


Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		011-7S2427 R							
						Issued		2014-09-25							
Company holding the		Zewotherm GmbH				Country		Germany							
Brand (optional)		-				Website		www.zewotherm.de							
Street, street number		Konrad-Zuse-Ring 34 - 41				E-mail		info@zewotherm.de							
Postal Code / City, province		DE-53424		Remagen		Tel/Fax		+49 2642 90 56-0 /-19							
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						Evacuated tubular collector									
Thermal / photo voltaic hybrid collector? (PVT collector)						No									
Integration in the roof possible ? (manufacturers declaration)						No									
						Power output per collector module									
						G = 1000 W/m ²									
						T _m -T _a									
						0 K	10 K	30 K	50 K	70 K					
Collector name						m ²	mm	mm	mm	m ²	W	W	W	W	W
ZEWO-SOL ZX 20						1.888	2'010	1'452	167	2.919	1'237	1'197	1'112	1'020	920
ZEWO-SOL ZX 30						2.833	2'010	2'150	167	4.322	1'856	1'796	1'669	1'531	1'380
Performance test method						Glazed liquid heating collector - steady state - outdoor									
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						0.655	2.04	0.0051							
Bi-directional incidence angle						Yes	K _θ values are obligatory for 50°.								
Incidence angle modifiers K _θ (θT) transversal direction						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
						K _θ (θT)	1.01	1.04	1.12	1.23	1.28	1.19	0.92	0.49	0.00
Incidence angle modifiers K _θ (θL) longitudinal direction						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
						K _θ (θL)	1.00	1.00	0.98	0.96	0.91	0.82	0.68	0.43	0.00
Stagnation temperature - Weather conditions see note 2						T _{stg}	196 °C								
Effective thermal capacity						C _{eff} = C/A _g	9.3 kJ/(m ² K)								
Max. intended operation temperature - see note 3						T _{max,op}	- °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)	0.007	0.014	0.021	0.028	0.035	0.042	0.049	0.056	0.063	0.070				
Pressure drop, ΔP	Pa	397	1083	2059	3324	4878	6721	8853	11275	13986	16986				
Optional weather data		Location				Link									
Testing Laboratory		SPF, CH-8640 Rapperswil													
Website		www.spf.ch													
Test report id. number		C1646LPEN, C1647LPEN, C1647QPEN				Date of test reports		24.09.2014							
During the test G _{DIF} /G _{TOT} was always between		0.16		and		0.29									
Comments of testing laboratory:															
-															
Note 1	Flow rate	0.025 kg/(s m ²)	Fluid	Water-Glycole											
Note 2	Irradiance, G = 1000 W/m ² ; Ambient temperature, T _a =30 °C														
Note 3	Given by manufacturer														
Dr. Andreas Bohren 															
Datasheet version: 4.06, 2014-01-15															
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															

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2427 R
	Issued	2014-09-25

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	
ZEWO-SOL ZX 20	2'231	1'837	1'468	1'823	1'474	1'161	1'328	1'036	791	1'434	1'119	846	
ZEWO-SOL ZX 30	3'348	2'756	2'203	2'736	2'212	1'742	1'992	1'554	1'186	2'151	1'679	1'269	

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

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>.

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