Installation and Operation manual for

PVI 3800TL
PVI 5200TL
PVI 6600TL
PVI 7600TL

SOLECTRIA
RENEWABLES

This manual is subject to change.
Please check our website at http://www.solren.com/products-and-services/documentation/
for the most recent version.

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

1 General safety instructions

This manual contains important instructions for Solectria models PVI 3800TL, PVI 5200TL, PVI 6600TL and PVI 7600TL that should be followed during installation and maintenance of the inverter.

Solectria models PVI 5200TL, PVI 6600TL and PVI 7600TL inverters are designed and tested to meet all applicable North American and International safety standards. However, like all electrical and electronic equipment, safety precautions must be observed and followed during installation and operation of Solectria inverters to reduce the risk of personal injury and to ensure a safe installation.

Installation, commissioning, service, and maintenance of Solectria models PVI 3800TL, PVI 5200TL, PVI 6600TL and PVI 7600TL inverters must only be performed by qualified personnel that are licensed and/or satisfy state and local jurisdiction regulations.

Before starting installation or commissioning of the Solectria PVI 3800TL, PVI 5200TL, PVI 6600TL and PVI 7600TL, read through the entire manual and note all DANGER! WARNING! CAUTION!, and NOTICE! statements.

All US electrical installations must comply and be in accordance with all the state, local, utility regulations, and National Electrical Code ANSI/NFPA 70.

For installations in Canada, please ensure these are done in accordance with applicable Canadian standards.

1.1 Safety symbols and terminology definitions

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE indicates a situation that can result in property damage if not avoided.

INFORMATION provided will ensure optimal operation of the system.

HIGH VOLTAGE WARNING! Indicates hazardous high voltages are present, which, if not avoided, will result in death or serious injury. Thus, only authorized and trained personnel should install and/or maintain this product.

Primary Earth (PE) Ground

Wait for a prescribed amount of time before engaging in the indicated action

1.2 Safety Instructions

The inverter installation must be performed by an licensed electrician in accordance with the local and National Electrical Code ANSI/NFPA 70 and OSHA requirements.

- The inverter section contains no user-serviceable parts. For all service and maintenance, the inverter should be returned to a Solectria Authorized Service Center.
- Read all of these instructions, cautions, and warnings for the Solectria inverter and associated PV array documentation.
- Before connecting the Solectria inverter to the AC distribution grid, approval must be received by the appropriate local utility as required by national and state interconnection regulations, and must be connected only by qualified personnel.
- During operation, the inverter wiring and connections can have hazardous voltages and currents present, thus only authorized and qualified personnel shall install and/or maintain the inverter.
- During some operation instances, the inverter chassis & heatsink surfaces may become hot.
- PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Use dark opaque sheets to cover the PV solar array before wiring or connecting cable terminations.

2 Introduction

With this device you have acquired a inverter for connection of a photovoltaic system to the grid. This inverter is characterized by an advanced housing design and state-of-the-art high-frequency technology, which enable the highest levels of efficiency and longest life.

The inverter includes key features and capabilities, such as anti-islanding protection, LCD, RS485 interfaces.

The inverter is usable indoors and outdoors. It fulfills the directives of ANSI/NFPA 70, NEC 690.5, UL 1741, IEEE 1547 and IEEE 1547.1 for parallel operation of power generation plants on low-voltage network of regional electrical utility companies.

The function of the anti-islanding protection (automatic isolation point for in-plant generation systems) complies with UL 1741 / IEEE 1547 specifications.

In the following technical description, the precise functions are explained to the installer, as well as the user, which are required for the installation, operational start-up and handling of the inverter.

2.1 System

Renewable energy use worldwide is increasing annually by approximately 25%. The reason for this rise can be primarily attributed to the constantly increasing demand for power, the increasing interest in environmentally friendly technologies, as well as the increasing costs of non-renewable energy.

Use of renewable energy sources, can reduce levels of CO_2 and other harmful gases in the atmosphere produced by conventional power generation.

The inverter converts direct current from solar array into alternating current. This enables you to feed your self-produced solar energy into the electric grid.

Thanks to efficient MPP tracking, maximum capacity utilization of the solar energy plant is ensured even in cases of misty and cloudy skies.

The string concept means that PV modules are always connected in series (in a string) and/or that strings with the same voltage are connected in parallel to the inverter with the aim of significantly reducing the photovoltaic system's cabling requirements.

The fact that the modules are connected in strings also means that the photovoltaic system can be perfectly matched to the inverter's input voltage range.

The inverter is transformerless, without galvanic isolation. Therefore, the inverter may only be operated with ungrounded PV arrays. Furthermore, the PV array must be installed in accordance with the NEC690.35 (Ungrounded Photovoltaic Power Systems) and the locally valid regulations for ungrounded PV arrays. Additionally, the PV array (PV modules and cabling) must have protective insulation and the PV modules used must be suitable for use with this inverter. PV modules with a high capacity to ground may only be used if their coupling capacity does not excessed 1,200 nF with 60Hz grid.

2.2 Data evaluation and communication

The integrated data display, processing and communication of the device enables easy operation of the inverter. Monitoring of the operational status and signaling of operational failures are capable of being reviewed on the device display. The data interfaces enable the downloading of data.

The best way of accessing this functionality is via a monitoring system, such as SolrenView, connected to your inverter.

The read-out of the data on the display is possible when the inverter is connected to AC.

2.3 Technical structure of the inverter

The photovoltaic voltage is adjusted so that the maximum power output of the PV modules is also achieved with different solar irradiation levels and temperatures (MPP-Tracking). These inverters have quite wide MPP range of suit for variety of PV modules by a variety of manufacturers. Measures must be taken to ensure that the maximum no- load voltage of 600 V is never exceeded. Please note that the maximum no-load voltage will occur at the lowest temperatures anticipated. You will find more detailed information about temperature dependency in the data sheet for the PV modules. The device's power consumption is kept to a minimum (1.5 W). Warranty is void if 600VDC is exceeded.

The high-quality aluminum casing corresponds to protection degree NEMA 4 / IP65 (water-jet proof and dust-proof) and is protected by an anti-corrosion finish. The heat sink on the PVI 3800-7600TL inverters is designed in such a way that operation of the inverter is possible at ambient temperatures from -13°F to +122°F (-25°C to +50°C) at full rated power and optimal efficiency for either 240 Vac or 208 Vac AC grids.

Aluminum fins designed into the back of the inverter chassis are used to dissipate heat and protect the unit. An internal temperature control protects the interior of the device. In case of high ambient temperatures, the maximum power is limited.

The inverter is controlled by microcontrollers which provide interface communication and the values and messages on the front-panel display.

AC grid monitoring is done by an independent dedicated micro controller set up to meet the requirements of UL 1741 / IEEE 1547. This enables a connection of the inverter to the grid.

Operator protection requirements are met by electrically isolating the grid from the PV module. The electrical isolation between the grid and the PV array is equivalent to basic insulation. Maximum operator protection is ensured by reinforced isolation between the grid, PV modules and accessible interfaces (display, RS485 interface and fan port). Relevant standards concerning electromagnetic compatibility (EMC) and safety are fulfilled.

The inverter can only function as a grid-tied device. Anti-islanding function, which was certified according to UL 1741, guarantees disconnection in case of loss of AC grid.

2.4 Ambient temperature

The inverter can be operated in ambient temperatures between -13°F to 158°F (-25°C to +70°C). The following diagram illustrates how the power of the inverter is reduced automatically depending on ambient temperature.

The device should be installed in a well-ventilated, cool and dry location.

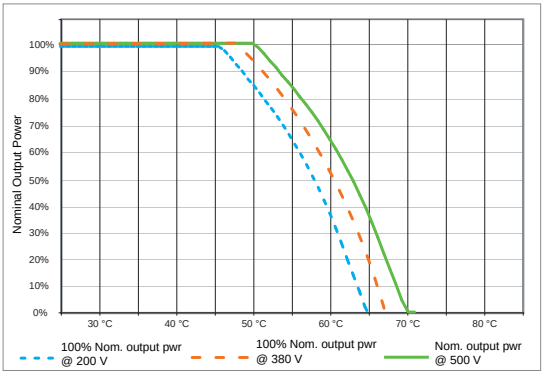


*Figure 1 demonstrates typical behavior for PVI 3800-7600TL series inverters.

Figure 1: Solectria PVI 3800-7600TL inverter output power vs ambient temperature curve*

2.5 Inverter DC input voltage range

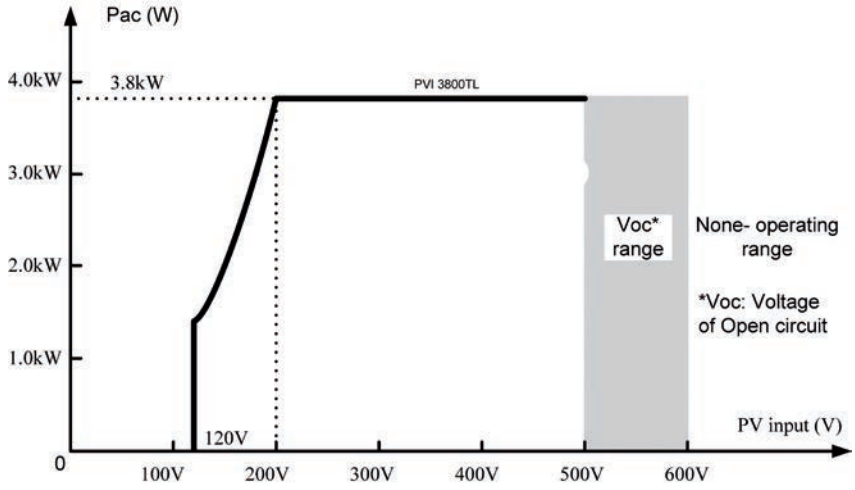


Figure 2: Solectria PVI 3800TL DC input voltage range

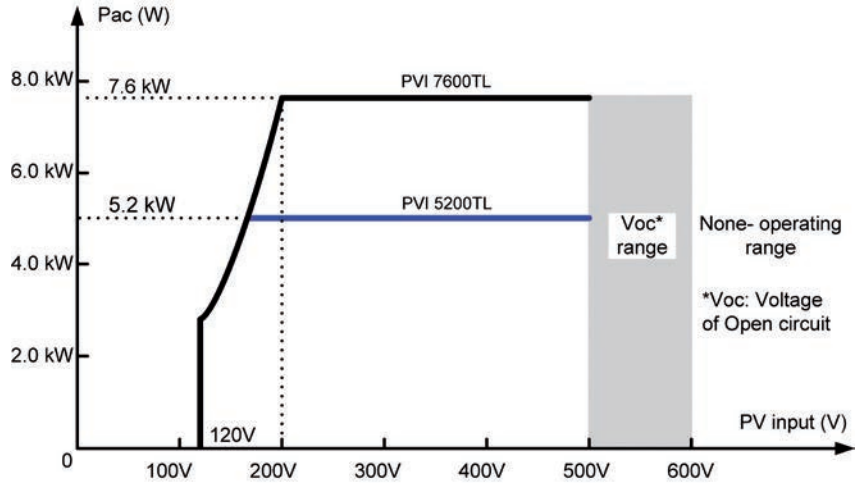


Figure 3: PVI 5200TL and PVI 7600TL PV input DC voltage range

2.6 Efficiency

The best efficiency of the inverter is obtained at input voltages > 320V for 208V grid, and input voltages > 380V for 240V grid.

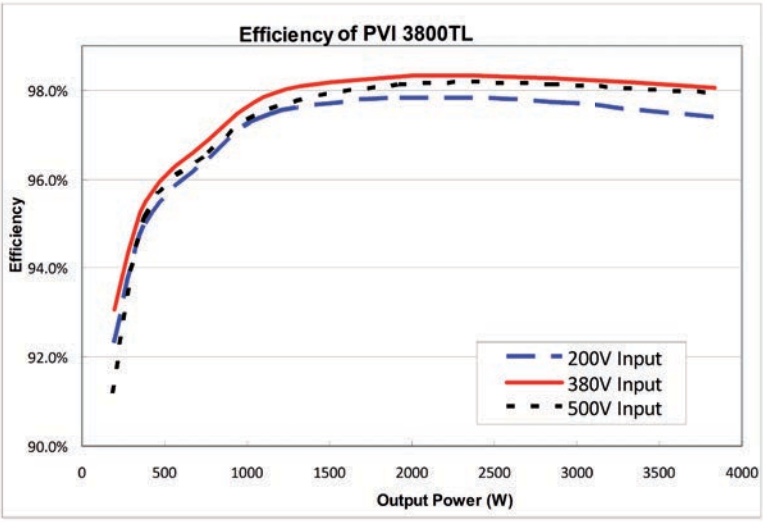


Figure 4: PVI 3800TL efficiency plot

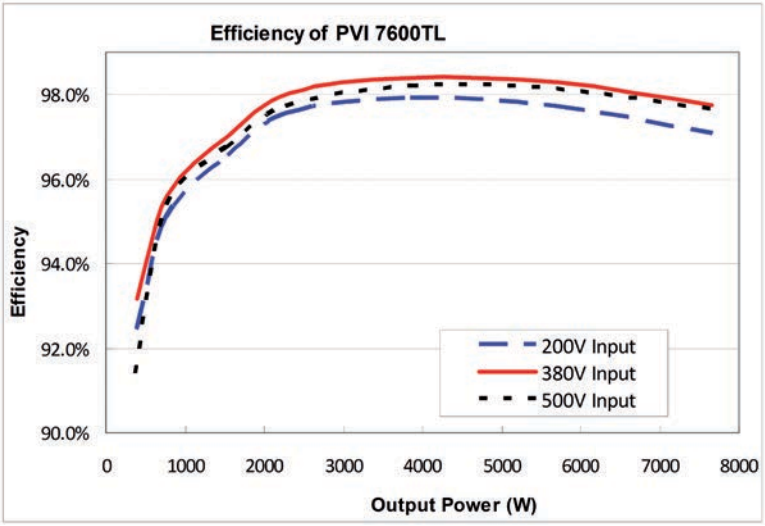
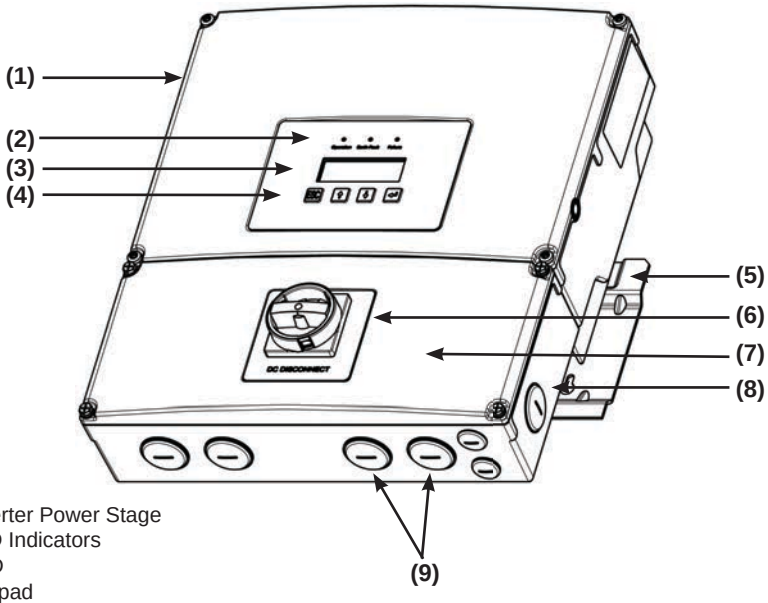


Figure 5: PVI 7600TL efficiency plot

2.7 Equipment overview



(1) Inverter Power Stage
(2) LED Indicators
(3) LCD
(4) Keypad
(5) Mounting Bracket
(6) Lockable DC Disconnect
(7) Wiring Box Cover
(8) Wiring Box
(9) Conduit Plugs

Figure 6: Exterior view of inverter main components

A further description of the equipment features:

(1) Inverter Power Stage - This is the inverter section of the assembly. This section is sealed at the factory and there are no user-serviceable parts inside. All wiring to install the inverter is done in the wiring compartment.

(2) LED Indicators - The three LED indicators show errors or status as described in section 9.

(3) LCD - The 20 character, 4 line LCD shows important messages regarding the inverter status and performance.

(4) Display Control Keys - These 4 keys allow the user to access status and performance information and to change settings via the display.

(5) Mounting Bracket - The inverter ships with a mounting bracket that allows for easy installation of the inverter to a wall.

(6) Lockable DC Disconnect - The DC disconnect is lockable and allows DC power to be disconnected from the inverter. See figure 7 below.

(7) Wiring Box Cover - This is the cover for the wiring compartment. The removal procedure is shown on page 29. Please note the DC disconnnect must be in the OFF position before this cover can be removed.

(8) Wiring Box - This is the compartment where all the wiring for the inverter inputs and outputs plus the RS485 communication is done.

(9) Conduit Opening - There are 6 - 1“ conduit openings and 2 - 1/2“ conduit openings. Each conduit opening comes fitted with a conduit plug that should be removed before installing conduit fittings. Conduit fittings need to be water tight with either a NEMA 4, 4X, 6, or 6X rating.

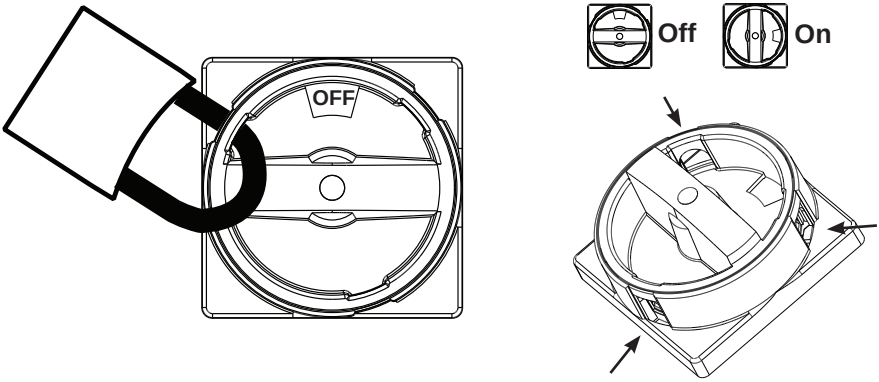


Figure 7: Lockable DC Disconnect

DC Disconnect shown with lock in off position. There are three openings on the disconnect where a lockout padlock can be attached as shown above.

2.8 Inverter Nameplate and Safety Labels

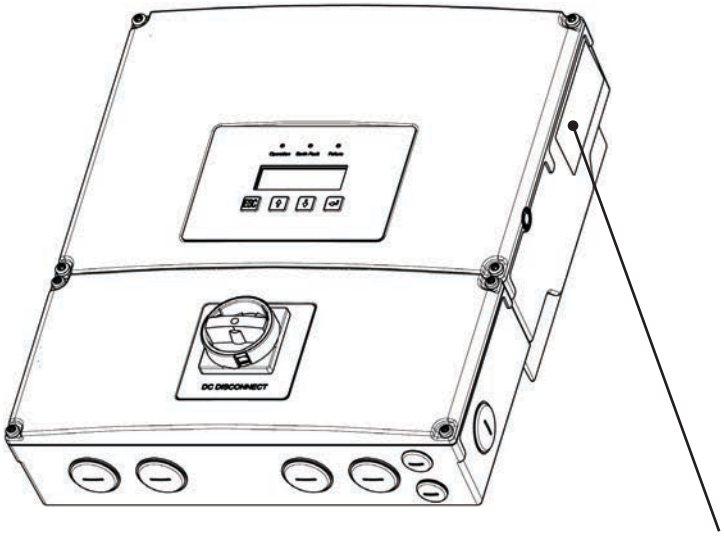
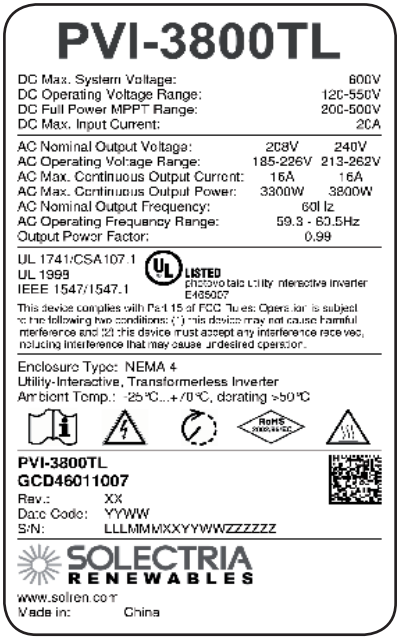


Figure 8: Nameplate Label location

The nameplate label is shown in figure 8.

The inverter serial number can be found on the nameplate label.

*Models PVI-5200TL, PVI-6600TL & PVI-7600TL are not UL Listed by UL LLC as of the time of print of this manual.“


PVI-3800TL

DC Max. System Voltage:		600V
DC Operating Voltage Range:		120-550V
DC Full Power MPPT Range:		200-500V
DC Max. Input Current:		20A
AC Nominal Output Voltage:	208V	240V
AC Operating Voltage Range:	185-226V	213-262V
AC Max. Continuous Output Current:	16A	16A
AC Max. Continuous Output Power:	3300W	3800W
AC Nominal Output Frequency:	60 Hz	
AC Operating Frequency Range:	59.3 - 60.5Hz	
Output Power Factor:	0.99	

UL 1741/CSA107.1
UL 1998
IEEE 1547/1547.1

LISTED
PV Grid Voltage Utility Interactive Inverter
E486007

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Enclosure Type: NEMA 4
Utility-Interactive, Transformerless Inverter
Ambient Temp.: -25°C...+70°C, derating >50°C

PVI-3800TL
GCD46011007
Rev.: XX
Date Code: YYWW
S/N: LLLMMMXXYYWWZZZZZZ

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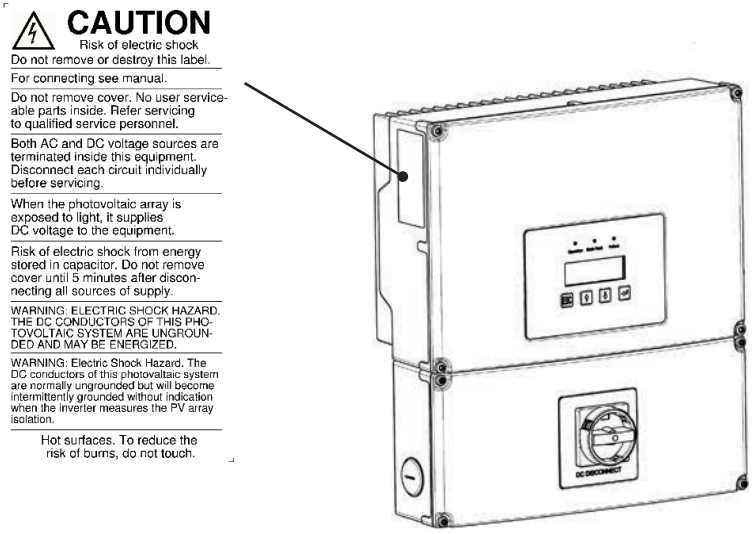
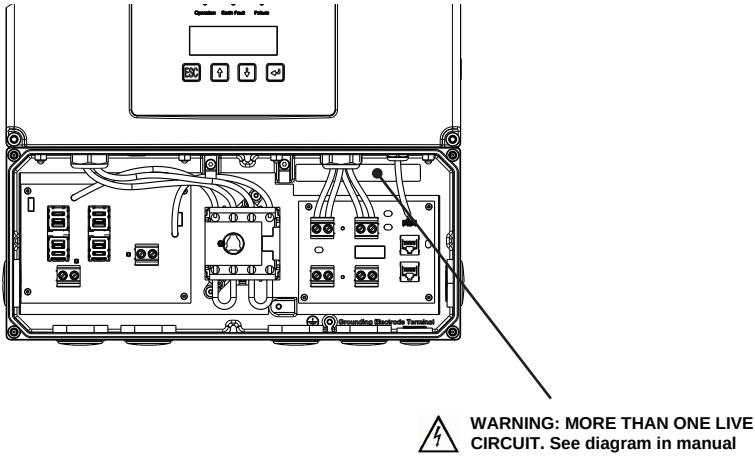
www.solren.com
Made in: China



The main caution label in English is on the left side of the inverter in the middle of the unit and the equivalent label in French is located just above as shown in the illustration.



The caution label located in the wiring box enclosure as shown above indicates that there is more than one live circuit.

Figure 9: Location of Caution Labels

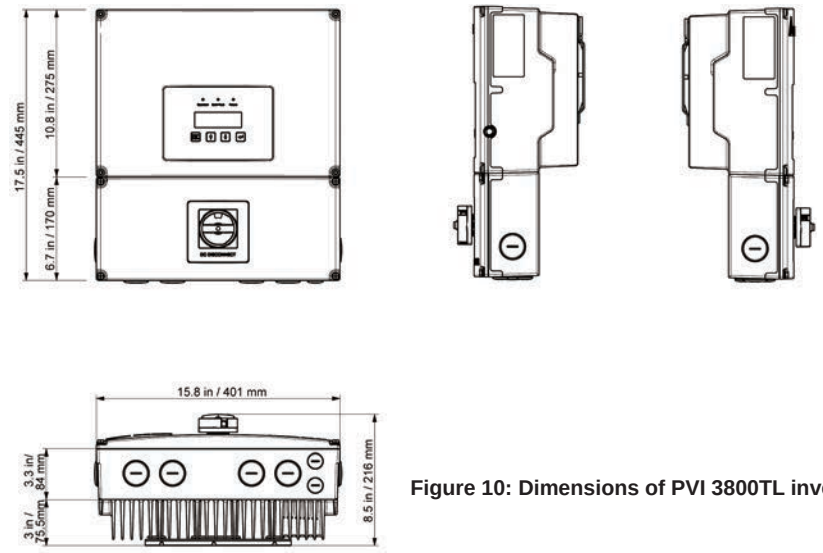


Figure 10: Dimensions of PVI 3800TL inverters

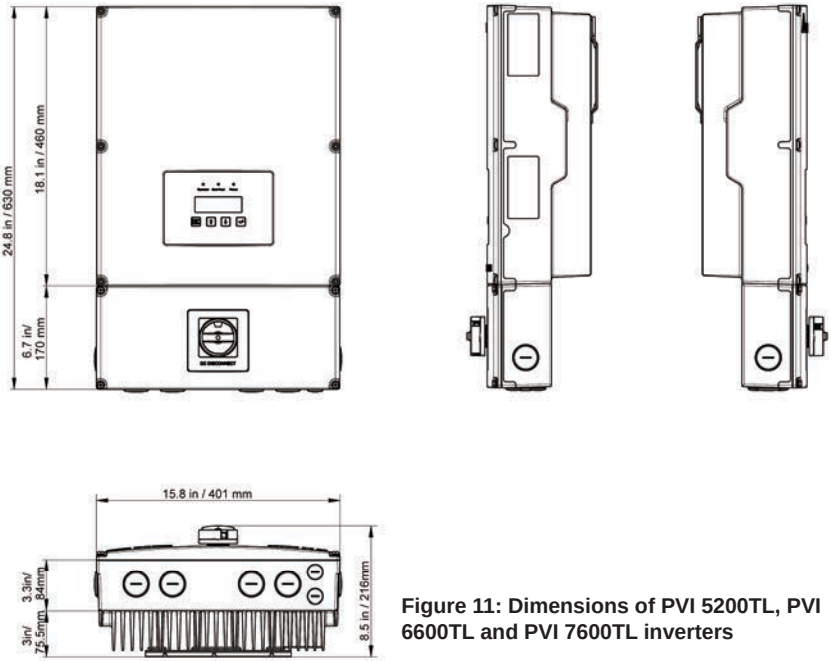
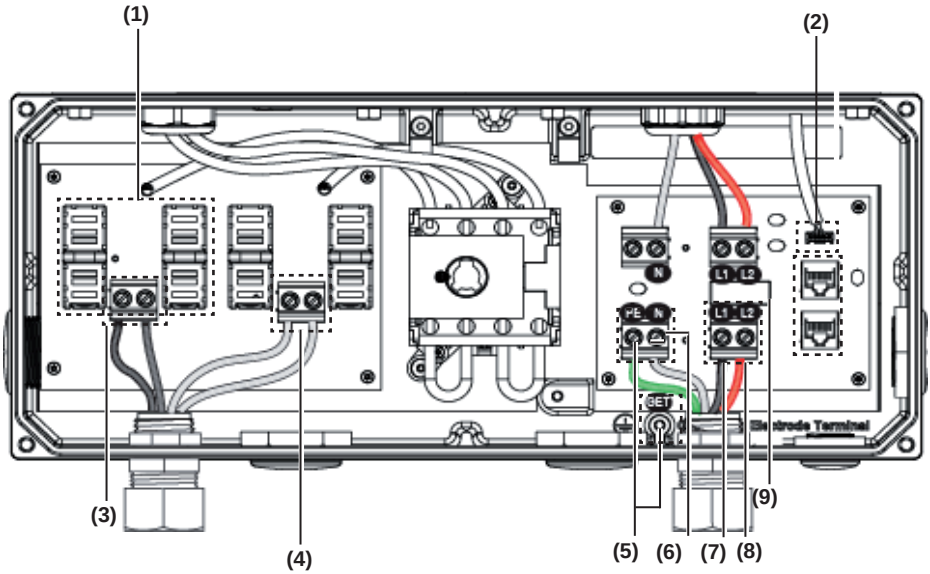


Figure 11: Dimensions of PVI 5200TL, PVI 6600TL and PVI 7600TL inverters



(1) Fuse Holders
(2) RS485 Termination
(3) PV Positive Terminals
(4) PV Negative Terminals
(5) AC side Grounding Terminals
(6) AC side Neutral
(7) AC side L2
(8) AC side L1
(9) RS485 communication ports

Figure 12: Wiring box connection options

Required torques for wiring box terminals

Terminals in figure 12	Wire size permitted	Required torque
3-8 (see location and description above)	14 - 6 AWG (2.5 - 16 mm^2)	10.5 in-lbs (1.2 Nm)

Table 1: Required torques for wiring box terminals

3 Installation

Read all of these instructions, cautions, and warnings for the Solectria PVI inverter and associated PV array documentation.

Installation and commissioning must be performed by a licensed electrician in accordance with local, state, and National Electrical Code ANSI/NFPA 70 requirements.

The installation and wiring methods used in the installation of this inverter in the U.S. must comply with all US National Electric Code requirements (NEC) and local Authority Having Jurisdiction (AHJ) inspector requirements. In Canada, the installation and wiring methods used must comply with the Canadian Electric Code, parts I and II, and the local AHJ inspector requirements. System grounding when required by the Canadian Electrical Code, Part 1, is the responsibility of the installer.

These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, refer all servicing to factory qualified service personnel. No user service parts are contained inside the inverter.

The secondary short-circuit current rating is increased at the transfer connection point to the public electricity supply system by the nominal current of the connected inverter.

To reduce the risk of fire, connect only to a circuit provided with branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA70.

The unit or system is provided with fixed trip limits and shall not be aggregated above 30KW on a single point of common connection.

In order to be able to carry out an energy measurement, a revenue meter kWh must be attached between the networks feed-in point and the inverter.

3.1 Visual inspection

All Solectria PVI inverters are 100% tested, packaged in a heavy duty cardboard shipping carton, and visually inspected before leaving our manufacturing facility. If you receive the inverter in a damaged shipping carton, please reject the shipment and notify the shipping company.
Verify Solectria PVI shipping carton contains:
a. Correct Solectria PVI inverter model: PVI 3800TL, PVI 5200TL, PVI 6600TL and PVI 7600TL
b. Mounting bracket
c. Operation and Installation Manual

Visually inspect the Solectria PVI inverter for any physical damage such as a bent heatsink fin and dented chassis.

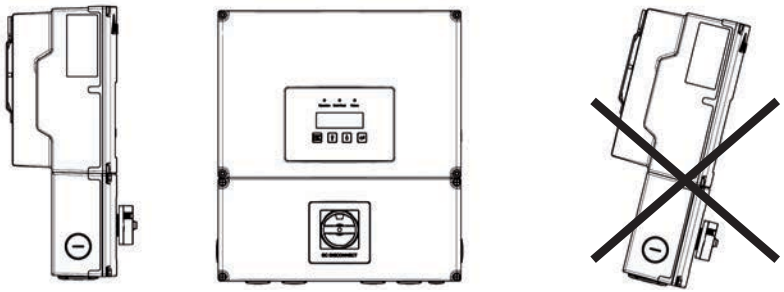
If the inverter appears to be damaged or if the inverter needs to be returned, please contact your local Solectria representative.

No user serviceable parts are contained in the inverter section. Do not attempt to open or repair the inverter. The inverter section is factory sealed to maintain its NEMA 4 rating and will void the inverter warranty.

3.2 Installation location

1. Install the inverter on a non-flammable support base.
2. The inverter must be mounted vertically on a flat surface.
3. For clearances around inverter, see Figure 13.
4. Ensure the mounting hardware and structure can support the weight of the inverter.
5. Ensure the mounting hardware meets the appropriate building code.
6. Avoid installation on resonating surfaces (light construction walls etc.).
7. Installation can be indoors or in protected outdoor areas.
8. Avoid direct sun exposure.
9. Ensure inverter ambient temperature is within -13°F to +122°F (-25°C to +50°C) for optimal efficiency of the PV system.
10. Chose a mounting height for easy viewing of the display.
11. Despite having a NEMA 4 / IP65 enclosure with a soiling category III certification, the inver ter must not be exposed to heavy soiling.
12. Unused connectors and interfaces must be covered through sealing connectors.

3.3 Mounting the inverter



Please make sure the inverter is installed vertically, especially if it is installed outdoors.

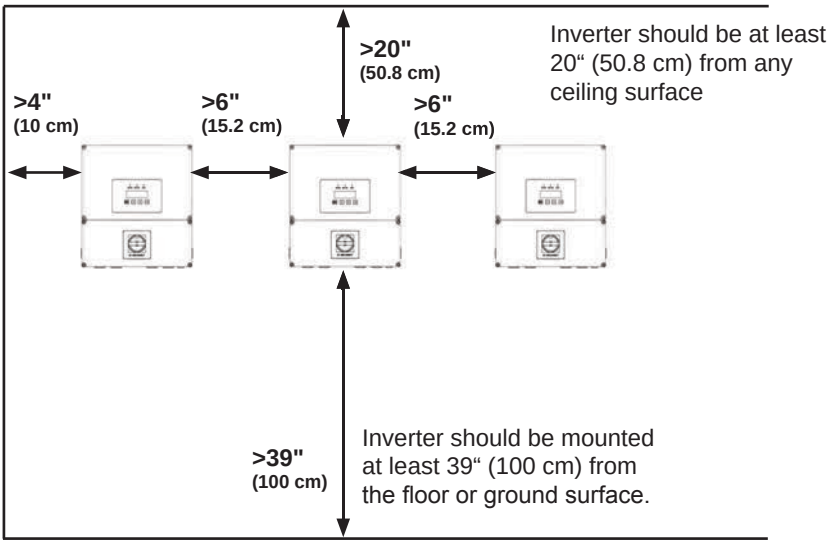


Figure 13: Inverter clearances

The National Electric Code may require significant larger working clearances (see NEC Section 110.26)

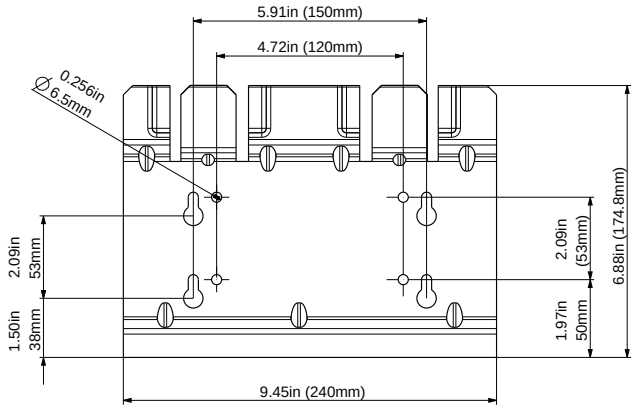


Figure 14: Dimensional drawing of mounting plate

1. Mount the mounting plate to the wall with at least 4 screws and anchors (Ø 1/4“). With 4 screws use 4 holes A or 4 holes B (see Figure 14). You can use the mounting plate as a template for marking the positions of the boreholes.

2. Tighten the screws firmly to the wall.

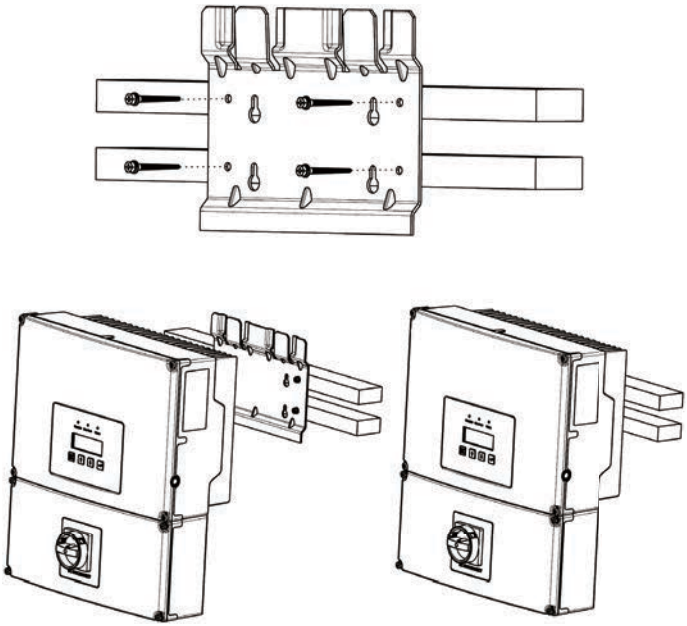


Figure 15: Installing the mounting bracket and inverter on a wood stud wall.

1. Using the mounting bracket as a template, mark four screw holes onto the wall. For 16 in. (40.6 cm) on center stud mounting, use the four holes that are indicated for this purpose in the figure. Make sure the holes are in the center of each stud before marking the drill location.

2. After marking the screw hole locations, drill the pilot holes for the appropriate screw type that will hold the weight of the inverter in the selected material. 1/4“ lag bolts are recommended for mounting on wood framed walls.

3. Align the mounting bracket over the pilot holes and install the mounting hardware to 3/16 inches flush to mounting surface. Please tighten to the recommended torque necessary to hold the mounting bracket firmly to the wall surface type.

4. As the inverters are heavy, they should be lifted out of the cardboard container by at least two persons (PVI 3800TL weighs 42 lbs (19 kg) and PVI 5200/6600/7600TL weigh 64 lbs (29 kg)).

5. With two people, lift up the inverter and place it carefully onto the mounting bracket. Install two locking nuts as shown in the figure 16 to secure the device.

6. Check that the inverter is seated securely on the wall.

It is recommended to use stainless steel screws, especially if installed outdoors. Be sure to verify sheer and pullout strength of anchors or other wall attachments.

3.4 Required torques for PVI inverters

Part	Description	Required torque
Wiring Box Cover Screws	M6 screws (x4) for attaching the wiring box cover to the wiring box	max. 71 in-lbs (8 Nm)
Wiring Box Interior Nuts	10mm nuts (x4) that secure the wiring box to the inverter stage assembly	max. 71 in-lbs (8 Nm)

Table 2: Required Torques for PVI inverters

4 Electrical connections

4.1 General safety

Read all of the instructions, cautions, and warnings for the Solectria PVI inverter and associated PV array documentation.

Installation and commissioning must be performed by a licensed electrician in accordance with local, state, and National Electrical Code ANSI/NFPA 70 requirements. Use 90°C (194 °F) copper solid or stranded wire for all DC and AC wiring to the PVI inverter to optimimize system efficiency. Size conductors per NEC requirements.

PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Using dark opaque sheets cover the PV solar array before wiring or connecting cable terminations.

Before connecting the Solectria PVI inverter to the AC distribution grid, approval must be received by appropriate local utility as required by national and state interconnection regulations, and must be connected only by qualified personnel.

Do not attempt to open or repair the inverter as the inverter is factory sealed to maintain its NEMA 4 / IP65 rating and will void the inverter warranty.

The PV AC output circuits are isolated from the enclosure. The PV system Ground Electrode Conductor (GEC) when required by National Electric Code (NEC), ANSI/NFPA 70 Sections 690.41, 690.42, and 690.43 is the responsibility of the installer.

4.2 Utility AC voltage

The Solectria PVI inverters are grid-tied to the public utility. PVI inverters are software configurable via the user display panel for various 208 Vac or 240 Vac 60 Hz service configurations as shown in figures 18-22.

CAUTION!
PRUDENCE!

The Solectria PVI Inverters should never be connected to a 120 Vac utility service. NEC 690.64(b)(1) requires that the inverter be connected to a dedicated circuit with no other outlets or devices connected to the same circuit.

AC connection voltage and frequency limits:

Voltage range for 208 V nominal, line to line	183 V - 228 V
Voltage range for 240 V nominal, line to line	211 V - 262 V
Frequency Range	59.3 Hz - 60.5 Hz

Table 3: AC connection voltage and frequency limits

Grid configurations allowed:

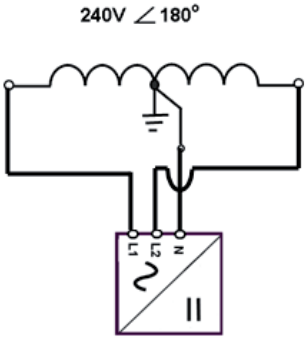


Figure 16: 240V/120V Split Phase AC Grid

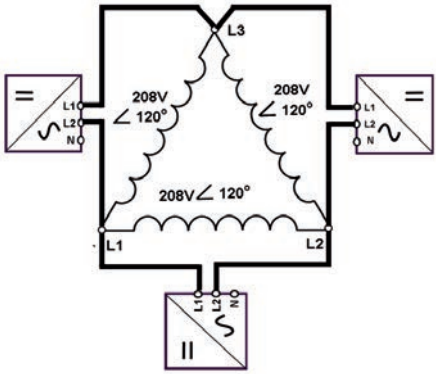


Figure 17: 208V Delta AC Grid

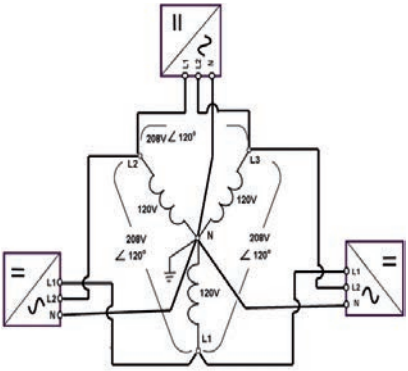


Figure 18: 208V/120V WYE AC Grid

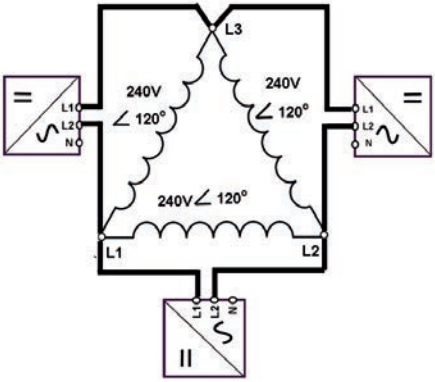


Figure 19: 240V Delta AC Grid

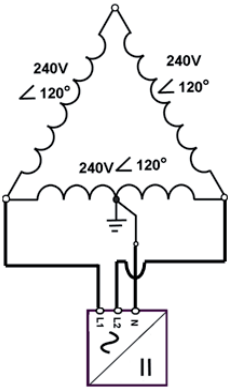


Figure 20: 240V/120V Stinger AC Grid

Grid Configurations NOT Allowed:

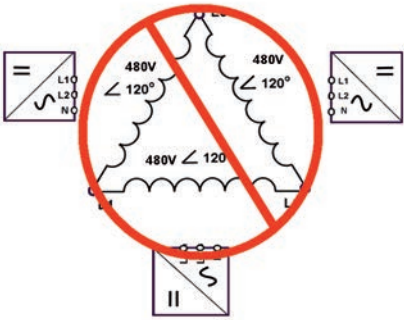


Figure 21: 480V Delta AC Grid

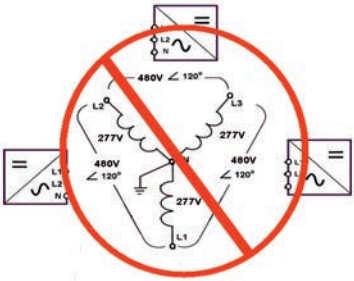


Figure 22: 480V/277V WYE AC Grid

4.3 AC circuit breaker requirements

A dedicated circuit breaker in the building circuit panel is required for each Solectria PVI inverter that is installed. There should be a circuit breaker or fuse to protect each AC line, L1 and L2. The circuit breaker should be able to handle the rated maximum output voltage and current of the inverter. Please refer to the table below to determine the appropriate circuit breaker size to avoid potential fire hazards. The National Electrical Code (NEC), ANSI/NFPA 70 or applicable local electrical codes must be folllowed when determining maximum branch-circuit over-current protection requirements.

Inverter model	Recommended AC branch protection
PVI 3800TL	2-pole, 20 A 208/240 Vac
PVI 5200TL	2-pole, 35 A 208 Vac / 30 A 240 Vac (max 40 A)
PVI 6600TL	2-pole, 40 A 208/240 Vac (max 40 A)
PVI 7600TL	2-pole, 40 A 208/240 Vac (max 40 A)

4.4 Grounding Electrode Conductor (GEC)

Per NEC 690.47, a GEC must be installed, and the Grounding Electrode Terminal (GET) conductor must be sized in accordance with NEC article 250.166. The GET conductor should be terminated at the GET screw terminal inside the wiring box compartment.

4.5 Lightning and surge protection

Solectria PVI inverters are designed and certified to meet stringent UL 1741 / IEEE 1547 and ANSI/ IEEE 62.41/62.42 AC lighting and surge requirements; however, every PV installation is unique, thus additional external UL/NEC AC and DC surge protection and solid grounding practice are recommended

4.6 Multiple inverters

Multiple Solectria PVI inverters are permitted at a common location if all applicable NEC, state, local building codes and local utility commissioning guidelines are met. In addition, each inverter should have its own dedicated AC branch protection circuit breaker and a dedicated PV string/ array, not to exceed the inverter's ratings.

4.7 PV string considerations

There are a large number of PV module string combinations that will offer optimal performance from either the PVI 3800TL, PVI 5200TL, PVI 6600TL and PVI 7600TL inverters due to its wide MPP DC voltage range (200 V – 500 V).

Follow the temperature multiplication factors given in NEC 690.7 table and the PV module manufacturer specified V/Temp coefficient to ensure PV string voltage is less than < 600 Vdc. Maximum inverter PV input voltage for all possible weather conditions in the location of installation.

System wiring voltage losses should be no greater than 1 to 2 percent for optimal system efficiency and performance.

4.8 Inverter connections

4.8.1 General information

Installation and commissioning must be performed by a licensed electrician in accordance with local, state, and National Electrical Code ANSI/NFPA 70 requirements.

Inputs and output circuits of this unit are isolated from the enclosure. System grounding must be done in accordance with the National Electrical Code (NEC), ANSI/NFPA 70 and Compliance is the responsibility of the installer.

Ensure no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect, AC disconnect, and dedicated AC branch circuit breaker are in the “OFF” position, before inverter installation.

PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Use dark opaque sheets cover the PV solar array before wiring or connecting cable terminations

Before any electrical wiring can be connected to the inverter, the inverter must be permanently mounted.

Use solid or stranded copper conductors only.
6 AWG (16 mm^2) is maximum allowed wire size.

Inverter warranty is VOID if the DC input voltage exceeds the inverter 600 Vdc maximum.

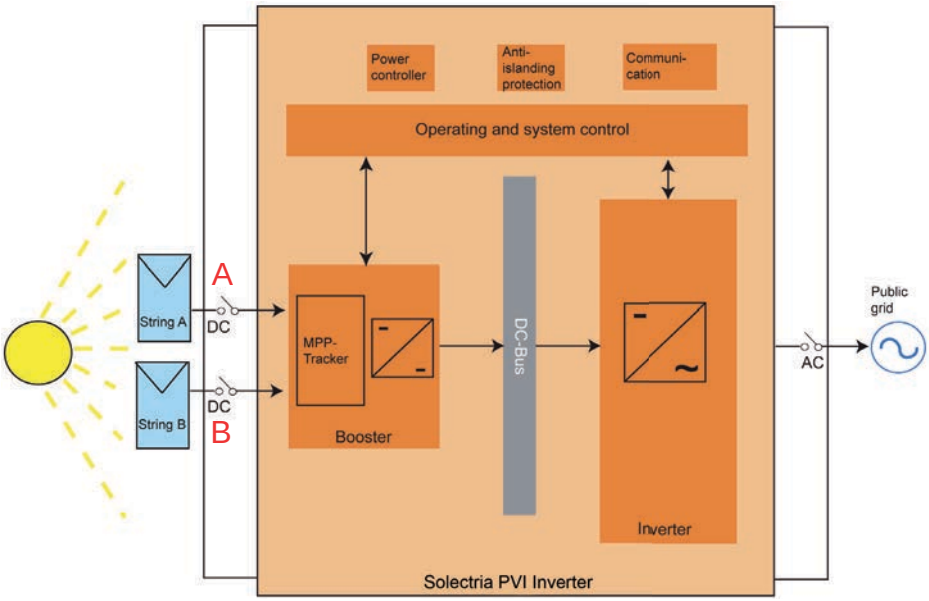


Figure 23: PVI 3800TL Inverter electrical diagram

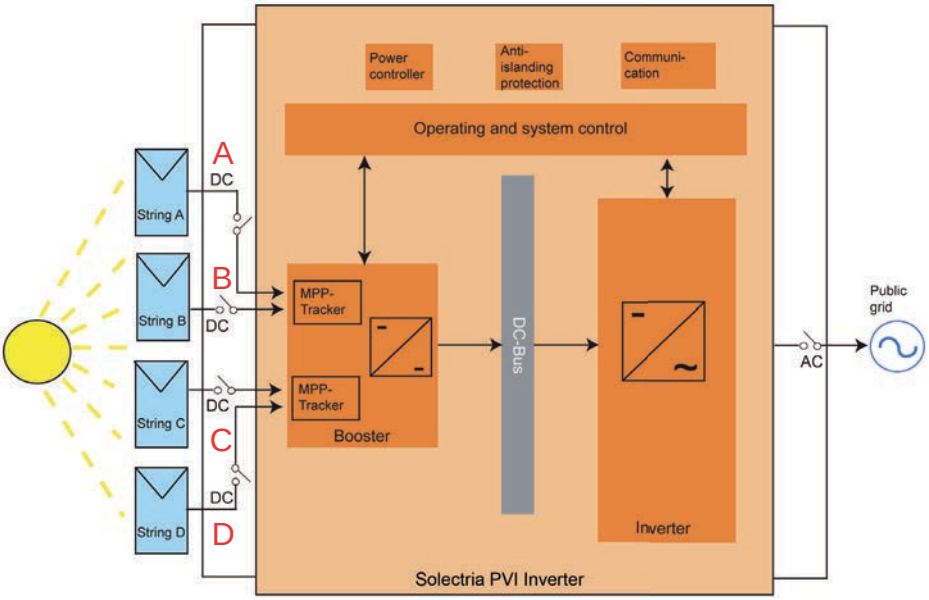


Figure 24: PVI 5200TL, PVI 6600TL and PVI 7600TL Inverter electrical diagram

POWER FED FROM MORE THAN ONE SOURCE, MORE THAN ONE LIVE CIRCUIT. Please note that there are three DC inputs that may all carry current. Please see diagram above.

4.8.2 Opening the wiring box cover

Ensure no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect, AC disconnect, and dedicated AC branch circuit breaker are in the “OFF” position, before inverter installation.

PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Using dark opaque sheets cover the PV solar array before wiring or connecting cable terminations.

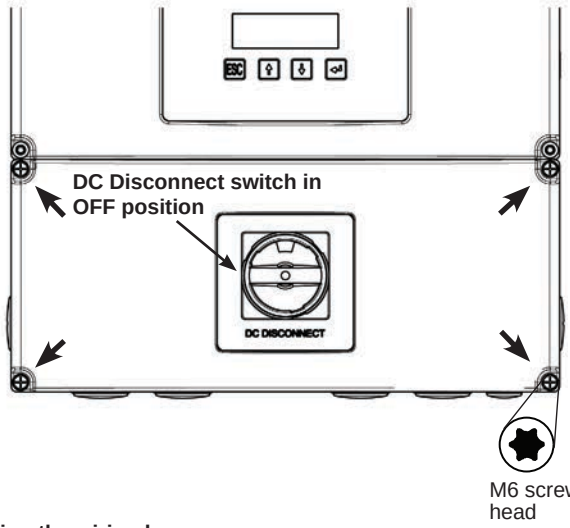


Figure 25: Removing the wiring box cover

1. Place DC Disconnect switch in “OFF” position. Please note the cover cannot be removed when the DC Disconnect switch is in the “ON” position.
2. Remove the 4 cover screws indicated above.
3. Lift the cover upward and place off to the side.

4.8.3 Wiring box conduit openings

Conduit openings are provided for 1 inch and ½ inch conduit fittings. If conduit fitting used is between 1 inch and ½ inch (2.54 cm and 1.27 cm), an appropriate conduit reducer should be used.

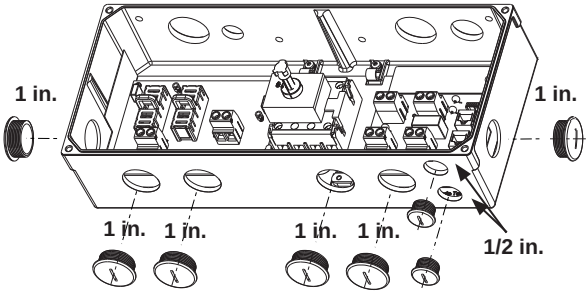
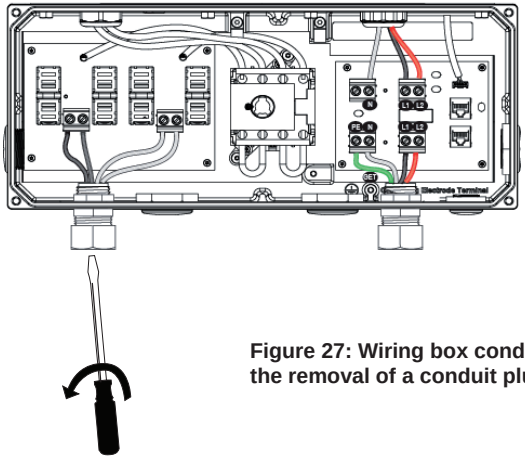


Figure 26: Wiring box conduit opening locations

CAUTION!
PRUDENCE!

Do not enlarge the wiring compartment conduit openings as the wiring box enclosure will be damaged which will void the inverter warranty.



The conduit plugs are removed by placing a flat blade screwdriver in the slot on the conduit plug face and turning while gripping the nut on the inside of the enclosure to ensure it does not slip. Unscrew the nut from the conduit plug and slip the conduit plug out of the conduit opening.

Figure 27: Wiring box conduit plug removal (illustration showing the removal of a conduit plug)

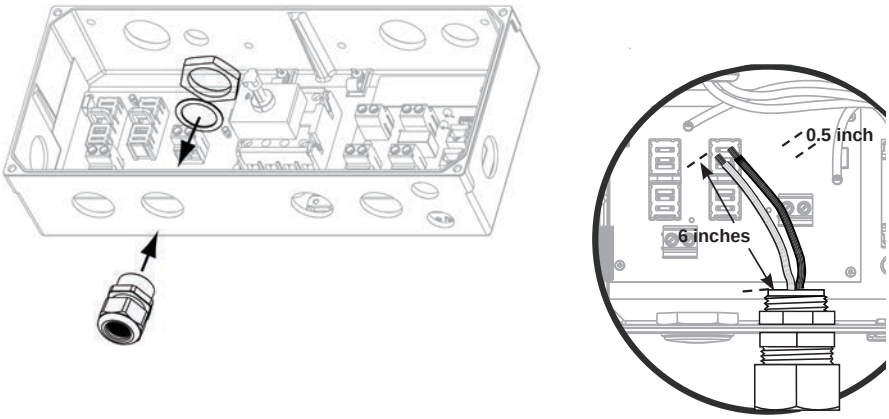


Figure 28: Conduit installation and wiring routing

Conduit fittings need to be water tight with either a NEMA 4, 4X, 6, or 6X rating insulated type is preferred.

Once conduit and fittings are installed, route wiring thru conduit and fitting and allow a 6 inch strain relief service loop within the wiring box compartment.

4.8.4 PV array string input connections

DANGER!
DANGER!

To ensure maximum protection against hazardous contact voltages while assembling photovoltaic installations, both the positive and the negative leads must be strictly isolated electrically from the protective ground potential (PE). All string fuses must be removed from wiring box.

WARNING!
AVERTISSEMENT!

– Risk of electric shock and fire. Use only with PV modules with a maximum system voltage of rating of 600V or Higher.

– Electric shock hazard. The DC conductors of this photovoltaic system are ungrounded and may be energized.

– Electric shock hazard. The DC conductors of this photovoltaic system are ungrounded but will become intermittently grounded without indication when the inverter measures the PV array isolation.

CAUTION!
PRUDENCE!

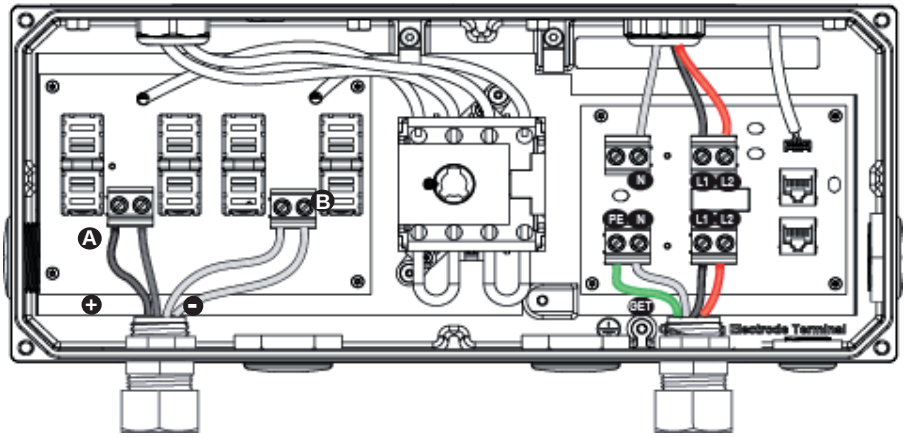
– Verify all DC conductor voltages and polarities with volt meter because damage to the inverter could result if incorrect DC input voltage or polarity is connected. After verification of correct voltage and polarity, DC fuses can be installed. NOTE: array V_{OC} at extreme cold ambient temperature must be veri fied by calculation never to exceed 600 VDC.

INFORMATION!
INFORMATIONS!

The PV Array positive or negative leads must not be connected to ground before the inverter!

INFORMATION!
INFORMATIONS!

All screw terminals accept solid or stranded copper 14 – 6 AWG wire only. A 3.5 mm flat blade screw driver is recommended for tightening screw terminals to a 10.5 in-lbs. (1.2 Nm) torque.



Ⓐ PV_Positive Terminals

Ⓑ PV_Negnative Terminals

Figure 29: Wiring box - PV input connections

1. Verify that the exposed wires are at least 6 inches in length to provide adequate strain relief and wire end strip length required. Secure the conduit into both fittings then tighten conduit fittings to manufacturer's recommended torque.

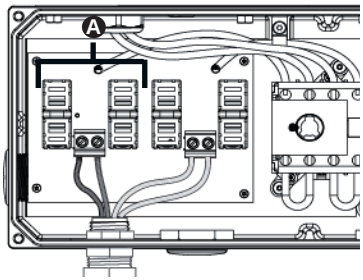
2.. Connect the positive lead from each PV array string to 1 of the PV_Positive Terminals (A) in the wiring box compartment. Using a 3/16" (4 mm) flat blade cabinet screw driver tighten the screw terminal to 10.5 in-lbs (1.2 Nm) of torque.

   Note: If the PV Array contains more than 3 PV Module strings then an external PV combiner is recommended.

3. Connect the negative lead from each PV array string to 1 of the PV_Negative Terminals (B) in the wiring box compartment. Using a 3/16" (4 mm) flat blade cabinet screw driver tighten the screw terminal to 10.5 in-lbs (1.2 Nm) of torque.

4. Verify Inverter to wiring box compartment connections DC wiring board assembly:
   - "BLACK" wire goes to "PV_Positive" Terminal Ⓐ
   - "WHITE" wire goes to "PV_Negative" Terminal Ⓑ

4.8.5 Selecting PV string fuse(s)



Ⓐ = 2 String Fuse Holders (black)

Figure 30: String fuse locations

4.8.5.1 PV string fuse information and calculating string fuse size

The PVI 3800TL, PVI 5200TL, PVI 6600TL, and PVI 7600TL inverters are shipped with 3 X 15 A 600Vdc Littlefuse KLKD 15 string fuses. The provided string fuses may or may not be appropriate for your particular installation. Proper sizing of overcurrent protection is based on the maximum short circuit current Isc (module) and calculated in accordance with NEC Article 690 requirements.

NOTICE!
AVIS!

The maximum acceptable string fuse for the PVI Inverter is 20 A (KLKD 20). Use of larger fuses will void the warranty.

WARNING!
AVERTISSEMENT!

The string fuse rating should never exceed the Maximum Series Fuse Rating provided by the module manufacturer. This value is typically listed on the module label.

4.8.5.1.1 Calculating the minimum string fuse per NEC Article 690

The minimum string fuse size is calculated by multiplying the module Isc x 1.56.

Thus, if we are using modules that have an Isc = 6.25 A, we would calculate our minimum string fuse size as follows:

String Fuse (minimum) = 6.25 A x 1.56 = 9.75 A

Reviewing our Littelfuse KLKD series fuses, we find that 10 A is the next available fuse size. Thus, to satisfy the minimum string fuse requirements per NEC Article 690, we would remove the 15 A fuses shipped with the inverter and replace them with 10 A fuses.

A partial listing of the Littelfuse KLKD Fuses is as shown.

Part Number	Amperage
KLK D 008.	8 A
KLK D 009.	9 A
KLK D 010.	10 A
KLK D 012.	12 A
KLK D 015.	15 A
KLK D 020.	20 A

It is worth noting that for this example we calculated the minimum series fuse rating. However, it may be appropriate to use the supplied 15 A fuses insofar as they do not exceed the maximum series fuse rating (provided by the module manufacturer) or the overcurrent protection requirements of your PV source wires. Please reference the appropriate NEC Article(s) for further discussion regarding proper sizing of overcurrent protection

4.8.5.1.2 Generic fuse properties

Other fuse manufacturers may have compatible fuse types. The generic properties are:

- Fast-acting
- Dimensions: 1 1/2" in length x 13/32" fuse diameter
- Interrupt Rating: >= 10 kA @ 600 Vdc
- UL and CSA approval of the fuse is mandatory
- String fuses can be sized from 1 A to max. 20 A and rated for 600 Vdc. Please see above sec. 4.9.8.1.1 for calculating string fuse size.

4.8.5.2 String fuse replacement

Ensure no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect, AC disconnect, and dedicated AC branch circuit breaker are in the "OFF" position, before inverter installation.

PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Using dark opaque sheets, cover the PV solar array before wiring or connecting cable terminations.

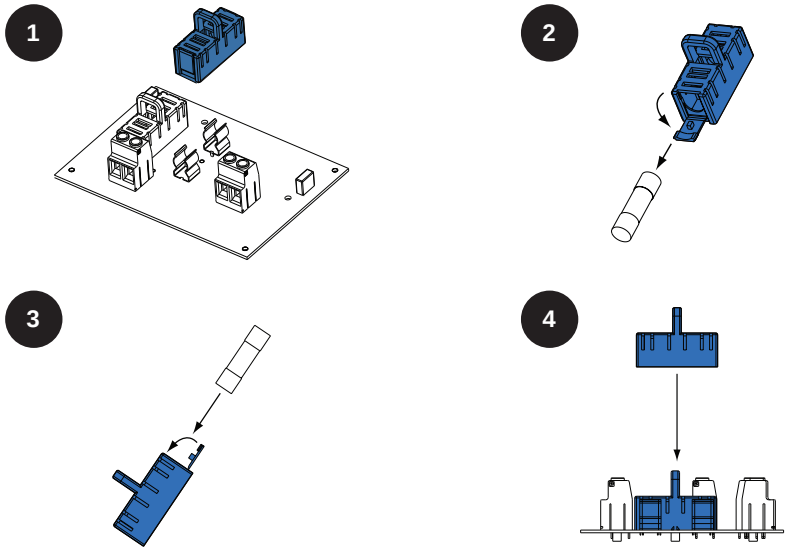


Figure 31: String fuse replacement procedure

Note: Refer to Figure 31 for String Fuse Locations.

1. Gripping only the plastic tab on top of the fuse extractor, pull straight upwards without touching the fuse's metal end caps or fuse-holder clips on printed circuit board.

2. Away from open wiring box compartment, open the fuse extractor door and tilt fuse extractor downward with a hand underneath to catch fuse as it slides out of fuse extractor.

3. Next place the replacement fuse into fuse extractor and tilt upward to keep fuse from dropping out. Close the fuse extractor door.

4. With fuse/fuse extractor parallel to empty fuse position, lower fuse extractor while aligning fuse caps with open fuse clips. Then push downward until the fuse snaps into the clips.

Follow the same procedure for replacing string fuses.

4.8.6 Inverter AC output wire connections

– Read all of the instructions, cautions, and warnings for the Solectria PVI Inverter and associated PV array documentati on.

– Installation and commissioning must be performed by a licensed electrician in accordance with local, state, and National Electrical Code ANSI/NFPA 70 requirements.

– Ensure no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect, AC disconnect, and dedicated AC branch circuit breaker are in the "OFF" position, before inverter installation.

– Verify that the dedicated 2-pole 240 Vac / 208 Vac circuit breaker in the building electrical service panel is turned-off.

All screw terminals accept solid or stranded copper 14 – 6 AWG wire only. A 3/16" (4 mm) flat blade cabinet screw driver is recommended for tightening screw terminals to a 10.5 in-lbs (1.2 Nm) torque.

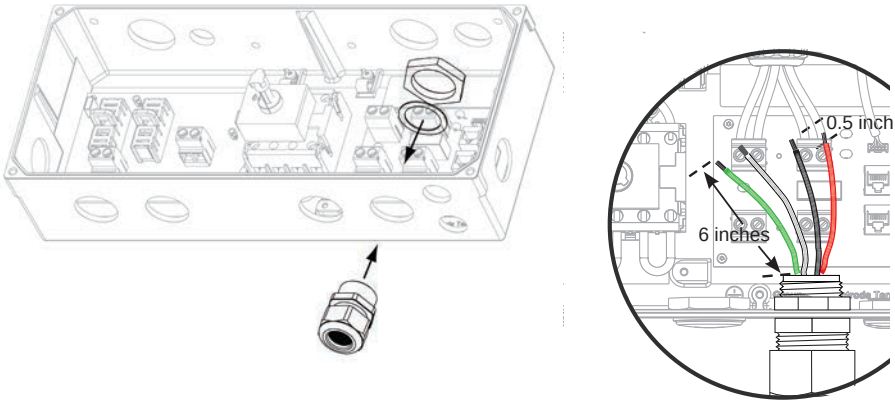


Figure 32: Conduit installation and AC wiring routing

Conduit fittings need to be water tight with either a NEMA 4, 4X, 6, or 6X rating insulated type is preferred.

Once conduit and fittings are installed, route wiring thru conduit and fitting and allowing a 6 inch strain relief loop within the wiring box compartment.

Potential AC voltage loss in AC wires is possible to determine for a given wire cross section and wire length. Pages 37-38 contain diagrams for each PVI inverter model to help determine the best wire size for your particular installation. Solectria recommends you select a wire size and length to ensure a maximum voltage loss between 1 - 2 %. Please note that the diagrams only offer approximate voltage loss and more precise voltage loss should be calculated by a licensed electrician in accordance with local, state, and National Electrical Code ANSI/NFPA 70 requirements.

PVI 3800TL

Percentage of voltage loss with 208 V AC and 240 V AC service. The load used in the calculation is the max. continuous AC current of the inverter.

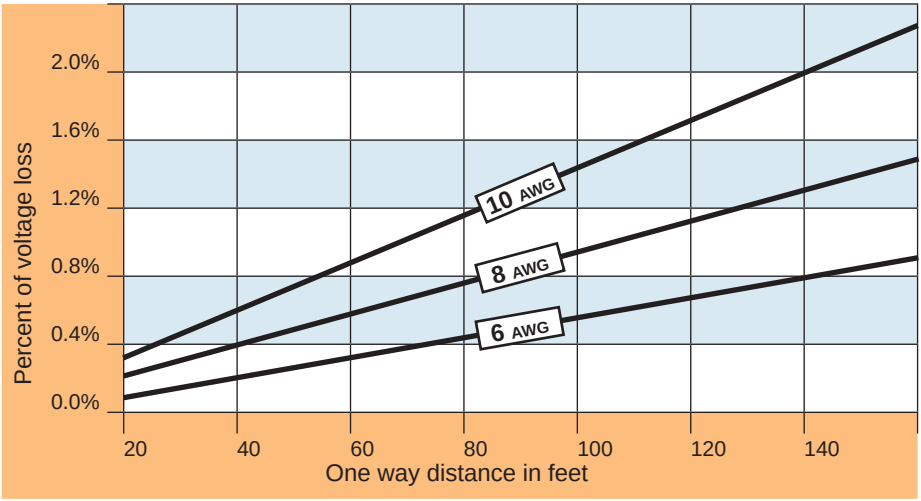


Figure 33: PVI 3800TL-AC voltage loss with different wire sizes and lengths

PVI 7600TL

Percentage of voltage loss with 208 V AC and 240 V AC service. The load used in the calculation is the max. continuous AC current of the inverter.

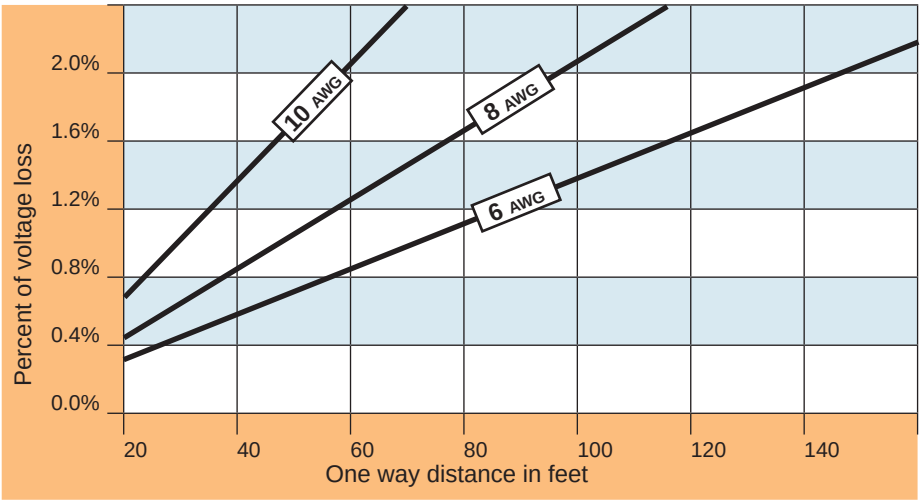
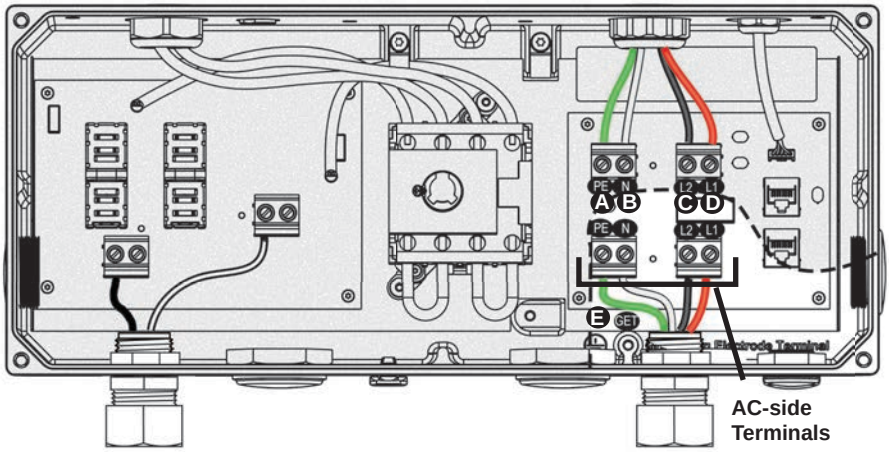


Figure 34: PVI 7600TL- AC voltage loss with different wire sizes and lengths



Ⓐ PE Terminal (Grid Ground)

Ⓑ N Terminal

Ⓒ L2 Terminal

Ⓓ L1 Terminal

Ⓔ GET (Grounding Electrode Terminal)

Figure 35: Wiring box AC assembly – terminal labeling

NOTICE!
AVIS!

Stranded copper wire should be checked so that all strands go into the terminal opening.

WARNING!
AVERTISSEMENT!

AC disconnect may be required by your local AHJ. Please check local regulations to determine if the AC disconnect is required for your installation.

1. Mount the AC disconnect (if required by local AHJ) close enough to the inverter.
2. Install conduit fitting and conduit into the wiring box compartment from AC disconnect or utility service panel.
3. Thread the inverter's AC output wires through cup piece of conduit and loosely fit the conduit into the inverter's open conduit fitting and the DC disconnect or junction box conduit fitting.
4. Route AC wiring through conduit and verify that the exposed wires are at least 6 inches in length to provide adequate strain relief and wire end strip length required. Secure the conduit into both fittings then tighten conduit fittings to manufacturer's recommended torque.

5. Terminate inverter's AC output wires inside the AC disconnect or junction box.

   – Connect the AC equipment GND wire to the PE screw terminal (A) and using a 3/16" (4 mm) flat blade cabinet screw driver tighten the screw terminal to to 10.5 in-lbs (1.2 Nm) of torque.

   – Connect the "WHITE" Neutral wire to the "N" screw terminal (B), and using a 3/16" (4 mm) flat blade cabinet screw driver tighten the screw terminal to to 10.5 in-lbs (1.2 Nm) of torque.

   – Connect "RED" L1 wire to the "L1" terminal (D), and using a 3/16" (4 mm) flat blade cabinet screw driver tighten the screw terminal to to 10.5 in-lbs (1.2 Nm) of torque.

   – Connect "BLACK" L2 wire to the "L2" terminal (C), and using a 3/16" (4 mm) flat blade cabinet screw driver tighten the screw terminal to to 10.5 in-lbs (1.2 Nm) of torque.

NOTICE!
AVIS!

Stranded copper wire should be checked so that all strands go into the terminal opening.

NOTICE!
AVIS!

If a neutral wire connection is required for the grid connection, make sure the neutral wire is securely connected to the neutral terminal. Loose neutral wire connection can result in incorrect grid voltage detection.

4.8.7 Inverter RS485 communication connections

WARNING!
AVERTISSEMENT!

Read all of these instructions, cautions, and warnings for the Solectria PVI inverter and associated PV array documentation.

Interface connection RS485

The Solectria PVI inverters offer an RS485 communication interface which can address up to 16 daisy chained inverters. For optimal performance, all unused interface connections must always be terminated by placing the termination jumper in the "on" position.

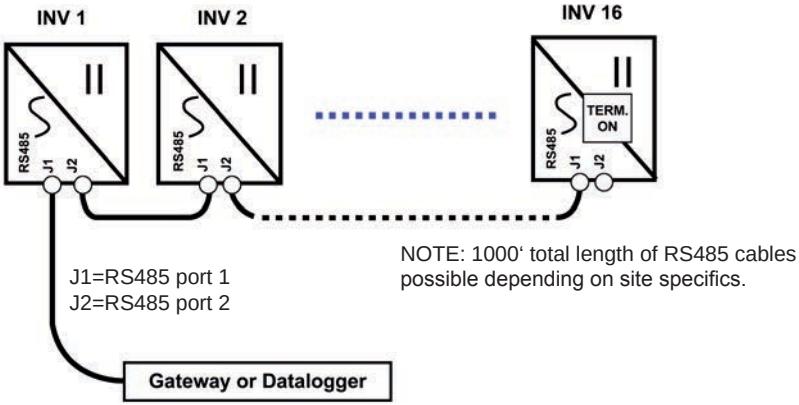
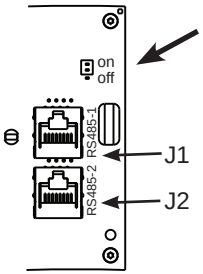


Figure 36: Inverter RS485 system diagram



The Termination Jumper is shown in the diagram on the left. To enable termination place the jumper over the two upper pins next to the “on” label on the board. To disable termination place the jumper in the off position on the lower two pins.

Figure 37: RS485 Termination Jumper

RS485 connector pin-out

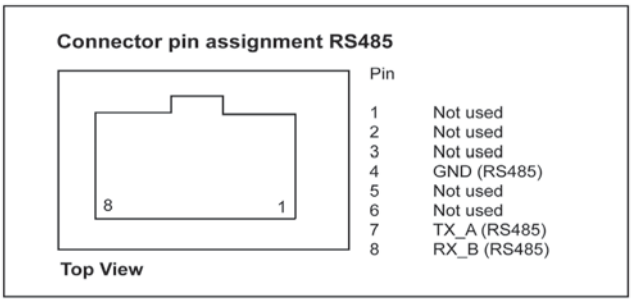


Figure 38: RS485 connector pin-out

RS485 data format	
Baud Rate	Programmable, 2400/4800/9600/19200/38400, default = 19200
Data Bit	8
Stop Bit	1
Parity	N/A

Contact Solectria for available 485 cables for daisy-chaining 485 on multimple inverters or connecting to SolrenView monitoring logger.

5 Commissioning the PV system

Read all of these instructions, cautions, and warnings for the Solectria PVI inverter and associated PV array documentation.

Installation and commissioning must be performed by a licensed electrician in accordance with local, state, and National Electrical Code ANSI/NFPA 70 requirements.

Verify that the dedicated 2-pole 240 Vac / 208 Vac circuit breaker in the building electrical service panel is turned-off.

With the disconnect in the “OFF” position, verify the PV input polarity once more simply by carefully using a 600 V, DC rated digital volt meter and probing the positive (+) and negative (-) PV array connections.

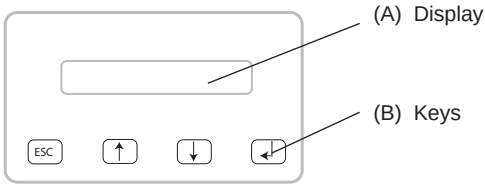
5.1 Status LEDs

No.	Label	Designation	Color
(A)	***POWER***	Power	Green
(B)	***GROUND FAULT***	Ground Fault	Red
(C)	***ERROR***	Error	Yellow

Information on the LED messages is provided in “9. Diagnosis and maintenance”, p. 59.

5.2 Display and Keypad

5.2.1 Components



5.2.2 Display layout

```
      Format
 --------------------
->Date:    DD.MM.YYYY
 Time:           12h
```

The display has 4 rows of 20 characters each.

The first row contains the name of the currently displayed menu.

The second to fourth rows show the menu elements.

A small arrow in the third row shows the currently selected menu item.

5.2.3 Keypad

Symbol	Use
	• Exit the current menu • Cancel the setting of a value
	• Move upwards in a menu • Set a value (increase the value)
	• Move downwards in a menu • Set a value (decrease the value)
	• Select a menu entry • Open a configurable value for editing • Finish editing (adopt the set value)

5.2.4 General menu structure

The menus have up to three levels:

[Main menu]
...

400 Production info

410 Current data
411 Current overview
412 Current data AC
...
420 Day statistics
430 Week statistics
...
500 User settings

Most menu names consist of a three-digit number and a menu title.

See “12.3 Overview of menu structure” for an overview of the complete menu structure.

5.3 Inverter turn-on procedure

1. Turn on the DC disconnect (put in closed position).
2. Check for inverter initialization; all 3 LED indicators are illuminated.
3. Turn on the dedicated 2-pole 240 Vac / 208 Vac circuit breaker in the building electrical service panel (put in closed position).
4. Turn on the AC disconnect (put in closed position).
5. Refer to section 5 for setup process that needs to be completed before the inverter can begin feeding power to the grid.

5.4 Inverter turn-off procedure

1. Turn off the AC disconnect (put in open position).
2. Turn off the dedicated 2-pole 240 Vac / 208 Vac circuit breaker in the building electrical service panel (put in open position).
3. Turn off the DC disconnect (put in open position).

5.5 Standard initial commissioning

5.5.1 Brief overview of the commissioning steps

– Select the grid

– Set up the RS485 communication

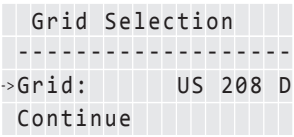
5.5.2 Detailed description of the commissioning steps

1. Check all connections and cables for damage and correct seating. Correct the installation if necessary.

2. Switch on the DC disconnect
   → The startup process of the inverter begins.

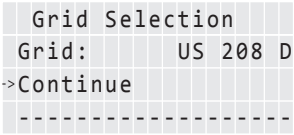
   After the startup process and the automatic self-test, the initial commissioning procedure of the inverter starts and the **Installation** menu is displayed.

3. Select a grid.



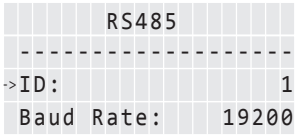
Grids available for standard commissioning	
Display text	**Description**
US 208 D	US 208 DELTA
US 208 WYE	US 208V/120V WYE
US 240 D	US 240 DELTA
US 240 STING	US 240/120 STING
US 240 SPLIT	US 240/120 SPLIT

4. Select ***Continue*** and press the ↵ key.



→ The **RS485** menu is displayed

5 Set the RS485 ID and the baud rate.



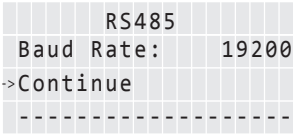
Configurable parameters		
Display text	**Designation**	**Description**
ID	RS485 ID	1 .. 255
Baud rate	Baud rate	2400 | 4800 | 9600 | 19200 | 38400, the standard is 19200

NOTICE!
AVIS!

Connecting multiple inverters via RS485.

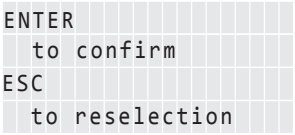
– If multiple inverters are to be connected via RS485, select a different ID for each inverter. This ID will also be used later to identify each inverter when loading settings or transferring data.

6. Select ***Continue*** and press the ↵ key.



–> The last menu is displayed

7 Press the ↵ key to finish commissioning.



Commissioning is now finished.

5.6 Setting values

You can set parameters in several menus. The ↓ ↑ keys are used to change parameter values.

The ↑ key increases the value of the parameter.

The ↓ key decreases the value of the parameter.

The ESC key can be used to cancel the setting, and the original value is then displayed once more.

Pressing the ↵ key causes the new parameter value to be adopted.

The example on the next page illustrates the procedure for changing the value of a parameter. This procedure is the same for all configurable parameters.
Example: Setting the date

Keys	Action	Result
	1. Press the ↓ ↑ keys in the main menu to select the **Install settings** menu.	PVI ## G4 ---------- →Install settings Options
	2. ..Press the ↵ key to open the **100 Install settings** (installation settings) menu.	100 Install settings ---------- →Date and time Display settings
	3. ..Press the ↵ key to open the **110 Date and time** menu.	110 Date and time Format →Date: 18/06/2013 Time: 13:10:20pm
	4. Use the ↓ ↑ keys to select ***Date*** menu item.	110 Date and time Format →Date: 18/06/2013 Time: 13:10:20pm
	5. ..Press the ↵ key to begin making the setting. → The digits for the first value (in this case the month) flash.	110 Date and time Format →Date: 18/06/2013 Time: 13:10:20pm

Keys	Action	Result
	6. Use the ↓↑ keys to set the month.	110 Date and time Format →Date: 18/07/2013 Time: 13:10:20pm
	7. Press the ↵ key to adopt the new value. → The digits for the second value (in this case the day) flash.	110 Date and time Format →Date: 18/07/2013 Time: 13:10:20pm
	8. Use the ↓↑ keys to set the day.	110 Date and time Format →Date: 15/07/2013 Time: 13:10:20pm
	9. ..Press the ↵ key to adopt the new value.. → The digits for the last value (in this case the year) flash.	110 Date and time Format →Date: 15/07/2013 Time: 13:10:20pm
	10. Use the ↓↑ keys to set the year.	110 Date and time Format →Date: 15/07/2014 Time: 13:10:20pm
	11. ..Press the ↵ key to adopt the new value..	
	√ The value is adopted and the editing mode is exited.	110 Date and time Format →Date: 15/07/2014 Time: 13:10:20pm

6 Production Information

All production information is provided for orientation purposes only. The measuring devices and meters provided by the electricity supply company are the authoritative source of information for invoicing.

6.1 Overview

The 400 Production info menu contains current data and statistics. The information is write-protected and cannot be edited.

– Select the **Production info** menu item in the main menu.

→ The **400 Production info** menu is displayed.

```
400 Production Info
 --------------------
→Current Data
 Day Statistics
```

Structure of the 400 Production info menu

Sub-menu	Content	Description
410 Current data	Current data for power, AC, PV, insulation	“6.2 Current data”
420 Day statistics	Statistics for AC, PV and ISO	“6.3 Other statistics”
430 Week statistics		
440 Month statistics		
450 Year statistics		
460 Total statistics		
470 Feed-in settings	Settings for currency and revenue per kWh	“7.3 Grid feed-in settings”
480 Event journal	List of operating state messages	“8. Diagnosis and maintenance”
490 History	Statistics for the last seven days in which the inverter was in operation.	“6.3 Other statistics”

6.2 Current Data

Relevant menu

The actual production data is provided in the menu **410 Current data**.

Access

– Access the menu by navigating to **Main menu** > **Production info** > **Current data**.

→ The **410 Current data** menu is displayed.

```
410 Current data
 --------------------
->Current overview
 Current data AC
```

Structure

Sub-menu	Contents and example display

411 Current overview	Current power and energy generation for the current day.
	Current operating state (see “8. Diagnosis and maintenance”)
	
	`411 Current Overview`
	`Now: _W`
	`Day: _Wh`
	`Normal operation`
	
	If there are messages, the list of messages can be opened by pressing the ↵ key. For a detailed description, see chapter “8. Diagnosis and maintenance”

412 Current data AC	Displays for: voltage, frequency, current, active power P, reactive power Q
	
	`412 Current data AC`
	`L1 Voltage: _V`
	`L1 Current: _._A`
	`L1 Freq.: _.__Hz`

416 Current data PV	Data for: voltage, current
	
	`416 Current data PV`
	
	`PV1 Voltage: ---V`
	`PV1 Current: -.--A`

Sub-menu	Contents and example display
41A Date and time	Shows the current date and time. Use the **110 Date and time** menu to set the values, see “7.2.1 Date and time”. 41A Date and time Date: 18/06/2013 Time: 10:20:30
41B Current isolation	Data for: maximum and minimum insulation resistances 41B Current isolat. R iso+: _kΩ R iso-: _kΩ

6.3 Other statistics

Menu
420 Day statistics
430 Week statistics
440 Month statistics
450 Year statistics
460 Total statistics
490 History

Example display

```
420 Day statistics
 Day stat. AC
->Day stat. PV
 Day stat. ISO
```

The statistics for day, week, month, year and total production time all offer the same type of data.

The **490 History** menu shows the statistics for the last seven days over which the inverter was in operation.

```
490    History
 Day:   10.10.12
->Day:   10.10.12
 Day:   10.10.12
```

Structure

Sub-menu	Contents

421 Day stat. AC
431 Week stat. AC
441 Month stat. AC
451 Year stat. AC
461 Total stat. AC
	Statistics for: total energy, runtime, revenue
	
	Information on configuring the revenue settings is provided in “7.3 Grid feed-in settings”.
	
	`421 Day stat. AC`
	`Energy:  ----Wh`
	`Runtime:  -:--h`
	`Revenue:  --.--USD`

	Displays for:
	Δf Minimum/maximum frequency
	Imax Maximum current
	ΔU Minimum/maximum voltage
	Pmax Maximum active power
	Qmax Maximum reactive power
	Qmin Minimum reactive power
	
	`421 Day stat. AC`
	`L1 Δf: --.--/--.--Hz`
	`L1 Imax:  --.--A`
	`L1 ΔU:  ---/---V`

422 Day stat. DC
432 Week stat. DC
442 Month stat. DC
452 Year stat. DC
462 Total stat. DC
	Displays for:
	
	Pmax Maximum power
	
	Imax Maximum current
	
	Umax Maximum voltage
	
	`422 Day stat. DC`
	`PV1 Imax:  _._A`
	`PV1 Umax:  _V`
	`PV1 Pmax:  _W`

Sub-menu	Contents

423 Day stat. ISO
433 Week stat. ISO
443 Month stat. ISO
453 Year stat. ISO
463 Total stat. ISO
	Statistics for: maximum/minimum insulation resistances
	
	Pmax Maximum power
	Imax Maximum current
	
	`423 Day stat. ISO`
	
	`R ISO max: ----kΩ`
	`R ISO min: ----kΩ`

491 ... 497 Day ...	Statistics for the last 7 days in which the inverter was in operation.
	
	The statistics contain the same information as the menus **421**, **422** and **423**.
	
	`491 Day 18.06.2013`
	`Energy: ----Wh`
	`Runtime: -:--h`
	`Revenue: --.--USD`

6.4 Deleting statistics

Description

All statistics can be deleted (except for **410 Current data**). The procedure is always the same.

1. Navigate to **Production info > Feed-in settings > statistics**.

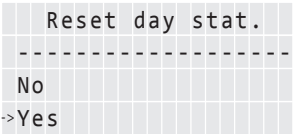
   → The **471 statistics** menu is displayed.

   ```
   471   Statistics
   >Reset day stat.
    Reset week stat.
    Reset month stat.
   ```

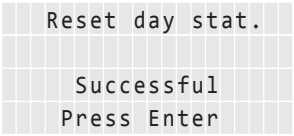
2. Use the ↓ ↑ keys to select the statistic you wish to delete (e.g., **Reset day stat**.) and press the ↵ key.

   → A confirmation query is displayed.

3. Select the option ***Yes*** and press the ↵ key to delete the statistic.



→ A confirmation message is displayed.



The statistic is deleted.

7 Settings

7.1 Overview

This chapter describes how to edit the configurable settings.

- Installation settings (“7.2 Installation settings”)
- Grid feed-in settings (“7.3 Grid feed-in settings”)
- Options settings (“7.4 Options settings”)
- Standard menu (“7.5 Standard menu”)

Information on operating the display is provided in “5.2 Display and keypad”.

7.2 Installation settings

Configurable settings

- Date, time
- Date and time format
- Contrast
- Grid selection
- RS485 settings

7.2.1 Date and time

Description

Menu	110 Date and time
Menu access	**Main menu > Install settings > Date and time**
Example display	110 Date and time Format →Date: 18/06/2013 Time: 13:10:20pm

Configurable parameters

Display text	Designation	Description
Date	Date	Feedly configurable according to the selected date format.
Time	Time	Feedly configurable according to the selected time format.

7.2.2 Date and time formats

Description

Menu	111 Format
Menu access	**Main menu > Install settings > Date and time > Format**
Example display	111 Format →Date: DD/MM/YYYY Time: 13:10:20pm

Configurable parameters

Display text	Designation	Description
Date	Date format	DD.MM.YYYY DD/MM/YYYY DD-MM-YYYY
Time		12h | 24h

7.2.3 Contrast

Description

Menu	120 Display settings
Menu access	**Main menu > Install settings > Display settings**
Example display	120 Display settings -------------------- Contrast: 10

Configurable parameters

Display text	Designation	Description
Contrast	Display Contrast	5...10

7.2.4 Grid selection

If the selected grid is changed, a completely new commissioning process is started, see “5. Commissioning the PV system”.

Always first contact the Solectria Support Team **before** changing the selected grid!

You always require a PIN in order to enter the grid selection mode. You require a new PIN each time you wish to select a new grid. You obtain a PIN from the Solectria Support Team on request.

You must provide a key in order to receive a PIN. You will find the key in the menu 132 Grid change.

1. To display the key, navigate to **Main menu > Install settings > Grid selection> Grid change**.

```
132 Grid change
Grid:       US 208 D
Key:    ############
PIN: ____  Confirm
```

The key consists of 11 numbers and letters.

2. The Solectria Support Team will provide you with the four digit PIN.

3. When you have received the PIN, navigate to the menu **132 Grid change** and press the ↵ key.

   → The first digit of the PIN flashes.

4. Use the ↓↑ keys to set the first digit and press the ↵ key to proceed to the next digit.

   → After entering the full PIN, the word ***Confirm*** flashes.

```
132 Grid change
Grid:       US 208 D
Key:     ##########
PIN: 1234  Confirm
```

5. Press the ↵ key to confirm the entered PIN.

   → The **Installation** menu is displayed.

```
  Installation
 --------------------
->Language:   English
 continue
```

6. Start the commissioning of the inverter, see “5. Commissioning the PV system”.

7.2.5 RS485

Description

Menu	111 Format
Menu access	**Main menu > Install settings > RS485**

Example display	`140 RS485`
	` --------------------`
	`->ID:                1`
	` Baud rate:    19200`

Configurable parameters

Display text	Designation	Description
ID	RS485 ID	1...255
Baud rate	Baud rate	2400 | 4800 | 9600 | 19200 | 38400, the standard is 19200

Connecting multiple inverters via RS485.

► Select a different ID for each inverter.
► A 220 ohm termination resistor must be connected to the last inverter in the series (see “4.8.7 Inverter RS485 Communication Connections”).

7.3 Grid feed-in settings

Description

Menu	470 Feed-in settings
Menu access	**Main menu > Production info> Feed-in settings**
Example display	470 Feed-in settings ›Currency: USD USD / kWh: 0.28

Configurable parameters

Display text	Designation	Description
Currency	Currency	No pre-defined values.
USD / kWh	USD/kWh	No pre-defined values. The amount (USD) per kWh is required for the revenue calculation.

7.4 Options settings

Configurable settings

- Shading

7.4.1 Shading

Description

The “Shading“ option is an extended MPP tracker. When the option is switched on, the MPP tracker performs an additional search at regular intervals.

The MPP tracker then searches for the maximum power over a wider voltage range.

This option should be switched on if shadows regularly pass slowly over the PV modules in the course of a day. These types of moving shadows can be caused by chimneys or trees, for example. This option has a relatively small effect in the case of fast-moving shadows, e.g., from passing clouds.

The option is set depending on the size of the shading.

Menu	**210 Shading**
Menu access	**Main menu > Options > Shading**
Example display	210 Shading ---------- ->Mode: disabled ----------

Configurable parameters

Display text	**Designation**	**Description**
Mode	Mode	Disabled
		Extended MPP tracking is disabled
		High
		High shading, time cycle: 0.5 hours
		Medium
		Medium shading, time cycle: 2 hours
		Low
		Low shading, time cycle: 4.5 hours

7.5 Standard menu

Description

A standard menu can be defined, which is automatically displayed when the display keys are not used for a certain period of time. When the standard menu is displayed, pressing the ESC key displays the main menu.

The standard menu is set to 411 Current data at the factory. This menu shows the current data and current operating messages.

The number must be a valid menu number.

See “12.3 Overview of menu structure” for an overview of all available menu numbers.

1. Press the ↵ key to enter the menu number.

   → The first digit flashes.

2. Enter the first digit of the menu number using the ↓ ↑ keys.

   → You can only set menu numbers that actually exist. The name of the associated menu is displayed in the fourth display row.

3. Once you have set the first digit, press the ↵ key.

   → The second digit flashes.

4. Enter the second and third digit in the same manner.

5. Press the ↵ key.

   → The menu corresponding to the entered menu number is displayed.

Menu	**800 Standard**
Menu access	**Main menu > Standard**
Example display	800 Standard menu -------------------- ->Menu number: 411 411 Current overview

Configurable parameters

Display text	Designation	Description
Menu number	Menu number	Any valid menu number.

8 Diagnosis and maintenance

8.1 Operating states

8.1.1 Types of operating states

Operating state	Associated influencing factors	Grid feed-in
Normal operation	No factors are present that influence the production results.	Yes
Limited operation	Non-critical factors that can affect the production results but which are not failures (e.g., self-test).	Different
Warning	External events or internal failures are present that affect the production results.	Yes
Failure		No
Insulation or grounding failure	Problems exist with insulation	No

See chapter "8.1.2 Factors influencing the operating state" for a description of the influencing factors.

Note: When in failure mode, the inverter will not produce power.

8.1.2 Factors influencing the operating state

Different influencing factors are assigned to the individual operating states. These influencing factors are divided into the following categories.

Non-critical factors

Non-critical factors are (for example) the self-test or a DC voltage that is too low due to bad weather. Non-critical factors are therefore not failures.

Events

Events are usually caused outside the inverter. Events are divided into **external events** (e.g., voltage or frequency errors) and **parameter changes** occurring via the keys or the RS485 interface.

Internal failures

Internal failures are caused from within the inverter and must be corrected with help of the Solectria Support Team.

Insulation and grounding failures

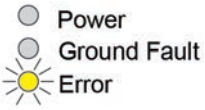
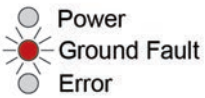
Insulation and grounding failures are logged and displayed when this failure occurs.

8.1.3 Display of the current operating state

The actual operating state is indicated via LEDs. A short message is also shown in the fourth line of the **411 Current overview** menu.

```
411 Current Overview
Now:              _W
Day:              _Wh
Normal operation
```

The **411 Current overview menu** is automatically displayed when a new message arrives.

Message category	LED status	Display text in menu 411
Normal operation		`Normal operation`
Limited operation		e.g. `Self-test`
General warning messages		For external events: `External events` For internal failures: `Warning ### (3-digit number)`
General failure messages		For external events: `External events` For internal failures: `Failure ### (3-digit number)`
Insulation or grounding failure		`Insulation`

The software defines which events trigger a warning and which events trigger a failure.

8.2 Event journal

8.2.1 Overview

Menu	480 Event journal
Menu access	**Main menu > Production info> Event journal**
Example display	480 Event journal -------------------- →External events Change events

The event journal contains the messages relating to the following events:

- Parameter changes - Changes to all parameters influencing the energy production and thus also the revenue.
- External events - Problems with the insulation and grounding

Sub-menu	Description
481 External events	A list of all external events.
482 Change events	A list of parameter changes made via the display or via RS485.

8.2.2 External events menu

Description

Menu	481 External events
Menu access	**Main menu > Production info> Event journal > External events**
Example display	481 External events 18.06.2013 17:29:56 L1 Islanding Begin

The external event message has the following structure:

2nd line	Date and time when the external event occurred..
3rd line	Short description of the failure (see chapter "8.3 Troubleshooting and correction")
4th line	Additional information, e.g., "Begin" for the occurrence of an event or "End" for the disappearance of an event.

8.2.3 Change events menu

Description

The **482 Change events** menu contains a chronological list of all changes to parameters influencing the energy production and thus also the revenue.

Menu	482 Change events
Menu access	**Main menu > Production info> Event journal > Change events**
Example display	482 Change events 18.06.13 17:29:56 D Max. power: 100% Max. power: 90%

The parameter change entry has the following structure:

Menu	482 Change events
2nd line	Date and time when the external event occurred. Source of the change: D: Display E: External (RS485) S: System
3rd line	Name of the changed parameter + previous value
4th line	Name of the changed parameter + new value

8.3 Troubleshooting and correction

8.3.1 External events / Insulation and grounding failures

The **411 Current overview** menu shows one of the following messages:

```
411 Current overview
Now:            -W
Day:            0Wh
External events
```

```
411 Current overview
Now:            -W
Day:            0Wh
Insulation
```

1. To receive a more exact description of the problem, press the ↵ key in the **411 Current overview** menu.

   → The **External events** menu is displayed.

```
   External events
PV1 ISO running fail
PV1 ISO startup fail
--------------------
```

The menu contains a list of all active messages relating to external events and insulation/grounding.

2 press the ↵ key again.

   → The **480 Event journal** menu containing the detailed message text is displayed (see "8.2 Event journal").

```
480 Event journal
 --------------------
→External events
 Change events
```

3 Select the entry ***External events*** and press the ↵ key again.

```
480 Event journal
 --------------------
→External events
 Change events
```

→ The **481 External events** menu is displayed.

```
481 External events
18.06.2013 17:29:56
L1 Islanding
Begin
```

Alternatively, you can also directly open the **483 External events** menu via the "Go to menu" function, see chapter "12.3.1 'Go to menu' function".

The following table shows the failure messages that can appear in the **483 External events** menu and provides troubleshooting and correction suggestions.

LED	Display message	Message description Fault correction
	`Warning ###`	Internal failure ("Warning" + three-digit number) ► Please contact Solectria Support.
	`Failure ###`	Internal failure ("Failure" + three-digit number) ► Please contact Solectria Support.
	`L1 Voltage failure`	AC overvoltage or undervoltage on phase L. ► Check the grid voltage shown on the display (menu **412 Current data AC**). ► If no voltage is present, check the circuit breaker.
	`L1 Frequency error`	AC high frequency or low frequency on phase L. ► Check the grid frequency shown on the display (menu **412 Current data AC**). ► If no voltage is present, check the automatic circuit breaker.

LED	Display message	Message description Fault correction
	L1 Islanding	Frequency shift failure on phase L. ► Ask your electricity utility about the current state of the grid. ► Check the installation. ► Restart the inverter. Contain your maintenance technician if the failure persists.
	PV Power too low	The solar power is too low. Insufficient solar irradiation (dawn/dusk).. ► Check the PV array voltage shown on the display (menu **416 Current data PV**).
	PV1 ISO startup fail	The startup insulation is too low. ► Check the insulation resistance at the DC side of the PV modules.
	PV1 ISO running fail	Residual current beyond the safety standard. ► Check the insulation resistance at the DC side of the PV modules.

8.3.2 Internal failures

In the case of an internal failure, the message "Warning XXX" or "Failure XXX" is displayed in the **411 Current overview** menu. XXX stands for a 3-digit failure number.

```
411 Current data
L1                _W
Day:              _Wh
Warning 123
```

```
411 Current data
L1                _W
Day:              _Wh
Failure 351
```

In the case of internal failures, always contact the Solectria Support Team (see address list on the rear cover of this manual).

8.3.3 Other LED and display messages

LED	Display message	Message description Fault correction
	PV1 Voltage too low	The PV1 voltage is too low. There is insufficient solar irradiation. ► Check the PV cell voltage shown on the display (menu **416 Current data PV**).
	L1 Power reduction	Power reduction activefor L1.
	PV1 PW limit to Pn	Power limiting active for PV1.
	PV1 Temp derating	Temperature derating active for PV1. Reduced electricity production.
		The internal temperature of the inverter is between +45 and +70 °C. ► Check the ventilation of the inverter. ► Prevent direct sunlight on reaching the inverter.

8.4 Displaying grid settings

Description

The actual grid settings can be displayed using the **131 View grid setup** menu. The contents of this menu are write-protected.

Menu	131 View grid setup
Menu access	**Main menu > Install settings >Grid selection> View grid setup**
Example display	131 View grid setup →Grid: US 208 D Fnom: --.--Hz

If a power limit was set when the inverter was commissioned, then the following message is displayed before the menu opens:

```
  The maximun power
  of that inverter
has been limited to
     ##.##kW
```

8.5 Internal log

Description

The internal log contains information on the internal failures that have occurred.

Menu	620 Internal log
Menu access	**Main menu > Diagnostic&Alarm > Internal log**
Example display	620 Internal log 12.04.12 7:39:25 126 127
Parameter change entries have the following structure	
3rd Line	Date and time when the external event occurred.
4th Line	Number(s) of the internal failure(s)

8.6 Maintenance

Danger of death from hazardous voltage.
Hazardous voltage exists while the inverter is operating. Hazardous voltage may still be present 5 minutes after all power sources have been disconnected.

► Never open the inverter. The inverter contains no components that are user serviceable. Opening the cover will void the warranty.

Ensure that the inverter is not covered during operation.

Regularly clean the inverter to prevent soiling of the enclosure.

9 Repair

Danger of death from hazardous voltage.
Hazardous voltage exists while the inverter is operating. Hazardous voltage may still be present 5 minutes after all power sources have been disconnected.

► Never open the inverter. The inverter contains no components that are user serviceable. Opening the cover will void the warranty.

The inverter contains no components that are user serviceable.

10 Removal, transport, storage, disposal

Danger of death or severe injuries from dangerous voltage

► Disconnect the inverter from the AC grid before removing the AC conductors.

► Verify absence of AC voltage before removing conductors.

Danger of death or severe injuries from dangerous voltage

Dangerous voltages can be present at the DC connections of the inverter.

► Never disconnect the PV modules when the inverter is connected to AC grid or DC disconnect is on. First switch off the AC conductors grid so that the inverter cannot feed energy into the grid. Then, open the DC disconnect.

► Verify absence of DC voltage before removing conductors.

Danger of injury due to heavy weight

The inverter is heavy (see “11. Techical Data”, p. 71). Incorrect handling can lead to injuries.

► The inverter must be lifted and carried by two people.

10.1 Removal

1. Switch off the AC breaker and verify absense of AC voltage.
2. Open the DC disconnect, verify the absense of DC voltage on both the inverter and array sides, then disconnect PV array.
3. Remove DC and AC conductors and conduits from the inverter.
4. Unscrew the inverter from the wall bracket.
5. Lift the inverter from the wall bracket.

10.2 Packaging

Use the original packaging or packaging of the same quality.

10.3 Transport

Always transport the inverter in the original packaging or packaging of the same quality.

10.4 Storage

Always store the inverter in the original packaging or packaging of the same quality. Observe the specifications relating to storage conditions described in chapter 11: “Technical data”.

10.5 Disposal

Dispose of the inverter in a technically appropriate manner according to the legal requirements of your country, state and municipality.

11 Technical data

INPUT (DC)	PVI 3800TL	PVI 5200TL	PVI 6600TL	PVI 7600TL
Max. recom-mended PV power	4580 W_P	6200 W_P	8000 W_P	9100 W_P
Max. System Voltage	600 V			
Operational Voltage range	120 ... 550 V			
Full powerr MPP range	200... 500 V			
Max. current	20 A	15 A per MPP tracker	18 A per MPP tracker	20 A per MPP trachker
DC disconnect	Internal			
MPP tracker	1	2	2	2
MPP efficiency	99.8% (static) 99.5% (dynamic)			

OUTPUT (AC)	PVI 3800TL	PVI 5200TL	PVI 6600TL	PVI 7600TL
Nominal power	3800 W	5200 W	6600 W	7600 W
Max. power[1)]	3300 W @ 208 V / 3800 W @ 240 V	5200 W @ 208 V / 5200 W @ 240 V	6600 W @ 208 V / 6600 W @ 240 V	6600 W @ 208 V / 7600 W @ 240 V[)]
Voltage range	183...228 V @ 208 V / 211...264 V @ 240 V			
Nominal current	15.8 A @ 208 V / 15.8 A @ 240 V	25 A @ 208 V / 21.6 A @ 240 V	31.7 A @ 208 V / 27.5 A @ 240 V	31.7 A @ 208 V / 31.7 A @ 240 V
Max. current	16 A	25 A	32 A	32 A
Nominal frequency	60 Hz			
Frequency range	59.3-60.5 Hz			
Night consumption	< 1 W			
Total harmonic distortion @ norminal power	< 3%			
Power factor @ norminal power	0.99			
Reactive power capability	Yes			

GENERAL SPECIFICATION	PVI 3800TL	PVI 5200TL	PVI 6600TL	PVI 7600TL
Max efficiency	98%			
CEC efficiency	97.5%			
Operating temperature	-13 - +158 °F (-25 - +70 °C) / Derate above 122 °F (50 °C)			
Storage temp.	-40 - +185 °F (-40 - +85 °C)			
Humidity	0 ... 100%			
Max operating altitude	2000 m above sea level			

MECHANICAL DESIGN	PVI 3800TL	PVI 5200TL	PVI 6600TL	PVI 7600TL
Dimensions L x W x D inches (L x W x D) mm	17.72 x 15.75 x 6.89 (450 x 400 x 175)	23.23 x 15.75 x 6.89 (590 x 400 x 175)	23.23 x 15.75 x 6.89 (590 x 400 x 175)	23.23 x 15.75 x 6.89 (590 x 400 x 175)
Weight	42 lbs (19 kg)	64 lbs (29 kg)	64 lbs (29 kg)	64 lbs. (29 kg)
Cooling	Convection			
AC connectors	Screw terminals in connection box			
DC connectors	Screw terminals in connection box			
Communication interface	RS485			
Display	3 LEDs, 4-line LCD			
Enclosure material	Aluminum			

STANDARDS / DIRECTIVES	PVI 3800TL	PVI 5200TL	PVI 6600TL	PVI 7600TL
Electronics protection rating	NEMA 4	To Be Certified		
Safety	UL 1741, CSA 22.2 No. 107-01	To Be Certified		
SW Approval	UL 1998	To Be Certified		
Isolation Monitor Interrupt (IMI)	NEC 690.35, UL1741 CRD	To Be Certified		
Anti-islanding protection	IEEE 1547, IEEE 1547.1	To Be Certified		
EMC	FCC part 15 A & B, ICES-003	To Be Certified		
AFCI	UL169B, NEC 690 2011 (Available March 2014)	To Be Certified		

WARRANTY	PVI 3800TL	PVI 5200TL	PVI 6600TL	PVI 7600TL
Standard warranty	10 years			
Extended warranty	Based on request (15 or 20 year options)			

11.1 FCC Compliance Information

SOLECTRIA RENEWABLES, LLC. string inverters, Model PVI 3800TL, PVI 5200TL, PVI 6600TL and PVI 7600TL.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna
Increase the separation between the equipment and the receiver
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.
The user is cautioned that changes or modifications not expressly approved by SOLECTRIA RENEWABLES could void the user‘s authority to operate this equipment.

Contact SOLECTRIA RENEWABLES for more information:

SOLECTRIA RENEWABLES
360 Merrimack Street
Building 9, Floor 2
Lawrence, MA 01843
U.S.A
http://www.solren.com/products-and-services/grid-tied-solar-inverters/residential/pvi-3800-7600TL-solar-inverter

Support Email: service@solectria.com
Support Hotline: 978-683-9700

11.2 Canadian Compliance Information

This Class B digital apparatus complies with Canadian ICES-003.

12 Appendix

12.1 Overview of setting options

The following table contains an overview of all settings that can be made in the inverter.

Function / Characteristic	Short description	Menu Manual chapter
Options		**200 Options** “7.4 Options settings”
Shading	For setting up the extended MPP tracking	**210 Shading** “7.4.1 Shading”
Display settings		
Date and time	For setting the date and time	**110 Date and time** “7.2.1 Date and time”
Date and time format	For setting the date and time formats	**111 Format** “7.2.2 Date and time formats”
Contrast	For setting the contrast	**120 Display settings** “7.2.3 Contrast”
Standard menu	For selecting the display to be shown when no key has been pressed for a certain period of time.	**800 Standard** “7.5 Standard menu”
Monitoring		
RS485 settings	For setting the RS485 ID and the baud rate and for switching the termination resistor on and off	**150 RS485** “7.2.5 RS485”
Showing statistics		
Showing statistics on the display	-	**400 Production info** “6. Production information”
Feed-in settings		
Currency, revenue per kWh	For setting the currency and the revenue per kWh	**471 Feed-in settings** “7.3 Grid feed-in settings”

12.2 Order numbers

RS485 cable

RS485 connection cable
Cable for connecting inverters

Please contact Solectria for available options.

12.3 Overview of menu structure

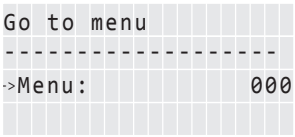
12.3.1 "Go to menu" function

NOTICE!
AVIS!

You can use the “Go to menu” function to directly navigate to a particular menu.

1. To open the Go to menu function, press and hold the ESC key on the inverter for at least 3 seconds.

   → **Go to menu** opens.



2. Press the ↵ key to enter the menu number.

   → The first digit flashes.

3. Enter the first digit of the menu number using the keys. Press the ↓↑ key when you are finished.

   → The second digit flashes.

4. Enter the second and third digit in the same manner.

5. Press the ↵ key.

   → The menu corresponding to the entered menu number is displayed.

12.3.2 Installation settings (100)

100 Installation	Explanation
130 Grid selection	Display the grid settings, change the grid
140 RS485	Change RS485 settings

110 Date and time		Explanation
Date:	18/06/2013	Date
Time:	15:12:23	Time
111 Format		Date and time formats

111 Format		Explanation
Date:	DD/MM/YYYY	Date format
Time:	24h	Time format (12h or 24h)

120 Display settings		Explanation
Contrast:	10	1...10

130 Grid selection	Explanation
131 View grid setup	Actual grid settings
132 Grid change	Set a different grid

140 RS485		Explanation
ID:	---	If multiple inverters are connected via RS485, then each inverter must have a different ID. (1 ... 254)
Baud rate:		Baud rate (2400 / 4800 / 9600 / 19200 / 38400)

12.3.3 Shading (210)

Mode	Explanation
Disable	Monitoring is deactivated.
High	High shading, time cycle: 0.5 hours
Medium	Medium shading, time cycle: 2 hours
Low	Low shading, time cycle: 4.5 hours

210 Shading		Explanation
Mode	Disable	Disabled / High / Medium / Low

12.3.4 Production information (400)

400 Production info	Explanation
410 Current data	Current power and energy values. Messages on the current operating status.
420 Day statistics	Statistics for the current day
430 Week statistics	Statistics for the current calendar week
440 Month statistics	Statistics for the current calendar month
450 Year statistics	Statistics for the current calendar year
460 Total statistics	Statistics for the entire operating period
470 Feed-in settings	Settings for currency and revenue per kWh
480 Event journal	Messages off events
490 History	Power and energy value of latest 7 days

410 Current data	Explanation
411 Current overview	Current status
412 Current data AC	AC = AC side
416 Current data PV	PV = module side
41A Date and time	Date and time
41B Current insulation	Insulation resistance value

411 Current overview		Explanation
Now:	200W	Current active power
Day:	2000Wh	Energy production current day
Normal operation		Current status messages

412 Current data AC		Explanation
L1 voltage:	---V	Voltage
L1 Freq.:	--.--Hz	Frequency
L1 Current:	-.--A	Phase current
L1 P:	---W	Active power
L1 Q:	---Var	Apparent power
L1 DC inj.:	---mA	Feed-in current

416 Current data PV		Explanation
PV1 Voltage:	---V	Voltage on the PV side
PV1 Current:	-.--A	Current on the PV side

41A Date and time		Explanation
Date:	18.06.2013	Current date
Time:	15:05:19	Current time

41B Current insulation		Explanation
R iso:	----kΩ	Insulation resistance at DC+

420 Day statistics	Explanation
421 Day statistics AC	AC = AC side
422 Day statistics DC	DC = DC side
423 Day statistics ISO	ISO = Insulation
430 Week statistics	
440 Month statistics	
450 Year statistics	
460 Total statistics	
470 Feed-in settings	
480 Event journal	
490 History	

421 Day statistics AC		Explanation
Energy:	---Wh	Energy
Runtime:	-:--h	Runtime
Revenue:	---USD	Revenue
L1 Imax:	-.--A	Maximum current
L1 Pmax:	---W	Maximum active power
L1 Qmax:	---Var	Maximum apparent power
L1 Qmin:	---Var	Minimum apparent power
431 Week statistics AC		
441 Month statistics AC		
451 Year statistics AC		
461 Total statistics AC		

491 Day		Explanation
Energy:	---Wh	Energy
Runtime:	-:--h	Runtime
Revenue:	---USD	Revenue
L1 Imax:	-.--A	Maximum current
L1 Pmax:	---W	Maximum active power
L1 Qmax:	---Var	Maximum apparent power
L1 Qmin:	---Var	Minimum apparent power
492 Day		
493 Day		
494 Day		
495 Day		
496 Day		
497 Day		

422 Day statistics DC		Explanation
PV1 Imax:	---A	Max. current
PV1 Umax:	---V	Max. voltage
PV1 Pmax:	---W	Max. power
432 Week statistics DC		
442 Month statistics DC		
452 Year statistics DC		
462 Total statistics DC		

423 Day statistics ISO		Explanation
R ISO max:	---kΩ	Max. insulation resistance
R ISO min:	---kΩ	Min. insulation resistance
433 Week statistics ISO		
443 Month statistics ISO		
453 Year statistics ISO		
463 Total stat. ISO		

470 Feed-in settings		Explanation
Currency	USD	Define the currency
USD / kWh:	#.##	Define the revenue pro kWh

480 Event journal	Explanation
481 External events	Overview of all external events and insulation/ grounding problems
482 Change events	Overview of all parameter changes

12.3.5 Diagnostics and Alarms (600)

The reports that are displayed depend on the grid that has been set:

- Internal log (is always displayed)

600 Diagnostic&Alarm	Explanation
620 Internal log	Firmware update

13.3.6 Software version/inverter data (700)

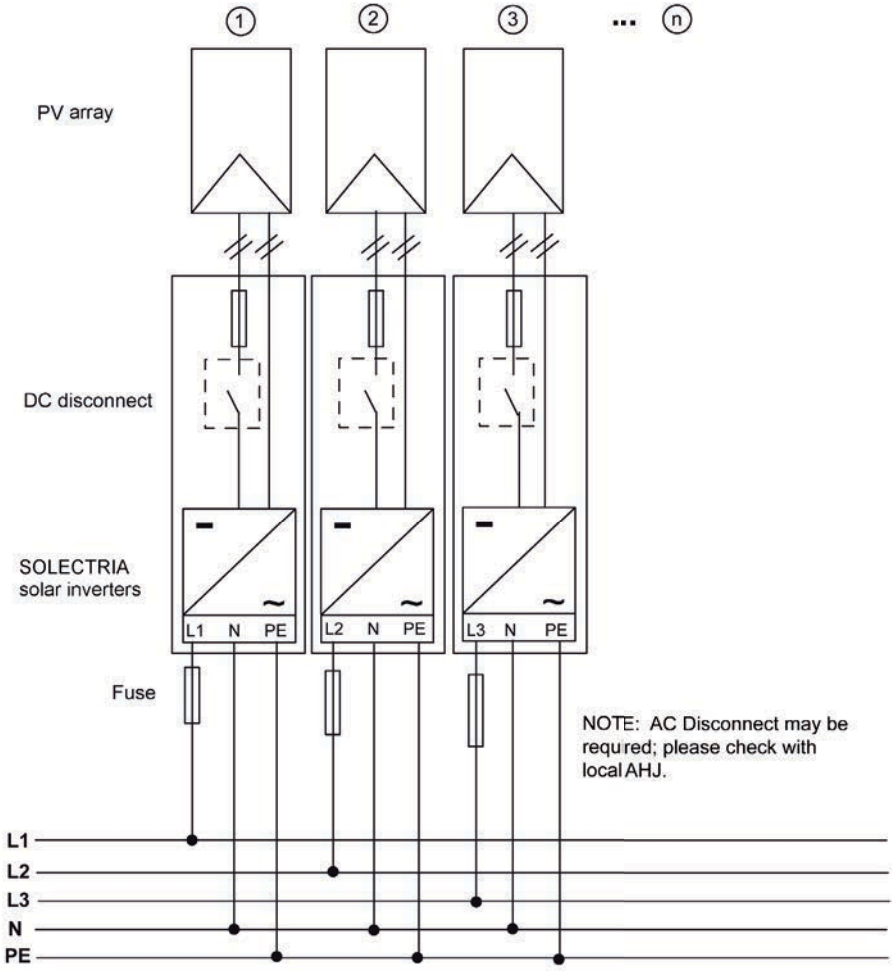
700 Inverter info	Explanation
710 Software vers.	Version of the installed software
720 Inverter data	Production date and serial number

12.3.7 Standard menu (800)

800 Standard menu	Explanation
Menu number:	Number of the menu that is to be displayed as the standard menu.

12.4 Installation example on a 3-phase 208 or 240 VAC electrical system

12.5 Wiring diagrams



13 Glossary

AC
Abbreviation for “Alternating Current”.

AHJ
Abbreviation for “Authority Having Jurisdiction” (electrical inspector).

Anti-islanding protection
This is a unit for grid monitoring with assigned switching elements (anti-islanding protection) and is an automatic isolation point for small power generation systems (to 30 kWp).

Basic Insulation
Insulation to provide basic protection against electric shock.

CE
With the CE identification code, the manufacturer confirms the conformity of the product with the valid CE Guideline and compliance with the significant requirements stipulated therein.

CEC
Abbreviation for the California Energy Commission

CEC Efficiency
CEC Efficiency is the California Energy Commission Efficiency rating, a performance rating for modules and inverters based on the real environment that a system will be in.

CSA
Abbreviation for the Canadian Standards Association.

DC
Abbreviation for “Direct Current”.

EMC
The Electro-Magnetic Compatibility (EMC) concerns the technical and legal basics of the mutual influencing of electrical devices through electromagnetic fields caused by them in electrical engineering.

FCC
FCC is the abbreviation for Federal Communications Commission.

Galvanic isolation
No conductive connection between two component parts.

GEC
Grounding Electrode Conductor

GET
Grounding Electrode Terminal

IEEE
The Institute of Electrical and Electronics Engineers or IEEE (read I-Triple-E) is an international non-profit, professional organization for the advancement of technology related to electricity.

IMI
Isolation Monitor Interrupter

Initialization
Under initialization is understood the part of the loading process of a program, in which the storage space required for the execution (e.g. variable, code, buffers ...) for the program is reserved and is filled with initial values.

Isc
Short Circuit Current

Local utility company
A local utility company is a company which generates electrical energy and distributes it over the public grid.

MPP
The Maximum Power Point is the point on the current-voltage (I-V) curve of a module, where the product of current and voltage has it's maximum value.

NEC
The National Electrical Code (NEC), or NFPA 70, is a United States standard for the safe installation of electrical wiring and equipment.

Nominal power
Nominal power is the maximum permissible continuous power output indicated by the manufacturer for a device or a system. Usually the device is also optimized so that the efficiency is at its maximum in case of operation with nominal power.

Nominal current
Nominal current is the absorbed current in case of electrical devices if the device is supplied with the nominal voltage and yields its nominal power.

PE
In electric systems and cables a protective earth conductor is frequently employed. This is also called grounding wire, protective grounding device, soil, grounding or PE (English „protective earth").

Photovoltaics (abbr.: PV)
The conversion of PV energy into electrical energy.
The name is composed of the component parts: Photos - the Greek word for light - and Volta - after Alessandro Volta, a pioneer in electrical research.

Power dissipation
Power dissipation is designated as the difference between absorbed power and power of a device or process yielded. Power dissipation is released mainly as heat.

PV cell
PV cells are large-surface photodiodes which convert light energy (generally sunlight) into electrical energy. This comes about by utilization of the photoelectric effect (photovoltaics).

PV generator
System comprising of a number of PV modules.

PV module
Part of a PV generator; converts PV energy into electrical energy.

RJ45
Abbreviation for standardized eight-pole electrical connector connection. RJ stands for Registered Jack (standardized socket).

RS485 (EIA485)
Differential voltage interface on which the genuine signal is transmitted on one core and the negated (or negative) signal on the other core.

Separate grid system
Energy supply equipment which is completely independent of an interconnected grid.

Inverter
is an electrical device which converts DC direct voltage into AC voltage and/or direct current into alternating current.

String
Designates a group of electrical PV modules switched in series.

String inverter (inverter concept)
The PV generator is divided up into individual strings which feed into the grid over their own string inverters in each case. In this way, the installation is considerably facilitated and the gain decrease, which can arise from the installation or from different shading conditions of the PV modules, is considerably reduced.

UL
Stands for Underwriters Laboratory, an organization that sets standards for different product categories and tests products to make sure they meet the standards.

Voc
Open Circuit Voltage

14 Certificates

Not all certificates for the Solectria PVI 3800TL, PVI 5200TL, PVI 6600TL and PVI 7600TL were available at the time of print. Please check our web site for the most recent certificates at: http:// www.solren.com/products-and-services/grid-tied-solar-inverters/residential/pvi-3800-7600TL-solar-inverter for the most recent certificates.

15 Warranty

Warranty Registration:
It is important to have updated information about the inverter location. Please visit http://www.solectria.com/registration and complete the information requested for each inverter.

The Solectria Renewables Warranty Policy is stated below.
1.1.1 Definitions:
Standard Limited Warranty: The initial warranty period provided for the product.
Extended Limited Warranty: A purchased warranty for a number of years after the expiration of the Standard Limited Warranty. Coverage is the same as the Standard Limited Warranty. The maximum number of years for entire warranty period is 20 years for certain products.
Parts Only Limited Warranty: A purchased warranty for a number of years after the expiration of the Standard Limited Warranty, includes Parts Only, additional charges apply for travel, labor, shipping.

1.1.2 Solectria Renewables Warranty Coverage:
Solectria Renewables Limited Warranties are provided by Solectria Renewables, LLC. ("Solectria Renewables") and cover defects in workmanship and materials. Solectria Renewables' price for the products is based on inclusion of these limited warranty provisions and disclaimers. In the event of a conflict between the terms of this Limited Warranty and any terms and conditions proposed by purchasers of Solectria Renewables' products, these Limited Warranty provisions shall govern the parties' obligations with respect to warranty coverage for defective products.

Product Description	Standard Limited Warranty	Extended Limited Warranty	Parts Only Limited Warranty
PVI 1800, PVI 2500	5 years (60 months)	Not Available	Not Available
PVI 3000S, PVI 4000S, PVI 5000S, PVI 5300, PVI 6500, PVI 7500	10 years (120 months)	Not Available	Not Available
PVI 3800TL, PVI 5200TL, PVI 6600TL, PVI 7600TL	10 years (120 months)	Up to additional 10 years available	Not Available
PVI 10KW, PVI 13KW, PVI 15KW	5 years (60 months)	Up to additional 15 years available	Up to additional 15 years available
PVI 14TL, PVI 20TL, PVI 23TL, PVI 28TL	10 years (120 months)	Up to additional 10 years available	Not Available
PVI 50KW, PVI 60KW, PVI 75KW, PVI 85KW, PVI 100KW	5 years (60 months)	Up to additional 15 years available	Up to additional 15 years available
SGI 225, SGI 250, SGI 266, SGI 300, SGI 500, SGI 500PE, SGI 500XT	5 years (60 months)	Up to additional 15 years available	Up to additional 15 years available

1.1.3 Warranty start date:
Solectria Renewables warranty begins on the date of shipment to the end user, or no later than 4 months from the date of shipment by Solectria Renewables.

1.1.4 Duration of Solectria Renewables Extended Warranty Period:
If a warranty extension has been purchased, the term is defined as an extension beyond the initial Standard Limited Warranty period.For example, if Standard Limited Warranty is 5 years and a 5 year extension is purchased, the term becomes 10 years (120 months) from date of shipment.

If Solectria Renewables repairs or replaces a product, its warranty continues for the remaining portion of the original Warranty Period or 90 days from the date of the repair of the inverter or replacement shipment to the customer, whichever is greater.

Solectria Renewables' obligation to repair or replace a defective product under this warranty is contingent upon Solectria Renewables receiving full and timely payment for the warranted products and associated shipping charges. Solectria Renewables Warranty Coverage is voidable, at Solectria Renewables' sole option, if full payment for products and associated shipping charges are not received in full and in a timely manner by Solectria Renewables. Please contact Solectria Renewables Customer Service for further details on other products.

1.1.5 Standard or Extended Limited Warranty Coverage:
Solectria Renewables will, at its sole option, repair or replace the defective product feed of charge, provided that Solectria Renewables is notified of the product defect within the Warranty Period for the product, and provided that Solectria Renewables, through inspection, establishes the existence of such a defect and that it is covered by the Limited Warranty.

Solectria Renewables will, at its sole option, use new and/or reconditioned parts in performing warranty repair and/or replacements. Solectria Renewables reserves the right to use parts or products of original or improved design in the repair or replacement of the product. All replaced products and all parts removed from repaired products become the property of Solectria Renewables.

Solectria Renewables will attempt to repair the unit within a reasonable time period. No provision will be made for reimbursement of lost energy production.

1.1.6 Parts Only Limited Warranty Coverage:
The parts only warranty includes parts needed to provide repairs to the product. Solectria Renewables will, at its sole option, use new and/or reconditioned parts in performing warranty repair and/or replacements. Solectria Renewables reserves the right to use parts or products of original or improved design in the repair or replacement of the product. All replaced products and all parts removed from repaired products become the property of Solectria Renewables.

All labor, travel, expenses and shipping are excluded from this warranty and an estimate must be paid prior to dispatching a technician.

1.1.7 For three-phase inverters 10kW and higher:
Within the Continental United States and Canada: Solectria Renewables warranty covers parts, travel and labor necessary to repair the product and shipment of parts to and from the customer via a Solectria Renewables-selected non-expedited surface freight.

Outside of the Continental US: For Alaska, Hawaii and all other installation locations Solectria Renewables will supply necessary parts and labor as needed for warranty repairs; however, travel is not included. Solectria Renewables will only provide non-expedited freight shipping of parts. The warranty does not include customs fees, broker fees or other taxes that may be imposed by any government agency

1.1.8 For three-phase inverters PVI14TL, PVI20TL, PVI23TL PVI28TL and single-phase inverters 7.6kW and lower:
Solectria Renewables warranty covers replacement inverters or parts necessary to repair the product and shipments of parts or replacement inverters to and from the customer via a Solectria Renewables-selected non-expedited surface freight within the contiguous United States and Canada. For Alaska, Hawaii and all other installation locations Solectria Renewables will cover the cost of return shipment of product one way from the customer. The warranty does not include customs fees, broker fees or other taxes that may be imposed by any government agency.

2.0 Obtaining Service:
If your product requires troubleshooting or warranty service, contact the installer or place of purchase. If you are unable to contact the installer/place of purchase or they are unable to provide service, contact Solectria Renewables directly at the number listed on the website in the customer service section for your product.

Solectria Renewables may send personnel to a jobsite or contract authorized, trained service personnel to service/replace components.

Reimbursement for contracted services: Solectria Renewables will submit a purchase order to the designated service personnel before work is performed. This purchase order will cover time expected for the required service and most likely an allocation for travel time. There is a flat rate for inverter replacements.

Direct returns may be performed according to the Solectria Renewables Return Material Authorization Policy.

In any warranty claim, dated proof of purchase must accompany the product and the product must not have been disassembled or modified without prior written authorization by Solectria Renewables.

Proof of purchase may be in any one of the following forms:

- The dated purchase receipt from the original purchase of the product at point of sale to the end user, or
- The dated distributor or dealer/installer invoice or purchase receipt showing original equipment manufacturer (OEM) status, or
- The dated invoice or purchase receipt showing the product exchanged under warranty.

Solectria Renewables provides technical assistance Monday-Friday, 8:30am-7pm EST and on- call technical support is provided outside normal business hours.

2.1 What does the Solectria Renewables warranty not cover?
Solectria Renewables Limited Warranties do not cover normal wear and tear of the product or costs related to the removal, installation, or troubleshooting of the customer‘s electrical systems. These warranties do not apply to and Solectria Renewables will not be responsible for any defect in or damage to:

a) The product, if it has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment;
b) The product, if it has been subjected to fire, water, generalized corrosion, biological infestations, acts of God or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the Solectria Renewables product specifications including high input voltage from generators or lightning strikes;

c) The product, if repairs have been made to it other than by Solectria Renewables or its authorized, trained service personnel;
d) The product, if it is used as a component part of a product expressly warranted by another manufacturer;
e) The product, if its original identification (trademark, serial number) markings have been defaced, altered, or removed;
f) The product, if it has been damaged in shipping (unless approved in writing by Solectria Renewables);
g) The product, if damaged by customer connections or any items installed by customer or installation company including third party monitoring;
h) Any installation and operation beyond the scope covered by relevant safety regulations (UL1741, NFPA 70, etc.);
i) Third party monitoring equipment;
j) Failure to perform Preventative Maintenance may void the warranty.

3. 0 DISCLAIMER

SOLECTRIA RENEWABLES LIMITED WARRANTIES ARE THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY SOLECTRIA RENEWABLES IN CONNECTION WITH YOUR SOLECTRIA RENEWABLES PRODUCT AND ARE, WHERE PERMITTED BY LAW, IN LIEU OF ALL OTHER WARRANTIES, CONDITIONS, GUARANTEES, REPRESENTATIONS, OBLIGATIONS AND LIABILITIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE IN CONNECTION WITH THE PRODUCT, HOWEVER ARISING (WHETHER BY CONTRACT, TORT, NEGLIGENCE, PRINCIPLES OF MANUFACTURER'S LIABILITY, OPERATION OF LAW, CONDUCT, STATEMENT OR OTHERWISE), INCLUDING WITHOUT RESTRICTION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR CONDITION OR QUALITY OF THE PRODUCT, ANY IMPLIED WARRRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OR ANY IMPLIED WARRANTY OF DISTRIBUTOR OR DEALER/INSTALLER ABILITY, ALL OF WHICH ARE EXPRESSLY DISCLAIMED TO THE FULLEST EXTENT PERMITED BY LAW.

ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY IMPLIED WARRANTY OF DISTRIBUTOR OR DEALER / INSTALLER ABILITY, TO THE EXTENT REQUIRED UNDER APPLICABLE LAW TO APPLY TO THE PRODUCT, SHALL BE LIMITED IN DURATION TO THE PERIOD STIPULATED UNDER THIS LIMITED WARRANTY, TO THE FULLEST EXTENT PERMITTED BY LAW.

IN NO EVENT WILL SOLECTRIA RENEWABLES, INCLUDING ITS SUPPLIERS, MANUFACTURERS, VENDORS, SUBCONTRACTORS, DISTRIBUTORS, DEALERS AND ANY OTHER AFFILIATES BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, COSTS OR EXPENSES HOWEVER ARISING WHETHER IN CONTRACT OR TORT INCLUDING WITHOUT RESTRICTION ANY ECONOMIC LOSSES OF ANY KIND, ANY LOSS OR DAMAGE TO PROPERTY, INCLUDING LOSS OF USE AND INTANGIBLE HARM OF ANY KIND, AND ANY PHYSICAL DAMAGE OR OTHER DAMAGE ARISING FROM OR AS A RESULT OF ANY USE, MISUSE OR ABUSE OF THE PRODUCT, OR THE INSTALLATION, INTEGRATION OR OPERATION OF THE PRODUCT, REGARDLESS OF WHETHER SUCH INSTALLATION, INTEGRATION OR OPERATION WAS PERFORMED PROPERLY OR IMPROPERLY.

Solectria Renewables neither assumes nor authorizes any other person to assume for it any other liability in connection with the repair or replacement of the Product.

If your product is a consumer product, the applicable law may not permit exclusion of implied warranties. To the extent permitted by the applicable law such warranties are limited to the duration of this Limited Warranty. Some jurisdictions do not allow any limitations on the duration of an implied warranty, or exclusions on implied warranties, or on the limitation or exclusion of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you. This Limited Warranty gives you specific legal rights. You may have other rights, which may vary from state to state or province to province.

WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, UNLESS SPECIFICALLY AGREED TO BY IT IN WRITING, SOLECTRIA RENEWABLES

(a) MAKES NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL OR OTHER INFORMATION PROVIDED IN MANUALS OR OTHER DOCUMENTATION PROVIDED BY IT IN CONNECTION WITH THE PRODUCT; AND

(b) ASSUMES NO RESPONSIBILITY OR LIABILITY FOR LOSSES, DAMAGES, COSTS OR EXPENSES, WHETHER SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL, WHICH MIGHT ARISE OUT OF THE USE OF SUCH INFORMATION.

THE USE OF ANY SUCH INFORMATION WILL BE ENTIRELY AT THE USERS' RISK.

WARNING: LIMITATIONS ON USE

Please refer to your product user manual for limitations on uses of the product. Specifically, please note that Solectria Renewables' products are not intended for use in connection with life support systems and Solectria Renewables makes no warranty or representation in connection with any use of the product for such purposes.

4.0 Return Material Authorization Policy

Please review our Return Merchandise Authorization Policy below.

4.1 Obtaining a required, Return Material Authorization:

Before returning a product directly to Solectria Renewables you must obtain a Return Material Authorization (RMA) number and the correct factory "Ship To" address. Products must also be shipped prepaid. Product shipments will be refused and returned at your expense if they are unauthorized, returned without an RMA number clearly marked on the outside of the shipping box, if they are shipped collect, or if they are shipped to the wrong location. Refer to the terms and conditions statement provided when the item was purchased for details Restocking fees may apply.

4.2 Information Solectria Renewables needs when you are obtaining service:

1) The model name and serial number of your product
2) The reason for return

Preparing the product for shipping:

1) Package the unit safely, preferably using the original box and packing materials. Please ensure that your product is shipped fully insured in the original packaging or equivalent. This warranty will not apply where the product is damaged due to improper packaging.
2) Include the following:
   a. The RMA number supplied by Solectria Renewables clearly marked on the outside of the box.
   b. A return address to which the unit can be shipped. Post office boxes are not acceptable.

c. A contact telephone number where you can be reached during work hours.
d. A brief description of the problem.

Ship the unit prepaid to the address provided by your Solectria Renewables' customer service representative.

Returning a product from outside of the USA or Canada:
In addition to the above, you MUST include return freight funds and are fully responsible for all documents, duties, tariffs, and deposits.

CERTIFICATE OF COMPLIANCE

Certificate Number	20131223-E465007
Report Reference	E465007-20131211
Issue Date	2013-DECEMBER-23
Issued to:	SOLECTRIA RENEWABLES L L C SUITE 9, 360 MERRIMACK ST LAWRENCE, MA, 01843-1740, US
This is to certify that representative samples of	Static Inverters, Converters and Accessories for Use in Independent Power Systems PVI-3800TL
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 1741 - Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Listing Mark should be considered as being covered by UL's Listing and Follow-Up Service.

The UL Listing Mark generally includes the following elements: the symbol UL in a circle, Ⓤ with the word "LISTED"; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

Look for the UL Listing Mark on the product.

William R. Carney

William R. Carney, Director, North American Certification Programs

UL LLC

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SOLECTRIA RENEWABLES

November 22, 2013