



Summary of	EN12977-5	CONTROLLER test results	Licence Number	011-7S2852 S																	
Annex to Solar KEYMARK Certificate			Issued	2018-04-10																	
Company	Ritter Energie- u. Umwelttechnik GmbH & Co. KG					Country	Germany														
Brand (optional)						Website	www.ritter-gruppe.de														
Street	Kuchenäcker 2					E-mail	info@ritter-gruppe.de														
Postal Code	72135	Dettenhausen				Tel. / Fax	+49	715753591200 / 1289													
Solar heating system controller - description and features																					
General control principle/type	Multi-function					No. temperature sensors												5			
No. clocks	1					No. irradiance sensors												-			
No. timers	1					No. flow sensors												1			
No. counters	-					No. pressure sensors												-			
No. differential thermostats	2					No. level sensors												-			
No. output for pumps	1					No. outputs for magnetic valves												1			
No. other outputs	2					No. output for motor valves												1			
Freeze damage protection	Included					Power in W (control box only)												2			
Scald protection	Not included					Input voltage range (V)	218	to	242	V	~										
High temperature protection	Included					Photovoltaic supply												No			
Solar heating system controller - test results																					
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																		
Counter	Max. tolerance	%																			
Temperature sensor	Min. temp.****	°C	-30	0	0	0	-30														
	Max. temp.****	°C	260	110	110	110	110														
	Tolerance at max. temp.***	K	0.9	0.9	0.9	1.0	0.7														
Irradiance sensor	Max. irradiance***	%																			
	Tolerance at max. irradiance***	%																			
Flow sensor	Min. flow rate****	m ³ /h	0.054																		
	Max. flow rate****	m ³ /h	0.9																		
	Tolerance at max. flow***	m ³ /h	0.007																		
Pressure sensor	Min. pressure****	kPa																			
	Max. pressure****	kPa																			
	Tolerance at max. pressure***	kPa																			
Level sensor	Min. level****	xxx																			
	Max. level****	xxx																			
	Tolerance at max. level***	xxx																			
) Tolerance given in minutes per month. *) Max. tolerance in whole sensor range. ****) Specified by manufacturer																					
Differential thermostats																					
	max. store temp./1				Freeze Protection/2				Name/Number				Name/Number								
Range ΔTON	-2				0																
Range ΔTOFF	0				1																
Temp. level	90°C				4°C				20°C				80°C								
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS					
ΔTON	-2	-2			0	0															
ΔTOFF	0	0			1	1															
Flow rate control																					
	Solar Pump/1				Name/Number				Name/Number				Name/Number								
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS					
Flow rate	62%	62%	100%	98%																	
Temperature control																					
	TSA/1				TW/2				TSV/3				TSE/4								
SET/MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS					
Temperature	9.8	10.3	89.8	90.5	9.8	10.6	89.8	89.9	9.8	10.6	89.8	90.3	50.0	50.3	90.5	89.7					
Testing Laboratory	ITW/TZS University of Stuttgart																				
Website	www.itw.uni-stuttgart.de																				
Test report id. number	17CTR54																				
Date of test report	2018-02-19																				



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Differential thermostats (cont.)																	
		Name/Number				Name/Number				Name/Number				Name/Number			
Range ΔT_{ON}		-				-				-				-			
Range ΔT_{OFF}		-				-				-				-			
Temp. level		20°C		90°C		20°C		90°C		20°C		90°C		20°C		90°C	
SET/MEAS		SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
ΔT_{ON}																	
ΔT_{OFF}																	
Flow rate controllers (cont.)																	
		Name/Number				Name/Number				Name/Number				Name/Number			
SET/MEAS		SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
Flow rate																	
Temperature controllers (cont.)																	
		TAM/5				Name/Number				Name/Number				Name/Number			
SET/MEAS		SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS	SET	MEAS
Temperature		-15.3	-15.4	34.8	35.5												
Description of controls/functions																	
-																	
Testing Laboratory												ITW/TZS University of Stuttgart					
Website												www.itw.uni-stuttgart.de					
Test report id. number												17CTR54					
Date of test report												2018-02-19					
Comments of test lab																	
The control of the solar loop pump does not use a differential thermostat. The switch of this pump depends on several system temperatures and is time-dependent. For more information please see test report 17CTR54																	