

Holder/Issued to/Manufacturer

Benefits Ascend International Limited

Rm 1304, 729 PuJian Road, PuDong, 200127, Shanghai, China

Product name and description

Flat plate solar thermal collectors for water heating.
For technical information see Appendix (2 pages).

Models: FPB-ZT-2.0 FPB-ZT-2.5

Performance specification

The product is found to comply with the requirements in EN 12975-1:2006+A1:2010 Solar collectors, Part 1: General requirements and the Specific CEN Keymark Scheme Rules for Solar Thermal Products, and are based on test results according to EN ISO 9806:2013 Solar thermal collectors – Test methods.

Marking

Products conforming to this certificate shall be marked in accordance with the requirements in the Specific CEN Keymark Scheme Rules for Solar Thermal Products. The marking shall, together with the Keymark logo, show the identification code of the empowered certification body (RISE Research Institutes of Sweden AB, No. 012), also see CEN-CENELEC Internal Regulations Part 4 Certification, Annex A.

Validity

This certificate is valid until 2021-09-21 provided that the conditions in the Solar Keymark Rules are fulfilled and the standard or rules are not modified significantly. The validity of the certificate can be checked in the database, see Solar Keymark website <http://www.solarkeymark.org>.

Miscellaneous

The manufacturer's factory production control procedures are under surveillance by the responsibility of RISE. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Martin Tillander


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RISE Research Institutes of Sweden AB | Certification
Box 857, SE-501 15 Borås, Sweden
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2017-08-08



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Annex to Solar Keymark Certificate					Licence Number		C900233							
					Date issued		2020-10-29							
					Issued by		RISE							
Licence holder		Benefits Ascend International Limited			Country		China							
Brand (optional)		BENEFITS ASCEND			Web		-							
Street, Number		Rm 1304, 729 Pujian Road, PuDong			E-mail		adwardwu@vip.163.com							
Postcode, City		200127, Shanghai			Tel		+86 21 55219296							
Collector Type					Flat plate 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	84 K				
					m ²	mm	mm	mm	mm	mm				
FPB-ZT-2.0					2,00	2 000	1 000	80	1 318	1 251	1 068	821	510	263
FPB-ZT-2.5					2,50	2 000	1 250	80	1 648	1 564	1 335	1 026	637	328
Power output per m ² gross area					659	625	534	410	255	131				
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 ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0,671	2,976	0,040	0,000	0,00	5 500	0,000	0,00	0,00	0,88			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K _{ET, coll}	1,00	1,00	0,99	0,96	0,92	0,84	0,69	0,44	0,00			
Longitudinal		K _{EL, coll}	1,00	1,00	0,99	0,96	0,92	0,84	0,69	0,44	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}	53,55	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)					ϑ_{stg}	170	°C							
Maximum operating temperature					$\vartheta_{max, op}$	120	°C							
Maximum operating pressure					p _{max, op}	1000	kPa							
Testing laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch					http://www.intertek.com							
Test report(s)		200827020GZU-001					Dated		2020-10-13					
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26									
Above efficiency parameters come from test type FPB-ZT-2.0.														
<p>RISE Research Institutes of Sweden AB Certification Box 857, SE-501 15 Borås, Sweden, Phone: +46 10-516 50 00, certifierring@ri.se www.ri.se</p>														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	C900233
	Issued	2020-10-29

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
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
FPB-ZT-2.0		2 066	1 364	683	1 531	904	376	1 139	652	277	1 241	703	297
FPB-ZT-2.5		2 583	1 705	854	1 914	1 130	470	1 424	815	347	1 551	878	371
Annual output per m ² gross area		1 033	682	342	765	452	188	570	326	139	620	351	148
Annual efficiency, η_a		59%	39%	19%	47%	28%	12%	49%	28%	12%	50%	28%	12%
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. 6.1 (September 2019). 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
Maximum tested positive load				2400	Pa
Maximum tested negative load				2400	Pa
Hail resistance using steel ball (maximum drop height)				2,0	m

Additional collector attribute(s)			
<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)

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
FPB-ZT-2.0	2,00	9-VH-1234S-A:8,1887-C:22,1056-D	1,81
FPB-ZT-2.5	2,50	11-VH-1234S-A:8,1887-C:22,1306-D	2,31

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})	48%	Zero-loss efficiency (η_0)	0,66
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)	2,98
		Second-order coefficient (a_2)	0,040
		Incidence angle modifier IAM (50°)	0,92
		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.	