

Oventrop evacuated tube solar
thermal collector
OVSOL 5 - 8, 8 tube collector
and
OVSOL 5 - 16, 16 tube collector

1. General Specifications

1.01 Certifications

- 1) SRCC OG-100

SRCC OG-100 certification number:
100-2006-027A



1.02 Warranty

- 1) Evacuated tube vacuum seal is to be ten (10) years full replacement of tube.

2. General Solar Collectors

2.01 Manufacturers

- 1) Oventrop OV 5 evacuated tube collector
- 2) Vacuum tube solar collectors, with a total absorber surface area of 38.75ft². The collector construction shall consist of vacuum tubes based on the heat pipe principle, single pass copper heat exchange manifold box, non-degrading thermal insulation and stainless steel mounting rails.
- 3) Each collector shall have a total gross area of 22.28 ft² (8 tube model) or 44.67 ft² (16 tube model).
- 4) The height of each collector shall be 83" (2110 mm), and the width shall be 38" (960 mm) [8 tube model], or 76" (1920 mm) [16 tube model].
- 5) Evacuated tube outer diameter is to be 4 inches.

2.02 Operation

- 1) Minimum angle of inclination 25^o, maximum angle of inclination 90^o
- 2) Maximum pressure operating capacity of 87 psig (6 bar)
- 3) Maximum stagnation temperature of 302^oF (150^oC).

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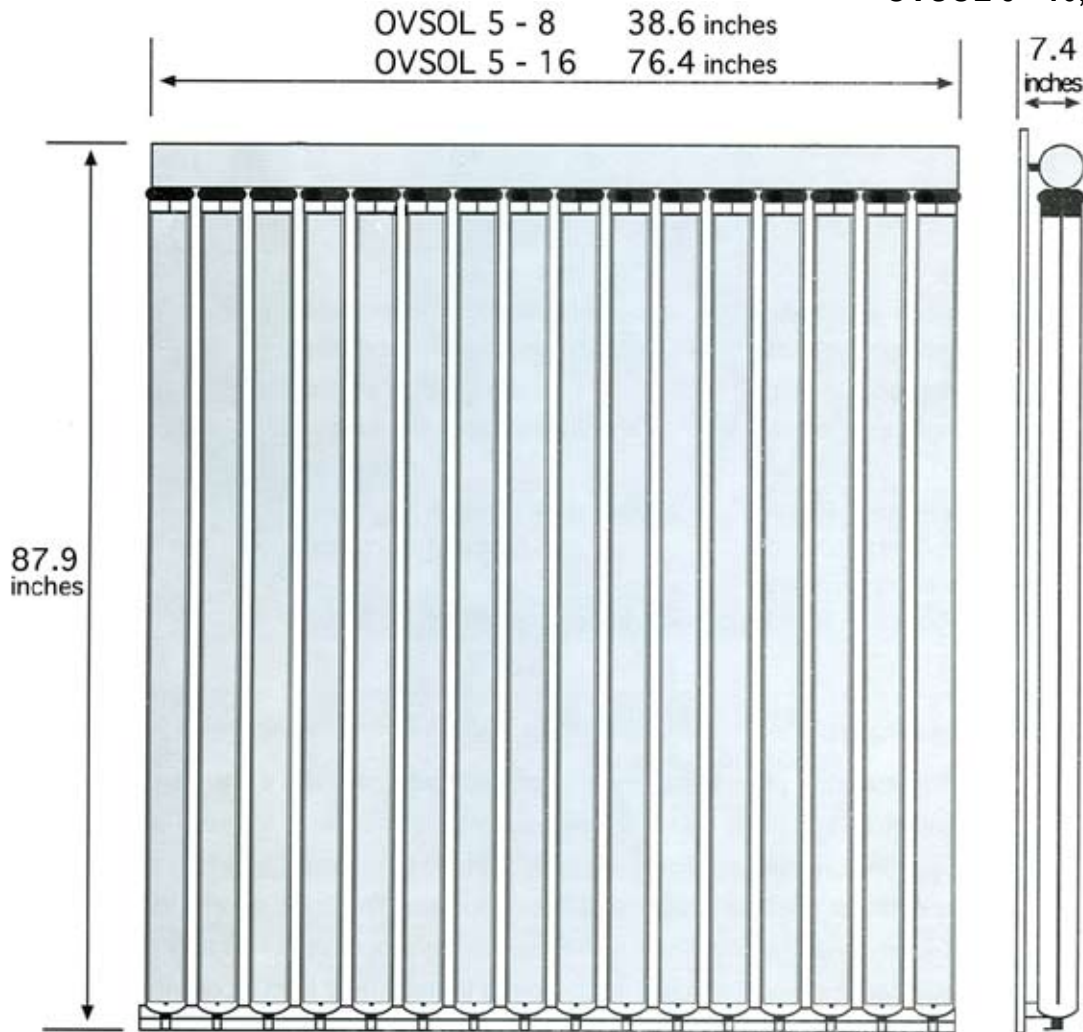
3. Vacuum Tube Specifications

3.01 Construction

- 1) The collector shall consist of either 8 or 16 tube vacuum glass tubes made of borosilicate glass. Each tube contains an aluminum absorber plate, coated with a aluminum nitrate selective surface, bonded to a copper heat pipe tube. The aluminum nitrate selective surface shall have a coefficient of absorption of 0.92 and a coefficient of emission of 0.08.
- 2) The heat pipe tube shall be connected to the condenser tip via a copper riser connection. Each individual tube shall be placed with the absorber selective surface (blue side) facing out toward the sun.
- 3) Absorber is convex, selective surface (blue side) facing out.
- 4) The condenser tip of the heat pipe shall be connected into the copper heat exchanger (manifold) with a dry connection facilitating removal and installation of the individual tubes without draining the system heat transfer fluid. The heat exchanger shall be a single pass copper design, which completely encloses the condenser port.
- 5) The collector connection shall incorporate an integrated temperature sensor well on the return side of the collector.
- 6) The heat exchanger enclosure housing shall be constructed of aluminum, and shall incorporate foam insulation surrounding the heat exchanger.
- 7) The vacuum tubes shall be attached to a stainless steel rail support. Each individual tube shall be held in place with a stainless steel clip, which connects the tube to the support rail.
- 8) The collectors shall be joined together using compression couplings. This shall allow up to 64 tubes to be joined together in one collector array. The collectors shall be connected to the system piping with 22mm x _" copper pipe adapters.
- 9) The collectors shall be designed to connect directly to the mounting hardware for a flush mount on a sloped roof, or a rack system on a flat roof. All mounting hardware shall be supplied by Oventrop.

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4. Dimensioned Product Drawing



Dimension Specifications

OVSOL 5 - 8: 87.9L x 38.6W x 7.4D inches
OVSOL 5 - 16: 87.9L x 76.4W x 7.4D inches


Gross collector area: **OVSOL 5 - 8:** 22.28 sq. ft.
OVSOL 5 - 16: 44.67 sq. ft.

Net absorber area: **OVSOL 5 - 8:** 19.37 sq. ft.
OVSOL 5 - 16: 38.75 sq. ft.

Gross weight: **OVSOL 5 - 8:** 110 lbs.
OVSOL 5 - 16: 220 lbs.

Operation Specifications

Inclination angle: 25° to 90°
Typical operating temperature: 158 - 248 °F
Stagnation temperature: 375 °F
Pressure drop per module at 26 gal/h: 0.17 ft/hd
Absorber coating: Aluminum nitride
Vacuum grade: 10 mbar

SOLAR COLLECTOR CERTIFICATION AND RATING  SRCC OG-100	CERTIFIED SOLAR COLLECTOR SUPPLIER: Oventrop Corporation 29 Knipes Road East Granby, CT 06026 USA MODEL: OV 5-16 AS/AB COLLECTOR TYPE: Tubular CERTIFICATION#: 2006027B
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COLLECTOR THERMAL PERFORMANCE RATING

Megajoules Per Panel Per Day				Thousands of BTU Per Panel Per Day			
CATEGORY (Ti-Ta)	CLEAR DAY	MILDLY CLOUDY	CLOUDY DAY	CATEGORY (Ti-Ta)	CLEAR DAY	MILDLY CLOUDY	CLOUDY DAY
A (-5 °C)	45.0	34.0	23.0	A (-9 °F)	42.6	32.2	21.8
B (5 °C)	42.4	31.4	20.5	B (9 °F)	40.2	29.8	19.4
C (20 °C)	38.3	27.4	16.5	C (36 °F)	36.3	26.0	15.7
D (50 °C)	30.6	19.6	9.5	D (90 °F)	29.0	18.6	9.0
E (80 °C)	22.8	12.6	3.0	E (144 °F)	21.6	12.0	2.8

A- Pool Heating (Warm Climate) B- Pool Heating (Cool Climate) C- Water Heating (Warm Climate) D- Water Heating (Cool Climate) E- Air Conditioning

Original Certification Date: 13-APR-07

COLLECTOR SPECIFICATIONS

Gross Area:	4.097 m ²	44.09 ft ²	Net Aperature Area:	3.63 m ²	39.11 ft ²
Dry Weight:	105.0 kg	232. lb	Fluid Capacity:	1 liter	0.3 gal
Test Pressure:	1000. KPa	145. psg			

COLLECTOR MATERIALS

Frame:	Stainless Steel
Cover (Outer):	Glass Vacuum Tube
Cover (Inner):	None

Pressure Drop

Flow		ΔP	
ml/s	gpm	Pa	in H ₂ O

Absorber Material:	Tube - Copper / Plate - Aluminum
Absorber Coating:	Sputtered aluminium nitride

Insulation Side:	Vacuum
Insulation Back:	Vacuum

TECHNICAL INFORMATION


Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Taj]	Y INTERCEPT	SLOPE
S I UNITS: $\eta = 0.489 - 1.58550 (P)/I - 0.00524 (P)^2/I$	0.492	-1.924 W/m².°C
I P UNITS: $\eta = 0.489 - 0.27929 (P)/I - 0.00051 (P)^2/I$	0.492	-0.339 Btu/hr.ft².°F

Incident Angle Modifier [(S)=1/cosθ - 1, 0°<θ<=60°]	Model Tested:	2006026A
Kα = 1 0.947 (S) -1.076 (S) ²	Test Fluid:	Water
Kα = 1 -0.18 (S) Linear Fit	Test Flow Rate:	41 ml/s 0.65 gpm

REMARKS: Tested with long axis of tubes oriented No-So. IAM perpendicular to the tubes is listed above. IAM parallel to the tubes = 1.0 - 0.32(S)

SOLAR RATING & CERTIFICATION CORPORATION

c/o FSEC ♦ 1679 Clearlake Road ♦ Cocoa, FL 32922 ♦ (321) 638-1537 ♦ Fax (321) 638-1010

SOLAR COLLECTOR CERTIFICATION AND RATING  SRCC OG-100	CERTIFIED SOLAR COLLECTOR SUPPLIER: Oventrop Corporation 29 Knipes Road East Granby, CT 06026 USA MODEL: OV 5-8 AS/AB COLLECTOR TYPE: Tubular CERTIFICATION#: 2006027A
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COLLECTOR THERMAL PERFORMANCE RATING

Megajoules Per Panel Per Day				Thousands of BTU Per Panel Per Day			
CATEGORY (Ti-Ta)	CLEAR DAY	MILDLY CLOUDY	CLOUDY DAY	CATEGORY (Ti-Ta)	CLEAR DAY	MILDLY CLOUDY	CLOUDY DAY
A (-5 °C)	22.3	16.8	11.4	A (-9 °F)	21.1	15.9	10.8
B (5 °C)	21.0	15.5	10.1	B (9 °F)	19.9	14.7	9.6
C (20 °C)	19.0	13.6	8.2	C (36 °F)	18.0	12.9	7.8
D (50 °C)	15.1	9.7	4.7	D (90 °F)	14.3	9.2	4.5
E (80 °C)	11.3	6.2	1.5	E (144 °F)	10.7	5.9	1.4

A- Pool Heating (Warm Climate) B- Pool Heating (Cool Climate) C- Water Heating (Warm Climate) D- Water Heating (Cool Climate) E- Air Conditioning

Original Certification Date: 13-APR-07

COLLECTOR SPECIFICATIONS

Gross Area:	2.028 m ²	21.83 ft ²	Net Aperature Area:	1.83 m ²	19.70 ft ²
Dry Weight:	49.2 kg	108. lb	Fluid Capacity:	.5 liter	0.1 gal
Test Pressure:	1000. KPa	145. psg			

COLLECTOR MATERIALS

Frame:	Stainless Steel
Cover (Outer):	Glass Vacuum Tube
Cover (Inner):	None

Pressure Drop

Flow		ΔP	
ml/s	gpm	Pa	in H ₂ O
20.00	0.32	73.40	0.29
50.00	0.79	458.4	1.8
80.00	1.27	1173.10	4.71

Absorber Material:	Tube - Copper / Plate - Aluminum
Absorber Coating:	Sputtered aluminium nitride

Insulation Side:	Vacuum
Insulation Back:	Vacuum

TECHNICAL INFORMATION

Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Taj]				Y INTERCEPT	SLOPE
S I UNITS:	$\eta = 0.489$	$-1.58550 (P)/I$	$-0.00524 (P)^2/I$	0.492	-1.924 W/m².°C
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