


Summary of EN 12975 Test Results,						Licence Number		011-7S2455 F			
annex to Solar KEYMARK Certificate						Issued		2014-12-19			
Company holding the		HELIONAL solar systems				Country		Greece			
Brand (optional)		--				Website		www.helional.com			
Street, street number		Oreokastro Industrial Park, P.O. Box 89				E-mail		info@helional.com			
Postal Code / City, province		57013 Thessaloniki				Tel/Fax		30 2310783691			
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 (A _a) m ²	Gross length mm	Gross width mm	Gross height mm	Gross area (A _G) 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	
MS 1.5	1.33	1,480	980	85	1.45	1,008	947	815	669	509	
MS 2.0	1.78	1,980	980	85	1.94	1,349	1,268	1,091	896	682	
MS 2.4	2.18	1,980	1,185	85	2.35	1,652	1,553	1,336	1,097	835	
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	0.758	4.447	0.013								
Bi-directional incidence angle	No		<i>K_θ values are obligatory for 50°.</i>								
Incidence angle modifiers K_θ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Incidence angle modifier not bi-directional - leave fields blank	K _θ (θ)					0.94				0.00	
Stagnation temperature - Weather conditions see note 2	T _{stg}						199.4 °C				
Effective thermal capacity	ceff = C/Ag						5.92 kJ/(m ² K)				
Max. intende operation temperature - see note 3	T _{max,op}						200 °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 m² aperture area											
Flow rate	kg/(s m ²)	0.000	0.012	0.027	0.040	0.055	0.070				
Pressure drop, ΔP	Pa	0	35	89	145	217	300				
Optional weather data	Location				Link						
Testing Laboratory	Fundación CENER-CIEMAT, LEST										
Website	www.cener.com										
Test report id. number	30.2429.0-4-1 30.2429.0-5-1 30.2429.0-6-1 30.2429.1				Date of test report			2014/12/17			
During the test GDIF/GTOT was always between		0.09	and	0.1							
Comments of testing laboratory:											
The collectors models MS 1.5 and MS 2.4 were tested according to ISO 9806:2013. According to SKM rules the results of the collector model MS 1.5 are representative for the whole MS family.											
Note 1	Flow rate	0.020 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										
											
Datashet 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	011-7S2455 F
	Issued	19/12/2014

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
MS 1.5	1,595	1,053	618	1,161	739	410	865	518	278	943	558	295
MS 2.0	2,135	1,409	828	1,553	988	548	1,157	693	372	1,262	746	395
MS 2.4	2,615	1,726	1,014	1,903	1,211	672	1,417	849	456	1,545	914	484

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/m²	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>.