ICIM S.p.A. a socio unico
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Capitale Soc EUR. 260.000,00 int. versato ed esistente
C.F./P. IVA e Iscriz. Reg. Imprese di Milano n. 12908230159 - R.E.A. n. 1596292

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	**Licence Number**	**102BN/0**
	Issued	2012-06-19

Company holding the	ARISTON THERMO S.p.A.	**Country**	Italy
Brand (optional)		**Website**	www.aristonthermo.com
Street, street number	Viale Aristide Merloni, 45	**E-mail**	info@aristontermo.com
Postal Code / City, province	60044 Fabriano (AN)	**Tel/Fax**	39 0731 871 448 /-448

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

	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
Collector name	m²	mm	mm	mm	**m²**	W	W	W	W	W
ZELIOS VN 2.2	2,01	1.100	1.995	68	**2,20**	1.495	1.428	1.246	1.001	694

Performance test method	Glazed liquid heating collector - steady state - indoor									
Performance parameters related to aperture area	η0	a1	a2							
Units	-	W/(m²K)	W/(m²K²)							
Test results - Flow rate and fluid see note 1	0,744	2,965	0,039							

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)					0,89				0,00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	184 °C
Effective thermal capacity	ceff = C/Ag	24,31 kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	190 °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)	0,003	0,007	0,010	0,013	0,017	0,020	0,023	0,027	0,030	0,033
Pressure drop, ΔP	Pa	14	39	75	123	181	250	331	422	524	638

Optional weather data	Location		Link
Testing Laboratory	Istituto Giordano S.p.A.		
Website	www.giordano.it		
Test report id. number	294264	**Date of test report**	2012/05/10
During the test GDIF/GTOT was always between	0,1	and	0,2

Comments of testing laboratory:

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**				

ISTITUTO GIORDANO S.p.A.
Sede Legale e Amministrativa:
Via G. Rossini, 2 - 47814 BELLARIA (RN)
Cod. Fisc. e P. IVA 00549540409
Distaccamento: Via Erbosa, 70/84 - 47043 GATTEO (FC)

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**	**102BN/0**
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Annual collector output kWh/module

	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
ZELIOS VN 2.2	2.279	1.567	860	1.728	1.085	518	1.274	775	373	1.383	832	395

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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