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ALTRONICS M8139 / 44 / 45 Multifunctional Power Inverter

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1. INTRODUCTION

1.1 General Description

The pure sine wave Inverter is a powerful all-in-one cost effective solution that delivers unsurpassed clean true sine wave output power, combined with a selectable multi-stage battery charging current. This inverter is capable of continuous 24-hour operation. It is designed to operate with a wide range of devices such as air conditioners, home appliances, consumer electronics and office equipment. The built-in five stage intelligent charger automatically charges any type of battery without the risk of overcharge. The compact and modular design makes installations easier.

1.2 Key features

1. Multiple microprocessor design base.
2. Compatible with both linear and non-linear loads.
3. Stronger charger to support batteries of 600AH and up.
4. 24-hour continuous operation.
5. DC start and automatic self-diagnostic function.
6. THD less than 3%.
7. High efficiency design to save electricity.
8. Low heat dissipation during long periods of continuous operation.
9. Designed to operate under harsh environments.
10. Wall-mounted design.

1.3 Important Notices

1. Read instructions carefully before operating the Inverter.
2. Follow the Inverter power connection instruction.
3. Do not open the case. There is a danger of electric shock.
4. Do not overload the inverter. Use it within specified power ratings.
5. Keep the inverter clean and dry.

2. SAFETY

2.1 Transporting

1. Disconnect all power cables.
2. Exercise caution while lifting the inverter, which is quite heavy.
3. Do not place the inverter upside down.
4. Please transport the inverter inside its original packaging (to protect against shock and impact).

2.2 Positioning

1. Do not put the inverter on rough or inclined surfaces.
2. Do not install the inverter system near water or in damp environments.
3. Do not install the inverter system where it would be exposed to direct sunlight.
4. Do not block off ventilation openings in the inverter system's housing and don't leave objects on the top of the inverter.
5. Keep the inverter far away from heat emitting sources.
6. Do not expose it to corrosive gas.
7. Ambient temperature: 0°C - 40°C

2.3 Installation

1. Connect the inverter system only to an earthed shock-proof socket outlet.
2. Place cables in such a way that no one can step on or trip over them.

2.4 Operation

1. Do not disconnect the mains cable on the inverter system or the building wiring socket outlet during operations since this would cancel the protective earthing of the inverter system and of all connected loads.
2. The inverter can be started up by only DC power source (or batteries). The output terminals may be live even when the inverter is not connected to the AC supply.
3. Ensure that no fluids or other foreign objects can enter the inverter system.

2.5 Maintenance and Service

Caution! - Risk of Electric Shock.

1. Even after the unit is disconnected from the mains power supply (building wiring socket outlet), components inside the inverter system are still connected to the battery and are still electrically live and dangerous. Before carrying out any kind of servicing and/or maintenance, disconnect the batteries and verify that no current is present.
2. Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
 - a. Remove wristwatches, rings and other metal objects
 - b. Use only tools with insulated grips and handles.

3. CABLE CONNECTION

3.1 Inspection

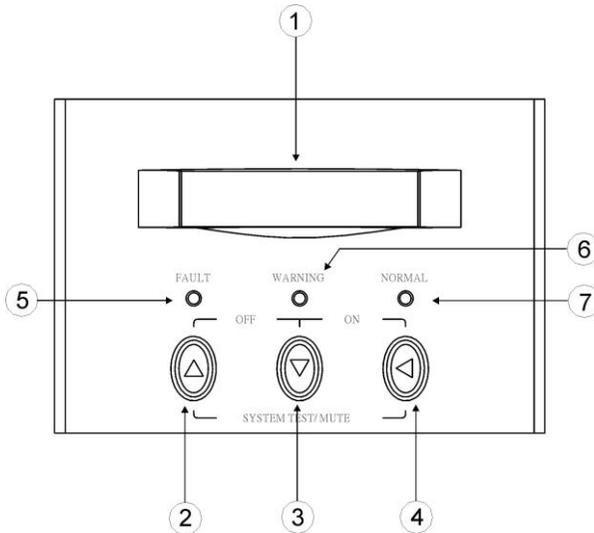
1. The system may be installed and wired only by qualified electricians in accordance with applicable safety regulations.
2. When installing the electrical wiring, please note the nominal amperage of your incoming feeder.
3. Inspect the packaging carton and its contents for damage. Please inform the transport agency immediately should you find signs of damage. Please keep the packaging in a safe place for future use.
4. Please ensure that the incoming feeder is isolated and secured to prevent it from being switched back on again.

3.2 Connection

Please use a properly rated power cord to connect the inverter to the power load.

4. SYSTEM DESCRIPTION

Front Panel Description for LCD Model

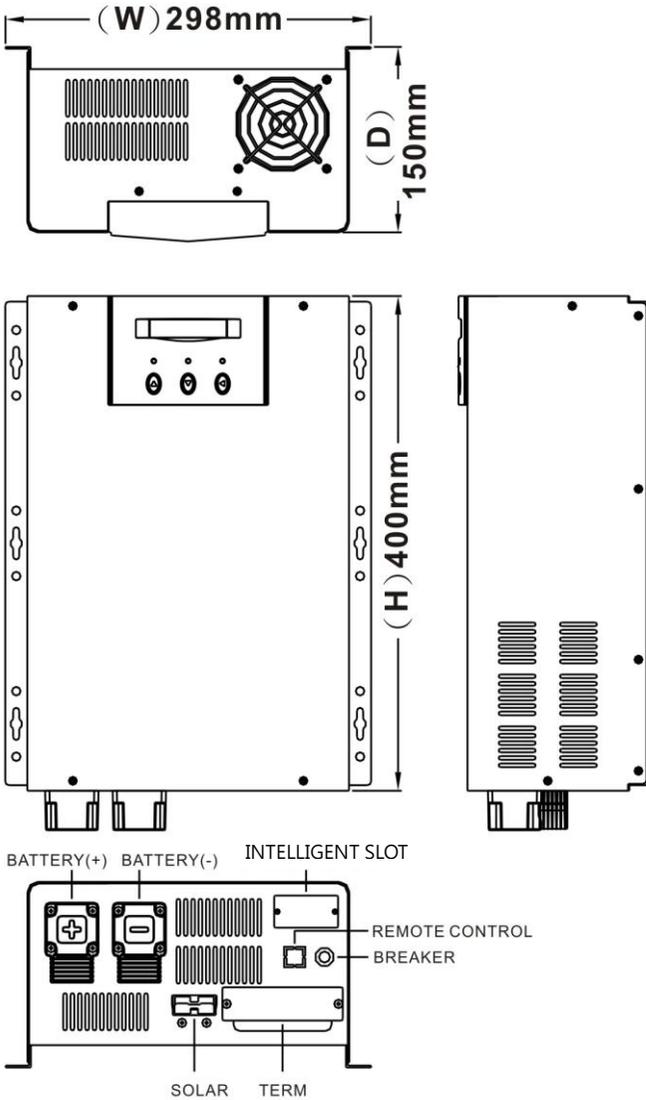


- 1 LCD: This displays the inverter operation information, including inverter status, input/output voltage, input/output frequency, battery voltage, battery capacity left, output load, inside temperature, and the times of operational events (i.e. history).
- 2 Up-key: Use to scroll upward through the inverter status on the LCD.
- 3 Down-key: Use to select downward the inverter status on the LCD. Otherwise, press it simultaneously with the Up-key to switch off the inverter.
- 4 Enter-Key: It is pressed with the Down-key to turn on the inverter. In battery operation mode, press it with Up-key at the same time to disable the buzzer. Otherwise, press it to confirm and enter the item selected.
- 5 Fault LED (red): To indicate the inverter is in fault condition because of inverter shutdown or over-temperature.

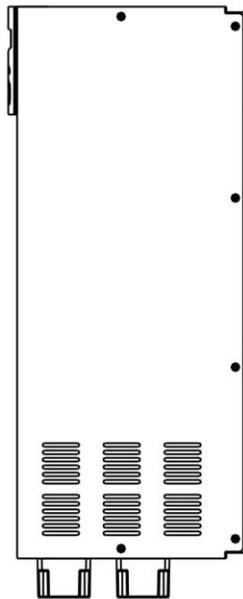
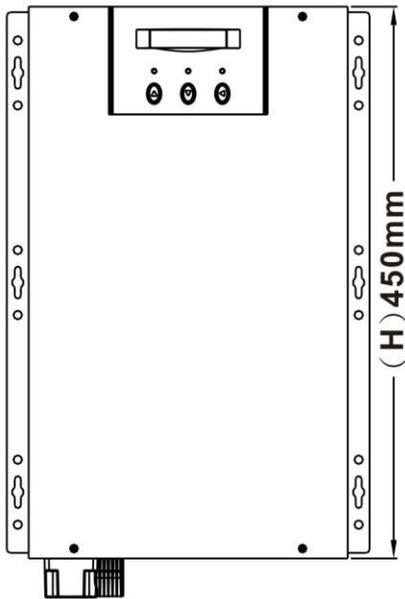
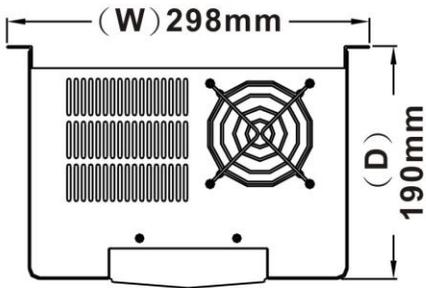
- 6 Warning LED (yellow): To indicate the inverter is in the status of overload, bypass and battery back-up.
- 7 Normal LED (green): To indicate the inverter is operating normally.
- 8 ON/TEST/MUTE key: It should be pressed with the control key simultaneously to switch on inverter, do inverter auto-test in normal AC mode and turn off the buzzer in battery operation.

5. HARDWARE DESCRIPTION

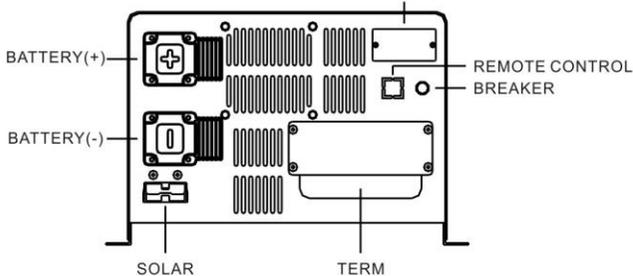
M8139 - 1.2KVA Wall Mounted Type



M8144 5 - 2.4KVA / 3.6KVA Wall Mounted Type



INTELLIGENT SLOT



6. INVERTER OPERATION

6.1 Check Prior to Start Up

1. Ensure the inverter is in a suitable position.
2. Check power cord is securely plugged in.
3. Make sure the load is disconnected or in the “OFF” position.
4. Check if the input voltage meets the required inverter rating.

6.2 Storage Instruction

Disconnect the power cord from the rear panel if you will not use the inverter for a long period. If the inverter is stored for over three months, please ensure that the inverter battery is charged once for at least 24 hours during that time, so that it retains its charge capacity.

6.3 Operation Procedure for LCD Model

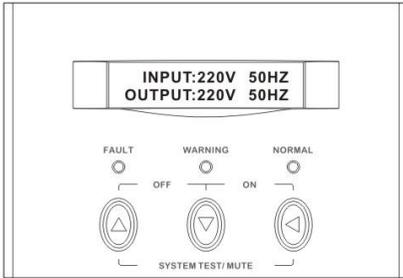
Please follow the instructions below for inverter operation.



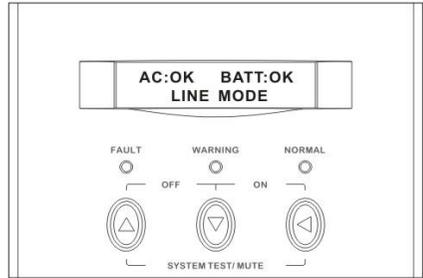
1. Once the AC source is connected, the LCD will light up immediately (8~10 seconds showing the greeting message) and revert to standby for inverter startup.
2. By pressing the Enter-key and the Down-key simultaneously for three seconds, the inverter will beep twice and start up. The NORMAL LED will illuminate to indicate the power is from its bypass AC main to the load.
3. When the Down-key and the Up-key are pressed simultaneously for three seconds, the inverter will beep twice and switch off. The UPS is on the standby status (LCD display illuminates and Normal LED is blinking) until AC source is disconnected.

4. LCD Menu - Use the Up/Down key to select the different menu options displayed on the LCD, as described in the diagrams below. This screen will refresh once the system power is enabled.

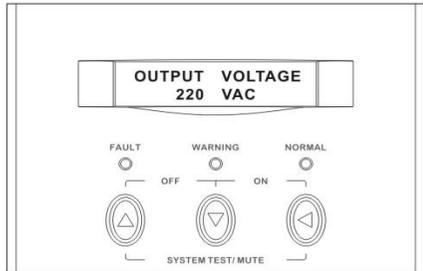
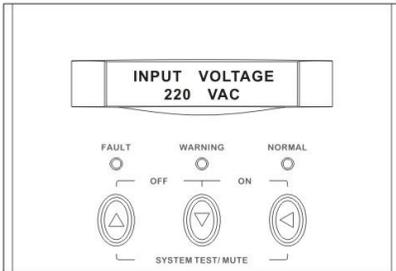
Rated Spec



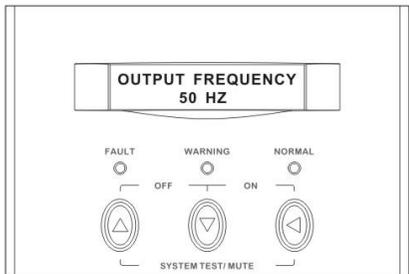
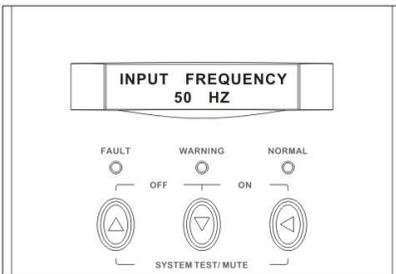
Status



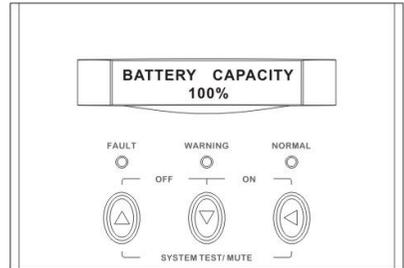
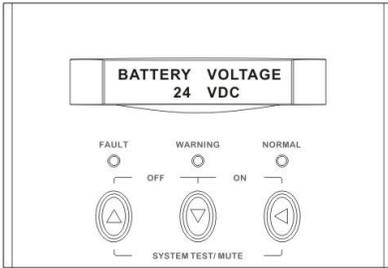
Voltage



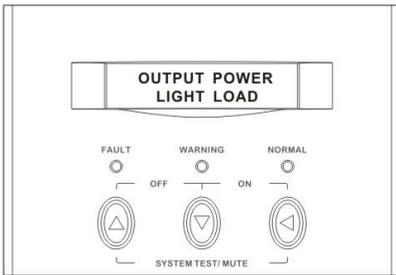
Frequency



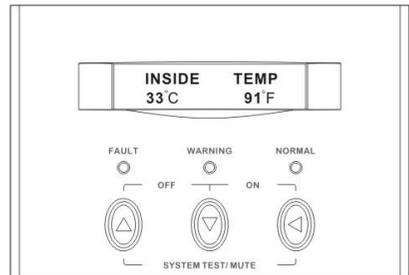
Battery Status



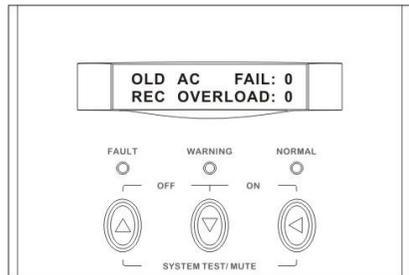
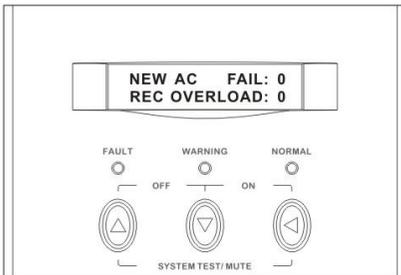
Output Power



Temperature



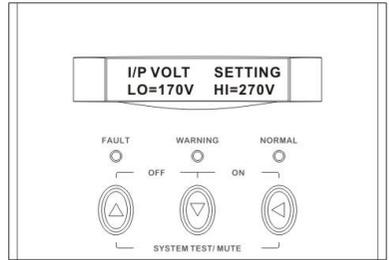
History Record



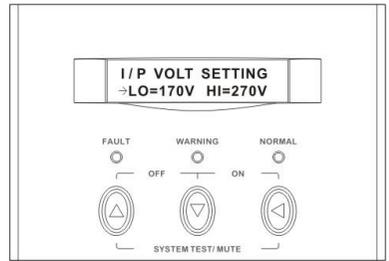
5. Input Voltage Range Setting - After inverter startup, press the Down-key to find the screen and then press Enter-key for setting.

Input Voltage Adjust

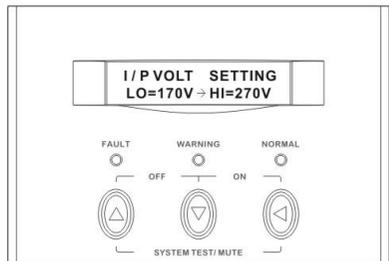
- A. In this screen, press Enter-key to enter the following steps for input voltage and frequency adjustment.



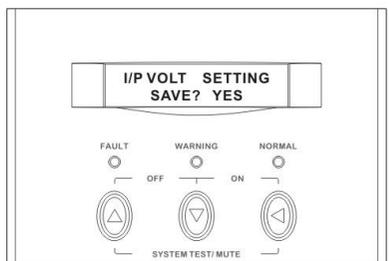
- B. The cursor (→) will pop up to indicate the input voltage and frequency newly selected.



- C. Use Up or Down-key to adjust the input LOW voltage (if 220V configuration, 120V~200V is selectable; if 110V configuration, 60V~100V is selectable). Press Enter-key to confirm voltage and then the cursor will move to input HIGH voltage selection (if 220V configuration, 250V~280V is selectable; if 110V configuration, 125V~140V is selectable).



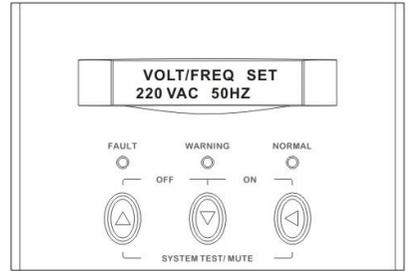
- D. Once the correct voltage is selected, press Enter-key again to save the selection.



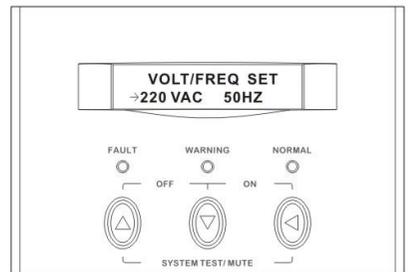
6. Output Voltage / Frequency Setting

Output Voltage & Frequency Adjust

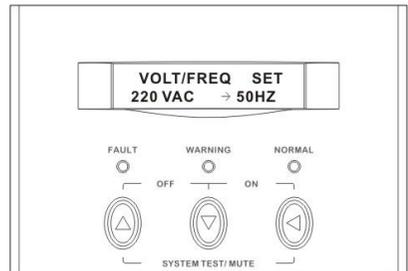
A. In this screen, press Enter-key to enter the following steps for output voltage and frequency adjustment.



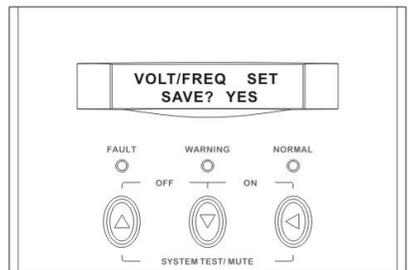
B. The cursor (→) will pop up to indicate the newly selected output voltage and frequency.



C. Use Up or Down-key to adjust the output voltage (if 220V configuration, 220V, 230V, and 240V is selectable; if 110V configuration, 100, 110V, 115V, and 120V is selectable). Press Enter-key to confirm voltage and then the cursor will move to frequency selection. The output frequency (50Hz or 60Hz) can be adjusted by the same key operation.



D. Once the correct voltage is selected, press Enter-key again to save the selection.

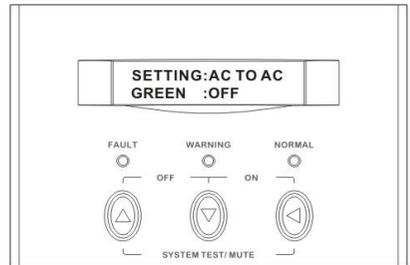


E. Turn off the unit and then restart it to enable the setting

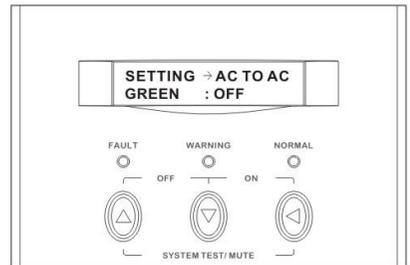
7. AC/DC Prior Setting (Option) Functioning only under AC (Line) Mode.

AC/DC Prior Adjust

- A. In this screen, press Enter-key to enter the following steps for AC/DC prior adjustment.

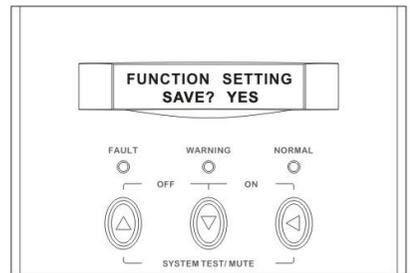


- B. The cursor (→) will pop up to indicate the AC/DC prior.



- C. Use Up or Down-key to adjust AC/DC prior.

- D. Press Enter-key again to save the selection.

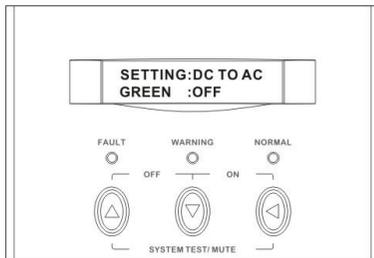


- E. Turn off the unit and then restart it to enable the setting

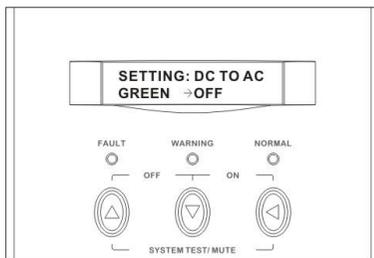
8. Green Power On/Off and Load and Time Setting (Option) functioning only under Inverter Mode.

Green Power On/Off & Load & Time Adjust

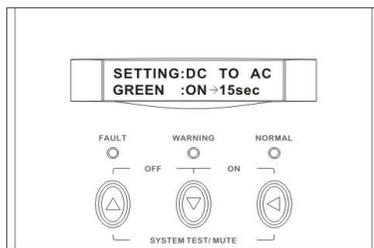
A. In this screen, press Enter-key twice to enter the following steps for Green Power On/Off adjustment.



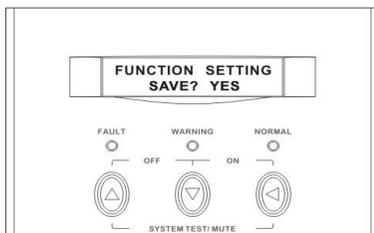
B. The cursor (→) will pop up to indicate the Green Power On/Off.



C. Use Up or Down-key to select the Green Power On/Off. Press Enter-key to confirm, and then the cursor will move to the time adjustment. The time period (15Sec., 30Sec., 45Sec., and 60Sec. is selectable) for next detecting can be adjusted by the same key operation.



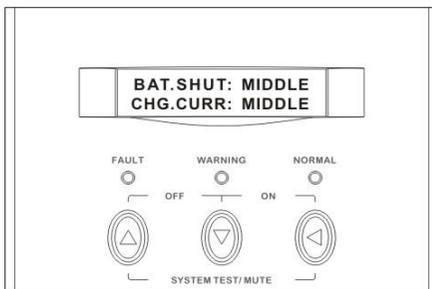
D. Press Enter-key again to save the selection.



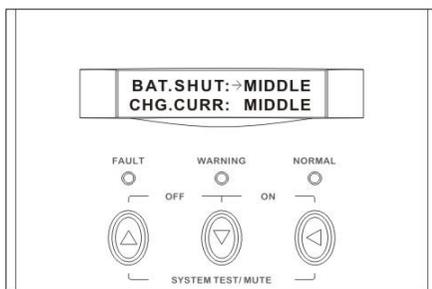
9. Battery Shutdown Voltage & Current Setting (24V)

Battery Shutdown Voltage & Current

A. In this screen, press Enter-key to enter the following steps for battery shutdown voltage adjustment.



B. The cursor (→) will pop up to indicate the battery shutdown voltage.



C. Use Up or Down-key to adjust the battery shutdown voltage (if 24V configuration, HIGH: 21V, MIDDLE: 20V, LOW: 19V is selectable).

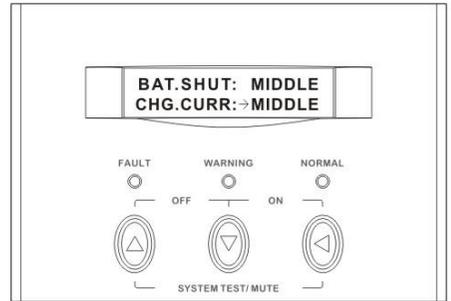


D. Once the correct voltage is selected, press Enter-key again to save the selection.

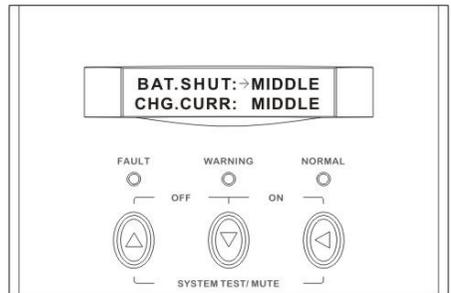
10. Battery Charging Current Setting

Battery Charging Current Adjust

A. In this screen, press Enter-key twice to enter the following steps for battery charging current adjustment.



B. The cursor (→) will pop up to indicate the battery charging current.



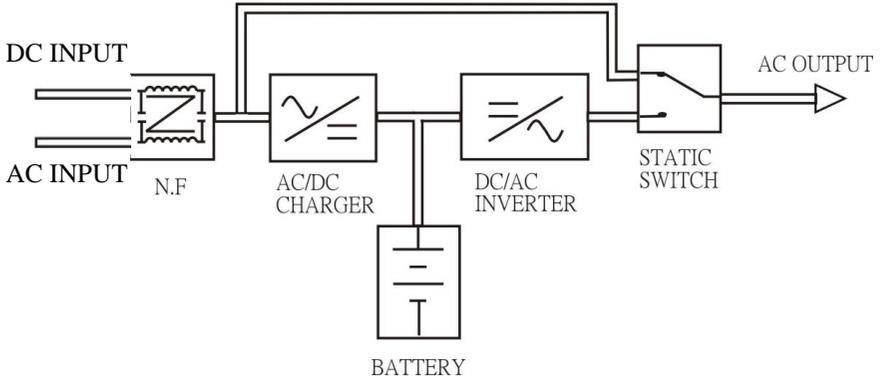
C. Use Up or Down-key to adjust the battery charging current (LOW: 100AH, MIDDLE: 300AH, HIGH: 600AH is selectable).



D. Once the correct battery charging current is selected, press Enter-key again to save the selection.

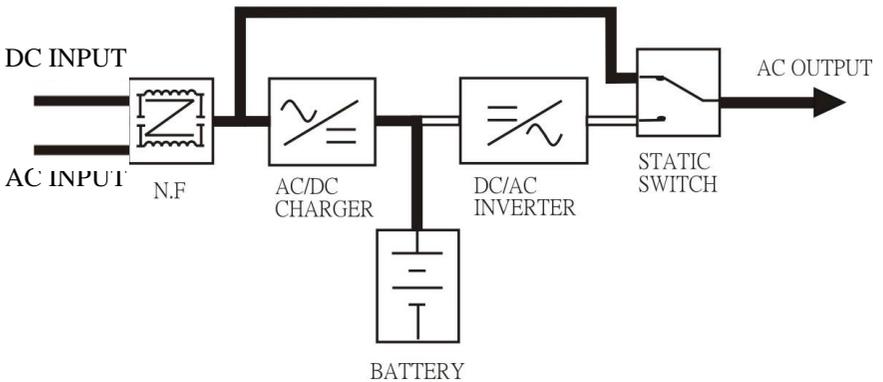
7. OPERATION MODES OF THE INVERTER

7.1 Inverter System Block Diagram



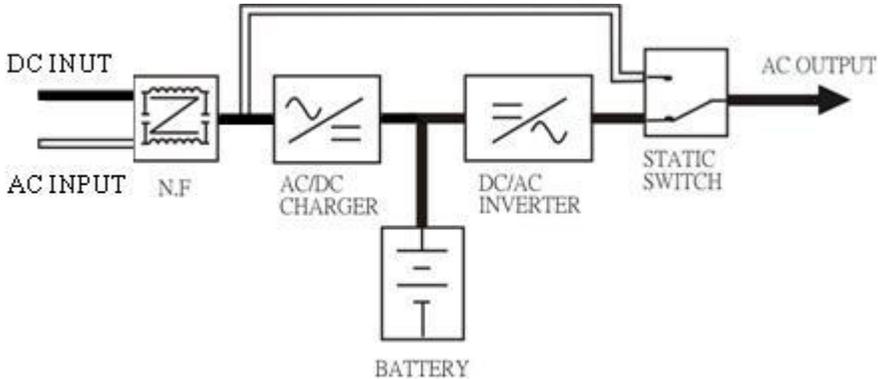
7.2 Normal Operation

There are two main loops when AC utility is normal and DC electricity is generated from solar array under sufficient sunlight: the AC loop and the battery charging loop. The AC output power comes from AC utility input and passes through the static switch to support power to load. The battery charging voltage comes from AC utility input and is converted by AC/DC charger to support battery-charging power.



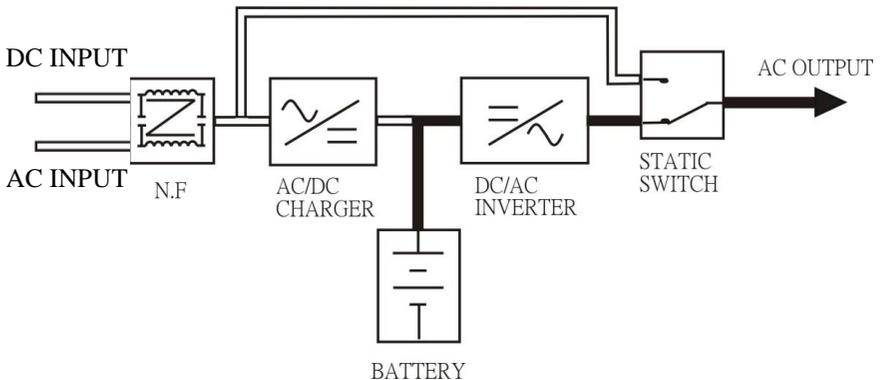
7.3 AC Utility Failure during daytime

The AC output comes from the battery bank through DC/AC inverter when the AC mains utility fails. The solar array will charge the batteries during this time.



7.4 AC Utility Failure at Night

The AC output comes from the battery bank through the DC/AC inverter when AC mains utility fails. This will continue until the battery shutdown voltage selected is reached. Refer page 16 of manual.



8. TROUBLE SHOOTING GUIDE

The following guideline may be helpful for basic problem solving.

No.	INVERTER STATUS	POSSIBLE CAUSE	ACTION
1	AC utility power is normal. Inverter is running normally, but fault LED lights up. Buzzer beeps continuously.	1. Charger PCB is damaged. 2. Fan is damaged. 3. Unknown	1. Replace the charger PCB. 2. Replace the fan. 3. Restart inverter
2	AC utility power is normal but inverter is overloaded. Warning LED lights up and buzzer beeps per second.	Overload $100% < \text{load} < 125\%$	Please reduce the critical load to $<100\%$.
3	AC utility power is normal. Warning LED does not fade out and buzzer beeps per half second.	Overload $125% < \text{load} < 150\%$	Please reduce the critical load to $<100\%$.
4	AC utility power is normal. Warning LED lights up and buzzer beeps continuously.	Overload $150% < \text{load}$	Please reduce the critical load to $<100\%$.

No.	INVERTER STATUS	POSSIBLE CAUSE	ACTION
5	AC utility power fails .The load is supplied by battery power. Buzzer alarm sounds every 4 seconds.	<ol style="list-style-type: none"> 1. AC utility power failure. 2. AC input connection may be not correct. 	<ol style="list-style-type: none"> 1. Reduce the less critical load in order to extend backup time. 2. Please check the rated input or connected line.
6	AC utility fails. Inverter is in battery backup mode. Buzzer alarm beeps every second.	Battery power is approaching low level.	Inverter will shut down automatically. Please save data or turn off the loads soon.
7	AC utility power fails. Inverter has shut down automatically.	Battery runs out	Inverter will restart up when AC utility power is restored.

NOTE: If the system is connected to 240V grid, and it suffers from a "brown out" where the grid voltage drops below 120V ac +/- 2%, the UPS will switch to inverter mode. The technical term for this is line low transfer. When the mains voltage gets above 130V ac +/- 2%, the UPS will switch back to normal mode. The technical term for this is line low return.

9. SPECIFICATIONS OF INVERTER

Model		Inverter 1.2K	Inverter 2.4K	Inverter 3.6K	
Capacity	VA / Watt	1.2KVA / 800W	2.4KVA / 1600W	3.6KVA / 2400W	
Input	Nominal Voltage		220Vac; 110Vac		
	Voltage Range	Acceptable Voltage Range	120-275Vac ; 60-135Vac		
		Frequency	50Hz / 60Hz (45Hz - 70Hz)		
		Line Low Transfer	120VAC \pm 2% ; 60VAC \pm 2%		
		Line Low Return	130VAC \pm 2% ; 65VAC \pm 2%		
		Line High Transfer	275VAC \pm 2% ; 135VAC \pm 2%		
		Line High Return	260VAC \pm 2% ; 130VAC \pm 2%		
Output	Voltage		220Vac (230V or 240VAC re-settable via LCD panel); 110Vac (115V or 120VAC re-settable via LCD panel)		
	Voltage Regulation (Batt. Mode)		< 3% RMS for entire battery voltage range		
	Frequency		50Hz or 60Hz		
	Frequency Regulation (Batt. Mode)		\pm 0.1Hz		
	Power Factor		0.67		
	Waveform		Pure Sinewave		
	Efficiency		> 75%	> 80%	
	Overload Protection	Line Mode	Circuit Breaker		
Battery Mode		110% ~ 150% for 30 sec. , >150% for 200ms			
Transfer Time	Typical	< 8 ms.			

Model		Inverter 1.2K	Inverter 2.4K	Inverter 3.6K
Capacity	VA / Watt	1.2KVA / 800W	2.4KVA / 1600W	3.6KVA / 2400W
Battery	Battery Voltage	12Vdc or 24Vdc	24Vdc	24Vdc
	Backup Time (at full load)	Long time available		
	Charging Current (3 steps selectable)	10~30A	10~40A	
Display LCD	LCD	Inverter status, I/P&O/P Voltage Frequency, Load%, Battery Voltage & %, Charge current, Temperature, Model		
	LED	Normal (Green), Warning (Yellow), Fault (Red)		
Audible Alarm	Battery Mode	Beeping every 4 seconds		
	Low Battery	Beeping every second		
	inverter Fault	Beeping Continuously		
	Overload	Beeping twice per second		
Environment	Operation Temperature	0-40 degree C; 32-104 degree F		
	Relative Humidity	0-95% non-condensing		
	Audible Noise	Less than 55dBA (at 1M)		
Physical	Net Weight (Kg)	14	21	23
	(WxHxD)mm Wall Mounted	298*400*150	298*450*190	298*450*190

- Specifications are subjected to change without prior notice.

APPENDIX 2: NEW LCD SETTINGS

1. I / P Voltage Range Setting	
	Default: Input Voltage: 220V (110V) LO = 170V (85V), HI = 270V (135V).
	LO: 120V ~ 200V(60V ~ 100V) One Touch: +/- 1V
	HI: 250V ~ 280V(125V ~ 140V) One Touch: +/- 1V
	Mark: 1. Return point= +/- 10V (5V) from the transfer point.
	2. Press Enter to enable the setting. No need to re-start the inverter.
2. O/P Voltage /Frequency Setting	
	Voltage: 220VAC / 230VAC / 240VAC(100VAC / 110VAC / 115VAC / 120VAC) Selectable
	Frequency: 50HZ / 60HZ Selectable
	Mark: Press Enter to confirm. Need to re-start the inverter to Enable the setting.
3. AC/DC Prior Setting (Optional) Functioning only under AC Mode.	
	Default: AC TO AC
	Select "AC TO AC" (AC MODE) for AC Prior, "DC TO AC" (inverter MODE) for DC Prior.
	Mark: 1. When the inverter is set to "DC Prior", if the inverter itself diagnoses problems, it will auto change to AC if AC normal.
	2. Press Enter to confirm. Need to re-start the inverter to Enable the setting.
4.Green Power On/Off Setting (Optional) Functioning only under inverter Mode.	
	Default: Off.
	Green Power Off: System running continuously.
	Green Power On: System Auto Shutdown when Load < Pre-setting
	Mark: Press Enter to enable the setting. No need to re-start the inverter.
5.Green Power Load & Time Setting (Optional)	
	Default: Time period for next detecting: 30 Sec.
	Time: 15 Sec., 30 Sec., 45 Sec. 60 Sec selectable.
	Mark: 1. Detecting load: 5~10VA
	2. When the load is less than 5~10VA, the inverter will auto turn off and count the pre-set time (30 Sec.), then, re-start.
	3. Press Enter to enable the setting. No need to re-start the inverter.

6. Battery Shutdown Voltage & Current Setting (48V/ 24V)	
	Default: MIDDLE
	HIGH: 42V (21V) / MIDDLE: 40V (20V) / LOW: 38V (19V) Selectable
	Mark: 1. Low Voltage warning point: 42.5V (21.5V)
	2. Press Enter to enable the setting. No need to re-start the inverter.
7. Battery Charging Current Setting	
	Default: Middle
	LOW (100AH) - MIDDLE (300AH) - HIGH (600AH)
	Mark: Press Enter to enable the setting. No need to re-start the inverter.

NOTE: For 1.2KVA, this new LCD setting is available only for 24VDC version.

APPENDIX 2: SOLAR CHARGER SPECIFICATION

With respect to M8145 Inverter UPS Sinewave 2400W 24V IP

Battery Voltage	12V (1.2KVA)	24V (2.4KVA, 3.6KVA/5.0KVA)
Charging Voltage	13.8V	27.7V
Solar Maximum Peak Voltage	22.0V	45.0V
Solar Charging Working Voltage	11.7V ± 0.5V	23.5V ± 1V
Maximum Charging Current	50A	50A
Polarity Protection	YES	YES
Backflow Protection	YES	YES

Remark: The output current of solar cells should not exceed 50A.

WARRANTY

Altronic Distributors warrants this product for one year from date of purchase from Altronics or its resellers to the consumer. If this item is part of an installation or another product, please contact the installer or supplier for your warranty.

During the warranty period, we undertake to repair or replace your product at no charge if found to be defective due to a manufacturing fault. The warranty excludes damage by misuse or incorrect installation (i.e. failure to install and operate device according to specifications in the supplied instruction manual), neglect, shipping accident, or no fault found, nor by use in a way or manner not intended by the supplier.

For speakers, misuse includes burnt out voice coils.

For repair or service please contact your PLACE OF PURCHASE.

If this item was purchased directly from Altronics please make a warranty claim by:

FOR MAIL ORDER CUSTOMERS (includes school and trade orders),
Ringing us on 1300 797 007 and quoting your tax invoice number.

Upon contacting Altronics, we will issue an R.A. (Return Authorisation). As Altronics have a number of service agents throughout Australia, a copy of the R.A. will be emailed, faxed or mailed to you with full instructions of how and where to send the goods. The freight for shipping goods back to Altronics for all repairs is at the customer's expense.

A copy of the R.A. form, (or at the very minimum, the R.A. number) must accompany the goods to effect the repair.

Altronics will pay the return freight to the customer where the warranty claim has been accepted.

Please quote the R.A. number in any correspondence to us.

FOR OVER THE COUNTER PURCHASES; to make a warranty claim, please return the goods to us in any of our stores, with a copy of your proof of purchase (tax invoice).

Upon leaving the goods at one of our stores, an R.A. number will be issued to you.

Once repaired, you will be contacted, advising that the goods are ready to be collected from the store.

It is at Altronics discretion as to whether the goods will be repaired or replaced (whilst under warranty); and as to whether identical goods will be used to replace the item due to changes of models / products.

Note: Under no circumstances should you attempt to repair the device yourself

or via a non-authorized Altronics service centre, as this will invalidate the warranty!

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

NOT FIELD SERVICEABLE.

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