



INSTRUCTION MANUAL and WARRANTY REGISTRATION CARD



Grid Connect

Latronics P.O. Box 73 Moffat Beach Qld 4551 AUSTRALIA

Ph 61 7 5491 6988

web: www.latronics.com

email: technical@latronics.com



**LATRONICS
P.O. BOX 73
MOFFAT BEACH QLD 4551
AUSTRALIA**

Please
Affix
Stamp
Here

WELCOME

Latronics products are all proudly designed, engineered and manufactured in Australia. As a specialist sine wave inverter company we produce Inverters for a diverse range of applications such as; mining, railways, telecommunications, marine, remote power, motor homes, and other industrial or commercial installations.

In order to produce the most reliable products available, *Latronics* Inverters have been designed to endure the most rugged terrain and the harshest conditions across the Australian continent.

All products are engineered using the latest high quality components and manufactured to stringent quality standards, thus ensuring *Latronics* customers all enjoy many years of trouble free operation.

It is important to us at *Latronics*, that our clients enjoy the maximum benefits from our Inverters in a safe and productive environment. So we strongly advise that you read through the next few pages of this manual, which explains all the modes of operation and relevant safety precautions for your new Power Inverter.

Please remember to complete and return your registration card on the last page of this manual to validate your warranty. Please retain your receipt as proof of purchase.

If your Inverter requires service or repair please complete the Warranty Repair Form on page 20.

LATRONICS
PO BOX 73
MOFFAT BEACH Q 4551
PH: 61 7 5491 6988 FAX: 61 7 5491 6792
EMAIL: technical@latronics.com
WEB: www.latronics.com

IMPORTANT !

As an environmentally conscious customer you may choose to Register online at <http://latronics.com> . Once completed online, there is no need to post this registration card.

Serial No..... Date card returned.....



REGISTRATION CARD

Your warranty is only valid if this card or online registration is completed within 3 months of the date of purchase.

Name:.....Post code:.....Serial No:.....

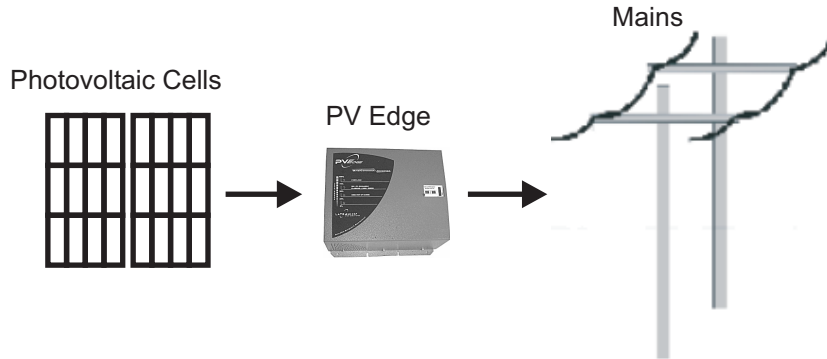
Date of Purchase:.....Supplier:.....

Email / Phone (optional):.....Comments:.....

-
- * Where is your Inverter being used? Residential Commercial
 - * What Energy Source is connected to your Inverter? Solar Batteries Wind Other
 - * Was your decision made because of?
Features Value for Money Appearance Recommendation Warranty Australian Made
 - * How do you rate the service from your supplier? Fair Good Very Good Excellent
 - * Did your new Inverter meet your expectations? Above Expectations Yes No

INSTALLATION

- Grid Interactive Solar Systems have become increasingly popular in recent years. These systems do not necessarily require batteries for storage and therefore can have a very simple configuration.



BEFORE INSTALLATION

- Ensure the Inverter has not been damaged in transit.
- The unit must be placed in a well ventilated and protected area, not exposed to the open environment, and free from contaminants (i.e. exhaust gases, sea air, dust etc.).
- The PV edge is designed for indoor installation in a suitable location where ambient temperature will not exceed rated values.
- As the PV edge has a wall mountable enclosure, ensure proper air circulation for cooling of the Inverter.
- Safety- DC solar input and AC grid are electrically and galvanically isolated via the Toroidal Transformer.

It is important that all wiring in the installation complies with the relevant standards (AS4777) .

**Any work carried out is to be preformed by
Qualified and Licensed personnel.**

DECLARATION OF CONFORMITY

Manufacturer:
Latronic Sunpower Pty Ltd
105 Grigor St West
Moffat Beach Industrial Park
Caloundra Queensland 4551
Australia

Declare that the PV Edge grid connected Inverter Model No. PVE1200 and PVE2500 conform to the requirements of following standards

EN61000-6-1
EN61000-6-3
EN55014
AS1044
EN60335-1
AS3100
AS4777



And therefore conform to the regulations of the EC directives
Directive 2004/108/CE (EMC directive), Directive 2006/95/CE (low Voltage
Directive)
Date that CE marking was first affixed 2007

Also conforms to the regulations of C-tick mark for Australian emission standards

Australian Safety Certificate approval number CS06713V

All products are manufactured with full traceability in accordance with the
Quality System Requirements of AS/NZS ISO 9002

Signed

Brad Cowin
Electrical Engineer

SPECIFICATIONS

Model	PVE1200	PVE2500
Input Data		
Maximum Solar Input Power	1600W	3100W
Maximum DC Input Power	1350W	2650W
Maximum DC Input Current	25A	25A
Maximum DC Input Voltage	100V	200V
Maximum Power Point Tracking Range	54VDC - 100VDC	108VDC - 200VDC
Ideal Operating Window (Array VOC)	80-90VDC	160-180VDC
Automatic Turn ON (PV Mode)	70VDC	140VDC
Automatic Turn ON (Battery mode)	54VDC	108VDC
Starting Operation	10W	
Reverse Polarity Protection	Short Circuit Diode Across DC Input Terminals	
Output Data		
Output Power	1100W at 50°C (1250W Max)	2100W at 50°C (2500W Max)
Output Voltage Range	205 - 265 Vac	
Output Frequency	50Hz tolerance +/- 1Hz	
Peak Efficiency	94%	95%
Night Time Power Consumption	NIL. Automatically Disconnects from AC Grid	
Input/Output Isolation	3500V via Toroidal Transformer	
Operating Temperature	-10°C to 50°C	
Anti islanding Protection	Over/under voltage, Over/under frequency, Active phase shift	
General Data		
Status Indicators	Output power in 25% Increments Grid Monitoring - Stability check Solar Input ON Grid Fault Overload LCD Meter - Total Energy Output kWh	
Wall Mount Enclosure	Powder Coated Aluminum	
Dimensions	330mm H x 296mm W x 150mm D	370mm H x 386mm W x 180mm D
Weight	11 kg	22 kg
Connections	AC/DC Pluggable Connectors	
Warranty	3 years	

DC WIRING

Check solar array does not exceed inverter's maximum voltage rating!

- * The inverter is designed to operate with a 48V solar panel array (PVE1200) or 96V solar panel array (PVE2500).
- * A 48V solar array will have an open circuit panel voltage of about 87Vdc.
- * A 96V solar array will have an open circuit panel voltage of about 174Vdc.
- * If other sources of DC input are required e.g wind turbines, micro hydro turbines etc, a battery bank or Latronics Turbine Controller (see pg 9) will be required with the Maximum Power Point Tracking (MPPT) disabled (see pg 13).
- * The DC input voltage is stated on the PV Edge compliance label and the technical specifications sheet within this manual. Check that the input voltage is within the required limits and does not exceed the maximum limit (see pg 18).
- * Recommended cable size for the DC Input is 6sqmm with an insulation rating of 0.6/1KV.
- * **Observe Polarity.**
- * The Inverter is fitted with DC circuit breakers for the positive and negative DC Input connections.
- * Ensure the DC breakers are switched OFF when connecting or disconnecting the DC leads.

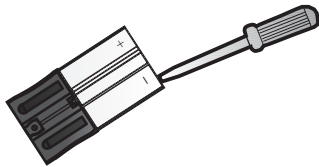
POSITIVE/NEGATIVE EARTHING

The PV Edge inverter is suitable for use with solar arrays that require positive or negative earthing. Due to the inverter's galvanic isolation between AC and DC inputs no additional modifications are required. Simply connect the positive or negative of the solar array to the system earth.

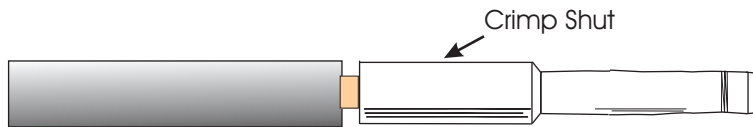
SBS50 CONNECTOR WIRING

The inverter comes with an SBS50 connector panel mounted on the case. To assemble the connecting partner, take the SBS50 connector and follow the instructions below.

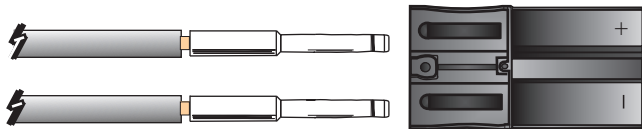
1. Remove the lugs with a screwdriver from the plug by inserting into the end and pressing down on the thin metal retaining strip.



2. Strip back 10mm of cable (Recommended Cable: 6sqmm or bigger). Insert the stripped cable into the metal insert and crimp shut.



3. Push cable lugs into the main body until clipped in, taking care with polarity, which is marked on the connector housing by + & - .



NB. This is a touch proof connector as per UL 1977, Section 10.2 . The DC connector can be disconnected under load and complies with AS4777 standards for an isolator at the inverter

WARRANTY CONDITIONS

All conditions and warranties expressed or implied by statute, common law, equity, trade, custom, usage, or otherwise howsoever are hereby expressly excluded to the maximum extent permitted by law. Where so permitted the liability of Latronics for a breach of condition or warranty that cannot be excluded is limited (at Latronics option) to the replacement or repair of the goods or of acquiring equivalent goods or the cost of replacing or repairing the goods or of acquiring equivalent goods. Latronics shall not be liable in any way whatsoever for indirect or consequential loss or damage whatsoever (whether based on tort or contract or otherwise)

- Damage caused by unauthorised repair, alteration or substitution of non-standard parts, incorrect installation, insufficient ventilation, misuse, negligence, failure to observe applicable safety regulations, accident or similar cause, or usage other than in accordance with the operating instructions, is not covered under warranty.
- Unauthorised opening of the goods will render the Warranty invalid.
- The company may, at its discretion, agree to act as agent for the owner where delivery is requested and all costs for cartage and insurance will be for the owners account. All warranty work is ex-factory.
- The replacement of any part or labour involved will not have the effect of extending the period of the warranty of the goods.
- Any faulty part replaced under Warranty becomes the property of the Company for purposed of examination and claim under proprietary Warranty.
- Registration Card or Online Registration must be completed within 3 months from date of purchase to validate your warranty.
- Keep your receipt as proof of purchase, should any difficulties arise concerning the return of the registration card.
- Inverters are supplied by the manufacturer, or the manufactures agents, under the express condition that no responsibility is implied or accepted by the above parties for any damage to any appliance, equipment or property associated with the correct or otherwise operation of the Inverter.
- If service is required contact your local supplier/installer, or contact Latronics direct. Please ensure that you have completed the warranty repair form on page 20 to enable prompt processing.

RADIO FREQUENCY INTERFERENCE

Radio Frequency Interference (RFI) is a phenomenon that exists in modern society and is a problem in many areas of electronics. For Inverter users, RFI normally presents itself in the form of static and/or interference when listening to an AM radio and in unusual cases may interfere with TV reception.

Over the years Latronics has continued to invest significant time and effort in the reduction of RFI related emissions from the entire product range, so that they comply with the appropriate International and/or Australian Standards.

Even with this compliance, there are situations where RFI may still be a cause for concern, and can differ greatly from installation to installation. Accordingly, the following is a list of recommendations made to assist in the overall reduction of RFI.

1. **Separate DC and AC wiring.** Avoid running DC and AC cables in the same conduits and/or cable trenches. It is strongly recommended that DC and AC wiring be separated by the greatest distance possible. In extreme cases, the use of shielded conduit may be necessary.
2. **Minimize length of DC cabling.** DC cables can act as an aerial, therefore all such cables should be kept as short as is practicable. For best performance minimize DC cable length to Inverter and Batteries and if possible avoid the use of auxiliary DC loads.
3. **240Vac Earth.** For household installations, it is recommended that a "good" Earth Stake is located as nearby the Inverter as is possible.
4. **AM and HF Radios.** These types of radio equipment inherently suffer from all forms of RFI, especially when the received signal level is weak. In such cases reception can sometimes be improved by relocation of the radio itself, alternatively the use of an appropriate external antenna and co-axial cable may be necessary. External antennas should be located in a manner that ensures maximum signal strength whilst affording the greatest possible distance away from the Inverter and Batteries.
5. **Televisions.** TV signals are transmitted as FM waveforms. This type of signal fundamentally reduces the effects of RFI, therefore the use of a good antenna and feeder cable is normally sufficient to ensure quality reception. Locating the television as far as possible from the Inverter may also improve picture clarity.

AC WIRING

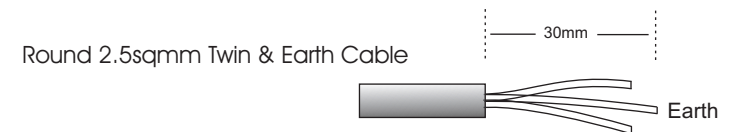
Both models require an external circuit breaker for protection of inverter's AC input. Usually mounted in main switchboard. The active and neutral of the AC output are electrically isolated from the DC inputs and earth connections.

Latronics Inverters have the AC output (active and neutral) floating with respect to the DC and Earth. This configuration provides the highest safety and most flexibility for installation wiring. The earth **E** is connected internally to the Inverter case and is suitable for *MEN* wiring.

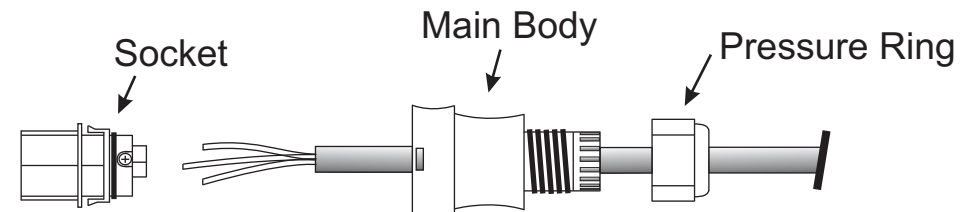
The unit is supplied with both male and female 20Amp Wieland Gesis lockable AC connectors.

To install connectors read the following procedure.

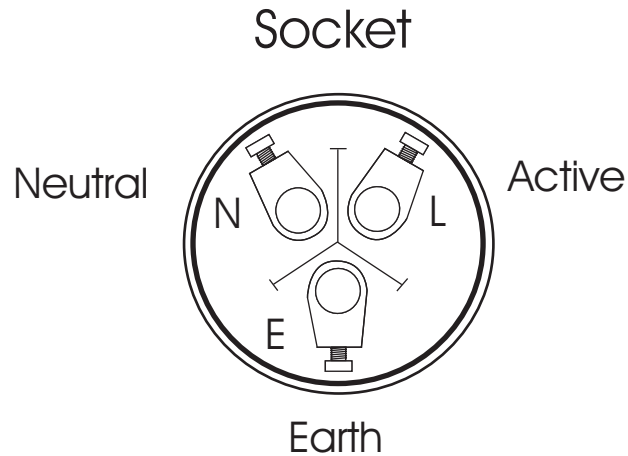
1. Make sure Inverter is switched OFF before working on mains wiring. Turn external AC Circuit Breaker switch into OFF position and make sure it cannot be switched back on.
2. Test the wiring with a voltmeter to make sure no voltage is present.
3. Peel back 30mm of cable jacket and cut Active and Neutral cables 5mm shorter than Earth.



4. Strip 5mm off all three cables.
5. Take the Wieland Gesis connector, disassemble into three main sections and insert stripped wire through as shown below.



6. Connect the Active, Neutral and Earth cables as per diagram below.



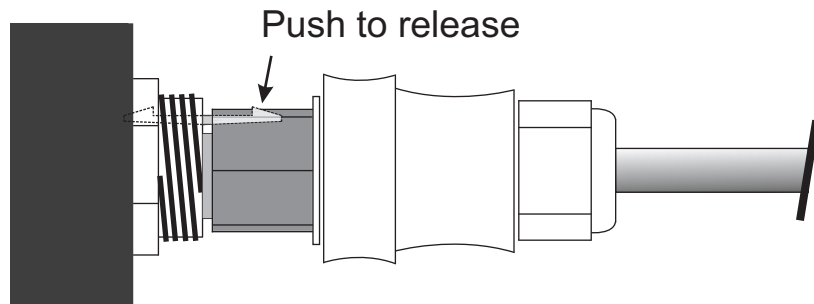
7. Push the socket back into the Main Body until it clips in.

8. Screw the Pressure Ring back in to form a tight seal.

9. Plug into PV Edge.

To disconnect the plug, simply push the clip in and unplug.

Note: The clip section can be completely taken out if a lockable connector is not desired.



FAULT FINDING

Should the Inverter appear to be malfunctioning we suggest the following to eliminate any external problems.

- Turn the Inverter OFF by switching the DC & external AC Circuit Breakers OFF. Leave OFF for 60 seconds.
- Reconnect the DC Solar Input by switching DC breaker ON. All lights on the Inverter should come ON for 1 second at power up and then go OFF. The 75% light should remain ON to indicate the Solar Input is available. Solar Input voltage needs to be above the automatic turn ON voltage, see pg 18, for the light to turn ON. If the light does not illuminate check Solar Input for correct operation.
- Next reconnect the AC grid by switching the external AC breaker ON. After 20 seconds the 75% light should begin flashing to indicate Inverter reconnecting to the AC grid. The light will flash for 60 seconds while the PV Edge checks that the mains voltage and frequency are stable. Should the light not begin flashing check if the AC grid is present.
- After the 75% light stops flashing the Inverter will begin feeding power into the AC Grid.

HELPFUL HINTS

- Make certain that you understand the operation of the Inverter.
- Remember that it has automatic reconnection to the AC grid.
- Make sure leads and terminals are not corroded, loose or faulty in any way.
- Make sure Circuit Breakers or switches are reset properly. If unsure switch OFF and ON again.

SOLAR INPUT CONFIGURATION

PVE 1200 (Max Solar Input: 1600Wp)

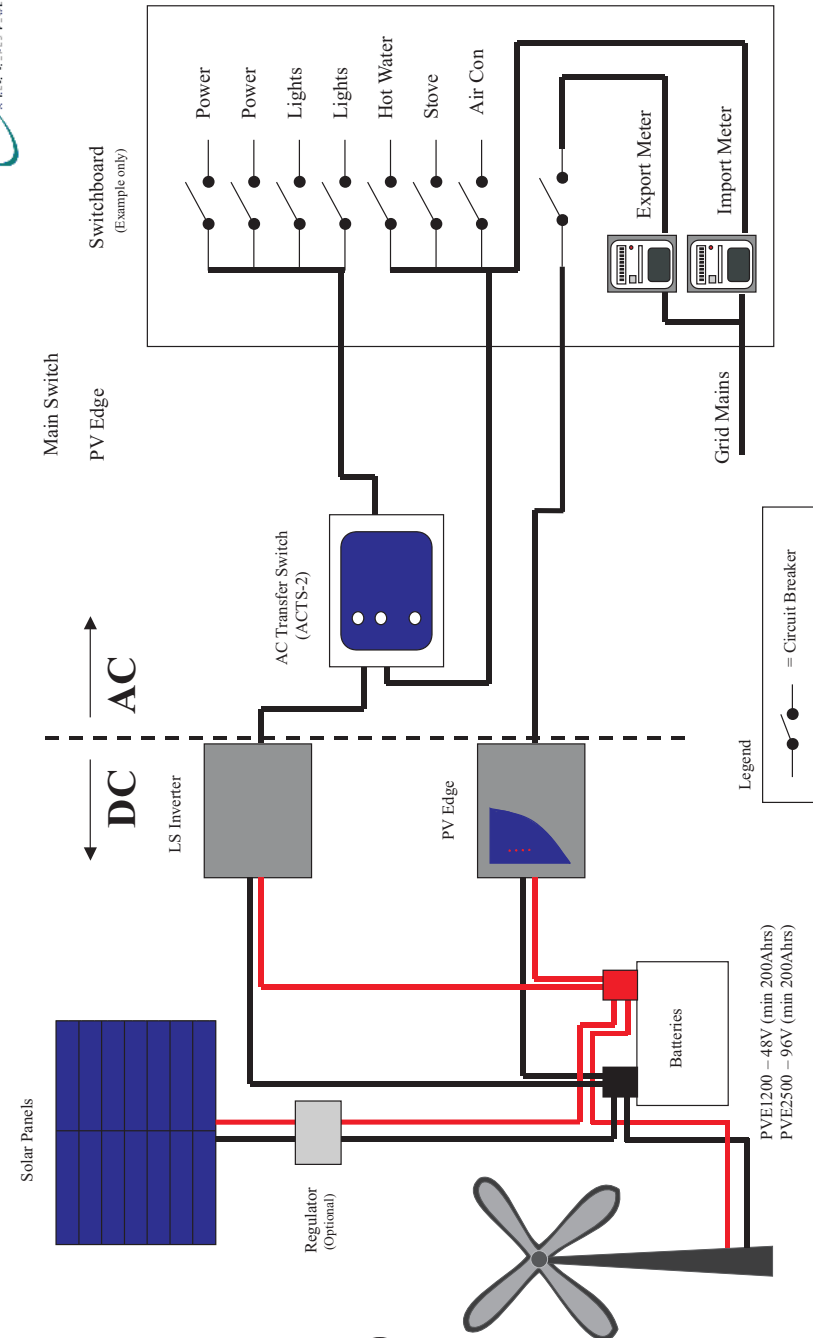
Panel Power At 25°C	Module Type	Number of Panels Per String	No. of Strings	Solar Input Power
100W	12V	4	4	1600W
125W	12V	4	3	1500W
130w	12V	4	3	1560W
165W	24V	2	4	1320W
175W	24V	2	4	1400W
185W	24V	2	4	1480W
190W	24V	2	4	1520W

PVE 2500 (Max Solar Input: 3100Wp)

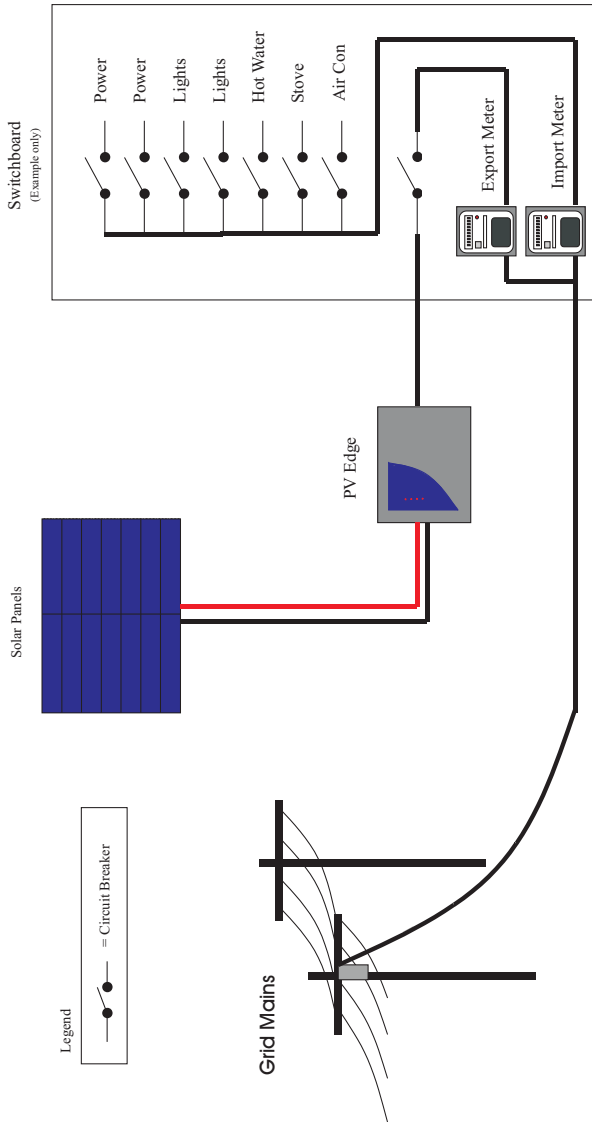
Panel Power At 25°C	Module Type	Number of Panels Per String	Number of Strings	Solar Input Power
110W	12V	8	3	2640W
125W	12V	8	3	3000W
140W	24V	4	5	2800W
150W	24V	4	5	3000W
160W	24V	4	4	2560W
165W	24V	4	4	2640W
175W	24V	4	4	2800W
185W	24V	4	4	2960W
190W	24V	4	4	3040W

- Note 1:** The DC input is suitable for connection to solar modules only, when MPPT is enabled.
- Note 2:** Do not exceed recommended Maximum DC Input Power.
- Note 3:** All solar modules should be of the same type and brand. Therefore the maximum power point and voltage variation with temperature are consistent for all modules, which will ensure maximum system output.

Battery Back-Up System



Standard Grid Connect System



WARNING:

The Inverter output is connected to mains electricity, thus it is important that all AC wiring complies with the requirements of the relevant wiring standards, (AS3000, AS4777).

Any work carried out on AC/Mains wiring is to be performed by Qualified And Licensed personnel only.

DIP SWITCH SETTINGS

Switch 1 -MPPT / Battery mode

In the ON position (**default**) the Maximum Power Point Tracking is enabled. This is required when the DC input is Photovoltaic Solar Modules only. In the OFF position the Maximum Power Point Tracking is disabled and the voltage tracking will operate at a fixed voltage of 54V (PVE1200) or 108V (PVE2500). This setting is required in a system where a 48V (PVE1200) or 96V (PVE2500) Battery Bank is required on the DC input.

Switch 2 - 50/60 Hz

In the ON position the Inverter is set for 60Hz operation. In the OFF position (**default**) the Inverter is set for 50Hz operation.

Switch 3

Battery type selector not used if switch 1 is ON.
ON = Gel/SLA battery.
OFF = Flooded battery. (**default**)

Switch 4

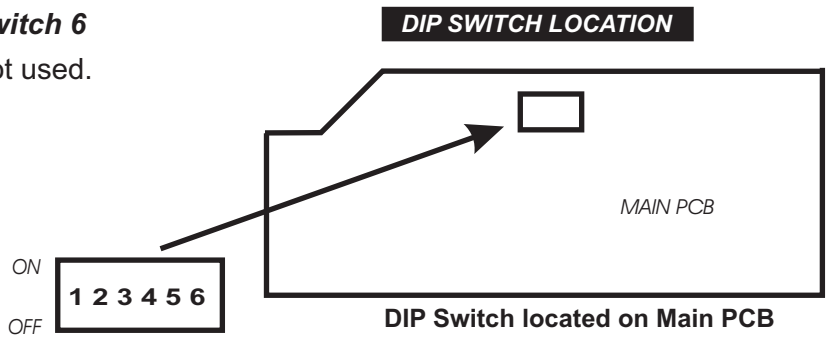
Must be in OFF position (**default**) for normal operation. The ON position is a factory AC test setting.

Switch 5

Must be in the OFF position (**default**) for normal operation. The ON position is a factory DC test setting.

Switch 6

Not used.



WARNING:

Due to dangerous voltages existing inside the unit, make sure the DC circuit breaker and AC solar isolator are turned off before opening the unit. Only *qualified Trades Persons* are permitted to adjust these settings.

SPECIAL FEATURES

Circuit Breakers

There is one double pole DC circuit breaker isolating both DC positive & DC negative.

Digital kWh Meter

The kWh meter shows an accumulative reading of the total power generated and allows the user to monitor their green power production. LCD display with 5 digits and 2 decimal places (i.e. 99999.99kwh).

Note: When you new Inverter arrives there will be a small amount of power already registered on the meter. This is due to the factory testing.

Night Time Disconnect

After dark when the solar input is no longer available the Inverter will automatically disconnect from the AC grid. This feature ensures that during the night, the Inverter cannot consume any power whatsoever while remaining idle. Upon sunrise the next morning when solar input becomes available again, the PV edge will automatically reconnect to the AC grid and begin generating power.

Parallel Operation

The PV edge automatically synchronizes to the AC grid, therefore the output of multiple units can all be connected together, and they will all be synchronized by the AC grid.

Note: The Solar inputs of multiple unit Inverters are not to be paralleled.

Maximum Power Point Tracking

The optimum power level from the solar input depends on the available solar modules. Even in cloudy weather with fluctuations in the solar radiation level, the PV Edge constantly monitors and tracks the optimum operating point to ensure maximum power from the solar modules is achieved.

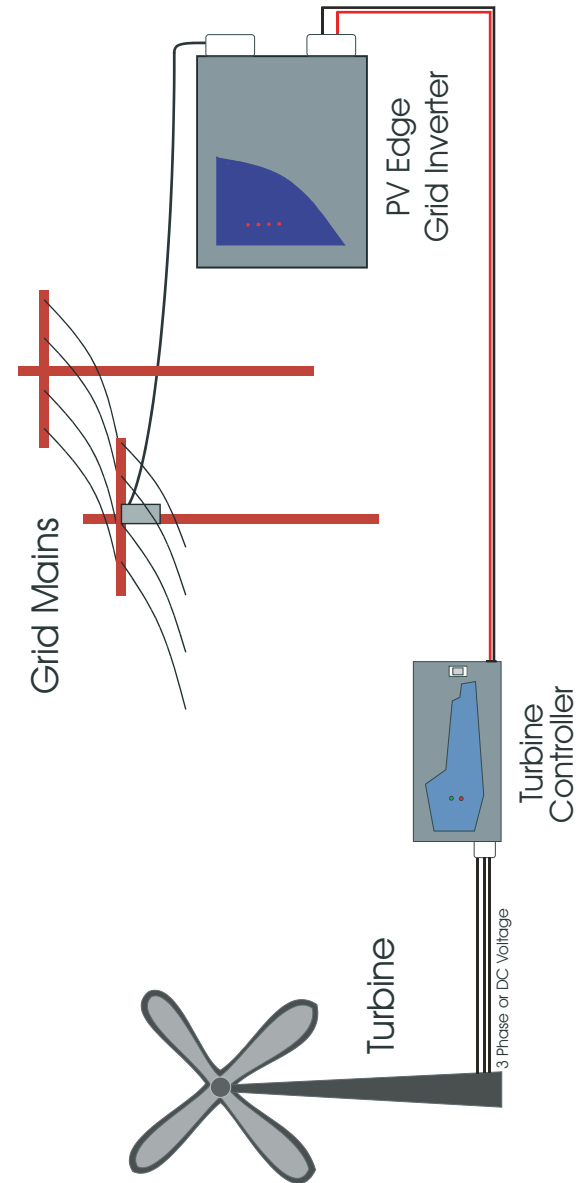
Protection

The AC grid supply is constantly monitored for under and over voltage, over and under frequency, and anti islanding conditions via active phase shifts. Isolation between the DC input and AC output is achieved via the Toroidal Transformer. The Inverter is fitted with a cooling fan, which is temperature controlled and only operates when required.

Maintenance Cycle

When in Battery mode (MPPT disabled) a maintenance cycle is performed every 30 days. This is a short boost cycle for sealed batteries or an equalize charge for flooded cells. In this mode the bottom LED will flash slowly until the cycle is completed.

12



9

NOTE: PV Edge must be in Battery Mode. (See pg 13)

The Latronics Turbine Controller utilizes the latest in micro-controller design to deliver a stable and safe supply of power to the grid connect inverter. Designed specifically to integrate with the PV Edge line of Latronics inverters, it allows battery-less grid connection of wind and water turbines.

INVERTER OPERATION

When the Inverter is switched on all 4 LED'S light up for 1 second while the microprocessor performs a start up and system check procedure.

100% Light (Overload)

This light illuminates when the power level is between 75% - 100%. This light also indicates overtemp/overload. In this mode the lower lights will be OFF and this light will flash.

75% Light (AC Grid)

This light will be ON when the power level is between 50% -75%.

This light also has 2 other modes of operation.

When in either of these 2 modes the bottom light will be OFF.

This light will be ON when the solar input is present and the AC grid is disconnected and/or awaiting reconnection.

This light will FLASH for 90 seconds when the inverter initially connects to the AC grid and performs a voltage and frequency stability check before feeding power into the AC grid.

50% Light (AC Fault)

This light will be ON when the power level is between 25% - 50%. When an AC fault is present this light will FLASH and the bottom light will be OFF.

25% Light

This light will be ON when the power level is between 0% - 25% or it will flash during a battery maintenance cycle (see pg12).

Indicator Lamps

The 4 lights on the front panel indicate the Inverter power level in increments of 25%

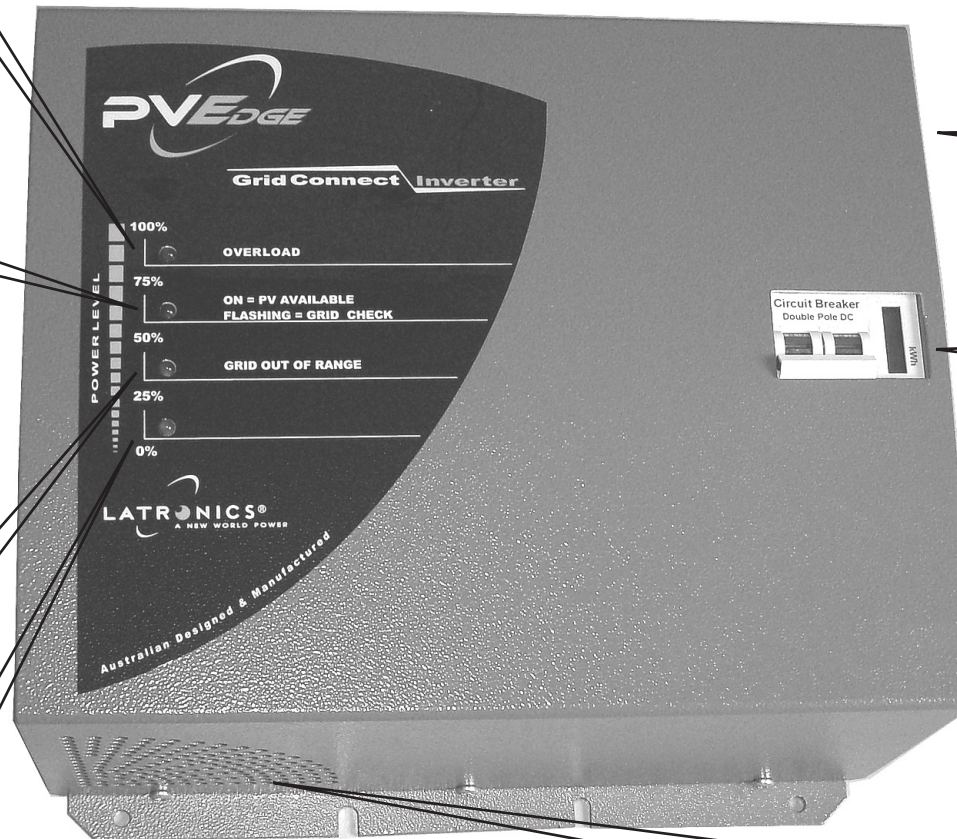
LED 4 -100% (top Led).

LED 3 - 75%.

LED 2 - 50%.

LED 1 - 25%. (Bottom Led).

If the Inverter were supplying 60% of Full power then Led's 1, 2 & 3 would be illuminated.



DC Solar Connector

For easy connection and disconnection of DC Input Power from Solar Panels or Battery Bank.

Circuit Breakers

ON - OFF switch
DC Circuit Breakers & kWh Meter

Plug & Play AC Connector

For easy connection and disconnection to AC grid.

Fan

If the temperature inside the Inverter reaches preset levels, the variable speed fan will switch on initially in low speed and then into higher speed if the temperature continues to increase. Obstruction of the air intake and output will reduce the power rating of the Inverter.