

Solar Collector Factsheet

MM Solar Heliosin AKH



Model	Heliosin AKH
Type	Evacuated tube collector
Manufacturer	MM Solar Sp. z o.o.
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	PL-94-250 Lodz
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Test date	08.2007

- Performance test EN12975:2006
- Quality test EN12975:2006

Dimensions

Total length	1.628 m
Total width	1.183 m
Gross area	1.926 m ²
Aperture area	1.005 m ²
Absorber area	0.845 m ²
Weight empty	38 kg

Technical data

Minimum flowrate	80 l/h
Nominal flowrate	140 l/h
Maximum flowrate	300 l/h
Fluid content	0.8 l
Maximum operating pressure	6 bar
Stagnation temperature	250 °C

Types of mounting

- Construction for sloping roof
- Integration into sloping roof
- On flat roof with stand
- Facade

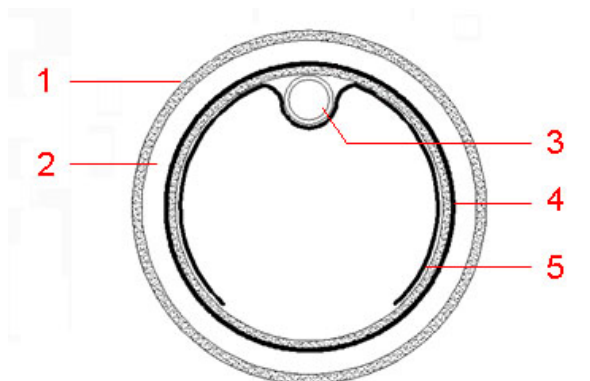
Further information

- Units in different sizes available
- Glazing replaceable

Hydraulic connection

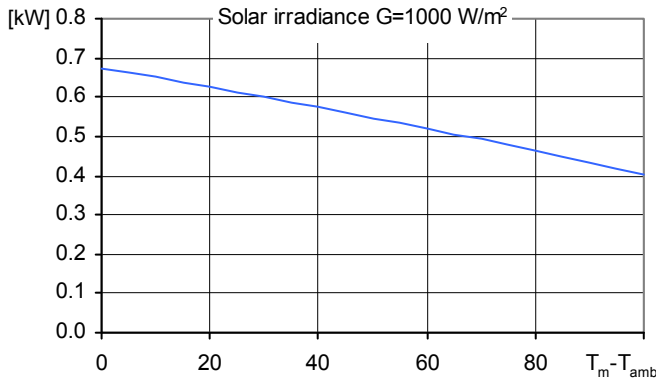
Copper pipe, nominal diameter 22 mm

Construction



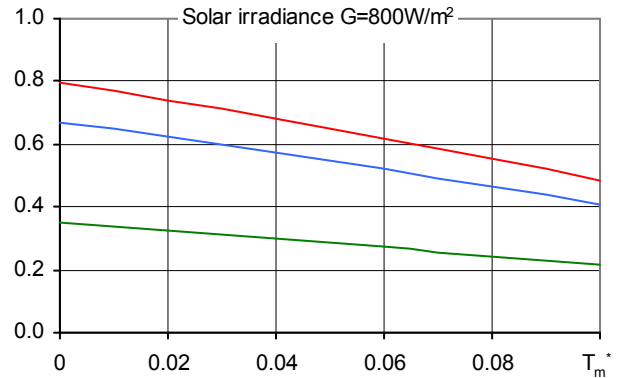
- 1 Glazing
- 2 Vacuum
- 3 Heat pipe
- 4 Absorber
- 5 Heat-conducting metal sheet

Peak Power per collector unit W_{peak}



Peak Power W_{peak}	674 W
Thermal capacity*	12.5 kJ/K
Flowrate during test	110 l/h
Fluid for test	Water-Glycol 33.3%

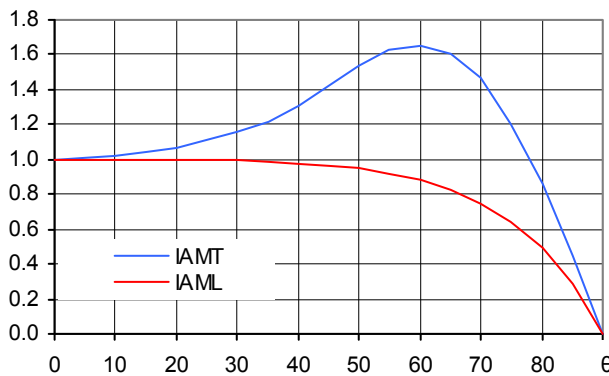
Relative efficiency η



Reference	Gross	Aperture	Absorber
η_0	0.350	0.671	0.798
a_1 [$WK^{-1}m^{-2}$]	1.23	2.36	2.81
a_2 [$WK^{-2}m^{-2}$]	0.0017	0.0032	0.0038

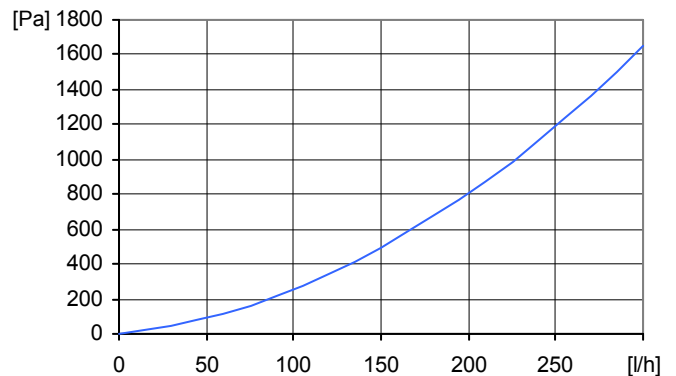
*) Specific thermal capacity C of the collector without fluid, determined according to 6.1.6.2 of EN12975-2:2006

Incident angle modifier IAM



K1, transversal IAM at 50°	1.54
K2, longitudinal IAM at 50°	0.95

Pressure drop Δp



Pressure drop at nominal flowrate
 $\Delta p = 440$ Pa (T=20°C)

SPF Simulation of systems using Polysun

Short description of the system

Climate: Central Switzerland, orientation of the collectors: South,
Cold water 10°C, Hot water 50°C

Domestic hot water: $F_{ss}^* = 60\%$

Tank 450 l, collector inclination 45°,
Daily energy demand 10 kWh (4-6 persons)
Energy demand of the reference system 4200 kWh/year

Water pre-heating: $F_{ss}^* = 25\%$

2 Tanks: 1500 l & 2500 l, collector inclination 30°,
Domestic hot water consumption 10'000 l/day (200 persons)
Daily heat losses (circulation and tanks) 60 kWh,
Energy demand of the reference system 191'700 kWh/year

Space heating system: $F_{ss}^* = 25\%$

Combined storage 1200 l, collector inclination 45°,
Daily energy demand 10 kWh (4-6 persons), Building 200 m², moderately
heavy construction, well insulated, Heating power demand 5.8 kW (ambient
temperature -8°C), Energy demand space heating 12140 kWh/year,
Energy demand of the reference system 16340 kWh/year

Surface demand**
Number of collectors

Solar yield**

4.41 m²
4.4 collectors

580 kWh/m²

59.2 m²
58.9 collectors

812 kWh/m²

12.4 m²
12.3 collectors

439 kWh/m²

*) Fractional solar savings: Proportion of the final energy that, thanks to the solar system, can be saved compared to a reference system.
**) Surface demand and solar yield are given with respect to the aperture area.