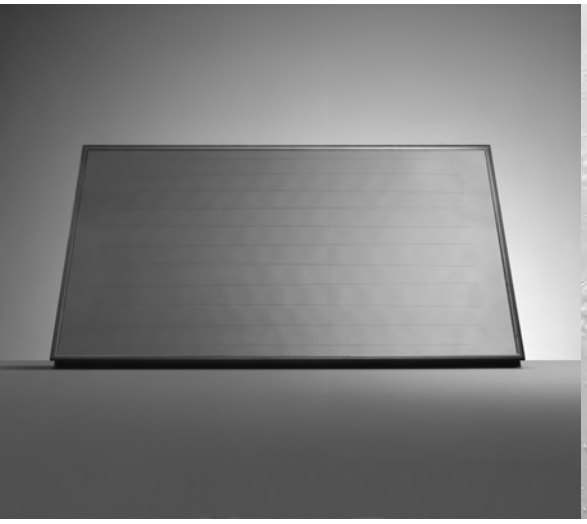
auroTHERM



VFK 145 H/V
VFK 150 H/V

GB, In roof

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For the expert technician

Installation manual

auroTHERM

In-roof mounting

VFK 145 H/V
VFK 150 H/V

GB

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1 Notes on the documentation

The instructions below are intended to help you throughout the entire documentation.

1.1 Other applicable documents

All installation instructions of flat collectors and components of the installation must be observed when installing the solar system. These instructions are included with the individual components of the system and the additional components.

We accept no liability for a damage caused by failure to observe these instructions.

1.2 Attachment and storage of documents

Please pass on this installation manual and all other applicable documents and auxiliary equipment to the plant operator, whose responsibility it is to ensure the manuals and auxiliary equipment are available whenever required.

1.3 Symbols used

Please observe the safety instructions in this installation manual for the installation of the collector!

Danger!
Immediate risk of serious injury or death!

Danger!
Risk of death from electric shock!

Danger!
Danger of burning and scalding!

Caution!
Potentially dangerous situations for the product and the environment!

Note
Useful information and instructions.

- Symbol indicating the required action

1.4 Applicability of the manual

These installation manual applies exclusively to flat collectors with the following article numbers:

Collector type	Article number
VFK 145 H	0010004457
VFK 145 V	0010004455
VFK 150 H	0010006285
VFK 150 V	0010006283

Table 1.1 Collector types and article numbers

For the flat collector article number please see the identification plate on the upper collector edge.

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Vaillant auroTHERM flat collectors are available in different versions: one for the horizontal position, one for the vertical position.
Besides, collectors in the collector field can be arranged side by side and on top of each other.
Generally, the installation steps and the instructions described in this manual are valid for both collector positions and field arrangements.
Any different installation steps are clearly pointed out:

With horizontal collector position

With vertical collector position

With fields arranged side by side

With fields arranged on top of each other

2 Intended use

The Vaillant auroTHERM flat collectors are built and designed according to accepted safety rules and regulations.
Nevertheless, improper use may cause danger to life and limb of the user or third parties and could impair the operation of the unit and other objects.
The unit is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and/or knowledge, unless they have been given supervision or instruction concerning use of the unit by a person responsible for their safety.
Children must be watched to ensure that they do not play with the unit.
Vaillant auroTHERM flat collectors are used for heating support and for solar hot water generation.
Any other use or use exceeding the above-mentioned applications shall be considered as improper use. The manufacturer/supplier shall not be responsible for any damages resulting from such improper use. The user alone bears the risk.
Use includes observance of the operating and installation manuals and all other applicable documents, as well as adherence to the maintenance and inspection conditions.

Caution!
Any improper use is forbidden!

2.1 Combination with other components

Vaillant flat collectors should be combined only with Vaillant components (fixing, connections) and system components.
The use of other components or system components shall be considered as improper use. We accept no liability.

2.2 Operational conditions

Caution!
Collector damage!
Flat collectors are suitable for a maximum snow load of 5.0 kN/m² and a maximum wind load of 1.6 kN/m².

Caution!
The roof may collapse!
Mount the flat collectors only on roofs with a sufficient load-carrying capacity.
If necessary, call a technician.

Caution!
Lack of tightness!
For in-roof mounting, the roof must have a pitch of ≥ 22°.
With roof angles < 22° rainwater can collect on the cover plates and leaks can occur.
With roof angles of 15°-22° use the Vaillant cover kit 0020059599 or 0020059879.

2.3 CE mark

The CE mark certifies that the appliances, according to the models available, satisfy the basic requirements of the following directives:
– Directive 97/23/EWG of the European Parliament and Council for approximation of the laws of the member states regarding pressure equipment

CE

auroTHERM flat collectors are built according to the state of the art and recognised safety rules and regulations.
Conformity with the applicable standards has been demonstrated.

DIN Geprüft

auroTHERM flat collectors have been successfully tested according to the rules and requirements for the Solar Keymark.

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3 Safety instructions

The following safety instructions, technical rules and accident prevention regulations must be observed when installing the flat collectors.

Danger!
Risk of death from falls and falling objects!
Observe the national regulations for working at heights.

Danger!
Danger of burning and scalding!
In case of solar irradiation inside the units, collectors can reach 200 °C. Remove the sun protection film installed at the factory only after the solar energy system has been started up.

Danger!
Danger of burning and scalding!
In case of solar irradiation inside the units, collectors can reach 200 °C.
Do not perform maintenance work under direct sunlight.

Caution!
Collector damage!
In order to install flat collectors according to the installation manual, a qualified engineer is required. The installation should be performed only by qualified engineers.

3.1 Technical Guidance

The system must be installed in accordance with all relevant and applicable national regulations, and must be installed to suit site conditions.
Observe all national regulations, including:
- Working at Heights Regulations 2005
- Health and Safety at Work Act 1974
- Electricity at Work Regulations 1989
- IEE Wiring Regulations BS 7671
- Lightning protection requirements
- Equipotential bonding of electrical installations.

3.2 Related documents

The installation of the solar system must be in accordance with the relevant requirements of Health and Safety Document No. 635 (The Electricity at Work Regulations 1989), BS7671 (IEE Wiring Regulations) and the Water Supply (Water Fitting) Regulations 1999, or The Water Bylaws 2000 (Scotland). It should also be in accordance with the relevant requirements of the Local Authority, Building Regulations, The Building Regulations (Scotland), The Building Regulations (Northern Ireland) and the relevant recommendations of the following British Standards:
- BS EN 806: Specification for installations inside buildings conveying water for human consumption
- BS 6700: Services supplying water for domestic use within buildings and their curtilages.
- BS. 5449 Forced circulation hot water central heating systems for domestic premises.
  Note: only up to 45 kW.
- BS. 6880 Low temperature hot water heating systems of output greater than 45 kW.
  Part 1 Fundamental and design considerations.
  Part 2 Selection of equipment.
  Part 3 Installation, commissioning and maintenance.
- BS 6114: Expansion vessels using an internal diaphragm for unvented hot water supply systems
- BS 4814 Specification for: Expansion vessels using an internal diaphragm, for sealed hot water heating systems.

Unvented hot water systems must comply with building regulation G section 3.

3.3 Regulations for the prevention of accidents

When carrying out works such as solar installation work it is necessary to do so in a safe and workman like manner, taking due care of any aspects of the works that could result in injuries to person in or about the building as well as workers, passers by and the general public at large. To that end these works must conform, but not be limited to, the current regulations in force such as the following
- Health and Safety at Work act 1974
- Work at Height Regulations 2005.
- Electricity at Work Regulations 1989
- All necessary Building Regulations.

Work should be preceded by a risk assessment covering all aspects of health and safety risks, or training requirements that can reasonably be foreseen to be associated with the work. All scaffolding in the UK, other than prefabricated (zip-up) scaffold towers, must be designed and constructed by a vetted contractor, and have suitable kick boards, hand rails and where appropriate netting. Areas around the scaffolding should be zoned off and marked with suitable warning signs to a suitable distance to protect persons from falling objects. Workers should have available and use personal protective equipment as necessary. This would include equipment such as fall protection systems, safety gloves, goggles, dust masks as well as any specialised equipment that may be in use such as lifting and handling equipment.
The completed works shall comply with all necessary BS EN Standards and Codes of practice as well as Building control or planning requirements and be confirmed where necessary by notification to building control or the appropriate competence based notification body.

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3.4 Lightning protection

Caution!
Damage from lightning!
If the installation height is more than 20 m or if the collectors are projected above the roof ridge, electro-conductive components must be connected to a lightning protection device!

3.5 Frost protection

Caution!
Damage due to frost!
Under no circumstances should water on its own be in the collector if there is a danger of frost!
After pressurisation and flushing, the collectors may contain water residues.
Immediately fill the solar system with solar fluid. Check the fluid concentration with a frost protection tester. Water remaining in the solar circuit may dilute the fluid.

4 Installation

4.1 Before installation

Please note the following instructions before and during installation:

Danger!
Risk of death from falls and falling objects!
Observe the national regulations for working at heights.
Wear the Vaillant safety belt (article number 302066).

Danger!
Risk of death from falls!
During installation never step on the cover plate. It might break due to an excessive load.

Danger!
Danger of burning and scalding!
In case of solar irradiation inside the units, collectors can reach 200 °C. Remove the sun protection film installed at the factory only after the solar energy system has been started up.

Caution!
Collectors may be damaged by incorrect storage!
Always store the collectors in a dry place and protected from the elements.

Caution!
Roof construction damage due to missing rear roof ventilation!
There must be roof back ventilation in accordance with regulations.

Caution!
System error function due to air bubbles!
To fill the system, use the fill trolley (article number 0020042548) to avoid air bubbles.
Use the manual air vent installed on the collector field.
Alternatively, install the Vaillant solar automatic air vent (article number 302019) in the highest point of the system or the automatic de-aerator (article number 302418) in the solar circuit. Observe the relevant installation and operating manual.

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4.2 Scope of delivery

- Check the mounting kit for completeness based on the illustrations and bills of materials.

Note
The vertical collectors are arranged side by side in the collector field.

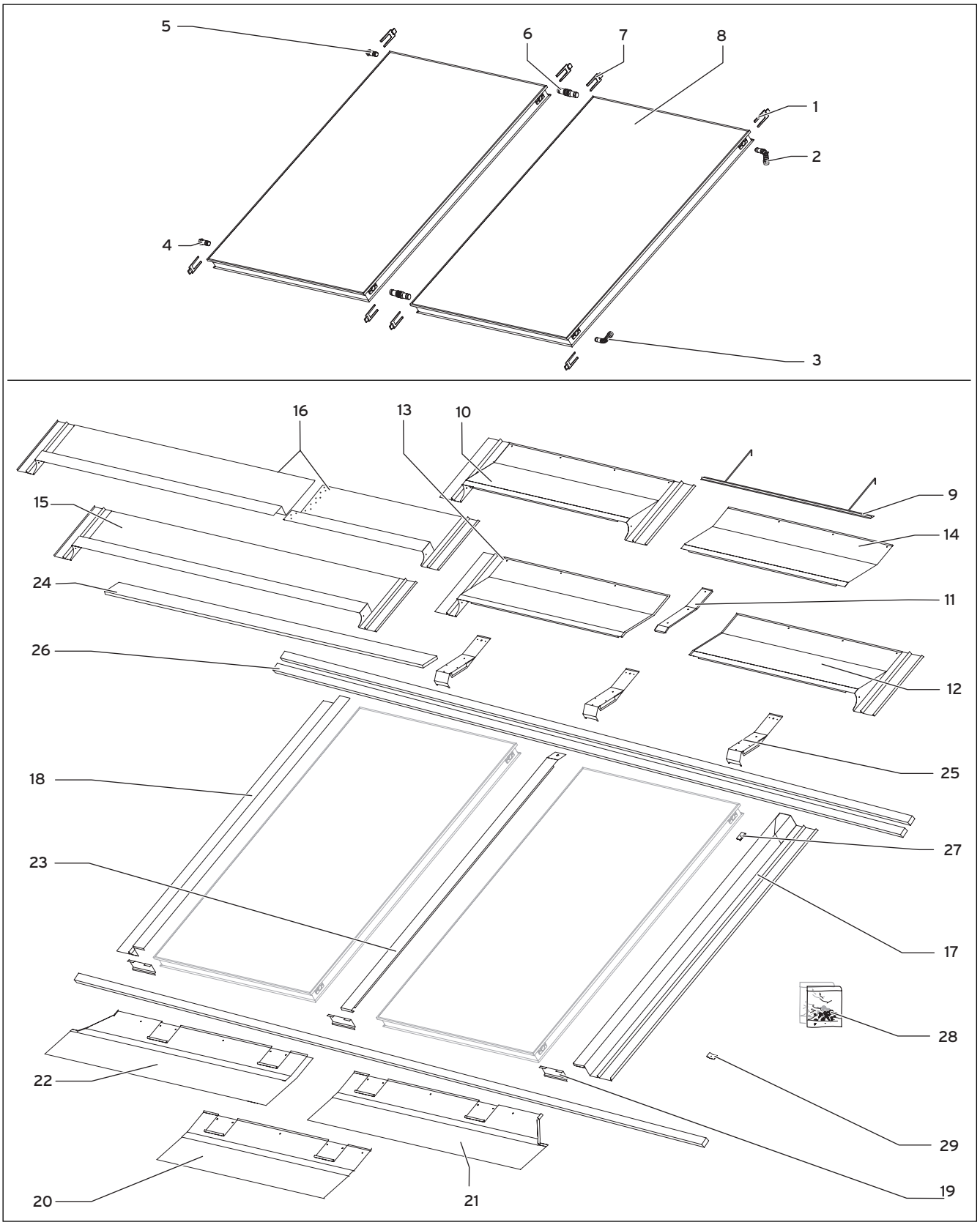

Fig. 4.1 Vertical collector mounting kit

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		Roof angle 15-22°				Roof angle 22-75°					
						Basic kit		Basic kit		Extension kit	
	Number of collectors	2		3		1		2		1	
Pos.	Description	Number	Kit no.	Number	Kit no.	Number	Kit no.	Number	Kit no.	Number	Kit no.
1	Clamp	4	0020065267	4	0020065267	4	0020065267	4	0020065267	-	
2	Upper supply (with probe)	1		1		1		1		-	
3	Return (inlet)	1		1		1		1		-	
4	Lower plug	1		1		1		1		-	
5	Upper plug (with ventilation)	1		1		1		1		-	
6	Pipe coupling	2	0020055181	4	2x 0020055181	2	0020055181	2	0020055181	2	0020055181
7	Clamp	4		8		4		4		4	
8	Collector	2		3		1		2		1	
9	Tile bar	2	0020059599	3	0020059879	1	0020060175	2	0020055196		0020055198
10	Ridge plate	-		-		1		-		-	
11	Upper ridge plate coupling	-		-		-		1		1	
12	Right ridge plate	-		-		-		1		-	
13	Left ridge plate	-		-		-		1		-	
14	Ridge plate extension	-		-		-		-		1	
15	Ridge plate 2 collectors roof angle 15-22°	1		-		-		-		-	
16	Ridge plate 3 collectors roof angle 15-22°	-		1		-		-		-	
17	Right side section	1		1		1		1		-	
18	Left side section	1		1		1		1		-	
19	Profile end	3		4		2		3		1	
20	Central front section	-		1		1		-		1	
21	Right front section	1		1		-		1		-	
22	Left front section	1		1		-		1		-	
23	Intermediate plate	1		2		-		1		1	
24	Support board	-		-		1		1		1	
25	Lower ridge plate coupling	-		-		2		3		1	
26	Roof batten	3		3		2		3		3	
27	Inner clamp	9		12		6		9		3	
28	Bolt kits (no. 1-5) (TX 25)										
	Bolts no. 1	28		40		16		28		12	
	Bolts no. 2	17		19		15		17		2	
	Bolts no. 3	10		13		7		10		3	
	Bolts no. 4	10		14		6		10		4	
	Bolts no. 5	3		5		-		3		2	
29	External clamp	10		10		10		10		-	

Table 4.1 Vertical collector mounting kit side by side

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Note
The horizontal collectors can be arranged in the collector field both side by side and on top of each other.

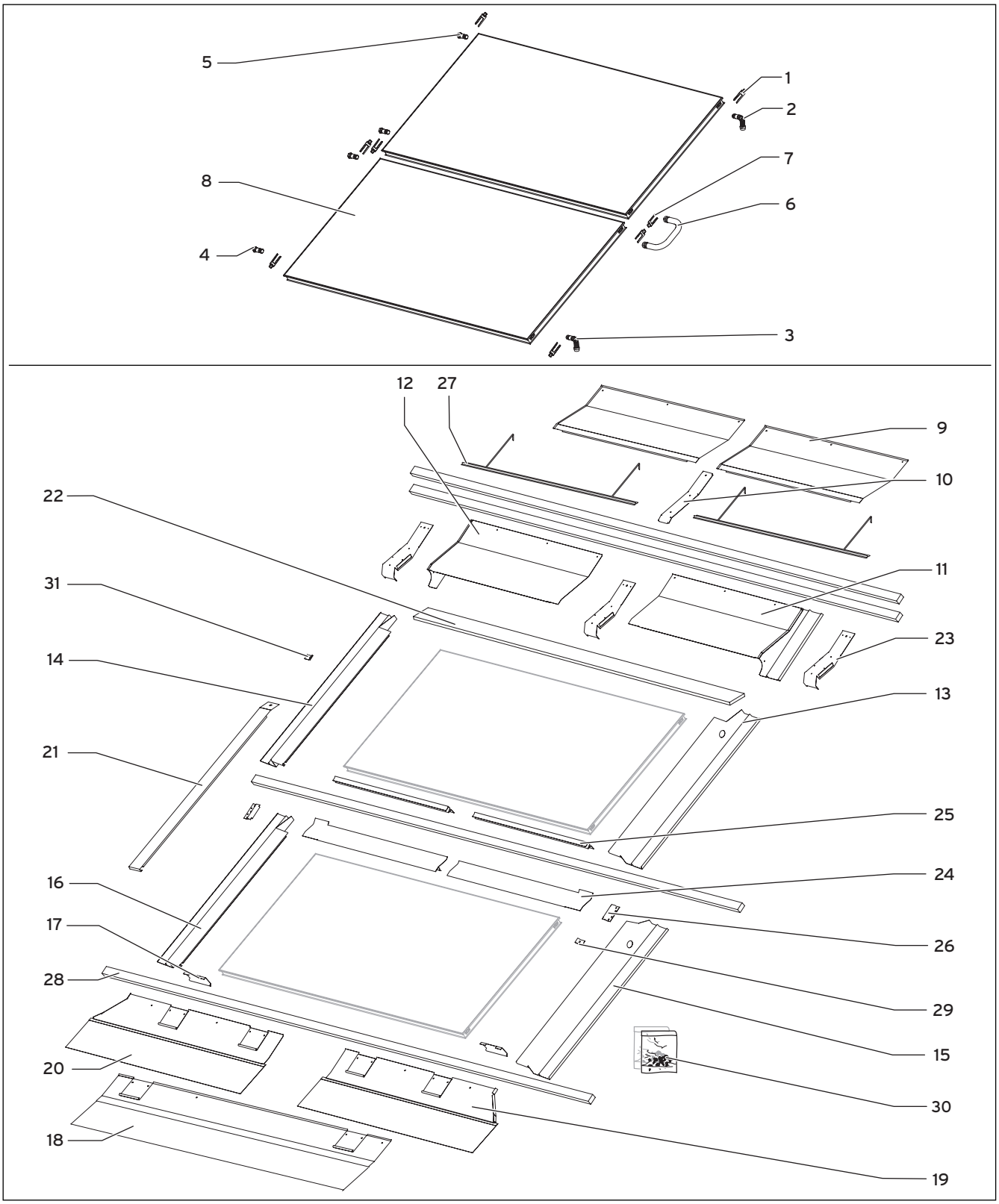

Fig. 4.2 Horizontal collector mounting kit

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		Basic kit side by side		Basic kit side by side		Extension side by side		Extension on top of each other	
	Collectors	**1**		**2**		**1**		**2**	
Pos.	**Description**	**Number**	**Kit no.**	**Number**	**Kit no.**	**Number**	**Kit no.**	**Number**	**Kit no.**
1	Clamp	4	0020065267	4	0020065267	-		-	
2	Upper supply (with probe)	1		1		-		-	
3	Return (inlet)	1		1		-		-	
4	Lower plug	1		1		-		-	
5	Upper plug (with ventilation)	1		1		-		-	
6	Pipe coupling	-		2	0020055181	2	0020055181	-	
7	Clamp	-		4		4		-	
8	Collector	1		2		1		2	
9	Central ridge plate	-	0020059906	2	0020055197	2	0020055199	-	0020059911
10	Upper ridge plate coupling	1		3		2		-	
11	Right ridge plate	1		1		-		-	
12	Left ridge plate	1		1		-		-	
13	Right side section	1		1		-		-	
14	Left side section	1		1		-		-	
15	Right side section (lower)	-		-		-		1	
16	Left side section (lower)	-		-		-		1	
17	Profile end	2		3		1		-	
18	Central front section	-		1		1		-	
19	Right front section	1		1		-		-	
20	Left front section	1		1		-		-	
21	Intermediate plate	-		1		1		-	
22	Support board	1		2		1		-	
23	Lower ridge plate coupling	3		5		2		-	
24	Horizontal intermediate plate	-		-		-		1	
25	Retainer strip	-		-		-		2	
26	Spacer	-		-		-		2	
27	Tile bar	1		2		1		-	
28	Roof batten	4		8		4		8	
29	Inner clamp	6		9		6		12	
30	Bolt kit (no. 1-5) (TX 25)								
	Bolt no. 1	22		44		22		7	
	Bolt no. 2	15		20		5		7	
	Bolt no. 3	7		10		3		6	
	Bolt no. 4	10		18		8		8	
	Bolt no. 5	3		7		4		-	
31	External clamp	8		8		-		8	

Table 4.2 Horizontal collector mounting kit

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4.3 Collector field packaging

Define the required components based on Tab. 4.3.

			Number of collectors:	1	2	3	4	5	6	7	8	9	10
Field arrangement side by side	22-75° roof angle	Horizontal collector position	In-roof covering 1st kit horizontal Article number 0020059906	1	-	-	-	-	-	-	-	-	-
			In-roof covering 2nd kit horizontal Article number 0020055197	-	1	1	1	1	1	1	1	1	1
			In-roof covering Extension horizontal Article number 0020055199	-	-	1	2	3	4	5	6	7	8
			Hyd. connection kit Article number 0020065267	1									
			Hyd. connection kit Article number 0020055181	-	1	2	3	4	5	6	7	8	9
		Vertical collector position	In-roof covering 1st kit vertical Article number 0020060175	1	-	-	-	-	-	-	-	-	-
			In-roof covering 2nd kit vertical Article number 0020055196	-	1	1	1	1	1	1	1	1	1
			In-roof covering Extension vertical Article number 0020055198	-	-	1	2	3	4	5	6	7	8
			Hyd. connection kit Article number 0020065267	1									
			Hyd. connection kit Article number 0020055181	-	1	2	3	4	5	6	7	8	9
	15-22° roof angle	Vertical collector position	In-roof covering 2nd kit vertical Article number 0020059599	-	1	-	-	-	-	-	-	-	-
			In-roof covering 3rd kit vertical Article number 0020059879	-	-	1	-	-	-	-	-	-	-
			Hyd. connection kit Article number 0020065267	-	1	1	-	-	-	-	-	-	-
			Hyd. connection kit Article number 0020055181	-	1	2	-	-	-	-	-	-	-
Field arrangement on top of each other	Horizontal collector position		In-roof covering 1st kit horizontal Article number 0020059906	1	1	-	-	-	-	-	-	-	-
			In-roof covering Extension horizontal Article number 0020059911	-	1	-	-	-	-	-	-	-	-
			Hyd. connection kit Article number 0020065267	1	1	-	-	-	-	-	-	-	-
			Hyd. connection kit Article number 0020059894	-	1	-	-	-	-	-	-	-	-

Table 4.3 Collector field package

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4.4 Interconnection diagram

Note
Observe the planning information when dimensioning the field volume flow.

Caution!
Lack of tightness!
For in-roof mounting, the roof must have a pitch of ≥ 22°. At roof pitches < 22° rainwater can collect on the cover plates and leaks can occur.
With roof angles of 15°-22° use the Vaillant cover kit 0020059599 or 0020059879.

Field arrangement side by side

Note
If you connect 1 to 5 collectors one after another, the hydraulic connections can be laid one below the other on one side.

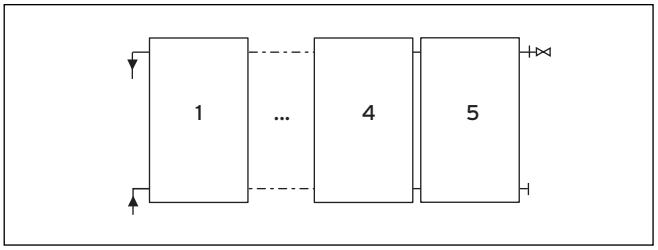

Fig. 4.3 Field arrangement side by side for 1 - 5 collectors

Note
If you connect 6 or more collectors one after another, the hydraulic connections must be arranged diagonally, to force a complete flow.

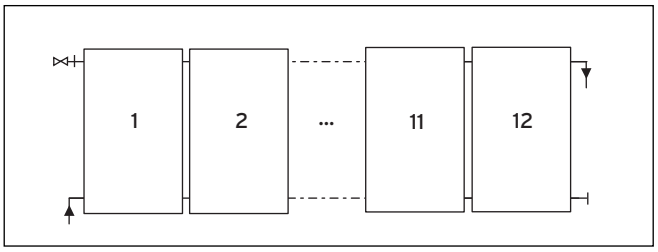

Fig. 4.4 Field arrangement side by side for 6 - 12 collectors

Field arrangement on top of each other

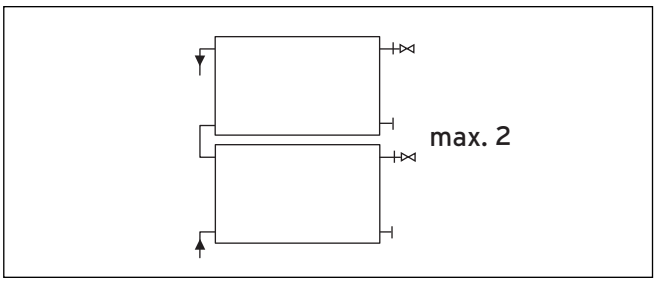

Fig. 4.5 Field arrangement on top of each other

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4.5 Installation dimensions

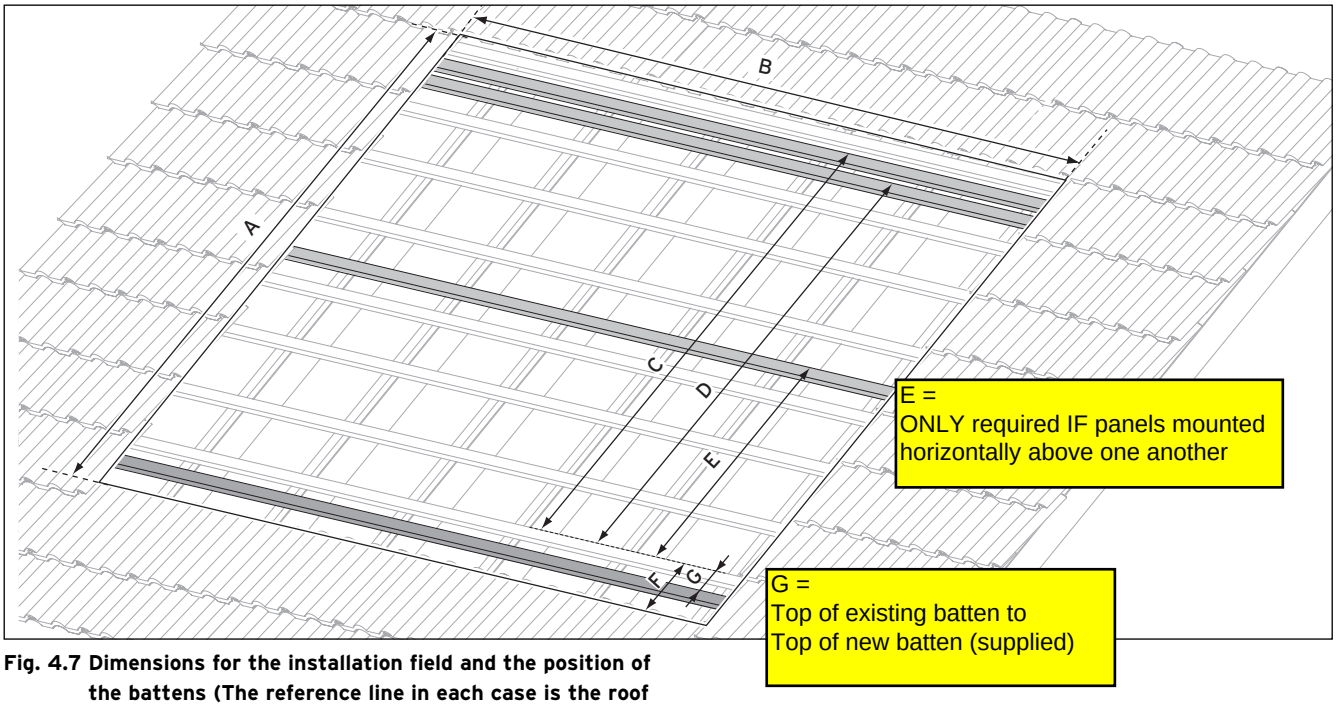

Fig. 4.7 Dimensions for the installation field and the position of the battens (The reference line in each case is the roof tile border)

	A	B	C	D	E	F	G
Vertical collector position							
Field arrangement side by side	2725	see Tab. 4.5	2291	2191	n.a.	309 (min. 280)	150
Horizontal collector position							
Field arrangement side by side	1925	see Tab. 4.5	1487	1387	n.a.		
E.. Field arrangement on top of each other	see Tab. 4.5	2597	2796	2586	1146		

Table 4.4 Dimensions of the installation field in mm

		Number of collectors	1	2	3	4	5	6
Field arrangement side by side	Vertical	Exposed surface width (**B**)	2073	3336	4599	5862	7125	8388
		Covered surface width (Roofing border to the metal protection from left to right)	1457	2720	3983	5246	6509	7772
	Horizontal	Exposed surface width (**B**)	2873	4936	6999	9062	11125	13188
		Covered surface width (Roofing border to the metal protection from left to right)	2337	4400	6463	8526	10589	12498
Field arrangement on top of each other	Horizontal	Exposed surface height (**A**)	1925	3230	n. a.			
		Covered surface width (Roofing border to the metal protection from left to right)	2337	2337				

Table 4.5 Dimensions of the covered/exposed surface

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4.6 Hydraulic connection preparation

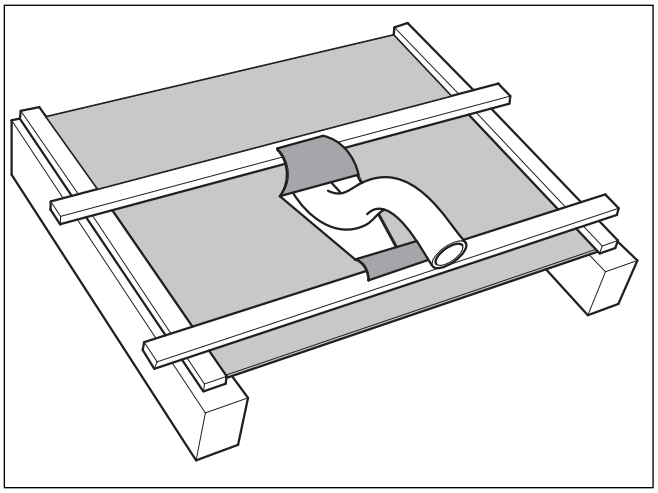

Fig. 4.8 Feeding the pipe through the sarking membrane

If there is a sarking membrane, proceed as follows:
- Cut the sarking membrane vee-shaped.
- Fold the upper, larger tab on the roof batten above, and the lower, smaller tab on the roof batten below.
- Fix the sarking membrane tight to the roof batten. This ensure that the dampness flows away to the side.

- With the roofs activated, cut out a hole with the compass saw.
- Work the roofing felt as described for the sarking membrane.

4.7 Installation

- For the installation of flat collectors, prepare the following tools and materials.

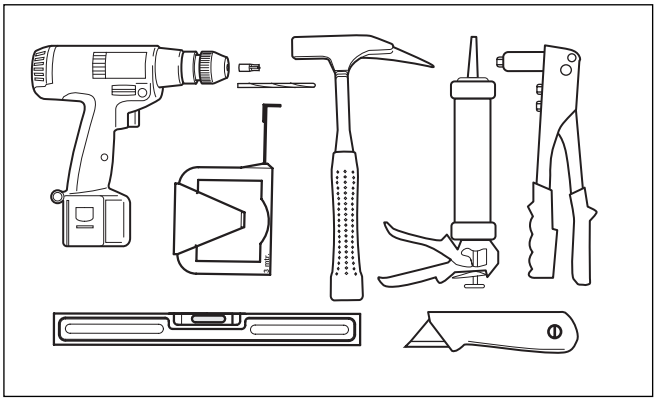

Fig. 4.9 Installation tools: water level, cordless screwdriver, Torx bit (TX25, supplied), drill 4.5 mm, hammer, measuring tape/folding rule, rubber mallet, trimming knife, waterproof silicone and hand riveter (supplied)

Vaillant flat collectors are available in different versions: one for the horizontal position, one for the vertical position.
Besides, they can be arranged in the collector field side by side and on top of each other.
Generally, the installation steps and the instructions described in this manual are valid for both collector positions and field arrangements.
Any different installation steps are clearly pointed out:

With horizontal collector position

With vertical collector position

With fields arranged side by side

With fields arranged on top of each other

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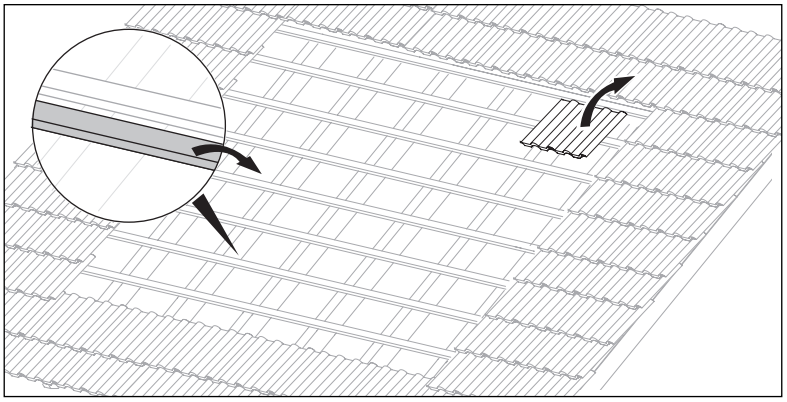

Fig. 4.10 Defining the installation field

- Based on the dimensions **(see Fig. 4.7),** define the installation field on the roof.
- Remove the tiles.
- Mount additional roof battens in accordance with **Fig. 4.7**.

Caution!
If you use the existing roof battens for fixing, check the roof battens for sufficient load carrying capacity!

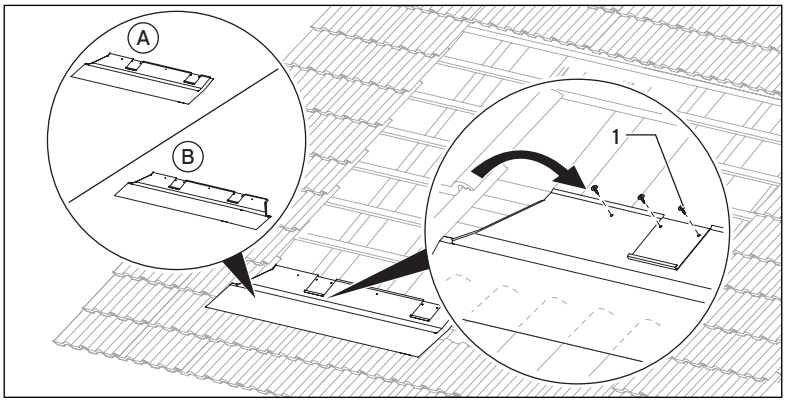

Fig. 4.11 Mounting the left lower frame

- Hook the left front section (**A**) to the roof batten.
- When mounting a single vertical collector, hook the front section (**B**) to the roof batten.
- With 6 sealing bolts (bolts no. 1) (**1**) screw the front section to the roof batten using the supplied Torx bit.

Caution!
Remove the protection film from the flexible protection adhesive surface only after the installation of the entire collector field!

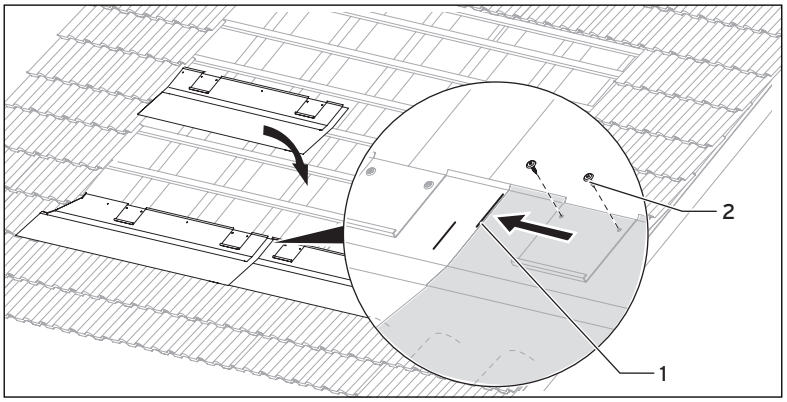

Fig. 4.12 Mounting the remaining lower frames

- Slide the next front section up to the mark (**1**) on the first front section and with the supplied Torx bit screw it to the roof batten with the 6 supplied sealing bolts (bolts no. 1).
- Gradually fix the remaining frame components from left to right based on the number of collectors.
- Conclude the field with the right front section.

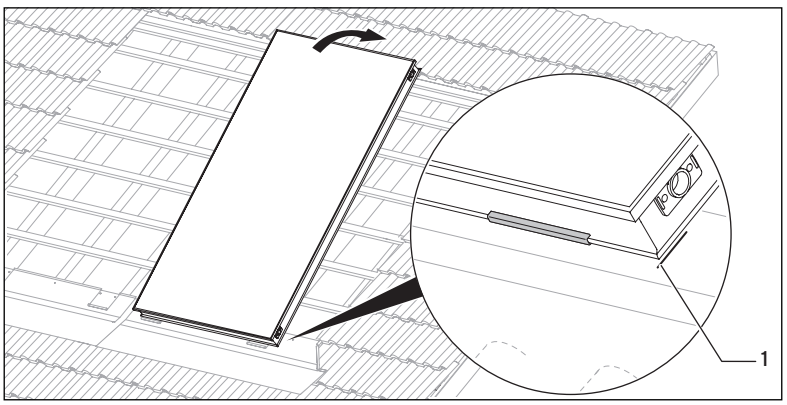

Fig. 4.13 Inserting the right collector

- Hook the right collector to the straps on the front section.
- Align the collector laterally with the mark (**1**) on the front section.

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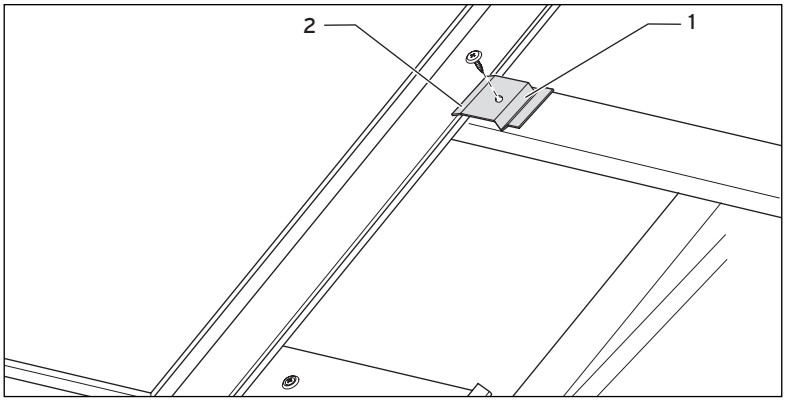

Fig. 4.14 Screwing the flat collectors

- With the supplied Torx bit screw the collector laterally to the roof battens with 4 supplied clamps and bolts no. 3.
  The folded side (**1**) of the clamp must point away from the collector.
- Take care that the chamfered side (**2**) of the clamp grips the edge of the collector.

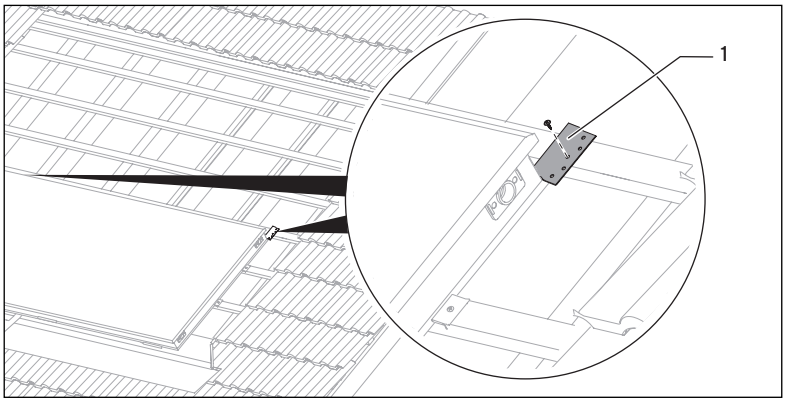

Fig. 4.15 Screwing the spacers

With fields arranged on top of each other

- With the supplied Torx bit screw the spacers to the roof battens above the collector with the supplied bolts no. 3.

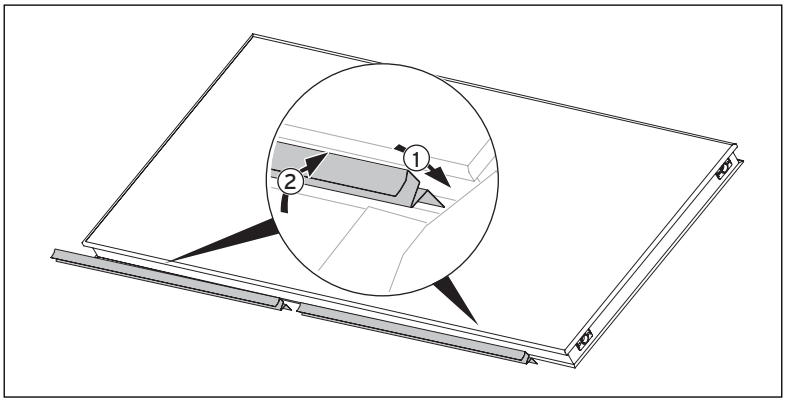

Fig. 4.16 Preparing the collector

With fields arranged on top of each other

Upper collector preparation

- Insert the retainer strips into the lower slot of the collector frame (**1**).
- Slide the retainer strips under the upper collector edge, until they lock (**2**).

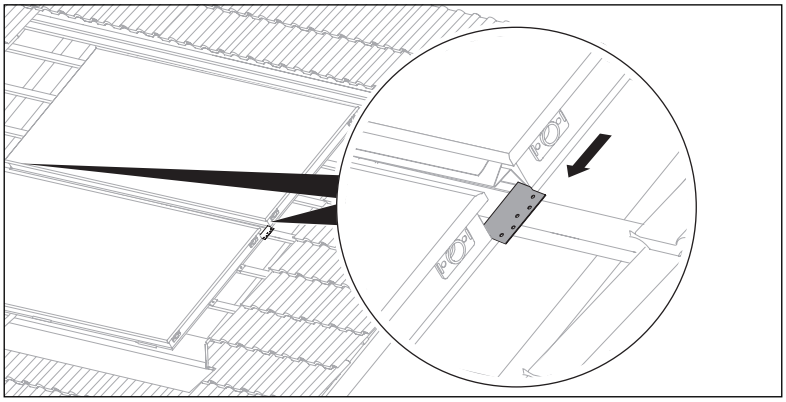

Fig. 4.17 Placing the collector

With fields arranged on top of each other

- Place the next collector so that it flashes with the spacers.

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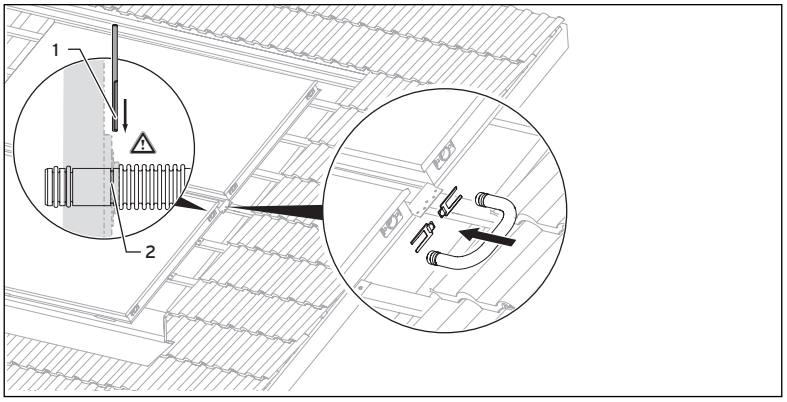

Fig. 4.18 Hydraulic connection

With fields arranged on top of each other

- Connect the collectors with the O-ring pipe coupling.
- Fix the connection with the clamps.

Caution!
Danger of damage to the collector as a result of incorrect assembly!
Make sure that the clamps (1) slide into the slot on the O-Ring pipe coupler (2).

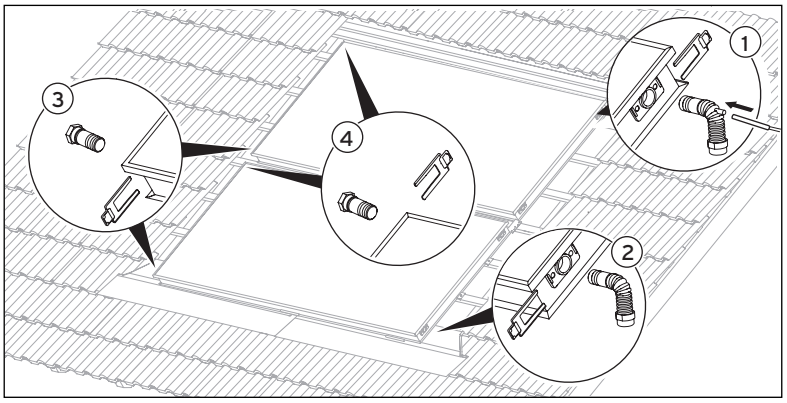

Fig. 4.19 Hydraulic connections

With fields arranged on top of each other

- Connect the supply (outlet with opening for collector sensor) (**1**) on top.
- Insert the collector sensor into the corresponding opening in the supply.
- Connect the return (inlet) (**2**) at the bottom.
- Mount the plug without valve (**3**) in the lower part of both collectors.
- Mount the plug with bleeding valve (**4**) on top of both collectors.
- Fix connections and plugs with the clamps.
- Connect the collector supply and return to the system with the connection pipes.
- If necessary check the connections for leaks.

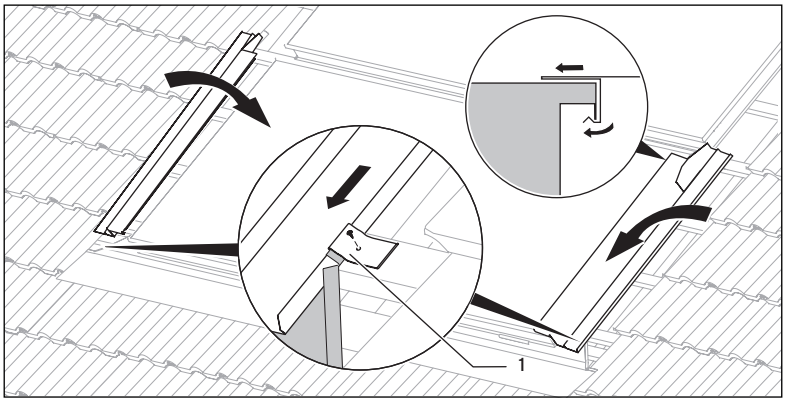

Fig. 4.20 Fixing the lower side sections

With fields arranged on top of each other

- Slide the longer side sections (from extension kit, Article No. 0020059911) laterally over the lower collector.
- Make sure that the side section is on the collector frame and that it is locked.
- Fix the longer side sections to the roof battens with the supplied brackets (**1**) and No. 2 screws using the supplied Torx bit.

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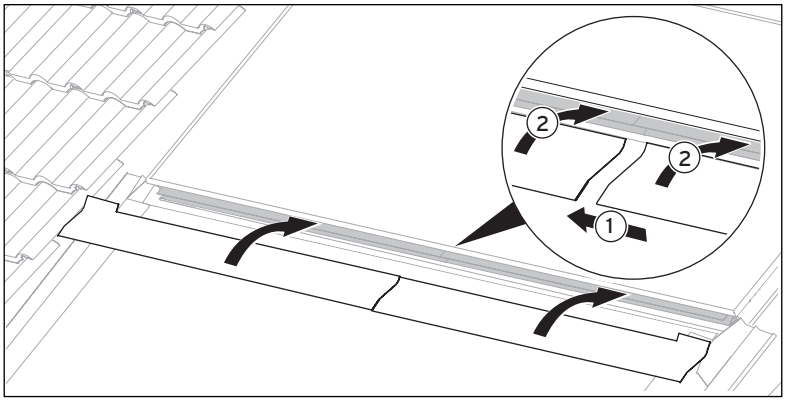

Fig. 4.21 Fixing the horizontal intermediate plates

With fields arranged on top of each other

- Slide the intermediate plates into each other (**1**).
- Slide the horizontal intermediate plates between the collector edge and the intermediate plate (**2**).
- Slide the plates over the upper edge of the lower collector until they can be felt locking .

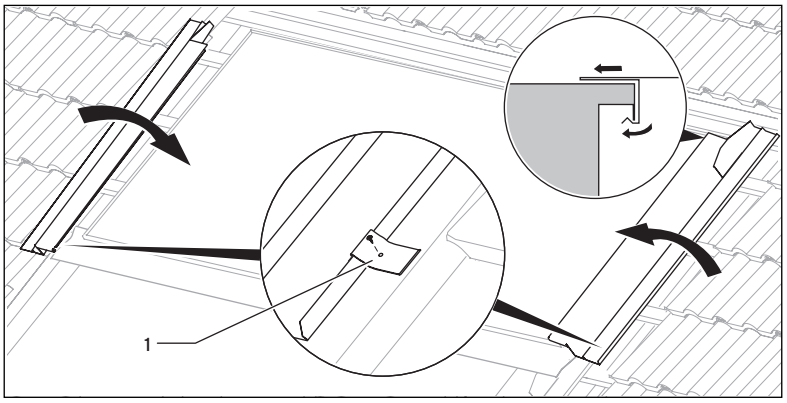

Fig. 4.22 Fixing the upper side sections

With fields arranged on top of each other

- Slide the shorter side sections (from basic kit, Article No. 0020059906) laterally over the upper collector.
- Make sure that the side section is on the collector frame and that it is locked.
- Fix the side sections to the roof battens with the supplied brackets (**1**) and bolts no. 2 using the supplied Torx bit.

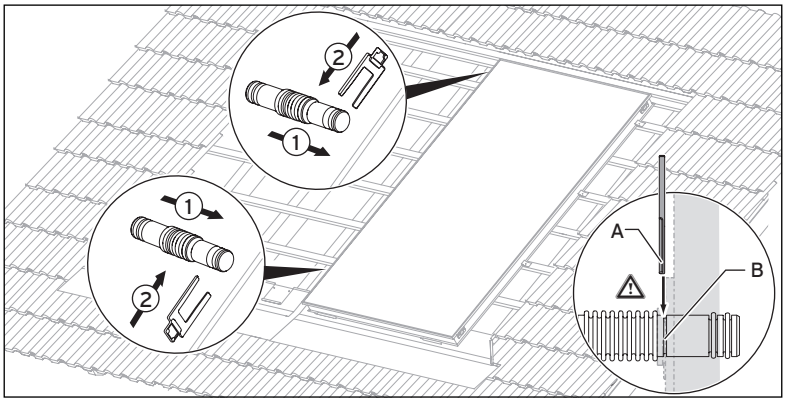

Fig. 4.23 Mounting the hydraulic connection pipes

With fields arranged side by side

- Insert the pipe couplings into the side openings of the collector (**1**) up to the stop.
- Fix the pipe couplings with clamps (**2**).

Caution!
Danger of damage to the collector as a result of incorrect assembly!
Make sure that the clamp (A) slides into the slot in the pipe coupler (B).

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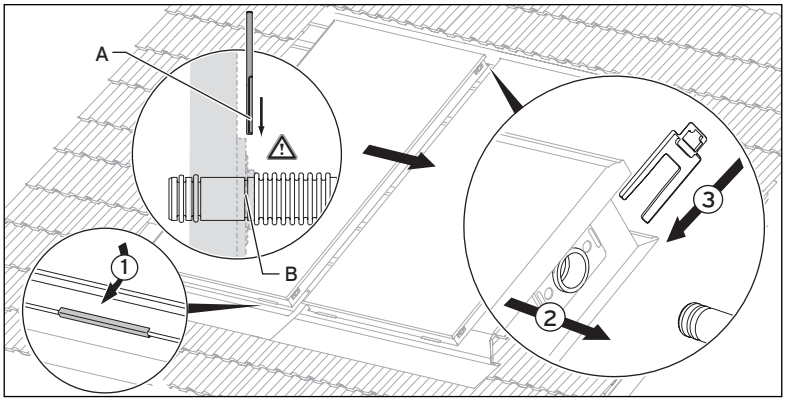

Fig. 4.24 Inserting the remaining collectors

With fields arranged side by side

- Hook the next collector to the straps of the front sections (**1**).
- Compress the collectors (**2**) and align them with the marks on the front sections.

The pipe couplings should slip and fit in the side openings.

- Make sure that the right side of the moved collector slips under the retainer clamps of the adjacent collector.
- Fix the pipe couplings with clamps (**3**).
- With the supplied Torx bit screw the collector laterally to the roof battens with 4 supplied clamps and bolts no. 3 (see Fig. 4.14).

Caution!
Danger of damage to the collector as a result of incorrect assembly!
Make sure that the clamp (A) slides into the slot in the pipe coupler (B).

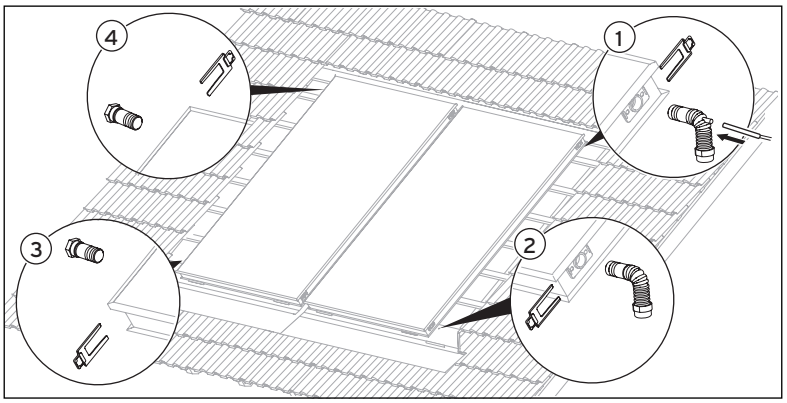

Fig. 4.25 Mounting the hydraulic connections (1-5 collectors)

With fields arranged side by side

- Connect the supply (outlet with opening for collector sensor) (**1**) on top.
- Insert the collector sensor into the corresponding opening in the supply.
- Connect the return (inlet) (**2**) at the bottom.
- Mount the plug without valve (**3**) in the lower part of the collector.
- Mount the plug with bleeding valve (**4**) in the highest position.
- Fix connections and plugs with the clamps.
- Connect the collector supply and return to the system with the connection pipes.
- If necessary check the connections for leaks.

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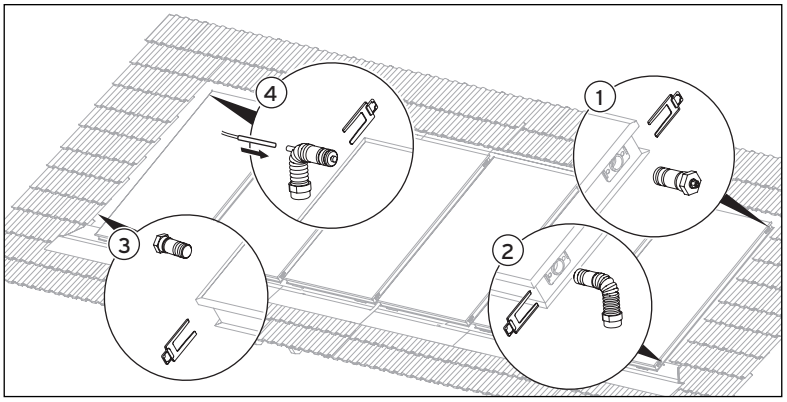

Fig. 4.26 Mounting the hydraulic connections (6-12 collectors)

With fields arranged side by side

Note
If you connect 6 or more collectors one after another, the hydraulic connections must be arranged diagonally, to force a complete flow.

- Insert the return (inlet) (**2**) in the lower side opening on one side and, diagonally across it, the supply (outlet with opening for collector sensor) (**4**) into the upper side opening.
- Insert the collector sensor into the corresponding opening in the supply.
- Fix connections and plugs with the clamps.
- Mount the plug without valve (**3**) in the lower part of the collector.
- Mount the plug with bleeding valve (**1**) in the highest position.
- Connect the collector supply and return to the system with the connection pipes.
- If necessary check the connections for leaks.

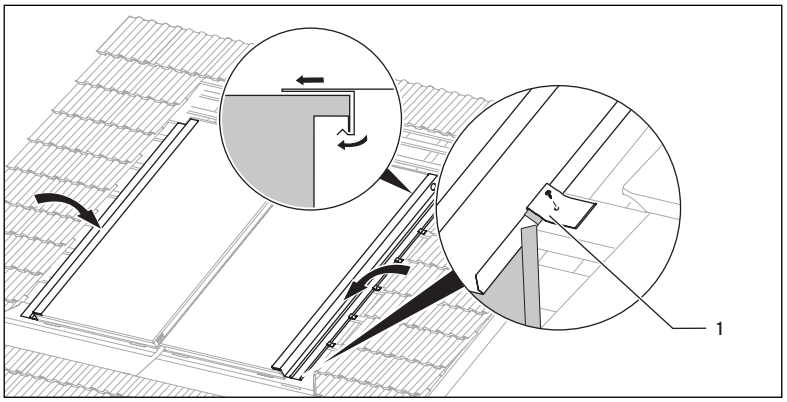

Fig. 4.27 Screwing the side sections

With fields arranged side by side

- Fix the side sections to the roof battens with the supplied brackets (**1**) and bolts no. 2 using the supplied Torx bit.
- Make sure that the side section is on the collector frame and that it is locked.

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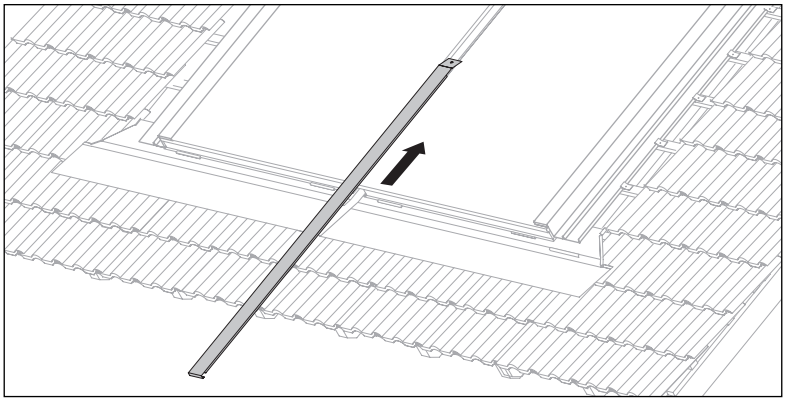

Fig. 4.28 Attaching the vertical intermediate plate

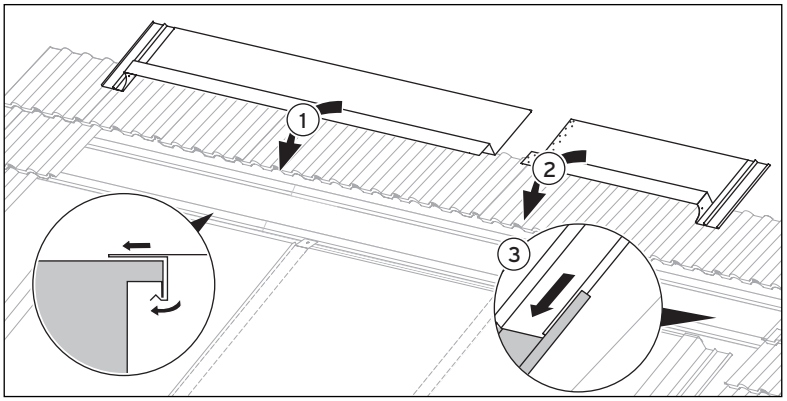

Fig. 4.29 Mounting the ridge plates (roof angle 15-22°)

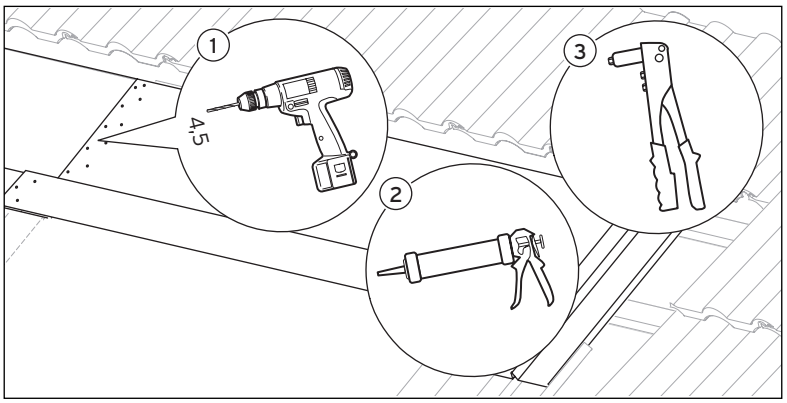

Fig. 4.30 Joining the ridge plates (roof angle 15-22°)

With fields arranged side by side

- Slide the vertical intermediate plate from below between the collectors, until it flushes with the lower collector edge.

Note
If necessary use a common soft soap to ease the installation.

- If it is not possible to mount the intermediate plate from below (because of dormers, etc.), carefully bend up the intermediate plate, slide the plate from the top between the collectors and bend it down again.

With roof angles of 15-22°

2 collectors
- Slide the ridge plate on both collectors.

3 collectors
- Slide the left ridge plate on the 2 left collectors (**1**).
- Slide the right ridge plate on the right collector (**2**).

- Make sure that the ridge plates are above the side sections and slip in the corresponding rail (**3**).

With roof angles of 15-22°

3 collectors
- Drill holes in the lower left ridge plate (**1**) passing through the holes in the right ridge plate.
- Apply silicone to the points where plates overlap (**2**).
- Rivet both ridge plates together (**3**).

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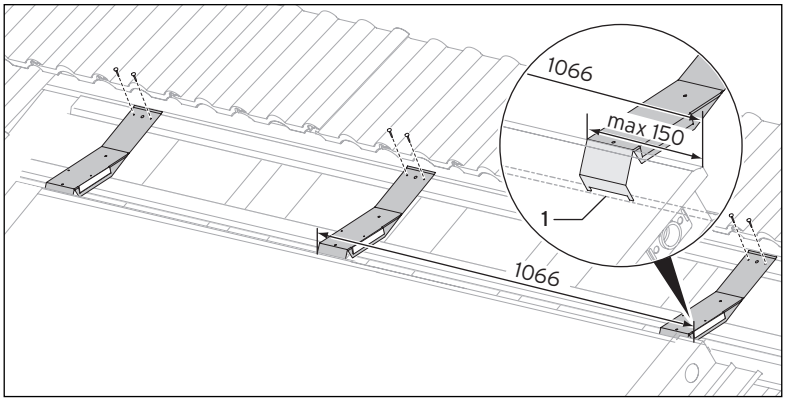

Fig. 4.31 Mounting the support plates (horizontal collector)

With roof angles of 22-75°

With horizontal collector position

- Mount the support plates above the collector:
  - one on the external edge (max. 150 mm from the edge)
  - in the centre of the collector (1066 mm from the edge).
- Make sure that the support plates are on the collector frame slot (**1**).
- Fix the support plates to the roof batten with two bolts no. 3 using the supplied Torx bit.

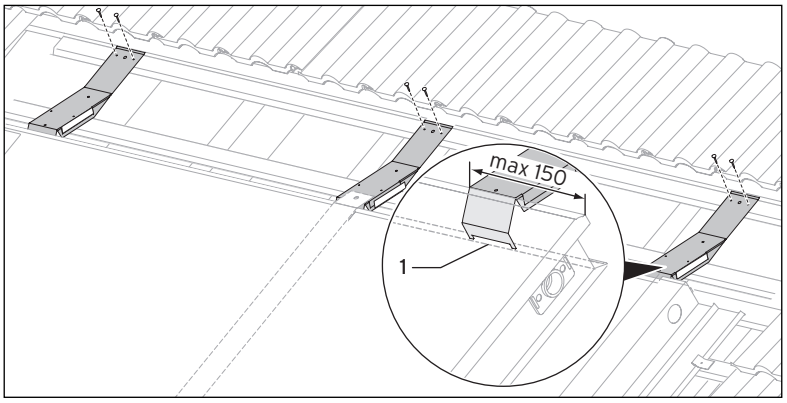

Fig. 4.32 Mounting the support plates (vertical collector)

With roof angles of 22-75°

With vertical collector position

- Mount the support plates above the collector:
  - one on the external edge (max. 150 mm from the edge)
  - one per collector joint (central).
- Make sure that the support plates are on the collector frame slot (**1**).
- Fix the support plates to the roof batten with two bolts no. 3 using the supplied Torx bit.

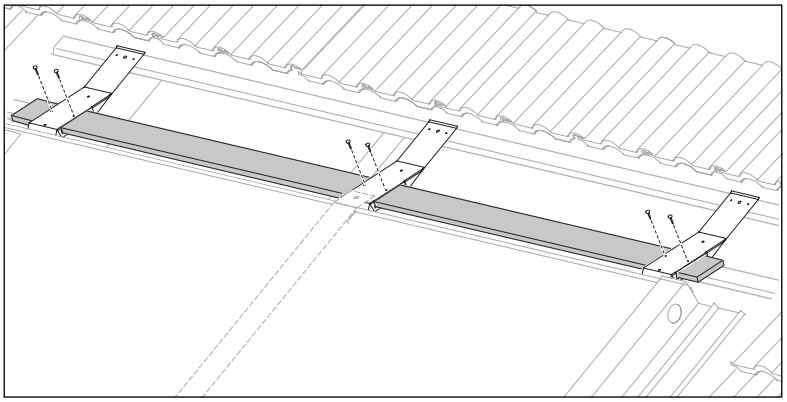

Fig. 4.33 Mounting the support boards

With roof angles of 22-75 °

- Slide the boards in the support plates.
- Fix the boards to the support plates with two bolts no. 2 using the supplied Torx bit.

Note
The boards support the frames in case of maintenance or snow load.

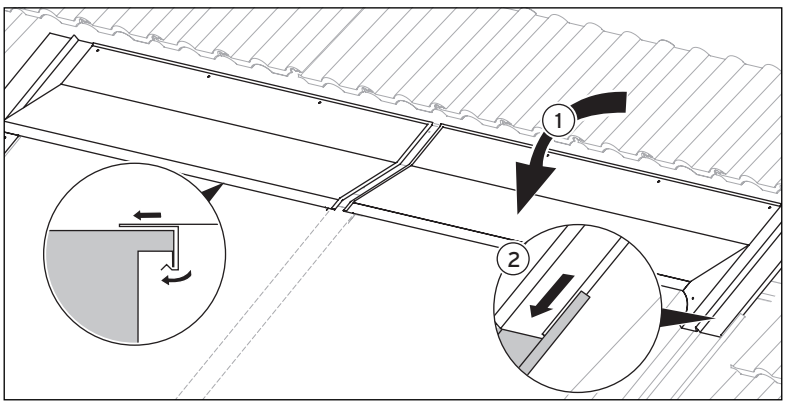

Fig. 4.34 Mounting the ridge plates

With roof angles of 22-75 °

- Slide the ridge plates on the support plates (**1**).
- Make sure that the ridge plates are above the side sections and slip in the corresponding rail (**2**).

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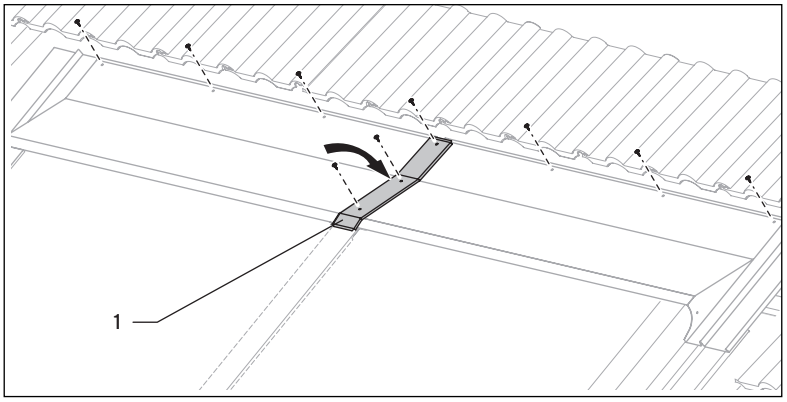

Fig. 4.35 Ridge plate coupling

With roof angles of 22-75°

- Fix the ridge plates to the roof battens with the bolts no. 1 using the supplied Torx bit.
- Fix the ridge plate coupling (**1**) to the ridge plate joint with three bolts no. 5 using the supplied Torx bit.

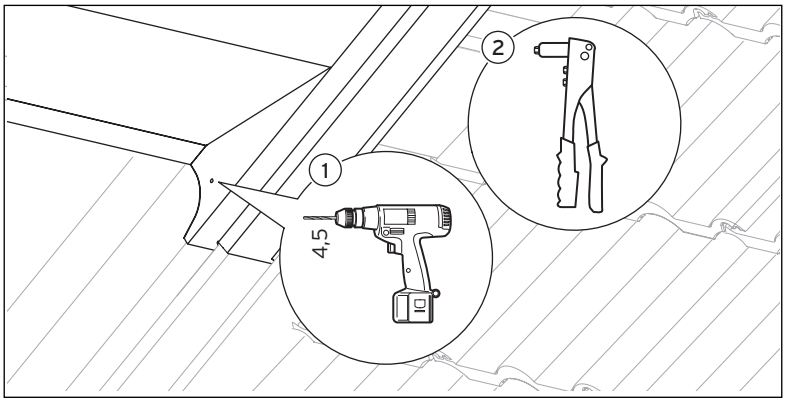

Fig. 4.36 Rivetting the frame

- Drill **respectively right and left** a hole (diameter 4.5 mm) on the marks laterally through the ridge plate (**1**).
- Rivet the ridge plate with the side section (**2**).

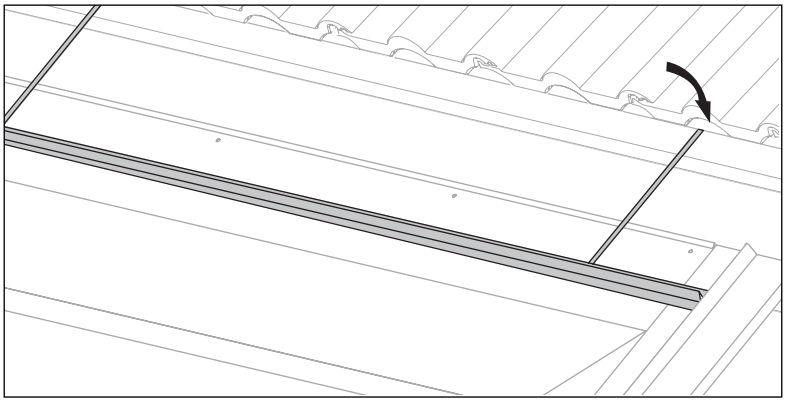

Fig. 4.37 Covering the profile ends

- Place the tile bars on the ridge plates.
- Bend the metal bands and hook the tile bars to the roof batten from the top.

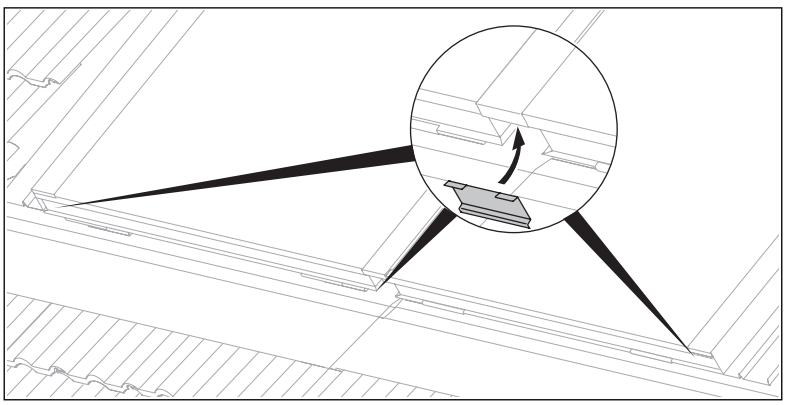

Fig. 4.38 Covering the profile ends

- Cover the side profile ends and the collector joints with the profile ends from the bottom.
- For this purpose fit the profile ends from the bottom and then tilt them up, until they lock in the upper collector edge.

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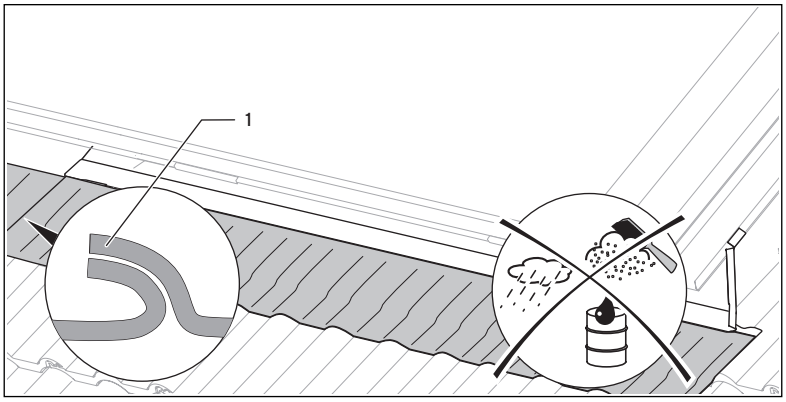

Fig. 4.39 Adapting the flexible protection

- Remove the protection film from the adhesive surface of the flexible protection.
- Adapt the flexible protection to the tile shape.
- Stick the flexible protection where parts overlap (**1**).

Note
Make sure that the adhesive surface is dry and free from dust and grease.

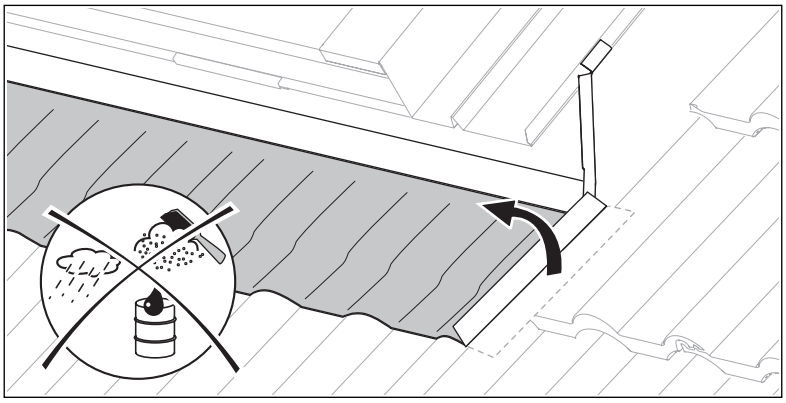

Fig. 4.40 Sticking the flexible protection

- Bend the flexible protections on the collector field ends.

Note
Make sure that the adhesive surface is dry and free from dust and grease.

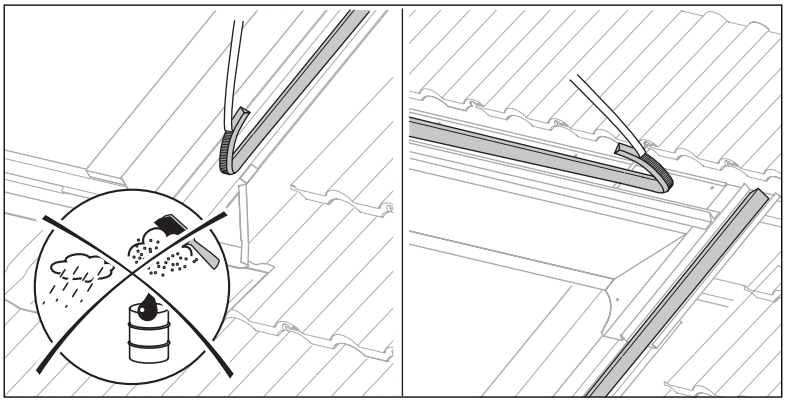

Fig. 4.41 Mounting the foam sealing wedge

- Stick the foam sealing wedge on the side sections of the collector frame.
- Stick the foam wedge on the ridge plates.
- If necessary carefully cut the foam sealing wedge with the trimming knife.

Note
Make sure that the adhesive surface is dry and free from dust and grease.

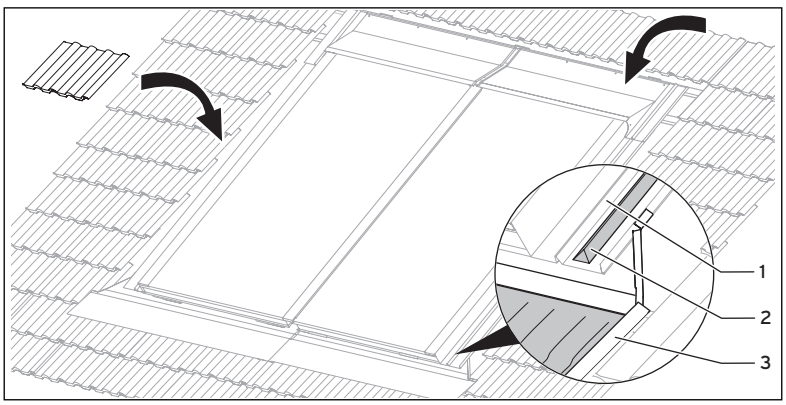

Fig. 4.42 Covering the roof

- Close the free spaces between collector and pantiles.
- Make sure that the pantiles on the side of the collector field
  - meet the central web (**1**) of the side sections,
  - are positioned on the foam sealing wedge (**2**),
  - are stuck with the adhesive surfaces (**3**) of the flexible protection.
- For dimensions please see Tab. 4.5.
- For this purpose use the removed tiles and adapt them if necessary.

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4.8 Concluding work

Based on the following table, make sure all work steps have been performed.

	Step	
1	All connections fixed with safety clamps	
2	Hydraulic connections laid correctly	
3	Collector sensor connected	
4	Collectors connected to lightning protection device	
5	Pressure test carried out, all connections tight	
6	Intact insulation	

Table 4.6 Final operations

☞ **Note**
After commissioning and in seasons when wide outside temperature fluctuations occur, condensate can form in the collector.
This is normal.

☞ **Note**
Reflections caused by irregularities of the glass are typical of the material.

5 Disposal

All Vaillant GmbH solar collectors comply with the requirements of the German environmental label "Blue Angel". In this context, we, as manufacturers, commit ourselves to withdrawing and recycling the components when, after years of reliable operation, they must be disposed of.

6 Vaillant Customer Service and warranty

6.1 Vaillant warranty

Vaillant provide a full parts and labour warranty for this appliance. The appliance must be installed by a suitably competent person in accordance with the Gas Safety (Installation and Use) Regulations 1998, and the manufacturer's instructions. In the UK "CORGI" registered installers undertake the work in compliance with safe and satisfactory standards.
All unvented domestic hot water cylinders must be installed by a competent person to the prevailing building regulations at the time of installation (G3).
Terms and conditions apply to the warranty, details of which can be found on the warranty registration card included with this appliance.
Failure to install and commission this appliance in compliance with the manufacturer's instructions may invalidate the warranty (this does not affect the customer's statutory rights).

6.2 Vaillant Service

To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement.
Please contact Vaillant Service Solutions (0870 6060 777) for further details.

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7 Technical data

	Units	VFK 145 H/V	VFK 150 H/V
Absorber type		Serpentine horiz./vert.	
Dimensions (L x W x H)	mm	2033 x 1233 x 80 (V)	
		1233 x 2033 x 80 (H)	
Weight	kg	38	
Volume	l	2.16 (H) 1.85 (V)	
Max. pressure	bar	10	
Stagnation temperature	°C	171	172
Gross area	m^2	2.51	
Aperture surface area	m^2	2.35	
Absorber surface area	m^2	2.33	
Absorber	mm	Aluminium (vacuum coated) 0.5 x 1178 x 1978	
Coating		High selective (blue)	
		α = 95 % ε = 5 %	
Glass covering	mm	3.2 (thickness) x 1233 x 2033	
Glass type		Solar safety glass (prismatic structure)	Solar safety glass (anti-reflex coating)
Transmission	%	τ = 91	τ = 96
Back wall insulation	mm W/m^2K kg/m^3	40 λ = 0.035 ρ = 55	
Edge insulation		none	
Efficiency ηo	%	80.1 (H) 79.1 (V)	84.2 (H) 83.3 (V)
Heat capacity	Ws/m^2K	9700 (H) 8200 (V)	
Heat loss factor (k_1)	W/m^2K	3.32 (H) 2.41 (V)	3.82 (H) 2.33 (V)
Heat loss factor (k_2)	W/m^2K^2	0.023 (H) 0.049 (V)	0.018 (H) 0.049 (V)

Table 7.1 Technical data

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VFK 145 H, VFK 150 H

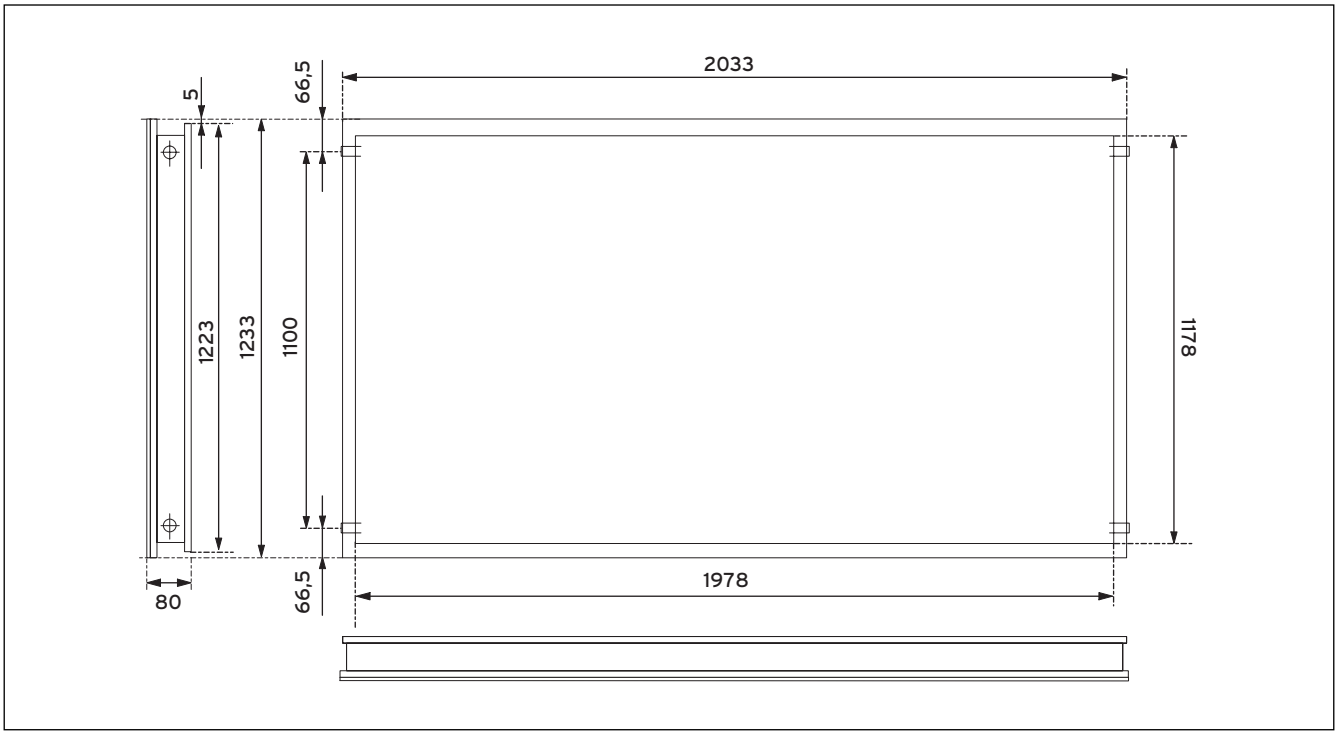

Fig. 7.1 Scale drawing VFK 145 H, VFK 150 H

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VFK 145 V, VFK 150 V

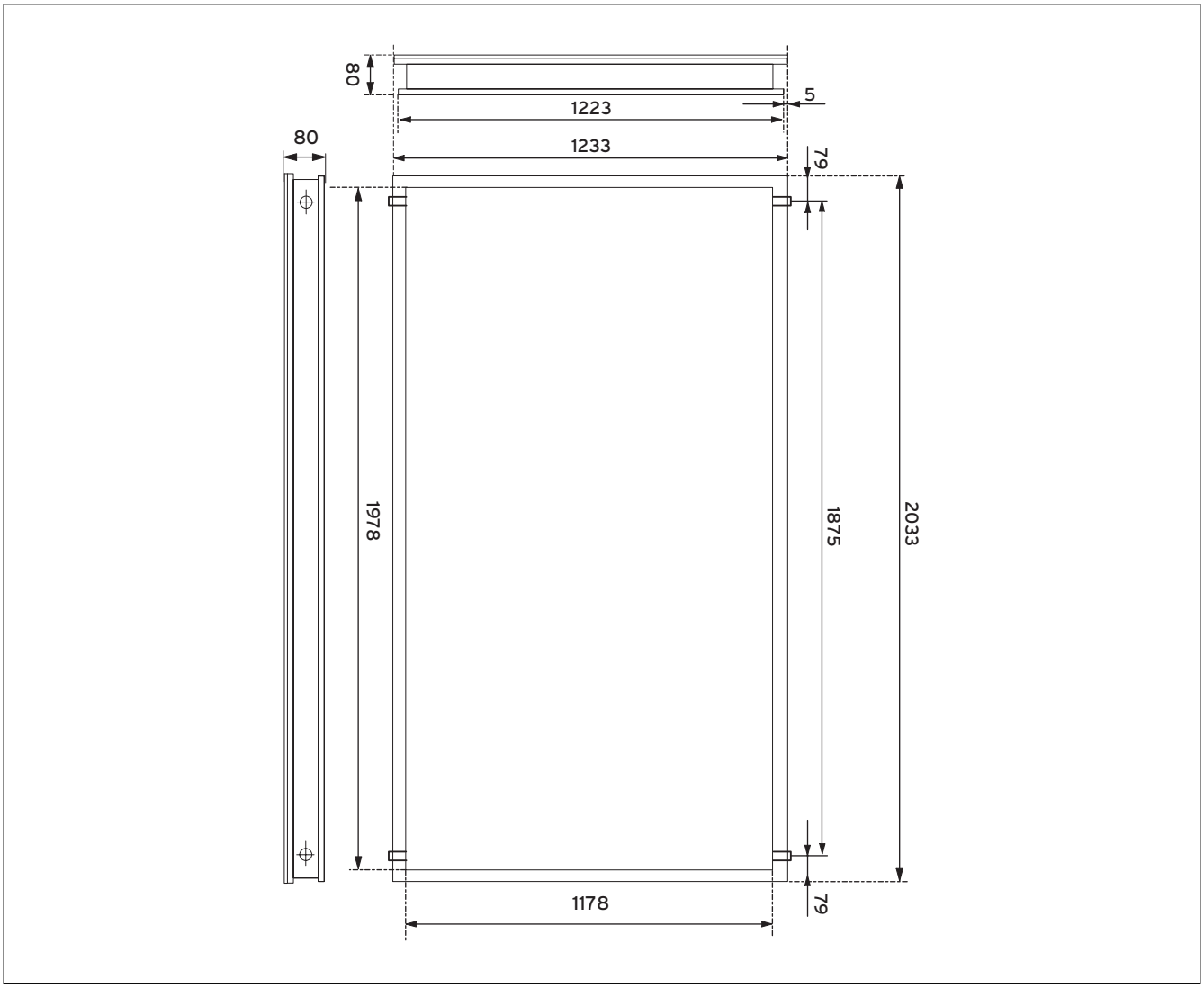

Fig. 7.3 Scale drawing VFK 145 V, VFK 150 V

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