

BP SX 20 and BP SX 30 photovoltaic modules are part of BP Solar's SX module series, providing cost-effective photovoltaic power for DC loads with moderate energy requirements. With 36 multicrystalline cells in series, they charge batteries efficiently in virtually any climate. Typical commercial applications of these modules, which generate nominal maximum power of 20 watts and 30 watts respectively, include remote telemetry, instrumentation systems, security sensors, signals, and land-based navigation aids.

These modules are available in the **M** configuration, which includes the versatile Multimount™ frame and an output cable; and the **U** configuration, which includes the heavy-duty Universal frame and a high-volume junction box with dual-voltage output. In both configurations, cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron 3mm tempered glass.

### BP SX 20M and BP SX 30M

The BP SX 20M and 30M are general-purpose PV modules intended for single-module 12-volt applications with DC system voltage not exceeding 30 volts. Output is via a 4.6m (15-foot) PVC-jacketed cable which terminates in a low-profile junction box on the module back. Epoxy-potted in the box, module electrical connections are sealed against corrosion and effectively strain-relieved.



### Multimount Frame

The Multimount™ frame of the BP SX 20M and 30M provides great flexibility in mounting approach. Oriented parallel to the edge and back of the module, its dual channels accept the heads of 5/16" or 8mm hex bolts, allowing the module to be mounted from the side or back. Bolts may be located anywhere along the channels, a configuration which prevents them from turning during tightening and allows installation with just one wrench.



### Universal Frame

### BP SX 20U and 30U

The BP SX 20U and 30U are designed primarily for industrial use and other particularly demanding applications. Their rugged Universal frame is suitable for severe duty, and exceeds the requirements of all certifying agencies.

### Limited Warranties

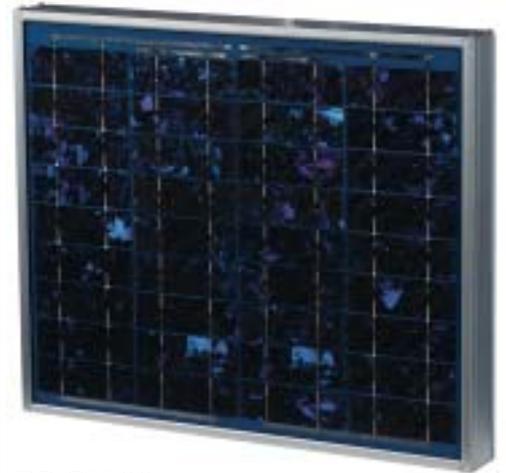
- Power output for 12 years;
- Freedom from defects in materials and workmanship for 2 years.

See our website or your local representative for full terms of these warranties.

### High-Capacity Versatile Junction Box

The large (411cc, 25 cubic inches) junction box of the U modules is raintight (IP54 rated) and accepts PG13.5 or 1/2" nominal conduit or cable fittings. With its six-terminal connection block, it enables most system array connections (putting modules in series or parallel) to be made right in the junction box. Optionally, this junction box can be fitted with:

- blocking and bypass diodes;
- an oversize terminal block which accepts conductors up to 25mm<sup>2</sup> (AWG #4); standard terminals accept up to 6mm<sup>2</sup> (AWG #10);
- a Solarstate™ charge regulator.



### BP SX 20U

The BP SX 20U and 30U junction box may be field-wired to provide 12V or 6V nominal output. Six-volt modules are intended to support 6V loads, and are not recommended as series elements in higher voltage arrays. The BP SX 20U and 30U are approved by Factory Mutual Research for application in NEC Class 1, Division 2, Groups C & D hazardous locations, and rated for use in systems up to 600V (per U.S. NEC.)



## Electrical Characteristics<sup>1</sup>

	BP SX 30	BP SX 20
Maximum power ( $P_{max}$ ) <sup>2</sup>	30W	20W
Voltage at $P_{max}$ ( $V_{mp}$ )	16.8V	16.8V
Current at $P_{max}$ ( $I_{mp}$ )	1.78A	1.19A
Warranted minimum $P_{max}$	27W	18W
Short-circuit current ( $I_{sc}$ )	1.94A	1.29A
Open-circuit voltage ( $V_{oc}$ )	21.0V	21.0V
Maximum series fuse rating	5A	3A
Temperature coefficient of $I_{sc}$	(0.065±0.015)%/°C	
Temperature coefficient of $V_{oc}$	-(80±10)mV/°C	
Temperature coefficient of power	-(0.5±0.05)%/°C	
NOCT <sup>3</sup>	47±2°C	

## Notes

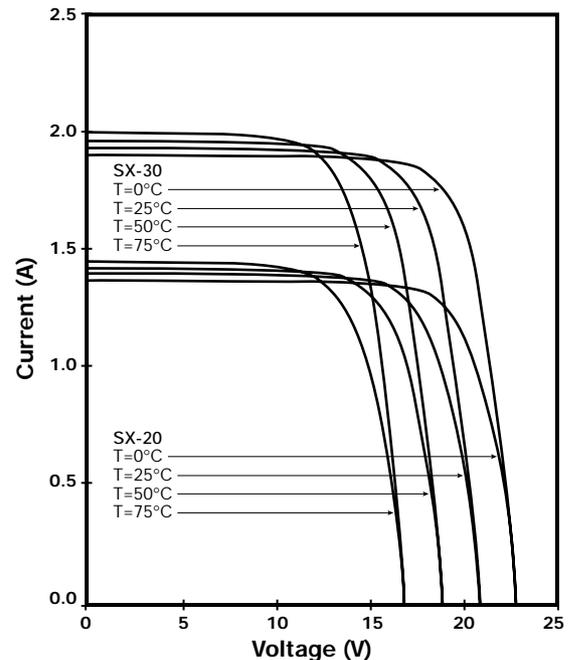
- These data represent the performance of typical modules in 12V configuration as measured at their output, and do not include the effect of such additional equipment as diodes. The data are based on measurements made in accordance with ASTM E1036 corrected to SRC (Standard Reporting Conditions, also known as STC or Standard Test Conditions), which are:
  - illumination of 1 kW/m<sup>2</sup> (1 sun) at spectral distribution of AM 1.5 (ASTM E892 global spectral irradiance);
  - cell temperature of 25°C.
- During the stabilization process which occurs during the first few months of deployment, module power may decrease approximately 3% from typical  $P_{max}$ .
- The cells in an illuminated module operate hotter than the ambient temperature. NOCT (Nominal Operating Cell Temperature) is an indicator of this temperature differential, and is the cell temperature under Standard Operating Conditions: ambient temperature of 20°C, solar irradiation of 0.8 kW/m<sup>2</sup>, and wind speed of 1m/s.

## Quality and Safety

All BP SX 20 and 30 modules are manufactured in ISO 9001-certified factories and are:

- certified by TÜV Rheinland as Class II equipment and for use in systems with voltage up to 1000 VDC (U only; M models are certified to 30V);
- listed by Underwriter's Laboratories for electrical and fire safety (Class C fire rating);
- compliant with the requirements of IEC 61215, including:
  - repetitive cycling between -40°C and 85°C at 85% relative humidity;
  - simulated impact of 25mm (one-inch) hail at terminal velocity;
  - a "damp heat" test, consisting of 1000 hours of exposure to 85°C and 85% relative humidity;
  - a "hot-spot" test, which determines a module's ability to tolerate localized shadowing (which can cause reverse-biased operation and localized heating);
  - static loading, front and back, of 2400 pascals (50 psf); front loading (e.g. snow) of 5400 pascals (113 psf, U only).

## I-V Curves



## Mechanical Characteristics

### Weight

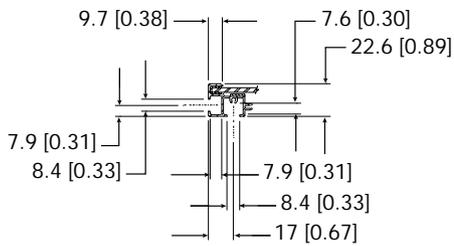
BP SX 20M	2.5 kg (5.6 pounds)
BP SX 20U	3.0 kg (6.5 pounds)
BP SX 30M	3.5 kg (7.7 pounds)
BP SX 30U	3.9 kg (8.5 pounds)

### Dimensions

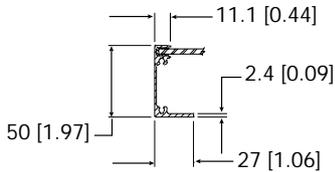
Unbracketed dimensions are in millimeters. Bracketed dimensions are in inches.  
Overall tolerances  $\pm 3\text{mm}$  (1/8")

### Output Cable

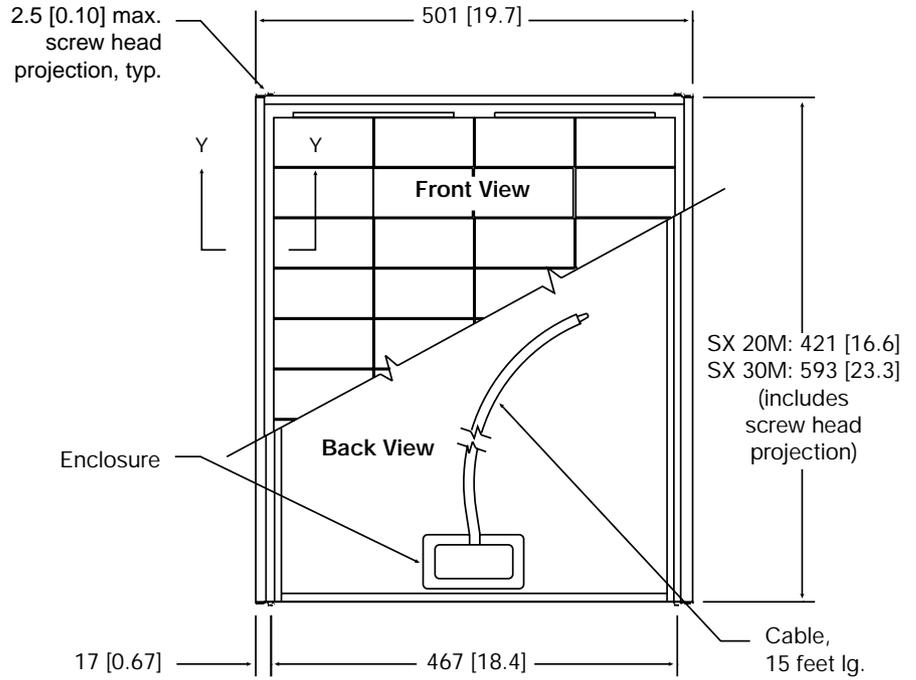
BP SX 20M	1mm <sup>2</sup> (AWG 18-2)
BP SX 30M	2.5mm <sup>2</sup> (AWG 14-2)



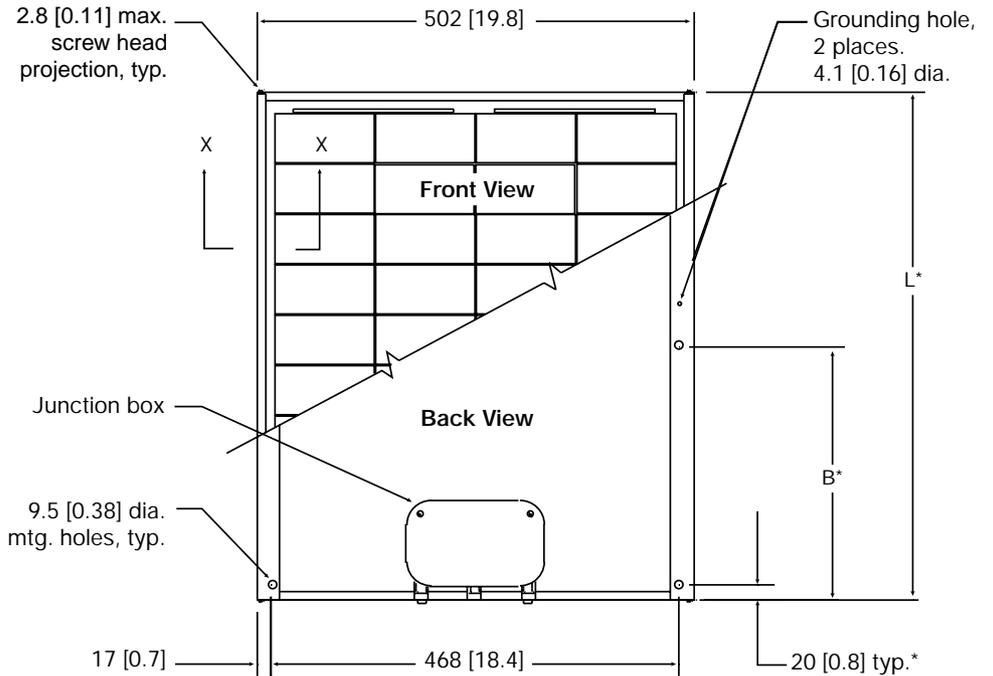
Section Y-Y



Section X-X



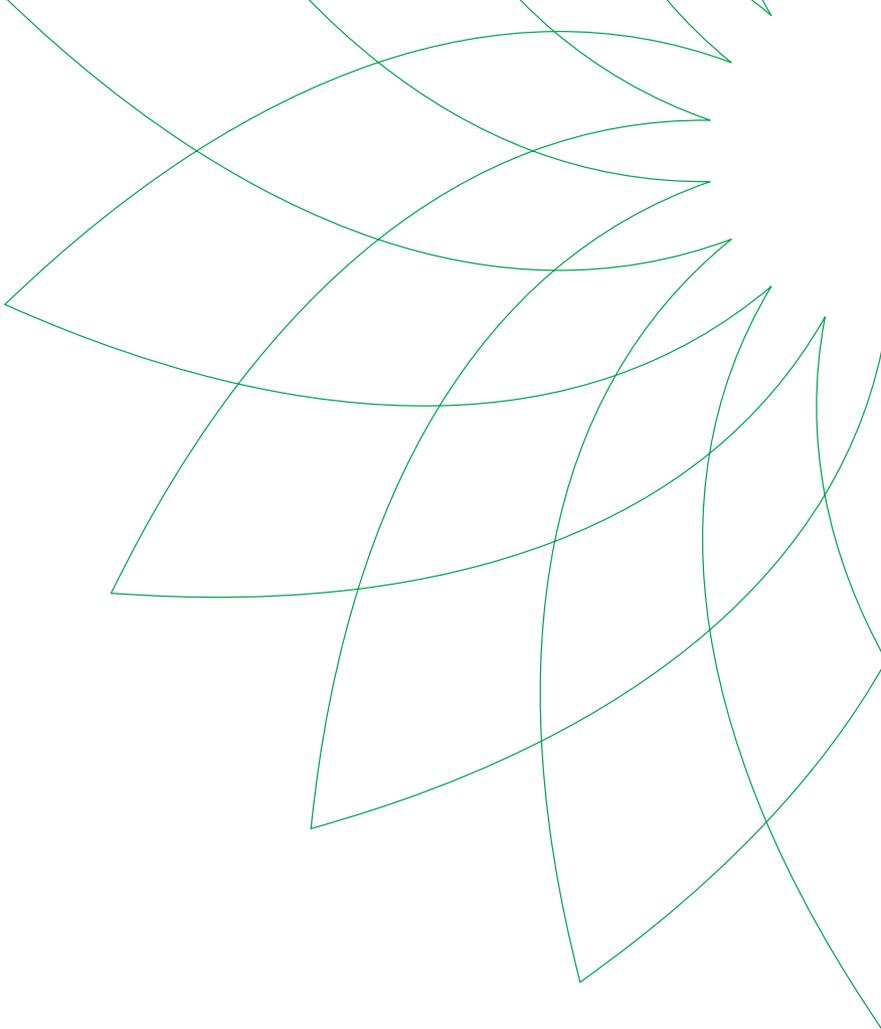
BP SX 20M, BP SX 30M



BP SX 20U, BP SX 30U

	L*	B*
BP SX 20U	$\frac{424}{[16.7]}$	$\frac{212}{[8.3]}$
BP SX 30U	$\frac{594}{[23.4]}$	$\frac{297}{[11.7]}$

Note:  
\* dimensions include screw head projection.



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This publication summarizes product warranty and specifications, which are subject to change without notice and should not be used as the definitive source of information for final system design. Additional warranty and technical information may be found on our website [www.bpsolar.com](http://www.bpsolar.com) or may be obtained from your local representative.



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