

SOLARCOMP 911

CONTROLLER FOR SOLAR COLLECTORS

Installation and Operating Instructions

for model u6.x, Rev. 2, May 2011



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.
- All wiring and mounting should be done only by duly authorized 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 with these Instructions, and whether the controller's power supply conforms to 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 and 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.

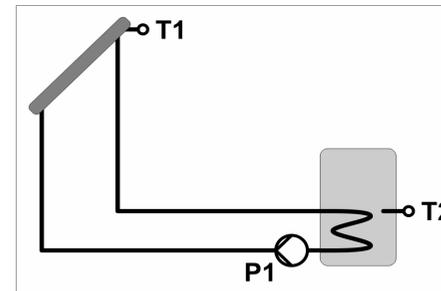
By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health. Penalties may be applicable for incorrect storage or disposal of this waste, in accordance with national legislation.

Introduction

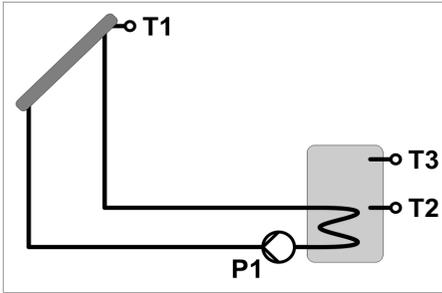
SOLARCOMP 911 controller has been designed for control of thermal solar heating systems. Basic features of the controller include:

1. **Special purpose graphic display** – a special-purpose display makes the operation of the controller easy. It helps to identify the system variant used and system parameters.
2. **Heat meter** – the controller calculates the amount of heat obtained from the solar panel.
3. **Smooth pump control** – the controller provides smooth control of the pump loading the tank, which allows for economic use of solar energy (the energy can be obtained from the solar panel even in dull weather).
4. **Solar panel heat discharge** – the controller offers a special **HOLIDAY MODE** which protects the system from overheating when hot water is not used.
5. **Regular DHW tank sterilization** – the tank is disinfected every week to destroy bacteria in water.
6. **Solar panel frost protection** – the controller protects solar fluid from freezing by activating the pump when the panel temperature drops below the set limit.
7. **Tank frost protection** – the controller switches on the heating coil or another heat source when the tank temperature drops below 4°C.
8. **Protective functions** – the controller uses control algorithms for the solar panel and tank protection. This protects the panel from overheating (and consequently allows for stopping the tank loading) or protects the tank from overheating.
9. **Extended system control** – an additional output provided enables the device to control extended systems when two extra sensors are connected.

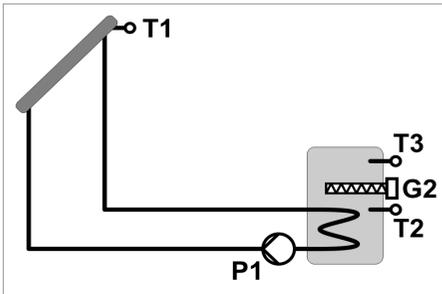
List of system operation variants



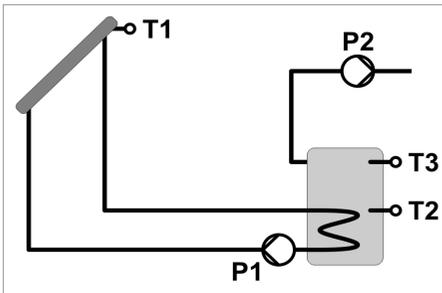
Variant no. 1 – tank loaded from the solar panel. Here the controller works with one tank sensor.



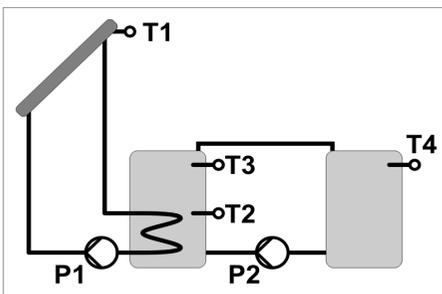
Variant no. 2 – tank loaded from the solar panel. Here the controller works with two tank sensors.



Variant no. 3 – tank loaded from the solar panel plus tank extra heating option.



Variant no. 4 – tank loaded from the solar panel plus extra heat discharge.



Variant no. 5 – tank loaded from the solar panel plus heat transfer to another tank (based on temperature difference).

NOTE:

User parameters can be edited after selecting code 99.

After selecting code 199, service parameters can be edited.

SERVICE PARAMETRS SHOULD NOT BE MADE AVAILABLE TO THE USER!



Control Panel Description

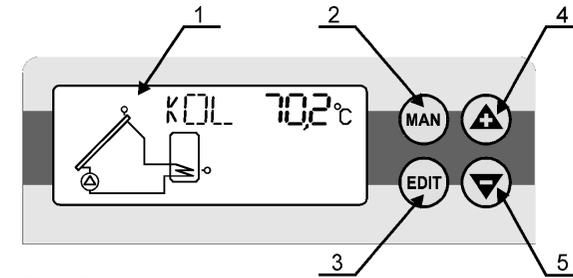
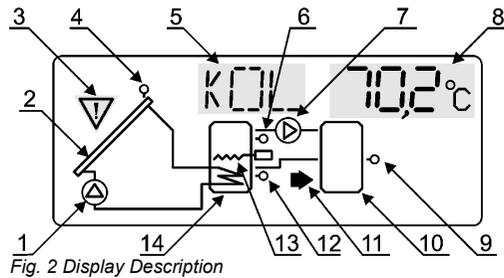


Fig. 1 Controller button layout

1. Special-purpose LCD display – described in the following section.
2. **MAN** button
 - press to read solar pump delivery rate and alarm information,
 - after setting the code to 105, press to enter manual mode.
3. **EDIT** button
 - press to switch between parameter editing mode and viewing mode,
 - after holding the button down for 3 s in the collector temperature reading window, press to switch on/off holiday mode – see section on Holiday Mode – Heat Discharge from the Tank, p. 14
4. Plus / up arrow button
 - press to scroll up the parameter list,
 - in editing mode – press to increase parameter value.
5. Minus / down arrow button
 - press to scroll down the parameter list ,
 - in editing mode – press to reduce parameter value.

LCD Display Description

Fig. 2 presents LCD display with all the symbols displayed. During standard operation only the required symbols display.



Package Contents:

1. SOLARCOMP 911 controller - 1 pc.
2. T1301 collector sensor (T1) - 1 pc.
3. T1001 tank sensor (T2) - 1 pcs.
4. Fitting bolts - 2 pcs.
5. Set of cable caps and clips.
6. Operating Instructions.
7. Warranty card.

NOTE: T3 and T4 sensors are optional and not included in the scope of supply.

1. Solar panel pump. Flashing means the pump is working.
2. Solar panel.
3. Alarm signal. More information in section on Malfunctions on p. 15
4. Solar panel temperature sensor (T1).
5. Parameter name field – flashing means parameter value can be edited.
6. Tank top zone temperature sensor (T3).
7. P2 pump for heat discharge or heat transfer to an auxiliary tank. Flashing means the pump is working.
8. Parameter value field.
9. Tank no. 2 temperature sensor (T4).
10. Tank no. 2.
11. Flashing arrow indicates HOLIDAY MODE.
12. Tank bottom zone sensor (T2).
13. Electric heating coil. Flashing means the coil is on.
14. Solar tank (no. 1).

Sensor connections

SOLARCOMP 911 works with four sensors:

- T1301 collector T1 sensor. It can be connected to the controller with a max. 30 m long cable, cable cross-section of 0.5 mm² to 1.5 mm². Remember that connection resistance of 3.9 Ω causes an error of +1°C in the readings.
- T1001 tank T2 and T3 sensors. They can be connected to the controller with a max. 30 m long cable, cable cross-section of 0.5 mm² to 1.5 mm².
- T1001 auxiliary tank T4 sensor. It can be connected to the controller with a max. 30 m long cable, cable cross-section of 0.5 mm² to 1.5 mm².

A minimum spacing of 30 cm between the sensor cables and parallel live network cables should be kept. A smaller spacing may result in unstable temperature readings.

| Temperature [°C] | Resistance [Ω] | Temperature [°C] | Resistance [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 |

Table 1 Resistance values for T1001 and T1301 sensors at different temperatures

INPUTS

- solar panel sensor - T1301 sensor, measuring range of -40 to 200°C, maximum wire length complying with the EMC requirements: 30 m.
- storage tank and tank no. 2 sensors - T1001 sensor, measuring range of 0 to 100°C, maximum wire length complying with EMC requirements: 30m.

OUTPUTS

- P1 pump - triac, output terminal 230V~, resistance capacity 0.6A/230V; induction capacity (cos=0.8) 0.6A/230V;
- P2 pump / heating coil - relay, output terminal 230 V~, resistance capacity 2A/230V; induction capacity (cos=0.8) 1A/230V;

Controller Operation

Basic Parameter Readings

When the controller is on, the display shows the current system variant and measured panel temperature. The arrow buttons can be used to view temperature readings and controller operating parameters. The list of parameters is presented below:

| | | |
|-------------|--|---|
| KOL 63,2°C | solar panel temperature T1, the sensor symbol near the panel is flashing | |
| T2 31,2°C | tank bottom zone temperature T2, relevant sensor symbol in the tank is flashing | |
| T3 33,8°C | tank top zone temperature T3, relevant sensor symbol in the tank is flashing, (not displayed in variant no. 1) | |
| Δ 12 18,0°C | T1 - T2 temperature difference (between the panel and tank bottom) | |
| T4 21,4°C | temperature T4, (displayed only in variant no. 5 or when precise heat meter option is enabled). | |
| Δ 34 5,0°C | T3 - T4 temperature difference (between the tank top and the tank to which the heat is transferred), displayed only in variant no. 4. | |
| MOC 850 | MOC – current power obtained from the solar panel. Value without a comma is expressed in watts [W]. Value with a comma is expressed in kilowatts [kW]. | |
| LO 23,7 | L0 – current day energy meter. Hold down the EDIT button for 5 s to zero the meter at any time. Another zero adjustment combined with its value being transcribed to L1 meter will take place after 24 hours. Unit – kWh | |
| L1 30,5 | L1 – previous day energy meter Unit – kWh | |
| kWh 550 | kWh – kilowatt-hour meter | Total energy obtained equals the sum of MWh and kWh meters. |
| MWh 14 | MWh – megawatt-hour meter | |

Symbols displayed:

 Err °C Err – temperature reading error

 alarm signal – see section on Malfunctions p. 15

Basic Parameter Settings

In order to change the controller's operation parameters:

1. Use the arrow buttons to access KOD parameter.
2. Press  - KOD will flash.
3. Use arrow buttons to set the value to 99.
4. Press  - KOD will stop flashing.
5. Use arrow buttons to access the parameter which you wish to change.
6. Press  - parameter name will start flashing.
7. Use arrow buttons to change the value.
8. Press  - parameter name will stop flashing.

The number and type of parameters which can be accessed by the user depend on the system operation variant and have been described further down in the document.

Wiring Diagram

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

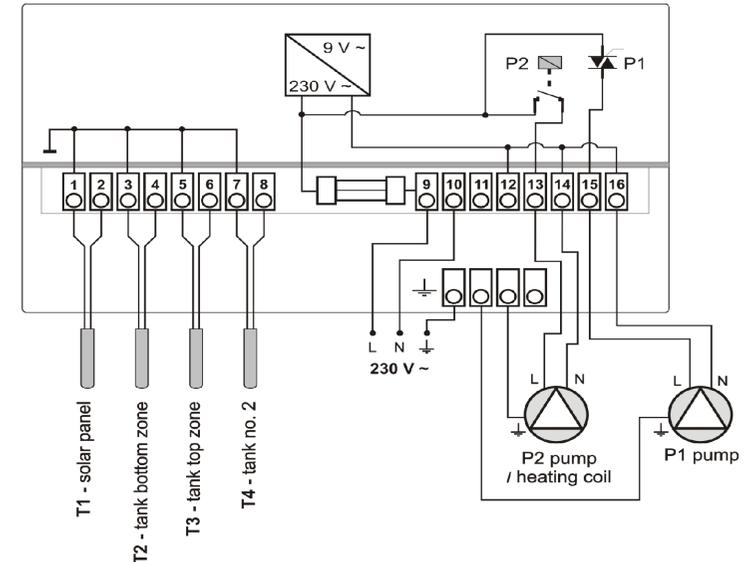


Fig. 11 Connection diagram

INPUTS:

- 1, 2 - T1 sensor – solar panel temperature
- 3, 4 - T2 sensor – storage tank bottom temperature
- 5, 6 - T3 sensor – storage tank top temperature
- 7, 8 - T4 sensor – auxiliary tank temperature (in systems with heat transfer)

OUTPUTS:

- 9, 10 - power supply 230 V~ 50Hz +5/-10%
- 11, 12 - vacant
- 13, 14 - P2 pump output or heating coil contactor control
- 15, 16 - P1 loading pump input

Controller Installation and Commissioning

Mounting

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

1. Hang the controller on the fitting bolt (using the opening at the back of the housing).
2. Remove the connection cover and fix the controller to the wall with additional bolts.
3. Connect the panel temperature sensor to terminals 1,2. Place the sensor bit in the measuring point in the collector.
4. Connect the tank sensors to appropriate terminals as shown in the diagram. Place the sensor bits in relevant temperature measuring points.
5. Ensure good thermal contact between the sensor and the sleeve. If necessary, use thermal grease.
6. Connect P1 pump to terminals 15,16.
7. Connect P2 pump to terminals 13,14. Connect the electric heating coil via an additional contactor whose coil will be supplied from terminals 13, 14.
8. Connect the earth wires using the controller's bottom terminal strip.
9. Replace the controller cover.

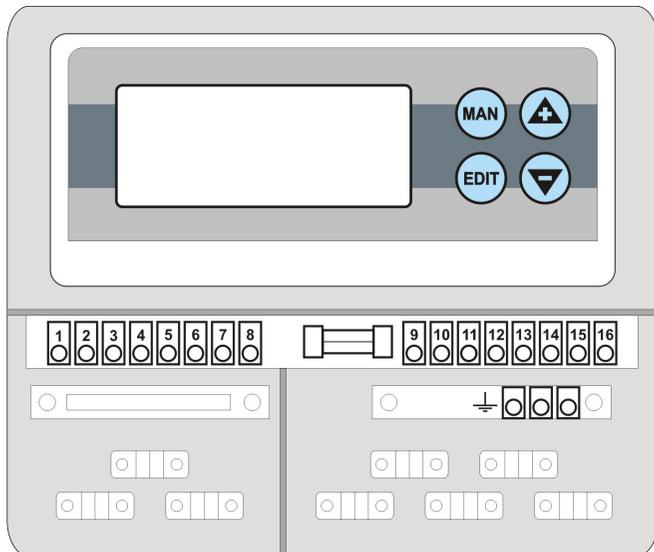


Fig. 10 SOLARCOMP 911- pictorial view

System Operation Variants

VARIANT no. 1 – tank with one sensor loaded from the solar panel.

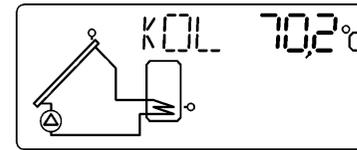
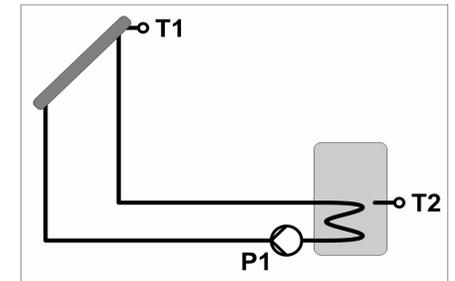


Fig. 3 Controller display for Variant no. 1



Tank loading

If the temperature difference between the solar panel and the tank (T1-T2) exceeds ΔT_1 , the controller will switch on the tank loading pump (pump symbol displayed) at full speed. If the temperature difference drops below the set parameter, the controller will reduce the pump's speed. If, despite the reduced speed, T1-T2 temperature difference drops below ΔT_2 , the pump will be switched off. It can be switched on again only after the temperature difference (T1-T2) exceeds ΔT_1 .

The loading of the tank stops when tank temperature T2 exceeds T_{T2} - even if the temperature difference between the panel and the tank (T1-T2) is big enough for the pump to run.

Basic settings

| | |
|--------------|--|
| T_{T2} | Set temperature of DHW tank. If the tank temperature (T2 or T3) exceeds this value, the loading stops. |
| ΔT_1 | T1-T2 difference; when exceeded, the tank loading pump is switched on. |
| ΔT_2 | If T1-T2 difference drops below this value, the tank loading pump will switch off. |
| SYG | Enabling of a sound alarm. 0 – sound alarm disabled, 1 – sound alarm enabled. |

VARIANT no. 2 - tank with two sensors loaded from the solar panel.

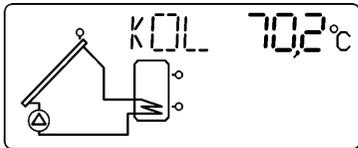
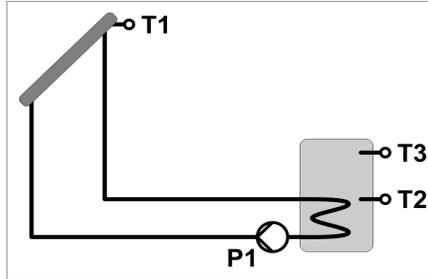


Fig. 4 Controller display for Variant no. 2



Tank loading

If the temperature difference between the solar panel and the tank (T1-T2) exceeds $Z\Delta 1$, the controller will switch on the tank loading pump (pump symbol displayed) at full speed. If the temperature difference drops below the set parameter, the controller will reduce the pump's speed. If, despite the reduced speed, T1-T2 temperature difference drops below $Z\Delta 2$, the pump will be switched off. It can be switched on again only after the temperature difference (T1-T2) exceeds $Z\Delta 1$.

The loading of the tank stops when tank temperature T2 or T3 exceeds ZTZ - even if the temperature difference between the panel and the tank (T1-T2) is big enough for the pump to run.

Basic settings

| | |
|-------------|--|
| ZTZ | Set temperature of DHW tank. If the tank temperature (T2 or T3) exceeds this value, the loading stops. |
| $Z\Delta 1$ | T1-T2 difference; when exceeded, the tank loading pump is switched on. |
| $Z\Delta 2$ | If T1-T2 difference drops below this value, the tank loading pump will switch off. |
| SYG | Enabling of a sound alarm. 0 – sound alarm disabled, 1 – sound alarm enabled. |

| | |
|------|--|
| OF 2 | T1 sensor calibration (Setting range -9,9 to 9,9°C, step 0.1°C, default setting: 0°C). |
| LTR | Energy meter – solar fluid type 0 Water 1 ERGOLID EKO -15°C 2 ERGOLID EKO -20°C 3 ERGOLID EKO -25°C 4 ERGOLID EKO -35°C 5 Transtherm N -15°C 6 Transtherm N -20°C 7 Transtherm N -25°C 8 Transtherm N -35°C 9 Transtherm EKO -15°C 10 Transtherm EKO -20°C 11 Transtherm EKO -25°C 12 Transtherm EKO -35°C 13 Termsol EKO concentrate 14 Termsol EKO -15°C 15 Termsol EKO -20°C 16 Termsol EKO -25°C 17 Termsol EKO -35°C |
| LWP | Energy meter – maximum delivery rate of the solar pump , it should be read on the solar flowmeter at 100% pump speed e.g. in manual mode. |
| LTL | Energy meter – meter type : 1 – basic meter, 2 – precise meter – requires T4 sensor located on the solar tank return pipe |
| SC4 | Variant selection. (Setting range 1 to 5, default setting: 1) |
| WE R | Controller software version. A read only parameter. |

Service Parameters

| | |
|------|--|
| 03M1 | P1 pump minimum speed. Appropriate parameter value should be selected to ensure stable operation of the pump (Setting range 10 to 100%, step 1%, default setting: 50%). |
| KMX | Maximum temperature T1 exceeding of which starts P1 pump. This function protects the collector from overheating. When minimum value is selected, the function is disabled – OFF message will display. (Setting range 0 to 199°C, step 1°C, default setting: 110°C). |
| KOF | Maximum temperature T1 exceeding of which switches off the whole system. When minimum value is selected, the function is disabled – OFF message will display. (Setting range 1 to 199°C, step 1°C, default setting 130°C). |
| KMT | Solar panel minimum temperature T1. If the temperature drops below this value, tank loading will stop. Enabling this function prevents frequent solar pump switch-offs at low solar panel temperature. When minimum value is selected, this function is disabled and the controller will display OFF message. (Setting range 1 to 199°C, step 1°C, default setting: OFF). |
| ZOF | Tank maximum temperature exceeding of which stops the loading completely (Setting range 20 to 99°C, step 1°C, default setting: 85°C). |
| FKM | Serpentine collector function. By analysing changes in the collector temperatures, the controller causes the solar pump to run temporarily for the time set in parameter FKM. This allows for measuring collector's current temperature and earlier activation of the tank heating or collector overheat protection. (Setting range: OFF, 30 to 200 sec, step 5 sec, default setting: OFF) |
| FZK | Solar panel frost protection. This parameter determines the collector temperature below which solar pump will start in order to prevent the fluid from freezing or thickening. If the tank temperature (T2) drops below 4°C, the controller will switch off the solar panel frost protection function. When maximum value is selected, the function is disabled and the controller will display OFF message. (Setting range: -10 to +10, OFF, step 0.1°C, default setting: OFF). Note: As the collector frost protection function absorbs heat from the tank, it can be used in locations where temperature conditions leading to solar panel freeze occur for a maximum of a few days a year. |
| LEG | Regular tank sterilization function (LEGIONELLA). This parameter determines the tank set temperature when this function is on. First sterilization takes place 2 days after the power supply is connected and then every 7 days. (Setting range 60 to 80°C, step 1°C, default setting: OFF). |
| OF 1 | T1 sensor calibration (Setting range -9,9 to 9,9°C, step 0.1°C, default setting: 0°C). |

VARIANT no. 3 – tank loaded from the solar panel plus tank extra heating option.

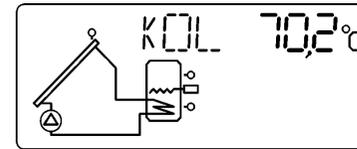
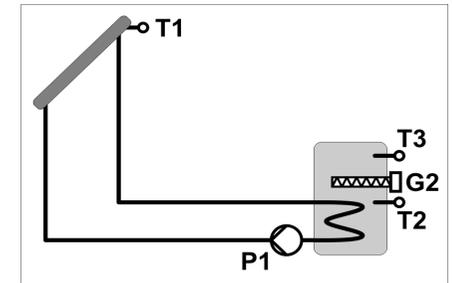


Fig. 5 Controller display for Variant no. 3



Tank loading

If the temperature difference between the solar panel and the tank (T1-T2) exceeds $Z\Delta 1$, the controller will switch on the tank loading pump (pump symbol displayed) at full speed. If the temperature difference drops below the set parameter, the controller will reduce the pump's speed. If, despite the reduced speed, T1-T2 temperature difference drops below $Z\Delta 2$, the pump will be switched off. It can be switched on again only after the temperature difference (T1-T2) exceeds $Z\Delta 1$.

The loading of the tank stops when tank temperature T3 exceeds ZTZ - even if the temperature difference between the panel and the tank (T1-T2) is big enough for the pump to run.

Extra heating of the tank – heating coil on

The controller allows for activating another heat source (heating coil) for DHW. The coil (or another heat source) is switched on when temperature T3 drops below $TXC2 - 1^\circ\text{C}$, and it is switched off when T3 exceeds $TXC2 + 1^\circ\text{C}$. This function maintains a minimum useful temperature of DHW irrespective of the energy supplied by the solar system. The coil is activated only if the solar pump is not working. NOTE! If HOLIDAY MODE is selected in this variant, the operation of the coil is blocked.

Basic settings

| | |
|------|--|
| ZTZ | Set temperature of DHW tank. If the tank temperature (T2 or T3) exceeds this value, the loading stops. |
| ZΔ1 | T1-T2 difference; when exceeded, the tank loading pump is switched on. |
| ZΔ2 | If T1-T2 difference drops below this value, the tank loading pump will switch off. |
| TXC2 | Parameter defining the threshold temperature up to which the coil is to remain switched on. |
| SYG | Enabling of a sound alarm. 0 – sound alarm disabled, 1 – sound alarm enabled. |

VARIANT no. 4 - tank loaded from the solar panel plus extra heat discharge.

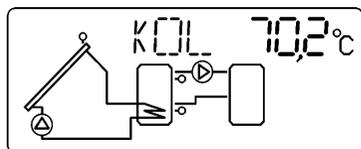
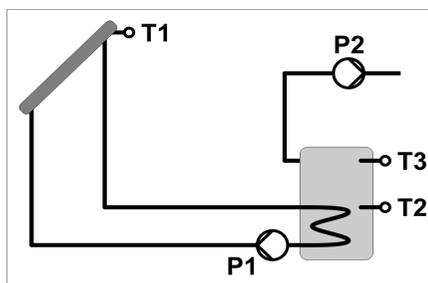


Fig. 6 Controller display for Variant no.4



Tank loading

If the temperature difference between the solar panel and the tank (T1-T2) exceeds $Z\Delta 1$, the controller will switch on the tank loading pump (pump symbol displayed) at full speed. If the temperature difference drops below the set parameter, the controller will reduce the pump's speed. If, despite the reduced speed, T1-T2 temperature difference drops below $Z\Delta 2$, the pump will be switched off. It can be switched on again only after the temperature difference (T1-T2) exceeds $Z\Delta 1$.

The loading of the tank stops when tank temperature T3 exceeds ZTZ - even if the temperature difference between the panel and the tank (T1-T2) is big enough for the pump to run.

Heat discharge

If temperature T3 exceeds $TX2 + 1^\circ\text{C}$, the controller starts P2 pump to discharge the excess heat (pump symbol displayed). Heat discharge stops if T3 drops below $TX2 - 1^\circ\text{C}$. This function maintains DHW temperature within safe limits.

NOTE: If HOLIDAY MODE is selected in this variant, heat discharge works as usual. When the LEGIONELLA function is selected, heat discharge is off.

Basic settings

| | |
|-------------|--|
| ZTZ | Set temperature of DHW tank. If the tank temperature (T2 or T3) exceeds this value, the loading stops. |
| $Z\Delta 1$ | T1-T2 difference; when exceeded, the tank loading pump is switched on. |
| $Z\Delta 2$ | If T1-T2 difference drops below this value, the tank loading pump will switch off. |
| $TX2$ | If this temperature is exceeded by the tank (T3), heat discharge is started. |
| SYG | Enabling of a sound alarm. 0 – sound alarm disabled, 1 – sound alarm enabled. |

User Parameters

| | |
|-------------|--|
| ZTZ | Set temperature of DHW tank. If the tank temperature (T2 or T3) exceeds this value, the loading will stop (Setting range 0 to 90°C, step 1°C, default setting: 50°C). |
| $Z\Delta 1$ | T1-T2 difference; when exceeded, the tank loading pump will switch on. (Setting range 0 to 50°C, step 0.2°C, default setting: 10°C). Note: $Z\Delta 1$ must be at least 1°C higher than $Z\Delta 2$. |
| $Z\Delta 2$ | If T1-T2 difference drops below this value, the tank loading pump will switch off. (Setting range 0 to 50°C, step 0.2°C, default setting: 2°C). Note: Minimum $Z\Delta 2$ value should not be lower than 2°C. |
| $TX2$ | Variant no. 1 not available Variant no. 2 not available Variant no. 3 tank temperature T3 below which the coil is activated Variant no. 4 tank temperature T3 exceeding of which activates heat discharge Variant no. 5 tank no. 2 temperature T4 exceeding of which activates heat transfer (Setting range 0 to 90°C, step 1°C, default setting: 45°C) |
| $2\Delta 1$ | Only in variant no. 5: T3-T4 difference exceeding of which activates P2 pump (Setting range 0 to 50°C, step 0.2°C, default setting 4°C). Note: $2\Delta 1$ must be at least 1°C higher than $2\Delta 2$. |
| $2\Delta 2$ | Only in variant no. 5: if T3-T4 difference drops below this value, P2 pump will switch off (Setting range 0 to 50°C, step 0.2°C, default setting: 2°C). |
| SYG | Enabling of a sound alarm. 0 – sound alarm disabled, 1 – sound alarm enabled (default setting: 0) |

Advanced Parameter Settings

Service parameters can be modified after entering the service code given on the last page of these Instructions. If necessary, the installer can remove the last page to protect important settings from unauthorized access.

Depending on the operation variant selected, the controller will display relevant temperatures. All temperature readings are explained below.

| | | |
|------------|--|---|
| KOL 63,2°C | solar panel temperature T1, the sensor symbol near the solar panel is flashing | |
| T2 31,2°C | tank bottom zone temperature T2, relevant sensor symbol near the tank is flashing | |
| T3 33,8°C | tank top zone temperature T3, relevant sensor symbol near the tank is flashing; if the controller works in variant no. 1, T3 is not displayed. | |
| Δ12 18,0°C | T1 - T2 temperature difference (between the panel and tank bottom zone) | |
| T4 21,4°C | temperature T4 (auxiliary tank). Displayed only in variant no. 5. | |
| Δ34 5,0°C | T3 - T4 temperature difference (between the tank top and the tank to which the heat is transferred), displayed only in variant no. 5. | |
| MOC 850 | MOC – current power obtained from the solar panel. Value without a comma is expressed in watts [W]. Value with a comma is expressed in kilowatts [kW]. | |
| L0 23,7 | L0 – current day energy meter in kilowatt-hour [kWh] | |
| L1 30,5 | L1 – previous day energy meter in kilowatt-hour [kWh] | |
| kWh 550 | kWh – kilowatt-hour meter | Total energy obtained equals the sum of MWh and kWh meters. |
| MWh 14 | MWh – megawatt-hour meter | |
| KOD 100 | Parameter access code. To edit user parameters select code 99. To go to manual mode select code 105. | |

VARIANT no. 5 - tank loaded from the solar panel with heat transfer to auxiliary tank (based on temperature difference).

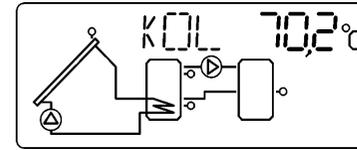
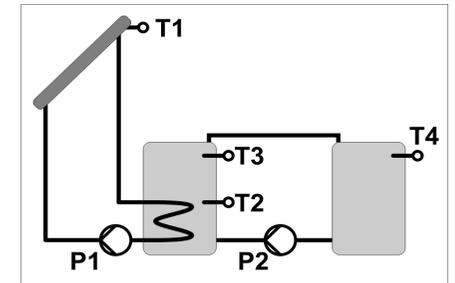


Fig. 7 Controller display for Variant no.5



Tank loading

If the temperature difference between the solar panel and the tank ($T1-T2$) exceeds $Z\Delta 1$, the controller will switch on the tank loading pump (pump symbol displayed) at full speed. If the temperature difference drops below the set parameter, the controller will reduce the pump's speed. If, despite the reduced speed, $T1-T2$ temperature difference drops below $Z\Delta 2$, the pump will be switched off. It can be switched on again only after the temperature difference ($T1-T2$) exceeds $Z\Delta 1$.

The loading of the tank stops when tank temperature $T3$ exceeds ZTZ - even if the temperature difference between the panel and the tank ($T1-T2$) is big enough for the pump to run.

Heat transfer to tank no. 2 (buffer tank). P2 pump on.

Heat transfer with P2 pump is started when the temperature difference $T3-T4$ is lower than $Z\Delta 1$ and temperature $T4$ in tank no. 2 is lower than $TXC2 - 1^\circ\text{C}$. P2 pump is switched off when the temperature difference drops below $Z\Delta 2$ or when temperature $T4$ in tank no. 2 exceeds $TXC2 + 1^\circ\text{C}$.

NOTE! If HOLIDAY MODE is selected in this variant, heat transfer works as usual.

Basic settings

| | |
|------------|---|
| 777 212 | Set temperature of DHW tank. If the tank temperature (T2 or T3) exceeds this value, the loading stops. |
| 711 211 | T1-T2 difference; when exceeded, the tank loading pump is switched on. |
| 712 212 | If T1-T2 difference drops below this value, the tank loading pump will switch off. |
| TX2 1x2 | Set temperature of tank no. 2. Heat transfer between the tanks is disrupted when temperature T4 exceeds the value set for this parameter by 1°C. It can be started again when temperature T4 drops 1°C below the parameter value. |
| 211 211 | Temperature difference T3-T4, exceeding of which activates P2 pump. |
| 212 212 | If temperature difference T3-T4 drops below this value, P2 pump switches off. |
| 5Y6 5Y6 | Enabling of a sound alarm. 0 – sound alarm disabled, 1 – sound alarm enabled. |

Manual Mode

In order to switch to manual mode, set the code to 105 and press  button. The display will show MAN. Using arrow keys you can change P1 pump speed.  button controls P2 output. Press  button again to exit manual mode.

Holiday Mode – Heat Discharge from the Tank

This mode, which is user-activated, is used to cool the tank if hot water is not used (e.g. the house is uninhabited). This prevents excessive heat accumulation and the risk of system overheat. Cooling of the tank takes place when the sun goes down (late evening and night). If solar panel temperature T1 drops 2°C below tank temperature T2, circulation pump P1 is activated and the heat accumulated in the tank is radiated by the collector. Cooling of the tank will stop if its temperature drops below 10°C.

If the collector temperature exceeds the tank temperature, P1 pump is switched off. If HOLIDAY MODE is selected in variant no. 2 (with heating coil), the coil's operation will also be blocked.

To select holiday mode, access collector temperature reading and hold down  button for three seconds.

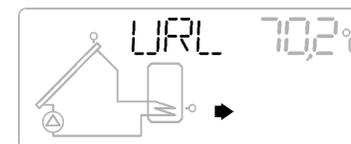


Fig. 8 Flashing arrow symbol and URL (holiday mode) displayed instead of KOL indicates holiday mode

To disable holiday mode, access collector temperature reading and hold down  button for three seconds – the controller will resume normal operation. Active disinfection function (LEGIONELLA) in HOLIDAY MODE increases the tank temperature up to a set value every 7 days.

Malffunctions

If a fault occurs, the controller will display a flashing symbol presented in Fig. 9.



Fig. 9 Symbol displayed in the case of an error

The error code can be identified by pressing  button. The controller identifies the following errors:

- AWR 1 Collector maximum temperature exceeded (set in KMX)
- AWR 2 Collector switch-off temperature exceeded (set in KOF)
- AWR 3 AWR 1 + AWR 2
- AWR 4 Tank switch-off temperature exceeded (set in ZOF)
- AWR 5 AWR 4 + AWR 1
- AWR 6 AWR 4 + AWR 2
- AWR 7 AWR 4 + AWR 2 + AWR 1
- AWR 8 Sensor failure
- AWR 9 AWR 8 + AWR 1
- AWR 10 AWR 8 + AWR 2
- AWR 11 AWR 8 + AWR 2 + AWR 1
- AWR 12 AWR 8 + AWR 4
- AWR 13 AWR 8 + AWR 4 + AWR 1
- AWR 14 AWR 8 + AWR 4 + AWR 2
- AWR 15 AWR 8 + AWR 4 + AWR 2 + AWR 1

If all the temperature values are within appropriate limits, OK will display instead of an error code.

In the case of a sensor failure, check temperature readings. If the sensor is damaged, a relevant temperature reading will be replaced by „Err“. Check if the sensor is connected appropriately or replace the sensor.