



# SolarRoofs.com, Inc.

Wholly owned by ACR Solar International Corp.  
5840 Gibbons Dr. Suite G Carmichael, CA 95608 (916) 481-7200



## “Skyline” Closed Loop System 5

**Models: “200152C80EX”, “200153C80EX” and “200154C80EX”**

### SRCC OG300 Rated Systems

#### Permit Set

December, 2006

The solar energy system described by this manual, when properly installed and maintained meets or Exceeds the minimum standards established by the Solar Rating and Certification Corporation (SRCC) and the collectors meet or exceed SRCC OG100 and FSEC minimum standards. This certification does not imply endorsement or warranty of this product by SRCC. (Note: SkyLine formerly Fireball)

## System 5 Components

**Two Collectors, Three Collectors, Four Collectors** (double for 10-01 collectors)

**System 5.** Complete 20 Square Foot (1.86 m<sup>2</sup>), 20” x 12’ (.508 m x 3.66 m), Solar Panels with mounting kit and Rails, **12 Volt PV Powered Circulator + Complete Rheem Double Wall Heat Exchanger Tank Connections.**

These advanced 12V PV powered systems have matched PV Panels and Pumps for best operation.

2 collector system includes ElSid Circulator with 20 Watt PV Panel, A larger 12V Electronic Circulator and 30 Watt PV Panel is used for 3 or 4 collectors, with 25' of wire, 50' - 1/2" OD Copper connecting line, all line connections, Collector Air Vent and Pressure Relief Valve, 2 Temperature Gauges, Mixing Valve, Install Kit, full instructions, Owners Manual. Includes Expansion Tank and all Connections. 81V080HE1 Heat Exchanger tank, optional.

**Tilt Kit (option)** Tilts collectors approximately 18 degrees from existing roof angle, Other angles available on request. Tilt kits are used when a better winter angle is desired on a low pitch roof or to “re-orientate” panels to face south by running the panels up and down an East or West facing roof. See Special Instructions.

**Single Panel:** Collector kit with 3 Modified 24” rails with 6” legs and hardware:  
(Option Code /#TK01)

**Double panels:** Collector kit 3 - 4’ 1” x 1” Aluminum Rails with 12” legs and hardware:  
(Option Code /#TK02)

**Tripple panels:** Collector kit 3 - 6’ 1” x 2” Alum. Rails with 24” legs and hardware:  
(Option Code /#TK03)

**Standard Color (Default):** **Musket Brown (C101)**

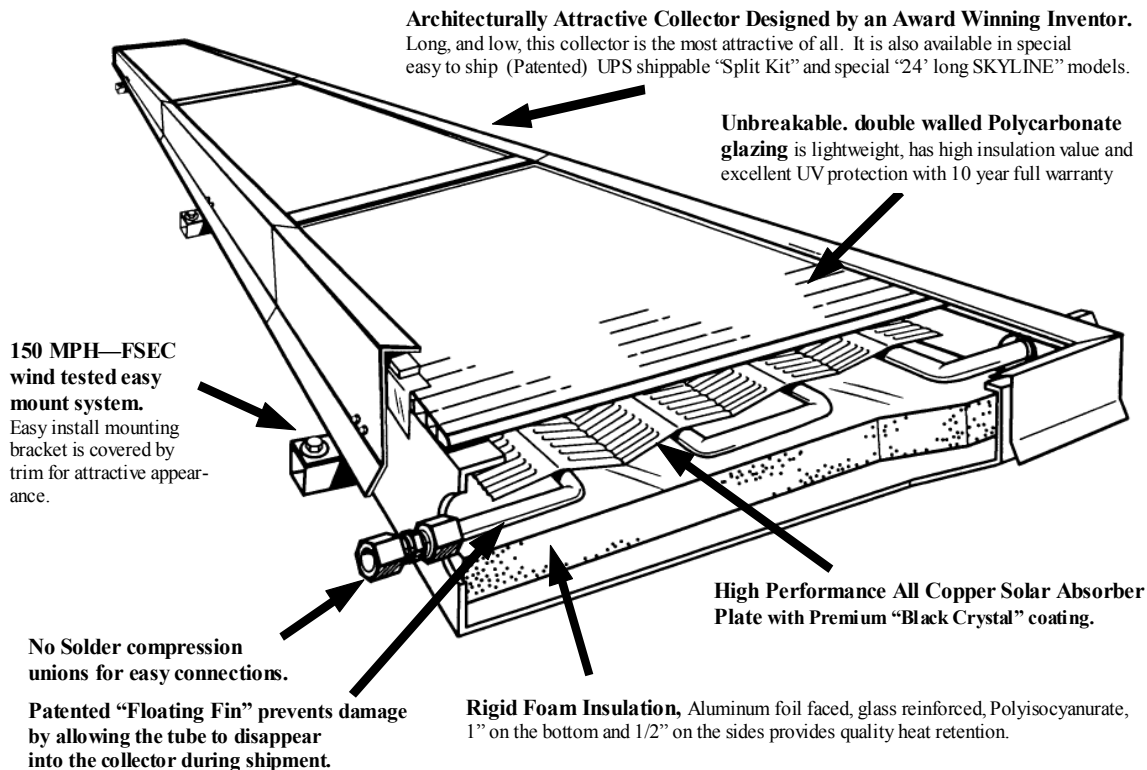
**Free Optional Color:** **Dove/Old Town (Medium) Gray (C109)** - Note: This is a no cost option.

**Optional Colors Include:** Colonial (light) Gray (CO102), Tahoe Blue (CO103), Colonial Red (CO104), Forest Green (CO105), White (CO106), Buckskin Brown (CO107), Beaver (medium) Brown (CO108), C.B. (medium) Blue (CO110), Spanish Green (CO111), Storm/Slate (dark) Gray (CO112), Royal Brown (CO113), Ivory (CO114), Sea Blue (CO115), Leaf Green (CO116), Pebblestone Clay (CO117), Woodbeige (CO118), Peach (great on many light orange tile roofs) (CO119), Almond (CO120), Black (CO121), Adobe Tan (CO121), Classic Cream (CO122), Bronze (CO123), Heritage Cream (CO124), Marine Green (CO125).

**H180, 180 F High Temperature snap switch**, open 180 F, close 140 F, place on cold in:

**Collector Weight is less than 2 Lb. Per Square Foot Dry, 2.035 Lb. per Square Foot Wet**


**SolarRoofs "Skyline" 10-01 and 20-01 Solar Collectors:** These rugged, powerful 10 and 20 Square foot collectors weigh only 19 and 38 pounds. They are easy to carry by one person and are much safer to get on the roof to install. They are available in architectural colors and have an attractive appearance on the roof. No soldering is required to install the collector (s).



**COLLECTOR SPECIFICATIONS:**

Trim & Frame Materials: Finished 27 mil Aluminum Trim and Frame = Total 54 mil (1.37 mm)  
 Absorber Material: "Black Crystal" or Black Chrome coated absorber with all copper 1/2" od tube  
 Glazing: Twinwall Polycarbonate UV Treated .236" (6.0 mm)  
 Dimension / Weight: 72" / 144.1"x 20"x 3" 19 / 38 lb = 1.9 lb. s/f (3.67 m x 0.51 m x 0.076 m 17.24 Kg) 18.4 net s/f (1.71 m<sup>2</sup>)  
 Recommended Flow Rate: .20 to .6 GPM  
 Maximum Working Pressure: 150 PSI (10.21 atm) Maximum Stagnation Temp: 250 °F (121.11 °C).  
 Heat Transfer Fluid: Potable water or Propylene glycol - Fluid Capacity: 10-01 = .15 gal. / 20-01 = .3 gal.  
 Standard Components: Mounting Ell brackets with tech screws and 2 1/4" washers.  
 Color: Standard: Musket Brown or Dove Gray. Optional trim colors are available.

**SolarRoofs 20-01 SRCC OG 100 Collector Rating:**

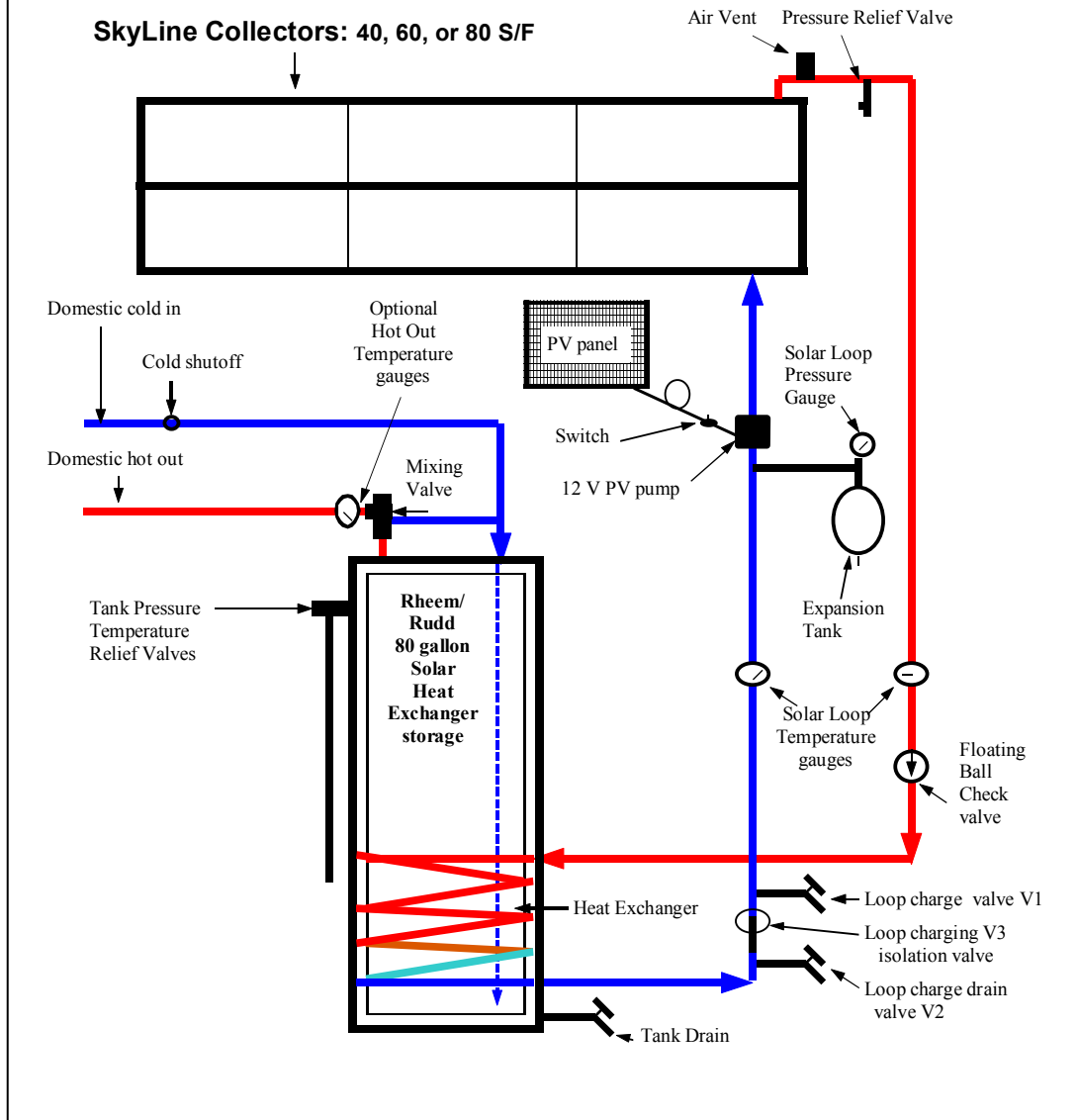
SOLAR COLLECTOR CERTIFICATION AND RATING		COLLECTOR THERMAL PERFORMANCE RATING			
SOLAR COLLECTOR CERTIFICATION AND RATING		Thousands of Btu Per Panel Per Day			
CERTIFIED SOLAR COLLECTOR		CATEGORY (Ti-Ta)	CLEAR DAY 2000 Btu/ft <sup>2</sup> -d	MILDLY CLOUDY 1500 Btu/ft <sup>2</sup> -d	CLOUDY DAY 1000 Btu/ft <sup>2</sup> -d
 SRCC OG-100	SUPPLIER: <b>ACR Solar International</b> 5840 Gibbons Dr. Suite G Carmichael, CA 95608  MODEL: Fireball Fireball 2001 COLLECTOR TYPE: Glazed Flat-Plate CERTIFICATION #: 100-2001-002A	A (-9 °F)	23	17	12
		B (9 °F)	20	15	9
		C (36 °F)	17	11	6
		D (90 °F)	10	6	1
		E (144 °F)	6	2	

**Web: [www.SolarRoofs.com](http://www.SolarRoofs.com) Email: [richsolar@aol.com](mailto:richsolar@aol.com) Phone: (916) 481-7200**  
**Fax: (916) 481-7203 Address: 5840 Gibbons Drive Suite G, Carmichael CA 95608**

# Skyline System 5 OG300 Tank Installation

**Models: 200152C80EX, 200152C80EX, 200152C80EX,**

**SkyLine Collectors: 40, 60, or 80 S/F**



# Skyline SRCC OG300 Solar Water Heater Specifications

## COLLECTOR (Panel)

Trim & Frame Materials:	Finished 27 mil Aluminum Trim and Frame = Total 54 mil (1.37 mm).
Absorber Material:	"Black Crystal" coated - all Copper with unions.
Glazing:	.236" (6.0 mm) Twinwall Polycarbonate UV Treated
Dimension / Weight:	200 -144.3"x 20."x 3" 38 lb (3.67 m x 0.51 m x 0.076 m 17.24 Kg) 18.4 Net s/f (1.71 m <sup>2</sup> )
Fluid Capacity:	20-01 = .3 gallon, 10-01 = .15 gallons
Recommended Flow Rates:	.20 to .35 GPM (0.946 to 1.324 L/min)
Maximum Working Pressure:	150 PSI (10.21 atm).
Maximum Stagnation Temp:	250 °F (121.11 °C).
Heat Transfer Fluid:	Potable water or Propylene glycol
Standard Components:	Mounting rails, mounting brackets, tech screws and lags
Color:	Musket Brown (C101 – default color) or Dove/Old Town Gray (C109) + optional colors

## PV (Photovoltaic) POWERED CIRCULATOR

PV Panel:	20 or 30 Watt, 12volt DC
Circulator:	12 Volt - "El Sid", March or equal.

## FREEZE PROTECTION

**Type: Closed Loop Glycol with Storage Tank Heat Exchanger.**

The SolarRoofs.com's closed loop Propylene Glycol Antifreeze heat exchange system's collector as well as feed and return lines will not be damaged by (ambient) hard freeze temperatures as low as -54 degrees F below zero with a 60/40 mixture of propylene glycol/water. The solar storage tank must be kept in an area above 32 degrees F.

## CONNECTING LINES, INSULATION (standard)

Tubing:	1/2" (12.7 mm) OD copper - 50' (15.24 m)
Insulation (6' (1.83 m) supplied):	1/2" (12.7 mm) ID 1/2" (12.7 mm) or 3/4" (19.05 mm) wall

## TUBING CONNECTION METHODS (standard)

Type:	Brass Union, Compression, (Brass Fittings for Heat Exchanger)
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## STORAGE TANK - Rheem / Rudd / Richmond Model Number: 81V080HE1 (Not Supplied)

Fluid Used:	80 Gallon Tank with In Tank Double Wall Heat Exchanger. Propylene Glycol (Sierra)
Components Supplied:	Expansion Tank, one floating ball check valve, Temperature Gauge, fill, drain, and pressure relief valves.

## CONTROL

Type:	12 Volt Circulator with Switch, which automatically regulates circulator operation.
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**Although we will make every effort to give notice, Specifications and prices subject to change without notice.**

## Antifreeze Safety Data - Sierra Antifreeze-Coolant

### FLUID HANDLING, SAFETY AND FIRST AID:

1. Store fluid in tightly closed and properly vented containers, away from heat, sparks or open flame.  
Dispose of any aqueous waste at permitted landfill sites only.
2. Chemical splash goggles or full face shield must be worn when possible eye contact exists.
3. Ingestion: Give pint of luke warm water or induce vomiting if large quantity is ingested.
4. EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC)

Freezing point: -28 deg F (50/50 mixture)

Flash Point: 211F

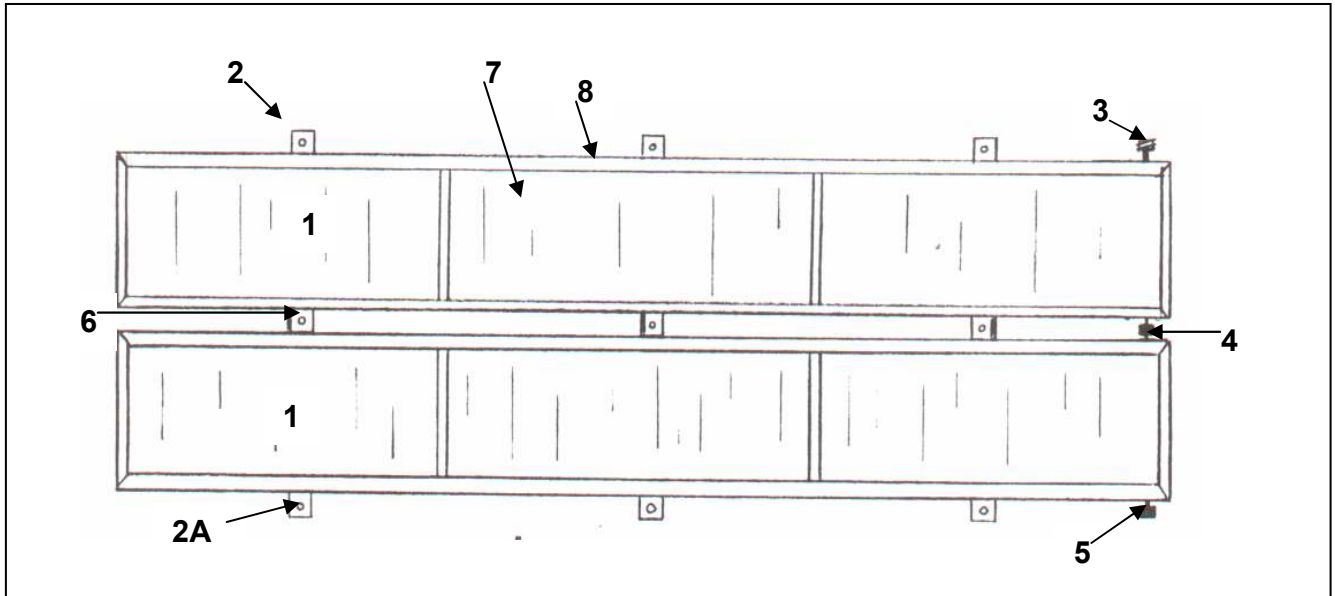
Boiling point: 365 deg F

Appearance: Green

Specific Gravity: 1.04

Vapor Density: 2.6

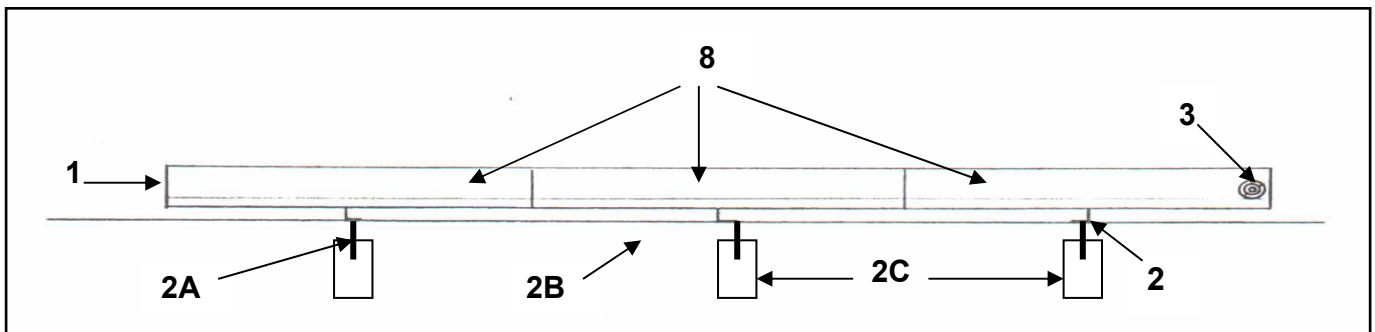
## Two Collector Skyline 20-01 Top View (10-01 collectors use 2 rails about 1' in from the ends)



The Diagram above is a top view of two collectors installed together showing:

1. Two 20" x 12' Collectors mounted with connections to the right.
  2. The Mounting Rails with Mounting Brackets (3 rails and 6 Mounting Brackets plus 3 Quick Connect Clips (QCC) per additional collector set (6.), 3 two panel rails, 6 Mounting Brackets and 3 QCCs shown in this diagram).
  - 2A. Mounting Rail Lag holes top and bottom.
3. The "Hot Out" Collector connection going to the storage tank.
4. The between Collector connection.
5. The "Cold In" Collector connection from the storage tank.
6. The Quick Connect Clip bolts to the mounting rail here with the tabs overlapping the top of the collector.
7. Collector Glazing (Lexan)
8. Collector trim sections.

### 2001 Side View



The above Diagram shows a side view of the Collector installed on the roof and shows:

**(Refer to Color Pictures for Details of Ell Brackets)**

- |  |   |
|--|---|
| 1. Side view of a Collector.               | 2C. Roof Rafter.                        |
| 2. Mounting Rails (3 per 20-01 collector). | 3. Collector feed or return connection. |
| 2A. Mounting Rail Lag.                     | 8. Collector Trim.                      |
| 2B. Roof sheathing.                        |   |

### LAGS AND RAFTERS:

**For maximum strength, you want your mounting rail (2) lags (2A) to go into rafters.** After locating the best area for the collector, "sound out" the roof for the rafters with a hammer and mark the rafter centers with chalk.

# Solaraide™ HE Solar Heat Exchanger, Solar Tank, or Electric Storage Water Heater



Available in 80 and 120 Gallon Models

► 6-Year Limited Tank and Parts Warranty\*

- Brass drain valve
- Choice of two models...storage tank or single element water heater
- Temperature and pressure relief valve included
- Collector feed and return fittings located at front of tank for convenient installation
- Isolated tank design for better heat retention
- High efficiency heating element
- Rheemglas® tank lining resists corrosion and prolongs tank life
- Heat exchanger: copper tubing wrapped around and secured to the tank. Double wall, vented design for positive leak detection
- Cold water inlet brings cold water to tank bottom to prevent mixing with heated water
- Anode rod equalizes aggressive water action for prolonged tank life
- Cold water inlet, hot water outlet, relief valve and anode rod at top of tank for easy access and fast, economical installation
- Automatic temperature control
- Over temperature protector

\* See Residential Warranty Information Brochure for complete warranty information.



TYPE	DESCRIPTION			ROUGHING IN DIMENSIONS (SHOWN IN INCHES)			ENERGY INFORMATION
	GAL. CAP.	MODEL NUMBER	ELEMENT WATTAGE UPPER	HEIGHT A	DIAMETER B	APPROX. SHIP WT. (LBS.)	APPROX. R-FACTOR
	80	81V80HE-1	4500 W*	58-3/4	24-1/2	222	R-17.3
	80	81V80HE-T	Storage only	58-3/4	24-1/2	222	R-17.3
	120	82V120HE-1	4500 W*	62	28-1/4	380	R-17.3
	120	82V120HE-T	Storage only	62	28-1/4	380	R-17.3

- \* Heaters furnished with standard 240 volt AC, single phase non-simultaneous wiring and 4500 watt heating element.
- If heating elements of different wattages than those shown are demanded by zone requirements, they must be specifically requested.
- To prevent corrosion, proper pH levels in transfer fluid must be maintained.
- Solaraide models meet all current state requirements for solar storage tanks.
- The tanks are Rheemglas lined and are designed to operate up to 150 PSI.

A special 1/2" NPT opening is provided for installation of a "probe type" thermostat.

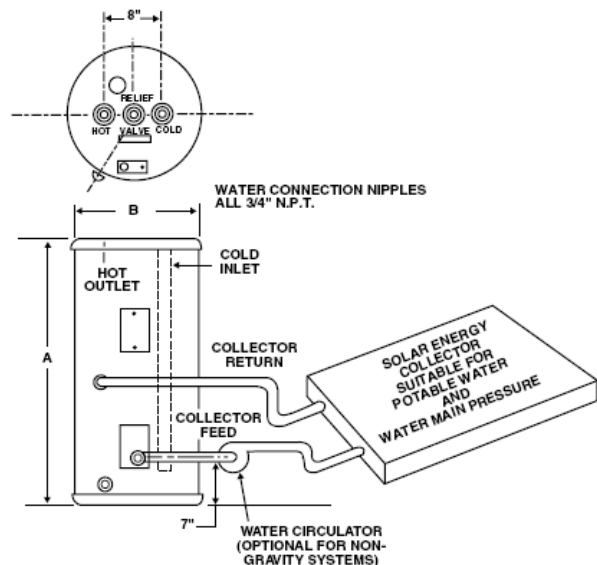


### COPPER COIL DATA (Type L Copper)

Maximum pressure = 150 PSI  
Maximum temperature = 185° F  
Tube I.D. = 5/8"

Solaraide HE Tank Capacity	Coil Capacity Gallons	Length of Tubing Around Tank (Ft)
80 Gallons	2.2	120
120 Gallons	2.6	143

PRESSURE DROP THROUGH COIL (Feet of H <sub>2</sub> O)		
Flow Rate	Head Loss (Feet)	
	80 Gallon	120 Gallon
1 GPM	1.3	1.6
2 GPM	4.8	5.7
3 GPM	10.0	12.0



In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

Rheem Water Heating • 101 Bell Road, Montgomery, Alabama 36117 • www.rheem.com

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06/06 WP

FORM NO. 101-16 Rev. 12





This product certified by  
Solar Rating and Certification  
Corporation  
c/o FSEC, 1679 Clearlake Road  
Cocoa, FL 32922

SRCC Document OG-300  
Conformance to HUD UM 100

ACR Solar  
International  
5840 Gibbons Dr.  
Carmichael, CA 95608

Model No.: Fireball 2001  
Gross Area:  
1.897 m<sup>2</sup> (20.11 ft<sup>2</sup>)  
Serial Number:

Mildly Cloudy Day  
Rating in Category C

12 MJ/day  
11 Mbtu/day

## SOLAR COLLECTOR CERTIFICATION

FLORIDA SOLAR ENERGY CENTER  
1679 Clearlake Road  
Cocoa, FL 32922-5703



FSEC 00030

MANUFACTURED BY:  
ACR Solar International Corp.  
5840 Gibbons Dr., Suite G  
Carmichael, California 95608

MODEL #  
Fireball 2001

SERIAL #

has been tested for thermal performance and meets the minimum  
standards established by the Florida Solar Energy Center as  
directed by Section 377.705 Florida Statutes.

### THERMAL PERFORMANCE RATINGS\*

Low Temp. (35°C, 95°F)	19,000 kJ/day	18,100 Btu/day
Intermediate Temp. (50°C, 122°F)	15,600 kJ/day	14,800 Btu/day
High Temp. (100°C, 212°F)	7,000 kJ/day	6,600 Btu/day

\*Based on an assumed standard day for Florida.

GROSS COLLECTOR AREA: 1.865 m<sup>2</sup> (20.07 ft<sup>2</sup>)  
COVER PLATE AREA: 1.720 m<sup>2</sup> (18.52 ft<sup>2</sup>)  
COLLECTOR LENGTH: 3.658 m (12.00 ft)  
COLLECTOR WIDTH: 0.510 m (1.67 ft)  
COLLECTOR WEIGHT: 17.2 kg (38.0 lb)  
FLUID CAPACITY: 1.8 L (0.5 gal)  
REC. FLOW RATE: 34 Liquid mL/s (0.5 gpm)  
TEST PRESSURE: 1103 kPa gauge (160 psig)  
MAX. WIND LOAD: 2394 Pa (50 psf)  
THERMAL PERFORMANCE EFFICIENCY (ASHRAE 93-86)

Y INTERCEPT: 60.4

SLOPE:  $373 \frac{\text{Watts}}{\text{m}^2 \cdot ^\circ\text{C}}$   $\left( 68 \frac{\text{Btu}}{\text{ft}^2 \cdot \text{hr} \cdot ^\circ\text{F}} \right)$

INCIDENT ANGLE MODIFIER, AXIS 1: 0.21 AXIS 2: N/A



This product certified by  
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Cocoa, FL 32922

SRCC Document OG-300  
Conformance to HUD UM 100

ACR Solar  
International  
5840 Gibbons Dr.  
Carmichael, CA  
95608

System Model  
200152C80EX

Solar Energy  
Factor  
1.6

System Serial  
No. \_\_\_\_\_



This product certified by  
Solar Rating and Certification  
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c/o FSEC, 1679 Clearlake Road  
Cocoa, FL 32922

SRCC Document OG-300  
Conformance to HUD UM 100

ACR Solar  
International  
5840 Gibbons Dr.  
Carmichael, CA  
95608

System Model  
200153C80EX

Solar Energy  
Factor  
2.0

System Serial  
No. \_\_\_\_\_



This product certified by  
Solar Rating and Certification  
Corporation  
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Cocoa, FL 32922

SRCC Document OG-300  
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ACR Solar  
International  
5840 Gibbons Dr.  
Carmichael, CA  
95608

System Model  
200154C80EX

Solar Energy  
Factor  
2.4

System Serial  
No. \_\_\_\_\_