

TECHNICAL INFORMATION



PRODUCT

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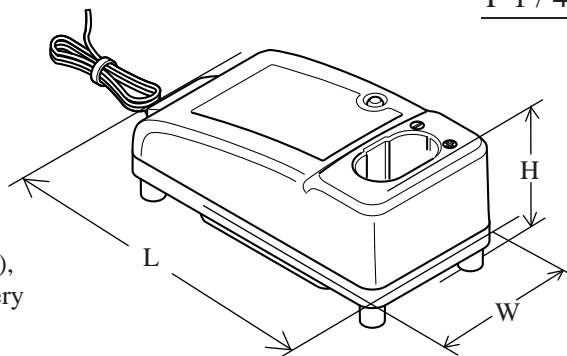
Models No. ▶ DC1414

Description ▶ Charger

CONCEPT AND MAIN APPLICATIONS

Up dated from DC1413, the new DC1414 charges Ni-DCd and Ni-MH batteries from 7.2V to 14.4V.

Packed in the newly designed sharp looking round body, DC1414 has maintenance charge system (Trickle charge system), which maintains the battery always fully charged when the battery is left in the charger after the regular charging process.



Dimensions : mm (")	
Length (L)	193 (7-5/8)
Width (W)	92 (3-5/8)
Height (H)	78 (3-1/16)

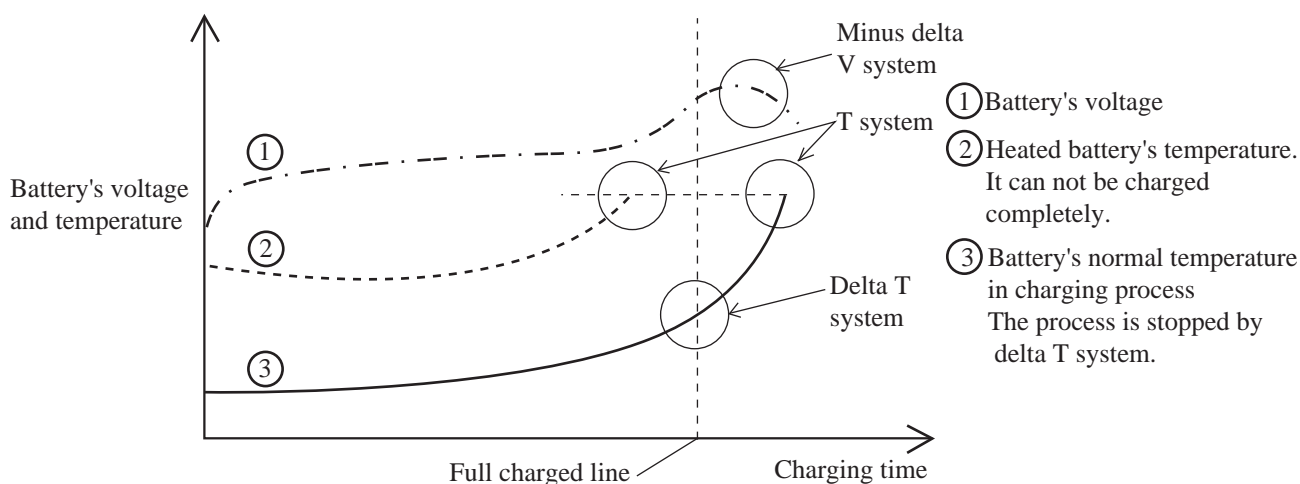
► Specification

Voltage (V)	Current (A)	Cycle (Hz)	Continuous Rating (W)		Max. Output(W)
			Input	Output	
110 - 120		50 / 60	60		
120		50 / 60	60		
220		50 / 60	60		
220 - 240		50 / 60	60		
230 - 240		50 / 60	60		

Output voltage : V		7.2, 9.6, 12, 14.4
Output current : A		2.6
Charging time : minute	Ni-Cd battery of 1.3Ah	Approx. 30
	Ni-Cd battery of 2.0Ah	Approx. 45
	Ni-MH battery of 2.6Ah	Approx. 60
	Ni-MH battery of 3.0Ah	Approx. 70
Protection of circuit from over current		by Fuse

Ideal charging system in this class with the following installations

- * Controlling by micro computer : The installed micro computer senses the full charged condition, and control the optimum way to stop the charging process, from the followings.
 - A) Minus delta V system : Stop the charging process with perceiving the battery's voltage drop.
 - B) Delta T system : Stop the charging process with sensing the change of battery's temperature. (This system is applied to only the charger of 4 terminal-type.)
 - C) T system : Stop the charging process with sensing the battery's temperature which is input in the micro computer in advance. For instance the charging process is to be stopped at 45°C for 1.3Ah battery, and at 60°C for 1.7 - 2.2Ah battery.
 - D) Timer system : Stop the charging process in 150 minutes after starting the charge, if the full charged condition would not be sensed with any of the above 3 systems.



- * Current transforming system : The built-in "High-Frequency Tranceformer" suply the charging current as follows.
 1. Convert alternative current into direct current.
 2. Re-convert the above direct current into alternative current, however, high frequency of approx. 150 - 160 kHz in this stage.
 3. Reduce the voltage to the battery's voltage.
 The feature of "High-Frequency Tranceformer" is light and compact comparing with the existing trance.
- * Constant output current (charging current) : By keeping the output current (Ampere) in the constant level, it is possible to stop the charging process with sensing the battery's voltage drop exactly. Namely it is possible to sense the full charged condition by the above "Minus delta V system".
- * Trickle charging mode : Continue to produce very small charging current (approx. 40mA) for full charged battery, left in charger.

The chargeable batteries

	* Charging time	Capacity	Battery's type No.			
			7.2 V	9.6 V	12 V	14.4 V
Ni-Cd	Approx. 30 min.	1.3Ah	7000 7100 7120	9000 (9050) 9100 9100A 9120	1200 1200A 1210 1220 (1250)	1420 (1450)
	Approx. 40 min.	1.7Ah	7001	9001 9101 9101A	1201 1201A	—
	Approx. 45 min.	2.0Ah	7002	9002 9102 9102A 9122 9122A	1202 1202A 1222	1422
Ni-MH	Approx. 50 min.	2.2Ah	7033	9033 9133	1233	1433
	Approx. 60 min.	2.6Ah	—	9134	1234	1434
	Approx. 70 min.	3.0Ah	—	9135 9135A	1235 1235A 1235F	1435 1435F

<Note> The charging time can be different from conditions to conditions of batteries and room temperature.

<Note> The items with () are the batteries for MAKTEC series models.

Model No. Specifications		MAKITA		
		DC1414	DC1413	DC1411
Chargeable battery voltage		7.2V - 14.4V	7.2V - 14.4V	7.2V - 14.4V
* Charging time : min.	1.3Ah	Approx. 30 min.	Approx. 30 min.	Approx. 40 min.
	1.7Ah	Approx. 40 min.	Approx. 40 min.	Approx. 50 min.
	2.0Ah	Approx. 45 min.	Approx. 45 min.	Approx. 60 min.
	2.2Ah	Approx. 50 min.	Approx. 50 min.	Approx. 65 min.
	2.6Ah	Approx. 60 min.	Approx. 60 min.	Approx. 75 min.
	3.0Ah	Approx. 70 min.	Approx. 70 min.	Approx. 90 min.
Dimensions : mm (")	Length	193 (7-5/8)	193 (7-5/8)	
	Width	92 (3-5/8)	92 (3-5/8)	
	Height	78 (3-1/16)	78 (3-1/16)	
Net weight : Kg (lbs)		0.41 (0.9)	0.41 (0.9)	

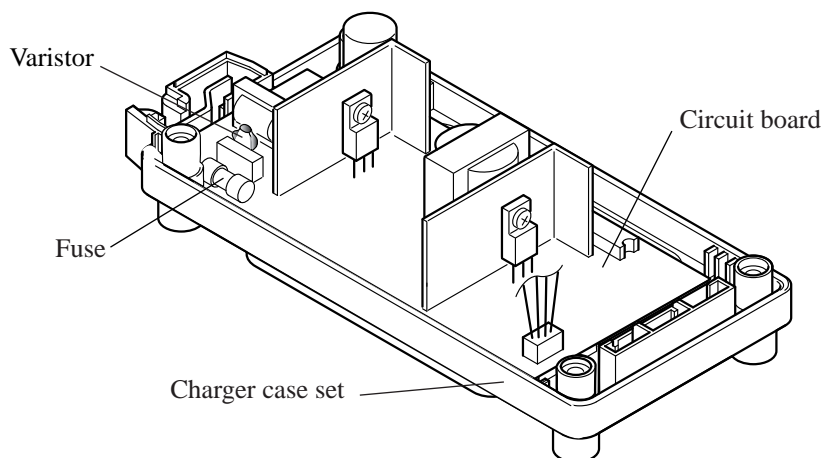
<Note> The charging time can be different from conditions to conditions of batteries and room temperature.

► Repair

- <1> The circuit board can not be repaired, because the circuit itself are molded on the board .
It has to be replaced as a set with new one.
- <2> In case of damaged varistor or fuse, they can be repaired according to the following procedure without replacing the circuit board.

(1) How to find broken varistor

- a. In case that the surface of varistor (ref. to the following illustration) has broken or has become black, and fuse has been cut, the varistor has been damaged.
- b. Varistor can be damaged easily, if the charger is plugged in a double voltage of the rating one.
- c. It is considered that the varistor has been broken for other reasons, if the fuse is broken while the surface of varistor is not damaged. In this case circuit board has to be replaced.



(2) Replacing damaged varistor

- a. Varistor is assembled on circuit board with solder. Remove it from circuit board with soldering iron.

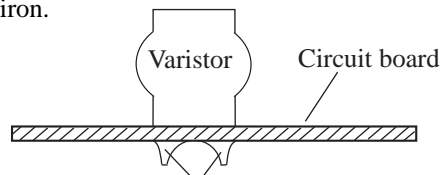


Fig.2

When removing varistor, melt this part with soldering iron and remove varistor.

- b. Assemble new varistor to the circuit board by soldering.
c. Cut the surplus of varistor's wire with nipper.

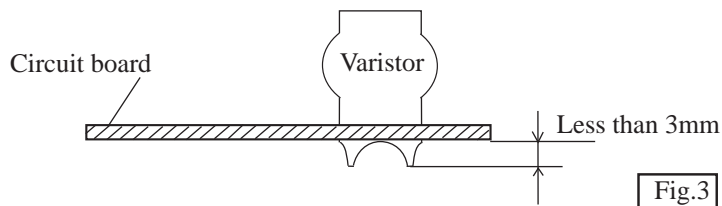


Fig.3

(3) Replacing damaged fuse

- a. Fuse is assembled on circuit board with solder. Remove it from circuit board with soldering iron.
b. Assemble new fuse to the circuit board by soldering.
c. Cut the surplus of fuse's wire with nipper.

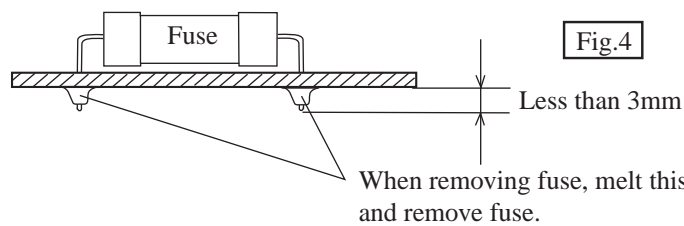


Fig.4

When removing fuse, melt this part with soldering iron and remove fuse.