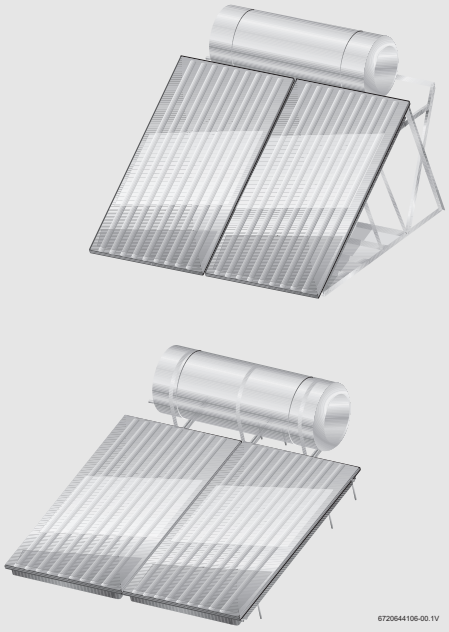

Thermosiphon for flat roofs and rooftops

TSS300

300 l system - TSS SERIES SOLAR HOT WATER SYSTEM

BOSCH

Installation instructions

6 720 644 106 (2011/04) AU

Contents

1 Key to symbols and safety instructions

1.1 Key to symbols

Warning information

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

If there is a risk of electrocution, the exclamation mark in the warning triangle is replaced by a lightning symbol.

Signal words 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 that fatal injury may occur.

Important information

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

Additional symbols

Symbol	Explanation
▶	Action step
→	Cross-reference to other parts of this document or to other documents
•	List/list entry
–	List/list entry (second level)

Tab. 1

1.2 Safety instructions

This chapter explains how the information in these installation instructions is laid out, and gives general safety instructions for safe and trouble-free operation. Safety instructions and user notes relating specifically to installation are found in the installation instructions alongside the specific installation steps. Please read the safety instructions carefully before starting the installation. If safety instructions are ignored, severe or even fatal injuries may result, as well as material losses and environmental damage.

Danger when working on roofs

- Take appropriate action to prevent accidents during all work on roofs.
- Take precautions against a possible fall while working on roofs.
- Always wear your own protective clothing and safety equipment.
- After completing the installation, check the installation set, the collectors and the cylinder are securely positioned.

Installation and maintenance

- Only have the appliance installed or modified by licensed contractors.
- Only use the cylinder for heating domestic hot water.

Risk of scalding!

Always monitor operation if temperatures are above 60 °C.

- We recommend installing a solar tempering valve on the outlet connection.

Risk of burns!

If the collector and installation material have been exposed to the sun's rays for a prolonged period, touching certain components may cause burns.

- Always wear your own protective clothing and safety equipment.
- Before and during installation, cover the collector (for example with a blanket) and installation material to protect against high temperatures caused by the sun's rays. It is worth leaving the equipment covered until the system is commissioned.

Maintenance

- **Customer recommendation:** Bosch recommend that this appliance is serviced by a suitably qualified person at periods not exceeding 2 years.
- The user is responsible for the safety and environmental compatibility of the appliance.
- Only use genuine Bosch spare parts.

Instructing the customer

- Instruct the customer in the functions and operation of the appliance.
- Inform the customer that they must not carry out any modifications or repairs.

Risk of damage due to operator error

Operator errors can result in injury and damage to property.

- Ensure that children never operate this appliance unsupervised or play with it.
- Ensure that only personnel who can operate this appliance correctly have access to it.

2 Information about the installation set

2.1 Intended use

The rooftop installation set is designed to hold solar thermal collectors and their associated cylinder, which are installed on pitched roofs at an angle of 25° to 45°. Use special double ended screws for the installation. The flat roof installation set can be used with a roof slope of up to 15° towards the collector. Never damage the structure of the building while installing the solar thermal system.

Conditions of use

Only fit the installation set on roofs with sufficient load-bearing capacity; if necessary, ask a structural engineer or professional roofer for guidance.

The installation set is suitable for a maximum standard snow load of 1.0 kN/m^2 and an installation height of no more than 20 m.

Never use the rooftop and flat roof installation sets to fix any other objects to the roof. It is designed only to enable the solar collectors and cylinder to be securely fixed.

Observe all standards and directives applicable to the installation and operation of this heating appliance.

All installations must be carried out in accordance with AS/NZS3500.4, NZS5261, AS/NZS3000 and all local building, plumbing and electrical regulations.

CAUTION:

For sanitary fixtures used primarily for the purpose of personal hygiene that a temperature control device be fitted (such as a tempering valve) as per AS3498 must be used.

Lightning protection

The components of the thermosiphon solar thermal system which conduct electricity must be connected by an electrician to an earth cable of at least 16 mm^2 and to the bonding.

If a lightning protection system is installed, an electrician must check the connection of the thermosiphon solar thermal system to this system.

If the height of the building (installation height) is less than 20 m and the system has no electrical heating element, no special measures are required for lightning protection.

3 Specification

Thermosiphon system TSS300		
Certificates		**AS/NZS 2712:2007**
Further details		**TSS 300**
Approximate operating weight	kg	510
Clearance between supports	mm	920 + 920
Dimensions of the system installed[1)]: L x W x H	mm	2320x2365x1705

Tab. 2 System specification

1) flat roof

Collectors FCC-TSS		
Length	mm	1965
Width	mm	1035
Height	mm	67
Clearance between collectors	mm	25
Absorber capacity, vertical version	l	0.8
External surface area (gross)	m^2	2.03
Absorber surface area (net)	m^2	2.09
Net weight, vertical version	*kg*	30
Permissible collector operating pressure	kPa	600

Tab. 3 Collector specification

Cylinder TSS300		
Version		**300 l**
Weight (dry)	kg	95
Volume, primary circuit	l	20
Volume, secondary circuit	l	280
Max. operating pressure, primary circuit	kPa	250
Max. operating pressure, secondary circuit	kPa	1000
Diameter	mm	580
Width	mm	1850

Tab. 4 Collector specification

4 Before installation

4.1 General notes

DANGER: Risk to life through falls and falling parts!

- Take precautions against a possible fall while working on roofs.
- Always wear your own protective clothing and safety equipment.
- After completing the installation, check the installation set, the collectors and the cylinder are securely positioned.

Before installation, familiarise yourself with the on-site conditions and local regulations.

Check

- That the delivered material is complete and undamaged.
- The structure of the roof for sufficient load-bearing capacity and damage (e.g. leaks).
- The optimum orientation of the solar collectors. Take solar radiation into account (northerly orientation). Avoid shade from high trees or similar.
- The stability of the installation surface. Remove gravel or similar material.

Only use original spare parts from the manufacturer and replace faulty parts immediately.

Minor diviations from optimal orientation do not result in noticeable differences in output. For further information on the output curve of the system in cases where the orientation/slope deviates, see the technical documentation.

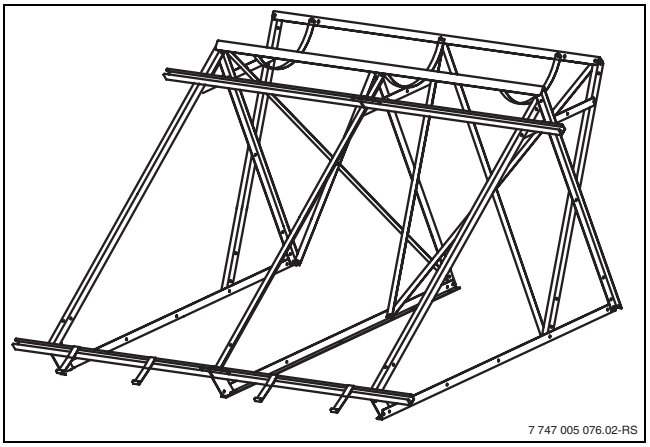

Fig. 1 Full view of flat roof frame

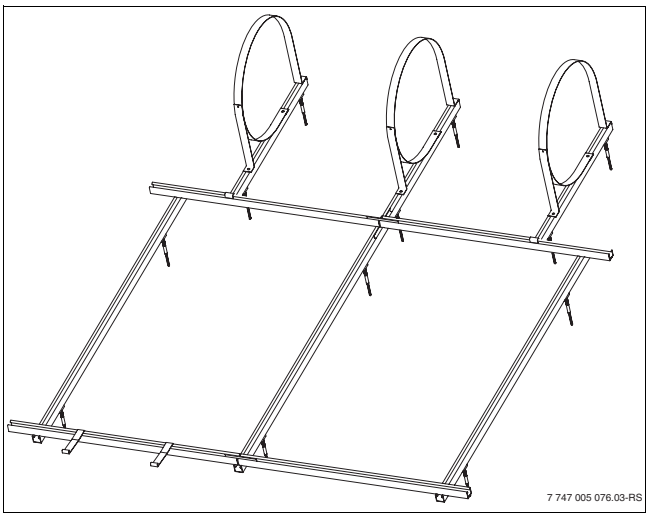

Fig. 2 Full view, rooftop installation

4.2 Component description

4.2.1 Installation set for flat roofs

The installation sets are designed to hold and secure the cylinder and collectors.

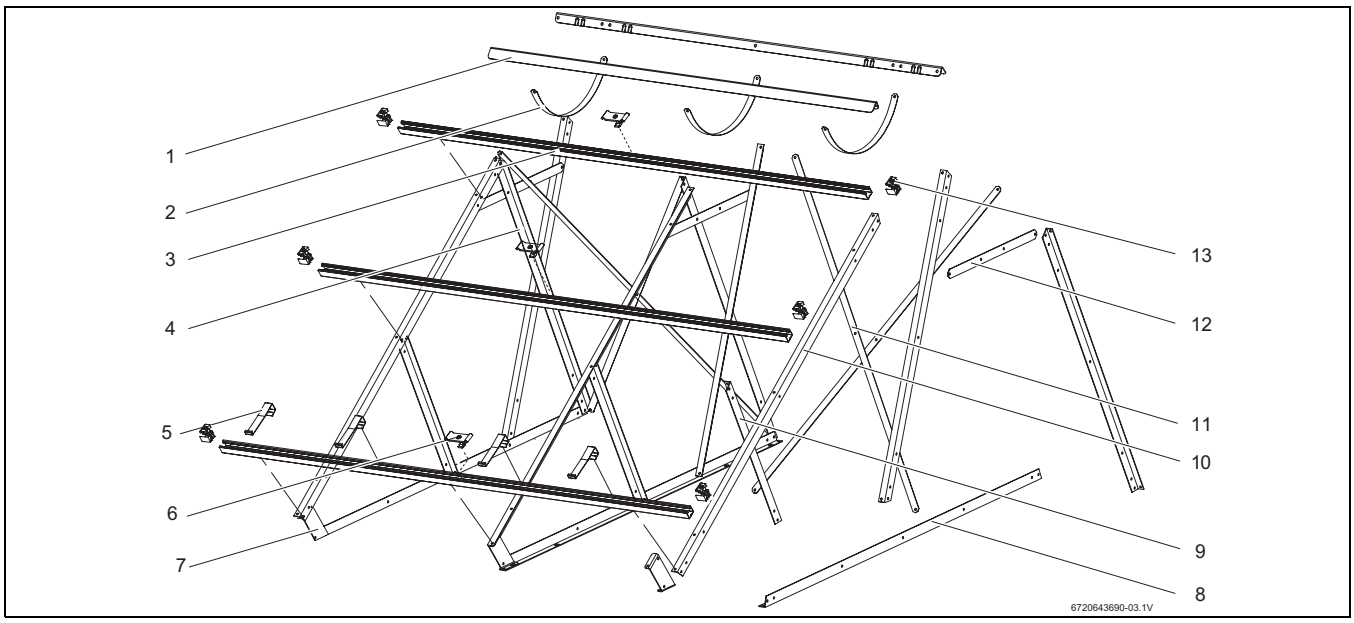

Fig. 3 Installation sets for 2 collectors: 1 standard installation set, 1 extension installation set

Flat roof, standard installation set:			**Flat roof, extension installation set for 300 l system**:		
Pos.	Qty.	**Description**	**Pos.**	Qty	**Description**
2	2x	Cylinder strap	**1**	2x	Cylinder support bracket (35/30)
3	2x	Flat roof/rooftop profile rail	**2**	1x	Cylinder strap
4	4x	Cylinder support rail (1400 mm - 45/30)	**3**	2x	Flat roof/rooftop profile rail
5	2x	Anti-slip bracket	**4**	2x	Cylinder support rail (1400 mm - 45/30)
7	2x	Lower support	**5**	2x	Anti-slip bracket
8	2x	Lower support rail (2070 mm - 35/30)	**6**	2x	Double sided collector tensioner
10	2x	Collector support rail (1950 mm - 45/	**7**	1x	Lower support
11	2x	Wind brace	**8**	1x	Lower support rail (2070 mm - 35/30)
12	2x	Cross brace	**10**	1x	Collector support rail (1950 mm - 45/
13	4x	Single sided collector tensioner	**11**	2x	Wind brace
	30x	Round head screw M8x20	**12**	1x	Cross brace
	30x	M8 nut		1x	Self-adhesive foam pad
	2x	Self-adhesive foam pad		20x	Round head screw M8x20
				20x	M8 nut
Flat roof, additional support, standard installation			**Flat roof, additional support, extension:**		
Pos.	Qty.	**Description**	**Pos.**	Qty	**Description**
3	1x	Flat roof/rooftop profile rail	**3**	1x	Flat roof/rooftop profile rail
9	2x	Additional support (750 mm - 45/30)	**6**	1x	Double sided collector tensioner
13	2x	Single sided collector tensioner	**9**	1x	Additional support (750 mm - 45/30)
	6x	Round head screw M8x20		3x	Round head screw M8x20
	6x	M8 nut		3x	M8 nut

Tab. 5

4.2.2 Rooftop installation set

The installation sets are designed to hold and secure the cylinder and collectors.

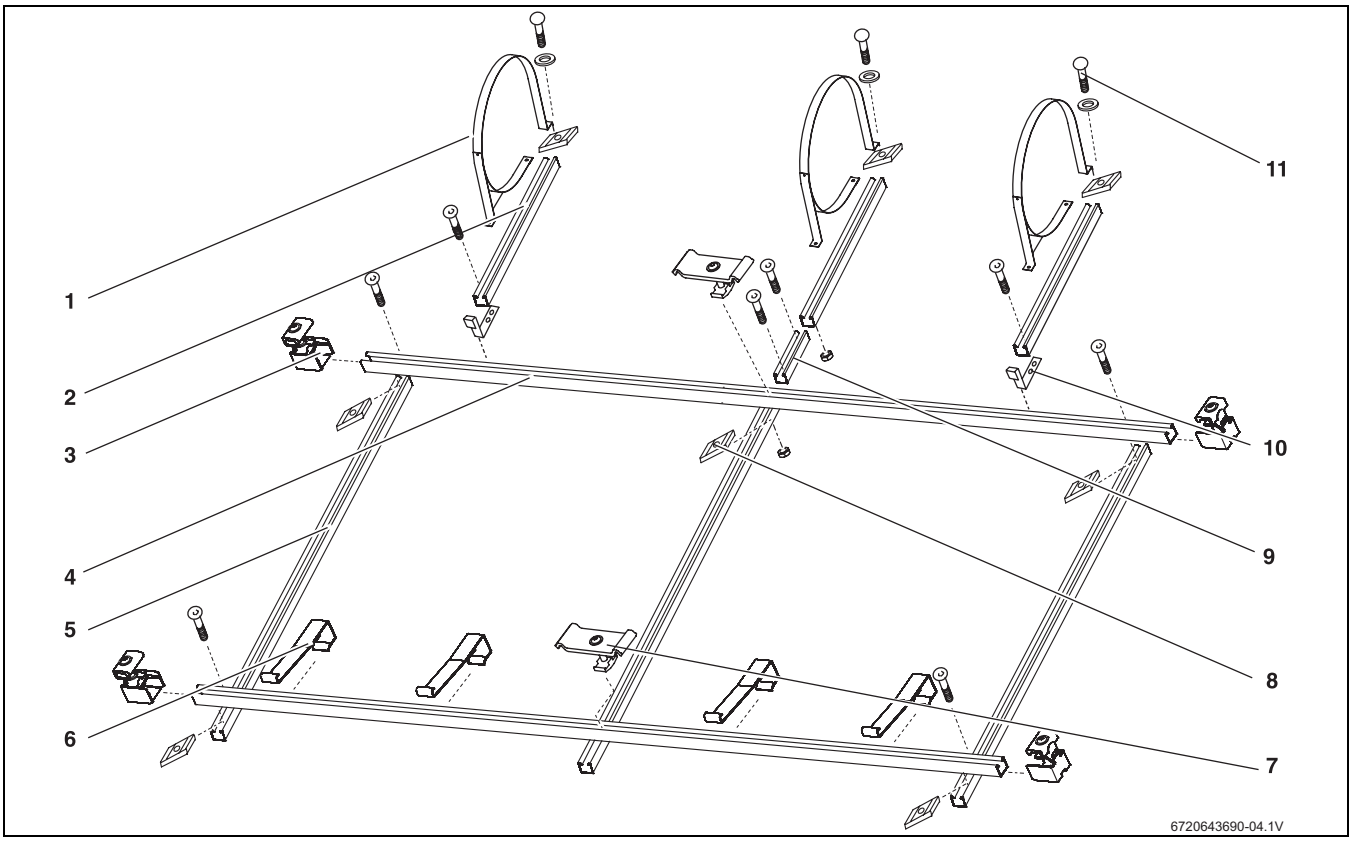

Fig. 4 Installation sets for 2 collectors: 1 standard installation set, 1 extension installation set

Standard installation set:				**Extension installation set for 300 l system:**		
Pos.	**Quantity**	**Description**		**Pos.**	**Quantity**	**Description**
1	2x	Cylinder strap		**1**	1x	Cylinder strap
2	2x	Cylinder profile rail		**2**	1x	Cylinder profile rail
3	4x	Single sided collector tensioner		**4**	2x	Flat roof/rooftop profile rail
4	2x	Flat roof/rooftop profile rail		**5**	1x	Collector profile rail
5	2x	Collector profile rail		**7**	2x	Double sided collector tensioner
6	2x	Anti-slip bracket		**6**	2x	Anti-slip bracket
8	10x	Locking bolt		**8**	5x	Locking bolt
9	2x	TSS joiner		**10**	2x	Positioning bracket
11	2x	Screw M8x50		**11**	1x	Hexagon bolt M8x50
	2x	Washer			1x	Washer
	4x	M8 nut			2x	M8 nut
	12x	Round head screw M8x20			6x	Round head screw M8x20

Tab. 6

4.2.3 Hydraulic connection for installation on flat roofs and rooftops

For the hydraulic connection, you will need a connection set and a joining set for the connections between collectors.

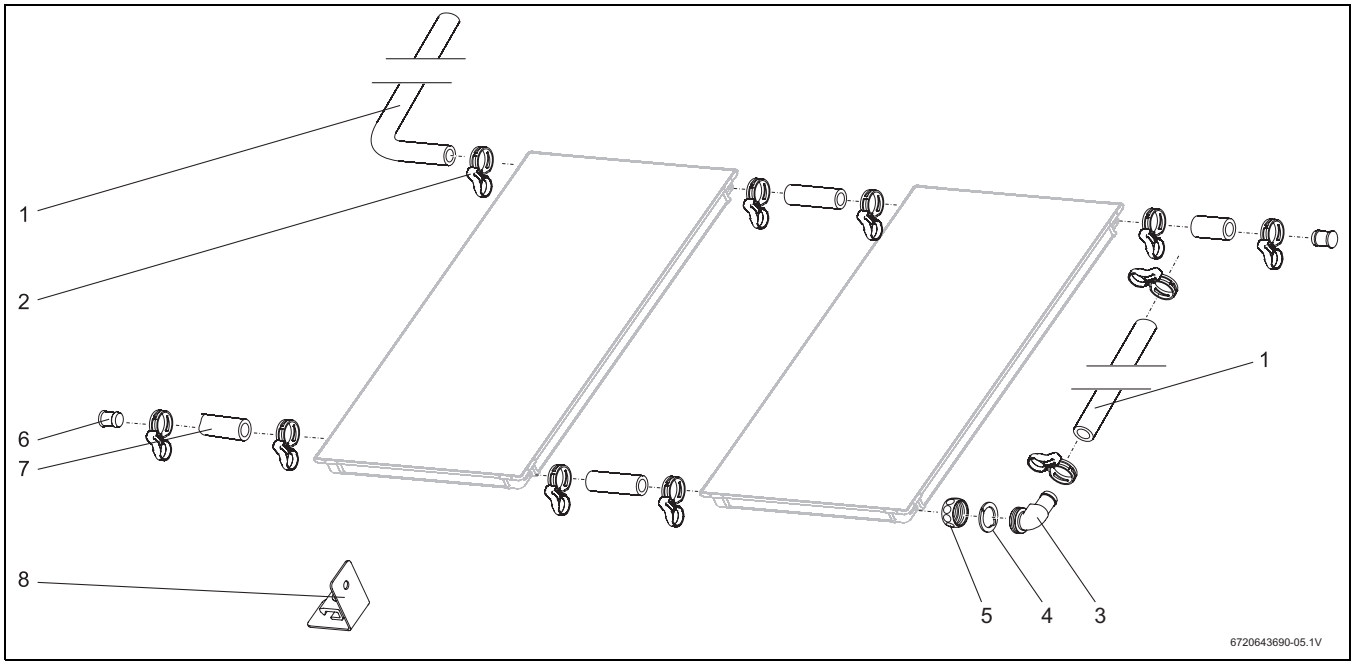

Fig. 5 Connection set and joining set (shown with 2 vertical collectors)

(Connection set TSS → Fig. 5):						
Pos.	**Quantity**	**Description**		**Pos.**	**Quantity**	**Description**
1	1x	Solar hose 3300 mm			1x	Safety valve ½ " 250 kPa
2	4x	Hose clip			1x	Cap ½ "
3	1x	Angled terminal G1xD21			2x	Hose terminals 18 x ¾ "
4	1x	Clamping disc			1x	Sealing disc
5	1x	Union nut G1			2x	Solar endform
6	2x	Dummy plug			1x	Arrestor valve
7	2x	Solar hose 55 mm			1x	Brass elbow ¾ " F
8	1x	Retainer for flow line			2x	Brass adapter ¾ " F
					1x	PTR valve
					1x	PTR Adapter ½ " F

Tab. 7

Joining set for each collector (in four transport corners, → Fig. 6)

Pos.	Quantity	Description
1	4x	Hose clip
2	2x	Solar hose 95 mm long (only for FCB-TSS)

Tab. 8

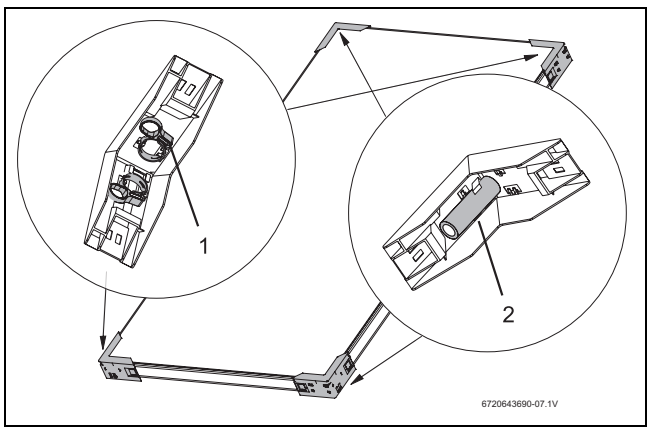

Fig. 6 Four transport corners with one joining set

4.3 Other equipment required

- Brace/cordless screwdriver
- Tape measure
- Wood drill, Ø 6 mm (drill bit length → chapter 5.2.2)
- Metal drill bit, Ø 13 mm
- Spanner sizes 13, 15, 19 and 30
- Spirit level
- Plumb line
- Vacuum pump
- Safety harness with safety line
- Material for pipe insulation
- Scaffolding
- Crane or mobile hoist
- For flat roofs: spanner for roof connection
- Pipe cutter
- Drain line for PTR
- Plumbing valves (if required)

4.4 Transport and storage

All components are protected by transport packaging.

Transport protection for collector and cylinder connections

The collector connections are protected against damage with plastic caps.

NOTICE:

- Do not remove the plastic caps [1] until immediately prior to installation.

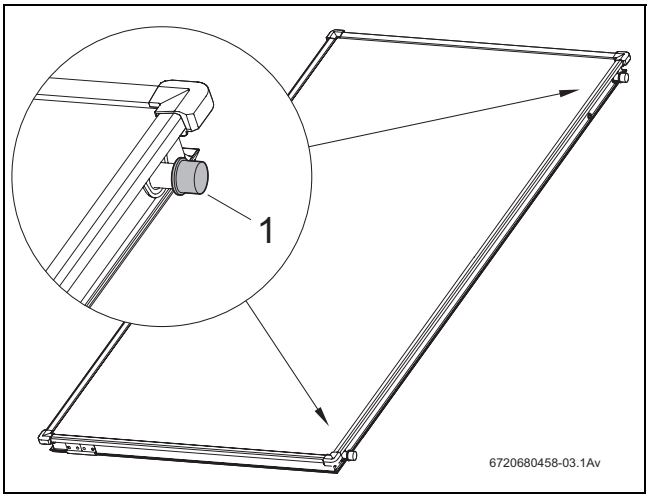

Fig. 7 Plastic caps on collector connections

Storage

Store the collectors in a dry location.

4.5 Estimating your space requirements

NOTICE: System damage through wind gusts and pressure peaks at the flat roof perimeter.

- Before commencing installation, ensure that a clearance of at least one metre is allowed between the flat roof frame and the roof perimeter (→ Fig. 8).

- Allow sufficient installation surface.

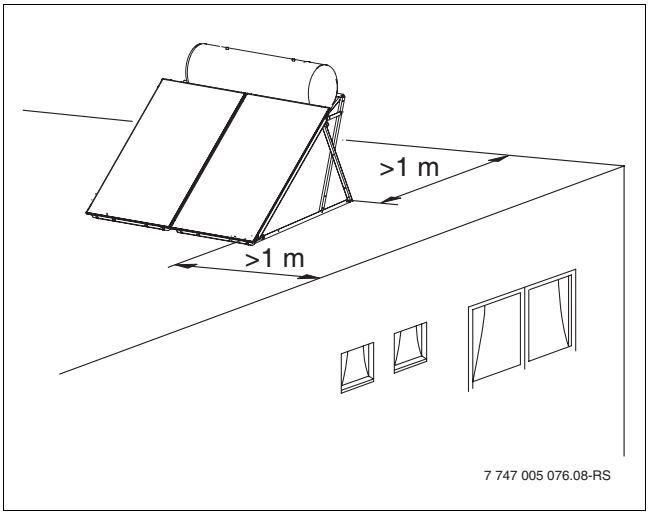

Fig. 8 Distance from roof perimeter (here 300 l system)

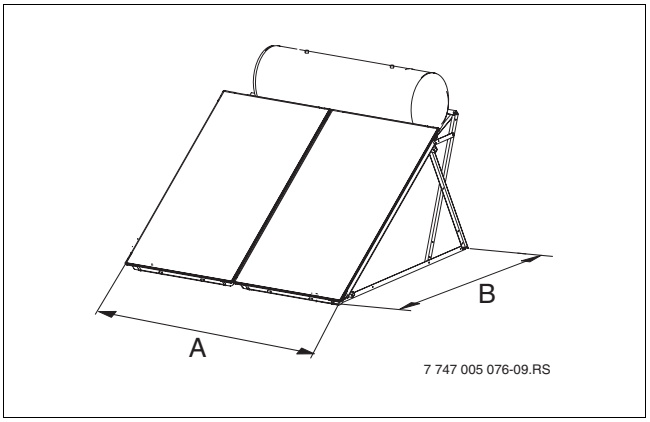

Fig. 9 Space requirement, collector array

The dimensions (Tab. 9 and Tab. 10) relate to the required roof surface.

Number of collectors	Dimension A	Dimension B
2 (300 l)	2335 mm	2770 mm

Tab. 9 Space requirement for rooftop installation

Number of collectors	Dimension A	Dimension B
2 (300 l)	2335 mm	2365 mm

Tab. 10 Space requirement for flat roofs

Take the pipework into consideration when calculating in the space requirement. For the pipes on the right and left of the collector array, allow at least an extra 0.5 m on either side.

5 Installing the flat roof frame and the rooftop support

DANGER: Risk to life through falls and falling parts!
- Take appropriate action to prevent accidents during all work on roofs.

5.1 Flat roof

5.1.1 Installing flat roof frame 300 l system - building not taller than 20 m

To facilitate installation, first tighten all screws by hand.

- Join two cylinder support rails together in the centre to form a cross (Fig. 10, [1]), and fit to the lower support rail [2] in such a way that the surface lying on the ground comes to face inwards.
- Secure lower support (Fig. 10, [3]) to the end of the lower support rail.

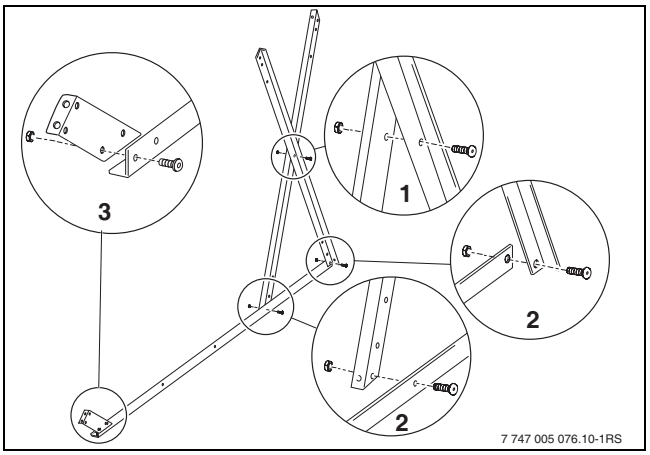

Fig. 10 Securing the support rails

- Secure the collector support rails at the top to the cylinder support rail (Fig. 11, [1]), and at the bottom to the support [2].

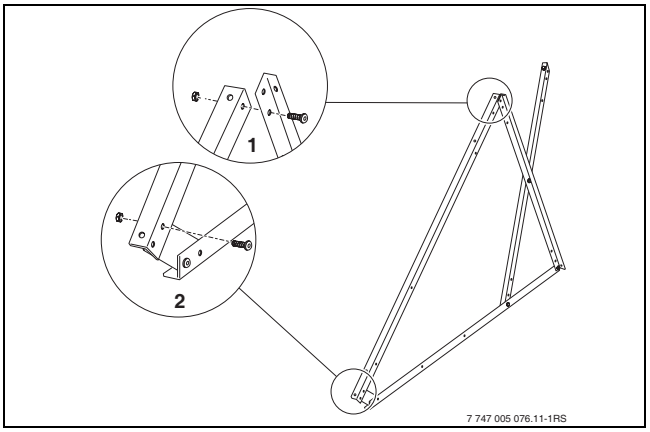

Fig. 11 Fitting the collector support rail

- Secure the cross brace (Fig. 12, [1]) to the two cylinder support rails and the collector support rail.

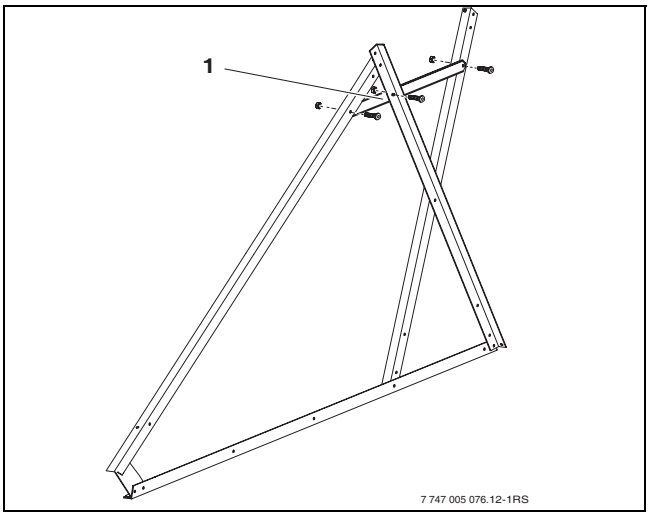

Fig. 12 Inserting the cross brace

- Make two further side triangles:
  - the centre triangle (Fig. 13, [2]) as a mirror image of the first [1],
  - the left triangle (Fig. 13, [3]) the same as the first side triangle [1].

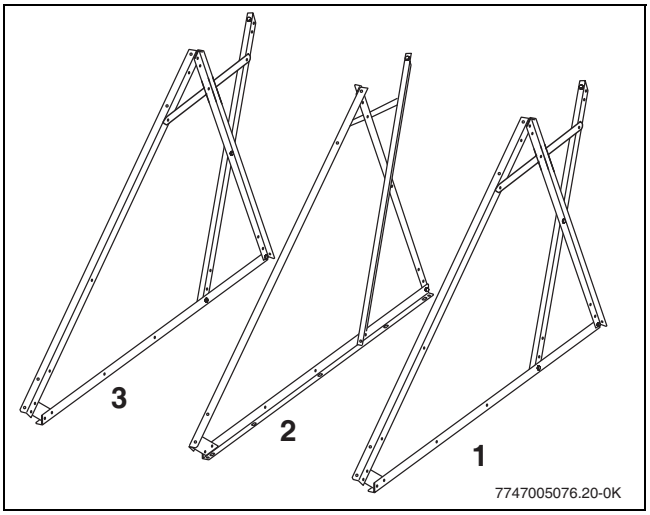

Fig. 13 Further side triangles

- Make 2 crosses from 4 wind braces (Fig. 14, [1]).
- Connect the three side triangles to the wind brace crosses. Ensure that the planes of both wind brace crosses are in opposite directions. Initially only secure the wind brace cross at the bottom.
- With the right wind brace cross, ensure that
  - the first wind brace is installed from the top back right down to the bottom front left.
  - the second wind brace is installed from the top back left down to the bottom front right.

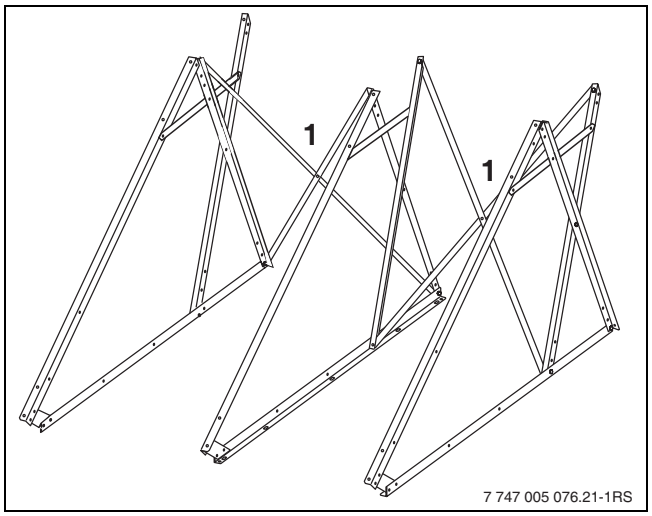

Fig. 14 Fitting the wind braces

- Initially only secure cylinder support bracket (Fig. 15, [1]) at the right and left to the wind brace cross and cylinder support rail.

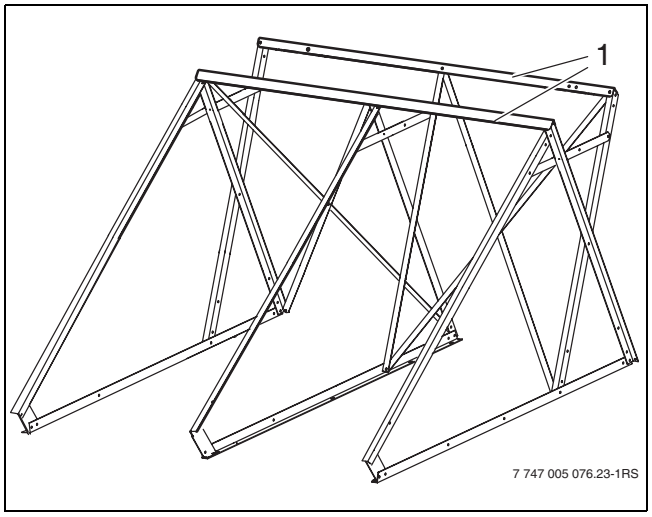

Fig. 15 Securing the cylinder support bracket

- Attach cylinder straps (Fig. 16, [1]) between the two cylinder support brackets. Ensure that the flattened screw head points in the direction of the DHW cylinder (which is fitted later).

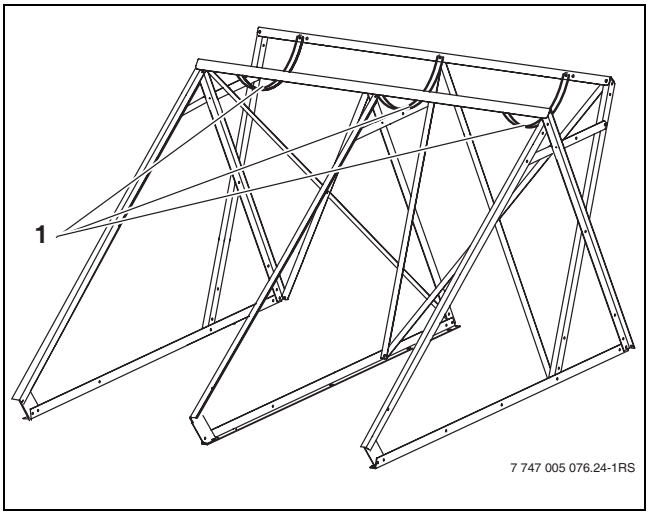

Fig. 16 Attaching the cylinder straps

- Connect the profile rails on both sides to the collector support rails.
- Align the lower support rails (Fig. 17, [2]) so they are parallel to each other.
- Tighten all screws.
- Affix the self-adhesive foam pads supplied to the cylinder straps.

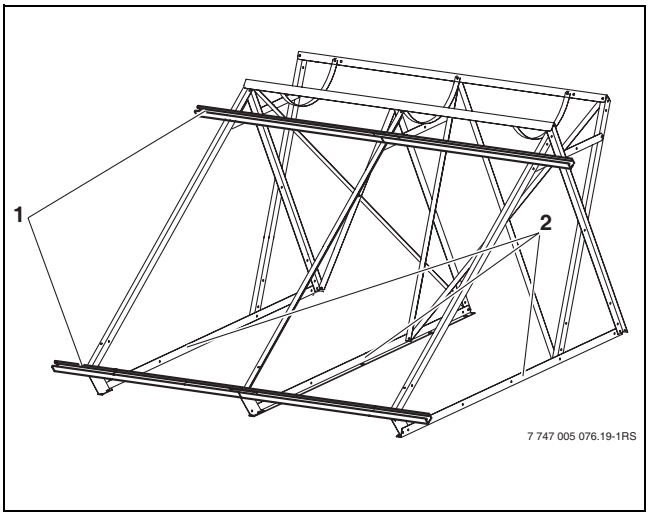

Fig. 17 Fitting the flat roof/rooftop profile rails

Fitting anti-slip brackets

To prevent the collectors from slipping, fasten two anti-slip brackets to the lower flat roof/rooftop profile rails for each collector.

- Push each anti-slip bracket (Fig. 18, [3]) in the inner slots [1] from the outside over the profile rails until it clicks into place [2].

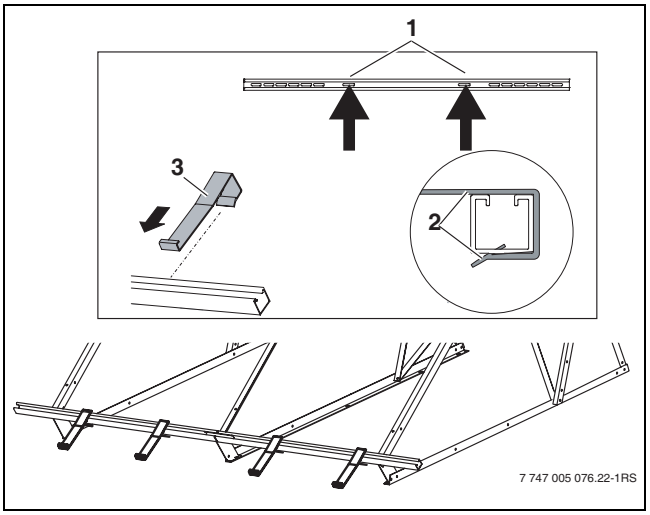

Fig. 18 Hooking in the anti-slip brackets

5.1.2 Roof connection

NOTICE: System damage due to inadequately secured lower support rails.

- Ensure the support rails are adequately secured given the surface on which they are mounted; consult a structural engineer if necessary.
- Take the influence of wind forces into account.

Secure the lower support rails to the surface using three screws (core diameter 10 mm) per rail (→ Fig. 19).

- Secure the lower support rail at the back near the cylinder with two screws.
- Secure the lower support rail at the front near the collector with one screw.

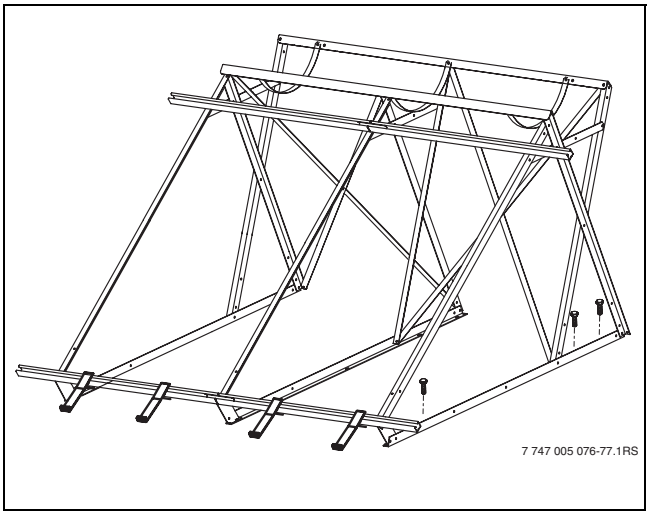

Fig. 19 Roof connection for flat roof system

Observe country-specific standards and guidelines regarding wind loads.

In order to prevent the structure slipping or being damaged by wind, choose the fixing option that will not cause damage to the roof membrane:

- Fix profile rails directly to the roof
- Fix profile rails to steel girders
- Fix profile rails to concrete slabs

Whichever method is used, take account of the structural integrity of the roof.

Roof connection for flat roof installation			
Height of building	Wind speed	Securing the lower profile rails Number and type of screws[1)]	Concrete slabs (Minimum weight) TSS 300
0 to 8 m	102 km/h	3 x M10/8.8	290 kg
8 to 20 m	129 km/h		500 kg

Tab. 11 Values for required fixing for thermosiphon systems

1) Per lower rail

Fixing the lower profile rails

The flat roof frame can be secured with the fixings for the lower profile rails. As an example, the process is described using I-beams.

Design the subframe in such a way that the thermosiphon system can withstand wind and snow loads that act on it.

In addition, provide a means of fixing on site that stabilises the structure and prevents damage to the roof.

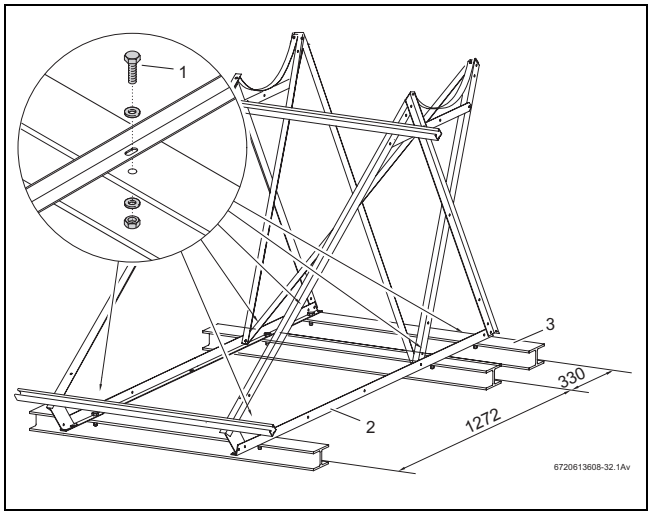

Fig. 20 Roof connection for flat roof system on I-beams; dimensions in mm

5.2 Rooftop installation

5.2.1 Roof connection for rooftop installation

DANGER: Risk to life through falls and falling parts!

- Take precautions against a possible fall while working on roofs.
- Take appropriate action to prevent accidents during all work on roofs.
- Always wear your own protective clothing and safety equipment.

Use a roofing ladder to provide a better footing on roofs or slide the roof tiles up at the edge of the collector array.

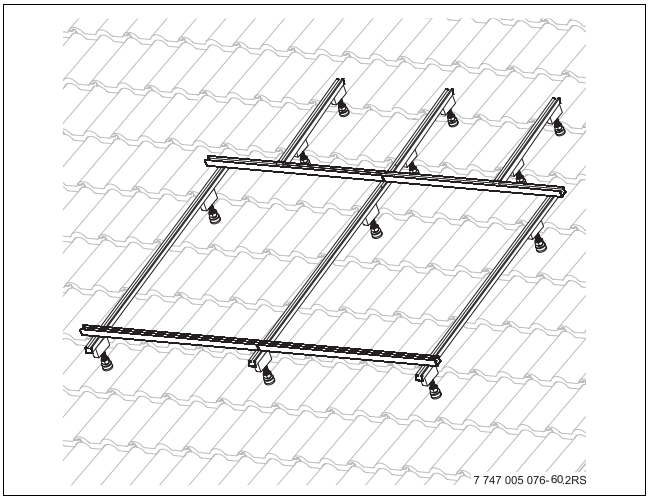

Fig. 21 Pre-assembled profile rails for two collectors

Determining clearances

The dimensions given in the tables are guide values that should be approximately maintained.

On tiled roofs, the corrugations determine the distance between the roof connections.

Distance between the double ended screws

Every profile rail is secured with two double ended screws [1] (→ Fig. 22). See table 12 for the distance between the roof connections.

System	Distance A	Distance B	Distance C	Distance D	Distance E
300 l	1890 ± 180 mm	1550 ± 70 mm	1930 ± 70 mm	2420 ± 70 mm	1440 ± 180 mm

Tab. 12 Distance between the double ended screws

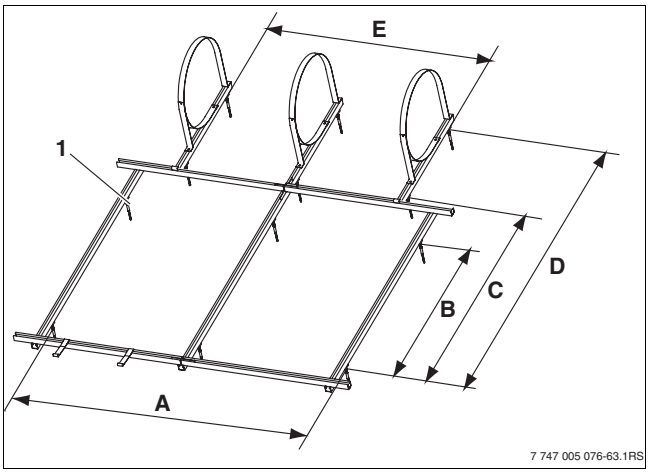

Fig. 22 Distance between the double ended screws

5.2.2 Roof connection with double ended screws

DANGER: Risk to life due to breathing in fibres containing asbestos!

- Work with materials containing asbestos must only be carried out by experts or persons who have been fully instructed on the correct procedures.

Fit double ended screws to secure the profile rails.

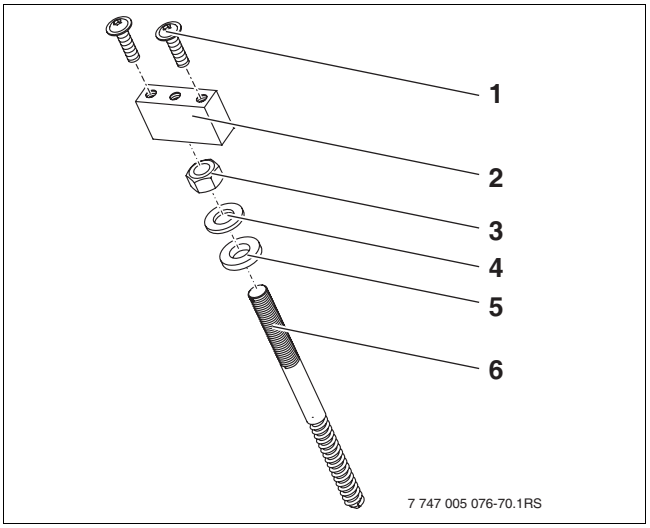

Fig. 23 Roof connection

1 Screws
2 Support block
3 M12 nut
4 Washer
5 Sealing disc
6 M12 double ended screw

NOTICE: System damage due to a subframe with inadequate load bearing capacity.

- Check that the subframe has adequate load bearing capacity. To secure the double ended screws, timber supports at least 40 x 40 mm thick are required.
- If necessary, install additional timber supports in order that the measurements in table 12, page 18 can be maintained.

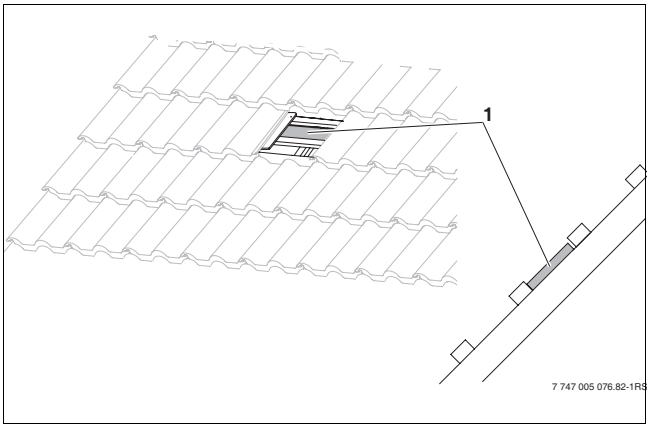

Fig. 24 Installing boards/planks if required

Fitting the double ended screws

Using the wood drill, drill precisely at a 90° angle through the roof subframe to obtain a flat, level surface between the support block and profile rail. To do so, we recommend preparing a drilling guide or template. Take a timber support approx. 0.50 m to 1.00 m long. Drill a hole (Ø 6 mm) vertically right through the timber support (→Fig. 25).

- Determine the length of the drill bit for the wood drill required according to the following calculation (→ Fig. 25):

	90 mm
Height of tile peak	+
Height of drilling template	+
Required wood drill bit length from drill chuck (Ø 6mm)	=

Tab. 13

NOTICE: Building damage due to leaking roof.

- Never drill into a tile valley.

- Drill through the corrugated roof using a metal drill bit (Ø 13 mm), taking account of the positions of the double ended screws (Tab. 12, page 18). Do not drill into the wood beneath!
- Feed wood drill bit (Ø 6 mm) through the template and drill vertically into the subframe (timber support).
- When fitting the double ended screws, note the sequence of the individual parts (→ Fig. 26).
- Turn support block (Fig. 26, [1]) as far as it will go onto the double ended screw (Fig. 26, [5]).

- Using a size 15 spanner, turn the pre-assembled double ended screws into the roof until dimension B is achieved (→ Tab. 14).

When turning in the double ended screws, ensure that the distances (→ Tab. 14, Fig. 27) are the same for all double ended screws.

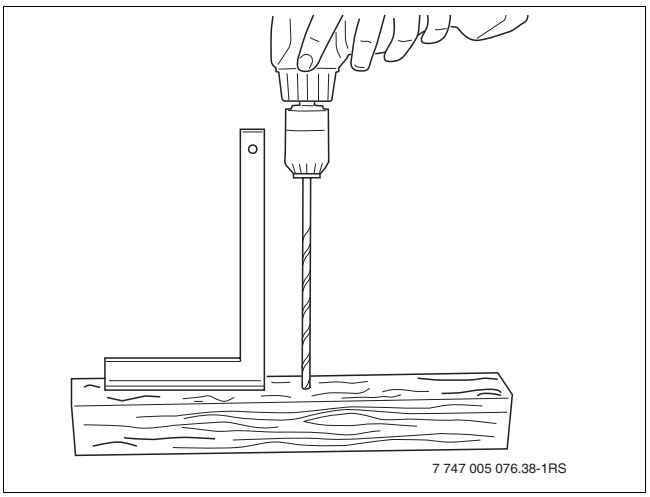

Fig. 25 Creating a drilling template

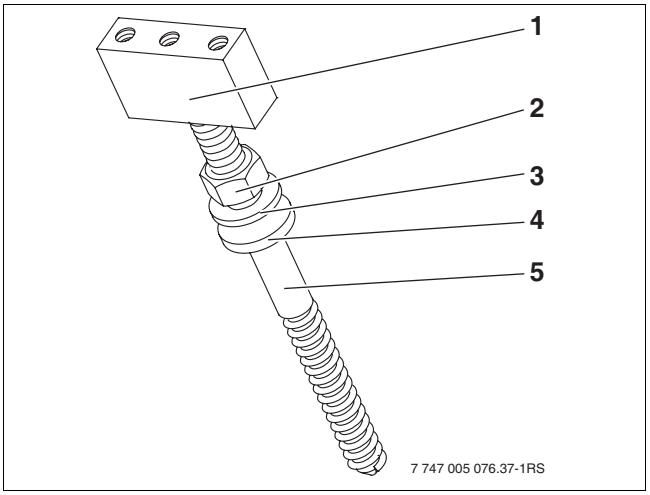

Fig. 26 Fitting the double ended screws - sequence

1 Support block
2 M12 nut
3 Washer
4 Sealing disc
5 M12 double ended screw

- Tighten the nuts (Fig. 26, [2]) until the sealing disc (Fig. 27, [3]) fully touches the roof.

The support block must be turned fully onto the double ended screw.

Height of tile peak Dimension A	Dimension B
35 mm	70 mm
40 mm	65 mm
45 mm	60 mm
50 mm	55 mm
55 mm	50 mm
60 mm	45 mm

Tab. 14 Installation dimensions. Dimensions depend on the height of the relevant corrugated tile peak

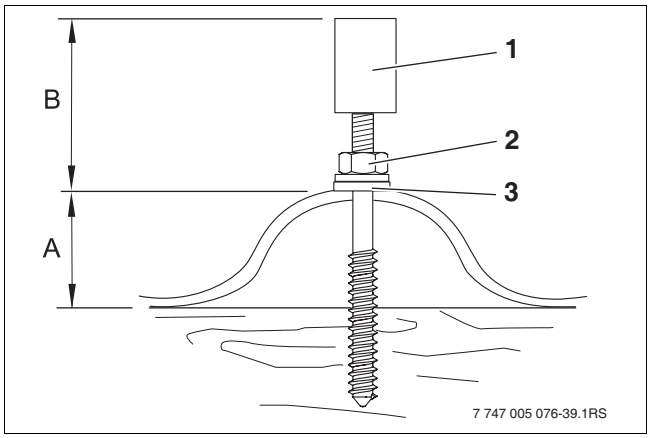

Fig. 27 Installed double ended screw

1 Support block
2 M12 nut
3 Sealing disc

5.2.3 Installing profile rails

Preparing centre collector profile rail

The centre collector profile rail must be equipped at the upper edge with the TSS joiner for subsequent connection to the cylinder profile rail.

- Push TSS joiner (Fig. 28, [1]) into the collector profile rail [2] and secure with M8x20 screws and M8 nuts.

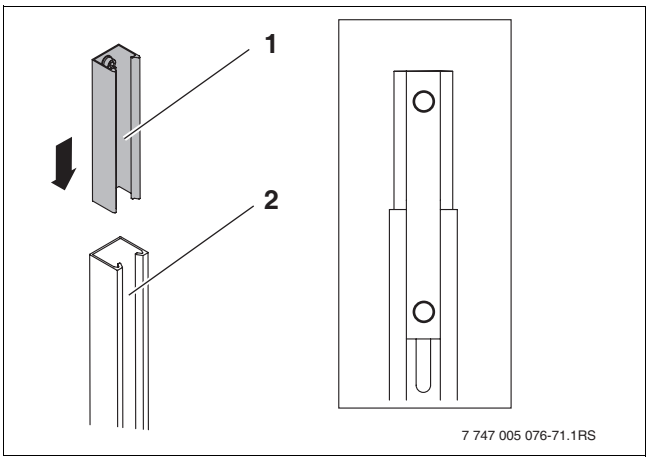

Fig. 28 Inserting TSS joiner into collector profile rail

1 TSS joiner
2 Collector profile rail

- Secure collector profile rails (Fig. 29, [3]) with two screws each [1] to the support block [2], beginning in the lower slot.

The collector profile rails must not sag due to differences in the rafter levels.

- Use a plumb line to check. If necessary, underlay the profile rails at the support block.

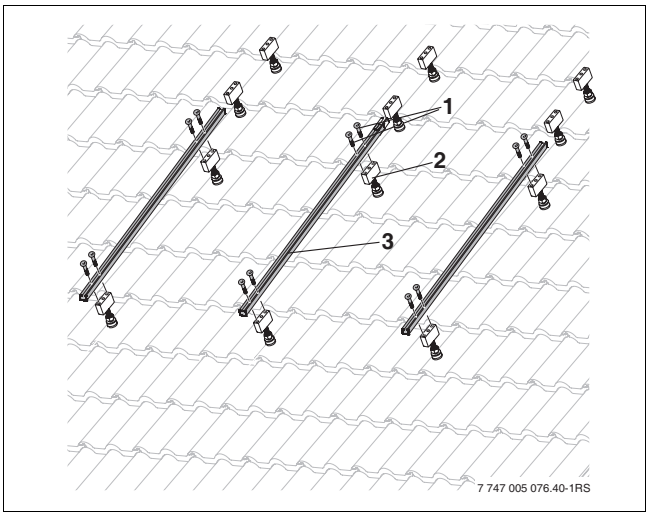

Fig. 29 Fastening the profile rail to the support block

1 Screw
2 Support block
3 Collector profile rail

Preparing flat roof/rooftop profile rails

- Position locking bolt (Fig. 30, [2]) in the collector profile rail [3] and tighten screw.

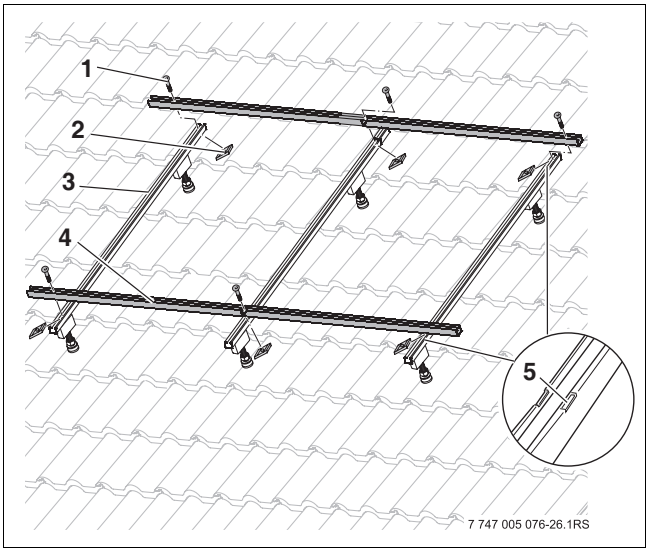

Fig. 30 Securing flat roof/rooftop profile rail to collector profile rail

1 Screw
2 Locking bolt
3 Collector profile rail
4 Flat roof/rooftop profile rail
5 Notch

- Push centre cylinder profile rail (Fig. 31, [1]) onto TSS joiner on centre collector profile rail and secure with M8x20 screws and M8 nuts.
- Secure positioning bracket (Fig. 31, [2]) to the side cylinder profile rails [1] using screws and nuts.
- Hook the two side cylinder profile rails (Fig. 31, [1]) into the flat roof/rooftop profile rail [3].

- Secure cylinder profile rails (Fig. 31, [1]) with two screws each to the support block.

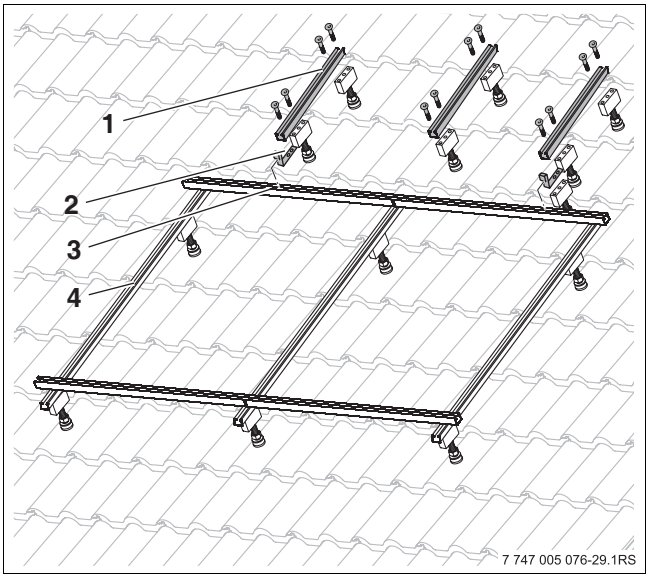

Fig. 31 Securing cylinder profile rails

1 Cylinder profile rail
2 Positioning bracket
3 Flat roof/rooftop profile rail
4 Collector profile rail

We recommend fitting the screws to the cylinder strap on the ground in advance. Subsequently fit the cylinder strap to the cylinder profile rail.

- Insert screw into the front end of cylinder strap (Fig. 32, [3]) and loosely attach locking bolt [4] until a little resistance can be felt.
- Insert screw into cylinder strap support bracket (Fig. 32, [5]) and loosely attach locking bolt until a little resistance can be felt.
- Position front end of cylinder strap (Fig. 32, [3]) in notch [6] and tighten screw.
- Position cylinder strap support bracket (Fig. 32, [5]) in the second notch and tighten screw.
- Fit screw, washer and locking bolt to end of cylinder strap (Fig. 32, [1]). Do not fasten this end yet!
- Tighten all screws.

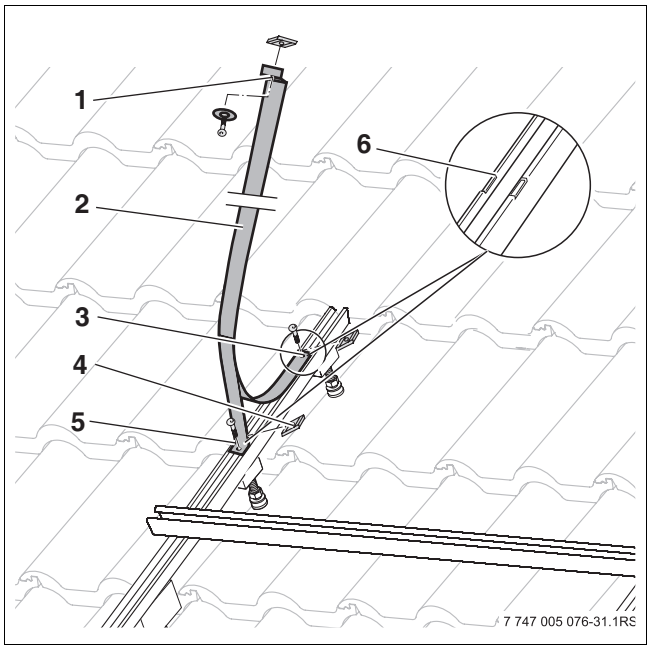

Fig. 32 Securing cylinder strap

1 End of cylinder strap
2 Cylinder strap
3 Front end of cylinder strap
4 Locking bolt
5 Cylinder strap support bracket
6 Notch

Fitting anti-slip brackets

To prevent the collectors from slipping, fasten two anti-slip brackets to the lower roof profile rails for each collector.

- Push each anti-slip bracket [3] in the inner slots [1] from the outside over the profile rails until it clicks into place [2].

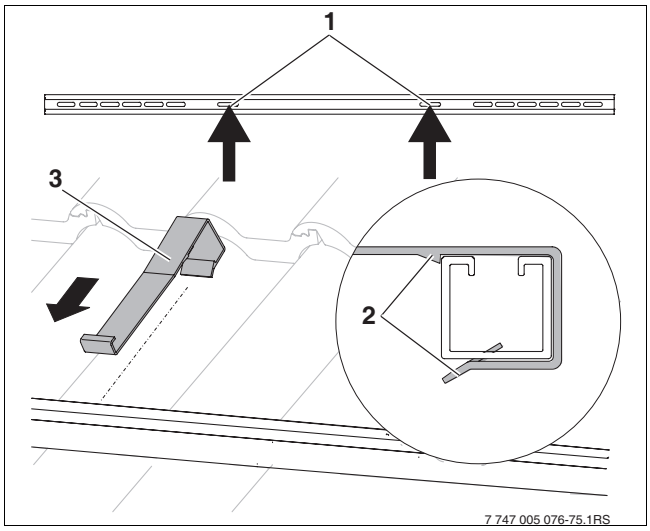

Fig. 33 Attaching an anti-slip bracket

1 Fixing holes for the anti-slip brackets
2 Clicking the anti-slip bracket into place
3 Anti-slip bracket

6 Collector installation

Observe the following safety instructions and user information.

DANGER: Risk to life through falls and falling parts!
- Take appropriate action to prevent accidents during all work on roofs.
- Take precautions against a possible fall while working on roofs.
- Always wear your own protective clothing and safety equipment. After completing installation, check the installation set and collectors are securely positioned.

DANGER: Risk of injury due to falling collectors.
- During transport and installation, secure the collectors to prevent them falling.

NOTICE: System damage due to damaged sealing faces.
- Do not remove the plastic caps on the collector connections until immediately prior to installation.

NOTICE: System damage due to leaking solar hoses.
- It is very important to ensure the hose clip (Fig. 36, [4]) is positioned correctly before removing the locking ring (Fig. 36, [1]). Subsequent loosening using pliers can impair resilience.

Use lifting equipment as used by professional roofers or 3-point suction handles with adequate load bearing capacity for the installation.

NOTICE: Risk of burns!
- Always cover collectors prior to comissioning of system.

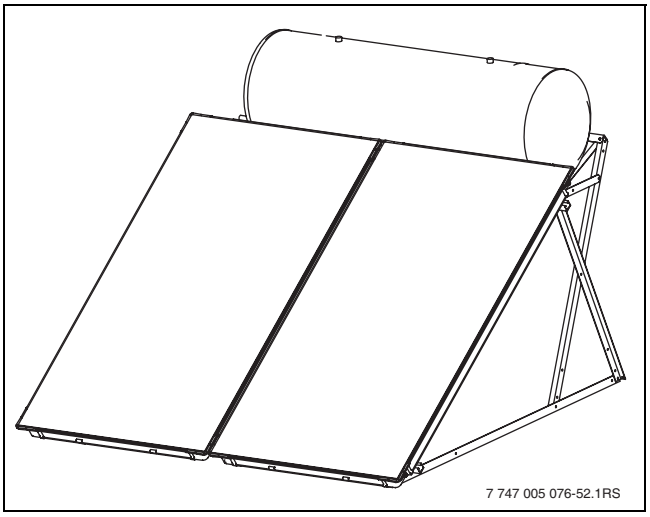

Fig. 34 View of flat roof installation

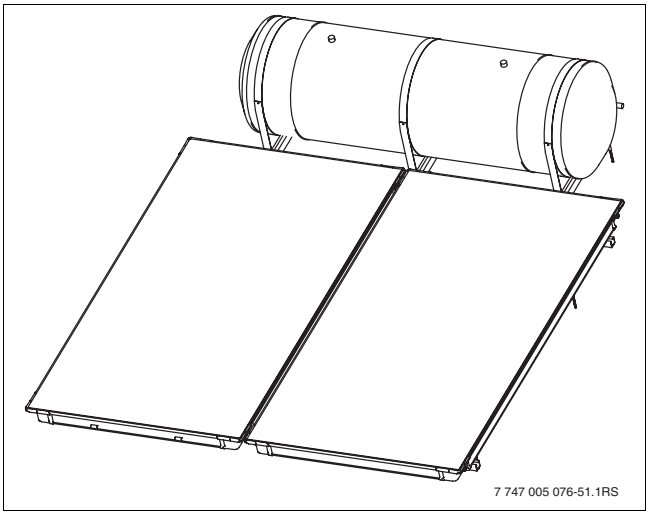

Fig. 35 View of rooftop installation

6.1 Preparing to install the collectors

NOTICE: System damage due to leaking solar hoses.

- It is very important to ensure the hose clip (Fig. 36, [4]) is positioned correctly before removing the locking ring (Fig. 36, [1]). Subsequent loosening using pliers can impair resilience.

DANGER: Risk of injury.

Only tighten the locking ring once the hose clip is positioned over the solar hose.

The locking ring must be removed from the hose clip to close or secure the solar hose.

To make installation easier, we recommend placing the solar hoses in hot water, especially when the ambient temperature is low.

6.1.1 Pre-assembling dummy plugs

Before beginning actual installation on the roof, pre-assemble the short solar hoses and dummy plugs on the ground to make work on the roof easier.

- Push dummy plug (→ Fig. 36, [3]) as far as it will go onto 55 mm solar hose [2].
- Bring hose clip (→ Fig. 36, [4]) into position and pull locking ring [1] to secure the plug.
- Remove plastic caps (transport protection) from the unused collector connections.

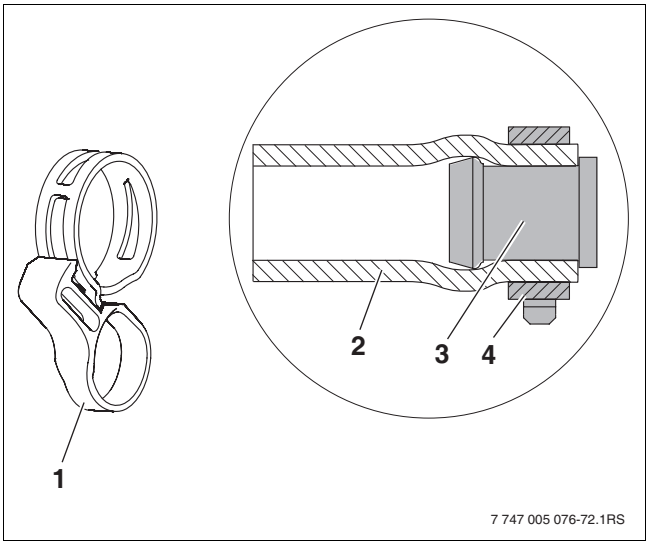

Fig. 36 Hose clip with locking ring and pre-assembled dummy plug

1 Locking ring
2 Solar hose 55 mm
3 Dummy plug
4 Hose clip

- Push pre-assembled dummy plugs (Fig. 37, [1]) with hose clips [2] onto the two free connections on the collector array.
- Once the hose clips are seated correctly, pull the locking rings to secure the connection.

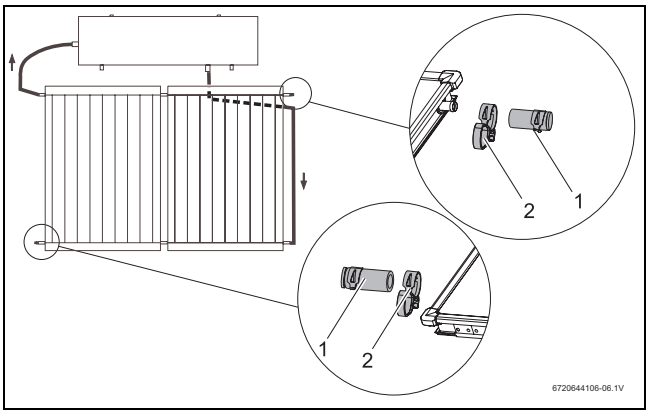

Fig. 37 Hose clip with locking ring and pre-assembled dummy plug

1 Pre-assembled dummy plug
2 Hose clip with locking ring

6.1.2 Pre-mount the joining set

The hydraulic connection between two collectors is made using the joining set (95 mm solar hoses and hose clips from the transport corners).

The diagrams show the joining set with the first collector being installed on the right.

- Remove plastic caps (transport protection) from the relevant collector connections.
- Push 95 mm solar hoses (Fig. 38, [2]) onto the r.h. connections of the second collector.
- Push hose clips (Fig. 38, [1]) over the solar hose (the second clip later secures the connection of the other collector).
- Once the hose clip is seated correctly, pull the locking ring to secure the connection (Fig. 38, [3]).

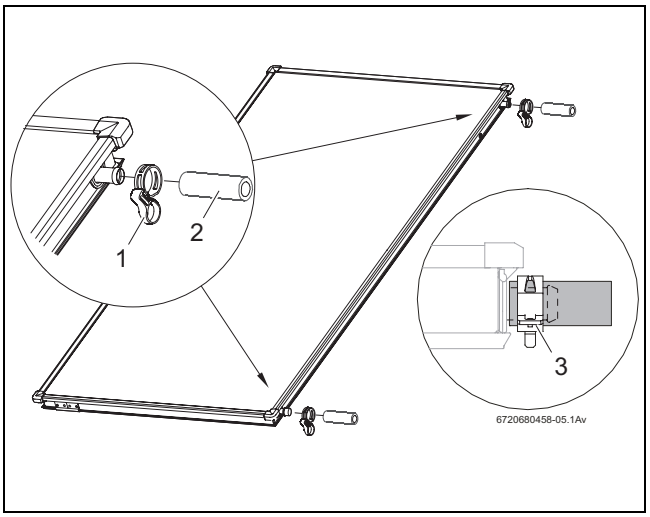

Fig. 38 Fitting the joining set

6.2 Hydraulic connection

As a general principle, connect the collectors as shown below (→ Fig. 39).

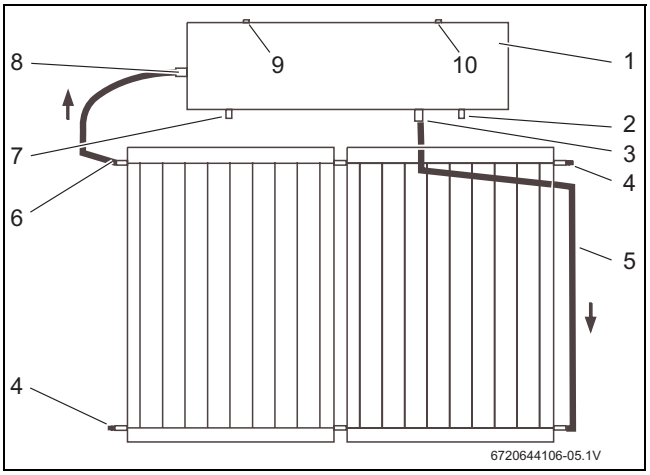

Fig. 39 Hydraulic connection

1 Cylinder
2 Cold water connection
3 Solar flow connection
4 Dummy plug
5 Slow flow line
6 Solar return line
7 DHW connection
8 Solar return connection
9 Safety valve connection, solar
10 Heat transfer medium filler

6.3 Securing the collectors

The collectors are secured to the profile rails by the single sided collector tensioners (Fig. 40, [2]) at the ends of each flat roof/rooftop profile rail, and the double sided collector tensioners [1] between the collectors.

In addition, the anti-slip brackets (Fig. 40, [3]) prevent the collector slipping.

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

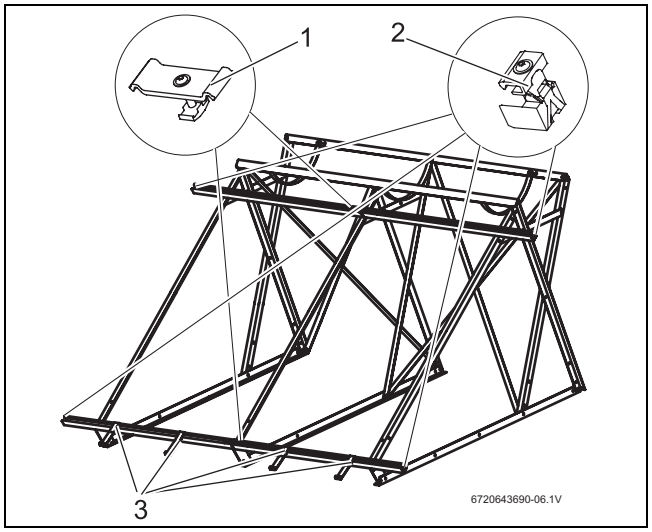

Fig. 40 Collector fixing elements

6.3.1 Inserting the single sided collector tensioner on the right

- Push the single sided collector tensioner (Fig. 41, [1]) on the right into the flat roof/rooftop profile rails until it clicks into place in the first slot on the profile rail.

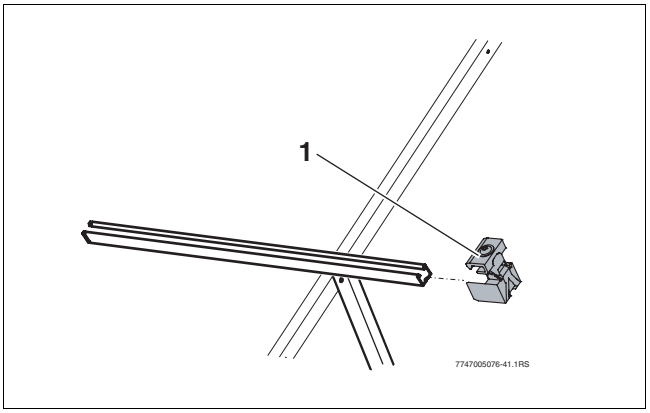

Fig. 41 Inserting the single sided collector tensioner

6.3.2 Positioning the first collector

Begin placing the collectors on r.h. side of the profile rails.

DANGER: Risk of injury.

- The collectors should always be installed by two people.

- Place the first collector on the profile rails and let it slide into the anti-slip brackets (Fig. 42, [2]). Position the lower collector edge (Fig. 42, [1]) in the aperture of the anti-slip bracket.

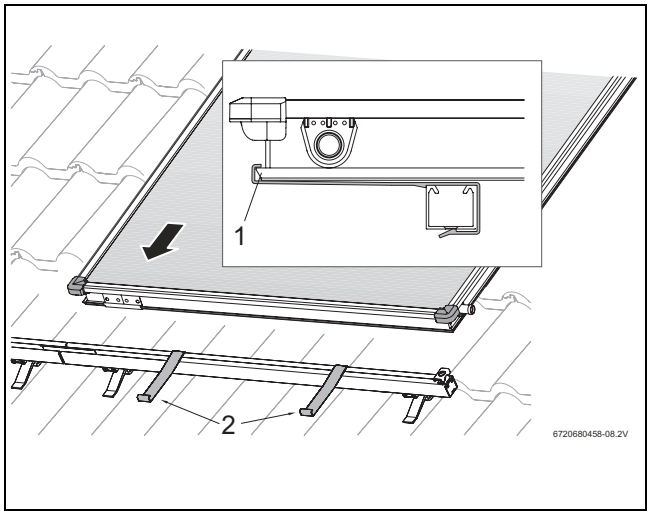

Fig. 42 Laying the first collector on the profile rails

- Carefully push the collector (Fig. 43, [1]) up against the single sided collector tensioner and level horizontally.
- Secure single sided collector tensioner with size 5 spanner.
  The hold-down retainer (Fig. 43, [2]) on the collector tensioner now grips the lower collector edge.

When the screw is tightened, the plastic guide at the pre-determined cut-off points breaks away.

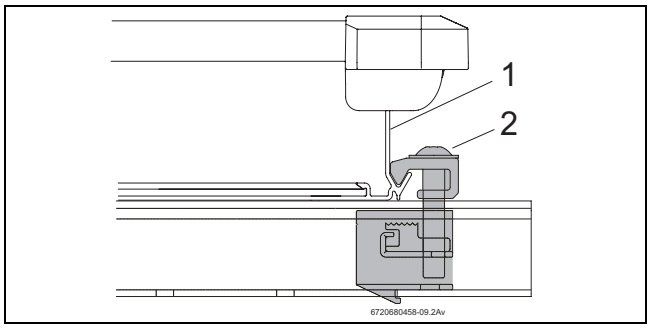

Fig. 43 Threaded single sided collector tensioner

6.3.3 Inserting the double sided collector tensioner

- Place the double sided collector tensioner, with attached nut, into the aperture of the profile rail and joiner in such a way that the plastic spacer (Fig. 44, [1]) surrounds the profile rail.
- Push double sided collector tensioner up against the collector frame.

Do not tighten the screw until the second collector has been pushed up against the double sided collector tensioner.

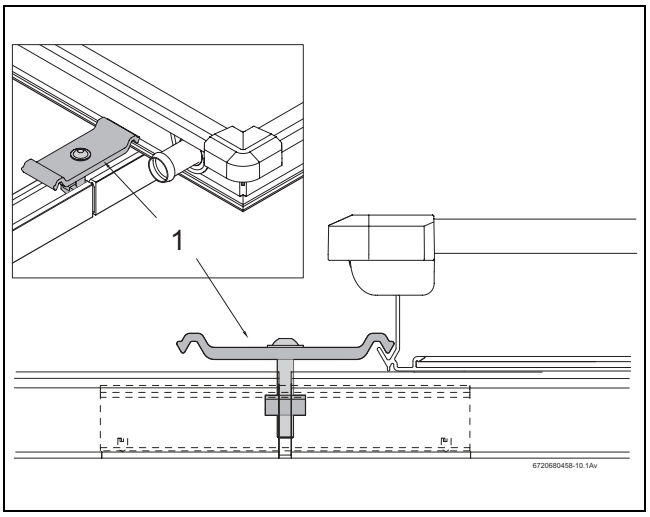

Fig. 44 Fitting the double sided collector tensioner

6.3.4 Positioning second collector

- Place the second collector with the pre-assembled solar hoses (Fig. 45, [1]) at the top of the profile rails and let it slide into the anti-slip brackets.
- With both connections, push the second hose clip (Fig. 45, [2]) onto the solar hose [1].
- Push the second collector up against the first (Fig. 45, [4]) in such a way that the pre-assembled solar hoses are pushed onto the l.h. connections [3] on the first collector.

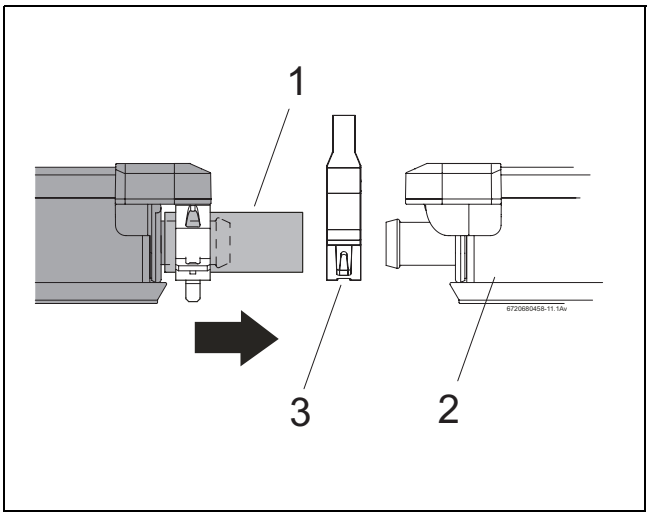

Fig. 45 Pushing second collector towards the first

1 Solar hose
2 Hose clip
3 Connections on the collector side
4 First collector

- Push the hose clip over the bead on the collector connection and pull the locking ring.

NOTICE: System damage due to leaking hose connections or dummy plugs.

- Secure solar hoses and dummy plugs to collector connection with a hose clip (→ Fig. 46).

- Tighten the screw on the double sided collector tensioner with the size 5 spanner.
  The hold-down retainer (Fig. 47, [1]) on the collector tensioner now grips the lower collector edge.

When the screw is tightened, the plastic lugs at the pre-determined cut-off points break away.

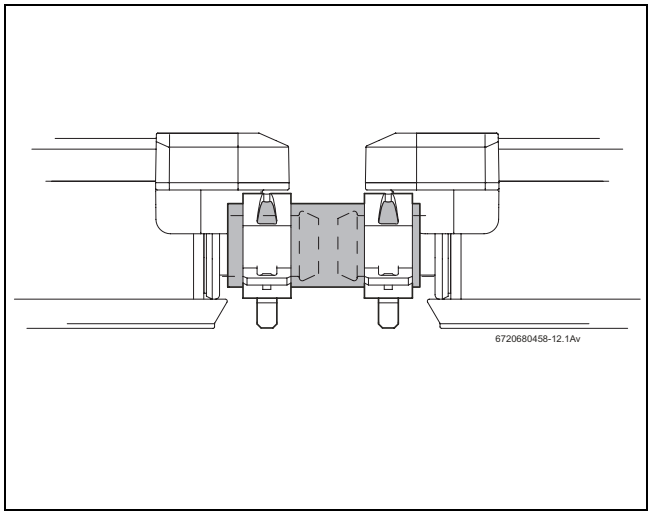

Fig. 46 Solar hose with secured hose clips

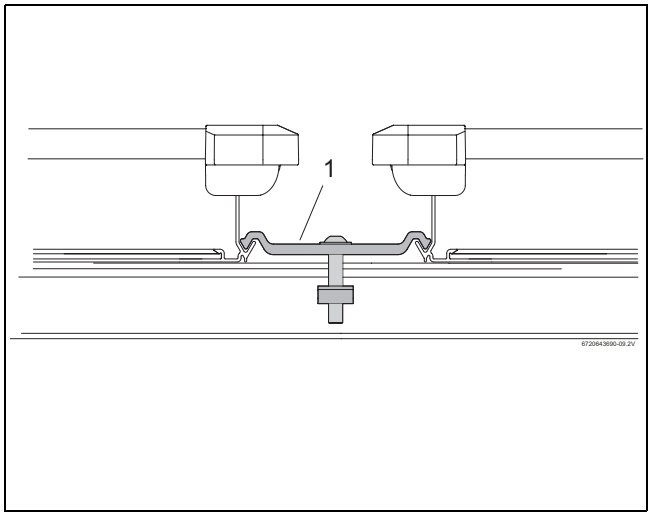

Fig. 47 Double sided collector tensioner between 2 collectors

6.3.5 Installing the single sided collector tensioner on the left

- Push the single sided collector tensioner (Fig. 48, [1]) into the ends of the profile rail.
- Push collector tensioner up against the collector frame and secure in place with size 5 spanner. The hold-down retainer (Fig. 48, [2]) on the collector tensioner now grips the lower collector edge.

When the screw is tightened, the plastic guide at the pre-determined cut-off points breaks away.

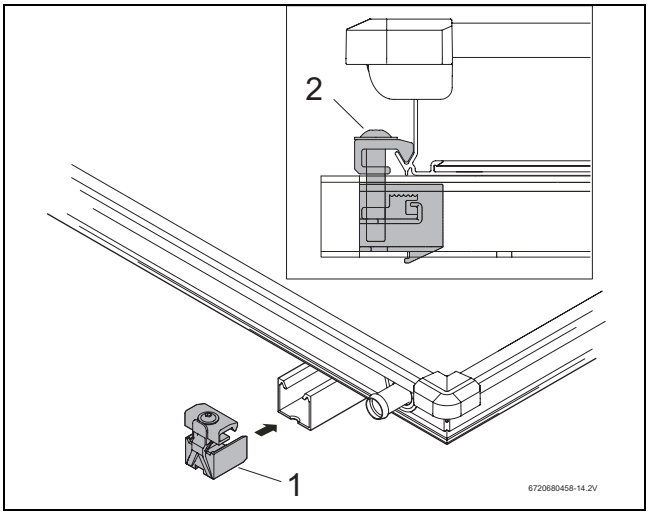

Fig. 48 Single sided collector tensioner on the left

Once all the collectors have been fitted, the remaining single sided collector tensioners can be secured.

7 Installing the cylinder

Observe the following safety instructions and user information.

DANGER: Risk to life through falls and falling parts!
- ▶ Take appropriate action to prevent accidents during all work on roofs.
- ▶ Take precautions against a possible fall while working on roofs.
- ▶ Always wear your own protective clothing and safety equipment.
- ▶ After completing installation, check the retaining straps and the cylinder are securely positioned.

DANGER: Risk of injury due to falling cylinder.
- ▶ During handling and installation, secure the cylinder to prevent it falling or rolling.

Use lifting equipment as used by professional roofers for the installation. Never carry the cylinder by yourself.

Before mounting the cylinder on the installation system, equip the cylinder connections with connectors on the ground.
- Solar return
- Cold water
- DHW

Position the cylinder in such a way that the connections are aligned vertically.

7.1 Installing the cylinder in flat roof systems

- ▶ Insert the cylinder [1] into the cylinder straps. Ensure that the solar flow comes to lie on the left and the connections for solar return, cold water and DHW are pointing downwards.
- ▶ Align the cylinder centrally.

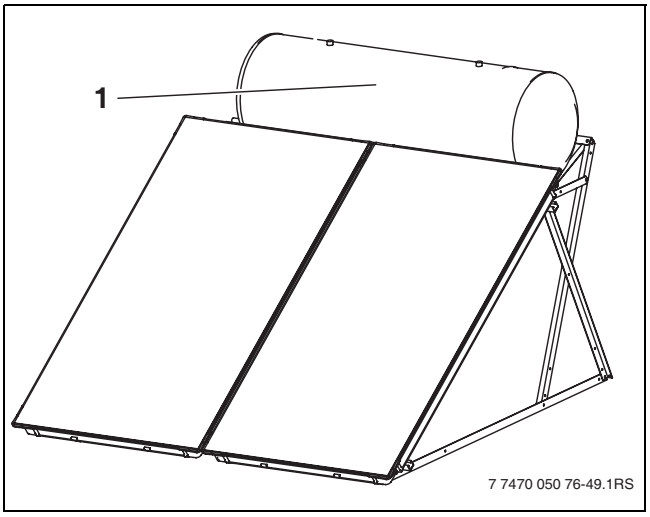

Fig. 49 View of flat roof installation

7.2 Installing the cylinder in rooftop systems

- ▶ Insert the cylinder [1] into the cylinder straps. Ensure that the solar flow comes to lie on the left and the connections for solar return, cold water and DHW are pointing downwards.
- ▶ Align the cylinder centrally.

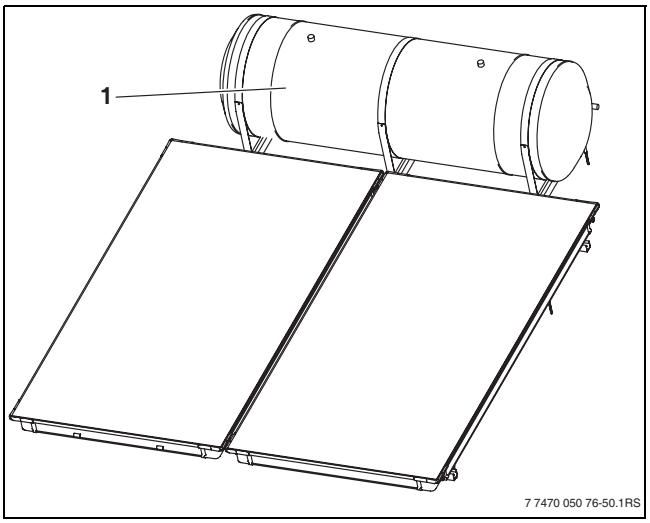

Fig. 50 View of rooftop installation

7.2.1 Securing the cylinder with cylinder straps

- Position locking bolt [2] at the end of the cylinder strap [1] in the cylinder profile rail [3] and tighten screw.

After being tightened, the screw protrudes from the slot, which provides the cylinder strap with additional protection against slipping out of the profile rail.

NOTICE: System damage due to loose screw connections.

- Tighten all screw connections after inserting the cylinder.

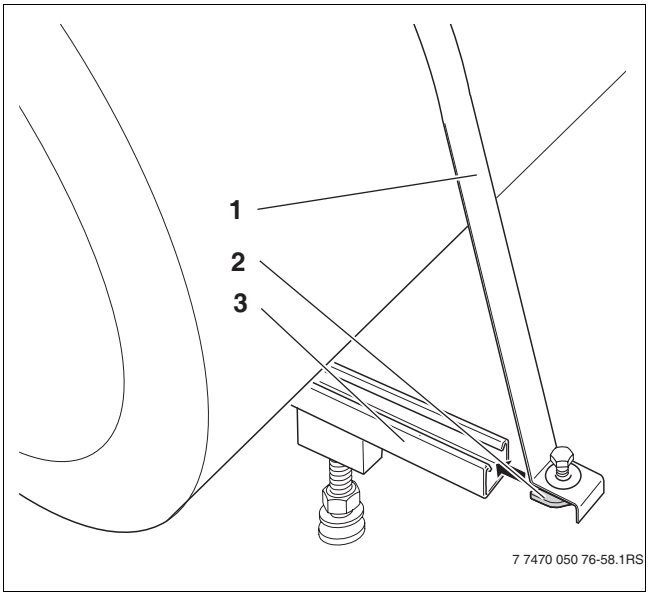

Fig. 51 View of rooftop installation

1 Cylinder strap
2 Locking bolt
3 Cylinder profile rail

8 Installing connection lines

Always use pipe sealing compound that can withstand temperatures up to 150 °C.

NOTICE: System damage due to leaking solar hoses.

- It is important to ensure the hose clip is positioned correctly before removing the locking ring.
  Subsequent loosening using pliers can impair resilience.

Remove the locking ring from the hose clip prior to closing or sealing the solar hose.

DANGER: Risk of injury.
Only tighten the locking ring once the hose clip is positioned over the solar hose.

8.1 Connecting the solar return line in a 300 l system

- Remove plastic caps (transport protection) from the relevant collector connections.
- Push solar hose [4] directly onto collector connection [9] and secure with hose clip [3].
- Thread brass adapter [2] onto solar return connection [8] on the cylinder.
- Thread solar endform [1] onto the brass adapter [2].

NOTICE: Water may escape from loose and/or damaged sealing discs.

- The maximum torque for this connection is 35 Nm. A higher torque may damage the sealing disc.
- Do not over tighten.

- Trim the collector solar hose [4] to the right length and connect to the solar endform [1].
- Push hose clip onto the solar hose.
- Push the solar hose as far as it will go onto the solar endform [1] and secure with a hose clip.

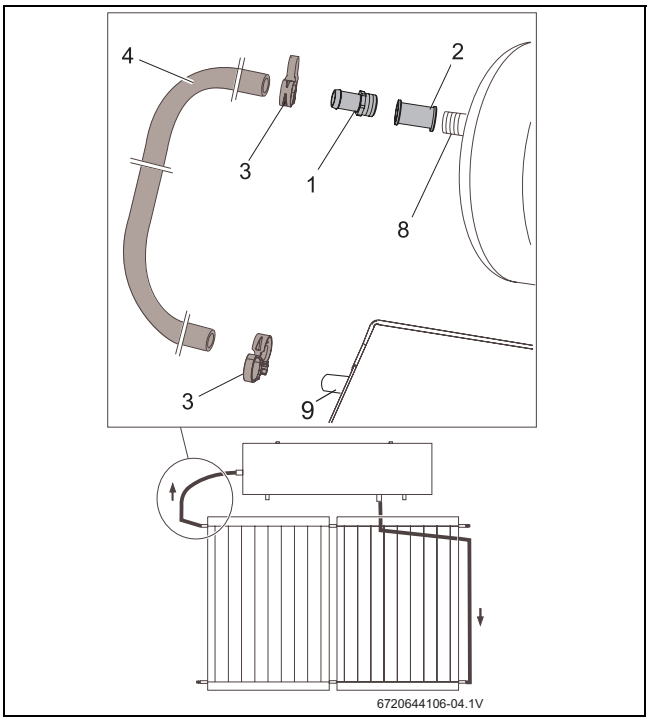

Fig. 52 Installing the flow line

1 Solar endform
2 Brass adapter
3 Hose clip
4 Solar return line (has to be cut from the solar hose supplied)
8 Solar return connection
9 Collector connection

8.2 Connection of the solar flow pipe

- Push union nut [6] over the collector connection.
- Place clamping disc [7] behind the bead on the collector connection and press together.
- Press collector bracket with O-ring [8] onto connection, align and secure with a union nut.
- Push solar hose [5] onto the cylinder bracket and secure with hose clip [3].
- Thread brass elbow [1] onto solar flow connection [4] on the cylinder.

NOTICE: Water may escape from loose and/or damaged sealing discs.
- The maximum torque for this connection is 35 Nm. A higher torque may damage the sealing disc.
- Do not over tighten.

- Thread arrestor valve [2] onto the brass elbow [1].
- Thread brass adapter [10] onto the arrestor valve [2].
- Thread solar endform [11] onto the brass adapter [10].
- Route solar hose [5] from the collector to the solar flow connection [4] and trim to the required length.
- Push a hose clip [3] over the solar hose.
- Push solar hose as far as it will go onto the solar endform [11] and secure with a hose clip.

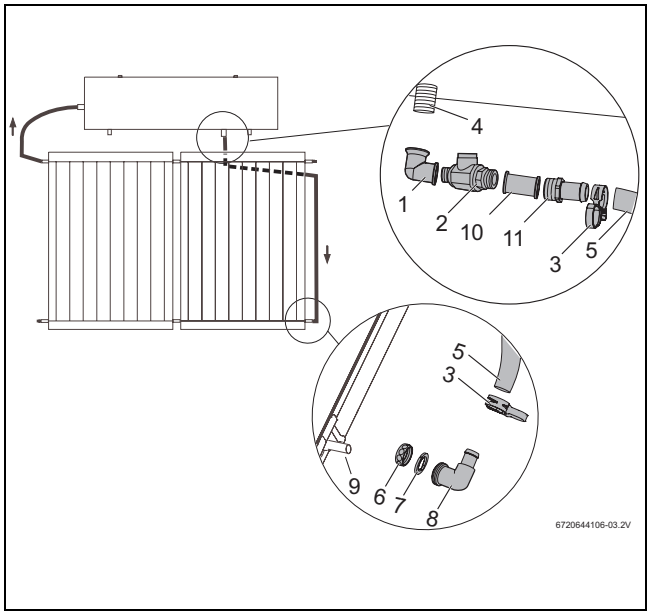

Fig. 53 Installing the return line

1 Brass elbow
2 Arrestor valve
3 Hose clip
4 Solar flow connection
5 Solar flow line (has to be cut from the solar hose supplied)
6 Nut
7 Clamping disc
8 Collector bracket
9 Collector connection
10 Brass adapter
11 Solar endform

8.3 Installing the retainer for the return line

The solar hoses must never be kinked as this would restrict the flow.

- The solar hose can be attached to the collector with the retainer.
- Place retainer [1] on collector frame and tighten the screw with a size 5 spanner.
- Secure the solar hose to the retainer.

WARNING: System damage due to damaged solar hoses.
- Route the solar hose in such a way that it does not come into contact with any sharp edges.

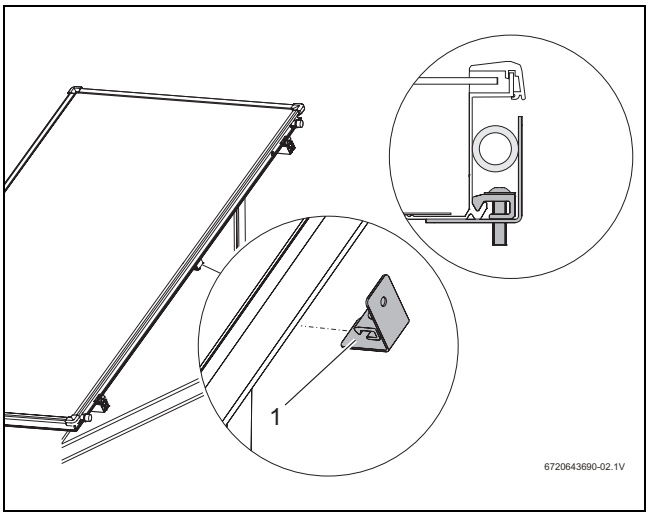

Fig. 54 Securing retainer to the collector frame

1 Tensioning device

8.4 Connecting DHW lines

NOTICE: System damage due to high pressures.
- The maximum water pressure for this appliance is 500 kPa. If the pressure is in excess of this pressure, a pressure reducing valve must be fitted.

To safeguard the DHW circuit, the PTR valve provided as part of the connection set must first be installed.

Due to differences in temperature and pressure throughout the day, water may escape from the PTR valve (Fig. 55, [1]). Install a drain pipe to ensure the water that escapes is routed away appropriately.

All installations must be carried out in accordance with AS/NZS3500.4, NZS5261, AS/NZS3000 and all local building, plumbing and electrical regulations.
If local regulations or circusnstances require install ECV (Expansion Control Valve), PLV (Pressure Limiting Valve), and FRV (Flow Return Valve).

With rooftop installation, there may not be enough room to install plumbing valves. If this is the case, the valves can be fitted in a more accessible place up to 1 m from the cylinder. It is connected to the cylinder via an extended line.

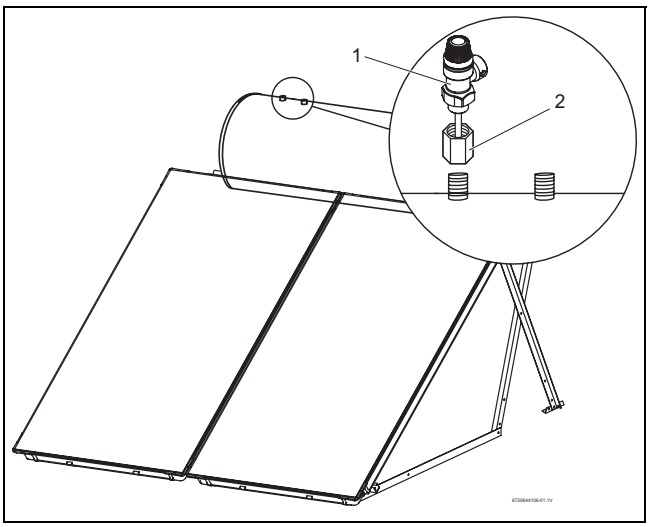

Fig. 55 Installing the PTR valve

1 PTR valve
2 PTR Adapter

To install the PTR valve use ½ inch adapter from the delivery package.

WARNING: Ensure correct operation!
- Operate the PTR valve easing gear at least once every six months to ensure correct operation.

Continuous leakage of water from the valve may indicate a problem with the water heater.

Install and connect the DHW lines on site.

- Connect the cold water line [2] and DHW line [1] in accordance with local regulations.

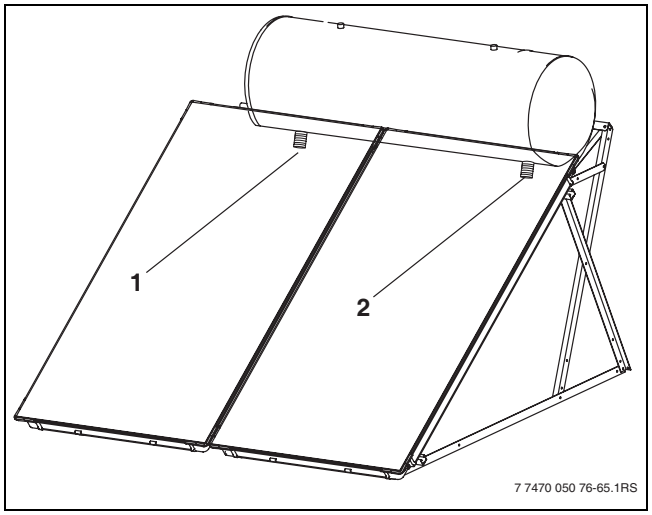

Fig. 56 Connecting DHW lines

1 DHW connection
2 Cold water connection

8.5 Insulating connection lines

Carry out the insulating work only when all connections are tight.

▶ Check the installation set, collector and cylinder are securely positioned.

Insulation of the manifolds in internal or external installations

- When insulating external pipework, use materials that are resistant to UV and high temperatures (150 °C).
- When insulating internal pipework, use materials that are resistant to high temperatures (150 °C).

9 Commissioning

Prior to commissioning, ensure that all connections are tight.

9.1 Filling the DHW circuit

If the water contains particles of dirt or other suspended matter, we recommend installing a filter.

- Open the non-return valve built into the safety valve.
- Open a hot water tap until the circuit has been filled.

DANGER: Risk of injury due to falling cylinder.

- During handling and installation, secure the cylinder to prevent it falling or rolling.

9.2 Filling the solar circuit

Failure to fill the system may cause damage and void your system warranty.

WARNING: Risk of injury through contact with heat transfer medium

- When handling heat transfer medium, always wear protective gloves and goggles.
- If heat transfer medium comes into contact with the skin, it can be washed off with water and soap.
- If, despite protective goggles, heat transfer medium comes into contact with the eyes, rinse eyes thoroughly under running water while holding eyelids wide open. The medium is non-corrosive and biodegradable. A safety datasheet with further information regarding the heat transfer medium is available from the manufacturer on request.

NOTICE:

The heat transfer medium will expand and evaporate while the solar thermal system is being commissioned.

- Only fill the solar thermal system with heat transfer medium when the sun is not shining on the collector, i.e. when it is very cloudy, early in the morning, in the evening or with the collector covered.

9.2.1 Filling with glycol mixture

The solar thermal system must only be operated with heat transfer medium. The heat transfer medium is premixed and ready to use. It guarantees safe operation down to –14 °C, protects the system from frost damage and ensures high steam safety.

- Fill the cylinder with heat transfer medium from the top (Fig. 57, [1]) until it begins escaping from the filler.
- When the system has been filled, seal the filler with the plug provided.

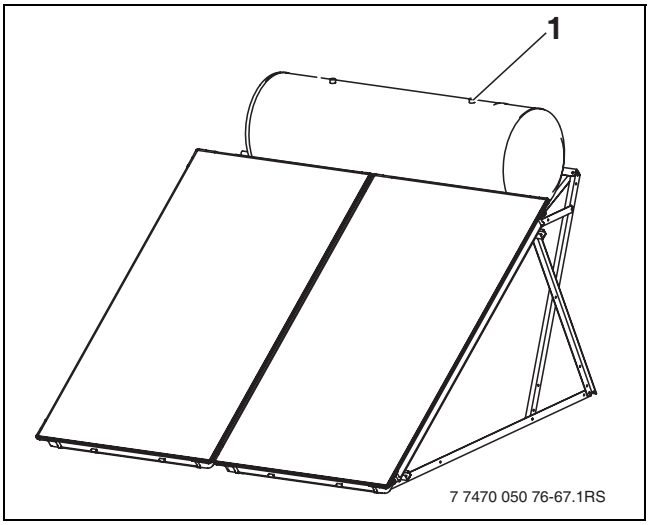

Fig. 57 Filling the system

Only use Bosch heat transfer medium (glycol mixture).

9.2.2 Filling with water

NOTICE: System damage due to low temperatures!

Water can only be used as heat transfer medium, in regions where temperatures are not susceptible to be lower than 5 °C. Damage due to frost will not be covered by warranty.

The solar thermal system must only be operated with heat transfer medium. It guarantees safe operation down to 5 °C.

- ▶ Fill the cylinder with heat transfer medium from the top (Fig. 57, [1]) until it begins escaping from the filler.
- ▶ When the system has been filled, seal the filler with the plug provided.

Conditions for using water

- In a 2-circuit solar systems the heat transfer medium is in a closed circuit separated from the DHW without contact to the ambient air. Water should not be exchanged.
- The continues refill of the system should be avoided! In cases of pressure losses in the system, the reason have to be detected and resolved. Using of automatic refill systems is forbidden.

Characteristic	Value
pH	7.5 - 9.0
Electric conductivity	100 - 1500 µS/m
Chloride	max. 30 mg/l
Sulphate ionic concentration	< 1,5

Tab. 15

Installing the safety valve for the solar circuit

To safeguard the solar circuit, install the safety valve provided as part of the connection set.

- ▶ Install the 250 kPa solar safety valve (Fig. 58, [1]) at the top of the cylinder.

DANGER: Risk of scalding at the safety valve!

The safety valve opens if the pressure on the solar side exceeds 250 kPa. However, it is not possible to actually route the steam.

- ▶ Avoid spending too much time near the system while it is operational.

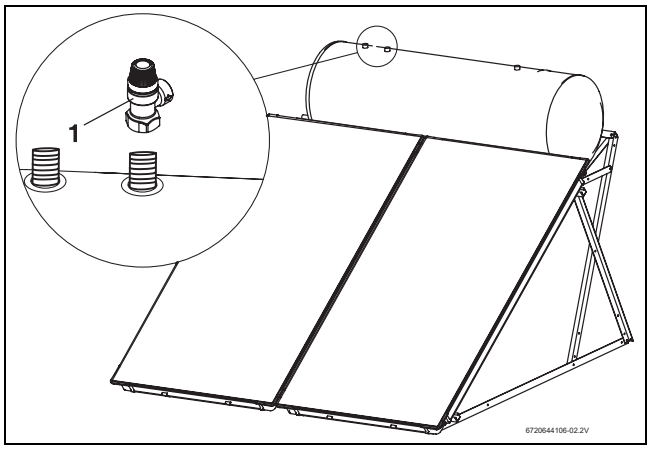

Fig. 58 Installing the solar safety valve

10 Checks following commissioning and maintenance

Only carry out the final insulation work when the points in the checklist have been ticked off.

Checklist

Solar hoses secured with hose clips (locking rings pulled)?	☐
Screws on the single sided and double sided collector tensioners tightened?	☐
Double ended screws to attach the profile rails to the roof tightened?	☐
Anti-slip brackets installed and clicked into place in the profile rail?	☐
Pressure test carried out and all connections tight? (→ Complete station instructions)	☐

Tab. 16

11 Maintenance

Installation set and collector

- Check all threaded connections and tighten if necessary.

Heat transfer medium

- Check and analyse the frost protection level.

As result from the use of the arrestor valve, higher temperatures in the collector can cause the reduction of the heat transfer medium lifetime as well as more frequency in the solar safety valve opening.

We recommend checking the frost protection level annually.

Cylinder

Unless agreed otherwise in writing, the cylinder may only be filled with potable water.

Generally, we recommend having the cylinder checked and cleaned by a authorised contractor at least every two years.

Cleaning intervals should be shorter where unfavourable water quality (hard or very hard water) and/or high temperature stresses prevail.

- Remove the handhole cover with the magnesium anode.
- Check the magnesium anode and replace if necessary. Seal the magnesium anode back into place.
- Inspect and clean the cylinder.

Tighten all hexagon screws first by hand, then with a spanner by a three quarter turn (equal to the recommended torque of 40 Nm with a torque wrench).

12 Environmental protection/ Recycling

Environmental protection is one of the fundamental company policies of the Bosch Group.
Quality of performance, efficiency and environmental protection are goals of equal importance to us. We comply with all environmental laws and regulations.
In order to protect the environment, we use economically advanced technologies and the best materials.

Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling.
All packaging materials are environmentally compatible and can be reused.

Used appliances

Used appliances contain materials that should be recycled.
The components are easy to separate and the types of plastic are identified. This allows the various assemblies to be appropriately sorted for recycling or disposal.

13 Warranty details

Your Bosch Hot Water product is guaranteed as follows

For appliances used in domestic applications, ie. normal hot water drawn from household outlets, the warranty period is six (6) years part and one (1) year labour on the tank only, eight (8) years part and one (1) year labour on the solar collectors only, two (2) years part and one (1) year labour on all other components.

Purchased spare parts are guaranteed for 12 months, replacement only.

For appliances used in commercial applications the warranty period is Twelve (12) months parts and labour.

The warranty period commences from the purchase date. Claims for warranty will only be accepted upon suitable proof of purchase submitted to Robert Bosch (Australia) Pty. Ltd. or an approved Bosch Service Agent authorised to carry out warranty repairs.

Purchaser‘s statutory rights

The warranty terms set out below do not exclude any conditions or warranties which may be mandatorily implied by law, and your attention is drawn to the provisions of the Trade Practices Act, 1974, and State legislation which confers certain rights upon consumers. The Robert Bosch (Australia) Pty Ltd warranty supplements these.

Extract of terms and of delivery and sale

a) RBAU warrants products marketed by it as free from faults and defects and having the specified qualities according to the respective state of technology. Notwithstanding that the products may have been sold by description or sample the products shall be accepted by the Buyer even though alterations in design or construction have been generally introduced between the date of contract and the delivery of the products

b) The warranty shall be limited to the replacement or repair at the option of RBAU for any defective products and of such parts of RBAU's products as have been damaged in consequence of the defect despite proper treatment. Parts replaced will not be returned.

i) Repairs and maintenance shall not extend the warranty period of the appliance;

ii) the consumer shall be responsible for the return of the defective product to either the place of purchase or an authorised service centre and where applicable;

iii) Costs, and if necessary the expenses of freight, packing and charges of a similar nature;

Without limiting the generality of these terms of delivery this warranty shall not apply to products sold in the following cases:

i) if the products sold are repaired or altered by any third party without RBAU's consent;

ii) where parts not manufactured or sold by RBAU are used in and replacement or repair;

iii) if products are not used with proper care and for the purpose for which they are sold and in accordance with any specified instruction for use;

iv) if changes occur in the condition or operational qualities of the products due to incorrect storage or mounting or due to climatic or other influences;

v) in respect of faulty construction or defects due to the use of unsuitable materials if such method of construction or use of material has been specified by the Buyer;

vi) in respect of surface coating and glass damage;

vii) in respect of the replacement of parts when such replacements are part of the normal maintenance, service or normal wear and tear.

No servant or authorised service agent has authority to add to or alter the terms of this warranty.

PLEASE NOTE: If a service call is requested and it is found that it is not a manufacturing fault, you will be charged for the call even during the warranty period.

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