




Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2527 R																	
					Date issued		2017-07-17																	
					Issued by		DIN CERTCO																	
Licence holder		Photonomi Nominees IP Ltd			Country		United Kingdom																	
Brand (optional)		HONE			Web		www.photonomi.com																	
Street, Number		13-14 Esplanade, Jerse			E-mail		john@photonomi.com																	
Postcode, City		JE1 1EE, St Helier			Tel		44 2034115312																	
Collector Type					Evacuated tubular collector																			
Collector name					Gross area (A_G)		Gross length		Gross width		Gross height		Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² ∅_m - ∅_a											
					m ²		mm		mm		mm		mm		0 K		10 K		30 K		50 K		70 K	
HONE501:4					1.68		1 608		1 045		136		660		639		598		556		514		381	
Power output per m² gross area					393		381		356		331		306		227									
Performance parameters test method					Steady state - outdoor																			
Performance parameters (related to AG)					η ₀ ,hem		a1		a2															
Units					-		W/(m ² K)		W/(m ² K ²)															
Test results					0.393		1.240		0.000															
Incidence angle modifier test method					Quasi dynamic - outdoor																			
Bi-directional incidence angle modifiers					Yes																			
Incidence angle modifier					Angle		10°		20°		30°		40°		50°		60°		70°		80°		90°	
Transversal					K _{θT, coll}		1.01		1.06		1.16		1.31		1.61		1.76		1.69		1.45		0.00	
Longitudinal					K _{θL, coll}		1.00		0.99		0.98		0.96		0.93		0.87		0.76		0.00		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 for thermal performance calculations					(∅ _m -∅ _a) _{max}		134		K															
Standard stagnation temperature (G = 1000 W/m²; ∅_a = 30 °C)					∅ _{stg}		254.4		°C															
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²		14.78		kJ/(Km ²)															
Maximum operating temperature					∅ _{max, op}		120		°C															
Maximum operating pressure					P _{max, op}		1000		kPa															
Testing laboratory					TÜV Rheinland (Shanghai) Co., Ltd.																			
Test report(s)					154105842a_EN_HONE501_Report_Han																			
					Dated		2015-07-06																	
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01																			
																								
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2527 R
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Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results

Collector name	Standard Locations 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
HONE501:4		1 328	1 126	948	1 084	909	761	804	655	533	866	705	573
Annual output per m ² gross area		791	670	564	645	541	453	479	390	317	516	420	341
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	Yes	
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	2400	Pa
Maximum tested negative load	1800	Pa
Hail resistance using steel ball (maximum drop height)	1	m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
HONE501:4	1.68	Collector efficiency (η_{col})	34 %
		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)	0.393 --
		First-order coefficient (a_1)	1.24 W/(m ² K)
		Second-order coefficient (a_2)	0.000 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1.26 --
		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.	