

Solar Collector Factsheet

Atmosfera CBK-A-58-30



Model	CBK-A-58-30
Type	Evacuated tube collector
Manufacturer	Atmosfera-Tehnologhii Prirody, ltd
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Test date	08.2008

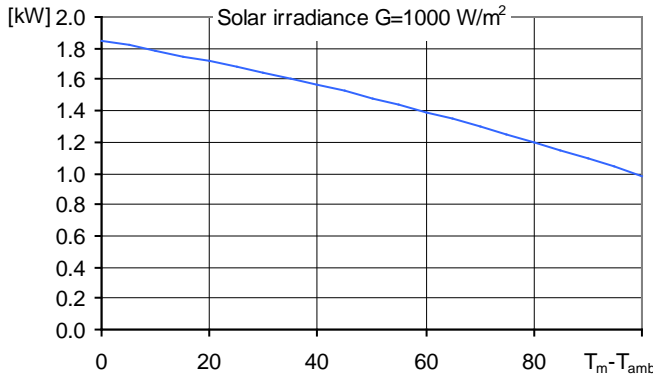
- Performance test EN12975:2006
- Quality test EN12975:2006

Dimensions		Technical data	
Total length	1.990 m	Minimum flowrate	120 l/h
Total width	2.487 m	Nominal flowrate	180 l/h
Gross area	4.949 m ²	Maximum flowrate	300 l/h
Aperture area	2.800 m ²	Fluid content	1.8 l
Absorber area	2.401 m ²	Maximum operating pressure	8 bar
Weight empty	102 kg	Stagnation temperature	187 °C

Types of mounting	Further information
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Construction for sloping roof <input type="checkbox"/> Integration into sloping roof <input checked="" type="checkbox"/> On flat roof with stand <input type="checkbox"/> Facade 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Units in different sizes available <input type="checkbox"/> Glazing replaceable <p>Hydraulic connection Copper pipe, nominal diameter 22 mm</p>

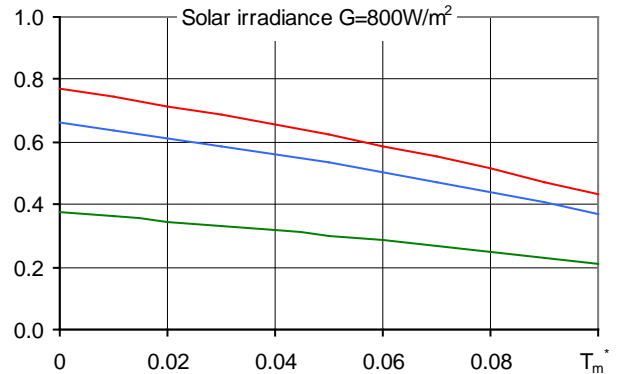
Construction
<ul style="list-style-type: none"> 1 Glazing 2 Heat-conducting metal sheet 3 Heat pipe 4 Vacuum 5 Absorber

Peak Power per collector unit W_{peak}



Peak Power W_{peak}	1846 W
Thermal capacity*	33.7 kJ/K
Flowrate during test	160 l/h
Fluid for test	Water-Glycol 33.3%

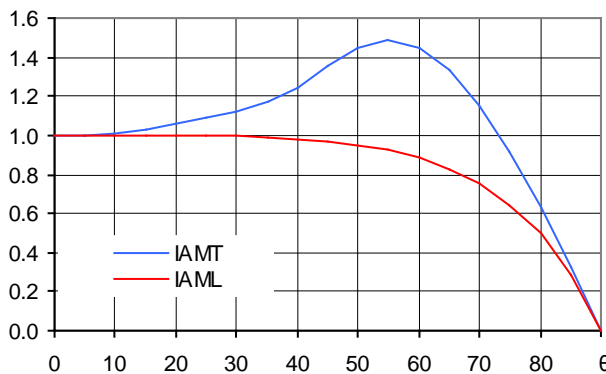
Relative efficiency η



Reference	Gross	Aperture	Absorber
η_0	0.373	0.659	0.769
a_1 [$WK^{-1}m^{-2}$]	1.22	2.16	2.52
a_2 [$WK^{-2}m^{-2}$]	0.0051	0.0091	0.0106

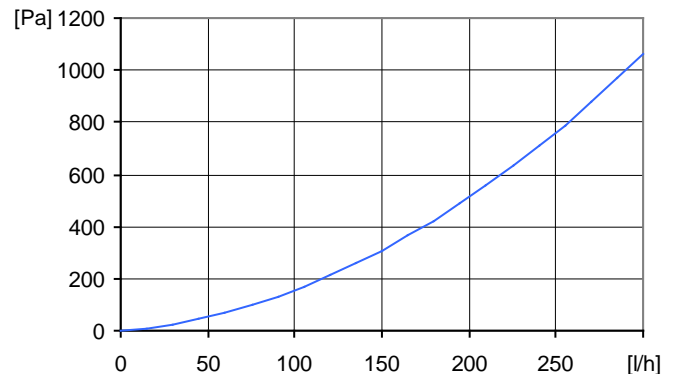
*) Specific thermal capacity C of the collector without fluid, determined according to 6.1.6.2 of EN12975-2:2006

Incident angle modifier IAM



K1, transversal IAM at 50°	1.44
K2, longitudinal IAM at 50°	0.95

Pressure drop Δp



Pressure drop at nominal flowrate
$\Delta p = 424$ 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°

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**

4.71 m²
1.7 collectors 542 kWh/m²

62.9 m²
22.5 collectors 764 kWh/m²

13.6 m²
4.9 collectors 400 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.