Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence Number	011-7S1271 F
		Issued	2015-04-13

Company holding the	Max Weishaupt GmbH		Country	Deutschland	
Brand (optional)			Website	www.weishaupt.de	
Street, street number			E-mail	fg.eisler@weishaupt.de	
Postal Code / City, province	88475	Schwendi	Tel/Fax	+49	7353 83 380/ 7353 83305

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)	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
WTS-F2 K4	2.33	2 070	1 213	96	2.51	1 897	1 812	1 625	1 416	1 184
WTS-F2 K3*	2.33	1 213	2 070	96	2.51	1 897	1 812	1 625	1 416	1 184

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	0.814	3.527	0.012	

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)	1.00	0.99	0.98	0.97	0.94	0.89	0.78	0.46	0.00
Incidence angle modifier not bi-directional - leave fields blank											

Stagnation temperature - Weather conditions see note 2	Tstg	196 °C
Effective thermal capacity	ceff = C/Ag	8.84 kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	- °C
Max. operation pressure - see note 3	pmax,op	600 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	09COL847OEM01
Date of test report	2010.07.07

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

Comments of testing laboratory:

* dimensions accroding 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

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S1271 F
	Issued	13.04.2015

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
WTS-F2 K4	3 025	2 217	1 509	2 332	1 663	1 097	1 711	1 156	733	1 857	1 250	779
WTS-F2 K3*	3 025	2 217	1 509	2 332	1 663	1 097	1 711	1 156	733	1 857	1 250	779

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)