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Web: [EnergyPal.com/solar](http://EnergyPal.com/solar)

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# **EnergyPal**

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

**Ferrania Solis S.r.l.**

**AP 60 210-245**

**AP 60-215**

Also available on the web at  
[EnergyPal.com/ferrania-solis-s-r-l-solar-panels/ap-60-215](http://EnergyPal.com/ferrania-solis-s-r-l-solar-panels/ap-60-215)

# Photovoltaic Modules AP 60 Low Power

## 60 cells – Multicrystalline silicon – 34mm frames

Silver Wp: 210 - 215 - 220 - 225 - 230 - 235 – 240 - 245

*Output Power exceeds nominal value*



**Made in EU**

### Characteristics & Performance

Available in Silver version

- **Quality and Robustness**
  - High Quality raw materials
  - Advanced production technology
  - Deep quality and process control
- **Resistance to critical environment**
  - Static load at 600 kg/m<sup>2</sup> (6000 Pa)
  - Dynamic load at 300 kg/m<sup>2</sup> - wind 150 km/h
  - Hail with diameter of 25mm and speed of 83 km/h
- **High productivity**
  - Special anti-reflective glass for higher energy yields: up to 4% more
  - Current/power range strictly classified

### Product Warranty

- 10 years warranty on manufacturing defects

### Performance Warranty

- 12 years warranty on 90% of the nominal power
- 25 years warranty on 80% of the nominal power

### Disposal Warranty and Recycling

- COBAT (for Italy)

**cobat**

### System Certifications

Integrated Management System

- Quality - UNI EN ISO 9001:2008
- Environment - UNI EN ISO 14001:2004
- Health & Safety - OHSAS 18001:2007
- Certiquality Certificate of Excellence



### Product Tests and Certifications



Safety Class II

- **Conformity and Factory Inspection**
- **"MADE IN EU" Attestation for Italy**
- **Type Approval**  
IEC 61215 - Quality and Robustness  
IEC 61730 - 1 / 2 - Safety



**EUROTEST**  
Laboratori

- **Salt Mist Fog Resistance Test-IEC 61701:2011**  
Resistance in seaside areas
- **Ammonia Resistance Test-IEC 62716:2013**  
Resistance in farms
- **Special Component mechanical test**  
Mechanical load test for BIPV
- **PID Free (Potential Induced Degradation)**
- **Ageing Resistance Test**  
2000h Heat-Dump Test (85°C/85%R.H.)  
40 years ageing in average environmental conditions
- **Fire Reaction Class (Class I)**  
UNI 9177



eurofins | TECH

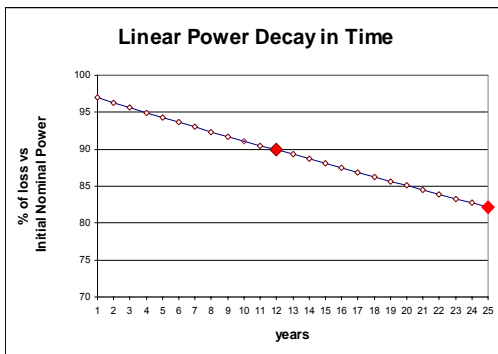


# Photovoltaic Modules AP 60 Low Power

## Electrical Features

| Type   |                      | AP 60-210 | AP 60-215 | AP 60-220 | AP 60-225 | AP 60-230 | AP 60-235 | AP 60-240 | AP 60-245 |
|--|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Performance at Standard Conditions (STC): Irradiance 1000W/m<sup>2</sup>; Module temperature 25°C; AM 1.5</b> |                      |           |           |           |           |           |           |           |           |
| Model  | Color                | Silver    | Silver    | Silver    | Silver    | Silver    | Silver    | Silver    | Silver    |
| Nominal Power  | P <sub>mpp</sub> (W) | 210       | 215       | 220       | 225       | 230       | 235       | 240       | 245       |
| Maximum Power Voltage  | V <sub>mpp</sub> (V) | 27.00     | 27.00     | 27.71     | 28.26     | 28.74     | 29.00     | 29.06     | 29.44     |
| Maximum Power Current  | I <sub>mpp</sub> (A) | 186.67    | 7.96      | 7.94      | 7.96      | 8.00      | 8.10      | 8.36      | 8.41      |
| Open Circuit Voltage   | V <sub>oc</sub> (V)  | 35.1      | 35.40     | 35.80     | 36.20     | 36.54     | 37.15     | 36.64     | 37.05     |
| Short Circuit Current  | I <sub>sc</sub> (A)  | 8.36      | 8.44      | 8.52      | 8.60      | 8.62      | 8.70      | 8.93      | 8.97      |
| Fill Factor  | %                    | 71.57     | 71.96     | 72.13     | 72.27     | 73.02     | 72.71     | 74.30     | 74.50     |
| Module efficiency  | %                    | 12.65     | 12.95     | 13.26     | 13.56     | 13.86     | 14.16     | 14.46     | 14.76     |
| Power Tolerance  | %                    | 0 / +5%   | 0 / +5%   | 0 / +5%   | 0 / +5%   | 0 / +5%   | 0 / +5%   | 0 / +5%   | 0 / +5%   |
| Working Temperature  | (°C)                 | -40 / 85  | -40 / 85  | -40 / 85  | -40 / 85  | -40 / 85  | -40 / 85  | -40 / 85  | -40 / 85  |
| Maximum Voltage  | (V <sub>oc</sub> )   | 1000      | 1000      | 1000      | 1000      | 1000      | 1000      | 1000      | 1000      |
| NOCT (Silver)  | (°C)                 | 43 +/- 2  | 43 +/- 2  | 43 +/- 2  | 43 +/- 2  | 43 +/- 2  | 43 +/- 2  | 43 +/- 2  | 43 +/- 2  |
| <b>Performance at NOCT: Irradiance 800W/m<sup>2</sup>; Module temperature 43°C; AM 1.5</b>                       |                      |           |           |           |           |           |           |           |           |
| Maximum Power  | P <sub>max</sub> (W) | 152.1     | 158       | 162.6     | 166.5     | 170.1     | 174.9     | 178.1     | 181.4     |
| Maximum Power Voltage  | V <sub>mpp</sub> (V) | 25.35     | 25.50     | 26.01     | 26.74     | 27.30     | 28.21     | 27.98     | 28.35     |
| Maximum Power Current  | I <sub>mpp</sub> (A) | 6.11      | 6.15      | 6.18      | 6.19      | 6.20      | 6.25      | 6.33      | 6.36      |
| Open Circuit Voltage   | V <sub>oc</sub> (V)  | 33.12     | 33.50     | 33.90     | 34.45     | 34.68     | 35.20     | 34.52     | 34.90     |
| Short Circuit Current  | I <sub>sc</sub> (A)  | 6.56      | 6.61      | 6.66      | 6.70      | 6.77      | 6.75      | 6.96      | 6.98      |

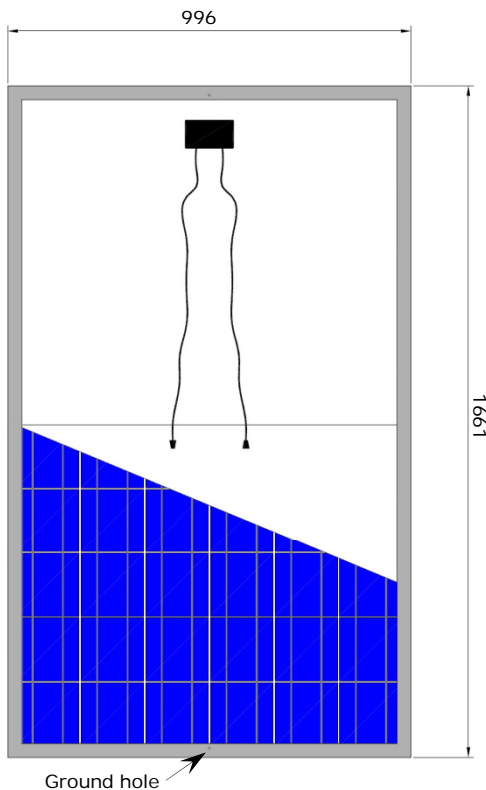
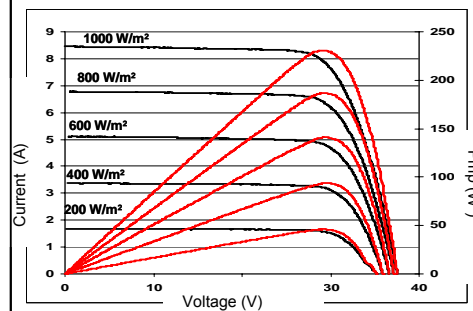
All electrical measures ±10% tolerance (but P<sub>mpp</sub> and NOCT)



### Temperature Coefficients

of I<sub>sc</sub> (α) = 0.06 % / °C // 5.429 mA / °C  
of V<sub>oc</sub> (β) = -0.31 % / °C // -0.116 V / °C  
of P<sub>max</sub> (γ) = -0.43% / °C // 0.969 W / °C

### Electrical features at different irradiance



### Design

|                     |  |
|---------------------|--|
| <b>Front</b>        | 3.2 mm tempered glass                                  |
| <b>Cells</b>        | 60 cells – Multicrystalline Silicon - 156 x 156 mm     |
| <b>Encapsulant</b>  | EVA ( Etylene - Vinyle Acetate co/polymer )            |
| <b>Backsheet</b>    | Polymeric laminate - white backside - white sunny side |
| <b>Profile</b>      | Anodized Aluminium                                     |
| <b>Junction Box</b> | IP 65 - Class II - 3 by-pass diodes                    |
| <b>Cables</b>       | 2 unipolar, 4 mm <sup>2</sup> wires - 1 m lenght       |
| <b>Connectors</b>   | MC4 compatible - rapid clutch                          |

### Dimensions

|                          |      |      |
|--------------------------|------|------|
| <b>Lenght</b>            | (mm) | 1661 |
| <b>Width</b>             | (mm) | 996  |
| <b>Profile Thickness</b> | (mm) | 34   |
| <b>Weight</b>            | (kg) | 17.5 |

### Holes

|                    |                                  |
|--------------------|----------------------------------|
| <b>Ground Hole</b> | 1 hole with identification label |
| <b>Drain Holes</b> | 2 drain holes on each side       |

**Made in Italy**

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