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Delta UPS - Amplon Family

N Series, Single Phase
6/12 kVA

User Manual

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Save This Manual

This manual contains important instructions and warnings that you should follow during the installation, operation, storage and maintenance of this product. Failure to heed these instructions and warnings will void the warranty.

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1. IMPORTANT SAFETY INSTRUCTIONS

- This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries.
- Install the on line UPS in a well ventilated area, away from flammable liquids and gases. Do not let the unit come in contact with water.
- External slits and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect from overheating these openings must not be blocked or covered. Objects must never be inserted into ventilation holes or openings.
- Do not stand beverage containers on the unit.
- This UPS was designed to power all modern computer loads and associated peripheral devices, such as monitors, modems, cartridge tape drives, external floppy drives etc.. Do not use it for pure inductive or capacitive loads. It is not rated to power life support equipment.
- All recorded media, such as diskettes, tapes and cartridges, should be kept a minimum of 60cm from the UPS. Otherwise, the magnetic field created by operation of the UPS may erase data on those devices.
- All repairs or installation should be performed by qualified service personnel. The UPS contains voltages which are potentially hazardous. The output receptacles may be alive even when the UPS is not connected to the mains.
- Risk of a possible electrocution is possible when the battery is connected to the UPS. Therefore, do not forget to disconnect the batteries before any service is to be done on the UPS. To disconnect, remove the battery fuse holder which is located at the rear panel of the UPS.
- Isolate Uninterruptible Power Supply (UPS) before working on the circuit. A readily accessible disconnect device shall be incorporated in the fixed wiring.
- HIGH LEAKAGE CURRENT – Earth connection essential before connecting power source.
- Federal Communications Commission Interference Statement
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
FCC Caution: To assure continued compliance, (example-use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

- ATTENTION, hazardous through electrical shock. Also with disconnection of this unit from the mains, hazardous voltage still may be accessible through supply from the batteries. The battery supply should be therefore disconnected in the plus and minus pole of the batteries when maintenance or service work inside the UPS is necessary.
- Do not dispose of the batteries in a fire, the batteries may explode.
- Do not open or mutilate the batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- A battery can present a risk of electric shock and chemical hazard. The following precaution should be observed when working on batteries.

* Remove watches, rings or other metal objects.

* Use only tools with insulated handles.

- The compliance with the following standards provides the conformity:
- EN 62040-1-1
- EN 62040-2 CLASS A
- IEEE-C62.41 Category B
- IEC 61000-2-2
- IEC 61000-4-2 LEVEL3
- IEC 61000-4-3 LEVEL3
- IEC 61000-4-4 LEVEL4
- IEC 61000-4-5 LEVEL4
- IEC 61000-4-6
- IEC 61000-4-8
- CNS 14843-1
- CNS 13438 CLASS A

SYMBOL



PROTECTIVE GROUNDING TERMINAL: A TERMINAL WHICH MUST BE CONNECTED TO EARTH GROUND PRIOR TO MAKING ANY OTHER CONNECTION TO THE EQUIPMENT.



A TERMINAL TO WHICH OR FROM WHICH A DIRECT CURRENT OR VOLTAGE MAY BE APPLIED OR SUPPLIED.



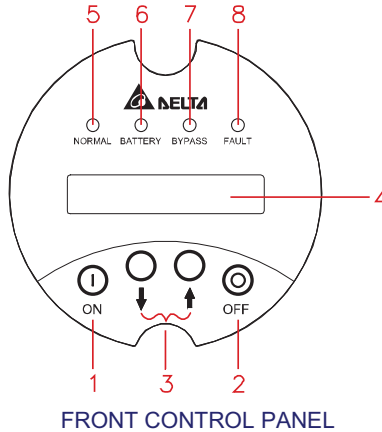
THIS SYMBOL INDICATES THE WORD "PHASE".

2. INTRODUCTION

2-1 FUNCTIONS AND FEATURES

- A True ON LINE design. The UPS insures the critical power protection for your mission-critical equipment at all times.
- Wide input range of power supply that reduces discharge rate of battery.
- A smart charger design for auto equalizing charge to shorten charging time.
- Equipped with RS232 port and Dry-contact interface, using the power management software “UPSentry Smart 2000” allows near-end and far-end UPS monitoring management.
- Automatic detection of 50/60Hz field input frequency
- With excellent performance. Input current using active input power factor correction and a high-frequency inverter with pulse width modulation.
- Optional isolated output transformer: Provides isolation and multiple output voltage.
- Start-on-battery capability for powering up the UPS even if utility power is not available.
- Optional SNMP interface card is an optional accessory for network communication.
- Implementing diagnostic test and LCD message display by using microprocessor technology can provide detailed information on operation status.
- Manual and static bypass switch forms. Allowance for switching to the main power supply.
- Static bypass supply circuit incorporates functions such as surge suppression and EMI filter.
- Remote emergency power off (REPO): Emergency shutdown control through the remote emergency power-off (REPO) port.
- Auto recovery function of inverter:
 - When the AC power is restored after a low battery shutdown, the UPS inverter will automatically restart.
 - Automatic transfer to inverter output from static bypass after overload condition is cleared.
- Alarm cancel facility to switch off the audible alarm and indicative lights still lit in the event of long BACK-UP periods.
- External battery cabinet can be used for extending operation time of battery mode.
- Operation of “ECONOMY mode” (Optional): When input voltage is within the range of rating voltage ($\pm 10\%$), the UPS is working in the bypass mode for higher efficiency. Otherwise the UPS will be switched to inverter mode.
- Auto detection for voltage in bypass mode: The protection range is $+15\% \sim -20\%$. When the bypass voltage is beyond protection range, the UPS will not supply output power to the load.
- Auto detection and display for normal operation of fan.

2-2 FRONT CONTROL PANEL



FRONT CONTROL PANEL

1. INVERTER ON BUTTON

Press the “ON” button for 3 seconds to activate the inverter.

2. INVERTER OFF BUTTON

Press the “OFF” button for more than 3 seconds to disable the inverter.

3. FUNCTION BUTTON

- In BYPASS/ECONOMY/ON LINE/BATTERY mode, press the up (↑) or down (↓) button to view information on load, voltage and frequency of bypass, input and output, battery and charger. (Refer to 5.2.)

- In ON LINE and ECONOMY modes, pressing the up (↑) button for more than 3 seconds can detect the battery capacity.

NOTE: If the UPS is in alarm status, pressing the up (↑) or down (↓) button for more than 3 seconds can disable the buzzer.

4. BACKLIT LCD DOT MATRIX DISPLAY

16×2 character display indicates the operating status of I/P and O/P voltage and battery voltage.

5. NORMAL LED

Display the UPS DC/AC circuit is working or not.

6. BATTERY LED

Display the UPS power source is from battery.

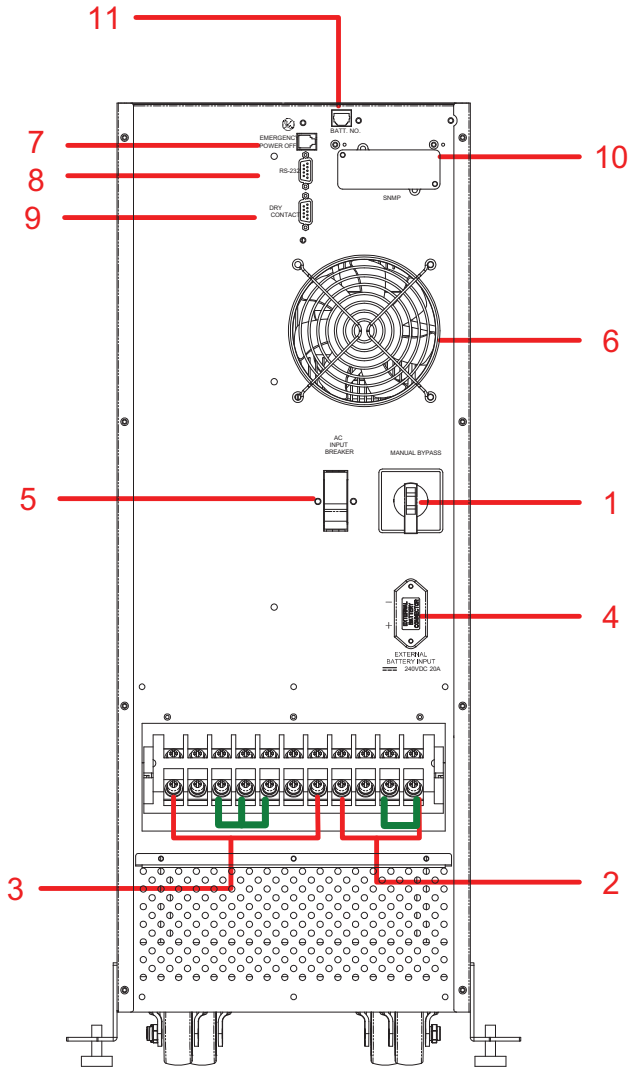
7. BYPASS LED

Display bypass voltage condition and UPS output voltage path from bypass.

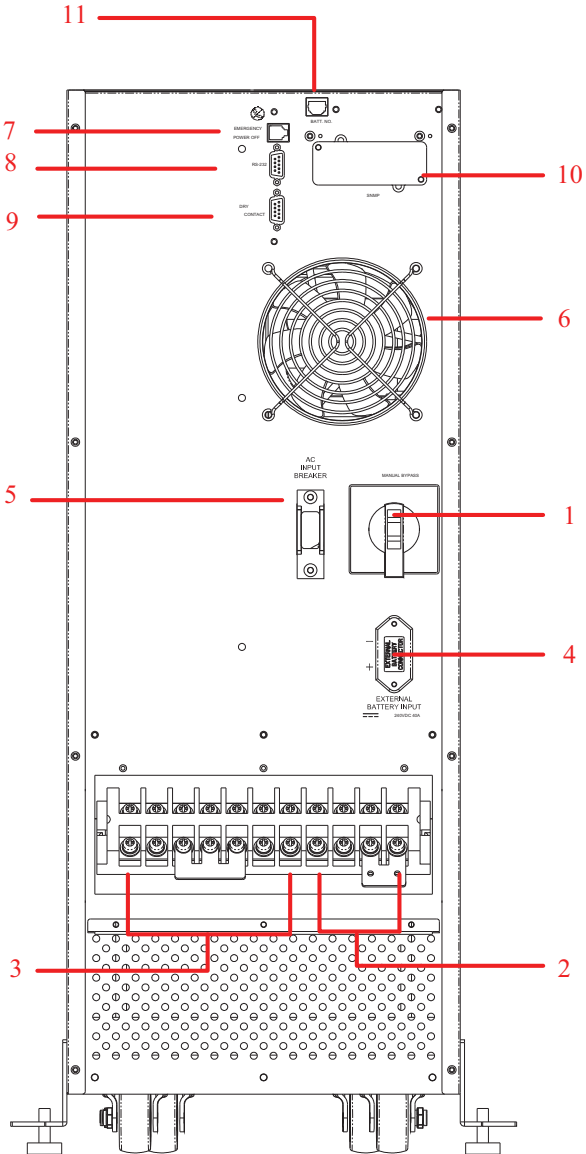
8. FAULT LED

Display any abnormality condition happened on UPS.

2-3 REAR CONTROL PANEL



6KVA



12KVA

1. MANUAL BYPASS SWITCH:

To change power load from static bypass to directive bypass while maintaining UPS without any power interruption.

2. INPUT TERMINALS:

To connect the AC mains input.

3. OUTPUT TERMINALS:

Connection of the load terminals is supported by UPS.

4. EXTERNAL BATTERY CABINET CONNECTOR:

Connects to external battery cabinet to extend the backup time.

5. AC INPUT BREAKER:

Provides safe protection for UPS AC input.

6. EXHAUST FANS:

For cooling air ventilation of UPS.

7. REMOTE EMERGENCY POWER OFF:

For more details, refer to Chapter 6.

8. TRUE RS232 INTERFACE PORT:

For more details, refer to Chapter 6.

9. DRY-CONTACT INTEERFACE PORT:

For more details, refer to Chapter 6.

10. SNMP CARD (OPTIONAL):

For more details, refer to Chapter 6.

11. EXTERNAL BATTERY PACK DETECTION:

For more details, refer to Chapter 6.

3. TECHNICAL SPECIFICATION

Model	6KVA	12KVA
1. Power		
1.1 Power (VA)	6000VA	12000VA
1.2 Power (W) PF=0.7	4200W	8400W
2. Output Waveform	Sine wave	
3. Input		
3.1 Input Voltage	220Vac, single phase	
3.2 Input Current	27.3A	54.5A
- Inrush Current	< 200A	
- Power Factor	> 0.99 (At Normal Line and Full Load)	
3.3 Efficiency (Full Resistance Load)		
- On line Mode (AC to AC)	88% (Full linear load)	
- Economy Mode	94% (Full linear load)	
3.4 Input Frequency	50/60Hz±0.5, 1, 2, 3, 4, 5 Hz (Programmable)	
3.5 Input Protection Circuit Breaker	40A (1 pole x 1)	63A (1 pole x 1)
4. Output		
4.1 Output Voltage		
- RMS Voltage	120V/220Vac, single phase	
- Static Regulation	± 2%	
4.2 Harmonic Distortion	< 5%	
4.3 Overload Capability	≤ 102% Continuous	
	102%~125%: 1 Minute	
	125%~150%: 30 Seconds	
	> 150%: Immediate	
4.4 Overload Release	90± 5% (Rated Load)	
4.5 Inverter Short Circuit Protection Current	90A	150A
4.6 Short Circuit Protection	Shutdown and no output	
4.7 Output Frequency	50/60Hz ± 0.5Hz (Battery mode)	
4.8 Output Protection Circuit Breaker		
- Bypass (Outside Installation Capacity)	40A(1pole*1)	63A(1pole*1)
- Inverter	Electronic protection	
4.9 Crest Factor	2.7:1	

Model	6KVA	12KVA
5. Battery & Charger		
5.1 Types	Sealed Lead Acid	
5.2 Number of Battery	12Vdc battery x 20 PCS	
5.3 Protection	30A/600V x 2pcs FUSE	
5.4 Recharge Voltage	Floating 271Vdc/ Boost 280Vdc	
5.5 Recharge Current	8Hrs 90%	
- Standard Mode	0.7A at 250Vdc (175W)	1.4A at 250Vdc (350W)
5.6 Battery Leakage Current	$\leq 1\text{mA}$	
5.7 Battery Low Voltage Alarm	220Vdc \pm 3%	
5.8 Battery Shutdown Voltage	212Vdc \pm 3%(discharge exceed 1hour)	
5.9 Back-up Time	≥ 7 Minutes (4200W)	≥ 3 Minutes (8400W)
6. Operation		
6.1 Transfer Time		
- On line Mode		
- Main Power Failure	0ms	
- Main Power Recover	0ms	
- Inverter To Bypass	< 1ms	
- Bypass To Inverter	< 1ms	
- Economy Mode		
- Main Power Recover	0ms	
- Inverter To Bypass	< 1ms	
- Bypass To Inverter	< 1ms	
- Main Power Failure	8ms (Typical)	
6.2 Audible Noise	< 53 dBA	< 65 dBA
7. Indications		
7.1 LED Status Mimic Diagram	Normal, Battery, Bypass, Fault	
7.2 LCD Display	Refer to Chapter 5.	
8. Communications		
8.1 RS232	Refer to Chapter 6.	
8.2 Remote Emergency Power Off	Refer to Chapter 6.	
8.3 Dry-Contact	Refer to Chapter 6.	
8.4 SNMP Function (Optional)	Refer to Chapter 6.	
8.5 External Battery Pack Detection	Refer to Chapter 6.	

Model	6KVA	12KVA
9. Connection		
9.1 Input Terminal Block	60A/600V 4 Pin x1	
9.2 Output Terminal Block	60A/600V 7 Pin x1	
9.3 Extended Battery I/P Socket	40A	
10. Manual Bypass Switch Function	25A	63A
11. Outlook		
11.1 Dimension		
- Depth (D)	581mm/22.87 inches 630mm	
- Width (W)	280mm/11.02 inches 280mm	
- Height (H)	784mm/30.87 inches 565mm	
- Net Weight	133KG/ 293LB	166KG/ 365.7LB
- Battery Cabinet Weight	180KG/ 396LB	
12 Environment		
12.1 Ambient Operating Temperature	0°C~40 °C/32 °F~104 °F	
12.2 Ambient Storage Temperature	-20 °C~40 °C/-4 °F~104 °F	
12.3 Relative Humidity	5%~95% H	
13 Standards		
13.1 CNS 14843-1	Yes	
13.2 CNS 13438 Class A	Yes	
13.3 IEEE-C62.41 Category B	Yes	
13.4 EN62040-1-1	Yes	
13.5 EN62040-2 Class A	Yes	
13.6 IEC 61000-2-2	Yes	
13.7 IEC 61000-4-2 Level 3	Yes	
13.8 IEC 61000-4-3 Level 3	Yes	
13.9 IEC 61000-4-4 Level 4	Yes	
13.10 IEC 61000-4-5 Level 4	Yes	
13.11 IEC 61000-4-6	Yes	
13.12 IEC 61000-4-8	Yes	

4. INSTALLATION

4-1 UNPACKING AND INITIAL INSPECTION

Carefully unpack and inspect the UPS upon receipt. If there is damage or anything is missing from the shipment, contact the dealer from whom you purchased the unit and save the packaging for future shipment. The packaging is recyclable, save the box and packing material for reuse. (Pay attention to the packing method. If you need to return the UPS any time, repack it how it was originally shipped.) If the unit passes the initial inspection, record the purchase date on rear panel of the unit .

Package content: 1. User Manual × 1
2. RS232 Cable × 1
3. "UPSentry Smart 2000" software CD × 1

4-2 STORAGE AND BATTERY MAINTENANCE

- If the UPS is to be stored before installation, it should be placed in a dry, ventilated area where it will not be exposed to dirt, moisture or other contaminants.
- Extreme storage temperatures:
 - 20°C to + 60°C without batteries.
 - 20°C to + 45°C with batteries for a short period.
- Maximum period for battery storage: 6 months at 20°C or 3 months at 30°C.
- Eight hours of charging time is needed when the UPS is used for the first time.
- If battery capacity still remains low after recharging for 8 hours, contact your dealer to replace the batteries.
- If the UPS is not used for a long period, the batteries should be recharged every 3 months to prevent irreversible battery damage.
- While replacing the batteries, use the same number and the following types of batteries:
 - 6KVA:12V/7Ah*20/1SET, YUASA(NP7-12) or CSB(GP1270) or B&B(HR7-12).
 - 12KVA:12V/9Ah*20/1SET, YUASA (REW45-12) or CSB (HR1234WF2) or B&B (HR9-12) or Matsushita(LC-R19).

4-3 PLACEMENT

Install the ON LINE UPS in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Ambient temperature must not exceed 40°C (104°F).

NOTE: To maintain the maximum battery life, please keep the UPS at an ambient temperature of 15°C to 25°C. Battery lifetime is reduced by half for every 10°C above 25°C.

Required Protective Devices and Cable Selection

Refer to the following table on recommended cables and upstream protection:

Model	Rated Input Cable	Rated Output Cable	Upstream Circuit-Breaker
6 KVA	8AWG or 8mm ²	8AWG or 8mm ²	D curve – 40A
12 KVA	6AWG or 14mm ²	6AWG or 14mm ²	D curve – 63A

Selection of Conduit and Bushing

According to National Electrical Code, install all the wiring with suggested suitable conduit and bushing as below.

- Conduit: Flexible metal conduit sized one inch.
- Bushing: Overall diameter is 40.5mm, height is 13.1mm.

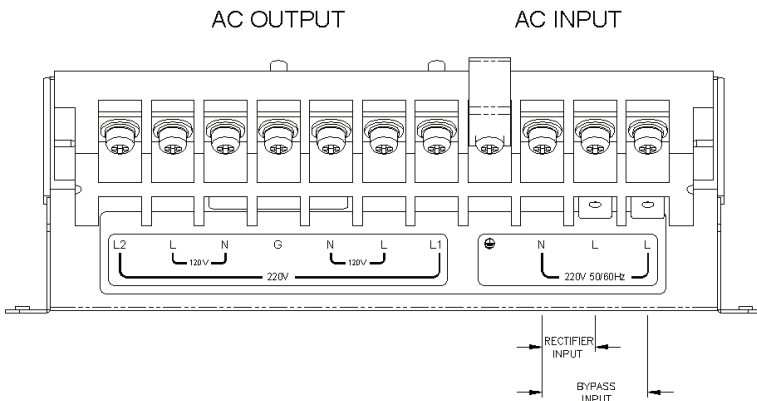
Input and Output Connection

When connecting the cable, please note that:

1. Before connecting, turn off the UPS and cut off AC power and battery.
2. Ensure the cable is fitted. The minimum tightening torque shall not be less than 35 lbs with a cable sleeve & secured by the connector clamp.
3. Connect the EARTH wire to the terminal marked with "⊕".

Connective Methods of Input and Output

1. Output 1Ø: (For 6KVA and 12KVA)



4-4 HANDLING

- The unit is fitted with wheels for moving it over a short distance. It is stabilized by four feet at both side.
For safety reason, secure the unit by releasing the feet. Refer to Fig.1 & 2 or Fig.1 & 3.
- The UPS should always have a clearance space of 300mm at the rear and 100mm on its side. Refer to Fig.4.

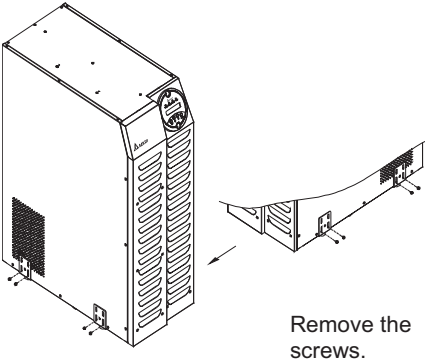


Fig.1

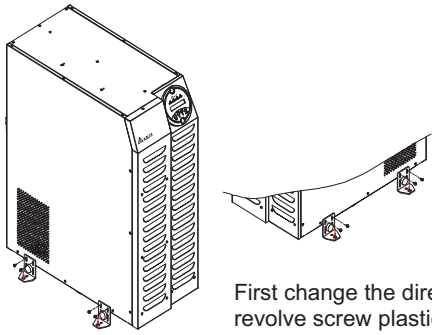
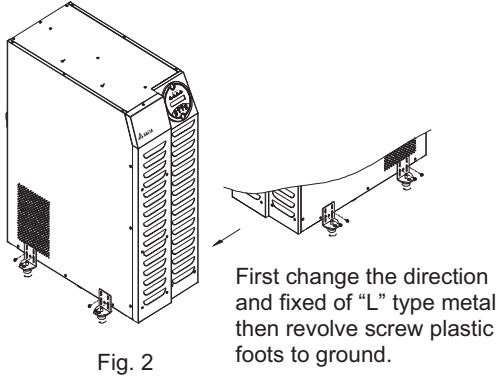
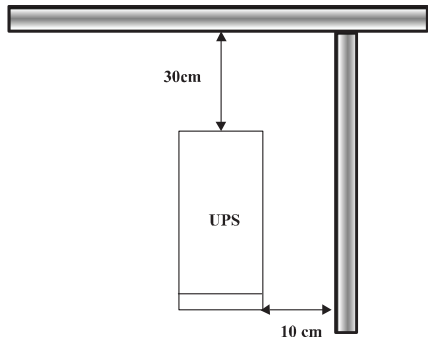


Fig.3



5. OPERATION

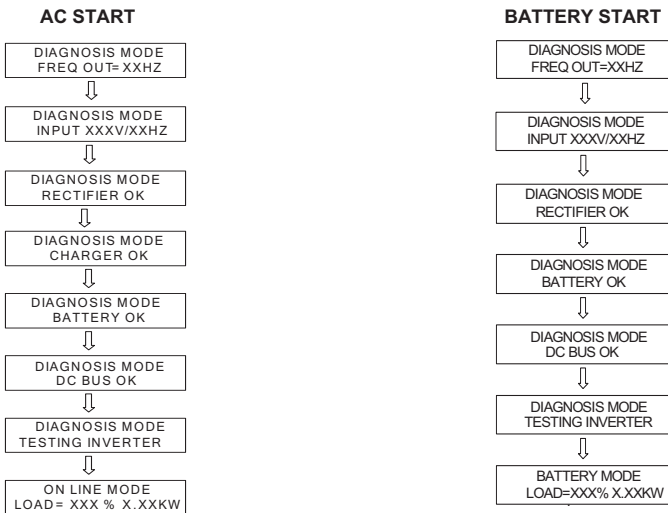
5-1 POWER ON/OFF INVERTER

Power On Inverter

Switch on the AC input breaker on rear control panel, and the load will be energized.

- When the AC input is normal, press the inverter “ON” button on front control panel for 3 seconds.
- When the AC input fails, press the “ON” button for more than 3 seconds to turn on inverter from batteries.
- The UPS starts diagnostic test and shows the results on the back lit LCD display as below.

DIAGNOSIS MODE



- After diagnostic test, the load is supplied by the inverter; if the diagnostic test fails, the error messages will be shown as below.

ERROR MESSAGES

BAD BATTERY	BAD BATTERY SHUT DOWN
CHARGER FAILURE	CHARGER FAILURE SHUT DOWN
DC BUS FAILURE	DC BUS FAILURE SHUT DOWN
INVERTER FAILURE	INVERTER FAILURE SHUT DOWN
OUTPUT FAILURE	OUTPUT FAILURE SHUT DOWN
FAN FAILURE	FAN FAILURE SHUT DOWN

Power Off Inverter

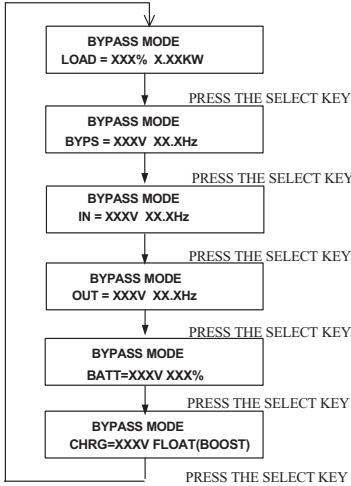
Press the "OFF" button on front control panel to disable the inverter.

- If the AC input power exists, the UPS will be switched to BYPASS mode.
- If the UPS is in backup mode, the message "UPS OFF WAITING" will be displayed on LCD about thirty seconds then disappear.
- Before removing the battery connect wire, please wait until the message "UPS OFF WAITING" displayed on LCD disappears.

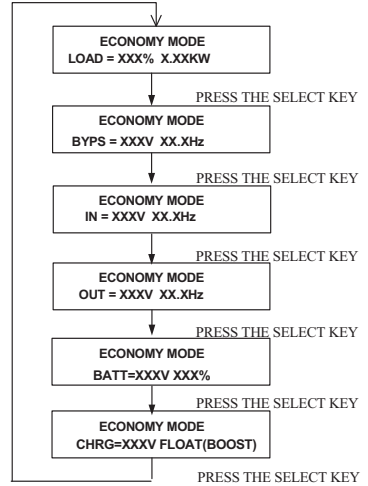
5-2 LCD FUNCTION SELECTION SWITCH

In BYPASS/ECONOMY/ON LINE/BATTERY mode, press the up (↑) or down (↓) button on front control panel to view different power readings on LCD.

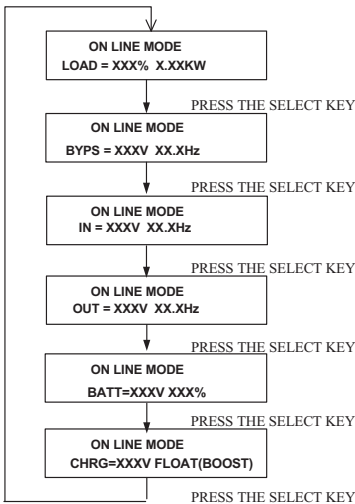
OPERATION IN BYPASS MODE



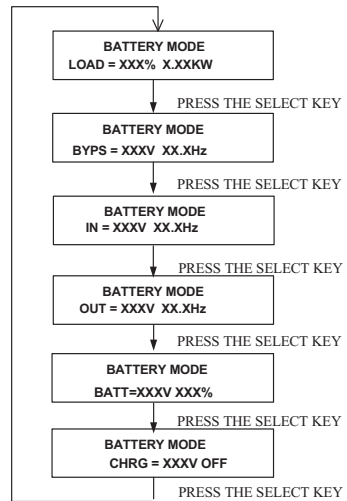
OPERATION IN ECONOMY MODE



OPERATION IN ON LINE MODE



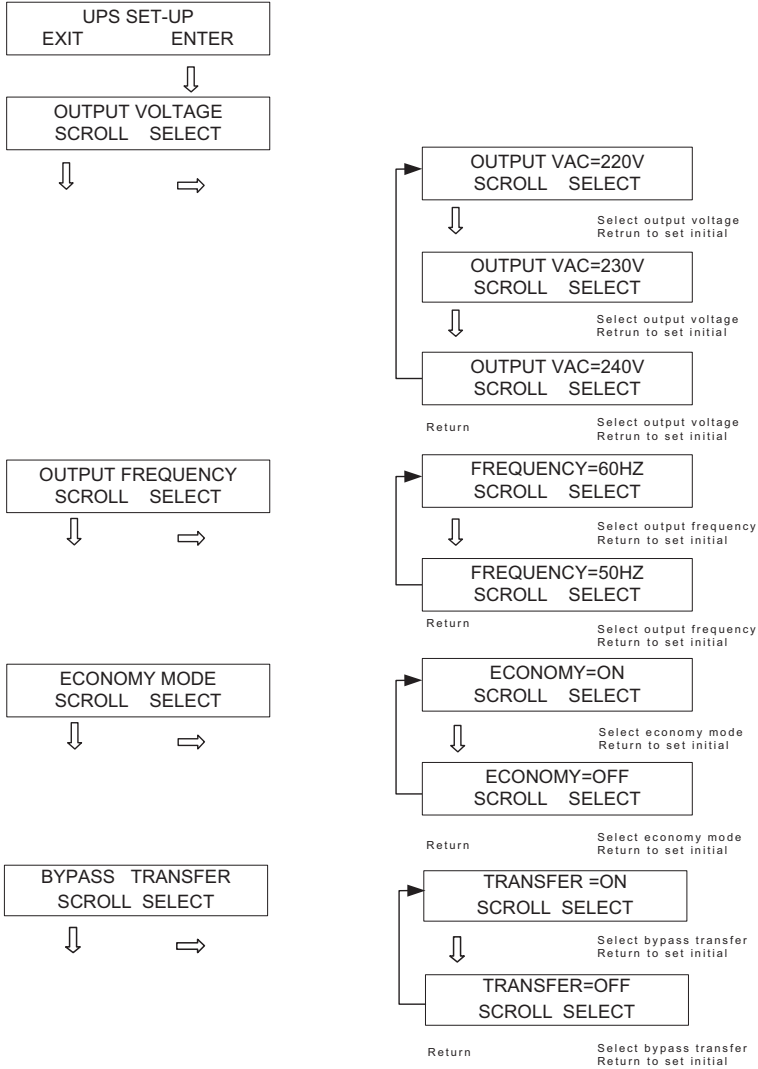
OPERATION IN BATTERY MODE

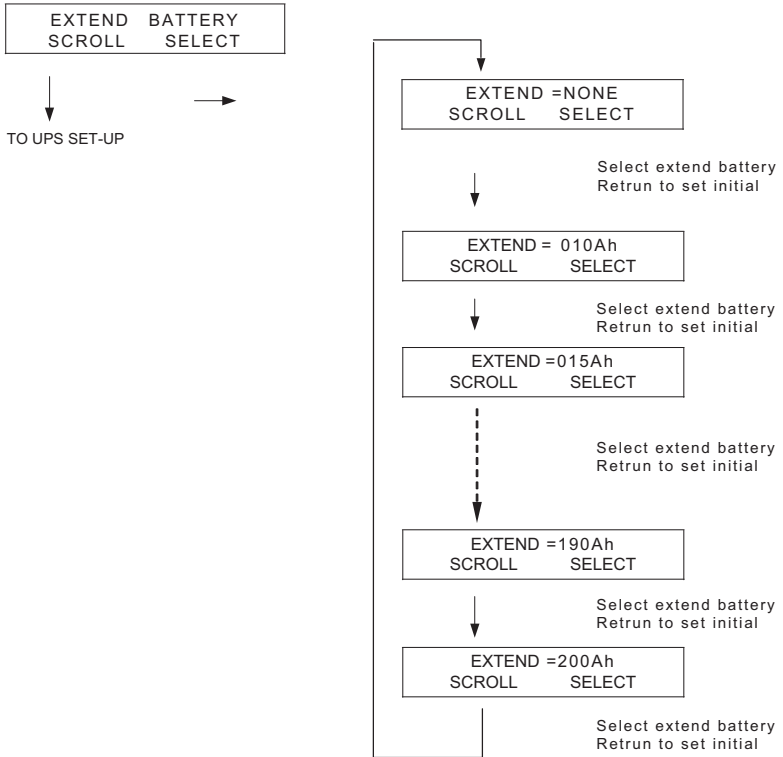


5-3 PARAMETER SET-UP MODE

Press both up (↑) and down (↓) buttons altogether for 3 seconds, then the UPS will enter SET-UP mode.

SET-UP MODE





Option items:					
01:NONE					
02:010Ah	07 : 035Ah	12:060Ah	17:100Ah	22:150Ah	27:200Ahh
03:015Ah	08 : 040Ah	13:065Ah	18:110Ah	23:160Ah	
04:020Ah	09 : 045Ah	14:070Ah	19:120Ah	24:170Ah	
05:025Ah	10 : 050Ah	15:080Ah	20:130Ah	25:180Ah	
06:030Ah	11 : 055Ah	16:090Ah	21:140Ah	26:190Ah	

5-4 OPERATION ON BYPASS VOLTAGE BEYOND ALLOWABLE RANGE

The UPS can automatically detect the voltage in bypass mode. The protection range is +15%~-20%. When the bypass voltage is beyond protection range, the UPS will not supply output power to the load.

BYPS OUT OF VOLT
LOAD = XXX% X.XXKW

When the bypass voltage is higher than 115% of rating voltage, the UPS will alarm and will not supply output power to the load. The message "BYPS OUT OF VOLT" will also be displayed on LCD.

When the bypass voltage is lower than 80% of rating voltage, the UPS will alarm and will not supply output power to the load. The message "BYPS OUT OF VOLT" will also be displayed on LCD.

5-5 OVERLOAD AND SHUTDOWN OPERATION

Overload Operation

When the UPS detects an output overload, it will commence a countdown (The length of time depends on the severity of the overload.). If the UPS is still overloaded at the end of the countdown, the UPS will automatically shut down and enter BYPASS mode.

Overload Condition	LCD Display Message	Countdown to Shutdown
102%-125%	OVERLOAD 102% LOAD=XXX%X.XXKW	1 minute
125%-150%	OVERLOAD 125% LOAD=XXX%X.XXKW	30 seconds
>150%	OVERLOAD 150% LOAD=XXX%X.XXKW	Immediate

Shutdown Operation

Condition	LCD Display Message
Extended Overload	OVERLOAD XXX% SHUT DOWN
Output Short Circuit	OVER CURRENT SHUT DOWN
Remote Shutdown Command	REMOTE COMMAND SHUT DOWN
Emergency stop power off	EMERGENCY STOP SHUT DOWN
DC BUS Fault	+/-DC BUS HIGH/ LOW SHUT DOWN
Internal Temperature Faults	OVER TEMPERATURE SHUT DOWN

5-6 VERIFYING THE BATTERY STATUS

The battery status is shown as below:

Battery Status	Buzzer of Back-up Status	LCD Display
Full	Beep per 2 seconds	BATTERY MODE BATT=XXXVXXX%
Mid		
Low	Beep per 0.5 seconds	LOW BATTERY LOAD=XXX% X.XXKW
Under	Long beep	LOW BATTERY SHUTDOWN

5-7 OPERATION OF MANUAL BYPASS SWITCH

The manual bypass switch is used for maintenance. In this situation, the AC input power is directly supplied to the load.

CAUTION!

Activate manual bypass switch only when the UPS is in BYPASS mode.

NORMAL



BYPASS

- STEP 1: Turn off the inverter power to switch the UPS to BYPASS Mode.
- STEP 2: Switch from "NORMAL" to "BYPASS".
- STEP 3: Switch off the AC Input breaker on rear panel.
- STEP 4: Remove the battery connect wire.

BYPASS



NORMAL

- STEP 1: Insert the battery connect wire.
- STEP 2: Switch on the AC Input breaker on rear panel..
- STEP 3: Switch from "BYPASS" back to "NORMAL".
- STEP 4: Press the ON button on front control panel to turn on the inverter.

6. COMMUNICATION INTERFACE

6-1 RS232 INTERFACE

A 9-pin female SUB-D connector is provided on rear panel of UPS to transmit the UPS signals to the computer. Using the Delta “UPSenrty Smart 2000” software allows users to check the power status. The details on signals are shown as below.

- Load level
- Battery status
- Battery level
- UPS mode
- Input voltage
- Output voltage
- Input frequency
- Temperature inside unit
- Set shut-down delay time
- Enable / Disable beeper
- Remote shut-down

Pin Assignment:

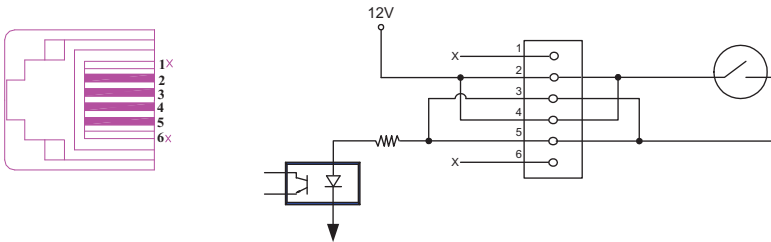
- Pin 2: TXD (Transmit Data)
- Pin 3: RXD (Receiving Data)
- Pin 5: GND (Signal Ground)
- Pin 7: PNP (Signal Receiving)

Hardware:

- Baud Rate -----2400 bps
- Data Length ----- 8 bits
- Stop Bit ----- 1 bit
- Parity ----- NONE

6-2 REMOTE EMERGENCY POWER OFF (REPO)

Pin Assignment of RJ11:



If short pin (2, 3) or pin (2, 5) or pin (4, 5) or pin (4, 3), then the UPS will be powered off.

NOTE: This port must not be connected to the Telecom Port.

6-3 DRY CONTACT

The sub-D communication port (9-pin female type) is used for powering on/off the UPS by external control signal. UPS can also transmit its status through this port. Refer to the following Dry contact table.

State \ Pin	Pin 8, 3	Pin 1, 3	Pin 6, 3	Pin 5, 3	Pin 2, 3
Normal	Open	Open	Open		
Back up	Close				
Low Battery		Close			
Fault			Close		
Bypass				Close	Open
Inverter				Open	Close

NOTE:  means the state may be "Open" or "Close".

Pin Assignment:

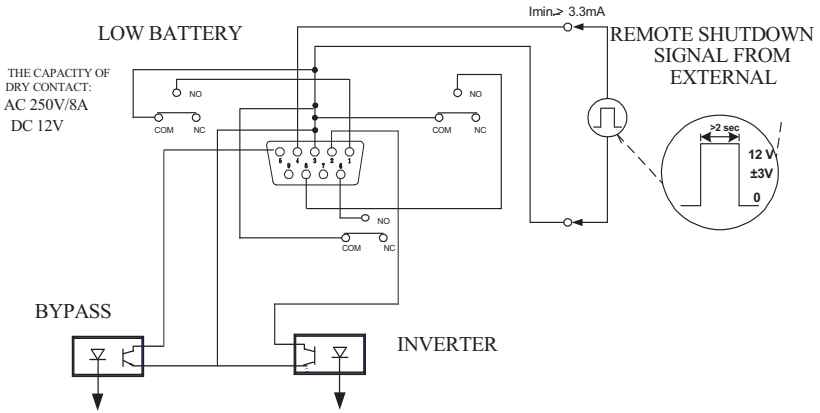
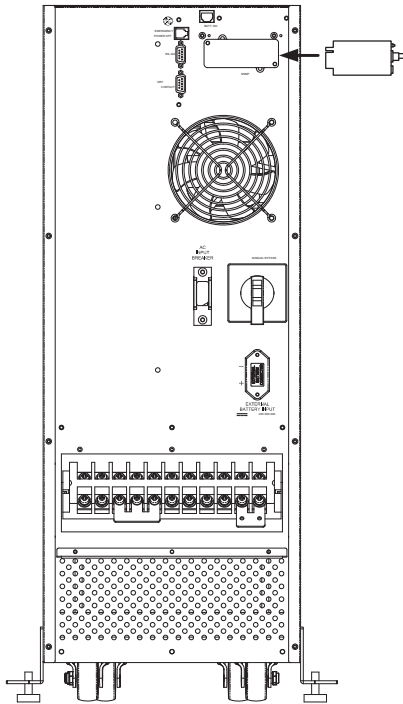


Fig. 5-2

6-4 SNMP CARD (OPTIONAL)

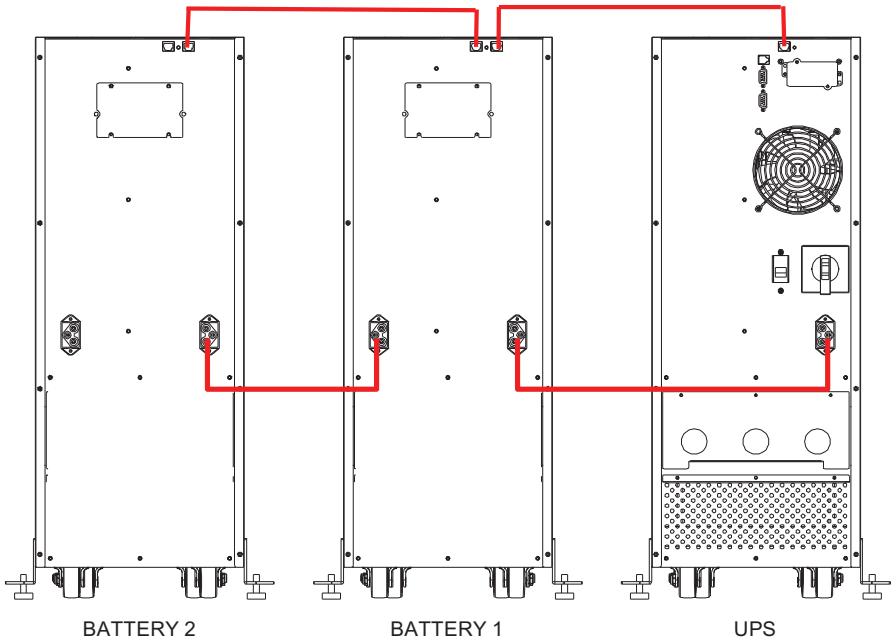
SNMP network interface is a powerful tool for remote control and UPS monitoring.



NOTE: For more information on SNMP card (optional), contact your local dealer.

6-5 DETECTION FOR QUANTITY OF EXTERNAL BATTERY PACK

When the UPS is connected with Delta's standard battery packs, you can detect the total battery capacity by linking the UPS to the battery pack.



NOTE: This function can detect up to a maximum of two external battery packs.

Warranty

Seller warrants this product, if used in accordance with all applicable instructions, to be free from original defects in material and workmanship within the warranty period. If the product has any failure problem within the warranty period, Seller will repair or replace the product at its sole discretion according to the failure situation.

This warranty does not apply to normal wear or to damage resulting from improper installation, operation, usage, maintenance or irresistible force (i.e. war, fire, natural disaster, etc.), and this warranty also expressly excludes all incidental and consequential damages.

Maintenance service for a fee is provided for any damage out of the warranty period. If any maintenance is required, please directly contact the supplier or Seller.

WARNING : The individual user should take care to determine prior to use whether the environment and the load characteristic are suitable, adequate or safe for the installation and the usage of this product. The User Manual must be carefully followed. Seller makes no representation or warranty as to the suitability or fitness of this product for any specific application.

