



CERTIFIED SOLAR COLLECTOR

SUPPLIER:
SunEarth, Inc.
 8425 Almeria Avenue
 Fontana, CA 92335 USA
 www.sunearthinc.com

BRAND: ThermoRay
 MODEL: TRB-40
 COLLECTOR TYPE: Glazed Flat Plate
 CERTIFICATION #: 10001803
 Original Certification: March 06, 2013
 Expiration Date: February 01, 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.

COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
Climate -> Category (Ti-Ta)	High Radiation (6.3 kWh/m ² .day)	Medium Radiation (4.7 kWh/m ² .day)	Low Radiation (3.1 kWh/m ² .day)	Climate -> Category (Ti-Ta)	High Radiation (2000 Btu/ft ² .day)	Medium Radiation (1500 Btu/ft ² .day)	Low Radiation (1000 Btu/ft ² .day)
A (-5 °C)	17.7	13.4	9.1	A (-9 °F)	60.4	45.7	31.1
B (5 °C)	16.1	11.8	7.6	B (9 °F)	55.1	40.4	25.8
C (20 °C)	13.7	9.5	5.4	C (36 °F)	46.7	32.4	18.3
D (50 °C)	9.3	5.4	1.8	D (90 °F)	31.9	18.3	6.0
E (80 °C)	5.4	2.1	0.0	E (144 °F)	18.4	7.0	0.0

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					
Gross Area:	3.804 m ²	40.95 ft ²	Dry Weight:	59 kg	131 lb
Net Aperture Area:	3.419 m ²	36.80 ft ²	Fluid Capacity:	3.3 liter	0.9 gal
Absorber Area:	3.456 m ²	37.20 ft ²	Test Pressure:	1103 kPa	160 psi

TECHNICAL INFORMATION			Tested in accordance with: ISO 9806		
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
SI UNITS:	$\eta = 0.751 - 3.72680(P/G) - 0.00670(P^2/G)$	Y Intercept:	0.753	Slope:	-4.172 W/m ² .°C
IP UNITS:	$\eta = 0.751 - 0.65682(P/G) - 0.00066(P^2/G)$	Y Intercept:	0.753	Slope:	-0.735 Btu/hr.ft ² .°F

Incident Angle Modifier								Test Fluid:	
θ	10	20	30	40	50	60	70	Water	
Kτ	1.00	0.99	0.98	0.96	0.94	0.88	0.77	Test Mass Flow Rate:	0.0199 kg/(s m ²) 14.75 lb/(hr ft ²)
								Impact Safety Rating: 11	

REMARKS:

Jen Higgins

Technical Director





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ADDITIONAL INFORMATION (click here to return to the rating page)			
Test Lab:	TÜV Rheinland PTL, LLC	Test Report Date:	February 01, 2013
Test Report Number:	RS1-KIO120809	Test Location:	outdoors

SOLAR COLLECTOR CONSTRUCTION DETAILS					
Gross Length:	3.105 m	Gross Width:	1.225 m	Gross Depth:	85.000 mm

COLLECTOR MATERIALS					
Outer Cover:	Glass sheet	Enclosure back:	Aluminum	Back Insulation:	Fiber, Foam
Inner Cover:	None	Enclosure side:	Aluminum	Side Insulation:	None, Foam
Absorber Description:	Tubes connected to Single Sheet	Flow Pattern:	Parallel/Harp		
Riser Tube:	Copper	Fin:	Aluminum		
Absorber Coating:	Selective	Tube to fin connection	Laser Weld		

GLAZING	Outer Cover	Inner Cover
Material:	Glass sheet	None
Surface Characteristics:	Textured	
Thickness:	3.8 mm	N/A
Transmissivity:	High (equal to or greater than 90%)	
Length:	3.015 m	
Width:	1.134 m	
Tube Glazing to Header Enclosure Seal:	Silicone bead	

ABSORBER:		Absorber Coating:		Selective	
Header Material:	Copper	Header OD:	28.5 mm	Header Wall:	0.8 mm
Riser Tube Material:	Copper	Riser Tube OD:	9.9 mm	Riser Tube Wall Thickness:	0.4 mm
Fin Material:	Aluminum	Fin Thickness:	0.50 mm		





Flow Pattern:	Parallel/Harp				
Number of Riser Tubes:	10	Tube Spacing:	121.4 mm	Number of times each riser crosses the absorber:	1
Length of Flow Path:	2.90 m	Riser to Fin/Plate Bond:	Laser Weld		

INSULATION:					
Location	Type	Thickness	Location	Type	Thickness
Back – Top Layer:	Fiber	29.0 mm	Sides – Inner Layer:	None	
Back – Bottom Layer:	Foam	25.0 mm	Sides – Outer Layer:	Foam	25.0 mm
Enclosure Fastening Methods:	Screws				

Power Output per Collector(W) [Ti-Ta, G = 1000 W/m ²]					
0	10	30	50	70	
2856	2712	2408	2083	1738	

PRESSURE DROP					
Flow	ΔP		Flow	ΔP	
ml/s	Pa		gpm	in H ₂ O	
20	0		0.32	0.0	
50	0		0.79	0.0	
80	0		1.27	0.0	

