

**Holder/Issued to/Manufacturer**

## Solardirekt24 GmbH

Spiesheimerweg 22, 55286 Wörrstadt, Deutschland

**Product name and description**

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

Models: EUROTHERM SOLAR CPC 16R  
EUROTHERM SOLAR CPC 20R  
EUROTHERM SOLAR CPC 24R

**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 12975-2:2006 Solar collectors Part 2: 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 2024-01-20 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. This certificate was first issued 2014-06-16. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Lennart Aronsson

Martin Tillander

Certificate No. SC0501-14 | issue 2 | 2019-06-27

RISE Research Institutes of Sweden AB | Certification  
Box 857, SE-501 15 Borås, Sweden  
Phone: +46 10-516 50 00  
[certifiering@ri.se](mailto:certifiering@ri.se) | [www.ri.se](http://www.ri.se)

2017-08-08



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<b>Annex to Solar Keymark Certificate Supplementary Information</b>	<b>Licence Number</b>	<b>SC0501-14</b>
	<b>Issued</b>	<b>2019-06-27</b>

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$													
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
EUROTHERM SOLAR CPC 16R		3 217	2 770	2 325	2 708	2 288	1 894	1 952	1 603	1 289	2 106	1 731	1 388
EUROTHERM SOLAR CPC 20R		4 009	3 453	2 898	3 375	2 852	2 361	2 433	1 998	1 606	2 625	2 158	1 729
EUROTHERM SOLAR CPC 24R		4 800	4 134	3 470	4 040	3 415	2 827	2 913	2 392	1 923	3 142	2 583	2 070
Annual output per m <sup>2</sup> gross area		938	808	678	789	667	552	569	467	376	614	505	405
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1714 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. 6.0 (October 2018). A detailed description of the calculations is available at [www.solarkeymark.org/scenocalc](http://www.solarkeymark.org/scenocalc)

### Additional Information

Collector heat transfer medium	Water
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)	C
G (W/m <sup>2</sup> ) >	800
$\vartheta_a$ (°C) >	10
$H_x$ (MJ/m <sup>2</sup> ) >	420
Maximum tested positive load	2860 Pa
Maximum tested negative load	-
Hail resistance using steel ball (maximum drop height)	0,8 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"/> Wind and/or infrared sensitive collector(s) (WISC)
<input type="checkbox"/> Façade collector(s)	

### Energy Labelling Information

	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Hydraulic Designation Code
EUROTHERM SOLAR CPC 16R	3,43	1-H-12S-C:19.3,1865-D
EUROTHERM SOLAR CPC 20R	4,28	1-H-12S-C:19.3,2305-D
EUROTHERM SOLAR CPC 24R	5,12	1-H-12S-C:19.3,2745-D

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 ( $\eta_{col}$ )	48%		
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 ( $A_{sol}$ ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.	Zero-loss efficiency ( $\eta_0$ )	0,54	--
	First-order coefficient ( $a_1$ )	1,21	W/(m <sup>2</sup> K)
	Second-order coefficient ( $a_2$ )	0,004	W/(m <sup>2</sup> K <sup>2</sup> )
	Incidence angle modifier IAM (50°)	1,01	--
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.			