

Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration No. Registernummer Num. d'enregistrement Date / Datum / Date	OEM 9965/12/1 10/8/2022
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Company / Firma / Société	BSG CALDAIE A GAS S.P.A.	Country/Land/Pays	Italy
Street / Straße / Rue	Via Pravalton 1/B	Website	
Postal Code, Place / PLZ, Ort / Code postal, Place	33170 Pordenone	E-mail	supportotecnico@bsgcaldiae.it
		Tel. / Fax	+039 434.238.341

System classification / G / F	
Flow principle / G / F	Thermosyphon / G / F
Direct / indirect / G / F	Direct / G / F
Press. principle / G / F	Closed / G / F
Drain back/down / G / F	No drain (always filled) / G / F
Storage location / G / F	Outdoor / G / F
Storage position / G / F	Horizontal / G / F
Int. back-up / G / F	None / G / F
If other: / G / F	English / Deutsch / Français
EN12976 type / G / F	Solar only / G / F

Collector(s) / Kollektor(en) / Capteur(s)					Storage(s) / Akkumulator(en) / F						
Company / Hersteller / Manufactuer Keymark reg. no. (optional)					Company / Hersteller / Manufactuer						
BSG CALDAIE A GAS S.P.A. OEM 9965/9/1					BSG CALDAIE A GAS S.P.A.						
Model Bezeichnung Modèle	Per module / G / F				No. modules G F min - max	Model Bezeichnung Modèle	Total volume G F litres	Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors tout	Gross length Länge (Außenmaß) longueur hors tout	Back-up heated volume G F litres	El. back-up power G F kW
	Aperture area (Aa) Aperturfläche (Aa) Superficie d'entrée (Aa)	Gross length Länge (Außenmaß) Longueur Hors tout	Gross width Breite (Außenmaß) Largeur hors Tout								
	m ²	m	m								
15 SOL BLACK	1,4	1,53	1,03	1 - 1	120 BLACK	115	580	782	~	0 - 4	
20 SOL BLACK	1,88	2,03	1,03	1 - 1	160 BLACK	150	580	1053	~	0 - 4	
26 SOL BLACK	2,37	2,03	1,28	1 - 1	200 BLACK	190	580	1312	~	0 - 4	
					300 BLACK	290	580	1980	~	1 - 4	
					320 BLACK	310	580	2072	~	0 - 4	

Controller / G / F		Fluid / G / F	
Company/Hersteller/Manufacteur		Company/Hersteller/Manufacteur	
Model / Bezeichnung / Modèle		Model / Bezeichnung / Modèle Propylene glycol solution	
Functions G F	English Deutsch Français	Freezing point G F	-6 to 10 °C

System family overview / G / F					
Collector G F	No. collectors / G / F				
	Storage / G / F				
	120 BLACK	160 BLACK	200 BLACK	300 BLACK	320 BLACK
15 SOL BLACK	1	2	2		
20 SOL BLACK	1	1	2	2	2 3
26 SOL BLACK		1	1	2	
0					
0					

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtsnummer / F	6029 DE4, 6034 DE4, 6034 F7
Date of test report / Datum G / date F	20/8/2018, 30/8/2018

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	Stamp & signature of test lab
English Deutsch Français	

**Summary of EN 12976 Test Results,
annex to Solar KEYMARK Certificate**

Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar
KEYMARK

Registration

Registernummer
Num. d'enregistrement

OEM 9965/12/1

Date / Datum / Date

10/8/2022

Company / Firma / Société	BSG CALDAIE A GAS S.P.A.	Country/Land/Pays	Italy
Street / Straße / Rue	Via Pravalton 1/B	Website	0
Postal Code, Place / PLZ, Ort / Code postal, Place	33170 Pordenone	E-mail	supportotecnico@bsgcaldaie.it
		Tel. / Fax	+039 434.238.341

System family overview / G / F

Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK					
15 SOL BLACK	1			2			2											
20 SOL BLACK		1			1			2			2			2	3			
26 SOL BLACK					1			1			2							

Name of system configuration / G / F CN BLACK 120/1.5

Collector type	15 SOL BLACK	No. collectors	1	Storage type	120 BLACK
G		G		G	
F		F		F	

Calculated annual results / G / F

Location G F	Daily draw-off litres/day / G / F /																	
	80			110			140			80			110			140		
	l/d			l/d			l/d			l/d			l/d			l/d		
	Q _d kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	1.244	1.708	2.172	583	671	714	46,8	39,3	32,9									
Würzburg, DE	1.191	1.638	2.085	601	704	759	50,5	43,0	36,4									
Davos, CH	1.349	1.848	2.356	857	972	1.025	63,5	52,6	43,5									
Athens, GR	929	1.270	1.621	743	911	1.034	80,0	71,7	63,8									

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Q _d ; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions G F	Stockholm SE					Würzburg DE					Davos CH					Athens GR					
	G	1.156					1.226					1.682					1.717				
	G	7,5					9,0					3,2					18,5				
	F	8,5					10,0					5,4					17,8				
	F	ΔT _c 2.1 - 14.9					7.0 - 13.0					4.6 - 6.2					10.4 - 25.2				

G	kWh/m ²	Annual irradiation South, 45° / G / F
T _a	°C	Annual mean air temp. / G / F
T _c	°C	Annual mean cold water temp. / G / F
ΔT _c	°C	Seasonal variation of T _c / G / F
T _h	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side	300	kPa	Max. operating press. - tank side	1.000	kPa
G			G		
F			F		

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Date of test report / G / F	20/8/2018, 30/8/2018
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
English Deutsch Français	



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System family overview / G / F																		
Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK					
15 SOL BLACK	1			2			2			2			2			2	3	
20 SOL BLACK		1		1			2			2			2			2	3	
26 SOL BLACK				1			1			2			2			2	3	

Name of system konfiguration / G / F											CN BLACK 120/2	
Collector type G F	20 SOL BLACK	No. collectors G F	1	Storage type G F	120 BLACK							

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F /																	
	80			110			140			80			110			140		
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d			
	Qd kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	1.244	1.708	2.172	711	854	937	57,4	50,1	43,2									
Würzburg, DE	1.191	1.638	2.085	696	847	946	58,5	51,8	45,3									
Davos, CH	1.349	1.848	2.356	990	1.165	1.261	73,7	63,1	53,7									
Athens, GR	929	1.270	1.621	837	1.069	1.253	90,5	84,3	77,6									

Perf. indicators G F	Q_d	Heat demand / G / F
	Q_L	System output / G / F
	f_{sol}	QL/Qd; solar fraction / G / F
	Q_{par}	Elec. for pumps/controllers / G / F

Ref. conditions G G F	Stockholm SE	Würzburg DE	Davos CH	Athens GR	
	G	1.156	1.226	1.682	1.717
	T _a	7,5	9,0	3,2	18,5
	T _c	8,5	10,0	5,4	17,8
	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2
G	kWh/m ²	Annual irradiation South, 45° / G / F			
T _a	°C	Annual mean air temp. / G / F			
T _c	°C	Annual mean cold water temp. / G / F			
ΔT _c	°C	Seasonal variation of T_c / G / F			
T _h	45°C	Desired (mix. valve) temp. / G / F			

Max. operating press. - collector side G F	300	kPa	Max. operating press. - tank side G F	1.000	kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Francais	Stamp & signature of test lab
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System family overview / G / F																		
Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK					
15 SOL BLACK	1			2			2											
20 SOL BLACK		1			1			2			2				2	3		
26 SOL BLACK						1			1			2						

Name of system konfiguration / G / F												CN BLACK 160-1		
Collector type G F	20 SOL BLACK			No. collectors G F	1			Storage type G F	160 BLACK					

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F /																	
	110			140			170			110			140			170		
	l/d			l/d			l/d			l/d			l/d			l/d		
	Qd kWh/y			QL kWh/y			fsol %			Qpar kWh/y								
Stockholm, SE	1.708	2.172	2.637	870	972	1.042	51,0	44,8	39,5									
Würzburg, DE	1.638	2.085	2.532	863	972	1.051	52,7	46,9	41,5									
Davos, CH	1.848	2.356	2.856	1.191	1.314	1.384	64,4	55,7	48,4									
Athens, GR	1.270	1.621	1.962	1.077	1.279	1.428	85,0	79,1	72,8									
Perf. indicators G F	Qd	Heat demand / G / F																
	QL	System output / G / F																
	fsol	QL/Qd; solar fraction / G / F																
	Qpar	Elec. for pumps/controllers / G / F																

Ref. conditions G F	Stockholm SE					Würzburg DE					Davos CH					Athens GR					
	G	1.156					1.226					1.682					1.717				
	Ta	7,5					9,0					3,2					18,5				
	Tc	8,5					10,0					5,4					17,8				
	ΔTc	2.1 - 14.9					7.0 - 13.0					4.6 - 6.2					10.4 - 25.2				
G	kWh/m ²	Annual irradiation South, 45° / G / F																			
Ta	°C	Annual mean air temp. / G / F																			
Tc	°C	Annual mean cold water temp. / G / F																			
ΔTc	°C	Seasonal variation of Tc / G / F																			
Th	45°C	Desired (mix. valve) temp. / G / F																			

Max. operating press. - collector side G F	300 kPa			Max. operating press. - tank side G F	1.000 kPa		
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	6029 DE4, 6034 DE4, 6034 F7
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	Stamp & signature of test lab
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System family overview / G / F																		
Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK					
15 SOL BLACK	1			2			2			2			2			2	3	
20 SOL BLACK	1			1			2			2								
26 SOL BLACK				1			1			2								

Name of system configuration / G / F Collector type G F											CN BLACK 160/2.6		
26 SOL BLACK			No. collectors G F			1			Storage type G F			160 BLACK	

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F /																	
	110			140			170			110			140			170		
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Q _d kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	1.708	2.172	2.637	972	1.121	1.226	57,1	51,7	46,5									
Würzburg, DE	1.638	2.085	2.532	955	1.113	1.235	58,3	53,5	48,8									
Davos, CH	1.848	2.356	2.856	1.358	1.551	1.682	73,5	66,0	58,7									
Athens, GR	1.270	1.621	1.962	1.148	1.393	1.603	90,5	86,1	81,5									

Perf. indicators G F	Q _d	Heat demand / G / F										
	Q _L	System output / G / F										
	f _{sol}	QL/Q_d; solar fraction / G / F										
	Q _{par}	Elec. for pumps/controllers / G / F										

Ref. conditions G F		Stockholm SE	Würzburg DE	Davos CH	Athens GR			
	G	1.156	1.226	1.682	1.717			
	T _a	7,5	9,0	3,2	18,5			
	T _c	8,5	10,0	5,4	17,8			
	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2			
G	kWh/m ²	Annual irradiation South, 45° / G / F						
T _a	°C	Annual mean air temp. / G / F						
T _c	°C	Annual mean cold water temp. / G / F						
ΔT _c	°C	Seasonal variation of T_c / G / F						
T _h	45°C	Desired (mix. valve) temp. / G / F						

Max. operating press. - collector side G F	300 kPa	Max. operating press. - tank side G F	1.000 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6029 DE4, 6034 DE4, 6034 F7 20/8/2018, 30/8/2018 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	Stamp & signature of test lab
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System family overview / G / F					
Collector type	Number of collectors / G / F				
	Storage type / G / F				
	120 BLACK	160 BLACK	200 BLACK	300 BLACK	320 BLACK
G					
F					
15 SOL BLACK	1	2	2		
20 SOL BLACK	1	1	2	2	2 3
26 SOL BLACK		1	1	2	

Name of system configuration / G / F				CN BLACK 160/3	
Collector type G F	15 SOL BLACK	No. collectors G F	2	Storage type G F	160 BLACK

Calculated annual results / G / F												
Location	Daily draw-off litres/day / G / F /											
	110	140	170	110	140	170	110	140	170	110	140	170
	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	1.708	2.172	2.637	1.016	1.174	1.288	59,3	54,2	49,0			
Würzburg, DE	1.638	2.085	2.532	990	1.156	1.288	60,3	55,4	50,8			
Davos, CH	1.848	2.356	2.856	1.419	1.629	1.770	76,6	69,0	61,8			
Athens, GR	1.270	1.621	1.962	1.165	1.419	1.638	92,0	87,9	83,4			

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	Q_L/Q_d; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions	Stockholm SE				Würzburg DE				Davos CH				Athens GR			
	G	F	G	F	G	F	G	F	G	F	G	F	G	F		
G	1.156		1.226		1.682		1.717									
G	7,5		9,0		3,2		18,5									
F	T _c	8,5		10,0		5,4		17,8								
F	ΔT _c	2.1 - 14.9		7.0 - 13.0		4.6 - 6.2		10.4 - 25.2								
G	kWh/m ²	Annual irradiation South, 45° / G / F														
T _a	°C	Annual mean air temp. / G / F														
T _c	°C	Annual mean cold water temp. / G / F														
ΔT _c	°C	Seasonal variation of T_c / G / F														
T _h	45°C	Desired (mix. valve) temp. / G / F														

Max. operating press. - collector side G F	300 kPa	Max. operating press. - tank side G F	1.000 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6029 DE4, 6034 DE4, 6034 F7 20/8/2018, 30/8/2018 ISO 9459-5 (DST)
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System family overview / G / F					
Collector type	Number of collectors / G / F				
	Storage type / G / F				
	120 BLACK	160 BLACK	200 BLACK	300 BLACK	320 BLACK
G					
F					
15 SOL BLACK	1	2	2		
20 SOL BLACK	1	1	2	2	2 3
26 SOL BLACK		1	1	2	

Name of system configuration / G / F Collector type G F				26 SOL BLACK No. collectors G F	1 Storage type G F	CN BLACK 200-1 200 BLACK
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Calculated annual results / G / F																					
Location	Daily draw-off litres/day / G / F /									Q _d kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y		
	170	200	250	170	200	250	170	200	250	170	200	250	170	200	250	170	200	250			
	l/d			l/d			l/d			l/d			l/d			l/d			l/d		
Stockholm, SE	2.637	3.101	3.881	1.060	1.121	1.174	40,3	36,0	30,3												
Würzburg, DE	2.532	2.970	3.714	1.069	1.130	1.183	42,4	37,9	31,9												
Davos, CH	2.856	3.364	4.205	1.402	1.463	1.515	49,1	43,5	36,1												
Athens, GR	1.962	2.313	2.891	1.445	1.568	1.664	73,7	67,7	57,7												

Perf. indicators G F		Q _d Heat demand / G / F Q _L System output / G / F f _{sol} QL/Q _d ; solar fraction / G / F Q _{par} Elec. for pumps/controllers / G / F
Ref. conditions G G F		Stockholm SE Würzburg DE Davos CH Athens GR G 1.156 1.226 1.682 1.717 Ta 7,5 9,0 3,2 18,5 Tc 8,5 10,0 5,4 17,8 ΔTc 2.1 - 14.9 7.0 - 13.0 4.6 - 6.2 10.4 - 25.2
G	kWh/m ²	Annual irradiation South, 45° / G / F
Ta	°C	Annual mean air temp. / G / F
Tc	°C	Annual mean cold water temp. / G / F
ΔTc	°C	Seasonal variation of Tc / G / F
Th	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side G F	300 kPa	Max. operating press. - tank side G F	1.000 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6029 DE4, 6034 DE4, 6034 F7 20/8/2018, 30/8/2018 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	Stamp & signature of test lab
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**Summary of EN 12976 Test Results,
annex to Solar KEYMARK Certificate**

Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar
KEYMARK

Registration

Registernummer
Num. d'enregistrement

OEM 9965/12/1

Date / Datum / Date

10/8/2022

Company / Firma / Société

BSG CALDAIE A GAS S.P.A.

Country/Land/Pays

Italy

Street / Straße / Rue

Via Pravalton 1/B

Website

0

Postal Code, Place / PLZ, Ort / Code
postal, Place

33170 Pordenone

E-mail

supportotecnico@bsgcaldaie.it

Tel. / Fax

+039 434.238.341

System family overview / G / F

Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK					
15 SOL BLACK	1			2			2											
20 SOL BLACK	1			1			2			2			2	3				
26 SOL BLACK				1			1			2								

Name of system configuration / G / F

CN BLACK 200/3

Collector type

15 SOL BLACK

No. collectors

2

Storage type

200 BLACK

G
F

G
F

G
F

Calculated annual results / G / F

Location G F	Daily draw-off litres/day / G / F /																	
	170			200			250			170			200			250		
	l/d			l/d			l/d			l/d			l/d			l/d		
	Q _d kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	2.637	3.101	3.881	1.323	1.419	1.515	50,3	45,8	39,1									
Würzburg, DE	2.532	2.970	3.714	1.314	1.419	1.533	52,0	47,8	41,2									
Davos, CH	2.856	3.364	4.205	1.813	1.927	2.032	63,4	57,2	48,3									
Athens, GR	1.962	2.313	2.891	1.656	1.857	2.094	84,5	80,3	72,6									

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Q _d ; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions G F	Stockholm SE					Würzburg DE					Davos CH					Athens GR					
	G	1.156					1.226					1.682					1.717				
	G	7,5					9,0					3,2					18,5				
	F	8,5					10,0					5,4					17,8				
	F	ΔT _c 2.1 - 14.9					7.0 - 13.0					4.6 - 6.2					10.4 - 25.2				

G	kWh/m ²	Annual irradiation South, 45° / G / F
T _a	°C	Annual mean air temp. / G / F
T _c	°C	Annual mean cold water temp. / G / F
ΔT _c	°C	Seasonal variation of T _c / G / F
Th	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side

300 kPa

Max. operating press. - tank side

1.000 kPa

G
F

G
F

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais

NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB

Website

www.solar.demokritos.gr

Test report id. number / Prüberichtnummer / F

6029 DE4, 6034 DE4, 6034 F7

Date of test report / G / F

20/8/2018, 30/8/2018

Test method / G / F

ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire

English
Deutsch
Français

Stamp & signature of test lab



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration Registernummer Num. d'enregistrement	OEM 9965/12/1
	Date / Datum / Date	10/8/2022

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	BSG CALDAIE A GAS S.P.A. Via Pravolton 1/B 33170 Pordenone	Country/Land/Pays Website E-mail Tel. / Fax	Italy 0 supportotecnico@bsgcaldaie.it +039 434.238.341
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System family overview / G / F					
Collector type	Number of collectors / G / F				
	Storage type / G / F				
	120 BLACK	160 BLACK	200 BLACK	300 BLACK	320 BLACK
G					
F					
15 SOL BLACK	1	2	2		
20 SOL BLACK	1	1	2	2	2 3
26 SOL BLACK		1	1	2	

Name of system configuration / G / F Collector type G F				20 SOL BLACK No. collectors G F	2 Storage type G F	CN BLACK 200-2 200 BLACK
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Calculated annual results / G / F												
Location	Daily draw-off litres/day / G / F /											
	170	200	250	170	200	250	170	200	250	170	200	250
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	2.637	3.101	3.881	1.323	1.419	1.515	50,3	45,8	39,1			
Würzburg, DE	2.532	2.970	3.714	1.314	1.419	1.533	52,0	47,8	41,2			
Davos, CH	2.856	3.364	4.205	1.813	1.927	2.032	63,4	57,2	48,3			
Athens, GR	1.962	2.313	2.891	1.656	1.857	2.094	84,5	80,3	72,6			

Perf. indicators G F	Q _d	Heat demand / G / F										
	Q _L	System output / G / F										
	f _{sol}	Q _L /Q _d ; solar fraction / G / F										
	Q _{par}	Elec. for pumps/controllers / G / F										

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1.156	1.226	1.682	1.717
G	T _a	7,5	9,0	3,2	18,5
F	T _c	8,5	10,0	5,4	17,8
	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2

G	kWh/m ²	Annual irradiation South, 45° / G / F										
T _a	°C	Annual mean air temp. / G / F										
T _c	°C	Annual mean cold water temp. / G / F										
ΔT _c	°C	Seasonal variation of T _c / G / F										
T _h	45°C	Desired (mix. valve) temp. / G / F										

Max. operating press. - collector side G F	300 kPa	Max. operating press. - tank side G F	1.000 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6029 DE4, 6034 DE4, 6034 F7 20/8/2018, 30/8/2018 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	Stamp & signature of test lab
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration Registernummer Num. d'enregistrement	OEM 9965/12/1
	Date / Datum / Date	10/8/2022

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	BSG CALDAIE A GAS S.P.A. Via Pravalton 1/B 33170 Pordenone	Country/Land/Pays Website E-mail Tel. / Fax	Italy 0 supportotecnico@bsgcaldaie.it +039 434.238.341
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System family overview / G / F																						
Collector type	Number of collectors / G / F																					
	Storage type / G / F																					
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK									
G																						
F																						
15 SOL BLACK	1				2			2														
20 SOL BLACK		1				1			2			2							2	3		
26 SOL BLACK							1			1			2									

Name of system configuration / G / F												CN Black 300-2		
Collector type		No. collectors				Storage type								
G	20 SOL BLACK	G	2			G	300 BLACK							
F		F				F								

Calculated annual results / G / F												
Location	Daily draw-off litres/day / G / F /											
	250	300	400	250	300	400	250	300	400	250	300	400
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	3.872	4.652	6.202	1.752	1.857	1.997	45,2	39,9	32,2			
Würzburg, DE	3.714	4.459	5.948	1.813	1.962	2.120	48,8	44,0	35,6			
Davos, CH	4.205	5.046	6.728	2.567	2.724	2.882	61,0	54,0	42,8			
Athens, GR	2.891	3.469	4.625	2.260	2.532	2.882	78,2	73,0	62,3			

Perf. indicators	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	Q _L /Q _d ; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR			
	G	1.156	1.226	1.682	1.717			
	G	T _a	7,5	9,0	3,2	18,5		
	F	T _c	8,5	10,0	5,4	17,8		
	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2			
G	kWh/m ²	Annual irradiation South, 45° / G / F						
T _a	°C	Annual mean air temp. / G / F						
T _c	°C	Annual mean cold water temp. / G / F						
ΔT _c	°C	Seasonal variation of T _c / G / F						
Th	45°C	Desired (mix. valve) temp. / G / F						

Max. operating press. - collector side		300	kPa	Max. operating press. - tank side		1.000	kPa
G				G			
F				F			

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	6029 DE4, 6034 DE4, 6034 F7
Date of test report / G / F	20/8/2018, 30/8/2018
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	Stamp & signature of test lab
English Deutsch Français	



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration Registernummer Num. d'enregistrement	OEM 9965/12/1
	Date / Datum / Date	10/8/2022

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	BSG CALDAIE A GAS S.P.A. Via Pravolton 1/B 33170 Pordenone	Country/Land/Pays Website E-mail Tel. / Fax	Italy 0 supportotecnico@bsgcaldaie.it +039 434.238.341
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System family overview / G / F																		
Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK					
15 SOL BLACK	1			2			2											
20 SOL BLACK		1			1			2			2			2	3			
26 SOL BLACK					1			1			2							

Name of system konfiguration / G / F CN BLACK 300-5.2											
Collector type G F	26 SOL BLACK	No. collectors G F	2	Storage type G F	300 BLACK						

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F /																	
	250			300			400			250			300			400		
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	3.872	4.652	6.202	1.945	2.102	2.313	50,2	45,2	37,3									
Würzburg, DE	3.714	4.459	5.948	1.989	2.199	2.453	53,5	49,3	41,2									
Davos, CH	4.205	5.046	6.728	2.900	3.136	3.373	69,0	62,1	50,1									
Athens, GR	2.891	3.469	4.625	2.409	2.733	3.189	83,3	78,8	69,0									

Perf. indicators G F	Q _d Q _L f _{sol} Q _{par}	Heat demand / G / F System output / G / F Q_L/Q_d; solar fraction / G / F Elec. for pumps/controllers / G / F
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Ref. conditions G F	Stockholm SE Würzburg DE Davos CH Athens GR	G Ta Tc ΔTc	1.156 7,5 8,5 2.1 - 14.9	1.226 9,0 10,0 7.0 - 13.0	1.682 3,2 5,4 4.6 - 6.2	1.717 18,5 17,8 10.4 - 25.2
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Max. operating press. - collector side G F	300 kPa	Max. operating press. - tank side G F	1.000 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6029 DE4, 6034 DE4, 6034 F7 20/8/2018, 30/8/2018 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	Stamp & signature of test lab
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration Registernummer Num. d'enregistrement	OEM 9965/12/1
	Date / Datum / Date	10/8/2022

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	BSG CALDAIE A GAS S.P.A. Via Pravolton 1/B 33170 Pordenone	Country/Land/Pays Website E-mail Tel. / Fax	Italy 0 supportotecnico@bsgcaldaie.it +039 434.238.341
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System family overview / G / F					
Collector type	Number of collectors / G / F				
	Storage type / G / F				
	120 BLACK	160 BLACK	200 BLACK	300 BLACK	320 BLACK
G					
F					
15 SOL BLACK	1	2	2		
20 SOL BLACK	1	1	2	2	2 3
26 SOL BLACK		1	1	2	

Name of system configuration / G / F Collector type G F	20 SOL BLACK No. collectors G F	2 Storage type G F	CN Black 300-4 320 BLACK
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Calculated annual results / G / F Location G F												
Daily draw-off litres/day / G / F /												
	250	300	400	250	300	400	250	300	400	250	300	400
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	3.881	4.652	6.202	1.901	2.050	2.216	49,0	44,0	35,7			
Würzburg, DE	3.714	4.459	5.948	1.892	2.059	2.243	50,9	46,1	37,6			
Davos, CH	4.205	5.046	6.728	2.584	2.751	2.926	61,5	54,5	43,5			
Athens, GR	2.891	3.469	4.625	2.409	2.716	3.119	83,3	78,3	67,5			

Perf. indicators G F	Q _d Q _L f _{sol} Q _{par}	Heat demand / G / F System output / G / F QL/Q_d; solar fraction / G / F Elec. for pumps/controllers / G / F
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Ref. conditions G F	Stockholm SE Würzburg DE Davos CH Athens GR	1.156 1.226 1.682 1.717	7,5 9,0 3,2 18,5	8,5 10,0 5,4 17,8	2.1 - 14.9 7.0 - 13.0 4.6 - 6.2 10.4 - 25.2
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G Ta Tc ΔTc Th	kWh/m ² °C °C °C 45°C	Annual irradiation South, 45° / G / F Annual mean air temp. / G / F Annual mean cold water temp. / G / F Seasonal variation of Tc / G / F Desired (mix. valve) temp. / G / F
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Max. operating press. - collector side G F	300 kPa	Max. operating press. - tank side G F	1.000 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6029 DE4, 6034 DE4, 6034 F7 20/8/2018, 30/8/2018 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Francais	Stamp & signature of test lab
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration Registernummer Num. d'enregistrement	OEM 9965/12/1
	Date / Datum / Date	10/8/2022

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	BSG CALDAIE A GAS S.P.A. Via Pravalton 1/B 33170 Pordenone	Country/Land/Pays Website E-mail Tel. / Fax	Italy 0 supportotecnico@bsgcaldaie.it +039 434.238.341
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System family overview / G / F																						
Collector type	Number of collectors / G / F																					
	Storage type / G / F																					
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK									
G																						
F																						
15 SOL BLACK	1				2			2														
20 SOL BLACK		1				1			2				2							2	3	
26 SOL BLACK							1						2									

Name of system konfiguration / G / F												CN BLACK 300-3		
Collector type G F	20 SOL BLACK			No. collectors G F	3			Storage type G F	320 BLACK					

Calculated annual results / G / F																		
Location	Daily draw-off litres/day / G / F /																	
	250			300			400			250			300			400		
	l/d			l/d			l/d			l/d			l/d			l/d		
G	Qd kWh/y			QL kWh/y			fsol %			Qpar kWh/y								
F																		
Stockholm, SE	3.881	4.652	6.202	2.243	2.497	2.803	58,0	53,6	45,2									
Würzburg, DE	3.714	4.459	5.948	2.190	2.453	2.812	59,0	55,0	47,4									
Davos, CH	4.205	5.046	6.728	3.136	3.451	3.819	74,6	68,4	56,7									
Athens, GR	2.891	3.469	4.625	2.628	3.040	3.697	91,1	87,6	80,0									

Perf. indicators G F	Q _d Q _L f _{sol} Q _{par}	Heat demand / G / F System output / G / F QL/Qd; solar fraction / G / F Elec. for pumps/controllers / G / F
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Ref. conditions G F	Stockholm SE Würzburg DE Davos CH Athens GR	1.156 7,5 8,5 2.1 - 14.9	1.226 9,0 10,0 7.0 - 13.0	1.682 3,2 5,4 4.6 - 6.2	1.717 18,5 17,8 10.4 - 25.2
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G Ta Tc ΔTc Th	kWh/m ² °C °C °C 45°C	Annual irradiation South, 45° / G / F Annual mean air temp. / G / F Annual mean cold water temp. / G / F Seasonal variation of Tc / G / F Desired (mix. valve) temp. / G / F
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Max. operating press. - collector side G F	300 kPa	Max. operating press. - tank side G F	1.000 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6029 DE4, 6034 DE4, 6034 F7 20/8/2018, 30/8/2018 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Francais	Stamp & signature of test lab
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