Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence Number	011-7S2434 R
		Issued	2014-12-17

Company holding the	Ritter XL Solar GmbH		Country	Germany
Brand (optional)			Website	www.ritter-xl-solar.com
Street, street number	Ettlinger Str. 30		E-mail	A.Jandrey@ritter-xl-solar.com
Postal Code / City, province	76307	Karlsbad	Tel/Fax	49 7202 922 146 / 7202 922 125

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Evacuated tubular collector
Thermal / photo voltaic hybid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module 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
XL 19/33 P*	3.00	2 033	1 627	122	3.31	2 061	2 042	1 998	1 947	1 888
XL 15/26 P*	2.33	1 616	1 627	122	2.62	1 601	1 586	1 552	1 512	1 466
XL 15/39 P*	3.49	1 616	2 432	122	3.93	2 398	2 375	2 324	2 264	2 197

Performance test method	Glazed liquid heating collector - steady state - outdoor			
Performance parameters related to aperture	η0	a1	a2	
Units	-	W/(m²K)	W/(m²K²)	
Test results - Flow rate and fluid see note 1	0.687	0.613	0.003	

Bi-directional incidence angle modifiers?	Yes	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θT) transversal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θT)	1.01	1.02	1.02	1.02	0.96	1.06	1.20		0.00
Incidence angle modifiers Kθ(θL) longitudinal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θL)	1.00	0.99	0.97	0.94	0.90	0.86	0.85		0.00

Stagnation temperature - Weather conditions see note 2	Tstg	338	°C
Effective thermal capacity	ceff = C/Ag	8.78	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	200	°C
Max. operation pressure - see note 3	pmax,op	1000	kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area											
Flow rate	kg/(s m²)	-	-	-	-	-	-	-	-	-	-
Pressure drop, ΔP	Pa	-	-	-	-	-	-	-	-	-	-

Optional weather data	Location	-	Link	-
Testing Laboratory	TZS, ITW University Stuttgart			
Website	http://www.itw.uni-stuttgart.de			
Test report id. number	11COL1008/3OEM02, 11COL1007Q/4OEM03	Date of test report	2014.12.17	

During the test GDIF/GTOT was always between	0	and	1

Comments of testing laboratory:

* dimensions according to manufacturer

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

Datasheet version: 4.06, 2014-01-15

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2434 R
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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
XL 19/33 P*	3 547	3 328	3 079	3 141	2 908	2 658	2 259	2 058	1 857	2 417	2 208	1 991
XL 15/26 P*	2 755	2 584	2 391	2 440	2 258	2 065	1 754	1 599	1 442	1 877	1 715	1 546
XL 15/39 P*	4 127	3 871	3 582	3 654	3 383	3 093	2 628	2 395	2 160	2 811	2 568	2 316

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

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)