

# CERTIFICATE

**Certificate holder** **Immergas S.p.A.**  
**Via Cisa Ligure 95**  
**42041 Brescello RE**  
**ITALY**

**Production facility** Aspropyrgos

**Product** Thermal solar systems

**Type, Model** NATURAL SOL 150 V2, NATURAL SOL 200 V2, NATURAL SOL 280 V2

**Testing basis** DIN EN 12976-1:2017-04  
DIN EN 12976-2:2017-04  
Specific CEN Keymark Scheme Rules for Solar Thermal Products Version 31 (2018-03)

**Mark of conformity**



**Registration No.** 011-7S2657 A

**Valid until** 2023-06-30

**Nutzungsrecht** This certificate entitles the holder to use the mark of conformity shown above in conjunction with the specified registration number.

See annex for further information.



2018-06-25 *S.S*  
Dipl.-Wi.-Ing. (FH) Sören Scholz  
Head of Certification Body



# ANNEX

**Certificate** 011-7S2657 A dated 2018-06-25

**Technical Data** see data sheet, part of the test report of 2016-06-20

1. System variant(s):

Designation	Tank	Collector (Registration No.: 011-7S494 F)
SV 160	160 l	1 ARIS 2004
SV 200	200 l	1 ARIS 2004
SV 300	300 l	2 ARIS 2004

2. Note(s):

- The freeze resistance test according to DIN EN ISO 9806, clause 15 was not necessary. According to the manufacturer's declaration, the certified solar collectors may be used in frost exposed areas only in combination with appropriate frost protection mixtures or with appropriate frost protection controller.

**Testing laboratory/  
Inspection body** Institut für Solartechnik SPF  
Hochschule für Technik  
Rapperswil  
Oberseestraße 10  
8640 Rapperswil  
SWITZERLAND

**Test report(s)** S248QPEN, S249EN dated 2018-06-20









<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>011-7S2657 A</b>						
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		<b>2018-06-21</b>						
<b>Company</b>		IMMERGAS S.p.A.			<b>Country</b>		Italy						
<b>Brand (optional)</b>		--			<b>Website</b>		www.immergas.com						
<b>Street</b>		Via Cisa Ligure 95			<b>E-mail</b>		sales-export@immergas.com						
<b>Postal Code</b>		IT-42041	Brescello		<b>Tel. / Fax</b>		+39 522 689 450/178						
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SV160		SV200		SV300								
ARIS2004	1		1		2								
<b>Name of system configuration</b>													
Collector name					ARIS2004		No. Collectors		1				
					Storage name		SV160						
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh	Daily drawoff   140				Daily drawoff   170				Daily drawoff   200			
		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	%
Stockholm SE	--	7821	3386	--	43	9492	3664	--	39	11164	3829	--	34
WürzburgDE	--	7506	3543	--	47	9114	3892	--	43	10691	4084	--	38
Davos CH	--	8483	4954	--	58	10281	5315	--	52	12110	5534	--	46
Athens GR	--	5834	4451	--	76	7064	5015	--	71	8326	5487	--	66
<b>Perf. indicators for the table above</b>													
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 <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1'157	1'230	1'684	1'736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>			300	kPa	<b>Max. operating press. - tank side</b>			1'000	kPa				
<b>Testing Laboratory</b>					Institut für Solartechnik SPF, CH-8640 Rapperswil								
<b>Website</b>					www.spf.ch								
<b>Test report id. number</b>					S248QPEN; S249EN								
<b>Date of test report</b>					2018-06-20								
<b>Test method</b>					ISO 9459-5 (DST)								
<b>Comments of test lab</b>													
The SPF test number for the system subtype NATURAL SOL 150 V2 is S249 ST1. The annual performance for the system subtype was calculated according to the Specific CEN Keymark Scheme Rules for system families.													





Summary of	EN12976-2	test results	Certification No.	011-7S2657 A									
Annex to Solar KEYMARK Certificate			Issued	2018-06-21									
Company	IMMERGAS S.p.A.		Country	Italy									
Brand (optional)	--		Website	www.immergas.com									
Street	Via Cisa Ligure 95		E-mail	sales-export@immergas.com									
Postal Code	IT-42041	Brescello	Tel. / Fax	+39 522 689 450/178									
<b>System family overview</b>													
For each storage and collector size, give number of collectors													
Collector name	SV160	SV200	SV300										
ARIS2004	1	1	2										
Name of system configuration													
			NATURAL SOL 200 V2										
Collector name	ARIS2004	No. Collectors	1	Storage name									
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh MJ/y	Daily drawoff 170				Daily drawoff 200				Daily drawoff 250			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	--	9492	3626	--	38	11164	3851	--	35	13939	4056	--	29
WürzburgDE	--	9114	3855	--	42	10691	4105	--	38	13371	4359	--	33
Davos CH	--	10281	5223	--	51	12110	5522	--	46	15137	5813	--	38
Athens GR	--	7064	4980	--	71	8326	5503	--	66	10407	6088	--	59
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	300	kPa	Max. operating press. - tank side	1'000	kPa								
Testing Laboratory	Institut für Solartechnik SPF, CH-8640 Rapperswil												
Website	www.spf.ch												
Test report id. number	S248QPEN; S249EN												
Date of test report	2018-06-20												
Test method	ISO 9459-5 (DST)												
Comments of test lab													
The SPF test number for the system subtype NATURAL SOL 200 V2 is S249 ST3. The annual performance for the system subtype was calculated according to the Specific CEN Keymark Scheme Rules for system families.													
 													



<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>011-7S2657 A</b>						
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<b>Postal Code</b>		IT-42041	Brescello		<b>Tel. / Fax</b>		+39 522 689 450/178						
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SV160		SV200		SV300								
ARIS2004	1		1		2								
<b>Name of system configuration</b>													
						NATURAL SOL 280 V2							
<b>Collector name</b>	ARIS2004		<b>No. Collectors</b>		2		<b>Storage name</b>		SV300				
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Q<sub>d,sh</sub></b> MJ/y	<b>Daily drawoff 250  </b>				<b>Daily drawoff 300  </b>				<b>Daily drawoff 400  </b>			
		<b>Q<sub>d,hw</sub></b> MJ/y	<b>Q<sub>L</sub></b> MJ/y	<b>Q<sub>par</sub></b> MJ/y	<b>f<sub>sol</sub></b> %	<b>Q<sub>d,hw</sub></b> MJ/y	<b>Q<sub>L</sub></b> MJ/y	<b>Q<sub>par</sub></b> MJ/y	<b>f<sub>sol</sub></b> %	<b>Q<sub>d,hw</sub></b> MJ/y	<b>Q<sub>L</sub></b> MJ/y	<b>Q<sub>par</sub></b> MJ/y	<b>f<sub>sol</sub></b> %
Stockholm SE	--	13939	6760	--	49	16746	7335	--	44	22327	7882	--	35
Würzburg DE	--	13371	6940	--	52	16052	7641	--	48	21413	8330	--	39
Davos CH	--	15137	9915	--	66	18165	10645	--	59	24220	11238	--	46
Athens GR	--	10407	8481	--	82	12488	9529	--	76	16651	12073	--	73
<b>Perf. indicators for the table above</b>													
<b>Q<sub>d,sh</sub></b>	MJ/y	Not relevant for solar domestic hot water system											
<b>Q<sub>d</sub></b>	MJ/y	Annual heat demand for domestic hot water											
<b>Q<sub>L</sub></b>	MJ/y	Annual heat energy delivered by the solar system											
<b>Q<sub>par</sub></b>	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
<b>f<sub>sol</sub>=Q<sub>L</sub>/Q<sub>d</sub></b>	-	Solar fraction											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	<b>G</b>	1'157	1'230	1'684	1'736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
<b>T<sub>a,ave</sub></b>	°C	Annual average outdoor air temperature											
<b>T<sub>c,ave</sub></b>	°C	Annual average mains cold water temp.											
<b>ΔT<sub>c</sub></b>	K	Seasonal variation of T <sub>c</sub>											
<b>Th</b>	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>				300	kPa	<b>Max. operating press. - tank side</b>				1'000	kPa		
<b>Testing Laboratory</b>				Institut für Solartechnik SPF, CH-8640 Rapperswil									
<b>Website</b>				www.spf.ch									
<b>Test report id. number</b>				S248QPEN; S249EN									
<b>Date of test report</b>				2018-06-20									
<b>Test method</b>				ISO 9459-5 (DST)									
<b>Comments of test lab</b>													
NATURAL SOL 280 V2 was tested as the "medium" subtype under SPF Test Number S249.													

