AE Solar
alternative energy

Inspiring green-energy since 2003

AE HALF LARGE CELL
MONOCRYSTALLINE PV MODULES
AE MD-120 Series 440W-460W
tested by Fraunhofer CSP

120
CELLS
MICRO-CRACK FREE
PID RESISTANT
SALT CORROSION RESISTANT
SAND RESISTANT
AMMONIA RESISTANT
HIGHLY STABLE AND TOUGH

TEMPERATURE
Hot spot temperature lower than 85°C
The IEC61215 test shows that with a zero percentage, a
small and a 100 percentage of shaded area, respectively hot
spots will not exceed 85°C, which is the maximum operating
condition.

SAFETY
Instantly reduced temperature, thus eliminating material
hazard and ensuring more safety of the module, preventing
fire risks caused by hot spots.

GERMAN QUALITY
AE Solar photovoltaic modules are produced using high
quality materials, automated robotic lines, German
technology and standards.

PERFORMANCE GUARANTEE
AE Solar assures high investment, security and warranty
claims by providing linear performance guarantee of 30
years and 12 years of product warranty.

RELIABILITY
Bypass diodes prevent cells mismatching at shaded areas.
The lower temperature of hot-spot free modules will
eliminate potential cause for back sheet degradation, hence
enhancing reliability for longer term.

HIGH RETURNS
This new technology prevents instant falls in the module
output, thus increasing the performance ratio up to 30%
and return for all types of installations.

PLUS-SORTING
Higher yield due to plus-sorting from 0 up to +5 Wp
guarantees the high system efficiency and yield stability.

CERTIFICATES
Lining with international standards, AE Solar Photovoltaic
modules are tested and certified under extreme stress
conditions and it can bear harsh environment influences.

OUR PERFORMANCE GUARANTEE

<table>
<thead>
<tr>
<th>Year</th>
<th>AE Solar</th>
<th>Commercial Guarantee</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>97%</td>
<td>95%</td>
</tr>
<tr>
<td>5</td>
<td>95%</td>
<td>93%</td>
</tr>
<tr>
<td>10</td>
<td>93%</td>
<td>91%</td>
</tr>
<tr>
<td>15</td>
<td>91%</td>
<td>89%</td>
</tr>
<tr>
<td>20</td>
<td>89%</td>
<td>87%</td>
</tr>
<tr>
<td>25</td>
<td>87%</td>
<td>85%</td>
</tr>
<tr>
<td>30</td>
<td>85%</td>
<td>83%</td>
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</table>

Performance Guarantee
Product Warranty

30 years
12 years

Deutsche Qualität Garantiert
### TECHNICAL DATA
**AE MD-120 Series 440W-460W**

#### SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>AE440MD-120</th>
<th>AE445MD-120</th>
<th>AE450MD-120</th>
<th>AE455MD-120</th>
<th>AE460MD-120</th>
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</thead>
<tbody>
<tr>
<td>Nominal Max. Power</td>
<td>440</td>
<td>445</td>
<td>450</td>
<td>455</td>
<td>460</td>
</tr>
<tr>
<td>Pmax (Wp)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum power voltage</td>
<td>Vmp(V)</td>
<td>34.62</td>
<td>34.87</td>
<td>35.13</td>
<td>35.38</td>
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<tr>
<td>Maximum power current</td>
<td>Up (A)</td>
<td>12.71</td>
<td>12.76</td>
<td>12.81</td>
<td>12.86</td>
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<tr>
<td>Open-circuit voltage</td>
<td>Voc(V)</td>
<td>41.35</td>
<td>41.66</td>
<td>41.98</td>
<td>42.29</td>
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<tr>
<td>Module efficiency</td>
<td>(%)</td>
<td>20.33</td>
<td>20.56</td>
<td>20.79</td>
<td>21.03</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>(°C)</td>
<td>-40 to +85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum system voltage DC</td>
<td>V (IEC)</td>
<td>1500</td>
<td></td>
<td></td>
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<tr>
<td>Maximum series fuse rating</td>
<td>(A)</td>
<td>25</td>
<td></td>
<td></td>
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<tr>
<td>Power tolerance</td>
<td>(%)</td>
<td>0 ~ + 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp. coefficients of Pmax</td>
<td>(%)/°C</td>
<td>-0.35</td>
<td></td>
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<tr>
<td>Temp. coefficients of Voc</td>
<td>(%)/°C</td>
<td>-0.275</td>
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<td>Temp. coefficients of Isc</td>
<td>(%)/°C</td>
<td>0.045</td>
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<tr>
<td>Nom. Operating cell temp. (NOCT)</td>
<td>(°C)</td>
<td>45±2</td>
<td></td>
<td></td>
<td></td>
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</table>

The electrical data apply to standard test conditions (STC): Irradiance of 1000 W/m² with spectrum AM 1.5 and a cell temperature of 25°C.

### MATERIAL CHARACTERISTICS

- **Cell type**: Mono-crystalline 182 x 91 mm
- **No. of cells**: 120 (60 full cells)
- **Dimensions**: 1910 x 1133 x 35 MM
- **Weight**: 24 KG
- **Junction box**: IP 68 rated (3 bypass diodes)
- **Output cable**: 1 x 4.0mm² 350 mm length or customised
- **Connector type**: MC 4 / MC 4 compatible
- **Hail resistance**: Max. Ø 25 mm, at 23 m/s
- **Wind load**: 2400 Pa / 244 kg/m²
- **Mechanical load**: 5400 Pa / 550 kg/m²

### PACKAGING INFORMATION

- **Packing configuration**: 62 pcs / double pallet
- **Loading Capacity**: 744 pcs / 40HQ
- **Size / pallet (mm)**: 1945 x1140 x 2490 mm
- **Weight**: 1598 kg / double pallet

### DIMENSIONS

![Dimensions Diagram]

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**CERTIFICATES**

[Certifications Logos: TÜV Rheinland, CE, CHSCH]

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