

# Sunmodule<sup>®</sup> Plus

## SW 285 MONO (33mm frame)



TUV Power controlled:  
Lowest measuring tolerance in industry



Every component is tested to meet  
3 times IEC requirements



Designed to withstand heavy  
accumulations of snow and ice



Sunmodule Plus:  
Positive performance tolerance



25-year linear performance warranty  
and 10-year product warranty



Glass with anti-reflective coating



### World-class quality

Fully-automated production lines and seamless monitoring of the process and material ensure the quality that the company sets as its benchmark for its sites worldwide.

### SolarWorld Plus-Sorting

Plus-Sorting guarantees highest system efficiency. SolarWorld only delivers modules that have greater than or equal to the nameplate rated power.

### 25-year linear performance guarantee and extension of product warranty to 10 years

SolarWorld guarantees a maximum performance digression of 0.7% p.a. in the course of 25 years, a significant added value compared to the two-phase warranties common in the industry, along with our industry-first 10-year product warranty.\*

\*in accordance with the applicable SolarWorld Limited Warranty at purchase.  
[www.solarworld.com/warranty](http://www.solarworld.com/warranty)



- Qualified, IEC 61215
- Safety tested, IEC 61730
- Blowing sand resistance, IEC 60068-2-68
- Arc-splatter resistance, IEC 62716
- Salt mist corrosion, IEC 61701
- Periodic inspection



- Periodic inspection
- Power controlled



# Sunmodule<sup>®</sup> Plus

## SW 285 MONO (33mm frame)



### PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)\*

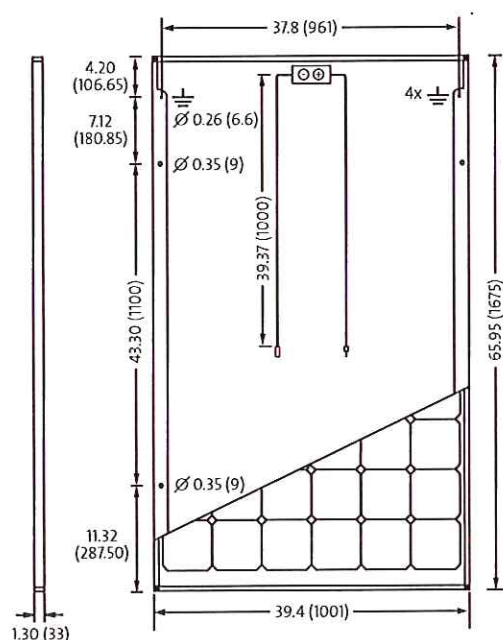
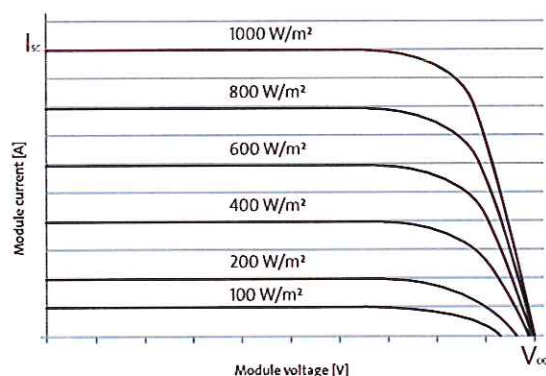
Maximum power	$P_{max}$	285 Wp
Open circuit voltage	$V_{oc}$	39.7 V
Maximum power point voltage	$V_{mpp}$	31.3 V
Short circuit current	$I_{sc}$	9.84 A
Maximum power point current	$I_{mpp}$	9.20 A
Module efficiency	$\eta_m$	17.0 %

\*STC: 1000 W/m<sup>2</sup>, 25°C, AM 1.5

1) Measuring tolerance ( $P_{max}$ ) traceable to TUV Rheinland: +/- 2% (TUV Power Controlled).

### THERMAL CHARACTERISTICS

NOCT	46 °C
TC $I_{sc}$	0.04 %/°C
TC $V_{oc}$	-0.30 %/°C
TC $P_{mpp}$	-0.41 %/°C
Operating temperature	-40°C to 85°C



### PERFORMANCE AT 800 W/m<sup>2</sup>, NOCT, AM 1.5

Maximum power	$P_{max}$	213.1 Wp
Open circuit voltage	$V_{oc}$	36.4 V
Maximum power point voltage	$V_{mpp}$	28.7 V
Short circuit current	$I_{sc}$	7.96 A
Maximum power point current	$I_{mpp}$	7.43 A

Minor reduction in efficiency under partial load conditions at 25°C: at 200 W/m<sup>2</sup>, 100% (+/-2%) of the STC efficiency (1000 W/m<sup>2</sup>) is achieved.

### COMPONENT MATERIALS

Cells per module	60
Cell type	Mono crystalline
Cell dimensions	6.17 in x 6.17 in (156.75 x 156.75 mm)
Front	Tempered glass (EN 12150)
Frame	Clear anodized aluminum
Weight	39.7 lbs (18.0 kg)

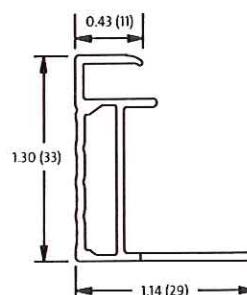
### SYSTEM INTEGRATION PARAMETERS

Maximum system voltage SC II / NEC		1000 V
Maximum reverse current		25 A
Number of bypass diodes		3
Design Loads*	Two rail system	113 psf downward 64 psf upward
Design Loads*	Three rail system	178 psf downward 64 psf upward
Design Loads*	Edge mounting	178 psf downward 41 psf upward

\* Please refer to the Sunmodule installation instructions for the details associated with these load cases.

### ADDITIONAL DATA

Power sorting <sup>1</sup>	-0 Wp / +5 Wp
J-Box	IP65
Module leads	PV wire per UL4703 with H4 connectors
Module type (UL 1703)	1
Glass	Low iron tempered with ARC

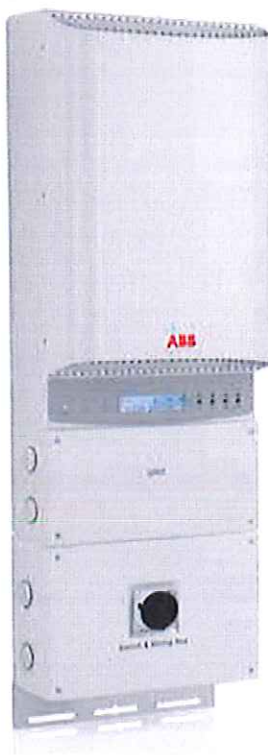


- Compatible with both "Top-Down" and "Bottom" mounting methods
- Grounding Locations:
  - 4 locations along the length of the module in the extended flange.



## Solar inverters

# ABB string inverters PVI-5000/6000-TL-OUTD 5kW to 6kW



Designed for residential and small commercial PV installations, this inverter fills a specific niche in the ABB product line to cater for those installations producing between 5kW and 20kW.

**This inverter includes dual input section to process two strings with independent Multiple Power Point Tracker (MPPT).**

The high-speed and precise MPPT algorithm offers real-time power tracking and energy harvesting.

Flat efficiency curves ensure high-efficiency at all output levels ensuring consistent and stable performance across the entire input voltage and output power range.

This outdoor inverter has been designed as a completely sealed unit to withstand the harshest environmental conditions.

**The wide input voltage range makes the inverter suitable for low-power installations with reduced string size.**

The transformerless operation offers high performance efficiencies of up to 97.1 percent.

Free remote monitoring capability is available with every installation. This enables homeowners to view their energy production and offers installers a proactive and economic way of maintaining and troubleshooting the system.

### Highlights:

- Single-phase and three-phase output grid connection
- Wide input range for increased stringing flexibility
- The high-speed and precise MPPT algorithm offers real-time power tracking and improved energy harvesting
- Outdoor NEMA 4X rated enclosure for unrestricted use under any environmental condition
- Integrated DC disconnect switch in compliance with international Standards (-S Version)

Power and productivity  
for a better world™



## Additional highlights

- RS-485 communication interface (for connection to laptop or data logger)
- Available with the optional VSN300 Wifi Logger Card for easy and affordable wireless monitoring
- Compliant with NEC 690.12 when used with ABB's Rapid Shutdown device
- Comes standard with DC Arc Fault Circuit Interruptor (AFCI) to comply with NEC 690.11



## Technical data and types

Type code	PVI-5000-OUTD-US			PVI-6000-OUTD-US		
General Specifications						
Nominal output power	5000W			6000W		
Maximum output power	5000W			6000W		
Rated grid AC voltage	208V	240V	277V	208V	240V	277V
Input side (DC)						
Number of independent MPPT channels	2			2		
Maximum usable power for each channel	4000W			4000W		
Absolute maximum voltage (Vmax)	600V			600V		
Start-up voltage (Vstart)	200V (adj. 120-350)			200V (adj. 120-350)		
Full power MPPT voltage range	145-530V			175-530V		
Operating MPPT voltage range	0.7 x Vstart - 580V (≥90V)			0.7 x Vstart - 580V (≥90V)		
Maximum current (Idcmax) for both MPPT in parallel	36A			36A		
Maximum usable current per channel	18A			18A		
Maximum short circuit current per channel	22A			22A		
Number of wire landing terminals per channel	2 Pairs			2 Pairs		
Array wiring termination	Terminal block, pressure clamp, AWG20-AWG6					
Output side (AC)						
Grid connection type	1Ø/2W	Split-Ø/3W	1Ø/2W	1Ø/2W	Split-Ø/3W	1Ø/2W
Adjustable voltage range (Vmin-Vmax)	183-228V	221-264V	244-304V	183-228V	211-264V	244-304V
Grid frequency	60Hz					
Adjustable grid frequency range	57-60.5Hz					
Maximum current (I <sub>L2,max</sub> ) A <sub>RMS</sub>	27A	23A	20A	30A	28A	24A
Power factor	> 0.995 (adjustable to ±0.8)					
Total harmonic distortion at rated power	< 2%					
Contributory fault current <sup>1</sup>	36.25 A <sub>pk</sub> / 25.63A <sub>RMS</sub>	36.5 A <sub>pk</sub> / 25.81A <sub>RMS</sub>	31.75 A <sub>pk</sub> / 22.45A <sub>RMS</sub>	36.25 A <sub>pk</sub> / 25.63A <sub>RMS</sub>	36.5 A <sub>pk</sub> / 25.81A <sub>RMS</sub>	31.75 A <sub>pk</sub> / 22.45A <sub>RMS</sub>
Grid wiring termination type	Terminal block, pressure clamp, AWG20-AWG4					
Input						
Reverse polarity protection	Yes					
Over-voltage protection type	Varistor, 2 for each channel					
PV array ground fault detection	Pre start-up R <sub>iso</sub> and dynamic GFDI (requires floating arrays)					
Output						
Anti-islanding protection	Meets UL1741 / IEEE1547 requirements					
Over-voltage protection type	Varistor, 2 (L <sub>1</sub> - L <sub>2</sub> / L <sub>1</sub> - G)					
Maximum AC OCPD rating	35A	30A	25A	40A	35A	30A
Efficiency						
Maximum efficiency	97.1%					
CEC efficiency	96%	96.5%	96.5%	96%	96.5%	96.5%
User interface						
Graphic display						
Operating performance						
Stand-by consumption	<8W <sub>RMS</sub>			<8W <sub>RMS</sub>		
Nighttime consumption	<0.6W <sub>RMS</sub>			<0.6W <sub>RMS</sub>		
Communication						
User-interface	16 characters x 2 lines LCD display					
Remote monitoring (1xRS485 incl.)	VSN700 Data Logger (opt.), VSN300 Wifi Logger Card (opt.)					
Environmental						
Ambient air operating temperature range	-13°F to +140°F (-25°C to +60°C)			-13°F to +140°F (-25°C to +60°C) with derating above 122°F (50°C)		
Ambient air storage temperature range	-40°F to +176°F (-40°C to +80°C)			-40°F to +176°F (-40°C to +80°C)		
Relative humidity	0-100% RH condensing			0-100% RH condensing		
Acoustic noise emission level	< 50 db (A) @1m			< 50 db (A) @1m		
Maximum operating altitude without derating	6560ft (2000m)			6560ft (2000m)		



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Solar PV System  
Installation Photos



1- Completed roof mounted PV Array

Marc Ducharme  
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## Solar PV System Installation Photos

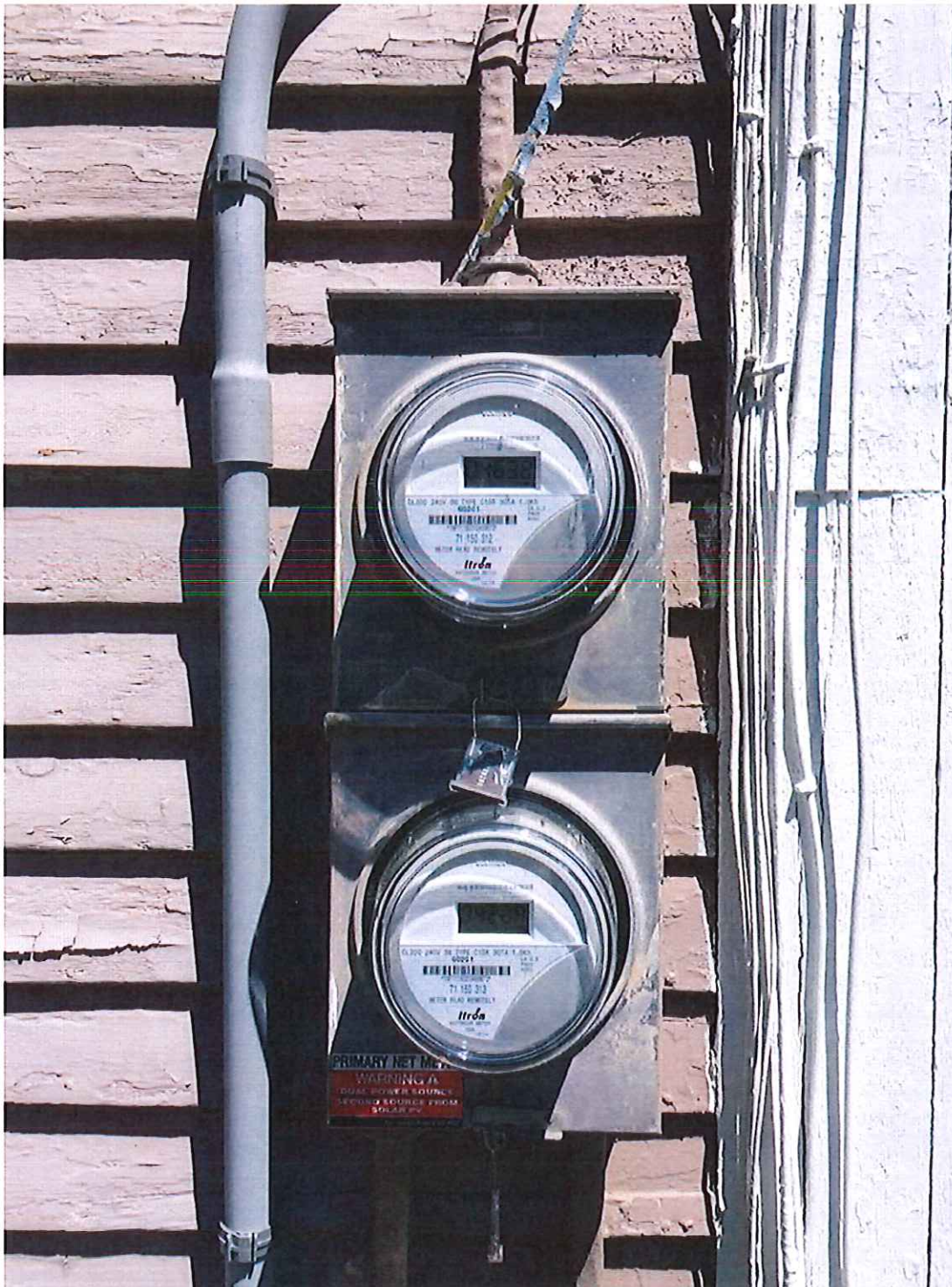


**2- Point of Interconnection, AC Disconnect and Inverter**





3- Inverter



4- Interconnected Utility (Eversource) Meter