Summary of annex to Solar KEYMARK Certificate	EN12976-2	SOLAR SYSTEM test results	Licence Number	011-7S3360 A
Annex to Solar KEYMARK Certificate			Issued	2026-10-16

Company	SUNERG SOLAR SRL		Country	ITALY	
Brand (optional)	SUNERG		Website	www.sunergsolar.com	
Street	VIA DONNINI 51		E-mail	info@sunergsolar.com	
Postal Code	6012	CITTA'DI CASTELLO(PG)	Tel. / Fax	+39	758540018

System classification	
Application(s)	Hot water
Solar loop, circulation principle	Thermosyphon
Direct solar loop / heat exchanger	Direct
Open, vented or closed solar loop	Closed
Drain back/down	Drain down
Store location	Outdoor
Store orientation (of main axis)	Horizontal
Type of auxiliary heating (internal back-up heat)	None
If other auxiliary/internal back-up heating, please specifiy:	None
Solar+supplementary OR Solar-only / Solar pre-heat	Solar only / Solar preheat

Collector(s)

Company	-
Keymark lic.no. if available	*None*

Collector name	Per module: Gross Area (Ag)	Gross length	Gross width
	m^2	mm	mm
8tube	1.73	1800	960
12tube	2.59	1800	1440
15tube	3.24	1800	1800
20tube	4.28	1800	2380

Heat store(s)

Company	-
Keymark lic.no. if available	*None*

Store name	Total nominal volume	Gross height	Gross width	Gross depth	Auxiliary heated volume	Electrical aux. heating power
	litres	mm	mm	mm	litres	kW
97L	97	460	1080	460	-	-
144L	144	460	1520	460	-	-
180L	180	460	1850	460	-	-
239L	239	460	2400	460	-	-

Solar loop controller

Keymark lic.no. if available	*None*
Company	NA
Name	NA
Solar loop pump - power range	- W to - W

Solar loop fluid

Recommended/required	No recommend./requirements
Company	NA
Name	NA
Freezing point	- °C

System family overview

Collector name	Number of collectors in each configuration for each store: Store name 97L	144L	180L	239L
8tube	1			
12tube		1		
15tube			1	
20tube				1

Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Website	www.intertek.com.cn
Test report id. number	240613013GZU-001, 240613013GZU-002, 260910200GZU-001
Date of test report	2025/4/25, 2025/4/25, 2026/10/16

Comments of test lab
None

intertek
Stamp Steve Zhu

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Tel: +49 30 7562-1131 ● Fax: +49 30 7562-1141 ● E-Mail: info@dincertco.de ● www.dincertco.de

Summary of	EN12976-2	test results	Certification No.	011-7S3360 A
Annex to Solar KEYMARK Certificate			Issued	2026-10-16

Company	SUNERG SOLAR SRL		Country	ITALY	
Brand (optional)	SUNERG		Website	www.sunergsolar.com	
Street	VIA DONNINI 51		E-mail	info@sunergsolar.com	
Postal Code	6012	CITTA'DI CASTELLO(PG)	Tel. / Fax	+39	758540018

Parameters for systems extrapolation (Annex D)

Collector of measured system		Storage tank of measured system	
A_{ref} [m^2]	-	Volume [l]	144
h_0	-	A_{hx} [m^2]	-
a_1 [W/Km^2]	-	Piping	
a_2 [W/Km^2]	-		
IAM (50º)	-	$U_{loop,p}$	NA

Parameters of system tested (ISO 9459-2)

Name of System Configuration Tested	I-O Diagram Parameters and Tank heat loss coeficient			
	a_1 [$1/m^2$]	a_2 [MJ/K]	a_3 [MJ]	U_s [W/K]
	1.159	0.129	0.561	2.097

Draw-off profiles

	H<16 MJ/m^2	H≥16 MJ/m^2	Mixing Draw-off		H<16 MJ/m^2	H≥16 MJ/m^2	Mixing Draw-off
V/V_{dep}	$f(V/V_{dep})$	$f(V/V_{dep})$	$g(V/V_{dep})$	V/V_{dep}	$f(V/V_{dep})$	$f(V/V_{dep})$	$g(V/V_{dep})$
0.1	10.40	10.15	9.42	1.6	0.95	1.23	0.62
0.2	10.43	10.24	9.41	1.7	0.86	1.11	0.56
0.3	10.42	10.17	9.41	1.8	0.78	1.01	0.50
0.4	10.26	10.12	9.38	1.9	0.70	0.89	0.45
0.5	9.85	9.95	9.29	2.0	0.63	0.83	0.41
0.6	8.98	9.54	9.19	2.1	0.56	0.75	0.37
0.7	7.96	8.22	9.05	2.2	0.49	0.68	0.33
0.8	7.08	4.97	8.77	2.3	0.44	0.61	0.28
0.9	4.95	2.89	7.80	2.4	0.39	0.57	0.27
1.0	2.52	2.29	4.28	2.5	0.35	0.52	0.23
1.1	1.71	2.00	1.61	2.6	0.32	0.47	0.21
1.2	1.48	1.78	1.06	2.7	0.28	0.44	0.18
1.3	1.32	1.62	0.89	2.8	0.24	0.39	0.17
1.4	1.16	1.47	0.78	2.9	0.22	0.35	0.15
1.5	1.06	1.32	0.68	3.0	0.20	0.32	0.08

Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Website	www.intertek.com.cn
Test report id. number	240613013GZU-001, 240613013GZU-002, 260910200GZU-001
Date of test report	2025/4/25, 2025/4/25, 2026/10/16
Test method	ISO 9459-2 (CSTG)

Comments of test lab

No comments

intertek

Steve Zhu

Summary of	EN12976-2	test results	Certification No.	011-7S3360 A
Annex to Solar KEYMARK Certificate			Issued	2026-10-16

Company	SUNERG SOLAR SRL		Country	ITALY	
Brand (optional)	SUNERG		Website	www.sunergsolar.com	
Street	VIA DONNINI 51		E-mail	info@sunergsolar.com	
Postal Code	6012	CITTA'DI CASTELLO(PG)	Tel. / Fax	+39	758540018

System family overview

Collector name	For each storage and collector size, give number of collectors			
	97L	144L	180L	239L
8tube	1			
12tube		1		
15tube			1	
20tube				1

Name of system configuration					HV150		
Collector name	12tube	No. Collectors	1	Storage name	144L		

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh	Daily drawoff 110 l				Daily drawoff 140 l				Daily drawoff 170 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	0	6142	3219	0	52	7798	3965	0	51	9457	4368	0	46
WürzburgDE	0	5882	3254	0	55	7470	4065	0	54	9072	4613	0	51
Davos CH	0	6656	5015	0	75	8467	6037	0	71	10256	6550	0	64
Athens GR	0	4568	3402	0	74	5814	4284	0	74	7042	5205	0	74

Perf. indicators for the table above

Qd,sh	MJ/y	**Not relevant for solar domestic hot water system**
Qd	MJ/y	**Annual heat demand for domestic hot water**
QL	MJ/y	**Annual heat energy delivered by the solar system**
Qpar	MJ/y	**Annual parasitic energy: (electricity for pumps/controllers)**
$f_{sol}=Q_L/Q_d$	-	**Solar fraction**

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1,157	1,230	1,684	1,736
	Ta,ave	7.5	9.0	3.2	18.5
	Tc,ave	8.5	10.0	5.4	17.8
	± ΔTc	6.4	3.0	0.8	7.4

G	kWh/m²	**Annual irradiation South, 45°**
Ta,ave	°C	**Annual average outdoor air temperature**
Tc,ave	°C	**Annual average mains cold water temp.**
ΔTc	K	**Seasonal variation of Tc**
Th	45 °C	**Desired hot water temperature (mixing valve temperature).**

Max. operating press. - collector side	NA	kPa	Max. operating press. - tank side	600	kPa

Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Website	www.intertek.com.cn
Test report id. number	240613013GZU-001, 240613013GZU-002, 260910200GZU-001
Date of test report	2025/4/25, 2025/4/25, 2026/10/16
Test method	ISO 9459-2 (CSTG)

Comments of test lab

No comments

intertek

Steve Zhu

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

Version 4.5, 2017-10-24

Summary of	EN12976-2	test results	Certification No.	011-7S3360 A
Annex to Solar KEYMARK Certificate			Issued	2026-10-16

Company	SUNERG SOLAR SRL		Country	ITALY	
Brand (optional)	SUNERG		Website	www.sunergsolar.com	
Street	VIA DONNINI 51		E-mail	info@sunergsolar.com	
Postal Code	6012	CITTA'DI CASTELLO(PG)	Tel. / Fax	+39	758540018

System family overview

Collector name	For each storage and collector size, give number of collectors			
	97L	144L	180L	239L
8tube	1			
12tube		1		
15tube			1	
20tube				1

Name of system configuration					HV100	
Collector name	8tube	No. Collectors	1	Storage name	97L	

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh	Daily drawoff 80 l				Daily drawoff 110 l				Daily drawoff 140 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	0	4457	2313	0	52	6142	2887	0	47	7798	3112	0	40
WürzburgDE	0	4284	2397	0	56	5882	3043	0	52	7470	3342	0	45
Davos CH	0	4828	3651	0	76	6656	4340	0	65	8467	4513	0	53
Athens GR	0	3316	2502	0	75	4568	3441	0	75	5814	4035	0	69

Perf. indicators for the table above

Qd,sh	MJ/y	**Not relevant for solar domestic hot water system**
Qd	MJ/y	**Annual heat demand for domestic hot water**
QL	MJ/y	**Annual heat energy delivered by the solar system**
Qpar	MJ/y	**Annual parasitic energy: (electricity for pumps/controllers)**
$f_{sol}=Q_L/Q_d$	-	**Solar fraction**

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1,157	1,230	1,684	1,736
	Ta,ave	7.5	9.0	3.2	18.5
	Tc,ave	8.5	10.0	5.4	17.8
	± ΔTc	6.4	3.0	0.8	7.4

G	kWh/m²	**Annual irradiation South, 45°**
Ta,ave	°C	**Annual average outdoor air temperature**
Tc,ave	°C	**Annual average mains cold water temp.**
ΔTc	K	**Seasonal variation of Tc**
Th	45 °C	**Desired hot water temperature (mixing valve temperature).**

Max. operating press. - collector side	NA	kPa	Max. operating press. - tank side	600	kPa

Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Website	www.intertek.com.cn
Test report id. number	240613013GZU-001, 240613013GZU-002, 260910200GZU-001
Date of test report	2025/4/25, 2025/4/25, 2026/10/16
Test method	ISO 9459-2 (CSTG)

Comments of test lab

No comments

intertek

Steve Zhu

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

Version 4.5, 2017-10-24

Summary of	EN12976-2	test results	Certification No.	011-7S3360 A
Annex to Solar KEYMARK Certificate			Issued	2026-10-16

Company	SUNERG SOLAR SRL		Country	ITALY	
Brand (optional)	SUNERG		Website	www.sunergsolar.com	
Street	VIA DONNINI 51		E-mail	info@sunergsolar.com	
Postal Code	6012	CITTA'DI CASTELLO(PG)	Tel. / Fax	+39	758540018

System family overview

Collector name	For each storage and collector size, give number of collectors			
	97L	144L	180L	239L
8tube	1			
12tube		1		
15tube			1	
20tube				1

Name of system configuration					HV200
Collector name	15tube	No. Collectors	1	Storage name	180L

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh	Daily drawoff 140 l				Daily drawoff 170 l				Daily drawoff 200 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	0	7798	4047	0	52	9457	4864	0	51	11138	5353	0	48
WürzburgDE	0	7470	4152	0	56	9072	4978	0	55	10685	5643	0	53
Davos CH	0	8467	6317	0	75	10256	7454	0	73	12082	8071	0	67
Athens GR	0	5814	4299	0	74	7042	5222	0	74	8298	6309	0	76

Perf. indicators for the table above

Qd,sh	MJ/y	**Not relevant for solar domestic hot water system**
Qd	MJ/y	**Annual heat demand for domestic hot water**
QL	MJ/y	**Annual heat energy delivered by the solar system**
Qpar	MJ/y	**Annual parasitic energy: (electricity for pumps/controllers)**
$f_{sol}=Q_L/Q_d$	-	**Solar fraction**

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1,157	1,230	1,684	1,736
	Ta,ave	7.5	9.0	3.2	18.5
	Tc,ave	8.5	10.0	5.4	17.8
	± ΔTc	6.4	3.0	0.8	7.4

G	kWh/m²	**Annual irradiation South, 45°**
Ta,ave	°C	**Annual average outdoor air temperature**
Tc,ave	°C	**Annual average mains cold water temp.**
ΔTc	K	**Seasonal variation of Tc**
Th	45 °C	**Desired hot water temperature (mixing valve temperature).**

Max. operating press. - collector side	NA	kPa	Max. operating press. - tank side	600	kPa

Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Website	www.intertek.com.cn
Test report id. number	240613013GZU-001, 240613013GZU-002, 260910200GZU-001
Date of test report	2025/4/25, 2025/4/25, 2026/10/16
Test method	ISO 9459-2 (CSTG)

Comments of test lab

No comments

intertek

Steve Zhu

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

Version 4.5, 2017-10-24

Summary of	EN12976-2	test results	Certification No.	011-7S3360 A
Annex to Solar KEYMARK Certificate			Issued	2026-10-16

Company	SUNERG SOLAR SRL	Country	ITALY
Brand (optional)	SUNERG	Website	www.sunergsolar.com
Street	VIA DONNINI 51	E-mail	info@sunergsolar.com
Postal Code	6012 CITTA'DI CASTELLO(PG)	Tel. / Fax	+39 758540018

System family overview

Collector name	For each storage and collector size, give number of collectors			
	97L	144L	180L	239L
8tube	1			
12tube		1		
15tube			1	
20tube				1

Name of system configuration					HV300	
Collector name	20tube	No. Collectors	1	Storage name	239L	

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh	Daily drawoff 200 l				Daily drawoff 250 l				Daily drawoff 300 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	0	11138	5814	0	52	13914	6869	0	49	16697	7465	0	45
WürzburgDE	0	10685	5979	0	56	13356	7233	0	54	16027	7957	0	50
Davos CH	0	12082	9119	0	75	15098	10449	0	69	18137	11067	0	61
Athens GR	0	8298	6262	0	75	10382	7870	0	76	12452	9030	0	73

Perf. indicators for the table above

Qd,sh	MJ/y	**Not relevant for solar domestic hot water system**
Qd	MJ/y	**Annual heat demand for domestic hot water**
QL	MJ/y	**Annual heat energy delivered by the solar system**
Qpar	MJ/y	**Annual parasitic energy: (electricity for pumps/controllers)**
$f_{sol}=Q_L/Q_d$	-	**Solar fraction**

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1,157	1,230	1,684	1,736
	Ta,ave	7.5	9.0	3.2	18.5
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	± ΔTc	6.4	3.0	0.8	7.4

G	kWh/m²	**Annual irradiation South, 45°**
Ta,ave	°C	**Annual average outdoor air temperature**
Tc,ave	°C	**Annual average mains cold water temp.**
ΔTc	K	**Seasonal variation of Tc**
Th	45 °C	**Desired hot water temperature (mixing valve temperature).**

Max. operating press. - collector side	NA	kPa	Max. operating press. - tank side	600	kPa

Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
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Test report id. number	240613013GZU-001, 240613013GZU-002, 260910200GZU-001
Date of test report	2025/4/25, 2025/4/25, 2026/10/16
Test method	ISO 9459-2 (CSTG)

Comments of test lab

No comments

intertek

Steve Zhu

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Version 4.5, 2017-10-24