



Annex to Solar Keymark Certificate	Licence Number	OEM 10115.1.2
	Date issued	2023-04-20
	Issued by	DQS Hellas

Licence holder	FERROLI S.p.A.	Country	Italy
Brand (optional)	SOLEXTECH	Web	www.ferroli.com
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Collector Type	Flat plate collector
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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 $\vartheta_m - \vartheta_a$					
					0 K	10 K	30 K	50 K	70 K	88 K
					W	W	W	W	W	W
SOLEXTECH 2.1 V	2,09	1.696	1.230	86	1.640	1.559	1.375	1.165	928	694
SOLEXTECH 2.6 V	2,60	2.111	1.230	86	2.041	1.939	1.711	1.449	1.154	864
SOLEXTECH 2.6 H	2,60	1.230	2.111	86	2.041	1.939	1.711	1.449	1.154	864
SOLEXTECH 3 V	3,00	1.996	1.500	86	2.355	2.237	1.974	1.672	1.332	997
SOLEXTECH 3 H	3,00	1.500	1.996	86	2.355	2.237	1.974	1.672	1.332	997

Power output per m <sup>2</sup> gross area	785	746	658	557	444	332
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Performance parameters test method	Steady state - outdoor									
Performance parameters (related to A <sub>G</sub> )	$\eta_0, b$	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</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	0,795	3,75	0,016	0,000	0,00	0	0,000	0,00	0,0E+00	0,92

Incidence angle modifier test method	Steady state - outdoor									
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T, coll}$	1,00	1,00	1,00	0,98	0,96	0,89	0,76	0,51	0,00
Longitudinal	$K_{\theta L, coll}$	1,00	1,00	1,00	0,98	0,96	0,89	0,76	0,51	0,00

Heat transfer medium for testing	Water									
Flow rate for testing (per gross area, A <sub>G</sub> )	dm/dt	0,022	kg/(sm <sup>2</sup> )							
Maximum temperature difference during thermal performance test	$(\vartheta_m - \vartheta_a)_{max}$	57,8	K							
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\vartheta_a = 30$ °C)	$\vartheta_{stg}$	175,7	°C							
Maximum operating temperature	$\vartheta_{max, op}$		°C							
Maximum operating pressure	$p_{max, op}$	1000	kPa							

Testing laboratory	NCSR Demokritos / Solar & other Energy System	www.solar.demokritos.gr								
Test report(s)	4295 DQ1 4301 DE1 4302 DE1	Dated	4/12/2020 4/12/2020 4/12/2020							

Comments of testing laboratory	Datasheet version: 6.1, 2019-09-26									



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Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
SOLEXTECH 2.1 V		2.637	1.867	1.190	1.999	1.361	826	1.472	948	555	1.602	1.026	591
SOLEXTECH 2.6 V		3.281	2.323	1.480	2.487	1.693	1.027	1.832	1.180	690	1.993	1.277	736
SOLEXTECH 2.6 H		3.281	2.323	1.480	2.487	1.693	1.027	1.832	1.180	690	1.993	1.277	736
SOLEXTECH 3 V		3.785	2.680	1.708	2.870	1.953	1.185	2.113	1.361	797	2.300	1.473	849
SOLEXTECH 3 H		3.785	2.680	1.708	2.870	1.953	1.185	2.113	1.361	797	2.300	1.473	849
Annual output per m <sup>2</sup> gross area		1.262	893	569	957	651	395	704	454	266	767	491	283
Annual efficiency, $\eta_a$		71%	51%	32%	59%	40%	24%	60%	39%	23%	62%	39%	23%
Fixed or tracking collector	Fixed (slope = latitude - 15°; rounded to nearest 5°)												
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 <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)	A		--
<input type="checkbox"/> G (W/m <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >	20
<input type="checkbox"/> H <sub>x</sub> (MJ/m <sup>2</sup> ) >	600		
<input type="checkbox"/> Maximum tested positive load	3000		Pa
<input type="checkbox"/> Maximum tested negative load	3000		Pa
<input type="checkbox"/> Hail resistance using steel ball (maximum drop height)	1,6		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 <sub>sol</sub> (m <sup>2</sup> )	Hydraulic Designation Code	Aperture Area, A <sub>a</sub> (m <sup>2</sup> )
SOLEXTECH 2.1 V	2,09	14-VH-1234S-A:7.2,1600-C:20.6,1295-	1,96
SOLEXTECH 2.6 V	2,60	14-VH-1234S-A:7.2,2009-C:20.6,1295-	2,44
SOLEXTECH 2.6 H	2,60	18-H-1234S-A:7.2,1131-C:20.6,2170-	2,44
SOLEXTECH 3 V	3,00	17-VH-1234S-A:7.2,1900-C:20.6,1563-	2,84
SOLEXTECH 3 H	3,00	18-H-1234S-A:7.2,1400-C:20.6,2060-	2,84

Data required for CDR (EU) No 811/2013 - Reference Area A <sub>sol</sub>		Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>	
Collector efficiency ( $\eta_{col}$ )	61%	Zero-loss efficiency ( $\eta_0$ )	0,78
Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.		First-order coefficient (a <sub>1</sub> )	3,75
		Second-order coefficient (a <sub>2</sub> )	0,016
		Incidence angle modifier IAM (50°)	0,96
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Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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.			