



**2U 19"/23" Rack-mount Model
RM - UIPSW3KVA Series
Pure Sine Wave Inverter
User Manual**

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1. Features

- Pure sine wave output (THD < 3%) R Load
- By pass function
- Inverter mode / UPS mode
- Output frequency: 50 / 60Hz switch
- RS – 232 interface / Remote controls port / Wire connection to PC
- Wired Remote control
- Loading controlled cooling fan
- Advanced microprocessor
- Protection : Input low voltage Overload Short circuit
 Low battery alarm Input over voltage Over temperature

1-1 Utilities Application

1-1-1 Power tools – circular saws, drills, grinders, sanders, buffers, weed and hedge trimmers, air compressors.

1-1-2 Office equipment – computers, printers, monitors, facsimile machines, scanner.

1-1-3 Household items – vacuum cleaners, fans, fluorescent and incandescent lights, shavers, sewing machines,

1-1-4 Kitchen appliances – microwave ovens, refrigerators and freezers, coffee makers, blenders, ice makers, toasters.

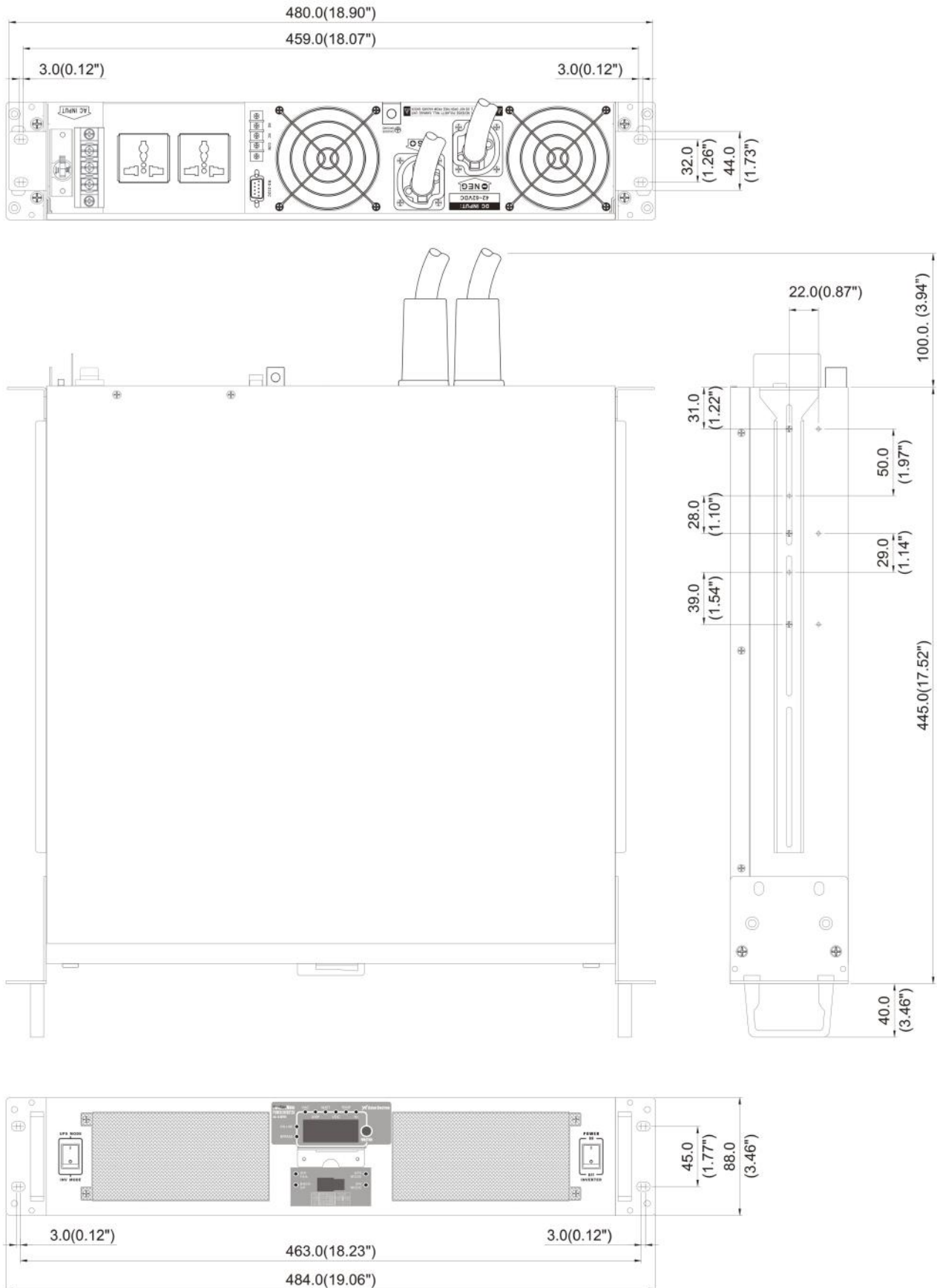
1-1-5 Industrial equipment – metal halide lamp, high – pressure sodium lamp.

1-1-6 Home entertainment electronics – television, VCRs, video games, stereos, musical instruments, satellite equipment.

1-2 Electrical Performance

| Specification | Model | | | | | | | | | | |
|----------------------------------|--|--------------------|--------------------|---------------------|---------------------|---|---------------------|---------------------|----------------------|----------------------|--|
| Item | RM-UIPSW 123KVA | RM-UIPSW 243KVA | RM-UIPSW 483KVA | RM-UIPSW 1103KVA | RM-UIPSW 2203KVA | RM-UIPSW 123KVAE | RM-UIPSW 243KVAE | RM-UIPSW 483KVAE | RM-UIPSW 1103KVAE | RM-UIPSW 2203KVAE | |
| Continuous Output Power | 3000W | | | | | | | | | | |
| Surge Rating | 3Min. | 3200W | | | | | | | | | |
| | 3Sec. | 3500W | | | | | | | | | |
| Peak | 6000W | | | | | | | | | | |
| Input Voltage | 12V | 24V | 48V | 110V | 220V | 12V | 24V | 48V | 110V | 220V | |
| Frequency | 50/60Hz \pm 0.05% (Switch Selectable) | | | | | | | | | | |
| Output Voltage Adjustment | 100~120VAC (Tune VR) | | | | | 200~240VAC (Tune VR) | | | | | |
| Peak Output Current | 54A | | | | | 27A | | | | | |
| Efficiency (full load) | 86% | 88% | 89% | 94% | 94% | 87% | 90% | 92% | 94% | 94% | |
| No load Current Draw | 1.50A | 0.82A | 0.39A | 0.16A | 0.11A | 2.20A | 1.08A | 0.55A | 0.28A | 0.12A | |
| Output Wave form | R Load Pure Sine Wave < 3% THD | | | | | | | | | | |
| P.F. | 1.0 | | | | | 1.0 | | | | | |
| Input Voltage Range | 10-16 VDC | 20-32 VDC | 42-62 VDC | 90-140 VDC | 180-275 VDC | 10-16 VDC | 20-32 VDC | 42-62 VDC | 90-140 VDC | 180-275 VDC | |
| DC Input over voltage alarm | 15.5VDC | 31.0VDC | 61.0VDC | 135.0VDC | 270.0VDC | 15.5VDC | 31.0VDC | 61.0VDC | 135.0VDC | 270.0VDC | |
| DC Input over voltage shut-down | 16.0VDC | 32.0VDC | 62.0VDC | 140.0VDC | 275.0VDC | 16.0VDC | 32.0VDC | 62.0VDC | 140.0VDC | 275.0VDC | |
| DC Input under voltage alarm | 10.5VDC | 21.0VDC | 43.0VDC | 95.0VDC | 185.0VDC | 10.5VDC | 21.0VDC | 43.0VDC | 95.0VDC | 185.0VDC | |
| DC Input under voltage shut-down | 10.0VDC | 20.0VDC | 42.0VDC | 90.0VDC | 180.0VDC | 10.0VDC | 20.0VDC | 42.0VDC | 90.0VDC | 180.0VDC | |
| Protection | Overload, Short Circuit, Reverse Polarity (Fuse), Over/Under Input Voltage, Over Temperature | | | | | | | | | | |
| Digital Display | OVP, UVP, OTP, OLP, VAC, AMP, WATT, VDC, TEMP, Hz | | | | | | | | | | |
| Safety | EN60950-1 | | | | | | | | | | |
| EMC | FCC Class A | | | | | EN 55022: 2006 · Class A EN 61000-3-2: 2006 EN 61000-3-3: 1995+ A1:2001+A2:2005 | | | | | |
| Interface Control Port | RS-232C With Baud Rate 2400, 4800, 9600, 19200 (Switch Selectable) | | | | | | | | | | |
| Remote Control Unit | Optional | | | Can't support | | | Optional | | | Can't support | |
| AC Input | 110VAC(90~130V) | | | | | 220VAC(180~260V) | | | | | |
| AC Frequency | (50Hz ~ 60 Hz) \pm 3% | | | | | (50Hz ~ 60 Hz) \pm 3% | | | | | |
| Bypass | 4~10ms | | | | | 4~10ms | | | | | |
| | Inverter mode or UPS mode by switch | | | | | | | | | | |
| Operating Temperature Range | -20°C to 50°C | | | | | | | | | | |
| Storage Temperature Range | -30°C to 70°C | | | | | | | | | | |
| Cooling | Loading controlled cooling fan | | | | | | | | | | |
| Dimensions | 445(L) × 424(W) × 88(H) mm | | | | | | | | | | |
| Weight | 14.3kgs | | | | | | | | | | |

1-3 Mechanical Drawings



2. Introduction:

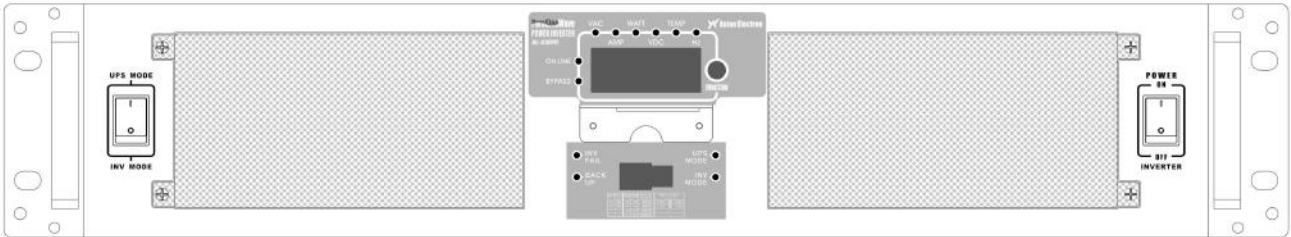
The power inverter series are the member of the most advanced line of mobile AC power systems available.

To get the most out of the power inverter, it must be installed and used properly.

Please read the instructions in this manual before installing and using this model.

2-1 Front Panel Operation :

2-1-1 Front view :



2-1-2 ON / OFF switch :

Power ON / OFF switch, leave in the OFF position during installation.

2-1-3 Function Key

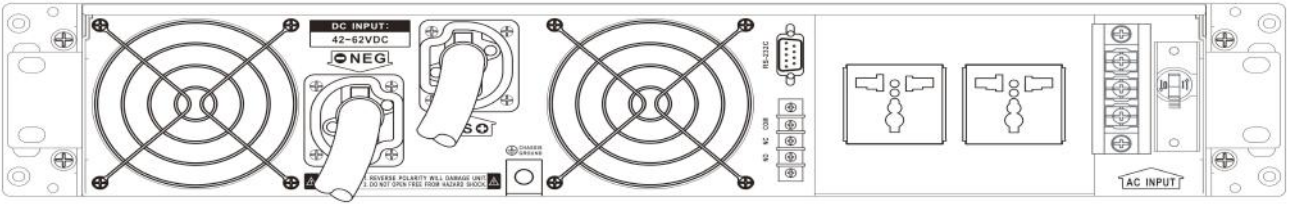
When sequentially push "Function Key", it will display various status on the function screen, Such as VAC, Amp, watts... and so on.

When malfunction is occurred, its display will be flashed on the screen.

2-1-4 AC outlet (Outlet sockets available) :

| | |
|----------------------------|-------------------------------------|
| Universal | Australia / New Zealand |
| | |
| United Kingdom | Continental European(SCHUKO) |
| | |
| North America(GFCI) | North America |
| | |
| AC terminal block | IEC |
| | |

2-2 Rear Panel Operation :



2-2-1 Ventilation openings :

Do not obstruct, allow at least 3 inch for air flow.

2-2-2 Battery terminals :

Connect to 12V / 24V / 48V solar panel or other 12V / 24V / 48V power Source. **【 + 】** is positive, **【 - 】** is negative. Reverse polarity connection will blow internal fuse and may damage inverter permanently.

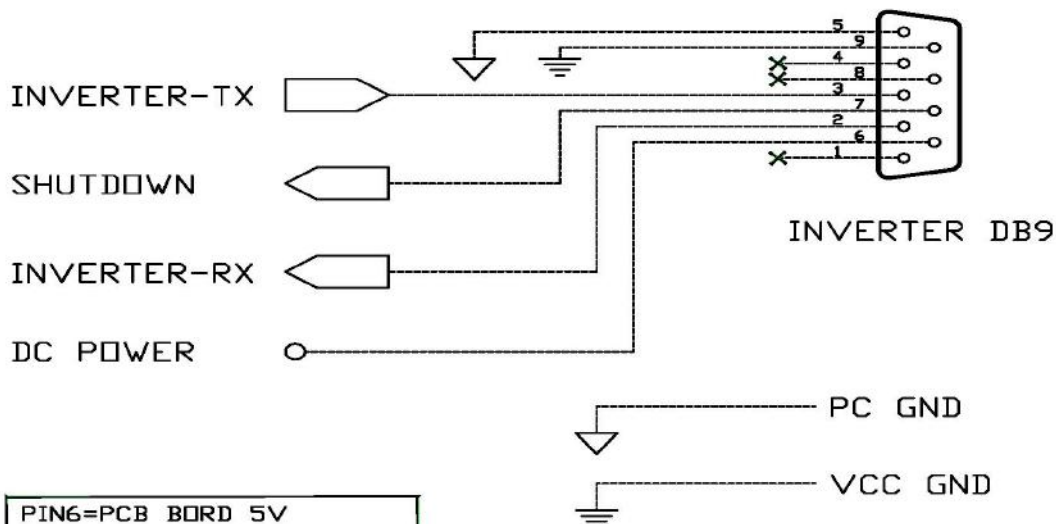


WARNING!

Do not connect the 12V model to a 24V solar panel, the unit will be destroyed immediately.

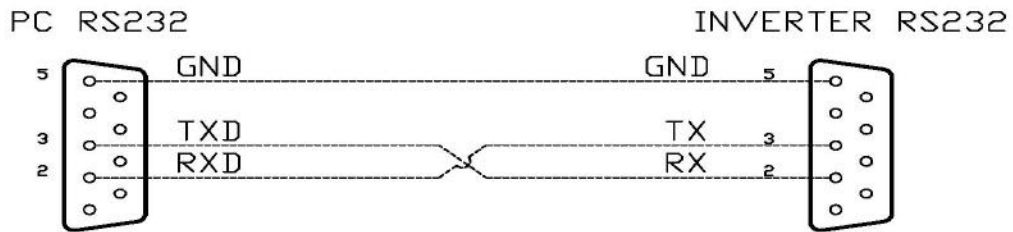
2-2-3 RS-232:

Connect to remote control unit (option accessory) or connect to computer to remote control working status.



PIN6=PCB BORD 5V
 PIN7=REMOTE ON/OFF
 PIN9=VCC GND
 * PIN6,PIN7,PIN9 ARE FOR
 REMOTE CONTROL USE,
 NOT FOR PC CONNECTION.

PART NAME: RS232_PIN_ASSIGNMENT_V00
 SCALE:1/1, Qty: by set, UNIT:mm
 DATE:20080728
 1. UNSPECIFIED THICKNESS TO BE
 2. UNSPECIFIED RADIUS TO BE MIN
 3. UNSPECIFIED ALLDANCE TO BE
 4. UNSPECIFIED DIMENSION TO FOLLOW ORIGINAL DATA



PART NAME: RS232-PC_PIN ASSIGNMENT_V00
 SCALE: 1/1, Qty: by set, UNIT: mm
 DATE: 20080728
 1. UNSPECIFIED THICKNESS TO BE
 2. UNSPECIFIED RADIUS TO BE MIN
 3. UNSPECIFIED ALLOWANCE TO BE
 4. UNSPECIFIED DIMENSION TO FOLLOW ORIGINAL DATA



WARNING!

Any damages caused by using incorrect RS232 cable will be outside of our warranty scope. If you are not sure which one is correct RS232 cable, please purchase the correct RS232 cable from us directly.

2-2-4 Connect chassis ground terminal to earth or to vehicle chassis using # 8 AWG wire.



WARNING!

Operation of the inverter without a proper ground connection may result in an electrical safety hazard.



WARNING!

Shock Hazard. Before proceeding Further, Carefully check the inverter is NOT connected to any batteries, and that all wiring is disconnected from any electrical sources. Do not connect the output terminals of the inverter to an incoming AC source.

2-3 Installation:

Where to install.

The power inverter should be installed in a location that meets the following requirements.

2-3-1 Dry – Do not allow water to drip or splash on the inverter.

2-3-2 Cool – Ambient air temperature should be between -20°C and 50°C, the cooler the better.

2-3-3 Safe – Do not install in a battery compartment or other areas where flammable fumes may exist, such as fuel storage areas or engine compartments.

2-3-4 Ventilated – Allow at least one inch of clearance around the inverter for air flow. Ensure the ventilation openings on the rear and bottom of the unit are not obstructed.

2-3-5 Dust-free – Do not install the Inverter in a dusty environments where are dust, wood particles or other filings/shavings. The dust can be pulled into the unit when the cooling fan is operating.

2-3-6 Close to batteries – Avoid excessive cable lengths but do not install the Inverter in the same compartment as batteries.

Use the recommended wire lengths and sizes (see section 2-6).

Also do not mount the Inverter where it will be exposed to the gases produced by the battery.

These gases are very corrosive and prolonged exposure will damage the Inverter.

2-3-7 You can choose **Inverter** mode or **UPS** mode freely. If inverter mode fail, the device will connect to UPS mode automatically. If UPS mode fail, the device will connect to Inverter mode automatically. It will not influence the performance of server and could supply a uninterrupted power to the ultimate load.

2-4 Quick hook – up and testing:

2-4-1 Unpack and inspect the power inverter, check to see that the power switch in the OFF position.

2-4-2 Connect the cables to the power input terminals on the rear panel of power inverter.

The red terminal is positive (+) and black terminal is negative (-).

Insert the cables into the terminals and tighten relative nut to clamp the wires securely.



WARNING !

You may observe a spark when you make this connection since current may flow to charge capacitors in the power inverter.

Do not make this connection in the presence of flammable fumes, explosion or fire may result.

**WARNING!**

Make sure all the DC connections are tight (torque to 9-10 ft-lbs, 11.7-13Nm). Loose connections will overheat and could result in a potential hazard.

- 2-4-3 Before proceeding further, carefully check that cable you have just connected negative terminal of inverter to the negative output power source.

**CAUTION !**

Reverse polarity connection will blow a fuse in Inverter and may permanently damage the inverter. Damage caused by reverse polarity connection is not covered by our warranty.

- 2-4-4 Connect the cable from the negative terminal of the inverter to the negative terminal of the power source. Make a secure connection.

**WARNING !**

You may observe a spark when you make this connection since current may flow to charge capacitors in the power inverter. Do not make this connection in the presence of flammable fumes, explosion or fire may result.

- 2-4-5 Set the power switch to the ON position; you will hear the “bi-bi-bi” sound. At the same time, the display is showed the word “ASIAN” for two times. After that, you will hear the continuous sound from internal alarm. Then, the AC voltage shows on the display. It means the device has done the operation.
- 2-4-6 Set the power switch to the OFF position; the device shut down completely.
- 2-4-7 Please use a power meter accurately measure the true output R.M.S. voltage of inverter. We use a power meter such as IDRC CP-350 or ABM 2019 to measure our product.

2-5 AC Safety Grounding:

During the AC wiring installation, Ac input and output ground wires are connected to the inverter. The AC input ground wire must connect to the incoming ground from your AC utility source.

The AC output ground wire should go to the grounding point for your loads (for example, a distribution panel of bus chassis).

2-5-1 Neutral Grounding (GFCI's) :

2-5-1-1 **120V models:** The neutral conductor of the AC output circuit of the Inverter is automatically connected to the safety ground during inverter operation. This conforms to national electrical code requirements that separately derived AC sources (such as inverter and generators) have their neutral conductors tied to ground in the same way that the neutral conductor from the utility is tied to ground at the GFCI breaker panel. For models configured with a transfer relay, while AC utility power is presenting and the Inverter is in bypass mode, this connection (neutral of the Inverter's AC output to input safety ground) is not present so that the utility neutral is only connected to ground at your breaker panel, as required.

2-5-1-2 **230V models:** There is no connection made inside the Inverter from either the line or neutral conductor to the safety ground.



WARNING!

Do not operate the power inverter without connecting it to Ground. Electrical shock hazard may result.

2-6. Marking DC Wiring Connections:

Follow this procedure to connect the battery cables to the DC input terminals on the Inverter. Your cables should be as short as possible (ideally, less than 10 feet / 3 meters) and large enough to handle the required Current in accordance with the electrical codes or regulations applicable to your installation.

Cables that are not an adequate gauge (too narrow) or are too long will cause decreased inverter performance such as poor surge capability and frequent low input voltage warnings and shutdowns.

These low input voltage warnings are due to DC voltage drop across the cables from the inverter to the batteries.

The longer and narrower these cables, the greater the voltage drop.



WARNING !

The installation of a fuse must be on positive cable. Failure to place a fuse on “ + “ cables running between the inverter and battery may cause damage to the inverter and will void warranty

Increasing your DC cable size will help improve the situation.

Our company recommends the following cables for optimum inverter performance (apply both 120V and 230V versions)

| Model No | Wire AWG | Inline Fuse |
|-------------------------------------|----------|-------------|
| RM-UIPSW123KVA RM-UIPSW123KVAE | #4/0 | 400A |
| RM-UIPSW243KVA RM-UIPSW243KVAE | #2/0 | 200A |
| RM-UIPSW483KVA RM-UIPSW483KVAE | #1/0 | 100A |
| RM-UIPSW1103KVA RM-UIPSW1103KVAE | #2 | 50A |
| RM-UIPSW2203KVA RM-UIPSW2203KVAE | #4 | 25A |

Also, use only high quality copper wiring and keep cable length short from 3-6 feet.

2-7 Inverter Operation:

To operate the power inverter, turn it on using the ON/OFF switch on the front panel. The power inverter is now ready to deliver AC power to your loads.

If you are operating several loads from the power inverter, turn them on separately after the inverter has been turned on.

This will ensure that the power inverter does not have to deliver the starting currents for all the loads at once.

2-7-1 Controls and indicators :

The ON / OFF switch turns the control circuit in the power inverter on and off.

Inverter operates from an input voltage ranging from :

10.0 to 16.0 VDC for 12V models

20.0 to 320.0 VDC for 24V models

42.0 to 62.0 VDC for 48V models

90 to 140 VDC for 110V models

180 to 275VDC for 220V models

The Inverter will indicate high and low DC voltage conditions as follows:

| Model | DC Input over voltage shut-down | DC Input over voltage alarm | DC Input under voltage alarm | DC Input under voltage shut-down |
|-------------------------------------|---------------------------------|-----------------------------|------------------------------|----------------------------------|
| RM-UIPSW123KVA RM-UIPSW123KVAE | 16.0VDC | 15.5VDC | 10.5VDC | 10.0VDC |
| RM-UIPSW243KVA RM-UIPSW243KVAE | 32.0VDC | 31.0VDC | 21.0VDC | 20.0VDC |
| RM-UIPSW483KVA RM-UIPSW483KVAE | 62.0VDC | 61.0VDC | 43.0VDC | 42.0VDC |
| RM-UIPSW1103KVA RM-UIPSW1103KVAE | 140VDC | 135VDV | 95VDC | 90VDC |
| RM-UIPSW2203KVA RM-UIPSW2203KVAE | 275VDC | 270VDC | 185VDC | 180VDC |

2-7-2 Output Voltage Indicator :

LED displays light on VAC as show as output Voltage value

2-7-3 Output Current Indicator

LED displays light on AMP as show as output current value

2-7-4 Output Watts Indicator

LED displays light on Watts as show as output Watts value

2-7-5 Input DC Voltage Indicator

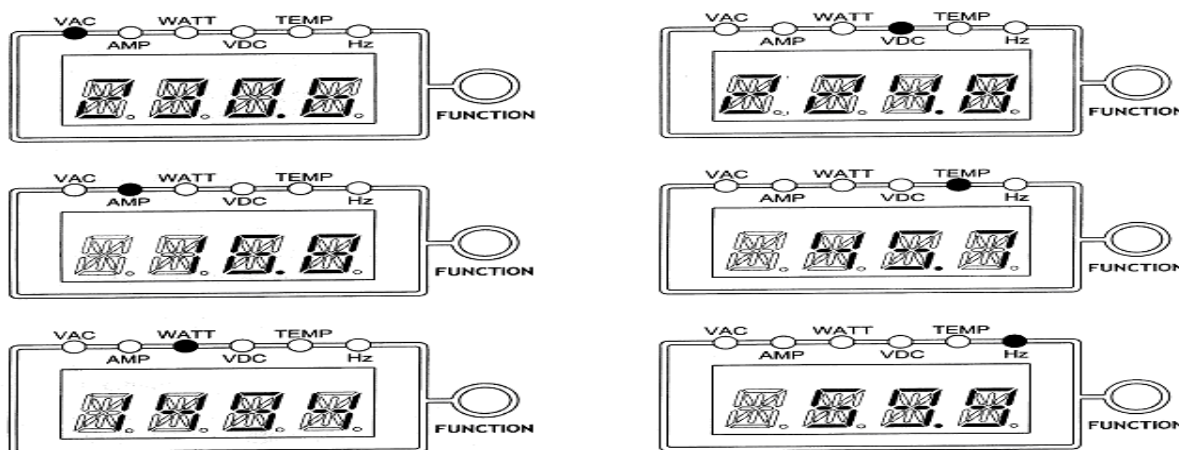
LED displays light on VDC as show as input DC voltage value

2-7-6 Temperature Indicator

LED displays light on TEMP as show as internal operating temperature value

2-7-7 Output Frequency DC Indicator

LED displays light on Hz as show as output frequency value.



Please have the accuracy of 6 functions of display, as below:

| Function | VAC | | AMP | WATT | VDC | | | | | TEMP | Frequency | |
|----------|----------------|----------------|---------|-------|--------------|--------------|--------------|---------------|----------------|--------|-----------|-------|
| Range | 100-120 VAC | 200-240 VAC | 0-30A | 0-3KW | 10-16 VDC | 20-32 VDC | 42-62 VDC | 90-140 VDC | 180-275 VDC | 0-120□ | 50Hz | 60Hz |
| Accuracy | ± 1% | ± 1% | 1%±0.5A | ± 3% | ± 2% | ± 2% | ± 2% | ± 2% | ± 2% | ± 1% | ±0.01 | ±0.01 |

2-7-8 Over voltage protection indicator: (OVP)

The over voltage indicator indicates that the power inverter has shut itself down because its input voltage exceeded 110/220VDC version. (Ref.point 2-7-1)

2-7-9 Under voltage protection indicator: (UVP)

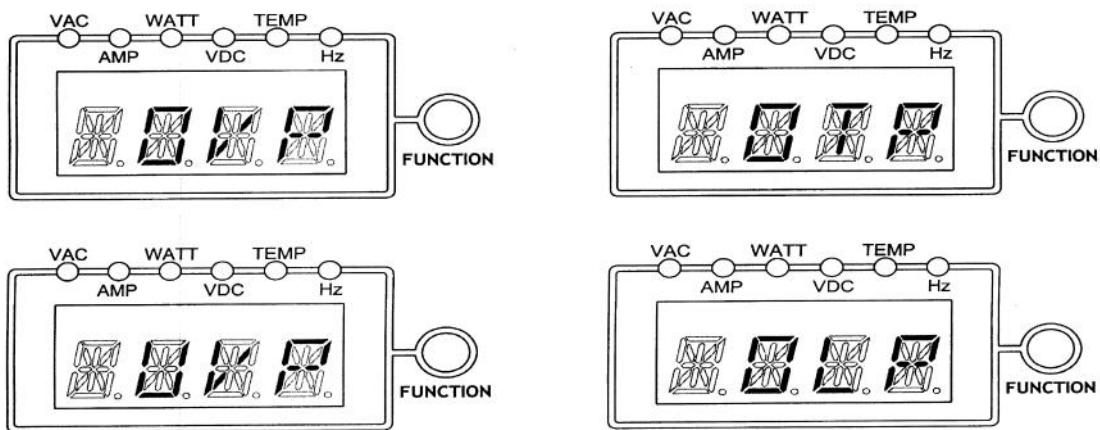
The under voltage indicator indicates that the power inverter has shut itself down because its input voltage fell below 110 / 220VDC. (Ref.point 2-7-1)

2-7-10 Over temp protection indicator : (OTP)

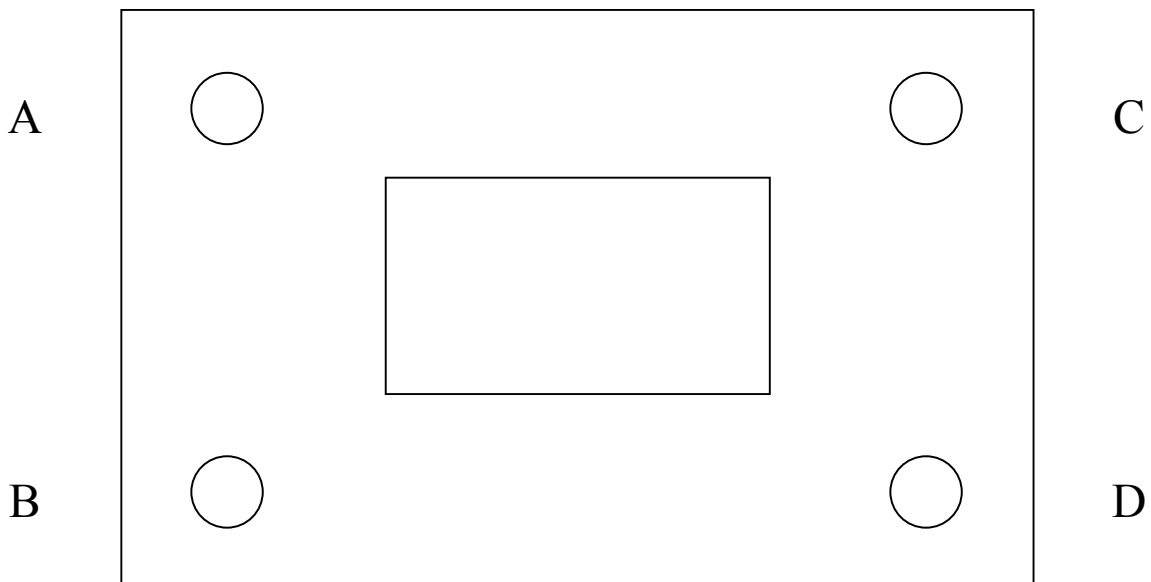
The over temp indicator indicates that the power inverter has shut itself down because its temp has become overheated. The power inverter may overheat because it has been operated at power levels above its rating, or because it has been installed in a location which does not allow it to dissipate heat properly. The power inverter will automatically back up, once it has cooled off.

2-7-11 Overload protection indicator : (OLP)

The overload indicator indicates that the power inverter has shut itself down. When output voltage over continue power, then must return to operate manually.

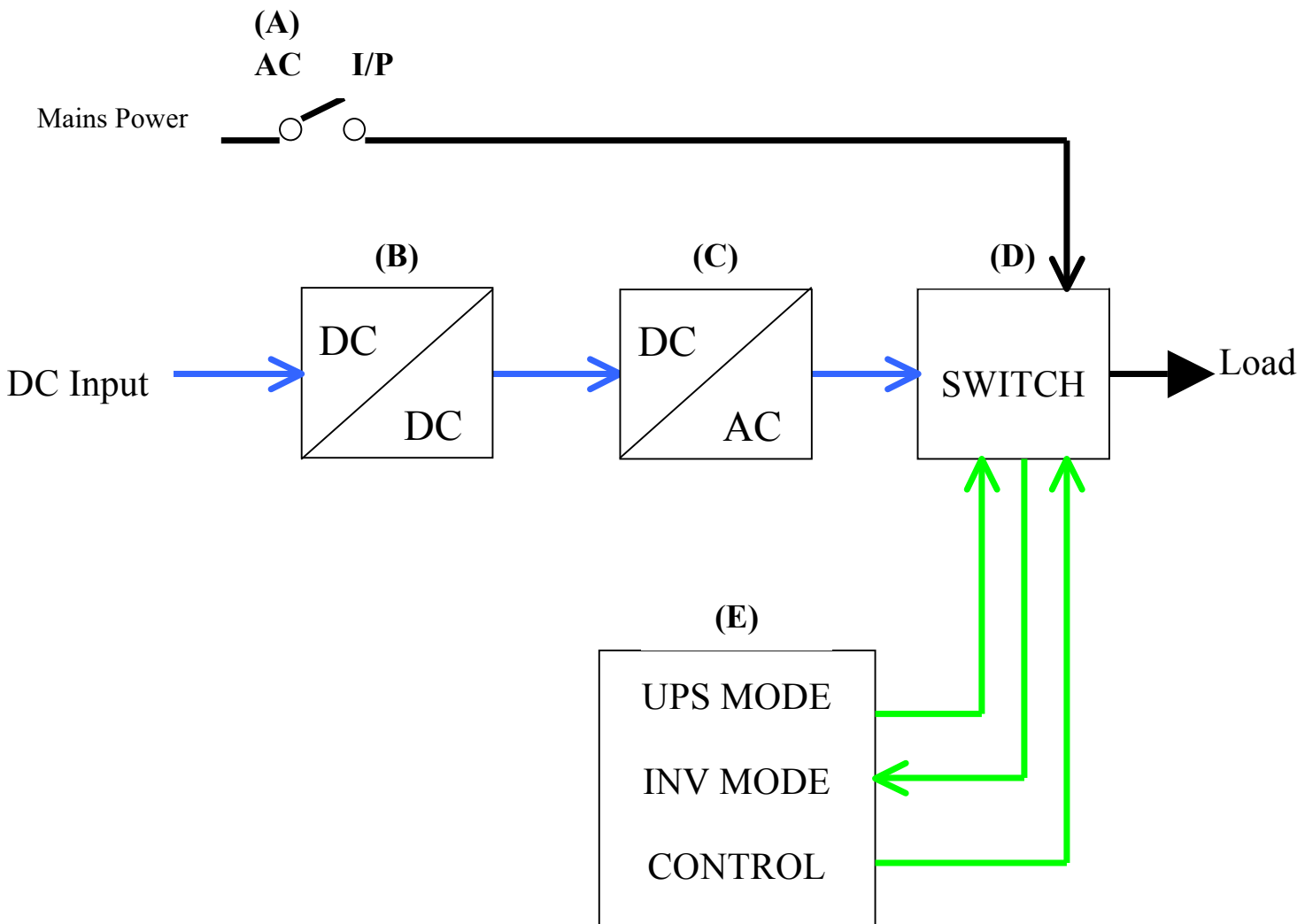


2-7-12 Display Instructions



- A: Inverter Fault
- B: Back Mode
- C: UPS Mode
- D: Inverter Mode

2-7-13 Flow Chart



(A) AC INPUT SWITCH

(B) DC TO DC

(C) DC TO AC

(D) SWITCH

(E) UPS MODE & INVERTER MODE

UPS MODE: If DC to AC Inverter fails the UPS mode (mains input) takes over

INVERTER MODE: If UPS mode (mains input) fails the Inverter takes over

2-8 Cooling fan working code:

Cooling fan of inverter is through detecting output power and over temperature situation to work.

When start to turn on the inverter and output power is under 300W, the cooling fan does not start running. It complies with saving energy sources requirement. Until, output power is up to 300W, the cooling fan will start to work in order to drop the inner temperature.

If the ventilation opening is obstructed, the inverter will enter over temperature protection mode (OTP) and shut down. The cooling fan will continue working to drop the inner temperature. When the temperature comes down to normal situation, the inverter will turn on automatically.

3. Maintenance :

Very little maintenance is required to keep your inverter operating properly.

You should clean the exterior of the unit periodically with a dry cloth to prevent accumulation of dust and dirt. At the same time, tighten the Screws on the DC input terminals.

4. Troubleshooting guide:



WARNING !

Do not open or disassemble the Inverter, attempting to service the unit yourself may result in a risk of electrical shock or fire.

| Problem & Symptoms | Possible Cause | Solution |
|--|--|---|
| Low output voltage (110V: 95-105VAC 220V: 190-210VAC) | Using average reading voltmeter | Use true RMS reading meter and cable. (Ref. point 2-4-7) |
| Load Display OLP flash. | Over load | Reduce load. |
| No output voltage Fault input voltage. | Low/High input voltage | Recharge battery, check connections and cable. (Ref. point 2-7-1) |
| No output voltage Over Temp indicator Load less than 2500W | Thermal shutdown | Improve ventilation , Make sure ventilation openings in inverter are not obstructed, Reduce ambient temperature. |
| No output voltage, Over load indicator | Short circuit or wiring error very high power load | Check AC wiring for short circuit or improper polarity (hot and neutral reversed) Remove load. |

5. Warranty :

We warrant this product against defects in materials and workmanship for a period of 12 months from the date of purchase and will repair or replace any defective power inverter when directly returned (postage paid) to us.

This warranty will be considered void if the unit has suffered any obvious damage by natural and man-made factors, or alteration either internal or external and does not cover damage arising from improper use such as plugging the unit into an unsuitable power sources attempts to operate products with excessive power consumption requirement, or use in unsuitable environments.

This is the only warranty that the company makes.

No other warranties express or imply including warranties of merchantability and fitness for a particular purpose.

Repair and replacement are your sole remedies and the company shall not be liable for damages, whether direct, incidental, special or consequential, even though caused by

negligence or other fault.

6. Important Safety Instructions



WARNING !

Before you install and use your Inverter, be to read and save these safety instructions.

6-1 General Safety Precautions

- 6-1-1 Do not expose the Inverter to rain, snow, spray, bilge or dust. To reduce risk of hazard, do not cover or obstruct the ventilation openings. Do not install the Inverter in a zero-clearance compartment. Overheating may result.
- 6-1-2 To avoid a risk of fire and electronic shock. Make sure that existing wiring is in good electrical condition; and that wire size is not undersized. Do not operate the Inverter with damaged or substandard wiring.
- 6-1-3 This equipment contains components which can produce arcs or sparks. To prevent fire or explosion do not install in compartments containing batteries or flammable materials or in locations where require ignition protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, or joints, fittings, or other connection between components of the fuel system.

6-2 Precautions When Working with Battery bank

- 6-2-1 If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 20minutes and get medical attention immediately.
- 6-2-2 NEVER smoke or allow a spark or flame in vicinity of battery or engine.
- 6-2-3 Do not drop a metal tool on the battery. The resulting spark or short-circuit on the battery or other electrical part may cause an explosion.
- 6-2-4 Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery.
A lead-acid battery produces a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.

7. Appendices A

7-1. Dip Switch (at the left side of inverter)

| S1 | FREQ (Hz) | S2 | S3 | BAUD RATE | ACV-ADJ (VAC) |
|-----|--------------|-----|-----|--------------|---|
| ON | 60 | ON | ON | 2400 | 240  200 |
| OFF | 50 | OFF | ON | 4800 | 120  100 |
| — | — | ON | OFF | 9600 | — |
| — | — | OFF | OFF | 19200 | — |

S1: Freq (Hz)

S2/S3: Baud Rate

When you set up S1~S3, please reset the inverter and let update data through CPU.

7-2 Tune VR

Tune VR (VAC) output voltage from 100 – 120 VAC or 200 – 240 VAC

The VAC value will gradually increase; tune VR from right to left.

RE-MARK:

The user manual is subject to change without notice.