Energetyka Solarna ensol Sp. z o.o.

Technical data of the flat solar collectors
ES2V/5,23 Al-Cu (DIS 50 Al-Cu)
for vertical installation

ES2V/5,23S Al-Cu and ES2V/5,23B Al-Cu (DIS 50) – flat solar collector for vertical montage with meander absorber, for vertical installation .

Ensol solar collector type ES2V/5,23S **Al-Cu** and ES2V/5,23B **Al-Cu (DIS 50)** is designed for changing energy of solar radiation into useful thermal energy used for preparing warm service water, heating swimming-pools or supporting heat source in heating system.

Collector's housing construction is based on a rigid frame bent from the special aluminium profile patented by ENSOL company. At the bottom the housing is closed with aluminium sheet, whereas the cover is made of special, high-transmission solar glass with antireflective coating. 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 aluminium sheet covered with the high selective 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. 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/5,23S Al-Cu and ES2V/5,23B Al-Cu** have certificate of compatibility with standard **DIN EN 12975-2:2006** conducted by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and **Solar Keymark certifikate**.

Flat collector:	Symbol	Unit	Value
Width	A	mm	2220
Height	B	mm	2356
Depth	C	mm	85
Weight	m	kg	95
Surface	S	m^2	5,23

Collector efficiency ES2V/5,23 Al.-Cu (DIS 50 Al.-Cu) (for G=1000 W/m2)						
Tm-Ta	0 K	10 K	30 K	50 K	70 K	100 K
Power	4123	3940	3524	3041	2491	1540

Parameters relative to the area of the aperture			
Optical efficiency	$\eta_{o,hem}$	%	84,1
Coefficient	a1	$W/(m^2K)$	3,559
Coefficient	a2	$W/(m^2K^2)$	0,0174

Parameters relative to the gross area			
Optical efficiency	$\eta_{o,b}$	%	79,8
Coefficient	a1	$W/(m^2K)$	3,34
Coefficient	a2	$W/(m^2K^2)$	0,016
Coefficient of angle of incidence	IAM (K_d)	-	0,92
Connection: copper tube	ø	mm	28
Housing	Aluminium profile		
Cover	Tempered solar glass, 4mm thick with anti-reflective coating		
Absorber:			
Absorber's type	Hydraulic system Cu - Al sheet		
Absorber sheet coating	High selective layer		
Execution technology	Laser welding		
Absorption coefficient	α	%	95
Emission coefficient	ε	%	5
Width	a	mm	1066 x 2
Height	b	mm	2303 x 2
Absorber's surface	S_b	m^2	4,91
Aperture surface	S_n	m^2	4,91
Liquid content	V	dm^3	4,18
Stagnation temperature	T_s	°C	210
Flow: recommended permissible	 l/h l/h		 150-210 140-440
Lower insulation:	Mineral wool 40 mm thick		
Lateral insulation:	Melamine foam 8mm thick		
Guarantee	10 years		
Solarkeymark	011-7S 3112F		

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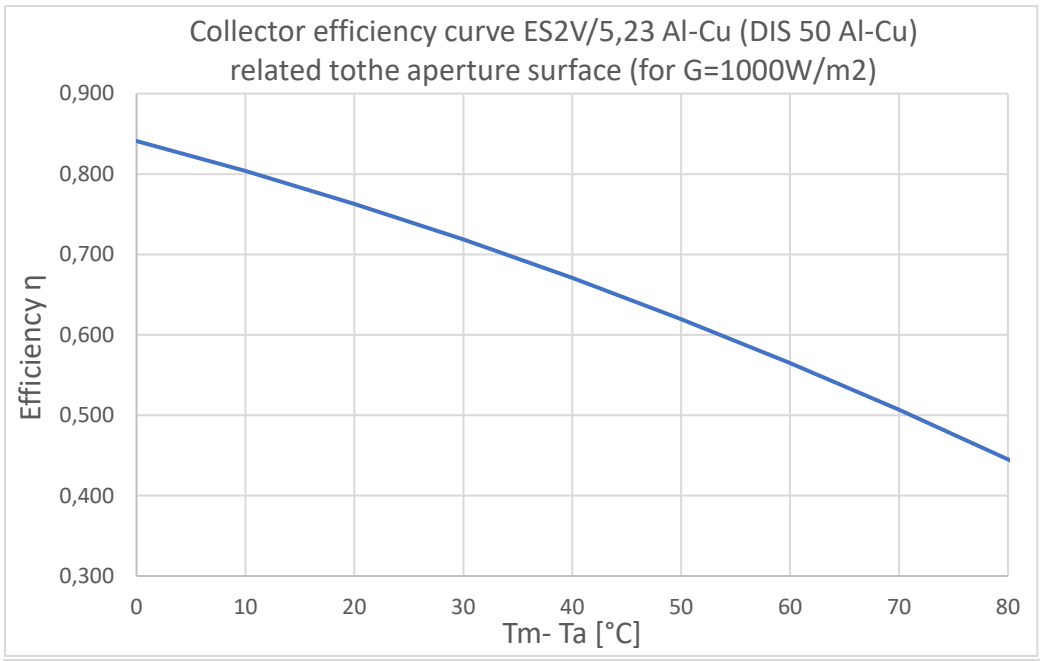

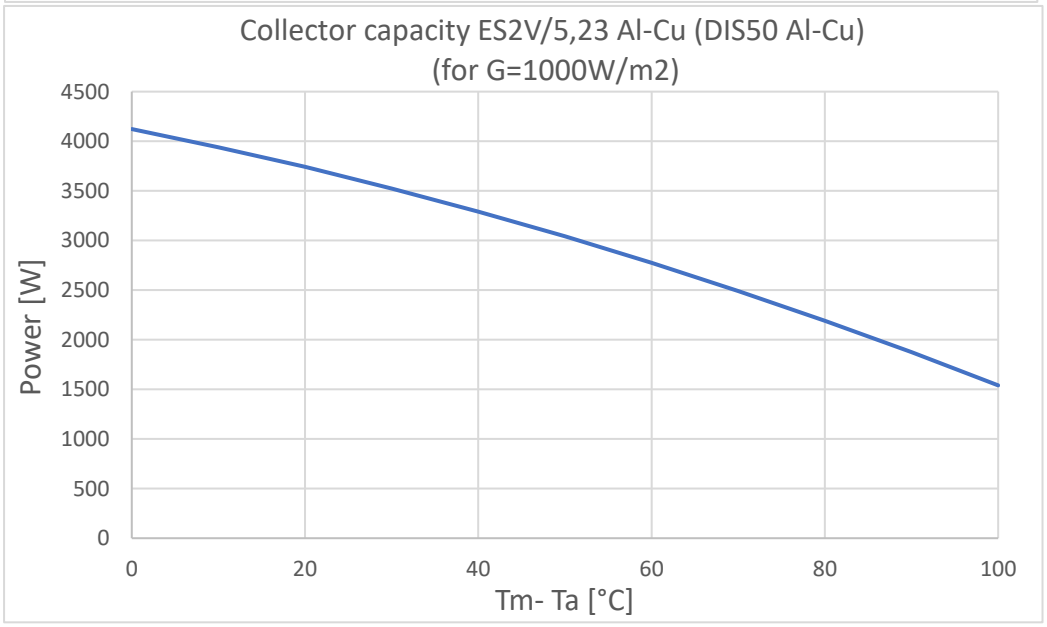

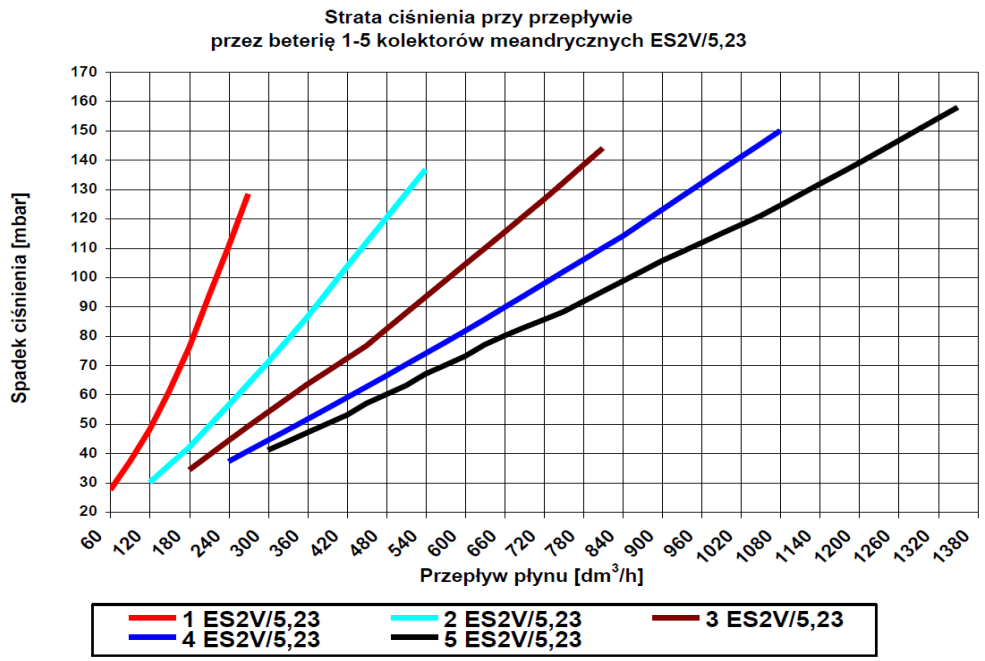

The key:

tm – average liquid temperature;

ta – environment temperature;

G – intensity of solar radiation