

AENOR

Keymark Certificate Solar thermal energy



078/000028

AENOR certifies that the organization

DELPASO SOLAR, S.L.

registered office PARQUE TECNOLÓGICO DE ANDALUCÍA, AVENIDA JUAN LÓPEZ DE PEÑALVER, 3 29590 MÁLAGA (Malaga - España)

supplies Solar collectors

in compliance with UNE-EN 12975-1:2006 (EN 12975-1:2006)

Trade Mark DPS HSH-42200, DPS HSH-42600, DPS VSH-42200, DPS VSH-42600
Technical information Specified in Annexes to the Certificate

Production site PARQUE TECNOLÓGICO DE ANDALUCÍA, AVENIDA JUAN LÓPEZ DE PEÑALVER, 3 29590 MÁLAGA (Malaga - 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 078/000028, dated 2016-11-25

First issued on 2011-11-25
Modified on 2017-11-23
Validity date 2021-11-25

Rafael GARCÍA MEIRO
Chief Executive Officer



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		078/000028									
					Date issued		2017-11-23									
					Issued by		AENOR									
Licence holder		DELPASO SOLAR SL			Country		España									
Brand (optional)		--			Web		http://www.delpasosolar.es									
Street, Number		Par. Tec. Andalucía, Av Juan López de Peñalver 3			E-mail		calidad@energiasolardps.com									
Postcode, City		29590 Málaga			Tel		+34 952 11 15 24									
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							
					0 K	10 K	30 K	50 K	70 K	50 K	W	W	W	W	W	W
DPS HSH 42200					2,21	1.069	2.069	98	1.551	1.479	1.315	1.127	914	1.123		
DPS VSH 42200					2,21	2.069	1.069	98	1.551	1.479	1.315	1.127	914	1.123		
DPS HSH 42600					2,55	1.234	2.069	98	1.790	1.706	1.518	1.301	1.055	1.296		
DPS VSH 42600					2,55	2.069	1.234	98	1.790	1.706	1.518	1.301	1.055	1.296		
Power output per m ² gross area					702	669	595	510	414	508						
Performance parameters test method					Steady state - indoor											
Performance parameters (related to AG)					η _{0,hem}	a ₁	a ₂									
Units					-	W/(m ² K)	W/(m ² K ²)									
Test results					0,702	3,139	0,014									
Incidence angle modifier test method					Steady state - outdoor											
Bi-directional incidence angle modifiers					No											
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°		
Transversal					K _{θT, coll}					0,95				0,00		
Longitudinal					K _{θL, coll}					0,95				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}	50,4									K	
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}	210,8									°C	
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	4,83									kJ/(Km ²)	
Maximum operating temperature					θ _{max, op}	200									°C	
Maximum operating pressure					p _{max, op}	1000									kPa	
Testing laboratory					Fundación CENER-CIEMAT, LEST					http://www.cener.com						
Test report(s)					30.1699.0-1-1 30.1699.0-2-1 30.1699.0-3-1 30.1699.0 R					Dated		28/10/2011 21/12/2011				
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01											
DPS VSH 42600 is representative collector of the collectors DPS SH. These collectors were tested according to EN 12975-2 in 2011.																
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																



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000028
	Issued	2017-11-23

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_m	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
DPS HSH 42200		2.503	1.806	1.183	1.913	1.327	827	1.410	927	558	1.532	1.004	594
DPS VSH 42200		2.503	1.806	1.183	1.913	1.327	827	1.410	927	558	1.532	1.004	594
DPS HSH 42600		2.888	2.083	1.365	2.207	1.531	955	1.627	1.070	643	1.767	1.159	685
DPS VSH 42600		2.888	2.083	1.365	2.207	1.531	955	1.627	1.070	643	1.767	1.159	685
Annual output per m ² gross area		1.133	817	535	865	601	374	638	420	252	693	455	269
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	Yes	
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)	--	m

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
DPS HSH 42200	2,21	Collector efficiency (η_{col})	55 %
DPS VSH 42200	2,21	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.	
DPS HSH 42600	2,55		
DPS VSH 42600	2,55		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0,702 --
		First-order coefficient (a_1)	3,14 W/(m ² K)
		Second-order coefficient (a_2)	0,014 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,95 --
		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.	