




<b>Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>						<b>Licence Number</b>		<b>011-7S2233 F</b>				
						<b>Issued</b>		2013-09-16				
<b>Company holding the</b>			Consolar Solare Energiesysteme GmbH			<b>Country</b>		Germany				
<b>Brand (optional)</b>						<b>Website</b>		www.consolar.de				
<b>Street, street number</b>			Gewerbstraße 7			<b>E-mail</b>		info@consolar.de				
<b>Postal Code / City, province</b>			D- 79539	Lörrach		<b>Tel/Fax</b>		+49 (0)7621-4222830 /Fax -31				
<b>Collector Type (flat plate glazed/un-glazed; evacuate tubular)</b>						Flat plate collector - glazed						
Thermal / photo voltaic hybrid collector? (PVT collector)						No						
Integration in the roof possible ? (manufacturers declaration)						Yes						
	<b>Aperture area (Aa)</b>	<b>Gross length</b>	<b>Gross width</b>	<b>Gross height</b>	<b>Gross area (AG)</b>	<b>Power output per collector module</b>						
						G = 1000 W/m <sup>2</sup>						
<b>Collector name</b>	m <sup>2</sup>	mm	mm	mm	m <sup>2</sup>	Tm-Ta						
						0 K	10 K	30 K	50 K	70 K		
						W	W	W	W	W		
INTEGRO 25 VI	2,34	2.055	1.227	100	2,52	1.736	1.675	1.511	1.291	1.017		
INTEGRO 50 VI	4,62	2.456	2.057	100	5,05	3.428	3.307	2.982	2.549	2.008		
<b>Performance test method</b>						Glazed liquid heating collector - steady state - indoor						
<b>Performance parameters related to aperture</b>			η <sub>0</sub>	a <sub>1</sub>	a <sub>2</sub>							
<b>Units</b>			-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )							
<b>Test results - Flow rate and fluid see note 1</b>			0,742	2,334	0,029							
<b>Bi-directional incidence angle</b>		No		K <sub>θ</sub> values are obligatory for 50°.								
<b>Incidence angle modifiers K<sub>θ</sub>(θ)</b>		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
		K <sub>θ</sub> (θ)					0,95				0,00	
<b>Incidence angle modifier not bi-directional - leave fields blank</b>												
<b>Stagnation temperature - Weather conditions see note 2</b>						Tstg	206		°C			
<b>Effective thermal capacity</b>						ceff = C/Ag	6,593		kJ/(m <sup>2</sup> K)			
<b>Max. intende operation temperature - see note 3</b>						Tmax,op	140		°C			
<b>Max. operation pressure - see note 3</b>						pmax,op	1000		kPa			
<b>Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m<sup>2</sup> aperture area</b>												
<b>Flow rate</b>	kg/(s m <sup>2</sup> )											
<b>Pressure drop, ΔP</b>	Pa											
<b>Optional weather data</b>	Location						Link					
<b>Testing Laboratory</b>		IZES gGmbH, TZSB										
<b>Website</b>		www.izes.de/tzsb/										
<b>Test report id. number</b>		KT07_03, KT07_05					<b>Date of test report</b>		2007.10.11			
During the test GDIF/GTOT was always between			0,15	and	0,28							
<b>Comments of testing laboratory:</b>												
Der Kollektor INTEGRO 25 VI ist baugleich mit dem entsprechend Prüfbericht KT07_03 getestetem Kollektor / The collector INTEGRO 25 VI is identical with the tested collector according to test report KT07_03 ; Die Leistung je Kollektormodul wurde mit den in Prüfbericht KT07_03 ermittelten Leistungsparametern errechnet / the power output per collector unit was calculated with performance parameters according to test report KT07_03. Zusätzliche Qualitätsprüfungen wurden an einem größeren Modul entsprechend Prüfbericht KT07_05 durchgeführt / additional quality tests were performed at a larger collector module according to test report KT07_05												
<b>Note 1</b>	<b>Flow rate</b>	0,010	kg/(s m <sup>2</sup> )	<b>Fluid</b>	Water							
<b>Note 2</b>	Irradiance, G = 1000 W/m <sup>2</sup> ; Ambient temperature , Ta=30 °C											
<b>Note 3</b>	Given by manufacturer											
						 Testzentrum Saarbrücken Altkesselstr. 17 Gebäude D2 66115 Saarbrücken						
						Datasheet version: 4.04, 2013-04-22						
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												



<b>Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>	<b>Licence Number</b>	<b>CERTNO-01C</b>
	Issued	16.09.2013

<b>Annual collector output kWh/module</b>													
<b>Collector name</b>	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	
INTEGRO 25 VI	2.820	2.130	1.383	2.229	1.565	928	1.636	1.107	641	1.771	1.202	685	
INTEGRO 50 VI	5.569	4.206	2.730	4.400	3.090	1.832	3.229	2.186	1.266	3.497	2.373	1.352	

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

<b>Overview of locations</b>				
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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	4.04, 2013-04-22
	ScenoCalc version:
	Ver. 4.04 (Jun, 2013)