

## Technical data of flat solar collectors

### Ensol ES2V/2,65S Cu-Al and ES2V/2,65B Cu-Al for vertical installation

**Ensol ES2V/2,65 Cu-Al – flat solar collector with meander absorber, made of copper and aluminum for vertical montage.**

Ensol solar collector ES2V/2.65 Cu-Al is designed to convert energy of solar radiation into useful thermal energy used for preparing warm service water, heating swimming-pools or supporting heat source in the heating system.

Collector's housing construction is based on a rigid frame bent from the special aluminum profile patented by ENSOL company. At the bottom the housing is closed with 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 the thermal tensions.

The main part of the collector is an absorber, the plate of which is made of aluminum sheet covered with the high selective eta plus coat in order to ensure high level of solar radiation absorption, which results in obtaining high efficiency of the energy conversion process.

Absorber's plate is welded by means of laser welding with the system of copper tubes, 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 made of mineral wool of low heat conduction.

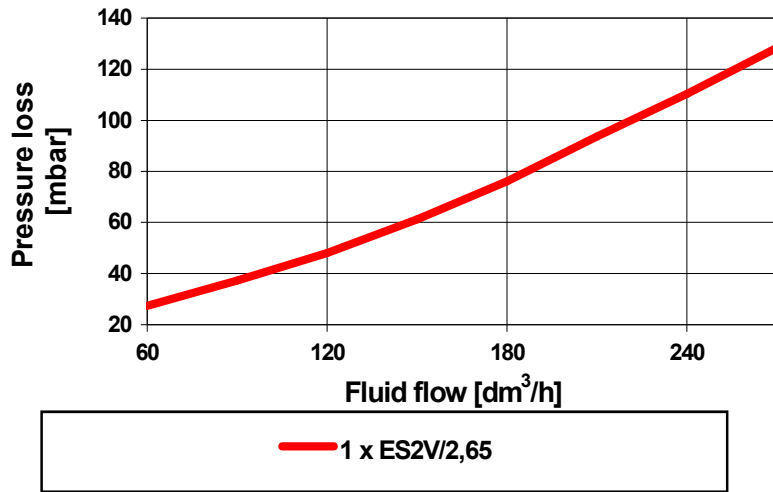
Specially designed assembly sets made of stainless steel are used for trouble free and secure mounting of collectors to roof constructions with different angle of roof slope inclination.

Flat collectors with prismatic glass have certificate of compatibility with norm **DIN EN 12975-2:2006** conducted by TUV Rheinland Immissionschutz und Energiesysteme GmbH and **Solar Keymark** certificate.

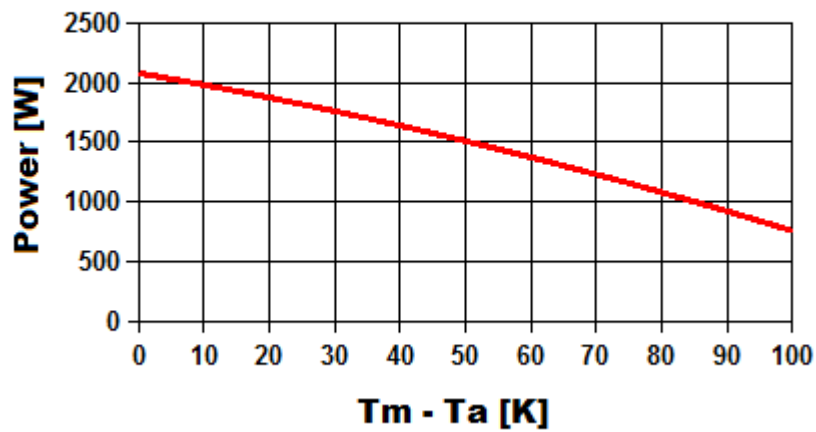


Flat collector:	Symbol	Unit	Value
Width	A	mm	1120
Height	B	mm	2356
Depth	C	mm	85
Mass of collector	m	kg	49
Surface	S	m <sup>2</sup>	2,65
Optical efficiency	$\eta_0$	%	85,2
Coefficient	a1	W/(m <sup>2</sup> K)	3,92
Coefficient	a2	W/(m <sup>2</sup> K)	0,015
Service line: tube Cu	$\varnothing$	mm	22
Casing	Aluminum profile		
Cover	Prismatic solar glass, 4mm in thickness		
<b>Absorber:</b>			
Kind of absorber	Metal sheet Al; thickness 0,5 mm		
High-selective layer	BlueTec		
Technology of execution	Laser welding		
Absorption coefficient	$\alpha$	%	95
Emission coefficient	$\epsilon$	%	5
Width	a	mm	1060
Height	b	mm	2299
Surface of absorber	S <sub>b</sub>	m <sup>2</sup>	2,44
Netto surface	S <sub>n</sub>	m <sup>2</sup>	2,44
Amount of liquid	V	dm <sup>3</sup>	2,2
Temperature balance	T <sub>r</sub>	°C	208
Guaranteed minimal heat output	kWh/m <sup>2</sup> ·year		525
Recommended flow	l/h l/h		approx. 75-105 50-150
<b>Insulation</b>	Rock wool		
Conduction coefficient	$\lambda$	W/mK	0,035
Thickness of insulation layer:			
lower	d	mm	40
lateral	d <sub>1</sub>	mm	10
Test Raport TUV Koln 21214977_EN_R/P			
Solar Keymark	011-7S2562 F		

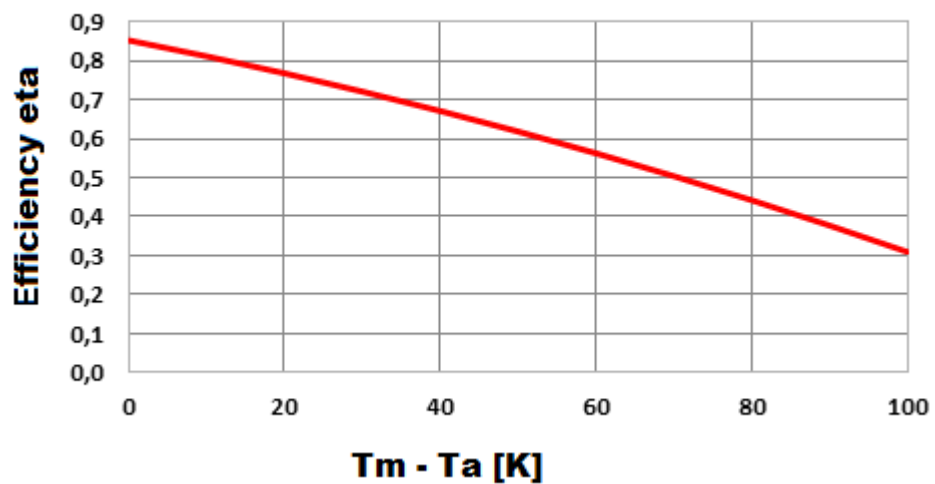
Pressure loss with flow through 1 meandric collector ES2V/2,65



Collector efficiency [G=1000 W/m<sup>2</sup>]



Collector efficiency curve [G=1000 W/m<sup>2</sup>]



**Legend:**

t<sub>m</sub> – average temperature of liquid  
t<sub>a</sub> – ambient temperature

G – solar irradiance