


Precisely Right.

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate							Licence Number		011-75824 F							
							Issued		2015-03-13							
Company holding the				Chromagen (ACS) Ltd.			Country		Israel							
Brand (optional)				Kibbutz Sha'ar Haa'makim			Website		www.chromagen.com							
Street, street number				--			E-mail		yair@chromagen.com							
Postal Code / City, province				3658800 --			Tel/Fax		972 4-9538839							
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)							Yes									
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										
						T _m -T _a										
						0 K	10 K	30 K	50 K	70 K						
						W	W	W	W	W						
QR-K	1,52	1.817	919	90	1,67	1.058	982	818	635	433						
QR-D	1,77	1.909	1.082	90	2,07	1.232	1.144	952	739	505						
QR-E	2,17	2.199	1.082	90	2,37	1.510	1.402	1.167	906	619						
QR-F	2,58	2.180	1.270	90	2,77	1.796	1.667	1.388	1.077	735						
Performance test method							Glazed liquid heating collector - steady state - indoor									
Performance parameters related to aperture							η ₀	a ₁	a ₂							
Units							-	W/(m ² K)	W/(m ² K ²)							
Test results - Flow rate and fluid see note 1							0,696	4,821	0,015							
Bi-directional incidence angle							No	K _θ values are obligatory for 50°.								
Incidence angle modifiers K _θ (θ)							Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
							K _θ (θ)					0,85			0,00	
Incidence angle modifier not bi-directional - leave fields blank																
Stagnation temperature - Weather conditions see note 2							T _{stg}	165,1 °C								
Effective thermal capacity							c _{eff} = C/Ag	4,82 kJ/(m ² K)								
Max. intended operation temperature - see note 3							T _{max,op}	160 °C								
Max. operation pressure - see note 3							p _{max,op}	1000 kPa								
Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m ² aperture area																
Flow rate	kg/(s m ²)	0,000	0,008	0,018	0,030	0,040	0,050									
Pressure drop, ΔP	Pa	0	50	121	212	300	396									
Optional weather data		Location				Link										
Testing Laboratory		Fundación CENER-CIEMAT														
Website		www.cener.com														
Test report id. number		30.1166.0-3-1; 30.1166.0-4-1; 30.1166.0-5-1; 30.1126.0-4-2; 30.1166.1				Date of test report		06/05/2009 - 15/06/2009 05/06/2009								
During the test GDIF/GTOT was always between							0,11	and	0,12							
Comments of testing laboratory: QR-K is representative collector of the collectors QR-D, QR-E and QR-F.																
Note 1	Flow rate	0,019 kg/(s m ²)	Fluid	Water												
Note 2	Irradiance, G = 1000 W/m ² ; Ambient temperature, T _a =30 °C															
Note 3	Given by manufacturer															
 Datasheet version: 4.06, 2014-01-15																
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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S824 F
	Issued	13/03/2015

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
QR-K	1.531	907	460	1.067	611	282	797	431	197	869	458	209
QR-D	1.783	1.056	535	1.243	711	329	928	502	230	1.012	534	243
QR-E	2.185	1.295	656	1.524	872	403	1.137	615	282	1.240	654	298
QR-F	2.598	1.540	780	1.812	1.037	479	1.352	731	335	1.475	778	355

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)
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Overview of locations				
Location	Latitude °	Gtot kWh/m ²	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/m ²
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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	ScenoCalc version: Ver. 4.06 (Jan, 2014)