



सत्यमेव जयते

TEST / CALIBRATION REPORT

EMC / EMI Test Report for MECO Watt Transducer With 19V To 90V DC Aux. Supply

Testing as per BS EN 61326 (Edition 1999)



ELECTRONICS REGIONAL TEST LABORATORY (WEST)
MINISTRY OF COMMUNICATIONS & INFORMATION TECHNOLOGY, (STQC Dte.)
Government of India

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MEMORANDUM

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

ELECTRONICS REGIONAL TEST LABORATORY (WEST)		REPORT NO.	
MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)		ERTL (W)/ 2003EMI 326	
SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER		DATE	PAGE OF
			1 10

6 JAN 2004

1. SCOPE

1.1 Service Request No : ERTL (W)/20031936

1.1.1 Service Request finalised on : 1ST - OCT - 2003

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

1.3 Item No.	Description	Qty	Manufacturer and Type No.*	Serial No*
1.	ELECTRICAL TRANSDUCER	01	MECO INSTRUMENTS PVT. LTD / WT 11	007

1.4 Test specifications : BS EN 61326 : 1999

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 : Spectrum Analyser (HP8568B) for CE
6. EMI/048 : ESD Gun for ESD test

* As declared by Manufacturer



ELECTRONICS REGIONAL TEST LABORATORY (WEST) MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)	REPORT NO. ERTL (W)/ 2003EMI 326		
SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER	DATE	PAGE	OF
		2	10

6 JAN 2004

2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Description

EUT is a Electrical Transducer WT 11 , which operates on auxiliary supply between 19 V DC to 90 V DC. EUT was made operational.

2.2 Operating modes during normal testing.

EUT is supplied with an auxiliary supply between 19 V DC to 90 V DC. An Input supply of 0 to 63.5 V AC , 50Hz, Single phase is given at input terminals 13 and 14 and 5 A AC, 50Hz current is passed through terminals 17 & 18. The output of EUT shall be loaded with rated resistive load for normal operations & all applicable tests. The output current shall remain in the range of (-) 10 - 0 - (+) 10 mA DC at output 1 & 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.

Performance Criterion - 'A'

During testing, normal performance within specification limits.

Performance Criterion - 'B'

During testing temporary degradation or loss of function is allowed which is self recovering e. g. during testing output observed current may deviate by allowed margin ± 0.5 %. However after the test EUT shall function normal within specified limits.

Performance Criterion - 'C'

During testing, temporary degradation or loss of function or performance which requires operator intervention or system reset occurs.



ELECTRONICS REGIONAL TEST LABORATORY (WEST)		REPORT NO.	
MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)		ERTL (W)/ 2003EMI 326	
SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER		DATE	PAGE
			3
			OF 10

6 JAN 2004

3.0 Test Results

3.1 CONDUCTED EMISSION

Test Rationale: To measure emissions of the EUT* (referenced to Earth) on Power Mains 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

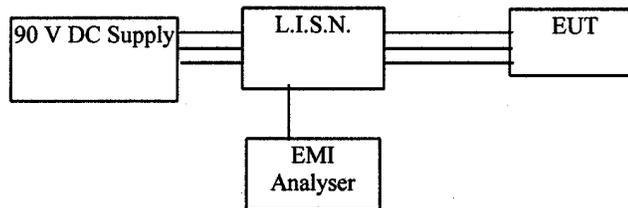
a) Test Condition

Set-up As per BS EN 55022 : 1995
 Measurement Range 150 kHz – 30 MHz
 Measurement On Spectrum Analyser
 Line Voltage 90 V DC supply
 Line Frequency 50 Hz

b) Receiver

Bandwidth 9 KHz
 Detectors Quasi – peak and Average
 Configuration Conforming to CISPR 16 - 1

c) Test procedure



EUT supplied with 90 V DC power supply through an LISN. Emission of the EUT were measured with a Spectrum Analyser .

d) Requirements

EUT emissions shall be below following Class 'B' limits

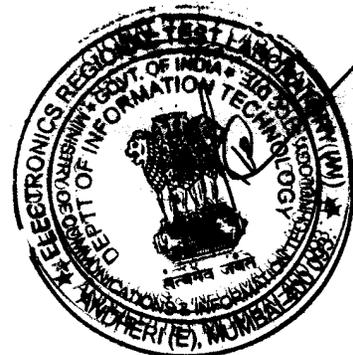
Freq. (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.15-0.5	79	66
0.5-5	73	60
5-30	73	60

e) Observations

Measurements with peak detector were carried.
 Pl. see Graph at page 10 of 10

f) Results

Complied



ELECTRONICS REGIONAL TEST LABORATORY (WEST)		REPORT NO.	
MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)		ERTL (W)/ 2003EMI 326	
SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER		DATE	PAGE
		6 JAN 2004	4
			OF 10

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 : 1995
 Frequency Range 30 MHz – 1000MHz
EUT in normal operating condition with output loaded with full resistive load.

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.

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

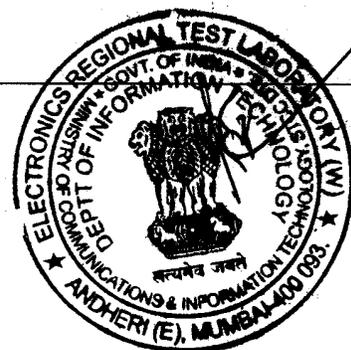
Freq. (MHz)	Limits (dBuV/m)
30-230	QP
230-1000	50
	57

e) Observations

Emission peaks found below required limits.

f) Results

Complied.



ELECTRONICS REGIONAL TEST LABORATORY (WEST)		REPORT NO.	
MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)		ERTL (W)/ 2003EMI 326	
SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER		DATE	PAGE
		6 JAN 2004	5
			OF 10

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 : 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 before and after the test as per Sr. No. 2.2.

d) **Requirement:**

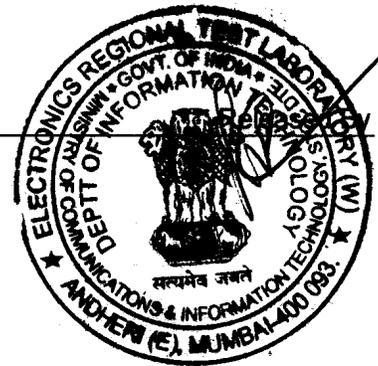
Performance Criterion 'A', Normal Operation of the EUT with specified performance as per Sr. No. 2.2

e) **Observations**

Operation of the EUT was found normal before and after the test as per Sr. No. 2.2.

f) **Results**

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ELECTRONICS REGIONAL TEST LABORATORY (WEST) MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)	REPORT NO. ERTL (W)/ 2003EMI 326		
	SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER	DATE 6 JAN 2004	PAGE 7

3.5 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 : 1995
Mode of simulation: Contact Discharge on conductive surfaces &
Air Discharge on non- conductive surfaces
Test level 2
Test Voltage: **Contact Discharge:** 4kV
Air Discharge: 8kV
No. of Discharges 10
Polarity Positive and Negative
Points of Discharge **Contact Discharge**
Maintenance screws, conducting metal surfaces
Air Discharge :
➤ Insulating surfaces

Simulation Using ESD Gun
EUT in normal operating condition as per Sr. No. 2.2

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 :

Performance Criterion B ,temporary degradation or loss of function is allowed during the test. After the test EUT shall function normal as per Sr. No. 2.2.

e) Observations

Operation of the EUT was found to be normal during and after the test as per Sr. No. 2.2.

f) Results

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ELECTRONICS REGIONAL TEST LABORATORY (WEST) MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)	REPORT NO. ERTL (W)/ 2003EMI 326			
	SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER	DATE	PAGE	OF
		8	10	

6 JAN 2004

3.6 ELECTRICAL FAST TRANSIENTS (EFT)

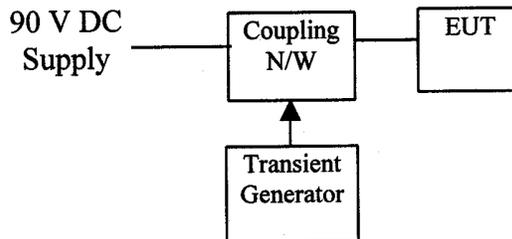
Test Rationale :

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 : 1995
Pulse 5/50 ns
Modes Common and Differential
Test Level 3
Pulse Amplitude 2kV
Pulse Rep. Rate 5 kHz
Polarity Positive and Negative
Duration of test in each mode 60 s
Simulation On 90 V DC supply 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 90 V DC Supply through a coupling N/W .

d Requirements :

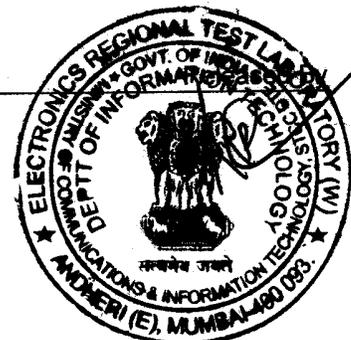
Performance Criterion B ,temporary degradation or loss of function is allowed during the test. After the test EUT shall function normal as per Sr. No. 2.2.

e Observations

Operation of the EUT was found to be normal during and after the test as per Sr. No. 2.2.

f Results

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ELECTRONICS REGIONAL TEST LABORATORY (WEST) MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY (STQC DTE)	REPORT NO. ERTL (W)/ 2003EMI 326		
SUBJECT: EMC TESTING ON ELECTRICAL TRANSDUCER	DATE	PAGE	OF
		9	10

6 JAN 2004

4.0 General Remarks: Nil

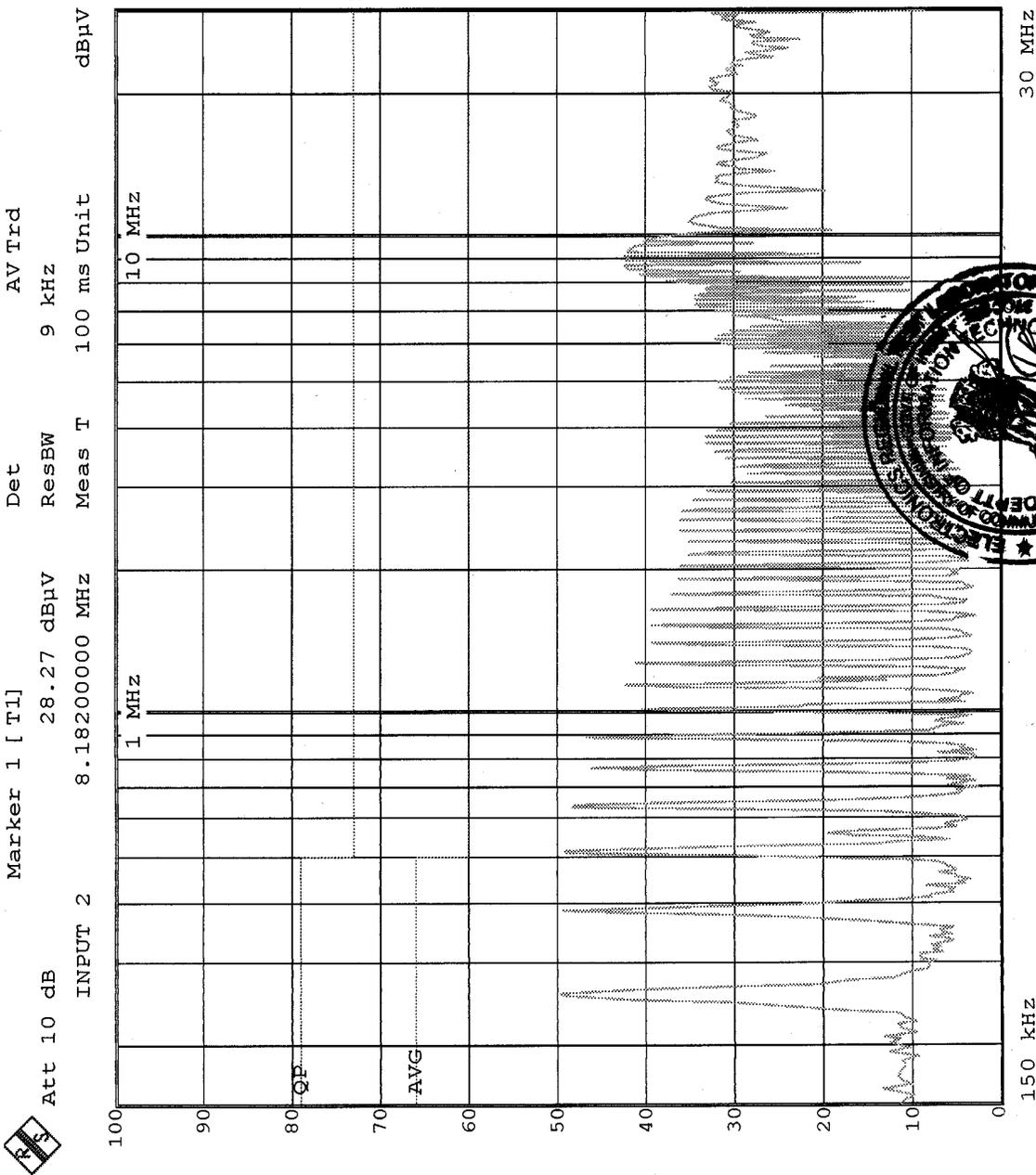
REPORT APPROVED BY

REPORT NO.

A VK Pher
5/11/04
 HEAD (EMI/PCT)



JAN 2004



Date: 24.DEC.2003 18:14:15

OUR ACCREDITATION STATUS

ERTL (W) set up under the STQC Directorate, Ministry of Communications & Information Technology, Govt. of India has been accredited 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 <ul style="list-style-type: none"> ● Resistors (Fixed) ● Capacitors (Fixed) 	Accredited as ITL (Independent Test Laboratory)
NABL (C), India National Accredital Board for Test & Calibration laboratories (Calibration System)	Calibration <ul style="list-style-type: none"> ● Electro-technical discipline ● Thermal discipline ● Mechanical discipline 	Accredited Calibration Laboratory
NABL(T), India National Accredital Board for Test & Calibration laboratories (Testing System)	Electronic & Electrical Testing	Accredited Test Laboratory
IECEE-CE-Scheme	<ul style="list-style-type: none"> ● Mains Operated Electronic Consumer Products 	Approved as a CB test Laboratory
Other recognition		Recognised by CSPO of State Govt., DOT, Naval Docyard, LCSO etc.