


Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		011-7S134 R								
						Issued		2015-11-30								
Company holding the			Ritter Energie- und Umwelttechnik GmbH & Co. KG			Country		Deutschland								
Brand (optional)						Website		www.ritter-gruppe.com								
Street, street number			Kuchenäcker 2			E-mail		info@ritter-gruppe.com								
Postal Code / City, province			D-72135 Dettenhausen		Tel/Fax		49 (0)7157 5359 -1200 / -1209									
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						Evacuated tubular collector										
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					
CPC 6 INOX							1.00	1 640	707	103	1.16	644	636	617	594	567
CPC 6 XL INOX							1.29	2 057	707	103	1.45	831	820	796	766	732
CPC 12 INOX							2.00	1 640	1 397	103	2.29	1 288	1 272	1 234	1 188	1 134
CPC 12 XL INOX							2.57	2 057	1 397	103	2.87	1 655	1 635	1 586	1 527	1 457
CPC 18 INOX							3.00	1 640	2 087	103	3.42	1 932	1 908	1 851	1 782	1 701
CPC 6 OEM							1.00	1 640	707	103	1.16	644	636	617	594	567
CPC 12 OEM							2.00	1 640	1 397	103	2.29	1 288	1 272	1 234	1 188	1 134
CPC 18 OEM							3.00	1 640	2 087	103	3.42	1 932	1 908	1 851	1 782	1 701
Performance test method							Glazed liquid heating collector - steady state - outdoor									
Performance parameters related to aperture area							η_0	a1	a2							
Units							-	W/(m ² K)	W/(m ² K ²)							
Test results - Flow rate and fluid see note 1							0.644	0.749	0.005							
Bi-directional incidence angle modifiers?							Yes <i>Kθ values are obligatory for 50°.</i>									
Incidence angle modifiers Kθ(θT) transversal direction							Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
							K θ (θ T)	1.01	1.01	1.02	1.02	0.98	1.05	1.14	0.57	0.00
Incidence angle modifiers Kθ(θL) longitudinal direction							Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
							K θ (θ L)	1.00	1.00	0.99	0.98	0.95	0.89	0.76	0.38	0.00
Stagnation temperature - Weather conditions see note 2							Tstg		301		°C					
Effective thermal capacity							ceff = C/Ag		9.18		kJ/(m ² K)					
Max. intende operation temperature - see note 3							Tmax,op		160		°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)	-	-	-	-	-	-	-	-	-	-				
Pressure drop, ΔP		Pa	-	-	-	-	-	-	-	-	-	-				
Optional weather data		Location					Link									
Testing Laboratory		TZS, ITW University of Stuttgart														
Website		www.itw.uni-stuttgart.de/institut/abteilungen/tzs/														
Test report id. number		14COL1031, 14COL1032Q				Date of test report		2015.11.30								
During the test GDIF/GTOT was always between		0	and	1												
Comments of testing laboratory:																
No comment.																
Note 1		Flow rate	0.020	kg/(s m ²)	Fluid	Water										
Note 2		Irradiance, G = 1000 W/m ² ; Ambient temperature , Ta=30 °C														
Note 3		Given by manufacturer														
																
Datasheet version: 4.06, 2014-01-15																
DIN CERTCO • Alboinstraße 56 • 12103 Berlin Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de																

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S134 R
	Issued	30.11.2015

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	
CPC 6 INOX	1 111	1 019	911	973	874	768	698	616	532	749	663	572	
CPC 6 XL INOX	1 434	1 314	1 175	1 255	1 128	991	901	795	686	967	855	738	
CPC 12 INOX	2 223	2 038	1 822	1 945	1 749	1 536	1 396	1 232	1 063	1 498	1 326	1 145	
CPC 12 XL INOX	2 856	2 619	2 342	2 500	2 247	1 974	1 794	1 583	1 366	1 926	1 703	1 471	
CPC 18 INOX	3 334	3 057	2 733	2 918	2 623	2 304	2 094	1 848	1 595	2 248	1 988	1 717	
CPC 6 OEM	1 111	1 019	911	973	874	768	698	616	532	749	663	572	
CPC 12 OEM	2 223	2 038	1 822	1 945	1 749	1 536	1 396	1 232	1 063	1 498	1 326	1 145	
CPC 18 OEM	3 334	3 057	2 733	2 918	2 623	2 304	2 094	1 848	1 595	2 248	1 988	1 717	

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>.

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	ScenoCalc version: Ver. 4.06 (Jan, 2014)