bp solar

230W Photovoltaic module

BP 3230N

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BP Solar has been manufacturing solar wafers, cells and modules for more than 35 years. This experience shows that the best way to optimize module life and electrical energy production is to attend to every detail in the design and manufacture of our products, our process controls and testing methods. BP Solar's Generation Endura photovoltaic modules offers the following benefits:

Strong, resistant, innovative design

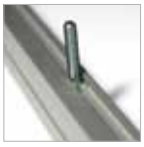
The tubular frame is designed with Porsche Engineering to withstand heavy snow loads (5400Pa - 540kg/m^2) in multiple mounting conditions. Shock absorbing corners, rounded profile and thick polyester back sheet protect the module against rough handling.

Excellent energy yields

High transmission ARC glass and margin allowance for LID effect maximize energy production. Increased distance between cells and frame and enhanced design that pushes the laminate to the front, reduce soiling losses.

More reliable connections, better cooling diodes

IntegraBus™ technology positions the bypass diodes and junction box away from the cells, ensuring cooler operation. Latching MC4 connectors for increased safety of the installation.



Flexible mounting, easy to handle

Using bolts or clamps, the Endura frame can be mounted in various configurations - even end-mounting; the rounded profile and low g/W ratio makes handling easier while reducing installation costs.

Enhanced warranty offer

BP Solar launches an industry leading warranty offer, with lower degradation rates on our modules manufactured beginning January 1st, 2010. Our internal testing standards that go well beyond international requirements back this innovative offer.

ISO 9001
ISO 14001

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Electrical characteristics

	[1] STC 1000W/m²	[2] NOCT 800W/m²
Maximum power (P_{max})	230W	165.6W
Voltage at P_{max} (V_{mpp})	29.1V	25.9V
Current at P_{max} (I_{mpp})	7.90A	6.32A
Short circuit current (I_{sc})	8.40A	6.80A
Open circuit voltage (V_{oc})	36.7V	33.4V
Module efficiency	13.8%	
Tolerance P_{max}	-3/+5%	
Nominal voltage	20V	
Efficiency reduction at 200W/m²	<5% reduction (efficiency 13.1%)	
Limiting reverse current	8.40A	
Temperature coefficient of I_{sc}	0.105%/ °C	
Temperature coefficient of V_{oc}	-0.360%/ °C	
Temperature coefficient of P_{max}	-0.45%/ °C	
[3] NOCT	47±2°C	
Maximum series fuse rating	20A	
Application class (according to IEC 61730:2007)	Class A	
Maximum system voltage	600V (U.S. NEC rating); 1000V (IEC 61730:2007)	

1: Values at Standard Test Conditions (STC): 1000W/m² irradiance, AM1.5 solar spectrum and 25ºC module temperature
2: Values at 800W/m² irradiance, Nominal Operation Cell Temperature (NOCT) and AM1.5 solar spectrum
3: Nominal Operation Cell Temperature: Module operation temperature at 800W/m² irradiance, 20ºC air temperature, 1m/s wind speed

All solar modules are individually tested prior to shipment; an allowance is made within our factory measurement to account for the typical power degradation (LID effect) which occurs during the first few days of deployment.

Mechanical characteristics

Solar cells	60 polycrystalline 6" silicon cells (156x156mm) in series
Front cover	High transmission 3.2mm (1/8th in) glass
Encapsulant	EVA
Back cover	White polyester
Frame	Silver anodized aluminum
Diodes	IntegraBus™ with 6 Schottky diodes
Junction box	Potted (IP 67); certified to meet UL 1703 flammability test
Output cables	4mm² cable with latching MC4 connectors Asymetrical cable lengths: (-)1250mm (49.21in) / (+)800mm (31.50in) Certified as PV Wire according to UL4703 and PV1-F according to VDE EPV 01:2008-02 standards
Dimensions	1667x1000x50mm / 65.6x39.4x2.0in
Weight	19.4kg / 42.8lbs

All dimensional tolerances within ±1% unless otherwise stated.

Warranty

- Free from defects in materials and workmanship for 5 years
- 93% min. power output over 12 years
- 85% min. power output over 25 years

Certification

Certified according to the extended version of the IEC 61215:2005 (Crystalline silicon terrestrial photovoltaic modules - Design qualification and type approval)

Certified according to IEC 61730-1 and IEC 61730-2. (Photovoltaic module safety qualification, requirements for construction and testing)

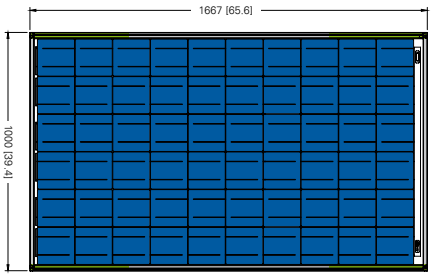
Listed to UL 1703 and ULC ORD-C1703 Standard for Safety by Intertek ETL

Manufactured in ISO 9001 and ISO 14001 certified factories

Module electrical measurements are calibrated to World radiometric reference via third party international laboratories

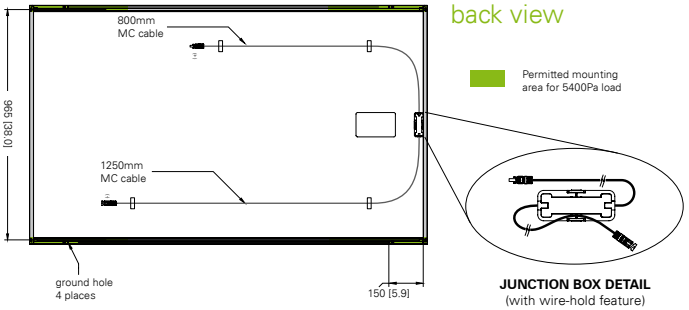
This data sheet complies with the EN 50380 requirements.

front view



side view

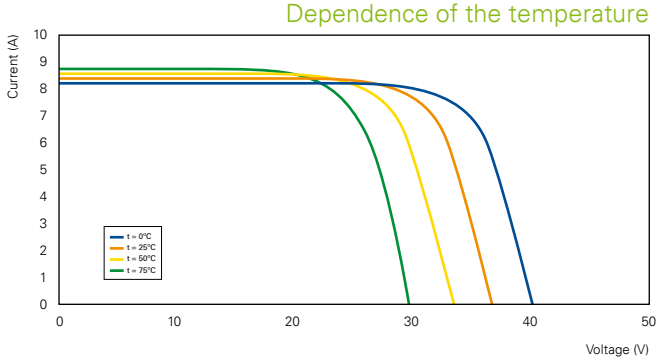
back view



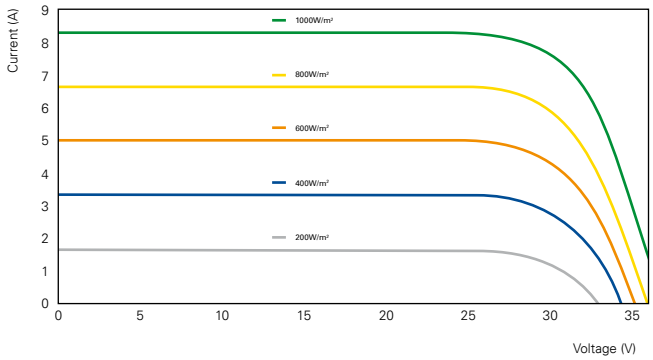
JUNCTION BOX DETAIL
(with wire-hold feature)
39.60 x 100.60 x 13.20 (mm)
1.56 x 3.96 x 0.52 (in)

Dimensions in mm [in]

Dependence of the temperature



Dependence of the irradiance



Contact:

Your BP Solar partner