

AENOR

Keymark Certificate Solar thermal energy



078/000179

AENOR certifies that the organization

BDR THERMEA GROUP B.V

registered office	MARCHANTSTRAAT, 55 7300 AA APELDOORN (Holanda - Países Bajos)
supplies	Factory made thermal solar heating systems
in compliance with	UNE-EN 12976-1:2006 (EN 12976-1:2006)
Trade Mark	WESTEN STS 150 - 2.0, WESTEN STS 200 - 2.0, WESTEN STS 200 - 2.5, WESTEN STS 300 - 2.0, WESTEN STS 300 - 2.5
Technical information	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 078.02.
First issued on	2013-02-12
Last issued	2018-02-12
Validity date	2023-02-12


Rafael GARCÍA MEIRO
Chief Executive Officer

Original Electronic Certificate

AENOR INTERNACIONAL S.A.U.
Génova, 6. 28004 Madrid. España
Tel. 91 432 60 00.- www.aenor.com

Product certification body accredited by ENAC, number 01/C-PR002.078




Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate						Licence Number		078/000179				
						Issued		2018/02/12				
Company holding licence			BDR THERMEA GROUP B.V.			Country		NETHERLANDS				
Street			MARCHANSTRAAT 55			Website		www.bdrthermea.com				
Postal Code			7300 AA	APPELDOORN		E-mail		oleguer.fuertes@baxi.es				
						Tel. / Fax		+34 902898989				
System classification / Systemeigenschaften / Caractéristiques du système												
Flow principle						Thermosyphon						
Direct/indirect						Indirect						
Press. principle						Closed						
Drain back/down						Always filled (no drain)						
Storage location						Outdoor						
Storage position						Horizontal						
Internal back-up						None						
If other internal back-up, please specify:												
EN12976 type						Solar only						
Collector(s)						Storage(s)						
Company			BDR THERMEA			Company			Sole S.A.			
<i>Keymark reg, no (if available)</i>			078/000158 and 078/000160			<i>Keymark reg, no. (if available)</i>						
Model	Per module/			Number of modules	Model	Total volume	Gross diameter/width	Gross length	Back-up heated volume	El. back-up power		
	Aperture area (Aa)	Gross length	Gross width								min - max	litres
	m ²	m	m									
Mediterraneo 200	1,92	1,750	1,147	1 - 2	STS 150	150	500	1203	0	0		
Mediterraneo 250	2,4	2,187	1,147	1 - 2	STS 200	200	580	1229	0	0		
					STS 300	300	580	1744	0	0		
Controller						Fluid						
Company			-			Company			SUNE			
Model			-			Model			Water-Glycol			
						Freezing point			-10 °C			
System family overview												
Collector name		Number of collectors										
		Storage										
		STS 150		STS 200			STS 300					
Mediterraneo 200		1		1			2					
Mediterraneo 250				1			2					
Testing Laboratory						CENER						
Website						www.cener.com						
Test report id. number						30.2469.0 Technical Appendix of Solar System Family, 30.2469.0-1 Test report and 30.2469.1-1 Test report						
Date of test report						2014/12/17						
Comments of test lab						 CENER NATIONAL RENEWABLE ENERGY CENTRE AD tech Stamp & Signature Lab						
STS 150 2.0, STS 200 2.0, STS 200 2.5, STS 300 2.0 and STS 300 2.5 is considered a Solar System Family. The thermal characterisation was performed on model STS 150 2.0 and the high-temperature test was performed on model STS 300 2.5.												

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of $\pm 5\%$ to $\pm 15\%$

Version 2.1, 2012-02-08




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				Issued		2018/02/12						
Company		BDR THERMEA GROUP B.V.		Country		NETHERLANDS						
Street		MARCHANSTRAAT 55		Website		www.bdrthermea.com						
Postal Code		7300 AA APPELDOORN		E-mail		oleguer.fuertes@baxi.es						
				Tel. / Fax		+34 902898989						
System family overview												
For each storage and collector size, give number of collectors												
Collector name	STS 150		STS 200		STS 300							
Mediterraneo 200	1		1		2							
Mediterraneo 250			1		2							
Name of system configuration												
				WESTEN STS 150 2.0								
Collector name	Mediterraneo 200	No. Collectors	1		Storage name	STS 150						
Calculated annual results												
Daily draw-off (litres/day)												
Location	110	140	170	110	140	170	110	140	170			
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d			
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	1.706	2.171	2.636	831	934	1.004	48,7	43,0	38,1	--	--	--
Würzburg, DE	1.635	2.082	2.528	854	986	1.080	52,2	47,4	42,7	--	--	--
Davos, CH	1.850	2.355	2.860	1.224	1.371	1.474	66,1	58,2	51,5	--	--	--
Athens, GR	1.271	1.617	1.964	1.039	1.226	1.387	81,7	75,8	70,6	--	--	--
Perf. indicators for the table above												
Q _d	kWh/y	Heat demand										
Q _L	kWh/y	Back-up heating needed										
Q _{par}	kWh/y	Electricity for pumps/controllers										
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR							
	G	1.157	1.230	1.684	1.718							
	T _a	7,5	9,0	3,2	18,5							
	T _c	8,5	10,0	5,4	17,8							
	± ΔT _c	6,4	3,0	0,8	7,4							
G	kWh/m ²	Annual irradiation South, 45°										
T _a	°C	Annual mean air temperature										
T _c	°C	Annual mean cold water temp.										
ΔT _c	°C	Seasonal variation of T_c										
T _h	45 °C	Desired hot water temperature (mixing valve temperature).										
Max. operating press. - collector side				250	kPa	Max. operating press. - tank side				800	kPa	
Testing Laboratory						Fundación CENER-CIEMAT						
Website						www.cener.com						
Test report id. number						30.2469.0-1 Test report						
Date of test report						17/12/2014						
Test method						ISO 9459-5 (DST)						
Comments of test lab laboratoire												
No comments												
						 CENER NATIONAL RENEWABLE ENERGY CENTRE <small>ADItech</small>						

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

Version 2.1, 2012-02-08



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Certification No.		078/000179						
				Issued		2018/02/12						
Company		BDR THERMEA GROUP B.V.		Country		NETHERLANDS						
Street		MARCHANSTRAAT 55		Website		www.bdrthermea.com						
Postal Code		7300 AA APPELDOORN		E-mail		oleguer.fuertes@baxi.es						
				Tel. / Fax		+34 902898989						
System family overview												
For each storage and collector size, give number of collectors												
Collector name	STS 150		STS 200		STS 300							
Mediterraneo 200	1		1		2							
Mediterraneo 250			1		2							
Name of system configuration				WESTEN STS 200 2.0								
Collector name		Mediterraneo 200		No. Collectors		1						
				Storage name		STS 200						
Calculated annual results												
Location	Daily draw-off (litres/day)											
	170			200			250					
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d			
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	2.636	3.101	3.876	959	1.029	1.095	36,4	33,2	28,3	--	--	--
Würzburg, DE	2.528	2.974	3.717	1.031	1.110	1.211	40,8	37,3	32,6	--	--	--
Davos, CH	2.860	3.365	4.206	1.410	1.506	1.627	49,3	44,8	38,7	--	--	--
Athens, GR	1.964	2.311	2.888	1.360	1.505	1.689	69,3	65,1	58,5	--	--	--
Perf. indicators for the table above												
Q _d	kWh/y	Heat demand										
Q _L	kWh/y	Back-up heating needed										
Q _{par}	kWh/y	Electricity for pumps/controllers										
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR							
	G	1.157	1.230	1.684	1.718							
	T _a	7,5	9,0	3,2	18,5							
	T _c	8,5	10,0	5,4	17,8							
	± ΔT _c	6,4	3,0	0,8	7,4							
G	kWh/m ²	Annual irradiation South, 45°										
T _a	°C	Annual mean air temperature										
T _c	°C	Annual mean cold water temp.										
ΔT _c	°C	Seasonal variation of T _c										
T _h	45 °C	Desired hot water temperature (mixing valve temperature).										
Max. operating press. - collector side			250	kPa	Max. operating press. - tank side			800	kPa			
Testing Laboratory				Fundación CENER-CIEMAT								
Website				www.cener.com								
Test report id. number				30.2469.0 Technical Appendix of Solar System Family								
Date of test report				17/12/2014								
Test method				ISO 9459-5 (DST)								
Comments of test lab laboratoire												
The thermal performance and the long-term prediction were extrapolated according to Annex D of Solar keymark Specific Scheme Rule for model STS 150 2.0.												
 CENER NATIONAL RENEWABLE ENERGY CENTRE <small>Star ADItech</small>												

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5% to ± 15%

Version 2.1, 2012-02-08



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate			Certification No.	078/000179
			Issued	2018/02/12
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Street	MARCHANSTRAAT 55		Website	www.bdrthermea.com
Postal Code	7300 AA	APPELDOORN	E-mail	oleguer.fuertes@baxi.es
			Tel. / Fax	+34 902898989

System family overview

Collector name	For each storage and collector size, give number of collectors											
	STS 150			STS 200			STS 300					
Mediterraneo 200	1			1			2					
Mediterraneo 250				1			2					

Name of system configuration			WESTEN STS 200 2.5		
Collector name	Mediterraneo 250	No. Collectors	1	Storage name	STS 200

Calculated annual results

Location	Daily draw-off (litres/day)																	
	170			200			250			170			200			250		
	l/d			l/d			l/d			l/d			l/d			l/d		
	Qd kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	2.636	3.101	3.876	1.109	1.201	1.288	42,1	38,7	33,2	--	--	--						
Würzburg, DE	2.528	2.974	3.717	1.179	1.286	1.418	46,7	43,3	38,1	--	--	--						
Davos, CH	2.860	3.365	4.206	1.655	1.780	1.935	57,9	52,9	46,0	--	--	--						
Athens, GR	1.964	2.311	2.888	1.489	1.662	1.907	75,8	71,9	66,0	--	--	--						


Perf. indicators for the table above		
Q _d	kWh/y	Heat demand
Q _L	kWh/y	Back-up heating needed
Q _{par}	kWh/y	Electricity for pumps/controllers

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1.157	1.230	1.684	1.718
	T _a	7,5	9,0	3,2	18,5
	T _c	8,5	10,0	5,4	17,8
	± ΔT _c	6,4	3,0	0,8	7,4

G	kWh/m ²	Annual irradiation South, 45°
T _a	°C	Annual mean air temperature
T _c	°C	Annual mean cold water temp.
ΔT _c	°C	Seasonal variation of T _c
T _h	45 °C	Desired hot water temperature (mixing valve temperature).



Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	800	kPa
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Testing Laboratory	Fundación CENER-CIEMAT
Website	www.cener.com
Test report id. number	30.2469.0 Technical Appendix of Solar System Family
Date of test report	17/12/2014
Test method	ISO 9459-5 (DST)

Comments of test lab <small>laboratoire</small>	
The thermal performance and the long-term prediction were extrapolated according to Annex D of Solar keymark Specific Scheme Rule for model STS 150 2.0.	

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						Tel. / Fax		+34 902898989										
System family overview																		
For each storage and collector size, give number of collectors																		
Collector name	STS 150			STS 200			STS 300											
Mediterraneo 200	1			1			2											
Mediterraneo 250				1			2											
Name of system configuration						WESTEN STS 300 2.0												
Collector name		Mediterraneo 200		No. Collectors		2		Storage name		STS 300								
Calculated annual results																		
Daily draw-off (litres/day)																		
Location	250			300			400			250			300			400		
	l/d			l/d			l/d			l/d			l/d			l/d		
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	3.876	4.651	6.202	1.777	1.899	2.130	45,8	40,8	34,3	--	--	--						
Würzburg, DE	3.717	4.460	5.947	1.835	2.035	2.307	49,4	45,6	38,8	--	--	--						
Davos, CH	4.206	5.047	6.729	2.615	2.846	3.152	62,2	56,4	46,8	--	--	--						
Athens, GR	2.888	3.466	4.621	2.280	2.584	3.034	78,9	74,6	65,7	--	--	--						
Perf. indicators for the table above																		
Q _d	kWh/y	Heat demand																
Q _L	kWh/y	Back-up heating needed																
Q _{par}	kWh/y	Electricity for pumps/controllers																
Ref. conditions																		
		Stockholm SE	Würzburg DE	Davos CH	Athens GR													
G		1.157	1.230	1.684	1.718													
T _a		7,5	9,0	3,2	18,5													
T _c		8,5	10,0	5,4	17,8													
± ΔT _c		6,4	3,0	0,8	7,4													
G	kWh/m ²	Annual irradiation South, 45°																
T _a	°C	Annual mean air temperature																
T _c	°C	Annual mean cold water temp.																
ΔT _c	°C	Seasonal variation of T_c																
T _h	45 °C	Desired hot water temperature (mixing valve temperature).																
Max. operating press. - collector side				250	kPa	Max. operating press. - tank side				800	kPa							
Testing Laboratory						Fundación CENER-CIEMAT												
Website						www.cener.com												
Test report id. number						30.2469.0 Technical Appendix of Solar System Family												
Date of test report						17/12/2014												
Test method						ISO 9459-5 (DST)												
Comments of test lab laboratoire																		
The thermal performance and the long-term prediction were extrapolated according to Annex D of Solar keymark Specific Scheme Rule for model STS 150 2.0.																		
						 CENER NATIONAL RENEWABLE ENERGY CENTRE 												

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Postal Code		7300 AA APPELDOORN		E-mail		oleguer.fuertes@baxi.es												
				Tel. / Fax		+34 902898989												
System family overview																		
For each storage and collector size, give number of collectors																		
Collector name	STS 150		STS 200		STS 300													
Mediterraneo 200	1		1		2													
Mediterraneo 250			1		2													
Name of system configuration																		
				WESTEN STS 300 2.5														
Collector name	Mediterraneo 250	No. Collectors	2		Storage name	STS 300												
Calculated annual results																		
Location	Daily draw-off (litres/day)																	
	250			300			400			250			300			400		
	l/d			l/d			l/d			l/d			l/d			l/d		
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	3.876	4.651	6.202	1.985	2.158	2.467	51,2	46,4	39,8	--	--	--	--	--	--	--	--	
Würzburg, DE	3.717	4.460	5.947	2.022	2.277	2.647	54,4	51,0	44,5	--	--	--	--	--	--	--	--	
Davos, CH	4.206	5.047	6.729	2.962	3.280	3.695	70,4	65,0	54,9	--	--	--	--	--	--	--	--	
Athens, GR	2.888	3.466	4.621	2.445	2.800	3.344	84,7	80,8	72,4	--	--	--	--	--	--	--	--	
Perf. indicators for the table above																		
Q _d	kWh/y	Heat demand																
Q _L	kWh/y	Back-up heating needed																
Q _{par}	kWh/y	Electricity for pumps/controllers																
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR													
	G	1.157	1.230	1.684	1.718													
	T _a	7,5	9,0	3,2	18,5													
	T _c	8,5	10,0	5,4	17,8													
	± ΔT _c	6,4	3,0	0,8	7,4													
G	kWh/m ²	Annual irradiation South, 45°																
T _a	°C	Annual mean air temperature																
T _c	°C	Annual mean cold water temp.																
ΔT _c	°C	Seasonal variation of T _c																
Th	45 °C	Desired hot water temperature (mixing valve temperature).																
Max. operating press. - collector side		250	kPa	Max. operating press. - tank side		800	kPa											
Testing Laboratory				Fundación CENER-CIEMAT														
Website				www.cener.com														
Test report id. number				30.2469.0 Technical Appendix of Solar System Family														
Date of test report				17/12/2014														
Test method				ISO 9459-5 (DST)														
Comments of test lab laboratoire																		
The thermal performance and the long-term prediction were extrapolated according to Annex D of Solar keymark Specific Scheme Rule for model STS 150 2.0.																		
				 CENER <small>NATIONAL RENEWABLE ENERGY CENTRE</small> <small>ADItch</small>														

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