



Complete Power Solution™



ONL 33 Series Un-interruptible Power Supply

User Manual



www.pcmups.com.tw

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1 Preface

1-1 Introduction

ONL 33 series UPS that is proven to be the industry's most reliable and stable power protection equipment, yet controlled by DSP (Digital Signal Processor) to protect your valuable equipment last ever. Specially ONL 33 series UPS is used for computer, precision instrument etc....

1-2 Safety Note and Precaution

For use the device safety, please refer to warning mark as follows.



Don't touch



Risk of electrical shock

Above two symbols are warning symbols of this series. In the area with symbol entitled "Risk of electrical shock" indicate 410VDC high voltage and don't touch the parts with this mark.

2 System structure

2-1 System Diagram of ONL33

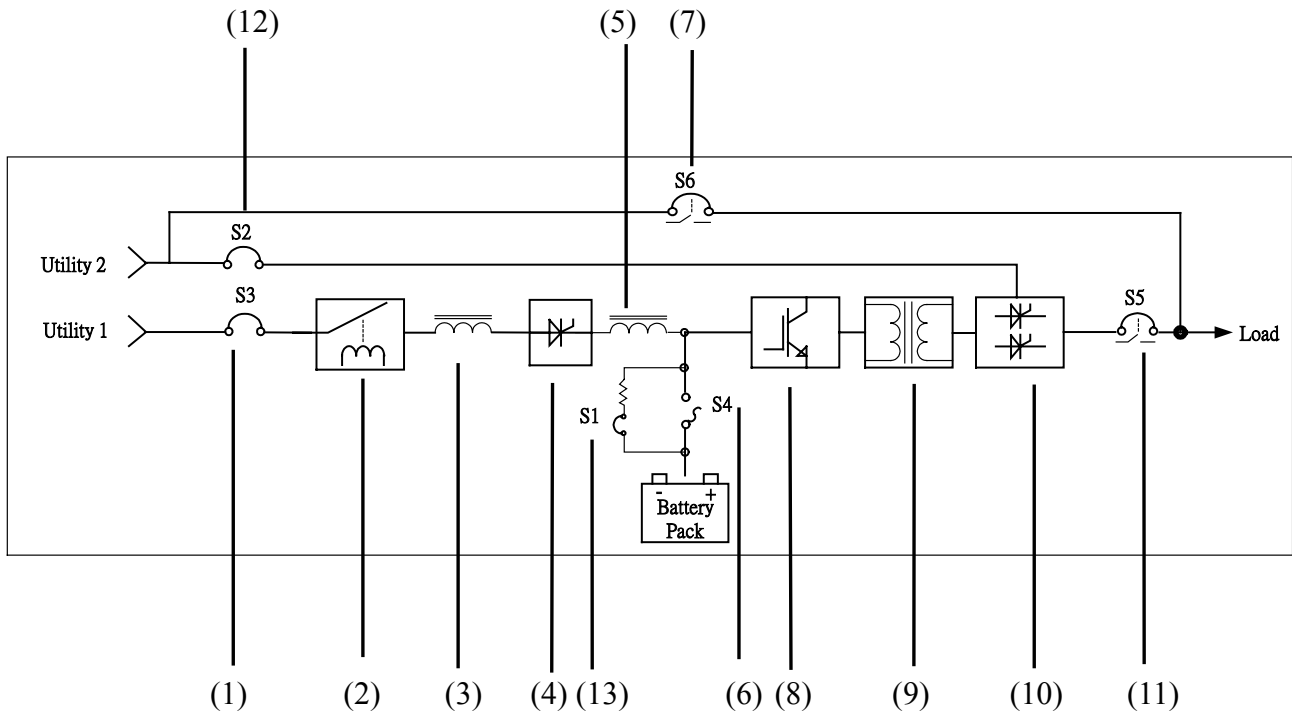


fig. 2-1

- (1) Main power switch (S3)
- (2) Input protection
- (3) Three phase alternating current power inductor
- (4) Rectifier / battery charger module
- (5) Direct current power inductor
- (6) Battery fuse switch (S4)
- (7) Manual bypass switch (S6)
- (8) Inverter module
- (9) Isolated transformer
- (10) Static switch module
- (11) Output switch (S5)
- (12) Second power switch (S2)
- (13) Start up auxiliary switch (S1)

Note :

- (1) This UPS input system can input by single power system or input by dual power.
- (2) Dual power input is option.

2-2 Assembly of System and allocation

Diagram 2-2A and 2-2B are assembly diagram of ONL33 series 22.5K, 30K.

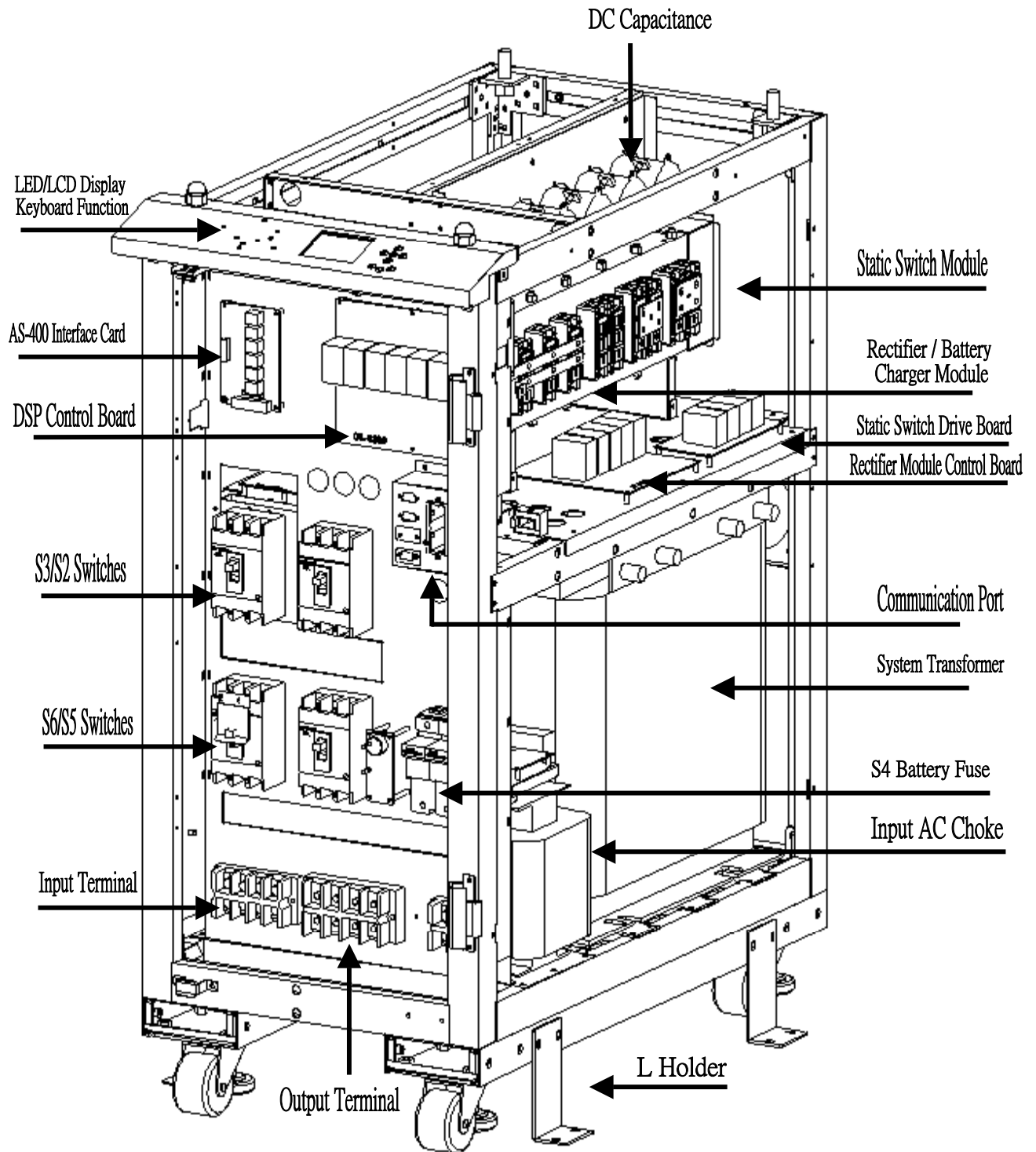


Fig. 2-2A

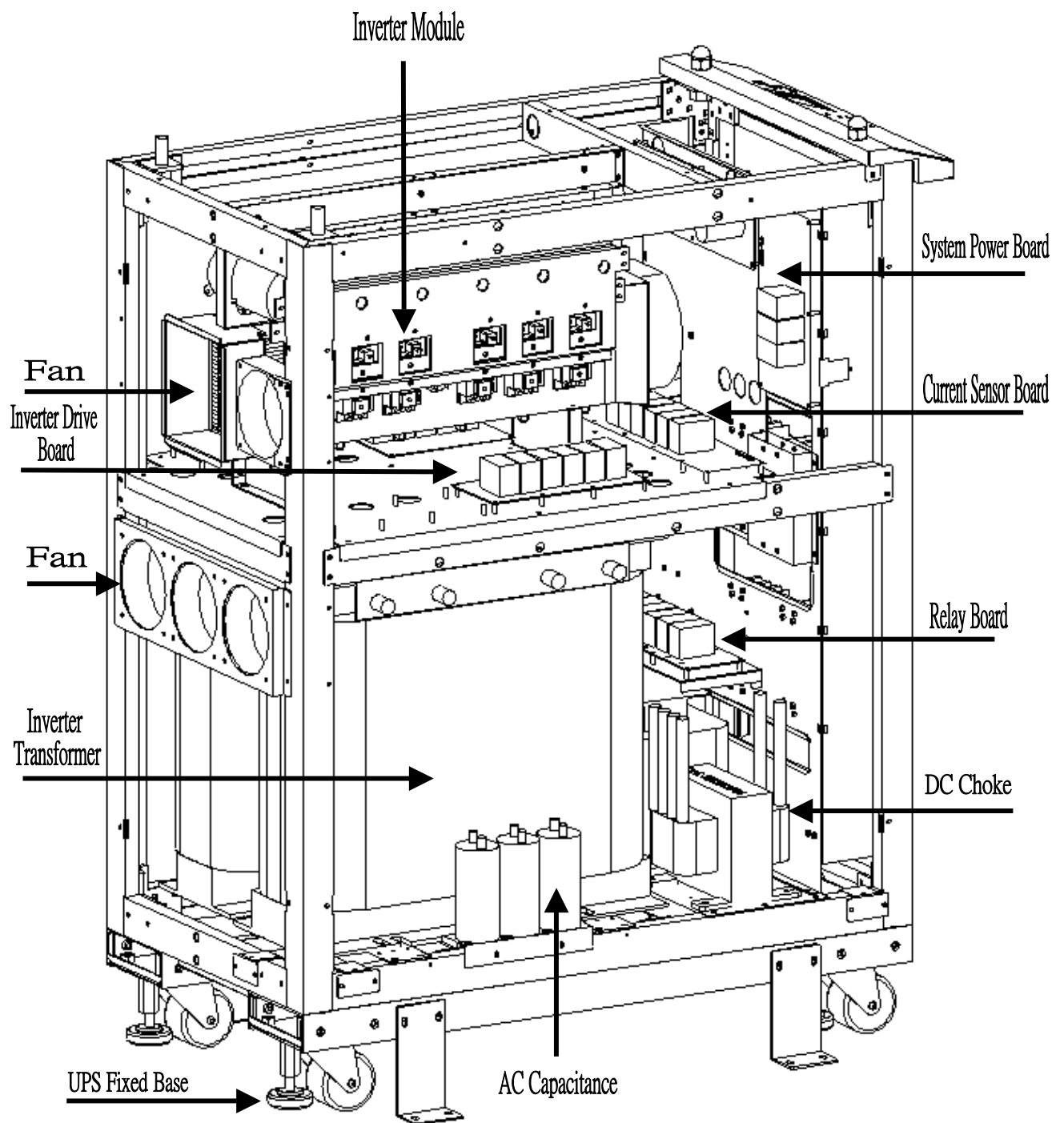


Fig. 2-2B

Figure 2-2C and 2-2D are details instruction on ONL33 series. (10K&15K)

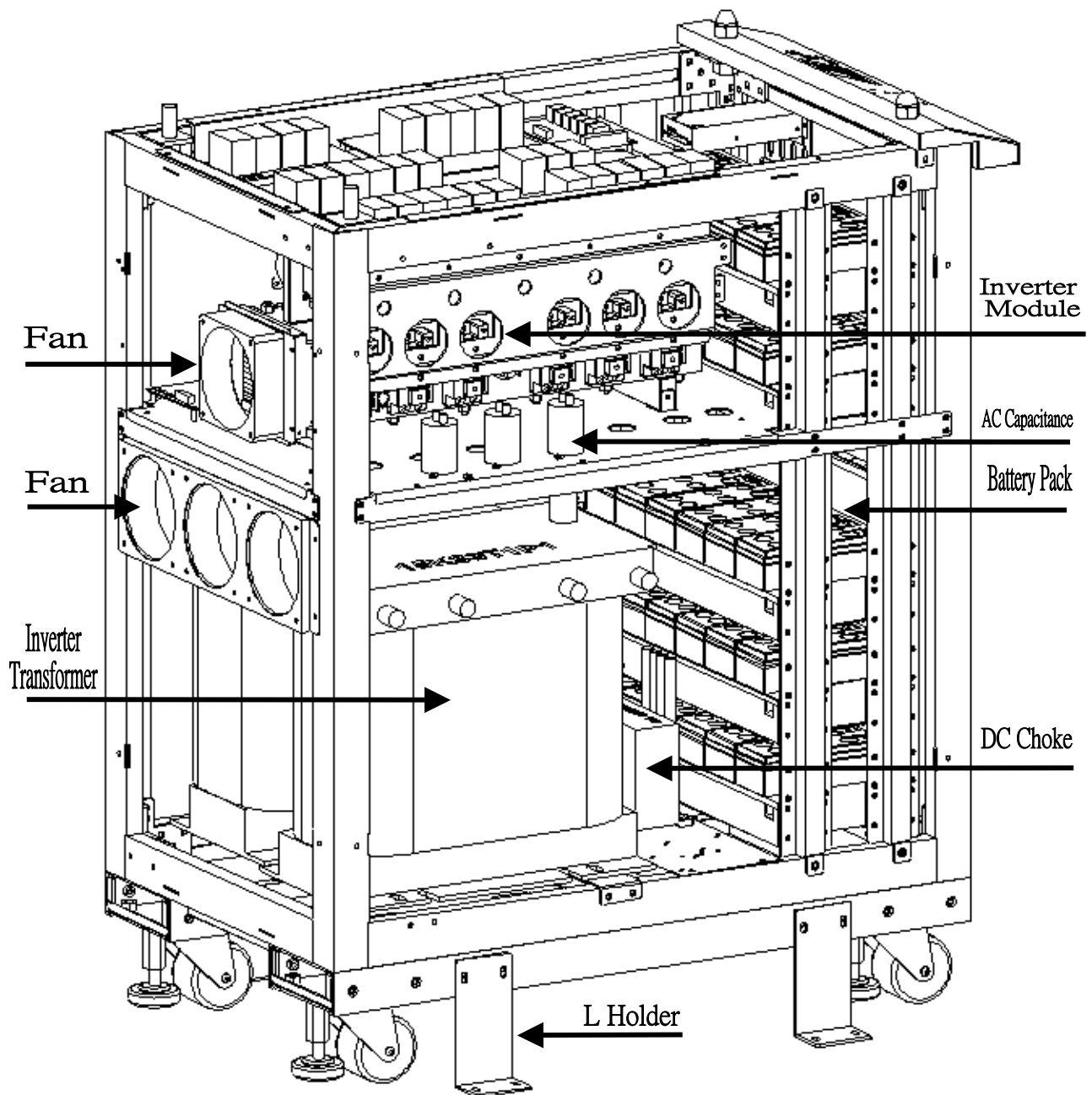


Fig. 2-2C

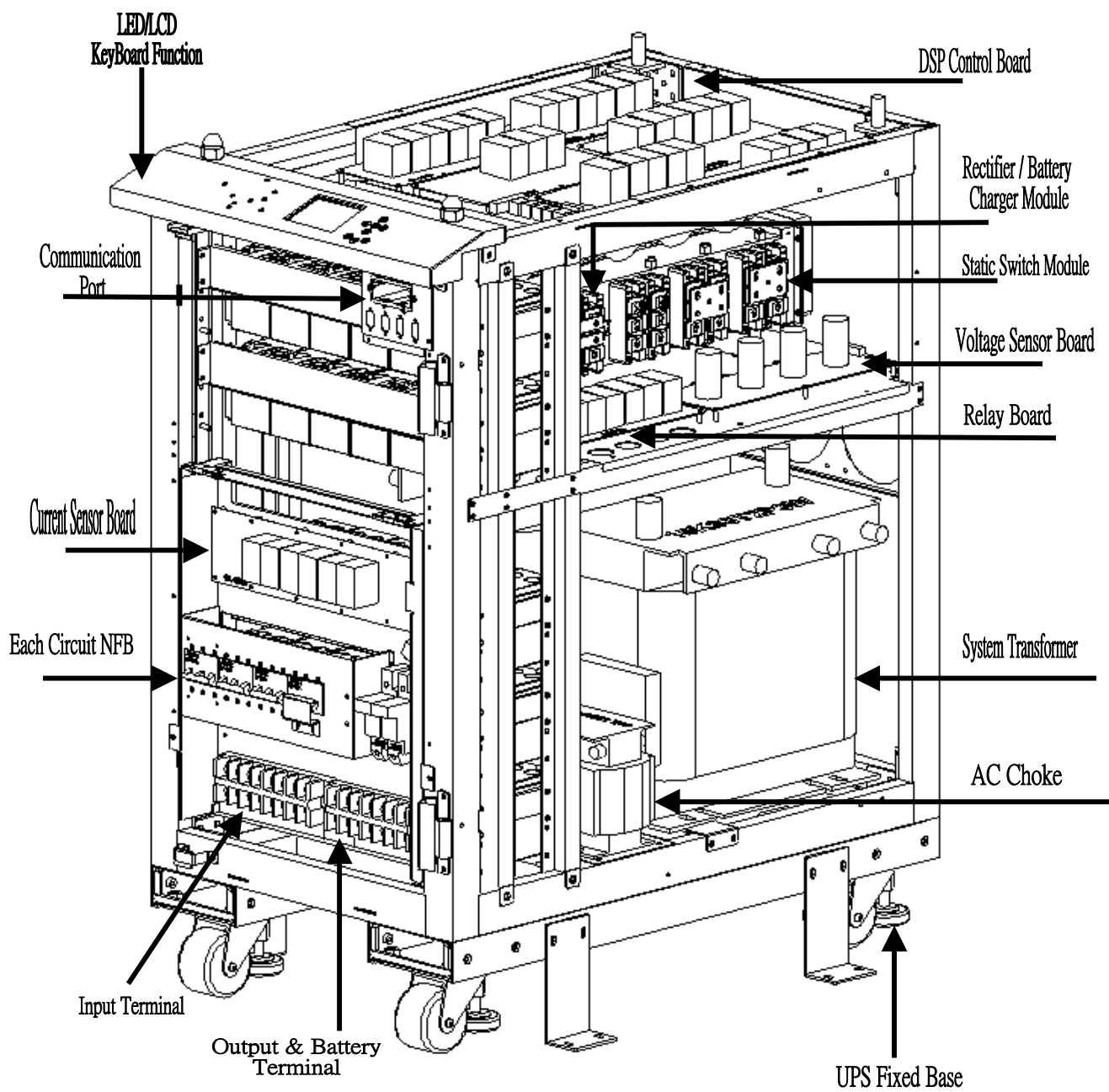
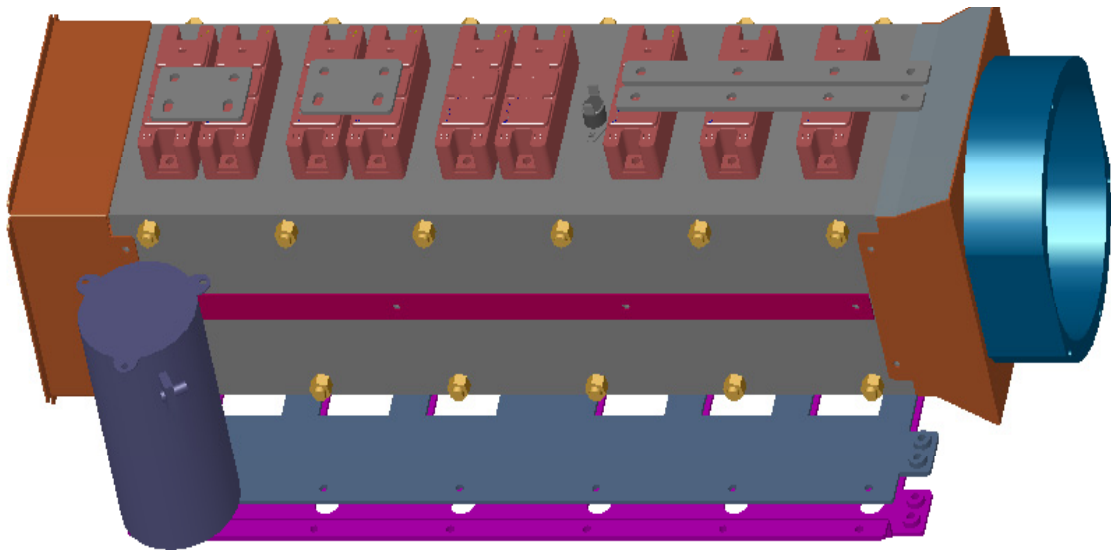


Fig. 2-2D

2-3 Introduction on function of main module

2-3-1 Rectifier / battery charger

- (1) Rectifier / battery charger module is used on SCR component for transforming AC to DC voltage and recharging to battery.
- (2) In Rectifier / battery charger module, double control method to CPLD and DSP are combined to keep rectifier and battery charger more steady and reliable.
- (3) Has complete system for protecting from over voltage.
- (4) Detection on phase sequence error or locking of phase.
- (5) Equips with function on DC voltage starts up slowly.
- (6) Designs with 3 phases and 6 pulse which supports six phase 12 phase pulse (Option).
- (7) It supports Float charge and Equal charge, free-care battery. Floating charge voltage is DC 420V, equal charge voltage is DC 430V, floating charge voltage is 410V.
- (8) It can conduct self test even in on lines status.
- (9) Recharge current is controlled by LCD panel setting.



2-3-2 Introduction to inverter module

- (1) Uses IGBT as power component.
- (2) Uses high technique of DSP chip skill and digitalize control on inverter module.
- (3) Utilize digital control management to prevent analogue component from aging, temperature slant and deduce quantity on parts to enhance system reliability.
- (4) Integrated A/D signal processing, 12bit resolution and ability on high speed transferring.
- (5) Reserve communication port on parallel machine, detection of secondary power, ATS control signal, SPWM testing port.
- (6) System highly in integration, compact and highly reliable.
- (7) It can use with rectifier AS-400 interface board、IGBT driver、static transfer number, LCD panel, secondary power board (included ATS function) PT board, CT board to connect to a mains.
- (8) It can reserve function on hardware control to process more information.



Fig. 2-3-2(Real model composition)

2-3-3 Static switch

- (1) Use SCR component as circuit switch between INV and BYPASS and control by high frequency electrical technique.
- (2) Use high frequency technique to isolate trigger circuit which can efficiently do trigger control on SCR to two set of circuit become “zero” break down.
- (3) Complete accept DSP control and keep energized, bypass and converse circuit in trigger status.
- (4) Real assembly model diagram is shown in fig. 2-3-1.
- (5) Notice: static module and module should be produced in the same heat sunk.

2-3-4 Input start up/protect trigger

- (1) Start up function. This function is used for delaying put in when utility recovery or transmission of power to protect main machine form impact by surge. The function is controlled by main control board.
- (2) Protection function. This function is used whenever input voltage is too high or too low or phase sequence or locking phase to cut off action of input trigger and protect main machine. The function is controlled and detected by main control board.

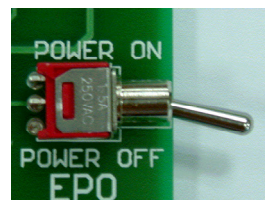
2-3-5 EPO switch (Emergency Power Off)

- (1) EPO (Emergency Power Off) is a device for shutting down the UPS in case of emergency happened. By turning off the switch, The UPS can be shut down immediately. If user encounter emergency and hope to shut down UPS in the shortest time, please use this switch to shut down UPS. (Fig 2-3-5 is horizontal panel illustration) (Fig 2-3-6 is vertical panel illustration), For UPS of vertical panel, please push down switch “EPO” to power off the UPS. For UPS of horizontal panel, please use needle-like pin of 3mm-5mm to insert into switch “EPO” and the UPS will be shut down. When the UPS was shut down, all system will be locked and all status are stop. If you want to restart the system, for UPS of vertical panel, please push up switch “EPO” to power on. And for UPS of horizontal panel, please press “OFF” button on the front panel and then press “ON” button and then “ON” button and press “Enter” again to restart inverter and UPS.

PCB 3304 :



normal EPO status



EPO is on work

Fig. 2-3-5

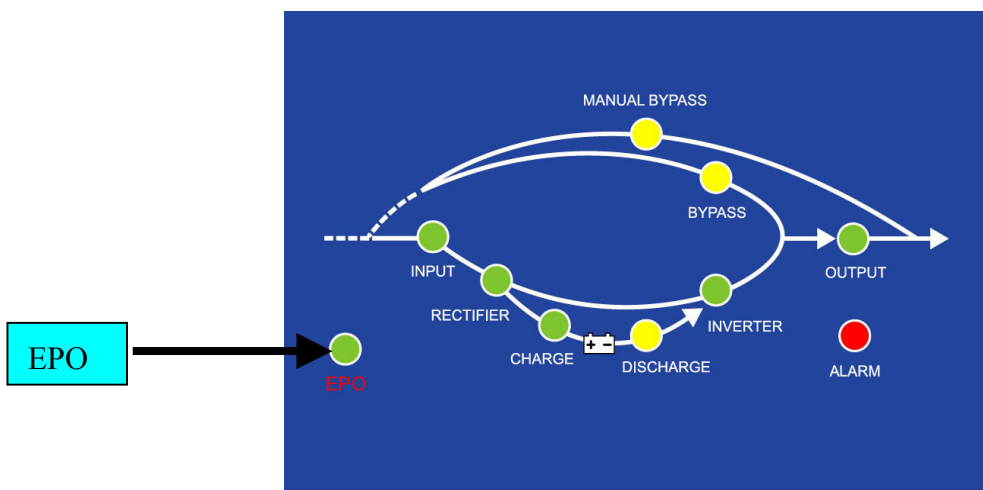


Fig. 2-3-6

2-4 System operation mode

2-4-1 System is normal (Fig. 2-4-1)

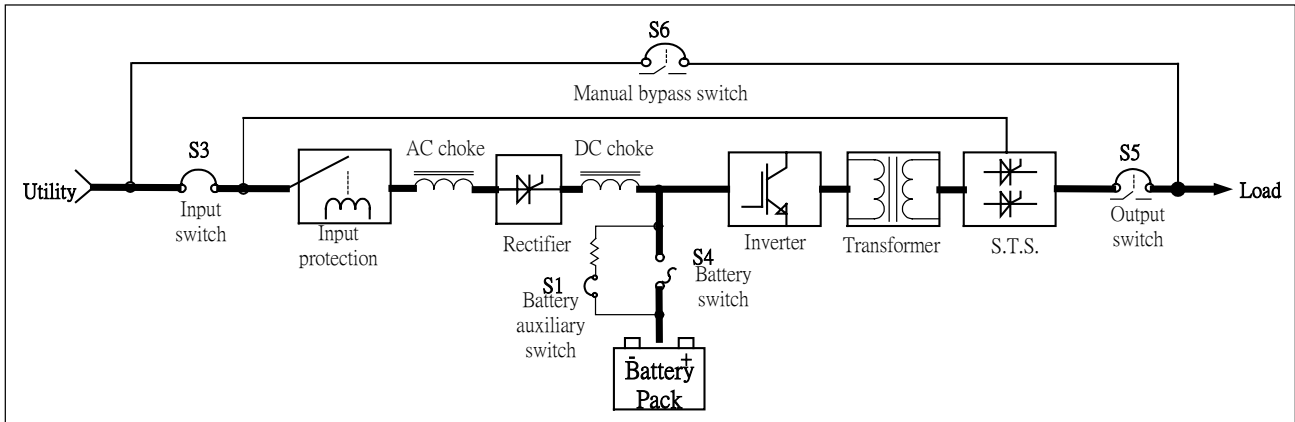


Fig. 2-4-1

Operating mode of system is that utility input then pass through rectifier /battery charger. Battery is recharged while utility pass through inverter module, static switch module to load. At this time power is supplied by inverter.

2-4-2 System bypass (fig.2-4-2)

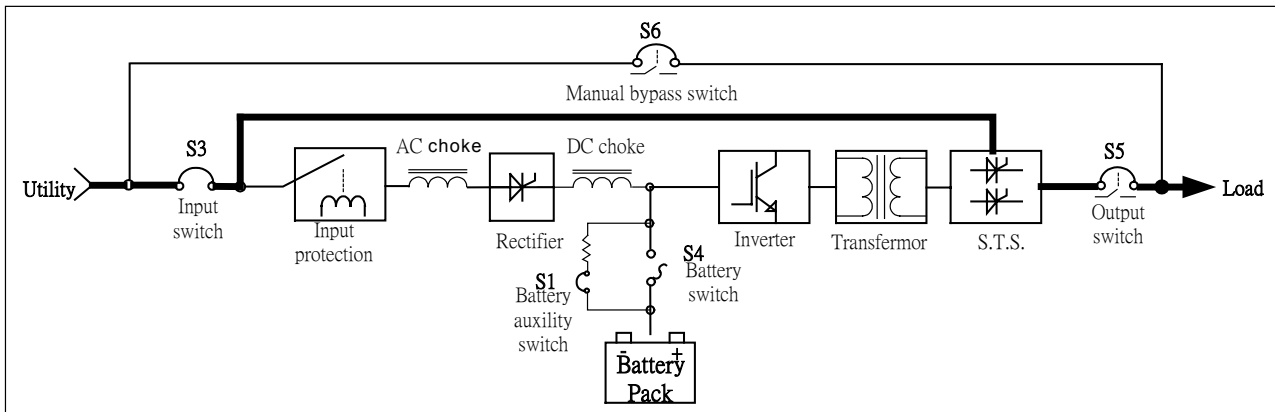


Fig. 2-4-2

Operating mode of system is that input power and then trough static switch and to load. At this time power is supplied by utility.

2-4-3 System is powered by battery (fig.2-4-3)

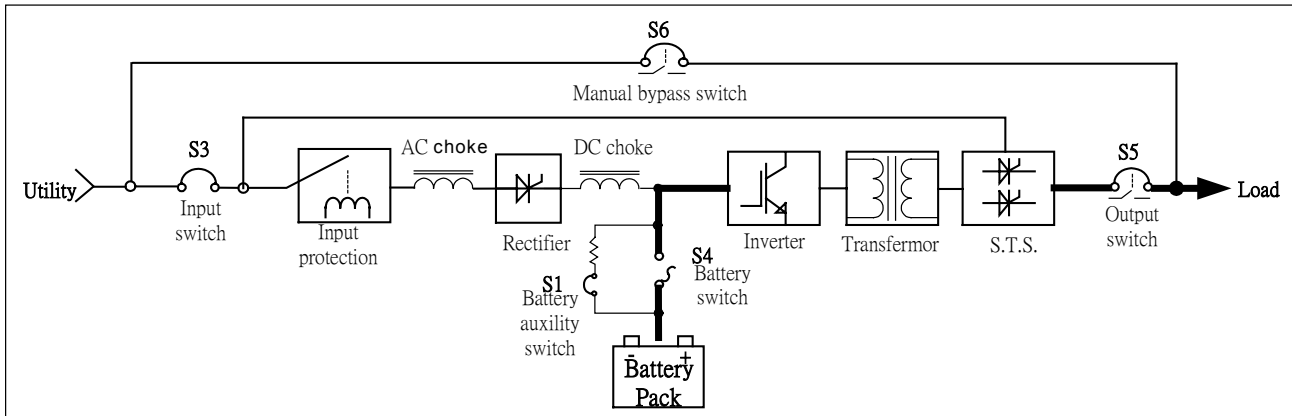


Fig. 2-4-3

Operating mode of system is that power is supplied form inverter module and then trough static switch and then to load when no utility input. At this time, INVERTER supply power. When power is supplied by batters, back up time depends on number of batter and load, therefore we suggest when break off, place save the files and shut down computer in normal procedure as soon as possible.

2-4-4 System Diagram for manual maintenance bypass mode (shown as fig. 2-4-4)

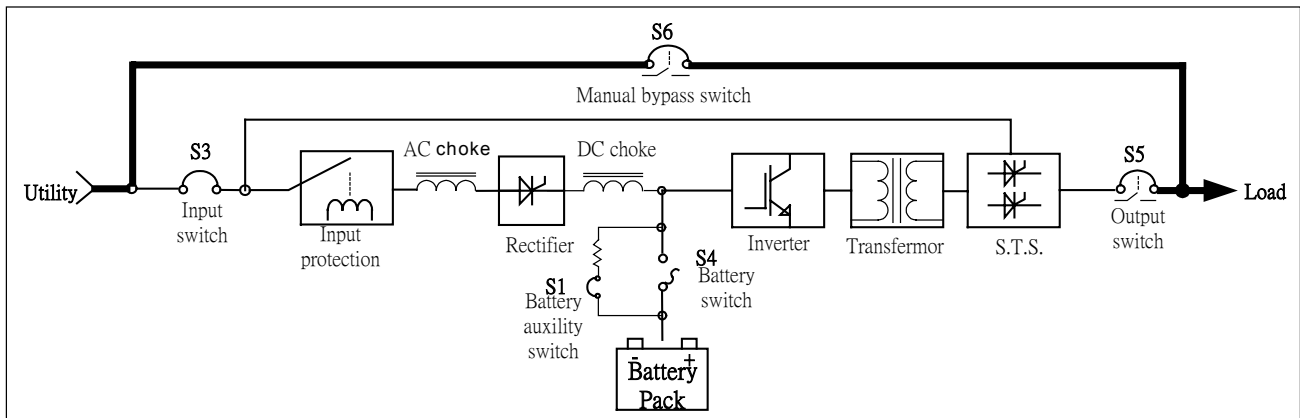


Fig. 2-4-4

Operating mode of system is that utility is input through manual maintenance switch to output load. At the time power is supplied by utility. For the reason above, this system mode is operated by technician to maintain and clean the main machine.

2-4-5 EPO switch (fig. 2-4-5)

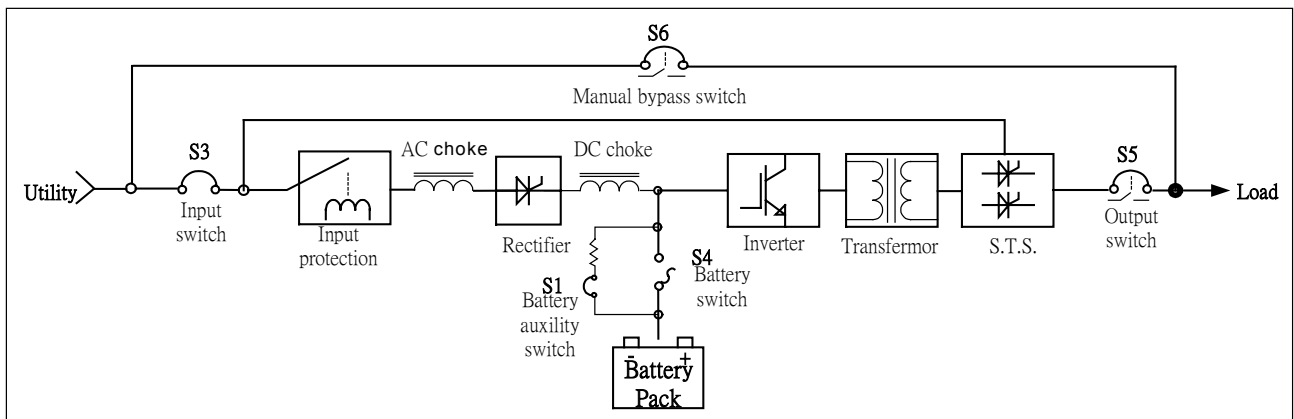


Fig 2-4-5

This system operating mode is operated when no utility input. Be sure the to check if UPS is in emergency mode before start up in this mode, otherwise when this system is start up, UPS will be shut down and no any voltage output.

3 Panel function

3-1 Status indication on LED panel (Fig. 3-1 and Fig 3-2)

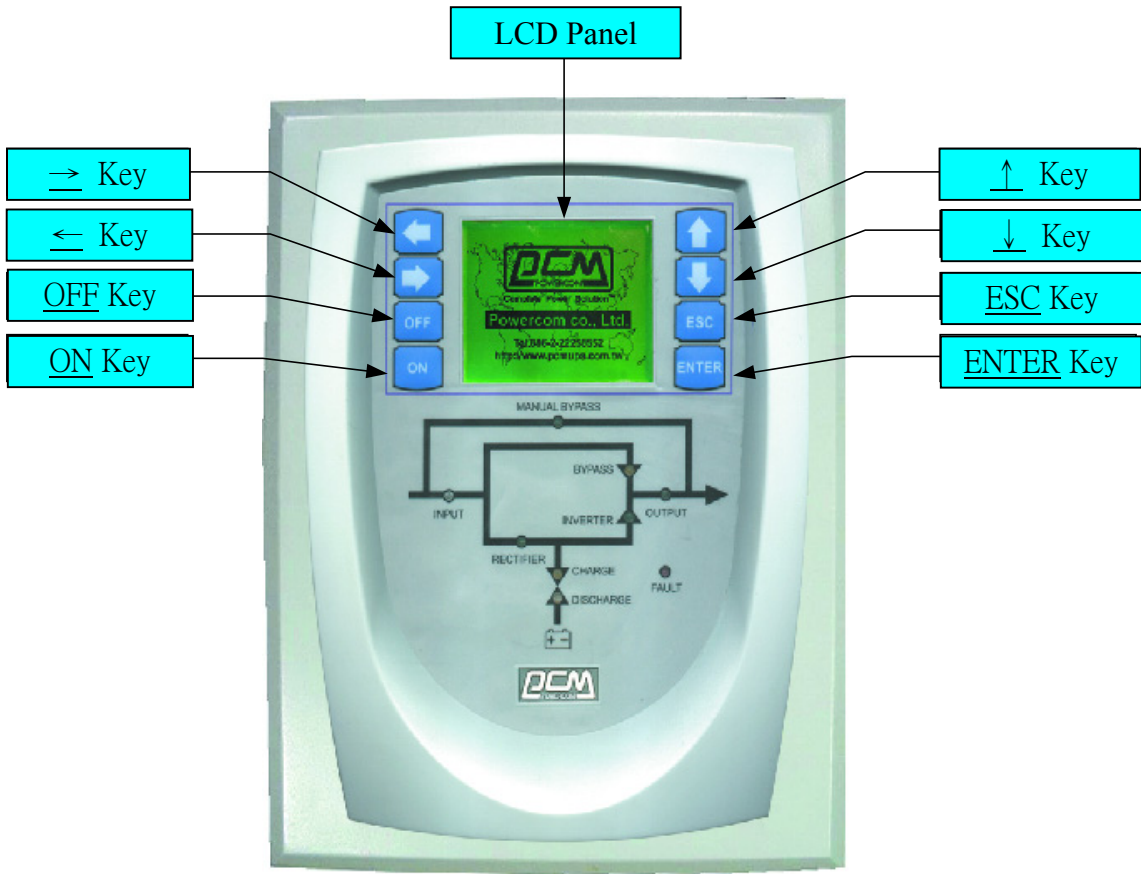


Fig. 3-1

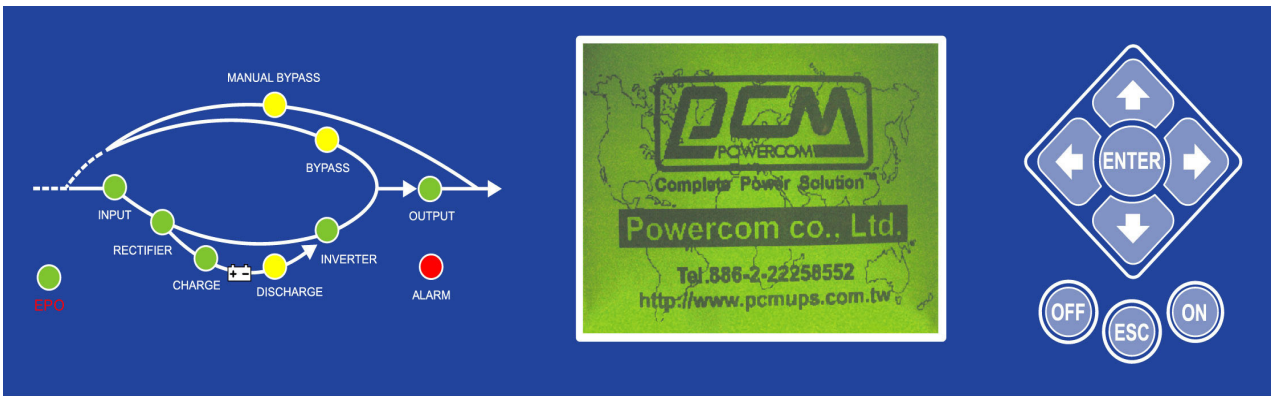


Fig. 3-2

Status indication on LCD/LED panel is divided into following 4 modes:

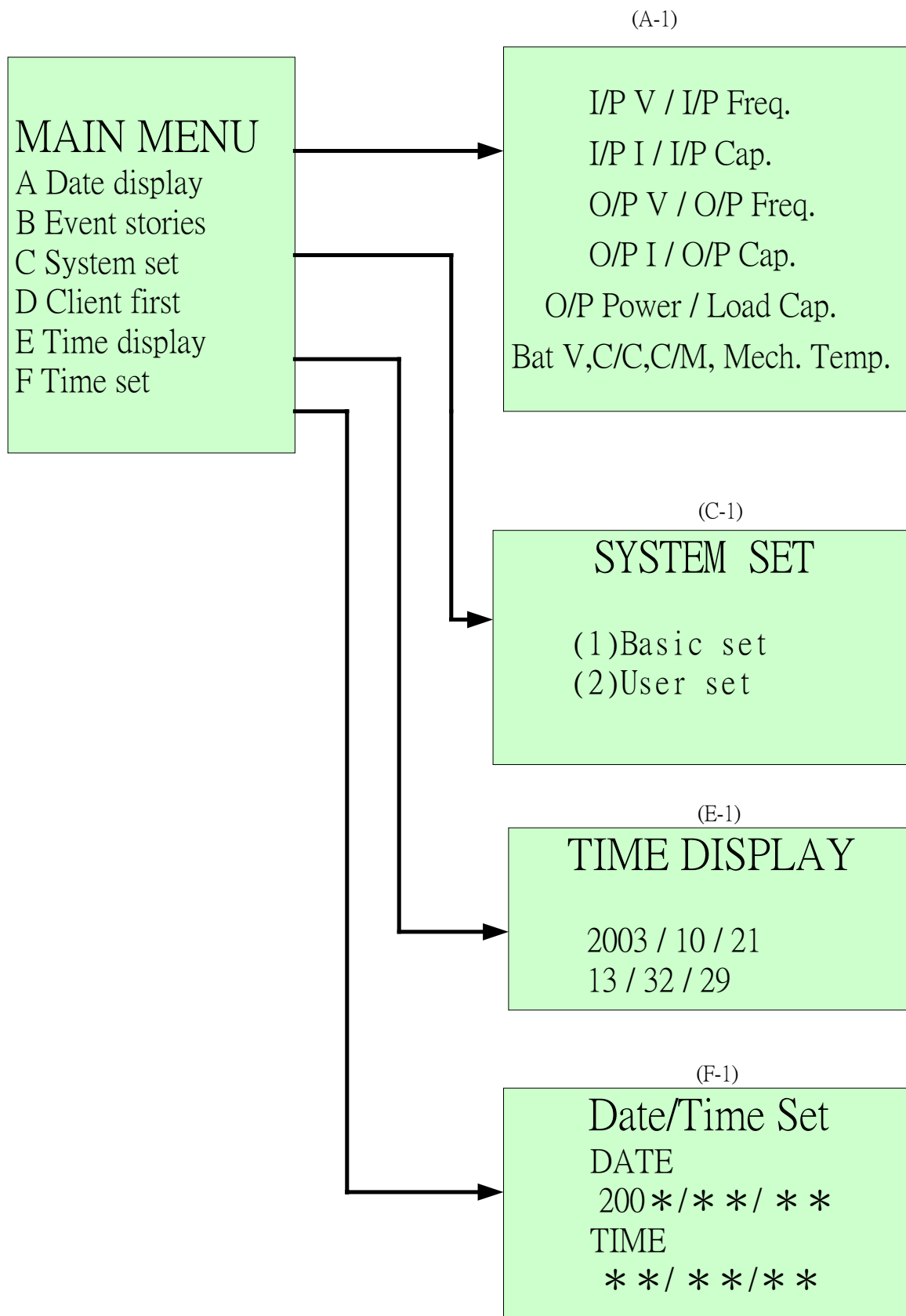
- (1) System Normal mode: In this mode, only INPUT, RECTIFIER, CHARGE INVERTER, OUTPUT LEDs are illuminated and others LEDs are lit off.
- (2) System Bypass mode: INPUT, BYPASS and OUTPUT LEDs are illuminated and others are extinguish in the mode.
- (3) Back-up mode: DISCHARGE, INVERTER and OUTPUT LEDs are illuminated and others are lit off.
- (4) Manual Bypass mode: When no-fuse Switch S6 is switched to “ON” position, Only MANUAL BYPASS LED is on, others all extinguish. It means system is transferred to Manual Bypass mode correctly. After S1, S2, S3(No-fuse Switch) and S4(fuse Switch) are switched “OFF”, use discharge tooling to release voltage on DC capacitor. And then LED MANUAL BYPASS will be put off to execute maintenance operation.

3-2 Function key

Introduction to function key on the panel

	button	for turning on inverter
	button	for turning off inverter
	button	for shifting cursor left
	button	for shifting cursor right
	button	for shifting cursor up or turn to other page
	button	for shifting cursor down or turn to other page
	button	Exit from present page
	button	for confirming setting

3-3 LCD Panel description



(A-1)

I/P V / I/P Freq.
I/P I / I/P Cap.
O/P V / O/P Freq.
O/P I / O/P Cap.
O/P Power / Load Cap.
Bat V,C/C,C/M, Mech. Temp.

(A-2-1)

I/P V
RS 000.0V RN 000.0V
ST 000.0V SN 000.0V
TR 000.0V TN 000.0V
I/P Freq. : 00.0 HZ

(A-2-2)

I/P I I/P Cap.
RN 000.0A 000.00KVA
SN 000.0A 000.00KVA
TN 000.0A 000.00KVA
Total Cap. : 000.00KVA

(A-2-3)

O/P V
RS 380.0V RN 220.0V
ST 380.0V SN 220.0V
TR 380.0V TN 220.0V
O/P Freq. : 60.0Hz

(A-2-4)

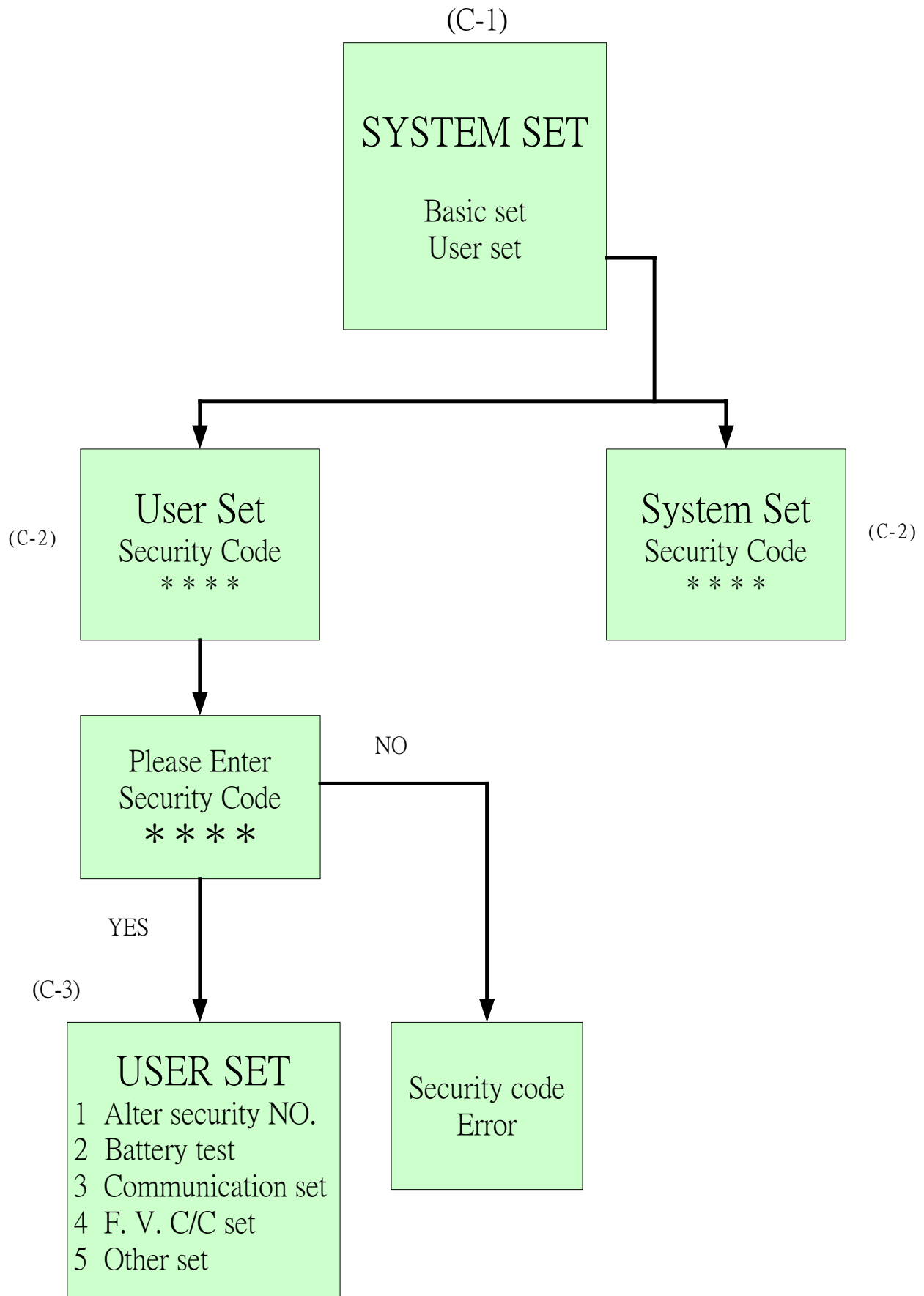
O/P I O/P Cap.
RN 000.0A 000.00KVA
SN 000.0A 000.00KVA
TN 000.0A 000.00KVA
Total Cap. : 000.00KVA

(A-2-5)

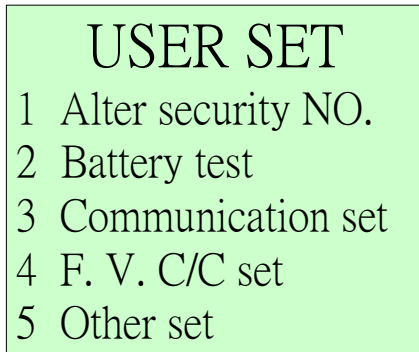
O/P POWER R 000.00KW
S 000.00KW
T 000.00KW
Total Power 000.00 KW
Load Cap. : 000.00 %

(A-2-6)

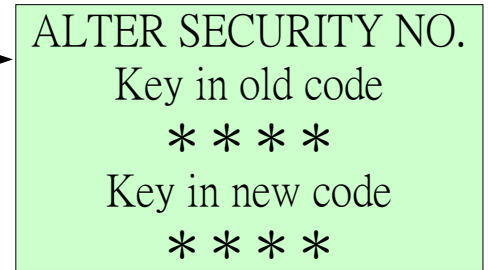
Bat V : DC 000.0V
Bat C/C : 000.0A
Bat C/M : FL
Mech. Temp. : 00.0Deg



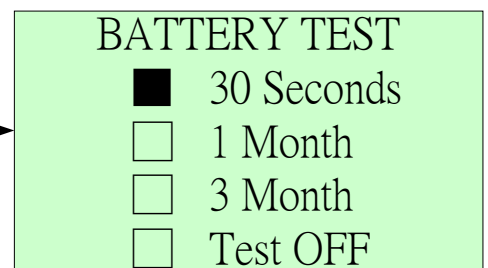
(C-3)



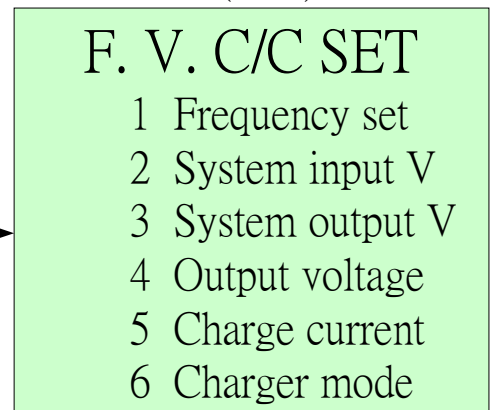
(C-4-1)



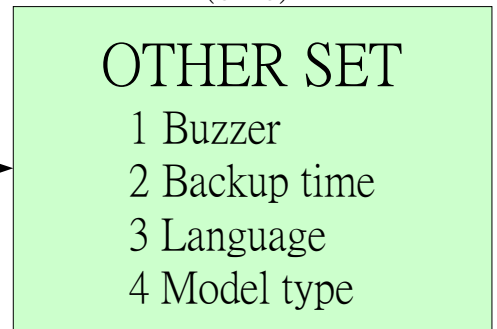
(C-4-2)



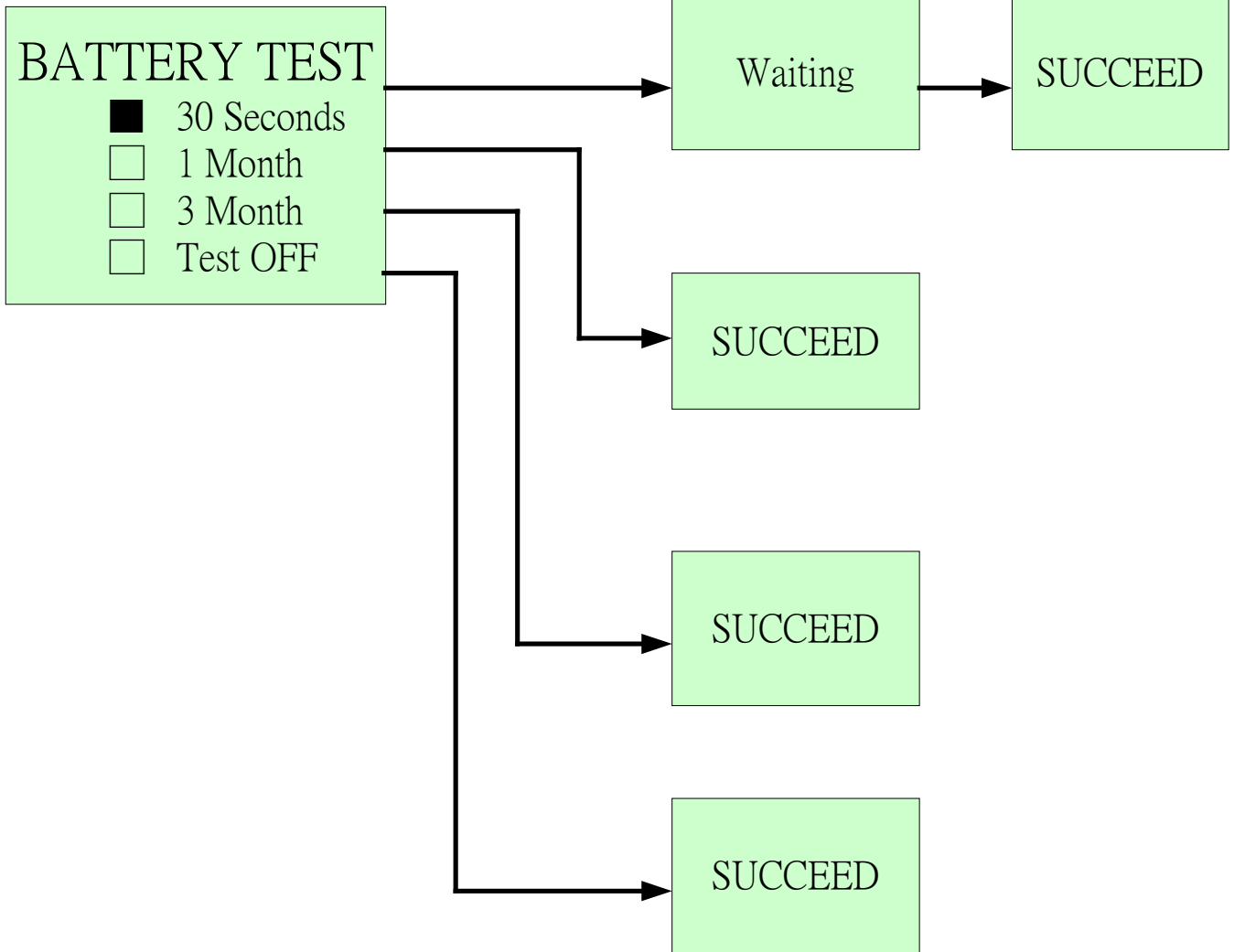
(C -4-4)



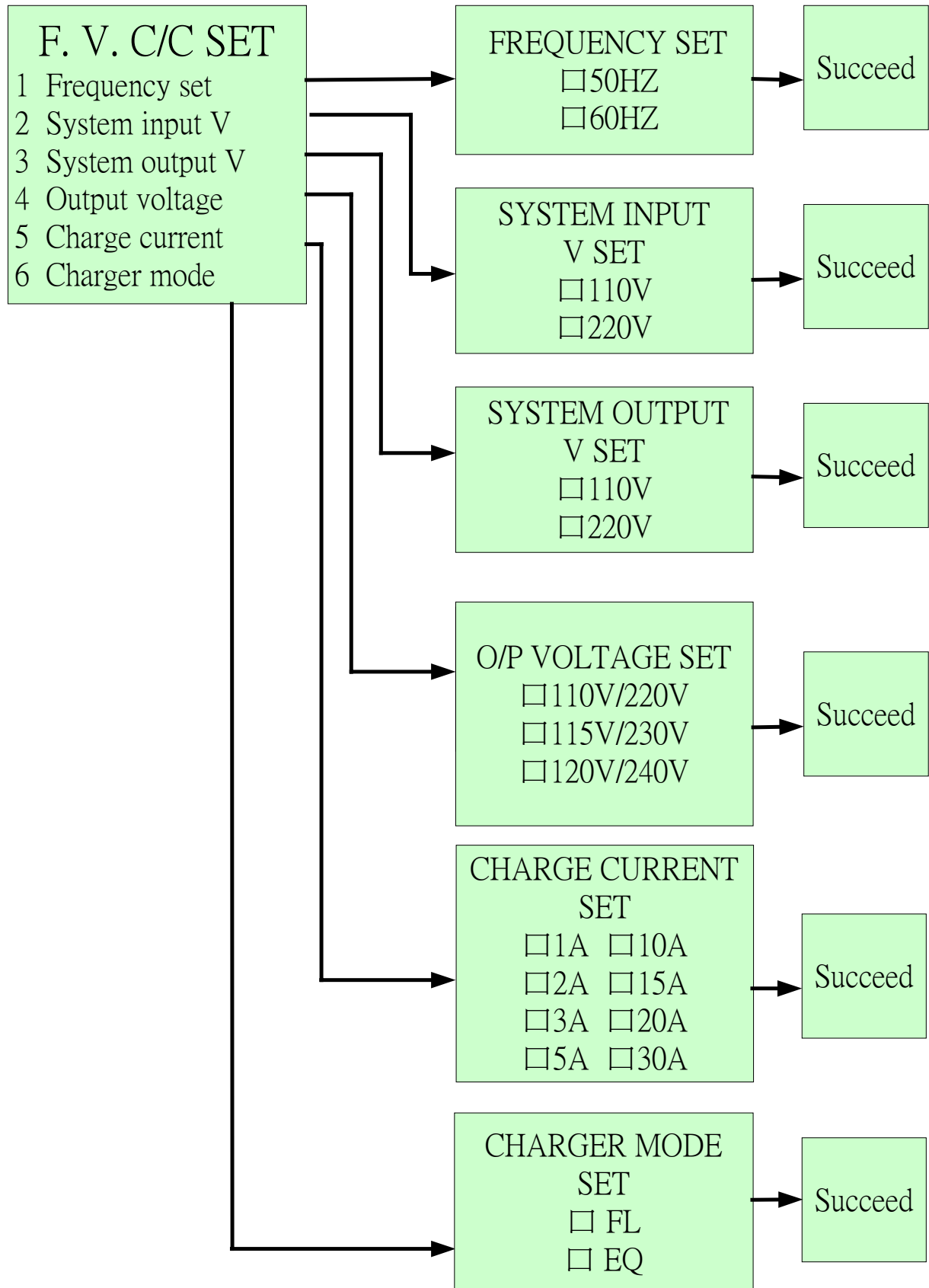
(C-4-5)



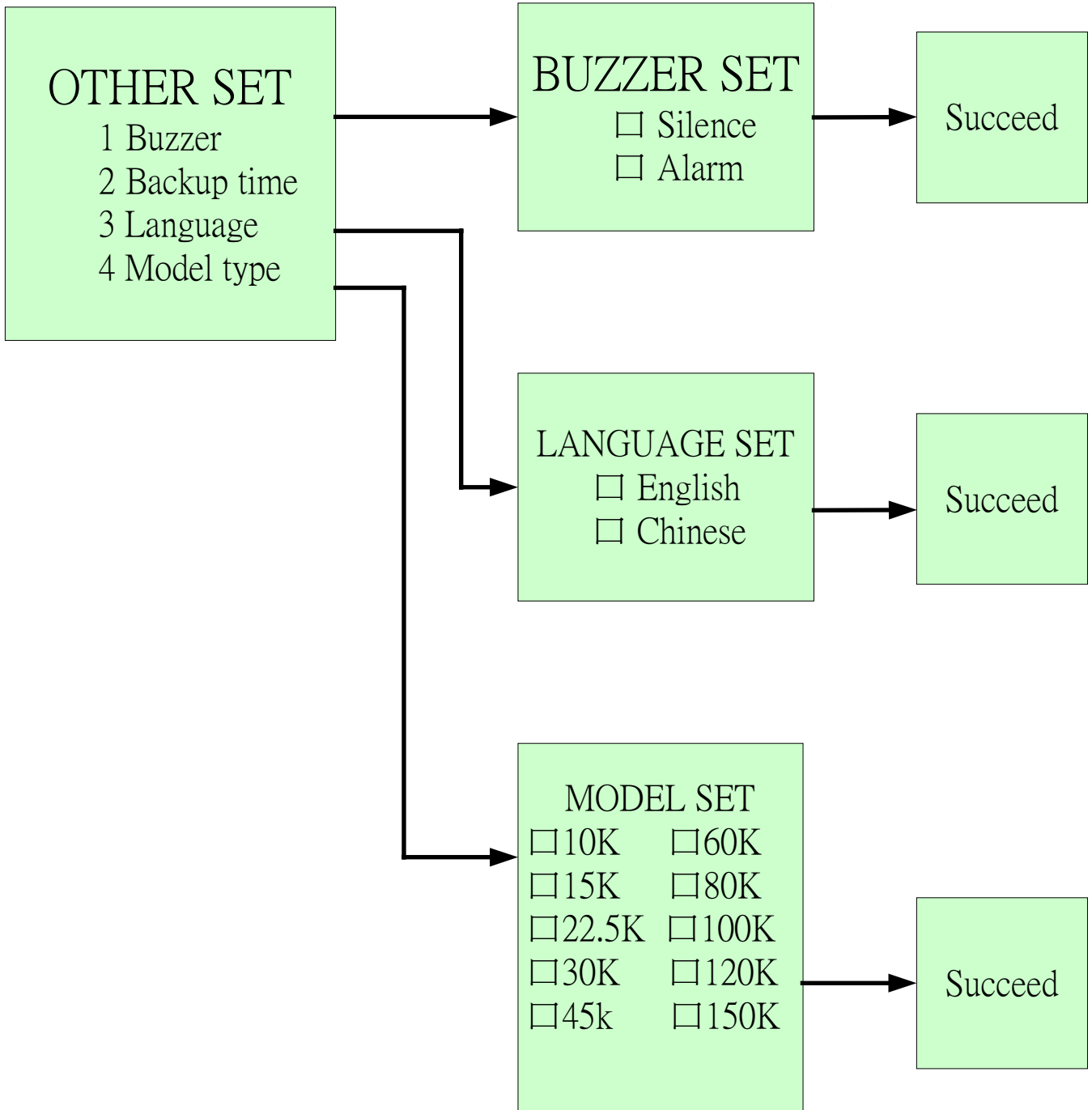
(C-4-2)



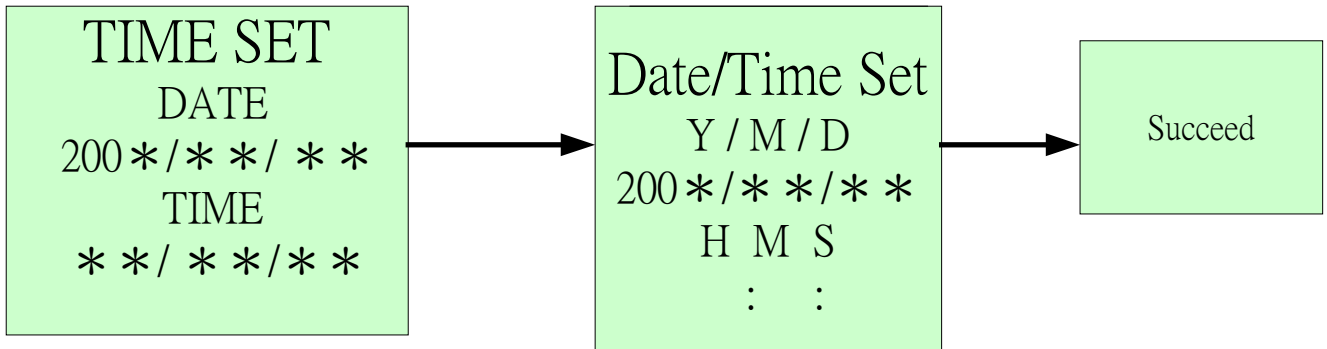
(C-4-4)



(C-4-5)



(F-1)



4 Placement and installation

4-1 Placement

4-1-1 Transport

The UPS system are composed of main equipment and battery pack. Therefore be careful when transport and handle it and following the point listed below.

- (1) Please follow the arrow symbol in the carton to place UPS. Don't upside down or slant it.
- (2) It is necessary to fasten the system well when transporting the system
- (3) When transporting this system, don't remove packaging to reduce impact to the system.
- (4) When transporting, please pay attention not to touch water .
- (5) Try not to drop or big impact to this UPS for protect component in this machine form damage.

4-1-2 Unpacking

Please follow steps below to unpack the UPS.

- (1) Cut the wrapping and remove the packing board.
- (2) Remove PE cubicle for protecting the equipment.
- (3) Unscrew screws fastening the pallet to L-shape fixed shelf of UPS base.
- (4) Put a slant board at the back of UPS, and let the UPS slide down smoothly for let the UPS reach to floor easily.

4-1-3 Position and Environment:

Precaution for storage

- (1) Ambient temperature of installation site range form $+28^{\circ}\text{C}$ to -10°C . Battery life will reduced if ambient temperature exceeds this range. Ideal ambient temperature for operating the equipment is between $+25^{\circ}\text{C}$ and 5°C . °
- (2) Sufficient space must be around the equipment to enable maintenance operations. A space of 1M must be left in front of the equipment and 50cm of space left around the UPS for heat sinking.
- (3) Table 4-1-3 is value of BUT consumption for ONL-33 series.

model	BTU	Model	BTU
ONL-10K33	4819	ONL-45K33	21682
ONL-15K33	7225	ONL-60K33	28909
ONL-22.5K33	10841	ONL-80K33	38546
ONL-30K33	14454	ONL-100K33	48183

Table 4-1-3

- (4) It is necessary to equipment with sufficient illumination and fire control device in control room.

4-2 Installation

4-2-1 specifications for main and I/O Voltage

System output 50Hz/60Hz 3 wire 3 phase wire 200Vac,220Vac 50Hz/60Hz 3 phase 4 wire and grounding wire 110/190Vac,115/200Vac,120/208Vac,127/220Vac 220/380Vac,230/400Vac,240/415Vac
System output 50Hz/60Hz 3 phase 4 wire and grounding wire 110/190Vac, 115/200Vac, 120/208Vac, 127/220Vac, 220/380Vac, 230/400Vac, 240/415Vac following specifications table is main machine input/output current and switch speciation.(Table 4-2-1)

rating	Voltage	Input max. current	Input switch	Out max current	Output switch	Neutral wire max. current
10KVA	110/190V	55A	3P/60A	38A	3P/50A	65A
	120/208V	49A	3P/50A	35A	3P/40A	60A
	220/380V	28A	3P/30A	19A	3P/20A	32A
15KVA	110/190V	82A	3P/100A	57A	3P/75A	98A
	120/208V	74A	3P/75A	52A	3P/60A	90A
	220/380V	39A	3P/40A	28A	3P/30A	48A
22.5KVA	110/190V	122A	3P/125A	85A	3P/100A	147A
	120/208V	114A	3P/125A	78A	3P/80A	135A
	220/380V	62A	3P/80A	43A	3P/60A	74A
30KVA	110/190V	163A	3P/175A	113A	3P/125A	195A
	120/208V	149A	3P/150A	104A	3P/125A	180A
	220/380V	83A	3P/100A	57A	3P/75A	98A
45KVA	110/190V	239A	3P/300A	170A	3P/200A	294A
	120/208V	223A	3P/225A	156A	3P/150A	270A
	220/380V	121A	3P/125A	85A	3P/100A	147A
60KVA	110/190V	312A	3P/350A	226A	3P/225A	391A
	120/208V	290A	3P/300A	208A	3P/225A	360A
	220/380V	158A	3P/175A	114A	3P/125A	197A
80KVA	220/380V	211A	3P/225A	149A	3P/150A	263A
100KVA	220/380V	242A	3P/300A	189A	3P/200A	327A
120KVA	220/380V	291A	3P/300A	227A	3P/300A	393A
150KVA	220/380V	364A	3P/400A	284A	3P/300A	491A
200KVA	220/380V	485A	3P/500A	378A	3P/400A	654A
250KVA	220/380V	598A	3P/600A	473A	3P/500A	819A

Table 4-2-1

When users install main equipment, please refer to table of 4-2-1 for corresponding input/output fuse switch. 4-2-2 Wire specifications and capacity

Follows are specifications table of wiring and capacity(Tab. 4-2-2A)

Insulating Wire		Acceptable highest temperature of insulating materials
1	PVC wire	60℃
2	RB wire	
3	Heatproof PVC wire	75℃
4	PE Wire	
5	SBR Wire	80℃
6	Artificial rubber wire	
7	EP rubber wire	90℃
8	Cross connect PE wire	

Ampere capacity for every kind wire(ambient temperature 35℃)

wire	Copper conducting wire		number diameter	60℃ insulation	75℃ insulation	80℃ insulation	90℃ insulation
	SWG	AWG		Ampere capacity (A)			
Wiring	2.0	14	7/0.6	20			
	3.5	12	7/0.8	30			
	5.5	10	7/1.0	40			
	8	8	7/1.2	55	65	70	80
	14	6	7/1.6	80	95	100	110
	22	4	7/2.0	100	125	135	145
	30		7/2.3	125	150	160	170
	38		7/2.6	145	180	190	205
	50		19/1.8	175	210	220	245
	60		19/2.0	200	240	250	280
	80		19/2.3	230	285	300	330
	100		19/2.6	270	330	350	380
	125		19/2.9	310	380	400	440
	150		37/2.3	360	440	460	505
	200		37/2.6	425	520	550	600
	250		61/2.3	505	615	650	710
	325		61/2.6	590	720	760	830
	400		61/2.9	680	825	870	995
	500		61/3.2	765	930	985	1080

Table 4-2-2A

Wire diameter for different capacity of UPS system, please check the table 4-2-2B below

	Wire diameter of ground wire
10KVA	8mm ²
15KVA	8mm ²
22.5KVA	8mm ²
30KVA	14mm ²
45KVA	22mm ²
60KVA	22mm ²
80KVA	38mm ²
100KVA	38mm ²

Table 4-2-2B

4-2-3 Input/Output connection and precaution

From table 4-2-1 and table 4-2-2, we could know installation wire diameter and switch capacity. (because load feature of main output is non-linear, wire diameter is based on). As shown in table 4-2-3.

Rating	Mains capacity	Input switch	Input wire diameter (mm ²)	Output switch	Output wire diameter (mm ²)
10KVA	110/190V	3P/60A	14	3P/50A	14
	120/208V	3P/50A	14	3P/40A	14
	220/380V	3P/30A	5.5	3P/20A	5.5
15KVA	110/190V	3P/100A	22	3P/75A	14
	120/208V	3P/75A	22	3P/60A	14
	220/380V	3P/40A	8	3P/30A	8
22.5KVA	110/190V	3P/125A	38	3P/100A	22
	120/208V	3P/125A	38	3P/80A	22
	220/380V	3P/80A	22	3P/60A	14
30KVA	110/190V	3P/175A	50	3P/125A	38
	120/208V	3P/150A	50	3P/125A	38
	220/380V	3P/100A	22	3P/75A	22
45KVA	110/190V	3P/300A	100	3P/200A	60
	120/208V	3P/225A	60	3P/150A	38
	220/380V	3P/125A	38	3P/100A	22
60KVA	110/190V	3P/350A	125	3P/225A	60
	120/208V	3P/300A	100	3P/225A	60
	220/380V	3P/175A	60	3P/125A	38
80KVA	220/380V	3P/225A	60	3P/150A	38
100KVA	220/380V	3P/300A	150	3P/200A	60
120KVA	220/380V	3P/300A	150	3P/250A	80
150KVA	220/380V	3P/400A	200	3P/300A	150
200KVA	220/380V	3P/500A	225	3P/400A	200
250KVA	220/380V	3P/600A	250	3P/500A	225

Tab. 4-2-3

After wiring , please check the following points listed below.

- (1) If screw in each point are screwed tightly.
- (2) If ground wire connects well.
- (3) If shortcut happens in output switch board and circuit.
- (4) If battery fuse switch S4 is switched off.
- (5) If polarity of battery wire are same with marked on terminal head.
- (6) If each switch of main equipment from S1 to S6 are switched off.

4-2-4 Precaution for grounding system

The grounding mode is divided into 4 categories:

- (1) Equipment grounding: used in low voltage equipment, grounding by non-charged metal.
- (2) Internal wire system grounding: internal wire inside house which belongs to dual grounding of grounding wire.
- (3) Low voltage power system grounding: grounding by twice side low voltage neutral wire of switch transformer.
- (4) Equipment and system grounding together: use the same grounding wire in internal wire grounding and equipment grounding or connect to same point.

4-2-5 precaution for connection wire of battery.

- (1) For safety, technician should put on insulating glove when handle or install the equipment.
- (2) Before removing the equipment, be sure to check if grounding line connected tightly and keep hands and legs dry. Then cut off battery circuit to remove equipment.
- (3) When removing battery, please remove terminal B+ and B-, then remove the wire connected with different layers to avoid incident happening.
- (4) When remove copper sheet slice or wire between batteries, pay attention not to touch neighbor battery to avoid short cut.
- (5) When allocate batteries, please assemble separately battery set in each layer, and then connect different layers and finally connect B+ and B- terminal to breaker.
- (6) After installation of battery, please measure two voltages polarity of a switch breaker in same site with power meter to check if polarity is same. polarity need to be the same.

Table for battery cable diameter corresponding to capacity of UPS (Tab. 4-2-5)

UPS capacity	Battery cable diameter (mm ²)
10KVA	5.5mm ²
15KVA	8mm ²
22.5KVA	14mm ²
30KVA	14mm ²
45KVA	30mm ²
60KVA	50mm ²
80KVA	60mm ²
100KVA	80mm ²
120KVA	125mm ²
150KVA	150mm ²
200KVA	200mm ²
250KVA	250mm ²

Table 4-2-5

5 Operation procedure

5-1 Start up procedure

5-1-1 Initial start up operation procedure

(1) Introduction to switches inside the equipment and its function

S1 Switch: auxiliary switch

S2 Switch: secondary input power switch or BYPASS switch for the model with input transformer.

S3 Switch: main input power switch

S4 Fuse Switch: power switch of the equipment

S5 Switch: equipment switch

S6 Switch: manual bypass switch used when maintaining equipment

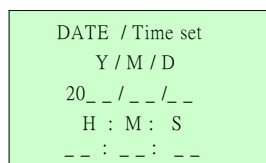
(2) Input phase sequence testing:

Switch on the switchboard and power is delivered to input terminal. Measure voltage on each point with power meter to see if all voltage on each point agree to specifications of this equipment.

Then use 3-phase sequence meter to check input sequence. If phase sequence is correct, keep on next step. On the contrary, if phase sequence is reversed, please turn off external power switch and exchange input terminal wires S and T and then turn on external power switch to deliver power once more and do test on 3-phase multiple check. If phase sequence is correct, go to next step.

(3) Initial start up procedure:

Press on “ESC” button on the LCD and return to main menu. Press on ↓ or ↑ button to option F. Time setting and then press “ENTER” button to enter to Date/ Time setting. you will see the following display page.

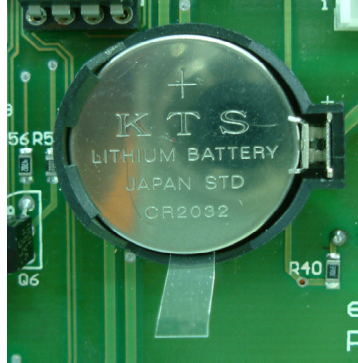


DATE / Time set
Y / M / D
20 _ _ / _ _ / _ _
H : M : S
_ _ : _ _ : _ _

shift cursor to place “year” and press ↑ to shift digital form 0 to 9 in sequence. And if you press on ↓ button to shift digital form 9 to 0 in sequence. Press on → button to shift right. Press on ← button to swift left. Please follow the steps above to do setting on date and time, After complete setting procedure, please press on “ENTER” button to save the setting and return to main menu. Press ↓ button to move cursor to E. display time and then press “ENTER” button to enter the following display page.

(4) Saving system time and date:

After executing step 3, please pull out the plastic insulation pad of lithium cell on OL-3304 LCD PCB board as shown in figure below. The procedure above is for saving setting to system clock and used for battery testing and time record in case of UPS fault.



(5) 1. Initial start up procedure:

Make sure all the loads connected to the equipment (UPS) are switched off or all wiring connected to the equipment are pull out. Turn on Switch S1, S2 and turn off S3 in sequence. Then turn off S4 fuse switch and battery fuse switch on side of UPS. Press the “ ON” button on the LCD panel and a screen for confirming setting appears. Please press on “ ENTER” button. A message “Setting complete” on the screen appears in a few seconds to indicate setting is successful. At that time the system will detect battery for 30 seconds. And then the UPS system transform form Bypass mode to Inverter mode. Use power meter to measure output voltage and frequency on terminal R, S, T to see if the reading is correct. Also measure voltage on voltage on terminal B+ and B- with power meter to see if the voltage is DC410V. Please follow operating steps as shown in (fig. 5-1-1).

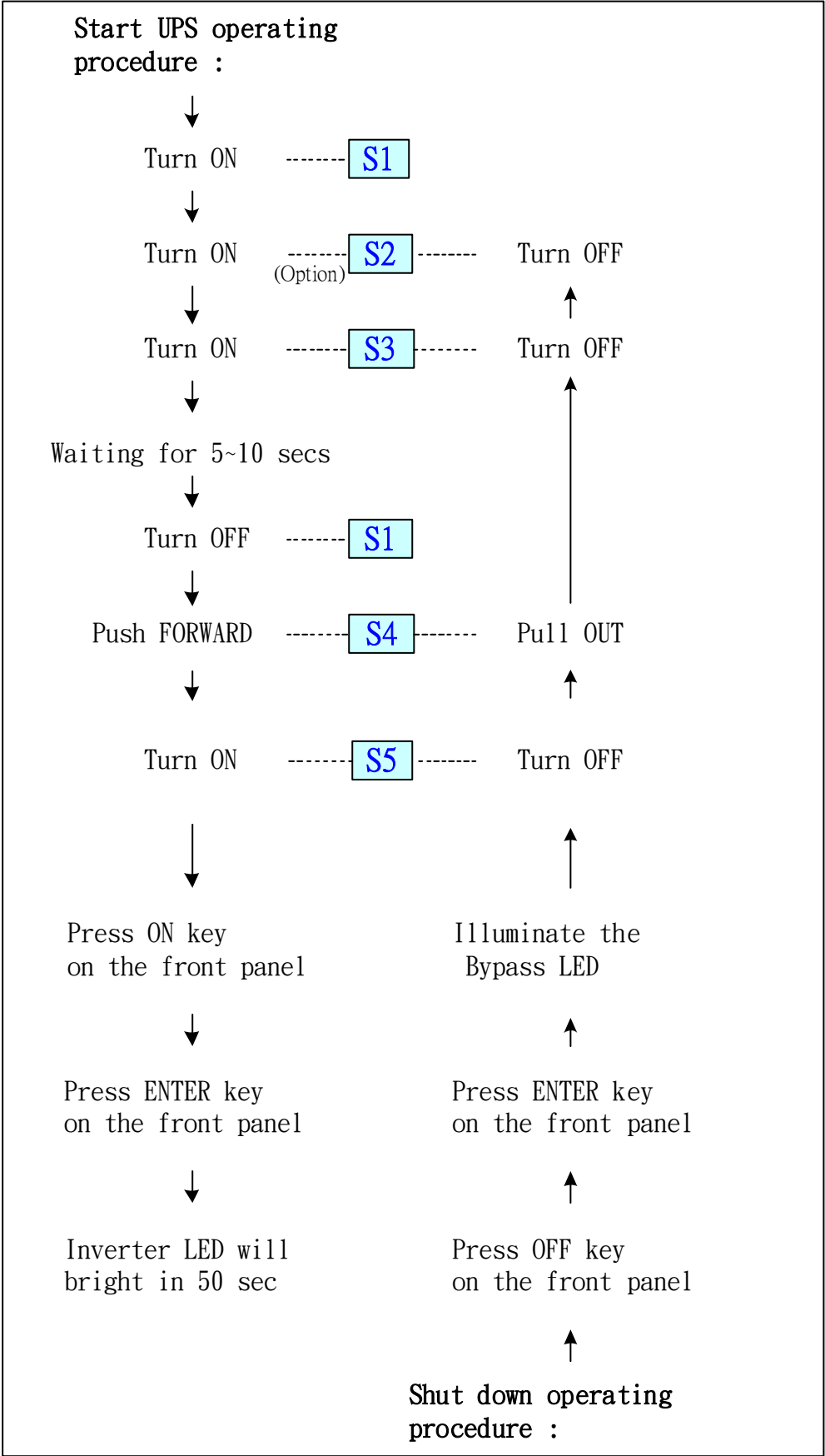


Fig. 5-1-1

5-1-2 General start up procedure

After the system is initialized successfully and shut down, please follow the steps below for start up the equipment again.

Press on the “ ON” button on the LCD panel and a screen for confirming setting appears. Please press on “ ENTER” button. Then a message “Setting complete” appears in a few seconds to indicate setting successfully. BYPASS LED on the front panel will be lit off and INVERTER indicator will be light up in 50 seconds, which indicates UPS’ is powered by INVERTER.

5-2 Shut down procedure

5-2-1 General shut down procedure

General shut down procedure is used for shut down the equipment when the system functions well. Procedure is as follows.

Press on the “OFF” button on the LCD panel and a screen for confirming setting appears. Please press on “ ENTER” button. Then a message “Setting complete” appears in a few seconds to indicate setting successfully. INVERTER LED on the front panel will be lit off and BYPASS LCD indicator will be light up, which indicates UPS’ is powered by BYPASS.

5-2-2 System shut down procedure

Press on “OFF” button on the LCD panel and a screen for conformity will appear. Please press on “ENTER” to confirm the setting. The INVERTER LED indicator will be lit off, instead the Bypass LED indicator will be lit on, and then please turn off switch S5, S4, S3, S2 (for some model only), S1(for some model only) one by one.

5-3 Maintenance procedure

5-3-1 Maintenance procedure

Press “OFF” button on the LCD panel and a screen will appear for conformity. Please press on “ENTER” to confirm the setting. The INVERTER LED indicator will be lit off, instead the Bypass LED indicator will be lit on, please unscrew protection plate of S6 to switch on Switch S6, then switch off Switch 5, switch on Switch S4, switch off Switch S3 and, S2 as shown in figure.5-3:

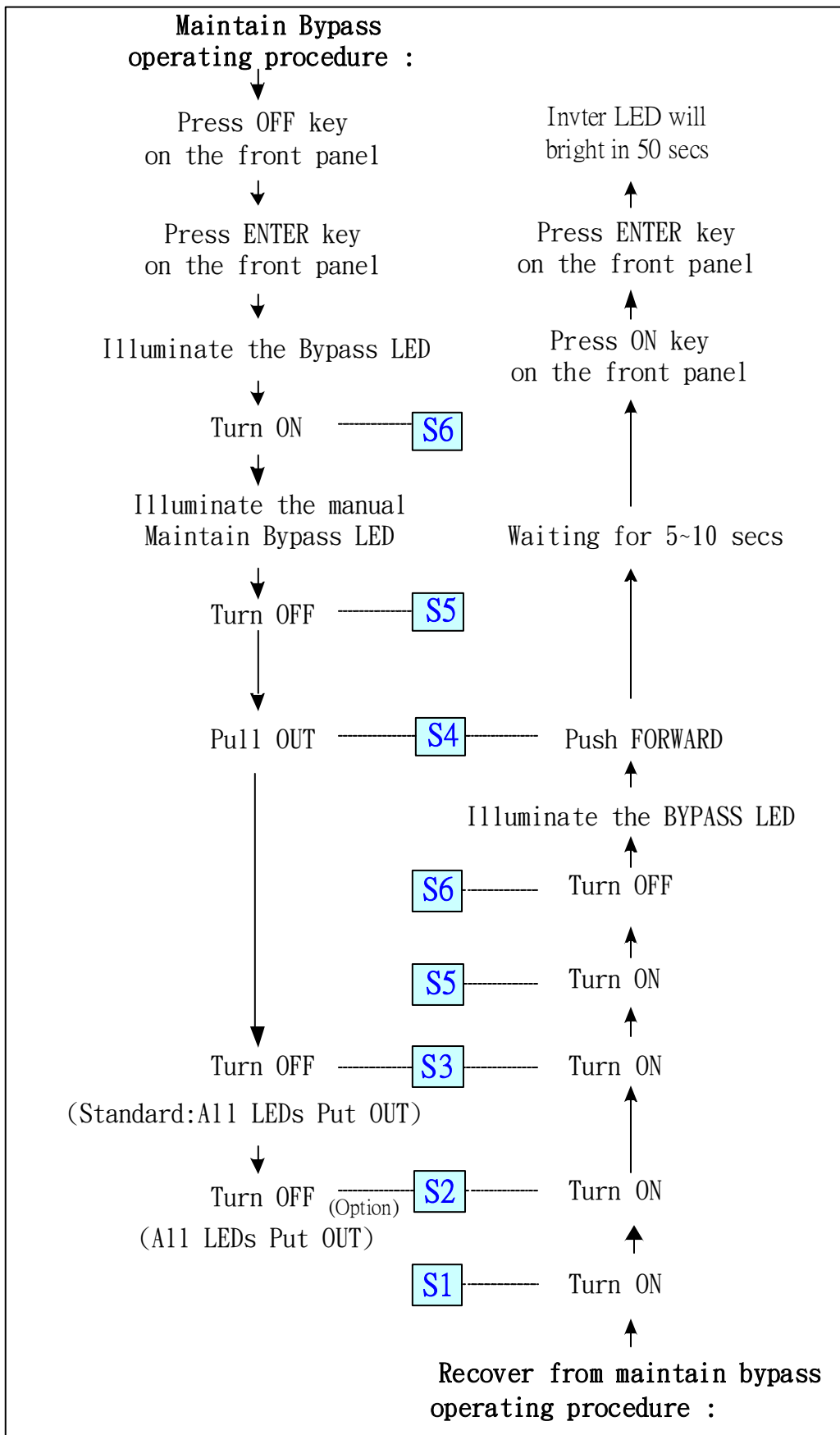


Fig. 5-3

5-3-2 Procedure for replacing battery

(1) Turing off INVERTER

Push “OFF” button on the front panel and then push “ENTER” button to shut down UPS. At the time the UPS enters into maintenance bypass mode.

(2) Entering into maintenance bypass mode

Turn switch “S6” to “ON” position and fix in place with metal board, and then turn off switch of S5, S4, S3, S2 in sequence (only for some model), switch “S1” (position of “OFF”) , and fix in place with metal board.

(3) Replacing battery

Wait for one minutes and then remove iron sheet on front of the switch and battery apron. Remove battery connection line and replace with new battery. Connect the wiring again according to original wiring method between batteries. (Be sure to verify out put voltage and polarity after connecting wiring of batteries)

(4) Restarting UPS

After fixing battery apron and switch iron sheet in place, turn on switch “S1, S2”(For only some model), “S3, S4” and “S5”. Turn the switch “S6” to “OFF” position and use metal board to fix in place. Remove other switch metal board and follow “UPS start up procedure” to start up UPS. Until the UPS entering into Inverter mode, all procedure for replacing battery will be finished.

5-4 System recovery form maintenance procedure

Turn ON switch S1 (For only some model of UPS), S2 (For only some model of UPS), S3 and S5, Turn off S6 in sequence. Turn on S4 and then press “ON” button on the panel in a few seconds. A screen for confirming setting appears. Please press “ENTER” button for sure. The DSP system will response with a message “Setting is successful” in a few seconds. The LCD panel will be illuminated after 50 seconds. Use power meter to measure voltage on terminal B+ and B- to see if the voltage value is exact DC410V. Measure output voltage and frequency of terminal R, S, T to see if they are all correct. If the reading is correct, it means the system is initialized successfully. Finally screw up protection plate on Switch S6. Please follow operating steps as shown in fig.5-3 °

5-5 Introduction to LCD front panel and illustration of each function

Introduction to function Key on the front panel

→ button: Move the page cursor on screen to the right

← button: Move the page cursor on screen to the left

OFF button: “OFF” function key

ON button: “ON” function key

↑ button: Move up the page cursor

↓ button: Move down the page cursor

ENTER button: Execution/confirming setting

ESC button: Return to previous page

Use →, ←, ↑, ↓ function key to select item on LCD menu and then press ENTER to enter the category you need. Use → and ← key to set and enter into a setting code field of 4 digitals and use ↑ and ↓ key to select digital. Then Press ENTER key to confirm previous setting and execute. If you want to turn to other function, please press ESC key to return to previous page or press ESC key twice to return to main menu and use →, ←, ↑, ↓ key to set other function.

5-6 Emergency shut down device procedure

Introduction for EPO operation.

EPO (Emergency Power Off) is a device for shutting down the UPS in case of emergency. when some unexpected case happen and needs to shut down this UPS immediately. If EPO is turned on, then following action will be performed:

- (1) Stop Inverter immediately.
- (2) Stop S.T.S static switch immediately and system hasn't output power.
- (3) Stop RCM rectify charge system.

Except the 3 above action, the LCD panel still remains active and keeps record on EPO time for starting up and recovered. Meanwhile the UPS keeps communication with other device as it were.

For recovering EPO, please turn on the switch as diagram below while press “OFF” button on the LCD panel and a screen for confirming setting appears. Please press on “ENTER” button. The DSP system will response in a few seconds and finally a message “Setting complete” appears in a few seconds to indicate setting successfully. At the moment check the voltage reading on the screen if the voltage of battery reaches to DC410V. If it reads DC410V, switch off S4 breaker at once. The system will detect the battery for 30 seconds and after the procedure, DC will recover and the UPS will transfer form Bypass mode to Inverter mode. The UPS is powered by INVERTER.

6 Maintenance

- (1) Please keep clean in the operating environment and clear the main equipment inside for at least once yearly.
- (2) Please discharge and charge the battery at least once for every three months to improve the life of battery.
- (3) Please notice temperature and humidity of operating environment.
- (4) When the main equipment is in storage, please use PE plastic bag to packet.

7 Specifications for ONL-33 Series UPS

Model		ONL 10K33	ONL 15K33	ONL 22.5K33	ONL 30K33	ONL 45K33	ONL 60K33	ONL 80K33	ONL 100K33	ONL 120K33
Capacity		10KVA	15KVA	22.5KVA	30KVA	45KVA	60KVA	80KVA	100KVA	120KVA
Rating Power		8KW	12KW	18KW	24KW	36KW	48KW	64KW	80KW	96KW
Power factor		0.8								
AC input	Phase	3 Phase 3 wire / 3 Phase 4 wire and ground								
	Voltage	380V/220V or 208V/120V ±20 %								
	Frequency	Auto-sensing, 50Hz/60Hz ±5 Hz								
	Regulation style	3 phase 6 pulses or 12 pulses (option)								
	DC voltage	DC410V								
	Efficiency of rectifier	>97%								
Efficiency of Inverter		>90%								
Total Efficiency		>88%								
Output	Phase	3 phase 4 wire and ground								
	Voltage range	380V/220V or 208V/120V								
	Voltage regulation	±1%								
	Transient state	Return to 90% with 4 cycle								
	Overload capacity	Bypass after 30 min while overload >100% <125%								
		Bypass after 30 sec while overload =125% <150%								
		Bypass after 30 cycles while overload exceed ≥ 150%								
	Way of Inverter	Sine wave modulated from 20KHz pulse by DSP control								
	Frequency	50Hz/60Hz								
	Frequency regulation	±0.1%								
	Range of phase lock	±5 Hz								
	Range of lock released	>±5 Hz								
	Range of lock back	±3 Hz								
	Wave	Sine wave								
	Load crest factor	3:1								
Total harmonic distortion	Less 3% linear load									
Static Switch	Transfer way	When inverter and utility are synchronized at same phase and voltage, bypass								
	Transfer way	Bypass to inverter 0mS								
		Normal state, inverter to bypass 0mS								
	Efficiency	> 99%								
Charger	Voltage	DC410V								
	Current	Current can be adjusted at 1A, 2A, 3A, 5A, 10A, 15A, 20A, 30A automatically								
	Charging period	Return to 90% from 100% exhausted battery within 8 hours (depending on type of batteries)								
Utility	Battery type	Bank with 12V X 30 pcs								
	Backup time	Depending on type of batteries								
	Noise	Less than 60dBA from the surface of 1m away								
Environ ment	Operating Temperature	0~40℃								
	Storage Temperature	-25℃~55℃								
	Ambient operation	3,500 meters max. elevation, 0-95% humidity non-condensing								

Model		ONL 10K33	ONL 15K33	ONL 22.5K33	ONL 30K33	ONL 45K33	ONL 60K33	ONL 80K33	ONL 100K33	ONL 120K33
Physical size	W	530mm	530mm	530mm	530mm	750mm	750mm	1500mm	1500mm	1500mm
	D	875mm	875mm	960mm	960mm	800mm	800mm	800mm	800mm	800mm
	H	1010mm	1010mm	1180mm	1180mm	1700mm	1700mm	1700mm	1700mm	1700mm
	120V/208V	427Kg	463Kg	457Kg	530Kg	800Kg	950Kg			
	W	530mm	530mm	530mm	530mm	750mm	750mm	750mm	1500mm	1500mm
	D	875mm	875mm	960mm	960mm	800mm	800mm	800mm	800mm	800mm
	H	1010mm	1010mm	1180mm	1180mm	1700mm	1700mm	1700mm	1700mm	1700mm
	220V/380V	333Kg	343Kg	345Kg	395Kg	530Kg	590Kg			

8 ONL-33 Series troubleshooting

8-1 Simple troubleshooting for recharge machine

Error message displayed	Error description	Troubleshooting
Input over-voltage	(1)Utility voltage is too high	Recover utility to +/-20% or below
	(2)Ol-3320 detects circuit error	Replace ol-3320
	(3)Ol-3300 feedbacks circuit error	Replace ol-3300
	(4)Ol-3300 program parameter is too high	Correct program parameter
Input under-voltage	(1)Utility voltage is too low	Recover utility to +/-20% or below
	(2)Ol-3320 detects circuit error	Replace ol-3320
	(3)Ol-3300 feedbacks circuit error	Replace ol-3300
	(4)Ol-3300program parameter is too low	Correct program parameter
Input over-current	(1)Load is over for 125% above	Unload to 100% below
	(2)Ol-3316 feedbacks circuit error	Replace ol-3320
	(3)Ol-3300program parameter is too high	Correct program parameter
	(4)SCR component damaged	Replace SCR component
	(5)Ol-3302 trigger signal to SCR is abnormal	Replace ol-3302
	(6)Ol-3302controlerror	Replace ol-3302
Input frequency is too high	(1)Utility frequency is too high	Recover frequency to +/-3Hz
	(2)Ol-3320 detects circuit error	Replace ol-3320
	(3)Error on ol-3300 zero point detects circuit	Replace ol-3300
	(4)Error on ol-3300program diagnose	Replace program
Input frequency is to low	(1)Utility frequency is too low	Recover frequency to +/-3Hz
	(2)Ol-3320 detects circuit error	Replace ol-3320
	(3)Error on ol-3300 zero point detects circuit	Replace ol-3300
	(4)Error on ol-3300 program diagnose	Replace program

Voltage of DC chain voltage is too high	(1)Ol-3302DCvoltage feedbacks point open circuit	Recover feedbacks circuit
	(2)Ol-3302 feedbacks circuit error	Replace ol-3302
	(3)Ol-3300program parameter is too high	Correct program parameter
	(4)SCR component short circuit	Replace SCR component
	(5)Error on ol-3302 control	Replace ol-3302
Voltage of DC chain voltage is too low	(1)Ol-3302DCvoltage feedbacks point open circuit	Recover feedbacks circuit
	(2)Ol-3302 feedbacks circuit error	Relaceol-3302
	(3)Parameter of ol-3300 program is too low	Correct program parameter
	(4)Battery power is insufficient and utility voltage is too low	Recover utility to +/-20% or below
	(5)IGBT component short circuit	Replace IGBT component
	(6)Ol-3302 control error	Replace ol-3302
Recharge current is too high	(1)Ol-3302 recharge current exceeds limit current point	Replace ol-3302
	(2)Ol-3302 feedbacks circuit error	Replace ol-3302
	(3)Ol-3300 program parameter is too high	Replace ol-3300
	(4)Error on ol-3302 control	Replace ol-3302
	(5)Battery is not function well	replace battery
Temperature of recharge machine is too high	(1)Temperature of side heat sink sheet on recharge machine is too high	Unload to under 100% load
	(2)Temperature switch line is open	Recover temperature switch line
	(3)Error on ol-3302 receiving signal	Replace ol-3302
	(4)Error on ol-3300 receiving signal	Replace ol-3300
Input phase sequence error	(1)Phase sequence of input power is reverse	Recover input power to positive phase sequence
	(2)Ol-3320 feedbacks circuit error	Replace ol-3302
	(3)Error on ol-3302 CPLD signal	Replace ol-3302
	(4)Error on ol-3300 receive signal	Replace ol-3302

8-2 Simple troubleshooting for Inverter

Error message displayed	Error description	Troubleshooting
Output over-voltage	(1)Ol-3320 detects circuit error	Replace Ol-3320
	(2)Ol-3300 feedbacks circuit error	Replace Ol-3300
	(3)Ol-3300 program parameter is too high	Correct Program Parameter
	(4)Ol-3300controlerror	Replace Ol-3300
Output under-voltage	(1)Ol-3320 detects circuit error	Replace Ol-3320
	(2)Ol-3300 feedbacks circuit error	Replace Ol-3300
	(3)Ol-3300program parameter is too low	Correct Program Parameter
	(4)Ol-3300controlerror	Replace Ol-3300
Output over-current	(1)Load exceeds 100% above	Unload Load To Under 100%
	(2)Ol-3316 detects circuit error	Replace Ol-3316
	(3)Ol-3300 program parameter is too high	Correct Program Parameter
Inverter input over-current	There isn't a function like this for now	
Temperature on the Inverter is too high	(1)Temperature of heat sink sheet on inverter side is too high	Unload Load To Below 100%
	(2)Temperature switch line is open	Recover Temperature Switch Line
	(3)Error on receiving ol-3312 signal	Replace Ol-3312
	(4)Error on receiving ol-3300 signal	Replace Ol-3300
VCE Fault	(1)IGBT component short circuit	Replace IGBT Component
	(2)Output is short circuit	Eliminate Short Circuit
	(3)Error on IGBT signal line connection method	Recover IGBT Signal Line Connection Method
	(4)Ol-3312 control error	Replace Ol-3312
	(5)Ol-3300 control error	Replace Ol-3300

8-3 Simple troubleshooting for system function

Error message displayed	Description	Troubleshooting
Battery can't supply power	(1)No battery found	Add battery
	(2)Battery power is insufficient	Recharge battery
	(3)Ol-3302 detects circuit error	Replace ol-3302
	(4)Ol-3300 program parameter inaccuracy	Correct program parameter
Input voltage is lower than 25%	(1)Utility voltage is too low	Recover utility to within+/-20%
	(2)Ol-3320 detects circuit error	Replace ol-3320
	(3)Ol-3300 feedbacks circuit error	Replace ol-3300
	(4)Ol-3300 program parameter inaccuracy	Correct program parameter
Temperature of main machine is overheat	(1)Error on system	Inform service technician
	(2)Error on ol-3300 feedback circuit	Replace ol-3300
	(3)Ol-3300 program parameter is too high	Correct program parameter
Humidity of main machine is too high	There is no this function for now	
No second power found	(1)No second power	Add second Power
	(2)Ol-3320 detects circuit error	Replace ol-3320
	(3)Ol-3300 feedbacks circuit error	Replace ol-3300
	(4)Ol-3300program parameter inaccuracy	Correct program parameter
No any Power	(1)No any power is added	Add any Power
	(2)Error on ol-3320 detecting circuit error	Replace ol-3320
	(3)Error on ol-3302 detecting circuit	Replace ol-3302
	(4)Error on ol-3300 feedback	Replace ol-3300
	(5)Error on ol-3300program parameter	Correct program parameter
Input voltage is too low and battery discharges	(1)Input power is too low or no utility	Recover utility to within+/-20%
	(2)Ol-3320 detects circuit error	Replace ol-3320
	(3)Ol-3302 detects circuit error	Replace ol-3302
	(4)Ol-3300 feedbacks circuit error	Replace ol-3300
	(5)Error on ol-3300program parameter	Correct program parameter

Battery is in low voltage and UPS is about to be shut down	(1)Input power to low or no utility	Recover utility to within+/-20%
	(2)Battery voltage decreases to low voltage point	Unload to 10%~20% of load
	(3)Ol-3320 detects circuit error	Replace ol-3320
	(4)Ol-3302 detects circuit error	Replace ol-3302
	(5)Ol-3300 feedbacks circuit error	Replace ol-3300
	(6)Error on ol-3300 program parameter	Correct program parameter
Error on battery test	(1)No battery	Add battery
	(2)Battery power is not insufficient	Recharge battery
	(3)Ol-3302 detects circuit error	Replace ol-3302
	(4)Ol-3300 program parameter inaccuracy	Correct program parameter
Emergency power functions	(1)Emergency switch functions	Recover Emergency Switch
	(2)Input short circuit	Eliminate short circuit
	(3)Ol-3304 detects circuit error	Replace ol-3304
	(4)Ol-3300 detects circuit error	Replace ol-3300

ONL 33 系列 不斷電電源供應系統

中文

使用手冊



ONL-33 系列 中文使用手冊

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1 序言

1-1 簡介

ONL33 系列不斷電系統採用先進之 DSP 晶片作為系統的核心處理器，專門針對電腦、精密儀器...等使用設備而開發設計的產品，整機俱有高可靠度，且極為快速的暫態反應。ONL33 系列設計非常簡潔，體積小易於維護，並且極為安靜，非常適合裝置於電腦機房內。

在這資訊的洪流中，電力的使用非常普及化，複雜多變之電氣商品如雨後春筍般的推出，但也因此造成用戶端電源品質下降，如電源波形嚴重失真、突波大、相角差距過大及電壓不穩等現象發生，因此在電源側需要藉由 UPS 以增加一層安全的保護，而在線式 ONL33 系列的輸出能提供完全純淨的電源品質，絲毫沒有突波、衝擊波和陷波等的現象發生，以提供使用者全方位的保護機能，及避免因輸入電源變化而造成主機故障，甚至影響到負載當機，同時因 ONL33 系列整體採用模組化的設計，因此維護極為簡單。主機運作採用最新一代 DSP 控制，俱有高達 40MIPS 極高運算處理能力，並將控制數位化處理，以提高整體的可靠度，且週邊支援擴充容易與豐富，是傳統 UPS 使用類比控制模式無法比擬的。ONL33 系列搭配先進的超智慧電池管理系統，以有效提高電池之使用壽命，系統於開機時會自動偵測有無連接電池，且在市電正常下也可立即或定期完成電池的測試功能。由於操作複雜是傳統 UPS 的缺點，而 ONL33 系列模組化及數位化的設計，使得操作更加簡單化。

1-2 安全指示及注意事項

為了確保使用之安全，ONL33 系列中的告警標示如下：



請勿碰觸



高壓危險

以上為本系統之警示標誌，在有貼高壓危險標示之位置為 410VDC 高壓直流，因此千萬不可碰觸。

2 系統架構

2-1 ONL33 系列之系統方塊圖

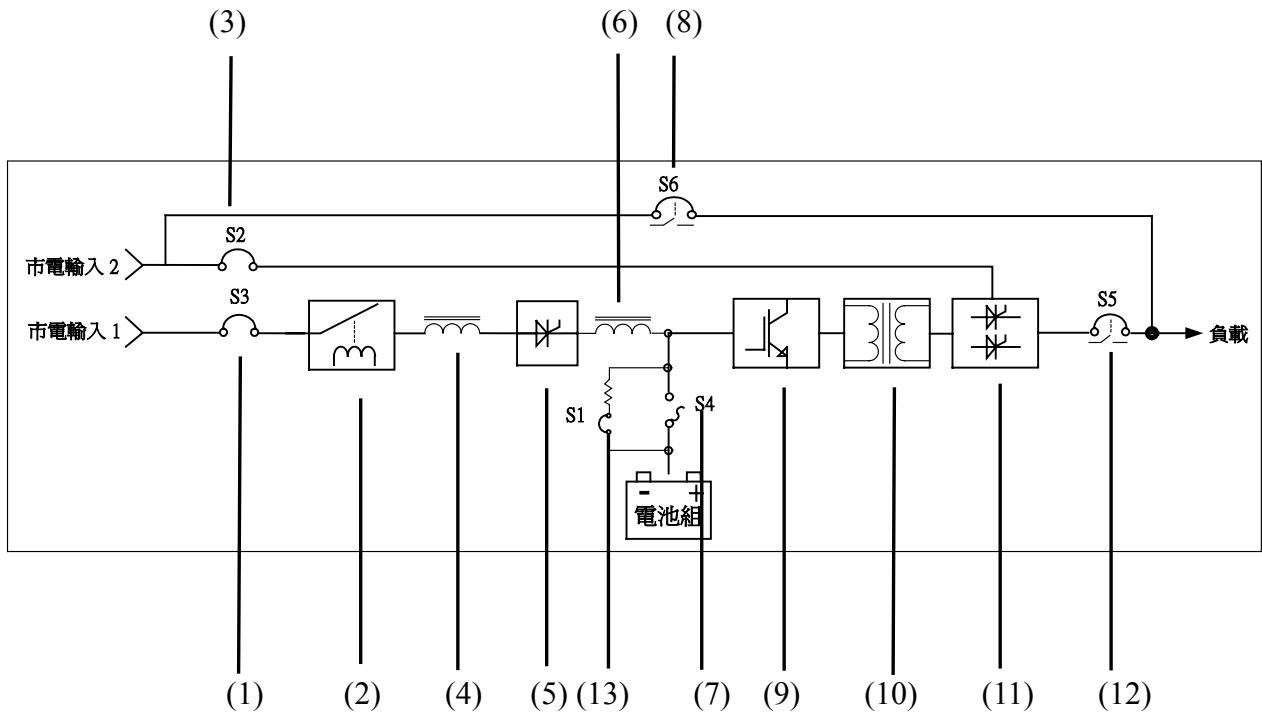


圖 2-1

- (1) 主電源輸入開關(S3)
- (2) 輸入繼電器
- (3) 第二電源輸入開關(S2)
- (4) 三相交流電感器
- (5) 整流器/充電機模組
- (6) 直流電感器
- (7) 電池保險絲開關(S4)
- (8) 維修旁路開關(S6)
- (9) 逆變器模組
- (10) 逆變器之隔離變壓器
- (11) 靜態開關模組
- (12) 輸出開關(S5)
- (13) 電池輔助開關(S1)

註:(1)此 UPS 輸入系統可單電源輸入或
雙電源輸入
(2)雙電源輸入為選配

2-2 系統組成及配置

圖 2-2A 與 2-2B 為 ONL33 系列 22.5K、30K 組成及配置圖

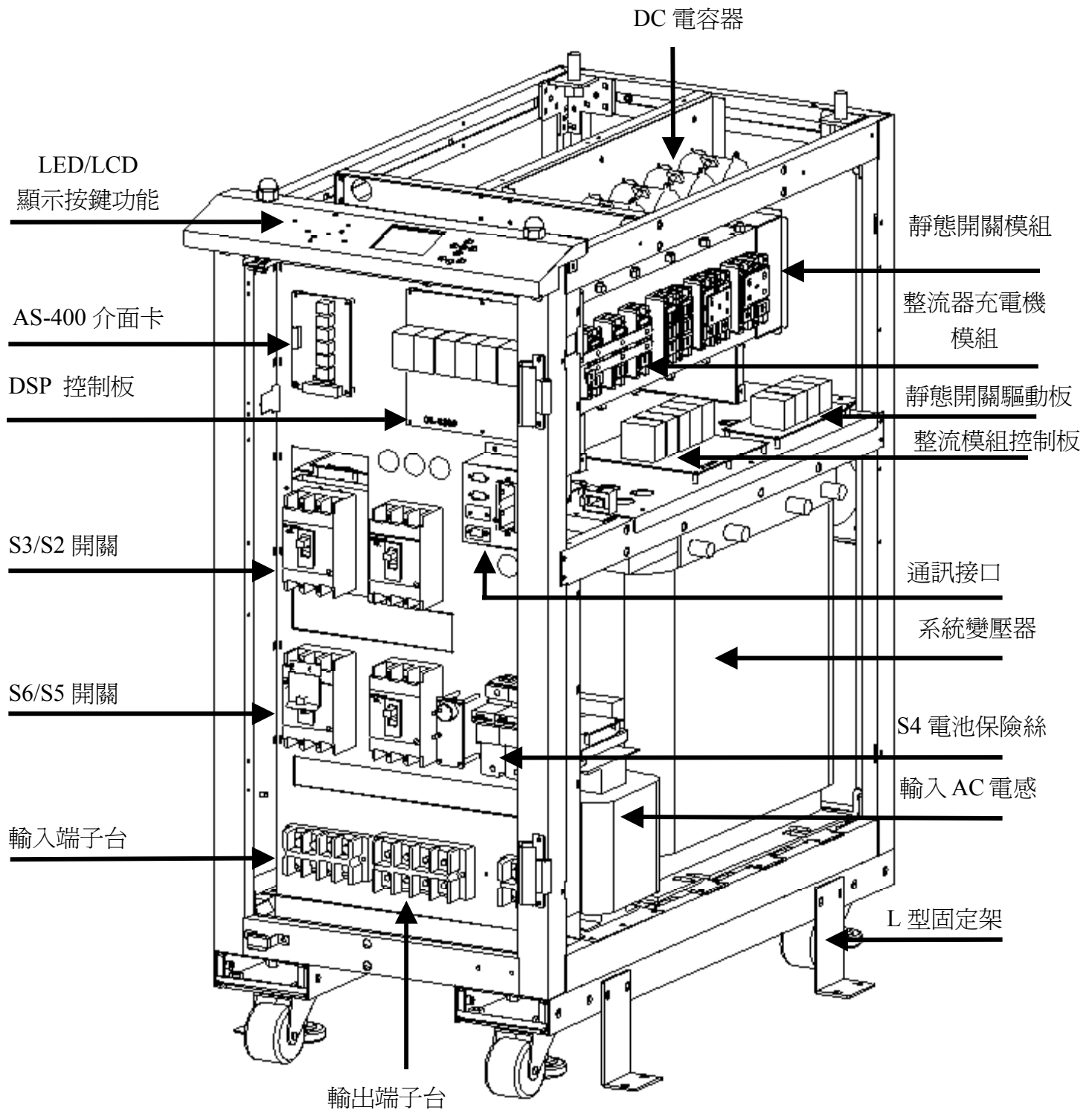


圖 2-2A

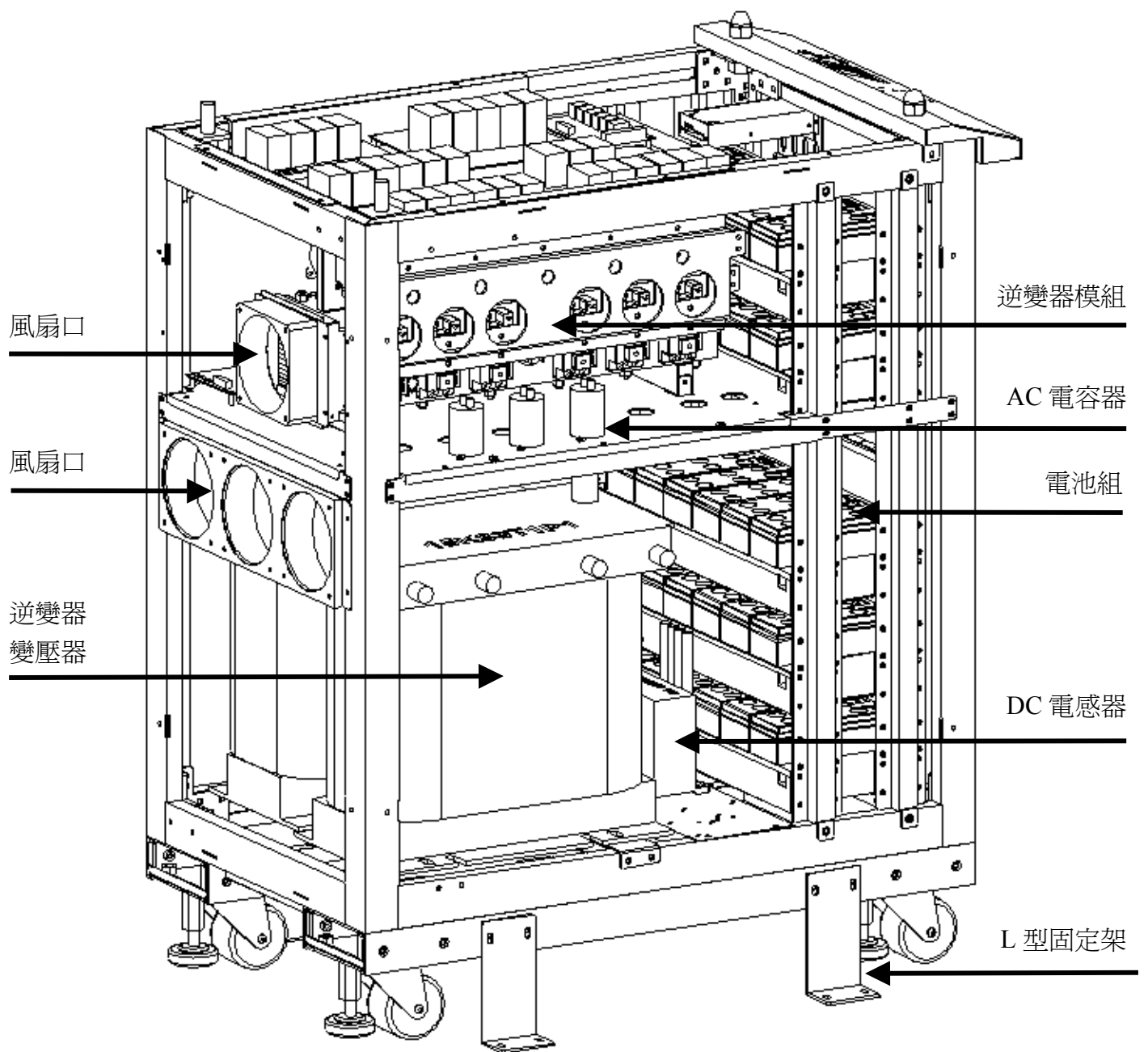


圖 2-2B

圖 2-2C 與 2-2D 為 ONL33 系列(10K&15K)組成及配置

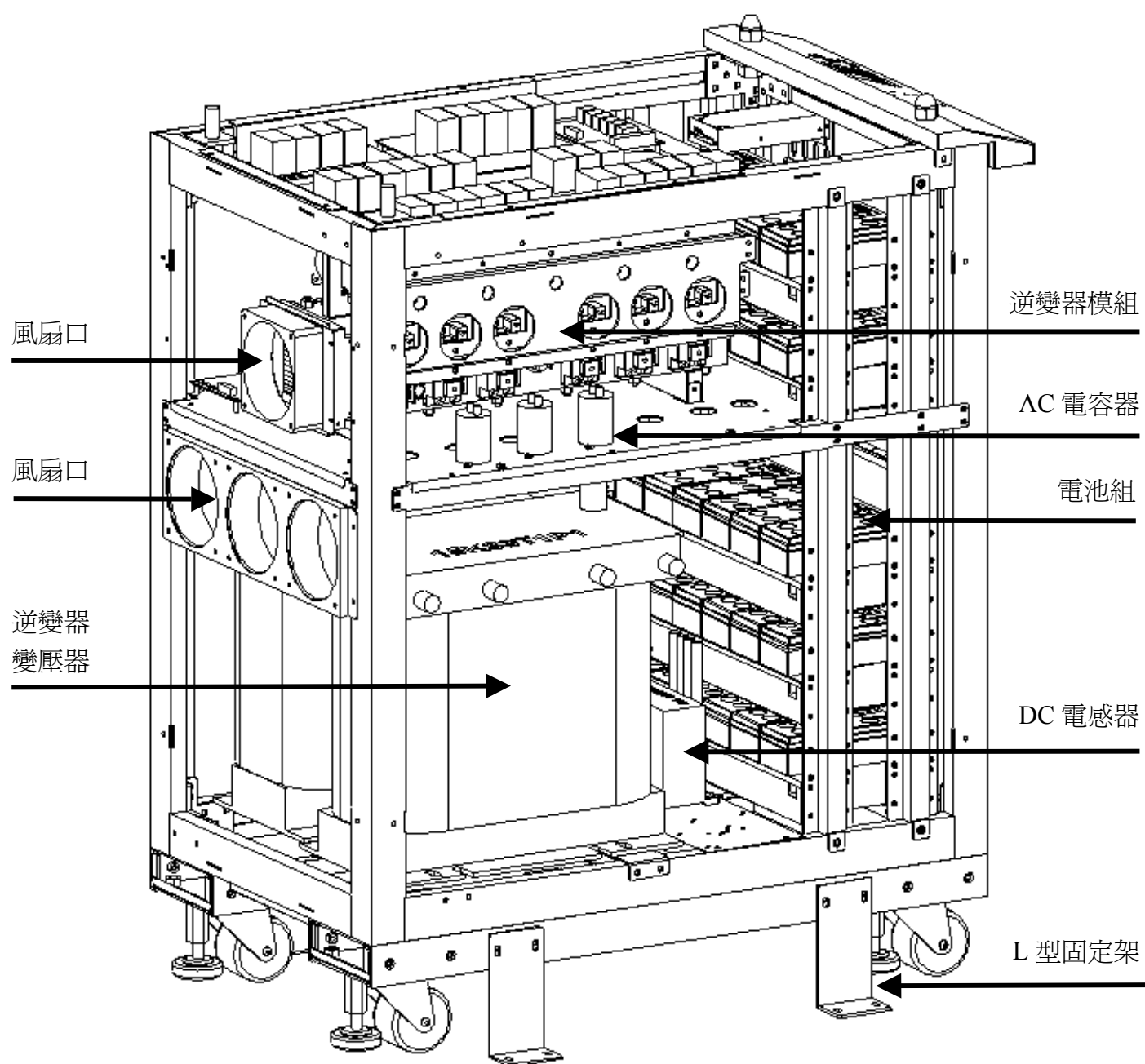


圖 2-2C

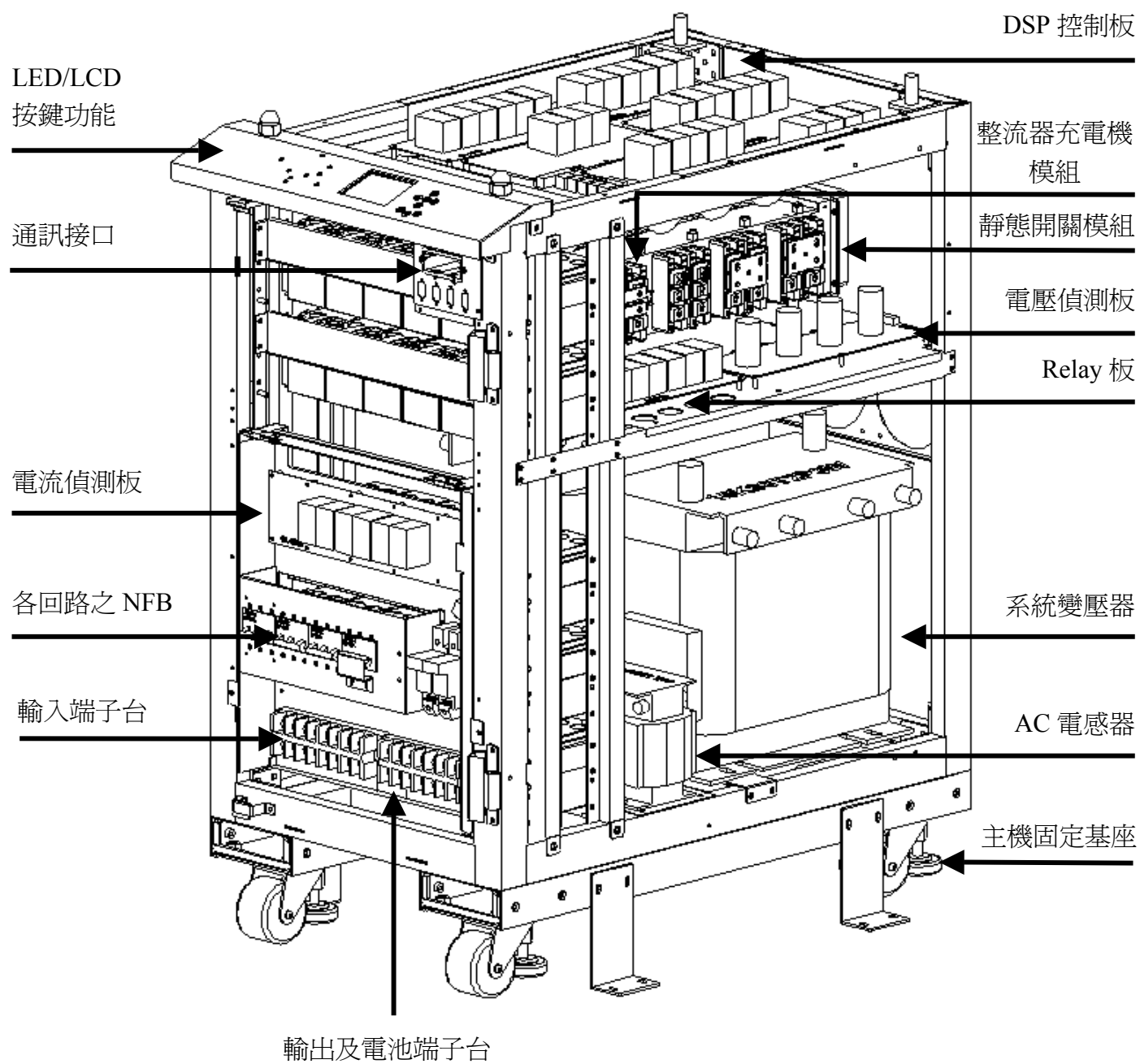


圖 2-2D

2-3 系統主要模組功能介紹

2-3-1 整流器/充電機

- (1) 整流器/充電機模組使用 SCR 元件，將交流轉變為直流電壓，並對電池充電。
- (2) 在整流器/充電機模組裡，結合 CPLD 與 DSP 雙重控制法則，讓整流器與充電機更穩定與可靠。
- (3) 完善的過高壓保護系統。
- (4) 相序錯誤及缺相偵測。
- (5) DC 電壓緩啟動功能。
- (6) 三相 6 脈波設計同時支援六相 12 脈波功能(選配)。
- (7) 支援浮充(Float charge)及均充(Equal charge)，免加水電池，均充電壓為 DC 420V，加水電池均充電壓為 DC 430V，浮充電壓為 410V。
- (8) 可在不停電狀態下做電池測試功能。
- (9) 充電電流可由 LCD 面板設定。

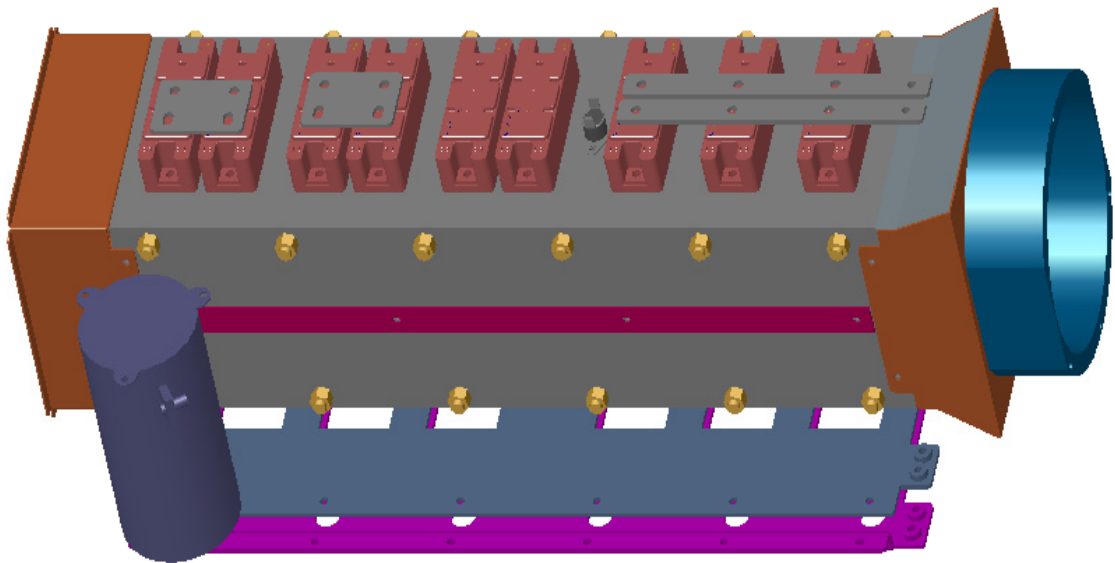


圖 2-3-1(實際模組組立圖面)

2-3-2 逆變器模組功能介紹

- (1) 使用 IGBT 作為功率元件。
- (2) 導入高科技 DSP 晶片技術，逆變器模組控制數字化。
- (3) 採用數位控制處理，改善類比零件老化、溫度偏移及降低使用零件數量以提高系統可靠度。
- (4) 整合式 A/D 訊號處理，12bit 解析度及高速轉換能力。
- (5) 預留並聯機通訊埠，第二電源偵測，ATS 控制訊號，SPWM 測試埠。
- (6) 系統整合度高，體積小、可靠度高。
- (7) 可與整流充電機 AS-400 介面板、IGBT Driver、靜態轉換板、LCD 面板、第二電源板(含 ATS 功能)PT 板、CT 板來連接串成整機。
- (8) 可預留硬體控制功能，處理更多資訊。



圖 2-3-2(實際模組組立圖面)

2-3-3 靜態開關

- (1) 主要使用 SCR 元件來作為 INV 及 BYPASS 回路切換，並以高頻的電子技術來作控制。
- (2) 採用高頻技術來隔離觸發電路，此電路功能能有效率對 SCR 來作觸發控制，使兩組回路達到零中斷。
- (3) 完全接受 DSP 主動控制，具有非致能、旁路和逆變回路的觸發狀態。
- (4) 實際組立模組在圖 2-3-1 中。

註:靜態模組與整流器模組製作在同一個散熱片區域上。

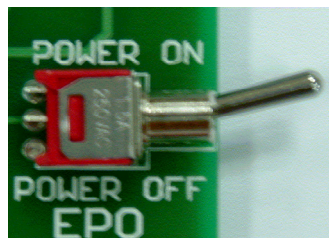
2-3-4 輸入啓動/保護繼電器

- (1) 當市電復電及初次供電時，將經由主控板偵測電壓以延遲投入此輸入繼電器，避免在市電中復電時，突波衝擊到主機輸入。
- (2) 當無論初次送電或是運轉中，輸入過高/低壓，或是欠相及相序錯誤時，經由主控板作偵測控制，來作為輸入繼電器動作切離，保護主機設備。

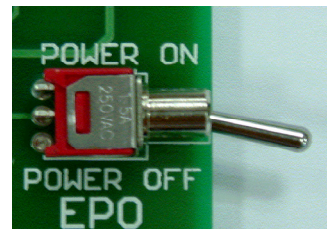
2-3-5 緊急關機裝置

- (1) 當設備運轉中，使用單位成員遇到不可抗拒之因素或緊急狀況，希望能以最短時間來關閉 UPS 系統。即可使用此一功能(圖 2-3-5 為直式面板實際圖面)(圖 2-3-6 為橫式面板機種圖面)，直式面板採用開關方式，將開關往下切換至 POWER OFF，即可關閉 UPS 系統，橫式面板中可將約 3mm~5mm，針狀尖頭物品插入，即可關閉 UPS 系統，當關閉 UPS 後，整個系統將關閉鎖住，所有狀態停止。若要系統重新啟動系統，直式面板需將開關往上切換至 POWER ON，橫式面板不需要，按面板 OFF 鍵，ENTER 鍵確認，按面板 ON 鍵，ENTER 確認，即可重新開始 INVETER 啟動。

PCB 3304 :



normal EPO status



EPO is on work

圖 2-3-5

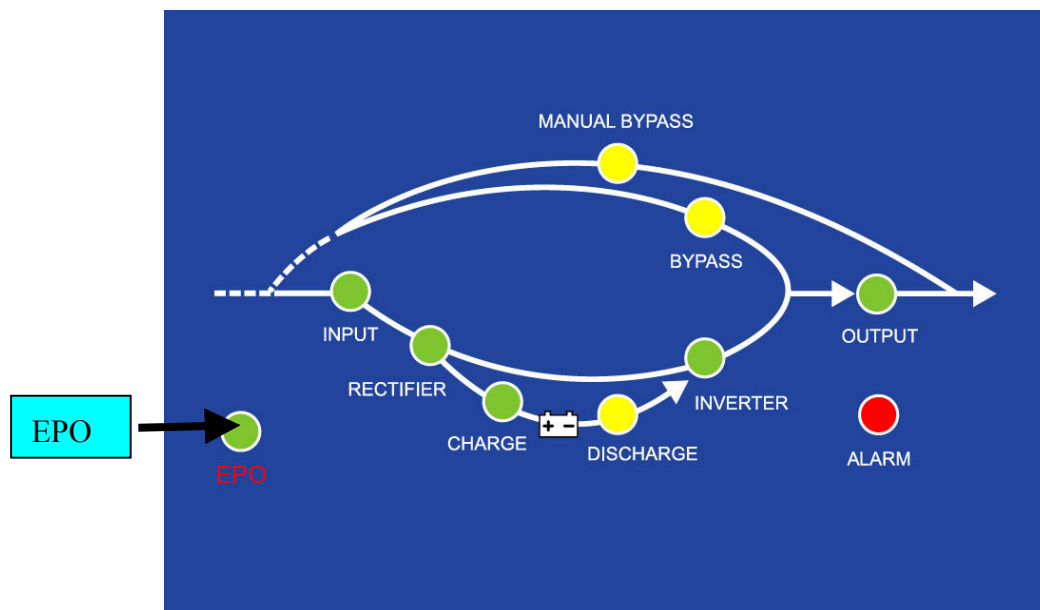


圖 2-3-6

2-4 系統運轉模式

2-4-1 系統正常(圖 2-4-1 所示)

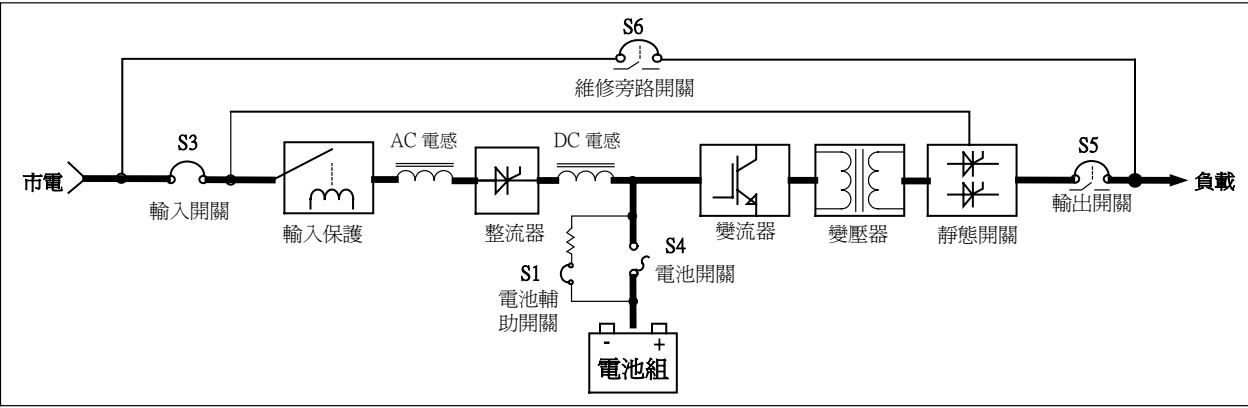


圖 2-4-1

此系統運轉模式為輸入經整流器/充電機模組，一方面對電池充電，另一方面經逆變壓器模組、靜態開關模組至輸出負載，此時為 INVERTER 電源供應。

2-4-2 系統旁路(圖 2-4-2 所示)

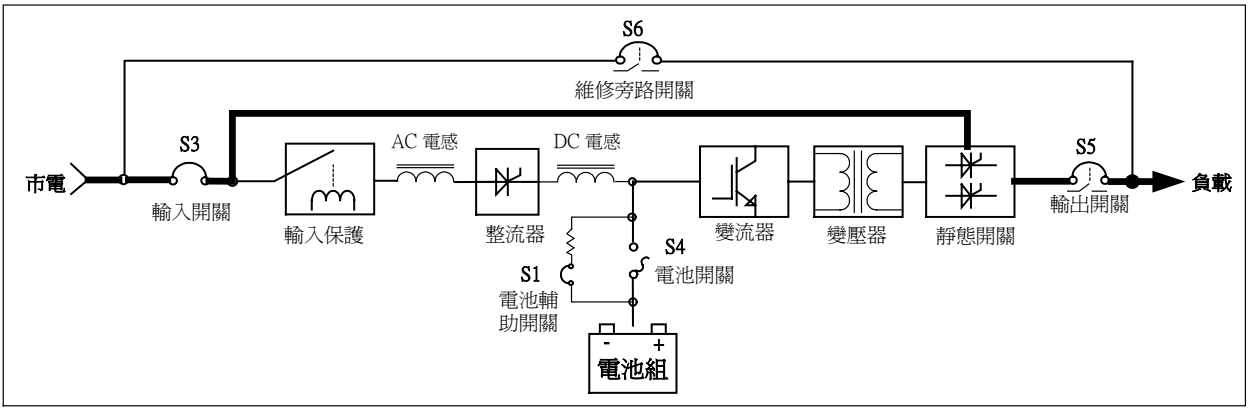


圖 2-4-2

此系統運轉模式為輸入經旁路回路，靜態開關模組至輸出負載，此時為市電電源供應。

2-4-3 系統電池供電圖(圖 2-4-3 所示)

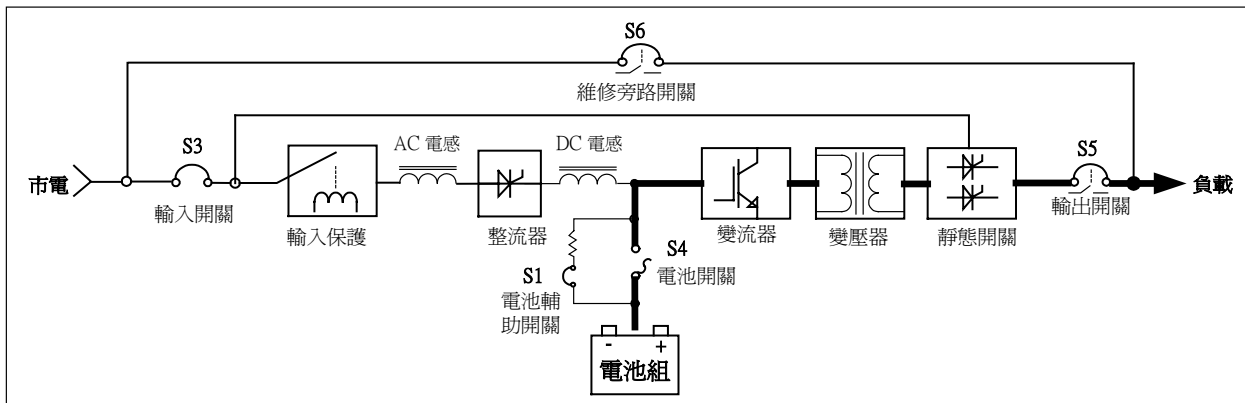


圖 2-4-3

此系統運轉模式為無市電輸入時，由逆變壓器模組，靜態開關模組至輸出負載，此時為電池電源供應。使用電池供電時，其供電時間受電池數量與負載量大小而有所不同，故建議如果市電中斷時，請儘快做資料的儲存與正常的關機程式。

2-4-4 系統手動維修旁路(圖 2-4-4 所示)

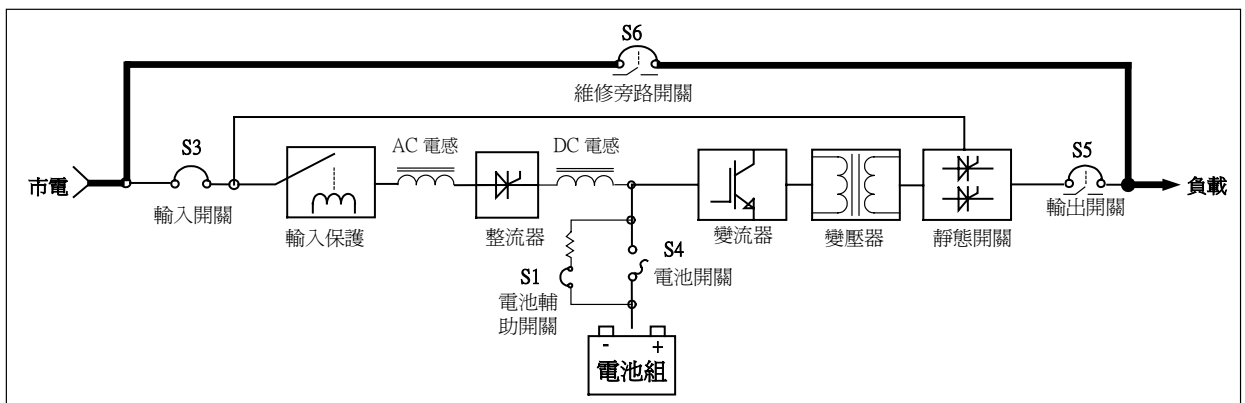


圖 2-4-4

此系統運轉模式為市電經由手動維修開關至輸出負載，此時負載的電源線為市電電源供應。且此一系統操作模式為專業維護人員方可操作，作用為 UPS 系統裏之維護及清潔保養。

2-4-5 緊急開關(圖 2-4-5 所示)

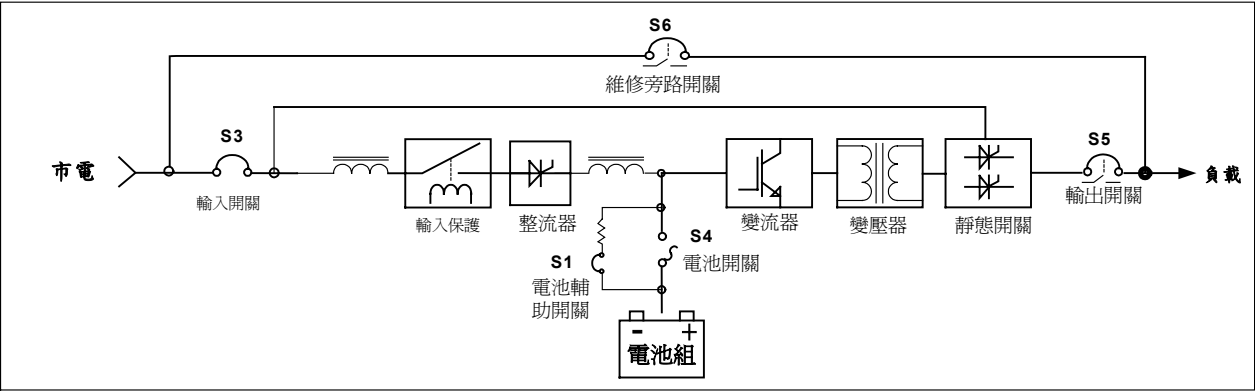


圖 2-4-5

此系統運轉模式為市電無輸出，此操作模式必須在 UPS 確定為緊急狀況時，才可啟動，否則當此功能被啟動時，UPS 將被關閉，導致毫無輸出電壓。

3 面板功能

3-1 LED 流程指示

22.5K 以上機種如圖 3-1 所示，15K 以下機種如圖 3-2 所示。

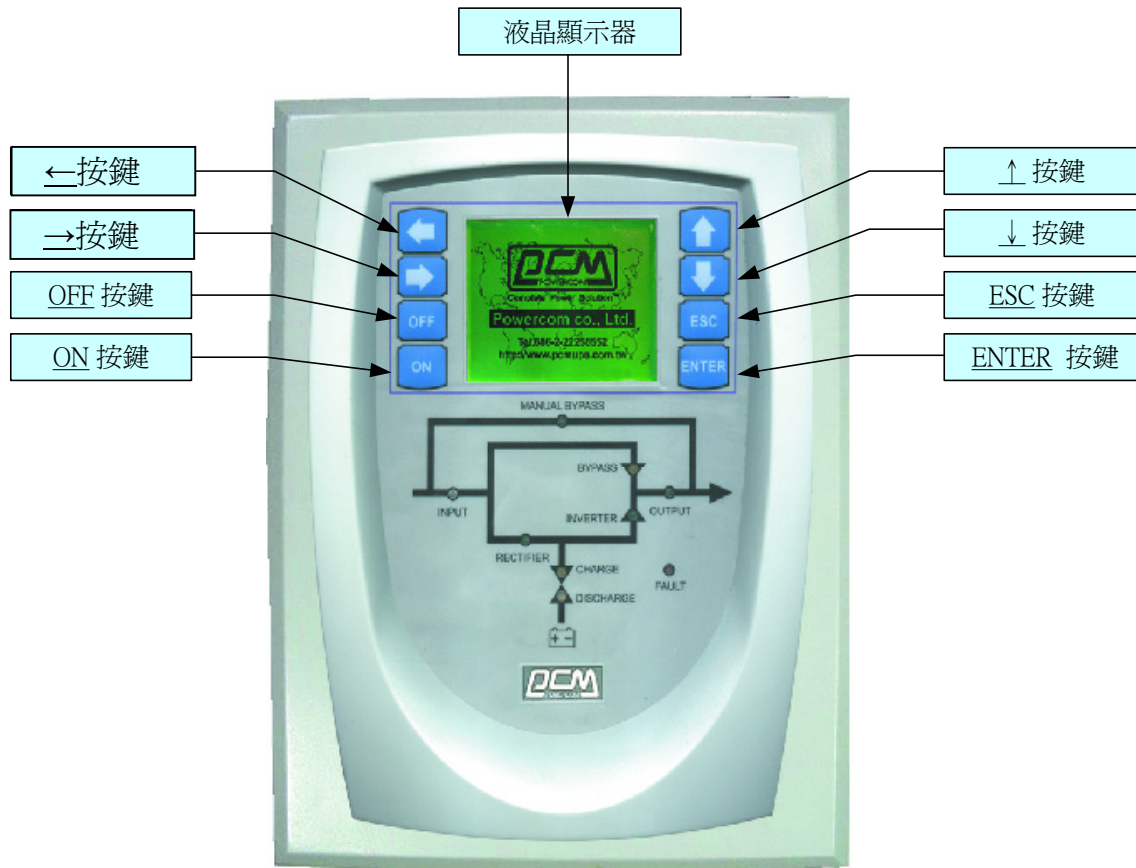


圖 3-1

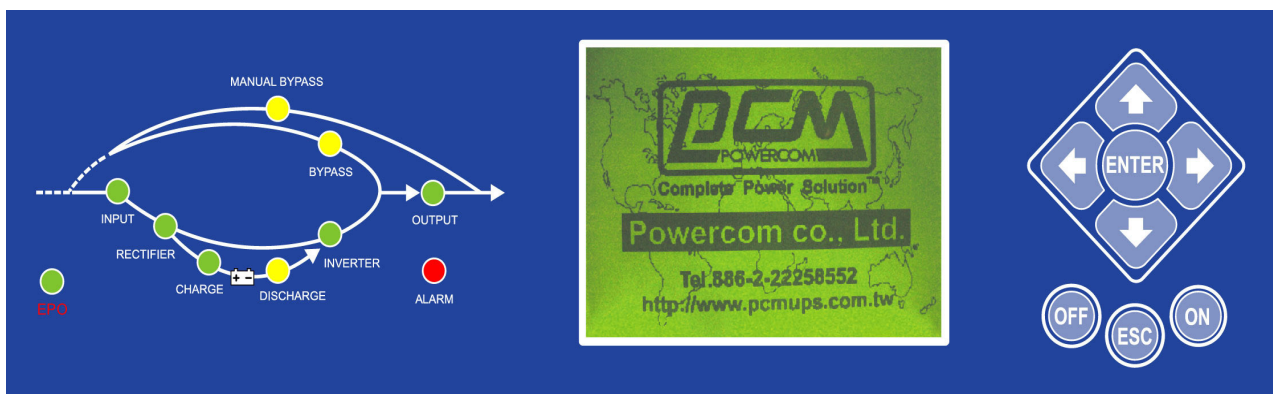


圖 3-2

上圖為操作面板 LED 示意圖，狀態流程可分以下四種模式：

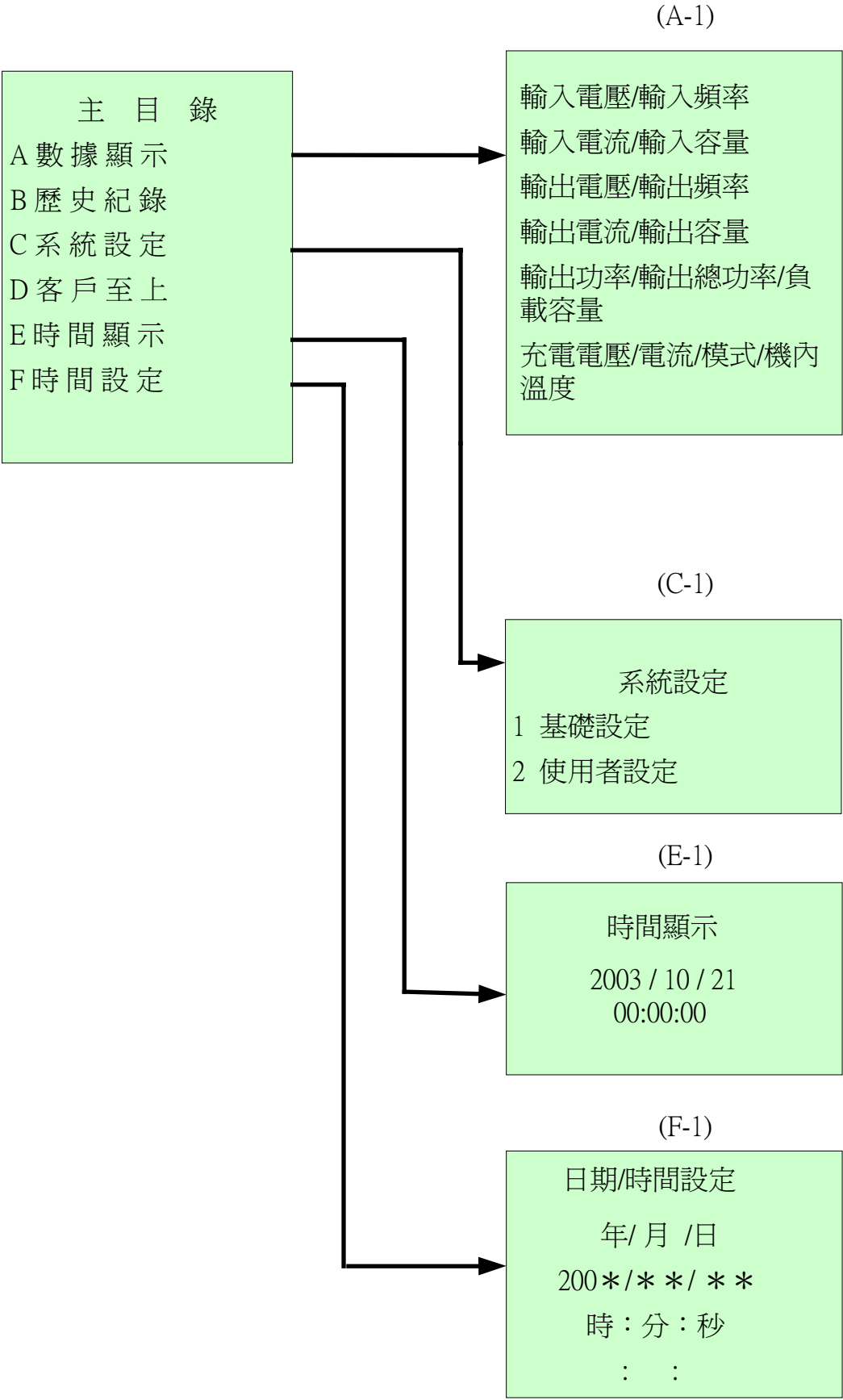
- (1) 系統正常運轉模式: INPUT、RECTIFIER、CHARGE、INVERTER、OUTPUT 燈亮，其餘熄滅。
- (2) 系統旁路運轉模式: INPUT、BYPASS、OUTPUT 燈亮，其餘熄滅。
- (3) 電池供應運轉模式: DISCHARGE、INVERTER、OUTPUT 燈亮，其餘熄滅。
- (3) 維修旁路運轉模式: S6 無熔絲開關切換至 ON 位置時，只有 MANUAL BYPASS 燈亮，其餘熄滅，此時表示系統已正確切換到維修旁路，待 S1、S2、S3(無熔絲開關)、S4(保險絲開關) OFF 後，再使用放電治具洩放 DC 電容器上之電壓完成後，MANUAL BYPASS 熄滅，此時即可執行保養與維修。

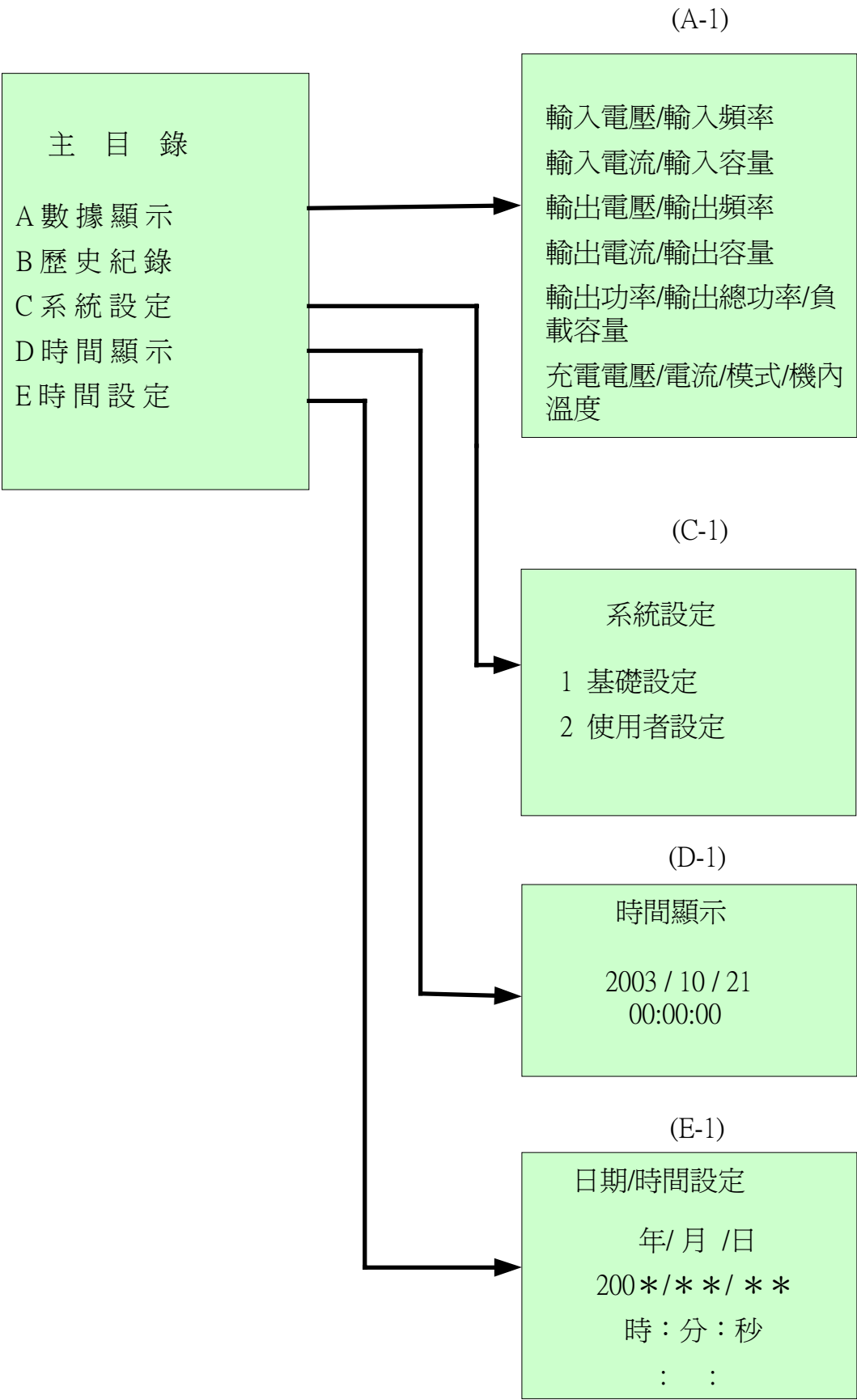
3-2 鍵盤功能

面板按鍵操作說明

	按鍵	開啓逆變器用按鍵
	按鍵	關閉逆變器用按鍵
	按鍵	游標向左移位用鍵
	按鍵	游標向右移位用鍵
	按鍵	游標向上移位或更換畫面用鍵
	按鍵	游標向下移位或更換畫面用鍵
	按鍵	離開目前畫面用鍵
	按鍵	確認/執行用鍵

3-3 LCD 功能目錄:(1.0 版)





(A-1)

輸入電壓/輸入頻率
輸入電流/輸入容量
輸出電壓/輸出頻率
輸出電流/輸出容量
輸出功率/輸出總功率/負載
容量
充電電壓/電流/模式/機內
溫度

(A-2-6)

充電電壓：DC 000.0V
充電電流：DC 000.0A
充電模式：浮充
機內溫度： 00.0度

(A-2-1)

輸入電壓
RS 000.0V RN 000.0V
ST 000.0V SN 000.0V
TR 000.0V TN 000.0V
輸入頻率：00.0 HZ

(A-2-2)

輸入電流	輸入容量
RN 000.0A	000.00KVA
SN 000.0A	000.00KVA
TN 000.0A	000.00KVA
輸入總容量	000.00KVA

(A-2-3)

輸出電壓
RS 380.0V RN 220.0V
ST 380.0V SN 220.0V
TR 380.0V TN 220.0V
輸出頻率：60.0Hz

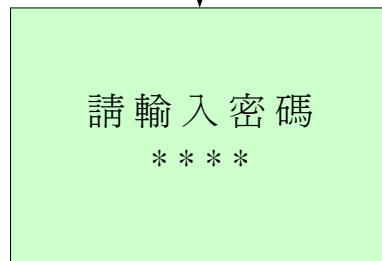
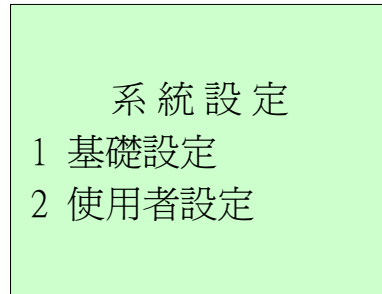
(A-2-4)

輸出電流	輸出容量
RN 000.0A	000.00KVA
SN 000.0A	000.00KVA
TN 000.0A	000.00KVA
輸出總容量	000.00KVA

(A-2-5)

輸出功率：	R	000.00KW
	S	000.00KW
	T	000.00KW
輸出總功率：		000.00 KW
負載容量：		000.00%

(C-1)



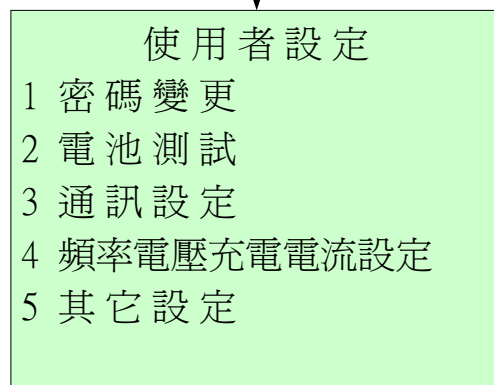
NO



YES



(C2)



(C-2)

使用者設定

- 1 密碼變更
- 2 電池測試
- 3 通訊設定
- 4 頻率電壓充電電流設定
- 5 其它設定

(C-3-1)

密碼變更

請輸入舊密碼

請輸入新密碼

(C-3-2)

電池測試

☒ 30 秒
☐ 定期每個月
☐ 定期每3個月
☐ 關閉定期測試

(C -3-4)

頻率電壓充電電流設定

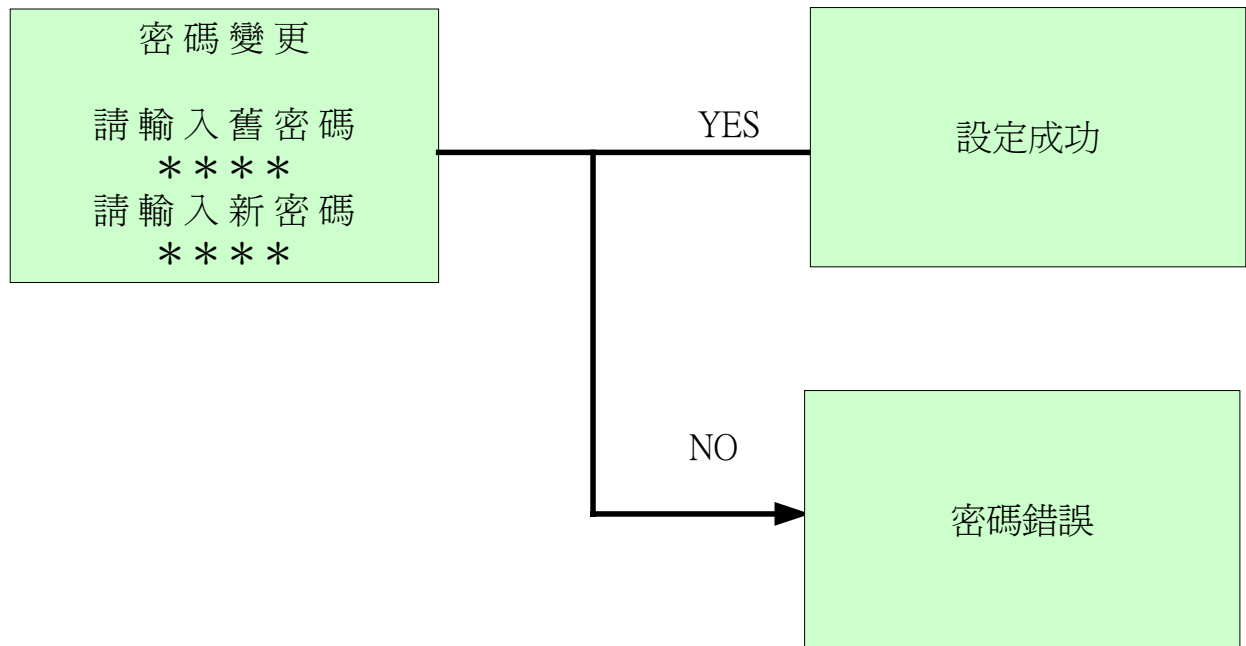
- 1 頻率設定
- 2 系統輸入電壓設定
- 3 系統輸出電壓設定
- 4 輸出電壓設定
- 5 充電電流設定
- 6 充電機模式設定

(C-3-5)

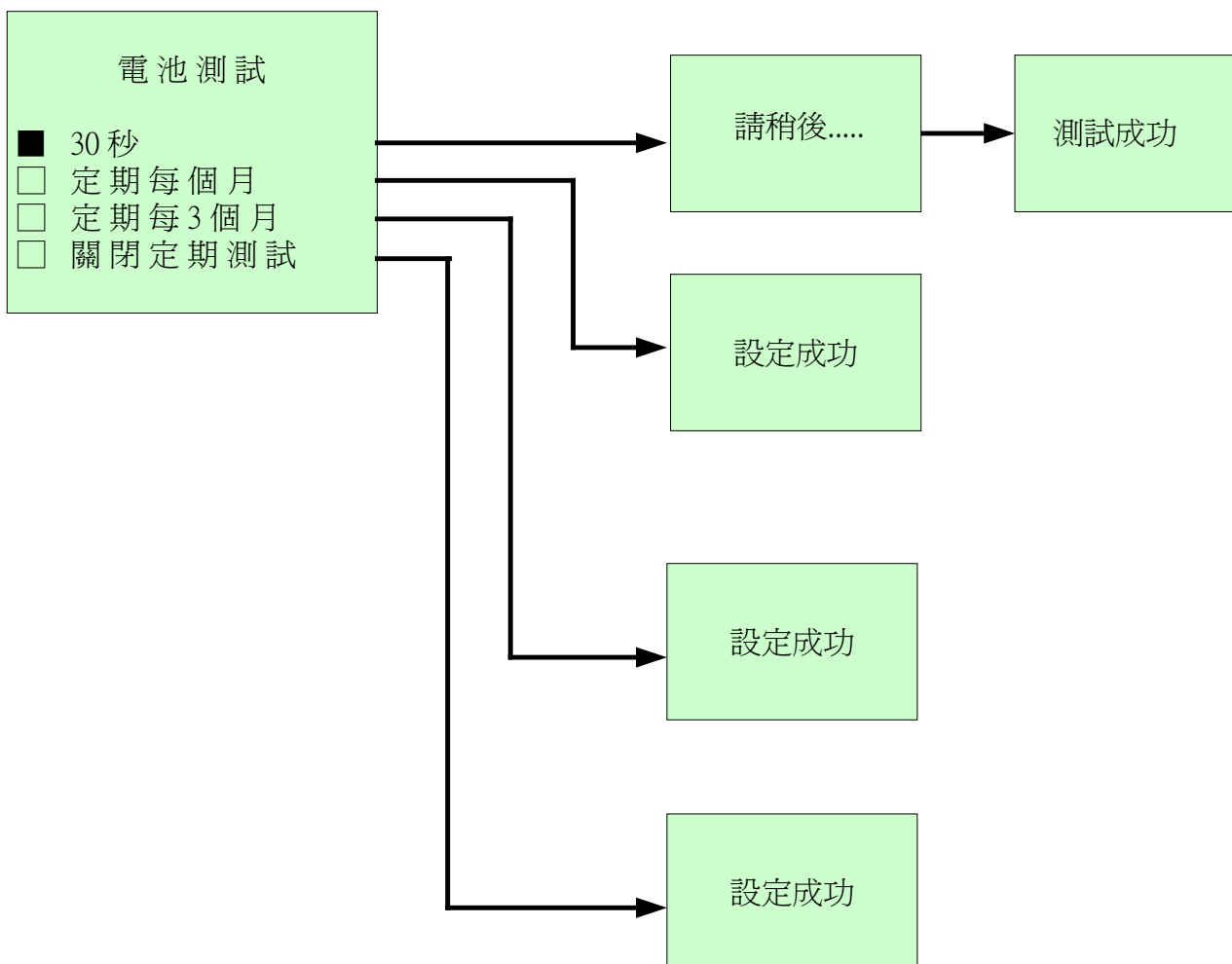
其他設定

- 1 告警音設定
- 2 放電時間
- 3 語系設定
- 4 機型設定

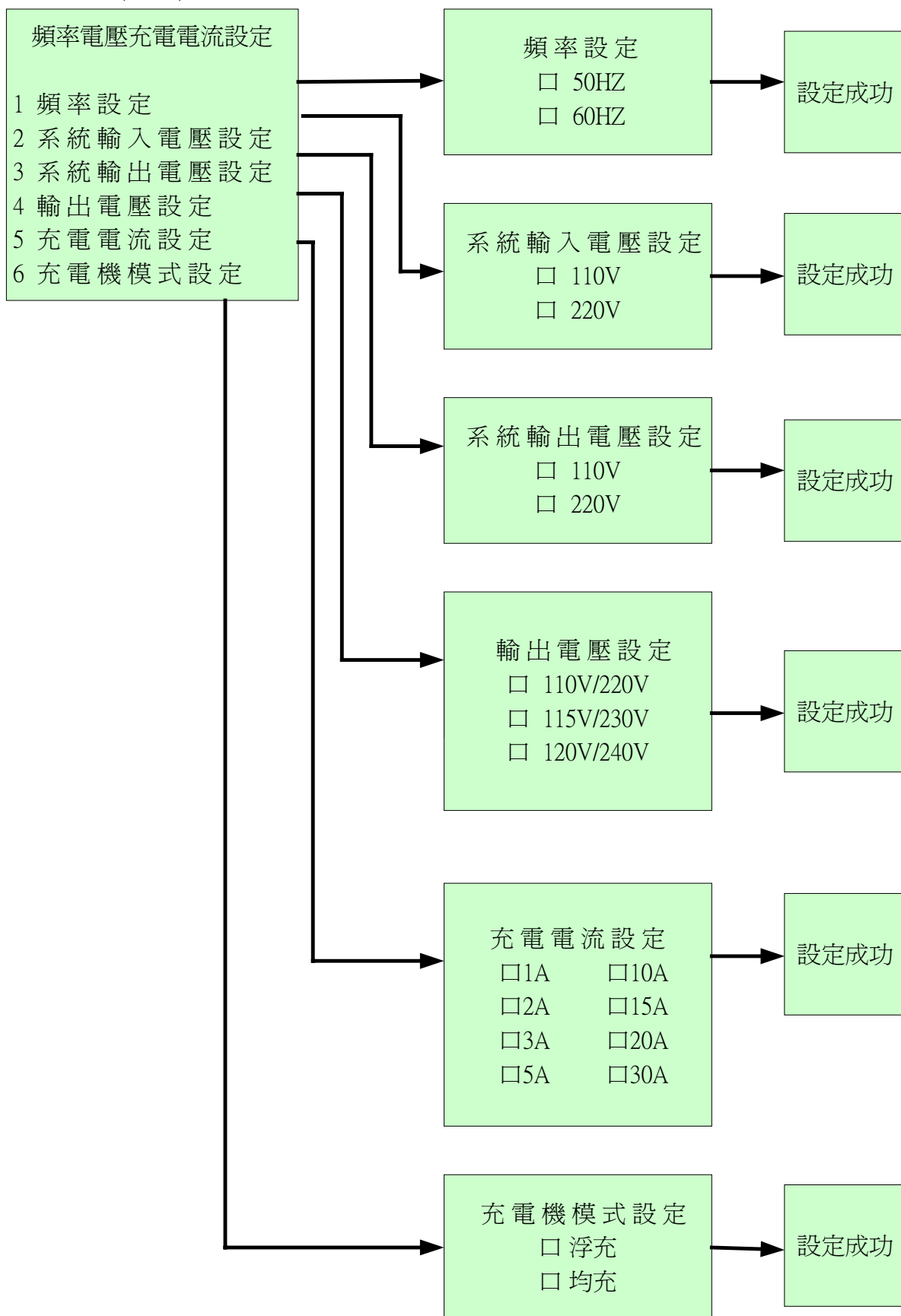
(C-3-1)



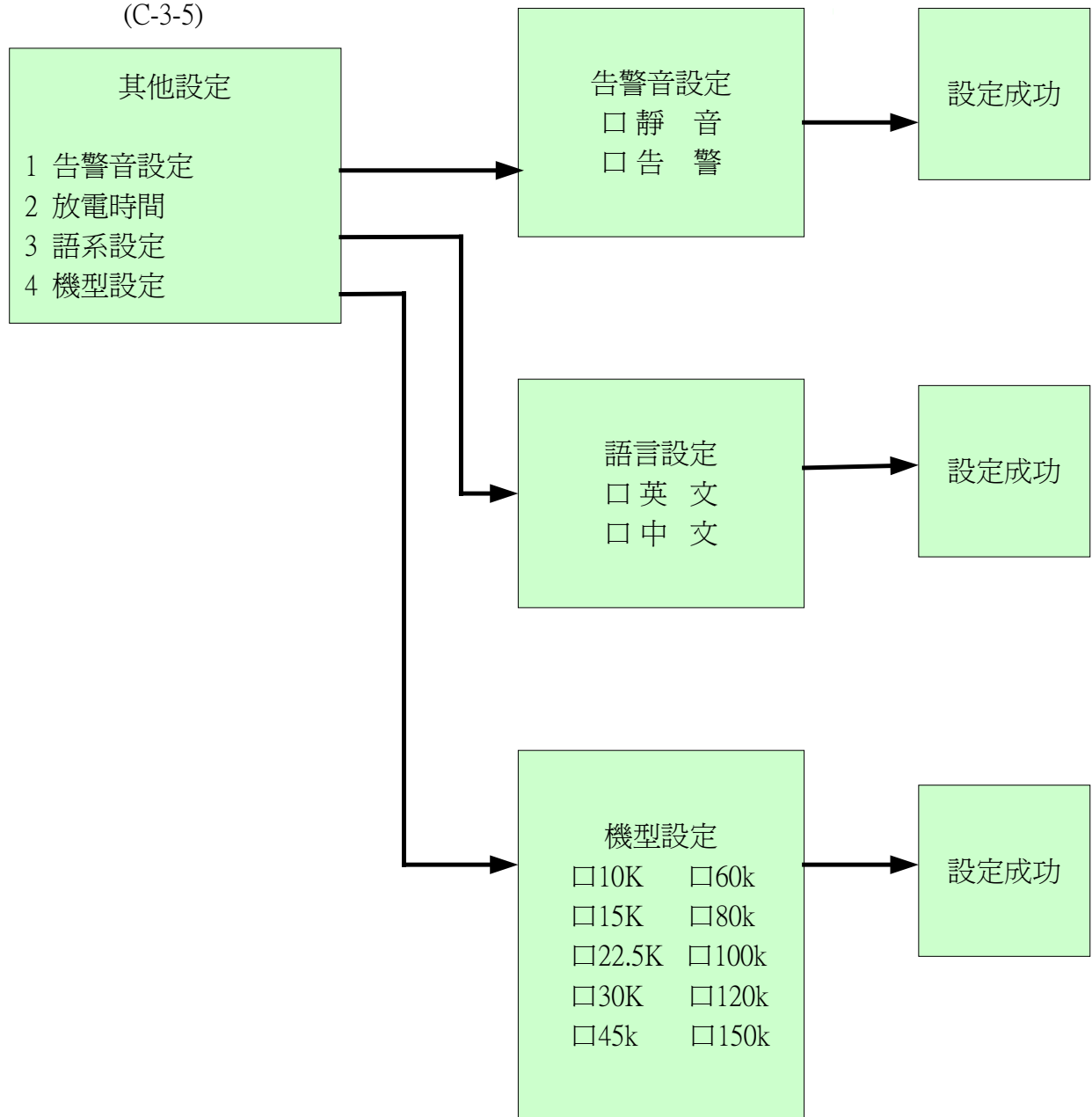
(C-3-2)



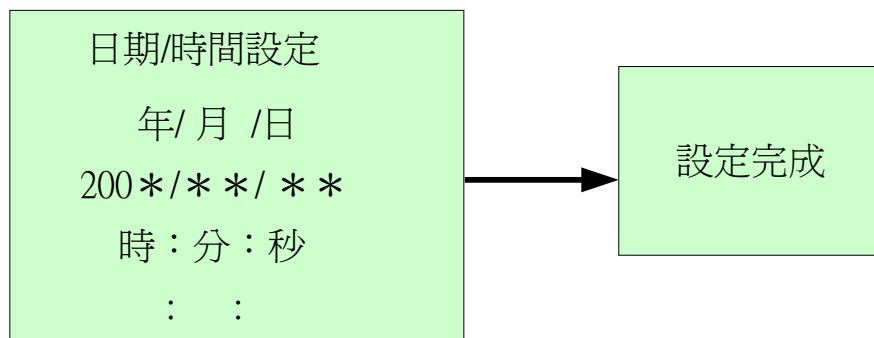
(C-3-4)



(C-3-5)



(E-1)



4 定位與安裝

4-1 定位作業

4-1-1 搬運

就整體而言，UPS 系統分別由主機與電池組兩個單元組合而成，因此在搬運過程中，請注意以下各點：

- (1) 系統運載放置方式，請依照外箱之擺放方向符號放置，切勿倒放或傾斜放置。
- (2) 此系統運載時，必須固定牢靠。
- (3) 運載時，請勿拆卸包裝材料，可降低外力撞擊而損傷本體。
- (4) 運載時，請注意防水措施。
- (5) 禁止掉落或重擊本機器，以保護產品所有元件不受傷害。

4-1-2 拆箱

拆箱的方式如下：

- (1) 首先剪開捆綁的繩索及包裝材料。
- (2) 將保護用之 PE 膜沿著四周圍旋轉取下。
- (3) 拆卸固定在棧板及 UPS 底盤之 L 型固定架螺絲。
- (4) 將斜坡板放在 UPS 後方，使主機可從斜坡板順勢往下移動，如此主機將可非常容易與方便的到達地面。

4-1-3 定位及擺置環境注意事項：

系統定位時注意事項：

- (1) 機房環境必須潔淨，且有空調系統，機房溫度不要超過 $-10^{\circ}\text{C} \sim +28^{\circ}\text{C}$ ，如果超出此範圍，UPS 及電池的壽命則會縮短，適當的操作溫度為 $5^{\circ}\text{C} \sim +25^{\circ}\text{C}$ 範圍內為最適當。
- (2) 系統定位之位置，周圍必須預留空間，正面及左右預留 100 公分距離，後面預留 50 公分，以利散熱及維修。
- (3) 表 4-1-3 為 ONL-33 系列所消耗之 BTU 值。

型 號	BTU	型 號	BTU
ONL-10K33	4819	ONL-45K33	21682
ONL-15K33	7225	ONL-60K33	28909
ONL-22.5K33	10841	ONL-80K33	38546
ONL-30K33	14454	ONL-100K33	48183

表 4-1-3

- (4) 機房環境需有充足之照明及裝設緊急消防系統。

4-2 安裝作業

4-2-1 主機規格及輸入/出電力規格

系統輸入規格: 50Hz/60Hz 3 相 3 線 200Vac，220Vac

50Hz/60Hz 3 相 4 線加地線 110/190Vac，115/200Vac，120/208Vac，127/220Vac
220/380Vac，230/400Vac，240/415Vac

系統輸出規格: 50Hz/60Hz 3 相 4 線加地線 110/190Vac，115/200Vac，120/208Vac，127/220Vac
220/380Vac，230/400Vac，240/415Vac

以下規格表為主機輸入/輸出電流與開關規格(表 4-2-1)

主機容量	電壓規格	輸入最大電流	輸入開關	輸出最大電流	輸出開關	中性線最大電流
10KVA	110/190V	55A	3P/60A	38A	3P/50A	65A
	120/208V	49A	3P/50A	35A	3P/40A	60A
	220/380V	28A	3P/30A	19A	3P/20A	32A
15KVA	110/190V	82A	3P/100A	57A	3P/75A	98A
	120/208V	74A	3P/75A	52A	3P/60A	90A
	220/380V	39A	3P/40A	28A	3P/30A	48A
22.5KVA	110/190V	122A	3P/125A	85A	3P/100A	147A
	120/208V	114A	3P/125A	78A	3P/80A	135A
	220/380V	62A	3P/80A	43A	3P/60A	74A
30KVA	110/190V	163A	3P/175A	113A	3P/125A	195A
	120/208V	149A	3P/150A	104A	3P/125A	180A
	220/380V	83A	3P/100A	57A	3P/75A	98A
45KVA	110/190V	239A	3P/300A	170A	3P/200A	294A
	120/208V	223A	3P/225A	156A	3P/150A	270A
	220/380V	121A	3P/125A	85A	3P/100A	147A
60KVA	110/190V	312A	3P/350A	226A	3P/225A	391A
	120/208V	290A	3P/300A	208A	3P/225A	360A
	220/380V	158A	3P/175A	114A	3P/125A	197A
80KVA	220/380V	211A	3P/225A	149A	3P/150A	263A
100KVA	220/380V	242A	3P/300A	189A	3P/200A	327A
120KVA	220/380V	291A	3P/300A	227A	3P/300A	393A
150KVA	220/380V	364A	3P/400A	284A	3P/300A	491A
200KVA	220/380V	485A	3P/500A	378A	3P/400A	654A
250KVA	220/380V	598A	3P/600A	473A	3P/500A	819A

表 4-2-1

進行裝機工程時，請參考表 4-2-1 內主機容量所對應之輸入/輸出無熔絲開關規格。

以下規格表為線材規格及容量(表 4-2-2A)

絕緣電線之種類		絕緣物之容許溫度
1	PVC 電線	60°C
2	RB 電線	
3	耐熱 PVC 電線	75°C
4	PE 電線	
5	SBR 電線	80°C
6	人造橡膠電線	
7	EP 橡膠電線	90°C
8	交連 PE 電線	

各種電線安培容量表(周圍溫度 35°C)

線 別	銅導線		根數 直徑	60°C 絕緣	75°C 絕緣	80°C 絕緣	90°C 絕緣
	SWG	AWG		安培容量(A)			
絞 線	2.0	14	7/0.6	20			
	3.5	12	7/0.8	30			
	5.5	10	7/1.0	40			
	8	8	7/1.2	55	65	70	80
	14	6	7/1.6	80	95	100	110
	22	4	7/2.0	100	125	135	145
	30		7/2.3	125	150	160	170
	38		7/2.6	145	180	190	205
	50		19/1.8	175	210	220	245
	60		19/2.0	200	240	250	280
	80		19/2.3	230	285	300	330
	100		19/2.6	270	330	350	380
	125		19/2.9	310	380	400	440
	150		37/2.3	360	440	460	505
	200		37/2.6	425	520	550	600
	250		61/2.3	505	615	650	710
	325		61/2.6	590	720	760	830
	400		61/2.9	680	825	870	995
	500		61/3.2	765	930	985	1080

表 4-2-2A

裝置於不斷電系統之接線之線徑容量如下表 4-2-2B

	接地線之線徑
10KVA	8mm ²
15KVA	8mm ²
22.5KVA	8mm ²
30KVA	14mm ²
45KVA	22mm ²
60KVA	22mm ²
80KVA	38mm ²
100KVA	38mm ²

表 4-2-2B

4-2-3 輸入/輸出連接及注意事項

表 4-2-1 及表 4-2-2 可知悉裝機配線之線徑及開關容量(因主機輸出的負載特性為非線性，所以線徑容量以 N 為準)如下表 4-2-3 所示。

主機容量	主機規格	輸入開關規格	輸入線徑(mm ²)	輸出開關規格	輸出線徑(mm ²)
10KVA	110/190V	3P/60A	14	3P/50A	14
	120/208V	3P/50A	14	3P/40A	14
	220/380V	3P/30A	5.5	3P/20A	5.5
15KVA	110/190V	3P/100A	22	3P/75A	14
	120/208V	3P/75A	22	3P/60A	14
	220/380V	3P/40A	8	3P/30A	8
22.5KVA	110/190V	3P/125A	38	3P/100A	22
	120/208V	3P/125A	38	3P/80A	22
	220/380V	3P/80A	22	3P/60A	14
30KVA	110/190V	3P/175A	50	3P/125A	38
	120/208V	3P/150A	50	3P/125A	38
	220/380V	3P/100A	22	3P/75A	22
45KVA	110/190V	3P/300A	100	3P/200A	60
	120/208V	3P/225A	60	3P/150A	38
	220/380V	3P/125A	38	3P/100A	22
60KVA	110/190V	3P/350A	125	3P/225A	60
	120/208V	3P/300A	100	3P/225A	60
	220/380V	3P/175A	60	3P/125A	38
80KVA	220/380V	3P/225A	60	3P/150A	38
100KVA	220/380V	3P/300A	150	3P/200A	60
120KVA	220/380V	3P/300A	150	3P/250A	80
150KVA	220/380V	3P/400A	200	3P/300A	150
200KVA	220/380V	3P/500A	225	3P/400A	200
250KVA	220/380V	3P/600A	250	3P/500A	225

表 4-2-3

配線完成後，請依序檢查下列事項：

- (1) 各接點螺絲是否鎖緊
- (2) 地線是否接妥
- (3) 輸出配電盤及迴路是否有短路
- (4) 電池保險絲開關 S4 應於斷路狀態
- (5) 電池線正負極性是否與端子台標示相同
- (6) 主機各開關 S1 到 S6 是否處於 OFF 狀態

4-2-4 接地系統注意事項

設備形態分爲 4 種形態:

- (1) 設備接地:高低壓用電設備，非帶電金屬部份之接地
- (2) 內線系統接地:屋內線路屬於被接地線之再行接地
- (3) 低壓電源系統接地:配電變壓器之二次側低壓中性線之接地
- (4) 設備與系統共同接地:內線系統接地與設備共用接地線或同一接地點

不斷電系統爲電源系統設備，所以用設備接地之接地點來對此系統做外殼接，接至主機輸出的負載，請用獨立之設備專用接地來連接。

4-2-5 電池連接線注意事項

- (1) 爲了安全起見，施工人員應戴絕緣手套，施工工具之握把應加以絕緣，施工人員應以 2 人以上爲佳。
- (2) 在拆卸施工前必須確認地線是否接妥，且手腳保持乾燥，再切斷電池迴路後，實施拆卸工程。
- (3) 拆卸電池時，請將頭端 B+及 B-移除，再將層別相連之電線移除，以降低施工危險性。
- (4) 拆卸電池與電池間連接之銅片或電線時注意工具頭尾在運轉時，不可碰觸到旁邊電池，以免短路。
- (5) 在安裝電池時，請先將各層別電池組裝好，再實施各層別相連，最後實施 B+及 B-連接到斷路裝置。
- (6) 電池安裝完畢後，請先用電表量取同一邊之開關斷路器兩側電壓極性是否相同，相同時方可送電。
- (7) 當施工中不幸發生人員受傷時，切記請實施下列步驟:
 - (a) 電擊受傷者如果昏迷而呼吸正常，予以採復甦姿勢即可，如無法切斷電擊物，請用繩子套住傷患的手臂或腳將他脫離電源。
 - (b) 因電池液外洩而受傷，請在水龍頭下緩慢沖洗傷處至少 10 分鐘，並同時去除受污染之衣物，而後用乾淨或無菌紗布輕敷傷口後送醫，如傷及眼睛亦似雷同。
 - (c) 不可在傷患處塗抹軟膏，油膏或黏性敷料，也不要弄破水泡或剝除鬆離的皮膚。
 - (d) 受傷人員在無意識情況下，可施以 CPR 急救或立即送醫。

電池之連接線與容量對照表如下(表 4-2-5)

UPS 容量	電池連接線之線徑(mm ²)
10KVA	5.5mm ²
15KVA	8mm ²
22.5KVA	14mm ²
30KVA	14mm ²
45KVA	30mm ²
60KVA	50mm ²
80KVA	60mm ²
100KVA	80mm ²
120KVA	125mm ²
150KVA	150mm ²
200KVA	200mm ²
250KVA	250mm ²

表 4-2-5

5 操作程序

5-1 開機操作程序

5-1-1 首次開機送電操作程序

(1) 主機內各開關之名稱及功能:

S1 開關:電池輔助開關

S2 開關:第二電源輸入開關或是有前置變壓器機型之 BYPASS 開關

S3 開關:主電源輸入開關

S4 保險絲座開關:電池輸入開關

S5 開關:主機輸出開關

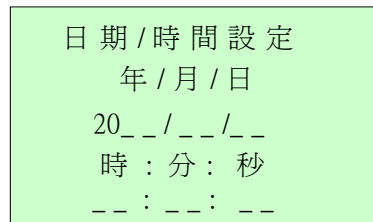
S6 開關:主機維修時手動旁路開關

(2) 輸入相序測試:

首先將配電盤開關打開，電源送至輸入端端子台，先用電表測量各點電壓是否符合主機規格再用三相相序檢測器量測輸入相序，如果正確時，可繼續下一步驟之機器操作。如相序相反時，請把外部電源關閉，交換輸入端 S 與 T 兩條線後，外部電源再次送電，並作三相相序檢測，如正確始可進一步機器操作。

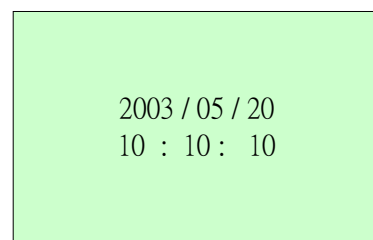
(3)設定系統時間及日期:

首先按 LCD 面板 ESC 按鍵由常態畫面回到主目錄，按↓↑鍵到選項 E.時間設定按 ENTER 鍵，可進入日期/時間設定，畫面如下:



日期 / 時間 設 定
年 / 月 / 日
20__ / __ / __
時 : 分 : 秒
__ : __ : __

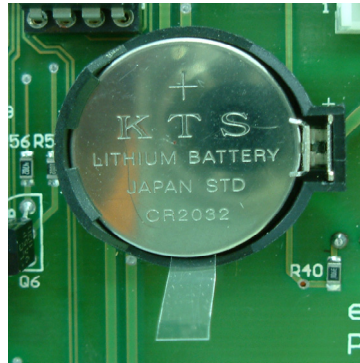
將游標移至年位置，按↑鍵為依序 0~9 循環，按↓鍵為依序 9~0 循環，按→鍵為自右移位或下一空格，按←鍵為向左移或上一格，請遵照以上操作方式分別設定日期及時間，當設完後按 ENTER 鍵可儲存並回至主選單。按↓鍵游標移至 E.時間顯示，按 ENTER 鍵後，畫面如下:



2003 / 05 / 20
10 : 10 : 10

(4) 系統時間及日期儲存:

當執行妥(3)設定系統時間及日期後將 ONL-3304 LCD 電路板上之鋰電池座上之塑膠絕緣墊片拉出，如下圖所示，此時計時系統之備用電源啟動，並且將來做電池測試或時間顯示紀錄都將依此為依據。



(5) 主機首次開機步驟:

首先須確定接於 UPS 輸出之負載電源線全部拆除或關閉負載電源開關，依序開啓 S1、S2 及 S3 開關，等待 5~10 秒，關閉 S1，接著立即將 S4 保險絲座開關及電池箱側保險絲座開關推入閉合，打開 S5，接著按 LCD 面板 ON 鍵後，LCD 會跳出確認畫面，此時請按 ENTER 鍵確認，約數秒後系統會顯示設定成功，此時系統會作電池偵測約 30 秒，之後 UPS 系統由 BYPASS 轉換到 INVERTER，此時使用電表量測端子台 R，S，T 輸出，判斷電壓頻率是否正確，並且量測端子台 B+及 B-電壓是否為 DC410V，如操作流程圖 5-1-1:

系統第一次開機程序：

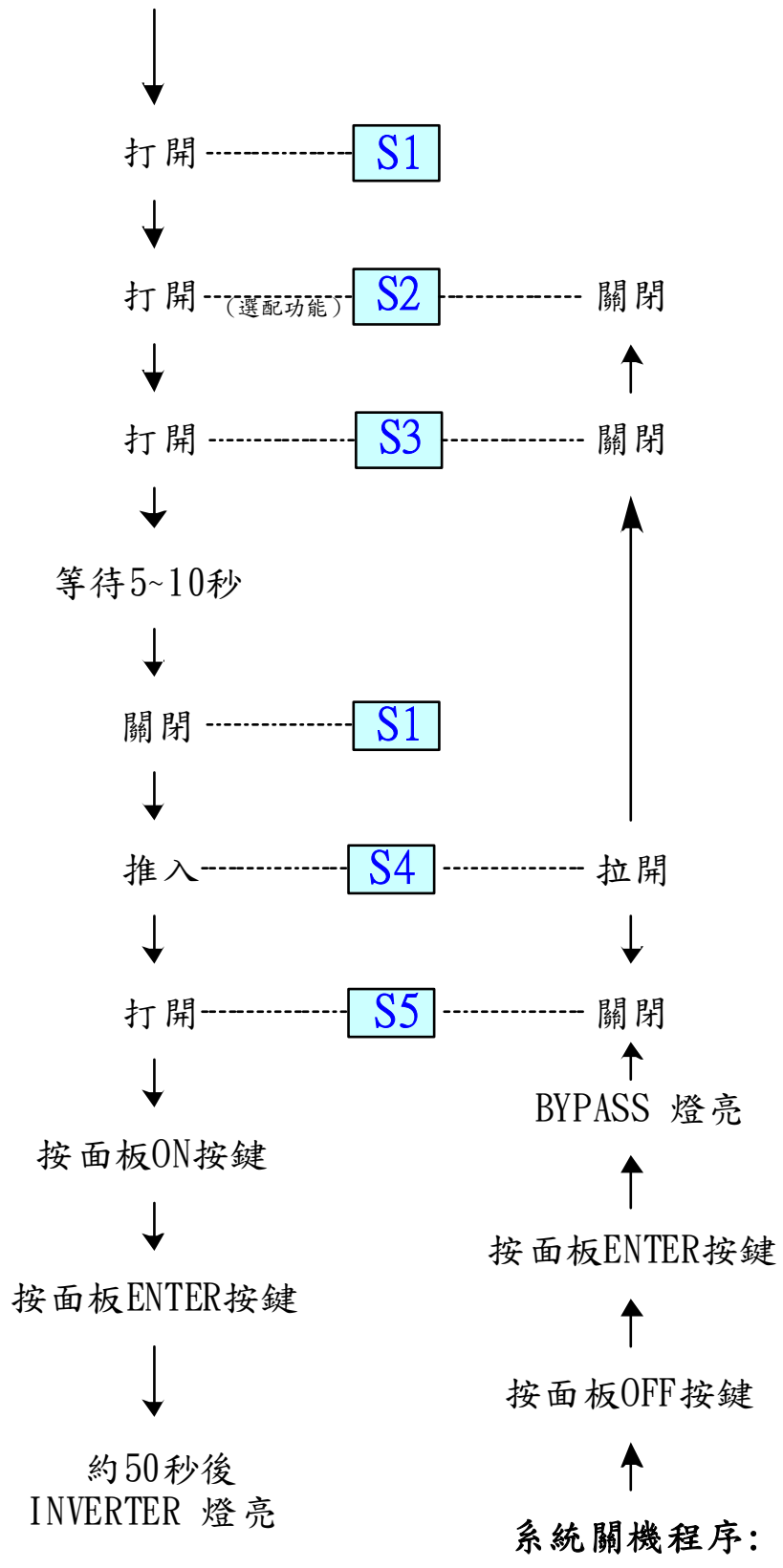


圖 5-1-1

5-1-2 一般開機操作程序

當第一次開機完成後，如有作一般關機時，需再次啓動此系統時，則用以下操作程序即可。操作程序爲，按 LCD 面板 ON 鍵 LCD 會跳出確認畫面，此時請按 ENTER 鍵確認，數秒後系統會顯示設定完成，且約 50 秒之後，面板 BYPASS LED 燈熄滅轉由 INVERTER 燈亮，即 UPS 由 INVERTER 供電。

5-2 關機操作程序

5-2-1 一般關機操作程序

當系統正常運轉中，平時關機可藉由此一操作程序來執行即可，操作程序爲按 LCD 面板 OFF 鍵 LCD 會跳出確認畫面，此時請按 ENTER 確認，此時面板 LED INVERTER 燈熄滅，轉由 BYPASS 燈亮，即 UPS 已由 BYPASS 供電。

5-2-2 整機關機操作程序

當系統正常運轉中，需整機系統關畢，可由此一操作程序來執行即可，操作程序爲按 LCD 面板 OFF 鍵後，LCD 會跳出確認畫面，此時請按 ENTER 確認，此時面板 LED 流程 INVERTER 燈熄滅，轉由 BYPASS 燈亮，之後請依關閉 S5，S4，S3，S2(限部份機種)，S1(限部份機種)即可。

5-3 維修操作程序

5-3-1 維修操作程序

按 LCD 面板 OFF 按鍵後，LCD 會跳出確認畫面，此時請按 ENTER 確認，此時面板 LED INVERTER 燈熄滅轉由 BYPASS 燈亮，移除 S6 壓板，打開 S6，再依次關閉 S5，拉開 S4，關閉 S3，S2，S1 即可。如操作流程圖 5-3

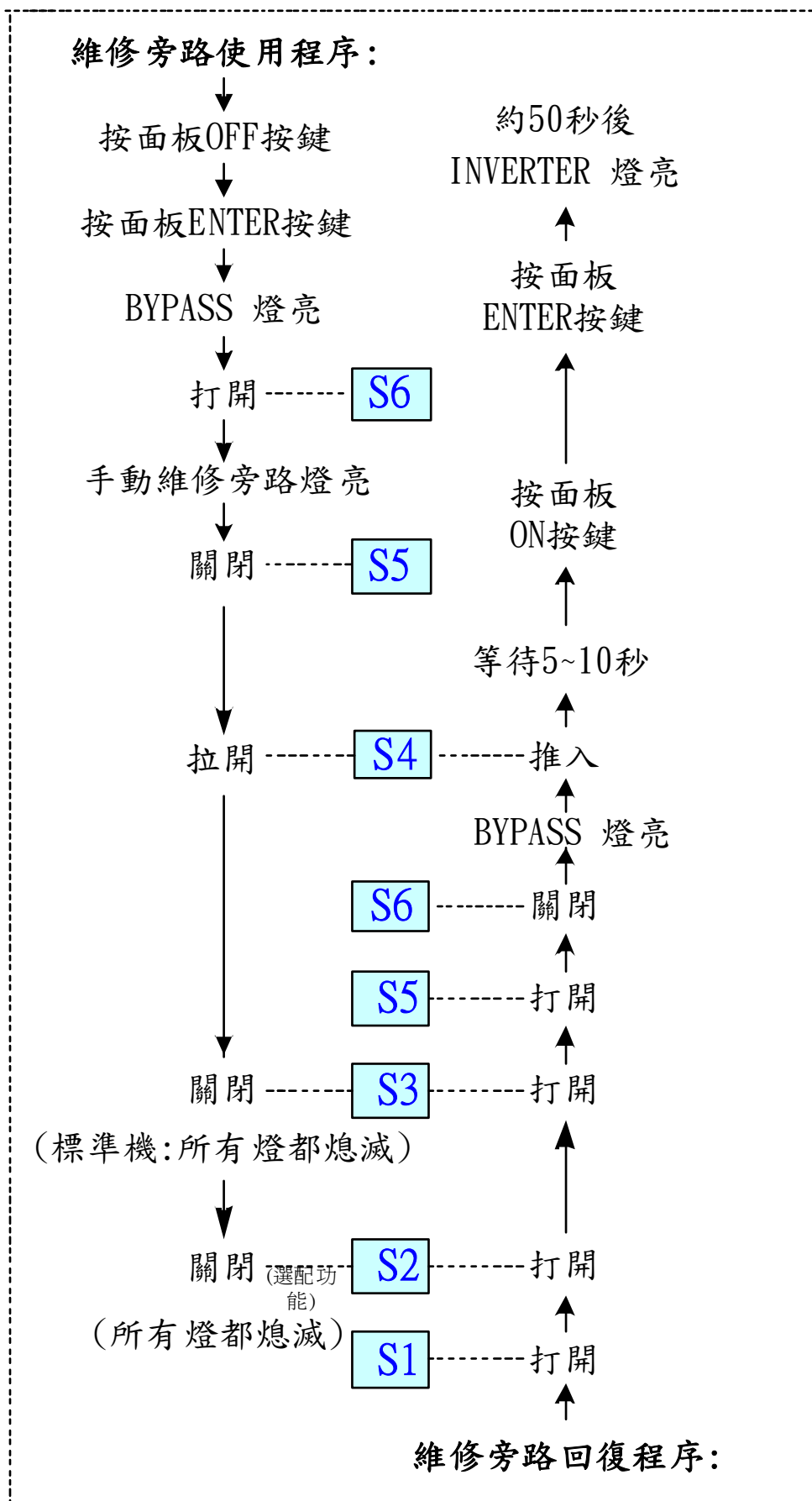


圖 5-3

5-3-2 更換電池步驟

(1). 關閉 INVERTER

於顯示面板中按下“OFF”鍵，再按下“ENTER(確定)”鍵關閉 UPS，此時 UPS 進入旁路輸入狀態。

(2). 進入維修旁路狀態

將“S6”開關開啓到“ON”的位置並使用檔片固定，然後依序關閉 S5，S4，S3，S2(僅限部分機種)，S1 開關(“OFF”位置)，並使用檔片固。

(3). 更換電池

等待一分鐘後，拆除前面開關鐵板及電池檔板，拆除電池連接線並更換成新的電池後，依照原來電池與電池間的配線方式重新連接。(連接完成後請確認電池輸出電壓及極性)。

(4). 重新開啓 UPS

重新固定電池檔板及開關鐵板後，依序開啓 S1，S2(僅限部分機種)，S3，S4 及 S5，關閉 S6 開關至“OFF”位置並使用檔片固定，移除其他開關檔片並依照 UPS 開機程序開機，待 UPS 進入轉換器(Inverter)狀態後即完成更換電池工作。

5-4 維修復歸操作程序

依序開啓 S1(僅限部份機種)、S2(僅限部分機種)、S3 及 S5，關閉 S6，此時 BYPASS LED 燈亮，將 S4 推入，經過數秒後，按 LCD 面板 ON 鍵，LCD 會跳出確認畫面，此時請按 ENTER 鍵確認，約數秒後系統會顯示設定成功，約 50 秒後 INVERTER LED 燈亮，使用電表量測端子台 B+及 B-電壓是否為 DC410V，量測端子台 R，S，T 輸出電壓頻率是否正確，如果正確則此系統表示開機成功，最後將 S6 壓板鎖回復原，如操作流程圖 5-3。

5-5 LCD 面板功能操作說明

在 LCD 目錄中，可以用→、←、↑、↓來選擇，然後按 ENTER，即進入你需求的目錄功能內，如要設定可用→及←鍵來移位進入 4 個設定碼之位置，而設定碼之號碼可用↑及↓鍵設定，設定完成後，按 ENTER 鍵來執行或表示設定完成鍵，此一設定值為確定值。如要到別項功能時，請按 ESC 按鍵，跳至前一頁畫面或連續按 ESC 鍵，跳至主目錄，再用→、←、↑、↓、ENTER 來作別項功能之設定。

5-6 緊急關機裝置操作程序

EPO 操作說明:

EPO 為(Emergency Power Off)緊急時電源關閉裝置，本 UPS 設此開關爲了機器遇到一些特殊狀況時，如系統無法控制時候或遇到外來災害時，可將本開關關閉，本開關關閉後連動如下:

- (1) INVERTER 立即停止動作。
- (2) S.T.S 靜態開關立即停止動作，系統無輸出。
- (3) RCM 整流充電系統立即停止作用。

除了以上三種條件，LCD 面板會保持作用狀態，並將 EPO 被動作時間及復原時間將之紀錄下，同時 UPS 對外通訊將保持暢通，並不影響。復原 EPO 時，請將開關打開，此時請按 LCD 面板 OFF 按鍵後 LCD 會跳出確認畫面，此時請按 ENTER 確認，約數秒 DSP 系統會回應設定成功，此時觀察常態畫面之電池是否到達 DC410V，如果爲 DC410V 請立即將 S4 斷路開關送上，此時系統會作電池偵測約 30 秒，結束後直流電壓會回升，UPS 系統由 BYPASS 轉換到 INVERTER，輸出由 INVERTER 供電中。

6 保養及保存說明

- (1) 平時注意機房的潔淨，機器請於每半年一次做內部清潔的工作。
- (2) 電池請至少三個月做一次充放電，減緩內部特性改變延長使用壽命
- (3) 注意機房的溫、溼度。
- (4) 機器在保存時，請用 PE 塑膠膜，整機包紮完成輸入及輸出，電池線均脫離。

7 ONL-33 系列 UPS 電器規範

型 號		ONL 10K33	ONL 15K33	ONL 22.5K33	ONL 30K33	ONL 45K33	ONL 60K33	ONL 80K33	ONL 100K33	ONL 120K33
容 量		10KVA	15KVA	22.5KVA	30KVA	45KVA	60KVA	80KVA	100KVA	120KVA
額 定 功 率		8KW	12KW	18KW	24KW	36KW	48KW	64KW	80KW	96KW
功 率 因 素		0.8								
輸 入 部 品	相 數	3 相 4 線 加地線								
	電 壓 範 圍	380V/220V or 208V/120V ±20 %								
	頻 率 範 圍	自動偵測 50Hz/60Hz ±5 Hz								
	整 流 方 式	三相 6 脈波 or 三相 12 脈波								
	直 流 電 壓	DC410V								
整 流 器 效 率		大於 97%								
逆 變 器 效 率		大於 90%								
整 機 效 率		大於 88%								
輸 出 部 品	相 數	3 相 4 線 加地線								
	電 壓	380V/220V or 208V/120V								
	穩 壓 率	±1%								
	暫 態	四周期回復至 90%								
	超 載 能 力	> 100% ~ < 125% 30 分鐘跳旁路								
		≥ 125% ~ < 150% 30 秒跳旁路								
		≥ 150% 10 周期跳旁路								
	逆 變 器 工 作 方 式	DSP 控制 20K Hz 脈波調變正弦波								
	頻 率	50Hz/60Hz								
	頻 率 穩 定 度	±0.1%								
	鎖 相 範 圍	±5 Hz								
	脫 鎖 範 圍	大於±5 Hz								
	回 鎖 範 圍	±3 Hz								
	波 形	正弦波								
	波 峰 比	3:1								
總 諧 波 失 真		線性負載 小於 3%								
靜 態 開 關	轉 換 方 式	逆變器與市電同步 同相 同壓時 旁路轉逆變器								
	冷 啓 動 轉 換 方 式	無市電時 逆變器兩段式電壓轉換								
	轉 換 時 間	旁路轉逆變器 0ms								
		正常狀態 逆變器轉旁路 0ms								
	效 率	大於 99%								
充 電 電 壓	DC410V									
電 流	可設定 1A,2A,3A,5A,10A,15A,20A,30A 自動限流(請依電池容量大小而設定)									
機 時 效	100% 放電 8 小時回充至 90% (依電池規格而定)									

型 號		ONL 10K33	ONL 15K33	ONL 22.5K33	ONL 30K33	ONL 45K33	ONL 60K33	ONL 80K33	ONL 100K33	ONL 120K33
整 機	電 池 規 格	DC410V 時 12V 30 顆一組								
	放 電 時 間	依電池規格容量而定								
	噪 音	距離機器各面一公尺處 小於等於 60 dBA								
	工 作 溫 度	0~40℃								
	儲 存 溫 度	-25℃~55℃								
	儲 放 標 高	<10000M (海拔公尺)								
	操 作 標 高	<3500M (海拔公尺)								
	相 對 溼 度	不結霜 90%								
尺 寸	寬 度 (W)	530mm	530mm	530mm	530mm	750mm	750mm	1500mm	1500mm	1500mm
	深 度 (D)	875mm	875mm	960mm	960mm	800mm	800mm	800mm	800mm	800mm
	高 度 (H)	1010mm	1010mm	1180mm	1180mm	1700mm	1700mm	1700mm	1700mm	1700mm
	120V/208V	427Kg	463Kg	457Kg	530Kg	800Kg	950Kg			
	寬 度 (W)	530mm	530mm	530mm	530mm	750mm	750mm	750mm	1500mm	1500mm
	深 度 (D)	875mm	875mm	960mm	960mm	800mm	800mm	800mm	800mm	800mm
	高 度 (H)	1010mm	1010mm	1180mm	1180mm	1700mm	1700mm	1700mm	1700mm	1700mm
	2 2 0 V / 3 8 0 V	333Kg	343Kg	345Kg	395Kg	530Kg	590Kg			

8 ONL-33 系列簡易故障排除

8-1 充電機簡易故障排除

錯誤訊息顯示	故障檢知	故障排除
輸入過電壓	(1)市電電壓過高	使市電回復至 $\pm 20\%$ 內
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3300 迴授電路錯誤	更換 ol-3300
	(4)ol-3300 程式參數值太高	校正程式參數值
輸入欠電壓	(1)市電電壓過低	使市電回復至 $\pm 20\%$ 內
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3300 迴授電路錯誤	更換 ol-3300
	(4)ol-3300 程式參數值太低	校正程式參數值
輸入過電流	(1)負載超載 125% 以上	卸載至 100%負載以下
	(2)ol-3316 迴授電路錯誤	更換 ol-3320
	(3)ol-3300 程式參數值太高	校正程式參數值
	(4)SCR 元件毀壞	更換 SCR 元件
	(5)ol-3302 觸發信號至 SCR 異常	更換 ol-3302
	(6)ol-3302 控制錯誤	更換 ol-3302
輸入頻率過高	(1)市電頻率過高	使頻率回復至 $\pm 3\text{Hz}$
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3300 零點偵測電路錯誤	更換 ol-3300
	(4)ol-3300 程式判斷錯誤	更新程式
輸入頻率過低	(1)市電頻率過低	使頻率回復至 $\pm 3\text{Hz}$
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3300 零點偵測電路錯誤	更換 ol-3300
	(4)ol-3300 程式判斷錯誤	更新程式
直流鏈電壓電壓過高	(1)ol-3302 直流電壓迴授點開路	將迴授線路回復
	(2)ol-3302 迴授電路錯誤	更換 ol-3302
	(3)ol-3300 程式參數值太高	校正程式參數值
	(4)SCR 元件短路	更換 SCR 元件
	(5)ol-3302 控制錯誤	更換 ol-3302
直流鏈電壓電壓過低	(1)ol-3302 直流電壓迴授點開路	將迴授線路回復
	(2)ol-3302 迴授電路錯誤	更換 ol-3302
	(3)ol-3300 程式參數值太低	校正程式參數值
	(4)電池電力不足且市電電壓太低	使市電回復至 $\pm 20\%$ 內
	(5)IGBT 元件短路	更換 IGBT 元件
	(6)ol-3302 控制錯誤	更換 ol-3302
充電電流過高	(1)ol-3302 充電電流超過限流點	更換 ol-3302

	(2)ol-3302 迴授電路錯誤	更換 ol-3302
	(3)ol-3300 程式參數值太高	更換 ol-3300
	(4)ol-3302 控制錯誤	更換 ol-3302
	(5)電池異常	更新電池
充電機溫度過高	(1)充電機側散熱片溫度太高	卸載至 100%負載以下
	(2)溫度開關線開路	將溫度開關線回復
	(3)ol-3302 信號擷取錯誤	更換 ol-3302
	(4)ol-3300 信號擷取錯誤	更換 ol-3300
輸入相序錯誤	(1)輸入電源反相序	將輸入電源回復為正相序
	(2)ol-3320 迴授電路錯誤	更換 ol-3302
	(3)ol-3302 的 CPLD 訊號有誤	更換 ol-3302
	(4)ol-3300 擷取信號錯誤	更換 ol-3302

8-2 逆變器簡易故障排除

錯誤訊息顯示	故障檢知	故障排除
輸出過電壓	(1)ol-3320 偵測電路錯誤	更換 ol-3320
	(2)ol-3300 迴授電路錯誤	更換 ol-3300
	(3)ol-3300 程式參數值太高	校正程式參數值
	(4)ol-3300 控制錯誤	更換 ol-3300
輸出欠電壓	(1)ol-3320 偵測電路錯誤	更換 ol-3320
	(2)ol-3300 迴授電路錯誤	更換 ol-3300
	(3)ol-3300 程式參數值太低	校正程式參數值
	(4)ol-3300 控制錯誤	更換 ol-3300
輸出過電流	(1)負載超載 100% 以上	卸載至 100%負載以下
	(2)ol-3316 偵測電路錯誤	更換 ol-3316
	(3)ol-3300 程式參數值太高	校正程式參數值
逆變器輸入過電流	目前無此功能	
逆變器溫度過高	(1)逆變器側散熱片溫度太高	卸載至 100%負載以下
	(2)溫度開關線開路	將溫度開關線回復
	(3)ol-3312 信號擷取錯誤	更換 ol-3312
	(4)ol-3300 信號擷取錯誤	更換 ol-3300
VCE Fault	(1)IGBT 元件短路	更換 IGBT 元件
	(2)輸出發生短路	短路排除
	(3) IGBT 信號線接法錯誤	IGBT 信號線接法回復
	(4)ol-3312 控制錯誤	更換 ol-3312
	(5)ol-3300 控制錯誤	更換 ol-3300

8-3 系統功能簡易故障排除

錯誤訊息顯示	故障檢知	故障排除
電池無法供電	(1)無電池	加入電池
	(2)電池電力不足	對電池充電
	(3)ol-3302 偵測電路錯誤	更換 ol-3302
	(4)ol-3300 程式參數值誤差	校正程式參數值
輸入電壓低於 25%	(1)市電電壓太低	使市電回復至 $\pm 20\%$ 內
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3300 迴授電路錯誤	更換 ol-3300
	(4)ol-3300 程式參數值誤差	校正程式參數值
機內溫度過高	(1)系統異常	通知維護人員
	(2)ol-3300 迴授電路錯誤	更換 ol-3300
	(3)ol-3300 程式參數值太高	校正程式參數值
機內濕度過高	目前無此功能	
無第二電源	(1)無第二電源	加入第二電源
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3300 迴授電路錯誤	更換 ol-3300
	(4)ol-3300 程式參數值誤差	校正程式參數值
無任何電源	(1)無任何電源加入	加入任何電源
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3302 偵測電路錯誤	更換 ol-3302
	(4)ol-3300 迴授電路錯誤	更換 ol-3300
	(5)ol-3300 程式參數值異常	校正程式參數值
輸入電壓過低，電池放電	(1)輸入電源過低或無市電	使市電回復至 $\pm 20\%$ 內
	(2)ol-3320 偵測電路錯誤	更換 ol-3320
	(3)ol-3302 偵測電路錯誤	更換 ol-3302
	(4)ol-3300 迴授電路錯誤	更換 ol-3300
	(5)ol-3300 程式參數值異常	校正程式參數值
電池低壓，UPS 即將關機	(1)輸入電源過低或無市電	使市電回復至 $\pm 20\%$ 內
	(2)電池電壓將至低壓點	卸載至 10%~20%負載
	(3)ol-3320 偵測電路錯誤	更換 ol-3320
	(4)ol-3302 偵測電路錯誤	更換 ol-3302
	(5)ol-3300 迴授電路錯誤	更換 ol-3300
	(6)ol-3300 程式參數值異常	校正程式參數值
電池測試異常	(1)無電池	加入電池
	(2)電池電力不足	對電池充電
	(3)ol-3302 偵測電路錯誤	更換 ol-3302
	(4)ol-3300 程式參數值誤差	校正程式參數值
緊急開關動作	(1)緊急開關動作	緊急開關回復
	(2)輸出短路	短路排除
	(3)ol-3304 偵測電路錯誤	更換 ol-3304
	(4)ol-3300 偵測電路錯誤	更換 ol-3300