

# SUMMARY INFORMATION SHEET

## FLORIDA SOLAR ENERGY CENTER

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



March 1998  
FSEC # 98006C

### MANUFACTURER

Pool Heating Distributors  
8051 N. Tamiami Tr.  
Sarasota, Florida 34243

Revised August 1998

### Collector Model

Vortex VT40

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	3.054 meters	10.02 feet
Gross Width	1.210 meters	3.97 feet
Gross Depth	0.006 meters	0.02 feet
Gross Area	3.696 square meters	39.78 square feet
Transparent Frontal Area	3.696 square meters	39.78 square feet
Volumetric Capacity	14.0 liters	3.7 gallons
Weight (empty)	11.3 kilograms	25.0 pounds
Recommended Flow Rate	259 ml/s	4.1 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	Co-polymer plastic with UV stabilization
Absorber Coating	None
Insulation	None

### THERMAL PERFORMANCE

Tested per ASHRAE 96-1980 (RA 1989)

Incident Angle Modifier  $K_{\tau\alpha} = 1.0 - 0.12 \left( \frac{1}{\cos\theta} - 1 \right)$

Efficiency Equations

$$\eta = 80.2 - 1636 (T_i - T_a)/I$$

$$\eta = 80.2 - 288 (T_i - T_a)/I$$

$$\eta = 80.4 - 1548 (T_i - T_a)/I - 4372 [(T_i - T_a)/I]^2$$

$$\eta = 80.4 - 272 (T_i - T_a)/I - 135 [(T_i - T_a)/I]^2$$

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 $^{\circ}\text{F}$ )	40,200 Kilojoules/day	38,100 Btu/day
Intermediate Temperature, 50 $^{\circ}\text{C}$ (122 $^{\circ}\text{F}$ )	17,100 Kilojoules/day	16,200 Btu/day
High Temperature, 100 $^{\circ}\text{C}$ (212 $^{\circ}\text{F}$ )	0 Kilojoules/day	0 Btu/day

REFERENCE 93016