

## ASSEMBLY INSTRUCTIONS FOR „KOMPAKT 300H” + SAFETY KIT BOILER

### Use and construction of „KOMPAKT 300 HB” water heater

KOMPAKT 300HB water heaters are used to heat water using thermal energy from solar collectors and thermal energy from a central heating boiler. The bottom coil is designed for solar collectors, and the top one for the central heating boiler. KOMPAKT 300HB heater is integrated with the solar installation's pump and control unit and expansion tank.

The pump and control unit is compacted in a foamed polypropylene cover, composed of accessories necessary for correct functioning of the solar installation.

Construction of the KOMPAKT 300HB heater and the pump and control unit is presented in the following drawings.



Fig. 1. KOMPAKT 300HB water heater

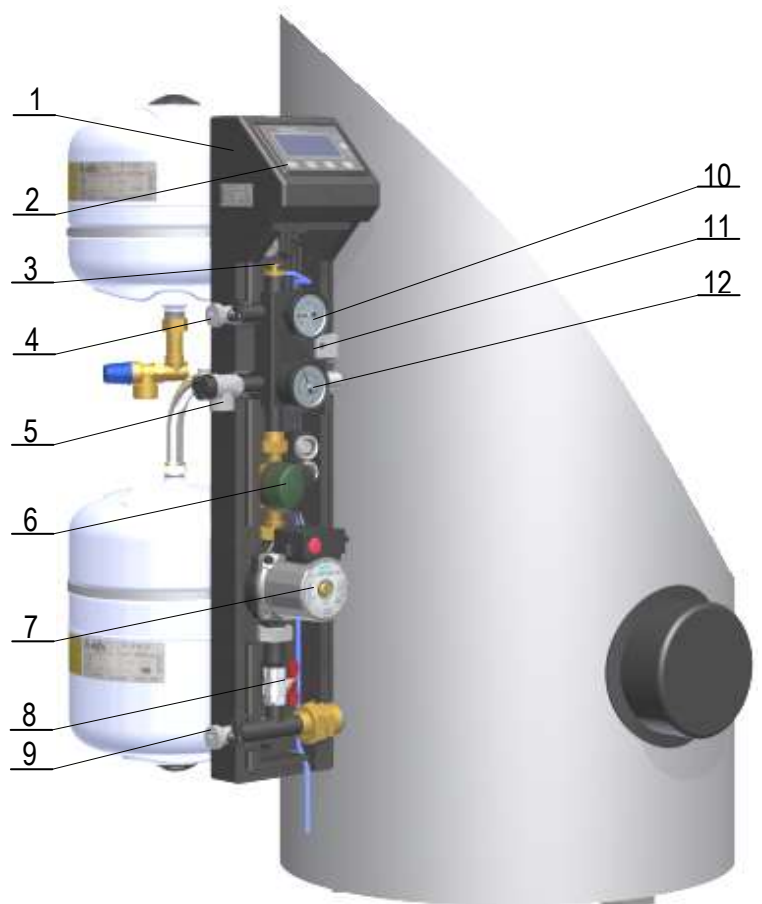


Fig. 2. Components of ZPS pump control unit

### Construction of the pump and control unit (Fig. 2)

1	Pump and control unit cover
2	G422 controller with 4 temperature sensors
3	Automatic vent with a cable
4	Release valve - top
5	Safety valve 6bar
6	Electronic G-916 flow meter with two LEDs: Green – flow meter supply on Red – fluid flow pulse
7	Circulating pump WILO 15-6
8	Ball valve
9	Release valve - bottom
10	Thermometer 0 – 120°C
11	Air separator with an integrated check valve
12	Manometer 0 – 6bar

### ATTENTION!!!

On the back side of the heater there are 2 electric wires. They are available for the controller. In case of using the wires follow the labelling:

Label C – circulation pump wire

Label K – boiler start-up wire

## Diagram of solar installation's connections

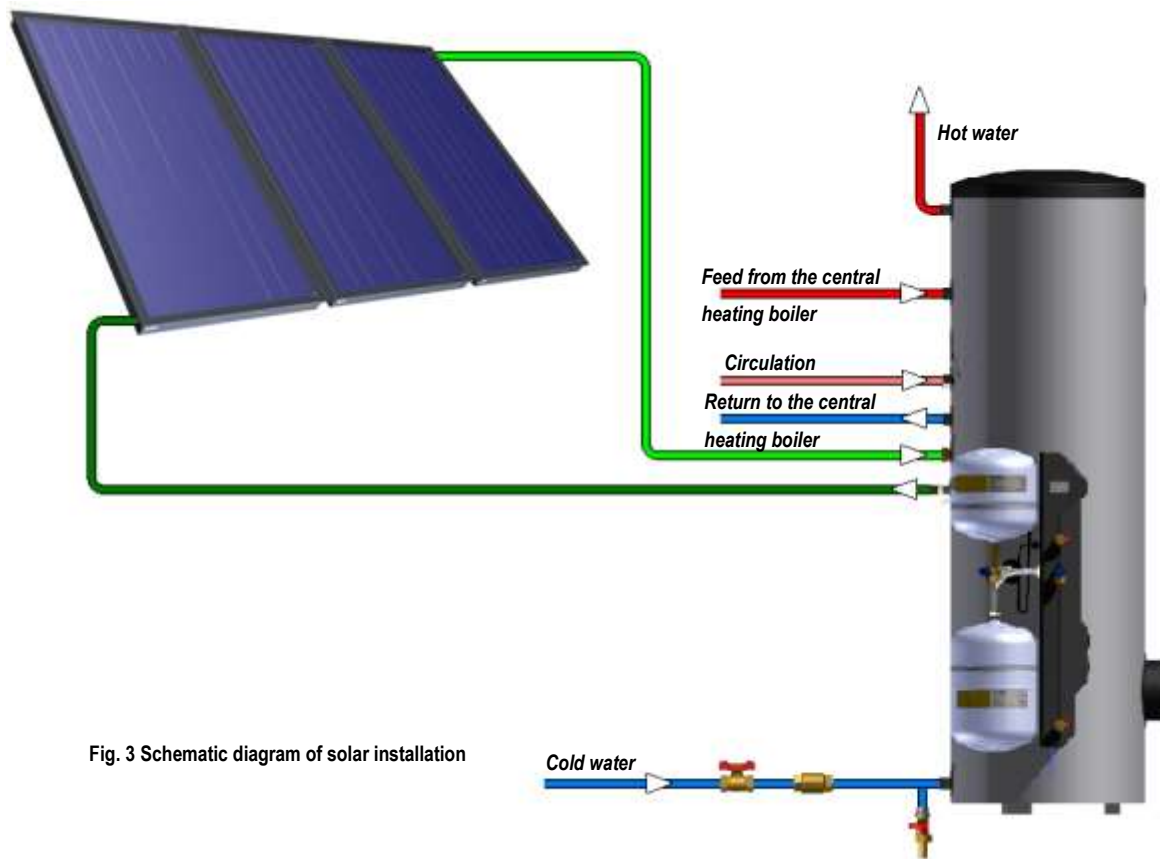


Fig. 3 Schematic diagram of solar installation

### Assembly of KOMPAKT 300HB heater

Consecutive steps.

- Remove the heater from the wooden pallet by unscrewing 3 safety bolts located on the pallet's back, using S19 wrench.
- Connect the heater with solar collectors and tap water piping installation, as shown in the schematic diagram of the installation (Fig. 3), or the schematic diagram of the installation in a warranty card.
- Connect the wire to the terminal block in place designated for solar collector temperature sensor.

**ATTENTION!!! The heater is featured with a safety valve and tap water circuit expansion vessel.**






### Filling and starting the installation.

The installation should be filled with a proper heat transfer fluid which is a water solution of propylene glycol, with a solidification temperature of  $-25^{\circ}\text{C}$  with an addition of an inhibitor pack, protecting the installation from corrosion.

**ATTENTION!!! TERMSOL EKO should not be diluted with water.**

### System filling with heating medium, with the use of a rotary pump unit.

Consecutive steps.

- Unit pipes: connect supply pipe to the lower discharge valve (9), and overflow pipe to the upper discharge valve (4). Fill the unit tank with the heating medium, open discharge valves (4 and 9) and start up the rotary pump.
- After pumping the heating medium for about 30 seconds, close the ball valve (8) inside the pump control unit (open valve causes the liquid to flow through the inner element of the pump control unit).
- Do not switch off the rotary pump until full deaeration of the system – that is, till air bubbles stop appearing in the overflow pipe.
- When air bubbles stop appearing in the overflow pipe, close the upper discharge valve (4) and continue pumping heating medium to the system, to reach system overpressure of  $p = 2.5 \text{ bar}$ , which is measured by pressure gage (12). When required overpressure is reached, close lower discharge valve (9), switch off rotary pump and open the ball valve (8).
- Insert the controller plug into the  $\sim 230\text{V}$  mains socket and switch on the solar collector pump in the manual mode. In order to switch on the pump in a manual mode, one should:
  - Switch on the controller with the  button - CAUTION!! this will calibrate temperature detectors.
  - Go to MENU pressing the  button.
  - Using the arrow buttons  or  choose the option „Manual control” and confirm pressing  button.
  - Switch off the pump P manually replacing the option „On” with „Off”.
- Remaining air should be removed automatically by opening the manual valve (3).

- g. In case of a reduction or interruption of the flow (message “**flow insufficient**” – confirm with the OK button) turn counter clockwise the circulation pump main screw (11) and let out the air blocking the pump. Continue till full deaeration of the system. If, after 5 minutes, the flow is still insufficient, the controller will issue a “**Pump blocked...**” message – in order to switch the pump on again, press OK button.
- h. In case the pressure measured by the pressure gage (12) is below 1.5 bar, fill in the system to reach required system overpressure of  $p = 2.5$  bar.
- i. Disconnect supply and overflow pipes of the rotary pump.
- j. Set the required flow rate of the heating medium – to do this, choose the option **flow/rotameter**.
- k. Entering the **Nominal** option will switch the pump on and will cause appearance of a new **Current** option. While in the **Nominal** option, input the proper value calculated for the number of solar collectors (count 1.5 l/min per each flat plate collector, or 1.0 l/min per each evacuated tube collector).
- l. If current flow exceeds requirements, reduce rotational speed of the pump, by switching to the lower pump mode.
- m. If, even with the pump switched to the 1-st mode, the flow is still excessive, it can be controlled via the ball valve (8) – closing or opening this valve will change the flow rate. Set the heating medium flow so that values **Nominal** and **Current** are identical.
- n. Input the set circulation pump mode number into the controller.
- o. Return to normal controller mode by triple pressing **Esc** button.

### G422 electronic controller

The controller is an independent control block designed to control circulation pumps and other devices, which may be a part of solar collector installations. G422 controller has 4 temperature sensors, which depending on the selection of one of various installation programmes (schemes), should be placed in appropriate temperature measurement locations indicated in the diagram of the respective installation scheme (see: G422 independent control block operation manual).

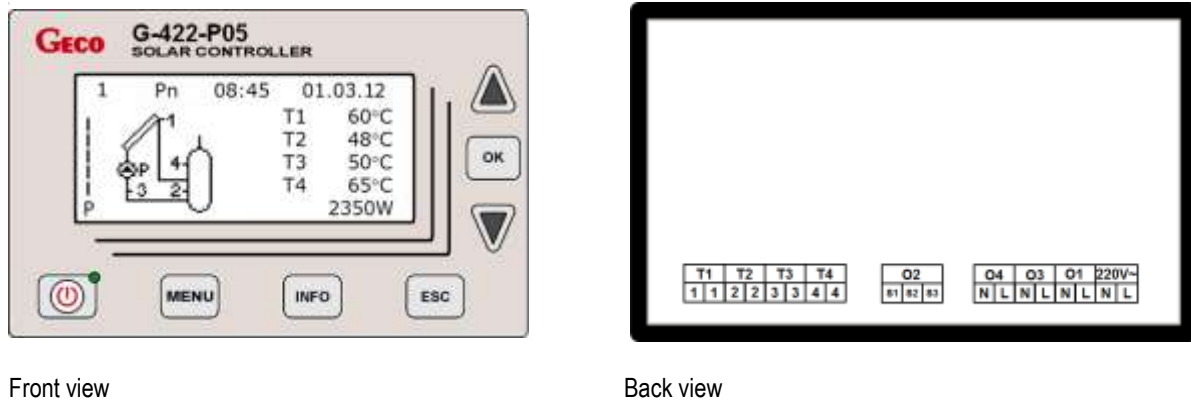


Fig. 4. Description of measurement outputs and relay inputs for system no.1.

Input / Output	Description
220V~	Connection to 230V~/ 50Hz power grid
O1	Output of the collector pump – <b>Maximum 1A current load</b>
O2	Volt free output for the resistors replacing boiler DHW (Domestic Hot Water) detector
O3	Output of the circulation pump - <b>Maximum 8A current load</b>
T1	Temperature detector of the solar collectors.
T2	Temperature detector of the heater – lower heating coil
T3	Temperature detector of the air separator (return of heating medium)
T4	Temperature detector of the heater – upper heating coil
F1	Input from the electronic flow gage – G916 type 5 : +12V, 6 : GND, 7 : +FRQ, 8 : GND

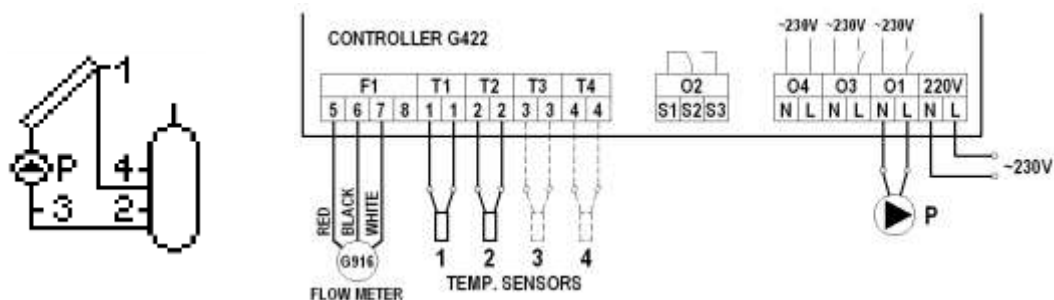


Fig. 5. Schematic and electric diagram of installation no. 1

**ATTENTION!!! On the electric diagram dashed lines denote sensors which may be connected, but are not necessary for proper functioning of the controller in scheme no. 1.**


### Description of G422 controller




Controller is equipped with an LCD screen and 7 buttons.

After connecting electric connections correctly, turn on the controller by pressing .

In normal operation, the controller's screen displays:

- Current installation scheme number and diagram,
- Current date and time,
- Current temperatures in respective measurement locations (a lack of the sensor is indicated by displaying - - -, and damage of the sensor by displaying **Err** messages)
- During the pump operation (pump symbol pulsing) following information is alternately displayed: temporal solar collectors power, heating medium flow, solar collectors pump power load.

Pressing  selects controller's menu.

- Using directional buttons  and  select the desired option and confirm by pressing .

### Description of control parameters for the first programme.

Parameter	Description	Range
Solar collector type	Choosing the collector type	Flat plate/Evacuated tube
Collectors pump starting T1, T2 temp. delta	Temperature difference (T1-T2) switching on the solar collectors pump P.	2 – 15 °C
Collectors pump stopping Max. temp.T2	Maximum heater temperature allowed, above which the solar collectors pump is switched off.	10 – 85 °C
Collectors pump rotational speed control	Option for smooth control of solar collectors pump rotational speed	YES / NO
Protection against overheating of collectors	Option of protection against overheating of the solar collectors	YES / NO
Max. temp. T2 overheating protection	Maximum heater temperature allowed, above which the solar collectors pump is switched off in the overheating option.	60 – 85 °C
Collectors antifreezing protection	Option of protection against solar collectors freezing.	YES / NO

### Alerts issued by the controller


#### Temperature detectors error.


The controller has a temperature detectors connection control. When: detector is malfunctioning, cable is broken, detector has been disconnected, controller issues detector alert. During alert all outputs are cut off, in addition – while controller displays main screen, alert can be acoustic. In the alert mode it is possible to review menu, to set parameters configuration, as well as to manually control external devices. Information, which detector issues alert, is available on the main screen. Instead of the temperature beside the detector symbol, "Err" is displayed. When controller issues detectors alert, the installation should be checked for installation errors, detector connection errors or temperature detectors failure.

#### Insufficient heating medium flow rate while pump is operative.

##### Option of the analog rotameter is switched on: (option Flow/Rotameter : Measure : No)

Insufficient flow control has two stages.

**Stage I** – If, after 5 min collectors pump operation, temperature delta T1-T3 > 30°C – the controller generates acoustic signal and displays message: **INSUFFICIENT FLOW. CHECK AND ADJUST**. After accepting with the  button, the message will disappear and the acoustic signal is stopped.

**Stage II** – If, after additional 5 min collectors pump operation, temperature delta T1-T3 > 50°C - the controller generates acoustic signal, switches the collectors pump off and displays message: **INSUFFICIENT FLOW. PUMP FAILURE. AIR TRAPPED IN THE SYSTEM. FLOW BLOCKED**. After user accepts with the  button, the solar collectors pump is switched on again. If the flow is still insufficient, the alert will be cyclically repeated.

**ATTENTION!!! Detailed description of all options is included in the separate controller manual.**