

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	011-7S1785 F
	Date of issue	03.05.2012

Company holding the licence	COSMO GmbH	Country	Germany
Brand (optional)		Website	
Street, number	Brandstücken 31	E-mail	info@cosmo-info.de
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City	Hamburg	Fax	

Collector Type (flat plate / evacuate tubular / un-glazed)	Flat plate collector
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Integration in the roof possible ?	No
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Collector name	Aperture area (A _a) [m ²]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (A _G) [m ²]	Power output per collector unit				
						G = 1000 W/m ² T _m -T _a :				
						0 K	10 K	30 K	50 K	70 K
						[W]	[W]	[W]	[W]	[W]
COSMO 251RK	2,295	2.150	1.170	83	2,52	1.864	1.774	1.577	1.357	1.112
COSMO 251RKW	2,295	2.150	1.170	83	2,52	1.864	1.774	1.577	1.357	1.112

Collector efficiency parameters related to aperture area (A_a) Type of fluid and flow rate see note 1	η_{0a}	0,812	-
	a_{1a}	3,763	W/(m ² K)
	a_{2a}	0,0131	W/(m ² K ²)

Stagnation temperature - Weather conditions see note 2	t_{stg}	189	°C
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Effective thermal capacity	$C_{eff} = C/A_a$	4,47	kJ/(m ² K)
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Max. operation pressure - see note 3	p_{max}	10 bar	kPa
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Incidence angle modifiers $K_{\theta}(\theta)$	G_{DIF}/G_{TOT}		θ_T / θ_L	50°	10°	20°	30°	40°	60°	70°
	min	max	$K_{\theta}(\theta_T)$	0,96	1,00	1,00	1,00	0,99	0,90	0,78
	0,152	0,206	$K_{\theta}(\theta_L)$	0,96	1,00	1,00	1,00	0,99	0,90	0,78
G_{DIF}/G_{TOT} : min&max - while measuring					Optional values					

Testing Laboratory	Fraunhofer ISE, TestLab Solar Thermal Systems,
Website	www.kollektortest.de
Test report id. number	ktb-2012-01-a; ktb2012-02-a
Date of test report	03.05.2012
Perf. test method	EN 12975-2 6.1.5 (indoor)

Comments of testing laboratory :

Note 1	Fluid	Water	Flow rate	0,020 kg/s per m ²
Note 2	Irradiance, G_s=1000 W/m²; Ambient temperature , T_a=30 °C			
Note 3	Given by manufacturer			

TestLab
 Solar Thermal
 Systems

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VERSION 3.7, 2012.03.22



Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	RRRRRRRRR
	Issued	dd-mm-yyyy

Annual collector output kWh												
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
COSMO 251RK	3.020	2.177	1.444	2.477	1.723	1.090	1.694	1.120	688	1.843	1.213	733
COSMO 251RKW	3.020	2.177	1.444	2.477	1.723	1.090	1.694	1.120	688	1.843	1.213	733

Collector mounting: Fixed or tracking No tracking; 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

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 (Tm). Detailed description with all equations used is available from the Solar Keymark web site (direct link: <http://www.estif.org/solarkeymark/annexb1.php>)

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	VERSION 3.7, 2012.03.22
	Calculation program version:
	3.07, October 2011 (SP)