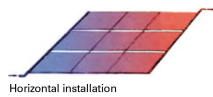
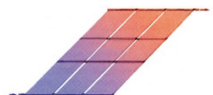


**Technical details for OKU-swimming-pool solar heating systems:**



Horizontal installation



Vertical installation



Three-way motor ball valve



Pump



OKU Suncontrol

The water of the swimming pool can flow through the OKU-solar-panels in either direction, so they can be mounted both lengthwise and side by side. The individual rows of panels are connected on a Tichelmann principle (same routes for each row). It is not advisable to connect more than seven panels in series.

**Design**

Recommended panel area in % of pool surface for open-air pools with cover or indoor swimming-pools (early May through end of September). Temperature increase 4-7°C compared to unheated swimming-pools.

Angle of inclination	Direction of inclination				
	E	SE	S	SW	W
90°	90	80	70	75	85
60°	80	65	55	60	70
45°	70	60	50	55	65
30°	60	55	45	50	55
15°	55	50	50	50	55
0°	50	50	50	50	50

Panel area in % of pool surface

The panel area should be chosen 50% larger if there is no cover. The regionally different number of sunshine hours can be allowed for by adding or deducting up to 20% panel area.

**Pump performance**

The flow rate should be 150 to 250 l/m<sup>2</sup> panel area per hour. The required type of pump is easy to determine. The delivery rate is calculated from the absorber area x 200 l. The delivery head is the difference in height between the water level and the panel plus approx. 5 m.

I am interested in the OKU-swimming-pool solar heating

Please send me free of charge and without any obligation:

- Information material
- Guideline price quotation for swimming pool of size:

\_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

- Open air       Indoor
- Cover             yes  no

Your OKU-dealer:

## OKU Solar Heating – Let the sun do the work!



## OKU – solar heating of swimming-pools

The problem is all too familiar. An outdoor, unheated swimming pool, will reach its ideal bathing temperature for only three or four weeks in the height of summer. That is a very short time, when you think of the investment and maintenance you put into it.

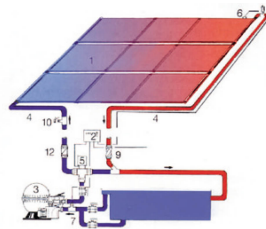
An indoor swimming pool has to be heated all year round, even in the middle of summer. Heating a swimming pool using conventional means of energy can be costly and is also a load on the environment. That is why solar energy is

the best solution. OKU-solar-panels are especially designed for this application. This is what OKU-solar heating provides: maximum efficiency and the right temperature for your swimming pool.

Enjoy a warm and comfortable pool temperature with OKU-solar heating. It is a rewarding investment that is powered by the sun's free energy and it is your contribution to protecting the environment.

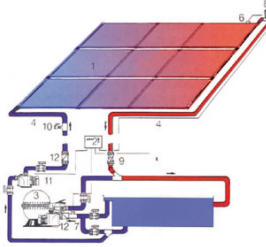


## Different configurations of OKU-swimming-pool solar heating



### Operation with filter pump via three-way motor ball valve with difference-temperature regulation

This configuration can usually be selected if the panels are not to be set up higher than 6 m above the surface of the water. The three-way motor ball valve is integrated into the pressure line of the filter installation. Because of the difference-temperature regulation the ball valve is changed over when the panel temperature is higher than the temperature of the water of the swimming-pool. The filter stream is then pumped through the panels. The warmed water flows back into the filter circuit by way of a Tee.



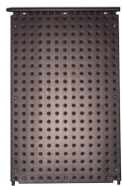
### Operation with own pump and temperature difference regulator integrated into filter circuit

In many cases it may be sensible or even necessary to install a separate pump for the solar heating. For example when the delivery head from the water level to the panel is more than 6 m. The water is diverted from the filter installation by way of a Tee and pumped through the panels by the auxiliary pump. This pump is switched by the difference-temperature regulation to ensure that it only runs to actually win energy. The filter and solar pump are separately regulated. It is usually advisable to integrate non-return valves in both the solar and the filter circuit.

### The components

- 1 OKU-panel
- 2 Difference-temperature regulator OKU Suncontrol
- 3 Filter installation
- 4 Solar circuit forward and return
- 5 Three-way motor ball valve
- 6 Temperature sensor, panels

- 7 Temperature sensor, swimming-pool
- 8 Vent valve
- 9 Stop cock (downdraft brake)
- 10 Drain cock
- 11 Pump for solar circuit
- 12 Non-return valve



- Item no. 1000**
- integrated collecting pipe dia. 40 mm
  - two couplings dia. 25mm
  - length 1320 mm
  - width 820 mm
  - 1,08 m<sup>2</sup>



- Item no. 1001**
- with four couplings dia. 25 mm
  - length 1280 mm
  - width 820 mm
  - 1,05 m<sup>2</sup>



- Item no. 1002**
- with 2 integrated collecting pipe dia. 40 mm
  - length 1360 mm
  - width 820 mm
  - 1,12 m<sup>2</sup>



## OKU-solar-panels, made of high density polyethylene, offer the right foundation for operating such installations.

OKU-solar-panel	
Low pressure drop	approx. 0.003 bar at 200 l/h/m <sup>2</sup>
Flow rate	150 to 250 l/m <sup>2</sup> /h
Molded in one piece	homogeneous black
Weight	approx. 6 kg/m <sup>2</sup> – water content 6 l/m <sup>2</sup>
Testing pressure	4.5 bar at NT
Working pressure	up to 1.2 bar – 40°C
Efficiency	up to approx. 80% – power up to 0.8 kWh/m <sup>2</sup> output 4-5 kWh/m <sup>2</sup> per day
Average value	0.5 to 0.6 kWh/m <sup>2</sup>
Temperature-resistant	from -50 to +115°C

- Operation often possible with existing filter pump
- Non-corroding – resistant to swimming-pool water
- Pool water pumped direct through panel
- Idling-proof
- Full - area through - flow - frost - resistant - supports human weight

