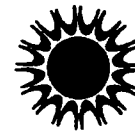


# SUMMARY INFORMATION SHEET

## FLORIDA SOLAR ENERGY CENTER

1679 CLEARLAKE ROAD, COCOA, FLORIDA 32922-5703 (321) 638-1000



June 1994  
FSEC # 94021N

### MANUFACTURER

SunEarth, Inc.  
4315 Santa Ana Street  
Ontario, California 91761

Revised October 1999

### Collector Model

EP-40

This solar collector was evaluated by the Florida Solar Energy Center (FSEC) in accordance with prescribed methods and was found to meet the minimum standards established by FSEC. This evaluation was based on solar collector tests performed at the National Solar Test Facility, Mississauga, Ontario, Canada. The purpose of the tests is to verify initial performance conditions and quality of construction only. The resulting certification is not a guarantee of long term performance or durability.

### DESCRIPTION

|                            |                     |                    |
|----------------------------|---------------------|--------------------|
| Gross Length               | 3.102 meters        | 10.18 feet         |
| Gross Width                | 1.222 meters        | 4.01 feet          |
| Gross Depth                | 0.083 meters        | 0.27 feet          |
| Gross Area                 | 3.791 square meters | 40.81 square feet  |
| Transparent Frontal Area   | 3.468 square meters | 37.33 square feet  |
| Volumetric Capacity        | 4.5 liters          | 1.2 gallons        |
| Weight (empty)             | 62.6 kilograms      | 138.0 pounds       |
| Recommended Flow Rate      | 126 ml/s            | 2.0 gpm            |
| Maximum Operating Pressure | 552 kPag            | 80 psig            |
| Maximum Wind Load          | 1436 Pa             | 30 psf             |
| Number of Cover Plates     | One                 |                    |
| Flow Pattern               | Parallel            | Forced Circulation |
| Number of Flow Tubes       | Ten                 |                    |

### MATERIALS

|                  |  |
|------------------|--|
| Enclosure        | Aluminum frame, aluminum back                            |
| Glazing          | Tempered low iron glass, 0.32 cm thick                   |
| Absorber         | Copper tubes soldered to copper sheet                    |
| Absorber Coating | Moderately selective black paint                         |
| Insulation       | Polyisocyanurate, 2.5 cm thick; Fiberglass, 2.5 cm thick |

### THERMAL PERFORMANCE

Based on tests conducted per ASHRAE 93-1986

$$\text{Incident Angle Modifier} \quad K_{\tau\alpha} = 1.0 - 0.19 \left( \frac{1}{\cos\theta} - 1 \right)$$

#### Efficiency Equations

$$\eta = 70.8 - 473 (T_i - T_a)/I$$

$$\eta = 70.8 - 83 (T_i - T_a)/I$$

$$\eta = 69.1 - 350 (T_i - T_a)/I - 1220 [(T_i - T_a)/I]^2$$

$$\eta = 69.1 - 61 (T_i - T_a)/I - 37 [(T_i - T_a)/I]^2$$

Units of  $T_i - T_a/I$  are  $^{\circ}\text{C} / \text{Watt}/\text{m}^2$

Units of  $T_i - T_a$  are  $^{\circ}\text{F} / \text{Btu}/\text{hr}\cdot\text{ft}^2$

### RATING

The collector has been rated for energy output on measured performance and an assumed standard day. Total solar energy available for the standard day is 5045 Watt-hours/ $\text{m}^2$  (1600 Btu/ $\text{ft}^2$ ) distributed over a 10 hour period.

Output energy ratings for this collector based on the second-order efficiency curve are:

#### Collector Temperature

#### Energy Output

|   |                       |                |
|---|-----------------------|----------------|
| Low Temperature, 35 $^{\circ}\text{C}$ (95 $^{\circ}\text{F}$ )           | 44,700 Kilojoules/day | 42,400 Btu/day |
| Intermediate Temperature, 50 $^{\circ}\text{C}$ (122 $^{\circ}\text{F}$ ) | 36,800 Kilojoules/day | 34,900 Btu/day |
| High Temperature, 100 $^{\circ}\text{C}$ (212 $^{\circ}\text{F}$ )        | 13,300 Kilojoules/day | 12,600 Btu/day |

Reference 93010N