

INVERTER

DC / AC Power Transfer System

1500VA

■ USER'S MANUAL ■

IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

- **WARNING (Controlled Environment)** : Intend for installation in a controlled environment.
- **WARNING (Fuses)**: To reduce the risk of fire, replace only with the same type and rating of fuse.
- **CAUTION (Live Heat Sink)**: Risk of electric shock-Heat sink is live. Disconnect unit before servicing.
- **CAUTION**: Do not dispose of batteries in a fire, the battery may explode.
- **CAUTION**: Do not open or mutilate the battery, released electrolyte is harmful to the skin and eyes. It may be toxic.
- **CAUTION**: A battery can present a risk of electric shock and high short circuit current. The following precaution should be observed when working on batteries
 - Remove watches, rings or other metal objects.
 - Use tools with insulated handles.
 - Wear rubber gloves and boots.
 - Do not lay tools or metal parts on top of batteries.
 - Disconnect charging source prior to connecting or disconnecting battery terminals.
- **DANGER (DC Supplies Over 60V)**: Risk of electric shock. Do not touch uninsulated battery terminals.
- Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.
- When replacing batteries, replace with the same number and type.
- The right way to de-energize the Inverter properly in an emergency is to move the I/O switch to the OFF position and disconnect the power cord from the mains supply.

TABLE OF CONTENTS

IMPORTANT SAFETY INSTRUCTIONS.....	1
TABLE OF CONTENTS.....	2
INTRODUCTION.....	2
1. PRESENTATION.....	3
2. INSTALLATION.....	6
3. OPERATION.....	6
4. ALARMS.....	7
5. SOFTWARE OPTIONS AND COMPUTER INTERFACE PORT.....	7
APPENDIX A. TROUBLESHOOTING.....	9
APPENDIX B. SPECIFICATIONS.....	10

INTRODUCTION

Please read and save this manual!

Thank you for selecting this Inverter. It provides you with a perfect protection for connected equipment. The manual is a guide to install and use this system. It includes important safety instructions for operation and correct installation of the Inverter. If you should have any problems with the Inverter, please refer to this manual before calling customer service.

Intelligent microprocessor control

The product is an advanced Inverter based on dual-microprocessor control. This means that it operates with the newest technology, high performance and powerful function.

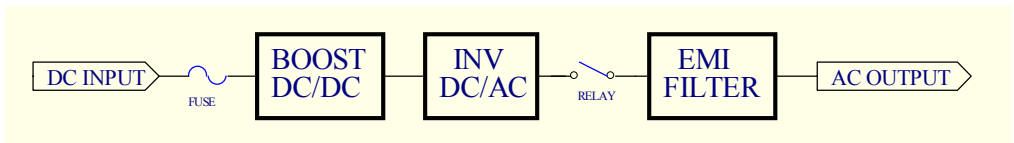
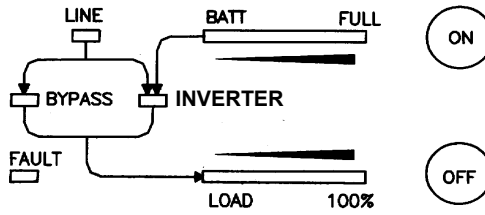


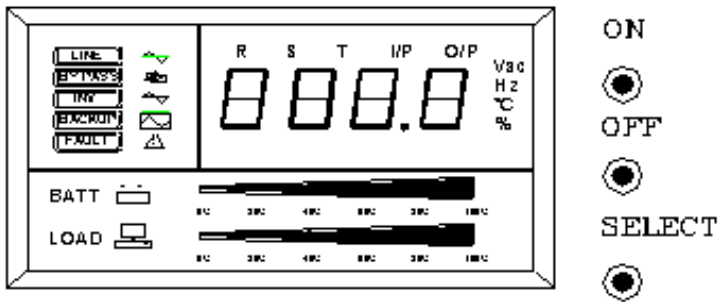
Figure. System block diagram.

1. PRESENTATION

Front LED Panel



Front LCD Panel



1.1 “INV” or “INVERTER” indicator

The indicator illuminates when the unit is working and output power is provided from the unit. It also ensures that the output power is provided from the inverter circuit.

1.2 “BACKUP” indicator (LCD Panel only)

The indicator illuminates when the power is supplied from the DC power or inter/external batteries.

1.3 “FAULT” indicator

It shows something wrong concerning about the Inverter.

1.4 “ON” button

With the Inverter is plugged in, press the “ON” button to turn on the Inverter and power on the loads.

1.5 “OFF” button

Press the OFF button to turn off the Inverter and the loads.

1.6 “SELECT” button (LCD Panel only)

The relevant value appears on the upper screen. There are two display modes can be selected.

Output voltage display

Temperature inside the unit

1.7 “BATT” bar graph (RECTANGLE INDICATOR)

The rectangle indicator shows the percentage of battery capacity.

1.8 “LOAD” bar graph (RECTANGLE INDICATOR)

The indicator shows the power being drawn by the load.

1.9 “FAULT” codes (LCD Panel only)

The relevant value appears at the upper screen. There are seven kinds of fault modes can be displayed.

E01: Warning of fail output

E02: Warning of wrong temperature

E03: Warning of output short circuit

E04: Warning of overload (exceeding 150%)

E05: Warning of mistaken +/- DC Bus

E06: Warning of wrong input DC voltage

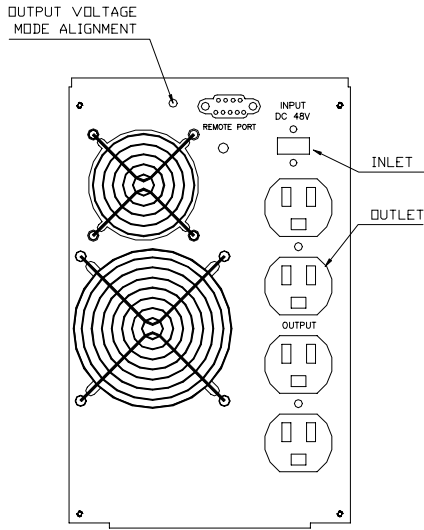
E07: Warning of input DC power is not enough

<u>Load Indicator</u>	<u>% of Load Value</u>	<u>Battery Indicator</u>	<u>% of Bat Level</u>
Light no.5	over 96%	Light no.5	over 91 %
Light no.4	76-95 %	Light no.4	76-90 %
Light no.3	51-75 %	Light no.3	51-75 %
Light no.2	26-50 %	Light no.2	26-50%
Light no.1	10-25 %	Light no.1	0-25%

1.10 OUTPUT POWER RECEPTACLES

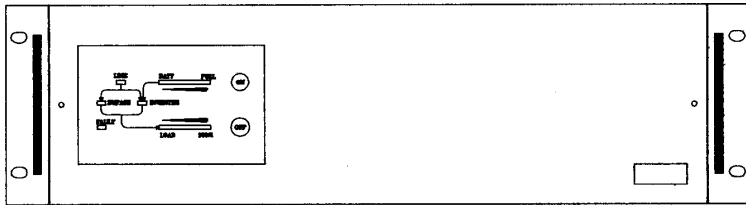
1.11 DC INPUT POWER RECEPTACLE

Rear Panel (Tower type)

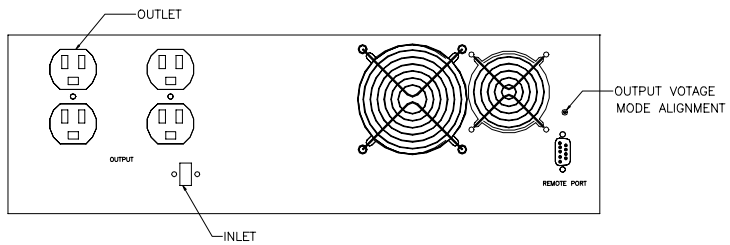


Rear Panel (Rack-Mount type)

FRONT VIEW



REAR VIEW



2. INSTALLATION

2.1 Inspect

Inspect the Inverter upon receipt. The packaging is recyclable; keep it for reuse or be disposed of properly.

2.2 Placement

Install the Inverter in a protected area with adequate flowing air and free of excessive dust. Do not operate the Inverter where the temperature and humidity is out of the specified limits.

2.3 Connect the input power

Please connect the unit to the DC telecom power or a dc power supplier/batteries. Please make sure the DC rating is match with the rating label. For example, DC 48 V described on the label means input voltage should be DC 48 V.

2.4 Connect the loads

Connect the loads with the terminal block at the rear of the Inverter. To use the UPS as a master on/off switch, make sure all of the loads are switched on.

3. OPERATION

3.1 Switch on

While utility input is connected to the Inverter, press the "ON" button and keep pressing over than 3 seconds. After that, connect the electrical cords of the equipment that is going to be used such as computer or monitor with the outlets on the rear panel of Inverter.

Don't overload the machine with all the equipment used. The buzzer will beep continuously to indicate overload status. Inverter will shut down automatically to protect the machine.

CAUTION: Never connect a laser printer or plotter to the Inverter with other computer equipment. A laser printer or plotter periodically draws significantly more power than when its idle status, and may overload the Inverter.

3.2 Switch off

By pressing and holding OFF button until the "BACK UP" LED off.

3.3 Silence

When Inverter is under "BACKUP" mode, press "ON" button more than 1 second to silence the audible alarm. (The function is disable when Inverter is under condition of "LOW BATTERY" or "OVERLOAD")

3.4 Auto-detect

Once the unit is turned on and keep working. System will detect the itself always.

4. ALARM

4.1 "BACKUP"(slow alarm)

When the Inverter is working under "BACKUP" mode, the Inverter would emit audible alarm. The alarm stops when the Inverter is return to "MUTE" mode operation. .

Attention: The alarm of "BACKUP" is going to beep every four seconds. (Slow-speed beep).

Attention: The Inverter provides mute function for the warning. When the beeping sound occurs, press "ON" to stop it; and press "ON" again to regain the sound.

4.2 "LOW DC voltage" (rapid alarm)

In the "BACKUP" mode, when the energy of battery becomes to lower level. (about 20%~30%) The beeps rapidly until the Inverter shuts down from DC power failure.

Attention: The alarm of DC voltage batteries caused by low voltage beeps every second. (Fast-speed beep).

Attention: The rapid alarm under "LOW BATTERY" condition can't be erased.

4.3 "FAULT" (continuous alarm)

Here is listing some "FAULT" conditions as following for reference.

5. SOFTWARE OPTIONS AND COMPUTER INTERFACE PORT

5.1 Power Monitoring Software

The UPS-MON series software (or other power monitoring software) is applied standard RS-232 interface to perform monitoring functions, and then provides an orderly shutdown of a computer in the event of power failure. Moreover, UPS-MON displays all the diagnostic symptoms on monitor, such as Voltage, Frequency, Battery level and so on. The software is available for DOS, Windows 3.1x, Windows 95/98/2000, Windows NT V3.5/4.0 or later, Novell Netware and others. Call your dealer for more information on computer OS compatible solutions.

5.2 Interface Kits

A series of interface kits is available for operation systems that provide UPS monitoring. Each interface kit includes the special interface cable required to convert status signals from the UPS into signals which individual operating system recognize. The interface cable at UPS side must be connected to REMOTE PORT, at computer side can be either COM 1 or COM 2. The other installation instructions and powerful features please refer to READ.ME file.

CAUTION: Use only factory supplied or authorized UPS monitoring cable!

5.3 The characteristics of computer interface port

The computer interface port has the following characteristics:

The communication port on the back of the UPS may be connected to host computer. This port allows the computer to monitor the status of the UPS and control the operation of the UPS in some cases. Its major functions normally include some or all of the following:

To broadcast a warning when power fails.

To close any open file before the battery is exhausted.

To turn-off the UPS.

Some computers are equipped with a special connector to link with the communication port. In addition, special plug-in cord may be needed. Some computers may need special UPS monitoring software. Contact your dealer for the details on the various interface Kits.

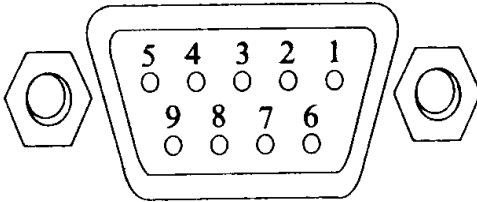
5.4 The pin of computer interface port

The pin of computer interface port has the following characteristics:

- 5.4.1. Pin 5 and 2 are open collector outputs that must be pulled up to a common referenced supply no greater than DC +40V. The transistors are capable of a maximum nonconductive load of DC 50 mA, Use only pin 7 as the common.
- 5.4.2. Pin 5 generates a High to Low signal when the battery inside the UPS has less than 5 minutes back up time left.
- 5.4.3. Pin 2 generates a High to Low signal when the line is fail.
- 5.4.4. The UPS will shut down when a high RS-232 level is sustained on pin 6 for 0.36 seconds.
- 5.4.5. Pin 9 is also the RS-232 data output.
- 5.4.6. Pin 6 is RS-232 data input (RxD)

NOTE:

- 1. Switch rating +40V, 0.15A non-inductive.
- 2. Pin 7 should be connected to ground only.



Communicating Interface Port

We provide a standard RS232 line (that is compatible with DB9 line) socket on the rear panel of UPS. That port possesses several signals as explained below:

Pin#	Function Explanation	I/O
2	Power Fail-normally open status, will become closed during active	OUTPUT
4	Reference GND for pin2,5	OUTPUT
5	Battery Low- normally open status, will become closed during active	OUTPUT
6	Remote shutdown UPS-keep this pin at high voltage(+5V~+12V) 500ms to shutdown UPS. Activates at battery mode	INPUT
7	Reference GND for pin6	INPUT

APPENDIX A TROUBLESHOOTING

Problems	Possible Reasons	Solutions
Inverter can't operate after pressing On/Off switches	DC Input power is not correct	Contact the dealer or service center for help
	Input fuse open	Change the input fuse (in side)
	Time of pressing the ON button is too short	Keep pressing the ON button over 3 seconds
	Output short circuit or overload on Inverter	Turn off the inverter, and take off all loads to make sure there are no problems on it. Turn on the unit again.
	Unit damaged.	Contact the dealer or service center for help
System cannot work under DC mode.	Input power cord is disconnected.	Plug-in the power cord and turn on the unit again.
	No input power	Check the input power.
	Unit damaged	Contact the dealer or service center for help
Working time under backup mode is not match with the specification.	Batteries are not fully charged.	Keep charging more than 24 hours. If the problem is still the same, contact the dealer or service center for help.
	Batteries are damaged.	Contact the dealer or service center for help
	Charger is damaged	Contact the dealer or service center for help
Screen of connected TV/Monitor is shaking.	Problem caused by TV/Monitor .	Contact the dealer or service center for help
	TV/Monitor is not adjusted correct.	Adjust the TV/Monitor correctly.
	TV/Monitor is influenced by other appliances. For example: mobile phone.	Adjust the location of relevant appliances and keep the influence far away .
Buzzer keeps beeping	Overload	Take off some loads

APPENDIX B SPECIFICATIONS

Tower model		INV-1500-LCD/ INV-1500-LED
19" rack-mount		INV-1500-LCD RM/ INV-1500-LED RM
Power rating	P.F.=0.7	1.5KVA/ 1050W
DC Input	Dc Voltage	+/- 48VDC
	Dc Voltage range	+/- 34~ 60VDC
AC output	Waveform	Pure Sine-wave
	Frequency	50Hz or 60Hz (Option)
	Voltage	100/110/115/120V or 200/208/220/230/240V
	Voltage regulation	+/- 2%
	Frequency stability	+/- 0.5%
	Power factor	0.7 (lagging)
	Harmonic distortion	<3% of T.H.D. at linear load
	Overload detection	>105% for 10 seconds, >130%/+/-10% for 300ms Crest factor ratio 3:1
Efficiency	DC to AC	>85%
PROTECTION	Inside Protection	Overload protection
		Over temperature protection
		Short circuit protection
		Input DC voltage limit protection
Noise level	1m. distance	<45dBA
LCD Display (For INV-1500-LCD INV-1500-LCD RM)	Status	Indicate inv, backup, fault, bat capacity, load capacity, O/P voltage, inside temperature, fault status
LCD Display (For INV-1500-LCD INV-1500-LCD RM)	Status	Inverter output (green), fault (red)
	Battery capacity	4 green, 1 red LED and bar LEDs indicates low capacity
	Load level	4 green, 1 red LED and bar LEDs indicates overload capacity
Alarm	Input DC voltage	The first warning will beep every 4 seconds to indicate battery in use. The second warning will beep every 1 second to signal battery low condition
ENVIRONMENT	Temperature	0-40°C
	Humidity	0-95% (Non- condensing)
Physical size WxDxH(mm)	Tower model	145x400x220(5.7"x15.7"x8.7")
	19" rack-mount	430x400x130(16.9"x15.7"x5.1")
Net weight (kgs)	Tower model	18 (39.7lb)
	19" rack-mount	25 (55.1lb)

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