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TEST / CALIBRATION REPORT

Calibration Report
for
MECO Current Transducer

Testing as per IEC 60688

ELECTRONICS REGIONAL TEST LABORATORY (WEST)

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

Government of India

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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.

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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 reprot shall not be regarded in any way diminishing the normal contractual responsibilites / 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) DEPARTMENT OF INFORMATION TECHNOLOGY	REPORT NO. ERTL (W)/2003E&S117		
SUBJECT: TESTING OF CURRENT TRANSDUCER	DATE 23 JAN 2004	PAGE 1	OF 7

1. **SCOPE**

1.1 Service Request No : ERTL(W)/20031587DATED 22nd AUG 2003

1.1.1 Service Request finalised on : 22nd AUG 2003

1.2 Requested by
(Name and address of organisation) : MECO INSTRUMENTS PVT LTD.,
301, BHARAT INDUSTRIAL EASTATE,
T.J. ROAD, SEWREE (W),
MUMBAI – 400 015.

1.3	Description	Qty	Manufacturer	Type No.	Serial Nos.
	CURRENT TRANSDUCER, INPUT : 0 – 5 AAC, OUTPUT : 4 – 20 mA Accuracy: 0.5 %	01 No.	MECO	CMT	030620

1.4 Test specifications : Testing as per IEC 60688

1.5 Lab Ambient : Temperature: (25 ± 2) ° C
RH : (55± 5) %

1.6 Test Equipment used :

1) Calibration System	S&C/138
2) Energy Meter Calibrator	E&S/126
3) System DMM	EM!/006
4) Vibration Machine	ENV/008
5) Shock Test Machine	ENV/018
6) Over Voltage Test Generator	EMI/002
7) HF Test Generator	EMI/019
8) Coupling Network	EMI/021
8) Programmable Humidity Chamber	ENV/042

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2.0 Test Results

Sr. No.	Reference Clause No.	Test/Parameter	Test Condition	Requirement	Observation	Remark
2.1	5.2.3	Open Circuit Voltage	Auxiliary power supply : 230 VAC Input Current =5A AC	15V DC (max)	14.094 V	Complied
2.2	5.4	Ripple	Auxiliary power supply : 230 VAC Input Current =5A AC	Not exceed twice of class index.	0.67 %	Complied
2.3	5.5.2	Response Time	Auxiliary power supply : 230 VAC Input Current switched from 0 to 5A AC.	Time required for output signal to reach 99% from 0% of fiducial value shall be less than 400ms.	96.1 ms	Complied
2.4	5.10	Limiting conditions for storage and transport.	Temp : -20 deg.C. Temp : +70 deg.C.	After returning to reference conditions the DUT shall meet the requirements of the specification.	Complied	Complied
2.5	4.2	Intrinsic error	Auxiliary power supply : 230 VAC. a) Input current = 0A AC b) Input current = 2.5A AC c) Input current = 5A AC	Class index (0.5 %)	0.07 % 0.09 % 0.01 %	Complied
2.6	6.2	Variation due to auxiliary supply voltage	Input current = 5A AC. Aux. Voltage varied from 184 V to 276 V.	50 % of class index	0.02 %	Complied
2.7	6.3	Variation due to auxiliary supply frequency	Input current = 5A AC. Aux. frequency varied from 45 Hz to 55 Hz	50 % of class index	0.006 %	Complied

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Sr. No.	Reference Clause No.	Test/Parameter	Test Condition	Requirement	Observation	Remark
2.8	6.4	Variation due to ambient temp.	Auxiliary power supply : 230 VAC Input current = 5A AC. Temp. varied from 0 deg. C to 45 deg. C	100 % of class index	0.1 %	Complied
2.9	6.5	Variation due to the frequency of input quantities	Auxiliary power supply : 230 VAC Input current = 5A AC. Input current frequency varied from 45 Hz and 55 Hz.	100 % of class index	0.1 %	Complied
2.10	6.9	Variation due to output load	Auxiliary power supply : 230 VAC Input current = 5A AC. Output load resistance varied from 0 ohm to 500 ohm.	50 % of class index	0.037 %	Complied
2.11	6.10	Variation due to distortion of input quantities	Auxiliary power supply : 230 VAC Input current = 5A AC. I/p with 20 % 3rd harmonics	200 % of Class index	0.02 %	Complied
2.12	6.11	Variation due to magnetic field of external origin	Auxiliary power supply : 230 VAC Input current = 5A AC. Magnetic field of 0.4 kA/m	Class index	0.66 %	Complied
2.13	6.14	Variation due to self heating	Auxiliary power supply : 230 VAC Input current = 5A AC. Test duration: 35 min.	Class index	0.01 %	Complied

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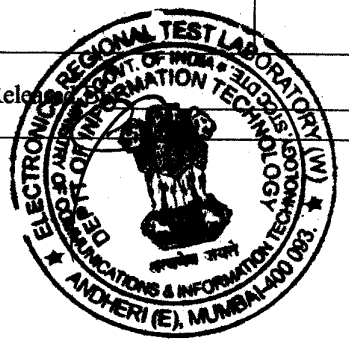

Sr. No.	Reference Clause No.	Test/Parameter	Test Condition	Requirement	Observation	Remark
2.14	6.15	Variation due to continuous operation	Auxiliary power supply : 230 VAC Input current = 5A AC. Test duration: 6 h	Continue to comply the accuracy class	0.019 %	Complied
2.15	6.16	Variation due to common mode interference	Auxiliary power supply : 230 VAC Input current = 5A AC. With 100 V rms at 45 Hz to 65 Hz applied between either output terminal and earth.	Class index	0.018 %	Complied
2.16	6.17	Variation due to series mode interference	Auxiliary power supply : 230 VAC Input current = 5A AC. With 1 V rms at 45 Hz to 65 Hz applied in series with output signal	Class index	0.012 %	Complied
2.17	6.18	Permissive excessive inputs				
2.17.1	6.18.1	Continuous excessive inputs	Apply 120 % of nominal upper value on aux. Supply voltage and current inputs.	Continue to comply the accuracy class after test	Complied	Complied
2.17.2	6.18.2	Excessive inputs of short duration	For current inputs: 20 times the nominal value of the measured current applied for 1 s and repeated 5 times at 300 s interval	Continue to comply the accuracy class after test	Complied	Complied
2.17.3	4.2	Intrinsic error	Auxiliary power supply : 230 VAC a) Input current = 0A AC b) Input current = 2.5A AC c) Input current = 5A AC	Class index (0.5 %)	-0.067 % 0.067 % -0.004 %	Complied

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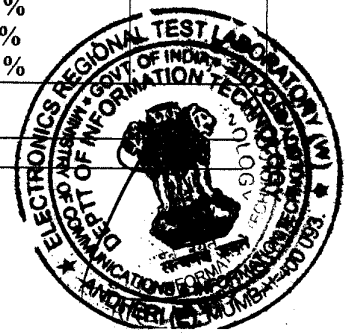

Sr. No.	Reference Clause No.	Test/Parameter	Test Condition	Requirement	Observation	Remark
2.18	6.19	Voltage test	At 2 kV AC for 1 min. between a) Input & output b) Aux. & output c) Aux. & input	No breakdown	No breakdown observed.	Complied
2.19	6.20	Impulse voltage tests	At peak test voltage of 5 kV in both positive and negative senses having the standardized impulse waveform of 1.2/50 us, applied between terminals of each circuit in turn and all other circuit connected together.	After completion of the test the DUT shall comply with the requirement appropriate to its class index.	Complied	Complied
2.19.1	4.2	Intrinsic error	Auxiliary power supply : 230 VAC a) Input current = 0A AC b) Input current = 2.5A AC c) Input current = 5A AC	Class index (0.5 %)	 -0.077 % 0.066 % -0.001 %	Complied
2.20	6.21	High frequency disturbance test	2.5 kV peak between independent circuits. 1kV peak between terminals of the same circuit.	The variation due to the effect of disturbance shall not be twice of class index.	0.64 %	Complied
2.20.1	4.2	Intrinsic error	Auxiliary power supply : 230 VAC a) Input current = 0A AC b) Input current = 2.5A AC c) Input current = 5A AC	Class index (0.5 %)	 -0.07 % 0.076 % -0.004 %	Complied
2.21	6.22	Test for temperature rise.	Current circuit loaded at 110 % for 2 h Voltage circuit loaded at 120 % for 2 h	For input circuits: 60 k For exterior surface: 25 k	2.7 deg. C	Complied

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Sr. No.	Reference Clause No.	Test/Parameter	Test Condition	Requirement	Observation	Remark
2.22	6.23	Vibration Test	Freq. : 10 - 55 - 10 Hz. Amplitude: 0.15 mm. 5 cycles, 1 octave/min. Axis: Vertical			---
2.22.1	4.2	Intrinsic error	Auxiliary power supply : 230 VAC a) Input current = 0A AC b) Input current = 2.5A AC c) Input current = 5A AC	Class index (0.5 %)	 -0.07 % 0.1 % 0.15 %	Complied
2.23	6.23	Shock Test	15g, ½ sine, 11 ms, 3 shocks on each sense. Total 18 shocks.			---
2.23.1	4.2	Intrinsic error	Auxiliary power supply : 230 VAC a) Input current = 0A AC b) Input current = 2.5A AC c) Input current = 5A AC	Class index (0.5 %)	 -0.082 % 0.072 % -0.03 %	Complied
2.24	6.23	Drop & topple Test.	Drop height: 25 mm, one drop about each of four bottom edges. One topple about each of four bottom edges.			---
2.24.1	4.2	Intrinsic error	Auxiliary power supply : 230 VAC a) Input current = 0A AC b) Input current = 2.5A AC c) Input current = 5A AC	Class index (0.5 %)	 -0.086 % 0.07 % -0.03 %	Complied

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3.0 **General Remarks :** Nil.

REPORT APPROVED BY	**REPORT RELEASED BY**
HEAD (E&S)	ELECTRONICS REGIONAL TEST LABORATORY (W) * GOVT. OF INDIA * MINISTRY OF COMMUNICATIONS & INFORMATION TECHNOLOGY * DEPTT OF INFORMATION TECHNOLOGY * STQC DIR * ANDHERI (E), MUMBAI-400 093.

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.