Spain Portugal

en

Installation and Service Manual

Pressurised domestic installations

Solar hydraulic unit

SH 7 COMPACT
SH 7 COMPACT TOP
SH 7
SH 14
SH 7 SIMPLE

Dear Customer,

Thank you very much for buying this appliance.

Please read through the manual carefully before using the product, and keep it in a safe place for later reference. In order to ensure continued safe and efficient operation we recommend that the product is serviced regularly. Our service and customer service organisation can assist with this.

We hope you enjoy years of problem-free operation with the product.

1 Safety

1.1 General safety instructions

1.1.1 General safety

Peligro
This appliance can be used by children aged 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they are given correct supervision or instruction on using the appliance in complete safety and understand the hazards involved. Children must not play with the appliance. Cleaning and user maintenance must not be carried out by children without supervision.

Peligro de electrocución
Before any work, switch off the power supply to the appliance.

Atención
Use only genuine spare parts.

Importante
Only qualified professionals are permitted to install the appliance, in accordance with prevailing local and national regulations.

Advertencia
Do not touch the pipes. Depending on the settings, the temperature of the pipes may exceed 60 °C.

Advertencia
Take precautions with the domestic hot water. Depending on the settings, the temperature of the domestic hot water may exceed 60 °C.

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

Advertencia
Use protective gloves.

Importante
The installation must comply on all points with prevailing regulations and Directives, which govern work and interventions in individual homes, blocks of flats and other buildings.

1.1.2 Electrical safety

Advertencia
If a power supply cable comes with the appliance and it turns out to be damaged, it must be replaced by the manufacturer, its after sales service or persons with similar qualifications in order to obviate any danger.

Importante
The installation must comply on all points with prevailing regulations and Directives, which govern work and interventions in individual homes, blocks of flats and other buildings.

> **Advertencia**
> Do not neglect to service the appliance. Contact a qualified professional or take out a maintenance contract for the annual maintenance of the appliance.

1.2 Recommendations

> **Advertencia**
> The installation must comply with all the provisions of the regulations (DTU, EN, etc.) governing work and interventions in individual homes, blocks of flats or other buildings.

> **Importante**
> Keep the appliance accessible at all times.

> **Importante**
> Regularly check that the system is operating correctly.

> **Importante**
> Never remove or cover the labels and data plates affixed to appliances. The labels and data plates must be legible throughout the entire service life of the appliance.
> Damaged or illegible instructions and warning stickers must be replaced immediately.

> **Importante**
> Only remove the casing to perform maintenance and repair work.
> Put the casing back in place after maintenance and repair work.

1.3 Liabilities

1.3.1 Manufacturer's liability

Our products are manufactured in compliance with the requirements of the various Directives applicable. They are therefore delivered with the CE marking and any documents necessary. In the interests of the quality of our products, we strive constantly to improve them. We therefore reserve the right to modify the specifications given in this document.

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

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

1.3.2 Installer's liability

The installer is responsible for the installation and initial commissioning of the appliance. The installer must observe the following instructions:

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

1.3.3 User's liability

To guarantee optimum operation of the system, you must abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on a qualified professional to carry out installation and initial commissioning.
- Get your installer to explain your installation to you.
- Have the required inspections and maintenance carried out by a qualified installer.
- Keep the instruction manuals in good condition close to the appliance.

2 About this manual

2.1 General

This manual is intended for installers of pressurised hydraulic units.

2.2 Symbols used

2.2.1 Symbols used in the manual

This manual uses various danger levels to draw attention to special instructions. We do this to improve user safety, to prevent problems and to guarantee correct operation of the appliance.

Peligro
Risk of dangerous situations that may result in serious personal injury.

Peligro de electrocución
Risk of electric shock.

Advertencia
Risk of dangerous situations that may result in minor personal injury.

Atención
Risk of material damage.

Importante
Please note: important information.

Consejo
Reference to other manuals or pages in this manual.

3 Technical specifications

3.1 Directives

The pump and solar control supplied with this product comply with the CE marking.

For all provisions and Directives referred to in these instructions, it is agreed that all addenda or subsequent provisions will apply at the time of installation.

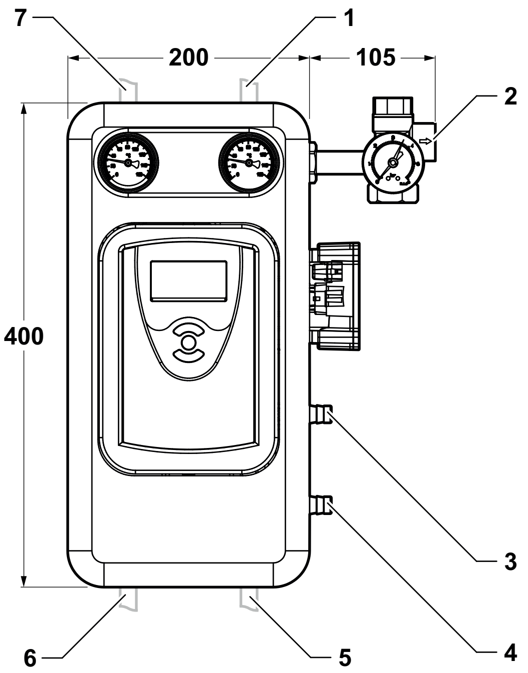
3.2 Technical data

Tab.1 Technical data of the hydraulic units

		SH 7 COMPACT	SH 7 COMPACT TOP	SH 7	SH 14	SH 7 SIMPLE
Maximum field of collectors	m^2	14	14	14	28	14
Nominal flow rate	$l/h \cdot m^2$	30	30	30	30	30
Supply voltage	V	1~230/50 Hz	1~230/50 Hz	1~230/50 Hz	1~230/50 Hz	1~230/50 Hz
Electrical power consumption	W	46	46	45	60	45
Maximum current	A	16	3	16	16	16
Protection rating	IP	20	20	20	20	20

3.3 Dimensions and connections

Fig.1 Dimensions and connections SH 7 Compact / SH 7 Compact Top



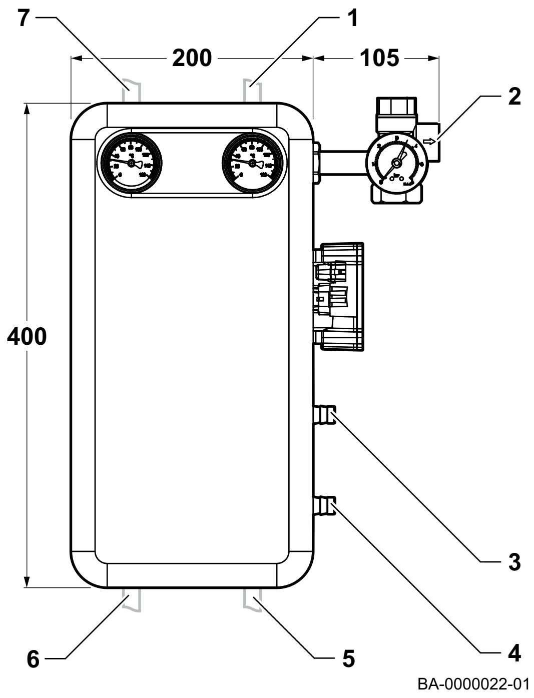
3.3.1 SH 7 Compact / SH 7 Compact Top

Tab.2 Connections SH 7 Compact / SH 7 Compact Top

	Connection	Size
1	Flow pipe to solar installation (lower connection of solar panels)	Dia. 22
2	Safety valve outlet	G3/4" H
3	Filling the system	G3/4" M
4	Draining the system	G3/4" M
5	Tank outlet	Dia. 22
6	Tank inlet	Dia. 22
7	System return (upper connection of solar panels)	Dia. 22

3.3.2 SH 7, SH 14

Fig.2 Dimensions and connections SH 7 and SH 14

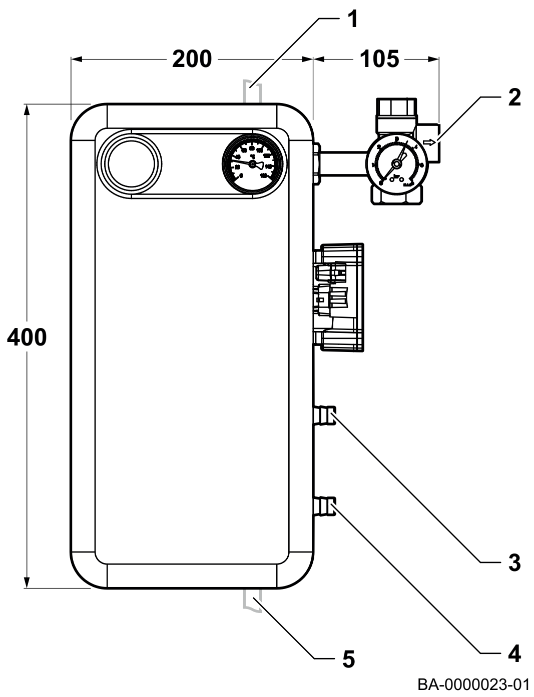


Tab.3 Connections SH 7 and SH 14

	Connection	Size
1	Flow pipe to solar installation (lower connection of solar panels)	Dia. 22
2	Safety valve outlet	G3/4" H
3	Filling the system	G3/4" M
4	Draining the system	G3/4" M
5	Tank outlet	Dia. 22
6	Tank inlet	Dia. 22
7	System return (upper connection of solar panels)	Dia. 22

3.3.3 SH 7 Simple

Fig.3 Dimensions and connections SH 7 Simple



Tab.4 Connections SH 7 Simple

	Connection	Size
1	Flow pipe to solar installation (lower connection of solar panels)	Dia. 22
2	Safety valve outlet	G3/4" H
3	Filling the system	G3/4" M
4	Draining the system	G3/4" M
5	Tank outlet	Dia. 22

3.4 Electrical diagram

Fig.4 Electrical diagram of the SH 7 Compact unit

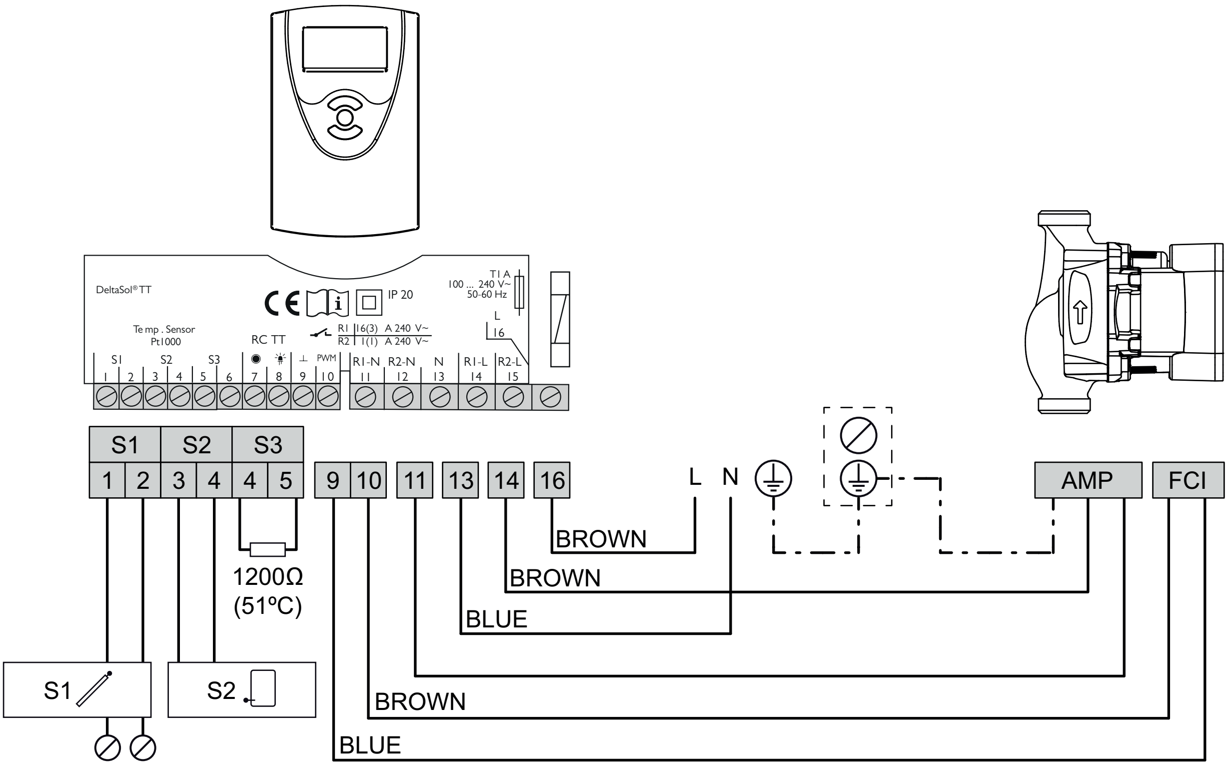


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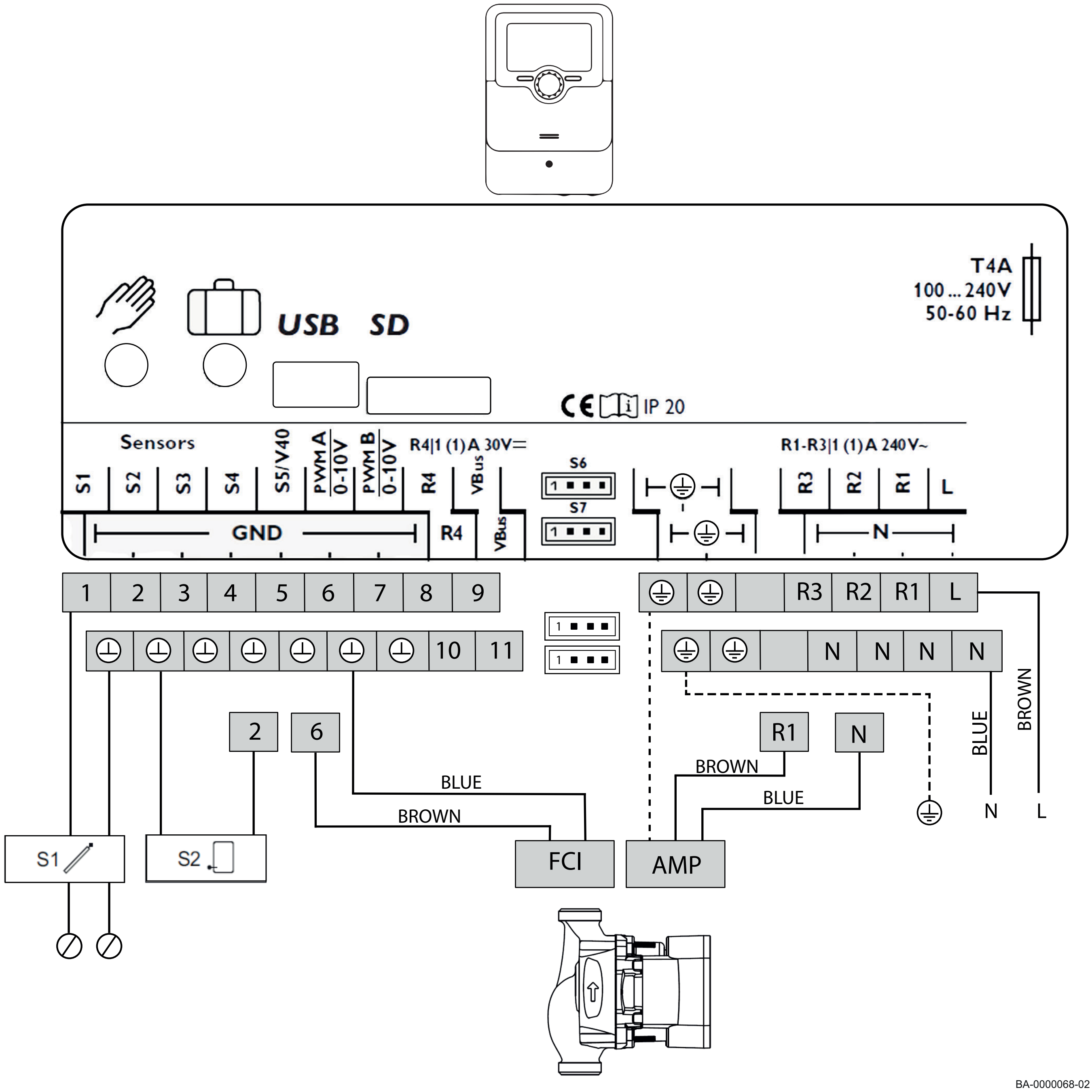
Fig.5 Electrical diagram of the SH 7 Compact Top unit



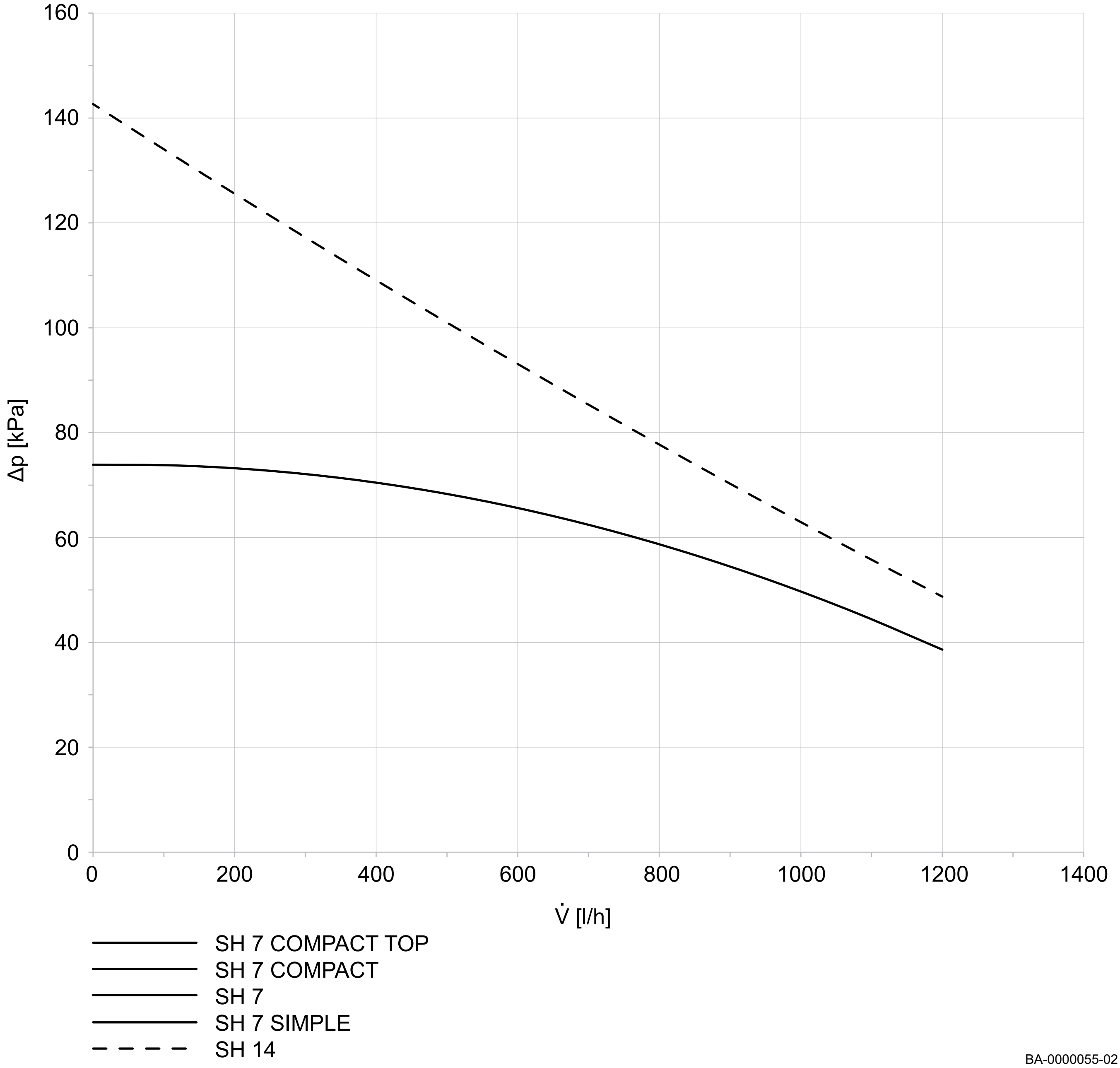
Importante
These electrical diagrams only refer to the SH 7 Compact & SH 7 Compact Top systems

Importante
The SH 7, SH 14 and SH 7 Simple systems require an external solar control to be connected.

Importante
Observe the line-neutral polarity

3.5 Characteristic curve

Fig.6 Characteristic curve of the hydraulic unit



4 Description of the product

4.1 General description

The SH 7 Compact Top SH 7 Compact, SH 7, SH 14 and SH 7 Simple hydraulic units are a small and compact solution containing all elements required to easily, quickly and conveniently install solar thermal energy systems.

The solar hydraulic unit is designed to connect the accumulator and the collector field.

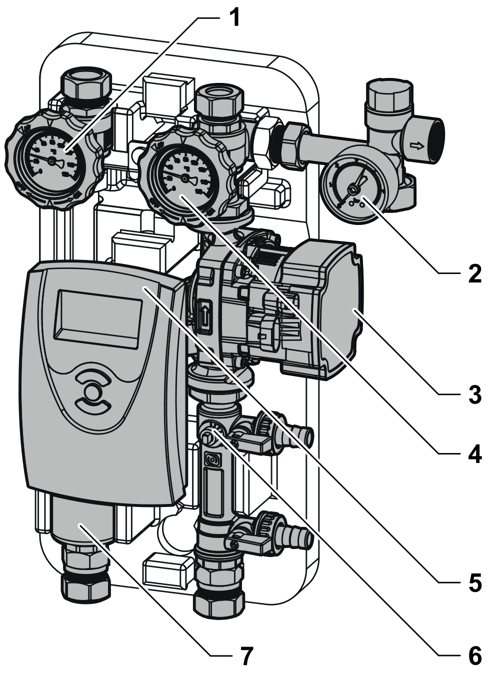
4.2 Operating principle

The solar pump station transports the hot heat transfer fluid from the collector field to the domestic hot water tank or the buffer tank. The solar control controls the solar pump station.

Importante
An external solar control is required to control the solar pump station for the SH 7, SH 14 and SH 7 Simple units.

4.3 Main components

Fig.7 Main components of the SH 7 Compact / SH 7 Compact Top unit



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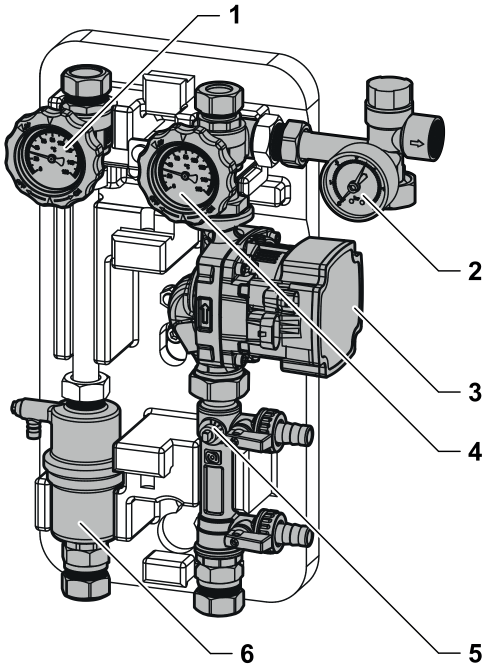
4.3.1 SH 7 Compact/SH 7 Compact Top

The SH 7 Compact / SH 7 Compact Top system comprises the following main components:

1 Return valve
2 Safety group
3 Solar circuit pump
4 Outlet valve
5 Solar control box
6 Flow regulator
7 Air separator

4.3.2 SH 7, SH 14

Fig.8 Main components of the SH 7 and SH 14 units



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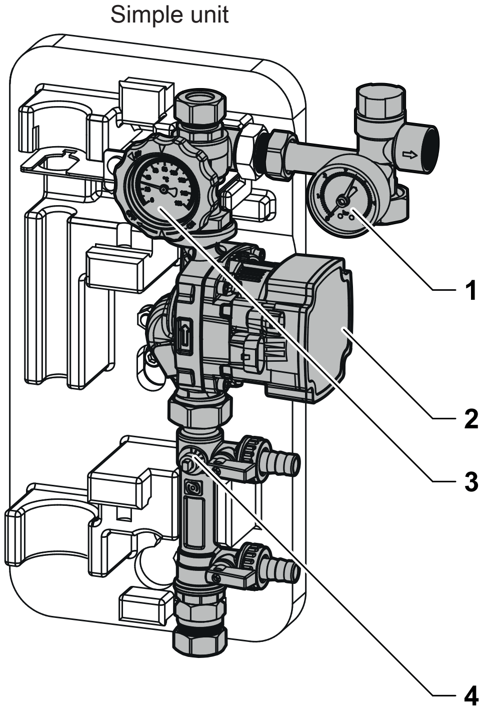
The SH 7 and SH 14 systems comprise the following main components:

1 Return valve
2 Safety unit
3 Solar circuit pump
4 Outlet valve
5 Flow regulator
6 Air separator

4.3.3 SH 7 Simple

Fig.9 Main components of the SH 7 Simple unit



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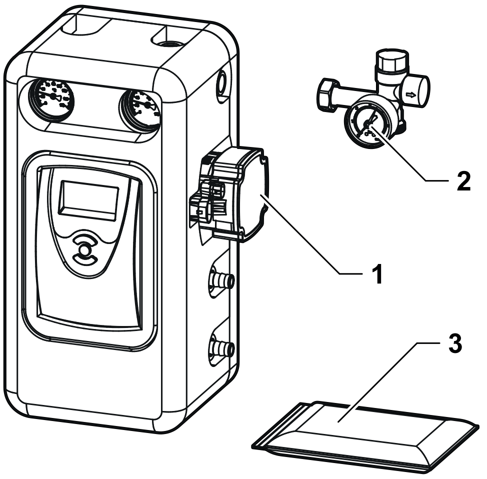
The SH 7 Simple system comprises the following main components:

1 Safety unit
2 Solar circuit pump
3 Outlet valve
4 Flow regulator

4.4 Standard delivery

Fig.10 Standard delivery



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Each solar hydraulic unit package contains:

1 Hydraulic unit
2 Safety unit and assembly accessories
3 Documentation pack

Importante
The final product may differ from the image.

5 Before installation

5.1 Installation regulations

> **Advertencia**
> The system must be installed by a qualified professional in accordance with prevailing local and national regulations.

5.2 Electrical requirements

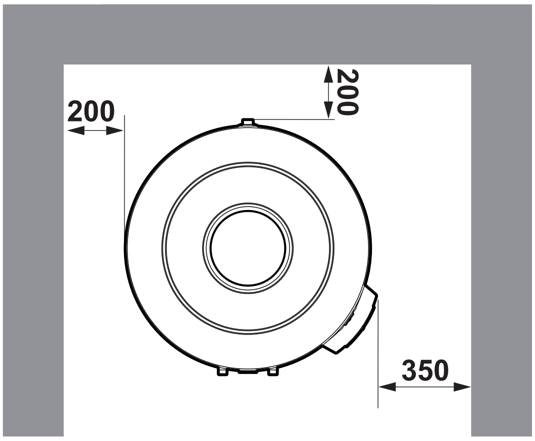
Tab.5 Electrical information

	Values
Supply voltage	1~230 V/50 Hz
Power supply	Single phase

5.3 Choice of the location

5.3.1 Location dimensions

Fig.11 Recommended clearances



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Decide on the ideal position for the installation, taking into account the legal provisions and the spatial requirements for the appliance. Allow sufficient space around the system to ensure adequate access to the appliance and enable any and all maintenance operations to be carried out.

The dimensions shown in the figure should be used as a guideline.

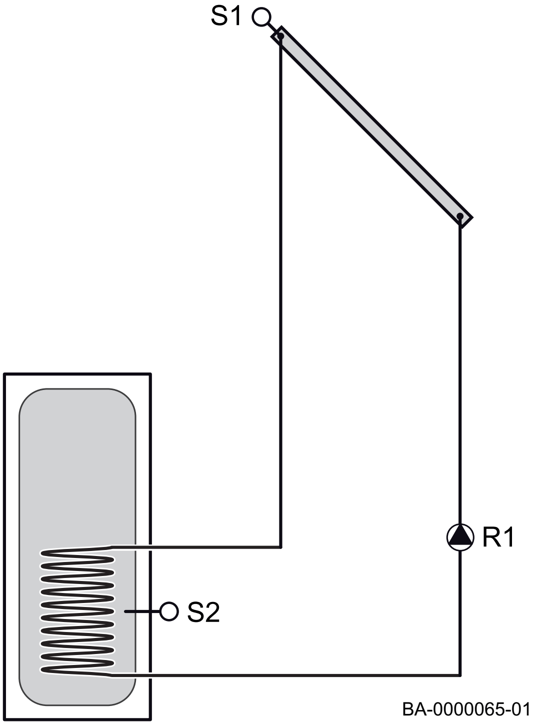
5.3.2 Accumulator location

> **Atención**
> Install the appliance in a frost-free location.

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

5.3.3 Installation examples

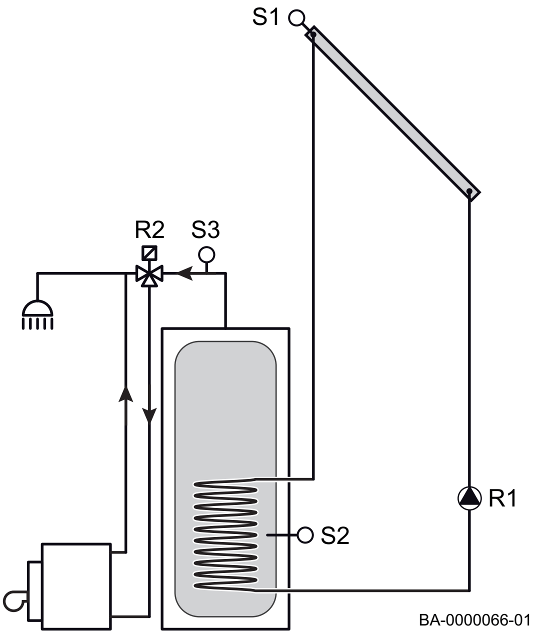
Fig.12 System 1



Standard solar power system with an accumulator for all models of control panel.

- The solar control compares the temperature difference between the collector sensor S1 and the accumulator sensor S2. If the temperature difference is greater than or equal to the activation value set on the control for the pump R1, the pump starts up and charges the accumulator until it reaches either the value for the shutdown difference or the set maximum accumulator temperature.

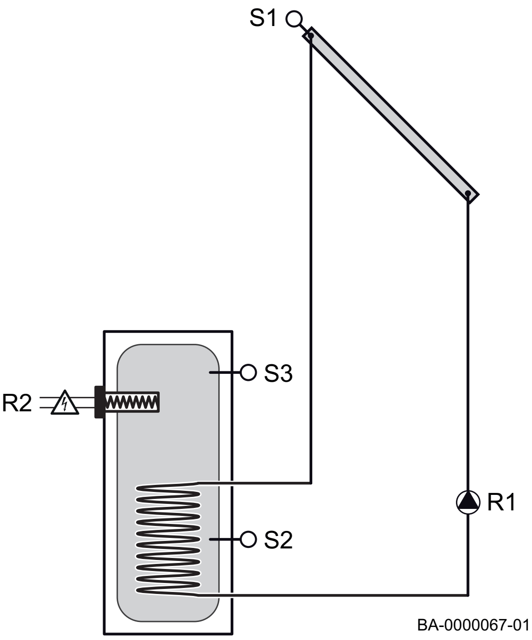
Fig.13 System 2



Standard solar power system with an accumulator and auxiliary heater for all models of control panel.

- The solar control compares the temperature difference between the collector sensor S1 and the accumulator sensor S2. If the temperature difference is greater than or equal to the activation value set on the control for the pump R1, the pump starts up and charges the accumulator until it reaches either the value for the shutdown difference or the set maximum accumulator temperature. Once the temperature for S3 reaches the configured value or falls below it, the 3-way valve R2 changes to the direction of the boiler until the offset temperature has been reached.

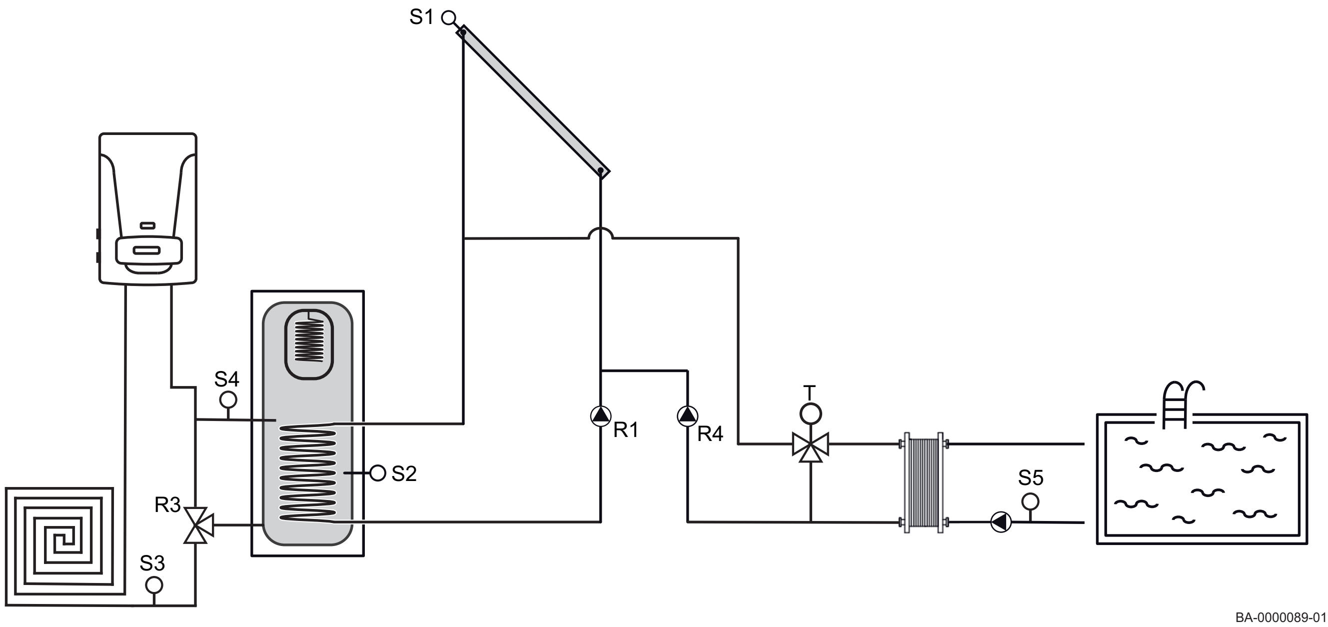
Fig.14 System 3



Standard solar energy system with an accumulator and auxiliary electric heating for the SH 7 Compact model.

- The solar control compares the temperature difference between the collector sensor S1 and the accumulator sensor S2. If the temperature difference is greater than or equal to the preset activation value for the pump R1, the pump starts up and charges the accumulator until it reaches either the value for the shutdown difference or the set maximum accumulator temperature. Once the temperature for S3 reaches the configured value or falls below it, the electrical resistance heating starts up and remains active until the set offset temperature has been reached.

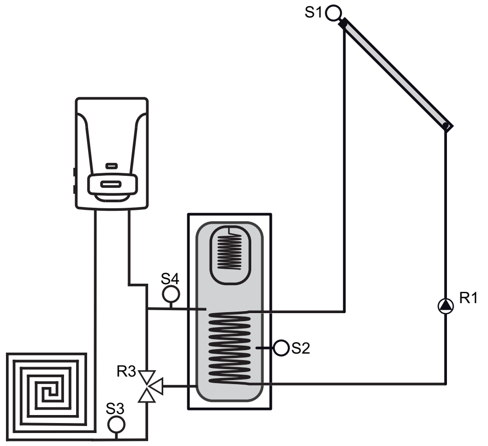
Fig.15 System 4



Standard solar power system with heating circuit for the SH 7 Compact Top model.

- The solar system heats a hot water cylinder which serves as a buffer tank. This buffer tank is used to heat the domestic hot water and simultaneously transfer heat to the heating circuit return. The assigned relay is connected when the difference in temperature between the buffer tank and the return is greater than the connection temperature difference.

Fig.16 System 5



Standard solar power system with pool and heating circuit for SH 7 Compact Top model.

- The solar system is used to provide DHW and heating as a priority and, once this demand has been met, any surplus heat is used to heat the pool. The solar system heats a hot water cylinder which serves as a buffer tank. This buffer tank is used to heat the domestic hot water and simultaneously transfer heat to the heating circuit return. The assigned relay is connected when the difference in temperature between the buffer tank and the return is greater than the connection temperature difference. Also, when the buffer tank reaches the setpoint temperature, if the collectors sensor S1 is greater than the pool sensor S4, the second primary pump is activated, thereby using the surplus solar power to heat the pool.

5.3.4 Pipe diameter calculation

To size the piping, it is recommended that the linear pressure drop of the pipes does not exceed 40 mmH2O/m and the maximum speed does not exceed 2 m/s (the design flow rate taken into account is between 30 $l/h·m^2$ and 60 $l/h·m^2$)

Tab.6 Pipe diameter with a 30% glycol concentration at 40 °C

Number of collectors	Solar capture surface area (m^2)	Maximum flow rate (l/h) (50 $l/h·m^2$)	Recommended diameter		
			Nominal diameter	V (m/s)	ΔP (mmH2O/m)
1	2	100	Dia. 10x1.0	0.55	88.5
2	4	200	Dia. 15x1.0	0.42	29.3
4	8	400	Dia. 18x1.0	0.55	36.0
6	12	600	Dia. 22x1.0	0.53	25.2
8	16	800	Dia. 22x1.0	0.71	41.4
10	20	1000	Dia. 28x1.5	0.57	21.2
12	24	1200	Dia. 28x1.5	0.68	29.1
14	28	1400	Dia. 28x1.5	0.79	38.0

5.3.5 Quantity of antifreeze

BAXI heat transfer fluid can be used to fill the installation, in the correct concentration for the minimum foreseeable outdoor temperature in the location. It is recommended that you use a mixture of water and glycol in the following proportions:

Tab.7 Concentration of heat transfer fluid

Volume of heat transfer fluid	26%	33%	37%
Minimum outdoor temperature	-10 °C	-15 °C	-20 °C

Importante
Under no circumstances should the mixture of water and glycol exceed 40%.

Atención
The concentration of heat transfer fluid in the installation must never fall below 20%.

Advertencia
Although it is non-toxic, odourless and biodegradable, it is appropriate to take precautions when handling the product. It is recommended that you use gloves which are resistant to chemical products and wear suitable eye protection when handling the product.

Advertencia
If the fluid comes into contact with your skin, wash it with soap and water. If it comes into contact with your eyes, wash them immediately with plenty of clean running water.

6 Installation

6.1 General

The following observations must be taken into account for the hydraulic unit installation:

- Once all the hydraulic connections have been completed, check the sealing of the entire circuit.
- It is helpful to protect the collectors from the potential effects of solar radiation once the packaging has been removed, until the installation has been filled.
- If there is no demand, or it is anticipated that there will be long periods without any DHW being extracted, it is recommended to protect the system using thermal blankets.
- Once all the connections on the solar control box sensors have been completed, it is important to check that these do not run across other electrical cables as this could generate interference and alter the readout values.
- It is recommended to use a shielded cable for the sensor connections.

Before installing the solar unit, the entire installation needs to be cleaned.

The solar unit must always be installed at a lower level than the collectors so that no vapour can enter the expansion vessel in case of a blockage.

If the expansion vessel is installed at the same or a higher level than the solar unit, a heat insulation circuit is required.

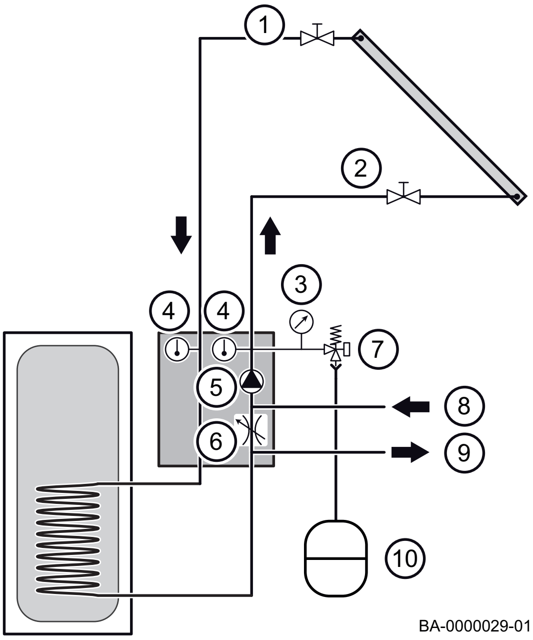
The installation must be rinsed with fresh water after each draining process.

The solar unit is not suitable for direct contact with pool water or solvents.

Atención
Do not use any lubricant or grease on the installation, as this can damage the seals. Any particles of dirt, grease or lubricant residue must be rinsed out of the installation prior to installing the solar unit.
Do not use any solvents to clean the system, as this can damage plastic parts such as the pump impellers.

6.2 Hydraulic diagram

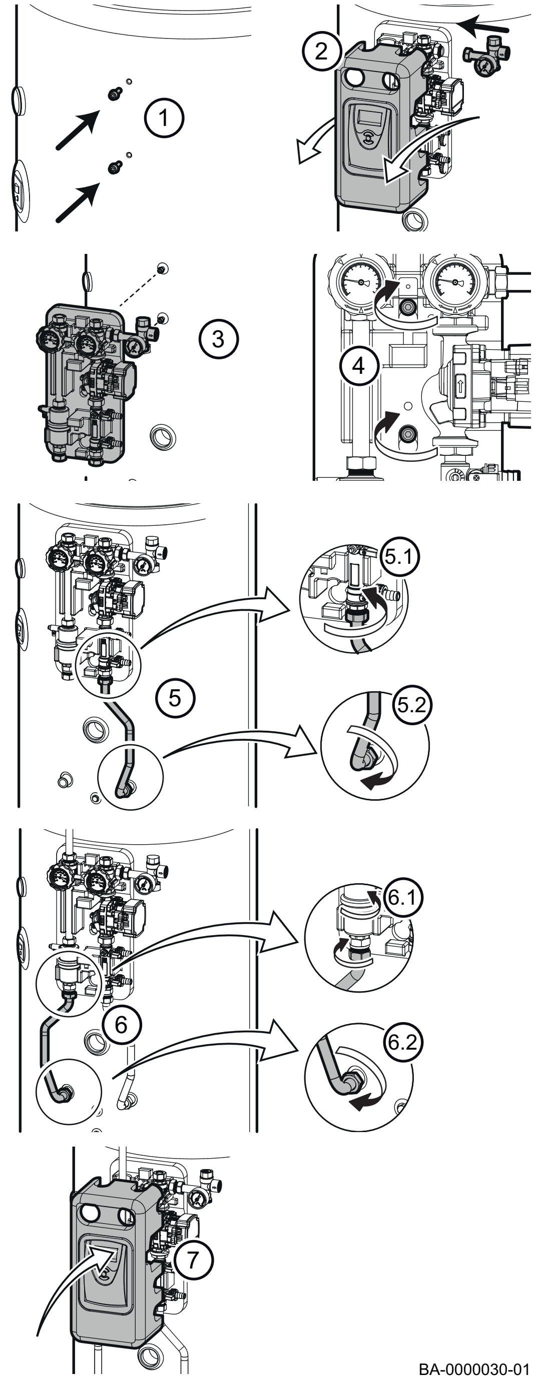
Fig.17 Hydraulic diagram



1. Return from the solar installation
2. Flow pipe to the solar installation
3. Pressure gauge
4. Thermometer
5. Solar pump
6. Flow regulator
7. Safety valve
8. Filling valve
9. Draining branch pipe
10. Expansion vessel

6.3 Assembly

Fig.18 Assembly of the hydraulic unit



6.3.1 Assembly of the hydraulic unit

Importante
All units can be mounted on a wall rather than on the tank, as illustrated below.

Importante
The solar unit must be installed vertically (flow rate direction from the pump going up towards the collector). This installation position means that the thermometers, pressure gauges and flowmeters are easily visible. The functions of the flowmeter, air separator and safety valve are only guaranteed if the unit is installed vertically.

1. Fit the screws with the lock washers on the accumulator.

Importante
Position the fastening elements without tightening the screws

Importante
The fastening screws and corresponding washers are located in a separate bag within the bag for the safety unit.

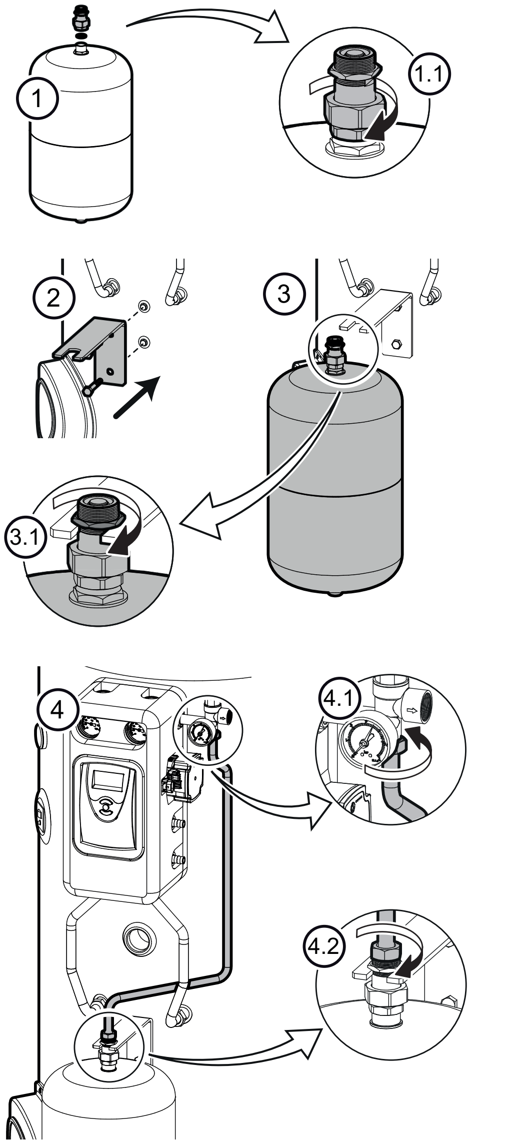
2. Remove the front housing together with the solar control. Connect the safety group.
3. Hang the SH DB unit in the accumulator using the fastening screws.
4. Tighten the fastening screws to the tank.
5. Connect the pump's flow pipe.
6. Connect the return pipe to the installation's return pipe.

Importante
The connection fitting for the pipes is located in the box in the hydraulic kit.

7. Refit the front housing together with the solar control.

6.3.2 Assembly of the expansion vessel

Fig.19 Assembly of the expansion vessel



1. Connect the hydraulic connection to the expansion vessel.
2. Screw on the bracket for the expansion vessel with the screws supplied.
3. Hang the expansion vessel using the intended groove on the hydraulic connection. Fix the expansion vessel in place with the connector nut.
4. Connect the flow line of the safety unit outlet to the expansion vessel connection.

Importante
To guarantee that all connections are leak-tight, use the sealing washers included in the kit's accessories bag.

6.4 System connection

Advertencia
Make the appliance's electrical connections in compliance with the requirements of the prevailing standards, the information given in the electrical diagrams delivered with the appliance, and the recommendations in this instruction manual.

Atención
Only qualified professionals may carry out electrical connections, always with the power off.

Earth the appliance before making any electrical connections. This machine is only electrically safe if it is correctly connected to an efficient earth system in compliance with current safety regulations.

Disconnect the power supply at the mains before carrying out any work on the appliance or accessories connected to the appliance.

The unit is supplied fully pre-wired. Do not modify the connections inside the control panel.

The mains supply is made via the connection cable pre-wired in the appliance.

Advertencia
If the power cable is damaged, for safety reasons this must only be replaced by the manufacturer, by its after sales department or by qualified personnel.

The appliance must be powered with a circuit equipped with a omnipolar switch with a contact opening distance of 3 mm. To replace the cable, use a cable approved in line with HAR H05 VV-F with a suitable cross-section.

Earthing must comply with the prevailing installation standards.

Precaución
Separate the sensor cables from the 230 V circuit cables. The installation must be fitted with a main switch.

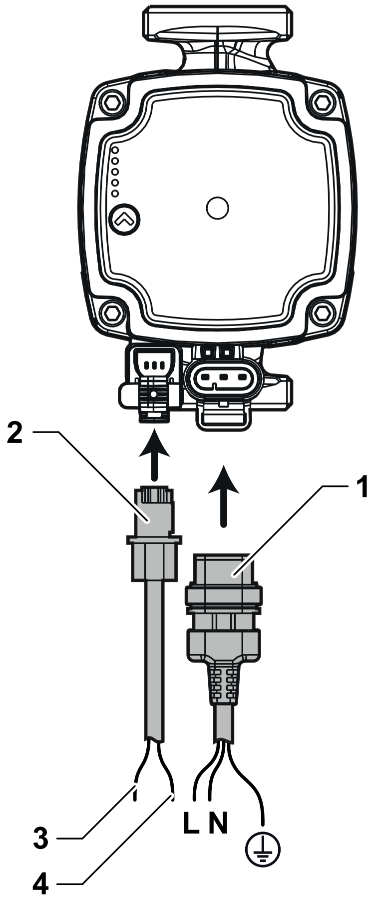
All connections are made to the terminal blocks provided for that purpose in the system's connection box.

Importante
Failure to comply with these instructions could lead to interference and control unit malfunctioning, damage to the electronic circuitry, damage to the installation and even compromise the safety of persons.

6.5 Use of high-efficiency pumps

Atención
Modifications of any kind to the heat insulation are not permitted. The pump motor must not be covered.

Fig.20 Connecting the pump wiring



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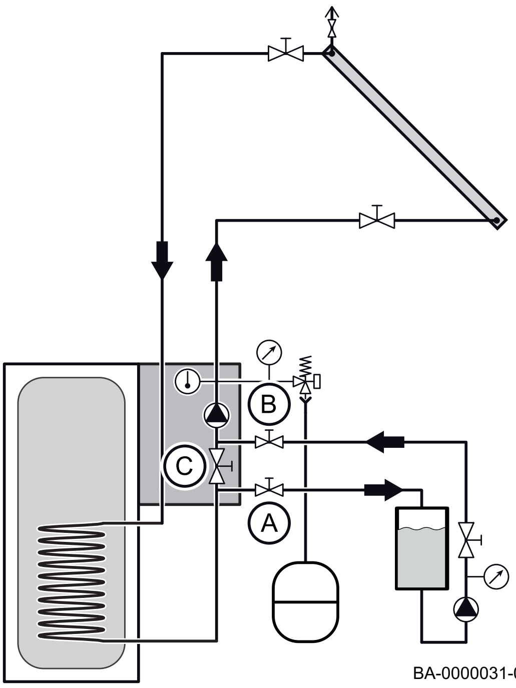
In addition to the power cable, high-efficiency pumps with speed control require a separate cable to transmit the control signal (signal cable).

1. Power supply 230 V
2. Signal cable
3. Blue = GND (earth)
4. Brown = PWM (output signal)

6.6 Filling the installation



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6.6.1 General

Atención
During the start-up process, pay particular attention to cover the collectors, in order to avoid an undesirable increase in pressure.

Atención
The installation must be filled with the system empty.

6.6.2 Filling the installation

Close valves A, B and C before filling the installation.

Importante
The installation must be filled using mechanical or electrical filling equipment.

1. Calculate the amount of antifreeze fluid required for the installation.

Consejo
Quantity of antifreeze, página 18

2. Mix the amount of antifreeze fluid required with tap water.
3. Connect the flow of the filling unit to the inlet valve on the flowmeter (B).
4. Connect the return of the filling unit to the outlet valve on the flowmeter (A).

Importante
Make sure that the valve on the flowmeter (C) is closed.

5. Open the inlet and outlet valves on the flowmeter (A and B).
6. Recirculate the fluid until there are no more air bubbles in the filling unit.

Importante
Only continue filling the installation once there are no more bubbles in the filling unit.

7. Open the valve on the flowmeter (C).
8. Close the system's drain valve (A).
9. Pressurise the system to a pressure of 2 bar.
10. Close the system's filling valve (B).

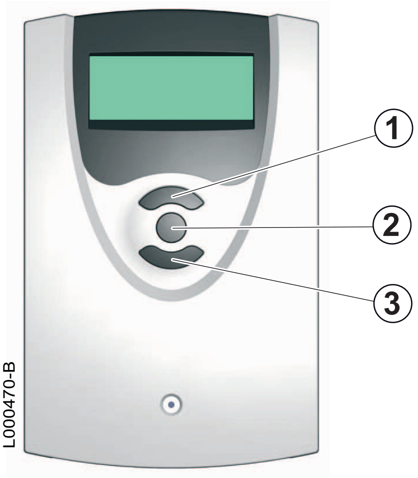
Importante
After a few minutes, use the pressure gauge supplied with the hydraulic unit to check that the system pressure has not dropped.

7 Solar control

7.1 Description of the solar control on the SH 7 Compact

7.1.1 Keys

Fig.21 Solar controller



The controller is operated using the three keys under the screen:

1 Forwards (+)
2 **SET** (selection/setting mode)
3 Back (-)

Key 1 is used to move forwards in the menu or to increase values. Key 2 is used to select channels and confirm settings. Key 3 is used to move backwards in the menu or to reduce values.

During normal operation, the screen only shows the display channels.

To switch between channels, press keys 1 and 3.

To access the setting channels, press key 1 until you reach the last display channel; then press and hold key 1 for approximately 2 seconds. When the screen shows a setting channel, the **SET** symbol will appear on the right-hand side.

To select a setting channel, press key 2. **SET** begins to flash. Set the desired value using keys 1 and 3. Briefly press key 2. **SET** will appear permanently, the value set is stored in the memory.

Importante
After four minutes of inactivity, the system will automatically switch back to the first display (status display).

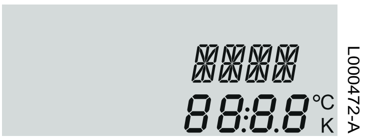
7.1.2 Display

The monitoring screen comprises two parts:

- The channel indicator.
- The symbol bar.

7.1.3 Display channels

Fig.22 Channel indicator

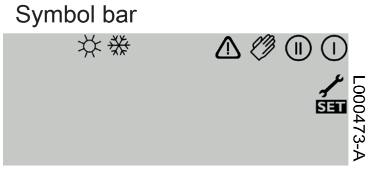


The channel indicator has two lines:

- The upper alphanumeric line displays the channel names and the menu levels.
- The lower alphanumeric line displays the values of the channels and the adjustment parameters.
- The temperatures and temperature differences are displayed in °C or K.

7.1.4 Operating indicators

Fig.23 Symbol bar



The symbols in the symbol bar indicate the current system status.

Tab.8 Meaning of the symbols

Symbol permanently lit	Flashing	Operating status indication
(I)		Relay 1 active
(II)		Relay 2 active
	(II)+✋	Rapid heating active, relay 2 active
	⚠+✋	Manual mode is active

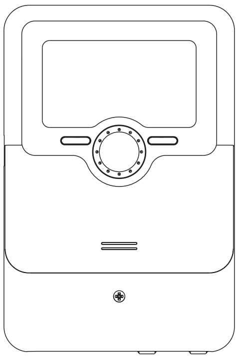
Symbol permanently lit	Flashing	Operating status indication
	3 times ✋	Rapid heating is not possible because the shutdown temperature has been exceeded
☼		Maximum accumulator threshold on (the temperature of the accumulator has exceeded the maximum value)
	☼	Collector cooling function, system cooling function or accumulator cooling function active
❄		Antifreeze option activated
	❄	Minimum threshold collector on, antifreeze function active
	⚠	Collector safety disconnection activated
	⚠+🔧	Sensor error
	⚠+☼	Accumulator safety disconnection activated
SET		Parameter
	SET	Setting mode

7.2 Description of the solar control on the SH 7 Compact Top

7.2.1 Keys and dial

The controller is operated using the 2 keys and the dial located under the screen:

Fig.24



1 Return to the previous menu
2 Confirm/select
3 Move up/down, increase/reduce values
4 Manual mode
5 Holiday mode

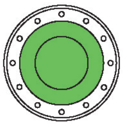
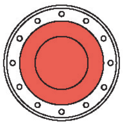
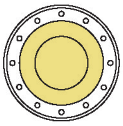
Briefly press the manual mode key to access the manual mode menu.

The holiday mode key is used to activate the holiday mode. Pressing and holding this key down for approx. 3 seconds displays the Holiday Days setting where you can set the holiday duration in days. If you set a value above 0, the set function in the Holiday mode menu will be activated and a countdown of the remaining days will be displayed from midnight. If this value is set to 0, the function remains deactivated.

7.2.2 Control indicator

The control features a control indicator with various colours in the centre of the dial. This indicates the following operating statuses:

Tab.9 Premium solar control box operating statuses

Colour	Permanently lit	Flashing
Green 	All correct	Manual mode: One relay at least in manual mode
Red 		Broken sensor cable, short-circuit on the cable of one sensor, monitor flow rate, overpressure, low pressure
Yellow 	Holiday mode ON	Temperature difference too high, night-time circulation, SUPP/RET reversed, maximum temperature exceeded, updating, MicroSD card write error

8 Solar pump

8.1 Operating data

The pump UPM3 Solar is a high-efficiency pump designed to function with and without the PWM signal, therefore enabling the following curves:

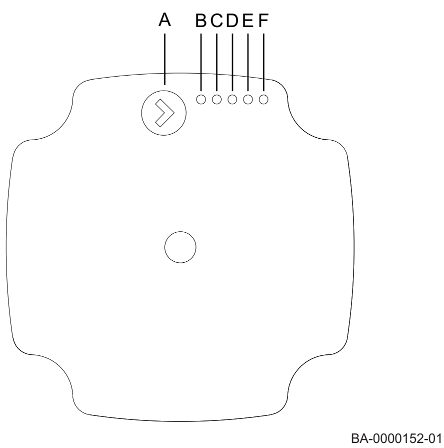
- 3 Constant curves (functioning without PWM signal)
- One PWM curve with solar profile C (stopping without PWM signal)

Importante
The pump is preset to curve with profile C PWM by default.

Importante
If the controller does not have an PWM output, do not connect the signal cable and program the pump with constant curves.

The UPM3 Solar operation panel is designed with a single button, one red/green LED and four yellow LEDs.

Fig.25 Solar pump operation panel



Tab.10 Solar pump operation panel

Pos.	Description
A	Press the button
B	LED 1
C	LED 2
D	LED 3
E	LED 4
F	LED 5

The operation panel displays:

- Control mode
- Status of alarms.

8.2 Pump status

If a pump has detected one or more alarms, LED 1 will change from green to red and one of the other LEDs will go yellow. Refer to the faultfinding information

If multiple alarms are active at the same time, the LEDs will only display the highest priority error. The priority is defined by the sequence in the table shown in the faultfinding information.

Tab.11 Sequence of error alarms

LED 1	LED 2	LED 3	LED 4	LED 5	Indications	Pump operation	Action
x				x	Rotor blocked	Attempt restart every 1.33 seconds	Wait and unblock the shaft
x			x		Voltage supplied too low	Warning only, pumps continues to run	Check the voltage supplied
x		x			Electrical fault	The pump has stopped running because the voltage supplied is low, or there is a serious fault	Check the voltage supplied. Replace the pump

When there are no active alarms, the operation panel returns to operational mode.

It works with an external solar profile PWM C or in internal control with constant curve.

Tab.12 Operating status

	LED 1 (green)	LED 2 (green)	LED 3 (yellow)	LED 4 (yellow)	LED 5 (yellow)
CC1			x		
CC2			x	x	
CC3			x	x	x
PWM C shutdown signal		x *	x	x	x
PWM C start-up signal		x**	x	x	x

(*) 1 flash per second

(**) 2 flashes per second

8.3 Pump technical data

Tab.13 Technical data

	UPM3 15-75	UPM3 15-145
Pressure system	Max. 1.0 MPa (10 bar)	Max. 1.0 MPa (10 bar)
Minimum input pressure	0.05 MPa (0.50 bar) at 95 °C of fluid temperature	0.05 MPa (0.50 bar) at 95 °C of fluid temperature
Fluid temperature	2-110 °C (TF110) Max. 130 °C (60 °C ambient temperature)	2-110 °C (TF110) Max. 130 °C (60 °C ambient temperature)
IP class	IPX4D	IPX4D
Motor protection	No external protection necessary	No external protection necessary

8.4 Pump profile

Tab.14 Electrical data, 1~230 V/50 Hz

Speed	Units	UPM3 15–75	UPM3 15–145
Min. - Max.	P_1 [W]	2 - 45	2 - 60
Min. - Max.	$P_{1/1}$ [A]	0.04 - 0.48	0.04 - 0.58

Tab.15 Data in line with the selected curve

Selected curve	Units	UPM3 15–75	UPM3 15–145
Curve 1 [C1]	Nominal height	5.5 m	8.5 m
Curve 1 [C1]	P_1 nominal	28 W	45 W
Curve 2 [C2]	Nominal height	6.5 m	10.5 m
Curve 2 [C2]	P_1 nominal	35 W	52 W
Curve 3 [C3]	Nominal height	7.5 m	14.5 m
Curve 3 [C3]	P_1 nominal	45 W	60 W

Fig.26 Pump profile UPM3 15–75

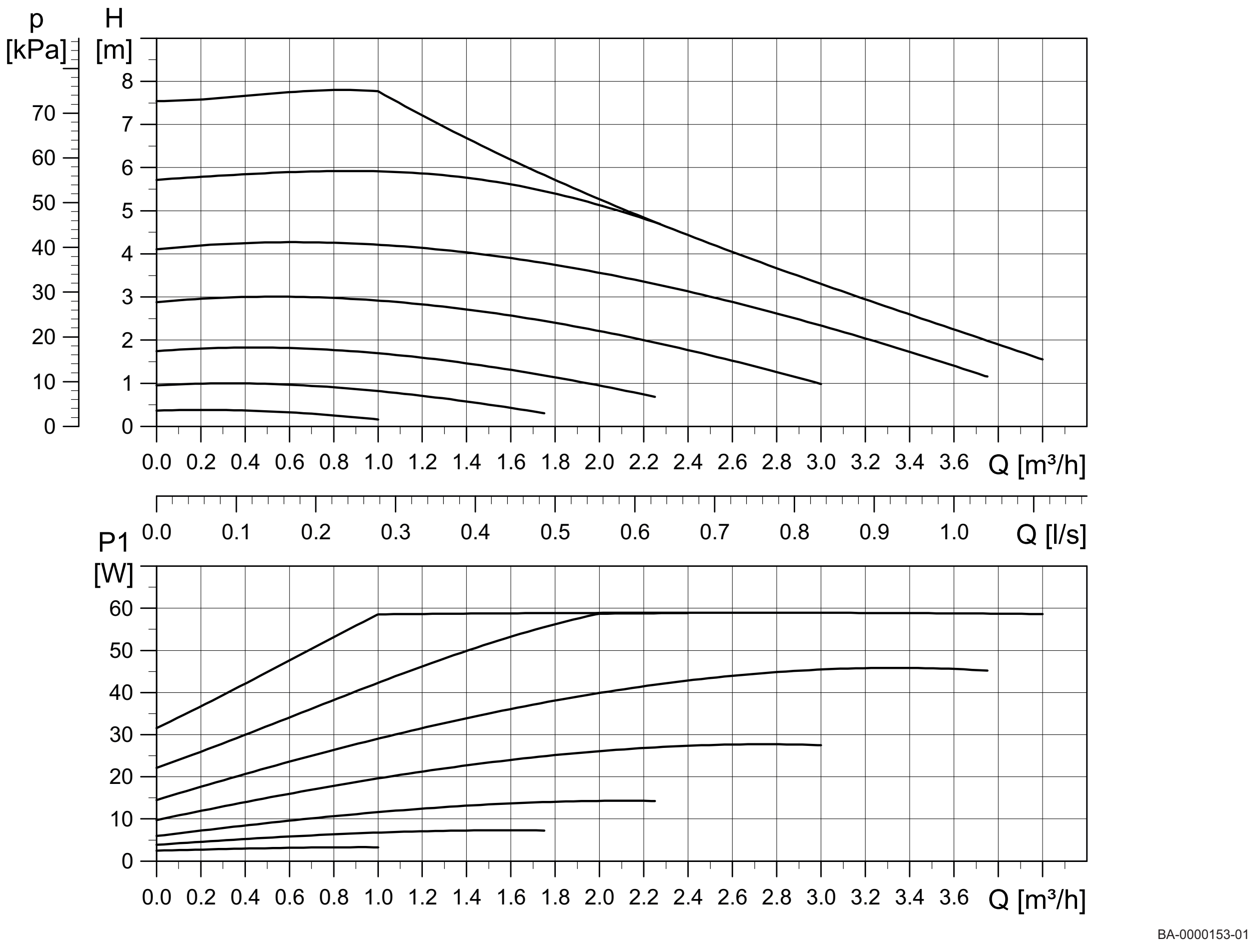
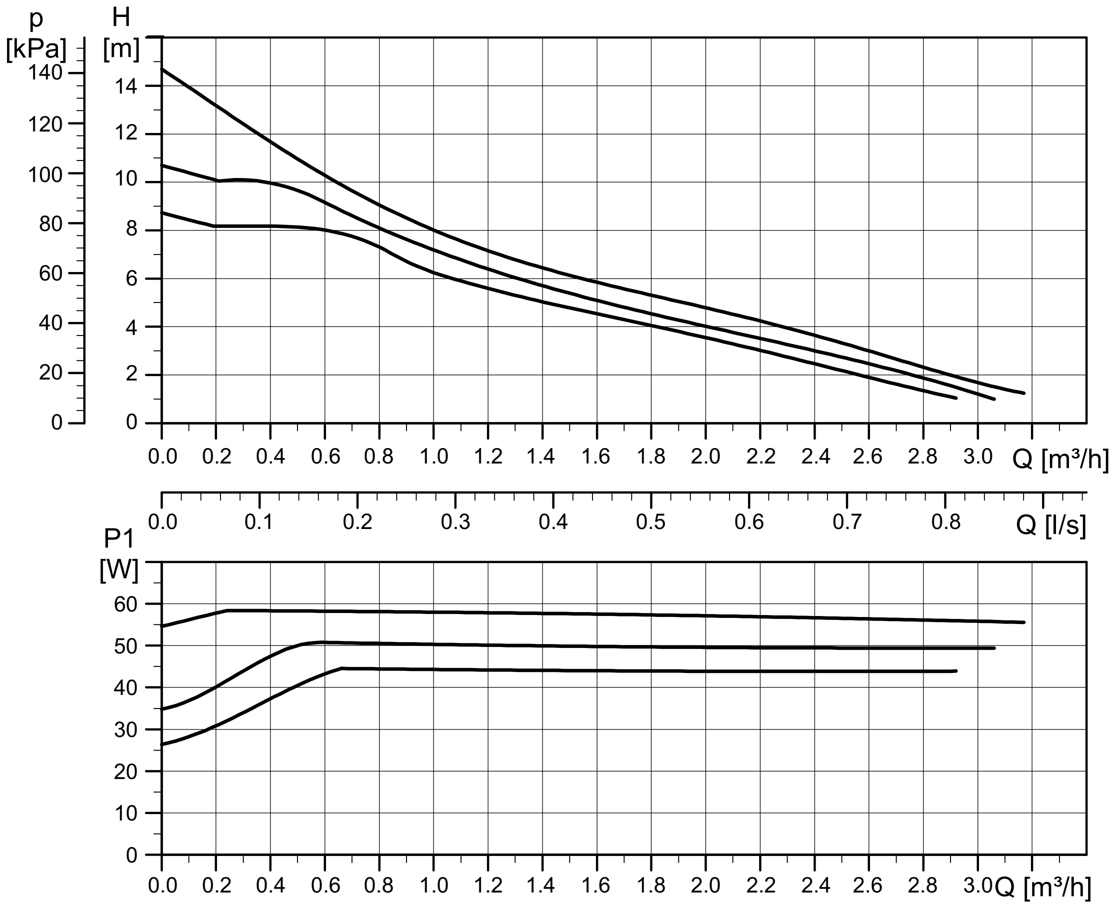


Fig.27 Pump profile UPM3 15–145



BA-0000154-01

9 Commissioning

9.1 General

The system is commissioned to enable it to be used for the first time, after it has been out of service for a prolonged period or after any circumstance requiring a full reinstallation of the system.

Commissioning the system enables the user to check the various settings and perform the necessary checks to start up the system in complete safety.

9.2 Checklist before commissioning

1. Check that the installation and the system are filled with heat transfer fluid and have been bled correctly.
2. Check the tightness of the pipe connections.
3. Bleed the system if necessary.
4. Check the pressure shown on the unit's pressure gauge.
5. Check the electrical connections.
6. Check that there is an earth connection and the corresponding earth connection circuit.

9.3 Commissioning procedure for SH 7 Compact

9.3.1 Settings

Once the filling procedure is complete, the system must be connected to the power supply.

Although the system is configured in the factory, if the control is reset, the first time that the control is switched on, the initialisation phase begins and the commissioning menu launches automatically.

The commissioning menu guides the user through the key adjustment parameters required to operate the system.

Importante
All the settings made during commissioning can be changed later if necessary, via the corresponding parameter. Additional functions and options can also be enabled and adjusted.

Language

Select the language required.

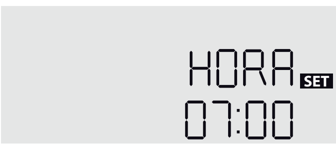
Fig.28 Language

BA-0000057-01

Time

Set the clock.

Fig.29 Time



BA-0000058-01

System

Fig.30 System

Select the solar system required.

Maximum accumulator temperature

Fig.31 Maximum accumulator temperature

Adjust the desired maximum temperature of the accumulator.

Connection temperature for the auxiliary heating

Fig.32 Connection temperature

Set the required connection temperature.

Shutdown temperature for the auxiliary heating

Fig.33 Shutdown temperature

Set the required shutdown temperature.

Finalising settings in the commissioning menu

Fig.34 Confirmation

After accessing the last channel in the commissioning menu, a safety request is displayed to confirm the settings made. To confirm the settings made, press the central key.

9.3.2 Factory setting values

Tab.16 Factory values

Channel	Meaning	Factory setting
SIST	System	1
DT O	Difference in connection temperature	6.0 K
DT F	Difference in shutdown temperature	4.0 K
DT N	Difference in nominal temperature	10.0 K
A MX	Maximum accumulator temperature	60 ºC
AUM	Increase	2 k
CSEG	Collector temperature limit	130 ºC
ORC	Collector cooling option	OFF
OMNC	Minimum threshold collector option	OFF
OAH	Antifreeze option	OFF
OCT	Vacuum tube collector option	OFF

Channel	Meaning	Factory setting
ODB	Drainback option	OFF
ORSI	System cooling option	OFF
ORA	Accumulator cooling option	OFF
OT1	Option thermostat 1	ON
CA1O	Connection temperature thermostat 1	40 ºC
CA1F	Shutdown temperature thermostat 1	45 ºC
TIR	Thermostat 1 cooling	OFF
t1O1	Thermostat 1 connection time 1	07:00
t1F1	Thermostat 1 shutdown time 1	08:00
t2O1	Thermostat 1 connection time 2	11:00
t2F1	Thermostat 1 shutdown time 2	12:00
t3O1	Thermostat 1 connection time 3	18:00
t3F1	Thermostat 1 shutdown time 3	20:00
ODT	Thermal disinfection option	OFF
REL1	Signal type from R1	SOL
MIN	Minimum speed	30%
MAX	Maximum speed	100%
MAN1	Manual mode R1	Auto
MAN2	Manual mode R2	Auto
IDIO	Language	ES

9.4 Commissioning procedure for SH7 Compact Top

9.4.1 Settings

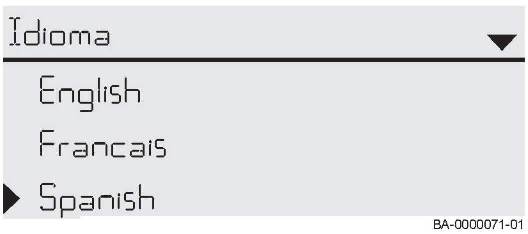
Once the filling procedure is complete, the hydraulic unit must be connected to the power supply.
Although the system is configured in the factory, if the control is reset, the first time that the control is switched on, the initialisation phase begins (during which the central key flashes red) and the commissioning menu launches automatically.

The commissioning menu guides the user through the key adjustment parameters required to operate the system.

The commissioning menu comprises the parameters described below. To make an adjustment, set the desired value using the central dial and press the right-hand key to confirm. The following parameter will appear on the screen.

- **Language**

Fig.35 Language



Select the language required.

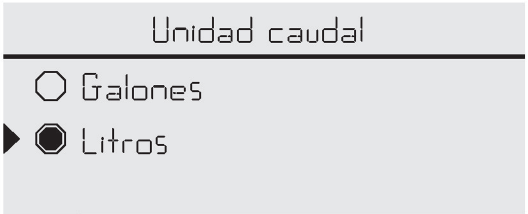
Units

Fig.36 Temperature unit

BA-0000072-01

Select the unit of temperature.

Fig.37 Flow rate unit



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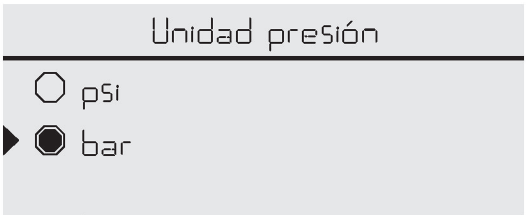
Select the flow rate unit.

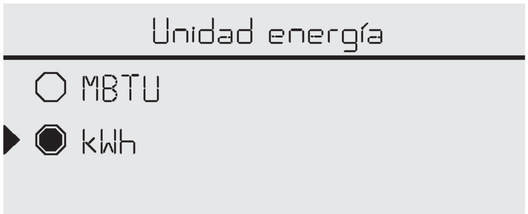
Fig.38 Pressure unit



BA-0000074-01

Select the unit of pressure.

Fig.39 Energy unit



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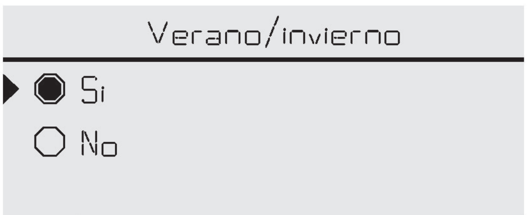
Select the unit of energy.

Switching between summer and winter time

Fig.40 Switching between summer and winter time



BA-0000076-01

Enable or disable automatic switching between summer and winter time.

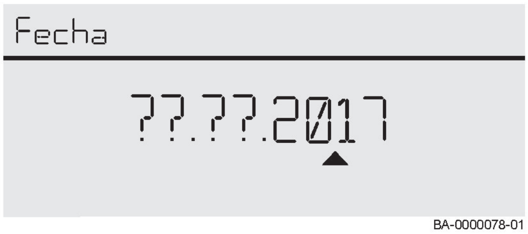
Time

Fig.41 Time

Set the clock. Set the hours first, then the minutes.

Date

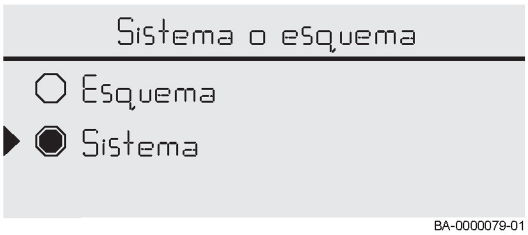
Fig.42 Date



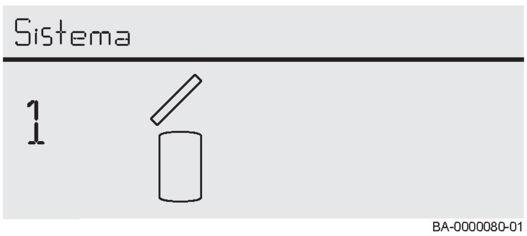
Adjust today's date. Set today's date by setting the year first, then the month and the day.

Selection: System or diagram

Fig.43 Selection: System or diagram



Select to configure the controller with a system.



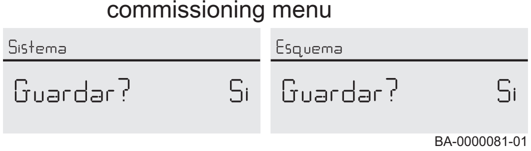
Select solar system 1. This solar system has the following configuration of sensors and relays:

Tab.17 Sensors and relays in solar system 1

Sensors			
Collector 1	S1	Solar pump	R1; PWMA
Lower accumulator	S2	-	-

Finalising settings in the commissioning menu

Fig.44 Finalising settings in the commissioning menu



After selecting the system or entering the diagram number, a security request is displayed. If the request is confirmed, the settings will be saved.

To confirm the security request, press the right-hand button.

To return to the commissioning menu, press the left-hand button. After confirming the safety request, the solar control is ready to use and should make optimal use of the system using the factory settings.

Importante
All the settings made during commissioning can be changed later if necessary, via the corresponding parameter. Additional functions and options can also be enabled and adjusted.

9.4.2 Premium factory setting values

■ Solar

Tab.18 Factory values on the solar menu

Basic settings	
System	1
Collector	
Min. coll. temp.	10 °C
Safety limit	130 °C
Accumulator	
ΔT_{on}	6.0K
ΔT_{off}	4.0K
$\Delta T_{nom.}$	10.0K
Acc. nom. temp.	60 °C
Acc. max. temp.	60 °C
AccHys	2.0K
Increase	2.0K
t_{min}	30 s
Minimum speed	40%
Accumulator	Activated

■ Installation

Tab.19 Factory values on the installation menu

Optional functions	
Parallelling relay	
Relay	R4
Reference relay	R1
Extend	Deactivated
Delay	Deactivated
Speed	Deactivated
Reverse	Deactivated
Function	Activated

■ Energy meter

Tab.20 Factory values on heating menu

Energy meter	
Feed flow sensor	S3
Return flow sensor	S6
Flow sensor	Activated
Flow sensor	S6
Fluid type	Water
Function	Deactivated

■ Inputs/Outputs

Tab.21 Factory values on the inputs menu

Inputs	
S1	PT1000
S2	PT1000

Inputs		
S3	PT1000	
S4	PT1000	
S5	None	
S6	Type	VFS
	Min.	5 l/min
	Max.	100 l/min
S7	None	

Tab.22 Factory values on the outputs menu

Outputs		
R1	Signal	0-10 V
	Output	A
	Type	Solar
	Min. speed	40%
	Max. speed	100%
R2	Signal	Standard
	Min. speed	100%
	Max. speed	100%
R3	Free	
R4	Signal	Standard

Tab.23 Configured inputs/outputs

Solar	
Collector	S1
Lower. accum.	S2
Primary pump	R1
Parallelling relay	R4

Tab.24 Heat exchanger

Heat exchanger	
Heat exchanger heat	S3
Heat exchanger consumption	S2
Secondary pump	R2

Tab.25 Energy meter

Energy meter	
Energy meter feed flow	S3
Energy meter return flow	S6
Energy meter flow rate	S6

10 Maintenance

10.1 General

> **Advertencia**
> Maintenance work must be carried out by a qualified professional.

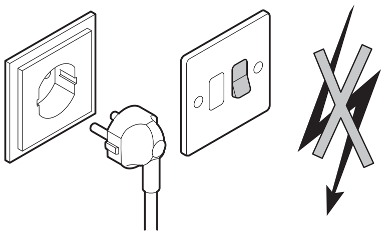
> **Advertencia**
> Failure to service the system will void the warranty.

> **Advertencia**
> Use only genuine spare parts.

> **Peligro**
> There is always a risk that they pump could become extremely hot, depending on the operating conditions of the pump as well as the installation (temperature of the flow medium). Risk of burns when touching the pump!

10.2 Standard inspection and maintenance operations

Fig.45 Switching off the power supply



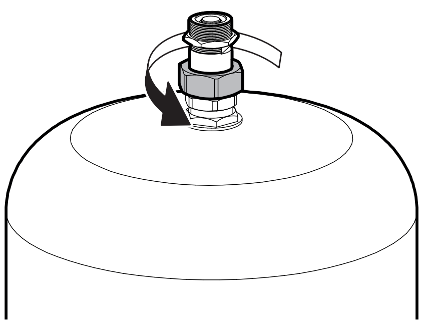
> **Peligro de electrocución**
> Disconnect the appliance from the power mains before carrying out any maintenance operations.

Have a service carried out at least once a year, or more often, depending on the regulations in force in your country:

1. Check for leaks in the system.
2. Check the hydraulic pressure.
3. Check the fluid drained via the safety valve and fill the installation if necessary.
4. Check the status of the components.
5. Check the maximum flow rate of the pump.
6. Check the electrical connections.
7. Check that the collectors are not too dusty. The collectors can be cleaned with water, but they must be cold to avoid breaking the glass.
8. Check if the collector installation shows any signs of damage or if there is any accumulated waste.
9. Check if the collector shows any signs of corrosion.
10. Check if there is any damage or leaks in the accessories and pipework, and check the condition of the insulation on these components.

10.3 Specific inspection and maintenance operations

Fig.46 Replacement of the expansion vessel



The expansion vessel has a non-return valve so that it can be removed without having to drain the system should it need to be replaced.

11 Troubleshooting

11.1 General malfunctions

Peligro de electrocución
Always disconnect the unit from the power supply before removing the cover from the solar control.

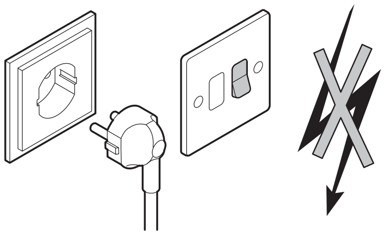
Tab.26 General malfunctions

Fault	Possible cause	Solution
The collector field installation does not heat the accumulator water.	The surface of the collectors is dirty.	Clean the surface of the collectors.
	The flow rate is insufficient.	Check the flow rate and, if necessary, adjust it to the correct value using the flow regulator.
	Incorrect sensor reading.	Check that the sensors are correctly positioned. If faulty, replace.
	Solar control malfunction.	Check the parameter configuration of the control. If in doubt, contact the technical department.
No fluid circulating in the installation.	The installation has not been correctly sized.	The installation's pipe network does not meet the criteria in terms of the required dimensions and arrangement, therefore the fluid cannot circulate.
	System electrical fault.	Check the electrical supply at various points in the system.
	Air found in the pump intake.	Bleed the entire system. Repeat the installation filling process if necessary.
The solar pump does not run.	The pump is blocked.	Disassemble the pump and check that there is no obstruction. If the error persists, contact the technical department.
	The solar pump is not powered.	Check the pump connections. Check the electrical supply to connection R1.
	The solar control is incorrectly configured.	Check the configuration of the solar control.
The pump starts and stops intermittently.	The temperature difference in the control is too small.	Change the ∆Ton and ∆Toff settings to the correct values.
	Collector sensor fitted in the wrong place.	Position the temperature sensor at the hottest output of the collector.
The pump starts running after a long delay.	∆Ton connection temperature difference too great.	Change the ∆Ton and ∆Toff settings to the correct values.
	Collector sensor incorrectly positioned.	When the sun is shining, briefly adjust the solar pump in manual mode, and check if the temperature of the collectors increases.
The accumulator cools down overnight.	The solar circuit pump works overnight.	Check the operating status of the pump.
		Check the configuration of the solar control.
The solar pump does not run although the temperature of the collectors is greater than the temperature of the accumulator.	The temperature difference in the control is too great.	Change the ∆Ton and ∆Toff settings to the correct values.
	The solar control is incorrectly configured.	Check the configuration of the solar control.
		Check the position of the sensors.

12 Decommissioning

12.1 Decommissioning procedure

Fig.47 Switching off the power supply



If you need to decommission the SH DB system, either temporarily or permanently, proceed as follows:

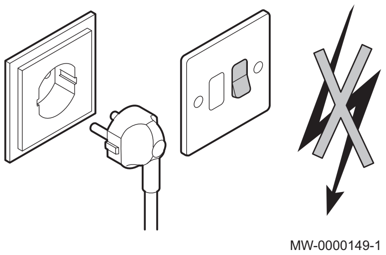
1. Switch off the power supply to the system.
2. Wait until the fluid has drained out of the installation and is stored in the SH DB system.
3. Close all the valves on the system.
4. Drain the system.

13 Disposal

13.1 Disposal and recycling

Fig.48 Recycling

Fig.49 Switching off the power supply



Advertencia
Removal and disposal of the system must be carried out by a qualified installer in accordance with local and national regulations.

Disassemble the system as follows:

1. Switch off the power supply to the system.
2. Close all the valves on the system.
3. Drain the system via the valve used for filling/draining.

Advertencia
Handle with care: The fluid inside can be very hot.

Importante
The fluid inside is a mix of glycol and water; do not pour it down the drain – recycle it appropriately.

4. Disconnect all the inlets and outlets on the system.
5. Recycle or dispose of the system.

BAXI
Tel. +34 902 89 80 00
www.baxi.es
informacion@baxi.es