

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		SK-0010							
						Issued		2015-10-26							
Company holding the						HELIOFRANCE		Country		France					
Brand (optional)						COPERNIC H272 / V272 / H232 / V232		Website		www.heliofrance.com					
Street, street number						2862 Route de Toulouse		E-mail		mykieta@heliofrance.com					
Postal Code / City, province						31370 Bérat		Tel/Fax		33 561 444 689 -1					
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						Flat plate collector - glazed									
Thermal / photo voltaic hybrid collector? (PVT collector)						No									
Integration in the roof possible ? (manufacturers declaration)						No									
Collector name	Aperture area (Aa) m <sup>2</sup>	Gross length mm	Gross width mm	Gross height mm	Gross area (AG) m <sup>2</sup>	Power output per collector module									
						G = 1000 W/m <sup>2</sup>									
						Tm-Ta									
						0 K	10 K	30 K	50 K	70 K					
						W	W	W	W	W					
COPERNIC H272.12-N-AR	2,60	2 192	90	1 241	2,72	1 994	1 871	1 618	1 355	1 082					
COPERNIC H272.12-AR	2,60	2 192	90	1 241	2,72	1 994	1 871	1 618	1 355	1 082					
COPERNIC V272.12-N-AR	2,60	1 241	90	2 192	2,72	1 994	1 871	1 618	1 355	1 082					
COPERNIC V272.12-AR	2,60	1 241	90	2 192	2,72	1 994	1 871	1 618	1 355	1 082					
COPERNIC H232.12-N-AR	2,30	1 870	90	1 241	2,32	1 764	1 655	1 431	1 199	957					
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COPERNIC V232.12-N-AR	2,30	1 241	90	1 870	2,32	1 764	1 655	1 431	1 199	957					
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Performance test method						Glazed liquid heating collector - steady state - outdoor									
Performance parameters related to aperture						η <sub>0</sub>	a <sub>1</sub>	a <sub>2</sub>							
Units						-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )							
Test results - Flow rate and fluid see note 1						0,774	4,729	0,005							
Bi-directional incidence angle						No <i>Kθ values are obligatory for 50°.</i>									
Incidence angle modifiers Kθ(θ)						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Incidence angle modifier not bi-directional - leave fields blank						Kθ(θ)					0,97				0,00
Stagnation temperature - Weather conditions see note 2						Tstg	185		°C						
Effective thermal capacity						ceff = C/Ag	8,9		kJ/(m <sup>2</sup> K)						
Max. intended operation temperature - see note 3						Tmax,op	200		°C						
Max. operation pressure - see note 3						pmax,op	600		kPa						
Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m <sup>2</sup> aperture area															
Flow rate	kg/(s m <sup>2</sup> )	0,004	0,006	0,011	0,015	0,019									
Pressure drop, ΔP	Pa	18	41	114	224	370									
Optional weather data						Location	Link								
Testing Laboratory						CSTB/Instituto Giordano									
Website						http://www.cstb.fr / www.giodano.it									
Test report id. number						N° VAL 14-26049352 / N°296464/			Date of test report			24/10/2015 16/07/2012			
During the test GDIF/GTOT was always between						0,1	and	0,2							
Comments of testing laboratory:															
The Company HelioFrance has changed her certification body from ICIM to Eurovent Certita Certification. This certificate is established with the previous results used for the certification of the range COPERNIC H272 / V272 / H232 / V232 (report N°296464).															
Note 1	Flow rate	0,019	kg/(s m <sup>2</sup> )	Fluid	Water										
Note 2	Irradiance, G = 1000 W/m <sup>2</sup> ; Ambient temperature, Ta=30 °C														
Note 3	Given by manufacturer														
						Date sheet version: 4.06/2014-01-15									
EUROVENT CERTITA CERTIFICATION SAS au capital de 100 000 € - 48-50 rue de la Victoire 75009 Paris FRANCE Tel. : 33 (0)1 75 44 71 71 - 513 133 637 RCS Paris - SIRET 513 133 637 000 35 - TVA FR 59513133637															
www.eurovent-certification.com / www.certita.fr															

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	SK-0010
	Issued	26/10/2015

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
COPERNIC H272.12-N-AR	3 275	2 195	1 368	2 383	1 565	948	1 779	1 089	630	1 942	1 179	671
COPERNIC H272.12-AR	3 275	2 195	1 368	2 383	1 565	948	1 779	1 089	630	1 942	1 179	671
COPERNIC V272.12-N-AR	3 275	2 195	1 368	2 383	1 565	948	1 779	1 089	630	1 942	1 179	671
COPERNIC V272.12-AR	3 275	2 195	1 368	2 383	1 565	948	1 779	1 089	630	1 942	1 179	671
COPERNIC H232.12-N-AR	2 898	1 942	1 210	2 108	1 385	839	1 573	963	557	1 718	1 043	593
COPERNIC H232.12-AR	2 898	1 942	1 210	2 108	1 385	839	1 573	963	557	1 718	1 043	593
COPERNIC V232.12-N-AR	2 898	1 942	1 210	2 108	1 385	839	1 573	963	557	1 718	1 043	593
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Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)
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Overview of locations				
Location	Latitude °	Gtot kWh/m <sup>2</sup>	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/m <sup>2</sup>
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>.

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	ScenoCalc version: Ver. 4.06 (Jan, 2014)