

Test Report No. SMR(K)/T & M-TR/09-10/014

ELECTRICAL TYPE TEST OF SCR CONTROLLED BATTERY CHARGER

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SAMEER - KOLKATA CENTRE

(Society for Applied Microwave Electronics Engineering and Research)  
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Kolkata 700091, India

February, 2010

SAMEER - KOLKATA CENTRE, KOLKATA - 700091  
ELECTRICAL TYPE TEST OF SCR CONTROLLED BATTERY CHARGER

**Test Request Particulars**

01. Equipment under Test : SCR Controlled Battery Charger  
(Input: 3 $\Phi$ /415V, 50Hz and Output: 110VDC, 20A)
02. Number of test sample : One
03. Model Number of EUT : TYPE-M
04. Serial number of EUT : 1001030
05. Manufacturer : M/s. Electro Service (India),  
Building No.2, Behala Industrial Estate,  
620, D.H. Road, Kolkata - 700 034.
06. Customer : M/s. Electro Service (India),  
Building No.2, Behala Industrial Estate,  
620, D.H. Road, Kolkata - 700 034.
07. Type of test requested : Electrical Type Test
08. Test Method Used : As per Customer's Test Method for Battery Charger Unit.
09. Tested on : 12<sup>th</sup> February, 2010.
10. Test Venue : Customer's premises.
11. Test Witnessed by : Mr. D. Mondal (H.Q.C, M/s. Electro Service (India)
12. Test Request Number : SMR (K)/T & M -TRQ/09-10/014

The Battery Charger has been tested for the parameters reflected in the subsequent pages and that the data reported in this report are valid only for the test samples mentioned above at the time of and under the stated condition of measurement. Particulars of manufacturer / supplier, given in this report, are based on the information given by the customer, along with test request and SAMEER KOLKATA does not assume any responsibility for the correctness of that information for the above mentioned equipment under test.

Test Conducted by:

(J.PRAKASH)  
SA-'C'

Approved By:

(D. DAN)  
Scientist-'C'

Issued By:

(S. CHAKRABARTI)  
Scientist-'C'



Equipment Under Test : SCR Controlled Battery Charger.  
Model No. : TYPE-M  
Serial No. : 1001030  
Customer : M/S Electro Service (India).

**A. Test Equipment Used**

Equipment	Make	Model	Serial Number	Last Cal. Date
Power Quality Analyzer	Fluke	Fluke 43B	DM8410225	27.10.2009
Digital Multimeter	Mastech	M890G	261005	09.06.2009
Relative Humidity Indicator	Bombay Engineering	RH100C	0705RH21	05.06.2008
Digital Real Power Oscilloscope *	Tektronix	THS720P	B054424	23.07.2009
Megger*	Waco	Analogue	950333	26.10.2009
High Voltage Break* Down (Flash) Tester	Agronic	Agronic215	30901	26.10.2009

\*Equipment supplied by customer



Equipment Under Test : SCR Controlled Battery Charger.  
Model No. : TYPE-M  
Serial No. : 1001030  
Customer : M/S Electro Service (India).

**1. Measurement of Output Voltage Regulation and Transient Response of Converter Circuit**

**1.1 Measurement Procedure:**

**1.1.1 Output Voltage Regulation:**

The Battery Charger output Voltage set to 110VDC in No-load Condition at a nominal three phase Input of 415VAC, 50Hz. Output voltage variation measured against the Input Voltage variation of 374VAC to 457VAC (i.e. +/- 10% of 415VAC) at No-load to Full load condition. Maximum deviation from the set value of the output voltage (i.e. 110VDC) have been measured and percentage voltage regulation been computed accordingly.

**1.1.2 Transient Response of Converter Circuit:**

Equipment under test (EUT) stabilized at its nominal input and output voltage with full load condition. Transient Response time that is time taken to come back to its final stabilized output voltage value at full load to no-load condition has been measured at output controlled bridge circuit.

**1.2 Measurement Result:**

**1.2.1 Output Voltage Regulation:**

Input Voltage (VAC)	Load		Output Voltage (VDC)	Voltage Regulation %
	%	Amp		
374	0	0	110.3	+0.27 to - 0.82
415	0	0	110.3	
457	0	0	110.3	
374	50	10	109.6	
415	50	10	109.6	
457	50	10	109.5	
374	100	20	109.1	
415	100	20	109.1	
457	100	20	109.1	

**1.2.2 Transient Response:**

Transient Response time is 240ms.



Equipment Under Test : SCR Controlled Battery Charger.  
Model No. : TYPE-M  
Serial No. : 1001030  
Customer : M/S Electro Service (India).

## 2. High Voltage Break-Down Test

### 2.1 Test Procedure:

Before the test all electronic PCBs are removed from the EUT. Input power supply terminals (i.e. R,Y,B and N) are shorted together and considered as one terminal DC insulation measured at 500VDC between shorted terminal and enclosure Earthing terminal. 2.5KVAC, 50Hz applied between those two terminals for one minute. Leakage current between the terminals has been measured. After the test again DC insulation measured at 500VDC between the terminals.

### 2.2 Test Result:

DC Insulation before the test is 400MΩ and after the test is 500MΩ. There is no breakdown or arcing observed during the test run. Leakage current between the shorted terminal could not measured due to the equipment sensitivity restriction(upto 200mA).

## 3. Temperature Rise Measurement

### 3.1 Measurement Procedure:

Temperature rise measurement carried-out for 08(eight) hours at nominal input and output with full load condition.

### 3.2 Measurement Result:

Time (hrs.)	Ambient (°C)	Cubicle Temp(°C)	Rise (°C)	Thyristor4 (°C)	Rise (°C)	Thyristor6 (°C)	Rise (°C)	Transformer (°C)	Rise (°C)	Blocking Diode (°C)	Rise (°C)	Choke (°C)	Rise (°C)
0	26	26	0	26	0	26	0	26	0	26	0	26	0
1	27	31.4	4.4	55.4	28.4	58.2	31.2	41.1	14.1	36.4	9.4	38	11
2	29.5	35.3	5.8	59.8	30.3	61.3	31.8	51.4	21.9	40	10.5	46.2	16.7
3	29.8	37.8	8.0	59.9	30.1	61.2	31.4	66	36.2	47	17.2	54	24.2
4	30.1	39.9	9.8	59.8	29.7	62.0	31.9	68.9	38.8	48.4	18.3	54.8	24.7
5	30.9	40.6	9.7	60.2	29.3	62.3	31.4	72.6	41.7	49.7	18.8	55.3	24.4
6	31.1	40.8	9.7	60.6	29.5	62.8	31.5	73.0	41.9	49.9	18.8	55.7	24.6
7	31.3	40.5	9.2	60.9	29.8	62.9	31.6	73.3	42	49.4	18.1	56.0	24.7
8	29	38.2	9.2	58.6	29.6	60.6	31.6	71.0	42	47.1	18.1	53.7	24.7

## 4. Short-Circuit Test

### 4.1 Test Procedure:

EUT set to its nominal working condition without load. Then Output terminals ('+ve' and '-ve') were shorted with the help of a MCB and kept for one minute. Short-circuit released after one minute.

### 4.2 Test Result:

There was no blowing of fuse or tripping of electronic circuit. At that time output voltage was 1.04VDC and current limited to 21A. Output voltage returns to its nominal value after releasing short-circuit condition.

