

Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S1736 F				
					Date issued		2017-04-03				
					Issued by		DIN CERTCO				
Licence holder		Centrometal d.o.o.			Country		Kroatien				
Brand (optional)					Web		www.centrometal.hr				
Street, Number		Glavna 12			E-mail		servis@centrometal.hr				
Postcode, City		40306 Macinec			Tel		+385 40 372 622				
Collector Type					Flat plate collector, glazed						
Collector name		Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ; u = 3 m/s θ _m - θ _a					
						0 K W	10 K W	30 K W	50 K W	70 K W	115 K W
CPK7210 N Alu		2.09	2 032	1 031	94	1 391	1 319	1 163	991	801	314
Power output per m ² gross area						666	631	557	474	383	150
Performance parameters test method		Quasi dynamic									
Performance parameters (related to AG)		η _{0,b}	c ₁	c ₂	c ₃	c ₄	c ₆	K _d			
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-			
Test results		0.669	3.333	0.010	0.000	0.000	0.000	0.966			
Incidence angle modifier test method		Quasi dynamic - outdoor									
Bi-directional incidence angle modifiers		No									
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal		K _{θT, coll}	1.00	0.99	0.98	0.96	0.92	0.86	0.74	0.35	0.00
Longitudinal		K _{θL, coll}	1.00	0.99	0.98	0.96	0.92	0.86	0.74	0.35	0.00
Heat transfer medium for testing		Water									
Flow rate for testing (per gross area, A _G)		dm/dt		0.017		kg/(sm ²)					
Maximum temperature difference for thermal performance calculations		(θ _m -θ _a) _{max}		115		K					
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)		θ _{stg}		199		°C					
Effective thermal capacity, incl. fluid (per gross area, A _G)		C/m ²		7.307		kJ/(Km ²)					
Maximum operating temperature		θ _{max, op}		-		°C					
Maximum operating pressure		p _{max, op}		1000		kPa					
Testing laboratory		TZS, ITW University Stuttgart					www.itw.uni-stuttgart.de				
Test report(s)		11COL1004OEM03 11COL1002QOEM03					Dated		20.10.2011 20.10.2011		
Comments of testing laboratory						Datasheet version: 5.01, 2016-03-01					
This data sheet replaces the data sheet issued on 20.10.2011						 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmelehre Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)					
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S1736 F
	Issued	2017-04-03

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
CPK7210 N Alu		2 239	1 575	1 014	1 682	1 144	706	1 242	799	475	1 357	867	507
Annual output per m² gross area		1 071	753	485	805	548	338	594	382	227	649	415	243
Fixed or tracking collector	Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane		1765 kWh/m²			1714 kWh/m²			1166 kWh/m²			1244 kWh/m²		
Mean annual ambient air temperature		18.5°C			3.2°C			7.5°C			9.0°C		
Collector orientation or tracking mode		South, 25°			South, 30°			South, 45°			South, 35°		
The collector is operated at constant temperature ϑ_m (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	C	--
Maximum tested positive load	3000	Pa
Maximum tested negative load	3000	Pa
Hail resistance using ice balls (diameter)	-	mm

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
CPK7210 N Alu	2.09	Collector efficiency (η_{col})	52	%
		Remark: Collector efficiency (η_{col}) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0.666	--
		First-order coefficient (a_1)	3.33	W/(m ² K)
		Second-order coefficient (a_2)	0.010	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.92	--
		Remark: The data given in this section are related to collector reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.		