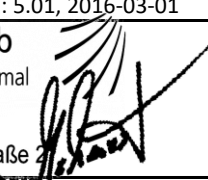


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		011-7S3104 L							
						Date issued		2022-01-25							
						Issued by		Din Certco							
Licence holder		Trigo Energies inc.				Country		Canada G9A 5E1							
Brand (optional)						Web		www.trigoenergies.com							
Street, Number		345, rue Vachon				E-mail		christian.vachon@trigoenergies.com							
Postcode, City		G9A 5E1, Trois-Rivieres, QC				Tel/Fax		+1 819 347-5477 /							
Collector Type						Flat plate collector, unglazed									
Collector name						Power output per collector unit [W]									
						wind speed, u = 1,3 m/s									
						Air flow rate [kg/h]		Net irradiance, G" [W/m ²]							
								400		700		1000			
Calento SL - lanced						98		421		734		1047			
						320		731		1274		1817			
						548		834		1453		2073			
Maximum power output per m ² gross area												810			
Performance parameters test method						Steady state - indoor									
Performance parameters (related to AG)						\dot{m}	$\eta_{0,hem}$	b1	b2	b _u	ϵ/α				
Units						kg/h	-	W/(m ² K)	Ws/(m ³ K)	s/m	-				
Test						98	0,503	-	-	0,070	0,052				
						320	0,816	-	-	0,079					
						548	0,895	-	-	0,062					
Incidence angle modifier test method						Steady state - outdoor									
Bi-directional incidence angle modifiers						No									
Incidence angle modifier						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal						K _{BT, coll}	1,00	1,00	1,00	1,00	0,99	0,96	0,87	0,63	0,00
Longitudinal						K _{BL, coll}	1,00	1,00	1,00	1,00	0,99	0,96	0,87	0,63	0,00
Heat transfer medium for testing						Air									
Maximum flow rate for testing (per gross area, A _G)						dm/dt	0,059	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations						($\vartheta_m - \vartheta_a$) _{max}	19	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)						ϑ_{stg}	119	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)						C/m ²	7,3	kJ/(Km ²)							
Maximum operating temperature						$\vartheta_{max, op}$	120	°C							
Maximum operating pressure						p _{max, op}	-	kPa							
Testing laboratory		TestLab Solar Thermal Systems, Fraunhofer ISE				http://www.collectortest.com									
Test report(s)		KTb Nr.: 2020-02-k3 KTb Nr.: 2022-01-2020-02-k3				Dated		13.12.2021 25.01.2022							
Comments of testing laboratory						Datasheet version: 5.01, 2016-03-01									
<p>Note: Scenocalc results and energy labeling information (see p.2) is not applicable for solar air heating collectors which can only be measured in open to ambient operation. The performance parameters are given as instantaneous efficiency points.</p> <p>Note2: An available customized Scenocalc version 5.01 was used, because the newest Scenocalc version 6.2 is not functional for air heating WISC.</p>						<p>TestLab Solar Thermal Systems</p>  Heidenhofstraße 2 D-79110 Freiburg Tel: +49 (0)761 4588 5354 www.din-certco.de									
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															

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S3104 L
	Issued	2022-01-25

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on EN ISO 9806:2013 test results

Standard Locations	ϑ_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
Collector name		See note on p.1											
Calento SL - lanced													
Annual output per m ² gross area	#WERT!												
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²		
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	Air	
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)	A	--
Maximum tested positive load	4300	Pa
Maximum tested negative load	1700	Pa
Hail resistance using ice balls (diameter)	25	mm

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
Calento SL - lanced	2,56	Collector efficiency (η_{col})	See note on p.1 %
		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)	See note on p.1 --
		First-order coefficient (a_1)	See note on p.1 W/(m ² K)
		Second-order coefficient (a_2)	See note on p.1 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	See note on p.1 --
		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.	