AENOR

Keymark Certificate
Solar thermal energy

078/000260

AENOR certifies that the organization

BDR THERMEA GROUP B.V

registered office	MARCHANTSTRAAT, 55 7300 AA APELDOORN *(Holanda - Países Bajos)*
supplies	Solar collectors
in compliance with	UNE-EN 12975-1:2006 *(EN 12975-1:2006)*
Trade Mark Technical information	BRÖTJE FKS 20 Specified in Annexes to the Certificate
Production site	CL MANGANÉS, 2 08755 CASTELLBISBAL *(Barcelona - España)*
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 078/000260, dated 2016-02-16
First issued on Modified on Validity date	2016-02-16 2017-11-23 2021-02-16

Rafael GARCÍA MEIRO
Chief Executive Officer

Original Electronic Certificate

AENOR INTERNACIONAL S.A.U.
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Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	078/000260
	Issued	2017-11-23

Company holding the	BDR THERMEA GROUP B.V.	Country	NETHERLANDS	
Brand (optional)	--	Website	www.bdrthermea.com	
Street, street number	MARCHANSTRAAT 55	E-mail	oleguer.fuertes@baxi.es	
Postal Code / City, province	7300 AA APPELDOORN	Tel/Fax	+34	902898989

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Flat plate collector - glazed
Thermal / photo voltaic hybid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module G = 1000 W/m² Tm-Ta 0 K	10 K	30 K	50 K	70 K
	m²	mm	mm	mm	m²	W	W	W	W	W
BRÖTJE FKS 20	1,92	1.757	1.151	46	2,02	1.405	1.328	1.154	953	727

Performance test method	Glazed liquid heating collector - steady state - indoor								
Performance parameters related to aperture	η0	a1	a2						
Units	-	W/(m²K)	W/(m²K²)						
Test results - Flow rate and fluid see note 1	0,732	3,860	0,017						

Bi-directional incidence angle modifiers?	No	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)					0,95				0,00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	212,3 °C
Effective thermal capacity	ceff = C/Ag	3,79 kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	180 °C
Max. operation pressure - see note 3	pmax,op	1000 kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area											
Flow rate	kg/(s m²)	0,000	0,010	0,023	0,035	0,047	0,060				
Pressure drop, ΔP	Pa	0	56	161	283	432	636				

Optional weather data	Location		Link	
Testing Laboratory	Fundación CENER-CIEMAT, LEST			
Website	www.cener.com			
Test report id. number	30.2755.0-1-1 R 30.2755.0-2-1 / 30.2755.0	Date of test report	04/02/2016 28/12/2015	
During the test GDIF/GTOT was always between	0,08	and	0,09	

Comments of testing laboratory:

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Note 1	Flow rate	0,020	kg/(s m²)	Fluid	Water
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C				
Note 3	Given by manufacturer				

CENER ADItech

Datasheet version: 4.06, 2014-01-15

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	078/00260
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Annual collector output kWh/module

Collector name	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
BRÖTJE FKS 20	2.253	1.532	916	1.667	1.082	604	1.239	760	412	1.350	822	439

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

Overview of locations

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.