Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence Number	011-7S2409 F
		Issued	2014-11-24

Company holding the	Aventa AS	Country	Norway
Brand (optional)		Website	www.aventa.no
Street, street number	Nedre Grønliveien 16	E-mail	mm@aventa.no
Postal Code / City, province	1472 Fjellhamar	Tel/Fax	47 2216 1410 /-

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

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module Gb = 850 W/m²; Gd = 150 W/m² Tm-Ta 0 K	10 K	30 K	50 K	70 K
	m²	mm	mm	mm	**m²**	W	W	W	W	W
Solar collector vertical absorbers	2.14	2 100	1 260	106	**2.65**	1 439	1 315	1 048	755	436
Solar collector horizontal absorbers	2.03	1 225	2 092	107	**2.56**	1 365	1 248	994	716	413

Performance test method	Liquid heating collector - quasi-dynamic - outdoor								
Performance parameters related to aperture area	η0b	c1	c2	c3	c4	c6	Kθd		
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	s/m	-		
Test results - Flow rate and fluid see note 1	0.679	5.649	0.015	0.000	0.000	0.000	0.937		

Bi-directional incidence angle modifiers?	No	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)	0.99	0.98	0.96	0.92	0.85	0.74	0.49	0.25	0.00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	147 °C
Effective thermal capacity	ceff = C/Ag	34.68 kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	95 °C
Max. operation pressure - see note 3	pmax,op	50 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	12COL1121/1, 12COL1122/1, 12COL1122Q/1	Date of test report	2014.11.04	
During the test GDIF/GTOT was always between	0	and	1	

Comments of testing laboratory:

The collector is a custom made collector usually having more than 10 m². The performance test was carried out using small specimen and a smaller volume flow. Due to a much better aperture - absorber ratio for full size collectors and the higher flow rate used a higher thermal performance is expected for actual installations.

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

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2409 F
	Issued	24.11.2014

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
Solar collector vertical absorbers	2 163	1 167	501	1 421	717	263	1 083	518	191	1 199	560	209
Solar collector horizontal absorbers	2 052	1 107	475	1 348	680	250	1 028	491	181	1 138	531	198

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.

DIN CERTCO • Alboinstraße 56 • 12103 Berlin
Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de •
www.dincertco.de

Datasheet version: 4.06, 2014-01-15

ScenoCalc version: Ver. 4.06 (Jan, 2014)