

SUMMARY INFORMATION SHEET

FLORIDA SOLAR ENERGY CENTER

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



March 1998
FSEC # 98007C

MANUFACTURER

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

Collector Model

Vortex VT48

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	3.658 meters	12.00 feet
Gross Width	1.210 meters	3.97 feet
Gross Depth	0.006 meters	0.02 feet
Gross Area	4.426 square meters	47.64 square feet
Transparent Frontal Area	4.426 square meters	47.64 square feet
Volumetric Capacity	15.5 liters	4.1 gallons
Weight (empty)	13.6 kilograms	30.0 pounds
Recommended Flow Rate	310 ml/s	4.9 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/ 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 $^{\circ}\text{F}$)	48,100 Kilojoules/day	45,600 Btu/day
Intermediate Temperature, 50 $^{\circ}\text{C}$ (122 $^{\circ}\text{F}$)	20,500 Kilojoules/day	19,400 Btu/day
High Temperature, 100 $^{\circ}\text{C}$ (212 $^{\circ}\text{F}$)	0 Kilojoules/day	0 Btu/day

REFERENCE 93016