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# EnergyPal

## **Solar Panel Guide Specification Data Sheet**

**Swisswatt AG  
MW 190-210-72C  
MW190**

Also available on the web at  
[EnergyPal.com/swisswatt-ag-solar-panels/mw190](http://EnergyPal.com/swisswatt-ag-solar-panels/mw190)



## MODULE SERIES MW 190 - 210 - 72C

MODULE TYPES

MW190, MW195, MW200, MW205, MW210



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*The electrical parameters are typical values from historical production data. Measuring tolerance  $\pm 3\%$ .  
Technical changes in the course of product development, mistakes and errors reserved. Data sheet MW190 - 210 72c V02-13*

## PRODUCT FEATURES

MONOWATT Modules with 72 cells offer 5 performance classes designed for roof - or ground mounting. The modules are best suitable for small, medium and large scale solar systems for on- or off-grid operations. Technology, design and construction guarantee the highly efficient and reliable long term output of each and every module. Our automatic production and our latest flash tower technology guarantee a documented performance above industry standard.

- + Industry leading power tolerance 0 - + 3 %
- + Unique frame design for insolation and weather exposure
- + Automatic clean-room production for sustainable returns
- + Frame mounting concept for long- and short side mounting
- + High transmission low iron tempered glass
- + Enhanced strength and impact resistance
- + Advanced EVA component encapsulation, multilayer backsheets technology

## WARRANTIES & ASSURANCES


Industry leading guaranty on material and manufacturing: 10 years

Output assurance: up to 12 years: 90 %, up to 25 years: 80%

Please refer to our warranty conditions

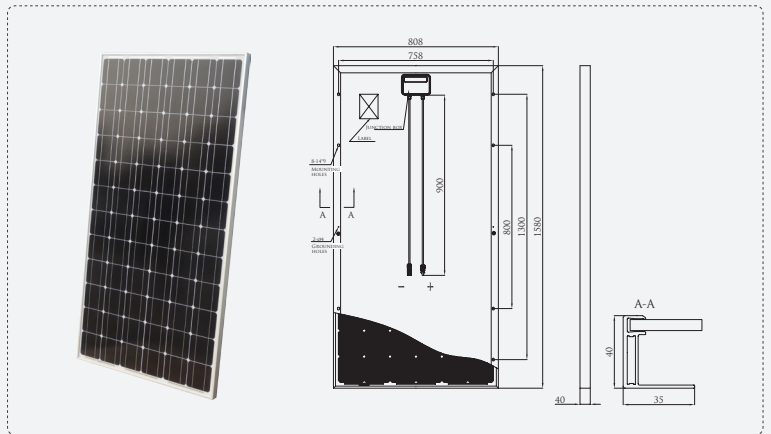
## QUALIFICATIONS & CERTIFICATES

Ongoing quality control and performance testing executed by independent testing laboratories grant the maximal benefit of your environmentally friendly energy production.

IEC 61215.2 / IEC 61730 / safety class II 



## TECHNICAL DATA MODULE SERIES MW 190 - 210 - 72C



## MECHANICAL DATA & MEASURES

|                              |  |
|------------------------------|--|
| Cable type, Diameter, Length | 4mm <sup>2</sup> , TÜV certified, 900 mm           |
| Connector type               | RADOX® SOLAR or Typ IV compatible                  |
| Dimension (mm)               | 1580 x 808 x 40 ( <b>45 extrem</b> )               |
| Weight                       | 15,5   |
| Drainage Holes in Frame      | 12   |
| Glass, Type, Thickness       | High Transmission, Low Iron, 3,2 mm Tempered Glass |
| Junction box                 | IP 65 Typ IV or IP67 RADOX® SOLAR                  |
| Bypass-Diodes                | 3  |

## ABSOLUTE RATINGS

|                                   |                                      |
|-----------------------------------|--------------------------------------|
| Dielectric Insulation Voltage (V) | 3000 V                               |
| Operating Temperature (°C)        | -40 ~ +85                            |
| Storage Temperature (°C)          | -40 ~ +85                            |
| Mechanical Load                   | 5400 Pa up to <b>10000 Pa extrem</b> |

## MODULE SERIES MW 190 - 210 - 72C

|                                       |  |
|---------------------------------------|--|
| Max-System Voltage (VDC)              | 600V(UL) / 1000V(IEC)                          |
| Number, type and arrangement of cells | 72, Mono-Crystalline Silicon (6 x 12)          |
| Cell Size (mm)                        | 125 x 125                                      |
| Max. Series fuse (A)                  | 15   |
| Module variants                       | Indus, <b>extrem</b> , Shadow Black (190-205W) |

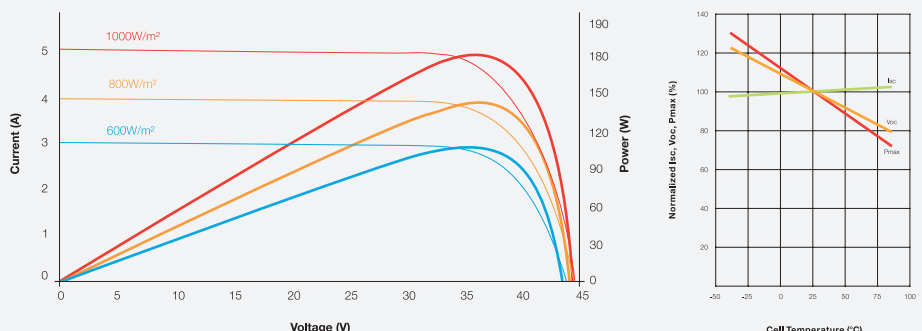
## ELECTRICAL DATA AT STC / NOCT (47 ± 2°C)

| Module type                               | MW190          | MW195           | MW200          | MW205          | MW210           |
|---|----------------|-----------------|----------------|----------------|-----------------|
| Rated output P <sub>MPP</sub> (W)         | 190 Wp         | 195 Wp          | 200 Wp         | 205 Wp         | 210 Wp          |
| Max-Power Voltage V <sub>m</sub> (V)      | 36,4 / 32,7 V  | 36,93 / 33,15 V | 37,3 / 33,5 V  | 37,66 / 33,5 V | 38,14 / 33,68 V |
| Max-Power Current I <sub>MPP</sub> (A)    | 5,29 / 4,4 A   | 5,35 / 4,45 A   | 5,43 / 4,52 A  | 5,51 / 4,63 A  | 5,57 / 4,72 A   |
| Open circuit Voltage V <sub>OC</sub> (V)  | 45,2 / 41,28 V | 45,3 / 41,37 V  | 45,7 / 41,73 V | 46,1 / 42,1 V  | 46,6 / 42,55 V  |
| Short circuit voltage I <sub>SC</sub> (A) | 5,6 / 4,77 A   | 5,65 / 4,81 A   | 5,72 / 4,87 A  | 5,79 / 4,93 A  | 5,86 / 4,99 A   |
| Cell Efficiency (%)                       | 17,00%         | 18,23%          | 18,70%         | 18,90%         | 19,4%           |
| Module efficiency %                       | 14,88%         | 15,27%          | 15,66%         | 16,10%         | 16,45%          |

## CURRENT-VOLTAGE CURVE (I-V-CURVE)

### I-V Curve

The current in relation to the voltage, illustrates the cell performance at different irradiances and temperatures. (AM1.5; 25°C)



### THERMAL CHARACTERISTICS

|   |         |
|---|---------|
| P <sub>m</sub> Temperature Coefficient (%/K)  | -0,4454 |
| I <sub>sc</sub> Temperature Coefficient (%/K) | 0,0499  |
| V <sub>oc</sub> Temperature Coefficient (%/K) | -0,3336 |