



Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence number	011-7S2011F
		Date of issue	10.09.2012
Company holding the licence	HMS Umwelttechnik GmbH	Country	Germany
Brand (optional)	-	Website	http://www.hms-umwelttechnik.de
Street, number	Weberstraße, 12	E-mail	info@hms-umwelttechnik.de
Postal Code	72622	Tel.	+49 07022 / 244529-0
City	Nürtingen	Fax	+49 07022 / 244529-99
Collector Type (flat plate / evacuate tubular / un-glazed)		Flat plate collector	
Integration in the roof possible ?		No	

Collector name	Aperture area (Aa) [m ²]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (Ag) [m ²]	Power output per collector unit				
						G = 1000 W/m ² Tm-Ta :				
						0 K	10 K	30 K	50 K	70 K
HMS-FK 2.25 AR Hochleistungs- Flachkollektor	2,01	1.933	1.163	110	2,25	1.676	1.602	1.435	1.245	1.032

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0,833	-
	a_{1a}	3,55	W/(m ² K)
	a_{2a}	0,0146	W/(m ² K ²)

Stagnation temperature - Weather conditions see note 2	t _{stg}	208	°C
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Effective thermal capacity	C _{eff} = C/A _a	5,5	kJ/(m ² K)
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Max. operation pressure - see note 3	p _{max}	1000	kPa
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Incidence angle modifiers K _θ (θ)	θ _T / θ _L		50°	10°	20°	30°	40°	60°	70°
		K _θ (θ _T)	0,93	1,00	0,99	0,98	0,96	0,87	0,75
		K _θ (θ _L)	0,93	1,00	0,99	0,98	0,96	0,87	0,75
Optional values									

Testing Laboratory	Institut für Solarenergieforschung Hameln
Website	www.isfh.de
Test report id. number	99-12/KD, 100-12/KQ
Date of test report	29.08.2012, 29.08.2012
Perf. test method	EN 12975-2 6.1.5 (indoor)

Comments of testing laboratory :

Note 1	Fluid	Water	Flow rate	0,04	kg/s per m ²	Institut für Solarenergieforschung GmbH Am Ohrberg 1 D-31860 Emmerthal Tel.: 0 51 51 / 999-100 Fax: 0 51 51 / 999-500
Note 2	Irradiance, G _s =1000 W/m ² ; Ambient temperature , Ta=30 °C					
Note 3	Given by manufacturer					

VERSION 3.6, 2012.01.20



Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	011-7S2011F
	Issued	10.09.2012

Annual collector output kWh															
Collector name	Location and collector temperature (T _m)														
	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			
HMS-FK 2.25 AR Hochleistungs Flachkollektor	2.652	1.939	1.340	2.191	1.544	989	1.500	1.008	629	1.627	1.088	667			

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

Overview of locations				
Location	Latitude °	G _{tot} kWh/m ²	T _a °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°

G _{tot}	Annual total irradiation on collector plane	kWh/m ²
T _a	Mean annual ambient air temperature	°C
T _m	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

Calculation of the annual collector performance is done by the official Solar Keymark spreadsheet tool. Hour by hour the collector output is calculated according to the efficiency parameters from the Keymark test using constant collector operating temperature (T_m). Detailed description with all equations used is available from the Solar Keymark web site (direct link: <http://www.estif.org/solarkeymark/annexb1.php>)

DIN CERTCO • Alboinstraße 56 • 12103 Berlin Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de .	Datasheet version: VERSION 3.6, 2012.01.20 Calculation program version: 3.07, October 2011 (SP)
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