


Annex to Solar Keymark Certificate					Licence Number		011-7S3016 F							
					Date issued		2021-05-12							
					Issued by		DIN CERTCO							
Licence holder		POWERTECH MANUFACTURER S.L.			Country		Spain							
Brand (optional)		GreenCom by Powertech			Web		www.greencombypt.com							
Street, Number		Avda. Primo de Rivera, 5-2°			E-mail		sales@powertechmanufacturer.com							
Postcode, City		15006-A Coruna			Tel		+34 910 053 885							
Collector Type					WISC (Wind and/or infrared sensitive collector)									
Collector name					Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector					
									G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
					m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	57 K
ROD001					1.36	1 700	800	20	1 021	759	235	0	--	0
ROD002					1.31	1 700	770	20	983	731	226	0	--	0
Power output per m² gross area									750	558	173	0	--	0
Performance parameters test method					Quasi dynamic									
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					0.796	24.76	0.000	3.234	1.00	7 980	0.032	0.00	0.0	1.00
Incidence angle modifier test method					Quasi dynamic - outdoor									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{θT, coll}	1.00	1.00	1.00	1.00	1.00	0.98	0.93	0.47	0.00
Longitudinal					K _{θL, coll}	1.00	1.00	1.00	1.00	1.00	0.98	0.93	0.47	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}	27								K
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)					ϑ_{stg}	71								°C
Maximum operating temperature					$\vartheta_{max, op}$	70								°C
Maximum operating pressure					p _{max, op}	1000								kPa
Testing laboratory					Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)				http://www.igte.uni-stuttgart.de					
Test report(s)					19COL1483OEM01 17COL1391Q/1OEM01 17COL1391OEM01				Dated		05.05.2021 05.05.2021 05.05.2021			
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26									
<i>Documented performance parameters are taken from 19COL1483OEM01(ROD002)</i>														
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S3016 F
	Issued	2021-05-12

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	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
ROD001		1 256	106		474	14		450	27		532	43	
ROD002		1 209	102		456	13		433	26		513	42	
Annual output per m ² gross area		923	78	--	348	10	--	331	20	--	391	32	--
Annual efficiency, η_a		52%	4%	--	21%	1%	--	28%	2%	--	31%	3%	--
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	H_x (MJ/m ²) >	540	
Maximum tested positive load					2400	Pa
Maximum tested negative load					2400	Pa
Hail resistance using steel ball (maximum drop height)					2	m

- Additional collector attribute(s)**
- Using external power source(s) for normal operation
 - Active or passive measure(s) for self-protection
 - Co-generating thermal and electrical power
 - 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)
ROD001	1.36	X-HV-14S-AC:X	1.36
ROD002	1.31	X-HV-14S-AC:X	1.31

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})	-2%	Zero-loss efficiency (η_0)	0.75	
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)	19.26	
		Second-order coefficient (a_2)	0.000	
		Incidence angle modifier IAM (50°)	1.00	--
		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.		