Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7S1948 R
	Date of issue	16.07.2012

Company	Linuo Ritter International, Ltd.	**Country**		China
Brand (optional)		**Website**		www.linuo-ritter-international.com
Street, number	No.30766 East Jingshi Road	**E-mail**		nic@linuo.com
Postal Code	250103	**Tel.**	86	53,188,729,599
City	Jinan, Shanding Province	**Fax**	86	53,188,729,599

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

Collector name	Aperture area (Aa) [m²]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (AG) [m²]	Power output per collector unit G = 1000 W/m², Tm-Ta : 0 K [W]	10 K [W]	30 K [W]	50 K [W]	70 K [W]
CPC 1506*	1.00	1,640	702	101	1.15	642	633	615	595	575
CPC 1509*	1.49	1,640	1,047	101	1.72	957	943	916	887	857
CPC 1512*	1.99	1,640	1,392	101	2.28	1,278	1,260	1,223	1,185	1,145
CPC 1515*	2.50	1,640	1,737	101	2.85	1,605	1,583	1,536	1,488	1,438
CPC 1518*	2.99	1,640	2,082	101	3.41	1,920	1,893	1,838	1,780	1,720

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0.642	-
	a_{1a}	0.885	W/(m²K)
	a_{2a}	0.001	W/(m²K²)
Stagnation temperature - Weather conditions see note 2	t_{stg}	272	°C
Effective thermal capacity	$c_{eff} = C/A_a$	8.416	kJ/(m²K)
Max. operation pressure - see note 3	p_{max}	1000	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°*
			$K_\theta(\theta_T)$	0.99	1.01	1.01	1.02	1.03	1.05	1.10
	-	-	$K_\theta(\theta_L)$	0.89	1.00	0.99	0.97	0.95	0.80	0.65

G_{DIF}/G_{TOT}: min&max - while measuring

Optional values

Testing Laboratory	TZS, ITW University of Stuttgart
Website	www.tzs.uni-stuttgart.de
Test report id. number	06COL513/3OEM16
Date of test report	16.07.2012
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory :

* dimensions according to manufacturer

Note 1	**Fluid**	Water	**Flow rate**	0.017	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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VERSION 3.6, 2012.01.13

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7S1948 R
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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
CPC 1506*	1,089	997	907	1,009	922	837	682	606	539	732	650	577
CPC 1509*	1,623	1,485	1,351	1,503	1,373	1,248	1,017	903	802	1,090	969	860
CPC 1512*	2,168	1,984	1,804	2,008	1,834	1,666	1,358	1,206	1,072	1,456	1,294	1,148
CPC 1515*	2,724	2,492	2,267	2,522	2,304	2,093	1,706	1,516	1,346	1,829	1,625	1,443
CPC 1518*	3,258	2,981	2,711	3,017	2,756	2,504	2,041	1,813	1,610	2,187	1,944	1,725

Collector mounting: Fixed or tracking	Fixed; 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:
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