


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2448 F							
					Date issued		2017-07-12							
					Issued by		DIN CERTCO							
Licence holder		Solahart Industries Pty Ltd.			Country		Australia							
Brand (optional)					Web		www.rheem.com.au							
Street, Number		55 Brodie Street			E-mail		Reena.Subramaniam@rheem.com.au							
Postcode, City		2116, Rydalmere			Tel		+61 296 849 100							
Collector Type					Flat plate collector, glazed									
Collector name					Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ; u = 3 m/s ϑ _m - ϑ _a									
					0 K	10 K	30 K	50 K	70 K	107 K				
					W	W	W	W	W	W				
SPA2000 Collector					2.08	1 996	1 043	82	1 526	1 397	1 102	757	362	0
Power output per m² gross area					734	672	530	364	174	0				
Performance parameters test method					Quasi dynamic									
Performance parameters (related to AG)					η _{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					0.745	5.892	0.030	0.000	0.000	0.000	0.899			
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 _{θT, coll}	1.00	0.98	0.95	0.91	0.83	0.70	0.43	0.00	0.00
Longitudinal					K _{θL, coll}	1.00	0.98	0.95	0.91	0.83	0.70	0.43	0.00	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					(ϑ _m -ϑ _a) _{max}	107	K							
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)					ϑ _{stg}	136	°C							
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²	20.23	kJ/(Km ²)							
Maximum operating temperature					ϑ _{max, op}	100	°C							
Maximum operating pressure					p _{max, op}	200	kPa							
Testing laboratory					TZS, ITW University Stuttgart				www.itw.uni-stuttgart.de					
Test report(s) 14COL1226/1 14COL1226Q/1					Dated		12.07.2017							
							12.07.2017							
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01									
<p>This data sheet replaces the data sheet issued on 10.11.2014 Document performance parameters are taken from 14COL1226/1 The company address was updated</p>					 <p>Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Plattenwaldring 6, 70560 Stuttgart (Vaihingen)</p>									
<p>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</p>														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2448 F
	Issued	2017-07-12

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
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
SPA2000 Collector		2 249	1 193	466	1 479	710	219	1 130	525	168	1 247	564	185
Annual output per m ² gross area		1 081	573	224	711	342	105	543	252	81	600	271	89
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)	A	--
Maximum tested positive load	3000	Pa
Maximum tested negative load	3000	Pa
Hail resistance using steel ball (maximum drop height)	0.8	m

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
SPA2000 Collector	2.08	Collector efficiency (η_{col})	45 %
		<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)	0.734 --
		First-order coefficient (a_1)	5.89 W/(m ² K)
		Second-order coefficient (a_2)	0.030 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.83 --
		<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>	