



**CERTIFIED SOLAR COLLECTOR**

**SUPPLIER:**  
**Jiangsu Sunrain Solar Energy Co. Ltd.**  
 Ning Hai Industrial Zone  
 Lianyungang City, JIANGSU PROVINCE 222243 China  
 www.sunrain.com

**BRAND:** Sunrain  
**MODEL:** TZ58/1800-20R  
**COLLECTOR TYPE:** Tubular  
**CERTIFICATION #:** 2009042A  
**Original Certification:** October 18, 2010  
**Expiration Date:** June 30, 2022

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)	9.4	7.1	4.7	A (-9 °F)	32.1	24.1	16.1
B (5 °C)	9.2	6.8	4.5	B (9 °F)	31.3	23.3	15.3
C (20 °C)	8.6	6.2	3.9	C (36 °F)	29.3	21.3	13.3
D (50 °C)	6.8	4.5	2.2	D (90 °F)	23.3	15.5	7.6
E (80 °C)	4.3	2.2	0.3	E (144 °F)	14.6	7.6	1.1

**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>	3.476 m <sup>2</sup>	37.42 ft <sup>2</sup>	<b>Dry Weight:</b>	76 kg	167 lb
<b>Net Aperture Area:</b>	1.989 m <sup>2</sup>	21.41 ft <sup>2</sup>	<b>Fluid Capacity:</b>	1.6 liter	0.4 gal
<b>Absorber Area:</b>	1.709 m <sup>2</sup>	18.39 ft <sup>2</sup>	<b>Test Pressure:</b>	1103 kPa	160 psi

TECHNICAL INFORMATION		Tested in accordance with:			
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
<b>SI UNITS:</b>	$\eta = 0.398 - 0.62210(P/G) - 0.01611(P^2/G)$	<b>Y Intercept:</b>	0.406	<b>Slope:</b>	-1.753 W/m <sup>2</sup> .°C
<b>IP UNITS:</b>	$\eta = 0.398 - 0.10964(P/G) - 0.00158(P^2/G)$	<b>Y Intercept:</b>	0.406	<b>Slope:</b>	-0.309 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>	1.02	1.07	1.16	1.29	1.45	1.54	0.96	<b>Test Mass Flow Rate:</b>	0.0199 kg/(s m <sup>2</sup> )	14.75 lb/(hr ft <sup>2</sup> )

REMARKS:

*Jen Higgins*

Technical Director





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ADDITIONAL INFORMATION (click here to return to the rating page)			
Test Lab:	Florida Solar Energy Center	Test Report Date:	June 30, 2010
Test Report Number:	270	Test Location:	

SOLAR COLLECTOR CONSTRUCTION DETAILS					
<b>Header Enclosure:</b>					
<b>Gross Length:</b>	2.037 m	<b>Gross Width:</b>	1.733 m	<b>Gross Depth:</b>	
<b>Tube Bank:</b>					
<b>Gross Length:</b>		<b>Gross Width:</b>			

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

GLAZING	Outer Cover	Inner Cover
<b>Material:</b>	Glass Tube	None
<b>Surface Characteristics:</b>		
<b>Thickness:</b>	1.7 mm	N/A
<b>Transmissivity:</b>		
<b>Gross Tube Length (uninstalled):</b>	1.840 m	
<b>Diameter:</b>	0.058 m	
<b>Tube Glazing to Header Enclosure Seal:</b>	EPDM gasket	
<b>Reflector Shape:</b>		<b>Reflector Material:</b>

ABSORBER





Certification #: 2009042A  
 Supplier: Jiangsu Sunrain Solar Energy Co. Ltd.  
 Brand Name: Sunrain  
 Model Number: TZ58/1800-20R

Header Material:		Header OD:		Header Wall:	
Riser Tube Material:	Copper	Riser Tube OD:		Riser Tube Wall Thickness:	
Fin Material:		Fin Thickness:	0.34 mm		
Flow Pattern:		Number of Flow Tubes / Heat Pipes:	20	Tube / Heat Pipe Spacing:	
Number of absorber tubes:	20	Flow Tube to Fin Bond:		Length of Flow Path:	1.82 m
Length of Flow Path:	1.82 m	Riser to Fin/Plate Bond:			

INSULATION:					
Location	Type	Thickness	Location	Type	Thickness
Back – Top Layer:			Sides – Inner Layer:		
Back – Bottom Layer:			Sides – Outer Layer:		
Enclosure Fastening Methods:			Header Enclosure:		

Power Output per Collector(W) [ $T_i - T_a$ , $G = 1000 \text{ W/m}^2$ ]				
0	10	30	50	70

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

