

EVOSOL

EN INSTALLATION AND MAINTENANCE MANUAL

RANGE

MODEL	CODE
EVOSOL	20120499

ACCESSORIES

For a complete list of accessories and details of their compatibility, refer to the Catalogue.

Dear heating engineer,

*We would like to congratulate you on having recommended a solar controller **EVOSOL** unit: a modern product that is capable of ensuring a high degree of reliability, efficiency, quality and safety.*

While your technical skills and knowledge will certainly be more than sufficient, this booklet contains all the information that we have deemed necessary for the device's correct and easy installation.

Thank you again, and keep up the good work,

CONFORMITY

EVOSOL solar controllers conform to:

- EN 61000-6-1:2007
- EN 61000-6-3:2007/A1:2011
- EN 61000-3-2:2014
- EN 61000-3-3:2013
- EN 60335-1:2012
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Machinery Directive 2006/42/EC
- Directive 93/42/EEC concerning medical devices
- Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.



At the end of its life, the product should be not be disposed of as solid urban waste, but rather it should be handed over to a differentiated waste collection centre.

CONTENTS

1 GENERAL INFORMATION	4
1.1 General Safety Information	4
1.2 Precautions	4
1.3 Description of the appliance	4
1.4 System layout	4
1.5 Technical specifications	5
2 INSTALLATION	6
2.1 Installation on products	6
2.2 Unpacking the product (only for separately purchased version)	7
2.3 Dimensions	7
2.4 Assembly (only for separately purchased version)	7
2.5 Wiring diagram	8
2.6 Electrical connections	9
2.6.1 Controller power connections	9
2.6.2 Inputs for temperature sensors	9
2.6.3 U1-U2 outputs	10
2.6.4 PWM control signals	11
2.6.5 Modbus data transmission	12
2.7 User interface	13
2.7.1 Nr. displayed	13
2.7.2 Display icons	13
2.8 Menu structure	14
3 PARAMETER DESCRIPTION	18
3.1 Probe temperature display	18
3.2 ΔT settings	18
3.3 Manual mode U1-U2	18
3.4 Accumulation tank priority	19
3.5 Accumulation tank 1 high part setpoint	19
3.6 Accumulation tanks 1 and 2 low part setpoint	19
3.7 Accumulation tank 1 zone priority	19
3.8 Heat transfer activation threshold between accumulation tank 1 and 2	19
3.9 Threshold for collector 1 and 2 solar pump start	20
3.10 System selection	20
3.11 Supplement activation threshold	20
3.12 Supplement deactivation threshold	20
3.13 Weekly schedule	21
3.14 Solar pump 1 current speed	21
3.15 Minimum speed of solar pump 1 and pump 2	22
3.16 U1-U2 output control mode	22
3.17 Pump modulation	22
3.18 U1-U2 output modulation differential set	22
3.19 Output u2 activation temperature for solid fuel generator supplementary system	23
3.20 Output u2 deactivation temperature for solid fuel generator supplementary system	23
3.21 Anti-stagnation function (overtemperature dispersion) collector 1 and 2	23
3.22 Accumulation tank 1-2 safety stop maximum temperature	24
3.23 Anti-thermal shock function	24
3.24 Anti-thermal shock function stop threshold	24
3.25 Pump on interval during anti-thermal shock function	24
3.26 Pump off interval during anti-thermal shock function	25
3.27 Pump speed in antishock mode	25
3.28 Enabling supplementary system	25
3.29 Anti-freeze activation	25
3.30 Thermal disinfection function (anti-legionella)	25
3.31 Thermal disinfection temperature	26
3.32 Thermal disinfection monitoring period	26
3.33 Thermal disinfection heating period	26
3.34 Thermal disinfection in progress counter	26
3.35 Thermal disinfection delayed activation time	27
3.36 Operating hours output U1-U2	27
3.37 Accumulation tank 1 – accumulation tank 2 night cooling function	27
3.38 Restore Default parameters	28
3.39 Control unit modbus address	28
4 PUTTING INTO SERVICE	29
4.1 Initial startup	29
4.1.1 Current time and week day display	29
4.1.2 Setting up current time, week day and language	29
4.1.3 Enter Password	29
4.1.4 System layout configuration	30
4.1.5 Change installer parameters	32
4.1.6 Change weekly time schedule	32
5 INSTALLATION DIAGRAMS	33
6 TROUBLESHOOTING	65
7 RECYCLING AND DISPOSAL	67

The following symbols are used in this manual:



CAUTION! = Identifies actions that require caution and adequate preparation.



STOP! = Identifies actions that you MUST NOT do.

1 GENERAL INFORMATION

1.1 General Safety Information

- A** After having removed the package, be sure to verify the integrity and the completeness of the consignment, and contact the Agency from which the device was purchased if any discrepancies are encountered.
- A** The product's installation must be carried out by an authorised company that will issue a declaration of the installation's conformity to the product's owner once the work has been completed, indicating that the work has been carried out in accordance with the standards of good practice, the current National and Local regulations, and the indications provided by the manufacturer in the instruction booklet accompanying the device.
- A** The product must be used for its intended purpose (as described by the manufacturer) for which it has been expressly manufactured. The manufacturer shall bear no responsibility, whether of a contractual or non-contractual nature, for any damage caused to people, animals, or property due to incorrect installation, adjustments, or maintenance, or improper use.
- A** This booklet is an integral part of the device, and must therefore be carefully preserved, and must ALWAYS accompany the solar controller, even in the event that it is sold to another Owner or User, or is transferred to another system. If it is damaged or lost, another copy can be requested to Technical Assistance Service in your Area.

1.2 Precautions

- E** Never clean the boiler without first disconnecting it from the mains electricity supply by turning the mains power switch and the control panel switch OFF.
- E** Do not tamper with or adjust the safety or control devices without prior authorisation and instructions from the manufacturer.
- E** Never pull, disconnect, or twist the electrical cables coming from the appliance even if it is disconnected from the mains electricity supply.
- E** All maintenance and repairs must be carried out by a legally qualified heating engineer.
- E** Do not use water to extinguish fire in the control panel. Switch power OFF at the mains power switch to isolate the control panel electrically first. Then use a class E fire extinguisher (marked "SUITABLE FOR LIVE ELECTRICAL ITEMS") to extinguish the flames.
- E** Do not dispose of packaging material into the environment, or leave it within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.
- E** Do not allow children or infirm persons to operate the system unsupervised.
- E** It is forbidden to touch the device while barefoot or with wet or moist body parts.
- E** It is forbidden to commission the equipment, even temporarily, with safety devices that are not working or have been tampered with.

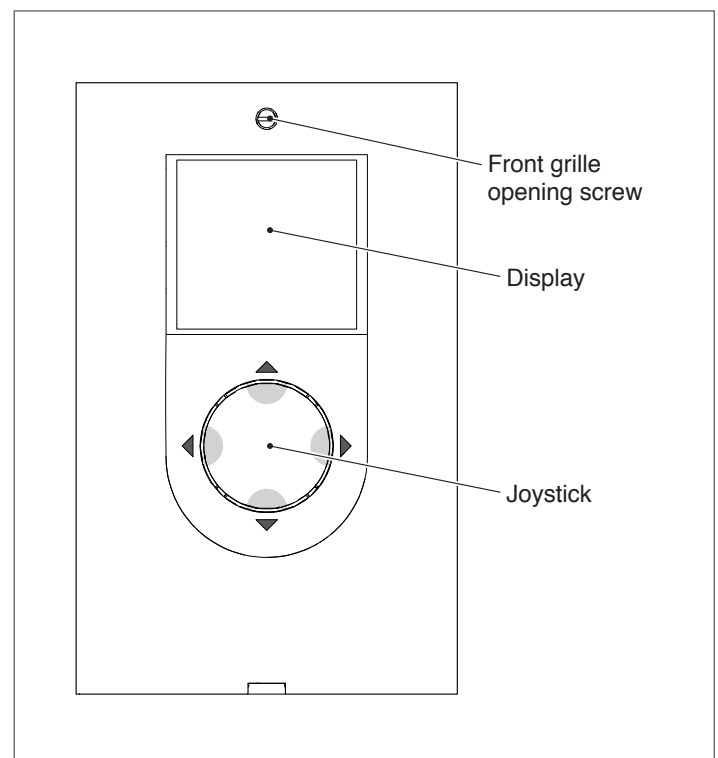
1.3 Description of the appliance

The solar regulator **EVOSOL** is suitable for regulating a solar integration system: it controls the heat transfer from the solar collectors to a storage system. It is responsible for the operation of the pump using the information collected from temperature probes. It can also control the integration.

The solar regulator provides 9 system layouts and advanced functions, such as adjustment of pump speed, thermal disinfection function, protection of solar collectors against overtemperature and too low temperatures (anti-freeze function), and operating hours counter.

The solar regulator is provided with 4 inputs for temperature probes, 2 NTC 10K @ 25°C (ß 3435) to be installed in storage system 1, and 2 PT1000 to be installed in the solar collectors or in the second storage system, 1 static control output for pumps or standard 230 VAC 3-way valves, 1 Volt-free dry contact and 2 PWM outputs for modulating pumps.

1.4 System layout



1.5 Technical specifications

Description	EVOSOL	
Power supply	230Vac +10 -15% 50-60Hz	
Protection (fuse)	F 3.15A - 250V - 5x20mm - rapid	
Maximum consumption in stand-by	3W	
Maximum allowed overall consumption	600W	
Level of protection from external agents	IP20	
Outputs	U1	1 static output 230Vac 1.3A Max @ $\cos \varphi > 0.5$
	U2	1 Volt-free dry contact output (230Vac 1A Max)
Control outputs	CN6	2 PWM static outputs at 24VDC 25mA Max
Temperature sensors	S1-S4(S6)	PT1000 class B
	S2-S3	NTC 10K @ 25°C (β 3435)
Conversion accuracy	$\pm 2^\circ\text{C}$	
Interconnection with other control units	RS-485 line (Modbus RTU protocol)	
Maximum number of interconnected devices	32	
Maximum interconnection length (node sum)	500 m twisted pair shielded cable AWG 22-24 @ 9600 Baud transmission speed	
Start and end termination of control unit interconnection	through jumper position J4	
Net weight	300g	

2 INSTALLATION

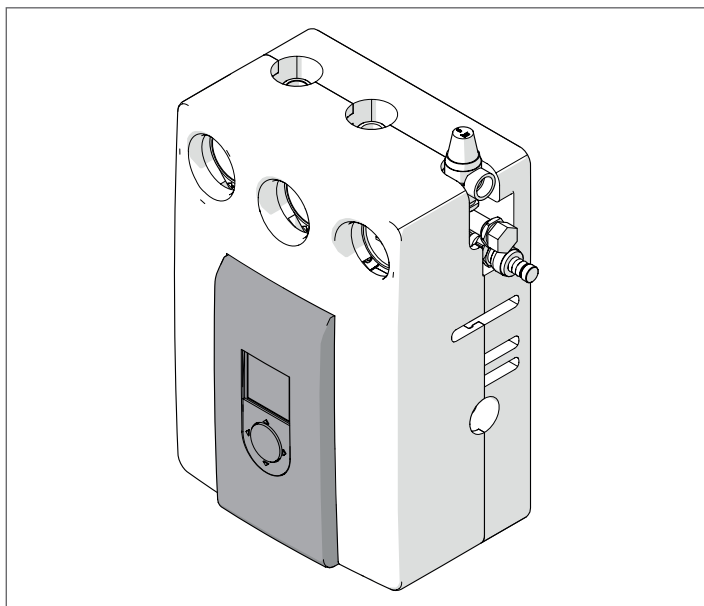
2.1 Installation on products

⚠ For information on the receipt of the solar regulator purchased as already integrated in a different product (for example, heater or solar station), refer to the indications outlined in the booklets provided with the product.

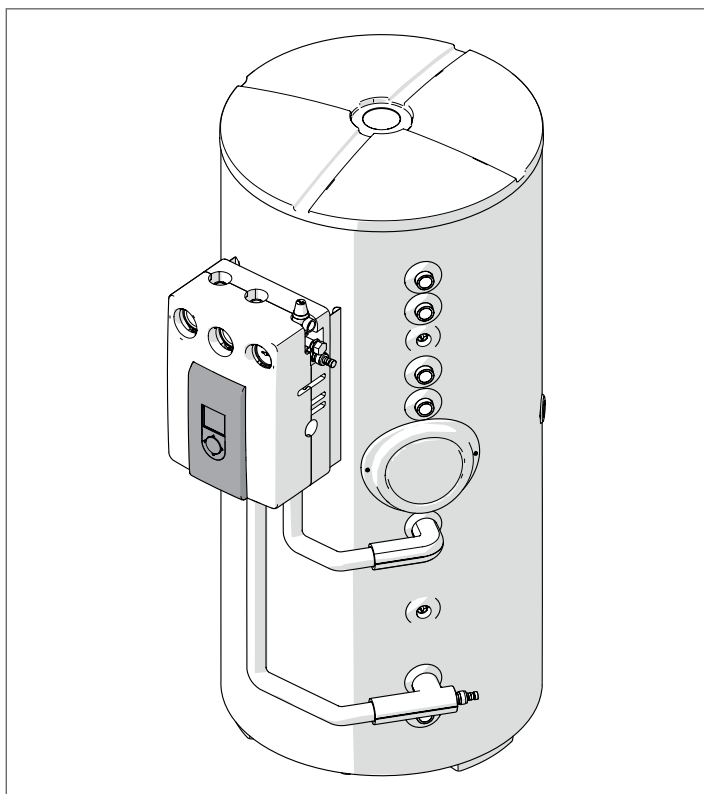
The regulator is already mounted as standard on the following products:

- solar station
- boiler with compact solar station
- boiler with column-solar station.

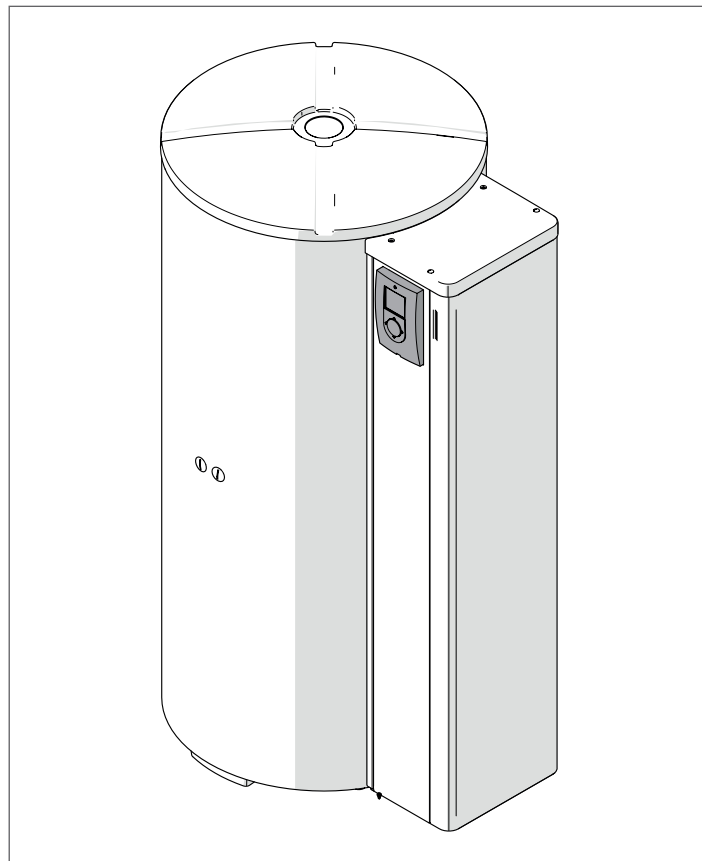
Solar station



Boiler with compact solar station

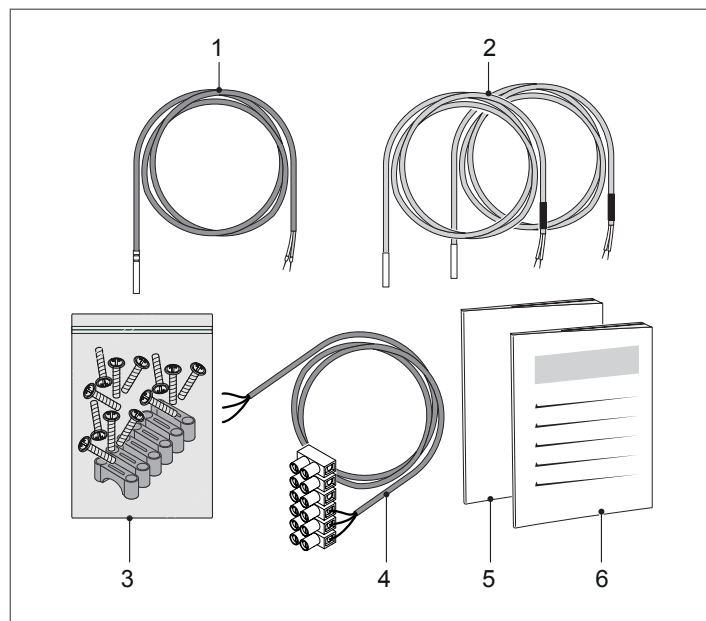


Boiler with column-solar station



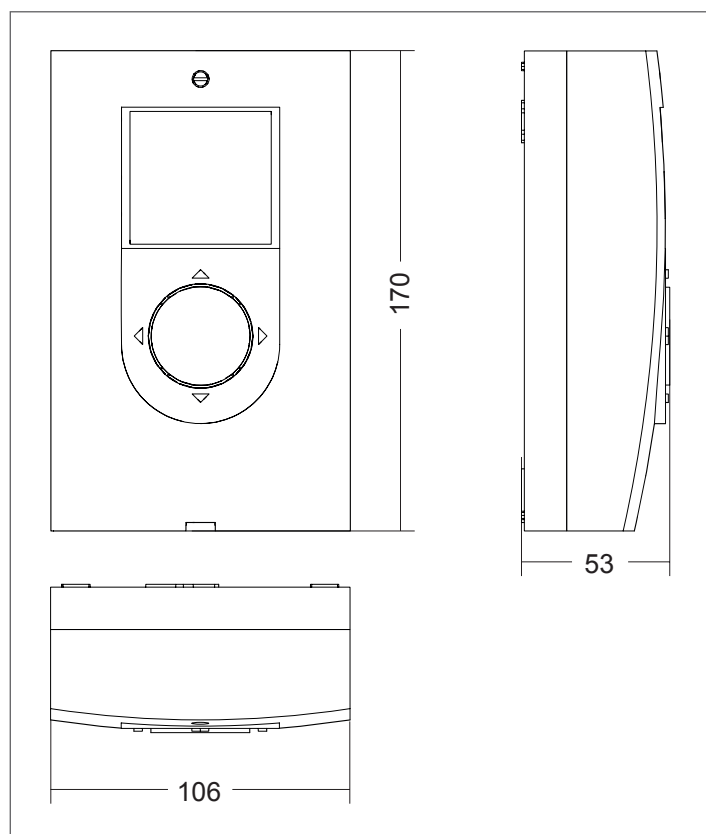
2.2 Unpacking the product (only for separately purchased version)

The controller **EVOSOL** is supplied packed in a carton box together with the following accessories:



- 1 1 probe PT1000
- 2 2 probes NTC 10K @ 25°C (β 3435)
- 3 1 x accessories bag containing:
6 cable glands with fastening screws
- 4 wiring for PWM signal connection
- 5 Installer booklet
- 6 User booklet.

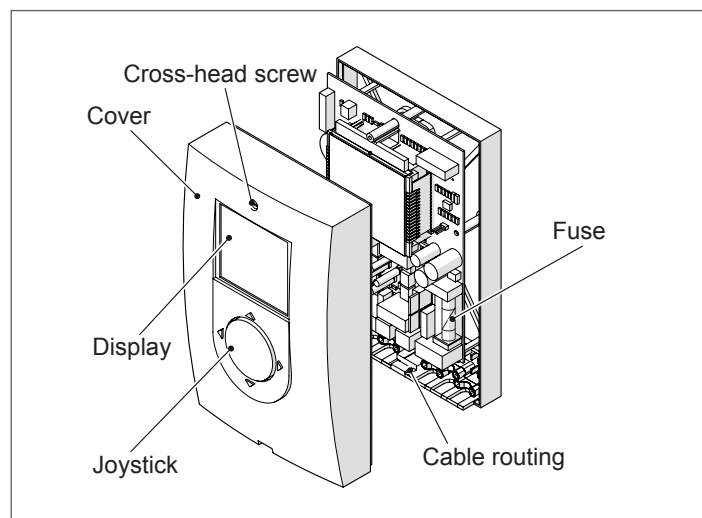
2.3 Dimensions



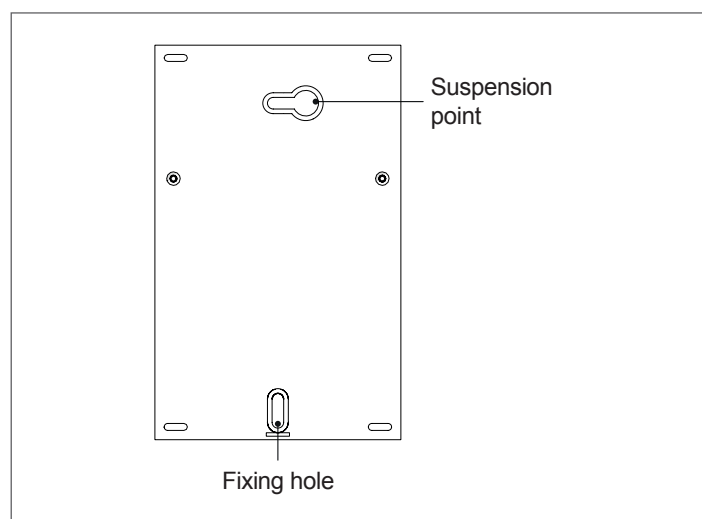
2.4 Assembly (only for separately purchased version)

To assemble the regulator:

- Unscrew the cross screw and remove the front controller grille

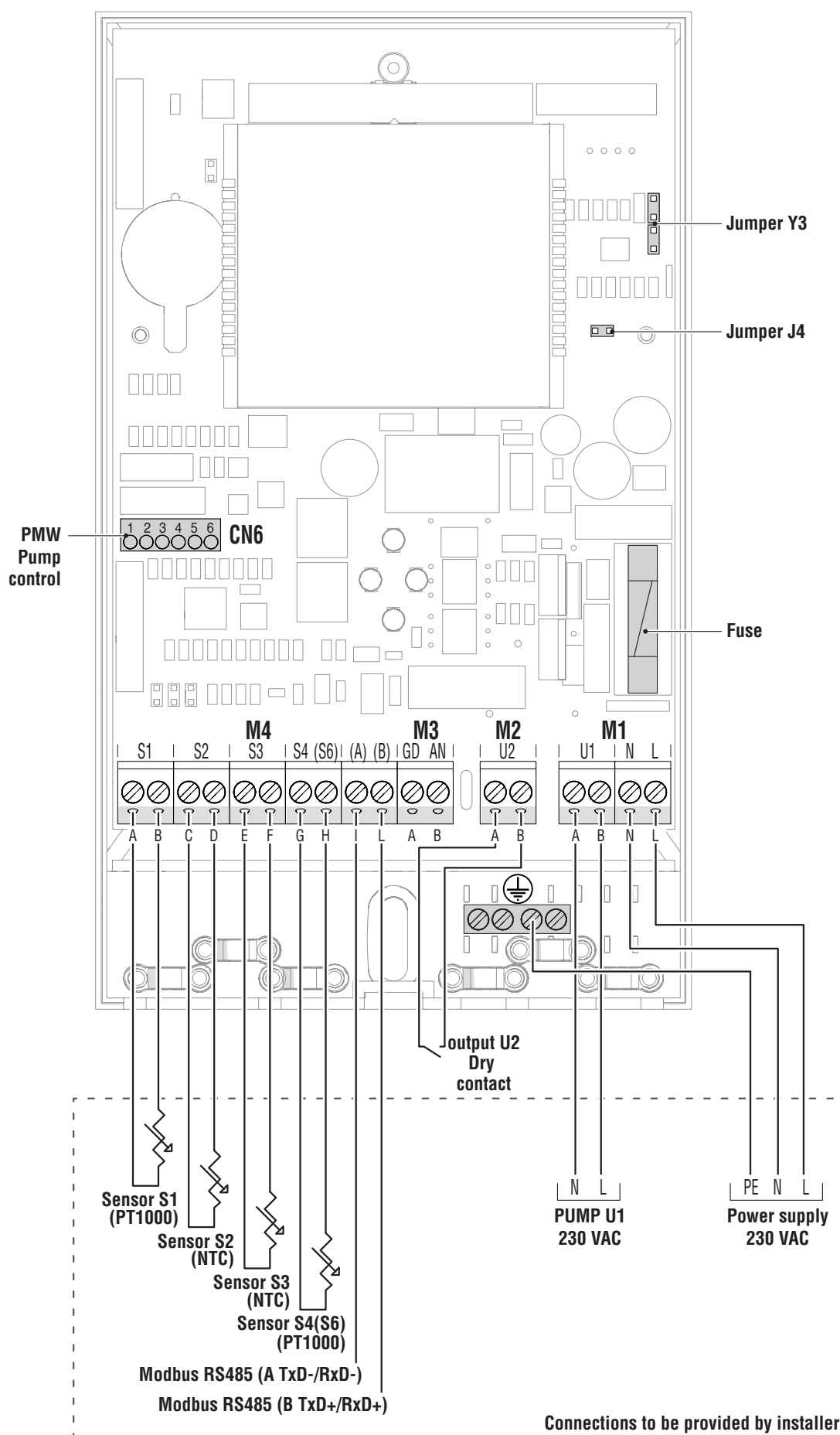


- Mark the upper fastening point on the mounting bracket or on the wall, drill and pre-install the block with the screw



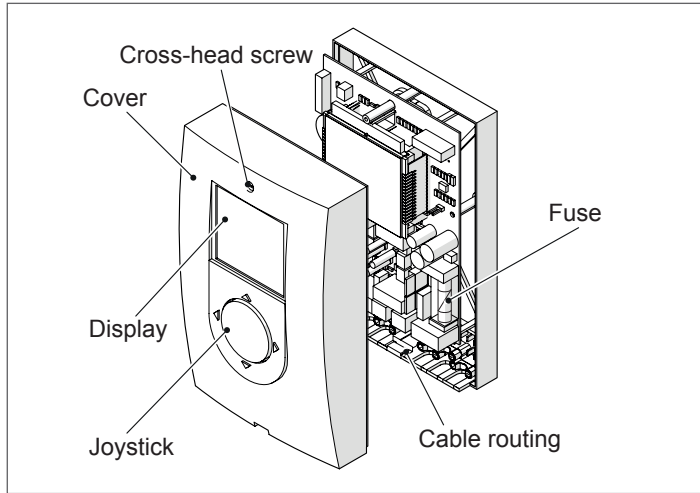
- Fit the controller casing over the top fixing point and mark the position of the bottom fixing hole (distance between holes 130 mm)
- Drill the hole and fit the bottom wall plug
- Hitch the device to the upper fastening point and fasten it to the lower block
- Make electrical connections respecting the terminal nomenclature according to the instructions in the following paragraph
- Remove the protective film from the display
- Fit the grille and fasten it to the case with the cross screw.

2.5 Wiring diagram



2.6 Electrical connections

- ⚠** Before opening the solar regulator, make sure that the mains voltage is completely cut off.
- Unscrew the cross screw and remove the front solar regulator grille



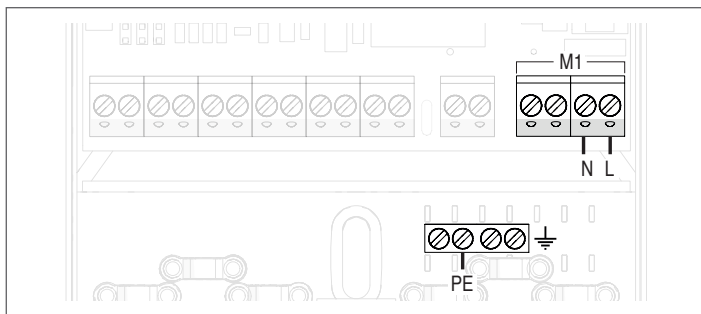
- Route the cables through the fairleads and fasten them using the cable glands supplied.
- When electrical connections are ready, fasten the front grille.

2.6.1 Controller power connections

The solar regulator power supply must have a voltage of: 230V and 50-60Hz.
Prepare a power supply disconnecting switch for maintenance purposes.

Terminal block M1 connections:

- L** Live
N Neutral
PE Earth/ground



2.6.2 Inputs for temperature sensors

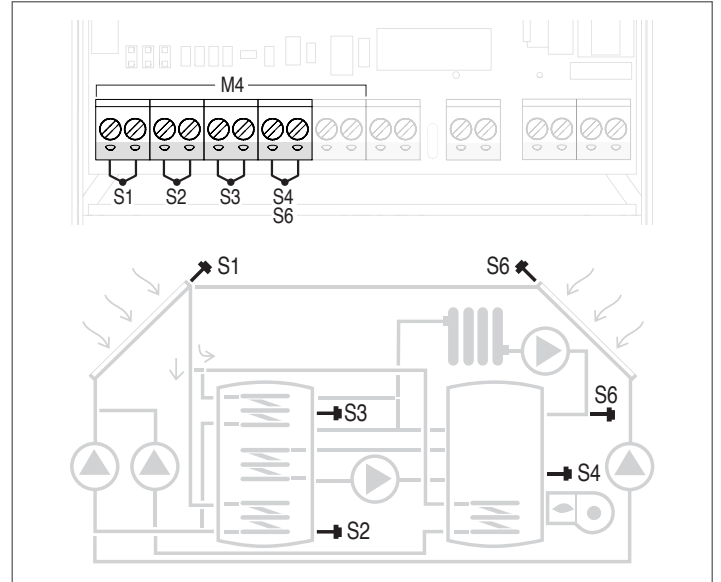
The solar regulator is equipped with 4 inputs for temperature probes to be connected according to the system layout chosen. Cable polarity is not important.

Upon connection, or should it be necessary to increase probe cable length, refer to these remarks:

- Absolutely avoid laying probe cable together with mains power cables and/or AC cables
- Absolutely avoid routing cables close to strong magnetic fields
- Avoid any cable jointing as much as possible; solder and duly insulate any indispensable jointing
- Use twisted and shielded wires
- Use cables having a cross-section of over 0.5 mm²

Terminal block M4 connections:

- Probe S1 PT1000 (collector 1 temperature probe)
- Probe S2 NTC (accumulation tank 1 lower temperature probe)
- Probe S3 NTC (accumulation tank 1 upper temperature probe)
- Probe S4 PT1000 (accumulation tank 2 temperature probe) or probe S6 PT1000 (collector 2 temperature probe; heating system return temperature probe).



When temperature probes are connected they can be tested with a multimeter. The correspondence between temperature and resistance is shown in the following tables.

Resistance values for Pt1000 sensors				
°C	Ω		°C	Ω
-10	961		55	1213
-5	980		60	1235
0	1000		65	1252
5	1019		70	1271
10	1039		75	1290
15	1058		80	1309
20	1078		85	1328
25	1097		90	1347
30	1117		95	1366
35	1136		100	1385
40	1155		105	1404
45	1175		110	1423
50	1194		115	1442

Resistance values of probes NTC 10K @ 25°C (β 3435)							
°C	Ω	°C	Ω	°C	Ω	°C	Ω
0	27200	28	8947	56	3433	84	1492
1	26061	29	8625	57	3326	85	1451
2	24976	30	8316	58	3222	86	1412
3	23942	31	8020	59	3122	87	1373
4	22957	32	7763	60	3026	88	1336
5	22017	33	7463	61	2934	89	1300
6	21120	34	7201	62	2844	90	1266
7	20265	35	6950	63	2758	91	1232
8	19449	36	6709	64	2674	92	1199
9	18670	37	6477	65	2594	93	1167
10	17926	38	6254	66	2516	94	1137
11	17216	39	6040	67	2441	95	1107
12	16537	40	5835	68	2369	96	1078
13	15889	41	5637	69	2299	97	1050
14	15270	42	5448	70	2232	98	1023
15	14678	43	5265	71	2166	99	997
16	14112	44	5090	72	2103	100	971
17	13571	45	4921	73	2043	101	947
18	13053	46	4758	74	1984	102	923
19	12558	47	4602	75	1927	103	900
20	12084	48	4452	76	1872	104	877
21	11630	49	4307	77	1819	105	855
22	11195	50	4168	78	1767	106	834
23	10780	51	4033	79	1717	107	813
24	10381	52	3904	80	1669	108	793
25	10000	53	3780	81	1623	109	774
26	9634	54	3660	82	1578	110	755
27	9283	55	3544	83	1534		

2.6.3 U1-U2 outputs

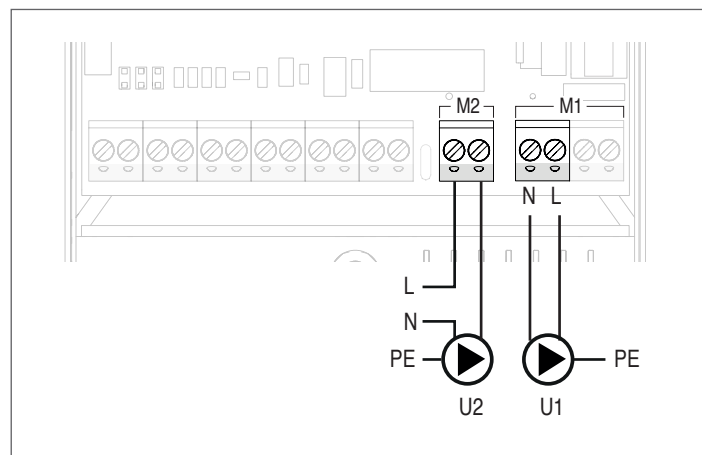
The solar regulator is equipped with 2 independent outputs for standard or modulating pump. On the U2 output it is possible to manage a 3-way valve based on the chosen system layout.

STANDARD PUMP CONNECTION

Terminal block M1 connections: output U1 (230Vac)

- Pump 1 neutral (N)
- Pump 1 phase (L)

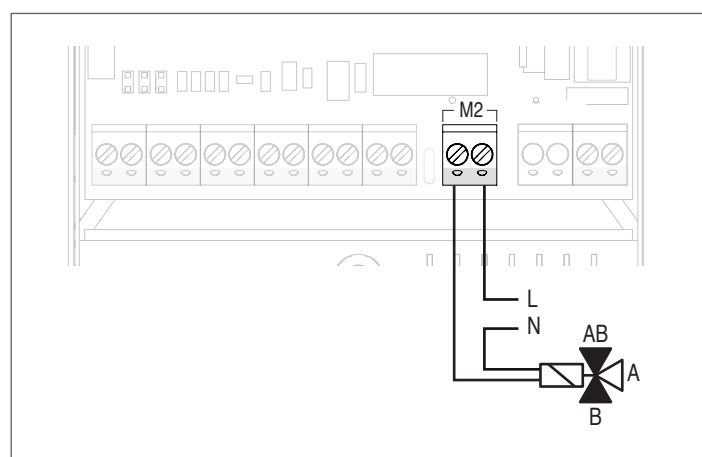
Terminal block M2 connections: output U2 (Volt-free dry contact)



CONNECTION FOR 3-WAY VALVE

Terminal block M2 connections: output U2 (Volt-free dry contact)

- AB-B valve ON
- AB-A valve OFF

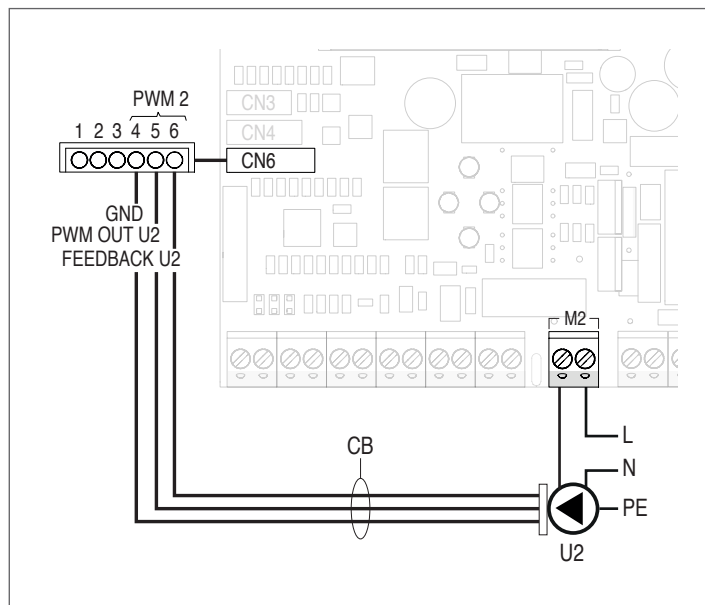


⚠ The regulator only manages non-modulating on-off valves. The connection to the CN6 connector must not be used.

CONNECTION TO PWM MODULATING PUMPS

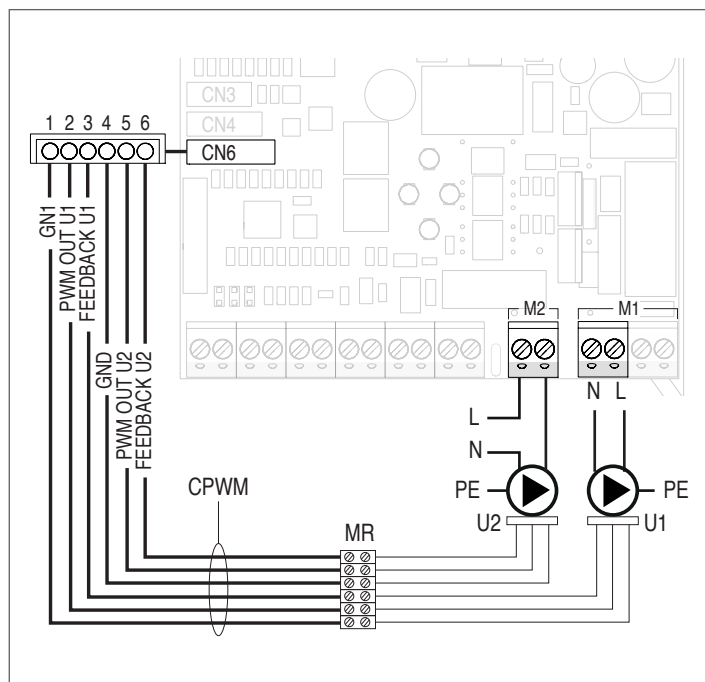
REGULATOR ADDED TO ANOTHER PRODUCT

The solar regulator already added to another product can handle a further modulating pump (as an alternative to the standard 230Vac pump) connecting the pump control to connector CN6 using the wiring (CB) available as an accessory. The power part must be connected to terminal board M2 (output U2).



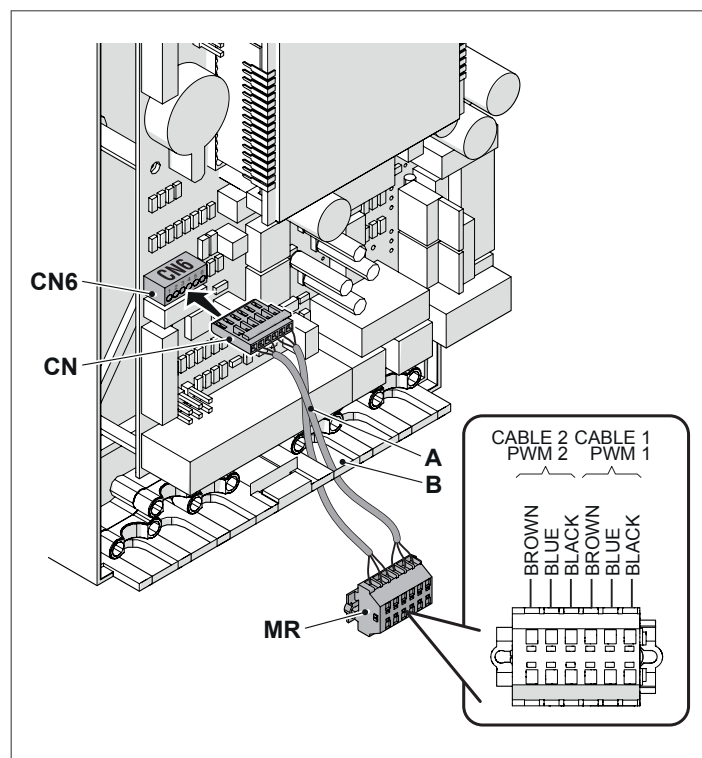
REGULATOR PURCHASED SEPARATELY

The solar regulator purchased separately is able to handle 2 modulating pumps (as an alternative to standard 230Vac pumps) by connecting the pump control to the CN6 connector using the "WIRING FOR PWM SIGNAL CONNECTION" (WPWM) supplied. The power part must be connected to terminal board M1 (output U1) and M2 (output U2).



For the installation of the "WIRING FOR PWM SIGNAL CONNECTION" operate as described below.

- Insert the connector (CN) in the connector (CN6) on the regulator board
- Thread the wiring (A) from the regulator through the passages (B)
- Connect the wiring to the feedback terminal board (MR) as shown in the diagram below



- Connect the PWM controls of the pumps to the feedback terminal board (MR).

⚠ The feedback terminal board (MR) should be positioned in an appropriate electrical cabinet or in any case in a suitably prepared and protected place.

2.6.4 PWM control signals

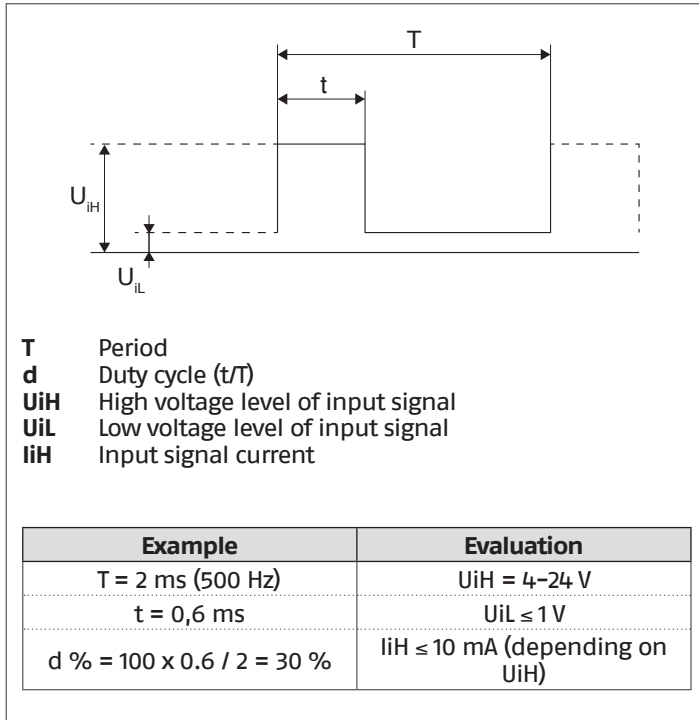
The pump must be controlled via a PWM (pulse width modulation) low-voltage digital signal. The speed changes according to the input signal, as indicated in paragraph "PWM input signal". Here below are the main characteristics required of the PWM signal.

⚠ Check the characteristics of your pump PWM signal to ensure they comply with the features below. Different signals could irreversibly damage the pump on-board electronics.

PWM low-voltage digital signal

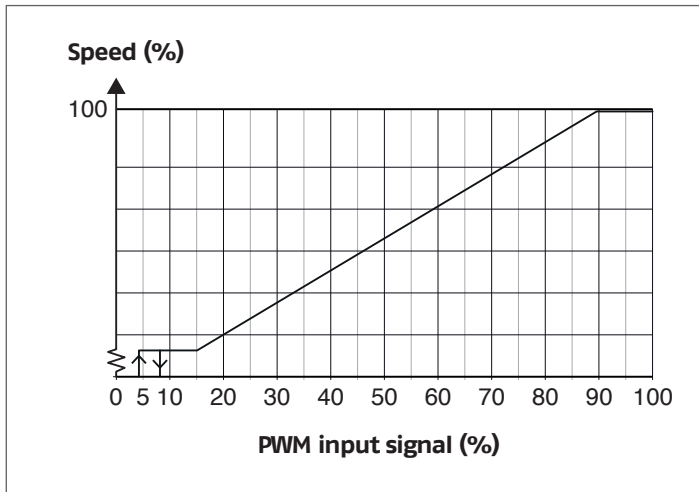
The PWM square wave signal was designed for a frequency interval between 100 and 4000 Hz. The PWM signal is used to set pump speed.

Example of Duty cycle



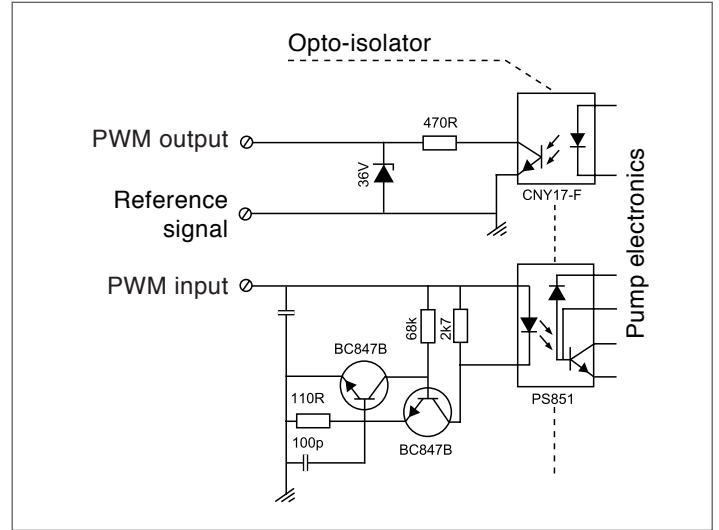
PWM input signal

With a low input value (<5 % PWM), the pump cannot start. The pump stops when input signal is 5 to 8% of PWM signal or when PWM signal is not present, for safety reasons. If the pump receives no input, due for instance to failure of the signal cable, it will stop in order to avoid solar system overheating.



! Verify that the control logic of your pump is directly proportional (as indicated in the chart) and not inversely proportional.

Electronic circuit



Technical specifications

Maximum power	Symbol	Value
PWM input frequency	f	100–4000 Hz
Consumption in stand-by		< 1 W
High voltage level of input signal	U_{iH}	4–24 V
Low voltage level of input signal	U_{iL}	< 1 V
Input signal current	I_{iH}	< 10 mA
Input Duty cycle	PWM	0–100%

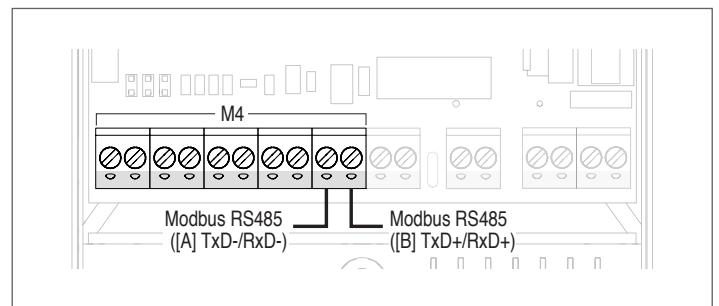
2.6.5 Modbus data transmission

The solar regulator is equipped with 1 terminal for data transmission and reception through MODBUS RTU protocol on RS-485 line.

! Pay attention to polarity of terminals A and B.

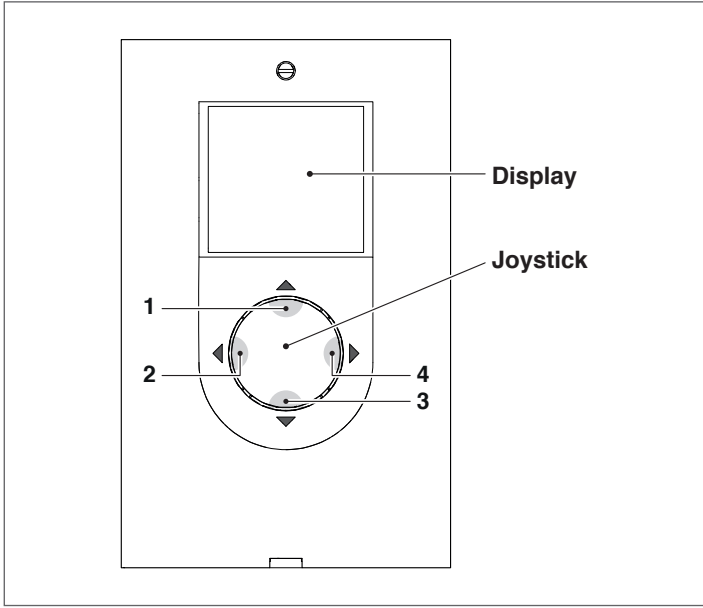
Terminal block M4 connections:

- MODBUS RS485 ([A] TxD–/RxD–)
- MODBUS RS485 ([B] TxD+/RxD+)



2.7 User interface

The solar controller is controlled through the joystick with 4 keys.

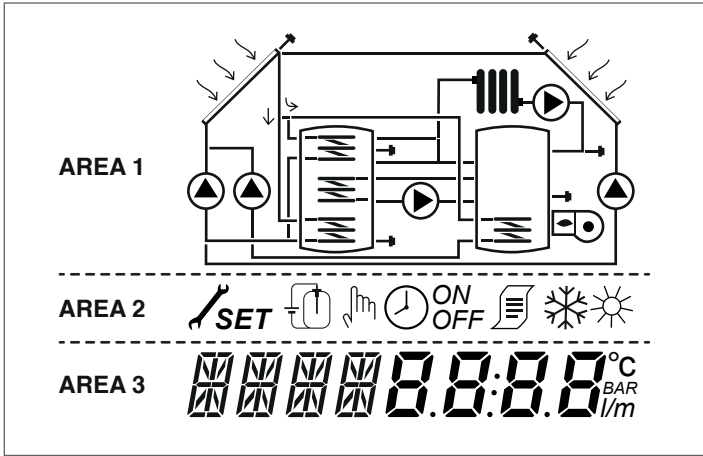


- Press "◀" (2) for a few seconds to enter the password to access parameters intended for the Installer.
- Press "◀" (2) or "▶" (4) to scroll adjustment/display parameters; during a parameter change, press for a few seconds to confirm the value set and go back to the list of parameters.
- Press "▲" (1) for a few seconds to make the parameter displayed editable and increase its value.
- Press "▼" (3) to decrease the value of the selected parameter.
- Press "▼" (3) for a few seconds to edit time, day and display language.

2.7.1 Nr. displayed

The solar controller is provided with a backlit 2.8" LCD. The display can be divided into 3 areas:

- 1 **System layout area**
- 2 **Symbol area**
- 3 **Parameter area**



1 System layout area

The system layout area shows the active layout stored through parameter SYSN. The symbols displayed flash, remain steady or disappear according to the current system status.

2 Symbol area

The symbol area indicates the system status.

3 Parameter area

In the lower display area it is possible to display solar controller parameters; the left area displays the parameter code, whereas the right area displays the value with the relevant unit of measurement or setting of the parameter.

During stand-by the display is turned off with an indication of the temperature of the upper part of the storage (S3). Press any button to view the display.

2.7.2 Display icons

	Solar Collector
	Pump The symbol flashes during operation
	Accumulation tank
	Supplementary system The symbol flashes during operation
	Radiator/heating system
	Accumulation tank coil
	Temperature probe The symbol flashes when the relevant display parameter is selected
	Alarm presence (maintenance request)
	Anti-freeze symbol
	Panel overtemperature
SET	Parameter programming When the parameter displayed can be edited, the steady SET writing is displayed, when accessing edit mode, the writing starts flashing until confirmation
	"Automatic" schedule
	Manual mode (it enables the forced management of the outputs U1/U2)
	Energy calculation (not used)
	These symbols start flashing when the thermal disinfection function (anti-legionella) is enabled

2.8 Menu structure

The solar regulator menu has a circular structure and does not contain any submenus. Press "►" to scroll cyclically all the parameters present according to the associated system layout. Once the last parameter is reached, press "►" to go back to the first one.

Instead, by pressing "◄" it is possible to scroll through the parameters in the opposite direction, but the display stops once it reaches the first parameter (any empty positions are not displayed, for example in layout 1 after parameter 9 the menu skips to parameter 41).

Installer parameters can be accessed only after having entered the security password (see chapter "Enter Password").

Key:

x

U

I

VIS

SET

Parameter available in the relevant system diagram

Parameters displayed by the User

Parameters displayed by the Installer

Read-only parameter

Settable parameter

Par. No.	Nr. displayed Display	Initials	UM		Value				USER / INST.	System layout								
					min.	max.	default	step		1	2	3	4	5	6	7	8	9
0		S1	°C	VIS	-40	>260	/	0,1	U	x	x	x	x	x	x	x	x	x
1		S2	°C	VIS	-40	>260	/	0,1	U	x	x	x	x	x	x	x	x	x
2		S3	°C	VIS	-40	>260	/	0,1	U	x	x	x	x	x	x	x	x	x
3		S4	°C	VIS	-40	>260	/	0,1	U		x			x	x		x	
5		S6	°C	VIS	-40	>260	/	1	U							x		x
8	DTON S1S2	ON12	°C	SET	5	10	6	0,5	I	x	x	x	x	x	x	x	x	x
9	DTOFF S1S2	OF12	°C	SET	1	4	4	0,5	I	x	x	x	x	x	x	x	x	x
10	DTON S1S3	ON13	°C	SET	5	10	6	0,5	I				x					
11	DTOFF S1S3	OF13	°C	SET	1	4	4	0,5	I				x					
12	DTON S1S4	ON14	°C	SET	5	10	6	0,5	I					x	x			
13	DTOFF S1S4	OF14	°C	SET	1	4	4	0,5	I					x	x			
14	DTON S6S2	ON62	°C	SET	5	10	6	0,5	I							x		
15	DTOFF S6S2	OF62	°C	SET	1	4	4	0,5	I							x		
16	DTON S3S4	ON34	°C	SET	5	10	5	0,5	I		x							
17	DTOFF S3S4	OF34	°C	SET	1	4	1	0,5	I		x							
18	DTON S3S6	ON36	°C	SET	5	10	6	0,5	I									x
19	DTOFF S3S6	OF36	°C	SET	1	4	4	0,5	I									x
24	DTON S4S3	ON43	°C	SET	5	10	6	0,5	I								x	
25	DTOFF S4S3	OF43	°C	SET	1	4	4	0,5	I								x	
35	U1 MODULATING PUMP FEEDBACK	U1 W	W	VIS	STOP ELFA WARN WATT	/	1	/	I	Not utilised								
38	U2 MODULATING PUMP FEEDBACK	U2 W	W	VIS	STOP ELFA WARN WATT	/	1	/	I	Not utilised								
41	MANUAL MODE U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	I	x	x	x	x	x	x	x	x	x
44	MANUAL MODE U2	MAN2	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	I		x	x			x	x	x	
53	BOILER PRIORITY	PRB0	-	SET	1	2	1	1	I					x	x			
56	SETPOINT BO11 HIGH ZONE	B1HI	°C	SET	15	90	60	0,5	U				x				x	
59	SETPOINT BO11 LOW ZONE	B1LO	°C	SET	15	90	60	0,5	U	x	x	x	x	x	x	x	x	x
64	SETPOINT BO12 LOW ZONE	B2LO	°C	SET	15	90	60	0,5	U		x			x	x			
67	BO11 ZONE PRIORITY	PZB1	-	SET	LO	HI	HI	1	I				x					
73	HEAT EXCHANGE THRESHOLD BO11-BO12	ST12	°C	SET	15	90	50	0,5	U		x							

Par. No.	Nr. displayed Display	Ini-tials	UM		Value				USER / INST.	System layout								
					min.	max.	default	step		1	2	3	4	5	6	7	8	9
76	THRESHOLD FOR U1 SOLAR PUMP ACTI-VATION	PS10	°C	SET	10	30	10	0,5	I	x	x	x	x	x	x	x	x	x
79	THRESHOLD FOR U2 SOLAR PUMP ACTI-VATION	PS20	°C	SET	15	60	30	0,5	I							x		
82	SYSTEM NUMBER	SYSN	-	SET	1	9	1	1	I	x	x	x	x	x	x	x	x	x
91	Supplement acti-vation threshold	SAB1	°C	SET	40	70	50	0,5	U			x						
94	Supplement deac-tivation threshold	SSB1	°C	SET	45	70	55	0,5	U			x						
103	SUPPLEMENT BURN-ER SCHEDULE DAY1	DAY1	-	SET	0	48	1	/	U			x						
104	SUPPLEMENT BURN-ER SCHEDULE DAY2	DAY2	-	SET	0	48	1	/	U			x						
105	SUPPLEMENT BURN-ER SCHEDULE DAY3	DAY3	-	SET	0	48	1	/	U			x						
106	SUPPLEMENT BURN-ER SCHEDULE DAY4	DAY4	-	SET	0	48	1	/	U			x						
107	SUPPLEMENT BURN-ER SCHEDULE DAY5	DAY5	-	SET	0	48	1	/	U			x						
108	SUPPLEMENT BURN-ER SCHEDULE DAY6	DAY6	-	SET	0	48	1	/	U			x						
109	SUPPLEMENT BURN-ER SCHEDULE DAY7	DAY7	-	SET	0	48	1	/	U			x						
112	ACTUAL SPEED U1	U1 %	%	VIS	0	100	/	1	I	x	x	x	x	x	x	x	x	x
115	ACTUAL SPEED U2	U2 %	%	VIS	0	100	/	1	I		x	x			x	x	x	x
124	MINIMAL SPEED U1	U1 %	%	SET	10	90	30		I	x	x	x	x	x	x	x	x	x
127	MINIMAL SPEED U2	U2 %	%	SET	10	90	10		I		x	x			x	x	x	
136	U1 OUTPUT CONTROL MODE	PIU1	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	MODU	1	I	x	x	x	x	x	x	x	x	x
139	U2 OUTPUT CONTROL MODE	PIU2	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	ON-OFF	1	I		x				x	x	x	
147	Pump modulation	ALTM	-	SET	OFF	ON	ON	1	I	x	x	x	x	x	x	x	x	x
148	U1 MODULATION DIFFERENTIAL SET	SOU1	°C	SET	ON12	30	20	0,5	I	x	x	x	x	x	x	x	x	x
151	U2 MODULATION DIFFERENTIAL SET	SOU2	°C	SET	5	30	20	0,5	I		x				x	x	x	
160	Output U2 activa-tion temperature for solid fuel gen-erator supplemen-tary system	T10N	°C	SET	65	75	65	0,5	U								x	
163	Output U2 deacti-vation tempera-ture for solid fuel generator supple-mentary system	T10F	°C	SET	60	40	60	0,5	I								x	
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE	OSP1	°C	SET	100	120	120	0,5	I	x	x	x	x	x	x	x	x	x
169	SOLAR PANEL 1 AN-TISHOCK FUNCTION START TEMPERATURE	OPP1	°C	SET	125	200	140	0,5	I	x	x	x	x	x	x	x	x	x
172	SOLAR PANEL 2 ANTI-STAGNATION FUNCTION START TEMPERATURE	OSP2	°C	SET	100	120	120	0,5	I							x		
175	SOLAR PANEL 2 AN-TISHOCK FUNCTION START TEMPERATURE	OPP2	°C	SET	125	200	140	0,5	I							x		

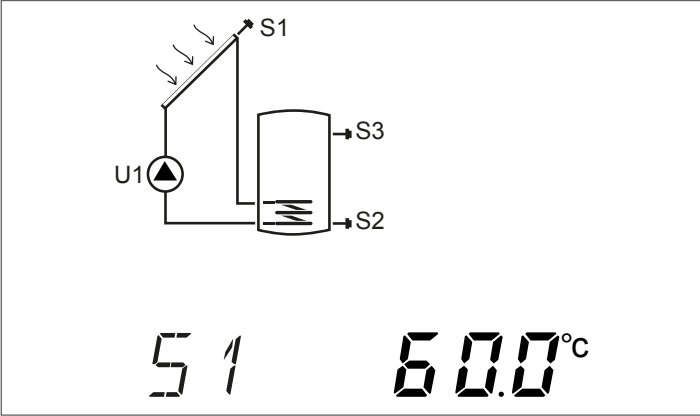
Par. No.	Nr. displayed Display	Ini-tials	UM		Value				USER / INST.	System layout								
					min.	max.	default	step		1	2	3	4	5	6	7	8	9
178	BOI1 SAFETY MAXIMUM TEMPERATURE	B1ST	°C	SET	70	90	85	0,5	I	x	x	x	x	x	x	x	x	x
181	BOI2 MAX SAFETY TEMPERATURE THRESHOLD	B2ST	°C	SET	70	90	85	0,5	I		x	x			x			
182	THERMAL ANTISHOCK FUNCTION ENABLE	ASCK	-	SET	OFF	ON	ON	1	I	x	x	x	x	x	x	x	x	x
183	ANTISHOCK FUNCTION STOP THRESHOLD	ASST	°C	SET	115	125	120	1	I	x	x	x	x	x	x	x	x	x
184	Pump ON interval during anti-thermal shock function	TS0N	sec	SET	1	120	3	1	I	x	x	x	x	x	x	x	x	x
185	Pump OFF interval during anti-thermal shock function	TS0F	sec	SET	30	1800	60	1	I	x	x	x	x	x	x	x	x	x
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	I	x	x	x	x	x	x	x	x	x
187	ENABLE SUPPLEMENT	BRU1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	I			x						
190	ANTIFREEZE ENABLE	APS1	-	SET	OFF	ON	ON	1	I	x	x	x	x	x	x	x	x	x
192	ANTIFREEZE ENABLE	APS2	-	SET	OFF	ON	ON	1	I							x		
193	THERMAL DISINFECTION FUNCTION ENABLE	DT0N	°C	SET	ON	OFF	OFF	1	I	x		x					x	
194	THERMAL DISINFECTION TEMPERATURE	TMPD	°C	SET	60	95	60	0,5	I	x		x					x	
195	THERMAL DISINFECTION CONTROL PERIOD	PRDM	dd:hh	SET	00:00	30:24	01:00	1	I	x		x					x	
196	THERMAL DISINFECTION PERIOD	PRDR	hh:mm	SET	00:00	23:59	01:00	1	I	x		x					x	
197	THERMAL DISINFECTION IN PROGRESS COUNTER	CNTD	h	VIS	00:00	30:24	/		I	x		x					x	
198	THERMAL DISINFECTION START TIME	ORAD	hh:mm	SET	00:00	23:59	00:00	1	I	x		x					x	
199	OPERATING HOURS OUTPUT U1	P1TI	h	VIS	0	9999	/	1	I	x	x	x	x	x	x	x	x	x
201	OPERATING HOURS OUTPUT U2	P2TI	h	VIS	0	9999	/	1	I						x			
203	OPERATING HOURS OUTPUT U2	P3TI	h	VIS	0	9999	/	1	I		x	x					x	
205	OPERATING HOURS OUTPUT U2	P4TI	h	VIS	0	9999	/	1	I							x		
208	BOI1 NIGHT COOLING FUNCTION	NCB1	-	SET	OFF	ON	ON	1	I	x	x	x	x	x	x	x	x	x
211	BOI2 NIGHT COOLING FUNCTION	NCB2	-	SET	OFF	ON	ON	1	I		x			x	x			
214	CALORIMETER ENABLE (Not utilised)	ABCA	-	SET	OFF	ON	OFF	1	I									
217	GRUNDFOS RPS SENSOR PRESSURE RANGE (Not utilised)	RPSR	-	SET	0,6 1,0 1,6 2,5 4,0 6,0 10,0 16,0	16	6	1	I									

Par. No.	Nr. displayed Display	Ini-tials	UM		Value				USER / INST.	System layout								
					min.	max.	default	step		1	2	3	4	5	6	7	8	9
220	GRUNDFOS VFS SENSOR FLUX RANGE (Not utilised)	VFSR	-	SET	12 15 20 40 100 200 400	400	12	1	I									
223	GRUNDFOS RPS PRESSURE SENSOR (Not utilised)	PRPS	-	VIS	0,6	16	/	0,1	I									
226	GRUNDFOS RPS TEMPERATURE SEN- SOR (Not utilised)	TRPS	-	VIS	0	100	/	1	I									
229	GRUNDFOS VFS FLUX SENSOR (Not utilised)	FVFS	-	VIS	12	400	/	1	I									
232	GRUNDFOS VFS TEMPERATURE SEN- SOR (Not utilised)	TVFS	-	VIS	0	100	/	1	I									
235	CALORIMETER EN- ERGY COUNTER (Not utilised)	MWh	-	VIS	0	999	/	1	I									
238	CALORIMETER EN- ERGY COUNTER (Not utilised)	KWh	-	VIS	0	999	/	1	I									
241	ANTIFREEZE LIQUID (Not utilised)	LANT	-	SET	TYFO GLIE GLIP H2O	TYFO GLIE GLIP H2O	H2O	1	I									
244	ANTIFREEZE LIQUID PERCENTAGE (Not utilised)	PAG%	-	SET	20	70	45	1	I									
247	RESET DEFAULT PARAMETERS	RSTD	-	SET	0	1	0	1	I	x	x	x	x	x	x	x	x	x
250	MODBUS SLAVE ADDRESS	ADMB	-	SET	1	32	1	1	I	x	x	x	x	x	x	x	x	x

3 PARAMETER DESCRIPTION

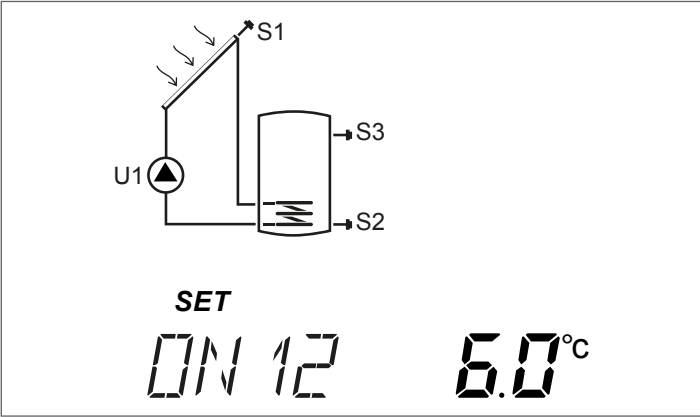
3.1 Probe temperature display

S1-S2-S3-S4-S6 (par. no.: 0-1-2-3-5)
Indicates the temperature detected by the probe concerned (display only).
Only the probes concerning the system chosen are displayed.

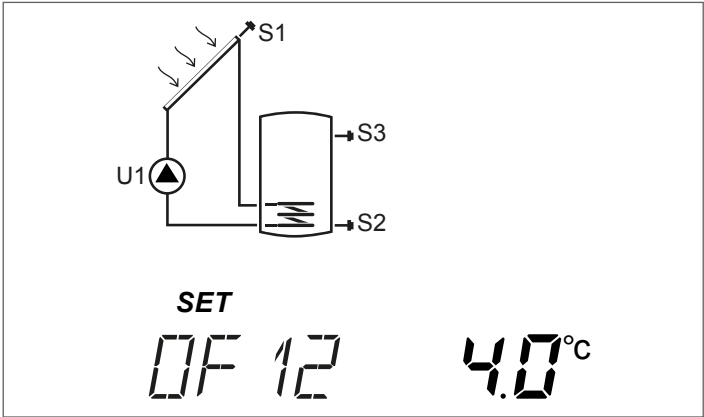


3.2 ΔT settings

ON12-ON13-ON14-ON62-ON34-ON36-ON43 (par. no.: 8-10-12-14-16-18-24)
These parameters allow setting the required temperature difference between the indicated probes to activate the pump or switch the three-way valve, according to the system layout selected (for example, "ON12" refers to the temperature difference between probe S1 and probe S2).

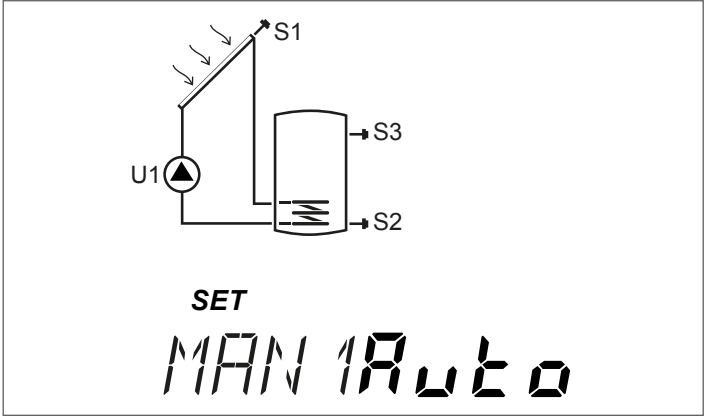


OF12-OF12-OF13-OF14-OF62-OF34-OF36-OF43 (par. no.: 9-11-13-15-17-19-25)
These parameters allow setting the required temperature difference between the indicated probes to deactivate the pump or switch the three-way valve, according to the system layout selected (for example, "OF12" refers to the temperature difference between probe S1 and probe S2).



3.3 Manual mode U1-U2

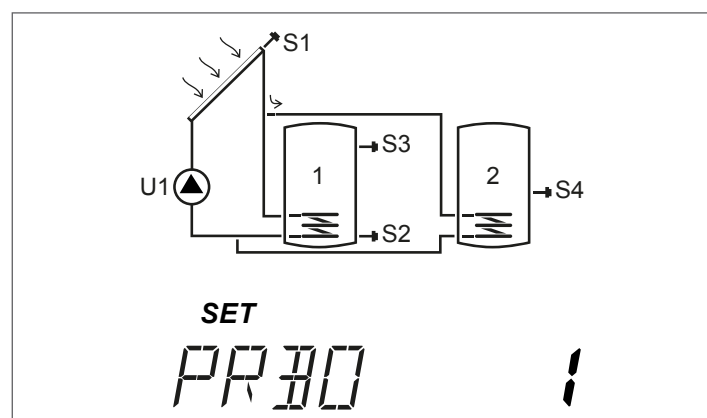
MAN1-MAN2 (par. no.: 41-44)
These parameters allow forcing the status of the outputs U1 and U2, to which the solar collector pump and the second pump or 3-way valve are connected.
Settable parameters are:
OFF Output always disabled
ON Output always enabled
AUTO Output mode based on solar regulator programming



3.4 Accumulation tank priority

PRB0 (par. no.: 53)

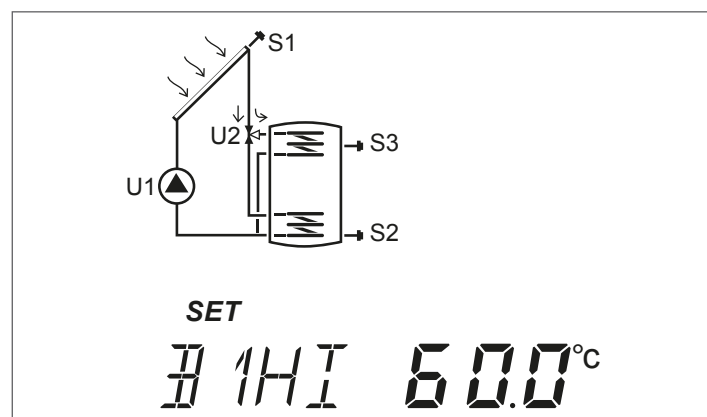
In system layouts where several accumulation tanks are present, it is possible to select the accumulation tank having heating priority.



3.5 Accumulation tank 1 high part setpoint

B1HI (par. no.: 56)

With this parameter, it is possible to set the water temperature setpoint for the high zone of storage system 1. The temperature is detected by probe S3.



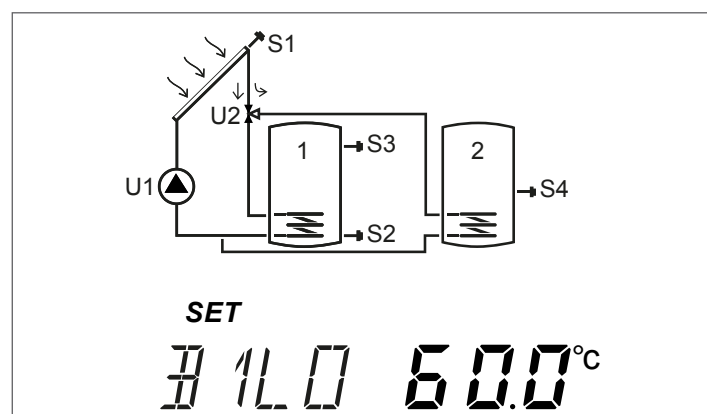
3.6 Accumulation tanks 1 and 2 low part setpoint

B1LO-B2LO (par. no.: 59-64)

With these parameters, it is possible to set the water temperature setpoint for the low zone of storage systems 1 and 2. The temperature is detected by probes:

S2 for accumulation tank 1

S4 for accumulation tank 2



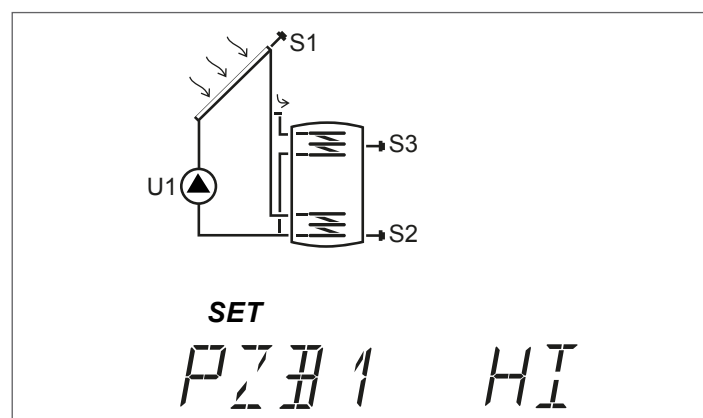
3.7 Accumulation tank 1 zone priority

PZB1 (par. no.: 67)

In system layouts with double heating zone of an storage system, it is possible to set a heating priority.

HI High zone priority

Lo Low zone priority

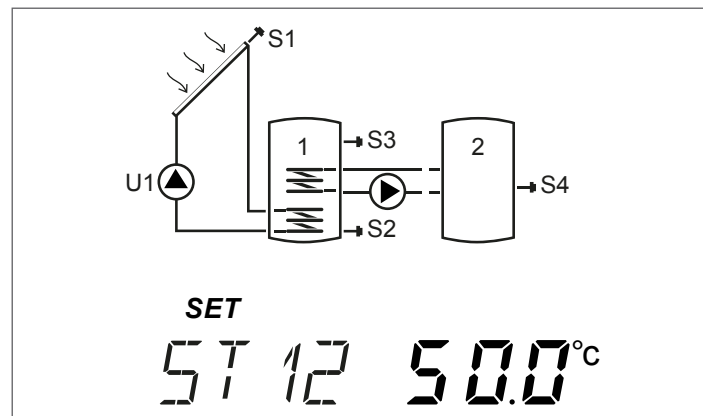


3.8 Heat transfer activation threshold between accumulation tank 1 and 2

ST12 (par. no.: 73)

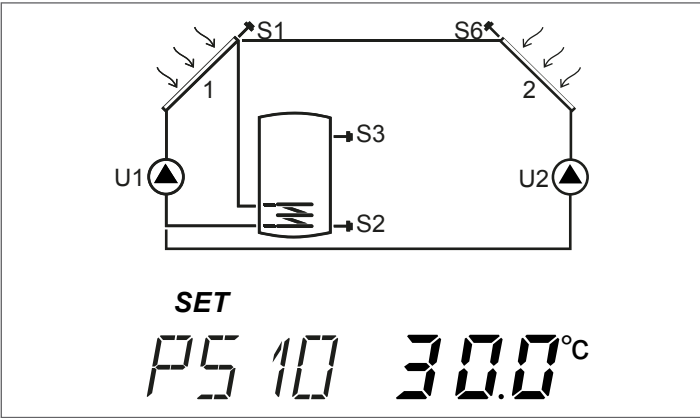
With this parameter it is possible to set the temperature at which heat exchange between accumulation tank 1 and accumulation tank 2 can be activated.

The reference temperature is detected by probe S3 through the differential between the temperatures detected by probes S3 and S4.



3.9 Threshold for collector 1 and 2 solar pump start

PS10-PS20 (par. no.: 76-79)
With these parameters, it is possible to set the minimum temperature of the solar collector to activate pumps.

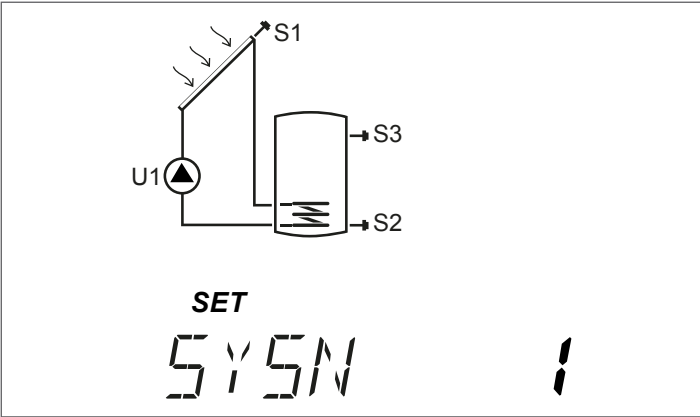


The reference temperature is detected by probes:

- S1 for solar collector 1
- S6 for solar collector 2

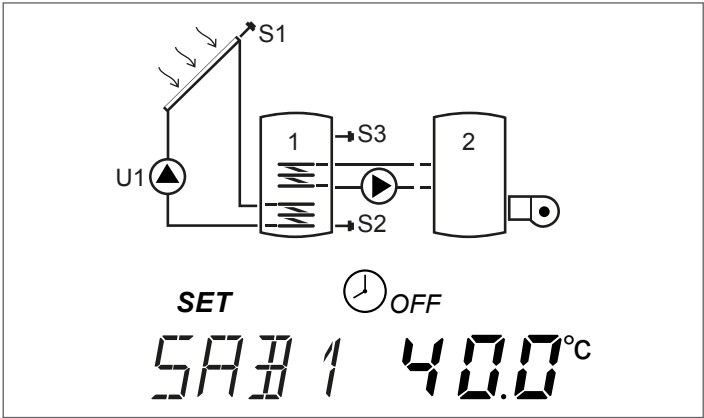
3.10 System selection

SYSN (par. no.: 82)
With this parameter it is possible to select the preset system layout.
9 system layouts are available; while user scrolls the systems in the list, the corresponding basic hydraulic diagram is displayed. Every system layout has some specific presets that can be modified individually.



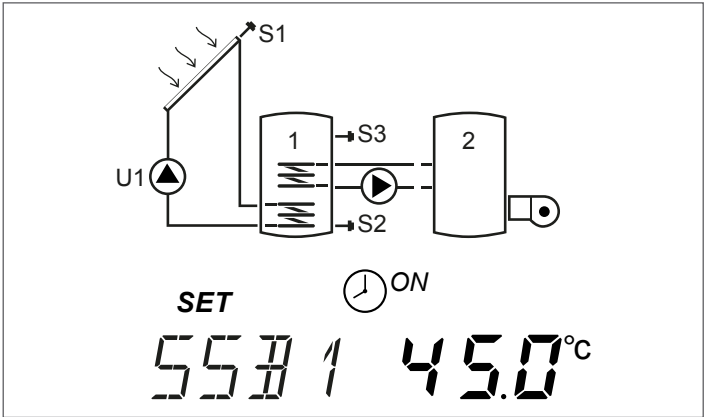
3.11 Supplement activation threshold

SAB1 (par. no.: 91)
With this parameter it is possible to set the temperature of storage 1, detected by probe S3, under which the supplementary system turns on if it is in the time schedule set.



3.12 Supplement deactivation threshold

SSB1 (par. no.: 94)
With this parameter it is possible to set the storage temperature, detected by probe S3, at which the supplementary system can be turned off.



3.13 Weekly schedule

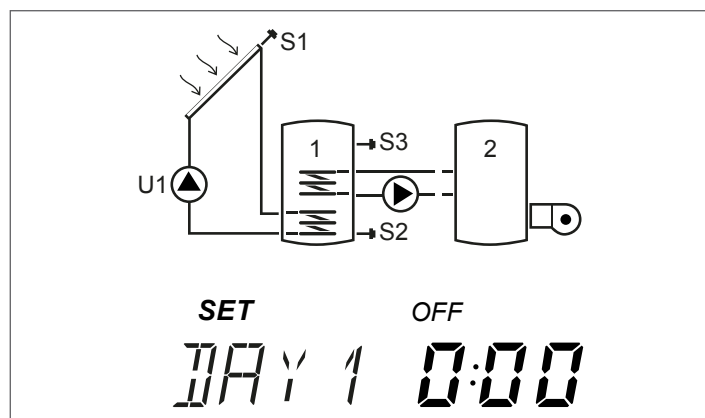
DAY1-DAY2-DAY3-DAY4-DAY5-DAY6-DAY7 (par. no.: 103-104-105-106-107-108-109)

With these parameters, it is possible to set the activation time intervals of the burner or thermal integration system for every day of the week and at intervals of 30 minutes in a 24 hour frame.

Within the intervals set, if the temperature detected by probe S3 is lower than the value set in parameter "SUPPLEMENT ACTIVATION THRESHOLD (par. no. 91)", the burner or thermal integration system is activated and remains operational until the temperature set in parameter "BURNER 1 DEACTIVATION THRESHOLD (par. no. 94)" is reached.

The number x that follows the parameter (DAYx) indicates the day of the week:

- 1 Monday
- 7 Sunday



Press "▲" or "▼" to scroll the 24 hours of the specified day and view the settings. "ON" and "OFF" icons indicate the status of the burner or thermal integration system in the relevant half hour:

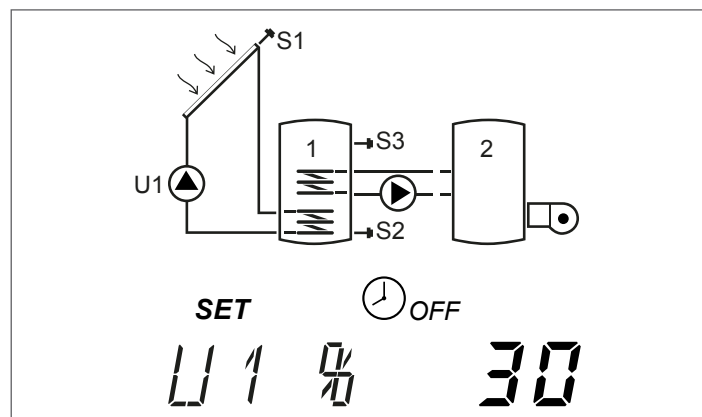
Example:

- If 0:00 and OFF appear, in the half hour from 12:00 a.m. to 12:30 a.m. the burner or thermal integration system is off even if activation conditions are met
- If 0:00 and ON appear, in the half hour from 12:00 a.m. to 12:30 a.m. the burner or thermal integration system is on even if activation conditions are met

3.14 Solar pump 1 current speed

U1%- U2% (par. no.: 112-115)

With these parameters it is possible to display the percentage speed of pumps connected to outputs U1 and U2, respectively. This function is suitable for solar pumps with PWM control.

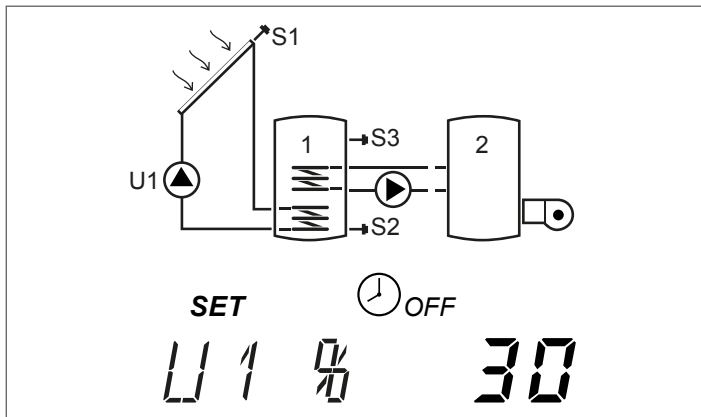


NOTE: With NON modulating pumps, "100" is displayed when the pump is stopped and "0" when the pump is operating.

3.15 Minimum speed of solar pump 1 and pump 2

U1%-U2% (par. no.: 124-127)

With these parameters it is possible to set the minimum speed of pumps connected to outputs U1 and U2, respectively.



3.16 U1-U2 output control mode

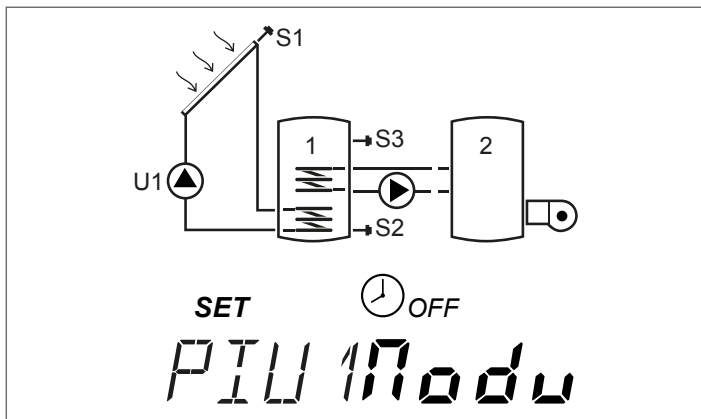
PIU1-PIU2 (par. no.: 136-139)

With these parameters it is possible to set the control mode of pumps connected to output U1 and U2.

ON-OFF Control mode of standard 230 Vac pumps

IMPU It allows modulating the speed of standard 230 Vac pumps at cut-off based on ΔT between collector and storage system temperatures as defined by parameter SOU1-SOU2 (par. no. 148-151).

MODU PWM control mode of modulating pumps allows modulating speed through pump on-board electronics, based on ΔT between collector and storage system temperatures as defined by parameter SOU1-SOU2 (par. no. 148-151).



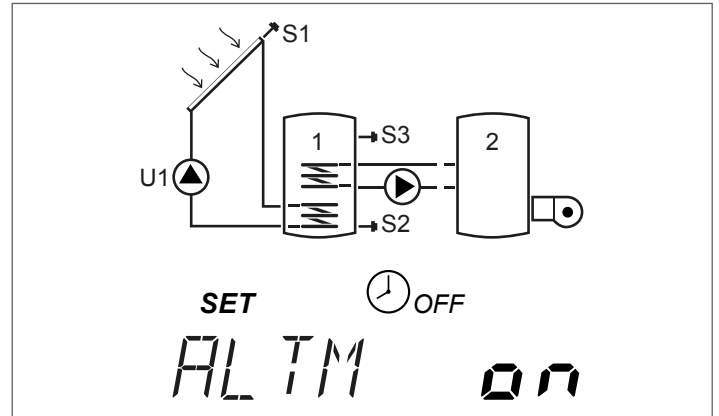
3.17 Pump modulation

ALTM (par. no.: 147)

This parameter allows setting the regulation type of modulating pumps to maintain the setpoint set in parameter "U1-U2 MODULATION DIFFERENTIAL SET (par. no. 148-151)":

OFF P modulation. By setting this modulation type, the pump speed is regulated only proportionally (linear). The rotation speed range is from 100% to xx% "MINIMUM SPEED U1" (par. no. 124-127).

ON PID modulation. By setting this modulation type, the pump speed is regulated with a PID function (Proportional-Integral-Derivative regulation type). The speed modulation range is from 100% to xx% "MINIMUM SPEED U1" (par. no. 124-127).

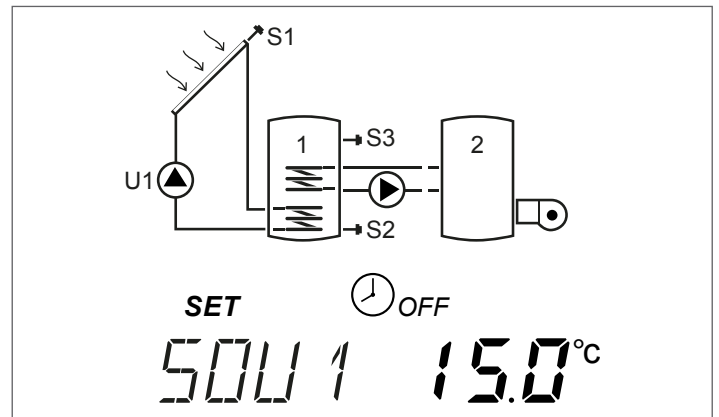


3.18 U1-U2 output modulation differential set

SOU1-SOU2 (par. no.: 148-151)

These parameters allow setting the temperature differential required to activate pump modulation set via parameter "PUMP MODULATION" (par. no.: 147).

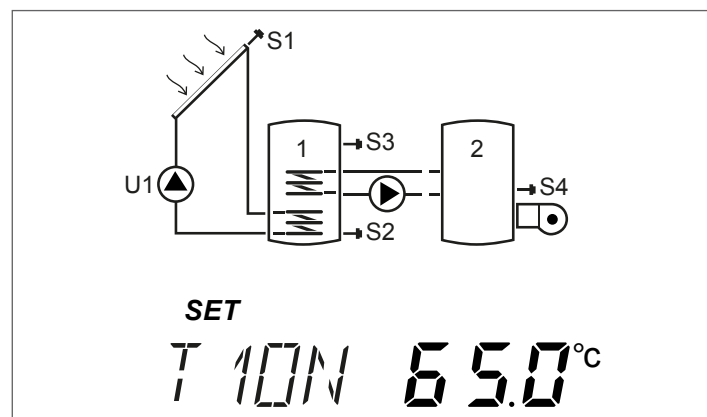
SOU1 (measured from difference between S1-S2) affects the pump connected to output U1; SOU2 affects the pump connected to output U2 and is linked to its activation differential, which is not always the same and depends on the applied layout type (for example, in layout 2 it is measured between S3-S4).



3.19 Output u2 activation temperature for solid fuel generator supplementary system

T10N (par. no.: 160)

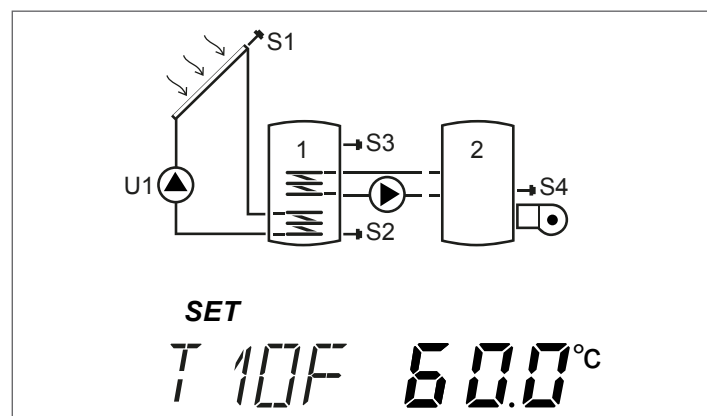
With this parameter it is possible to set the minimum temperature, detected by probe S4, to start heat exchange between solid fuel generator and accumulation tank.



3.20 Output u2 deactivation temperature for solid fuel generator supplementary system

T10F (par. no.: 163)

With this parameter it is possible to set the temperature, detected by probe S4, to stop heat exchange between solid fuel generator and accumulation tank.



3.21 Anti-stagnation function (overttemperature dispersion) collector 1 and 2

OSP1-OSP2 – OPP1-OPP2 (par. no.: 166-172-169-175)

Parameters OSP1 and OSP2 allow to set the temperature to activate **ANTI-STAGNATION FUNCTION** of collectors 1 and 2.

If probes S1, S6 detect a temperature equal to the value set, in parameters OSP1 and OSP2 respectively, the function that avoids the frequent stagnation in solar panels activates, to avoid their overheating.

The function activation is signalled by icon ☀ flashing at 1 sec-ond frequency.

The function is disabled when the temperature set in parameters OPP1 and OPP2 is reached

The anti-stagnation function is set through the following parameters:

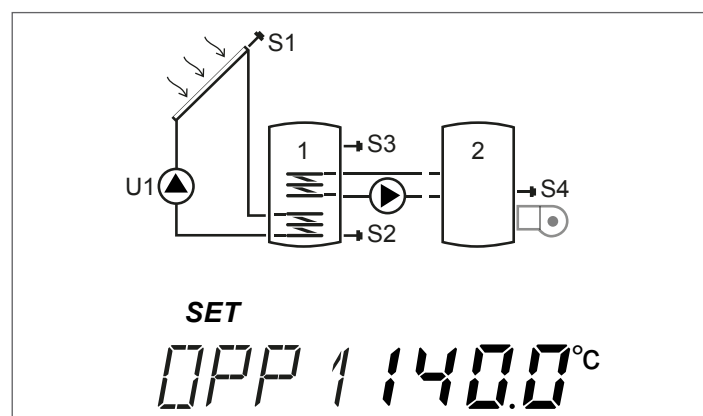
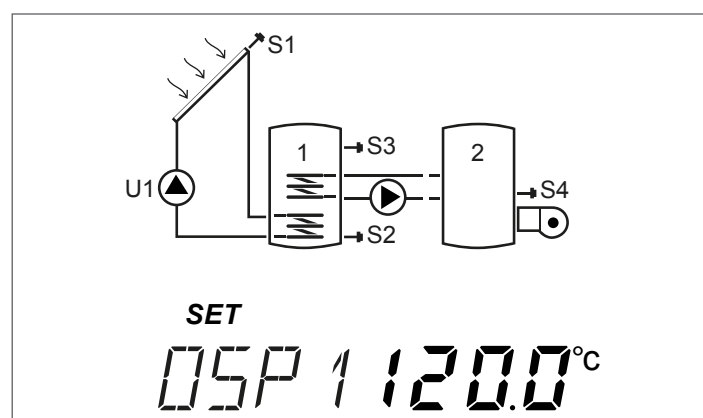
- SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE – OSP1 (120°C)
- SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE – OPP1 (140°C)
- SOLAR PANEL 2 ANTI-STAGNATION FUNCTION START TEMPERATURE (120°C)
- SOLAR PANEL 2 ANTISHOCK FUNCTION START TEMPERATURE (140°C)
- SAFETY STOP MAXIMUM TEMPERATURE B011 – B1ST (85°C)
- SAFETY STOP MAXIMUM TEMPERATURE B012 – B2ST (85°C)
- ANTI-STAGNATION DEACTIVATION COLLECTOR TEMPERATURE THRESHOLD CONSTANT (90°C Constant, non-adjustable value)

Conditions required for anti-stagnation function start:

- Temperature of accumulation tank S3 (S4) lower than the value set with parameter B1ST (B2ST)
- The temperature of collector S1 (S6) must be greater than the value set in parameter OSP1 (OSP2)
- The temperature of collector S1 (S6) must be lower than the value set in parameter OPP1 (OPP2)

Conditions required for anti-stagnation function stop:

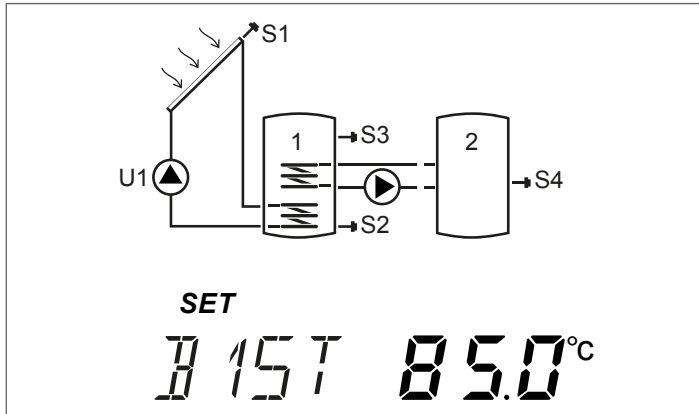
- Temperature of collector S1 (S6) lower than 90°C
- Temperature of collector S1 (S6) greater than the value set in parameter OPP1 (OPP2)
- Temperature of accumulation tank S3 (S4) greater than or equal to the value set in parameter B1ST (B2ST)



3.22 Accumulation tank 1-2 safety stop maximum temperature

B1ST-B2ST (par. no.: 178-181)

With this parameter it is possible to set the accumulation tank temperature, over which it is necessary to stop any anti-stagnation and heat exchange function.



3.23 Anti-thermal shock function

ASCK (par. no.: 182)

Anti-thermal shock function allows to protect solar collectors in case of excessive increase of collector temperature (higher than the value set in parameter OPP1-2) through the operation of the pump by pulses of adjustable duration.

This parameter allows to activate the anti-thermal shock function.

The function activation is signalled by icon ☀ flashing at 0.5 second frequency.

ON function enabled
OFF function disabled

The anti-thermal shock function is adjusted through the following programmable parameters:

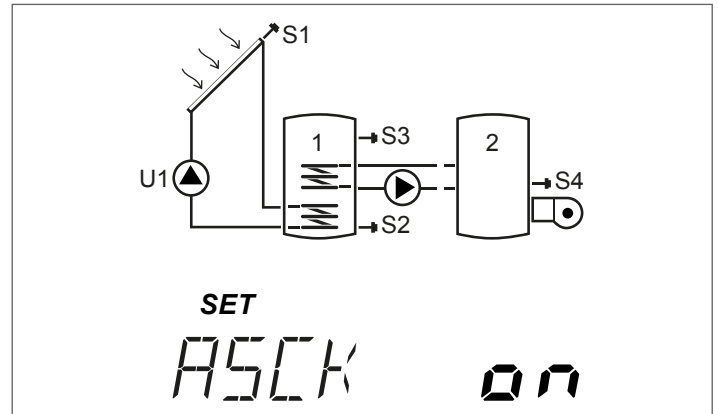
- ANTI-THERMAL SHOCK FUNCTION ACTIVATION - ASCK (ON)
- SOLAR PANEL 1/2 ANTISHOCK FUNCTION START TEMPERATURE - OPP1/OPP2 (140°C)
- ANTI-THERMAL SHOCK FUNCTION STOP THRESHOLD - ASST (120°C)
- ACCUMULATION TANK 1/2 SAFETY STOP MAXIMUM TEMPERATURE - B1ST/B2ST (85°C)
- PUMP OFF INTERVAL TIMER DURING ANTI-THERMAL SHOCK FUNCTION - TSOF (60s)
- PUMP ON INTERVAL TIMER DURING ANTI-THERMAL SHOCK FUNCTION - TSON (3s)
- PUMP SPEED IN ANTISHOCK MODE - ASPE (100%)

Conditions required for anti-thermal shock function start:

- Temperature of collector S1 (S6) greater than the value set at parameter "SOLAR PANEL 1-2 OVERTEMPERATURE FUNCTION STOP THRESHOLD" (par. no.: 169-175)
- Temperature of accumulation tank S3 (S4) lower than the value set at parameter "ACCUMULATION TANK 1-2 SAFETY STOP MAXIMUM TEMPERATURE" (par. no.: 178-181)

Conditions required for anti-thermal shock function stop:

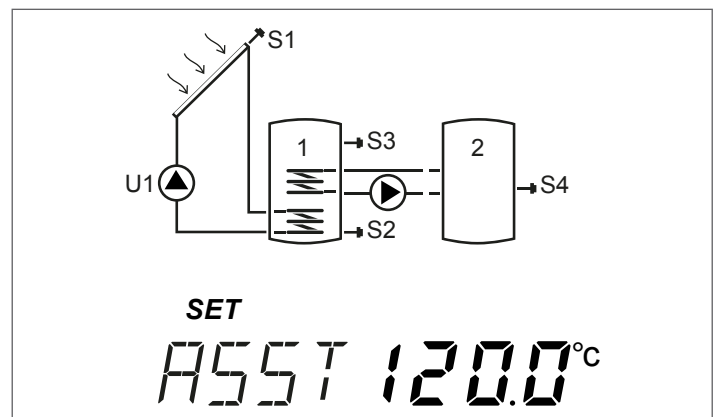
- Temperature of collector S1 (S6) lower than the value set at parameter "ANTI-THERMAL SHOCK FUNCTION STOP THRESHOLD" (par. no.: 183)
- Temperature of accumulation tank S3 (S4) higher than or equal to the value set at parameter "ACCUMULATION TANK 1-2 SAFETY STOP MAXIMUM TEMPERATURE" (par. no.: 178-181)



3.24 Anti-thermal shock function stop threshold

ASST (par. no.: 183)

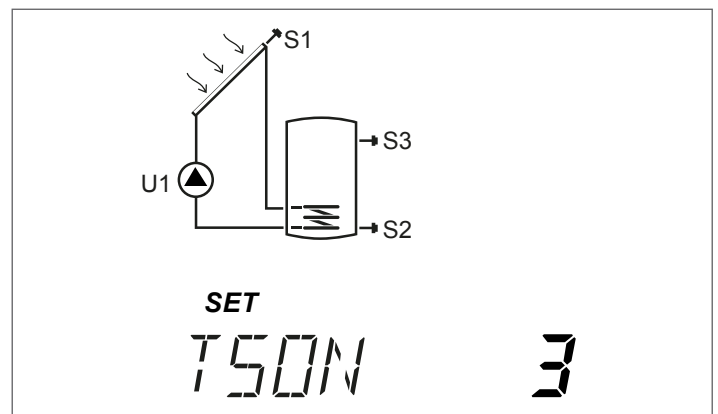
With this parameter it is possible to set the collector temperature threshold under which anti-thermal shock function is deactivated.



3.25 Pump on interval during anti-thermal shock function

TSON (par. no.: 184)

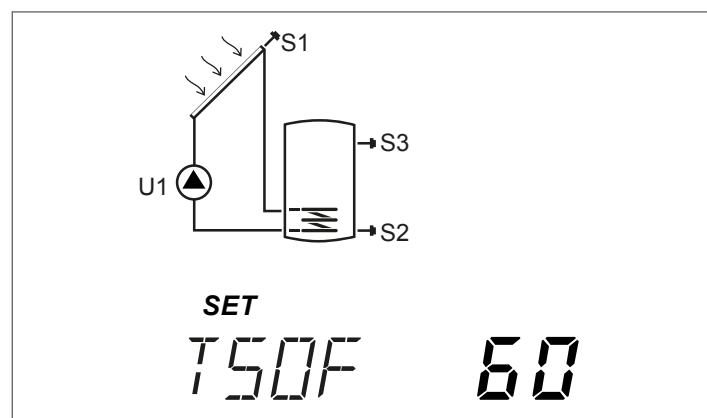
With this parameter it is possible to set the pump pulse duration during anti-thermal shock function.



3.26 Pump off interval during anti-thermal shock function

TSOF (par. no.: 185)

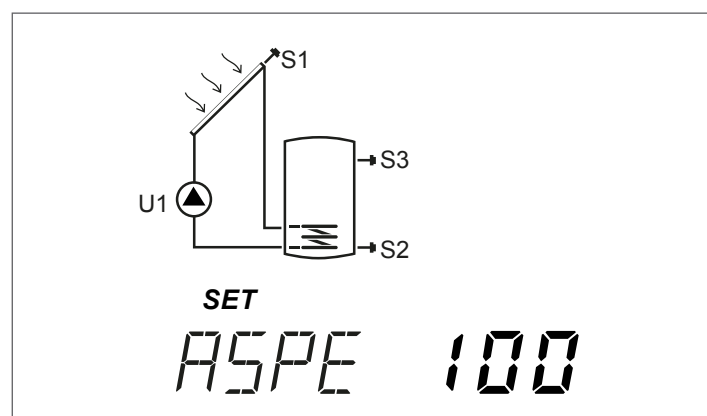
With this parameter it is possible to set the duration of the pause period between two pump pulses.



3.27 Pump speed in antishock mode

ASPE (par. no.: 186)

With this parameter it is possible to set the percentage speed of the pump during the pulse.

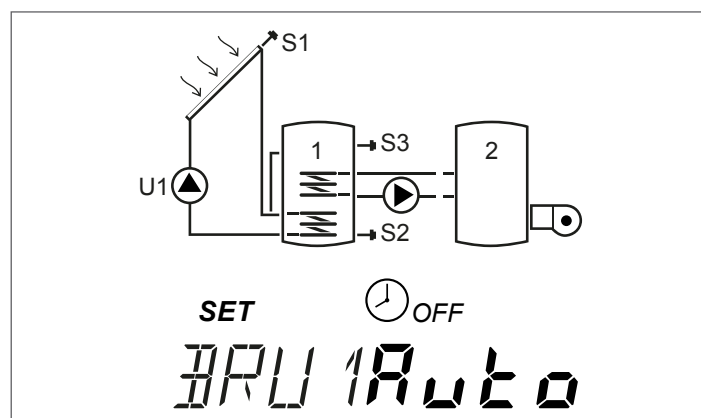


3.28 Enabling supplementary system

BRU1 (par. no.: 187)

With this parameter, it is possible to set the burner/integration system activation mode:

- OFF** The burner/integration system is not activated
- ON** The burner/supplementary system is activated once the temperature set in parameter "SUPPLEMENT ACTIVATION THRESHOLD" is reached (par. no.: 91), regardless of the schedule set
- AUTO** The burner/supplementary system is activated if the temperature set in parameter "SUPPLEMENT ACTIVATION THRESHOLD" is reached (par. no.: 91) and the system is in the ON time interval.



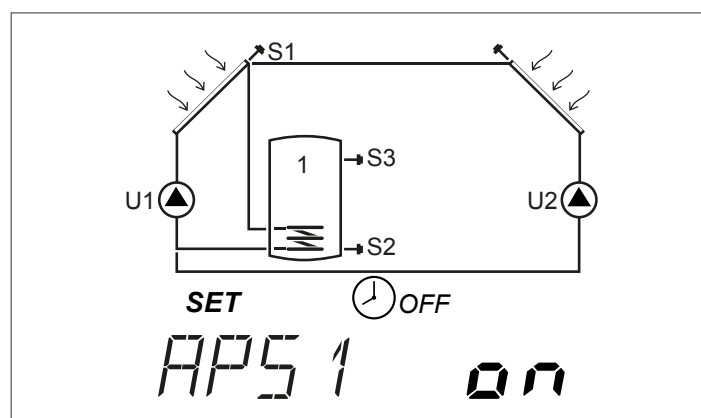
3.29 Anti-freeze activation

APS1-APS2 (par. no.: 190-192)

With this parameter it is possible to enable the anti-freeze function to protect collector 1 and 2.

The anti-freeze function activates solar pump U1 (U2) when the collector temperature is lower than 5°C.

- ON Anti-freeze function enabled
- OFF Anti-freeze function disabled



3.30 Thermal disinfection function (anti-legionella)

DTON (par. no.: 193)

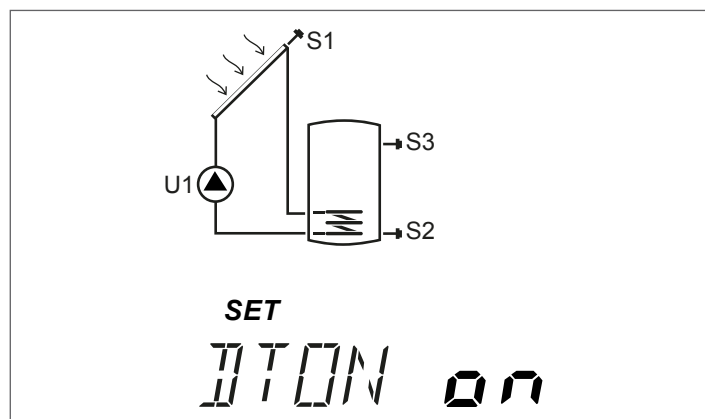
With this parameter it is possible to activate the thermal disinfection function to protect the accumulation tank from legionella.

Probe S3 monitors the domestic hot water temperature in the upper zone of the accumulation tank.

To complete an anti-legionella cycle it is necessary that, during the monitoring period PRDM, the temperature of probe S3 is higher than the value set in parameter TMPD, for the whole heating period PRDR. If this occurs, the cycle is over and a new monitoring period will start as soon as the temperature of S3 is lower than TMPD. If during monitoring period PRDM no complete cycle was performed, at the end of this period output U2 is activated to control an auxiliary heater in order to increase the accumulation tank temperature above the value set in TMPD.

The thermal disinfection function (available in systems 1, 3 and 8) is managed through the following parameters:

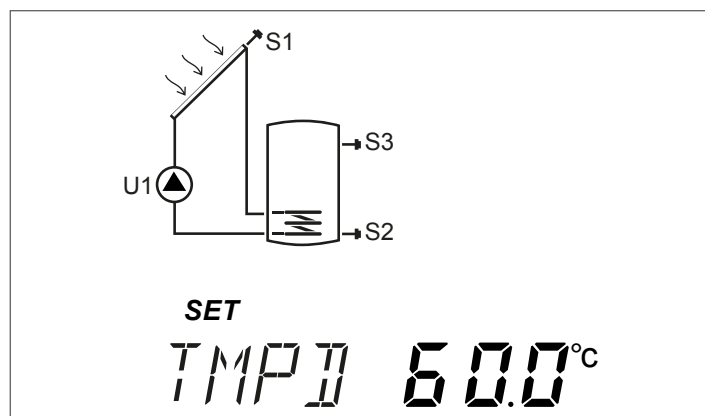
- THERMAL DISINFECTION FUNCTION ACTIVATION - DTON (ON)
- THERMAL DISINFECTION TEMPERATURE - TMPD (60°C)
- THERMAL DISINFECTION MONITORING PERIOD - PRDM (01:00)
- THERMAL DISINFECTION HEATING PERIOD - PRDR (01:00)
- THERMAL DISINFECTION IN PROGRESS COUNTER - CNTD
- THERMAL DISINFECTION DELAYED ACTIVATION TIME - ORAD (00:00)



3.31 Thermal disinfection temperature

TMPD (par. no.: 194)

With this parameter it is possible to set the disinfection temperature of the upper part of the accumulation tank.



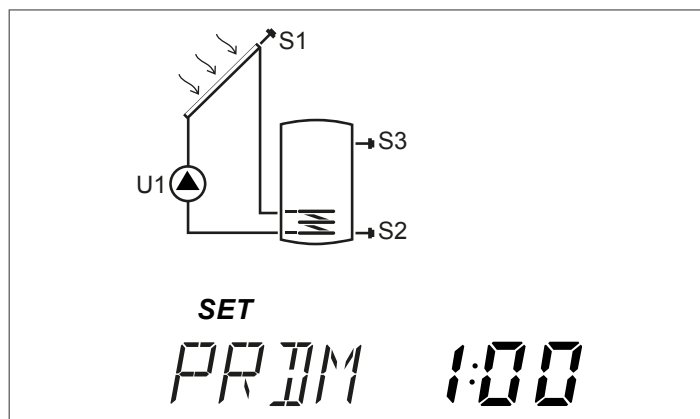
3.32 Thermal disinfection monitoring period

PRDM (par. no.: 195)

With this parameter it is possible to set the monitoring period of the accumulation tank temperature..

The setting range is: 0..30:0..24 (dd:hh)

The monitoring period starts as soon as the temperature detected by probe S3 is lower than disinfection temperature TMPD. If the temperature detected by S3 is constantly higher than TMPD, for the whole heating period PRDR, thermal disinfection is over and a new monitoring period starts.

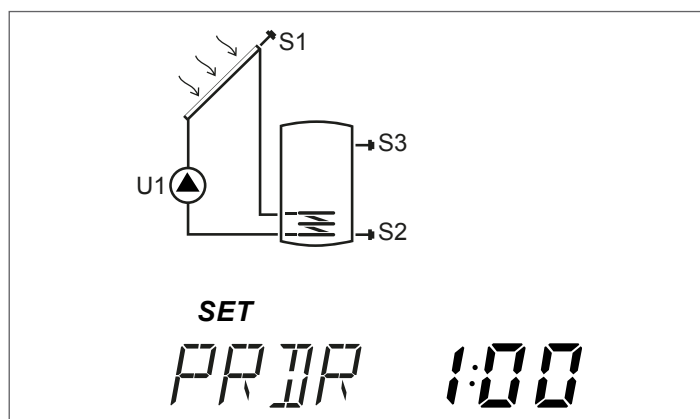


3.33 Thermal disinfection heating period

PRDR (par. no.: 196)

With this parameter it is possible to set the accumulation tank heating activation period during which the temperature detected by S3 must be higher than TMPD.

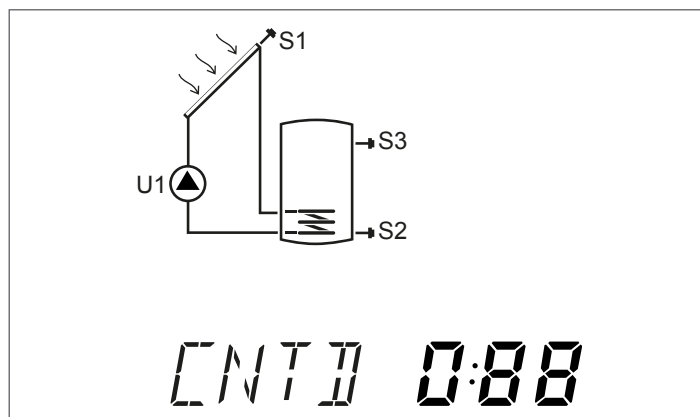
The setting range is: 0..24:0..59 (hh:mm).



3.34 Thermal disinfection in progress counter

CNTD (par. no.: 197)

With this parameter it is possible to display the countdown of remaining hours to monitoring period PRDM.

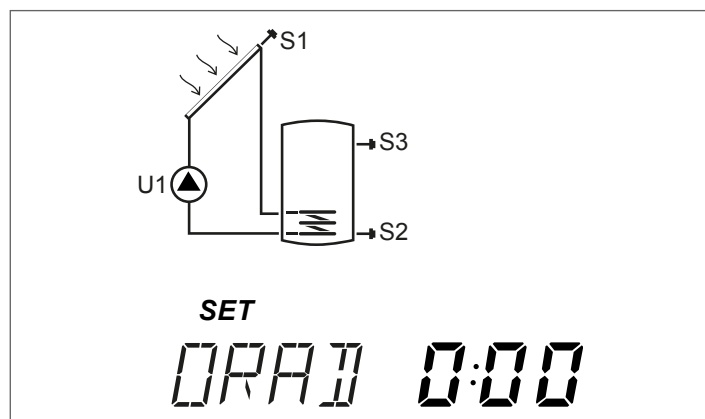


3.35 Thermal disinfection delayed activation time

ORAD (par. no.: 198)

With this parameter it is possible to postpone the activation time of the auxiliary heater.

In particular, if the time set in parameter ORAD is subsequent to the moment in which the monitoring period ends, output U2 is activated at the time set in parameter ORAD, instead if the time set precedes the moment in which the monitoring period ends, output U2 is activated at the end of the monitoring period.

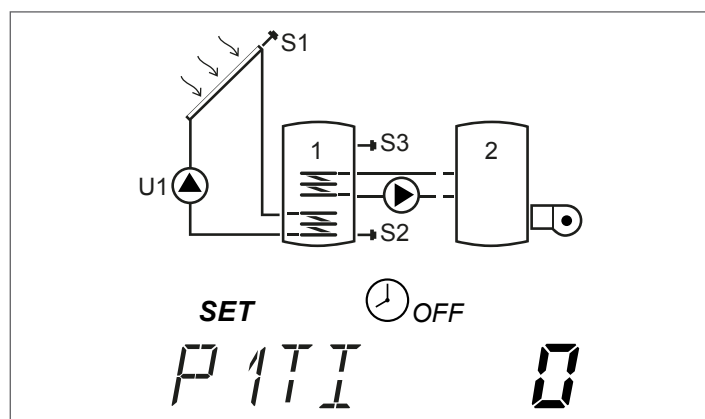


3.36 Operating hours output U1-U2

P1TI-P2TI-P3TI-P4TI (par. no.: 199-201-203-205)

With these parameters it is possible to display and reset the operating hours of circulators. To reset operating hours, press "▲" for a few seconds, until the value is reset.

Circulators are indicated as P1 - P2 - P3 - P4, according to the system layout.



3.37 Accumulation tank 1 - accumulation tank 2 night cooling function

NCB1-NCB2 (par. no.: 208-211)

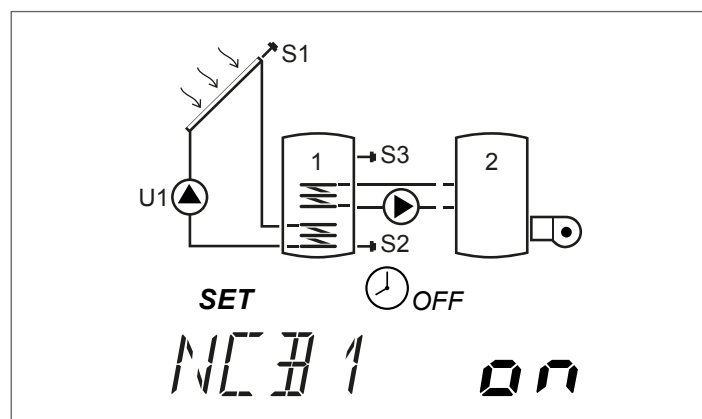
With this parameter, it is possible to enable/disable the night cooling function of storage systems 1 and 2.

The night cooling function allows decreasing the temperature of storage systems at night to limit frequent activations of anti-stagnation function in the hottest periods.

The night cooling function activation is signalled by icons ☀ and ❄ flashing at 0.5 second frequency.

The night cooling function is set through the following programmable and non-programmable parameters:

- NIGHT COOLING FUNCTION BO1 - NCB1 (ON)
- NIGHT COOLING FUNCTION BO2 - NCB2 (ON)
- NIGHT_COOLING_ACTIVATION_COLLECTOR_TEMPERATURE_CONSTANT (90°C Constant, non-adjustable value)
- NIGHT_COOLING_ACTIVATION_UPPER_STORAGE_SYSTEM_TEMPERATURE_CONSTANT (85°C Constant, non-adjustable value)
- NIGHT_COOLING_DEACTIVATION_UPPER_STORAGE_SYSTEM_TEMPERATURE_CONSTANT (75°C Constant, non-adjustable value)
- NIGHT_COOLING_DEACTIVATION_PSOLX_TEMPERATURE_CONSTANT (95°C Constant, non-adjustable value)
- EVENING_NIGHT_COOLING_ACTIVATION_TIME_CONSTANT (10.00PM Constant, non-adjustable value)
- EVENING_NIGHT_COOLING_DEACTIVATION_TIME_CONSTANT (11.59PM Constant, non-adjustable value)
- NIGHTTIME_NIGHT_COOLING_ACTIVATION_TIME_CONSTANT (12.00AM Constant, non-adjustable value)
- NIGHTTIME_NIGHT_COOLING_DEACTIVATION_TIME_CONSTANT (05.00AM Constant, non-adjustable value)



Example

For storage system 1 with BO1=ON, the function is active from 10:00 PM to 5:00 AM.

It is activated if S1<90°C and if S3<85°C.

It is deactivated if one of the following conditions is verified:

- S1<75°C;
- S1>95°C;
- outside the indicated time interval.

Example

For storage system 2 (system 2) with BO2=ON, the function is active from 10:00 PM to 5:00 AM.

It is activated if S3<90°C and if S4<85°C.

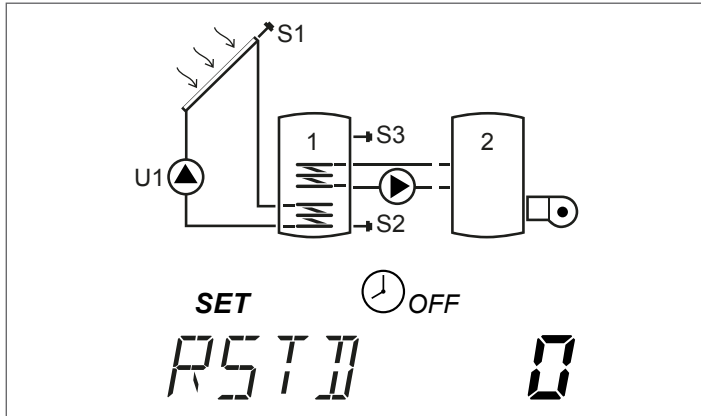
It is deactivated if one of the following conditions is verified:

- S3<75°C;
- S3>95°C;
- outside the indicated time interval.

3.38 Restore Default parameters

RSTD (par. no.: 247)

Set this parameter to 1 to restart the controller and restore factory settings.



3.39 Control unit modbus address

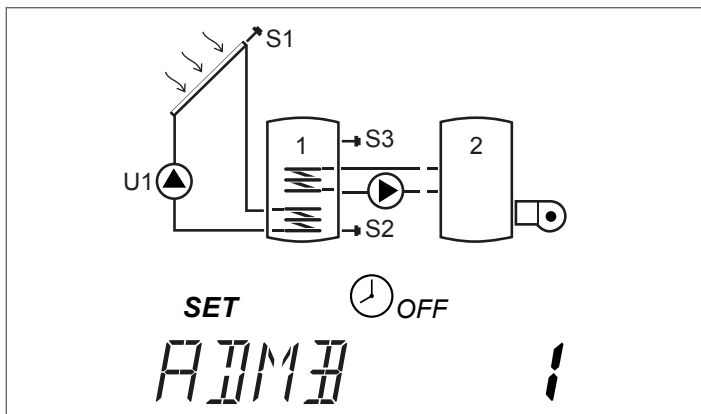
ADMB (par. no.: 250)

The solar regulator is enabled for interconnection on a data line RS-485 through Modbus RTU protocol in SLAVE mode. Therefore it is possible to create a SINGLE-SLAVE/MULTI-SLAVE network

Ex. Data logging of 3 cascade control units (SLAVE) through pc protocol (MASTER):

- 1 Set parameter "CONTROL UNIT MODBUS ADDRESS" (par. no.: 250) of 1st control unit =1
- 2 Set parameter "CONTROL UNIT MODBUS ADDRESS" (par. no.: 250) of 2nd control unit =2
- 3 Set parameter "CONTROL UNIT MODBUS ADDRESS" (par. no.: 250) of 3rd control unit =3
- 4 Remove jumpers from Y3 on all SLAVE control units
- 5 Remove jumper from J4 on control units SLAVE 2 and SLAVE 3
- 6 Connect adapter RS-485/USB (not supplied) or RS-485/Lan (not supplied) to the pc
- 7 Power the devices

The parameter ADMB allows setting the solar regulator slave address



4 PUTTING INTO SERVICE

4.1 Initial startup

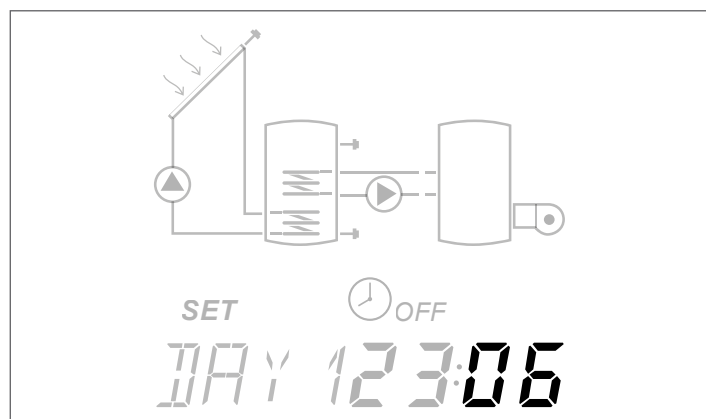
Upon commissioning or after a reset, it is necessary to set current time/day/language and system layout number.

4.1.1 Current time and week day display

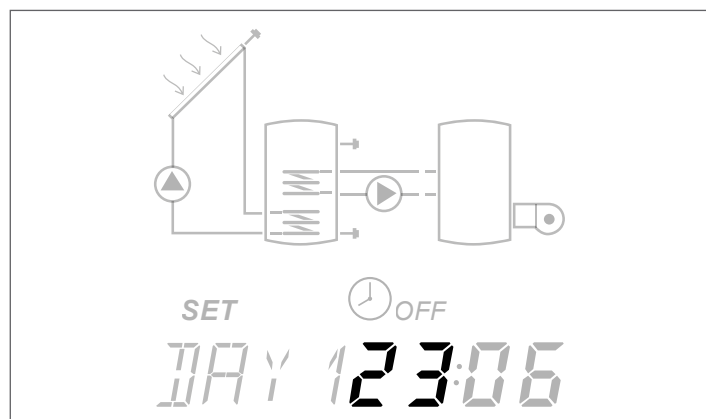
Press "▼" for 2 seconds to display time and week day
Press "►" or "◄" to exit the page

4.1.2 Setting up current time, week day and language

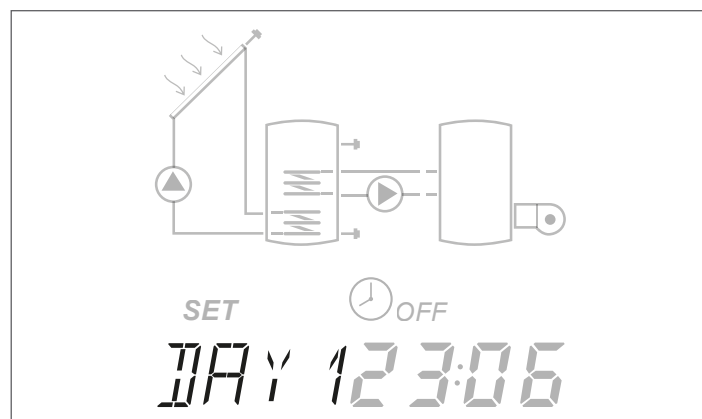
Press "▼" for 5 seconds to edit time, week day and language
- Press "▲" or "▼" to set minutes



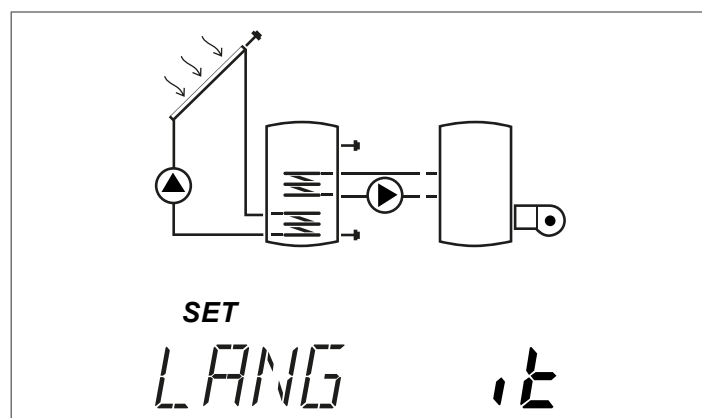
- Press key "◄" to confirm
- Press "▲" or "▼" to set hours



- Press key "◄" to confirm
- Press "▲" or "▼" to set the week day; **DAY1** corresponds to Monday – **DAY7** to Sunday



- Press key "◄" to confirm
- Press "▲" or "▼" to set the controller language !da duplicazione! (available languages are it-en-de-fr)



Press key "◄" to confirm and exit the change.

! In case of power supply missing for longer than three days, only date and time must be reset.

! It is possible to exit the setup mode at any stage (for example, after setting the minutes), pressing the "◄" button for at least 2 seconds.

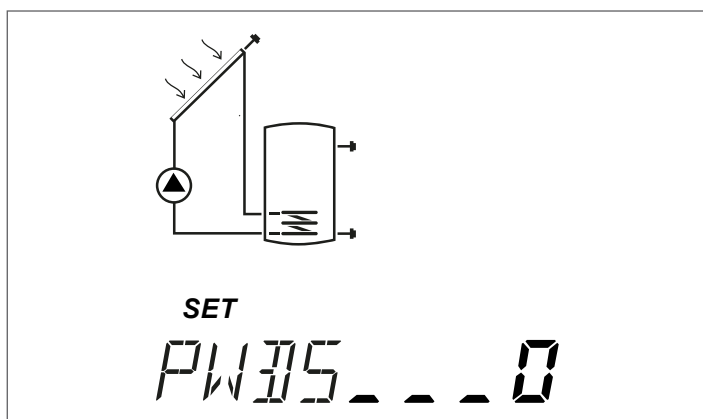
4.1.3 Enter Password

To access Installer parameters, it is necessary to enter the **password: 0000**.

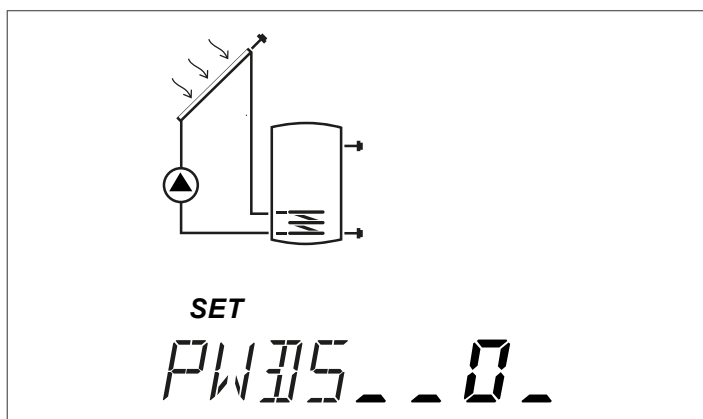
If the password is correct Installer parameters will be displayed. If the password is incorrect, the default screen (parameter S3) is displayed and the procedure must be repeated.

After a period of inactivity of 5 minutes (no button pressed), Installer functions are disabled and the display goes back to the previous screen. To access again Installer functions it is necessary to enter the password again.

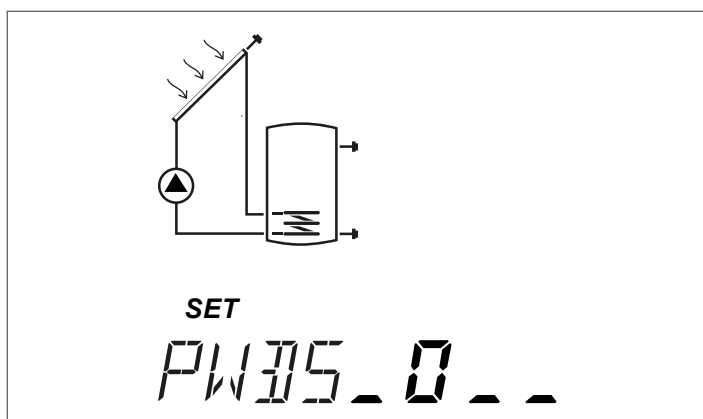
- Press "◀" for 5 seconds.
- Press "▲" or "▼" until "0" is displayed



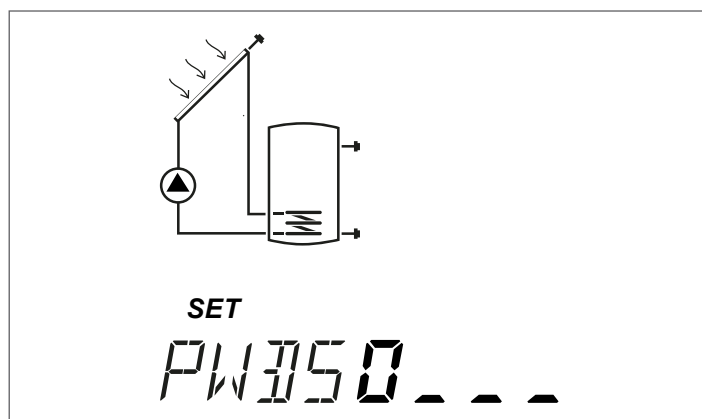
- Press key "◀" to confirm
- Press "▲" or "▼" until "0" is displayed



- Press key "◀" to confirm
- Press "▲" or "▼" until "0" is displayed



- Press key "◀" to confirm
- Press "▲" or "▼" until "0" is displayed



- If necessary, it is possible to go back and change the figures previously confirmed with button "▶"
- Press key "◀" to confirm the password.

4.1.4 System layout configuration

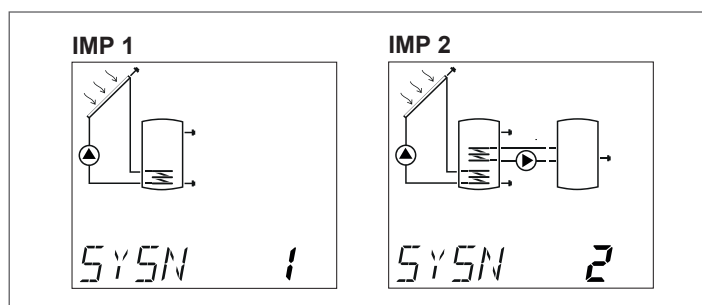
The solar regulator manages 9 system layouts that can be selected through parameter **SYSN** (system number).

If no system is set, system no. 1 is enabled by default.

Overview of system layouts:

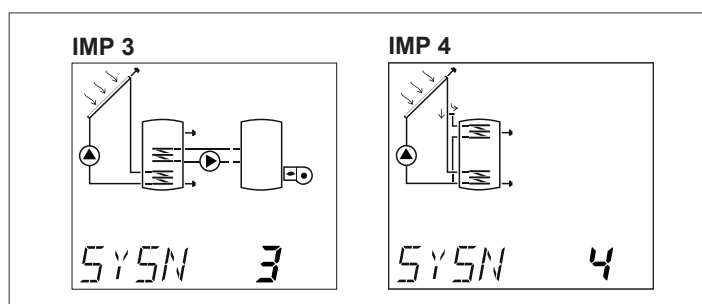
IMP 1: Standard solar system

IMP 2: Solar system with heat transfer

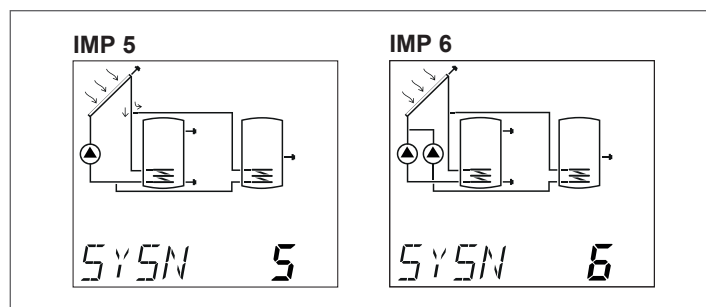


IMP 3: Solar system with supplementary heating

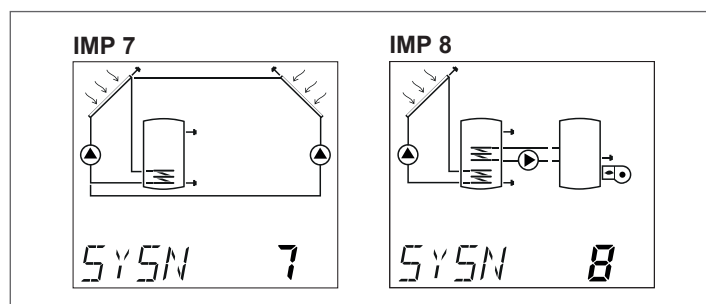
IMP 4: Solar system with stratified filling of the accumulation tank



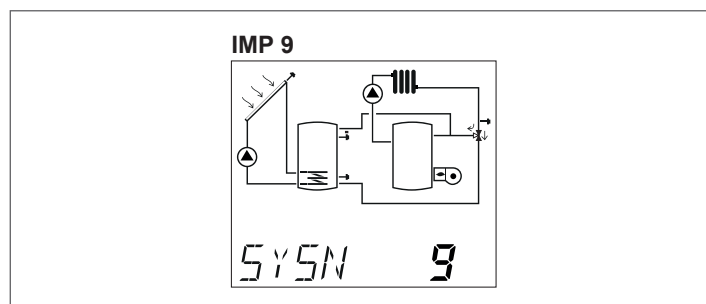
IMP 5: Solar system with 2 accumulation tanks and priority logics
IMP 6: Solar system with 2 accumulation tanks and operation with pumps



IMP 7: Solar system with 2 collectors and 1 accumulation tank
IMP 8: SOLAR SYSTEM WITH SUPPLEMENTARY HEATING THROUGH PUMP ACTING ON SOLID FUEL GENERATOR

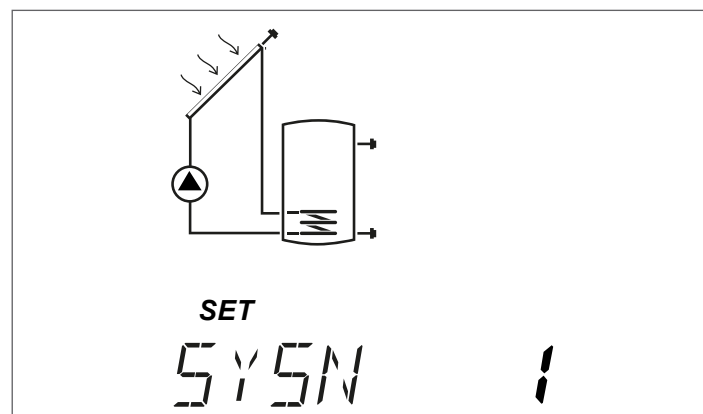


IMP 9: Solar system with temperature increase system in heating circuit return



To change the system layout after entering the password:

- Press "►" until parameter **NUMERO SISTEMA – SYSN** is displayed



- Press "▲" for at least 3 seconds to enter parameter editing mode. The icon "SET" and the system layout number start flashing
- Scroll the various system layouts by pressing "▲" or "▼" until the correct layout number is displayed
- Confirm the change by pressing "►" or "◄" for at least 3 seconds.

! Indicate the configured layout in the user manual in the chapter "System layouts".

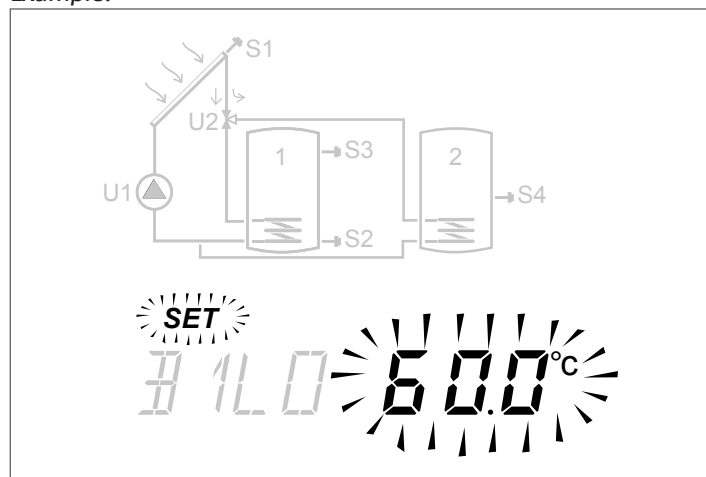
4.1.5 Change installer parameters

A When changing parameters all functions are active at the default or previously set values. For example, if the conditions for activation of the pump associated with the output U1 are met, the corresponding pump will operate.

To edit the displayed parameter:

Press "▲" for a few seconds to enter edit mode, the icon **SET** and the parameter value start flashing.

Example:



Press "▲" or "▼" to edit.

Press "►" or "◄" for at least 3 seconds to confirm the change and go back to the parameter list.

A In case of error in parameter editing, repeat the procedure.

For instructions and settings of the individual parameters refer to chapter "Parameter description".

For each system layout, chapter "Installation diagrams" contains the basic wiring diagram and the list of dedicated parameters, each with the default value and the allowed range.

4.1.6 Change weekly time schedule

Set up as follows:

- Press "▲" for at least 3 seconds, the icon **SET** starts flashing
- Press "▲" to activate, the time indicated and the icon **ON** flash to confirm the activation
- Press "▼" to deactivate, the time indicated and the icon **OFF** flash to confirm the deactivation

For convenience, press and hold "▲" or "▼" during programming to set sequentially the time intervals ON or OFF respectively. When user completes programming of the 48 half hours of the day, the parameter will go back to display status.

It is possible to exit the setting page before having programmed the whole 48 half hours by pressing "►" for a few seconds.

For systems that use a supplementary heating system with a timer (system no.3), the following schedule is stored by default.

START	STOP	TIME BAR	MON	TUE	WED	THU	FRI	SAT	SUN
0:00	0:30	0							
0:30	1:00	1							
1:00	1:30	2							
1:30	2:00	3							
2:00	2:30	4							
2:30	3:00	5							
3:00	3:30	6							
3:30	4:00	7							
4:00	4:30	8							
4:30	5:00	9							
5:00	5:30	10							
5:30	6:00	11							
6:00	6:30	12							
6:30	7:00	13							
7:00	7:30	14							
7:30	8:00	15							
8:00	8:30	16							
8:30	9:00	17							
9:00	9:30	18							
9:30	10:00	19							
10:00	10:30	20							
10:30	11:00	21							
11:00	11:30	22							
11:30	12:00	23							
12:00	12:30	24							
12:30	13:00	25							
13:00	13:30	26							
13:30	14:00	27							
14:00	14:30	28							
14:30	15:00	29							
15:00	15:30	30							
15:30	16:00	31							
16:00	16:30	32							
16:30	17:00	33							
17:00	17:30	34							
17:30	18:00	35							
18:00	18:30	36							
18:30	19:00	37							
19:00	19:30	38							
19:30	20:00	39							
20:00	20:30	40							
20:30	21:00	41							
21:00	21:30	42							
21:30	22:00	43							
22:00	22:30	44							
22:30	23:00	45							
23:00	23:30	46							
23:30	0:00	47							

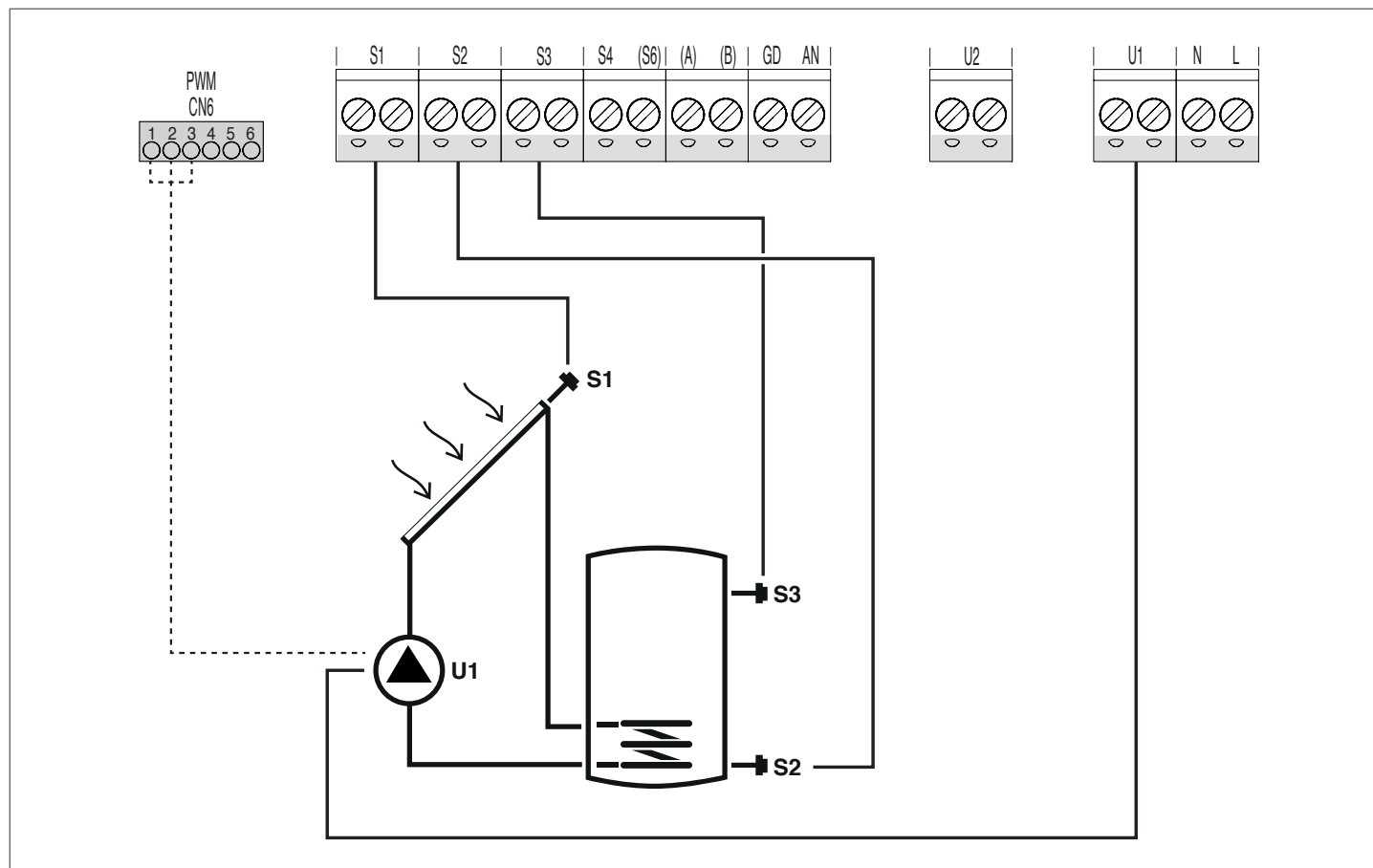
In the boxes indicate the time schedule set.

5 INSTALLATION DIAGRAMS

System 1 – SOLAR HEATING WITH 1 STORAGE SYSTEM

The system works on the temperature difference between solar collector (S1) and the low zone of storage system (S2) to maintain the storage temperature set in parameter n°59 (B1LO SETPOINT BOILER1 LOW).

If the difference S1-S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated. The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).



Key:			
SET	editable parameter	S	temperature probe
/	parameter or value not utilised	U	pump/valve managed by regulator
R/O	parameter available for modbus in read-only mode		
R/W	parameter available for modbus in write and read mode		

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
8	DTON S1S2 defines the S1-S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	OF12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
59	SETPOINT BOI1 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1LO	°C	SET	15	90	60	0,5	1059[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	MODU	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	ON12	30	20	0,5	1148[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
178	BOI1 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TSO1	sec	SET	1	120	3	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TSOF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
193	THERMAL DISINFECTION FUNCTION ENABLE activates the anti-legionella thermal disinfection function	DTON	°C	SET	ON	OFF	OFF	1	/	/	I
194	THERMAL DISINFECTION TEMPERATURE	TMPD	°C	SET	60	95	60	0,5	/	/	I
195	THERMAL DISINFECTION CONTROL PERIOD	PRDM	dd:hh	SET	00:00	30:24	01:00	1	/	/	I
196	THERMAL DISINFECTION PERIOD	PRDR	hh:mm	SET	00:00	23:59	01:00	1	/	/	I
197	THERMAL DISINFECTION IN PROGRESS COUNTER	CNTD	h	VIS	00:00	30:24	/		/	/	I
198	THERMAL DISINFECTION START TIME	ORAD	hh:mm	SET	00:00	23:59	00:00	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
208	BOI NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

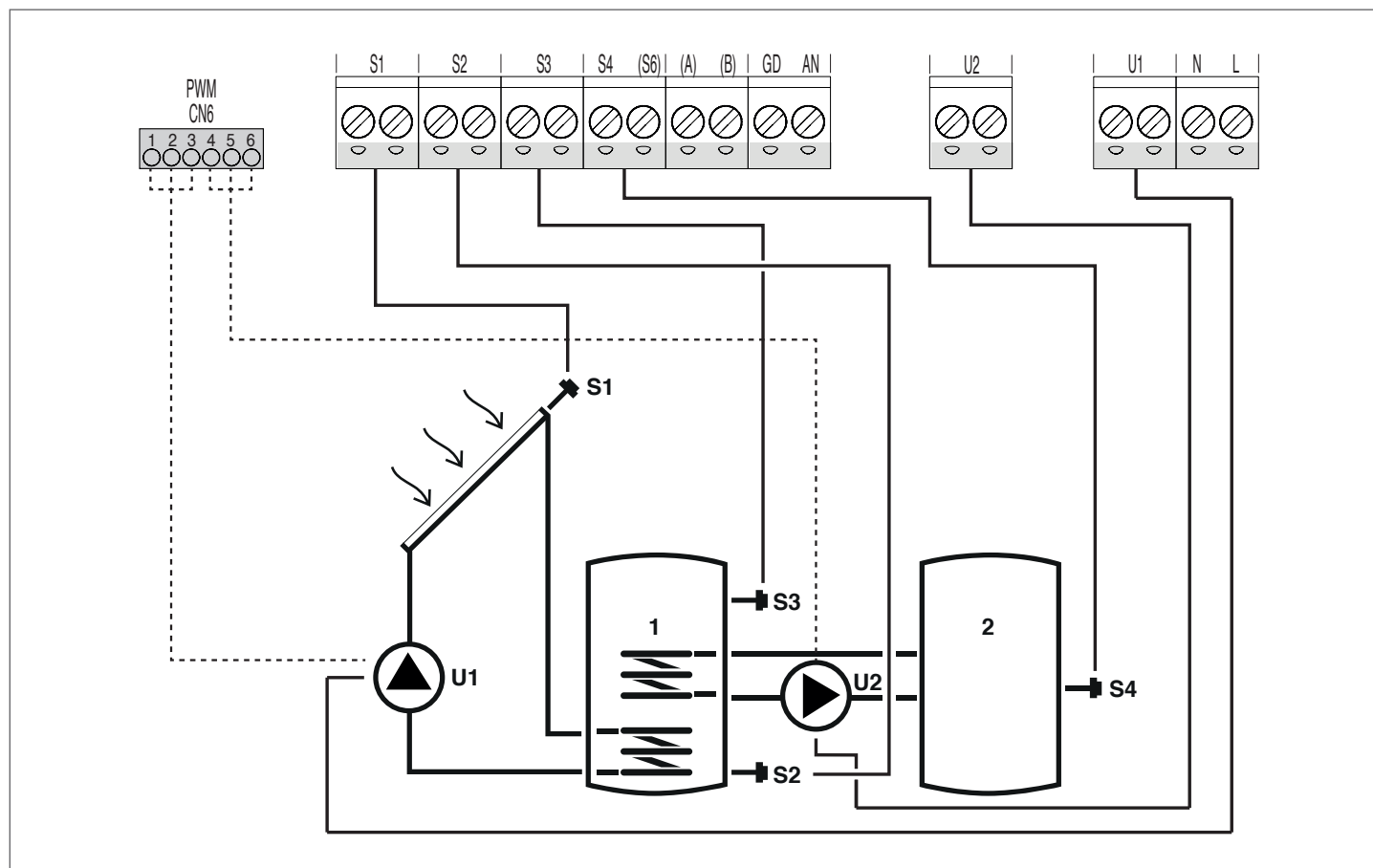
System 2 – SOLAR HEATING WITH HEAT TRANSFER

The system works on the temperature difference between solar collector (S1) and the low zone of the first storage system (S2) to maintain the storage 1 temperature set in parameter no. 59 (B1L0 – SETPOINT BOILER1 LOW). It also works on the temperature difference between the high zone of the first storage (S3) and the low zone of the second storage system (S4) to maintain the storage 2 temperature set in parameter no. 64 (B2L0 – SETPOINT BOILER2 LOW).

If the difference S1–S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated. The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).

If the difference S3–S4 is greater than or equal to the value set in parameter n°16 (ON34) and probe S3>ST12, the pump connected to output U2 is activated.

The pump (U2) remains active until the temperature difference between S3 and S4 reaches the value set in parameter n°17 (OF34).



Key:			
SET	editable parameter	S	temperature probe
/	parameter or value not utilised	U	pump/valve managed by regulator
R/O	parameter available for modbus in read-only mode		
R/W	parameter available for modbus in write and read mode		

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
3	S4 probe S4 temperature display	S4	°C	VIS	-40	>260	/	0,1	1003[R/O]	1	U
8	DTON S1S2 defines the S1–S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	0F12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
16	DTON S3S4 defines the S3-S4 differential for starting the pump associated to output U2	0N34	°C	SET	5	10	5	0,5	1016[R/W]	1	I
17	DTOFF S3S4 defines the S3-S4 differential for stopping the pump associated to output U2	0F34	°C	SET	1	4	1	0,5	1017[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
44	MANUAL MODE U1 enables/disables manual operation of output U2	MAN2	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
59	SETPOINT BOI1 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1L0	°C	SET	15	90	60	0,5	1059[R/W]	1	U
64	SETPOINT BOI2 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 2	B2L0	°C	SET	15	90	60	0,5	1064[R/W]	1	U
73	HEAT EXCHANGE THRESHOLD BOI1-BOI2 defines the temperature threshold at which heat exchange between STORAGE SYSTEM 1 and STORAGE SYSTEM 2 is permitted	ST12	°C	SET	15	90	50	0,5	1073[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
115	ACTUAL SPEED U2 displays the current speed of the pump connected to output U2	U2 %	%	VIS	0	100	/	1	1115[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
127	MINIMAL SPEED U2 defines the minimum speed of the modulating pump associated to output U2	U2 %	%	SET	10	90	10		1127[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON- OFF IMPU MODU	ON- OFF IMPU MODU	MODU	1	/	/	I
139	U2 OUTPUT CONTROL MODE defines the control type of output U2: ON-OFF; IMPU= impulsive; MODU= PWM	PIU2	-	SET	ON- OFF IMPU MODU	ON- OFF IMPU MODU	ON-OFF	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	ON12	30	20	0,5	1148[R/W]	1	I
151	U2 MODULATION DIFFERENTIAL SET defines the temperature differential associated with output U2, regulated according to the function defined by the parameter PUMP MODULATION	SOU2	°C	SET	5	30	20	0,5	1151[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the circulator switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
178	BOI1 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
181	BOI2 MAX SAFETY TEMPERATURE THRESHOLD defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 2 must stop	B2ST	°C	SET	70	90	85	0,5	1181[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the circulator returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the circulator operating interval during antishock	TSOON	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the circulator deactivation interval during antishock	TSOFF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
203	OPERATING HOURS OUTPUT U2 Stores/resets the operating hours of the pump/supplementary system connected to output U2	P3TI	h	VIS	0	9999	/	1	1202[R/W]	1	I
208	BOI1 NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
211	BOI2 NIGHT COOLING FUNCTION activates the night cooling function of integration system 2	NCB2	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

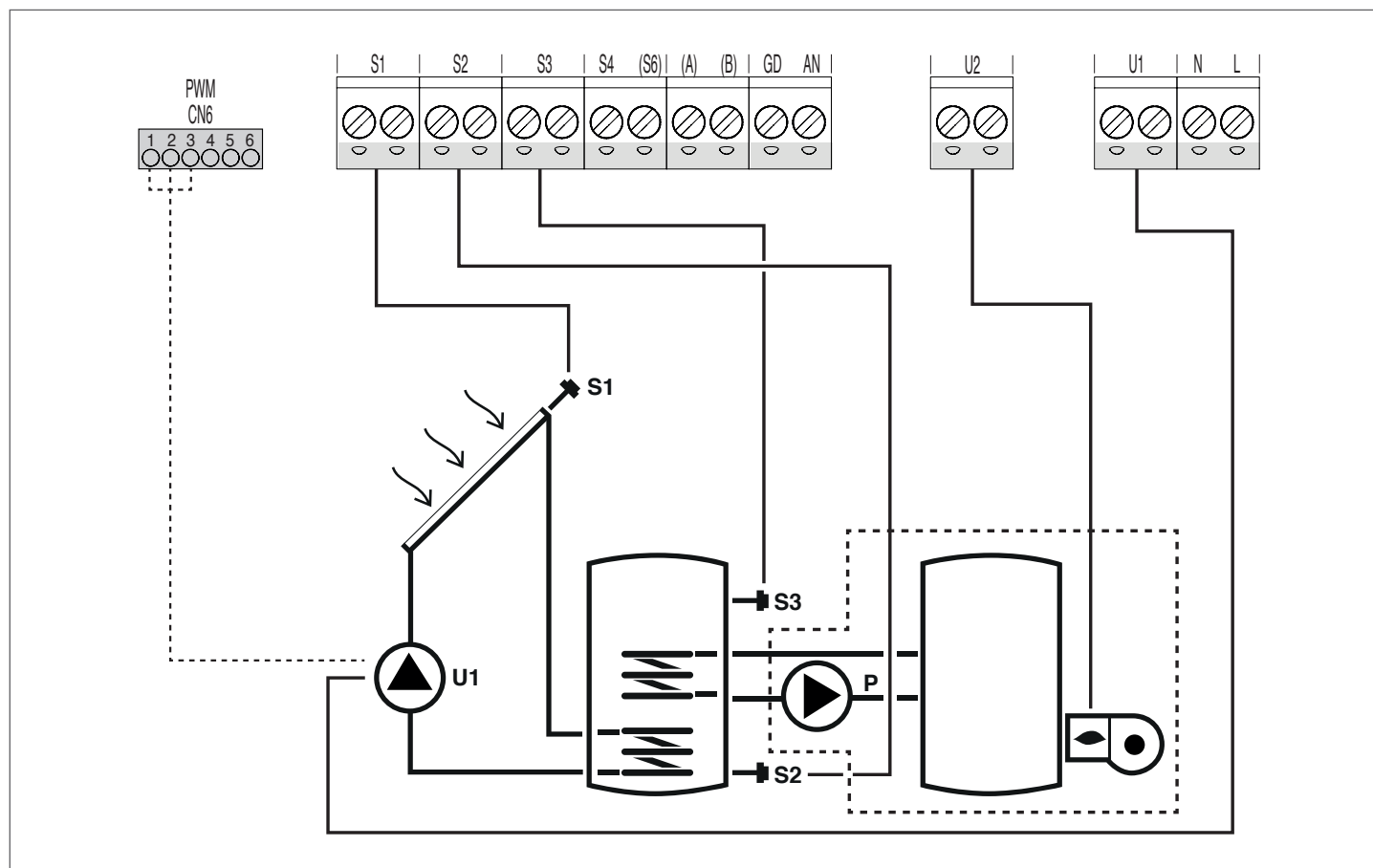
System 3 – SOLAR SYSTEM WITH SUPPLEMENTARY HEATING

The system works on the temperature difference between solar collector (S1) and the low zone of storage system (S2) to maintain the storage temperature set in parameter n°59 (B1LO SETPOINT BOILER1 LOW).

A supplementary heating, activated through time schedule with parameters n°103÷109 (DAYn), is used as supplement to the solar collector.

If the difference S1-S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated. The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).

Through the schedule set in parameters DAYn it is possible to take advantage of a supplementary system to integrate heat exchange between solar collectors and accumulation tank.



Key:			
SET	editable parameter	S	temperature probe
/	parameter or value not utilised	U	pump/valve managed by regulator
R/O	parameter available for modbus in read-only mode	P	pump
R/W	parameter available for modbus in write and read mode	---	integration system

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
8	DTON S1S2 defines the S1-S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	OF12	°C	SET	1	4	4	0,5	1009[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
44	MANUAL MODE U2 enables/disables manual operation of output U2	MAN2	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
59	SETPOINT B01 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1LO	°C	SET	15	90	60	0,5	1059[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
91	Supplement activation threshold defines the temperature threshold below which the burner/integration system starts within the set schedule.	SAB1	°C	SET	40	70	50	0,5	1091[R/W]	1	U
94	Supplement deactivation threshold defines the temperature threshold above which the burner/integration system stops within the set schedule.	SSB1	°C	SET	45	70	55	0,5	1094[R/W]	1	U
103	SUPPLEMENT BURNER SCHEDULE DAY1 programs the 48 Monday time bars.	DAY1	-	SET	0	48	1	/	/	/	U
104	SUPPLEMENT BURNER SCHEDULE DAY2 programs the 48 Tuesday time bars.	DAY2	-	SET	0	48	1	/	/	/	U
105	SUPPLEMENT BURNER SCHEDULE DAY3 programs the 48 Wednesday time bars	DAY3	-	SET	0	48	1	/	/	/	U
106	SUPPLEMENT BURNER SCHEDULE DAY4 programs the 48 Thursday time bars	DAY4	-	SET	0	48	1	/	/	/	U
107	SUPPLEMENT BURNER SCHEDULE DAY5 programs the 48 Friday time bars	DAY5	-	SET	0	48	1	/	/	/	U
108	SUPPLEMENT BURNER SCHEDULE DAY6 programs the 48 Saturday time bars	DAY6	-	SET	0	48	1	/	/	/	U
109	SUPPLEMENT BURNER SCHEDULE DAY7 programs the 48 Sunday time bars	DAY7	-	SET	0	48	1	/	/	/	U
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
115	ACTUAL SPEED U2 displays the current speed of the pump connected to output U2	U2 %	%	VIS	0	100	/	1	1115[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
127	MINIMAL SPEED U2 defines the minimum speed of the modulating pump associated to output U2	U2 %	%	SET	10	90	10		1127[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	MODU	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	ON12	30	20	0,5	1148[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
178	BO11 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
181	BO12 MAX SAFETY TEMPERATURE THRESHOLD defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 2 must stop	B2ST	°C	SET	70	90	85	0,5	1181[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TSOON	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TSOF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
187	ENABLE SUPPLEMENT defines the activation mode of a burner/integration system	BRU1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
193	THERMAL DISINFECTION FUNCTION ENABLE activates the anti-legionella thermal disinfection function	DTON	°C	SET	ON	OFF	OFF	1	/	/	I
194	THERMAL DISINFECTION TEMPERATURE	TMPD	°C	SET	60	95	60	0,5	/	/	I
195	THERMAL DISINFECTION CONTROL PERIOD	PRDM	dd:hh	SET	00:00	30:24	01:00	1	/	/	I
196	THERMAL DISINFECTION PERIOD	PRDR	hh:mm	SET	00:00	23:59	01:00	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
197	THERMAL DISINFECTION IN PROGRESS COUNTER	CNTD	h	VIS	00:00	30:24	/		/	/	I
198	THERMAL DISINFECTION START TIME	ORAD	hh:mm	SET	00:00	23:59	00:00	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
203	OPERATING HOURS OUTPUT U2 Stores/resets the operating hours of the pump/supplementary system connected to output U2	P3TI	h	VIS	0	9999	/	1	1202[R/W]	1	I
208	BOI1 NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

System 4 – SOLAR SYSTEM WITH STRATIFIED FILLING OF THE STORAGE SYSTEM

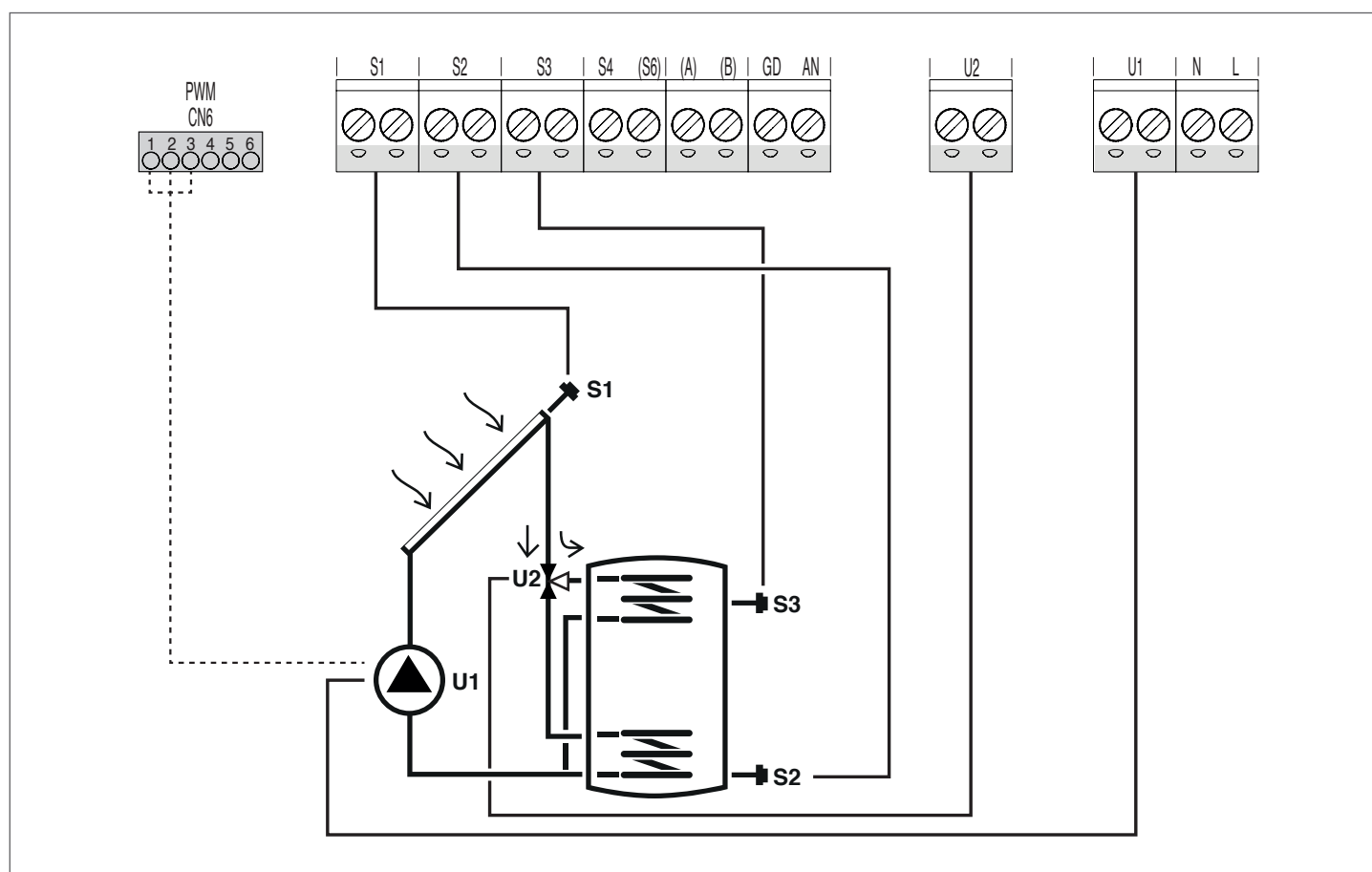
The system makes it possible to heat two storage zones at different times, allowing the choice of which of the two zones has time priority over the other. Through parameter n°67 (PZB1) it is possible to change priority of the zone to be heated (high zone by default). The system works on the temperature difference between solar collector (S1) and the storage system both to heat the high zone (S3) and maintain the temperature set in parameter n°56 (B1HI – SETPOINT BOILER1 HIGH) as well as to heat the low zone (S2) and maintain the temperature set in parameter n°59 (B1LO – SETPOINT BOILER1 LOW). Thus, it is possible to manage the storage system heating, controlling the stratification between high zone (S3) and low zone (S2).

If the difference S1-S3 is greater than or equal to the value set in parameter n°10 (ON13), the pump connected to output U1 is activated and the solenoid valve connected to output U2 changes over to allow for circulation between the solar collector and the storage system high zone (contact of output U2 closed).

The pump (U1) remains active until the difference reaches the value set in parameter n°11 (OF13).

If the difference S1-S3 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated and the solenoid valve connected to output U2 changes over to allow for circulation between the solar collector and the storage system low zone (contact of output U2 open).

The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).



Key:			
SET	editable parameter	S	temperature probe
/	parameter or value not utilised	U	pump/valve managed by regulator
R/O	parameter available for modbus in read-only mode		
R/W	parameter available for modbus in write and read mode		

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
8	DTON S1S2 defines the S1-S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	0F12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
10	DTON S1S3 defines the S1-S3 differential for starting the pump associated to output U1	0N13	°C	SET	5	10	6	0,5	1010[R/W]	1	I
11	DTOFF S1S3 defines the S1-S3 differential for stopping the pump associated to output U1	0F13	°C	SET	1	4	4	0,5	1011[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
56	SETPOINT BO11 HIGH ZONE defines the water temperature setpoint for the high zone of STORAGE SYSTEM 1	B1HI	°C	SET	15	90	60	0,5	1056[R/W]	1	U
59	SETPOINT BO11 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1LO	°C	SET	15	90	60	0,5	1059[R/W]	1	U
67	BO11 ZONE PRIORITY defines the area in the boiler that must be satisfied first	PZB1	-	SET	LO	HI	HI	1	/	/	I
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON- OFF IMPU MODU	ON- OFF IMPU MODU	MODU	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	0N12	30	20	0,5	1148[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
178	BOI1 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TSOON	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TSOF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
208	BOI1 NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

System 5 – SOLAR SYSTEM WITH 2 TANKS AND PRIORITY LOGICS

The system works on the temperature difference between solar collector (S1) and the low zone of the first storage system (S2) to maintain the storage 1 temperature set in parameter n°59 (B1L0 – SETPOINT BOILER1 LOW). It also works on the temperature difference between solar collector (S1) and the low zone of the second storage system (S4) to maintain the storage 2 temperature set in parameter n°64 (B2L0 – SETPOINT BOILER2 LOW).

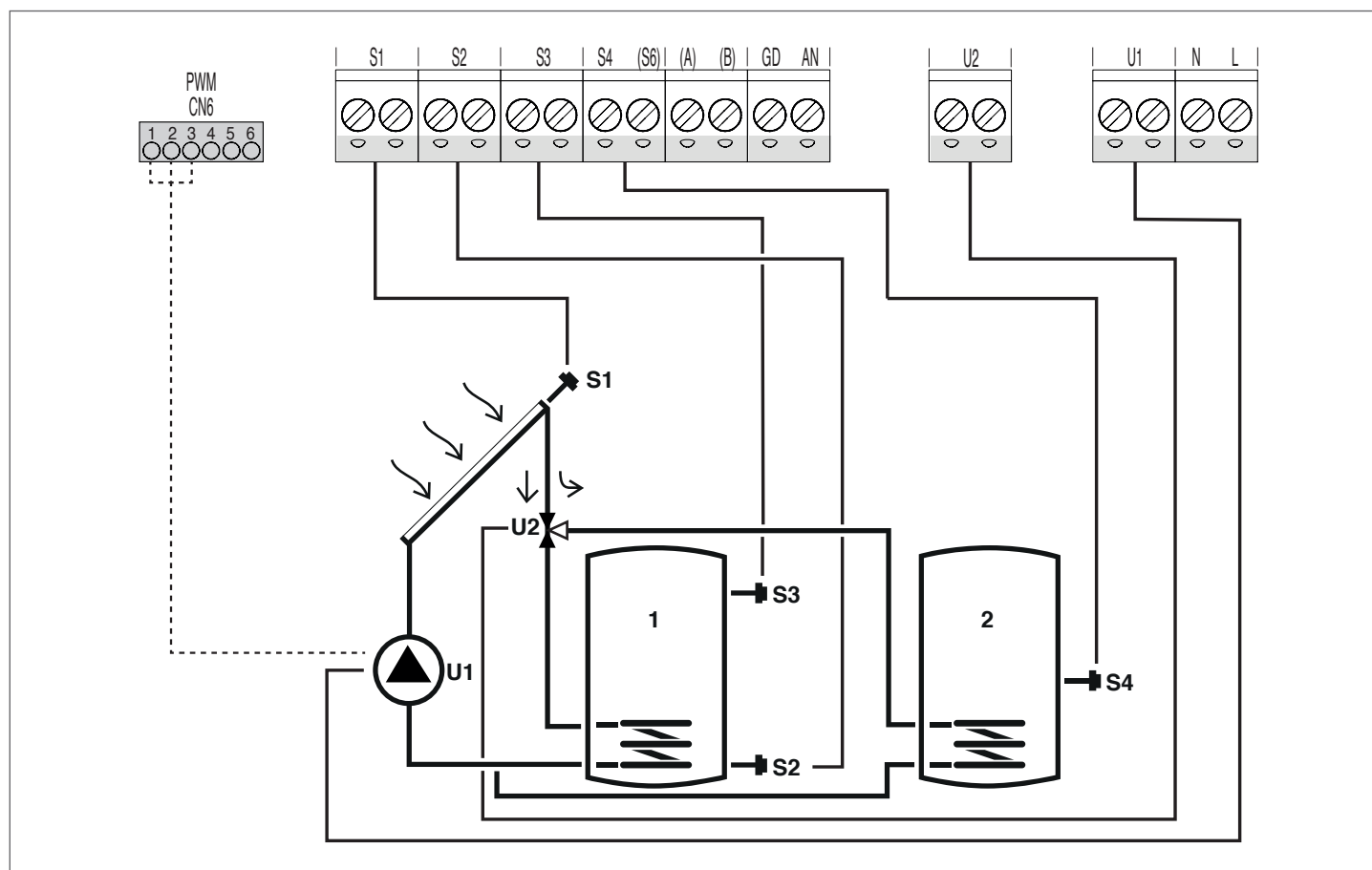
If the difference S1-S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated and the solenoid valve connected to output U2 changes over to allow for circulation between the solar collector and the storage system 1 low zone (contact of output U2 open).

The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).

If the difference S1-S4 is greater than or equal to the value set in parameter n°12 (ON14), the pump connected to output U1 is activated and the solenoid valve connected to output U2 changes over to allow for circulation between the solar collector and the storage system 2 low zone (contact of output U2 closed).

The pump (U1) remains active until the temperature difference between S1 and S4 reaches the value set in parameter n°13 (OF14).

It is possible to change the priority of the accumulation tank to be heated with parameter n°53 (PRB0) (first accumulation tank by default).



Key:			
SET	editable parameter	S	temperature probe
/	parameter or value not utilised	U	pump/valve managed by regulator
R/O	parameter available for modbus in read-only mode		
R/W	parameter available for modbus in write and read mode		

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
3	S4 probe S4 temperature display	S4	°C	VIS	-40	>260	/	0,1	1003[R/O]	1	U

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
8	DTON S1S2 defines the S1-S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	OF12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
12	DTON S1S4 defines the S1-S4 differential for starting the pump dedicated to storage system 2 heating	ON14	°C	SET	5	10	6	0,5	1012[R/W]	1	I
13	DTON S1S4 defines the S1-S4 differential for stopping the pump dedicated to storage system 2 heating	OF14	°C	SET	1	4	4	0,5	1013[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
53	BOILER PRIORITY in systems with double accumulation tank it states whichever must have heating priority	PRB0	-	SET	1	2	1	1	/	/	I
59	SETPOINT BOI1 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1LO	°C	SET	15	90	60	0,5	1059[R/W]	1	U
64	SETPOINT BOI2 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 2	B2LO	°C	SET	15	90	60	0,5	1064[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON- OFF IMPU MODU	ON- OFF IMPU MODU	MODU	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	ON12	30	20	0,5	1148[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
178	BOI1 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TSON	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TSOF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
208	BOI1 NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
211	BOI2 NIGHT COOLING FUNCTION activates the night cooling function of integration system 2	NCB2	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

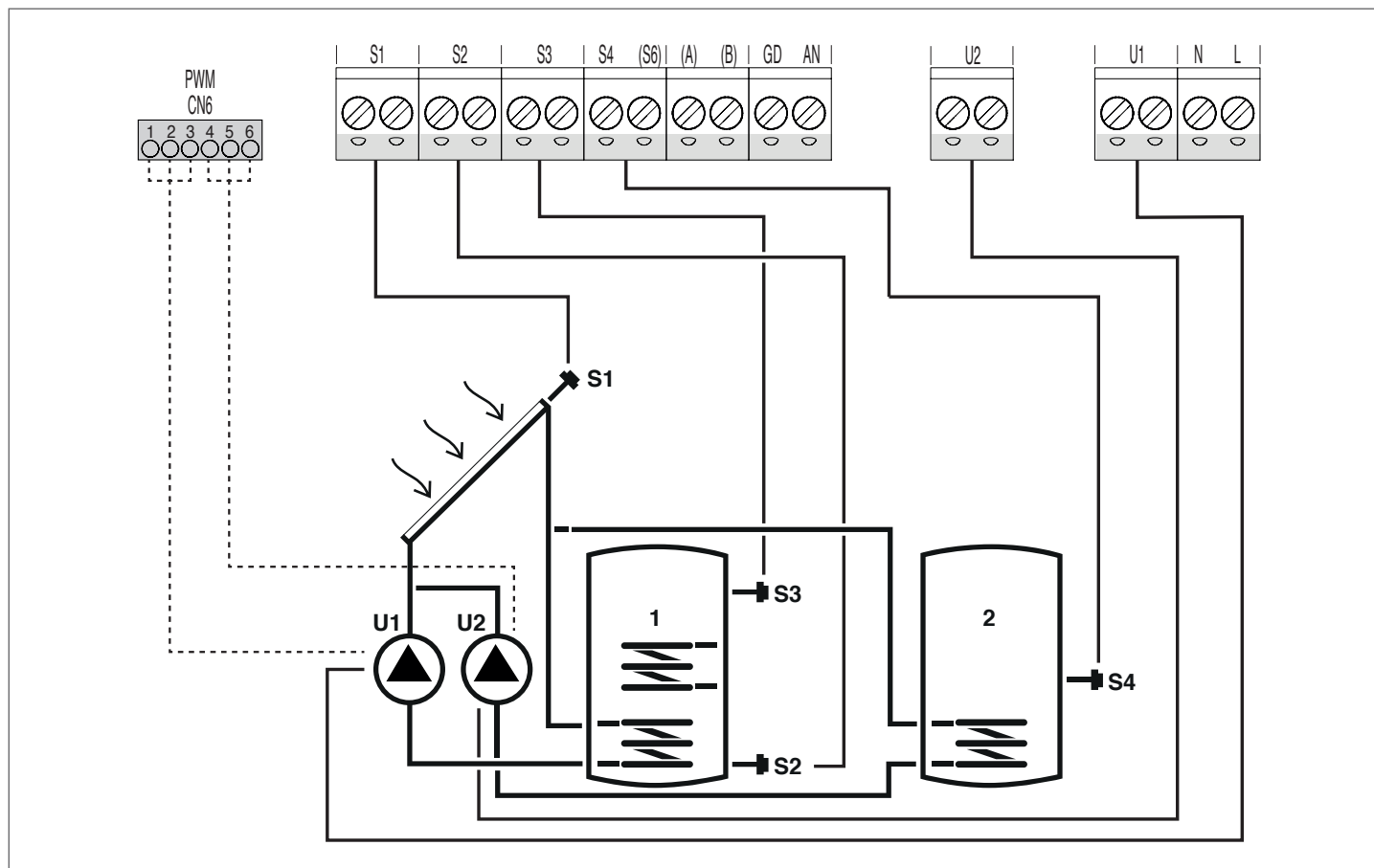
System 6 – SOLAR SYSTEM WITH 2 TANKS AND OPERATION WITH PUMPS

The system works on the temperature difference between solar collector (S1) and the low zone of the first storage system (S2) to maintain the storage 1 temperature set in parameter n°59 (B1L0 – SETPOINT BOILER1 LOW). It also works on the temperature difference between solar collector (S1) and the low zone of the second storage system (S4) to maintain the storage 2 temperature set in parameter n°64 (B2L0 – SETPOINT BOILER2 LOW).

If the difference S1-S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated. The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12). If the difference S1-S4 is greater than or equal to the value set in parameter n°12 (ON14), the pump connected to output U2 is activated.

The pump (U2) remains active until the temperature difference between S1 and S4 reaches the value set in parameter n°13 (OF14). The system works with priority logic (alternating between the two storage zones) and it is possible to change the priority of the storage to be heated first with the parameter n°53 (PRB0) (by default the first storage zone has priority).

NOTE: as second pump (U2), it is recommended to use a pump with modulation PWM.



Key:			
SET	editable parameter	S	temperature probe
/	parameter or value not utilised	U	pump/valve managed by regulator
R/O	parameter available for modbus in read-only mode		
R/W	parameter available for modbus in write and read mode		

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
3	S4 probe S4 temperature display	S4	°C	VIS	-40	>260	/	0,1	1003[R/O]	1	U
8	DTON S1S2 defines the S1-S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	OF12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
12	DTON S1S4 defines the S1-S4 differential for starting the pump dedicated to storage system 2 heating	ON14	°C	SET	5	10	6	0,5	1012[R/W]	1	I
13	DTON S1S4 defines the S1-S4 differential for stopping the pump dedicated to storage system 2 heating	OF14	°C	SET	1	4	4	0,5	1013[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
44	MANUAL MODE U1 enables/disables manual operation of output U2	MAN2	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
53	BOILER PRIORITY in systems with double accumulation tank it states whichever must have heating priority	PRB0	-	SET	1	2	1	1	/	/	I
59	SETPOINT BOI1 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1LO	°C	SET	15	90	60	0,5	1059[R/W]	1	U
64	SETPOINT BOI2 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 2	B2LO	°C	SET	15	90	60	0,5	1064[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
115	ACTUAL SPEED U2 displays the current speed of the pump connected to output U2	U2 %	%	VIS	0	100	/	1	1115[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
127	MINIMAL SPEED U2 defines the minimum speed of the modulating pump associated to output U2	U2 %	%	SET	10	90	10		1127[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON- OFF IMPU MODU	ON- OFF IMPU MODU	MODU	1	/	/	I
139	U2 OUTPUT CONTROL MODE defines the control type of output U2: ON-OFF; IMPU= impulsive; MODU= PWM	PIU2	-	SET	ON- OFF IMPU MODU	ON- OFF IMPU MODU	ON-OFF	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	ON12	30	20	0,5	1148[R/W]	1	I
151	U2 MODULATION DIFFERENTIAL SET defines the temperature differential associated with output U2, regulated according to the function defined by the parameter PUMP MODULATION	SOU2	°C	SET	5	30	20	0,5	1151[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
178	BOI1 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
181	BOI2 MAX SAFETY TEMPERATURE THRESHOLD defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 2 must stop	B2ST	°C	SET	70	90	85	0,5	1181[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TSOON	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TSOFF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
201	OPERATING HOURS OUTPUT U2 Stores/resets the operating hours of the pump connected to output U2	P2TI	h	VIS	0	9999	/	1	1199[R/W]	1	I
208	BOI1 NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
211	BOI2 NIGHT COOLING FUNCTION activates the night cooling function of integration system 2	NCB2	-	SET	OFF	ON	ON	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

System 7 – SOLAR SYSTEM WITH 2 COLLECTORS AND 1 ACCUMULATION TANK

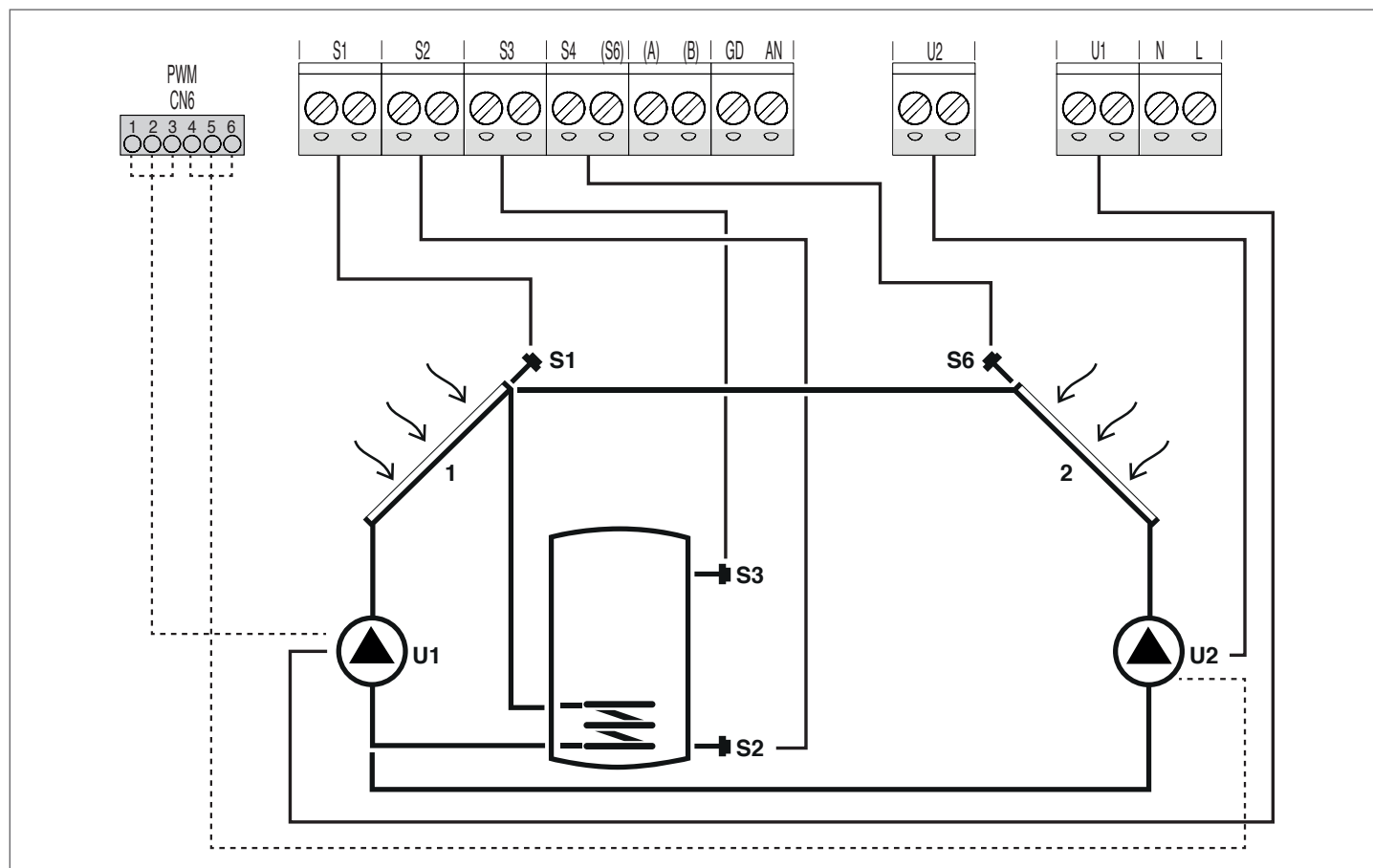
The system works both on the temperature difference between the first solar collector (S1) and the low zone of storage system (S2) as well as on the temperature difference between the second solar collector (S6) and the same zone (S2) to maintain the storage temperature set in parameter no. 59 (B1LO – SETPOINT BOILER LOW).

If the difference S1-S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated. The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).

If the difference S6-S2 is greater than or equal to the value set in parameter n°14 (ON62), the pump connected to output U2 is activated. The pump (U2) remains active until the temperature difference between S6 and S2 reaches the value set in parameter n°15 (OF62).

The pump (U2) remains active until the temperature difference between S6 and S2 reaches the value set in parameter n°15 (OF62).

NOTE: as second pump (U2), it is recommended to use a pump with modulation PWM.



Key:			
SET	editable parameter	S	temperature probe
/	parameter or value not utilised	U	pump/valve managed by regulator
R/O	parameter available for modbus in read-only mode		
R/W	parameter available for modbus in write and read mode		

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
5	S6 probe S6 temperature display	S6	°C	VIS	-40	>260	/	1	1005[R/O]	1	U
8	DTON S1S2 defines the S1-S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	0F12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
14	DTON S6S2 defines the S6-S2 differential for starting the pump associated to output U2	0N62	°C	SET	5	10	6	0,5	1014[R/W]	1	I
15	DTOFF S6S2 defines the S6-S2 differential for stopping the pump associated to output U2	0F62	°C	SET	1	4	4	0,5	1015[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
44	MANUAL MODE U1 enables/disables manual operation of output U2	MAN2	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
59	SETPOINT B011 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1L0	°C	SET	15	90	60	0,5	1059[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
79	THRESHOLD FOR U2 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS20	°C	SET	15	60	30	0,5	1079[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
115	ACTUAL SPEED U2 displays the current speed of the pump connected to output U2	U2 %	%	VIS	0	100	/	1	1115[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
127	MINIMAL SPEED U2 defines the minimum speed of the modulating pump associated to output U2	U2 %	%	SET	10	90	10		1127[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	MODU	1	/	/	I
139	U2 OUTPUT CONTROL MODE defines the control type of output U2: ON-OFF; IMPU= impulsive; MODU= PWM	PIU2	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	ON-OFF	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	ON12	30	20	0,5	1148[R/W]	1	I
151	U2 MODULATION DIFFERENTIAL SET defines the temperature differential associated with output U2, regulated according to the function defined by the parameter PUMP MODULATION	SOU2	°C	SET	5	30	20	0,5	1151[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
172	SOLAR PANEL 2 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S6 is activated	OSP2	°C	SET	100	120	120	0,5	1172[R/W]	1	I
175	SOLAR PANEL 2 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP2	°C	SET	125	200	140	0,5	1175[R/W]	1	I
178	BO11 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TSON	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TSOF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
192	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.2	APS2	-	SET	OFF	ON	ON	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
205	OPERATING HOURS OUTPUT U2 Stores/resets the operating hours of the pump connected to output U2	P4TI	h	VIS	0	9999	/	1	1205[R/W]	1	I
208	BOH NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

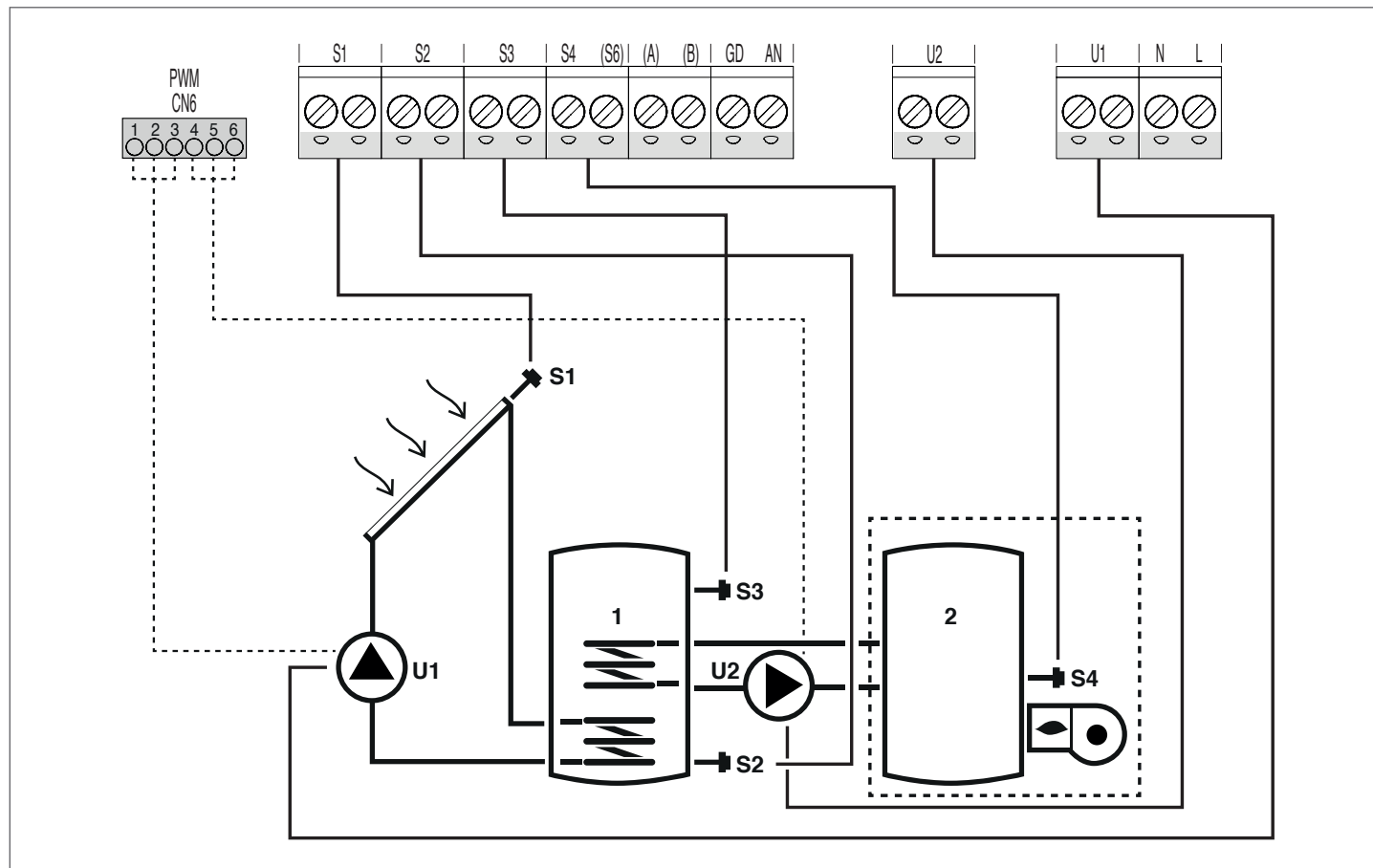
System 8 – Solar system with supplementary heating through pump acting on solid fuel generator

The system works on the temperature difference between solar collector (S1) and the low zone of storage system (S2) to maintain the temperature set in parameter no. 59 (B1LO – SETPOINT BOILER1 LOW). It manages a supplementary system (2), for example a solid fuel generator, by working on the temperature difference between said system (S4) and the high zone of storage system (S3) to maintain the temperature set in parameter no. 56 (B1HI – SETPOINT BOILER1 HIGH).

If the difference S1–S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated. The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).

If the difference S4–S3 is greater than or equal to the value set in parameter n°24 (ON43) and the temperature of solid fuel generator (S4) is greater than the value set in parameter n°160 (T10N), the pump connected to output U2 is activated.

The pump (U2) remains active until the difference S4–S3 reaches the value set in parameter n°24 (OF43) or if the temperature of solid fuel generator (S4) reaches the value set in parameter n°163 (T10F).



Key:

SET editable parameter

/ parameter or value not utilised

R/O parameter available for modbus in read-only mode

R/W parameter available for modbus in write and read mode

S temperature probe

U pump/valve managed by regulator

--- integration system

For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
3	S4 probe S4 temperature display	S4	°C	VIS	-40	>260	/	0,1	1003[R/O]	1	U
8	DTON S1S2 defines the S1–S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	0F12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
24	DTON S4S3 defines the S4-S3 differential for starting the pump associated to output U2	0N43	°C	SET	5	10	6	0,5	1024[R/W]	1	I
25	DTOFF S4S3 defines the S4-S3 differential for stopping the pump associated to output U2	0F43	°C	SET	1	4	4	0,5	1025[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
44	MANUAL MODE U1 enables/disables manual operation of output U2	MAN2	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
56	SETPOINT B011 HIGH ZONE defines the water temperature setpoint for the high zone of STORAGE SYSTEM 1	B1HI	°C	SET	15	90	60	0,5	1056[R/W]	1	U
59	SETPOINT B011 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1LO	°C	SET	15	90	60	0,5	1059[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
115	ACTUAL SPEED U2 displays the current speed of the pump connected to output U2	U2 %	%	VIS	0	100	/	1	1115[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
127	MINIMAL SPEED U2 defines the minimum speed of the modulating pump associated to output U2	U2 %	%	SET	10	90	10		1127[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	MODU	1	/	/	I
139	U2 OUTPUT CONTROL MODE defines the control type of output U2: ON-OFF; IMPU= impulsive; MODU= PWM	PIU2	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	ON-OFF	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	ON12	30	20	0,5	1148[R/W]	1	I
151	U2 MODULATION DIFFERENTIAL SET defines the temperature differential associated with output U2, regulated according to the function defined by the parameter PUMP MODULATION	SOU2	°C	SET	5	30	20	0,5	1151[R/W]	1	I
160	Output U2 activation temperature for solid fuel generator supplementary system defines the temperature threshold to activate heat exchange between stove and storage system	T1ON	°C	SET	65	75	65	0,5	1160[R/W]	1	U
163	Output U2 deactivation temperature for solid fuel generator supplementary system defines the temperature threshold to deactivate heat exchange between stove and storage system	T1OF	°C	SET	60	40	60	0,5	1163[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I
178	BO11 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TSON	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TSOF	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
193	THERMAL DISINFECTION FUNCTION ENABLE activates the anti-legionella thermal disinfection function	DTON	°C	SET	ON	OFF	OFF	1	/	/	I
194	THERMAL DISINFECTION TEMPERATURE	TMPD	°C	SET	60	95	60	0,5	/	/	I
195	THERMAL DISINFECTION CONTROL PERIOD	PRDM	dd:hh	SET	00:00	30:24	01:00	1	/	/	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
196	THERMAL DISINFECTION PERIOD	PRDR	hh:mm	SET	00:00	23:59	01:00	1	/	/	I
197	THERMAL DISINFECTION IN PROGRESS COUNTER	CNTD	h	VIS	00:00	30:24	/		/	/	I
198	THERMAL DISINFECTION START TIME	ORAD	hh:mm	SET	00:00	23:59	00:00	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
203	OPERATING HOURS OUTPUT U2 Stores/resets the operating hours of the pump/supplementary system connected to output U2	P3TI	h	VIS	0	9999	/	1	1202[R/W]	1	I
208	BOI1 NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

System 9 – SOLAR SYSTEM WITH TEMPERATURE INCREASE SYSTEM IN HEATING CIRCUIT RETURN

The system works on the temperature difference between solar collector (S1) and the low zone of storage system (S2) to maintain the storage temperature set in parameter no. 59 (B1LO – SETPOINT BOILER1 LOW). It also checks the temperature difference between the high zone of storage system (S3) and the return circuit of heating system (S6) to integrate such system in case the storage system is sufficiently heated.

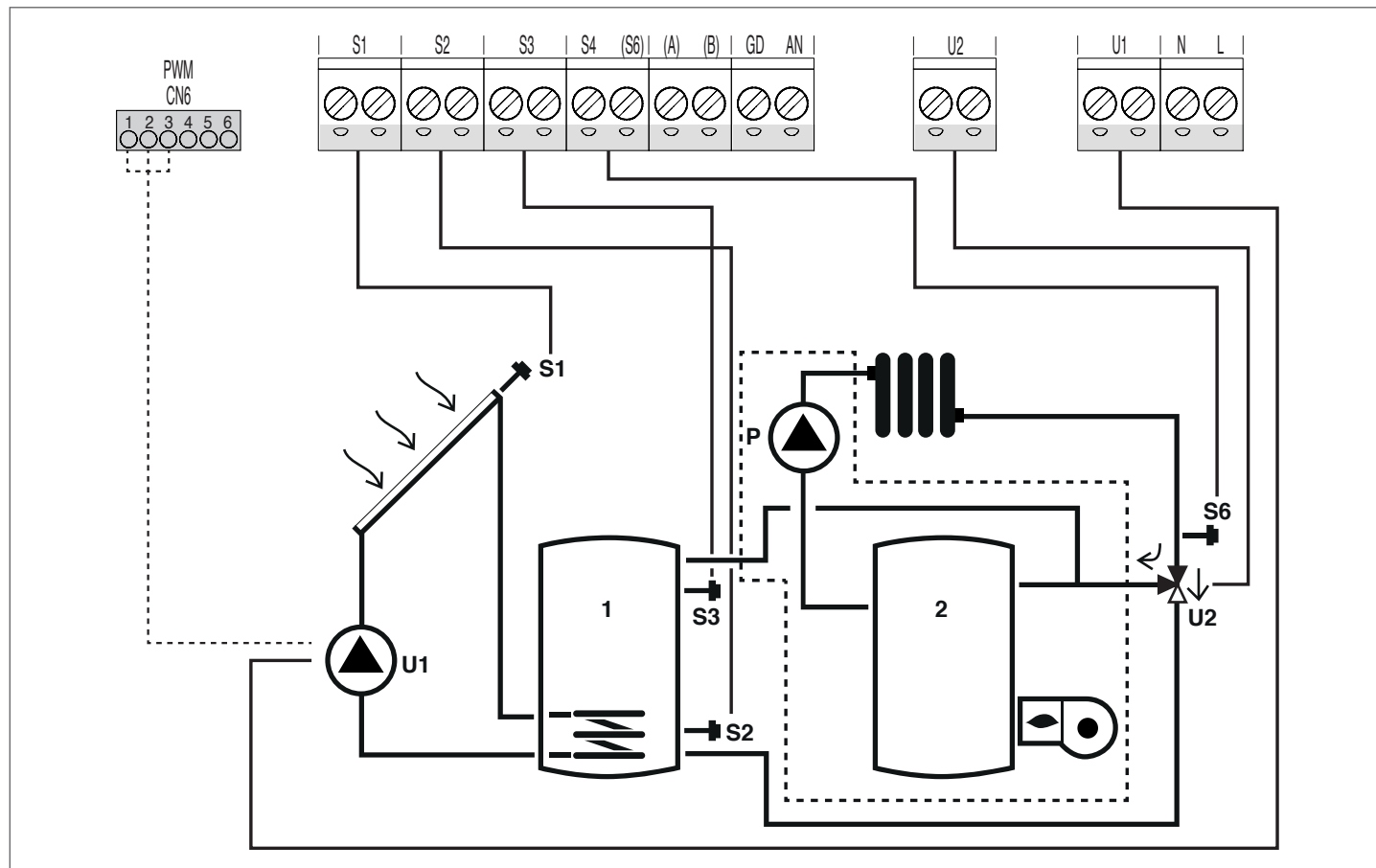
The supplementary increase system is used for the return circuit of the heating system.

If the difference S1-S2 is greater than or equal to the value set in parameter n°8 (ON12), the pump connected to output U1 is activated.

The pump (U1) remains active until the temperature difference between S1 and S2 reaches the value set in parameter n°9 (OF12).

If the difference S3-S6 is greater than or equal to the value set in parameter n°18 (ON36), the solenoid valve connected to output U2 is switched.

The heating circuit is heated until the difference S3-S6 reaches the value set in parameter n°19 (OF36).



Key:

SET editable parameter

/ parameter or value not utilised

R/O parameter available for modbus in read-only mode

R/W parameter available for modbus in write and read mode

S temperature probe

U pump/valve managed by regulator

P pump

--- heat generator








For operating instructions on how to modify adjustable parameters, refer to chapter "Parameter description".

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
0	S1 probe S1 temperature display	S1	°C	VIS	-40	>260	/	0,1	1000[R/O]	1	U
1	S2 probe S2 temperature display	S2	°C	VIS	-40	>260	/	0,1	1001[R/O]	1	U
2	S3 probe S3 temperature display	S3	°C	VIS	-40	>260	/	0,1	1002[R/O]	1	U
5	S6 probe S6 temperature display	S6	°C	VIS	-40	>260	/	1	1005[R/O]	1	U
8	DTON S1S2 defines the S1-S2 differential for starting the pump associated to output U1	ON12	°C	SET	5	10	6	0,5	1008[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
9	DTOFF S1S2 defines the S1-S2 differential for stopping the pump associated to output U1	0F12	°C	SET	1	4	4	0,5	1009[R/W]	1	I
18	DTON S3S6 defines the S3-S6 differential for enabling the valve associated to output U2	0N36	°C	SET	5	10	6	0,5	1020[R/W]	1	I
19	DTON S3S6 defines the S3-S6 differential for disabling the valve associated to output U2	0F36	°C	SET	1	4	4	0,5	1021[R/W]	1	I
41	MANUAL MODE U1 enables/disables manual operation of output U1	MAN1	-	SET	OFF ON AUTO	OFF ON AUTO	AUTO	1	/	/	I
59	SETPOINT B01 LOW ZONE defines the water temperature setpoint for the low zone of STORAGE SYSTEM 1	B1LO	°C	SET	15	90	60	0,5	1059[R/W]	1	U
76	THRESHOLD FOR U1 SOLAR PUMP ACTIVATION defines the temperature threshold at which heat exchange between solar panel and storage system is permitted	PS10	°C	SET	10	30	10	0,5	1076[R/W]	1	I
82	SYSTEM NUMBER defines the system number to be used	SYSN	-	SET	1	9	1	1	1082[R/W]	1	I
112	ACTUAL SPEED U1 displays the current speed of the pump connected to output U1	U1 %	%	VIS	0	100	/	1	1112[R/O]	1	I
115	ACTUAL SPEED U2 displays the current speed of the pump connected to output U2	U2 %	%	VIS	0	100	/	1	1115[R/O]	1	I
124	MINIMAL SPEED U1 defines the minimum speed of the modulating pump associated to output U1	U1 %	%	SET	10	90	30		1124[R/W]	1	I
136	U1 OUTPUT CONTROL MODE defines the control type of output U1: ON-OFF; IMPU= cut-off; MODU= PWM	PIU1	-	SET	ON-OFF IMPU MODU	ON-OFF IMPU MODU	MODU	1	/	/	I
147	Pump modulation defines the modulating pump regulation type to maintain the set setpoint (OFF = linear regulation; ON = PID regulation).	ALTM	-	SET	OFF	ON	ON	1	/	/	I
148	U1 MODULATION DIFFERENTIAL SET defines the temperature differential (S1-S2) associated with output U1, regulated according to the function defined by the parameter PUMP MODULATION	SOU1	°C	SET	0N12	30	20	0,5	1148[R/W]	1	I
166	SOLAR PANEL 1 ANTI-STAGNATION FUNCTION START TEMPERATURE defines the temperature threshold at which the anti-stagnation function relating to the solar collector controlled by probe S1 is activated	OSP1	°C	SET	100	120	120	0,5	1166[R/W]	1	I
169	SOLAR PANEL 1 ANTISHOCK FUNCTION START TEMPERATURE defines the temperature threshold at which the pump switches from continuous operation to intermittent operation (antishock)	OPP1	°C	SET	125	200	140	0,5	1169[R/W]	1	I

Par. No.	Description	Initials	UM		Value				Register Index	Modbus address	USER / INST.
					min.	max.	default	step			
178	BO11 SAFETY MAXIMUM TEMPERATURE defines the temperature threshold at which any anti-stagnation or heat exchange function relating to storage system 1 must stop	B1ST	°C	SET	70	90	85	0,5	1178[R/W]	1	I
182	THERMAL ANTISHOCK FUNCTION ENABLE enables the anti-thermal shock function to protect the solar collectors	ASCK	-	SET	OFF	ON	ON	1	/	/	I
183	ANTISHOCK FUNCTION STOP THRESHOLD defines the temperature threshold below which the pump returns to continuous operation (antishock operation stop)	ASST	°C	SET	115	125	120	1	1183[R/W]	1	I
184	Pump ON interval during anti-thermal shock function defines the pump operating interval during antishock	TS0N	sec	SET	1	120	3	1	/	/	I
185	Pump OFF interval during anti-thermal shock function defines the pump deactivation interval during antishock	TS0F	sec	SET	30	1800	60	1	/	/	I
186	ANTISHOCK FUNCTION PUMP SPEED	ASPE	%	SET	10	100	100	1	/	/	I
190	ANTIFREEZE ENABLE activates the anti-freeze function to protect solar panel no.1	APS1	-	SET	OFF	ON	ON	1	/	/	I
199	OPERATING HOURS OUTPUT U1 Stores/resets the operating hours of the pump connected to output U1	P1TI	h	VIS	0	9999	/	1	1196[R/W]	1	I
208	BO11 NIGHT COOLING FUNCTION activates the night cooling function of integration system 1	NCB1	-	SET	OFF	ON	ON	1	/	/	I
247	RESET DEFAULT PARAMETERS set the parameter to 1 to restart the control unit and restore the default parameters	RSTD	-	SET	0	1	0	1	/	/	I
250	MODBUS SLAVE ADDRESS defines the address of the solar regulator configured as Slave in a MODBUS RTU network	ADMB	-	SET	1	32	1	1	/	/	I

6 TROUBLESHOOTING

FAULT	CAUSE	SOLUTION
The control unit does not turn on.	Lack of power supply.	<ul style="list-style-type: none"> – Check the power cable. – Check electric power supply. – Check the status of the regulator fuse.
The temperature of probe Sx is not displayed (x = 1, 2, 3, 4, 6).	Cable of sensor Sx not connected to the control unit.	– Check connection between probe Sx and control unit.
	Probe Sx faulty.	– Replace probe Sx.
The symbol  flashes Pump P1 is stopped and output U1 turned off	Probe S1, positioned on solar collector no.1, not correctly installed or faulty. Probe S2, positioned in the low zone of the storage system, not correctly installed or faulty.	<ul style="list-style-type: none"> – Replace the probe. – Check the proper positioning of the probe and the wiring/connection integrity.
The symbol  flashes Parameter LOW BOILER1 SETPOINT B1LO is limited to 50°C	Probe S3, positioned in the high zone of the storage system, faulty.	– Replace the probe.
The symbol  flashes Pump P3 is stopped and output U2 turned off in systems 2 and 8	Probe S4, positioned on the second storage system, faulty.	– Replace the probe.
The symbol  flashes Output U2 is turned off in system 5	Probe S4, positioned on the second storage system, faulty.	– Replace the probe.
The symbol  flashes Pump P2 is stopped and output U2 turned off in system 6	Probe S4, positioned on the second storage system, faulty.	– Replace the probe.
The symbol  flashes Pump P4 is stopped and output U2 turned off in system 7	Probe S6, positioned on solar collector no.2, faulty.	– Replace the probe.
The symbol  flashes Output U2 is turned off in system 9	Probe S6, positioned on return circuit of heating system, faulty.	– Replace the probe.

FAULT	CAUSE	SOLUTION
Pressure of Grundfos sensor is not displayed.	Cable of sensor not connected to the control unit.	- Check connection between sensor and control unit.
	Sensor faulty.	- Replace the sensor.
Temperature of Grundfos sensor is not displayed.	Cable of sensor not connected to the control unit.	- Check connection between sensor and control unit.
	Sensor faulty.	- Replace the sensor.
Flow rate of Grundfos sensor is not displayed.	Cable of sensor not connected to the control unit.	- Check connection between sensor and control unit.
	Sensor faulty.	- Replace the sensor.
Anti-thermal shock function is not performed.	Anti-thermal shock function disabled.	- Enable anti-thermal shock function through the menu.
Anti-freeze function is not performed.	Anti-freeze function disabled.	- Enable anti-freeze function through the menu.
Thermal disinfection function is not performed (available for systems 1, 3, 8 only).	Thermal disinfection function disabled.	- Enable thermal disinfection function through the menu.
Night cooling function is not performed.	Night cooling function disabled.	- Enable night cooling function through the menu.

7 RECYCLING AND DISPOSAL

The solar controller includes the ABS casing and the electronic board. At the end of the device's useful life, these components must be separated and disposed of according to current regulations in the country of installation.

The manufacturer strives to continuously improve all products. Appearance, dimensions, technical specifications, standard equipment and accessories are therefore liable to modification without notice.