AENOR

Keymark Certificate
Solar thermal energy

078/000244

AENOR certifies that the organization

ZANTIA CLIMATIZAÇÃO, S.A.

registered office	ZONA INDUSTRIAL DE MUNDÃO LOTE 10-A 3505-459 VISEU *(Viseu - Portugal)*
supplies	Solar collectors
in compliance with	UNE-EN 12975-1:2006+A1:2011 *(EN 12975-1:2006+A1:2010)*
Trade Mark Technical information	ZANTIA ZHS ECO 200, ZANTIA ZHS ECO 250 Specified in Annexes to the Certificate
Production site	606111-517470
Certification scheme	In order to grant this Certificate, AENOR has tested the product and has verified the quality system implemented for its manufacture. AENOR performs these tasks periodically while the Certificate has not been cancelled, in accordance with Specific Rules RP 078.01.
	This certificate supersedes 078/000244, dated 2017-11-23
First issued on Modified on Validity date	2015-09-11 2020-11-20 2025-09-11

Rafael GARCÍA MEIRO
Chief Executive Officer

Original Electronic Certificate

AENOR INTERNACIONAL S.A.U.
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Product certification body accredited by ENAC, number 1/C-PR271

Annex to Solar Keymark Certificate		Licence Number	078/000244
		Date issued	2020-11-20
		Issued by	AENOR

Licence holder	Zantia Climatização S.A.	**Country**	Portugal
Brand (optional)		**Web**	www.zantia.com
Street, Number	Zona Industrial de Mundão, Lote 10-A	**E-mail**	rui.marques@zantia.com
Postcode, City	3505-459 Viseu	**Tel**	+351 927.996.552

Collector Type	Flat plate collector

Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
					0 K	10 K	30 K	50 K	70 K	105 K
	m²	mm	mm	mm	W	W	W	W	W	W
ZANTIA ZHS ECO 200	1,97	2.056	957	70	1.466	1.399	1.256	1.098	926	592
ZANTIA ZHS ECO 250	2,48	2.055	1.205	70	1.845	1.761	1.581	1.382	1.166	745
Power output per m² gross area					744	710	637	557	470	300

Performance parameters test method	Quasi dynamic									
Performance parameters (related to A_G)	η0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	J/(m²K)	s/m	W/(m²K⁴)	W/(m²K⁴)	-
Test results	0,746	3,28	0,009	0,000	0,00	12.850	0,000	0,00	0,0	0,98

Incidence angle modifier test method		Quasi dynamic - outdoor								
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T,coll}$	1,00	1,00	0,98	0,95	0,89	0,76	0,45	0,23	0,00
Longitudinal	$K_{\theta L,coll}$	1,00	1,00	0,98	0,95	0,89	0,76	0,45	0,23	0,00

Heat transfer medium for testing		Water-Glycole	
Flow rate for testing (per gross area, A_G)	dm/dt	0,020	kg/(sm²)
Maximum temperature difference during thermal performance test	$(\vartheta_m-\vartheta_a)_{max}$	75	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	208	°C
Maximum operating temperature	ϑ_{max_op}	200	°C
Maximum operating pressure	$p_{max,op}$	1000	kPa

Testing laboratory	Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)	http://www.igte.uni-stuttgart.de	
Test report(s)	17COL1398OEM01, 17COL1398QOEM01 17COL1399OEM01, 17COL1399QOEM01	**Dated**	30.10.2020, 30.10.2020 30.10.2020, 30.10.2020

Comments of testing laboratory — Datasheet version: 6.1, 2019-09-26

Documented performance parameters are taken from 17COL1399OEM01 (ZANTIA ZHS ECO 250)

Stamp & signature of test lab

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Supplementary Information	Issued	2020-11-20

Annual collector output in kWh/collector at mean fluid temperature ϑ_m

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
ZANTIA ZHS ECO 200		2.345	1.724	1.184	1.810	1.296	870	1.321	898	578	1.444	976	620
ZANTIA ZHS ECO 250		2.951	2.170	1.491	2.279	1.632	1.095	1.663	1.130	728	1.818	1.228	781
Annual output per m² gross area		1.190	875	601	919	658	442	671	456	294	733	495	315
Annual efficiency, η_a		67%	50%	34%	56%	40%	27%	58%	39%	25%	59%	40%	25%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m²			1630 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 ϑm (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.1 (September 2019). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/

Additional Information

Collector heat transfer medium				Water-Glycole	
The collector is deemed to be suitable for roof integration				No	
The collector was tested successfully under the following conditions:					
Climate class (A+, A, B or C)				B	--
G (W/m²) >	900	ϑ_a (°C) >	15	H_X (MJ/m²) >	540
Maximum tested positive load				3000	Pa
Maximum tested negative load				2500	Pa
Hail resistance using steel ball (maximum drop height)				2	m

Additional collector attribute(s)

- ☐ Using external power source(s) for normal operation
- ☐ Active or passive measure(s) for self-protection
- ☐ Co-generating thermal and electrical power
- ☐ Façade collector(s)

Energy Labelling Information

	Reference Area, A_{sol} (m²)
ZANTIA ZHS ECO 200	1,97
ZANTIA ZHS ECO 250	2,48

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}

Collector efficiency (η_{col})	60%

Remark: Collector efficiency (ηcol) 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/m², expressed in % and rounded to the nearest integer. Deviating from the regulation ηcol is based on reference area (Asol) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.

Additional Informative Technical Data

	Hydraulic Designation Code	Aperature Area, A_a (m²)
ZANTIA ZHS ECO 200	8-V-1234S-A:8,1903-C:18,1023-D	1,88
ZANTIA ZHS ECO 250	10-V-1234S-A:8,1903-C:18,1273-D	2,39

Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}

Zero-loss efficiency (η_0)	0,74	--
First-order coefficient (a_1)	3,28	W/(m²K)
Second-order coefficient (a_2)	0,009	W/(m²K²)
Incidence angle modifier IAM (50°)	0,91	--

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.