Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S 2244 F
	Issued	2015-11-09

Company holding the	Bosch Thermotechnik GmbH		Country	Germany	
Brand (optional)	Junkers		Website	www.bosch-thermotechnik.de	
Street, street number	Junkersstrasse 20-24		E-mail	solarthermie@de.bosch.com	
Postal Code / City, province	73249	Wernau	Tel/Fax	+49	(0)2557 9399-0 / - - -

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)	Yes

	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
Collector name	m²	mm	mm	mm	m²	W	W	W	W	W
Junkers FKC-2s	2.25	2 017	1 175	87	**2.37**	1 725	1 650	1 478	1 279	1 053

Performance test method	Glazed liquid heating collector - steady state - indoor			
Performance parameters related to aperture	η0	a1	a2	
Units	-	W/(m²K)	W/(m²K²)	
Test results - Flow rate and fluid see note 1	0.766	3.216	0.015	

Bi-directional incidence angle	No	*Kϑ values are obligatory for 50°.*									
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)	1.00	0.99	0.98	0.96	0.92	0.86	0.73	0.37	0.00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	200	°C
Effective thermal capacity	ceff = C/Ag	3.56	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	- - -	°C
Max. operation pressure - see note 3	pmax,op	600	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)										
Pressure drop, ΔP	Pa										

Optional weather data	Location		Link

Testing Laboratory	TÜV Rheinland Energie und Umwelt GmbH
Website	www.tuv.com/st
Test report id. number	21216476_EN_Bosch
Date of test report	2011.05.31

During the test GDIF/GTOT was always between	0.088	and	0.273

Comments of testing laboratory:

Note 1	**Flow rate**	0.023	kg/(s m²)	**Fluid**	Water
Note 2	**Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C**				
Note 3	**Given by manufacturer**				

Datasheet version: 4.05, 2013-11-07

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S 2244 F
	Issued	09.11.2015

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
Junkers FKC-2s	2 717	1 984	1 322	2 097	1 479	947	1 537	1 031	636	1 667	1 111	675

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.

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Datasheet version: 4.05, 2013-11-07
ScenoCalc version: Ver. 4.05 (Nov, 2013)