



MILLENNIUM ELECTRIC: MSS - MIL-PVT-190W-MO2 DATA SHEET

> High Performance

High-power module using 72 high efficient 125*125 mm square mono-crystalline silicon cells.

>High Quality

High Quality Advanced EVA encapsulation.

> CELL EFFICIENCY 17%

17% cell conversion efficiency. PVT modules with 3 bypass diodes minimize the power drop caused by shade.

> The Most Efficient Solar Collector in the World

-Up to **30% higher PV efficiency** for production of electricity.
 -Up to **70% additional thermal energy** from the same collector.

> Warranty

Warranty for module 90% performance after 10 years. for module 80% performance after 25 years.

Millennium's Photovoltaic-Thermal modules offer industry-leading performance, durability, and reliability for a variety of electrical power requirements. Using breakthrough technology, these modules use high efficiency cells and contacts to reduce reflection of sunlight, a structure to improve conversion efficiency and anti-reflective coating provides uniformity.



MSS, Millennium's Unique Technology:

The Multi Solar system is an innovative, patented Solar PV/Thermal System that makes it possible to **convert solar energy into Electrical energy (PV) and Thermal energy at the same time using a single integrated flat plate collector system**. The Multi Solar System uses air and water pipes to cool the PV cells in order to increase the relative efficiency of the electric system and at the same time produce hot water and hot air which can be channelled for further thermal use.

The **PV cells which are cooled by the water and air flow inside the pipes** can provide up to **30% higher annual electrical production than the usual PV system under the same conditions**. The MSS collector creates this advantage by preventing the efficiency degradation of regular PV caused by excessive heat (negative heat coefficient of half percent per degree of heat in any normal photovoltaic panel). The thermal efficiency of the MSS collector system reaches up to 70%. With the additional 15% efficiency of the PV electrical production the MSS reaches to 85% efficiency: **The Most Efficient Solar Collector in the World.**

Common applications include:

- Solar MSS power stations
- Solar MSS Co-generation power stations
- Grid connected houses
- Solar houses
- Solar air conditioning systems



STC: irradiance level 1000W/m², spectrum AM 1.5 and cell temperature 25°C
 Specifications and design are subject to change without prior notice.

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MILLENNIUM ELECTRIC LTD.

MSS Mil-PVT 190W M-02 Module

> High Performance

High-power module using 72 high efficient 125*125 mm square mono-crystalline silicon cells.

> CELL EFFICIENCY 17%

17% cell conversion efficiency. PVT modules with 3 bypass diodes minimize the power drop caused by shade.

> High Quality encapsulation

High Quality Advanced EVA encapsulation.

Millennium's Photovoltaic-Thermal modules offer industry-leading performance, durability, and reliability for a variety of electrical power requirements. Using breakthrough technology, these modules use high efficiency cells and contacts to reduce reflection of sunlight, a structure to improve conversion efficiency and anti-reflective coating provides uniformity.



*Millennium also participates in the IEA task 35 on PVT, Task 35 reports also indicates millennium as the only manufacture with Flat plate PVT collector that produce also Hot air and Hot water, with the largest number in the world of installed systems of PVT air & liquid collectors. Some are **working successfully with no problems from 1991.***

The MSS-PVT generates both electric and thermal energy using a single integrated collector, allowing the photovoltaic cells to be cooled by water/air which increases its relative efficiency. The cell cooling system generates up to 30% higher PV efficiency annually, compared to a regular PV panel under similar hot, summer conditions. As the cells are cooled, the water/air pipes are heated and accumulate an efficiency of 85%: (15% electricity production and 70% thermal energy production), which can be used for various residential and industrial uses.

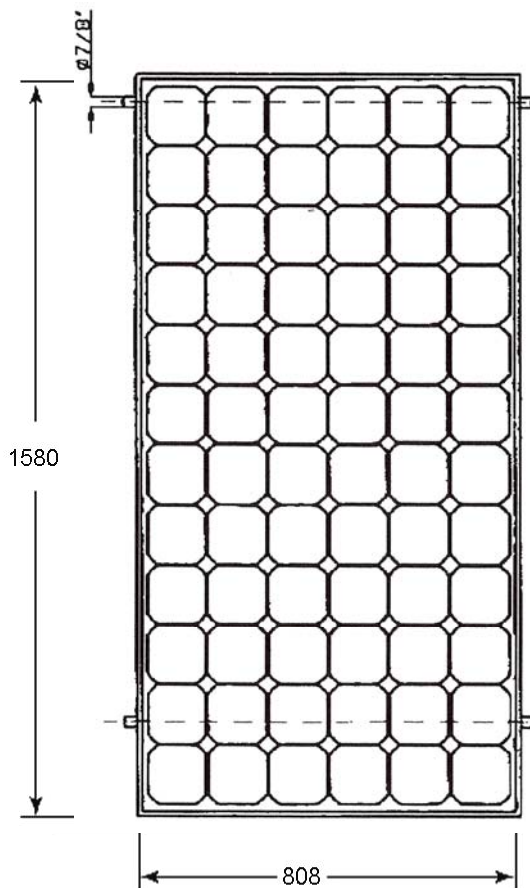
Designed to withstand rigorous weather conditions, a junction box is also provided for easy electrical connections in the field, making Millennium's modules the perfect combination of advanced technology and reliability.



Millennium Electric Panels in a PV Power stations in Italy

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COMPONENT DESCRIPTION

COMPONENT MANUFACTURER	Millennium Electric
Type	MSS-MIL-PVT-190W-MO2
Power	190W
Power tolerance	+/-5%
BIPV	No
Cell type	High Efficient Mono crystalline
Cell shape	Square 125*125 mm
Cell efficiency	17%
Cells per Module	72
Quality guarantee	Warranty for module 90% performance after 10 years. for module 80% performance after 25 years.
Distribution	worldwide
Length	1,580 mm
Width	808 mm
Thickness	45 mm
Frame type	Anodized Aluminum Alloy
Connection type	MC
Weight	25 kg
Voc	43.2 V
Isc	5.91 A
Maximum Power Voltage	36V
Maximum Power Current	5.28 A
Coefficient of voltage	-0.38%/°C
Coefficient of current	0.09%/°C
Coefficient of power	-0.45%/°C
Max System Voltage	DC 1000 V
Test conditions	1000W/m2, AM1.5, 25°C
Thermal Production	2000 Kcal/Day



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Connection Box	With 3 pcs built-in bypass diodes
Grounding connection	Yes
Solar Junction boxes:	Solar Junction box provides the user with safety, swift and reliable way to connect. The junction box can be connected to the photovoltaic collector. Solar Junction box provided with cable and connector, PV/T junction box for time-saving, safe and reliable cabling.
Cable Type and Length, connector type	MC

Junction boxes for Millennium PV/T modules

