

ATTACHMENT 1

Sunmodule® SWA 340 - 350 XL MONO



Data sheet

For Reference Only!



QUALITY BY SOLARWORLD

SolarWorld's foundation is built on more than 40 years of ongoing innovation, continuous optimization and technology expertise. All production steps from silicon to module are established at our production sites ensuring the highest possible quality for our customers. Our modules come in a variety of different sizes and power, making them suitable for all global applications – from residential solar systems to large-scale power plants.

- » Lower BOS costs than for 60-cell modules – faster return on investment
- » Tested in extreme weather conditions – hail-impact tested and resistant to salt spray, frost, ammonia, dust and sand
- » Proven guarantee against hotspots and PID-free to IEC 62804-1
- » SolarWorld Efficell™ PERC cell technology for the highest possible energy yields
- » Patented corner design with integrated drainage for optimized self-cleaning
- » High-transmissive glass with anti-reflective coating
- » Long-term safety and guaranteed top performance – 25-year linear performance warranty; 20-year product warranty



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Sunmodule®

SWA 340 - 350 XL MONO



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PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

		SWA 340	SWA 345	SWA 350
Maximum power	P_{max}	340 Wp	345 Wp	350 Wp
Open circuit voltage	V_{oc}	47.0 V	47.2 V	47.3 V
Maximum power point voltage	V_{mpp}	37.1 V	37.5 V	37.8 V
Short circuit current	I_{sc}	9.81 A	9.82 A	9.82 A
Maximum power point current	I_{mpp}	9.26 A	9.28 A	9.29 A
Module efficiency	η_m	17.04 %	17.29 %	17.54 %

Measuring tolerance (P_{max}) traceable to TUV Rheinland: +/- 2%

*STC: 1000W/m², 25°C, AM 1.5

PERFORMANCE AT 800 W/m², NOCT, AM 1.5

		SWA 340	SWA 345	SWA 350
Maximum power	P_{max}	257.3 Wp	260.4 Wp	262.2 Wp
Open circuit voltage	V_{oc}	43.6 V	43.6 V	43.7 V
Maximum power point voltage	V_{mpp}	34.4 V	34.7 V	34.9 V
Short circuit current	I_{sc}	7.97 A	7.98 A	7.98 A
Maximum power point current	I_{mpp}	7.49 A	7.50 A	7.56 A

Minor reduction in efficiency under partial load conditions at 25 °C: at 200 W/m², 97% (+/-3%) of the STC efficiency (1000 W/m²) is achieved.

PARAMETERS FOR OPTIMAL SYSTEM INTEGRATION

Power sorting	-0 Wp / +5 Wp
Maximum system voltage SC II / NEC	1000 / 1500 V
Maximum reverse current	25 A
Number of bypass diodes	3
Operating temperature	-40 to +85 °C
Maximum design loads (Two rail system)*	113 psf downward, 64 psf upward

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

COMPONENT MATERIALS

Cells per module	72
Cell type	Monocrystalline PERC
Cell dimensions	6 in x 6 in (156 mm x 156 mm)
Front	Tempered safety glass with ARC (EN 12150)
Back	Multi-layer polymer backsheet, white
Frame	Clear anodized aluminum
J-Box	IP65
Connector	PV wire (UL4703) with Amphenol UTX connectors
Module fire performance	(UL 1703) Type 1

DIMENSIONS / WEIGHT

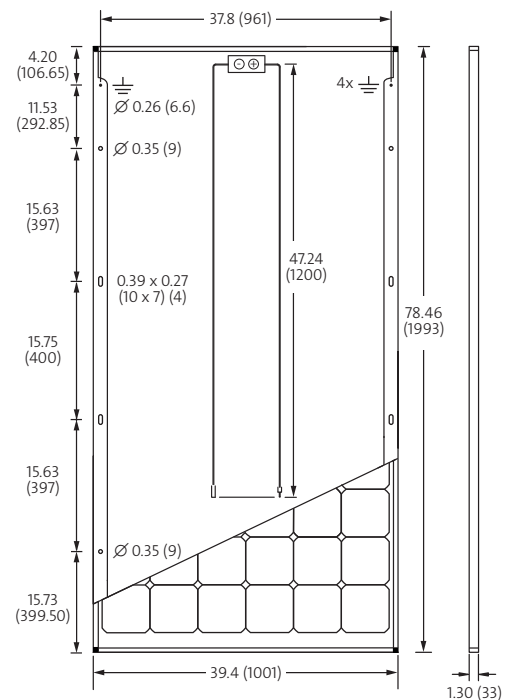
Length	78.46 in (1993 mm)
Width	39.40 in (1001 mm)
Height	1.30 in (33 mm)
Weight	47.6 lb (21.6 kg)

THERMAL CHARACTERISTICS

NOCT	46 °C
TC I_{sc}	0.03 % /C
TC V_{oc}	-0.29 % /C
TC P_{mpp}	-0.42 % /C

ORDERING INFORMATION

Order number	Description
82000664	Sunmodule SWA 340 XL mono
82000561	Sunmodule SWA 345 XL mono
82000563	Sunmodule SWA 350 XL mono



All units provided are imperial. SI units provided in parentheses.

CERTIFICATES AND WARRANTIES

Certificates	IEC 61730	IEC 61215	UL 1703
	IEC 62716	IEC 60068-2-68	IEC 61701
Warranties*	Product Warranty	20 years	
	Linear Performance Guarantee	25 years	

*Supplemental warranty coverage available through SolarWorld Assurance™
Warranty Protection Program – www.solarworld.com/assurance

For Reference Only!

3-PH TRANSFORMERLESS
STRING INVERTERS



PVI 23TL PVI 28TL PVI 36TL

FEATURES

- 1000 VDC
- Best in class efficiency
- Touch-safe fuses
- Dual & wide MPP tracking zones
- Modbus communications
- Integrated DC fused string combiner
- DC arc-fault protection
- PVI 36TL - HECO and Rule 21 compliant

OPTIONS

- Web-based monitoring
- Shade cover
- DC/AC disconnect covers
- Roof mount array brackets
- DC combiners bypass

3-PH TRANSFORMERLESS STRING INVERTERS

Yaskawa - Solectria Solar's PVI 23TL, PVI 28TL, and PVI 36TL are compact, transformerless three-phase inverters with a dual MPP tracker. These inverters come standard with AC and DC disconnects, user-interactive LCD, and an integrated fused string combiner. Its small, lightweight design makes for quick and easy installation and maintenance. These inverters include an enhanced DSP control, comprehensive protection functions, and advanced thermal design enabling highest reliability and uptime. They also come with a standard 10 year warranty with options for 15 and 20 years. Options include web-based monitoring, shade cover, DC/AC disconnect covers, DC combiners bypass, and roof mount array bracket.



SPECIFICATIONS	PVI 23TL	PVI 28TL	PVI 36TL
DC Input			
Absolute Maximum Open Circuit Voltage	1000 VDC		
Operating Voltage Range	240-950 VDC		
Max Power Input Voltage Range (MPPT)	480-800 VDC	500-800 VDC	540-800 VDC
MPP Trackers	2 with 4-fused inputs per tracker		2 with 5-fused inputs per tracker
Maximum Operating Input Current	25 A per MPPT (50 A)	29 A per MPPT (58 A)	35 A per MPPT (70 A)
Maximum Available PV Current (Isc x 1.25)	41 A per MPPT (82 A)	48 A per MPPT (96 A)	62.5 A per MPPT (125 A)
Maximum PV Power (per MPPT)	15.5 kW	19 kW	27 kW
Strike Voltage	330 V		
AC Output			
Nominal Output Voltage	480 VAC, 3-Ph		
AC Voltage Range (Standard)	-12%/+10%		
Continuous Output Power	23 kW	28 kW	36 kW
Maximum Output Current	27.7 A	33.7 A	43.5 A
Maximum Backfeed Current	0 A		
Nominal Output Frequency	60 Hz		
Output Frequency Range	59.3-60.5 Hz (adjustable 55-65 Hz)		57-63 Hz
Power Factor	Unity, >0.99 (±0.8 adjustable)		
Fault Current Contribution (1 Cycle RMS)	69.6 A		73.2 A
Total Harmonic Distortion (THD) @ Rated Load	< 3%		
Grid Connection Type	3Ø+N/GND (4-wire)		
Efficiency			
Peak Efficiency	98.6%		98.5%
CEC Efficiency	98.0%		
Tare Loss	2 W		
Integrated String Combiner			
Fused Positions	8 fused positions (4 positions per MPPT) 15 A (fuse by-pass available)		10 fused positions (5 positions per MPPT) 15 or 30 A (30A only for combined inputs)
Temperature			
Ambient Temperature Range	-22°F to +140°F (-30°C to +60°C) Derating occurs over +45°C		
Storage Temperature Range	No low temp minimum to +158°F (+70°C)		
Relative Humidity (non-condensing)	0-95%		
Operating Altitude	13,123 ft/4,000 m (derating from 6,562 ft/2,000 m)		
Data Monitoring			
SolrenView Web-based Monitoring	Optional, External		
Revenue Grade Monitoring	Optional, External		
External Communication Interface	RS-485 Modbus RTU		
Testing & Certifications			
Safety Listings & Certifications	UL 1741/IEEE 1547, CSA C22.2#107.1, FCC part 15 B		
Testing Agency	CSA		
Warranty			
Standard	10 year		
Optional	15, 20 year; extended service agreement		
Enclosure			
dBA (Decibel) Rating	< 50 dBA @ 3 m		
AC/DC Disconnect	Standard, fully-integrated		
Dimensions (H x W x D)	39.4 in. x 23.6 in. x 9.1 in. (1001 mm x 600 mm x 232 mm)		
Weight	104 lbs (47.2 kg)		121 lbs (55kg)
Enclosure Rating	Type 4		Type 4X
Enclosure Finish	Polyester powder coated aluminum		
Mounting/Installation Angle*	15° to 90° from horizontal		

*Shade cover accessory required for installation angles of 75 degrees or less

For Reference Only!

PV System Builder Rev 3.12

[Print](#)

US

Project Specifications

Module manufacturer	Solar World
Module model	SW 350 XL Mono
Mounting method	less than 10° on flat roof
Temperature range	10 to 34 ° C
Phase	Three Phase - 480 V
DC-AC ratio	1.40

Module Specifications

STC	350 W	PTC	308 W
IMP	9.17 A	ISC	9.82 A
VMP (25 °C)	38.4 V	VOC (25 °C)	48 V
Vmp Temp Coefficient	0.1641 V/°C	Voc Temp Coefficient	0.1459 V/°C
Warmest Day Vmp	30.54 V	Coldest Day VOC	50.19 V

Inverter Specifications

PVI 36TL (10 STR)



V _{dc} max	1000 V
V _{dc} min	520 V
V _{dc} start	280 V

Recommended String Sizing Solution

P _{STC} [W _{DC}]	P _{PTC} [W _{DC}]	¹ * P _{AC} [W _{AC}]	Total Modules	Strings	Mods / String	² * VMP Hot	VOC Cold	DC-AC ratio	Suggested Inverters
100800	88704	72000 limited	288	16	18	550[736]	904[744]	1.40	(2) PVI 36TL (10 STR)

¹* Estimated AC output power
²* 1% DC wire loss included