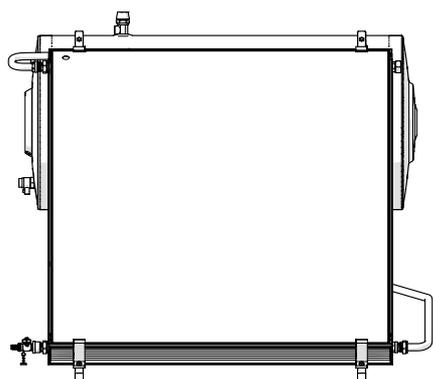
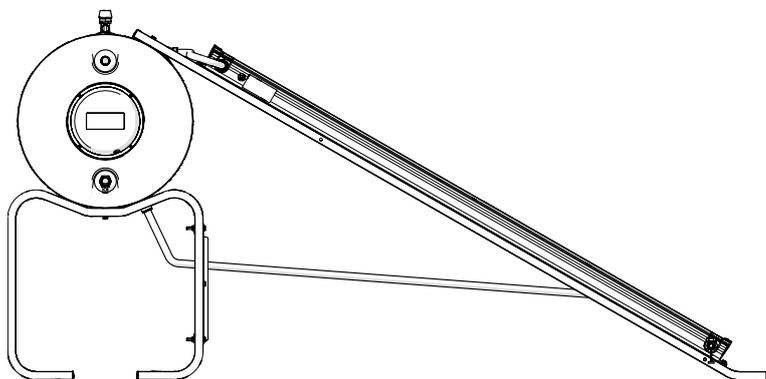


## NB-SOL TP

Solar | Natural Circulation Systems



**EN** Installation and Operation Manual



Dear Customer,

Thank you for choosing a **Beretta** Natural circulation system. You have purchased a modern, quality product that is designed to give dependable and safe service and to provide comfort in the home for many years to come. Arrange for your Natural circulation system to be serviced regularly by an authorised **Beretta** Technical Assistance Centre. Their personnel are specially trained to keep your product efficient and cheap to run. Your **Beretta** Technical Assistance Centre will also stock any original spare parts that might be required.

This instruction manual contains important instructions and precautions that must be observed to ensure the trouble-free installation and efficient functioning of your **Beretta** solar water heating system.

Please accept our renewed thanks for your purchase.

## CONFORMITY

The solar collectors used in **Beretta** natural circulation systems conform to EN standard 12975. **Beretta** storage cylinders conform to DIN 4753-3 and UNI EN 12897 standards.

## RANGE

MODEL	CODE
NB-SOL 150/1 TP	20100366
NB-SOL 200/1 TP	20100367
NB-SOL 220/2 TP	20100368
NB-SOL 300/2 TP	20100369
NB-SOL 300/3 TP	20100370

## ACCESSORIES

For a complete list of accessories and details of their compatibility, refer to the Catalogue.

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**At the end of its life, the product should be not be disposed of as solid urban waste, but rather it should be handed over to a differentiated waste collection centre.**

The following symbols are used in this manual:

 **CAUTION!** = Identifies actions that require caution and adequate preparation.

 **STOP!** = Identifies actions that you MUST NOT do.

## 1 GENERAL SAFETY INFORMATION

-  Check that the product is complete, undamaged and as ordered as soon as you receive it. Report any discrepancies or damage to the **Beretta** dealer who sold it.
-  This product must be installed by a legally qualified heating engineer. On completion of the installation, the installer must issue the owner with a declaration of conformity confirming that the installation has been completed to the highest standards in compliance with the instructions provided by **Beretta** in this instruction manual, and that it conforms to all applicable laws and standards.
-  This product must only be used for the purpose for which it is designed and made, as specified by **Beretta**. **Beretta** declines all responsibility, contractual or other, for damage to property or injury to persons or animals caused by improper installation, adjustment, maintenance or use.
-  Make sure that the roof is strong enough to support the weight of the solar water heating system under operating conditions. Also make sure that the section of roof chosen for the installation enjoys a high level of insolation, and is not shaded during the day by tall plants, trees, other houses, hills, etc..
-  The installation of a solar water heating system modifies the existing structure of the roof. Verify the suitability of all roof elements and if necessary adapt them to avoid leaks or damage by wind and/or snow loads.
-  If the system is installed in an area subject to gusting winds or snow loads in excess of the limits given in the technical specifications, consult your supplier for advice.
-  Snow can build up in the sheltered area behind the solar water heating system. Provide adequate protection to avoid increasing the static load on the roof.
-  The system must be serviced at least once a year.
-  The water supply circuit must permit the storage cylinder to be filled and emptied in safety. Shut-off valves must therefore be easily accessible to the user and the operation of emptying the storage cylinder must not create any risk of flooding or other damage.
-  Insulate the domestic water pipes (hot and cold) and the pipes of the solar collector circuit. Provide suitable insulation for all outdoor accessories.
-  The point through which the water pipes enter the building must be rain-proof and damp-proof.
-  If you notice any water or heat transfer liquid leaks, disconnect the system immediately from the mains electricity supply (if a supplementary heating element is installed), shut off the water supply, and notify **Beretta's** Technical Assistance Service or a qualified heating engineer immediately.

-  Make sure that the water-glycol mix in the solar collector circuit is able to resist the minimum temperatures likely to occur in the place of installation.
-  The system can reach very high temperatures. Safety valves can therefore discharge extremely hot liquids. Make sure that the expansion vessel is of a suitable size and design for use in solar water heating systems.
-  Use proper slings to lift and move the elements of the system. Never lift the collector or storage cylinder by their fittings. Avoid subjecting the collector to impacts or mechanical strain, and take care to protect the glass panel. Use the personal protection equipment required by applicable safety standards.

## 2 PRECAUTIONS

-  Never attempt to install the system without using the personal protection equipment and without following the safety precautions specified by applicable occupational safety standards.
-  Never install solar collectors on roofs without an adequate lightning protection system.
-  Never install the system without providing proper drainage for the two safety valves: that of the domestic hot water circuit and that of the primary (solar collector) circuit.
-  If the storage cylinder is equipped with a supplementary heating element, never attempt any cleaning or maintenance without first disconnecting it from the mains power supply.
-  Do not allow children or infirm persons to operate the system unsupervised.
-  Do not tamper with or adjust the safety or control devices without prior authorisation and instructions from the manufacturer.
-  Never use anti-freeze other than that supplied by **Beretta** to fill or top up the solar collector circuit. Mixing different products can reduce the anti-freeze protection provided.
-  Never drain the solar collector circuit under sunny conditions or when the collector is hot.
-  Do not dispose of packaging material into the environment, or leave it within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.

### 3 DESCRIPTION OF THE SYSTEM

The **NB-SOL TP** system is a solar hot water heating system that functions on the principle of natural circulation. The heat transfer liquid therefore circulates by normal convection.

The system comprises one or more solar collectors and a jacket type storage cylinder, located under the collector/s.

The system does not require any pumps or adjustments. A supplementary heating element is also available for use if needed.

**The system comprises:**

- Solar collector/s
- A jacket type solar storage cylinder
- Box of water pipes and fittings
- Mounting brackets
- Anti-freeze liquid.

### 4 SAFETY DEVICES

The system is equipped with the following safety devices:

- A primary circuit safety valve that opens if pressure in the primary (solar collector) circuit rises above a 2.5 bar threshold.
- A secondary circuit safety valve that opens if pressure in the secondary (DHW) circuit rises above a 10 bar threshold.

 Water may come out of the primary and secondary circuit safety valves as a result of variations in temperature and pressure during the course of the day. Ensure that proper drainage is provided. For the same reason, avoid standing near the safety valves during the day.

 Safety devices must only be replaced by **Beretta's** Technical Assistance Service using original spare parts.

 Over-temperature protection requires an adequate supply of cold water from the mains.

### 5 IDENTIFICATION

**Beretta NB-SOL TP** systems are identified by:

**Storage cylinder data plate**



Beretta Caldaie  
Via Risorgimento, 13  
23900 Lecco (LC)

**SISTEMA SOLARE A CIRCOLAZIONE NATURALE**  
**NATURAL CIRCULATION SOLAR WATER HEATING SYSTEM**

Mod. \_\_\_\_\_  
Cod. \_\_\_\_\_  
Serial N° \_\_\_\_\_  
Tipo/Type \_\_\_\_\_

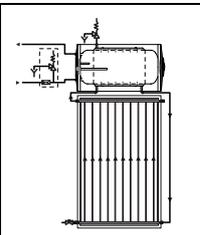
Anno \_\_\_\_\_  
Year \_\_\_\_\_

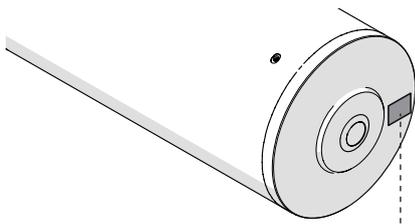
Capacità bollitore \_\_\_\_\_ l  
Storage cylinder capacity \_\_\_\_\_ l

Pressione di progetto acqua sanitaria \_\_\_\_\_ bar  
DHW circuit operating pressure \_\_\_\_\_ bar

Pressione max circuito solare \_\_\_\_\_ bar  
Max solar heating circuit pressure \_\_\_\_\_ bar

La protezione da sovratemperatura dipende dalla fornitura di acqua fredda sanitaria  
Over - temperature protection requires an adequate supply of cold water





**Collector data plate**

CODICE : xxxxxxxx

S/N :   

SEGALE PROGRESSIVO 13000000

BAR CODE 1288

Anno di produzione \_\_\_\_\_

TIPO : CP20TSS

FABBRICATO IN ITALIA da Riello S.p.A.

EN 12975  
Certif. 0117S2400F

**COLLETTORE SOLARE PIANO**

DIMENSIONI: 1818X1048X70 mm

SUPERFICIE LORDA: 1,91 m<sup>2</sup>

SUPERFICIE DI APERTURA: 1,78 m<sup>2</sup>

SUPERFICIE ASSORBITORE: 1,77 m<sup>2</sup>

PESO A VUOTO: 34 kg

MAX PRESSIONE ESERCIZIO: 10 bar

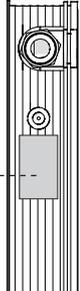
TEMPERATURA DI STAGNAZIONE: 192°C

CONTENUTO LIQUIDO: 1,6 l

MAX CONCENTRAZIONE GLICOLE: 50%

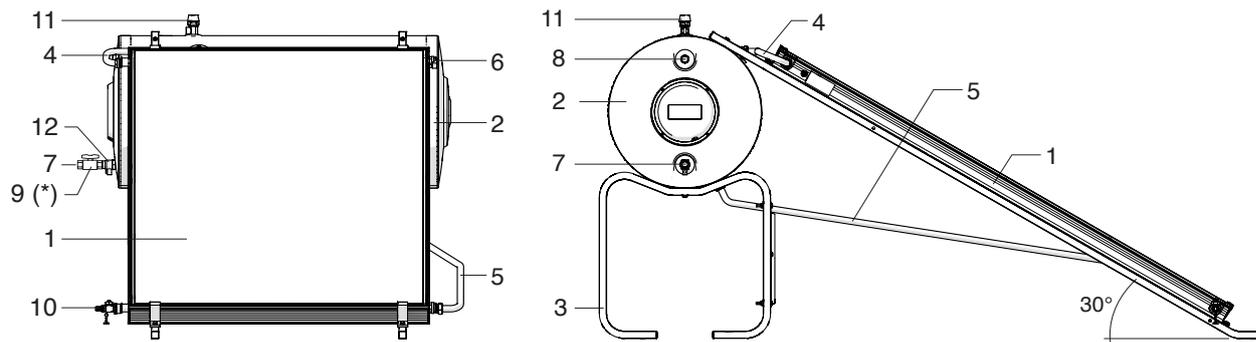
LIQUIDO TERMOMETTORE:  
ACQUA+GLICOLE PROPYLENICO

20092406\_E2



 If these plates or any other means of clearly identifying the product are defaced, removed or lost, proper installation and servicing may be rendered difficult.

## 6 SYSTEM LAYOUT



### Components

- 1 Solar collector/s
- 2 Storage cylinder
- 3 Mounting frame

### Pipes and fittings

- 4 Collector outlet
- 5 Collector return
- 6 Plug

### External connections

- 7 Domestic cold water inlet - 3/4"
- 8 Domestic hot water outlet - 3/4"
- 9 Domestic cold water inlet cock
- 10 Filling/drain cock

### Safety devices

- 11 Primary circuit safety valve (2.5 bar)
- 12 Non-return valve - Secondary circuit safety valve (10 bar)

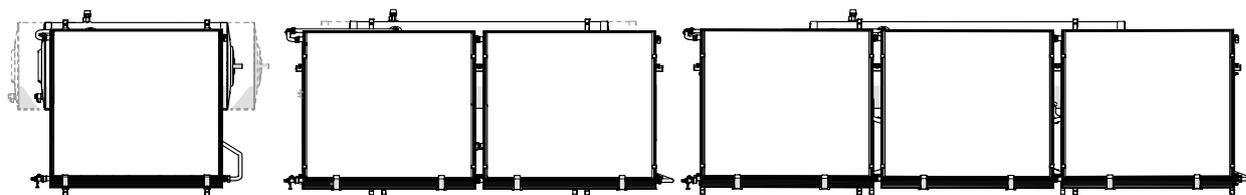
(\*) (Not supplied. To be provided by installer.)

### POSSIBLE CONFIGURATIONS

**NB-SOL TP**  
150/1 ÷ 200/1

**NB-SOL TP**  
220/2 ÷ 300/2

**NB-SOL TP**  
300/3



## 7 TECHNICAL SPECIFICATIONS

Description	NB-SOL TP					
	150/1	200/1	220/2	300/2	300/3	
Collector surface area	1,91 x 1	1,91 x 1	1,91 x 2	1,91 x 2	1,91 x 3	m <sup>2</sup> x n. of pan.
Exposed area	1,78 x 1	1,78 x 1	1,78 x 2	1,78 x 2	1,78 x 3	m <sup>2</sup> x n. of pan.
Absorption area	1,77 x 1	1,77 x 1	1,77 x 2	1,77 x 2	1,77 x 3	m <sup>2</sup> x n. of pan.
Stagnation temperature	192					°C
Storage cylinder capacity	153	202	223	278	278	l
Magnesium anode	22 x 300	22 x 300	22 x 300	22 x 400	22 x 400	Ø x mm
Heat transfer liquid capacity	8,5	13,6	16,3	20,3	22,2	l
Maximum wind and snow load	2000	2000	2000	2000	2000	Pa
DHW circuit safety valve operating pressure	10					bar
Solar collector circuit safety valve operating pressure	2,5					bar
A <sub>sol</sub> (*)	1,78	1,78	3,56	3,56	5,34	m <sup>2</sup>
η <sub>0</sub> (*)	0,778	0,778	0,778	0,778	0,778	
a <sub>1</sub> (*)	4,96	4,96	4,96	4,96	4,96	W/(m <sup>2</sup> K)
a <sub>2</sub> (*)	0,0005	0,0005	0,0005	0,0005	0,0005	W/(m <sup>2</sup> K <sup>2</sup> )
IAM (50°) (*)	0,87	0,87	0,87	0,87	0,87	
η <sub>col</sub> (**)	58	58	58	58	58	%

Description	NB-SOL TP					
	150/1	200/1	220/2	300/2	300/3	
S	77	85	88	95	95	W
V	153	202	223	278	278	l
Qnonsol M (***)	1109	1132	1007	1044	1023	kWh/a
Qnonsol L (***)	2122	2124	1711	1723	1494	kWh/a
Qnonsol XL (***)	3610	3600	2977	2970	2527	kWh/a
Qnonsol XXL (***)	4753	4738	4022	4008	3457	kWh/a

(\*) Tested according to EN 12975, referred to a 33,3% water-glycol mix, flow rate of 140 l/h , and irradiation G = 800 W/ m<sup>2</sup>.

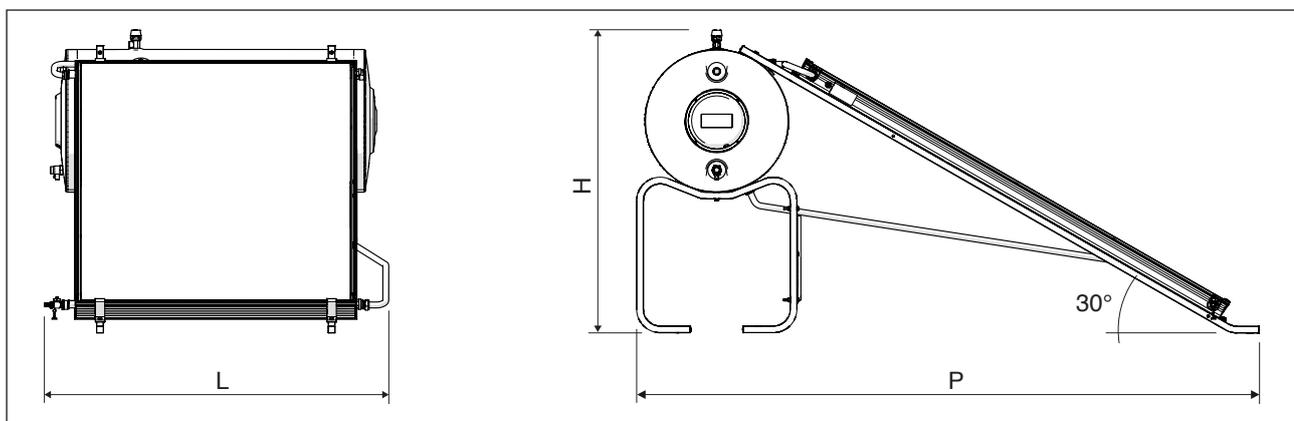
$$T_m = (\text{Coll.}_{inlet\_temp.} + \text{Coll.}_{outlet\_temp.}) / 2$$

$$T^*m = (T_m - T_{ambient}) / G$$

(\*\*) Calculated with a temperature difference of 40K between the solar collector and the surrounding air, and with total solar radiation of 1000 W/m<sup>2</sup> referred to the exposed area.

(\*\*\*) Value calculated in terms of primary electrical energy and/or calorific content of fuel under average climatic conditions, in load profiles M, L, XL and XXL, with permanent backup and storage cylinder inside building.

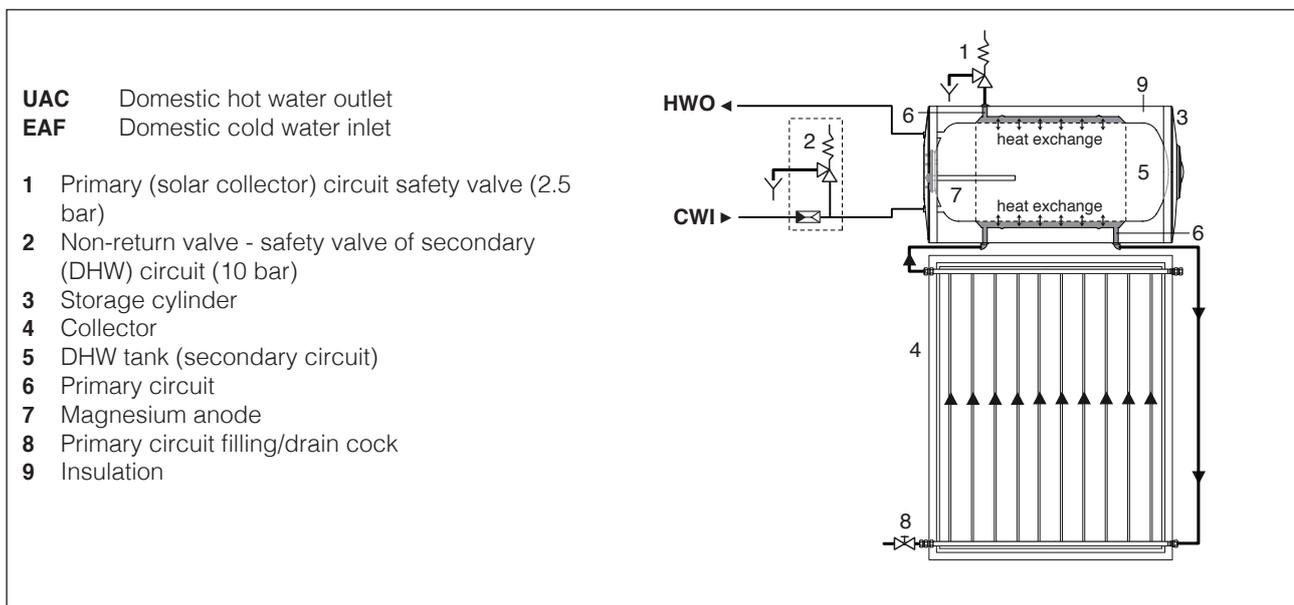
## 8 OVERALL DIMENSIONS AND WEIGHTS



7

Description	NB-SOL TP					
	150/1	200/1	220/2	300/2	300/3	
Empty weight	112	136	162	198	236	kg
Full weight	274	352	401	496	597	kg
L	1310	1310	2400	2400	3500	mm
P	2310	2310	2310	2310	2310	mm
H	1130	1130	1130	1130	1130	mm

## 9 WATER CIRCUIT



## 10 UNPACKING THE PRODUCT

### Contents of packing:

- Solar collector/s
- Storage cylinder
- Box of accessories containing fittings and a container of glycol anti-freeze
- Mounting kit for flat roofs (see the assembly section for details of kit contents).

A plastic pouch containing:

- Instruction manual
- Bar code label
- Serial number plate.



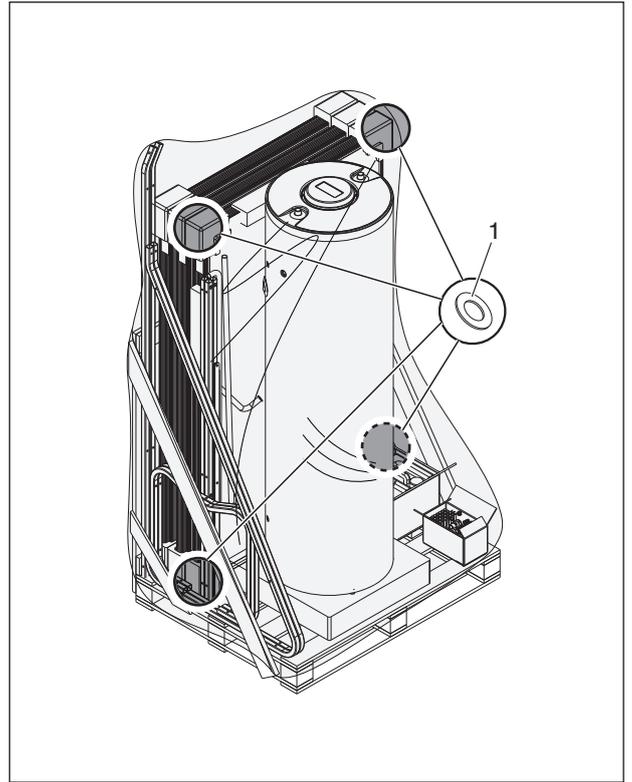
This instruction manual is an integral part of the **NB-SOL TP** system. Once located, read it thoroughly and keep it safe.



**A protective film is applied to the glass of the solar collector. On completion of installation, only remove this film if you are going to put the system into service immediately.**



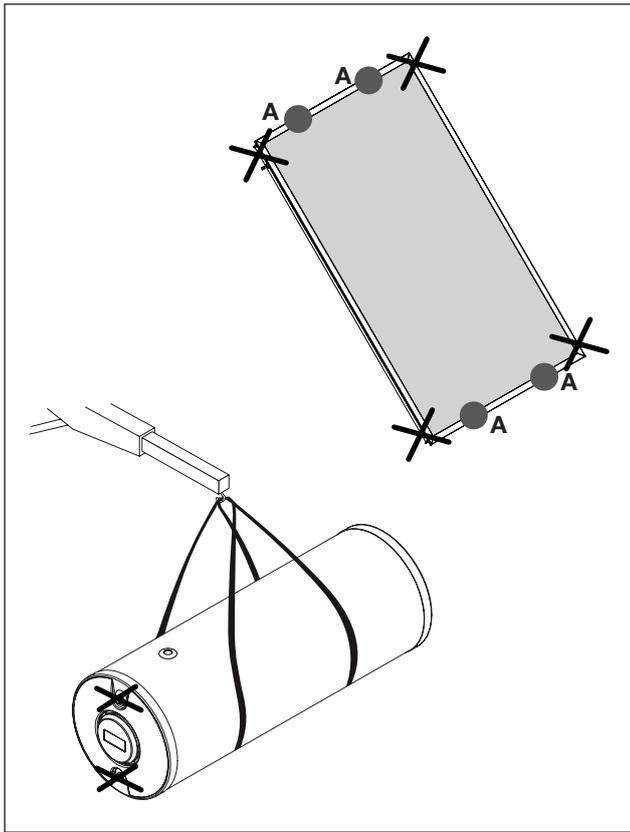
Take care not to lose the four flat seal rings (1) located in the corner profiles of each collector.



Description	NB-SOL TP					
	150/1	200/1	220/2	300/2	300/3	
<b>WEIGHT</b>						
Total weight of supply	See the transport document					kg
COLLECTOR/S package	34	34	2 x 34	2 x 34	3 x 34	kg
STORAGE CYLINDER package	62	76	84	106	116	kg
<b>DIMENSIONS</b>						
Total supply package	2077 x 1246 x 770	2077 x 1246 x 770	2162 x 1246 x 870	2160 x 1250 x 870	2155 x 1246 x 870	mm
COLLECTOR/S package	1865 x 1200 x 95	1865 x 1200 x 95	2 x (1865 x 1200 x 95)	2 x (1865 x 1200 x 95)	3 x (1865 x 1200 x 95)	mm
STORAGE CYLINDER package	1250 x 600 x 600	1250 x 600 x 600	1250 x 600 x 600	2050 x 600 x 600	2050 x 600 x 600	mm

## 11 HANDLING

Hold solar collectors at the points shown (A) to move them. Lift and move the storage cylinder in a horizontal position. Make sure that the slings and lifting gear used are suitable for the weight.



-  Do not lift the solar collector by its water fittings.
-  Do not lift the storage cylinder by its water fittings.
-  Wear suitable personal protective equipment and use suitable safety devices.

## 12 PREPARING FOR INSTALLATION

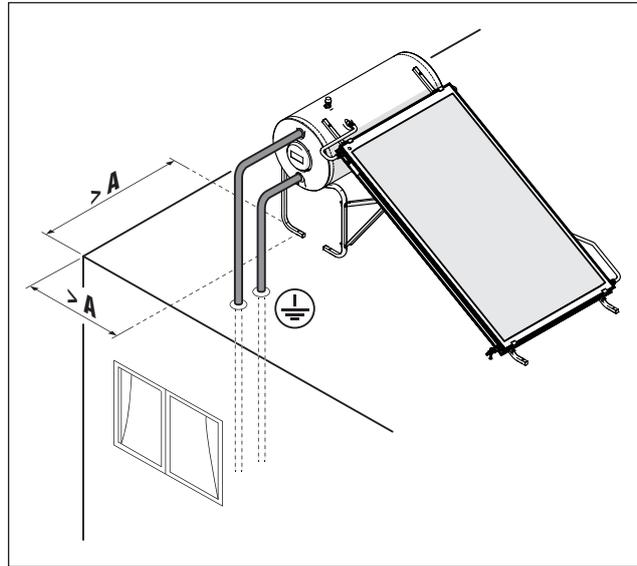
Select the best possible orientation for the solar collectors (ideally facing south). Avoid positions that are shaded by plants, trees, buildings or hills, etc. during the day.

Maintain the minimum distance (A) between the system and the edge of the roof.

Remove all gravel and detritus from the surface on which the system is to be installed.

The mounting kit must not be used to install other superstructures. It is designed only for use with **Beretta** solar water heating systems.

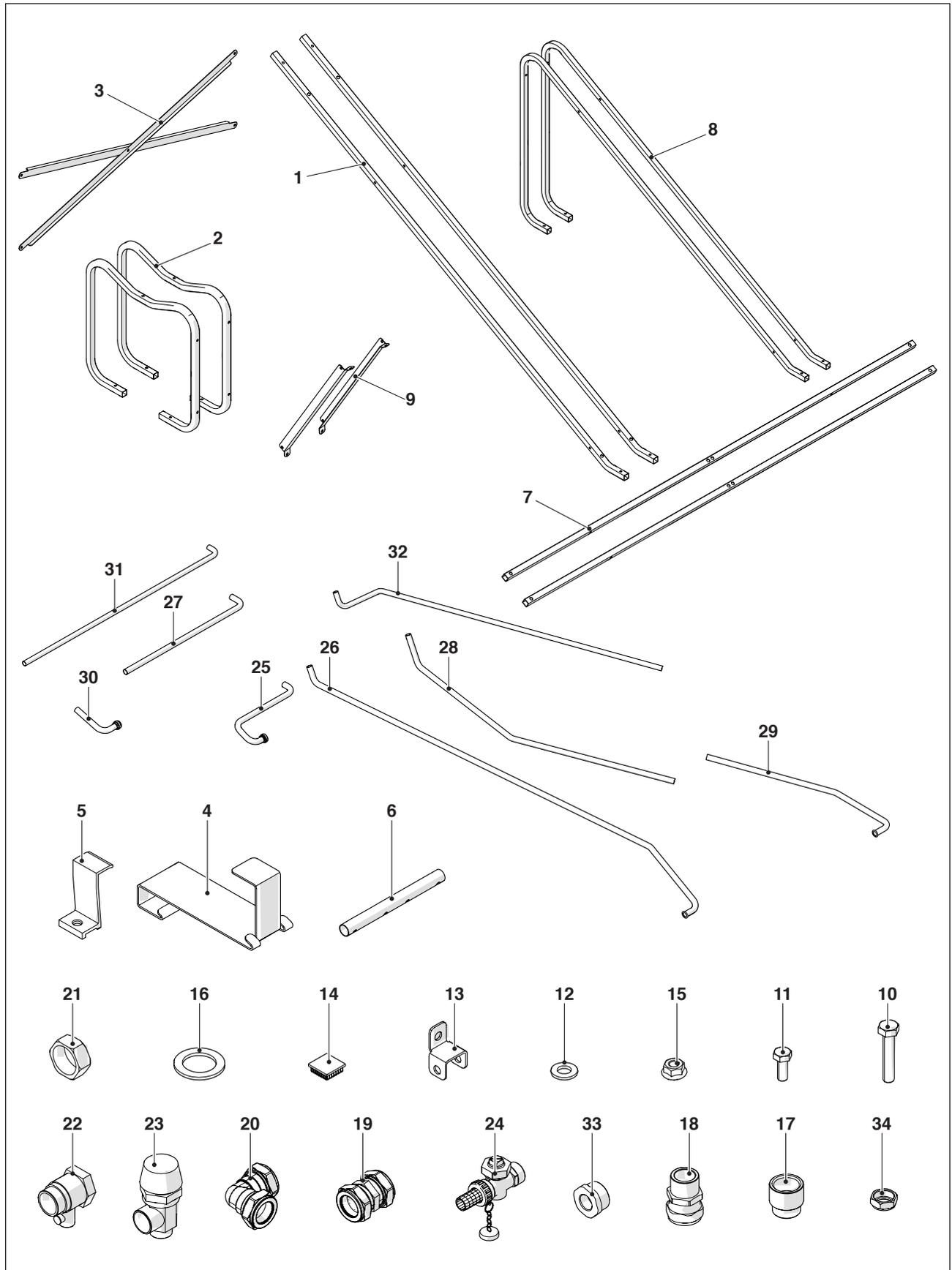
The installation of a solar water heating system modifies the existing structure of the roof. Verify the suitability of all roof elements and if necessary adapt them to avoid leaks or damage by wind and/or snow loads.



	NB-SOL TP					U.M.
	150/1	200/1	220/2	300/2	300/3	
A	1	1	1,5	1,5	1	m

# 13 ASSEMBLY

Start installing the system by assembling the mounting frame for flat roofs. To do so, follow the instructions given below.



**CONTENTS OF MOUNTING KIT**

Description	NB-SOL TP				
	150/1	200/1	220/2	300/2	300/3
1 Collector support bars	2	2	2	2	2
2 Storage cylinder supports	2	2	2	2	2
3 Cross bars	2	2	2	2	4
4 Brackets	-	-	4	4	8
5 Collector fixing bracket	4	4	8	8	12
6 Tube join	-	-	-	-	2
7 Square tubes	-	-	2	2	4
8 Additional collector supports	-	-	-	-	2
9 Bar props	-	-	2	2	2
10 M8x40 screws	8	8	16	16	34
11 M8x16 screws	5	5	9	9	13
12 M8 washer	6	8	11	11	15
13 Cross bracket	-	-	4	4	4
14 Plugs	8	8	12	12	16
15 M8 flanged nut	5	5	13	13	31
16 1" seal (in corner profiles of collector)	4	4	6	6	8
17 3/4" extension	1	1	1	1	1
18 3/4" straight union	2	2	2	2	2
19 3/4" straight union	-	-	1	1	1
20 Elbow union	-	-	1	1	1
21 Collector plug	1	1	1	1	1
22 10 bar safety valve	1	1	1	1	1
23 2.5 bar safety valve	1	1	1	1	1
24 Cock	1	1	1	1	1
25 150-200 return pipe	1	1	-	-	-
26 150-200 flow pipe	1	1	-	-	-
27 200-300 return pipe	-	-	1	1	-
28 200-300 flow pipe	-	-	1	1	-
29 Additional flow pipe	-	-	1	1	1
30 Additional return pipe	-	-	1	1	1
31 300 return pipe	-	-	-	-	1
32 300 flow pipe	-	-	-	-	1
33 Ring nut for cock	1	1	1	1	1
34 Ring nut	1	1	1	1	1

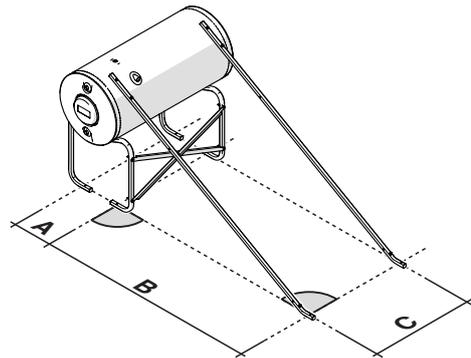
## 13.1 Steps valid for all models

- Mark the anchoring points

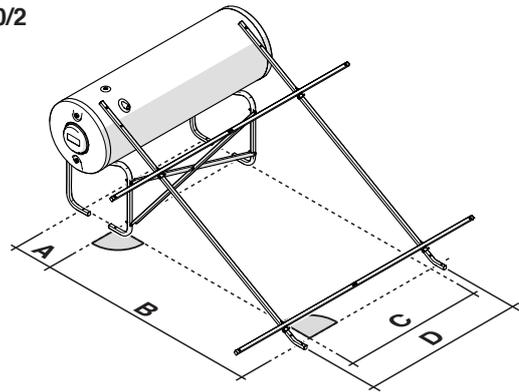
 Check that the marks are square.

	NB-SOL TP					
	150/1	200/1	220/2	300/2	300/3	
A	300	300	300	300	300	mm
B	1832	1832	1832	1832	1832	mm
C	860	860	1160	1160	1160	mm
D	-	825	1310	1310	1310	mm
E	-	-	-	-	300	mm
F	-	-	-	-	3216	mm

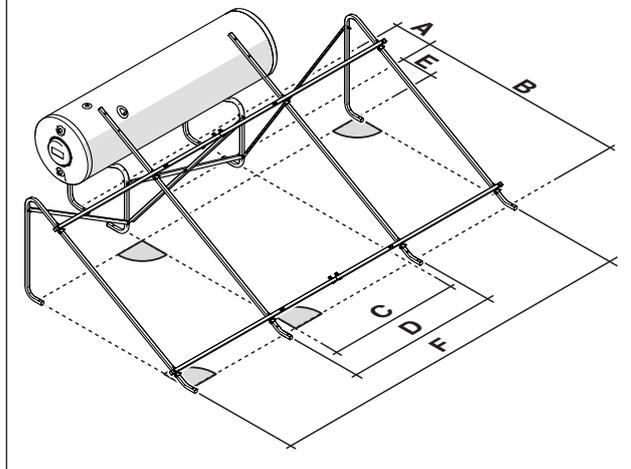
150/1  
200/1



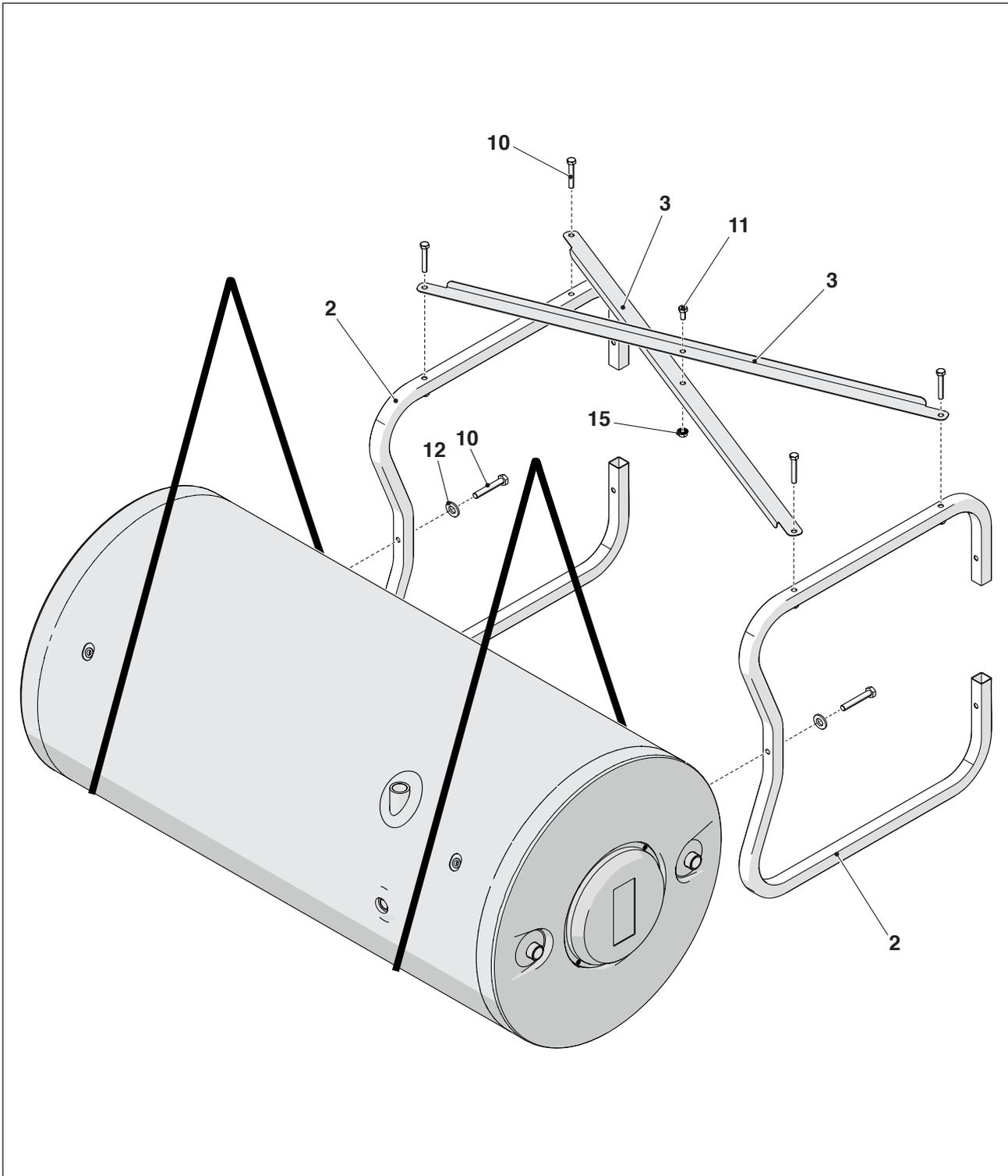
220/2  
300/2



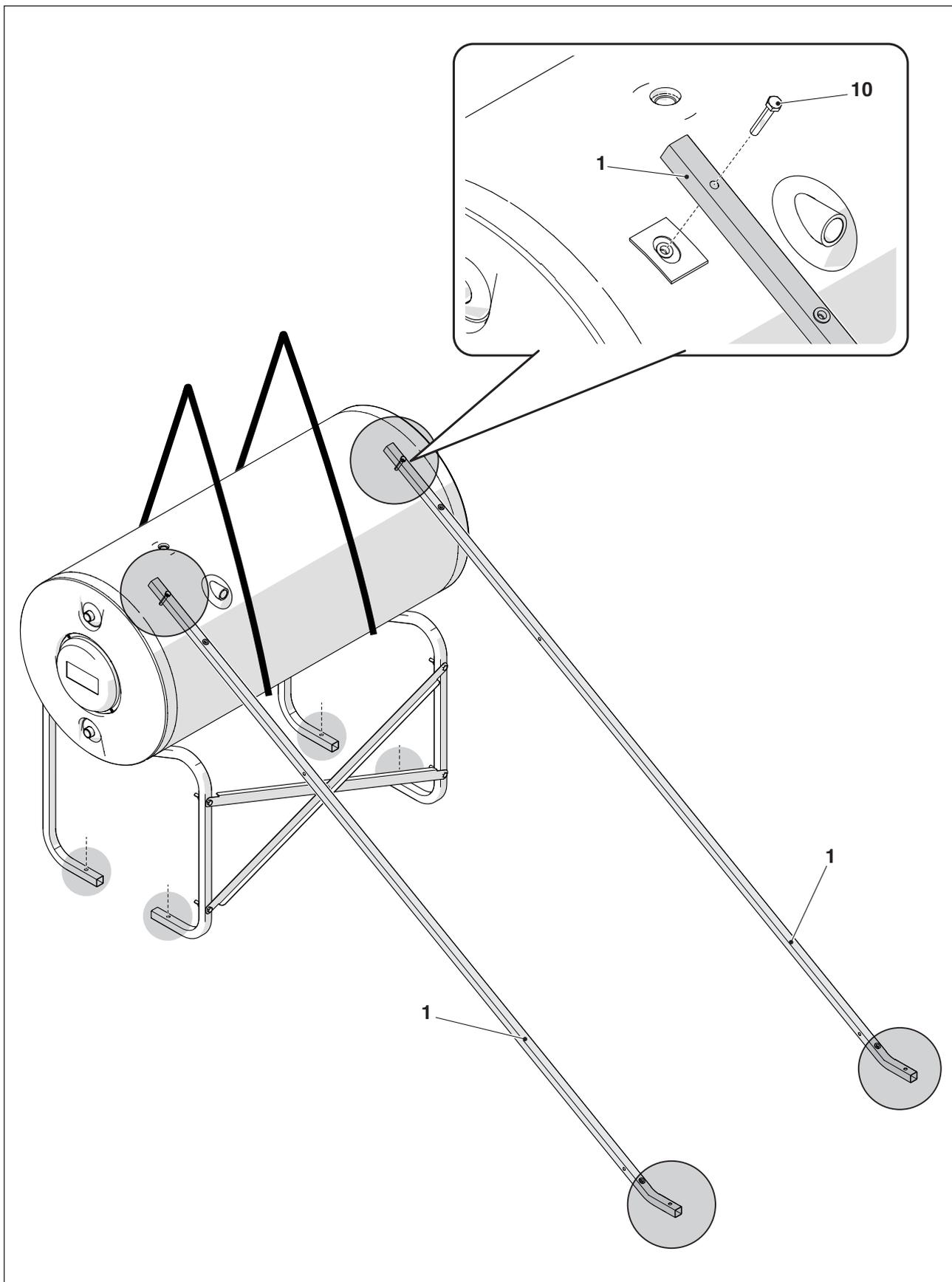
300/3



- Assemble the base by fixing the cross bars (3) to the storage cylinder supports (2)
- Fix the storage cylinder to its assembled base

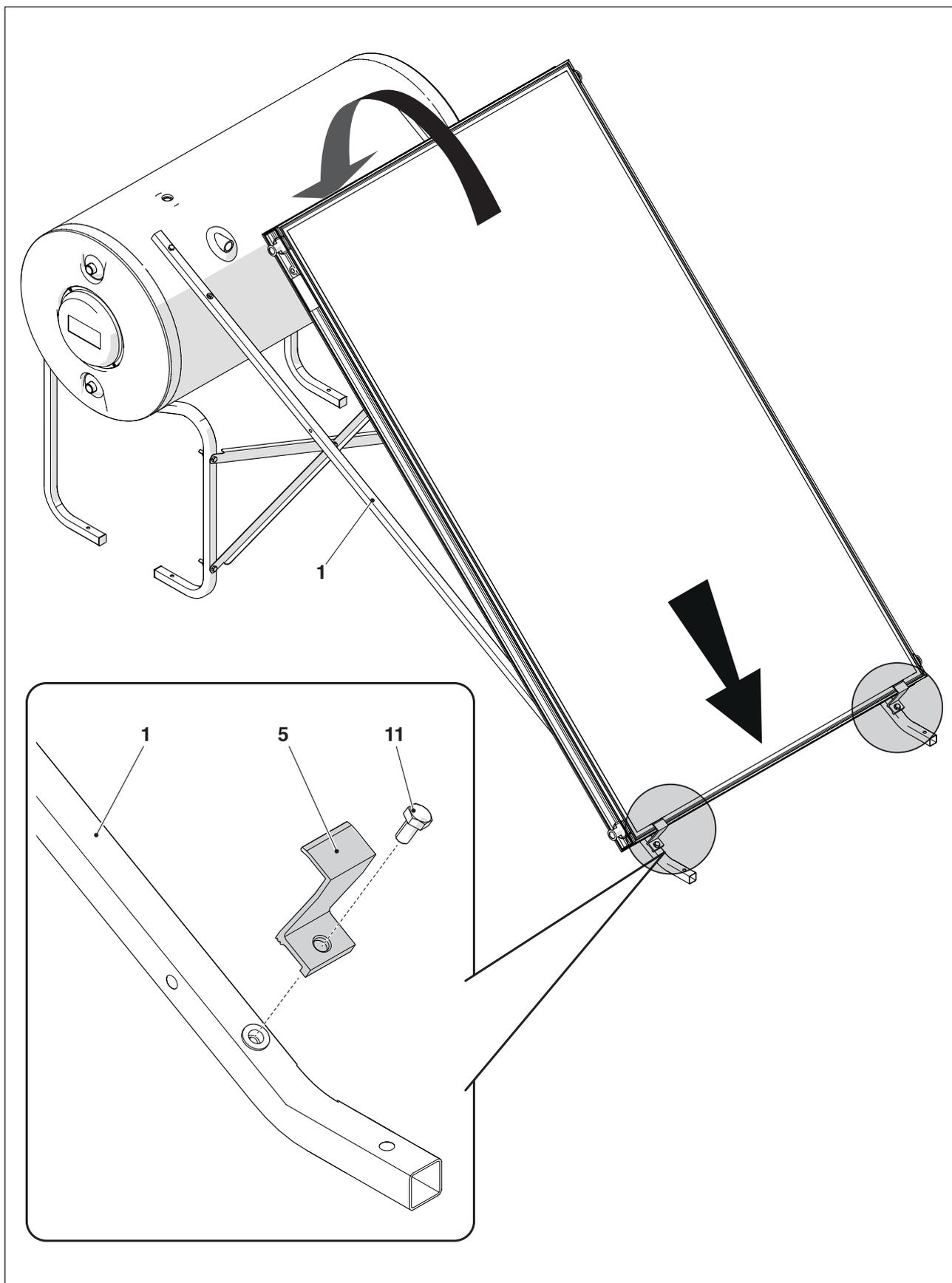


- Turn the storage cylinder upright and fix the base to the roof
- Fix the collector support bars (1) to the storage cylinder and to the roof

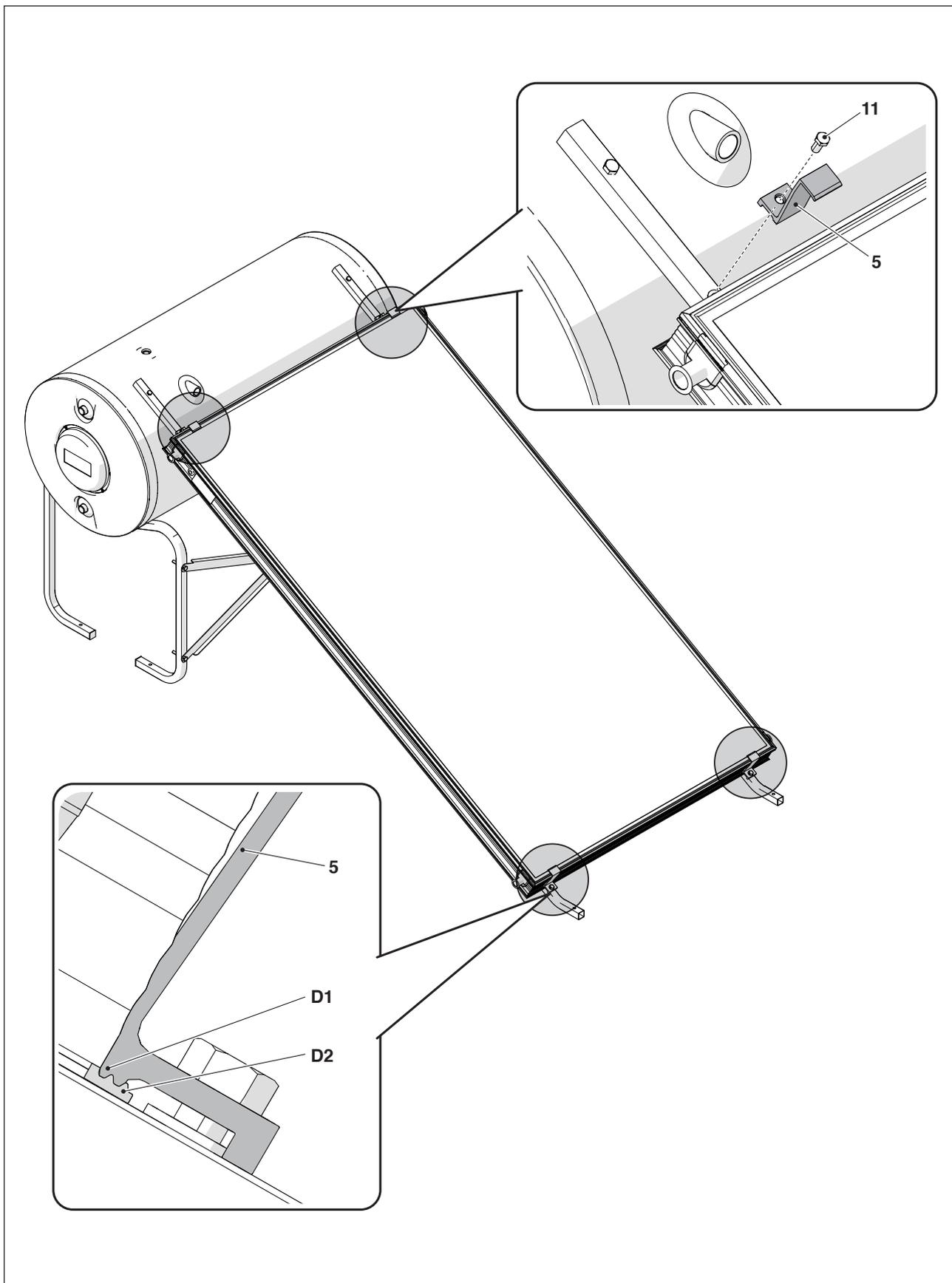


### 13.2 Steps valid for the following models: 150/1 - 200/1

- Loosely fit the bottom collector fixing brackets (5)
- Engage the collector in the bottom fixing brackets (5) and lay it on the collector support bars (1)



- Tighten the bottom collector fixing brackets
- Secure the collector with fixing brackets (5) at the top

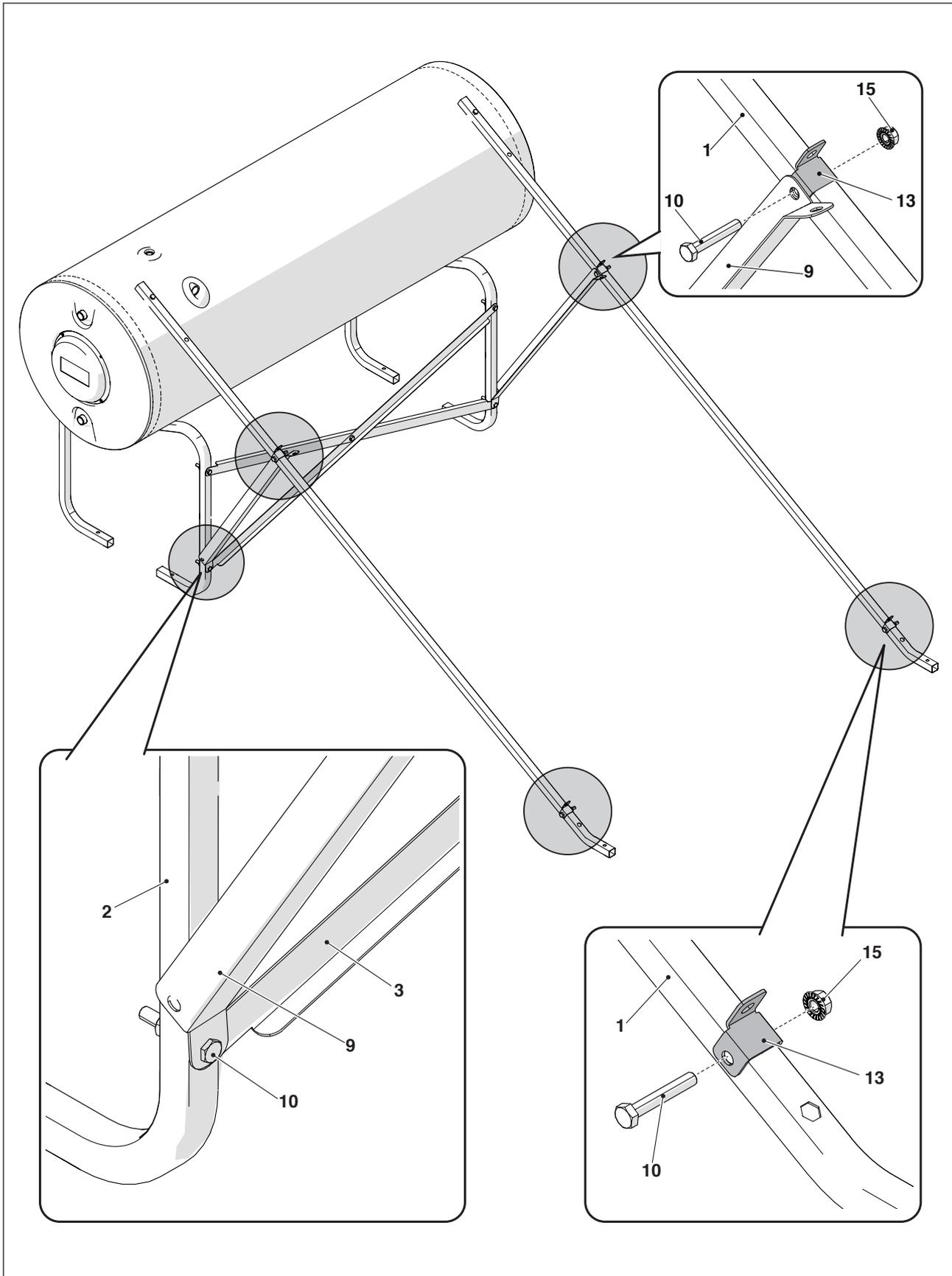


16

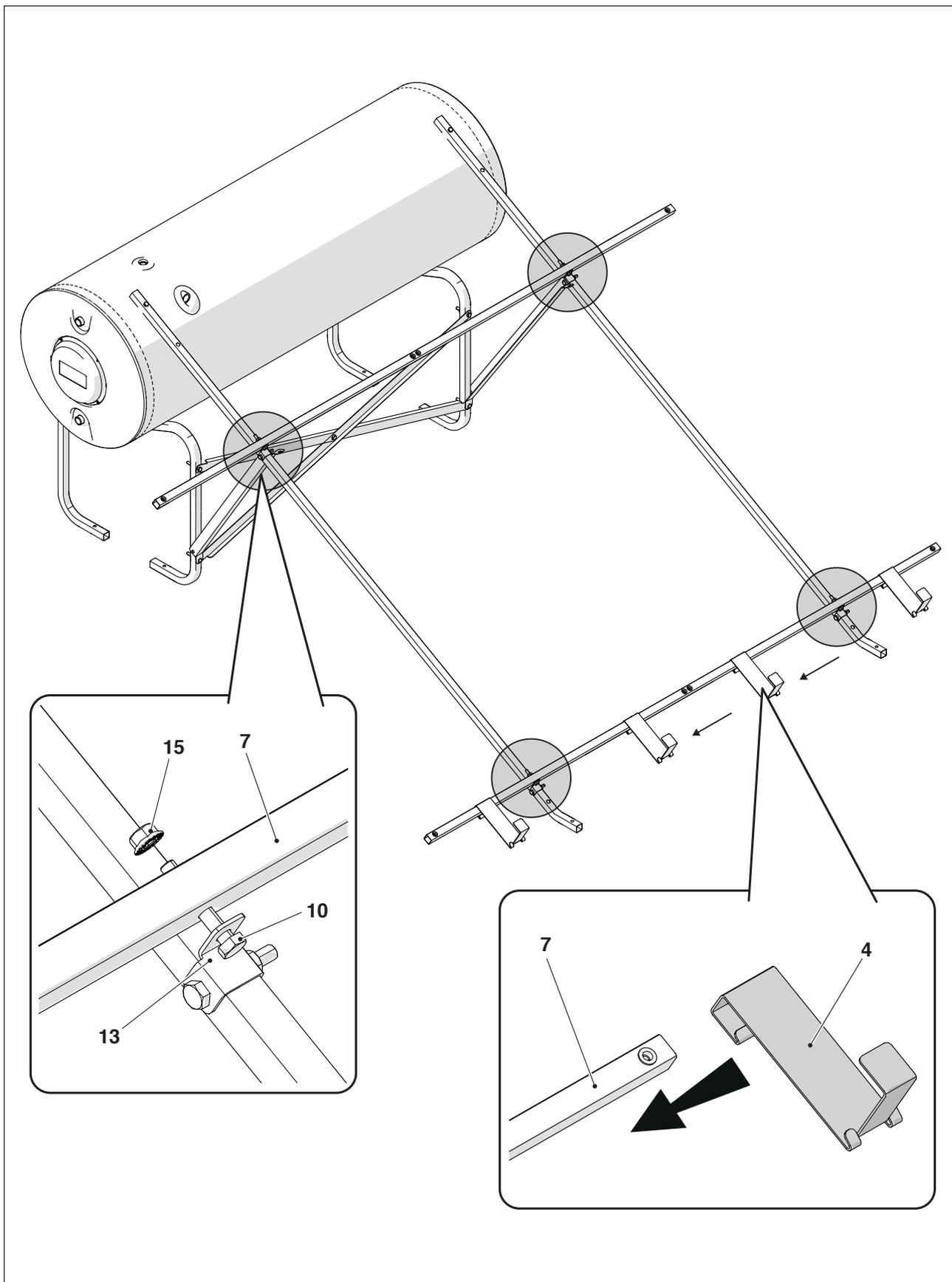
⚠ Engage the ridges on the clamp (D1) with the ridges on the frame of the collector (D2)

### 13.3 Steps valid for the following models: 220/2 - 300/2

- Fix the bar props (9) to the cross bars (3) and the storage cylinder supports (2)
- Fit the cross brackets (13) to the bottom of the support bars (1)

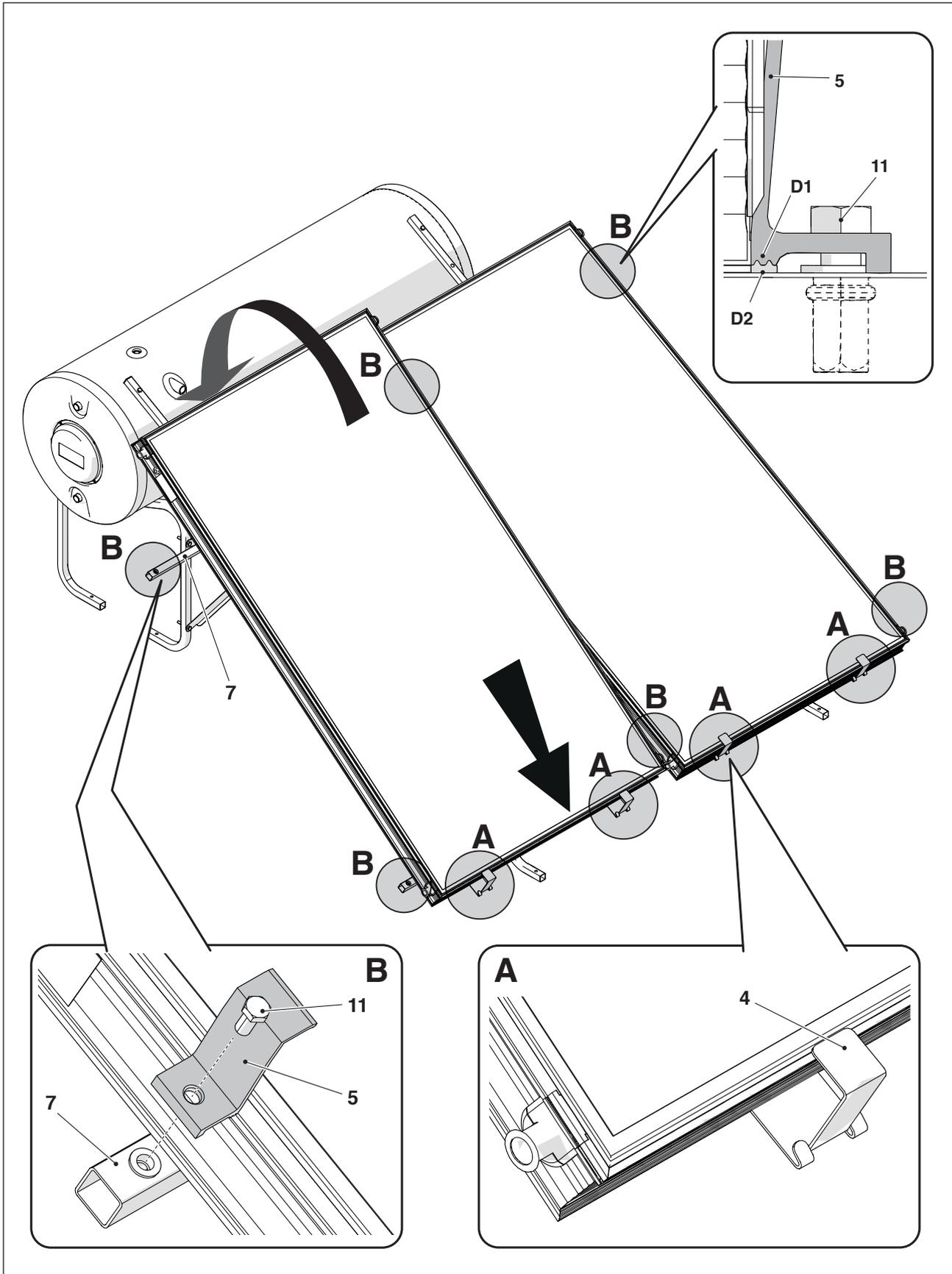


- Slide the brackets (4) over the bottom square tube (7)
- Secure the square tubes (7) to the cross brackets (13)



18

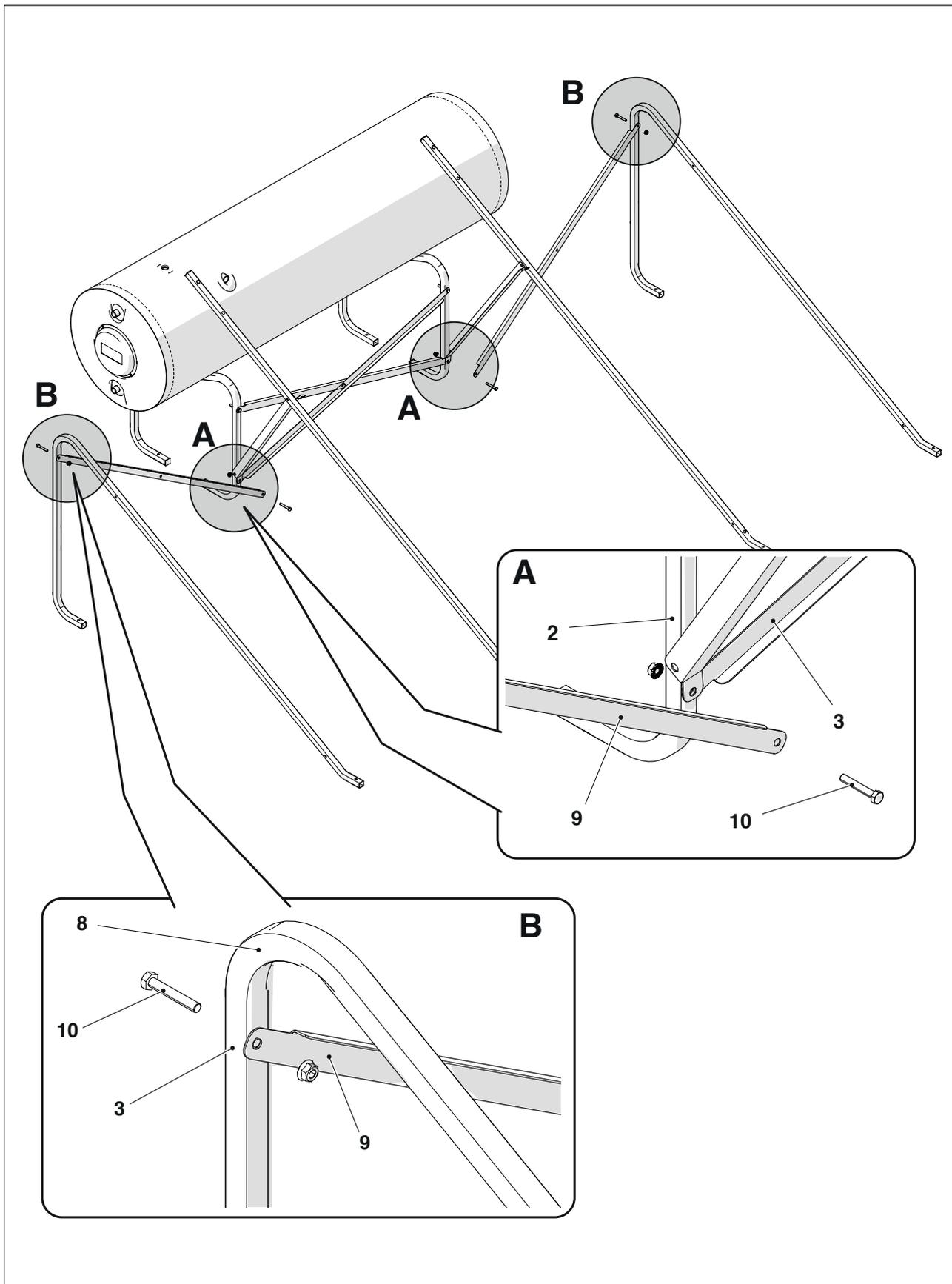
- Engage the collectors in the brackets (4) and lay them on the square tubes (7)
- Fit the unions, complete with seals, to the collectors
- Secure the collectors at the sides with collector fixing brackets (5)



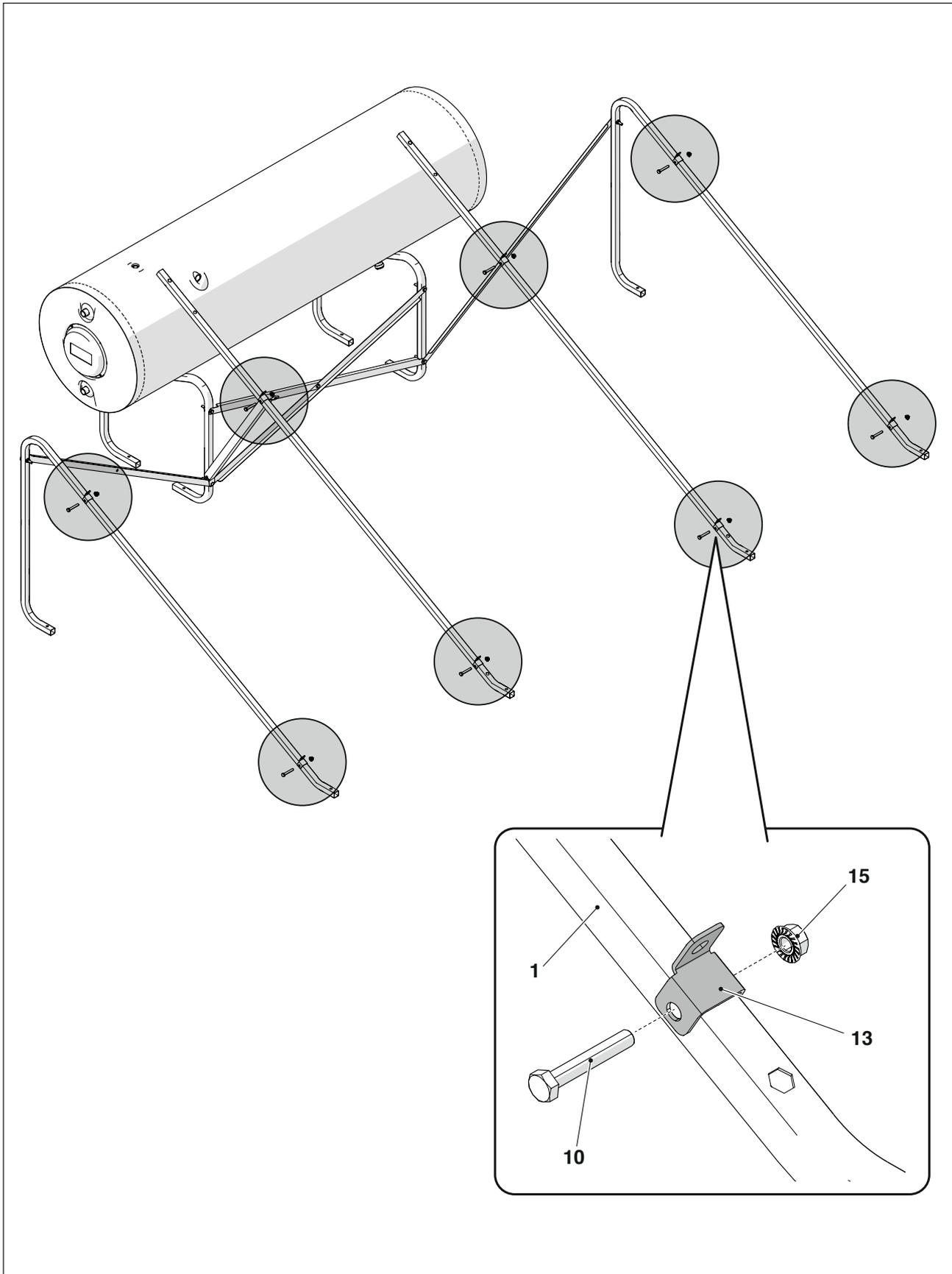
 Engage the ridges on the clamp (D1) with the ridges on the frame of the collector (D2)

### 13.4 Steps valid for the following models: 300/3

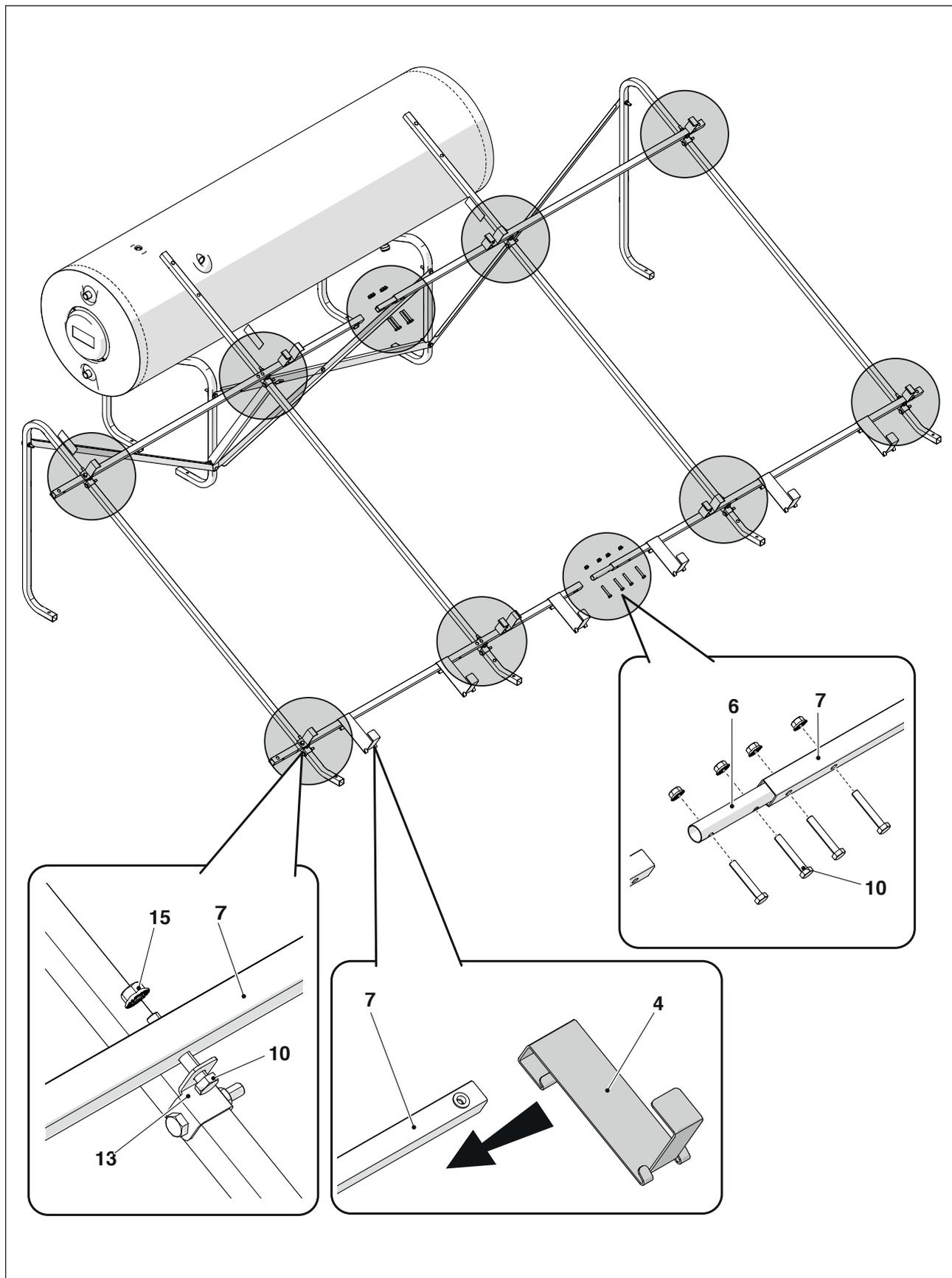
- Fix the additional cross bars (3) and the bar props (9) using the two screws already in place
- Fit the additional collector supports (8) to the cross bars



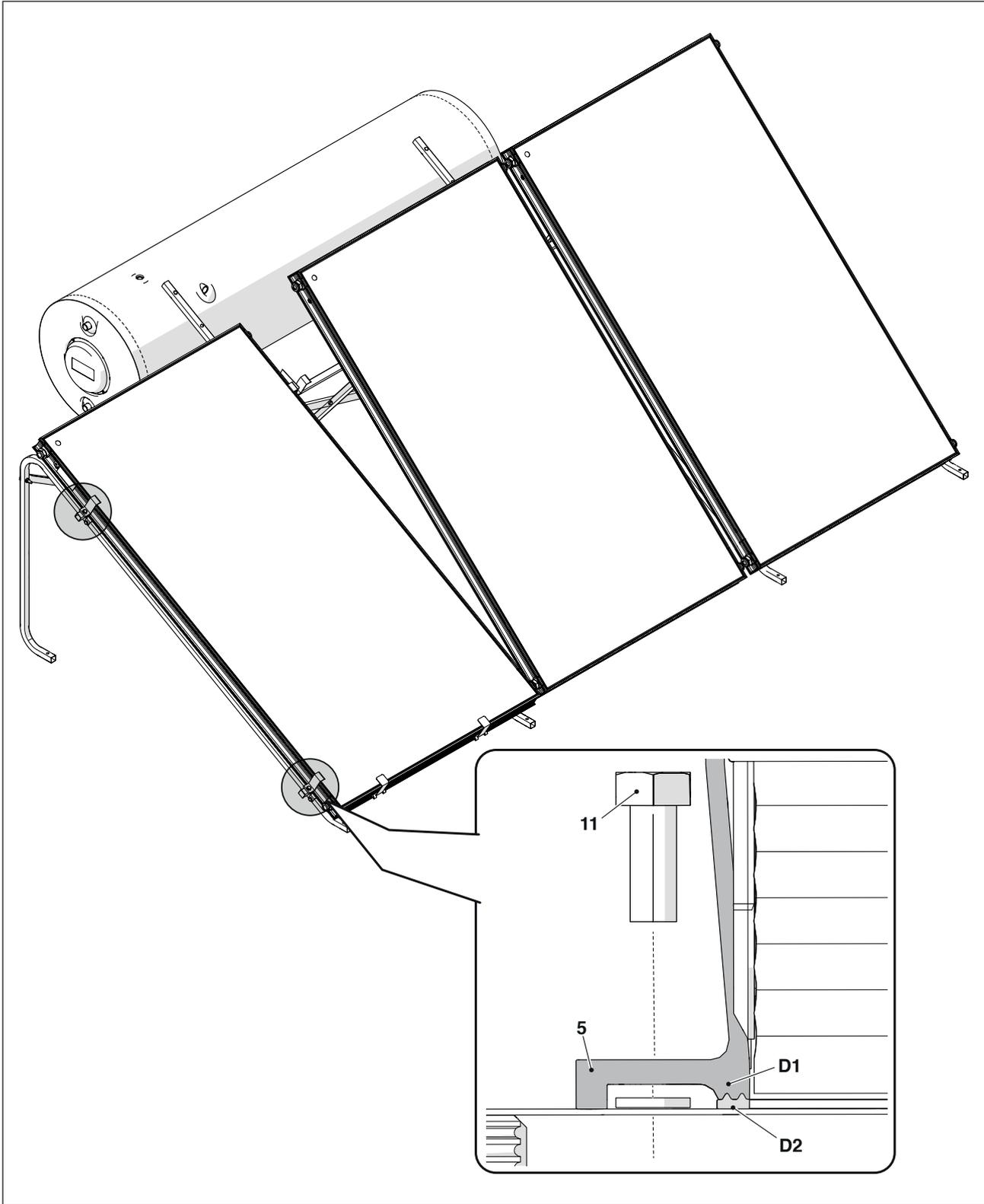
- Fit the cross brackets (13) to the support bars (1) and (8)



- Slide the brackets (4) over the bottom square tube (7)
- Join up and fix the square tubes (7) using the tube join (6)
- Secure the square tubes (7) to the cross brackets (13)



- Engage the collectors in the brackets (4) and lay them on the square tubes (7)
- Fit the unions, complete with seals, to the collectors
- Secure the collectors at the sides with collector fixing brackets (5)

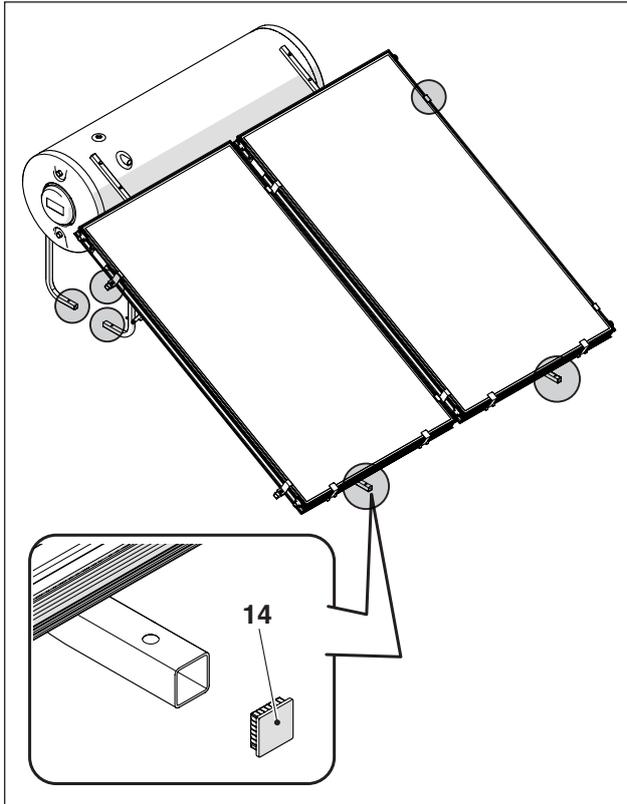


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⚠ Engage the ridges on the clamp (D1) with the ridges on the frame of the collector (D2)

## 13.5 Steps valid for all models

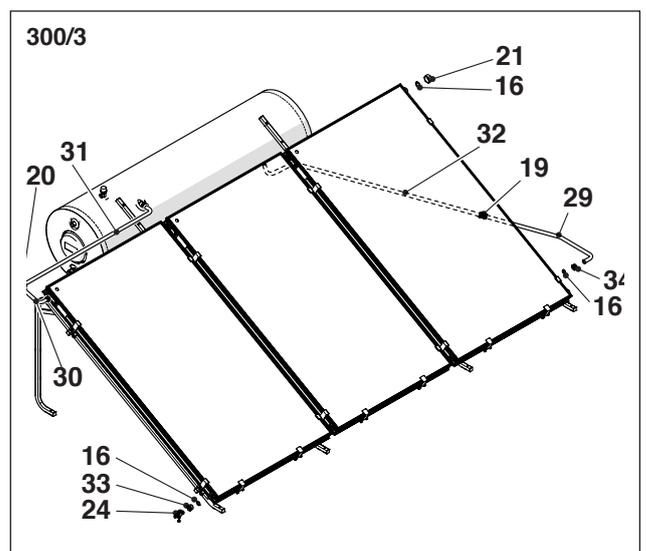
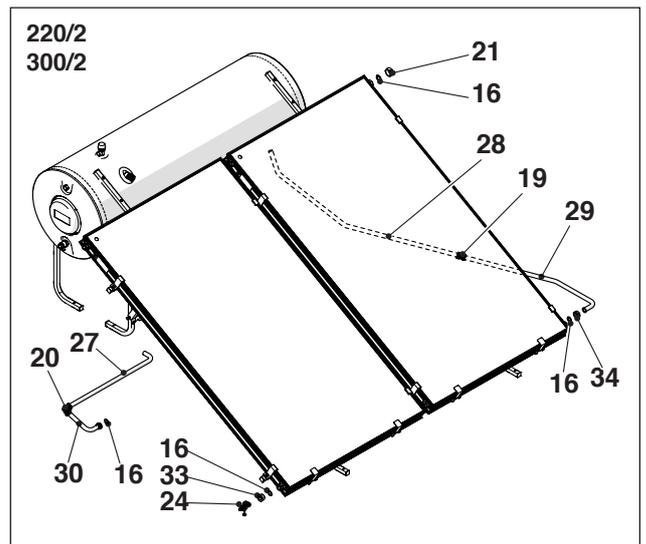
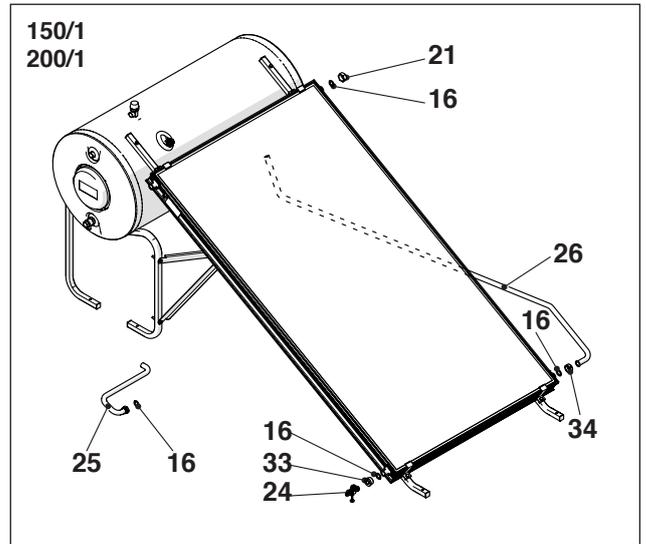
- Insert the plugs (14) into the ends of the storage cylinder base tubes, collector support bars (1) and square tubes (7)



Complete the collector water connections:

- flow pipes
- return pipes
- drain cock
- plug

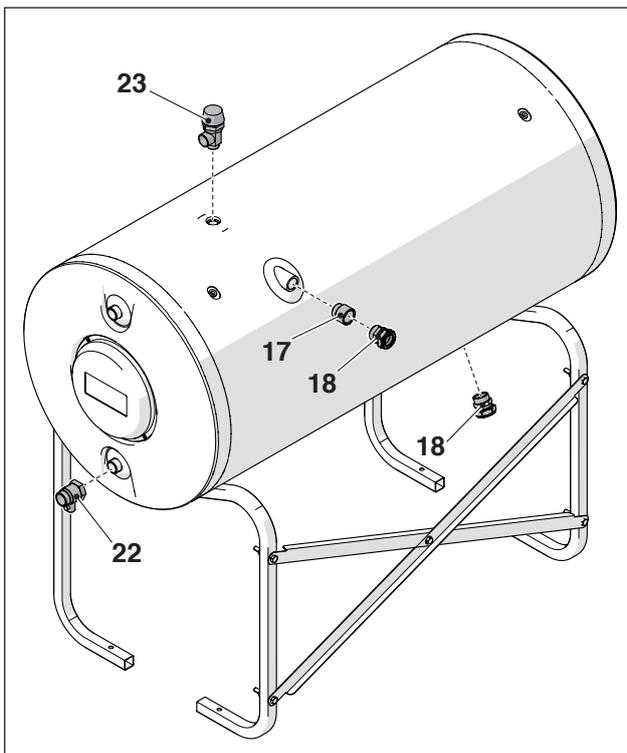
⚠ The seals are located inside the collector's corner profiles.



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Make the following connections:

- 2.5 bar safety valve (23)
- 10 bar safety valve (22)
- straight flow and return unions (18) and straight extension union (17)

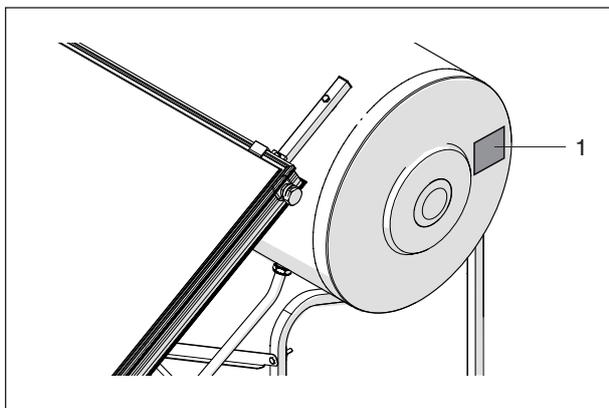


Make sure that you comply with all applicable lightning protection and building potential compensation legislation.

On completion of assembly, make sure that the **Beretta** solar water heating system is perfectly stable, then remove the protective film from the storage cylinder. Apply the data plate (1) and the **Beretta** label to the storage cylinder.

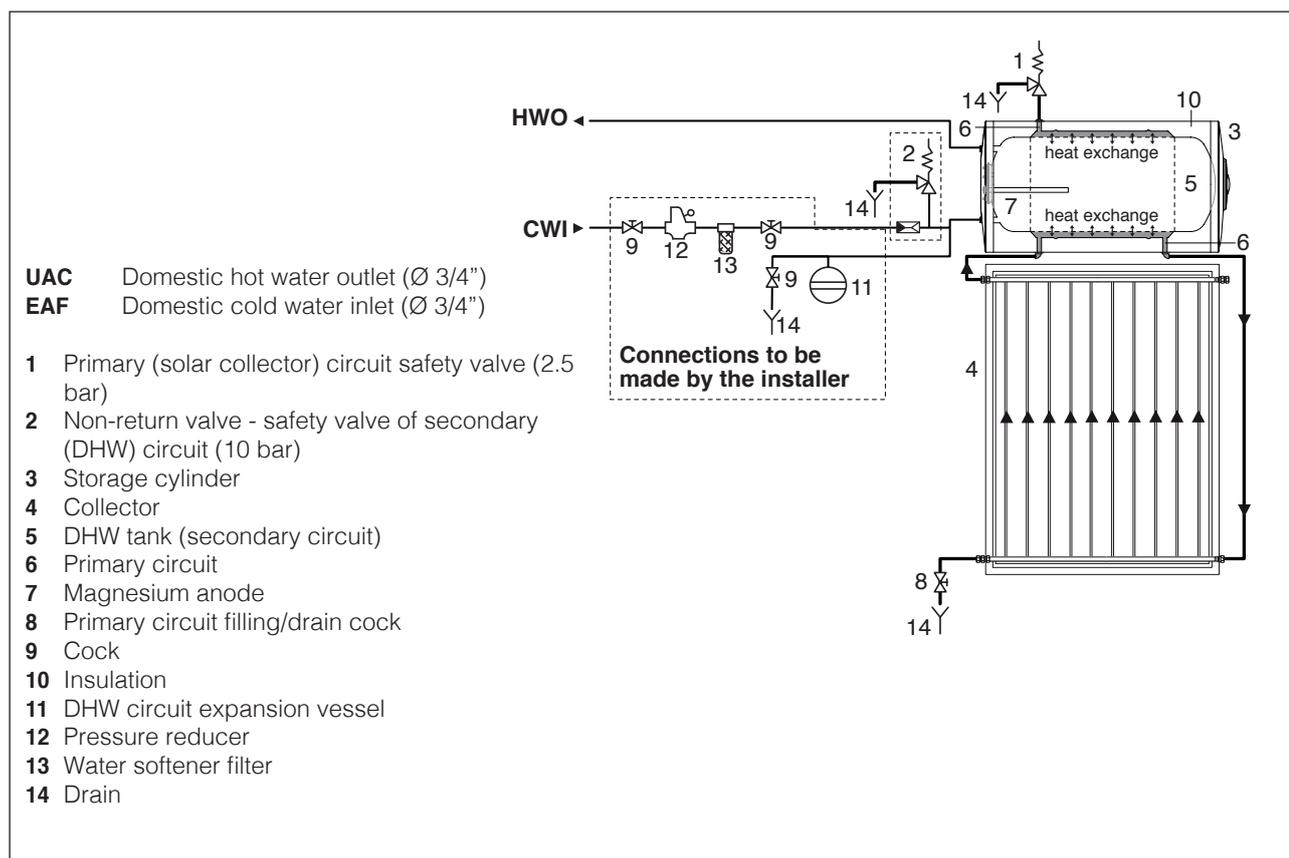


Never attempt to install the system without using the personal protection equipment and without following the safety precautions specified by applicable occupational safety standards.



A protective film is applied to the glass of the solar collector to protect the absorber against solar irradiation and prevent the solar collector from becoming too hot if it is not going to be put into service immediately. **Fill the system, but do not remove the film until you are ready to put the system into service.** Take care when removing the film as it may be electrostatically charged. Do not leave the protective film in place for longer than 12 months. Once removed, the protective film cannot be re-used. Dispose of the protective film in compliance with legislation governing the disposal of PVC.

## 14 SYSTEM WATER CONNECTIONS



The water supply circuit must permit the storage cylinder to be filled and emptied in safety. Shut-off valves must therefore be easily accessible to the user and the operation of emptying the storage cylinder must not create any risk of flooding or other damage.



All water pipe connections must conform to applicable standards.



A thermal mixing valve must always be connected to the hot water outlet to control the temperature of hot at the taps.

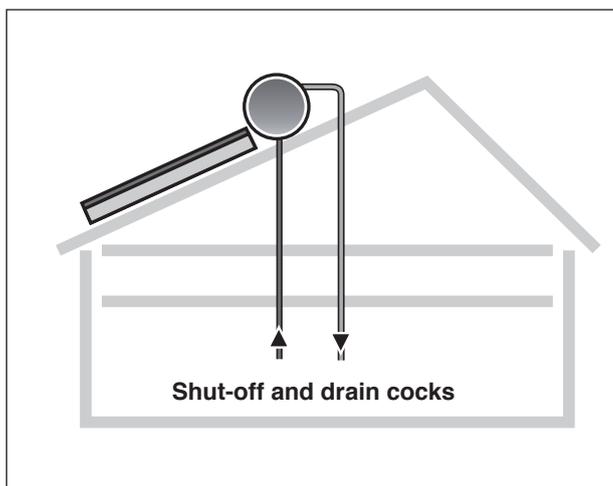


The operating pressure limits specified on the data plate must never be exceeded. It may therefore be necessary to fit a pressure reducer.



The point through which the water pipes enter the building must be rain-proof and damp-proof.

- ⚠ All shut-off cocks and drain cocks must be easily accessible. Make sure that the end user fully understands how they function.



## 15 PREPARING FOR INITIAL STARTUP

Proceed as follows to fill the primary and secondary circuits.

- Fill the DHW tank.
- Flush out the solar collector circuit.
- Fill the solar collector circuit.

- ⚠ Fill the DHW tank before filling the solar collector circuit.

- ⚠ Only fill the solar collector circuit when the collectors are cold.

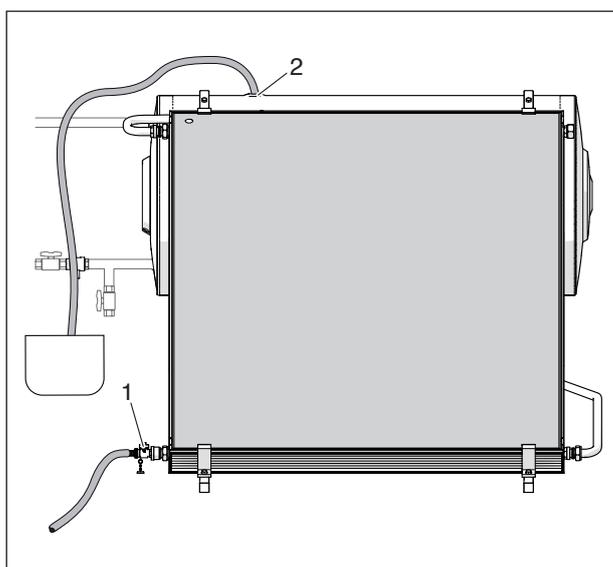
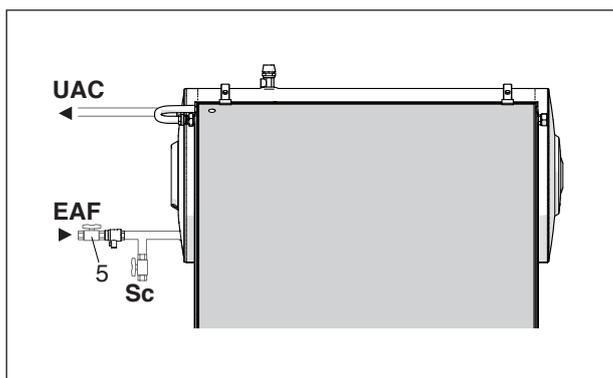
### FILLING THE DHW TANK

- Open and leave open the cock (5) for the domestic cold water inlet (CWI).
- Open a hot water tap and fill the storage cylinder with cold water from the mains supply. When water starts coming out of the hot water tap, leave it run until you obtain an even flow then close the tap. The DHW tank is now full.

### FLUSHING THE SOLAR COLLECTOR CIRCUIT

Carefully check all connections and unions for leaks before filling the system with the water and glycol mix. Use the following procedure to test for water tightness. The same procedure can also be used to flush out the circuit to remove any residues.

- Connect the hose union on the filling/drain cock (1) to a cold water tap using a length of hose pipe.
- Connect the union (2) on the storage cylinder to a drain.
- Open the cock (1) and the cold water tap and leave water flow into the solar collector circuit for a few minutes.
- Close the cold water tap and the cock (1).
- Check all connections and unions for leaks.



## FILLING THE SOLAR COLLECTOR CIRCUIT

### Heat transfer liquid

The anti-freeze supplied contains non-toxic, biodegradable and environmentally friendly propylene glycol. Mix the propylene glycol with water (preferably demineralised). Establish the necessary concentration of propylene glycol using the table alongside on the basis of the temperatures for which anti-freeze protection is required.



Only use the products listed in the **Beretta** Catalogue to top up the circuit.

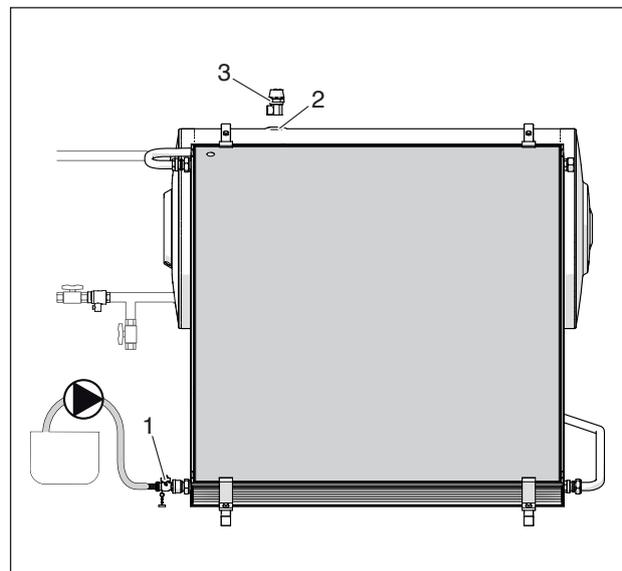
Anti-freeze	Temperature	Density (20 °C)
55%	-40 °C	1,048 kg/dm <sup>3</sup>
50%	-32 °C	1,045 kg/dm <sup>3</sup>
45%	-26 °C	1,042 kg/dm <sup>3</sup>
40%	-21 °C	1,037 kg/dm <sup>3</sup>
35%	-17 °C	1,033 kg/dm <sup>3</sup>
30%	-14 °C	1,029 kg/dm <sup>3</sup>
25%	-10 °C	1,023 kg/dm <sup>3</sup>

### Pressure and gravity filling

- Premix a sufficient volume of water and glycol solution in a suitable container, selecting the right concentration according to the table above.

#### Pressure filling

- Use lengths of rubber hose to connect a pump between the container and the hose union on the filling/drain cock (1). Open the cock.
- Start up the pump and fill the solar heating circuit until the heat transfer liquid starts to flow out of the fitting (2) at the top of the storage tank.

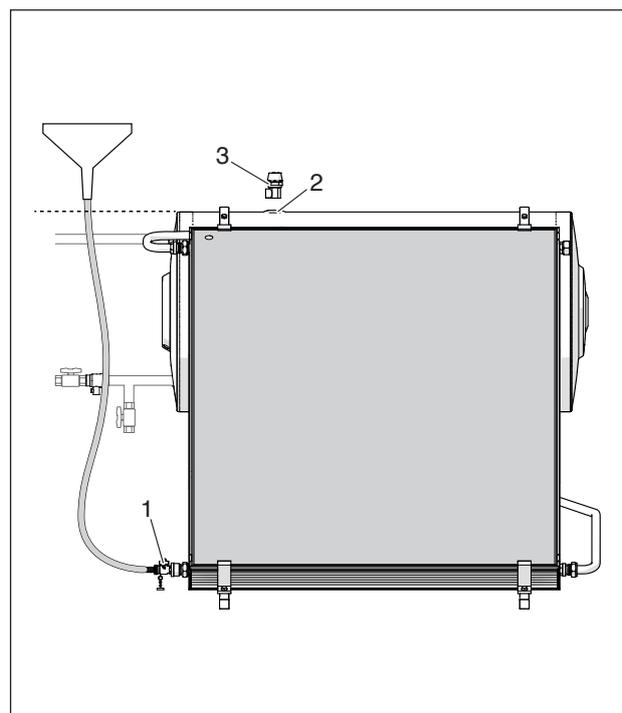


#### Gravity filling

- Use a length of rubber hose to connect the container to the filling/drain cock (1). Open the cock.
- Fill the solar heating circuit under gravity until the heat transfer liquid starts to flow out of the fitting (2) at the top of the storage tank.

#### When the storage cylinder is full:

- Close the cock (1).
- Fit the safety valve (3) to the fitting (2).



## 16 INITIAL STARTUP

### Checks and preparations for initial start-up

Fill the storage cylinder with (potable) water.	
Fill the solar collector circuit.	
Make sure that the domestic cold water inlet cock is open.	
Make sure that the safety valves are functioning.	
Check the system for leaks.	

Check the concentration of the anti-freeze.	
Uncover the solar collectors and clean them if necessary.	
Make sure that the system is securely fixed to the mounting frame.	
Make sure that the roof does not leak.	
Inspect the insulation.	

## 17 MAINTENANCE

⚠ The solar water heating system must be serviced periodically by **Beretta's** Technical Assistance Centre or by a qualified heating engineer.

⚠ The system should be serviced at least once a year, ideally in the autumn.

⚠ Check the condition of the magnesium anode.

Visually inspect the collectors for damage/dirt.	
Visually inspect the storage cylinder.	
Visually inspect the mounting frame and roof anchor points.	
Inspect the insulation.	
Make sure that the roof does not leak.	
Make sure that the safety valves are functioning.	

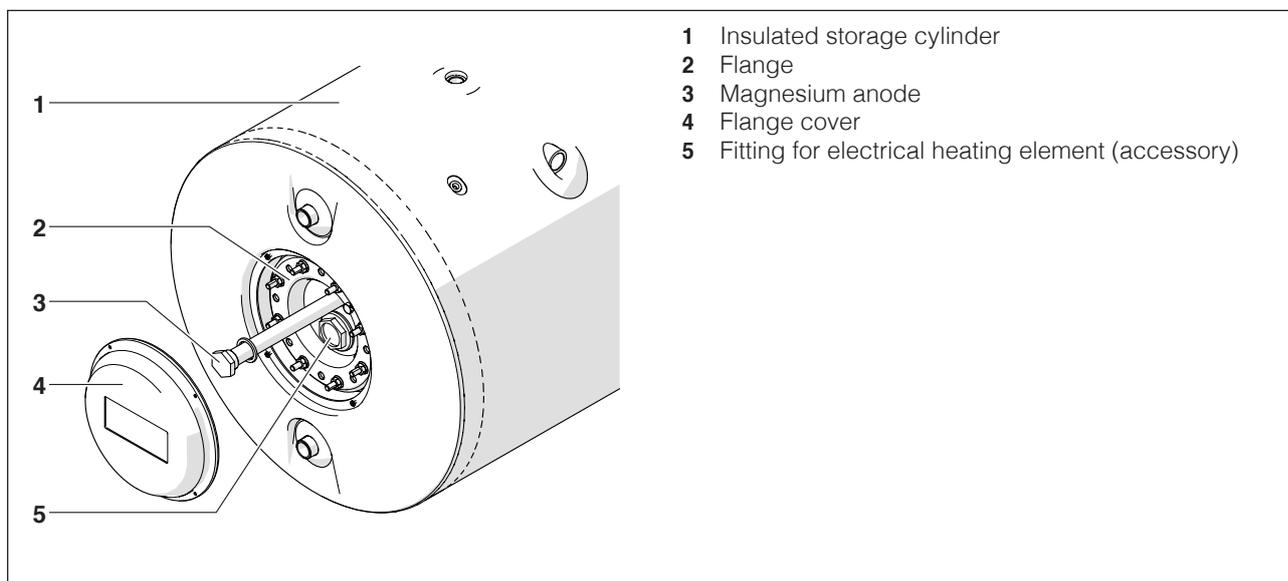
Check the system for leaks.	
Check the concentration of the anti-freeze.	
Check the pH of the anti-freeze with litmus paper.	
Topping up or changing the heat transfer liquid	
Clean inside the storage cylinder (every 2 years or more frequently in hard water/high temperature areas)	

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### Checking the heat transfer liquid

- Use an instrument like a refractometer or densimeter to check the density of the anti-freeze. If the value is below that necessary to protect the system at the minimum temperature selected, replace the heat transfer liquid or add anti-freeze.
- Use litmus paper to check the pH (nominal value approx. 7.5). If the measured value is below 7, change the heat transfer liquid.

### Storage cylinder components



- 1 Insulated storage cylinder
- 2 Flange
- 3 Magnesium anode
- 4 Flange cover
- 5 Fitting for electrical heating element (accessory)

### Topping up or changing the heat transfer liquid

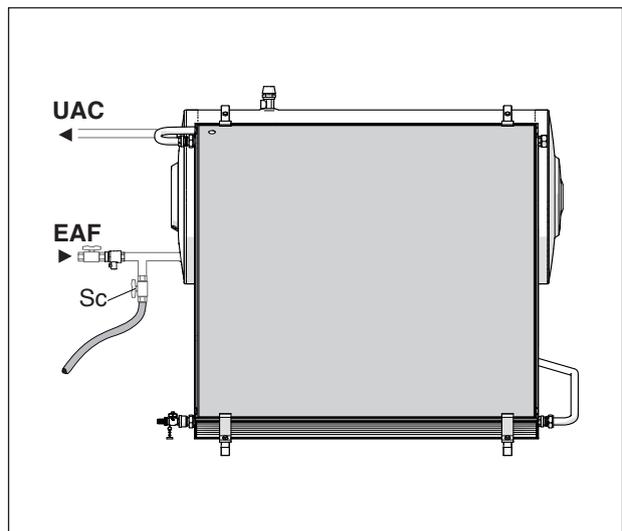
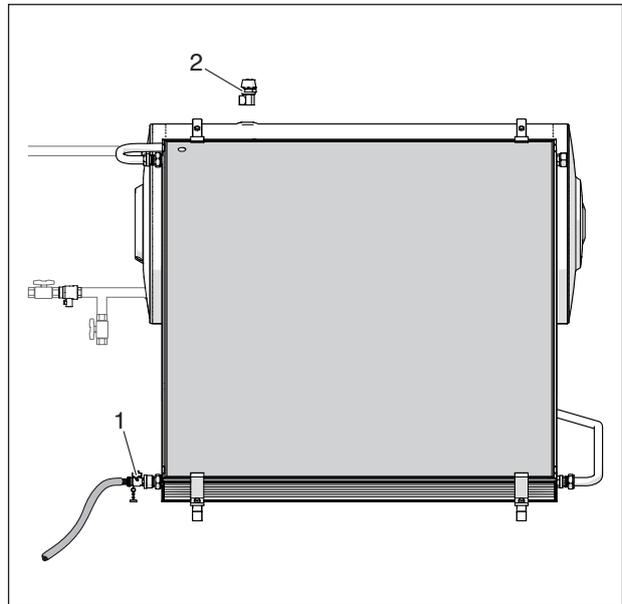
For certain maintenance operations (such as replacing pipes or unions or changing the heat transfer liquid) the solar collector (primary) circuit may have to be drained. Proceed as follows:

- Connect a hose to the hose union on the filling/drain cock (1).
- Open the cock (1).
- Remove the safety valve (2) to allow air into the primary circuit and allow the heat transfer liquid to flow out.

 Only use the products listed in the **Beretta** Catalogue to top up the circuit.

 In areas where there is a significant risk of freezing, take particular care over tightness testing and flushing with water.

 DO NOT drain the solar collector circuit under sunny conditions or when the collectors are hot.

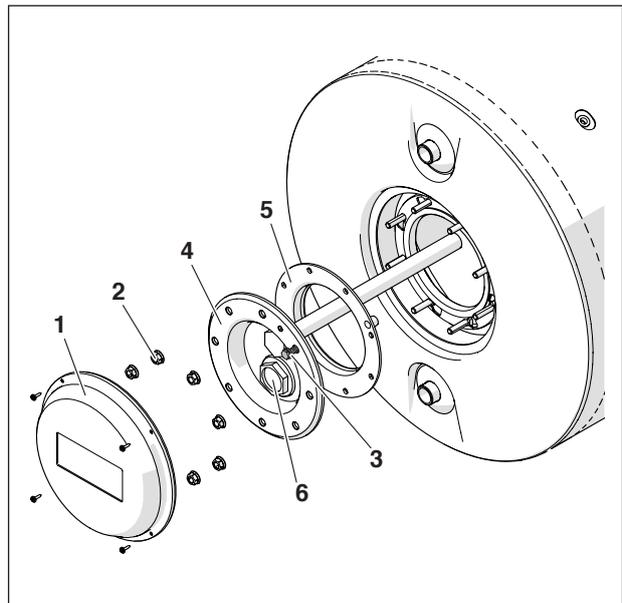


### Cleaning inside the storage cylinder

Proceed as follows to clean inside the storage cylinder:

- Close the domestic cold water inlet cock.
- Connect a hose to the storage cylinder drain cock (D) fitted on installation, and open the cock. Leave the water run out until the tank is completely empty.
- Unscrew the fixing screws and remove the flange cover (1) from the left of the storage cylinder.
- Remove the nuts (2) and screw the bolt (3) in to release the flange (4) from the tank.
- Remove the flange (4). Check and clean the inside of the tank. Check the condition of the seal (5). Replace if necessary.
- Check the magnesium anode (6) for wear and replace it if necessary.
- On completion of cleaning, follow the above steps in the reverse order to refit all removed parts.

 Screw the bolt (3) out until the flange fits snugly against the tank. Tighten the nuts (2) to secure the flange (4), proceeding diagonally around the flange to apply pressure uniformly around the seal.



## END USER INSTRUCTIONS

The **NB-SOL TP** system is a solar hot water heating system that functions on the principle of natural circulation. The heat transfer liquid therefore circulates by normal convection.

The system comprises one or more solar collectors and a jacket type storage cylinder, located above the collector/s. The system does not require any pumps or adjustments.

## 18 PUTTING INTO SERVICE

The system must be put into service for the first time by **Beretta's** Technical Assistance Centre. After this it will continue to function automatically.

## 19 MAINTENANCE

If the system is easily accessible, regularly check the cleanliness of the glass panel/s of the collector/s. If necessary, clean the glass, but only when it is cold, preferably in the early morning. If access is difficult, contact your local Technical Assistance Centre.

Once a year, check the condition of the insulation around the pipes.

If the system is not going to be used for an extended period of time, contact your local Technical Assistance Centre to have it made safe.



The solar water heating system must be serviced periodically by **Beretta's** Technical Assistance Centre or by a qualified heating engineer.



The system must be serviced at least once a year.



If no domestic hot water is drawn off from the system, the safety valves of the domestic hot water and solar collector circuits may open to discharge pressure and ensure correct functioning.



These safety valves present a risk of burns or scalding. If a pressure in excess of 2.5 bar builds up in the solar collector circuit, the safety valve opens.



Check the condition of the magnesium anode regularly as it provides protection against corrosion.



The system can reach very high temperatures (>150°C) under normal operating conditions. Take the greatest care to avoid burns or scalding.



In the event of any malfunctioning or failure, and to have parts replaced, contact **Beretta's** Technical Assistance Centre.

## 20 TROUBLESHOOTING

FAULT	CAUSE	SOLUTION
<b>No or insufficient domestic hot water production</b>	Unusually high draw of DHW.	- Check.
	Water leaks in the DHW distribution circuit.	- Check.
	Collector glass covered in dust or leaves.	- Clean.
	The level of heat transfer liquid in the circuit has dropped as the result of leaks from the unions or because of over-temperature during extended periods of disuse.	- Top up the circuit with water/glycol mix and bleed any air out.
	Air bubbles have formed inside the circuit and are impeding natural circulation.	- Bleed the circuit by loosening the uppermost union on the short pipe until liquid comes out. - Top up to replace any lost liquid.
<b>Vibrations</b>	Loose screws.	- Tighten the screws.

## 21 DISPOSAL

When the system is no longer needed, do not abandon it in the environment, but dispose of it through appropriate channels and in compliance with applicable legislation.

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[www.berettaboilers.com](http://www.berettaboilers.com)

The manufacturer strives to continuously improve all products. Appearance, dimensions, technical specifications, standard equipment and accessories are therefore liable to modification without notice.

