力诺瑞特太阳能
LINUO PARADIGMA SOLAR ENERGY
德国技术 国际品质

Tai Yang Collector
Assembly and operating instructions
for specialized craft trades

Table of contents

1. General information

Carefully read the following instructions.

Guarantee or warranty claims are void if these instructions are not observed. Improper usage as well as inapproriate modifications of the product will result in the exclusion of any liability claims. Please exactly follow the safety notes in order to avoid any danger and damage for humans and material assets.

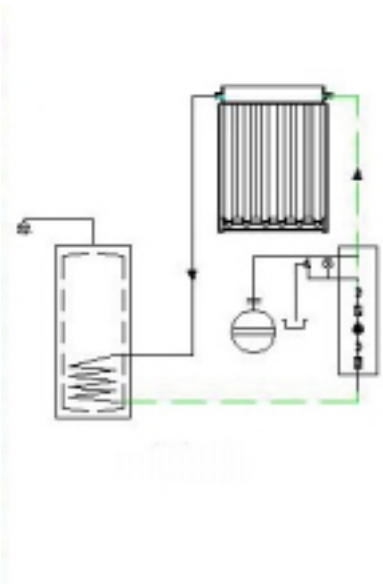
For operability of the solar system a persistent electrical and water supply must be ensured.This is not in liability of the contractor. For damages failures because of non-observance,claims of compensation are not possible.

1.1. Purpose/function

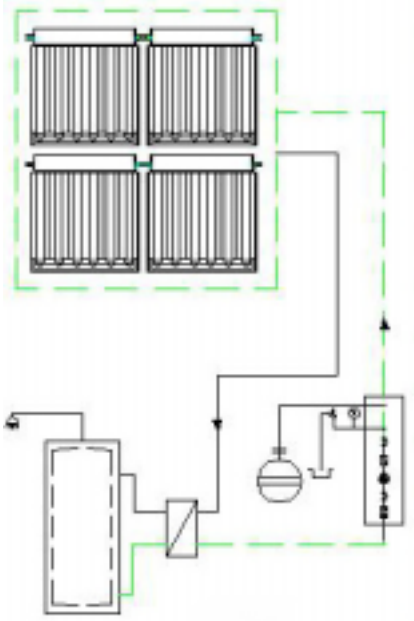
The Linuo Paradigma Tai Yang collector is an evacuated tube collector for solar thermal systems. The collectors must be used in a closed loop solar system only. **The collector must not be used in solar systems where permanent renewed fresh water for use as the potable water is circulating in the collector loop. Only water in a closed circle is allowed as the heat transfer medium in the solar system.** If any other medium is used, guarantee or warranty claims are void.

If the collector is used under sub-zero climate conditions, suitable anti-freezing functions in the solar system must be ensured.

The Tai Yang collectors can be used in both, low flow and high flow solar systems. If the collectors are used in a high flow solar system, the internal heat exchanger of the solar storage tank must be tuned to the collector area.The flow rate in the solar circuit must be adjusted at a flow meter according to the values mentioned below.



High flow solar system (Hf)
flow rate: 0,4 to 1,0 l/(min m²)
internal heat exchanger



Low flow solar system (Lf)
flow rate: 0,25 to 0,4 l/(min m²)²)
external heat exchanger

1.2 Safety notes

- The relevant national safety regulations are to be observed.
- Solar collectors require report or permission according to the national legal regulations in force.
- Assembly, start up, maintenance and repairs must be performed by authorized specialists only.
- The piping system of the solar circuit is to be electrically connected in the lower part of the building according to natioanal regulations (e.g. VDE, IEC).
- The connection of the solar system to an existing or to be created lightning protection system or potential equalization may be implemented only by authorized specialists.
- The glass tubes of a collector have to be handle with caution. To avoid injury we recommend to wear gloves and safety glasses.
- We recommend to use an automatic mixing valve on the hot water outlet of the solar hot water storage tank in principle to avoid danger of burn.
- Closed solar circuits must be equiped with safety devices in principle, such as expansion tanks and safety valves. Safety devices must not be cut of from the solar system.

A solar system with evacuated tube collectors can reach to high temperatures ,so it's necessary to seize precausions, to be sure that threat of burn is impossible. Especially in places where the glass tubes can be damaged.It's necessary to seize precausions to avoid cullet (e.g. gardens with playing children).

1.3 Assembly notes

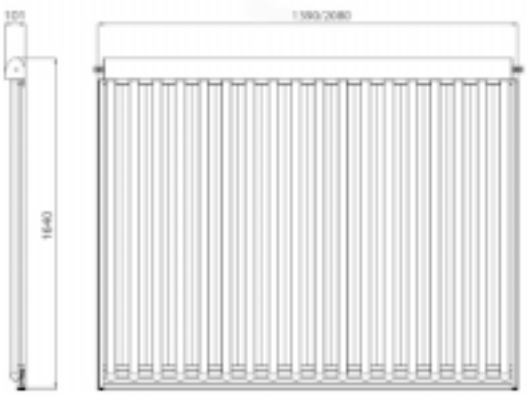
- The entire solar plant is to be installed according to the generally established principles of technology.
- The rules of the professional trade association for the prevention of accidents are to be observed.
- Dangers of crashes, falling down of objects, stepping through because of lacking load-carrying capacity etc. are to be counteracted through measures like the use of scaffolds, simple ladders, rope-up protection
- The maximum load for the substructure and the required distance to the roof edge must be observed.
- Carefully fasten the components so that during storm and tempest the resulting tensile loads are safely taken up by the mounting plates.
- **Remove the sun protection film on the collectors only after the initial start-up of the solar system.**
- Inside the solar circuit, only work with hard soldered connections or clamping ring connectors.
- If clamping ring connections are used, we recommend additional use of high temperature resistent screw lock (e.g. Loctite 622)
- Only high temperature resistant tubes are allowed to use for solar circuit and hot water (e.g. copper)!
- Use suitable and sufficient thermal insulation to for all piping to avoid high heat losses. Pay attention to temperature resistance (150°C) and UV stability (pipes laid in the open).
- The vacuum tubes are hail resistant according to DIN EN 12975-2. We nevertheless recommend including damage through tempest and hail in the property insurance. Our material guarantee does not extend to such damage.
- Collectors and solar circuit must be de-aerated by a rinsing process before initial start-up of the system. We recommend to use the Linuo Paradigma filling and rinsing valve in combination with the Linuo Paradigma filling and rinsing station.
- ***The solar system must be taken into service no later than 4 weeks after assembly.***

2. Technical data

2.1 Collector data

fully pre-mounted unit consisting of:

- Evacuated tubes according to the thermos principle
- Manifold with direct flow heat conduction unit
- CPC mirror
- Sun protection film over evacuated tubes



Note:

All Linuo Paradigma collectors are produced according to ISO 9001 and every hydraulic component is controlle by a leaking detector. The quality of Linuo solar tubes was confirmed by positive test results in the impact-from-hail test according to DIN EN 12975-2 and the thermal shock test.

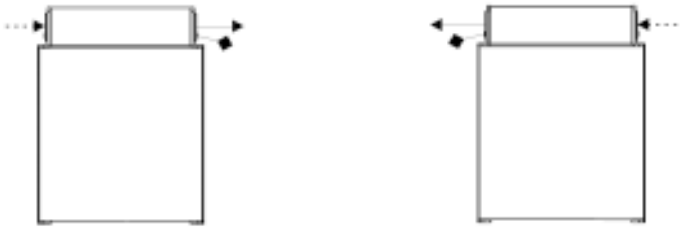
Series		**CPC6**	**CPC 12**	**CPC 15**	**CPC 18**
Number of evacuated tubes		6	12	15	18
Collector height x depth H X D	m	1,64 x 0,1			
Collector length L	m	0,70	1,39	1,74	2,08
Gross surface	m^2	1,14	2,28	2,85	3,41
Aperture surface	m^2	1,0	2,0	2,50	3,0
Collector capacity	l	0,8	1,6	2,0	2,4
Weight	kg	19	37	45	54
Operating positive pressure, max. permissible	bar	10			
Standstill temperature, max.	°C	295			
Pressure loss at 0,25 l/(min m^2) Lf at 40°C	mbar	1	5	8	11
Pressure loss at 0,66 l/(min m^2) Hf at 40 °C	mbar	3	13	24	32
Connection width, flow/return flow	mm	15			
sensor tube inner diameter	mm	6			
Material collector		Al / Cu / glass / silicone / PBT / EPDM / TE			
Material glass tube		Borosilicate 3.3			
Material selective absorber layer		Aluminium nitrite			
Glass tube, (out/in. dia./wall thick./tube len.)	mm	47/37/1,6/1500			
Colour (aluminium frame profiles)		Natural aluminium			
Colour (plastic parts)		Black			
Heat medium		Water in closed solar circuit			
Test report EN 12975-2, report number		02COL282			

2.2 Hydraulic interconnection and placement of collectors

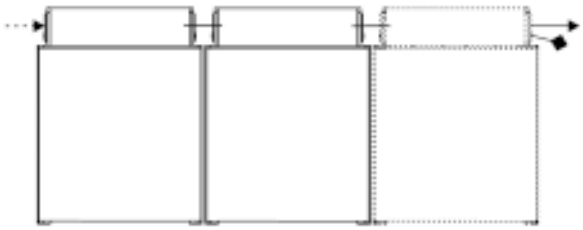
Sensor position always on the flow side (hot) of the collector
Maximum collector area, connected in series:
Low flow = 12 m² High flow = 9 m²

- Align collectors toward the south, if possible.
- Take care about trees and buildings, that can cast shadow to the collectors in different seasons.
- On principle, the manifold is always to be installed on top.
- With rooftop and flat-roof constructions, a minimum inclination of 15° is appropriate for self-cleaning reasons.

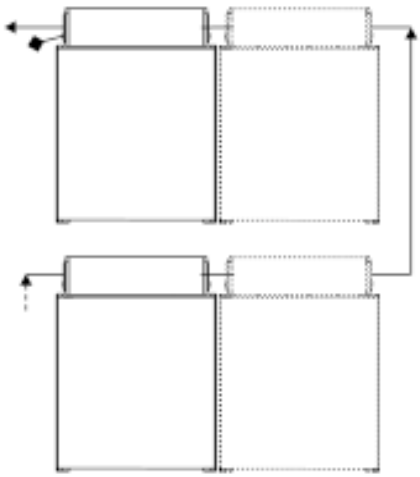
Connection of a single collector:



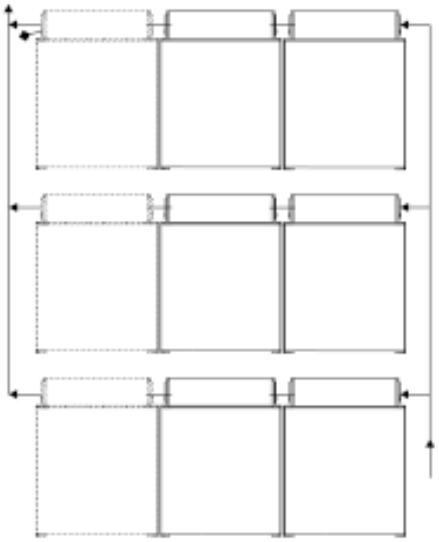
Interconnection of 2 or more collectors in series, one beside the other:



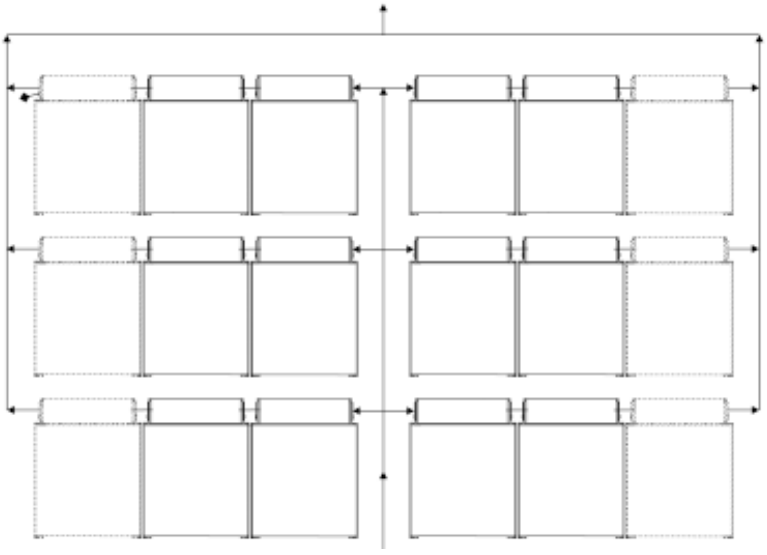
Interconnection of 2 or more collectors in series, one above the other:



Interconnection of collectors in series
and different rows in parallel flow arrangement (collector unit):



Parallel flow arrangement
of different collector units:



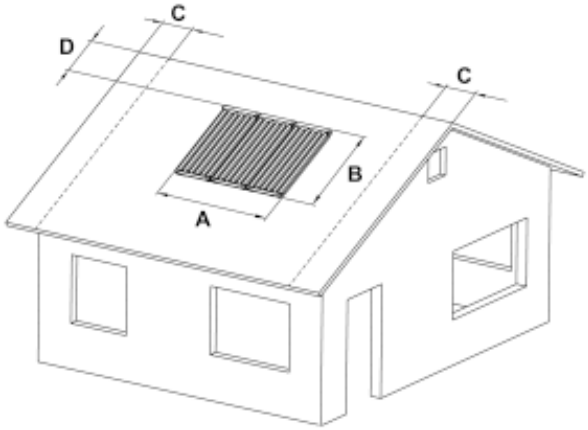
Note:

If during start-up for flushing, venting and filling of the solar system a motor- driven scavenge pump is used (please refer to the prerequisites in the service instructions, chapter Startup), separate venting at the highest point of the system is not necessary.

In case of different collector rows, interconnected in parallel, all rows have to be equiped with a separate stop valve, with a temperature resistance of minimum 250°C on the flow side (hot) of the collector row, to enable successful rinsing of all rows.

3. Installation of supporting bars on pitch roofs

3.1 Space requirements



Space requirement for a single-row collector field: **Dimension B = 1,64 m**

Number of collectors	CPC6	CPC 12	CPC 15	CPC 18
		Dim. A (m)		
1	0,70	1,40	1,75	2,10
2	1,40	2,80	3,50	4,20
3	2,15	4,20	5,25	6,30
4	2,85	5,60	7,00	8,35
5	3,55	7,00	8,75	-
6	4,25	8,40	10,50	-

Space requirement for a double-row collector field: **Dimension B = 3,35**

Number of collectors	CPC 6	CPC 12	CPC 15	CPC 18
		Dim. A (m)		
2	0,70	1,40	1,75	2,10
4	1,40	2,80	3,50	4,20
6	2,15	4,20	5,25	6,30
8	2,85	5,60	7,00	8,35
10	3,55	7,00	8,75	-
12	4,25	8,40	10,50	-

Dimension C

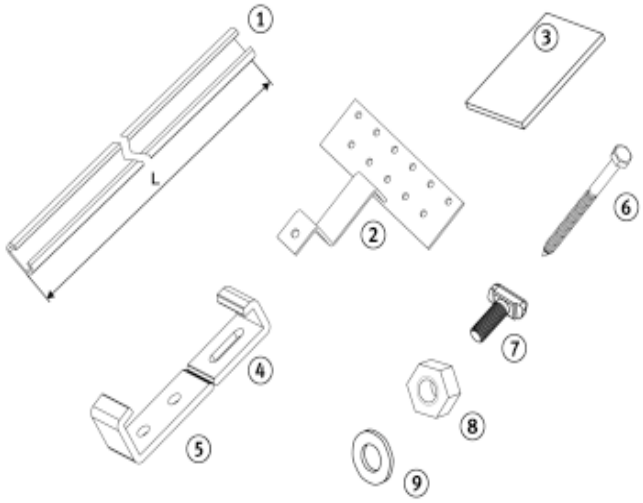
corresponds to the roof projection including the gable wall thickness. The adjacent 0.30 m distance to the collector are needed under the roof for the hydraulic connection.

Dimension D

stands for at least 3 pan tile rows up to the roof ridge. Particularly with wet-set pan tiles there would otherwise be the risk of damage to the roofing at the roof ridge.

3.2 Roofing tiles and plain tile roofing

3.2.1 Components



Pos	Parts list	CPC 6	CPC 12	CPC 15	CPC 18
1	Supporting bar L=1605 mm	2	2	2	3
2	Retainer	4	4	4	6
3	Distance board for elevation adjustment	required accessoires			
4	Upper retaining claw	2	2	2	3
5	Lower Retaining claw	2	2	2	3
6	screws 8 x 120 mm	required accessoires			
7	Hammer-head bolt	12	12	12	18
8	Hexagon nut	12	12	12	18
9	Washer	12	12	12	18

3.2.2 Required accessories and tools

Accessoires

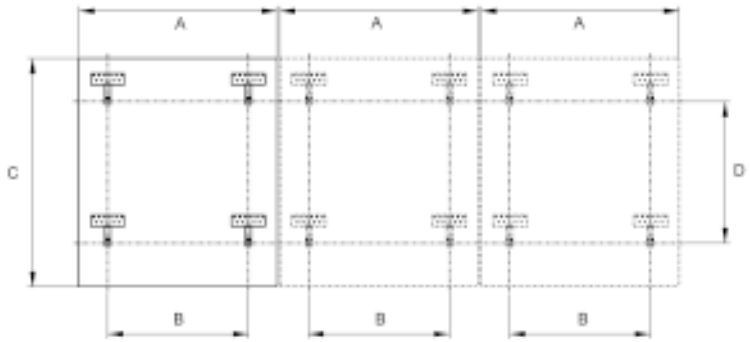
- 1-2 ventilation tiles, according to the number of roof penetrations
- Distance boards for elevation adjustment
- Screws 8 x 120 mm to fasten the Retainers on the roof construction (the minimum number of screws for each retainer is 3)

Tools

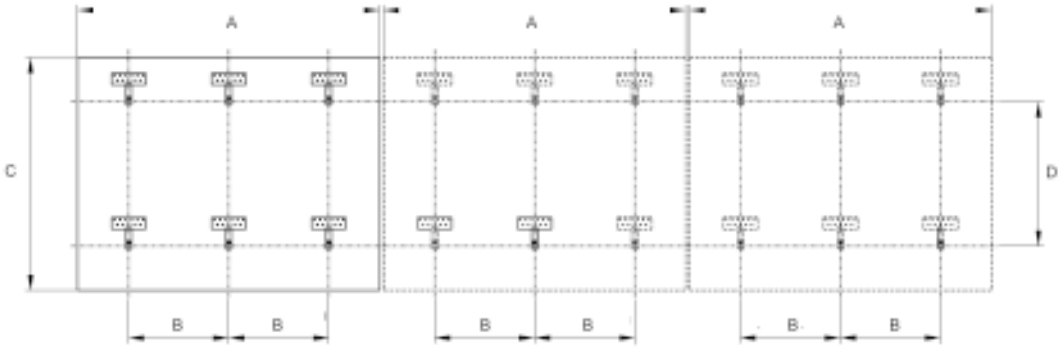
- Battery-powered screwdriver and/or battery drill, 6 and 9 mm drills
- Wrench set SW 13, 14, 17, 27
- 300g.Hammer
- Cut-off grinder with stone disk (for plain tile roofing).

3.2.3 Installation of supporting bars

placement of retainers
for CPC 6, CPC 12 and CPC 15:

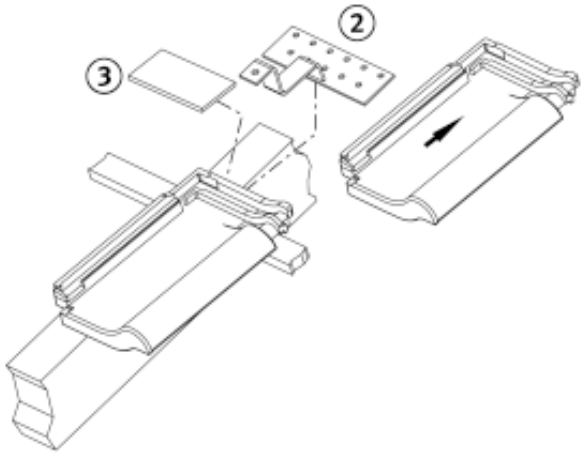


placement of retainers
for CPC 18:



distance	CPC6	CPC 12	CPC 15	CPC 18
A (m)	0,70	1,39	1,74	2,08
B (m)	0,5 - 0,6	0,8 - 1,2	1,0 - 1,4	0,7 - 1,0
C (m)	1,64			
D (m)	1,00			

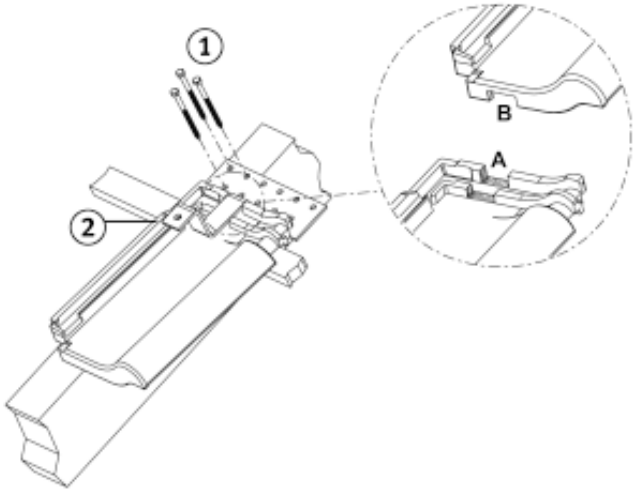
Assembly of the retainers for roofing tiles:



1. Look for the position of the rafters, and remove 2-3 roofing tiles of a row for the installation of the retainers.

Note:

The retainer must lie in the wave valley of the roof pan.



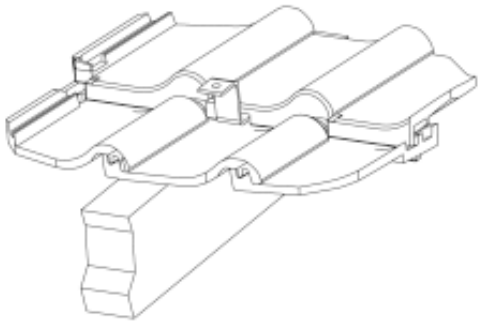
2. If necessary specify the height of the retainer (pos. 2) by backing with the distance boards (pos. 3) in such a way that it exits at the level of the underlying roof pan.

Note:

Within the range of the retainers the rain noses (pos. B) and profiles (pos. A) must be removed from the roofing tiles.

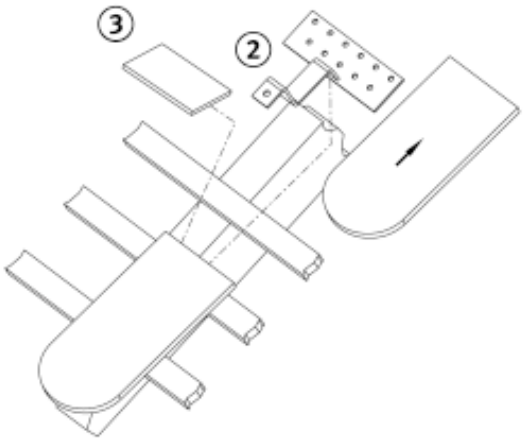
3. Pre-drill the distance boards according to the holes of the mounting plate of the retainer with a 9 mm drill.

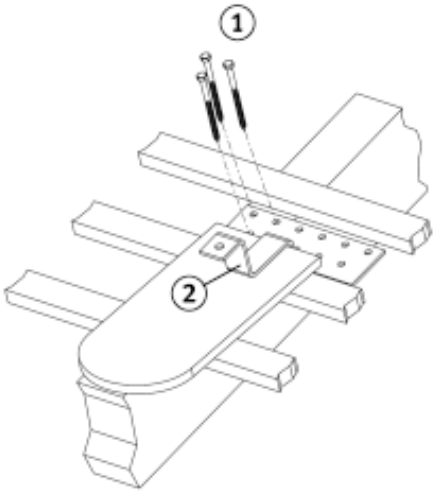
4. Pre-drill the rafters with a 6 mm drill. Screw the retainers (pos. 2) with wood screws 8 x 120 mm (pos. 1) onto the rafter.

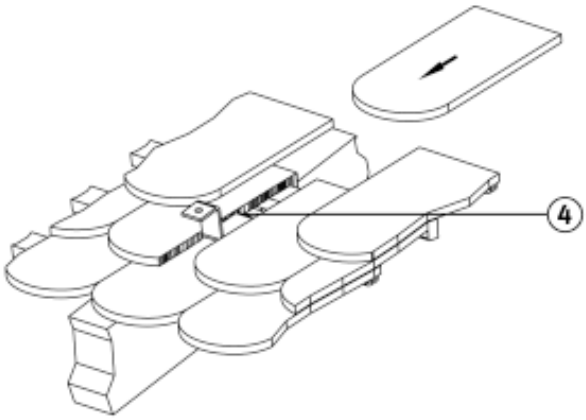


5. Cover up the roofing tiles again.

Installation of the retainers for plain tiles:







1. Look for the position of the rafters, and remove 2-3 roofing tiles of a row for the installation of the retainers.

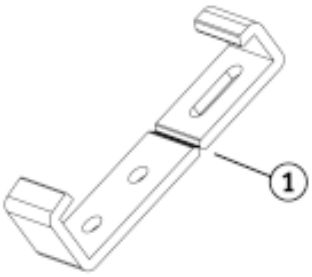
2. If necessary specify the height of the retainer (pos. 2) by backing with the distance boards (pos. 3) in such a way that it exits at the level of the underlying roof pan.

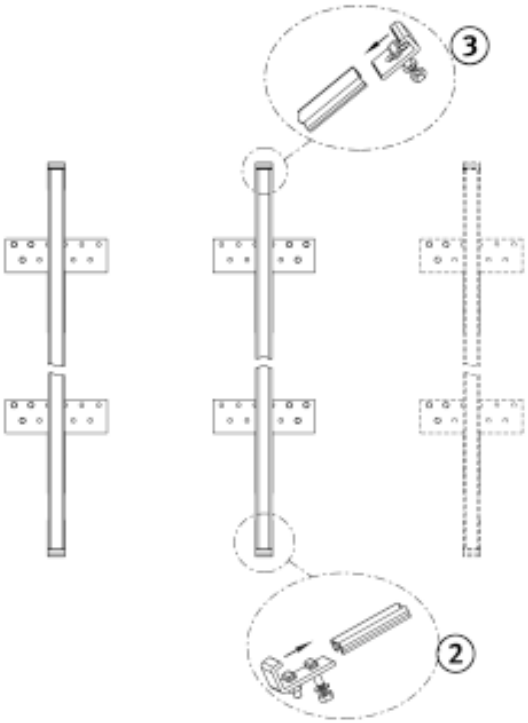
3. Pre-drill the distance boards according to the holes of the mounting plate of the retainer with a 9 mm drill.

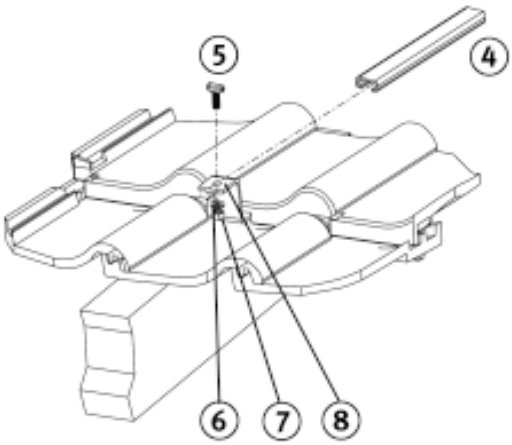
4. Pre-drill the rafters with a 6 mm drill. Screw the retainers (pos. 2) with wood screws 8 x 120 mm (pos. 1) onto the rafter.

5. Cover up the roofing tiles again. For that purpose, cut off the tiles besidethe retainer in the width of the retainer (pos. 4) with a cut-off grinder.

Installation of the supporting bars and retaining claws:







1. Separate lower and upper claw by breaking at the predetermined breaking point (pos. 1).

2. Install lower claws (pos. 2) with 2 hammer-head bolts each at the supporting bars.

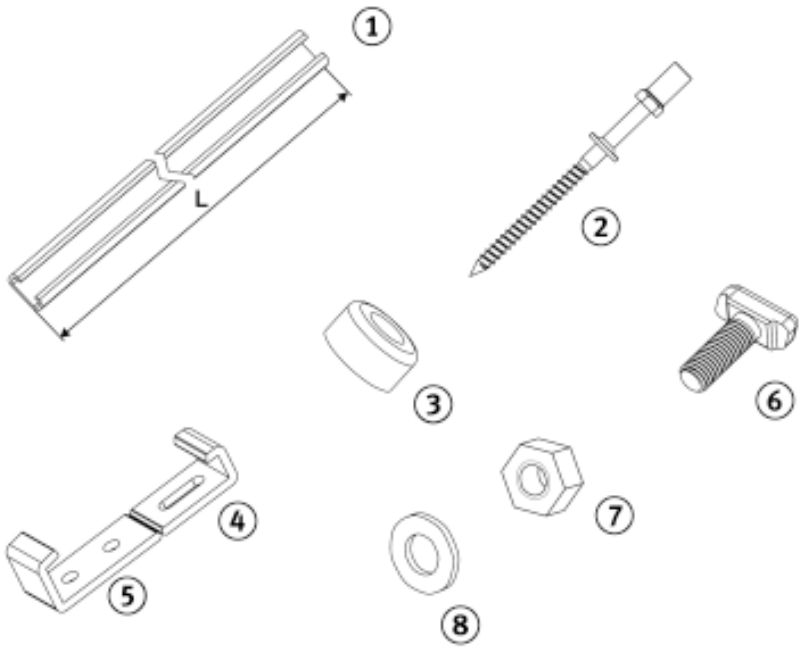
3. The upper claws (pos. 3) are only installed after collector assembly with 1 hammer-head bolt each at the supporting bars.

4. Bolt the supporting bars (pos. 4) with one hammer-head bolt (pos. 5), shim (pos. 6), and hexagon nut (pos. 7) each with the retainers (pos. 8). Align the supporting bars in such a way that at all ends of the supporting bars show the same projecting length. The alignment of the supporting bars is to be ensured with the help of a cord.

5. Check for tightness.

3.3 Corrugated board roofing

3.3.1 Components



Pos	Partslist	CPC 6	CPC 12	CPC 15	CPC 18
1	Supporting bar L=1605 mm	2	2	2	3
2	Stick screw	4	4	4	6
3	Sealing disk	4	4	4	6
4	Upper retaining claw	2	2	2	3
5	Lower retaining claw	2	2	2	3
6	Hammer-head bolt	12	12	12	18
7	Hexagon nut	12	12	12	18
8	Washer	12	12	12	18

3.3.2 Required accessories and tools

Accessoires

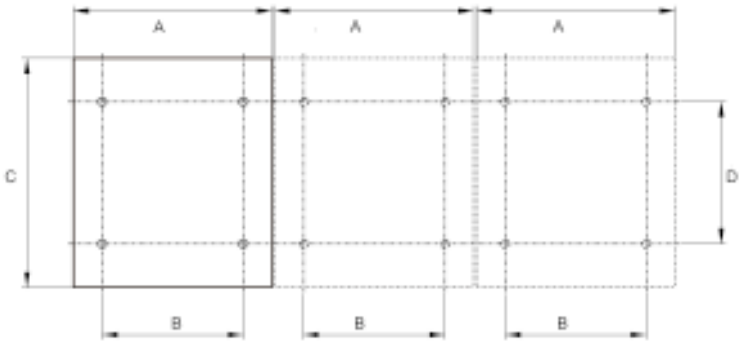
- 1-2 ventilation tiles, according to the number of roof penetrations

Tools

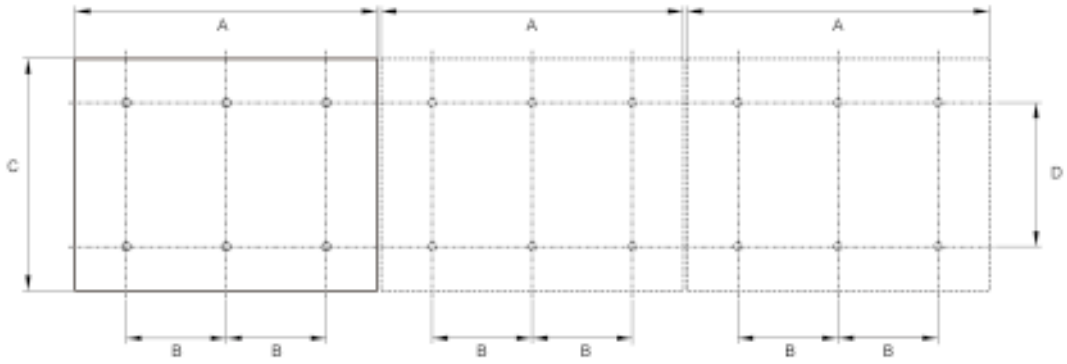
- Dust protection mask
- Battery-powered screwdriver and/or battery-powered drill, 13 mm wood drill, 16 mm drill for Eternit
- Wrench set SW 13, 14, 17, 27, 30

3.3.3 Installation of supporting bars

placement of stick screws
for CPC 6, CPC 12 and CPC 15:

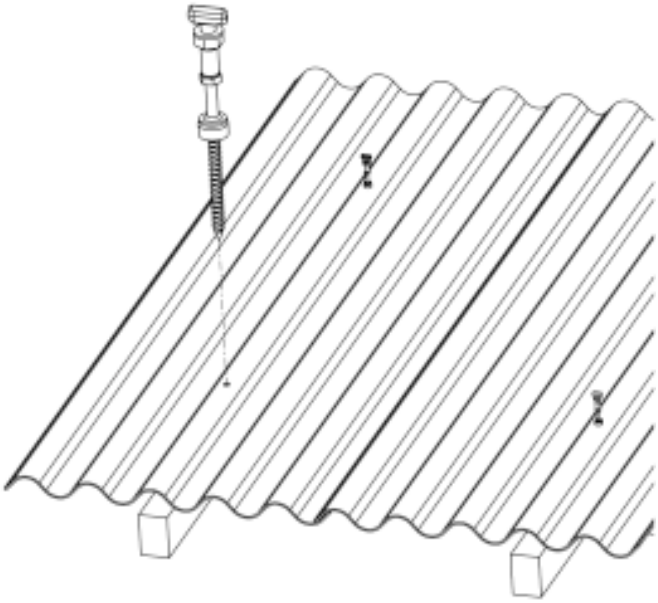


placement of stick screws
for CPC 18:



distance	CPC6	CPC 12	CPC 15	CPC 18
A (m)	0,70	1,39	1,74	2,08
B (m)	0,5 - 0,6	0,8 - 1,2	1,0 - 1,4	0,7 - 1,0
C (m)	1,64			
D (m)	1,00			

Installation of the stick screws:

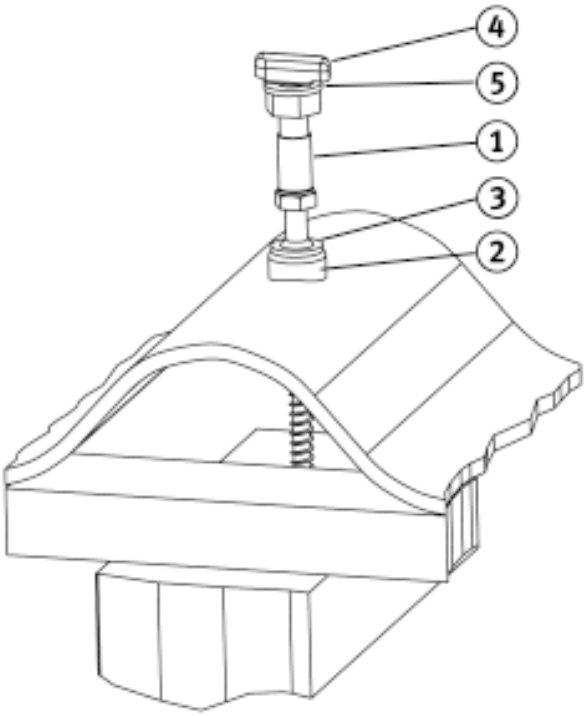


1. Look for the position of the rafters.

Note:

Absolutely carry dust protection mask when drilling in asbestos cement and/or fibrated concrete!

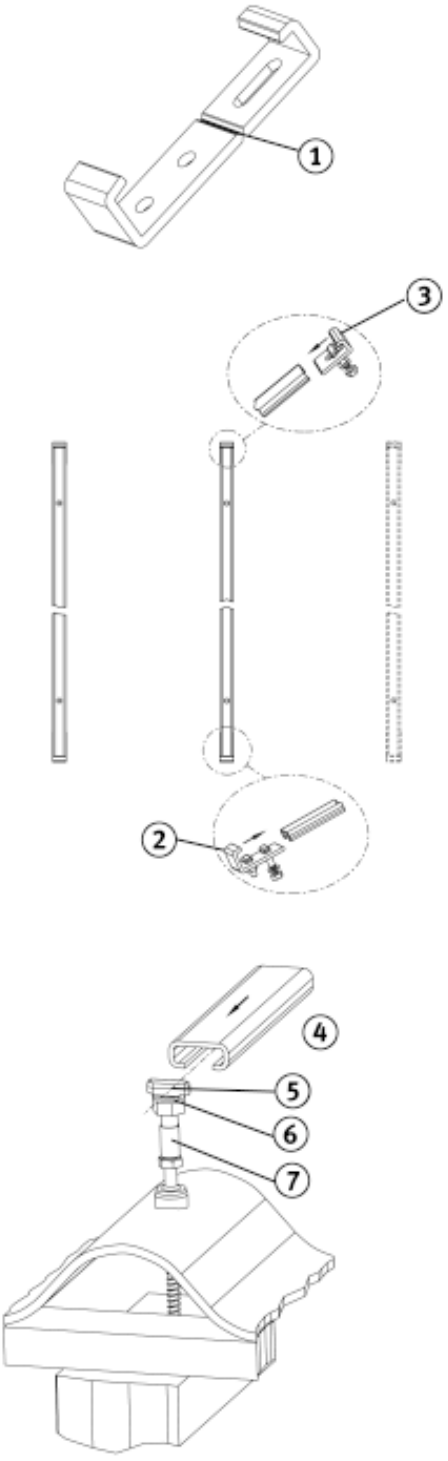
2. Drill the corrugated board with a 16 mm drill and the rafter with a 13 mm drill.



3. Screw-in the stick screw (pos.1) at least 80 mm deep into the rafter, but so far that the black sealing disk made of EPDM rubber (pos. 2) fits laminar and compressed between the peak of the corrugated board and the welded disk of the stick screw (pos. 3). The bore hole of the corrugated board must be completely sealed.

4. Screw-in the hammer-head bolt (pos. 4) with shim (pos. 5) 7 revolutions into the head of the stick screw.

Installation of the supporting bars and retaining claws:



1. Separate lower and upper claw by breaking at the predetermined breaking point (pos. 1).

2. Install lower claws (pos. 2) with 2 hammer-head bolts each at the supporting bars.

3. The upper claws (pos. 3) are only installed after collector assembly with 1 hammer-head bolt each at the supporting bars.

4. Bolt the supporting bars (pos. 4) with hammer-head bolt (pos. 5) and shim (pos. 6) to the stick screws (pos. 7). Align the supporting bars in such a way that at all ends of the supporting bars show the same projecting length. The alignment of the supporting bars is to be ensured with the help of a cord.

5. Check for tightness.

4. Installation of frames on flat roofs

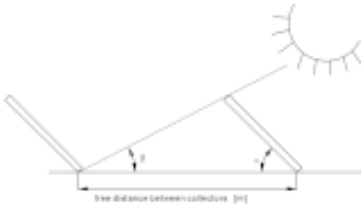
4.1 Space requirements

Space requirements for a single-row collector field:

	Dim A (m)				Dim B (m)		
Collectors	**CPC 6**	**CPC12**	**CPC15**	**CPC18**	**CPC6 to CPC18**		
					30 °	**45 °**	**60 °**
1	0,70	1,40	1,75	2,10	1,55	1,27	0,96
2	1,40	2,80	3,50	4,20	1,55	1,27	0,96
3	2,15	4,20	5,25	6,30	1,55	1,27	0,96
4	2,85	5,60	7,00	8,35	1,55	1,27	0,96
5	3,55	7,00	8,75	-	1,55	1,27	0,96
6	42,5	8,40	-	-	1,55	1,27	0,96

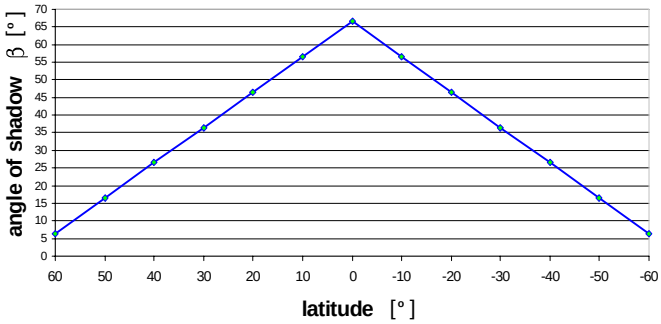
Free distance between the collectors, for double or multi row collector fields.

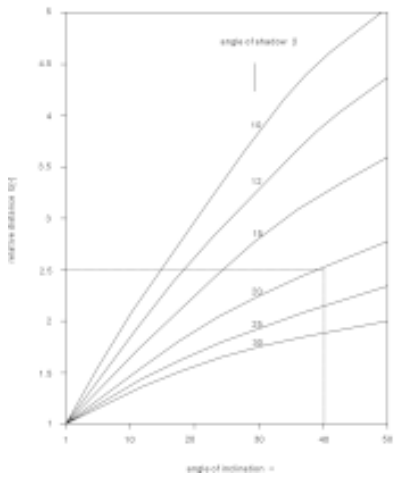
1. Determine the angle of shadow,
   depending on the latitude



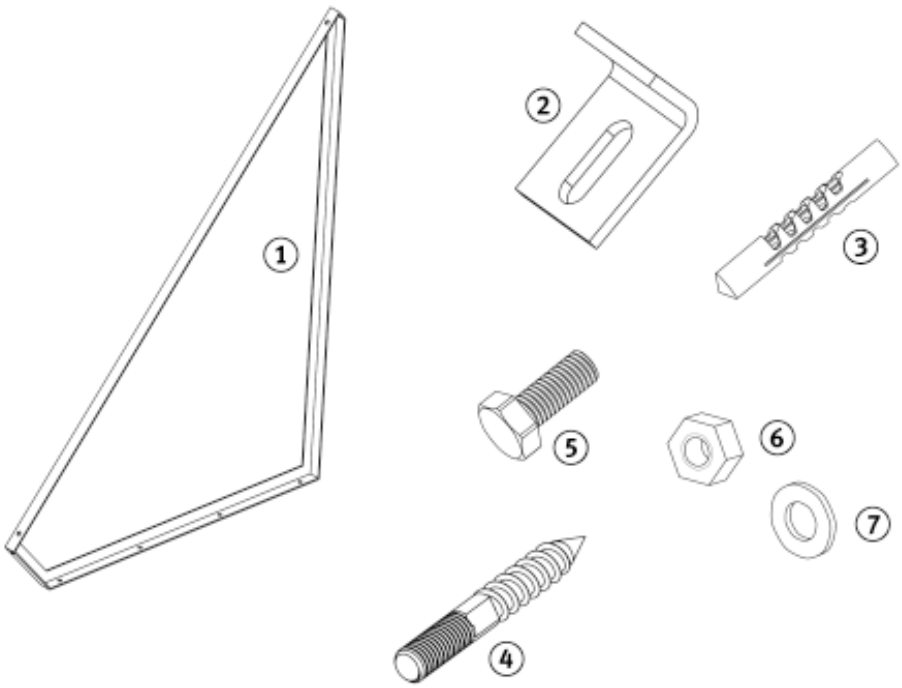
2. Determine the relative distance b between
   two rows of collectors

3. Calculate free distance betwen the collectors by
   Free distance [m = b x 1,64 m





4.2 Components



Pos	Parts list	CPC 6	CPC 12	CPC 15	CPC 18
1	Angle frame	2	2	2	3
2	Upper/lower retaining claw	4	4	4	6
3	Peg 10 mm	4	4	4	6
4	Stick screw	4	4	4	6
5	Hexagonal screw	4	4	4	6
6	Hexagon nut	8	8	8	12
7	Washer	4	4	4	6

4.3 Required accessories and tools

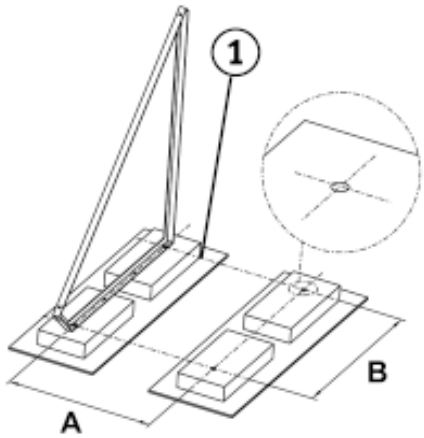
Accessoires per frame

- 2 pce. concrete plates
- 1 pce. building protection mat

Tools

- Stone drill 10 mm
- Wrench set SW 13, 14, 17, 27, 30.

4.4. Installation of angle frames



Weight and placement of the concrete plates:

Note:

Flat roofs with flint pouring:

Free laying space for concrete plates from gravel.

Flat roofs with plastic sheet roofing:

Lay concrete plates on protection cover
(building protection mats pos. 1).

Align concrete plates in accordance with the accompanying illustration

Placement of concrete plates:

	Dim A (m)				Dim B (m)		
	CPC 6	CPC 12	CPC 15	CPC 18	CPC 6 to CPC 18		
					30°	45°	60°
distance	0,55	1,10	1,25	0,85	1,20	0,95	0,7

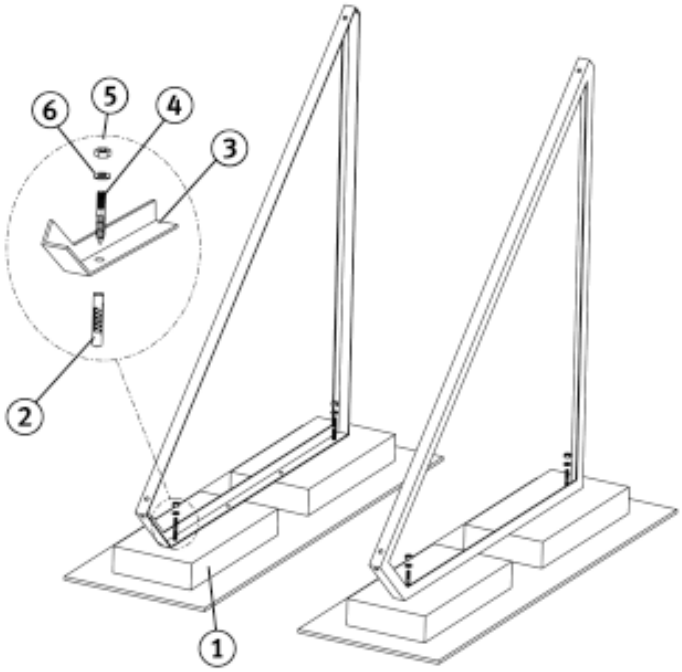
Necessary weight of front and rear plates:

	Buildings up to 8 m		Buildings up to 20 m	
	front plate	rear plate	front plate	rear plate
CPC 6	75 kg	75 kg	112 kg	112 kg
CPC 12	75 kg	75 kg	112 kg	112 kg
CPC 15	75 kg	75 kg	112 kg	112 kg
CPC 18	75 kg	75 kg	112 kg	112 kg

Note:

The weight of plates for different angles of frames is the same

Installation of the angle frames and the retaining claws



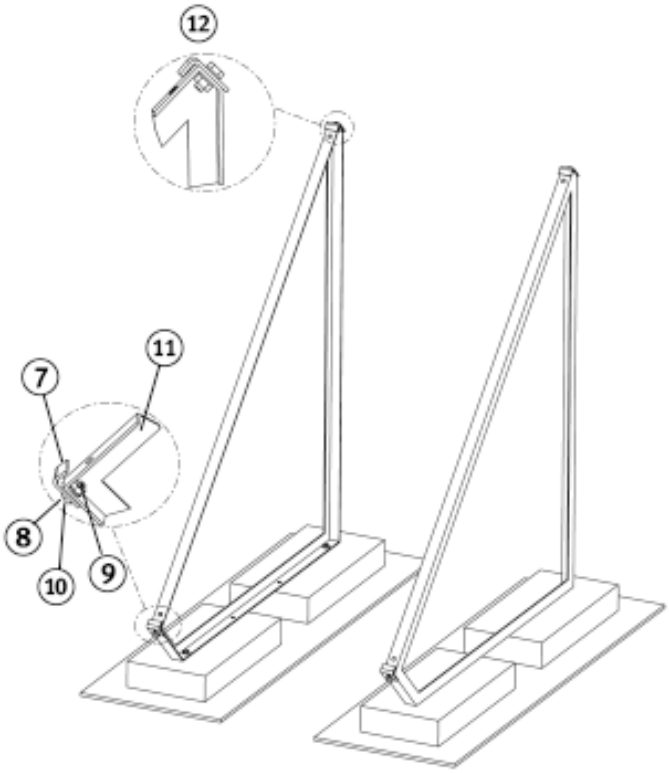
1. Drill holes 10 mm into the concrete plates (pos. 1), set pegs 10 mm (pos. 2) and screw the angle frame (pos. 3) with the enclosed stick screws (pos. 4), nuts (pos. 5), and shims (pos. 6) onto the concrete plates.

2. The alignment of the angle frames is to be specified with the help of a cord.

3. Fasten the lower retaining claws (pos. 7) with the enclosed screws (pos. 8), nuts/ mothers (pos. 9), and shims (pos. 10) to the angle frames (pos. 11).

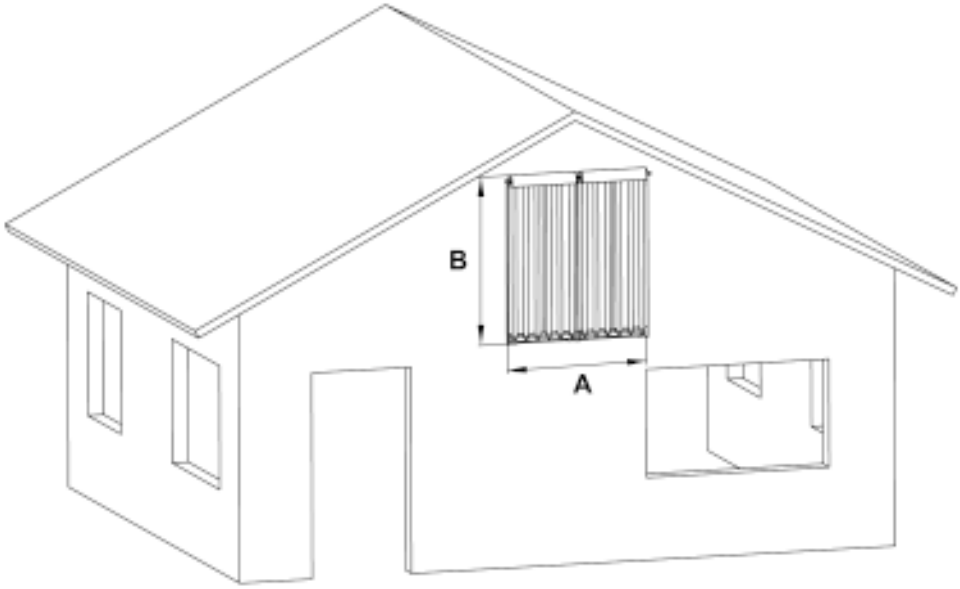
4. The upper claws (pos. 12) are only fastened after assembly of the collector to the angle frame.

5. Check for tightness.



5. Installation of supporting bars on the facade / perpendicular

5.1 Space requirements



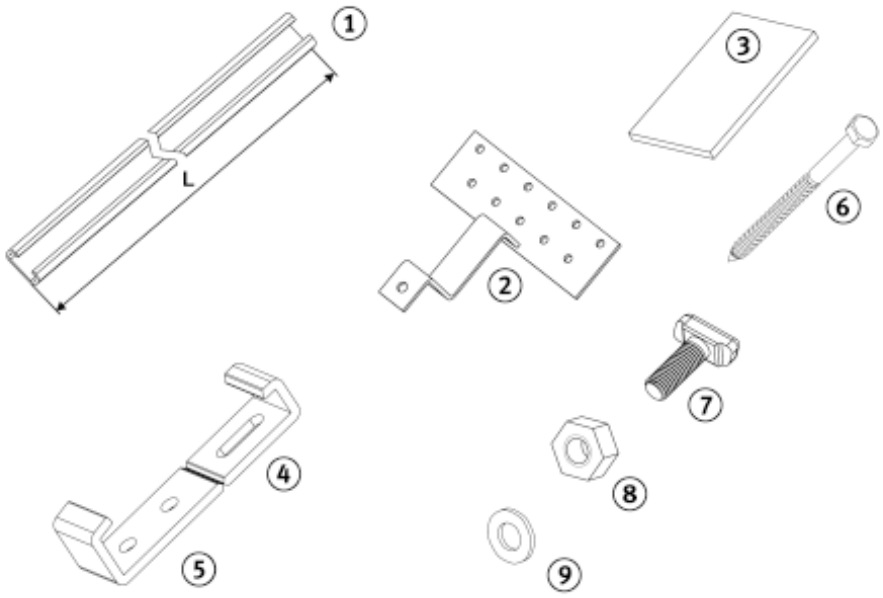
Space requirement for a single-row collector field: **Dimension B = 1,64 m**

Number of collectors	CPC6	CPC 12	CPC 15	CPC 18
	Dim. A (m)			
1	0,70	1,40	1,75	2,10
2	1,40	2,80	3,50	4,20
3	2,15	4,20	5,25	6,30
4	2,85	5,60	7,00	8,35
5	3,55	7,00	8,75	-
6	4,25	8,40	10,50	-

Space requirement for a double-row collector field: **Dimension B = 3,35**

Number of collectors	CPC 6	CPC 12	CPC 15	CPC 18
	Dim. A (m)			
2	0,70	1,40	1,75	2,10
4	1,40	2,80	3,50	4,20
6	2,15	4,20	5,25	6,30
8	2,85	5,60	7,00	8,35
10	3,55	7,00	8,75	-
12	4,25	8,40	10,50	-

5.2 Components



Pos	Parts list	CPC 6	CPC 12	CPC 15	CPC 18
1	Supporting bar L=1605 mm	2	2	2	3
2	Retainer	4	4	4	6
3	Upper retaining claw	2	2	2	3
4	Lower Retaining claw	2	2	2	3
5	Screws 8 x 120 mm	required accessoires			
6	Hammer-head bolt	12	12	12	18
7	Hexagon nut	12	12	12	18
8	Washer	12	12	12	18

5.3 Required accessories and tools

Accessoires

- Suitable screws and pegs for wall mounting.
- Distance boards for elevation adjustment

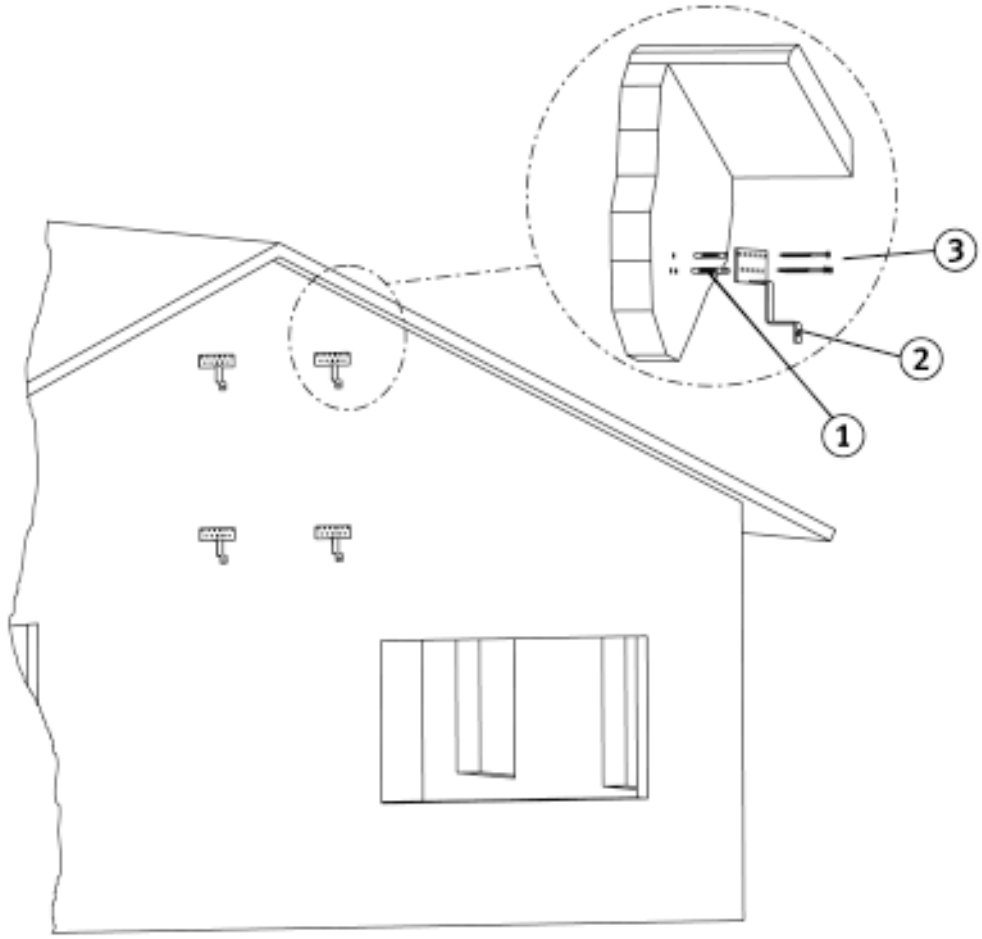
Tools

- Drill press and stone drill
- Wrench set SW 13, 14, 17, 27

5.4 Installation of supporting bars

Placement of retainers:

For placement of the retainers please look up side 10.

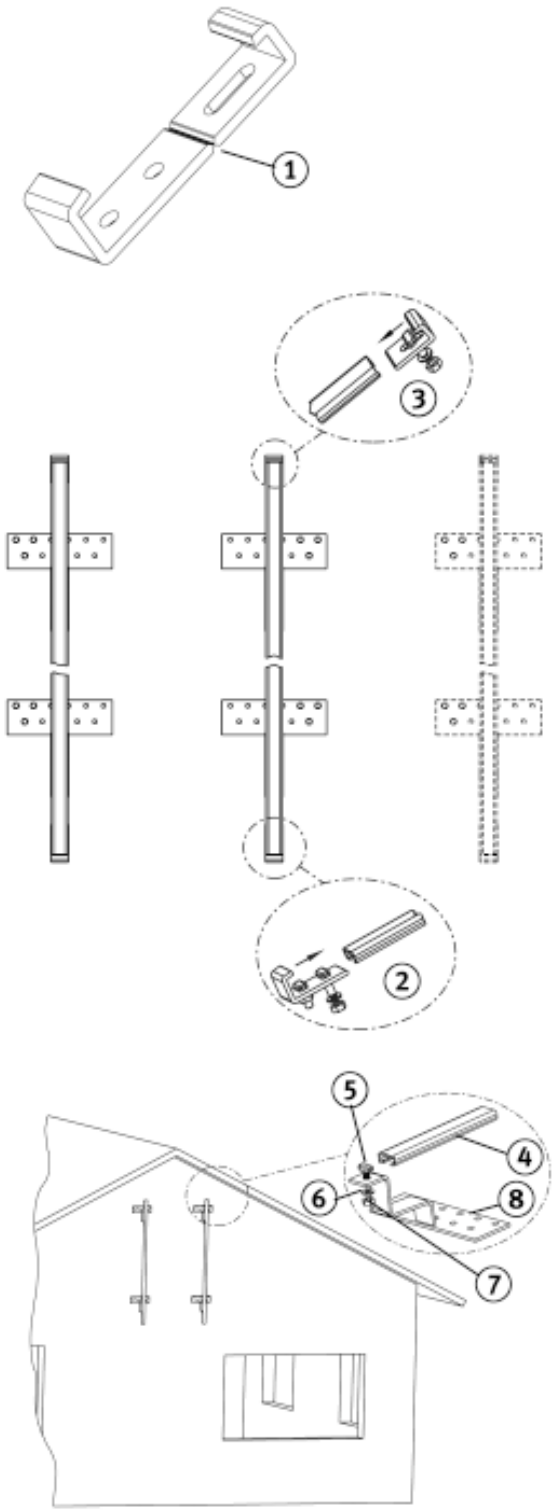


Installation of retainers:

1. Drill holes 10 mm and set pegs (pos. 1)

2. Screw retainers (pos. 2) with the screws (pos. 3) to the facade.

Installation of the supporting bars and retaining claws:



1. Separate lower and upper claw by breaking at the predetermined breaking point (pos. 1).

2. Install lower claws (pos. 2) with 2 hammer-head bolts each at the supporting bars.

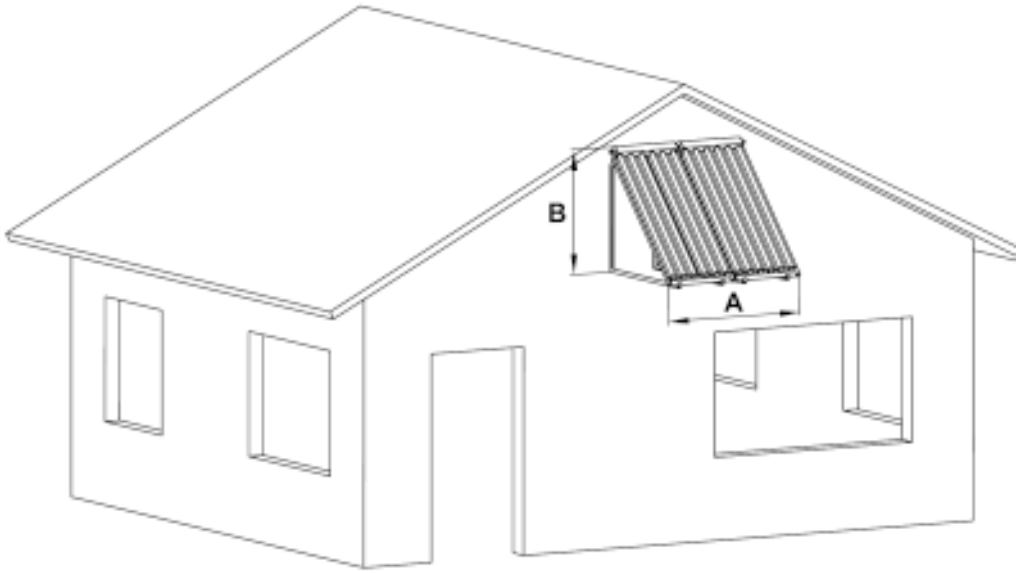
3. The upper claws (pos. 3) are only installed after collector assembly with 1 hammer-head bolt each at the supporting bars.

4. Bolt the supporting bars (pos. 4) with one hammer-head bolt (pos. 5), shim (pos. 6), and hexagon nut (pos. 7) each with the retainers (pos. 8). Align the supporting bars in such a way that at all ends of the supporting bars show the same projecting length. The alignment of the supporting bars is to be ensured with the help of a cord.

5. Check for tightness

6. Installation of frames on the facade / angle frame

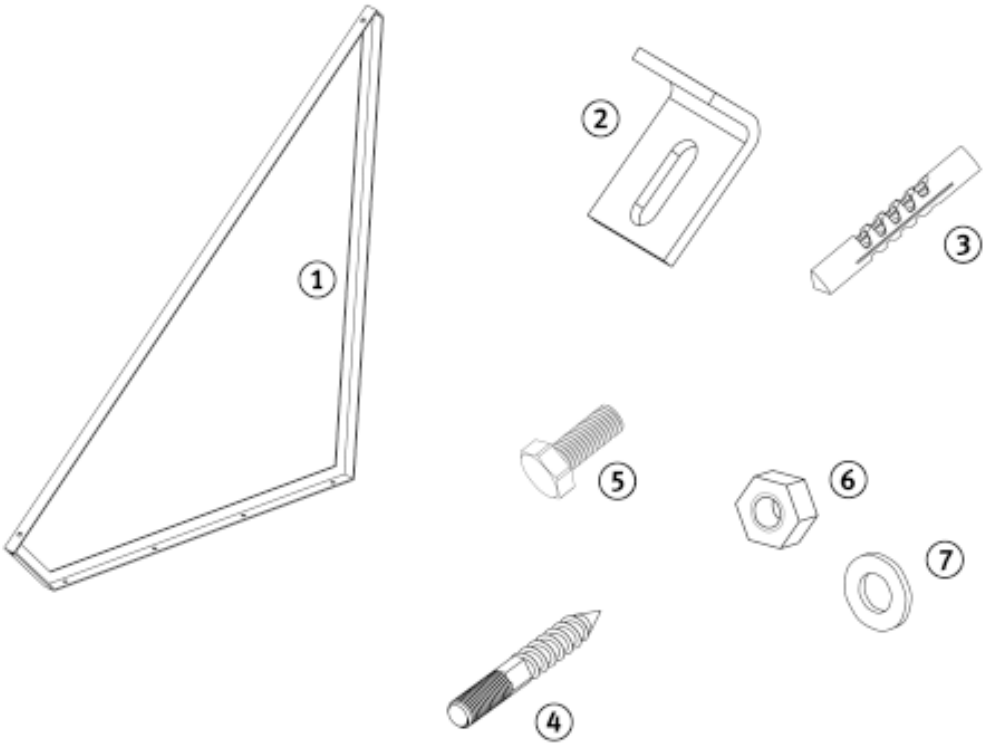
6.1 Space requirements



Space requirements for a single-row collector field:

	Dim A (m)				Dim B (m)		
	CPC 6	CPC12	CPC15	CPC18	CPC6 to CPC18		
					30 °	45 °	60 °
1	0,70	1,40	1,75	2,10	1,06	1,23	1,47
2	1,40	2,80	3,50	4,20	1,06	1,23	1,47
3	2,15	4,20	5,25	6,30	1,06	1,23	1,47
4	2,85	5,60	7,00	8,35	1,06	1,23	1,47
5	3,55	7,00	8,75	-	1,06	1,23	1,47
6	4,25	8,40	-	-	1,06	1,23	1,47

6.2 Components



Pos	Parts list	CPC 6	CPC 12	CPC 15	CPC 18
1	Angle frame	2	2	2	3
2	Upper/lower retaining claw	4	4	4	6
3	Peg 10 mm	required accessoires			
4	Stick screw	required accessoires			
5	Hexagonal screw	4	4	4	6
6	Hexagon nut	8	8	8	12
7	Washer	4	4	4	6

6.3 Required accessories and tools

Accessoires

- Suitable screws and pegs for wall mounting
- Distance boards for elevation adjustment

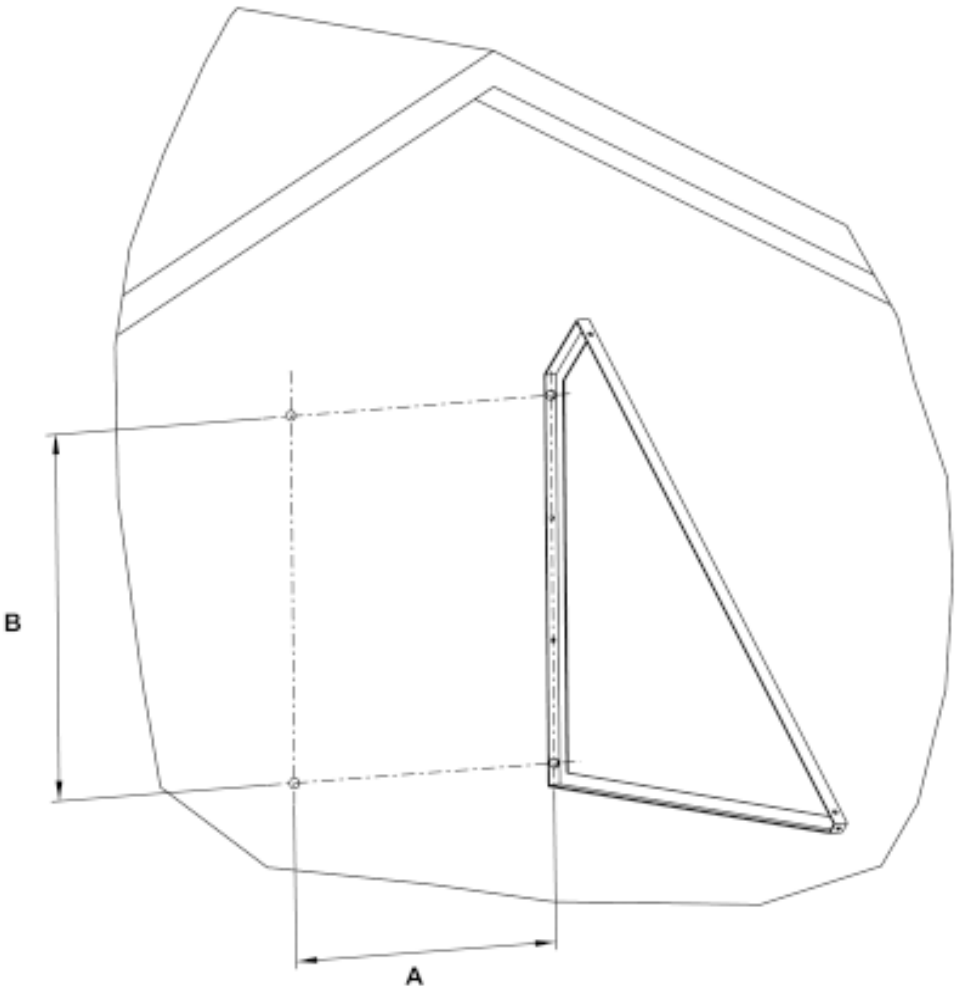
Tools

- Drill press and stone drill
- Wrench set SW 13, 14, 17, 27

6.3 Installation of angle frames

Placement of the angle frames:

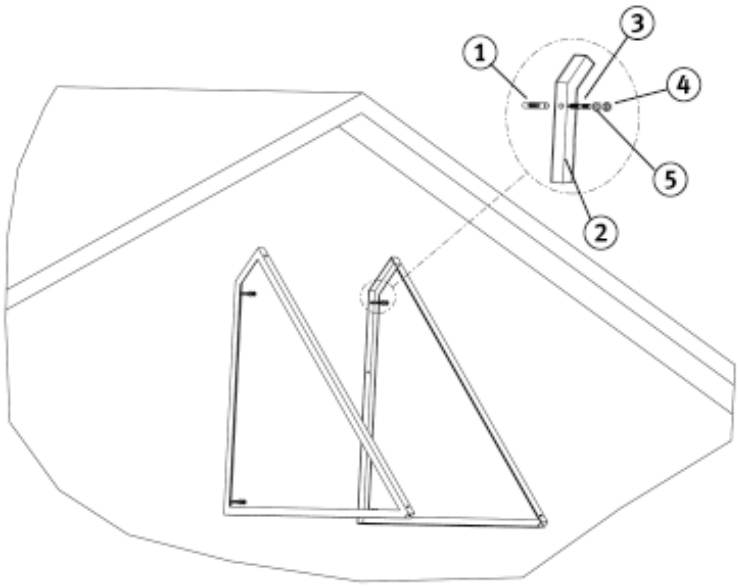
In order to be able to specify the position of the angle frames, the following illustration is to be observed.



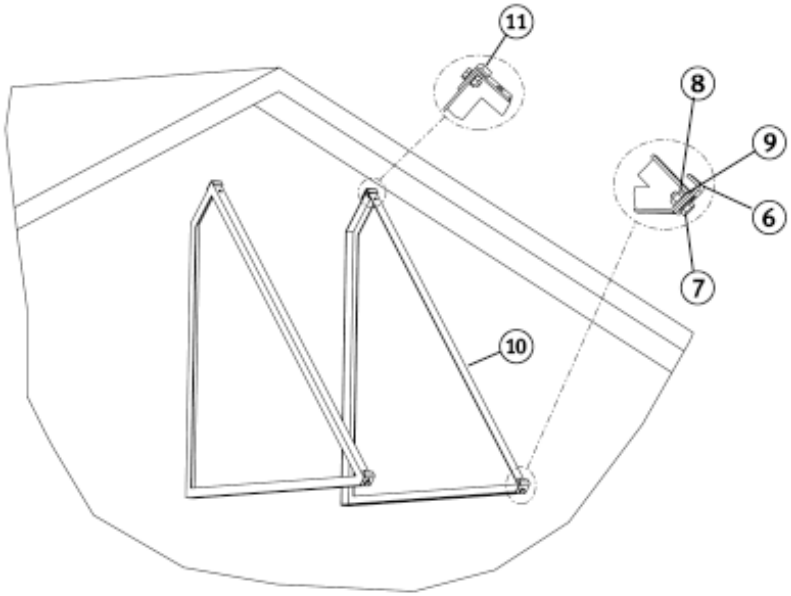
Placement of frames:

	Dim A (m)				Dim B (m)		
Collectors	**CPC 6**	**CPC 12**	**CPC 15**	**CPC 18**	**CPC 6 to CPC 18**		
					30°	**45°**	**60°**
distance (m)	0,55	1,10	1,25	0,85	0,30	0,40	0,60

Installation of the angle frames and the retaining claws



1. Drill holes 10 mm into the fac ade, set pegs 10 mm (pos. 1) and screw angle frame (pos. 2) with the enclosed stick screws (pos. 3), nuts (pos. 4), and shims (pos. 5) to the facade.



2. Fasten lower retaining claws (pos. 6) with the enclosed screws (pos. 7), nuts/mothers (pos. 8), and shims (pos. 9) to the angle frames (pos. 10).

3. The upper claws (pos. 11) are only fastened after collector assembly to the angle frames.

4. Check for tightness.

7. Location of collectors

1. Set the collector on the supporting bars or angle frames, and let it slide into the lower claws.

   Note:
   Thereby the lower claw must embrace the end section of the collector

2. Center-align the collector on the supporting bars or angle frames in such a way that the projection is the same on both sides.

3. Fasten the lower claw by using suitable wrenches.

4. Install the upper claws at the supporting bars or angle frames.

5. Check for tightness.

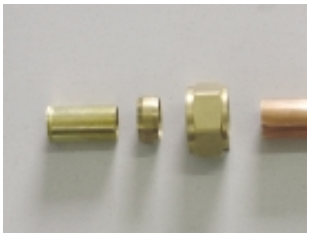
8. Hydraulic connections

8.1 Connection technique with clamping rings

1. Cut pipe to the required length with a metall saw.

2. Remove burrs.

3. Deburr the copper with convenient tools like tubing reamer.



4. Control for correct position of the clamping ring at the fitting. Push the pipe through the clamping ring up to the stop into the fitting. **Brass clamping rings must be used only!**

5. Tighten the union nut "with feeling". Also use fork wrenches to hold against.

   Overwinding of the union nut can lead to breaking!

6. Check for tightness.

It is imperative to use the support tubing and to hold against at the fitting body during tightening and loosening of the screw connections!

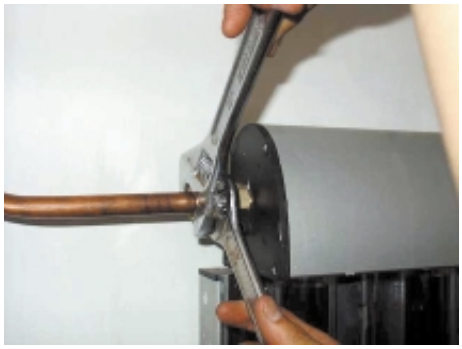
use convenient bending dies for the copper tube

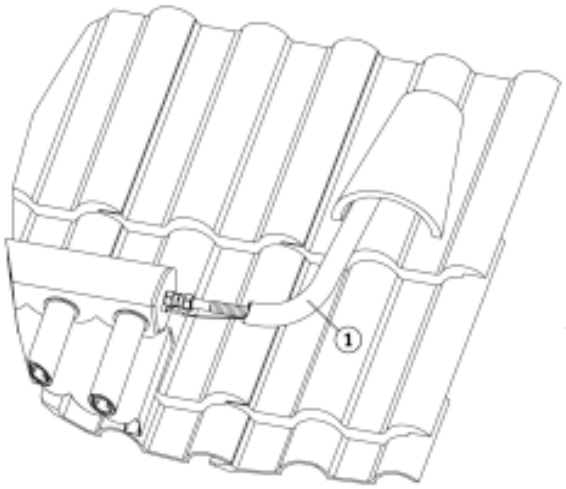
8.2 Connection of flow and return flow pipes

Note:
The advance and/or return connection can take place alternatively on the left or right side of the collector.
Use brass clamping rings only for screwed connections.

Interconnect connection pipes with clamping ring connector in accordance with the accompanying illustration.

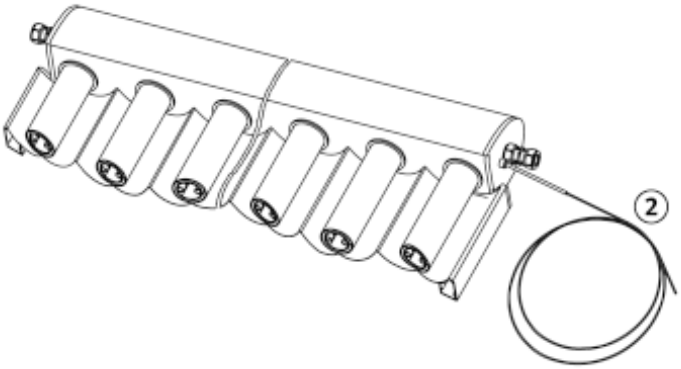
⚠ **It is imperative to use the support tubing and to hold against at the fitting body during tightening and loosening of the screw connections**





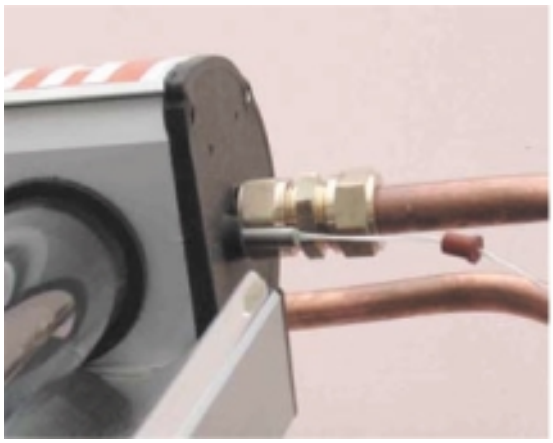
For flexible connection of the collector to the piping, flexible metallic connection tubes are available as accessory set (pos.1).

9. Sensor connection



Note:
The sensor (pos. 2) is on principle installed at the hot flow side.

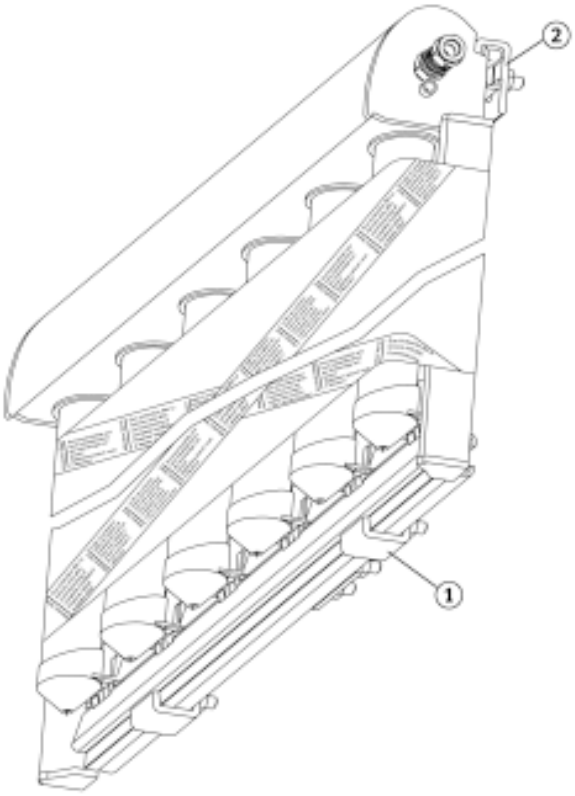
Both on the left and on the right side, there is a dipping sleeve integrated in the collector side part.



1. Insert ***sensors*** up to the stop into the dipping sleeve

2. Stopper the dipping sleeve with the silicon stopper

10. Sun protection film



The plastic film for sun protection is only removed after start-up of the solar system.

On delivery,the collector is covered with a plastic film for sun protection.This is intended to serve for a problem-free start-up of the solar system even during strong sun exposure.It prevents that the heat distribution medium goes into steam and makes a start-up impossible.

11. Initial start up of the solar system

- After finishing the installation of the complete solar system, including solar station, storage tank or heat exchanger and all necessary safety devices, the solar circuit has to be rinsed thoroughly with suitable equipement. We recommend to use the Linuo Paradigma filling and rinsing station.
- The system has to be checked for leakage.
- Before filling of the solar system, the pre-pressure of the expansion tank has to be checked.
- Before the the filling and rinsing process starts, all valves and flow meters have to be brought in open position.
- In case of parallel arrangement of collectors, all rows have to be rinsed separately, by closing the stop valves in other rows. After the rinsing process, all valves have to be opened again.
- After der rinsing process, the calculated working pressure and the flow rate in the collector circuit have to be adjusted.
- Take regard to the working pressure as an indicator for leakage in the solar circuit.
- Assembly instructions of the other components used have to be regarded before the initial start up.

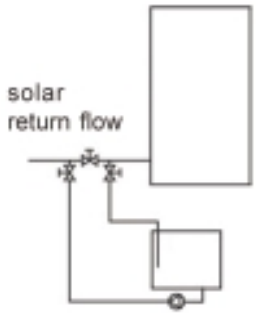
11.1 Filling and rinsing process

We recommend to use the Linuo Paradigma filling and rinsing station in combination with the Linuo Paradigma filling and rinsing valve for the initial start up process.

Linuo Paradigma filling and rinsing valve

Linuo Paradigma filling and rinsing station

The filling and rinsing valve should be placed accessible for mainenance near by the storage tank or the solar station in the return flow of the solar circuit!



1.Connect the filling and rinsing station with the filing and rinsing valve. Fill the station with water.Check, if all valves in the solar circuit are opened and the solar pump is switched off.

2. Switch on the pump of the filling an rinsing station.
Regard position of the valves in the picture.

3. Let the pump keep running until there are no more bubbles to see. Refill the station with water, if necessary.

4. Close the return flow valve of the station.

5. Increase the pressure at the presure gauge of the solar station to 0,6 MPa.

6. Close the flow valve of the station and switch off the pump of the filling an rinsing station. Wait for some minutes.

7. Open the return flow valve of the station.

8. Wait till pressure of the system is low again.

9. Open both valves of the filling and rinsing valve agein and switch on the pump of the station.

10. Let the pump keep running until there are no more bubbles to see. (repeat step 4 to 10 3 to 5 times if necessary).

11. Close the return flow valve of the station.

12. Increase the pressure at the presure gauge of the solar station to the calculated system pressure (e.g. 0,4 MPa).

13. Close the flow valve of the station and switch off the pump of the filling an rinsing station.

14. Open the red valve at the filling and rinsing valve. The system is now ready for operation. The controller can be set to automatic function.

Note:
In case of large collector areas, with different collector rows, interconnected in parallel, all rows have to be rinsed separately!

11.2 Adjustment of the flow rate

The flow rate in the solar circuit has to be adjusted, according to the general design data of the system. For use in combination with the Linuo Paradigma Tai Yang collectors, the following flow rates should be use.

high flow systems (e.g. domestic hot water sytem): 0,66 l/(min m²)
low flow systems (e.g. solar update sytem): 0,30 l/(min m²)