



**ELECTRICAL DATA / STC\***

Electrical Data CS6P	250P	255P	260P
Nominal Max. Power (Pmax)	250 W	255 W	260 W
Opt. Operating Voltage (Vmp)	30.1 V	30.2 V	30.4 V
Opt. Operating Current (Imp)	8.30 A	8.43 A	8.56 A
Open Circuit Voltage (Voc)	37.2 V	37.4 V	37.5 V
Short Circuit Current (Isc)	8.87 A	9.00 A	9.12 A
Module Efficiency	15.54%	15.85%	16.16%
Operating Temperature	-40°C ~ +85°C		
Max. System Voltage	1000 V (IEC) or 1000V (UL) or 600 V (UL)		
Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC61730)		
Max. Series Fuse Rating	15 A		
Application Classification	Class A		
Power Tolerance	0 ~ +5 W		

\* Under Standard Test Conditions (STC) of irradiance of 1000 W/m<sup>2</sup>, spectrum AM 1.5 and cell temperature of 25°C.

**ELECTRICAL DATA / NOCT\***

Electrical Data CS6P	250P	255P	260P
Nominal Max. Power (Pmax)	181 W	185 W	189 W
Opt. Operating Voltage (Vmp)	27.5 V	27.5 V	27.7 V
Opt. Operating Current (Imp)	6.60 A	6.71 A	6.80 A
Open Circuit Voltage (Voc)	34.2 V	34.4 V	34.5 V
Short Circuit Current (Isc)	7.19 A	7.29 A	7.39 A

\* Under Nominal Operating Cell Temperature (NOCT), irradiance of 800 W/m<sup>2</sup>, spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

**PERFORMANCE AT LOW IRRADIANCE**  
 Industry leading performance at low irradiance, +96.5% module efficiency from an irradiance of 1000 W/m<sup>2</sup> to 200 W/m<sup>2</sup> (AM 1.5, 25°C).

As there are different certification requirements in different markets, please contact your sales representative for the specific certificates applicable to your products. The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to ongoing innovation, research and product enhancement, Canadian Solar Inc. reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the most recent version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.

**CANADIAN SOLAR INC.** December 2014. All rights reserved. PV Module Product Datasheet 1 V5.0\_EN  
 Caution: Please read safety and installation instructions before using the product.

**Technical data**

	Sunny Boy 3000TL-US 208 V AC / 240 V AC	Sunny Boy 3800TL-US 208 V AC / 240 V AC	Sunny Boy 4000TL-US 208 V AC / 240 V AC	Sunny Boy 5000TL-US 208 V AC / 240 V AC
<b>Input (DC)</b>				
Max. DC power (P <sub>max</sub> )	3200 W	4200 W	4200 W	5300 W
Max. DC voltage	600 V	600 V	600 V	600 V
Rated MPPT voltage range	175 ~ 480 V	175 ~ 480 V	175 ~ 480 V	175 ~ 480 V
MPPT operating voltage range	125 V ~ 500 V	125 V ~ 500 V	125 V ~ 500 V	125 V ~ 500 V
Min. DC voltage / start voltage	125 V / 150 V	125 V / 150 V	125 V / 150 V	125 V / 150 V
Max. input current / per MPPT tracker	18 A / 15 A	24 A / 15 A	24 A / 15 A	30 A / 15 A
Number of MPPT trackers / strings per MPPT tracker	2 / 2			
<b>Output (AC)</b>				
AC nominal power	3000 W	3330 W	3840 W	4550 W / 5000 W
Max. AC apparent power	3000 VA	3330 VA	3840 VA	4550 VA / 5000 VA
Nominal AC voltage / adjustable	208 V / ● / 240 V / ●	208 V / ● / 240 V / ●	208 V / ● / 240 V / ●	208 V / ● / 240 V / ●
AC voltage range	183 ~ 229 V	211 ~ 264 V	183 ~ 229 V	211 ~ 264 V
AC grid frequency range	60 Hz / 59.3 ~ 60.5 Hz	60 Hz / 59.3 ~ 60.5 Hz	60 Hz / 59.3 ~ 60.5 Hz	60 Hz / 59.3 ~ 60.5 Hz
Max. output current	15 A	16 A	20 A	22 A
Power factor (cos φ)	1	1	1	1
Output phases / line connections	1 / 2	1 / 2	1 / 2	1 / 2
Harmonics	< 4%	< 4%	< 4%	< 4%
<b>Efficiency</b>				
Max. efficiency	96.8%	97.1%	96.8%	97.2%
CEC efficiency	96%	96.5%	96%	96.5%
<b>Protection devices</b>				
DC-disconnection device	●	●	●	●
DC reverse polarity protection	●	●	●	●
Ground fault monitoring / Grid monitoring	●	●	●	●
AC short circuit protection	●	●	●	●
All-pole sensitive residual current monitoring unit	●	●	●	●
Ac-fault circuit interrupter (AFCI) compliant to UL 1699B	●	●	●	●
Protection class / overvoltage category	1 / II			
<b>General data</b>				
Dimensions (W / H / D) in mm (in)	490 / 519 / 185 (19.3 / 20.5 / 7.3)			
DC Disconnect dimensions (W / H / D) in mm (in)	187 / 297 / 190 (7.4 / 11.7 / 7.5)			
Packing dimensions (W / H / D) in mm (in)	617 / 597 / 266 (24.3 / 23.5 / 10.5)			
DC Disconnect packing dimensions (W / H / D) in mm (in)	370 / 240 / 280 (14.6 / 9.4 / 11.0)			
Weight / DC Disconnect weight	24 kg (53 lbs) / 3.5 kg (8 lb)			
Packing weight / DC Disconnect packing weight	27 kg (60 lbs) / 3.5 kg (8 lb)			
Operating temperature range	-40 °C ~ +60 °C (-40 °F ~ +140 °F)			
Noise emission (typical)	< 25 dB(A)			
Internal consumption at night	< 1 W			
Topology	Transformerless			
Cooling concept	Convection			
Electronics protection rating	NEMA 3R			
<b>Features</b>				
Secure Power Supply	●	●	●	●
Display: graphic	●	●	●	●
Interface: ES45 / Speedwire / Webconnect	●	●	●	●
Interface: ZigBee	○	○	○	○
Warranty: 10 / 15 / 20 years	●/○/○	●/○/○	●/○/○	●/○/○
Certificates and permits (more available on request)	UL 1741, UL 1998, IEEE 1547, FCC Part 15 (Class A & B), CAN/CSA C22.2 107.1-1			
NOTE: US inverters ship with gray lids				
Type designation	SB 3000TLUS-22	SB 3800TLUS-22	SB 4000TLUS-22	SB 5000TLUS-22

**Electrical Notes:**

- All aspects of the electrical work required to complete the project represented in this document shall comply with the manufacturer's recommendations/specifications and all codes, statutes, and standards adopted by the State and the Local Authority Having Jurisdiction.
- The information provided in these documents is not exhaustive. It remains the contractor's responsibility to achieve the proposed installation, in full exercise of care and compliance with the items identified in General Electrical Note 1.
- All AC disconnect, at the electrical service entrance, is exempt from requirement by law, for tier 1 Renewable Energy Systems, per Florida Administration Code 25-6.065(6)(a). Auxiliary disconnects are a utility Co. option. If required by the utility Co., the utility Co. shall bear the additional expense incurred, as stipulated by the Florida Administration Code.
- All conductors are to be Cu.
- All signage shall be provided as required by the NEC 2011 ed.
- All unidentified conductors under modules are UL listed and manufacturer provided cables, connectors and assemblies.
- All electrical components, (raceways, junction boxes, disconnects, panelboards, etc.), shall be installed plumb, level, and in compliance with all applicable sections of NEC Article 110.
- All Raceways shall be supported on intervals and by methods as approved/required by the NEC.
- All raceways, cables and J-boxes on the roof shall be located out of direct sunlight.
- All module leads, MC cable and ground conductors shall be secured at points of origin, points of termination, on 18" intervals and as may be further required by the NEC.
- Solar panels to be bonded to racking, utilizing WEBB bonding components.
- Racking system to have continuous bonding, with #8 gnd.
- Contractor shall verify the installation of a bidirectional utility service meter.
- Contractor shall seal all penetrations resulting from this scope of work.
- The DC J-box shall be labelled with Phenolic Placards (02) and (05).
- The inverters shall be labelled with Phenolic Placard (03) and (04).
- The House Panel shall be labelled with Phenolic Placards (03) and (04).
- The service disconnect shall be labelled with Phenolic Placards (06).

**PANTHULU SYSTEM ANALYSIS**

**Solar Energy System Approval# CS13-NT90-0427 FS. 377.705 (3)(b)**

**Modules:CS6P260P**

Vmp	=	30.4 v
Imp	=	8.56 amps
Voc	=	37.5 v
Isc	=	9.12 amps
Pmax	=	260 w
Series Fuse	=	15 amps
Temp Coefficient(Voc)	=	-0.34 %/°C
Temp Coefficient(Isc)	=	0.065 %/°C
Temp Coefficient(Pmax)	=	-0.43 %/°C

Unless otherwise specified, all measurements are at Standard Test Conditions of 1000 w/m<sup>2</sup>, irradiance at 25 deg. C

**Over Irradiation and Continuous Current Correction for DC conductors:**  
 NEC 690.8(A)(1), (B)(1)

Factor	=	1.5625
Imp corrected	=	13.38 amps
Isc correction	=	14.25 amps

**Temperature Correction for Crystalline Modules:**  
 per manufacturers data  
 Effects considered at 0 °C for voltage & Power  
 Effects considered at 70 °C for amperage

Voltage Factor	=	108.5 %
Vmp corrected	=	32.98 v
Voc corrected	=	40.69 v

Current Factor	=	102.93 %
Imp corrected	=	8.61 amps
Isc corrected	=	9.39 amps

**Inverter I/O information:**

**SMA SB5000TL US Inverter Data:**

Vdc max	=	600 v
Tracking Voltage	=	175-480 v
I <sub>dc</sub> max/string	=	15 amps
Vdc start	=	150 v
Max Ac power out	=	5 kw
I <sub>ac</sub> max @ 208v	=	22 amps
I <sub>ac</sub> max @ 240v	=	21 amps
I <sub>ac</sub> max @ 277v	=	- amps
Vac range @ 208v	=	183-229 v
Vac range @ 240v	=	211-264 v
Vac range @ 277v	=	v
Peak inverter Eff.	=	97.6 %

**Inverter #1 Analysis**

**String description: A** 1 W/ 10 modules  
 All data @ STC

Vmp	=	304.0 v
Imp	=	8.56 amps
Voc	=	375.0 v
Isc	=	9.12 amps
Pmax/string	=	2.6 Kw

**String description: B** 1 W/ 10 modules

Vmp	=	304.0 v
Imp	=	8.56 amps
Voc	=	375.0 v
Isc	=	9.12 amps
Pmax/string	=	2.6 Kw
Pmax total	=	5.2 Kw

**Max System Voltage temperature adjusted for extreme conditions:**

Voc	=	406.9 v
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**Phenolic Placards:**

- (01) WARNING  
 ELECTRIC SHOCK HAZARD.  
 IF A GROUND FAULT IS INDICATED, NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED.
- (02) WARNING  
 DC SHOCK HAZARD.  
 Imp: 8.56 amps  
 Vmp: 304.0 v  
 Voc: 406.9 v  
 Isc: 9.12 amps
- (03) WARNING  
 INVERTER OUTPUT CONNECTION  
 DO NOT RELOCATE THIS OVERCURRENT DEVICE
- (04) WARNING  
 ELECTRIC SHOCK HAZARD  
 DO NOT TOUCH TERMINALS.  
 TERMINALS ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION.
- (05) WARNING  
 ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED.
- (06) WARNING  
 UTILITY SERVICE IS BACKED BY SOLAR PHOTOVOLTAIC SYSTEM. SEE ADJACENT DISCONNECT.

I CERTIFY THAT THIS DESIGN & SPECIFICATIONS MEET THE FBC2010 & NEC 2011

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**THE PANTHULU RESIDENCE**  
 INSTALLATION OF A ROOF MOUNT  
**RENEWABLE ENERGY SYSTEM**

SITUS: 2728 MANOR DR, SEBRING, FL 33872  
 PARCEL ID: C-04-34-28-130-2650-0460

DRAWN BY ARCH D (PV) ELEC PRINT SIZE MAY VARY

**CONTRACTOR:**

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REVISIONS:	DATE

SHEET NAME:  
**ELECTRICAL PERMIT**  
 THIS IS SHEET 1 OF 1 FOR ELEC. PERMIT

DRAWN: SB CHECKED: AG

SHEET NO:  
**0377PV20**

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