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IGTE

Annex to Solar Keymark Certificate		Licence Number	011-7S2564 F
		Date issued	2025-07-28
		Issued by	DINCERTCO

Licence holder	**Ernst Schweizer AG**	**Country**	Switzerland		
Brand (optional)	-	**Web**	http://www.ernstschweizer.com		
Street, Number	Bahnhofsplatz 11	**E-mail**	julian.perrenoud@ernstschweizer.com		
Postcode, City	CH-8909 Hedingen	**Tel**	41	44 763 66 95	

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	111 K
	m²	mm	mm	mm	W	W	W	W	W	W
FK2-XS H4	2.51	1'212	2'070	68	1'882	1'788	1'579	1'345	1'085	469
FK2-XS V4	2.51	2'070	1'212	68	1'882	1'788	1'579	1'345	1'085	469
Power output per m² gross area					750	712	629	536	432	187

Performance parameters test method	Quasi dynamic									
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	0.751	3.63	0.013	0.000	0.00	11'170	0.000	0.00	0.0	0.99

Incidence angle modifier test method		Quasi dynamic - 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	0.94	0.87	0.61	0.31	0.00
Longitudinal	$K_{\theta L,coll}$	1.00	0.99	0.99	0.98	0.94	0.87	0.61	0.31	0.00

Heat transfer medium for testing	Water		
Flow rate for testing (per gross area, A_G)	dm/dt	0.020	kg/(sm²)
Maximum temperature difference during thermal performance test	$(\vartheta_m-\vartheta_a)_{max}$	81	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	210	°C
Maximum operating temperature	$\vartheta_{max\ op}$	120	°C
Maximum operating pressure	$p_{max,op}$	600	kPa

Testing laboratory	Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)	http://www.igte.uni-stuttgart.de	
Test report(s)	25COL1776	**Dated**	28.07.2025
	25COL1777		28.07.2025
	25COL1777Q		28.07.2025

Comments of testing laboratory	Ver. 6.2 (13.01.2022)
Documented performance parameters are taken from 25COL1776 (FK2-XS H4)	TZS Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)

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Supplementary Information	Issued	2025-07-28

Gross Thermal Yield 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
FK2-XS H4		3'060	2'176	1'407	2'320	1'589	983	1'704	1'106	659	1'866	1'204	707
FK2-XS V4		3'060	2'176	1'407	2'320	1'589	983	1'704	1'106	659	1'866	1'204	707
Gross Thermal Yield per m² gross area		1'219	867	561	924	633	391	679	441	262	743	480	282
Annual efficiency, η_a		69%	49%	32%	57%	39%	24%	58%	38%	23%	60%	39%	23%
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. 6.2 (13.01.2022). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/

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)				A	--
G (W/m²) >	1000	ϑ_a (°C) >	20	H_X (MJ/m²) >	600
Maximum tested positive load				3000	Pa
Maximum tested negative load				2000	Pa
Hail resistance using steel ball (maximum drop height)				1.4	m

Additional collector attribute(s)

Using external power source(s) for normal operation	No	Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power	No	Façade collector(s)	No

Energy Labelling Information

	Reference Area, A_{sol} (m²)
FK2-XS H4	2.51
FK2-XS V4	2.51

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

Collector efficiency (η_{col})	58%

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	Aperture Area, A_a (m²)
FK2-XS H4	1-H-1234S-7.2,20768-16.4,2080	2.33
FK2-XS V4	1-V-1234S-7.2,21950-16.4,1222	2.33

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

Zero-loss efficiency (η_0)	0.75	--
First-order coefficient (a_1)	3.63	W/(m²K)
Second-order coefficient (a_2)	0.013	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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