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Licence holder Brand (optional) Street, Number Postcode, City Collector Type Collector name						Date is	sued		2022-0				
Brand (optional) Street, Number Postcode, City Collector Type Collector name	NOBEI				Annex to Solar Keymark Certificate								
Brand (optional) Street, Number Postcode, City Collector Type Collector name	NOBE								DQS Hellas				
Street, Number 4 Postcode, City 2 Collector Type Collector name							ed by DQS Hellas						
Postcode, City Collector Type Collector name	APOLLON AL Web						http://nobel.bg						
Collector Type Collector name	48, VITOSHA BLV						The state of the s						
Collector name	2100 ELIN PELIN						Tel +359 2 4210232						
Collector name						Flat plat	e collecto	r					
				I 1									
		(9	Gross length	Gross width	Gross height	Power output per collector Gb = 850 W/m2, $Gd = 150 W/m2$ & $u = 1.3 m/s\vartheta_m - \vartheta_a$							
		Gross area (A _G)											
						0 K	10 K	30 K	50 K	70 K	76 K		
		m²	mm	mm	mm	W	W	W	W	W	W		
APOLLON AL 1500		1.52	1,510	1,010	110	1,054	992	860	718	567	520		
APOLLON AL 2000		2.03	2,010	1,010	110	1,408	1,325	1,148	959	757	694		
APOLLON AL 2600		2.53	2,010	1,270	110	1,755	1,651	1,431	1,196	944	865		
									-				
Power output per m ² gross area						694	653	566	473	373	342		
Performance parameters test metho	od	Steady s	tate - out	door									
Performance parameters (related to		η0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd		
Units	<u> </u>	-		W/(m²K²)		-	J/(m²K)	s/m		W/(m²K⁴)	-		
Test results		0.704	4.02	0.008	0.000	0.00	7,860	0.000	0.00	0.0E+00	0.90		
Incidence angle modifier test method			Steady s	tate - out	door	•			•	<u> </u>			
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°		
Transversal		K _{θT,coll}	1.00	1.00	0.99	0.98	0.94	0.87	0.73	0.48	0.00		
Longitudinal		K _{θL,coll}	1.00	1.00	0.99	0.98	0.94	0.87	0.73	0.48	0.00		
Heat transfer medium for testing						•	Water		•				
Flow rate for testing (per gross area, A _G)							dm/dt 0.022 kg/(sm²)						
Maximum temperature difference during thermal performance test							$(\vartheta_{m}-\vartheta_{a})_{n}$	nax	46 K				
Standard stagnation temperature (G = 1000 W/m ² ; ϑ_a = 30 °C)							ϑ_{stg}		174 °C				
Maximum operating temperature							ϑ_{max_op}			100 °C			
Maximum operating pressure							p _{max,op}		1000 kPa				
Testing laboratory	NCSR Demokritos							www.solar.demokritos.gr					
Test report(s) 4188DE1 4189DE1						Dated			27/07/16				
									27/07/16				
4023DQ2, 4046DQ2								05/09/13					
Comments of testing laboratory								Ver.	6.2 (13.01.	2022)			
							N.C.S.R. "D E M O K R I T O S" SOLAR ENERGY LABORATOR Tel: +210 6503815 - Fax: +210 6544592 P.O. BOX 60037, 15310 Ag. Paraskevi, Greece						

Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +30 210 6233493-4, Fax: +30 210 6233495, http://www.dqs.gr, e-mail: i.alexiou@dqs.gr

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Annex to Solar Keymark Certific		ce Nur	nber	SKM 9965/1 2022-08-29									
Supplementary Information		Issue	d										
Gross Thermal Yield in kWh/collect	or at m	ean flu	ıid tem	peratu	re მ _ო								
Standard Locations	Athens	Davos				Stockholm) Würzk			urg			
Collector name ϑ_n	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	
APOLLON AL 1500	_	1,121	689	1,226	804	478	908	559	319	990	602	338	
APOLLON AL 2000		1,497	920	_	1,074	638	1,213	746	426	1,322	804	452	
APOLLON AL 2600	2,779	1,866	1,147	2,041	1,339	796	1,511	930	531	1,648	1,002	563	
Gross Thermal Yield per m² gross area	1,099	737	453	807	529	314	597	368	210	651	396	222	
Annual efficiency, η _a	62%	42%	26%	49%	32%	19%	51%	32%	18%	52%	32%	18%	
Fixed or tracking collector			F	ixed (slo	pe = la	titude -	15°; rou	unded to no	earest 5	°)			
Annual irradiation on collector plane	176	65 kWh,	/m²	163	30 kWh,	/m²	1	166 kWh/r	n²	124	14 kWh/	m²	
Mean annual ambient air temperature		18.5°C			3.2°C			7.5°C			9.0°C		
Collector orientation or tracking mode	S	outh, 2	5°	S	outh, 30)°		South, 45°		South, 35°			
	mperature ϑ m (mean of in- and outlet temperatures). The ca												
performance is performed with the offi						cenocal	c Ver. 6.	2 (13.01.20)22). A d	detailed	descript	tion of	
the calculations is available at http://w	ww.estif	f.org/so	larkeyn	narknew	/								
		Ad	dditio	nal Info	ormati	ion							
Collector heat transfer medium						Water-Glycole							
The collector is deemed to be suitable f	or roof i	integrat	ion							N	0		
The collector was tested successfully ur	der the	followi	ng cond	litions:									
Climate class (A+, A, B or C)		(0.0)								A	-		
$G(W/m^2) > 1000$ $\theta_a(^{\circ}C) >$					20			H _x (MJ/	1	200		600 Pa	
Maximum tested positive load						1000 Pa							
Maximum tested negative load	n dran	hoight)							10	JUU			
Hail resistance using steel ball (maximu	ili urop		onal c	ollocto	r attri	huto/	٠١				n	1	
Using external power source(s) for norn			No	_				or self-pro	toction			No	
Co-generating thermal and electrical po		ation	No		collect		3u1 C(3) 1	or sell-pro	tection			No	
Energy Labelling Info		n	110	raçaac			al Info	rmative	Tochn	ical Da	ta	110	
Lifetgy Labelling IIIIO			. , 2									2\	
ADOLLON AL 1500	Reference Area, A _{sol} (m ²)			Hydraulic Designation Code 10-V-1234S-A:7.2,1342-C:20.6,1060-I					Aperture Area, A _a (m ²)				
APOLLON AL 1500	1.52			·				-					
APOLLON AL 2000	2.03			10-V-1234S-A:7.2,1842-C:20.6,1060									
APOLLON AL 2600	2.53			13-V-1234S-A:7.2,1842-C:20.6,1320-D					2.32				
Data required for CDR (EU) No 811/20	13 - Ref	erence A	Area	Data re	quired	for CDI	R (EU) N	o 812/201	3 - Refe	rence A	rea A _{sol}		
Collector efficiency (η _{col})		52%			ss effici					69	-	-	
	_		_	First-or	der coe	fficient	(a ₁)		4.	02	W/(r	n²K)	
Remark: Collector efficiency (ηcol) is defined				Second	-order	coeffici	ent (a ₂)		0.0	800	W/(n	n²K²)	
811/2013 as collector efficiency of the solar of				Inciden	ce angl	e modif	fier IAM	(50°)	0.	94			
difference between the solar collector and the		_		Remark.	The dat	a given i	in this sec	tion are rela	ted to co	ollector re	ference c	irea	
and a global solar irradiance of 1000 W/m², e							-	alues accord	_		_		
rounded to the nearest integer. Deviating from the regulation ncol is based on reference area (Asol) which is aperture area for values					for ISO 9806. Consistent data sets for either aperture or gross area can be u in calculations like in the regulation 811 and 812 and simulation programs.								
according to EN 12975-2 or gross area for ISC				ın calcui	ations lik	ke in the	regulatio	on 811 and 8.	12 and si	ımulation	progran	15.	
Central Offices: Kalavriton 4, 145 64 l	cifisia, A	thens,	Tel: +30	210 62	33493-	4 , Fax:	+30 210	6233495,	http://	www.do	ηs.gr, e-	mail:	

i.alexiou@dqs.gr