

RemaSol

EN

Solar hot water calorifer

200SE-2S - 300SE-2S



L000541-B



Installation and Service Manual

7607575-001-03

 **remeha**

Declaration of conformity

The device complies with the standard type described in the EG declaration of conformity. It was manufactured and commissioned in accordance with European directives.

The original of the declaration of compliance is available from the manufacturer.

**DÉCLARATION DE CONFORMITÉ CE
EG - VERKLARING VAN OVEREENSTEMMING
EC - DECLARATION OF CONFORMITY
EG - KONFORMITÄT SERKLÄRUNG**

Fabricant/Manufacturer/Hersteller/Fabrikant : Remeha B.V
Adresse/Adress/Adress : Marchantstraat 55
Ville, pays Stad, Land/City, Country/Land, Ort : NL-7332 AZ Apeldoorn

déclare ici que le produit suivant : **150SE-1S – 200SE-2S – 300SE-2S**
verklaart hiermede dat de toestel
this is to declare that the following product
erklärt hiermit daß das Produkt

Produit par : DDTH
Manufactured by : 57, rue de la Gare
Hergestellt von : F-67580 Mertzwiller
Geproduceerd door:

répond aux directives CEE suivantes:
voldoet aan de bepalingen van de onderstaande EEG-richtlijnen:
is in conformity with the following EEC-directives:
den Bestimmungen der nachfolgenden EG-Richtlinien entspricht:

CEE-Directive: 97/23 CEE (art.3, section 3)
EEG-Richtlijn: 97/23 EEG (art.3, lid 3)
EEC-Directive: 97/23 EEC (art.3, sub 3)
EG-Richtlinie: 97/23 EG (art.3, Absatz 3)

CEE-Directive: 2006/95/CEE EN 62233
EEG-Richtlijn: 2006/95/EEG EN 60335-1
EEC-Directive: 2006/95/EEC EN 60335-2-21
EG-Richtlinie: 2006/95/EWG

CEE-Directive: 2004/108/CEE EN 55014-1
EEG-Richtlijn: 2004/108/EEG EN 55014-2
EEC-Directive: 2004/108/EEC EN 61000-3-2
EG-Richtlinie: 2004/108/EWG EN 610000-3-3

Mertzwiller, le 17/06/2015


Yves LICHTENBERGER

R&D Director

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1 Introduction

1.1 Symbols used

1.1.1. Symbols used in the manual

In these instructions, various danger levels are employed to draw the user's attention to particular information. In so doing, we wish to safeguard the user's safety, obviate hazards and guarantee correct operation of the appliance.



DANGER

Risk of a dangerous situation causing serious physical injury.



WARNING

Risk of a dangerous situation causing slight physical injury.



CAUTION

Risk of material damage.



Signals important information.



Signals a referral to other instructions or other pages in the instructions.

1.1.2. Symbols used on the equipment



Before installing and commissioning the device, read carefully the instruction manuals provided.



Dispose of the used products in an appropriate recovery and recycling structure.




1.2 Abbreviations

- ▶ **CFC:** Chlorofluorocarbon
- ▶ **DHW:** Domestic hot water

1.3 General

1.3.1. Manufacturer's liability

Our products are manufactured in compliance with the requirements of the various applicable European Directives. They are therefore delivered with  marking and all relevant documentation.

In the interest of customers, we are continuously endeavouring to make improvements in product quality. All the specifications stated in this document are therefore subject to change without notice.

Our liability as the manufacturer may not be invoked in the following cases:

- ▶ Failure to abide by the instructions on using the appliance.
- ▶ Faulty or insufficient maintenance of the appliance.
- ▶ Failure to abide by the instructions on installing the appliance.

1.3.2. Installer's liability

The installer is responsible for the installation and initial start up of the appliance. The installer must respect the following instructions:

- ▶ Read and follow the instructions given in the manuals provided with the appliance.
- ▶ Carry out installation in compliance with the prevailing legislation and standards.
- ▶ Perform the initial start up and carry out any checks necessary.
- ▶ Explain the installation to the user.
- ▶ If a maintenance is necessary, warn the user of the obligation to check the appliance and maintain it in good working order.
- ▶ Give all the instruction manuals to the user.

1.4 Homologations

1.4.1. Certifications

This product complies to the requirements to the european directives and following standards:

- ▶ 2006/95/EC Low Voltage Directive.
Reference Standard: EN 60.335.1.
- ▶ 2004/108/EC Electromagnetic Compatibility Directive.
Reference Standards: EN 50.081.1, EN 50.082.1, EN 55.014

1.4.2. Directive 97/23/EC

This product conforms to the requirements of european directive 97 / 23 / EC, article 3, paragraph 3, on pressure equipment.

2 Safety instructions and recommendations

2.1 Safety instructions

**CAUTION**

Before any work, switch off the mains supply to the appliance.

**CAUTION**

In order to limit the risk of being scalded, the installation of a thermostatic mixing valve on the domestic hot water flow piping is compulsory.

2.2 Recommendations

**CAUTION**

Do not neglect to service the appliance. Service the appliance regularly to ensure that it operates correctly.

**WARNING**

Only qualified professionals are authorised to work on the appliance and the installation.

**WARNING**

- ▶ The heating water and the water-propylene-glycol mixture must not come into contact with the domestic hot water.
- ▶ The domestic hot water must not circulate through an exchanger.
- ▶ Solar installations can be protected against lightning and must be earthed or connected to an equipotential connection.

To take advantage of the guarantee, no modifications must be made to the appliance. Only remove the covers for maintenance and breakdown repair operations and put the covers back in place after the maintenance and breakdown repair operations.

Instructions stickers

The instructions and warnings affixed to the appliance must never be removed or covered and must remain legible during the entire lifespan of the appliance. Immediately replace damaged or illegible instructions and warning stickers.

**WARNING**

Never cut the power to the solar control system, even during extended absences. The control system protects the installation against overheating in summer when it is running.

**WARNING**

Do not modify the control system parameters unless fully conversant with them.

During extended absences, we recommend lowering the set point temperature in the solar DHW calorifier to 45°C. When the user is present, the set point must be set to 60°C.

3 Technical description

3.1 General description

200SE-2S - 300SE-2S domestic hot water calorifiers are connected to solar collectors by a solar station.

The calorifiers 200SE-2S - 300SE-2S are fully equipped with a solar technical station, consisting of a charge device for each zone, a safety device, an expansion vessel, a pump, a solar control system Delta Sol AEL etc.

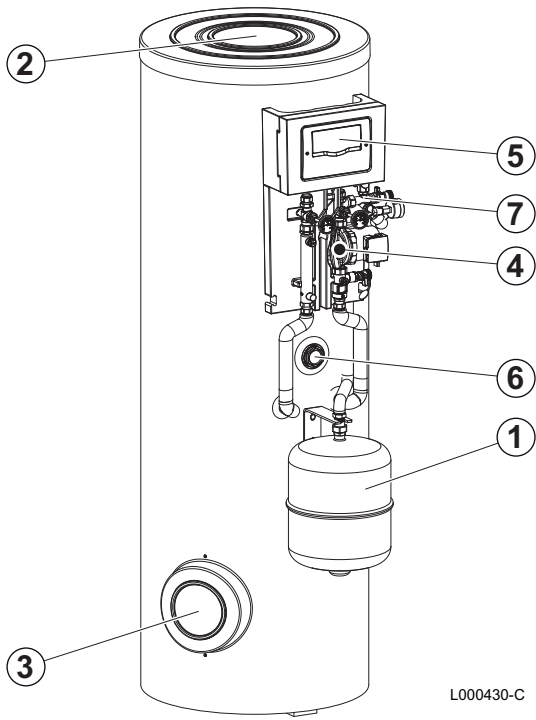
Main parts:

- ▶ The tanks are made of high quality steel lined with food quality standard enamel vitrified at 850°C, which protects the tank from corrosion.
- ▶ The heat exchangers welded into the tank are made of smooth piping, the external surface of which, in contact with the drinking water, is enamelled.
- ▶ The appliance is highly insulated with CFC-free polyurethane foam, which reduces thermal losses to a minimum.
- ▶ The external casing is made of ABS.
- ▶ The tanks are protected against corrosion by several magnesium anodes.

3.2 Main parts

3.2.1. Solar domestic hot water calorifier

200SE-2S - 300SE-2S: External view



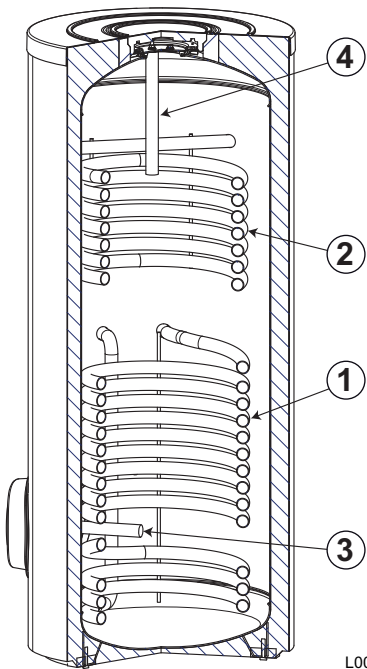
L000430-C

- ① Expansion vessel
- ② Top inspection trap
- ③ Side inspection plate
- ④ Solar station
- ⑤ Solar regulator
- ⑥ Electrical back-up (Option)
- ⑦ Safety control unit for the solar circuit



All components are checked for leaks and tested in the factory. The control system, the pump and the electrical back-up are pre-wired.

200SE-2S - 300SE-2S: Internal view



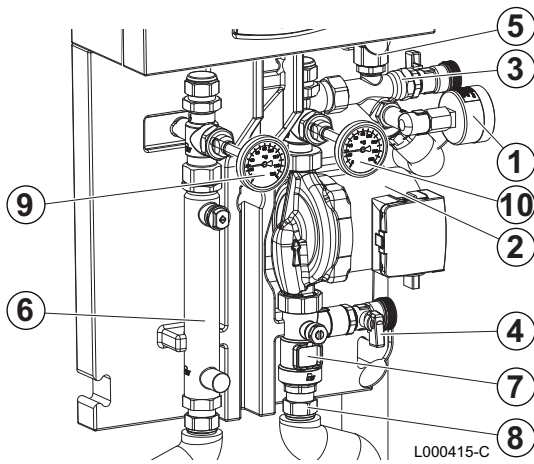
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- ① Solar exchanger
- ② Back-up exchanger (Boiler or heat pump)
- ③ Anode - Side inspection plate
- ④ Anode - Top inspection trap



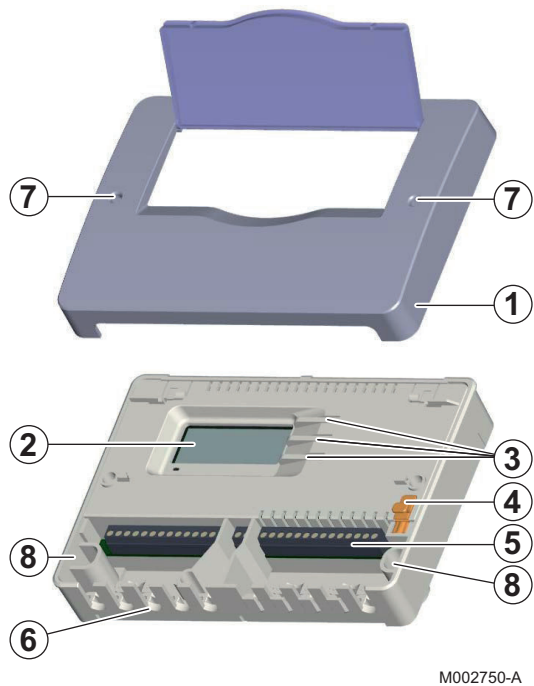
All components are checked for leaks and tested in the factory. The control system, the pump and the electrical back-up are pre-wired.

3.2.2. Solar station



- ① Pressure gauge
- ② Solar circulation pump
- ③ Filling valve
- ④ Draining valve
- ⑤ Safety valve
- ⑥ Solar circuit air vent
- ⑦ Flowmeter
- ⑧ Clamping ring fitting
- ⑨ Red flow thermometer
- ⑩ Blue flow thermometer

3.2.3. Solar regulator

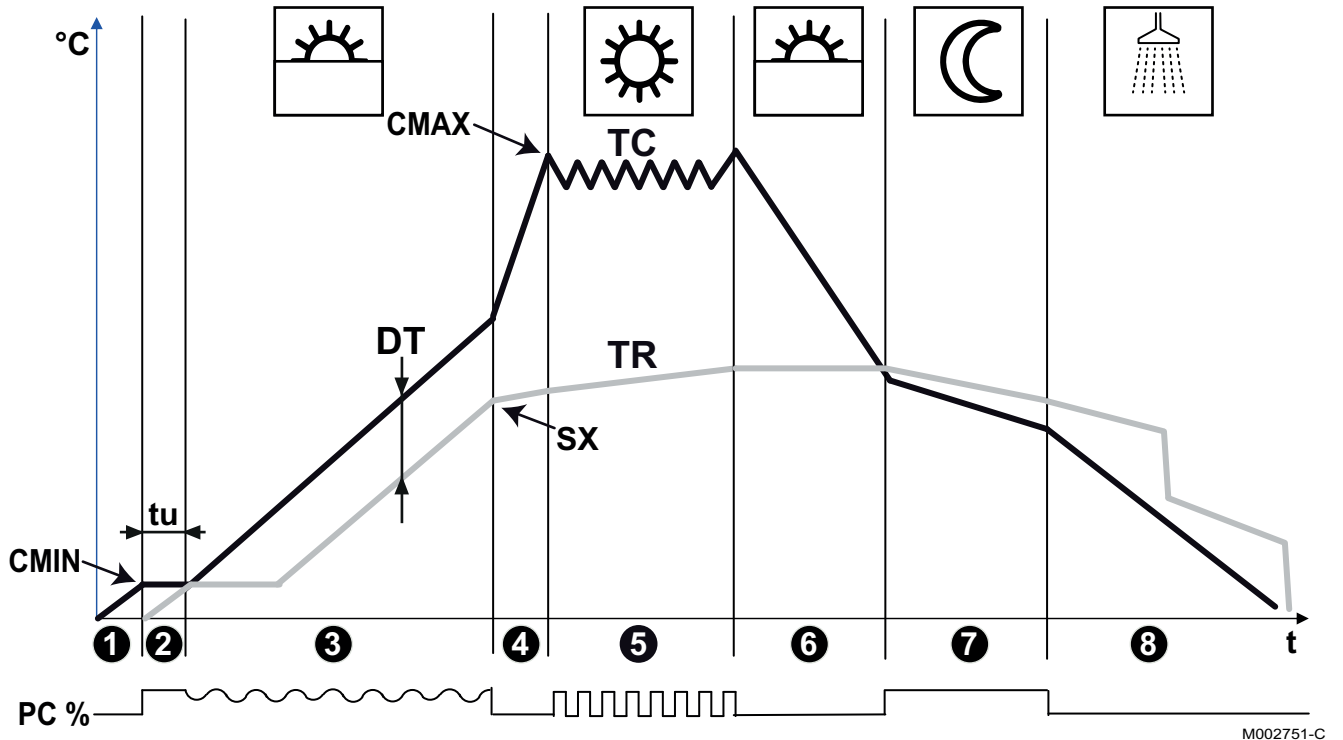


- ① Cover
- ② Alphanumeric LCD display
- ③ Control keys
- ④ Fuse 4 AT backup
- ⑤ Connectors
- ⑥ Routing the cables
- ⑦ Cover screw
- ⑧ Hole for fixation screw

3.3 Operating principle

The solar control system optimises the collection of solar energy in order to reheat the domestic hot water contained in the calorifier.

3.3.1. General principle



- TC** Temperature of the solar collectors
- TR** Temperature of the lower part of the tank
- DT** Reference temperature difference
- SX** Set temperature of the solar calorifier
- PC %** Solar circulation pump mode
- CMIN** Minimum collector temperature triggering the pump
- CMAX** Maximum temperature of the solar collector
- tu** Self-calibration time
- °C** Temperature
- t** Time

☞ See chapter: "Description of the installer parameters", page 47.

Live	Operating description
①	The sun's irradiation heats the transfer fluid in the collector. To trigger the circulation pump, a minimum temperature of 30°C is necessary in the collectors (CMIN) as is a temperature difference of 6 K between the temperature of the collectors and the DHW tank.
②	In the automatic calibration phase (setting parameter tu , factory setting 3 minutes), the solar pump (relay 1) operates on full (100%) in order to stabilise the temperature in the solar circuit.
③	Subsequently, the rate at which the solar pump operates is calculated dynamically to maintain a reference temperature difference (parameter DT , factory setting 20 K) between the collectors and the DHW tank.
④	The system loads the DHW tank according to the heat available in the collectors and stops when the set point temperature of the DHW tank is reached (setting parameter SX , factory setting 60).

Live	Operating description
⑤	When the temperature in the collectors reaches the maximum value (adjustment parameter C MAX, factory setting 110°C), the solar pump is triggered to cool the collectors. The pump continues to operate until the temperature in the collectors is lower than 5 K at parameter C MAX and/or the maximum storage temperature (80°C) is reached in the hot water storage tank.
⑥	When there is less available sunlight, the temperature in the collectors drops and the temperature in the DHW tank is stable.
⑦	As soon as the temperature in the collectors drops below the temperature in the calorifier, the calorifier is cooled down to its set temperature.
⑧	When the set point S X is reached, the circulation pump shuts down, the temperature in the collectors drops again and the temperature in the DHW tank falls according to any draw-offs made.



The DHW tank cooling function is inactive if using tubular collectors (function **FT** active).

3.3.2. Protection against overheating on the solar circuit

The control system has various functions, which are easy to discern for the user, which limit overheating of the installation's components.

3.4 Technical specifications

3.4.1. Solar domestic hot water calorifier

		200SE-2S	300SE-2S
Primary circuit: Solar exchanger			
Maximum operating temperature	°C	110	110
Maximum operating pressure	bar (MPa)	10	10
Exchanger capacity	litres	5.6	8.1
Exchange surface	m ²	0.84	1.2
Primary circuit: Back-up exchanger			
Maximum operating temperature	°C	110	110
Maximum operating pressure	bar (MPa)	10	10
Exchanger capacity	litres	5.1	5.1
Exchange surface	m ²	0.76	0.76
Pressure drop at 2 m ³ /Time	kPa	4	4
Secondary circuit (domestic water)			
Maximum operating temperature	°C	95	95
Maximum operating pressure	bar (MPa)	10	10
Water content	litres	225	300
Top up volume	litres	75	105
Solar volume	litres	150	195
Weight			
Gross weight	kg	125	125
Net weight	kg	109	111.5
(1) Primary temperature: 80 °C - Domestic cold water inlet: 10 °C - Domestic hot water outlet: 45 °C - Primary flow rate: 2 m ³ /h			
(2) Primary temperature: 80 °C - Domestic cold water inlet: 10 °C - Domestic hot water outlet: 40 °C - Domestic hot water storage: 65 °C			
(3) Satisfies the requirements of the EN 12977-1 standard			

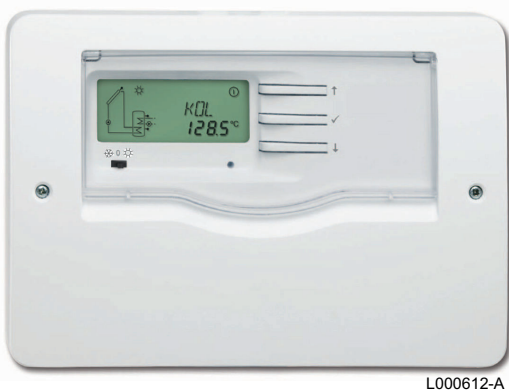
		200SE-2S	300SE-2S
Performance Primary circuit: Back-up exchanger			
Power exchanged ⁽¹⁾	kW	24	24
Performance			
Flow per hour ($\Delta T = 35\text{ }^\circ\text{C}$) ⁽¹⁾	litres per hour	590	590
Transfer capacity over 10 minutes ($\Delta T = 30\text{ }^\circ\text{C}$) ⁽²⁾	litres per 10 min.	150	200
Cooling constant Cr	Wh/24h·L·K	0.23	0.20
Maintenance consumption ($\Delta T=45\text{K}$) ⁽³⁾	kWh/24h	1.8	2.2
Performance N_L		0.7	1.2
(1) Primary temperature: 80 °C - Domestic cold water inlet: 10 °C - Domestic hot water outlet: 45 °C - Primary flow rate: 2 m ³ /h (2) Primary temperature: 80 °C - Domestic cold water inlet: 10 °C - Domestic hot water outlet: 40 °C - Domestic hot water storage: 65 °C (3) Satisfies the requirements of the EN 12977-1 standard			

3.4.2. Sensor characteristics

Temperature in °C	-10	0	10	20	30	40	50	60	70	80	90	100	110
Resistance in Ω (Pt1000)	961	1000	1039	1078	1117	1155	1194	1232	1271	1309	1347	1385	1423

3.4.3. Solar regulator

■ Specifications



L000612-A

- ▶ ABS box
- ▶ Class of protection: IP 20 / EN 60529
- ▶ Ambient temperature: 0...35°C
- ▶ Dimensions: 144x208x43 mm
- ▶ Display: Alphanumeric LCD display
- ▶ Control: via 3 keys on the front panel
- ▶ Storage temperature: -20...+70°C
- ▶ Inputs: 3 Pt1000 temperature sensors
- ▶ Output: 1 inverter contact electromechanical relay and 2 high output relays
- ▶ Max. current: 4 A - 250 V
- ▶ Power supply: 210...240 V(AC) - 50...60 Hz
- ▶ Consumption on standby: 0.7 W
- ▶ Total shutdown capacity: 4 (1) A (100...240)V
- ▶ Shutdown capacity of the electromechanical relay: 4 (1) A (100...240)V
- ▶ Shutdown capacity of the high output relays: 14 (3) A (100...240)V

■ Function

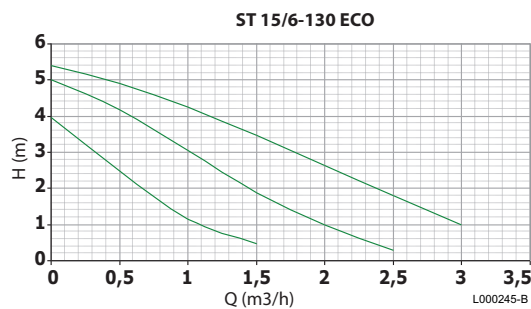
- ▶ Hour run meter on the electrical back-up.

- ▶ Hour run meter on the solar pump.
- ▶ Tubular solar collector function.
- ▶ Calorimetric balance.
- ▶ Hourly command thermostat.
- ▶ 3-position switch.

3.4.4. Solar station

Dimensions	Spacer	100 mm
	Connections for pipes	DN18 clamping ring screw connections
	Connection for expansion vessel	3/4 external thread (Sheet gasket)
	Outflow safety valve	3/4 internal thread
Operating data	Maximum admissible pressure	PN 10
	Maximum operating temperature	120 °C
	Maximum short-term temperature	160 °C < 15 mn
	Max. propylene glycol content	50%
Equipment	Safety valve	6 bar (0.6 MPa)
	Pressure gauge	0–6 bar (0.0–0.6 MPa)
	Anti-thermosiphon valve	2 x 200 mmWG
	Circulation pump	Wilo ST 15 / 6
Materials used	Valves	Brass
	Gaskets	EPDM
	Anti-thermosiphon valve	Brass

■ Circulation pump



H Manometric height

Q Water flow

4 Installation

4.1 Regulations governing installation



CAUTION

Installation of the appliance must be done by a qualified engineer in accordance with prevailing local and national regulations.



CAUTION

France: The installation must comply in all matters to the standards and rules which govern the work and interventions in individual and collective homes, and other constructions.

4.2 Package list

4.2.1. Standard delivery

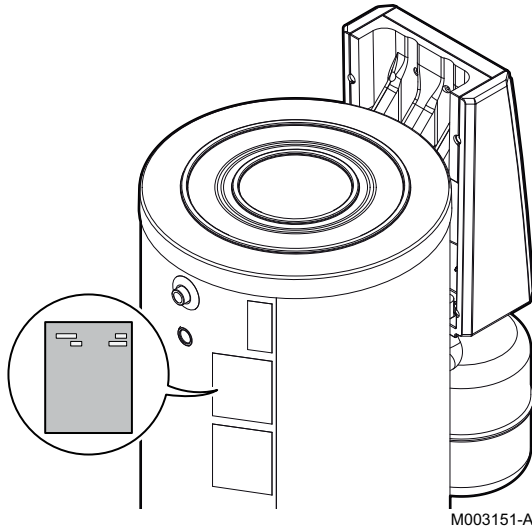
The delivery includes:

- ▶ Solar calorifier, with complete solar station, control system, etc..
- ▶ User Guide.
- ▶ Installation and Service Manual.

Description	Pack no.	Reference
200SE-2S	ER453	7606322
300SE-2S	ER454	7606323

4.3 Choice of the location

4.3.1. Type plate



The type plate must be accessible at all times.
The type plate identifies the product and provides the following information:

- ▶ DHW calorifier type
- ▶ Manufacturing date (Year - Week)
- ▶ Serial number.

4.3.2. Positioning of the appliance

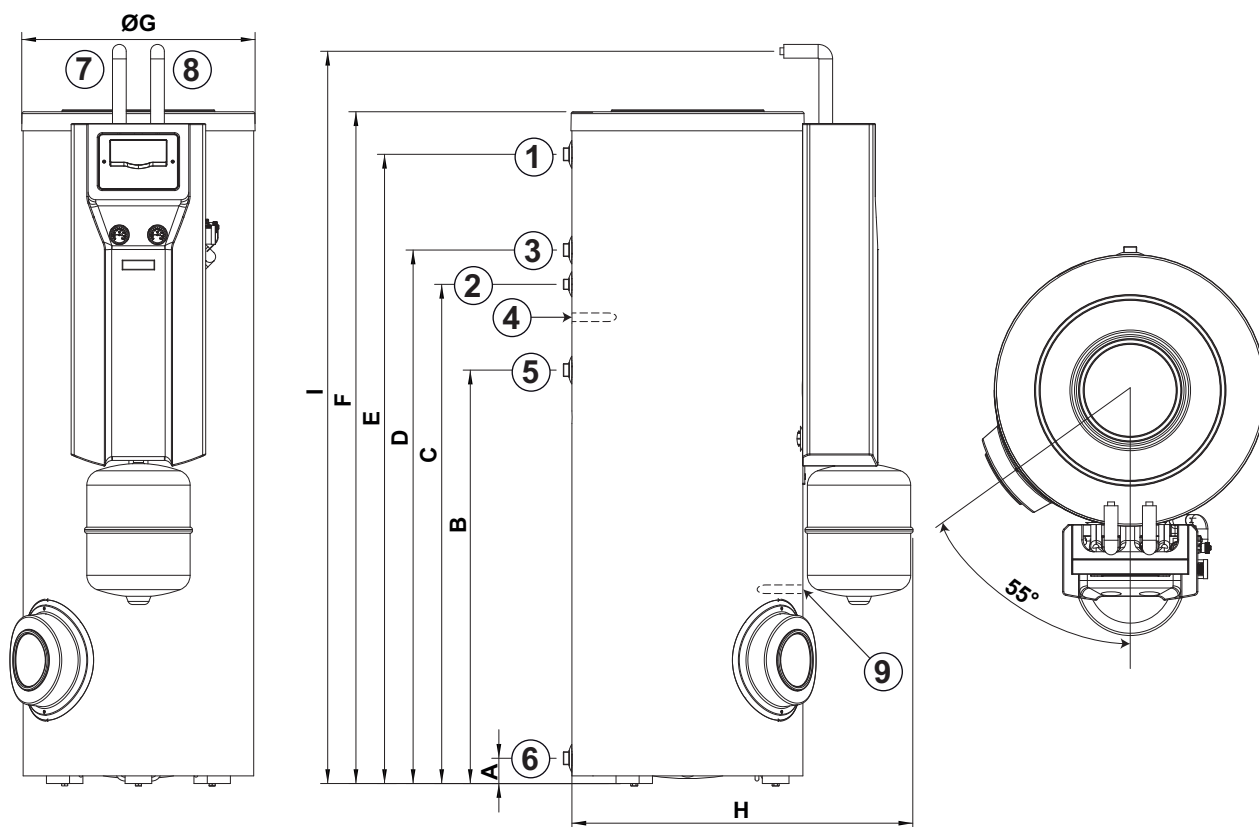


CAUTION

Put the appliance in a frost-free location.

- ▶ Place the appliance as close as possible to draw-off points in order to minimise energy losses through the pipes.
- ▶ Place the appliance on a base frame to facilitate cleaning of the premises.
- ▶ Install the appliance on a solid, stable structure able to bear its weight.

4.3.3. Main dimensions



L000601-A

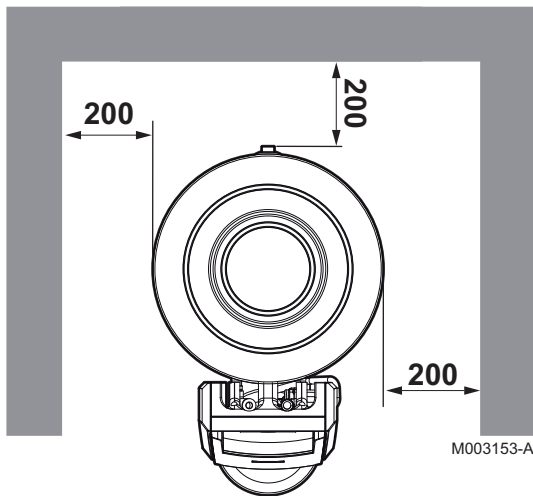
- ① Domestic hot water outlet G1"
- ② Circulation G³/₄"
- ③ Exchanger inlet G1"
- ④ Domestic hot water sensor
- ⑤ Exchanger outlet G1"
- ⑥ Domestic cold water inlet + Drain opening G1"
- ⑦ Solar exchanger inlet DN18
- ⑧ Solar exchanger outlet DN18
- ⑨ Position solar sensor

	200SE-2S	300SE-2S
A	70.5	71
B	912	1127
C	1092	1307
D	1182	1397
E	1323.5	1694
F	1422.5	1796
G (Ø)	604	604
H	892	892
I	1718	1898



G : Exterior cylindrical threading, sealed by sheet gasket

4.4 Positioning the appliance



CAUTION

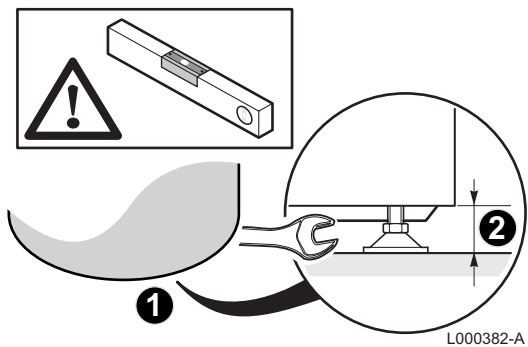
- ▶ Have 2 people available.
- ▶ Handle the appliance with gloves.

1. Remove the packaging from the DHW calorifier, leaving the calorifier on the pallet used for transport.
2. Remove the protective packaging.
3. Remove the 3 screws securing the calorifier to the pallet.
4. Lift the DHW calorifier and place it in its final position, respecting the distances shown on the diagram.

4.5 Levelling

The DHW calorifier is levelled using the 3 feet (delivered in the instructions pack) to be screwed to the bottom of the DHW calorifier.

1. Mount the 3 adjustable feet under the appliance.
2. Level the appliance using the adjustable feet.



- i**
- ▶ Adjustment range: 10 mm.
 - ▶ Use metal blocks under the feet of the calorifier if necessary.

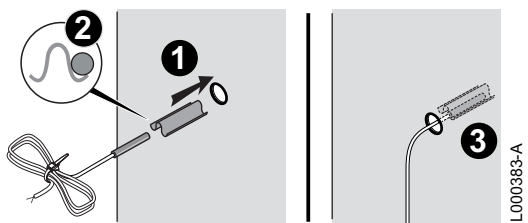
CAUTION

Do not place the blocks on the exterior sides of the domestic hot water calorifier.

4.6 Installing the temperature sensors

i The sensors are preinstalled if the calorifier is pre-fitted with a solar technical station.

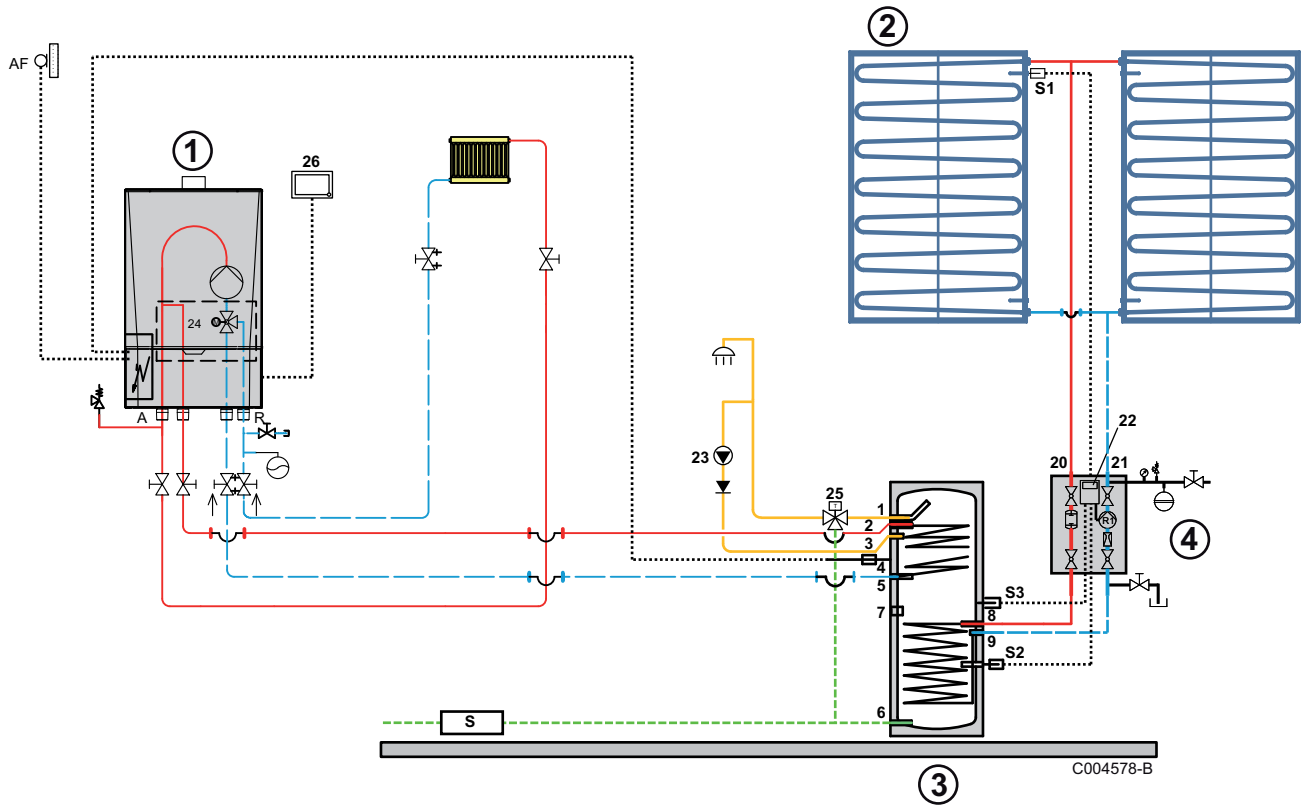
👉 See sensor location: "Main dimensions", page 18



1. Insert the sensor into the sensor tube with the help of the sensor tube separator. The sensor tube separator is provided in the instructions bag.
2. Check that the sensors are correctly positioned in the sensor tube.
3. Check the mounting of the sensor tube separator.

4.7 Hydraulic installation diagrams

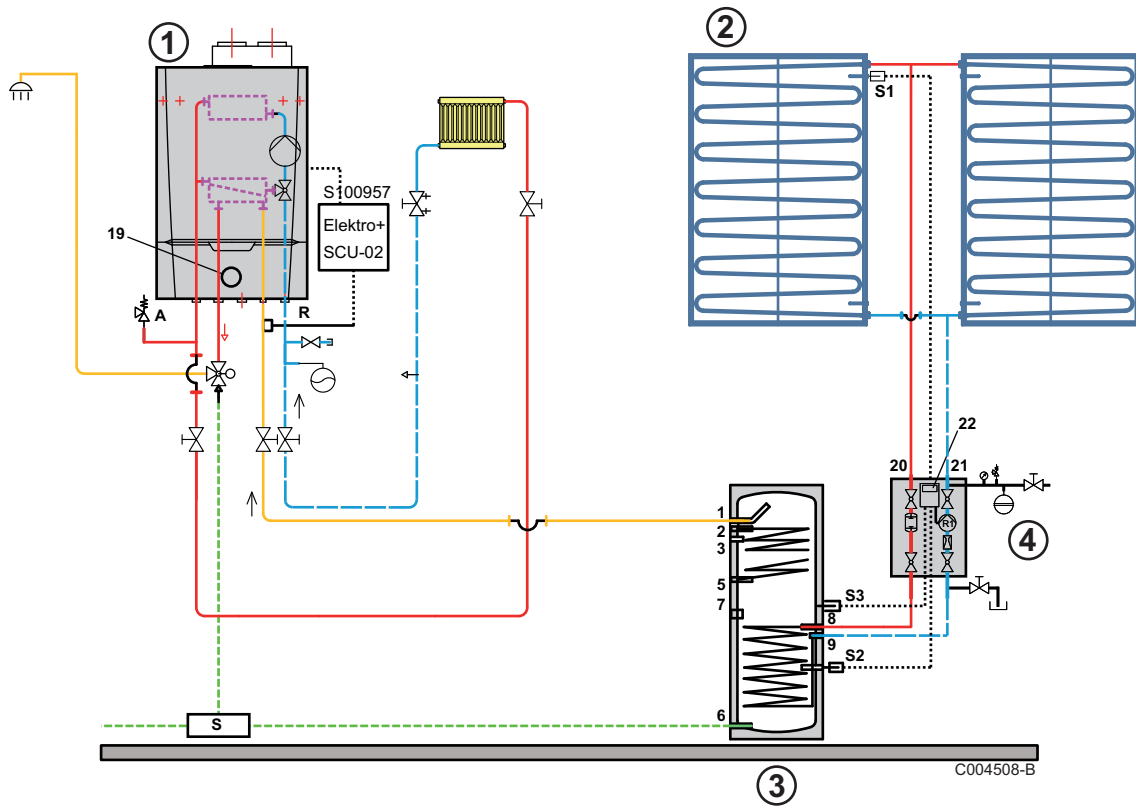
4.7.1. Boiler for heating only (Output <45 kW) + 200/300SE-2S



- ① Wall-hung gas boiler (Calenta)
- ② 2 collectors running in parallel
- ③ RemaSOL 200SE-2S
RemaSOL 300SE-2S
- ④ Solar station
- 1 Domestic hot water outlet
- 2 DHW calorifier exchanger primary inlet
- 3 Domestic hot water circulation loop return
- 4 Domestic hot water sensor
- 5 DHW calorifier heat exchanger primary outlet
- 6 Domestic cold water inlet
- 7 Integration option
- 8 DHW calorifier exchanger primary inlet
- 9 DHW calorifier heat exchanger primary outlet
- 20 Solar flow
- 21 Solar return
- 22 Solar regulator SOL AEL

- 23** D.H.W. loop back pump
- 25** Domestic hot water thermostatic mixing valve
- 26** iSense
- S** Safety unit
- S1** Solar sensor probe
- S2** Solar domestic hot water calorifier sensor
- S3** Sensor option
- AF** Optional outside sensors
- R1** Primary solar circuit pump
- A** Boiler flow (Calenta solo)
- R** Boiler return (Calenta solo)

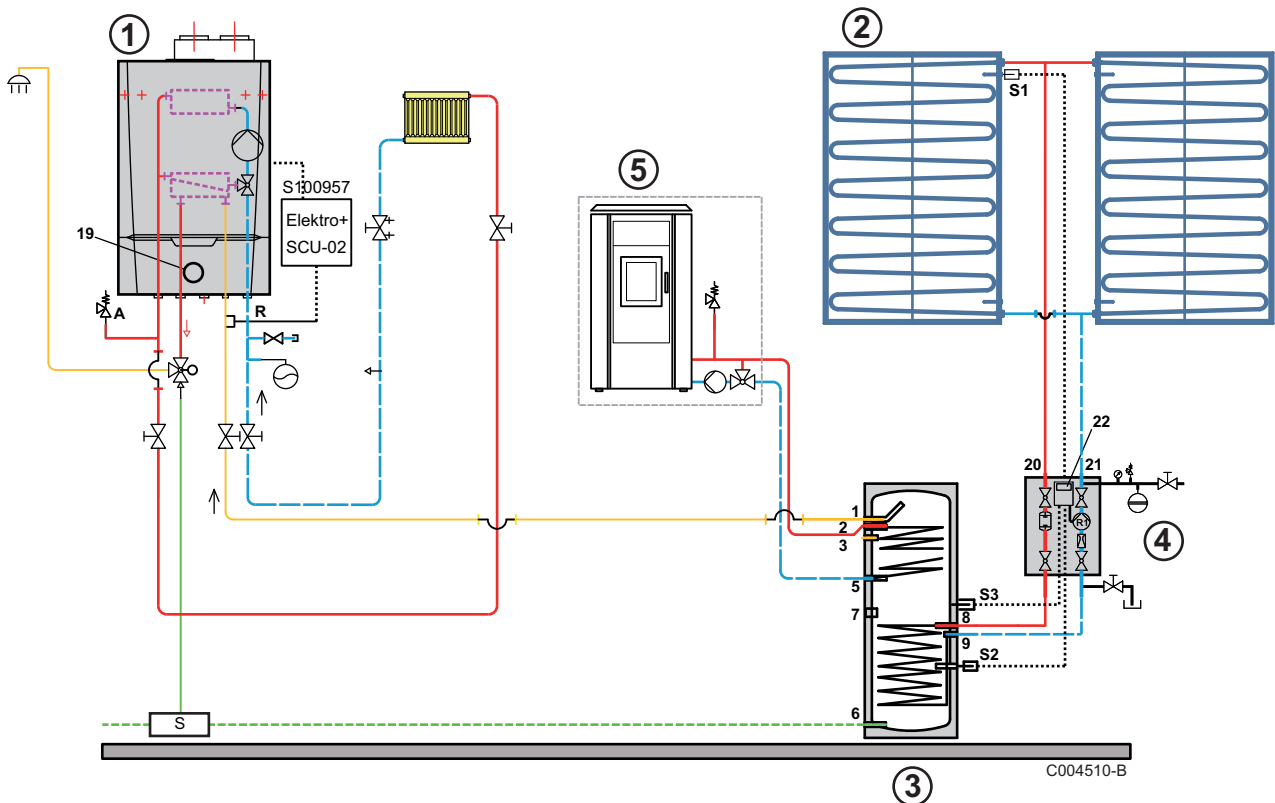
4.7.2. Combi boiler + 200/300SE-2S



- ①** Combiketel (Calenta)
- ②** 2 collectors running in parallel
- ③** RemaSOL 200SE-2S
RemaSOL 300SE-2S
- ④** Solar station
- 1** Domestic hot water outlet
- 3** Domestic hot water circulation loop return
- 5** DHW calorifier heat exchanger primary outlet
- 6** Domestic cold water inlet

- 7 Integration option
- 8 DHW calorifier exchanger primary inlet
- 9 DHW calorifier heat exchanger primary outlet
- 19 Connection kit for the solar tank
- 20 Solar flow
- 21 Solar return
- 22 Solar regulator SOL AEL
- S Safety unit
- S1 Solar sensor probe
- S2 Solar domestic hot water calorifier sensor
- S3 Sensor option
- AF Optional outside sensors
- R1 Primary solar circuit pump
- A Boiler flow (Calenta)
- R Boiler return (Calenta)

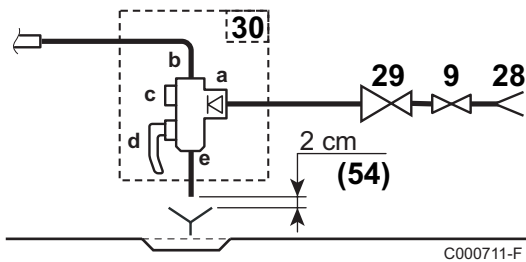
4.7.3. Combi boiler + Additional heating (Output <45 kW) + 200/300SE-2S



- ① Combi boiler (Calenta)
- ② 2 collectors running in parallel
- ③ RemaSOL 200SE-2S
RemaSOL 300SE-2S

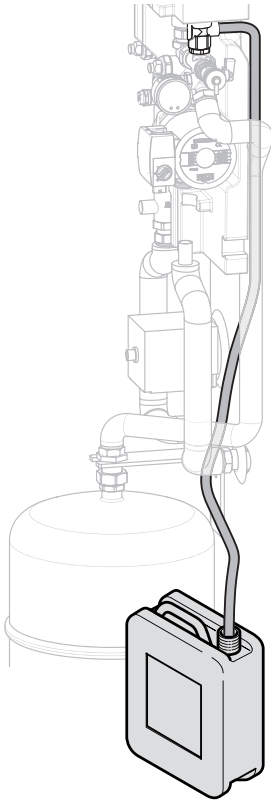
- ④ Solar station
- ⑤ Additional heat source (output <45 kW)
- 1 Domestic hot water outlet
- 2 Flow to external heat source
- 3 Circulation piping connection (optional)
- 5 Tank return to external heat source
- 6 Domestic cold water inlet
- 7 Integration option
- 8 DHW calorifier exchanger primary inlet
- 9 DHW calorifier heat exchanger primary outlet
- 19 Connection kit for the solar tank
- 20 Solar flow
- 21 Solar return
- 22 Solar regulator SOL AEL
- S Safety unit
- S1 Solar sensor probe
- S2 Solar domestic hot water calorifier sensor
- S3 Sensor option
- R1 Primary solar circuit pump
- A Boiler flow (Calenta)
- R Boiler return (Calenta)

4.8 Safety unit



- 9 Isolating valve
- 28 Domestic cold water inlet
- 29 Pressure reducer
- 30 Safety unit
- 54 End of the discharge pipe free and visible 2 to 4 cm above the flow funnel
- a Cold water inlet with an integrated non-return valve
- b Connection to the DHW calorifier cold water inlet
- c Stop cock
- d All countries except Germany:
7 bar safety valve (0.7 MPa)
Germany: 10 bar safety valve (1 MPa) maximum
- e Drain opening

4.9 Hydraulic connections



L000613-A

4.9.1. Primary solar circuit



CAUTION

When switched off, the temperature in the collectors can exceed 150 °C.



CAUTION

To protect against frost, use a water-propylene glycol mixture as the heat transporting fluid.



CAUTION

Due to the high temperatures, the use of propylene glycol and the pressure in the primary solar circuit, the primary solar water connections must be made with the utmost care, in particular with regard to insulation and watertightness.



CAUTION

The pressure in the solar circuit can rise to 6 bar (*2 MPa) maximum.



CAUTION

Protection of the environment

Place a container of sufficient volume under the drain pipe and the valve discharge pipe.




CAUTION

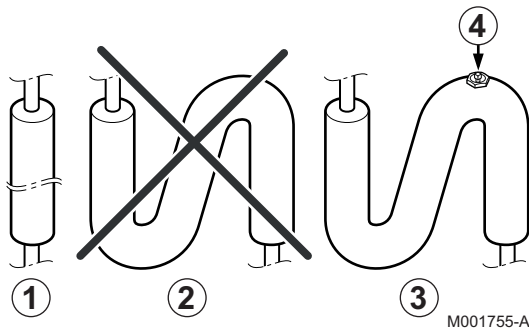
Safety valve discharge pipe

- ▶ Pipe length 2 m max.
- ▶ closing up impossible
- ▶ DN 20
- ▶ fitted with constant slope towards the drain

■ Connection dimensions

- ▶ To be able to have pipework without degassers or bleed valves at high points, the solar fluid flow rate must not fall below 0.4 m/s during the degassing procedure.
- ▶ The pipes must be as short as possible and always sloping downwards between the collectors and the connection to the solar calorifier.
- ▶ Maximum length:  See installation instructions of the solar collectors.

If the installation criteria for good degassing cannot be met, a manual bleed degasser ④ must always be installed at the high point(s) of the solar equipment.



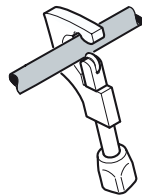
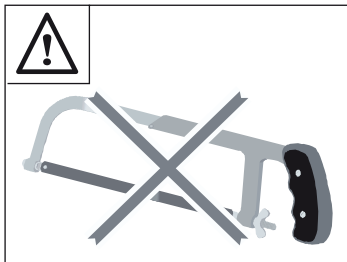
- ① Ideal
- ② Incorrect (high point with no air vent)
- ③ Correct (high point with air vent)
- ④ Location of manual bleed valve degasser

■ Connecting



CAUTION

Soft soldering is not authorized. The use of flux promotes corrosion conditions in systems operating with propylene glycol as heat transfer fluid. In all cases the inside of the pipes must be flushed.



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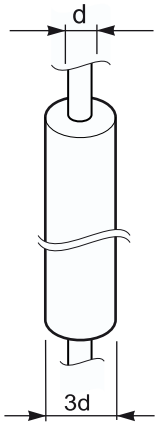
- ▶ Use of a hacksaw is prohibited.
- ▶ Pipe connections by compression fittings.
- ▶ Hard soldering: Hard soldering: hard soldering filler metal without flux in accordance with DIN EN 1044, e.g. L-Ag2P or L-CuP6.
- ▶ Pipe fittings: can only be used if they are resistant to glycol, pressure (6 bar depending on version) and temperature (-30 °C, 180 °C) (manufacturer's data).
- ▶ Sealing material: Hemp.
- ▶ Press fitting (6 bar (*2 MPa), 140 °C).

■ Pipe insulation



CAUTION

To protect the insulation against mechanical damage, bird picking and UV light, add extra protection for the heat insulation sleeves in the roof area by using an aluminium sheet sleeve or aluminium adhesive tape. This additional protection must be sealed with silicone.



M001704-A

- ▶ If different copper pipes are used, the insulation must be:
 - Resistant to constant temperatures up to 150 °C in the collector zone and the hot outlet and also down to - 30 °C.
 - Insulation preferably waterproof and continuous.
 - with a thickness equal to the tube diameter and with a K coefficient of 0.04 W/mK.



50 % reduction of the insulation is permitted when passing through the roof and walls.

- ▶ Recommended materials for temperatures up to 150 °C:
 - Armaflex HT
 - mineral wool
 - glass fibre

■ Solar expansion vessel

- ▶ The expansion vessel compensates for variations in the volume of heat transporting fluid caused by temperature variations. The total amount of heat transporting fluid in the collector is absorbed when the safety of the installation is compromised (power cut in full sunshine) and when the installation reaches its shutdown temperature. In this case, some of the heat transporting fluid is converted into gas and moves the fluid from the collector to the expansion vessel. As the collector no longer contains any heat transporting fluid, the installation is no longer at risk. If, at the end of the afternoon, for example, the temperature drops, the gas undergoes a condensation process and is converted back into heat transporting fluid.
- ▶ The pre-inflation pressure in the expansion vessel pushes the heat transporting fluid back to the collector. On start-up after installation, a degassing process, which lasts 3 min, is initiated. Any air bubbles present are picked up and evacuated by the Airstop system. The installation is once again fully operational.
- ▶ Expansion vessels are resistant to the heat transporting fluid and are selected primarily according to the number of collectors. When the number of solar collectors is high, the expansion vessels are mounted in parallel.

Content of the solar expansion vessel	
	Calculation formula
Volume of the installation (V_A) Length = 20 m diameter = 18 mm	$V_K + V_S + V_C + V_{sol}$ V _K : Volume of the solar collectors V _S : Solar exchanger volume V _C : Pipe volume V _{sol} : Solar station volume
Net volume (V_n) Tmax = 110 °C GL = 40 %	$V_v + V_e + 1.1 \times V_K$ V _v = 0.005 x V _A (minimum 3 litres) V _e = V _A x e e = Thermal expansion of the heat-exchanging medium (depends on its concentration and Tmax)
Inflation pressure of the vessel (P₀)	$(H_{st}/10) + 0.3 + P_d + p$ H _{st} : Static height of the solar installation P _d : Vaporisation pressure (depends on Tmax) p: Differential pressure across the pump (depends on its location) ⁽¹⁾
Max final pressure (P_{e max})	$0.9 \times PSV$ PSV: Calibration of the safety valve
Total expansion volume (V_{exp})	$V_n \times \epsilon$ $\epsilon = (P_{e max} - P_0) / (P_{e max} + 1)$

(1) If the expansion vessel is connected on the suction side of the pump, then p = 0, if the expansion vessel is connected on the discharge side of the pump, then p = differential pressure in bar

■ STEAMBACK® System

The expansion vessel (ADG) absorbs the increase in solar fluid volume. Remeha solar installations are equipped with the SteamBack safety system for solar heating installations. In this case, some of the solar fluid is converted into gas at a temperature of around 145°C and displaces the fluid in the collector into the expansion vessel. As the collector no longer contains solar fluid, the installation is in no danger. If, at the end of the afternoon, for example, the temperature falls below 135°C, the gas undergoes a condensation process and is converted back into solar fluid.

The pressure in the expansion vessel pushes the solar fluid back into the collector. The next time the installation is started up, a 3-minute degassing process starts: any air bubbles present are carried to the Airstop system at the bottom and bled out. The installation is once again fully operational. Thanks to the STEAMBACK safety system, Remeha solar installations are self-protecting and do not need to be drained or shut down during prolonged absences.

The STEAMBACK^R safety concept includes the construction of the collector, the expansion vessel and the safety valve, the sizing of the pipes, the solar fluid, the microbubble separator and the solar control system. Together, all of these components guarantee the problem-free operation without interventions from the After Sales Service of Remeha solar heating installations. Whether you are going on holiday, there is a power cut or another error occurs: the STEAMBACK^R safety pack is always in control of your solar heating installation. STEAMBACK^R by Remeha protects your solar installation, reduces the number of maintenance operations and prolongs its lifespan.

4.9.2. Primary heating circuit

Before connection, rinse the primary circuit to evacuate any particles that may damage certain devices (safety valve, pumps, valves, etc.).

- ▶ Hydraulically isolate the primary and secondary circuits using stop valves to facilitate maintenance operations on the unit. The valves make it possible to carry out maintenance on the calorifer and its components without draining the entire installation.
- ▶ Carry out installation in compliance with the prevailing legislation and standards.

4.9.3. Connecting the calorifer to the domestic water circuit (secondary circuit)

When making the connections, it is imperative that the standards and corresponding local directives are respected. To reduce heat losses as much as possible, insulate the pipes.

Belgium: Make the connections in accordance with Belgaqua technical instructions.

■ Specific precautions

Before making the connection, **rinse the drinking water inlet pipes** in order not to introduce metal or other particles into the appliance's tank.

■ Provision for Switzerland

Make the connections according to the instructions of the Société Suisse de l'Industrie du Gaz et des Eaux. Comply with local instructions from water distribution plants.

■ Safety valve



CAUTION

In accordance with safety rules, a safety valve calibrated to 7 bar (0.7 MPa) is mounted on the tank's domestic cold water inlet.

Germany: 10 bar safety valve (1.0 MPa) maximum.

France: We recommend NF-marked hydraulic membrane safety control units.

- ▶ Integrate the safety valve in the cold water circuit.
- ▶ Install the safety valve close to the calorifer in a place which is easy to access.

■ Size

- ▶ The diameter of the safety unit and its connection to the calorifer must be at least equal to the diameter of the domestic cold water inlet on the calorifer.
- ▶ There must be no cut-off element between the valve or the safety unit and the domestic hot water calorifer.
- ▶ The outlet pipe in the valve or safety assembly must not be blocked.

To avoid restricting the flow of water in the event of overpressure:

- ▶ The discharge pipe from the safety unit must have a continuous and sufficient gradient.
- ▶ The cross section of the discharge pipe from the safety unit must be at least equal to the cross section of the opening of the safety unit outlet.

Germany: Define the dimensions of the safety valve in accordance with the DIN 1988 standard.

Calorifer capacity (litres)	Minimum inlet connection size of the safety valve	Heating output (kW) (max)
< 200	R or Rp 1/2	75
200 to 1000	R or Rp 3/4	150

- ▶ Fit the safety valve above the calorifer to avoid draining the tank during servicing.
- ▶ Install a drainage valve at the lowest point on the calorifer.

■ Isolating valves

Hydraulically isolate the primary and secondary circuits using stop valves to facilitate maintenance operations on the unit. The valves make it possible to carry out maintenance on the calorifer and its components without draining the entire installation.

These valves are also used to isolate the calorifer unit when conducting a pressurised check on the leak tightness of the installation if the test pressure is greater than the admissible operating pressure.



CAUTION

If the mains pipes are made of copper, fit a sleeve made of steel, cast iron or any other insulating material between the tank's hot water outlet and the pipes to prevent corrosion to the connection.

■ Connecting the domestic cold water

Make the connection to the cold water supply according to the hydraulic installation diagram.

The components used for the connection to the cold water supply must comply with the prevailing standards and regulations in the country concerned.

- ▶ Install a water drain in the boiler room and a funnel-siphon for the safety unit.
- ▶ Fit a one-way valve to the domestic cold water circuit.

- ▶ In regions where the water is very hard ($T_h > 20^\circ\text{F}$), we recommend fitting a softener. Water hardness must always be between 12°F and 20°F to be capable of providing effective protection against corrosion. The softener does not bring about a derogation from our warranty provided that it is approved and set pursuant to the codes of practice and is regularly inspected and maintained.

■ Pressure reducer

If the mains pressure exceeds 80% of the calibration of the valve or safety unit (e.g. 8 bar (0.8 MPa) for a safety unit calibrated to 10 bar (1.0 MPa)), a pressure reducer must be installed upstream of the appliance. Install the pressure reducer downstream the water meter in such a way as to ensure the same pressure in all of the installation pipes.

■ Domestic hot water circulation loop

To guarantee the availability of hot water as soon as the taps are turned on, a circulation loop between the draw-off points and the recirculation pipes in the DHW calorifer can be installed. A non-return valve must be included in this loop.



Run the domestic hot water circulation loop via the boiler control system or an additional timer program to optimise energy consumption.

■ Measures to take to prevent hot water flow return

Fit a one-way valve to the domestic cold water circuit.

4.10 Electrical connections

4.10.1. Recommendations



WARNING

- ▶ Only qualified professionals may carry out electrical connections, always with the power off.
- ▶ Earth the appliance before making any electrical connections.

Make the electrical connections of the appliance according to:

- ▶ The instructions of the prevailing standards,
- ▶ The instructions on the circuit diagrams provided with the appliance,
- ▶ The recommendations in the instructions.



CAUTION

- ▶ Separate the sensor cables from the 230/400 V circuit cables.
- ▶ The installation must be fitted with a main switch.

The appliance is delivered pre-wired.

The electricity supply is connected to the mains by connection cable (~230 V, 50 Hz) and electrical plug.



The electrical plug must be accessible at all times.

4.10.2. Connecting the solar control system



DANGER

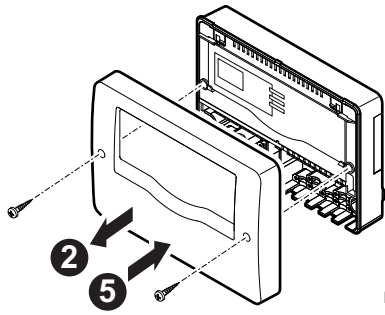
Do not expose the appliance to strong magnetic fields. Keep the electrical connection cable separate from the sensor cables.



CAUTION

It must be possible for the regulator to be isolated from the mains by a circuit breaker that provides at least a 3 mm gap between all the poles or by a circuit breaker that conforms to installation standards.

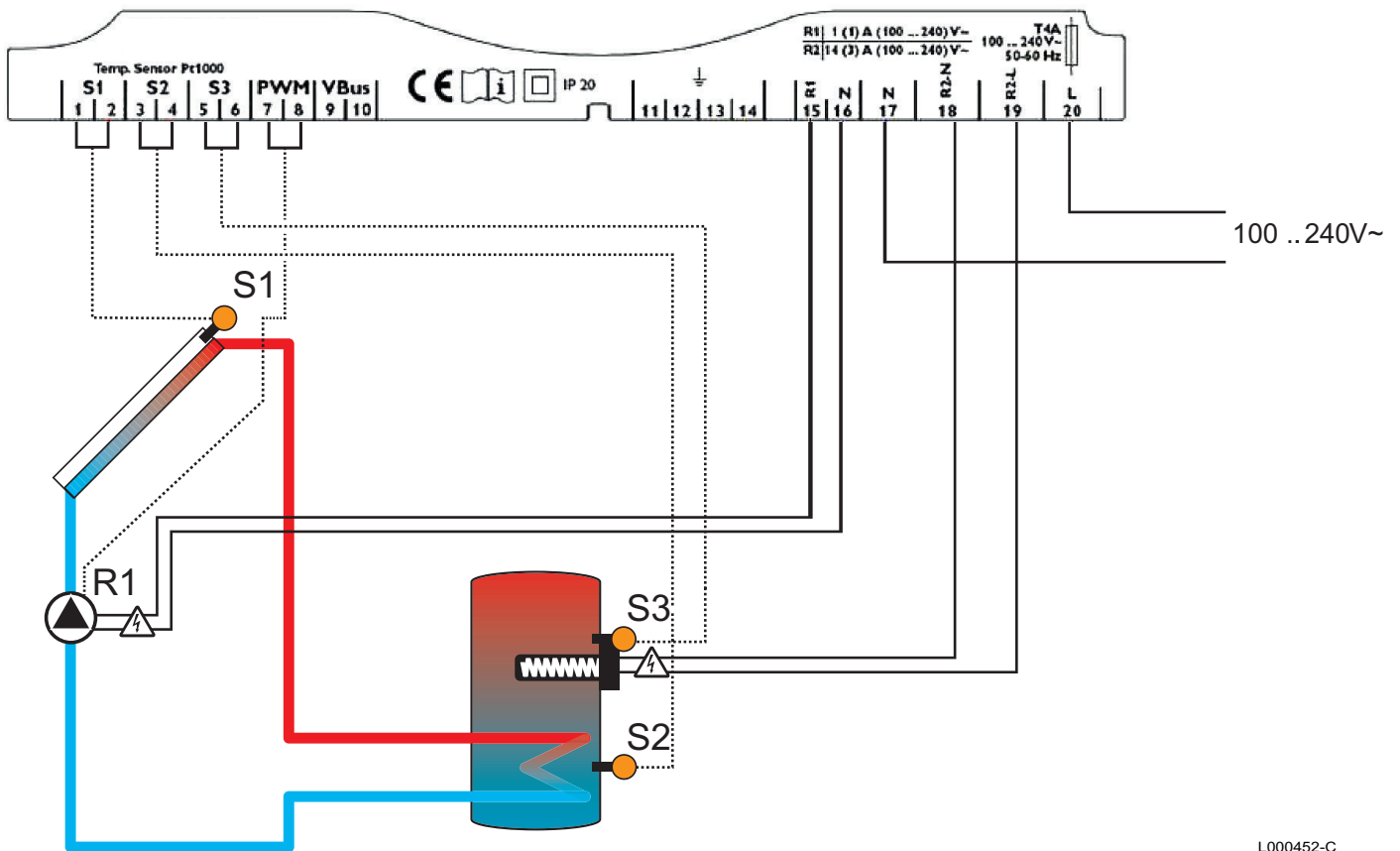
1. Remove the insulating shell from the front of the solar station, if necessary.



M002758-A

2. Remove the Phillips-head screws from the cover and detach it from the box.
3. Make the electrical connection.
See electrical schematics.
4. Put the cover back in place and secure with the screws.
5. Put the insulating shell back in place if necessary.

4.10.3. Electrical diagram



L000452-C

Reference	Terminals	Description	Connector / Sensor
1-2	S1	Solar sensor probe - TC	PT1000 FK
3-4	S2	DHW sensor, lower tank zone - TR	PT1000 FR
5-6	S3	DHW sensor - Electrical back-up - THR	PT1000 FR
7	PWM	PWM solar circulation pump	-
8	PWM	PWM solar circulation pump	+
9-10	VBus	DL2 connection	
11-14	⊕	Earthing terminals	Conductor - Green/Yellow
15	R1	Solar circulation pump	Live - Brown - (Cable provided)
16	N	Solar circulation pump	Neutral - Blue - (Cable provided)
17	N	230 V main supply	Neutral
18	R2-N	Electric heating resistance	Neutral
19	R2-L	Electric heating resistance	Live
20	L	230 V main supply	Live

4.10.4. Connecting the resistor

The electrical schematics above present a traditional connection with permanent power supply to the control system. Connect an electrical resistor with integrated thermostat to the electrical power only, without going through the control system. Use a different mains supply for the control system and the electrical resistor with integrated thermostat.




CAUTION

The forcing functions, set-point temperatures for the backup and 3-position switch on the front of the control system are not used with a resistor with integrated thermostat.

4.10.5. Connecting the circulation pump

Carry out connection of the heating pump according to the instructions given in the above schematics and then select the pump type used (traditional pump or PWM) on the control system.

 See chapter: "Description of the installer parameters", page 47.

4.11 Filling the DHW calorifer



CAUTION

Initial commissioning must be done by a qualified professional.

1. Flush the domestic circuit and fill the calorifer through the cold water inlet tube.
2. Open a hot water tap.
3. Completely fill the domestic hot water calorifer via the cold water inlet pipe, leaving the hot water valve open.
4. Close the hot water valve when the water flow is regular, without noise in the pipes.
5. Carefully vent all of the DHW pipes by repeating steps 2 to 4 for each hot water tap.



Venting the domestic hot water calorifer and the mains network helps to prevent noises and banging caused by trapped air moving through the pipes during draw-off.

6. Vent the tank exchanger circuit using the bleed valve provided for this purpose.
7. Check the safety devices (particularly the valve or safety unit), referring to the instructions provided with these components.

**CAUTION**

During the heating process, a certain amount of water may flow through the valve or safety unit, this is caused by water expansion. This phenomenon is completely normal and must in no event be hindered.

4.12 Filling the primary solar circuit

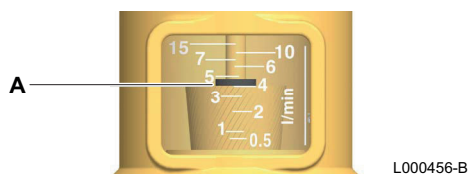
**CAUTION**

To protect against frost, use a water-propylene glycol mixture as the heat transporting fluid.

**CAUTION**

check the connection to the series of collectors and the collector sensor connection.
Antifreeze is included in the mixture.

4.12.1. Flowmeter



L000456-B

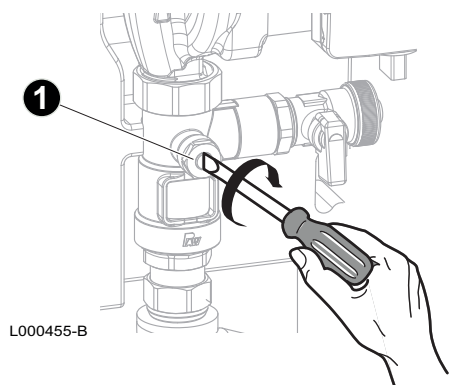
A Upper edge of the turbine

The flowmeter is used to visualise the circulation of the fluid in the circuit, independently of a control system. The upper edge of the turbine indicates the flow.

■ Setting the volume flow

Follow the instructions on volume flow rate given in the installation manuals for the solar collectors or the solar control systems.

1. If necessary, adjust the flow rate by operating the spherical plug valve located above the flowmeter.
2. Set the regulator to automatic mode.

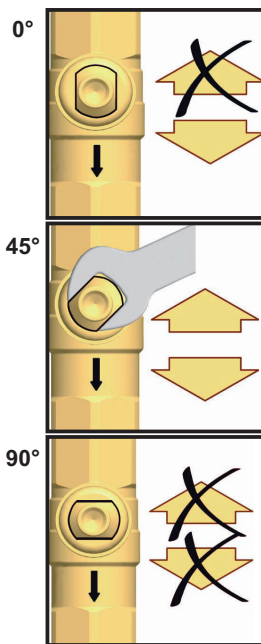


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**WARNING**

The solar installations fitted with a control system do not require any setting of the solar circuit flow rate; in this case, it is important to keep the flowmeter fully open in order to guarantee correct operation of the installation.

4.12.2. Anti-thermosiphon valve



Position	Operation
0°	<ul style="list-style-type: none"> ▶ Gravity brake in operation. ▶ Stream only runs in direction of flow (arrow on the pipe). ▶ When the installation is running, the valves must be set back to the vertical position. Check the circulation on the flowmeter.
45°	<ul style="list-style-type: none"> ▶ Anti-thermosiphon valve completely open. ▶ Stream possible in both directions. ▶ To fill, vent and rinse the installation, the valves must be set at 45°.
90°	<ul style="list-style-type: none"> ▶ Ball valve closed. ▶ Circulation blocked.

L000547-C

4.12.3. Filling the primary solar circuit



CAUTION

The installation must not be rinsed or filled when the solar collectors are at more than 100°C (intense sunlight). Heating up off the collectors may cause fluid leakage in the form of steam, which may result in scalding / burns.



CAUTION

In order to prevent the risk of frost in the installation, use only heat transporting fluid to drain the circuit. As a heat transfer medium, use a water-propylene glycol mix with a maximum of 50 % propylene glycol.



CAUTION

To prevent impurities getting into the expansion vessel, we recommend separating the expansion vessel from the rest of the solar installation during the flushing and filling phases.

■ **Flushing procedure**



With small systems, use propylene glycol containers to recover fluid under the empty valve discharge pipe.



CAUTION

Do not carry out rinsing in the event of direct solar radiation (vapor formation) or if there is risk of freezing (risk of deteriorations).

■ Flushing and sealing control



The solar circuit is flushed in the normal flow direction, as shown by the arrow on the circulation pump.

When commissioning, the solar installation must be flushed thoroughly to remove grit, deposits and any flux residue.

Flushing time: 10 minutes

Flushing fluid: Heat transporting fluid only

The system must be tested for leaks with the heat transfer fluid when flushing is finished.

- ▶ Testing pressure: 3–6 bar (0.3–0.6 MPa)
- ▶ Test time: 10-20 minutes

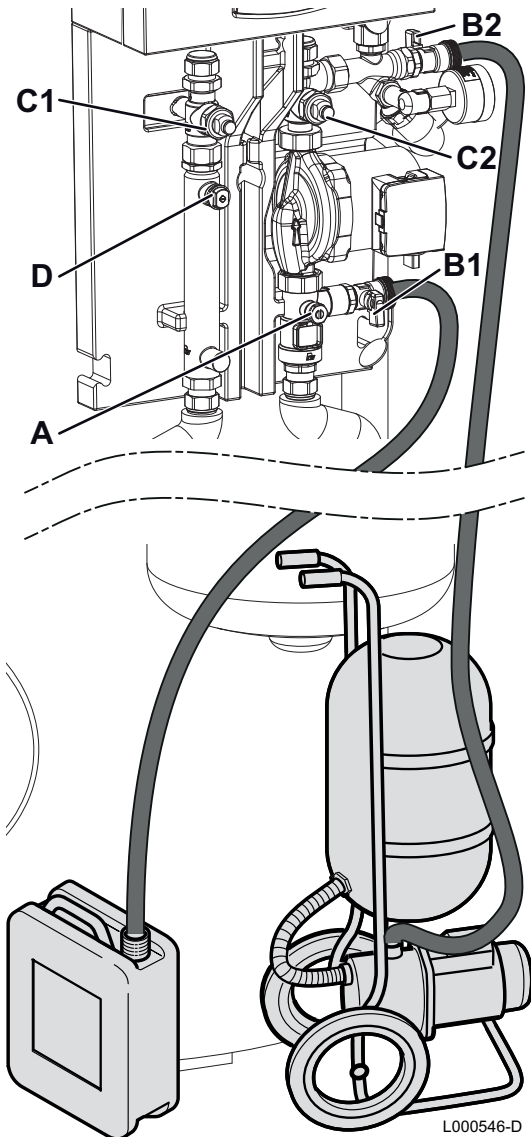


CAUTION

Propylene glycol leaks very easily. The pressure tests do not guarantee that there will be no leaks when the system is filled with propylene glycol under pressure. For this reason, we recommend an additional leak test when the system is filled and working.

**CAUTION**

Do not carry out a leak test when the installation is exposed to direct solar radiation (risk of vaporisation) or when it is freezing (risk of damage).



1. Fully open the flow valve (45° position) **C1**.
2. Close the return valve **C2** (position 90°).
3. Fully open the flowmeter valve **A**.
4. Connect the filling station to the solar station. The filling pipe must be connected to the filling valve **B2**. The draining pipe must be connected to the drain cock **B1** and to the heat transporting fluid collection can.
5. Open the filling valve **B2** and the draining valve **B1**.
6. Switch on the filling station. Let the station run, making sure that there is always enough fluid.
7. Vent several times with the vent plug **D** until the heat transporting fluid comes out without any bubbles or particles.
8. To vent the pump part, open and slowly reclose the return valve **C2**.
9. Close the drain cock **B1** and allow the pressure to rise to 5 bar (0.5 MPa) bar, then close the filling valve **B2**.
10. Open the return valve **C2** and the flow valve **C1** (0° position).
11. If the pressure in the installation drops, correct any tightness problems.
12. When the test time has elapsed, allow the pressure in the system to rise until it triggers the safety valve (operating check).

In the absence of air in the solar circuit, the test pressure must not decrease.

■ Filling

**CAUTION**

Before filling the installation, check the preload of the expansion vessel according to the static height.
(Preload = static Height/10 + 0.3 bar (0.03 MPa) (0.03 MPa)).

**CAUTION**

check the connection to the series of collectors and the collector sensor connection.

Filling pressure

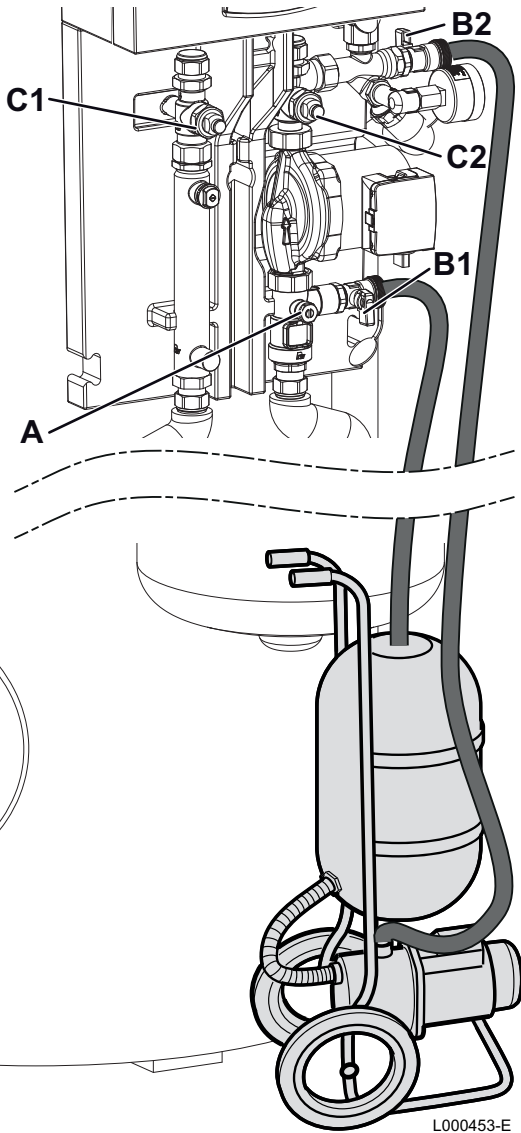
The filling pressure must be more than 5 bar (0.5 MPa) above the expansion vessel pre-load pressure. The ready-to-use mixture must be pumped directly from the filling station.



CAUTION

Do not use a manual filling pump.

Prolonged operation of the solar pump already brings about pre-degassing of the solar circuit.

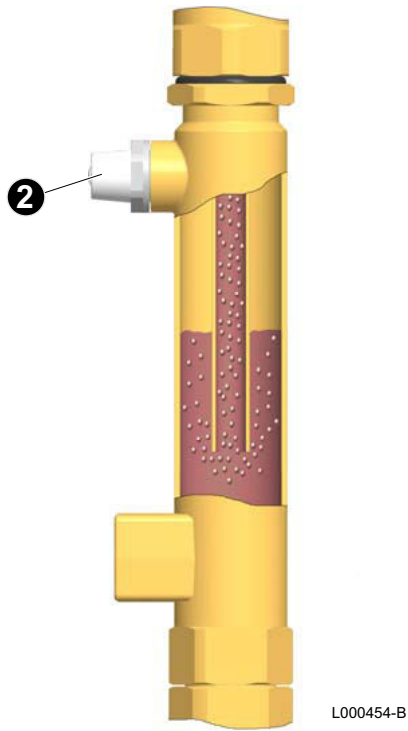


1. Fully open the flow valve (45° position) **C1**.
2. Close the return valve **C2** (position 90°).
3. Open the valve on the flowmeter **A**.
4. Connect the filling station to the solar station. The filling pipe must be connected to the filling valve **B2**. The drainage pipe must be connected to the drain cock **B1** as well as to the filling station tank.
5. Open the filling valve **B2** and the draining valve **B1**.
6. Switch on the filling station.
7. Close the drain cock **B1**.
8. After reaching a pressure of 5 bar (0.5 MPa), close the filling valve and switch off the filling station.
9. Set the solar circuit to a pressure of 2–3 bar (0.2–0.3 MPa) by adjusting valve **B1**.
10. Close the draining and filling valves (**B1, B2**).
11. Switch off the filling station.
12. Open the return valve **C2** and the flow valve **C1** (0° position).
13. Place the plugs provided in the instruction bag on the filling valve **B1** and drain cock **B2**

■ **Bleed**

The manual air vent valve is used to bleed the installation. To guarantee that the solar circuit is fully vented, the fluid circulation speed must rise to at least 0.3 m/s.

Pipe diameter (mm)		Flow rate (0.3 m/s)	
External diameter	internal diameter	l/h	l/min
15	13	143	2.4
18	16	217	3.6
22	20	339	5.7



The air vented from the solar fluid is collected in the top of the air vent and can be evacuated via the vent plug.

1. Switch on the circulating pump. The air bubbles are directed towards the venting points.
2. Vent several times with the vent plug ② until the heat transporting fluid comes out without any bubbles or particles.
3. Stop the circulating pump.
4. Open the air vent and then close it again.



CAUTION

Depending on the fluid temperature and system pressure, when the degassing screw is opened, the fluid may spurt out with some force. If the water temperature is high, be careful: **RISK OF SCALDING / BURNS.**

Repeat the operation several times; alternate operation of the pump assists degassing.



CAUTION

Bleeding must be continued until pressure variations can no longer be detected at the pressure gauge, or when starting or stopping the pump. If the pressure drops continuously, repair the leaks and top up with heat transporting fluid.



The pressure gauge needle may move owing to the modulation of the circulation pump.



CAUTION

After a few days of operation at high working temperature, bleeding should be repeated. This bleeding is necessary because small air bubbles form in the propylene glycol at high working temperatures.



CAUTION

For systems installed in the winter, it is advisable to bleed them again in the summer.

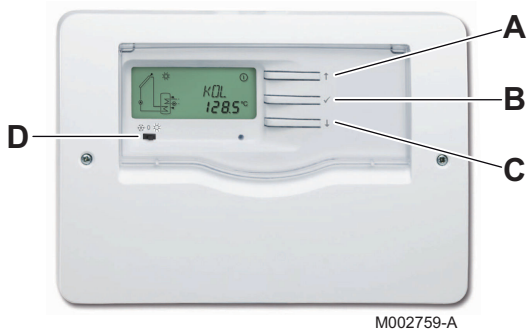
4.13 Filling the heating circuit

See the installation and service manual for the boiler.

5 Commissioning

5.1 Control panels

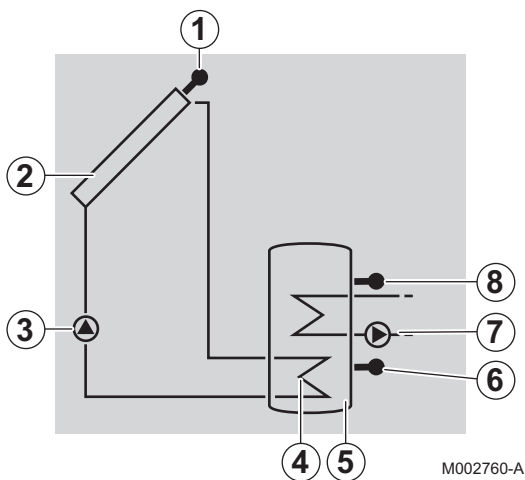
5.1.1. Description of the keys



- A** **Key ↑:**
 - ▶ Move the cursor upwards.
 - ▶ Increase the value of parameter .
- B** **Key ✓:**
 - ▶ Access a selected parameter.
 - ▶ Confirm a value modification.
- C** **Key ↓:**
 - ▶ Move the cursor downwards.
 - ▶ Reduce the parameter value.
- D** **3-position switch:**
 - ▶ ☀: The back-up may be active in day mode and night mode.
 - ▶ 0: The back-up is deactivated.
 - ▶ ☀: The back-up is active in night mode only.

5.1.2. Description of the display

■ System schematics (System-Screen)



- ① Solar sensor probe
- ② Solar collectors
- ③ Solar circulation pump
- ④ Solar exchanger
- ⑤ Solar hot water calorifer
- ⑥ Solar sensor
- ⑦ Back-up
- ⑧ DHW sensor - Back-up

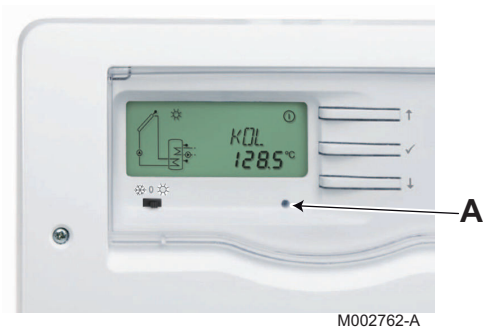
■ Operating indicators



Steady symbol	Flashing symbol	State
ⓘ		Solar pump activated.
ⓘ		Back-up activated.
☀		DHW calorifer set point temperature exceeded.
ⓘ	☀	Cooling function of the collector or DHW calorifer activated.
❄		Antifreeze function activated.
ⓘ	❄	Antifreeze function active (running).
	❄	Minimum collector temperature exceeded.
	⚠☀	Maximum DHW tank temperature exceeded.
	⚠	Maximum collector temperature exceeded.
SET		Adjustment parameter.
	SET	Changing the settings.
🔧	⚠	Sensor fault.
👉 + ⓘ	⚠	Forcing of the solar pump.
👉 + ⓘ	⚠	Forcing the additional heating.

■ LED display

A LED



LED message code	Heating pump status	Description
Continuously green	Pump relay is closed.	Regulation operating normally (System Operating).
Green/red flashing	<ul style="list-style-type: none"> ▶ Initialisation phase ▶ Manual mode 	<ul style="list-style-type: none"> ▶ The installation is in manual mode: Set the regulator to automatic mode.
Red flashing	<ul style="list-style-type: none"> ▶ Sensor fault. ▶ Maximum tank temperature exceeded. 	<ul style="list-style-type: none"> ▶ The hot water tank has reached the set temperature and the installation is in overheating safety mode or in cooling mode. ▶ There is a sensor fault. <p>👉 See chapter: "Sensor fault", page 59.</p>

5.2 Check points before commissioning



CAUTION

If the temperature in the solar collectors is higher than 130°C, the control system operates in safety mode. Wait until the evening before start-up or cool down (cover) the solar collectors.


5.2.1. Domestic hot water calorifer

1. Before start-up, the heating installation must be completely emptied and rinsed.
2. Make sure that all valves on the circuit are opened.
3. Fill the installation with water and check hydraulic tightness.

5.2.2. Primary solar circuit



The system is filled with heat transfer fluid without any air bubbles.

- ▶ Inspect all the connections in the system for leaks.
- ▶ Check that the anti-thermosiphon valves on the flow and return are on position "0°" to allow circulation of the fluid.
- ▶ Check that the valve located above the flowmeter is open.
- ▶ Check that the filling and draining valves are correctly plugged (the plugs are delivered in the manuals and instructions bag).
- ▶ Check the connection of the solar pump.
- ▶ Check that the control system is in automatic mode.
- ▶  See the instructions supplied with the control unit and any remote control unit used.

5.2.3. Primary heating circuit

 See boiler installation instructions

5.2.4. Electrical connection

Check the electrical connections, particularly the earth.

5.3 Commissioning procedure



WARNING

- ▶ Initial commissioning must be done by a qualified professional.
- ▶ During the heating process, water can flow through the bleed circuit to guarantee the safety of the installation. This phenomenon is perfectly normal and must in no circumstances be hindered.

5.3.1. Secondary circuit (domestic water)

Set the domestic hot water thermostatic mixing valve to the required temperature to avoid scalding when running domestic hot water.



WARNING

The thermostatic mixing valve must be set to maximum at 60°C.

5.3.2. Primary solar circuit

1. Inspect all the connections in the system for leaks.
2. Leave the fluid circulating round the system for some time and check again for leaks - (regulator in manual mode).
3. Open the vent valve of the manual bleed degasser (bleed again).
4. Bring the pressure in the system up to the 2 bar working pressure by topping up if necessary with heat transfer fluid.
5. After several hours of operation, the system should be bled again (via the manual bleed degasser). After bleeding, check the system pressure and add more fluid if necessary.
6. Check that the control system is in automatic mode.
7. Check the anti-thermosiphon valves.
8. Check the connection of the solar pump.
9. Check the position of the solar hot water tank sensor.
10. Complete the "Commissioning protocol" sheet at the end of the notice.

■ Starting and stopping the control system




CAUTION

If the temperature in the solar collectors is higher than 130°C, the control system operates in safety mode. Wait until the evening before start-up or cool down (cover) the solar collectors.






The installation is switched on.

The regulator starts an initialisation phase during which the LED flashes red and green. When initialisation is complete, the regulator changes to automatic mode. To initiate the solar pump, a minimum temperature of 30 °C is required at the collector and a temperature difference of 6 °C with respect to the domestic hot water calorifier. Otherwise, the control system is on standby. Switch to manual mode (**MAN**) to force the solar pump relays and start it up.

 See chapter: "List of the parameters", page 45.

5.4 Reading out measured values


Scroll down the values measured using the **↓** and **↑** keys.

Parameter	Description	Remarks
TC	Collector temperature	S1 sensor. The value TC shows the temperature in °C given by the collector sensor in real time.
TR	Calorifier temperature (Solar exchanger - lower)	S2 sensor. The value TR shows the temperature in °C in real time measured by the sensor in the lower zone of the DHW calorifier.
THR	Calorifier temperature (Back-up)	S3 sensor. The value THR shows the temperature in °C in real time measured by the sensor in the upper zone of the DHW tank.
PC %	Pump regime	Value PC % gives the solar heating pump regime in real time (0-100%).
tc	Auto-calibration time	The value tc shows the self-calibration phase time remaining in seconds.
RAP	Force back-up	On : Back-up powered up. AUTO : Back-up managed by the control system.  See user guide.
h P1	Hour run meter on the solar pump	Reset to zero possible.  See chapter: "Resetting the values to zero", page 44.
h P2	Hour run meter on the electrical back-up	Reset to zero possible.  See chapter: "Resetting the values to zero", page 44.
KWh	Amount of heat (kWh)	<ul style="list-style-type: none"> ▶ The amount of heat received is calculated according to the parameters input on commissioning (DMAX). ▶ Reset to zero possible.  See chapter: "Resetting the values to zero", page 44. Values KWh or MWh give an estimate of the total amount of heat produced by the installation in kWh or MWh since commissioning of the control system. The amount of heat received is calculated according to the parameters input on commissioning (DMAX).
MWh	Amount of heat (MWh)	
HRE	Time	 See user guide.

5.4.1. Resetting the values to zero

It is possible to reset the value to zero when the symbol **SET** is displayed.

1. Select a value using the **↓** and **↑** keys.
2. Press the **✓** key for 2 seconds. The value is reset to zero.

 To suspend the operation, do not press any keys for 5 seconds. The control system will automatically go back to the value display mode.

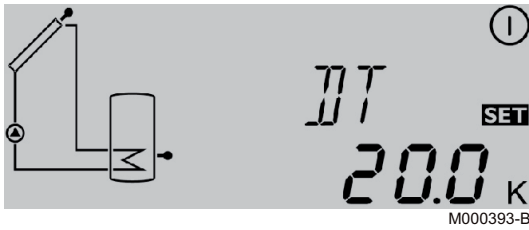
5.5 Installer parameters



WARNING

Modifying the factory parameters may impair correct operation of the solar DHW calorifer. The following parameters must only be modified by a qualified professional.

5.5.1. Modifying the installer parameters







1. Advance to the last display channel (**HRE**) with the **↓** key.
2. Press the **↓** key for 5 seconds.
A setting parameter is displayed, with the symbol **SET**.
3. Select a parameter using the **↓** and **↑** keys.
4. Briefly press the **✓** key.
The symbol **SET** flashes, the parameter can be set.
5. Modify the parameter using the **↓** and **↑** keys.
6. Press **✓** to confirm the setting.

5.5.2. List of the parameters

Parameter	Description	Adjustment range	Increment	Factory setting	Remarks
DT	Reference temperature difference	10/20 K	0.1	20	See chapter: "Description of the installer parameters", page 47
tu	Self-calibration phase	1 / 5 mn	1	3	See chapter: "Description of the installer parameters", page 47
SX	Set temperature of the solar calorifier	4 / 80 °C	1	60	See chapter: "Description of the installer parameters", page 47
CMAX	Maximum collector temperature	70 / 120 °C	1	110	See chapter: "Description of the installer parameters", page 47
CMIN	Minimum collector temperature	10 / 90 °C	0.5	30	See chapter: "Description of the installer parameters", page 47
OAC	Collector antifreeze option	On / OFF		OFF	<ul style="list-style-type: none"> ▶ On: On ▶ OFF: Off See chapter: "Description of the installer parameters", page 47
TAON	Antifreeze function activation temperature	-4 / 5.5 °C	0.5	4	Available if OAC = On
TAOF	Antifreeze function deactivation temperature	4.5 / 9 °C	0.5	6	Available if OAC = On
FT	Tubular collector option	On / OFF		OFF	<ul style="list-style-type: none"> ▶ On: On ▶ OFF: Off See chapter: "Description of the installer parameters", page 47

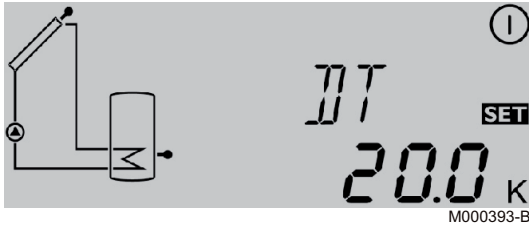
(1) The parameter is set to On if the S3 domestic hot water sensor is connected

Parameter	Description	Adjustment range	Increment	Factory setting	Remarks
POMP	Pump command mode	OnOF / PuLS / A / b / C		PuLS	<ul style="list-style-type: none"> ▶ OnOF: Heating pump ON or OFF (0% or 100%) ▶ PuLS: Pump modulation from 50% to 100% ▶ A: Wilo PWM heating pump ▶ b: Grundfoss PWM heating pump ▶ C: Laing PWM heating pump
OTHR	Activation of the electrical back-up	On / OFF		OFF ⁽¹⁾	<ul style="list-style-type: none"> ▶ On: Electrical back-up present ▶ OFF: No electrical back-up <p>If the S3 domestic hot water sensor is connected, the OFF setting is not available.</p>
THRn	Nighttime back-up set point temperature	40 / 95 °C	0.5	55	 See chapter: "Description of the installer parameters", page 47
tn O	Back-up activation time at night	00:00 / 23:45	00:15	23:00	
tn F	Back-up deactivation time at night	00:00 / 23:45	00:15	07:00	
O td	Daytime back-up option	On / OFF		ON	<ul style="list-style-type: none"> ▶ On: On ▶ OFF: Off  See chapter: "Description of the installer parameters", page 47
THRd	Daytime back-up set point temperature	40 / 95 °C	0.5	55	 See chapter: "Description of the installer parameters", page 47
td O	Daytime back-up activation time	00:00 / 23:45	00:15	16:00	Available if O td = On
td F	Daytime thermostat deactivation time	00:00 / 23:45	00:15	18:00	Available if O td = On
DMAX	Maximum flow rate (l/min)	0.5 / 100	10 - 1 - 0.1	3	 See chapter: "Description of the installer parameters", page 47
GELT	Antifreeze type	0 / 1 / 2 / 3 / 4	1	3	<ul style="list-style-type: none"> ▶ 0: Water ▶ 1: Propylene glycol ▶ 2: Ethyl glycol ▶ 3: Tyfocor LS / G-LS ▶ 4: Greenway
GEL%	Antifreeze concentration	20 / 70 %	1	45	If GELT = 1 or 2
MAN	Manual mode	Auto / 1 On / 1 OF		AUTO	<ul style="list-style-type: none"> ▶ Auto: Automatic mode ▶ 1 On: Solar pump activated ▶ 1 OF: Solar pump deactivated
XXX	Software version				

(1) The parameter is set to On if the S3 domestic hot water sensor is connected

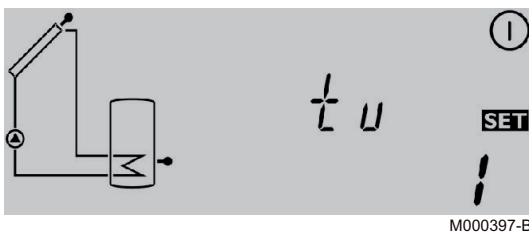
5.5.3. Description of the installer parameters

■ Reference temperature difference - DT



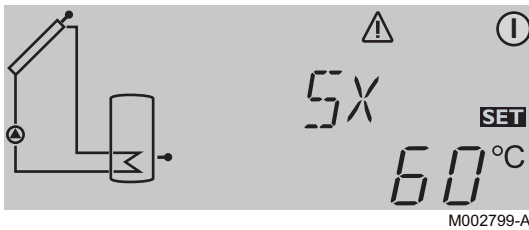
The regulator reads the temperatures measured by sensors **TC** and **TR** and compares the resulting temperature difference with the switching-on difference which is preset to 6 K. The regulator tries to achieve a temperature difference of 20 K (factory setting) between the collector and the tank to produce high temperature hot water as rapidly as possible.

■ Self-calibration phase - tu



When the solar collector reaches the minimum temperature **CMIN** and the predefined temperature difference of 6 K with the DHW tank temperature, the control system triggers the solar circulating pump at full regime for the period defined by the parameter **tu**. During this phase, any air bubbles in the solar collectors or pipes are evacuated to the solar station thanks to the high circulation speed in the pipes and eliminated by the air vent.

■ Set temperature of the solar calorifier - SX



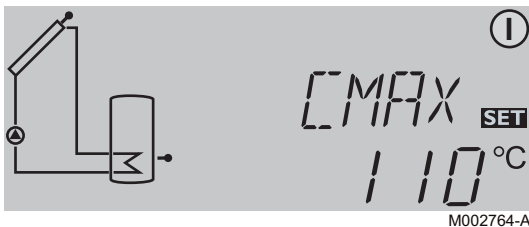
The set temperature **SX** is the desired temperature for the solar calorifier. The higher the set temperature for the calorifier, the greater the energy stored. Setting to 60°C is suitable for normal use with daily draw-offs.



CAUTION

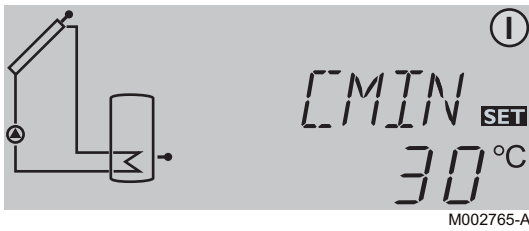
During extended absences, we recommend lowering the set point temperature in the solar DHW calorifier to 45°C. When the user is present, the set point must be set to 60°C.

■ Maximum collector temperature - CMAX



The maximum collector temperature **CMAX** helps to protect the collector against overheating. When the DHW tank set point temperature (**SX**) is reached, the solar pump stops. As soon as the solar collector reaches the maximum temperature **CMAX**, the solar pump runs until the temperature in the solar collector is again 5 K lower than the maximum collector temperature **CMAX**. The DHW tank temperature can increase until it reaches its maximum temperature of 80°C. If the DHW tank temperature exceeds 80°C, the system effects an emergency shutdown.

■ Minimum collector temperature - CMIN



The minimum collector temperature function **CMIN** prevents the solar pump from starting up too frequently in the event of low temperatures in the solar collector. The minimum collector temperature **CMIN** must be exceeded in order for the solar heating pump to be able to start up.

■ Collector antifreeze option - OAC



CAUTION

The antifreeze function should only be used if non-glycol water is used as the heat transporting fluid.



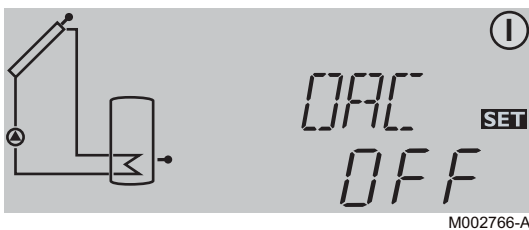
The function takes heat from the DHW calorifer; we therefore recommend using it only in regions where the temperature rarely falls below 0°C.

When the collector temperature is lower than the **TAON** temperature, the antifreeze function activates the solar pump in order to make the heat-transporting fluid circulate between the collector and the DHW calorifer to prevent it freezing. When the collector temperature exceeds the **TAOF** temperature, the antifreeze function stops the solar pump.

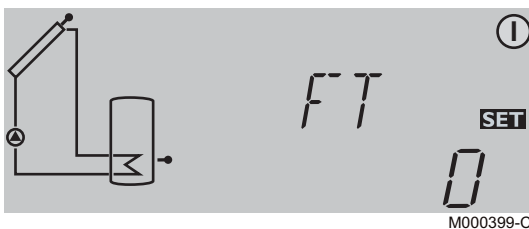


CAUTION

The collector antifreeze function only runs if the DHW tank temperature is higher than the collector temperature. The collector antifreeze function is deactivated if the DHW tank temperature is lower than 5°C.

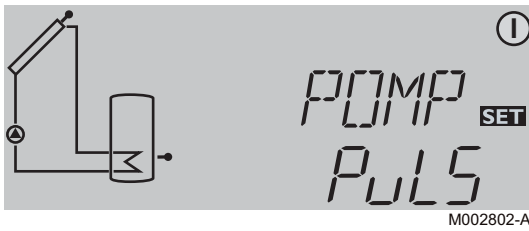


■ Tubular collector option - FT



The tubular collector function is used to take into account the position of the temperature sensor in the tubular collectors. If the regulator detects a temperature rise in the collector of 2 K compared to the last measurement, the solar pump runs at full speed for 30 seconds to measure the current average temperature. The measured temperature thus becomes the new reference temperature. If the measured temperature (new reference) then increases again by 2 K, the solar pump starts again for 30 seconds. The regulator switches automatically to solar heating mode if the temperature difference between the collector and the calorifer exceeds the switching-on temperature difference when the solar pump is operating or the system is stopped. If the collector temperature falls by 2 K while the system is stopped, the tubular solar collector activation temperature is rechecked.

■ Pump command mode - POMP

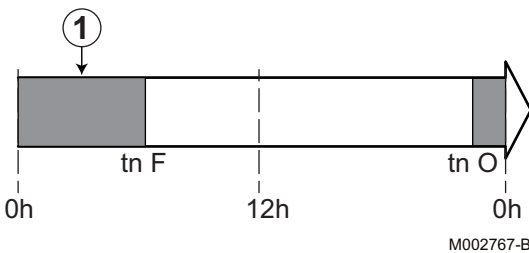


The **POMP** parameter is used to select the correct command program for the solar pump, according to the type of pump used. **PuLS** control (set by default) is designed for conventional frequency modulation pumps, **OnOF** control for "ON or OFF" pumps, channels **A**, **B** and **C** for PWM pumps according to their brand. See chapter: "List of the parameters", page 45.

■ OTHR electrical back-up option

If the S3 domestic hot water sensor on the electrical back-up is connected, the OTHR parameter is automatically set to On. As a result, it is impossible to modify the setting to OFF. If the S3 domestic hot water sensor is not connected, there is no electrical back-up. The OTHR parameter must be set manually to OFF.

■ Nighttime back-up set point temperature - THRn
(The parameter is only displayed if OTHR is set to On)



① Hourly nighttime range

The **THRn** temperature is the set point to be reached by the DHW tank using its back-up at night. The nighttime period is programmed between the start and end times **tn O** and **tn F** respectively.

■ Daytime back-up option - O td
(The parameter is only displayed if OTHR is set to On)

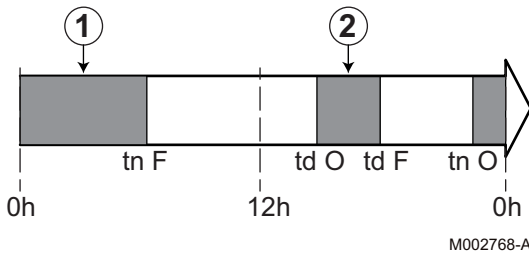
The **O td** option, when the parameter is set to **On**, enables use of the back-up during the day. The **O td** option, when the parameter is set to **Off**, prohibits use of the back-up during the day. The **RAP** parameter (forced back-up operation) always takes precedence over the **O td** parameter and the switch setting.

Installer parameter	O td	On
User setting	RAP	Auto
	3-position switch	☼ 0 ☼
Back-up at night	Activated between tn O and tn F until THRn	Off Activated between tn O and tn F until THRn
Back-up during the day	Activated between td O and td F until THRd	Off Off

Installer parameter	O td	OFF
User setting	RAP	Auto
	3-position switch	☼ 0 ☼
Back-up at night	Activated between tn O and tn F until THRn	Off Activated between tn O and tn F until THRn
Back-up during the day	Off	Off Off

Installer parameter	O td	On or OFF
User setting	RAP	On
	3-position switch	☀, 0 or ☀
Back-up at night	Activated until the set point THRn is reached	
Back-up during the day		

■ **Daytime back-up set point temperature - THRd**
(The parameter is only displayed if OTHR is set to On)



- ① Hourly nighttime range
- ② Hourly daytime range

THRd is the set point temperature to be reached by the DHW tank using its back-time during the day. The nighttime period is programmed between the start and end times **td O** and **td F** respectively. With a back-up, the programmed period is set in the factory to between 16:00 h and 18:00 h, i.e. at the end of the day when the solar contribution is less and just before the draw-off period.

■ **Maximum flow rate - DMAX**

In order for the regulator to calculate the quantity of heat produced by the installation (parameter **KWh / MWh**), input parameter **DMAX**. The parameter **DMAX** is equal to the flow in litres per minute in the solar circuit. Establish the **DMAX** value using the table below, according to the number of collectors. When the flow is input incorrectly, the display **KWh / MWh** will also be incorrect.

Number of flat collectors	Flow rate (l/min)
1	6.5
2	5
3	4.5
4	4
5	3.5
2x2	10
2x3	13



i If the installation is fitted with a flowmeter, take a reading of the flow rate value (when the heating pump is running at full regime) to input the **DMAX** parameter.

■ **Antifreeze type - GELT**



The **GELT** parameter is used to set the type of antifreeze used. The antifreeze concentration value is preset for using Tyfocor LS / G-LS and Greenway products. If using another antifreeze, select the setting values **1** or **2** and then set the **GEL%** parameter. See chapter: "List of the parameters", page 45.

6 Checking and maintenance

6.1 General instructions



CAUTION

- ▶ Maintenance operations must be done by a qualified engineer.
- ▶ Only original spare parts must be used.

6.2 Safety valve or safety unit

The safety valve or unit on the domestic cold water inlet must be operated at least **once a month** to ensure proper operating and to prevent from any overpressure which may that may damage the domestic hot water calorifier.



WARNING

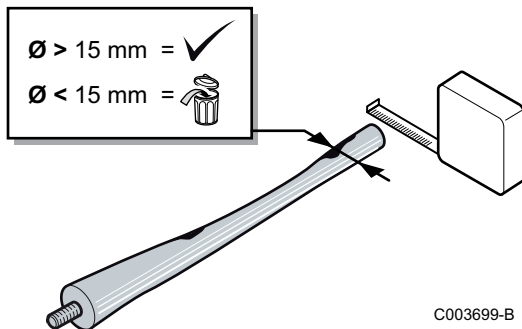
Failure to abide by this maintenance rule may damage the domestic hot water calorifier and void its warranty.



6.3 Cleaning the casing material

Clean the outside of appliances using a damp cloth and a mild detergent.

6.4 Checking the magnesium anode




Check the condition of the anodes at the end of the first year. It is necessary to determine the periodicity of subsequent checks as of the first check, according to wear and tear on anodes. Magnesium anodes must be checked at least every 2 years.



1. Remove the inspection hatches.
 See chapter: "Removing the inspection hatches", page 52.
2. Descale the calorifier if necessary.
3. Measure the diameter of the anode.
 Replace the anode if its diameter is less than 15 mm.
4. Reassemble the anode/inspection hatch unit.
 See chapter: "Remounting the inspection hatches", page 53.

6.5 Descaling

In regions with hard water, annual descaling of the appliance is recommended in order to maintain its performance.

1. Remove the inspection hatches.
 See chapter: "Removing the inspection hatches", page 52.
2. Check the magnesium anode each time the hatch is opened.
 See chapter: "Checking the magnesium anode", page 51.
3. Remove limescale deposits in the form of sludge or strips in the bottom of the tank. On the other hand, do not touch limescale adhering to the walls of the tank as it provides effective protection against corrosion and improves the insulation of the DHW calorifier.
4. Remove limescale deposits from the exchanger to guarantee its performance.
5. Fit the unit together.
 See chapter: "Remounting the inspection hatches", page 53.

6.6 Removing and remounting the inspection hatches



CAUTION

To guarantee tightness, the gasket unit must be replaced each time the hatch is opened.

- ▶ Use a new lip gasket and retainer ring for the top inspection hatch.
- ▶ Have a new gasket on hand for the side inspection hatch.

6.6.1. Removing the inspection hatches

1. Turn off the domestic cold water inlet.
2. Drain the calorifier.

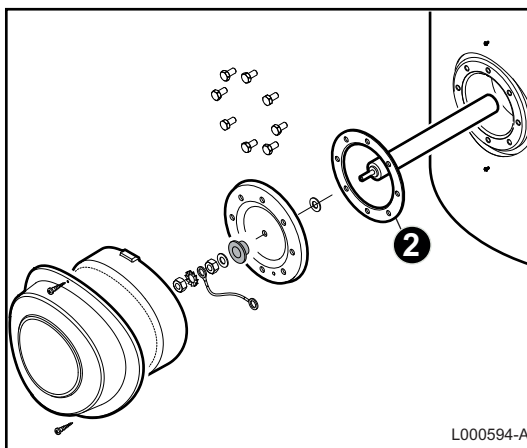
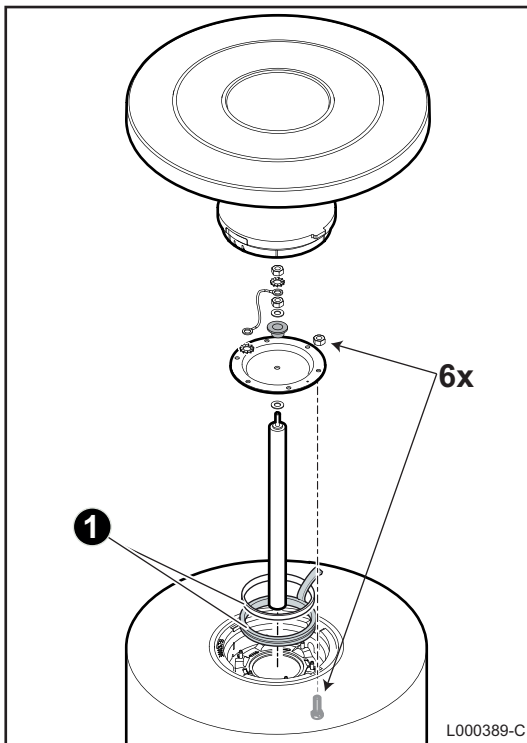


The domestic cold water inlet is also the drain opening.

3. Remove the inspection hatches.

6.6.2. Remounting the inspection hatches

1. Replace the lip seal and position it in the visit opening, making sure that you place its lug outside the DHW tank.



2. Replace the sheet gasket.
3. Fit the unit together.



CAUTION

Use a torque wrench.

Torque applied to the anode: 8 N·m.
The flange mounting bolts must not be excessively tight.

Flange	Torque load
Lip gasket	6 N·m +1/-0
Sheet gasket	15 N·m



Approximately 6 N·m is obtained by manipulating the box spanner with the small lever and 15 N·m by manipulating it with the large lever.

4. After reassembly, check the watertightness of the lateral flange.
5. Switch on.



See chapter: "Commissioning procedure", page 43.

6.7 Inspection and maintenance of the solar circuit

6.7.1. Maintenance operations to be performed



WARNING

Use only the same fluid as for refilling. Do not mix different fluids.

1. Check the level of the heat transporting fluid. Top up the solar fluid if necessary.
2. Check the antifreeze protection.
3. Check the pressures of the installation and the expansion vessel.
4. As the heat transporting fluid leaks much more readily than water, carry out a visual check on the tightness of all fittings and gaskets.
5. Check operation of the installation.


6.7.2. Adding heat transporting fluid



CAUTION

Addition of heat transporting fluid after the safety valve has been switched on

When the safety valve is switched on, a certain quantity of heat transporting fluid overflows into the glycol collection vat. Top up the solar circuit again by pumping the fluid from the glycol collection vat.

 See chapter: "Filling the primary solar circuit", page 34.

- ▶ The filling pressure must be more than *1 bar (*2 MPa) above the expansion vessel pre-load pressure.



CAUTION

- ▶ Check the installation of the collector sensor.
- ▶ Do not use a manual filling pump.



CAUTION

As the heat transporting fluid leaks much more easily than water, carry out a visual check on the tightness of all fittings and gaskets after a few hours' operation at normal operating pressure.

6.8 Maintenance form

Maintenance N°:

Owner	Company name
Street	Street
Town/Postcode.....	Town/Postcode.....
Tel. Fax.....	Tel. Fax.....
Mobile	Mobile
E-mail.....	E-mail
	Installer

Description of the installation

Solar installation for: Hot water preparation Additional heating Swimming pool heating

Solar power sensor: Aream²

DHW tank: Solar station:

Checks

System pressure checked bar	pH value
Pre-load in the solar tank bar	
Antifreeze protection checked °C	
	Sealing:	Inspection:
Collector	<input type="checkbox"/> OK	<input type="checkbox"/> OK
Pipes	<input type="checkbox"/> OK	<input type="checkbox"/> OK
Solar station	<input type="checkbox"/> OK	<input type="checkbox"/> OK
DHW tank	<input type="checkbox"/> OK	<input type="checkbox"/> OK
Regulation	Checking the operation	<input type="checkbox"/> OK
	Collector temperature	TC: °C
	DHW sensor temperature	TS: °C
	Temperature	Te: °C
	Amount of heat	AH: kW
Enamelled tanks:	Sacrificial anode checked	<input type="checkbox"/> condition satisfactory <input type="checkbox"/> must be replaced
Domestic hot water thermostatic mixing valve	Set to.....°C	
	Checking the operation	<input type="checkbox"/> OK <input type="checkbox"/> must be replaced

6.9 Installation report

Place of installation	Company name
Owner	Street
Street	Town/Postcode
Town/Postcode	Tel. Fax
Tel. Fax	Mobile
Mobile	E-mail
E-mail	Installer

Description of the installation

Solar installation for:	<input type="checkbox"/> Hot water preparation	<input type="checkbox"/> Additional heating	<input type="checkbox"/> Swimming pool heating
Solar power sensor:	Type:		Quantity:
Type of installation:	<input type="checkbox"/> On roof	<input type="checkbox"/> Roof-integral Installation	<input type="checkbox"/> On flat roof
Pipes:	<input type="checkbox"/> Duo-Tube	<input type="checkbox"/> Cu 15	<input type="checkbox"/> Cu 18
	<input type="checkbox"/> Other pipes ømm		Lengthm
	Insulation:mm	Type/brand	
Tank:	Type:		
Solar station:	<input type="checkbox"/> Solar station integrated in the tank		<input type="checkbox"/> Other:
Solar fluid:	<input type="checkbox"/> LS		I (volume):
System pressure:	bar	Pre-load in the solar tank:	bar

Solar outlet and return checks

For vertical collectors side-by-side or horizontal collectors one on top of the other:

- Connect the return (cold) Return OK
- Connect the outlet (hot) to the coil Outlet OK
- Mount the sensor on the side where the hot coil leaves the collector (outlet) Sensor position OK

For horizontal solar panels:

- checks in accordance with the assembly diagram

Regulator function check

10-minute bleed cycle	<input type="checkbox"/> OK	MCDB unloading pump, swimming pool pump	R8
Continuation in matched flow mode	<input type="checkbox"/> OK	DHW pump - MCDB	R9
Collector temperature (TC) S1 = °C		Amount of heat	AH = KW
Exchanger flow temperature (TE) S2 = °C		Reference temperature difference	DT = K
Domestic hot water tank temperature 1 lower zone (TS) S3 = °C		Zone changeover temperature	SZ = °C
Domestic hot water tank temperature 1 upper zone (TM) S4 = °C		Set temperature	SX = °C
Domestic hot water tank temperature 1 central zone / Pool temperature / MCDB S5 = °C		Maximum collector temperature	CX = °C
Biomass boiler temperature S8 = °C		Self-calibration phase	tu = min.
Input temperature heat meter S10 = °C		Adjustment parameter	PN = %
Output temperature heat meter S11 = °C		Maximum flow rate	FX = l/min
primary circuit pump, speed control R1		DHW booster temperature settings:	
secondary circuit pump, speed control R2		- boiler circuit °C
Reversal valve domestic hot water tank zones R3		- Electric heating resistance °C
Biomass boiler pump R4			
MCDB reversal valve R5			

Inspection of the installation

Components on roof:

All mounting bolts tight yes

All connections checked and leak-free yes

Solar station:

Outlet and return connections correct yes

Outlet and return thermometers present and checked yes

Tank:

Cold water safety kit installed yes

Pressure reducer set at bar yes

Thermostatic mixing valve with anti-thermosiphon circuit connected to the solar tank yes

Thermostatic mixing valve set to.....°C yes

Tank insulation checked yes

All connections installed yes

Expansion vessel:

Pressure of preload of the controlled expansion vessel yes

Readjustments

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Assembly instructions (solar collector, tank, complete station, regulator) handed to the owner yes

Solar installation operation (regulator) explained to the owner yes

Remarks

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Place:

Date:.....

Owner's signature

Installer's signature

7 Troubleshooting

7.1 Electricity supply



DANGER

Before any work, switch off the mains supply to the control system.

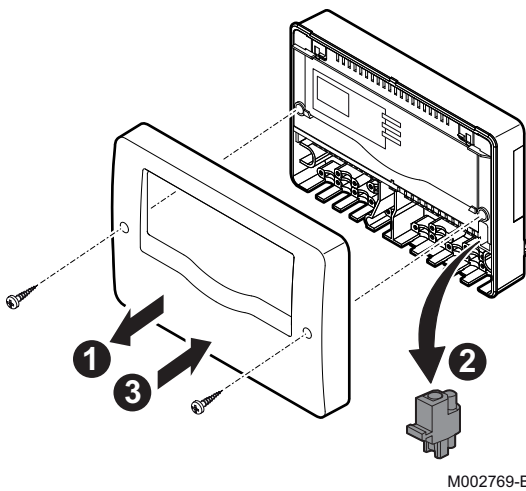
If the LED or the display are off, check the mains supply to the control system. The regulator is protected by a 4 A fuse.

1. Remove the control system cover by unscrewing the 2 screws.
2. Check the fuse and change it if necessary. A spare fuse can be found in the control system housing.
3. Put the cover back in place and secure with the screws.



CAUTION

If the control system still does not work, replace it.



7.2 Sensor fault

Steady symbol	Flashing symbol	State
		The sensor is defect.

1. Check the temperature display channels for each sensor.

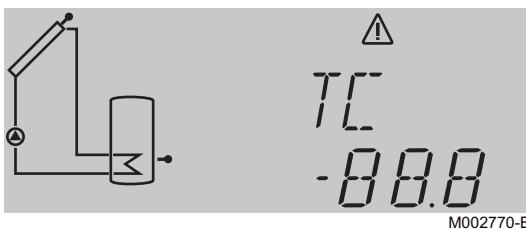
TC	Solar collector temperature sensor
TR	DHW tank temperature sensor
THR	Back-up temperature sensor

2. If the channel does not display the temperature, the sensor is defect. An error code is displayed in place of the temperature. The defective sensor flashes very rapidly on the display.


Error code	Description	Checking / solution
888.8	Cable breakage	Check the cable for the sensor concerned
-88.8	Short circuit	Check the cable for the sensor concerned

3. If the sensor is still defect, check its value with an ohmmeter.

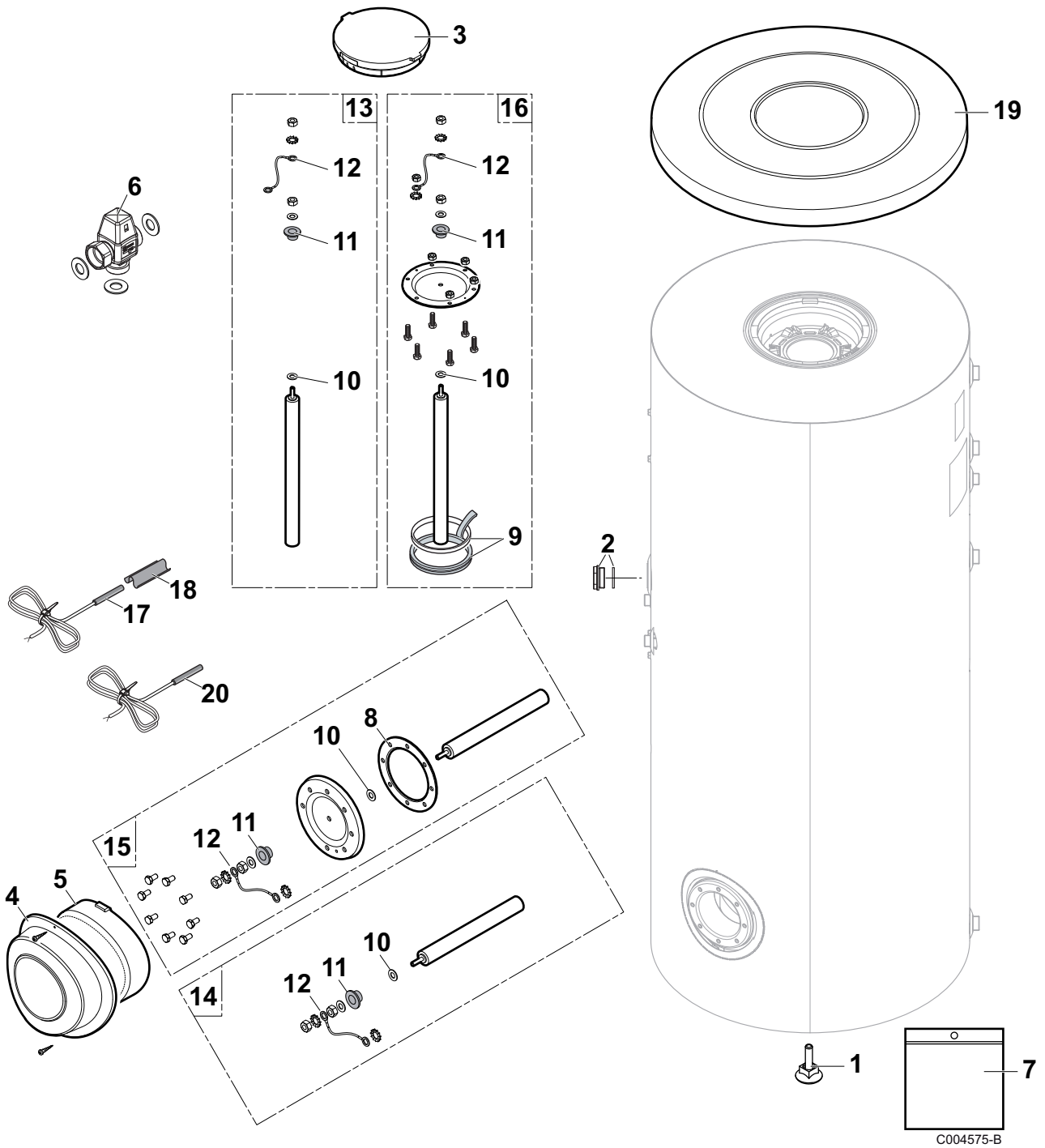
See chapter: "Technical specifications", page 13.



7.3 Incidents and solutions

Description	Checks	Solutions
The indicator light is off.	The fuse is defect.	Replace the fuse.  See chapter: "Electricity supply", page 59.
	The current has been cut.	Restore the current.
The solar pump is running but the DHW calorifier temperature is not increasing.	Air bubbles are present in the circuit.	Vent the heating installation. Check the pressure. Activate and deactivate the pump several times in a row.
	The solar collector filter is clogged.	Clean the filter.
The solar pump starts and stops continually.	The solar collector sensor is in the wrong place.	Place the collector sensor on the solar flow, the hottest point on the collector outlet.
	The temperature difference set on the control system is too small.	Modify the DT value.
	The tubular collector option is unsuitable.	Modify the FT value.
The solar pump starts later than expected.	The DT value is too high.	Modify the DT value.
	The collector sensor is incorrectly set or placed.	Modify the DT value. Place the collector sensor on the solar flow, the hottest point on the collector outlet.
The temperature difference between the DHW calorifier and the solar collector increases when the system is activated. The solar circuit cannot evacuate the heat.	The solar pump is defect.	Change the solar pump.
	The circuit is blocked.	Clean the solar circuit.
	The circuit is scaled up.	Descale the circuit.
The solar pump is not running but the collector temperature is higher than the DHW calorifier temperature.	The current has been cut.	Check the fuse in the control system. Check the electricity supply.
	The pump does not start in manual mode.	The pump is blocked. Turn the pump shaft using a screwdriver. Change the solar pump.
	The pump is not receiving power from the control system.	Check the fuse in the control system. Check the electricity supply. Change the control system.
	The DT value is too high.	Modify the DT value.
The tank temperature drops even though there is no draw-off.	The pump operates during the night.	Check the programming of the control system.
	There is recirculation in the solar circuit or the domestic hot water circuit.	Place a non-return device in the solar or domestic hot water circuit.
The collector temperature is higher than the outside temperature at night.	The non-return valves are not working.	Check the non-return valves.
	Thermosiphon circulation is too powerful.	Use more suitable non-return valves.

8.2.1. Domestic hot water tanks



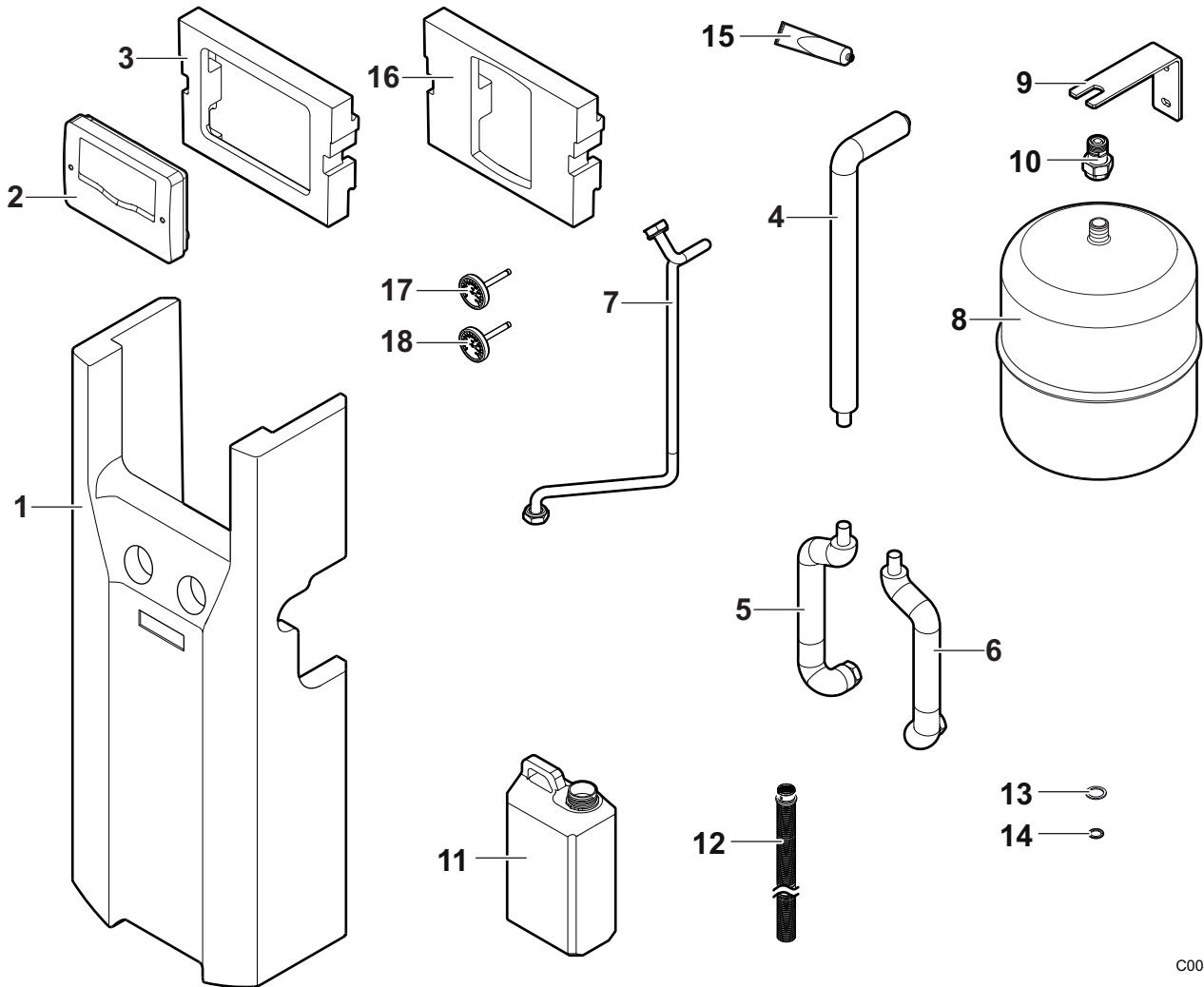
C004575-B

Markers	Reference	Description	200SE-2S	300SE-2S
1	97860646	Adjustable foot M10 x 35	x	x
2	200022499	Plug 3/4"	x	x
3	300026994	Insulation, buffer tank	x	x
4	300026735	Side cover	x	x
5	300026876	Side insulation	x	x
6	200021489	Domestic hot water thermostatic mixing valve	x	x
7	200021501	Inspection trap screws	x	x
8	300026031	EPDM seal	x	x

Markers	Reference	Description	200SE-2S	300SE-2S
9	89705511	7 mm gasket + 5 mm retainer ring	x	x
10	95014035	Seal ø 35 x 8.5 x 2	x	x
11	94974527	Nylon brace	x	x
12	89604901	Anode earthing wire	x	x
13	89708901	Complete anode diameter 33 mm - length 330 mm (1x) - For top trap	x	
13	89525511	Complete anode diameter 33 mm - length 290 mm (1x) - For top trap	x	x
13	89608950	Complete anode diameter 33 mm - length 420 mm (1x) - For top trap		x
14	89608950	Complete anode diameter 33 mm - length 420 mm (1x) - For side trap	x	x
15	7608649	Complete side trap with anode, gaskets and screws	x	x
16	200022433	Complete top inspection trap with anode and gasket	x	
16	200022466	Complete top inspection trap with anode and gasket		x
17	300010846	Solar sensor probe FKP6 lg 2.5 m	x	x
18	95365613	Contact spring for pocket	x	x
19	300027443	Cover for RAL9006 tank Diameter 605.5	x	x
20	97930801	Solar calorifier sensor FRP6 lg 2.5 m	x	x

8.2.2. Solar station

■ Overview

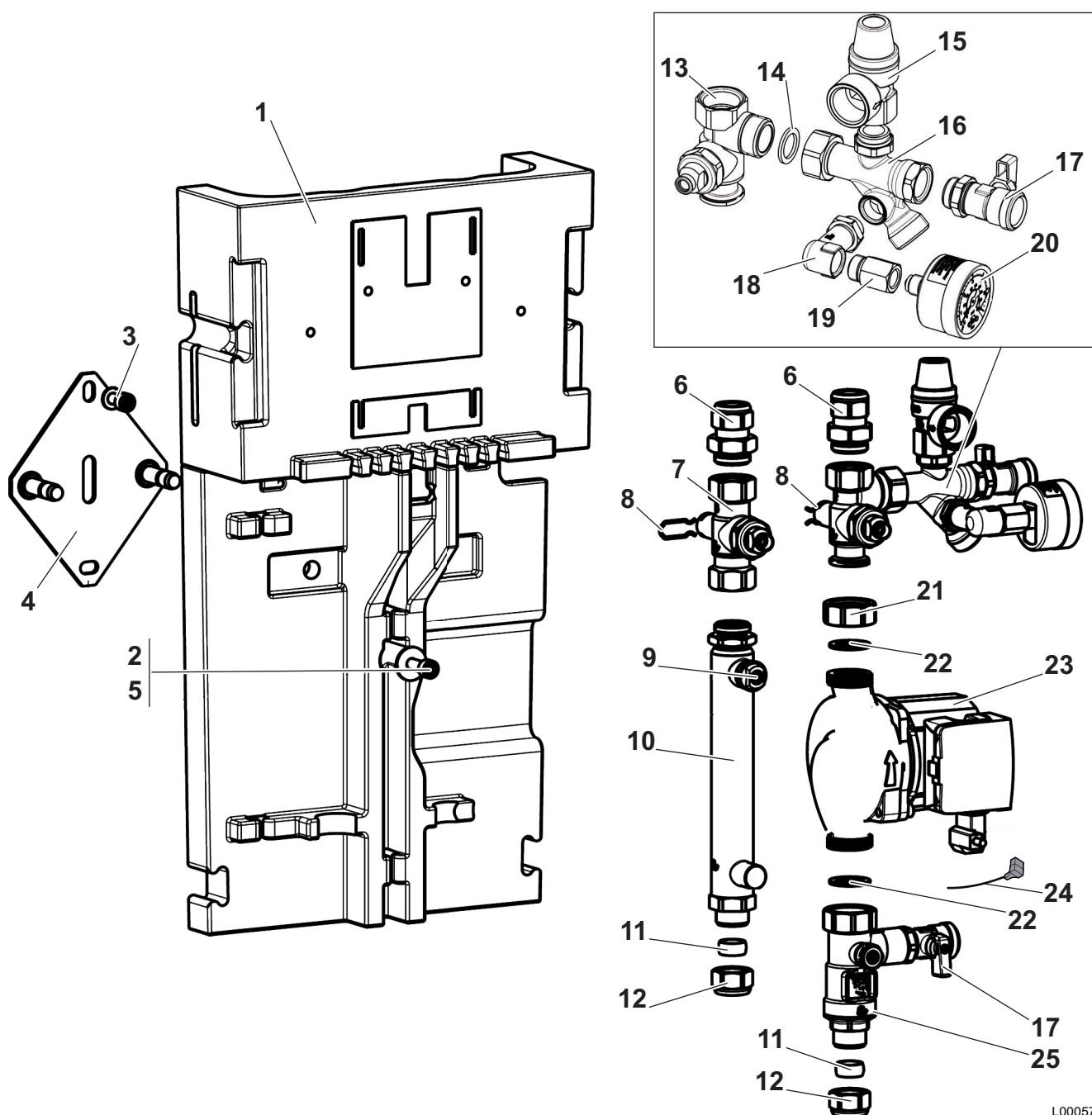


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Markers	Reference	Description
1	300027858	Medium cover
2	300027867	Sol AEL regulator
3	300027856	Control system support AEL
4	300027874	Insulated copper pipe - Top
5	300027873	Insulated copper pipe - Left
6	300027872	Insulated copper pipe - Right
7	300028300	Copper pipe - Expansion vessel connection
8	300027870	18-litre expansion vessel
9	300027869	Expansion vessel bracket
10	300027871	3/4" connection for expansion vessel
11	300019281	Glycol recovery drum - 2.5 litres
12	300018820	Ribbed flexible hose - Diameter 22 mm - Fittings 3/4" - Length 1700 mm
13	95013062	Green seal 30x21x2

Markers	Reference	Description
14	95013060	Green seal 24x17x2
15	97310700	Grease for O-ring
16	300027855	Control system support Ai
17	300027862	Red metal thermometer
18	300027938	Blue metal thermometer

■ Detailed drawing

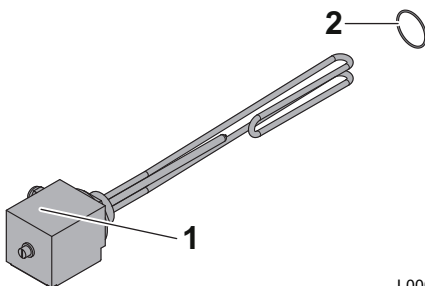


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Markers	Reference	Description
1	300028533	Back insulation module
2	300002992	Washer Ø 25x8.4x1.5
3	300028534	Screw M8x20

Markers	Reference	Description
4	300028535	Wall console
5	300028536	Screw M8x25
6	300028538	Cone union body retaining bush
7	300026341	Valve 3/4" FF Fixed valve pin
8	300019551	Locating pin
9	300004141	Bleeder valve stopper 3/8"
10	300028537	Degasser 3/4"
11	300028539	cone union body Ø 18.2x9 mm
12	300028540	Cone union body nut Ø 18 mm
13	300026332	Return tap
14	300022601	Seal ø 24x17x2 mm
15	97930837	6-bar safety valve
16	300026337	Connection body
17	300026343	Drain cock 1/2"
18	300028531	3/8" male/female elbow
19	300003218	Pressure gauge connection part
20	300028532	0-6 bar pressure gauge diameter 50 mm
21	300010046	1" nut
22	300010041	Seal ø 1/2"
23	300019797	Circulator ST15/6-130 6H
24	300010944	Circulating pump cable - 2 m
25	300028541	1/2" flow rate regulator - 0.5-15 litres/minute

8.2.3. Electric heating resistance



Markers	Reference	Description
1	100019163	Electric heating resistance 1.5 kW/230 V~
1	100019164	Electric heating resistance 2.3 kW/230 V~
2	300027886	Gasket 60x48x3

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