TÜVRheinland®
DIN CERTCO

LNEG

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	011-7S2146 F
	Date of issue	08-06-2015

Company holding the licence	INNOSOLAR ENERGY CO., LTD	**Country**	P.R. China
Brand (optional)	Innosolar	**Website**	www.innosolarenergy.com
Street, number	10 Chaoyang Road, Dong Ping Town, Lishui District	**E-mail**	sales@innosolarenergy.com
Postal Code		**Tel.**	
City	Nanjing Jiangsu Province, China	**Fax**	+86 757-86254987

Collector Type (flat plate / evacuate tubular / un-glazed)	Flat plate collector
Integration in the roof possible ?	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (A_G)	Power output per collector unit G = 1000 W/m² Tm-Ta : 0 K	10 K	30 K	50 K	70 K
	[m²]	[mm]	[mm]	[mm]	[m²]	[W]	[W]	[W]	[W]	[W]
FP CU ETA-PLUS	1.86	1 999	1 008	95	2.02	1 404	1 322	1 144	949	735

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0.755	-
	a_{1a}	4.30	W/(m²K)
	a_{2a}	0.012	W/(m²K²)
Stagnation temperature - Weather conditions see note 2	t_{stg}	165	°C
Effective thermal capacity	$c_{eff} = C/A_a$	14.3	kJ/(m²K)
Max. operation pressure - see note 3	p_{max}	1200	kPa

Incidence angle modifiers $K_\theta(\theta)$	G_{DIF}/G_{TOT} min	G_{DIF}/G_{TOT} max	θ_T / θ_L	50°	10°	20°	30°	40°	60°	70°
			$K_\theta(\theta_T)$	0.89	---	---	---	---	---	---
	0.08	0.12	$K_\theta(\theta_L)$	0.89	---	---	---	---	---	---
G_{DIF}/G_{TOT}: min&max - while measuring					*Optional values*					

Testing Laboratory	LNEG
Website	www.lneg.pt
Test report id. number	03.V2/LES/2011, 01.V2/LES/2011
Date of test report	24-09-2013
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory:

Note 1	**Fluid**	Water	**Flow rate**	0.020	kg/s per m²
Note 2	**Irradiance, Gs=1000 W/m²; Ambient temperature , Ta=30 °C**				
Note 3	**Given by manufacturer**				

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Laboratório de Energia Solar

VERSION 3.7, 2012.03.22

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	011-7S2146 F
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Annual collector output kWh

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
FP CU ETA-PLUS	1 994	1 286	746	1 543	965	528	1 071	638	348	1 164	680	361

Collector mounting: Fixed or tracking	No tracking; Slope = latitude - 15° (rounded to nearest 5°)

Overview of locations

Location	Latitude °	Gtot kWh/m²	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/m²
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

Calculation of the annual collector performance is done by the official Solar Keymark spreadsheet tool. Hour by hour the collector output is calculated according to the efficiency parameters from the Keymark test using constant collector operating temperature (Tm). Detailed description with all equations used is available from the Solar Keymark web site (direct link: http://www.estif.org/solarkeymark/annexb1.php)

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Datasheet version:
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Calculation program version:
3.07, October 2011 (SP)