TÜVRheinland®
DIN CERTCO

Genau. Richtig.

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate				Licence Number	011-7S2241 F
				Issued	2013-09-12

Company holding the	BES GmbH		Country	GERMANY	
Brand (optional)	--		Website	www.bes-eu-com	
Street, street number	Robert-Koch-Str. 50		E-mail	info@bes-eu.com	
Postal Code / City, province	D-55129	Mainz	Tel/Fax	49	6131 250617-0 / 250617-9

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Flat plate collector - 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 0 K	10 K	30 K	50 K	70 K
	m²	mm	mm	mm	m²	W	W	W	W	W
IS-XL 2,7 S	2,49	2.150	1.250	79	2,69	1.973	1.874	1.650	1.393	1.103

Performance test method	Glazed liquid heating collector - steady state - indoor									
Performance parameters related to aperture area	η0	a1	a2							
Units	-	W/(m²K)	W/(m²K²)							
Test results - Flow rate and fluid see note 1	0,793	3,818	0,017							

Bi-directional incidence angle modifiers?	No	*Kϑ values are obligatory for 50°.*									
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)					0,96				0,00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	210,3	°C
Effective thermal capacity	ceff = C/Ag	5,9891	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	120	°C
Max. operation pressure - see note 3	pmax,op	1000	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)	0,032	0,025	0,019	0,012	0,005	0,000				
Pressure drop, ΔP	Pa	53080	34810	20330	9660	2770	0				

Optional weather data	Location		Link	

Testing Laboratory	Fundación CENER-CIEMAT, LEST		
Website	www.cener.com		
Test report id. number	30.1093.0-5-1 / 30.1093.0-6-1	Date of test report	10/06/2009 - 30/06/2009

During the test GDIF/GTOT was always between	0,11	and	0,14	

Comments of testing laboratory:

Note 1	Flow rate	0,016	kg/(s m²)	Fluid	Water
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C				
Note 3	Given by manufacturer				

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Datasheet version: 4.04, 2013-04-22

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2241 F
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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
IS-XL 2,7 S	3.205	2.260	1.430	2.416	1.632	974	1.789	1.143	659	1.947	1.240	703

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.

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

Datasheet version: 4.04, 2013-04-22
ScenoCalc version: Ver. 4.04 (Jun, 2013)