

# RCC-6SX

## INSTRUCTION MANUAL 使用說明書

**RCC-6SX****RCE-6BA**

### CONTENTS

1	INTRODUCTION 前言
2	CHARGER PARTS DIAGRAM AND SPECIFICATIONS 充電器各部名稱及規格
3	BALANCER PARTS DIAGRAM AND SPECIFICATION 平衡器各部名稱及規格
4~5	ASSISTANCE FUNCTIONS SETUP 輔助性功能設置
6~10	LITHIUM BATTERY CHARGE (LI-ION/POLY) 鋰電池的充電
11~13	CHARGING METHOD FOR USING A BALANCER 搭配平衡器的充電方式
14~20	NICKEL CADMIUM BATTERY CHARGE/DISCHARGE (NI-CD) 鎳鎘電池的充電和放電
21	NI-MH BATTERY CHARGE AND DISCHARGE 鎳氫電池的充電和放電
21	OTHER INFORMATION 其它資訊
21~22	OPTIONS FOR PROTECTION FUNCTIONS 保護功能
22	BUZZER WARNING INDICATION 蜂鳴器警告提示

- 1~6 Cells Li-ion/polymer
- 1~18 Cells Ni-Cd or Ni-MH
- 100mA~5A Charge Current
- 5W/1A Discharge Current

## Safety Note 安全注意事項

- ★ Read these instructions completely and attentively, before you use this unit for the first time.
- ★ Do not attempt to open the case, and do not modify the unit in any way. It can avoid the warranty.
- ★ Use the charger exclusively to recharge rapid-charge capable Li-Ion/Li-Polymer, NiCd or NiMH batteries.
- ★ Observe the charging instructions of the battery provided by manufacturer. And you have to follow the instructions exactly. (Especially, Li-Ion and Li-Polymer batteries)
- ★ Do not cover the charger with anything; provide adequate ventilation for cooling.
- ★ Use the charger only to charge battery pack consists of cells of same type and capacity.
- ★ Do not attempt to charge two battery packs simultaneously.
- ★ Do not charge packs which are heated up high temperature; take time to allow them cool down.
- ★ Do not leave the charger is operating unsupervised.
- ★ The charger may become hot when operating. Take care when touching the unit when it is hot.
- ★ Do not put the charger to a direct sunshine or in the car with closing windows when it is operating.
- ★ Keep the charger, battery and cables well away from flammable or temperature-sensitive materials.
- ★ Protect the charger from dust, damp, rain and vibration to avoid any short circuit or damage.

☆在開始操作之前，請務必詳閱本說明書。

☆請勿將產品外殼拆開或改裝，否則無保固。

☆本產品專用於可重複充電之鋰離子/鋰聚合物/鎳鎘/鎳氫電池。

☆請遵照電池原廠所提供的充電說明書。並且完全遵從以下操作說明(特別是Li-Ion and Li-Polymer電池)

☆充電時請勿覆蓋任何物品，請置於通風良好處，可助於充電效能及降溫。

☆本充電器只適用於相同款式和容量的裸電所構成的電池組。

☆請勿將兩組相同或不相同類型電池並聯同時充電。

☆電池組溫度過高時請勿充電；需待電池溫度下降後才可進行充電。

☆請勿在無人看顧時離開使用中的充電器，避免任何不可預期之意外災害發生。

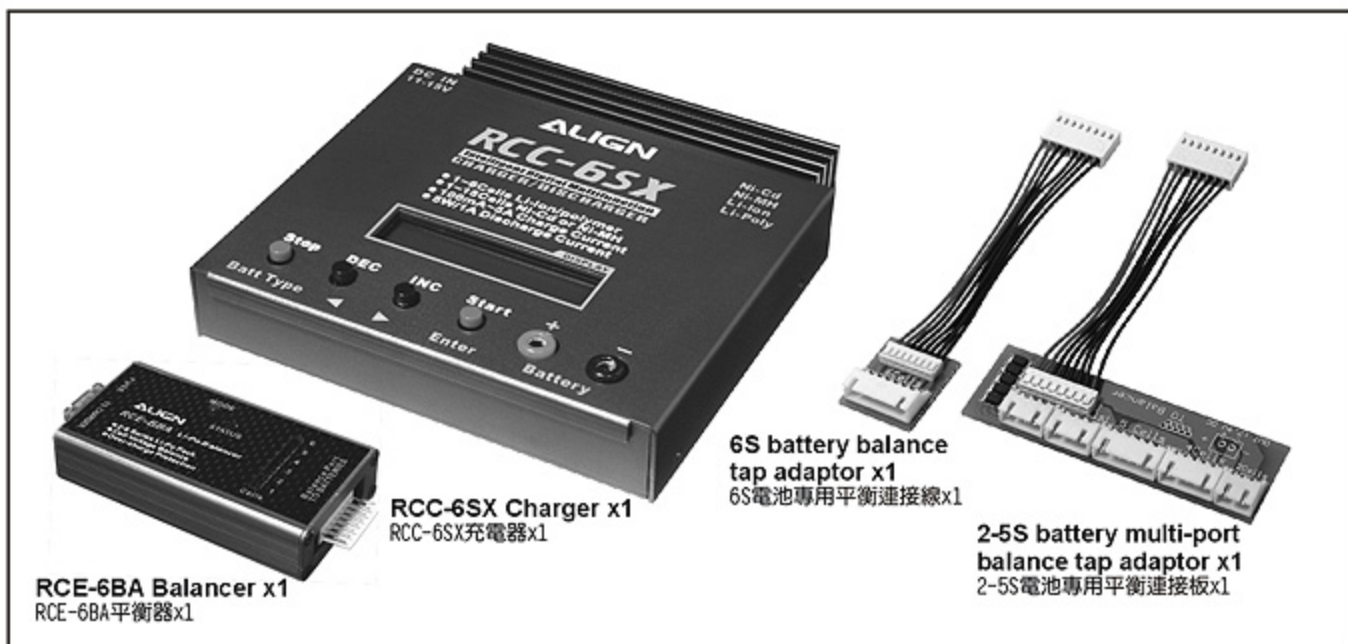
☆充電器使用時可能變熱，此時如果要接觸充電器，請務必小心。

☆充電器使用時，請勿將充電器置於太陽底下、或是窗戶緊閉的房內或車上。

☆請將充電器、電池和電線遠離易燃物質。

☆避免置於灰塵、濕氣、雨水和震動處造成不可預期短路損壞危險。

## Standard Equipment 標準配備





**Functions 各部件名稱說明**

**DEC INC**

Decrease or increase the setting values.  
減少或增加所設定的數值

**Battery Type/stop**

Choose battery type and stop functions.  
選擇電池種類與停止功能

**Start/Enter**

To start the procedure or command confirmation.  
充電啟動或選擇確認



Heat sink  
散熱片

Display  
(LCD,16Char.x2Line)  
液晶顯示器

Battery Output  
輸出端

**Charger Specifications 充電器規格**

**User Setting 使用設定**

Li-Ion/Polymer Voltage Type 電壓類型:

3.6V/3.7V

Safety Timer 定時安全保護:

on/off, 1~900min.

Key Beep/Buzzer Alarms 蜂鳴器告警:

on/off

12V Pb Battery Low Voltage Cut off 鉛酸電池截止電壓保護: 11~15V (0.1V Step)

**Battery Type 電池類型**

Li-Ion/ Polymer 鋰離子/鋰聚:

1~6 series (Auto Voltage Detection/Manual)

Ni-MH 鎳氫:

1~18Cells

Ni-cd 鎳鎘:

1~18Cells

Charge Current 充電電流:

0.1A~5.0A(0.1A Step)

Discharge Current 放電電流:

0.1A~1.0A(0.1A Step) 5w max

Discharge >charge 放電>充電循環:

1~5Cycles

charge >Discharge 充電>放電循環:

1~5Cycles

**Safety functions 安全功能**

Reverse polarity protection both for input and output. 輸入/輸出極性反接保護。

Safety check to the input voltage. 輸入電壓保護設定。

Self-protection for short-circuit during charging. 充電短路保護。

Built-in safety timer for max. 15 hrs of charging. If over, it will be off automatically.

可設定最大15小時定時安全保護，超過設定時間將直接關機。

Input Voltage 輸入電壓:

DC11V~15V

Charging Output Rate 充電輸出功率:

Max 5.0A App.125W

Discharging Rate 放電功率:

Max 1.0A App.5W

Display 顯示器:

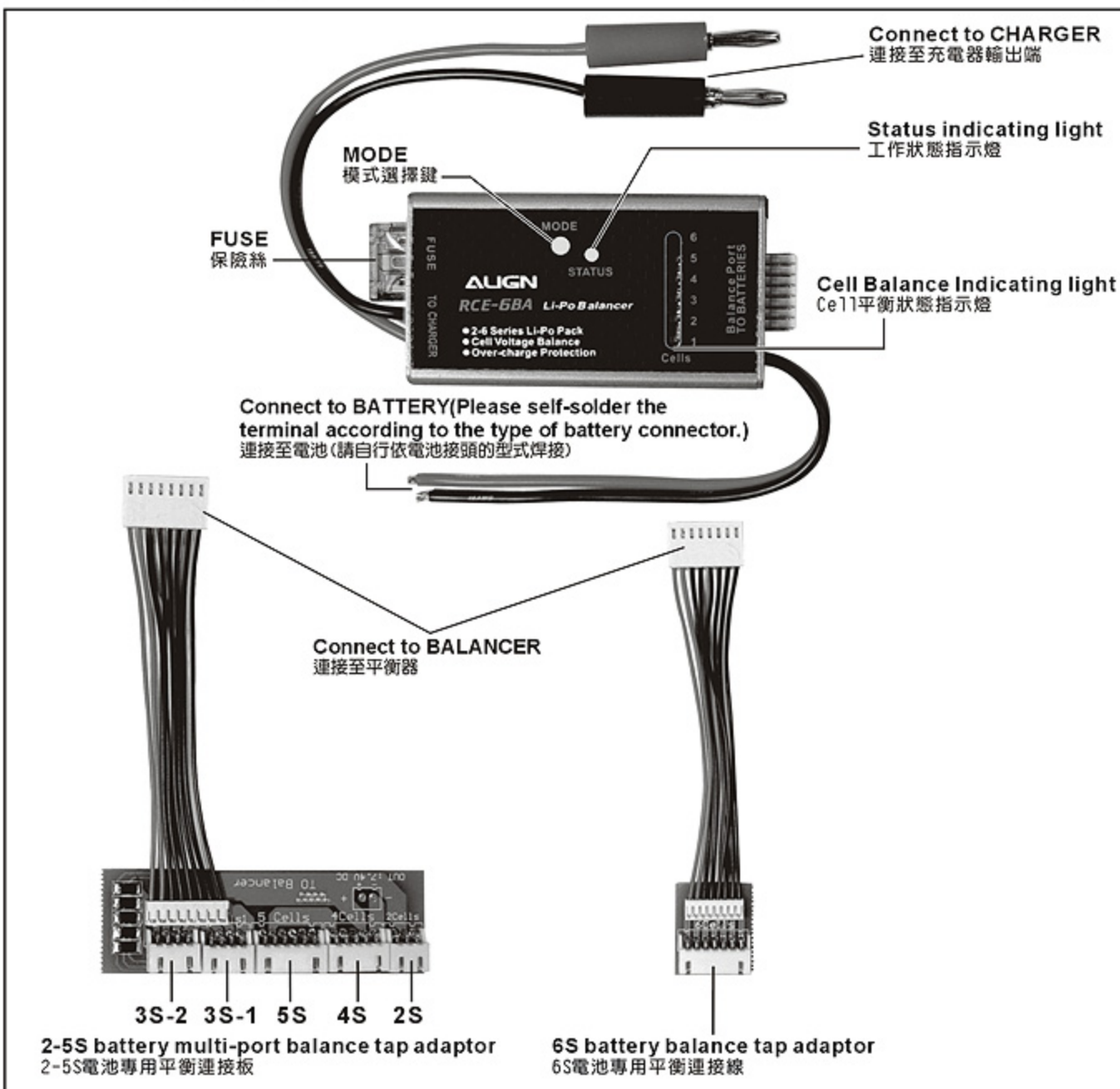
LCD 16char. x2Lines

Dimensions 尺寸:

W150 xH142 xD33mm

Outer case temp.(during charging)approx. (Room temp.22°C) 充電時外殼溫度約(室溫22°C)	1A	2A	3A	4A	5A
	28°C	32°C	42°C	50°C	60°C

#### Functions 各部名稱說明



#### Balancer Specifications 平衡器規格

Lithium polymer cell count: 2~6 cells in series configuration.  
 Balancing activation voltage: automatic: >0.03V imbalance  
 manual: >0.01V imbalance  
 Discharge current during balancing: 350mA  
 Imbalance control voltage:  $\pm 0.005V$   
 Maximum cell voltage cutoff: 4.26V  
 Balancing voltage resolution:  $\pm 0.005V$   
 Dimension: 83x45x19mm  
 Weight: 120g

鋰聚平衡cell數: 2-6cell串聯電池組  
 平衡啟動電壓: 自動: >0.03V不平衡狀態  
 手動: >0.01V不平衡狀態  
 平衡時釋放電流: 350mA  
 不平衡控制電壓:  $\pm 0.005V$   
 單cell過充電壓保護: 4.26V  
 平衡電壓解析度:  $\pm 0.005V$   
 尺寸: 83x45x19mm  
 重量: 120g



Plug the charger into an electrical outlet and then press "TYPE/STOP" to enter the "Battery Type User Set" interface (Refer to Figure 2).

充電器接通電源後，按下“TYPE/STOP”進入“Battery Type User Set”介面，顯示器顯示(圖2)

Figure 2  
圖2

#### 4.1 Lithium battery type setup (Li-Ion / Poly) 鋰電池類型調整

Press "ENTER" to enter the Lithium battery type setup interface. (Refer to Figure 3).

鋰電池類型調整按“ENTER”進入鋰電池類型調整介面，顯示器顯示(圖3)

Figure 3  
圖3

Press "ENTER" again and the value (voltage) at the low right corner on the screen will glitter by a hertz frequency, like Figure 3. (The sun mark in the diagram does not exist on the screen. It only tells users the glitter of the voltage value at the low right corner on the screen). Press "DEC" or "INC" to choose the type of Lithium battery being charged, which is (Li-Ion) Lithium Ion battery 3.6V/ (Li-Poly) Polymer Lithium battery 3.7V. The default value for this function is 3.7V. After completing the setting, press "ENTER" to withdraw. The value at the low right corner on the screen will no longer glitter.

進入介面後再次按“ENTER”螢幕右下角數值(電壓)將會以一赫茲頻率閃爍，如圖3，(圖中的太陽標記在顯示器中是沒有的，圖中標記是為方便區別)。按“DEC”或“INC”鍵可選擇被充鋰電池的類型，即鋰離子電池3.6V/鋰聚合物電池3.7V，此功能預設值為3.7V，設置完成後按“ENTER”退出，螢幕右下角數值將不再閃爍。

#### 4.2 Charger safety timer setup 充電器安全定時調整

Press "INC" to enter the safety timer setup interface. (Refer to Figure 4)

按“INC”進入定時調整介面，顯示器顯示(圖4)

Figure 4  
圖4

Press "ENTER" again and the value at the low left corner on the screen will glitter by a hertz frequency, like Figure 4. Press "DEC" or "INC" to set the value to be "On" or "Off".

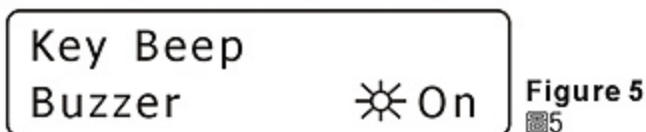
Press "ENTER" to set the time value at the low right corner on the screen, which will glitter by a hertz frequency. Press "DEC" or "INC" to adjust the time value within the range of 1-900 Min. If hold the "+" or "-" key, the value will be updated by 1 hertz per second. If the setting is "On", the charger will automatically terminate charge whenever it detects the predefined time value (1-900Min). If the setting is "Off", this function will be invalid. The default value for this function is "Off"; the time value is 120Min. After completing the settings, press "ENTER" to withdraw. The value on the screen will no longer glitter.

進入介面後再次按“ENTER”螢幕下部左邊字母將會以一赫茲頻率閃爍，如圖4，按“INC”或“DEC”鍵可設置為“On”或“Off”，按“ENTER”轉到時間選項，螢幕右下角數值(時間)將會以一赫茲頻率閃爍，此數值按“DEC”或“INC”鍵可從1~900min(分鐘)調整，若長按“加”或“減”鍵則以1赫茲(1秒步進)不停跳變，此功能默認設置為“Off”，若設置為“On”，則每次充電或放電計時達到所設置時間(1~900min)機器將自動停止充電，若設置為“Off”則此功能無效，此功能默認為“Off”，數值為120Min，設置完成後按“ENTER”退出。螢幕數值將不再閃爍。

## 4.3 Buzzer warning functions setup 蜂鳴器警告設置

Press "INC" to enter the buzzer warning function setup interface. (Refer to Figure 5).

按 "INC" 進入定時調整介面，顯示器顯示(圖5)



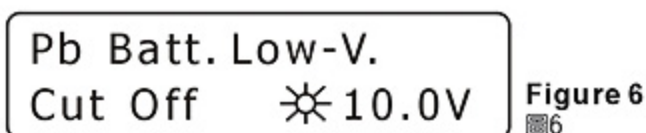
Press "ENTER" again and the value at the low right corner on the screen will glitter by a hertz frequency. Press "DEC" or "INC" to set the value to be "On" or "Off". The default value for this function is "On". If there is warning indication when the charger is operating, the buzzer will indicate a fault with sound. If the value for this function is set to be "Off" there is no sound. After completing the setting, press "ENTER" to withdraw. The value on the screen will no longer glitter.

進入介面後再次按 "ENTER" 螢幕右下角字母將會以一赫茲頻率閃爍，按 "DEC" 或 "INC" 鍵可設置為 "On" 或 "Off"，此功能默認設置為 "On"，即充電在工作過程中有警告提示時蜂鳴器將鳴響，反之則無聲，設置完成後按 "ENTER" 退出。螢幕數值將不再閃爍。

## 4.4 Input power source with low voltage - auto shutdown setup 輸入電源低電壓關機設置

Press "INC" to enter the auto shutdown setup interface. (Refer to Figure 6).

按 "INC" 進入定時調整介面，顯示器顯示(圖6)



Press "ENTER" again and the value at the low right corner on the screen will glitter by a hertz frequency, like Figure 6. This function is to protect the input power source. In order to prevent damaging the battery and power supply system, the charger terminates charge by detecting a predefined value of input voltage, Press "DEC" or "INC" to adjust the voltage value for auto shutdown. If hold the "DEC" or "INC" key, the value will be updated by 1 hertz per second (by 0.1A). The range for setting the voltage value is 9-11.5V. The default value for this function is 9V. After completing the setting, press "ENTER" to withdraw. The value on the screen will no longer glitter.

進入介面後再次按 "ENTER" 螢幕右下角數值(電壓)將會以一赫茲頻率閃爍，如圖6，此功能是為了保護輸入電源而設，即當輸入電壓降到某一設定值，機器即時停止所有工作，以避免損壞機器和供電系統，且蜂鳴器警告提示，按 "DEC" 或 "INC" 鍵可調整關機電壓值，若長按 "DEC" 或 "INC" 鍵則以1赫茲(0.1V步進)不停跳變，其數值範圍是9-11.5V，此功能預設值為9V，設置完成後按 "ENTER" 退出。螢幕數值將不再閃爍。



Press "TYPE/STOP" to enter the "Battery Type Li-Ion/Poly" interface. (Refer to Figure 7).

按下 "TYPE"，進入 "Battery Type Li-Ion/Poly" 介面，顯示器顯示(圖7)




Figure 7  
圖7

### 5.1 Charging current/voltage setup 充電電流/電壓設置

Press "ENTER" to enter the battery capacity/charging current/voltage setup interface.

Press "ENTER" again and the value (battery capacity) at the upper right corner on the screen will glitter by a hertz frequency, like Figure 8.

按 "ENTER" 進入被充電池容量/充電電流/電壓 (電池cell數) 調整介面，再次按 "ENTER" 螢幕右上角數值(被充電池容量)將會以一赫茲頻率閃爍，如圖8

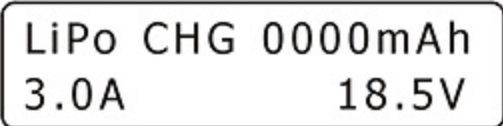


Figure 8  
圖8

Press "DEC" or "INC" to set the value of the battery capacity, within the range of 0100mAh-9900mAh.

Press "DEC" or "INC" once, the value will be updated by 100mAh. If hold the "DEC" or "INC" key, the value will be updated by 200mAh by 1 hertz. Press "ENTER" to set the charging current. The value of charging current at the low left corner on the screen will glitter by a hertz frequency, like Figure 9.

按 "DEC" 或 "INC" 鍵可設置被充電池容量，其數值範圍是 0100mAh-9900mAh；若單次按 "DEC" 或 "INC" 鍵每次跳變100mAh，若長按 "DEC" 或 "INC" 鍵則以1赫茲(200mAh步進)不停跳變，按 "ENTER" 螢幕左下角字母 (充電電流) 將會以一赫茲頻率閃爍，如圖9

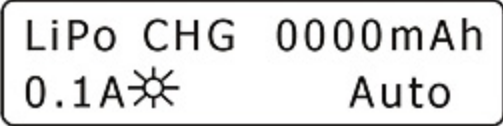


Figure 9  
圖9

Press "DEC" or "INC" to set the value of the charging current, within the range of 0.1A-5.0A

(by 0.1A). Press "DEC" or "INC" once, the value will be updated by 0.1A. If hold the "DEC" or "INC" key, the value will be updated by 0.2A by 1 hertz. Press "ENTER" to set the value of battery voltage. The value of battery voltage at the low right corner on the screen will glitter by a hertz frequency, like Figure 10.

按 "DEC" 或 "INC" 鍵可設置充電電流，其數值範圍是0.1A-5.0A(0.1A步進)若單次按 "DEC" 或 "INC" 鍵每次跳變0.1A，若長按 "DEC" 或 "INC" 鍵則以1赫茲(0.2A步進)不停跳變，按 "ENTER" 螢幕右下角字母將會以一赫茲頻率閃爍，如圖10




Figure 10  
圖10



Recommend setting the maximum value of charging current within 4A. If want to select 5A to charge, please use this device in a location with adequate air flow and ventilation or cooling by a fan due to the temperature of charger case will be higher.

建議最大充電電流設定在4A以內，若要選擇5A充電時由於外殼溫度會較高，請務必在通風良好的環境下進行充電或另外以風扇輔助散熱。

Press "DEC" or "INC" to set the value of battery voltage. If the value set in 2.1 is 3.6V, the range is AUTO/3.6/7.2/10.8/14.4/18/21.6V, represent AUTO/1/2/3/4/5/6 respectively. If the value set in 2.1 is 3.7V, the range is AUTO/3.7/7.4/11.1/14.8/18.5/22.2V, represent AUTO/1/2/3/4/5/6 respectively. After completing all the settings, press "ENTER" to withdraw. The value on the screen will no longer glitter. Press "ENTER" for 2 seconds after completing all the above-mentioned settings. Buzzer beeps for 0.5 second to indicate that the charger is going into the process of charge.

按“DEC”或“INC”鍵可設置充電電池cell數，其數值範圍是：若2.1章節裡將鋰電池每cell設置為3.6V，則是AUTO/3.6/7.2/10.8/14.4/18/21.6V，分別代表AUTO/1/2/3/4/5/6cell電池；若2.1章節將鋰電池每cell設置為3.7V，則是AUTO/3.7/7.4/11.1/14.8/18.5/22.2V，分別代表AUTO/1/2/3/4/5/6cell電池，設置完成後按“ENTER”退出。

螢幕數值將不再閃爍。以上參數設定無誤後長按“ENTER”2秒（蜂鳴器將鳴響0.5秒以提示）充電器將進入充電程式：



1. When choosing the charging current, read the instructions of the battery being charged carefully; otherwise, the battery might be damaged or exploded.
2. For new battery, the best way is to charge it by a little amount of current and in the safety time setting way, in order to make sure the battery is fully charged. Time setting refers to 2.2.
3. When charging 2-6 cell Li-Ion or Li-poly battery, please use a balancer to avoid imbalanced charging causing the battery damage or explosion.

1. 當您選擇即調整充電電流時請參考被充電電池說明書或電池表面的充電規範文字，否則可能會造成電池損壞或爆炸。
2. 對於新買的電池，最好採用小電流和定時的方式充電，以確保電池完全被充滿。關於定時選項請參考2.2節說明。
3. 進行2-6cell的鋰離子或鋰聚電池充電時，務必搭配平衡器使用，以免造成充電不均而使電池損壞或爆炸。

### 5.2 Necessary functional examinations for battery 電池必需的功能檢測

Every time before the process of charge starts, the charger would have some necessary functional examinations for battery. (Refer to Figure 11)

每次充電程式啟動前，充電器將對電池進行一些必需的功能檢測，顯示器顯示圖11

Battery  
Check

Figure 11  
圖11

For the Lithium battery, the contents of necessary functional examinations are as follows:  
對鋰電池而言，其檢測內容是：

#### 5.2.1 Battery connection polarity examination 電池連接極性檢測

When the charger is connected to the battery being charged, the negative electrode (cathode) and the positive electrode (anode) must be confirmed. If it is connected in a wrong way by humans, the charger will terminate charge and the buzzer will beep.

充電器在被充電電池連接的情況下，將對電池的正負極性進行必要的確認，若人為連接錯誤，充電器將啟動鳴叫警示，並且停止充電功能。

#### 5.2.2 Battery circuit examination 電池線路檢測

When the charger is in the process of charge, the charger will terminate charge if the battery is not connected correctly with the charger. (Refer to Figure 12)

如果充電器啟動了充電程式，電池未與充電器連接或電池開路，充電器將拒絕充電，顯示器顯示圖12

Batt                      circuitry  
Disconnection

Figure 12  
圖12

Press "ENTER" to withdraw if this protection function starts.

此功能保護啟動後，按“ENTER”可退出此次充電程式。



## 5.2.3 Examination of battery specification and voltage confirmation 電池規格設置及電壓確定檢測

If the examinations in 3.2.1/3.2.2 are normal, the charger will charge the battery by a little amount of current for a period of time in order to make sure the following:

第3.2.1/3.2.2節均正常後，充電器將以小電流對鋰電池進行預測充電一段時間，這一步驟主要確定以下內容：

## 5.2.3.1 Determination of Battery voltage value 電池電壓選項確定

If Lithium battery voltage is selected in 3.1, the charger is going to check whether it is correct.

若在電池電壓選項中人為設置了鋰電池cell數（3.1節），則檢測是否正確：此時螢幕顯示圖12.1



On the screen in Figure 12.1, the value at the upper right corner is accumulative charging capacity (mAh). The value at the low left corner on the screen is the battery voltage (V). The value in the low middle of the screen is the real charging current (A). The value at the low right corner on the screen is the charging time.

If the battery voltage is not in the normal range, the "Vol Select Err" is shown and the buzzer beeps to indicate a fault. The charger terminates charge. (Refer to Figure 13)

圖12.1螢幕中，右上角顯示值為累計充電量（mAh），左下角為電池電壓（V），下中部為實際充電電流（A），右下角為充電計時。若所測量到的電池電壓不在正常範圍內，則判定為選擇錯誤，充電器將拒絕繼續充電，蜂鳴器也將警告提示，顯示器顯示圖13

Vol Select Err

Figure 13  
圖13

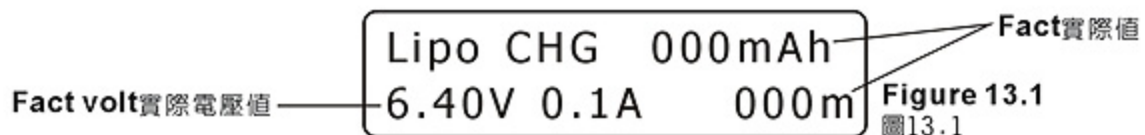
If the voltage is in the normal range, the charger starts to charge battery according to the settings in 3.1 until the battery is fully charged.

若所測量到的電壓在範圍內，則判定為選擇正確，充電器就開始按所設置的參數（3.1節）充電，直到充滿。

## 5.2.3.2 Automatic examination for lithium battery voltage 自動檢測鋰電池電壓

If the "AUTO" is selected in 3.1 for the battery voltage, the charger has an examination for battery voltage in order to automatically determine the suitable battery voltage. The charger charges the battery by a little amount of current for a period of time, and to confirm the battery voltage. (Refer to Figure 13.1).

若在電池電壓選項中設置為AUTO（3.1節），則充電器對電池電壓進行檢測以自動確定cell數，充電器將以小電流對鋰電池進行預測充電一段時間，以對電池電壓進行內部計算，此時螢幕顯示圖13.1



When the charger finishes the determination of battery voltage, it starts to charge the battery according to the predefined parameters (3.1) until the battery is fully charged

當充電器內部對電池cell數自動確定後就開始按所設置的參數（3.1節）充電，直到充滿。

## 5.3 Controls of battery charge and determination method of completion 電池充電程序控制及完成判定方法

## 5.3.1 Battery charge controls 電池充電程序控制

The charge of Lithium battery uses the limitation of current first and then the limitation of voltage. When the charger starts the charge, it charges battery according to the predefined current parameter in 3.1, which is constant-current charge. When the battery voltage reaches the maximum value of voltage (The maximum value of voltage for 3.6 is 4.1V / The maximum value of voltage for 3.7 is 4.2V), the charger will carry on a constant-voltage charge, using the maximum value of voltage. (The buzzer beeps to indicate that the charger transfers from a constant-current charge to a constant-voltage charge)

The buzzer beeps for 5 times, which lasts for 5 seconds, to indicate that the charge is finished. (Refer to Figure 14). The screen will stay the same until someone presses key to withdraw.

對於鋰電池來說，採用先限流後限壓的方法充電，即開始按所設置的電流參數（3.1節）恒流充電，當電池電壓達到每cell電池最高電壓（3.6/鋰離子其最高電壓為4.1V；3.7/鋰聚合物其最高電壓為4.2V）時，再以每cell電池最高電壓（4.1或4.2V）恒壓充電，（在從恒流→恒壓轉換時蜂鳴器將鳴響0.5秒以提示）。充電器確認電池充滿後，蜂鳴器警告提示5聲次，即5秒，提示充電完成，顯示器顯示圖14（此介面將一直保持，直到人為按動按鍵退出）



## 5.3.2 Parameter modifications in charge 充電過程中可改變的參數

In the process of charge, after press "ENTER", the value of charging current on the screen will glitter by a hertz. Press "INC" or "DEC" to adjust the value of charging current. Press "ENTER" again to withdraw. The charger would charge battery according to the new setting value of current. If the charger is in the process of constant-voltage charge, pressing "ENTER" is invalid. The value of charging current cannot be changed. If press "INC" or "DEC" to adjust the value of charging current but have not yet pressed "ENTER" and during this time the charger goes into the process of constant-voltage charge, the charger will return to the original settings and ignore the value just be changed. If press "ENTER" without pressing "INC" or "DEC" in 3 seconds, the charger will also return to the original settings.

In the process of charge, the battery voltage and type cannot be changed.

In the process of charge, pressing "DEC" cannot stop charge. The monitor would only show safety timer function, but the parameter cannot be changed. (Refer to Figure 15)

在充電過程中，若按下“ENTER”，顯示幕中電流值將會以一赫茲頻率閃爍。這時按“INC”或“DEC”鍵可改變充電電流，再按“ENTER”退出，充電器將按新設置的電流充電。

若機器已進入了恒壓充電狀態，按“ENTER”將無效，即不能改變電流了，此外如果在按“INC”或“DEC”鍵改變充電電流而未按“ENTER”確認這一期間充電器已進入了恒壓充電狀態，充電器也會退回到原來的狀態；若按下“ENTER”三秒鐘未按“INC”或“DEC”鍵，充電器也會退回到原來的狀態。

在充電過程中，電池電壓和類型是不能改變的；

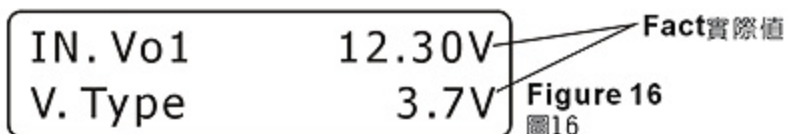
在充電過程中，若按“DEC”鍵，充電器充電不會停止，而顯示器則顯示安全定時功能選項，但不可改變參數，如圖15





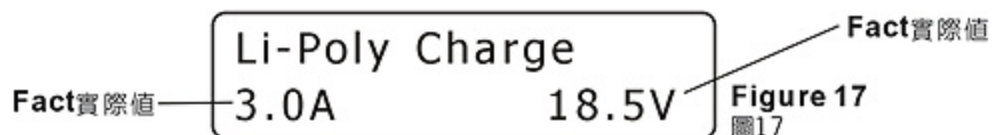
The screen will be kept for 3 seconds and then return to the contents of charge.  
 In the process of charge, pressing "INC" cannot stop charge. The monitor would only show the value of input voltage and the parameters of the battery being charged, which cannot be changed. (Refer to Figure 16)

該介面顯示3秒鐘後自動返回充電顯示內容：  
 在充電過程中，若按“INC”鍵，充電器充電不會停止，而顯示器則顯示輸入電源電壓和被充電池電壓類型，但不可改變參數，如圖16



The screen will be kept for 3 seconds and then return to the contents of charge.  
 In the process of charge, press "TYPE/STOP" to stop charge. (Refer to Figure 17)

該介面顯示3秒鐘後自動返回充電顯示內容：  
 在充電過程中，若按“TYPE/STOP”鍵，機器充電就會停止，顯示器則顯示圖17



ALIGN RCE-6BA cell balancer is designed to balance 2 to 6 lithium polymer cells connected in series. When properly used, this balancer will prevent damages caused by imbalance of cell's voltage, internal resistance, and capacity, thus prolonging the battery's life and ensure its performance consistency. The cell overcharge prevention feature will minimize damage of cells by capping the maximum voltage within  $4.20+0.05V$  limit.

ALIGN RCE-6BA平衡器為針對2-6cell串聯的Li-Poly電池組所設計，可避免電池組於串聯方式充電時，因每cell電壓、內阻、容量等差異造成充飽電壓不均，而影響電池的放電特性與使用壽命。此外，採用更安全的 $4.26V/cell$ 電壓過充保護設計，除了可避免過充發生危險外，更可將電壓限制在Li-Poly所能承受的 $4.20+0.05V$ 的最高電壓以內，使電池的損壞減至最低。

### 6.1 For concurrent usage with charger 充電平衡電池

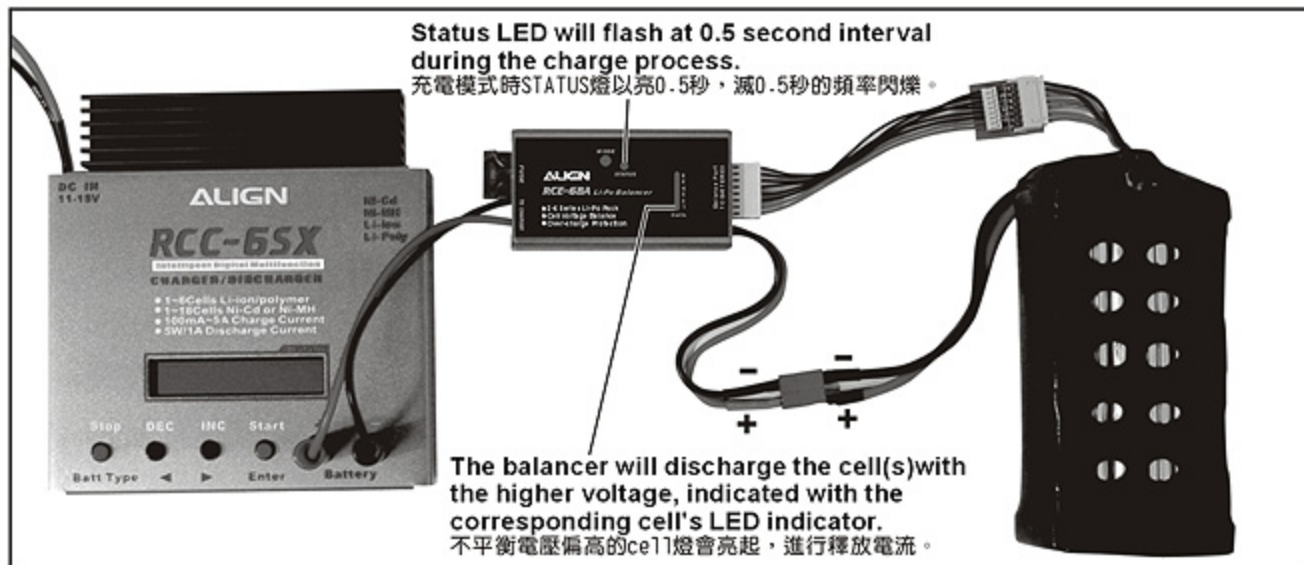
For concurrent usage with charger:

- Plug the balancer's input power plug to the charger's output port. Note the polarity, red is positive, black is negative.
- Attach the battery balancing tap to balancer using the included adaptor. The LED's will light up for 2 seconds indicating correct detection of cell counts. The number of LED's represents the number of cells in the pack (For example, 6 LED's will light up if a 6S pack is attached).
- Then the LED's will cycle sequentially indicating voltage detection of individual cells.
- When the Status LED lights up, attach the balancer's power output to lipo's main power plug, again noting the polarity of the wires.
- Press the MODE button on the balancer. Status LED will flash at 0.5 second interval (on/off 0.5 second each).
- Begin the charge process on the charger. (Note: If it is not under the charge Mode, the charger will not start.)

Notes for concurrent usage:

For 6S pack, please use the 6S balance tap adaptor. For 2-5S pack, please use the multi-port balance tap adaptor. If cell imbalance exceeds 30mV within a pack, we recommend using the stand alone mode to bring the imbalance to within 30mV before charging. If the charger terminates with "Batt Circuitry Disconnection" error during charge process, this is due to large voltage imbalance of cells which triggers the balancer's overcharging cutoff feature. We recommend manually balancing the cells with the balancer in stand alone mode or setting the charge current to within 0.3A before charging.

充電平衡電池：以6cell(22.2V)串聯的電池組為例，首先將平衡器充電輸入端的兩個接頭，依照正(紅色)、負(黑色)的極性接至充電器，然後將所附的6S平衡連接線8pin端連接至平衡器(注意防呆缺口方向)，另一端與6cell電池的分壓線頭連接，接入的同時平衡器1-6cell燈全亮約2秒(如果是3cell，則1-3cell燈會全亮)，表示接入的電池正常，接著cell燈依1-6的順序輪流亮起進行每cell電壓的偵測，工作狀態指示燈(STATUS)亮起，然後將平衡器的輸出端與電池的充電接頭連接，接著按下平衡器的"MODE"鍵進入充電模式，此時工作狀態指示燈(STATUS)會以0.5秒的頻率閃爍(亮/滅各0.5秒)，最後按下充電器的啟動鍵即可於充電過程中平衡電池。\*注意：若未進入充電模式，將無法啟動充電器。進行2-5cell電池的充電平衡時，請使用"2-5S平衡連接板"，操作方式同上。若電池組的不平衡電壓超過30mV以上時，建議先將電池平衡至30mV以內時再進行充電。若充電過程中，充電器停止充電且LCD顯示"Batt circuitry Disconnection"，表示電池不平衡電壓差距過大，使平衡器啟動過充電壓保護，此時建議先將電池進行手動平衡或將充電電流設定為0.3A以下再進行充電。





## 6.2 The balancer could also be used to charge two 3S packs concurrently as a 6S pack 同時充兩組3cell (11.1V) 的電池

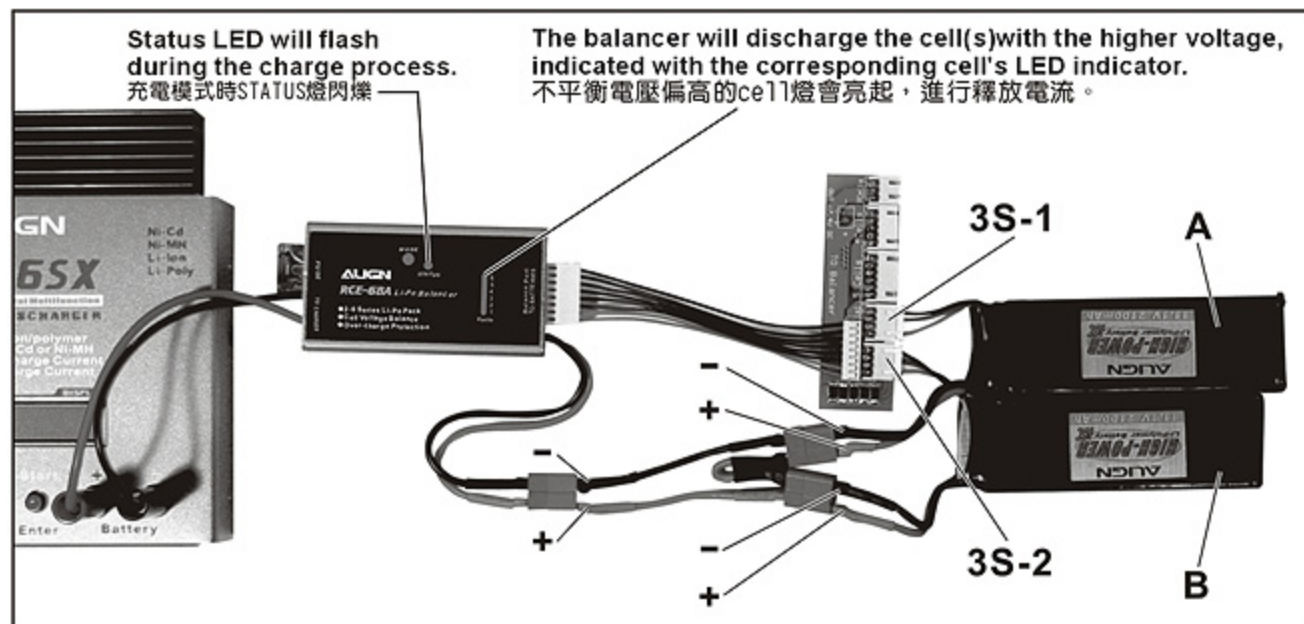
Label the two 3S packs "pack A" and "pack B". Fabricate a series adaptor as shown in the photo below. This will effectively create a 6S pack out of the two 3S packs. Attach pack B's balancing tap into 3S-2 port on the multi-port balance adaptor, and then pack A's balancing tap into 3S-1 port. LED 1 through 6 will light up for 2 seconds indicating correct detection of cell counts. Attach the series adaptor between the balancer and lipo packs. Note the wire configuration must match the photo below. The negative port on balancer output must be connected pack A's negative terminal. Press the MODE button once on the balancer. Status LED will flash at 0.5 second interval. Begin the charge process on the charger.

利用所附的“2-5S平衡連接板”，可同時充兩組3cell Li-Po電池，接線方式如下圖所示，您必須依接頭的型式另外準備一條串接線將兩組電池串聯，連接方式及步驟如下：先將B電池接到3S-2的插座上，再將A電池接到3S-1的插座上，此時6顆cell燈會全亮2秒，表示接入的電池正常，然後將串接線依下圖極性標示連接，之後按下平衡器的“MODE”鍵一次進入充電模式（STATUS燈閃爍），將已設定在6cell (22.2V) 模式下的充電器按下啟動鍵，啟動充電功能。



1. The wiring must be followed precisely as shown in the photo to prevent damage to the balancer.
2. Since this charging method involves 2 independent packs, we recommend balancing the cells to within 30mV before charging them concurrently.
3. When attaching 3S pack to the 2-5S multi-port balance tap adaptor, only use the 3S plug on right side of the adaptor (port 3S-1).

1. 分壓線與串接線務必依照下圖方式連接，否則將導致平衡器損壞！
2. 由於兩組3cell電池並非同時放電使用，所以充電前必須確認兩組電池電壓差距不可過大，建議先行平衡至30mV內再行充電。
3. 如果僅充電/平衡一組3cell的Li-Po時，電池的分壓接頭必須接在連接板的3S-1插座上，如果接到3S-2的插座，平衡器將無法動作。



## 6.3 For stand alone usage 單獨平衡電池

Plug the battery pack's balancing plug into the included balance tap adaptor, with the other end of adaptor attached to the balancer (note the plug is keyed to prevent reverse polarity). There are two balance tap adaptors. One for 6S pack, and a multi-port one for 2-5S packs. The LED's will light up for 2 seconds indicating correct detection of cell counts. The number of LED's represents the number of cells in the pack (For example, 6 LED's will light up if a 6S pack is attached). Then the LED's will cycle sequentially indicating voltage detection of individual cells. If any imbalances exist, the Status LED will light up indicating the start of cell balancing. If cells' voltage difference is  $\pm 15\text{mV}$  or higher, the balancer will discharge the cell(s) with the higher voltage, indicated with the corresponding cell's LED indicator. When cell balance is achieved, all indicator LED's will shut off.

6cell (22.2V) 串聯的電池組為例，首先將所附的6S平衡連接線8Pin端連接至平衡器(注意防呆缺口方向)，另一端與6cell電池的分壓接頭連接，接入的同時平衡器1-6cell燈會全亮約2秒(如果電池是3cell，則1-3cell燈會全亮)，表示接入的電池正常，接著cell燈依1-6的順序輪流亮起進行每cell電壓的偵測，之後工作狀態指示燈(STATUS)亮起，開始平衡電壓。若電池不平衡壓差在 $\pm 15\text{mV}$ 以上，平衡器會將電壓較高的cell釋放電流，被釋放的cell指示燈會亮起，直到電池平衡壓差在 $\pm 5\text{mV}$ 以內，所有指示燈都會熄滅，停止平衡。若接入電池的壓差已在 $\pm 5\text{mV}$ 以內，即不進行平衡。

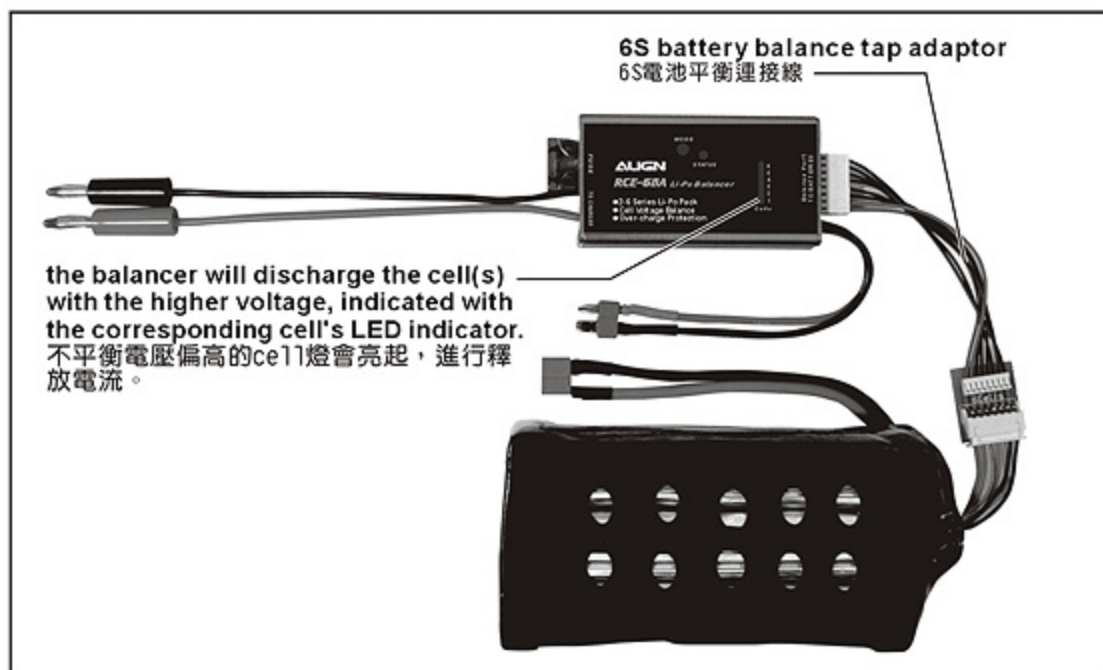
The balancer can also be set to high precision balancing mode, which will balance the cells to  $\pm 5\text{mV}$  difference. To do this, press the MODE button once during balancing process. Status LED will flash at 0.5 second interval in this high precision mode.

若需提高平衡壓差的解析度，可以在平衡時按下“MODE”鍵一次，此時工作狀態指示燈會以0.5秒的頻率閃爍並使平衡後的壓差在 $\pm 5\text{mV}$ 以內。若接入的電池壓差已在 $\pm 5\text{mV}$ 以內，即不進行平衡。

進行2-5cell電池的平衡時，請使用“2-5S平衡連接板”，操作方式同上。



1. When used as stand along balancer, DO NOT attach the power plug of the battery to the balancer power output. Only use the balancing tap plugs.
2. Only the two 3S ports can be used concurrently on 2-5S multi-port balance tap adaptor. The remaining ports must be used individually.
3. When attaching 3S pack to the 2-5S multi-port balance tap adaptor, only use the 3S port on right side of the adaptor (port 3S-1).
4. If the voltage of any cell is below 3.3V, balancer will not function, and all indicator LED's will go off.
  1. 進行電池單獨平衡的功能時，請勿接上電池與平衡器的串電接頭。
  2. 2-5S平衡連接板除了3S的2個插座允許同時使用外，其餘插座一次只允許接入1組電池。
  3. 2-5S平衡連接板僅接一組3cell電池時，必須使用右側的3S-1插座。
  4. 若電池組中有任一cell電壓低於3.3V，則平衡器將不執行平衡功能，所有指示燈均會熄滅。





## 7.1 Setup of Nickel cadmium battery charge parameters 鎳鎘電池的充電參數設置

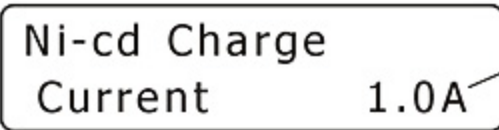
Press "TYPE/STOP" to enter the Nickel cadmium battery type interface. (Refer to Figure 18).  
按 "TYPE/STOP" 進入鎳鎘電池類型介面，顯示器顯示圖18



Battery Type  
Ni-cd Batt

Figure 18  
圖18

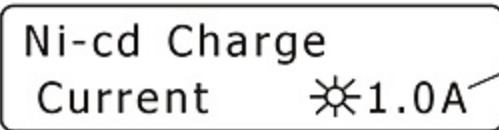
Press "ENTER" again to enter the Nickel cadmium charge interface. (Refer to Figure 19)  
進入介面後按 "ENTER" 進入鎳鎘電池充電介面顯示器顯示圖19




Ni-cd Charge  
Current 1.0A

Fact實際值  
Figure 19  
圖19

Press "ENTER" again and the value at the low right corner will glitter by a hertz frequency.  
(Refer to Figure 20)  
再次按 "ENTER" 螢幕右下角數值(電流)將會以一赫茲頻率閃爍，如圖20



Ni-cd Charge  
Current  1.0A

Fact實際值  
Figure 20  
圖20

Press "DEC" or "INC" to set the value of the charging current, within the range of 0.1A-5.0A (updated by 0.1A). Press "DEC" or "INC" once, updated by 0.1A. If hold the "DEC" or "INC" key, the value will be updated by 0.2A by 1 hertz. Press "ENTER" to withdraw after completing the setting. The value on the screen will no longer glitter.

按 "INC" 或 "DEC" 鍵可設置充電電流，其數值範圍是0.1A-5.0A(0.1A步進)若單次按 "INC" 或 "DEC" 鍵每次跳變0.1A，若長按 "INC" 或 "DEC" 鍵則以1赫茲(0.2A步進)不停跳變，設置完成後按 "ENTER" 退出。螢幕數值將不再閃爍。



1. Recommend setting the maximum value of charging current within 4A. If want to select 5A to charge, please use this device in a location with adequate air flow and ventilation or cooling by a fan due to the temperature of charger case will be higher.
2. When choosing the charging current, read the instructions of the battery being charge carefully; otherwise, the battery might be damaged or exploded.
3. For new battery, the best way is to charge it with a little amount of current and in the safety time setting way, in order to make sure the battery is fully charged. Time setting refers to 2.2.
4. This charger charge is at a rapid rate. If the predefined value of the charging current is less than 500mA, it will be better to charge the battery in a time setting way, in order to make sure the battery is fully charged. Time setting refers to 2.2.

Press "ENTER" for 2 seconds after completing all the above-mentioned settings.

Buzzer beeps for 0.5 second to indicate that the charger is going into the process of charge.

1. 建議最大充電電流設定在4A以內，若要選擇5A充電時由於外殼溫度會較高，請務必在通風良好的環境下進行充電或另外以風扇輔助散熱。
2. 當您選擇及調整充電電流時請參考被充電電池說明書或電池表面的充電規範文字，否則可能會造成電池損壞或爆炸。
3. 對於新買的電池，最好採用小電流和定時的方式充電，以確保電池完全被充滿，關於定時選項請參考2.2節說明。
4. 由於本充電器是快速充電，如果您選擇及調整充電電流小於500mA，最好採用定時的方式充電，以確保電池完全被充滿，關於定時選項請參考2.2節說明。

以上參數設定無誤後長按 "ENTER" 2秒 (蜂鳴器將鳴響0.5秒以提示) 充電器將進入充電程式。

## 7.2 Necessary functional examinations for battery 電池必需的功能檢測

Every time before the process of charge starts, the charger would have some necessary functional examinations for the battery. (Refer to Figure 21)

每次充電程式起動前，充電器將對電池進行一些必需的功能檢測，顯示器顯示圖21



Figure 21  
圖21

For the nickel cadmium battery, the contents of the functional examinations are as follows:  
對鎳鎘電池而言，其檢測內容是：

## 7.2.1 Battery connection polarity examination 電池連接極性檢測

When the charger is connected to the battery being charged, the negative electrode (cathode) and the positive electrode (anode) must be confirmed. If it is connected in a wrong way by humans, the charger will terminate charge and the buzzer will beep.

充電器在被充電電池連接的情況下，將對電池的正負極性進行必要的確認，若人為連接錯誤，充電器將啟動鳴叫警示，並停止充電功能。

## 7.2.2 Battery circuit examination 電池線路檢測

When the charger is in the process of charge, the charger will terminate charge if the battery is not connected correctly with the charger. (Refer to Figure 22)

如果充電器啟動了充電程式，電池未與充電器連接或電池開路，充電器將拒絕充電，顯示器顯示圖22



Figure 22  
圖22

Press "ENTER" to withdraw if the protection function starts.

If all the above parameters are normal, the charger will start to charge battery according to the setting value of current. (Refer to Figure 22.1)

此功能保護啟動後，按“ENTER”可退出此次充電程式。

若以上參數均正常，則充電器將按所設定的電流進行充電，直到充電完成。如圖22.1

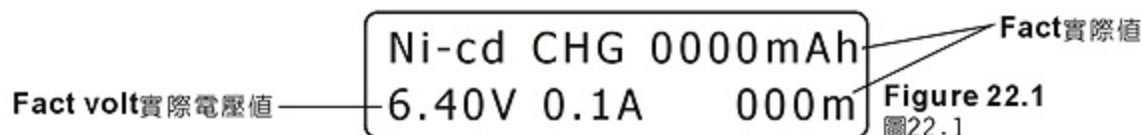


Figure 22.1  
圖22.1

On the screen in Figure 22.1, the value at the upper right corner is the accumulative charging capacity (mAh), the value at the low left corner is the battery voltage (V), the value in the low middle of the screen is the real charging current (A), the value at the low right corner is the charging time.

圖22.1螢幕中，右上角顯示值為累計充電量 (mAh)，左下角為電池電壓 (V)，下中部為實際充電電流 (A)，右下角為充電計時。

## 7.3 Controls of battery charge and determination method of completion 電池充電程序控制及完成判定方法

## 7.3.1 The battery charging controls 電池充電程序控制

For the Nickel cadmium battery, the charger uses constant-current charge until the battery is fully charged.

對於鎳鎘電池來說，機器將採用恒流充電，直到充電完成。



## 7.4 Nickel Cadmium battery discharge 鎳鎘電池的放電

## 7.4.1 Parameter modifications in Nickel Cadmium battery discharge 鎳鎘電池的放電參數設置

Press "ENTER" to enter the Nickel Cadmium battery type interface. (Refer to Figure 18)

Press "INC" to enter the Nickel Cadmium battery discharge interface. (Refer to Figure 27)

按 "ENTER" 進入鎳鎘電池類型介面，顯示器顯示圖18

再按 "INC" 進入鎳鎘電池放電介面，顯示器顯示圖27



Press "ENTER" to enter the parameter modification interface. The value at the low left corner on the screen will glitter by a hertz frequency. (Refer to Figure 28)

按 "ENTER" 進入鎳鎘電池放電參數調整介面，此時螢幕左下角數值將會以一赫茲頻率閃爍，顯示器顯示圖28



Press "DEC" or "INC" to set the value of the discharging current, within the range of 0.1A-1.0A (updated by 0.1A). Press "DEC" or "INC" once; the value will be updated by 0.1A. If hold the "DEC" or "INC" key; the value will be updated by 0.2A by 1 hertz. After completing the setting, press "ENTER" to turn to the ending discharge voltage setup interface. The value at the low right corner on the screen will glitter by a hertz frequency. (Refer to Figure 29)

按 "INC" 或 "DEC" 鍵可設置放電電流，其數值範圍是0.1A-1.0A(0.1A步進)若單次按 "INC" 或 "DEC" 鍵每次跳變0.1A，若長按 "INC" 或 "DEC" 鍵則以1赫茲(0.2A步進)不停跳變，設置完成後按 "ENTER" 轉到放電截止電壓參數調整介面，此時螢幕右下角數值將會以一赫茲頻率閃爍，顯示器顯示圖29



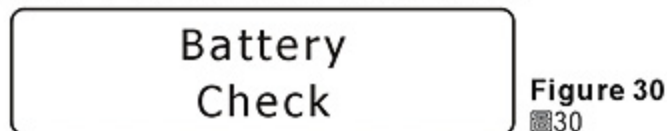
Press "DEC" or "INC" to adjust the discharging voltage, within the range of 0.1V-15V (updated by 0.1V). Press "+" or "-" each time; the value will be updated by 0.1V. If hold the "DEC" or "INC" key; the value will be updated by 0.2V by 5 hertz. After completing the settings, press "ENTER" to withdraw. Press "ENTER" for 2 seconds after completing all settings. Buzzer beeps for 0.5 second to indicate that the charger is going into the process of discharge.

按 "INC" 或 "DEC" 鍵可設置放電截止電壓，其數值範圍是0.1V-15V(0.1V步進)若單次按 "INC" 或 "DEC" 鍵每次跳變0.1V，若長按 "INC" 或 "DEC" 鍵則以5赫茲(0.2V步進)不停跳變，設置完成後按 "ENTER" 退出。長按 "ENTER" 2秒(蜂鳴器將鳴響0.5秒以提示)充電器進入放電程式。

## 7.5 Necessary functional examinations for battery 電池必須的功能檢測

Every time before the process of discharge starts, the charger would have some necessary functional examinations for battery. (Refer to Figure 30)

每次放電程式起動前，充電器將對電池進行一些必需的功能檢測，顯示器顯示圖30



For the Nickel cadmium battery, the contents of necessary functional examinations are as follows:  
對鎳鎘電池而言，其檢測內容是：

## 7.5.1 Battery connection polarity examination 電池連接極性檢測

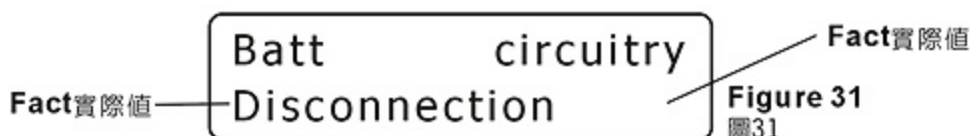
When the charger is connected to the battery being charged, the negative electrode (cathode) and the positive electrode (anode) must be confirmed. If it is connected in a wrong way by humans, the charger will terminate charge and the buzzer will beep.

充電器在被充電電池連接的情況下，將對電池的正負極性進行必要的確認，若人為連接錯誤，充電器將啟動鳴叫警示，並停止放電功能。

## 7.5.2 Battery circuit examination 電池線路檢測

When the charger is in the process of discharge, the charger will terminate discharge if the battery is not connected correctly with the charger. (Refer to Figure 31)

如果充電器啟動了放電程式，電池未與充電器連接或電池開路，充電器將拒絕放電，顯示器顯示圖31



Press "ENTER" to withdraw if the circuit protection function starts.

If all the above parameters are normal, the charger starts to discharge battery according to the setting of current until it is finished.

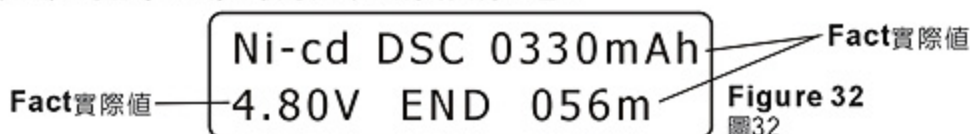
此功能保護啟動後，按“ENTER”可退出此次放電程式。

若以上參數均正常，則充電器將按所設定的電流與截止電壓進行放電，直到放電完成。

## 7.5.3 Controls of battery discharge and the determination method of completion 電池放電程序控制及完成判定方法

The charger uses the limited rate to discharge battery in order to prevent internal over temperature. The maximum rate for discharge is 5W. If the predefined discharging parameter exceeds 5W, the charger will lower the discharging current automatically. When the charger detects the predefined voltage value, it will terminate the process of discharge. (Refer to Figure 32)

充電器為防範內部溫度過熱，將採取限功率放電，最大放電功率為5W若設定的放電參數超過5W，充電器將自動降低放電電流，當充電器放電至設定截止電壓時，即停止放電程式，顯示器顯示如圖32



Buzzer beeps to indicate that the discharge is finished.

充電器確認電池放電結束後，蜂鳴器將警告提示

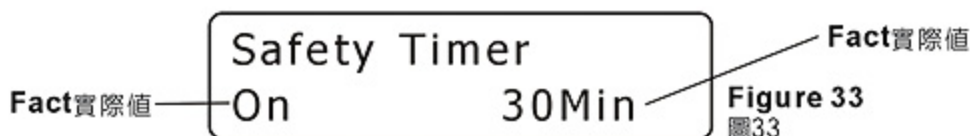
## 7.5.3.1 Parameter modifications in discharge 放電過程中可改變的參數

In the process of discharge, after pressing "ENTER", the value of current on the screen will glitter by a hertz frequency. Press "INC" or "DEC" to adjust the value of discharging current. Press "ENTER" again to withdraw. The charger would discharge battery according to the new setting of current.

In the process of discharge, pressing "DEC" cannot stop discharge. The monitor would only show safety timer function, but the parameter cannot be changed. (Refer to Figure 33)

在放電過程中，若按下“ENTER”，顯示幕中電流值將會以一赫茲頻率閃爍，這時按“INC”或“DEC”鍵可改變放電電流，再按“ENTER”退出，充電器將依照新設置的電流放電。

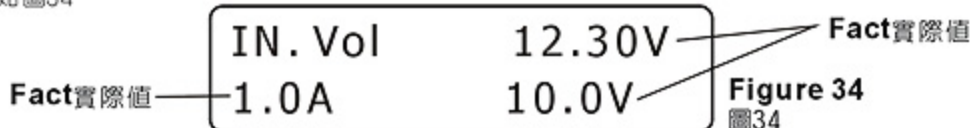
在放電過程中，若按“DEC”鍵，充電器放電不會停止，而顯示器則顯示安全定時功能選項，但不可改變參數，如圖33





The screen will be kept for 3 seconds and then return to the contents of discharge. In the process of discharge, pressing "INC" cannot stop discharge. The monitor would only show the value of input voltage and the parameters of the battery being discharged, which cannot be changed. (Refer to Figure 34)

該介面顯示3秒鐘後自動返回放電顯示內容：  
在放電過程中，若按“INC”鍵，充電器放電不會停止，而顯示器則顯示輸入電源電壓和被放電池設置參數選項，但不可改變參數，如圖34



The screen will be kept for 3 seconds and then return to the contents of discharge. In the process of discharge, press "TYPE/STOP" to stop discharge. (Refer to Figure 35)

該介面顯示3秒鐘後自動返回放電顯示內容：  
在放電過程中，若按“TYPE/STOP”鍵，充電器放電就會停止，顯示器則顯示圖35



## 7.6 Nickel Cadmium battery discharge and charge cycle 鎳鎘電池的放電/充電循環

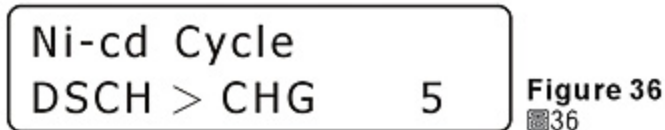
### 7.6.1 Parameter setup in discharge / charge cycle 放電/充電循環參數設置

Press "TYPE/STOP" to enter the Nickel Cadmium battery type interface. (Refer to Figure 18).

Press "ENTER" again to enter the Nickel Cadmium charge interface. (Refer to Figure 19)

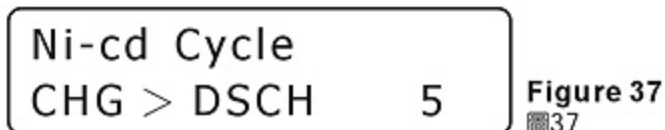
Press "INC" to enter the discharge/charge cycle interface. (Refer to Figure 36).

按“TYPE/STOP”進入鎳鎘電池類型介面，顯示器顯示圖18  
進入介面後按“ENTER”進入鎳鎘電池充電介面顯示器顯示圖19  
按“INC”鍵進入放/充電循環介面，顯示器顯示圖36



Another way to enter the discharge/charge cycle interface is to press "DEC" (Refer to Figure 37)

按“DEC”鍵也可進入充/放電循環介面，顯示器顯示圖37



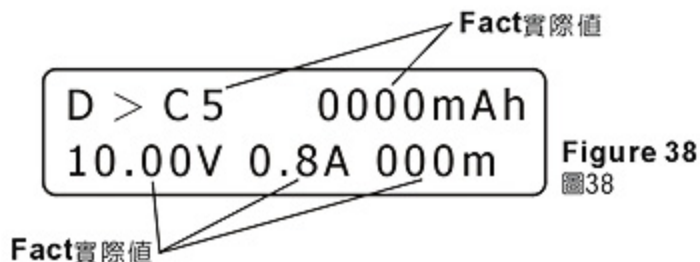
Press "ENTER" again to enter the times of cycle setup interface. In a discharge/charge cycle, a process of discharge is followed by a process of charge automatically. The charger can be set for 5 cycles. The cycle can also be reversed, which is charge first and then discharge. During the time of cycle setup, the value will glitter by a hertz frequency. Press "DEC" or "INC" to set up the times of cycle. Press "ENTER" to withdraw after completing the setting. Press "ENTER" for 2 seconds and the Buzzer will beep for 0.5 second to indicate that the charger is going into the process of discharge/charge.

進入介面後按“ENTER”進入調整循環次數介面，即一次放電程式結束，自動轉換到充電程式並充電完成，稱為一次循環，機器可以設置5次循環，也可以選擇先充電後放電。調整循環次數時螢幕右下角數值(次數)將會以一赫茲頻率閃爍，此時按“INC”或“DEC”鍵可選擇迴圈次數，設置完成後按“ENTER”退出。  
長按“ENTER”2秒(蜂鳴器將鳴響0.5秒以提示)充電器進入放電/充電程式：



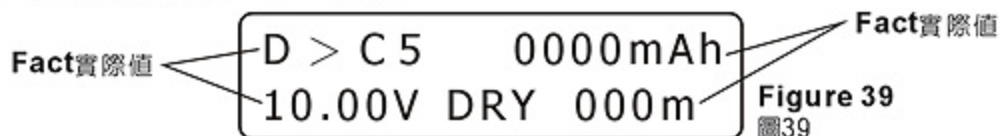
**For Nickel cadmium charge and discharge (4.0), the termination method and the setup of discharging current are the same. (Refer to Figure 38)**

放電電流調整及結束方法/充電電流調整及結束方法與4.0章節鎳鎘電池的充電和放電相同，其啓動等方式也一樣。循環工作時顯示器顯示如圖38



**In Figure 38, D represents discharge and C represents charge. If the charger is in the process of discharge, D will glitter by a hertz frequency. If the charger is in the process of charge, C will glitter by a hertz frequency. When the discharge is finished, the charger goes into the process of charge. The value of voltage, current, electric capacity on the screen will be updated to start over. The current will glitter as "DRY" by a hertz frequency for 5 minutes before the charge starts. (Refer to Figure 39)**

圖38中，D代表放電；C代表充電，充電器如工作在放電狀態，D將會以一赫茲頻率閃爍，如工作在充電狀態，則C將會以一赫茲頻率閃爍。當放電程式完成，轉入充電程式時，顯示幕中電壓、電流、電量會刷新重新開始，同時電流顯示一欄在前五分鐘以一赫茲頻率閃爍顯示“DRY”如圖39



**Before the 5-minute, the charger will do the recovery charge by a little amount of current which is 100mA. After the 5-minute, the charger starts to charge battery according to the setting of current. The "DRY" will disappear and show the value of charging current.**

在這前五分鐘充電器以100mA小電流對電池進行修復性充電，五分鐘後再以所設置的電流充電，“DRY”字母消失，顯示充電電流。



**1. There is no 5-minute from charge to discharge.**

**2. The value of times of cycle will be reduced when a cycle is finished.**

1. 由充電轉入放電程式時，是不須五分鐘這項的。
2. 當完成一次循環時，螢幕中部的次數值將相應遞減。



## 8.1 Parameters setup in Ni-MH battery charge 鎳氫電池的充電參數設置

Press "TYPE/STOP" to enter the Ni-MH battery type interface. (Refer to Figure 40)

按 "TYPE/STOP" 進入鎳氫電池類型介面，顯示器顯示圖40



Battery Type  
Ni MH Batt

Figure 40  
圖40

Press "ENTER" again to enter the Ni-MH battery charge interface. (Refer to Figure 41)

進入介面後按 "ENTER" 進入鎳氫電池充電介面顯示器顯示圖41



Ni MH Charge  
Current 1.0A

Figure 41  
圖41

Fact實際值

Other operations are the same as Nickel cadmium battery charge and discharge (4.0).

其後的所有操作與4.0章節鎳鎘電池的充電和放電都一樣。

## 9. OTHER INFORMATION 其它資訊

9.1 Current will be updated at a rate of 0.1A per second.

9.2 Voltage will be updated at a rate of 0.01V per second.

9.3 Electric capacity will be updated at a rate of 1mAh per second.

9.4 When all the process is finished, the last screen will be kept until "TYPE/STOP" is pressed.

9.1電流(Current)0.1A解析度，1秒鐘刷新一次。

9.2電壓(Volt)0.01V解析度，1秒鐘刷新一次。

9.3電量(mAh)1mAh解析度，1秒鐘刷新一次。

9.4充電器因程式結束，其最後畫面將會保持，直到按 "TYPE/STOP" 退出。

## 10. OPTIONS FOR PROTECTION FUNCTIONS 保護功能

## 10.1 Circuit disconnection protection 線路斷開保護

When in the process of charge/discharge, the circuit is disconnected by someone or by any other reasons. In this situation, the charger will terminate charge/discharge, and the buzzer beeps to indicate a fault. (Refer to Figure 42).

當充/放電過程中，人為或其他原因被充電線路斷開，此時充電器將拒絕充/放電，蜂鳴器警告提示，顯示器顯示圖42



Batt circuitry  
Disconnection

Figure 42  
圖42

## 10.2 Safety timer protection 定時安全保護

When the safety timer protection function is on (Refer to Figure 2.2), the charger cannot go into any process of charge/discharge ("Stand by" is an exception). In the process of charge/discharge, if the charger detects the predefined parameter, it will shut down for protection (Refer to figure 43).

當定時功能打開時，(見2.2充電器定時調整)充電器無論進入何種程式工作(待機例外)，工作時間達到所設定的參數，即啟動保護關機，顯示器顯示圖43



Time Over.

Figure 43  
圖43

In this situation, the charger would terminate charge/discharge. The buzzer beeps to indicate a fault.

此時充電器將拒絕充/放電，蜂鳴器警告提示。

## 10.3 Input power source protection 輸入電源保護

When the input voltage is lower than the predefined parameter (2.4 Input power source with low voltage - auto shutdown setup), the charger shuts down for protection. In this situation, it will not do any charge/discharge. The buzzer beeps to indicate a fault. (Refer to Figure 44).

當輸入電壓低於(2.4輸入電源低電壓關機設置)所設定的參數時，充電器將保護關機，此時拒絕充/放電，蜂鳴器警告提示，顯示器顯示圖44



In Voltage Err.

Figure 44  
圖44



If the input voltage is higher than 15.5V (DC) or ripple voltage is higher than 500mV (AC), the charger will also turn on the protection function. (Same as above)

當輸入電壓高於15.5V (DC)或紋波電壓高於500mV (AC)時，充電器也會進入保護狀態，顯示同上。

## 10.4 Output overload / Short circuit protection 輸出過載/短路保護

When in the process of charge/discharge, there is overload because of some reasons. The charger will terminate charge/discharge. The buzzer beeps to indicate a fault. (Refer to Figure 45).

當工作過程中由於某種原因造成充電器過載，此時將拒絕充/放電，蜂鳴器警告提示，顯示器顯示圖45



Warning:  
Over Loading

Figure 45  
圖45

## 11. BUZZER WARNING INDICATION 蜂鳴器警告提示

If the setting in 2.3 (Buzzer warning setup) is "ON", the buzzer will beep once (0.5 second) whenever the operational keys have been pressed. If any protection function is on, the buzzer will beep to give an indication.

If the setting in 2.3 (Buzzer warning setup) is "OFF", there is no sound at all.

如果(2.3蜂鳴器警告設置)為ON，則每按一下操作按鍵，蜂鳴器都會響一次(0.5秒)；

如果某一保護功能啟動，蜂鳴器警告提示。

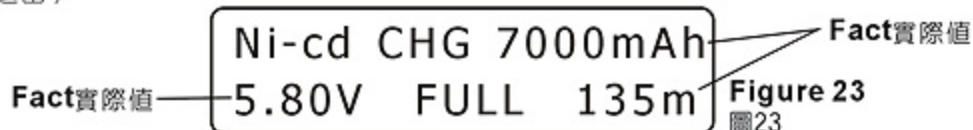
如果(2.3蜂鳴器警告設置)為Off，則無聲。



## 7.3.2 Determination method of charge completion 電池充電完成判定方法

The charger uses the quadratic value of battery voltage increase, which is  $d^2 v/dt^2$ , to check whether to terminate charge. In other words, when  $d^2 v/dt^2$  reaches a certain value, the charger knows the battery is fully charged. When the charger confirms that the battery is fully charged, the buzzer beeps to indicate that the charge is finished. (Refer to Figure 23). The screen will be kept until someone presses key to withdraw.

充電器是採用檢測電池電壓上升的二次導數 $d^2 v/dt^2$ 的方法來判斷是否終止充電，即 $d^2 v/dt^2$ 達到某一定值，則認為電池基本充滿電。充電器確認電池充滿後，蜂鳴器將警告提示，提示充電完成，顯示器顯示圖23（此介面將一直保持，直到人為按動按鍵退出）

Figure 23  
圖23

## 7.3.3 Parameter modifications in charge 充電過程中可改變的參數

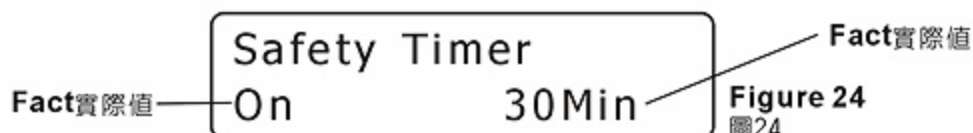
In the process of charge, if press "ENTER", the value of charging current on the screen will glitter by a hertz. Press "DEC" or "INC" to adjust the value of charging current. Press "ENTER" again to withdraw. The charger would charge battery according to the new setting of current. (During the time of setting, the charger would charge battery according to the original setting of current. After press "ENTER", the charger would charge battery according to the new setting of current. In other words, the charger would not stop charge during the time of setting).

When press "ENTER" without pressing "INC" or "DEC" in 3 seconds, the charger will return to the original settings.

In the process of charge, pressing "DEC" cannot stop charge. The monitor would only show safety timer with the amount of time left, which cannot be changed. (Refer to Figure 24)

在充電過程中，若按下“ENTER”，顯示幕中電流值將會以一赫茲頻率閃爍。這時按“INC”或“DEC”鍵可改變充電電流，再按“ENTER”退出，充電器將按新設置的電流充電。（在調整這一期間，充電器還是按原來所設定的電流充電，按“ENTER”退出後才依照新設置的電流充電，也就是說在調整這一期間充電是不會停止的）；若按下“ENTER”，三秒鐘未按“INC”或“DEC”鍵，機器也會退回到原來的狀態。

在充電過程中，若按“DEC”鍵，充電器充電不會停止，而顯示器則顯示安全定時功能選項，但不可改變參數，如圖24

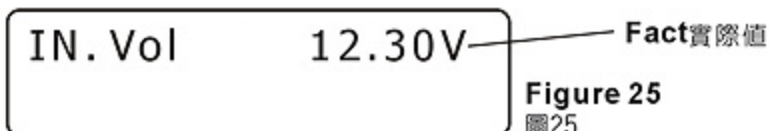
Figure 24  
圖24

The screen will be kept for 3 seconds and then return to the contents of charge.

In the process of charge, pressing "INC" cannot stop charge. The monitor would only show the value of input voltage and the parameters of the battery being charged, which cannot be changed. (Refer to Figure 25)

該介面顯示3秒鐘後自動返回充電顯示內容：

在充電過程中，若按“INC”鍵，充電器充電不會停止，而顯示器則顯示輸入電源電壓和被充電池設置參數選項，但不可改變參數，如圖25

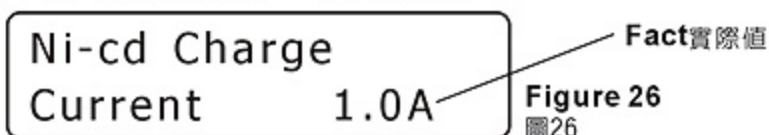
Figure 25  
圖25

The screen will be kept for 3 seconds and then return to the contents of charge.

In the process of charge, press "TYPE/STOP" to stop charge. (Refer to Figure 26).

該介面顯示3秒鐘後自動返回充電顯示內容：

在充電過程中，若按“TYPE/STOP”鍵，充電器充電就會停止，顯示器則顯示圖26

Figure 26  
圖26

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