Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence Number	011-7S2628 R
		Issued	2016-04-07

Company holding the	Solvis GmbH	Country	Deutschland
Brand (optional)		Website	www.solvis.de
Street, street number	Grotrian-Steinweg-Straße 12	E-mail	info@solvis.de
Postal Code / City, province	38112 Braunschweig	Tel/Fax	+49 (0)531 28904-0 / 531 28904-699

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
SolvisLuna LU-304*	2.57	2 033	1 412	122	**2.87**	1 655	1 635	1 586	1 527	1 457

Performance test method	Glazed liquid heating collector - steady state - outdoor									
Performance parameters related to aperture area	η0	a1	a2							
Units	-	W/(m²K)	W/(m²K²)							
Test results - Flow rate and fluid see note 1	0.644	0.749	0.005							

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	1.01	1.02	1.02	0.98	1.05	1.14	0.57	0.00
Incidence angle modifiers Kθ(θL) longitudinal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θL)	1.00	1.00	0.99	0.98	0.95	0.89	0.76	0.38	0.00

Stagnation temperature - Weather conditions see note 2	Tstg	301	°C
Effective thermal capacity	ceff = C/Ag	9.18	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	160	°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 Unsiversity of Stuttgart		
Website	www.itw.uni-stuttgart.de/institut/abteilungen/tzs/		
Test report id. number	14COL1031OEM01, 14COL1032QOEM01	Date of test report	2016.04.07

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	011-7S2628 R
	Issued	07.04.2016

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
SolvisLuna LU-304	2 856	2 619	2 342	2 500	2 247	1 974	1 794	1 583	1 366	1 926	1 703	1 471

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)