

MANUAL
USERS

**Instructions and
recommendations**
Installer
User
Maintenance technician

IE



**SOLAR SYSTEM WITH
NATURAL CIRCULATION
NATURAL SOL 150 - 200 V2**



STD.005441/000

Dear Customer,

Congratulations for having chosen a top-quality Immergas product, able to assure well-being and safety for a long period of time. As an Immergas Customer, you can also count on a qualified after-sales service, prepared and updated to guarantee constant efficiency of your product. Read the following pages carefully: you will be able to draw useful tips on the correct use of the device, compliance of which will confirm your satisfaction with the Immergas product.

For assistance and routine maintenance, contact Authorised Service Centres: they have original spare parts and are specifically trained directly by the manufacturer.

General recommendations

All Immergas products are protected with suitable transport packaging.

The material must be stored in a dry place protected from the weather.

The instruction booklet is an integral and essential part of the product and must be given to the new user in the case of transfer or succession of ownership.

It must be stored with care and consulted carefully, as all of the warnings provide important safety indications for installation, use and maintenance stages.

This instructions manual provides technical information for installing Immergas products. As for the other issues related to the installation of products (e.g. safety at the workplace, environmental protection, accident prevention), it is necessary to comply with the provisions of the standards in force and the principles of good practice.

In compliance with the legislation in force, the systems must be designed by qualified professionals, within the dimensional limits established by the Law. Installation and maintenance must be performed in compliance with the regulations in force, according to the manufacturer's instructions and by professionally qualified staff, meaning staff with specific technical skills in the plant sector, as provided for by Law.

Improper installation or assembly of the Immergas device and/or components, accessories, kits and devices can cause unexpected problems for people, animals and objects. Read the instructions provided with the product carefully to ensure proper installation.

Maintenance must be carried out by an authorised company. The Authorised Service Centre represents a guarantee of qualification and professionalism.

The system is only intended for the use it has expressly been designed for. Any other use will be considered improper and therefore potentially dangerous.

If errors occur during installation, operation and maintenance, due to non-compliance with technical laws in force, standards or instructions contained in this booklet (or however supplied by the manufacturer), the manufacturer is excluded from any contractual and extra-contractual liability for any damages and the device warranty is invalidated.

The company **IMMERGAS S.p.A.**, with registered office in via Cisa Ligure 95 42041 Brescello (RE), declares that the design, manufacturing and after-sales assistance processes comply with the requirements of standard **UNI EN ISO 9001:2015**.

For further details on the product CE marking, request a copy of the Declaration of Conformity from the manufacturer, specifying the appliance model and the language of the country.

The manufacturer declines all liability due to printing or transcription errors, reserving the right to make any modifications to its technical and commercial documents without forewarning.

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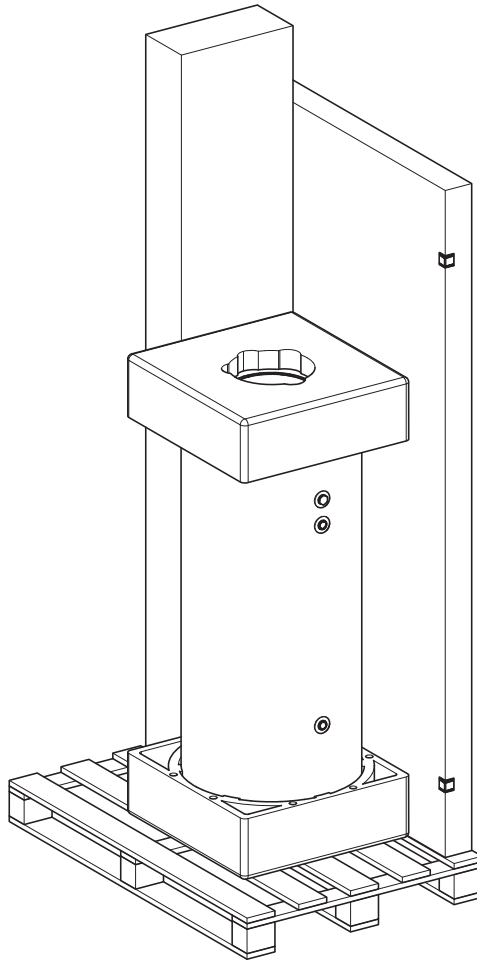
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1 INSTALLATION

1.1 PACKAGING.

It must be stored in a dry place, protected from humidity, in its original, closed packaging.



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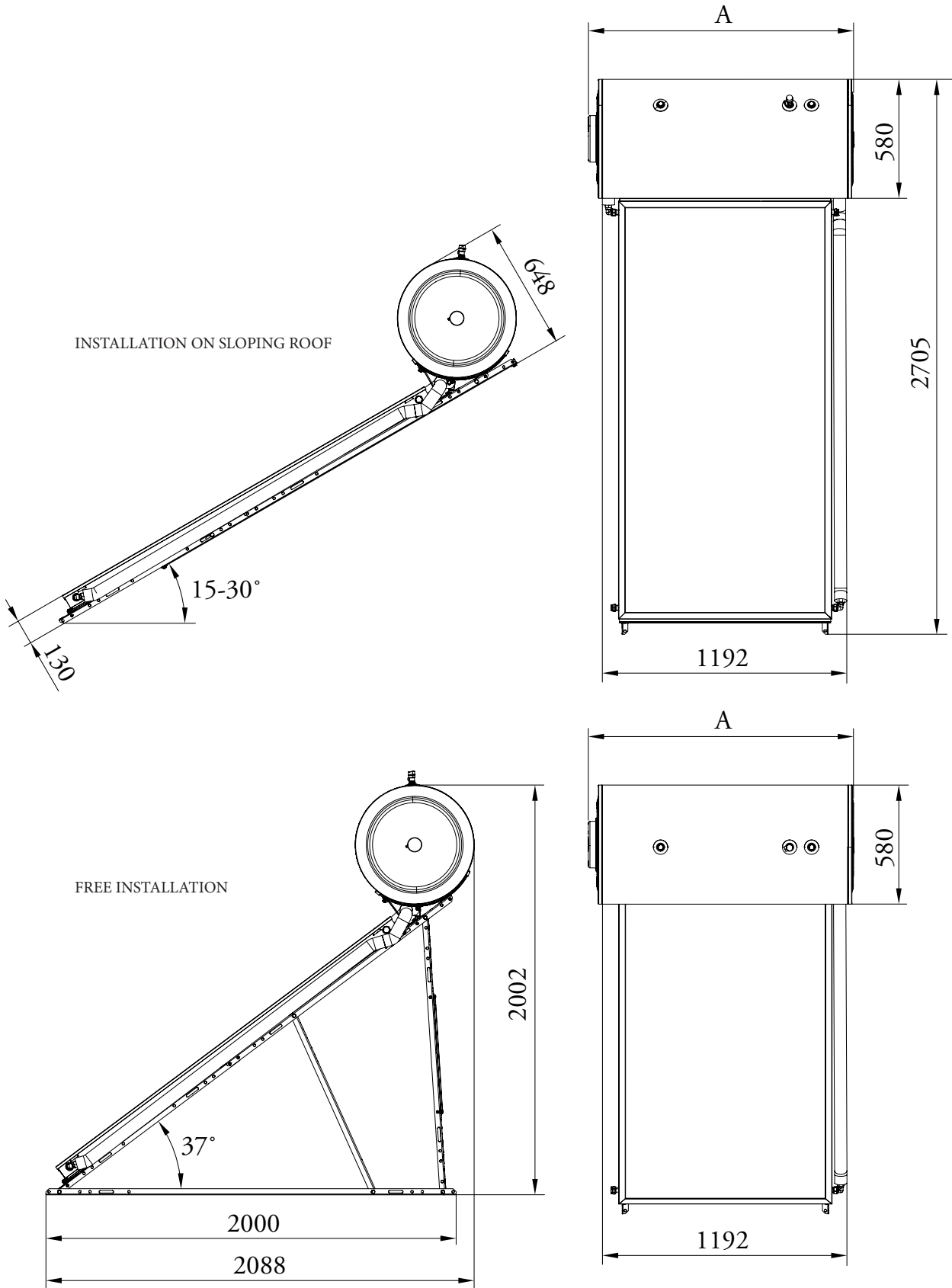
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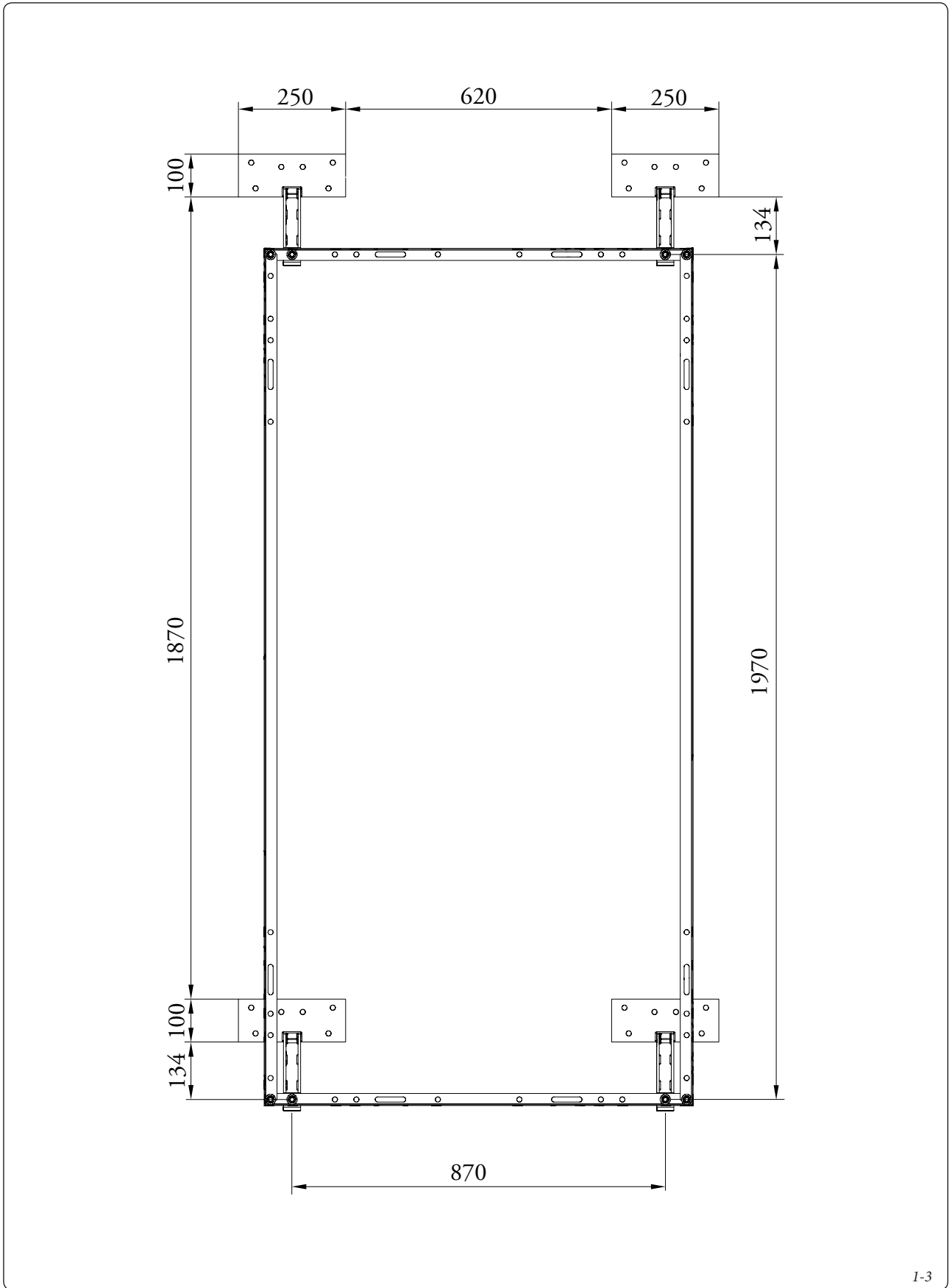
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1.2 OVERALL DIMENSIONS.

	150 L (mm)	200 L (mm)
A	1058	1290



1.3 CLEARANCES WITH BRACKETS FOR SLATES/TILES (OPTIONAL).



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1.4 TECHNICAL DATA.

Manifold		150 L	200 L
Dimensions	mm	2040 x 1040 x 89	2040 x 1040 x 89
Empty weight	kg	42	42
Gross surface	m ²	2.12	2.12
Net surface	m ²	1.92	1.92
Stagnation temperature	°C	191	191
Storage tank / Cylinder			
Dimensions	mm	1055 x 0 580	1324 x 0 580
Empty weight	kg	67	85
Content	l	152	198
Domestic hot water circuit / DHW Circuit max. pressure	bar	6	6
Solar circuit max. pressure	bar	3	3
Connections		3/4" F	3/4" F
Complete system			
Storage tank / Cylinder	l	152	198
Collectors	n°	1	1
Heat carrying fluid content	l	~ 10	~ 15
Empty weight	kg	~ 152	~ 171
Total weight	kg	~ 297	~ 360

Forecast of annual performance according to the EN 12976-2 Standard for European installations.

150 L. Storage tank performance

Performance indicators just for solar and solar pre-heating systems on a yearly basis for a volume request of 110 l/g				
Position (latitude)	Q _d MJ	Q _L MJ	f _{sol} %	Q _{par} MJ
Stockholm (59.6° N)	6150	2620	42.6	0
Würzburg (49.5° N)	5897	2860	48.5	0
Davos (468° N)	6654	4046	60.8	0
Athens (38.0°N)	4573	2949	64.5	0

200 L. Storage tank performance

Performance indicators just for solar and solar pre-heating systems on a yearly basis for a volume request of 140 l/g				
Position (latitude)	Q _d MJ	Q _L MJ	f _{sol} %	Q _{par} MJ
Stockholm (59.6° N)	7821	3347	42.8	7821
Würzburg (49.5° N)	7506	3685	49.1	7064
Davos (468° N)	8483	5158	60.8	8483
Athens (38.0°N)	5834	3746	64.2	5834

1.5 ASSEMBLY OF SOLAR COLLECTORS.

Assembly must only be performed on roofs or frames that are strong enough. The strength of the roof or frame must be checked on site by a structural engineer before assembly of the collectors.

The verification of the entire framework according to the local Standards in force by a structural engineer is necessary, especially in very snowy areas or areas exposed to strong winds. Therefore, all features of the installation area must be taken into consideration (gusts of wind, formation of whirlwinds, etc.), which can lead to an increase of loads on the structures.

Normally, it is not necessary to connect the natural circulation system to the lightning protection of the building.

Comply with the Standards in force in the respective countries!

If the sub-structure is in metal, consult an expert authorised on lightning protection. The metal wires on the solar circuit must be connected using a wire of at least 16 mm² CU with potential compensation main bar.

N.B. pay attention not to walk on the manifold during all assembly phases (j).

N.B.: assemble the frame without tightening the screws that will be tightened once the frame has been fully assembled and before installing the manifold and storage tank / Cylinder.

Before installing the system ensure that it has been delivered in perfect condition; if in doubt, contact the supplier immediately. Packing materials (staples, nails, plastic bags, polystyrene foam, etc.) constitute a hazard and must be kept out of the reach of children.

• Installation Standards:

- before starting the system, the solar collector must be covered to protect the absorber from overheating and the operator from any burns. The system must only be filled after all the hydraulic connections have been performed correctly.
- During handling, use protective gloves and avoid transporting the manifold gripping it by its connection fittings.

Attention:

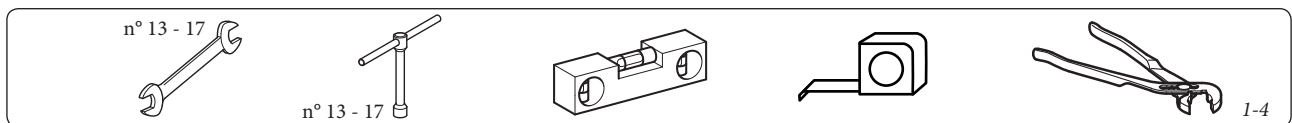
- it is obligatory to use the antifreeze supplied by the manufacturer;
- the use of a storage tank unit involves the installation of a safety valve, an expansion vessel and a one-way valve for the appropriately sized domestic hot water circuit, **these components are not always included with the pack.**

1.6 KIT COMPOSITION.

Ref.	Description	Q.ty
a	Frame structure bar L=2000	2
b	Frame reinforcement bar L=765 (150 V2) or L=1000 (200 V2)	2
c	Frame structure bar L=1370	4
d	Frame structure bar L=1120	2
and	Panel mount bar L=1030	2
f	Frame fixing laminate	4
g	Bracket for slates/tiles (optional)	4
h	Storage tank mount bracket	2
i	Calendered bracket for storage tank	2
j	Solar collector unit	1
k	150 or 200 litre storage tank / Cylinder unit	1

l	Insulated pipe L=2350 mm (150 V2) or L=2250 (200 V2)	1
m	Insulated pipe L=450 mm (150 V2) o L=360 (200 V2)	1
n	Frame reinforcement bar L=968	2
or	Frame reinforcement bar L=956 (150 V2) o L=1152 (200 V2)	2
p	90° bend / 90° elbow	2
q	Curve with d.22 ogive	2
r	Nipple G3/4 M-M	1
s	Rubber protection	4
t	G3/4 male cap	2
u	Cap with d.22 ogive	2

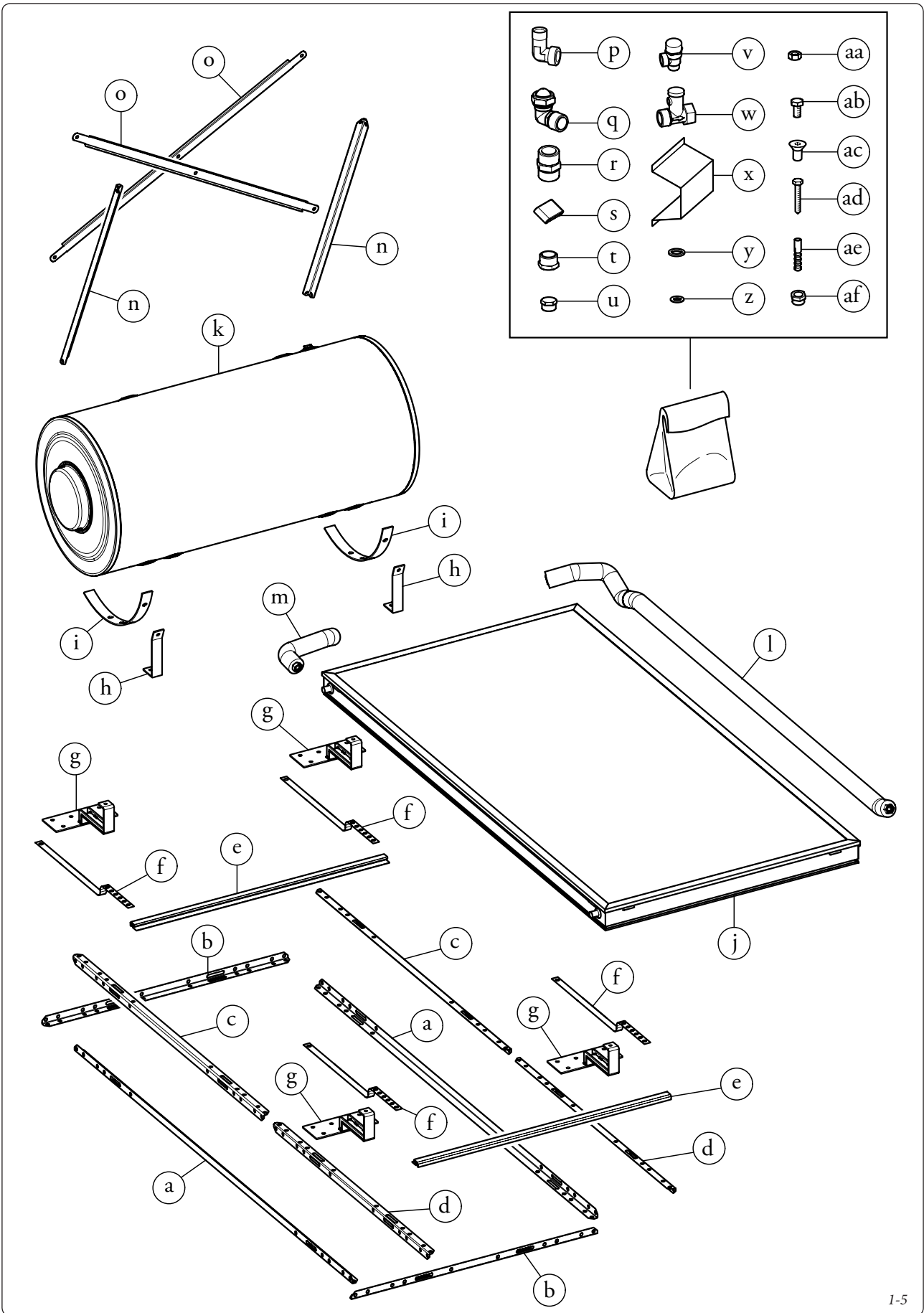
v	3 bar safety valve	1
w	6 bar safety valve	1
x	Insulated pipe fixing metal-sheet plate	2
y	24x16x2 mm gasket in afm 34	4
z	Flat washer M10 d. 19.9x10.5x2	35
aa	M10 uni 5588 zn hex nut	31
ab	M10x20 TE screw ch.17	21
ac	M10x20 TSEI screw	8
ad	Screw M8x50 for plug	4
ae	Plastic masonry plug	4
af	Reduction fitting 3/4M - 1/2F	1



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Installation drawings key:

a Unmistakeable component identification

1 Sequential identification of the operation to perform

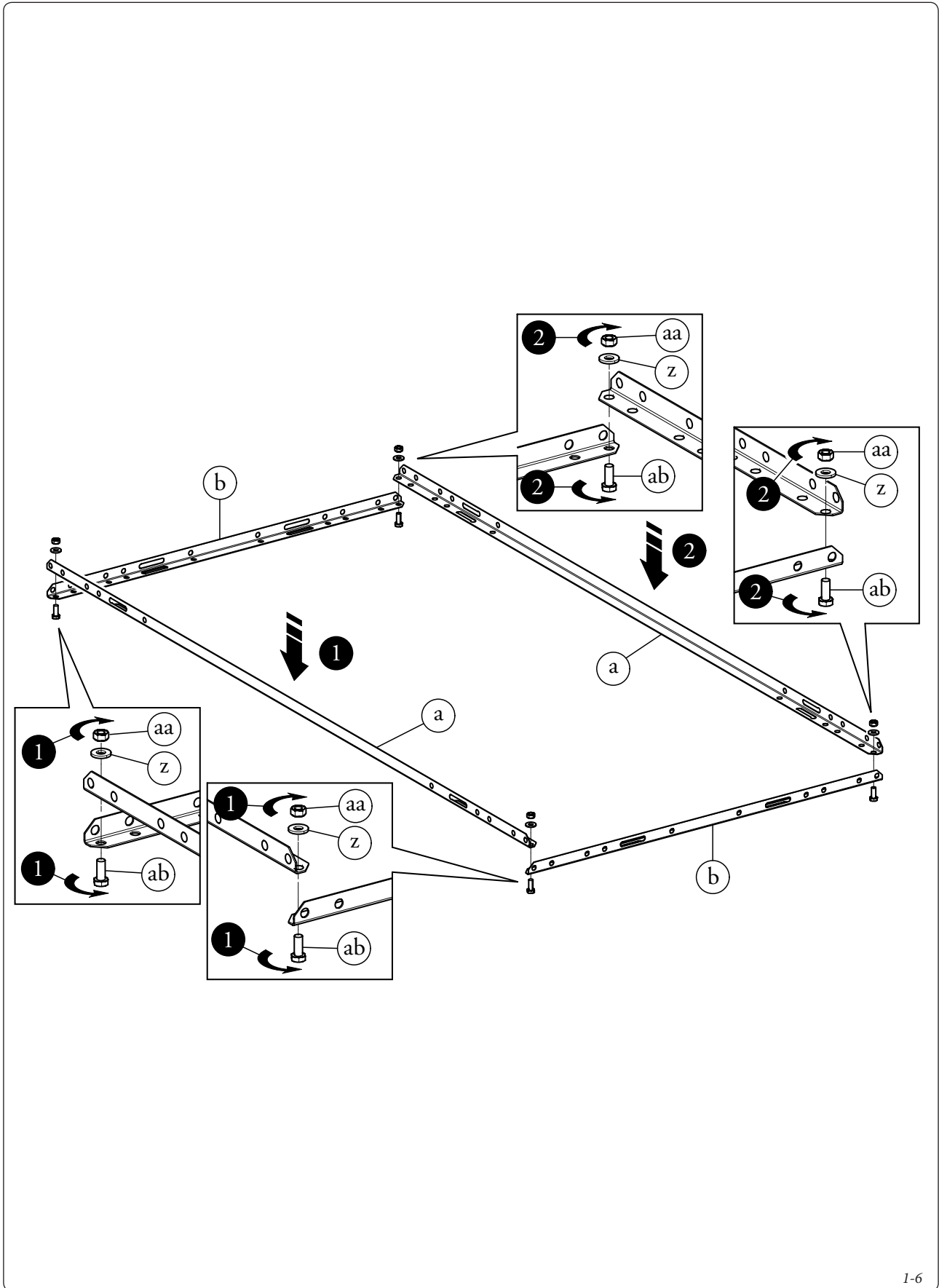
A Identification of generic or not supplied component



1.7 INSTALLATION ON SLOPING ROOF.

N.B.: during installation of the components represented below, pay full attention to the holes used and their correct reciprocal positioning.

- Assemble the lower frame as represented in sequences 1 and 2.



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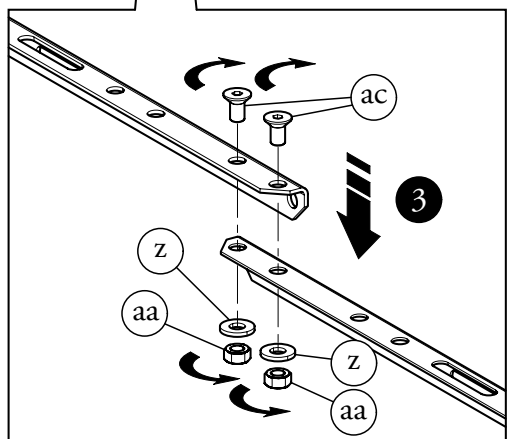
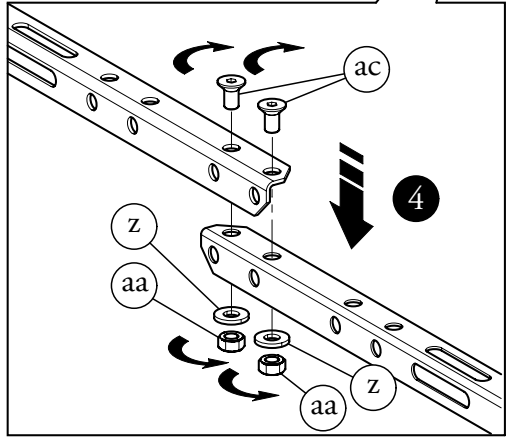
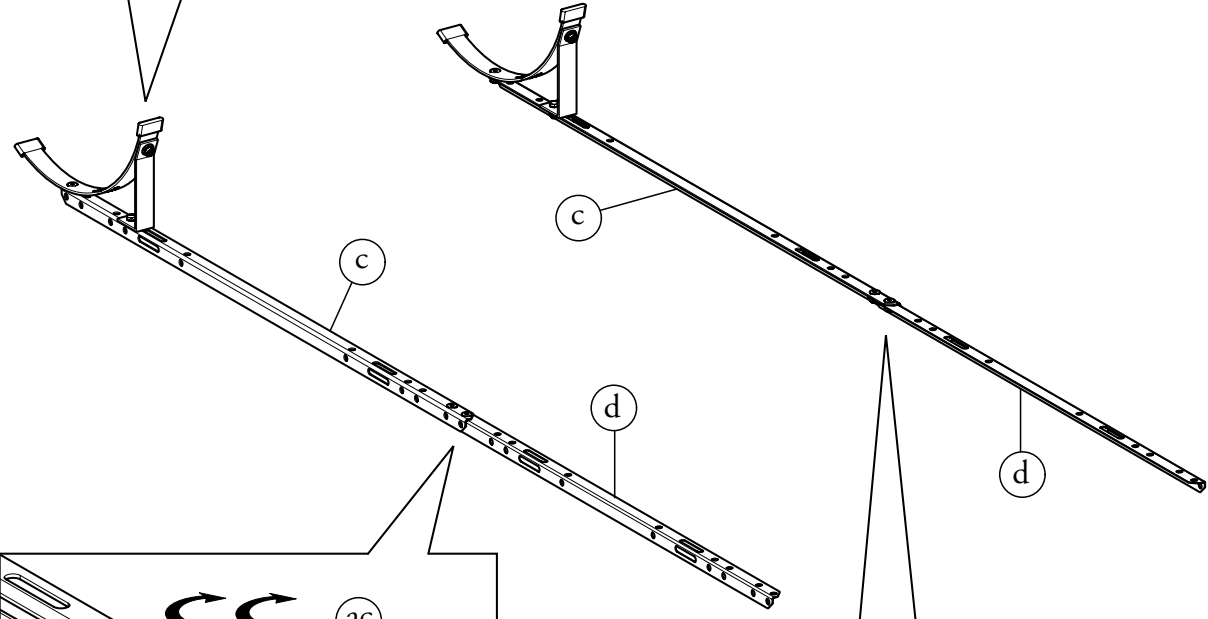
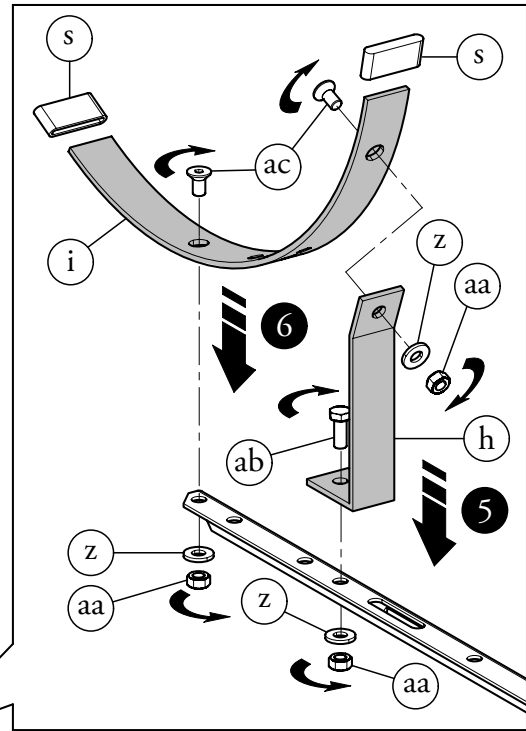
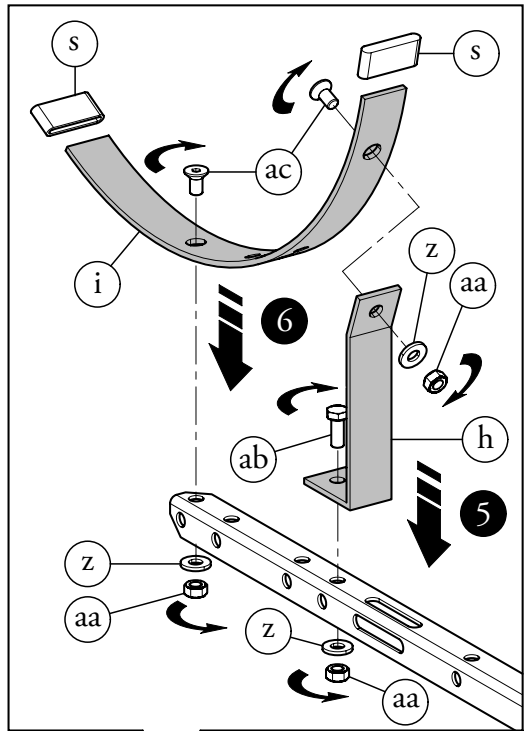
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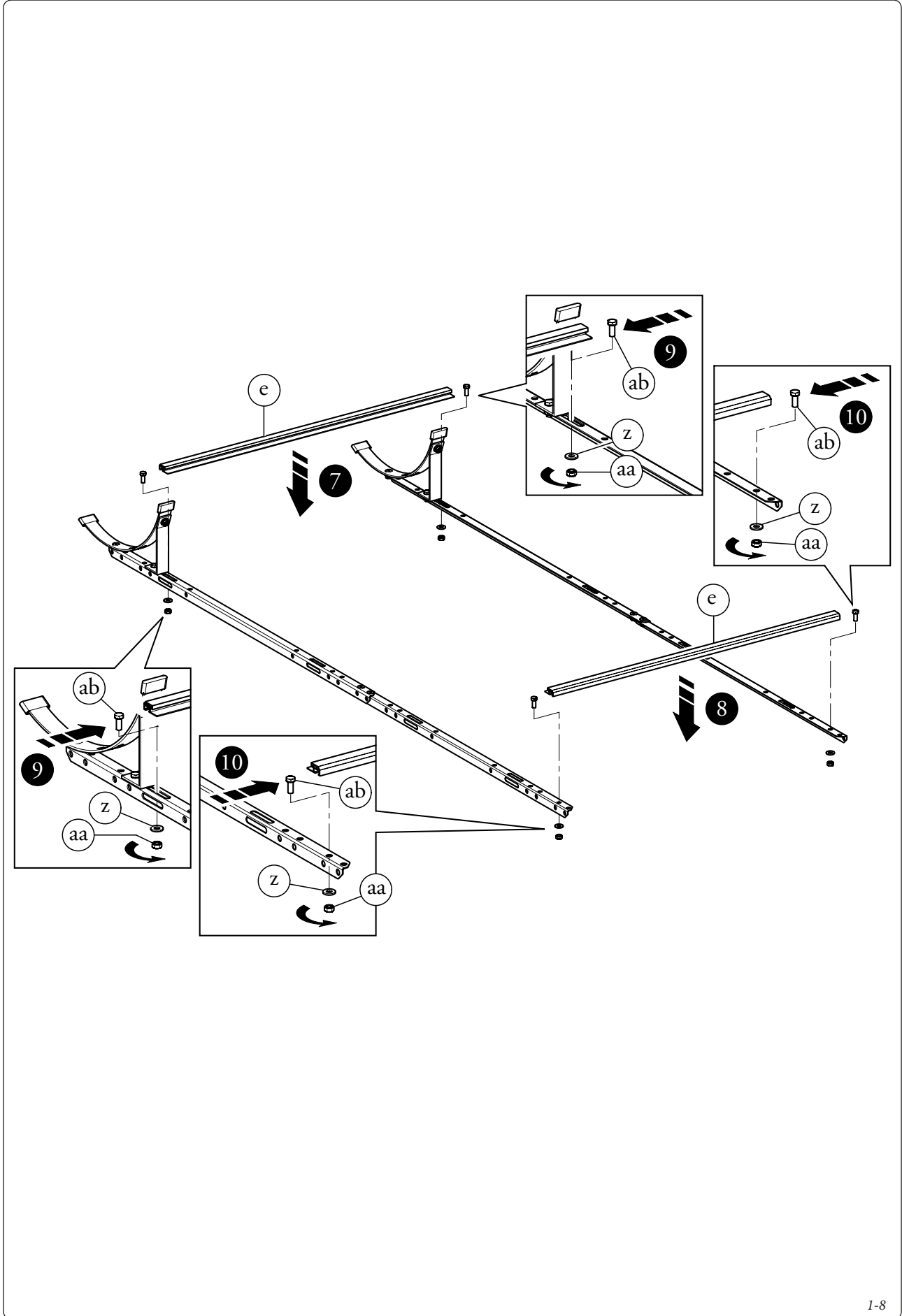
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Assemble the upper frame following operations 3 to 10.



N.B.: assemble the "e" bars without fully tightening the nuts (aa).

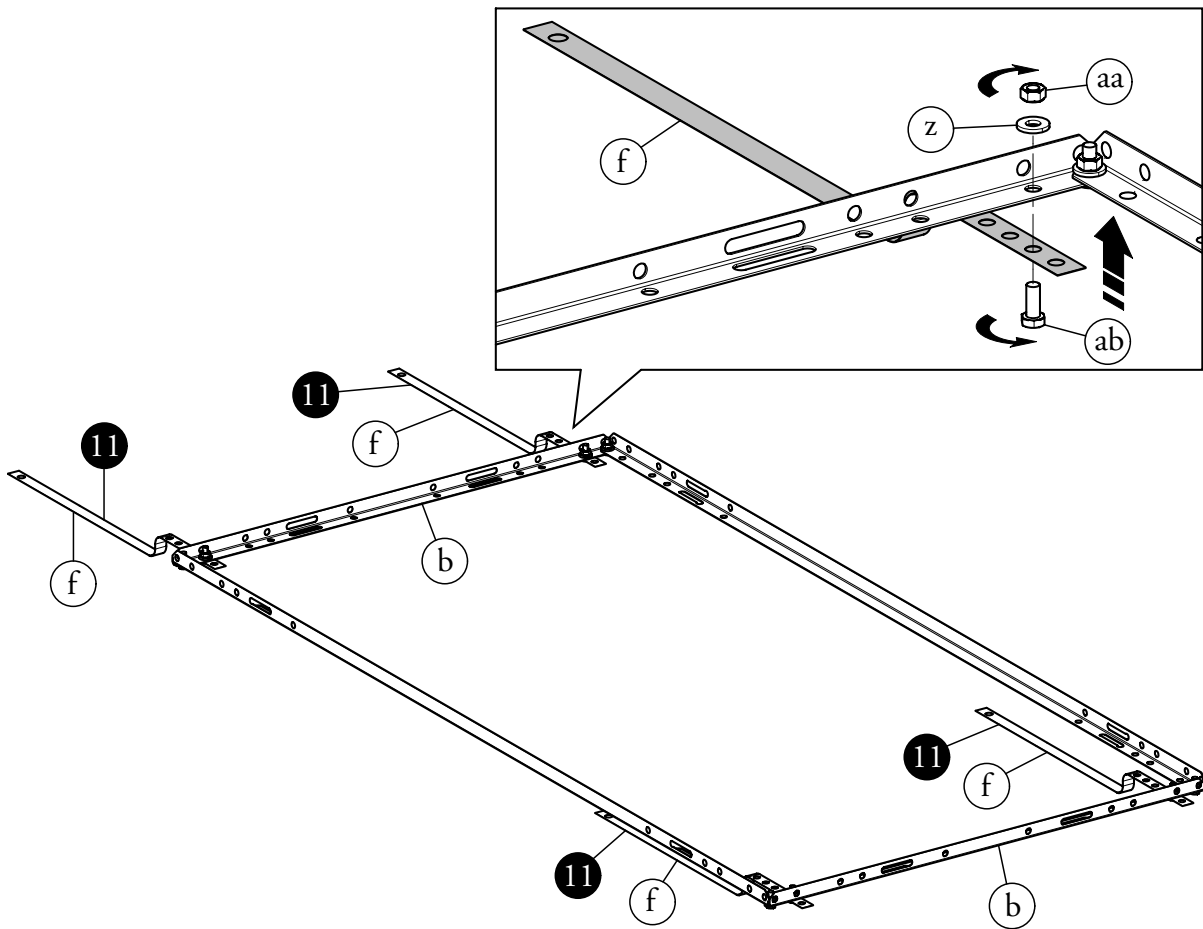


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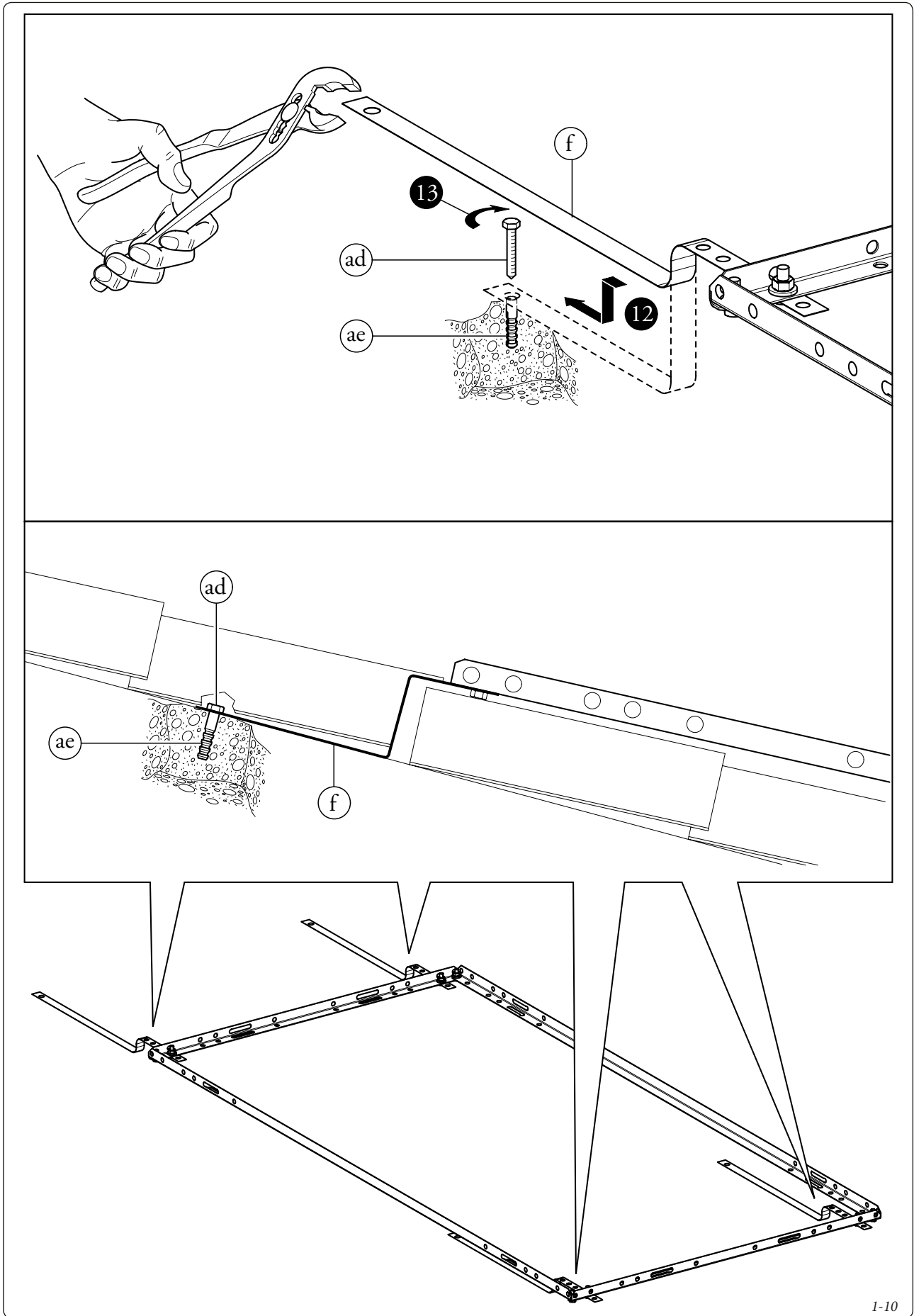
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- Install the 4 frame fixing laminate (f) using the holes present on the bars (b) selecting from those suitable, in a way to centre the laminates with the pitch of the tiles.



N.B. fix the laminates (f) to the roof using the most suitable device for the type of roof on which the installation is to be carried out.



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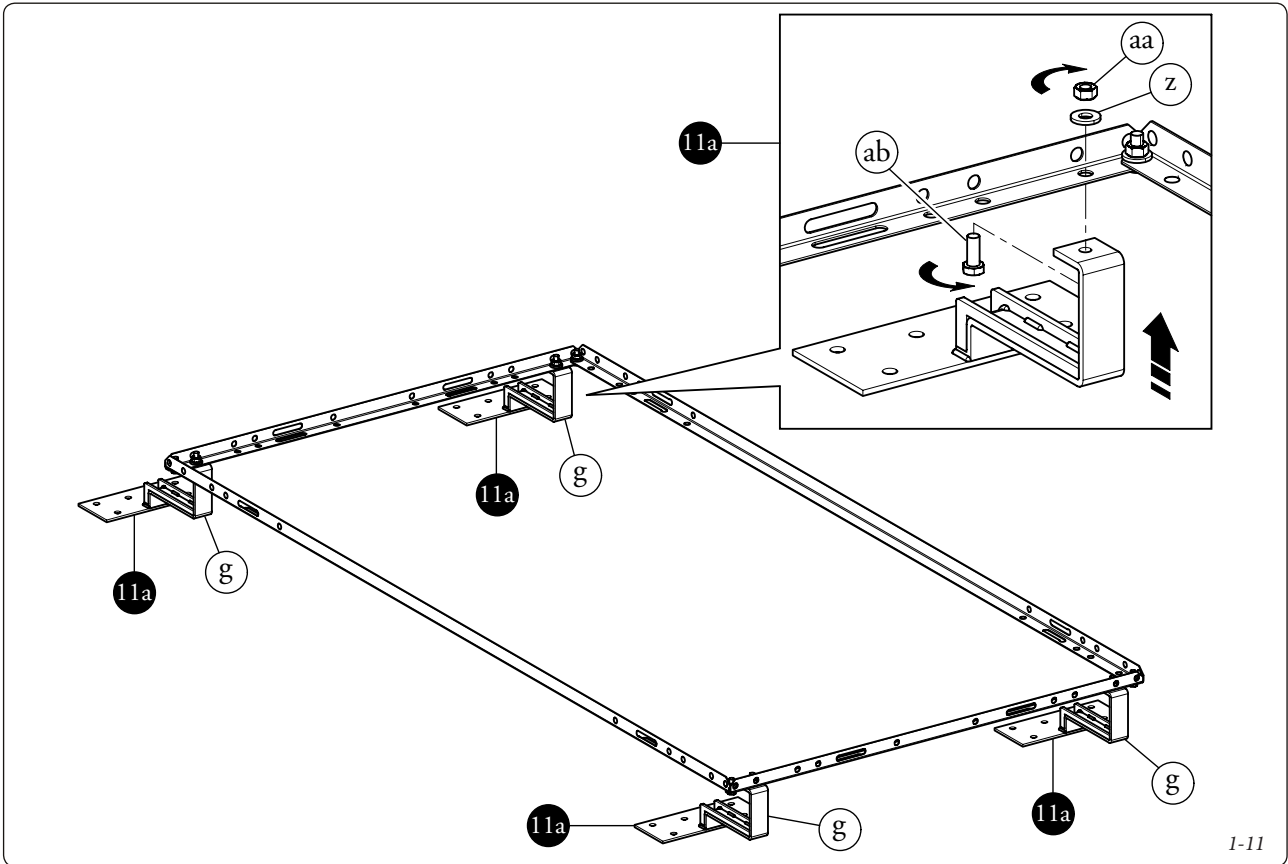
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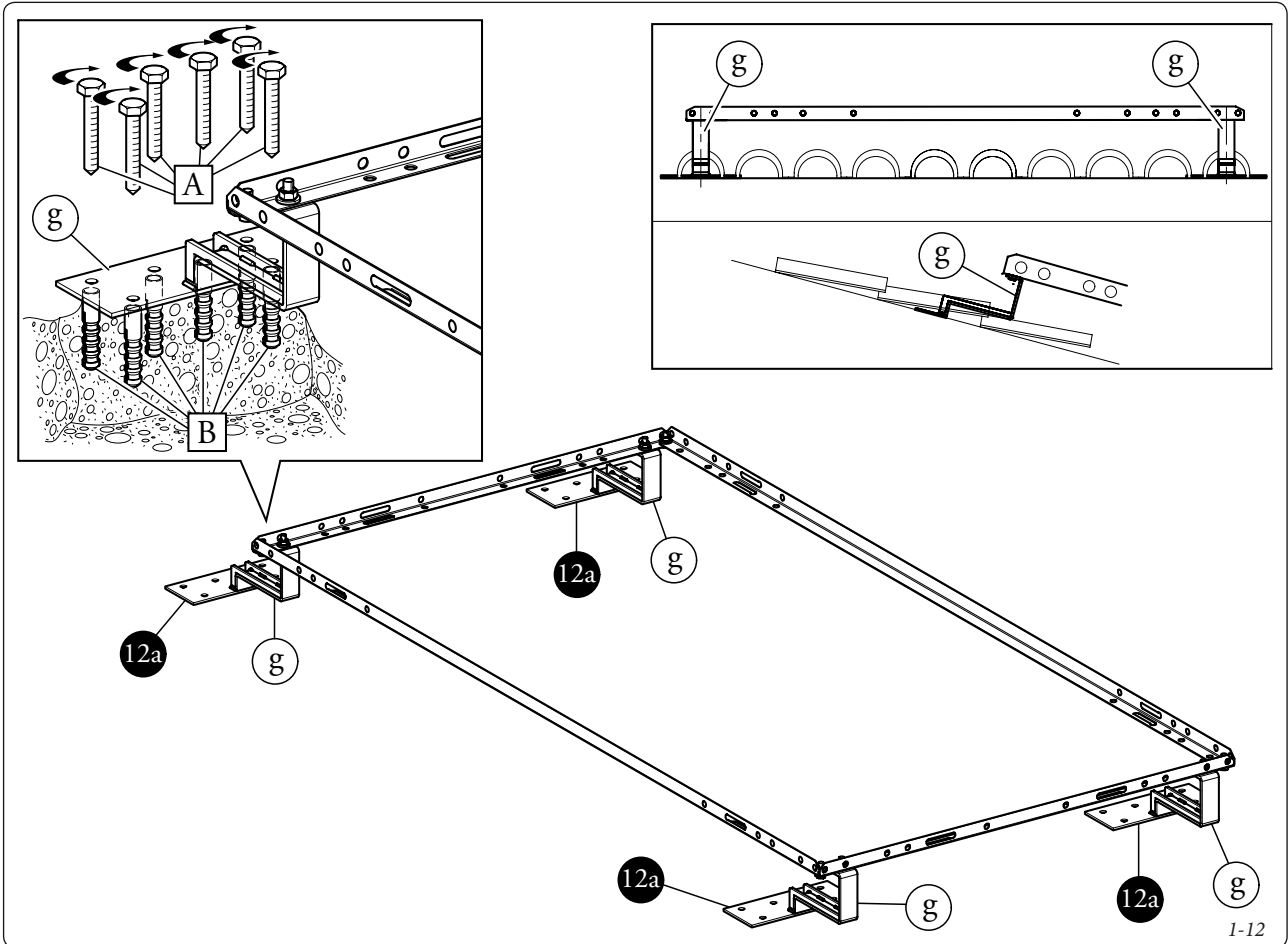
1-10

N.B.: if the installer does not deem it appropriate to apply the complete weight of the structure on the tiles, it is possible to fix the same using the brackets for slates/

tiles (g) supplied as an optional as shown below (steps 11a and 12a instead of steps from 11 to 13 for the installation of the laminates (f)).

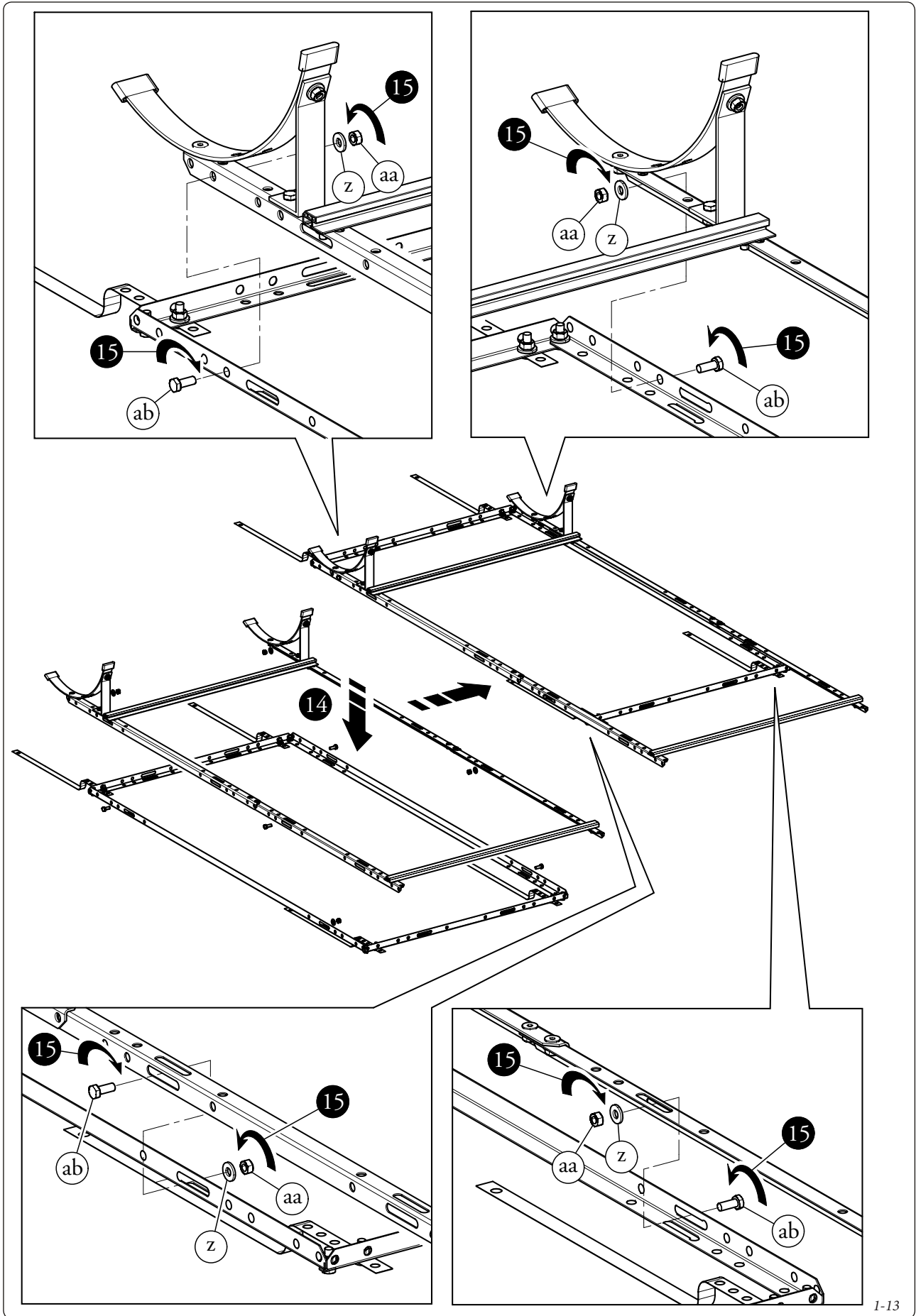


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- Join the lower frame fixed to the roof to the upper frame as represented below (sequences 14 and 15).



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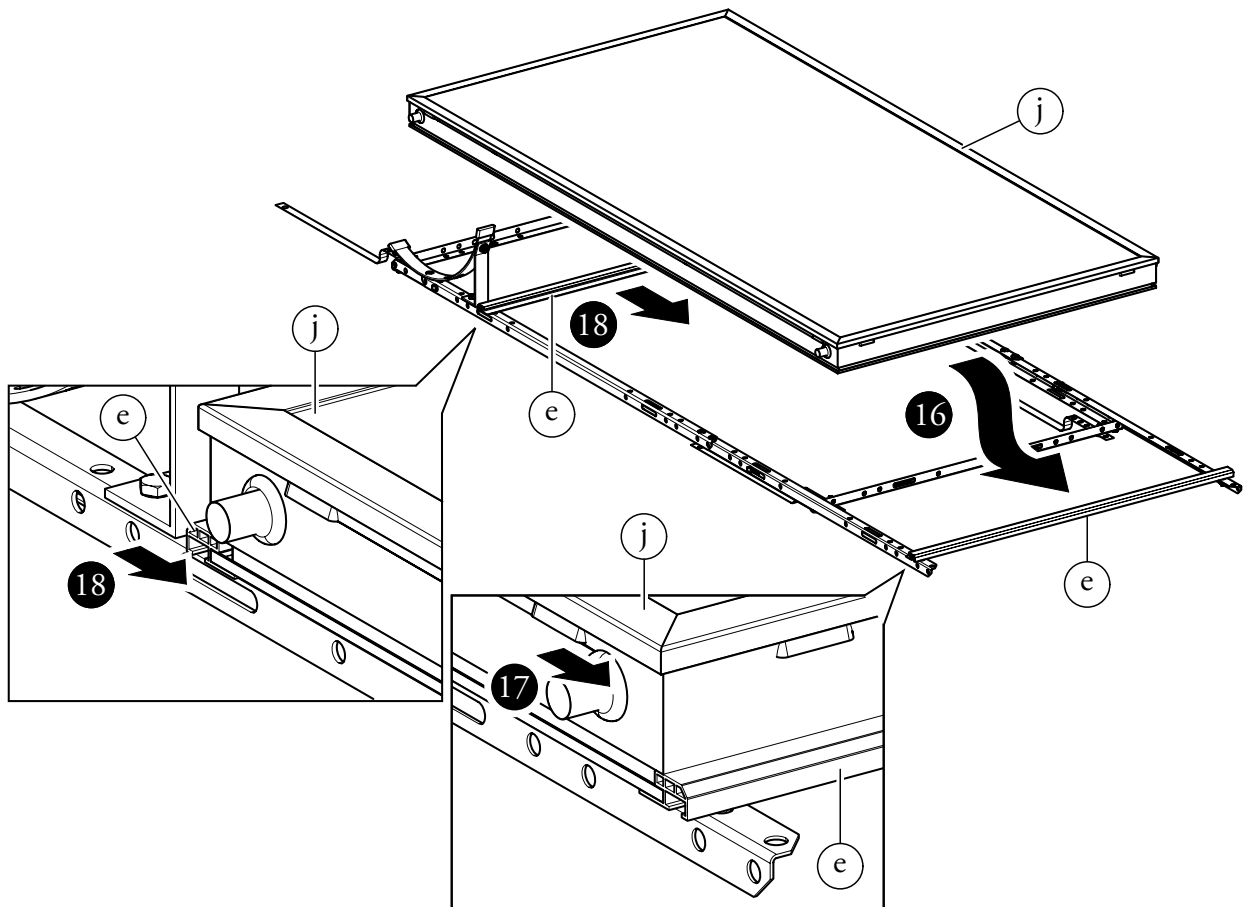
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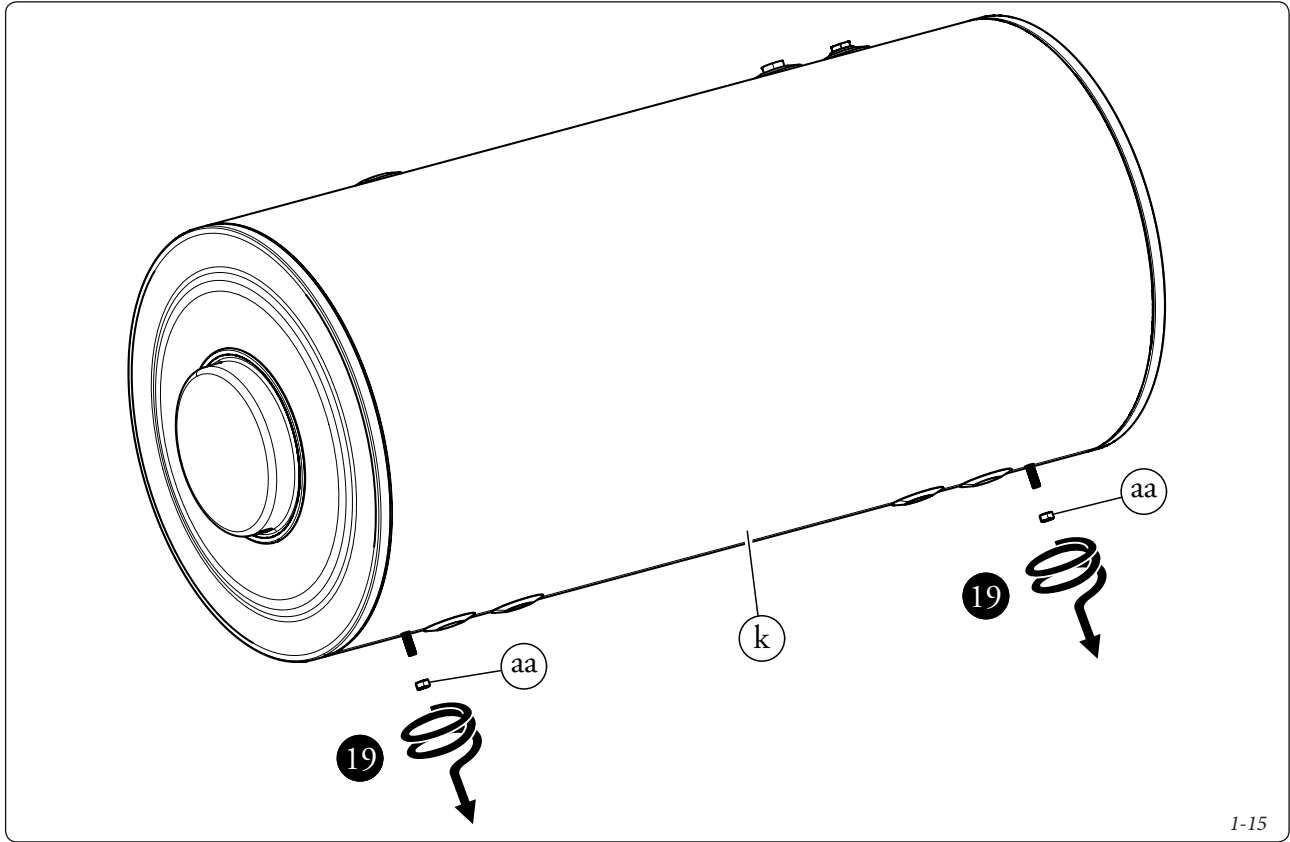
1-13

- After positioning the manifold (j), as shown in the figure, slide the upper mount bar (e) down until it touches the manifold itself. At the end, tighten the nuts used to assemble both bars (e).

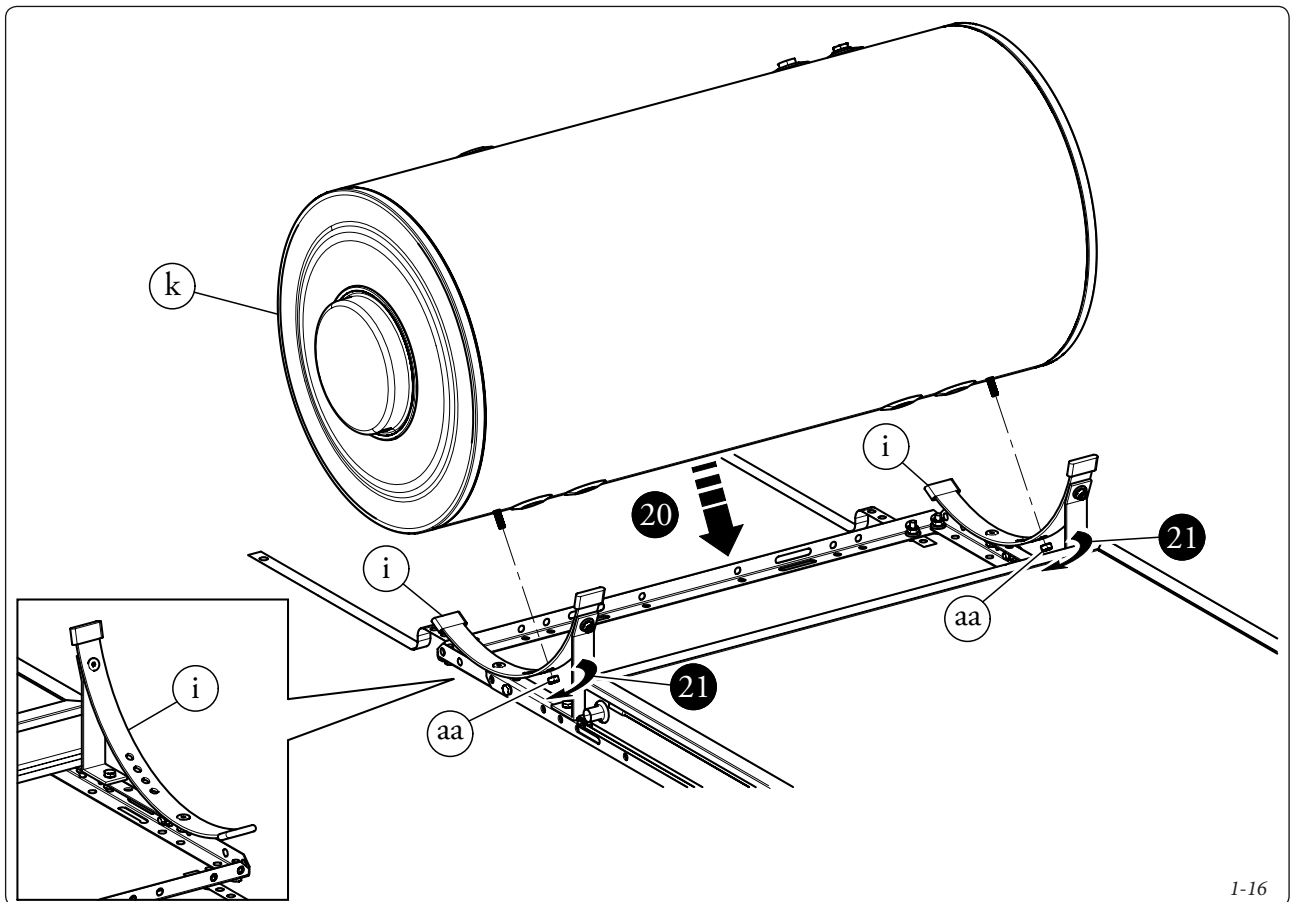
N.B.: do not handle the manifold (j) gripping it by the copper fittings.



- Position the storage tank / Cylinder on the two calendered brackets (i) selecting the most suitable hole on the basis of the inclination of the slope. At the end of installation, the upper fittings of the storage tank / cylinder must be as vertical as possible.



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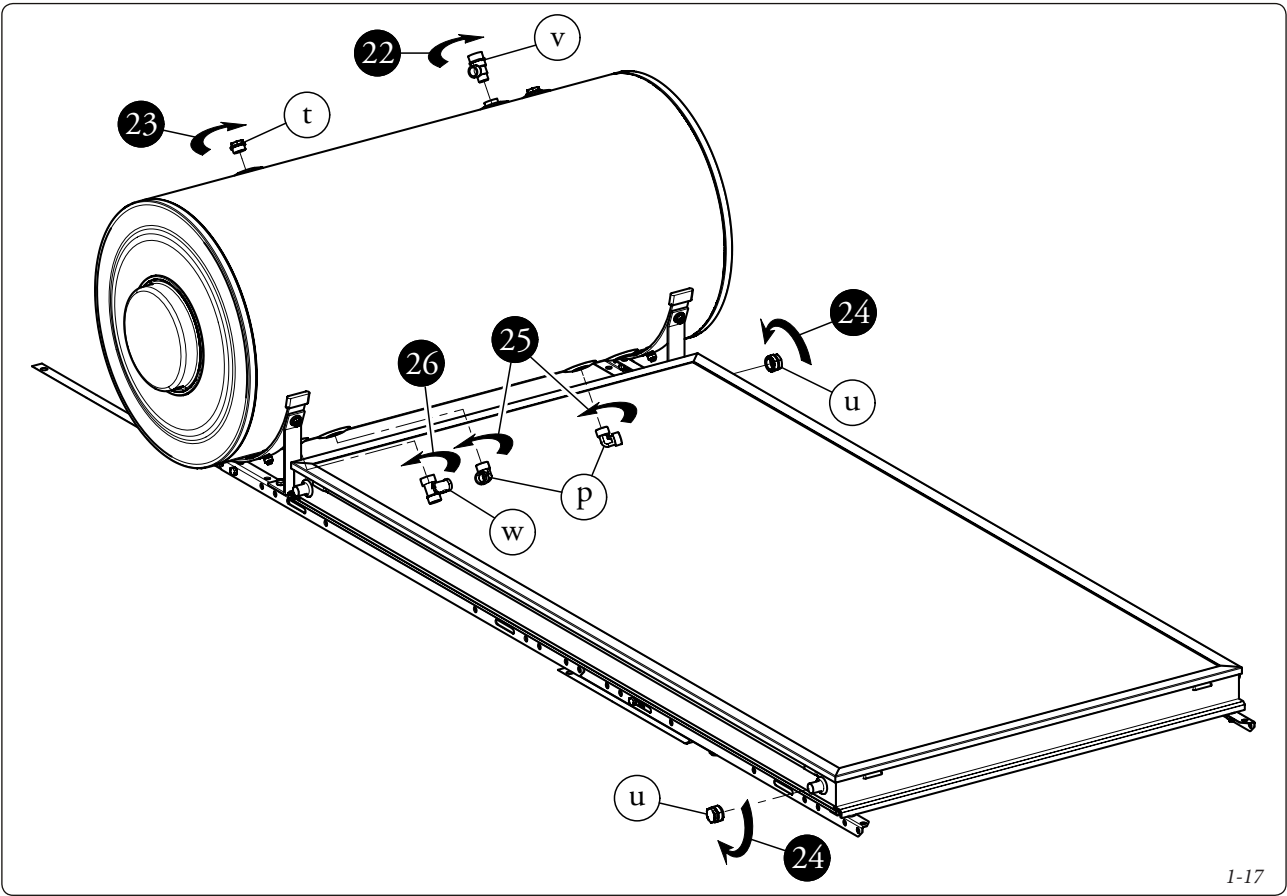
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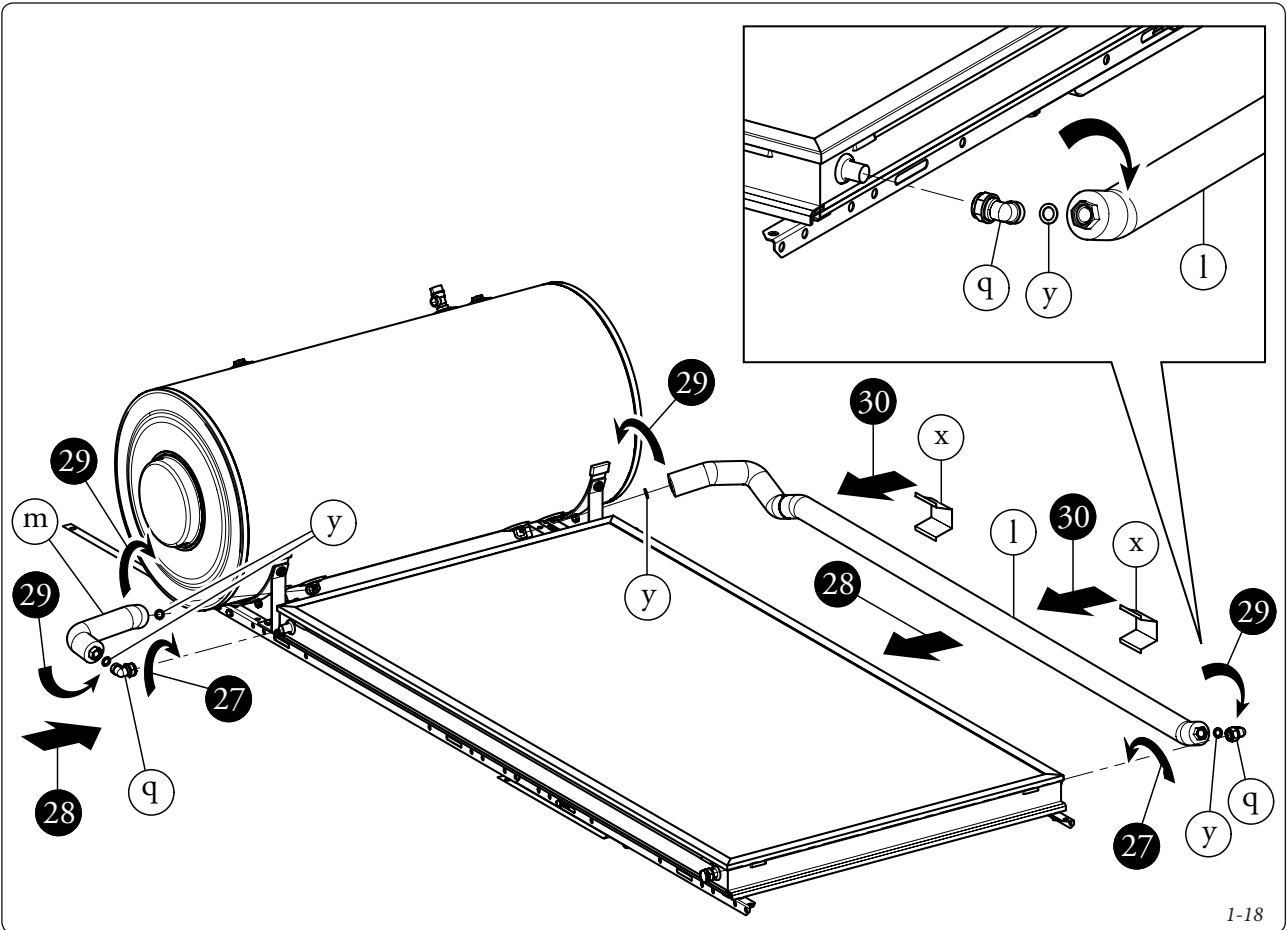
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N.B.: the safety valves ("v" and "w") must be mounted in a way that any emission of steam caused by overheating of the

system does not cause damage to objects or persons.



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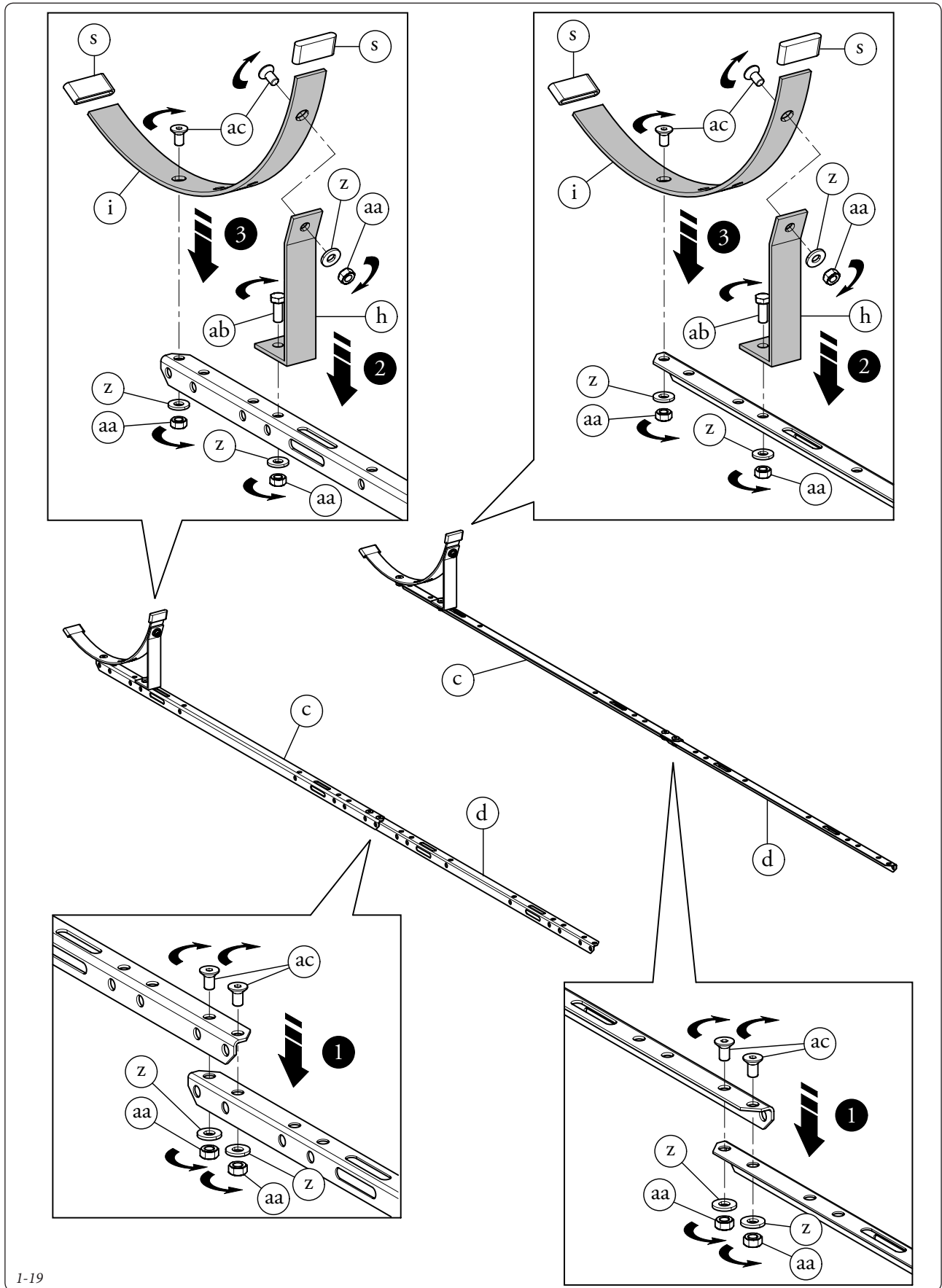


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1.8 FREE INSTALLATION.

N.B.: during installation of the components represented below, pay maximum attention to the holes used and the correct reciprocal positioning of the same.

Assemble the frame following operations from 1 to 6.



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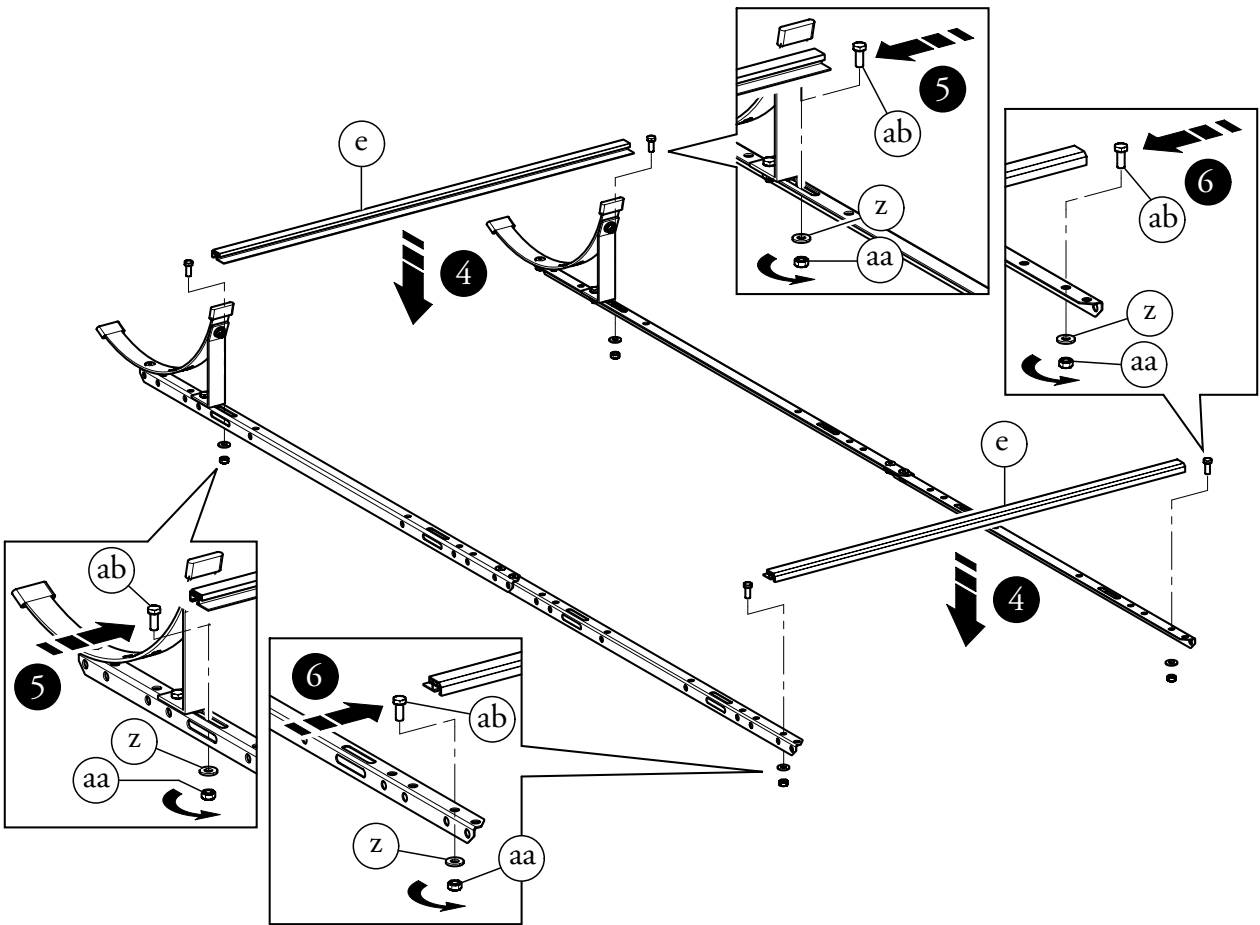
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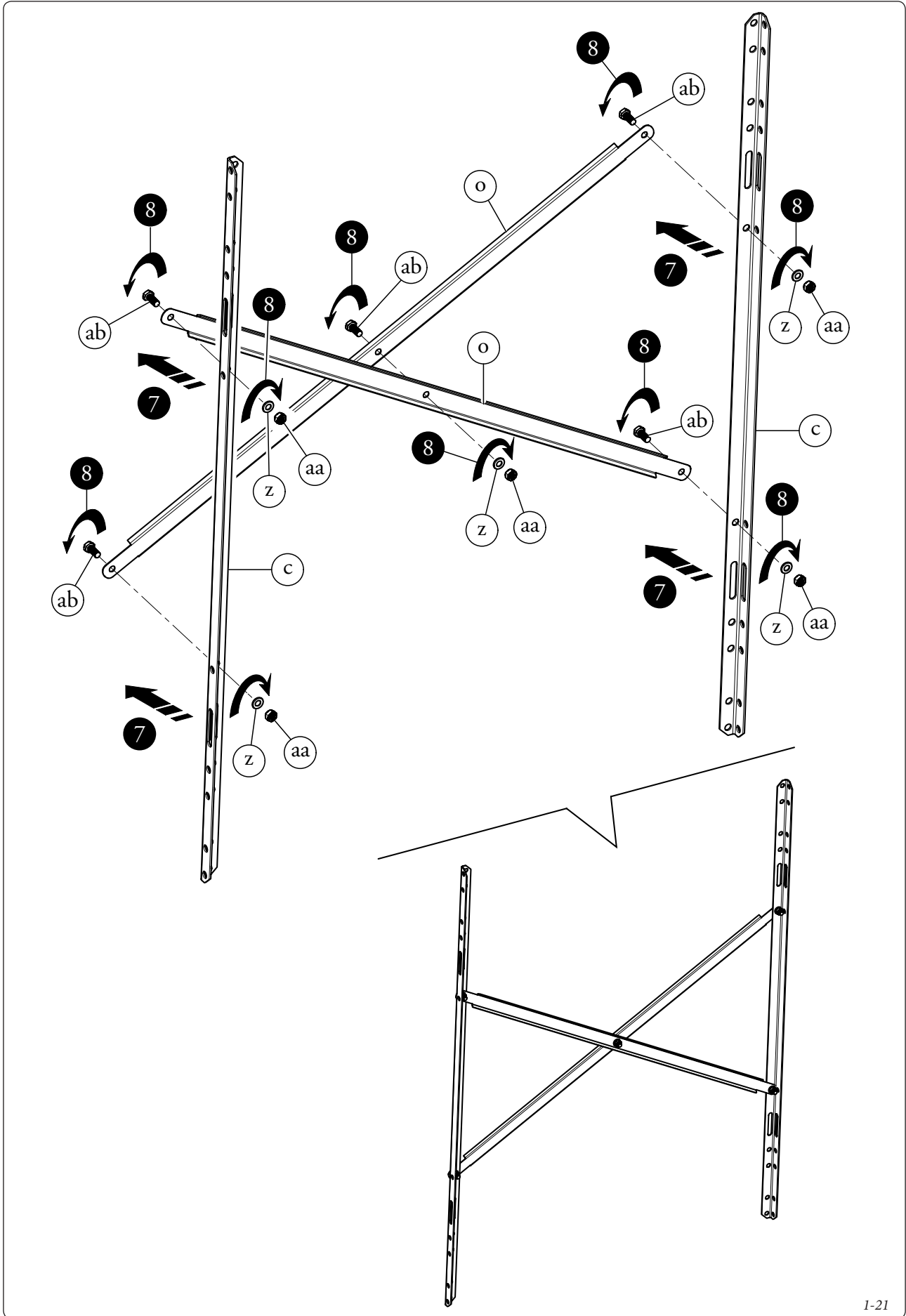
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N.B.: assemble the "e" bars without fully tightening the nuts (aa).



- Assemble the rear vertical mount (sequences 7 and 8).

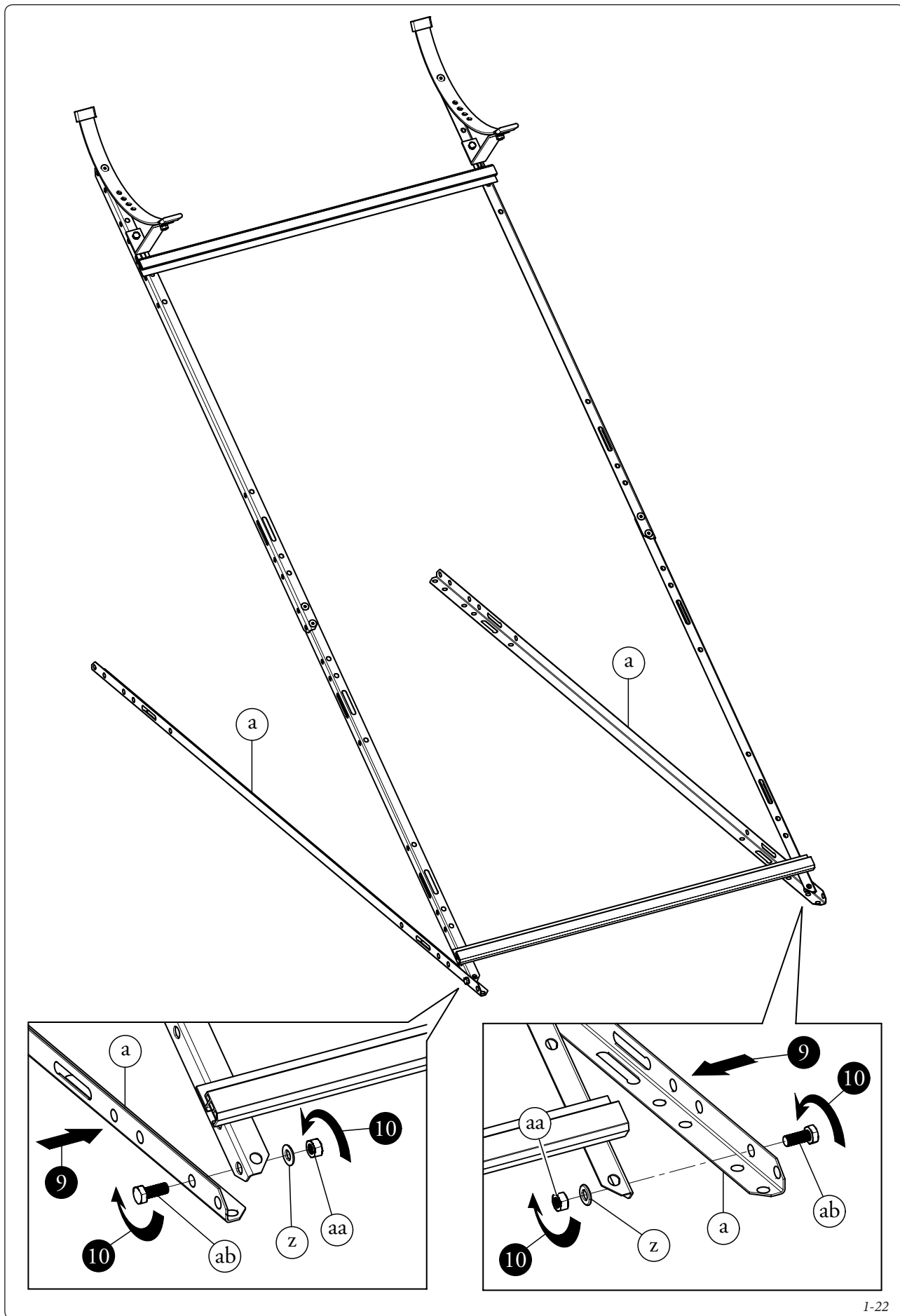


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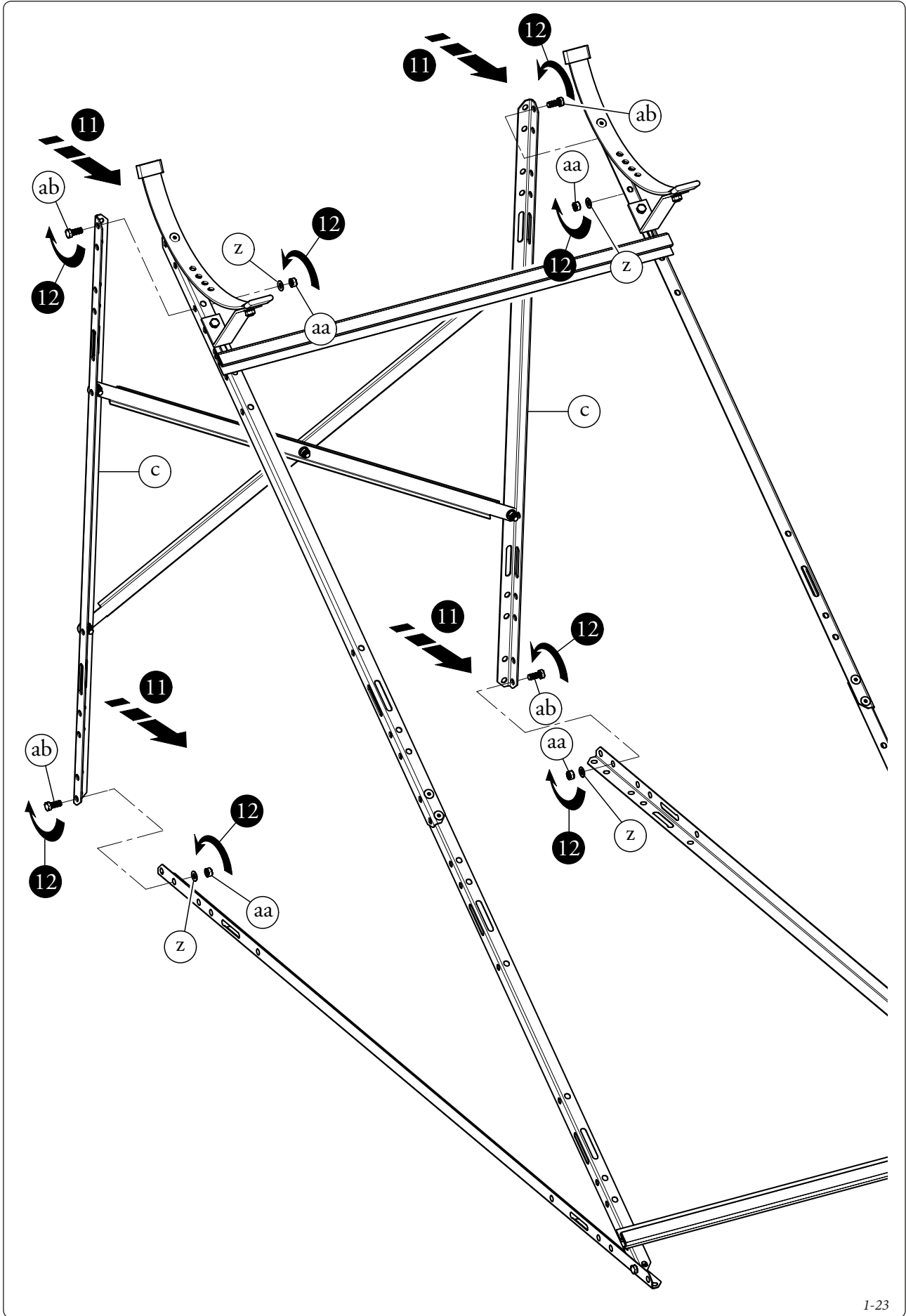
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- Fix the frame to the two frame structure bars (a).



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- Assemble the rear mount to the frame and to the two horizontal cross members (Sequences 11 and 12)

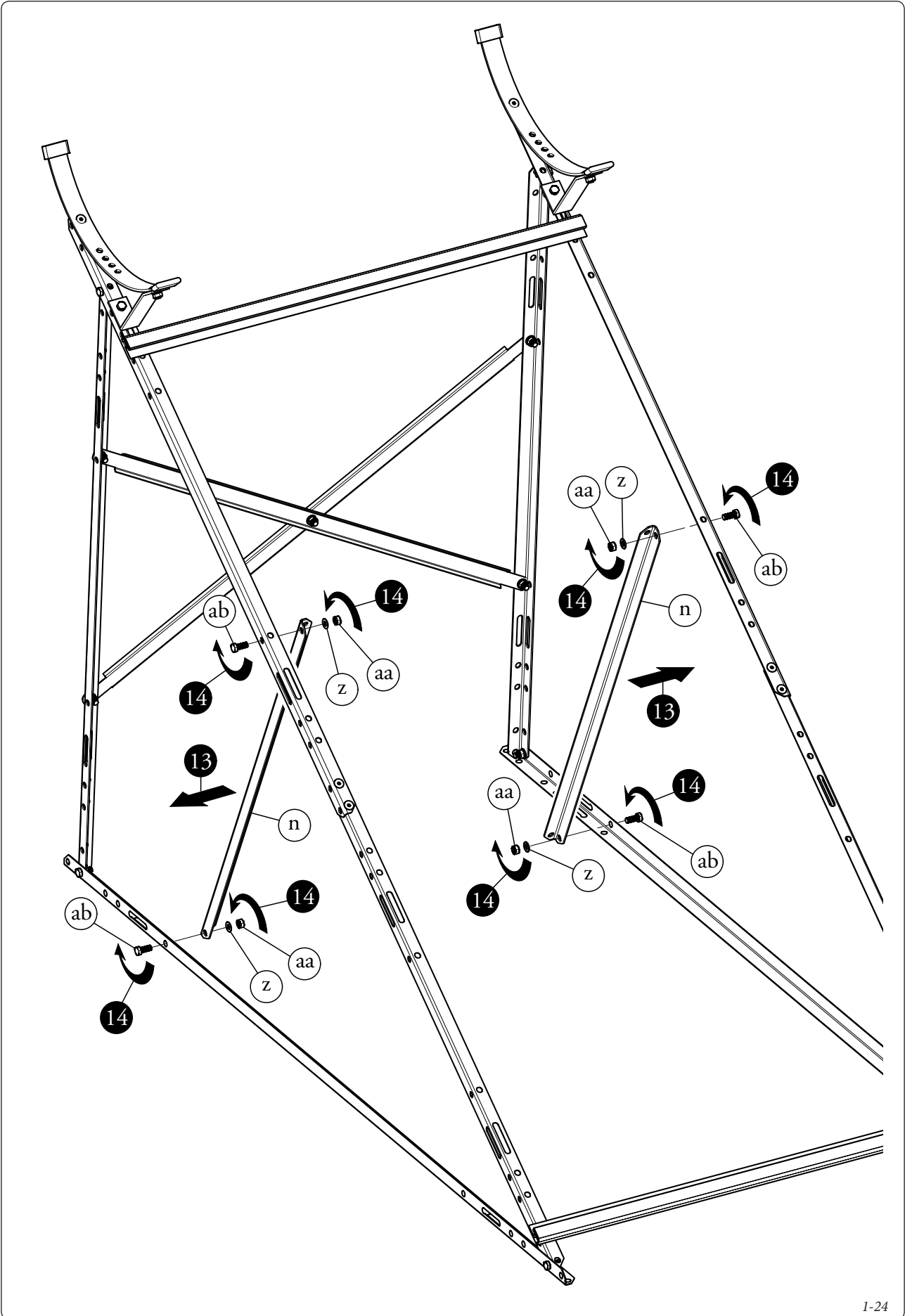


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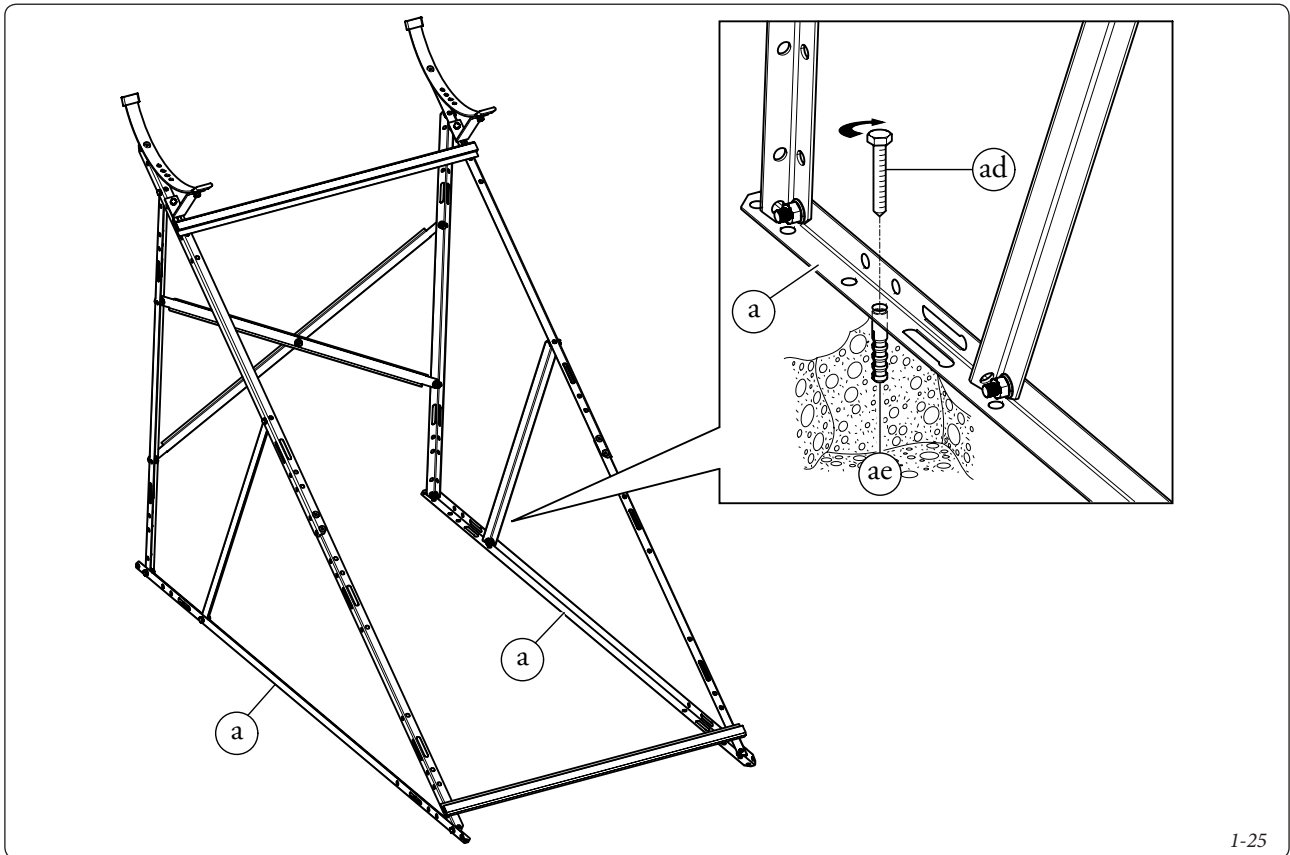
- Fix the two frame reinforcement bars (n) (sequence from 13 to 14).



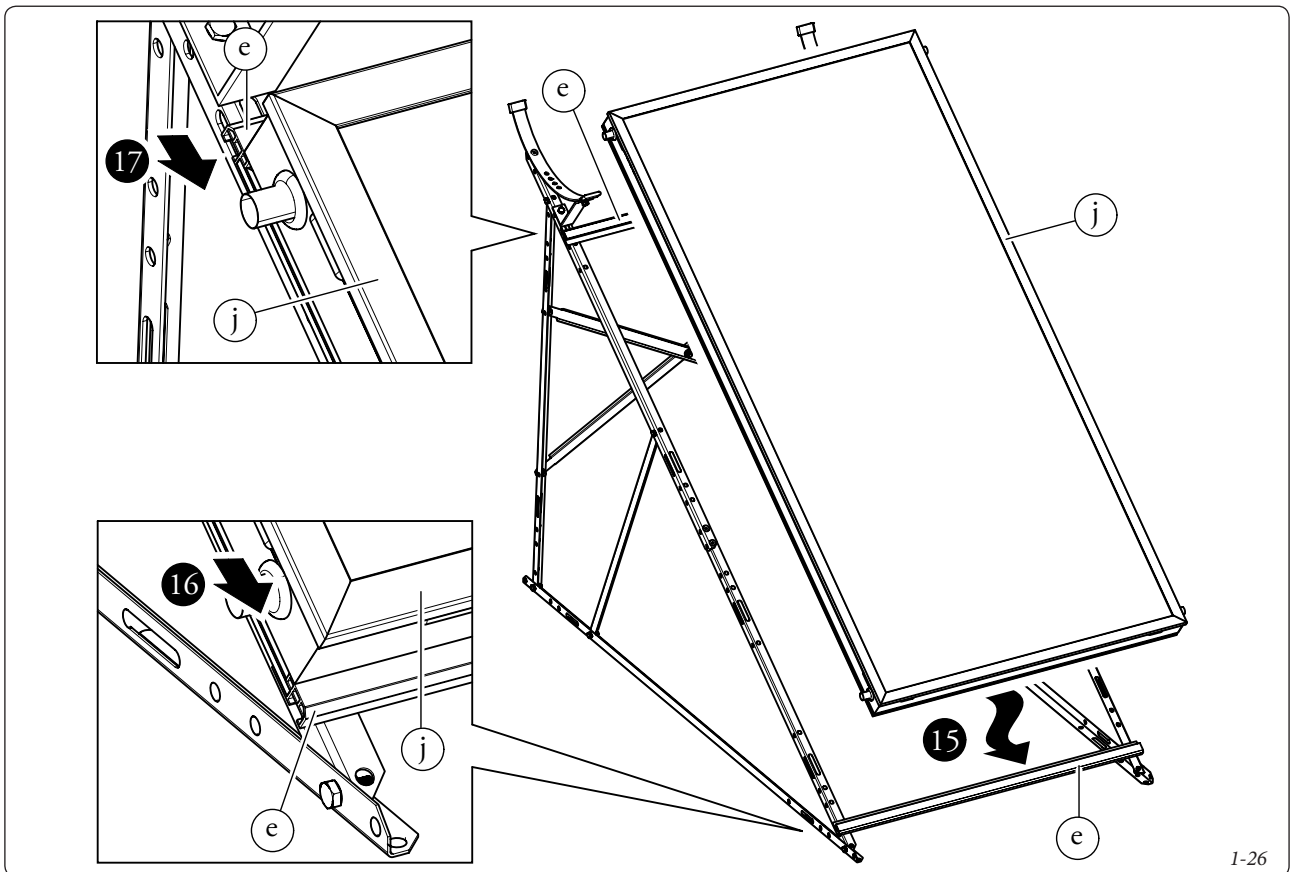
N.B. Fix the frame structure bars (a) using the most suitable device for the type of surface on which installation must be carried out.

• After positioning the manifold (j), as shown in the figure, slide the upper mount bar (e) down until it touches the manifold itself. At the end, tighten the nuts used to assemble both bars (e).

N.B. Do not handle the manifold (j) gripping it by the copper fittings.

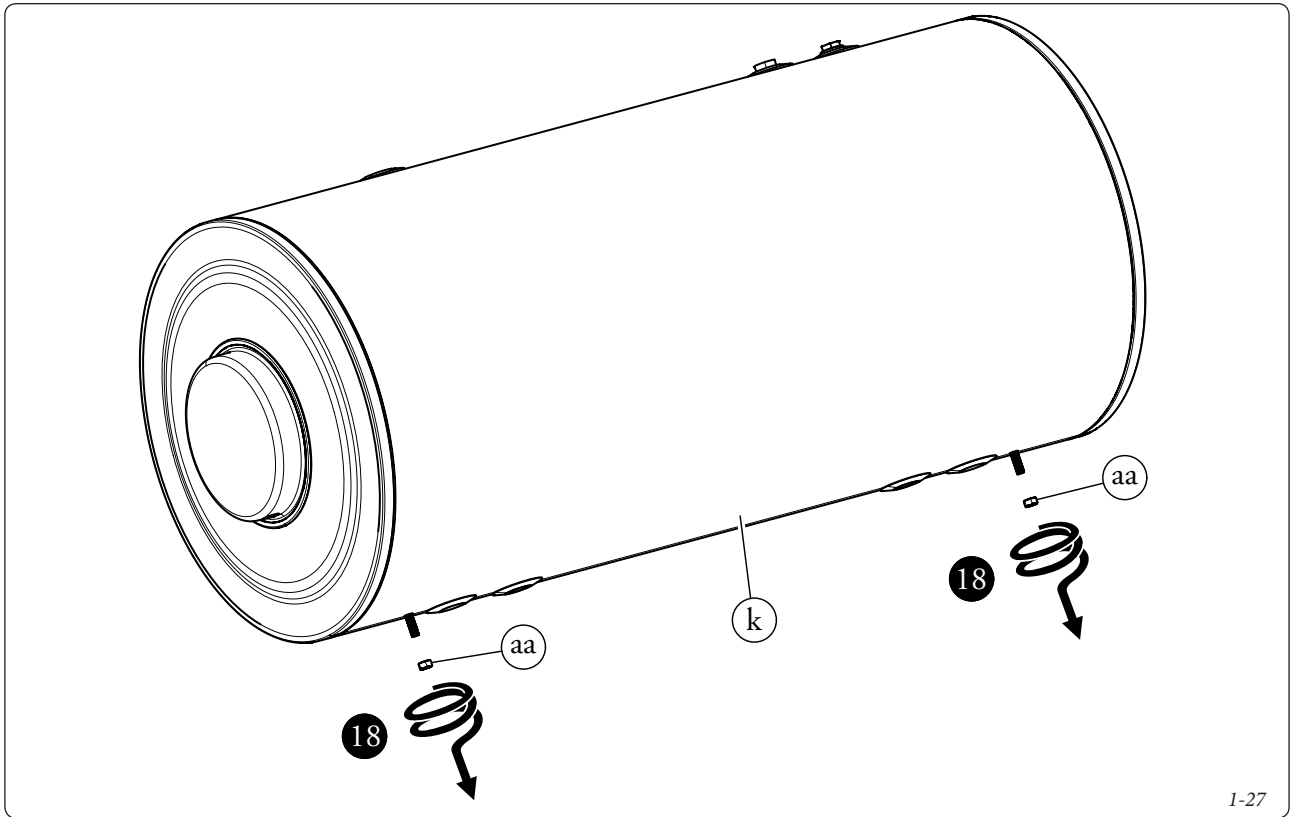


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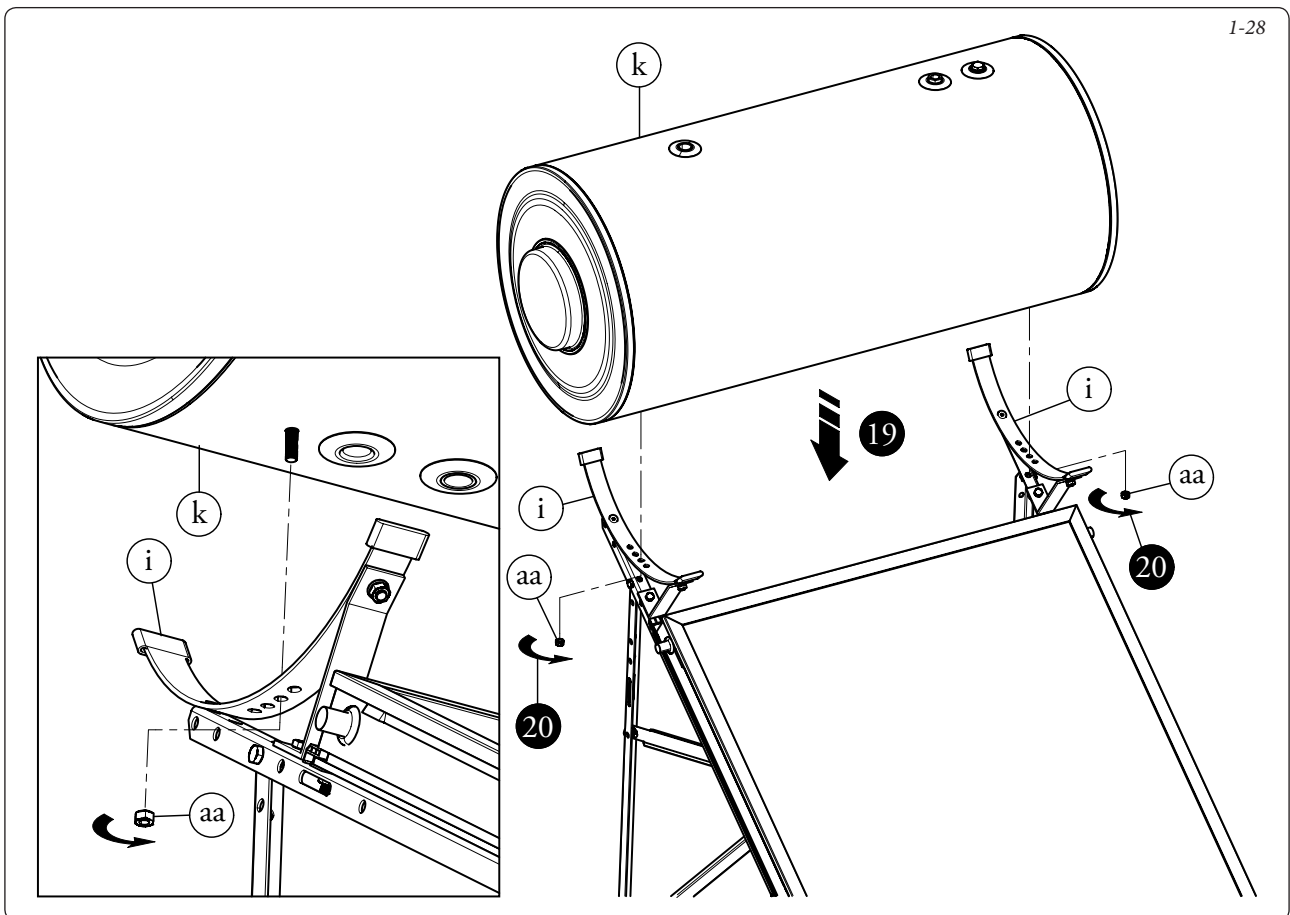


1-26

- Position the storage tank (k) on the two calendared plates (i) selecting the most suitable hole on the basis of the inclination of the slope.
At the end of installation, the upper fittings of the storage tank / cylinder must be as vertical as possible.

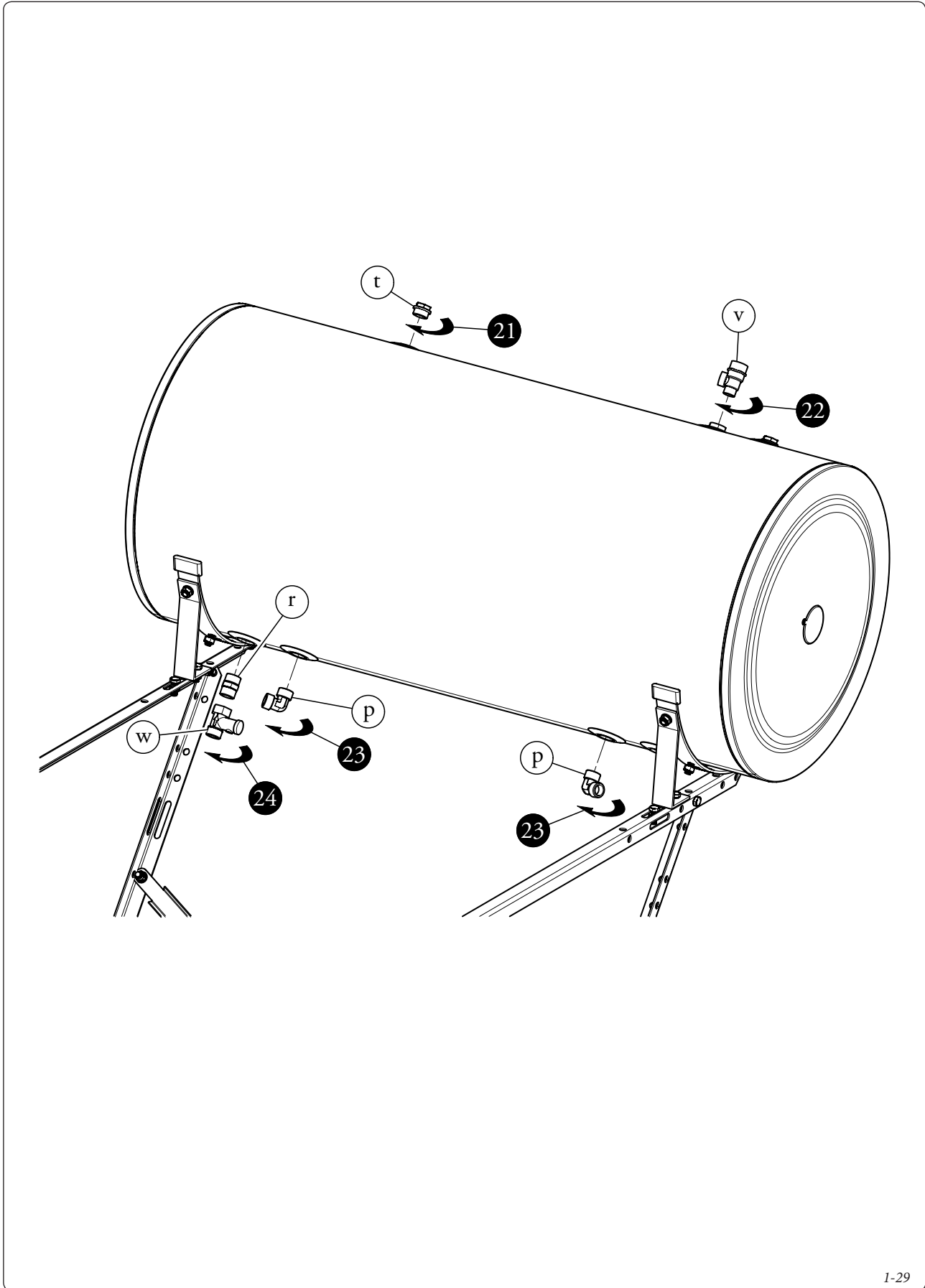


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1-28

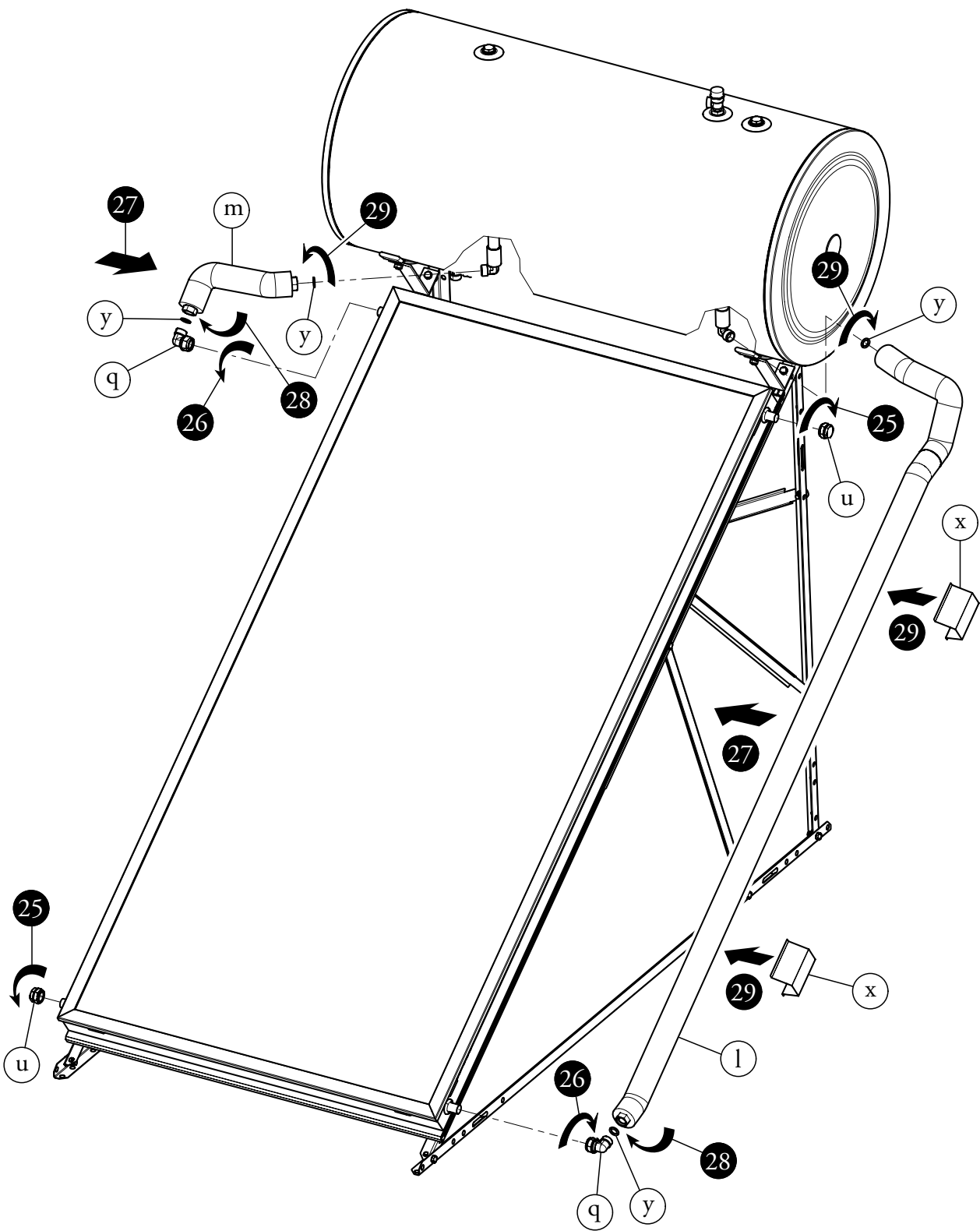
N.B.: the safety valves ("v" and "w") must be mounted in a way that any emission of steam caused by overheating of the system does not cause damage to objects or persons.



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1.9 SYSTEM CONNECTION.

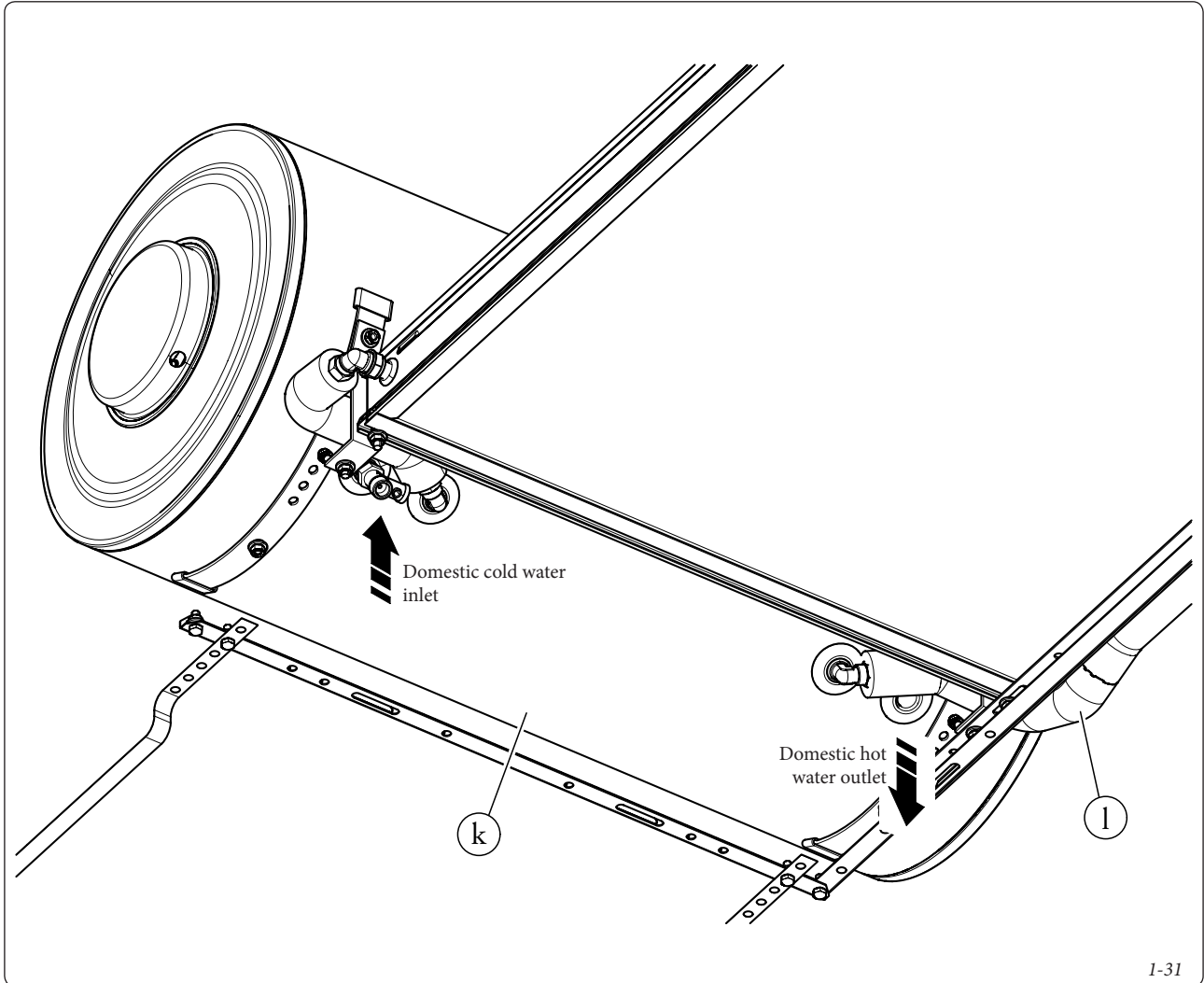
Attention: to avoid burns caused by the excessive temperatures of the DHW, a cold water mixing valve must be installed or a device that limits the output DHW to a maximum temperature of 60°C +/- 5°C.

1.10 BY-PASS KIT (OPTIONAL).

This kit allows you to install a bypass on the DHW circuit of a storage tank unit with natural circulation to keep it from freezing during the winter season (see the relative instruction sheet).

General indications.

- The pipes to implement the system are supplied with the kit.
- With the system closed, you must partially discharge the DHW circuit pressure of the storage tank unit by means of the specific cock.



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1.11 ELECTRICAL RESISTANCE.

Ref.	Description	Q.ty
k1	Closing plate	1
k2	Nut	8
k3	Storage tank gasket	1
k4	Washer	8
k5	Flange	1
k6	Gasket	1
k7	1.5 kw electric resistance	1
k8	Solar storage tank anode	1
k9	Screw	4

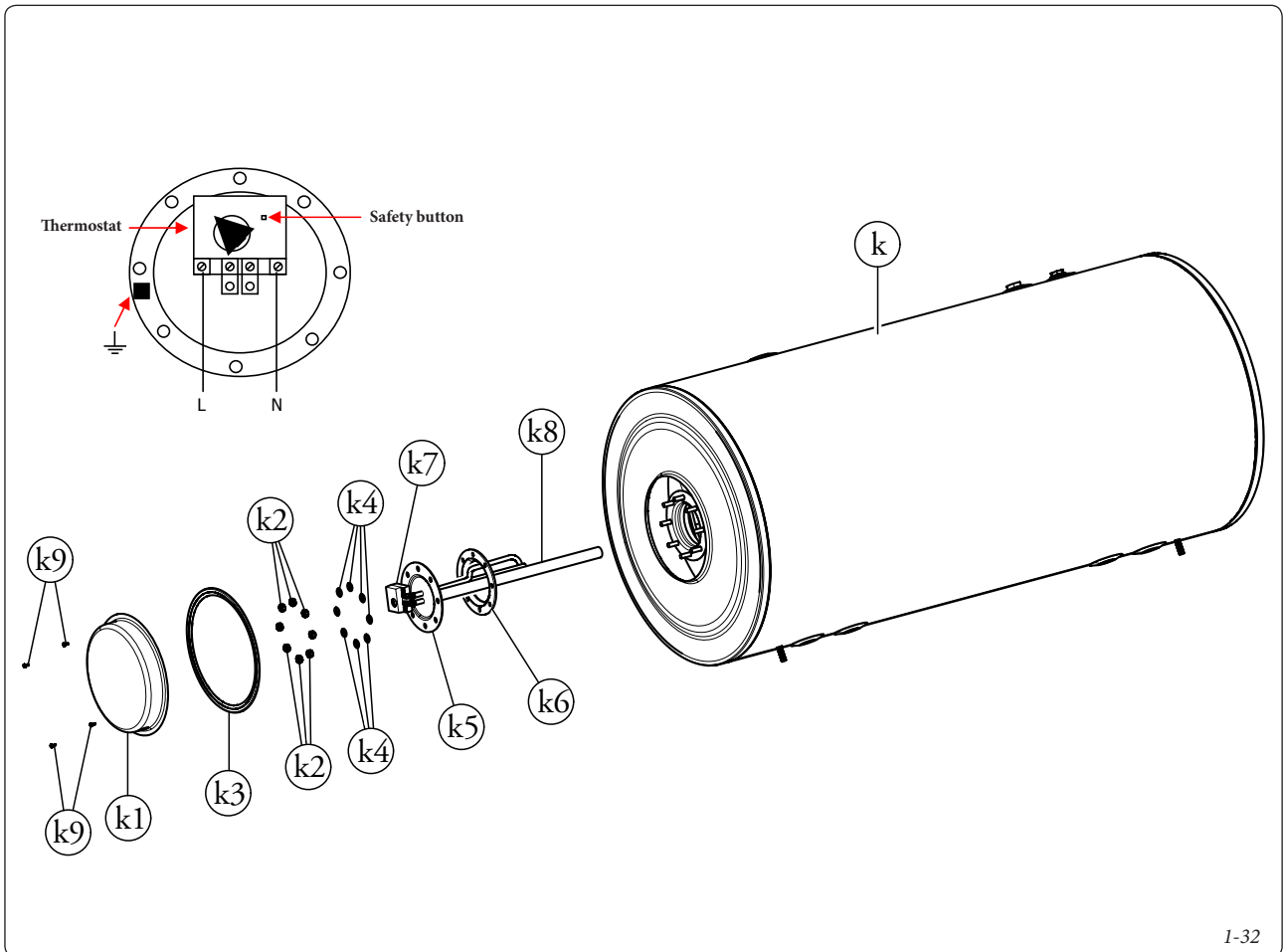
N.B.: before closing the external cover (k1) regulate the thermostat of the resistance (k7) to the desired temperature (the device is deactivated on the first notch).

The resistance must be regulated and started only for emergency situations and in the case of low environment temperature.

N.B.: the electric resistance must be connected by a qualified technician. All of the connections must be performed following the diagram shown below.

N.B.: the electric connections must only be made on the thermostat. DO NOT connect the electric power supply to the resistance by-passing the thermostat.

N.B.: the resistance must be connected to the power supply via a bipolar safety switch. The distance between the connectors must be AT LEAST 3 mm.



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1.12 SOLAR SYSTEM FILLING.

The steps stated below must be performed before commissioning:

- washing the system and sealing test

If copper piping is used and strong braze-welding is performed, the system must be washed to remove the residues of braze-welding. Successively perform the sealing test.

When installation has been completed, fill the circuit using the hole on the top of the tank (remove the 3/4" cap located near the flange). To facilitate filling, it is recommended to remove the safety valve in order to use the hole as a vent. On completion re-mount the cap and the safety valve.

N.B.: the circuit must be loaded slowly in a way to remove the air it contains completely.

1.13 SYSTEM FILLING WITH GLYCOL.

The glycol must be mixed with the water in a container before the system is filled (e.g. 40% glycol and 60% water allow an anti-freeze resistance to temperature of -22°C).

The propylene glycol is studied especially for solar applications as it maintains its features within the -32÷180°C interval. Moreover, it is non-toxic, biodegradable and biocompatible.

Do not use automatic filling systems.

The solar collector must be filled immediately with the water and glycol mixture, since after washing it may still contain water (freezing hazard).

Use the following table as a reference:

Concentration %	Temperature °C
10	-5
20	-8
30	-16
40	-22
50	-32

Unless strictly necessary, it is recommended not to mix the protective liquid at a concentration > 50% (protection to -32°C).

When the system has been completed, make sure that the water pipes have been isolated correctly.

Do not fill the system in conditions with strong insolation and with the manifolds at high temperatures.

Make sure that all air bubbles have been completely eliminated.

2 INSTRUCTIONS FOR USE AND MAINTENANCE.

2.1 CLEANING AND MAINTENANCE.

The system can develop high temperatures during the hours of irradiation, especially if there is no DHW withdrawal, with evident heat stress. It is therefore necessary to prescribe yearly maintenance of the system, thus allowing to keep the safety features, yield and functioning that distinguish it, unaltered through time. The Immergas conventional warranty assumes that the user has periodic maintenance of his system performed by an Authorised Technical After-sales Centre.

Maintenance operations on the system performed by unspecialised staff, not supplied with the necessary safety devices, when the system is not connected to earth, are prohibited.

Attention: the Solar Systems must undergo periodic maintenance (*ref. chap. 3*).

This ensures that the optimal safety, performance and reliability characteristics of the boiler, which distinguish the Immergas natural circulation system, remain unchanged over time.

We recommend stipulating a yearly cleaning and maintenance contract with an authorised local company.

The frequency and methods of maintenance on the Immergas Solar Systems leave any control and maintenance obligations prescribed by national, regional or local provisions in force not prejudiced.

2.2 GENERAL WARNINGS.

In the event of prolonged lack of DHW withdrawal from the solar system (prolonged absence, holidays etc.) the safety valve may intervene causing dispersion of water, or that the system overheats, damaging itself.

The safety valve outlet must be connected to a draining funnel. On the contrary, if the drain valve should intervene flooding the place of installation, the solar system manufacturer cannot be held responsible for any damage/injury to objects/persons.

To prevent overheating of the collector in the event of non-use, the Solar collector must be covered.

Failure to cover or withdraw water, especially in the summer, can lead to the necessity to vent the circuit and top-up the heat carrying fluid.

At the end of its service life, the appliance must not be disposed of like normal household waste nor abandoned in the environment, but must be removed by a professionally authorised company. Contact the manufacturer for disposal instructions.

INSTALLER

USER

MAINTENANCE TECHNICIAN

3 CONTROL AND MAINTENANCE.

The system develops high temperatures during the hours of irradiation, therefore it is recommended to perform the maintenance operations in relation to this factor.

Maintenance operations on the system performed by unspecialised staff, not supplied with the necessary safety devices, when the system is not connected to earth, are prohibited.

Yearly maintenance:

- cleaning of the solar collector glass.
- Replacing the magnesium anode (as described in the next paragraph).
- Check the safety valves (solar circuit and DHW circuit).

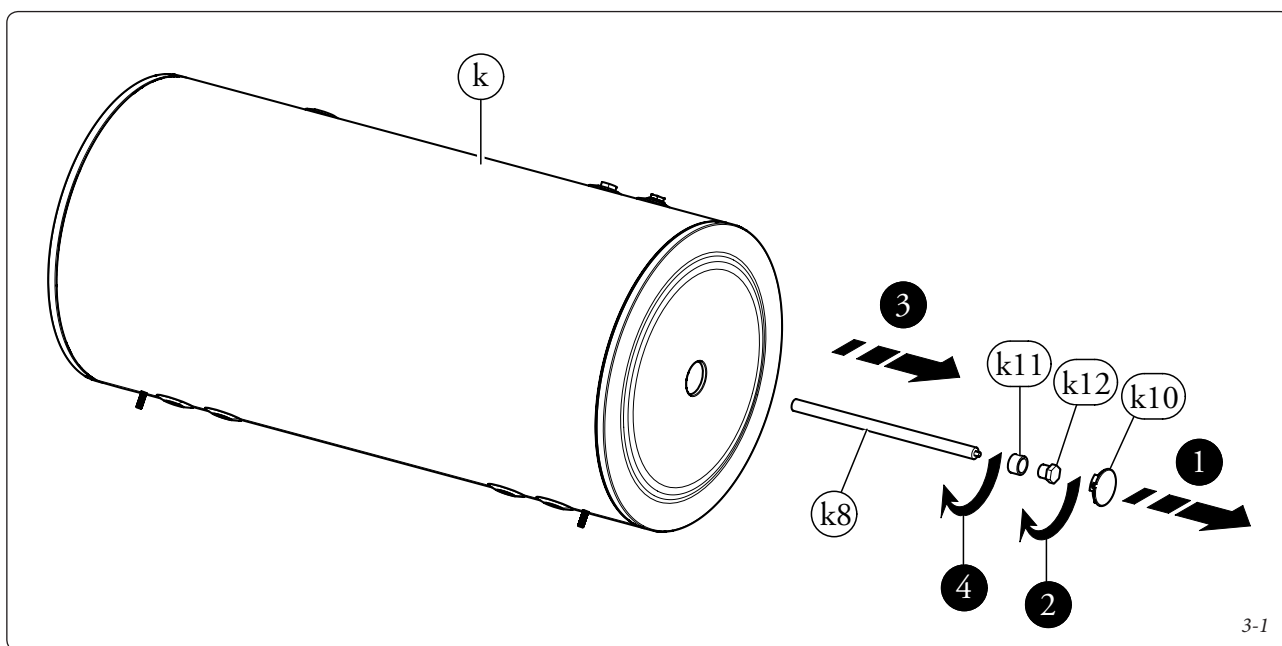
- Check sealing of the assembly elements (screws, bolts, plugs, structure elements, etc.).
- Check that the system is in good condition.
- **Vent**
Any air present in the system must be bled:
 - upon start-up (after filling)
 - if necessary, e.g. in the event of breakdown.
- **Check the heat carrying liquid**
The heat carrying liquid must be checked every 2 years for its antifreeze capacity and pH value.

Danger of burns from the liquid contained in the manifolds!

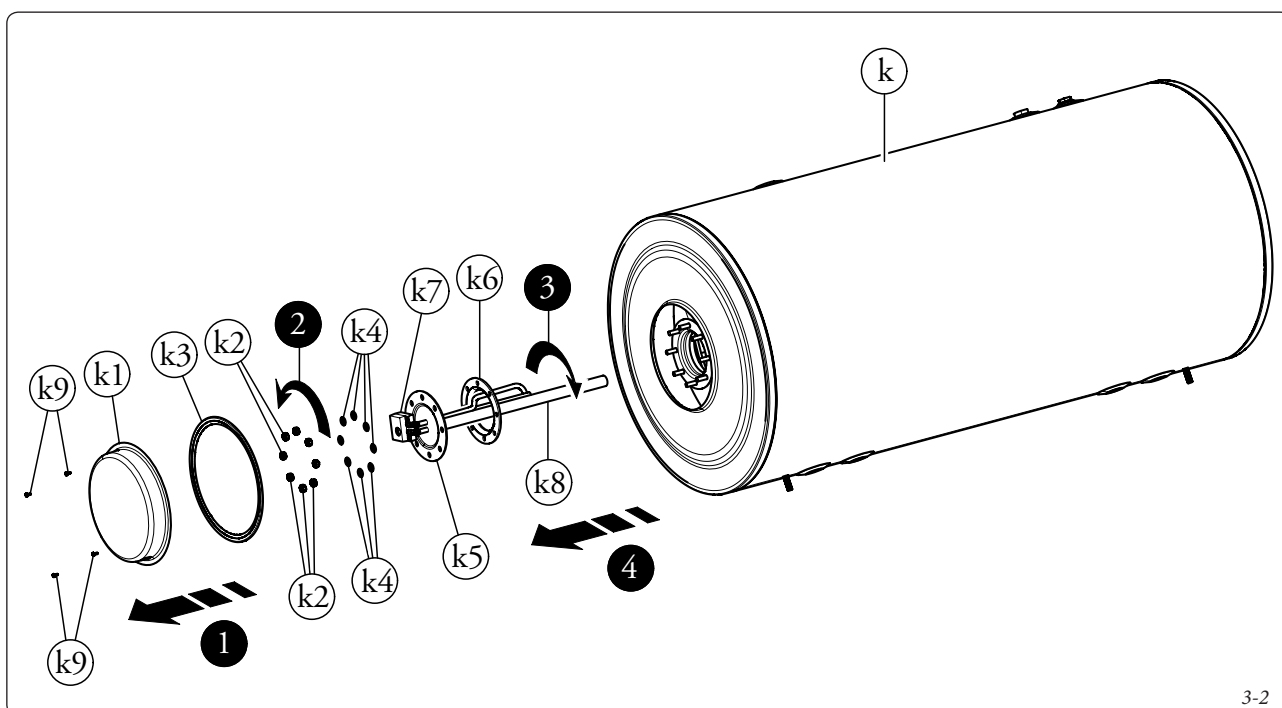
3.1 REPLACING THE ANODES.

The anodes (k 8) present in the storage tank must be replaced every year, proceeding as shown below:

Ref.	Description	Q.ty
k1	Closing plate	1
k2	Nut	8
k3	Storage tank gasket	1
k4	Washer	8
k5	Flange	1
k6	Gasket	1
k7	1.5 kw electric resistance	1
k8	Solar storage tank anode	1
k9	Screws	4
k10	Storage tank plastic cap	1
k11	Spacer	1
k12	Anode perforated cap	1



3-1



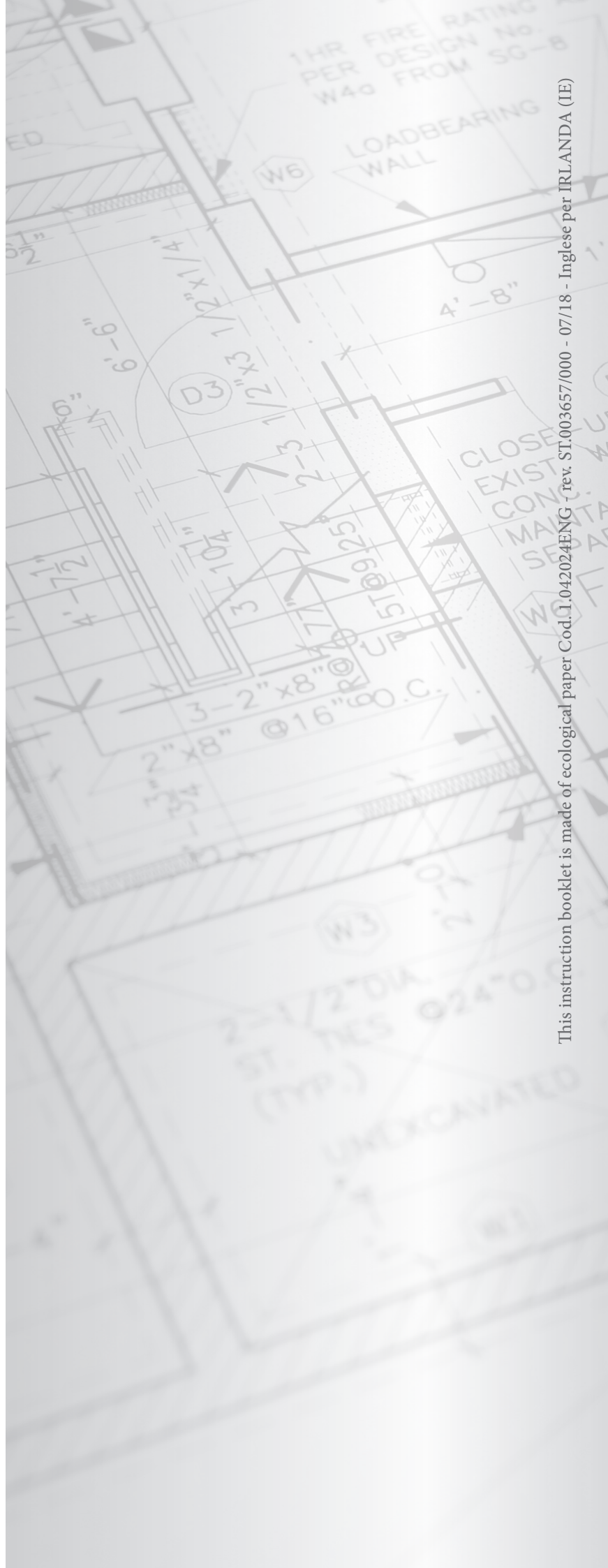
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