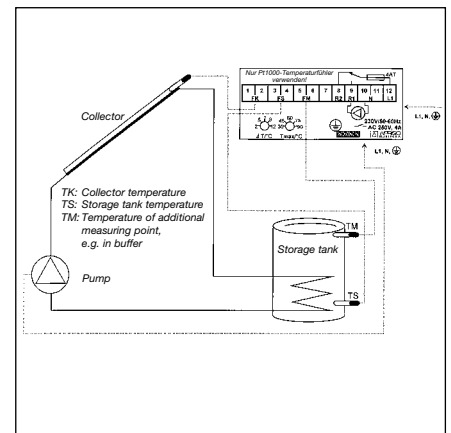


Differential temperature controllers for solar collectors



Solar controller SR1

Designed for manual or automatic control of solar systems for water heaters with one hot water circuit.

In automatic mode, the pump is switched on when the temperature difference between the collector and the storage tank has reached the adjustable value ΔT . If ΔT is below the set value or if the maximum tank temperature T_{max} . (adjustable) is reached, the pump is switched off and there is no further charging.

The digital display of the solar controller displays one of three selectable temperatures. The solar controller consists of a control unit and a maximum of 3 temperature probes (2 probes are supplied with the system). The control unit and the probes are connected by two-core signal cables (maximum length 50 m). Two probes detect the temperatures necessary to control the collector (TK) and the storage tank (TS). A third probe can be connected to display the temperature of an additional measuring point (TM) (e.g. buffer tank).

However, the latter has no influence on the control functions. The control unit evaluates the probe signals and switches the pump relay, depending on the adjustable parameters „temperature differential ΔT “ and „maximum storage tank temperature T_{max} .“.

Operating mode is selected using the operating mode selector switch with the following settings:

- 0** Pump off
- Auto** Automatic pump control depending on collector and storage tank temperatures
- 1** Pump on

Technical specifications

Control unit:

Dimensions W x H x D:

113 x 53 x 108 mm

Weight: 0.4 kg

Supply voltage: AC 230 V

Power consumption: 4 VA

Measuring range:

-19.9 °C/+149.9 °C

Accuracy of measurement: ± 1 % FS

Probe supply: 5 V, $R_i = 1$ k Ω

Probe type: Pt 1000

Output relay:

Changeover contact, max. 250 V, 3 A

On/off time delay in automatic mode: approx. 15 s

Display:

7-segment LED, 3 digits,

-9.9 °C/+99.9 °C: resolution 0.1 °C

Switch points:

• **Temperature difference ΔT :**

Range +2 °C/+12 °C, adjustable, on/off switching hysteresis: 1.5 °C

• **Storage tank max. temperature**

T_{max} :

Range +30 °C/+90 °C, On/off switching hysteresis: 2 °C

• **Collector max. temperature:**

140 °C, on/off switching hysteresis: 2 °C

Ambient temperature:

-10 °C/+50 °C

Protection class: II (EN 60730)

Protection: IP 30 (EN 60529)

Noise suppression: EN 50081-1

Noise immunity: EN 50082-1

Electrical safety: EN 60730

Probes:

Dimensions (\varnothing x L): 6 x 45 mm

Sensor type:

Pt 1000, DIN EN 60751 class B

Probe cable

• **Collector sensor:**

Silicone cable, 1.5 m, 2 x 0.5 mm²
-30 °C/+170 °C

• **Standard sensor:**

Oil-resistant cable, 2.5 m,
2 x 0.5 mm² -5 °C/+80 °C

Solar controller SR1R

Similar to SR 1, but with integrated overheating protection function.

In automatic mode, the overheating protection prevents excessive temperatures in the solar circuit if no water is withdrawn or in case of intensive sunshine. The pump remains on even if the set maximum storage tank temperature T_{max} . is exceeded. This allows the system to be cooled down via the collector after sundown.

When T_{max} . is reached, the pump is switched off.

If the maximum collector temperature is exceeded in automatic mode, the pump is switched on to prevent further heating up, thereby protecting the collector from possible damage.

DG: H	PU	Part no.	Price €
Solar controller SR1	1	78493	
Solar controller SR1R	1	78494	

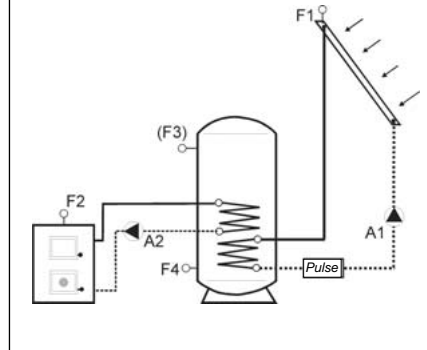
Differential solar controllers SD 1, SD 2 and SD 3



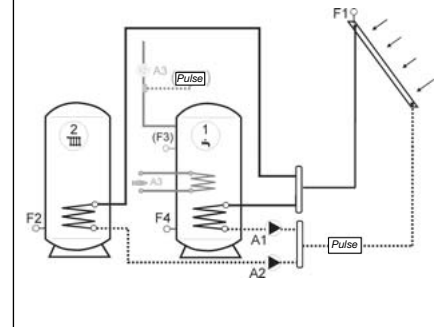
Differential solar controllers (series SD 1 - SD 3)



Application example SD 2



Application example SD 3



Application

Advanced solar systems are primarily used to heat process and pool water and to support room heating systems. The differential solar controllers SD 1, SD 2 and SD 3 are used in solar systems with flat plate or tube collectors to control the circulation pump, to cool the storage tank and, if necessary, to reheat by means of priority control.

Description

The differential solar controller consists of a digital display and control unit as well as a collector and storage tank sensor. If the temperature difference adjusted on the controller is exceeded (the collector sensor is then warmer than the storage tank sensor), the circulation pump is switched on and the solar energy is supplied to the storage tank. If the temperature difference falls below a pre-set value, the pump is switched off. When the temperature falls below the required temperature in the draw-off area of the storage tank, a priority control signal is sent to the actual heating controller.

- LCD display with temperature, operating state and heat quantity calculation
- Simple programming
- Automatic configuration and sensor recognition
- Pump kick function
- Daily and total yield (in kW/MW)

Control functions of the differential controller	SD 1	SD 2	SD 3
Solar control	●	●	●
Solid fuel boiler control	●	●	●
Solid fuel boiler control for 2 storage tanks			●
Solid fuel boiler control with solar integration		●	●
Solar control with 2 collectors		●	●
Solar control with 2 storage tanks valve switching		●	●
Solar control with 2 storage tanks - 2 pumps			●
Solar control with reheating function		●	●
Solar control with return flow increase of the heating system		●	●
Solid fuel boiler control with return flow increase via mixer			●
Solar control with 2 cascaded storage tanks			●
Solar control with stratifier			●
Sensor connections available (inputs)	3	4	4
Relay contacts	1	2	3

Technical specifications

Probes:

Collector sensor KLF (F1 and F2):

Pt 1000, 1 kOhm, ±0.2 % at 0 °C

Storage tank sensor SPF (F3 and F4):

NTC, 5 kOhm, ±1 % at 25 °C

Control unit:

Adjustment range SD1 – SD3

Maximum temperature:

Collector 80 °C/180 °C

Storage tank 10 °C/130 °C

Solid fuel boiler 30 °C/130 °C

Current flow terminal L1: 6.3 A max.

Power reserve of timer: > 10 h

Operating temperature range:

Ambient 0 °C/50 °C

Storage -20 °C/60 °C

Supply voltage: AC 230 V

Power consumption: Max. 5 VA

Contact rating: 250 V, 2 (2) A

Housing: Plastic housing

W x H x D: 148 x 96 x 75 mm

Protection: IP 40 (EN 60529)

Protection class: II, protective

insulation

(EN 60730)

DG: H	PU	Part no.	Price €
AFRISO SD 1	1	69299	
AFRISO SD 2	1	69300	
AFRISO SD 3	1	69301	
Boiler sensor KLF 1000	1	69302	
<small>(F1 and F2: Pt 1000, 1 kOhm, with silicone cable 1.5 m)</small>			
Storage tank sensor SPF	1	69326	
<small>(F3 and F4: NTC, 5 kOhm)</small>			