Tahmazo

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T15

AC/DC CHARGER

POWER UP

COMPUTERIZED PEAK CHARGE, DISCHARGER AND CYCLER

INSTRUCTION MANUAL

T15 AC/DC Manual Contents

T15 AC/DC Power Up Instructions

Features

01 Uses 12V Lead Acid battery, DC11~15V power supply input (not supplied) or AC100~240V wall outlet

02 Capable of charging and discharging
1-14 NiCad or NiMH cells,
1-5 Lithium-Ion or Lithium-Polymer cells, or
2-12V lead-acid batteries

03 Voltage monitoring of the Lithium cell using T6B Lithium Balancer only

04 Adjustable charge current (0.1A~5.0A)

05 Adjustable discharge current (0.1A~1.0A)

06 Microprocessor controlled charging and discharging system:
"Zero delta V"peak detection for NiCd and NiMH batteries
"Constant current/constant voltage" charge method for Lithium-Ion/Po batteries and Pb batteries

07 Programmable cycle mode (Charge to Discharge/Discharge to Charge) up to 5 cycles for NiCd and NiMH batteries

08 2t-line, 16 character LCD with backlight to make the screen clear and legible

09 To protect both the charger and batteries, the maximum charge and discharge currents are automatically limited

10 Zero Current Voltage Check prevents incorrect delta peak auto cut-off caused by open circuit or high resistance/old/faulty battery packs

11 Low and over voltage input warning function-input voltage outside the range 9.5~15.5v causes a warning message "Input Power" to be shown on the display, together with an audible warning

12 In the event of the battery being charged becoming disconnected from the charger, the display shows a warning message "Output Battery Connector Error" along with an audible warning

13 Reverse polarity protection. The display will show "Output Battery Reverse Polarity" with an audible warning alarm. The charger will not power up.

14 Various warning messages for improper input voltage, wrong connections, unsuitable battery condition, reverse polarity on output and input

Specifications

	Description
Input Voltage	DC 11.0~15.0 or AC 100~240V/50~60Hz
Battery Type & Cells	1-14 Nickel-Cadmium cells
	1-14 Nickel-Metal Hydride cells
	1-5 Lithium-Ion or Lithium-Polymer cells (type: 3.6V or 3.7V)
	1-6 Lead-Acid cells (2V per cell)
Charge Current	0.1A~5.0A per 100mA step
Discharge Current	0.1A~1.0A per 10mA step (auto limited to 5W maximum)
Trickle Charge Current	0~200mA
Charge Termination	"zero delta V" peak detection for NiCd/NiMH
	"constant current/constant voltage" for Li-Ion/Po and Pb
Cycling	Charge to Discharge/Discharge to Charge (for NiCd/NiMH only)
Display type	2-line, 16 backlit character LCD

T15 AC/DC Safety Precautions

01 Do NOT attempt to charge incompatible types of rechargeable batteries. This charger is designed to only charge and discharge nickel-cadmium, nickel-metal hydride, lithium-ion, and lithium-polymer batteries.

02 Make sure to place the charger on a firm level surface for charging.

03 Do not attempt to charge batteries at excessive charge currents.

04 Do not use automotive type battery chargers to power the charger.

05 Do not leave the charger unattended while charging. Disconnect the battery and remove input power from charger immediately if the charger becomes hot. Allow the charger or battery to cool down before reconnecting.

06 Do not allow water, moisture or foreign objects into the charger.

07 Do not place the battery or charger on or near a flammable object while in use. Keep away from carpets, cluttered workbenches, etc.

08 Do not cover the air intake holes on the charger as this could cause the charger to overheat.

09 Connect the input leads to a power supply first, and then connect the battery.

10 Do not disassemble the charger.

T15 AC/DC Quick Start

Input Power

T15 can be operated from a 12V lead acid battery, DC 11~15V power supply or AC100~240V wall outlet.

DC Power Supply

Connect the charger's red clip to the positive (+) terminal on the power source, and the black clip to the negative (-) terminal. The charger will display "Input voltage" error message if the input is below 11V, or above 15V. If this happens, please check the input power supply to make sure there is adequate power. (If using a DC power supply, please ensure that the input is at least a 2A regulated power supply.)

AC Power Supply

Connect the AC Plug to a regular AC 100~240V wall outlet

Output battery connections

Two (2) 4mm sockets **RED** and **BLACK** are located on the right side of the charger. Connect the battery charging leads to these sockets with the positive (+) lead connected to the red socket and the negative (-) lead to the black socket.

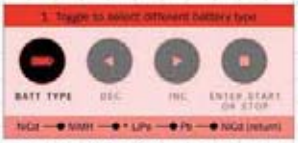
Watch out for:

"No battery" error massage with an audible warning will be displayed if you are trying to start charge without connecting a battery.

"Open circuit" error message with an audible warning will be displayed if a battery becomes disconnected from the charger while charging/discharging is in progress.

"Reverse polarity" error message with an audible warning will be displayed if a battery is connected to the charger in reverse polarity.

T15 AC/DC Quick Start



For the selection of the type of lithium battery, refer to Charging and Discharging Operation – Choosing lithium polymer or lithium ion.

01 Select The Type Of Battery

When the charger is connected to the power supply, the charger will show a battery mode that was last used. If the **Battery Type** button is briefly pressed, the present battery type (NiCd, NiMH, Lithium, or Pb) blinks.

While the existing battery type is blinking, when the **Battery Type** button is pressed, the following battery type modes are shown in the following cycle above.

Starting Charging Or Discharging

Hold the **Enter** button for 5 seconds to start charging or discharging. To stop the charging or discharging process, please the **Enter** button at any time.

Set The Charging/Discharging Current

Press the **Enter** button and a parameter will blink indicating that the parameter can be adjusted. Then press the **INC** or **DEC** button to change the setting of the parameter to the desired value.

To select or cycle to the next parameter, press the **Enter** button again. The blinking will stop if no buttons are depressed for 5 seconds. ('C' denotes Current measured in milliampere hour or mAh)

View Data

You can view the charging or discharging data by depressing the **Battery Type** button for 5 seconds, during or after the charging/discharging operation. The screen display will return to the previous function page after 5 seconds.

Displays During Charge, Discharge, And Cycle

Example of displays

- **CHG** : charge
- **DCH** : discharge
- **C->D** : cycle
- **D->C** : cycle

CHG	**030:25**	**00000**
NC	**+3.00A**	**10.75V**

DCH	**030:25**	**00000**
NC	**-3.00A**	**10.75V**

DELAY TIME
5:00

- **NC** : NiCd
- **NM** : NiMH
- **LI** : LiIo,
- **LP** : LiPo
- **Pb** : Pb

If the **Enter** button is pressed, the charge or discharge can be terminated.

Completion Display

END	**030:00**	**00000**
NC	**100mA**	**10.75V**

In order to move to the main display, press the **Enter** button.

T15 AC/DC Charging And Discharging Operation

Connect the charger's red clip to the positive (+) terminal on the power source, and the black clip to the negative (-) terminal. The last used setting will be displayed.

Selecting The Battery Type

Press the **Battery Type** button until the desired battery type is indicated on the display. Each time the **Battery Type** button is depressed, the charger will beep. The following battery type modes are shown in the following cycle:

NiCd ⟶ NiMH ⟶ * LiPo ⟶ Pb ⟶ NiCd (return)

Choosing lithium polymer or lithium ion

01 When the 'Lipo' battery type is blinking, pressing the **INC** button will cycle the screen to the following:

LiPo CHARGE ⟶ LiPo DISCHARGE ⟶ Lithium Type

02 Then press the **Enter** button and the 'LiPo' battery type will start to blink.
For selection the type of lithium battery:
Lithium Polymer ('LiPo') - Press **INC**
Lithium Ion ('LiIo') – Press **DEC**

03 Once you have selected the type of lithium battery, press the **Battery Type** button once and then **DEC** button to cycle

Selecting The Mode Of Operation

Press the **INC** or **DEC** button until the **CHARGE** (to charge the battery) or **DISCHARGE** (to discharge the battery) display appears. The following shows the screen displays for the different type of batteries. (For cycling of battery, please see CYCLING OPERATION)

	NICAD Battery	NIMH Battery	LIPO Battery	PB Battery
CHARGE :	**NiCd CHARGE C=3.0A**	**NiMH CHARGE C=3.0A**	**LiIo CHARGE C=3000mAh 10.8Vp**	**PB CHARGE C=3.0A 12Vpack**
DISCHARGE :	**NiCd DISCHARGE D=0.50A 4.8V**	**NiMH DISCHARGE D=0.50A 4.8V**	**LiIo DISCHARGE D=0.50A 10.8Vp**	**PB DISCHARGE D=0.50A 12Vpack**

T15 AC/DC Charging And Discharging Operation

Selecting The Charging Or Discharging Current

Press the **Enter** button once to select the 'C=' parameter ('C' denotes Charging Current measured in milliampere hour or mAh). Adjust the value by pressing the **INC** or **DEC** buttons. To cycle or select the next parameter, press the **Enter** button.

Selecting the voltage for lithium and lead acid battery

(This is applicable only for lithium battery and lead-acid battery. The charger will auto-detect the voltage of the battery if they are either NiCad or NiMh)

Press the **Enter** button until the parameter indicating the voltage is blinking. Set the appropriate value of the parameter by pressing the **INC** or **DEC** buttons.

CAUTION: CARE MUST BE TAKEN TO SET THE APPROPRIATE VOLTAGE FOR THE LITHIUM BATTERIES.

Voltage For Lithium Battery

Pack	Lithium Ion (v)	Lithium Polymer (v)
1-cell	3.6	3.7
2-cells	7.2	7.4
3-cells	10.8	11.1
4-cells	14.4	14.8
5-cells	18.0	18.5

Once all the parameters have been set, press and hold the **Enter** button for 5 seconds to start. The operation can be aborted anytime by pressing the **Enter** button.

T15 AC/DC Cycling Operation

Cycling operation will charge and discharge(C-D) or discharge and charge(D-C) the battery pack, over the desired number of times or cycle. Cycling operation is performed only for NiCd/NiMh batteries.

First, connect the charger's red clip to the positive (+) terminal on the power source, and the black clip to the negative (-) terminal. The last used setting will be displayed.

Selecting The Battery Type

Press the **Battery Type** button until the desired battery type is indicated on the display. Each time the **Battery Type** button is depressed, the charger will beep. The following battery type modes are shown in the following cycle:

NiCd ⟶ NiMH ⟶ * LiPo ⟶ Pb ⟶ NiCd (return)

Selecting The Mode Of Operation

Press the **INC** or **DEC** button until the 'CYCLE' displays with the following

- 'C-D' - to charge and then discharge the battery or
- 'D-C' - to discharge and then charge the battery.

Press the **Enter** button to confirm. Then press the **INC** or **DEC** button to select the type of cycling operation you will like to perform.

T15 AC/DC Cycling Operation

The following shows the different screen displays for the Nicd and NiMh.

	Nicd	NiMh
CHARGE, then DISCHARGE :	**NICd CYCLE C->D 5 C=3.0A D=0.50A**	**NIMH CYCLE C->D 5 C=3.0A D=0.50A**
DISCHARGE, then CHARGE :	**NICd CYCLE D->C 5 C=3.0A D=0.50A**	**NIMH CYCLE D->C 5 C=3.0A D=0.50A**

Selecting the number of cycles

When you have selected the mode of operation, press the **Enter** button to confirm. The number of cycles will blink. Set the number of cycles to perform by the **INC** or **DEC** button, up to a maximum of 5 cycles.

Selecting the charging and discharging current

Press the **Enter** button once to select the 'C=' parameter ('C' denotes Charging Current measured in milliampere hour or mAh). Adjust the value by pressing the **INC** or **DEC** buttons. To cycle or select the next parameter, press the **Enter** button.

Repeat this process for setting the discharge current 'D=' parameter ('D' denotes Discharge Current).

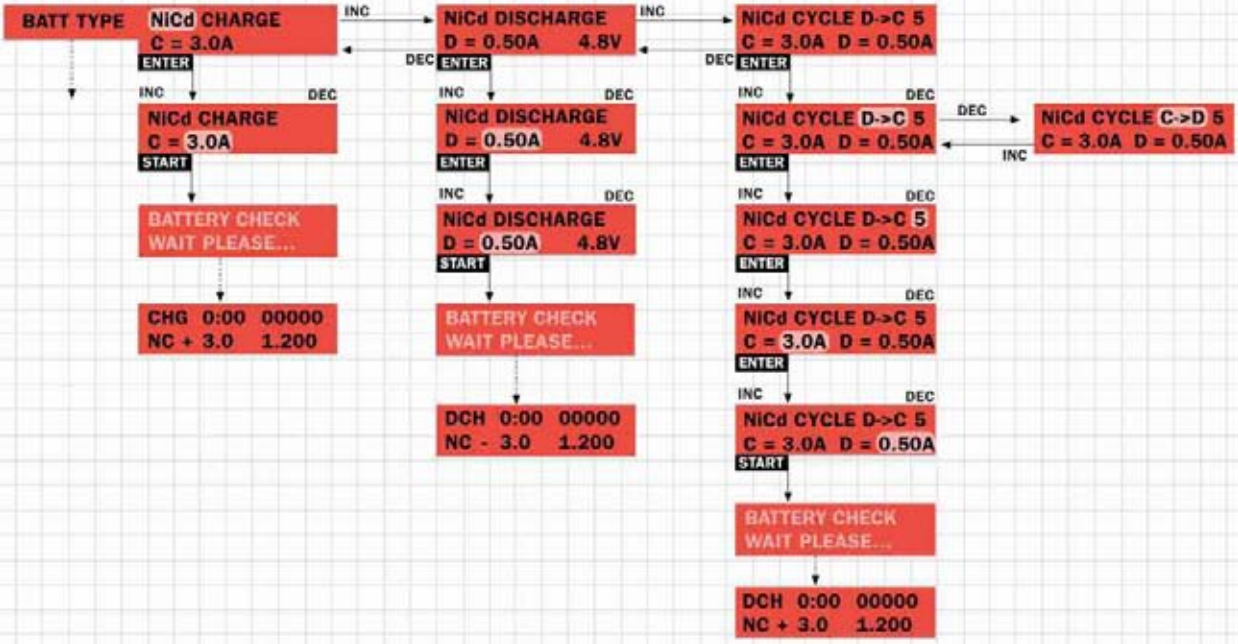
Once all the parameters have been set, press and hold the **Enter** button for 5 seconds to start. The operation can be aborted anytime by pressing the **Enter** button.

Voltage monitoring feature

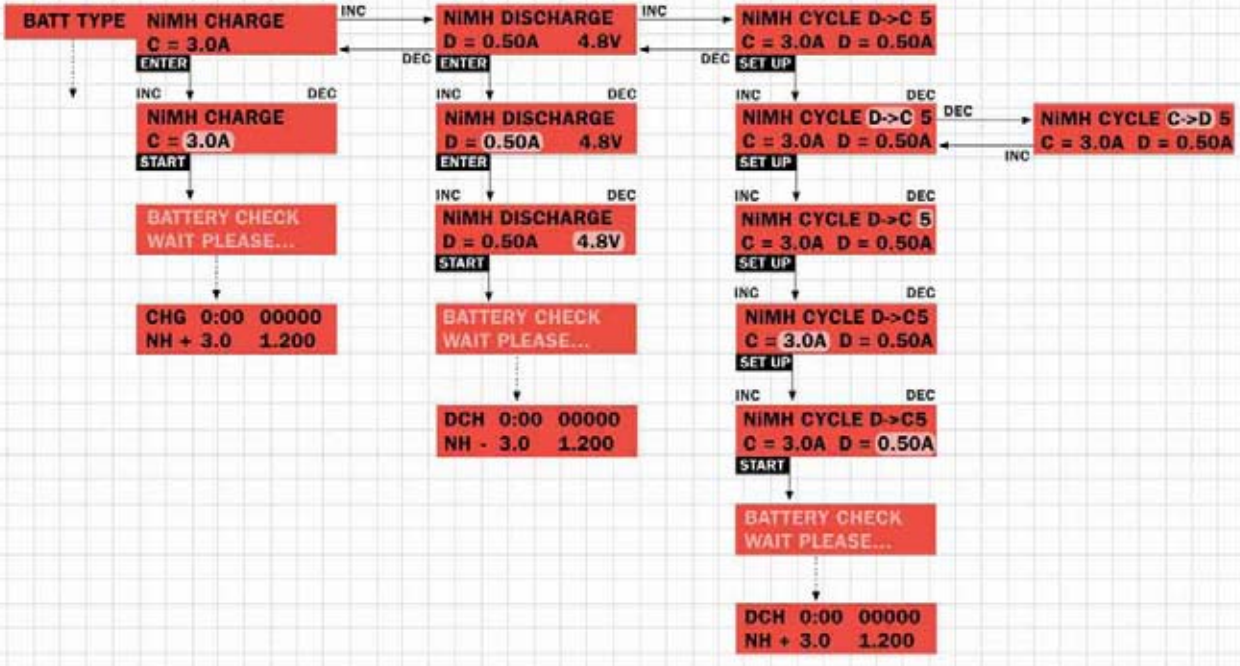
When the Tahmazo T6B Lithium cell balancer is connected to the charger via an interface cable, each cell voltage will be shown on the screens above while the T6B is balancing the battery pack.

When the charger is in operation and the **Battery Type** button is pressed, this data display also is shown on the screen.

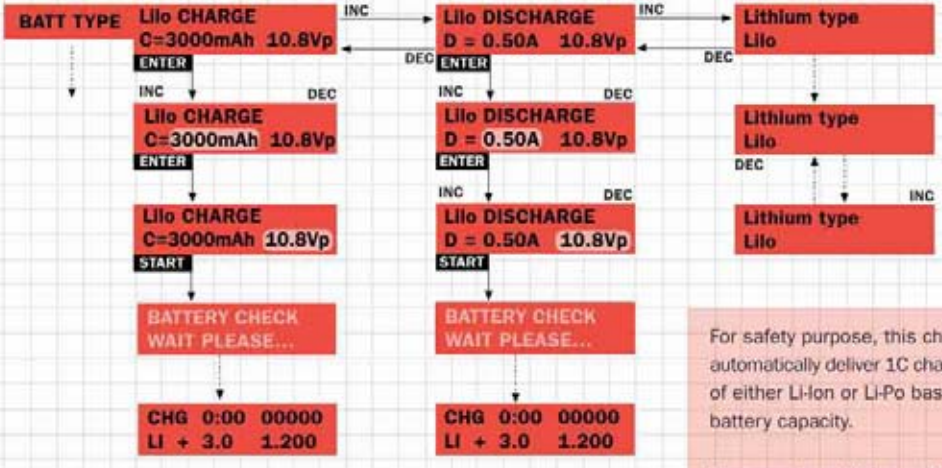
T15 AC/DC Quick Reference
NiCd MODE



T15 AC/DC Quick Reference
NiMH MODE



T15 AC/DC Quick Reference
Li-Ion & Li-Po MODE

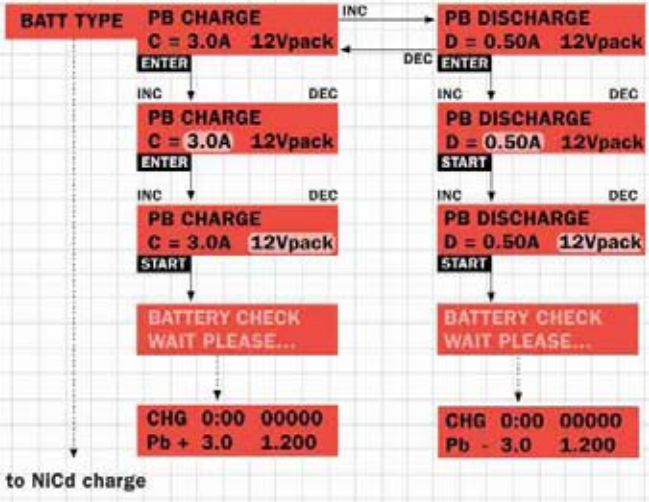


For safety purpose, this charger is designed to automatically deliver 1C charge rate to the batteries of either Li-Ion or Li-Po based on user selected battery capacity.

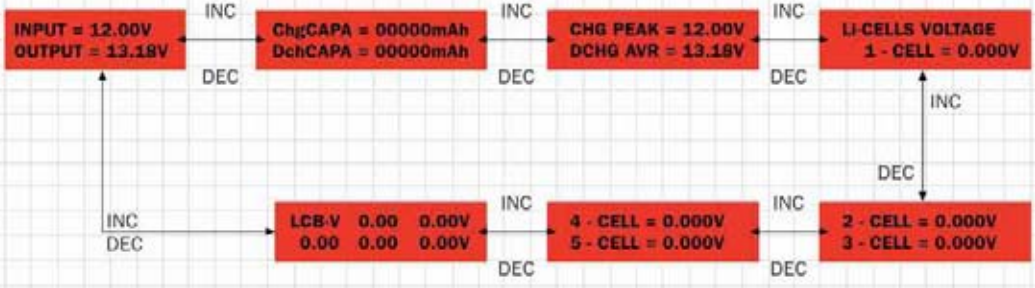
For example, a lithium polymer cell of 1500mAh capacity should be charge at 1C of battery current or 1.5Amps.

Note: The maximum voltage for Li-Ion batteries is 4.1V per cell, and 4.2V per cell for Li-Po batteries. Therefore, it is extremely important to choose the proper lithium battery type to be charged. Unless otherwise, it may cause very serious damage to the batteries and the surrounding area!

T15 AC/DC Quick Reference
Pb MODE



Data Display



When the **Battery Type** button is pressed for over 3 seconds, the data view will be displayed as above.

Data displays can be scrolled left and right by **INC** & **DEC** buttons. After 3 seconds when no buttons are depressed, this display will disappear.

Error Messages

INPUT BATTERY VOLTAGE ERROR	When input voltage is under 11.0V or exceeds 15V.
NO BATTERY	When a battery is not connected to the charger's output.
OUTPUT BATTERY REVERSE POLARITY	When a battery is connected to the output of the charger in reverse polarity.
OUTPUT CIRCUIT PROBLEM	When the charger's circuit has a problem.
CHECK THE BATT OPEN CIRCUIT	When a battery becomes disconnected during an operation.
CHECK THE BATT OVER VOLTAGE	If wrong voltages are set while charging Lithium or Pb batteries.
CHECK THE BATT LOW VOLTAGE	If **wrong voltages are set** or **batteries are over discharged** while charging Lithium or Pb batteries.