ELECTRONICS REGIONAL TEST LABORATORY (WEST) MINISRTY OF INFORMATION TECHNOLOGY (STQC DTE)	REPORT NO. ERTL (W)/ 2004EMI234		
SUBJECT: EMC TESTING ON CLAMP-ON GROUND RESISTANCE & LEAKAGE CURRENT TESTER.	DATE 6 AUG 2004	PAGE 1	OF 6

1. **SCOPE**

1.1 Service Request No : 20041322

1.1.1 Service Request finalised on : 8TH -JULY-2004

1.2 Requested by (Name and address of manufacturer) : M/s MECO
301,BHARAT INDUSTRIAL ESTATE,
T.J. ROAD, SEWREE,
MUMBAI-400 015.

1.3

Item No.	Description	Qty	Manufacturer and Type No.	Sr. No.
1.	CLAMP-ON GROUND RESISTENCE &LEAKAGE CURRENT TESTER.	01	M/s MECO INSTRUMENTS (P.V.I. LTD./ 4680	03480424

1.4 Test specifications : EN 61326:1998

1.5 Ambient Temperature : (25±2) deg C
Humidity : (55±5) RH

1.6 Test Equipment used:

1. EMI/034 : G-Strip Immunity Chamber
2. EMI/036 : RF Signal Generator
3. EMI/037 : RF Amplifier
4. EMI/048: ESD Simulator

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2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Description

The Clamp-on ground resistance & leakage current tester (EUT) which is used in light Industry & heavy industry environment. It finds application in the industry for monitoring of ground resistance at various positions without disconnecting the grounding system.

2.2 Operating modes during normal testing.

- Open the jaws of EUT and make sure the jaws mating surfaces are clean and free of dust,dirt or any foreign substance.
- Snap (open and close) the jaws of EUT few times to let the jaws sit on the best mating position.
- Turn the power of EUT on, set the rotary switch at Ω position. Do not clamp on to any conductor or open the jaws at this moment or during self-calibration.
- At powering on clamp-on ground tester will do the self-calibration for better accuracy. Users should wait for self-calibration to be done. During the self-calibration, LCD will show CAL7, CAL6, CAL2, CAL1.
- When the ground tester is ready, a beep sound will be heard.
- Clamp on to the electrode or ground rod to be measured. Snap (open and close) the jaws of EUT few times for better accuracy.
- Read the value of R_g (ground resistance) from LCD.
- This is normal operation of the EUT.

2.3 Functional check for all immunity tests.

Normal performance of EUT to be observed during & after the test as per Sr.No.2.2

Signature

6 AUG 2004

3.0 Test Results

3.1 **RADIATED EMISSION**

Test Rationale:

To measure emissions of the EUT radiated into space and to compare them with specified limits to ascertain that the EUT will not disturb other equipment by generating such emissions above a certain limit.

a) **Test Condition**:

Specification	BS EN 55011/CISPR 11
Set-up	As per BS EN 55022/ CISPR 22
Frequency Range	30 MHz – 1000MHz
Test Distance	3 m

EUT in normal operating condition as per Sr. No. 2.2

b) **Reciever:**

Bandwidth	120 kHz
Detectors	QP
Antenna	Bi-Conical (For 30 – 230 MHz) Log-Periodic (For 230 – 1000 MHz)
Configuration	Conforming to CISPR 16-1

c) **Test procedure**

- Emission measurements were carried out in an Open Area Test Site (OATS)
- Ambient measurements carried out first with EUT "off" and peaks noted
- EUT was switched "ON" and Emission peaks noted.
- QP analysis was performed at those frequencies that exceeded QP limit.
- Antenna height and position were changed to maximize Emissions.
- A table of emission and corresponding ambient was then drawn up.
- "Ambient" and "Emission" peaks were compared. Peaks with a difference of less than 5 dB were discarded.

d) **Requirements**

EUT emissions shall meet the following limits

Frequency (MHz)	QP Limits (dBuV/m) QP
30-230	50.00
230-1000	57.00

e) **Observations**

Maximum Emissions were obtained from front portion of EUT in Horizontal Polarisation. No significant emission peaks were found to exceed QP limits. Pl. see Annexure 'A' for details.

f) **Results**

Complied.

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3.2 RADIATED SUSCEPTIBILITY (RS) (Amplitude Modulated)

Test Rationale

To study immunity characteristics of the EUT in the presence of radiated fields generated by intentional emitters like Radio /TV transmitters, wireless equipment and the like by illuminating the EUT by such frequency

a). Test Condition:

Specification	BS EN 61000- 4-3
Set-up	As per BS EN 61000-4-3
Frequency Range	80 MHz – 1000MHz
Modulation	80 % AM @ 1 kHz
Amplitude	10 V/m
Simulation	Using G-Strip RF immunity chamber

EUT in normal operating condition as per Sr. No. 2.2

b). Test procedure

EUT was kept within field generated inside the G- Strip Immunity chamber and operation was monitored during & after the test.

c). Requirements

Operation of the EUT shall be normal during and after the test as per Sr. No. 2.3.
Performance Criterion: 'A'

d). Observations

Normal performance of EUT was observed during and after the test as per Sr. No. 2.3.

e). Results

Complied

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3.3 ELECTROSTATIC DISCHARGE (ESD)

Test Rationale:

To check immunity characteristics of the EUT against Discharge of Static Electricity that may occur when a charged operator touches the EUT.

a) Test Condition:

Set-up	As per BS EN 61000-4-2/ IEC 61000-4-2- 1995
Mode of simulation:	Contact Discharge on conductive surfaces & Air Discharge on non- conductive surfaces
Test level	2
Test Voltage:	**Air Discharge:** 8 kV
No. of Discharges	10
Polarity	Positive and Negative
Points of Discharge	**Air Discharge:** ➢ Insulating surfaces
Simulation	Using ESD Gun

EUT in normal operating condition.

c Test procedure:

- EUT initially subjected to indirect discharge on VCP and HCP.
- EUT was then screened in continuous discharge mode.
- At susceptible points, ten single discharges were applied.

d Requirement:

Temporary degradation or loss of function of EUT is allowed during the test. After the test EUT shall function as intended.

Performance Criterion 'B'

e Observations

Normal performance of EUT was observed during & after the test as per Sr. no. 2.3.

f Results

Complied.

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4.0 **General Remarks:** Nil

REPORT APPROVED BY

HEAD (EMI/EMC)

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Annexure 'A'

RADIATED EMISSIONS TEST RESULTS

SR.NO.	FREQUENCY (MHz)	EMISSIONS OBSERVED (dBμV/m)	LIMITS (dBμV/m)	REMARKS
1	37.14	27.55	50.00	Pass
2	40.50	24.00	50.00	Pass
3	42.95	30.20	50.00	Pass
4	50.51	36.45	50.00	Pass
5	57.01	28.30	50.00	Pass
6	61.78	29.00	50.00	Pass
7	74.52	18.00	50.00	Pass
8	87.19	22.85	50.00	Pass
9	95.52	24.05	50.00	Pass
10	132.00	20.85	50.00	Pass
11	144.30	[illegible]	50.00	Pass
12	162.00	[illegible]	50.00	Pass
13	172.20	[illegible]	50.00	Pass
14	194.00	[illegible]	50.00	Pass
15	196.60	22.95	50.00	Pass
16	199.30	23.45	50.00	Pass
17	616.40	24.70	57.00	Pass
18	666.00	26.40	57.00	Pass

Note: Testing has been carried out at 3-meter test distance & limits have been modified accordingly.

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