

INSTALLATION AND MAINTENANCE INSTRUCTIONS

FLAT-PLATE COLLECTOR

SOLAR-LIFESTYLE

FLAT ROOF AND WALL-MOUNTED INSTALLATION

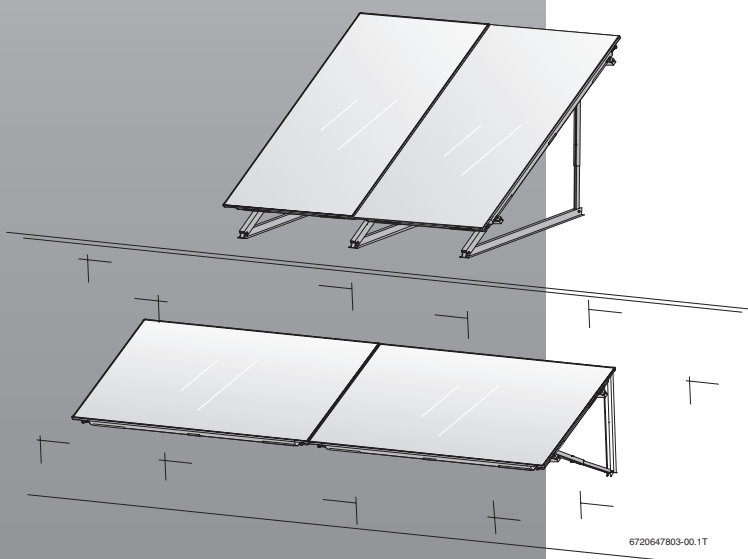


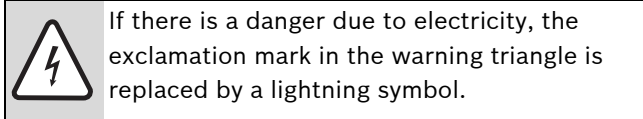
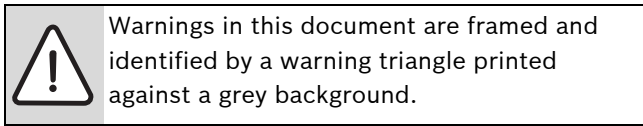
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1 KEY TO SYMBOLS AND SAFETY INSTRUCTIONS

1.1 EXPLANATION OF SYMBOLS

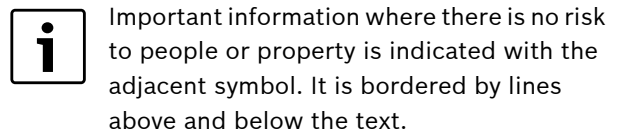
WARNINGS



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.

- **NOTICE** 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



ADDITIONAL SYMBOLS

Symbol	Meaning
▶	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)

Table 1

1.2 GENERAL SAFETY INSTRUCTIONS

STORAGE

- ▶ Only store flat-plate collectors in dry conditions (when 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.

INSTALLATION

Installation and maintenance must only be carried out by a 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 approved contractor.
- ▶ 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.

2.1 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.

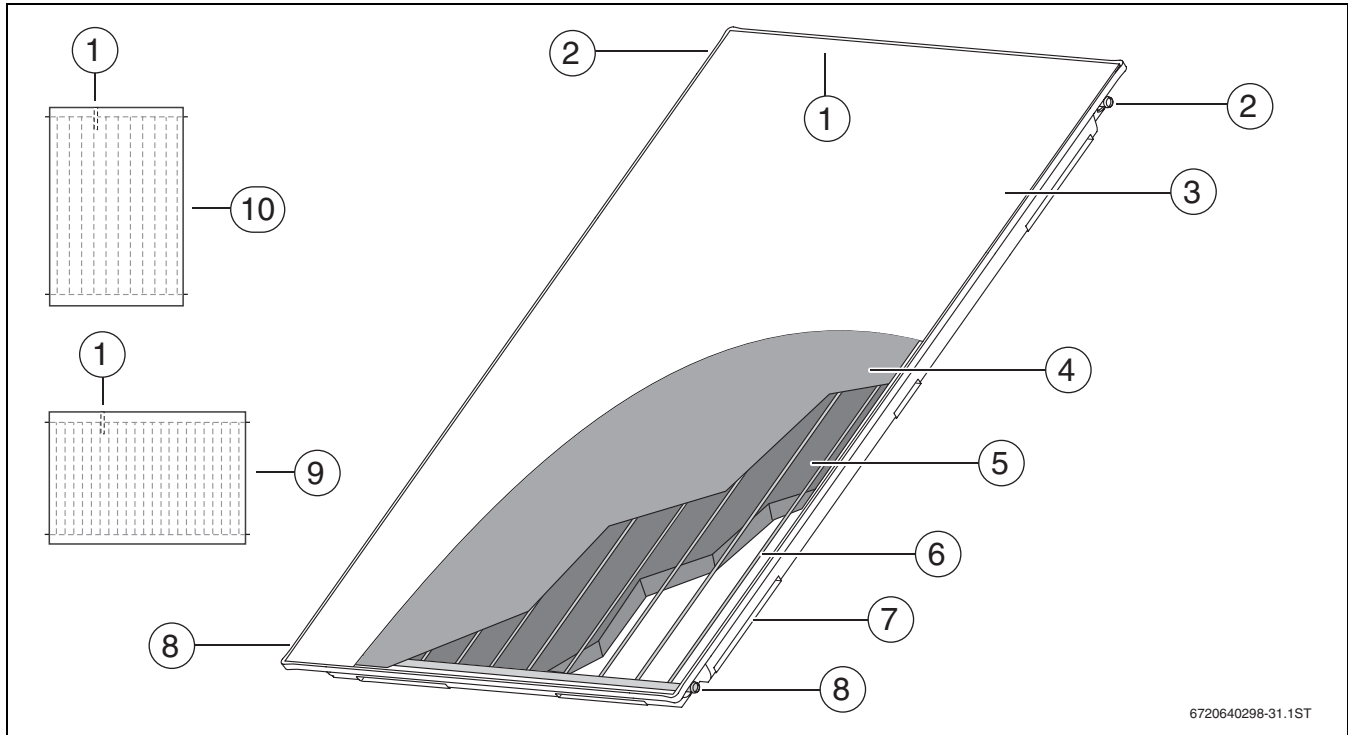


Fig. 1 Cross-section of portrait collector version

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

2.2 CORRECT USE

The collectors are designed to produce hot water 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 (exclusion of oxygen).

PERMISSIBLE HEAT TRANSFER MEDIUM

- ▶ To protect the collectors against damage through frost and corrosion, operate them with Tyfocor L solar heat transfer medium.

PERMISSIBLE TYPES OF ROOF

These instructions describe the installation of collectors on flat roofs and walls.

- ▶ Only use the installation set on such roofs.

PERMISSIBLE ROOF INCLINATIONS

- ▶ Fit the installation set only on flat roofs or those with a shallow pitch up to 25°.

COLLECTOR SUPPORTS

- ▶ When installing collectors on a flat roof, never use the collector supports to secure other parts of the roof structure.
- ▶ When installing collectors on a wall, only mount the collector supports on walls with sufficient load-bearing capacity.

PERMISSIBLE LOADS

- ▶ Only install collectors in locations with lower values than those shown in Tab. 2. If necessary, consult a structural engineer.



Subject to the type of installation, collector type and permissible loads, additional accessories may be required (additional collector supports, additional profile rails).

The installation set is suitable for the following maximum loads (with reference to DIN 1055, Parts 4 and 5):

Maximum snow load	Maximum wind speed
Installation on flat roofs	
2.0 kN/m ²	94 mph ¹⁾
3.8 kN/m ² ²⁾	94 mph ¹⁾
Installation on a wall	
2.0 kN/m ²	81 mph ³⁾

Table 2 Permissible loads

1) Corresponds to a dynamic pressure of 1.1 kN/m²

2) Depending on type of installation and collector type only possible with accessories

3) Equivalent to a dynamic pressure of 0.8 kN/m²

- ▶ To determine the maximum wind speed, take into account the following factors:
 - Location of the solar thermal system
 - Geographical height of the terrain
 - Topography (terrain/buildings)
 - Height of building

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

- ▶ Enquire about the locally applicable snow loads.

Prevent an accumulation of snow above or on the collector:

- ▶ Fit a snow guard above the collector (To be supplied by the installer).
- ▶ Regularly clear snow build-up.

To prevent snow loads, see also: Roof height differentials → page 13.

2.3 COMPONENTS AND TECHNICAL DOCUMENTATION

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

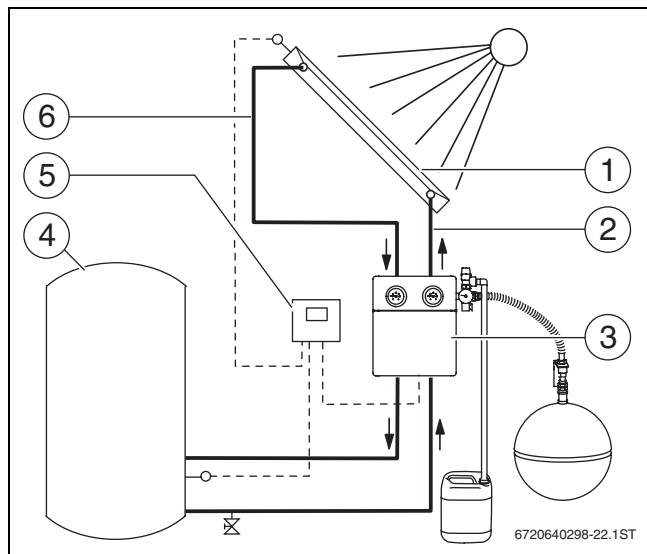


Fig. 2 Solar thermal system components

- 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

- Fitting the collector supports
- 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 system faults

SOLAR CYLINDER

- Siting and installing the cylinder
- Commissioning the cylinder
- Cylinder maintenance

SOLAR CONTROLLER

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

Further instructions may be found with the controller itself.

2.4 ACCESSORIES

In the following, please find a list of accessories that may be combined with the collector and the installation set. The Technical Specification document includes a comprehensive overview of all available accessories.

- Accessories for higher loads (→ Chapter 7.3, page 30)
- Air vent set (→ Chapter 9.3, page 38)
- Surge protector for collector sensor
- Solar double pipe (pipework), thermally insulated and with integral collector sensor lead

2.5 EU DECLARATION OF CONFORMITY

The design and operation of this product conforms 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).

2.6 DATA PLATE

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

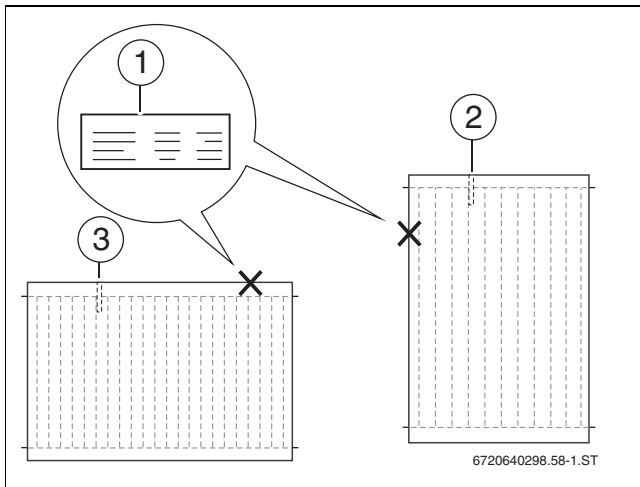


Fig. 3 Data plate position

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

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

Table 3 Data plate information



Important information: Please use the notes section at the end of this manual to record the serial number on each collector before installing on the roof. This information is required for guarantee registration.

2.7 SPECIFICATION




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

Table 4

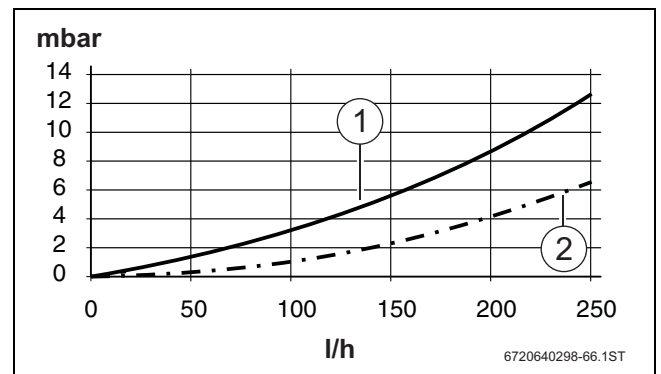


Fig. 4 Collector pressure drop

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

2.8 STANDARD DELIVERY

- ▶ Check that the delivered material is complete and undamaged.

2.8.1 COLLECTOR INSTALLATION SET

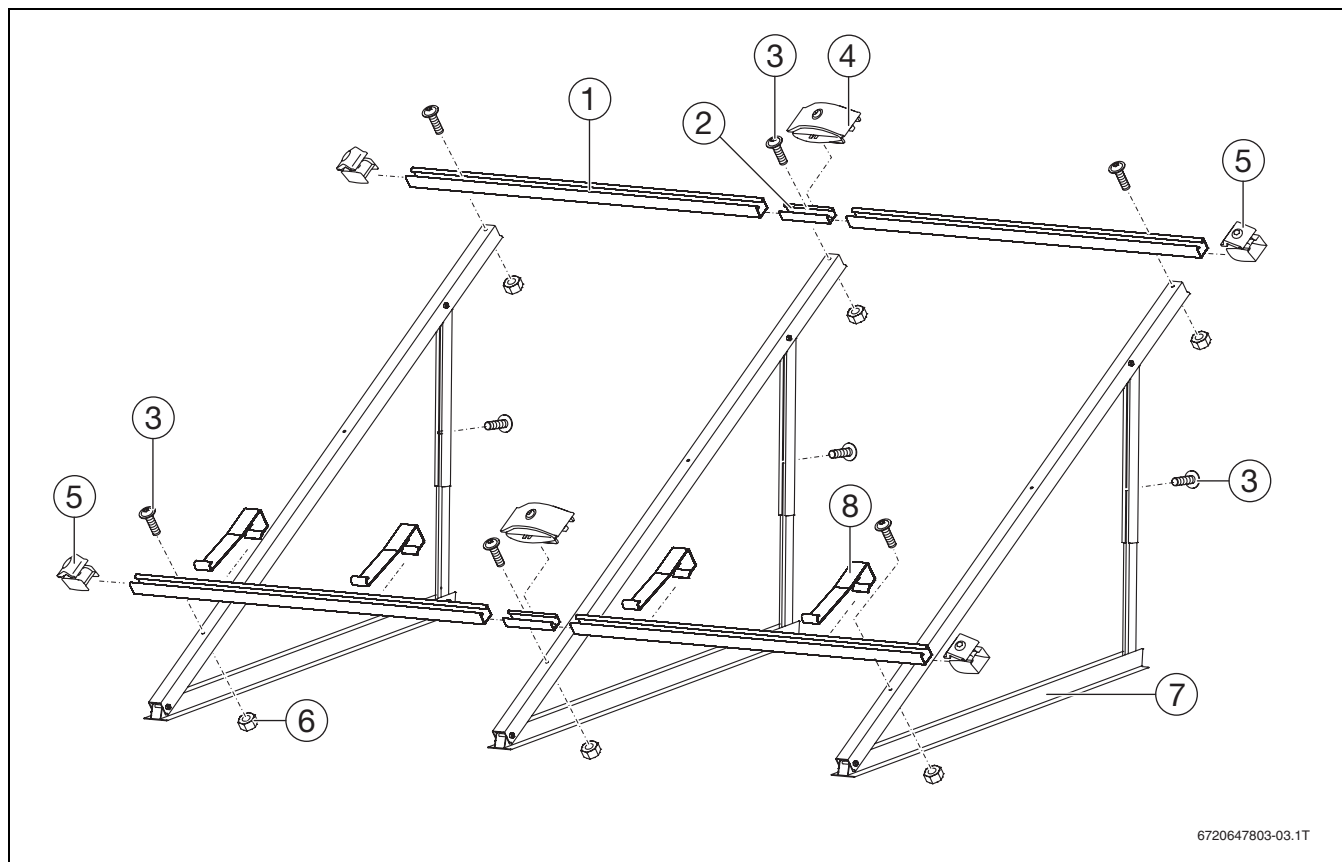


Fig. 5 Installation set for 2 portrait collectors: 1 standard installation set, 1 extension installation set

STANDARD INSTALLATION SET, PER COLLECTOR ROW AND FOR THE FIRST COLLECTOR:

Item 1	Profile rail	2 x
Item 3	Screw M8x20	6 x
Item 5	Single sided collector clamp	4 x
Item 6	M8 nut	4 x
Item 7	Collector brace	2 x
Item 8	Anti-slip protector	2 x

Table 5

EXTENSION INSTALLATION SET, FOR EACH ADDITIONAL COLLECTOR:

Item 1	Profile rail	2 x
Item 2	Connector	2 x
Item 3	Screw M8x20	3 x
Item 4	Double sided collector clamp	2 x
Item 6	M8 nut	2 x
Item 7	Collector brace	1 x ¹⁾
Item 8	Anti-slip protector	2 x

Table 6

1) for horizontal collector type: 2 x collector supports



Subject to the installation conditions, additional collector supports and additional profile rails may be required. Reference is made to these conditions in the following chapters.

2.8.2 CONNECTION SET

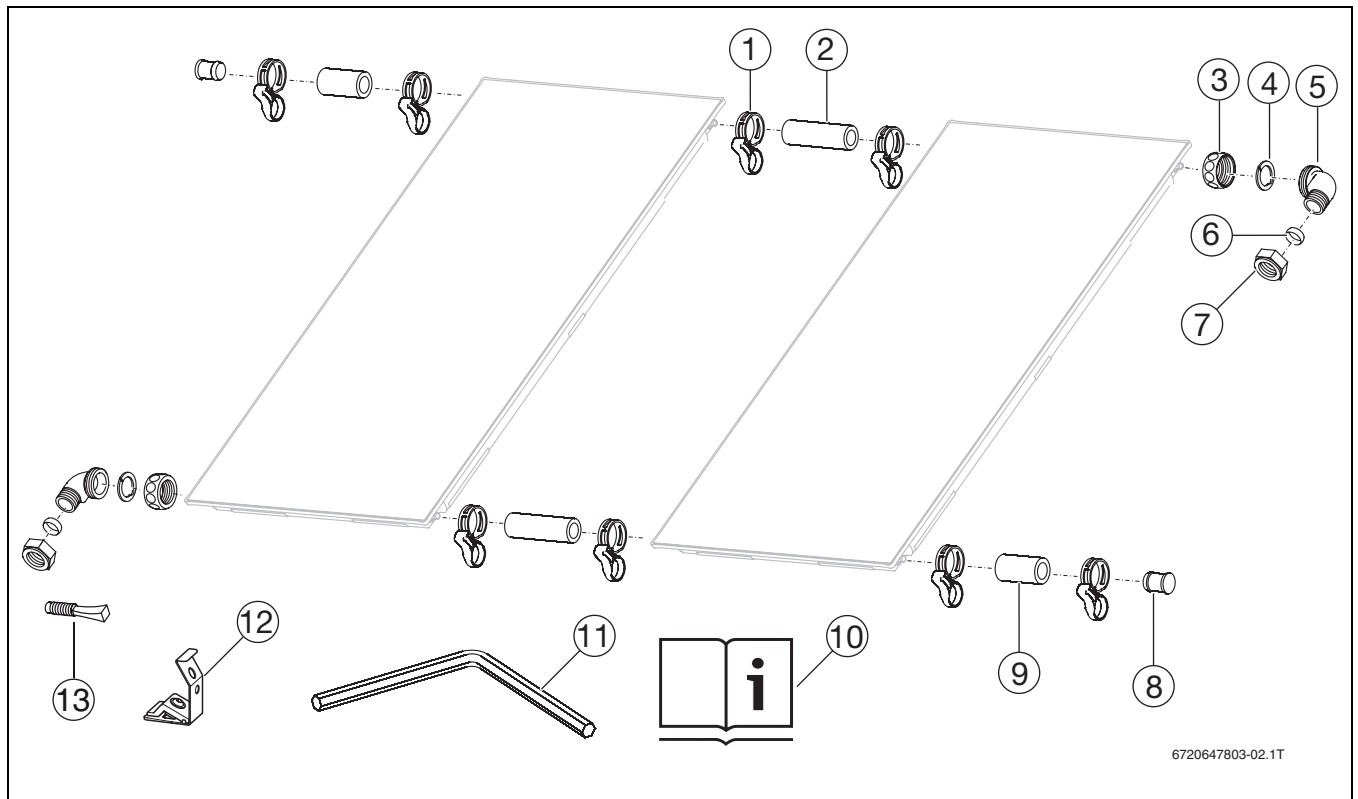


Fig. 6 1 flat roof connection set and 2 interconnection sets

CONNECTION SET FOR ONE COLLECTOR ARRAY:

Item 1	Hose clip (1 x as spare)	5 x
Item 3	G1 nut	2 x
Item 4	Clamping washer	2 x
Item 5	Angle	2 x
Item 6	18 mm locking ring	2 x
Item 7	Union nut R ^{3/4}	2 x
Item 8	Dummy plug	2 x
Item 9	Solar hose 55 mm	2 x
Item 10	Installation and maintenance instructions	1 x
Item 11	Allen key SW5	1 x
Item 12	Retainer for flow line	2 x
Item 13	Sensor pocket plug (collector sensor)	1 x

Table 7

2.8.3 COLLECTOR WITH 2 INTERCONNECTION SETS

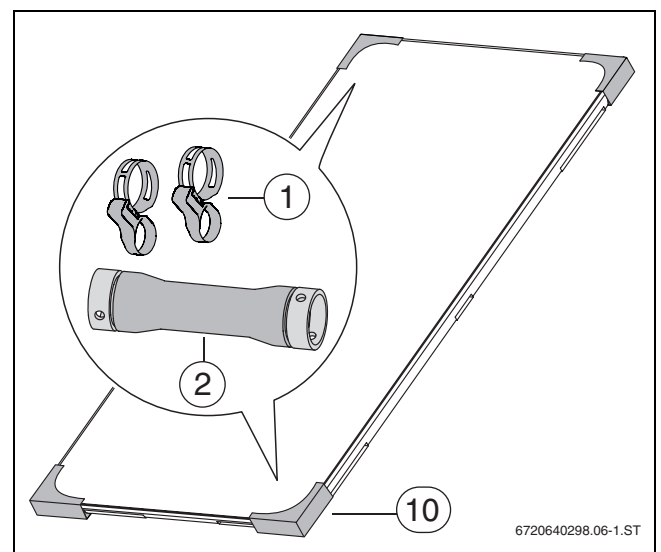


Fig. 7 2 protective shipping corners comprising 1 interconnection set each (1 interconnection set includes 2 hose clips and 1 solar hose each)

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

Table 8

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 of death by falling from roof.

- ▶ Never use a ladder to move components to the roof because the installation material and collectors are heavy.
- ▶ 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. 7, page 9). Please do not dispose of these corners until you have removed these parts.



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.

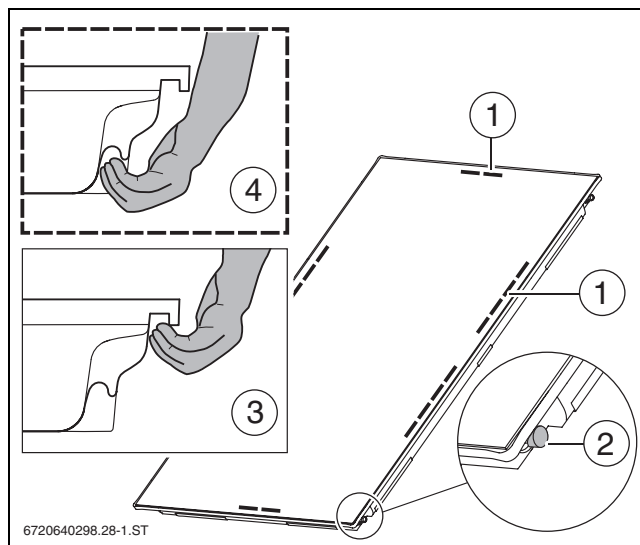


Fig. 8

- 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 or equipment for sweeping chimneys
- 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 solar connection.

- ▶ Remove plug [2] only immediately prior to fitting the solar hose (→ Chapter 8.1.2 for more information).

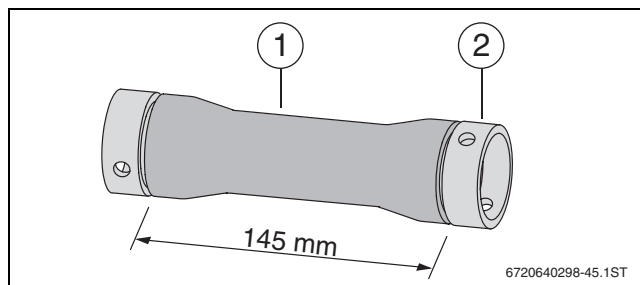


Fig. 9

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 risks associated.

- ▶ 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. 10).
 - Align the collector array so that it is in line with windows, doors etc. (→ Fig. 10).
 - Prevent possible shading (→ Fig. 11, 19 and 20).
 - Prevent height differentials (→ Fig. 13).
 - Observe the hydraulic connection to the pipework (→ Chapter 9).
 - Take the space required on the roof into account (→ Chapter 5.4).

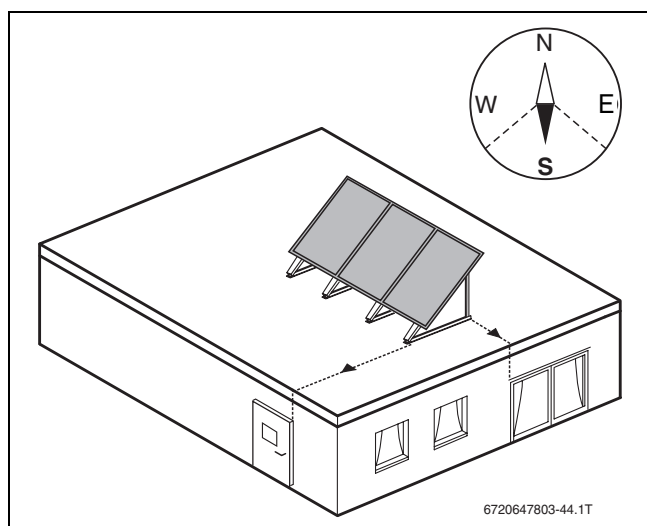


Fig. 10

- ▶ Prevent shading of the collector array through adjacent buildings, trees, other rows of collectors etc.

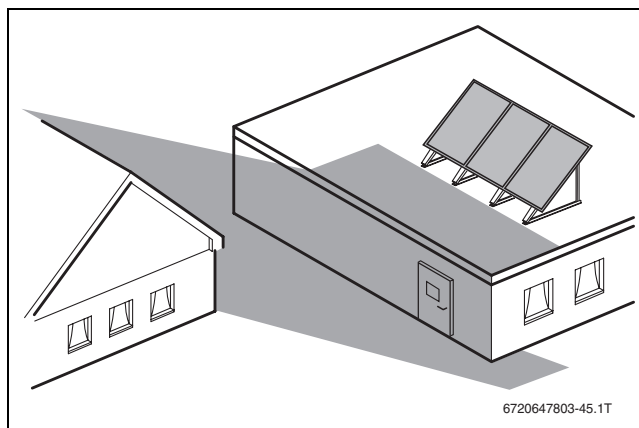


Fig. 11

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 (e.g. in the case of attic heating centres).

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

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

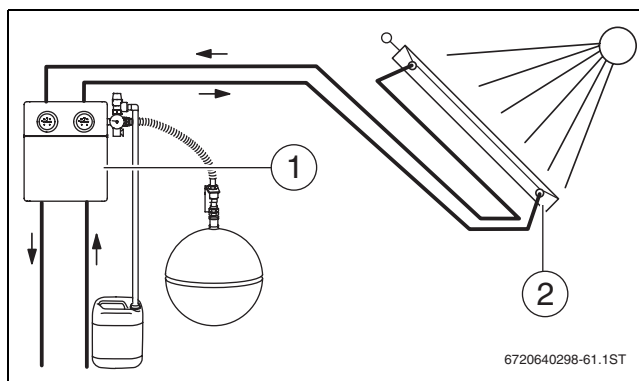


Fig. 12

HEIGHT DIFFERENTIALS IN ROOFS

Where there are height differentials in the roof, prevent snow loads from sliding down from a roof pitch of $\alpha > 15^\circ$. The length of the additional load through sliding snow loads results from the height differential (→ Fig. 13): $l_s = 2 \times h$

- ▶ Avoid installing collectors within the l_s area (roof length calculated for additional snow drift load) below height differentials.
- ▶ In the case of installation below a height differential:
 - Fit a snow guard to the higher roof area (not supplied).
 - Observe additional loads during the installation.

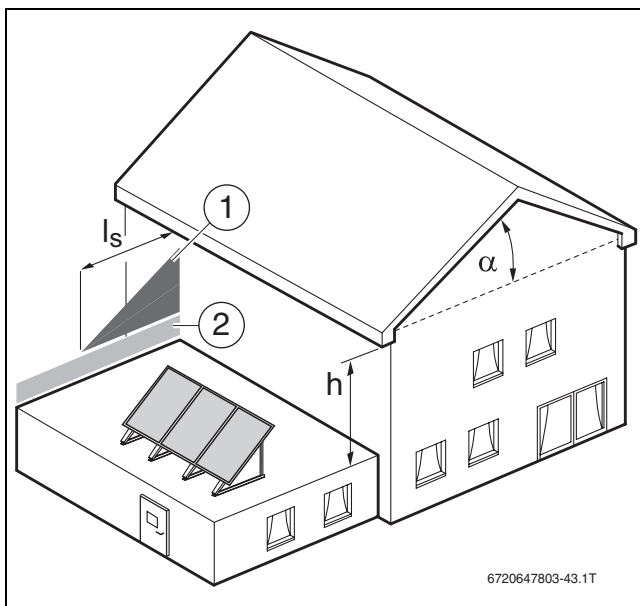


Fig. 13

- 1** Additional loads through sliding snow
- 2** Standard snow load
- α Roof pitch
- h** Height differential
- l_s Length of the additional load

5.2 ARRANGEMENT OF COLLECTORS

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

- ▶ Connect the collector array alternately (→ Fig. 14).

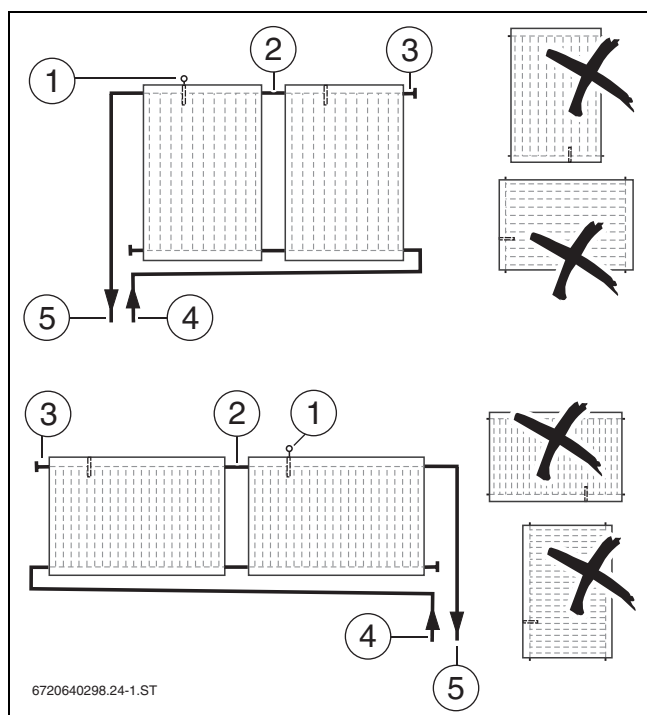


Fig. 14 Layout of portrait (top) and landscape (bottom) collectors

- 1 Collector sensor inside sensor pocket (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. 14 [1]).
- ▶ Plan the routing of the collector sensor lead so that the collector sensor (→ Fig. 14 [1]) can be fitted to the collector to which the flow [5] has been attached.

MAXIMUM NUMBER OF COLLECTORS AND COLLECTOR ARRAYS WITH SEVERAL ROWS

- ▶ Allow for no more than 10 collectors per row.
- ▶ Connect collector arrays comprising several rows in reverse return, so the total of all pressure drop values (e.g. pipe lengths with the same cross-section) between the first and last branches is identical.

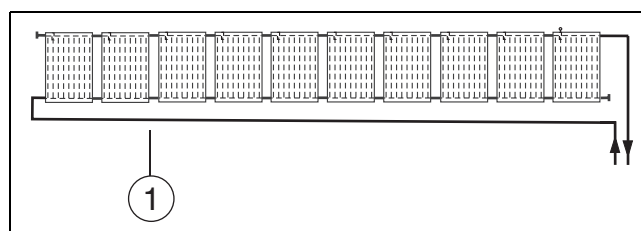


Fig. 15

- 1 Connection of a single row

5.3 COLLECTOR ANGLE OF INCIDENCE

The collectors' angle of incidence depends on the relevant application and the roof pitch. The angle of inclination of the collector support is subject to the application, roof pitch and angle of incidence. The angle of inclination of the collector support is set using the telescopic rails of the collector support.

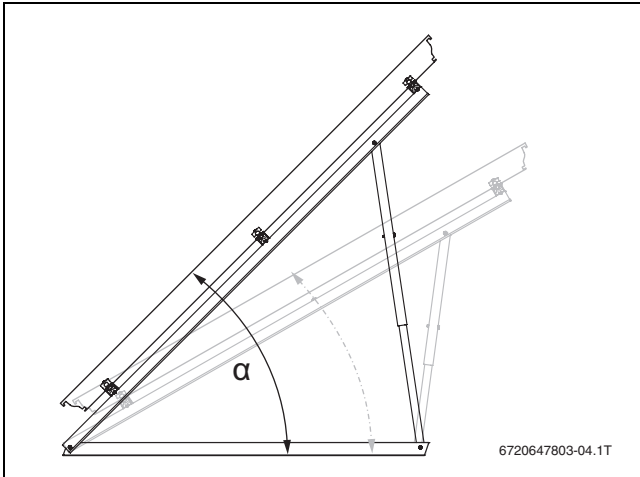


Fig. 16

α Angle of incidence

5.3.1 DETERMINING THE RANGE OF INCIDENCE

The different areas of application of solar thermal systems provide various angles of incidence that ensure an optimum solar yield depending on season.

Application	Range of incidence
DHW	30–45°
DHW + CH Backup	45–60°
DHW + swimming pool	30–45°
DHW + CH Backup + swimming pool	45–60°

Table 9

- Determining the range of incidence according to application.

5.3.2 DETERMINING THE ANGLE OF INCIDENCE AND ANGLE OF INCLINATION ON PITCHED ROOFS

On roofs with a slight inclination towards the south:

Angle of inclination [2] =

Angle of incidence [1] – Roof pitch [3]

On roofs with a slight inclination towards the north:

Angle of inclination [2] =

Angle of incidence [1] – Roof pitch [3]

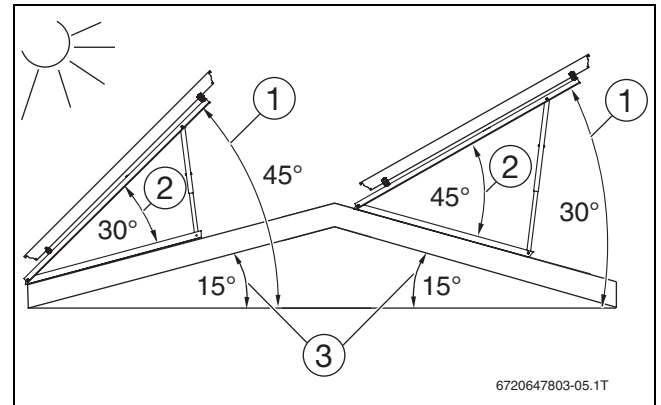


Fig. 17 Angle of incidence on pitched roofs

- 1 Collector angle of incidence (absolute angle to the horizontal plane)
- 2 Angle of inclination of the collector support
- 3 Roof pitch (up to 25°)

5.3.3 DETERMINING THE ANGLE OF INCIDENCE AND ANGLE OF INCLINATION ON WALLS

For wall mounting:

Angle of inclination [2] = 90° – angle of incidence [1]



The angle of incidence must be between 45° and 60°.

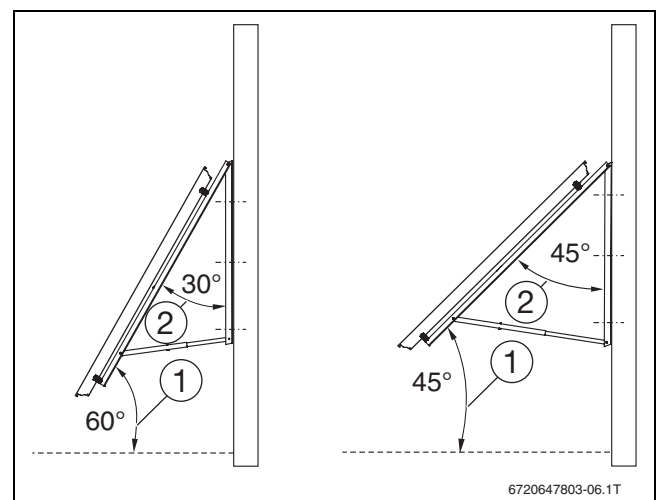


Fig. 18

- 1 Collector angle of incidence (absolute angle to the horizontal plane)
- 2 Angle of inclination of the collector support

5.4 SPACE REQUIRED ON ROOF

5.4.1 DETERMINING THE CLEARANCE BETWEEN ROWS OF COLLECTORS

The minimum clearance X between the collectors results from the collectors' angle of incidence.

Angle of incidence α	Clearance X		Wall Landscape
	Flat roof Portrait	Landscape	
30°	5.05 m	2.94 m	—
35°	5.44 m	3.17 m	—
40°	5.79 m	3.37 m	—
45°	6.09 m	3.55 m	2.33 m
50°	6.35 m	3.70 m	2.26 m
55°	6.56 m	3.82 m	2.18 m
60°	6.72 m	3.92 m	2.08 m

Table 10 Clearance between the rows of collectors at minimum solar altitude (on a flat roof: 17°; on a wall: 61°)

The clearance between the rows of collectors also depends on the possible shading.

- ▶ Take the minimum clearance X from Tab. 10.
- ▶ For arrays comprising several rows, select clearance X large enough to prevent shading from occurring (→ Fig. 19 and 20).

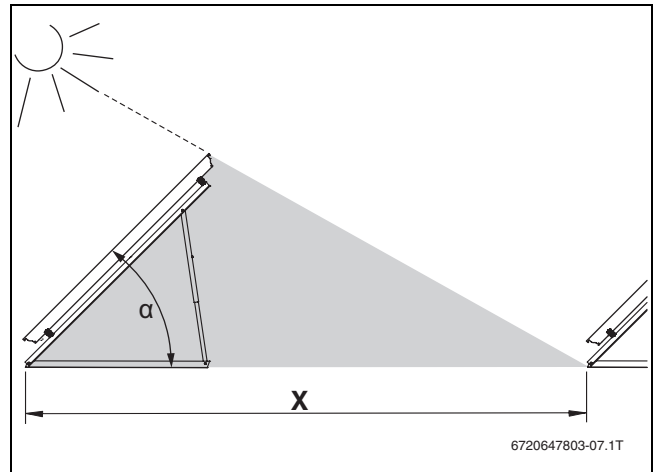


Fig. 19 Clearance and shading, flat roof installation

- α Angle of incidence
- X Clearance between collector rows

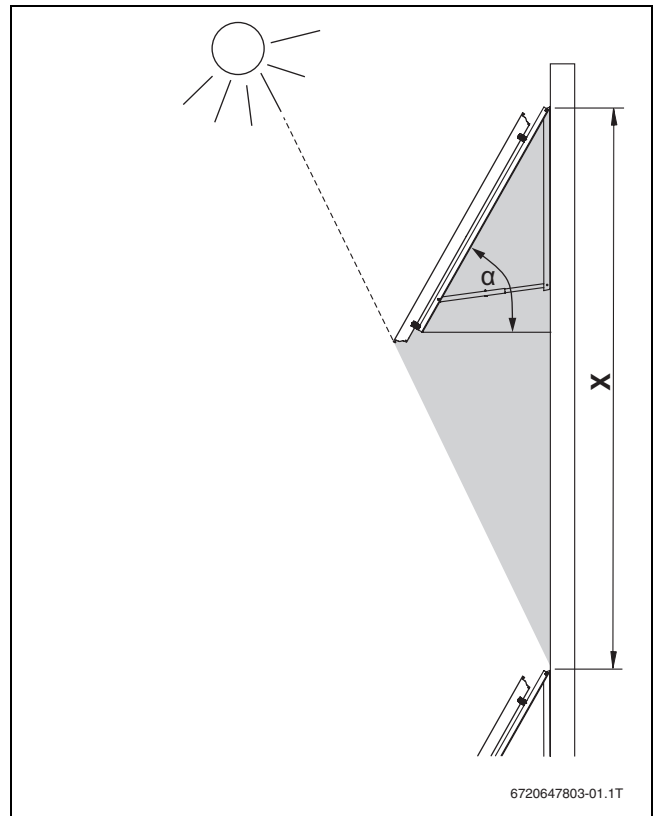


Fig. 20 Clearance and shading, wall mounting

- α Angle of incidence
- X Clearance between collector rows

5.4.2 DETERMINING THE SPACE REQUIRED



DANGER: Risk to life through collectors that cannot withstand high winds and suction forces.

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

- **Dimension a:** Either formula can be used. The lower value can be applied.
- **Dimension A, B and C:** → Tab. 11, 12 and 13

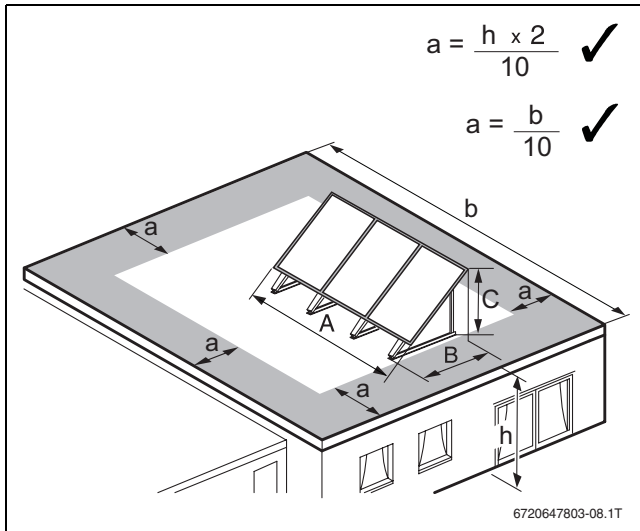


Fig. 21 Minimum clearances flat roof

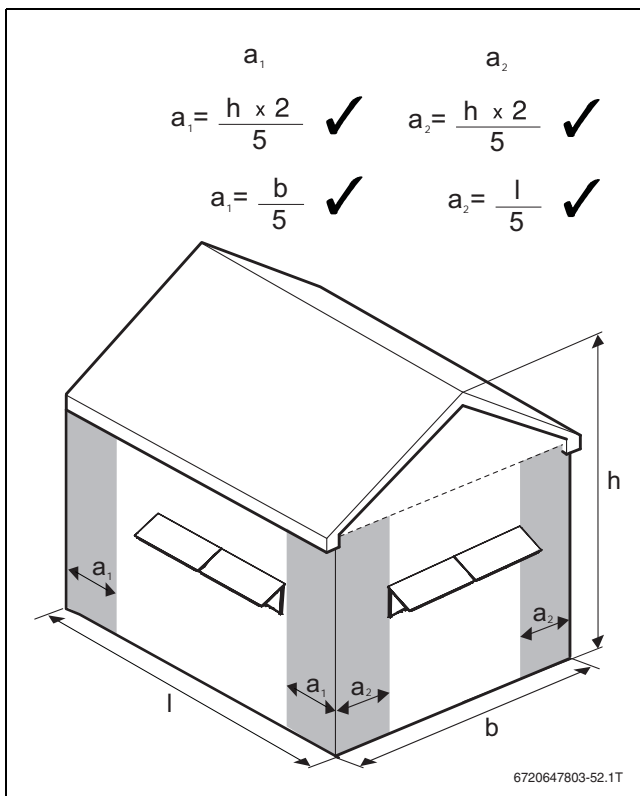


Fig. 22 Minimum clearances, wall mounted

Number of collectors	Dimension A	
	Portrait	Landscape
1	1.18 m	2.02 m
2	2.38 m	4.06 m
3	3.58 m	6.10 m
4	4.78 m	8.14 m
5	5.98 m	10.19 m
6	7.18 m	12.23 m
7	8.38 m	14.27 m
8	9.58 m	16.31 m
9	10.78 m	18.35 m
10	11.98 m	20.40 m

Table 11

Angle of inclination	Dimension B	
	Portrait	Landscape
30°	1.77 m	1.04 m
35°	1.67 m	0.98 m
40°	1.57 m	0.93 m
45°	1.50 m	0.88 m
50°	1.50 m	0.89 m
55°	1.52 m	0.90 m
60°	1.53 m	0.91 m

Table 12

Angle of inclination	Dimension C	
	Portrait	Landscape
30°	1.21 m	0.79 m
35°	1.36 m	0.87 m
40°	1.49 m	0.95 m
45°	1.62 m	1.02 m
50°	1.73 m	1.09 m
55°	1.83 m	1.15 m
60°	1.92 m	1.19 m

Table 13

5.5 LIGHTNING PROTECTION

- ▶ Check local 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.

5.6 REQUIRED TOOLS AND MATERIALS

- SW27 and 30 spanner (SW = diameter of spanner) for making the pipe connection
- SW24 and 37 spanner for the interconnection set (2 rows, accessory)
- Material for pipe insulation



Fitting the installation set and the connection set only requires the SW5 Allen key from the connection set.

5.7 INSTALLATION ORDER

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

1. Determine the collector angle of incidence.
2. Determine the space requirement for the collector array.
3. Fit telescopic rails.
4. Fit collector supports.
5. Connect and fit collector rails.
6. Fit the collectors and collector sensors.
7. Connect the pipework to the collectors.

6 FITTING THE COLLECTOR SUPPORTS



DANGER: Risk of death by falling from roof.

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

6.1 FITTING TELESCOPIC RAILS

- ▶ From the determined angle of incidence (→ Chapter 5.3.1, page 15), determine the angle of inclination of the collector support.



The collector angle of incidence and the angle of inclination of the collector support may be different subject to roof pitch and installation location.

6.1.1 SELECTING MOUNTING HOLES

- ▶ Select holes in accordance with the determined angle of inclination (→ Chapter 5.3.2 and 5.3.3, page 15) as well as the collector installation orientation and location.

PORTRAIT COLLECTOR INSTALLATION

- ▶ Select hole [1] in the lower rail and a corresponding hole in the upper rail:

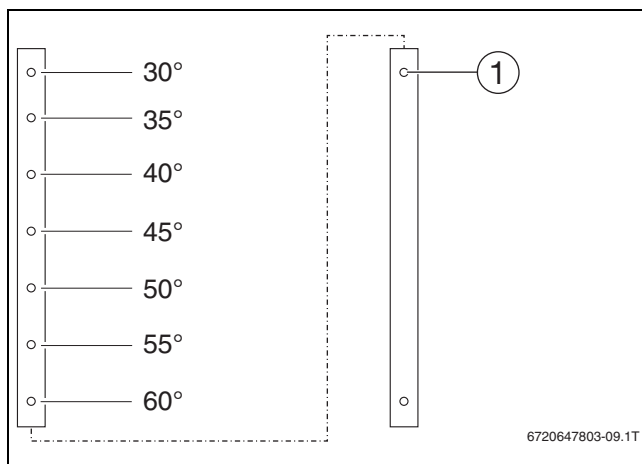


Fig. 23

LANDSCAPE COLLECTOR INSTALLATION

- ▶ Select hole [1] in the lower rail and a corresponding hole in the upper rail:
 - Angle of inclination 35°–60°: Select a hole in area [2] of the upper rail.
 - Angle of inclination 30°: Select hole [3] in the upper rail, trim the top of the upper rail by 140 mm and select the lower hole [4].

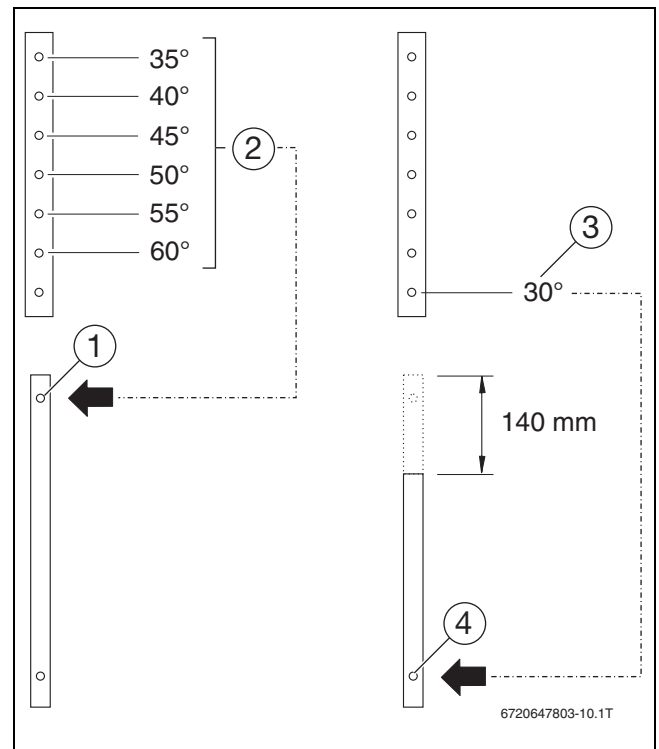


Fig. 24

INSTALLING THE COLLECTOR ON A WALL

- ▶ Select hole [1] in the lower rail and a corresponding hole in the upper rail:
 - Angle of inclination 35°–45°: Select a hole in area [2] of the upper rail.
 - Angle of inclination 30°: Select hole [3] in the upper rail, trim the top of the upper rail by 140 mm and select the lower hole [4].

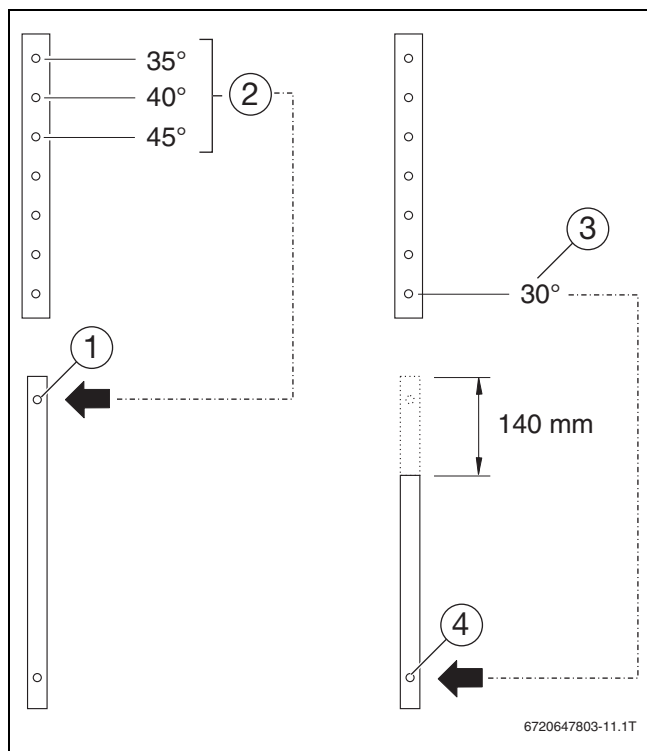


Fig. 25

6.1.2 FITTING TELESCOPIC RAILS

1. Push telescopic rails together.
2. Secure telescopic rails with M8 × 20 screw in the selected holes. For angles of inclination 30°: lock screw on site with a nut.

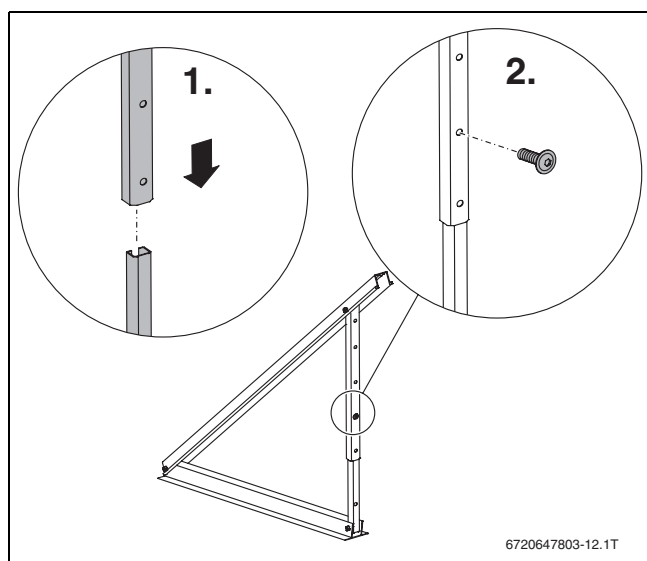


Fig. 26

6.2 DETERMINING THE COLLECTOR SUPPORT CLEARANCES

The collector support clearances are subject to the following:

- Collector type: portrait, landscape
- Maximum snow load and wind speed
- Installation type:
 - Installation with on-site base anchor points
 - Installation with loading trays



The following describes the installation of the collector supports with portrait collectors. Installation with landscape collectors is the same. Deviations will be pointed out.

There are two versions, subject to the building height (installation height), wind speed and snow load:

- Standard version, permissible for the following values:
 - Snow load: max. 2.0 kN/m²
 - Wind speed: max. 94 mph
- Version for higher loads
 - Snow load: max. 3.8 kN/m²
 - Wind speed: max. 94 mph

6.2.1 DETERMINING THE BASE ANCHOR POINT DISTANCES

STANDARD VERSION, PORTRAIT

The first collector requires 2 collector supports.

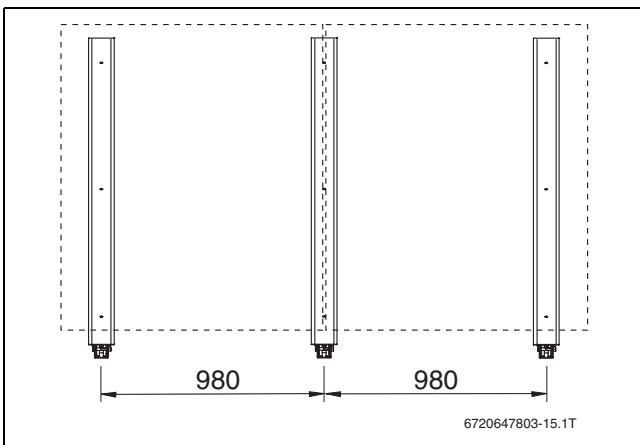


Fig. 27 Standard version, 2 portrait collectors

A further collector support is required for every additional portrait collector, → Fig. 28 and 29.

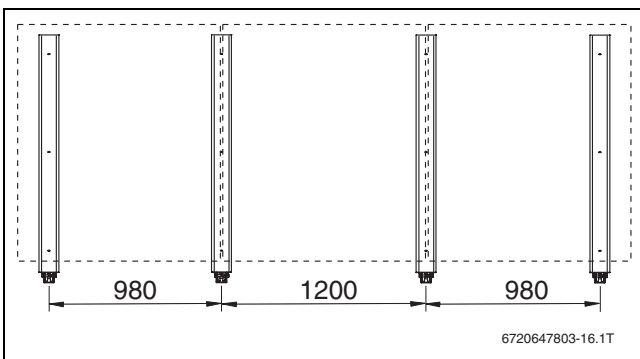


Fig. 28 Standard version, 3 portrait collectors

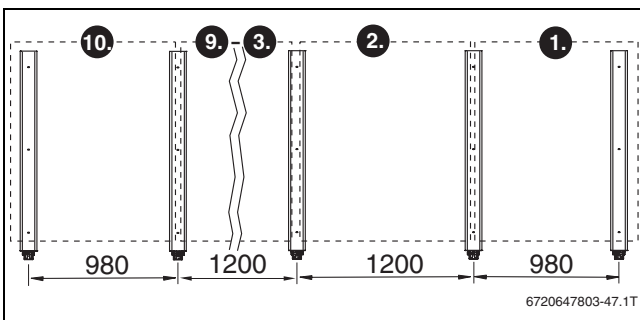


Fig. 29 Standard version, >3 portrait collectors

(Numbers represent the collector number in an array)

STANDARD VERSION, LANDSCAPE

Each landscape collector requires 2 collector supports, → Fig. 30.

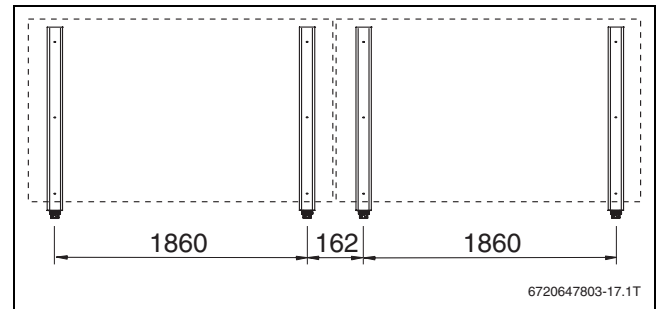


Fig. 30 Standard version, 2 landscape collectors

VERSION FOR HIGHER LOADS, PORTRAIT

Where collectors are arranged in portrait and in case of higher loads, the following components are required for the second and any further collectors:

- Additional collector supports
- Additional profile rails (→ Chapter 7.3, page 30)

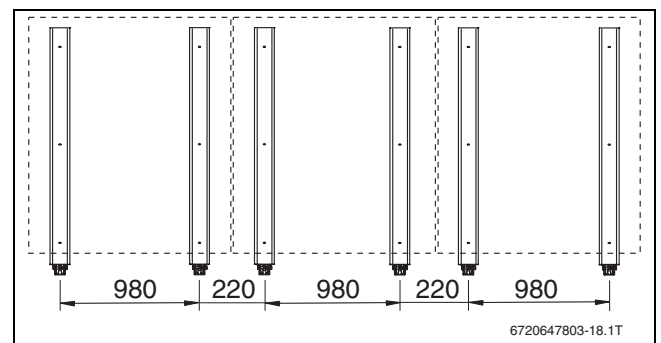


Fig. 31 Version for higher loads, 3 portrait collectors

VERSION FOR HIGHER LOADS, HORIZONTAL

Where collectors are arranged in landscape, the standard version is suitable for snow loads of 3.8 kNm².

No additional components are required.

6.2.2 DETERMINING DISTANCES FOR BALLAST TROUGHS

STANDARD VERSION, PORTRAIT

The first portrait collector requires 2 collector supports. A further collector support is required for every additional collector. Where collectors are arranged in portrait, additional collector support is required for the 3rd, 5th, 7th and 9th collector.

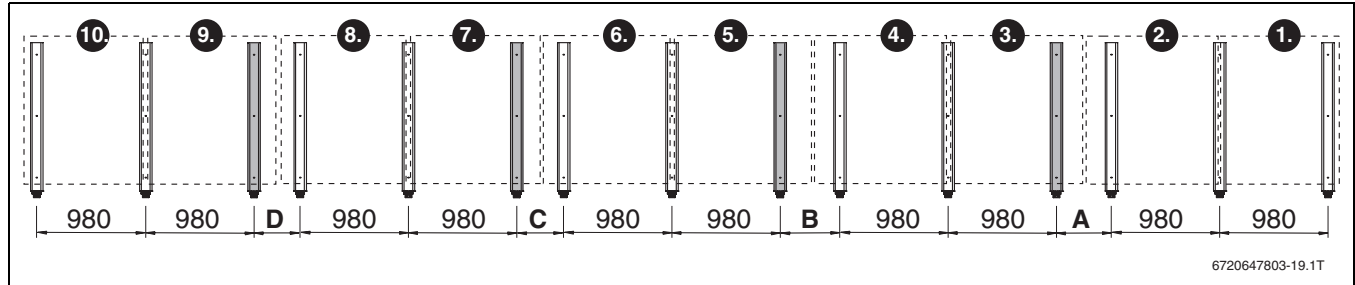


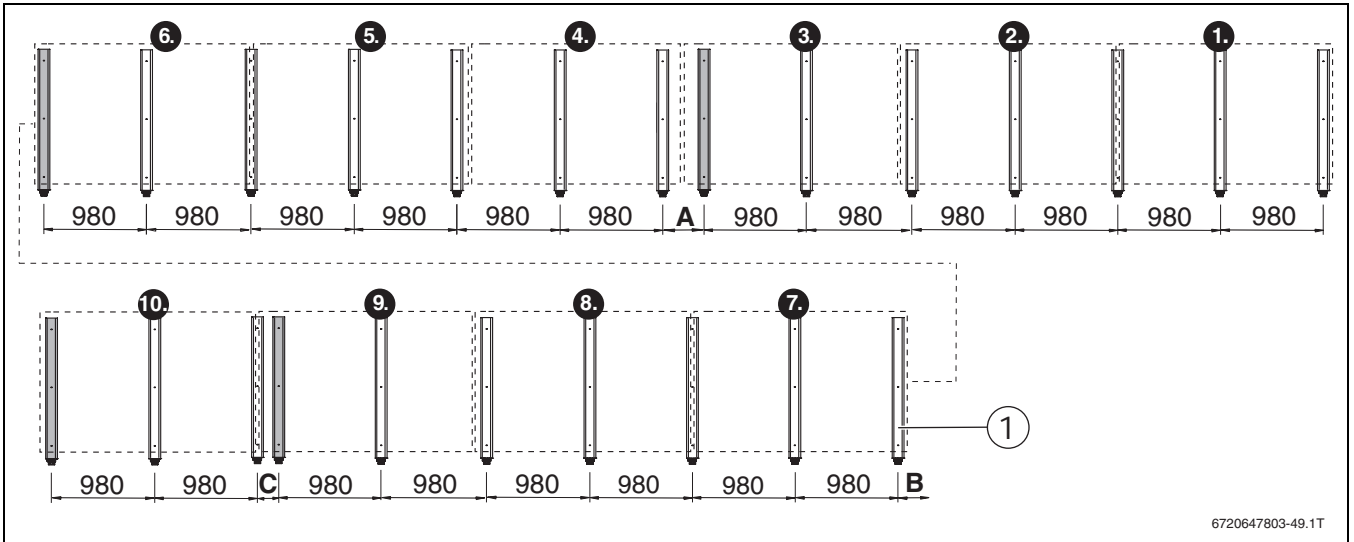
Fig. 32 Standard version, 10 portrait collectors (dimensions in mm)

Number of collectors	Number collector supports	Dimension A	Dimension B	Dimension C	Dimension D
1	2	—	—	—	—
2	3	—	—	—	—
3	5	355 mm	—	—	—
4	6	440 mm	—	—	—
5	8	440 mm	355 mm	—	—
6	9	440 mm	440 mm	—	—
7	11	440 mm	440 mm	355 mm	—
8	12	440 mm	440 mm	440 mm	—
9	14	440 mm	440 mm	440 mm	355 mm
10	15	440 mm	440 mm	440 mm	440 mm

Table 14 Distances of additional supports for the standard version with ballast troughs, portrait installation

STANDARD VERSION, LANDSCAPE

Where collectors are arranged in landscape, 2 collectors require 5 collector supports. In the case of more than 3 collectors being installed, additional collector supports are required for the 3rd, 6th, 9th and 10th collectors. In the case of 7 landscape collectors, support [1] is not required.



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Fig. 33 Standard version, 10 landscape collectors (dimensions in mm)

Number of collectors	Number of collector supports	Dimension A	Dimension B	Dimension C
1	3	—	—	—
2	5	—	—	—
3	7	—	—	—
4	10	164 mm	—	—
5	12	164 mm	—	—
6	14	328 mm	—	—
7	16	328 mm	—	—
8	19	328 mm	164 mm	—
9	21	328 mm	164 mm	—
10	24	328 mm	164 mm	164 mm

Table 15 Distances of additional supports for the standard version with ballast troughs, landscape installation

VERSION FOR HIGHER LOADS, PORTRAIT

The following additional components are required for higher loads:

- Securing with ropes (option) (→ Chapter 6.3, page 25)
- Additional profile rails (→ Chapter 7.3, page 30)
- Additional collector supports

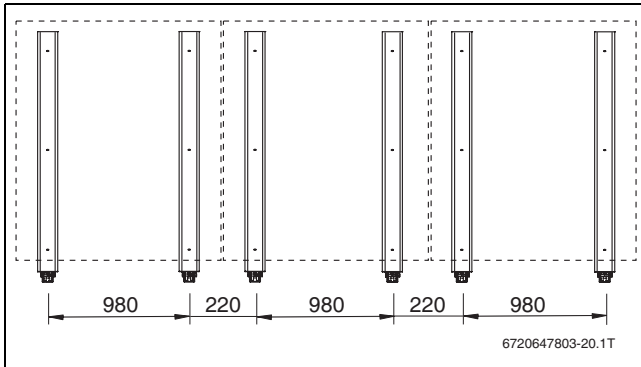


Fig. 34 Version for higher loads, 3 portrait and all other additional collectors (dimensions in mm)

VERSION FOR HIGHER LOADS, LANDSCAPE

Where collectors are arranged in landscape, the standard version is suitable for snow loads of 3.8 kNm^2 .


No additional components are required.

6.3 FITTING THE COLLECTOR SUPPORTS ON A FLAT ROOF

The following details refer to a single collector.


The installation may take 3 different forms:

- Base anchor (on-site fixing)
- Loading trays (filled with concrete slabs, gravel and similar)
- Securing with ropes plus ballast troughs




NOTICE: Roof damage from incorrect stabilisation.

- ▶ Consider the roof structure when selecting the method of fixing. Consult a roofing specialist and a structural engineer before selecting the final location of the collectors array.




NOTICE: Damage to the roof and the collectors through inadequate fixing on pitched roofs.

- ▶ On pitched roofs, provide adequate fixings for the collector supports on site.




NOTICE: Roof leaks through puncturing the roof membrane.

- ▶ To protect the roof membrane, put down conventional protective mats.
- ▶ Put down profiles, collector supports and additional installation materials only on protective mats.



When using loading trays with gravel, a ballast weight of up to 320 kg per collector is permissible.



The values in the following table refer to the stabilisation of a single collector.

- ▶ Subject to version, observe clearances and number of collector supports.

Speed pressure q	Wind speed	Base anchor Number and type of screws ¹⁾	Ballast without additional securing	Ballast secured with ropes	
			Weight in ballast trough	Weight in ballast trough	Rope tensile strength
0.50 kN/m ²	64 mph	2x M8/8.8	278 kg	180 kg	2.0 kN
0.80 kN/m ²	81 mph	2x M8/8.8	481 kg	320 kg	3.0 kN
1.10 kN/m ² ²⁾	94 mph	3x M8/8.8	695 kg	450 kg	4.0 kN

Table 16 Stabilising a collector


1) Per collector support

2) Additional profile rails only required for higher snow loads

6.3.1 BASE ANCHOR

The following describes by way of example how to secure the installation onto the double T-bars.

- ▶ Ensure that the substructure is designed so that the collectors can withstand the snow loads and wind forces affecting them.
- ▶ Ensure that the on-site fixings stabilise the solar thermal system and do not damage the roof.



NOTICE: Damage to the solar thermal system through structural modifications to the collector supports.

- ▶ Never drill through the collector support sections to secure them on site or otherwise modify their structure.

- ▶ Position the collector supports in accordance with the determined clearance dimensions (→ Chapter 6.2.1, page 21).
- ▶ Transfer the hole dimensions from the lower profile [2] to the double T-bars and pre-drill the necessary holes.
- ▶ Secure the profile to the bars section (double T-bars) [3] using screws (→ Tab. 16, page 25), nuts and washers [1].

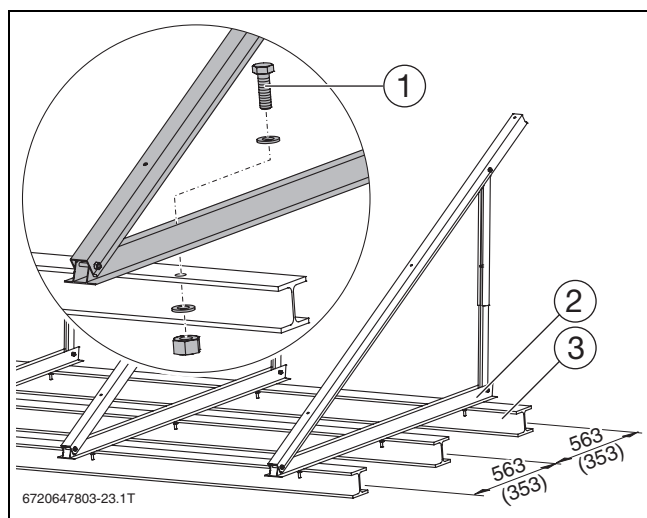


Fig. 35 Collector supports on double T-bars, dimensions in mm (value in brackets: portrait installation)

6.3.2 LOADING TRAYS

- ▶ Position the collector supports in accordance with the determined clearance dimensions (→ Chapter 6.2.2, page 22).
- ▶ For each collector, hook 4 ballast troughs [2] into the bottom profile [1] and into each other [3].
- ▶ Place ballast (concrete slabs, gravel or similar) into the loading trays (weight: → Tab. 16, page 25).

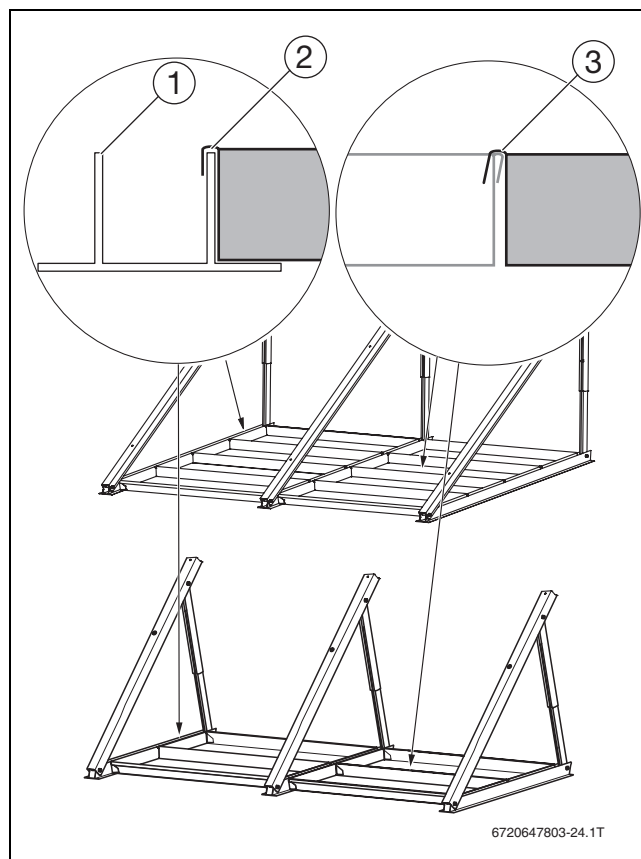


Fig. 36 Collector supports with ballast troughs for 2 portrait collectors (top) and 1 landscape collector (bottom)

6.3.3 SECURING WITH GUY ROPES

- ▶ Position the collector supports in accordance with the determined clearance dimensions (→ Chapter 6.2.2, page 22).
- ▶ Secure each collector on site with at least 2 guy ropes [1] to the screw on the bottom profile.
- ▶ Insert loading trays (→ Chapter 6.3.2, page 26).
- ▶ Anchor the guy ropes at a suitable point on the roof.

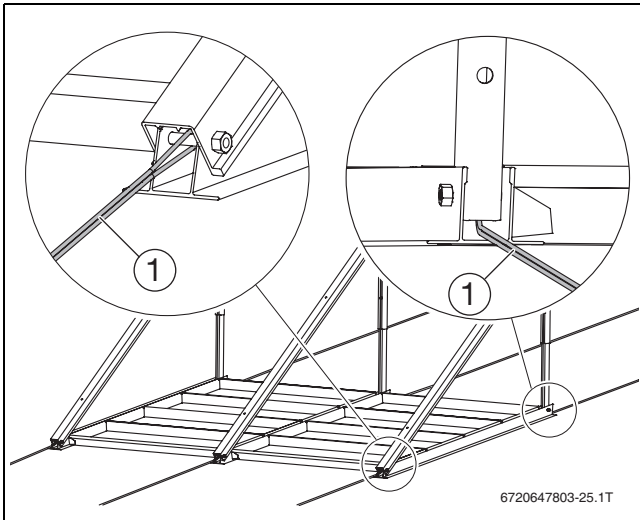


Fig. 37 Collector supports secured with ropes

6.4 FITTING THE COLLECTOR SUPPORTS TO A WALL

Installation on walls is only permissible if the following apply:

- Snow load: max. 2.0 kN/m²
- Angle of incidence: 45° to 60°
- Wind speed: max. 81 mph



DANGER: Risk to life through falling collectors if the wall is unsuitable.

- ▶ Install collector supports only on a solid wall that is unaffected by wind.
- ▶ Prior to installation, check the load-bearing capacity of the wall where the collectors are to be installed and its foundations. Seek the advice of a structural engineer, if required.



DANGER: Risk to life through falling collectors as a result of incorrect installation.

- ▶ Use only collector supports for landscape installation when installing collectors on a wall.
- ▶ Maintain the permissible angles of incidence (→ Chapter 5.3.3, page 15).
- ▶ Secure collector supports adequately.
- ▶ Never modify the structure of collector supports.
- ▶ Never store objects between the collector supports.
- ▶ Never fit any cladding to the collector supports.

For installation on a wall, the design values in Tab. 17, page 28 apply.

DESIGN VALUES

Wall construction ¹⁾	Screws/rawl plugs, per collector support
Steel-reinforced concrete, min. B25 (minimum thickness 120 mm)	3 × UPAT MAX Express anchor, type MAX 8 (A4) ²⁾
	3 × washers ³⁾ to DIN 9021
	3 × Hilti HST-HCR-M8 ²⁾
	3 × washers ³⁾ to DIN 9021
Substructure: steel (e.g. double T-bars)	3 × M8/4.6 2 × washers ³⁾ to DIN 9021

Table 17

- 1) Brickwork on request
- 2) Each rawl plug/screw must be able to withstand a tensile force of at least 1.63 kN or a vertical force (shearing force) of at least 1.56 kN.
- 3) 3 screw diameter = external diameter of the washer ×

FITTING THE COLLECTOR SUPPORTS TO A WALL



Number of collector supports and their clearances → Fig. 33 and Tab. 15, page 23.

- Secure each collector support side by side with 3 screws [1] to the wall.

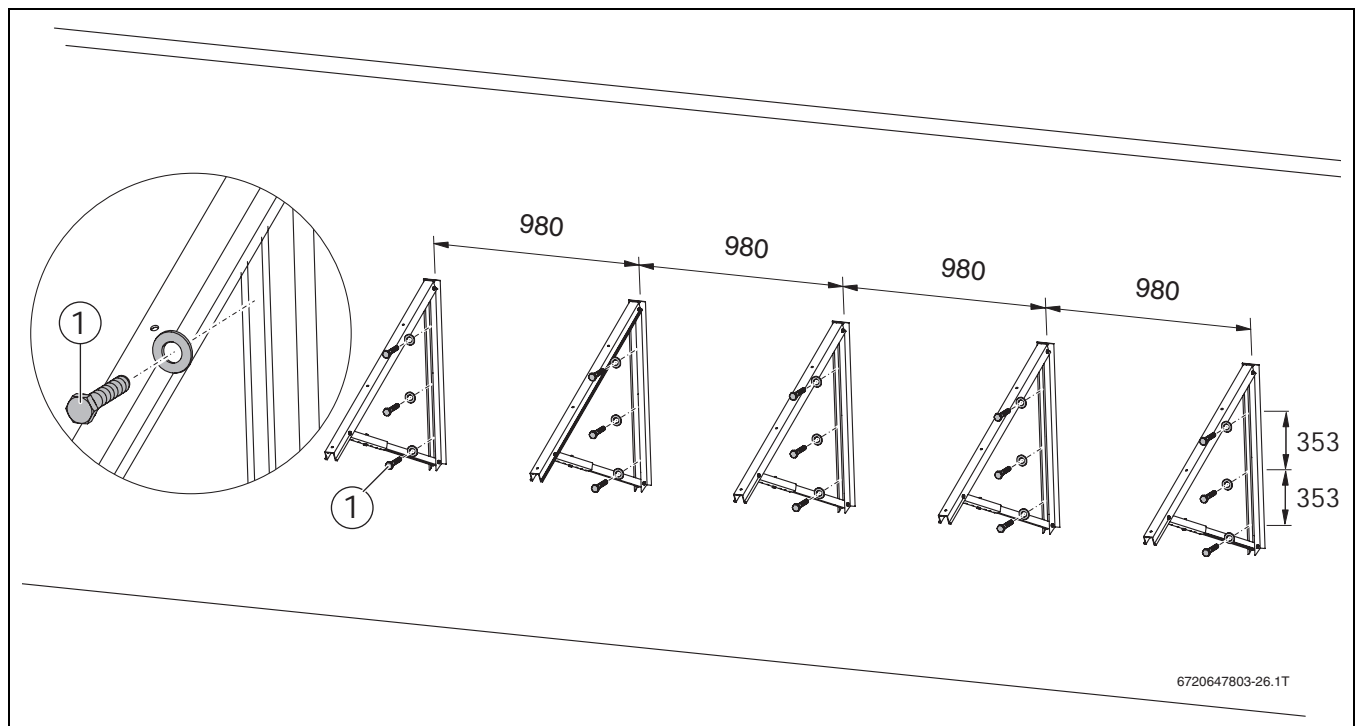


Fig. 38 Collector supports on the wall, 2 landscape collectors (dimensions in mm)

7 FITTING THE PROFILE RAILS

7.1 CONNECTING PROFILE RAILS

- ▶ Push profile rails [2] onto connector [1] until they click into place.

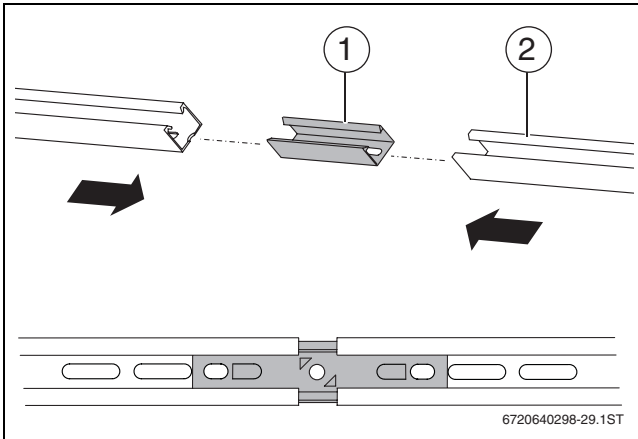


Fig. 39

7.2 FITTING THE PROFILE RAILS

POSITIONING THE PROFILE RAILS

The position of the profile rails depends on the following:

- Collector type: portrait, landscape
 - Collector support clearances
 - Type of installation (base anchor, ballast trough, wall)
- ▶ Position the profile rails on the collector supports. For this, start as shown in → Fig. 40 and Tab. 18, 19 plus 20 subject to type of installation.

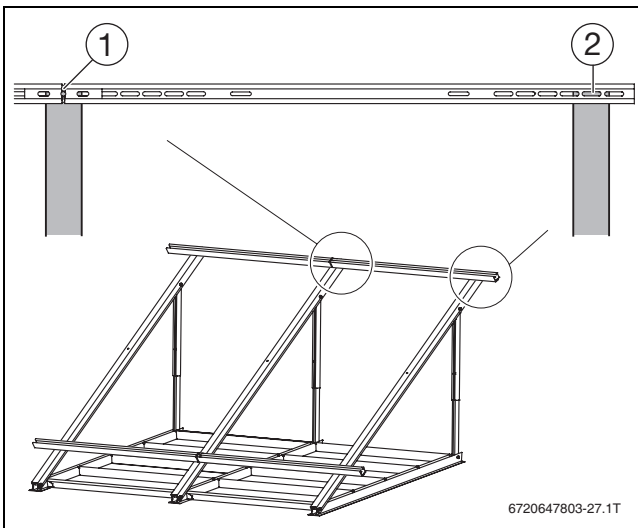


Fig. 40

Base anchor		
Collector type	Standard version	Version for higher loads
Portrait	Central hole of the connector (→ Fig. 40 [1])	Second hole from the right (→ Fig. 40 [2])
Landscape	Second hole from the right (→ Fig. 40 [2])	

Table 18

Ballast troughs		
Collector type	Standard version	Version for higher loads
Portrait	Central hole of the connector (→ Fig. 40 [1])	Second hole from the right (→ Fig. 40 [2])
Landscape	Central hole of the connector (→ Fig. 40 [1])	

Table 19

Collector type	Wall
Landscape	Central hole of the connector (→ Fig. 40 [1])

Table 20

FITTING THE PROFILE RAILS TO THE COLLECTOR SUPPORTS

- ▶ Secure the pre-assembled profile rails [2] with M8 × 20 screws [1] to the collector supports. Do not initially tighten the screws to enable the profile rails to be aligned.

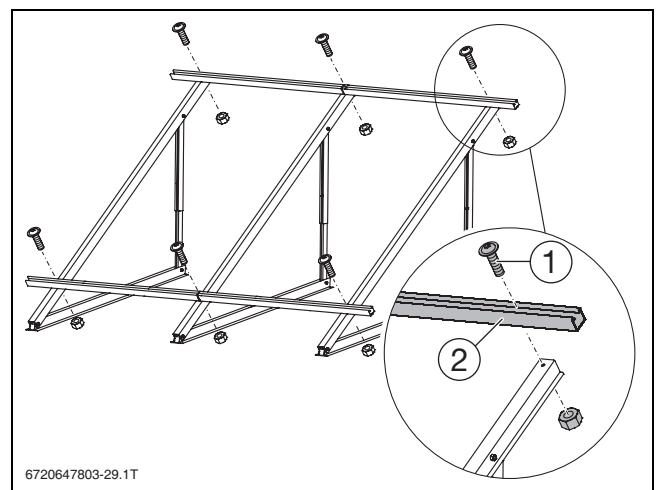


Fig. 41 Profile rail installation (here: 2 portrait collectors)

7.3 FITTING ADDITIONAL PROFILE RAILS

The installation of additional profile rails enables the installation system for portrait collectors to withstand higher loads (→ Chapter Permissible loads, page 5).

- ▶ Secure additional profile rails with M8 × 20 screws in the central hole of the collector supports. Do not as yet tighten the screws to enable the profile rails to be aligned.

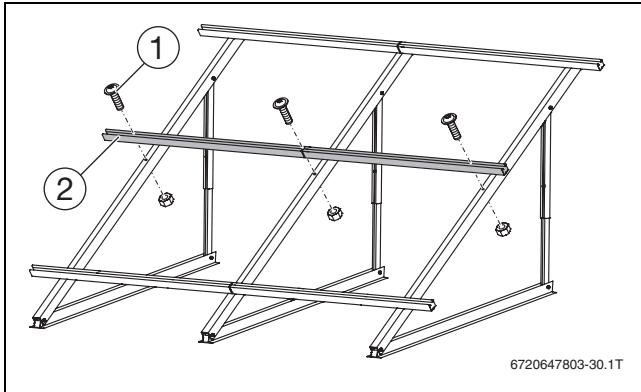


Fig. 42 Installation of additional profile rails (here: 2 portrait collectors)

7.4 ALIGNING THE PROFILE RAILS



It is important for the subsequent collector installation that the profile rails are accurately aligned.

- ▶ Level the profile rails horizontally and with the stated clearance. Use a spirit level.
- ▶ Align sides of the upper and lower profile rails with each other.
- ▶ Check that they are at right angles. Measure the diagonals or place a roof batten, for example, at the ends of the profile rails.
- ▶ Tighten screws M8.

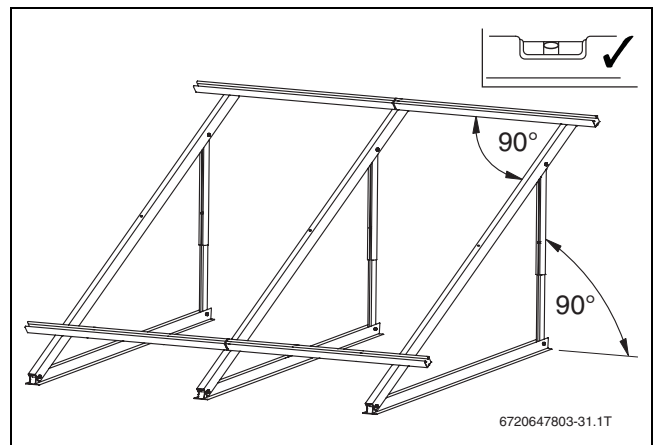


Fig. 43

7.5 FITTING THE ANTI-SLIP BRACKETS

Use both internal slots [1] to fit the two anti-slip brackets.

- ▶ Push the anti-slip bracket over the profile rail and let it click into the slot [2].

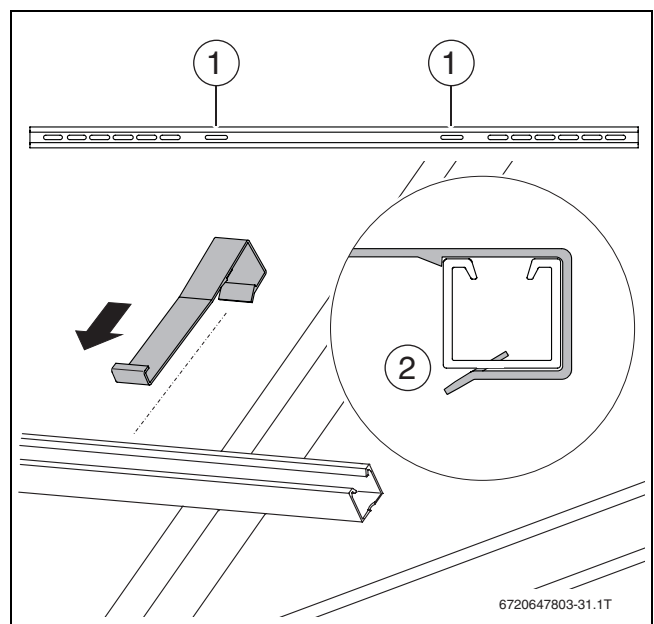


Fig. 44

8 INSTALLING THE COLLECTORS



DANGER: Risk of death 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 just before making the hydraulic connection.



NOTICE: Collector damage through damaged connections.

- ▶ Never use collector connections to lift the collector.
- ▶ To carry the collector, hold it with your hands by the recessed grips or by 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 circlip prior to installation.

- ▶ Tighten the circlip 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 tension force.

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

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

1. Remove plugs just before prior to fitting the solar hose.
2. Push the solar hose with its hose clip onto the collector connection.
3. Tighten the circlip when the hose clip is located directly in front of the bead.

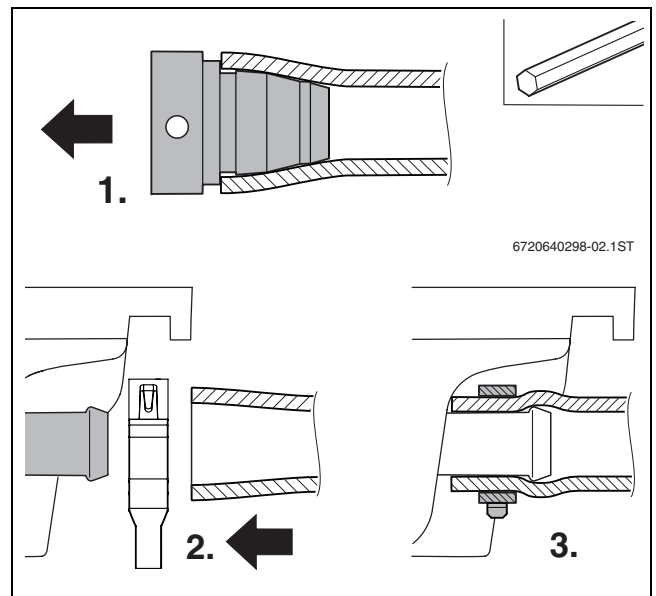


Fig. 45 Installation of the solar hose

8.1 PREPARING THE COLLECTOR INSTALLATION ON THE GROUND

- Observe the information in Chapter 5.2, page 14, 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.



The connection set (accessory) for two collector rows can also be preassembled on the ground (→ Chapter 9.4, page 39).

8.1.1 FITTING THE DUMMY PLUG

- 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.

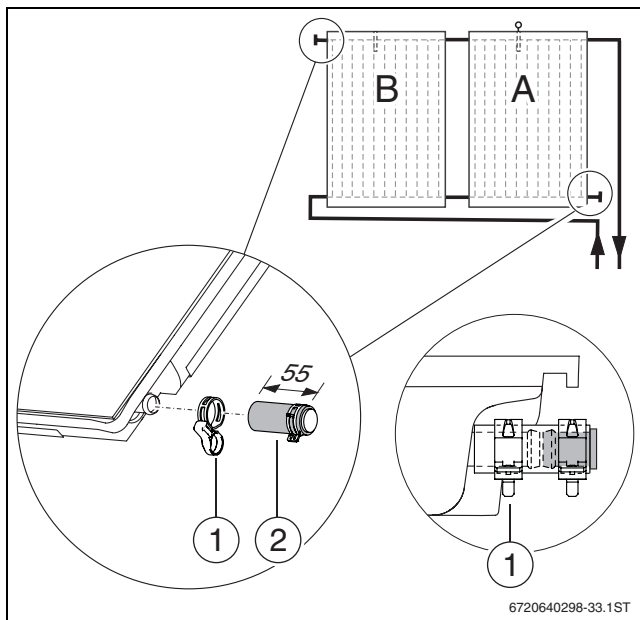


Fig. 46

8.1.2 FITTING THE INTERCONNECTION SET

- Remove the interconnection set from the protective corners.
1. Remove only one plug with an SW5 Allen key.
 2. Push solar hose [2] with a hose clip onto the collector connection.
 3. Tighten the circlip when hose clip [1] is located directly in front of the bead.

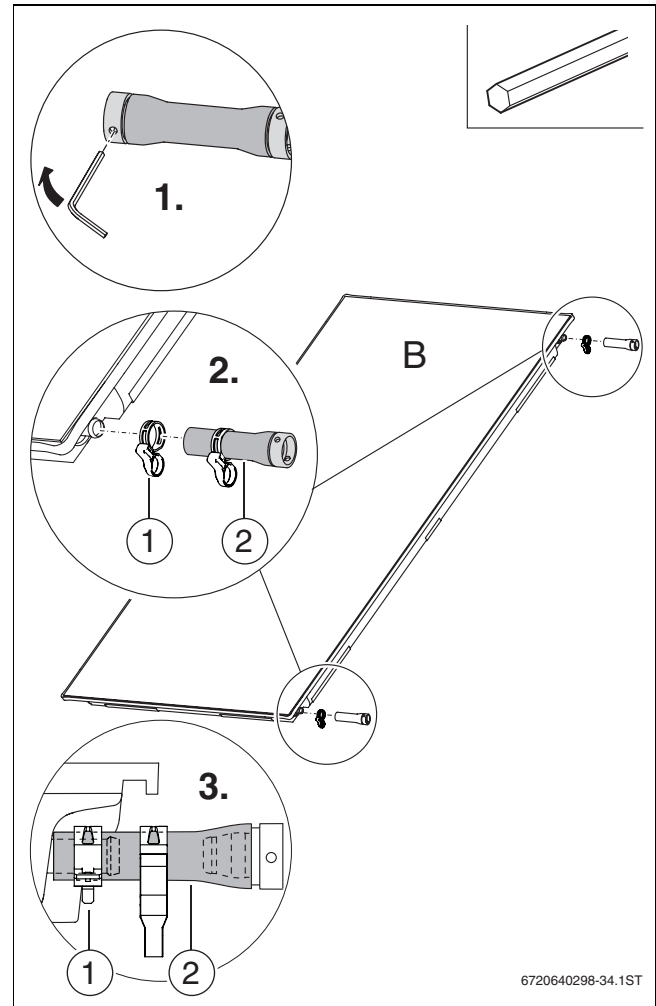


Fig. 47 Interconnection set on the second and all further collectors

8.2 SECURING THE COLLECTORS



WARNING: Risk of injury through falling collectors.

- ▶ Ensure that the installation pockets in the collector casing are undamaged and freely accessible.

The centre of the collectors are secured on the profile rails using doubled sided [1] and, at the ends of a collector row, single sided collector clamps [2].

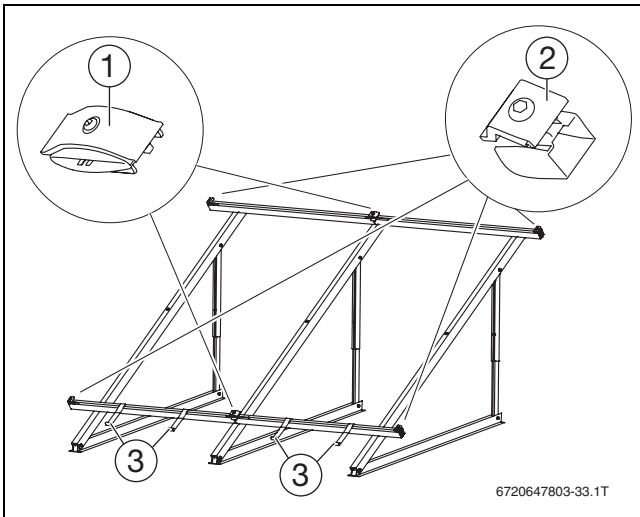


Fig. 48



The plastic parts on the collector clamps do not have any support function. They are simply intended to make installation easier.

8.2.1 FITTING SINGLE SIDED COLLECTOR CLAMPS ON THE RIGHT HAND SIDE



Fit the single sided collector clamp on the left hand side only after the final collector has been installed.

- ▶ Push collector clamp [1] into the profile rail and let it click into the slot.

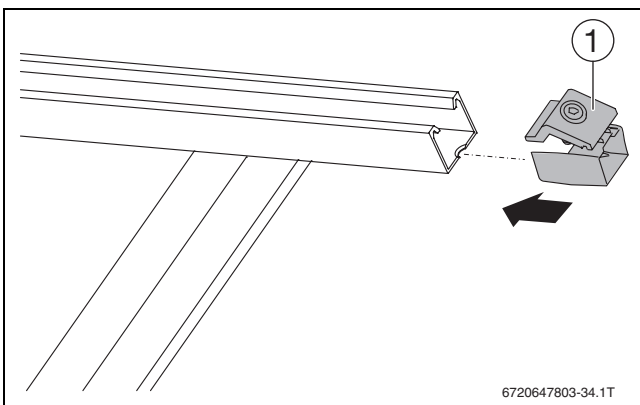


Fig. 49

8.2.2 PLACING THE FIRST COLLECTOR ON THE PROFILE RAILS

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



WARNING: Risk of injury through collectors that slip from the installation system with wall mountings.

- ▶ Ensure that the anti-slip brackets grip into the installation pockets.

- ▶ Place the collector on the right hand side of the profile rails and let the installation pockets [2] slide into the anti-slip brackets [1].

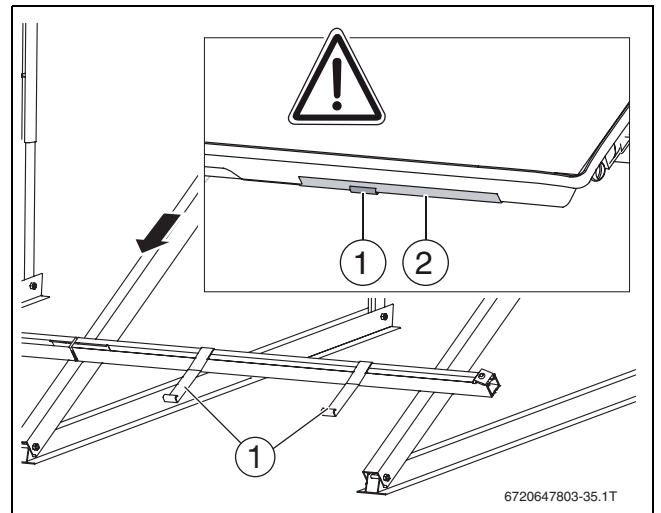


Fig. 50

- ▶ Carefully push the collector up against the collector clamp and level horizontally.

The hold-down retainer (→ Fig. 51, [1]) of the collector clamp must not be allowed to twist. If required, counterhold at the hold-down retainer.

- ▶ Tighten the screw of the collector clamp with an SW5 Allen key.

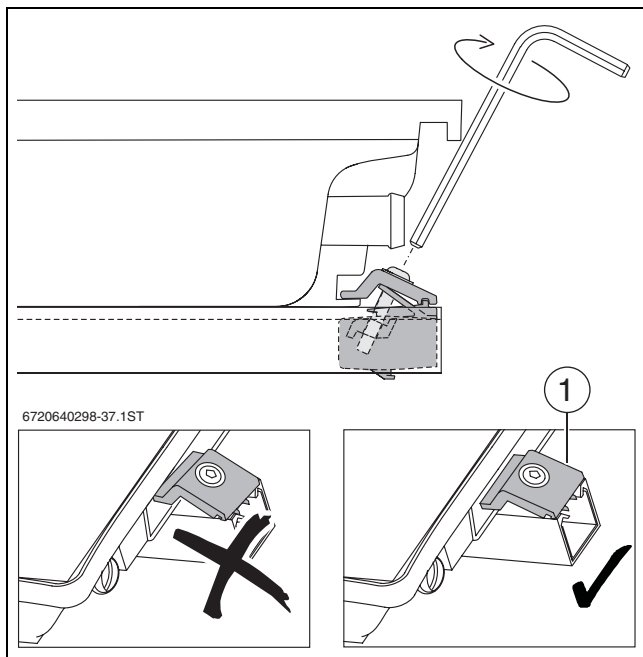


Fig. 51

8.2.3 INSERTING A DOUBLE SIDED COLLECTOR CLAMP

- ▶ Place the double sided collector clamp on the profile rail and push up to the collector.

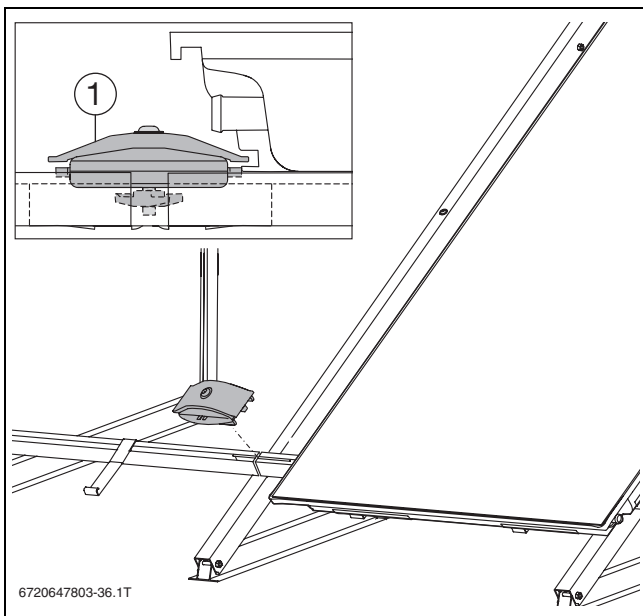


Fig. 52

8.2.4 PLACING THE SECOND COLLECTOR ON THE PROFILE RAILS

- ▶ Pull the plugs from the solar hoses.
- ▶ Place second collector [1] along with the pre-assembled solar hoses onto the profile rails and let it slide into the anti-slip brackets.
- ▶ Push two hose clips [2] onto the solar hoses.

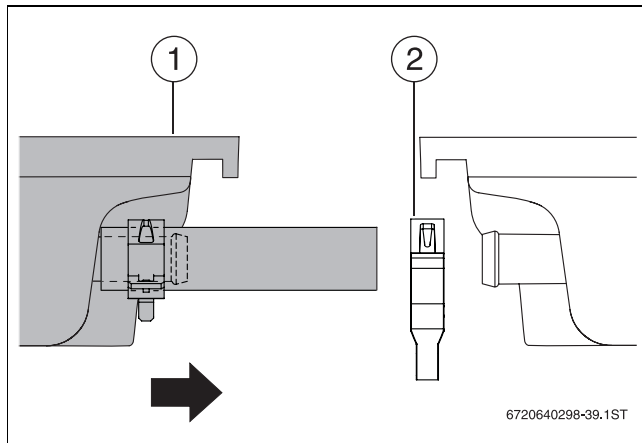


Fig. 53

- ▶ Push the collector up to the first collector so that the solar hoses are pushed onto the collector connections.

The collectors are correctly pushed together when the four apertures on the double sided collector clamp show only green [2].

- ▶ Tighten the screw of the double sided collector clamp with an SW5 Allen key.

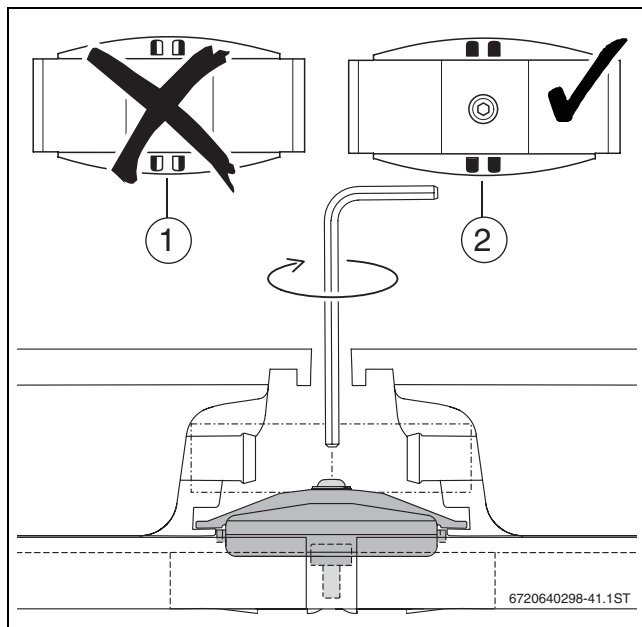


Fig. 54 Fitted double sided collector clamp

- 1 Collector not pushed far enough against the collector clamps
- 2 Collectors fitted correctly; screw can now be tightened

CAUTION: Risk of injury and leaks through escaping solar heat transfer fluid 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.

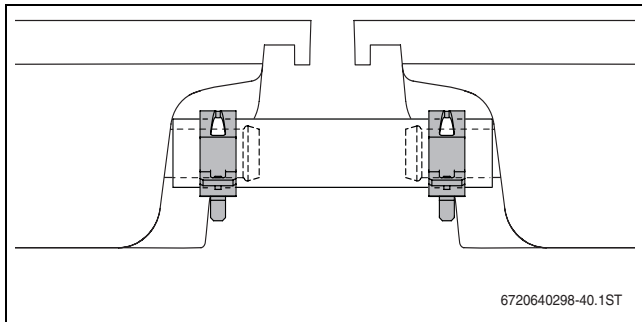


Fig. 55

- ▶ Fit all other collectors in the same way.

8.2.5 FITTING THE SINGLE SIDED COLLECTOR CLAMP ON THE LEFT

- ▶ Push collector clamp [1] into the profile rail and let it click into the slot.

The hold-down retainer [2] of the collector clamp must not be allowed to twist. If required, counterhold at the hold-down retainer.

- ▶ Tighten the screw of the collector clamp with an SW5 Allen key.

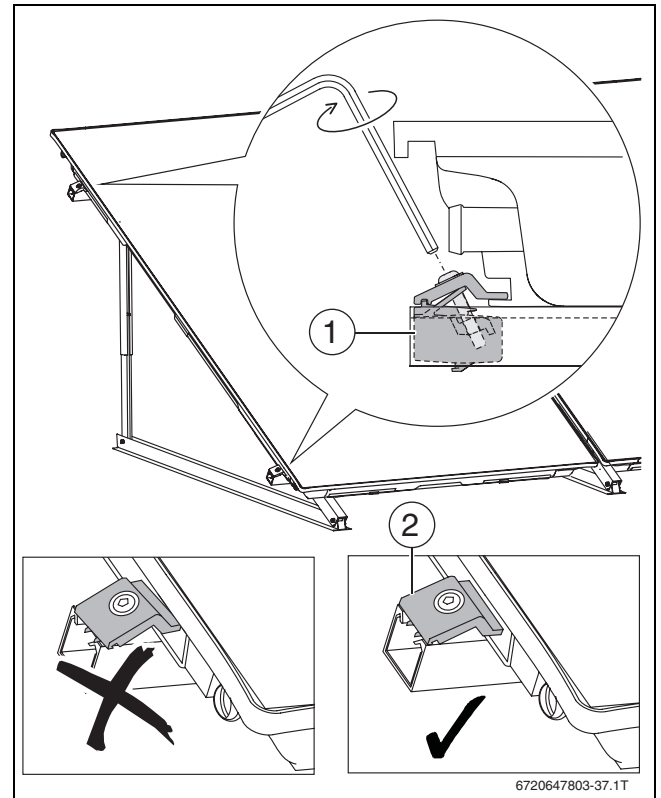


Fig. 56

8.3 INSTALLING THE COLLECTOR 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.



If the sensor pocket of the wrong collector is punctured, seal that sensor well with a plug from the connection set.

NOTICE: System failure through faulty sensor lead.

- ▶ Protect the sensor lead against possible damage.

- ▶ Fit the collector sensor with connected flow into the collector (→ Fig. 57).

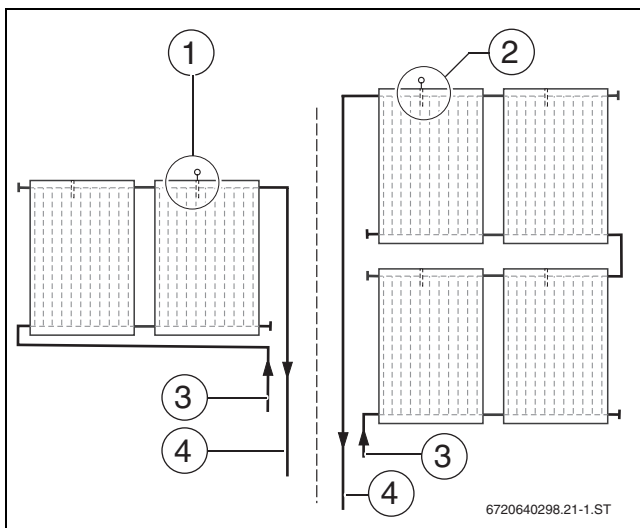


Fig. 57 Position of the collector sensor

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

- ▶ With a screwdriver (for example) puncture the sealing membrane of the sensor well and insert the collector sensor as far as it will go (equal to 165 mm).

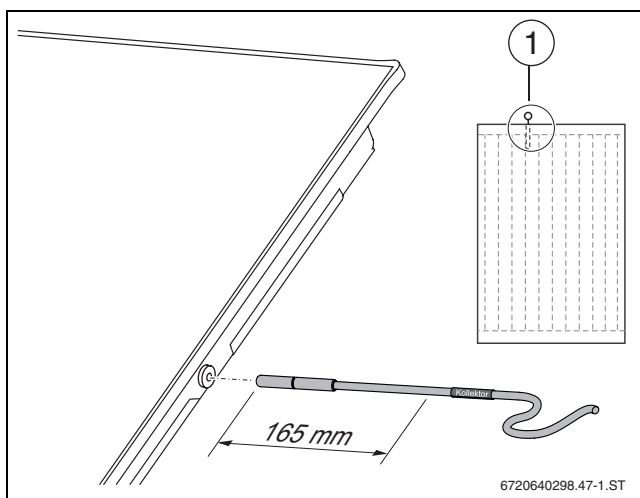


Fig. 58

- 1 Position of the sensor pocket for the collector sensor

9 HYDRAULIC CONNECTION

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

NOTICE: Leaks at the collector connections.

Subsequent loosening of the hose clip can impair its tension force.

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

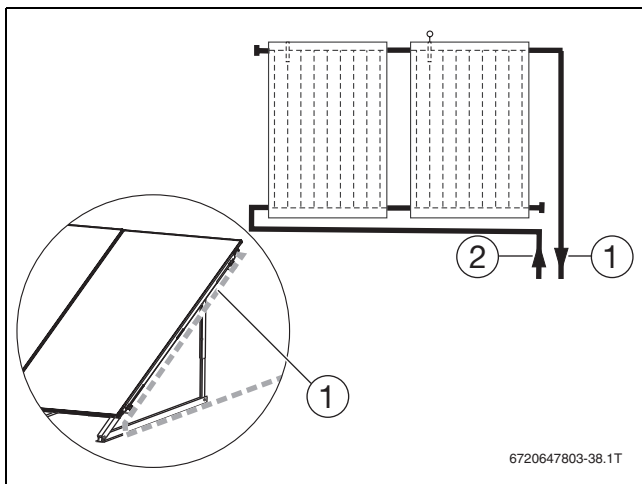


Fig. 59 Collector array pipework

- 1 Flow pipe
- 2 Return pipe

9.1 PIPEWORK INSTALLATION

NOTICE: Leaks on the collector connections.

In vertical flow pipe runs, thermal movements can result in leaks.

- ▶ Route on-site flow pipes along the collector (→ Fig. 59, page 37).
- ▶ Never route flow pipes vertically down.

9.1.1 FITTING RETAINER FOR FLOW LINE

- ▶ Locate retainer [3] at the bottom inside the installation pocket of the collector and at the top inside the all-round collector edge.
- ▶ Tighten screw through opening [2] using an SW5 Allen key.

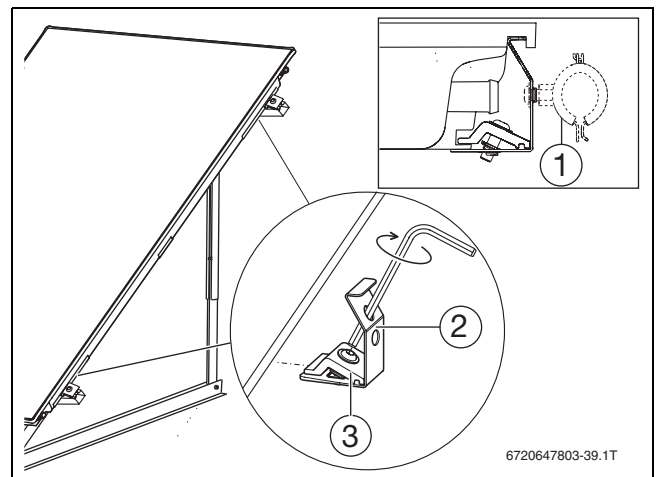


Fig. 60

- 1 Pipe clip (on site)
- 2 Aperture
- 3 Retainer

9.1.2 FITTING FLOW LINE

- ▶ Secure insulated flow pipe on site using a pipe clip on the retainer.

9.1.3 INSTALLING THE RETURN PIPE

- ▶ Route return pipes along the collector array.

9.2 CONNECTING THE PIPEWORK WITHOUT AIR VENT VALVE

9.2.1 CONNECTING PIPEWORK TO THE COLLECTOR

The flow and return pipes are connected to the collector as follows:

- ▶ 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.

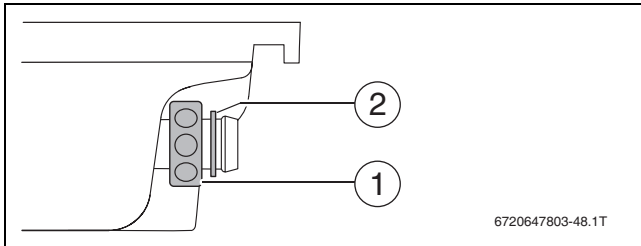


Fig. 61



NOTICE: Collector damage through twisted pipes.

- ▶ When tightening the fittings at elbow ferrule [3], counterhold with an SW24 spanner.

- ▶ Push elbow ferrule [3] with O-ring onto the collector connection and secure with union nut [1].
- ▶ Connect pipe to olive [4, 5].

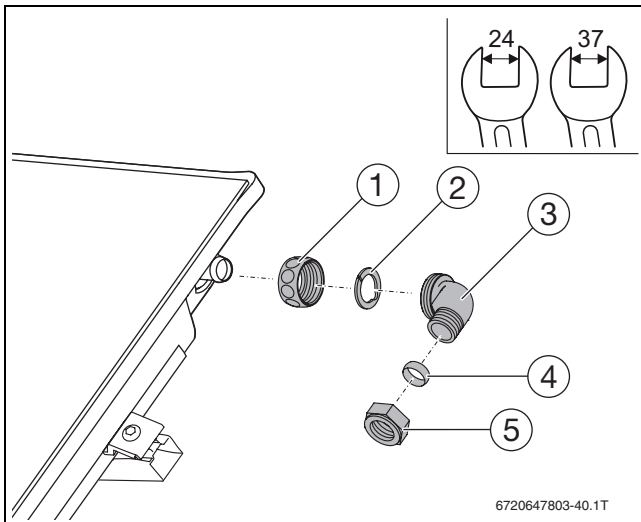


Fig. 62

- 1 Union nut
- 2 Clamping washer
- 3 Elbow
- 4 15 mm olive
- 5 Union nut for locking ring

9.3 CONNECTING PIPEWORK WITH AIR VENT VALVE (ACCESSORY)

To ensure the perfect function of the automatic air vent valve [1], take the following into account:

- ▶ Route flow [2] with an incline towards the air vent valve at the highest point of the system.
- ▶ Route the return with an incline to the collector array.
- ▶ For every change of direction downwards and renewed incline, fit an additional air vent valve.

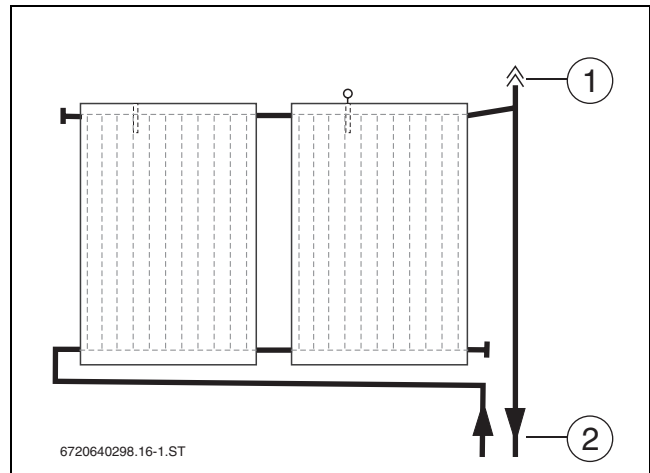


Fig. 63

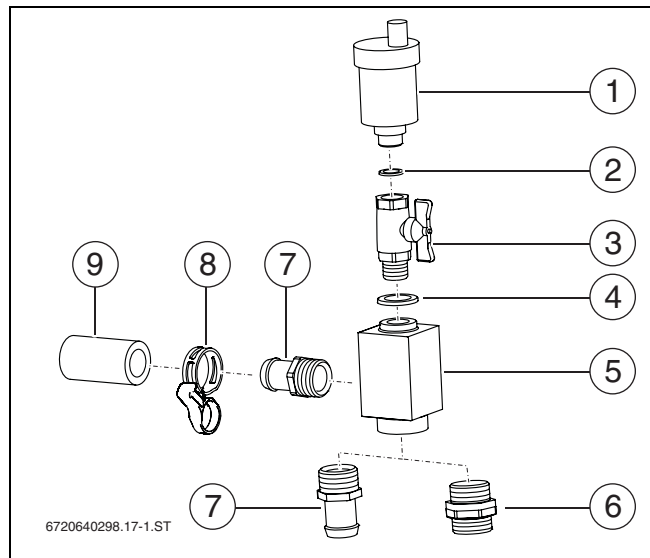


Fig. 64 Standard delivery, air vent valve set

- 1 Automatic air vent valve with locking screw (1x)
- 2 Gasket 9 x 15 mm (1x)
- 3 Isolating valve (1x)
- 4 Gasket 17 x 24 mm (1x)
- 5 Bleeding pot (1x)
- 6 Twin nipple G $\frac{3}{4}$ with O-ring (1x)
- 7 Hose ferrule (2x)
- 8 Hose clip (2x)
- 9 Solar hose, 55 mm (1x)

9.3.1 FITTING THE AIR VENT

- ▶ Push short solar hose [1] with hose clip [2] onto the collector connection.
- ▶ Route the solar hose and sensor lead through the roof.
- ▶ Fit the solar hose for the return in the same way.
- ▶ Insert the hose ferrule R $\frac{3}{4}$ with O-ring [3] and twin nipple [5] into the air separator.
- ▶ Push hose ferrule R $\frac{3}{4}$ [3] as far as it will go into the solar hose and secure with hose clip [2].
- ▶ Push pipe [7] into the 15 mm olive and tighten the fitting.

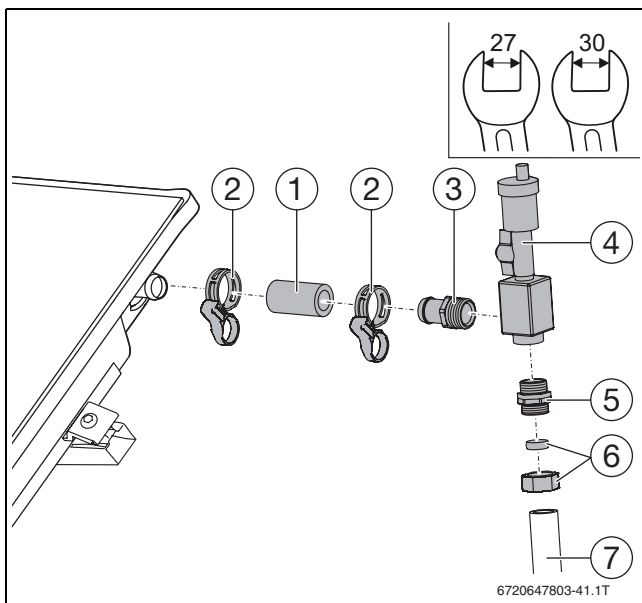


Fig. 65

- 1 Solar hose 55 mm
- 2 Hose clip
- 3 Hose ferrule
- 4 Air vent valve set
- 5 Twin nipple G $\frac{3}{4}$ with O-ring
- 6 Olive and union nut (take from the connection set)
- 7 Pipework (on site)

9.4 FITTING THE CONNECTION SET FOR 2 ROWS (ACCESSORY)

Connecting 2 rows of collectors requires a second connection set (→ Chapter 2.8.2, page 9).

9.4.1 FITTING THE CONNECTION SET

- ▶ Fit additional solar hose with dummy plug [2] and secure with hose clips [1], → Chapter 8.1.1, page 9.

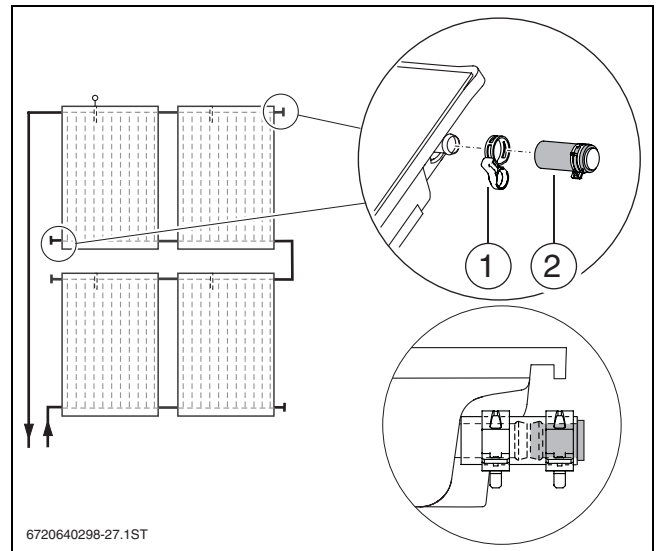


Fig. 66

- ▶ Connect elbow to collector connections (→ Chapter 9.2.1, page 38).
- ▶ Check the clearance between collector rows and trim pipework to that dimension.
- ▶ Make on-site connections [1] between collector rows using copper pipe.

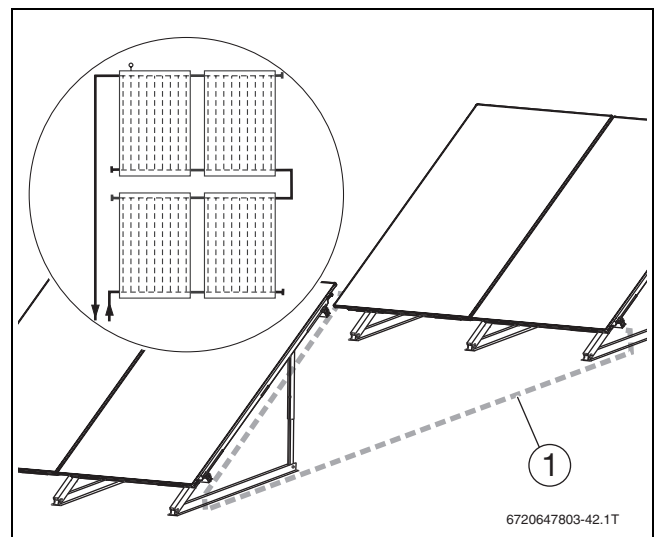



Fig. 67


10 FINAL STEPS

10.1 CHECKING THE INSTALLATION



NOTICE: System damage through corrosion.
Corrosion may result if residual water remains for prolonged periods in the solar thermal system following flushing or pressure testing.


- ▶ Immediately following a pressure test, commission the solar thermal system (→ solar pump station instructions) using solar heat transfer medium.


 After completing the checks, carry out the thermal insulation to complete the work.

Checks:

1.	Profile rails connected to collector supports and screws tightened?	<input type="radio"/>
2.	Anti-slip brackets fitted?	<input type="radio"/>
3.	Collector clamps fitted and screws tightened?	<input type="radio"/>
4.	Solar hoses secured with hose clips (circlip tightened)?	<input type="radio"/>
5.	Collector sensor inserted up to the end-stop?	<input type="radio"/>
6.	Pressure test carried out and all connections checked for leaks (see solar pump station instructions)?	<input type="radio"/>

Table 21

 If you are venting the solar thermal system with an automatic air vent valve (accessory), close the ball valve after venting (→ 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 rays, 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 CLEANING THE 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.

CLEANING GLASS PANES

At an angle of incidence 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.

CLEANING THE VENT

Moisture created during the night (condensation) can escape from the collector through the vents [1] located at each collector corner.

Environmental influences can cause these vents to become blocked.

- ▶ Should the collector still be misty in spite of 4 hours intensive solar radiation, clean the vents [1] with a thin nail, for example.

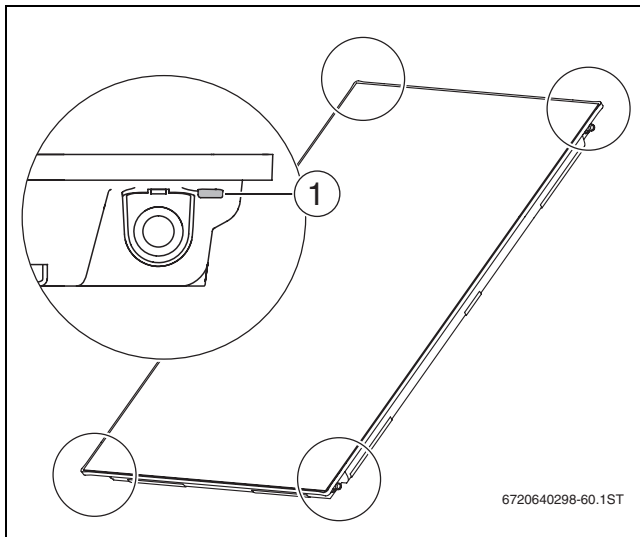


Fig. 68

12 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.
- ▶ Undo the collector clamps on the side and in between collectors.
- ▶ Remove solar hoses.
- ▶ Use lifting equipment for handling the collectors (→ Chapter 4, page 11).

DISPOSING OF COLLECTORS

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

13 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 solar thermal 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 maintenance.

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

Owner:	Site location:
--------	----------------

Maintenance and inspection tasks	Page	Maintenance/inspection			
Date:					
1.	Visual inspection of collectors carried out (safe seating, optical impression)?		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	Collector sensor positioned correctly and inserted into the sensor well as far as it will go?	36	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	Visual inspection of the installation system carried out?		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	Visual inspection for leaks carried out at the joints between the installation and the roof?	37	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	Visual inspection of pipe insulation carried out?	40	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	Visual inspection of glass panes. Cleaning in the case of severe contamination.	41	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Notes					
	The collector array has been serviced as specified by these instructions.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Date, stamp, signature	Date, stamp, signature	Date, stamp, signature

Table 22

Use this page note down the serial numbers from 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: _____

Collector 4: _____

Collector 5: _____

Collector 6: _____

Collector 7: _____

Collector 8: _____

Collector 9: _____

Collector 10: _____

The Worcester Greenskies Solar-Lifestyle carries a fully transferable 10 year guarantee against faulty material or manufacture subject to Terms and Conditions. To read the full Terms and Conditions, please visit us online at www.worcester-bosch.co.uk/guarantee.

The guarantee registration form is available on this page and can be submitted electronically. Alternatively please telephone one of our guarantee registration advisers on 0844 8922552.

Your statutory rights are not affected by the manufacturer's guarantee.

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