Energetyka Solarna ensol Sp. z o.o.

Technical Data for Ensol flat solar collectors ES2V/2,0HE S i ES2V/2,0HE B for vertical mounting

ES2V/2,0HE S and ES2V/2,0HE B - flat solar collector with meander absorber, made entirely of copper, designed for vertical mounting .

Solar collector ENSOL ES2V/2,0HE S and ES2V/2,0HE B is designed for changing energy of solar radiation into useful thermal energy used for providing warm service water, heating swimming pools or supporting a heat source in a heating system.

Collector's housing construction is based on a rigid frame bent from a special aluminum profile patented by ENSOL company. At the bottom the housing is closed with an aluminum sheet, whereas the cover is made of special, high-transmission solar glass. The manner of fixing the glass ensures tightness of housing and minimizes thermal tensions.

The main part of the collector is an absorber, the plate of which is made of copper sheet covered with a high selective coat in order to ensure a high level of solar radiation absorption, which results in obtaining high efficiency of the energy conversion process. . The absorber's plate is connected by means of ultrasonic welding with the copper tubes system, in which the medium circulates. Meander absorber ensures steady heat removal through the circulating medium.

Heat losses were minimized by application of lower and lateral insulation. Specially designed assembly sets made of aluminium and stainless steel are used for trouble-free and secure mounting of collectors to roof constructions with different angles inclination.

Flat collectors **ES2V/2,0HE S and ES2V/2,0HE B** have certificate of compatibility with norm **DIN EN 12975-1:2011-01 and DIN EN 9806:2014-03** conducted by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and the **Solar Keymark certificate**.

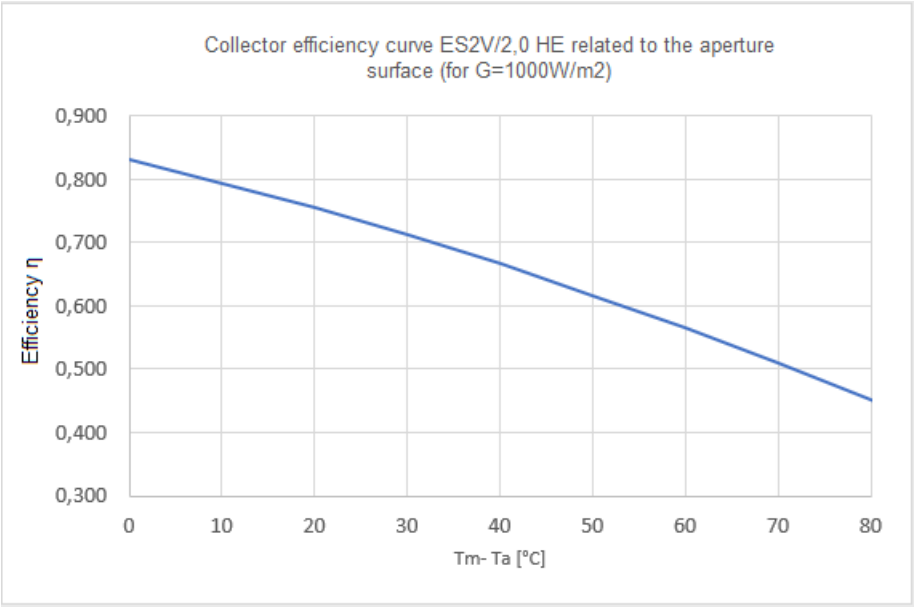
Flat collector:	Symbol	Unit	Value
Width	A	mm	1006
Height	B	mm	2008
Depth	C	mm	84
Weight	m	kg	40
Surface	S	m^2	2,02

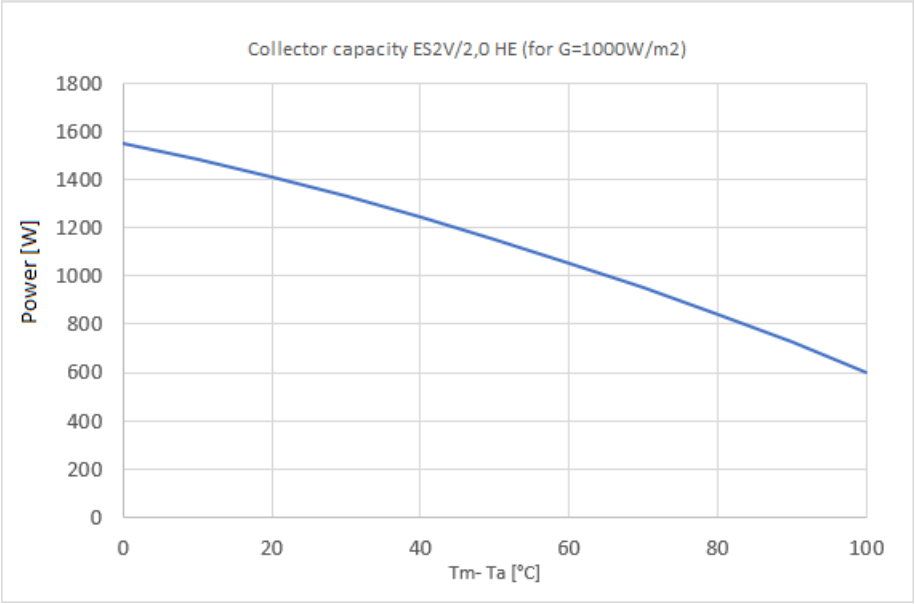
Collector efficiency ES2V/2,0 HE (for G=1000W/m2)					
Tm-Ta	0 K	10 K	30 K	50 K	70 K
Power	1551 W	1484 W	1330 W	1152 W	950 W

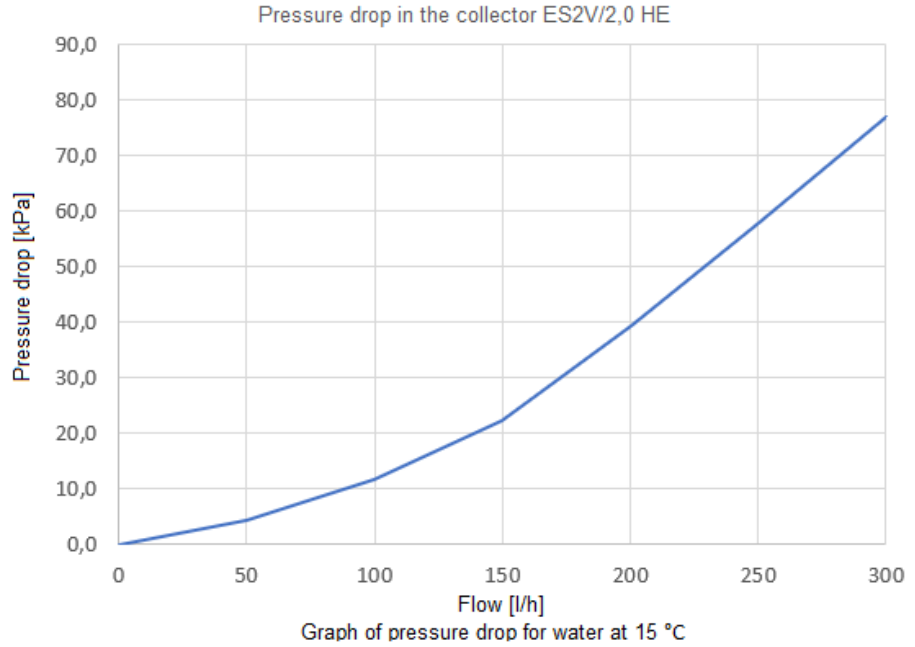
Parameters relative to the area of the aperture			
Optical efficiency	ηo, hem	%	83,1
Coefficient	a1	$W/(m^2K)$	3,469
Coefficient	a2	$W/(m^2K^2)$	0,016
Parameters relative to the gross area			
Optical efficiency	ηo, hem	%	76,8
Coefficient	a1	$W/(m^2K)$	3,205
Coefficient	a2	$W/(m^2K^2)$	0,015
Coefficient of angle of incidence	IAM (K_d=50°)	-	0,86
Connection: copper tube	ø	mm	22
Housing	Aluminum profile		
Cover	Tempered solar glass, 4mm thick with anti-reflective coating		
Absorber:			
Absorber's type	Hydraulic system Cu - Cu sheet		
Absorber sheet coating	High selective layer		
Execution technology	Ultrasonic welding		
Absorption coefficient	α	%	95
Emission coefficient	ε	%	5
Width	a	mm	1953
Height	b	mm	954
Absorber's surface	S_b	m^2	1,860
Aperture surface	S_n	m^2	1,866
Liquid content	V	dm^3	1,8
Stagnation temperaturę	T_s	°C	193,7
Flow: Recommended Permissible	 l/h l/h		 60-380 60-90
Lower insulation :	Mineral wool 50 mm thick		
Lateral insulation	Melamine foam 16 mm thick		
Guarantee	10 years		
Solar Keymark	011-7S2722 F		

Energetyka Solarna ensol Sp. z o.o.

Technical Data for Ensol flat solar collectors ES2V/2,0HE S i ES2V/2,0HE B for vertical mounting







Graph of pressure drop for water at 15 °C

The key:

tm – average liquid temperature;

ta – environment temperature;

G – intensity of solar radiation