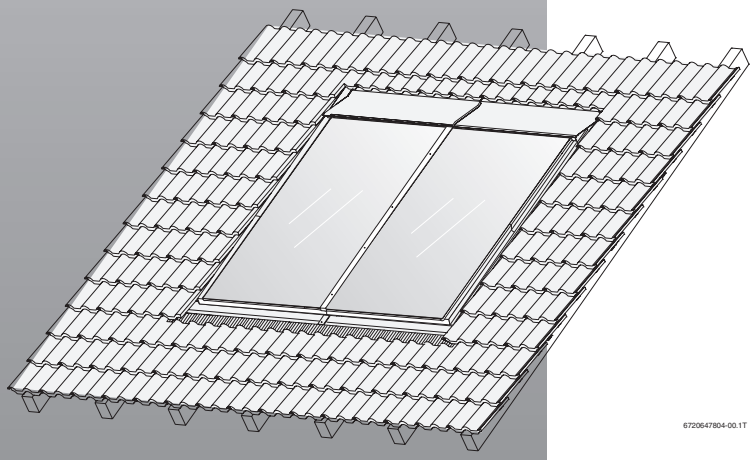
INSTALLATION AND MAINTENANCE INSTRUCTIONS

FLAT-PLATE COLLECTOR

SOLAR-LIFESTYLE

IN ROOF

6 720 648 308 (2011/05) UK



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1 KEY TO SYMBOLS AND SAFETY INSTRUCTIONS

1.1 KEY TO SYMBOLS

WARNINGS

Warnings in this document are framed and identified by a warning triangle printed against a grey background.

If there is a danger due to electricity, the exclamation mark in the warning triangle is replaced by a lightning symbol.

Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

- **NOTE** indicates that material losses may occur.
- **CAUTION** indicates that minor to medium injury may occur.
- **WARNING** indicates that severe injury may occur.
- **DANGER** indicates a risk to life.

IMPORTANT INFORMATION

Important information where there is no risk to people or property is indicated with the adjacent symbol. It is bordered by lines above and below the text.

ADDITIONAL SYMBOLS

Symbol	Explanation
▸	Action step
1., 2.	Numbered action steps
→	Cross-reference to other parts of this document or to other documents
•	List/list entry
–	List/list entry (second level)

Tab. 1

1.2 GENERAL SAFETY INSTRUCTIONS

STORAGE

- ▸ Only store flat-plate collectors in dry conditions (in the open only with a rain cover).

RISK OF BURNS FROM THE FLAT-PLATE COLLECTORS

Some parts may cause burns if the flat-plate collectors and installation materials are exposed to solar radiation for prolonged periods of time.

- ▸ Protect yourself with personal protective equipment.
- ▸ Protect the flat-plate collector and installation materials from solar radiation (e.g. with a tarpaulin).

DANGER OF FALLING WHEN WORKING ON THE ROOF

- ▸ Always wear personal protective equipment or safety equipment.
- ▸ For all work on the roof, follow guide lines set out in current working at heights legislation.
- ▸ Observe accident prevention regulations.

INSTALLATION

Installation and maintenance must only be carried out by an competent person.

- ▸ Please read these instructions carefully.
- ▸ Never modify components.
- ▸ Fit the installation set only on roofs with sufficient load-bearing capacity. If necessary, consult a structural engineer and/or roofer.

FUNCTION CHECK

The operator is responsible for the safety and environmental compatibility of the system.

- ▸ Users are recommended to arrange a maintenance and inspection contract with an competent person.
- ▸ Replace faulty parts immediately. Use only original spare parts.

INSTRUCTING THE USER

- ▸ Instruct users as to how the appliance functions, as well as how to operate the system as a whole.
- ▸ Inform users that they must never carry out any modifications or repairs.
- ▸ Hand these installation and maintenance instructions to the user. Point out that these instructions must be kept and passed on to the next owner/user.

2 PRODUCT INFORMATION

In these instructions, the Solar-Lifestyle flat-plate collector is simply referred to as the collector.

Pantiles, Roman tiles, stone tiles etc. will all be referred to as roof tiles.

2.1 ROOF CONNECTION

The graphics in these instructions use the example of a roof covered with roof tiles and the roof connection for this type of roof. If the installation varies for other types of roofs, this is indicated in the text.

2.2 STRUCTURE OF THE COLLECTOR

The graphics in these instructions show portrait collectors [10]. If the installation of landscape collectors [9] varies from that described, this is indicated in the text.

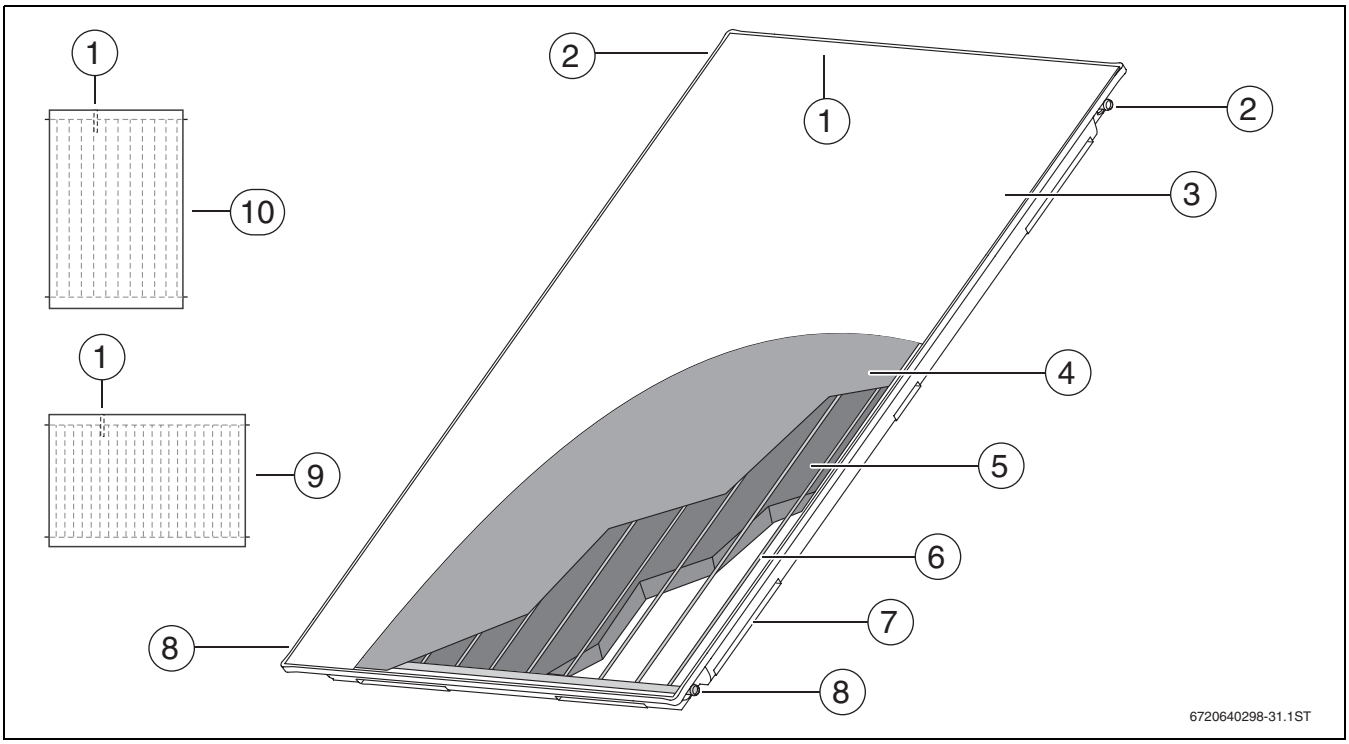

Fig. 1 Cross-section of portrait collector version

1 Sensor pocket for collector sensor
2 Collector connection, flow
3 Glass cover
4 Absorber
5 Insulation
6 Harp-shaped tube
7 Installation mount inside the casing
8 Collector connection, return
9 Schematic illustration of landscape collector version
10 Schematic illustration of portrait collector version

2.3 CORRECT USE

The collectors are designed to produce heat in solar thermal systems.

The installation set is exclusively designed for the safe mounting of collectors.

- Only operate collectors in conjunction with suitable solar controllers and in fail-safe sealed unvented solar thermal systems.

PERMISSIBLE HEAT TRANSFER MEDIUM

To protect the collectors against damage through frost and corrosion, only use Tyfocor L solar heat transfer fluid.

PERMISSIBLE TYPES OF ROOF

These instructions describe the collector installation on pitched roofs with roof tiles, plain tiles, raised tiles, slate/shingles.

- Only use the installation set on such roofs.

PERMISSIBLE ROOF INCLINATIONS

- Fit the installation sets only on roofs with the following inclinations.

Type of roof	Roof pitch
Roof tile	25° – 65°
Raised tile	17° – 65°
Slate/shingle/plain tile	25° – 65°

Tab. 2

PERMISSIBLE LOADS

- Only install collectors with the roof integration set in locations with lower values than those shown in table 3. If necessary, consult a structural engineer.

The installation set is suitable for the following maximum loads:

Maximum snow load	Maximum wind speed	Max. dynamic pressure
3.8 kN/m^2	**151 km/h**	**1.1 kN/m^2**

Tab. 3

- To determine the maximum wind speed, take into account the following factors:
  - Location of the solar thermal system
  - Geographic elevation of the terrain
  - Topography (terrain/buildings)
  - Height and structure of building

The maximum snow load is calculated using regional zones (snow load zones) and the ground level elevation.

- Enquire about the locally applicable standard snow loads.

Prevent an accumulation of snow above the collector:

- Install a snow guard above the collector (maintain a clearance of no more than 1 m between the collector and the snow guard).

-or-

- Regularly clear snow build-up.

Important Information

Please ensure that you are fitting the correct flashing kit for the roof type you are working on.

There are 3 types of flashing for in roof installation.

- Pan tile in roof flashing: For standard roof tiles
- Raised tile in roof flashing: For higher height tiles (including Roman tiles)
- Slate/Shingle in roof flashing: For slate / shingle roofs

if in doubt, please refer to table 18, page 23 for maximum permissible dimensions covered by pan tile and Raised tile flashings.

2.4 COMPONENTS AND TECHNICAL DOCUMENTATION

A solar thermal system is designed to heat domestic hot water (DHW). It comprises various components.

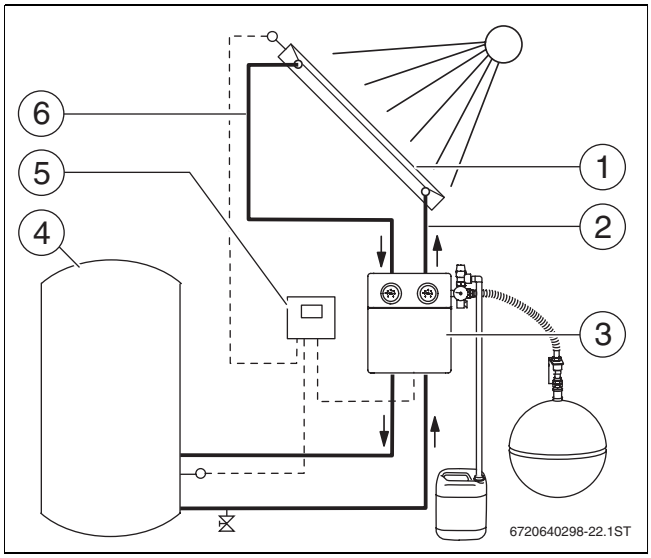

Fig. 2 Solar thermal system components

1 Collector with collector sensor at the top
2 Pipework (return)
3 Solar pump station with expansion vessel, temperature and safety equipment
4 Solar cylinder
5 Solar controller
6 Pipework (flow)

The following subjects are described in the component instructions:

COLLECTOR

- Installing the roof connection
- Fixing the collector
- Hydraulic collector connection
- Collector maintenance

SOLAR PUMP STATION

- Installation of the solar pump station
- Installing the pipework
- Commissioning the system as a whole
- Maintenance of the solar pump station and the whole system
- Information on faults in the whole system

SOLAR CONTROLLER

- Installation and electrical connection of the controller
- Operation of the controller and the whole system
- Controller maintenance
- Information on controller faults

Further instructions may be found with the accessories.

2.5 ACCESSORIES

In the following, please find a list of accessories that may be combined with the collector and the installation set.

- Air vent set (→ chapter 9.2, page 48)
- Solar Flexi Twin Way Pipe

2.6 EU DECLARATION OF CONFORMITY

The design and operation of this product conform to the European Directives and the supplementary national requirements. Its conformity is demonstrated by the CE designation. The Declaration of Conformity can be requested from the manufacturer (see the back cover for the address).

2.7 DATA PLATE

The collector data plate is located on the collector casing and includes information in the form of symbols.

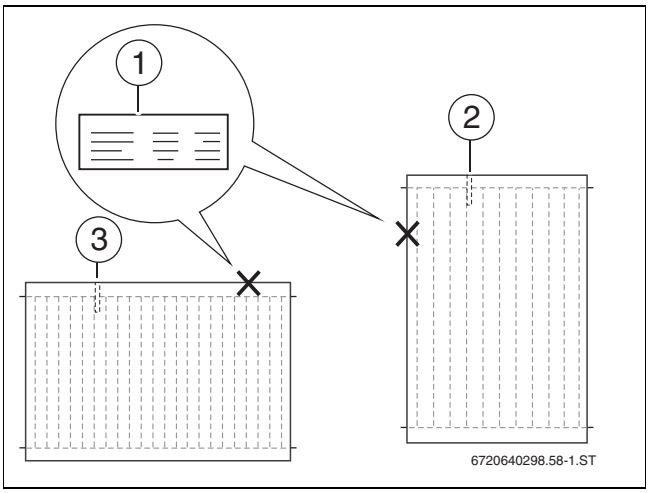

Fig. 3 Data plate position

1 Data plate on the collector casing
2 Sensor well, collector sensor, portrait collector version
3 Sensor well, collector sensor, landscape collector version

Symbol	Explanation	Explanation
t_{stg}	temperature stagnation	Max. stagnation temperature
p_{max}	pressure$_{maximum}$	Max. operating pressure
m	mass	Weight
A_G	area$_{gross}$	Gross area
A_a	area$_{aperture}$	Aperture area (translucent area)
A_A	area$_{absorber}$	Absorber area
V_f	volume$_{fluid}$	Collector capacity

Tab. 4 Data plate information

Note down the serial numbers on the data plates of the collectors that you will install. This information can be used to register the guarantee.

Installer Name: _____

Date of Installation:_____

Collector 1: _____

Collector 2: _____

Collector 3: _____

2.8 SPECIFICATION

Solar-Lifestyle	
Certificates	CE
Length	2017 mm
Width	1175 mm
Height	87 mm
Clearance between collectors	25 mm
Collector connection (in the shape of a nozzle)	23 mm
Absorber capacity, portrait (V_f)	0.94 l
Absorber capacity, landscape (V_f)	1.35 l
External area (gross area, A_G)	2.37 m^2
Absorber area (net area, A_A)	2.18 m^2
Aperture area (A_a)	2.25 m^2
Net weight, portrait version	40 kg
Net weight, landscape version	41 kg
Permissible operating pressure collector (p_{max})	6 bar
Max. stagnation temperature	199 °C

Tab. 5

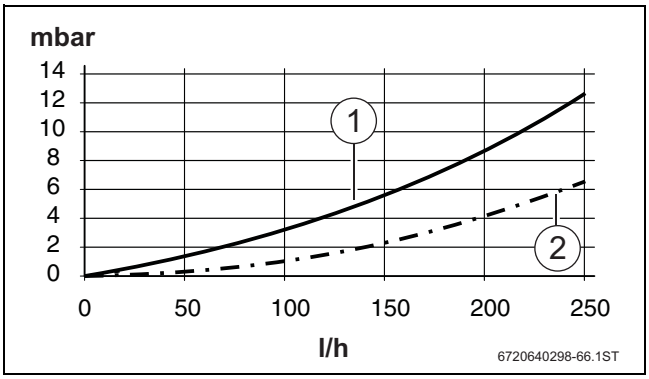

Fig. 4 Collector pressure drop

1 Pressure drop curve for portrait version
2 Pressure drop curve for landscape version

2.9 STANDARD DELIVERY

- Check that the delivered material is complete and undamaged.

Individual components of the installation set may be different subject to collector version (portrait/landscape) and roof cover (→ Alternative components if the roof is covered with slate/shingle, page 8).

2.9.1 INSTALLATION SET FOR PORTRAIT COLLECTORS

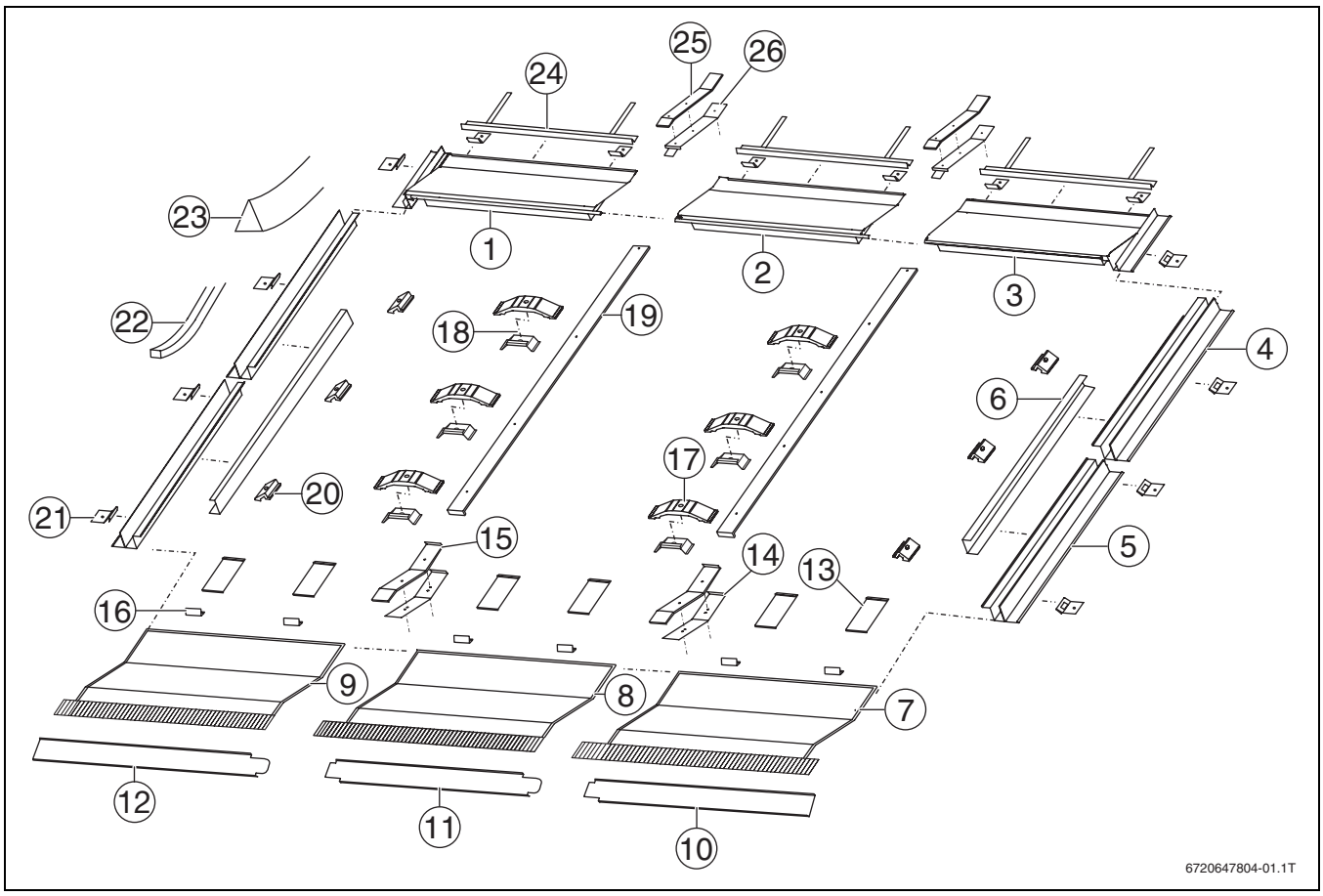

Fig. 5 Installation set for 3 portrait collectors:
1 basic installation set and 1 extension installation set

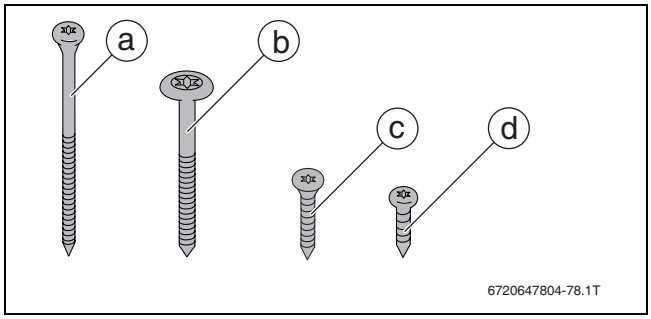

Fig. 6 Screws

a Screw 5x120
b Screw 6x70
c Screw 5x30
d Screw 5x13

ALTERNATIVE COMPONENTS IF THE ROOF IS COVERED WITH SLATE/SHINGLE

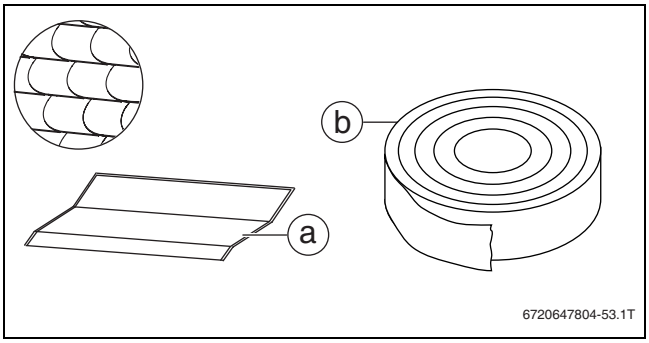

Fig. 7 Components for slate/shingle cover

a Lower flashing panels, without lead flashing
b Adhesive strip

INSTALLATION SET, BASIC VERSION FOR PORTRAIT COLLECTORS

Pos. 1	Upper flashing panel, left	1 x
Pos. 3	Upper flashing panel, right	1 x
Pos. 4	Lateral flashing panel, top left	1 x
	Lateral flashing panel, top right	1 x
Pos. 5	Lateral flashing panel, bottom	2 x
Pos. 6	Lateral support panel	2 x
Pos. 7	Lower flashing panel, right	1 x
Pos. 9	Lower flashing panel, left	1 x
Pos. 10	Fascia, right	1 x
Pos. 12	Fascia, left	1 x
Pos. 13	Retainer	4 x
Pos. 14	Joiner for lower flashing panel, bottom section	1 x
Pos. 15	Joiner for lower flashing panel, top section	1 x
Pos. 16	Anti-slip bracket	4 x
Pos. 17	Clamp, double-sided	3 x
Pos. 18	Spacer	3 x
Pos. 19	Middle cover strip	1 x
Pos. 20	Clamp, single-sided	6 x
Pos. 21	Mounting bracket	12 x
Pos. 22	Sealing tape (roll) for raised tiles/ roof tiles	1 x
Pos. 23	Triangular sealing tape for raised tiles	6 x
	Triangular sealing tape for roof tiles	4 x
Pos. 24	Roof tile support	2 x
Pos. 25	Joiner for upper flashing panel, top section	1 x
Pos. 26	Joiner for upper flashing panel, bottom section	1 x
a	Screw 5x120	1 x
b	Screw 6x70	9 x
c	Screw 5x30	18 x
d	Screw 5x13	4 x

Tab. 6

INSTALLATION SET, EXTENSION FOR PORTRAIT COLLECTORS

Pos. 2	Upper flashing panel, centre	1 x
Pos. 8	Lower flashing panel, centre	1 x
Pos. 11	Fascia, centre	1 x
Pos. 13	Retainer	2 x
Pos. 14	Joiner for lower flashing panel, bottom section	1 x
Pos. 15	Joiner for lower flashing panel, top section	1 x
Pos. 16	Anti-slip bracket	2 x
Pos. 17	Clamp, double-sided	3 x
Pos. 18	Spacer	3 x
Pos. 19	Middle cover strip	1 x
Pos. 21	Mounting bracket	6 x
Pos. 23	Triangular sealing tape for raised tiles	1 x
Pos. 24	Roof tile support	1 x
Pos. 25	Joiner for upper flashing panel, top section	1 x
Pos. 26	Joiner for upper flashing panel, bottom section	1 x
a	Screw 5x120	1 x
b	Screw 6x70	3 x
c	Screw 5x30	8 x
d	Screw 5x13	2 x

Tab. 7

2.9.2 INSTALLATION SET FOR LANDSCAPE COLLECTORS

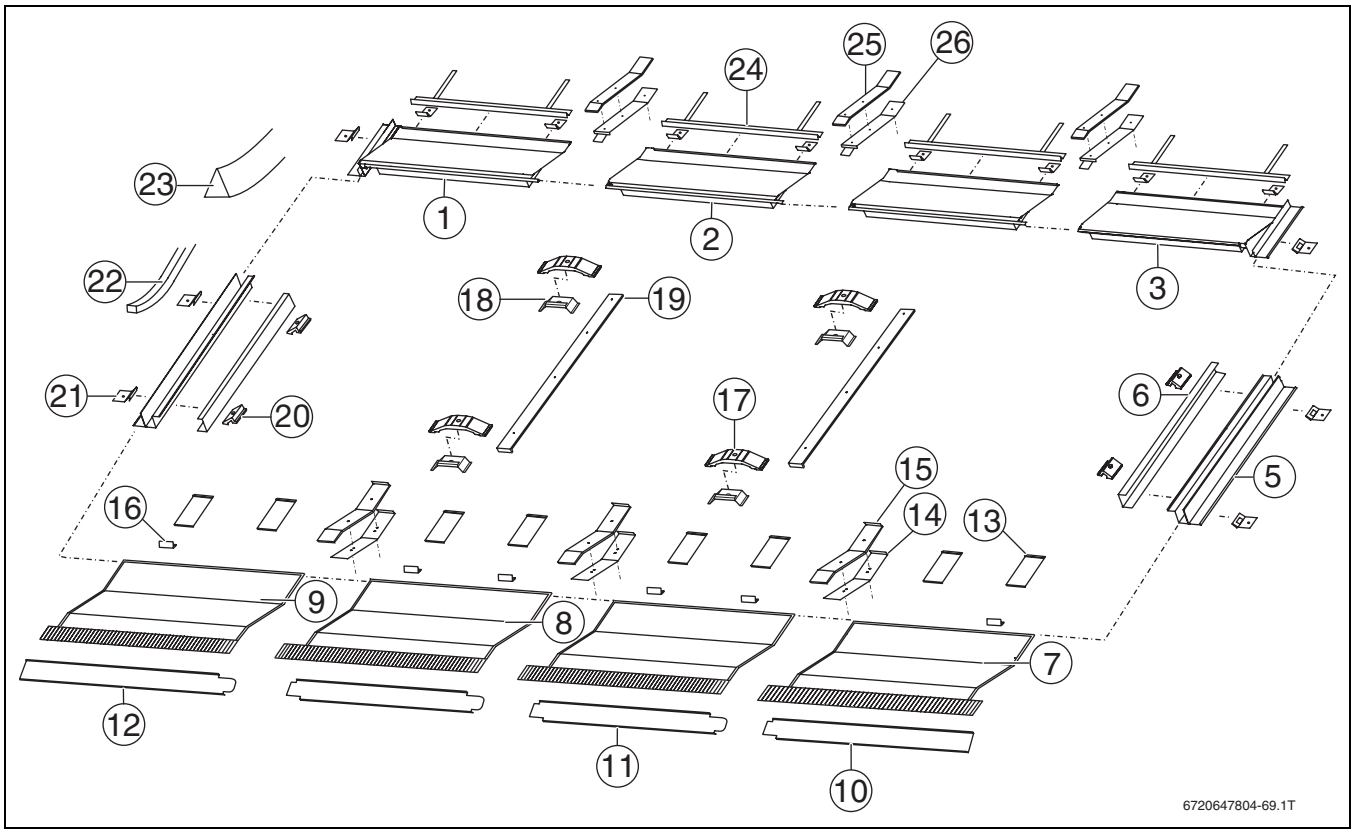

Fig. 8 Installation set for 3 landscape collectors:
1 basic installation set and 1 extension installation set

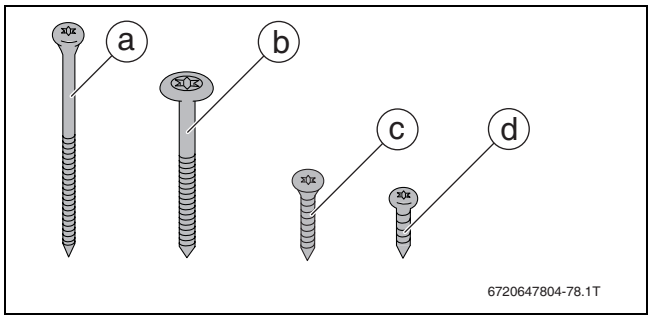

Fig. 9 Screws

a Screw 5x120
b Screw 6x70
c Screw 5x30
d Screw 5x13

ALTERNATIVE COMPONENTS IF THE ROOF IS COVERED WITH SLATE/SHINGLE

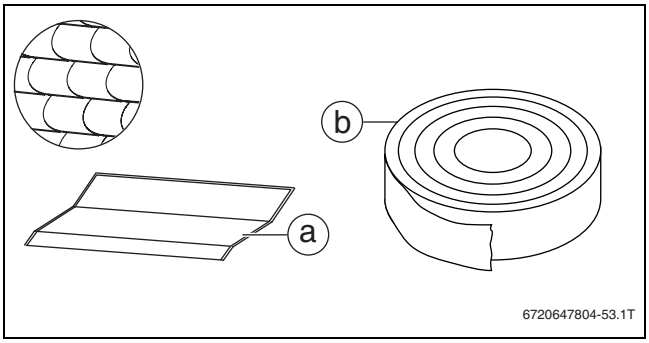

Fig. 10 Components for slate/shingle cover

a Lower flashing panels, without lead flashing
b Adhesive strip

INSTALLATION SET, STANDARD VERSION FOR LANDSCAPE COLLECTORS

Pos. 1	Upper flashing panel, left	1 x
Pos. 2	Upper flashing panel, centre	1 x
Pos. 3	Upper flashing panel, right	1 x
Pos. 5	Lateral flashing panel, left	1 x
	Lateral flashing panel, right	1 x
Pos. 6	Lateral support panel	2 x
Pos. 7	Lower flashing panel, right	1 x
Pos. 8	Lower flashing panel, centre	1 x
Pos. 9	Lower flashing panel, left	1 x
Pos. 10	Fascia, right	1 x
Pos. 11	Fascia, centre	1 x
Pos. 12	Fascia, left	1 x
Pos. 13	Retainer	6 x
Pos. 14	Joiner for lower flashing panel, bottom section	2 x
Pos. 15	Joiner for lower flashing panel, top section	2 x
Pos. 16	Anti-slip bracket	4 x
Pos. 17	Clamp, double-sided	2 x
Pos. 18	Spacer	2 x
Pos. 19	Middle cover strip	1 x
Pos. 20	Clamp, single-sided	4 x
Pos. 21	Mounting bracket	12 x
Pos. 22	Sealing tape (roll) for raised tiles/ roof tiles	1 x
Pos. 23	Triangular sealing tape for raised tiles	6 x
	Triangular sealing tape for roof tiles	2 x
Pos. 24	Roof tile support	4 x
Pos. 25	Joiner for upper flashing panel, top section	2 x
Pos. 26	Joiner for upper flashing panel, bottom section	2 x
a	Screw 5x120	2 x
b	Screw 6x70	6 x
c	Screw 5x30	22 x
d	Screw 5x13	4 x

Tab. 8

INSTALLATION SET, EXTENSION FOR LANDSCAPE COLLECTORS

Pos. 2	Upper flashing panel, centre	1 x
Pos. 8	Lower flashing panel, centre	1 x
Pos. 11	Fascia, centre	1 x
Pos. 13	Retainer	2 x
Pos. 14	Joiner for lower flashing panel, bottom section	1 x
Pos. 15	Joiner for lower flashing panel, top section	1 x
Pos. 16	Anti-slip bracket	2 x
Pos. 17	Clamp, double-sided	2 x
Pos. 18	Spacer	2 x
Pos. 19	Middle cover strip	1 x
Pos. 21	Mounting bracket	6 x
Pos. 23	Triangular sealing tape for raised tiles	2 x
Pos. 24	Roof tile support	2 x
Pos. 25	Joiner for upper flashing panel, top section	1 x
Pos. 26	Joiner for upper flashing panel, bottom section	1 x
a	Screw 5x120	1 x
b	Screw 6x70	2 x
c	Screw 5x30	8 x
d	Screw 5x13	2 x

Tab. 9

2.9.3 INSTALLATION SET FOR A SINGLE COLLECTOR

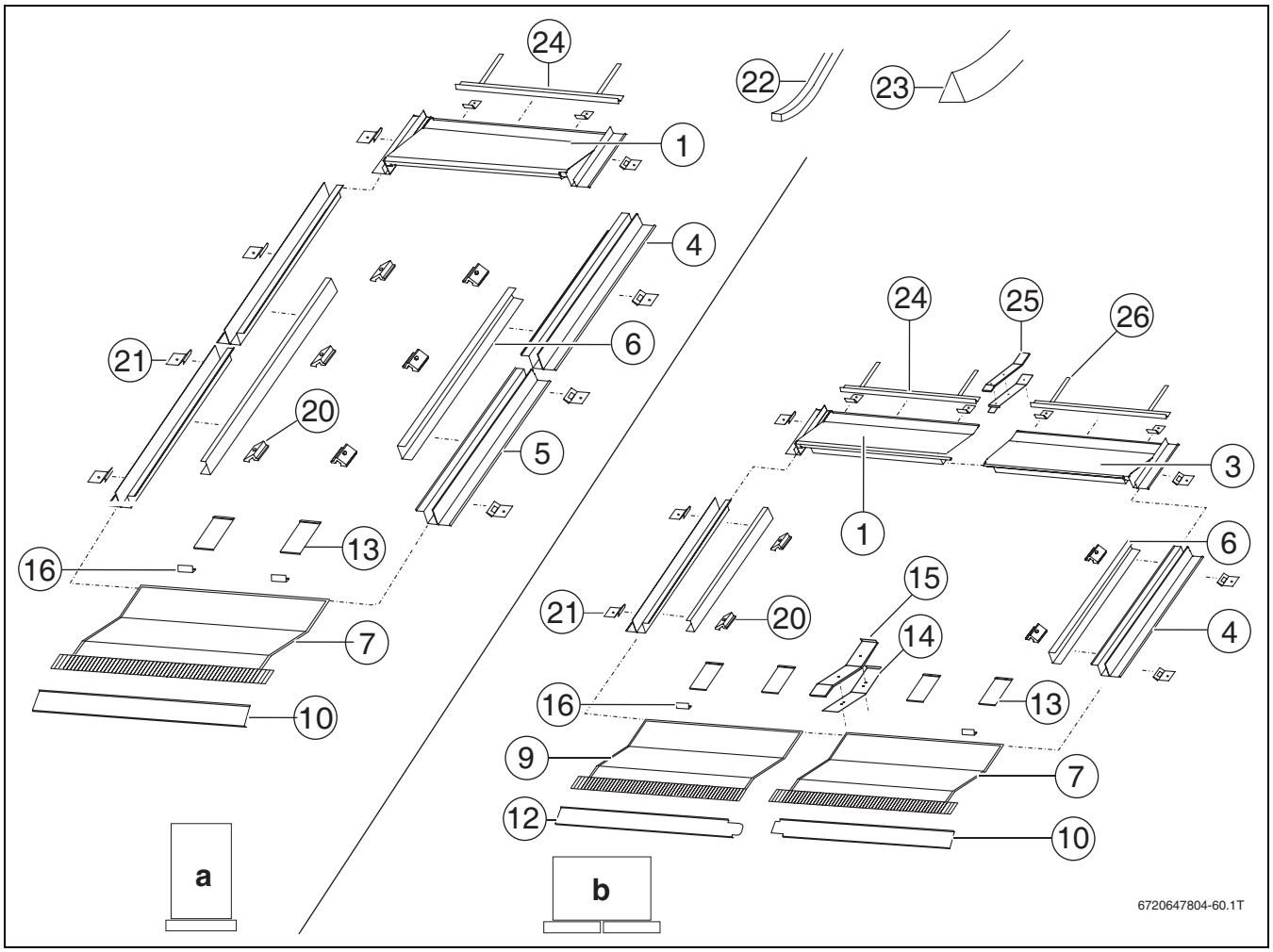

Fig. 11 Installation set for single portrait or landscape collector: single collector installation set

a One collector, portrait
b One collector, landscape

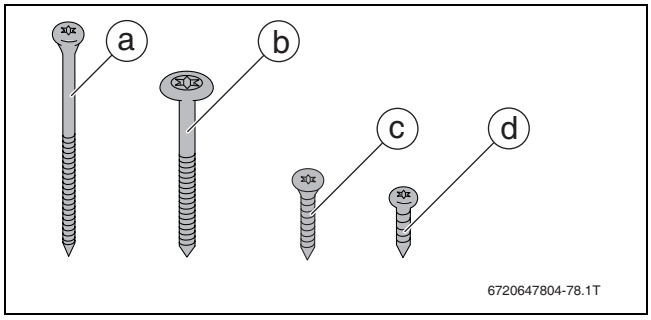

Fig. 12 Screws

a Screw 5x120
b Screw 6x70
c Screw 5x30
d Screw 5x13

ALTERNATIVE COMPONENTS IF THE ROOF IS COVERED WITH SLATE/SHINGLE

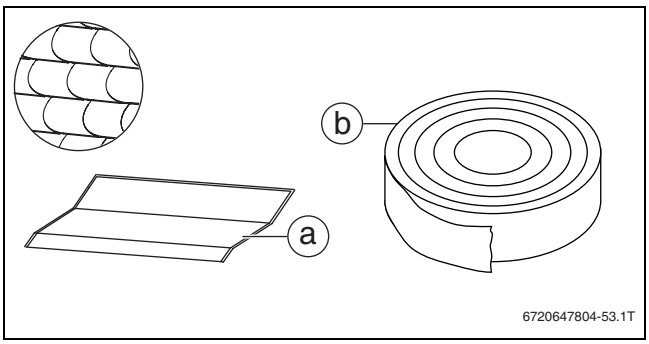

Fig. 13 Components for slate/shingle cover

a Lower flashing panels, without lead flashing
b Adhesive strip

INSTALLATION SET FOR 1 PORTRAIT COLLECTOR

Pos. 1	Upper flashing panel	1 x
Pos. 4	Lateral flashing panel, top left	1 x
	Lateral flashing panel, top right	1 x
Pos. 5	Lateral flashing panel, bottom	2 x
Pos. 6	Lateral support panel	2 x
Pos. 7	Lower flashing panel	1 x
Pos. 10	Restrictor	1 x
Pos. 13	Retainer	2 x
Pos. 16	Anti-slip bracket	2 x
Pos. 20	Clamp, single-sided	6 x
Pos. 21	Mounting bracket	12 x
Pos. 22	Roll of sealing tape	1 x
Pos. 23	Triangular sealing tape for raised tiles	5 x
	Triangular sealing tape for roof tiles	4 x
Pos. 24	Roof tile support	1 x
b	Screw 6x70	6 x
c	Screw 5x30	10 x
d	Screw 5x13	2 x

Tab. 10

INSTALLATION SET FOR 1 LANDSCAPE COLLECTOR

Pos. 1	Upper flashing panel, left	1 x
Pos. 3	Upper flashing panel, right	1 x
Pos. 4	Lateral flashing panel, top left	1 x
	Lateral flashing panel, top right	1 x
Pos. 6	Lateral support panel	2 x
Pos. 7	Lower flashing panel, right	1 x
Pos. 9	Lower flashing panel, left	1 x
Pos. 10	Fascia, right	1 x
Pos. 12	Fascia, left	1 x
Pos. 13	Retainer	4 x
Pos. 14	Joiner for lower flashing panel, bottom section	1 x
Pos. 15	Joiner for lower flashing panel, top section	1 x
Pos. 16	Anti-slip bracket	2 x
Pos. 20	Clamp, single-sided	4 x
Pos. 21	Mounting bracket	12 x
Pos. 22	Roll of sealing tape	1 x
Pos. 23	Triangular sealing tape for raised tiles	4 x
	Triangular sealing tape for roof tiles	2 x
Pos. 24	Roof tile support	2 x
Pos. 25	Joiner for upper flashing panel, top section	1 x
Pos. 26	Joiner for upper flashing panel, bottom section	1 x
a	Screw 5x120	1 x
b	Screw 6x70	4 x
c	Screw 5x30	14 x
d	Screw 5x13	2 x

Tab. 11

2.9.4 CONNECTION SET

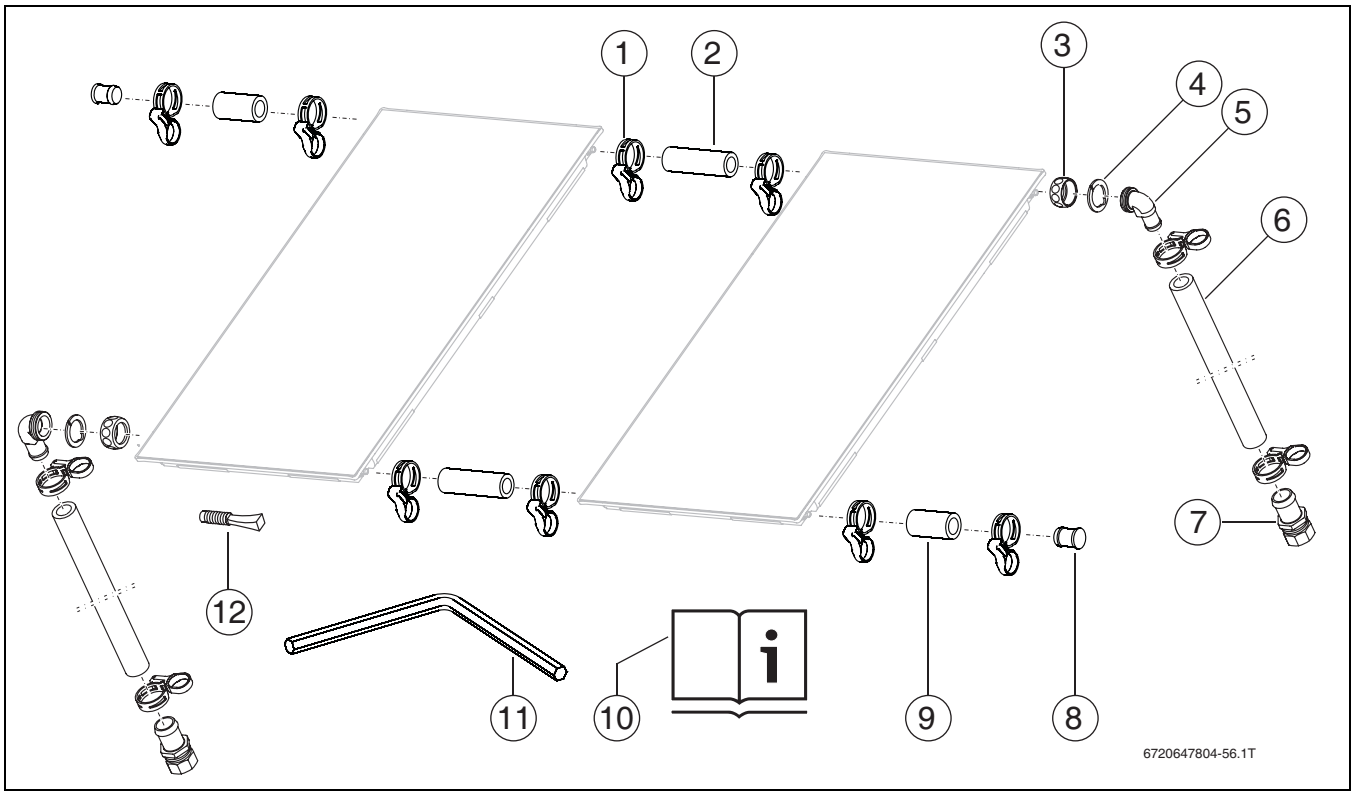

Fig. 14 1 roof integration connection set and 2 interconnection sets

CONNECTION SET FOR ONE COLLECTOR ARRAY:

Pos. 1	Hose clip (1 x as spare)	5 x
Pos. 3	Union nut G1	2 x
Pos. 4	Clamping washer	2 x
Pos. 5	Angled nozzle	2 x
Pos. 6	Solar hose 1000 mm	2 x
Pos. 7	Hose nozzle R¾ with 18 mm locking ring fitting	2 x
Pos. 8	Dummy plug	2 x
Pos. 9	Solar hose 55 mm	2 x
Pos. 10	Installation and maintenance instruction	1 x
Pos. 11	Allen key SW5	1 x
Pos. 12	Sensor well plug (collector sensor)	1 x

Tab. 12

2.9.5 COLLECTOR WITH 2 INTERCONNECTION SETS

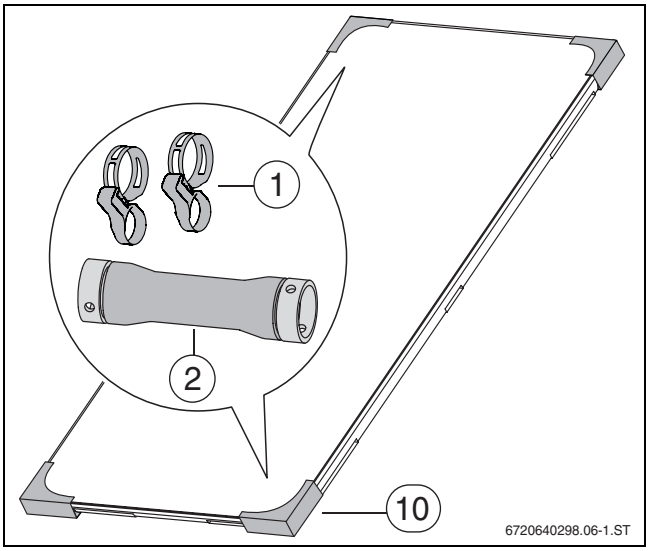

Fig. 15 2 protective corners comprising 1 interconnection set each (1 interconnection set includes 2 hose clips and 1 solar hose)

Pos. 1	Hose clip	4 x
Pos. 2	Solar hose, 145 mm with plug	2 x
Pos. 10	Protective corner with interconnection set	2 x

Tab. 13

3 REGULATIONS

3.1 VALIDITY OF REGULATIONS

- Observe updated regulations or supplements. These regulations also apply at the time of installation.

3.2 STANDARDS, REGULATIONS, DIRECTIVES

- Observe all standards and guidelines applicable to the installation and operation of the system in your country and region.

THE HEALTH AND SAFETY AT WORK ACT 1974.

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS (COSHH) 1994

THE PRESSURE EQUIPMENT REGULATIONS 1999

CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATION (CDM) 2007

THE WORK AT HEIGHT REGULATIONS 2005

MANUAL HANDLING OPERATIONS REGULATIONS 1992

THE LIFTING OPERATIONS AND LIFTING EQUIPMENT REGULATIONS (LOLER) 1999

REPORTING OF INJURIES, DISEASES OR DANGEROUS OCCURRENCES REGULATIONS (RIDDOR) 1995

CONFINED SPACES REGULATIONS 1997

PERSONAL PROTECTIVE EQUIPMENT AT WORK REGULATIONS 1992

ELECTRICITY AT WORK REGULATIONS 1989

PROVISION AND USES OF WORK EQUIPMENT REGULATIONS (PUWER) 1998

BS 6795:1986 CODE OF PRACTICE FOR SOLAR HEATING SYSTEMS FOR SWIMMING POOLS FOR SWIMMING POOL.

BS5918: A CODE OF PRACTICE FOR THE INSTALLATION OF DSHW SYSTEMS FOR DOMESTIC HOT WATER

BS5546: 2000 SPECIFICATION FOR INSTALLATION OF HOT WATER SUPPLIES FOR DOMESTIC PURPOSES, USING GAS-FIRED APPLIANCES OF RATED INPUT NOT EXCEEDING 70 KW.

BS6700: 2006 SPECIFICATION FOR DESIGN, INSTALLATION, TESTING AND MAINTENANCE, OF SERVICING SUPPLYING WATER FOR DOMESTIC USE WITHIN BUILDINGS AND THEIR CURTILAGES.

EN 12976: THERMAL SOLAR HEATING SYSTEM AND THEIR COMPONENTS (PREFABRICATED SYSTEMS).

ENV 12977: THERMAL SOLAR HEATING SYSTEM AND THEIR COMPONENTS (BESPOKE SYSTEMS).

BS 6920: SUITABILITY OF NON-METALLIC PRODUCTS FOR USE IN CONTACT WITH WATER INTENDED FOR HUMAN CONSUMPTION WITH REGARDS TO THEIR EFFECT ON THE QUALITY OF WATER

BSEN 12831:2003: HEATING SYSTEMS IN BUILDINGS. METHODS FOR CALCULATION OF THE DESIGN HEAT LOAD

BS 8000-15: 1990: WORKMANSHIP ON BUILDING SITES. CODE OF PRACTICE FOR HOT AND COLD WATER SERVICES (DOMESTIC SCALE)

4 HANDLING

DANGER: Risk to life by falling from roof!
- Never use a ladder to move components to the roof because the installation material and collectors are heavy and difficult to handle.
- Whilst working on the roof, take all necessary precautions against a possible fall.
- Always wear personal protective equipment.

WARNING: Risk of injury through falling parts.
- During transport, secure the collectors and installation materials to prevent them falling.

NOTICE: Leaks through damage to the sealing face at the collector connections.
- Remove the protective caps only immediately prior to installation on the roof.

Two of the four protective corners of the collector contain important parts (→ Fig. 15, page 14).

All packaging materials are environmentally compatible and can be recycled.

- Dispose of shipping packaging by environmentally responsible means.

NOTICE: Damage to the collector connections through incorrect use.
- Never use the collector connections as lifting points.
- To carry the collector, hold it with your hands by the recessed grips or by the collector edge.

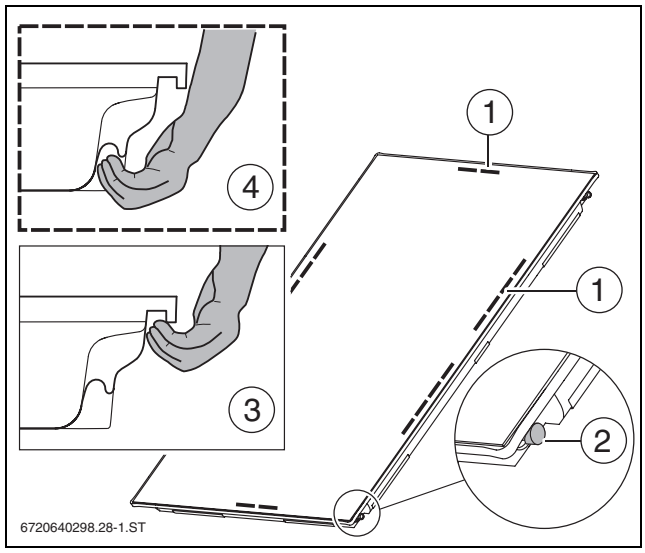

Fig. 16

1 Location of recessed grip
2 Remove the protective caps only on the roof
3 Carrying the collector: all-round collector edge
4 Carrying the collector: recessed grip

- To make it easier to transport the collectors and the installation materials, the following aids, which have sufficient load-bearing capacity, can be used:
  - Lifting belt
  - 3-point suction lift
  - Roofing ladder
  - Lean-to lift
  - Scaffolding

The solar hoses [1] inside the protective corners are supplied with greased plugs [2]. These plugs expand the solar hose and make it easier to fit it to the collector connection.

- Remove plug [2] only immediately prior to fitting the solar hose (→ chapter 7.1.3 for more information)

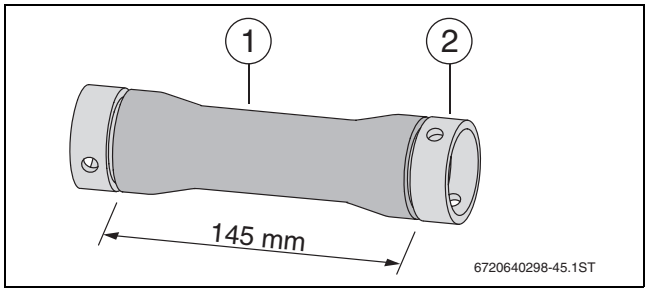

Fig. 17

5 BEFORE INSTALLATION

5.1 GENERAL NOTES

WARNING: Some parts may cause burns if the collector and installation materials are exposed to solar radiation for prolonged periods of time.

- Protect yourself with personal protective equipment.
- Protect the collector and installation materials from solar radiation.

We recommend that you engage the services of a roofing contractor, as they are experienced in working on roofs and will be aware of the risk of falling.

We recommend the application of an underlying waterproof membrane when installing collectors.

- Obtain information about on-site conditions and local regulations.
- Arrange collectors in the optimal position on the roof. For this, pay particular attention to the following:
  - Align the collector array facing as close to south as possible (→ Fig. 18).
  - Align the collector array so that it is in line with windows, doors etc. (→ Fig. 18).
  - Avoid shading (→ Fig. 19).
  - Observe the hydraulic connection to the pipework (→ chapter 5.2).
  - Take the space required on the roof into account (→ chapter 5.3).

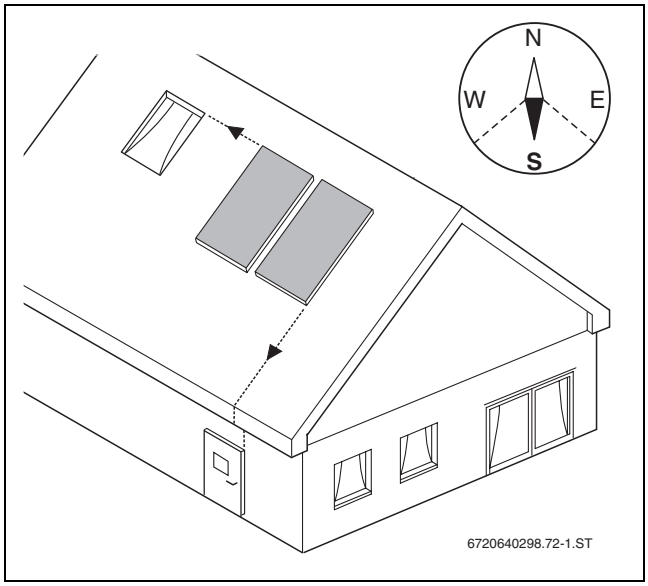

Fig. 18

- Prevent shading of the collector array through adjacent buildings, trees etc.

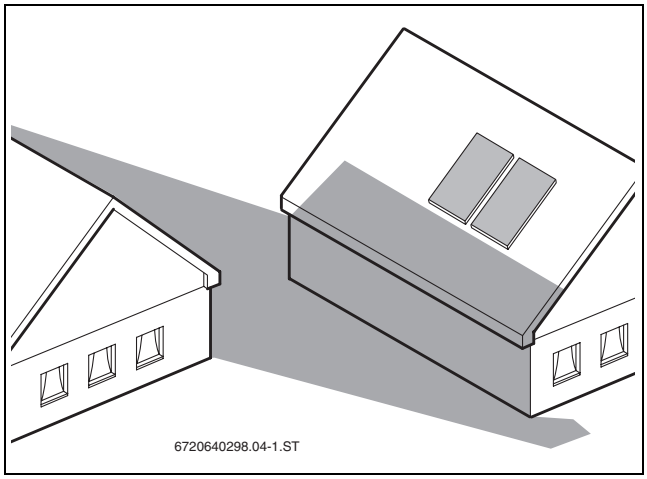

Fig. 19

FOR INSTALLATIONS WHERE THE SOLAR PUMP STATION IS NOT UNDERNEATH THE COLLECTOR ARRAY

In some cases, the solar pump station [1] cannot be sited underneath the collector array.

Form a "pipe trough" with the flow in order to prevent overheating in such systems.

- Firstly, route the flow down the height of collector as far as the return connection [2]. Then route it to the solar pump station.

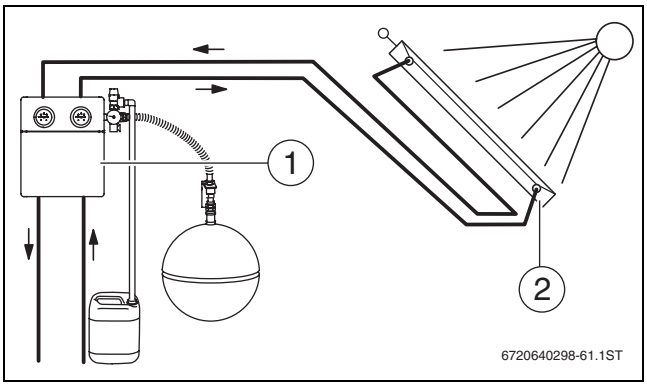

Fig. 20

5.2 COLLECTOR LAYOUT

The flow may be located on the right hand or the left hand side of the collector array.

- Connect the collector array alternately (→ Fig. 21).

Refer to the solar technical specification guide for detailed information on designing the system hydraulics and components.

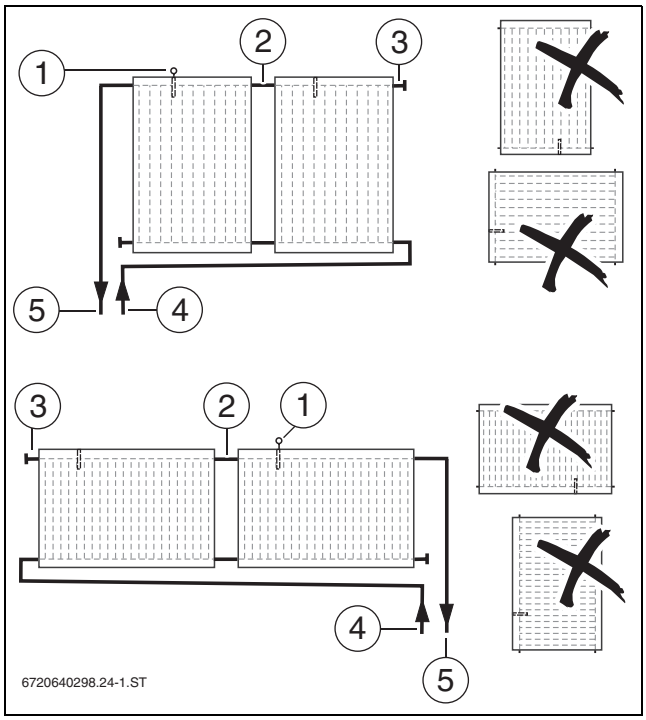

Fig. 21 Layout of portrait (top) and landscape (bottom) collectors

1 Collector sensor inside sensor well (always at the top of the collector where the flow is connected)
2 Solar hose 145 mm
3 Solar hose 55 mm and dummy plug
4 Return (from the cylinder)
5 Flow (to the cylinder)

PERMISSIBLE LAYOUT AND ORIENTATION

- When installing collectors, ensure that the sensor pocket for the collector sensor is located at the top (→ Fig. 21 [1]).
- Plan the routing of the collector sensor lead so that the collector sensor (→ Fig. 21 [1]) can be fitted to the collector to which the flow [5] has been attached.

MAXIMUM NUMBER OF COLLECTORS

- Install no more than 10 collectors per field.

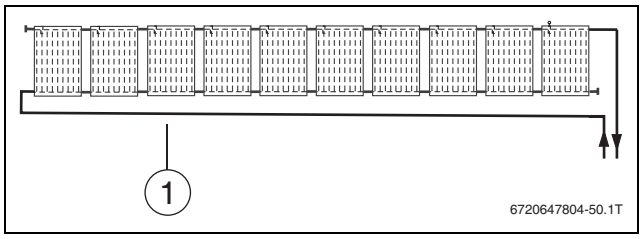

Fig. 22

1 Connection of a single row

5.3 SPACE REQUIRED ON ROOF

DANGER: Risk to life through collectors that cannot withstand high winds!

- ▸ Maintain the minimum clearance to the edge of the roof (dimension a).

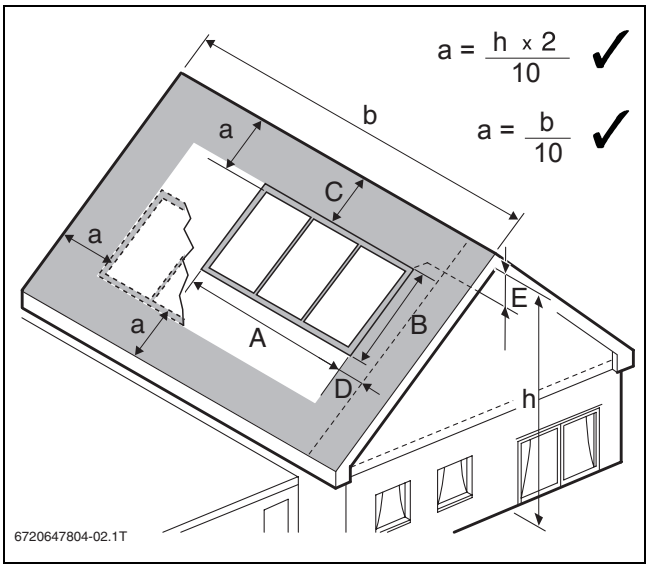

Fig. 23

- **Dimension a:** Either formula can be used. The lower value can be applied.
- **Dimension A:** Space requirement incl. panel → table 14
- **Dimension B:** Space requirement incl. panel → table 15
- **Dimension C:** At least two rows (or at least 0.5 m if 2 rows of tiles are smaller than this distance) of tiles to ridge or chimney.
- **Dimension D:** At least 0.5 m for the flow on the right or left of the collector array.
- **Dimension E**: If an air vent valve is required on the roof, at least 0.4 m for the flow.

Allow for a clearance of at least 3 roof tiles between both collector arrays.

Number of collectors	Dimension A, incl. flashing panels [m]			
	Roof tile/slate		Raised tile	
	Portrait	Landscape	Portrait	Landscape
1	1.54	2.38	1.61	2.45
2	2.74	4.42	2.81	4.49
3	3.94	6.46	4.01	6.53
4	5.14	8.50	5.21	8.57
5	6.34	10.55	6.41	10.62
6	7.54	12.59	7.61	12.66
7	8.74	14.63	8.81	14.70
8	9.94	16.67	10.01	16.74
9	11.14	18.71	11.21	18.78
10	12.34	20.76	12.41	20.83

Tab. 14 Space required for portrait and landscape versions

Series	Dimension B, incl. flashing panels [m]					
	Roof tile		Raised tile		Slate	
	Portrait	Landscape	Portrait	Landscape	Portrait	Landscape
1, without lead flashing	2.59	1.75	2.86	2.02	2.61	1.77

Tab. 15 Space required for portrait and landscape versions

5.4 LIGHTNING PROTECTION

▶ Check regional regulations as to whether a lightning protection system is required.

Lightning protection is frequently required for buildings higher than 20 m, for example.

▶ Have a qualified electrician install the lightning protection.

▶ If a lightning protection system is installed, check whether the solar thermal system is included in this system.

5.5 REQUIRED TOOLS AND ACCESSORIES

- Spanner SW8
- Rechargeable screwdriver
- Hammer
- Try-square
- Torx drill bits TX25
- Three-point suction pad
- SW27 and 30 spanners for making the pipe connections
- Angle grinder
- Spirit level
- Plumb line
- Ventilation tile
- Pipe insulation (rated for operation with solar)

5.6 INSTALLATION SEQUENCE

When installing a **single collector** some installation steps may differ from this installation sequence.

▶ Observe the on the individual installation steps.

To fasten the collectors to the roof, install in the following order:

- Determine the starting position (→ chapter 6.1, page 21).
- Uncover the roof (→ chapter 6.2, page 23).
- Prepare the collector installation at ground level (→ chapter 7.1, page 28)
- Fit additional roof battens as required (→ chapter 6.3, page 24).
- Mark out installation dimensions (→ chapter 7.2.2, page 31).
- Fit the lower flashing panels (→ chapter 7.2.3, page 34).
- Fit the left hand collectors (→ chapter 7.2.4, page 36).
- Fit further collectors (→ chapter 7.2.5, page 38).
  - This step is not required when fitting a **single collector**
- Complete the collector installation (→ chapter 7.2.6, page 39).
- Fit the lateral support panels (→ chapter 7.2.7, page 39).
- Fit the collector sensor (→ chapter 7.2.8, page 40).
- Make the hydraulic connections (→ chapter 7.2.9, page 40).
- Fit the lateral flashing panels (→ chapter 7.2.10, page 41).
- Fit fascias (→ chapter 7.2.11, page 42).
- Fit the centre cover strip (→ chapter 7.2.12, page 42)
  - This step is not required when fitting a **single collector**
- Fit the upper flashing panels (→ chapter 7.2.13, page 43).
- Fit the triangular sealing tape (→ chapter 7.2.14, page 44).
- Match the lead flashing to the flashing panels (→ chapter 7.2.15, page 45).
- Cover the roof (→ chapter 8, page 46).

6 PREPARING THE ROOF FOR INSTALLATION

- Use a roofing ladder to provide a better footing on roofs or to slide up individual roof tiles.
- Remove and replace broken roof tiles, shingles, roofing sheets etc.

DANGER: Risk to life by falling from roof!
- Whilst working on the roof, take all necessary precautions against a possible fall.
- Always wear personal protective equipment.

6.1 DETERMINING THE STARTING POSITION

COLLECTOR ARRAY LAYOUT

Using an example, the diagram shows the layout for pan tile cover. Dimensions for alternative roof covers → table 16, page 22

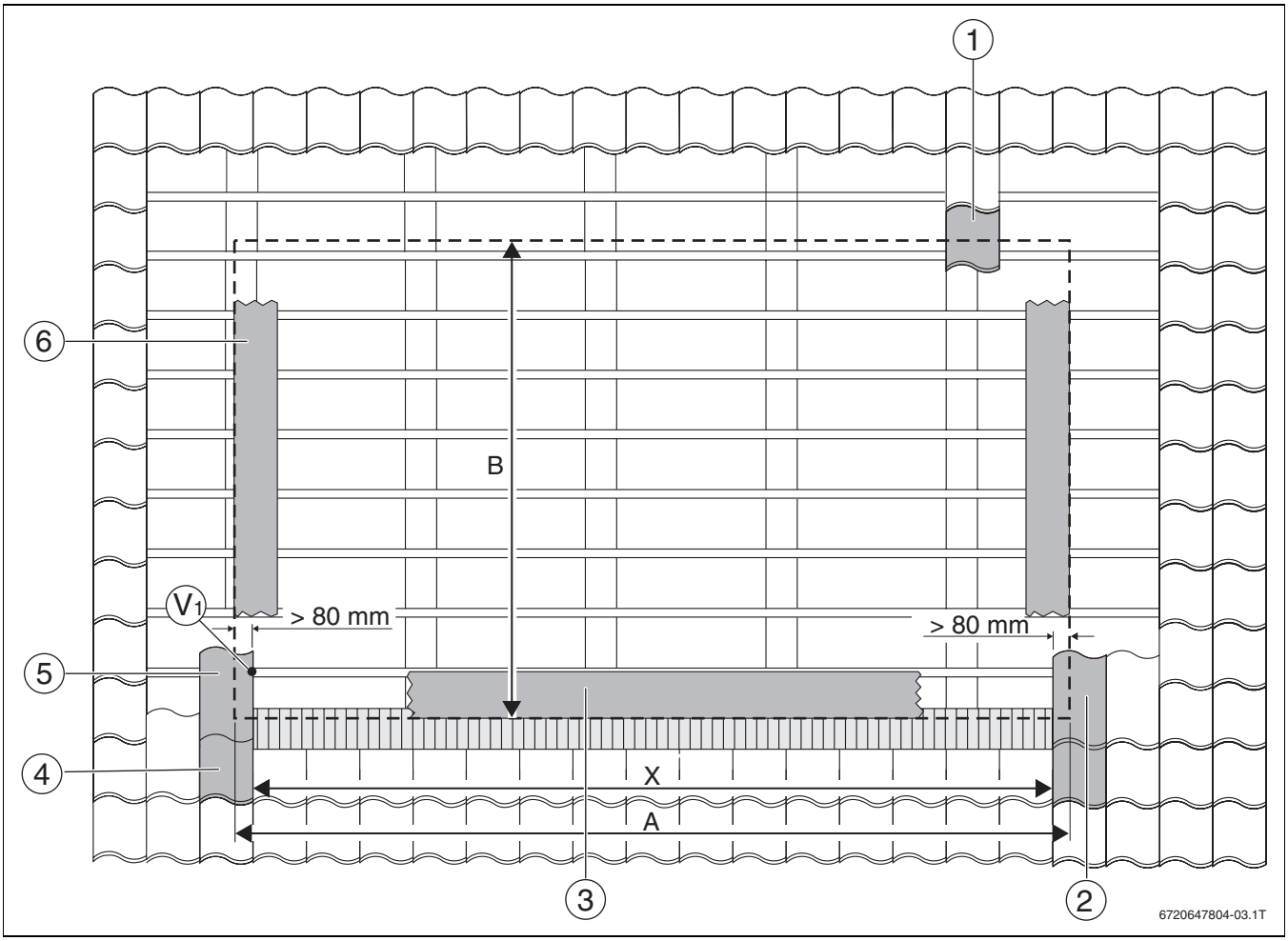

Fig. 24 Collector array layout

1 Top row of roof tiles
2 Right hand row of roof tiles
3 Lower flashing panel (with lead flashing)
4 Bottom row of roof tiles
5 Left hand row of roof tiles
6 Lateral flashing panel
A Width of the collector array including flashing panel
B Height of the collector array including flashing panel, excl. lead flashing
V1 Reference point to dimension X
X Clearance between the coverings that lie on the lateral flashing panels.

DIMENSION B, HEIGHT OF THE COLLECTOR ARRAY

Cover	Dim. B, incl. flashing panels, excl. lead flashing [m]	
	Portrait	Landscape
Pan tile	2.59	1.75
Raised tile	2.86	2.02
Slate/ shingle	2.61	1.77

Tab. 16

DIMENSION X, CLEARANCE BETWEEN THE COVERINGS

Number of collectors	Clearance [m]	
	Portrait	Landscape
1	1.38	2.22
2	2.58	4.26
3	3.78	6.31
4	4.98	8.35
5	6.18	10.39
6	7.38	12.43
7	8.58	14.47
8	9.78	16.52
9	10.98	18.56
10	12.18	20.60

Tab. 17

6.1.1 DETERMINING THE LANDSCAPE STARTING POSITION

Select the landscape starting position so that the roof tiles only need to be trimmed on the **right hand** edge of the collector array when the roof cover is reapplied.
When determining the starting position, ensure that the roof tiles on the right hand edge are only trimmed in the tile valley and that at least half of every tile remains.

- If there is no alternative, trim the roof tile on the **right hand** and **left hand** edge of the collector array.

- Transfer dimension X to the roof and determine the left hand row of roof tiles (→ Fig. 24, [5]).
- Determine the right hand row of roof tiles (→ Fig. 24, [2]) that may need to the trimmed when re-covering the roof later.

6.1.2 DETERMINING THE PORTRAIT STARTING POSITION

- Determine the bottom row of roof tiles (→ Fig. 24, [4]) giving due consideration to dimension B.
- Determine the top row of roof tiles (→ Fig. 24, [1]) that may need to the trimmed when re-covering the roof later (Observe minimum clearances to ridge tile).

6.2 UNCOVERING THE ROOF

- Remove the roof tiles for the collector array, starting with the identified rows of roof tiles.
- When removing the row of roof tiles [2] from the left hand side of the collector array, transfer the left hand reference point V1 from dimension X (→ Fig. 24) to the batten below the cover [1].
  This point is required as reference point V1 for the installation dimensions.

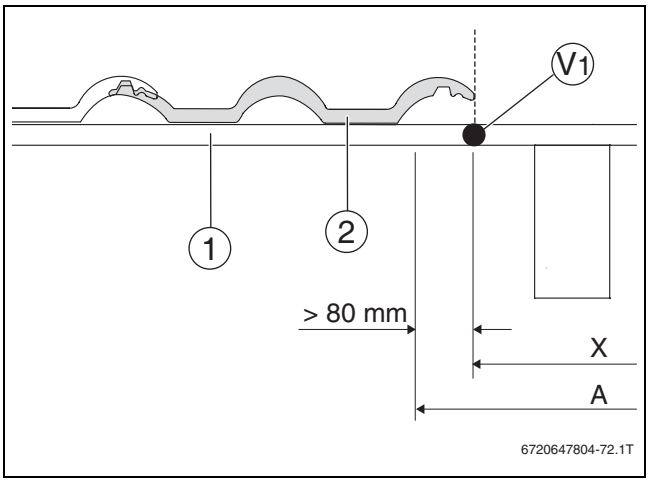

Fig. 25

1 Roof batten
2 Row of roof tiles to be removed
V1 Reference point to dimension X

- Remove an additional row of roof tiles on either side of the collector array, if required, to provide the necessary secure stepping area.

MATCHING UP THE BOTTOM ROW OF ROOF TILES

The lower row of tiles [3] bears the lower flashing panel [1] together with the lead flashing which seals the collector array.

- Ensure that the roof cover does not exceed the maximum permissible value (→ Fig. 26 and table 18, dimension h).

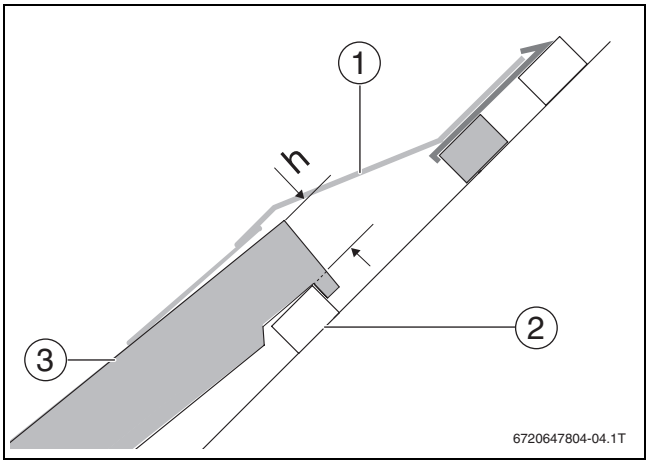

Fig. 26 Dimension h

Cover	Dimension h Maximum cover height: top edge of roof batten to top edge of roof cover
Pan tile	70 mm
Raised tile	140 mm

Tab. 18

If the roof cover is higher than the maximum permissible value:

- Chamfer the top edge of the cover [3] until the lower flashing panel [1] can lie flush.

6.3 FITTING ADDITIONAL ROOF BATTENS

No additional battens are required when installing on a boarded roof. The installation dimensions are marked on the existing boards.

6.3.1 LENGTH OF ADDITIONAL ROOF BATTENS

When laying the flashing panels and collectors in place, there will have to be additional roof battens of equal height to those already on the building.

Minimum length of additional battens (→ table 19 and Fig. 27, [2]):
Length = dimension A + approximately 10 cm (for lateral mounting brackets [1])

- Match the length of the additional battens [to the existing ones], enabling the battens butts to be secured on the rafters.

As an alternative to additional roof battens, those already present around the collector array area can be offset in accordance with the size of the additional roof battens. The following describes the installation using additional battens.

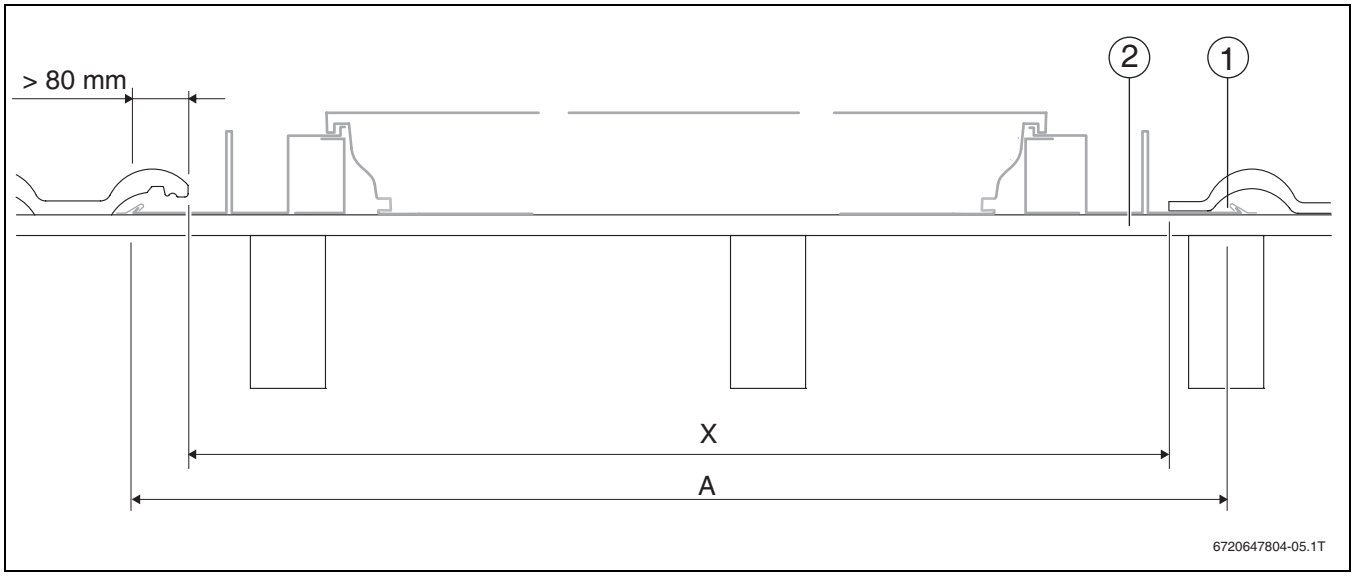

Fig. 27

1 Mounting bracket
2 Additional batten

DIMENSION A, WIDTH OF THE COLLECTOR ARRAY INCL. FLASHING PANEL

Number of collectors	Dimension A, incl. flashing panels [m]			
	Roof tile/slate		Raised tile	
	Portrait	Landscape	Portrait	Landscape
1	1.54	2.38	1.61	2.45
2	2.74	4.42	2.81	4.49
3	3.94	6.46	4.01	6.53
4	5.14	8.50	5.21	8.57
5	6.34	10.55	6.41	10.62
6	7.54	12.59	7.61	12.66
7	8.74	14.63	8.81	14.70
8	9.94	16.67	10.01	16.74
9	11.14	18.71	11.21	18.78
10	12.34	20.76	12.41	20.83

Tab. 19 Space required for portrait and landscape versions

6.3.2 POSITION AND CLEARANCES OF ADDITIONAL BATTENS

PORTRAIT COLLECTORS

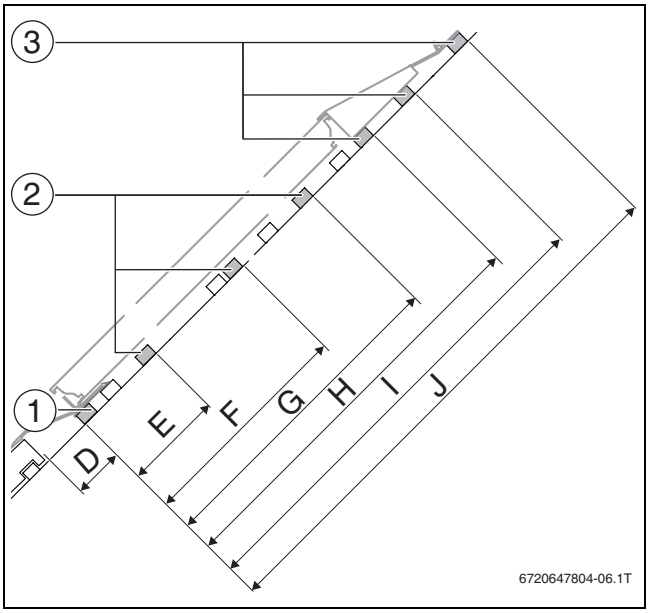

Fig. 28

1 Batten for retainer
2 Battens for clamp
3 Battens for top flashing panel

LANDSCAPE COLLECTORS

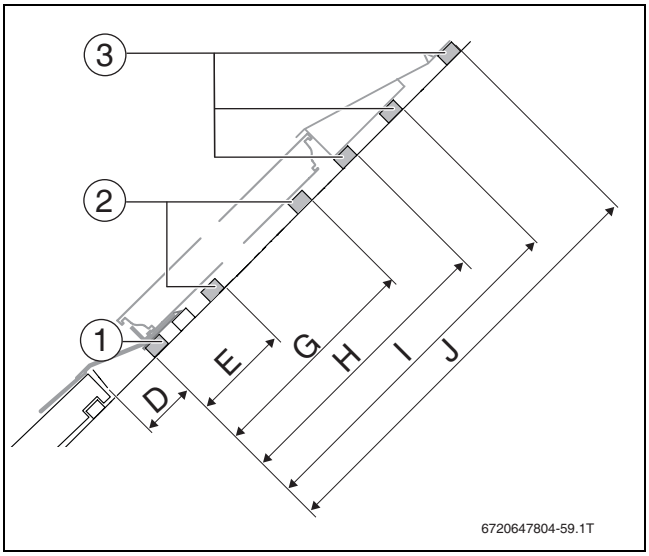

Fig. 29

D Clearance towards batten for retainer
E Clearance towards batten for clamp at the lower installation mount
F Clearance towards batten for clamp at the central installation mount
G Clearance towards batten for clamp at the top installation mount
H Clearance towards the batten for polystyrene wedge at the upper flashing panel
I Clearance towards the batten for polystyrene wedge at the upper flashing panel
J Clearance towards the batten for upper flashing panel

	Clearances of additional battens [mm]					
	Roof tile		Raised tile		Slate	
Clearances	Portrait	Landscape	Portrait	Landscape	Portrait	Landscape
D	140	140	280	280	140	140
E	200–380	200–380	200–380	200–380	200–380	200–380
F	1030	–	1030	–	1030	–
G	1660–1840	810–998	1660–1840	810–998	1660–1840	810–998
H	2080	1230	2080	1230	2080	1230
I	2250	1380	2360	1500	2250	1380
J	2450	1600	2570	1730	2450	1600

Tab. 20 Clearances of additional battens

6.3.3 FITTING ADDITIONAL ROOF BATTENS

CAUTION: Building damage through leaks in the roof.

- Fix batten onto rafters.
- Secure batten using adequate means.
- Compensate on site for different batten levels.

When fitting additional battens above existing battens:

- Offset additional batten sufficiently, towards the top to and leave sufficient space to be able to hook in the roof tiles.

If an additional batten must be fitted in a specific location that overlaps with an existing batten in the collector array:

- Re-position existing batten.

- Fit additional batten for retainer (→ Fig. 28 and 29, [1]).

The precise orientation of the batten for the retainer (→ Fig. 28 and 29, [1]) depends on the roof cover orientation.

- Align the batten over its entire length along the top edge of the lower roof cover use a plumb line, if required.

- Fit additional battens for clamp (→ Fig. 28 and 29, [2]).
- Fit additional battens for top flashing panel (→ Fig. 28 and 29, [3]).

OFFSETTING EXISTING BATTENS

- Offset existing batten [4] in the collector array [1] and secure with counter battens [3] if required.

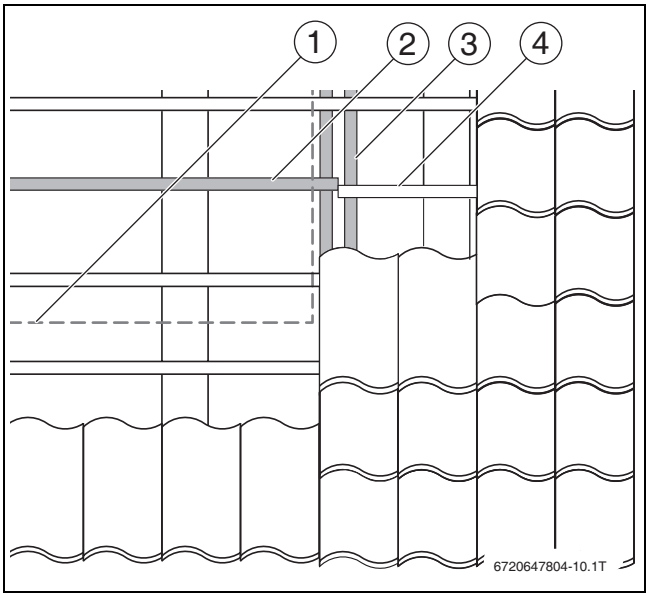

Fig. 30

1 Collector array
2 Offset roof batten
3 Counter batten
4 Existing batten

7 INSTALLING THE COLLECTORS

DANGER: Risk to life by falling from roof!
- Whilst working on the roof, take all necessary precautions against a possible fall.
- Always wear personal protective equipment.
- The installation on the roof must be performed by at least 2 people.

NOTICE: Collector damage through leaks at the collector connection.
- Remove protective caps from the collector connections immediately prior to making the hydraulic connection.

NOTICE: Collector damage through damaged connections.
- Never use collector connections to lift the collector.
- To carry collector, hold it with your hands using the recessed grips or the collector edge.

- For lifting the collector to the roof, use at least one of the following:
  - Lean-to lift
  - 3-point suction handles with adequate lifting capacity
  - Lifting belt

WARNING: Risk of injury through falling collectors.
- Secure the collectors against falling during handling and installation.
- After completing installation, check that the installation set and collectors are securely positioned.

IMPORTANT INFORMATION ON HANDLING SOLAR HOSES AND HOSE CLIPS

CAUTION: Risk of injury through tightened locking ring prior to installation.
- Tighten the locking ring only after the hose clip has been placed over the solar hose.

NOTICE: Leaks at the collector connections.

Subsequent loosening of the hose clip can impair its tensioning capacity.
- Push the hose clip immediately in front of the bead of the collector connection. Only then should the circlip be tightened.

Prior to installation, we recommend placing the solar hoses without plugs in hot water. This makes the installation easier, especially in cold weather.

Plugs are set into the solar hoses to facilitate the interconnection of collectors.

1. Remove plugs only immediately prior to fitting the solar hose. For this use a SW5 spanner, if required.
2. Push the solar hose with its hose clip onto the collector connection.
3. Tighten the locking ring when the hose clip is located directly in front of the bead.

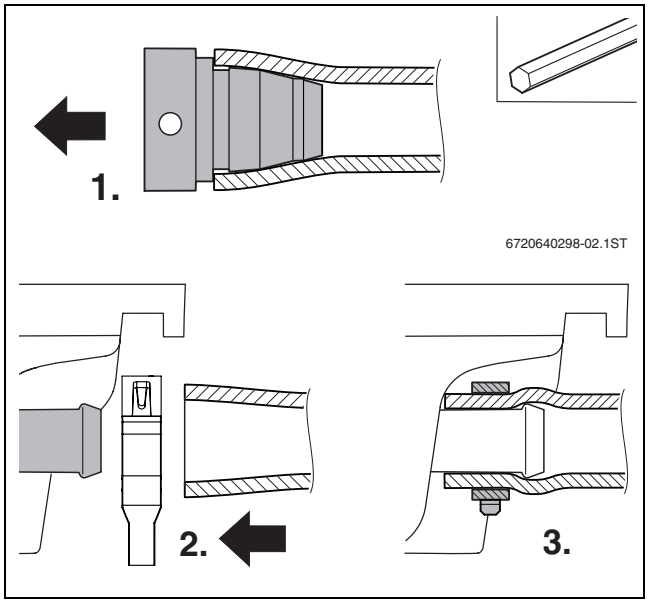

Fig. 31 Installation of the solar hose

7.1 PREPARING THE COLLECTOR INSTALLATION ON THE GROUND

- Observe the information in chapter 5.2, page 18, concerning the collector layout.

The process for the right hand side of the collector array is shown in the following by way of example, with the first collector being installed on the right hand side.

7.1.1 FITTING THE DUMMY PLUG

WARNING: Risk of injury through unsecured dummy plugs.

- Ensure that all dummy plugs are secured with a spring clip.

- Push solar hose [2] with prefitted dummy plug onto the available collector connections.
- Tighten the circlip when hose clip [1] is located directly in front of the bead.

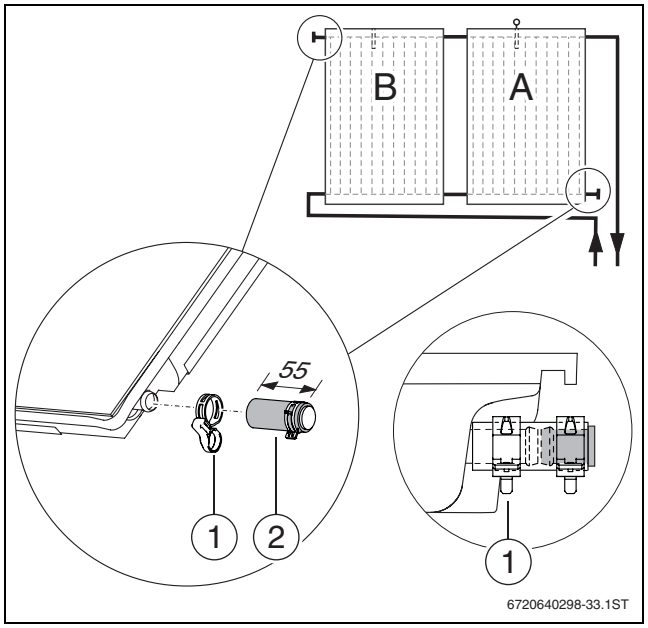

Fig. 32

7.1.2 INSERTING SEALING TAPE IN COLLECTOR FRAME

- Clean the collector edge [3].
- Remove protective film from the sealing tape.
- Apply sealing tape [2] with adhesive side in the collector edge on the outer left hand and right hand sides [1] of the collector array.

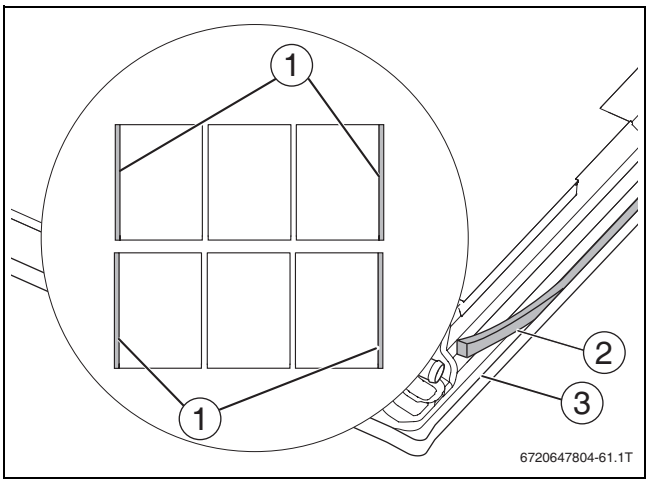

Fig. 33

7.1.3 FITTING THE INTERCONNECTION SET

- Remove the interconnection set from the protective corners.

1. Only remove one plug with an SW5 Allen Key.
2. Push solar hose [2] with hose clips onto the collector connection.
3. Tighten the circlip when hose clip [1] is located directly in front of the bead.

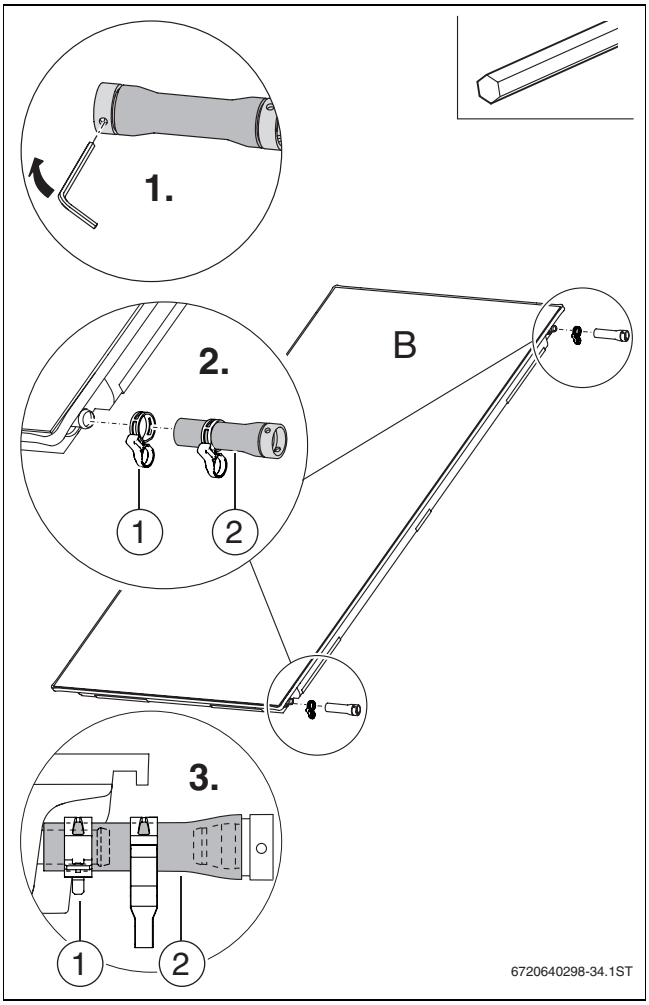

Fig. 34 Interconnection set on the second and all further collectors

7.2 COLLECTOR INSTALLATION

CAUTION: Building damage through leaking roof.

- Take care when fitting the flashing panels to prevent leaks in the collector array.

CAUTION: Risk of injury through panels with sharp edges

- Always wear suitable protective equipment when fitting the panels.

7.2.1 LAYOUT OF THE LOWER FLASHING PANELS

The number and length of the lower flashing panels differ subject to collector version and layout. Shown below are schematic representations of the arrangement of the lower flashing panels. The panels with grey background are components supplied as part of the extension set.

PORTRAIT COLLECTOR LAYOUT

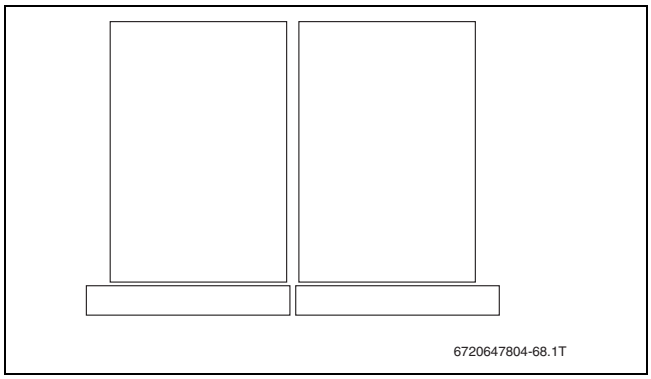

Fig. 35 Layout for 2 collectors

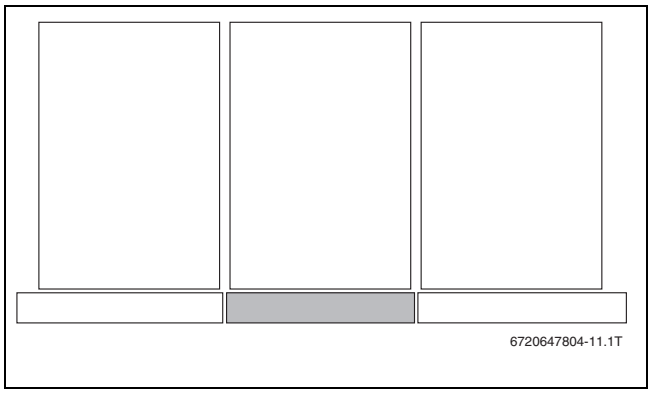

Fig. 36 Layout for >2 collectors

LANDSCAPE COLLECTOR LAYOUT

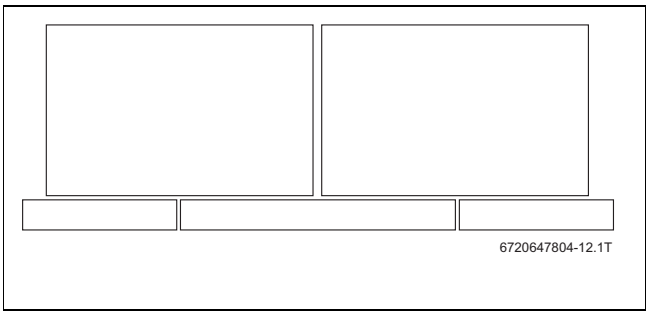

Fig. 37 Layout for 2 collectors

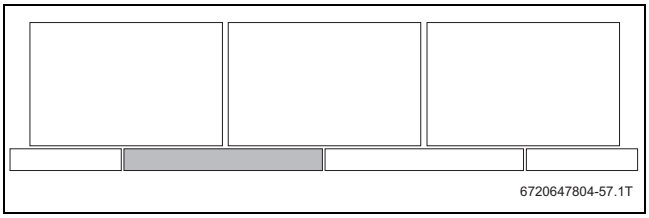

Fig. 38 Layout for >2 collectors

LAYOUT FOR SINGLE COLLECTORS

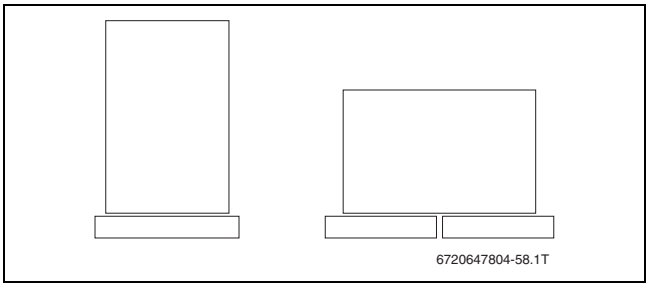

Fig. 39 Layout for single collectors (left: portrait; right: landscape)

7.2.2 MARKING OUT INSTALLATION DIMENSIONS

PORTRAIT COLLECTORS (2 OR MORE COLLECTORS)

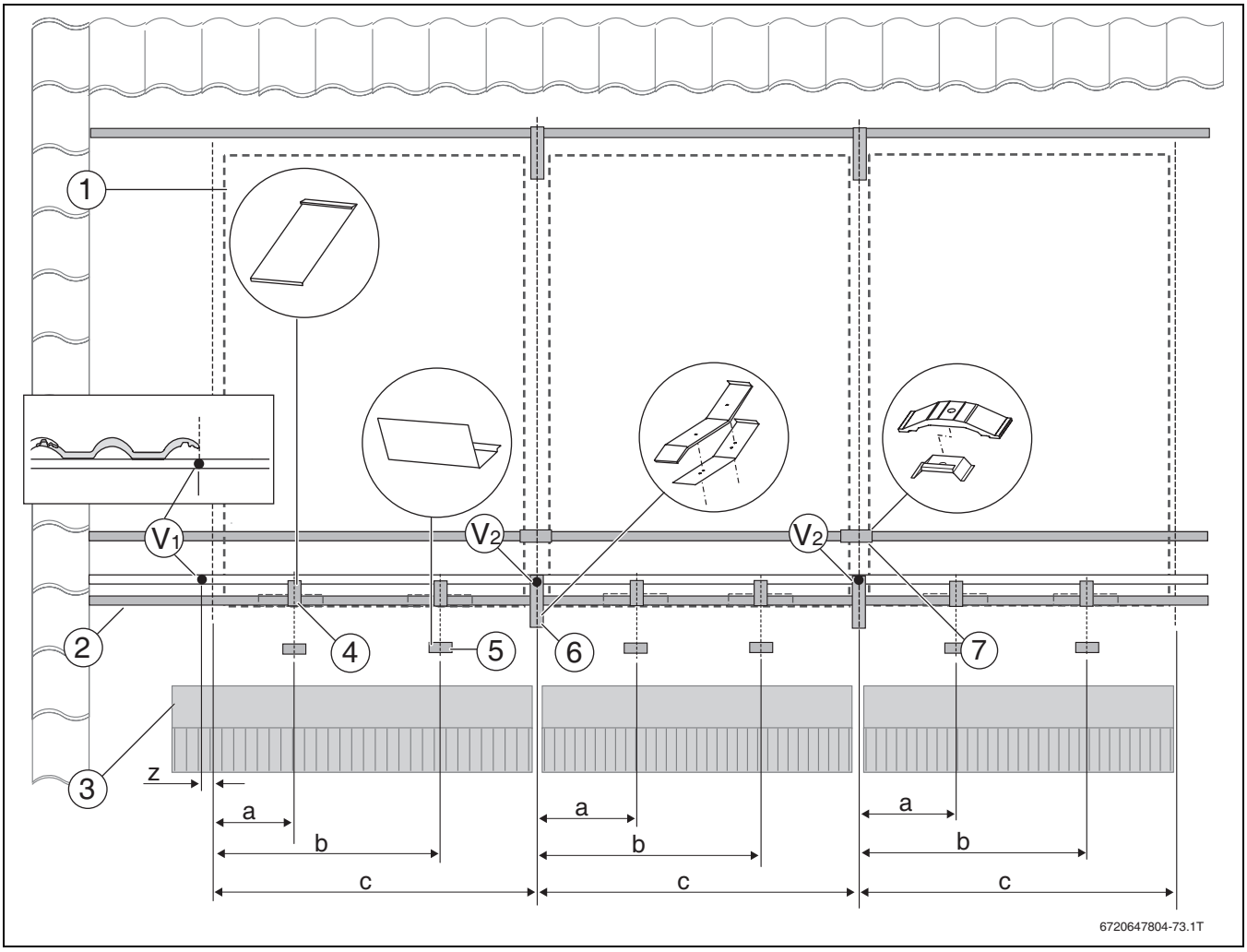

Fig. 40 Installation dimensions for portrait collectors

1 Collector
2 Additional batten
3 Lower flashing panel, with lead flashing
4 Retainer
5 Anti-slip bracket
6 Lower joiner
7 Double-sided clamp
V1 Reference point to dimension X (→ Fig. 24, page 21)
V2 Reference point: centre between two collectors

Installation dimensions for portrait collectors [mm]			
	Retainer		**Joiner, double-sided clamps**
Dimension z	**Dimension a**	**Dimension b**	**Dimension c**
90	300	900	1200

Tab. 21 Installation dimensions for portrait collectors

LANDSCAPE COLLECTORS

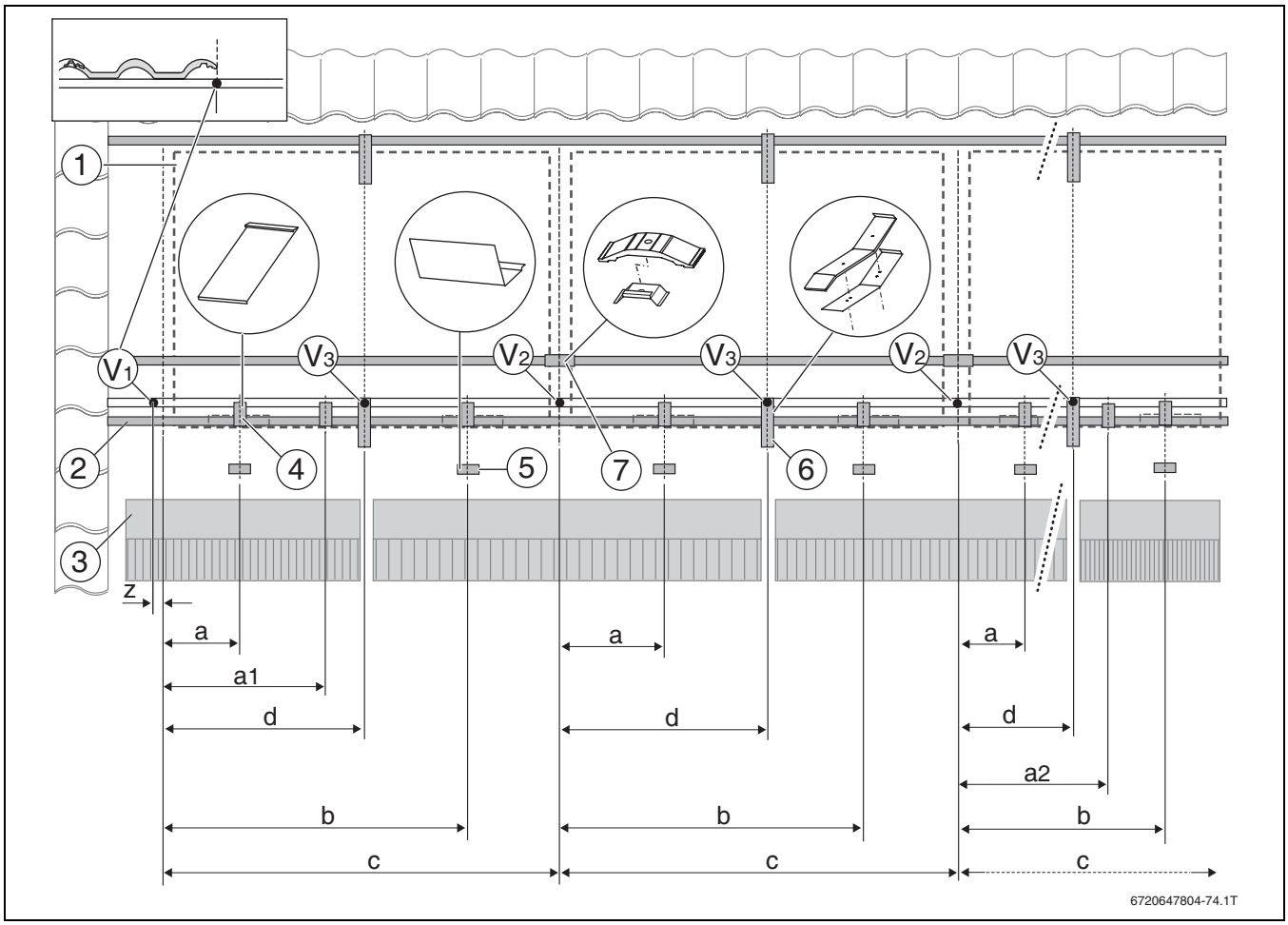

Fig. 41 Installation dimensions for landscape collectors

1 Collector
2 Additional batten
3 Lower flashing panel, with lead flashing
4 Retainer
5 Anti-slip bracket
6 Lower joiner
7 Double-sided clamp
V1 Reference point to dimension X (→ Fig. 24, page 21)
V2 Reference point: centre between two collectors
V3 Reference point: collector centre, joiner position

Installation dimensions for landscape collectors [mm]						
	Retainer				**Centre between collectors, double-sided clamps**	**Joiner**
Dimension z	**Dimension a**	**Dimension a1**	**Dimension a2**	**Dimension b**	**Dimension c**	**Dimension d**
90	300	900	1150	1750	2042	1021

Tab. 22 Installation dimensions for landscape collectors

SINGLE COLLECTORS (PORTRAIT AND LANDSCAPE)

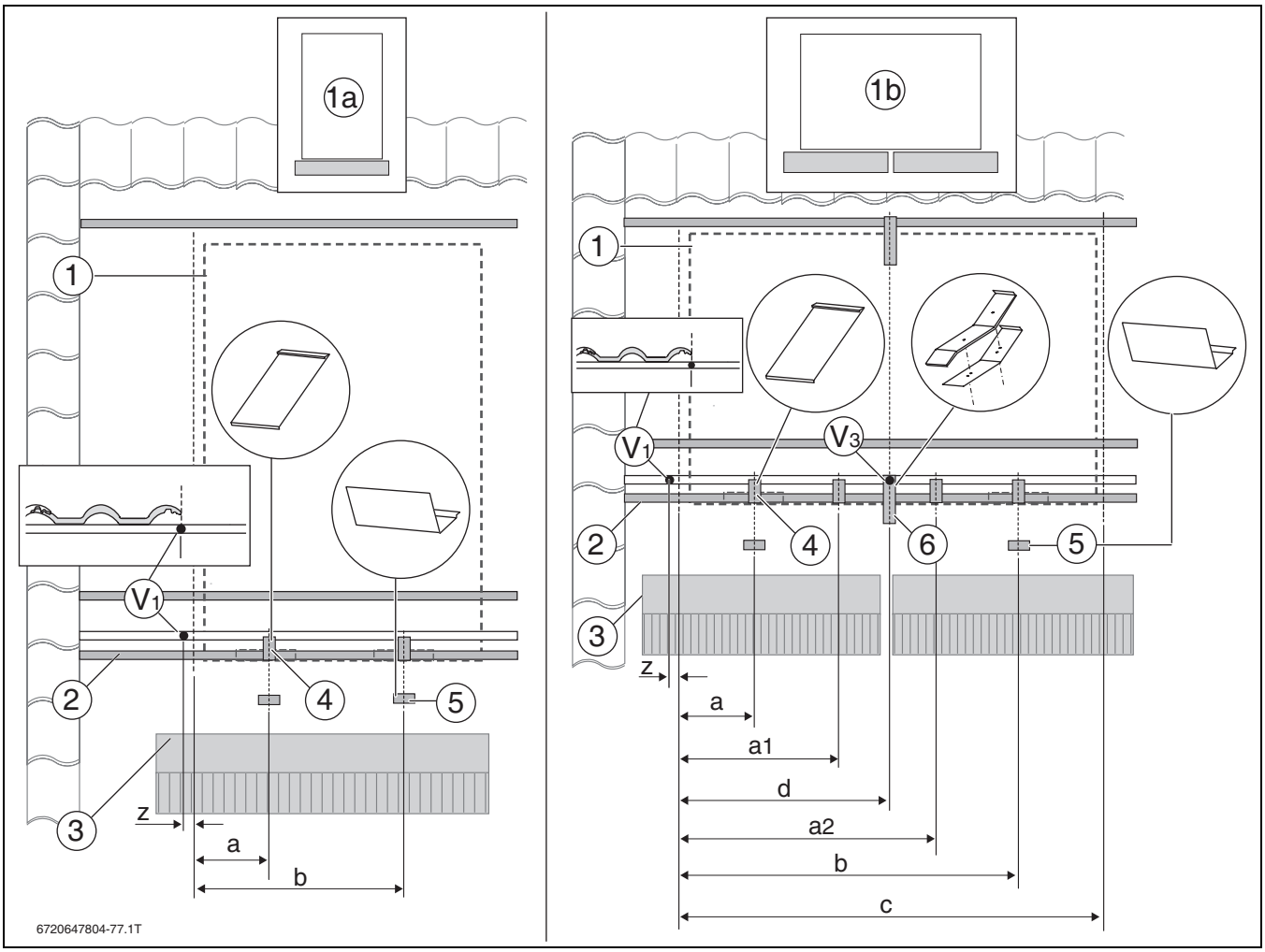

Fig. 42 Installation dimensions for single collectors

1 Collector;
1a: portrait collector;
1b: landscape collector
2 Additional batten
3 Lower flashing panel, with lead flashing
4 Retainer
5 Anti-slip bracket
6 Lower joiner
7 Double-sided clamp
V1 Reference point to dimension X (→ Fig. 24, page 21)
V3 Reference point: collector centre, joiner position

Installation dimensions for single collectors [mm]						
	Retainer					**Joiner**
Dimension z	**Dimension a**	**Dimension a1**	**Dimension a2**	**Dimension b**	**Dimension c**	**Dimension d**
Portrait single collector						
90	300	-	-	900	1200	-
Landscape single collector						
90	300	900	1150	1750	2024	1021

Tab. 23 Installation dimensions for single collectors

MARKING OUT INSTALLATION DIMENSIONS

For boarded roofs, the installation dimensions are marked on the existing boards.

- Starting from reference point [V1], mark dimension z on the bottom batten.
- Starting from mark dimension z, mark up the installation dimensions for the first collector on the bottom batten and mark the reference points.
  - **Portrait collectors** dimensions a, b, c (→ Fig. 40 and table 21, page 31)
  - **Landscape collectors** dimensions a, a1, b, c, d (→ Fig. 41 and table 22, page 32)
  - **Single collectors** dimensions a, b (→ Fig. 42 and table 23, page 33)
  - **Single collectors, landscape** dimensions a, a1, a2, b, c, d (→ Fig. 42 and table 23, page 33)
- Transfer reference point(s) [V..] precisely at an angle of 90° onto the next additional batten [1].
  - **Portrait collectors:** reference point V2
  - **Landscape collectors** reference points V2 and V3

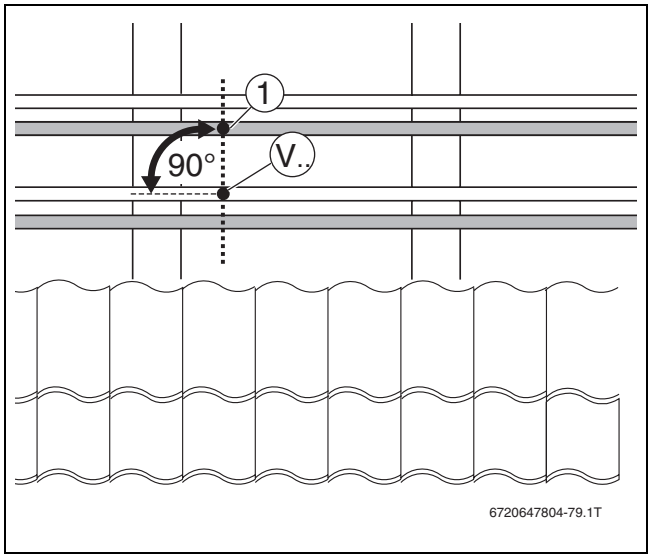

Fig. 43 Transferring reference points

7.2.3 FITTING THE LOWER FLASHING PANELS

FITTING RETAINERS

- Slide retainers [1] centrally into the marked installation positions [2] with their lower edge flush against the bottom edge of the batten for retainers [3] and secure with one 5x30 screw each.

The installation of the bottom joiner is not required when fitting a single portrait collector.

- To remove the joiner, undo the top section from the bottom section.
- Place the bottom section of joiner [4] in its precise installation position [5] on the batten and secure with a 5x30 screw.
  - For this, ensure that the bend in joiner [6] lies precisely on the bottom edge of the batten.

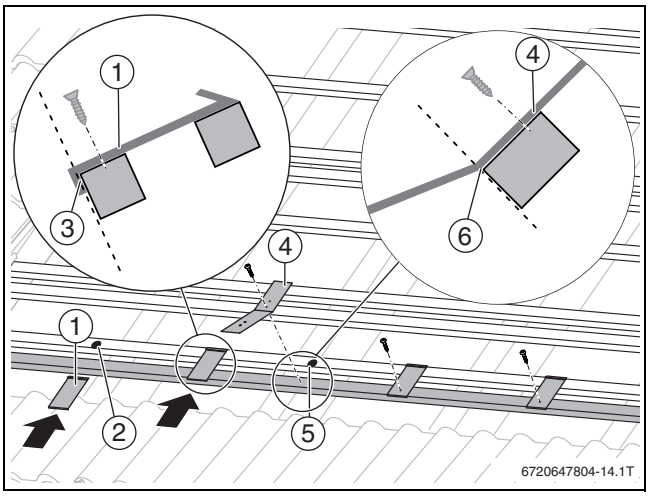

Fig. 44

1 Retainer
2 Installation position of the retainer
3 Bottom edge of the batten
4 Bottom section of the bottom joiner
5 Installation position of the bottom joiner
6 Bottom edge of the batten

- Secure the position of the joiner with a 5x120 screw [1] to the batten [2] on which the roof tiles rests.
  - If the screw is too short, fit a short batten to secure the bottom section.

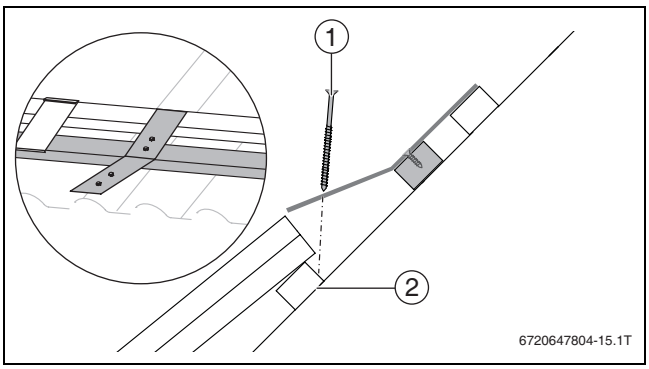

Fig. 45

FITTING THE LOWER FLASHING PANELS

When using the slate cover there is no lead flashing on the lower flashing panels.

The installation of only 1 lower flashing panel is required with a a single portrait collector.

NOTICE: Scratches on the flashing panels and lead flashing.

- Ensure that the substrate is clean when bending the lead flashing.

- Bend the lead flashing of all flashing panels forwards.

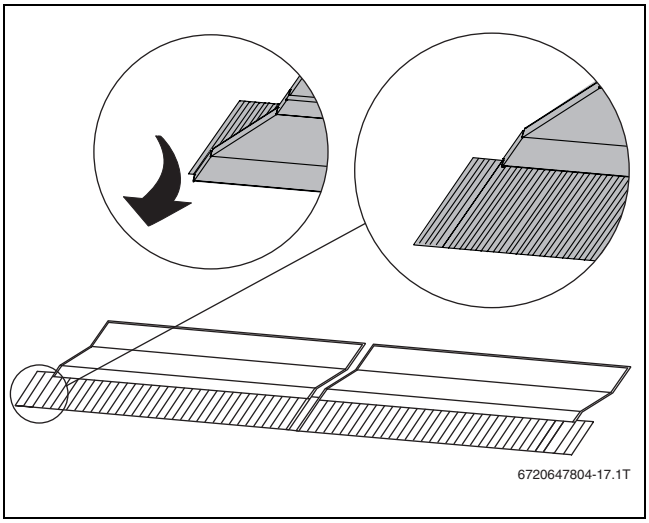

Fig. 46

- Push the **right hand** lower flashing panel [1.] into the retainer.
  A click can be heard when locking the panel into place.
- Push the **left hand** lower flashing panel [2] into the retainer and far enough over the bottom section of the joiner [3] that the drilled holes in the bottom section remain visible (clearance between panels: approx. 10 mm).
  A click can be heard when locking the panel into place.

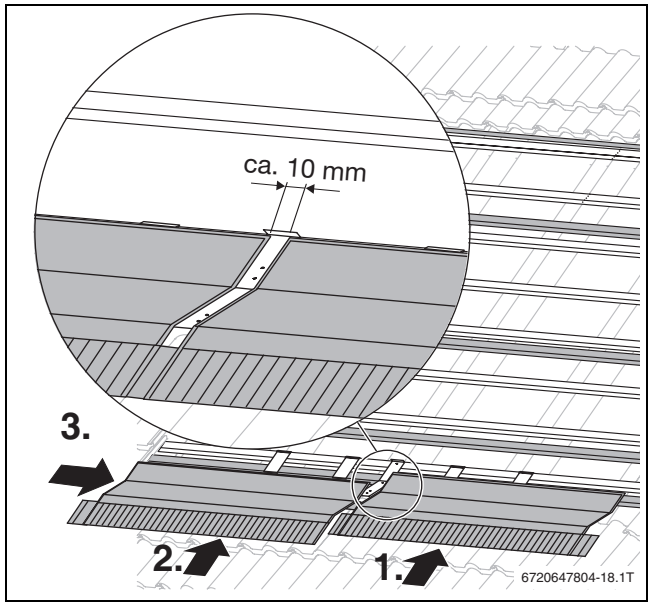

Fig. 47

- Pull protective foil off the anti-slip bracket [1].
- Affix the anti-slip bracket on the lower flashing panel so that the anti-slip protectors are flush with the retainers [2] and lie correctly in the bend of the flashing panel [3].

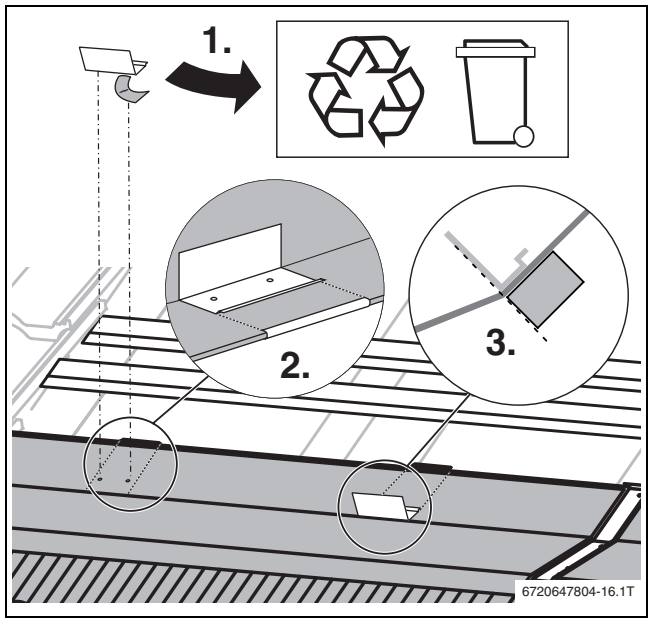

Fig. 48

- Secure lower flashing panels on the batten through the drilled holes in the anti-slip brackets using two 5x30 screws.

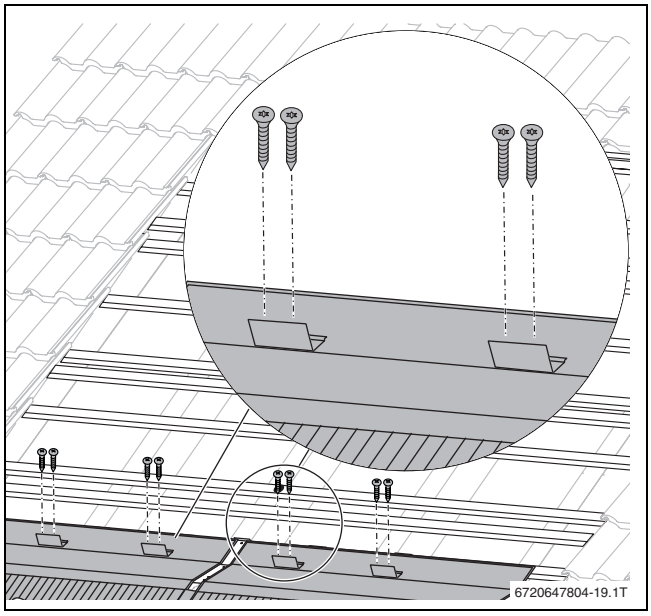

Fig. 49

- Hook the top section of the joiner into the lower edge of the flashing panels [1] and push down [2].
- Secure the top section of the joiner with 2 sealing washers and screws on the bottom section [3]. Do not overtighten the screws. If using a rechargeable screwdriver, set a low speed for tightening the screws.

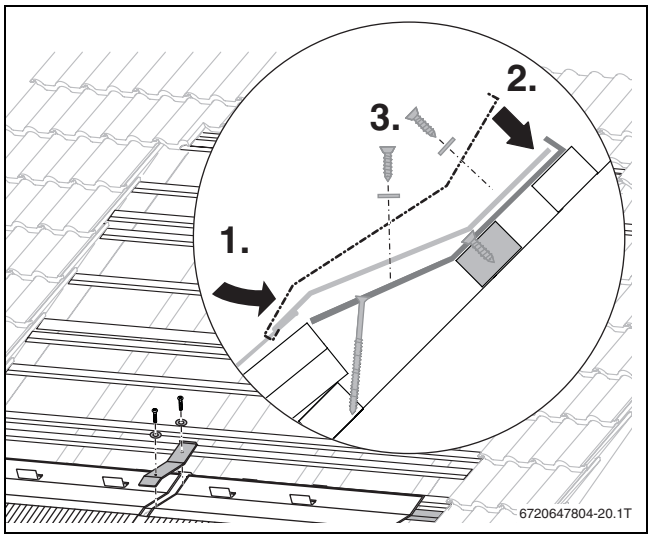

Fig. 50

7.2.4 FITTING THE LEFT HAND COLLECTOR

The double-sided clamps are initially only tightened lightly to enable the edges to grip the installation mounts during the collector installation.

For single collectors, use a single-sided clamp.

- Push the spacer and double-sided clamp [1] together.
- Secure the clamp with one 60x70 screw at the centre marking on batten [2] (which may have been fitted additionally). At this stage, tighten the screws only lightly.

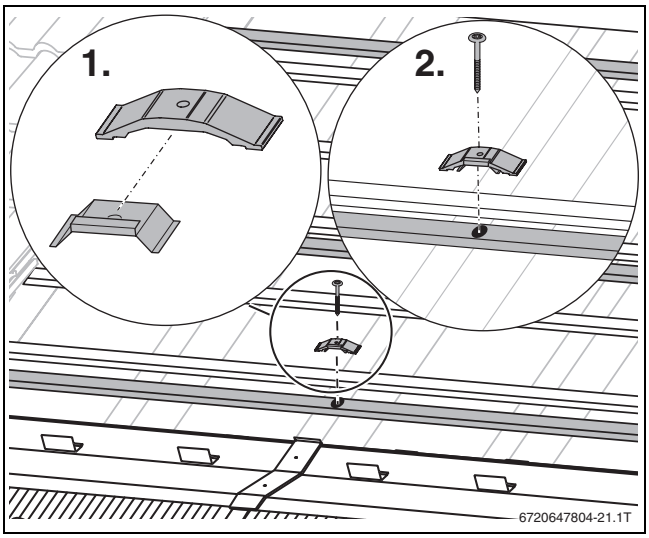

Fig. 51

- Turn the collector so that the sensor pocket for the collector sensor is located at the **top** of the collector.

NOTICE: Collector damage if the collector slips off the roof on account of the anti-slip brackets not gripping the installation mounts of the collector.

- Ensure that the anti-slip brackets grip the installation mounts.

- Position the left hand collector and let it slide with the lower installation mounts into the anti-slip brackets.

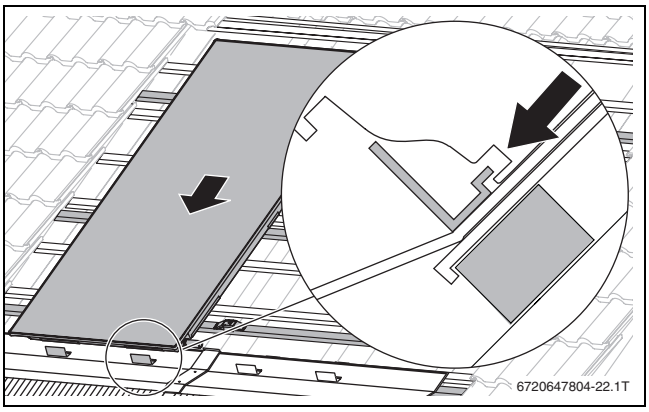

Fig. 52

- Push the collector to the right [1] until the clamp grips into the lateral installation mount and sits flush [2]. Carefully check the collector position and orientation.
- Pull the plug from the solar hose and push the second hose clip [3] onto the upper and lower solar hose on the left hand collector.

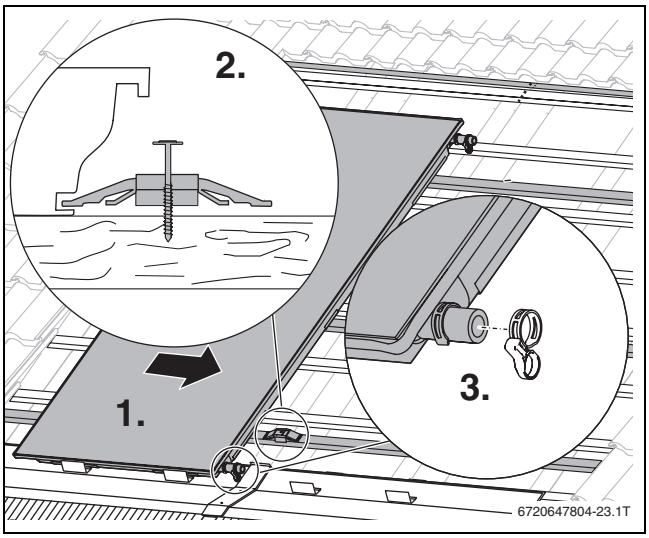

Fig. 53

For single collectors, use a single-sided clamp.

- **Single collector, portrait**: fit 2 additional single-sided clamps.
- **Single collector, landscape**: fit 1 additional single-sided clamp.

- Fit further double-sided clamps with 6x70 screws on the battens [1] and position so that the clamps grip into the lateral installation mounts and sit flush. At this stage, tighten the screws only lightly [2].
  - **Portrait layout:** 2 further clamps
  - **Landscape layout:** 1 additional clamp

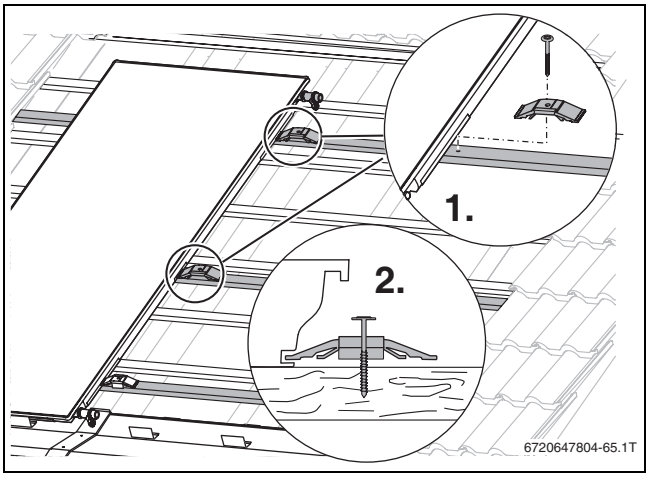

Fig. 54

- On the left hand side of the collector, insert the single-sided clamps into the lateral installation mounts of the collector and secure with 6x70 screws on the battens (which may have been fitted additionally).
  - **Portrait layout:** 3 single-sided clamps
  - **Landscape layout:** 2 single-sided clamps
  - **Single collector, portrait**: 3 single-sided clamps
  - **Single collector, landscape**: 2 single-sided clamps

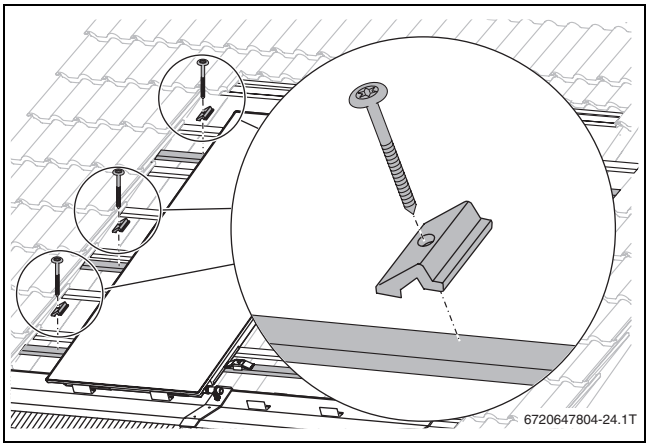

Fig. 55

7.2.5 FITTING FURTHER COLLECTORS

This step is not required when installing a single portrait collector.

- **Portrait layout:** With a plumb line, transfer the installation position of the double-sided clamps [1] onto the additional batten [2] for the top joiners. Mark out the installation position of the top joiner [3].

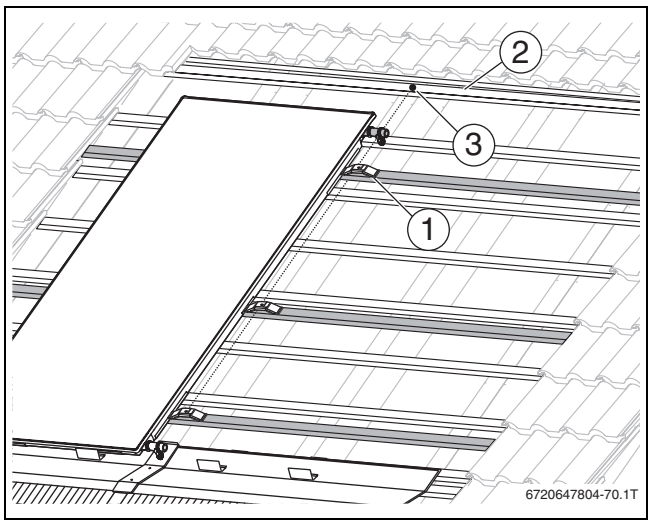

Fig. 56 Installation position of the top joiner for portrait collectors

- **Landscape layout:** With a plumb line, transfer the installation position of the double-sided clamps [1] onto the additional batten [2] for the top joiners.
  - Mark value d (→ Fig. 41 and table 22, page 32) and mark the installation position for the top joiners [3].

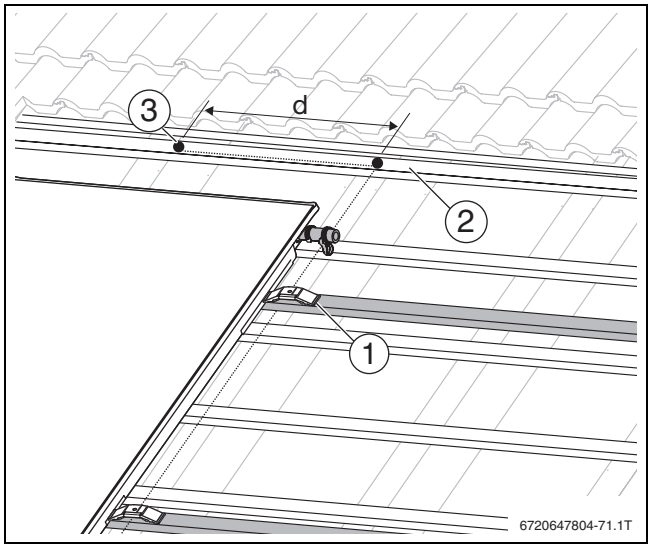

Fig. 57 Installation position of the top joiner for landscape collectors

- Mark up the installation dimensions for the additional collectors on the bottom batten and mark the reference points.
  - Portrait collectors: dimensions a, b, c (→ Fig. 40 and table 21, page 31)
  - Landscape collectors: dimensions a, b, c, d (→ Fig. 41 and table 22, page 32)

An additional retainer is required for the last landscape collector (→ Fig. 41 and table 22, page 32).

- For the last collector in the array, mark dimension a2.

- Position the right hand collector and let it slide with the lower installation mounts into the anti-slip brackets.

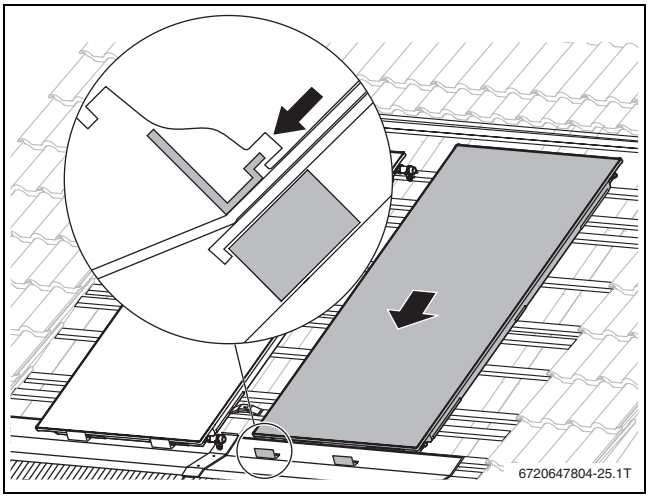

Fig. 58

- Push the collector to the left until the clamp grips the lateral installation mounts and sits flush.
- For this ensure that the connections are pushed onto the pre-assembled solar hoses on the left hand collector and the hydraulic interconnection is made.

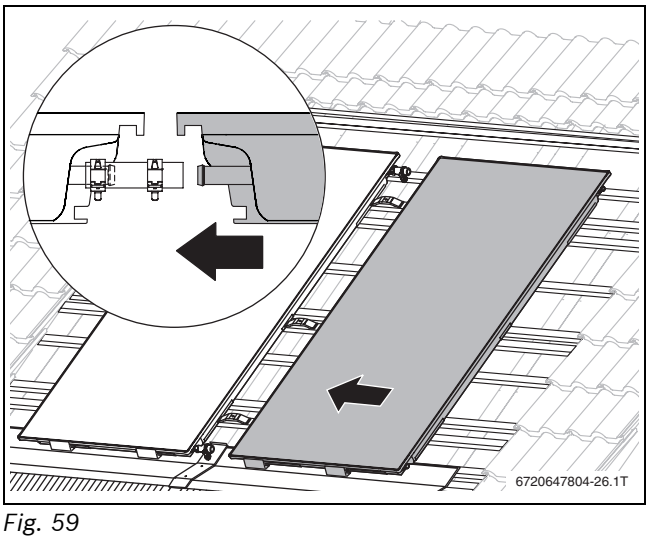

Fig. 59

CAUTION: Risk of injury and leaks through escaping solar heat transfer medium as a result of unsecured solar hoses.

- Secure every solar hose to the collector connection using a hose clip.

- Tighten the circlip when the hose clip is located directly in front of the bead.

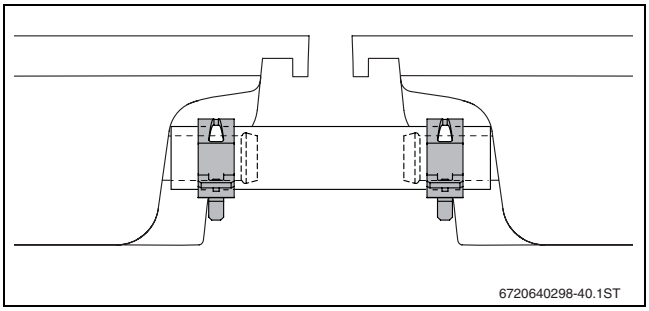

Fig. 60

- Tighten the clamp screws.

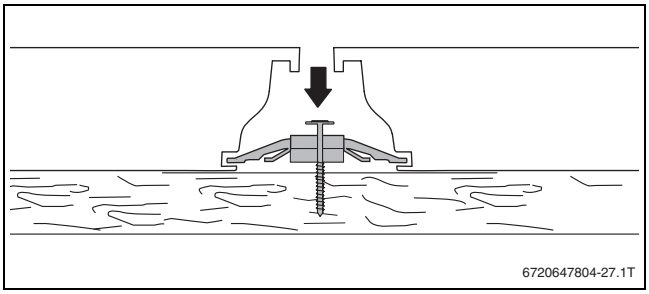

Fig. 61

- **In arrays with >2 collectors:** Fit further double-sided clamps with 6x70 screws [1] and position so that the clamps grip into the lateral installation mounts and sit flush. At this stage, tighten the screws only lightly [2].

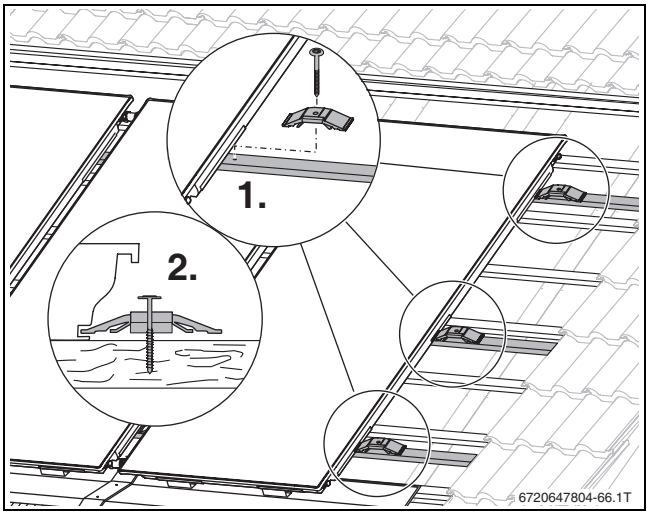

Fig. 62

- To fit further collectors, repeat installation steps for each collector as described in → chapter 7.2.5.

7.2.6 FINALISING THE COLLECTOR INSTALLATION

- **On the last collector in the array:** On the right hand side of the collector, insert the single-sided clamps into the lateral installation mounts of the collector and secure with 6x70 screws on the batten.

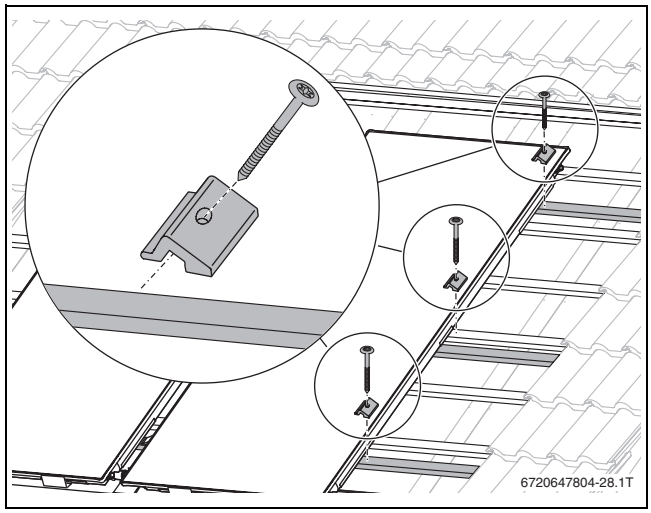

Fig. 63

7.2.7 FITTING THE LATERAL SUPPORT PANELS

The support panel can be adapted if support panels and pipework collide.

- Align the lateral support panels on the outer left hand and right hand sides of the collectors roughly centrally, push against the single-sided clamps and secure with two 5x30 screws.

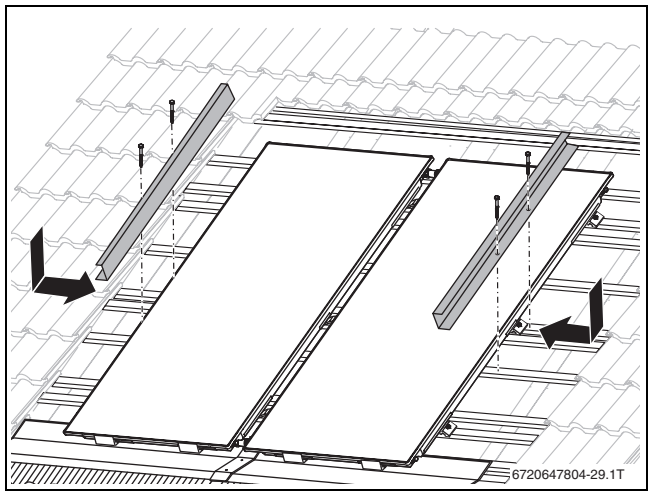

Fig. 64

7.2.8 INSTALLING THE COLLECTOR TEMPERATURE SENSOR

The collector sensor is included separately with the roof kit if the system is ordered as a roof kit / plumb kit combination. It is included with the solar controller in all other cases.

NOTICE: System failure through faulty sensor lead.

- Protect the sensor lead against possible damage, e.g. from rodents or birds.

- Fit the collector sensor with connected flow into the collector with the flow outlet (→ Fig. 65).

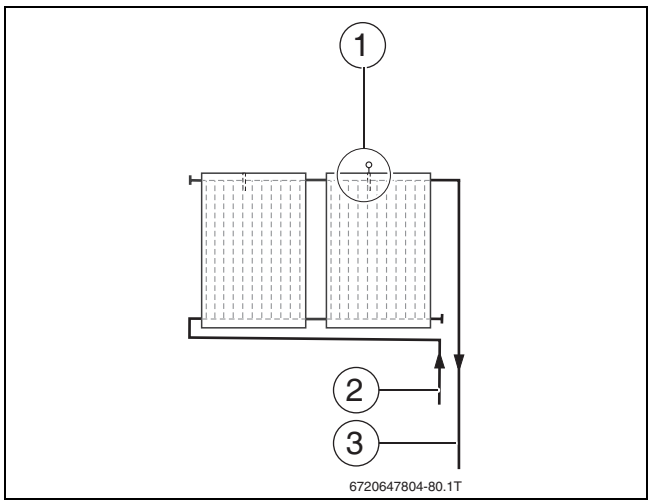

Fig. 65 Position of the collector sensor

1 Collector sensor position for single row arrays
2 Return
3 Flow

- With a collector sensor, puncture the sensor pockets of the sensor pockets and insert the sensor as far as it will go (equal to 165 mm).

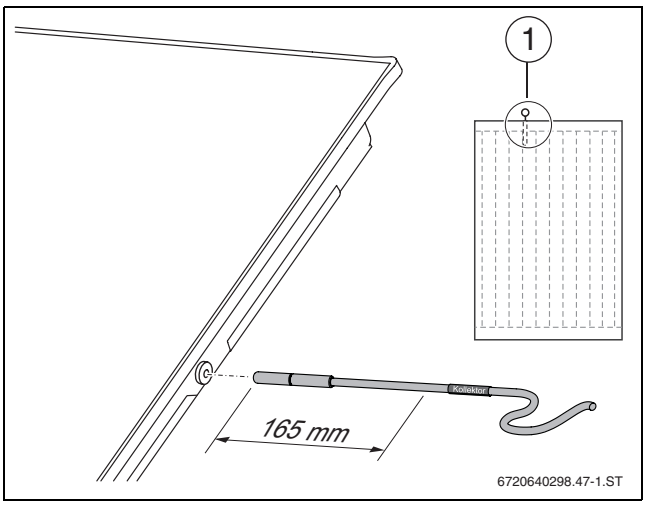

Fig. 66

1 Position of the sensor pocket for the collector sensor

If the sensor pocket is punctured incorrectly, seal that sensor pocket with a plug from the connection set.

7.2.9 CONNECTING THE PIPEWORK

- Make the hydraulic connections (→ chapter 9, page 47).

NOTICE: System damage through corrosion.

Corrosion may occur if residual water is allowed to stand for prolonged periods in the solar thermal system following flushing or a tightness test.

- Immediately following a tightness test, commission the solar thermal system (→ solar pump station instructions) with solar heat transfer fluid.

- Check the installation.

If you are venting the solar thermal system with an automatic air vent valve (accessory) on the roof, close the ball valve after the venting process (→ solar pump station instructions).

CHECKS

1.	Anti-slip brackets fitted?	❍
2.	Collector clamps fitted and screws tightened?	❍
3.	Solar hoses secured with hose clips (locking ring tightened)?	❍
4.	Collector sensor fully inserted into the sensor pocket and secured?	❍
5.	Tightness test carried out and all connections checked for leaks (see solar pump station instructions)?	❍

Tab. 24

After completing the checks, fit the flashing panels.

7.2.10 FITTING THE LATERAL FLASHING PANELS

The lateral flashing panel comprises two parts that are pushed into each other for installation. The parts for the left hand and right hand sides of the collector array are marked with "R" (right hand) and "L" (left hand). The top section can be recognised by its cut-out rebate.

- **Portrait layout:** push the split lateral flashing panel together.

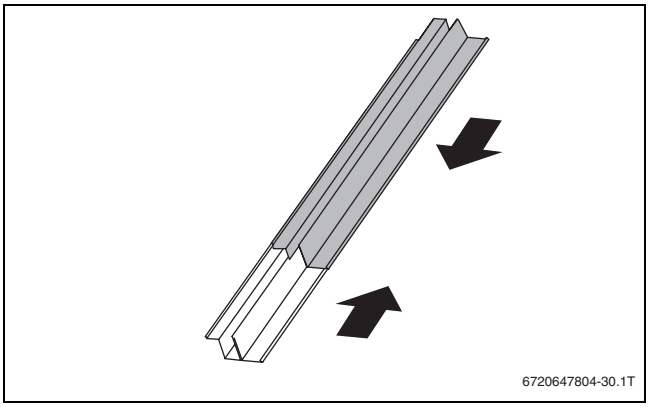

Fig. 67

- Place the lateral flashing panel at an angle, insert it between the collector edge and the top edge of the support panel and fold down.

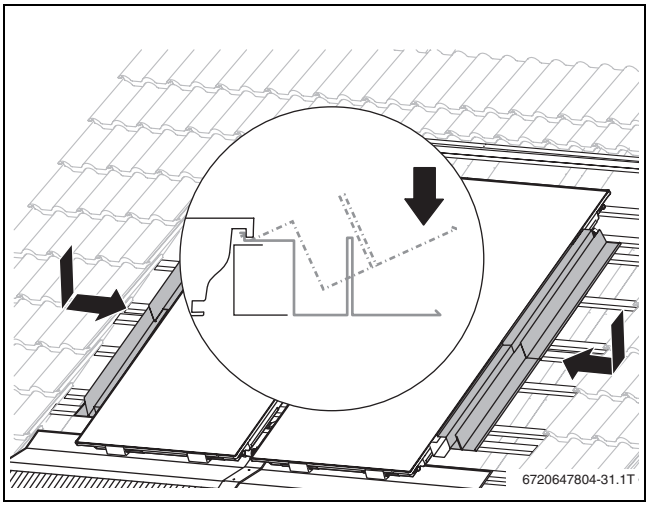

Fig. 68

- **Portrait layout:** pull both parts of the flashing panel far enough apart that they make contact with the top and bottom of the collector frame.

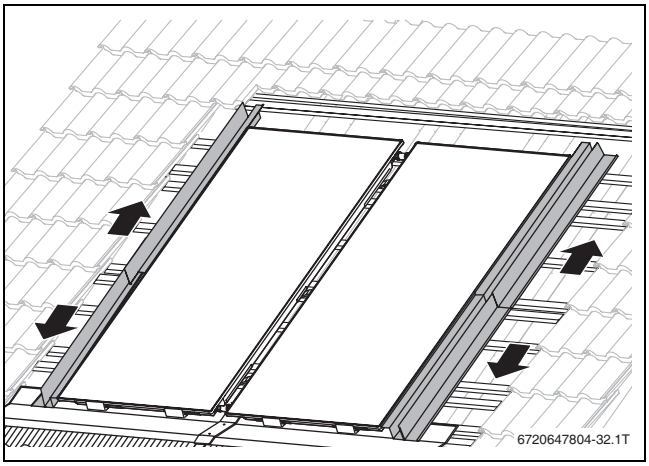

Fig. 69

- Secure the flashing panels with 3 mounting brackets.

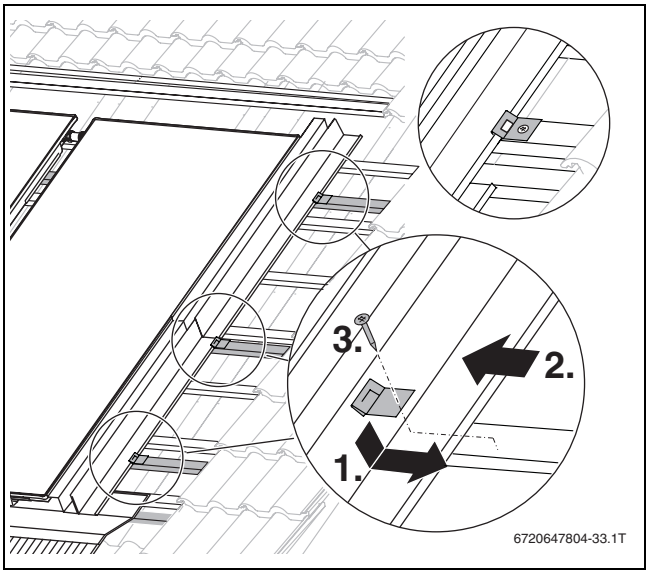

Fig. 70

7.2.11 SECURING FASCIAS

When installing a single portrait collector, the fascia comprises a single part.

- Push the fascia parts into each other.

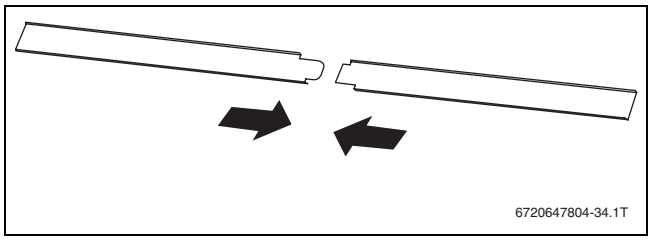

Fig. 71

- Place the left hand fascia at an angle and with its top edge, push it underneath the collector edge and push home [1].
- Fit the right hand fascia in the same way [2]; to do this, insert it into the left hand fascia part.
- Align the fascia parts [3].
- Secure the fascia with 5x13 self-tapping screws to the indented points of the anti-slip brackets [4].

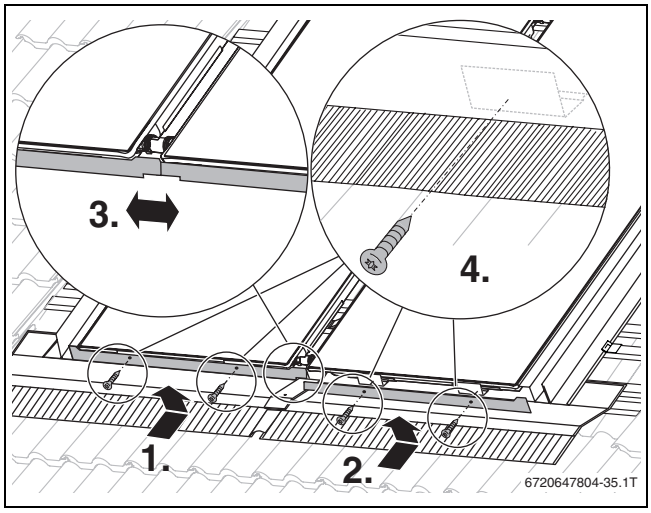

Fig. 72

7.2.12 FITTING THE CENTRAL COVER STRIP

This step is not required when installing a **single collector**.

- Bring all locking bolts of the cover strip into a portrait position.
- Hook the cover strip into the lower edge of the collectors [1], push home and align centrally.
- Tighten the screws [2], starting from the bottom, until the locking bolts bite and push the cover strip against the collectors. For this, do not overtighten the screws to ensure that the cover strip is not distorted.

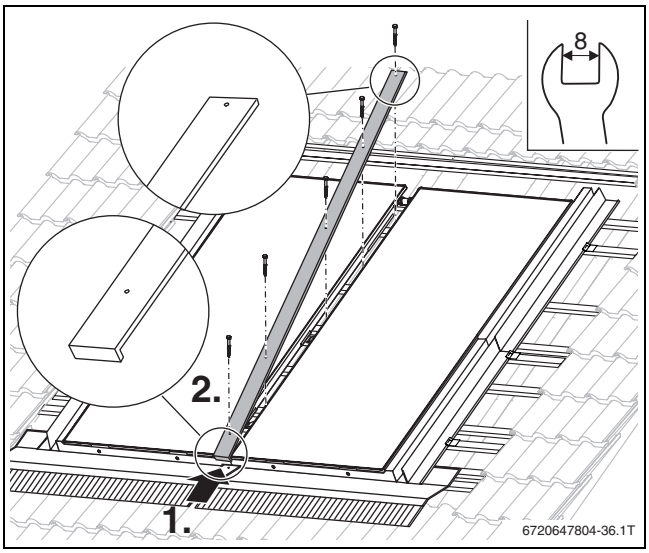

Fig. 73

7.2.13 FITTING THE UPPER FLASHING PANELS

The installation of only 1 upper flashing panel is required when fitting a **single portrait collector**.

- Position the bottom section of the joiner accurately at the marked position on the batten. Push it as far as it will go underneath the collector frame and secure on the additional batten with a 5x30 screw.

The mounting position on the upper collector frame is different for portrait and landscape collectors.

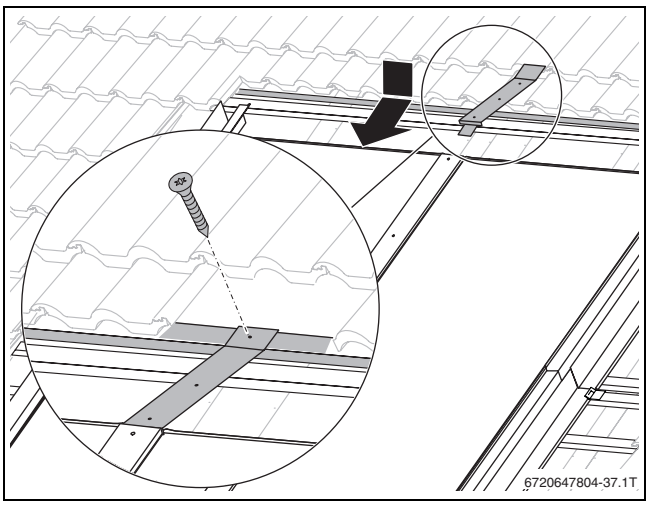

Fig. 74 For portrait collectors

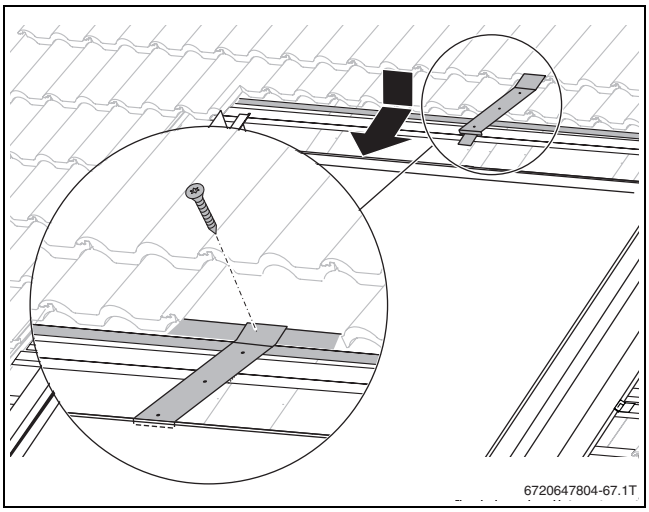

Fig. 75 For landscape collectors

- Let the right hand upper flashing panel click into the collector frame [1]; to do this, apply pressure from the top [2].
  Clicking into place is indicated by a sound.
- Ensure that the sealing lip rests on the glass surface.

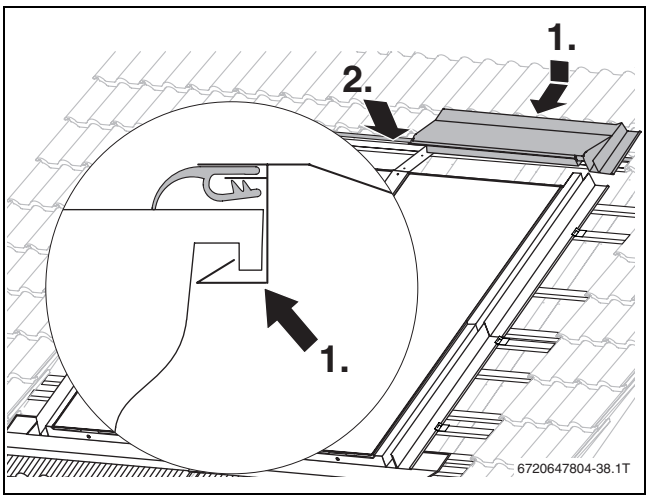

Fig. 76

- Place the left hand upper flashing panel next to the right hand upper flashing panel [1] and let it click into the collector frame by applying pressure from the top [2]. Ensure that the sealing lip rests on the glass surface.

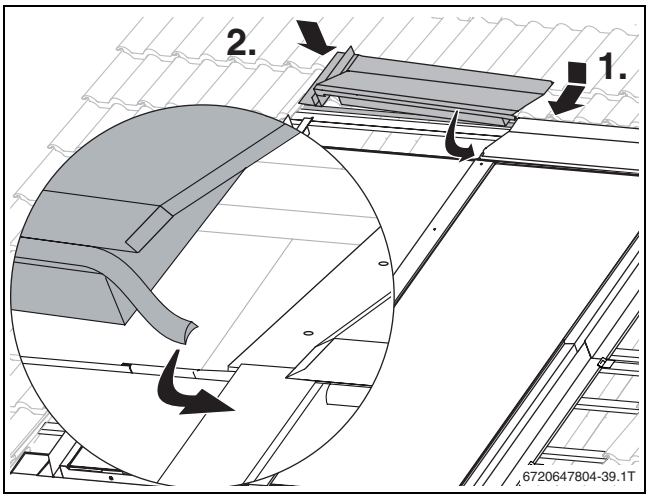

Fig. 77

- Align the upper flashing panel so that the drilled holes in the bottom section of the joiner are still visible and the flashing panels make contact with the outside edges of the collector.

- Trim the sealing lips [1] to size and thread below the flashing panel [2]. For this ensure that the sealing lips make contact with each other.

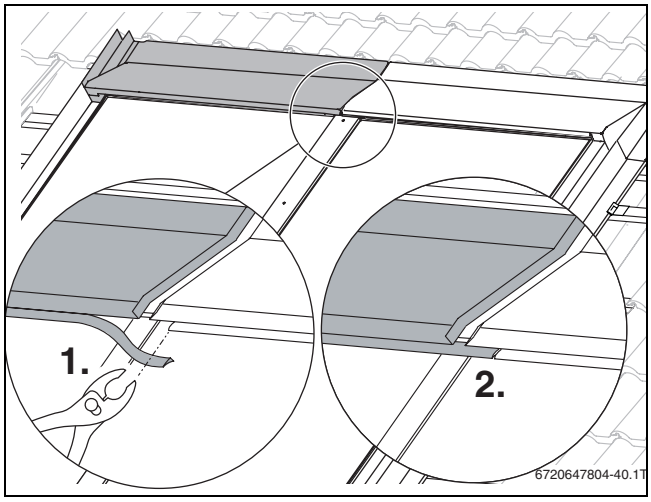

Fig. 78

- Secure the upper flashing panels with mounting brackets.

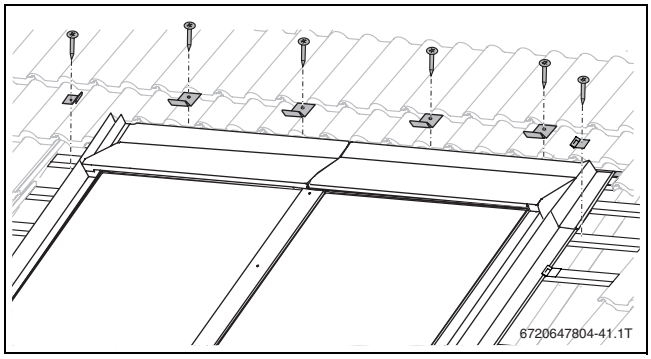

Fig. 79

- Let the bottom edge of the top section of the joiner (with the rebate) click into place between the sealing lip and the panel edge of the upper flashing panel [1] and press home [2].
- Secure the top section of the joiner with sealing washers [3].

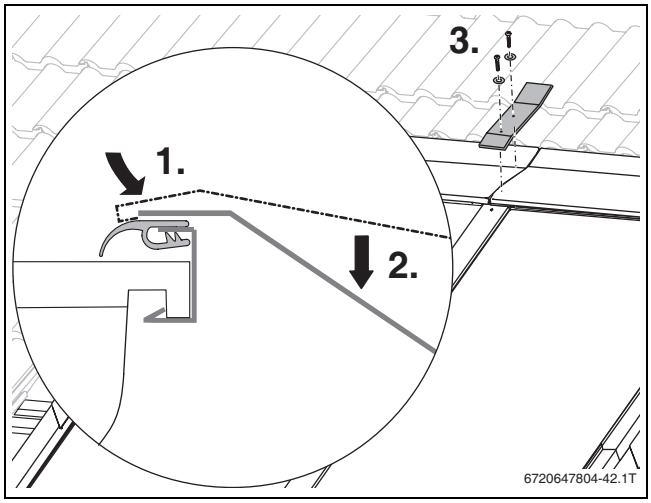

Fig. 80

7.2.14 FITTING THE TRIANGULAR SEALING TAPE

The triangular sealing tape is only used with pan tiles/raised tiles.

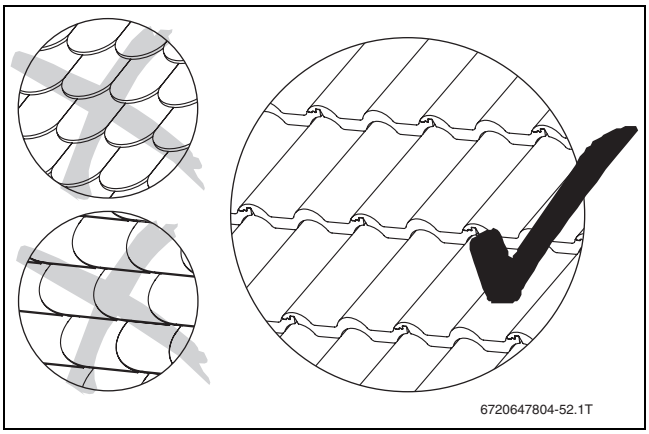

Fig. 81

- Trim the triangular sealing tape to the size of the collectors and insert into the external edges [1] of the lateral flashing panels.

When covering the roof with raised tiles, the triangular sealing tape may also be inserted into the top edge [2].

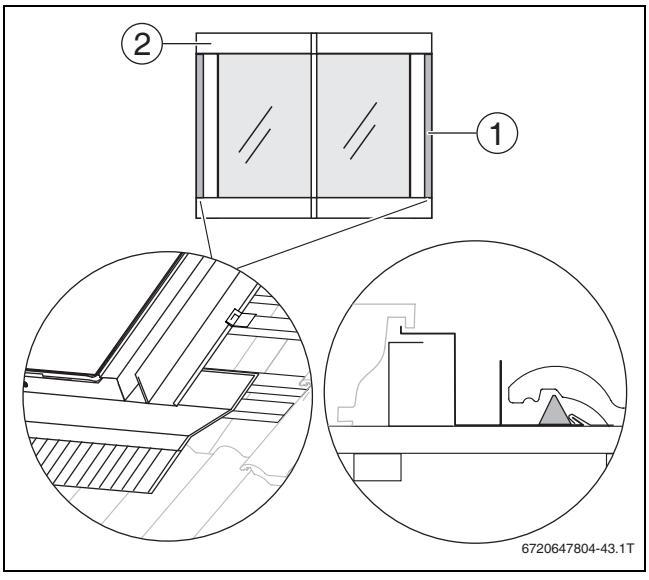

Fig. 82

- Make a cut into the triangular sealing tape after each tile.

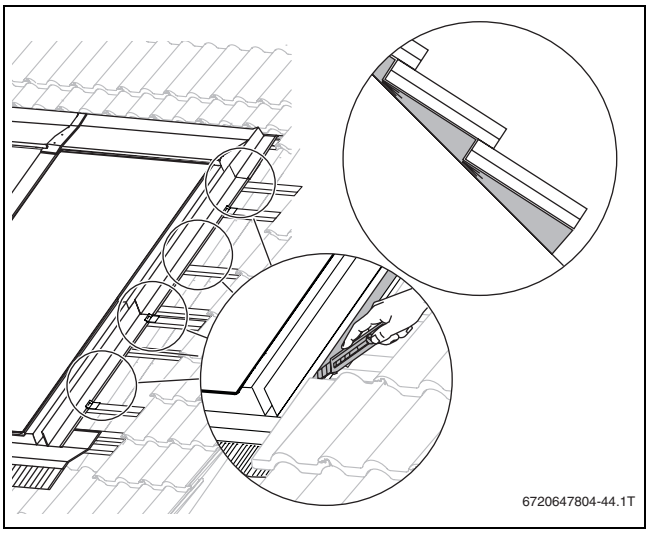

Fig. 83

7.2.15 MATCHING THE LEAD FLASHING TO THE FLASHING PANELS

- Observe the application information when fitting.
- If required, heat up the lower flashing panel with a suitable appliance.

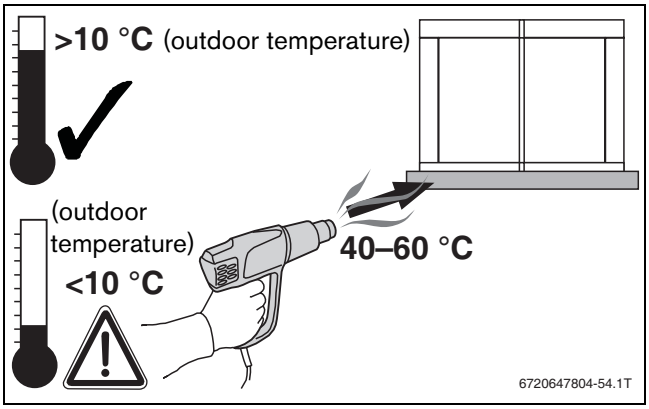

Fig. 84 Heating up the lead flashing at low outdoor temperatures

FOR ROOF COVER WITH RAISED TILES/PAN TILES

For raised tile/pan tile cover the lower flashing panels are already fitted with adhesive tape.

- Remove protective foil from the adhesive surface of the sealing tape [1].
- Carefully press the front part of the lead flashing with your hands so it matches the tile shapes [2].
  This presses the flashing panel with the sealing tape against the roof tiles.

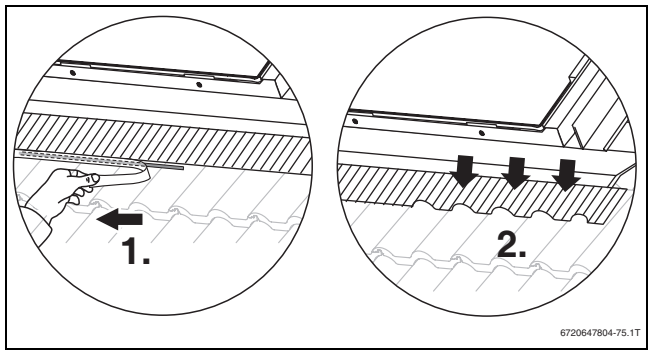

Fig. 85

FOR ROOFS WITH SLATES

- Trim the adhesive strip for the lower flashing panel to size; if necessary cut into individual pieces, so that at least 50 cm adhesive strip is provided for each flashing panel.
- Lift the lower edge of the flashing panel slightly [1], remove protective foil from the adhesive strip [2] and affix to the flashing panel.
- Push the flashing panel back down [3].
  This affixes the panel with the sealing tape to the slate cover.

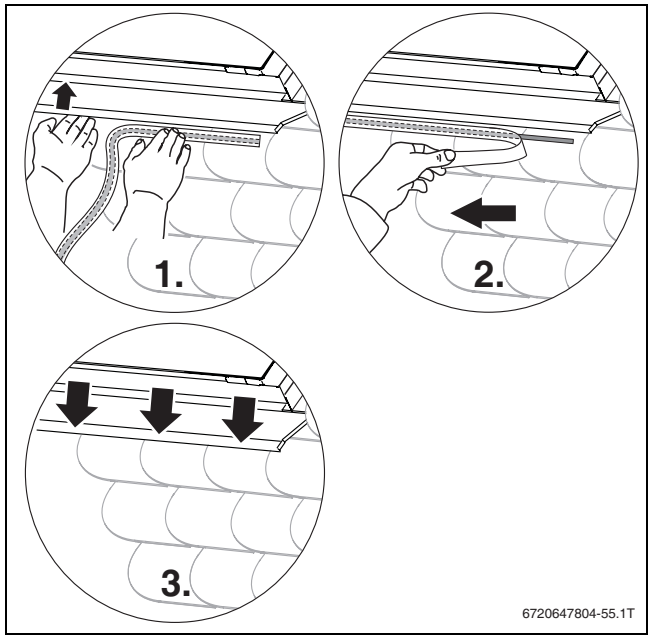

Fig. 86

8 COVERING THE ROOF

Fixing the trimmed roof tiles

- If required, secure the trimmed ends of the pan tiles with suitable clips obtained from trade outlets.

CAUTION: Building damage through leaks in the roof.

- Ensure that the roof tiles have sufficient overlap with the flashing panels.

8.1 TOP ROOF TILES

If the roof has slate cover, the slates can be placed directly on the flashing panel. The roof tile support is not required.

DETERMINE THE TRIM PATTERN OF THE TOP TILES AND THE POSITION OF THE ROOF TILE SUPPORT

- Place the roof tile support on the flashing panel, but do not secure yet.
- Place the whole roof tile on the top of the flashing panel and the roof tile support.
- Determine the trim pattern so that the following conditions are met:
  - The roof tile covers the flashing panel as far as possible but does not make contact with the flashing panel.
  - The trimmed roof tile is at the same angle as those outside the collector array that are not trimmed.
- If required move the roof tile support [1] in order to correct the angle.
  This ensures that the roof tile lies fully inside the tile valley.

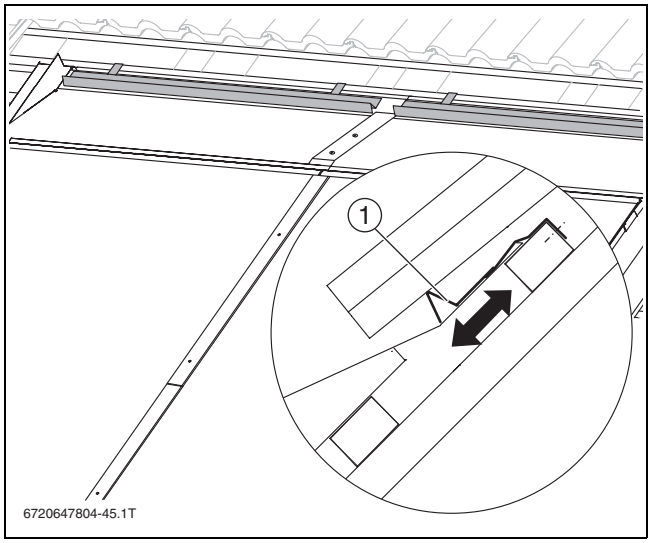

Fig. 87

- Trim the top roof tile in accordance with the marked trim pattern.

AFFIXING THE ROOF TILE SUPPORT AND POSITIONING THE TOP ROOF TILES

- Position the roof tile support in accordance with the determined position and secure to the batten.

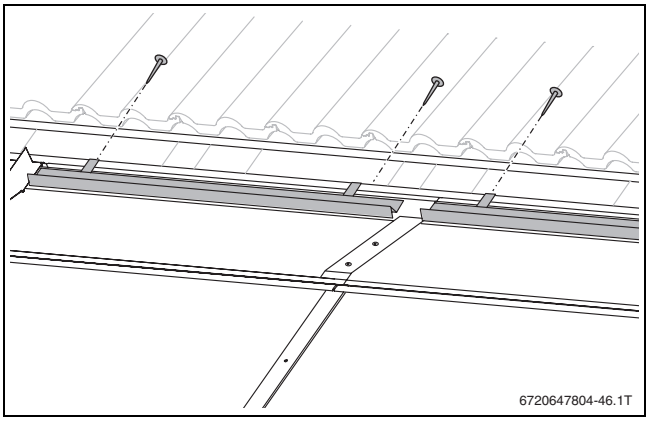

Fig. 88

- Place the trimmed roof tiles on top.

8.2 LATERAL ROOF TILES

Trimming roof tiles

- Cut roof tiles only in their valley. For this ensure that at least half of each tile remains.

- Trim roof tile according to dimension X (→ chapter 6.1, page 21) and place in position.

9 HYDRAULIC CONNECTION

The solar pump station instructions include information on the routing of pipework to the collector.

NOTICE: Collector damage through leaks.
The direct connection of rigid pipework to the collector is not permissible.

- Make the hydraulic connection of the collector to the pipework with flexible solar hoses.

NOTICE: Leaks at the collector connections.
Subsequent loosening of the hose clip can impair its tensioning capacity.

- Push the hose clip immediately in front of the bead of the collector connection. Only then should the locking ring be tightened.

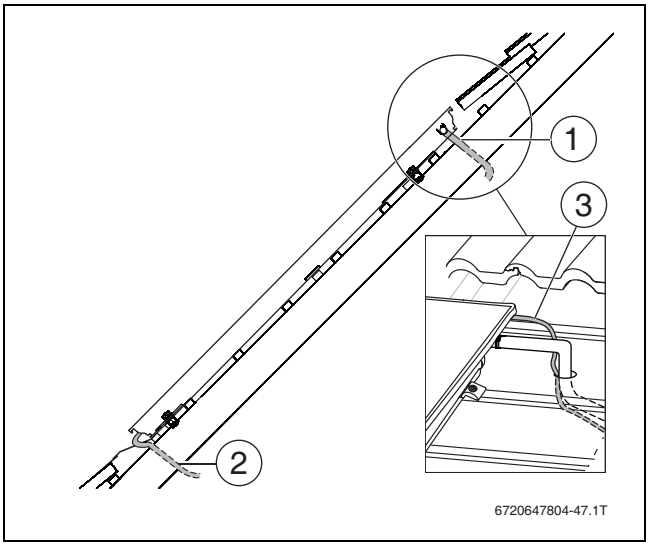

Fig. 89

1 Solar hose (flow)
2 Solar hose (return)
3 Sensor lead

9.1 CONNECTING THE SOLAR HOSE

The flow and return pipes are connected to the collector in the same way as described in the following.

- Remove protective caps from the collector connections.
- Push union nut [1] over the collector connection.
- Place washer [2] behind the bead on the collector connection and press together.

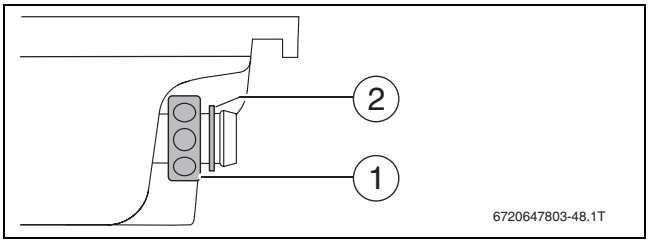

Fig. 90

- Offer angled nozzle [3] with O-ring to the collector connection and secure with union nut [1].
- Push solar hose [5] with hose clip [4] onto the angled nozzle.
- Tighten the locking ring of the hose clip when the hose clip is located directly in front of the angled nozzle bead.
- At the opposite end of the solar hose, push hose nozzle [6] together with the hose clip as far as possible into the solar hose.
- Tighten the locking ring when the hose clip is located directly in front of the hose nozzle bead.
- Route the fitted solar hose together with the sensor lead through the roof.
- Push pipe [7] into the 15 mm locking ring fitting of the hose nozzle and tighten the fitting.
- Fit the solar hose for the return in the same way.

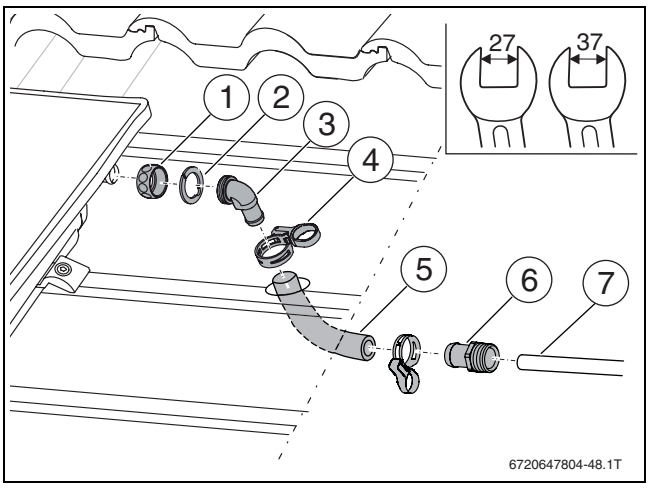

Fig. 91

1 Union nut
2 Clamping washer
3 Angled nozzle
4 Hose clip
5 Solar hose
6 Hose nozzle with locking ring
7 Pipework (on site)

9.2 CONNECTING THE SOLAR HOSE WITH AIR VENT VALVE

To ensure the correct functionality of automatic air vent [1], take the following into account:

- Route flow [2] with a rise towards the air vent at the highest point of the system.
- Route the return with a rise towards the collector array.
- For every change of direction downwards and renewed rise, fit an additional air vent.
- If there is a requirement for fitting of an air vent ensure it is fitted inside the roof space.

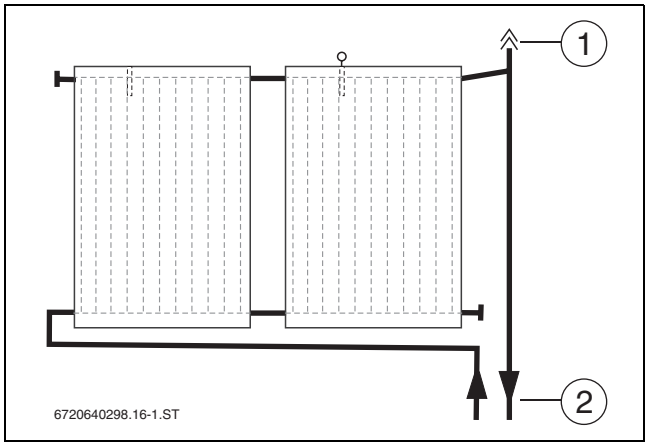

Fig. 92

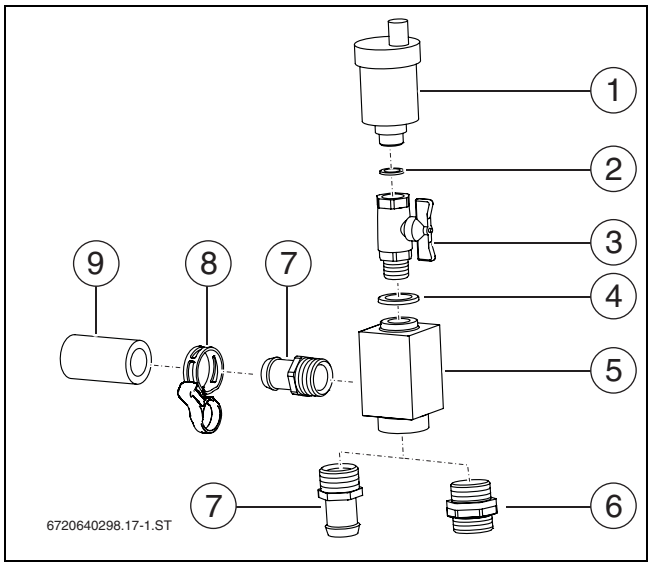

Fig. 93 Standard delivery, air vent valve set

1 Automatic air vent with locking screw (1x)
2 Gasket 9 x 15 mm (1x)
3 Ball valve (1x)
4 Gasket 17 x 24 mm (1x)
5 Air separator (1x)
6 Twin nipple G¾ with O-ring (1x)
7 Hose nozzle (2x) (only 1 required)
8 Hose clip (2x)
9 Solar hose 55 mm (1x)

9.2.1 FITTING THE AIR VENT VALVE UNDER THE ROOF

- Remove protective caps from the collector connections.
- Push union nut [1] over the collector connection.
- Place clamping washer [2] behind the bead on the collector connection and press together.

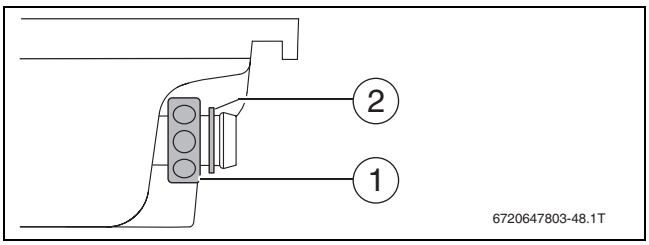

Fig. 94

- Offer angled nozzle [3] with O-ring to the collector connection and secure with union nut [1].
- Push solar hose [5] with hose clip [4] onto the angled nozzle.
- Tighten the circlip of the hose clip when the hose clip is located directly in front of the angled nozzle bead.
- Route the solar hose and sensor lead through the roof.
- Fit the solar hose for the return in the same way.
- Insert the hose nozzle R¾ with O-ring [6] and twin nipple [7] into the air separator. Take the locking ring and union nut from the connection set.
- Push hose nozzle R¾ [6] as far as it will go into the solar hose and secure with a hose clip.
- Push pipe [8] into the 15 mm locking ring fitting and tighten the fitting.

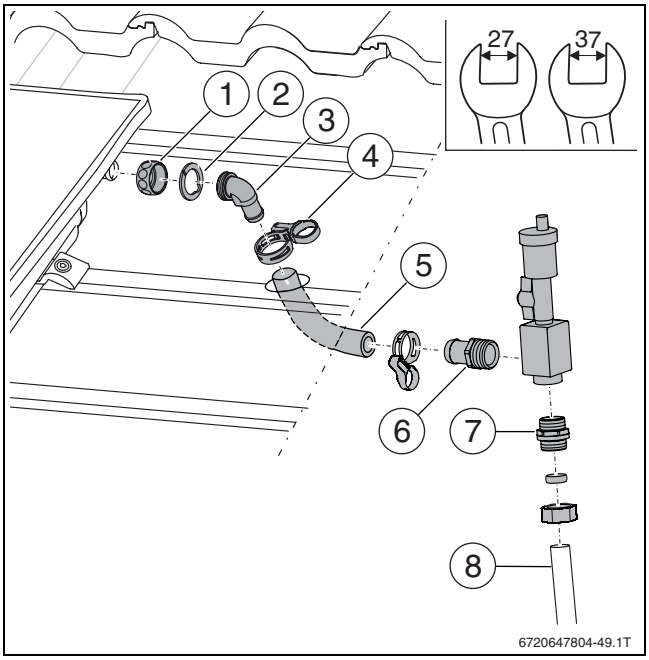

Fig. 95

10 FINAL STEPS

10.1 CHECKING THE INSTALLATION

NOTICE: System damage through corrosion.

Corrosion may result if residual water is allowed to stand for prolonged periods in the solar thermal system following flushing or a tightness test.

- Immediately following a tightness test, commission the solar thermal system (→ solar pump station instructions) with solar heat transfer fluid.

After completing the checks, fit the thermal insulation to complete the work.

Checks:

1.	Are all collector and roof cover joints designed to be protected from snow and rain?	❍

Tab. 25

If you are venting the solar thermal system with an automatic air vent (accessory), close the ball valve after the venting process (→ solar pump station instructions).

Commission the solar thermal system in accordance with the details in the solar pump station installation and maintenance instructions.

10.2 INSULATING THE CONNECTION LINES AND PIPEWORK

- Thermally insulate the pipework in the entire solar circuit in accordance with regulations.
- Thermally insulate the external pipework using material which is resistant to UV light, weather influences and high temperatures (150 °C).
- Insulate internal pipework with high temperature-resistant (150 °C) material.
- Protect the insulation against damage from birds if required.

11 ENVIRONMENTAL PROTECTION AND DISPOSAL

Environmental protection is one of our principal policies.

Quality of products, efficiency and environmental protection are equally important objectives for us. Statutory and other regulations concerning environmental protection are strictly applied. To protect the environment, we use the best possible technology and materials whilst taking into account economical aspects.

REMOVING COLLECTORS

DANGER: Risk to life through falling!

- Whilst working on the roof, take all necessary precautions against a possible fall.
- Always wear personal protective equipment.

- Drain the pipework.
- Remove flashing panels (→ chapter 12.1, page 51).
- Undo single and double-sided clamps between collectors.
- Remove solar hoses.
- Use lifting equipment for handling the collectors (→ chapter 4, page 16).

DISPOSING OF COLLECTORS

At the end of their service life, recycle the collectors using the most environmentally responsible process.

12 MAINTENANCE/INSPECTION

DANGER: Risk to life through falling!
- Whilst working on the roof, take all necessary precautions against a possible fall.
- Always wear personal protective equipment.

The installation and maintenance instructions of the solar pump station include details regarding the maintenance of the entire system. Also observe these details.

We recommend conducting the first service/inspection after about 500 hours of operation, and then every 1-2 years.

Use the table as a copy template so that you will have documentation available even after the third service.

- Check the collector array regularly (inspection). Immediately remedy all faults (maintenance).
- Fill out the report and tick off the tasks performed.

Operator:	System location:

Maintenance and inspection tasks		Page	Maintenance/inspection		
Date:					
1.	Visual inspection of collectors carried out (safe seating, visual impression)?		❍	❍	❍
2.	Collector sensor positioned correctly and inserted into the sensor pocket as far as it will go?	40	❍	❍	❍
3.	Visual inspection of the installation system carried out?		❍	❍	❍
4.	Visual inspection for leaks carried out at the joints between the installation and the roof?	47	❍	❍	❍
5.	Visual inspection of pipework insulation carried out?	49	❍	❍	❍
6.	Visual inspection of glass panes. Cleaning in the case of severe contamination.	51	❍	❍	❍
Notes					
	The collector array has been serviced as specified by these instructions.		❍	❍	❍
			Date, stamp, signature	Date, stamp, signature	Date, stamp, signature

Tab. 26

12.1 REMOVAL OF THE UPPER FLASHING PANELS

- Remove top section of the joiner [2] and cover strip [1].
- Pull off rubber profile from the upper flashing panel [1].

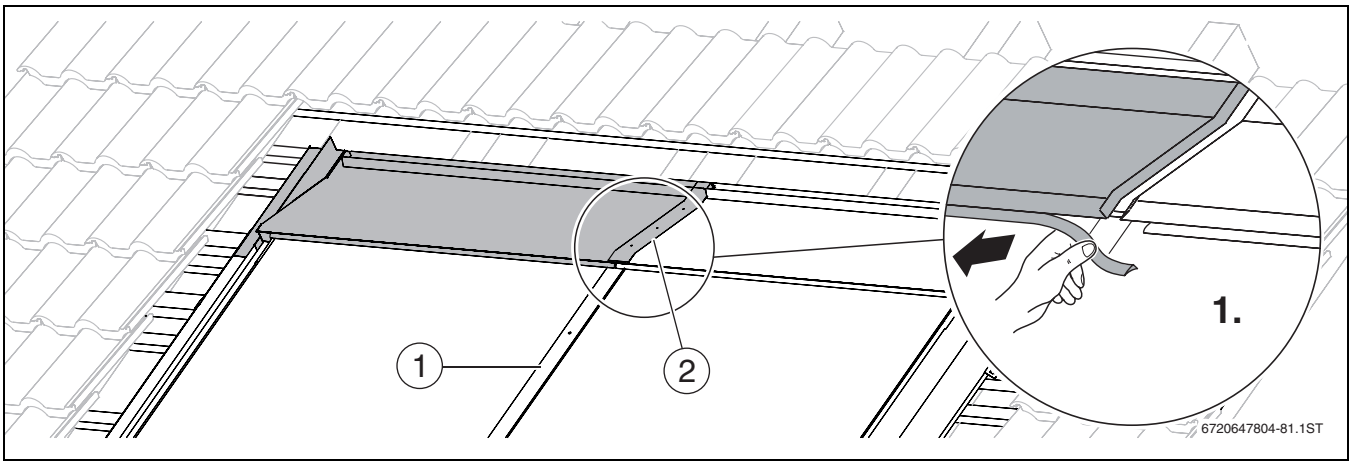

Fig. 96

- Push the upper flashing panel [1] from the top and remove the upper flashing panel towards the back [2].

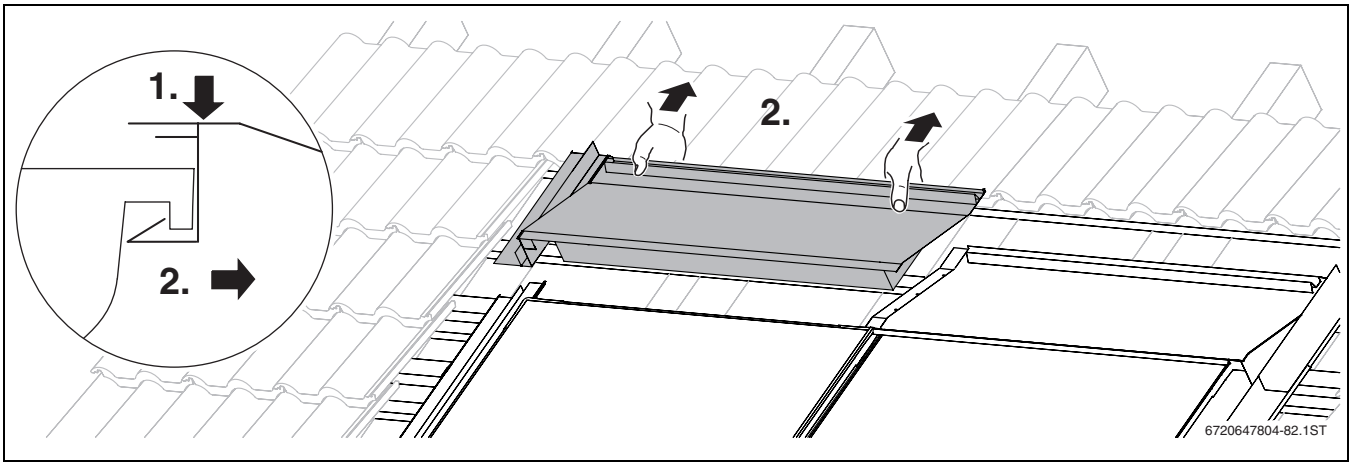

Fig. 97

12.2 CLEANING THE COLLECTORS

CLEANING GLASS PANES

At a roof inclination of 15° and steeper, glass panes are generally self-cleaning.

- In the case of more stubborn contamination, clean with a glass cleaner. Never use acetone.

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Worcester, Bosch Group
Cotswold Way, Warndon, Worcester WR4 9SW.
Tel. 0844 892 9900

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