



**CERTIFIED SOLAR COLLECTOR**

SUPPLIER:  
**Viessmann Manufacturing Company (US) Inc.**  
 45 Access Road  
 Warwick, RI 02886 USA  
 www.viessmann-us.com  
 In Accordance with:  
**-Please Select-**

BRAND: Vitosol  
 MODEL: 200-T SP2A - 3.03  
 COLLECTOR TYPE: Tubular  
 CERTIFICATION #: 10001881  
 Original Certification: December 06, 2013  
 Expiration Date: July 11, 2025

The solar collector listed below has been evaluated by the Solar Rating & Certification Corporation™ (SRCC™), an ANSI accredited and EPA recognized Certification Body, in accordance with SRCC OG-100, Operating Guidelines and Minimum Standards for Certifying Solar Collectors, and has been certified by the SRCC. This award of certification is subject to all terms and conditions of the Program Agreement and the documents incorporated therein by reference. This document must be reproduced in its entirety.

COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
Climate ->	High Radiation (6.3 kWh/m <sup>2</sup> .day)	Medium Radiation (4.7 kWh/m <sup>2</sup> .day)	Low Radiation (3.1 kWh/m <sup>2</sup> .day)	Climate ->	High Radiation (2000 Btu/ft <sup>2</sup> .day)	Medium Radiation (1500 Btu/ft <sup>2</sup> .day)	Low Radiation (1000 Btu/ft <sup>2</sup> .day)
Category (Ti-Ta)				Category (Ti-Ta)			
A (-5 °C)	14.2	10.7	7.2	A (-9 °F)	48.5	36.6	24.6
B (5 °C)	13.7	10.2	6.7	B (9 °F)	46.9	34.9	23.0
C (20 °C)	12.9	9.4	5.9	C (36 °F)	44.1	32.1	20.2
D (50 °C)	11.2	7.7	4.2	D (90 °F)	38.0	26.2	14.5
E (80 °C)	9.2	5.7	2.5	E (144 °F)	31.4	19.6	8.7

**A-** Pool Heating (Warm Climate) **B-** Pool Heating (Cool Climate) **C-** Water Heating (Warm Climate)  
**D-** Space & Water Heating (Cool Climate) **E-** Commercial Hot Water & Cooling

COLLECTOR SPECIFICATIONS					
<b>Gross Area:</b>	4.619 m <sup>2</sup>	49.72 ft <sup>2</sup>	<b>Dry Weight:</b>	79 kg	174 lb
<b>Net Aperture Area:</b>	3.193 m <sup>2</sup>	34.37 ft <sup>2</sup>	<b>Fluid Capacity:</b>	1.6 liter	0.4 gal
<b>Absorber Area:</b>	3.036 m <sup>2</sup>	32.68 ft <sup>2</sup>	<b>Test Pressure:</b>	900 kPa	131 psi

TECHNICAL INFORMATION			Tested in accordance with: ISO 9806		
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
<b>SI UNITS:</b>	$\eta = 0.507 - 0.95290(P/G) - 0.00480(P^2/G)$	<b>Y Intercept:</b>	0.508	<b>Slope:</b>	-1.256 W/m <sup>2</sup> .°C
<b>IP UNITS:</b>	$\eta = 0.507 - 0.16794(P/G) - 0.00047(P^2/G)$	<b>Y Intercept:</b>	0.508	<b>Slope:</b>	-0.221 Btu/hr.ft <sup>2</sup> .°F

Transverse Incident Angle Modifier								Longitudinal Incident Angle Modifier at 50°:	
$\theta$	10	20	30	40	50	60	70	<b>Test Fluid:</b>	Water
<b>K<sub>ra</sub></b>	1.00	0.99	0.97	0.95	0.90	0.82	0.66	<b>Test Mass Flow Rate:</b>	0.0144 kg/(s m <sup>2</sup> )    10.62 lb/(hr ft <sup>2</sup> )

REMARKS:

*Jen Higgins*

Technical Director





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ADDITIONAL INFORMATION <a href="#">(click here to return to the rating page)</a>			
Test Lab:	TÜV Rheinland Energie und Umwelt GmbH	Test Date:	July 11, 2013
Test Report Number:	21221633_SRCC_SP2A_V	Test Location:	indoors

SOLAR COLLECTOR CONSTRUCTION DETAILS					
<b>Header Enclosure:</b>					
<b>Gross Length:</b>	2.241 m	<b>Gross Width:</b>	2.061 m	<b>Gross Depth:</b>	0.150 m
<b>Tube Bank:</b>					
<b>Gross Length:</b>	0.222 m	<b>Gross Width:</b>	2.061 m		

COLLECTOR MATERIALS					
<b>Outer Cover:</b>	Glass Tube	<b>Enclosure back:</b>	Aluminum	<b>Back Insulation:</b>	Vacuum,
<b>Inner Cover:</b>	None	<b>Enclosure side:</b>	Aluminum	<b>Side Insulation:</b>	,
<b>Absorber Description:</b>	Tubes connected to Fins		<b>Flow Pattern:</b>	Mixed	
<b>Riser Tube:</b>	Copper		<b>Fin:</b>	Copper	
<b>Absorber Coating:</b>	Selective		<b>Tube to fin connection</b>	Ultrasonic Weld	

GLAZING	Outer Cover	Inner Cover
<b>Material:</b>	Glass Tube	None
<b>Surface Characteristics:</b>	Smooth	
<b>Thickness:</b>	2.0 mm	N/A
<b>Transmissivity:</b>	High (equal to or greater than 90%)	
<b>Gross Tube Length (uninstalled):</b>	2.049 m	
<b>Diameter:</b>	0.071 m	
<b>Tube Glazing to Header Enclosure Seal:</b>	EPDM gasket	
<b>Reflector Shape:</b>		<b>Reflector Material:</b>

ABSORBER





Certification #: 10001881  
 Supplier: Viessmann Manufacturing Company (US) Inc.  
 Brand Name: Vitosol  
 Model Number: 200-T SP2A - 3.03

<b>Header Material:</b>	Copper	<b>Header OD:</b>	22.0 mm	<b>Header Wall:</b>	1.0 mm
<b>Riser Tube Material:</b>	Copper	<b>Riser Tube OD:</b>	10.0 mm	<b>Riser Tube Wall Thickness:</b>	1.0 mm
<b>Fin Material:</b>	Copper	<b>Fin Thickness:</b>	0.12 mm		
<b>Flow Pattern:</b>	Mixed	<b>Number of Flow Tubes / Heat Pipes:</b>	24	<b>Tube / Heat Pipe Spacing:</b>	84.0 mm
<b>Number of absorber tubes:</b>	1	<b>Flow Tube to Fin Bond:</b>	Ultrasonic Weld	<b>Length of Flow Path:</b>	
<b>Length of Flow Path:</b>		<b>Riser to Fin/Plate Bond:</b>	Ultrasonic Weld		

INSULATION:					
Location	Type	Thickness	Location	Type	Thickness
<b>Back – Top Layer:</b>	Vacuum	28.5 mm	<b>Sides – Inner Layer:</b>		
<b>Back – Bottom Layer:</b>			<b>Sides – Outer Layer:</b>		
<b>Enclosure Fastening Methods:</b>	Screws		<b>Header Enclosure:</b>	Aluminum with plastic ends	

Power Output per Collector(W) [ Ti-Ta, G = 1000 W/m <sup>2</sup> ]				
0	10	30	50	70
2340	2294	2188	2065	1924

PRESSURE DROP				
Flow	$\Delta P$		Flow	$\Delta P$
ml/s	Pa		gpm	in H <sub>2</sub> O
20	6703		0.32	27.0
50	41857		0.79	168.5
80	107130		1.27	431.2





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BRAND: Vitosol  
 MODEL: 200-T SP2A - 1.51  
 COLLECTOR TYPE: Tubular  
 CERTIFICATION #: 10001882  
 Original Certification: December 06, 2013  
 Expiration Date: July 11, 2025

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COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
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Category (Ti-Ta)				Category (Ti-Ta)			
A (-5 °C)	7.3	5.5	3.7	A (-9 °F)	24.8	18.7	12.6
B (5 °C)	7.0	5.2	3.4	B (9 °F)	24.0	17.8	11.7
C (20 °C)	6.6	4.8	3.0	C (36 °F)	22.5	16.4	10.3
D (50 °C)	5.7	3.9	2.2	D (90 °F)	19.4	13.4	7.4
E (80 °C)	4.7	2.9	1.3	E (144 °F)	16.0	10.0	4.4

**A- Pool Heating (Warm Climate) B- Pool Heating (Cool Climate) C- Water Heating (Warm Climate)**  
**D- Space & Water Heating (Cool Climate) E- Commercial Hot Water & Cooling**

COLLECTOR SPECIFICATIONS					
<b>Gross Area:</b>	2.360 m <sup>2</sup>	25.40 ft <sup>2</sup>	<b>Dry Weight:</b>	34 kg	75 lb
<b>Net Aperture Area:</b>	1.597 m <sup>2</sup>	17.19 ft <sup>2</sup>	<b>Fluid Capacity:</b>	0.9 liter	0.2 gal
<b>Absorber Area:</b>	1.518 m <sup>2</sup>	16.34 ft <sup>2</sup>	<b>Test Pressure:</b>	900 kPa	131 psi

TECHNICAL INFORMATION			Tested in accordance with: ISO 9806		
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
<b>SI UNITS:</b>	$\eta = 0.507 - 0.95290(P/G) - 0.00480(P^2/G)$	<b>Y Intercept:</b>	0.508	<b>Slope:</b>	-1.256 W/m <sup>2</sup> .°C
<b>IP UNITS:</b>	$\eta = 0.507 - 0.16794(P/G) - 0.00047(P^2/G)$	<b>Y Intercept:</b>	0.508	<b>Slope:</b>	-0.221 Btu/hr.ft <sup>2</sup> .°F

Transverse Incident Angle Modifier								Longitudinal Incident Angle Modifier at 50°:	
$\theta$	10	20	30	40	50	60	70	<b>Test Fluid:</b>	Water
<b>K<sub>ra</sub></b>	1.00	0.99	0.97	0.95	0.90	0.82	0.66	<b>Test Mass Flow Rate:</b>	0.0144 kg/(s m <sup>2</sup> )    10.62 lb/(hr ft <sup>2</sup> )

REMARKS:

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Technical Director





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Test Report Number:	21221633_SRCC_SP2A_V	Test Location:	indoors

SOLAR COLLECTOR CONSTRUCTION DETAILS					
<b>Header Enclosure:</b>					
<b>Gross Length:</b>	2.241 m	<b>Gross Width:</b>	1.503 m	<b>Gross Depth:</b>	0.150 m
<b>Tube Bank:</b>					
<b>Gross Length:</b>	0.222 m	<b>Gross Width:</b>	0.885 m		

COLLECTOR MATERIALS					
<b>Outer Cover:</b>	Glass Tube	<b>Enclosure back:</b>	Aluminum	<b>Back Insulation:</b>	Vacuum,
<b>Inner Cover:</b>	None	<b>Enclosure side:</b>	Aluminum	<b>Side Insulation:</b>	,
<b>Absorber Description:</b>	Tubes connected to Fins		<b>Flow Pattern:</b>	Mixed	
<b>Riser Tube:</b>	Copper		<b>Fin:</b>	Copper	
<b>Absorber Coating:</b>	Selective		<b>Tube to fin connection</b>	Ultrasonic Weld	

GLAZING	Outer Cover	Inner Cover
<b>Material:</b>	Glass Tube	None
<b>Surface Characteristics:</b>	Smooth	
<b>Thickness:</b>	2.0 mm	N/A
<b>Transmissivity:</b>	High (equal to or greater than 90%)	
<b>Gross Tube Length (uninstalled):</b>	2.049 m	
<b>Diameter:</b>	0.071 m	
<b>Tube Glazing to Header Enclosure Seal:</b>	EPDM gasket	
<b>Reflector Shape:</b>		<b>Reflector Material:</b>

ABSORBER





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 Brand Name: Vitosol  
 Model Number: 200-T SP2A - 1.51

<b>Header Material:</b>	Copper	<b>Header OD:</b>	22.0 mm	<b>Header Wall:</b>	1.0 mm
<b>Riser Tube Material:</b>	Copper	<b>Riser Tube OD:</b>	10.0 mm	<b>Riser Tube Wall Thickness:</b>	0.9 mm
<b>Fin Material:</b>	Copper	<b>Fin Thickness:</b>	0.12 mm		
<b>Flow Pattern:</b>	Mixed	<b>Number of Flow Tubes / Heat Pipes:</b>	12	<b>Tube / Heat Pipe Spacing:</b>	85.0 mm
<b>Number of absorber tubes:</b>	1	<b>Flow Tube to Fin Bond:</b>	Ultrasonic Weld	<b>Length of Flow Path:</b>	
<b>Length of Flow Path:</b>		<b>Riser to Fin/Plate Bond:</b>	Ultrasonic Weld		

INSULATION:					
Location	Type	Thickness	Location	Type	Thickness
<b>Back – Top Layer:</b>	Vacuum	28.5 mm	<b>Sides – Inner Layer:</b>		
<b>Back – Bottom Layer:</b>			<b>Sides – Outer Layer:</b>		
<b>Enclosure Fastening Methods:</b>	Screws		<b>Header Enclosure:</b>	Aluminum with plastic ends	

Power Output per Collector(W) [ Ti-Ta, G = 1000 W/m <sup>2</sup> ]				
0	10	30	50	70
1195	1172	1118	1055	983

PRESSURE DROP				
Flow	$\Delta P$		Flow	$\Delta P$
m/s	Pa		gpm	in H <sub>2</sub> O
20	0		0.32	0.0
50	0		0.79	0.0
80	0		1.27	0.0

