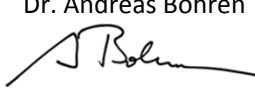


Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate							Licence Number		011-7S2415 F			
							Issued		2014-08-22			
Company holding the			H. Lenz AG				Country		Switzerland			
Brand (optional)			-				Website		www.lenz.ch			
Street, street number			Hirzenstrasse 2				E-mail		info@lenz.ch			
Postal Code / City, province			CH-9244		Niederuzwil		Tel/Fax		+41 (0)71 955 70 20/-25			
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		
Multisol M240	1.998	959	2'349	85	2.253	1'642	1'562	1'392	1'208	1'010		
Performance test method			Glazed liquid heating collector - steady state - outdoor									
Performance parameters related to <u>aperture</u>			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			0.822	3.91	0.0087							
Bi-directional incidence angle		Yes	Kθ values are obligatory for 50°.									
Incidence angle modifiers Kθ(θT) transversal direction		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
		Kθ(θT)	1.00	1.00	1.00	0.98	0.96	0.89	0.77	0.51	0.00	
Incidence angle modifiers Kθ(θL) longitudinal direction		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
		Kθ(θL)	1.00	1.00	1.00	0.98	0.96	0.89	0.77	0.51	0.00	
Stagnation temperature - Weather conditions see note 2							T _{stg}	186 °C				
Effective thermal capacity							C _{eff} = C/A _g	7.0 kJ/(m ² K)				
Max. intended operation temperature - see note 3							T _{max,op}	130 °C				
Max. operation pressure - see note 3							p _{max,op}	600 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)	0.004	0.009	0.013	0.018	0.022	0.026	0.031	0.035	0.040	0.044	
Pressure drop, ΔP	Pa	2264	6200	11807	19086	28037	38659	50953	64919	80556	97865	
Optional weather data		Location				Link						
Testing Laboratory		SPF, CH-8640 Rapperswil										
Website		www.solarenergy.ch										
Test report id. number		C1396LPEN, C1396QPEN				Date of test reports		22.08.2014				
During the test G _{DIF} /G _{TOT} was always between			0.07	and	0.19							
Comments of testing laboratory:												
-												
Note 1	Flow rate	0.021 kg/(s m ²)	Fluid	Water-Glycole							Dr. Andreas Bohren 	
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												
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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2415 F
	Issued	2014-08-22

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		
Multisol M240	2'648	1'911	1'296	2'021	1'430	947	1'484	990	627	1'613	1'070	668		

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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	4.06, 2014-01-15
	ScenoCalc version:
	Ver. 4.06 (Jan, 2014)