

## Multicrystalline Silicon Photovoltaic Modules

### Electrical Specifications @ STC (AM1.5, 1,000 W/m<sup>2</sup>, 25° C):

Module Type		BMU/214	BMU/224	BMU/227	BMU/233	BMU/239	BMU/245
Maximum Power	$P_{MPP}$ [W]	214	224	227	233	239	245
Short Circuit Current	$I_{SC}$ [A]	8.15	8.30	8.35	8.45	8.56	8.65
Open Circuit Voltage	$V_{OC}$ [V]	36.4	37.0	37.1	37.5	37.8	38.1
MPP Current	$I_{MPP}$ [A]	7.50	7.70	7.80	7.90	8.00	8.15
MPP Voltage	$V_{MPP}$ [V]	28.5	29.0	29.2	29.5	29.8	30.2
Solar Cell Efficiency	$\eta_C$ [%]	14.7	15.3	15.5	16.0	16.4	16.8
Module Efficiency	$\eta_M$ [%]	13.1	13.7	13.9	14.3	14.6	15.0

Additional power classes available upon request.

Efficiency of modules at low irradiation (200 W/m<sup>2</sup>) decreases to 95.7 % of efficiency at STC.

### Electrical Specifications @ AM1.5, 800 W/m<sup>2</sup>, Cell Temperature 44° C:

Module Type		BMU/214	BMU/224	BMU/227	BMU/233	BMU/239	BMU/245
Maximum Power	$P_{MPP}$ [W]	158	165	168	172	176	181
Short Circuit Current	$I_{SC}$ [A]	6.62	6.74	6.78	6.86	6.95	7.03
Open Circuit Voltage	$V_{OC}$ [V]	33.8	34.3	34.4	34.8	35.1	35.3
MPP Current	$I_{MPP}$ [A]	6.06	6.23	6.31	6.39	6.47	6.59
MPP Voltage	$V_{MPP}$ [V]	26.0	26.4	26.6	26.9	27.2	27.5
Solar Cell Efficiency	$\eta_C$ [%]	13.5	14.2	14.3	14.7	15.1	15.5
Module Efficiency	$\eta_M$ [%]	12.1	12.6	12.8	13.2	13.5	13.8

### Electrical Specifications:

Solar Cell Type	Multicrystalline Silicon
Solar Cell Dimensions	156 mm x 156 mm (6+")
Number of Cells	60 in series
Power Output Tolerance	± 3 %
Current Temperature Coefficient $\alpha$	+ 5.5 mA/° C
Voltage Temperature Coefficient $\beta$	- 120 mV/° C
Power Temperature Coefficient $\gamma$	- 0.40 %/° C
Maximum System Voltage	1,000 V (IEC 61730)
NOCT	44° C
Limiting Reverse Current	No external voltage higher than $V_{OC}$ should be applied

### Mechanical Specifications:

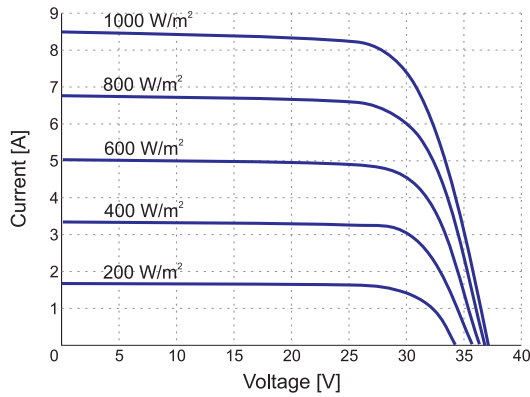
Length x Width x Thickness	1,649 mm x 991 mm x 40 mm
Weight	18.5 kg
Junction Box, Connectors	Tyco (IP 65) with three bypass diodes



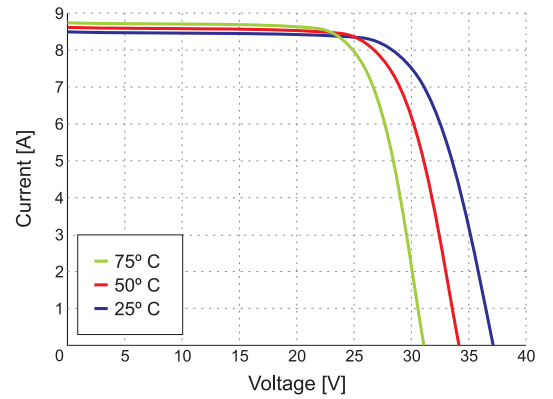
# Multicrystalline Silicon Photovoltaic Modules



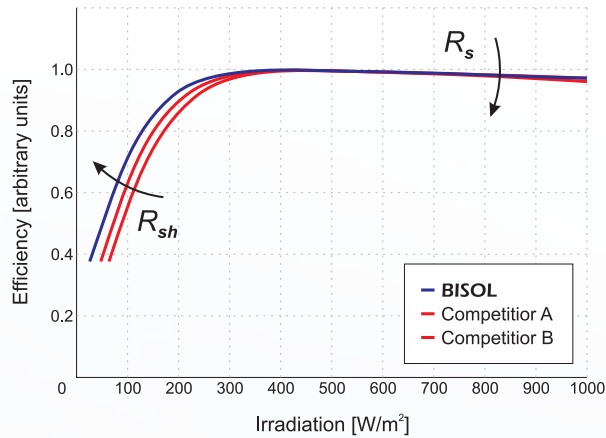
I-V Curve at Various Irradiation Levels



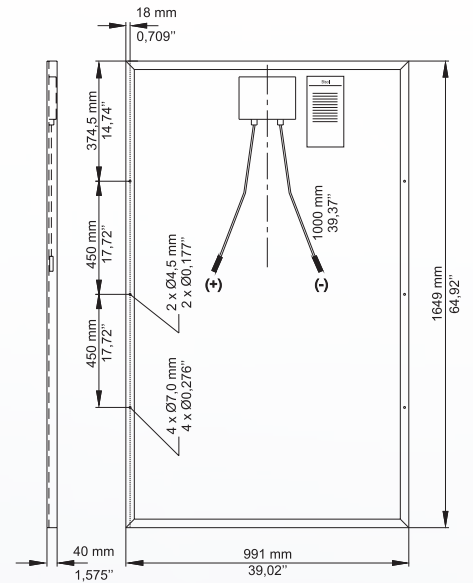
I-V Curve at Various Cell Temperatures



Effective Efficiency



Dimensions



**Warranty:**

- 10-year product warranty
- 12-year warranty on 90 % power output
- 25-year warranty on 80 % power output

CERTIFIED  
**IEC**  
61215 Ed.2

CERTIFIED  
**IEC**  
61730 Ed.1



**TÜVRheinland®**  
Precisely Right.



AUSTRIAN RESEARCH CENTERS