


Annex to Solar Keymark Certificate					Licence Number		011-7S3045 F							
					Date issued		2021-10-15							
					Issued by		DIN CERTCO							
Licence holder		Jiangsu Sunrain Solar Energy Co., Ltd			Country		P.R.China							
Brand (optional)		Sunrain			Web		http://www.sunrain.com							
Street, Number		Ninghai Industrial Zone			E-mail		certification@sunrain.com							
Postcode, City		222000/Lianyungang City, Jiangsu Province			Tel		+86 518-85959690							
Collector Type					Flat plate collector									
Collector name					Gross area (A <sub>G</sub> ) m <sup>2</sup>	Gross length mm	Gross width mm	Gross height mm	Power output per collector					
									G <sub>b</sub> = 850 W/m <sup>2</sup> , G <sub>d</sub> = 150 W/m <sup>2</sup> & u = 1.3 m/s θ <sub>m</sub> - θ <sub>a</sub>					
									0 K	10 K	30 K	50 K	70 K	89 K
									W	W	W	W	W	W
FPC200P					2.00	2,000	1,000	80	1,468	1,374	1,168	936	678	414
FPC250P					2.50	2,000	1,250	80	1,835	1,718	1,460	1,170	848	518
FPC270P					2.68	2,000	1,340	80	1,967	1,841	1,565	1,254	909	555
FPC300P					3.00	2,000	1,500	80	2,202	2,061	1,752	1,404	1,018	621
Power output per m <sup>2</sup> gross area									734	687	584	468	339	207
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to A <sub>G</sub> )		η <sub>0</sub> , b	a <sub>1</sub>	a <sub>2</sub>	a <sub>3</sub>	a <sub>4</sub>	a <sub>5</sub>	a <sub>6</sub>	a <sub>7</sub>	a <sub>8</sub>	K <sub>d</sub>			
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>2</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-			
Test results		0.754	4.518	0.016	0.000	0.000	5.800	0.000	0.000	0.000	0.822			
Incidence angle modifier test method					Steady state - outdoor									
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>GT, coll</sub>	1.00	0.99	0.96	0.94	0.85	0.75	0.59	0.36	0.00			
Longitudinal		K <sub>GL, coll</sub>	1.00	0.99	0.96	0.94	0.85	0.75	0.59	0.36	0.00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A <sub>G</sub> )		dm/dt	0.020					kg/(sm <sup>2</sup> )						
Maximum temperature difference during thermal performance test		(θ <sub>m</sub> - θ <sub>a</sub> ) <sub>max</sub>	58.72					K						
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; θ <sub>a</sub> = 30 °C)		θ <sub>stg</sub>	160					°C						
Maximum operating temperature		θ <sub>max, op</sub>	120					°C						
Maximum operating pressure		p <sub>max, op</sub>	1200					kPa						
Testing laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou				http://www.intertek.com								
Test report(s)		200330115GZU-001				Dated		2020/10/27						
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26									
This revision version would replace old version date 2021-08023					 Stamp & signature									
DIN CERTCO ● Alboinstraße 56 ● D-12103 Berlin Tel: +49 30 7562-1131 ● Fax: +49 30 7562-1141 ● E-Mail: info@dincertco.de ● www.dincertco.de														

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Supplementary Information		011-7S3045 F																																																											
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<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>																																																													
Standard Locations		Athens		Davos		Stockholm		Würzburg																																																					
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C																																																
FPC200P		2,185	1,375	750	1,564	949	482	1,165	666	334	1,269	711	351																																																
FPC250P		2,732	1,719	938	1,955	1,187	603	1,456	833	418	1,586	889	439																																																
FPC270P		2,928	1,843	1,005	2,096	1,272	646	1,561	893	448	1,700	953	470																																																
FPC300P		3,278	2,063	1,125	2,347	1,424	724	1,748	999	502	1,903	1,067	526																																																
Annual output per m <sup>2</sup> gross area		1,093	688	375	782	475	241	583	333	167	634	356	175																																																
Annual efficiency, $\eta_a$		62%	39%	21%	48%	29%	15%	50%	29%	14%	51%	29%	14%																																																
Fixed or tracking collector																																																													
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>																																																		
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 $\vartheta_m$ (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.1 (September 2019). A detailed description of the calculations is available at <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>																																																													
<b>Additional Information</b>																																																													
Collector heat transfer medium											Water																																																		
The collector is deemed to be suitable for roof integration											Yes																																																		
The collector was tested successfully under the following conditions:																																																													
Climate class (A+, A, B or C)											B		--																																																
G (W/m <sup>2</sup> ) >		900		$\vartheta_a$ (°C) >		15		H <sub>x</sub> (MJ/m <sup>2</sup> ) >		540																																																			
Maximum tested positive load											5900		Pa																																																
Maximum tested negative load											3000		Pa																																																
Hail resistance using steel ball (maximum drop height)											2		m																																																
<b>Additional collector attribute(s)</b>																																																													
<input type="checkbox"/> Using external power source(s) for normal operation											<input type="checkbox"/> Active or passive measure(s) for self-protection																																																		
<input type="checkbox"/> Co-generating thermal and electrical power											<input type="checkbox"/> Façade collector(s)																																																		
<b>Energy Labelling Information</b>						<b>Additional Informative Technical Data</b>																																																							
		Reference Area, A <sub>sol</sub> (m <sup>2</sup> )		Hydraulic Designation Code				Aperture Area, A <sub>a</sub> (m <sup>2</sup> )																																																					
FPC200P		2.00		8-VH-1234S-A:9,1885-C22,1060-D				1.85																																																					
FPC250P		2.50		8-VH-1234S-A:9,1885-C22,1310-D				2.34																																																					
FPC270P		2.68		8-VH-1234S-A:9,1885-C22,1400-D				2.52																																																					
FPC300P		3.00		8-VH-1234S-A:9,1885-C22,1560-D				2.83																																																					
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