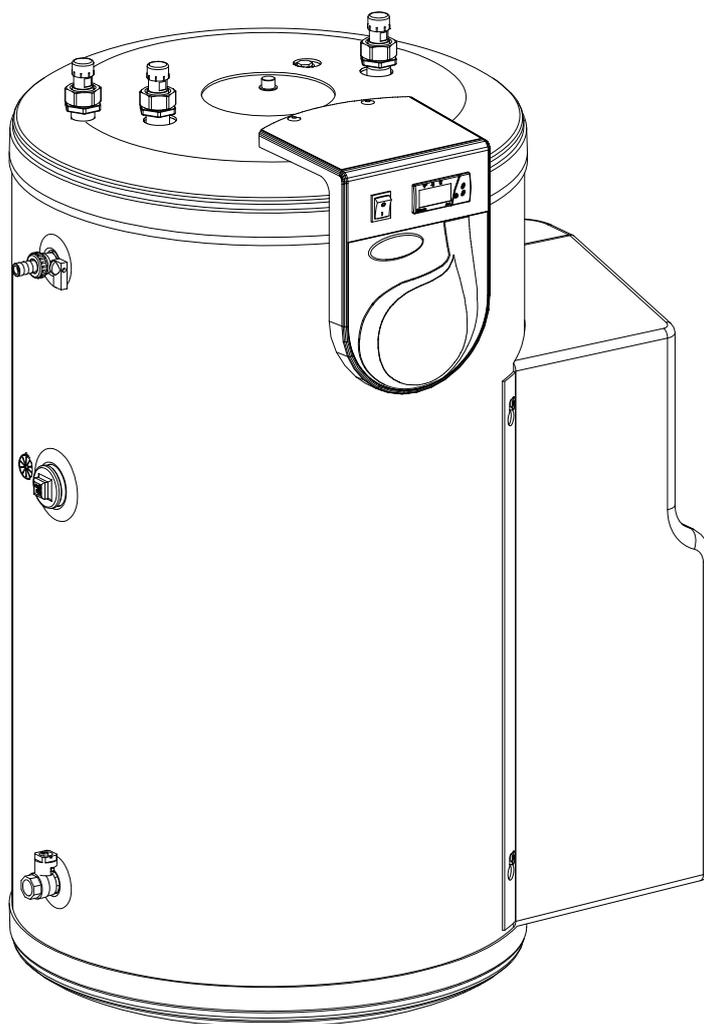


INSTALLATION AND OPERATING INSTRUCTIONS

- ↳ DS-matic H 1.15 / 1.15 Duo / PLUS 1.15 / PLUS 1.15 Duo
- ↳ DS-matic H 1.25 / 1.25 Duo / PLUS 1.25 / PLUS 1.25 Duo
- ↳ DS-matic H 2.25 / 2.25 Duo / PLUS 2.25 / PLUS 2.25 Duo



DOMUSA
T E K N I K

Thank you for choosing a **DOMUSA TEKNIK** product. From the range of **DOMUSA TEKNIK** products you have chosen the **DS-matic H** model, an automatic solar heating system for producing domestic hot water (DHW) with a double chamber.

This manual refers to the installation, operation and maintenance of the DS-matic H automatic solar heating system. It forms an essential part of the product and it must be given to the user. Read the warnings and recommendations in the manual carefully, as they contain important information on the safety of the installation and its use and maintenance.

These systems are to be installed by skilled personnel only, in accordance with the legislation in force and following the manufacturer's instructions.

The start-up of these boilers and any maintenance operations must only be carried out by **DOMUSA TEKNIK** is Authorised Technical Assistance Services.

Incorrect installation of these systems could result in damage to people, animals or property, and the manufacturer will hold no liability in such cases.

DOMUSA TEKNIK informs all parties concerned that, in compliance with section 1 of the first additional provision of Law 11/1997, the responsibility for delivering packaging waste or used packaging for its proper environmental management will be that of the final owner of the product (Article 18.1 Royal Decree 782/1998). At the end of its useful life, the product must be taken to a selected collection point for electrical and electronic equipment or must be returned to the distributor at the time of purchasing a new equivalent appliance. For more detailed information on the collection schemes available, contact either the collection facilities of the local authority or the distributor where the purchase was made.

USER GUIDE

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DS-matic H

1 SAFETY COMPONENTS

The DS-matic Hs are equipped with two safety valves. The solar circuit safety valve is calibrated to 0.3 MPa and the DHW valve to 0.7 MPa (this valve is optional and it is included with KIT M). The valves prevent overpressure in the two circuits by discharging the liquid as required when the pressure exceeds the calibrated values.

The solar power unit is already adjusted by default on supply, so no adjustment is necessary.

2 LOCATION

It is very important to choose a correct location for the solar collectors, as an unsuitable location can reduce the system's efficiency: wrong orientation, shadows cast on the solar collector, etc.

DOMUSA TEKNIK recommends taking the following indications into account when choosing a location:

1. Before choosing the location, the accessibility of the site must be taken into account, with a view to both the installation itself and for maintenance work on the solar collectors.
2. The solar collectors **must face South**. A difference of up to 10°-15° is not significant, but a greater difference could considerably effect their efficiency.
3. Ideally, the solar collectors should be installed at an angle of 45° from the horizon line (in countries at a latitude of 40°). In general, the inclination should be 5° greater than the latitude of the location. Any difference from this angle will reduce their efficiency.
4. **For models with built-in supports, the minimum slope must be 27° (51%).**
5. **The solar collectors must be levelled for installation, with the upper part horizontal.**
6. The weight of the full hot water tank must be taken into account when choosing a location.
7. The premises the hot water tank is to be installed on must be protected from the weather and any risk of freezing. The location must be free from dust or a corrosive atmosphere.
8. The hot water tank must be installed as close as possible to the solar collectors and the domestic hot water consumption point, to reduce heat loss from the pipes. The minimum and maximum distances indicated below must be observed.
9. A free height of 500mm must be left above the hot water tank so that maintenance work can be carried out.
10. The maximum snow load (sk) and main wind speed (vm) values the solar collector-support unit can withstand with the sloping roof supports are sk = 0.66 and vm = 1.75, and so the system may only be installed in areas with values lower than these.

When installing the solar collectors, ensure that no objects cast shadow on them, particularly in winter, when the sun is lower in the sky. The minimum distance from an obstacle the solar collectors can be installed at depends on the height of the obstacle and the latitude of the place of installation, as shown in the table below:

	Latitude 40°	Latitude 45°	Latitude 50°
Calculation of X	Y x 2	Y x 2,25	Y x 2,5

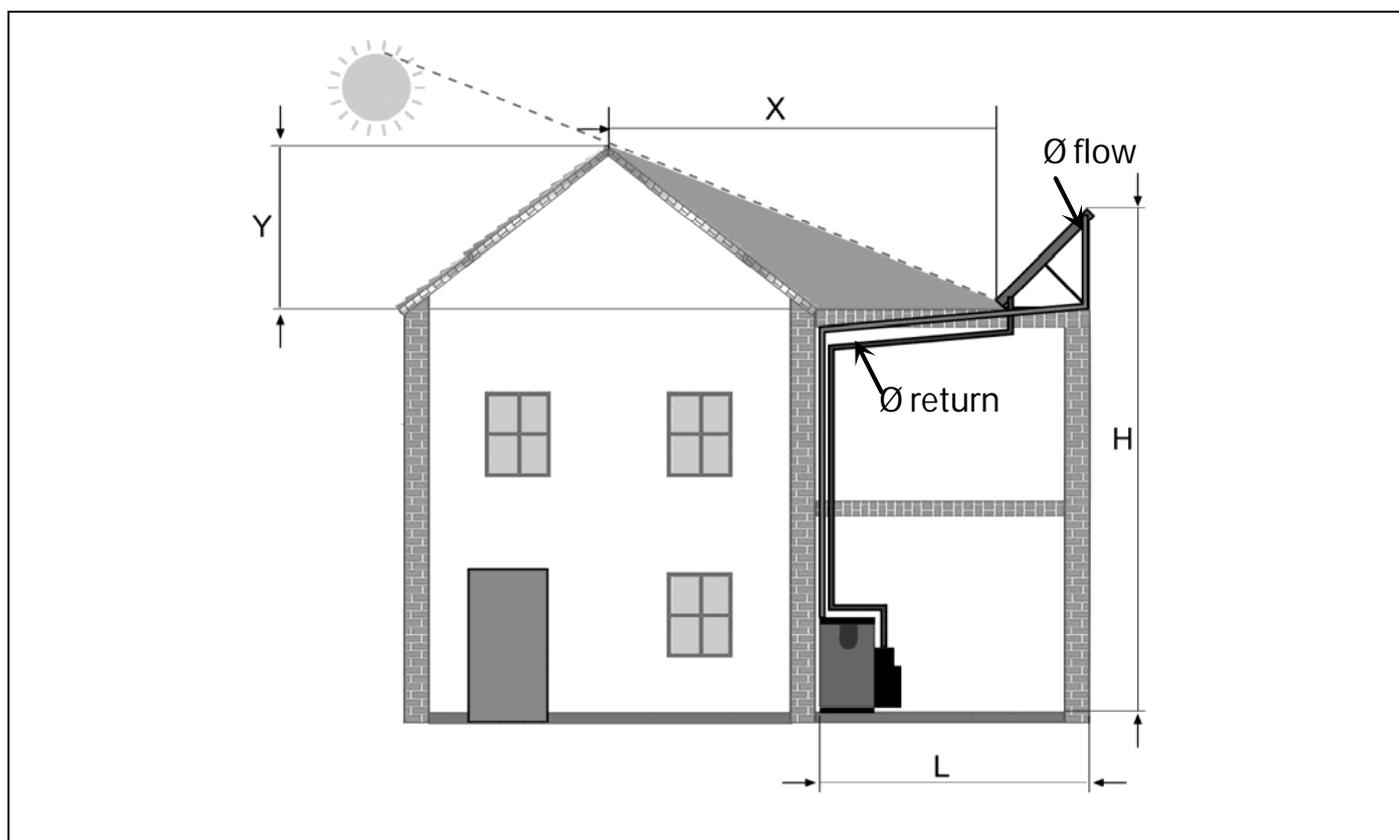


Figure 1

When making the hydraulic connection between the solar collectors and the hot water tank, the following limitations must be taken into account:

	Min. height (H)	Max. height (H)*	Max. horizontal length (flow+return)	Maximum length	Minimum slope	Diameter solar pipe
DS-matic H1.15	3m.	10 m.	20 m.	35 m.	4%	10/12 mm.
DS-matic H 1.25						
DS-matic H 2.25						
DS-matic H PLUS 1.15	3m.	15 m.	20 m.	40 m.	4%	10/12 mm.
DS-matic H PLUS 1.25						
DS-matic H PLUS 2.25						

! The DS-MATIC Hs are specially designed to function with a 12 mm connection tube (external) between the accumulator and the solar collectors. If other tube diameters are used it cannot be guaranteed to work properly, and there may also be risk of noise on functioning.

DS-matic H

DOMUSA TEKNIK supplies tubes with insulation and a cable for the sensor, together with the connectors for making the connections to the collectors and the accumulator.

3 SOLAR POWER UNIT

3.1 Models

There are two families of hot water tank, depending on the type of power unit: DS-matic H and DS-matic H Duo.

DS-MATIC H

The power unit of the DS-matic H models is designed for controlling the solar pumps only. It is equipped with two sensor inputs for this purpose - the collector sensor input and the hot water tank sensor input - and two outputs for the solar pumps. The power unit activates or deactivates the pumps depending on the parameters programmed.

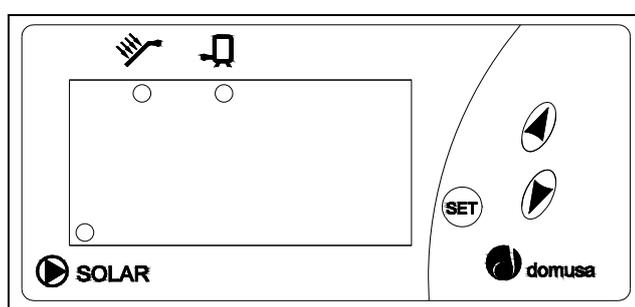


Figure 2

	Collector sensor LED
	Hot water tank sensor LED
	Solar pump LED

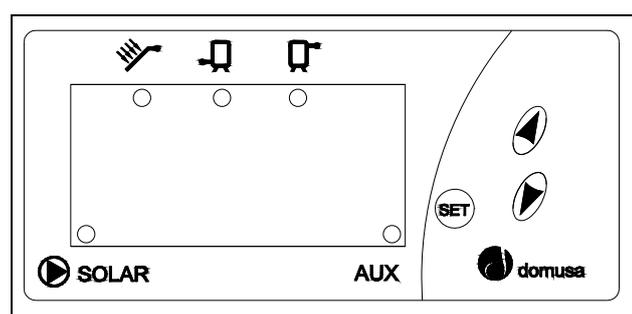
DS-MATIC H DUO

This power unit is designed to control a heating-only boiler as a back-up power supply for the DS-matic H Duo range. Apart from all the DS-matic H power unit inputs and outputs, it therefore has another input for the sensor on the upper part of the hot water tank (for measuring the temperature of the water heated by the boiler) and another switched output for the boiler.

The connection of the sensor to the upper part of the hot water tank is different depending on whether the back-up boiler has an input for a thermostat or an electronic sensor. Follow the instructions in point 7.5.1 Electrical diagram for this purpose (see page 46).

	Collector sensor LED
	Lower hot water tank sensor LED
	Upper hot water tank sensor LED
	Solar pump LED
AUX	Auxiliary pump LED

Figure 3



3.2 Display and control panel

The power units have three buttons. The purpose of each button is as follows:

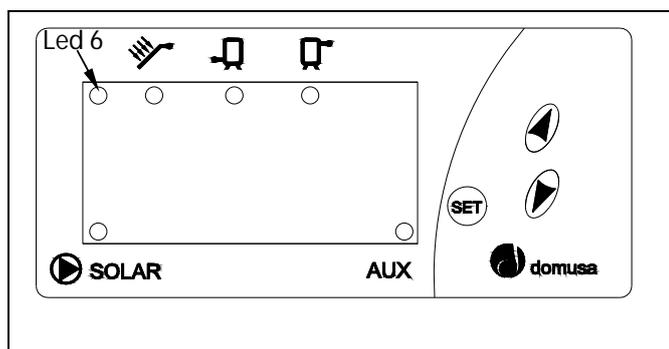


Figure 4

BUTTON	FUNCTION
	For scrolling up the menu and increasing the value displayed.
	For scrolling back down the menu and reducing the value displayed.
	For entering the basic parameter menu and programming the value displayed.
	For entering the advanced adjustment parameter menu.
	For exiting to the main display.

The power units also have 6 LEDs providing information on the sensors and the pump functioning mode.

LED	ON	FLASHING
	The temperature of the solar collector is displayed.	Solar collector sensor error. Text: Er 1
	The temperature of the lower part of the hot water tank is displayed.	Lower hot water tank sensor error. Text: Er 2
	The temperature of the upper part of the hot water tank is displayed.	Upper hot water tank sensor error. Text: Er 3
	Solar pumps activated	90%OFF - 10%ON: Solar pumps deactivated manually. 90%ON - 10%OFF: Solar pumps activated manually.
Led 6		90%ON - 10%OFF: Solar pumps activated at 100% PWM manually. 100%OFF: Solar pumps activated to "rub" manually.
AUX	Auxiliar pump activated	90%ON - 10%OFF: Auxiliar pump activated manually. 10%ON - 90%OFF: Auxiliar pump deactivated manually.

3.3 Equipment

The solar power unit is equipment with different sensors, according to the model. The different types of sensor depend on the hot water tank volume and on whether it is a DS-matic H or a DS-matic H Duo model.

	DS-matic H 1.15 DS-matic H PLUS 1.15	DS-matic H 1.25 / 2.25 DS-matic H PLUS 1.25 / 2.25	DS-matic H 1.15 Duo DS-matic H PLUS 1.15 Duo	DS-matic H 1.25 / 2.25 Duo DS-matic H PLUS 1.25 / 2.25 Duo
SENSORS	1 x CELC000285 (solar) 1xCELC000234 (DHW)	1 x CELC000285 (solar) 1 x CELC000211 (DHW)	1 x CELC000285 (solar) 2 x CELC000234 (DHW)	1 x CELC000285 (solar) 1 x CELC000211(DHW) 1 x CELC000234 (DHW)

!IMPORTANT:

DS-matic H

CHECK THE COMPATIBILITY OF THE SENSORS SUPPLIED BEFORE CONNECTING THEM TO A BOILER.

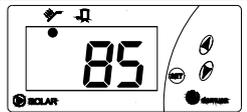
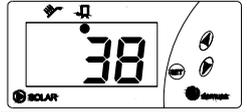
3.4 Parameters

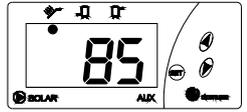
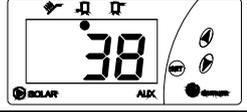
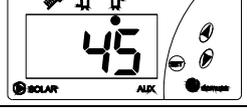
The system is supplied with all its power unit parameters adjusted for maximum efficiency, so none of the parameters need adjusting. There follows a description of all the power unit parameters.

3.4.1 Display parameters

The display parameters are for information purposes only, i.e. they provide data on the temperatures.

There follows a list of display parameters for each of the solar power units.

DISPLAY PARAMETERS FOR DS-MATIC H POWER UNITS		
Display	Function	Range
	Indicates the current temperature of the collector.	-50-150°C
	Indicates the current temperature of the hot water tank.	-50-150°C

DISPLAY PARAMETERS FOR DS-MATIC H DUO POWER UNITS		
Display	Function	Range
	Indicates the current temperature of the collector.	-50-150°C
	Indicates the current temperature of the hot water tank.	-50-150°C
	Indicates the current temperature of the collector.	-50-150°C

3.4.2 Adjustment parameters

The adjustment parameters regulate the functioning of the hot water tank. These parameters can be adjusted to change the way the system functions, adjusting them to each particular user's needs.

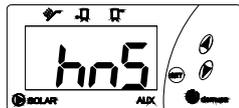
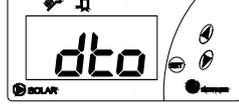
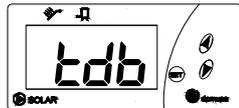
There are two types of adjustment parameters: the basic parameters, which affect the hot water tank setpoint temperatures, and the advanced parameters, for adjusting the functioning of the system.

The system is supplied with all the parameters programmed for optimum functioning, so none of the values need to be adjusted.

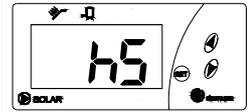
As is the case with the display parameters, the adjustment parameters are also different on the DS-matic H and the DS-matic H Duo models, and the adjustment parameters are therefore shown for each type of power unit.

Adjustment parameters for DS-matic H power units

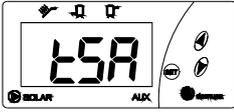
BASIC ADJUSTMENT PARAMETERS FOR DS-MATIC H POWER UNITS			
Display	Function	Range	Options
	Hot water tank setpoint temperature with solar energy input.	2...95°C Adjustment: 60°C	

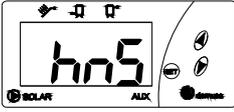
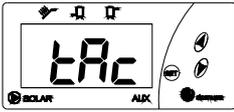
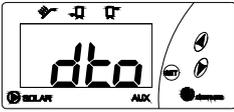
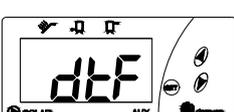
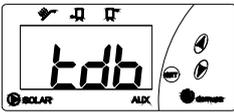
ADVANCED ADJUSTMENT PARAMETERS FOR DS-MATIC H POWER UNITS			
Display	Function	Range	Options
	Solar pump operating mode (relay 1 and 2).	0...3 Adjustment: 0	0: Pumps in automatic mode. 1: Pumps always off. 2: Pumps always on. 3: Pumps activated at the speed set in parameter "rub".
	Hot water tank setpoint temperature with solar energy input.	2...95°C Adjustment: 60°C	
	Switch-on temperature difference.	dtF+1...21°C Adjustment: 6K	The temperature difference between the solar collector and the hot water tank must exceed this value for the solar pumps to start up automatically.
	Switch-off temperature difference.	1...dtO-1°C Adjustment: 4K	When the temperature difference between the solar collector and the hot water tank is below this value and the pumps are running automatically, the solar heating circuit pumps switch off.
	Minimum temperature of solar collector.	-10...90°C Adjustment: 10°C	The temperature of the solar collector must exceed this value for the solar pumps to start up automatically.
	Upper pump switch-off time.	OFF, 5...30min Adjustment: 15min	When this time elapses with the two solar pumps running in automatic mode, the PWM signal is set as defined in the parameter "rub".
	Speed regulation of the solar pump.	15...100% Units: 1% Adjustment: 70%	Percentage of pump operation for the correct regulation of the flow.
	Solar collectors cooling	0...1 Adjustment: 0	0: Function off. 1: If the collector temperature raises to 140 °C, the solar pumps remain activated until collector temperature is less than 90 °C. If the store temperature is higher than hot water tank setpoint temperature (tSA) and the collector temperature is lower by 5 °C than the store temperature, the solar system remains activated until the store is again cooled down by the

DS-matic H

ADVANCED ADJUSTMENT PARAMETERS FOR DS-MATIC H POWER UNITS			
Display	Function	Range	Options
			hot water tank setpoint.
	Access code.	0...255 Adjustment: 0	This code must be entered to view and/or change the advanced adjustment parameters.

Adjustment parameters for DS-matic H Duo power units

BASIC ADJUSTMENT PARAMETERS FOR DS-MATIC H DUO POWER UNITS			
Display	Function	Range	Options
	Hot water tank setpoint temperature with solar energy input.	1...95°C Adjustment: 60°C	Minimum value: $tRc + 1^{\circ}\text{C}$
	Hot water tank setpoint temperature with auxiliary energy input.	0...94°C Adjustment: 45°C	Maximum value: $tSA - 1^{\circ}\text{C}$

ADVANCED ADJUSTMENT PARAMETERS FOR DS-MATIC H DUO POWER UNITS			
Display	Function	Range	Options
	Solar pump operating mode (relay 1 and 2).	0...3 Adjustment: 0	0: Pumps in automatic mode. 1: Pumps always off. 2: Pumps always on. 3: Pumps activated at the speed set in parameter "rub".
	Hot water tank setpoint temperature with solar energy input.	1...95°C Adjustment: 60°C	Minimum value: $tRc + 1^{\circ}\text{C}$
	Hot water tank setpoint temperature with auxiliary energy input.	0...94°C Adjustment: 45°C	Maximum value: $tSA - 1^{\circ}\text{C}$
	Switch-on temperature difference.	$dtF + 1...21^{\circ}\text{C}$ Adjustment: 6K	The temperature difference between the solar collector and the hot water tank must exceed this value for the solar pumps to start up automatically.
	Switch-off temperature difference.	$1...dtC - 1^{\circ}\text{C}$ Adjustment: 4K	When the temperature difference between the solar collector and the hot water tank is below this value and the pumps are running in automatic mode, the solar heating circuit pumps switch off.
	Minimum temperature of the solar collector.	-10...90°C Adjustment: 10°C	The temperature of the solar collector must exceed this value for the solar pumps to start up automatically.
	Relay 3 operating mode.	Aut - on - OFF Adjustment: Aut.	Aut: Relay 3 in automatic mode. on: Relay 3 always in NC position. OFF: Relay 3 always in NO position.
	Upper pump switch-off time.	OFF, 5...30min Adjustment: 15min	When this time elapses with the two solar pumps running in automatic mode, the PWM signal is set as defined in the parameter "rub".
	Speed regulation of the solar pump.	15...100% Units: 1% Adjustment: 70%	Percentage of pump operation for the correct regulation of the flow.

DS-matic H

ADVANCED ADJUSTMENT PARAMETERS FOR DS-MATIC H DUO POWER UNITS			
Display	Function	Range	Options
<p>The display shows 'FEC' in large digits. Above the digits are three small icons: a sun, a square with a diagonal line, and a square with a circle. Below the digits are the labels 'SOLAR' and 'AUX'.</p>	Solar collectors cooling	0...1 Adjustment: 0	0: Function off. 1: If the collector temperature raises to 140 °C, the solar pumps remain activated until collector temperature is less than 90 °C. If the store temperature is higher than hot water tank setpoint temperature (<i>E5A</i>) and the collector temperature is lower by 5 °C than the store temperature, the solar system remains activated until the store is again cooled down by the hot water tank setpoint.
<p>The display shows 'H0' in large digits. Above the digits are three small icons: a sun, a square with a diagonal line, and a square with a circle. Below the digits are the labels 'SOLAR' and 'AUX'.</p>	Software configuration.	0...1 Adjustment: 0	0: For installations with the upper hot water tank sensor connected on the power unit. 1: For installations where the upper hot water tank sensor is not connected on the power unit.
<p>The display shows 'H5' in large digits. Above the digits are three small icons: a sun, a square with a diagonal line, and a square with a circle. Below the digits are the labels 'SOLAR' and 'AUX'.</p>	Access code.	0...255 Adjustment: 0	This code must be entered to view and/or change the advanced adjustment parameters.

3.5 Display and adjustments

All the power unit functions are controlled by three buttons to the right of the display. There follows a description of the procedure for viewing the temperatures and adjusting the basic and advanced parameters.

3.5.1 Temperature display

The temperatures of the sensors installed are displayed on the main screen. To go from one sensor to another, press the  and  buttons. Those displayed on a grey background are visible on all the power units, and those with a white background are only displayed on the DS-matic H Duo models.

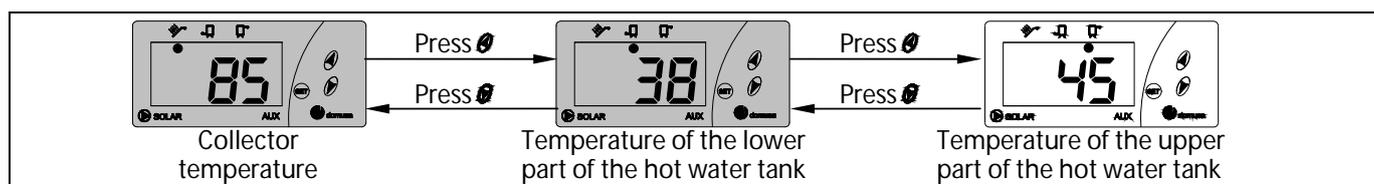


Figure 5

3.5.2 Configuring the basic adjustment parameters

The basic adjustment parameters are used for regulating the desired DHW temperature. On DS-matic H models only one temperature is adjusted, while on DS-matic H Duo both the temperature of the upper part (heated using auxiliary energy) and that of the lower part (heated using solar energy) can be adjusted. The procedure for adjusting these parameters is as follows:

- 1- Press the SET button. The parameter *LSA* .
- 2- Select the desired parameter using the  and  buttons.
- 3- Press the SET button again. The value programmed on the selected parameter will be displayed.
- 4- Change the programmed value using the  and  buttons.
- 5- Press the SET button again to store the value displayed.
- 6- Press the SET buttons and  simultaneously to exit to the main display (the buttons can be pressed regardless of the parameter displayed).

A flow diagram of the basic adjustment parameters is shown below. Those displayed on a grey background are visible on all the power units, and those with a white background are only displayed on the DS-matic H Duo models.

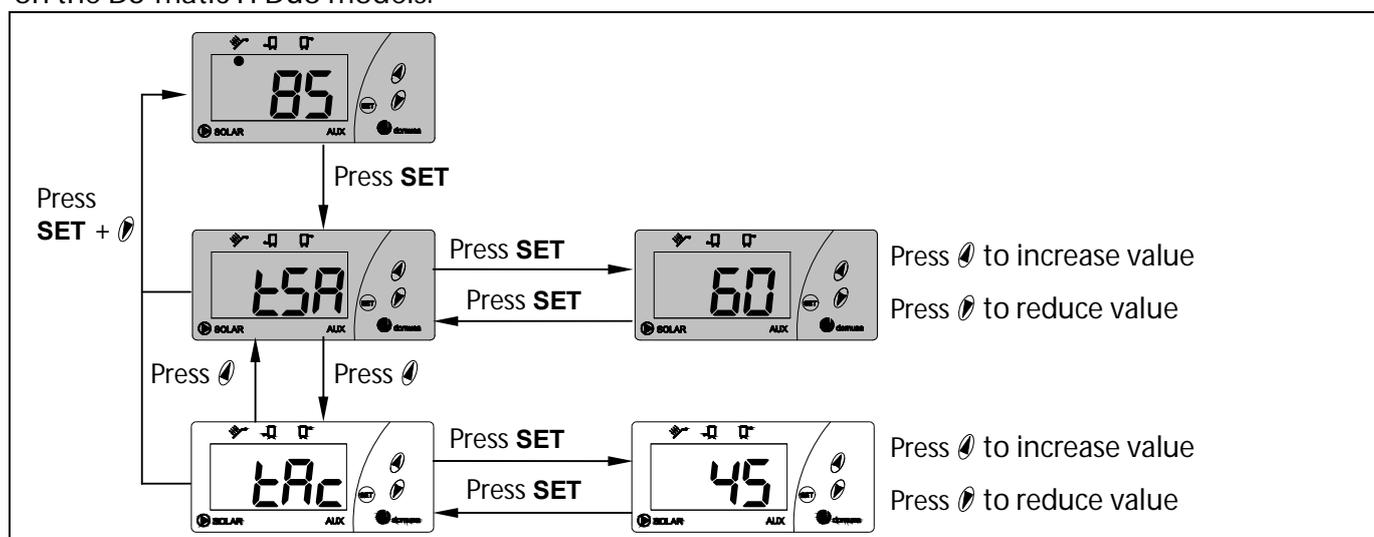


Figure 6

DS-matic H

! IMPORTANT: THE DISPLAYS WITH A WHITE BACKGROUND ONLY APPEAR ON THE DS-MATIC H DUO MODELS.

3.5.3 Configuring the advanced adjustment parameters

The advanced adjustment parameters are used for regulating the functioning of the DS-matic H models. The system is supplied with all the parameters programmed for optimum functioning, so none of the values need to be adjusted. The procedure for adjusting these parameters is as follows.

- 1- Press the SET button and hold it down for 8 seconds. The value 0 will appear on the display.
- 2- Select the access code (0 by default) using the  and  buttons and press the SET button. The parameter *h05*.
- 2- Select the desired parameter using the  and  buttons.
- 3- Press the SET button again. The value programmed on the selected parameter will appear on the display.
- 4- Change the value programmed using the  and  buttons.
- 5- Press the SET button again to store the value displayed.
- 6- Repeat steps 2 - 5 for the parameters you wish to change.
- 7- Press the SET and  buttons simultaneously to exit to the main display (the buttons can be pressed regardless of the parameter displayed).

A flow diagram for the advanced adjustment parameters is shown below. As for the other parameters, those displayed on a grey background are visible on all the power units, and those with a white background are only displayed on the DS-matic H Duo models.

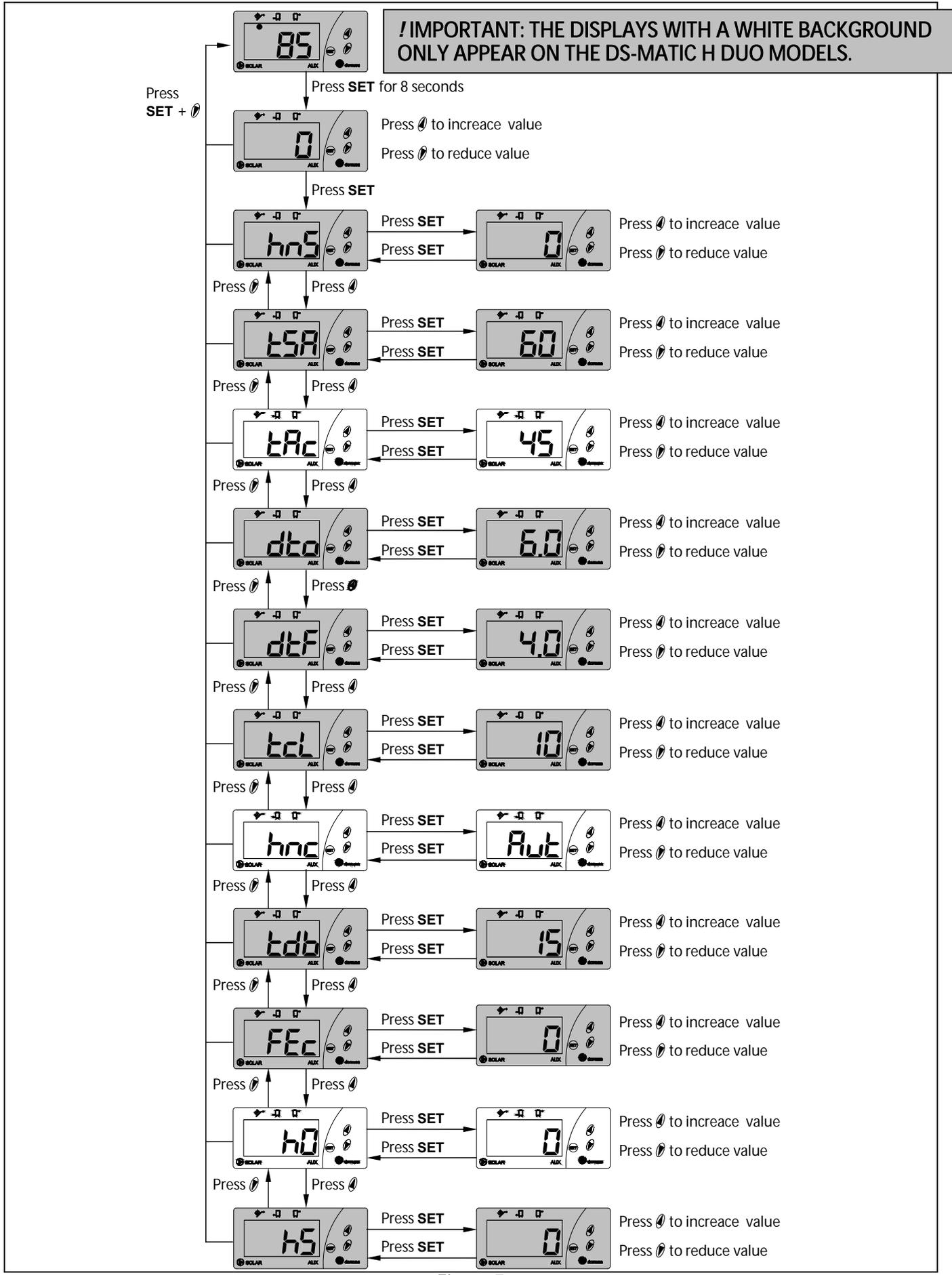


Figure 7

DS-matic H

4 STARTING UP THE INSTALLATION

Before starting up the installation, ensure the safety valves and the safety unit (if the installation has one) are working correctly, and check that the accumulator and the solar circuit have been filled following the instructions provided in point 8 of the instructions booklet.

5 FROST PROTECTION

The DS-matic H pumps are deactivated when the temperature difference between the collector and the accumulator is less than the value programmed (4°C by default). This means the liquid in the solar heating circuit flows down from the solar collectors to the accumulator and there is no risk of it freezing.

In any case, to prevent risk in case of incomplete draining, DOMUSA TEKNIK supplies an inhibitor liquid, which in addition to protecting the different components of the installation from corrosion, also serves as an anti-freeze. DOMUSA TEKNIK inhibitor liquid has a resistance and heat transmission making it suitable for use in solar installations. DOMUSA TEKNIK recommends using a minimum concentration of 30% inhibitor liquid.

**! IMPORTANT:
THE INHIBITOR LIQUID MUST ALWAYS BE MIXED WITH WATER BEFORE USE, AS OTHERWISE IT
COULD DAMAGE THE INSTALLATION.**

**! IMPORTANT:
DOMUSA TEKNIK WILL ONLY BE LIABLE FOR THE CORRECT FUNCTIONING OF THE SYSTEM IF IT HAS
BEEN FILLED WITH DOMUSA TEKNIK INHIBITOR LIQUID.**

6 DRAINING THE SOLAR CIRCUIT

If the solar circuit needs draining, the procedure is as follows:

1. Connect a hose to the filling/emptying valve and another hose to the level valve, and run them to a drain.
2. Run the hoses to a suitable container.
3. Open the filling/emptying valve and the level valve.
4. Completely drain the solar heating circuit (see table below).
5. Disconnect the hoses used.

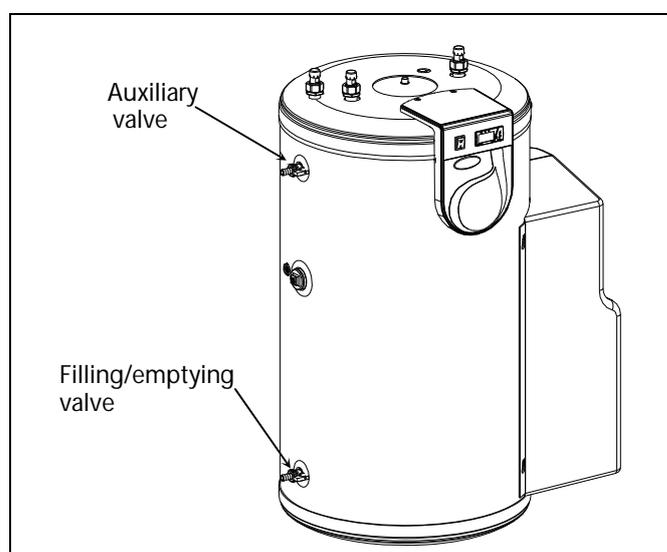


Figure 8

	DS-matic H 1.15 - 1.15 Duo PLUS 1.15 , PLUS 1.15 Duo	DS-matic H 1.25 - 2.25 PLUS 1.25 - 2.25	DS-matic H 1.25 - 2.25 Duo PLUS 1.25 - 2.25 Duo
Solar circuit volume	28 L	48 L	43 L

DS-matic H

7 SWITCHING OFF THE UNIT

If you wish to deactivate the unit, adjust the h_{n5} parameter to value 1, so that the pumps are permanently deactivated.

In case of prolonged absence, apart from deactivating the pumps (or disconnecting the unit from the electricity supply) you should also drain the accumulator primary circuit, following the instructions given in the previous point.

8 MAINTENANCE

Maintenance must only be carried out by qualified staff. All work carried out on the system must be done by the Official Technical Assistance Service, as changing the configuration could cause functioning errors and damage to the system and its surrounding environment.

8.1 Maintenance work

The table below shows a list of recommended maintenance work.

	Interval de maintenance
Hot water tank	
Check the connections are correctly sealed ¹	Yearly
Check the correct functioning of the safety valve	Yearly
Collector	
Check the state of the collectors: dirt, dents, connections, supports and levelling of the collectors ²	Yearly
Regulation	
Check the sensors are working correctly ³	Yearly
Check the power unit adjustment channels ⁴	Yearly
Check the pump is working correctly on automatic and manual (on/off) ⁵	Yearly
Check the mixing valve is working correctly, if the system has one ⁶	Yearly
Solar circuit	
Check the filling level of the solar liquid ⁷	Yearly
Renew the solar liquid with a concentration of at least 30% of the inhibitor liquid	At least once every 3 years.
Check the plates are self-draining ⁸	Yearly
Pipes	
Check the state of the insulation ⁹	Yearly
Check the installation is correctly sealed ¹⁰	Yearly

¹ Check the connections are correctly sealed

With the circulation pump running (see point ¡Error! No se encuentra el origen de la referencia. of the Installation guide), visually check the accumulator connections.

² Check the state of the collectors

Visually check the state of the collectors (dirt, dents, connections, etc.) and rectify any anomalies found.

³ Check the sensors are working correctly

Check that the temperatures indicated by the power unit coincide with the real temperature.

⁴ Check the power unit adjustment parameters

Check that the parameters are correctly adjusted (see point 2.2 of User guide).

⁵ Check the pump is working correctly in automatic and manual mode (on/off)

Programme the *hr5* parameter in all its configurations, checking the pumps are working correctly for each of the configurations.

⁶ Check the mixing valve is working correctly, if the unit has one

Check the water is coming out at the temperature calibrated on the mixing valve.

⁷ Check the solar liquid filling level

Open the level valve. If no water comes out, fill the solar circuit following the instructions in point **¡Error! No se encuentra el origen de la referencia.** of Intallation guide. If you fill the solar circuit, ensure a minimum concentration of 30% of inhibitor liquid.

⁸ Check the plates are self-draining

Set the pumps running (see point **¡Error! No se encuentra el origen de la referencia.** of Intallation guide), ensure the water is returning to the hot water tank and then disconnect the pumps. When 15 minutes have elapsed, remove the connection of the tubes with the solar collectors and check no water is coming out of the collectors.

⁹ Check the state of the insulation

Visually check the state of the insulation.

¹⁰ Check the installation is correctly sealed

With the circulating pump running (see point **¡Error! No se encuentra el origen de la referencia.** of Intallation guide), visually check the system connections.

DS-matic H

9 TECHNICAL DATA

	DS-matic H		DS-matic H		DS-matic H	
	1.15	1.15 Duo	1.25	1.25 Duo	2.25	2.25 Duo
Hot water tank						
Volume	150 litres		250 litres			
Insulation	Polyuréthane expansé					
External diameter	581 mm					
Width	747,5 mm					
Depth	581 mm					
Height	1028 mm		1628 mm			
Weight of empty hot water tank	84 Kg		113 Kg			
Weight of full hot water tank	234 Kg		363 Kg			
Type of solar liquid	Mélange glycol-eau					
L/hour*	250		416			

* This data is for a full accumulator at 60°C. The data may vary depending on the solar radiation on each particular day.

	1.15	1.15 Duo	1.25	1.25 Duo	2.25	2.25 Duo
Solar exchanger						
Exchanger area		1,3 m ²	2,1 m ²	1,9 m ²	2,1 m ²	1,9 m ²
Liquide volume		28 L	48 L	43 L	48 L	43 L
Max. liquide temperature	110°C					
Auxiliar exchanger						
Exchanger area	---	0.38 m ²	---	0.7 m ²	---	0.7 m ²
Max. liquide temperature	90°C					
DHW heated volume	---	55 L	---	84 L	---	84 L

	DS-matic H		DS-matic H PLUS	
Electrical consume with pumps activated	58 watt/h		108 watt/h	
Electrical consume with pumps and power unit in 2000h	116 kW		216 kW	

	1.15	1.15 Duo	1.25	1.25 Duo	2.25	2.25 Duo
Electrical element						
Voltage	230 V - 50 Hz					
Power	1.5 kW		2.5kW			
DHW heated volume	45 L	40 L	76 L	56 L	76 L	56 L
Power unit						
Sensor wire diameter	0,75 mm ²					
Min. power cable wire diameter	1,5 mm ² (1,5 kW) - 2 mm ² (2,5 kW) - 2,5 mm ² (3,5 kW)					
Voltage	230V - 50Hz					

	SOLAR COLLECTOR					
	DS-matic H		DS-matic H		DS-matic H	
	1.15	1.15 Duo	1.25	1.25 Duo	2.25	2.25 Duo
Absorption surface	2.26 m ²				2 x 2.26 m ²	
Width	1246 mm					
Height	2046 mm					
Depth	90 mm					
Weight of empty collector	53 Kg					
Weight of full collector	54,88 Kg					

10 GUARANTEE CONDITIONS

DOMUSA TEKNIK's **commercial guarantee**^(*) covers the regular functioning of the products manufactured by DOMUSA Calefacción S.Coop., in accordance with the following conditions and periods:

1. This **commercial guarantee**^(*) is valid for the following periods, as from the **start-up** date:

8 Years for domestic hot water tanks.

8 Years for solar collectors.

2 Years for electrical and hydraulic elements, pumps, valves, supports, etc.

During the 2-year period following the start-up date, DOMUSA TEKNIK will carry out any repairs of original flaws or defects totally free of charge.

After these 2 years have elapsed, until the end of the guarantee period, labour costs and call-out charges will be payable by the user.

2. The annual overhaul is not included in the terms of this guarantee.

3. Sufficient access must be provided for the maintenance and repair of the solar collectors. Costs arising from defective access will not be included in the terms of this guarantee.

4. The **start-up** and **annual overhaul** are to be carried out by personnel authorised by DOMUSA TEKNIK.

5. The **commercial guarantee**^(*) will be null and void in the following cases:

- If the **annual overhaul** by personnel authorised by DOMUSA TEKNIK has not been carried out.
- If the system has not been installed in accordance with the applicable laws and regulations concerning this type of appliance.
- If the boiler has not been started up immediately after its installation, by staff authorised by DOMUSA TEKNIK.
- If the inhibitor liquid is not replaced with the frequencies and under the maintenance conditions indicated in this manual.

Breakage of glass, electrical elements and anodes, failures arising due to misuse or incorrect installation, use of non-suitable power, supply with water with physical or chemical properties causing incrustation or corrosion, failure due to excessive pressure in the water network, failure due to frost, incorrect handling of the appliance and, in general, for any reason beyond DOMUSA TEKNIK's control, are excluded from this guarantee.

This guarantee does not affect the consumer's rights as stipulated by law.

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DS-matic H

1 DOCUMENTATION

DOMUSA TEKNIK provides a document describing the use and installation of the DS-matic H with the documentation for installing the solar collector supports.

The user must be given all the documentation so that it is available when required.

2 SAFETY GUIDELINES

The system must be installed by qualified staff in compliance with applicable regulations.

Any work on the system must be carried out by the official Technical Assistance Service, as any changes to its configuration could cause functioning errors and could damage the system and its surrounding environment.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use if the appliance in a safe way and understand the hazards involve. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

The electrical main power supply connection must respect the current legislation, making possible a complete disconnection of the tank, in order to make any maintenance operation safely. Look "Electrical connection" chapter.

To prevent risk of overvoltage, the solar circuit is to be earthed using a 16 mm² copper cable.

2.1 Hot water tank

The DS-matic H tank is prepared to be permanently connected to domestic water supply network, by means of DHW inlet. The maximum pressure admitted is specified in "Technical data" chapter.

To prevent overpressure caused by heating the domestic hot water, a safety valve calibrated to 0,7 MPa must be fitted, for which purpose the S200 hydraulic kit with dielectric sleeves, DHW expansion vessel and safety unit has been developed.

In some geographical areas, the domestic cold water inlet pressure can exceed 500 kPa, and it is therefore recommended to install a pressure reducer at the cold water inlet.

In order to prevent risk of burns and flooding it is compulsory to connect all safety valves to a drainage system. The evacuation piping must be opened to the atmosphere. Follow the instructions detailed in "Maintenance" chapter to ensure the correct functioning of the tank.

Follow the instructions detailed in the "Water draining of the tank" chapter to empty the tank.

2.2 Inhibitor liquid

The data below refer to the inhibitor liquid supplied by DOMUSA TEKNIK. Although the liquid is unalterable if it is stored in hermetically-sealed containers, the liquid used should be changed in accordance with the maintenance plan (see point 11 of Installation guide).

2.2.1 Product and company names

Product name: Inhibitor liquid

Supplier data: DOMUSA calefacción, S.Coop.

B° San Esteban s/n
20737 – Errezil, Spain
Tel: 943 813 899; Fax: 943 815 666
In case of emergency, call the nearest toxicology centre.

2.2.2 Composition / component information

Propane-1,2-diol with a concentration of over 90% with corrosion inhibitors.

2.2.3 Hazard identification

EFFECTS ON HEALTH: No particular hazard if the general hygiene rules are observed.

PHYSICAL AND CHEMICAL EFFECTS: Combustible liquid not classified as flammable. The product is not classified as a "hazardous compound" according to European Community regulations.

2.2.4 First aid

INHALATION: Not specifically concerned.

SKIN CONTACT: Rinse with water. If inflammation occurs (reddening, irritation, etc.) call a doctor.

EYE CONTACT: Wash immediately with water for at least 15 minutes, separating the eyelids. In case of persistent irritation, consult an ophthalmologist.

INGESTION: If a large amount has been swallowed and the patient is totally conscious, give them water to drink. If they are not totally conscious or unconscious, do not give them anything to drink.
Never attempt to induce vomiting.
Consult a doctor.

2.2.5 Fire prevention measures

SUITABLE FIRE EXTINGUISHING MEASURES: Carbon dioxide (CO₂), non-alcohol foam and powder.

UNSUITABLE FIRE EXTINGUISHING MEASURES: Water jet

SPECIFIC RISKS: Combustible.

The vapours are heavier than air and may travel to a source of ignition at a distance and flash back.

It floats and it may reignite on the surface of the water.

Vapour/air mixtures are explosive.

Heat action may cause a pressure increase inside hermetically sealed containers or tanks.

SPECIAL INTERVENTION METHODS: Evacuate the hazardous area.

Do not intervene without using specially adapted protection equipment.

Cool by spraying water on containers exposed to heat.

Do not discharge extinction water into the environment.

PROTECTION FOR INTERVENING STAFF: Individual insulated respiratory protection equipment.
Full body protection.

DS-matic H

2.2.6 Measures in case of accidental spillage

PERSONAL PRECAUTIONS: Avoid contact with skin and eyes.

Do not breathe in fumes.

Do not smoke.

Individual equipment: Full protection equipment.

Evacuate the hazardous area.

Cut off the leak.

Suppress the entire source of ignition.

ENVIRONMENTAL PRECAUTIONS: Channel and clean up the spillage.

Limit the use of water for cleaning.

Do not discharge into drains or rivers.

RECOVERY: Clean up the product using an absorbent material.

ELIMINATION: Dispose of the impregnated material in accordance with the applicable regulations.

FURTHER INFORMATION: This product may make the floor very slippery. Handling and storage

TECHNICAL HANDLING MEANS: Fume collection at the point of emission. Ventilation.

HANDLING PRECAUTIONS: Avoid any direct contact with the product.

Avoid high temperatures.

No smoking.

TECHNICAL STORAGE MEANS: The warehouse floor must be impermeable and arranged to form a retention basin.

STORAGE CONDITIONS: Store in a well-ventilated place, at ambient temperature, away from heat sources and with the container correctly closed and protected from damp.

PACKAGING MATERIALS NOT ADVISED: Galvanised steel.

INCOMPATIBLE MATERIALS: Strong oxidants.

2.2.7 Exposure control and personal protection

TECHNICAL MEASURES: Ensure correct ventilation of the work station.

PERSONAL PROTECTION.

Respiratory system protection: If there is adequate ventilation, the use of respiratory protection is not essential.

Hand protection: Rubber protection gloves.

Eye protection: Safety goggles.

INDUSTRIAL HYGIENE: Do not eat, drink or smoke in the workplace.

Wash hands after handling the product.

Shower systematically after work.

2.2.8 Physical and chemical properties

Physical state: Liquid.

Colour: Transparent

Smell: None

pH: 7.3 (7.6 in 50% aqueous solution)

Freezing temperature: -60°C

Initial boiling temperature: 155°C

Spontaneous combustion temperature: 371°C

Lower explosivity limits: 2.4% (volume)

Upper explosivity limits: 17.4% (volume)

Vapour pressure: <0.1 mmHg at 25°C

Vapour density (air=1): 2.6

Density: 1.051gr/cm³ at 20°C

Solubility in water: Total

Dynamic viscosity: 46mPa.s, at 25°C

Hygroscopicity: Hygroscopic product

2.2.9 Stability and reactivity

STABILITY: Stable at ambient temperature and under the conditions of use.

CONDITIONS TO BE AVOIDED: High temperatures and naked flames.

MATERIALS TO BE AVOIDED: Strong oxidants

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion gives off harmful carbon monoxide, carbon dioxide and other toxic gases.

2.2.10 Toxicological information

ACUTE TOXICITY: DL 50 pc (Rabbit): 20800 mg/kg

DL 50 po (Rat): 19400-36000 mg/kg

LOCAL EFFECTS: Not irritant by cutaneous application to rabbits.

May cause slight temporary irritation of eye mucous.

OTHER: This product or its emissions may worsen pre-existing eye complaints.

2.2.11 Ecological information

DEGRADABILITY: Easily biodegradable.

ECOTOXICITY. Effects on aquatic environment:

CE 50 (Daphnia: Daphnia magna) / 48h: 34400 mg/L

CL 50 (Fish: Onchorynchus mykiss) / 96h: 51600 mg/L

CE 50 (Bacteria: Photobacterium phosphoreum) / 0.5h: 26800 mg/L

CE 50 (Algae: Selenastrum capricornutum) / 96h: 19000 mg/L

DIVERSE HARMFUL EFFECTS. Effects on waste water treatment plants:

Does not affect the functioning of sewage treatment plants.

Chemical oxygen demand (COD): 1906000 mg/L O₂

Biochemical oxygen demand (BOD) 5 days: 1090000 mg/L O₂

2.2.12 Disposal considerations

PRODUCT WASTE. Dispose of in accordance with applicable local regulations.

SOILED CONTAINERS: To be destroyed at an authorised installation.

OBSERVATION: Users of this product are reminded of the possible existence of mandatory local stipulations regarding disposal.

DS-matic H

2.2.13 Information regarding transportation

RID / ADR / IMDG / IATA: No regulations.

OBSERVATIONS: As the regulations governing transportation of hazardous material may evolve, we recommend you ensure their validity by consulting the commercial agency.

2.2.14 Regulatory information

No R-phrase, no S-phrase.

The regulatory information figuring in this section refers only to the main stipulations specifically applicable to the product subject to the FDS.

The basic Community texts cited are subject to continuous updating and transcribed in international law.

We recommend taking into account all types of measures or stipulations that may apply, international, national and local.

We would draw the user's attention to the possible existence of other stipulations complementing those described above.

2.2.15 Further information

Product for industrial use only. For further information on the use of this product, please consult the technical manual.

Updated: 28.02.2008

2.3 Regulations

When making the installation, all the laws, directives, technical regulations and general regulations and standards must be complied with. Depending on the geographical area, different regulations may need to be complied with, and the laws for each Autonomous Community must therefore be studied.

Some of the regulations solar installations must comply with are listed below:

General information on solar heating installations:

PrEN ISO 9488

Terminology for solar heating installations and components (ISO/DIS 9488, 1995).

EN 12975-1

Solar heating installations and components. Solar collectors. Part 1: General requirements

EN 12975-2

Solar heating installations and components. Solar collectors. Part 2: Test methods

UNE-EN 12976-1

Solar heating installations and components; prefabricated installations, Part 1: General requirements.

UNE-EN 12976-2

Solar heating installations and components; prefabricated installations, Part 1: Test methods.

ENV 1991-2-3

Eurocode 1 – Basis for calculation and action on structures, Part 2-3: Action on structures, snow loads.

ENV 12977-1

Solar heating installations and components; specific prefabricated installations for clients, Part 1: General requirements.

ENV 12977-2

Solar heating installations and components; specific prefabricated installations for clients, Part 2: Test methods.

ISO 9459-1 : 1993

Solar domestic water heating systems, Part 1: Performance rating procedure using indoor test methods.

ISO/TR 10217

Solar energy / Water heating systems / Guide to material selection with regard to internal corrosion.

Collectors and collector assembly:**ENV 1991-2-4**

Eurocode 1 – Basis of design and actions on structures, part 2-4: actions on structures, wind action.

Hot water tanks and hot water tank assembly:**PrEN 806-1**

Technical standards regarding drinking water installations in buildings supplying water for human consumption, Part 1: General.

PrEN 1717

Prevention of contamination in drinking water installations and general requirements regarding safety devices preventing contamination caused by backflow in drinking water.

PrEN 12897

Water supply specifications for installations with hot water hot water tanks, indirectly heated and unvented (closed).

PrEN 12977-3

Solar heating systems and components; user-specific pre-fabricated installations, Part 3: Analysis of performance of hot water tanks.

EN 60335-2-21

Safety of household and similar electrical appliances, Part 2: Particular requirements for water heaters (storage heaters and heaters); (IEC 335-2- 21 : 1989 and complements 1; 1990 and 2; 1990, updated).

Lightning protection:**ENV 61024-1**

Protection of structures against lightning, Part 1: General principles (IEC 1024-1: 1990; amended).

DS-matic H

3 FUNCTIONING

The DS-matic H automatic solar heating system is an appliance designed to make maximum use of solar energy. Its operating principle is based on the liquid in the solar circuit being heated in the solar collector, and the absorbed heat then being exchanged with the domestic hot water in the hot water tank.

DS-matic H models consist of one or two solar collectors and a 150-litre or 250-litre hot water tank. A boiler may be connected to the hot water tank for all the models, to achieve the correct level of heating and hot water regardless of the weather.

The hot water tanks also have an element socket, which we recommend only using for auxiliary energy when the other options cannot be used.

3.1 Principle of functioning

The system's operating principle is based on pressure compensation. The liquid in the solar circuit does not fill the installation completely, and the solar collectors are filled with air when the pumps are not running, thus preventing problems with the collectors freezing or overheating.

When the pumps are not running, all the solar liquid is contained in the hot water tank and in the solar piping, which is below the filling level, and the solar collectors are therefore filled with air (Figure 1).

When the solar collectors reach a sufficient temperature, the solar control unit starts up the pumps so that all the air in the solar collectors and the pipes flows to the hot water tank and is deposited in the upper part of the same (Figure 2).

When the hot water tank reaches the desired temperature, the solar power unit deactivates the pumps and the compensation chamber allows the air to return to the solar collectors, thus preventing any overheating which could damage the collectors.

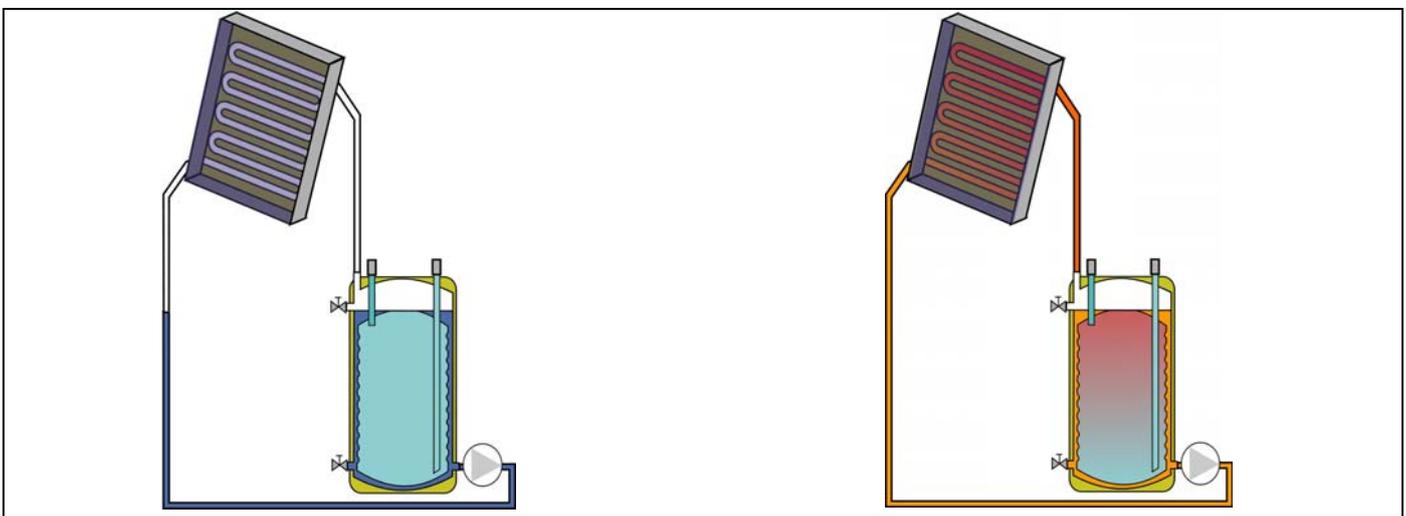


Figure 9

Figure 10

Avantages du DS-matic H

The DS-matic H automatic solar heating system has the following advantages as compared to traditional solar heating systems with a pressurised solar circuit:

1. Its compensation system drains all the water from the solar collectors when it does not require energy from them. This prevents any possibility of the solar collectors overheating or freezing.
2. As there is no risk of overheating, no safety measures need to be taken to protect the solar collectors in case of prolonged absence.
3. As the solar circuit does not fill up completely, no safety parts such as a bleed valve, an expansion vessel or a manometer need to be fitted.
4. The DS-matic H systems are supplied in kit form, with all the components of a suitable size for correct functioning.
5. The operating adjustments are changed intuitively, using the simple menu on the solar power unit.

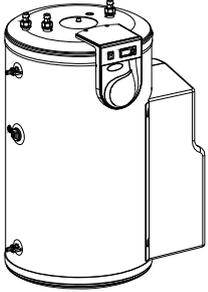
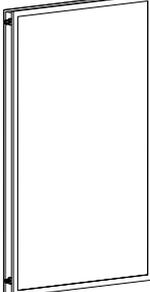
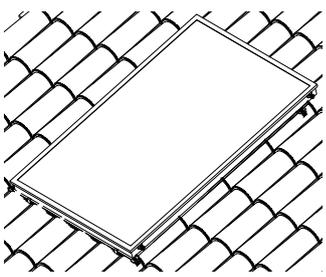
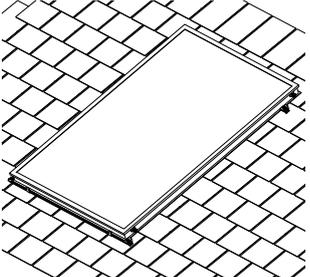
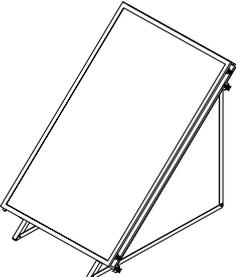
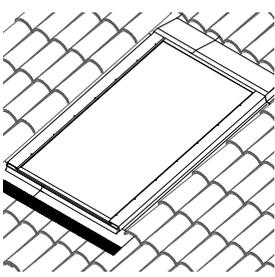
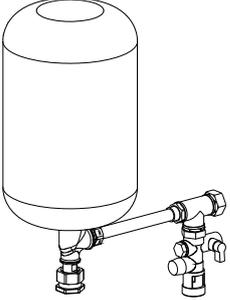
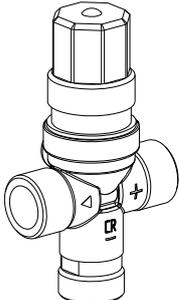
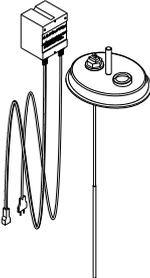
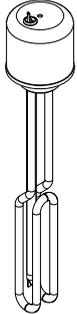
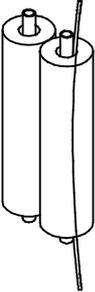
DS-matic H

4 COMPONENTS AND MAIN CHARACTERISTICS

DOMUSA TEKNIK has designed the DS-matic H PLUS range to overcome level differences of up to 15m. The DS-matic H and DS-matic H PLUS systems can also be combined with other optional components to add to their features.

DOMUSA TEKNIK has designed the DS-matic H PLUS range to overcome level differences of up to 15m. The DS-matic H and DS-matic H PLUS systems can also be combined with other optional components to add to their features.

The following figure is a diagram of the components making up the DS-matic H units, and its different options.

	 <p>150-litre hot water tank 250-litre hot water tank</p>		 <p>Solar collector</p>	
OBLIGATORY OPTION	 <p>Support on sloping roof</p>	 <p>Support on roof with flat tile</p>	 <p>Support on flat roof</p>	 <p>Built-in support</p>
	 <p>S200 hydraulic kit</p>	 <p>Thermostatic valve</p>	 <p>Cathodic protection</p>	
	 <p>Electrical element</p>	 <p>Hydraulic connection kit</p>	 <p>Sensor DHW</p>	

The following table shows the components supplied with each model and the options available.

	Hot water tank				N° of collectors	Electrical element	Inhibitor liquid (L)	Obligatory options				Options				
	150 L	150 L + pipe coil	250 L	250 L + pipe coil				Flat roof	Support on roof with flat tile	Sloping roof on tiles	Built-in	S200 Hydraulic kit	Cathodic protection	Thermostatic valve	Hydraulic connection kit	Sensor DHW
DS-matic H 1.15	•				1		8.5	•	•	•	•	•	•	•	•	
DS-matic H 1.25			•		1		14	•	•	•	•	•	•	•	•	
DS-matic H 2.25			•		2		14	•	•	•	•	•	•	•	•	
DS-matic H 1.15 Duo		•			1		8.5	•	•	•	•	•	•	•	•	•
DS-matic H 1.25 Duo				•	1		14	•	•	•	•	•	•	•	•	•
DS-matic H 2.25 Duo				•	2		14	•	•	•	•	•	•	•	•	•
DS-matic H 1.15 RE	•				1	•	8.5	•	•	•	•	•	•	•	•	
DS-matic H 1.25 RE			•		1	•	14	•	•	•	•	•	•	•	•	
DS-matic H 2.25 RE			•		2	•	14	•	•	•	•	•	•	•	•	
DS-matic H 1.15 Duo RE		•			1	•	8.5	•	•	•	•	•	•	•	•	•
DS-matic H 1.25 Duo RE				•	1	•	14	•	•	•	•	•	•	•	•	•
DS-matic H 2.25 Duo RE				•	2	•	14	•	•	•	•	•	•	•	•	•
DS-matic H PLUS 1.15	•				1		8.5	•	•	•	•	•	•	•	•	
DS-matic H PLUS 1.25			•		1		14	•	•	•	•	•	•	•	•	
DS-matic H PLUS 2.25			•		2		14	•	•	•	•	•	•	•	•	
DS-matic H PLUS 1.15 Duo		•			1		8.5	•	•	•	•	•	•	•	•	•
DS-matic H PLUS 1.25 Duo				•	1		14	•	•	•	•	•	•	•	•	•
DS-matic H PLUS 2.25 Duo				•	2		14	•	•	•	•	•	•	•	•	•
DS-matic H PLUS 1.15 RE	•				1	•	8.5	•	•	•	•	•	•	•	•	
DS-matic H PLUS 1.25 RE			•		1	•	14	•	•	•	•	•	•	•	•	
DS-matic H PLUS 2.25 RE			•		2	•	14	•	•	•	•	•	•	•	•	
DS-matic H PLUS 1.15 Duo RE		•			1	•	8.5	•	•	•	•	•	•	•	•	•
DS-matic H PLUS 1.25 Duo RE				•	1	•	14	•	•	•	•	•	•	•	•	•
DS-matic H PLUS 2.25 Duo RE				•	2	•	14	•	•	•	•	•	•	•	•	•

* All the hydraulic and electronic components of the DS-matic H systems are supplied together with the hot water tank.

DS-matic H hot water tanks are especially designed to make use of solar energy. Their special design enables automatic draining of the solar collectors, making it unnecessary to install drain valves, expansion vessels, etc.

DS-matic H

The heat exchange takes place via an indirect circuit, and so the domestic hot water is not in contact with the solar collectors. The hot water is accumulated in the stainless steel hot water tank, which is coated in the solar liquid. The solar liquid is conveyed through the solar collectors and heated up, transmitting the heat absorbed by the solar plates to the water in the hot water tank.

As regards insulation, the entire surface of the DS-matic H system hot water tanks is insulated with expanded polyurethane, reducing to a minimum any heat loss from the hot water tank.

The DS-matic Hs are equipped with two safety valves. The solar circuit safety valve is calibrated to 0.3 MPa (3 bar) and the DHW valve to 0.7 MPa (7 bar) (this valve is optional and is available with KIT M). The valves prevent overpressure in the two circuits by discharging the liquid as required when the pressure exceeds the calibrated values.

In either case, do not forget to connect the two valves to a drain outlet.

The sockets and components making up each of the accumulators are shown below.

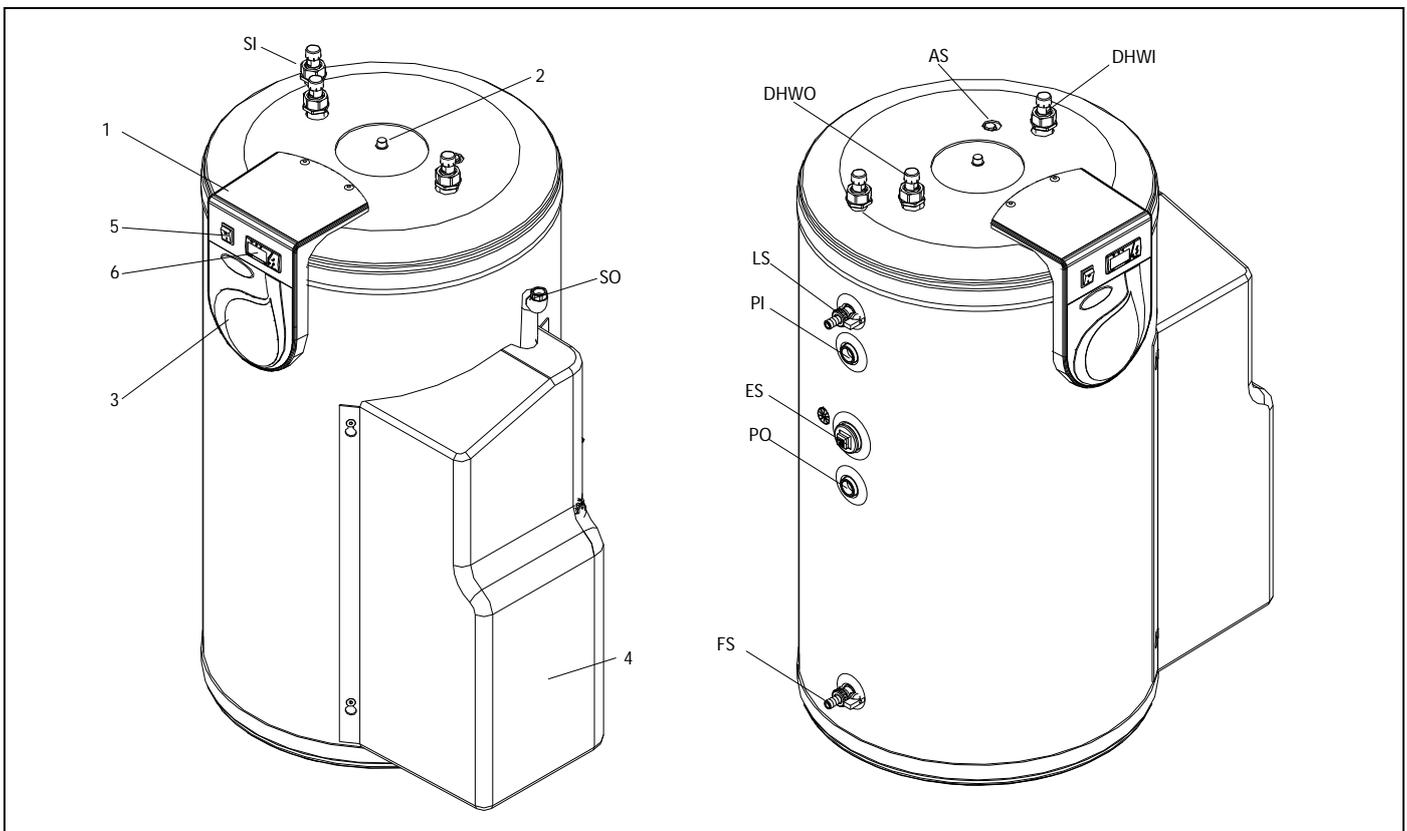


Figure 11

- 1. Control panel cover.
- 2. Bridge cover.
- 3. Control panel.
- 4. Casing
- 5. Element switch
- 6. Solar power unit

- FS:** Filling socket.
- ES:** Element socket.
- LS:** Level socket.
- PI:** Primary inlet (DS-matic H Duo).
- PO:** Primary outlet (DS-matic H Duo).
- DHWO:** Domestic hot water outlet.
- DHWI:** Domestic hot water inlet.
- AS:** Auxiliary socket.
- SI:** Solar inlet.
- SO:** Solar outlet.

The main characteristics of the DS-matic H and DS-matic H PLUS system hot water tanks are as follows:

	DS-matic H - DS-matic H PLUS	
	1.15 / Duo 1.15 RE / Duo RE	1.25 / Duo / Duo RE 2.25 / Duo / Duo RE
Volume	150 litres	250 litres
Insulation	Expanded polyurethane	
Height	1028mm	1628mm
Diameter	581mm	
DHW inlet socket	1/2" M	
DHW outlet socket	1/2" M	
Solar circuit inlet socket	1/2" M	
Solar circuit outlet socket	1/2" H	

4.1.1 Hot water tank control panel

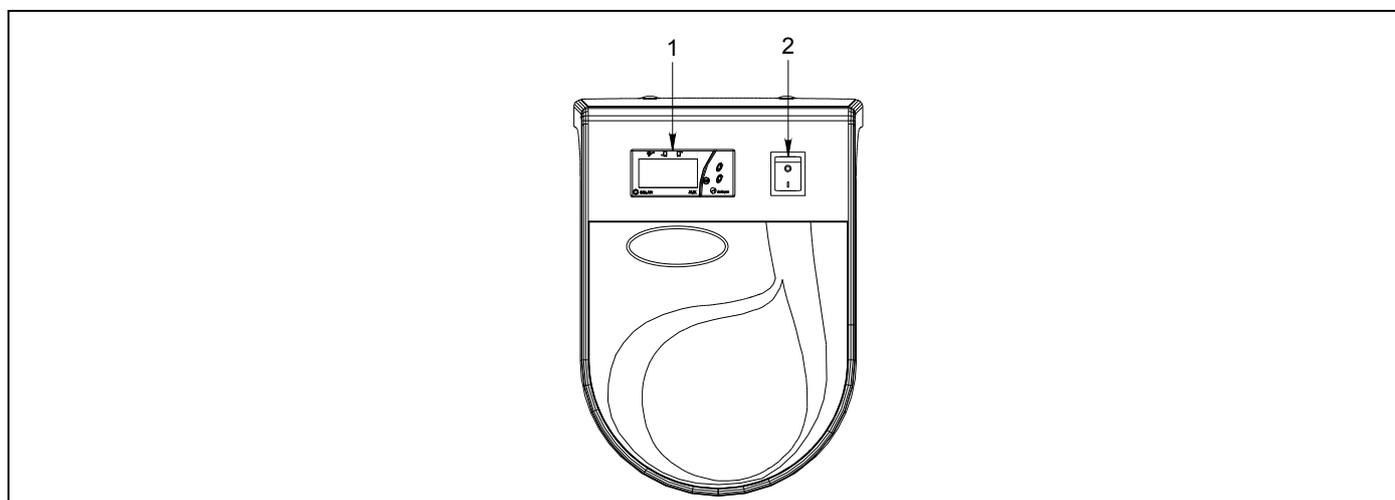


Figure 12

1. Solar power unit:

This activates or deactivates the solar pumps according to the functioning parameters:

2. Element switch:

This activates or deactivates the hot water tank's optional back-up element.

DS-matic H

The resistance and heat transmission of DOMUSA TEKNIK inhibitor liquid make it suitable for use in solar heating installations. Its main function is to protect the various components of the installation from corrosion, as different metals are used. DOMUSA TEKNIK recommends using a minimum concentration of 30% of inhibitor liquid.

**!IMPORTANT:
THE INHIBITOR LIQUID MUST ALWAYS BE MIXED WITH WATER BEFORE USE, AS OTHERWISE IT
COULD DAMAGE THE INSTALLATION.**

**!IMPORTANT:
DOMUSA TEKNIK WILL ONLY BE LIABLE FOR THE CORRECT FUNCTIONING OF THE SYSTEM IF IT HAS
BEEN FILLED WITH DOMUSA TEKNIK INHIBITOR LIQUID.**

DS-matic H is the ideal solution for combining with boilers or heaters producing domestic hot water.

The domestic water is heated up in the solar accumulator and conveyed to the cold water inlet of the boiler. The water is pre-heated before entering the boiler, to provide a suitable temperature for the hot water even if the burner is not ignited or is functioning on a lower setting.

For boilers producing instant hot water, the water inlet temperature is limited, and it is therefore recommended to install the optional mixing valve.

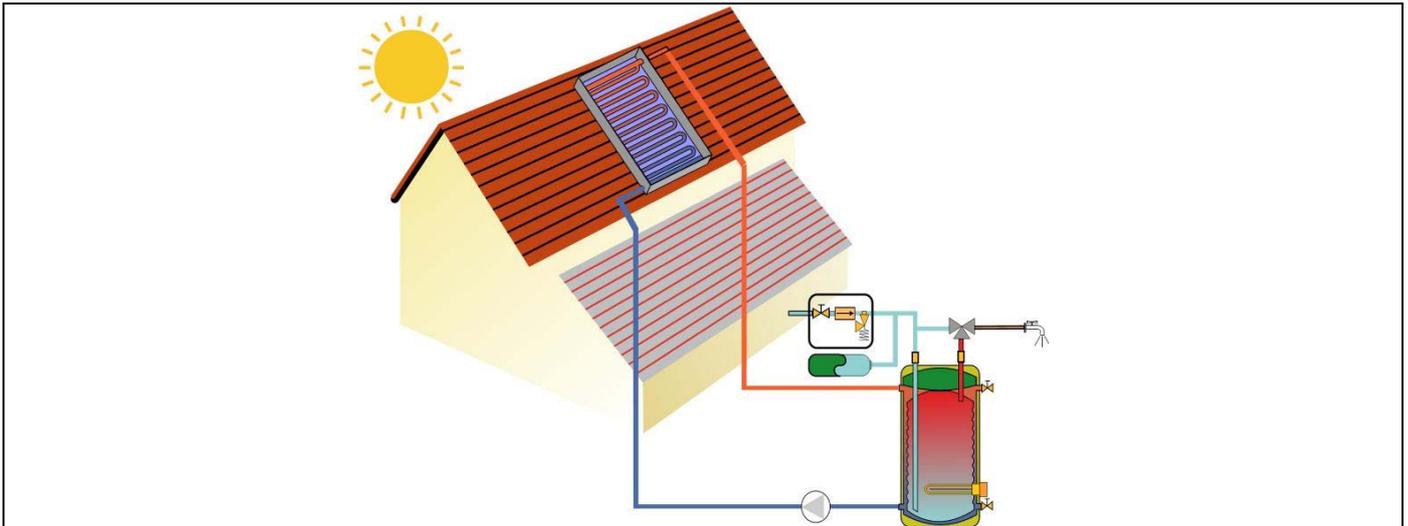


Figure 13

n

A supporting pipe coil inside the hot water tank enables the hot water tank to be connected to heating-only boilers for back-up.

This allows the large flows of water provided by a domestic hot water accumulation system to be obtained, in addition to assuring hot water on non-sunny days.

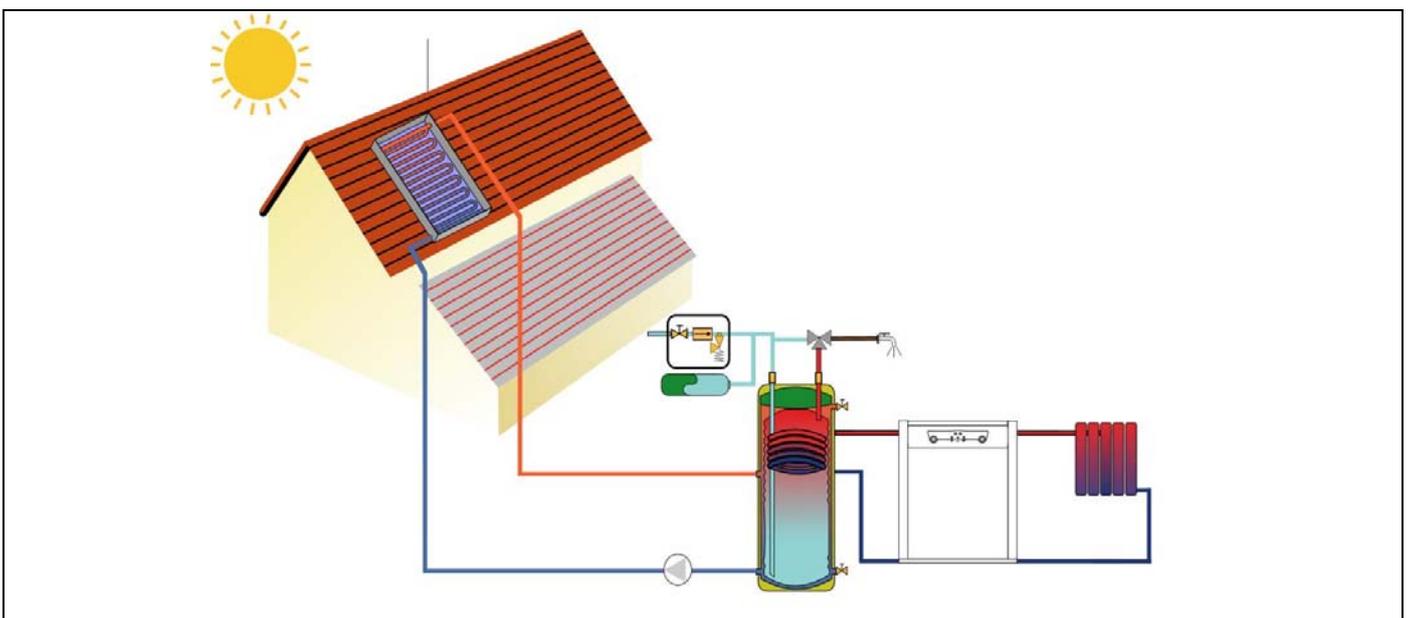


Figure 14

5 LOCATION

It is very important to choose a correct location for the solar collectors, as an unsuitable location can reduce the system's efficiency: wrong orientation, shadows cast on the solar collector, etc.

DOMUSA TEKNIK recommends taking the following indications into account when choosing a location:

1. Before choosing the location, the accessibility of the site must be taken into account, with a view to both the installation itself and for maintenance work on the solar collectors.
2. The solar collectors **must face South**. A difference of up to 10°-15° is not significant, but a greater difference could considerably effect their efficiency.
3. Ideally, the solar collectors should be installed at an angle of 45° from the horizon line (in countries at a latitude of 40°). In general, the inclination should be 5° greater than the latitude of the location. Any difference from this angle will reduce their efficiency.
4. **For models with built-in supports, the minimum slope must be 27°(51%).**
5. **The solar collectors must be levelled for installation, with the upper part horizontal.**
6. The weight of the full hot water tank must be taken into account when choosing a location.
7. The premises the hot water tank is to be installed on must be protected from the weather and any risk of freezing. The location must be free from dust or a corrosive atmosphere.
8. The hot water tank must be installed as close as possible to the solar collectors and the domestic hot water consumption point, to reduce heat loss from the pipes. The minimum and maximum distances indicated below must be observed.
9. A free height of 500mm must be left above the hot water tank so that maintenance work can be carried out.
10. The maximum snow load (sk) and main wind speed (vm) values the solar collector-support unit can withstand with the sloping roof supports are $sk = 0.66$ and $vm = 1.75$, and so the system may only be installed in areas with values lower than these.

When installing the solar collectors, ensure that no objects cast shadow on them, particularly in winter, when the sun is lower in the sky. The minimum distance from an obstacle the solar collectors can be installed at depends on the height of the obstacle and the latitude of the place of installation, as shown in the table below:

	Latitude 40°	Latitude 45°	Latitude 50°
Calculation of X	Y x 2	Y x 2,25	Y x 2,5

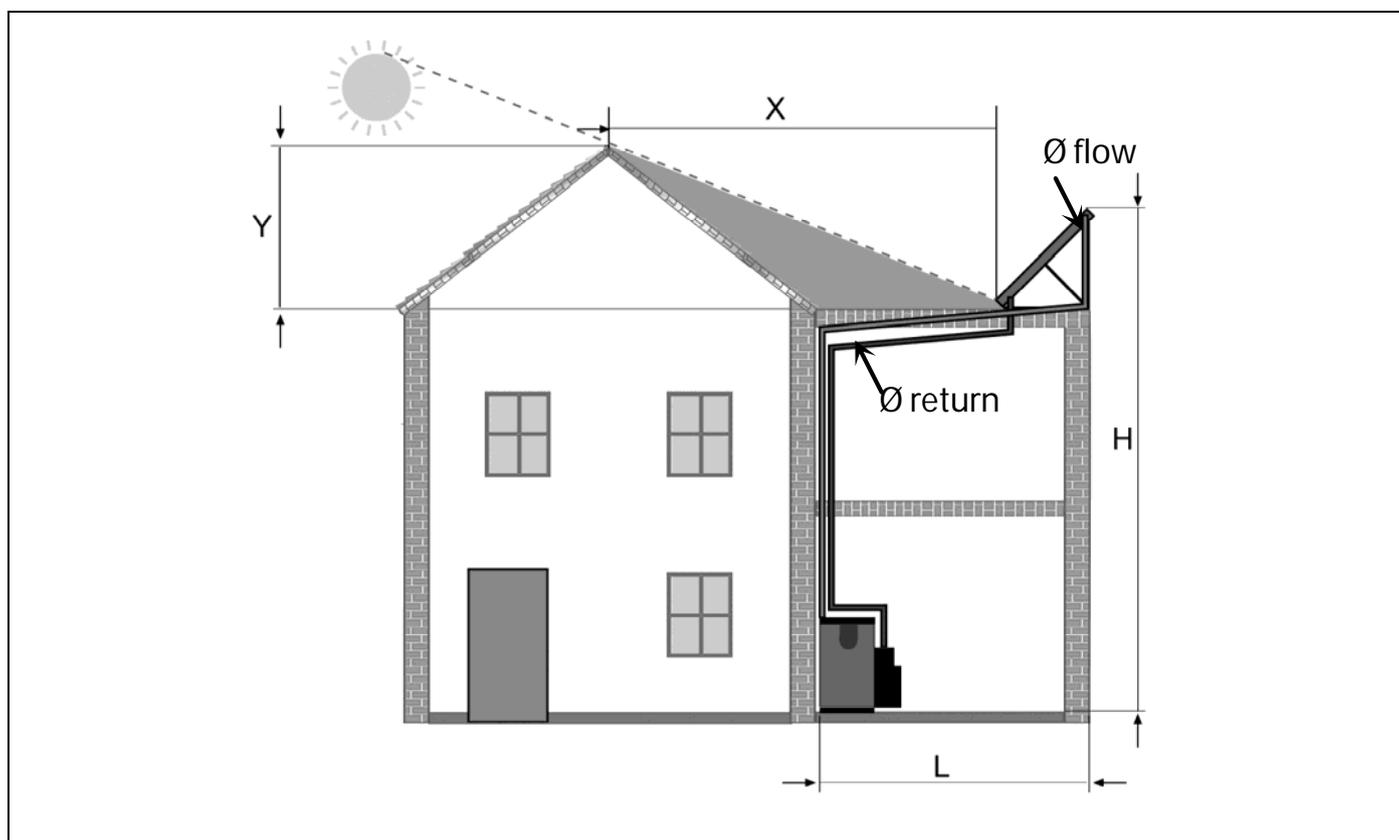


Figure 15

When making the hydraulic connection between the solar collectors and the hot water tank, the following limitations must be taken into account:

	Min. height (H)	Max. height (H)*	Max. horizontal length (flow+return)	Maximum length	Minimum slope	Diameter solar pipe
DS-matic H1.15	3m.	10 m.	20 m.	35 m.	4%	10/12 mm.
DS-matic H 1.25						
DS-matic H 2.25						
DS-matic H PLUS 1.15	3m.	15 m.	20 m.	40 m.	4%	10/12 mm.
DS-matic H PLUS 1.25						
DS-matic H PLUS 2.25						

! The DS-MATIC Hs are specially designed to function with a 12 mm connection tube (external) between the accumulator and the solar collectors. If other tube diameters are used it cannot be guaranteed to work properly, and there may also be risk of noise on functioning.

DS-matic H

DOMUSA TEKNIK supplies tubes with insulation and a cable for the sensor, together with the connectors for making the connections to the collectors and the accumulator.

6 PACKAGING AND TRANSPORT

The DS-matic Hs are supplied in two packs. The accumulator and the solar panels are supplied together on a pallet, and the supports come separately in another pack.

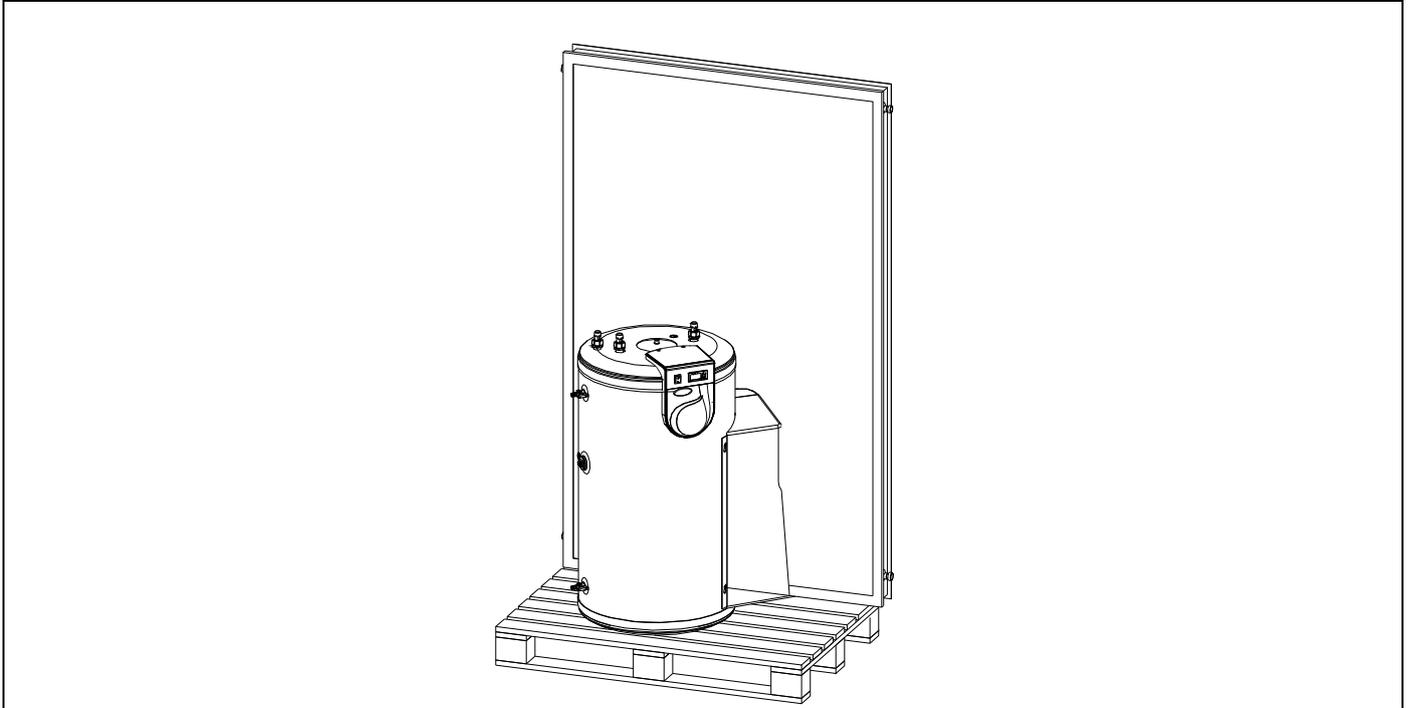


Figure 16

All the components should be stored indoors in their original packaging until they are installed.

The accumulator and the panels should be stored as they are supplied to prevent damage from knocks. They should be kept in upright position (as shown in the figure above), and they must not be stacked.

7 INSTALLATION

Before installing the DS-matic H system, ensure none of the components are electrically connected. Carefully read points 5 and 6 of this manual, ensuring all the instructions and all the applicable legislation are complied with.

7.1 Dimensions

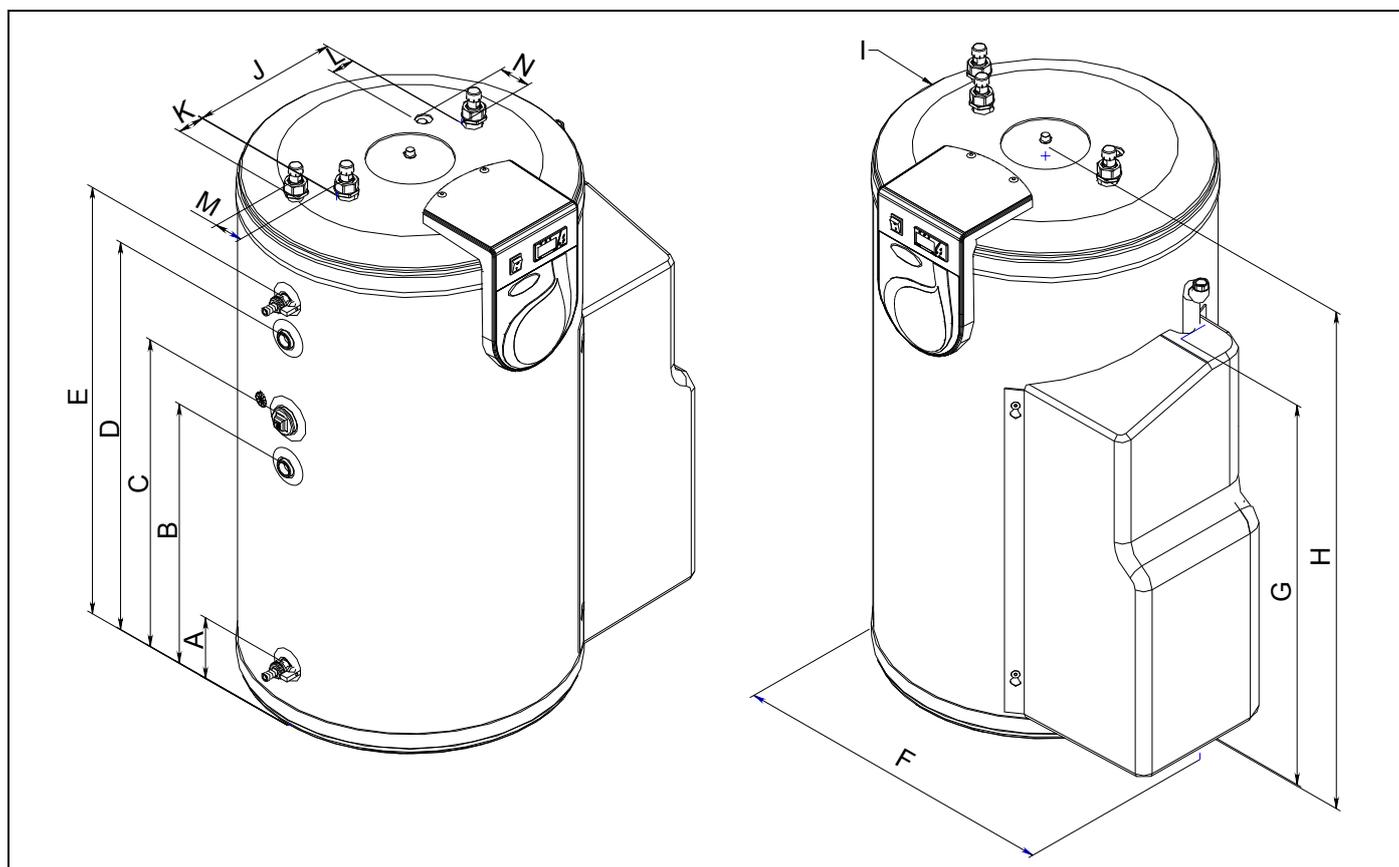


Figure 17

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
DS-matic H 1.15	140		621		892	747	800	1028	Ø581	298	63	53	68	68
DS-matic H 1.25	140		990		1491	747	800	1628	Ø581	298	63	53	68	68
DS-matic H 2.25	140		990		1491	747	800	1628	Ø581	298	63	53	68	68
DS-matic H 1.15 Duo	140	548	646	811	892	747	800	1028	Ø581	298	63	53	68	68
DS-matic H 1.25 Duo	140	944	1132	1408	1491	747	800	1628	Ø581	298	63	53	68	68
DS-matic H 2.25 Duo	140	944	1132	1408	1491	747	800	1628	Ø581	298	63	53	68	68
DS-matic H 1.15 RE	140		621		892	747	800	1028	Ø581	298	63	53	68	68
DS-matic H 1.25 RE	140		990		1491	747	800	1628	Ø581	298	63	53	68	68
DS-matic H 2.25 RE	140		990		1491	747	800	1628	Ø581	298	63	53	68	68
DS-matic H 1.15 Duo RE	140	548	646	811	892	747	800	1028	Ø581	298	63	53	68	68
DS-matic H 1.25 Duo RE	140	944	1132	1408	1491	747	800	1628	Ø581	298	63	53	68	68
DS-matic H 2.25 Duo RE	140	944	1132	1408	1491	747	800	1628	Ø581	298	63	53	68	68

* The DS-matic H PLUS models have the same measurements.

DS-matic H

7.2 Hot water tank

Remove the hot water tank from the pallet it is supplied on and place it in its definitive location, ensuring there is sufficient space for installation and maintenance work to be carried out.

The casing must be removed for installation and maintenance work. To do this, lift up the casing and pull it out. To replace it, perform the reverse procedure, placing the casing on the hot water tank fixings and moving it downwards until it fits into place.

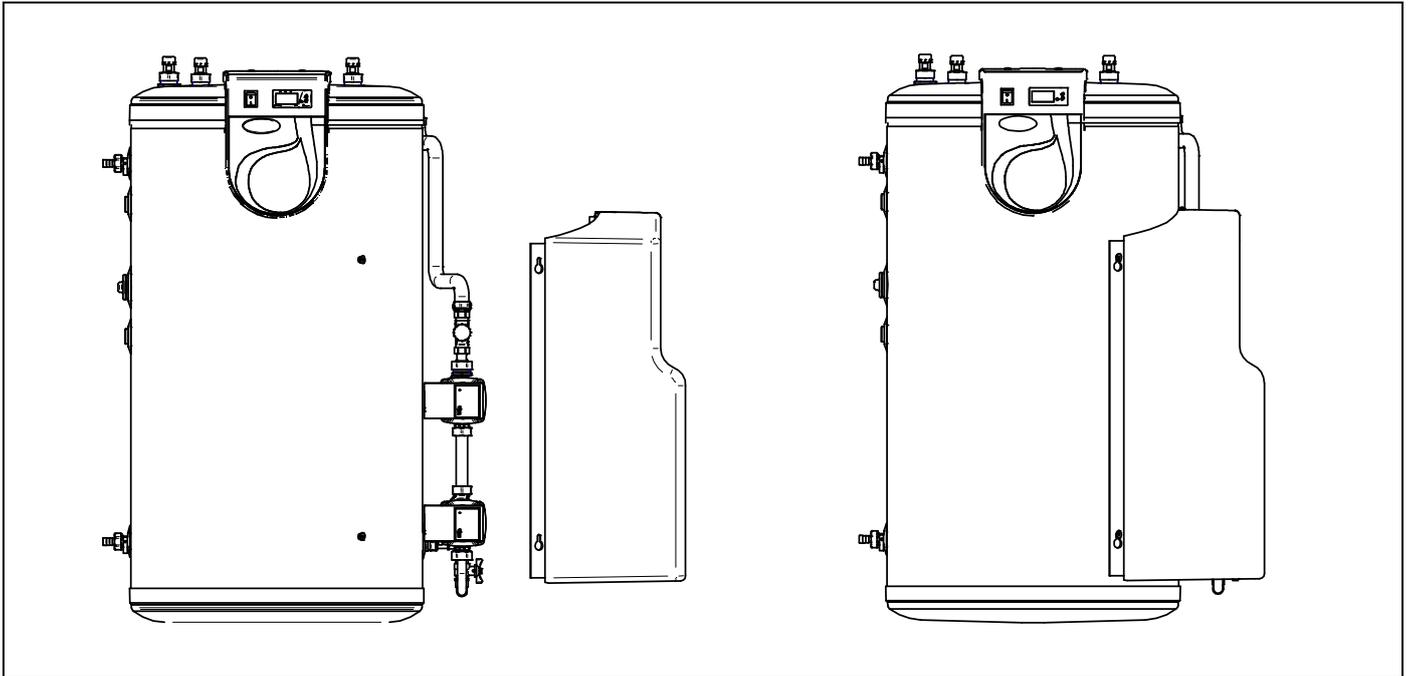


Figure 18

When removing the casing, pull the power unit upwards to separate it from the casing and remove it. Then pass it through the hole again and fit it on the hot water tank so that the tank can be placed in a convenient location.

7.3 Hydraulic connection

The DS-matic H tank is prepared to be permanently connected to domestic water supply network, by means of DHW inlet. The maximum pressure admitted is specified in "Technical data" chapter.

The domestic hot water and solar heating sockets on the hot water tank are described below.

7.3.1 Domestic hot water circuit

Although the maximum temperature of the water in the hot water tank is limited, the temperature of the stored water may vary significantly depending on the solar radiation, water consumption, insulation of the connections, etc. To adapt the hot water tank temperature to the consumption temperature, DOMUSA TEKNİK recommends fitting the optionally supplied mixing valve.

Also, when the stored water is heated up, the pressure in the hot water tank may increase, and DOMUSA TEKNİK therefore recommends fitting the S200 hydraulic kit (optional) consisting of dielectric sleeves, a DHW expansion vessel and a safety unit.

The DHW sockets on the hot water tank are shown in the diagram below.

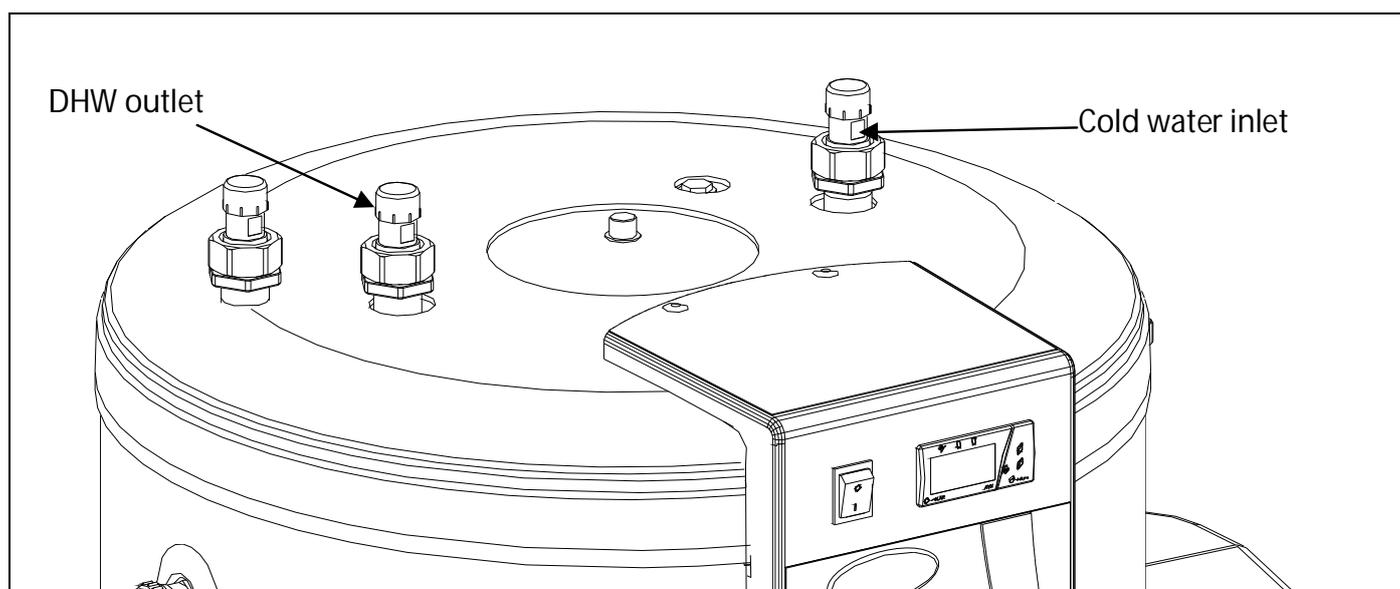


Figure 19

DS-matic H

7.3.2 Solar heating circuit

When installing the solar heating circuit, bear in mind that the up and down pipes must have a diameter of 12mm.

As regards minimum pipe lengths and angles, follow the instructions provided in point 5.

7.3.3 R Boiler connection

DS-matic H Duo models have a pipe coil on the upper part of the hot water tank for connecting a boiler primary circuit. This enables heating-only boilers to be connected to the solar accumulator, so that stored hot water is available even on cloudy days.

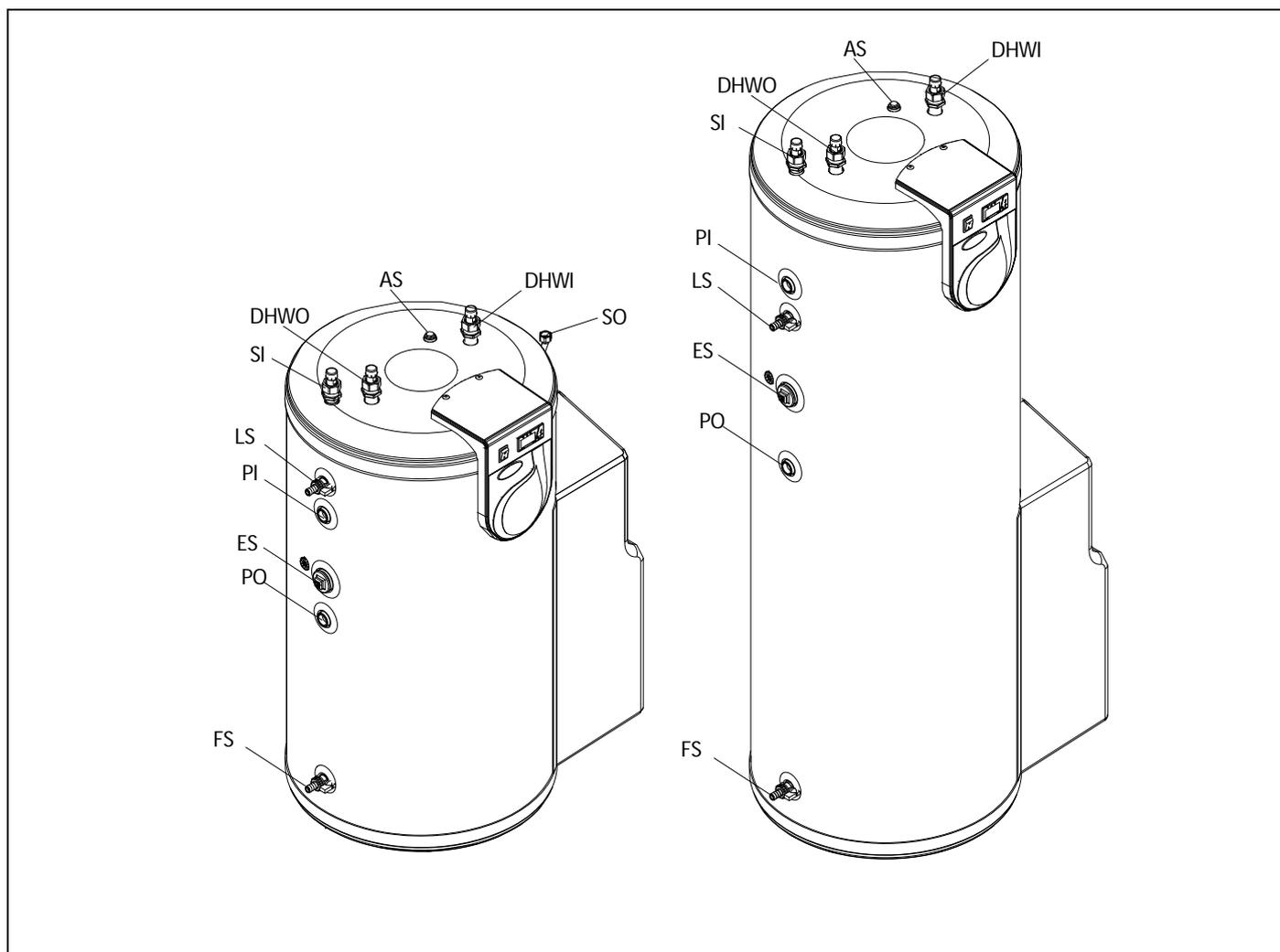


Figure 20

FS: Filling socket.

ES: Element socket.

LS: Level socket.

PI: Primary inlet (DS-matic H Duo).

PO: Primary outlet (DS-matic H Duo).

DHWO: DHW outlet.

DHWI: DHW inlet.

AS: Auxiliary socket.

SI: Solar inlet.

SO: Solar outlet.

DS-matic H

7.4 Installation example

Hydraulic diagram of a DS-matic H without back-up power.

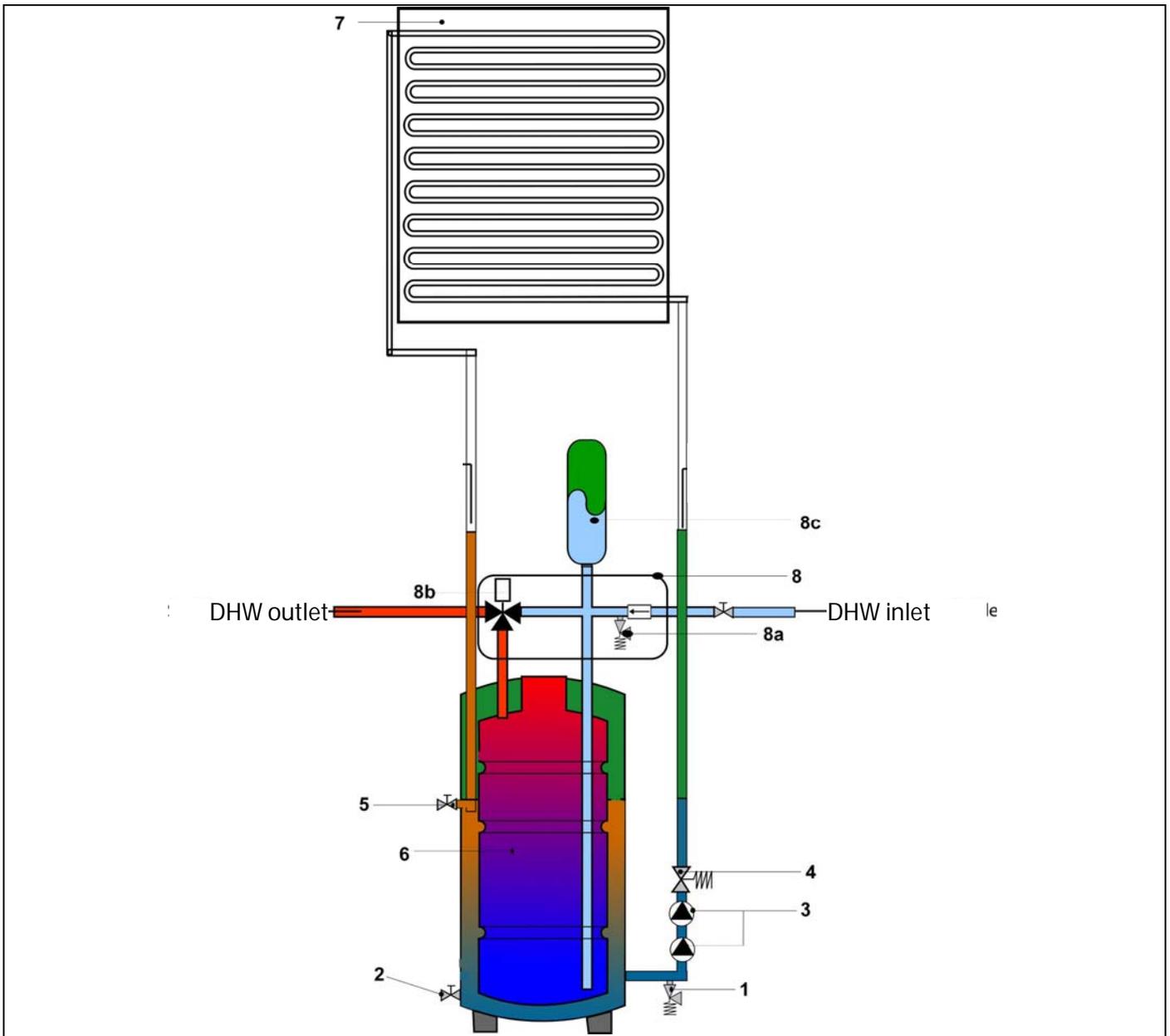


Figure 21

- 1: Pressure valve
- 2: Filling / empty socket.
- 3: Pumps.
- 4: Flow regulator.
- 5: Level socket.
- 6: Hot Water tank.
- 7: Solar collector.
- 8: Kit M. (Option)
 - 8a: Safety unit.
 - 8b: Thermostatic valve.
 - 8c: Expansion tank ECS (Option).

Hydraulic diagram of a DS-matic H with auxiliary support.

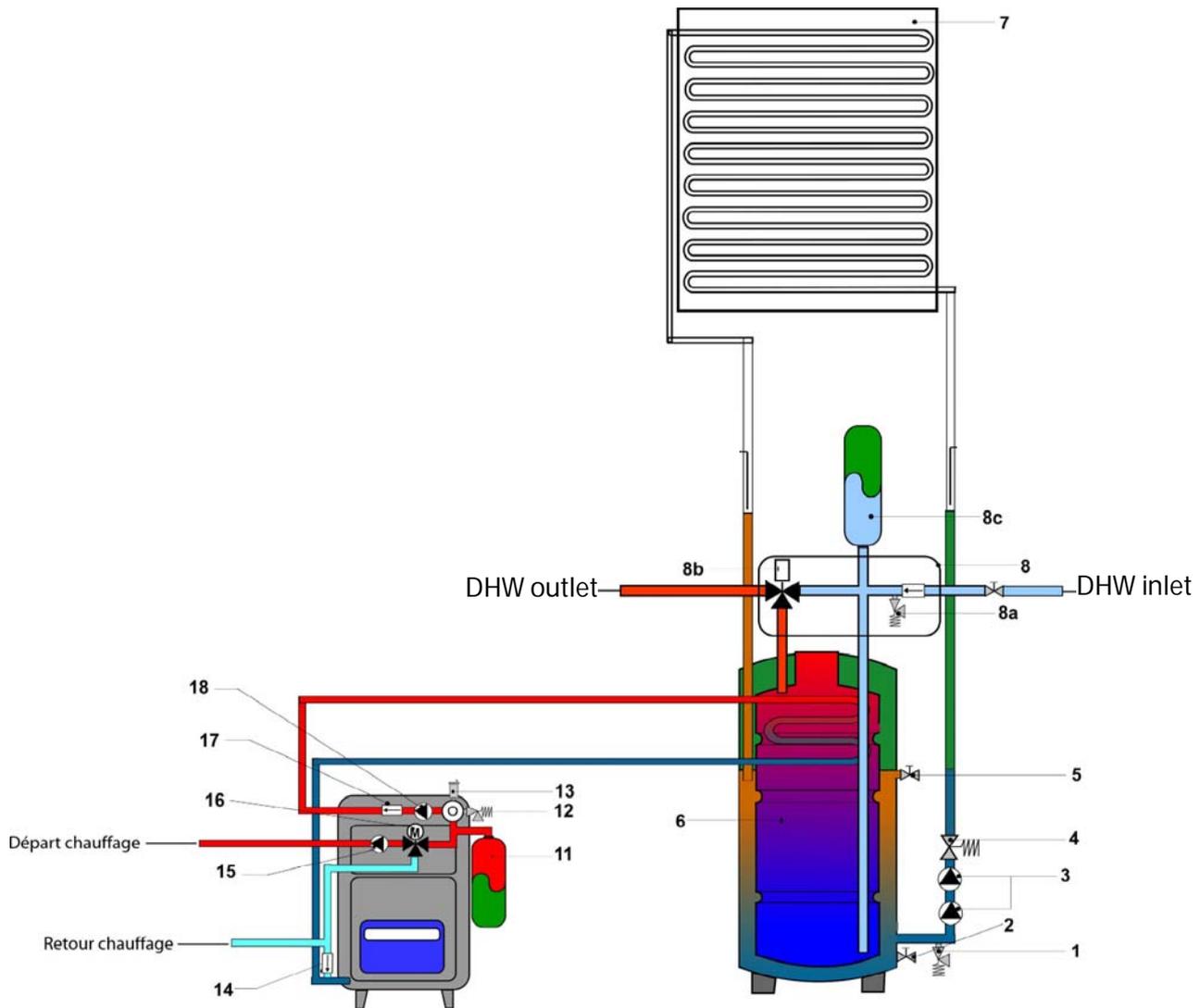


Figure 22

- 1: Pressure valve
- 2: Filling / empty socket.
- 3: Pumps.
- 4: Flow regulator.
- 5: Level socket.
- 6: Hot Water tank.
- 7: Solar collector.
- 8: Kit M. (Option)
- 8a: Safety unit.
- 8b: Thermostatic valve.
- 8c: Expansion tank ECS (Option)

DS-matic H

7.5 Electrical connection

The electrical connection of DS-matic H systems must be made by qualified staff, and any modifications may only be made by the official technical assistance service. The electrical connection must be made in accordance with the following recommendations:

- The connection must be made with a bipolar switch, with a minimum distance of 3 mm between each contact.
- If the length of the cabling is over 10m, the sensor must be separated from the energised cables.
- The solar collector sensor cables must never exceed 50m in length.
- Both the hot water tank and the solar heating circuit must be earthed with a 16mm² cable.
- The electrical supply installation must be realized by means of fixed wiring.

7.5.1 Electrical diagram

As can be seen in the figures below, the electrical configurations of the DS-matic H (Figure 23) and the DS-matic H Duo (Figure 24) systems are practically identical. The main difference between them is that on the DS-matic H Duo models the sensors are connected via the hot water tank terminal block and on the DS-matic H they are directly connected to the solar power unit.

DS-matic H

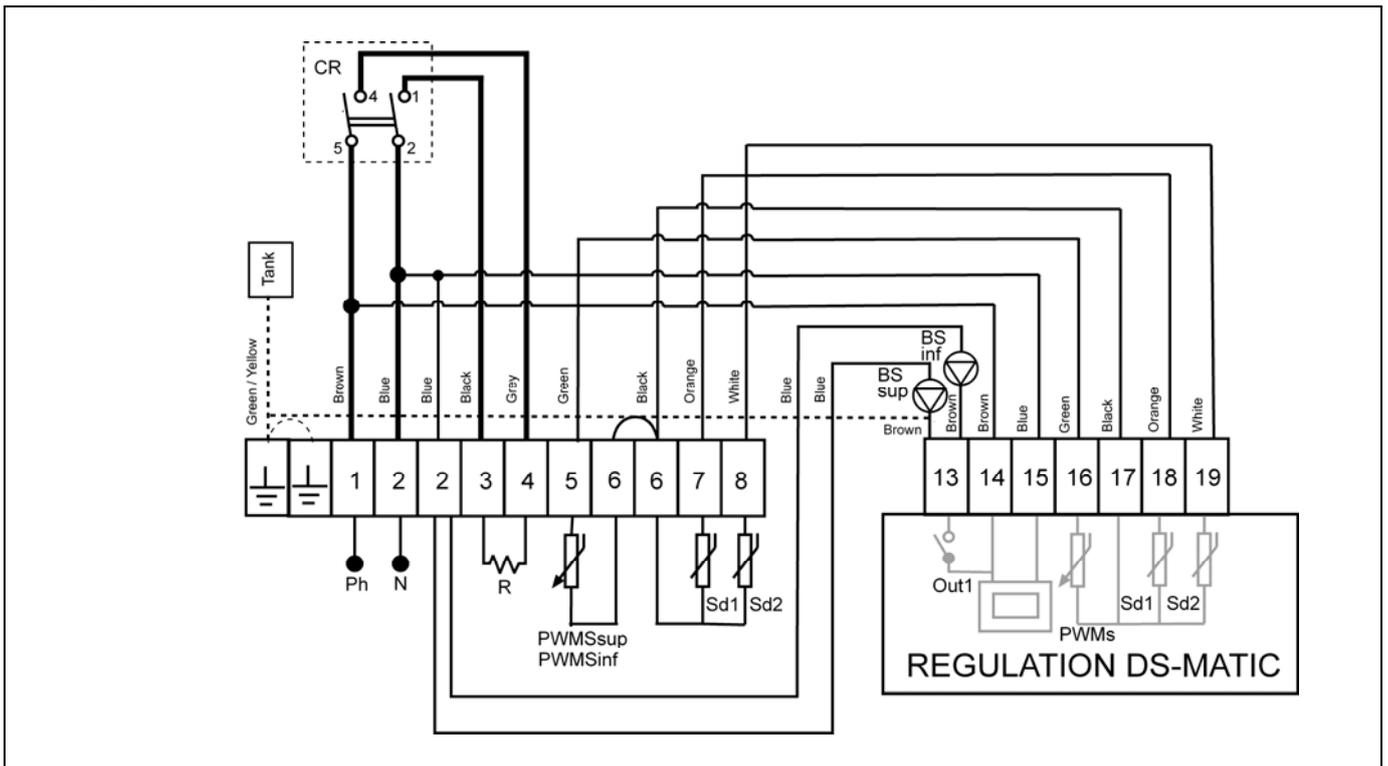


Figure 23

- CR:** Element switch.
- BS inf:** Lower solar pump.
- BS sup:** Upper solar pump.
- Sd1:** Collector sensor (Pt1000).
- Sd2:** Lower hot water tank sensor (PTC 1K).
- Out1:** Solar pumps relay.
- R:** Optional element.

DS-matic H Duo

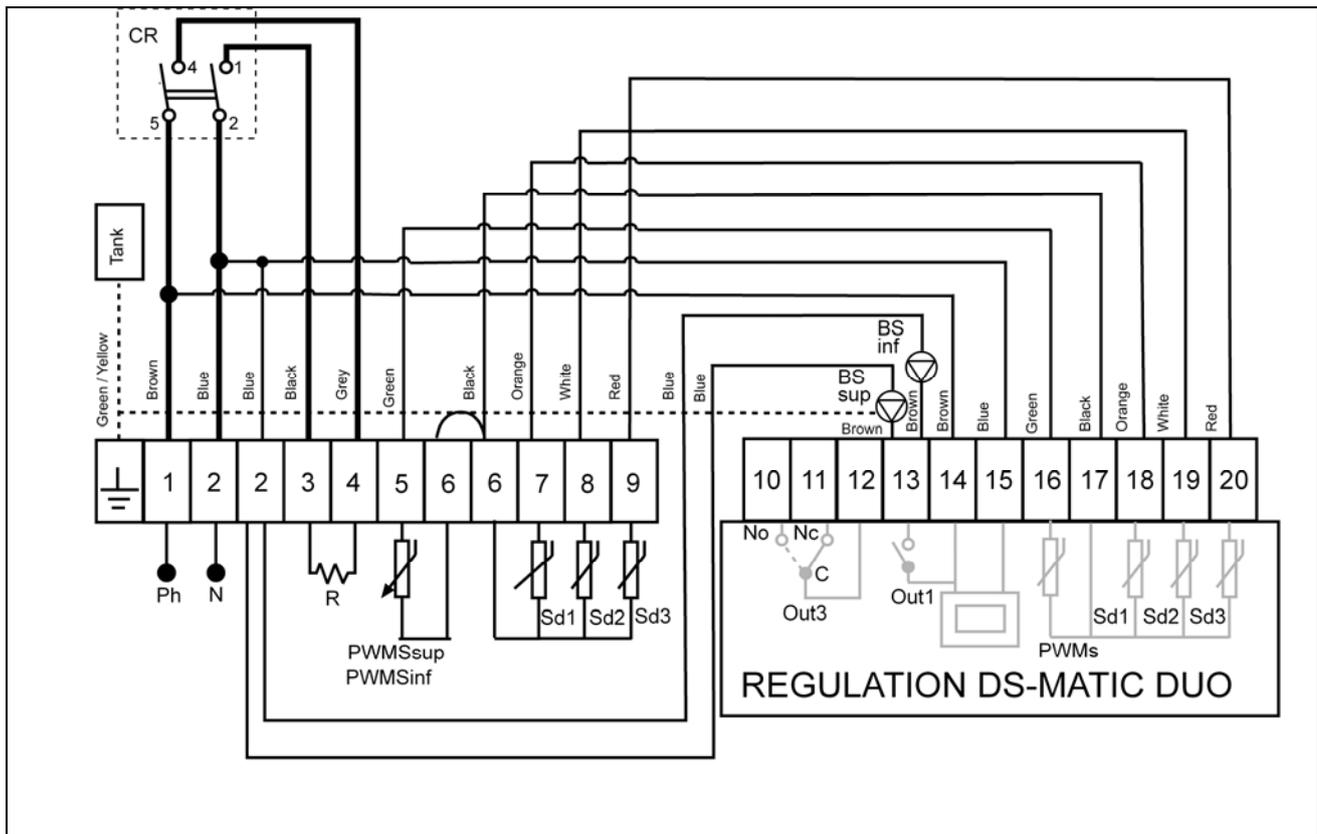


Figure 24

- CR:** Element switch.
- BS inf:** Lower solar pump.
- BS sup:** Upper solar pump.
- Sd1:** Collector sensor (Pt1000).
- Sd2:** Lower hot water tank sensor (PTC 1K).
- Sd3:** Upper hot water tank sensor (PTC 1K).
- Out1:** Solar pumps relay.
- Out3:** Switched relay for connection to boilers with a thermostat input.
- R:** Optional element.

DS-matic H

Connection to boilers

For connecting the DS-matic H Duo system to other boilers, check whether the boiler has a sensor or thermostat input (for measuring the temperature in the upper part of the hot water tank).

If the boiler has a thermostat input, the relay 3 terminals should be connected to the thermostat input terminals of the boiler. The electrical diagram of the boiler should be taken into account for this purpose, and the NO, NC and C sockets correctly connected.

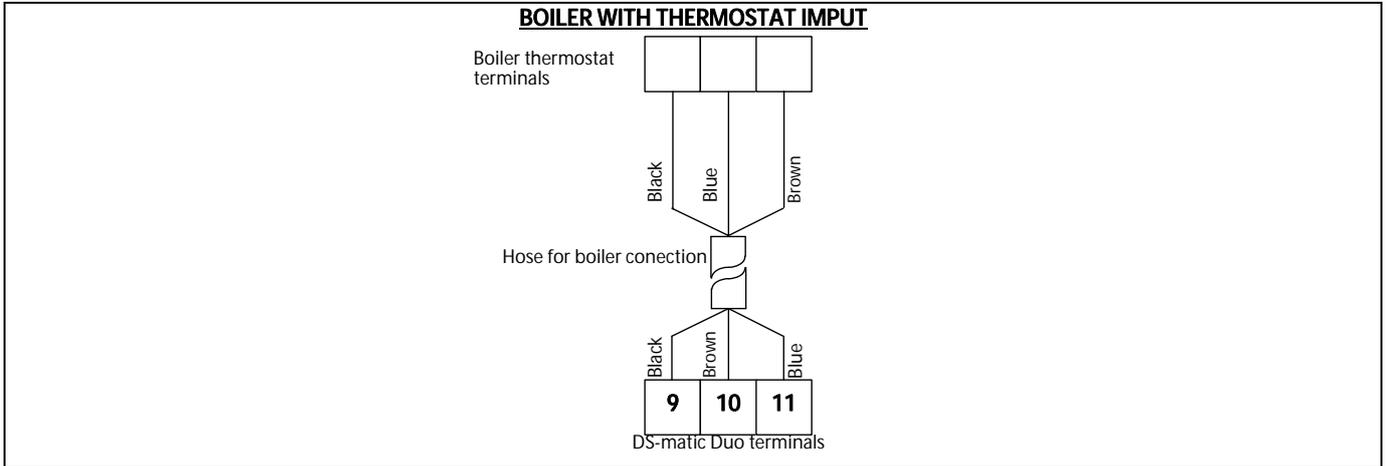


Figure 25

On boilers with a hot water tank sensor input, the sensor of the upper part of the hot water tank is to be connected to the boiler input. As the sensor is not fitted on the power unit, the DS-matic H Duo power unit needs to be configured in the same way as a DS-matic H power unit, programming the value 1 on the parameter H0 (see point 3.5.3 on page 14), as otherwise it would show a sensor 3 error.

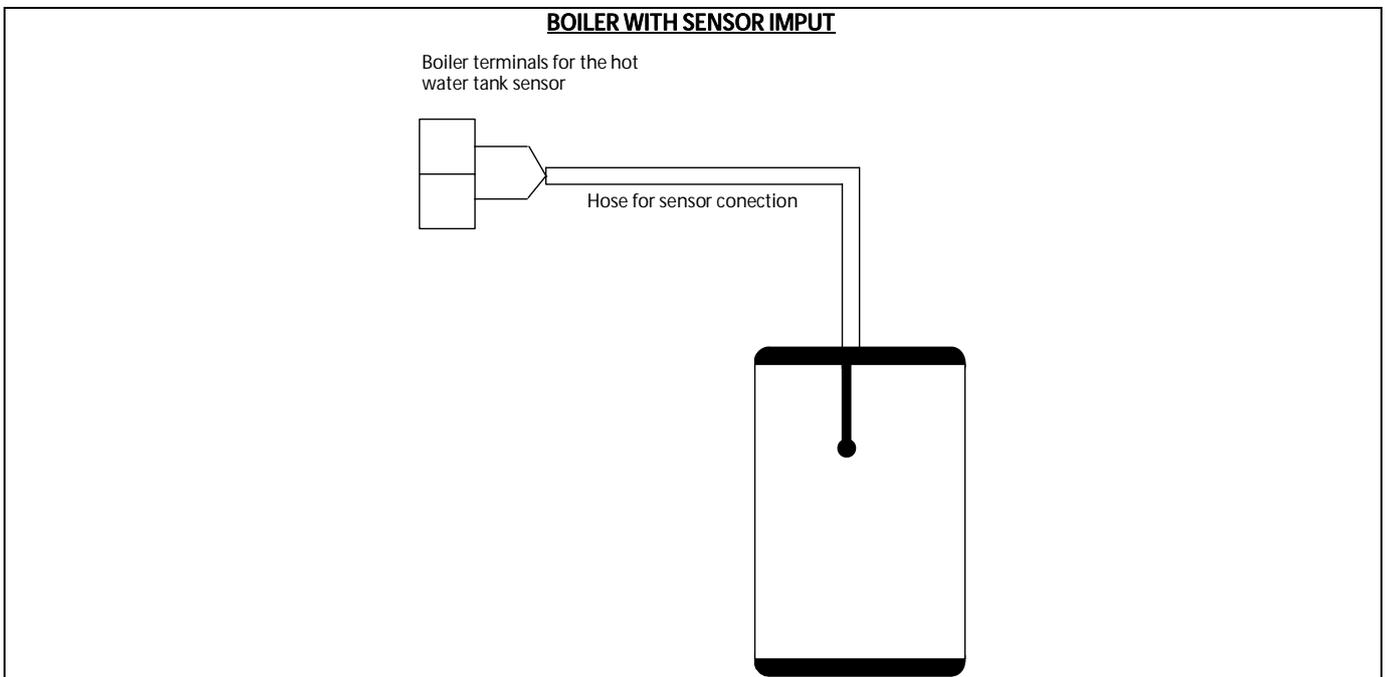


Figure 26

! IMPORTANT:
WHEN CONNECTING THE UPPER SENSOR OF THE HOT WATER TANK DIRECTLY TO THE BOILER, THE POWER UNIT MUST BE CHANGED TO DS-MATIC H MODE, OTHERWISE A SENSOR 3 ERROR WILL OCCUR.

7.5.2 Thermostatic valve

In installations where the domestic hot water of the DS-matic H system is conveyed to an instant hot water production boiler, it is recommendable to limit the temperature of the water entering the boiler.

DOMUSA TEKNIK supplies a mixing valve for this purpose, enabling the temperature to be regulated between 25 and 55°C.

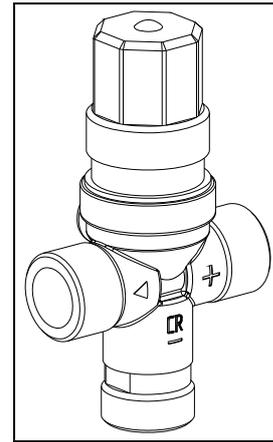


Figure 27

7.5.3 S200 hydraulic kit

It is a well-known fact that an increase in the temperature of the water stored in the hot water tank can cause the pressure in the tank to increase. DOMUSA TEKNIK therefore recommends fitting the S200 hydraulic kit consisting of dielectric sleeves, a DHW expansion vessel and a safety unit, to protect the hot water tank. To install it, read the assembly instructions supplied with the kit carefully.

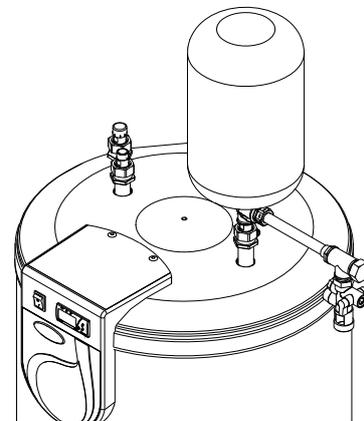


Figure 28

7.5.4 Cathodic protection

If the chloride concentration in the domestic hot water is higher than 250 mg/dm³, we recommend installing a cathodic protection inside the heat exchanger to avoid premature wear to the hot water tank. **DOMUSA TEKNIK** optionally supplies a suitable electronic cathodic protection for its range of heat exchangers. To install it, read the assembly instructions supplied with the cathodic protection carefully.

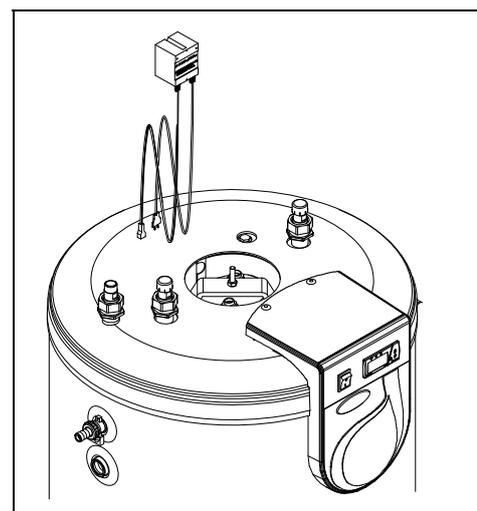


Figure 29

DS-matic H

7.5.5 Electrical element

All DS-matic H hot water tanks have a socket for connecting an electrical element. **DOMUSA TEKNIK** optionally supplies three elements, of 1.5, 2.5 and 3.5 kW. To install them, read the assembly instructions supplied with the elements carefully.

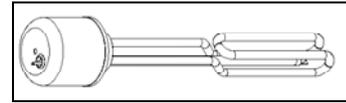


Figure 30

7.5.6 Hydraulic connection kit

The tubes supplied by **DOMUSA TEKNIK** have a diameter of 12 mm. They have external thermal insulation and a cable for the collector sensor. The insulation withstands high operating temperatures (+150°C, with peaks of up to +175°C) and it has a thermal conductivity of 0.04 W/mK at an average temperature of 0°C (0.048W/mK at 40°C).

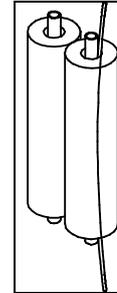


Figure 31

7.5.7 DHW sensor

This is required if the DS-matic H Duo is to be connected to an EVOLUTIONGAS EV C or an EVOLUTION GAS EV CKX using a sensor.

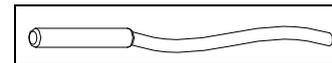


Figure 32

8 STARTING UP

DS-matic H systems must be started up by staff authorised by DOMUSA TEKNIK.

The start-up procedure is as follows:

1. Connecting the DS-matic H.
2. Fill the hot water tank.
3. Fill the solar circuit.
4. Check the seal.
5. Regulate the flow.
6. Consult the check list

We recommend disconnecting the DS-matic H unit during its installation and maintenance. If the solar power unit cannot be disconnected, you should start up the pumps manually to prevent automatic start-up, by programming a value of 1 on the advanced *h_{rs}* adjustment parameter

/IMPORTANT:
THE DS-MATIC H MUST REMAIN DISCONNECTED UNTIL THE FLOW HAS BEEN REGULATED.

8.1 Connecting the DS-matic H / DS-matic H Duo

1. Remove the front control panel and the bridge cover.
2. Thread the cable from the rear part (point A) through the central hole (via points B and C) to the front control panel (pulling it out through point D).
3. Connect the cable to the connector block as shown in the diagram in point 7.5.1.

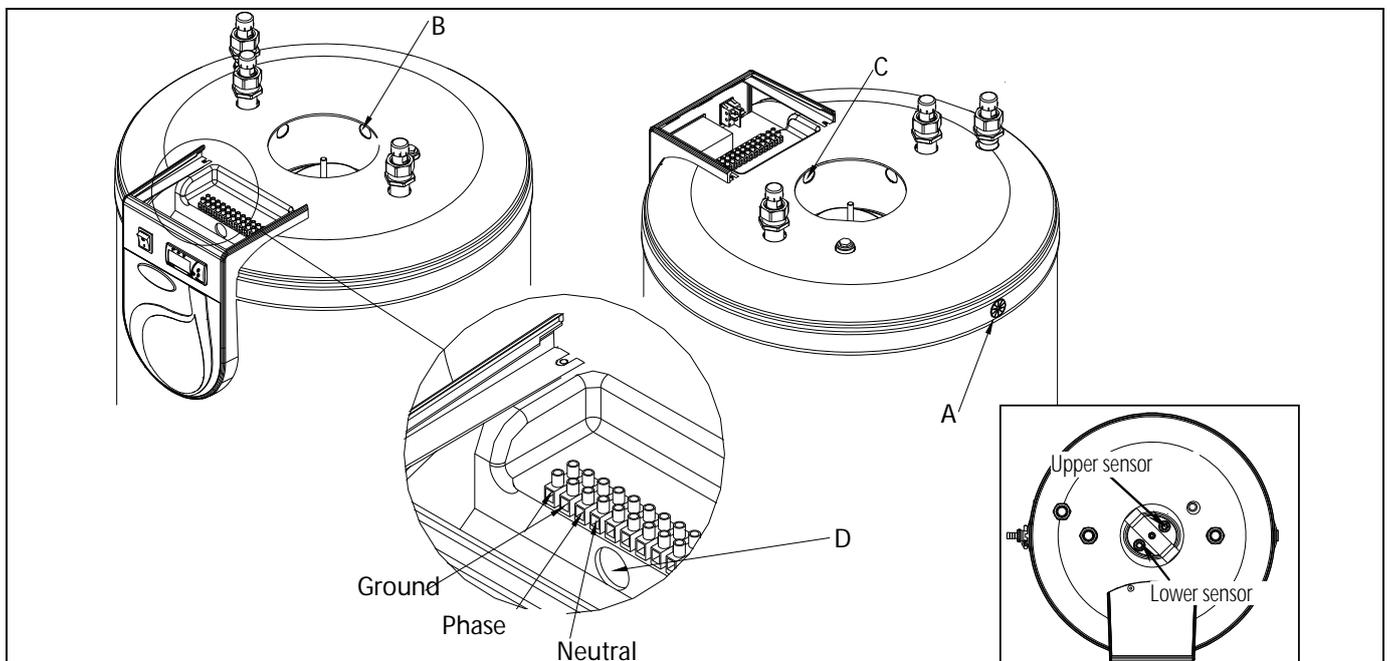


Figure 33

If you connect a sensor to measure the temperature of the upper part of the accumulator, you should insert it in the rear bulb-holder sheath in the elliptical cover. This bulb-holder sheath (which is shorter than the front sheath) only measures the temperature of the water in the upper part of the accumulator.

DS-matic H

8.2 Filling the hot water tank.

1. Turn on a hot water tap and fill the hot water tank.
2. When it is full, turn off the hot water tap and ensure the installation is correctly sealed.
3. Check the domestic hot water circuit safety devices are functioning correctly.

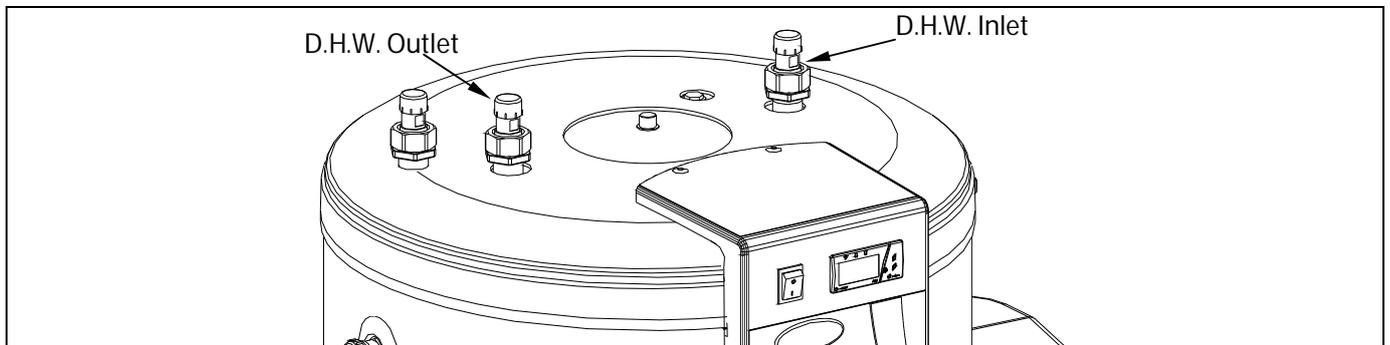


Figure 34

8.3 Filling the solar circuit.

1. Connect the fill/drain valve to the network socket with a hose.
2. Connect a hose from the level valve to a suitable container.
3. Open the level valve.
4. Pour the water in through the fill/drain valve or the solar inlet (with the aid of a funnel).
5. When liquid begins to come out of the level valve, close the fill/drain valve.
6. Close the level valve when no more liquid is coming out of it.
7. Check that the solar circuit safety devices are functioning correctly..

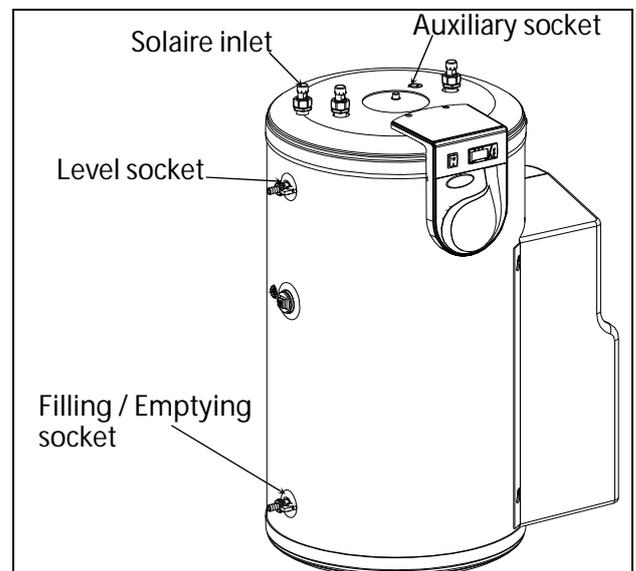


Figure 35

IMPORTANT!

DOMUSA TEKNIK WILL ONLY BE LIABLE FOR THE CORRECT FUNCTIONING OF THE SYSTEM IF IT HAS BEEN FILLED WITH DOMUSA TEKNIK INHIBITOR LIQUID.

8.4 Seal control

You should check that there are no leaks anywhere on the solar circuit while the pumps are activated. If you should discover any leaks, first check the seal and then repeat the load compensation operation.

IMPORTANT!

ENSURE THE SOLAR HEATING CIRCUIT IS CORRECTLY SEALED.

IMPORTANT!

ENSURE THERE IS NO SIPHON IN THE SOLAR HEATING CIRCUIT.

8.5 Flow regulation.

To regulate the flow of the solar heating circuit, the DS-matic H units have a manual regulator with a flow display. The units are supplied with the regulator totally open, i.e. at maximum flow, and so the regulation wheel should be turned clockwise until the flow is adjusted to 2 l/min.

To regulate the flow, start up the pumps in manual mode. The procedure is as follows:

- 1- Press the SET button and hold it down for 8 seconds. When the figure 0 begins to flash on the display, select the entry code (0 by default) using the  and  buttons, and press the SET button.
- 2- The parameter *h_{rs}* will appear on the display. Press the SET button (the programmed value will appear on the display).
- 3- Select value 2 by pressing the  and  buttons, then press the SET button again to programme the selected value (the pumps will start up).
- 4- Leave the pumps running for 15 minutes to stabilise the flow.
- 5- Repeat steps 1 and 2, then select value 3 in the *h_{rs}* parameter by pressing the  and  buttons. Press the SET button to programme the selected value (the upper pump will switch off).
- 6- If the flow exceeds the maximum recommended flow, turn the regulation wheel to adjust it. To do so, fit the red wheel onto the end of the flow indicator and turn it clockwise.
- 7- Repeat steps 1 and 2, then select 0 on the *h_{rs}* parameter by pressing the  and  buttons. Press the SET button to programme the selected value (the pumps will start up automatically).
- 8- When the flow has been adjusted, return the regulation wheel to its initial position.

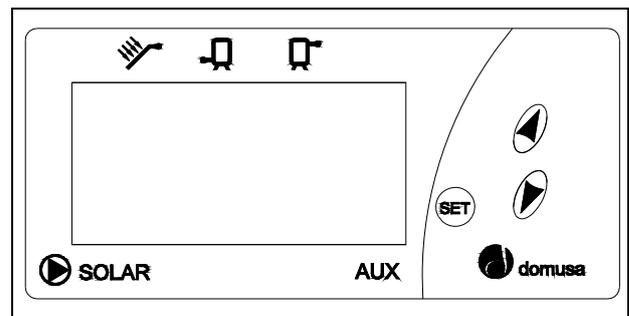


Figure 36

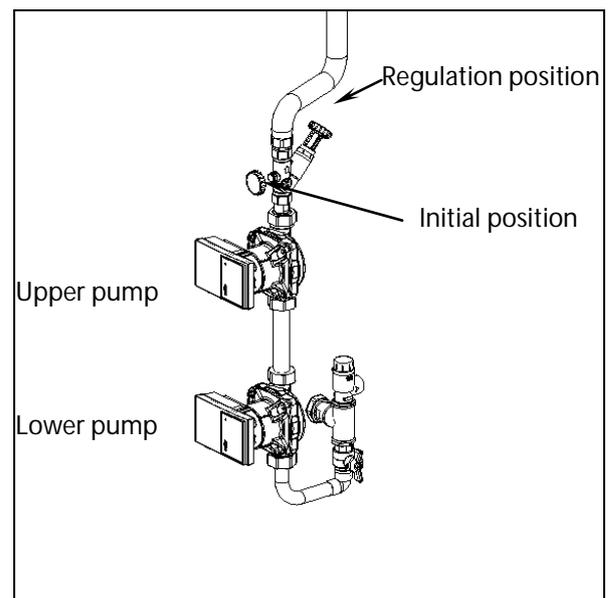


Figure 37

IMPORTANT!

THE SOLAR HEATING CIRCUIT FLOW MUST BE REGULATED TO 2 l/min.

For installations which do not reach a flow of 2 l/min, it is recommended to leave the flow regulator totally open.

DS-matic H

8.6 Check list

The following chart may be used as a guideline for installation and start-up.

	DONE	REMARKS
ASSEMBLY		
The supports have been placed according to the instructions		
The supports have been placed according to the instructions		
After fixing the supports in place, the roof covering has been correctly replaced		
The roof has not been damaged		
The solar circuit has been earthed		
START-UP		
Collectors levelled		
Inhibitor liquid has been used in the solar heating circuit		
The seal of the whole installation has been checked (including the heating installation seal on Duo models)		
REGULATION		
The sensor measurements are logical		
The solar pumps are working		
The flow of solar liquid is within the limits		
USER INSTRUCTIONS		
The display channels have been explained to the user		
The adjustment channels have been explained to the user		
The use of the element has been explained to the user (if the system has an element)		
The documentation has been given to the user		
The maintenance frequencies have been explained to the user		

IMPORTANT !
ENSURE THE SOLAR HEATING CIRCUIT IS CORRECTLY SEALED.

IMPORTANT !
ENSURE THERE IS NO SIPHON IN THE SOLAR HEATING CIRCUIT.

IMPORTANT !
THE SOLAR HEATING CIRCUIT FLOW MUST BE REGULATED TO 2 l/min.

IMPORTANT !
THE DS-MATIC H MUST REMAIN DISCONNECTED UNTIL THE FLOW HAS BEEN REGULATED.

9 SOLAR POWER UNIT

9.1 Display and control panel

The power units have three buttons. The purpose of each button is as follows.

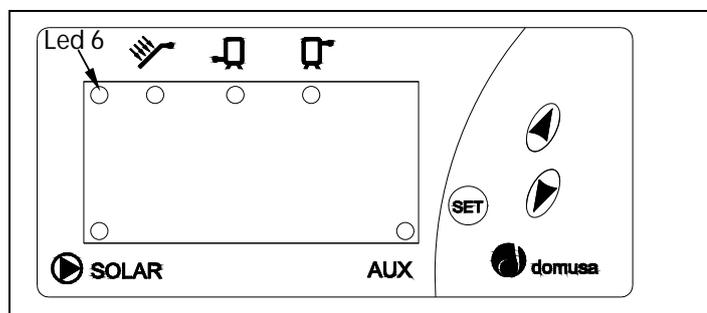


Figure 38

BUTTON	FUNCTION
	For scrolling up the menu and increasing the value displayed.
	For scrolling back down the menu and reducing the value displayed.
	For entering the basic parameter menu and programming the value displayed.
	For entering the advanced adjustment parameter menu.
	For exiting to the main display.

The power units also have 6 LEDs providing information on the sensors and the pump functioning mode.

LED	ON	FLASHING
	The temperature of the solar collector is displayed.	Solar collector sensor error. Text: <i>Er 1</i>
	The temperature of the lower part of the hot water tank is displayed.	Lower hot water tank sensor error. Text: <i>Er 2</i>
	The temperature of the upper part of the hot water tank is displayed.	Upper hot water tank sensor error. Text: <i>Er 3</i>
	Solar pumps activated	90%OFF - 10%ON: Solar pumps deactivated manually. 90%ON - 10%OFF: Solar pumps activated manually.
Led 6		90%ON - 10%OFF: Solar pumps activated at 100% PWM manually. 100%OFF: Solar pumps activated to "rub" manually.
AUX	Auxiliar pump aitivated	90%ON - 10%OFF: Auxiliar pump activated manually. 10%ON - 90%OFF: Auxiliar pump deactivated manually.

9.2 Equipment

The solar power unit is equipment with different sensors, according to the model. The different types of sensor depend on the hot water tank volume and on whether it is a DS-matic H or a DS-matic H Duo model.

	DS-matic H 1.15 DS-matic H PLUS 1.15	DS-matic H 1.25 / 2.25 DS-matic H PLUS 1.25 / 2.25	DS-matic H 1.15 Duo DS-matic H PLUS 1.15 Duo	DS-matic H 1.25 / 2.25 Duo DS-matic H PLUS 1.25 / 2.25 Duo
SENSORS	1 x CELC000285 (solar) 1xCELC000234 (DHW)	1 x CELC000285 (solar) 1 x CELC000211 (DHW)	1 x CELC000285 (solar) 2 x CELC000234 (DHW)	1 x CELC000285 (solar) 1 x CELC000211(DHW) 1 x CELC000234 (DHW)

!IMPORTANT:
CHECK THE COMPATIBILITY OF THE SENSORS SUPPLIED BEFORE CONNECTING THEM TO A BOILER.

DS-matic H

10 SOLAR POWER UNIT

10.1 Display and control panel

The power units have three buttons. The purpose of each button is as follows.

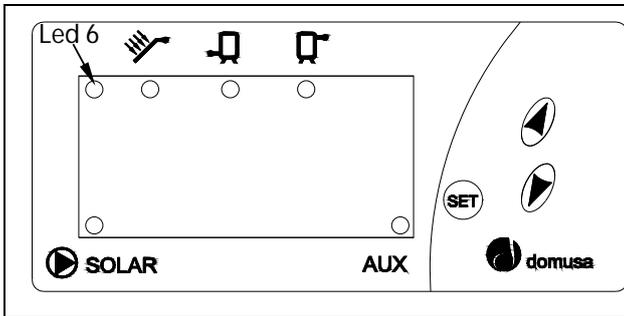


Figure 39

BUTTON	FUNCTION
	For scrolling up the menu and increasing the value displayed.
	For scrolling back down the menu and reducing the value displayed.
	For entering the basic parameter menu and programming the value displayed.
	For entering the advanced adjustment parameter menu.
	For exiting to the main display.

The power units also have 6 LEDs providing information on the sensors and the pump functioning mode.

LED	ON	FLASHING
	The temperature of the solar collector is displayed.	Solar collector sensor error. Text: <i>Er 1</i>
	The temperature of the lower part of the hot water tank is displayed.	Lower hot water tank sensor error. Text: <i>Er 2</i>
	The temperature of the upper part of the hot water tank is displayed.	Upper hot water tank sensor error. Text: <i>Er 3</i>
	Solar pumps activated	90%OFF - 10%ON: Solar pumps deactivated manually. 90%ON - 10%OFF: Solar pumps activated manually.
Led 6		90%ON - 10%OFF: Solar pumps activated at 100% PWM manually. 100%OFF: Solar pumps activated to "rub" manually.
AUX	Auxiliar pump aitivated	90%ON - 10%OFF: Auxiliar pump activated manually. 10%ON - 90%OFF: Auxiliar pump deactivated manually.

10.2 Equipment

The solar power unit is equipment with different sensors, according to the model. The different types of sensor depend on the hot water tank volume and on whether it is a DS-matic H or a DS-matic H Duo model.

	DS-matic H 1.15 DS-matic H PLUS 1.15	DS-matic H 1.25 / 2.25 DS-matic H PLUS 1.25 / 2.25	DS-matic H 1.15 Duo DS-matic H PLUS 1.15 Duo	DS-matic H 1.25 / 2.25 Duo DS-matic H PLUS 1.25 / 2.25 Duo
SENSORS	1 x CELC000285 (solar) 1xCELC000234 (DHW)	1 x CELC000285 (solar) 1 x CELC000211 (DHW)	1 x CELC000285 (solar) 2 x CELC000234 (DHW)	1 x CELC000285 (solar) 1 x CELC000211 (DHW) 1 x CELC000234 (DHW)

!IMPORTANT:
CHECK THE COMPATIBILITY OF THE SENSORS SUPPLIED BEFORE CONNECTING THEM TO A BOILER.

10.3 Electrical diagram

The electrical connection of all the power units must be made with a voltage of 210 - 250V and 50 - 60Hz, in accordance with the electrical diagram for each model (see 7.5.1 "Electrical diagram"). There follows a description of the electrical diagram of the power unit and its connection terminals.

DS-matic H

On DS-matic H models, the sensors and pumps (relay 1) are connected directly to the power unit, while the supply is made via the hot water tank terminal block (see 7.5.1 "Electrical diagram").

The power unit is equipped with 2 relays, which is used to control the two solar pumps of the DS-matic H models. The terminal to be used are as follows:

13 =relay 1 conductor for the pumps. Connect the neutral to terminal 15.

The temperature sensors (Sd1 and Sd2) should be connected to the following terminals, with any polarity:

17/16 =sensor 1 (collector sensor).

18/16 =sensor 2 (hot water tank sensor).

Cables PWMs (PWMs) must be connected with any polarity to the following terminals:

16/17 = PWMS (cable signals PWMS solar pumps).

The network connection is to be made to the following terminals via the hot water tank terminal block (see 7.5.1 "Electrical diagram"):

15 =neutral conductor N

14 =conductor Ph

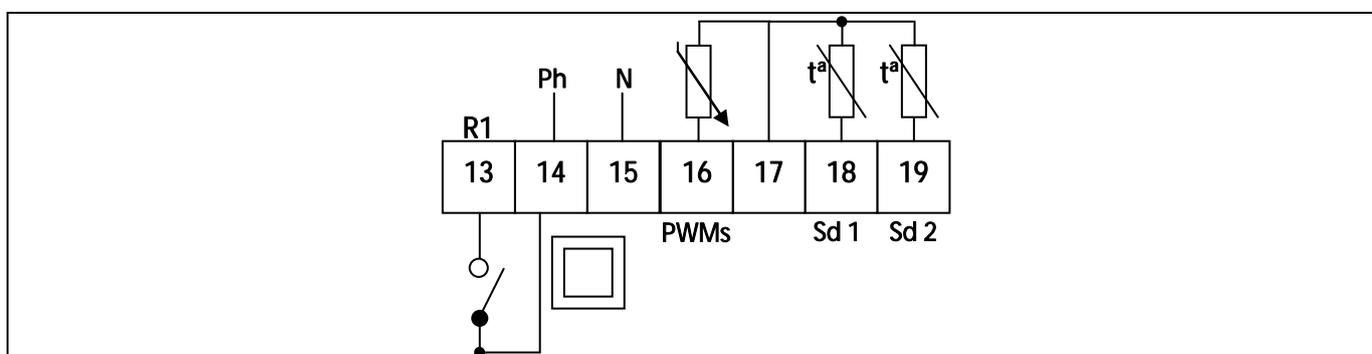


Figure 40

IMPORTANT !

OBSERVE THE DIAGRAM IN POINT 7.5.1. BEFORE MAKING THE CONNECTIONS

DS-matic H

DS-matic H Duo

On DS-matic H Duo models, the pumps (relay 1) are directly connected to the power unit, while the supply and the sensors (sensors 1, 2 and 3) are connected via the hot water tank terminal block (see 7.5.1 "Electrical diagram").

DS-matic H Duo power units are equipped with 2 relays. One of these are used for controlling the two solar pumps of the DS-matic H Duo models, and the second can be used for connecting the power unit to the back-up boiler. The terminals to be used are as follows:

- 13 = relay 1 conductor for the pumps. Connect the neutral to terminal 15.
- 11 = terminal for connection to the common thermostat input of the boiler.
- 10 = terminal for connection to the NO thermostat input of the boiler.
- 9 = terminal for connection to the NC thermostat input of the boiler.

The temperature sensors (Sd1, Sd2 and Sd3) are to be connected to the following terminals, with any polarity, via the hot water tank terminal block (see 7.5.1 "Electrical diagram"):

- 17/16 = sensor 1 (collector sensor)
- 18/16 = sensor 2 (lower hot water tank sensor)
- 19/16 = sensor 3 (upper hot water tank sensor)

Cables PWMs (PWMs) must be connected with any polarity to the following terminals:

- 16/17 = PWMS (cable signals PWMS solar pumps).

The network connection is made to the following terminals via the hot water tank terminal block (see see 7.5.1 "Electrical diagram"):

- 15 = neutral conductor N
- 14 = conductor Ph

IMPORTANT !
OBSERVE THE DIAGRAM IN POINT 7.5.1. BEFORE MAKING THE CONNECTIONS

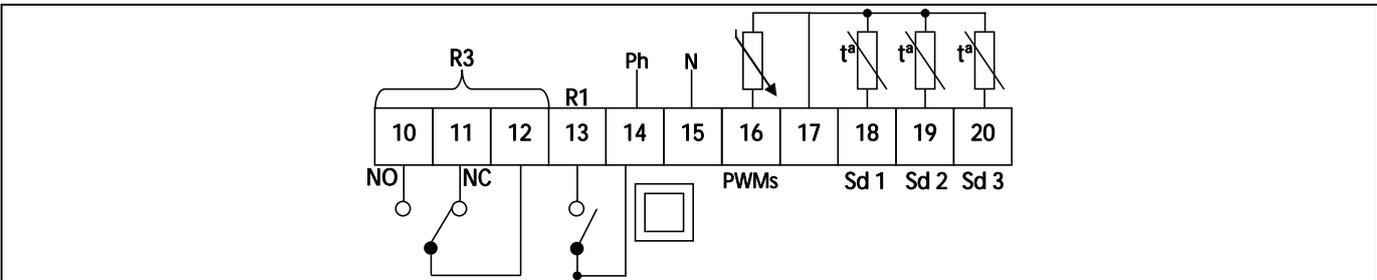


Figure 41

Connection to other boilers

For connecting the DS-matic H Duo system to other boilers, check whether the boiler has a sensor or thermostat input (for measuring the temperature in the upper part of the hot water tank).

10.4 Initial start-up

- 1- Make the electrical connections. The power unit will enter a start-up phase and all the LEDs on the display will come on. After start-up, the power unit will go into automatic functioning mode with the regulation as originally supplied.
- 2- Deactivate the pumps ($hrr5 = 1$), following the instructions in point 2.5.3. à la page 14.

11 MAINTENANCE

Maintenance must only be carried out by qualified staff. All work carried out on the system must be done by the Official Technical Assistance Service, as changing the configuration could cause functioning errors and damage to the system and its surrounding environment.

11.1 Cleaning the inside of the tank

The inside of the domestic hot water tank should be thoroughly cleaned once a year.

The upper part of the stainless steel tank is equipped with an access opening, for ease of cleaning.

If the hot water tank has an electronic cathode protection, this should be inspected once a year to ensure its correct functioning.

11.2 Checking the safety valve

Check the safety valve is functioning correctly by injecting air into it. If water comes out or if it does not close hermetically, replace it.

11.3 Collectors

The state of the collector supports should be checked periodically.

11.4 Draining the solar circuit

If the solar circuit needs draining, the procedure is as follows:

1. Connect a hose to the filling/emptying valve and another hose to the level valve.
2. Run the hoses to a suitable container.
3. Open the filling/emptying valve and the level valve.
4. Completely drain the solar heating circuit (see table below).
5. Disconnect the hoses used.

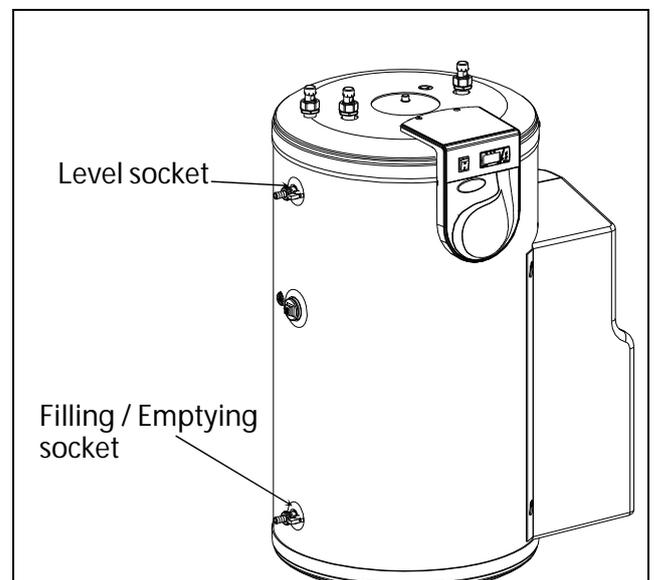


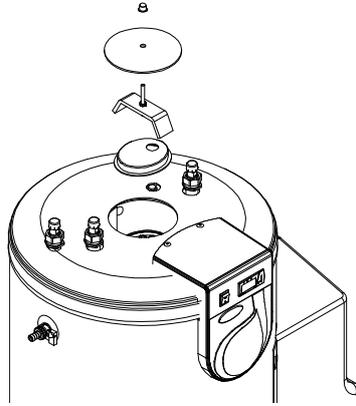
Figure 42

DS-matic H

11.5 Water draining of the tank

Before draining the water of the tank, its DHW circuit must be despressurized.

Remove tank's upper cap and put in a hose to empty it.



Direct the opposite end of the hose to a drainage, assuring that it is located in a level below the bottom of the tank. Inhale gently until the water starts flowing. Wait until the tank is completely empty.

11.6 Maintenance work

The table below shows a list of recommended maintenance work.

	Maintenance frequency
Hot water tank	
Check the connections are correctly sealed ¹	Yearly
Check the proper operation of the safety valves	Yearly
Collector	
Check the state of the collectors: dirt, dents, connections, supports and levelling of the collectors ²	Yearly
Regulation	
Check the sensors are working correctly ³	Yearly
Check the power unit adjustment parameters ⁴	Yearly
Check the pump is working correctly in automatic and manual mode (on/off) ⁵	Yearly
Check the mixing valve is working correctly, if the unit has one ⁶	Yearly
Solar circuit	
Check the solar liquid filling level ⁷	Yearly
Renew the solar liquid with a concentration of at least 30% of the inhibitor liquid	At least once every 3 years.
Check the collectors are self-draining ⁸	Yearly
Pipes	
Check the state of the insulation ⁹	Yearly
Check the installation is correctly sealed ¹⁰	Yearly

¹ Check the connections are correctly sealed

With the circulation pump running (see point 8.5), visually check the accumulator connections.

² Check the state of the collectors

Visually check the state of the collectors (dirt, dents, connections, etc.) and rectify any anomalies found.

³ Check the sensors are working correctly

Check that the temperatures indicated by the power unit coincide with the real temperature.

⁴ Check the power unit adjustment parameters

Check that the parameters are correctly adjusted (see point 2.4 of User guide).

⁵ Check the pump is working correctly in automatic and manual mode (on/off)

Programme the *h₀₅* parameter in all its configurations, checking the pumps are working correctly for each of the configurations.

⁶ Check the mixing valve is working correctly, if the unit has one

Check the water is coming out at the temperature calibrated on the mixing valve.

⁷ Check the solar liquid filling level

Open the level valve. If no water comes out, fill the solar circuit following the instructions in point 8.3. If you fill the solar circuit, ensure a minimum concentration of 30% of inhibitor liquid.

⁸ Check the plates are self-draining

Set the pumps running (see point 8.5), ensure the water is returning to the hot water tank and then disconnect the pumps. When 15 minutes have elapsed, remove the connection of the tubes with the solar collectors and check no water is coming out of the collectors.

⁹ Check the state of the insulation

Visually check the state of the insulation.

¹⁰ Check the installation is correctly sealed

With the circulating pump running (see point 8.5), visually check the system connections.

DS-matic H

12 SPARES LIST

12.1 Hot water tank

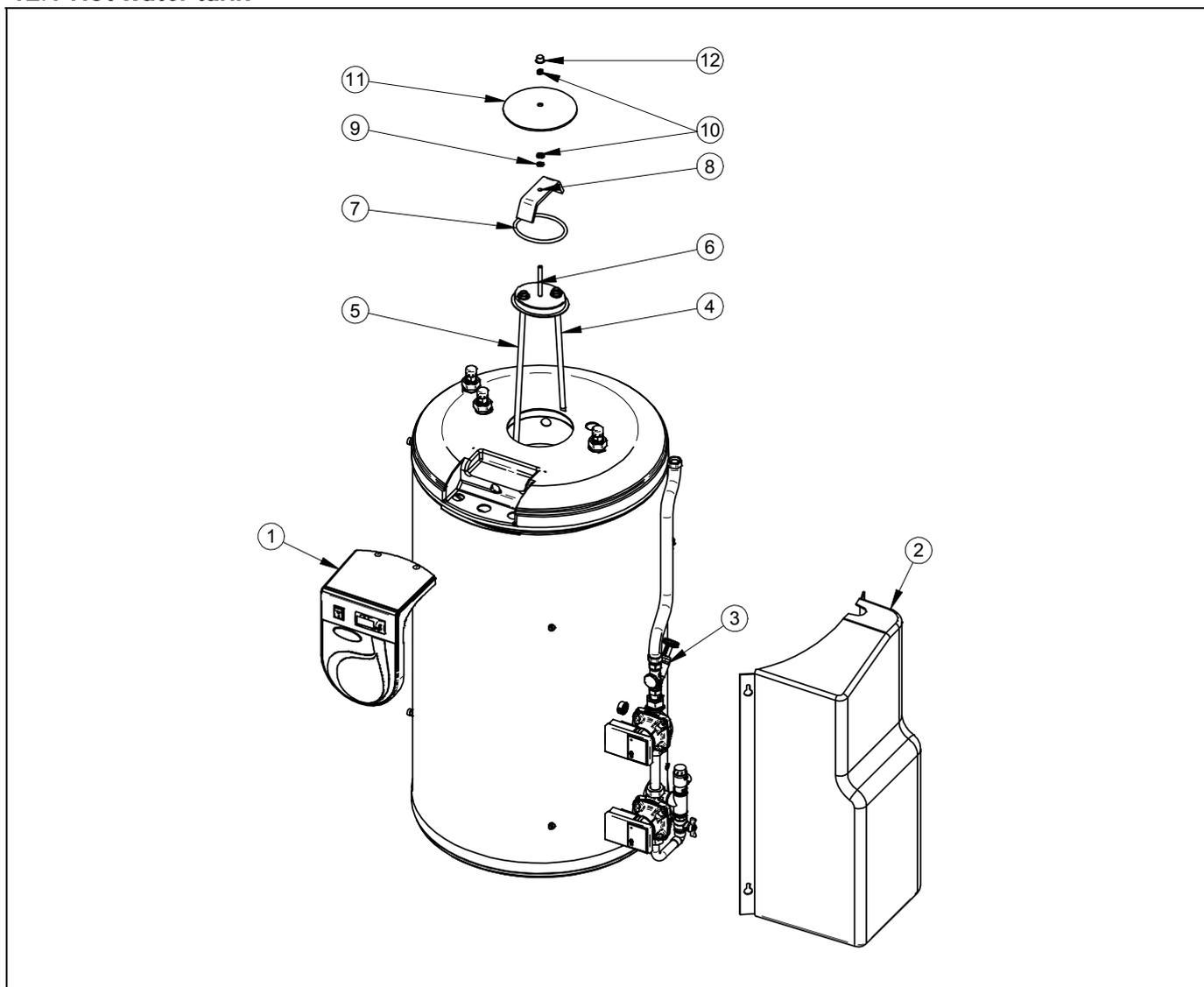


Figure 43

Pos.	Code	Designation
1	SELEDSM008	Electrical board (DS-matic H 150 / PLUS)
	SELEDSM009	Electrical board (DS-matic H 150 Duo / PLUS)
	SELEDSM010	Electrical board (DS-matic H 250 / PLUS)
	SELEDSM011	Electrical board (DS-matic H 250 Duo / PLUS)
2	CACU000051	Cover
3	GFONDSM005	Plumbing (DS-matic H / Duo)
	GFONDSM006	Plumbing (DS-matic H PLUS / PLUS Duo)

Pos.	Code	Designation
4		Short bulb-holder sheath (DS-matic H Duo / PLUS Duo)
5		Long bulb-holder sheath
6		Elliptical cover
7	COTR000006	O-ring
8		Bridge
9		M8 washer
10		M8 nut
11	CACU000038	Bridge cover
12	CFER000090	Black cap

12.2 Electrical board

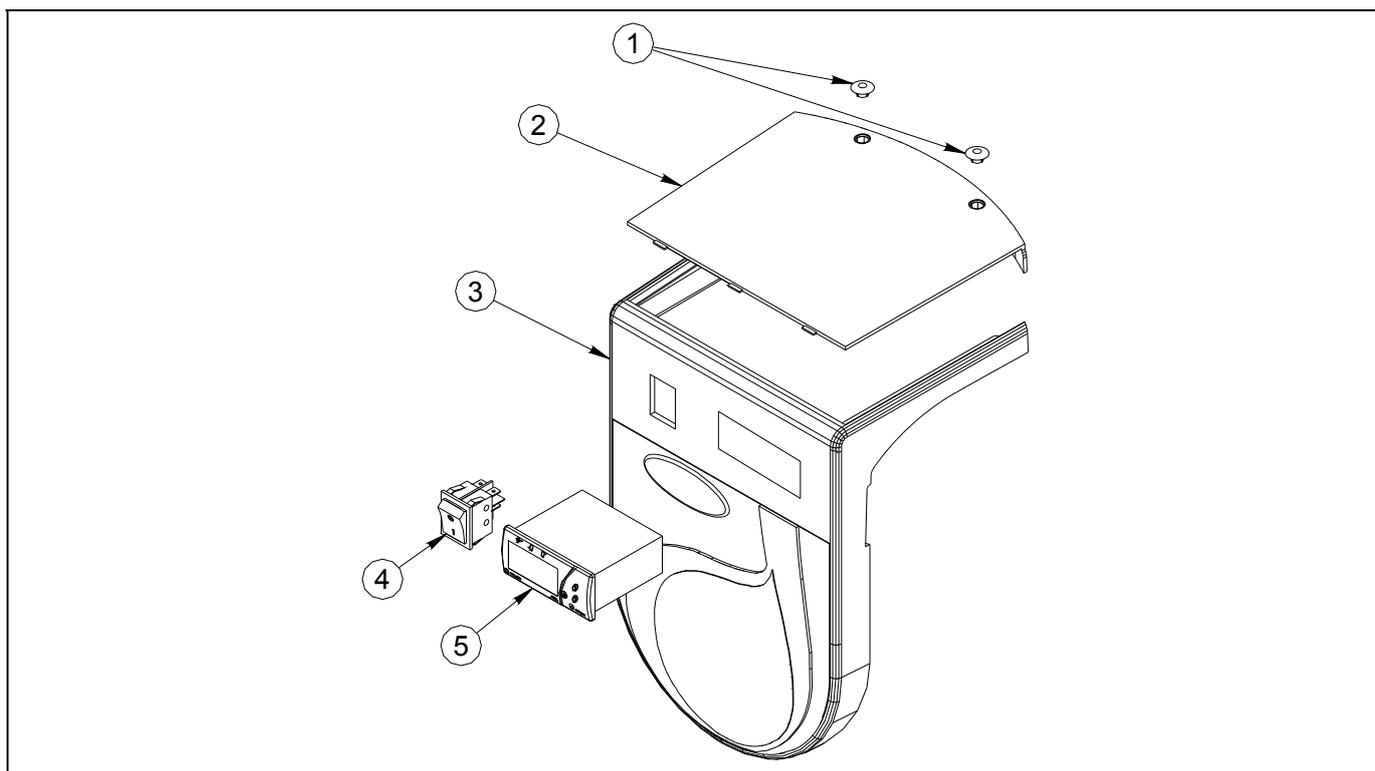


Figure 44

Pos.	Code	Designation
1	CACU000037	Control panel cover lid
2	CACU000036	Control panel cover
3	CACU000055	Control panel
4	CELC000025	Switch
5	CELC000362	Solar power unit (DS-matic H / DS-matic H PLUS)
	CELC000363	Solar power unit (DS-matic H Duo / PLUS Duo)

DS-matic H

12.3 Hydraulic unit

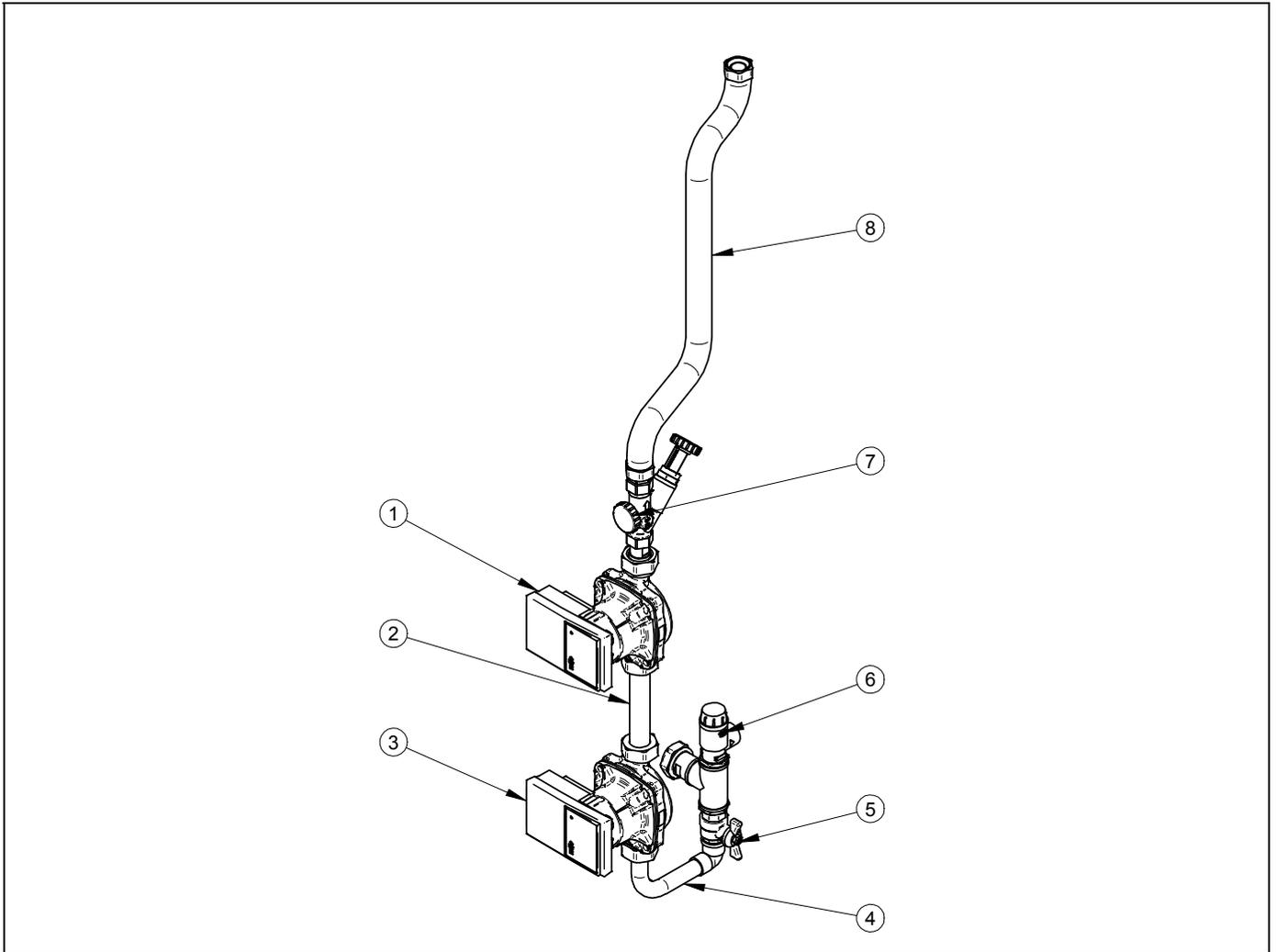


Figure 45

Pos.	Code	Designation
1	CFOV000153	Pump
2	SCOB011957	Pump joining tube
3	CFOV000144	Pump (DS-matic H / Duo)
	CFOV000152	Pump (DS-matic H PLUS / PLUS Duo)
4	SCOB012000	Pump siphon tube
5	CVAL000027	Valve
6	CVAL000017	Safety valve
7	CVAL000018	Flow regulator
8	SCOB012001	Flow regulator tube

13 TECHNICAL DATA

	DS-matic H		DS-matic H		DS-matic H	
	1.15	1.15 Duo	1.25	1.25 Duo	2.25	2.25 Duo
Hot water tank						
Volume	150 liters		250 liters			
Insulation	Polyuréthane expanded					
External diameter	581 mm					
Width	747,5 mm					
Depth	581 mm					
Height	1028 mm		1628 mm			
DHW connections	1/2"					
Solar circuit connections	1/2"					
Auxiliar primary connections	3/4"					
Weight of empty hot water tank	84 Kg		113 Kg			
Weight of full hot water tank	234 Kg		363 Kg			
Weight with packaging	159 Kg		188 Kg		243 Kg	
Max. storage temperature	75 °C					
DHW recommended temperature	60 °C					
Max. working pressure of hot water tank	0,7 MPa (7 bar)					
Max. pressure valve pressure	0,3 MPa (3 bar)					
Max. primary working pressure	0,3 MPa (3 bar)					
Type of solar liquide	Glycol-water melange					
L/hour*	250		416			

* This data is for a full accumulator at 60°C. The data may vary depending on the solar radiation on each particular day.

	1.15	1.15 Duo	1.25	1.25 Duo	2.25	2.25 Duo
Solar exchanger						
Exchanger area		1,3 m ²	2,1 m ²	1,9 m ²	2,1 m ²	1,9 m ²
Liquide volume		25 L	42,5 L	37,5 L	42,5 L	37,5 L
Max. liquide temperature		110°C				
Auxiliar exchanger						
Exchanger area	---	0.38 m ²	---	0.7 m ²	---	0.7 m ²
Max. liquide temperature		90°C				
DHW heated volume	---	55 L	---	84 L	---	84 L
Electrical consume						
Pumps power consumption		58 watt/h		108 watt/h		
Pumps and power unit power consumption (2000h)		116 kW		216 kW		

DS-matic H

	1.15	1.15 Duo	1.25	1.25 Duo	2.25	2.25 Duo
Electrical element						
Voltage	230 V - 50 Hz					
Power	1.5 kW			2.5kW		
DHW heated volume	45 L	40 L	76 L	56 L	76 L	56 L
Power unit						
Sensor wire diameter	0,75 mm ²					
Min. power cable wire diameter	1,5 mm ² (1,5 kW) - 2 mm ² (2,5 kW) - 2,5 mm ² (3,5 kW)					
Voltage	230V - 50Hz					

SENSORS Sd2, Sd3 PTC 1K (1000Ω at 25 °C)			
R (ohms)	Temp. (°C)	R (ohms)	Temp. (°C)
515,00	-50	1209,00	50
567,00	-40	1299,00	60
624,00	-30	1392,00	70
684,00	-20	1490,00	80
747,00	-10	1591,00	90
815,00	0	1696,00	100
886,00	10	1805,00	110
961,00	20	1915,00	120
1000,00	25	2023,00	130
1040,00	30	2124,00	140
1122,00	40	2211,00	150

SENSOR Sd1 Pt1000 (1000Ω at 0 °C)			
R (ohms)	Temp. (°C)	R (ohms)	Temp. (°C)
803,00	-50	1347,00	90
843,00	-40	1385,00	100
882,00	-30	1423,00	110
922,00	-20	1461,00	120
961,00	-10	1498,00	130
1000,00	0	1536,00	140
1039,00	10	1573,00	150
1078,00	20	1611,00	160
1097,00	25	1648,00	170
1117,00	30	1685,00	180
1155,00	40	1722,00	190
1194,00	50	1759,00	200
1232,00	60	1795,00	210
1271,00	70	1832,00	220
1309,00	80		

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