




Summary of	EN12977-5	CONTROLLER test results	Licence Number	011-7S2536 S												
Annex to Solar KEYMARK Certificate			Issued	2015-11-20												
Company	Vaillant GmbH		Country	Germany												
Brand (optional)	Vaillant		Website	<a href="http://www.vaillant.com">www.vaillant.com</a>												
Street	Berghauser Strasse 40		E-mail	<a href="mailto:info@vaillant.com">info@vaillant.com</a>												
Postal Code	42859	Remscheid	Tel. / Fax	+49 (0)2191-180												
<b>Solar heating system controller - description and features</b>																
General control principle/type	Multi-function controller	No. temperature sensors	4													
No. clocks	1	No. irradiance sensors	-													
No. timers	4	No. flow sensorss	1													
No. counters	2	No. pressure sensors	-													
No. differential thermostats	5	No. level sensors	-													
No. output for pumps	1	No. outputs for magnetic valves	-													
No. other outputs	1	No. output for motor valves	1													
Freeze damage protection	Included	Power in W (control box only)	9													
Scald protection	Not included	Input voltage range (V)	207 to 253	V ≈												
High temperature protection	Included	Photovoltaic supply	No													
<b>Solar heating system controller - test results</b>																
Parameter	Test result	Sensor no:	1	2	3	4	5	6	7	8	9	10				
Clock	Max. tolerance**	min/mon	< 1													
Timer	Max. tolerance**	min/mon	< 1	< 1	< 1	< 1										
Counter	Max. tolerance	%	N.N.	N.N.												
Temperature sensor	Min. temp.****	°C	-10	-10	-15	0										
	Max. temp.****	°C	120	120	150	90										
	Tolerance at max. temp.***	K	1.8	1.8	1.8	1.5										
Irradiance sensor	Max. irradiance***	%														
	Tolerance at max. irradi.***	%														
Flow sensor	Min. flow rate****	m <sup>3</sup> /h	99.9													
	Max. flow rate****	m <sup>3</sup> /h	99.9													
	Tolerance at max. flow***	m <sup>3</sup> /h	99.9													
Pressure sensor	Min. pressure****	kPa														
	Max. pressure****	kPa														
	Tolerance at max. pres.***	kPa														
Level sensor	Min. level****															
	Max. level****															
	Tolerance at max. level***															
**) Tolerance given in minutes per month. ***) Max. tolerance in whole sensor range. ****) Specified by manufacturer																
<b>Differential thermostats</b>																
	Solar Drain Back/1				Electrical Aux/2				External Aux/3				Freeze Protection /4			
Range ΔTON	99.9	-	99.9		99.9	-	99.9		99.9	-	99.9		99.9	-	99.9	
Range ΔTOFF	99.9	-	99.9		99.9	-	99.9		99.9	-	99.9		99.9	-	99.9	
Temp. level	20°C		70°C		60				60°C				10°C			
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
ΔTON	12	11.6	12	11.9	-5	-5.9			-5	-3.3			< 10	< 10		
ΔTOFF	3	2.7	3	2.6	0.5	0.5			0.5	0			> 15	> 15		
<b>Flow rate control</b>																
	Solar Pump/1															
SET/MEAS	SET*	MEAS	SET*	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
Flow rate	20%	31%	70%	82%												
<b>Temperature control</b>																
	Store HX inlet/ 1				Store bottom/ 2				Collector/ 3				Ext. Aux/ 4			
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
Temperature	9.9	10.1	89.6	88.6	10.0	10.5	89.6	89.5	9.9	10.4	89.7	90.6	10.0	10.8	89.7	89.5
Testing Laboratory			TÜV Rheinland Energie und Umwelt GmbH													
Website			<a href="http://www.tuv.com/st">www.tuv.com/st</a>													
Test report id. number			21227422.001													
Date of test report			2015-11-20													



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<b>Company</b>	Vaillant GmbH								<b>Country</b>	Germany								
<b>Brand (optional)</b>	Vaillant								<b>Website</b>	www.vaillant.com								
<b>Street</b>	Berghauser Strasse 40								<b>E-mail</b>	info@vaillant.com								
<b>Postal Code</b>	42859	Remscheid								<b>Tel. / Fax</b>	+49	(0)2191-180						
<b>Differential thermostats (cont.)</b>																		
		Solar-Aux/5				Solar Pressurized/1-1												
Range $\Delta T_{ON}$	99.9	-	99.9	99.9	-	99.9												
Range $\Delta T_{OFF}$	99.9	-	99.9	99.9	-	99.9												
Temp. level	70°C				50				20°C				90°C					
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
$\Delta T_{ON}$	-5	65			7	7												
$\Delta T_{OFF}$					3	2.4												
<b>Flow rate controllers (cont.)</b>																		
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
Flow rate																		
<b>Temperature controllers (cont.)</b>																		
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
Temperature																		
<b>Description of controls/functions</b>																		
<b>Testing Laboratory</b>					TÜV Rheinland Energie und Umwelt GmbH													
<b>Website</b>					www.tuv.com/st													
<b>Test report id. number</b>					21227422.001													
<b>Date of test report</b>					2015-11-20													
<b>Comments of test lab</b>																		
As it is not possible to give the exact setting and results for all operation points, it was tried to summarize the working principle in the best way.													 <b>TÜVRheinland®</b> Genau. Richtig.					
TÜV Rheinland Energie und Umwelt GmbH Am Grauen Stein 51105 Köln																		