



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	011-7S220 A 26.08.2009
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Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	Vaillant Group Berghauser Straße 42859 Remscheid	Country/Land/Pays Website E-mail Tel.	Germany www.vaillant.de marc.imann@vaillant.de +49 2 191 182 043
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System classification / G / F	
Flow principle / G / F	Forced / G / F
Direct / indirect / G / F	Direct / G / F
Press. principle / G / F	Closed / G / F
Drain back/down / G / F	Drain back / G / F
Storage location / G / F	Indoor / G / F
Storage position / G / F	Vertical / G / F
Int. back-up / G / F	Indirect G / F
If other: / G / F	English / Deutsch / Francais
EN12976 type / G / F	Solar + suppl. / G / F

Collector(s) / Kollektor(en) / Capteur(s)					Storage(s) / Akkumulator(en) / F											
Company / Hersteller / Manufactuer Vaillant Group Keymark reg. no. (optional)					Company / Hersteller / Manufactuer Vaillant Group											
Model Bezeichnung Modèle	Per module / G / F				No. modules G F	Model Bezeichnung Modèle	Total volume		Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors Tout		Höhe (Außenmaß) Höhe (Außenmaß) epaisseur hors tout		Back-up heated volume		El. back-up power	
	Aperture area (Aa) Aperturfläche (Aa) Superficie d'entrée (Aa)	Gross length Länge (Außenmaß) Longueur Hors tout	Gross width Breite (Außenmaß) Largeur hors Tout				G F	G F	G F	G F	G F	G F				
	m ²	mm	mm	min - max		litres	mm	mm	litres	kW						
VFK 135 D	2.352	2035	1.232	2 - 2	auroSTEP plus VLS 250	250	600	1692	120							
					auroSTEP plus VLS 250 E	250	600	1692	135	2						

Controller / G / F		Fluid / G / F	
Company/Hersteller/Manufacteur Vaillant Group Model / Bezeichnung / Modèle auroMatic Functions G collector loop F		Company/Hersteller/Manufacteur Propylen Glycol Model / Bezeichnung / Modèle TYFO GLS Freezing point G -28 °C F	

System family overview / G / F									
Collector G F	No. collectors / G / F								
	Storage / G / F								
	auroSTEP plus VLS 250	auroSTEP plus VLS 250 E							
VFK 135 D	1	1							

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / Datum G / date F	TZS, ITW University of Stuttgart www.tzs.uni-stuttgart.de 06SYS39/1 +06SYS40/1 25.11.2008
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Comments of test lab / Kommentare des Laboratoriums / Commentaires du laboratoire	TZS Stuttgart Pfaffenwaldring 6 70550 Stuttgart
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	Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	Vaillant Group Berghauser Straße Remscheid	Country/Land/Pays Website E-mail Tel. / Fax
	Germany www.vaillant.de marc.imann@vaillant.de +49 2 191 182 043		

System family overview / G / F											
Collector type G F	Number of collectors / G / F										
	Storage type / G / F										
	auroSTEP plus VLSL 250	auroSTEP plus VLSL 250 E									
VFK 135 D	1	1									

Name of system konfiguration / G / F			
Collector type G F	VFK 135 D	No. collectors G F	2
		Storage type G F	auroSTEP plus VLSL 250

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	140 l/d	170 l/d	200 l/d	140 l/d	170 l/d	200 l/d	140 l/d	170 l/d	200 l/d	140 l/d	170 l/d	200 l/d
	Q _d MJ/a			Q _{aux,net} MJ/a			fsav %			Q _{par} MJ/a		
Stockholm, SE	7 821	9 492	11 164	5 267	6 433	7 632	48.1	45.5	43.4	504	504	504
Würzburg, DE	7 442	9 114	10 628	4 604	5 676	6 780	52.8	50.3	47.6	504	504	504
Davos, CH	8 483	10 281	12 110	3 467	4 604	5 960	67.9	63.5	58.7	504	504	504
Athens, GR	5 834	7 064	8 326	2 595	3 248	4 037	68.2	65.4	62.1	504	504	504

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	1 113	1 230	1 684	1 359
	T _a	6.9	9.0	3.2	18.2
	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		300	kPa	Max. operating press. - tank side		1 000	kPa
G				G			
F				F			

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	TZS, ITW University of Stuttgart
Website	www.tzs.uni-stuttgart.de
Test report id. number / Prüberichtnummer / F	06SYS39/1
Date of test report / G / F	25.11.2008
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	TZS Stuttgart Pfaffenwaldring 6 70550 Stuttgart
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	Registernummer	011-7S220 A
	Num. d'enregistrement	
	Date / Datum / Date	26.08.2009

Company / Firma / Société	Vaillant Group	Country/Land/Pays	Germany
Street / Straße / Rue	Berghauser Straße	Website	www.vaillant.de
Postal Code, Place / PLZ, Ort / Code postal, Place	Remscheid	E-mail	marc.imann@vaillant.de
		Tel. / Fax	+49 2 191 182 043

System family overview / G / F

Collector type G F	Number of collectors / G / F											
	Storage type / G / F											
	auroSTEP plus VLSL 250			auroSTEP plus VLSL 250 E								
VFK 135 D	1			1								

Name of system konfiguration / G / F

Collector type		No. collectors		Storage type	
G	VFK 135 D	G	2	G	auroSTEP plus VLSL 250 E
F		F		F	

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 MJ/a			Q _{aux,net} MJ/a			fsav %			Q _{par} MJ/a		
Stockholm, SE	6 150	7 821	9 492	4 068	5 267	6 276	50.9	47.1	46.0	504	504	504
Würzburg, DE	5 897	7 442	9 114	3 564	4 604	5 550	55.6	51.9	50.7	504	504	504
Davos, CH	6 654	8 483	10 281	2 469	3 595	4 793	71.9	66.1	61.4	504	504	504
Athens, GR	4 573	5 834	7 064	1 949	3 248	3 248	71.0	64.7	64.7	504	504	504

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
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Ref. conditions G F		Stockholm SE	Würzburg DE	Davos CH	Athens GR		
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G	kWh/m ²	Annual irradiation South, 45° / G / F
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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		Max. operating press. - tank side	
G	300 kPa	G	1 000 kPa
F		F	

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	TZS, ITW University of Stuttgart
Website	www.tzs.uni-stuttgart.de
Test report id. number / Prüberichtnummer / F	06SYS40/1
Date of test report / G / F	25.11.2008
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	TZS Stuttgart Pfaffenwaldring 6 70550 Stuttgart
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