

Five Key Features

The SF 160 Mono Greenhouse module is especially developed for direct mounting in greenhouse structures.

- 1 High Energy Generation: Mono crystalline solar cells for maximum power output.
- 2 Optimized Cultivation: Favorable lighting conditions for a variety of plants through customized solutions.
- 3 Easy Installation: Frame configuration simplifies overall system design.
- 4 Guaranteed quality: 12 year product warranty, 25 year performance warranty *
- 5 Long term responsibility: Free module recycling in PV Cycle member countries

* Please refer to Hanwha SolarOne Co., Ltd. Product Warranty for details.

Quality and Environmental Certificates

- ISO 9001 quality standards and ISO 14001 environmental standards
- OHSAS 18001 occupational health and safety standards
- IEC 61215 and IEC 61730 Class A certifications
- Conformity to CE



About Hanwha SolarOne Co., Ltd.

Hanwha SolarOne Co., Ltd. is a vertically integrated manufacturer of photovoltaic modules designed to meet the needs of the global energy consumer.

- High reliability, guaranteed quality, and excellent cost-efficiency due to vertically integrated production and control of the supply chain;
- Optimization of product performance and manufacturing processes through a strong commitment to research and development;
- Global presence throughout Europe, North America, and Asia, offering regional technical and sales support.

Electrical Characteristics

Electrical Characteristics at Standard Test Conditions (STC)

Power Class	170 W	175 W	180 W	185 W	190 W	195 W
Maximum Power (P_{max})	170 W	175 W	180 W	185 W	190 W	195 W
Open Circuit Voltage (V_{oc})	43.8 V	44.0 V	44.3 V	44.6 V	44.8 V	45.0 V
Short Circuit Current (I_{sc})	5.36 A	5.48 A	5.59 A	5.68 A	5.78 A	5.85 A
Voltage at Maximum Power (V_{mpp})	35.0 V	35.2 V	35.4 V	35.6 V	35.8 V	36.0 V
Current at Maximum Power (I_{mpp})	4.86 A	4.98 A	5.11 A	5.21 A	5.33 A	5.42 A
Module Efficiency (%)	13.3 %	13.7 %	14.1 %	14.5 %	14.9 %	15.3 %
Cell Efficiency (%)	15.4 %	15.8 %	16.3 %	16.7 %	17.2 %	17.6 %

P_{max} , V_{oc} , I_{sc} , V_{mpp} , and I_{mpp} tested at STC defined as irradiance of 1000 W/m² at AM 1.5 solar spectrum and temperature 25 ± 2 °C.
Electrical Characteristics: measurement tolerance of ± 3 %.

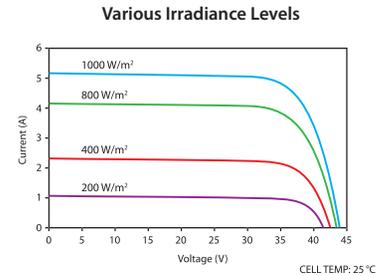
Electrical Characteristics at Normal Operating Cell Temperature (NOCT)

Power Class	170 W	175 W	180 W	185 W	190 W	195 W
Maximum Power (P_{max})	122 W	126 W	130 W	133 W	137 W	140 W
Open Circuit Voltage (V_{oc})	40.3 V	40.5 V	40.8 V	41.0 V	41.2 V	41.4 V
Short Circuit Current (I_{sc})	4.34 A	4.44 A	4.53 A	4.60 A	4.68 A	4.74 A
Voltage at Maximum Power (V_{mpp})	31.5 V	31.7 V	31.9 V	32.0 V <td 32.2 V	32.4 V	
Current at Maximum Power (I_{mpp})	3.89 A	3.98 A	4.09 A	4.17 A	4.26 A	4.34 A
Module Efficiency (%)	11.9 %	12.3 %	12.7 %	13.0 %	13.4 %	13.7 %
Cell Efficiency (%)	15.4 %	15.8 %	16.3 %	16.7 %	17.2 %	17.6 %

P_{max} , V_{oc} , I_{sc} , V_{mpp} , and I_{mpp} tested at NOCT defined as irradiance of 800 W/m²; wind speed 1 m/s.
Electrical Characteristics: measurement tolerance of ± 3 %.

Performance at Low Irradiance:

The typical relative change in module efficiency at an irradiance of 200 W/m² in relation to 1000 W/m² (both at 25 °C and AM 1.5 spectrum) is less than 5 %.



Temperature Characteristics

Normal Operating Cell Temperature (NOCT)	45 °C ± 3 °C
Temperature Coefficients of P	- 0.44 %/°C
Temperature Coefficients of V	- 0.33 %/°C
Temperature Coefficients of I	+ 0.03 %/°C

Maximum Ratings

Maximum System Voltage	1000 V
Series Fuse Rating	10 A
Maximum Reverse Current	Series fuse rating multiplied by 1.35

Mechanical Characteristics

Dimensions	1650 mm × 828 mm × 40 mm
Weight	15 kg
Frame	Aluminum alloy
Front	Tempered glass
Encapsulant	EVA
Back Cover	Composite sheet, white
Cell Technology	Monocrystalline
Cell Size	125 mm × 125 mm
Number of Cells (Pieces)	72 (6 × 12)
Junction Box	Protection class IP65 with bypass-diode
Output Cables	Solar cable: 4 mm ² ; length 900 mm
Connector	Linyang LY0706-2

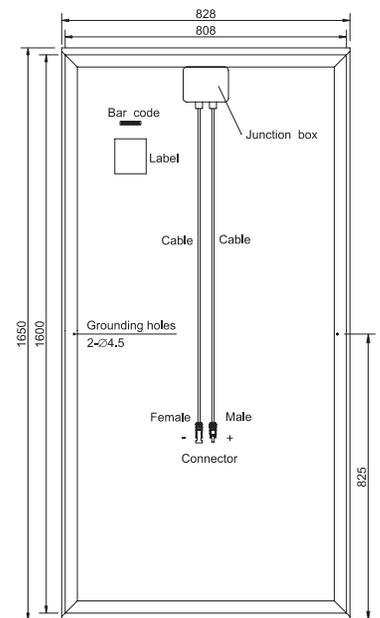
System Design

Operating Temperature	- 40 °C to 85 °C
Hail Safety Impact Velocity	25 mm at 23 m/s
Static Load Wind / Snow	2400 Pa

Packaging and Storage

Storage Temperature	- 40 °C to 85 °C
Packaging Configuration	36 pieces per pallet
Loading Capacity (40 ft. Container)	504 pieces

Basic Design



BACK VIEW

