


Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		011-7S1685 F			
						Issued		2013-08-21			
Company holding the		KBB Kollektorbau GmbH				Country		Germany			
Brand (optional)		-				Website		www.kbb-solar.com			
Street, street number		Bruno-Bürgel-Weg 142-144				E-mail		info@kbb-solar.de			
Postal Code / City, province		12439 Berlin				Tel/Fax		+49 (0)30 678 1789 -0/-55			
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						Flat plate collector - glazed					
Thermal / photo voltaic hybrid collector? (PVT collector)						No					
Integration in the roof possible ? (manufacturers declaration)						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 module					
						G = 1000 W/m ²					
						Tm-Ta					
						0 K	10 K	30 K	50 K	70 K	
						W	W	W	W	W	
K420-LC	1.833	1.908	1.058	75	2.02	1.395	1.319	1.152	966	762	
Performance test method		Glazed liquid heating collector - steady state - indoor									
Performance parameters related to aperture		η_0		a1		a2					
Units		-		W/(m ² K)		W/(m ² K ²)					
Test results - Flow rate and fluid see note 1		0.761		4.04		0.0127					
Bi-directional incidence angle		No		<i>Kθ values are obligatory for 50°.</i>							
Incidence angle modifiers Kθ(θ)		Angle		10°		20°		30°		40°	
		K θ (θ)		1.00		0.99		0.98		0.95	
Incidence angle modifier not bi-directional - leave fields blank											
Stagnation temperature - Weather conditions see note 2						Tstg		205		°C	
Effective thermal capacity						ceff = C/Ag		4.9		kJ/(m ² K)	
Max. intended operation temperature - see note 3						Tmax,op		-		°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 m ²)		0.008		0.018					
Pressure drop, ΔP		Pa		7000		24000					
Optional weather data		Location				Link					
Testing Laboratory		Institut für Solarenergieforschung Hameln									
Website		www.isfh.de									
Test report id. number		135-12/KD, 136-12/KQ				Date of test report		27.06.2013, 21.08.2013			
During the test GDIF/GTOT was always between		0.1	and		0.2						
Comments of testing laboratory:											
1) The conversion factor η_0 given in this data sheet corresponds to a value that would be measured outdoor at a ratio of diffuse to global radiation of Gd/G = 0.15.											
2) The values for the pressure drop table were provided by the manufacturer (fluid: water/propylenglycol-mixture; temperature: 20°C).											
Note 1	Flow rate	0.020	kg/(s m ²)	Fluid	Water						
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C										
Note 3	Given by manufacturer										
						 Institut für Solarenergieforschung GmbH Am Ohrberg 1 D-31860 Emmerthal Tel.: 0 51 51 / 999 400 Fax: 0 51 51 / 999 500					
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	011-7S1685 F
	Issued	21.08.2013

Annual collector output kWh/module														
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		
K420-LC	2 164	1 474	909	1 607	1 062	627	1 187	742	423	1 292	796	447		

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

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 (T_m). A detailed description of the calculations is available at <http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx>.