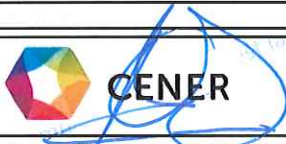




Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		011-7S2159 F			
						Issued		2013-10-10			
Company holding the		HEWALEX Sp. z.o.o. Sp.k.				Country		POLAND			
Brand (optional)		--				Website		www.hewalex.eu			
Street, street number		ul. Slowackiego 33				E-mail		hewalex@hewalex.pl			
Postal Code / City, province		43-502	Czechowice-Dziedzice			Tel/Fax		+48 32 214 17 10 / 32 214 50 04			
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					
						Tm-Ta					
						0 K	10 K	30 K	50 K	70 K	
						W	W	W	W	W	
KS 2100 TP ACR	1.82	2,018	1,037	89	2.09	1,505	1,442	1,295	1,119	913	
KS 2100 TLP ACR	1.82	2,018	1,037	89	2.09	1,505	1,442	1,295	1,119	913	
KS 2200 TP ACR	2.01	2,018	1,129	89	2.28	1,662	1,593	1,430	1,235	1,008	
KS 2200 TLP ACR	2.01	2,018	1,129	89	2.28	1,662	1,593	1,430	1,235	1,008	
KS 2400 TP ACR	2.19	2,018	1,221	89	2.46	1,811	1,736	1,558	1,346	1,099	
KS 2400 TLP ACR	2.19	2,018	1,221	89	2.46	1,811	1,736	1,558	1,346	1,099	
KS 2600 TP ACR	2.36	2,018	1,314	89	2.65	1,952	1,870	1,679	1,451	1,184	
KS 2600 TLP ACR	2.36	2,018	1,314	89	2.65	1,952	1,870	1,679	1,451	1,184	
Performance test method						Glazed liquid heating collector - steady state - indoor					
Performance parameters related to aperture		η_0	a1	a2							
Units		-	W/(m ² K)	W/(m ² K ²)							
Test results - Flow rate and fluid see note 1		0.827	3.247	0.020							
Bi-directional incidence angle		No <i>Kθ 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						Tstg	210.1 °C				
Effective thermal capacity						ceff = C/Ag	5.17 kJ/(m ² K)				
Max. intended operation temperature - see note 3						Tmax,op	250 °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 m ² aperture area											
Flow rate	kg/(s m ²)	0.000	0.019	0.023	0.037	0.050	0.063				
Pressure drop, ΔP	Pa	0	110	290	500	750	1030				
Optional weather data		Location			Link						
Testing Laboratory		Fundación CENER-CIEMAT, LEST									
Website		www.cener.com									
Test report id. number		30.2047.0-4-1 R / 30.2047.0-5-1 R				Date of test report		2013/09/18			
		30.2047.0-6-1 R / 30.2047.1									
During the test GDIF/GTOT was always between		0.12	and	0.13							
Comments of testing laboratory:											
The collectors models KS 2100 TLP ACR and KS 2600 TLP ACR were tested according to EN 12975-2. According to SKM rules, the results of the collector model KS 2100 TLP ACR are representative for the whole KS-ACR family.											
Note 1	Flow rate	0.030 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: 4.04; 2013-04-22					
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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2159 F
	Issued	2013-10-10

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	
KS 2100 TP ACR	2,415	1,785	1,190	1,876	1,326	837	1,377	928	566	1,493	1,005	602	
KS 2100 TLP ACR	2,415	1,785	1,190	1,876	1,326	837	1,377	928	566	1,493	1,005	602	
KS 2200 TP ACR	2,667	1,972	1,314	2,072	1,465	924	1,521	1,025	625	1,649	1,110	665	
KS 2200 TLP ACR	2,667	1,972	1,314	2,072	1,465	924	1,521	1,025	625	1,649	1,110	665	
KS 2400 TP ACR	2,906	2,148	1,431	2,258	1,596	1,007	1,657	1,117	681	1,797	1,209	725	
KS 2400 TLP ACR	2,906	2,148	1,431	2,258	1,596	1,007	1,657	1,117	681	1,797	1,209	725	
KS 2600 TP ACR	3,132	2,315	1,543	2,433	1,720	1,085	1,786	1,204	734	1,936	1,303	781	
KS 2600 TLP ACR	3,132	2,315	1,543	2,433	1,720	1,085	1,786	1,204	734	1,936	1,303	781	

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

<p style="text-align: center;">DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de</p>	Datasheet version:
	4.04, 2013-04-22
	ScenoCalc version:
	Ver. 4.04 (Jun, 2013)