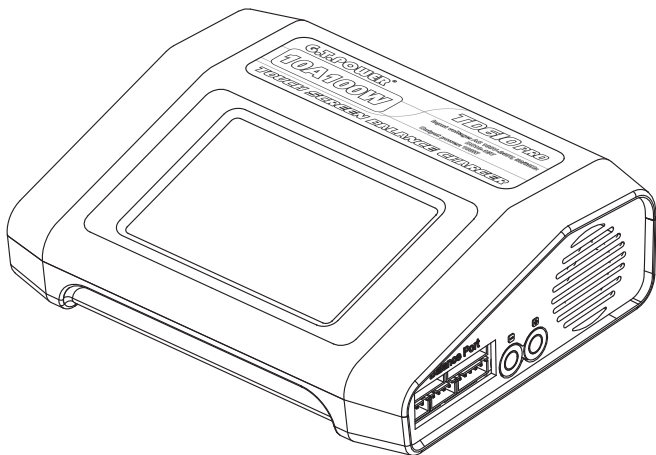


TD610 PRO

— Charger Manual —



Balance Charger with
Colorful Touch Screen

10A 100W

G.T. POWER®

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1. Specification

Input Voltage	DC. 10-18V
	AC. 100-240V
Charge Current	0.2-10A
Discharge Current	0.1-3A
Charge Power	Max.100W
Discharge Power	Max.8W
Balance Current	Max.0.4A
Balance Tolerance	± 0.01V
Charging cells/count	NiMH/NiCd 1-14cells
	LiPo/LiHv/LiFe/Lilon 1-6cells
Pb Battery Voltage	2-20V
Weight	456g
Dimension	164*133*50mm

2. Features

【Optimized operating software】

Touch screen controls displayed information. New system interface with humanity experience. It can prevent from over-charging which might lead to an explosion. These can be set as user's option. It provides best convenient balance port for Lithium batteries such as port 2S, 3S, 4S, 5S and 6S.

【High-Power and High-Performance circuit】

The max. output power is 100W, the max. charge current is 10A and the max. discharge current is 3A. Furthermore, the unit works properly without any problem under such power thanks for the high efficient cooling system.

【Balance voltage for Lithium battery Pack】

There is a special function for Lithium battery voltage balance inside. It does not require extra balancer to balance voltage when charge lithium batteries (LiIo/LiPo/LiFe/LiHv).

【Accept various types of Battery】

It is compatible with LiIo, LiPo, LiHv, LiFe, NiCd, NiMH and Pb battery. They have different characters due to their different chemistry. Select the corresponding program, set parameters based on their types and specifications, and then you can start to charge/discharge.

【Lithium battery “Fast” and “Storage” Mode】

Fast Charge reduces the charging time of Lithium battery and “Storage” mode makes batteries storage for a long time.

【Maximum Safety】

Delta-peak sensitivity: It's an automatic terminal process for charging current. The principle which works as it will stop charging when the battery voltage increases to the highest and start to drop. (NiCd/NiMH).

Capacity Limit: Multiple charging current by time, you will get the capacity. Under setting the maximum value, if the charging capacity exceeds the limit, the process will be terminated automatically.

Temperature Limit: The temperature of battery will rise by its internal chemical reaction. If you set the temperature limit, the process will be expired forcibly when it reach to the limit. (This function requests to connect a temperature sensing line)

Charge time limit: You can control the charge time to avoid any possible over-charge/over-discharge.

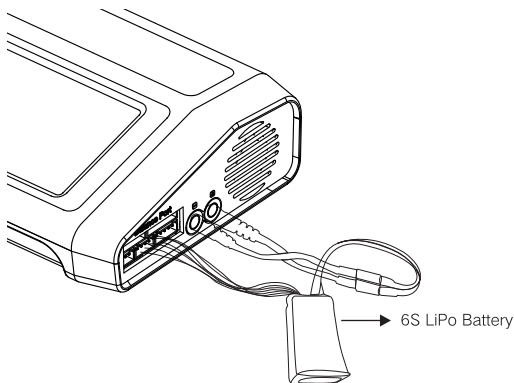
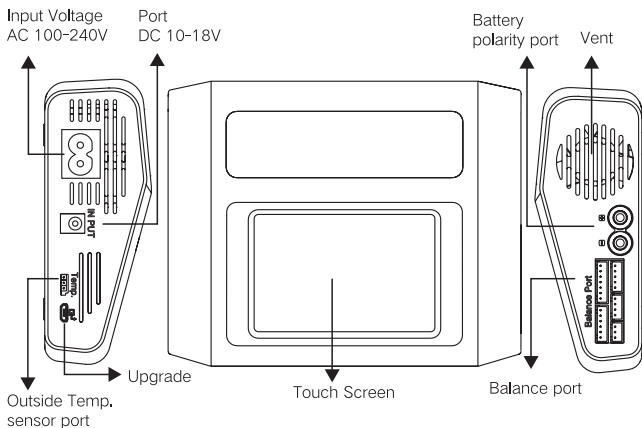
Input voltage monitor: Monitor input voltage to protect the battery from damaging when the charger input power is not enough, and the process will ended automatically when the voltage drops to the lowest limit.

Automatic cooling fan: During charging/discharging, the electric cooling fan will start to work when the inner temperature is too high.

【Cyclic charging/discharging】

Perform 1 to 9 cycles of NiCd/NiMH battery charge/discharge continually for battery refreshing and balancing.

3. Exterior of the unit



4. Warnings and Safety notes

- Never leave the charger unsupervised when it's connected to the power supply. Please terminate the process immediately if there is any malfunction, and check this Manual or ask for professional person.
- Keep away the unit from dust, humidity, direct sunlight and vibration.
- The unit circuit is designed by 10-18V for DC input and 100-240V for AC input only.
- Please place charger and battery on the stable, flammable proof and anti-conductor surface. Never place them on car seat, carpet or similar place. Keep unit far away from inflammable and explosive area.
- Never block or cover the cooling-vent of unit to keep well-ventilated. Please set up parameter of battery correctly. Otherwise, the battery may be damaged. Especially for Lithium battery, it may cause a fire or an explosion by over-charging.

NiCd/NiMH	Voltage Level :	1.2v/cell
	Allowable fast charge current:	1C~2C depends on the cell performance
	Cut off level of Discharge volt. :	0.85v /cell (NiCd), 1.0v/cell (NiMH)
Lilo	Voltage level :	3.6V/c
	Max. charge voltage:	4.1V/cell
	Allowable fast charge current:	1C or less
	Cut off level of Min. discharge voltage:	2.5V/cell or higher
LiPo	Voltage level :	3.7V/cell
	Max. charge voltage:	4.2V/cell
	Allowable fast charge current:	1C or less
	Cut off level of Min. discharge voltage:	3.0V/cell or higher
LiHV	Voltage level :	3.8V/c
	Max. charge voltage :	4.35V/cell
	Allowable fast charge current :	1C or less
	Cut off level of Min. discharge voltage:	3.0V/cell or higher
Pb (Lead-acid)	Voltage level :	2.0V/cell
	Max. charge voltage :	2.46V/cell
	Allowable fast charge current :	0.4C or less
	Cut off level of discharge voltage:	1.50V/cell or higher

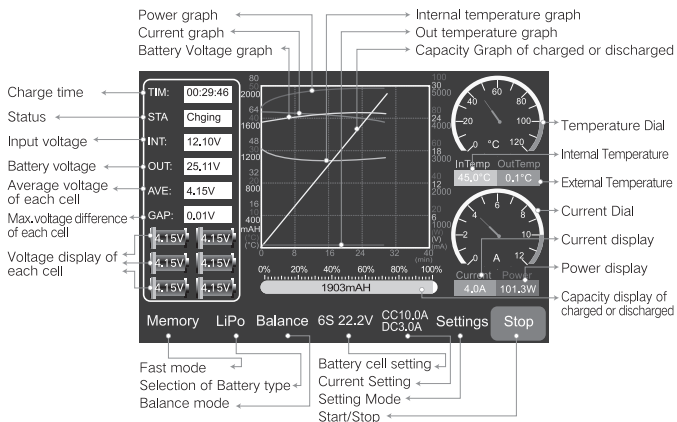
- To avoid short-circuits between the wires, **always** connect charge cable to the unit **firstly** and then connect to battery. Reverse the sequence when disconnecting.
- The capacity and voltage of Lithium battery pack should be verified **clearly**. It may be a mix of **parallel** and series connections. In **parallel** connection, individual cell capacity **multiply** by cell count is the pack capacity, and the voltage of pack is same. Unbalanced voltage in **parallel** connection may cause a fire or explosion in charging process. We recommend you compose the Lithium battery pack in series.

Discharge

- According to the rest of battery capacity or lower voltage of battery to set up discharge parameter. **Please** pay attention on the discharge process same with charging when discharge the battery. **Please** set nominal discharge voltage **correctly** to avoid over-discharging. The voltage of Lithium battery could not be lower than min. voltage, otherwise the capacity would be reduced or damaged the battery permanently. Generally, the Lithium battery is not necessary to be discharged.
- Some Batteries have memory function. If the capacity is partly used, they will "remember" it and use the part of capacity **only** next time. This is "Memory" function. Both NiCd and NiMH batteries have memory function. They prefer to complete cycles and be **fully** charged until used up. The memory function effect of NiMH battery is not good as NiCd battery.
- Lithium battery should be **partial** discharged instead of **fully** discharged. Frequently full discharge should be avoided if possible. **Instead**, please charge the battery regularly or keep the nominal voltage.
- A brand-new NiCd battery pack should be charged and discharged **circularly** for 3-5 times or more, and the capacity of pack would be the optimized status.

Those warnings and safety notes are particularly important. Please follow the instruction for maximum safely. Otherwise, the charger and battery would be badly damaged. It may cause a fire, lead to human injury or property lose too.

5. Flow Chart Instruction



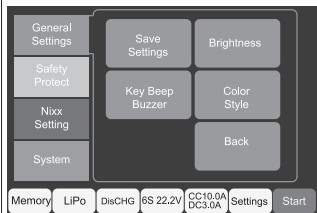
TIM : Charge time	INT : Input voltage
AVE : individual cell cut off voltage	Gap : Max. difference of voltage between each cell
STA : Indicate charge status	INTemp : Internal temperature of charger
OUT : Total voltage of battery pack	OutTemp : External temperature of charger
Current : Charge/Discharge current	Power : Charge/Discharge power
Memory : Fast Mode	LiPo : Battery type
Balance : Balance mode	6S 19,8V : Battery cells and total voltage
CC : Charge current	DC : Discharge current
Settings : Setting	Start : Start/Enter

Click Battery Voltage, Current, In.Tep, Power and Capacity, it could turn on or turn off data and graph, and system default to display all of the information.

6. Parameter Set up (Users' setting)

It would display as default in first time operation. All of the "Setting" options could be revised if necessary. Click the parameter in "Setting" menu, and enter to the option, save it after modified, and then go back to last page or modify other parameters.

Regular Settings



Save Settings

This multi-function smart charger could storage the setting data of each program. It could store 8 counts battery data for each battery type, includes many individual data such as battery cells, charge current and so on. There is no necessary to set up battery parameter again if charge or discharge next time. It's easy to operate and useful.

Brightness

This program is to adjust the brightness of screen.

Key Beep Buzzer

When turn on the button sound, there is sound confirming operation after clicking the touch screen each time.

When turn on the warning sound, there is warning sound in different situation.

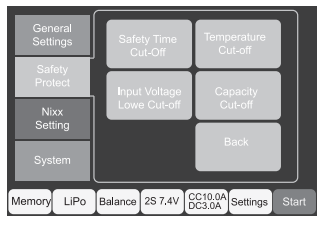
Color Style

This program is to select the color of main page. There is 5 colors in total, you could set the color according to your favor. Click corresponding color to set, and click any other button to leave this page.

Back

Click Back button, and back to last page.

Safety and Protection setting



Safety Time Cut-off

When turning on, the charger start to work, and safety timer start to work too. The range of safe time is 1-300 mins. If the system is error or it could not detect the battery when it's fully charged, the safety timer would protect the battery from over-charge. The safe time should meet battery charge saturation.

Temperature Cut-off

There is a 3pin port in the left of charger to connect temperature connection wire. Place the temperature sensor close to the surface of battery to detect the temperature. The range of available setting temperature is 40 to 80 degrees centigrade. To avoid damage by overheating or even worse result, it will stop charging/discharging when monitored temperature exceeds the setting value.

InputVoltage Low Cut-off

Input DC voltage is 10-18V, this program is to detect input voltage automatically. To protect the input terminal, the system will stop the program automatically if the voltage is lower than setting value.

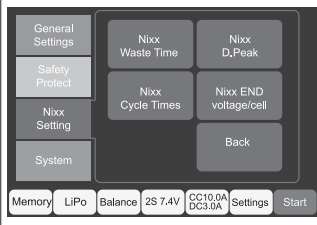
Capacity Cut-off

This program has set up max. charge capacity, and the battery will be supplied when charging. When the capacity value is set (setting range is 1Ah-20Ah), the program will stop (to charge) automatically if it could not monitor the peak value of voltage or safety timer stops to work with complex reasons.

Back

Click Back button, and back to last page.

NiMH and NiCD battery setting flow chart



Nixx Cycle Time

Batteries charge and discharge circularly. The battery will be warm after charged or discharged. Please set a delayed process after every charge and discharge to make sure battery is cool down before next process. Time range is 1-60mins.

Nixx D.Peak

Automatically charge strike current. It 's an automatically turn off program of charge current. It works that turn off charge current to finish charging when battery voltage reaches to the peak and then comes down. It would be over-charged if setting peak current is too high (range is 1-15mV), and the system may stop charging in advance if the setting peak current is too low. (NiMH default to 7mV; NiCd default to 12mV)

Nixx Cycle Times

Set cycle times and the sequence of charge and discharge. Set cycle times (1-10)

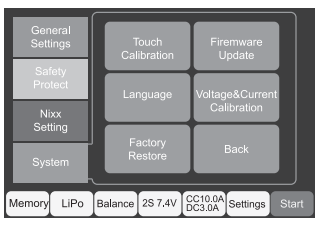
Nixx cut-off voltage/cell

Set cut-off voltage for each cell of NiMH/NiCd battery to protect the battery., the setting range is 700mV-1200mV.

Back

Click Back button, back to last page.

System Settings



Touch Calibration

Calibrate when the touch place is deviation during operation. Click "Confirm" and enter to calibration surface, and press arrow marks in the 3 corners separately and constantly. To finish calibrate one by one, and go back to main surface automatically after it's finished.

Firmware Update

Display the version No., and update the firmware and version according to the closest information from GT official website.

Notes: If it's power off suddenly during updating, please press the middle of touch screen constantly, then power on the unit and continue to update.

Language

Click it and enter to select corresponding language.

Voltage & Current Calibration

User could calibrate the voltage and current of unit. If you give up to calibrate by special issues during calibration, the unit will work properly after power off and reset.

Factory Restore

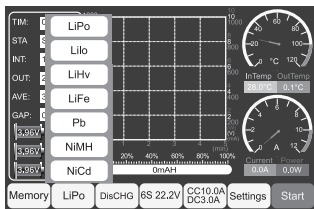
All of parameters will restore factory default setting.

Back

Click Back button, and back to last page.

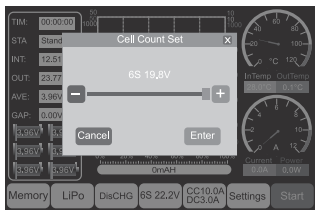
7. Battery parameter set up

7.1 Select Battery type



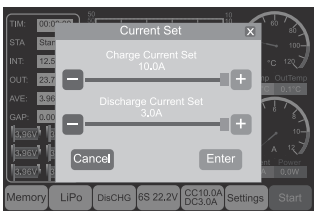
This unit is a smart multi-function charger. And it supports several types of batteries such as LiPo, LiFe, LiHv, LiIo, Pb, NiMH and NiCd. Normally, it's marked battery type in the outside of battery. Please confirm the battery type before use the charger, and click "LiPO" in the main surface, and then you would find 7 types of battery in total. Click the correct battery type which you would like to charge or discharge. For example, select LiPo Mode for Lithium battery.

7.2 Battery cell count setting



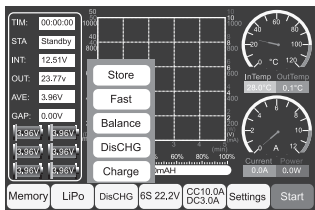
Click battery set button, refer to above image, click “-” or “+” or the slide iron to set the cell count of battery. Please make sure the setting cell count is exactly same with actual battery, otherwise the charger will detect charge error and you have to reset. Click Enter button if you finish setting and back to last page. Click Cancel button if you would like to cancel,

7.3 Battery current setting



Click Current Setting button, Charge Current in the top side to set charge current, and Discharge Current in the bottom to set discharge current. Click Enter to confirm and back if finish setting, or click Cancel to cancel set.

8、Lithium battery (Lilo/LiPo/LiFe/LiHv) Program



These programs are only for charging and discharging of Lithium batteries which nominal voltage is 3.3V, 3.6V, 3.7V, 3.8V. The batteries request different charge mode, CV and CC. The charge current is different due to the difference of battery capacity and performance. The last charge current is very important too. It should match with charge voltage: LiFe:3.6V LiIo:4.1V,LiPo:4.2V, LiHv : 4,35V. Please set the battery according to

the battery capacity and performance when start to charge. Please set the correct charge current and nominal voltage of different battery type.

⚠ Special Warning: This LiHV mode support 4.35V Lithium battery only. This function is not available for any other battery type, do not charge battery such as LiPo, Lilon or LiFe which voltage is 4.20V or the cut-off voltage is under 4.20V. Otherwise it may cause fire or explosion.

Charge

Select correct battery type, and click battery cell setting. Set the battery cells according to the actual situation. Click CC button to set charge current (0,2-10A). Click Start to enter charge mode. When it starts to charge, the system will detect battery automatically. Please check the battery connection when it shows error information of "connection break". It would show the charge status during charging. It would stop charge when it finishes charging automatically (there is warning tone when it finishes charging) or click "Stop" button.

Discharge

The typical purpose of discharging is to confirm the rest capacity or healthy condition of battery. To avoid over-discharging, please set up the right rated discharge voltage before you discharge the battery. The voltage of Lithium battery shouldn't be lower than the lowest voltage. Otherwise, it will lead to fast damage of capacity. Normally, it's not necessary to discharge Lithium battery. For safety reason, the setting discharging current could not exceed the nominal max. discharging current by battery manufacture. The rated voltage could not be lower than the recommended level from battery manufacture to avoid over-discharging.

When the setting parameter of battery is same with charger, click DC button to set discharge current. Click Start button to discharge Lithium battery and click Back button to back.

Balance charge

To make the voltage of each cell to balance after charging, internal system would monitor the voltage and control the current of each cell to balance charge. You have to connect the battery to output port of charger, and also connect to the balance port when charging.

Fast charge

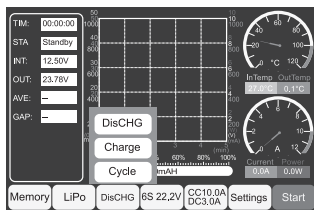
The charging current would be smaller and smaller as the charging finished. Fast charging program would finish charging in advance and omit some CV and balance process.

Actually, the charging current would be 1/5 of initial value when the process is finished. The charging capacity may be smaller than regular charging capacity, but the charging time would be decreased.

Storage mode

This program is to adjust each type of Lithium battery's voltage to corresponding level (LiPo:3.85V, LiHv:3.85V, Lilo:3.75V, LiFe:3.3V). And it would be suitable for long time storage. The process would discharge Lithium battery if the initial voltage is higher than storage voltage. On the contrary, it would charge the battery.

9. NiMH/NiCd Battery Program



It's designed to charge and discharge NiMH/NiCd battery in RC controller.

9.1 Charge NiMH/NiCd battery

Select NiMH/NiCd battery and enter to setting surface of charge parameter. Set the correct battery cells and charging current. Click "Start" constantly 2 seconds and start to charge. System would detect battery when start to charge. For example, please check the battery connection if it shows error message "Connection Break". The screen will display current charging status. You may wait for the program stops automatically (there is warning tone when finish charging), or click "STOP" button to stop charging.

To avoid any safe problem by temperature changing, please connect to outside temperature sensor when charge NiMH battery.

9.2 Discharge NiMH/NiCd battery

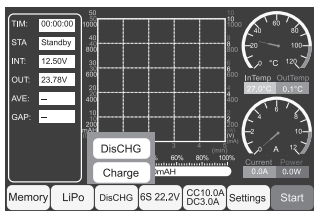
Click DisCHG button to select discharge program of NiMH battery. After set up cell count and discharge current, click "Start" 2 second constantly and go into discharge program, and then start to discharge. Discharging would be finished when voltage of discharge battery reach to cut-off voltage, or you can stop to discharge and go back by clicking "Stop" button.

9.3 Charge/discharge NiMH/NiCd battery circularly

You could balance, resume and break off battery by using this function. Please set a simple cooling period (1-60min) in the “User Setting” for every time of charge and discharge to avoid battery be over heat. The range of cycle number is 1-9.

Click Setting and go into parameter setting of NiMH/NiCd battery cycle mode. You can set the cycle times, cut-off voltage of each cell and so on. Please refer to setting program instruction for more information.

10. Pb battery program



This program is designed for charging/discharging Pb battery with a rated voltage of 2-20V. Pb battery is completely different from NiMH/NiCd battery. It could transmit lower current only due to the capacity of Pb battery is lower than NiMH/NiCd battery. There is similar limit of current during charging. The current of Pb battery is 1/10 of its capacity. The Pb battery could not be fast charged. Please follow the instruction of battery manufacture to operate.

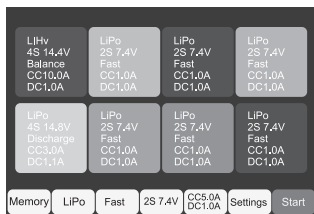
10.1 Charge Pb battery

Select Pb battery program and go into setting surface of charge parameter. Click “Start” 2 seconds constantly after setting, and then start to charge. Please operate refer to parameter setting program during charging. The system will detect battery automatically when it starts to charge. Please check battery connection if it shows error information of “Connection break”. The screen will display current status when charging. It will stop to charge auto. when finish charging (there is warning tone when finish charging), or click “Stop” to stop charge.

10.2 Discharge Pb battery

Select Pb battery program, and click “DisCHG” button to go into discharge parameter setting of Pb battery. Save the setting, and it will start to discharge after click “Start” two seconds constantly. The system will detect battery when start to discharge. Please check battery connection if it shows “Connection break”. It will stop to discharge auto. when finish discharging (there is warning tone when finish discharging), or click “Stop” to stop discharge.

11、Memory Mode



This unit could store 8 counts of batteries, including battery cells, setting charge current and several individual data. It's not necessary to reset battery parameter next time if the battery has been remembered. Click Memory and go into previous setting page. It's easy to operate and useful.

In the regular parameter setting surface, click Save Setting to enter. Click digit mode, it confirms the current recorded parameter is stored when it shows Start. Select the corresponding remembered position when connect to the battery next time. It's not necessary to reset.

12. Warnings and Error Messages

The unit combines multi-function of protection and monitor system to identify the electronic function and status of unit. The screen would show error information automatically with a warning tone when there is error in any case.

1. {" **Reverse connection Error!** " }Reverse connection of polarity, it's error connection of the polarity in output port of battery.
2. {" **Battery Connection Break!** " } Connection break. The connection of battery and output port break, or the charge leads is not connected when output operating during charging or discharging.
3. {" **Short Circuit Error** " }Short circuit of output port, please check the connection wires.
4. {" **Input Voltage Error!** " }Input voltage error. The voltage of input port is lower or higher limited.
5. {" **BATTERY LOW VOLTAGE** " }It detects battery with low voltage. The processor monitors that the voltage is lower than limited voltage in Lithium program. Please check the cells of battery pack.

6. {" **BATTERY HIGH VOLTAGE** "}It detects battery with high voltage. The processor monitors that the voltage is higher than the limited in Lithium program, please check the cells of battery pack.
7. {" **CELL LOW VOLTAGE** "}The battery cell with low voltage. The voltage of one cell from battery pack is too low, please check the battery voltage by sequence.
8. {" **Battery Cell Voltage High!** "}Battery cell with high voltage. The voltage of one cell from Lithium pack is too high, please check the battery voltage by sequence.
9. {" **Time Out Protect!** "}It exceeds the setting range of charge time. Please double check the setting of charge time.
10. {" **Temperature Protect!** "}Temperature is over heat. It has to be cool down due to internal temperature of battery is over heat .
11. {" **Capacity Out Protect!!** "}It exceeds setting range of capacity. Please double check the setting of battery capacity.

13. Warranty and Service

We warrant this product for one year (12 months) from the date of purchase. The guarantee applies only to material or operational malfunctions. During that period, we will replace or repair the unit without any service fee. Invoice or receipt is required. This warranty does not cover the damage due to wear, overloading, improper handling or using of incorrect accessories.



WARNING!



FIRE HAZARD!

NEVER USE CHARGER UNSUPERVISED!

- Batteries pose a SEVERE risk of fire if not properly handled.
- Read Entire operation manual before using charger.
- This unit may emit heat during use.
- Only operate this device in a cool ventilated area away from flammable objects.
- Failure to observe safety procedures may cause damages to property or injury.

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