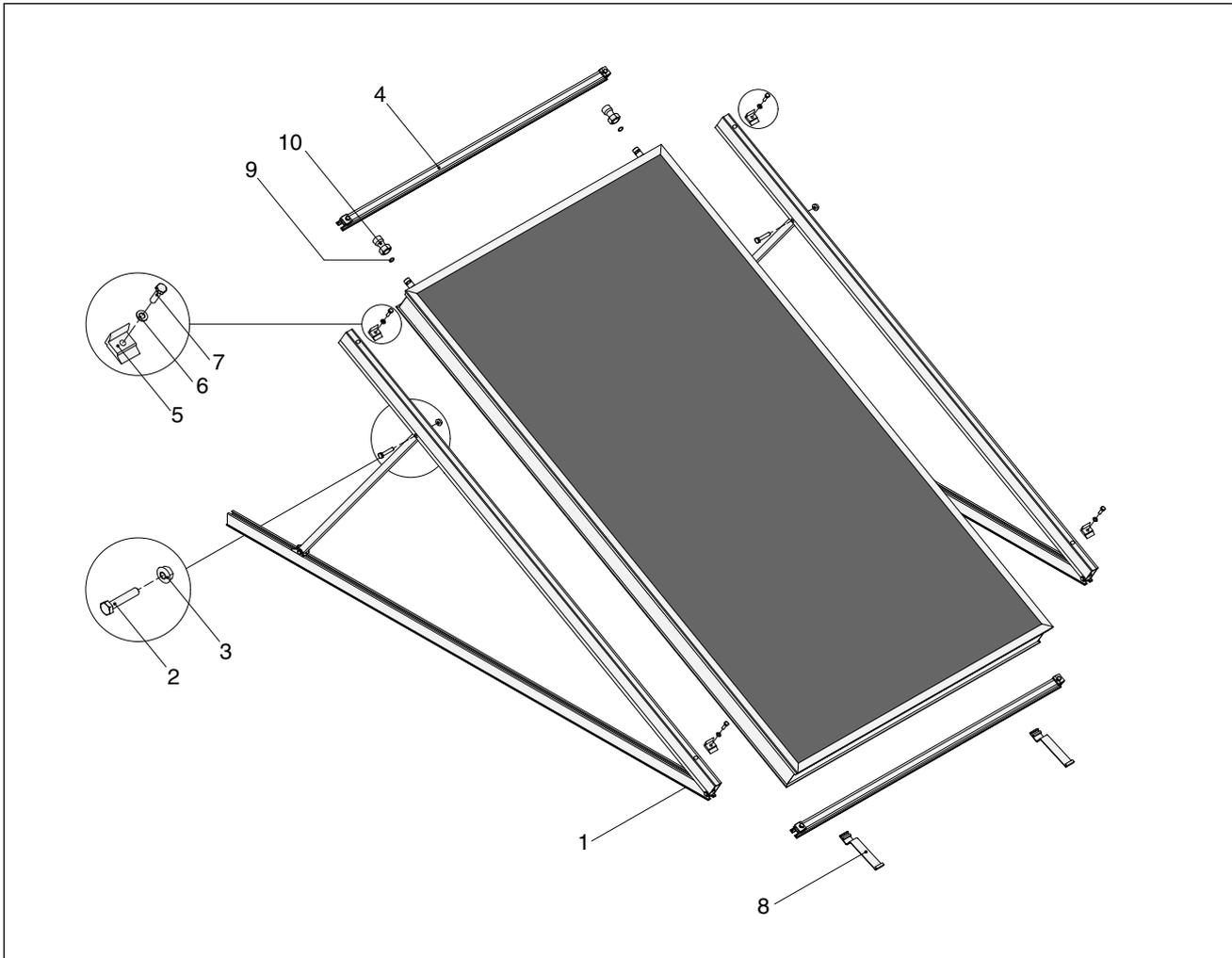
Do not mount collector with foil on the roof

Regulations for prevention of accidents during work on the roof



4 Installation

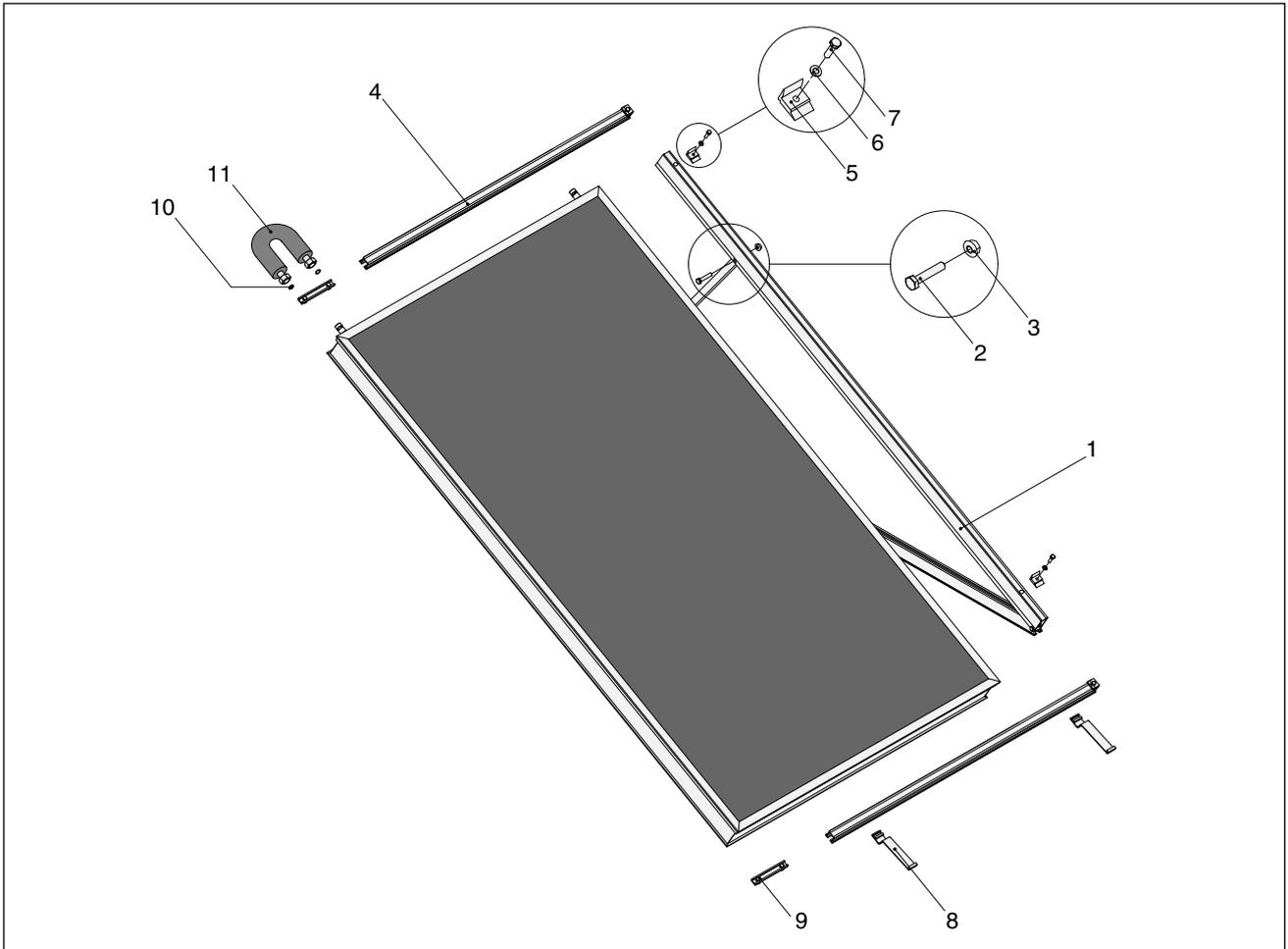
4.1 Basic set for vertical freestanding installation



Basic set for freestanding installation item no. 136 12 86 (collectors are not included in the delivery)

Pos.	Components: Basic set for freestanding installation	Number per set
1	Pre-assembled mounting triangle	2
2	Hexagon head screw M8 x 40	2
3	Nut M8 self-locking	2
4	1.202 mm with two collector clamps	2
5	Clamping elbow	4
6	Washer Ø 8.4	4
7	Hexagon head screw M8 x 30	4
8	Collector bracket	2
9	Ring gasket 1/2"	2
10	Connection nipple G 1/2 collar nut x Ø 18 mm solder tailpipe	2

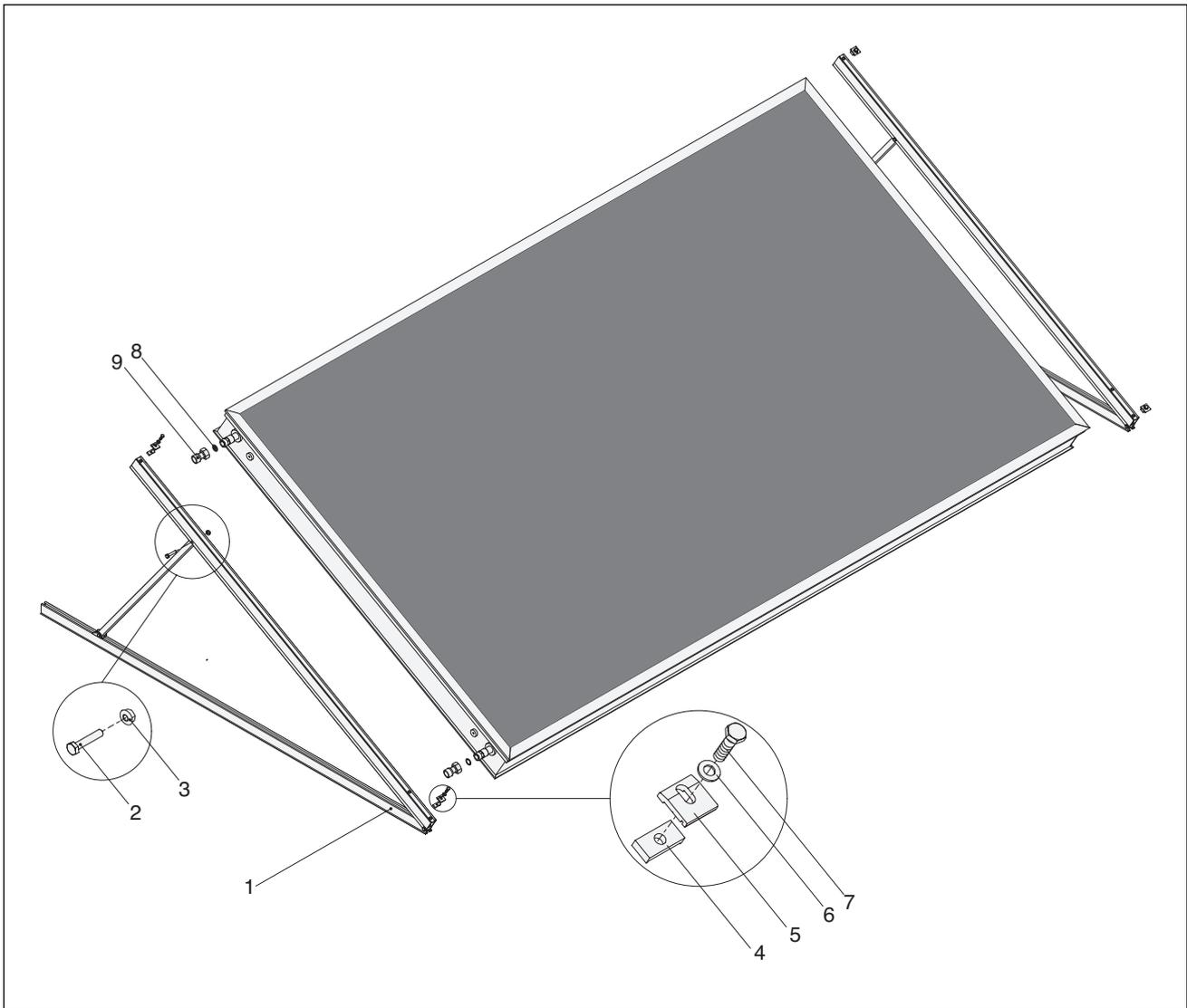
4.2 Extension set for vertical freestanding installation



Extension set for freestanding installation item no. 136 12 87 (collectors are not included in the delivery)

Pos.	Components: Extension set for freestading installation	Number per set
1	Pre-assembled mounting triangle	1
2	Hexagon head screw m8 x 40	1
3	Nut M8 self-locking	1
4	1.168 mm with one collector clamp	2
5	Clamping elbow	2
6	Washer Ø 8.4	2
7	Hexagon head screw M8 x 30	2
8	Collector bracket	2
9	Rail connection fitting	2
10	Ring gasket ½"	2
11	Connector coupling hose, 250 mm long	1

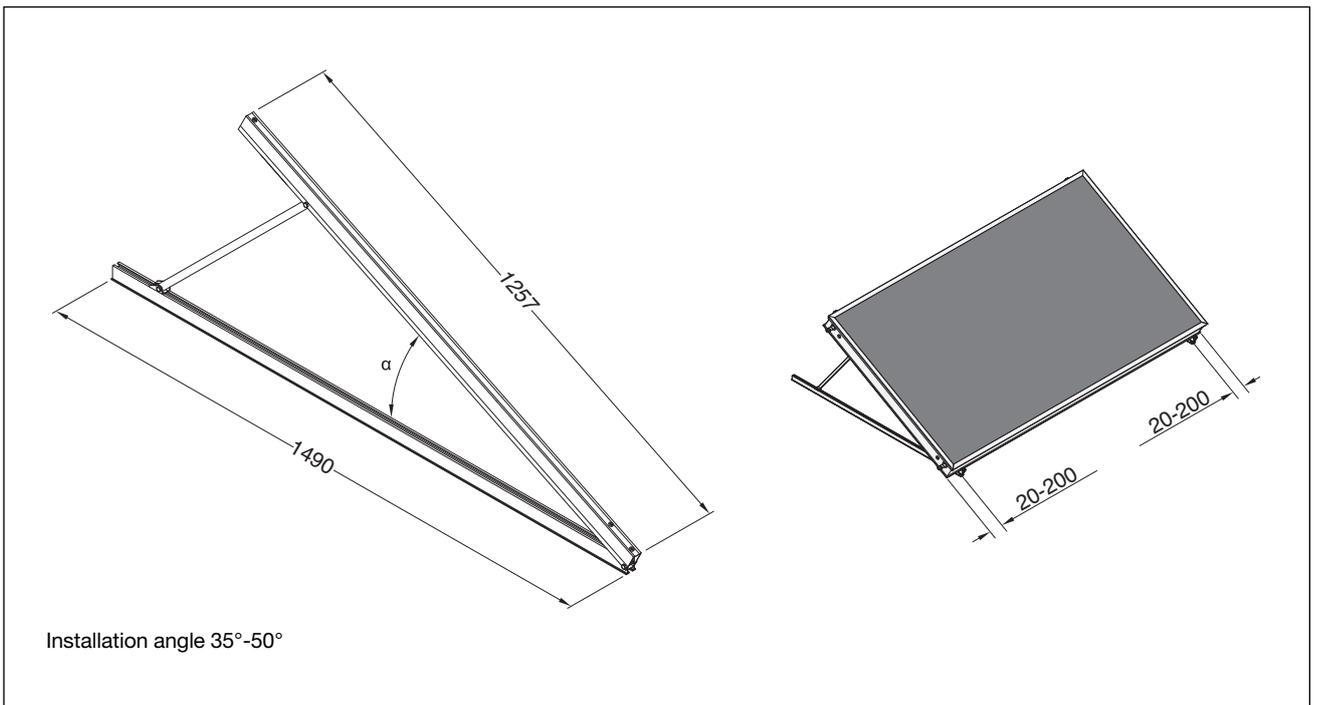
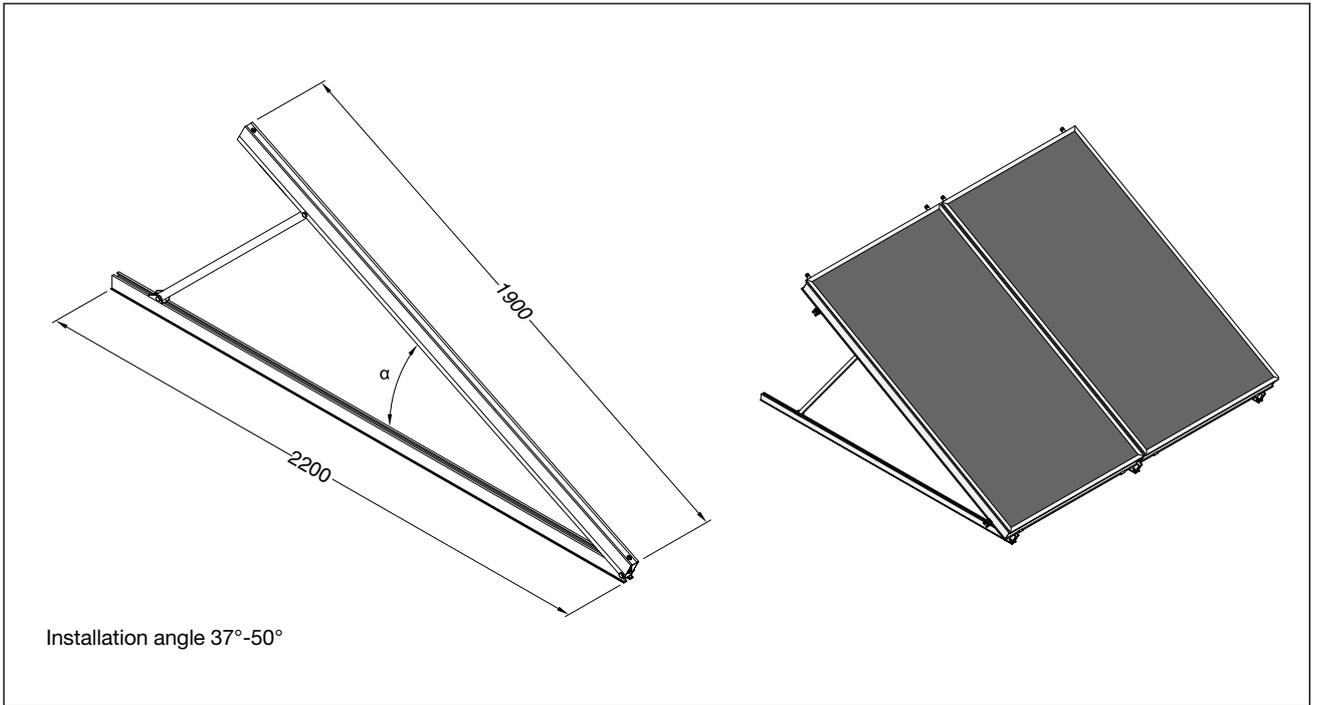
4.3 OKF-Freestanding installation, horizontal



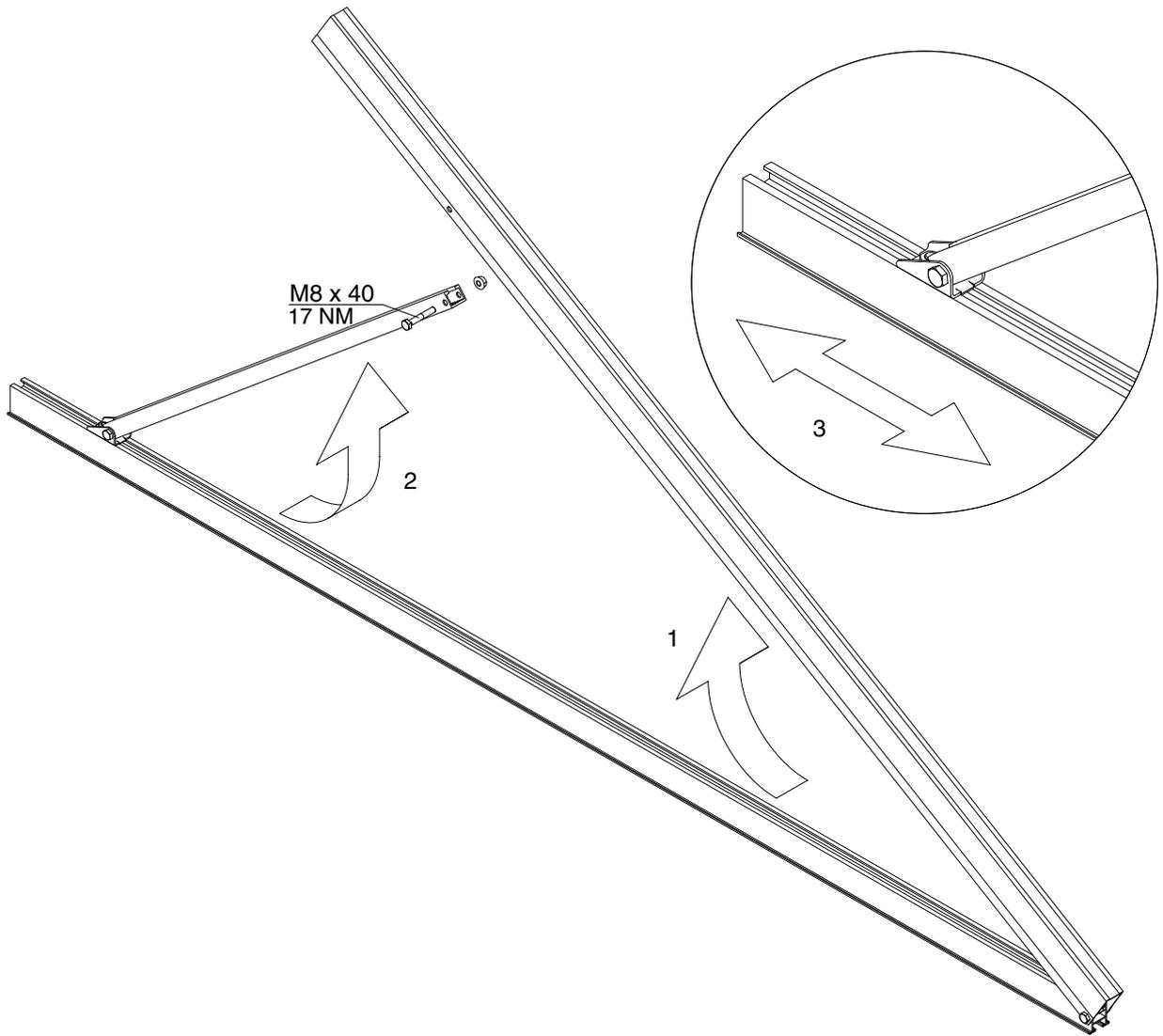
Freestanding installation item no. 136 13 86 (collectors are not included in the delivery)

Pos.	Components: Basic set for freestanding installation	Number per set
1	Pre-assembled mounting triangle	2
2	Hexagon head screw m8 x 40	2
3	Nut M8 self-locking	2
4, 5	Clamping elbow	4
6	Washer Ø 8.4	4
7	Hexagon head screw M8 x 30	4
8	Ring gasket 1/2"	2
9	Connection nipple G 1/2 collar nut x Ø 18 mm solder tailpipe	2

4.4 Freestanding triangles, possible installation angles

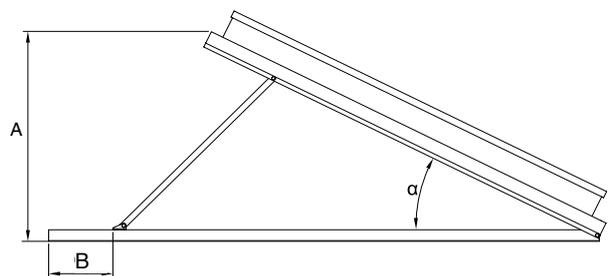


4.5 Installation of the supporting triangles



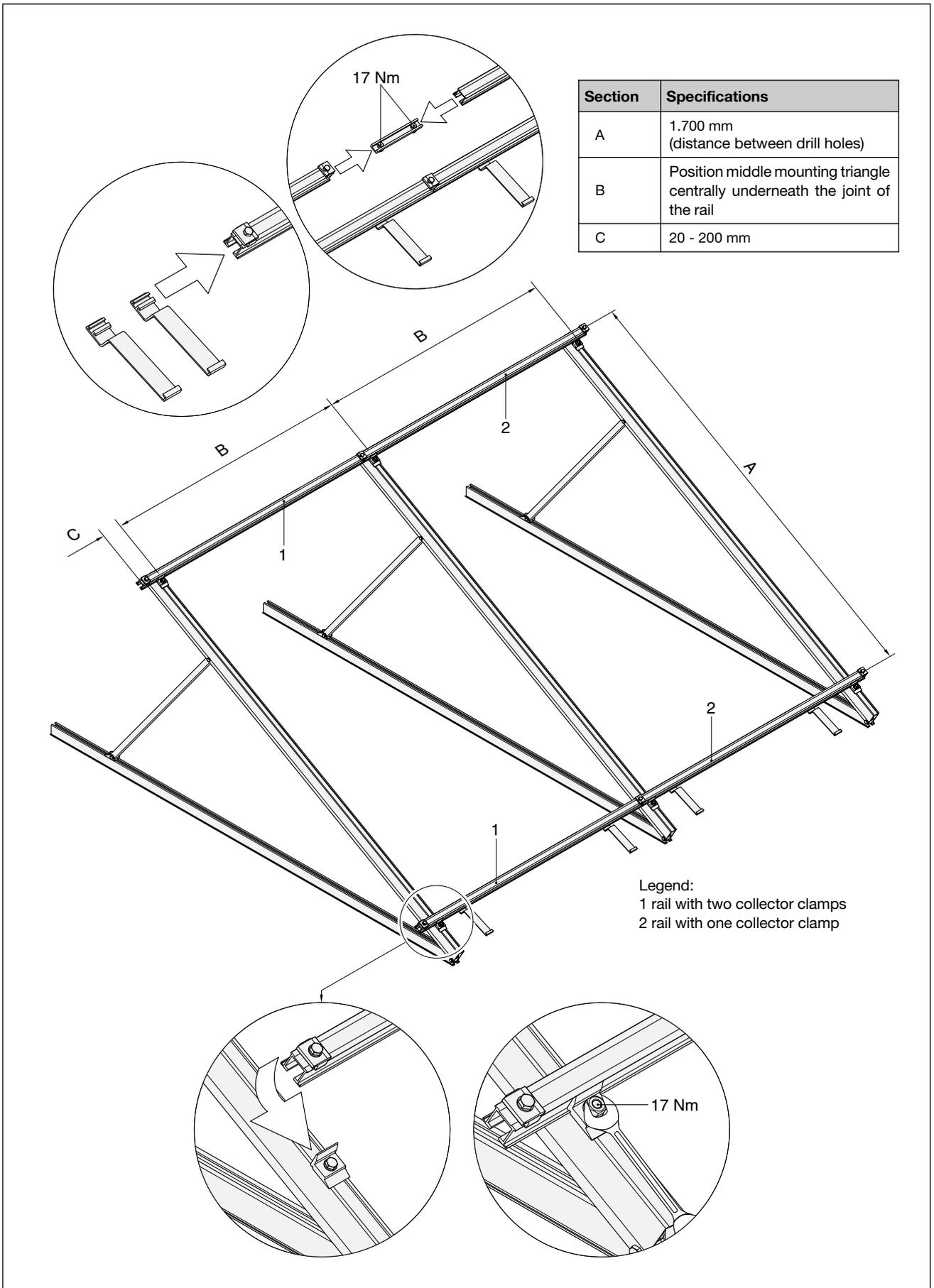
Determination of the installation angle α

	α	A [mm]	B [mm]
vertical	37°	1.338	0
	40°	1.410	153
	45°	1.522	458
	50°	1.619	920

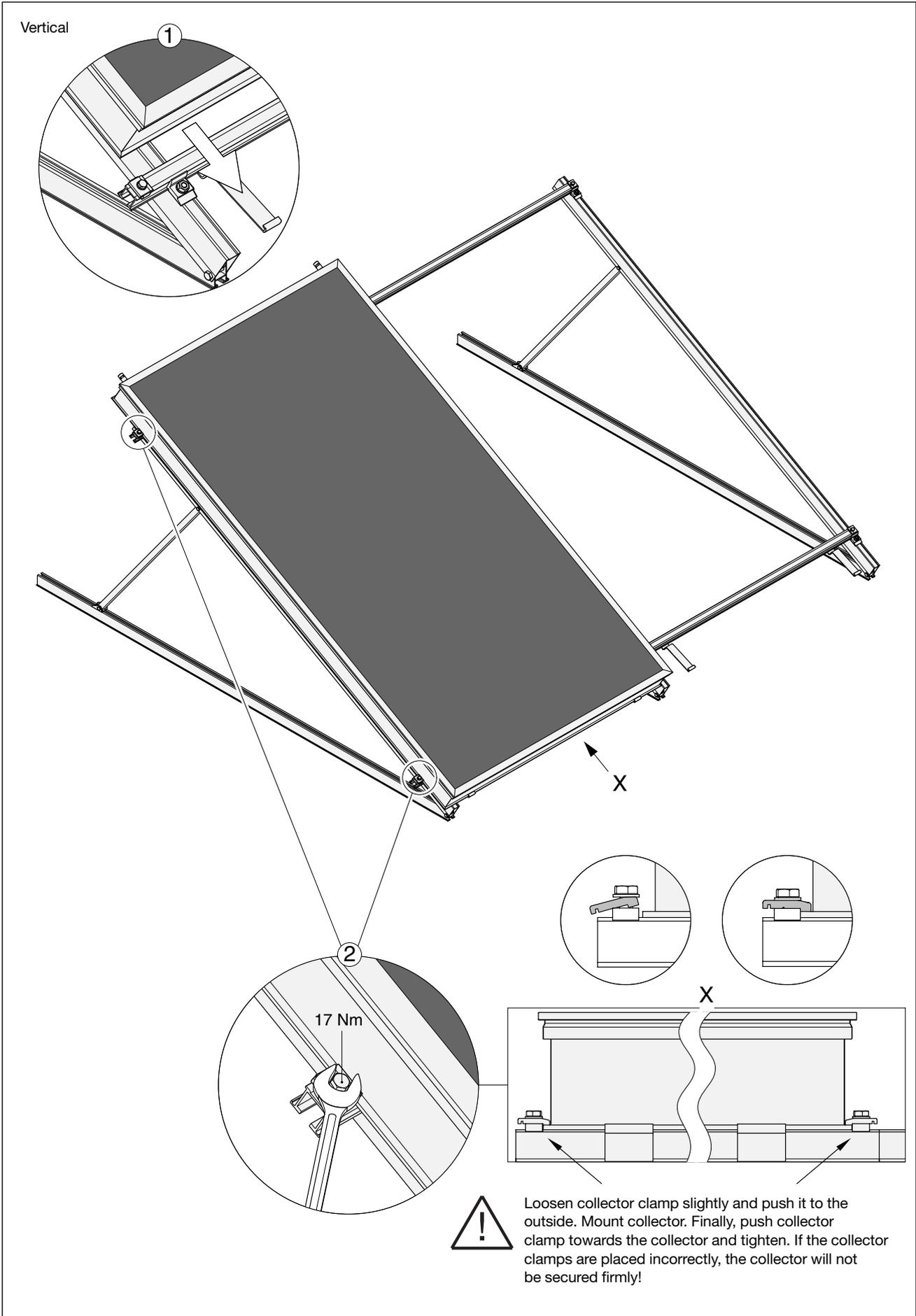


	α	A [mm]	B [mm]
horizontal	35°	863	10
	40°	940	147
	45°	1.009	311
	50°	1.070	521

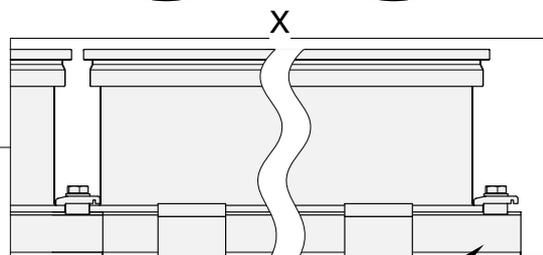
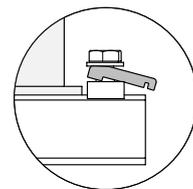
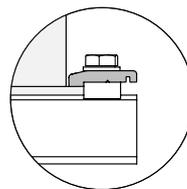
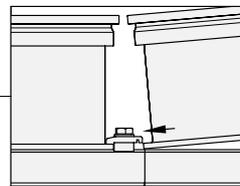
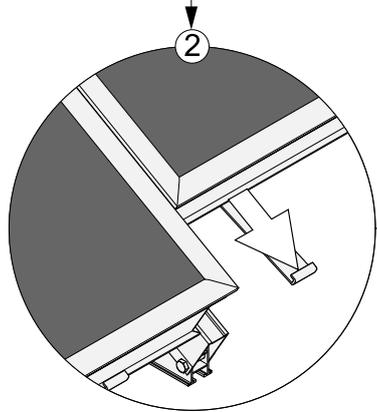
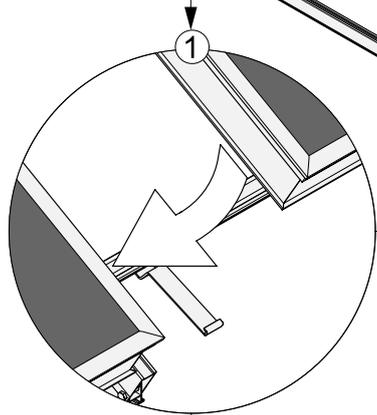
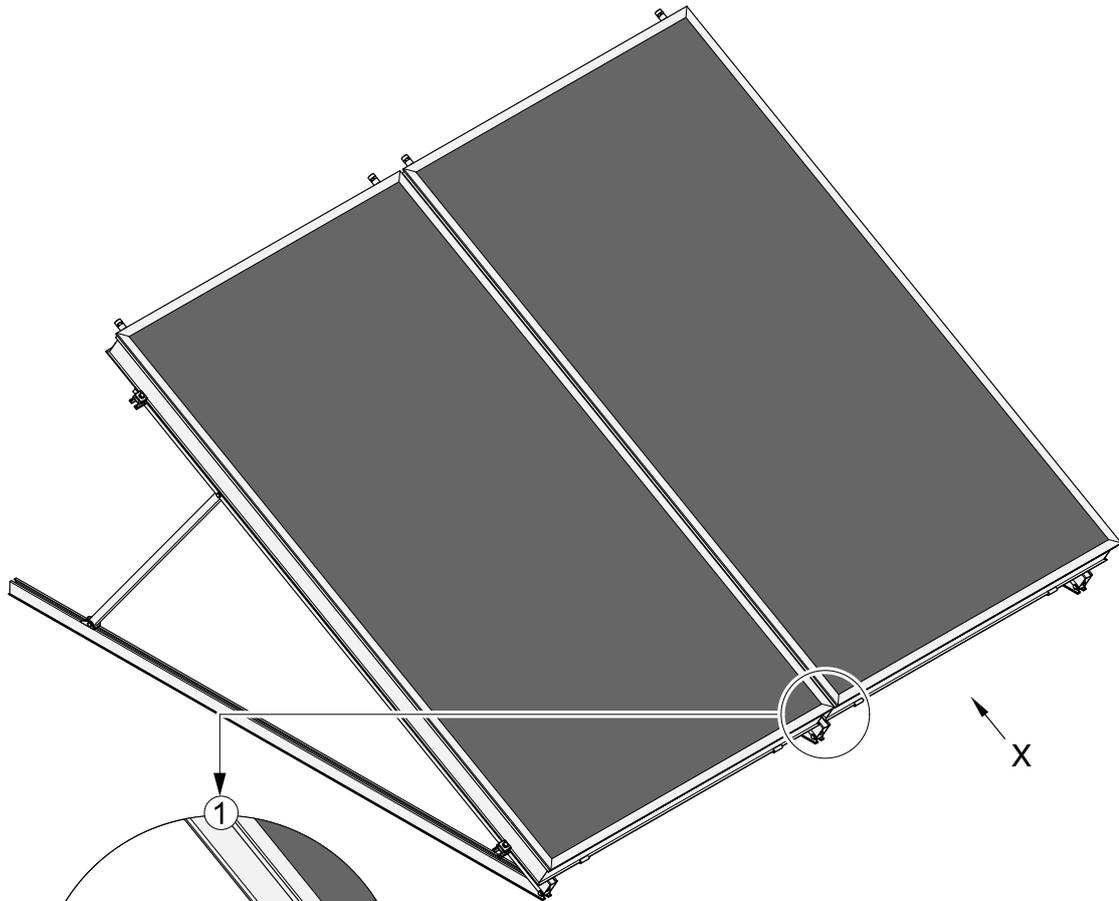
4.6 Rail installation



4.7 Collector installation

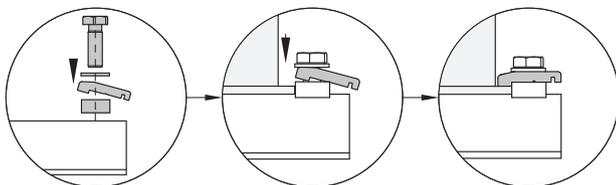
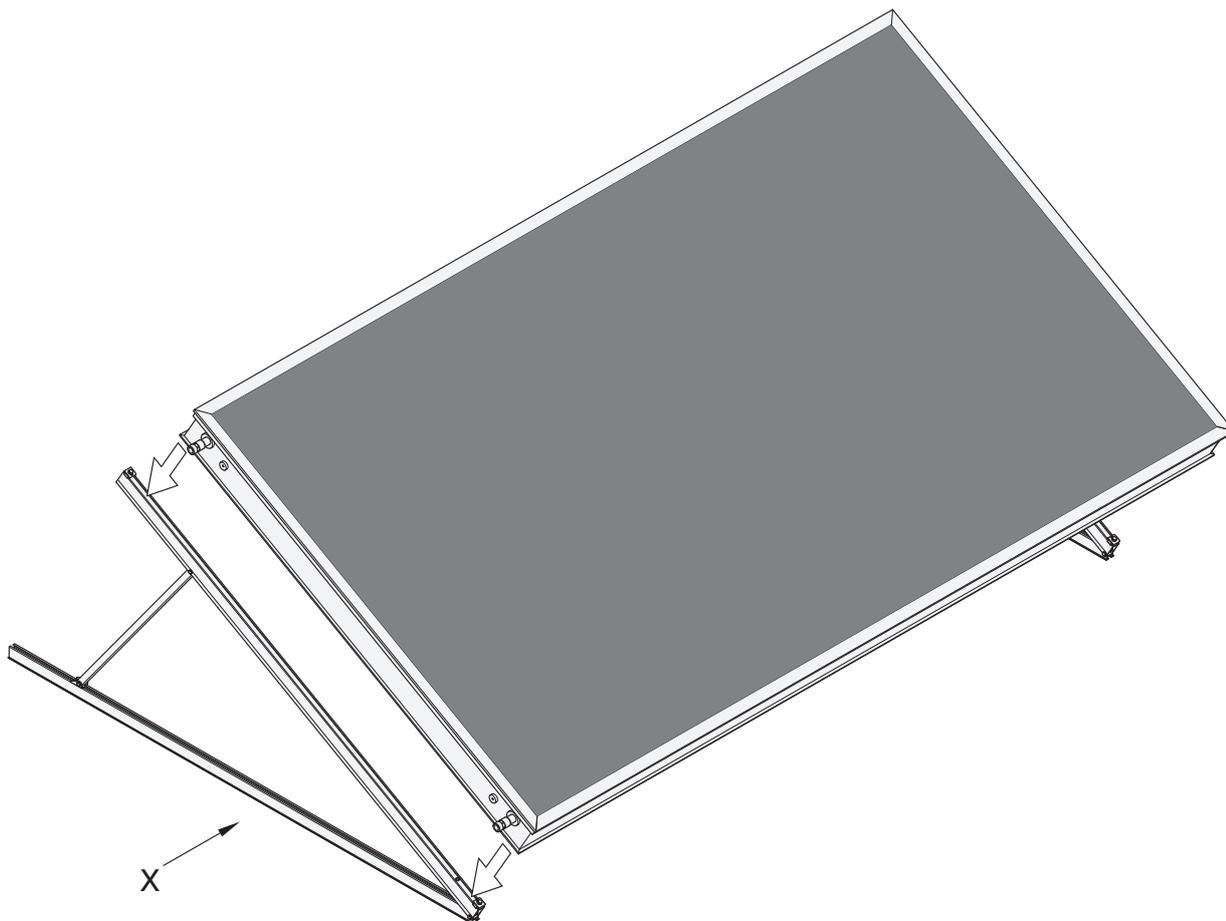


Vertical

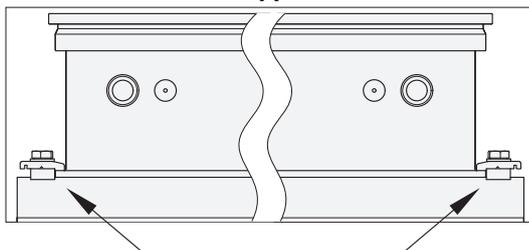


Push second collector with frame lug under the collector clamps. Tighten opposite collector clamps. If the collector clamps are placed incorrectly, the collector will not be secured firmly!

Horizontal



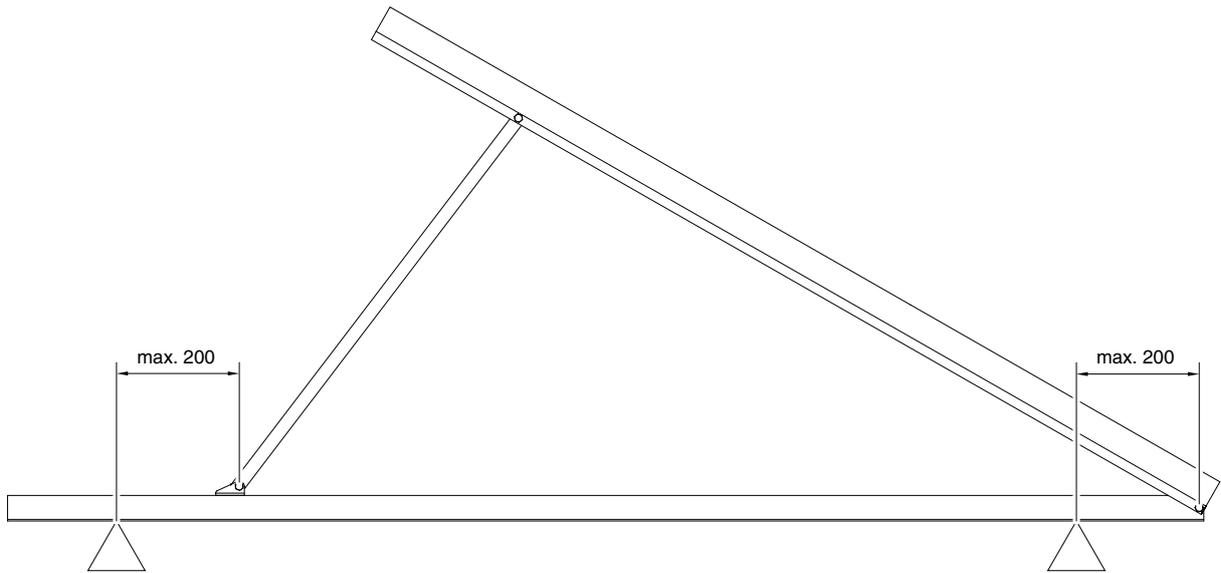
X



Pre-assemble collector clamp loosely. Mount collector. Finally, push collector clamp towards the collector and tighten. If the collector clamps are placed incorrectly, the collector will not be secured firmly!

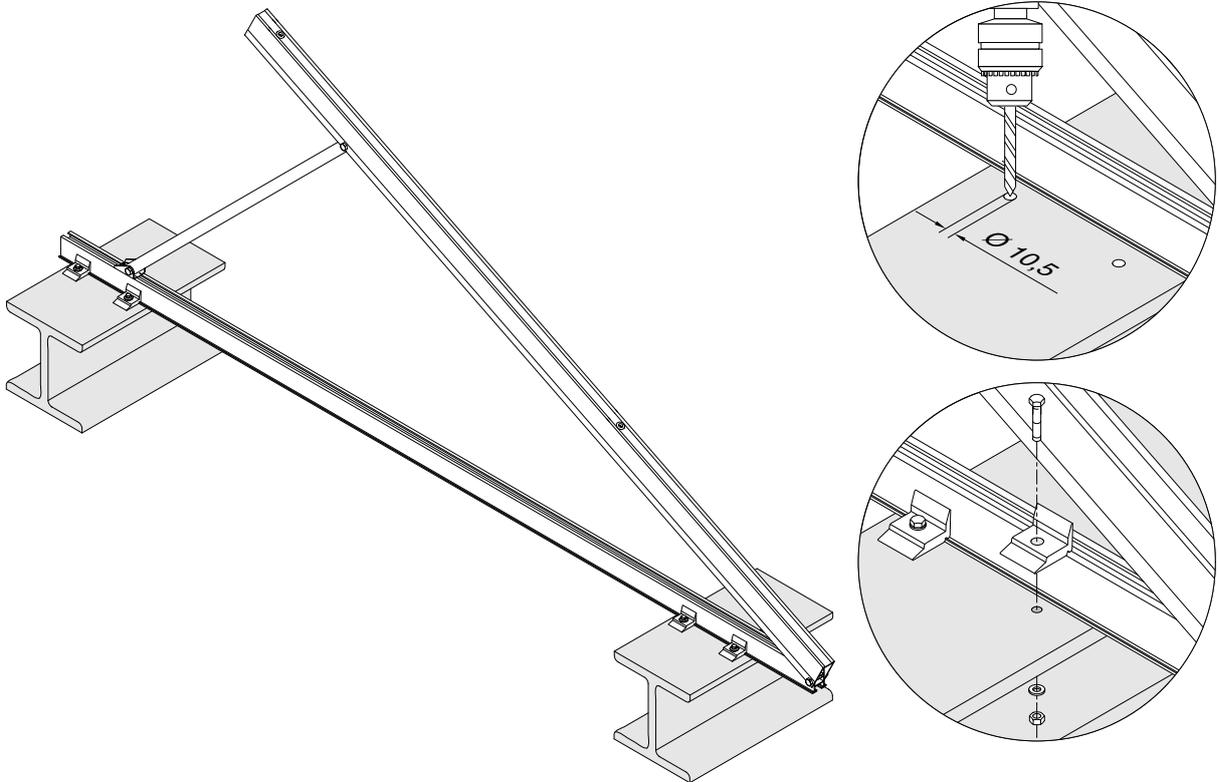


4.8 Positioning of the floor fixing devices

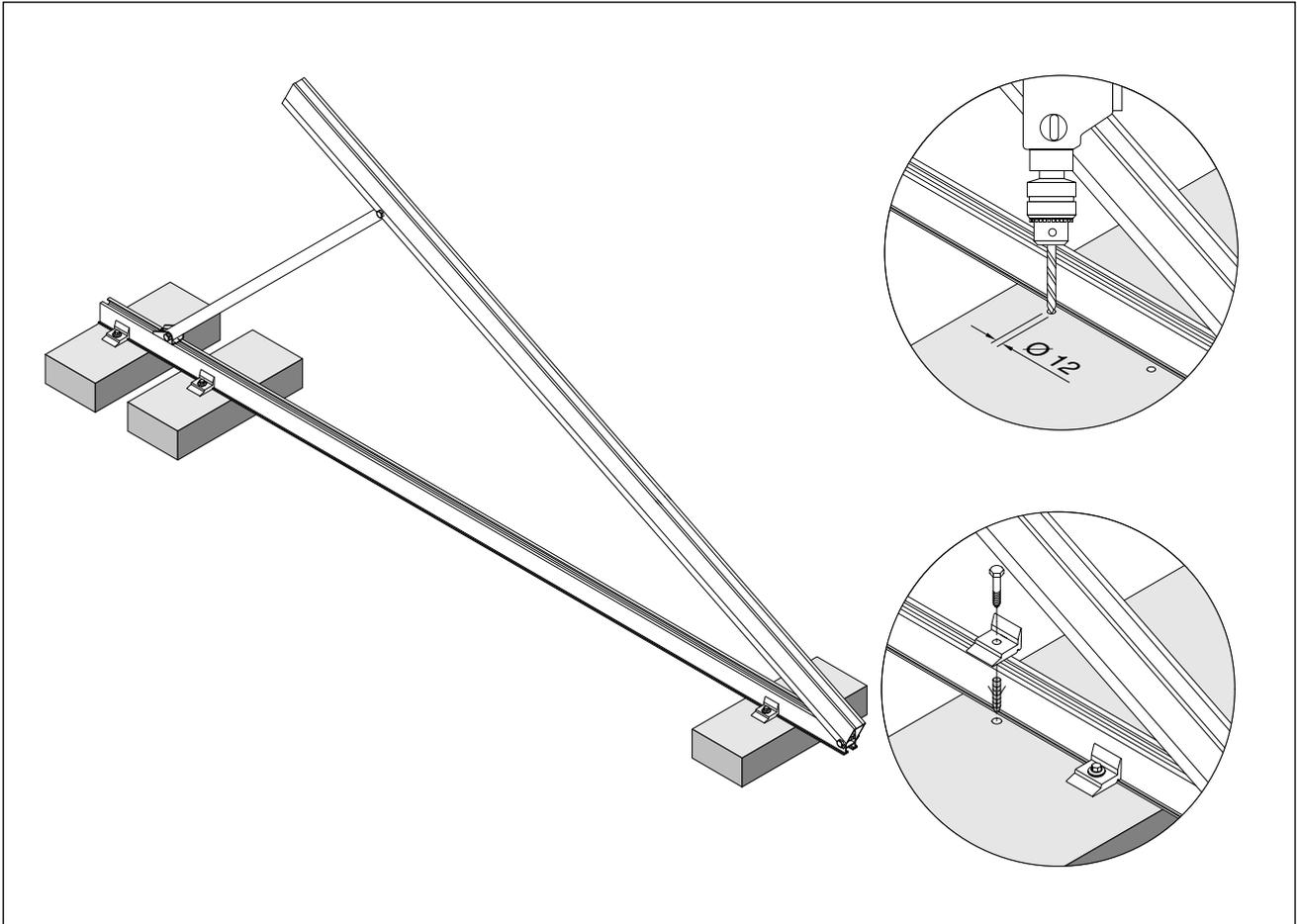


The number of clamping elbows item no. 136 12 89 required for fixing the mounting triangles varies depending on the underground.

Installation on steel girders:

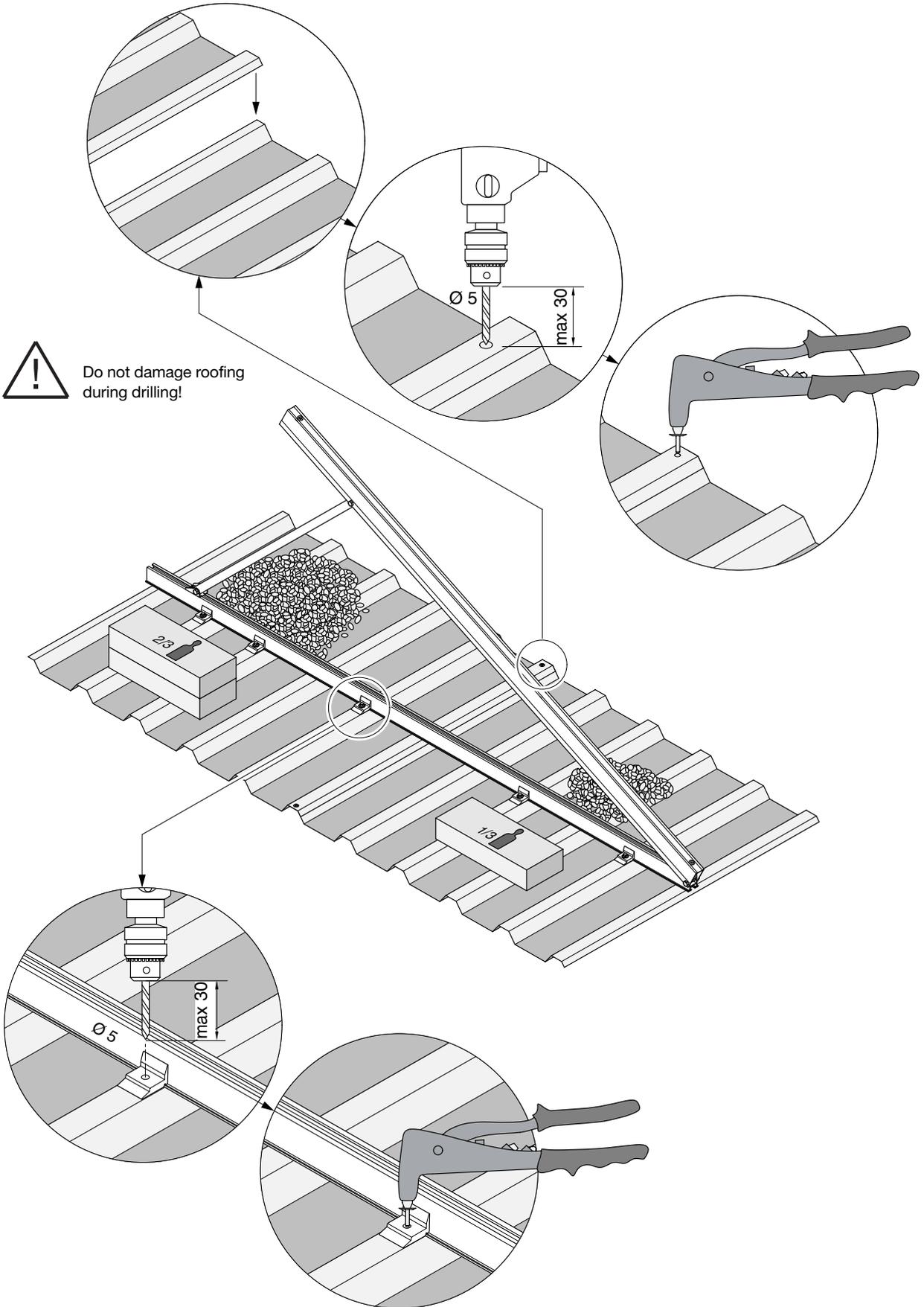


4.9 Installation on concrete blocks

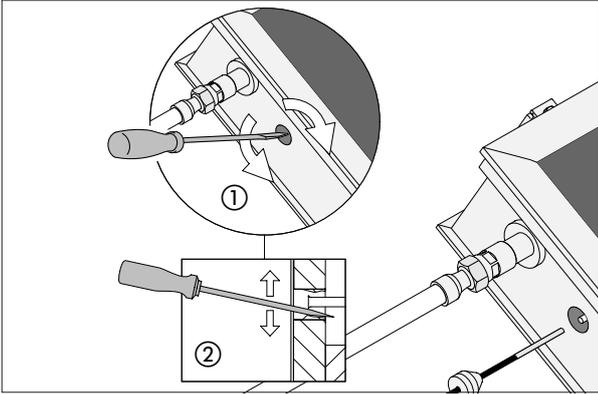




Do not damage roofing during drilling!

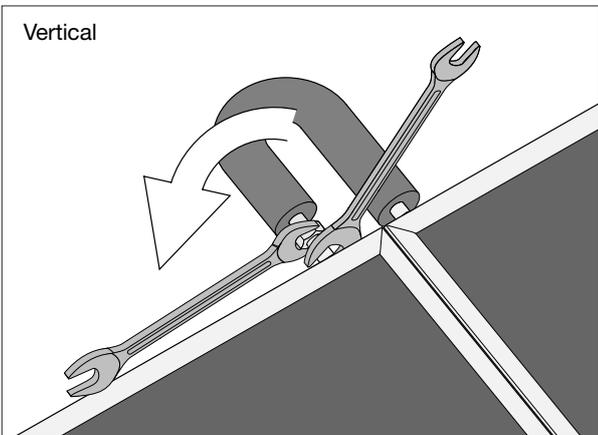


4.10 Sensor installation

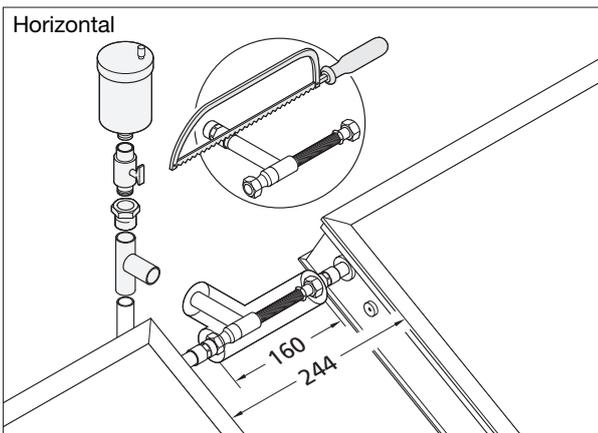


Remove rubber plug from frame ①. Uncover sensor sleeve using a screwdriver ②. Pull sensor through the rubber plug and insert sensor point into the sensor sleeve. Screw rubber plug back into frame.

4.11 Collector connections

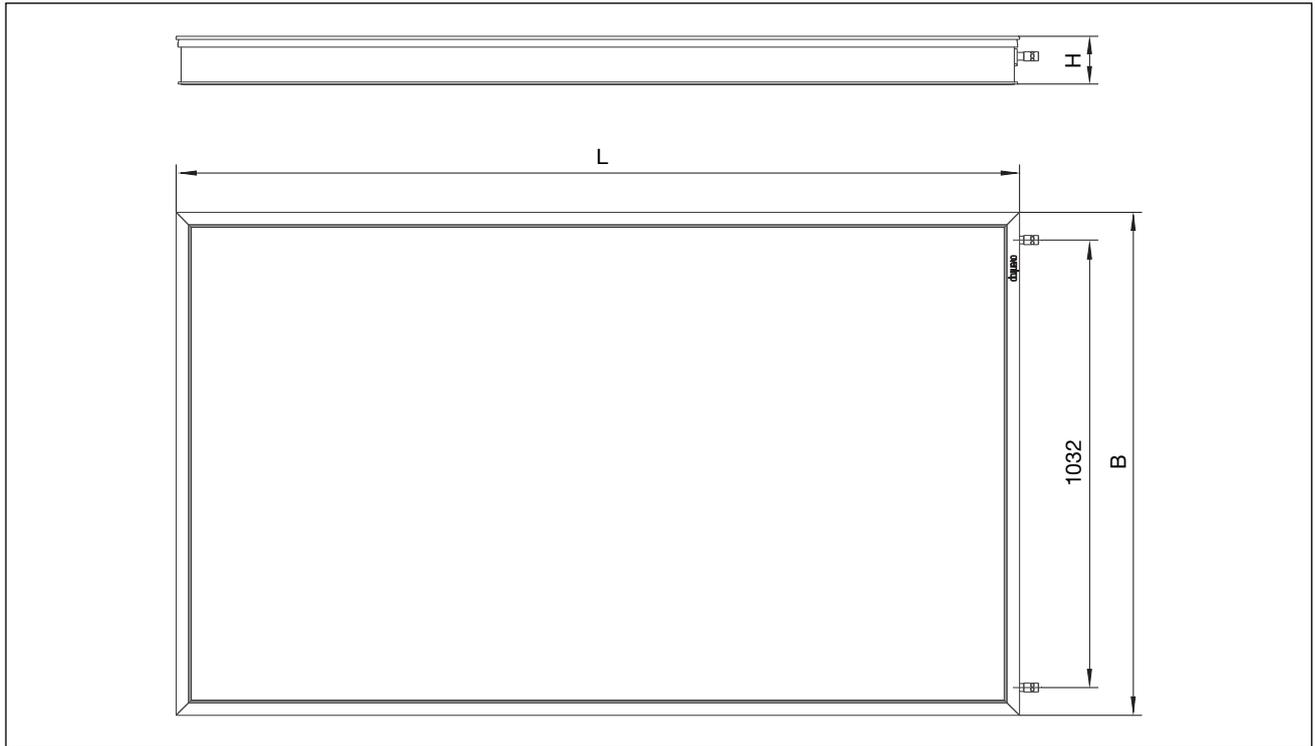


To avoid damage to the collector connection and hose, hold the collector coupling hose firmly (vertical freestanding installation) during tightening.



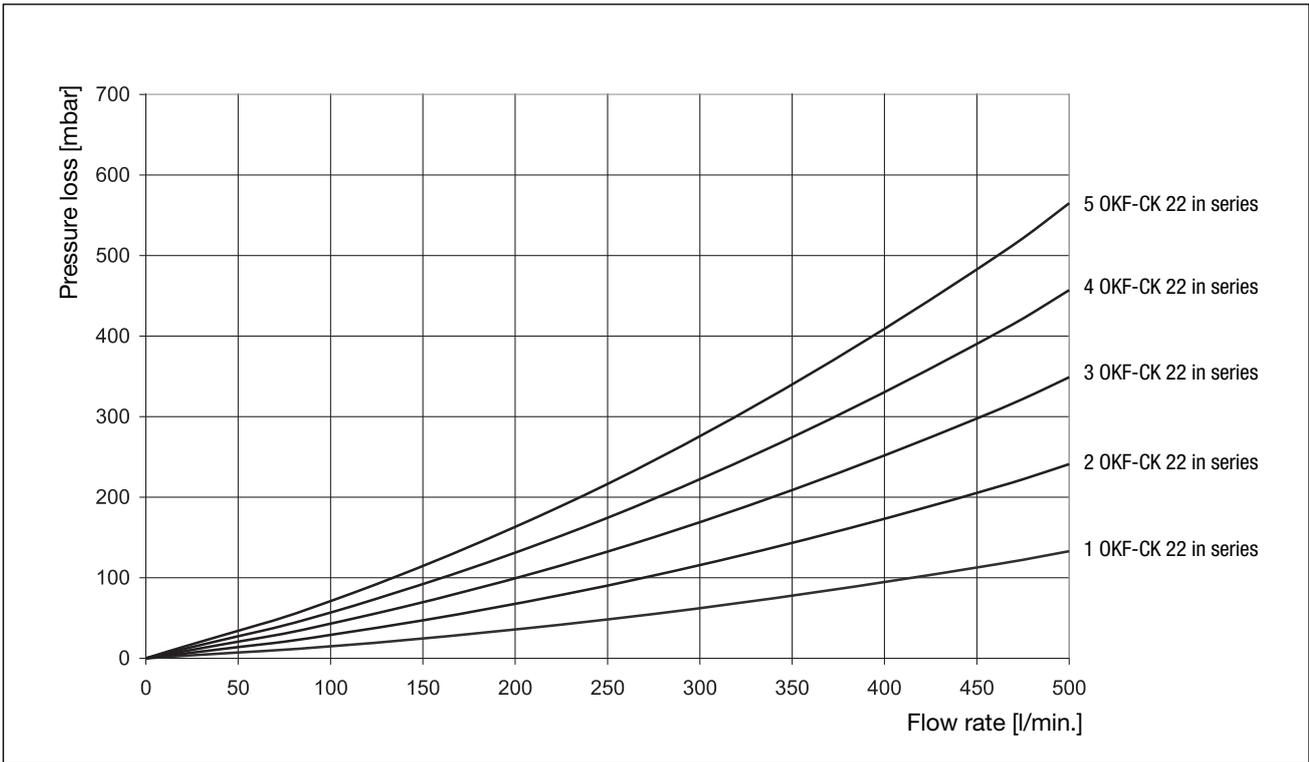
Installation dimensions for the connection set item no. 136 12 46.
For press or solder connection, cut $\frac{1}{2}$ " male connection to the required length.

5 Dimensions and technical data

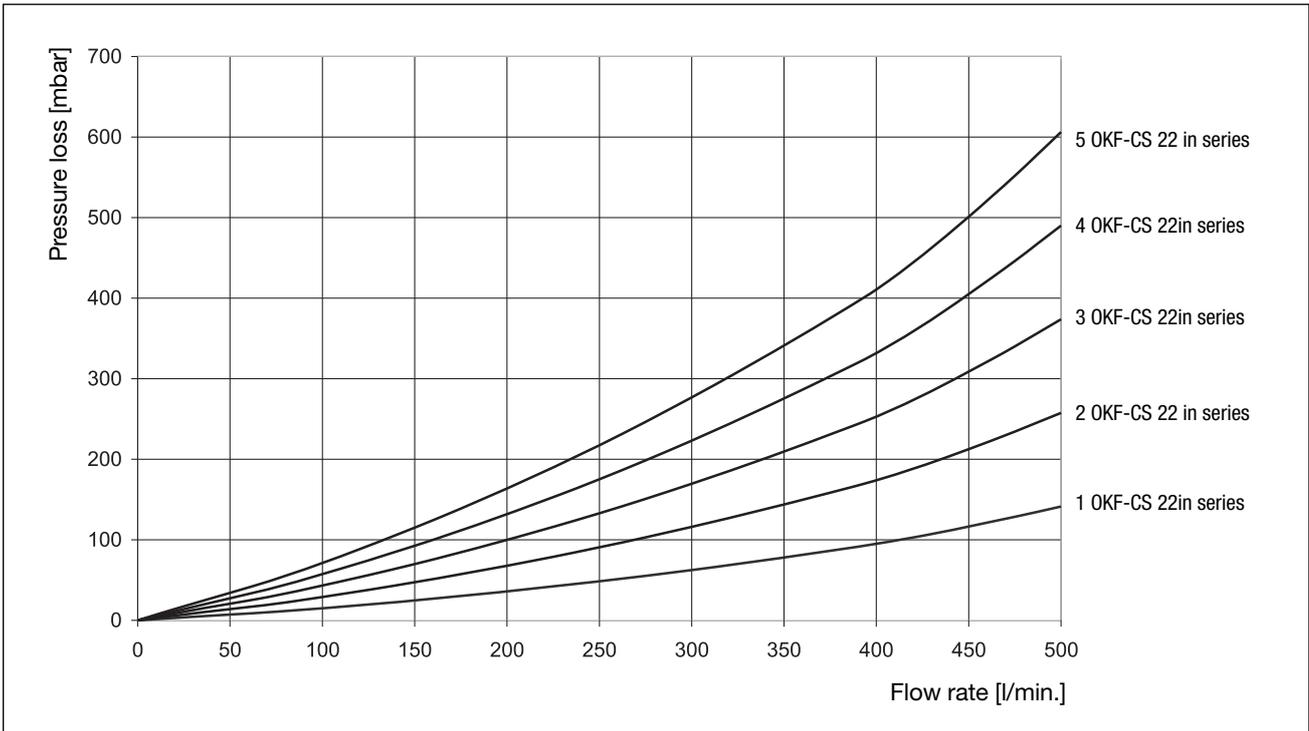


Flat-plate collector	Unit	OKF - CK 22	OKF-CS 22
Gross surface area	m ²	2.25	2.25
Outer dimensions (L x W x H)	m	1933 x 1163 x 110	1933 x 1163 x 80
Aperture surface area	m ²	2.02	2.02
Collector connection	-	G ½ AG	G ½ AG
Weight	kg	37	33
Absorption coefficient	α	95 %	95 %
Emission coefficient	ε	5 %	5 %
Transmission	τ	96 %	91 %
Collectors pitch angle (vertical)	Degree	37-50	37-50
Collectors pitch angle (horizontal)	Degree	35-50	35-50
Stagnation temperature at 1000 W/m ² and 30°C	°C	ca. 208	ca. 191
Max. permissible working pressure	bar	10	10
Collector heat return	kWh/m ²	> 525	> 525
Heat exchanger content	l	1.3	1.2
Glass cover	-	3.2 mm solar safety glass with antireflective coating	3.2 mm solar safety glass
Solar sensor (inner diameter)	Ø	6 mm	6 mm
Absorber	-	Absorber made of aluminium heat conducting steel sheet and copper pipe, laser welded	Absorber made of aluminium heat conducting steel sheet and copper pipe, laser welded

5.1 Pressure loss chart OKF

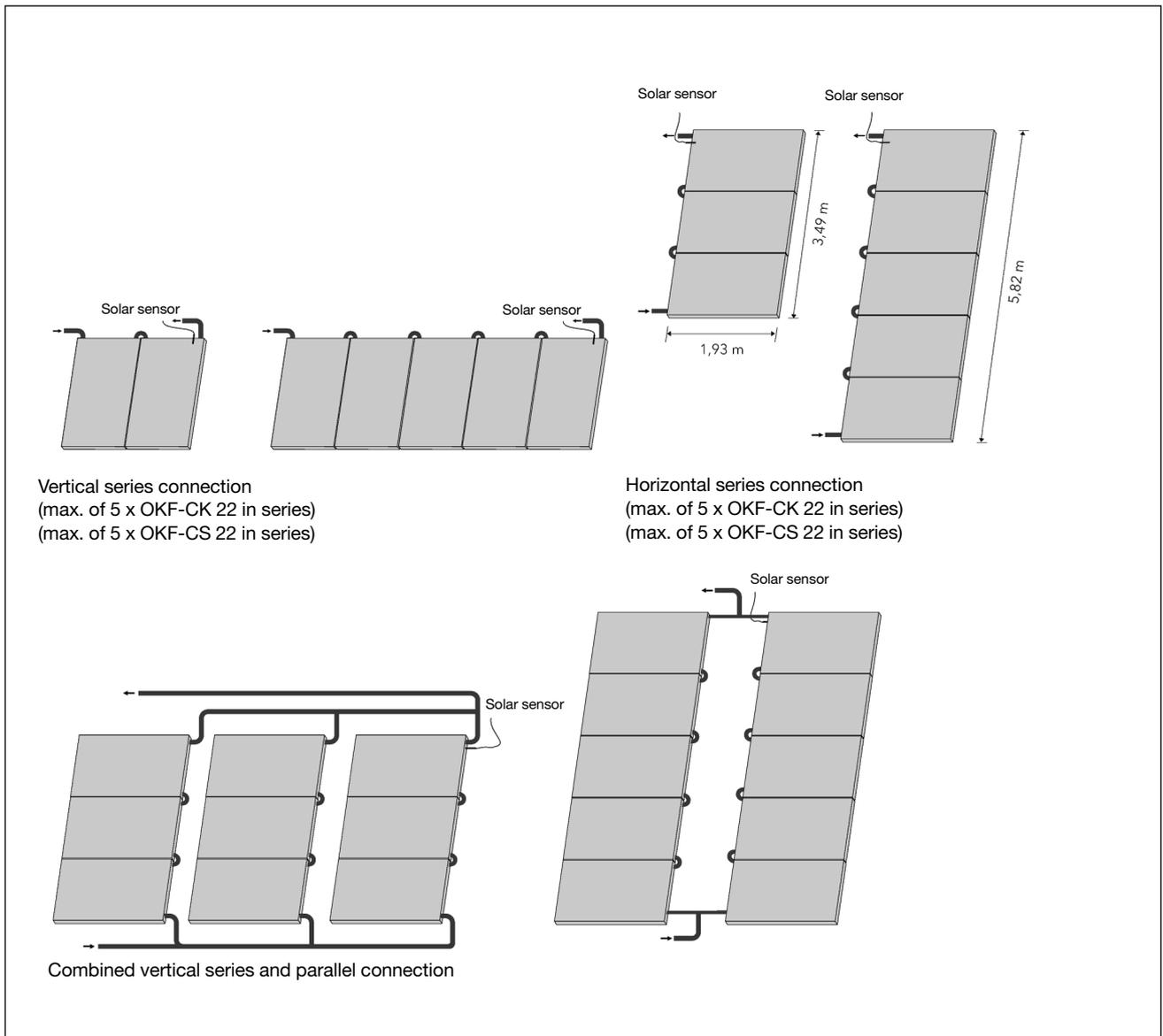


Pressure loss for several collectors connected in series depending on the volume flow, heat transfer liquid: 40% glycol / 60% water at 40°C, pressure loss including collector coupling and connection hoses.



Pressure loss for several collectors connected in series depending on the volume flow, heat transfer liquid: 40% glycol / 60% water at 40°C, pressure loss including collector coupling and connection hoses.

5.2 Hydronic switching operations



Note!

With parallel connections, the different fields must be hydraulically balanced. Use double regulating and commissioning valves if required.

