

SOLARCOMP 951



CONTROLLER FOR SOLAR COLLECTORS

Installation and Operating Instructions

for model u6.x, Rev. 1, June 2013



Safety Instructions

- Before installation read these Operation and Installation Instructions carefully and become familiar with warranty terms and conditions. Faulty installation, use or maintenance of the controller will result in losing warranty rights.
- Any installation work can only be carried out after power supply has been disconnected.
- Any other work can only be carried out after power supply has been disconnected and after ensuring that there is no hazardous voltage on the controller terminals.
- All wiring and mounting should only be done by duly authorized and qualified persons in accordance with the current regulations and standards.
- Do not install or use the controller if its housing shows visible damage. Risk of electric shock.
- The wiring system to which the controller is connected should be protected with appropriate safety fuses.
- Before the controller is switched on for the first time, check if the wiring is done in accordance with these Instructions, and whether the controller's power supply matches all the requirements.
- Any repairs of the controller can be done exclusively by the manufacturer's service. Repairs by unauthorized persons will invalidate the warranty.
- This controller is not a safety device! In systems liable to damage due to automatic control failure, it is necessary to install an extra safety device with appropriate certificates of approval. For systems which cannot be switched off, a control system designed to operate without the controller must be used.

Disposal of Waste Electrical and Electronic Equipment

(households only)



This symbol on the product or in the accompanying operating instructions indicates that the end-of-life electrical and electronic equipment should not be mixed with general household waste. For proper disposal for treatment, recovery or recycling, the product should be handed over to a designated collection point where it will be accepted on a free of charge basis. The product may be returned to your local retailer upon the purchase of a new product.

By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health. Penalties may be applicable for incorrect storage or disposal of this waste, in accordance with national legislation.

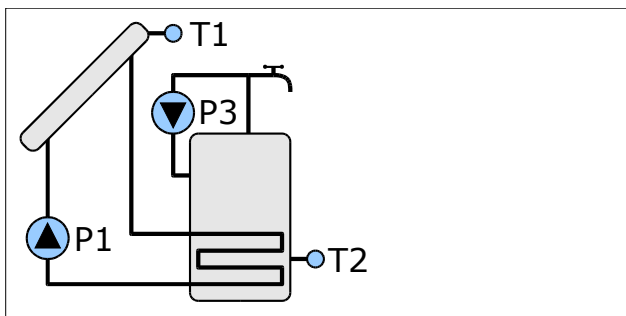
Introduction

SOLARCOMP 951 has been designed for control of solar heating systems.

Basic features of the controller include:

- **Graphic display** – it makes the operation of the controller easy. It helps to identify the system operation variant used and system parameters.
- **Heat meter** – the controller calculates the amount of heat obtained from the solar collector.
- **Cooperation with the flow meter** – input for connecting the pulser.
- **Built-in clock** – it works for 48 hours after power supply has been cut off.
- **Daily power chart** – energy obtained from the collector.
- **Weekly statistics** of the solar energy obtained.
- **Signalling tank gravity heat convection.**
- **DHW circulation pump control.**
- **Smooth pump control** – the controller provides smooth control of the tank loading pump, which allows for economic use of solar energy (the energy can be obtained from the solar panel even in dull weather).
- **Holiday mode** protecting the installation from overheating when hot water is not used.
- **Reverse cooling function** – stabilizes the tank temperature by radiating excess heat through the solar panel.
- **Anti-Legionella function (periodic DHW tank sterilization)** - once a week the set temperature of the DHW tank is increased to a set level in order to inhibit any possible growth of Legionella bacteria in the tank.
- **Collector freeze protection function** – the controller protects the solar thermal fluid from freezing by switching on the pump when the panel temperature drops below the set level.
- **Tank freeze protection function** – the controller switches on the connected heating coil or another heat source when the tank temperature drops below 4°C.
- **Protection functions** – the controller uses special algorithms for solar panel and tank protection. This protects the system from collector overheating (by stopping tank loading) or tank overheating.
- **Complex systems control** – the controller has extra outputs which make it possible to connect additional sensors, thus enabling the controller to operate more complex systems.
- **Digital interface** – it makes it easy to monitor the controller operation.

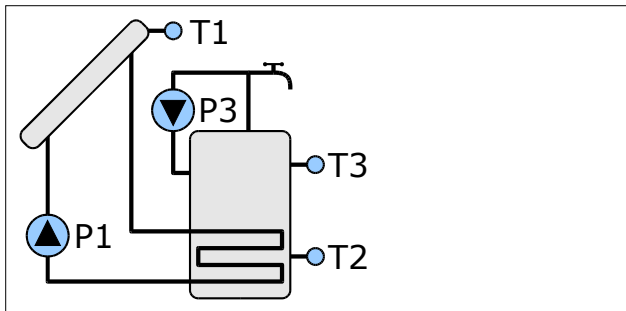
List of System Operation Variants



Variant no. 1

Tank loaded from the solar panel – system with two sensors.

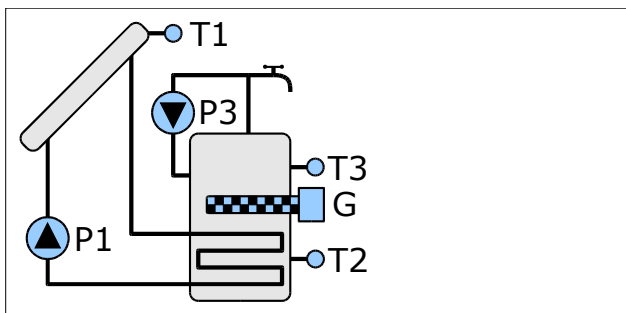
Circulation pump control.



Variant no. 2

Tank loaded from the solar panel – system with three sensors.

Circulation pump control.

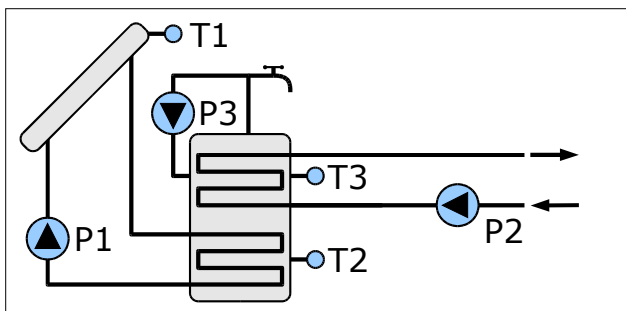


Variant no. 3

Tank loaded from the solar panel – system with three sensors.

Circulation pump control.

Additional heating of the tank with a heating coil.

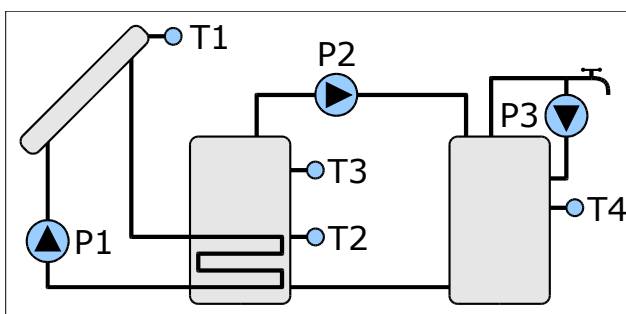


Variant no. 4

Tank loaded from the solar panel – system with three sensors.

Circulation pump control.

Excess tank heat discharge control.

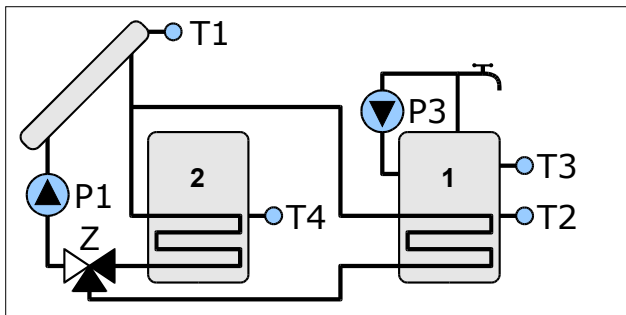


Variant no. 5

Tank loaded from the solar panel – system with three sensors.

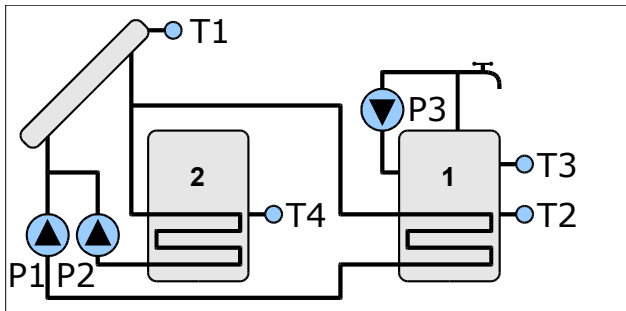
Circulation pump control.

Heat transfer to another tank (based on temperature difference).



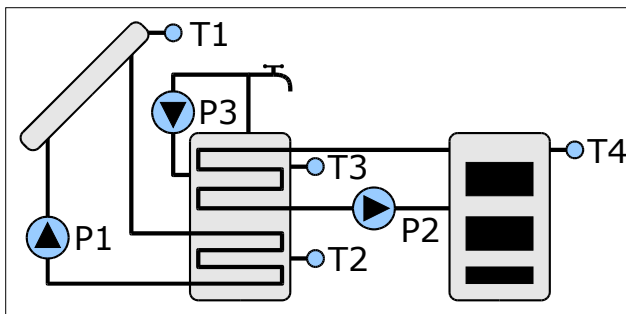
Variant no. 6

Two tanks loaded from the solar panel.
Switching between tanks with a valve.
Circulation pump control.



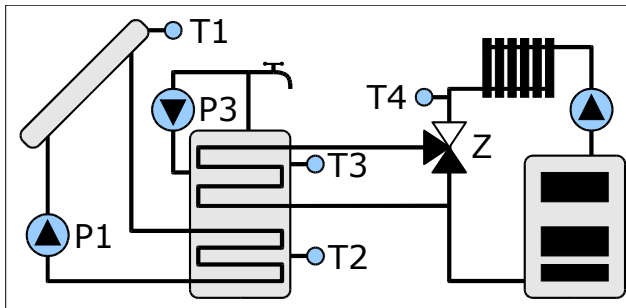
Schemat 7

Two tanks loaded from the solar panel –
system with two solar pumps.
Circulation pump control.



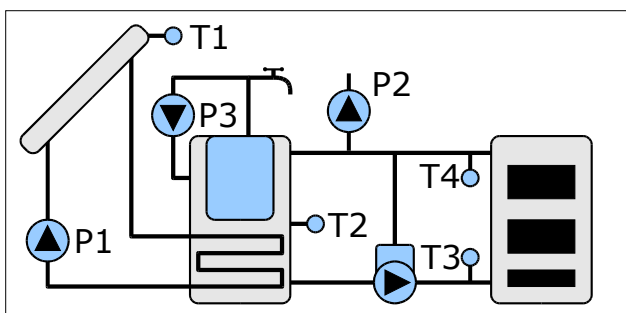
Variant no. 8

Tank loaded from the solar panel – system
with three sensors.
Solar tank loaded from an extra heat source
based on temperature difference.
Circulation pump control.



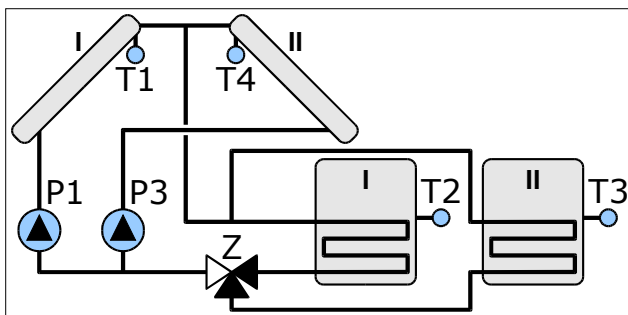
Variant no. 9

Tank loaded from the solar panel – system
with three sensors.
Central heating return support control.
Circulation pump control.



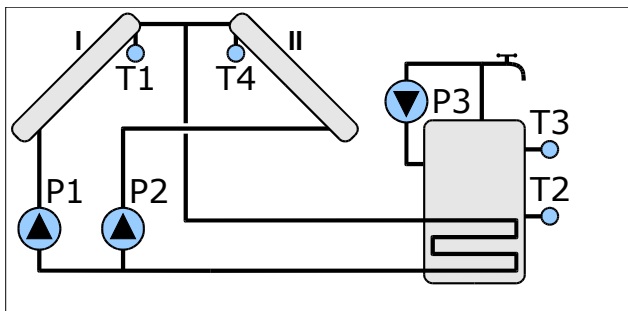
Variant no. 10

Tank loaded from the solar panel. Heat
meter on the boiler circuit. P2 discharge
pump control. Circulation pump control.



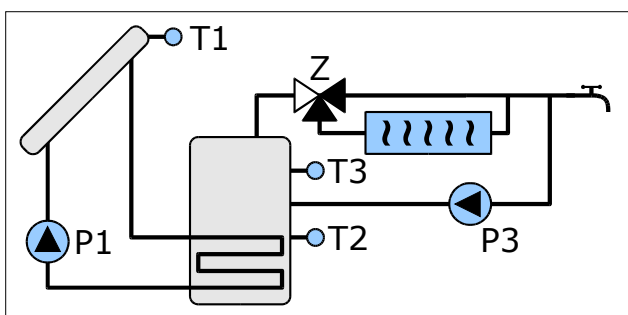
Variant no. 11

Two tanks loaded from a two-panel unit. Two solar pump unit control. Selecting of the loaded tank with a diverter valve.



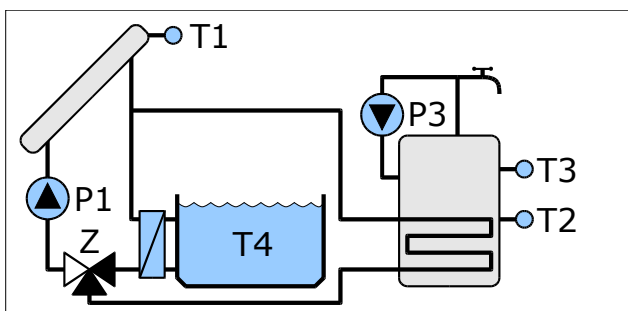
Variant no. 12

Tank loaded from a two-panel unit. Two solar pump unit control. Circulation pump control.



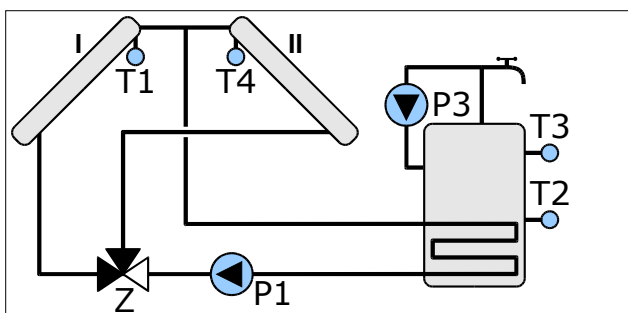
Variant no. 13

Tank loaded from the solar panel – system with three sensors. Valve control diverting DHW through flow water heater. Circulation pump control.



Variant no. 14

Tank loaded from the solar panel – system with three sensors. Pool loading control – system with a switching valve. Circulation pump control.



Variant no. 15

Tank loaded from a two-panel unit – system with a switching valve. Circulation pump control.

Control Panel Description

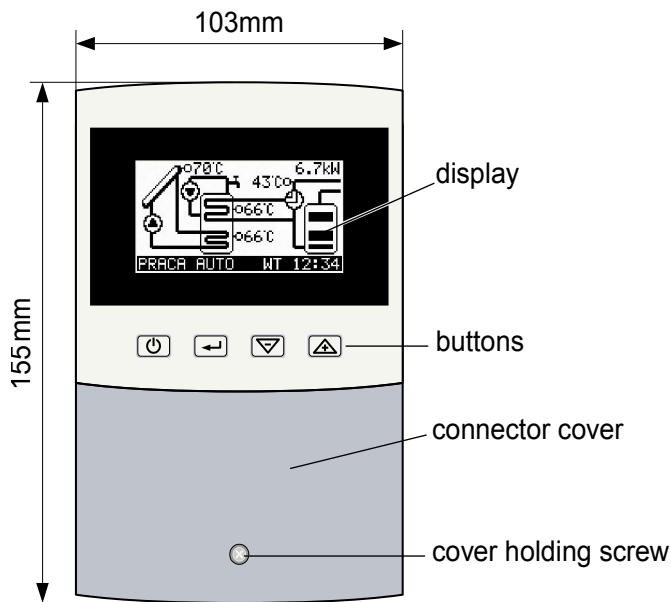


Fig. 1: Control panel button arrangement

Controller Operation

Function Buttons



ON/OFF button

It is used to move up one menu level or to move back to the information window with the solar system diagram.



ENTER button

It is used to return to the main MENU from information windows.

It is used to go from the main MENU to a selected submenu.

When in a submenu it switches between the parameter list viewing mode and parameter editing mode (changing parameter values).



Minus / down arrow button

When at the information window level, it is used to change the window displayed. When in the MENU and a submenu, it is used to change a given parameter.

When in the parameter editing mode, it is used to reduce the edited value.



Plus / up arrow button

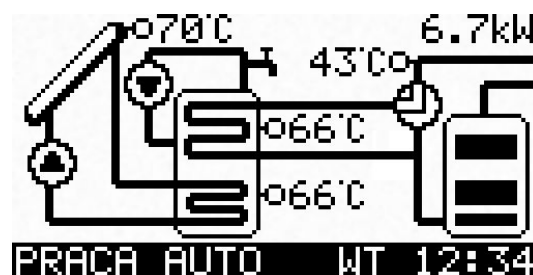
When at the information window level, it is used to change the window displayed.

When in the MENU and a submenu, it is used to change a given parameter.












When in the parameter editing mode, it is used to increase the edited value.

Basic Readings

When the controller is on, the display shows the current system operation variant and readings of the measured temperature and power obtained from the collector. The information bar at the bottom of the display provides information on the current operation mode as well as the symbol of the current day of the week and time.

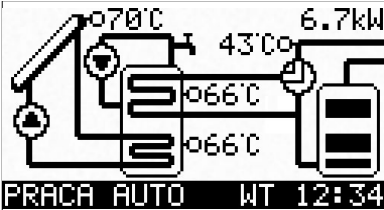

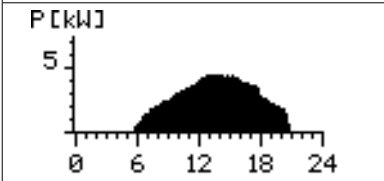


Sample Display Symbols


	Solar panel.
	Reverse cooling symbol.
	Pump – the symbol in the middle flashes when the pump is on.
	Temperature sensor. Next to it the display shows the measured temperature or !!! symbol when the temperature cannot be measured, e.g. because there is no sensor.
	Tank with a coil pipe.
	CH boiler.
	Heating coil. Its operation is signalled with heat waves.
	Switching valve.
	Pool with pool heat exchanger.
	Water flow heater.
	Laddomat





Information Windows

Information windows can be changed with  and  buttons beginning from the main window showing the solar system diagram.




	<p>Main information window. It shows the system diagram, sensor location and measured temperatures. In the top right-hand corner, instantaneous power output obtained from the solar panel is displayed. In variant no. 4 below the collector's power output CH boiler power output is displayed. At the bottom of the display the information bar provides information on the current operation mode as well as the symbol of the current day and time.</p>
	<p>Weekly power chart; it shows daily energy obtained from the solar panel within the last 7 days.</p>
	<p>Daily instantaneous energy chart; it shows changes in the energy obtained from the solar panel from 6:00 to 20:00.</p>
<p>INFORMATION</p> <p>E.TODAY 10.7kWh E.YESTERDAY 12.2kWh E.TOTAL 0000753kWh ΔT12 8.5K P1: 90% ΔT34 3.5K E.BOILER 000022kWh</p>	<p>E.TODAY – solar energy obtained the current day. E.YESTERDAY – energy obtained the previous day. E.TOTAL – solar energy meter from the date of system commissioning. ΔT12 - T1-T2 temperature difference. P1: 90% - information on P1 pump output. ΔT34 - T3-T4 temperature difference (variant no. 6). E.BOILER – meter of energy obtained from the CH boiler (variant no. 10).</p>
<p>COMPIT</p> <p>SolarComp 951 ver 4.0</p>	<p>Controller's name.</p> <p>Software version.</p>

Menu Structure

When  is pressed in the main window mode, the controller will display the following menu:

<p>MENU</p> <p>A. OPERATION MODE B. USER SETTINGS C. CLOCK SETTINGS D. SERVICE SETTINGS E. MANUAL MODE F. JĘZYK/LANG./SPRACHE</p>	<p>Use  and  buttons to highlight the desired option and then press  to access the next level. Press  to return to the main window.</p>
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Group A. Operation mode

A. OPERATION MODE	Use  and  buttons to highlight the desired option and then press  to save the change and return to the previous level.
√ AUTOMATIC MODE	
DEFROSTING	
HOLIDAY MODE	
SHUT-DOWN	

AUTOMATIC MODE – the controller automatically controls the solar system.

DEFROSTING – This mode is used to remove snow and ice from the solar panel by heating the panel with the heat coming from the tank. The solar pump is activated for the time set in parameter D.14 DEFROSTING TIME. The time left for defrosting to continue is displayed in the main information window in the status line. When the timer reaches zero the controller automatically activates the AUTOMATIC MODE.





HOLIDAY MODE – This mode is used for cooling the tank if hot water is not used (e.g. the house is unoccupied) and it is activated by the user. It helps to avoid excessive heat accumulation and reduces the risk of system overheating. Tank cooling takes place when the sun is down (late evening and night). If the panel temperature drops below the tank temperature the pump is activated and the heat accumulated in the tank is radiated by the collector. Tank cooling will be stopped if the tank temperature drops below 10°C

If the solar panel temperature exceeds the tank temperature, P1 pump is stopped. If the holiday mode is switched on in variant no. 3 (with a heating coil), the heating coil's operation is blocked.

ANTI-LEGIONELLA function activated in holiday mode results in the tank being heated up to the temperature set in parameter D18.ANTI-LEGIONELLA FUNCTION.

SHUT-DOWN – All system components are switched off. Malfunctions are not signalled.





Group B. User Settings



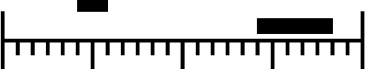

Use  and  buttons to highlight the desired option and then press  to access the editing mode. Press  to move up one menu level.

B. USER SETTINGS 01. DHW TANK SET TEMPERATURE <div>50°C</div> <div>MIN 0 MAX 85</div>	Set temperature of the solar tank. Default setting: 50°C.
B. USER SETTINGS 02. POOL HEATING ALLOWED <div>NO</div>	Function allowing pool heating. Default setting: NO
B. USER SETTINGS 03. DHW TANK 2 SET TEMPERATURE <div>45°C</div> <div>MIN 0 MAX 85</div>	Set temperature of DHW tank 2. Parameter available only in variant no. 11. Default setting: 45°C
B. USER SETTINGS 04. HEATER SET TEMPERATURE <div>35°C</div> <div>MIN 0 MAX 80</div>	Set temperature of the flow water heater. Available only in variant no. 13. Default setting: 35°C
B. USER SETTINGS 05. HEATING COIL SET TEMPERATURE <div>35°C</div> <div>MIN 0 MAX 80</div>	Set temperature of the heating coil. Parameter available only in variant no. 3. Default setting: 35°C.
B. USER SETTINGS 06. COIL BLOCKED WHEN PANEL ACTIVE <div>NO</div>	Function blocking the activation of the heating coil when the solar pump is working. Blocked heating coil operation when the solar pump is working saves energy. Parameter available only in variant no. 3. Default setting: NO.
B. USER SETTINGS 07. BOILER LOADED DHW SET TEMPERATURE <div>35°C</div> <div>MIN 0 MAX 80</div>	Set temperature up to which DHW tank is loaded from the boiler. Parameter available only in variant no. 8. Default setting: 35°C.

B. USER SETTINGS 08. BOILER BLOCKED WHEN PANEL ACTIVE YES	Function blocking tank loading from the boiler when the solar pump is working. Parameter available only in variant no. 3. Default setting: YES.
B. USER SETTINGS 09. COOLING WITH BOILER NO	Cooling with the boiler. If the solar tank is overheated, P2 pump activation starts heat discharge to the boiler. Parameter available only in variant no. 8. Default setting: NO.
B. USER SETTINGS 10. REVERSE COOLING NO	Reverse cooling function. This function stabilizes the tank temperature by cooling the tank through the solar panel if the tank temperature is higher than the set value and the panel temperature is lower than the tank temperature. Not available in variants nos. 6, 7 and 11. Default setting: NO.
B. USER SETTINGS 11. SOUND ALARM YES	Blocked P2 operation (CH off) Default setting: YES.
B. USER SETTINGS 12. SOUND ALARM YES	Enabling of a sound alarm. Default setting: NO.





Group C. Clock Settings

Use  and  buttons to highlight the desired option and then press  to access the editing mode. Press  to move up one menu level.

C. CLOCK SETTINGS 01. TIME WEDNESDAY 8:57.05	Clock set-up. Repeat pressing  to switch between day, hour and minute settings.
C. CLOCK SETTINGS 02. PANEL ACTIVE  from 06:00 to 20:00	Setting the panel operation times.
C. CLOCK SETTINGS 03. HEATING COIL ON  from 05:00 to 07:00 from 17:00 to 22:00	Setting the heating coil operation times. Available only in variant no. 3.
C. CLOCK SETTINGS 04. CIRCULATION ON  from 05:00 to 07:00 from 13:00 to 22:00	Setting the circulation pump operation times.

Group D. Service Settings

Service settings are protected with an access code. Entering the right code enables service settings editing.


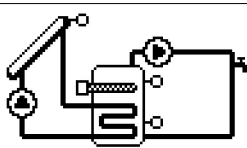
Use  and  buttons to highlight the desired option and then press  to access the editing mode. Press  to go up one menu level.

D. SERVICE SETTINGS ENTER SERVICE CODE <div>100</div> <div>MIN 1 MAX1000</div>	Access to service parameters is protected with a service code. Entering the right code allows you to edit service settings.
D. SERVICE SETTINGS 01.P1 PUMP MINIMUM SPEED <div>100%</div> <div>MIN 1 MAX100</div>	P1 pump minimum speed. Default setting: 100%
D. SERVICE SETTINGS 02.PANEL-TANK DELTA FOR PUMP ON <div>10.0K</div> <div>MIN 0.0 MAX 30.0</div>	Temperature difference between the panel and the tank for the solar pump to be activated. Default setting: 10.0K Note: Temperature difference for activating the solar pump must be at least 1K higher than temperature difference for stopping the pump. $D.02 > D.03 + 1$
D. SERVICE SETTINGS 03. PANEL-TANK DELTA FOR PUMP OFF <div>3.0K</div> <div>MIN 0.0 MAX 30.0</div>	Temperature difference between the panel and the tank for the solar pump to be stopped. Default setting: 3.0K
D. SERVICE SETTINGS 04.MAXIMUM DHW TEMPERATURE <div>85°C</div> <div>MIN 1 MAX 95</div>	DHW tank maximum temperature. The controller stops tank loading if the tank temperature exceeds the value set in this parameter. Default setting: 85°C
D. SERVICE SETTINGS 05.MIN. PANEL TEMP. (operation blocked) FUNCTION DISABLED! <div>0°C</div> <div>MIN 0 MAX 50</div>	Minimum solar panel temperature. If the panel temperature drops below this value, the controller activates the solar pump. When this function is enabled, it prevents frequent solar pump switch-off at low panel temperature. Selecting 0 disables this function. Default setting: 0°C = function disabled.






D. SERVICE SETTINGS 06.PANEL PROT. TEMP. (forced operation) 110°C MIN 0 MAX 199	Solar panel protection temperature; when exceeded, the solar pump is activated. This function protects the collector from overheating. Selecting 0 disables the function. Default setting: 110°C
D. SERVICE SETTINGS 07.OVERHEAT TEMP. (operation blocked) 140°C MIN 0 MAX 199	Panel overheat temperature; when exceeded, the solar pump is stopped. Selecting 0 disables this function. Default setting: 140°C
D. SERVICE SETTINGS 08.T3 FOR HEAT DISCHARGE 85°C MIN 0 MAX 99	T3 (tank) temperature above which the controller activates heat discharge. Refers to variant no. 4. Default setting: 85°C
D. SERVICE SETTINGS 09.P2 PUMP ON TEMP. (variant 10) 45°C MIN 0 MAX 90	Set temperature for activating P2 pump. P2 pump is started when the temperature measured with T2 sensor reaches the value set in this parameter. The pump is stopped when the temperature drops by 2°. Refers to variant no. 10. Default setting: 45°C.
D. SERVICE SETTINGS 10. T3-T4 DELTA FOR P2 PUMP ON 10.0K MIN 0.0 MAX 30.0	T3-T4 difference for activating P2 pump. Refers to variant no. 4. Default setting: 10.0K
D. SERVICE SETTINGS 11. T3-T4 DELTA FOR P2 PUMP OFF 2.0K MIN 0.0 MAX 30.0	T3-T4 difference for stopping P2 pump. Refers to variant no. 4. Default setting: 2.0K
D. SERVICE SETTINGS 12.MIN. BOILER TEMP. FOR TANK LOADING 40°C MIN 00 MAX 95	Minimum boiler temperature allowing for DHW tank loading. Refers to variant no. 8. Default setting: 40°C
D. SERVICE SETTINGS 13.MIN. TANK TEMP. FOR BOILER SUPPORT 40°C MIN 00 MAX 95	Minimum tank temperature at which CH return support can be activated. Refers to variant no. 9. Default setting: 40°C

D. SERVICE SETTINGS 14.DEFROSTING TIME 120s MIN 0 MAX 600	Solar pump operation time after starting panel defrosting mode. Default setting: 120s
D. SERVICE SETTINGS 15.HEAT CONVECTION DETECTION NO	Activating the detection of gravity heat convection from the tank. Default setting: NO.
D. SERVICE SETTINGS 16.SERPENTINE PANEL (periodic operation) FUNCTION DISABLED! 0s MIN 0 MAX 195	Serpentine collector function. By analysing panel temperature changes the controller periodically activates the solar pump for the time set in this parameter. It can measure the instantaneous temperature of the panel and activate tank heating or panel overheating protection function. Default setting: 0s = function disabled.
D. SERVICE SETTINGS 17. ANTI-FREEZE FUNCTION FUNCTION DISABLED! 10.0°C MIN -35.0 MAX 10.0	Function protecting the solar panel from freezing. This parameter determines the panel temperature below which the solar pump is activated in order to protect the solar thermal fluid from freezing or thickening. If tank temperature drops below 4°C, the controller will switch off the anti-freeze function. Selecting 10.0°C disables the function. Default setting: 10°C = function disabled
D. SERVICE SETTINGS 18. ANTI-LEGIONELLA FUNCTION FUNCTION DISABLED! 0°C MIN 0 MAX 80	ANTI-LEGIONELLA function involves periodic sterilization of the tank. This parameter determines the set tank temperature when this function is enabled. Sterilization starts weekly on Monday at 11:00 a.m. It stops when the temperature reaches the value set in this parameter. Default setting: 0°C = function disabled
D. SERVICE SETTINGS 19.HEAT METER TYPE 1 MIN 1 MAX 4	HEAT METER TYPE 1 – primary meter, 2 – high precision meter – requires T4 sensor to be placed on the return from the solar tank coil pipe. Operates in variants nos. 1..4. 3 – primary meter with a flow meter pulser connected to terminals 9,10. Operates in variants nos. 1..9. 4 – high precision meter (with T4 sensor) with a flow meter pulser connected to terminals 9,10. Operates in variants nos. 1..9. Default setting: 1

D. SERVICE SETTINGS 20.SOLAR FLUID TYPE	TYPE OF SOLAR THERMAL FLUID			
<div>1</div> <div>MIN 0 MAX 22</div>	0	Water		
	1	ERGOLID EKO -15°C	12	Transtherm EKO -35°C
	2	ERGOLID EKO -20°C	13	Termsol EKO concentrate
	3	ERGOLID EKO -25°C	14	Termsol EKO -15°C
	4	ERGOLID EKO -35°C	15	Termsol EKO -20°C
	5	Transtherm N -15°C	16	Termsol EKO -25°C
	6	Transtherm N -20°C	17	Termsol EKO -35°C
	7	Transtherm N -25°C	18	Termsol EKO-PRO -35°C
	8	Transtherm N -35°C	19	Immericol [BORIGHICOL PG -35°C]
	9	Transtherm EKO -15°C	20	Immericol Alu [BORIGHICOL PG -30°C ALU]
	10	Transtherm EKO -20°C	21	e'SOL – 29 °C
	11	Transtherm EKO -25°C	22	LAJT SOL – 29 °C
	Default setting: 1			
D. SERVICE SETTINGS 21.NOMINAL FLOW (pump output) <div>8.0l/min</div> <div>MIN 0.0 MAX 50.0</div>	NOMINAL FLOW – solar pump output. The value displayed by the flow meter (rotameter) of the solar unit when the pump operates at full speed. Default setting: 8.0 l/min			
D. SERVICE SETTINGS 22.FLOW METER (liter/pulse) <div>1.0</div> <div>MIN 0.0 MAX 50.0</div>	FLOW METER Flow meter pulser constant. This parameter is valid for heat meter 3 or 4. Default setting: 1.0 l/pulse			
D. SERVICE SETTINGS 23.LADDOMAT NOMINAL FLOW (pump output) <div>8.0l/min</div> <div>MIN 0.0 MAX 50.0</div>	LADDOMAT NOMINAL FLOW Only for variant no. 10. This value is used to count the energy obtained from the boiler. Enter the actual flow through the boiler. Default setting 8.0 l/min.			
D. SERVICE SETTINGS 24. T1 SENSOR ADJUSTMENT <div>0.0K</div> <div>MIN -10.0 MAX 10.0</div>	T1 sensor reading adjustment. Default setting: 0.0K			
D. SERVICE SETTINGS 25. T2 SENSOR ADJUSTMENT <div>0.0K</div> <div>MIN -10.0 MAX 10.0</div>	T2 sensor reading adjustment. Default setting: 0.0K			




D. SERVICE SETTINGS 26. RS485 NETWORK ADDRESS <div>10</div> <div>MIN 0 MAX 99</div>	Controller's address in the monitoring network. Default setting: 10
D. SERVICE SETTINGS 27. RS485 NETWORK SPEED <div>2400</div> <div>MIN 1200 MAX 9600</div>	Transmission speed. Default setting: 1200
D. SERVICE SETTINGS 28. RESTORE DEFAULT SETTINGS <div>YES</div>	Restoring default settings. To restore default settings enter code 70 and press  .
 D29. VARIANT	Selection of operation variant. Default setting: 1

Group E. Manual Mode

E. MANUAL MODE SOLAR PUMP 0% P2 RELAY O P3 RELAY O	Use  and  buttons to highlight the desired option and then press  to save the change. For the solar pump, the figure will start flashing which means you can change the pump's output using  and  buttons. When the control light is on it means the relay is active.
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Manual mode is automatically disabled when the user fails to press any button for 4 minutes.

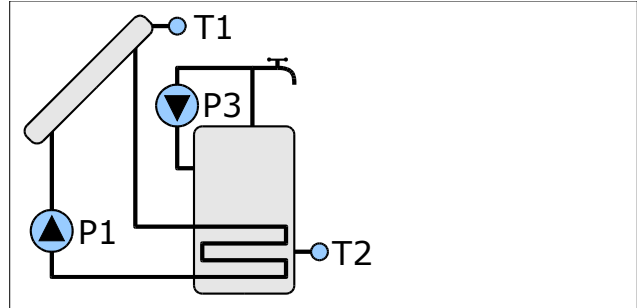
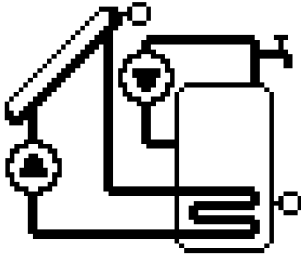
Group F. Language

F. JĘZYK/LANG./SPRACHE POLSKI ✓ ENGLISH DEUTSCH	Use  and  buttons to highlight the desired option and then press  to save the change.
-----------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

System Operation Variants

Variant no. 1

- Tank loaded from the solar panel – system with two sensors.
- Circulation pump control.



Tank loading

The solar pump (P1) can work at the time set in parameter C.02 PANEL ACTIVE. Outside those times the solar pump's operation is blocked.

The tank is loaded until temperature T2 reaches the value set in parameter B.01 DHW TANK SET TEMPERATURE. Hysteresis for the set temperature is 2K.

The loading of the tank depends on the temperature difference between the solar panel and the tank (T1-T2).

Parameter D.02 PANEL-TANK DELTA FOR P1 PUMP ON determines the temperature difference between the solar panel and the tank for activating the solar pump.

Parameter D.03 PANEL-TANK DELTA FOR P1 PUMP OFF determines the temperature difference between the solar panel and the tank for stopping the solar pump.

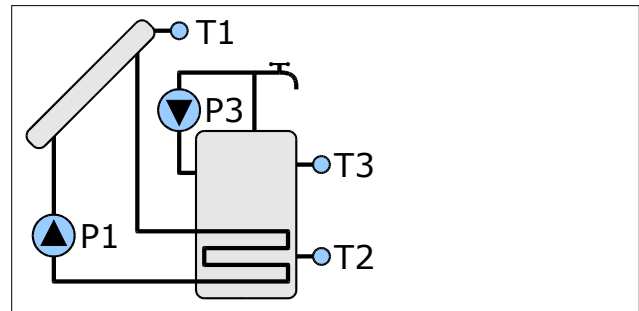
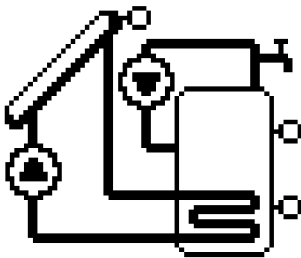
During tank loading the controller can modulate the speed of the solar pump for optimum use of solar energy.

DHW circulation

DHW circulation pump (P3) operates according to the clock and times set in parameter C.04 CIRCULATION ON.

Variant no. 2

- Tank loaded from the solar panel – system with three sensors.
- Circulation pump control.



Tank loading

The solar pump (P1) can work at the time set in parameter C.02 PANEL ACTIVE. Outside those hours the solar pump's operation is blocked.

The tank is loaded until temperatures T2 or T3 reaches the value set in parameter B.01 DHW TANK SET TEMPERATURE. Hysteresis for the set temperature is 2K.

The loading of the tank depends on the temperature difference between the solar panel and the tank (T1-T2).

Parameter D.02 PANEL-TANK DELTA FOR P1 PUMP ON determines the temperature difference between the solar panel and the tank for activating the solar pump.

Parameter D.03 PANEL-TANK DELTA FOR P1 PUMP OFF determines the temperature difference between the solar panel and the tank for stopping the solar pump.

During the tank loading the controller can modulate the speed of the solar pump for optimum use of solar energy.

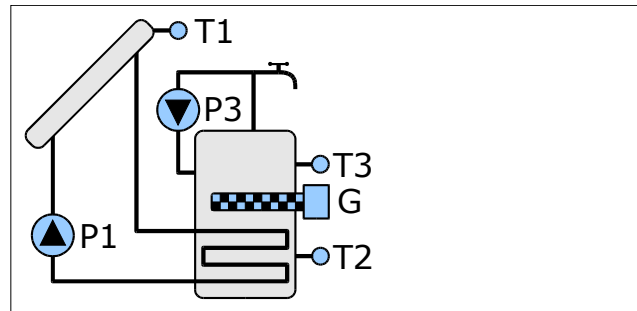
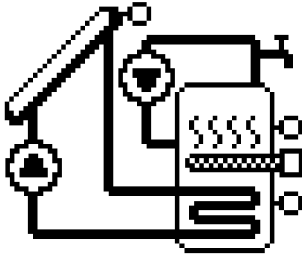
Minimum P1 pump speed is set in parameter D.01 P1 PUMP MINIMUM SPEED. When the value of 100% is set, operation without speed modulation is provided.

DHW circulation

DWW circulation is described on page 19.

Variant no. 3

- Tank loaded from the solar panel – system with three sensors.
- Circulation pump control.
- Additional heating of the tank with a heating coil.



Tank loading

The loading of the tank is described on page 20.

Heating coil operation

The coil can additionally heat the tank at the times set in parameter C.03 HEATING COIL ON. Outside the set hours its operation is blocked.

The heating coil works until the temperature set in parameter B.05. HEATING COIL SET TEMPERATURE is reached. Hysteresis is 2K.

Parameter B.06 COIL BLOCKED WHEN PANEL ACTIVE. makes it possible to block the coil's operation when the solar pump is working.

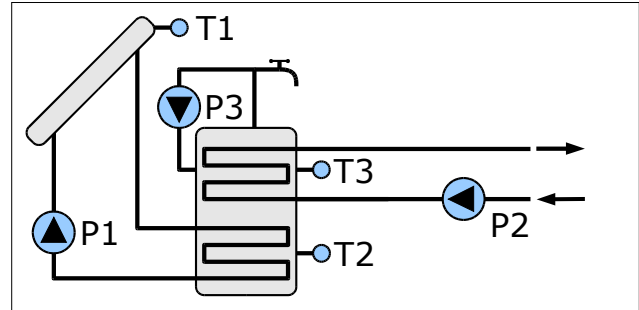
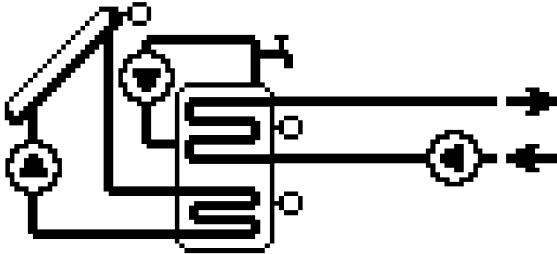
The operation of the heating coil is blocked in holiday mode.

DHW circulation

DWW circulation is described on page 19.

Variant no. 4

- Tank loaded from the solar panel – system with three sensors.
- Circulation pump control.
- Excess tank heat discharge control.



Tank loading

The loading of the tank is described on page 20.

Heat discharge

The temperature for starting the discharge of excess heat is determined in parameter D.08 T3 FOR HEAT DISCHARGE. Hysteresis is 2K.

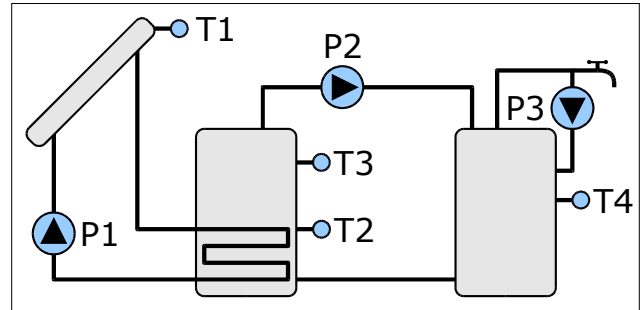
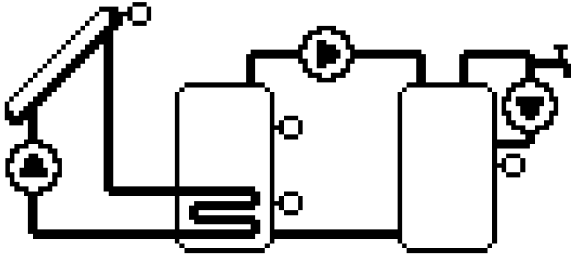
Holiday mode does not affect heat discharge.

DHW circulation

DHW circulation is described on page 19.

Variant no. 5

- Tank loaded from the solar panel – system with three sensors.
- Circulation pump control.
- Heat transfer to auxiliary tank (based on temperature difference).



Tank loading

The loading of the tank is described on page 20.

Heat transfer

Heat transfer depends on T3-T4 temperature difference and temperature T4.

The set temperature of tank no. 2 is determined by parameter B.02 DHW TANK 2 SET TEMPERATURE. Hysteresis for the set temperature is 2K.

Parameter D.10 T3-T4 DELTA FOR P2 PUMP ON determines T3-T4 delta for activating P2 pump.

Parameter D.11 T3-T4 DELTA FOR P2 PUMP OFF determines T3-T4 delta for stopping P2 pump.

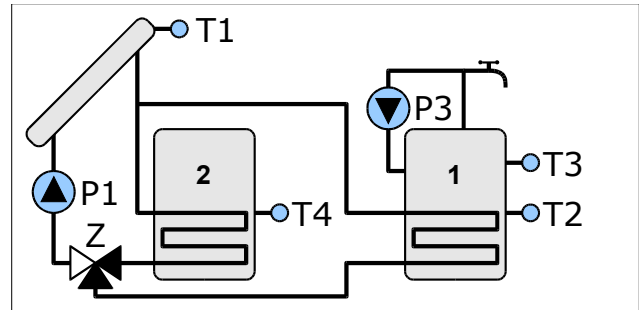
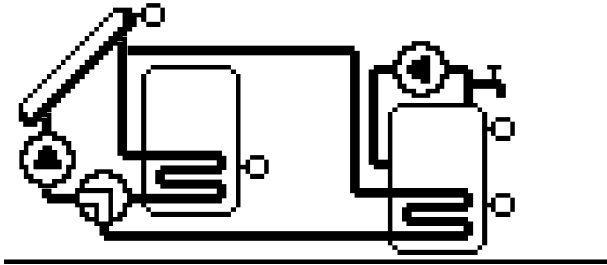
Holiday mode does not affect heat transfer.

DHW circulation

DHW circulation is described on page 19.

Variant no. 6

- Two tanks loaded from the solar panel.
- Switching between tanks with a valve.
- Circulation pump control.



Tank loading

First the primary tank is loaded (1). The auxiliary tank (2) can be loaded when tank 1 temperature reaches the value set in parameter B.01 DHW TANK SET TEMPERATURE. The controller switches the diverter valve Z. The auxiliary tank is loaded until it reaches the temperature set in parameter B.01 DHW TANK SET TEMPERATURE.

The loading of the tanks depends on the temperature difference between the solar panel and the currently loaded tank.

Parameter D.02 PANEL-TANK DELTA FOR P1 PUMP ON determines the temperature difference between the solar panel and the tank for activating the solar pump.

Parameter D.03 PANEL-TANK DELTA FOR P1 PUMP OFF determines the temperature difference for stopping the solar pump.

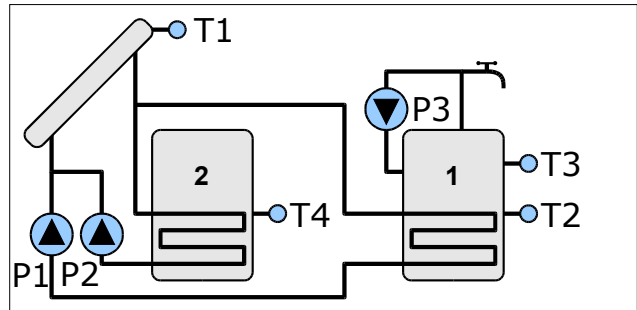
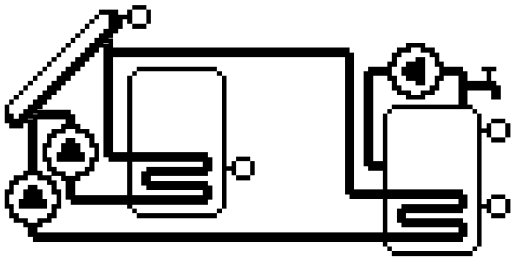
During tank loading the controller can modulate the speed of the solar pump for optimum use of solar energy. Minimum speed of P1 pump is set in parameter D.01 P1 PUMP MINIMUM SPEED. When the value of 100% is selected, operation without speed modulation is provided.

DHW circulation

DHW circulation is described on page 19.

Variant no. 7

- Two tanks loaded from the solar panel – system with two solar pumps.
- Circulation pump control.



Tank loading

First the primary tank is loaded (1). The auxiliary tank (2) can be loaded when tank 1 temperature reaches the value set in parameter B.01 DHW TANK SET TEMPERATURE. The auxiliary tank is loaded until it reaches temperature set in parameter B.01 DHW TANK SET TEMPERATURE.

The loading of the tanks depends on the temperature difference between the solar panel and the currently loaded tank.

Parameter D.02 PANEL-TANK DELTA FOR P1 PUMP ON determines the temperature difference between the solar panel and the tank for activating the solar pump. Parameter D.03 PANEL-TANK DELTA FOR P1 PUMP OFF determines the temperature difference for stopping the solar pump.

During primary tank loading the controller can modulate the speed of the solar pump for optimum use of solar energy. Minimum speed of P1 pump is set in parameter D.01 P1 PUMP MINIMUM SPEED. When the value of 100% is selected, operation without speed modulation is provided.

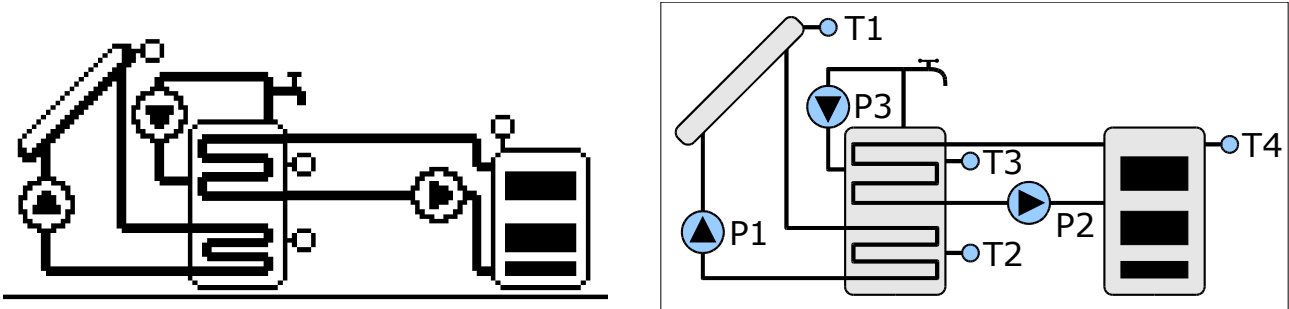
Speed of the auxiliary tank loading pump is not modulated.

DHW circulation

DHW circulation is described on page 19.

Variant no. 8

- Tank loaded from the solar panel – system with three sensors.
- Solar tank loaded from an additional heat source based on temperature difference.
- Circulation pump control.



Tank loading

The loading of the tank is described on page 20.

Tank heating from the CH boiler

The set tank temperature, for which heating from the CH boiler is on, is determined in parameter B.07 BOILER LOADED DHW SET TEMPERATURE.

Parameter B.08. BOILER BLOCKED WHEN PANEL ACTIVE makes it possible to switch off tank heating if the solar pump is working.

Parameter D.12 MIN. BOILER TEMPERATURE FOR TANK LOADING determines the minimum boiler temperature at which tank heating can be started. Hysteresis for the boiler minimum temperature is 3K.

Tank heating from the CH boiler depends on the temperature difference between the CH boiler and the tank T4-T3.

P2 pump is started when T4-T3 temperature difference exceeds 5K.

P2 pump is stopped when T4-T3 temperature difference drops to 1K.

Tank loading from the CH boiler is off in holiday mode.

Cooling with boiler

This function is activated in parameter B.09 COOLING WITH BOILER.

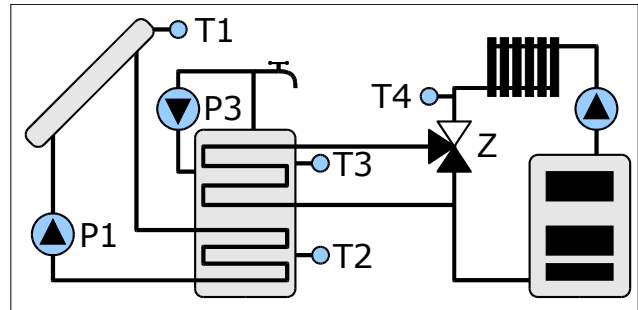
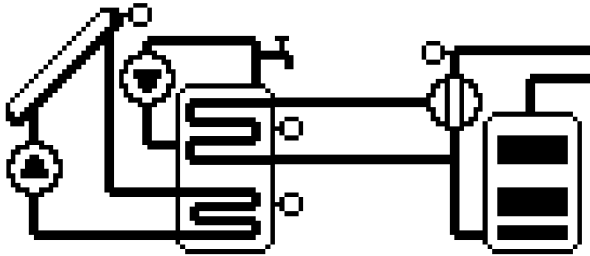
This function activates P2 pump if tank temperature (T3) exceeds the set temperature by 5K and tank temperature (T4) is lower than tank temperature (T3). Tank cooling continues until it reaches 3K below the set temperature.

DHW circulation

DHW circulation is described on page 19.

Variant no. 9

- Tank loaded from the solar panel – system with three sensors.
- Central heating return support control.
- Circulation pump control.



Tank loading

The loading of the tank is described on page 20.

CH support

CH support involves pre-heating of central heating return. This is done by means of the switching valve.

Parameter D.13 MIN. TANK TEMPERATURE FOR BOILER SUPPORT protects the DHW tank from excessive cooling. If tank temperature (T3) drops below the set value, CH support is switched off. Hysteresis for parameter D.13 is 3K.

Return support depends on the temperature difference between the tank and CH return (T3-T4).

CH support is switched on when T3-T4 difference is higher than 5K.

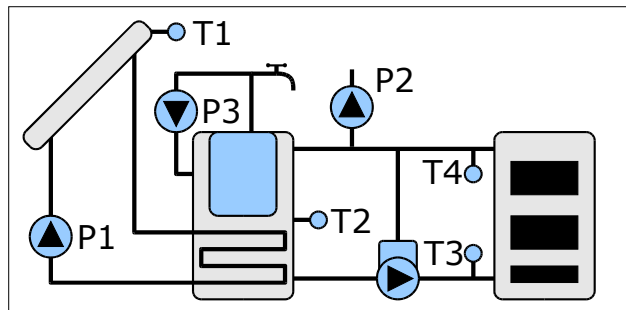
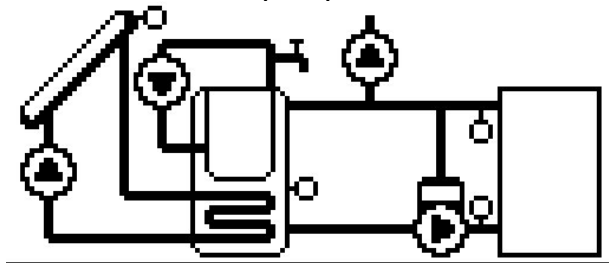
CH support is switched off when T3-T4 difference drops to 1K.

DHW circulation

DHW circulation is described on page 19.

Variant no. 10

- Tank loaded from the solar panel – system with two sensors.
- P2 pump control.
- Counting energy obtained from an auxiliary heat source (e.g. CH boiler).
- Circulation pump control.



Tank loading

The loading of the tank is described on page 19.

P2 pump control

P2 pump is started when the temperature measured with T2 sensor reaches the value set in parameter D09. P2 PUMO ON TEMPERATURE (variant no. 10). The pump is stopped when the temperature drops 2K below that value. When the LEGIONELLA function is selected, P2 pump's operation is blocked. P2 pump operation can be blocked for the summer in parameter B11. P2 OPERATION BLOCKED (CH off).

Auxiliary heat meter

The meter of energy obtained from an auxiliary heat source is based on T3 and T4 temperature measurement and LADDOMAT pump operation signal. For it to operate properly it is necessary to set the nominal flow generated by the LADDOMAT pump. This is set in parameter D.23. LADDOMAT NOMINAL FLOW (pump output).

Measured boiler output is displayed on the main panel below the measured solar panel output.

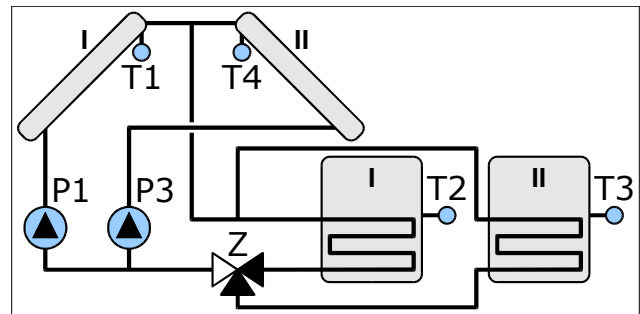
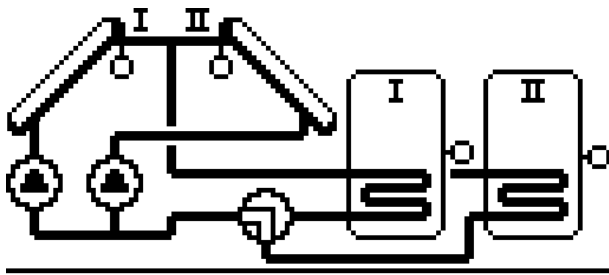
Energy meter readings E.BOILER can be found in the INFORMATION window.

DHW circulation

DHW circulation is described on page 19.

Variant no. 11

- Two tanks loaded from two solar panels.



Tank loading

The loading of tanks can take place at the times set in parameter C.02 PANEL ACTIVE. Outside those hours the pumps' operation is blocked.

First tank 1 is loaded. Loading of tank 2 can be started only after tank 1 has been heated up to the set temperature. The set temperature of tank 1 is determined in parameter B.01 DHW TANK SET TEMPERATURE. Set temperature of tank 2 is determined in parameter B.02 DHW TANK 2 SET TEMPERATURE. Hysteresis of the set temperature for both tanks is 2K.

Tank 1 loading from solar panel 1 takes place as a function of T1-T2 temperature difference.

Tank 1 loading from solar panel 2 takes place as a function of T4-T2 temperature difference.

Tank 2 loading from solar panel 1 takes place as a function of T1-T3 temperature difference.

Tank 2 loading from solar panel 2 takes place as a function of T4-T3 temperature difference.

Parameter D.02 PANEL-TANK DELTA FOR P1 PUMP ON determines the temperature difference between the solar panel and the tank for activating the solar pump.

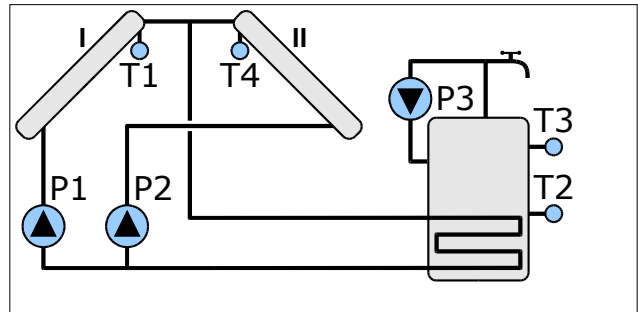
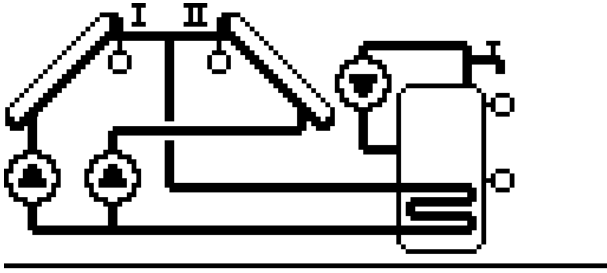
Parameter D.03 PANEL-TANK DELTA FOR P1 PUMP OFF determines the temperature difference between the solar panel and the tank for stopping the solar pump.

During tank loading the controller can modulate the speed of P1 pump for optimum use of solar energy. Minimum speed of P1 pump is set in parameter D.01.P1 PUMP MINIMUM SPEED. When 100% is selected, operation without speed modulation is provided.

P3 pump's speed is not modulated.

Variant no. 12

- Tank loaded from two solar panels.
- Circulation pump control.



Tank loading

The loading of tanks can take place at the times set in parameter C.02 PANEL ACTIVE. Outside those hours the pumps' operation is blocked.

The tank is loaded until temperature T2 or T3 reaches the temperature set in parameter B.01 DHW TANK SET TEMPERATURE. Hysteresis of the set temperature is 2K.

Tank loading from solar panel 1 takes place as a function of T1-T2 temperature difference.

Tank loading from solar panel 2 takes place as a function of T4-T2 temperature difference.

Parameter D.02 PANEL-TANK DELTA FOR P1 PUMP ON determines the temperature difference between the solar panel and the tank for activating the solar pump.

Parameter D.03 PANEL-TANK DELTA FOR P1 PUMP OFF determines the temperature difference between the solar panel and the tank for stopping the solar pump.

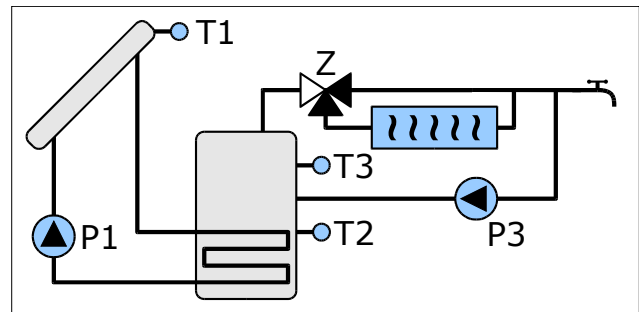
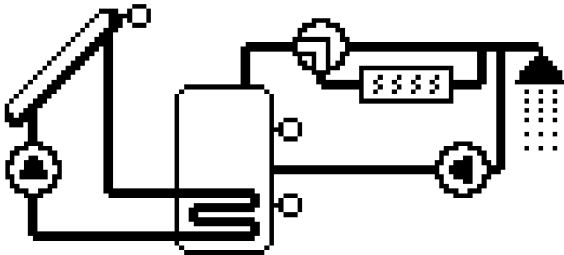
During tank loading the controller can modulate the speed of P1 pump for optimum use of solar energy. Minimum speed of P1 pump is set in parameter D.01 P1 PUMP MINIMUM SPEED. When 100% is selected, operation without speed modulation is provided.

DHW circulation

DHW circulation is described on page 19.

Variant no. 13

- Tank loaded from the solar panel – system with three sensors.
- Valve control diverting DHW through flow water heater.
- Circulation pump control.



Tank loading

The loading of the tank is described on page 20.

Switching valve control

The valve directs water through the flow water heater until temperature T3 reaches the value set in parameter B.04 HEATER SET TEMPERATURE. Hysteresis is 2K.

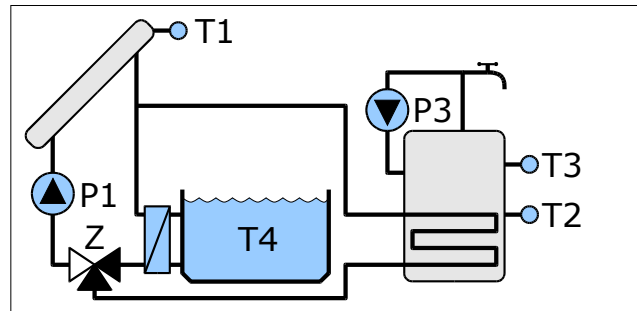
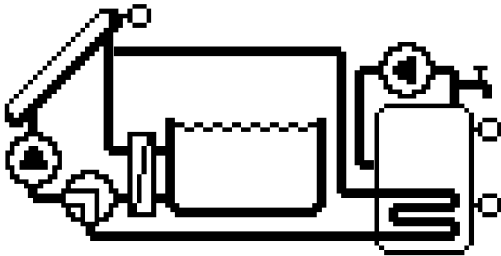
Holiday mode does not affect the operation of the switching valve.

DHW circulation

DHW circulation is described on page 19.

Variant no. 14

- Tank loaded from the solar panel – system with three sensors.
- Pool loading control – system with a switching valve.
- Circulation pump control.



Tank and pool loading

Heating of the pool can be activated in parameter B.02 POOL HEATING ALLOWED. The pool can be heated when the temperature of the primary tank reaches the value set in parameter B.01 DHW TANK SET TEMPERATURE. The controller then switches the diverter valve Z and the heat from the solar panel is directed to the pool heat exchanger.

Parameter D.02 PANEL-TANK DELTA FOR P1 PUMP ON determines the temperature difference between the solar panel and the tank for activating the solar pump and the difference between the solar panel and the pool while loading the pool.

Parameter D.03 PANEL-TANK DELTA FOR P1 PUMP OFF determines the temperature difference between the solar panel and the tank for stopping the solar pump and the difference between the solar panel and the pool while loading the pool.

The controller can modulate the output of the solar pump for optimum use of solar energy. Minimum speed of P1 pump is set in parameter D.01 P1 PUMP MINIMUM SPEED. When 100% is selected, operation without speed modulation is provided.

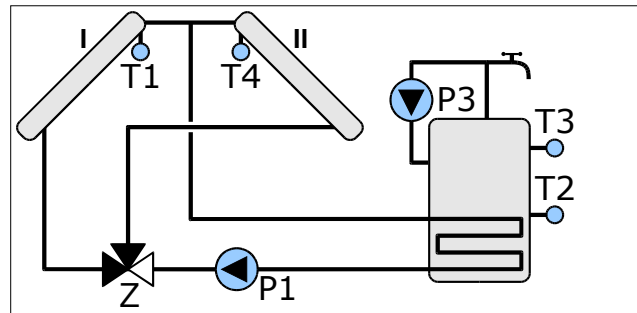
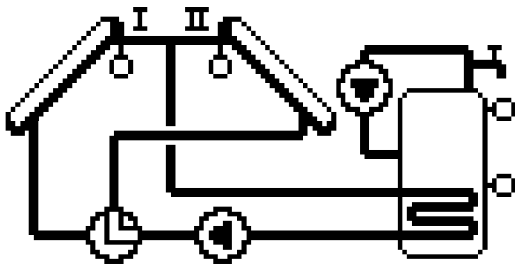
In holiday mode the pool is not heated.

DHW circulation

DHW circulation is described on page 19.

Variant no. 15

- Tank loaded from two solar panels – system with a switching valve.
- Circulation pump control.



Tank loading

The controller switches the valve so that the tank is loaded from the warmer solar panel. Tank loading takes place as a function of temperature difference $T1-T2$ or $T4-T2$. If such difference exceeds the value set in D.02 PANEL-TANK DELTA FOR PUMP ON, then the controller starts P1 pump. The pump is started at full speed, which is reduced if the temperature difference drops below D.02 PANEL-TANK DELTA FOR PUMP ON. If the difference drops below parameter D.03.PANEL-TANK DELTA FOR PUMP OFF, the pump is switched off. Minimum speed of the pump is limited by parameter D.01. P1 PUMP MINIMUM SPEED and should be set to ensure stable operation of the pump. If minimum speed is set at 100% then the on/off operation mode is enabled. The loading of the tank stops when temperature $T4$ exceeds the value set in B.01. DHW TANK SET TEMPERATURE.

DHW circulation

DHW circulation is described on page 19.

Multifunctions

Sensor failure signal can mean that the sensor is not connected. When several sensors fail, information on the last sensor failure is displayed.

T1panel SENSOR
FAILURE

Solar panel sensor T1 failure.
Temperature reading is replaced by “!!!”

T2tank SENSOR
FAILURE

Tank sensor T2 failure.
Temperature reading is replaced by “!!!”

T3tank SENSOR
FAILURE

Tank sensor T3 failure.
Temperature reading is replaced by “!!!”

T4 SENSOR
FAILURE

Sensor T4 failure
Temperature reading is replaced by “!!!”


PANEL
OVERHEAT

Solar panel overheating means that the panel temperature has exceeded value **D07.OVERHEAT TEMP. (operation blocked)**

MAX DHW
TEMPERATURE

Tank temperature has exceeded **D04. MAXIMUM DHW TEMPERATURE**

HEAT
CONVECTION

Gravity heat convection from the tank at night. This signal does not affect the controller's operation. The message is cancelled by pressing the  button.

Controller Installation and Commissioning

Controller Mounting

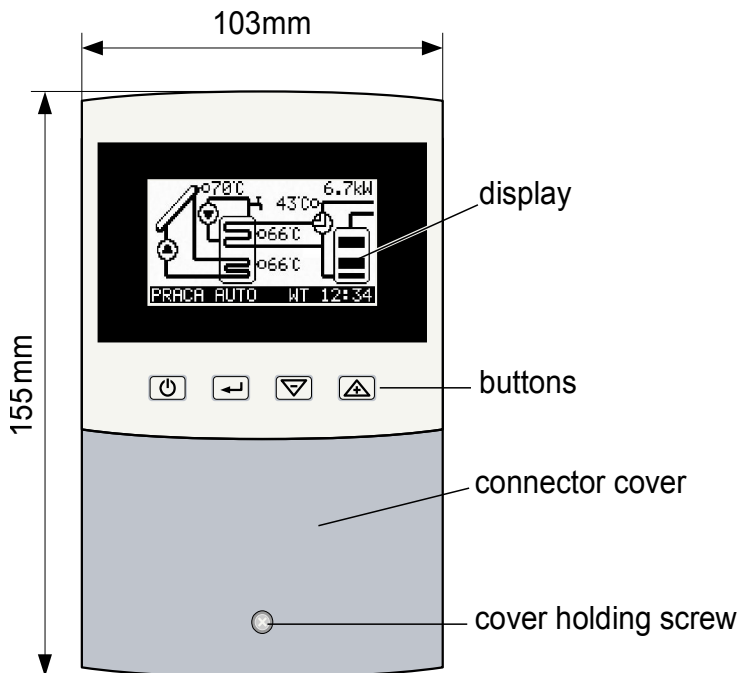


Fig. 2: SOLARCOMP 951 controller pictorial view.

- Undo the screw holding the connector's cover and remove the cover.
- Place the controller against the wall and mark the location of the bottom bolt.
- Mark the location of the top bolt (130mm spacing).
- Hang the controller on the top bolt and fix it to the wall with the bottom bolt.
- Connect the sensors, power supply and the controlled equipment as specified in the next section.
- Replace the connection cover and fix it with the screw provided.

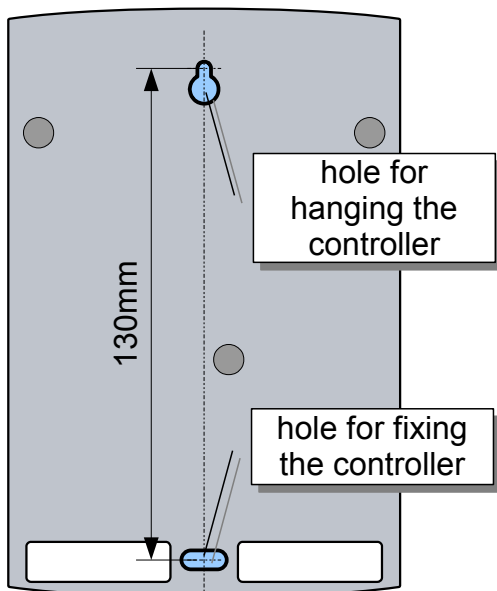


Fig. 3: Spacing of the mount-holes

Wiring Diagram

NOTE! Any electrical connections must be made by duly authorised and qualified persons after power supply has been disconnected!

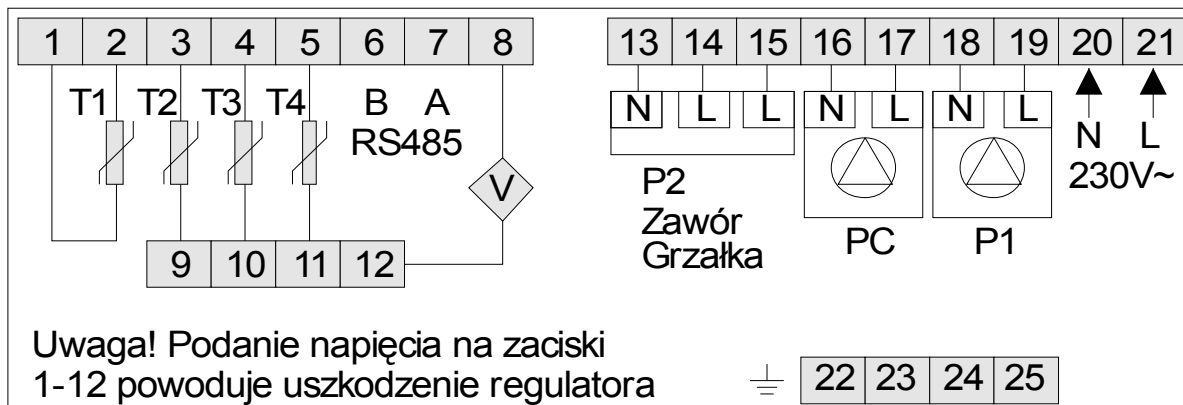


Fig. 4: Connection diagram

zawór – valve
grzałka – heating coil
pompa P1 – P1 pump

Uwaga! Podanie napięcia na zaciski 1-12 powoduje uszkodzenie regulatora – Note! Connecting power supply to terminals 1-12 will damage the controller

Temperature sensors

Temperature sensors should be connected to the following (polarity not important):

1,2 T1 – solar panel sensor (type T1301)

3,9 T2 – bottom sensor of primary tank (type T1001)

4,10 T3 – top sensor of primary tank (type T1001)

5,11 T4 – additional sensor, in a system with precise heat measurement, sensor of return from the coil pipe (type T1001)

Sensor cables must be routed separately from the power supply cables.

Flow meter

8,12 Flow meter, input for connecting the flow meter pulser.

Digital Interface RS-485

6 – line B

7 – line A

Controller supply

21 – phase conductor L

20 – neutral conductor N

25 – ground conductor PE

Solar pump P1

19 – phase conductor L

18 – neutral conductor N

24 – ground conductor PE

Circulation pump PC / P3

17 – phase conductor L

16 – neutral conductor N

23 – ground conductor PE

P2 pump/ heating coil

13 – phase conductor L

13 – neutral conductor N

22 – ground conductor PE

Diverter valve

13 – neutral conductor N

14 – phase conductor L (NO)

15 – phase conductor L (NC)

Connection Diagram - Examples

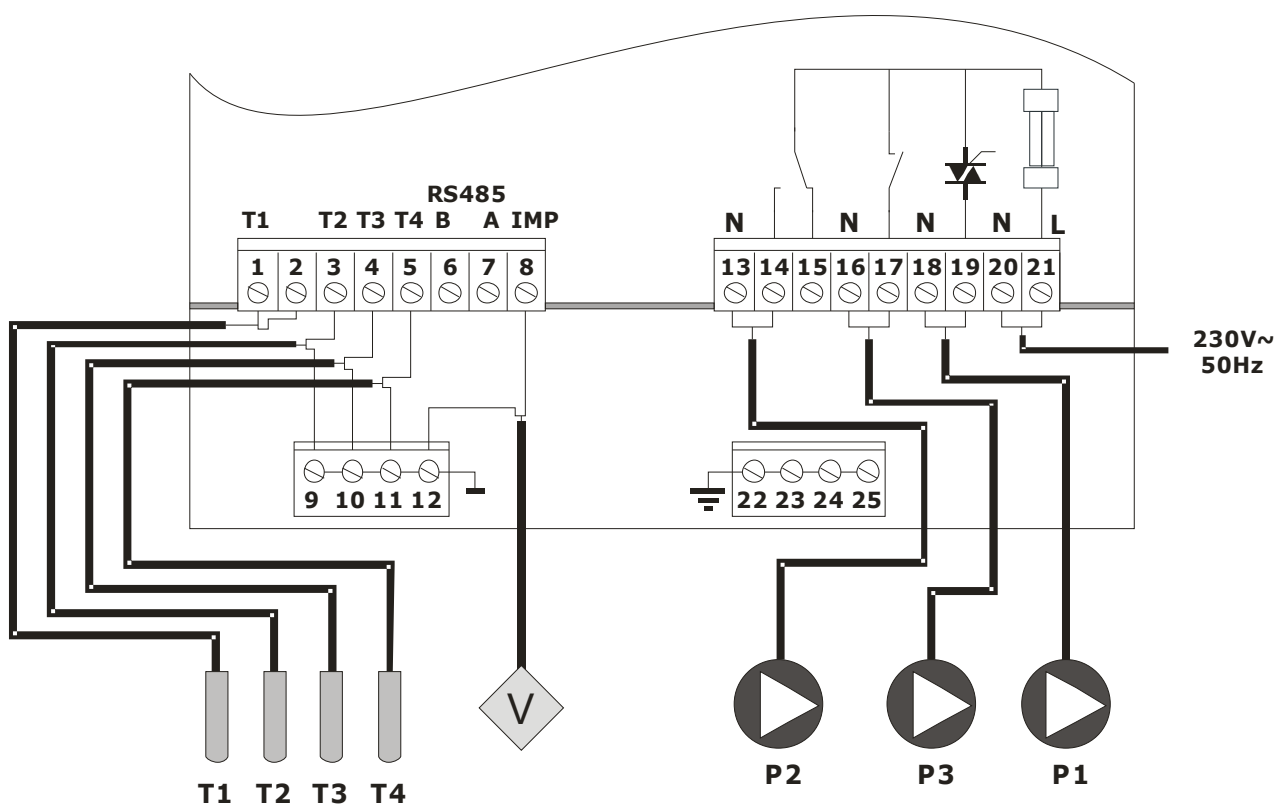


Fig. 5: Sample Connection Diagram

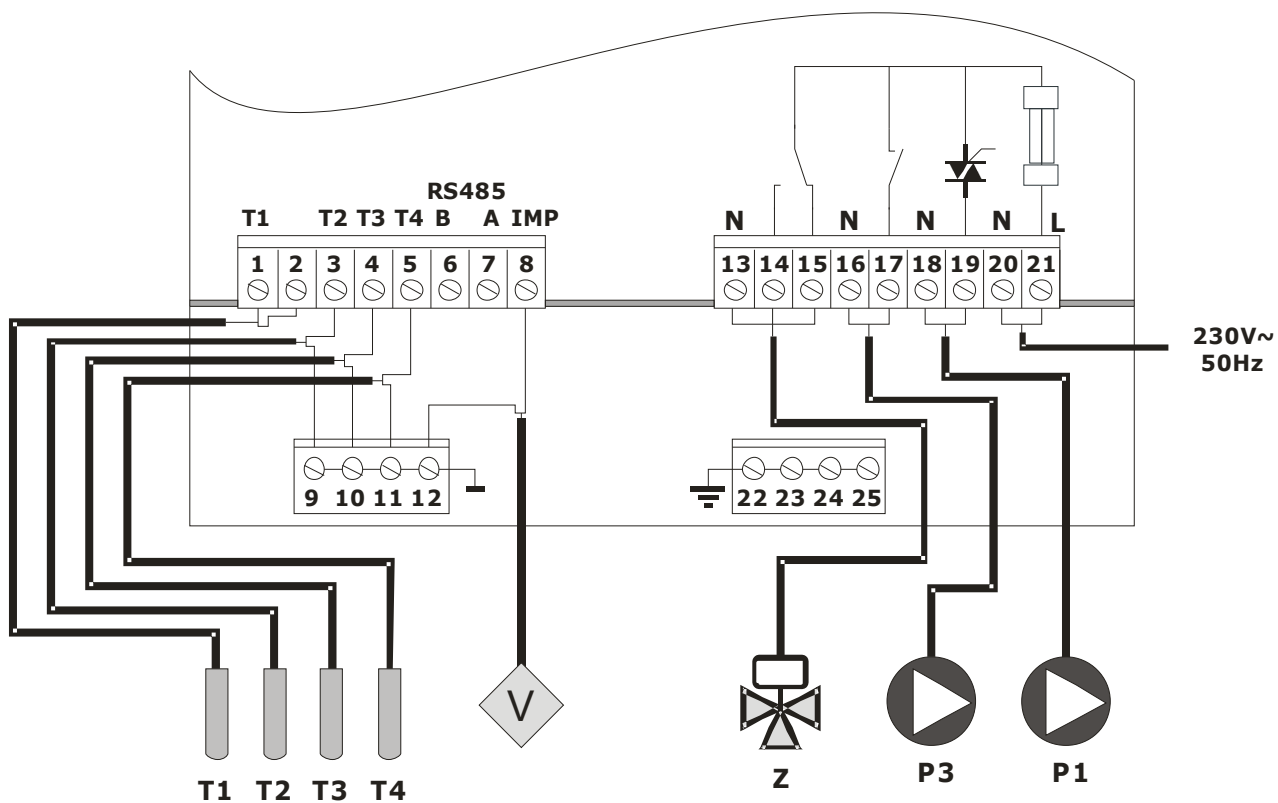


Fig. 6: Connecting sensors and components to the controller in systems with a distribution valve.

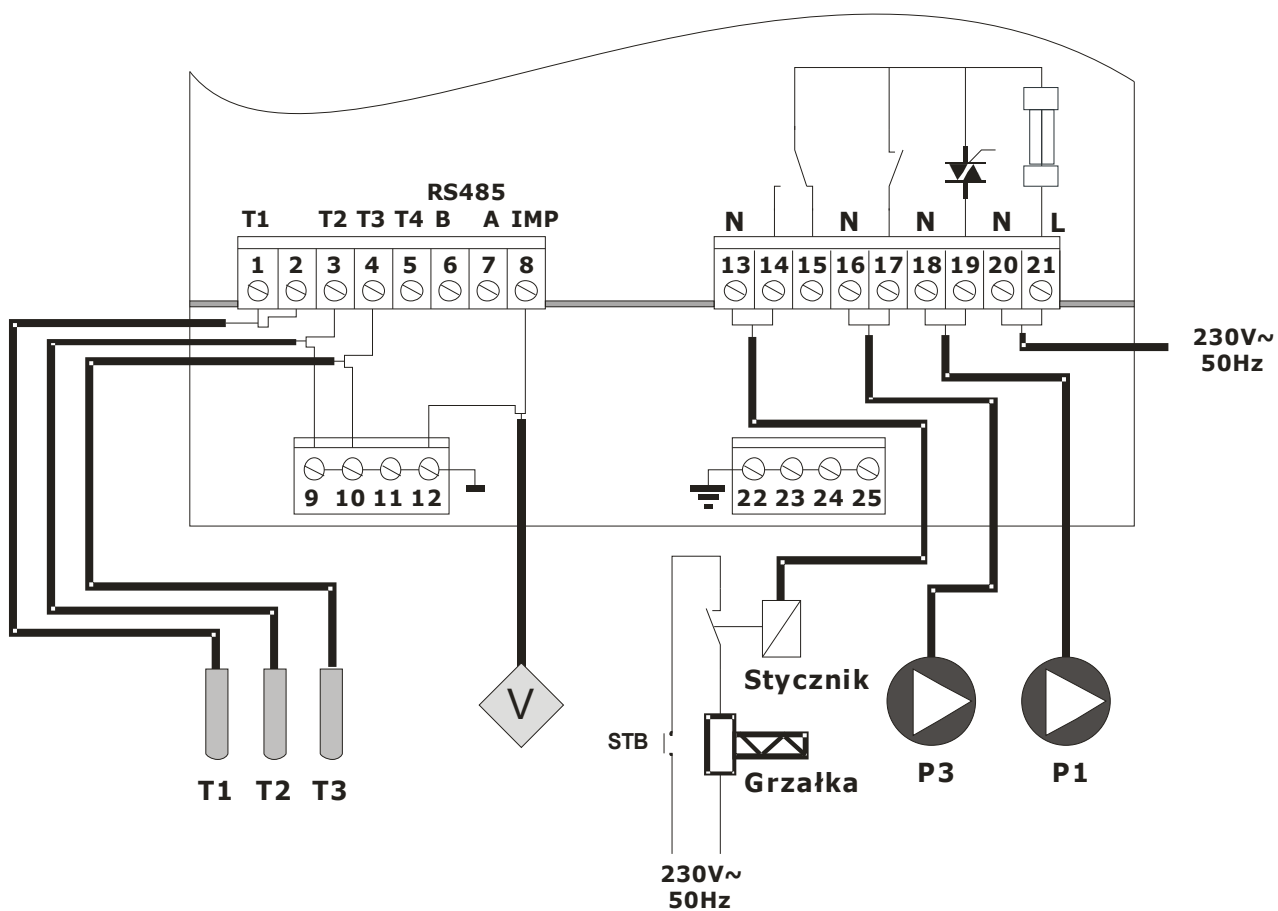


Fig. 7: Connecting sensors and components in systems with a heating coil.

Heating coil control requires a control coil 230V/50Hz compatible contactor.

Technical Data

Power supply:	230V, 50Hz	
Current:	$I < 0.02A$	
Fuse type	WTA-F 2A	
Maximum rated current:	P1	0.6A
	P2	2(0.6)A
	P3	2(0.6)A
Protection type:	IP20	
Ambient temperature:	0..55°C	
Storage temperature:	0..55°C	
Relative humidity:	5 – 80% without vapour condensation	
Flow meter input:	Frequency max. 5Hz Pulse time low min. 90ms, high min. 90ms.	
Measuring range:	T1,	-40.. +200°C
	T2, T3, T4	-9..+99°C
	T4 in variants no. 11 and 12	-40..+200
Temperature measurement resolution:	0,1°C	
Temperature measuring accuracy when working with sensors T1001 and T1301:	-40..0 °C	±2°C
	0..+110 °C	±1°C
	+110..+200 °C	±2°C
Connectors:	Screw terminals 1x1.5mm ²	
Display:	LCD graphic display, backlit	
Dimensions:	104x155x50mm	
Weight:	0.45kg	

Sensor specification

Temperature	Resistance	Temperature	Resistance
[°C]	[Ω]	[°C]	[Ω]
-40	842.1	30	1116.7
-30	881.7	40	1155.4
-20	921.3	50	1194.0
-10	960.7	60	1232.4
0	1000.0	70	1270.7
10	1039.0	80	1308.9
20	1077.9	90	1347.0



DECLARATION OF CONFORMITY

COMPIT Piotr Roszak
ul. Wielkoborska 77a
42-200 Częstochowa

hereby declares that the product

SolarComp 951 Microprocessor Controller

meets the following requirements when applied in conformity with its intended use and according to the Manufacturer's Installation and Operating Instructions:

1. Directive 2006/95/EC (LVD) of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (Ordinance of the Minister of Economy of 21 August 2007 on basic requirements for electrical equipment and transposing Directive 2006/95/EC)
2. Directive 2004/108/EC (EMC) of the European Parliament and of the Council of 15 December 2004 on the approximation of laws of Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC (OJ UE L 390 of 31.12.2004, p. 24) (Act of 13 April 2007 on electromagnetic compatibility implementing Directive 2004/108/EC)

List of harmonized standards concerning the fundamental requirements of the abovementioned directives:

PN-EN 60730-2-9:2006, EN 60730-2-9:2002 + A1:2003 + A11:2003 + A12:2004 + A2:2005, w połączeniu z PN-EN 60730-1:2002 + A12:2004 + A13:2005 + A14:2006, EN 60730-1:2000 + A11:2002 + A12:2003 + A13:2004 + A1:2004 + A14:2005

Identifying mark of the year in which the CE marking was affixed: 12

Częstochowa, 2012-11-30

Piotr Roszak, Owner

NOTE:

After selecting code 199, service parameters can be edited.

**SERVICE PARAMETERS SHOULD NOT BE MADE AVAILABLE
TO THE USER!**

