

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 9965/12/2 20/2/2020				
Company / Firma / Société		BSG CALDAIE A GAS S.P.A.		Country/Land/Pays		Italy				
Street / Straße / Rue		Via Pravolton 1/B		Website		http://www.biasi.it				
Postal Code, Place / PLZ, Ort / Code postal, Place		33170	Pordenone	E-mail		supportotecnico@bsgcaldaie.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 / Francais						
EN12976 type / G / F				Solar only / G / F						
Collector(s) / Kollektor(en) / Capteur(s)				Storage(s) / Akkumulator(en) / F						
Company / Hersteller / Manufactuer		BSG CALDAIE A GAS S.P.A.		Company / Hersteller / Manufactuer		BSG CALDAIE A GAS S.P.A.				
Keymark reg. no. (optional)		OEM 9965/9/1								
Model Bezeichnung Modèle	Per module / G / F				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) m ²	Gross length Länge (Außenmaß) Longueur Hors tout m	Gross width Breite (Außenmaß) Largeur hors tout m	No. modules G F min - max						
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/Manufactuer				Company/Hersteller/Manufactuer						
Model / Bezeichnung / Modèle				Model / Bezeichnung / Modèle		Propylene glycol solution				
Functions G F		English Deutsch Francais		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 / Prüfberichtsnummer / 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 Francais										

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	Date / Datum / Date	20/2/2020

Company / Firma / Société BSG CALDAIE A GAS S.P.A.	Country/Land/Pays Italy
Street / Straße / Rue Via Pravalton 1/B	Website http://www.biasi.it
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 Biasisol CN BLACK 120/1.5
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Collector type G F	15 SOL BLACK	No. collectors G F	1	Storage type G F	120 BLACK
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Calculated annual results / G / F
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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	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 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	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
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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	<i>Stamp & signature of test lab</i>
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System family overview / G / F																												
Collector type		Number of collectors / G / F																										
G		Storage type / G / F																										
F																												
		120 BLACK	160 BLACK		200 BLACK	300 BLACK																						
15 SOL BLACK		1			2																							
20 SOL BLACK		1	1			2	3																					
26 SOL BLACK				1			2																					
Name of system konfiguration / G / F					Biasisol CN BLACK 120/2																							
Collector type		No. collectors		Storage type																								
G 20 SOL BLACK		G 1		G 120 BLACK																								
F		F		F																								
Calculated annual results / G / F																												
		Daily draw-off litres/day / G / F /																										
Location		80			110			140			80			110			140											
G		l/d			l/d			l/d			l/d			l/d			l/d											
F																												
		Q _d kWh/y			Q _L 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		Q _d Heat demand / G / F																										
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																										
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		300			kPa			Max. operating press. - tank side						1.000			kPa											
G																												
F																												
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 / 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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		Date / Datum / Date		20/2/2020							
Company / Firma / Société		BSG CALDAIE A GAS S.P.A.		Country/Land/Pays Italy							
Street / Straße / Rue		Via Pravalton 1/B		Website http://www.biasi.it							
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		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							
20 SOL BLACK		1		2							
26 SOL BLACK		1		2							
Name of system configuration / G / F Biasisol CN BLACK 160-1											
Collector type		No. collectors		Storage type							
G 20 SOL BLACK		G 1		G 160 BLACK							
F		F		F							
Calculated annual results / G / F											
Location		Daily draw-off litres/day / G / F /									
G		110			140			170			
F		l/d			l/d			l/d			
		Q _d kWh/y			Q _L kWh/y			f _{sol} %			
Stockholm, SE		1.708			2.172			2.637			
Würzburg, DE		1.638			2.085			2.532			
Davos, CH		1.848			2.356			2.856			
Athens, GR		1.270			1.621			1.962			
Perf. indicators		Q_d Heat demand / G / F									
G		Q_L System output / G / F									
F		f_{sol} QL/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			
F		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			
G		kWh/m² 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		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									
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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									

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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 configuration / G / F Collector type G F				26 SOL BLACK G F	No. collectors G F	1 G F	Storage type G F	160 BLACK G F
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Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	110	140	170	110	140	170	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
	Q _d kWh/y			Q _L 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}	Q _L /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
Th	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side G F	300 kPa G F	Max. operating press. - tank side G F	1.000 kPa G F
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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	amp & signature of test lab
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate		Registration													
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat		Registernummer	OEM 9965/12/2												
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK		Num. d'enregistrement													
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Postal Code, Place / PLZ, Ort / Code postal, Place		E-mail	supportotecnico@bsgcaldaie.it												
33170 Pordenone		Tel. / Fax	+039 434.238.341												
System family overview / G / F															
Collector type	Number of collectors / G / F														
	Storage type / G / F														
G	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK		
F															
15 SOL BLACK	1			2			2			2			2	3	
20 SOL BLACK	1			1			2			2			2	3	
26 SOL BLACK				1			1			2					
Name of system configuration / G / F															
Biasisol CN BLACK 160/3															
Collector type		15 SOL BLACK		No. collectors		2		Storage type		160 BLACK					
G			G				G								
F			F				F								
Calculated annual results / G / F															
Location															
Daily draw-off litres/day / G / F /															
G	110	140	170	110	140	170	110	140	170	110	140	170	110	140	170
F															
	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	Q _d	Heat demand / G / F													
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	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				Max. operating press. - tank side											
G	300 kPa			G	1.000 kPa										
F				F											
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais								NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB							
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				supportotecnico@bsgcaldaie.it							
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System family overview / G / F											
Collector type		Number of collectors / G / F									
G		Storage type / G / F									
F											
		120 BLACK	160 BLACK	200 BLACK	300 BLACK						
15 SOL BLACK		1	2	2	2						
20 SOL BLACK		1	1	2	2 3						
26 SOL BLACK			1	1	2						
Name of system konfiguration / G / F											
Biasisol CN BLACK 200-1											
Collector type		No. collectors		Storage type							
G		26 SOL BLACK		G							
F		G		200 BLACK							
		1		F							
Calculated annual results / G / F											
Location		Daily draw-off litres/day / G / F /									
G		170	200	250	170	200	250	170	200	250	
F		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		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		Heat demand / G / F									
G		Q _d	System output / G / F								
F		Q _L	QL/Q_d; solar fraction / G / F								
		f _{sol}	Elec. for pumps/controllers / G / F								
		Q _{par}									
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								
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		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											
English						Stamp & signature of test lab					
Deutsch											
Français											

Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate					Registration							
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat					Registernummer							
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK					Num. d'enregistrement							
					Date / Datum / Date							
20/2/2020					OEM 9965/12/2							
Company / Firma / Société			BSG CALDAIE A GAS S.P.A.			Country/Land/Pays			Italy			
Street / Straße / Rue			Via Pravalton 1/B			Website			http://www.biasi.it			
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	Number of collectors / G / F											
	Storage type / G / F											
G	120 BLACK		160 BLACK		200 BLACK		300 BLACK		320 BLACK			
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 konfiguration / G / F												
Biasisol CN BLACK 200/3												
Collector type	15 SOL BLACK		No. collectors		2		Storage type		200 BLACK			
G			G				G					
F			F				F					
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
G	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
F												
	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	Q _d	Heat demand / G / F										
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												
G		Stockholm SE	Würzburg DE	Davos CH	Athens GR							
G	G	1.156	1.226	1.682	1.717							
G	Ta	7,5	9,0	3,2	18,5							
F	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										
G	Ta	Annual mean air temp. / G / F										
G	Tc	Annual mean cold water temp. / G / F										
G	ΔTc	Seasonal variation of Tc / G / F										
G	Th	Desired (mix. valve) temp. / G / F										
Max. operating press. - collector side												
G		300	kPa									
F												
Max. operating press. - tank side												
G		1.000	kPa									
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												

Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration							
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer							
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK				Num. d'enregistrement							
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				OEM 9965/12/2							
20/2/2020											
Company / Firma / Société		BSG CALDAIE A GAS S.P.A.		Country/Land/Pays							
Street / Straße / Rue		Via Pravalton 1/B		Website							
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		Number of collectors / G / F									
G		Storage type / G / F									
F											
		120 BLACK	160 BLACK	200 BLACK	300 BLACK						
15 SOL BLACK		1	2	2	2						
20 SOL BLACK		1	1	2	2 3						
26 SOL BLACK		1	1	2	2						
Name of system konfiguration / G / F											
Biasisol CN BLACK 200-2											
Collector type		No. collectors		Storage type							
G		20 SOL BLACK		G							
F		2		F							
				200 BLACK							
Calculated annual results / G / F											
Location		Daily draw-off litres/day / G / F /									
G		170	200	250	170	200	250	170	200	250	
F		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		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		Q _d	Heat demand / G / F								
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											
G		Stockholm SE	Würzburg DE	Davos CH	Athens GR						
G		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								
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						Max. operating press. - tank side					
G		300	kPa			1.000	kPa				
F											
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 / G / F				20/8/2018, 30/8/2018							
Test method / G / F				ISO 9459-5 (DST)							
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate		Registration																																																																																													
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15 SOL BLACK	1			2			2						2	3																																																																																	
20 SOL BLACK	1			1			2			2																																																																																					
26 SOL BLACK				1			1			2																																																																																					
Name of system configuration / G / F																																																																																															
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Calculated annual results / G / F																																																																																															
Daily draw-off litres/day / G / F /																																																																																															
Location G F	250			300			400			250			300			400																																																																															
	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 G F		<table border="1"> <tr> <td>Q_d</td> <td colspan="15">Heat demand / G / F</td> </tr> <tr> <td>Q_L</td> <td colspan="15">System output / G / F</td> </tr> <tr> <td>f_{sol}</td> <td colspan="15">QL/Q_d; solar fraction / G / F</td> </tr> <tr> <td>Q_{par}</td> <td colspan="15">Elec. for pumps/controllers / G / F</td> </tr> </table>														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																														
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T _a	°C	Annual mean air 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																																																																																					
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais								NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB																																																																																							
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate					Registration		OEM 9965/12/2					
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat					Registernummer							
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK					Num. d'enregistrement							
					Date / Datum / Date		20/2/2020					
Company / Firma / Société			BSG CALDAIE A GAS S.P.A.			Country/Land/Pays		Italy				
Street / Straße / Rue			Via Pravolton 1/B			Website		http://www.biasi.it				
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 konfiguration / G / F							Biasisol 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	
	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/v			Q _L kWh/v			f _{sol} %			Q _{par} kWh/v		
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	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 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			300 kPa		Max. operating press. - tank side			1.000 kPa				
G					G							
F					F							
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais					NCSR "DEMKRITOS"- SOLAR & ENERGY SYSTEMS LAB							
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Test report id. number / Prüberichtsnummer / F					6029 DE4, 6034 DE4, 6034 F7							
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration									
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer									
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK				Num. d'enregistrement									
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Company / Firma / Société				Country/Land/Pays									
Street / Straße / Rue				Website									
Postal Code, Place / PLZ, Ort / Code postal, Place				E-mail									
				Tel. / Fax									
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											
15 SOL BLACK		1	2	2	2								
20 SOL BLACK		1	1	2	2 3								
26 SOL BLACK			1	1	2								
Name of system configuration / G / F													
BiasiSol CN Black 300-4													
Collector type		No. collectors		Storage type									
G		G		G									
F		F		F									
20 SOL BLACK		2		320 BLACK									
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
		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													
		Heat demand / G / F											
		System output / G / F											
		QL/Q _d ; solar fraction / G / F											
		Elec. for pumps/controllers / G / F											
Ref. conditions													
		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								
		Annual irradiation South, 45° / G / F											
		Annual mean air temp. / G / F											
		Annual mean cold water temp. / G / F											
		Seasonal variation of T _c / G / F											
		Desired (mix. valve) temp. / G / F											
Max. operating press. - collector side		300 kPa		Max. operating press. - tank side		1.000 kPa							
G		G		G		G							
F		F		F		F							
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 / 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													

Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate		Registration																
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat		Registernummer	OEM 9965/12/2															
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK		Num. d'enregistrement																
		Date / Datum / Date	20/2/2020															
Company / Firma / Société		Country/Land/Pays	Italy															
BSG CALDAIE A GAS S.P.A.		Website	http://www.biasi.it															
Street / Straße / Rue		E-mail																
Via Pravalton 1/B		supportotecnico@bsgcaldaie.it																
Postal Code, Place / PLZ, Ort / Code postal, Place		Tel. / Fax	+039 434.238.341															
33170 Pordenone																		
System family overview / G / F																		
Collector type	Number of collectors / G / F																	
	Storage type / G / F																	
G																		
F																		
	120 BLACK			160 BLACK			200 BLACK			300 BLACK			320 BLACK					
15 SOL BLACK	1			2			2			2			2	3				
20 SOL BLACK	1			1			2			2			2					
26 SOL BLACK				1			1			2								
Name of system configuration / G / F																		
Biasisol CN BLACK 300-3																		
Collector type		No. collectors		Storage type														
20 SOL BLACK		3		320 BLACK														
G		G		G														
F		F		F														
Calculated annual results / G / F																		
Daily draw-off litres/day / G / F /																		
Location	250			300			400			250			300			400		
	l/d			l/d			l/d			l/d			l/d			l/d		
G																		
F																		
	Q _d kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y								
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																		
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																
G																		
F																		
Ref. conditions																		
		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										
ΔT _c		2.1 - 14.9		7.0 - 13.0		4.6 - 6.2		10.4 - 25.2										
G		Annual irradiation South, 45° / G / F																
Ta		Annual mean air temp. / G / F																
Tc		Annual mean cold water temp. / G / F																
ΔT _c		Seasonal variation of Tc / G / F																
Th		Desired (mix. valve) temp. / G / F																
G																		
F																		
Max. operating press. - collector side				Max. operating press. - tank side														
300 kPa				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																		
English Deutsch Francais																		