

Annex to Solar Keymark Certificate					Licence Number		011-7S2982 F							
					Date issued		2020-08-26							
					Issued by		ISFH CalTeC							
Licence holder		Paradigma Italia Srl			Country		Italy							
Brand (optional)					Web		http://www.paradigmaitalia.it							
Street, Number		Via Carlo Maffei 3			E-mail		info@paradigmaitalia.it							
Postcode, City		I- 38089 Darzo			Tel		+39 30 9980951							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	85 K				
					m ²	mm	mm	mm	mm	mm	mm			
EasySun Plus					2.53	2 168	1 168	93	1 875	1 781	1 574	1 340	1 080	868
Power output per m² gross area					741	704	622	530	427	343				
Performance parameters test method		Steady state - indoor												
Performance parameters (related to A_G)		η_0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0.753	3.58	0.013			5 300				0.89			
Incidence angle modifier test method		Quasi dynamic - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K _{θT, coll}	1.00	0.99	0.98	0.96	0.93	0.88	0.77	0.43	0.00			
Longitudinal		K _{θL, coll}	1.00	0.99	0.98	0.96	0.93	0.88	0.77	0.43	0.00			
Heat transfer medium for testing		Water-Glycole												
Flow rate for testing (per gross area, A_G)		dm/dt		0.020	kg/(sm ²)									
Maximum temperature difference during thermal performance test		$(\vartheta_m - \vartheta_a)_{max}$		55	K									
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)		ϑ_{stg}		210	°C									
Maximum operating temperature		$\vartheta_{max, op}$		-	°C									
Maximum operating pressure		p _{max, op}		600	kPa									
Testing laboratory		ISFH CalTeC					http://www.isfh.de							
Test report(s)		085-20/B					Dated		26.08.2020					
Comments of testing laboratory		Datasheet version: 6.1, 2019-07-11												
This data sheet is not complete as the testing of collector was performed according to EN 12975:2006 (which is replaced by ISO 9806)		Institut für Solarenergieforschung GmbH Am Ohrberg 1 D-31800 Emmerthal Tel.: 05151/999-100 Fax: 05151/999-500												
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de														

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Supplementary Information												Issued		2020-08-26	
Annual collector output in kWh/collector at mean fluid temperature ϑ_m															
Standard Locations		Athens			Davos			Stockholm			Würzburg				
Collector name	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C		
EasySun Plus		2 959	2 084	1 336	2 234	1 522	935	1 647	1 062	629	1 791	1 146	668		
Annual output per m ² gross area		1 169	824	528	883	602	369	651	420	249	708	453	264		
Annual efficiency, η_a		66%	47%	30%	54%	37%	23%	56%	36%	21%	57%	36%	21%		
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)													
Annual irradiation on collector plane		1765 kWh/m ²			1630 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²				
Mean annual ambient air temperature		18.5°C			3.2°C			7.5°C			9.0°C				
Collector orientation or tracking mode		South, 25°			South, 30°			South, 45°			South, 35°				
The collector is operated at constant temperature ϑ_m (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.1 (July 2019). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/															
Additional Information															
Collector heat transfer medium											Water-Glycole				
The collector is deemed to be suitable for roof integration											No				
The collector was tested successfully under the following conditions:															
Climate class (A+, A, B or C)											B		--		
G (W/m ²) >		900		ϑ_a (°C) >		15		H _x (MJ/m ²) >		540					
Maximum tested positive load											3750		Pa		
Maximum tested negative load											2750		Pa		
Hail resistance using steel ball (maximum drop height)											not tested		m		
Additional collector attribute(s)															
<input type="checkbox"/> Using external power source(s) for normal operation <input type="checkbox"/> Active or passive measure(s) for self-protection <input type="checkbox"/> Co-generating thermal and electrical power <input type="checkbox"/> Façade collector(s)															
Energy Labelling Information							Additional Informative Technical Data								
Reference Area, A _{sol} (m ²)							Hydraulic Designation Code				Aperture Area, A _a (m ²)				
EasySun Plus							1-H-1234S-A:9.2,19600-C:16.4,1174-				2.39				
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}							Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}								
Collector efficiency (η_{col})							Zero-loss efficiency (η_0)				0.74			--	
Remark: Collector efficiency (η_{col}) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A _{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.							First-order coefficient (a ₁)				3.58			W/(m ² K)	
							Second-order coefficient (a ₂)				0.013			W/(m ² K ²)	
							Incidence angle modifier IAM (50°)				0.92			--	
							Remark: The data given in this section are related to collector reference area (A _{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.								
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