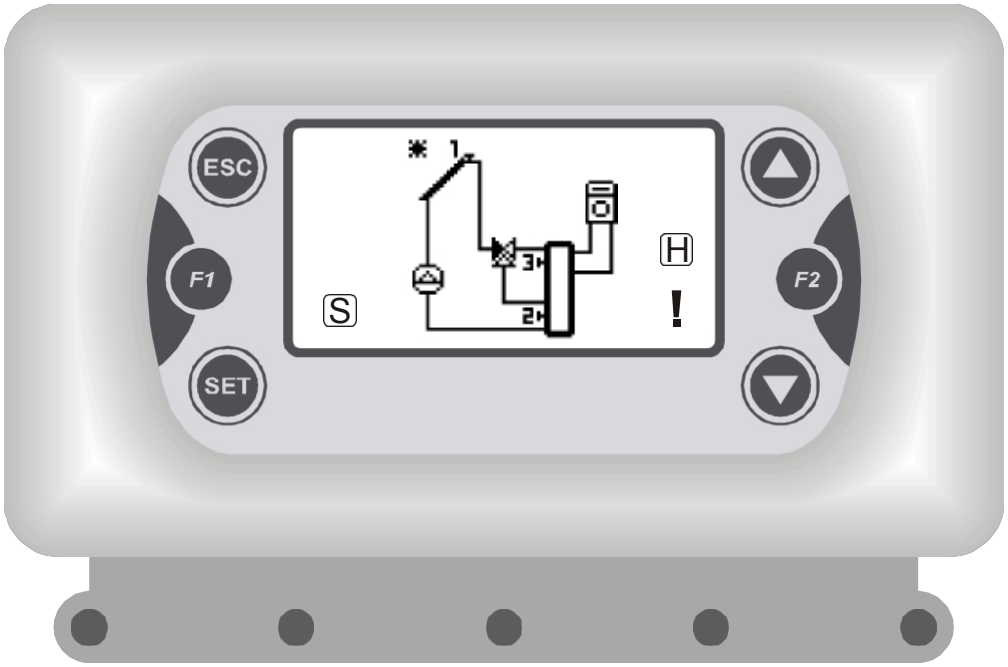
TSol503

DIFFERENTIAL TEMPERATURE CONTROLLER FOR SOLAR THERMAL SYSTEMS

TEMPERATURE CONTROLLER FOR THERMIC SOLAR PANEL SYSTEMS



1 INTRODUCTION

General

The ***TSol503*** solar temperature controller ***is*** an excellent controller for controlling solar thermal systems. It controls the correct function of the solar collectors, the loading of buffer tanks or swimming pools, the correct integration of additional heat generators and all protection and cooling functions.

Safety standards

Read the safety instructions below to avoid danger and damage to people and property. Before carrying out any work on the system, follow

- the accident prevention regulations
- the National Rules for Insurance against Accidents at Work
- the recognized safety regulations
- These instructions are intended exclusively for specialist technical personnel
- Electrical work may only be carried out by qualified personnel
- The initial commissioning of the system may only be carried out by trained personnel or by the manufacturer or personnel authorized by the manufacturer.

Declaration of conformity: **Applicable standards:**
EN 60730-1 50081-1 EN 60730-1 A1 50081-2

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Product composition	**Technical data**	
01x ***TSol503***	Power supply:	230 Vac 50 Hz
04x screws and dowels	Absorption:	2 VA
02x Fixing screws for the controller 01x	Flow Outputs:	5A 250 Vac
Flush-mounted and / or surface-mounted box	Internal fuse:	3.15 A
	Protection class:	IP40
01x Cover panel	Temperature sensor:	PT1000
01x 01 Pt1000 sensor kit	Measuring range:	-40 ÷ 300 °C
Installation conditions and use	**Mechanical features**	
Operating temperature: 0 ÷ 40 °C	Material:	ABS plastic
Storage temperature 0 ÷ 60 °C	Installation:	Surface-mounted
Humidity: 85% @25°C	Dimensions:	160 x 90 x 58 mm
	Display:	Graphic BackLight 128x64

2 INSTALLATION

2.1 ASSEMBLY

⚠ **Before working on the appliance, switch off the power supply and secure it against being switched on again!**

Check that there is no voltage! The electrical connection may only be carried out by a specialist in accordance with the applicable regulations. The controller must not be put into operation if there is visible damage to the housing, e.g. cracks.

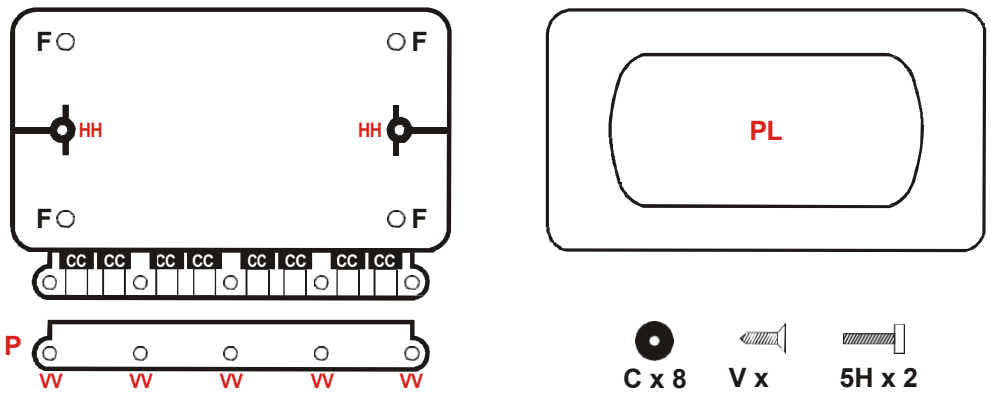


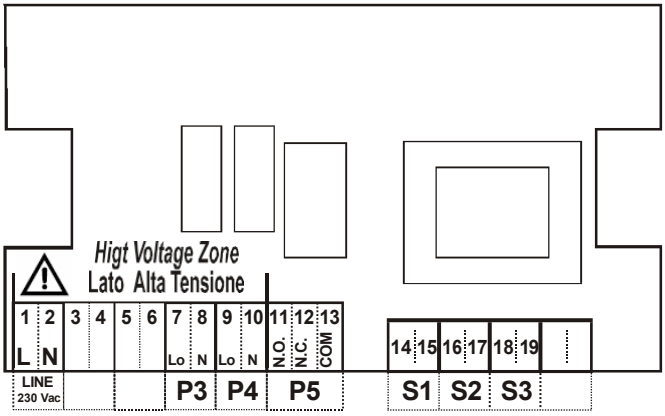
Fig. 1 Components

- Only install the controller in dry rooms and under ambient conditions
- Fix the surface-mounted or flush-mounted box with screws at points **F**
- Remove the cable cover **P**
- Strip the cables, insert them into the strain reliefs **C** and insert them into the recesses **CC**
- Open the terminals with a suitable screwdriver and make the electrical connection to the controller.
- Reinsert the upper part of the housing and secure with the screws **H** via the fixing points **HH**
- Fix the cables in the holes **VV** using the cover **P** with the screws **V**

• Attach **PL** cover

2.2 ELECTRICAL CONNECTION

Before working on the appliance, switch off the power supply and secure it against being switched on again! Check that there is no voltage! The electrical connection may only be carried out by a specialist in accordance with the applicable regulations. The controller must not be put into operation if there is visible damage to the housing, e.g. cracks.
Low-voltage cables such as temperature sensor cables must be laid separately from mains voltage-carrying cables.



S1	**S2**	**S3**	PT1000 sensor
P3	**P4**		Relay outputs with 230V
P5			Floating contact

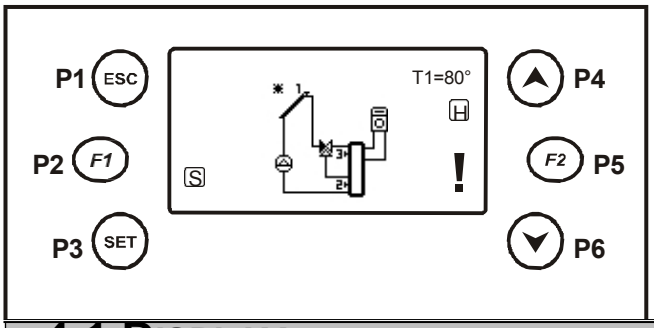
Fig. 2 Electrical connections

3 INSTALLING THE TEMPERATURE SENSORS

The **TSol503** controller works with Pt1000 temperature sensors with a range of -40 °C to 300°C (+/- 1°C) If there is a short circuit in the sensor, "**Short**" appears in the display. If the sensor is disconnected or not connected, "**Open" appears in the display**. Which measured values are displayed depends on the selected program, the connected sensors and the respective device version. ENVIRON accepts no responsibility for damage to sensors if they have not been used in the range or due to incorrect cable extensions.

- The temperature sensor cables must be laid separately from cables carrying mains voltage.
- If required, the sensor lines can be extended to a maximum of 30 m using a cable of at least 1 mm². Make sure that no transition resistances occur!
- Place the sensors exactly in the area to be measured!
- Only use the appropriate immersion, pipe contact or pipe contact cable for the respective area of application.
- Flat contact sensor with the corresponding permissible temperature range.

4 CONTROL ELEMENT: USE AND FUNCTIONS



Functions of the buttons:

P4/P6= Scroll through the menu - value increase/decrease P3= Enter the menu - Save in menu P1= Exit the menu
P5= Activation of the clock program

Fig. 3 LCD control element

4.1 DISPLAY

▲	Pump: ON when flashing	T1=80°	Temperature sensor 1
S	Collector protection: ON when flashing	⋈	Mixer: Flow direction
H	Holiday: Function active	▬	Boiler: ON when flashing

	Cooling circuit	!	active messages
	Swimming pool / Pool		Plate heat exchanger

Use the **P5** button to scroll between the measured temperatures.		
Press the **P4** button to access the "**Monitor**" menu. The measured temperatures are displayed.		
Sys 1 = selected investment scheme Sensor temperature Contact closed not connected or cable break	**Monitor** **Sys 1** T1 = 80 T2 = Short T3 = Open	

Fig. 4 Monitor menu

Press the **P4** button to access the "**Statistics**" display to view current error messages.		
Sys 1 =system Detected error messages Code Error message Additional information	**Statistics** **Sys 1** A02	

Fig. 5 Statistics menu

4.2 MESSAGES

DESCRIPTION	DISPLAY
Overtemperature of the collector: Temperature on S1 or S5 higher than thermostat **THS103**	**A01**
Boiler overtemperature: Temperature on S2 higher than thermostat **THS203**	**A02**
Anti-frost collector: Temperature on S1 or S5 lower than thermostat **THS101**	**A03**
Sensor anomaly: possible sensor break: it appears that the sensor is not connected	**A04**
Sensor anomaly: possible sensor break: the sensor causes a short circuit	**A05**

4.3 PANORAMIC INSTALLATION DIAGRAMS

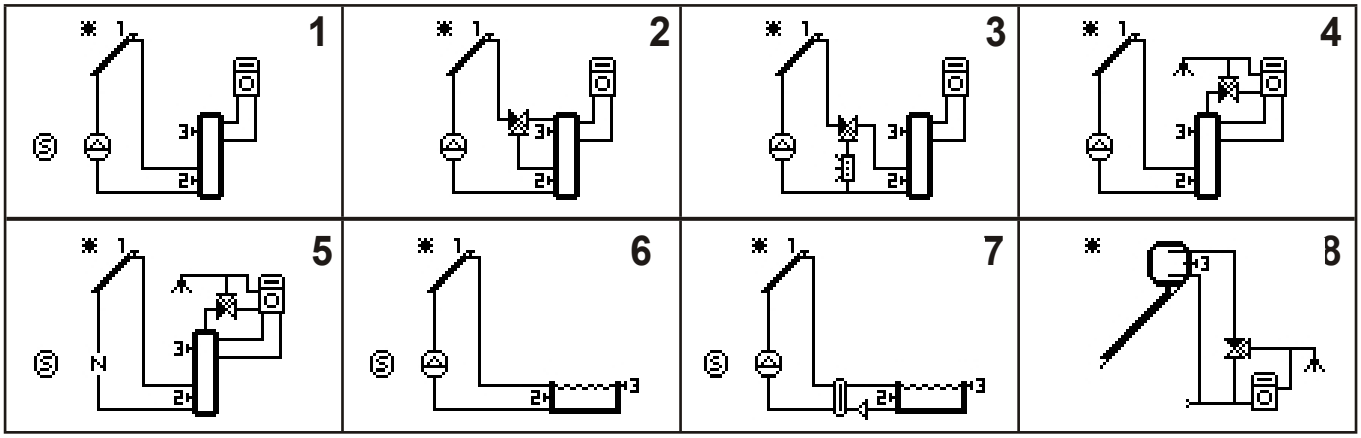


Fig. 6 Installations

5 STANDARD FUNCTIONS

5.1 BOILER MANAGEMENT / SWIMMING POOL

The following table shows the thermostats and hystereses in connection with the bucket load / swimming pool

DESCRIPTION	Code
Operating thermostat boiler/swimming pool on S3	**THS300**
Hysteresis thermostat THS300	**HYS300**
Differential thermostat (S1-S2) for loading boiler / swimming pool	**THD120**
Hysteresis differential thermostat THD120	**HYD120**
Minimum thermostat set to S1 - below this value the solar charging pump is switched off	**THS102**
Hysteresis thermostat THS102	**HYS102**
Thermostat to S2- above this value, the boiler cooling1 function is activated (by cooler or Solar system	**THS202**
Hysteresis thermostat THS202	**HYS202**
Thermostat to S2 Maximum temperature that the boiler or swimming pool can reach.	**THS203**
Hysteresis thermostat THS203	**HYS203**

5.2 DOMESTIC HOT WATER HEATING

Parameters for controlling the domestic hot water wiper

DESCRIPTION	Code
Thermostat to S3 - this value is used to move the domestic hot water mixer in the direction of Service water loading diverted	**THS305**
Hysteresis thermostat THS305	**HYS305**

5.3 BOILER requirement

The following table shows the thermostats and hystereses in connection with the boiler requirement

DESCRIPTION	Code
Thermostat on S3 under which the output for the inclusion of a boiler is activated	**THS302**
Hysteresis Thermosta THS302	**HYS302**

5.4 COOLING SOLAR CIRCUIT

The following table shows the thermostats and hysteresis in connection with the cooling of the solar circuit due to overtemperature.

DESCRIPTION	Code
Themrostat to S1 - the heat transfer fluid is cooled above this value	**THS104**
Hysteresis thermostat THS104	**HYS104**
Thermostat to S1 - above this value, the solar pump will charge the boiler or swimming pool until your maximum thermostats are reached.	**THS100**
Hysteresis thermostat THS100	**HYS100**
Maximum thermostat on S3 of the boiler / swimming pool	**THS303**
Hysteresis thermostat THS303	**HYS303**
Thermostat to S1 - the solar pump is stopped above this value.	**THS103**
Hysteresis thermostat THS103	**HYS103**

5.5 COLLECTOR PROTECTION

The following table shows the thermostats and hystereses in connection with collector protection. You can also use a roller blind over the collectors to cover them, for example.

DESCRIPTION	Code
Thermostat to S1 - the collector protection is activated above this value (e.g. roller blind / sun protection)	**THS103**
Hysteresis thermostat THS103	**HYS103**

6 Menu

The menu is divided into:

- Installation menu, where you will find all the parameters for TSol503.
- User menu, here you will find parameters that are available to the end user.

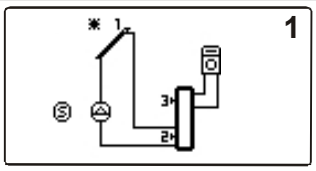
6.1 Installation MENU

Settings		Includes all thermostats, hystereses and Parameters that must be set by the specialist.
Thermostats		Contains all thermostats and hystereses from the selected system.
Parameters		Contains all parameters of the selected system.
Functions	**Intell. Loading/ temperature increase**	Contains the functions that can be used in the selected system.
	Holiday	
	Antifrost	
	Layering	
	Antiblock pump	
Statistics		Menu displays and resetting the statistics data (pump operating hours, alarms)
Actuator test		Menu for the test function of the outputs
Language		Selecting the language
Reset		Resetting the system
Change password		Menu to change your password
User menu		Menu for the transition to the user menu
Menu screen		Setting the LCD display menu

6.2 INITIAL COMMISSIONING

When you start up **TSol503 for** the first time, the respective system schemes that can be selected appear:

Scroll between the System diagrams with the buttons **P4 / P6**
Confirm the selected System diagram With the **P3** button



The same function can be selected in the Expert menu under the **Initialization** setting.

6.3 SPECIALIST menu

Main Menu **Specialist menu**	**PASSWORD?** **- - - -**	• The first number is selected with **P3 0 - - -** • The value is selected with **P4** and **P6 1 - - -** • Press **P3** to confirm the value **1 0 - -** • Repeat up to the 4th number **1 2 3 4** • Confirm PASSWORD with button **P3** • The set numbers are deleted with **P1**

If you do not press a button in the professional menu for a longer period of time, the system automatically takes you to the end user menu.

6.4 SETTINGS

Contains all thermostats, hystereses and parameters required for the selected system scheme.

6.5 THERMOSTATS

All thermostats and hystereses are displayed at this level.

6.6 PARAMETERS

All parameters for the selected investment scheme are displayed at this level.

6.7 FUNCTIONS

All functions are displayed at this level.

6.7.1 INTELLIGENT LOADING / TEMPERATURE INCREASE

The purpose of this function is to increase the temperature of the collector when there is little solar radiation. In the event that there is a temperature difference between S1 and S2, but the temperatures S1 and S3 are lower than the thermostat THS301, the solar charge pump is activated after the times TIM001 (pause) and TIM002 (operation) to facilitate the raising of the temperature until THS301 is reached. The pause/operation cycle is repeated for as long as COU000; the function is then deactivated for a time equal to TIM000. At the end of this time, the function resumes its work if the conditions are met.

In the system diagrams in which the stratification function has been selected, this is Function deactivated.

DESCRIPTION	Code
Thermostat on sensor S3 for activating the intelligent loading function	**THS301**
Hysteresis thermostat THS301	**HYS301**
Time for deactivating the Intell. Loading after COU00; pump is stopped.	**TIM000**
Pause time of the charging pump during the function	**TIM001**
Working time of the pump during operation	**TIM002**
Max. Number of pump pauses during the function	**COU000**
Activation of the function	**ENA000**

6.7.2 HOLIDAY

The **Holiday** function is used to change functions:

- The storage tank is cooled intelligently
- Integration of the gas, oil or pellet boiler is deactivated
- Storage tank is discharged by the collectors

DESCRIPTION	Code
thermostat on sensor S2; in addition, the system starts the intelligent discharge of the storage tank, if there is a negative differential between S1-S2.	**THS201**
Hysteresis THS201	**HYS201**
Activating the Holiday function	**ENA002**

6.7.3 FROST PROTECTION

Menu for setting the thermostats/hysteresis/parameters in relation to the frost protection function. If the temperature on sensor S1 is lower than thermostat THS101, the pump is switched to mode Pause/Operation activated.

DESCRIPTION	Code
Thermostat for the function deactivation	**THS101**
Hysteresis THS102	**HYS101**
Running time of the pump (seconds) during the frost protection function	**TIM012**
Pump pause (minutes) during the frost protection function	**TIM013**
Abilitation of the frost protection function	**ENA007**

6.7.4 INTELLIGENT LAYERING

If there is a temperature difference between S1-S3, the upper area of the cylinder is loaded until the THS306 thermostat is reached. The lower section of the cylinder is then loaded until the THS300 thermostat is reached. If there is no temperature difference between **S1-S3,** but there is a temperature difference between **S1-S2**, the lower part of the tank is loaded with the Pause/Operation mode. After a number of COU001 cycles, the function is deactivated for a time of TIM017. **In the system diagrams in which the stratification function is selected**
this function is deactivated.

DESCRIPTION	Code
Thermostat for intelligent layering	**THS306**
Hysteresis thermostat THS306	**HYS306**
Min. differential between S1 and S3	**THD130**
Max. Number of cycles pause/operation of the solar pump	**COU001**
Pause the pump during the intelligent stratification function	**TIM010**
Running time of the pump during the intelligent stratification function	**TIM011**
Time of deactivation of the intelligent stratification function	**TIM017**
Activation of the intelligent layering function	**ENA008**

6.7.5 ANTIBLOCK PUMP

Menu for setting the thermostat/hysteresis/parameters in relation to the anti-block pump function.

DESCRIPTION	Code
Waiting time of the anti-block pump function (in days)	**TIM019**
Running time of the pump in the anti-block pump function (in minutes)	**TIM020**
Activation of output P3 for the anti-block pump function	**P3**
Activation of output P4 for the anti-block pump function	**P4**
Activation of output P5 for the anti-block pump function	**P5**

6.8 STATISTICS

Enables the alarm log to be called up.
You can reset all counters and alarms using the Reset function.

6.9 TEST RELAY OUTPUT

This function allows you to check each relay output. The selected output can be checked by entering ON. When you exit the menu, the output status is automatically activated.

6.10 LANGUAGE

You can choose between different languages.

6.11 INITIALIZATION

Menu for re-initializing the system. This also allows you to select the system.

6.12 CHANGE PASSWORD

Menu for changing the password (expert). This changes the password for the protected level.

6.13 USER menu

Transition to the User menu

6.1 KEYPAD / LCD CONTROL ELEMENT

Menu for setting the LCD display

6.1.1 REGOLA CONTRASTO

Set contrast

+

15

-

- Setting with **P4 P6**
- Confirm with **P3**
- Exit menu with **P1**

6.1.2 REGOLA LUCEMINIMA

Min. light setting

+

15

-

- Setting with **P4 P6**
- Confirm with **P3**
- Exit menu with **P1**

1 INTRODUCTION

Main

*The Controller **TSol503** is for the management of Solar Plants with Natural and Forced Circulation with a Solar Panel, Accumulation/Boiler/Pool, Integration and Systems of Protection/Cooling*

Safety regulations

Read carefully the following safety regulations, in order to prevent damages and danger to people and things.

Before working on plants, follow

- *Accident prevention measures*
- *Environmental protection measures*
- *National Institute for Work accidents measures*
- *Recognized prevention measure*
- *Directions are only for technical staff*
- *Electrical works must be done only by qualified technicians*
- *The first installation of the plant must be done by expert personal or by the builder*

Declaration of Conformity: ***Rules:***
EN 60730-1 50081-1 EN 60730-1 A1 50081-2

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Product composition

*N. 01 **TSol503***
N. 04 screws and plugs
N. 02 screws for controller's fixing
N. 01 Box
N. 01 Plate
N. 01 Kit Probe PT1000

Technical data

Supply:	*230 Vac 50 Hz*
Input:	*2 VA*
Capacity:	*5A 250 Vac*
Internal fuse:	.15 A
Protection grade:	*IP40*
Reading probes:	*PT1000*
Measure Range:	*-40 ÷ 300 °C*

Installing and Use Conditions

Functioning temperature:	*0 ÷ 40 °C*
Storage temperature:	*0 ÷ 60 °C*
Humidity:	*85% @25°C*

Mechanical Characteristics

Material:	*ABS Plastic*
Installing:	*Wall / Panel*
Dimension:	*160 x 90 x 58 mm*
Display:	*Graphic Backlight 128x64*

2 INSTALLATION

2.1 MOUNTING

⚠ ***Before doing any operation make sure that the Main Power Supply is OFF***

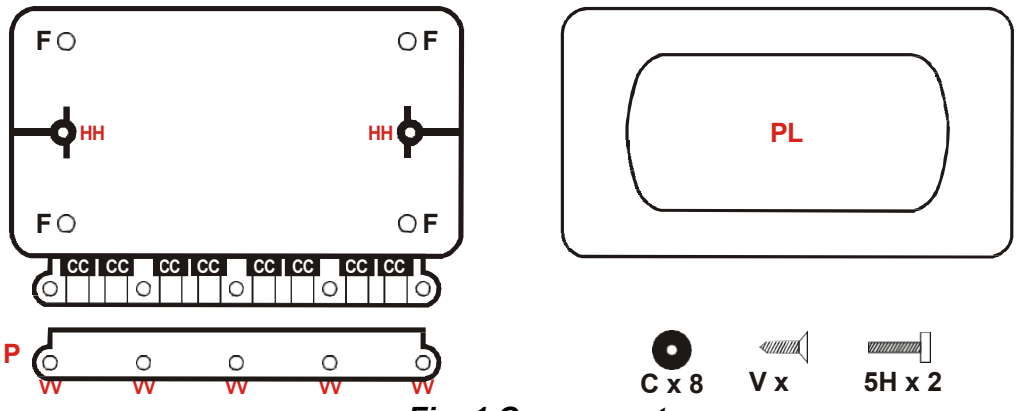


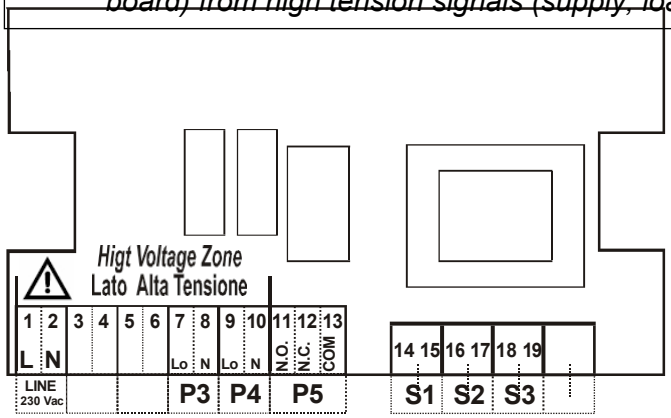
Fig. 1 Components

- *Install **TSol503** only in dry ambient and in correct climatic conditions*

- *Fix the Box with fixing points* **F**
- *Take away the lid that cable-block* **P**
- *Insert the connecting cables through cablethrough* **C** *that are in the points* **CC** *of the Box*
- *The box has 8 outputs for the cables: if more inputs are necessary USE multipolar cables but put together only cables of the same type*
- *Do the electrical connections*
- *Put the controller in the Box and put the cable in order to facilitate the insertion*
- *Block cable through the cable-block* **P** *with screws* **V** *in points* **VV**
- *Fix the controller through screws* **H** *in points* **HH**
- *Insert the plate* **PL**

2.2 ELECTRICAL CONNECTIONS

⚠ *For a correct and safe functioning always make the electrical connections to earth*
Make ordered connections and separate low tension signals (probes, contacts, cables of the control board) from high tension signals (supply, loads) to reduce interference problems



S1	**S2**	**S3**	*Probes PT1000*
P3	**P4**		*Supplied outputs 230 Vac*
P5			*In Exchange Contacts Output*

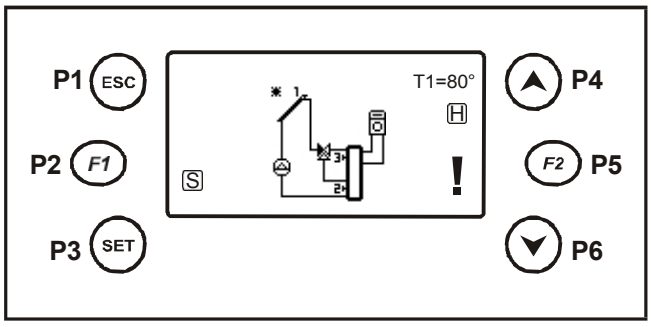
Fig. 2 Electrical Connections

3 PROBES INSTALLATION

TSol503 *manages temperature probes* ***PT1000***
The reading range is -40 ÷ 300°C with precision of 1°C.
If the probe is in ***short-circuit*** *the display shows "**Short**"*
If the probe is ***unconnected*** *or* ***broken*** *the display shows "**Open**".*

- *The probe's range depends on the declared probe's characteristics. TiEmme elettronica is not responsible for damages or malfunctioning of the probe that are due to a use of it out of the range or due to a break of the cable.*
- *The installing of the cables must be separated by the high tension cables like supply, pump commands, valves, in order to avoid interference problems during the temperature reading.*
- *Probes can be extended with a 2 x 1 mm cable until 30 mt*
- *Use the shielded cable in case of interference in the temperature reading.*

4 KEYBOARD USE AND FUNCTIONS



Button's functions:

P4/P6=Run Menu
Values Increase/decrease
P3=Enter in Menu
Save in Menu
P1=Exit Menu
P5= Probes' Temperature Scroll / Special Function

Fig. 3 LCD panel

4.1 *DISPLAY*

	Pump: ON if Blinking	T1=80	Sample 1 Temperature
S	*Panel Protection : ON if Blinking*		*Valve: Flux Direction*
H	*Holiday: Function Activated if present*		*Integration Boiler: ON if Blinking*
	Cooling circuit	!	*Alarm/s in Course*
	Pool		*Exchanger with Plates*

*Push the button **P5** to scroll the temperatures measured by the probes on the main screen*

*With button **P4** enter menu "**Monitor**" to consult the current ALARM states and other information*

Sys 1 *=Plant Number* *Sample Temperature* *Probe in short circuit* *Unconnected Probe or Broken*	**Monitor** **Sys 1** T1 = 80 T2 = Short T3 = Open	

Fig. 4 Monitor menu

*With button **P4** enter menu "**Statistics**" to consult the current ALARM states and other information*

Sys 1 = *Plant Number* *Alarms read* *Alarm code* *Other possible information*	**Statistics** **Sys 1** A02	

Fig. 5 Statistics menu

4.2 *ALLARMI*

DESCRIPTION	DISPLAY
Collector's over-temperature: temperature on S1 more than Thermostat **THS103**	**A01**
Boiler's over-temperature: Temperature on S2 more than Thermostat **THS203**	**A02**
Collector's De-Ice: temperature on S1 less then Thermostat **THS101**	**A03**
Probe Error: probable probe's break: the probe could be unconnected	**A04**
Probe Error: probable probe's break: the probe is in short-circuit	**A05**

4.3 PLANTS SURVEY

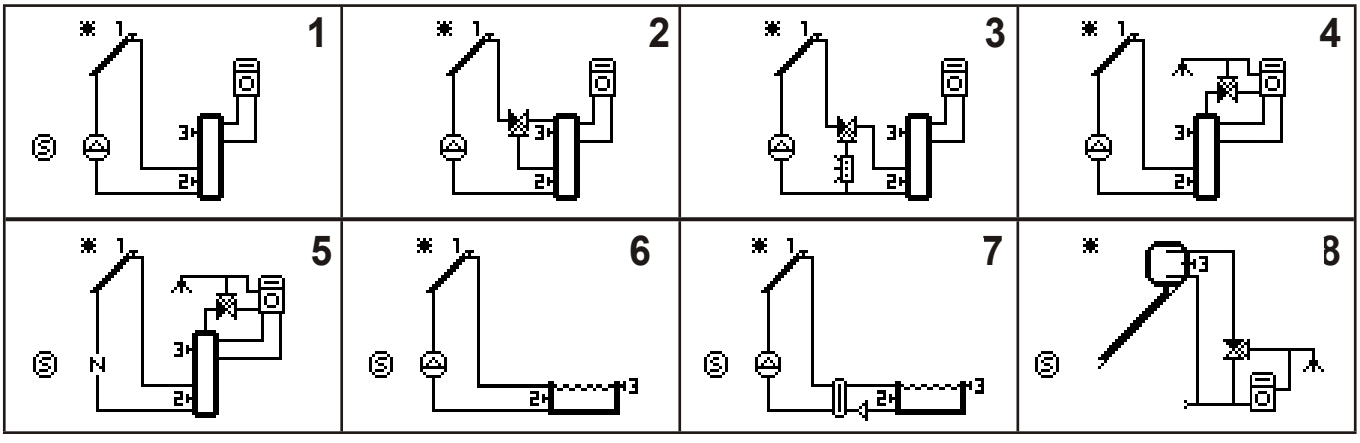


Fig. 6 Plants

5 DEFAULT FUNCTIONS

5.1 BOILER/POOL MANAGEMENT

Parameters of the management of Boiler/Pool charge

DESCRIPTION	Code
Running's Thermostat Boiler/Pool on S3	**THS300**
Hysteresis thermostat THS300	**HYS300**
Differential thermostat (S1-S2) for Boiler/pool charge	**THD120**
Thermostat hysteresis THS102	**HYD120**
Thermostat of minimum on S1 under the solar circuit pump is deactivated	**THS102**
Thermostat hysteresis THS102	**HYS102**
Thermostat on S2 over the Cooling Function Boiler is activated through the Cooling and/or Solar Circuit	**THS202**
Hysteresis thermostat THS202	**HYS202**
Thermostat of maximum on S2 that Boiler/Pool can reach	**THS203**
Thermostat hysteresis THS203	**HYS203**

5.2 SANITARY INCREASING

Parameters for the Sanitary Valve management

DESCRIPTION	Code
Thermostat on S3 over the Sanitary Valve is deviated to the sanitary water output	**THS305**
Thermostat hysteresis THS305	**HYS305**

5.3 BOILER INTEGRATION

Parameters for the Integration Boiler management

DESCRIPTION	Code
Thermostat on S3 under the Boiler Integration output is activated	**THS302**
Thermostat hysteresis THS302	**HYS302**

5.4 SOLAR CIRCUIT COOLING

Parameters for the Cooling management of the solar circuit for over temperature.

DESCRIPTION	Code
Thermostat on S1 over the collector fluid is convoyed to the Cooler	**THS104**
Thermostat hysteresis THS104	**HYS104**
Thermostat on S1 over the solar pump charges the boilers/pool and takes them to the maximum thermostats.	**THS100**
Thermostat hysteresis THS100	**HYS100**
Maximum thermostat on S3 Boiler/Pool	**THS303**
Thermostat hysteresis THS303	**HYS303**
Thermostat on S1 over the solar pump charge boiler is blocked	**THS103**
Thermostat hysteresis THS103	**HYS103**

5.5 PANEL PROTECTION

In the following schema the thermostats and hysteresis of the function panel's protection are managed for example with a tent/shutter to cover the panel

DESCRIPTION	Code
Thermostat on S1 over the output Protection Panel is activated (ex. Shutter/tent)	**THS103**
Thermostat hysteresis THS103	**HYS103**

6 MENU

The Menu is divided into:

- ***Installer Menu*** *where are available all the parameters of* ***TSol503***
- ***User's menu*** *where are available only the parameters reserved to the final user*

6.1 INSTALLER MENU

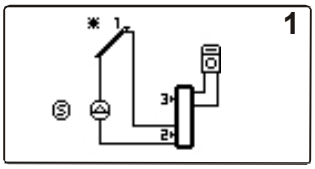
Settings		*Contains all the thermostats, hysteresis and parameters that the installer sets up*
Thermostats		*Contains all the thermostats and hysteresis used for the selected plant*
Parameters		*Contains all the parameters used for the selected plant*
Functions	**Bucket Charge**	*Contains only the functions used in the selected plant*
	Holiday	
	De-Ice	
	Stratification	
	Pumps DeBlock	
Statistics		*Menu for the visualization and reset of the statistic data (Pump functioning hours, alarms)*
Outputs Test		*Menu for the outputs functioning test*
Language		*To change the language*
Initialization		*Re-Initialization of the System*
Change Password		*For the installer's password change*
User Menu		*For the passage to User's menu*
KeyBoard Menu		*Display LCD regulation*

6.2 FIRST POWER ON

At the first Power ON ***TSol503*** *shows the available plants:*

Select the systems
With the buttons ***P4*** */* ***P6***

Confirm the selected PLANT
With the button ***P3***



The same function of plant selection is available in the Installer menu with ***Initialization***

6.3 INSTALLER MENU ACCESS

Main Menu **Installer Menu**	**PASSWORD?** **- - - -**	• *Push* ***P3*** *to select the first digit* **0 - - -** • *Select the value with* ***P4*** *and* ***P6*** **1 - - -** • *Confirm the value with button* ***P3*** **1 0 - -** • *Repeat until the 4th digit* **1 2 3** **4** • *Confirm the password with the button* ***P3*** • With **P1** digit are deleted

When it is in the this Menu for long time without pushing any button, the system automatically enter in the User's Menu.

6.4 SETTINGS

Contains thermostats, hysteresis, parameters of the default functions in the selected plant

6.5 THERMOSTATS

Contains thermostats and hysteresis for the management of the selected plant

6.6 PARAMETERS

Contains timer parameters, counters for the management of the selected plant

6.7 FUNCTIONS

From the main menu select the function from the available

6.7.1 BUCKET CHARGE

This function increases the collector's temperature in conditions of low radiation. In case of differential between the probes S1 and S2, but the temperatures S1 and S3 are both less than thermostat THS301*, the solar pump is managed with time* TIM001 *(Pause) and* TIM002 *(Work) to allow the increase of the solar fluid temperature until the value* THS301*. The cycle Pause/Work is repeated for a number of time* COU000*, then the function is deactivated for a time* TIM000*. In the end the function starts again in case of right conditions.*
N.B. In The systems with stratification, activating the Bucket Charge Function, the stratification function is automatically deactivated.

DESCRIPTION	Code
Thermostat(on S3 under the function is activated	**THS301**
Thermostat hysteresis THS301	**HYS301**
Function deactivation time after COU00 *pump's stop*	**TIM000**
Pump's pause time during the function	**TIM001**
Pump's work time during the function	**TIM002**
Maximum number of attempts of the pump during the function	**COU000**
Enable Function	**ENA000**

6.7.2 HOLIDAY

The function ***Holiday*** *is for the setting up of the system during long periods of break.*
When the function is activated the system does:

- *Boiler's Cooling*
- *Deactivation Boiler's Integration*
- *Boiler's Cooling through the Solar Circuit*

DESCRIPTION	Code
Thermostat on S2, over the system cools the boiler when there is negative differential S1-S2*.*	**THS201**
Thermostat hysteresis THS201	**HYS201**
Enable Holiday function	**ENA002**

6.7.3 DE-ICE

Contains Thermostats/Hysteresis/Parameters of the De-Ice function. If temperature (S1) is less than Thermostat **THS101***, the Solar Pump is activated in modality Pause / Work.*

DESCRIPTION	Code
Under this thermostat the function is activated	**THS101**
Thermostat hysteresis THS102	**HYS101**
Pump's work time during the function (sec)	**TIM012**
Pump's time pause during the function (min)	**TIM013**
De-ice function enable	**ENA007**

6.7.4 STRATIFICATION

In case of differential S1-S3 the high boiler zone is charged up to THS306; then the low boiler zone is charged up to the thermostat THS300. In case of absence of differential S1-S3 but presence of differential S1-S2, the lower boiler's zone is charged in Pause/Work modality.
After a number of cycles COU001*, the function is deactivated for a time* TIM017*.*
N.B. In plants with stratification, activating the function Bucket Charge, the function stratification is automatically deactivated and vice versa

DESCRIPTION	Code
Stratification thermostat	**THS306**
THS306 hysteresis thermostat	**HYS306**
Minimum differential between probes S1 and S3	**THD130**
Maximum number of cycles Pause/Work of Solar Pump modality	**COU001**
Pump's Pause time during the Stratification function	**TIM010**
Pump's Work time during the Stratification function	**TIM011**
Deactivation time of the Stratification function	**TIM017**
Stratification function Enable	**ENA008**

6.7.5 PUMPS DE-BLOCK

Menu that sets all the thermostats/hysteresis/ parameters of the Pump's De-Block function

DESCRIPTION	Code
Waiting Time For the De-Block activation (in days)	**TIM019**
Pump's Time work in De-Block (in minutes)	**TIM020**
Enable for P3 Pump's De-Block Control	**P3**
Enable for P4 Pump's De-Block Control	**P4**
Enable for P5 Pump's De-Block Control	**P5**

6.8 STATISTICS

To see the list of the managed alarms.
***Reset** sets at zero the counters and the alarms*

6.9 OUTPUTS TEST

To verify the output's functioning. Select one of the outputs to set them on ON (1).
The exit form menu automatically restores the system's state

6.10 LANGUAGE

To set the language

6.11 INITIALIZATION

To initialize again the system and to choose another plant

6.12 CHANGE PASSWORD

To change the enter password from the Installer's Menu

6.13 USER MENU

To enter into the User Menu

6.14 KEYBOARD MENU

Menu for the Display LCD regulation

6.14.1 CONTRAST REGULATION

Contrast Regulation

+

15

-

- *Set with **P4/P6***
- *Confirm with **P3***
- ***P1** to exit.*

6.14.2 MINIMUM LIGHT REGULATION

Min. light regulation

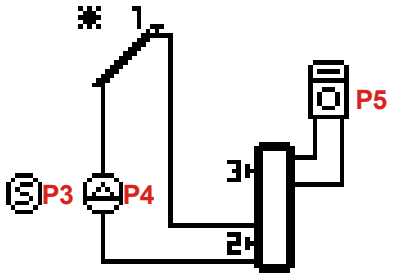
+

15

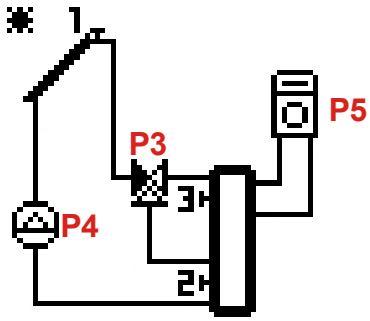
-

- *Set with **P4/P6***
- *Confirm with **P3***
- ***P1** to exit.*

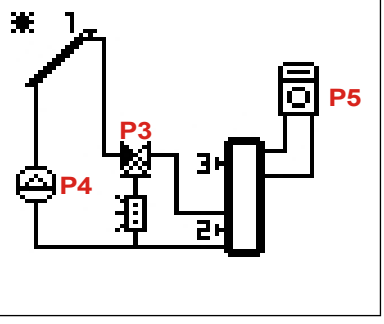
ATTACHMENT 1 Storage loading, boiler integration, collector protection				PLANT 1 *Boiler Charge, Boiler Integration, Panel Protection*	
P5	**11** N.O.	**12** N.C.	**13** Com	Boiler integration	*Boiler integration*
P4	**9-10**			Solar pump	*Solar Pump*
P3	**7-8**			Collector protection / roller blind Boiler 2 integration	*Panel Protection / Boiler Integration2*
S1	**14-15**			Collector sensor	*Collector sample*
S2	**16-17**			Buffer bottom sensor	*Low Boiler Probe*
S3	**18-19**			Buffer top sensor	*High Boiler Sample*



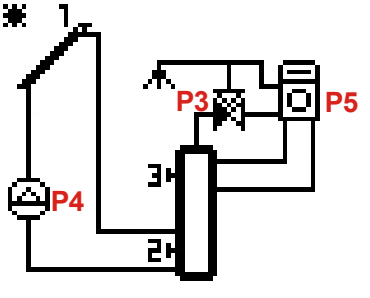
APPENDIX 2 Storage loading, internal stratification, boiler integration				PLANT 2 *Boiler Charge, Stratification, Boiler Integration*	
P5	**11** N.O.	**12** N.C.	**13** Com	Boiler integration	*Boiler integration*
P4	**9-10**			Solar pump	*Solar Pump*
P3	**7-8**			3-way valve for intell. Stratification	*Stratification Valve*
S1	**14-15**			Collector sensor	*Collector sample*
S2	**16-17**			Buffer bottom sensor	*Low Boiler Probe*
S3	**18-19**			Buffer top sensor	*High Boiler Sample*

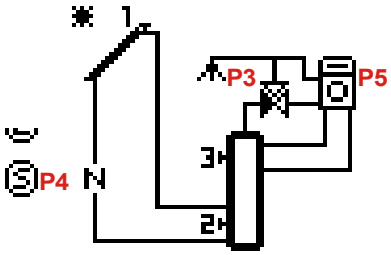


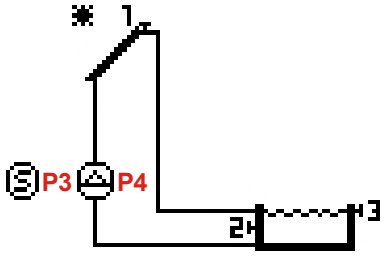
APPENDIX 3 Storage loading, cooling, boiler integration				PLANT 3 *Boiler Charge, Cooling, Boiler Integration*	
P5	**11** N.O.	**12** N.C.	**13** Com	Boiler integration	*Boiler integration*
P4	**9-10**			Solar pump	*Solar Pump*
P3	**7-8**			3-way valve for cooling	*Cooling Valve*
S1	**14-15**			Collector sensor	*Collector sample*
S2	**16-17**			Buffer bottom sensor	*Low Boiler Probe*
S3	**18-19**			Buffer top sensor	*High Boiler Sample*

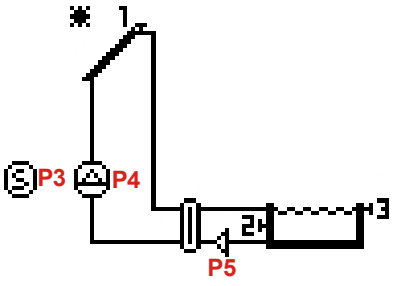


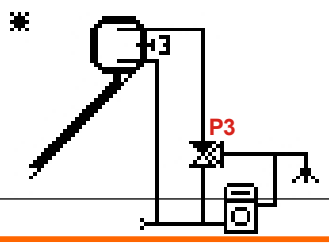
APPENDIX 4 Storage tank charging, increase in domestic hot water temperature, boiler integration				PLANT 4 *Boiler Charge, Sanitary Increasing, Boiler Integration*	
P5	**11** N.O.	**12** N.C.	**13** Com	Boiler integration	*Boiler integration*
P4	**9-10**			Solar pump	*Solar Pump*
P3	**7-8**			Domestic hot water valve	*Sanitary Valve*
S1	**14-15**			Collector sensor	*Collector sample*
S2	**16-17**			Buffer bottom sensor	*Low Boiler Probe*
S3	**18-19**			Buffer top sensor	*High Boiler Sample*



APPENDIX 5 Storage loading natural ornamental circulation, increase in domestic hot water temperature, integration of boiler, Collector protection					PLANT 5 *Boiler Charge Natural Circulation, Sanitary Increasing, Boiler Integration, Panel Protection*	
P5	**11** N.O.	**12** N.C.	**13** Com	Boiler integration	*Boiler integration*	
P4	**9-10**			Collector protection / roller blind	*Panel Protection / Boiler Integration2*	
P3	**7-8**			Domestic hot water valve	*Sanitary Valve*	
S1	**14-15**			Collector sensor	*Collector sample*	
S2	**16-17**			Buffer bottom sensor	*Low Boiler Probe*	
S3	**18-19**			Buffer top sensor	*High Boiler Sample*	

APPENDIX 6 Loading swimming pool, collector protection					PLANT 6 *Pool Charge, Panel Protection*	
P5	**11** N.O.	**12** N.C.	**13** Com	Not used	*Not used*	
P4	**9-10**			Swimming pool pump	*Pool Pump*	
P3	**7-8**			Collector protection / roller blind Boiler 2 integration	*Panel Protection / Boiler Integration2*	
S1	**14-15**			Collector sensor	*Collector sample*	
S2	**16-17**			Buffer bottom sensor	*Low Pool Sample*	
S3	**18-19**			Buffer top sensor	*High Pool Sample*	

APPENDIX 7 Loading swimming pool with heat exchanger, collector protection					PLANT 7 *Pool Charge with Exchanger, Panel Protection*	
P5	**11** N.O.	**12** N.C.	**13** Com	Swimming pool pump	*Pool Pump*	
P4	**9-10**			Solar pump	*Solar Pump*	
P3	**7-8**			Collector protection / roller blind Boiler 2 integration	*Panel Protection / Boiler Integration2*	
S1	**14-15**			Collector sensor	*Collector sample*	
S2	**16-17**			Buffer bottom sensor	*Low Pool Sample*	
S3	**18-19**			Buffer top sensor	*High Pool Sample*	

APPENDIX 8 Boiler loading with natural ornamental water, increase in domestic hot water temperature, boiler integration, collector protection					PLANT 8 *Boiler Charge Natural Circulation, Sanitary Increasing, Boiler Integration, Panel Protection*	
P5	**11** N.O.	**12** N.C.	**13** Com	Boiler integration	*Boiler integration*	
P4	**9-10**			Not used	*Not used*	
P3	**7-8**			Domestic hot water valve	*Sanitary Valve*	
S1	**14-15**			Not used	*Not used*	

S2	**16-17**	Not used	*Not used*
S3	**18-19**	Boiler sensor	*Boiler sample*

P5

8 TTHERMOSTATS ARAMETER U. P *THERMOSTATS AND PARAMETERS*

Description	Code	*Description*	Function *Function*	Range			U
				Min	Set	Max	
Differential thermostat (S1-S2) For the loading of Storage / swimming pool	**THD120**	*Differential thermostat (S1-S2) to activate the Boiler Charge*	Carica Boiler/Piscina *Boiler/Pool Charge*	1	**6**	30	**°C**
Hysteresis THD120	**HYD120**	*THD120 hysteresis*		1	**2**	5	**°C**
Differential thermostat (S1-S3) for activating the Intell. Layering	**THD130**	*Thermostat differential (S1-S3) to activate stratification*	Stratificazione *Stratification*	1	**3**	30	**°C**
Thermostat on sensor S1 If the temperature rises above this value, the pump loads the storage tank up to the maximum value. Thermostat	**THS100**	*Thermostat on S1 over the Solar Pump charges the Boiler until the Maximum Thermostats*	Protezione Collettore *Collector protection*	80	**95**	200	**°C**
Hysteresis THS100	**HYS100**	*THS100 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S1 If the temperature falls below this value, the frost protection function is activated.	**THS101**	*Thermostat on S1 under the function De-Ice is activated*	Antighiaccio *De-Ice*	-20	**5**	30	**°C**
Hysteresis THS101	**HYS101**	*THS101 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S1 If the temperature falls below this value, the solar pump is switched off. deactivated.	**THS102**	*Thermostat on S1 under the Solar Pump is deactivated*	Carica Boiler/Piscina *Boiler/Pool Charge*	0	**30**	40	**°C**
Hysteresis THS102	**HYS102**	*THS102 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S1 If the temperature exceeds this value, the solar pump is activated. blocked.	**THS103**	*Thermostat on S1 over the Solar Pump is blocked*	Protezione Collettore *Collector Protection*	80	**100**	298	**°C**
Hysteresis THS103	**HYS103**	*THS103 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S1 If the temperature rises above this value, the Solar fluid sent to the cooler.	**THS104**	*Thermostat on S1 over the collector fluid is sent to the Cooler*	Raffreddatore *Cooling*	70	**100**	200	**°C**
Hysteresis THS104	**HYS104**	*THS104 hysteresis*		0	**20**	30	**°C**
Thermostat on sensor S2 If the temperature rises above this value, the storage tank is cooled (differential S1-S2 negative)	**THS201**	*Thermostat on S2, over the Boiler is cooled with negative differential S1-S2.*	Holiday *Holiday*	20	**60**	85	**°C**
Hysteresis THS201	**HYS201**	*THS201 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S2 If the temperature rises above this value, the solar cooling of the storage tank is activated.	**THS202**	*Thermostat on S2 over the function Boiler cooling is activated through the solar circuit*	Protezione Boiler *Boiler Protection*	20	**85**	100	**°C**
Hysteresis THS202	**HYS202**	*THS202 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S2 Is the maximum value that the memory / swimming pool can be reached.	**THS203**	*Thermostat of maximum on S2 the boiler/pool can reach*	Protezione Boiler/Piscina *Boiler/Pool Protection*	20	**80**	298	**°C**
Hysteresis THS203	**HYS203**	*THS203 hysteresis*		0	**2**	25	**°C**

Operating thermostat on S3 of the Reservoir / swimming pool	**THS300**	*Boiler/Pool Running's thermostat on S3*	Carica Boiler/Piscina *Boiler/Pool Charge*	10	**70**	85	**°C**
Hysteresis THS300	**HYS300**	*THS300 hysteresis*		0	**2**	25	**°C**

Thermostat on sensor S1 and S3 sotto il quale è abilitata la Carica a Secchi	**THS301**	*Thermostat on S1 and S3 under the Bucket Charge is activated*	Carica a secchi *Bucket Charge*	20	**45**	85	**°C**
Hysteresis THS301	**HYS301**	*THS301 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S3 If the temperature falls below is this value, the Integration function is activated.	**THS302**	*Thermostat on S3 under the Boiler Integration is activated*	Carica Boiler/Piscina *Boiler/Pool Charge*	20	**50**	85	**°C**
Hysteresis THS302	**HYS302**	*THS302 hysteresis*		0	**2**	25	**°C**
Max thermostat on S3 which the storage tank/swimming pool may reach	**THS303**	*Thermostat of maximum on S3 the Boiler/Pool can reach*	Protezione Boiler/Piscina *Boiler/Pool Protection*	20	**90**	298	**°C**
Hysteresis THS303	**HYS303**	*THS303 hysteresis*		0	**2**	25	**°C**
Thermostat on sensor S3 If the temperature is above this value, the changeover valve is directed towards the drinking water storage tank.	**THS305**	*Thermostat on S3 over the Sanitary Valve is deviated to the sanitary water output*	Innalzamento Sanitario *Sanitary Increasing*	20	**50**	85	**°C**
Hysteresis THS305	**HYS305**	*THS305 hysteresis*		0	**2**	25	**°C**
Description	**Code**	***Description***	**Function** ***Function***	**Range** Min	**Set**	Max	**U**
Thermostat for Intell. Stratification on S3 If the temperature is below this value, the upper part of the storage tank is loaded.	**THS306**	*Stratification Function Thermostat on S3. Under this thermostat the high boiler zone is charged*	Stratificazione *Stratification*	20	**60**	85	**°C**
Hysteresis THS306	**HYS306**	*THS306 Hysteresis*		0	**2**	20	**°C**
Time for deactivation of the Function "Intell. Loading / temperature increase	**TIM000**	*Function Bucket Charge deactivation Time*	Carico a secchi *Bucket Charge*	1	**30**	480	**Min**
Pause time for the solar pump during the "Intell. Loading / temperature increase	**TIM001**	*Pump's Pause Time during the function Bucket Charge*	Carico a secchi *Bucket Charge*	1	**5**	60	**Min**
Working time of the solar pump during the "Intell. Loading / temperature increase	**TIM002**	*Pump's Work Time during the function Bucket Charge*	Carico a secchi *Bucket Charge*	1	**5**	60	**Min**
Pause time for the solar pump during the "Intell. Layering"	**TIM010**	*Pump's Pause Time during the function Stratification*	Stratificazione *Stratification*	1	**5**	60	**Min**
Working time of the solar pump during the "Intell. Layering"	**TIM011**	*Pump's Work Time during the function Stratification*	Stratificazione *Stratification*	1	**5**	60	**Min**
Working time of the solar pump during the frost protection function	**TIM012**	*Solar Pump's Work Time During the function De-Ice*	Antighiaccio *De-Ice*	1	**5**	480	**Sec**
Pause time for the solar pump during the frost protection function	**TIM013**	*Solar Pump's Pause Time During the function De-Ice*	Antighiaccio *De-Ice*	0	**5**	60	**Min**
Time of deactivation of the Function "Intell. Stratification"	**TIM017**	*Stratification deactivation Time*	Stratificazione *Stratification*	1	**3**	480	**hh**
Waiting time for activation of the anti-block pump function	**TIM019**	*Pause Time for the Pump's De-Block Pump activation*	Antiblocco Pompe *Pumps De-block*	1	**7**	30	**Giorni** ***Days***
Working time of the solar pump during the anti-block pump function	**TIM020**	*Work Time of the Pump in Pump's De-Block*	Antiblocco Pompe *Pumps De-block*	1	**1**	30	**Min**
Max. Number of stops of the solar pump during the " Intelligent loading / temperature increase	**COU000**	*Maximum number of stops of the Solar Pump during Bucket Charge*	Carico a secchi *Bucket Charge*	1	**5**	20	

Max. Max. number of cycles Pause/operation of the solar pump during the Intell. Layering.	**COU001**	*Maximum number of Cycles Pause/Work of the Solar Pump during Stratification function*	Stratificazione *Stratification*	1	**5**	20	
Activation of the "Intell. Loading / temperature increase	**ENA000**	*Bucket Charge Enable*	Carico a secchi *Bucket Charge*	0	**0**	1	
Activating the Holiday function	**ENA002**	*Holiday function Enable*	Holiday Holiday	0	**0**	1	
Activation of the function Frost protection	**ENA007**	*De-Ice function Enable*	Antighiaccio *De-Ice*	0	**0**	1	
Activation of the Intell. Layering	**ENA008**	*Stratification function Enable*	Stratificazione *Stratification*	0	**1**	1	
Configuration output 0=collector protection / 1=boiler integration 2	**ENA014**	*Output Configuration 0=Collector Protection / 1= Boiler Integration2*	Configurazione Uscita Output Configuration	0	**1**	1	
Activation of output P3 for monitoring the anti-block pump	**P3**	*Enable for P3 Output Pump's De-Block Control*	Antiblocco Pompe *Pumps De-block*	0	**0**	1	
Activation of output P4 for monitoring the anti-block pump	**P4**	*Enable for P4 Output Pump's De-Block Control*	Antiblocco Pompe *Pumps De-block*	0	**0**	1	
Activation of output P5 for monitoring the anti-block pump	**P5**	*Enable for P5 Output Pump's De-Block Control*	Antiblocco Pompe *Pumps De-block*	0	**0**	1	

Selected system:
Hydraulic Plant set: _____

Posted on:
Set on: _____

Posted by:
Set by: _____

Notes on installation:
Installation Note:

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