# BP SX 50
# BP SX 40

50-Watt & 40-Watt
Multicrystalline Photovoltaic Modules

SX 50 and SX 40 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 applications of these modules, which generate nominal maximum power of 50 watts and 40 watts respectively, include remote telemetry, instrumentation systems, security sensors, signals, and land-based navigation aids. They are also well-suited to providing subsistence power to homes in remote areas without utility (mains) service.

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.

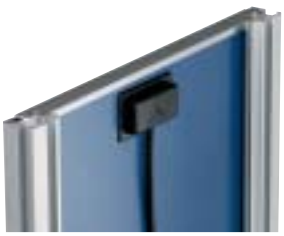
## Proven Materials and Construction

BP Solar's quarter-century of field experience shows in every aspect of these modules' construction and materials:

- 36 multicrystalline silicon solar cells configured as two 18-cell series strings;
- Cells are laminated between sheets of ethylene vinyl acetate (EVA) and high-transmissivity low-iron 3mm tempered glass.

## SX 50M and SX 40M

The SX 50M and 40M 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 2.5mm² (AWG 14-2) 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 SX 50M and 40M 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

Universal Frame

which prevents them from turning during tightening and allows installation with just one wrench.

## SX 50U and SX 40U

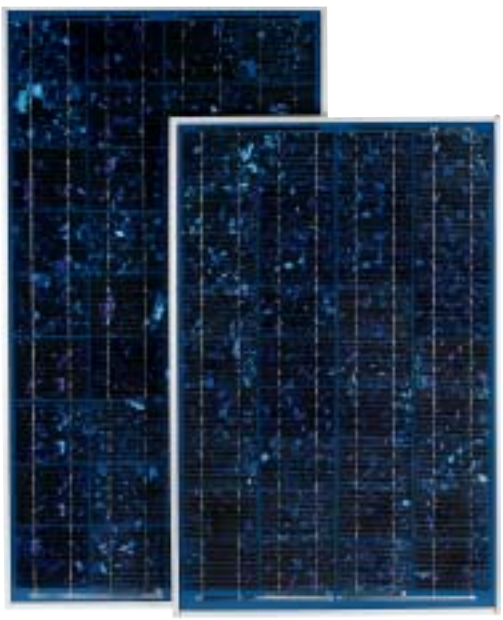
The BP SX 50U and 40U are designed primarily for industrial use and other particularly demanding applications. Their rugged Universal frame is suitable for severe duty, and exceeds the requirements of all certifying agencies.

## 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 25mm² (AWG #4); standard terminals accept up to 6mm² (AWG #10);
- a Solarstate™ charge regulator.

This 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.



SX 50U and 40U

## Limited Warranties

- Power output for 20 years;
- Freedom from defects in materials and workmanship for 2 years.

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

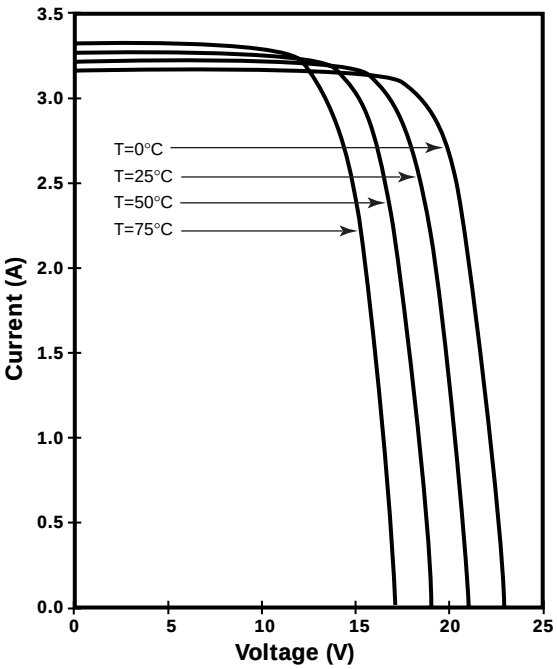
## Electrical Characteristics[1]

| | SX 50 | SX 40 |
|---|---|---|
| Maximum power ($P_{max}$)[2] | 50W | 40W |
| Voltage at $P_{max}$ ($V_{mp}$) | 16.8V | 16.8V |
| Current at $P_{max}$ (Imp) | 2.97A | 2.37A |
| Warranted minimum $P_{max}$ | 45W | 36W |
| Short-circuit current ($I_{sc}$) | 3.23A | 2.58A |
| Open-circuit voltage ($V_{oc}$) | 21.0V | 21.0V |
| Maximum series fuse | 20A | 5A |
| 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[3] | 47±2ºC | |
| Maximum system voltage | 600V (U.S. NEC rating)<br>1000V (TÜV Rheinland rating) | |

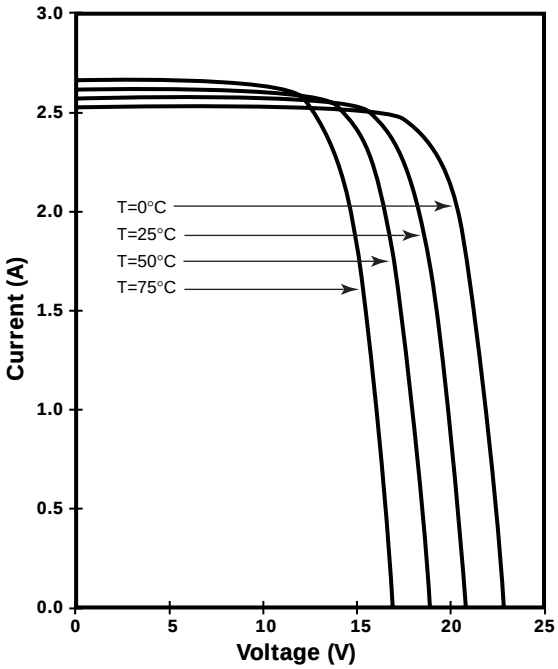
## Notes

1. 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/m² (1 sun) at spectral distribution of AM 1.5 (ASTM E892 global spectral irradiance);
   - cell temperature of 25°C.
2. During the stabilization process which occurs during the first few months of deployment, module power may decrease approximately 3% from typical $P_{max}$.
3. 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/m², and wind speed of 1m/s.

### SX 50 I-V Curves




### SX 40 I-V Curves



## Quality and Safety

All SX 50 and 40 modules are certified by PowerMark Corporation, certified by TÜV Rheinland as Class II equipment, listed by Underwriter's Laboratories for electrical and fire safety (Class C fire rating), and compliant with the requirements of IEC 61215, including:

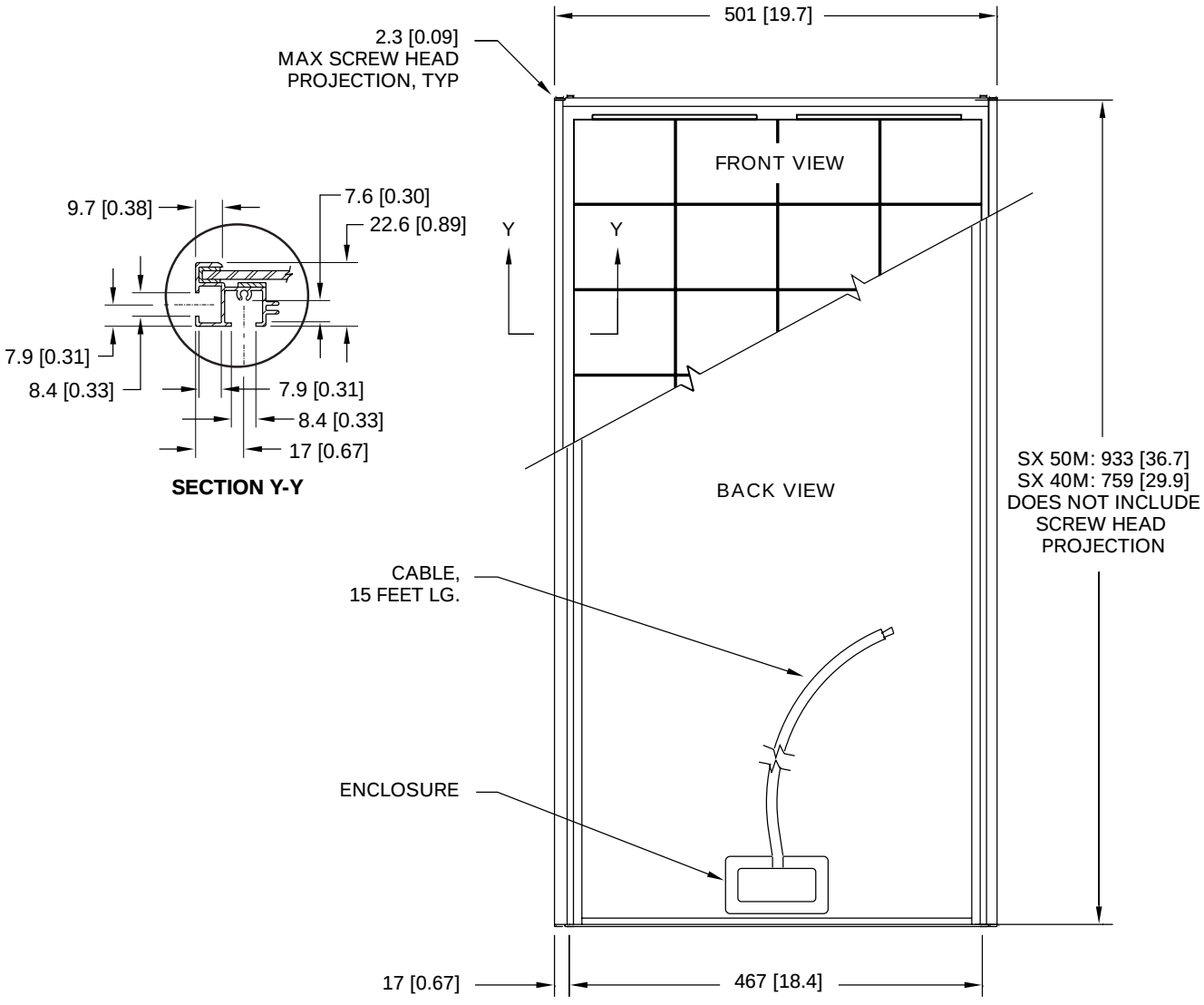
- repetitive cycling between -40°C and 85°C at 85% relative humidity;
- simulated impact of 25mm (one-inch) hail at terminal velocity;
- a "damp heat" test, consisting of 1000 hours of exposure to 85°C and 85% relative humidity;
- a "hot-spot" test, which determines a module's ability to tolerate localized 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).

The SX 50U and 40U are also approved by Factory Mutual Research for application in NEC Class 1, Division 2, Groups C & D hazardous locations.

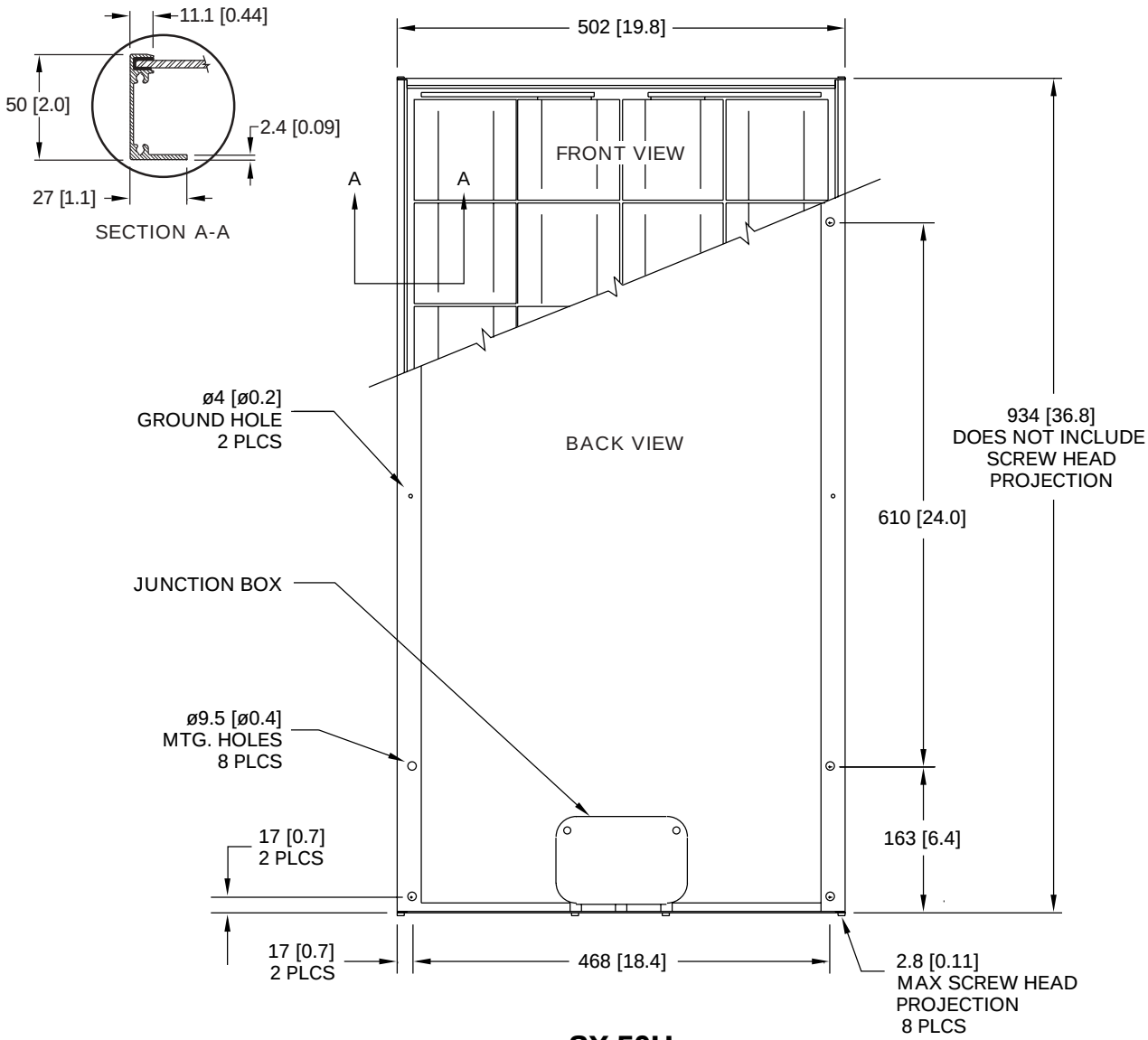
## Mechanical Characteristics

| Weight | |
|---|---|
| SX 50M | 5.7 kg (12.5 pounds) |
| SX 50U | 6.3 kg (13.9 pounds) |
| SX 40M | 4.9 kg (10.6 pounds) |
| SX 40U | 5.4 kg (11.8 pounds) |

Dimensions
Unbracketed dimensions are in millimeters.
Bracketed dimensions are in inches.
Overall tolerances ±3mm (1/8")




**SX 50M, SX 40M**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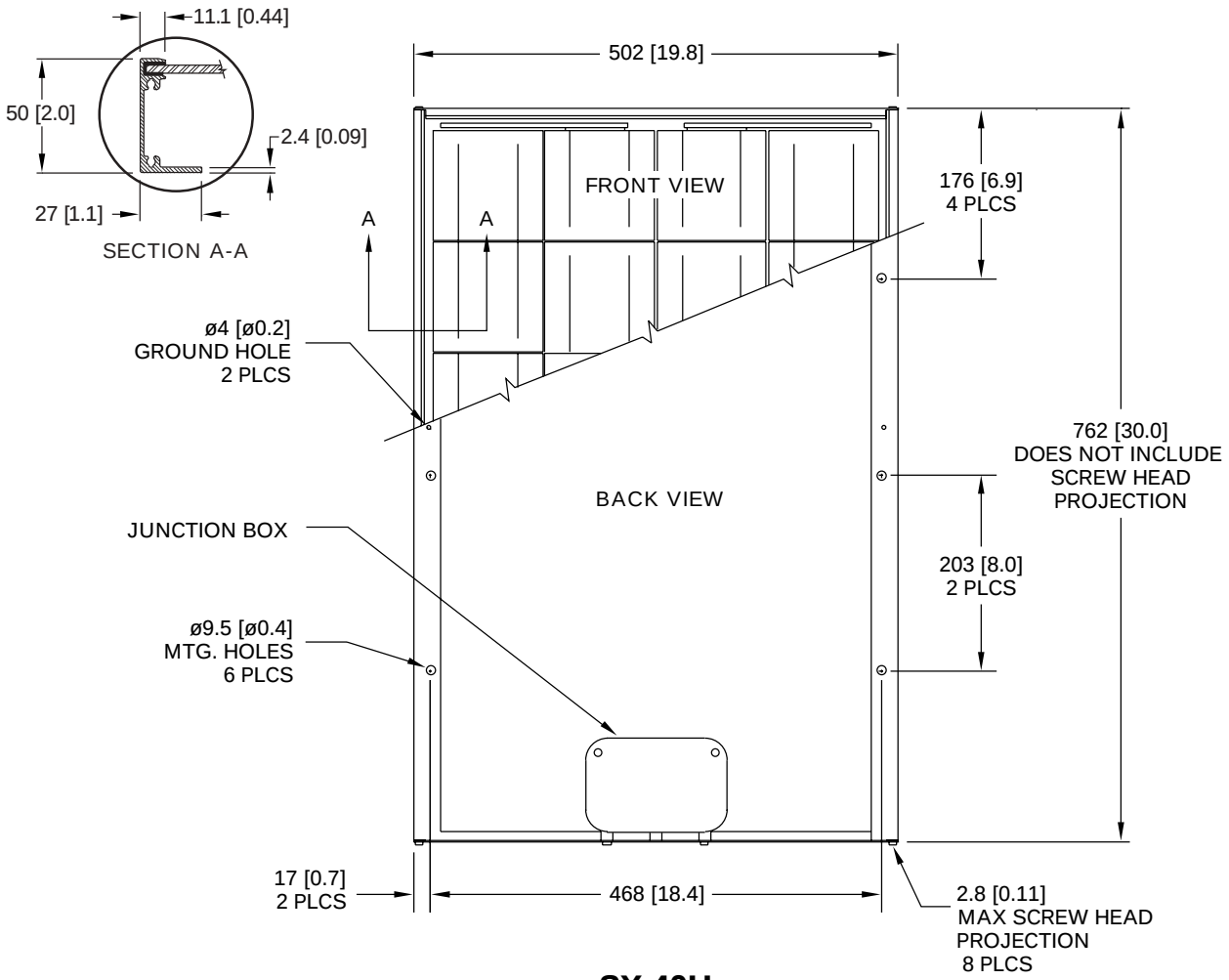
50 [2.0]
2.4 [0.09]
27 [1.1]
SECTION A-A
502 [19.8]
FRONT VIEW
A
A
ø4 [ø0.2]
GROUND HOLE
2 PLCS
BACK VIEW
934 [36.8]
DOES NOT INCLUDE
SCREW HEAD
PROJECTION
610 [24.0]
JUNCTION BOX
ø9.5 [ø0.4]
MTG. HOLES
8 PLCS
17 [0.7]
2 PLCS
163 [6.4]
17 [0.7]
2 PLCS
468 [18.4]
2.8 [0.11]
MAX SCREW HEAD
PROJECTION
8 PLCS

**SX 50U**


11.1 [0.44]
50 [2.0]
2.4 [0.09]
27 [1.1]
SECTION A-A
502 [19.8]
FRONT VIEW
A
A
176 [6.9]
4 PLCS
ø4 [ø0.2]
GROUND HOLE
2 PLCS
762 [30.0]
DOES NOT INCLUDE
SCREW HEAD
PROJECTION
BACK VIEW
JUNCTION BOX
203 [8.0]
2 PLCS
ø9.5 [ø0.4]
MTG. HOLES
6 PLCS
17 [0.7]
2 PLCS
468 [18.4]
2.8 [0.11]
MAX SCREW HEAD
PROJECTION
8 PLCS

**SX 40U**


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** or may be obtained from your local representative.

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