

TERMO SOLIS

electronic digital unit to control solar systems



TECHNICAL HANDBOOK EN DE

Read carefully this guide and follow the instructions before proceeding with installation.

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FOREWORD

This handbook contains information for use and installation of electronic unit TERMOSOLIS. Read carefully the guide before proceeding with any other action.
The warranty declines if the instructions are not respected. The producer cannot be held responsible for any damage caused to things or people due to an incorrect application of safety instructions.

COMPLIANCE

The device is in compliance with:

- **2006/95/CE**
(Low Voltage Directive)
- **2004/108/CE**
(EMC Directive)
- **EN 55014-1**
(Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission)
- **EN 60730-1**
(Automatic electrical controls for household and similar use. Part 1: General requirements)

Regulations concerning assembly and installation of solar device:

- **EN 12975-1:2006**
(Thermal solar systems and components – Solar collectors. – Part 1: General Requirements)
- **EN 12975-2:2006**
(Thermal solar systems and components – Solar collectors. – Part 2: Test methods)
- **EN 12976-1:2006**
(Thermal solar systems and components - Factory made systems - Part 1: General requirements)
- **EN 12976-2:2006**
(Thermal solar systems and components - Factory made systems - Part 2: Test methods)
- **EN 12977-3:2008**
(Thermal solar systems and components - Custom built systems - Part 3: Performance test methods for solar water heater stores)
- **PrEN 12977-1:2001**
(Thermal solar systems and components - Custom built systems - Part 1: General requirements)
- **PrEN 12977-2:2001**
(Thermal solar systems and components - Custom built systems - Part 2: Test methods)
- **PrEN 12977-4**
(Thermal solar systems and components - Custom built systems - Part 4: Performance test methods for solar combistores)
- **PrEN 12977-5**
(Thermal solar systems and components - Custom built systems - Part 5: Performance test methods for control equipment)
- **EN 60335-1**
(Safety of Household and Similar Appliances, Part 1: General Requirements)

WARRANTY

The electronic unit TERMOSOLIS is under seller's legal two-year warranty as provided by Consumer Code (Legislative Decree 6 September 2005 no. 206). Pursuant to articles from 128 to 135 of Consumer Code, consumers have right to obtain from seller free reparation or free replacement of products presenting a CONFORMITY DEFECT during 24 months after the delivery date. The defect must be notified within 2 months from its discovery.

Warranty does not include:

- Parts that are subject to wear and tear and wear materials
- Damages due to:
 - Contrary employ than the purpose use or no respect of what indicated in the instructions manual and/or in the safety instructions.
 - Carelessness, accidents or normal wear and tear
 - Influences/external agents (for example: damages due to vibrations, transport damages, exceeding heat, water, humidity or acids)
 - Use of not suitable accessories

Warranty is no more valid in case:

- Type or serial number and/or production date of the product are modified, cancelled, removed or are made illegible.
- Reparations or modification are made by not authorized third parts.

Warranty does not include:

- Ordinary maintenance or replacement of components due to normal wear and tear
- Packaging and transport costs
- Risks of transports that are connected directly or indirectly to the guarantee.
- Setting costs and similar.
- Reparation costs made after the warranty period

SAFETY INSTRUCTIONS AND RULES

- Please read carefully the instructions contained in this handbook.
- This handbook is part of the device and, consequently, must be well preserved for future references and it must go with TERMOSOLIS even in case of transfer to another proprietor.
- After unwrapping, check that the device is wholly corresponding to the power supply specs and, if not, do not use it and apply to the seller.
- TERMOSOLIS is intended only to be used according to its producers' end, any other destinations can be not proper and even dangerous.
- The constructor cannot be blamed for damages to people, animals or things, if they are caused by faulty installation, regulations and maintenance and by inappropriate use of the device.
- Device must be installed by skilled and qualified people ONLY working in conformity to current National and Local Directives and according to the instructions of this handbook.
- Comply strictly to the technical characteristics in the handbook, minding to not go beyond the reported limit sets.

- Before installing the device, cut the electrical supply or be sure that the net voltage has been completely removed.
- During installing the device must NOT be supplied.
- To assure device correct functioning, installing must accomplished only in dry outdoor places.
- Do not install the device in presence of high electromagnetic fields.
- Before connecting external components, read carefully the technical specs.
- External components must be installed by skilled technicians in case of a voltage overcoming 35Volt.
- Before touching the terminals, get sure that external components are NOT under voltage or have an electrical charge.
- In the electrical distribution, the power supply cables must be separated from the signaling ones.
- Protect probes from external overloading and from electrostatics discharges.
- If the cables show a clear wearing state, functioning must be immediately stopped and the cables must be replaced very quickly.
- Before set in motion the device, check that there are no voltage drops.
- The device is electrically safe only if it is correctly connected to a proper ground plant, made conforming to the current Safety Directives on plants (Law n° 46 - 5th March 1990). The device must be have an electrical connection to a 230V supply net (monophasic + ground) through a 3-wires cable.
- The device must be connected to electrical distribution through a bipolar switch which contacts must have an opening of 3 mm and a fuse type 2,5 A – fast.

FORBIDDEN OPERATIONS

- **It is strictly FORBIDDEN** any installing and maintenance operation before disconnecting the device from the electrical supply net by setting the general switch on "off". Get sure also that other external components connected to the board are not under voltage.
- **It is strictly FORBIDDEN** to pull, disconnect or twist the electrical cables coming out from the device, even if they are not connected to the electrical supply net.
- **It is FORBIDDEN** to pollute the environment with the package. This must be get disposed of according to the current regulation.
- **It is FORBIDDEN** to wet the board, or the external components in case of fire. The device must be electrically isolated by cutting the main supply and the flames must be put out with a fire extinguisher properly intended for electrical appliances.
- **It is FORBIDDEN** touching the device if you are barefoot or if your body is wet.
- **It is FORBIDDEN** modify the safety or regulation devices without the constructor's instructions or permission.

DESCRIPTION

TERMOSOLIS is a digital electronic device which can be programmed to manage thermal solar plants.

The solution **manages** wholly the solar system by checking the pumps, the eventual diverter valve, the probes (PT1000 e NTC), a puffer/boiler and, also, another secondary heating source.

The integrated user **interface** is composed by a backlight display and 4 buttons. The display shows the scheme of the selected plant and the probes in place with their values and the eventual anomalies, while the buttons can switch on or off the device and program the board functions.

To assure the system **endurance**, when switched off, some functions are kept on, as the anti-freezing protection, the anti-lock of the pump and of the diverter valve.

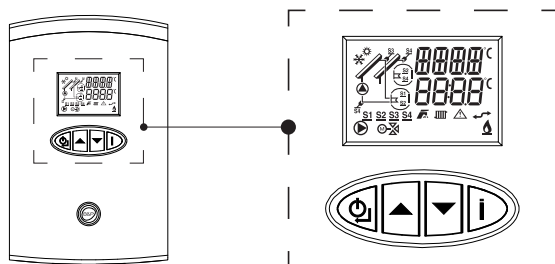
There are 3 possible **profiles** of the device, such as Stand Alone, in which only TermoSolis is present itself; communicating with a Sime Home/Sime Home Plus remote control, so a remote control and Full System manage the system; and then the complete solution, which sees the connections with other Sime devices to get the whole control of the heating and DHW plant.

SET CONTENT

- **Solar board composed by:**
 - Front cover
 - Back cover
 - Electronic board
 - LCD Display Base
 - Buttons
 - Phillips-head screw holding front and back
 - Cover to hide the holding screw
- **Accessories:**
 - N° 6 Holder for white cables
 - N° 12 Screws fo cables holders
 - N° 2 PT1000 probes (identified by a label)
 - N° 2 NTC probes (identified by a label)
 - N° 2 Wall plugs + screws to hang the device
 - Handbook

INTERFACE

The interface of the board is composed by a LCD display, dim. 41x28mm about, and by 4 buttons in row under the LCD.



The **display** shows 3 kinds of information:

1. Values*

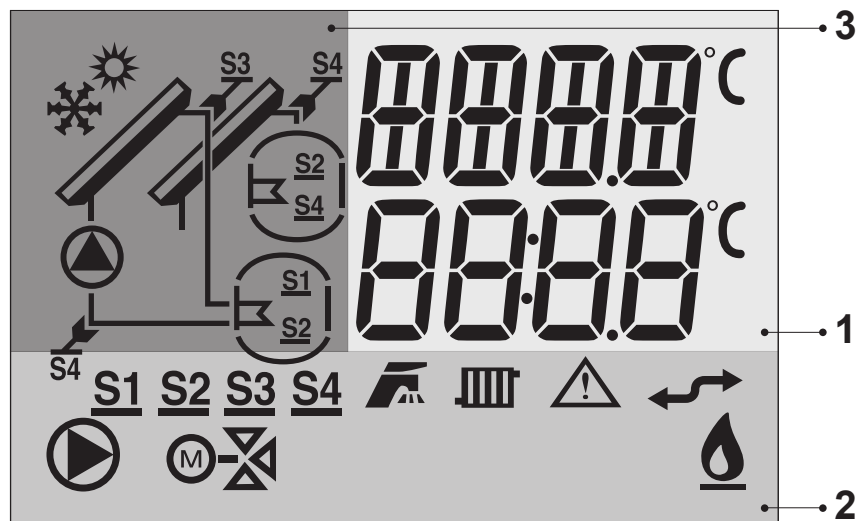
On the right hand of the display, in 2 rows, you can see the parameters, their settings, probes temperatures and, eventually, anomaly codes. All the temperature are in °C.

2. Signs

A presence of signs shows probes in place, status of the system, anomalies, etc.


3. Plant schemes

You can see the selected plant scheme (parameter 26) with different blinking signs, fixing signs or signs which fade away according to the current status of the system.







* when probes temperatures are shown in the upper row S3 or S4 are present while in the under one you can see S1 or S2

Meaning of the **signs**:

SIGN	DESCRIPTION	STATE		
		ON	BLINKING	OFF
	SOLAR PUMP	Not Working	Working	-
	PUMP 2	Not Working	Working	-
	DIVERTER VALVE	Switched (Relay is energized)	-	Open (Relay is not energized)
	FLAME	Boiler's burner is working*	-	-
	ANOMALY	-	Present	-
	OPEN THERM CONNECTION	Present	-	Absent
	HEATING (CH)	Boiler/Cascade control with CH enabled*	Boiler/Cascade control mode CH*	-
	SANITARY (DHW)	Boiler/Cascade control with DHW enabled*	Boiler/Cascade control mode DHW*	-
	SUN	-	Cooling function for the solar collector is active	-
	ANTIFREEZE	-	Working	-
	DEGREES CELSIUS	Measured temperature	-	-
	DIGIT	Showing of temperature, parameters or values	-	-
	PROBES IN THE SYSTEM PLAN	Present	Working condition satisfied or fault (if there is also: )	-
	PROBES	Main probes (Referred to the temperature shown in the digit)	Secondary probes (Referred to the temperature shown in the digit)	-
	TANK	Present	-	Absent
	SOLAR PANEL	Present	-	Absent

*in FULL SYSTEM conf., OpenTherm communication system to interchange with other devices (par. 25=3)

Function of the **buttons**:

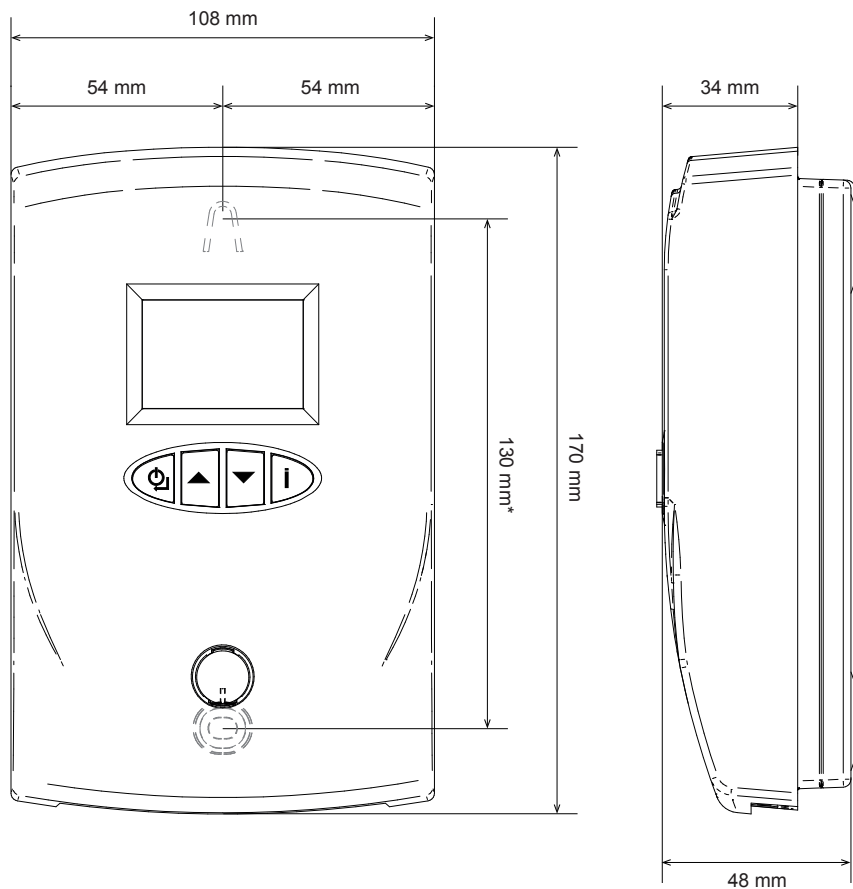
SERIGRAPH	DESCRIPTION	FUNCTION
	ON/OFF	Turn on or turn off the device
	BACK	Back to previous menu
	INCREASE	Go to next parameters or go to next value
	DECREASE	Go to previous parameter or go to previous value
	INFO	Keep pressed for 1 sec.: Temperature information (S2, S3 - S1,S4)
		Keep pressed for 10 sec.: Access to programming menu

TECHNICAL DATA

GENERAL

GENERAL	
Power supply	230 Vac +10% ÷ -15%
Frequency	50Hz +5% ÷ -5%
Range of working temperatures	-20°C ÷ +60°C
Fuse	3,15AF (fast) 5x20
Varistor	300 Vac D7
SOLAR PUMP - P1 TRIAC (230 Vac)	0,5A – Cosφ 1
AUX 3 out - P1 PWM (230 Vac)	230Vac – 0,5A
AUX 2 out - P2 (230 Vac)	0,5A – Cosφ 1
AUX 1 out - Enabled thermostat /P2	0,5A – Cosφ 1
FREE CONTACT out - D1 (230 Vac)	230Vac – 0,5A
TEMPERATURE PROBE NTC	
Range of correct work of the probes	-40°C ÷ +105°C
Temperature in which the probe will indicate a fault	-5°C>T>>120°C
General tolerance on temperatures (referred only to electronic board)	±1,5°C
TEMPERATURE PROBE PT1000	
Range of correct work of the probes	-40°C ÷ +250°C
Temperature in which the probe will indicate a fault	-50°C>T>170°C
General tolerance on temperatures (referred only to electronic board)	±1,5°C
ENVIRONMENTAL CONDITIONS OF USE	
Ambient working temperature	-20°C ÷ +60°C
Storage and transport temperature	-30°C ÷ +60°C
Max. environment humidity (without any condensing)	95% a 40°C

DIMENSIONS



The plastic box has protection rating IP20

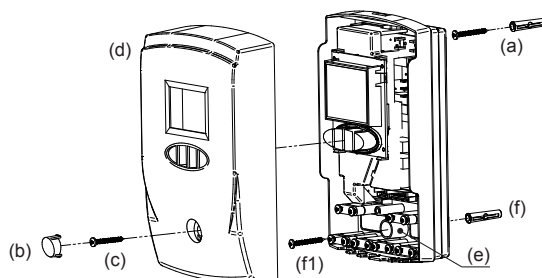
*130 mm is the wheelbase between the holding hanger, which is set up in the front side of the device (back cover), and the fixing hole, which is placed down in the back cover.

MOUNTING

- Read carefully the sections “CAUTIONS AND SAFETY RULES” and “FORBIDDEN OPERATIONS”.
- The device must be mounted by skilled and qualified people **ONLY** working in conformity to current National and Local Directives and following the instructions of this handbook.
- Before starting the mounting, power supply must be cut as well the voltage net.
- Take the right consideration of the room and space in order that the board can be easily reached and maintained.
- To be sure that the device works properly, installing operations have to be made in closed and dry places only.

Follow the instructions to mount TERMOSOLIS:

1. Place the suspending screw on the wall (a), taking carefully the measurements, in order to hanging in the device to suspension point
2. Take off the front cover from the device (b), with the help of a slot screwdriver and leveraging on the loopholes
3. Unscrew the holding Phillips screw (c) removing the front cover (d) mind not damaging the display
4. Mark the fixing down point (e)
5. Unhook the device, make a hole and insert the inferior wall-plug (f)
6. Hang in again the device and fix it to the wall through the holding screw (f1)
7. **Go on with the cabling (see section “CABLING”)**
8. Close the back with the front cover (d) and fix it by the screw which was taken off before (c)
9. Apply the cover on the screw (b)



CABLING

- Read carefully the sections “CAUTIONS AND SAFETY RULES” and “FORBIDDEN OPERATIONS”.
- The cabling of the device must be made by skilled and qualified people **ONLY** working in conformity to current National and Local Directives and following the instructions of this handbook.

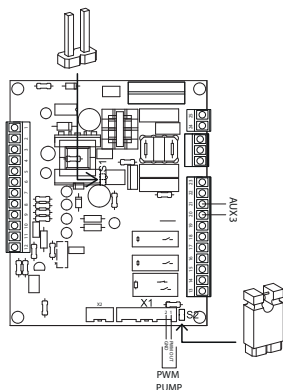
- Before starting the cabling, power supply must be cut as well the voltage net.
- Use the loopholes under the devices and the inserted cable holders to pass through the cables, be careful to keep the power cables apart (terminals 13 ÷ 25) from the signalling ones (terminals 1 + 12 and X1 "PWM PUMP").

And it is also essential:

- Use a magneto-thermal omnipolar switch, line disconnector, according to EN directives.
- Keep the connection L (Line) – N (Neutral), taking care that the ground conductor is at least 2 cm. longer than L and N.
- DO NOT use cables having a diameter lower than 1mm².
- Refer to this handbook schemes for any electrical work.
- All the connections must link to a good efficient ground plant
- DO NOT use the water pipes to connect the device to ground.

Before proceeding with the electrical connection choose a plant scheme, with its proper profile, among those which are in the paragraph "PLANT SCHEMES".

Choose as soon as possible the output of the main pump P1 which you want using if PWM, high efficiency pump, or TRIAC, traditional pump with induction motor. Choose the output TRIAC and set the jumper (cover) which is on the electronic board in the position S1, see the sketches here above (it is automatically set on S2 that is PWM). To make this operation and reach the board, you have to disconnect the display and remove it and its holder too, be careful to not damage it and move the jumper from S2 to S1 position. After putting the jumper in the right position, hang again the holder with the display and connect it to the board.

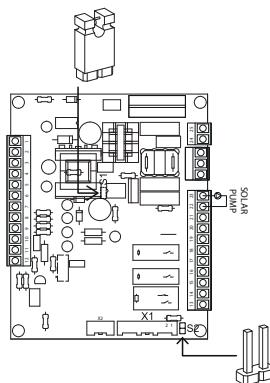


Default presence:

Jumper in S2= PWM (high efficiency pump with output PWM)

Connect the pump control to X1 (PWM PUMP) with appropriate wire and give power supply to terminals 21 and 20 (AUX3).

Set PAR 24 correctly.



To connect a traditional pump:

Move the jumper in S1= TRIAC (traditional pump with induction motor)

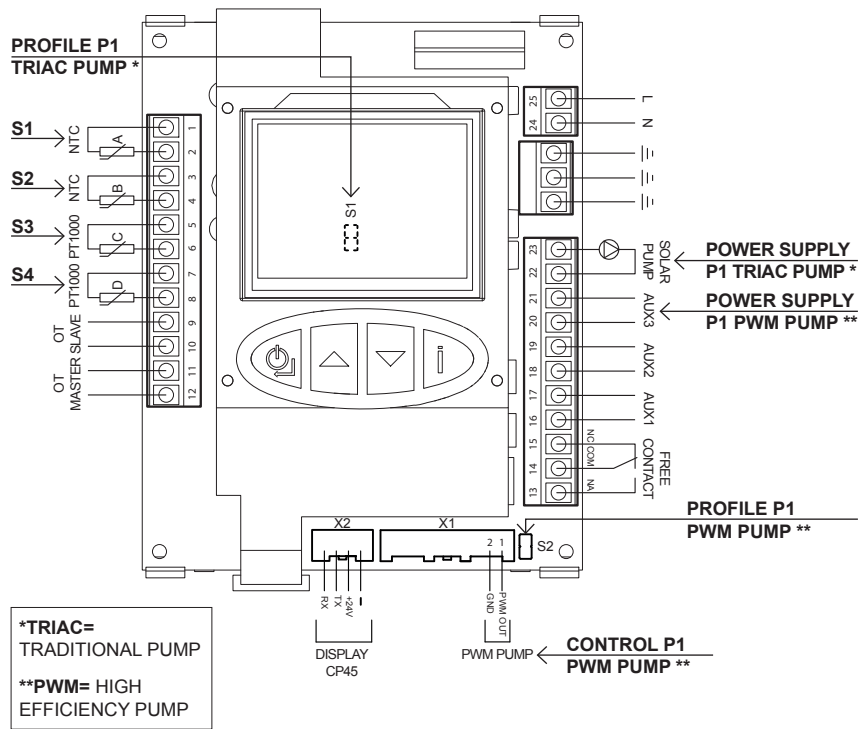
Give power supply to terminals 23 and 22 (SOLAR PUMP)*.

Set PAR 24 correctly.

*To use a pump more powerful than the declared data for output SOLAR PUMP, you must set PAR 3= 2 (pump 1 with output AUX2) and connect to this output an external relay with the due technical specifications.

The table and the drawing show the terminal numbers and their connections:

ATTENTION: Be careful when detaching the terminals.



POWER SUPPLY			
TYPE	TERMINAL	CONNECTION	WIRES LENGTH
POWER SUPPLY* (230Vac +10% + -15%)	25	Line	Not significant
	24	Neutral	Not significant
		Ground	2cm > L and N
LOADS			
TYPE	TERMINAL	CONNECTION	WIRES LENGTH
SOLAR PUMP = PUMP P1 TRIAC (230 Vac; 49W; cosφ 1)	23	Neutral	< 3m
	22	Line	
		Ground	
AUX3 = POWER SUPPLY PUMP P1 PWM (230 Vac)	21	Neutral	< 3m
	20	Line	
		Ground	

AUX2 = PUMP P2 (230 Vac; 0,5 A; cosφ 1)	19	Neutral	< 3m
	18	Line	
		Ground	
AUX1 = ENABLED THERM./PUMP P2 (230 Vac)	17	Neutral	< 3m
	16	Line	
		Ground	
FREE CONTACT = DIVERTER VALVE D1 (230Vac; 5W)	15	Normally closed	< 3m
	14	Shared	
	13	Normally open	
		Ground	
PWM OUT			
TYPE	JST X1	CONNECTION	WIRES LENGTH
PWM PUMP = P1 PWM CONTROL	X1	Wires without polarity	< 3m
PROBES			
TYPE	TERMINAL	CONNECTION	WIRES LENGTH
NTC A = S1	1,2	Wires without polarity	< 10m
NTC B = S2	3,4	Wires without polarity	
PT1000 C = S3	5,6	Wires without polarity	
PT1000 D = S4	7,8	Wires without polarity	
DATA TRANSMISSION			
TYPE	TERMINAL	CONNECTION	WIRES
OT - SLAVE = REMOTE CONTROL**	9,10	Wires without polarity	Wires: 2 Type of wire: bipolar**** Length: <50 m Max. resistance: 2*5
OT - MASTER = BOILER***	11,12	Wires without polarity	

* Place a power supply switch and disconnector of the device

** Or: zones manager

*** Or: cascade manager

**** In case of rooms the high electrical noise, it is recommended to use a shielded cable or a stranded wire.

Remind to keep the power cables apart (term. 13 ÷ 25) from the signaling cables (term. 1 ÷ 12 and connectors jst "PWM PUMP").

PLANT SCHEMES

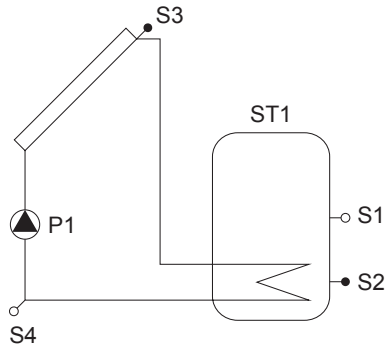
Before proceeding with the cabling, choose one of the 12 plants schemes with proper profiles or read carefully paragraph "CABLING".

- Connect the cables as per the related table
- Use the cables holder, minding to keep the power cables apart (terminals 13 ÷ 25) from the signaling cables (terminals 1÷12 and X1 "PWM PUMP")
- Check that the cables has been made correctly before go on with power supply

Under each scheme there is a description reporting which external components connect and how to made the cabling with the board outputs.

ATTENTION: The following operations must be made without any voltage net.

• **SCHEME 1 - BASIS (parameter 26= 1)**



Set parameter 27 according to the components you want to get enabled.

P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
2	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector return probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
3	S1	Tank superior probe - NTC A		1,2
	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	AUX1	Enabled thermostat - AUX1		17,16
4	S1	Tank superior probe - NTC A		1,2
	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector return probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	AUX1	Enabled thermostat - AUX1		17,16

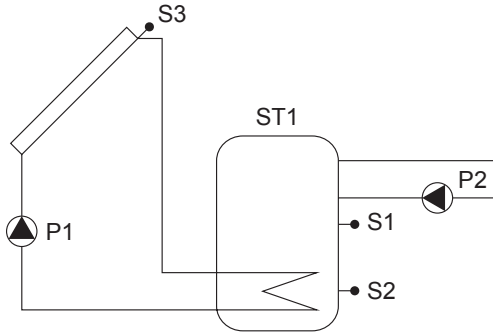
* Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, TRIAC modulating= 1, PWM ON/OFF= 2, PWM modulating= 3.

Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize the solar pump see the first and second point in the "MAIN FUNCTIONS" paragraph. See also "PARAMETERS" paragraph.

When the probe is present on the return of the solar collector (S4), you can set P1 in modulating mode (PAR 24= 1 if TRIAC modulating or PAR 24= 3 if PWM modulating). In this case for configurations 2 and 4.

• **SCHEME 1 - with P2 (parameter 26= 1)**



Set parameter 27 according to the components you want to get enabled.

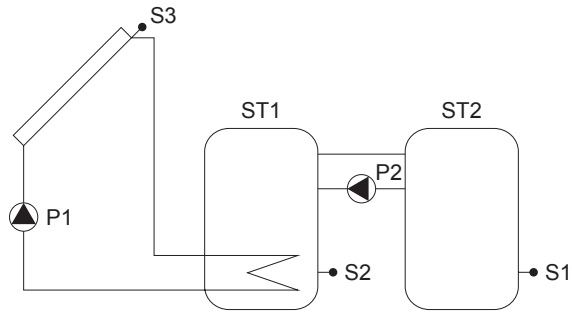
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
5	S1	Tank superior probe - NTC A		1,2
	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Pump2 - AUX1		17,16

* Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize the solar pump see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable P2 see the note. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• **SCHEME 1 - with P2 and ST2 (parameter 26= 1)**



Set parameter 27 according to the components you want to get enabled.

P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
6	S1	Tank inferior probe - NTC A		1,2
	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Pump2 - AUX1		17,16

* Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize the solar pump see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable or disable P2 see point 3. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• **SCHEME 1 - universal ΔT (parameter 26= 1)**

ΔT

Set parameter 27 according to the components you want to get enabled.

P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
7	S1	Probe - NTC A		1,2
	S2	Probe - NTC B		3,4
	S3	Probe - PT1000 C		5,6
	P1	Pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	AUX1	Enabled thermostat - AUX1		17,16

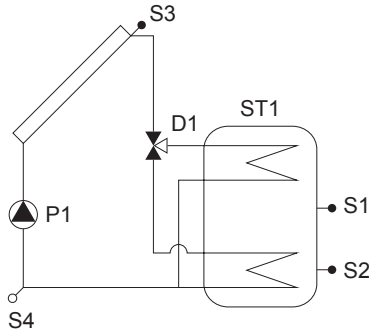
* Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To enable or disable P1 see the fourth point in "MAIN FUNCTIONS" paragraph. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

NOTE: Optional function such as anti-lock, anti-freezing, solar collector cooling, etc. are not enabled.

• **SCHEME 2 – layers loading of the tank (parameter 26= 2)**



Set parameter 27 according to the components you want to get enabled.

P27	COMPONENTI ATTIVI	DESCRIZIONE	MORSETTI
1	S1	Tank superior probe - NTC A*	1,2
	S2	Tank inferior probe - NTC B*	3,4
	S3	Collector delivery probe - PT1000 C	5,6
	P1	Solar pump**	TRIAC - SOLAR PUMP
			PWM - AUX3 and PWM PUMP
	D1	Diverter valve - FREE CONTACT	15,14,13
2	S1	Tank superior probe - NTC A*	1,2
	S2	Tank inferior probe - NTC B *	3,4
	S3	Collector delivery probe - PT1000 C	5,6
	S4	Collector return probe - PT1000 D	7,8
	P1	Solar pump**	TRIAC - SOLAR PUMP
			PWM - AUX3 and PWM PUMP
	D1	Diverter valve - FREE CONTACT	15,14,13

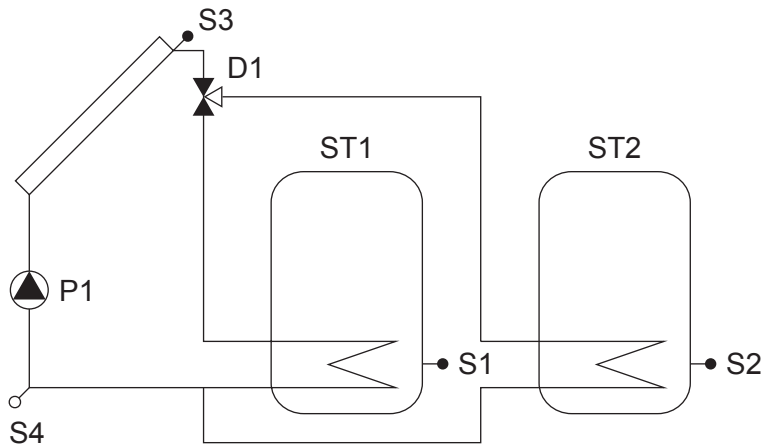
* set priority by parameter 28.

**Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, TRIAC modulating= 1, PWM ON/OFF= 2, PWM modulating= 3. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable or disable the diverter valve D1 see point 11. See also "PARAMETERS" paragraph.

When the probe is present on the return of the solar collector (S4), you can set P1 in modulating mode (PAR 24= 1 if TRIAC modulating or PAR 24= 3 if PWM modulating). In this case for configuration 2.

• **SCHEME 3 – double tank with diverter valve (par. 26= 3)**



Set parameter 27 according to the components you want to get enabled.

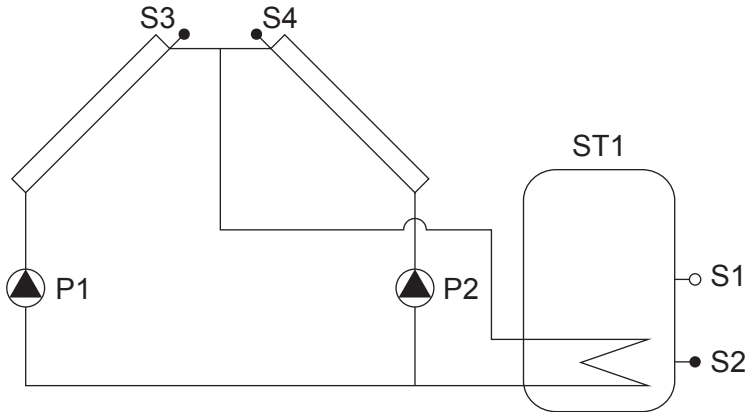
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S1	Tank inferior probe - NTC A*		1,2
	S2	Tank inferior probe - NTC B*		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	P1	Solar pump**	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	D1	Diverter valve - FREE CONTACT		15,14,13
2	S1	Tank inferior probe - NTC A*		1,2
	S2	Tank inferior probe - NTC B*		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector return probe - PT1000 D		7,8
	P1	Solar pump**	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	D1	Diverter valve - FREE CONTACT		15,14,13

* set priority by parameter 28.
**Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, TRIAC modulating= 1, PWM ON/OFF= 2, PWM modulating= 3.
Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable or disable diverter valve D1 see point 11. See also "PARAMETERS" paragraph.

When the probe is present on the return of the solar collector (S4), you can set P1 in modulating mode (PAR 24= 1 if TRIAC modulating or PAR 24= 3 if PWM modulating). In this case for configuration 2.

• **SCHEME 4 - east/west system (parameter 26= 4)**



Set parameter 27 according to the components you want to get enabled.

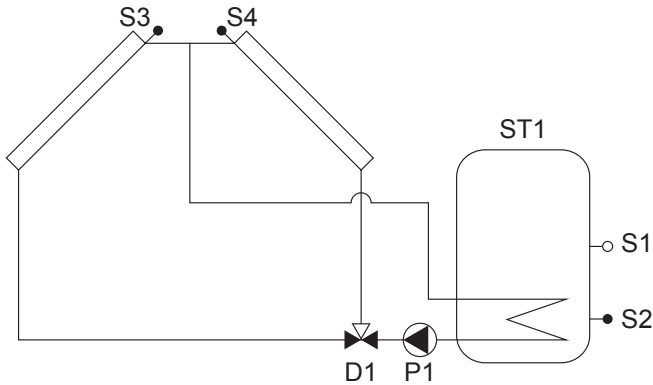
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector delivery probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Solar pump2 - AUX2		19,18
2	S1	Tank superior probe - NTC A		1,2
	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector delivery probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Solar pump2 - AUX2		19,18
	AUX1	Enabled thermostat - AUX1		17,16

*Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 and P2 see the first and second point in the "MAIN FUNCTIONS" paragraph. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• **SCHEME 5 - east/west system with diverter valve (par. 26= 5)**



Set parameter 27 according to the components you want to get enabled.

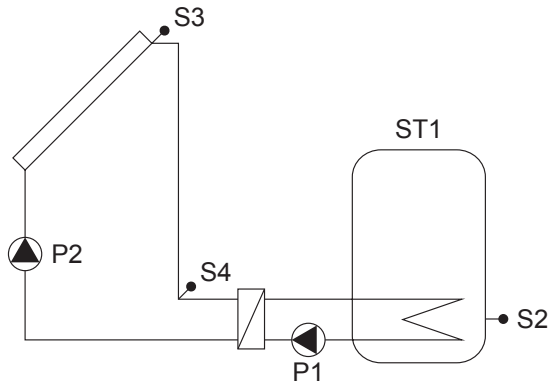
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector delivery probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	D1	Diverter valve - FREE CONTACT		15,14,13
2	S1	Tank superior probe - NTC A		1,2
	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector delivery probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	D1	Diverter valve - FREE CONTACT		15,14,13
	AUX1	Enabled thermostat - AUX1		17,16

*Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable or disable diverter valve D1 see point 12. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• **SCHEME 6 – with exchanger (par. 26= 6)**



Set parameter 27 according to the components you want to get enabled.

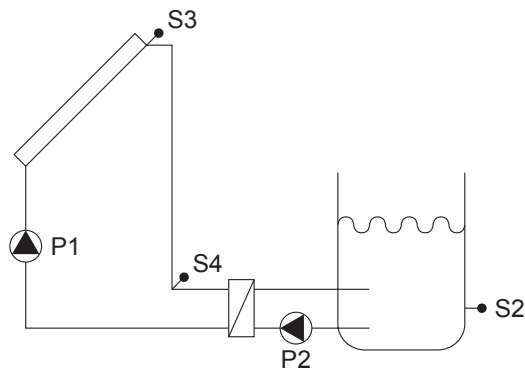
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Probe - PT1000 D		7,8
	P1	Secondary pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Solar pump - AUX2		19,18

*Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph “CABLING”.

To energize or de-energize the solar pump (P2) see the fifth point in the “MAIN FUNCTIONS” paragraph, to enable or disable the secondary pump (P1) see point 6. See also “PARAMETERS” paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• **SCHEME 7 – With exchanger and pool (par. 26= 7)**



Set parameter 27 according to the components you want to get enabled.

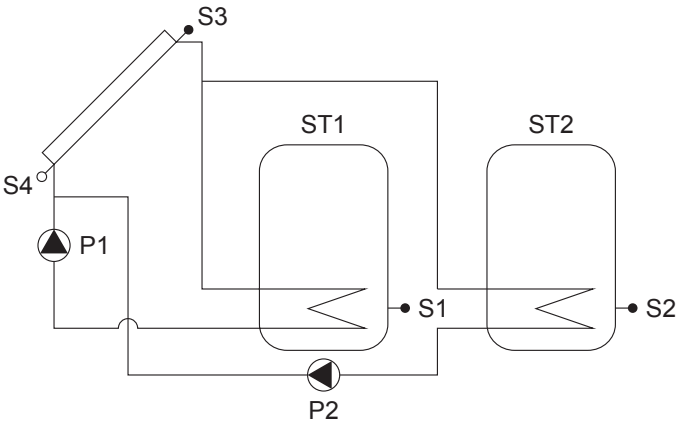
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Pool probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Secondary pump - AUX2		19,18

*Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph “CABLING”.

To energize or de-energize the solar pump (P1) see the fifth point in the “MAIN FUNCTIONS” paragraph, to enable or disable the secondary pump (P2) see point 6. See also “PARAMETERS” paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• **SCHEME 8 – double tank (par. 26= 8)**



Set parameter 27 according to the components you want to get enabled.

P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S1	Tank inferior probe - NTC A*		1,2
	S2	Tank inferior probe - NTC B*		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	P1	Solar pump**	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Solar pump2 - AUX2		19,18
2	S1	Tank inferior probe - NTC A*		1,2
	S2	Tank inferior probe - NTC B*		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Collector return probe - PT1000 D		7,8
	P1	Solar pump**	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Solar pump2 - AUX2		19,18

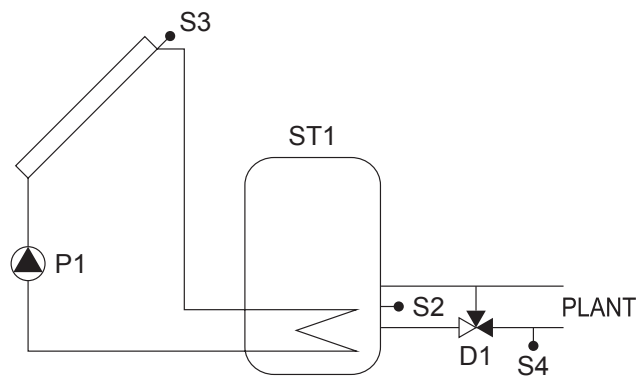
* set priority by parameter 28.

**Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, TRIAC modulating= 1, PWM ON/OFF= 2, PWM modulating= 3. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 and P2 see the first and second point in the "MAIN FUNCTIONS" paragraph. See also "PARAMETERS" paragraph.

When the probe is present on the return of the solar collector (S4), you can set P1 in modulating mode (PAR 24= 1 if TRIAC modulating or PAR 24= 3 if PWM modulating). In this case for configuration 2.

- **SCHEME 9 - with integration of heating mode on return plant (par. 26 = 9)**



Set parameter 27 according to the components you want to get enabled.

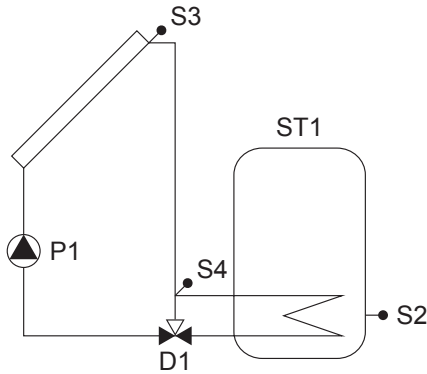
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Heating circuit return probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	D1	Diverter valve - FREE CONTACT		15,14,13

*Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable or disable the diverter valve D1 see point 13. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• **SCHEME 10 - with bypass (par. 26= 10)**



Set parameter 27 according to the components you want to get enabled.

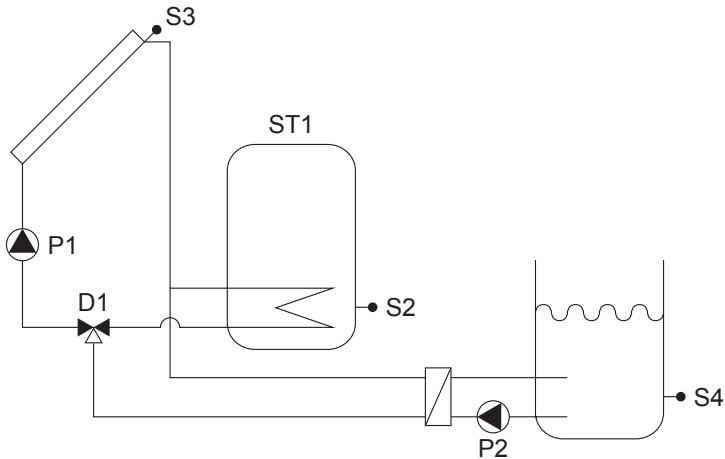
P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Tank inferior probe - NTC B		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Probe - PT1000 D		7,8
	P1	Solar pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	D1	Diverter valve - FREE CONTACT		15,14,13

*Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable or disable diverter valve D1 see point 14. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

• SCHEME 11 – with tank and pool (par. 26= 11)



Set parameter 27 according to the components you want to get enabled.

P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S2	Tank inferior probe - NTC B*		3,4
	S3	Collector delivery probe - PT1000 C		5,6
	S4	Pool probe - PT1000 D*		7,8
	P1	Solar pump**	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Secondary pump - AUX2		19,18
	D1	Diverter valve - FREE CONTACT		15,14,13

* set priority by parameter 28. When the solar pump is active, according to the setting of parameter 28 the tank will be loaded on S2 or S4 with priority. Tank loading with minor priority will not occur until the temperature set on parameter 41 (T priority), will not be overcome on the tank probe with the most priority.

**Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, PWM ON/OFF= 2. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 see the first and second point in the "MAIN FUNCTIONS" paragraph, to enable or disable P2 and diverter valve D1 see point 7. See also "PARAMETERS" paragraph.

Without probe on the return of the solar collector (S4), modulation function on P1 is not available.

- **SCHEME 12 - universal $2x\Delta T$ (parameter 26= 12)**

$2x\Delta T$

Set parameter 27 according to the components you want to get enabled.

P27	ACTIVE COMPONENTS	DESCRIPTION		TERMINAL
1	S1	Probe - NTC A		1,2
	S2	Probe - NTC B		3,4
	S3	Probe - PT1000 C		5,6
	S4	Probe - PT1000 D		7,8
	P1	Pump*	TRIAC - SOLAR PUMP	23,22
			PWM - AUX3 and PWM PUMP	21,20 + X1
	P2	Pump2 - AUX2		19,18

*Set TRIAC or PWM by PAR 24: TRIAC ON/OFF= 0, TRIAC modulating= 1, PWM ON/OFF= 2, PWM modulating= 3. Set also the jumper (cover) on the board in the correct position, S1= TRIAC or S2= PWM (its usual position is S2), see paragraph "CABLING".

To energize or de-energize P1 see point 8 in the "MAIN FUNCTIONS" paragraph, to enable or disable P2 see point 9. See also "PARAMETERS" paragraph.

When there are the probes on the return of the solar collector (S4) and on the delivery (S3), you can be set P1 in modulating mode (PAR 24= 1 if TRIAC modulating or PAR 24= 3 if PWM modulating).

NOTE: Optional function such as anti-lock, anti-freezing, solar collector cooling, etc. are not enabled.

FIRST COMMISSIONING

Before supplying, the device be sure of having:

- Fixed the back carefully
- Cabled the terminal properly
- Held tightly all the cables by the cables holders
- Closed firmly the front cover with the proper cross screw and its proper cover

After checking all these points, the device could be supplied and the board will start automatically the function "PLANT PARAMETERS SETTING", showing one by one on the display 3 parameters to be set (25,26,27).

- **Parameter 25 (device configuration):**

1 = Stand Alone, presence of TermoSolis only.

2 = Enabling remote control communication only, to see to manage the system by a Sime Home/Sime Home Plus remote control.

3 = Enabling FULL SYSTEM communication, configuration of the system in which OT communication (slave/master) is active. It is required the presence of a boiler Brava and a remote control Sime Home/Sime Home Plus.

Once decided the preferred value by pushing the ▲▼ buttons, confirm by pushing the  button.

- **Parameter 26 (plant selection):**

This parameter permits selecting plant scheme previously chosen during the cabling (see paragraph "PLANT SCHEMES").

Once decided the preferred value by pushing the ▲▼ buttons, confirm by pushing the  button.

- **Parameter 27 (plant configuration):**

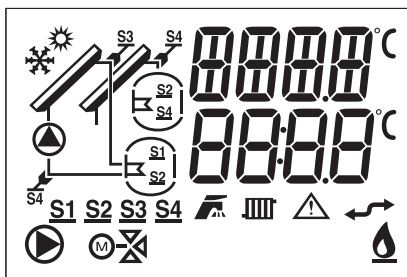
This parameter permits selecting "configuration type". Refer to the tables reported under each plant scheme (paragraph "PLANT SCHEME"). In some cases, it is essential to set also parameter 28 to define the priorities management (see the complete list of parameters in the paragraph "PARAMETERS").

Once decided the preferred value by pushing the ▲▼ buttons, confirm by pushing the  button.

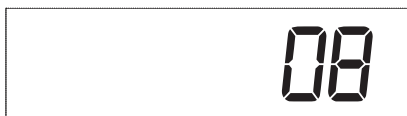
- **NOW THE SOLAR BOARD CAN OPERATE**

The following page shows the normal working.

- **After having set** the plant parameters and also every time the appliance is switched off and on, the display will show all the signs for 2 seconds.

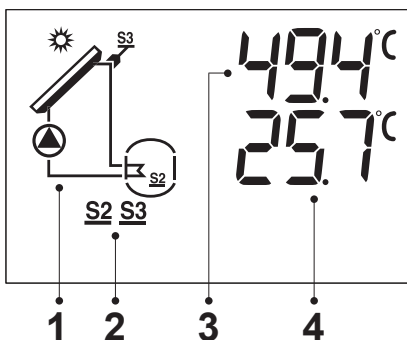



- **In the following 5 seconds**, the display will show the FW version of the board (the drawing on the right shows FW version 8).



- **Then** the board will reach normal plant (the drawing shows scheme 1 with configuration 1), where the following information will be shown:

1. Working scheme plant and active components
2. Probes with their values (max 2 per time)
3. Solar collector temperature with range $-0 \div 170^{\circ}\text{C}$ (shown S3 or S4)
4. Tank sensor temperature with range $-0 \div 125^{\circ}\text{C}$ (shown S1 or S2)



- **By pushing for 3 seconds** the  button the device reaches **OFF** mode (even if a fault is present). In this mode the device is not working and the display shows "OFF". Only anti-freezing protections, anti-lock pump and diverter valve keep on working. Solar collector anti-freeze function is NOT active.



MAIN FUNCTIONS

To see description and set parameters, see the chart of paragraph "PARAMETERS".

1. **SOLAR PUMP activation (parameters 12, 15, 16 and 31)**

The board will activate the solar pump differently in the three following situations:

- Without collector return probe, the pump is activated with the following conditions:

$$\text{Tank T} < (\text{PAR 15} - \text{PAR 31})$$

$$(\text{Solar collector T} - \text{Tank T}) > \text{PAR 16}$$
- With return collector probe, the pump is activated with the point 1. conditions and also with the following ones:

$$(\text{Solar collector T} - \text{Collector return probe T}) > \text{PAR 12}$$
- With S1 tank superior probe, **for configurations 3 and 4 of scheme 1**, the solar pump is activated with the point 1. and 2. conditions and also:

$$\text{Tank probe T S1} < \text{PAR 15}$$

NOTE: to guarantee correct working of P2, **for configuration 5 of scheme 1**, remember that the thermostat function must be active (parameter 29 and 30 have two different values).

2. **SOLAR PUMP deactivation (parameters 15 and 22)**

The board will deactivate the solar pump with one of the following conditions:

$$\text{Tank T} > \text{PAR 15}$$

$$\text{Solar collector T} < (\text{Tank T} + \text{PAR 22})$$

3. **P2 activation and deactivation for variant 6 of scheme 1 (par. 34 and 40)**

The board will ACTIVATE the pump with the following conditions:

$$\text{Tank T S2} > (\text{Tank T S1} + \text{PAR 40})$$

$$\text{Tank T S2} > \text{PAR 34}$$

The board will DEACTIVATE the pump with one of the following conditions:

$$\text{Tank T S2} < \text{Tank T S1}$$

$$\text{Tank T S2} < (\text{PAR 34} - 1^{\circ}\text{C})$$

4. **P1 activation and deactivation for variant 7 of scheme 1 (par. 16 and 22)**

The board will ACTIVATE the pump with the following condition:

$$(\text{Solar collector T} - \text{Tank T}) > \text{PAR 16}$$

The board will DEACTIVATE the pump with the following condition:

$$\text{Solar collector T} < (\text{Tank T} + \text{PAR 22})$$

NOTE: to guarantee correct working of P2 remember that the thermostat function must be active (parameter 29 and 30 have two different values).

5. **SOLAR PUMP activation and deactivation for schemes 6 and 7 (par. 16, 18 and 33)**

The board will ACTIVATE the pump with the following conditions:

$$\text{Solar collector T S3} > \text{PAR 33}$$

$$\text{Tank T S2} < (\text{PAR 18} - 1^{\circ}\text{C})$$

$$(\text{Solar collector T S3} - \text{Tank T S2}) > \text{PAR 16}$$

The board will DEACTIVATE the pump with one of the following conditions:

Solar collector T S3 < (PAR 33 - 5°C)

Tank T S2 > PAR 18

(Solar collector T S3 – Tank T S2) < (½ PAR 16)

6. SECONDARY PUMP activation and deactivation for schemes 6 and 7 (par. 18)

The board will ACTIVATE the secondary pump with the following conditions:

Tank T S2 < (PAR 18 - 1°C)

Tank T S2 < T S4

The board will DEACTIVATE the secondary pump with one of the following conditions:

Tank T S2 > PAR 18

Tank T S2 > T S4

7. P2 and DIVERTER VALVE activation and deactivation for scheme 11 (par. 36)

When the solar pump is active, the tank S2 or S4 will be activated with priority according to parameter 28.

The board will ACTIVATE the secondary pump and the diverter valve with the following condition:

Pool T S4 < PAR 36

The board will DEACTIVATE the secondary pump and the diverter valve with the following condition:

Pool T S4 > PAR 36

The load of the tank with lower priority will not occur until the temperature set on parameter 41 (T priorities), will not be overcome by the sensor with the higher priority.

8. P1 activation and deactivation for scheme 12 (par. 16 and 22)

The board will ACTIVATE the pump with the following condition:

(Solar collector T – Tank T) > PAR 16

The board will DEACTIVATE the pump with the following condition:

Solar collector T < (Tank T + PAR 22)

9. AUX2 out (pump2) activation and deactivation for scheme 12 (par. 34, 36 and 40)

The board will ACTIVATE the AUX2 out with the following condition:

(S4 T - S1 T) > PAR 40

The board will DEACTIVATE the AUX2 out with the following condition:

S4 T < (S1 T + (½ PAR 40))

10. Solar pump modulation for schemes 1 conf. 2 and 4, 2 conf. 2, 3 conf. 2, 8 conf. 2 and scheme 12 (parameters 13, 14 e 24)

The board manages the solar pump in the following mode:

- FIXED MODE (parameter 24= 0 or 2)

The solar pump will work ON/OFF according to the normal algorithms of activation and deactivation of the solar pump.

- MODULATING MODE (parameter 24= 1 or 3)

The following mode can be activated only if there is 1 solar pump and the collector return probe.

See the following chart to view the working mode:

SPEED	ΔT DELIVERY - RETURN SOLAR COLLECTOR	SPEED %
1	≤ PAR 13 (minimum power)	40%

2	> PAR 13	55%
3	> PAR 13 + PAR 14	70%
4	> PAR 13 + (PAR 14 x 2)	85%
5	> PAR 13 + (PAR 14 x 3) (maximum power)	100%

The pump is working at speed 5 (maximum power) for the first second and then changes state as shown previously.

11. DIVERTER VALVE activation and deactivation for schemes 2 and 3

The diverter valve will be ACTIVATED or DEACTIVATED depending on the probes (S1 or S2) to be served, on the set priority and on the temperatures reached by the probes.

12. DIVERTER VALVE activation and deactivation for scheme 5

The diverter valve will be ACTIVATED or DEACTIVATED depending on solar collector that will be used to heat the tank, normally the one with the highest temperature or the one having the conditions to be used.

13. DIVERTER VALVE activation and deactivation for scheme 9 (par. 34, 36 and 40)

The board will ACTIVATE the diverter valve with the following conditions:

$$\text{Tank T S2} > \text{PAR 34}$$

$$\text{S4 T} < \text{PAR 36}$$

$$(\text{S4 T} - \text{Tank T S2}) > \text{PAR 40}$$

The board will DEACTIVATE the divert valve with one of the following conditions:

$$\text{Tank T S2} < (\text{PAR 34} - 5^{\circ}\text{C})$$

$$\text{S4 T} > \text{PAR 36}$$

$$(\text{S4 T} - \text{Tank T S2}) < (\frac{1}{3} \text{ PAR 40})$$

14. DIVERTER VALVE activation and deactivation for scheme 10 (par. 18)

The board will ACTIVATE the diverter valve with the following conditions:

$$\text{Tank T S2} < (\text{PAR 18} - 1^{\circ}\text{C})$$

$$\text{S4 T} > \text{Tank T S2}$$

The board will DEACTIVATE the divert valve with one of the following conditions:

$$\text{Tank T S2} > \text{PAR 18}$$

$$\text{S4 T} < \text{Tank T S2}$$

15. Solar collector cooling function (par. 15, 17, 18, 19 and 20)

This function manages the pump when the solar panel is over temperature. The following points show the procedure:

- **FUNTIONING** (Pump activation) with the following conditions:

$$\text{PAR 15} < \text{Tank T} < \text{PAR 18}$$
$$\text{Solar collector T} > \text{PAR 17} - \text{PAR 19}$$
- **CHECK** (Intermittent solar pump: ON for 3 sec./ OFF for a time set by parameter 20) with the following condition:

$$\text{Solar collector T} > \text{PAR 17}$$
- **DEACTIVATION** (Solar pump deactivation) with one of the following conditions:

$$\text{Solar collector T} < (\text{PAR 17} - \text{PAR 19}) - 1^{\circ}\text{C}$$

$$\text{Tank } T \geq (\text{PAR } 18 + 1^{\circ}\text{C})$$

16. Identification of cold solar collector function (parameter 21)

The board will deactivate the solar pump (present only with return probe) in the following case:

$$(\text{Solar collector } T - \text{Return solar collector } T) < \text{PAR } 21$$

17. Solar collector anti-freeze function (parameter 23)

The solar pump will be activated with the following conditions:

$$\text{Solar collector } T < \text{PAR } 23$$

The board will not deactivate the solar pump as long as:

$$\text{Solar collector } T > (\text{PAR } 23 + 1^{\circ}\text{C})$$

Attention: the anti-freeze function is active by default.

18. Solar pump anti-lock function

After 24h of inactivity, all pumps of the system are activated for 3 seconds.

19. Diverter valve anti-lock function

After 24h of inactivity, the diverter valve is activated for 5 seconds.

20. Selecting output of solar pump 1 (parameter 32)

Through parameter 32 is possible selecting the board output to be used for the solar pump 1.

21. Thermostat function (parameters 29 and 30)

Thermostat function is deactivated with the following condition:

$$\text{PAR } 29 = \text{PAR } 30$$

Thermostat function for integrative heating is activated with the following conditions:

$$\text{PAR } 29 < \text{PAR } 30$$

$$S1 \text{ } T < \text{PAR } 29 \rightarrow \text{AUX } 1 \text{ ON}$$

$$S1 \text{ } T > \text{PAR } 30 \rightarrow \text{AUX } 1 \text{ OFF}$$

When AUX 1 is ON the display shows "INTB"

Thermostat function to use the exceeding heat is activated with the following conditions:




$$\text{PAR } 29 > \text{PAR } 30$$















$$S1 \text{ } T > \text{PAR } 29 \rightarrow \text{AUX } 1 \text{ ON}$$


$$S1 \text{ } T < \text{PAR } 30 \rightarrow \text{AUX } 1 \text{ OFF}$$

When AUX 1 is ON the display shows "HTE"

PROGRAMMING MENU

Keep the button  pressed for 10 seconds to access to selecting window. Through the   buttons, can choose the following menu:

- **TSP (transparent slave parameter):** parameters menu. To view the parameters press the  button and to scroll use the   buttons. Press again the  button to select the parameter and then use the   buttons to change the value. Press the  button to confirm the change or press the  button to return in the previous window without changing any value.
- **DRES (deep reset):** reset menu to reset all the parameters as the factory settings. Keep the button  pressed for 10 seconds to reset the device. When the display shows blinking "DRES", the device is reset.
- **NRES (normal reset):** reset menu to reset the parameters as the factory settings except PAR 25, 26, 27 and 28. Keep the button  pressed for 10 seconds to reset the device. When the display shows blinking "NRES", the device is reset.
- **MAN (manual override loads):** manual menu. During the first installation, you can verify the correct operating of pumps and diverter valve. To access the menu press the  button and to scroll use the   buttons. Press again the  button to change the state. After exiting the menu, loads will return to their normal conditions.

Press the  button to exit the menu window or, without pressing buttons, wait for 60 seconds.

PARAMETERS

The board is equipped by 41 parameters. From 1st to 11th are simple information and cannot be changed. From 12th to 41st are regulation parameters and can be set depending on the type of wanted operation.

PAR.	DESCRIPTION	VALUE	DEFAULT
1	TermoSolis firmware version	1÷99	1
2	S1 current temperature: NTC sensor (°C)	-0÷120*	-
3	S2 current temperature: NTC sensor (°C)	-0÷120*	-
4	S3 current temperature: PT1000 sensor (°C)	-0÷170*	-
5	S4 current temperature: PT1000 sensor (°C)	-0÷170*	-
6	S1 maximum temperature (for 24h, starting from the device latest turning on): NTC sensor (°C)	0÷120	-
7	S2 maximum temperature (for 24h, starting from the device latest turning on): NTC sensor (°C)	0÷120	-
8	S3 maximum temperature (for 24h, starting from the device latest turning on): PT1000 sensor (°C)	0÷170	-
9	S4 maximum temperature (for 24h, starting from the device latest turning on): PT1000 sensor (°C)	0÷170	-
10	Modulating pump current speed (Speed 1= 40%÷Vel.5= 100%)	0÷100%	-
11	System working time calculation	-	-

PAR.	DESCRIPTION	VALUE	DEFAULT
12	Temperature differential value Δ delivery – return solar collector for the ignition of the P1 pump (with return probe available)	5÷30°C	5°C
13	Temperature differential value for the P1 pump modulation (for speed 1 and 2)	5÷20°C	7°C
14	Temperature differential value for the P1 pump modulation (for speed 3, 4 and 5)	2÷10°C	3°C
15	Tank set point (turning off solar pump temperature)	60÷80°C	75°C
16	Temperature differential value Δ delivery – return solar collector for the ignition of the P1 pump ($\Delta T R1$)	1÷20°C**	5°C
17	Maximum delivery solar collector temperature (°C)	90÷160°C	140°C
18	Maximum tank temperature (°C) / Tmax S2	70÷95°C	85°C
19	Temperature differential value between maximum solar collector temperature (PAR 17) and solar collector temperature, beyond which the cooling function of solar collector is activated	0÷20°C	10°C
20	Time in which P1 pump is turned off during the test of solar collector cooling function	10÷240 Sec.	30 Sec.
21	Temperature differential value Δ delivery – return solar collector under which the collector is recognised as cold	0÷10°C	2°C
22	Temperature differential value Δ delivery solar collector – tank to turn off the solar pump	1÷10°C**	3°C
23	Temperature value of solar collector anti-freeze: 0= not working 1÷10°C= Protection temperature	0÷10°C	1°C
24	P1 solar pump functioning: 0= TRIAC ON/OFF 1= TRIAC modulating 2= PWM ON/OFF 3= PWM modulating	0÷3	3
25	Equipment configuration: 1= Stand alone 2= communication only with remote control 3= FULL SYSTEM communication (communication with boiler/ cascade control and with remote control/zones control)	1÷3	1
26	Plant scheme selected	1÷12	1
27	Plant configuration (the value interval changes depending on the plant scheme selected, see schemes that can be selected)	1÷X	1
28***	Priority: 1= priory control of S1**** 2= priory control of S2**** 3= S1 has priority 4= S2 has priority	1÷4	3
29	Temperature enabling the thermostat (S1)	3÷90°C	45°C
30	Temperature disconnecting the thermostat (S1)	3÷90°C	50°C
31	Δ between S2 temperature (tank probe) and tank set point (PAR 15), igniting the solar pump	1÷20	5
32	P1 pump out: 1= pump 1 with SOLAR PUMP out 2= pump 1 with AUX2 out	1÷2	1
33	S3 min T	0÷99°C	20°C

34	S2 min T	0÷99°C	20°C
35	S4 min T	0÷99°C	20°C
36	S4 max T	0÷99°C	90°C
37	0= OFF 1= ON Calculation of the energy produced:	0÷1	1
38	Maximum flow of solar circuit (l/min)	0÷20l	6l
39	Anti-freeze protection grade (%)	0÷50%	25%
40	ΔT R2	4÷20	10
41	Priority T	0÷90°C	40°C


- * Negative temperatures are displayed with -0.
- ** Parameters from 16th to 22nd are dynamic. Is not allowed to set a Δ between these two parameters under 2.
- *** S1 in the scheme 11 corresponds to S4.
- **** No probe has priority over the other, but a prior check is made to see if possible to heat the selected probe, if not, a switching is made to check if you can heat the other.


ATTENTION: The access from remote control to parameters of the solar control is possible through the TSP menu. When remote control is present (PAR 25= 2) in TSP menu the range of parameters starts from 1 and arrive to 41. With FULL SYSTEM configuration (PAR 25= 3) the range of parameters starts from 101 and arrive to 141, where 101 corresponds to the parameter 1 and 141 to 41.

ANOMALIES

The following chart shows the possible anomalies that will be showed on the display of solar control depending by the selected plant configuration.

When is active the FULL SYSTEM mode (PAR 25= 3), in case of anomaly of the boiler control board, if there is any anomaly of TermoSolis, the code is also shown on the remote control and on the TermoSolis display.

When there is an anomaly of TermoSolis in addition to the back light also the  symbol (anomaly) is blinking, as well the one of the faulty probe.

When there is an anomaly due to missing communication, the  symbol is turned off both on the TermoSolis's display and on the remote control.

ANOMALY	REASON	DESCRIPTION
81	S1 NTC sensor	A short circuit or open circuit of the sensor causes the deactivation of the solar pump (protection system is active).
82	S2 NTC sensor	A short circuit or open circuit of the sensor causes the deactivation of the solar pump (protection system is active).
83	S3 PT1000 sensor	A short circuit or open circuit of the sensor causes the deactivation of the solar pump (protection system is active).
84	S4 PT1000 sensor	A short circuit or open circuit of the sensor causes the deactivation of the solar pump (protection system is active).

ATTENTION: By repairing the fault, the fault condition is removed immediately.

PROBLEM SOLVING

PROBLEM	CHECK
The solar control does not turn on	Check the power supply
	Check the fuse on the board
The pump ignition is late	Check all parameters especially PAR. 15-16-12 (in case of return probe presence)
	Check ΔT setting to ignite pump
	Check the position of solar collector sensor
The pump turns on and off continuously	Check If collector cooling function is active
	Check all parameters especially PAR. 16-12 (in case of return probe presence)
	Check the position of solar collector sensor
The ΔT tank - collector is very high and the system is not able to drain the heat	Check the solar pump
	Check the condition of the heat exchanger
	Check the good insulation of the tank and wires
The tank/s get cold during the night	Check the parameters for the cooling function the solar collector
	Check the good insulation of the tank and wires
The solar pump does not work	Check the parameters for the activation solar pump function
	Check the fuse on the board
	Check the solar pump
The system does not turn on and the tank remains cool	Check the wiring of the NTC probe
Bad functioning of the diverter valve	Check the wiring
The remote control remains turned off/there is not communication	Check the wiring of terminals 9-10
	Check the setting of PAR 25
In mode double pump the functioning is inverted	Check the wiring of terminals 22-23 (SOLAR PUMP) 18-19 (AUX 2)

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Although this manual has been written with the maximum attention and care, we do not exclude any possible mistakes, incomplete or incorrect data. Before realizing the plant, should therefore be read carefully the current regulations. The constructor reserves the right to change the products specifications or to stop the production of the same without any previous advice and to include or supply new functions or new instructions of the products already sold. The constructor cannot be held responsible for any losses or damages, direct or not, that can originate from the use of the products.