TÜVRheinland®
DIN CERTCO
Precisely Right.

SPF INSTITUT FÜR SOLARTECHNIK

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2308 F
	Issued	2014-03-24

Company holding the	Fafco SAS		**Country**	Switzerland
Brand (optional)	–		**Website**	www.fafco.ch
Street, street number	5C rue du Point du Jour		**E-mail**	eo@fafco.ch
Postal Code / City, province	FR-21800	Chevigny-Saint-Sauveur	**Tel/Fax**	+33 3 80 44 90 60 / --

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Flat plate collector - un-glazed
Thermal / photo voltaic hybid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module G" = 1000 W/m²; Tm-Ta = 2 K Wind velocity 0 m/s	1.5 m/s	3 m/s
	m²	mm	mm	mm	m²	W	W	W
FAFCO Sonnenkollektor 3.0 m²	2.978	2'426	1'296	63	**3.144**	2'567	2'361	2'156

Performance test method	Unglazed liquid heating collector - steady state - outdoor				
Performance parameters related to aperture	η_{0a}	b_{1a}	b_{2a}	b_u	
Units	-	W/(m²K)	$Wsm^{-3}K^{-1}$	s/m	
Test results - *Flow rate and fluid see note 1*	0.887	12.58	3.49	0.044	

Bi-directional incidence angle	Yes	Kθ *values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θT)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
transversal direction	Kθ(θT)	0.99	0.98	0.97	0.96	0.94	0.88	0.69	0.38	0.00
Incidence angle modifiers Kθ(θL)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
longitudinal direction	Kθ(θL)	0.99	0.98	0.97	0.96	0.94	0.88	0.69	0.38	0.00

Stagnation temperature - *Weather conditions see note 2*	T_{stg}	84	°C
Effective thermal capacity	$c_{eff} = C/A_g$	23.96	kJ/(m²K)
Max. intende operation temperature - *see note 3*	$T_{max,op}$	90	°C
Max. operation pressure - *see note 3*	$p_{max,op}$	240	kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area

Flow rate	kg/(s m²)	0.005	0.010	0.015	0.020	0.025	0.030	0.034	0.039	0.044	0.049
Pressure drop, ΔP	Pa	63	134	213	299	393	495	604	721	846	978

Optional weather data	Location		Link	
Testing Laboratory	SPF, CH-8640 Rapperswil			
Website	www.solarenergy.ch			
Test report id. number	C1573LPEN, C1573QPEN	**Date of test reports**	07.02.2014	

During the test G_{DIF}/G_{TOT} was always between 0.12 and 0.18

Comments of testing laboratory:

The collector can be manufactured with a constant width and any length up to an area of 5.1m2. The collector with 3.0m2 was chosen as a representative size for the test. ε/α = 0.85

Note 1	**Flow rate**	0.020	kg/(s m²)	**Fluid**	Water-Glycole	Dr. Andreas Bohren
Note 2	**Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C**					
Note 3	**Given by manufacturer**					

Datasheet version: 4.06, 2014-01-15

DIN CERTCO ● Alboinstraße 56 ● 12103 Berlin, Germany
Tel: +49 30 7562-1131 ● Fax: +49 30 7562-1141 ● E-Mail: info@dincertco.de ● www.dincertco.de

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2308 F
	Issued	2014-03-24

Annual collector output kWh/module

Collector name	Location and collector temperature (Tm)											
	Athens			Davos			Stockholm			Würzburg		
	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
FAFCO Sonnenkollektor 3.0 m²	2'750	345	9	1'178	87	0	1'053	115	0	1'248	165	5

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations

Location	Latitude °	Gtot kWh/m²	Ta °C	Collector orientation or tracking mode
Athens	38	1'765	18.5	South, 25°
Davos	47	1'714	3.2	South, 30°
Stockholm	59	1'166	7.5	South, 45°
Würzburg	50	1'244	9.0	South, 35°

Gtot	Annual total irradiation on collector plane	kWh/m²
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (Tm). A detailed description of the calculations is available at http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx.