

# AENOR

## Keymark Certificate Solar thermal energy



**078/000347**

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+A1:2011 (EN 12975-1:2006+A1:2010)
Trade Mark Technical information	DE DIETRICH DH 160 SL Specified in Annexes to the Certificate
Production site	CL MANGANÉS, 2 POLIG. INDUSTRIAL CAN ALBAREDA 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.
First issued on	2019-11-08
Validity date	2024-11-08

Rafael GARCÍA MEIRO  
Chief Executive Officer





Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000347
	Issued	2019-11-08

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$													
Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
DE DIETRICH DH 160 SL		1.952	1.362	857	1.461	980	584	1.082	686	395	1.180	744	421
Annual output per m <sup>2</sup> gross area		1.205	841	529	902	605	361	668	423	244	729	459	260
Annual efficiency, $\eta_a$		68%	48%	30%	55%	37%	22%	57%	36%	21%	59%	37%	21%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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 $\vartheta_m$ (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.1 (September 2019). A detailed description of the calculations is available at <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>													

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)	A		--
G (W/m <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >	20
		$H_x$ (MJ/m <sup>2</sup> ) >	600
Maximum tested positive load	2400		Pa
Maximum tested negative load	2400		Pa
Hail resistance using steel ball (maximum drop height)	1,4		m

Additional collector attribute(s)			
<input type="checkbox"/> Using external power source(s) for normal operation	<input type="checkbox"/> Active or passive measure(s) for self-protection		
<input type="checkbox"/> Co-generating thermal and electrical power	<input type="checkbox"/> Façade collector(s)		

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Hydraulic Designation Code	Aperture Area, $A_a$ (m <sup>2</sup> )
DE DIETRICH DH 160 SL	1,62	1-V-12V-A:11,16098	1,53

Data required for CDR (EU) No 811/2013 - Reference Area $A_{sol}$		Data required for CDR (EU) No 812/2013 - Reference Area $A_{sol}$	
Collector efficiency ( $\eta_{col}$ )	57%	Zero-loss efficiency ( $\eta_0$ )	0,74
		First-order coefficient ( $a_1$ )	3,75
		Second-order coefficient ( $a_2$ )	0,014
		Incidence angle modifier IAM (50°)	0,94
Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area ( $A_{sol}$ ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.		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.	