


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		011-7S2426 F							
						Date issued		2017-06-14							
						Issued by		DIN CERTCO							
Licence holder		Cipag SA				Country		Schweiz							
Brand (optional)						Web		www.cipag.ch							
Street, Number		Route de la ZI du Verney 4				E-mail		info@cipag.ch							
Postcode, City		1070		Puidoux		Tel		+41 21 926 66 66							
Collector Type						Flat plate collector, glazed									
Collector name						Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² $\vartheta_m - \vartheta_a$									
						Gross area (A_G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	100 K
						m ²	mm	mm	mm	W	W	W	W	W	W
CIPAG SOLAR FH2.5						2.57	1 238	2 078	100	1 745	1 663	1 471	1 242	977	509
CIPAG SOLAR FV2.5						2.57	2 077	1 237	98	1 745	1 663	1 471	1 242	977	509
Power output per m² gross area						679	647	572	483	380	198				
Performance parameters test method						Steady state - indoor									
Performance parameters (related to AG)						$\eta_{0,hem}$	a1	a2							
Units						-	W/(m ² K)	W/(m ² K ²)							
Test results						0.679	3.011	0.018							
Incidence angle modifier test method						Steady state - indoor									
Bi-directional incidence angle modifiers						No									
Incidence angle modifier						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal						$K_{\theta T, coll}$	-	-	-	-	0.96	-	-	-	0.00
Longitudinal						$K_{\theta L, coll}$	-	-	-	-	0.96	-	-	-	0.00
Heat transfer medium for testing						Water									
Flow rate for testing (per gross area, A_G)						dm/dt		0.018		kg/(sm²)					
Maximum temperature difference for thermal performance calculations						$(\vartheta_m - \vartheta_a)_{max}$		100		K					
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30^\circ\text{C}$)						ϑ_{stg}		198		°C					
Effective thermal capacity, incl. fluid (per gross area, A_G)						C/m²		4.788		kJ/(Km²)					
Maximum operating temperature						$\vartheta_{max, op}$		n.a.		°C					
Maximum operating pressure						$p_{max, op}$		1000		kPa					
Testing laboratory						TZS, ITW University Stuttgart				www.itw.uni-stuttgart.de					
Test report(s)						2.04.00830.1.0-LT(5), Q(5) issued by AIT 2.04.00692.1.0-2-LT(6) issued by AIT				Dated		22.09.2014 22.09.2014			
Comments of testing laboratory						Datashet version: 5.01, 2016-03-01									
This data sheet replaces the data sheet issued from AIT on 22.09.2014 Documented performance parameters are taken from 2.04.00830.1.0-LT(5)						 TZS Forschungs- und Testzentrum für Solaranlagen <small>Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwalderg. 6, 70550 Stuttgart (Vaihingen)</small>									
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															

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2426 F
	Issued	2017-06-14

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results

Standard Locations Collector name	ϑ_m	Athens			Davos			Stockholm			Würzburg		
		25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
CIPAG SOLAR FH2.5		2 656	1 869	1 163	2 030	1 371	809	1 481	952	549	1 608	1 023	577
CIPAG SOLAR FV2.5		2 656	1 869	1 163	2 030	1 371	809	1 481	952	549	1 608	1 023	577
Annual output per m ² gross area		1 033	727	453	790	533	315	576	370	213	626	398	225
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

Additional Information

Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	C	--
Maximum tested positive load	1000	Pa
Maximum tested negative load	1000	Pa
Hail resistance using steel ball (maximum drop height)	n.a.	m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
CIPAG SOLAR FH2.5	2.57	Collector efficiency (η_{col})	53 %
CIPAG SOLAR FV2.5	2.57	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 9806:2013.	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.679 --
		First-order coefficient (a_1)	3.01 W/(m ² K)
		Second-order coefficient (a_2)	0.018 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.96 --
		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.	