


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2710 F																	
					Date issued		2016-12-12																	
					Issued by		DIN CERTCO																	
Licence holder		Honeywell Technologies Sarl			Country		Schweiz																	
Brand (optional)					Web		www.honeywell.com																	
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Postcode, City		1180 Rolle			Tel		+42 (0)545501744																	
Collector Type					Flat plate collector, glazed																			
Collector name					Gross area (A_G)		Gross length		Gross width		Gross height		Power output per collector $G_b = 850 \text{ W/m}^2$; $G_d = 150 \text{ W/m}^2$; $u = 3 \text{ m/s}$ $\vartheta_m - \vartheta_a$											
					m ²		mm		mm		mm		0 K		10 K		30 K		50 K		70 K		112 K	
SWH-CBS					1.98		1 740		1 140		75		1 380		1 304		1 136		947		738		231	
Power output per m ² gross area					697		659		574		478		373		117									
Performance parameters test method					Quasi dynamic																			
Performance parameters (related to AG)					$\eta_{0,b}$		c1		c2		c3		c4		c6		Kd							
Units					-		W/(m ² K)		W/(m ² K ²)		J/(m ³ K)		-		s/m		-							
Test results					0.703		3.726		0.013		0.000		0.000		0.000		0.944							
Incidence angle modifier test method					Quasi dynamic - outdoor																			
Bi-directional incidence angle modifiers					No																			
Incidence angle modifier					Angle		10°		20°		30°		40°		50°		60°		70°		80°		90°	
Transversal					$K_{\theta T, coll}$		1.00		0.99		0.98		0.95		0.92		0.85		0.71		0.29		0.00	
Longitudinal					$K_{\theta L, coll}$		1.00		0.99		0.98		0.95		0.92		0.85		0.71		0.29		0.00	
Heat transfer medium for testing					Water																			
Flow rate for testing (per gross area, A_G)					dm/dt		0.020		kg/(sm ²)															
Maximum temperature difference for thermal performance calculations					$(\vartheta_m - \vartheta_a)_{max}$		112		K															
Standard stagnation temperature ($G = 1000 \text{ W/m}^2$; $\vartheta_a = 30 \text{ °C}$)					ϑ_{stg}		179		°C															
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²		9.598		kJ/(Km ²)															
Maximum operating temperature					$\vartheta_{max, op}$		200		°C															
Maximum operating pressure					$p_{max, op}$		1000		kPa															
Testing laboratory					TZS, ITW University Stuttgart							www.itw.uni-stuttgart.de												
Test report(s)					14COL1220/10EM02 14COL1221Q/10EM02							Dated		20.10.2016 20.10.2016										
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01																			
This data sheet replaces the data sheet issued on 20.10.2016 Effective thermal capacity was corrected from 9598 kJ/Km ² to 9.598 kJ/Km ²					 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)																			
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2710 F
	Issued	2016-12-12

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
SWH-CBS		2 193	1 493	911	1 622	1 062	612	1 202	745	416	1 314	806	443
Annual output per m ² gross area		1 108	754	460	819	536	309	607	376	210	664	407	224
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)	B
Maximum tested positive load	3000 Pa
Maximum tested negative load	3000 Pa
Hail resistance using steel ball (maximum drop height)	1.8 m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
SWH-CBS	1.98	Collector efficiency (η_{col})	53 %
		<i>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/m², 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.</i>	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.697
		First-order coefficient (a_1)	3.73 W/(m ² K)
		Second-order coefficient (a_2)	0.013 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.92
		<i>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.</i>	