सत्यमेव जयते

TEST / CALIBRATION REPORT

EMC / EMI Test Report
for
MECO Voltage Transducer

Testing as per BS EN 61326 (Edition 1998)

ELECTRONICS REGIONAL TEST LABORATORY (WEST)

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

Government of India

Plot No. F 7 & 8, MIDC Area, Opp.SEEPZ,
Andheri (E), Mumbai-400 093.
Phone : (022) 2832 5134, 2830 1468, 2830 1138 Fax : (022) 2822 5713
E-mail : ertlbom@bom4.vsnl.net.in

MEMORANDUM

The Test/Calibration Report issued by **ERTL (W)** is a record of the measurements conducted on the products submitted to it for testing / calibration and the results thereof. Unless otherwise specified in the report, the results are applicable only to those products which have been tested / calibrated and do not apply to other products even though declared to be identical.

This Report, if reproduced for any purpose-commercial or otherwise would be reproduced in full. Reproduction of a part of the report or an abstract thereof must be specifically approved from the **ERTL (W).**

LIABILITY CLAUSE

1. **ERTL (W)** shall not be liable for any change in test / calibration data and performance specification on account of malfunctioning of the standard / instrument /equipment due to any damage caused to it after the report, in respect of it has been issued.

2. The report shall not be regarded in any way diminishing the normal contractual responsibilities / obligations between the customer and **ERTL (W).**

3. The result reported in this report are valid only at the time of and under the stated conditions of the measurements.

ELECTRONICS REGIONAL TEST LABORATORY (WEST) MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)	REPORT NO. ERTL(W)/ 2003EMI 262		
SUBJECT: EMC TESTING OF VOLTAGE TRANSDUCER	DATE 17 SEP 2003	PAGE 1	OF 9

1. **SCOPE**

1.1 Service Request No :ERTL(W)/20031658

1.1.1 Service Request finalised on :01- SEP - 2003

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

1.3

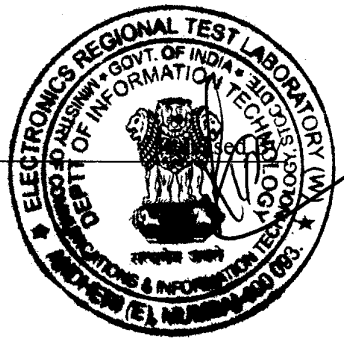
Item No.	Description	Qty	Manufacturer and Type No.	Serial No
1.	VOLTAGE TRNSDUCER	01	MECO INSTRUMENTS PVT. LTD./ VMT	30932

1.4 Test specifications BS EN 61326 (Edition 1998)

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

1.6 Test Equipment used :

1. EMI/034 : RS Chamber (Keytek, G-Strip)
2. EMI/036 : RF Signal Generator (HP, 8648 A) for C.S and R.S. tests
3. EMI/037 : RF Amplifier (AR, 25A100) for R.S test
4. EMI/044 : Three Phase Immunity Test System
5. CPU/064 : EMI receiver (HP8568B) for CE and RE test
6. EMI/048 : ESD Gun for ESD test
7. ------ : Biconical & Log periodic antennae.
8. EMI/033 : EFT Simulator
9. EMI/034 : Coupling / De coupling Network
10. CPU/066 : LISN



2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Description

EUT is an VOLTAGE TRANSDUCER.

2.2 Operating modes during normal testing.

The output of EUT shall be loaded with full rated resistive load for normal operations & all applicable tests. The output current shall remain in the range of 0 to 10 mA DC at output 1 & in the range of 4 to 20 mA DC for output 2, during after & before all tests. EUT was made operational with rated input voltage & output was loaded with resistive load during immunity tests.

2.3 Functional check for all immunity tests.

The functional check for all immunity tests of EUT is to observe output current across the resistive load for O/P 1 & O/P 2.

3.0 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:

Set-up As per BS EN 55022, CLASS 'A'

Frequency Range 30 MHz – 1000MHz

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

b) Receiver:

Bandwidth	120 KHz
Detectors	QP
Antenna	Bi-Conical (For 30 – 200 MHz) Log-Periodic (For 200 – 1000 MHz)
Configuration	Conforming to CISPR 16-1& CISPR 16-2

c) Test procedure

- 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 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 be below following limits

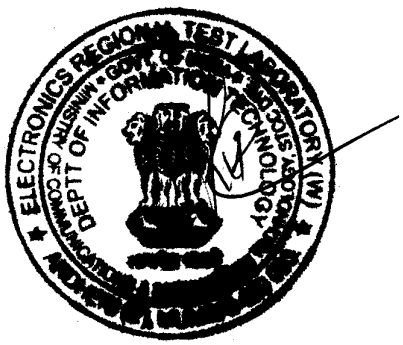
Freq. (MHz)	Limits (dBuV/m) QP
30-230	50
230-1000	57

e) Observations

For results pl. refer page 9 of 9.

f) Results

Complied



3.3 RADIATED SUSCEPTIBILITY (RS)

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 BS EN 61000-4-3 (Edition – 1995)
Frequency Range	80 MHz – 1000 MHz
Field Strength	10 V/m
Simulation	Using G – STRIP chamber

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

b) Test procedure

EUT enclosure was exposed to radiated field strength in G strip chamber for the above subject frequency range. EUT performance was observed during and after the test as per Sr. No. 2.3

c) Requirements

Normal performance of EUT shall be within the specifications as per Sr. No. 2.3.
Performance criterion A

d) Observations

Operation normal as per Sr. No. 2.3 during and after the test. No deviation from actual operating condition could be observed.

e) Results

Complied

ELECTRONICS REGIONAL TEST LABORATORY (W) DEPTT OF INFORMATION TECHNOLOGY

3.4 ELECTROSTATIC DISCHARGE (ESD)

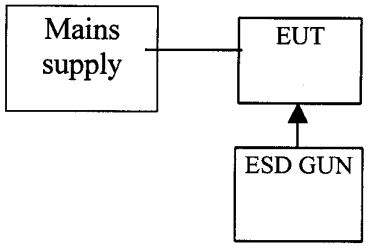
Test Rationale: To check immunity characteristics of the EUT against Discharge of Static Electricity that may occur when a charged operator touches the EUT.

a) Test Condition:

Set-up	As per BS EN 61000-4-2 (Edition 1995)
Mode of simulation:	Contact Discharge on conductive surfaces & Air Discharge on non- conductive surfaces
Test Voltage:	**Contact Discharge:** 4kV **Air Discharge:** 8kV
No. of Discharges	10
Polarity	Positive and Negative
Points of Discharge	**Contact Discharge** Contact screws **Air Discharge:** On the Insulated surfaces
Simulation	Using ESD Gun

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

b) 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.

c Requirement:

During testing, temporary degradation or loss of function or performance is allowed which is self-recoverable. Performance criterion B

d Observations

Operation of the EUT was found normal during and after the test as per Sr. No. 2.3

e Results

Complied

3.6 ELECTRICAL FAST TRANSIENTS (EFT)

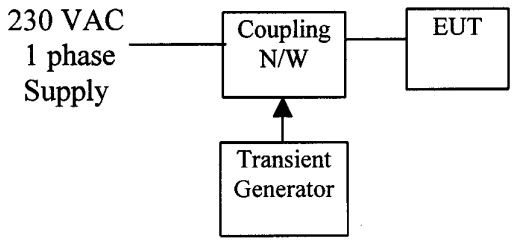
Test Rationale: To check immunity characteristics of the EUT against transients generated by inductive load switching, Relay contact bouncing, switching of high voltage switchgear and the like

a Test Condition:

Set-up	As per BS EN 61000-4-4 (Edition 1995)
Pulse	5/50 ns
Modes	Common and Differential
Test Level	3
Pulse Amplitude	2 kV
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 lines by Direct Injection

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

c Test procedure:



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

d Requirements :

During testing, temporary degradation or loss of function or performance is allowed which is self-recoverable. Performance criterion B

e Observations

Operation of the EUT was found to be normal as per Sr. No. 2.3 during and after the test.

f Results

Complied

3.3 Conducted susceptibility

Test Rationale:

To check immunity characteristics of the EUT against Conducted RF Susceptibility levels.

a) Test Condition:

Set-up As per BS EN 61000 – 4 –6 (Edition 1996)

Mode of simulation: Injected on power mains

Test Voltage: 3 V r.m.s

Simulation Using coupling/ decoupling Network

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

c Test procedure:

- Conducted RF level was injected to power mains by coupling/ decoupling network along the subject frequency range & EUT performance was monitored during and after the test as per Sr. No. 2.3

d Requirement:

Performance Criterion 'A', Normal Operation of the EUT with specified performance as per Sr. No. 2.3

e Observations

Operation of the EUT was found normal during and after the test as per Sr. No. 2.3

f Results

Complied

4.0 **General Remarks : Nil**

REPORT APPROVED BY

HEAD (EMI/PCT)

REPO

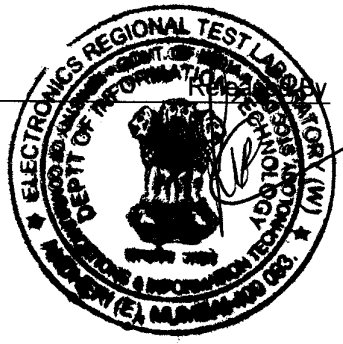
IC

==========

Radiated Emission Test Results

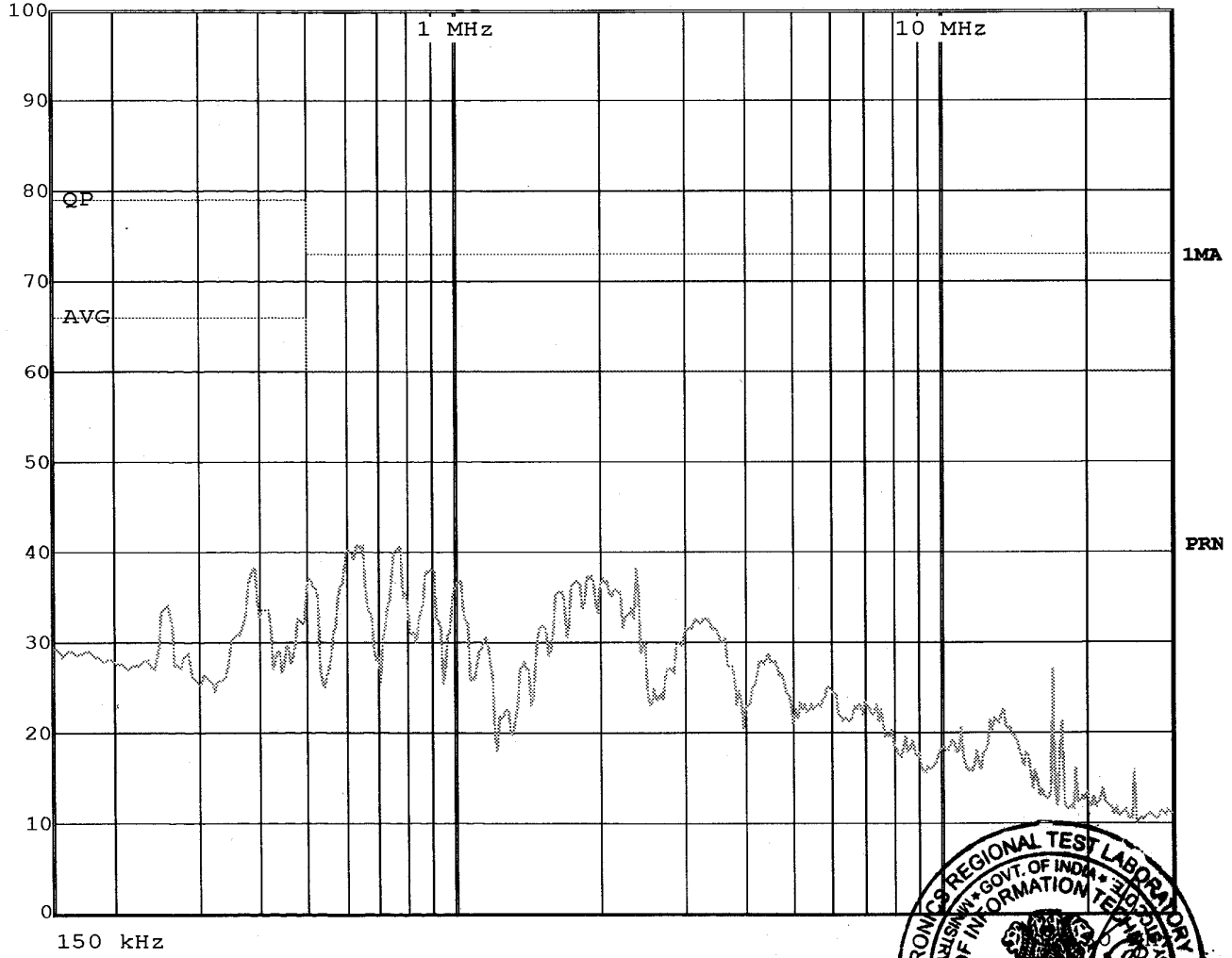
SR.NO.	FREQUENCY (MHz)	EMISSIONS OBSERVED (dBuV/m)	LIMITS (dBuV/m)	REMARKS
1.	49.60	40.50	50.00	Pass
2.	51.91	45.95	50.00	Pass
3.	63.32	31.40	50.00	Pass
4.	83.41	20.00	50.00	Pass

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



10 JAN 2004

Marker 1 [T1] Det AV Trd
Att 10 dB 16.21 dBµV ResBW 9 kHz
INPUT 2 8.18200000 MHz Meas T 100 ms Unit dBµV



Date: 24.DEC.2003 16:47:48

ELECTRONICS REGIONAL TEST LABORATORY (W)
DEPTT OF INFORMATION TECHNOLOGY
GOVT. OF INDIA
MINISTRY OF COMMUNICATIONS & INFORMATION TECHNOLOGY
ANDHERI (E), MUMBAI-400 093.

200BEMF325

Page 10 of 10

OUR ACCREDITATION STATUS

ERTL (W) set up under the STQC Directorate, Ministry of Communications & Information Technology, Govt. of India has been accreditated under number of national / international systems as follows :

SYSTEM	AREA	STATUS
IECQ (International Electro-technical Commission on Quality Assessment System for Electronic Components)	**Component Testing** • Resistors (Fixed) • Capacitors (Fixed)	Accreditated as ITL (Independent Test Laboratory)
NABL (C), India National Accreditational Board for Test & Calibration laboratories (Calibration System)	**Calibration** • Electro-technical discipline • Thermal discipline • Mechanical discipline	Accreditated Calibration Laboratory
NABL(T), India National Accreditational Board for Test & Calibration laboratories (Testing System)	Electronic & Electrical Testing	Accreditated Test Laboratory
IECEE-CE-Scheme	• Mains Operated Electronic Consumer Products	Approved as a CB test Laboratory
Other recognisation		Recognised by CSPO of State Govt., DOT, Naval Docyard, LCSO etc.