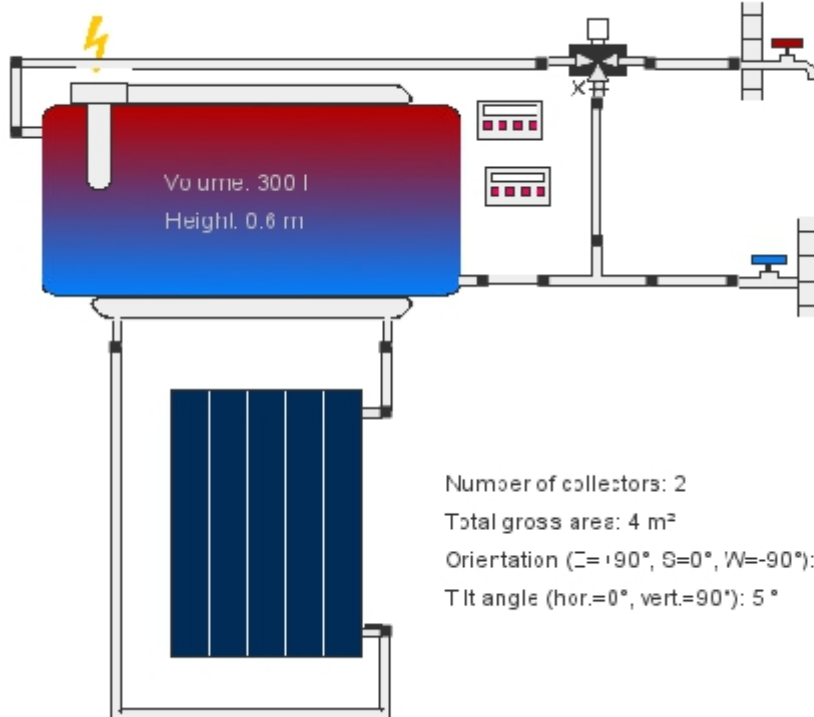


Hot Water

8i: Hot water (solar thermal, thermosiphon system 300L)

Storage tank: 300L thermosiphon tank (jacket heat exchanger electric resistance)



Temperature: 50 °C

Average volume withdrawal: 300 l/day

Number of collectors: 2

Total gross area: 4 m²

Orientation ($\alpha=190^\circ, \beta=0^\circ, \gamma=-90^\circ$): 0 °

Tilt angle (hor.=0°, vert.=90°): 5 °



Location of the system

Namibia

WINDHOEK

Longitude: 17.1°

Latitude: -22.57°

Elevation: 1905 m

This report has been created by:

Jiangsu GMO Hi-Tech Co.,Ltd.

info@gmohotwater.com

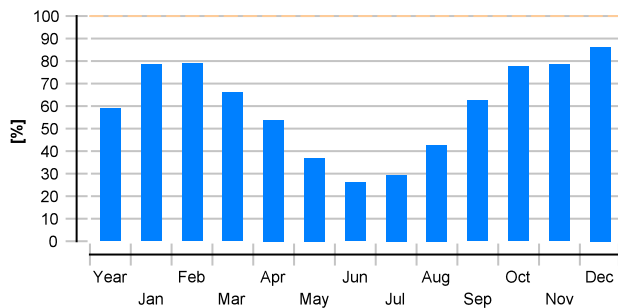
System overview (annual values)

Total fuel and/or electricity consumption of the system [Etot]	2066 kWh
Total electricity consumption [Ecs]	2066 kWh
Total energy consumption [Quse]	4005 kWh
System performance $[(Q_{use}+E_{inv}) / (E_{aux}+E_{par})]$	1.94
Primary energy factor	0.93
Comfort demand	Energy demand covered

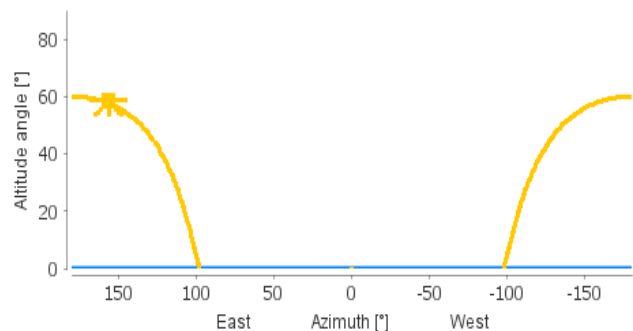
Overview solar thermal energy (annual values)

Collector area	4 m ²
Solar fraction total	59%
Total annual field yield	2819.1 kWh
Collector field yield relating to gross area	704.8 kWh/m ² /Year
Collector field yield relating to aperture area	761.9 kWh/m ² /Year
Max. energy savings	2967.5 kWh
Max. reduction in CO2 emissions	1592 kg

Solar fraction: fraction of solar energy to system [SF_n]



Horizon line



Meteorological data-Overview

Average outdoor temperature	20.9 °C
Global irradiation, annual sum	2362 kWh/m ²
Diffuse irradiation, annual sum	536 kWh/m ²

Component overview (annual values)

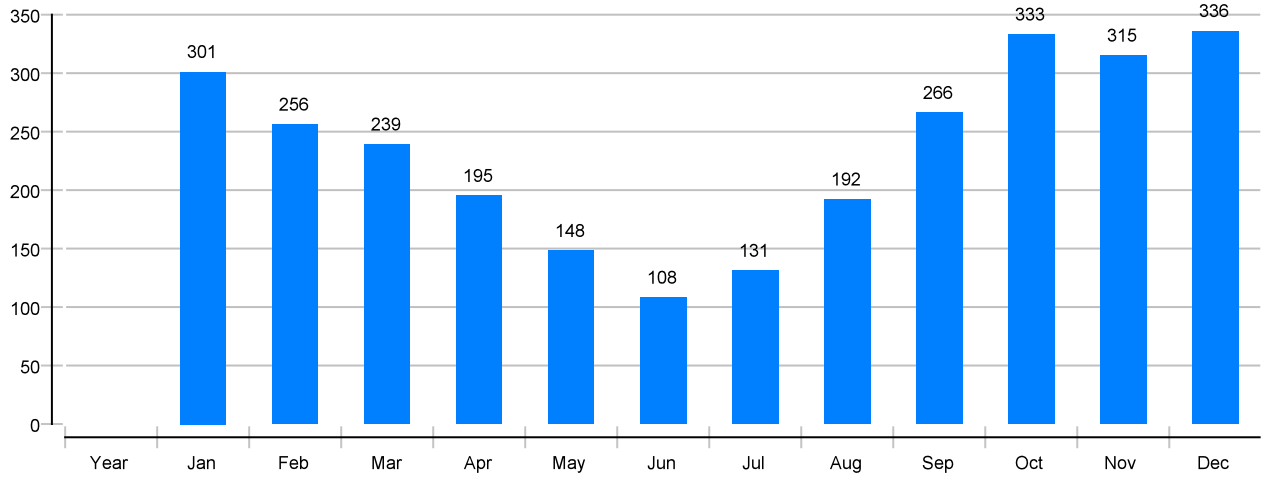
Collector North America 2		Solaqua 2000A	
Data Source			SRCC
Number of collectors			2
Number of arrays			1
Total gross area	m ²		4
Total aperture area	m ²		3.7
Total absorber area	m ²		3.7
Tilt angle (hor.=0°, vert.=90°)	°		5
Orientation (E=+90°, S=0°, W=-90°)	°		0
Collector field yield [Qsol]	kWh		2819
Irradiation onto collector area [Esol]	kWh		9116
Collector efficiency [Qsol / Esol]	%		30.9
Direct irradiation after IAM	kWh		6032
Diffuse irradiation after IAM	kWh		1804
Hot water demand		Daily peaks	
Volume withdrawal/daily consumption	l/d		300
Temperature setting	°C		50
Energy demand [Qdem]	kWh		3658
Pump		Natural convection	
Circuit pressure drop	bar		0.001
Flow rate	l/h		33.4
Storage tank Thermosiphon tank		300L thermosiphon tank (jacket heat exchanger electric resistance)	
Volume	l		300
Height	m		0.6
Material			Stainless steel
Insulation			Flexible polyurethane foam
Thickness of insulation	mm		55
Heat loss [Qhl]	kWh		181
Connection losses	kWh		271

Loop

Solar loop			
Fluid mixture			Propylene mixture
Fluid concentration	%		33.3
Fluid domains volume	l		14.4
Pressure on top of the circuit	bar		4

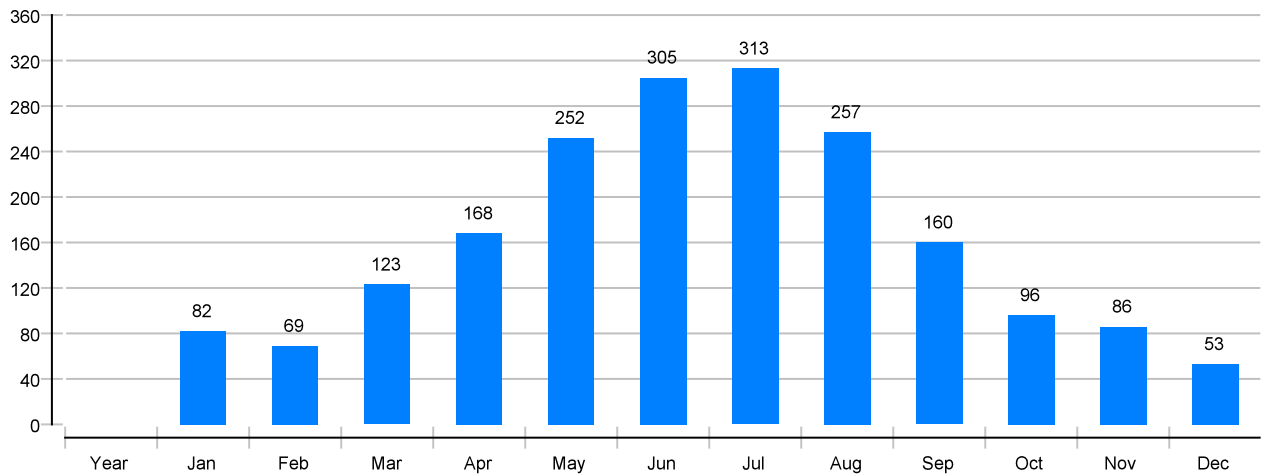
Solar thermal energy to the system [Qsol]

kWh



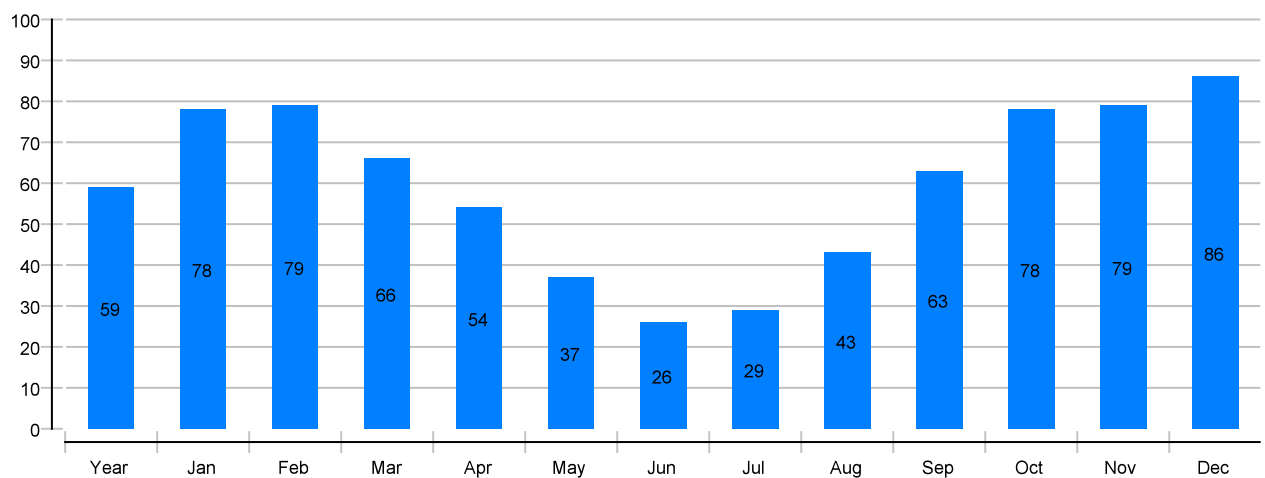
Heat generator energy to the system (solar thermal energy not included) [Qaux]

kWh



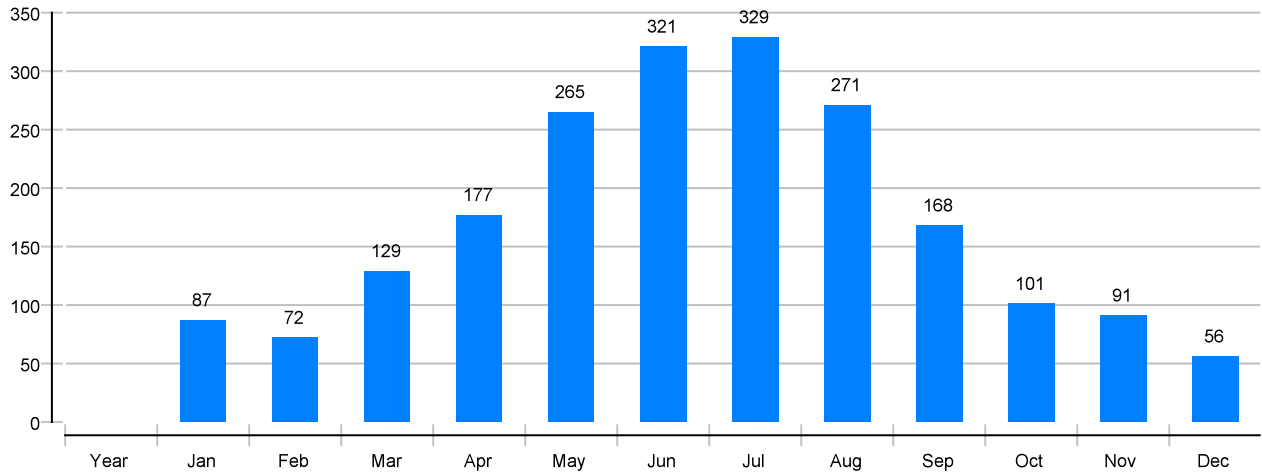
Solar fraction: fraction of solar energy to system [SFn]

%



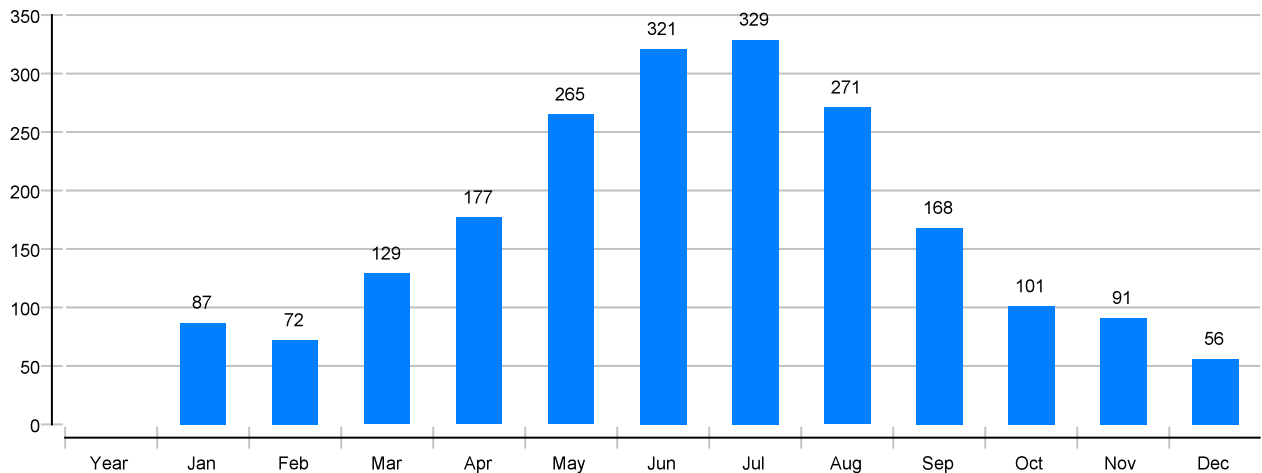
Total fuel and/or electricity consumption of the system [Etot]

kWh



Total electricity consumption [Ecs]

kWh



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Solar thermal energy to the system [Qsol]

kWh	2819	301	256	239	195	148	108	131	192	266	333	315	336
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Heat generator energy to the system (solar thermal energy not included) [Qaux]

kWh	1963	82	69	123	168	252	305	313	257	160	96	86	53
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Heat generator fuel and electricity consumption [Eaux]

kWh	2066	87	72	129	177	265	321	329	271	168	101	91	56
-----	------	----	----	-----	-----	-----	-----	-----	-----	-----	-----	----	----

Solar fraction: fraction of solar energy to system [SFn]

%	59	78.5	78.9	66	53.7	37	26.1	29.5	42.8	62.5	77.7	78.5	86.3
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Total fuel and/or electricity consumption of the system [Etot]

kWh	2066	87	72	129	177	265	321	329	271	168	101	91	56
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Irradiation onto collector area [Eso]

kWh	9116	905	785	767	680	609	532	580	684	791	913	898	974
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Total energy consumption [Quse]

kWh	4005	308	269	298	301	332	344	374	382	366	367	337	327
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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Heat loss to indoor room (including heat generator losses) [Qint]													
kWh	513	40	35	40	42	50	54	55	49	39	35	36	37
Heat loss to surroundings (without collector losses) [Qext]													
kWh	367	33	30	30	29	31	31	32	31	28	28	30	33
Total electricity consumption [Ecs]													
kWh	2066	87	72	129	177	265	321	329	271	168	101	91	56

Collector North America 2 Daily maximum temperature [°C]



Energy flow diagram (annual balance)

