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Microprocessor-based controller
for solar system pumps

MTS8 solar

Installation and Operation Manual

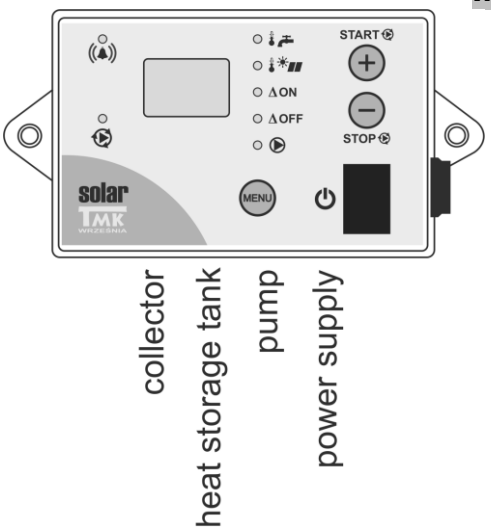
Applications

MTS8 solar is a microprocessor-based controller designed for the control of pumps loading heat storage tanks in solar systems. The controller heats the storage tank using the difference in temperatures existing between the solar collector and the heat storage tank, and in addition protects the collector and the storage tank from overheating. The device protects the collector by means of activating the pump when the temperature of the collector reaches 99°C. The heat storage tank, on the other hand, is protected by the transfer of excess heat into the collector when it is cool (e.g. at night). The collector's sensor ends with a silicon cable which is resistant to outside conditions and high temperatures.

Technical specifications

- Supply voltage	230V / 50Hz
- Maximum load capacity	100VA
- Temperature measurement range	0-99°C
- Range of temperature settings of the heat storage tank	30-80°C
- Pump activation delta	0-30°C
- Pump inactivation delta	0-20°C
- Control of pump output	20-100%
- Option of forced pump operation	

INSTALLATION



1. Controller mounting
Mount the controller on a suitable wall using 6 mm wall plugs (the plugs complete with screws are a part of the delivery set).

2. Mounting of collector temperature sensor

Mount the sensor on a non-insulated pipe going out of the collector.

Fasten the sensor to the pipe using two clamps (included in the delivery set) so that they adhere properly to the pipe.

It is advisable to wrap the pipe and the sensor with thermal insulation material.

3. Mounting of heat storage tank temperature sensor

Mount the sensor in a location recommended by the storage tank's manufacturer.

Note: The sensors are not suited for being used directly in the liquid!

4. Connection of the supply cable to the pump
- Connect the green-yellow wire (protective neutral conductor) of the 3-wire pump supply cable to the protective neutral terminal of the motor (marked with an appropriate symbol);
- Connect the brown and blue wires to the **N** and **L** terminals of the pump motor;

Note: Always ensure that regulator installation is performed by a properly qualified electrician.

5. Connection of the controller
Connect the supply cable to a **230 V, 50 Hz power outlet with an earth contact.**
The ambient temperature in the controller mounting location may not exceed 40°C.

Note: The connection cable of the regulator may only be replaced by the manufacturer.
Note: MTS8 solar controller is only able to operate when the system is filled with water. If the system is empty, the controller must be disconnected from the mains supply. Otherwise the pump may become damaged.

DESCRIPTION OF INDICATOR SYMBOLS – during controller operation

	- the current heat storage tank temperature is displayed
	- the current collector temperature is displayed
	- the pump is operating
	- the pump is operating regardless of temperature

CONTROLLER OPERATION

The controller makes it possible to switch between two pump operation modes: automatic and continuous. The default setting is the automatic mode. The user is able to manually switch on/off the continuous mode of pump operation by pressing the **START** (**+**) and **STOP** (**-**) buttons.
1. automatic operation mode:
- the controller activates the pump at full capacity if the collector temperature is higher than the storage tank temperature by the preset parameter "activation delta" (**ΔON**). If the difference in temperatures decreases, the pump slows down its operation until it stops completely after reaching the preset parameter "inactivation delta" (**ΔOFF**);
- the heat storage tank is heated until it reaches the temperature set by the user;
- when the pump is activated, the indicator light  is lit.
2. continuous operation mode:
- the pump operates regardless of the temperature (e.g. to check pump operation);
- the indicator light  is lit.

Note: After controller connection to the mains supply, the pump always operates in the automatic mode.

The controller can protect the heat storage tank from overheating – **STORAGE TANK PROTECTION**. In this case, the controller activates the pump if the temperature of the heat storage tank exceeds the preset temperature by the value of the **STORAGE TANK PROTECTION** parameter and the collector is at least 10°C cooler than the storage tank.

The controller can activate the pump in the emergency procedure if the collector's temperature exceeds 99°C despite the preset temperature of the heat storage tank being exceeded – **STORAGE TANK PROTECTION** from overheating.

CHANGE OF DISPLAYED TEMPERATURE

The controller makes it possible to monitor temperatures measured by both sensors. Switching between displayed temperatures can be performed by pressing the **MENU** button. The  and  indicators show which of the temperatures is currently displayed.

BASIC PARAMETERS MENU

To change parameters, press and hold the **MENU** button for two (2) seconds. To go into the next indicator (parameter), press the **MENU** button again until you find the desired parameter.

To change parameter value, use the ⊕ or ⊖ button.

- the indicator is pulsating – setting of desirable temperature of the heat storage tank (30 ÷ 80°C)
- the indicator is pulsating – activation/setting of the **STORAGE TANK PROTECTION** function:
  00 – protection inactive
  10 ÷ 20 – protection active (10 ÷ 20°C)
- the indicator **ΔON** is pulsating – setting of the difference in temperatures between the collector and storage tank at which the pump is switched on (0 ÷ 30°C)
- the indicator **ΔOFF** is pulsating – setting of the difference in temperatures between the collector and storage tank at which the pump is switched off (0 ÷ 20°C)
- the indicator ▶ is pulsating – setting of the minimum pump output (20 ÷ 100%)

Changes are saved and the **MENU** is closed when:
- no button is pressed for 10 seconds
- the **MENU** button is pressed while the bottom indicator ▶ is displayed.

COLLECTOR PROTECTION – ON/OFF

To switch on or off the function of **STORAGE TANK PROTECTION** from overheating, disconnect the controller from the mains supply ⏻, press the **START (+)** button and, without releasing it, switch on the controller. The screen displays “1” to show that the protection is active or “0” to represent that the protection is inactive.

To change the setting, use the **START (+)** and **STOP (-)** buttons. To confirm changes and resume operation, press the **MENU** button.

SAFETY DEVICES

The pump and controller are protected by means of a 500 mA fuse which blows up in emergency situations (e.g. short-circuit in the pump or controller).

DELIVERY SET

- controller
- clamps (2 pcs.)
- 6 mm wall plugs (2 pcs.)

WARRANTY

TMK sp.j. grants the user a warranty for the MTS8 solar controller. The warranty period is 3 years from the date of purchase of the device, however not longer than 4 years from the date of manufacture.

WARRANTY TERMS AND CONDITIONS

Warranty claims shall be accepted provided that the terms and conditions of warranty, and general rules of operation of electronic devices, are complied with as required. TMK sp.j. guarantees appropriate workmanship, high quality and reliable operation of the controller. In the event of any faults in the controller's operation, or defects which can be attributed to the manufacturer, TMK sp.j. shall repair or replace the faulty controller with a defect-free device within 14 working days from the date of returning the controller (in person or through post). The warranty scheme explicitly excludes all defects arising due to the user's fault and, particularly, defects caused by mechanical damage, faulty mounting, water ingress or operation of the device contrary to the general rules of operation of electronic devices.
The warranty is only valid with a proof of purchase.

DATE OF SALE:

.....
day, month, year

.....
Seller's stamp and signature

MANUFACTURER:
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DATE OF MANUFACTURE