

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		011-7S2471 L							
						Issued		2015-01-14							
Company holding the		CONA Entwicklungs- u. Handelsges.m.b.H.				Country		Österreich							
Brand (optional)						Website		www.cona.at							
Street, street number		Voitsdorf 55				E-mail		georg.hubmer@cona.at							
Postal Code / City, province		4551 Ried/Traunkreis				Tel/Fax		+43 7588 6446 / +43 7588 6446 46							
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									
						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						W	W	W	W	W					
CCS+						1.485	1.269	836	403						
Performance test method						Glazed air heating collector - steady state - outdoor									
Performance parameters related to aperture area						η_0	a1	a2							
Units						-	W/(m ² K)	W/(m ² K ²)							
Test results - Flow rate and fluid see note 1						0,772	11,247	0							
Bi-directional incidence angle modifiers?						No <i>Kθ values are obligatory for 50°.</i>									
Incidence angle modifiers Kθ(θ)						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
						K θ (θ)					0,89			0,00	
Incidence angle modifier not bi-directional - leave fields blank															
Stagnation temperature - Weather conditions see note 2						T _{stg}	120		°C						
Effective thermal capacity						c _{eff} = C/Ag	16,2		kJ/(m ² K)						
Max. intended operation temperature - see note 3						T _{max,op}	110		°C						
Max. operation pressure - see note 3						p _{max,op}	0,2		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	0,011	0,023	0,035	0,046	0,058							
Pressure drop, ΔP		Pa	0,0	1,0	2,9	6,0	9,7	14,5							
Testing Laboratory						Fraunhofer TestLab Solar Thermal Systems									
Website						www.collectortest.com									
Test report id. number						ktb-2014-27			Date of test report			2015.01.14			
During the test GDIF/GTOT was always between						0,1	and	0,2							
Comments of testing laboratory:						The efficiency of solar air heating collectors strongly depends on the air flow rate. The given efficiency results are valid at the air flow rate given in Note 1. More information can be found in the corresponding test report.									
Note 1						Flow rate	0,069	kg/(s m ²)	Fluid	Air					
Note 2						Irradiance, G = 1000 W/m ² ; Ambient temperature, T _a =30 °C									
Note 3						Given by manufacturer									
						TestLab Solar Thermal Systems Heidenhofstraße D-79110 Bad Säckingen Version: 4.06, 2014-01-15 Tel: +49 (0)761 4588 5354									
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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2471 L
	Issued	14.01.2015

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		
CCS+	2.121	758	155	1.144	360	47	926	283	36	1.027	305	46		

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>.

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	ScenoCalc version: Ver. 4.06 (Jan, 2014)