

Flat roof

Rack Mounting



BOSCH

Installation instructions

Contents

1	Key to symbols and safety instructions	3
1.1	Explanation of symbols	3
1.2	Safety instructions	3

2	Before the installation	4
2.1	Distances between the triangles	4
2.2	Scope of delivery	5
2.3	Required tools	6
2.4	Slope of the collectors	6
2.5	Determining space requirements	7
2.5.1	Minimum distance for multi-row collector arrays	7
2.5.2	Space requirements and collector array alignment	7

3	Making the roof connection	9
3.1	Roof tiles	9
3.2	Flat shingle	9
3.3	Corrugated sheet/metal roof	9
3.4	Asphalt, slate and composite shingles	9
3.5	Standing seam metal roof	9
3.6	Flat roof	9
3.6.1	Flat roof: occurring forces per connection point for design of the substructure	9

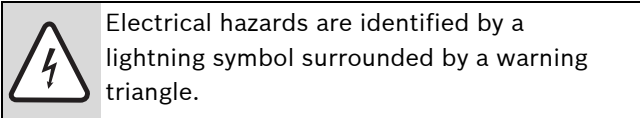
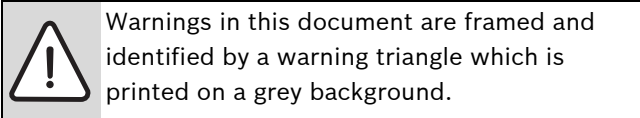
4	Installing the rack	10
4.1	Pre-installing triangles on the ground	10
4.2	Installing triangles on the roof connector	10
4.2.1	Installation on studs	10
4.2.2	Installation on roof jacks (asphalt/slate/composite shingles)	11
4.2.3	Installation on a substructure (flat roof)	11
4.3	Installing the profile rails and collector brackets	12
4.4	Installing steel cables as bracing for vertical collectors	13
4.5	Routing the cable	14
4.6	Tightening screws	14
4.7	Installing collectors	14

5	Warranty details	15
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1 Key to symbols and safety instructions

1.1 Explanation of symbols

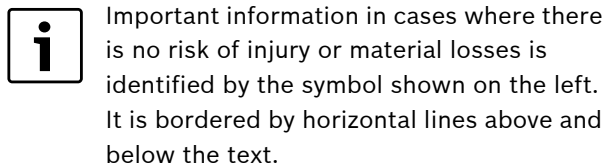
Warnings



Keywords indicate the seriousness of the hazard in terms of the consequences of not following the safety instructions.

- **NOTE** indicates that material damage may occur.
- **CAUTION** indicates that minor to medium injury may occur.
- **WARNING** indicates that serious injury may occur.
- **DANGER** indicates possible risk to life.

Important information



Additional symbols

Symbol	Meaning
▶	a step in an action sequence
→	a reference to a related part in the document or to other related documents
•	a list entry
–	a list entry (second level)

Tab. 1

1.2 Safety instructions

About these instructions

These instructions describe the installation of flat plate solar thermal collectors on racks for flat and sloped roofs. They are a supplement to the on-roof installation instructions.

These accessory instructions and the on-roof instructions contain important information for safe and professional installation and are directed at the trained professional.

- ▶ Read through the instructions carefully and keep them in a safe place.
- ▶ Follow the instructions and specifications for on-roof installation.
- ▶ Always follow the safety instructions to prevent injury and property damage.

Standards and guidelines

- ▶ Observe all country-specific standards and guidelines for installation. It is the installer's responsibility to ensure all national and local codes are met.

Correct use

- ▶ Only install on stable roofs that have the needed load capacity. Here you must take into account the additional roof load including collectors and if necessary consult a structural engineer.
- ▶ Only install this system on flat roofs or roofs with a shallow pitch of 0 - 36 ° (or 0 - 15 °, fig. 7).
- ▶ The installation set is suitable for a max. standard snow load of 2,0 kN/m² and a windspeed of 151 km/h.
- ▶ If there is a risk that larger quantities of snow might accumulate behind the collectors (towards the roof ridge), prevent this by fitting a suitable protective grill.
- ▶ Do not change the rack construction (e.g. by drilling additional holes). Exception: shorten the braces to adjust the slope.
- ▶ The flat roof installation set must not be used for fixing any other objects to the roof (e.g. antennas). The kit is intended exclusively for the safe fixing of solar collectors.

2 Before the installation

2.1 Distances between the triangles

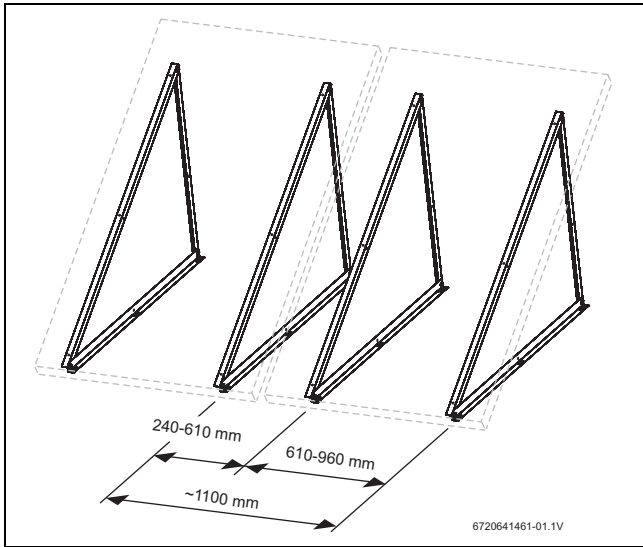


Fig. 1 Basic and extension installation kit

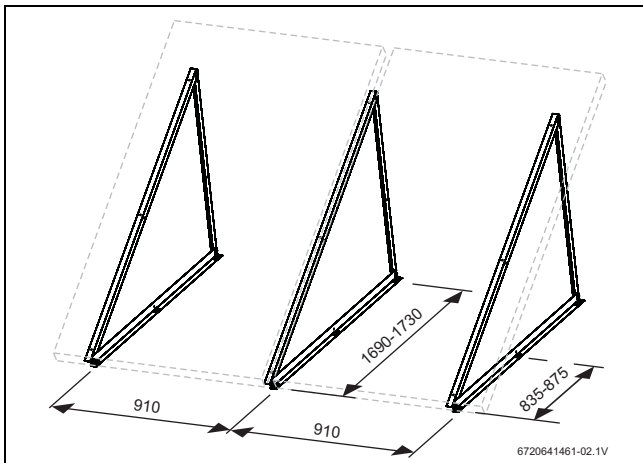


Fig. 2 Basic installation kit and additional supports for higher wind and snow loads (for 2 collectors)

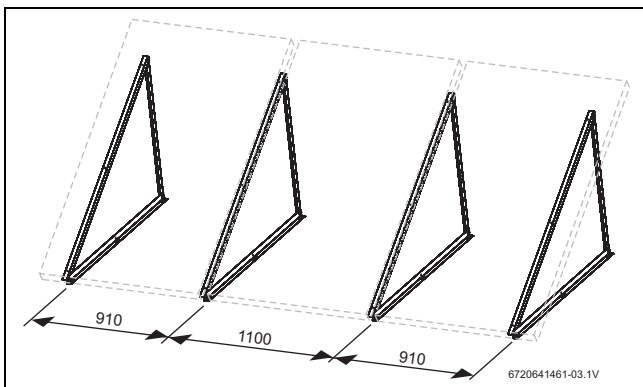


Fig. 3 Basic and extension kit (for more than 2 collectors)

2.2 Scope of delivery

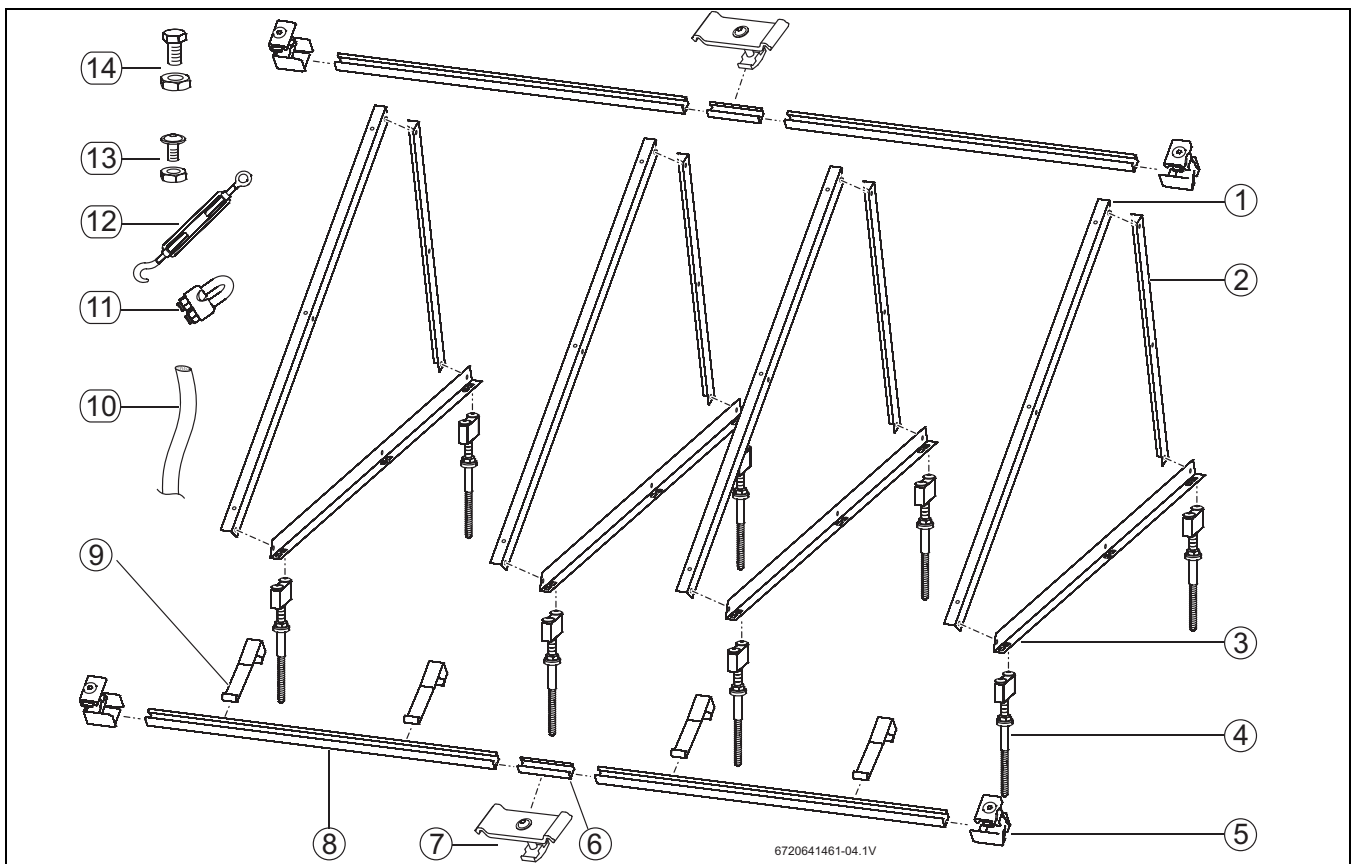


Fig. 4 Fastening materials for 2 vertical collectors on e.g. pantiled/tiled roof consisting of rack (basic and extension), collector installation (basic and extension), roof attachment (per collector)

Rack - basic installation kit:		
1	Collector rail	2 x
2	Rear rail	2 x
3	Lower rail	2 x
10	Wire 134" (3400 mm) (only for vertical)	1 x
11	Cable clamp (only for vertical)	2 x
12	Turnbuckle (only for vertical)	1 x
13	Screw M8 x 20 and nuts	7 x
14	Screw M10 x 20 and nuts	6 x

Rack - extension installation kit:		
1	Collector rail	2 x
2	Rear brace	2 x
3	Lower rail	2 x
13	Screw M8 x 20 and nuts	4 x
14	Screw M10 x 20 and nuts	6 x

Collector connection - basic installation kit:		
5	Single-sided collector clamp	4 x
8	Profile rail	2 x
9	Collector bracket	2 x
13	Screw M8 x 20	4 x

Collector connection -extension installation kit:		
6	Profile connector with threaded pins	2 x
7	Double-sided collector clamp	2 x
8	Profile rail	2 x
9	Collector bracket	2 x
13	Screw M8 x 20	4 x

Roof jack (per collector):		
4	e.g. with carriage bolts	4 x

Tab. 2 Basic installation kit = per collector array and for 1st collector / extension installation kit = for each additional collector

2.3 Required tools

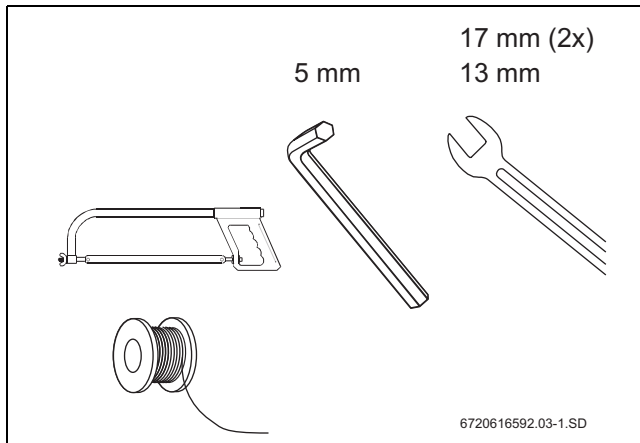


Fig. 5

2.4 Slope of the collectors

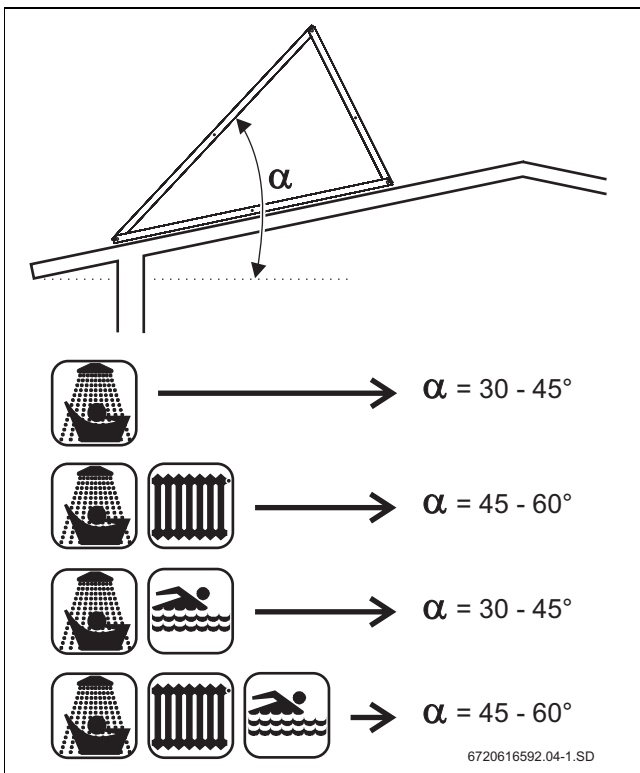


Fig. 6 Determining the area of application and slope

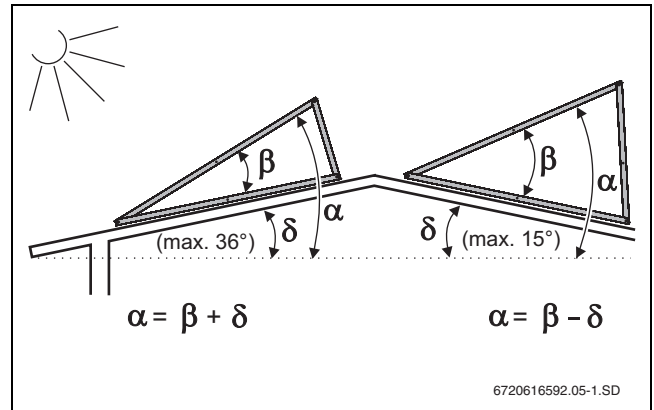


Fig. 7 Angles for sloped roofs

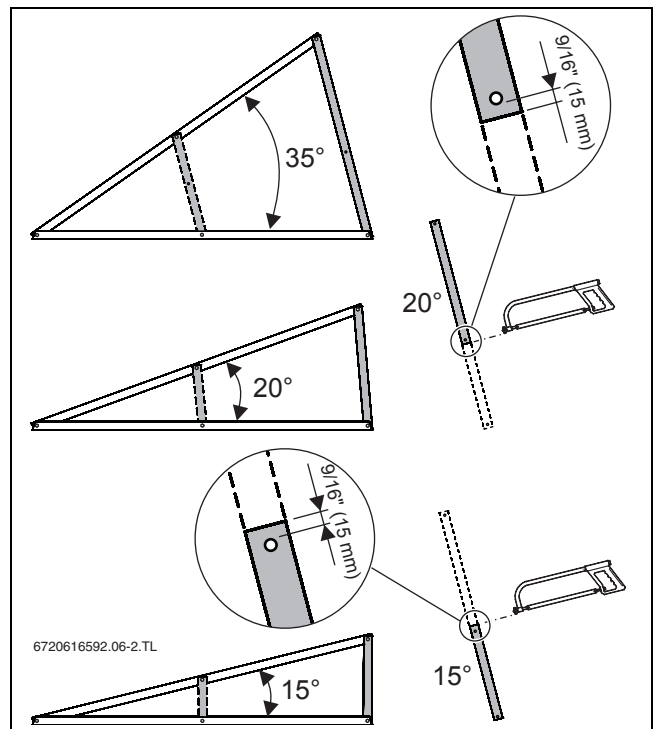


Fig. 8 Adjust rear rails; install additional rails (dashed) for angle 15° or 20° (rail uncut = 35° angle)

2.5 Determining space requirements

2.5.1 Minimum distance for multi-row collector arrays

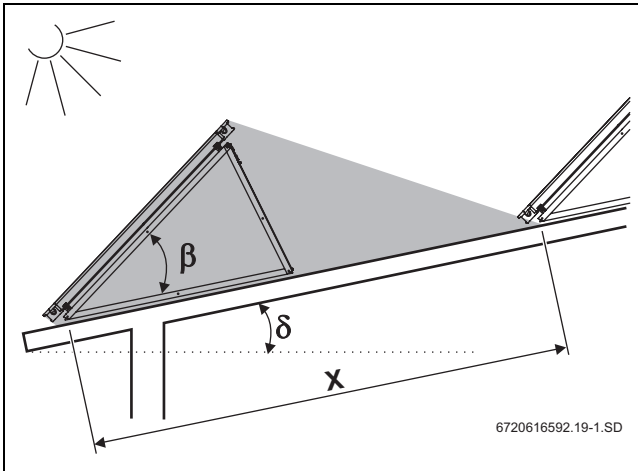


Fig. 9 Shadowing for multi-row collector arrays

Dimension X for vertical collectors			
δ	β = 15°	β = 20°	β = 35°
0°	4136 mm	4616 mm	5782 mm
5°	3582 mm	3925 mm	4743 mm
10°	3219 mm	3484 mm	4072 mm
15°	2969 mm	3170 mm	3602 mm
20°	2773 mm	2930 mm	3244 mm
25°	2626 mm	2744 mm	2965 mm
30°	2499 mm	2587 mm	2729 mm
35°	2391 mm	2460 mm	2533 mm

Tab. 3 Minimum distance for vertical collectors

2.5.2 Space requirements and collector array alignment

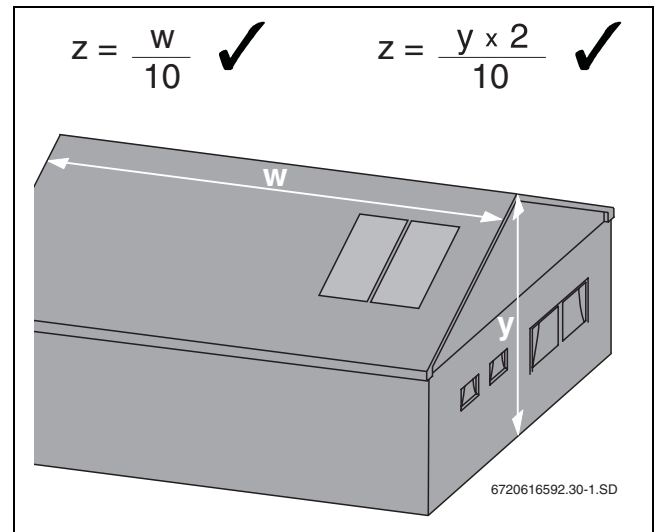


Fig. 10 Formulas for calculating the minimum distance from the edge (→ fig. 11 and 12)

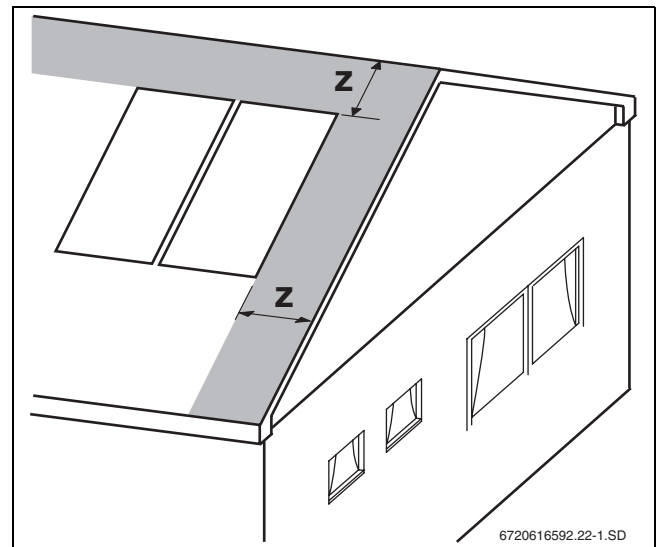


Fig. 11 Minimum distance from the edge area on sloped roofs

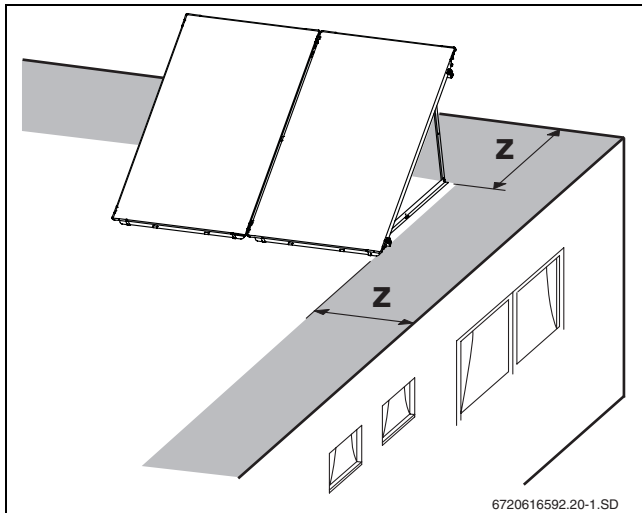


Fig. 12 Minimum distance from the edge on a flat roof

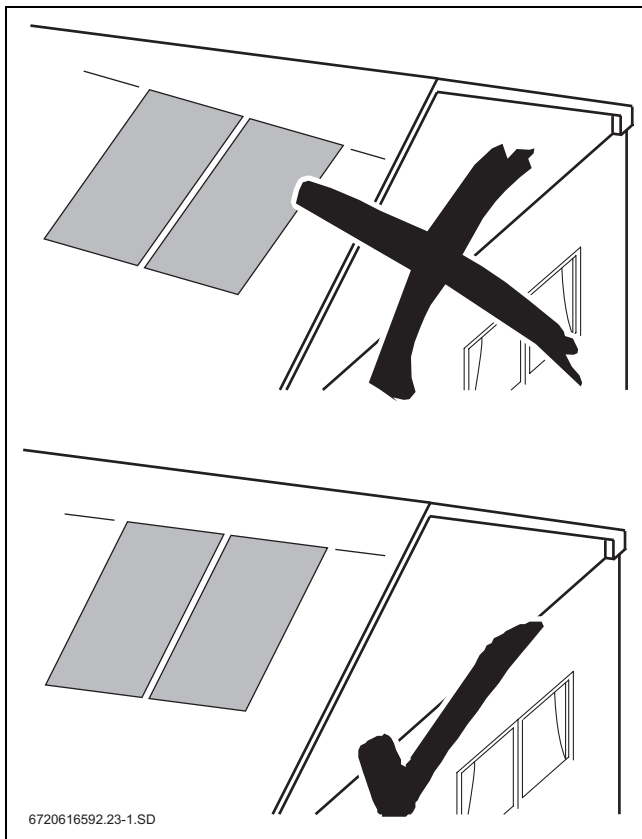


Fig. 13 Alignment of the collector array

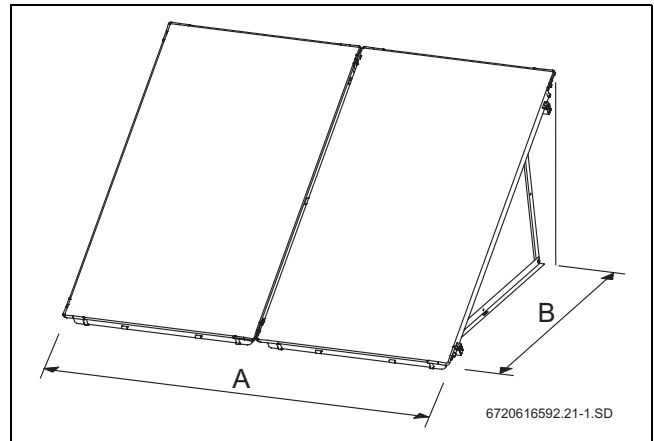


Fig. 14 Space requirement of a collector array

Number of collectors	Dimension A
2	2,20 m
3	3,30 m
4	4,40 m
5	5,50 m
6	6,60 m
7	7,70 m
8	8,80 m
9	9,90 m
10	11,00 m

Tab. 4 Space requirement (array width)

Angle of inclination	Dimension B
15°	1,99 m
20°	1,94 m
35°	1,93 m

Tab. 5 Space requirements (array depth)

3 Making the roof connection

For dimensions of the roof racks (holes of the rails) see page, → page 4.

3.1 Roof tiles



Make the roof connection using headless screws (studs) (→ 4.2.1 "Installation on studs").

3.2 Flat shingle



Make the roof connection using roof jacks (→ 4.2.2 "Installation on roof jacks (asphalt/slate/composite shingles)").

3.3 Corrugated sheet/metal roof



Make the roof connection with headless screws (→ 4.2.1 "Installation on studs").

3.4 Asphalt, slate and composite shingles



Make the roof connection with roof jacks (→ installation on roof jacks, asphalt/slate/composite shingles).

3.5 Standing seam metal roof



Purchase special roof hooks for standing seam metal roofs.

3.6 Flat roof



The roof connection for flat roof installation must be made on the building side (e.g. on I-beam, fig. 18). The idea is to not penetrate the roof membrane.



WARNING: The roof can be damaged!

- ▶ Consider the load rating of the roof and substructure.



WARNING: The solar system can be damaged!

- ▶ Design the building-side roof connection so that wind forces that occur on the collectors are within acceptable limits (→ tab. 6).

3.6.1 Flat roof: occurring forces per connection point for design of the substructure

Angle of the rack	up to 2,0 kN/m ² basic area snow load		
	Push ¹⁾	Pressure ²⁾	Pull ²⁾
15°	0,66 kN	3,00 kN	-2,49 kN
20°	0,88 kN	2,95 kN	-2,50 kN
35°	1,47 kN	2,51 kN	-2,52 kN

Tab. 6 for: roof angle 0° / maximum wind speed 151 km/h / installation height 20 m / base DIN 1055, part 4 + 5

1) parallel to the roof

2) perpendicular to the roof

4 Installing the rack

4.1 Pre-installing triangles on the ground

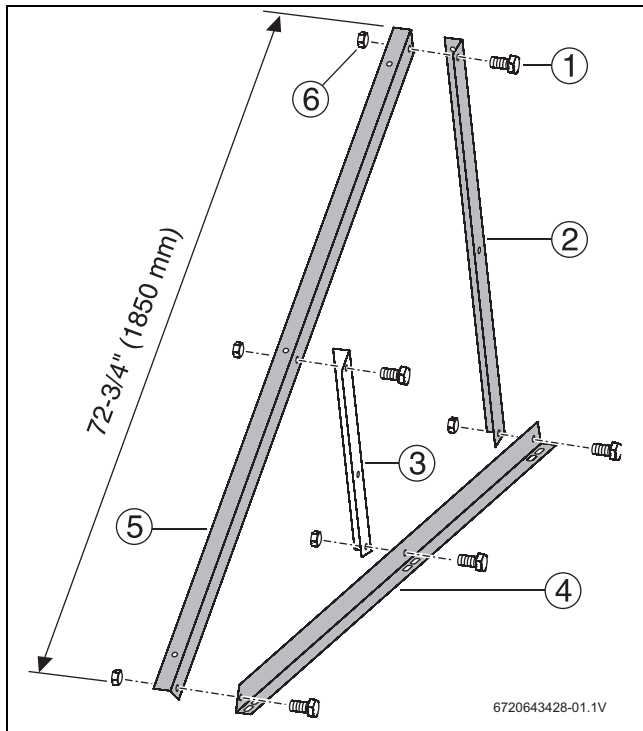


Fig. 15 Assemble rails

- 1 M10 screws
- 2 Rear rail
- 3 Center rail (accessory, for higher loads)
- 4 Lower brace
- 5 Collector rail
- 6 M10 nut

4.2 Installing triangles on the roof connector

4.2.1 Installation on studs

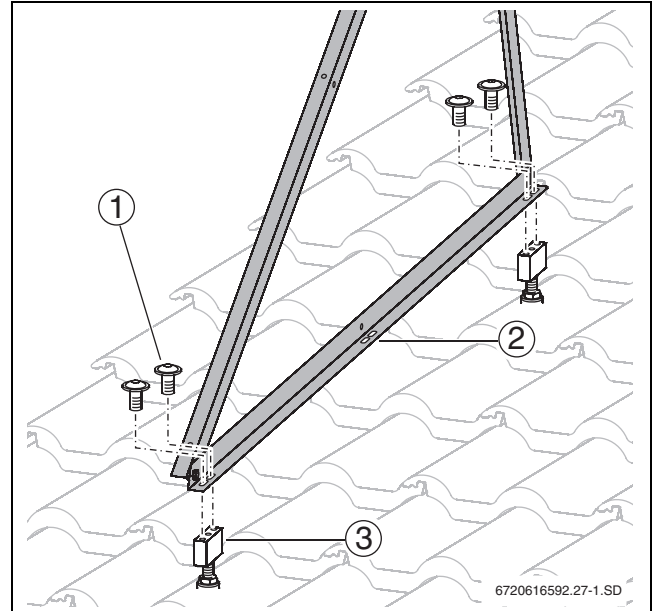


Fig. 16 Roof connection with headless screws (here: on a roof with tiles)

- 1 M8 x 20 screw
- 2 Position of additional roof connection for higher loads
- 3 Stud bolt installation set

4.2.2 Installation on roof jacks (asphalt/slate/composite shingles)

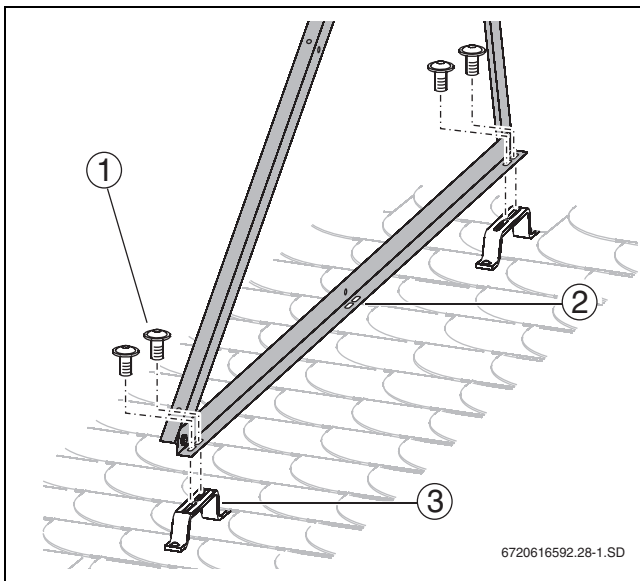


Fig. 17 Roof connection with roof jacks (here: on roof with asphalt/slate/composite shingles)

- 1 M8 x 20 screw
- 2 Position of additional roof connection for higher loads
- 3 Roof jack

4.2.3 Installation on a substructure (flat roof)

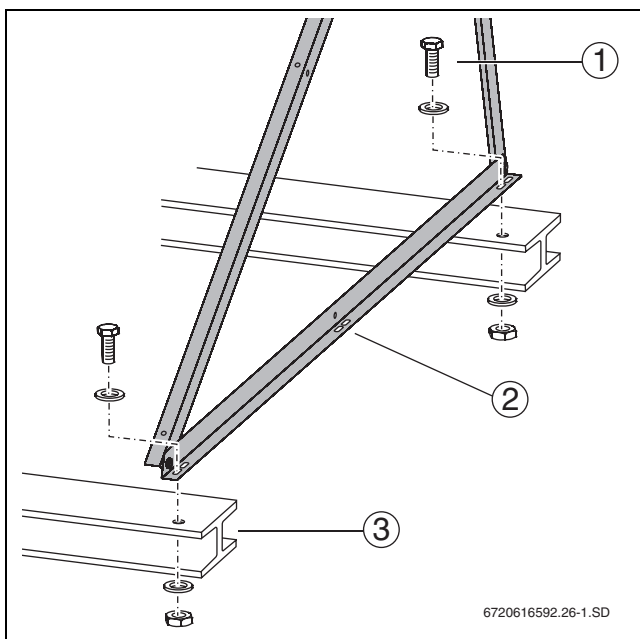


Fig. 18 Installation, e.g. on I-beams (provided on-site)

- 1 Required screw: at least M8/8.8
- 2 Position of additional I-beam for higher loads
- 3 I-beam provided on-site

4.3 Installing the profile rails and collector brackets

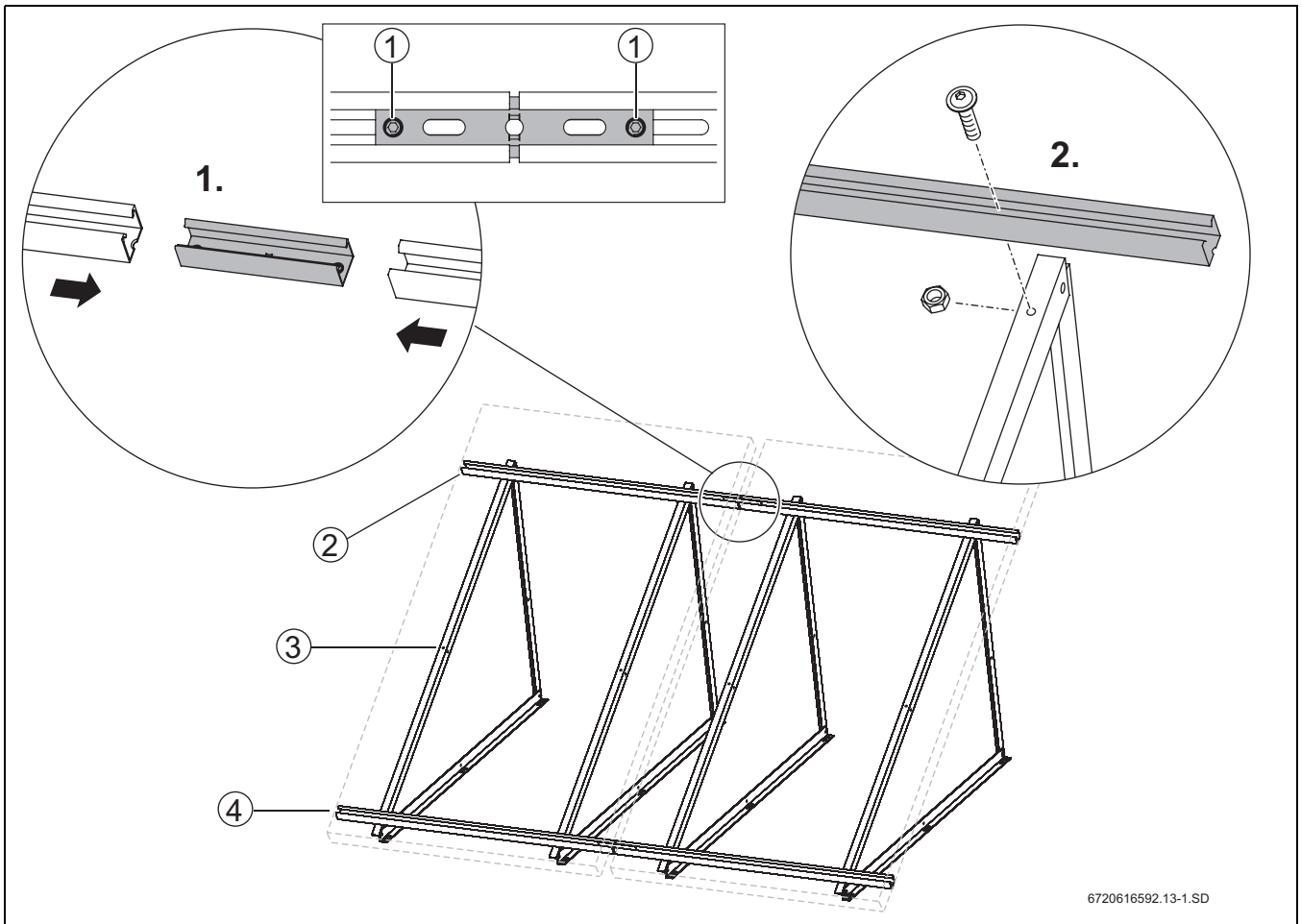


Fig. 19 Installing profile rails on triangles

- 1 Tighten M10 set screw to adjust
- 2 Upper profile rails
- 3 Position of additional profile rails for higher loads
- 4 Lower profile rails

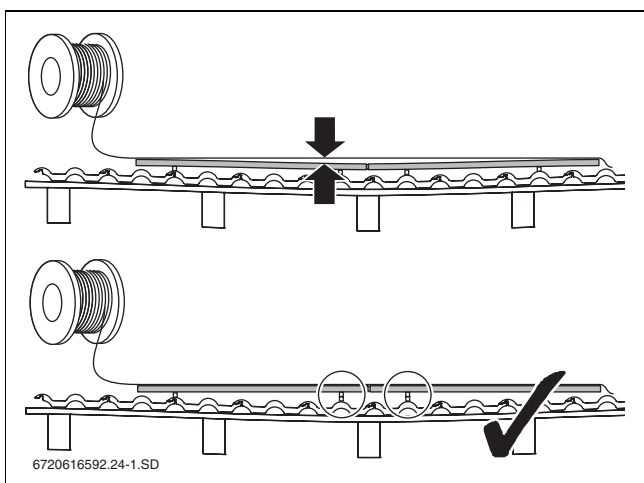


Fig. 20 If profile rails are bent, install spacers (check e.g. with cord)

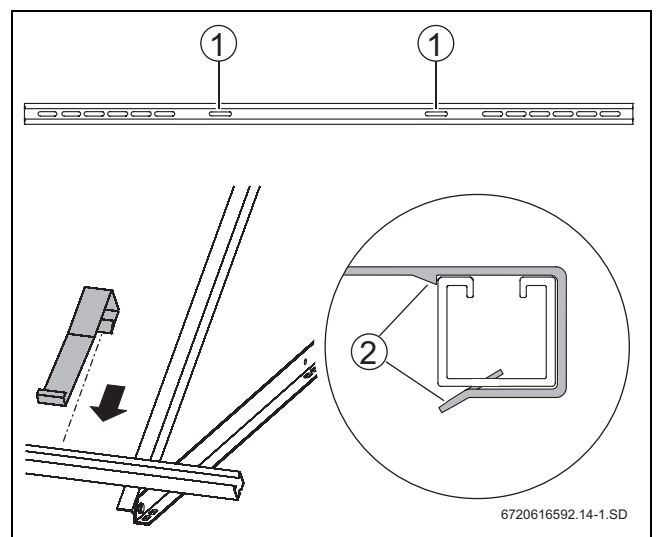


Fig. 21 Install two collector brackets per collector on lower profile rails

- 1 Slots for collector brackets
- 2 Snap the collector bracket into place

4.4 Installing steel cables as bracing for vertical collectors

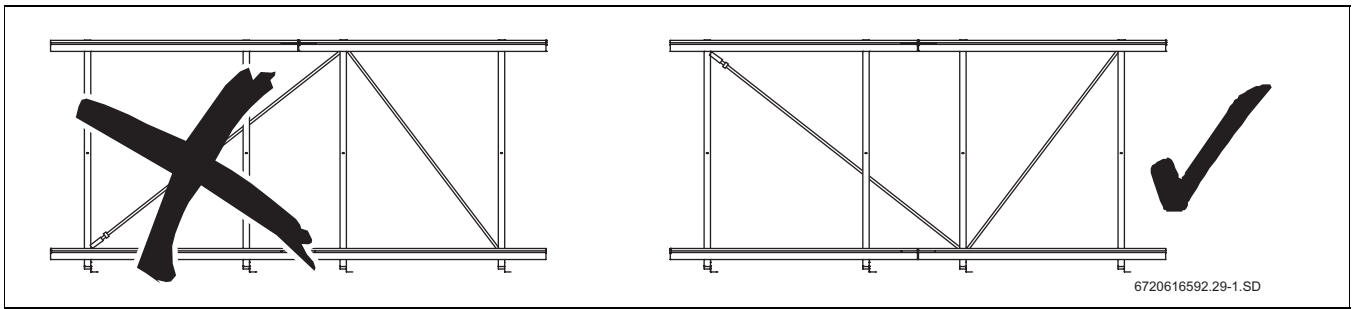


Fig. 22 Proper installation of the steel cable

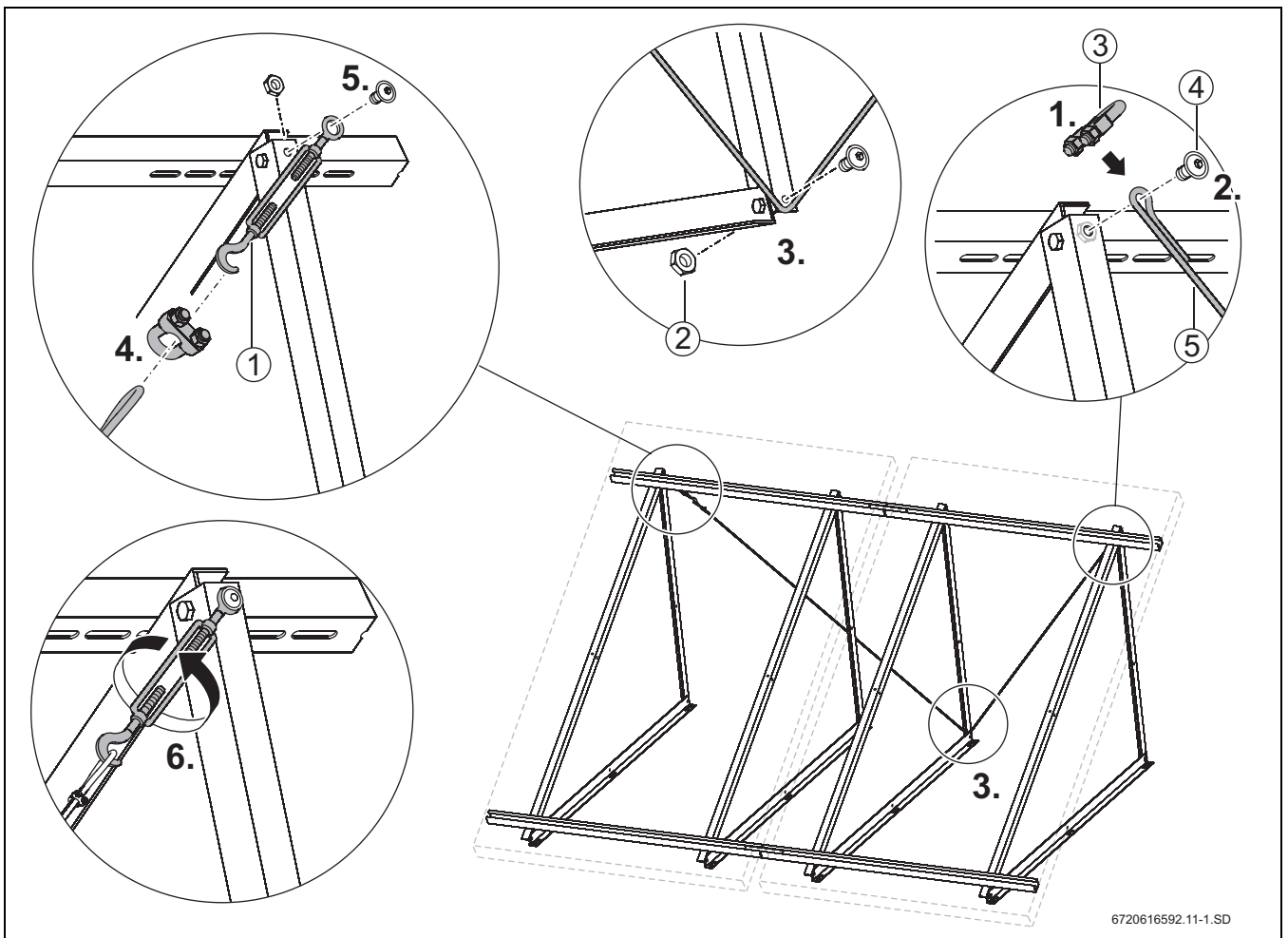



Fig. 23 Always attach the steel cable to two vertical collectors

- 1 Turnbuckle
- 2 M8 nut
- 3 Cable clamp
- 4 M8 x 20 screw
- 5 Steel cable



WARNING: System damage due to insufficient cable attachment!

- ▶ Ensure screw and nut (fig. 23, [2]) are sufficiently tight.

4.5 Routing the cable

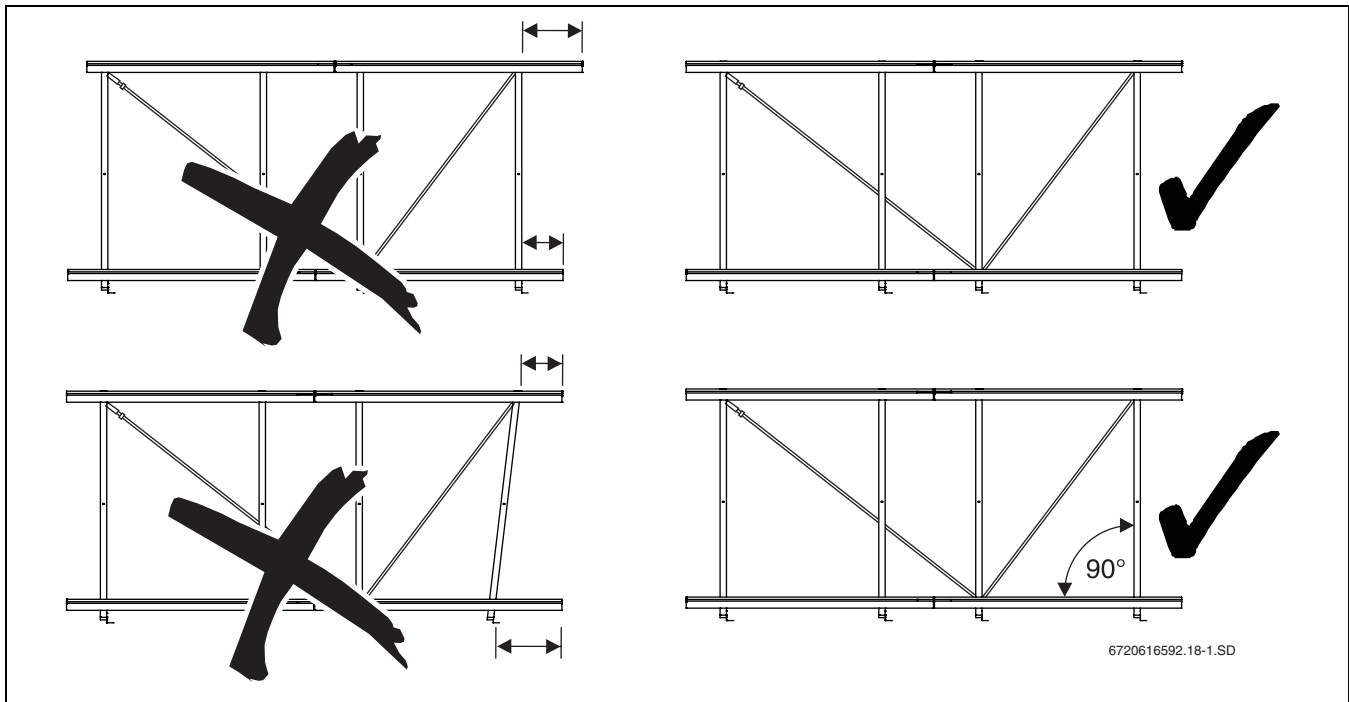


Fig. 24

4.6 Tightening screws

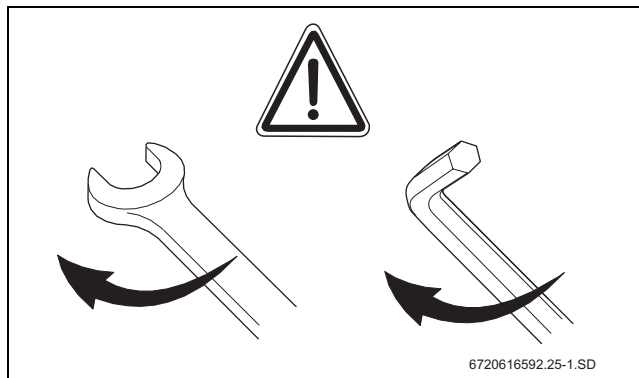


Fig. 25 Apertar suficientemente todos os parafusos

4.7 Installing collectors

For other installation steps not described here, please consult the on-roof instructions:

- Installing collectors
- Installing the collector sensor
- Connecting supply and return pipes
- Completion and final inspection

5 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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