

## E-PVT2,0 – Hybrid collector PVT

Collector E-PVT2,0 is a combination of a flat solar collector and a photovoltaic module with polycrystalline silicon cell. Solar collector is responsible for a conversion of a solar radiation to thermal energy, used for heating domestic water and central heating, while photovoltaic module changes solar energy into electric energy.

Photovoltaic module defined as a source of a pure electric energy is not without downsides; its efficiency lowers when the temperature of the module rises. When the temperature of cells goes up by 1 K, its capacity of producing energy goes down by 0,5%. Catalogue parameters of photovoltaic modules are given for the temperature of a module equal 25 degrees, with an insolation of 1000 W/m<sup>2</sup>. During the work in a full, lasting for several hours insolation, the temperature of a module rises to a level which could cause the loss of efficiency reaching even 40%.

By using thermal system in a hybrid collector PVT occurs a reception of warmth with the use of cooling fluid flowing by Roll-Bond exchanger. By removing the heat, thermal system increases the capacity to process solar radiation into electric current, but also provides a lot of thermal energy. Hybrid collector E-PVT2,0 is a technological progress in increasing efficiency of photovoltaic modules with a simultaneous exchange of a solar energy into thermal and electric energy.

### Advantages of a hybrid collector E-PVT2,0:

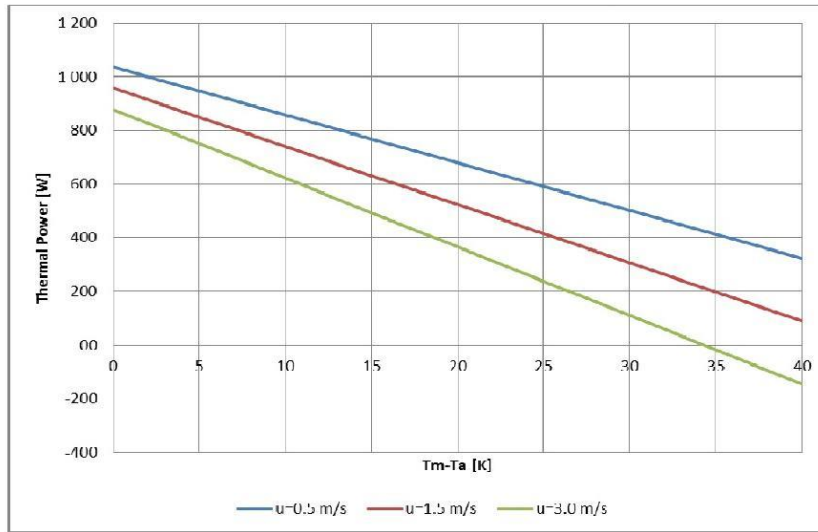
- higher efficiency of production of electric energy in comparison to standard photovoltaic modules.
- thermal part of a collector is used for heating domestic water and supporting central heating
- more economic possibilities – one module required for production of electrical current and heat
- lower investment cost of both systems than in traditional devices (fluid thermal collectors and photovoltaic modules)



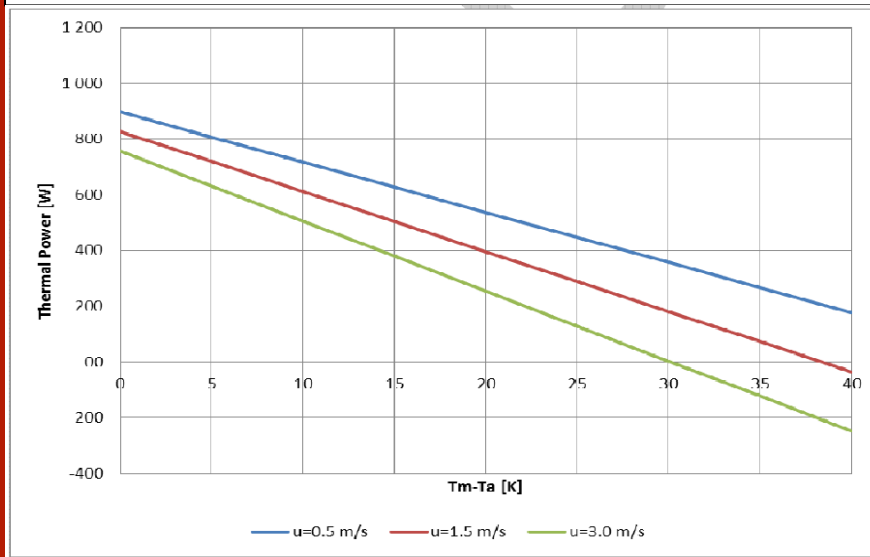
Collector E-PVT2,0:	Symbol	Unit	Value
Width	A	mm	1006
Height	B	mm	2007
Depth	C	mm	85
Surface	S	m <sup>2</sup>	2,02
Casing	Patented aluminium profile		
Glass thickness	4,0 mm		
Technical parameters			
Peak power (for 1000 W/m <sup>2</sup> and open circuit mode for PV module )	Q	W	1037
Peak power ( for 1000 W/m <sup>2</sup> and MPP mode for PV module )	Q	W	898
Absorber's pipe	Aluminium exchanger Roll-Bond		
Aperture surface	S <sub>n</sub>	m <sup>2</sup>	1,867
Width	a	mm	955
Height	b	mm	1955
Collector efficiency	η	%	48,1
Coefficient*	b <sub>u</sub>	W/(m <sup>2</sup> K <sup>2</sup> )	0,052
Coefficient*	b <sub>1a</sub>	W/(m <sup>2</sup> K <sup>2</sup> )	9,658
Coefficient*	b <sub>2a</sub>	W/(m <sup>2</sup> K <sup>2</sup> )	1,271
*Relative to the area of the aperture			
Maximum operating pressure	P <sub>max</sub>	bar	6
Fluid content	V	dm <sup>3</sup>	1,2
Electrical parameters			
Peak power (for 1000 W/m <sup>2</sup> )	P <sub>max</sub>	W	315
Type of cell	Polycrystalline		
Amount of cells		pcs	72
Rated current	I <sub>mpp</sub>	A	8,37
Short-circuit current	I <sub>sc</sub>	A	8,80
Nominal voltage	V <sub>mpp</sub>	V	37,92
Open-circuit voltage	V <sub>oc</sub>	V	45,27
Hybrid collector warranty	5 years		
PV module warranty	10 years		

## Collector efficiency (for 1000 W/m<sup>2</sup> and open circuit mode for PV module)

Collector Efficiency (for G=1000W/m<sup>2</sup>)



## Collector efficiency ( for 1000 W/m<sup>2</sup> and MPP mode for PV module )



### Legend:

t<sub>m</sub> - average temperature of liquid

t<sub>a</sub> - ambient temperature

G - solar irradiance