



Installation, use, maintenance manual - DualSun solar heating system for individual swimming pools

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1. Introduction

1.1. General safety instructions

Please read this installation manual thoroughly and in detail in order to be able to fully exploit the functionality of the product. DualSun disclaims all liability for defects and damages that would result from non-compliance with the installation instructions (improper use, incorrect installation, handling error, etc.).



IMPORTANT

- It is important to follow these instructions for personal safety. Improper mounting may cause serious injury. The end user must keep these safety instructions.
- The installation, control, commissioning, maintenance and repair of the installation must only be carried out by qualified personnel.
- The correct functioning of the installation is only guaranteed if the installation and assembly have been carried out in accordance with the rules of the art.



CAUTION

- The entire solar installation must be installed and operated in accordance with recognized technical rules.
- All electrical work must be done according to local guidelines.
- The installation must not be used if it shows signs of damage.



DANGER

- For installations on roofs, it is necessary to comply with personal safety standards, relating to roofing and waterproofing work and relating to scaffolding work with safety net by mounting the respective devices before starting work. Refer to the recommendation published by the national risk prevention organization.
- Gloves are compulsory when handling the panels to avoid any risk of injury or burns.
- Disconnect all connection cables from the power supply before working on the installation.

1.2. General standards to be observed

To ensure safe, ecological and economical operation, all applicable regional and national standards, rules and directives must be observed, particularly the international standards mentioned below:

1.2.1. Photovoltaic solar standards

- CEI / EN 61215 1 and 2 edition 1: Design qualification and approval of crystalline silicon photovoltaic (PV) modules for terrestrial application.

- CEI / EN 61730 1 and 2 edition 2: Qualification for dependability of photovoltaic (PV) modules - part 1: Requirements for construction and part 2: requirements for tests.

1.2.2. Solar thermal standards

- EN 12975 1 and 2: General requirements and control method for solar thermal collectors.
- EN 12976 1 and 2: General requirements and process for testing prefabricated solar thermal installations.

The installation instructions and safety instructions must be met.

Observe the regulations on the prevention of industrial accidents prescribed by professional associations, in particular those relating to work carried out on the roof.

1.3. Important points before starting the installation

1. Precautions for use when working on a roof or near a swimming pool:
 - Be careful with electric wires,
 - Secure the ladder to prevent it from slipping or falling,
 - Do not leave extension cords lying around in the pool or in the water,
 - Wear non-slip shoes to avoid slipping on the ladder or sloping roof,
 - Cut-off the power supply to the pool when installing the solar control system.
2. Technical considerations:
 - First of all, you have to decide on the location of the system and draw a diagram of the site. Specify on this diagram the inlet and outlet of the filtration circuit.
 - Size the installation using the online simulator [MyDualSun](#).
 - Make sure that the locations provided for the solar collectors allow them to drain properly when the system is off.
 - Check the power - manometric head of the filtration pump corresponding to the circulation flow rate in the solar panels, see useful documents referenced below.
 - Check the orientation of the motorized 3-way valve and the location of the bypass pipe.

To ensure trouble-free installation, do not skip any steps.

Useful documents downloadable from [DualSun online library](#):

- [Notice d'installation, utilisation, maintenance DualSun SPRING](#)
- [Notice d'installation, utilisation, maintenance - Ssystème de chauffage solaire DualSun pour piscine individuelle - Annexe dimensionnement pompe de filtration](#)

1.3.1. Pipes and fittings

Use PVC pressure pipes and fittings with anti-UV treatment and Ø 40 outside or Ø 50 outside section. DO NOT USE ABS PIPES: they are rarely UV treated like PVC pipes and do not last as long. For aesthetic reasons, it is possible to paint the PVC pipes: then take a good quality paint, anti UV if possible.

It is very important to use pipe sections adapted to the number of panels to be irrigated, an undersizing leading to poor irrigation of the solar panels. As a general rule, the connection is made with PVC with an external Ø of at least 40mm.

Check the correct diameter of the hydraulic lines in chapter [Selection of transfer pipes for DualSun solar swimming pool heating system \[12\]](#) in the [Notice d'installation, utilisation, maintenance DualSun SPRING](#).

In order to reduce thermal losses, the length of the pipe (return in particular) must be reduced as much as possible.

1.3.2. PVC stripper and glue

It is important to strip and glue each PVC element well. Comply with the manufacturers' recommendations for use.

Immediately after stripping each part, first glue the fitting thoroughly, then the end of the pipe. Fit the end of this pipe into the fitting by turning slightly so that the glue is evenly distributed and until each element is properly in place.

Hold the assembly for 5 or 10 seconds to allow a good grip.

Finally, remove excess glue from the gasket and the pipe.

1.3.3. Various

Depending on your plans, you will need other connection elements and materials such as PVC valves, stainless steel screws, silicone sealant, etc.

Make sure these are quality products that will withstand direct exposure to the sun over time.

1.3.4. Tools

Your installation will be easier if you have well prepared your plans and if you have the necessary tools and materials for your work.

The tools you will need are as follows:

- flat and cruciform screwdriver,
- electric drill with drill bits and plugs,
- metal saw,
- sanding paper,
- PVC stripper,
- glue gun,
- water pump pliers,
- ladder.

2. The DualSun SPRING hybrid panel

DualSun SPRING is a new generation hybrid solar panel that provides both electricity (photovoltaic) and hot water (thermal) for homes.

Protected by several patents, the SPRING panel produces 2.5 times more energy than a photovoltaic panel of the same surface. This innovative technology saves space and total integration on the roof, at a competitive energy cost.

Our technology is the result of a double observation on photovoltaic panels:

- They produce much more heat (80%) than electricity (20%) when exposed to the sun,
- Their yield decreases when their temperature increases.

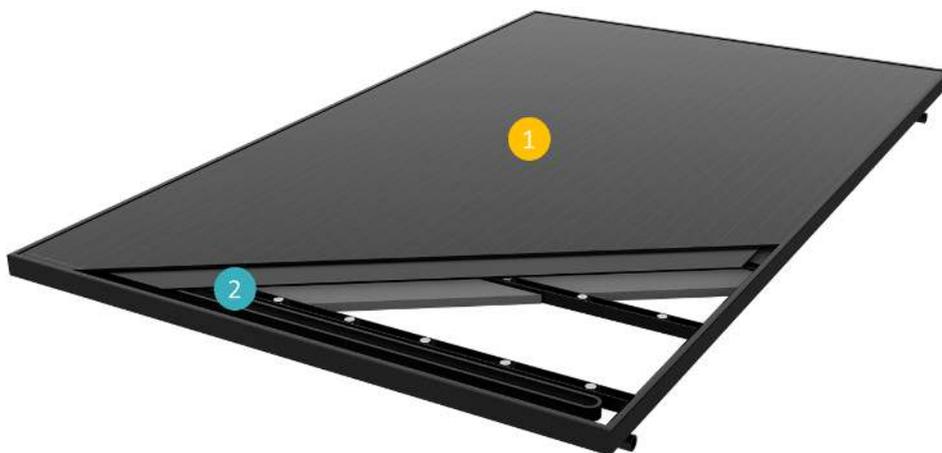
The SPRING panel thus absorbs solar energy to restore it in the form of two energies useful for the operation of buildings:

- Electricity through photovoltaic cells,
- Heat via a heat exchanger, completely integrated into the panel. This heat is captured at the DualSun SPRING panel exchanger by a heat transfer fluid. The latter transports the heat to the heat transfer device, which restores the calories of the heat transfer fluid to thermal storage or directly to the tank to be heated.

Thanks to a vertically integrated design of the photovoltaic and thermal components in a single panel (protected by 3 families of patents), the SPRING panel is specifically designed for optimized industrial manufacturing, making it more efficient, more aesthetic and cheaper than competitors.

Having the same shape as a conventional photovoltaic panel, the SPRING offers:

- A harmonious design and total integration into the roof,
- A real space saving thanks to a more efficient solar panel per m²,
- Simple and safe installation.



1. **Photovoltaic solar cells** : monocrystalline, high efficiency, they are cooled by the circulation of water
2. **Heat exchanger** : fully integrated into the panel, it allows excellent heat transfer between the photovoltaic front panel and the circulation of water.

For more details on the DualSun SPRING panel, you can consult the following chapters of the [Notice d'installation, utilisation, maintenance DualSun SPRING](#):

- [Technical characteristics of the DualSun SPRING panel \[7\]](#)
- [Recommended hydraulic flow rates for the DualSun SPRING panel \[7\]](#)
- [Maximum allowable pressures for the DualSun SPRING panel \[8\]](#)

2.1. Technical characteristics of the DualSun SPRING panel

The physical, photovoltaic and thermal characteristics of the hybrid DualSun SPRING panel can be consulted in the datasheet published in in our [online library](#).

The pressure losses and the thermal behavior of the panel as a function of the hydraulic flow rate can be consulted in the appendices of the datasheet published in our [online library](#).

2.2. Recommended hydraulic flow rates for the DualSun SPRING panel

Nominal average operating flow rates:

Application	DHW*	Thermal discharge**	Direct pool heating
Average nominal flow rate (L / h / panel)	32	100	200

* DHW: Domestic Hot Water

** Thermal discharge: Pressurized system with heat exchanger or coupling with geothermal probes

Recommended minimum filling flow rate:

- Panel in portrait mode: 200 L / h / panel
- Panel in landscape mode: 250 L / h / panel

Maximum allowable flow rate: 400 L / h / panel



WARNING

The choice of flow rate directly impacts the hydraulic pressure

2.3. Maximum allowable pressures for the DualSun SPRING panel



CAUTION

It is imperative never to exceed the following pressures in DualSun panels:

Maximum operating pressure = 1.5 bar

Maximum filling pressure = 2 bar

The maximum filling pressure corresponds to the allowable pressure in the panels, to purge correctly the air during hydraulic commissioning.

The pressure can be raised to 2 bar for only a few minutes.

At the end of commissioning of the installation, the maximum operating pressure to be observed is **1,5 bar**.

The temperature of the panels must be between 10 and 45 ° C during commissioning.

3. Installation of the DualSun solar heating system for individual swimming pools

Operating principle and limits [10]

Constitution of the DualSun solar pool heating kit [11]

Constitution of the DualSun solar pool drain kit [12]

Installation of the DualSun SPRING hybrid panel [12]

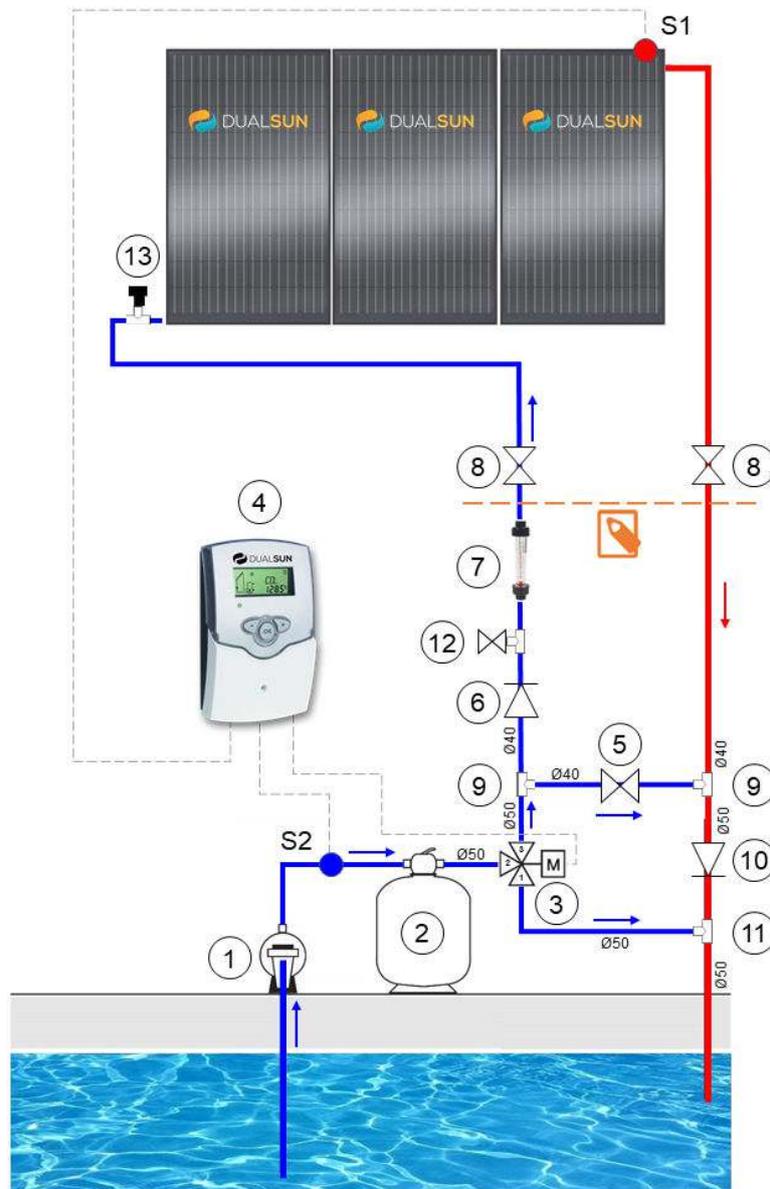
Selection of transfer pipes for DualSun solar swimming pool heating system [12]

Operation of the filtration pump and verification of its characteristics [13]

Installation of the DualSun BS/2 solar controller [14]

Installation of the motorized 3-way valve [19]

3.1. Operating principle and limits



- | | |
|-------------------------------------|--|
| (1) = Pool filtration pump | (9) = T 50/40/40 |
| (2) = Sand filter | (10) = Non-return valve Ø50 |
| (3) = Motorized 3-way valve | (11) = T 50/50/50 |
| (4) = DualSun BS/2 solar controller | (S1) = Panel temperature sensor |
| (5) = Bypass adjustment valve Ø40 | (S2) = Swimming pool temperature sensor |
| (6) = Non-return valve Ø40 | Drain kit (only for frost risk areas): |
| (7) = Ø40 flowmeter | (12) = T 40/40/40 + Valve Ø32 + Threaded end 3/4 " |
| (8) = Isolation valve Ø40 | (13) = T 50/40/40 + Solar ventilator |



NOTE

Frost risk areas:

If possible, keep all the elements located under the demarcation line in the previous figure in the technical room

The DualSun swimming pool heating kit is made up of the elements marked (3) to (11) in the diagram above.

This kit allows the connection of DualSun SPRING solar panels in bypass on the swimming pool filtration circuit, without additional pump, by means of a BY-PASS system by motorized 3-way valve.

The motorized 3-way valve is controlled by an electronic regulator. The assembly takes care of the direction of the flow according to the temperature differential between the pool water and the solar panels, and thus optimizes the installation.

When there is sufficient sunlight, part of the filtration flow of the swimming pool water is diverted to the solar panels in order to recover the calories and return them to the pool.

Solar heating will be connected after filtration.

The other equipment, such as water treatment or auxiliary heating, will be placed after the solar heating.

This system allows solar panels to be installed below the level of the pool up to a height differential of 5 meters maximum between the hydraulic entry point of the DualSun SPRING hybrid solar panels and the surface of the pool.

In that case:

- Install the drain valve (12) at the lowest point of the installation
- Do not install the non-return valve (6)
- Keep the flowmeter (7) vertically, flow from bottom to top

3.2. Constitution of the DualSun solar pool heating kit

Designation	Amount	Block diagram reference
3-WAY MOTORIZED VALVE DN 40 (Ø50 female ends to be glued)	1	(3)
DUALSUN BS/2 SOLAR REGULATION with 1 PT1000 temperature probe	1	(4)
BY-PASS ADJUSTMENT VALVE DN 40 PVC PRESSURE female to glue	1	(5)
Non-return valve Ø 40 PVC PRESSURE female to glue	1	(6)
FLOW METER Ø 40	1	(7)
SHUT-OFF VALVE DN 40 PVC PRESSURE female to glue	2	(8)
T 50/50/50 EQUAL 90 ° PVC pressure female to glue	2	(9)
REDUCTION 50/40 PVC PRESSURE to glue	4	(9)
Non-Return VALVE Ø 50 PVC PRESSURE female to glue	1	(10)
T 50/50/50 EQUAL 90 ° PVC pressure female to glue	1	(11)

3.3. Constitution of the DualSun solar pool drain kit

Designation	Amount	Block diagram reference
T 40/40/40 EQUAL 90 ° PVC PRESSURE female to glue	1	(12)
REDUCTION 40/32 PVC PRESSURE female to glue	1	(12)
SHUT-OFF VALVE DN 32 PVC PRESSURE female to glue	1	(12)
¾ " THREADED NOZZLE - 32	1	(12)
T 50/50/50 EQUAL 90 ° PVC PRESSURE female to glue	1	(13)
REDUCTION 50/40 PVC PRESSURE to glue	2	(13)
SOLAR AIR VENT	1	(13)

3.4. Installation of the DualSun SPRING hybrid panel

The installation steps of the DualSun SPRING hybrid solar panel are detailed in the [Notice d'installation, utilisation, maintenance DualSun SPRING](#)

Sizing:

The sizing of the number of panels depends mainly on the space available for their installation, the consumption profile to be covered and the geographical area. The online simulator [MyDualSun](#) allows you to determine the number of panels required according to the parameters of the installation to be carried out.

3.4.1. Hydraulic layout with the DualSun SPRING hybrid panel



IMPORTANT

Installation of panels in portrait only to allow winter emptying

See chapter [Équilibrage hydraulique de champs de panneaux pour système de chauffage solaire piscine DualSun](#) in the document [Notice d'installation, utilisation, maintenance DualSun SPRING](#)

3.5. Selection of transfer pipes for DualSun solar swimming pool heating system

1. Selection of material for transfer lines

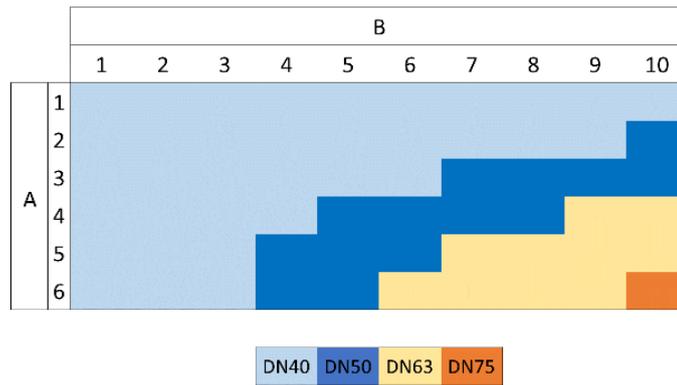
For direct swimming pool heating systems, it is recommended to use pressure PVC pipes with anti UV treatment.

For aesthetic reasons, it is possible to paint PVC pipes: take a good quality paint, anti UV if possible.

2. Selection of the diameter of the transfer pipes

We have defined a chart to choose the diameter of the pipes according to the number of DualSun SPRING panels connected to the solar swimming pool heating system.

A flow rate of 200L / h / panel is recommended to optimize the heat exchanges.



Reading the table above:

- A: Number of panels per hydraulic line
- B: Number of hydraulic lines

3.6. Operation of the filtration pump and verification of its characteristics

Operation:

The filtration of an individual swimming pool operates between 10 to 15 hours per 24 hours during daytime depending on the water temperature during the period from May to September.

Usage indicates that the filtration time must be diurnal and equal in hours to the temperature divided by 2.

For example, for a swimming pool water temperature of 24 ° C, the filtration time must be equal to 12 hours daytime.

The solar heating system will bypass the filtration flow, but it is not intended to activate the filtration.

Normally during the period of use of the swimming pool, the ambient temperature is higher than the temperature of the swimming pool, therefore the filtration flow is systematically bypassed in the panels to recover the available energy. The system will automatically divert the filtration flow to the solar panels when the latter are hotter than the temperature of the swimming pool, and within the maximum limit of the defined basin temperature.

Checking the characteristics of the filtration pump:



CAUTION

It is imperative to ensure that the filtration pump has a sufficient head to ensure the nominal flow rate necessary for the filtration of the swimming pool and for the correct irrigation of the solar panels.

See the specific approach: [Notice d'installation, utilisation, maintenance - Ssystème de chauffage solaire DualSun pour piscine individuelle - Annexe dimensionnement pompe de filtration.](#)

Make sure to regularly maintain your sand filter so that it does not clog abnormally and that its pressure drop remains compatible with the correct operation of the solar installation.

3.7. Installation of the DualSun BS/2 solar controller

3.7.1. General

The solar panels must be slaved to an automatic DualSun BS/2 controller allowing the pool to be maintained at the desired temperature.

The principle of operation of a solar control system is to direct the water from the filtration circuit into the solar collectors when the swimming pool needs to be heated and, on the contrary, prevent it from passing through them when the desired temperature is reached or when the ambient temperature is too low (risk of swimming pool cooling).

The water circulation in the solar collectors will be obtained from the filtration system pump.

The solar controller consists of a DualSun BS/2 differential controller intended to automatically control the motorized 3-way valve, see [Installation of the motorized 3-way valve \[19\]](#).

3.7.2. Overview of the DualSun BS/2 solar control system

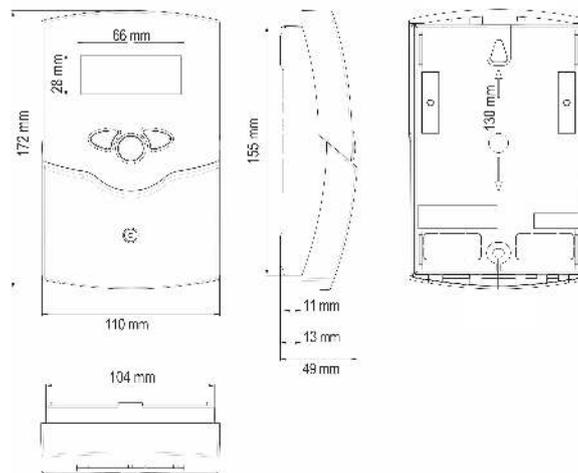
The DualSun BS/2 solar control unit is supplied with a sensor for measuring the temperature of the swimming pool water.

A probe supplied in the DualSun essential kit is intended for the temperature measurement of solar panels.

These two probes must be connected to the solar controller to ensure the differential temperature control of the solar installation.

Each probe can be fitted with an electric cable which can be extended if necessary using a 2 x 0.75mm² cable.

Dimensions:



3.7.3. Technical characteristics of the DualSun BS/2 solar control unit

- **Inputs** : 4 Pt1000 temperature probes
- **Outputs** : 1 semiconductor relay
- **Cut-off capacity** : 1 (1) A 240 V ~ (semiconductor relay)
- **Total cut-off capacity** : 1 A 240 V~
- **Power input** : 100 ... 240 V~ (50 ... 60 Hz)
- **Connection type** : X
- **Standby** : 0,45 W
- **Operation** : type 1.C.Y
- **Shock voltage** : 2,5 kV
- **Data interface** : VBus®
- **VBus® current output**: 35 mA
- **Casing** : Plastic, PC-ABS and PMMA
- **Dimensions** : 172 x 110 x 49 mm
- **Mounting**: Wall mounted or in a control panel
- **Command** : 3 keys
- **Type of protection** : IP 20 / IEC 60529
- **Protection class** : IP 20 / IEC 60529
- **Ambient temperature** : 0 ... 40°C
- **Functions** : Differential temperature regulator with optional functions. Function check, operating hours counter, calorimetric balance and speed regulation
- **Display / screen** : System-Monitoring to view the entire installation, 16-segment display, 7-segment display, 8 symbols to check the status of the system and 1 indicator light

3.7.4. Fixing of the DualSun BS/2 control unit



NOTE

Excessively strong electromagnetic fields can interfere with the operation of the regulator.

Be careful not to expose the device or the system to strong electromagnetic fields.

Install the device in a dry indoor room.

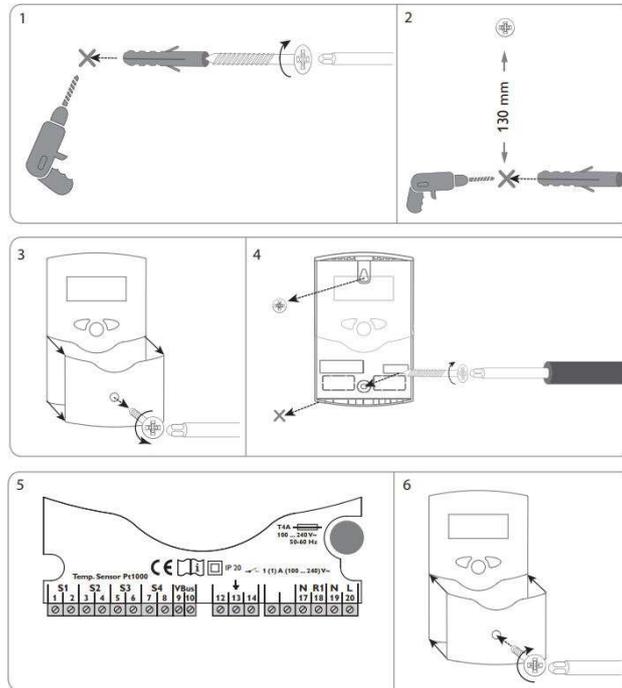
The regulator must be able to be separated from the electrical network by means of an additional device (with a minimum separation distance of 3 mm on all poles) or by means of a separation device (fuse), in accordance with the rules of installation in force.

During installation, make sure to keep the mains connection cable separate from the probe cables.

To fix the controller to the wall, do the following:

- Unscrew the cruciform screw on the cover and detach the cover from the case by pulling it upwards.
- Mark an attachment point on the wall, drill a hole and insert the wall plug and the corresponding screw (supplied with the mounting material).
- Hang the regulator housing on the fixing screw. Mark the lower fixing point for the clip (the distance between the two holes should be 130 mm).
- Drill a hole and insert the lower peg into it.
- Hang the controller on the upper screw and secure it to the wall with the lower screw.

- Make all the electrical connections (5) according to the connection plan, see [Electrical connections of the DualSun BS/2 solar control unit](#) [16].
- Replace the cover on the housing (6). Screw the housing with the corresponding screw



3.7.5. Electrical connections of the DualSun BS/2 solar control unit



CAUTION

Electrical shock!

When the enclosure is open, live components are accessible. Disconnect the device from the power supply before opening it.

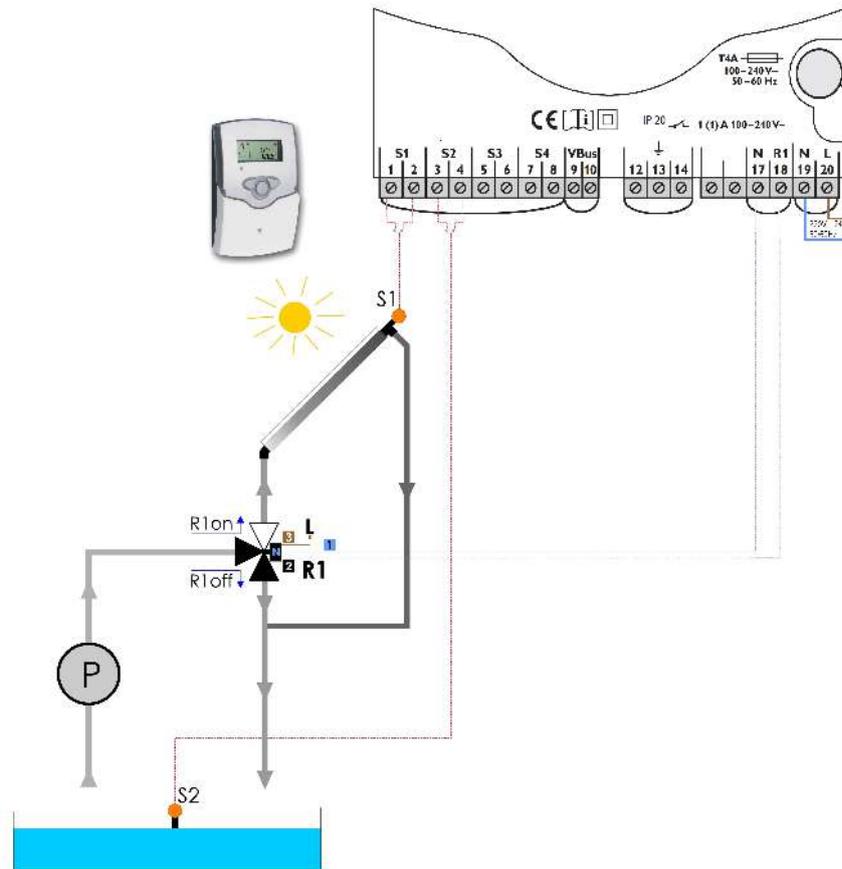


WARNING

Electrostatic discharge!

Electrostatic discharges can damage the electronic components of the device! Eliminate any static electricity you have on you before handling the internal parts of the device.

1. Wiring of the DualSun BS / 2 solar controller:



Power supply

Electrical network	DualSun regulation terminals
Phase (brown)	L (20)
Neutral (blue)	N (19)

3-way valve

3-way valve terminals	DualSun regulation terminals
1	N (17)
2	R1 (18)
3	L (20)

Temperature probes

Probes	DualSun regulation terminals
S1 - Panels	S1 (1 and 2)
S2 - Swimming pool	S2 (3 and 4)



NOTE

The grid connection must always be done last!

It is necessary to be able to disconnect the device from the electrical network at any time.

- Install the power outlet so that it is accessible at all times.
- If this is not possible, install an accessible switch.

Do not use the device if there is visible damage.

The supply voltage must be between 100 and 240 V ~ (50 and 60 Hz).

Secure the cables to the box using the wire clamps included in the mounting hardware and the corresponding screws.

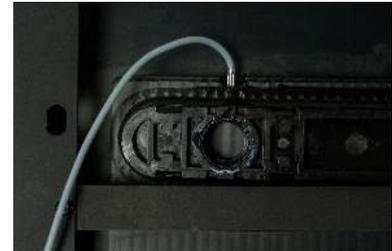
2. Wiring of temperature probes

• Panel temperature probe S1:

The DualSun temperature probe is a 4 mm PT1000 probe, delivered in the essential DualSun kit.

It is placed on the exit of the **latest** SPRING module of the thermal circuit.

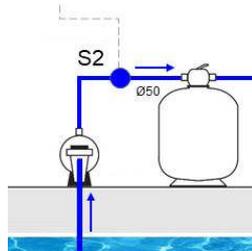
The probe is inserted into the recess on the last panel of the field. This allows a measurement as close as possible to the heat transfer fluid.



• S2 swimming pool temperature sensor:

The DualSun temperature sensor is a PT1000 sensor, supplied with the BS/2 solar control unit with a clamp.

- It is placed on the PVC pool filtration pipe using the clamp, between the filtration pump and the sand filter.
- Lay the probe with thermal grease to improve conductivity and insulate the probe with thermal insulation tape.



3. Wiring of the DualSun T-Box KM2 telemetry box (Optional):

The DualSun T-Box KM2 telemetry box allows:

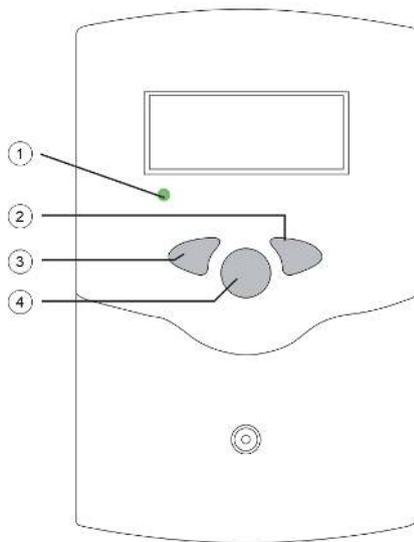
- Monitoring of your thermal production in real time
- Remote setting of solar control to minimize any field interventions



Its installation is simple:

- Power supply via wall plug
- Connection with solar control via 2-wire cable to VBus terminals (9) and (10)
- Connection with the internet router by RJ45 cable, PLC or Wi-Fi

3.7.6. DualSun BS/2 control buttons



The DualSun BS/2 solar control is controlled with the 3 keys located under the screen:

- Key (2) = Advance in the menu or increase the values (+)
- Key (3) = Go back in the menu or decrease the values (-)
- Key (4) = OK - Choose / Confirm

The indicator light (1) indicates the status of the solar control:

- Green = OK
- Red = Defective probe
- Off = Power or fuse problem

In normal operation, only the display values are displayed.

To switch from one display channel to another, press buttons (2) and (3).

Access settings :

Advance to the last display channel using key (2) and then press key (2) for 2 seconds.

Navigating the settings:

When a setting channel is displayed on the screen, the symbol **SET** appears to the right of it.

- To select an adjustment channel, briefly press button (4).
- **SET** flashes.
- Adjust the value by pressing buttons (2) and (3).
- Briefly press button (4), **SET** appears and remains displayed, the set value is saved.

Setting the 3-way valve:

To activate, deactivate or configure the 3-way valve in automatic mode, set parameter MAN1 to ON, OFF or Auto respectively.

The following parameters are set by default in the factory, they must be checked during commissioning:

- **DTO = 4K** - Activation temperature difference
- **DTF = 2 K** - Switch-off temperature difference
- **nMN = 100%** - Minimum speed relay R1
- **RMX = 32 ° C** - Maximum pool water temperature

3.8. Installation of the motorized 3-way valve

[Technical data of the motorized 3-way valve \[20\]](#)

[Hydraulic connection of the motorized 3-way valve \[20\]](#)

Electrical connection of the motorized 3-way valve [22]

3.8.1. Technical data of the motorized 3-way valve

Glue-in 3-way ball valve:

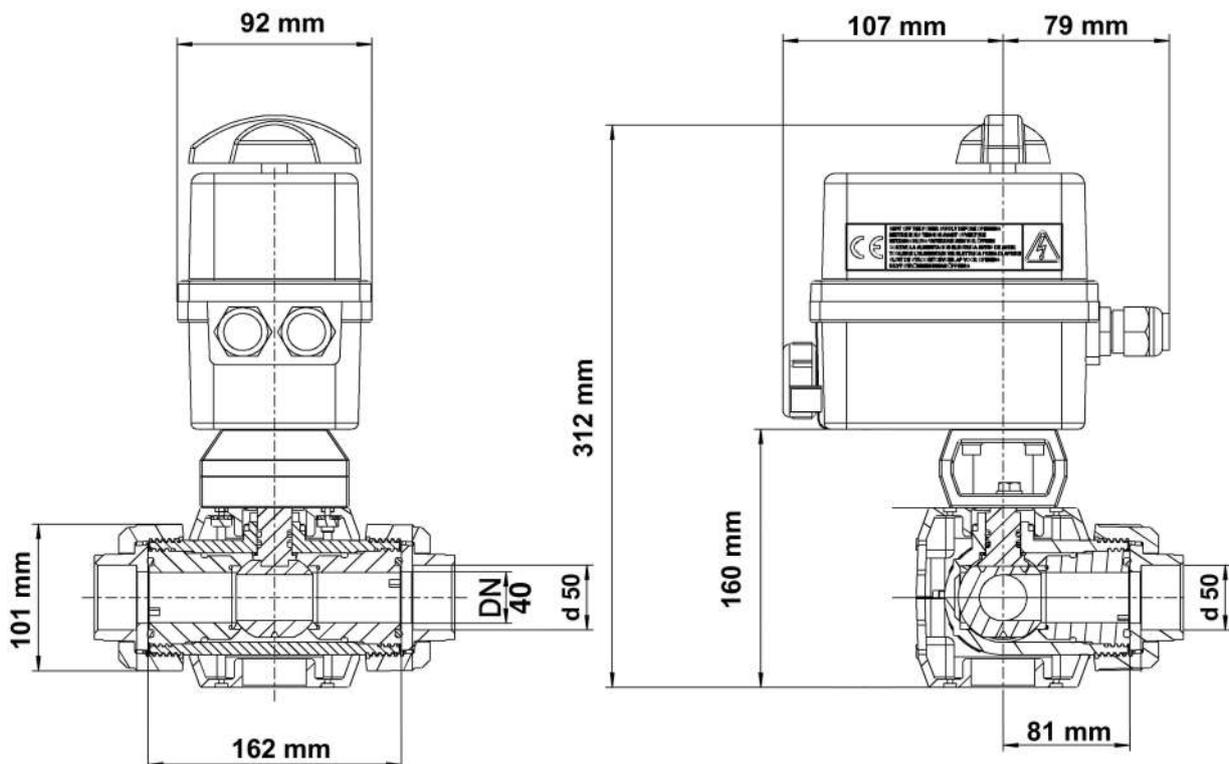
- Dimensions: DN40 - Ø50 female ends to be glued
- Body: L-shaped, PVC-u
- Seal material: EPDM PTFE

Electric actuator:

- On-Off control
- Voltage ranges: 100V to 240V AC (50 / 60Hz)
- Power: 15W
- Maneuvering time under load: 12 seconds
- Handle for manual use, with optical position indication
- Torque: 20 Nm
- Electrical connection: 1 Connector 3P + T DIN43650 + 1 ISO M20
- Temperature -10 ° C to + 55 ° C
- IP66 protection



Dimensions:



3.8.2. Hydraulic connection of the motorized 3-way valve

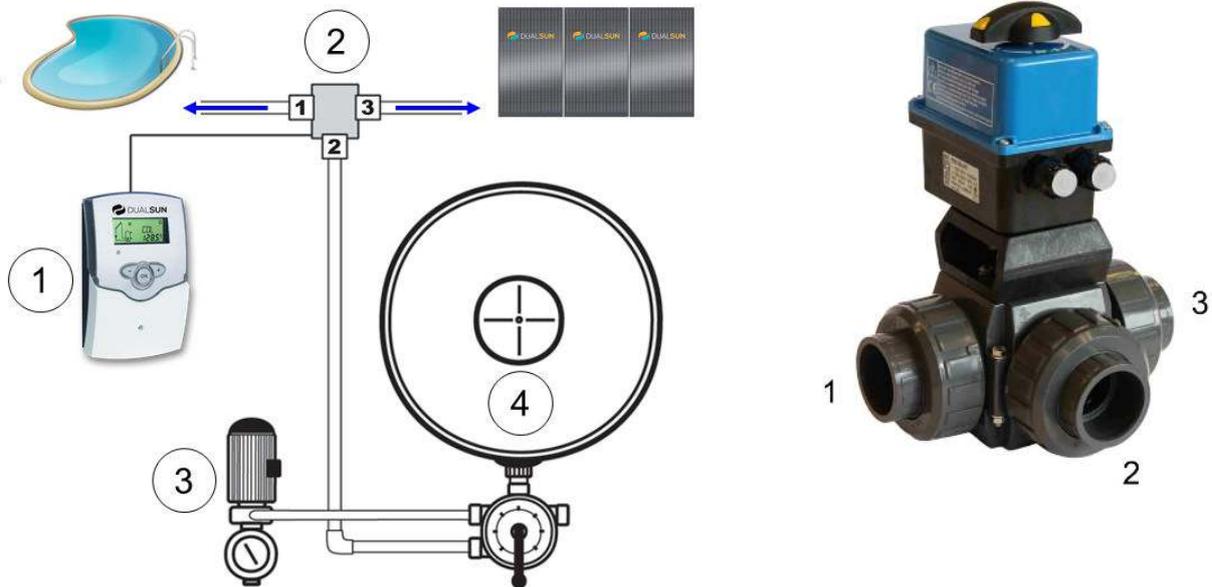
In the "automatic" position, the motorized 3-way valve, installed on the swimming pool's filtration circuit and controlled by the DualSun BS/2 solar control, will direct the water towards the solar collectors, provided that the temperature difference between these and the swimming pool water is not lower than the value indicated by the "Temperature difference" thermostat and that the desired temperature has not yet been reached.

Otherwise, the water from the filtration circuit will be conducted directly to the swimming pool, without going through the solar collectors.

The 3-way valve operations are automatic and take less than a minute to switch from one state to another.

The 3-way valve must not be installed with its motor at the bottom.

Its connection to filtration and solar collectors is indicated below:



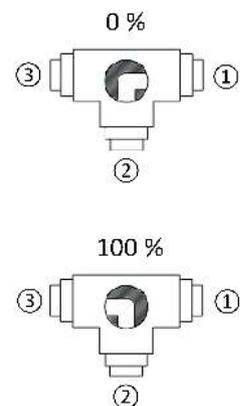
- (1) = DualSun BS/2 solar controller
- (2) = Motorized 3-way valve
- (3) = Pool filtration pump
- (4) = Sand filter

The positioning of the 3-way valve must be such that inlet 2 is connected to the outlet of the swimming pool filter.

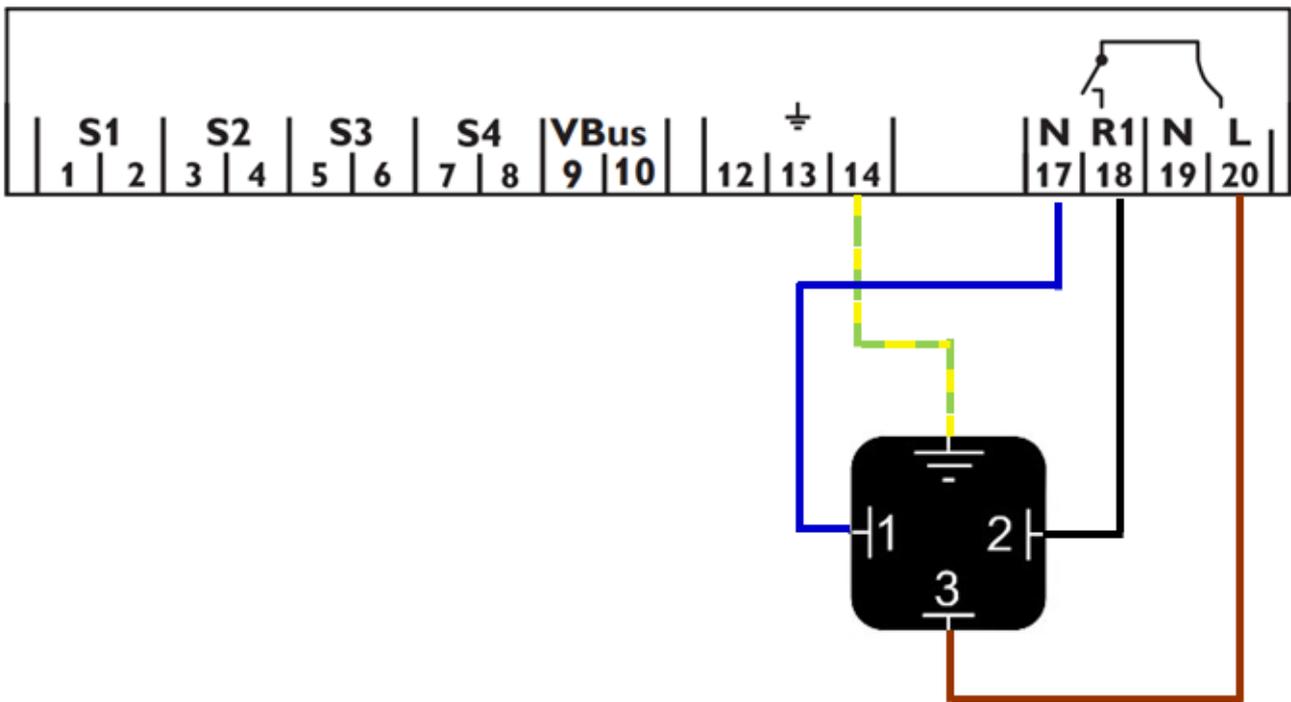
When the motor is stopped at 0%, the flow must be directed towards the filtration loop (L-shaped valve oriented between position 2 and 1).

When the motor is running at 100%, the flow must be directed towards the solar collectors (L-shaped valve directed between position 2 and 3).

The positioning of the valve is unique, it is not possible to reverse its operation by means of its electronic control.



3.8.3. Electrical connection of the motorized 3-way valve



Wiring to be carried out directly between the terminal block of the DualSun BS/2 control unit and the terminal block of the 3-way valve:

3-way valve terminals	DualSun regulation terminals
1	N (17) - Blue cable
2	R1 (18) - Black cable
3	L (20) - Brown cable
Earth	Earth (14) - Yellow and green cable

Motorized 3-way valve connections should only be entrusted to a qualified installer.

Access to the terminal block of the 3-way valve by removing the cover of the connection box which is on the top of the valve and which is held by 2 screws.

4. Commissioning of the DualSun individual swimming pool heating system



IMPORTANT

BEFORE CIRCULATING THE WATER:

- Allow the sealings to dry long enough according to the manufacturer's instructions
- Check that the non-return valves, the inspection valves and the drain plugs are correctly installed
- Check that all the clamps are correctly clipped and that the stainless steel clamps are tight
- Check that all screws are tight and that silicone has been put in to avoid any leakage on the roof
- Make sure that the hydraulic connections of the solar collectors are properly engaged
- Make sure that the system will drain automatically when the pump is turned off, or that the bleed valves are in sufficient quantity
- Check that all the pipes are correctly held by the clamps



WARNING

WATER QUALITY

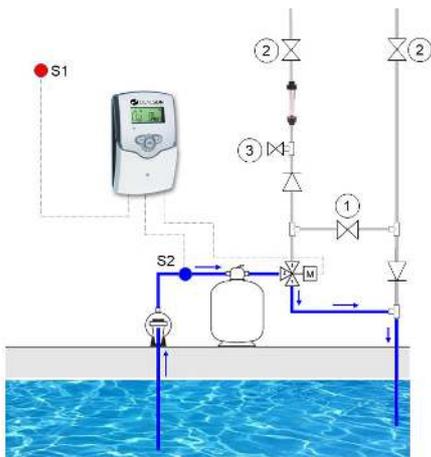
The 3-way valves fitted to our transfer units are designed to work in clear water.

They can accept a water salinity of up to 7 grams per liter - temperature 40 ° C.

The procedure for commissioning the DualSun BS/2 solar control unit and the motorized 3-way valve is to be carried out as follows:

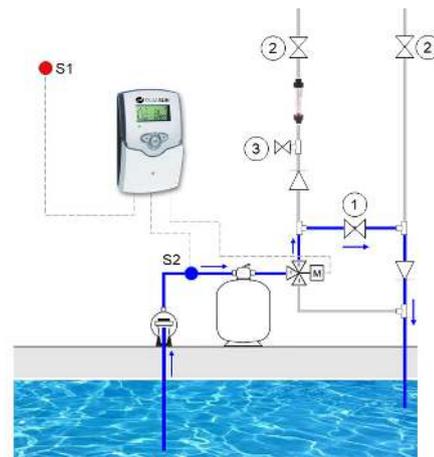
- Check the parameters of the solar control, see [DualSun BS/2 control buttons \[19\]](#)
- Carry out the hydraulic adjustments following the steps described below

Step 1:



Checking that the 3-way valve is correctly fitted - OFF mode:

- Check that MAN1 is OFF
- Close the isolation valves (2)
- Open the bypass valve (1)
- Start the filtration pump (purged and clean sand filter)
- Check that the filtration rate is correct



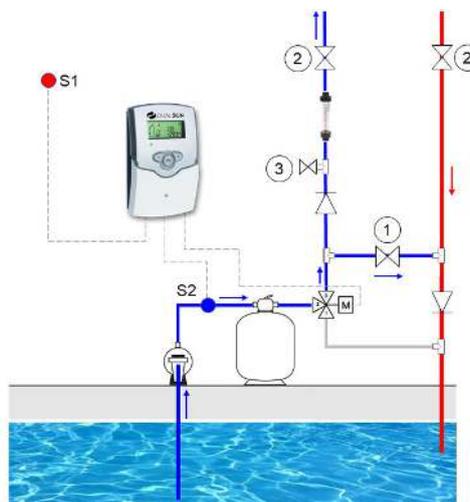
Checking that the 3-way valve is correctly fitted - ON mode:

- Leave the isolation valves (2) closed
- Leave the bypass valve (1) open
- Activate the 3-way valve by switching MAN1 to ON
- Check that the filtration rate is correct
- Modulate the closing of the bypass valve (1) and check the flow variation

Step 2:

Adjustment of the service flow in the solar panels:

- Leave the 3-way valve in ON mode
- Leave the bypass valve (1) open
- Open the isolation valves (2), **starting with the valve on the delivery line - exit of the panels**
- Gradually close the bypass valve (1) until the maximum allowable flow of 0,4 m³/ h / panel. Multiply this flow by the number of DualSun SPRING panels installed.
- Let the panels fill with water for at least 15 minutes in order to purge the air
- Adjust the bypass valve (1) so as to obtain the operating flow 0,2 m³/ h / panel. Multiply this flow by the number of DualSun SPRING panels installed.
- Check that the flow is stabilized after 15 minutes
- Switch the 3-way valve to AUTO mode



A	B
4	0,8
6	1,2
8	1,6
10	2
12	2,4
14	2,8
16	3,2
18	3,6
20	4

A = Number of SPRING panels

B = Service flow (m³/ h)



IMPORTANT

Installation in a frost risk area:

It is imperative to carry out a drain test before the final commissioning of the installation, see [Shutdown of the DualSun individual solar pool heating system \[26\]](#)

When the installation is running, the solar control unit displays the following symbols:

- ☉ : Relay 1 active = 3-way valve activated = solar heating active
- ⌈ : Maximum tank temperature reached = 3-way valve deactivated = solar heating off

NOTA BENE :

With the installation in operation, the temperature of the swimming pool water rises slowly to the desired temperature, provided that:

- The difference between the temperature of the solar panels and that of the swimming pool water is always greater than the chosen value,
- The temperature of the pool water is lower than the maximum value,
- The filter circuit pump is running.

The water heated by the solar panels is mixed with the pool water at the level of the bypass / adjustment valve. In addition, solar heating is deactivated as soon as the temperature of the swimming pool water reaches the maximum value. This helps prevent any risk of burns at the backflow into the pool.

5. Shutdown of the DualSun individual solar pool heating system

To stop the DualSun individual swimming pool solar heating system, stop the 3-way valve by switching MAN1 to OFF and close the isolation valves (2).



IMPORTANT

For frost risk areas, emptying the installation is compulsory and requires fitting the DualSun drain kit.

For proper operation, the following recommendations must be observed:

- Air vent at the entrance of the panel field, see figure below
- Air vent oriented upwards and placed vertically or with a maximum angle of 30 ° with the vertical
- Inclined piping / no counter slope (high point) to ensure water flow between the panels and the drain valve

Draining / Winterizing for fros risk areas:

- Leave the isolation valves (2) open
- Stop the 3-way valve by switching MAN1 to OFF
- Close the by-pass valve (1)
- Open the drain valve (3). It is possible to connect a garden hose to the threaded nozzle to collect the water in the basin or evacuate it toward a suitable place
- It is essential to rinse the installation with non-chlorinated water. Chlorine gas may damage the device.
- Drain completely after rinsing
- Close the drain valve (3)
- Close the isolation valves (2)

6. Guarantees

The legal warranty rights only apply if assembly, commissioning and maintenance have been carried out correctly.

We accept no liability for any improper use or unauthorized modification of the assembly components and the consequences thereof, as well as for the improper execution of the assembly instructions.

We invite you to consult the DualSun warranty conditions in our [online library](#).

This warranty is only valid if maintenance is performed and documented by qualified personnel.

This warranty takes effect on the invoice date of the equipment.

6.1. Commissioning report

The commissioning report can be downloaded from the [DualSun online library](#)



IMPORTANT

It is important to fill it out correctly in order to activate the DualSun guarantees.

7. General recommendations

Please read this manual carefully before starting the installation, the advice provided will help you ensure the safe installation, use and maintenance of your DualSun device.

The installation of the device, maintenance and repair must be carried out by companies trained in the specifics of the process, having the required skills in climatic engineering, plumbing and roofing, in accordance with the recommendations of this manual, using the accessories described in it, following the rules of the art.

This very important manual forms a whole with the device. It should be kept with care and must follow the device in the event of transfer to another owner or user and / or transfer to another installation.

Safety of workers

The implementation of the process at height imposes provisions relating to the protection and safety of people against the risk of falls such as:

The implementation of devices allowing the movement of people without direct support on the solar panels

The installation of fall arrest devices in accordance with the regulations in force: on the one hand, to prevent falls on the sensors and on the other hand, to prevent falls from the roof.

During upkeep and maintenance, the safety of workers must be ensured by the installation of protection against falls using guardrails or the like (refer to the recommendations indicated in the installation guidelines). and the maintenance of thermal and photovoltaic solar panels published by the national risk prevention body).



WARNING

This device is not intended for use by children or by persons with limited physical, sensory or intellectual faculties and / or knowledge impaired, unless they are under supervision or following the instructions of a person responsible for their safety.

The manufacturer declines all responsibility in the event of damage to persons, animals or property resulting from improper installation or use of the device.

The packaging elements represent a danger for children, do not leave them within their reach.

No flammable object must be near the device.

Keep the solar panels in their packaging until the final installation location to avoid damaging them.

After-sales service and maintenance conditions

The conditions of use and maintenance, all the checks to be carried out are specified in the care and maintenance instructions provided upon delivery:

- Integrity check and possible replacement of solar panels
- Integrity check and possible replacement of hydraulic connections
- Control of media and their integrity
- Checking the readability of product labels