



Annex to Solar Keymark Certificate					Licence Number		011-7S2264 R				
					Date issued		2024-01-23				
					Issued by		DIN CERTCO				
Licence holder		HAINING JU YANG NEW ENERGY CO., LTD			Country	China					
Brand (optional)		ONOSI			Web	http://www.onosisolar.com					
Street, Number		Puqiao Industry, No.58 Beitang road, Puqiao Village, Yuanhua Town			E-mail	onosi@onosisolar.com					
Postcode, City		314416, Haining City, Zhejiang Province			Tel	+86 573-87718300					
Collector Type					Evacuated tubular 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	89 K	
					W	W	W	W	W	W	
ONS-HPC-10					708	685	632	572	503	430	
ONS-HPC-12					841	813	751	679	598	510	
ONS-HPC-15					1 040	1 006	928	839	739	631	
ONS-HPC-16					1 107	1 070	988	893	787	671	
ONS-HPC-18					1 240	1 198	1 106	1 000	881	752	
ONS-HPC-20					1 368	1 323	1 221	1 104	972	830	
ONS-HPC-22					1 501	1 451	1 339	1 211	1 067	911	
ONS-HPC-24					1 634	1 579	1 458	1 318	1 161	991	
ONS-HPC-25					1 700	1 644	1 517	1 372	1 208	1 031	
ONS-HPC-30					2 032	1 965	1 813	1 640	1 444	1 233	
Power output per m² gross area					443	428	395	357	315	269	
Performance parameters test method		Steady state - outdoor									
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 ² K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-
Test results		0.446	1.41	0.006	0.000	0.00	8 390	0.000	0.00	0.0E+00	0.95
Incidence angle modifier test method		Steady state - outdoor									
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal		K _{gT, coll}	1.00	1.00	1.01	1.03	1.09	1.14	0.97	0.55	0.00
Longitudinal		K _{gL, coll}	1.00	1.00	0.99	0.97	0.94	0.87	0.73	0.37	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 during thermal performance test					($\vartheta_m - \vartheta_a$) _{max}	59.45	K				
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)					ϑ_{stg}	240	°C				
Maximum operating temperature					$\vartheta_{max, op}$	99	°C				
Maximum operating pressure					p _{max, op}	600	kPa				
Testing laboratory		TÜV Rheinland (Guangdong) Ltd.			http://www.tuv.com						
Test report(s)		CN23K94O 001 CN238W2I 001			Dated	2024-01-19 2024-01-19					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)						
<i>Above performance parameters come from type ONS-HPC-10.</i>					 TÜVRheinland® Precisely Right. 						
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		2024-01-23										
Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m														
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	
ONS-HPC-10		1 203	964	732	970	755	558	708	531	379	766	574	405	
ONS-HPC-12		1 429	1 144	869	1 152	897	662	841	630	450	910	682	481	
ONS-HPC-15		1 767	1 415	1 075	1 425	1 109	819	1 040	779	556	1 125	843	594	
ONS-HPC-16		1 880	1 506	1 143	1 516	1 180	871	1 107	829	592	1 197	897	632	
ONS-HPC-18		2 106	1 686	1 281	1 698	1 322	976	1 240	929	663	1 340	1 005	708	
ONS-HPC-20		2 324	1 861	1 413	1 874	1 458	1 077	1 368	1 025	731	1 479	1 109	782	
ONS-HPC-22		2 550	2 041	1 550	2 056	1 600	1 181	1 501	1 124	802	1 623	1 217	858	
ONS-HPC-24		2 775	2 222	1 688	2 237	1 742	1 286	1 634	1 224	873	1 767	1 324	933	
ONS-HPC-25		2 888	2 312	1 756	2 328	1 812	1 338	1 700	1 273	909	1 838	1 378	971	
ONS-HPC-30		3 452	2 764	2 099	2 783	2 166	1 599	2 032	1 522	1 086	2 197	1 647	1 161	
Gross Thermal Yield per m ² gross area		752	602	457	606	472	348	443	332	237	479	359	253	
Annual efficiency, η_a		43%	34%	26%	37%	29%	21%	38%	28%	20%	38%	29%	20%	
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. 6.2 (13.01.2022). 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											2000		Pa	
Maximum tested negative load											2000		Pa	
Hail resistance using steel ball (maximum drop height)											0.6		m	
Additional collector attribute(s)														
Using external power source(s) for normal operation											No		Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power											No		Façade collector(s)	No
Energy Labelling Information						Additional Informative Technical Data								
		Reference Area, A _{sol} (m ²)		Hydraulic Designation Code				Aperture Area, A _a (m ²)						
ONS-HPC-10		1.60		1-H-12S-C:19.5,895-D				0.94						
ONS-HPC-12		1.90		1-H-12S-C:19.5,1045-D				1.13						
ONS-HPC-15		2.35		1-H-12S-C:19.5,1270-D				1.41						
ONS-HPC-16		2.50		1-H-12S-C:19.5,1345-D				1.50						
ONS-HPC-18		2.80		1-H-12S-C:19.5,1495-D				1.69						
ONS-HPC-20		3.09		1-H-12S-C:19.5,1645-D				1.88						
ONS-HPC-22		3.39		1-H-12S-C:19.5,1795-D				2.07						
ONS-HPC-24		3.69		1-H-12S-C:19.5,1945-D				2.25						
ONS-HPC-25		3.84		1-H-12S-C:19.5,2020-D				2.35						
ONS-HPC-30		4.59		1-H-12S-C:19.5,2395-D				2.82						
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})		38%				Zero-loss efficiency (η_0)		0.44		--				
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)		1.41		Second-order coefficient (a ₂)		0.006		W/(m ² K)				
		Incidence angle modifier IAM (50°)		0.99						W/(m ² K ²)				
		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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