

MANUAL  
OWNER'S

Instruction booklet **IE**  
and warning

 **IMMERGAS**

# V2 HEATING SOLAR PANELS PACKS

\*1.041485ENG\*





### **Dear Customer,**

*Our compliments for having chosen a V2-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 its products.*

*Read the following pages carefully: you will be able to draw useful suggestions regarding the correct use of the device, the respect of which, will confirm your satisfaction for the Immergas product.*

*For any interventions or routine maintenance contact Authorised Centres: these have original spare parts and boast of specific preparation directly from the manufacturer.*

### **General recommendations**

*All Immergas products are protected with suitable transport packaging.*

*The material must be stored in dry environments protected against bad weather.*

*The instruction book is an integral and essential part of the product and must be consigned to the new user also 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 regarding installation of Immergas heating solar panels packs. As for the other issues related to installation of the said products (e.g. safety in the work site, environment protection, injury prevention), it is necessary to comply with the provisions specified in the regulations in force and principles of good practice.*

*In compliance with 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 an authorised company, which has specific technical expertise in the system sector, as required by Law.*

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

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

*The appliance must only be destined for the use for which it has been expressly declared. 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 book (or however supplied by the manufacturer), the manufacturer is excluded from any contractual and extra-contractual liability for any damages and the appliance 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 9001:2008**.

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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# 1 DEVICE INSTALLATION

## 1.1 DESCRIPTION OF THE DEVICE.

The Immergas solar solutions systems are supplied complete for its commissioning with exclusion of fixing systems (e.g. plugs etc.).

The solar collectors are certified and are in compliance with the standards Solarkeymark. They can be mounted on all roof types or directly on the ground by means of an additional appropriate structure.

The purpose of this manual is to give general indications on its installation and relative use of the complete system.

Installation must be carried out in compliance with current regulations and by qualified staff.

Installation must be carried out according to the standards, current legislation and in compliance with local technical regulations and the enabled companies.

In the event the pack is installed in damp places, one must provide an insulation system underneath it, to insulate it from the ground.

The place of installation of the appliance and relative Immergas accessories must have suitable features (technical and structural) such to allow (always in safety, efficiency and comfortable conditions):

- installation (according to the provisions of the technical legislation and technical regulations);
- maintenance operations (including scheduled, periodic, routine and special ones);
- removal (to outdoors in the place for loading and transporting the appliances and components) as well as the eventual replacement of those with appliances and/or equivalent components.

Before installing the system, ensure that it is 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.

In case of failure to use the solar system or prolonged absences, cover the collectors to prevent overheating of the system.

In the event of malfunctions, faults or incorrect operation, turn the system off immediately and cover it; it is also necessary to contact an authorised company (e.g. the Authorised Technical Assistance Centre, which has specifically trained staff and original spare parts). Do not attempt to modify or repair the appliance alone. Failure to comply with the above implies personal responsibility and invalidates the warranty.

“Anti-legionella” heat treatment of the Immergas storage tank (activated by the specific function present on the predisposed thermoregulatory systems): during this stage, the temperature of the water inside the storage tank exceeds 60°C with a relative risk of burns. Keep this domestic water treatment under control (and inform the users) to prevent unforeseeable damage to people, animals, things. If required install a thermostatic valve on the domestic hot water outlet to prevent scalding.

### • Installation regulations:

- The control of the entire framework by a statics expert, according to the Standards in force, is mostly necessary in areas with large snowfall or in areas exposed to strong winds. Therefore, all characteristics of the place of assembly must be taken into consideration (gusts of wind, vortex build-up, etc...) which can lead to an increase of loads on the structures.
- before starting the system, the solar collector must be covered to protect the absorber from over-heating and the operator from eventual burns. The system must only be filled when all hydraulic connections have been coupled correctly. It cannot be started until it is possible to eliminate the heat generated by the solar collector.
- The collector can be positioned on the basis of the conditions of the roof (flat or sloping) or in a prepared free structure. The collector cannot be positioned with the glass part facing down. This causes malfunctioning and damage.
- Pay attention not to force or put excessive

traction on the collector connection fittings in order to prevent damage to the same and the internal parts of the collector.

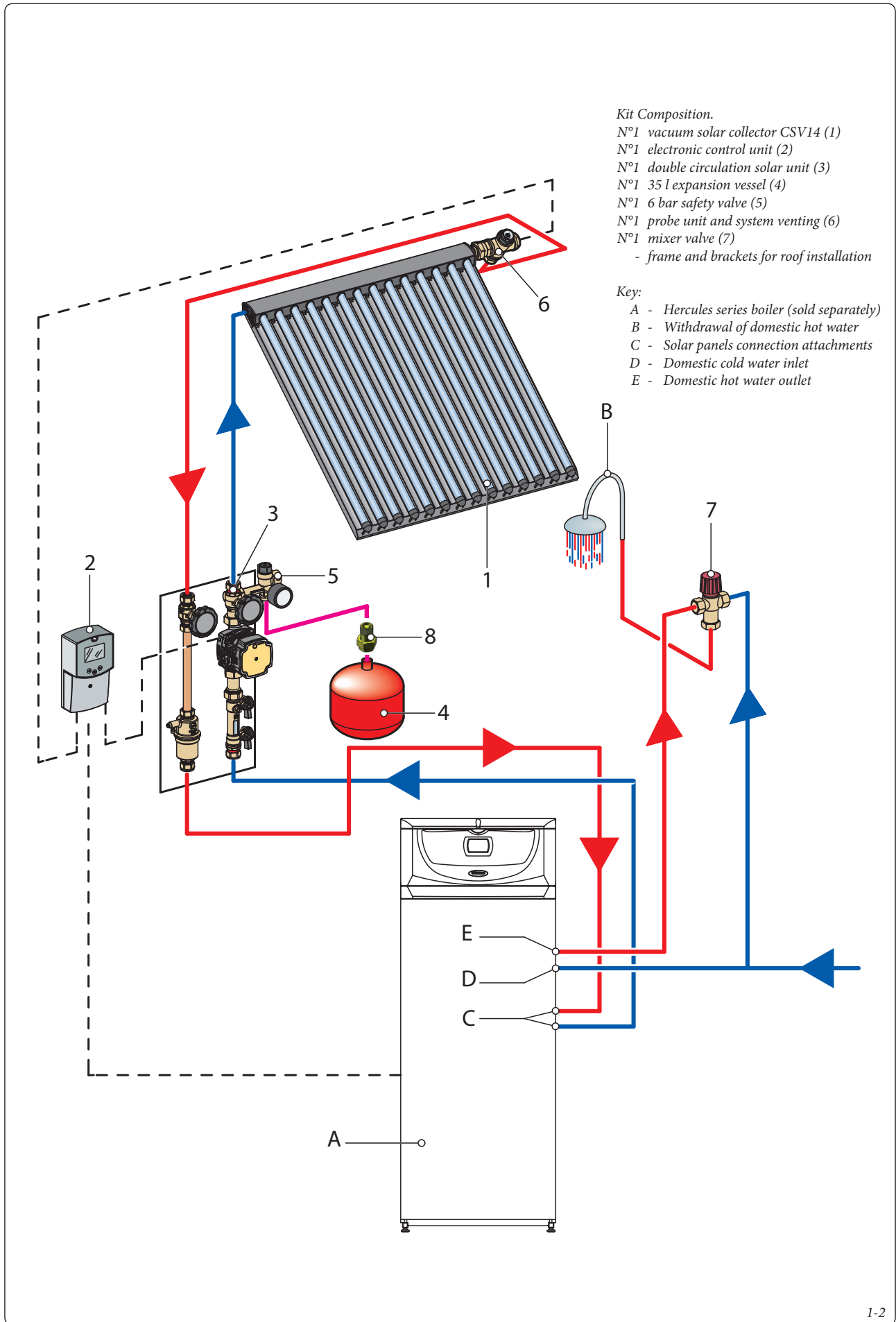
- During movement, use protective gloves and do not transport the collector holding it by the connection fittings.

### Attention:

- it is in fact obligatory to use antifreeze supplied by the manufacturer;
- when realising the hydraulic circuit (pipes, fittings, etc.), only use suitable materials that resist high temperatures and are suitable for use with solar systems.
- the use of a boiler 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 in the package.**

**N.B.:** if errors occur during installation, running and maintenance, due to the non compliance of technical laws in force, standards or instructions contained in this book (or however supplied by the manufacturer), the manufacturer is excluded from any contractual and extra-contractual liability for any damages and the warranty is invalidated.





*Kit Composition.*

- N°1 vacuum solar collector CSV14 (1)
- N°1 electronic control unit (2)
- N°1 double circulation solar unit (3)
- N°1 35 l expansion vessel (4)
- N°1 6 bar safety valve (5)
- N°1 probe unit and system venting (6)
- N°1 mixer valve (7)
- frame and brackets for roof installation

*Key:*

- A - Hercules series boiler (sold separately)
- B - Withdrawal of domestic hot water
- C - Solar panels connection attachments
- D - Domestic cold water inlet
- E - Domestic hot water outlet

**INSTALLER**

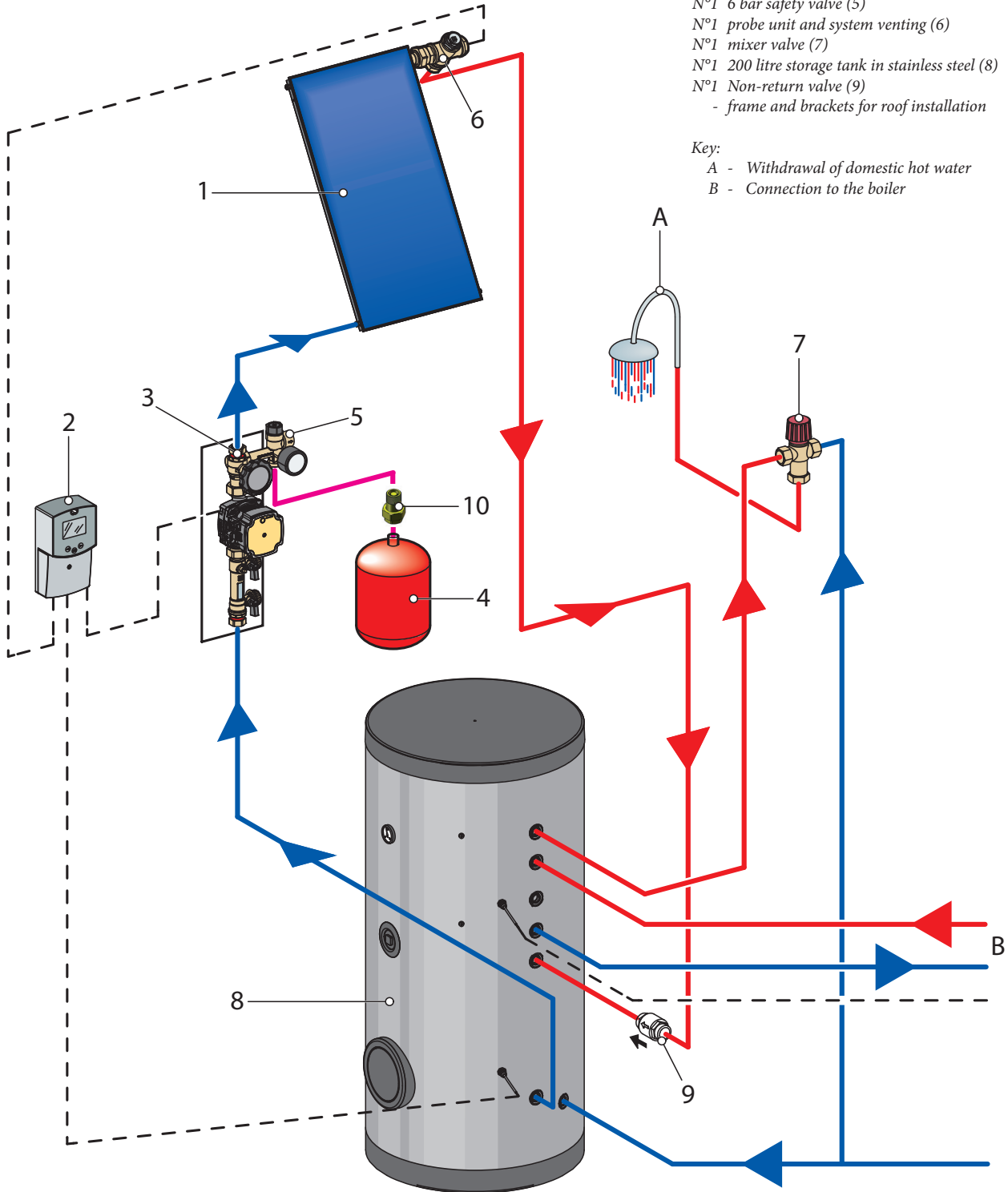
**USER**

**MAINTENANCE TECHNICIAN**

INSTALLER

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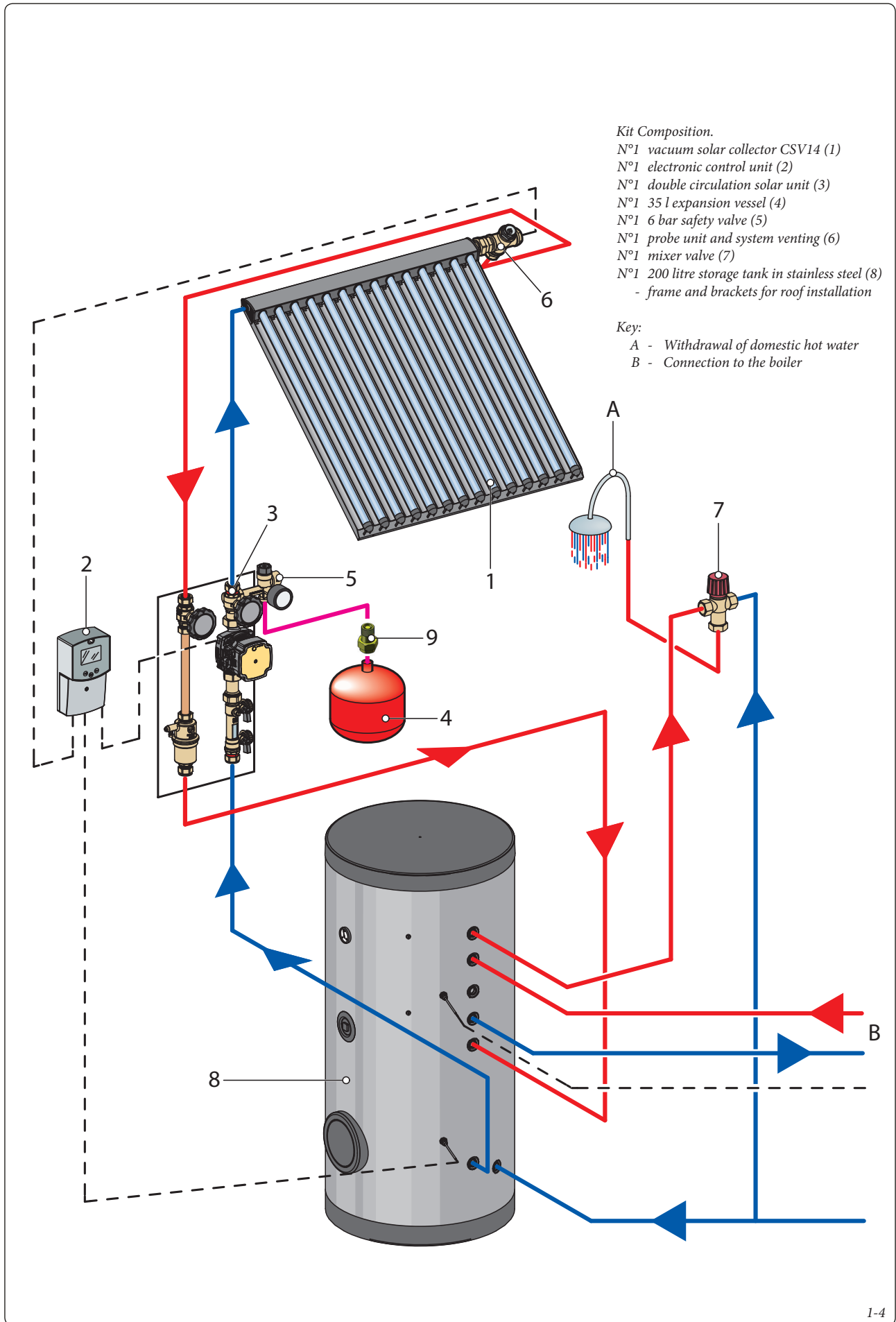
*Kit Composition.*

- N°1 flat solar collector CP4XL (1)
- N°1 electronic control unit (2)
- N°1 single circulation solar unit (3)
- N°1 18 l expansion vessel (4)
- N°1 6 bar safety valve (5)
- N°1 probe unit and system venting (6)
- N°1 mixer valve (7)
- N°1 200 litre storage tank in stainless steel (8)
- N°1 Non-return valve (9)
- frame and brackets for roof installation

*Key:*

- A - Withdrawal of domestic hot water
- B - Connection to the boiler





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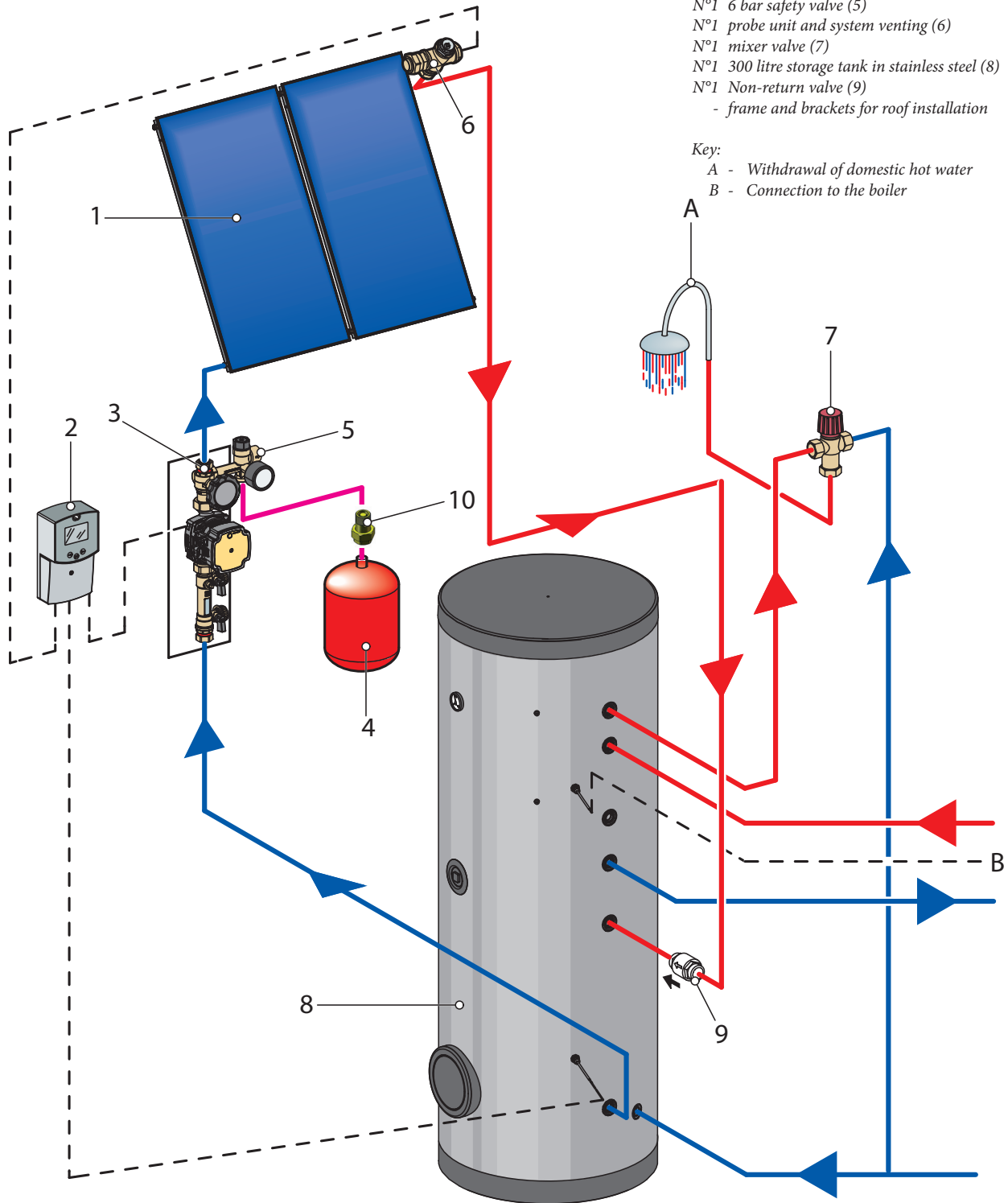
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MAINTENANCE TECHNICIAN

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*Kit Composition.*

- N°2 flat solar collectors CP4XL (1)
- N°1 electronic control unit (2)
- N°1 single circulation solar unit (3)
- N°1 18 l expansion vessel (4)
- N°1 6 bar safety valve (5)
- N°1 probe unit and system venting (6)
- N°1 mixer valve (7)
- N°1 300 litre storage tank in stainless steel (8)
- N°1 Non-return valve (9)
- frame and brackets for roof installation

*Key:*

- A - Withdrawal of domestic hot water
- B - Connection to the boiler

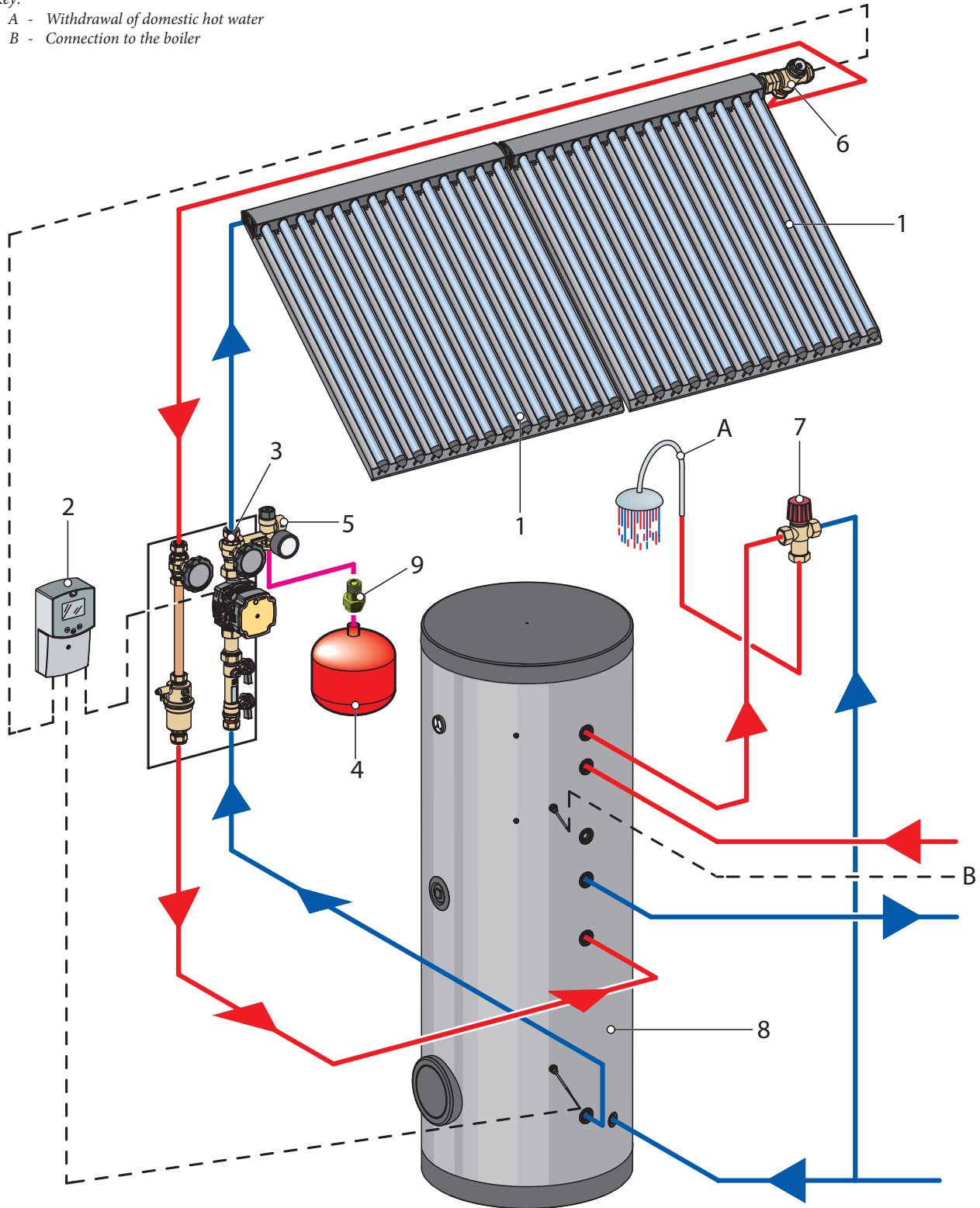
1.7 STAINLESS STEEL SOL 300 LUX V2.

*Kit Composition.*

- N°2 vacuum solar collectors CSV14 (1)
- N°1 electronic control unit (2)
- N°1 double circulation solar unit (3)
- N°1 35 l expansion vessel (4)
- N°1 6 bar safety valve (5)
- N°1 probe unit and system venting (6)
- N°1 mixer valve (7)
- N°1 300 litre storage tank in stainless steel (8)
- frame and brackets for roof installation

*Key:*

- A - Withdrawal of domestic hot water
- B - Connection to the boiler



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1.8 INOX SOL 500 V2.

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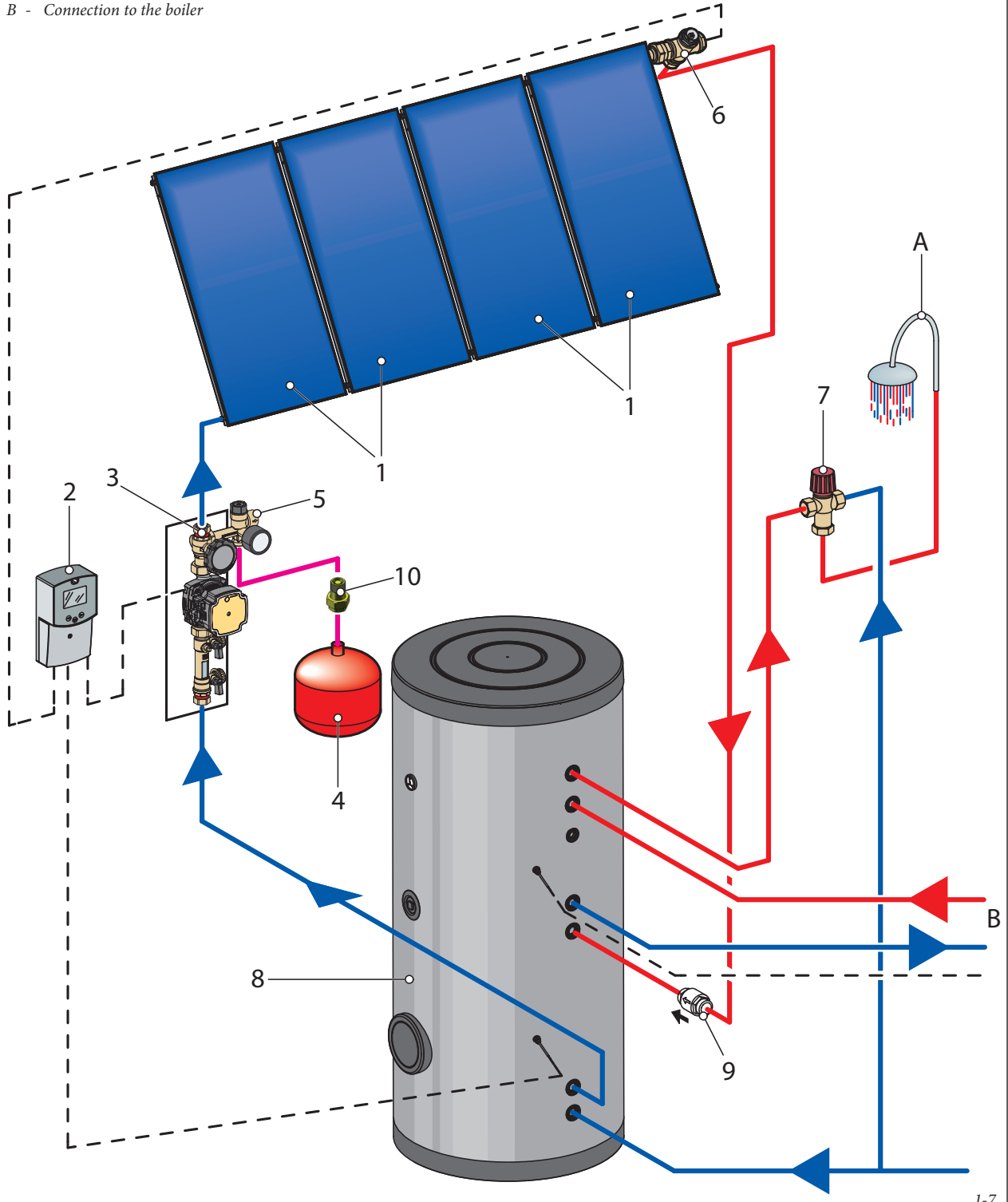
MAINTENANCE TECHNICIAN

**Kit Composition.**

- N°4 flat solar collectors CP4XL (1)
- N°1 electronic control unit (2)
- N°1 single circulation solar unit (3)
- N°1 35 l expansion vessel (4)
- N°1 6 bar safety valve (5)
- N°1 probe unit and system venting (6)
- N°1 mixer valve (7)
- N°1 500 litre storage tank in stainless steel (8)
- N°1 Non-return valve (9)
- frame and brackets for roof installation

**Key:**

- A - Withdrawal of domestic hot water
- B - Connection to the boiler



1-7

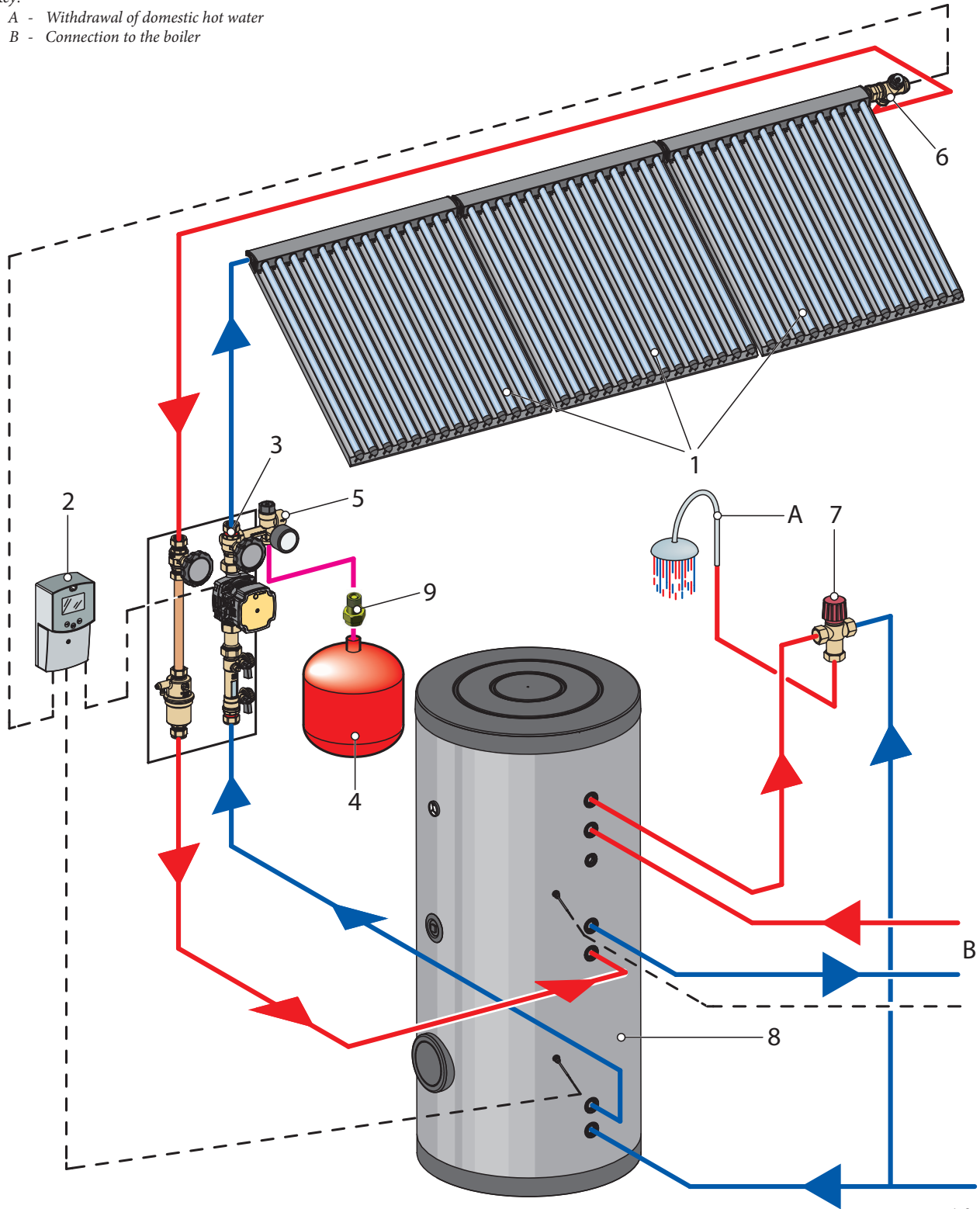
1.9 INOX SOL 500 LUX V2.

*Kit Composition.*

- N°3 vacuum solar collectors CSV14 (1)
- N°1 electronic control unit (2)
- N°1 double circulation solar unit (3)
- N°1 80 l expansion vessel (4)
- N°1 6 bar safety valve (5)
- N°1 probe unit and system venting (6)
- N°1 mixer valve (7)
- N°1 500 litre storage tank in stainless steel (8)
- frame and brackets for roof installation

*Key:*

- A - Withdrawal of domestic hot water
- B - Connection to the boiler



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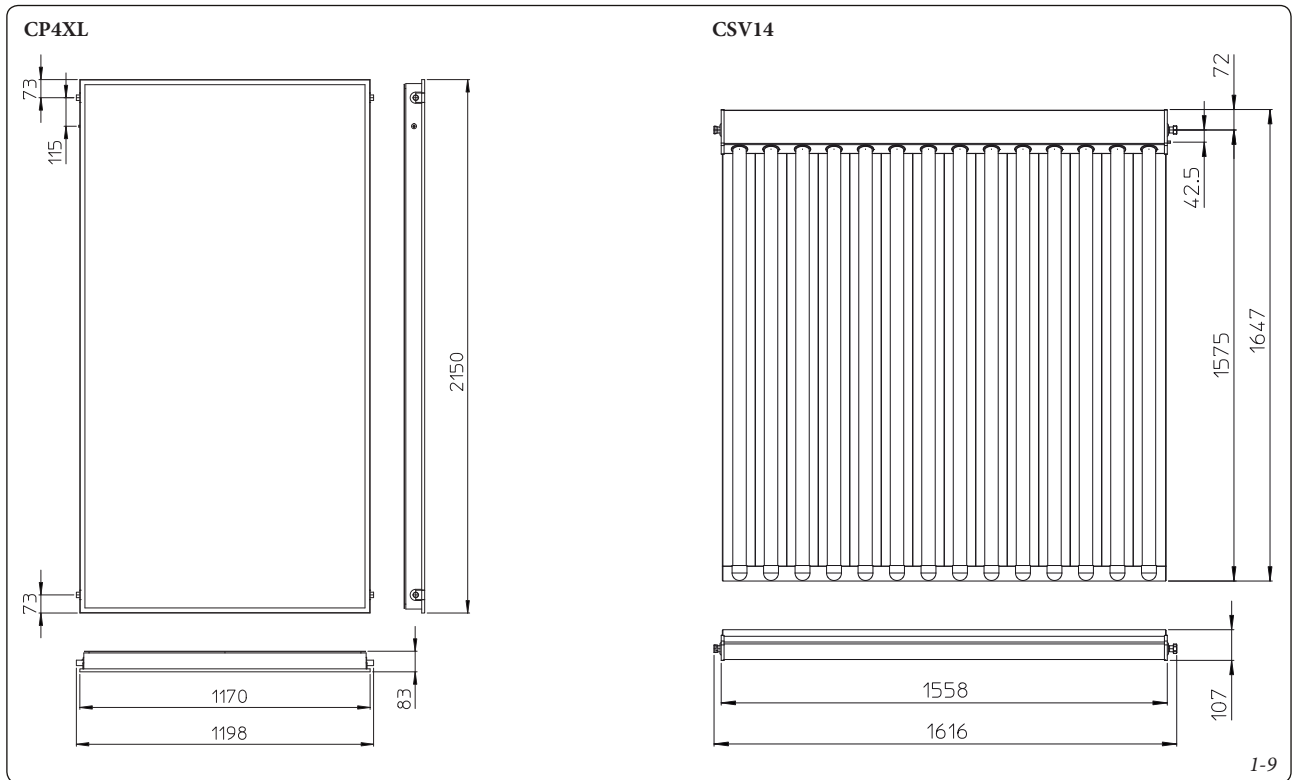
**1.10 SOLAR COLLECTORS.**

The installation of a heating solar collector requires analysis of a range of issues (installation area, positioning, inclination angle, etc.), of which depend on the performances the collector will be able to supply once started.

It is therefore important to contact an authorised company to check the various parameters installation.

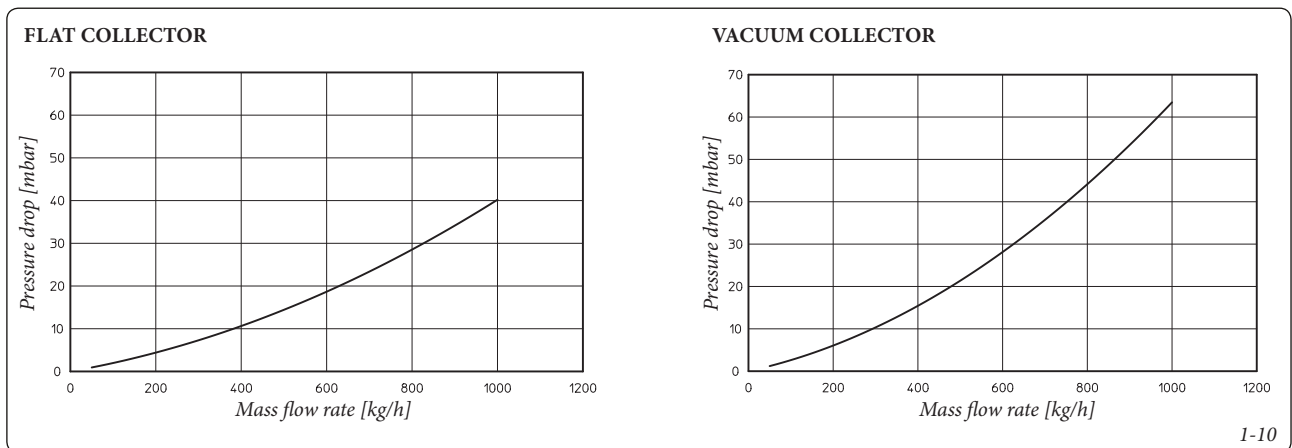
**Installation precautions:**

- Before installing the collector, proceed with an installation area check, ensure the installation of the collector can withstand atmospheric agents: wind and snow.
- The collector can be positioned based on the roofs conditions (flat or leaning) or in a predisposed adjustable structure. Under no circumstances can the collector be positioned with the collector glass facing downwards which is the cause of the malfunctions and damages.
- before starting the operating system, the solar collector must be covered to protect the absorber from overheating and the operator from scalding. The system must only be filled when the hydraulic system of the collector has been assembled and cannot be started before it has been possible to eliminate the heat generated from the solar collector.
- Be careful to not force or put the connection fittings under excessive traction to avoid damaging them and the internal parts of the collector.
- During handling use appropriate personal protective equipment (e.g. gloves etc.) and avoid transporting the collector from the connection fittings.
- Provide an appropriate earthing system connection and any lightning and surge protection systems to safeguard any electric devices. In the event these systems are already present, the Immergas solar system must be connected to the existing lightning protection system by a qualified firm, in compliance with the legislation in force, which must issue a declaration of conformity.



1-9

**HEAD LOSSES GRAPHICS.**



1-10

TECHNICAL FEATURES CP4 XL.

Name		Flat Collector
Dimensions (length x height x thickness)	mm	1198 x 2150 x 83
Weight of collector(empty)	kg	47
Attachment diameter	mm	Ø 22
Selector inside pipe diameter	mm	Ø 8
Capacity	l	1,7
Cover	--	Aluminium
Glass		Solar, toughened
Glass thickness	mm	4
Insulating material		Mineral wool
Absorber		Highly selective covering
Gross surface	m <sup>2</sup>	2.52
Solar absorption area	m <sup>2</sup>	2.31
Maximum stagnation temperature (dry)	°C	234
Optical output ratio (according to EN 12975)	η	0.759
a1 ref. Opening surface	W / m <sup>2</sup> K	3.48
a2 ref. Opening surface	W / m <sup>2</sup> K <sup>2</sup>	0.0161
K <sub>θ</sub> angle incidence 50°		0.95
Heating capacity	c <sub>eff</sub>	5.72
Maximum working pressure	bar	10
Average flow	l/min	1.25

TECHNICAL FEATURES CSV.

Name		Vacuum collector
Dimensions	mm	1616 x 1647 x 107
Weight of collector(empty)	kg	42
Attachment diameter	--	3/4"
Selector inside pipe diameter	mm	Ø 8
Capacity	l	2.30
Cover	--	Aluminium
Glass		Borosilicate
Insulating material		Vacuum chamber
Absorber		Aluminium nitrite
Gross surface	m <sup>2</sup>	2.57
Solar absorption area	m <sup>2</sup>	2.36
Maximum stagnation temperature (dry)	°C	286
Optical output ratio (according to EN 12975)	η	0.605
a1 ref. Opening surface	W / m <sup>2</sup> K	0.85
a2 ref. Opening surface	W / m <sup>2</sup> K <sup>2</sup>	0.010
K <sub>θ</sub> angle incidence 50°		θ <sub>i</sub> 50° = 0.92 θ <sub>i</sub> 50° = 1.15
Heating capacity	c <sub>eff</sub>	45.94
Maximum working pressure	bar	10
Average flow	l/min	1.25

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**1.11 CONTROL DEVICES UNIT.**

The control unit manages the solar system by controlling the solar unit pump. The various functions can be programmed via the 3 buttons (Fig. 1-11) positioned under the display.

1 Forward; 2 Reverse; 3 Set (Selection / operation mode)

The unit (A) activates the pump when a temperature difference set between the collector probe (T1) and the boiler probe (T2) (Fig. 1-12).

The installation must only be carried out in closed and dry environments. To guarantee regular operation, avoid areas with strong electromagnetic fields. The regulation control unit must be detachable from the electric network by means of an additional device in compliance with the Laws in force. During installation ensure that

the connection cable to the electric network and the probe cables remain separated.

The control unit is equipped with 3 relay to which to connect users such as pumps, valves, etc.

At the time of installation the unit is supplied pre-set for its correct use. For personalisation and installation information see the relative instructions book.

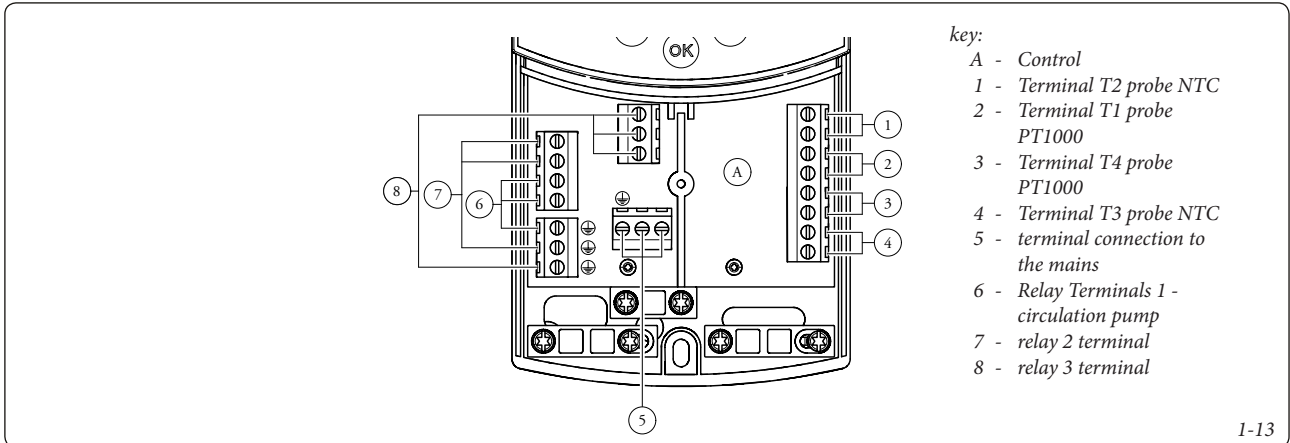
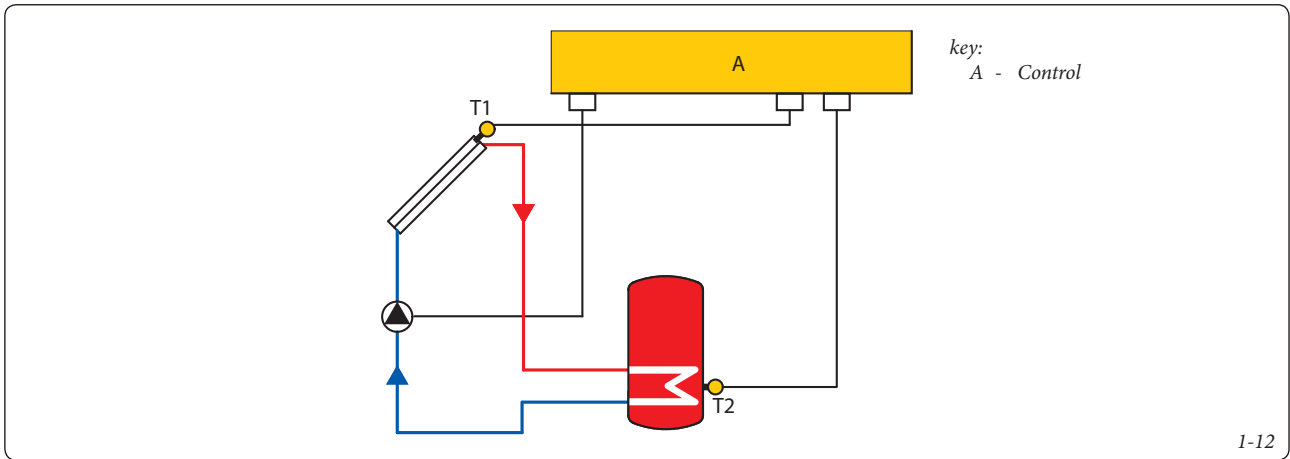
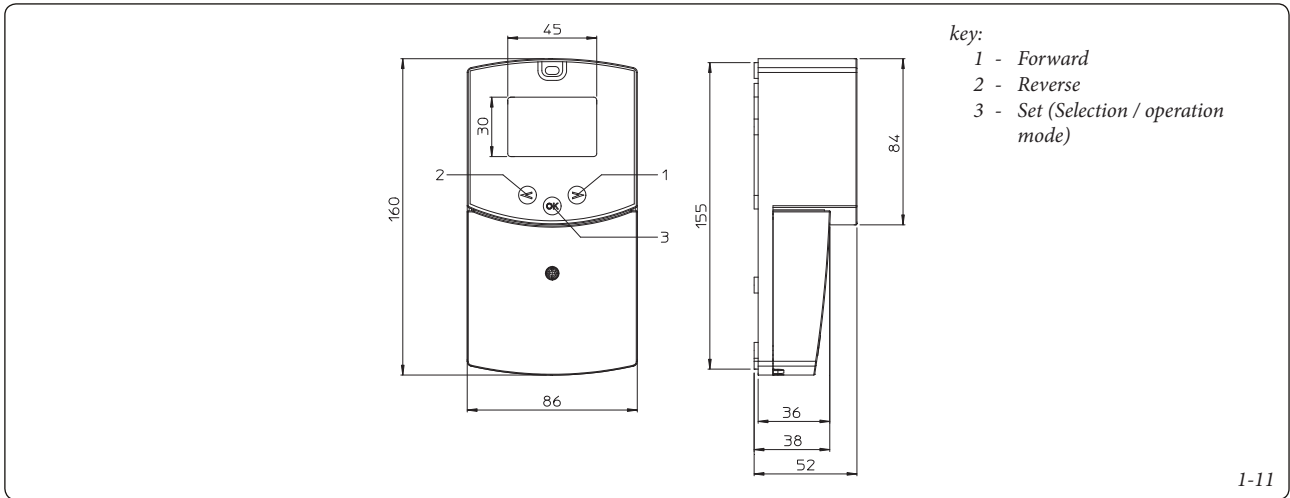
**Attention:** the probes supplied are used in accordance with the pre-fixed purpose:

T1 PT1000 solar probe

T2 NTC boiler probe.

**Technical data:**

Power Supply	220 ÷ 240 V AC
Stand-by	3,5 W
Inputs	2 temperature probes (pt 1000) 2 NTC 10 k probes
Outputs	3 relay
Room temp.	0 ÷ 40 °C
Protection type	IP 20 / DIN40050
Fuse	T 4 A





### 1.12 CIRCULATION UNIT.

The pump unit allows to connect the storage tank to the solar collector, making the water circulate according to the request of the control unit.

Two types of circulation units are present, single coupled flat collectors (CP4XL) and double coupled vacuum collectors (CSV14).

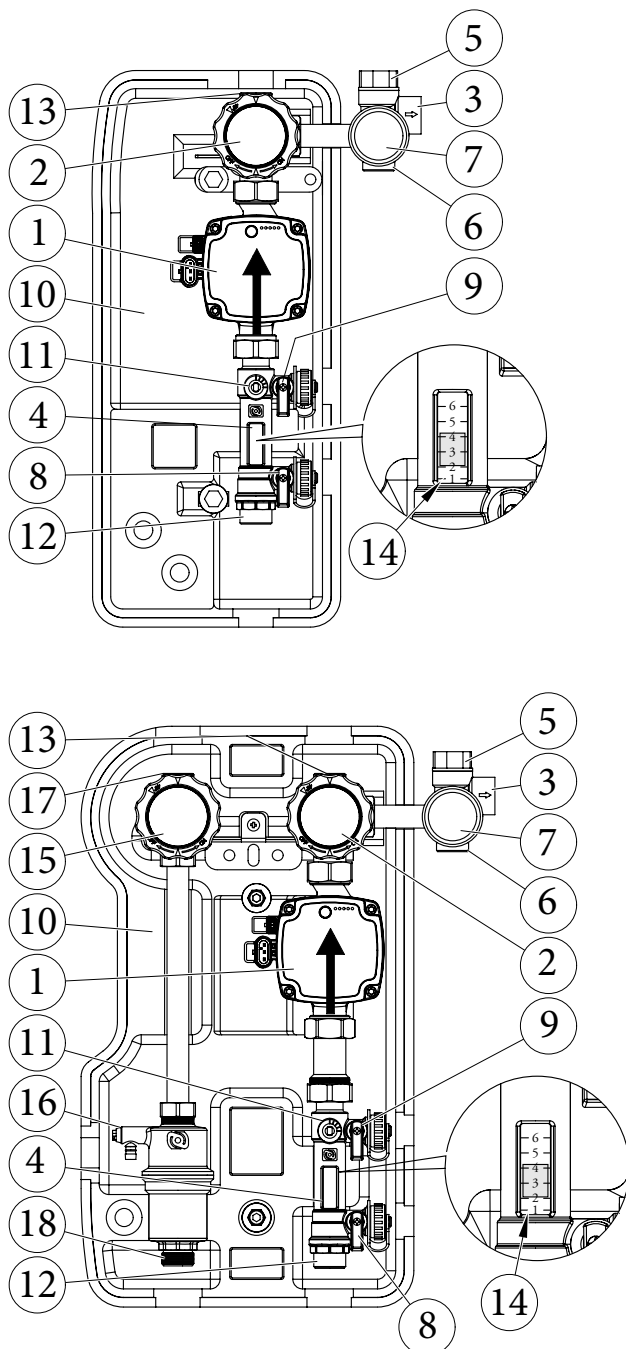
### Technical data:

Continuous functioning temp.	130°C
Short term ignition temp.	150°C
Safety valve pressure	6 bar
Pump consumption	36 W
Max. pump head	6,5 m
Max. pump capacity	1,8 m <sup>3</sup>
Regulator control range flow rate	1-6 l/min
EEL	≤ 0,20 - Part 3

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### Key:

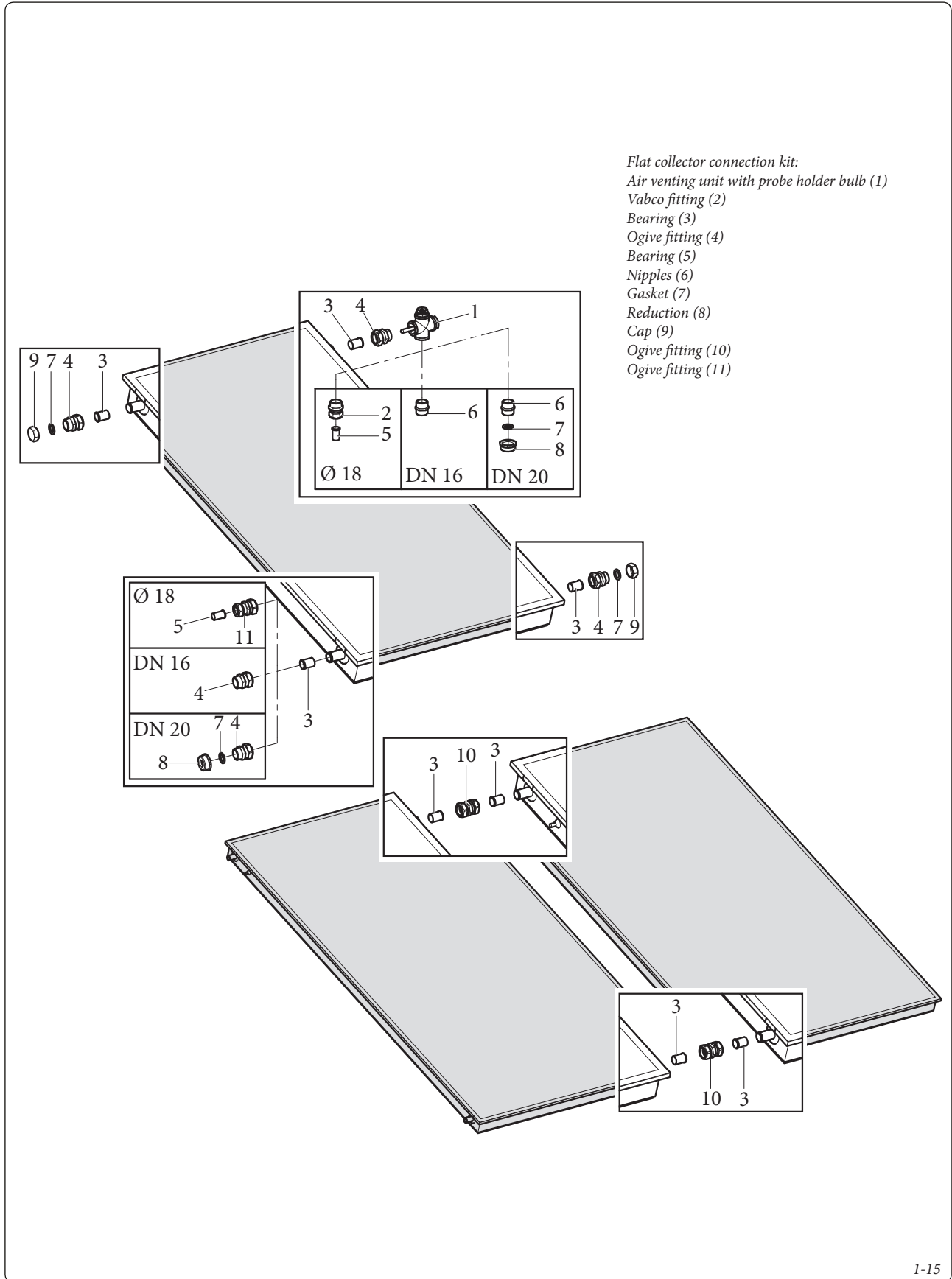
- 1 - Solar pump
- 2 - Non-return valve, thermometer and cock
- 3 - Valve drain fitting
- 4 - Flow meter
- 5 - 6 bar safety valve
- 6 - 3/4" connection for expansion vessel
- 7 - Manometer
- 8 - Draining valve
- 9 - Filling valve
- 10 - Insulating casing
- 11 - Flow rate regulator
- 12 - Boiler inlet
- 13 - Solar collector towards output
- 14 - Reference for flow rate reading
- 15 - Non-return valve, thermometer and cock
- 16 - Degasser
- 17 - Solar collector inlet
- 18 - Boiler towards output

**1.13 HYDRAULIC CONNECTION  
CP4XL FLAT COLLECTORS.**

The collectors installation must be carried out using the complete kits supplied by Immergas. The following can be connected to maximum six collectors in series, using the connection kits additional collectors.

**N.B.:** when mounting the fittings, including the air vent valve, apply teflon or other material with similar characteristics.

**N.B.:** before nearing the two solar collectors, insert both bushes (3) in the connection pipe and mount at least one side of the fitting (10).

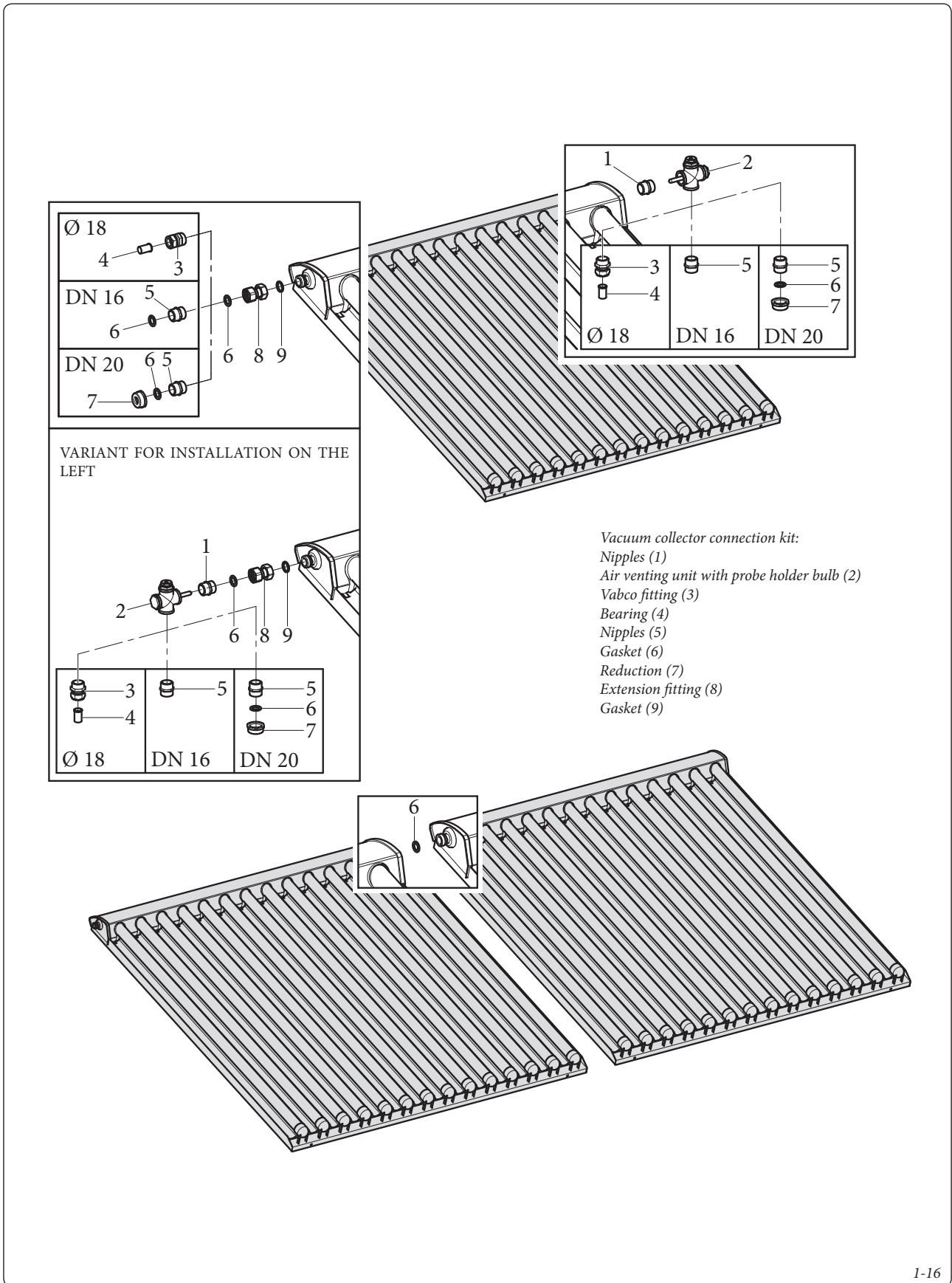


**1.14 HYDRAULIC CONNECTION  
CSV14 VACUUM COLLECTORS.**

The collectors installation must be carried out using the complete kits supplied by Immergas.

The following can be connected to maximum six collectors in series, using the connection kits additional collectors.

**N.B.:** when mounting the fittings, including the air vent valve, apply teflon or other material with similar characteristics.



INSTALLER

USER

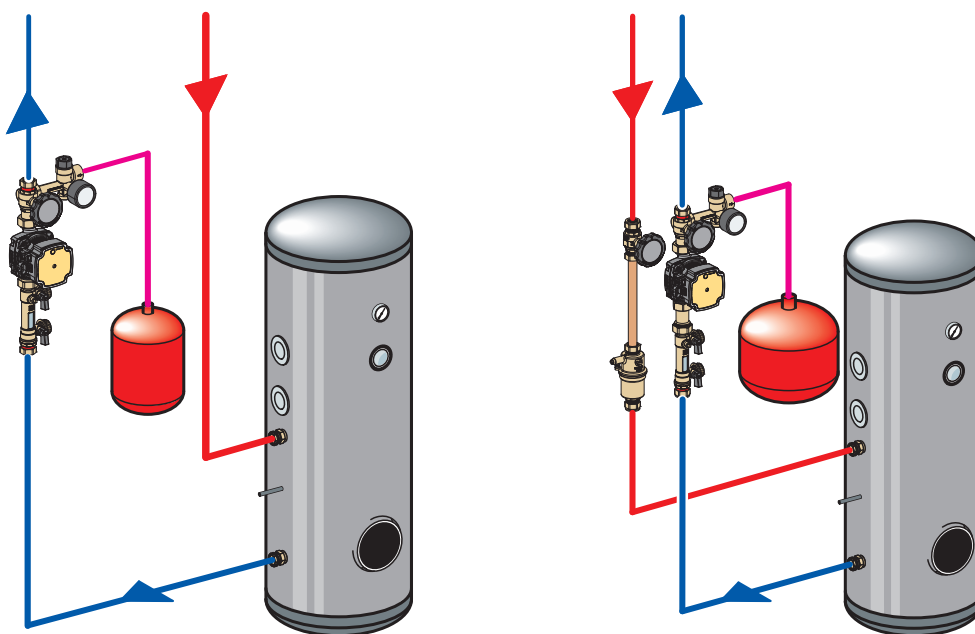
MAINTENANCE TECHNICIAN

### 1.15 CIRCULATION UNIT HYDRAULIC CONNECTION.

The device is pre-assembled before delivery. The pipes for connection must be ordered separately. To avoid any vapour entering the expansion vessel, position the expansion vessel lower than the collectors. If the vessel is positioned above the collectors height, it must be connected by means of a particular pipe to prevent the vessel from heating up (this pipe, which is not supplied by Immergas, interrupts the laminar circulation). Every time the system is emptied, it must be rinsed well with running water. The circulation unit is not designed for use in direct contact with swimming pool water.

### 1.16 ASSEMBLY INSTRUCTIONS.

- a) remove the device from the insulation casing by removing the front and rear halves.
- b) drill two holes  $\varnothing 8$  on the wall in correspondence with the holes on the supporting plate.
- c) fix the supporting plate to the wall by placing the rear half of the insulation casing.
- d) connect the circulation group fittings in accordance to the indications of the figures using the fittings kit supplied separately. If using copper pipes or pipes of limited physical resistance their terminals must be reinforced. The terminal part of the pipe must be cut perpendicular in respect to the pipe axis and cleaned.
- e) Mount the safety valve unit on the circulation unit. The safety valve outlet must be connected to a draining funnel. Otherwise, the manufacturer declines any responsibility in case of flooding if the drain valve cuts in.
- f) Connect the electric cable of the circulation unit as indicated in the respective manual of the control unit, positioning it at the centre of the device.
- g) Cover the circulation unit with the front case previously removed.



### 1.17 COMMISSIONING. PRELIMINARY CHECKS.

Before filling the hydraulic circuit and starting the system, carry out the following checks:

- ensure that the declaration of conformity of installation is supplied with the appliance;
- check the presence of the safety devices and their functionality, particularly:
  - safety valve (6 bar)
  - expansion vessel
  - thermostatic mixing valve
- check that there are no leaks in the hydraulic circuit;
- check that there is an air vent valve positioned in the highest point of the circuit above the collector and that it is operational.

- check connection of the unit to a network of 230V-50Hz, correct L-N polarity and the earthing connection;

If any checks/inspection give negative results, do not start the system.

### 1.18 EXPANSION VESSEL PRE-CHARGE.

To compensate the high temperatures that can be reached by the liquid in the circuit and therefore its dilation, an expansion vessel has been envisioned that has sufficient capacity to perform this task.

- Kit 1 or 2 flat collectors CP4XL: 18 litre expansion vessel
- Kit 4 flat collectors CP4XL: 35 litre expansion vessel
- Kit 1 or 2 vacuum collectors CSV14: 35 litre expansion vessel
- Kit 3 vacuum collector CSV14: 80 litre expansion vessel.

The expansion vessels are supplied factory-set at 1 bar. It is therefore necessary to charge them to the pressure necessary for the circuit.

The expansion vessel must be charged to:

**2 bar + 0.1 bar for every metre of the water column.**

“metre of the water column” means the vertical distance that is present between the expansion vessel and the solar collector.

Example:

The circulation unit is found on the ground floor and the solar collector is found on the roof at a hypothetical height of 6 m, the distance to be calculated is:

$$6 \text{ m} \times 0.1 \text{ bar} = 0.6 \text{ bar}$$

therefore the expansion vessel must be charged to:

$$2 + 0.6 = 2.6 \text{ bar}$$

### 1.19 SAFETY VALVE.

There is a safety valve present on the circulation unit that protects the system from an excessive increase in pressure. This valve intervenes by discharging the liquid contained in the circuit when the pressure reaches 6 bar.

If the safety valve intervenes and therefore part of the liquid contained in the circuit is lost, this must be re-integrated.

**N.B.:** it is advised to fit the drain valve to a container / can in order to recover the liquid contained in the solar circuit.

### 1.20 FILLING SYSTEM.

The system can only be filled when:

- the system is completely assembled;
- any working residues have been eliminated that cause obstructions and through time deteriorate the features of the glycol;
- all presence of water in the system has been eliminated, which could cause damage to the system in winter;
- the absence of leaks has been verified by checks using air;
- the storage tank unit has been filled;
- the expansion vessel has been charged according to system requirements.

The system must be filled only using the glycol supplied by Immergas via an automatic pump. The system must be filled with vent valve closed.

**N.B.:** do not dilute the “ready to use” propylene glycol supplied in the solar systems range with water.

Proceed as follows to fill the system:

- 1 connect the automatic pump flow pipe to the filling connector pipe (9 Fig. 1-14) positioned above the pump and open the filling valve.
- 2 connect the automatic pump return pipe to the input regulator pump (8 Fig. 1-14) and open the drain valve.
- 3 The flow rate regulator screw (11 Fig. 1-14) must be horizontal in order to guarantee closure of the integrated ball valve. Leave the thermometer in the (ON) reading position.
- 4 fill the pump tank with the amount of glycol necessary plus a minimum stock to be left on the bottom of the tank in order to prevent air circulating inside the circuit.
- 5 The filling phase must have minimum duration of 20 ÷ 25 minutes. This is the time needed to completely remove all air from the circuit. Every now and again open the flow rate regulator aeration screw (vertical position).
- 6 Eliminate any air in the solar circuit preferably using the so-called “pressure shot” method, which consists in raising the filling pressure of the circuit followed by a quick opening of the return valve (8 Fig. 1-14). This method allows to expel the air from the circuit.
- 7 Close the filling valve and switch the filling pump off, open the regulator screw of the flow rate regulator (notch in vertical position).
- 8 Leave the circuit pressurised. Any pressure drop indicates a leak in the system.

- 9 Set the functioning pressure in the circuit at 2 bar + 0.1 bar for every metre in the distance between the solar collector and the expansion vessel (practically, set the same pressure between expansion vessel and system).

- 10 Switch the solar pump on at a maximum speed and make it function for at least 15 minutes.

- 11 Disconnect the filling pump and close the fittings using the relevant screwing plugs.

## 2 DECOMMISSIONING

In the event of permanent shutdown of the system, contact an authorised company for the relative operations, ensuring among other things, that water supply is disconnected and the solar collector is covered.

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 qualified firm. Contact the manufacturer for disposal instructions.

### 3 CONTROLS AND MAINTENANCE

#### 3.1 MAINTENANCE.

The solar heat system must be serviced every year. This ensures that the optimal safety, performance and operation characteristics of the appliance remain unchanged through time.

#### 3.2 ANNUAL MAINTENANCE METHODS.

The following checks and maintenance should be performed at least once a year.

- Visually check for water leaks or oxidation from/on connections.
- Check visually that the safety and control devices have not been tampered with and in particular, the regulator probe, the expansion vessel and the safety valve.
- In case of hard water it is advised to carry out, at least once a year, the decalcification of the boiler.
- Check the status of the glycol present in the system.
- Carry out the cleaning of the solar collector.

INSTALLER

USER

MAINTENANCE TECHNICIAN



Follow us

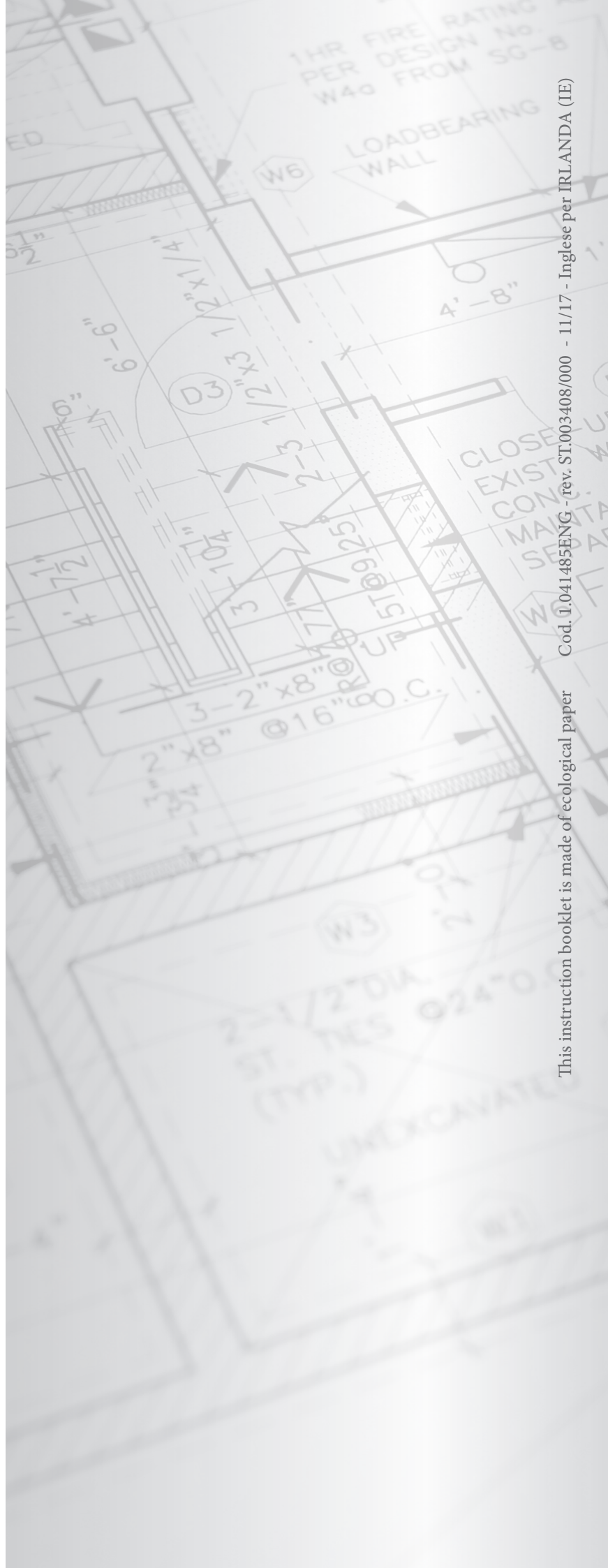
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