


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S1500 F								
					Date issued		2017-02-22								
					Issued by		DIN CERTCO								
Licence holder		TT THERMOTECH Scandinavia AB			Country		Sweden								
Brand (optional)					Web		www.thermotech.se								
Street, Number		Spårvägen 8			E-mail		info@thermotech.se								
Postcode, City		901 31	Umeå		Tel		+46 (0) 620-68 33 30								
Collector Type					Flat plate collector, glazed										
Collector name					Gross area (A _G)	Gross length	Gross width	Gross height	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² θ _m - θ _a						
					m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	100 K	
FP202					2.02	1 730	1 169	84	1 497	1 420	1 251	1 063	855	507	
Power output per m ² gross area					741	703	619	526	423	251					
Performance parameters test method					Steady state - indoor										
Performance parameters (related to A _G)					η _{0,hem}	a ₁	a ₂								
Units					-	W/(m ² K)	W/(m ² K ²)								
Test results					0.741	3.699	0.012								
Incidence angle modifier test method					Steady state - indoor										
Bi-directional incidence angle modifiers					No										
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal					K _{θT, coll}	-	-	-	-	0.98	-	-	-	0.00	
Longitudinal					K _{θL, coll}	-	-	-	-	0.98	-	-	-	0.00	
Heat transfer medium for testing					Water										
Flow rate for testing (per gross area, A _G)					dm/dt		0.018	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations					(θ _m -θ _a) _{max}		100	K							
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}		180	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²		5.411	kJ/(Km ²)							
Maximum operating temperature					θ _{max, op}		n.a.	°C							
Maximum operating pressure					p _{max, op}		1000	kPa							
Testing laboratory					TZS, ITW University Stuttgart			www.itw.uni-stuttgart.de							
Test report(s)					2.04.00750.1.0-2-LT(3) issued by AIT 2.04.00750.1.0-2-QT(3) issued by AIT			Dated		27.01.2011 27.01.2011					
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01										
This data sheet replaces the data sheet issued from AIT on 27.01.2011 Documented performance parameters are taken from 2.04.00750.1.0-2-LT(3)															
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S1500 F
	Issued	2017-02-22

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
FP202		2 476	1 753	1 133	1 862	1 271	782	1 382	889	526	1 506	966	562
Annual output per m ² gross area		1 226	868	561	922	629	387	684	440	260	745	478	278
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	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	1000	Pa
Maximum tested negative load	1000	Pa
Hail resistance using steel ball (maximum drop height)	n.a.	m

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
FP202	2.02	Collector efficiency (η_{col})	57	%
		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)	0.741	--
		First-order coefficient (a_1)	3.70	W/(m ² K)
		Second-order coefficient (a_2)	0.012	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.98	--
		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.		