TÜVRheinland®
DIN CERTCO
Genau. Richtig.

CERTIFICATE

Certificate holder	**Daikin Europe N.V.** **Zandvoordestraat 300** **8400 Oostende** **BELGIUM**
Production facility	Oostende
Product	Solar collectors
Type, Model	EKS V21P, EKS V26P, EKS H26P
Testing basis	DIN EN 12975-1:2011-01 DIN EN ISO 9806:2018-04 SOLAR KEYMARK Scheme Rules SKN N0444R7 (2024-01)
Mark of conformity	
Registration No.	011-7S1016 F
Valid until	2029-11-30
Right of use	This certificate entitles the holder to use the mark of conformity shown above in conjunction with the specified registration number. See annex for further information.

2024-10-11

Dipl.-Phys. Carlo Seiser
Head of Certification Body

DAkkS Deutsche Akkreditierungsstelle D-ZE-11125-01-01

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ANNEX

Certificate	011-7S1016 F dated 2024-10-11
Technical Data	See data sheet, part of the test report of 2019-11-27
Testing laboratory/ Inspection body	Institut für Solartechnik SPF Hochschule für Technik Oberseestrasse 10 8640 Rapperswil SG SWITZERLAND
Test report(s)	No. C1796ISO, No. C1797ISO, No. C1798ISO dated 2019-11-27

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Annex to Solar Keymark Certificate		Licence Number	011-7S1016 F
		Date issued	2019-12-20
		Issued by	DIN CERTCO

Licence holder	**Daikin Europe N.V.**	**Country**	Belgium
Brand (optional)	–	**Web**	www.daikin.eu
Street, Number	Zandvoordestraat 300	**E-mail**	–
Postcode, City	BE-8400 Oostende	**Tel**	+32 59 55 81 11

Collector Type	Flat plate collector

Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
					0 K	10 K	30 K	50 K	70 K	120 K
	m²	mm	mm	mm	**W**	W				
V21P	2.01	2'000	1'006	85	1'426	1'338	1'156	963	762	215
V26P	2.60	2'000	1'300	85	1'844	1'731	1'495	1'246	985	278
H26P	2.60	1'300	2'000	85	1'844	1'731	1'495	1'246	985	278
Power output per m² gross area					709	666	575	479	379	107

Performance parameters test method	Steady state - outdoor									
Performance parameters (related to A_G)	η0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	J/(m²K)	s/m	W/(m²K⁴)	W/(m²K⁴)	-
Test results	0.719	4.30	0.006	0.000	0.00	0	0.000	0.00	0.0E+00	0.91

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	0.99	0.99	0.98	0.95	0.89	0.69	0.37	0.00
Longitudinal	$K_{\theta L,coll}$	1.00	1.00	1.00	0.99	0.97	0.93	0.82	0.57	0.00

Heat transfer medium for testing	Water-Glycole		
Flow rate for testing (per gross area, A_G)	dm/dt	0.023	kg/(sm²)
Maximum temperature difference during thermal performance test	$(\vartheta_m-\vartheta_a)_{max}$	90	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	200	°C
Maximum operating temperature	ϑ_{max_op}	98	°C
Maximum operating pressure	$p_{max,op}$	600	kPa

Testing laboratory	SPF Testing, CH-8640 Rapperswil, Switzerland	www.spf.ch	
Test report(s)	C1796ISO	**Dated**	27.11.2019
	C1797ISO		27.11.2019
	C1798ISO		27.11.2019

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

SPF INSTITUT FÜR SOLARTECHNIK

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Annex to Solar Keymark Certificate	Licence Number	011-7S1016 F
Supplementary Information	Issued	2019-12-20

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
V21P		2'264	1'505	922	1'653	1'080	643	1'222	747	426	1'336	805	453
V26P		2'929	1'946	1'193	2'139	1'396	832	1'581	966	551	1'729	1'042	586
H26P		2'929	1'946	1'193	2'139	1'396	832	1'581	966	551	1'729	1'042	586
Annual output per m² gross area		1'127	749	459	823	537	320	608	372	212	665	401	225
Annual efficiency, η_a		64%	42%	26%	50%	33%	20%	52%	32%	18%	53%	32%	18%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m²			1630 kWh/m²			1166 kWh/m²			1244 kWh/m²		
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 ϑm (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				Yes	
The collector was tested successfully under the following conditions:					
Climate class (A+, A, B or C)				A	--
G (W/m²) >	1000	ϑ_a (°C) >	20	H_x (MJ/m²) >	600
Maximum tested positive load				2400	Pa
Maximum tested negative load				2400	Pa
Hail resistance using ice balls (diameter)				35	mm

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

	Reference Area, A_{sol} (m²)
V21P	2.01
V26P	2.60
H26P	2.60

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}

Collector efficiency (η_{col})	53%

Remark: Collector efficiency (ηcol) 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/m², expressed in % and rounded to the nearest integer. Deviating from the regulation ηcol is based on reference area (Asol) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.

Additional Informative Technical Data

	Hydraulic Designation Code	Aperature Area, A_a (m²)
V21P	9-V-1234S-A:7.2,1840-C:20.4,990-D	1.80
V26P	12-V-1234S-A:7.2,1840-C:20.4,1290-D	2.37
H26P	19-V-1234S-A:7.2,1140-C:20.4,1990-D	2.36

Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}

Zero-loss efficiency (η_0)	0.71	--
First-order coefficient (a_1)	4.30	W/(m²K)
Second-order coefficient (a_2)	0.006	W/(m²K²)
Incidence angle modifier IAM (50°)	0.96	--

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.

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