Q.ANTUM TECHNOLOGY: LOW LEVELISED COST OF ELECTRICITY
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.6%.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology\(^1\), Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty\(^2\).

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

1 APT test conditions according to IEC/TS 62804-1:2015, method B (-1500 V, 168 h)
2 See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:
Rooftop arrays on residential buildings
MECHANICAL SPECIFICATION

Format 1685 mm × 1000 mm × 12 mm (including frame)
Weight 18.7 kg
Front Cover 3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover Composite film
Frame Black anodised aluminium
Cell 6 × 20 monocrystalline Q.ANTUM solar half cells
Junction box 53-101 mm × 32-60 mm × 15-18 mm
Protection class IP67, with bypass diodes
Cable 4 mm² Solar cable; +49 (0)3494 66 99-23000 |
Connector Stäubli MC4, Hanwha Q CELLS HQC4; IP68

ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>POWER CLASS</th>
<th>310</th>
<th>315</th>
<th>320</th>
<th>325</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC (POWER TOLERANCE +5 W / −0 W)</td>
<td>Power at MPP</td>
<td>310</td>
<td>315</td>
<td>320</td>
</tr>
<tr>
<td>P_{MPP} [W]</td>
<td>232.0</td>
<td>235.8</td>
<td>239.5</td>
<td>243.3</td>
</tr>
<tr>
<td>Short Circuit Current</td>
<td>9.83</td>
<td>9.89</td>
<td>9.94</td>
<td>10.00</td>
</tr>
<tr>
<td>Open Circuit Voltage</td>
<td>40.02</td>
<td>40.29</td>
<td>40.56</td>
<td>40.83</td>
</tr>
<tr>
<td>Current at MPP</td>
<td>9.36</td>
<td>9.41</td>
<td>9.47</td>
<td>9.52</td>
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<tr>
<td>Voltage at MPP</td>
<td>33.12</td>
<td>33.46</td>
<td>33.80</td>
<td>34.14</td>
</tr>
<tr>
<td>Efficiency</td>
<td>±18.4</td>
<td>±18.7</td>
<td>±19.0</td>
<td>±19.3</td>
</tr>
</tbody>
</table>

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT

| Minimum | Power at MPP | 230.0 | 233.8 | 237.5 | 242.3 |
| Short Circuit Current | 7.92 | 7.97 | 8.01 | 8.05 |
| Open Circuit Voltage | 37.73 | 37.99 | 38.24 | 38.50 |
| Current at MPP | 7.37 | 7.41 | 7.45 | 7.49 |
| Voltage at MPP | 31.50 | 31.82 | 31.82 | 32.14 |
| Efficiency | ±18.4 | ±18.7 | ±19.0 | ±19.3 |

Note:

- **Temperature Coefficients**
  - Temperature Coefficient of I_{SC} \( \alpha \) [% / K] = +0.04
  - Temperature Coefficient of V_{OC} \( \beta \) [% / K] = −0.27
  - Temperature Coefficient of P_{MPP} \( \gamma \) [% / K] = −0.36

- **Permissible Module Temperature**
  - NMOT [°C] = 43 ± 3

- **Permissible Module Temperature**
  - −40 °C - +85 °C

- **Power at MPP**
  - (POWER TOLERANCE +5 W / −0 W)

- **System Design**
  - PV module classification Class II
  - Maximum System Voltage \( V_{DC} \) [V] = 1000
  - Maximum Reverse Current \( I_{R} \) [A] = 20
  - Permitted Module Temperature on Continuous Duty −40 °C - +85 °C

- **Q CELLS PERFORMANCE WARRANTY**

- **Performance at Low Irradiance**

- **TEMPERATURE COEFFICIENTS**

- **PROPERTIES FOR SYSTEM DESIGN**

- **QUALIFICATIONS AND CERTIFICATES**

- **PACKAGING INFORMATION**

**Q CELLS**

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