Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2054 F
	Issued	2015-04-24

Company holding the	Wagner Solar GmbH		Country	Germany	
Brand (optional)	-		Website	www.wagner-solar.com	
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Postal Code / City, province	D-35274	Kirchhain	Tel/Fax	+49	6421 8007-0 / -22

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Flat plate collector - glazed
Thermal / photo voltaic hybid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module G = 1000 W/m² Tm-Ta 0 K	10 K	30 K	50 K	70 K
	m²	mm	mm	mm	**m²**	W	W	W	W	W
EURO L40 MQ HTF	2.37	2 151	1 215	80	**2.61**	1 887	1 809	1 625	1 401	1 137

Performance test method	Glazed liquid heating collector - steady state - indoor			
Performance parameters related to aperture area	η0	a1	a2	
Units	-	W/(m²K)	W/(m²K²)	
Test results - Flow rate and fluid see note 1	0.796	3.050	0.021	

Bi-directional incidence angle modifiers?	No	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)	1.00	0.99	0.97	0.93	0.88	0.78	0.58	0.00	0.00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	184	°C
Effective thermal capacity	ceff = C/Ag	6.6	kJ/(m²K)
Max. intende 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 m²)	-									
Pressure drop, ΔP	Pa	-									

Optional weather data	Location		Link	
Testing Laboratory	ISFH - Institut für Solarenergieforschung Hameln			
Website	www.isfh.de			
Test report id. number	79-12/KD; 80-12/KQ		Date of test report	2012-11-09; 2012-11-09

During the test GDIF/GTOT was always between	0.1	and	0.3	

Comments of testing laboratory:

The collector efficiency parameters are related to G(DIF)/G(TOT)=0.15.
The incidence angle modifier was determined outdoor according to a quasi-dynamic test procedure.

Note 1	Flow rate	0.020	kg/(s m²)	Fluid	Water
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C				
Note 3	Given by manufacturer				

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Datasheet version: 4.06, 2014-01-15

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2054 F
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Annual collector output kWh/module

	Location and collector temperature (Tm)											
	Athens			Davos			Stockholm			Würzburg		
Collector name	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
EURO L40 MQ HTF	2 859	2 090	1 366	2 226	1 559	970	1 623	1 090	658	1 756	1 167	694

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

Overview of locations

Location	Latitude °	Gtot kWh/m²	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/m²
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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Datasheet version: 4.06, 2014-01-15
ScenoCalc version: Ver. 4.06 (Jan, 2014)