



सत्यमेव जयते

TEST / CALIBRATION REPORT

EMC TESTING SELF POWER CURRENT TRANSDUCER



ELECTRONICS REGIONAL TEST LABORATORY (WEST)

MINISTRY OF COMMUNICATIONS & INFORMATION TECHNOLOGY, (STQC Dte.)

Government of India

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ELECTRONICS REGIONAL TEST LABORATORY (WEST)		REPORT NO.	
MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)		ERTL (W)/ 2004EMI 366	
SUBJECT: EMC TESTING ON CURRENT TRANSDUCER, SELF POWER		DATE	PAGE
			OF
			1
			9

26 OCT 2004

1. SCOPE

1.1 Service Request No : ERTL (W)/20042011

1.1.1 Service Request finalised on : 06th - Oct. - 2004

1.2 Requested by (Name and address of manufacturer) : MECO INSTRUMENTS PVT LTD.,
301, BHARAT INDUSTRIAL ESTATE,
T. J. ROAD, SEVEREE, MUMBAI 400 015.

1.3 Item No.	Description	Qty	Manufacturer and	Type No.	Serial No
1.	CURRENT TRANSDUCER, SELF POWER	01 No.	MECO INSTRUMENTS PVT. LTD.	CMT	043535

1.4 Test specifications : EN 61326, 1998

1.5 Lab Ambient : Temperature : (25 +_2) deg.C
Humidity : (55 +_5) % RH

- 1.6 Test Equipment used:
1. CPU/064 : EMI receiver (HP8568B)
 2. EMI/044 : EMI Test System (EFT & ESD Simulator)
 3. EMI/036 : HP8648 RF Signal Generator
 4. EMI/024 : AR 25A100 RF Amplifier
 5. EMI/038 : CDN
 6. EMI/034 : G-Srip chamber
 7. EMI/037 : G-Srip Amplifier
 8. EMI/008 : Antennae Kit
 9. HP Plotter



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		26 OCT 2004	2
		OF	9

2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Description

EUT is Current Transducer (self powered) has an input of 1 A, AC, 50 Hz, single phase and two outputs of 0 to 10 mA DC.

Connection of screw terminal as follows :

Terminal nos.	Description
14, 15	1 A, AC, 50 Hz, single phase (INPUT)
5, 6	0 to 10 mA DC (OUTPUT -1)
7, 8	0 to 10 mA DC (OUTPUT -2)

EUT has been classified as class 'A' continuously unmonitored as per EN 61326 standard .

2.2 Functional performance test of Equipment Under Test (EUT) to be carried out before and at the end of each test:

Connect 1 A, AC, 50 Hz, single phase at input terminal 14 and 15 .

Out puts available at OUTPUT-1 terminal 6(+) & 5(-) and OUTPUT -2 terminal 8(+) & 7(-) should be 10 mA DC with 1 kΩ load in series.

2.3 Functional check for all immunity tests.

Performance Criteria- 'A'

The EUT shall continue to operate as intended during and after the test . No degradation of performance or loss of function is allowed.

Performance Criteria –'B'

The EUT shall continue to operate as intended during and after the test . During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed.

Performance Criteria – 'C'

Temporary loss of function is allowed , provided the function is self –recoverable or can be restored by the operation of the controls.



26 OCT 2004

3

9

TEST RESULTS:

3.2 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

Test Condition As per EN 61326 (1998)

Secification As per CISPER 22

Frequency Range 30 MHz – 1000 MHz

EUT in normal operating condition at rated load.

b) Reciever

Bandwidth 120 KHz

Detectors QP

Antenna Bi-Conical (For 30 – 200 MHz)

Log-Periodic (For 200 – 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.
- Antenna height and position were changed to maximize Emissions.
- A table of Emission and corresponding Ambients 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 be below following limits

Freq. (MHz)	Limits (dBuV/m) (@3 meters)
	QP
30-230	50
230-1000	57

e) Observations

Emission Peaks were found to be within the specified limits. (See

f) Results

Complied.



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26 OCT 2004

3.2 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 Voltage: **Contact Discharge:** 4 kV
Air Discharge: 8 kV

No. of Discharges 10

Polarity Positive and Negative

Points of Discharge **Contact Discharge**
➤ Metallic screws at enclosure fixing.

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:

After the test EUT shall function as per sr. no. 2.2.

Performance Criterion 'B'

e Observations

The EUT was found to operate as intended during and after the test as per Sr. No. 2.2.

Performance Criterion 'B'

f Results

Complied .



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3.3 ELECTRICAL FAST TRANSIENTS (EFT)

Test Rationale:

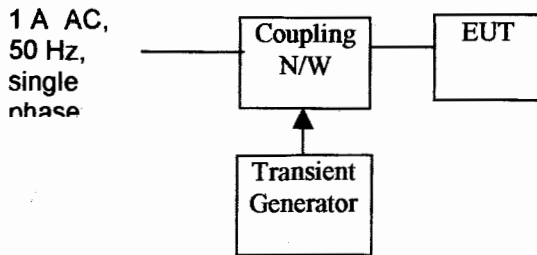
To check immunity characteristics of the EUT against transients generated by inductive load switching, Relay contact bouncing, switching of high voltage switchgear and the like

a Test Condition:

Set-up	As per BS EN 61000-4-4/ IEC 61000-4-4 - 1995
Pulse	5/50 ns
Modes	Differential
Pulse Amplitude	0.5kV
Pulse Rep. Rate	5 kHz
Polarity	Positive and Negative
Duration of test in each mode	60 s
Simulation	On 230 V single phase AC supply by Direct injection

EUT in normal operating condition.

c Test procedure:



➤ Transients generated by the generator were coupled to the 230 VAC Supply through a coupling N/W.

d Requirements:

Operation of EUT shall be normal as per Sr. No. 2.2 after the test.
Performance Criterion 'B'

e Observations

During and after the test EUT operation found normal as per Sr. No. 2.2.
Performance Criterion 'B'

f Results

Complied



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6

9

3.3 RADIATED RF ELECTROMAGNETIC FIELD (Radiated Susceptibility)

Test Rationale : To check 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 :

Set-up As per IEC 61000-4-3 / IEC 1000-4-3 (1995)
 Frequency Range 80 MHz – 1000 MHz
 Modulation 80 % AM @ 1 kHz
 Dwell time 0.5 s
 Amplitude 10 V/m
 Simulation Using G-Strip RF immunity Chamber

EUT in normal operating condition at rated load..

b) Test procedure

EUT was illuminated with the required field strength inside the test chamber, and operation was monitored.

c) Requirements

During testing normal performance of the EUT within the specification limits shall be there.

Performance Criterion 'A'.

d) Observations

During and after the test EUT operation found normal as per Sr. No. 2.2.

Performance Criterion 'A'.

e) Results

Complied.



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26 OCT 2004

7

9

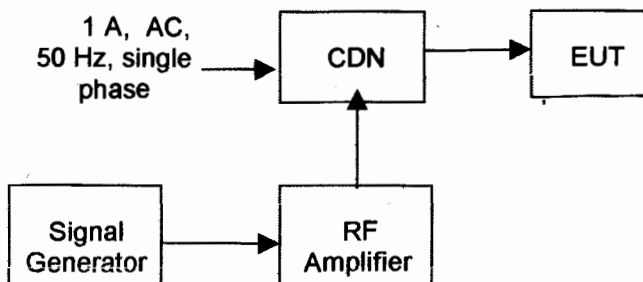
3.3 CONDUCTED RF SUSCEPTIBILITY**Test Rationale:**

To study immunity characteristics of the EUT when subjected to continuous conducted Noise.

a Test Condition:

Set-up	As per EN 61000 – 4 – 6 : 1996
Frequency	150 kHz – 80 MHz
Modulation	80 % AM @ 1 kHz
Amplitude	10 V
Simulation	On 230 VAC, Single Phase Mains through CDN M3

EUT in normal operating condition at rated load..

c Test procedure:

- The required simulation signal was generated by the Signal Generator and the Amplifier
- It was then coupled onto 230 VAC/50Hz I/P using CDN and operation of EUT was monitored

d Requirements:

The EUT shall continue to operate as intended during and after the test . No degradation of performance or loss of function is allowed.

Performance Criterion: 'A'.

e Observations:

The EUT was found to operate as intended during and after the test as per Sr. No. 2.2.

Performance Criterion 'A'.

f Results:

Complied.



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4.0 General Remarks: Nil

REPORT APPROVED BY

REPORT PREPARED BY

HEAD (EMI/EMC)



26 OCT 2004

9

ANNEXTURE 'A'

Radiated Emission Test Result

Sr.No	Frequency (MHz)	Emission dB μ V/m	Limit dB μ V/m	Results
1.	34.76	7.40	50.00	PASS
2.	36.86	11.50	50.00	PASS
3.	90.13	27.10	50.00	PASS
4.	117.30	9.40	50.00	PASS
5.	121.10	10.80	50.00	PASS
6.	180.90	24.60	50.00	*
7.	186.40	11.30	50.00	*
8.	952.40	56.00	57.00	*

- Note: 1) Testing has been carried out at 3 meter test distance and limits have been modified accordingly.
2) ** Indicates local noise from known sources

