

SOLAR CONTROLLER

SR 03



TECHNICAL DESCRIPTION AND OPERATION MANUAL

2003

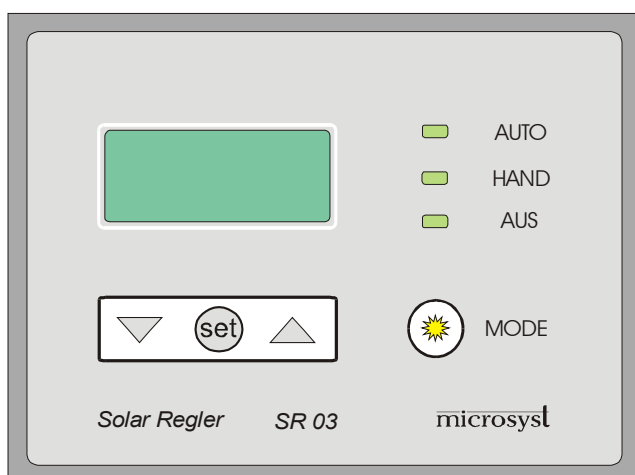
I. TECHNICAL DATA

Range and accuracy	-100 ÷ 150 °C / ± 0.5 °C
Analog inputs	3
RTD Sensor	PT 1000
Discrete outputs	2
K1 – Heating	Relay 250 V / 5, 10 A
K2 – Pump	Relay 250 V / 5, 10 A
Options	Triac 250 V/2A; OC for TTL or SSR 250 V / 10, 20, 40 A
Display and keypad	
Display	2 x 8 LCD
Keypad	Folio
Power supply	
Power supplying voltage	220 V / max 20 mA
Frequency of the power supplying voltage	50 Hz (± 1 Hz)
Operating conditions	
Operating temperature	0 ... 60 °C
Operating relative humidity	0 ... 80 % RH
Dimensions	
Overall dimensions (WxHxL)	125 x 85 x 58 mm
Material of the case	MS C4, Plastics
Weight	max 450 g
Instance of protection	IP65
Storage	
Storage temperature	-10 ... 75 °C
Storage relative humidity	0 ... 95 % RH

II. DESCRIPTION

SR 03 is designed for control of solar systems and the temperature of a boiler by control of three temperature channels. The controller controls two relay outputs (for control of pump and heater) on the basis of the read differences in the temperature of the separate points.

III. FRONT PANEL



IV. BASIC MENU

TX= XXX C
Pump Off

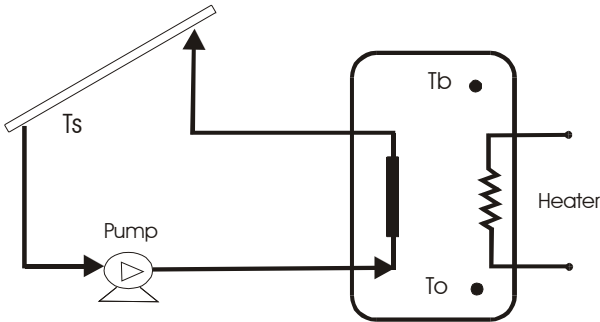
“TX” – displays the currently selected temperature channel. For selection of another channel, the operator must use the buttons **UP** and **DOWN** (by default after power supplying Tb is displayed)

“XXX” – the temperature in degrees.

“**Pump Off**” or “**Pump On**” – displays the status of the pump to the heat exchanger of the boiler.

The status of the heater is not displayed.

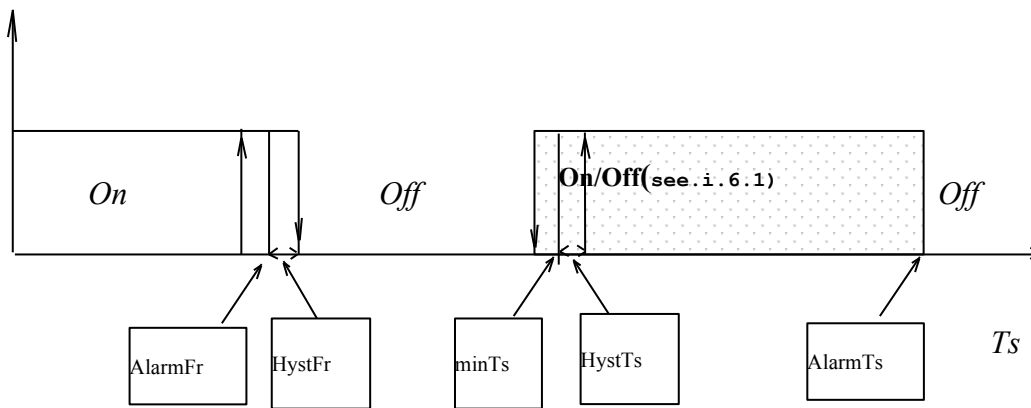
SR03 has four buttons. The buttons **UP** and **DOWN** are with joint designation. The button **MODE** can be used for switching of the operating modes. The three modes are:



Tb – temperature sensor, mounted in the upper part of the boiler (Channel 1)
 Ts – temperature sensor, mounted in the collector zone (Channel 2)
 To – temperature sensor, mounted in the lower part of the boiler (Channel 3)

AUTO – pump control on the basis of the following rules, ordered according to their importance:

- Tb > “AlarmTb” - Pump Off
- Ts > “AlarmTs” - Pump Off
- Ts < “AlarmFr” - Pump On (see the graphics)
- Ts < “minTs” - Pump Off (see the graphics)
- To > “AlarmTo” - Pump Off
- Ts – To > “DeltaSP” - Pump On



HAND – switching on of the pump
AUS – switching off of the pump

The heater is being controlled constantly, without depending on the mode of the pump (see i.6.1).

For tuning of the parameters of the device the button **SET** can be used in the following variants:

User tuning of the set-point of the electric heater **HeatSP** – hold for 2 s. and release. **HeatSP** appears and there is a possibility for change by the buttons **Up** and **Down**. Confirm by **SET**.

Tuning of the system parameters – hold **SET** for 5 s. till displaying of **Enter in tune**. For confirmation and passing to the next parameter use **SET**. Change by the buttons **Up** and **Down**.

Tuning of all (secret and system) parameters – as the upper one, but with pressed **SET** at power supplying

After the passing through all parameters, the basic menu is activated again. It is realized also, if during tuning, in 15 s. no action is done!

V. SYSTEM PARAMETERS

NAME	RANGE	DESCRIPTION
"DeltaSP"	1 ÷ 100 °C	Set-point for the pump in automatic mode (see.i.6.1)
"AlarmTb"	0 ÷ 100 °C	Alarm by Tb in automatic mode
"AlarmTo"	0 ÷ 100 °C	Alarm by To in automatic mode
"Hyst "	0 ÷ 10 °C	Hysteresis at the pump control (see.i.5.1)
"minTs"	-50 ÷ 100 °C	Minimum temperature of exchange (see rules for pump control)
"HystTs "	0 ÷ 10 °C	Hysteresis to "minTs"
"Hyst 2"	0 ÷ 10 °C	Hysteresis at heater control
"HeatSP"	0÷AlarmTb–Hist2	Set-point for the heater (without depending on the mode). The range is kept automatically at change in AlarmTb–Hist2

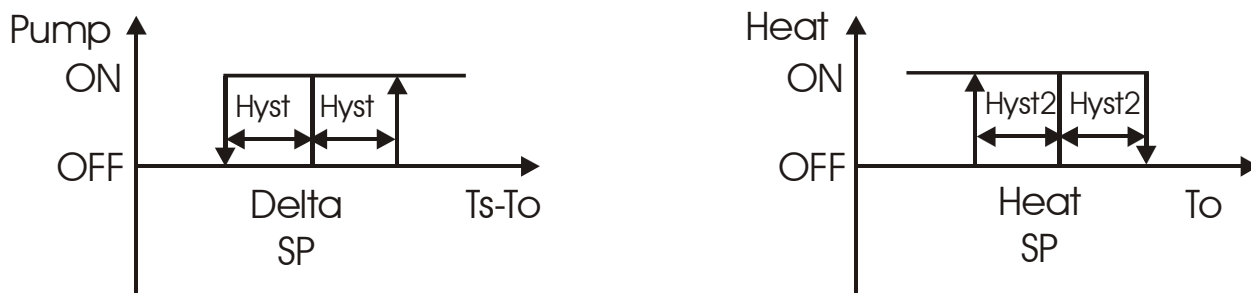
VI. SECRET PARAMETERS

For access to the secret parameters, you must press SET at power supplying of the device!

The secret parameters are displayed after the last system parameter. The parameters are accessible till power fault of the device.

"Alarm T"	0÷ 25.5 Sec	Time-delay before the switching off of the output (when the temperature is over "AlarmTb", "AlarmTo" or "AlarmTs"). It Does not concern "AlarmFr" , which is with hysteresis.
"Filter 1"	0 ÷ 127	Filter for channel 1(see below)
"Jump 1"	0 ÷ 255	Jump for filter 1
"T Jump 1"	0 ÷ 255 * 0.2 Sec	Time-delay before filter 1 jump
"Filter 2"	0 ÷ 127	Filter for channel 2(see below)
"Jump 2"	0 ÷ 255	Jump for filter 2
"T Jump 2"	0 ÷ 255 * 0.2 Sec	Time-delay before filter 2 jump
"Filter 3"	0 ÷ 127	Filter for channel 3(see below)
"Jump 3"	0 ÷ 255	Jump for filter 3
"T Jump 3"	0 ÷ 255 * 0.2 Sec	Time-delay before filter 3 jump 3
"AlarmTs"	0 ÷ 250 °C	Alarm by Ts in automatic mode (see rules for pump control)
"AlarmFr"	-50 ÷ 50 °C	Alarm "freezing of the collector" (see rules for pump control)
"HistFr"	0 ÷ 10 °C	Hysteresis to "AlarmFr"

6.1. OPERATION OF THE PARAMETERS "Hyst", "Hyst 2", "HeatSP" and "DeltaSP"



6.2. DESCRIPTION of "Filter"

The formation of the filter is determined by the following steps:

- a) if $Old_Temp - New_Temp < Jump$, then the following dependence must be used:

$$Temp = \frac{"Filt"}{128} \times New_Temp + \left(1 - \frac{"Filt"}{128}\right) \times Old_Temp$$

The new value can be calculated as a difference between the old and the new value.

Little value of "Filter" means deeper filter.

- b) if $Old_Temp - New_Temp > Jump$, then "T Jump" is decreased by 1. If "T Jump" becomes equal to 0, then Old_Temp becomes equal to New_Temp, "T Jump" is restored with its original value.

6.3. PIN CODE

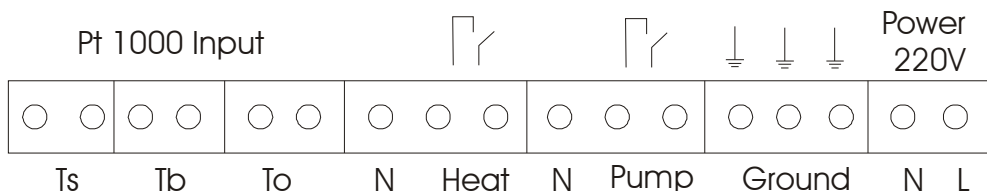
For switching on and off of Pin code of the controller, you must press and hold the buttons SET and DOWN (first press SET) for more than 4 sec. till "Input PIN" appears. The Pin code is four digital.

When the Pin code is set-pointed, after 14 days the controller will ask about Pin code and will not work in automatic mode without the code.

6.4. OFFSET CORRECTION

For correction of the current temperature channel, you have to press and hold the buttons SET and UP (first press SET) for more than 4 sec. till "Offset" appears on the display.

VII. TERMINALS AND CONNECTION



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