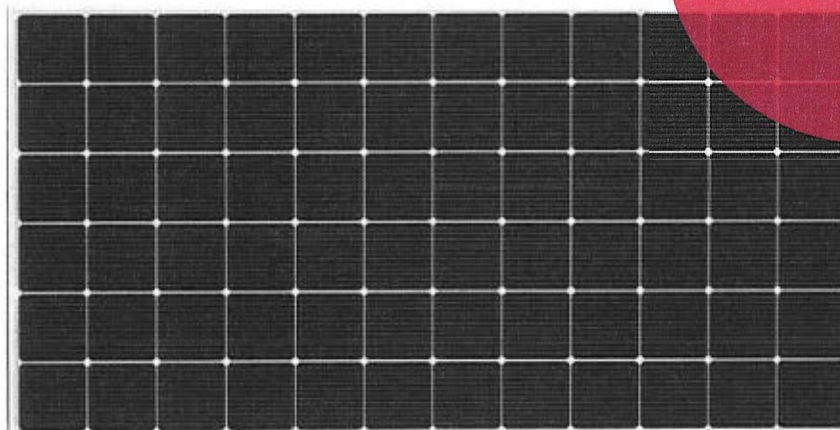


Exhibit S

Equipment Specification Sheets



Preliminary

Ver.03 Jan.10 2016

LG NeON™ 2 72cell

LG400N2W-A5 LG395N2W-A5 LG390N2W-A5

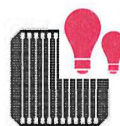
72 cell

LG's new module, LG NeON™ 2, adopts Cello technology. Cello technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. LG NeON™ 2 demonstrates LG's efforts to increase customer's value beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.



Enhanced Performance Warranty

LG NeON™ 2 has an enhanced performance warranty. The annual degradation has fallen from -0.6%/yr to -0.55%/yr. Even after 25 years, the cell guarantees 1.2% more output than the previous LG NeON™ 2 modules.



High Power Output

Compared with previous models, the LG NeON™ 2 has been designed to significantly enhance its output efficiency, thereby making it efficient even in limited space.



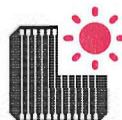
Aesthetic Roof

LG NeON™ 2 has been designed with aesthetics in mind; thinner wires that appear all black at a distance. The product may help increase the value of a property with its modern design.



Outstanding Durability

With its newly reinforced frame design, LG has extended the warranty of the LG NeON™ 2 for an additional 2 years. Additionally, LG NeON™ 2 can endure a front load up to 5400 Pa, and a rear load up to 2400 Pa.



Better Performance on a Sunny Day

LG NeON™ 2 now performs better on sunny days thanks to its improved temperature coefficient.



Double-Sided Cell Structure

The rear of the cell used in LG NeON™ 2 will contribute to generation, just like the front; the light beam reflected from the rear of the module is reabsorbed to generate a great amount of additional power.

About LG Electronics

LG Electronics is a global player who has been committed to expanding its operations with the solar market. The company first embarked on a solar energy source research programs in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry, and materials industries. In 2010, LG Solar successfully released its first Mono X® series to the market, which is now available in 32 countries. The LG NeON™ (previously known as Mono X® NeON) and the LG NeON™2 won the "Intersolar Award" in 2013 and 2015, which demonstrates LG Solar's lead, innovations and commitment to the industry.

Mechanical Properties

Cells	6 x 12
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	161.7 x 161.7 mm / 6 inches
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	2024 x 1024 x 40 mm 79.69 x 40.31 x 1.57 inch
Front Load	5400Pa
Rear Load	2400Pa
Weight	21.3 kg
Connector Type	MCA
Junction Box	IP67 with 3 Bypass Diodes
Cables	1200 mm x 2 ea
Glass	High Transmission Tempered Glass
Frame	Anodized Aluminium

Certifications and Warranty

Certifications	IEC 61215*, IEC 61730-1/-2* UL 1703* IEC 61701 (Salt mist corrosion test)* IEC 62716 (Ammonia corrosion test)* ISO 9001
Module Fire Performance (USA)	Type 1*
Fire Rating (CANADA)	Class C* (ULC / ORD C1703)
Product Warranty	12 years
Output Warranty of Pmax	Linear warranty**

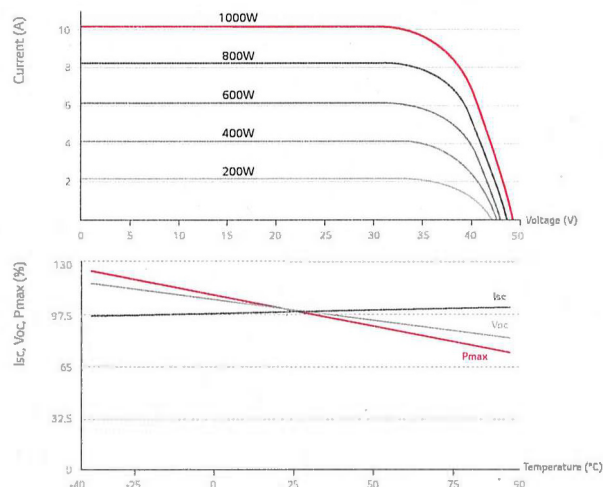
* In progress

** 1) 1st year : 98%, 2) After 2nd year : 0.55% annual degradation, 3) 25 years : 84.8%

Temperature Characteristics

NOCT	45 ± 3 °C
Pmpp	-0.36%/°C
Voc	-0.25%/°C
Isc	0.03 %/°C

Characteristic Curves



Electrical Properties (STC *)

Module	LG400N2W-A5	LG395N2W-A5	LG390N2W-A5
Maximum Power (Pmax)	400	395	390
MPP Voltage (Vmpp)	40.8	40.4	40.0
MPP Current (Impp)	9.81	9.78	9.76
Open Circuit Voltage (Voc)	49.4	49.1	48.4
Short Circuit Current (Isc)	10.49	10.46	10.43
Module Efficiency	19.3	19.1	18.8
Operating Temperature	-40 ~ +90		
Maximum System Voltage	1500		
Maximum Series Fuse Rating	20		
Power Tolerance (%)	0 ~ +3		

* STC (Standard Test Condition): Irradiance 1,000 W/m², Ambient Temperature 25 °C, AM 1.5

* The nameplate power output is measured and determined by LG Electronics at its sole and absolute discretion.

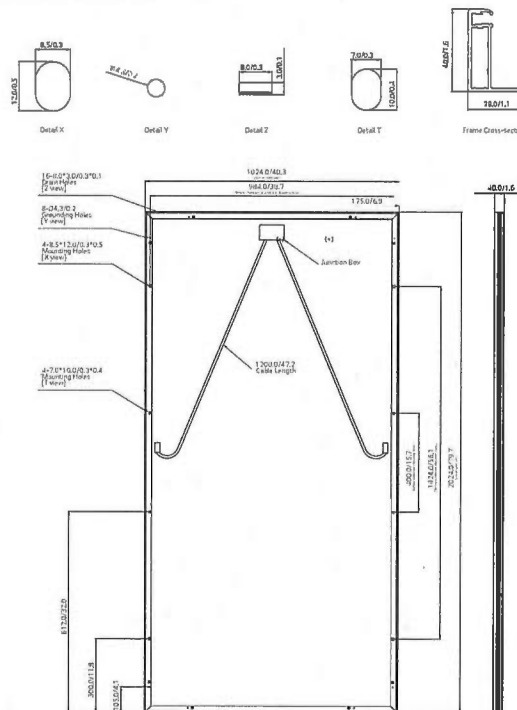
* The Typical change in module efficiency at 200W/m² in relation to 1000W/m² is -2.0%.

Electrical Properties (NOCT*)

Module	LG400N2W-A5	LG395N2W-A5	LG390N2W-A5
Maximum Power (Pmax)	295	291	288
MPP Voltage (Vmpp)	37.8	37.4	37.0
MPP Current (Impp)	7.82	7.79	7.78
Open Circuit Voltage (Voc)	46.0	45.8	45.1
Short Circuit Current (Isc)	8.44	8.42	8.39

* NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², ambient temperature 20 °C, wind speed 1m/s

Dimensions (mm/in)



* The distance between the center of the mounting/grounding holes.



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Contact: lg.solar@lge.com
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Product specifications are subject to change without notice.

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01/01/2017

Innovation for a Better Life





INVERTERS

SolarEdge Three Phase Inverters for the 277/480V Grid for North America

SE10KUS / SE20KUS / SE33.3KUS



The best choice for SolarEdge enabled systems

- Integrated arc fault protection for NEC 2011 690.11
- Rapid shutdown for NEC 2014 690.12
- Superior efficiency (98.5%)
- Outdoor and indoor installation
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Small, lightweight and easy to install on provided bracket
- Fixed voltage inverter, DC/AC conversion only
- Integrated Safety Switch and DC fuses (plus & minus)



Three Phase Inverters for the 277/480V Grid for North America

SE10KUS / SE20KUS / SE33.3KUS⁽¹⁾

	SE10KUS	SE20KUS	SE33.3KUS	
OUTPUT				
Rated AC Power Output	10000	20000	33300	VA
Maximum AC Power Output	10000	20000	33300	VA
AC Output Line Connections	4-wire WYE (L1-L2-L3-N) plus PE			
AC Output Voltage Minimum-Nominal-Maximum ⁽²⁾ (L-N)	244-277-305			Vac
AC Output Voltage Minimum-Nominal-Maximum ⁽²⁾ (L-L)	422.5-480-529			Vac
AC Frequency Min-Nom-Max ⁽²⁾	59.3 - 60 - 60.5			Hz
Max. Continuous Output Current (per Phase)	12	24	40	A
GFDI Threshold	1			A
Utility Monitoring, Islanding Protection, Country Configurable Set Points	Yes			
INPUT				
Maximum DC Power (Module STC)	13500	27000	45000	W
Transformer-less, Ungrounded	Yes			
Maximum Input Voltage DC to Gnd	490			Vdc
Maximum Input Voltage DC+ to DC-	980			Vdc
Nominal Input Voltage DC to Gnd	425			Vdc
Nominal Input Voltage DC+ to DC-	850			Vdc
Maximum Input Current	13.5	26.5	40	Adc
Max. Input Short Circuit Current	45			Adc
Reverse-Polarity Protection	Yes			
Ground-Fault Isolation Detection	1MΩ Sensitivity			
CEC Weighted Efficiency	98	98.5		%
Night-time Power Consumption	< 3	< 4		W
ADDITIONAL FEATURES				
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional)			
Rapid Shutdown – NEC 2014 690.12	With installation of rapid shutdown kit ⁽³⁾			
STANDARD COMPLIANCE				
Safety	UL1741, UL1699B, UL1998, CSA 22.2			
Grid Connection Standards	IEEE1547			
Emissions	FCC part15 class B			
INSTALLATION SPECIFICATIONS				
AC output conduit size / AWG range	3/4” minimum / 12-6 AWG			
DC input conduit size / AWG range	3/4” minimum / 12-6 AWG			
Number of DC inputs	2 pairs	3 pairs (with fuses on plus & minus) ⁽⁴⁾		
Dimensions (HxWxD)	21 x 12.5 x 10.5 / 540 x 315 x 260			in/mm
Dimensions with Safety Switch (HxWxD)	30.5 x 12.5 x 10.5 / 775 x 315 x 260			in/mm
Weight	73.2 / 33.2	99.5 / 45		lb/kg
Weight with Safety Switch	79.7 / 36.2	106 / 48		lb/kg
Cooling	Fans (user replaceable)			
Noise	< 50	< 55		dBA
Operating Temperature Range	-40 to +140 / -40 to +60			°F/°C
Protection Rating	NEMA 3R			

⁽¹⁾ For 208V inverters refer to: <http://www.solaredge.com/files/pdfs/products/inverters/se-three-phase-us-inverter-208V-datasheet.pdf>

⁽²⁾ For other regional settings please contact SolarEdge support.

⁽³⁾ Rapid shutdown kit P/N: contact SolarEdge.

⁽⁴⁾ Field replacement kit for 1 pair of inputs P/N: DCD-3PH-1TBK.



RoHS



SolarEdge Inverter Installation Guide, Update

This update is a supplement to the *SolarEdge Inverter Installation Guide, Versions 3.3 and 4.0* (P/N MAN-01-00002-3.3 and MAN-01-00002-4.0). This document describes the specifications of the new three phase inverters in North America: SE14.4KUS (for 208V grid) and SE33.3KUS (for 277/480V grid) .

	SE14.4KUS	SE33.3KUS	Units
OUTPUT			
Rated AC power output	14400	33300	VA
Maximum AC power output	14400	33300	VA
AC Output Line Connections	4-wire WYE (L1-L2-L3-N) plus PE or 3 wire Delta	4-wire WYE (L1-L2-L3-N) plus PE	
AC output voltage minimum-nominal-maximum ¹ (L-N)	105-120-132.5	244-277-305	Vac
AC output voltage minimum-nominal-maximum ¹ (L-L)	183-208-229	422.5-480-529	Vac
AC frequency min-nom-max ¹	59.3 - 60 - 60.5		Hz
Max. continuous output current (per Phase)	40		A
Max. output fault current and duration	48/20		A / mS
Max. back-feed current	0		A
Power factor	1 (adjustable from -0.8 to +0.8)		
GFDI threshold	1		A
Total harmonic distortion	<3%		
Utility monitoring, islanding protection, country configurable set points	Yes		

¹For other regional settings please contact SolarEdge Support.

	SE14.4KUS	SE33.3KUS	Units
INPUT			
Maximum DC power	19400	45000	W
Transformer-less, ungrounded	Yes		
Maximum input voltage DC to Gnd	300	490	Vdc
Maximum input voltage DC+ to DC-	600	980	Vdc
Nominal input voltage DC to Gnd	200	420	Vdc
Nominal input voltage DC+ to DC-	400	840	Vdc
Maximum input current ¹	38	40	Adc
Maximum short circuit current	45		Adc
Reverse-polarity protection	Yes		
Ground-fault isolation detection	1MΩ Sensitivity		
Maximum inverter efficiency	97	98.5	%
CEC weighted efficiency	97	98.5	%
Night-time power consumption	<4		W
ADDITIONAL FEATURES			
Supported communication interfaces	RS485, Ethernet, ZigBee (optional)		
Rapid Shutdown – NEC 2014 690.12	With SolarEdge rapid shutdown kit installed ²		
STANDARD COMPLIANCE			
Safety	UL1741, UL1699B, UL1998, CSA 22.2, NEC2014 (sec. 690.12)		

¹A higher current source may be used; the inverter will limit its input current to the values stated.

²Rapid shutdown kit P/N: Contact SolarEdge Support.

	SE14.4KUS	SE33.3KUS	Units
Grid connection standards	IEEE1547		
Emissions	FCC part15 class B		
RoHS	Yes		
INSTALLATION SPECIFICATIONS			
AC output conduit size / AWG range	3/4" minimum / 12-6 AWG		
DC input conduit size / # of inputs/ AWG range	3/4" minimum / 3 pairs (with fuses on plus & minus ¹)/ 12-6 AWG		
Dimensions (HxWxD)	21 x 12.5 x 10.5 / 540 x 315 x 260		in/mm
Dimensions with Switch (HxWxD)	30.5 x 12.5 x 10.5 / 775 x 315 x 260		in/mm
Weight	99.5 / 45		lb/kg
Weight with Safety Switch	106 / 48		lb/kg
Cooling	Fans (user replaceable)		
Noise (typical)	< 55		dBA
Operating temperature range	-40 to +140 / -40 to +60		°F/°C
Protection rating	NEMA3R		

Circuit breaker/fuse size to use at the connection point of the SolarEdge inverter to the grid:

Inverter	Maximum Output Current (A)	Fuse Rating (A)
SE14.4kUS	40	60
SE33.3kUS	40	60

You cannot use a fuse size larger than 60A.

¹Field replacement kit for 1 pair of inputs P/N: DCD-3PH-1TBK.

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Standard(s):	<p>UL 1741 Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, Second Edition, Issue: 2010/01/28, Rev through 2015/01/07</p> <p>CSA C22.2 #107.1 General Use Power Supplies Issued: 2001/09/01 Ed: 3 2011(R)</p> <p>UL SUBJECT 1699B, Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection - Issue No.2, 2013/01/14</p> <p>CSA TIL M-07, Interim Certification Requirements for Photovoltaic (PV) DC Arc-Fault Protection - Issue No.1, 2013/03/11</p>
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AUTHORIZATION TO MARK

Product:	PV Inverter
Brand Name:	SolarEdge
Models:	5 models: SE9kUS, SE10kUS, SE14.4kUS, SE20kUS, SE33.3kUS

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Brand Name:	SolarEdge
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AUTHORIZATION TO MARK

Product:	PV Inverter
Brand Name:	SolarEdge
Models:	5 models: SE9kUS, SE10kUS, SE14.4kUS, SE20kUS, SE33.3kUS

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Product:	PV Inverter
Brand Name:	SolarEdge
Models:	5 models: SE9kUS, SE10kUS, SE14.4kUS, SE20kUS, SE33.3kUS



PVI 14TL PVI 20TL

FEATURES

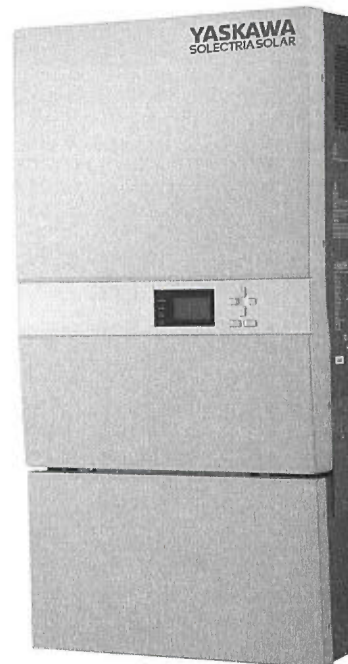
- 600 VDC
- Best in class efficiency
- Touch-safe fuses
- Dual & wide MPP tracking zones
- Modbus communications
- Integrated DC fused string combiner
- DC arc-fault protection

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 14TL and PVI 20TL 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 14TL	PVI 20TL
DC Input		
Absolute Maximum Open Circuit Voltage	600 VDC	
Operating Voltage Range	180-580 VDC	260-580 VDC
Max Power Input Voltage Range (MPPT)	300-540 VDC	300-550 VDC
MPP Trackers	2 with 4-fused inputs per tracker	
Maximum Operating Input Current	25 A per MPPT (50 A)	35 A per MPPT (70 A)
Maximum Available PV Current (Isc x 1.25)	45 A per MPPT (90 A)	45.5 A per MPPT (91 A)
Maximum PV Power (per MPPT)	9.5 kW	13.5 kW
Strike Voltage	300 V	
AC Output		
Nominal Output Voltage	208 VAC, 3-Ph	480 VAC, 3-Ph
AC Voltage Range (Standard)	-12%/+10%	
Continuous Output Power	14 kW	20 kW
Maximum Output Current	39 A	24 A
Maximum Backfeed Current	0 A	
Nominal Output Frequency	60 Hz	
Output Frequency Range	59.3-60.5 Hz (adjustable 55-65 Hz)	
Power Factor	Unity, >0.99 (±0.8 adjustable)	Unity, >0.99 (±0.9 adjustable)
Fault Current Contribution (1 Cycle RMS)	70.4 A	43.3 A
Total Harmonic Distortion (THD) @ Rated Load	< 3%	
Grid Connection Type	3ø+/N/GND (4-wire)	
Efficiency		
Peak Efficiency	96.7%	97.4%
CEC Efficiency	96.0%	97.0%
Tare Loss	4 W	2 W
Integrated String Combiner		
Fused Positions	8 fused positions (4 positions per MPPT) 15 A (fuse by-pass available)	
Temperature		
Ambient Temperature Range	-13°F to +140°F (-25°C to +60°C) Derating occurs over +50°C	
Storage Temperature Range	-22°F to +158°F (-30°C to +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	ETL	
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)	41.6 in. x 21.4 in. x 8.5 in. (1057 mm x 544 mm x 216 mm)	
Weight	141 lbs (64 kg)	132 lbs (60 kg)
Enclosure Rating	Type 4	
Enclosure Finish	Polyester powder coated aluminum	

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Listing Certificate

The following Company/product(s) is listed for use with the ETL/cETL Listed Mark(s).

Standard(s): Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources- UL 1741. Standard for General Use Power Supplies, CSA C22.2 No. 107.1-01, Reaffirmed 2006 with Interim Certification Requirements for Utility-Interconnected Inverters- Technical Information Letter (T.I.L.) No. I-43.

Company: Solectria Renewables, LLC.- Lawrence, MA USA

Product(s): Grid-Tie PV Inverter

Model(s): PVI 14TL-208
PVI 20TL-480



Intertek
Date: September 4, 2013

If you have any further questions, please feel free to call me at 1-847-718-6326

Sincerely,
Melissa Mueller

ETL Directory Coordinator
Intertek Testing Services NA Inc
545 E. Algonquin Road
Arlington Heights, IL





PVI 50TL PVI 60TL

FEATURES

- NEC 2014 compliant (arc fault and rapid shutdown)
- Compliant with UL1741SA
- 3 MPPTs with 5 inputs each
- Integrated DC and AC disconnects
- AC terminals compatible with copper and aluminum conductors
- Modbus communications
- Internal data logger
- 0 - 90° installation orientation
- Remote firmware upgrades
- Remote diagnostics

OPTIONS

- H4 wiring box
- Shade cover
- DC combiners bypass
- Web-based monitoring

3-PH TRANSFORMERLESS STRING INVERTERS

Yaskawa - Solectria Solar's PVI 50TL and PVI 60TL are grid-tied, transformerless three-phase inverters designed for ground mount, rooftop and carport arrays and can be installed from 0 - 90 degrees. The PVI 50/60TL inverters are NEC 2014 compliant and are the most reliable, efficient and cost effective in their class. They come standard with AC and DC disconnects, three MPPTs, a 15-position string combiner, remote diagnostics, remote firmware upgrades and various protection features. Options include H4 wiring box, shade cover, DC combiner fuse bypass, and web-based monitoring.



SPECIFICATIONS	PVI 50TL	PVI 60TL
DC Input		
Absolute Maximum Open Circuit Voltage		1000 VDC
Operating Voltage Range		200-950 VDC
Max Power Input Voltage Range (MPPT)	480-850 VDC	540-850 VDC
MPP Trackers		3
Maximum Operating Input Current	36 A per MPPT (108 A)	38 A per MPPT (114 A)
Maximum Available PV Current (Isc x 1.25)		60 A per MPPT (180 A)
Maximum PV Power	75 kW (25 kW per MPPT)	90 kW (30 kW per MPPT)
Start Voltage		330 V
AC Output		
Nominal Output Voltage		480 VAC, 3ø+/PE/N
AC Voltage Range (Standard)		-12%/+10%
Continuous Output Power	50 kW	60 kW
Maximum Output Current	61 A	73 A
Maximum Backfeed Current		0 A
Nominal Output Frequency		60 Hz
Output Frequency Range		57-63 Hz
Power Factor	Unity, >0.99 (adjustable 0.8 leading / 0.8 lagging)	
Fault Current Contribution (1 Cycle RMS)		55 A
Total Harmonic Distortion (THD) @ Rated Load		< 3%
Performance		
Peak Efficiency		99.0%
CEC Efficiency		98.5%
Tare Loss		< 2 W
Ambient Temperature Range	-22°F to +140°F (-30°C to +60°C) Derating occurs over +122°F (+50°C)	
Storage Temperature Range	No low temp minimum to +158°F (+70°C)	
Relative Humidity (non-condensing)		0-95%
Audible Noise	< 60 dBA @ 1 m at room temperature	
Operating Altitude	13,123 ft (4,000 m) Derating from 9,842.5 ft (3,000 m)	
Safety Listings & Certifications	UL 1741:2010, UL 1699B, CSA-C22.2 #107.1-01, IEEE1547; FCC PART15; UL 1741SA	
Testing Agency	ETL	
Mechanical		
15 Fused Positions (5 positions per MPPT)	15 A standard (20, 25, 30 A accepted*)	
AC/DC Disconnect	Standard, fully-integrated	
Enclosure Rating	Type 4X	
Enclosure Finish	Polyester powder coated aluminum	
Mounting Method**	0-90° from horizontal (vertical, angled, flat)	
Dimensions (H x W x D)	39.4 x 23.6 x 10.24 in. (1,000 x 600 x 260 mm)	
Weight	Inverter: 123.5 lbs (56 kg); Wiring Box: 33 lbs (15 kg)	
Communications		
Data Logger Hardware	Standard, Internal	
SolrenView Monitoring Service	Optional	
Revenue Grade Meter/Monitoring	Optional, External	
Communication Interface	RS-485 Modbus RTU	
Remote Firmware Upgrades	Standard	
Remote Diagnostics	Standard	
Features & Protections		
Arc-Fault Detection	Standard	
Smart Grid Features	L/HVRT, L/HFRT, Soft Start, Volt-Var, Frequency-Watt and Volt-Watt	
Warranty		
Standard	10 year	
Optional	15, 20 year; extended service agreement	

*Yaskawa - Solectria Solar does not supply the optional fuses

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



Certificate of Compliance

Certificate: 70145966

Master Contract: 259363

Project: 70145966

Date Issued: 2017-07-06

Issued to: Solectria Renewables, LLC
360 Marrimack St. Bldg 9,
Lawrence,
MA, 01843,
USA

Attention: Mr. James Worden

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Issued by: Kyle Song
Kyle Song

PRODUCTS

CLASS - C531109 - POWER SUPPLIES-Distributed Generation Power Systems Equipment

CLASS - C531189 - POWER SUPPLIES-Distributed Generation-Power Systems Equipment - Certified to U.S. Standards

Transformerless Grid Support Utility Interactive Inverter, PVI 50TL-480 and PVI 60TL-480 permanently connected.

Note:

For details related to rating, size, configuration, etc., reference should be made to the CSA Certification Record, Certificate of Compliance Annex A, or the Descriptive Report.



Certificate: 70145966

Project: 70145966

Master Contract: 259363

Date Issued: 2017-07-06

APPLICABLE REQUIREMENTS

CSA C22.2 No. 107.1-01 - General Use Power Supplies

*UL 1741 - Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources (Second Edition, Revision September 7, 2016)

CSA TIL M-07 - Interim Certification Requirements for Photovoltaic (PV) DC Arc-Fault Protection (Issue Number 1, March 11, 2013)

UL 1699B - Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection (Issue Number 2, January 14, 2013)

*Note: Conformity to UL 1741 (Second Edition, Revision September 7, 2016) includes compliance with applicable requirements of IEEE 1547-2003 (R2008), IEEE 1547.1-2005(R2011), California Rule 21 and Supplement SA.



Supplement to Certificate of Compliance

Certificate: 70145966

Master Contract: 259363

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description		
70145966	2017-07-06	Multiple Listing.		
		Original Report	Model No.	Listee Model No
		70128097	CPS SCA50KTL-DO/US-480	PVI 50TL-480
		70128097	CPS SCA60KTL-DO/US-480	PVI 60TL-480



PVI 23TL PVI 28TL PVI 36TL

FEATURES

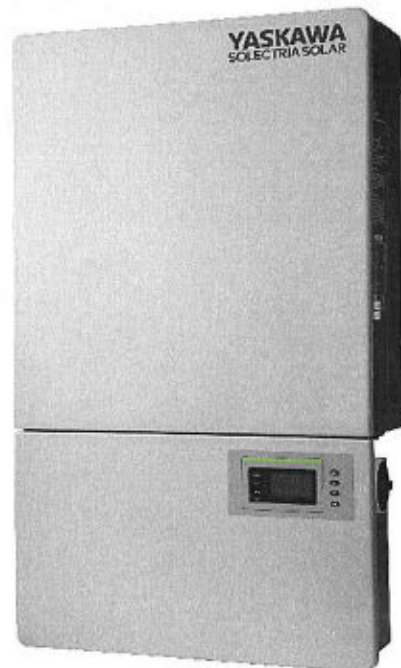
- 1000 VDC
- Best in class efficiency
- Touch-safe fuses
- Dual & wide MPP tracking zones
- Modbus communications
- Integrated DC fused string combiner
- DC arc-fault protection
- PVI 36TL - HECO and Rule 21 compliant

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



Certificate of Compliance

Certificate: 2665124

Master Contract: 259363

Project: 70036193

Date Issued: June 12, 2015

Issued to: Solectria Renewables, LLC.
360 Marmack St. Bldg 9,
Lawrence,
MA, 01843,
USA

Attention: Mr. James Worden

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only



Kyle Song.
Issued by: Kyle Song

PRODUCTS

CLASS 5311 09 - POWER SUPPLIES - Distributed Generation Power Systems Equipment
CLASS 5311 89 - POWER SUPPLIES - Distributed Generation - Power Systems Equipment
- Certified to U.S. Standards

Transformerless Utility Interactive Inverter, Models PVI 23TL-480, PVI 28TL-480 and PVI 36TL-480, permanently connected.

Note:

For details related to rating, size, configuration, etc., reference should be made to the CSA Certification Record, Certificate of Compliance Annex A, or the Descriptive Report.



Certificate: 2665124

Master Contract: 259363

Project: 70036193

Date Issued: June 12, 2015

APPLICABLE REQUIREMENTS

CSA C22.2 No. 107.1-01 - General Use Power Supplies

*UL Std. No.1741-Second Edition - Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources(January 28, 2010)

UL 1699B - Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection (Issue Number 2, January 14, 2013)

CSA TIL M-07 - Interim Certification Requirements for Photovoltaic (PV) DC Arc-Fault Protection (Issue Number 1, March 11, 2013)

*Note: Conformity to UL 1741-Second Edition (January 28, 2010) includes compliance with applicable requirements of IEEE 1547-2003 (R2008) and IEEE 1547.1-2005(R2011).



Supplement to Certificate of Compliance

Certificate: 2665124

Master Contract: 259363

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description		
70036193	Jun 12, 2015	Multiple Listing.		
		Original Report	Model No.	Listee Model No
		2645180	CPS SCA36KTL-DO/US	PVI 36TL-480
2665124	Sep 26, 2013	Multiple Listing.		
		Original Report	Model No.	Listee Model No
		2645180	CPS SCA23KTL-DO/US-480	PVI 23TL-480
		2645180	CPS SCA28KTL-DO/US-480	PVI 28TL-480