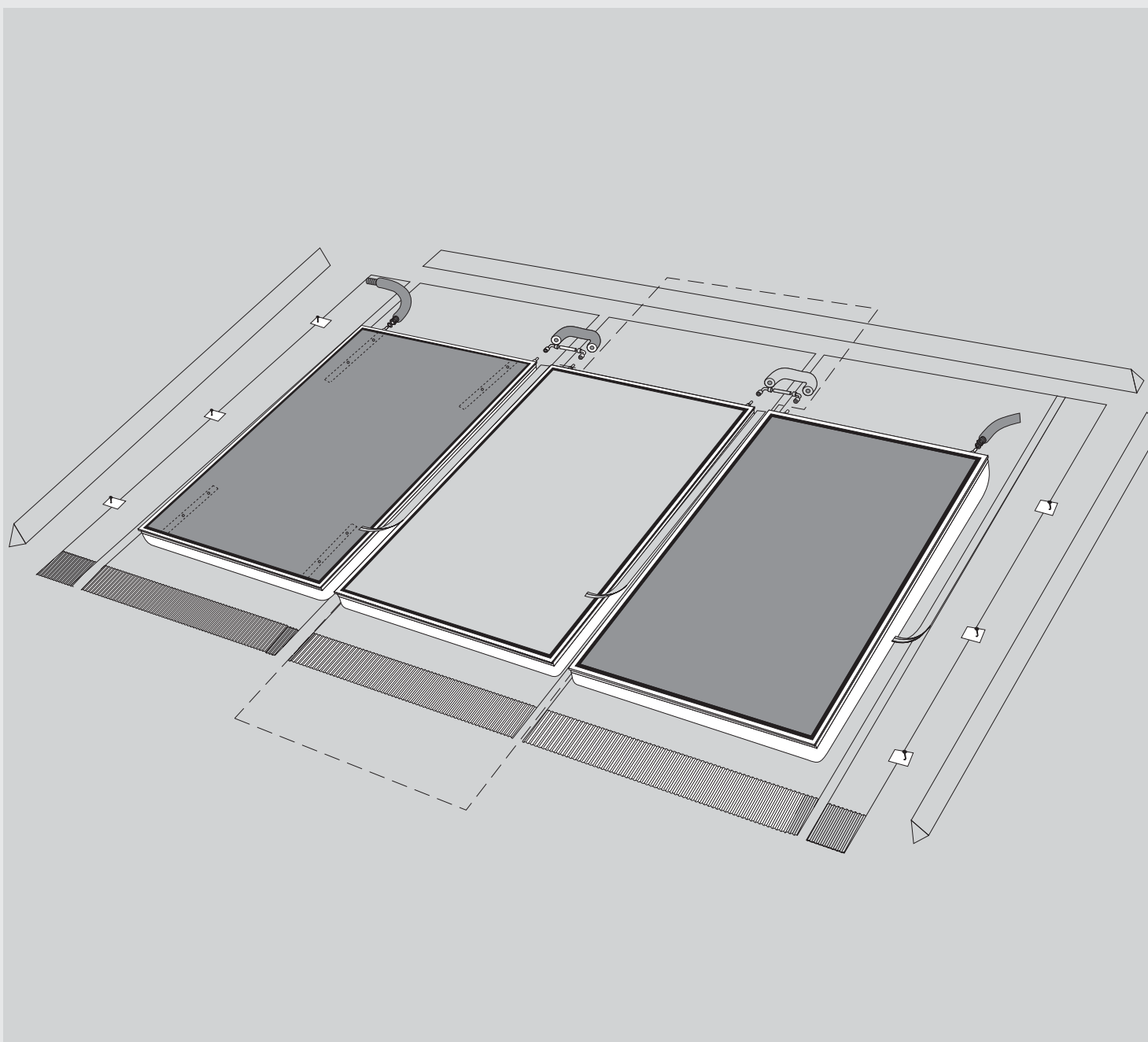


**IN-ROOF ATTACHMENT
FLAT COLLECTOR HELIOSTAR®
INSTALLATION INSTRUCTIONS**



Installation requirements

■ General requirements

The in-roof attachment set is capable for installation of Roth flat collectors in roofs with a slope greater than 27°. Installations on roofs made of natural slates should be carried out by companies employing professional tilers only. When installing collectors on top of sark-

ing membrane, a diffusion break respectively a casing (installation on expanded attics etc.) it is required to observe professional rear ventilation. Additional equipment could be necessary to transport the collector on the roof.

■ Safety information

Please read the installation instructions before starting the installation carefully and follow the indicated safety information. The valid industrial safety instructions and regulations of technology especially with regard to working on the roof have to be observed (see page 8). In case of higher loads of snow starting from zone 4 and in places above 600 m NN, please contact our technical department to discuss statics of the installation.

Important: For this installation method it could be possible the collectors cannot be completely evacuated. Therefore, the system

should only be filled with water/anti-freeze mixture which means to also refill anti-freeze after pressure or function test !
When storing the collectors before installation, make sure the collectors do not stand outside, lay on the glass and/or are stocked uncovered, to avoid humidity entering into the collector through the wholes in the collector frame. Before installing the collector connections, they must be annealed. Therefore, always push strongly against the 1/2" thread connection when tightening. Non-compliance can result in damage of the collector.

■ Potential adjustment and lightning protection

The metal pipelines of the solar circuit must be connected through a green/yellow conductor of min. 16 mm² Cu (H07 V respectively R) with the main potential adjustment rail. If a lightning protection installation is available, the collectors can be linked to it. Earthing can

also be done by a depth earth electrode. The grounding cable must be placed outside on the house. In addition the earth electrode must be connected with the main potential adjustment rail with a cable of the same diameter.

■ Installation of sensor

The sensor must be installed in the last flooded collector on the supply side (hot outlet). For this purpose, the rubber sleeve must be removed, the sensor must be threaded and the rock wool inside of the collector should be pushed aside. Afterwards place some heat conducting paste on top of the sensor and insert it as far as possible into the immersion sleeve. In the end push the rubber sleeve back

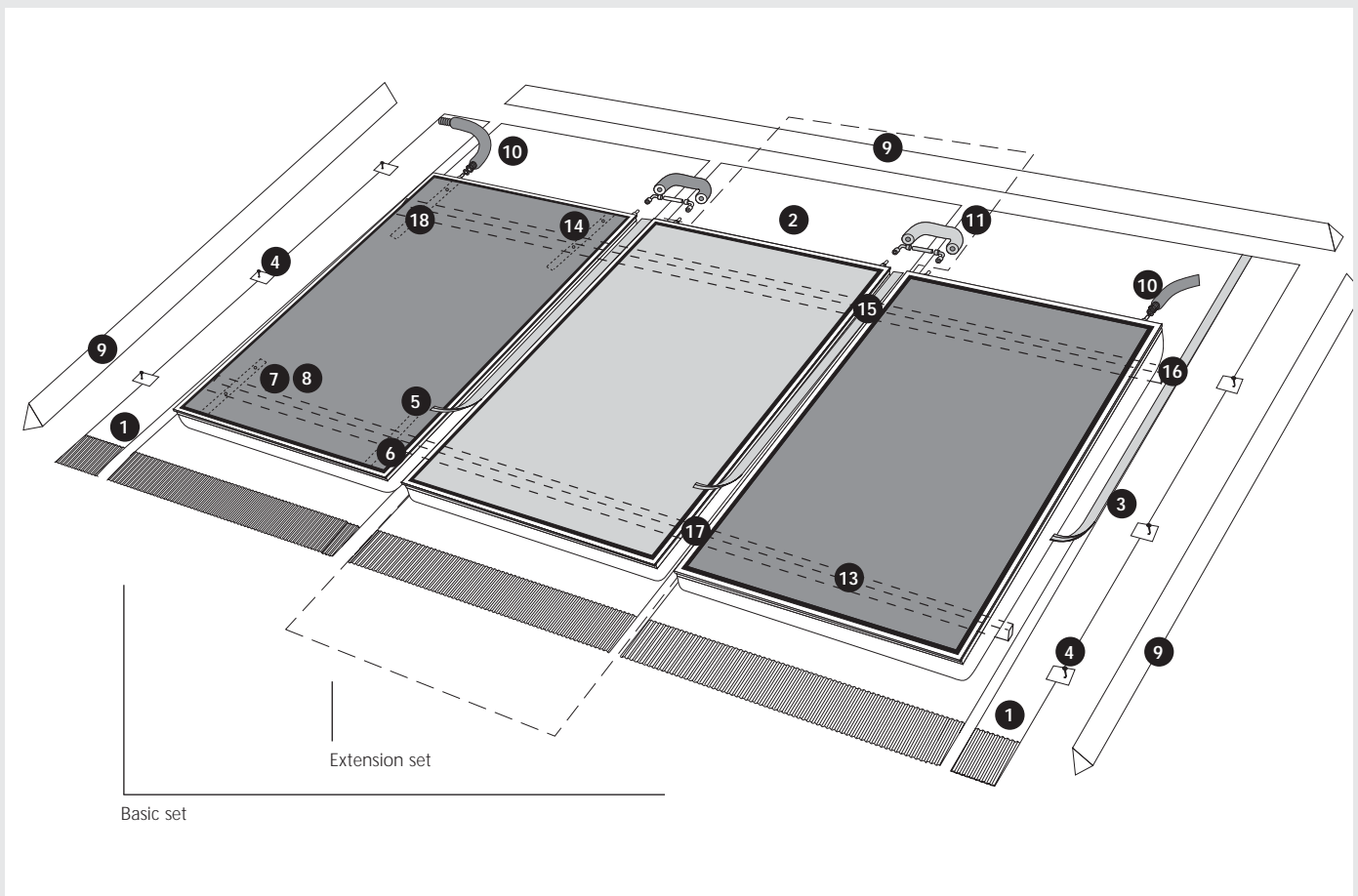
into its position until the countering lip interlocks with the collector frame. To extend the cable of the sensor up to 50 m it is sufficient to choose a cable diameter of 2 x 0,75 mm, for more than 50 m a diameter of 2 x 1,5 mm must be used. To protect the connected regulation units against overvoltage the collector sensor is to be extended appropriately, directly behind the collector, through an overvoltage protection case (optional).

■ Overview of tools

- Spanner SW 24 and SW 22 (are needed at the same time)
- 2 spanners SW 13
- Crosstip screwdriver or cordless screwdriver
- Boring machine
- Borer Ø 5 mm, 60° spot facer
- Possibly string
- Pencil



Overview of material

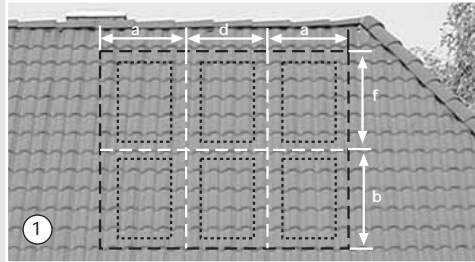


Material	Basic set in-roof quantity	Extension set in-roof (quantity)
① Lateral plate left, lead band	1	-
Lateral plate right, lead band	1	-
② Collector plate	2	1
③ Rubber connection profile 2425 mm	3	1
④ Plate holder and nails	6	-
⑤ Spax screws 5 x 40 with counter sunk	20	10
⑥ Sealing washer made of polyamide, blue	20	10
⑦ Hexagonal screws M 12 x 20, galvanised	4	4
⑧ Hexagonal nuts M 12, galvanised	4	4
⑨ Foam wedge, self-adhesive	6	1
⑩ Stainless steel corrugated hose, 1/2", with insulation, length 1000 mm	2	-
⑪ Stainless steel corrugated hose, 1/2", with insulation, length 300 mm	1	1
⑫ Flat sealing 1/2"	6	2
⑬ Installation rail L:1205 mm	4	2
⑭ Attachment flat L: 500 mm	8	4
⑮ U-connection profile 25 x 25 x 3 L: 130 mm	2	2
⑯ Attachment clamp single	4	-
⑰ Attachment clamp double	2	2
⑱ Hexagon socket head M 10 x 30	8	4

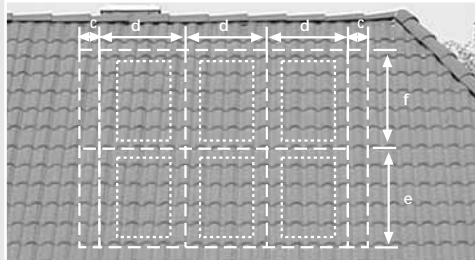
Installation instructions

■ Steps of installation

Required space (approximate):



Required space (real):



1. Before installing the collector field install solar circuit with solar station and expansion vessel to assure that the collector field can be pressure tested with the solar circuit before recovering the roof.

Width:

a: Approx. measure 1250 mm

Height:

b: Approx. measure 2300 mm (without lead band)

Measure f: 2400 mm for each extension row, define position of the collector field on roof. Leave 3 rows on ridge side if possible to protect ridge side from damage.

Size of collector field:

Width:

Measure c: 150 mm

Measure d: 1200 mm

Height:

Measure e: 2450 mm

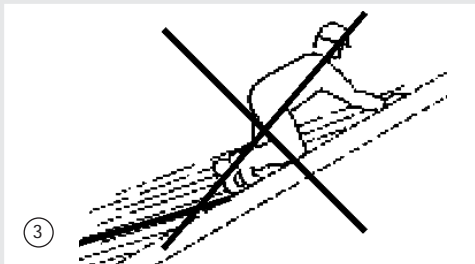
Measure f: 2400 mm for every additional collector row

■ Safety information



2. **For your safety:**

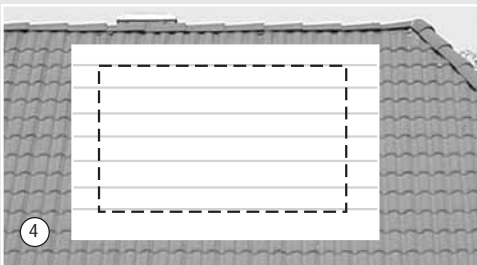
When working in danger of falling off the roof be sure to wear protective equipment (see page 8).



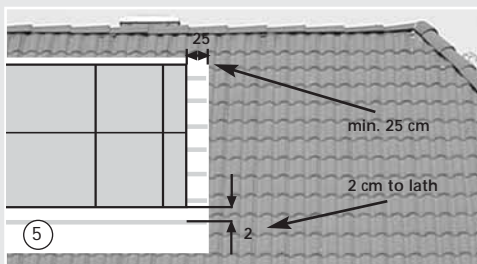
3. Do not step on attachment rail.

Installation instructions

■ Steps of installation



4. After measuring the collector field start removing the roof tiles. The last tile rows on the side as well as the upper and lower ones can remain, available laths should not be removed.



5. Insert 1 plate of the basic row in the cleared roof area. Leave 2 cm space between lower edge of plate and upper edge of the following lath. On the sides the distance between the edge and the next tiles should be 25 cm. To position the plate we recommend a second installer.



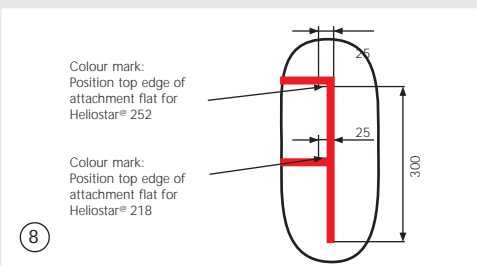
6. Fix adjusted lateral plate with 3 plate holder each on the side of the outer edges on the lath. The plates are jointly placed together. In between 2 plates there are no plate holders.



7. On the edges of 2 plates which are jointly positioned next to each other rubber connection profiles are retracted.

Important:

The rubber connection profile must be carefully be placed on every spot of the edges and accurately enclose it, rubber connection profile and collector plate must flush **below**.



8. Take the first attachment flat and position according to the collector size on the coloured mark on the plate.

Installation instructions

■ Steps of installation



9. To position the attachment flat remove the protection on the back side and stick it to the plate.

Afterwards fix the attachment flat by boring 2 holes with borer 5 mm. Insert spax screws with sealing washers through the holes on the attachment flat and tightly screw to laths.

Important:

When fixing the plates consider that these are horizontally aligned and jointly positioned next to each other.



10. Fix the installation rails with hexagon socket heads M 10 x 30.



11. Attach the installation rails with U-connection profile 25 x 25 x 3.



12. When connecting both profile rails push the attachment clamps in the designated grooves on the front side of the profile rails (for horizontal installation consider that the profile rails with closed long hole are used as rails below).

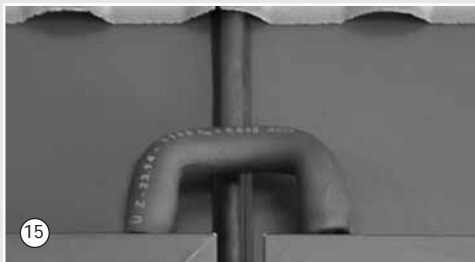


13. Place collector on profile rails and slide it into attachment clamps from the side.

Installation instructions



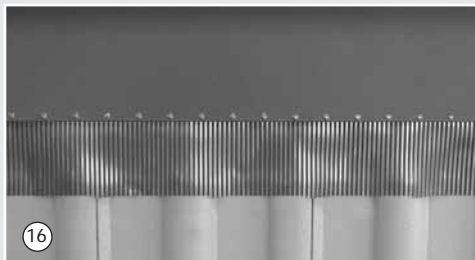
14. Fix attachment clamps with U profile and hexagonal screw M 12 x 20 mm from the outside. Before installing the second and any additional collector remove the protection film on the sides where the collectors touch.



15. Connect collectors with each other with short corrugated hose. After connection of the first side, push insulation aside (bulge) so that second connection becomes visible. Connect this side. Afterwards push heat insulation above the connections.

When installing the corrugated hose it must be observed to hold against the connection fitting with screwdriver SW 22.

Fix snow wedges on left, right and upper edge of the complete collector field. The lateral roofing tile rows can be placed back in a way that the snow wedge is located between the plate and tile. The same is valid for the upper roofing tile row.



16. Place the lower tile row below the lead band. Adjust lead band to form of roofing tiles. Detach protection foil from adhesive tape, press on lead band.



17. For installing the sensor remove the rubber sleeve, thread the sensor, place heat conducting paste on the sensor and insert as far as possible into the immersion sleeve. Afterwards push rubber sleeve behind the countering lip.



18. Slide insulation above long corrugated hose. One side with sealing should be screwed onto the outer collector connection, insert other side into the roof.

Tighten the union nut and simultaneously hold against the connection fitting of the collector with the second jaw wrench.

While doing this it is extremely important to observe rising corrugated hose positioning ! This enables ventilation on the highest point of the system.

■ Steps of installation

Security

■ Industrial safety instructions and regulations of technology

Industrial safety instructions and regulations of technology

- Installation on roofs: DIN 18338 tilers and roof sealing work, DIN 18339 plumbing, DIN 18451 scaffold work

- Connection of thermal solar installations: DIN 4757 part 1 and 3

- Electrical connections: VDE 0100 installation of electronic equipment, VDE 0185 general information with regard to lightning protection installation, VDE 0190 main potential adjustment of electronic installations, DIN 18382 electronic cables in houses

Detailed information referring to prevention of accidents can be found at Accident Prevention and Insurance Association!

Use ladder appropriate

Use ladder only for a height difference up to 5 m. Lean and secure in an angle of 65-75°. Exit must be topped by a minimum of 1 m.

Security of not falling of the roof

In case of falling height > 3m on roofs with a slope between 20° and 60°, it is required to provide corresponding security for falling protection (VBG 37, § 8). The vertical distance from the working place to the roof scaffold or alternatively the roof protection wall should not exceed 5 m. For protection it is also possible to use a safety line. Security hooks must be installed above the user on a sustainable component. Do not use ladder hooks!

Security of falling parts

Protect roads and working places below against falling or upsetting components. These areas must be marked and blocked.

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