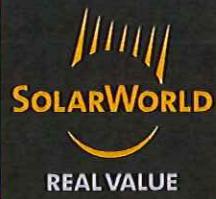


Sunmodule® Plus SW 285 MONO (33mm frame)



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

- Qualified, IEC 61215
- Safety tested, IEC 61730
- Flawing and resistance, IEC 60068-2-68
- Ammonia resistance, IEC 62716
- Salt mist corrosion, IEC 61701
- Periodic inspection

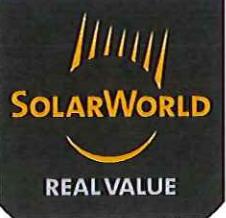


- Periodic inspection
- Power controlled



Sunmodule® Plus

SW 285 MONO (33mm frame)



PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

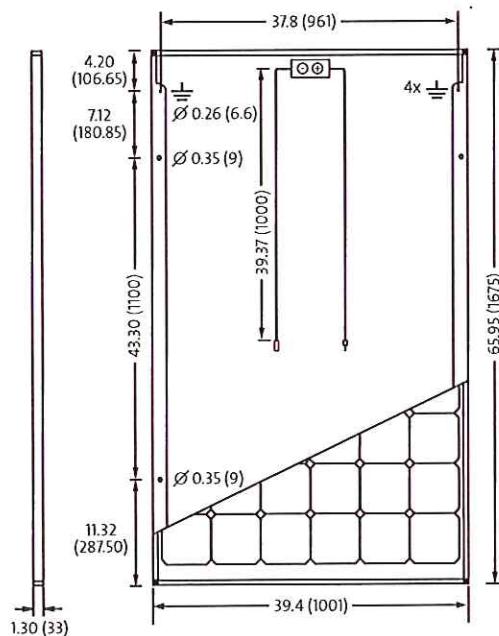
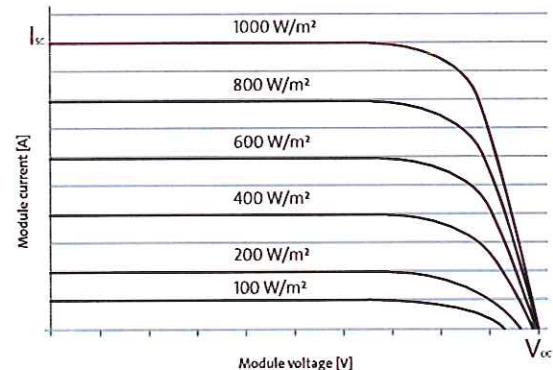
| | | |
|-----------------------------|-----------|--------|
| Maximum power | P_{max} | 285 Wp |
| Open circuit voltage | V_{oc} | 39.7 V |
| Maximum power point voltage | V_{mpp} | 31.3 V |
| Short circuit current | I_{sc} | 9.84 A |
| Maximum power point current | I_{mpp} | 9.20 A |
| Module efficiency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

*STC: 1000 W/m², 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/m², 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/m², 100% (+/-2%) of the STC efficiency (1000 W/m²) 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) |

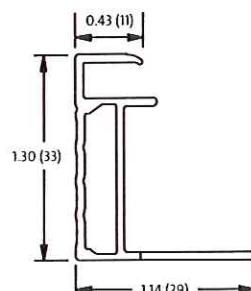
SYSTEM INTEGRATION PARAMETERS

| | |
|------------------------------------|---|
| 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 ¹ | -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 |

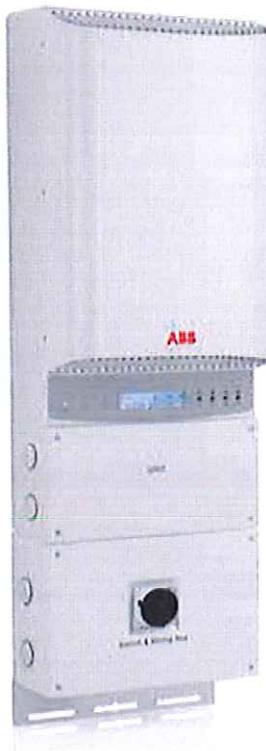


- Compatible with both "Top-Down" and "Bottom" mounting methods
- $\frac{1}{4}$ Grounding Locations:
 - 4 locations along the length of the module in the extended flange.

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.

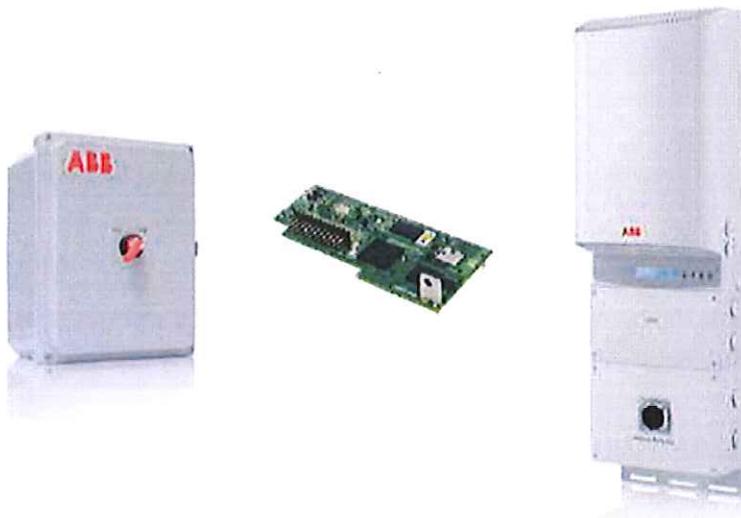
Free remote monitoring capability is available with every installation. This enables homeowners to view their energy production and offers installers a proactive and economic way of maintaining and troubleshooting the system.

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)

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 | | | |
| Maximum usable power for each channel | | | 4000W | | | |
| Absolute maximum voltage (Vmax) | | | 600V | | | |
| Start-up voltage (Vstart) | | | 200V (adj. 120-350) | | | |
| Full power MPPT voltage range | 145-530V | | | 175-530V | | |
| Operating MPPT voltage range | | | 0.7 x Vstart - 580V (\geq 90V) | | | |
| Maximum current (Idcmax) for both MPPT in parallel | | | 36A | | | |
| Maximum usable current per channel | | | 18A | | | |
| Maximum short circuit current per channel | | | 22A | | | |
| Number of wire landing terminals per channel | | | 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 ($I_{3\text{-}\text{max}}$) A _{RMS} | 27A | 23A | 20A | 30A | 28A | 24A |
| Power factor | | | > 0.995 (adjustable to ± 0.8) | | | |
| Total harmonic distortion at rated power | | | < 2% | | | |
| Contributory fault current ¹ | 36.25 A _{pk} / 25.63A _{RMS} | 36.5 A _{pk} / 25.81A _{RMS} | 31.75 A _{pk} / 22.45A _{RMS} | 36.25 A _{pk} / 25.63A _{RMS} | 36.5 A _{pk} / 25.81A _{RMS} | 31.75 A _{pk} / 22.45A _{RMS} |
| 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_{iso} and dynamic GFDI (requires floating arrays) | | | |
| Output | | | | | | |
| Anti-islanding protection | | | Meets UL1741 / IEEE1547 requirements | | | |
| Over-voltage protection type | | | Varistor, 2 (L ₁ - L ₂ / L ₁ - 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 | | $< 8\text{W}_{\text{RMS}}$ | | | $< 8\text{W}_{\text{RMS}}$ | |
| Nighttime consumption | | $< 0.6\text{W}_{\text{RMS}}$ | | | $< 0.6\text{W}_{\text{RMS}}$ | |
| 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) | |

Marc Ducharme
179 S Lincoln Street
Keene, NH 03431

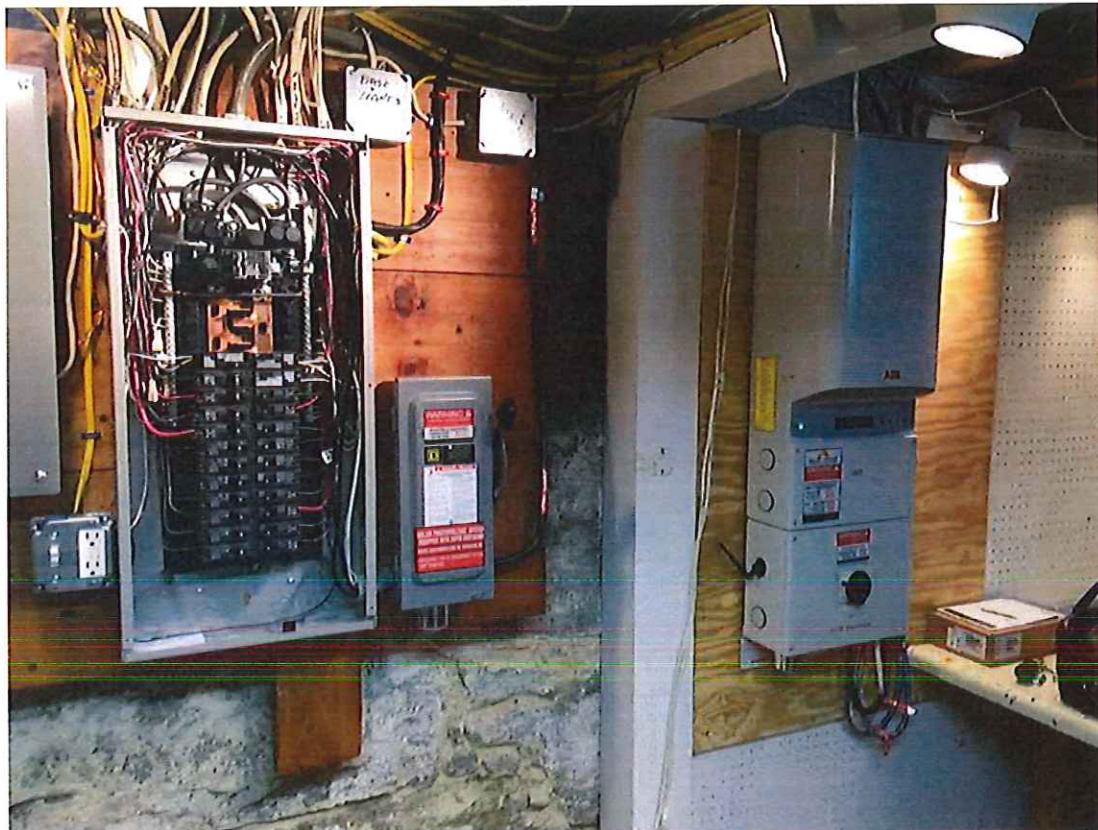
Solar PV System
Installation Photos



1- Completed roof mounted PV Array

Marc Ducharme
179 S Lincoln Street
Keene, NH 03431

Solar PV System
Installation Photos



2- Point of Interconnection, AC Disconnect and Inverter

Marc Ducharme
179 S Lincoln Street
Keene, NH 03431

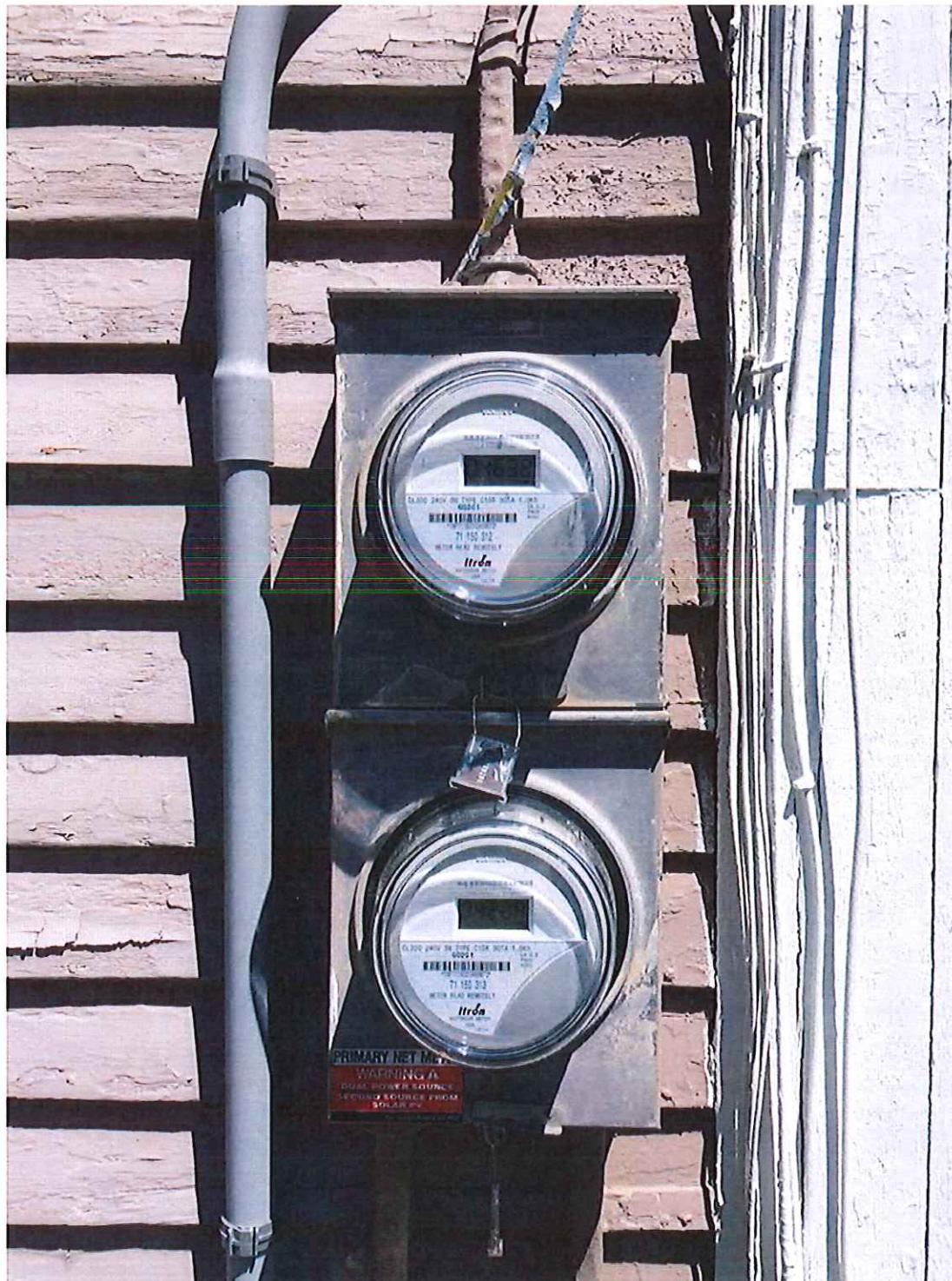
Solar PV System
Installation Photos



3- Inverter

Marc Ducharme
179 S Lincoln Street
Keene, NH 03431

Solar PV System
Installation Photos



4- Interconnected Utility (Eversource) Meter