# **User Manual**

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# N1C.LR10000 Online UPS

Version: 1.1

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# **ABOUT THIS MANUAL**

## Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

#### Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

# SAFETY INSTRUCTIONS



# WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

- 1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
- 2. **CAUTION** --To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
- 3. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
- 4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- 5. **CAUTION** Only qualified personnel can install this device with battery.
- 6. **NEVER** charge a frozen battery.
- 7. For optimum operation of this UPS, please follow required spec to select appropriate cable size. It's very important to correctly operate this UPS.
- 8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
- 9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
- 10. Fuses are provided as over-current protection for the battery supply.
- 11. GROUNDING INSTRUCTIONS -This UPS should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this UPS.
- 12. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
- 13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this UPS back to local dealer or service center for maintenance.

## Standard

* Safety	
IEC/EN 62040-2	
* EMI	
Conducted Emission :IEC/EN 62040-2	Category C2
Radiated Emission :IEC/EN 62040-2	Category C2
* EMS	
ESD :IEC/EN 61000-4-2	Meets the requirements of Performance
	Criterion B
RS :IEC/EN 61000-4-3	Meets the requirements of Performance
	Criterion A
EFT :IEC/EN 61000-4-4	Meets the requirements of Performance
	Criterion A
SURGE: IEC/EN 61000-4-5	Meets the requirements of Performance
	Criterion B
CS :IEC/EN 61000-4-6	Meets the requirements of Performance
	Criterion A
Power-frequency Magnetic field :IEC/EN 61000-4-8	Meets the requirements of Performance
	Criterion A
Low Frequency Signals :IEC/EN 61000-2-2	Meets the requirements of Performance
	Criterion A

# INTRODUCTION

This is a multi-function UPS, combining functions of inverter and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user-configurable and easy-accessible button operation such as battery charging current and acceptable input voltage based on different applications.

## Features

- Pure sine wave output
- Configurable input voltage range for home appliances and personal computers via LCD setting
- Configurable battery charging current based on applications via LCD setting
- Auto restart while AC is recovering
- Overload/ Over temperature/ short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function
- Zero-transfer Time

### **Product Overview**



- 1. LCD display
- 2. Bypass indicator
- 3. Status indicator
- 4. Charging indicator
- 5. Fault indicator
- 6. Function keys (Please refer to operation chapter for the detailed operation)
- 7. Battery input
- 8. AC output terminals
- 9. AC input terminals
- 10. Intelligent slot (Reserve)

# INSTALLATION

## **Unpacking and Inspection**

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- The unit with installed SNMP card x 1
- User manual x 1
- Communication cable x 2
- Software CD x 1
- Rack rail kits x 1 set
- Battery connection cables with ring terminals x 2

## Preparation

Before connecting all wirings, please take off bottom terminal cover.

## **UPS Rack Mounting**

Consider the following points before selecting where to install the UPS:

- Do not put the UPS on flammable construction materials.
- Dusty conditions on the unit may impair the performance of this UPS.
- The ambient temperature should be between 0°C and 40°C to ensure optimal operation.
- For proper operation, please use appropriate cables.



## **Battery Connection**

**CAUTION:** For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and UPS. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

#### **Ring terminal:**

**WARNING!** All wiring must be performed by a qualified personnel. **WARNING!** It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below.



#### Recommended battery cable and terminal size:

	Maximum	aximum Battery nperage capacity		Ring Terminal			Torque	
Model	Amnorago		Wire Size	Cable	Cable Dimens		Torque	
	Amperage			mm <sup>2</sup>	D (mm)	L (mm)	value	
N1C.LR10000	250A		200411	1*2/0AWG	115	10.5	50	
		250A 200AH	2*1/0AWG	180	8.4	50	4.311(1)	

Please follow below steps to implement battery connection:

- 1. Assemble battery ring terminal based on recommended battery cable and terminal size.
- 2. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the nuts are tightened with torque of 8-9 Nm. Make sure polarity at both the battery and the inverter/charge is correctly connected and ring terminals are tightly screwed to the battery terminals.



#### WARNING: Shock Hazard

Installation must be performed with care due to high battery voltage in series.



## AC Input/Output Connection

**CAUTION!!** Before connecting to AC input power source, please install a **separate** AC breaker between UPS and AC input power source. This will ensure the UPS can be securely disconnected during maintenance and fully protected from over current of AC input.

**CAUTION!!** There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

**WARNING!** All wiring must be performed by a qualified personnel.

**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for AC input/output connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below.

 Recommended cable requirement and terminal size or AC wires:					
Model	Gauge	Ring Terminal T			
		Cable	Dimensions		Value
		mm <sup>2</sup>	D (mm)	L (mm)	
N1C.LR10000	6AWG	14	6.4	29.8	3Nm

#### **Ring terminal:**



Please follow below steps to implement AC input/output connection:

- 1. Before making AC input/output connection, be sure to open DC protector or disconnector first.
- 2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3 mm. Then, insert one conductor into one ring terminal as an assembled wire.
- 3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor ( ) first.
  - $\oplus$   $\rightarrow$  Ground (yellow-green)
  - L1→LINE (black)





$\wedge$	WARNING:
<u>/!\</u>	Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

4. Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws. Be sure to connect PE protective conductor () first.

⊕→Ground (yellow-green)

#### L1→LINE (black)

#### L2→LINE (brown)



#### 5. Make sure the wires are securely connected.

**CAUTION:** Appliances such as air conditioner are required at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this UPS will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

## **Communication Connection**

#### **Communication port:**

RS232 port	USB port	Intelligent slot	
		• •	

To allow for unattended UPS shutdown/start-up and status monitoring, connect the communication cable one end to the USB/RS232 port and the other to the communication port of your PC. With the monitoring software installed, you can schedule UPS shutdown/start-up and monitor UPS status through PC.

The N1C.LR10000 UPS is equipped with intelligent slot perfect for either SNMP, AS400, Modbus or BMS card. When installing extra communication card in the UPS, it will provide advanced communication and monitoring options.

## **Software Installation**

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. Use supplied RS-232 or USB communication cable to connect RS-232/USB port of UPS and RS-232/USB port of PC. Then, follow below steps to install monitoring software.

- 1. Insert the included installation CD into CD-ROM drive and then follow the on-screen instructions to proceed software installation. If there no screen shows 1 minute after inserting the CD, please execute setup.exe file for initiating software installation.
- 2. Follow the on-screen instructions to install the software.

When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

# **OPERATION**

## **Operation and Display Panel**

The operation and display panel, shown in below chart, is on the front panel of the UPS. It includes three indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



#### **Function Keys**

Key	Function	Operation		
	Turn on the UPS	Press and hold the key for more than 1s.		
•/●	To confirm the selection	Press this key in setting mode		
	Turn off the UPS	Press and hold the key for more than 1s.		
	To exit setting mode	Press this key in setting mode		
070	Return to default display	Press this key in display mode		
	To go to previous selection	Press this key		
UP				
To go to next selection		Press this key		
DOWN				
► ► To enter setting mode		Press and hold these two keys simultaneous for		
UP+DOWN		more than 1s in display mode		

#### **LED Indicators**

LED Indicator		r	Messages
BYPASS	→ yellow Solid On		Output is powered by utility in Bypass/ Fault mode.
৾ৼ৾৵৾৾৻৾ঢ়৾৾	Croop	Solid On	Output is powered by utility in Line mode.
LINE BATT	Green	Flashing	Output is powered by battery in battery mode.
<b>F</b>			Battery is fully charged.
CHARGING	yellow	Flashing	Battery is charging.
	Ded	Solid On	Fault occurs in the UPS.
FAULT	LT Red		Warning condition occurs in the UPS.

There are 4 LEDs on front panel to show the UPS working status:

LED	BYPASS			
Houe	DITAGO		CHARGING	FAULI
UPS On	- <del>``</del>	- <del>`</del> .	- <b></b> -	- <del>`</del>
Bypass mode	*	0		0
Line mode	0	÷.		0
Battery mode	0	*	0	0
Fault mode		0		÷.
Warning mode				- <b>X</b> -

Note: 🔆 means LED is lit, 🤆 means LED is flashing, 🔿 means LED is faded, -- means LED is lit or faded.

## **LCD Display Icons**



Icon	Function description			
Input Source Information				
AC	Indicates the AC input.			
	Indicate input voltage, input frequency, charger current, charger power, battery voltage.			
Configuration Program and F	ault Information			
88	Indicates the setting programs.			
	Indicates the warning and fault codes. Warning: flashing with warning code.			
Output Information				
OUTPUTBATTLOAD VA VA Hz	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.			
<b>Battery Information</b>	Battery Information			

Indicates battery level by 0-24%, 25-49%, 50-74 battery mode and charging status in line mode.			0-74% and 75-100% in de.			
In AC mode, it wil	present batte	ry charging status				
Status	Battery voltag	e	LCD Displa	у		
	<2V/cell		4 bars will flash in turns.			
Constant	2 ~ 2.083V/ce	2 ~ 2.083V/cell		Bottom bar will be on and the other three		
Current mode /			Bottom two	o bars will be on a	and the other two	
Constant	2.083 ~ 2.167	/V/cell	bars will flash in turns.			
Voltage mode	> 2.167 V/cel	I	Bottom thr will flash.	Bottom three bars will be on and the top bar will flash		
Floating mode. B	atteries are ful	ly charged.	4 bars will	be on.		
<b>J</b>	In ba	ttery mode, it will	present bat	tery capacity.		
Load Perce	entage	Battery V	oltage	LCD Display	/	
		< 1.85V	//cell			
Load >	50%	1.85V/cell ~ 1	933V/cell			
		1.933V/cell ~ 1	2.017V/cell			
		> 2.017V/cell				
		< 1.892V/cell				
Load < 50%		1.892V/cell ~ 1.975V/cell				
		1.975V/cell ~ 2.	058V/cell			
		> 2.058V/cell				
Load Informatio	n					
OVER LOAD	Indicates ov	erload.				
0	Indicates the	e load level by 0-24%, 25-49%, 50-74% and 75-100%.				
M 🗗 100%	0%~249	% 25%~	49%	50%~74%	75%~100%	
25%	7	1	1	7		
Mode Operation	Information					
8	Indicates un	it connects to the	mains.			
BYPASS	Indicates un	Indicates unit will work in Bypass mode				
	Indicates the	Indicates the utility charger circuit is working.				
	Indicates the	Indicates the DC/AC inverter circuit is working.				
Mute Operation						
	Indicates un	Indicates unit alarm is disabled.				

## LCD Setting

After pressing and holding UP & ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button to exit.

#### Setting Programs:

Program	Description	Selectable option			
01	Force exit fault mode: After exit setting mode 10 seconds, the device will exit fault mode and mute the alarm.	Force exit fault mode disable (default) $\bigcirc I \_FSd$	Force exit fault mode enable $O_{O}$		
02	Maximum charging current: To configure total charging current.		The setting range is from 20A to 120A and increment of each click is 20A.		
06	Auto restart when overload occurs	Restart disable (default)	Restart enable		
07	Auto restart when over temperature occurs	Restart disable (default)	Restart enable		
08	Output voltage	230V(default) □ □ □ □ □ □ □ □ 220V □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	208V 08 208* 240V 08 240V 08 240V 08 240V		
09	Output frequency	60Hz (default)	50Hz 09		
10	Operation Logic	Automatically (default)	If selected and utility is available, UPS will work in line mode. Once utility frequency is unstable, UPS will work in bypass mode if bypass function is not forbidden in program 23. If selected, UPS will work in line mode when utility is available.		
18	Alarm control	Alarm on (default)	Alarm off		
19	Auto return to default display screen	Return to default display screen (default)	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.		

		Stay at latest screen	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default)	
22	Beeps while primary source is interrupted	Alarm on (default)	
23	Bypass function:	Bypass Forbidden	If selected, UPS won't work in bypass/ECO modes.
		Bypass disable	If selected and power ON button is pressed on, UPS can work in bypass/ECO mode only if utility is available.
		Bypass enable (default)	If selected and no matter power ON button is pressed on or not, UPS can work in bypass mode if utility is available.
25	Record Fault code		Record disable (default)

## **Display Setting**

The LCD display information will be switched in turns by pressing "UP" or "DOWN" key. The selectable information is switched as below order: input voltage, input frequency, charging power, battery voltage, output voltage, output frequency, load percentage, load in VA, load in Watt, DC discharging current, main CPU Version and second CPU Version.

Selectable information	LCD display
Input voltage/Output voltage (Default Display Screen)	Input Voltage=220V, output voltage=220V $\square \square \square \square \vee$ $\square \square \square \vee$
Input frequency	
Charging current	charging current=50A $\square \square \square$ $\blacksquare \square \square$
Battery voltage and output voltage	Battery voltage=55.5V, output voltage=220V $555^{v}$ $220^{v}$ $220^{v}$ $220^{v}$ $220^{v}$ $220^{v}$
Output frequency	Output frequency=50Hz UITPUT SSSV SOO Hz PUTPUT SSSV Hz 25%
Load percentage	Load percent=70%

	When connected load is lower than 1kVA, load in VA will present ww/A like below chart
	<u> </u>
Load in VA	When load is larger than 1kVA (≥1KVA), load in VA will
	present x.xkVA like below chart.
	When load is lower than 1kW, load in W will present
Load in Watt	When load is larger than 1kW ( $\geq$ 1KW), load in W will
	present x.xkW like below chart.
	Battery voltage=55.5V, discharging current=1A
Battery voltage/DC discharging current	
	Battery level=42%, AC output current=2A
Battery level/AC output current	



## **Operating Mode Description**

Operation mode	Description	LCD display
Standby mode <b>Note:</b> *Standby mode: The UPS is not turned on yet but at this time, the UPS can charge battery without AC output.	No output is supplied by the unit but it still can charge batteries.	Charging by utility.
Bypass Mode	The unit will provide output power from the utility. The utility can charge batteries.	Charging by utility $\underbrace{\text{EVFASS}}_{CHARGING}$ $\underbrace{\underbrace{\text{EVFASS}}}_{0}$ $\underbrace{\underbrace{\text{FVFASS}}}_{0}$ $\underbrace{\text{FVFASS}}_{0}$ $\text$
Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.	Utility can bypass.	No charging and Bypass

Line Mede	The unit will provide output power from the mains. It will	No charging.
	also charge the battery if connecting to battery.	Charging by utility.
Battery Mode	The unit will provide output power from battery.	Power from battery only.

## Fault Reference Code

Fault Code	Fault Event	Icon on
02	Over temperature	
03	Battery voltage is too high	
05	Output short circuited or over temperature is detected by internal converter components.	
06	Output voltage is too high.	
07	Overload time out	
08	Bus voltage is too high	
09	Bus soft start failed	
50	PFC over current	<u> </u>
51	OP over current	
52	Bus voltage is too low	
53	UPS soft start failure	
55	Over DC voltage in AC output	
57	Current sensor failed	
58	Output voltage is too low	
59	DC-DC over current	<u>59</u>
60	Power feedback protection	60
71	Firmware version inconsistent	
72	Current sharing fault	
80	CAN fault	80
81	Host loss	8
82	Synchronization loss	82

83	Battery voltage detected different	
84	AC input voltage and frequency detected different	
85	AC output current unbalance	
86	AC output mode setting is different	86

## Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan is locked when UPS is on.	Beep three times every second	
02	Over temperature	None	£50
04	Low battery	Beep once every second	ĴӋ₄
07	Overload	Beep once every 0.5 second	
10	Output power derating	Beep twice every 3 seconds	
12	EPO activated	Beep twice every 3 seconds	
13	Manual Bypass activated	Beep twice every 3 seconds	
17	Phase Lock failed	Beep twice every 3 seconds	
19	Bypass loss	Beep twice every 3 seconds	
20	Line loss	Beep twice every 3 seconds	204
21	Bypass lock	Beep twice every 3 seconds	
62	Battery is not connected	Beep twice every 3 seconds	<u> </u>

## SPECIFICATIONS

Table 1 Line Mode Specifications

MODEL	N1C.LR10000
Input Voltage Waveform	Sinusoidal
Nominal Input Voltage	220Vac/230Vac/240Vac
Low Loss Voltage	170Vac±7V
Low Loss Return Voltage	180Vac±7V
High Loss Voltage	280Vac±7V
High Loss Return Voltage	270Vac±7V
Max AC Input Voltage	300Vac
Nominal Input Frequency	50Hz / 60Hz (Auto detection)
Low Loss Frequency	46(56)±1Hz
Low Loss Return Frequency	46.5(57)±1Hz
High Loss Frequency	54(64)±1Hz
High Loss Return Frequency	53(63)±1Hz
Power Factor	>0.98
Output Short Circuit Protection	Line mode: Circuit Breaker Battery mode: Electronic Circuits
Efficiency (Line Mode)	93% (Peak Efficiency)
Transfer Time	Line mode←→Battery mode 0ms Line mode / Battery mode ←→Bypass mode 4ms

Table 2 Battery Mode Specifications

MODEL	N1C.LR10000
Rated Output Power	10KVA/8KW(220/230/240) or 8KVA/7.2KW(208)
Output Voltage Waveform	Pure Sine Wave
Output Voltage Regulation	230(220/240/208)Vac± 5%
Output Frequency	50Hz or 60Hz
Peak Efficiency	91%
	100ms@≥150% load;
Overload Protection	5s@125%~150% load;
	10s@105%~125% load;
Surge Capacity	2* rated power for 5 seconds
Nominal DC Input Voltage	48Vdc
Operating Range	40Vdc -60Vdc
Cold Start Voltage	46Vdc
Low DC Warning Voltage	
@ load < 50%	45.0Vdc
@ load ≥ 50%	44.0Vdc
Low DC Warning Return Voltage	
@ load < 50%	47.0Vdc
@ load ≥ 50%	46.0Vdc
High DC Recovery Voltage	56Vdc
High DC Cut-off Voltage	60Vdc
No Load Power Consumption	<67W @48V

Table 3 Charge Mode Specifications

Utility Charging Mode		
MODEL	N1C.LR10000	
Charging Current @ Nominal Input Voltage	Default: 20A, max: 120A	
Bulk Charging Voltage	56.4Vdc	
Floating Charging Voltage	54Vdc	
Overcharge Protection	60Vdc	
Charging Algorithm	3-Step	
Charging Curve	Battery Voltage, per cell 2. etwic (2. 33Wiel) 2. 23 view 1. 10 ° T0, moment ibnes, maimum flor Buik Absorption (Constant Voltage) Time	

## Table 4 Bypass Mode Specifications

Bypass Mode		
MODEL	N1C.LR10000	
Input Voltage Waveform	Sinusoidal	
Low Loss Voltage	170Vac±7V	
Low Loss Return Voltage	180Vac±7V	
High Loss Voltage	280Vac±7V	
High Loss Return Voltage	270Vac±7V	
Nominal Input Frequency	50Hz / 60Hz (Auto detection)	
Low Loss Frequency	46(56)±1Hz	
Low Loss Return Frequency	46.5(57)±1Hz	
High Loss Frequency	54(64)±1Hz	
High Loss Return Frequency	53(63)±1Hz	

## Table 5 General Specifications

MODEL	N1C.LR10000		
Parallel-able	NO		
Communication	slot		
Safety Certification	CE		
<b>Operating Temperature Range</b>	-10°C to 50°C		
Storage temperature	-15°C~ 60°C		
Humidity	5% to 95% Relative Humidity (Non-condensing)		
Dimension (D x W x H)	774 x 438 x 130.8 mm (30.47 x 17.24 x 5.15 inch)		
Net Weight	25 kgs (55.12 lb)		

# **TROUBLE SHOOTING**

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do	
Unit shuts down automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	<ol> <li>Re-charge battery.</li> <li>Replace battery.</li> </ol>	
No response after power on.	No indication.	<ol> <li>The battery voltage is far too low. (&lt;1.4V/Cell)</li> <li>Battery polarity is connected reversed.</li> </ol>	<ol> <li>Check if batteries and the wiring are connected well.</li> <li>Re-charge battery.</li> <li>Replace battery.</li> </ol>	
Mains exist but the unit works in battery mode.	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.	
	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	<ol> <li>Check if AC wires are too thin and/or too long.</li> <li>Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS→Appliance)</li> </ol>	
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.	
Buzzer beeps continuously and red LED is on.	Fault code 07	Overload error. The UPS is overload 110% and time is up.	Reduce the connected load by switching off some equipment.	
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.	
	Fault code 02	Internal temperature of UPS component is over 100°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.	
		Battery is over-charged.	Return to repair center.	
	Fault code 03	The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.	
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	<ol> <li>Reduce the connected load.</li> <li>Return to repair center</li> </ol>	
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.	
	Fault code 50	PFC over current or surge.	Restart the unit, if the error	
	Fault code 51	OP over current or surge.		
	Fault code 52	Bus voltage is too low.	happens again, please return to repair center.	
	Fault code 55	Output voltage is unbalanced.		
	Fault code 56	Battery is not connected well or fuse is burnt.	If the battery is connected well, please return to repair center.	

# **Appendix I: Approximate Back-up Time Table**

Model	Load(W)	Backup Time @ 48 Vdc 100Ah (min)	Backup Time @ 48 Vdc 200Ah (min)	Backup Time @ 48 Vdc 300Ah (min)	Backup Time @ 48 Vdc 400Ah (min)
N1C.LR10000	500	518	1037	1555	2074
	1000	259	518	778	1037
	1500	173	346	518	691
	2000	130	259	389	518
	2500	104	207	311	415
	3000	86	173	259	346
	3500	74	148	222	296
	4000	65	130	194	259
	4500	58	115	173	230
	5000	52	104	156	207
	5500	47	94	141	189
	6000	43	86	130	173
	6500	40	80	120	160
	7000	37	74	111	148
	7500	35	69	104	138
	8000	32	65	97	130

**Note:** Backup time depends on the quality of the battery, age of battery and type of battery.

Specifications of batteries may vary depending on different manufacturers.