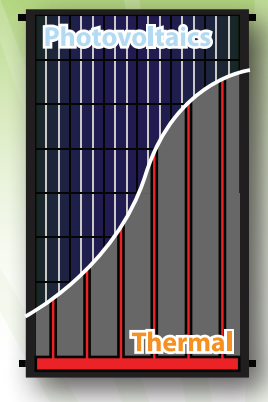
WIOSUN® PV-Therm-180

Combined Heat and Power Technology



NEW AGE ENERGY

THE POWER OF GREEN²

WIOSUN® PV-Therm-180

The BEST of BOTH WORLDS

2.5 x Energy Output:

PV-Therm generates up to 2.5 times the energy yield per sq. ft. of standard photovoltaic systems.

Higher Efficiency:

PV-Therm simultaneously generates hot water while cooling the solar electric cells. This substantially raises the electric cell efficiency.

Extended Life:

By cooling the panel and lowering the temperature we can extend the life of the panel and reduce output deterioration.

Better Space Utilization:

The combination of higher output and higher efficiency means better utilization of limited roof or rack space.

Lower Installation Cost:

Combining these two power generation functions eliminates redundant materials (glass, racking, etc.) and saves labor.

Cooler Roof:

Extracting heat from the back of a photovoltaic panel, which can exceed 170 degrees F during the summer, both lowers the building's cooling load and enhances the useful life of the roof.

Cooling PV:

The temperature behind a conventional PV module can exceed 170 degrees F on a summer day, resulting in a 25-30% drop in electrical output. The PV-Therm extracts heat from the PV portion of the module, raising the module output dramatically while simultaneously providing useful hot water.

Hot Water Generation:

PV-Thermal can generate 140 degree F hot water to offset the cost of expensive energy from fossil fuels.

Product History:

The WIOSUN PV-Therm was developed by Solarzentrum Allgau near Munich, Germany between 2003-2008. Solzentrum Allgau designed, manufactured and installed many prototype systems. In the first quarter of 2008, Solarzentrum Allgau completed an automated production facility that has produced thousands of panels in the past two years for German consumption and export to 12 countries. Additional plants are planned for the United State, South Korea and Yugoslavia in 2011.

Commercial/Industrial Applications:

Hospitals and Health Centers, Commercial Pools, Colleges and Universities, Industrial Plants

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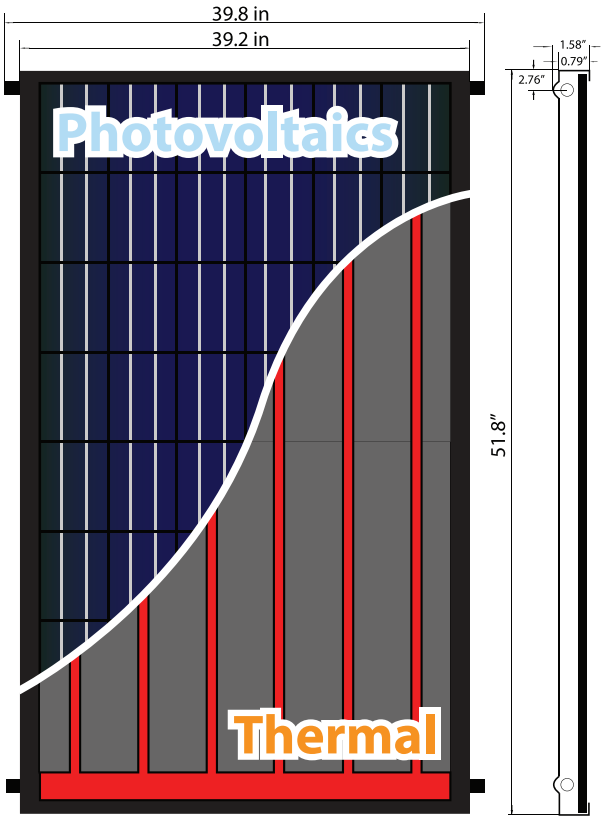
MODULE CHARACTERISTICS

System Voltage max	1000V
Capacity Tolerance	**-0 / +3 %**
Size of Cells	6.1 x 6.1
Number/Type/Size of Cells	48, polykristalline, 8 x 6
NOCT	118.4 °F ± 3.6 °F
Temperature Coefficient I_{SC}	+ 0.04 % / °C
Temperature Coefficient U_{OC}	+ 0.35 % / °C
Temperature Coefficient P_{MPP}	+ 0.5 % / °C
Overall Size L x W x H	51.8 in x 39.8 in x 0.79 in
Weight	85.1 lbs
Glass thickness	0.13 in
Maximum Surface Load Capacity	5.400pa / 112.8 lb/sf iaw. IEC 61730
Connecting System	MC4
Product warranty	2 years
Performance guarantee, electric	90/80% - 10/25 years
Safety Class	II
TÜV/Keymark/ANSI/UL/CEC/SRCC/FSEC	IEC 61215 / IEC 61730 / 1703 i.P.

THERMAL CHARACTERISTICS

Absorber Surface Area	12 ft²
Connections	DN 18
Fluid Capacity	1.32 Gallons
Operating Pressure	max. 21.44 PSI
Test Pressure	max. 42.87 PSI
Flow Rate	7.92-26.4 gal/h and module
Delta T	5 K at STB
Operating Temperature	between 50 °F – 140 °F
Stagnation Temperature	approx. 160 °F
Thermal efficiency eta 0	approx. 55%
Collector yield	approx. 51.1 W / ft²



			PVT170P	PVT175P	PVT180P	PVT185P
Capacity Rating -0 / +3 %	P_{max} (STC)	Wp	170	175	180	185
Rated Voltage	U_{MPP}	V	23.3	23.6	23.8	24.0
Rated Current	I_{MPP}	A	7.30	7.42	7.56	7.71
Short Circuit Current	I_{SC}	A	8.05	8.21	8.32	8.49
Open Circuit Voltage	U_{OC}	V	27.98	28.32	28.56	28.8
Cell Efficiency	%		14.55	15.00	15.41	15.83
Module Efficiency	%		12.97	13.35	13.73	14.11

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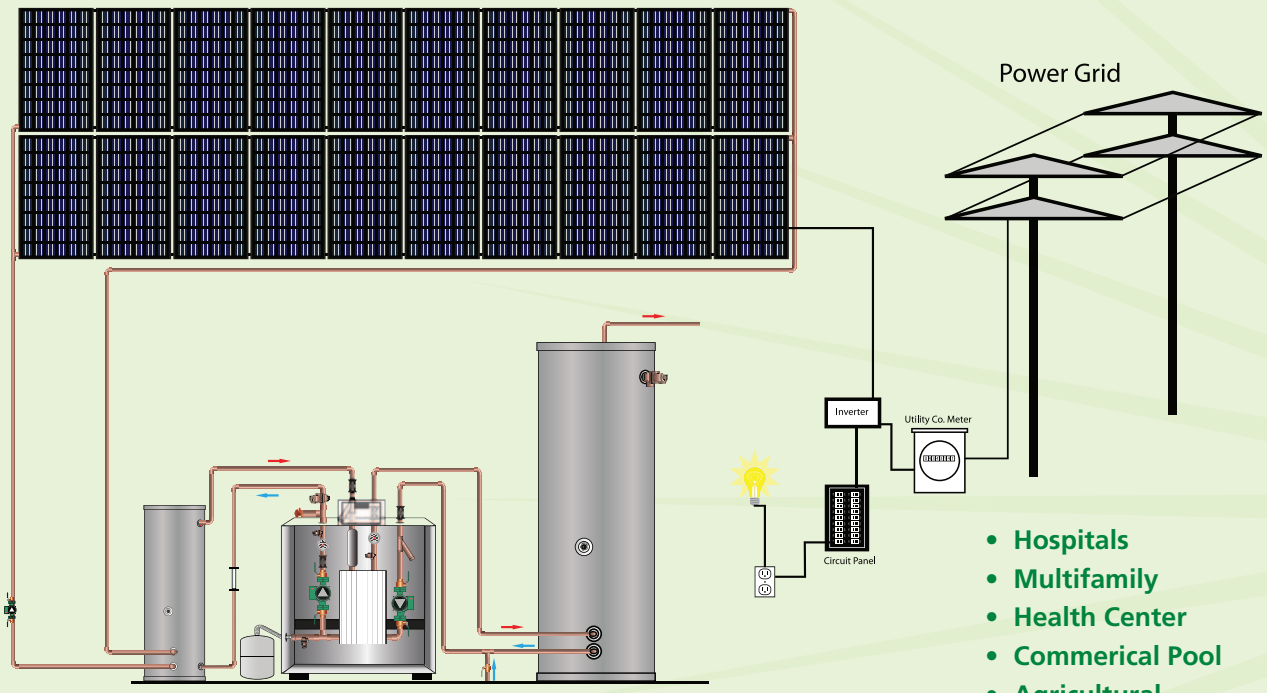
Commercial/Industrial



- Hospitals
- Multifamily
- Health Center
- Commerical Pool
- Agricultural

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