Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	**Certificate No.**	**OEM 9965/4/1**
	Date of issue	20/1/2017

Company	FONDERIE SIME SpA	**Country**		Italy
Brand (optional)		**Website**		http://www.sime.it/
Street, number	27, Via Garbo	**E-mail**		info@sime.it
Postal Code	37045	**Tel.**	+039	0442 631111
City	Legnano (VR)	**Fax**	+039	

Collector Type (flat plate / evacuate tubular / un-glazed)	Flat plate collector
Integration in the roof possible ?	Yes

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]
SIMESOL HRZ 182	1,84	1.010	2.010	110	2,03	1.435	1.357	1.175	961	715
SIMESOL HRZ 230	2,32	1.260	2.010	110	2,53	1.810	1.711	1.482	1.212	902

Collector efficiency parameters related to aperture area (Aa) Note 1	η_{0a}	0,78	-
	a_{1a}	4,05	W/(m²K)
	a_{2a}	0,022	W/(m²K²)
Stagnation temperature - Note 2	t_{stg}	159,00	°C
Effective thermal capacity	$c_{eff} = C/A_a$	9,75	kJ/(m²K)
Max. operation pressure - 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°*
	0,12	0,26	$K_\theta(\theta_T)$	0,94	*1,00*	*0,99*	*0,98*	*0,97*	*0,90*	*0,81*
			$K_\theta(\theta_L)$	0,94	*1,00*	*0,99*	*0,98*	*0,97*	*0,90*	*0,81*
G_{DIF}/G_{TOT}: min&max - while measuring					***Optional values***					

Testing Laboratory	Demokritos
Website	www.solar.demokritos.gr
Test report id. number	4065DE5, 4066DQ2, 4068DE4, 4071DE2, 4103DE2, 4104DE2
Date of test report	5/9/2013
Perf. test method	EN 12975-2 6.1.4 (outdoor/außen/extérieu

Comments of testing laboratory :

Example data sheet

Note 1	**Test conditions**	**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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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	OEM 9965/4/1
	Issued	20/1/2017

Annual collector output kWh / Jährliche Kollektor Leistung kWh / Energie annuelle produite par le capteur

	Location and collector temperature (Tm)														
	Athens			Davos			Stockholm			Würzburg					
Collector name	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
SIMESOL HRZ 182	2.278	1.538	894	1.811	1.144	603	1.252	759	397	1.364	819	422			
SIMESOL HRZ 230	2.872	1.939	1.127	2.283	1.442	761	1.579	957	500	1.720	1.033	532			

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:
VERSION 3.4, 30-11-2011
Calculation program version:
3.07 October 2011