

SUMMARY INFORMATION SHEET

FLORIDA SOLAR ENERGY CENTER

1679 CLEARLAKE ROAD, COCOA, FLORIDA 32922-5703 (407) 638-1000



January 1996
FSEC # 96001C

MANUFACTURER

Solar Industries SPHS (Solar Pool Heating Systems)
1940 Rutgers University Blvd.
Lakewood, New Jersey 08701

Collector Model

10001-1

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 Florida Solar Energy Center, Cocoa, Florida. 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	2.451 meters	8.04 feet
Gross Width	1.195 meters	3.92 feet
Gross Depth	0.049 meters	0.16 feet
Gross Area	2.927 square meters	31.51 square feet
Transparent Frontal Area	2.927 square meters	31.51 square feet
Volumetric Capacity	9.5 liters	2.5 gallons
Weight (empty)	6.5 kilograms	14.3 pounds
Recommended Flow Rate	208 ml/s	3.3 gpm
Maximum Operating Pressure	241 kPag	35 psig
Maximum Wind Load	Not Applicable	
Number of Cover Plates	None	
Flow Pattern	Parallel	Forced Circulation
Number of Flow Tubes	Multitube mat	

MATERIALS

Enclosure	None
Glazing	None
Absorber	Polypropylene tube mat with UV stabilization
Absorber Coating	None
Insulation	None

THERMAL PERFORMANCE

Tested per ASHRAE 96-1980 (RA 1989)

Incident Angle Modifier $K_{\tau\alpha} = 1.0 - 0.03 \left(\frac{1}{\cos\theta} - 1 \right)$

Efficiency Equations

$$\eta = 85.8 - 1943 (T_i - T_a)/I$$

$$\eta = 85.8 - 342 (T_i - T_a)/I$$

$$\eta = 86.3 - 1821 (T_i - T_a)/I - 5229 [(T_i - T_a)/I]^2$$

$$\eta = 86.3 - 320 (T_i - T_a)/I - 162 [(T_i - T_a)/I]^2$$

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/ m^2 (1600 Btu/ 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 $^{\circ}\text{F}$)	33,200 Kilojoules/day	31,500 Btu/day
Intermediate Temperature, 50 $^{\circ}\text{C}$ (122 $^{\circ}\text{F}$)	12,600 Kilojoules/day	11,900 Btu/day
High Temperature, 100 $^{\circ}\text{C}$ (212 $^{\circ}\text{F}$)	0 Kilojoules/day	0 Btu/day

REFERENCE 92025 & 93026C

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FLORIDA SOLAR ENERGY CENTER

300 STATE ROAD 401, CAPE CANAVERAL, FLORIDA 32920-4099, (407) 783-0300



September 1993

FSEC # 93027C

MANUFACTURER

Aquatherm Industries, Inc.
1985 Rutgers University Blvd.
Lakewood, New Jersey 08701

Collector Model
Solar Industries 10001-2

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 Florida Solar Energy Center, Cape Canaveral, Florida. 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	3.060 meters	10.04 feet
Gross Width	1.195 meters	3.92 feet
Gross Depth	0.049 meters	0.16 feet
Gross Area	3.657 square meters	39.36 square feet
Transparent Frontal Area	3.657 square meters	39.36 square feet
Volumetric Capacity	11.0 liters	2.9 gallons
Weight (empty)	7.8 kilograms	17.1 pounds
Recommended Flow Rate	252 ml/s	4.0 gpm
Maximum Operating Pressure	241 kPag	35 psig
Maximum Wind Load	Not Applicable	
Number of Cover Plates	None	
Flow Pattern	Parallel	Forced circulation
Number of Flow Tubes	Multitube mat	

MATERIALS

Enclosure	None
Glazing	None
Absorber	Polypropylene tube mat with UV stabilization
Absorber Coating	None
Insulation	None

THERMAL PERFORMANCE

Tested per ASHRAE 96-1980 (RA 1989)

$$\text{Incident Angle Modifier } K_{\tau\alpha} = 1.0 - 0.03 \left(\frac{1}{\cos\theta} - 1 \right)$$

Efficiency Equations

$$\eta = 85.8 - 1943 (Ti-Ta)/I$$

$$\eta = 85.8 - 342 (Ti-Ta)/I$$

$$\eta = 86.3 - 1821 (Ti-Ta)/I - 5229 [(Ti-Ta)/I]^2 \quad \eta = 86.3 - 320 (Ti-Ta)/I - 162 [(Ti-Ta)/I]^2$$

Units of $Ti-Ta/I$ are $^{\circ}C/Watt/m^2$

Units of $Ti-Ta/I$ are $^{\circ}F/Btu/hr ft^2$

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/ m^2 (1600 Btu/ 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 $^{\circ}C$ (95 $^{\circ}F$)	41,500 Kilojoules/day	39,300 Btu/day
Intermediate Temperature, 50 $^{\circ}C$ (122 $^{\circ}F$)	15,700 Kilojoules/day	14,900 Btu/day
High Temperature, 100 $^{\circ}C$ (212 $^{\circ}F$)	0 Kilojoules/day	0 Btu/day

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FLORIDA SOLAR ENERGY CENTER

1679 CLEARLAKE ROAD, COCOA, FLORIDA 32922-5703 (407) 638-1000



January 1996

FSEC # 96004C

MANUFACTURER

Solar Industries SPHS (Solar Pool Heating Systems)
1940 Rutgers University Blvd.
Lakewood, New Jersey 08701

Collector Model

10001-5

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 Florida Solar Energy Center, Cocoa, Florida. 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	3.670 meters	12.04 feet
Gross Width	1.195 meters	3.92 feet
Gross Depth	0.049 meters	0.16 feet
Gross Area	4.385 square meters	47.20 square feet
Transparent Frontal Area	4.385 square meters	47.20 square feet
Volumetric Capacity	12.1 liters	3.2 gallons
Weight (empty)	9.7 kilograms	21.3 pounds
Recommended Flow Rate	315 ml/s	5.0 gpm
Maximum Operating Pressure	241 kPag	35 psig
Maximum Wind Load	Not Applicable	
Number of Cover Plates	None	
Flow Pattern	Parallel	Forced Circulation
Number of Flow Tubes	Multitube mat	

MATERIALS

Enclosure	None
Glazing	None
Absorber	Polypropylene tube mat with UV stabilization
Absorber Coating	None
Insulation	None

THERMAL PERFORMANCE

Tested per ASHRAE 96-1980 (RA 1989)

Incident Angle Modifier $K_{\tau\alpha} = 1.0 - 0.03 \left(\frac{1}{\cos\theta} - 1 \right)$

Efficiency Equations

$$\eta = 85.8 - 1943 (T_i - T_a)/I$$

$$\eta = 85.8 - 342 (T_i - T_a)/I$$

$$\eta = 86.3 - 1821 (T_i - T_a)/I - 5229 [(T_i - T_a)/I]^2$$

$$\eta = 86.3 - 320 (T_i - T_a)/I - 162 [(T_i - T_a)/I]^2$$

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/ m^2 (1600 Btu/ 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°C (95°F)	49,700 Kilojoules/day	47,200 Btu/day
Intermediate Temperature, 50°C (122°F)	18,800 Kilojoules/day	17,800 Btu/day
High Temperature, 100°C (212°F)	0 Kilojoules/day	0 Btu/day

REFERENCE 92025 & 93029C