



TEST/CALIBRATION REPORT

Safety Test Report for

MECO Analog Frequency Meter

Testing as per IEC 1010 - 1 1990 + 2nd Amendment 1995

ELECTRONICS REGIONAL TEST LABORATORY (WEST)
DEPARTMENT OF ELECTRONICS, (STQC Dte.)
Government of India.

Plot F 7/8, M. I. D. C. Area, Opp. Seepz,
Andheri (E), Mumbai - 400 093.

MEMORANDUM

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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.

DEPARTMENT OF ELECTRONICS (STQC Dte.) : ERTL(W)/98SAF0046

SUBJECT: SAFETY TESTING OF ANALOG
FREQUENCY METER

DATE : 18 NOV 1998
PAGE : 01 OF 33

1. SCOPE :
- 1.1 Service Request No. : ERTL(W) 981029 Dt. 17-AUG-98
- 1.2 Service Request final- : 17-AUG-98
ised on
- 1.3 Requested by : MECO INSTRUMENTS P. LTD.
(Name and address : 301, BHARAT IND. ESTATE,
of organisation) T.J. ROAD, SEWRI, MUMBAI-15,
- 1.4

Item No.	Description	Qty.	Manufacturer / Make	Model / TYPE No.
01	ANALOG FREQUENCY METER	01	MECO INSTRUMENTS PVT. LTD.	F72
- 1.5 Test specifications : IEC 1010-1 1990 + 2nd Amendment 1995 :
Safety requirements for electrical
equipment for measurement, control
and laboratory use.
- 1.6 Lab Ambient : Temperature : (25 ± 2) deg.C
Humidity : (55 ± 5) % RH
- 1.7 Details of Test Equipments : See Annexure 'A-1'

Amendment Approved By
(Head Test Operation)

Amendment Released By
(OIC, CSE)

This is an amended version of page 1 of Test Report No. 98SAF0046
issued on 09/10/1998



ELECTRONICS REGIONAL TEST LABORATORY (WEST) : REPORT NO.

DEPARTMENT OF ELECTRONICS (STQC Dte.) : ERTL(W)/98SAF0046

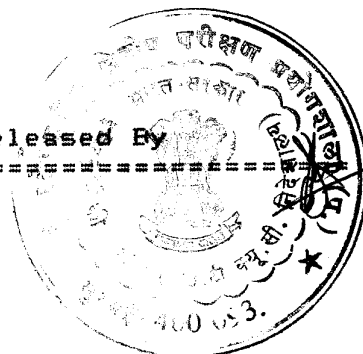
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- | 1.4 | <u>Item Description</u>
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<u>/ Make</u> | <u>Model/TYPE</u>
<u>No.</u> |
|-----|---------------------------------------|-------------|--------------------------------------|---------------------------------|
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and laboratory use.
- 1.6 Lab Ambient : Temperature : (25 ± 2) deg.C
Humidity : (55 ± 5) % RH
- 1.7 Details of Test : See Annexure 'A-1'
Equipments

Released By



IEC 1010-1

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COMPLIANCE VERIFICATION (COVER) REPORT

This unit was checked for compliance with IEC publication 1010-1. fifth edition 1990 with amendment No. 1 & 2

PART I - GENERAL INFORMATION

1. Product Name : ANALOG FREQUENCY METER
2. Model/Type : F72
440V AC, 45-65 Hz,
Permanent Magnet Moving Coil Type Panel Meter
3. Manufacturing Organisation : MECO INSTRUMENTS (P) LTD., MUMBAI-15
4. Product Rating This report covers the Analogue Frequency Meter range from 45 Hz to 65 Hz. , 440 V moving coil type panel meters, Size 72 sq. mm.
5. The Device complies with the standard.

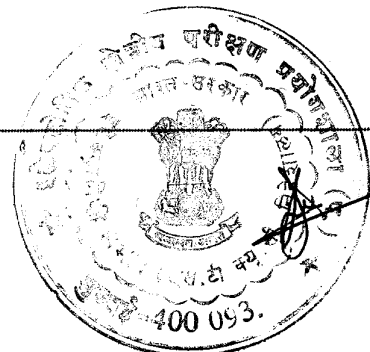
SOURCE : Electronics Regional Test Laboratory (West)
ORGANISATION : Dept. of Electronics, STQC Dte., Govt. of India,
Marol MIDC, Andheri (E), Bombay - 400 096.

(Name)

Prepared by : S.P.Pednekar

Checked by : G.R. Mahajan

Approved by : K. Murari



Report Cover Page I

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1. Product Description

- a. Permanent magnet moving coil type analog Frequency meter, Range 45 to 65 Hz, Size 72 sq. mm with single scale.
- b. Terminal with washer are provided at the rear side for connection. All hazardous live parts are enclosed by non-metallic enclosure and front side is enclosed by glass.

2. Engineering Considerations :

Frequency meter is tested against requirements of IEC 1010-1 standard with following considerations:

- a. For evaluation of Frequency meter as per IEC 1010-1 Standard, it is considered as a "Test and Measuring Equipment" and all applicable test for this category are performed.

- b. This Frequency meter is panel mounting type. After complete Installation, front panel glass would be accessible to the operator hence it is tested for Reinforced Insulation between hazardous live parts & front panel glass.

- c. All live parts are covered with Non-metallic enclosure. Considering the worst-case condition of the end-use application i.e. if fitted in metallic panel, which may not be reliably grounded, these panel meters are evaluated for reinforced insulation between all hazardous live parts and external panel enclosure (even if this enclosure is not directly accessible to the operator).

- d. Frequency meter does not have separate Input Power Supply, instead, it draws operational energy from the measuring terminals directly. These measuring terminals are provided on rear side of the panel meters and after complete Installation in the end-use, it is considered that these terminals would not be accessible to the operator (except during Installation process if the installation personnel happens to be the operator).

In view of above, marking details of the terminals explained in the product data sheets are accepted and deemed to meet the requirement of the standard.

- e. Frequency meter is considered as a component to be used for construction of other equipments & is not likely to be used as a stand alone in the end-use. Hence requirement of class II symbol marking is to be ensured in end-use product.



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f. Since no separate Input Power Supply is required, means of protection (like fuse) and means for disconnection (like ON/OFF switch) are not evaluated during its investigation. During final installation in end-use, above point needs to be considered.

g. Frequency meter is intended to be used for fixed type of appliances, as declared by manufacturer and hence, front panel glass which provides Reinforced Insulation between operator and pointer/metallic dial is exempted from "Impact Hammer Test" as per clause No. 8.2 of amendment no 2 of IEC 1010-1 standard.

h. The Frequency meter is evaluated considering it as/under
Installation Category II
Pollution Degree - 2

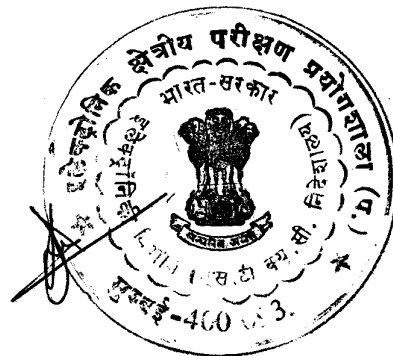
i. Compliance for protection against the spread of fire is verified by Clause 9.1 instead of Annexure 'F' which is an alternate method for Clause 9.1.

3. This report contents following

a) Report : Page 01 to 33

b) Annexures :

A-1 Test Equipment Calibration Details



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
5.0	<u>Marking and Documentation.</u>		
5.1	Marking.		
5.1.1	General.		Complied
	Equipment shall bear markings in accordance with 5.1.2 to 5.2.		
5.1.2	Identification.		Complied
	- Manufacturer's name or registered trade mark.	MECO	
	- Model number, name or other means to identify the equipment.	Hz	
5.1.3	Mains Supply.		Not Applicable
	a) Nature of Supply		
	b) Rated value of the supply voltage or range.		
	c) Maximum rated power in watts or VA or maximum rated input current. (measurement)		
	d) Multiple rated supply voltage		
	e) Accessory		

Comments :

5.1.2 Trademark and 'Hz' is marked on metallic dial placed behind front panel glass.

5.1.3 See Engineering considerations on Report Cover



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
5.1.4	Fuses:		Not Applicable
	Fuse replacement marking.		
5.1.5	Markings for measuring circuit terminals		Not Applicable
5.1.6	Terminals and operating devices. a) Functional earth terminals b) Protective conductor terminals. c) Terminals of measuring & control circuits. d) Terminals supplied from the interior of the equipment. e) Accessible functional earth terminals f) ON-OFF position of power-supply or circuit breakdown switches.		Not Applicable
5.1.7	Equipment protected by Double or Reinforced Insulation shall be marked with symbol 11 of table 1.		Complied
5.1.8	Battery charging.		Not Applicable
5.2	Warning marking. - Shall be visible in normal use. - Marking to refer to instruction manual. - Warning or Hazardous live parts. - Terminals for voltages above 1 kV. - Warnings for excessive temperature. - Activation of an interlock system.		Not Applicable

Comments :

5.1.6 & 5.1.7 See Engineering considerations given on Report Cover Pages.



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IEC 1010-1 1970 + Am. 1 & 2

Para	Prescribed	Measured	Observed
5.3	<p>Durability of markings (5.1.2 to 5.2)</p> <ul style="list-style-type: none"> - Clear and Legible <p>Test with water, isopropyl alcohol and cleaning agent as specified by manufacturer.</p> <ul style="list-style-type: none"> - Loosening or curling of adhesive labels. 		Complied
5.4	Documentation		
5.4.1	<p>General</p> <ul style="list-style-type: none"> - Technical specification - Instructions for use. - Name and address of the Manufacturer or supplier for technical assistance. - Definition of Installation category marked. 		Complied
5.4.2	<p>Equipment ratings</p> <ul style="list-style-type: none"> - Supply voltage/range. - Supply frequency/range. - Power or current rating. - Description of all input & output connections. - Ratings of the insulation of external circuits. - Range of environmental conditions. 		Complied

Comments:

5.4.1, 5.4.2 Technical Details are specified in the product data sheet.



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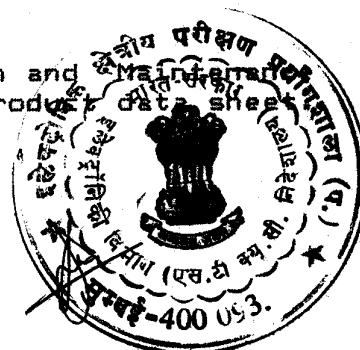
IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
5.4.3	<p>Equipment installation</p> <ul style="list-style-type: none"> - Assembly, location and mounting requirements. - Instructions for protective earthing - Connections to the supply. - Ventilation requirement - Requirements for special services. - The maximum sound power level. - Instructions relating to sound pressure level. <p>Permanently connected equipment</p> <ul style="list-style-type: none"> - Supply wiring requirements - Requirements for external switch. 		Complied
5.4.4	<p>Equipment operation</p> <ul style="list-style-type: none"> - Identification of operating controls - Instructions for inter-connections. - Specification of limits. - An explanation of symbols used. - Replacement of consumable materials - Instruction for cleaning. 		Complied
5.4.5	Equipment maintenance		Complied

Comments:

5.4.3 to 5.4.5

Product Installation, Operation and Maintenance details are specified in the product data sheet



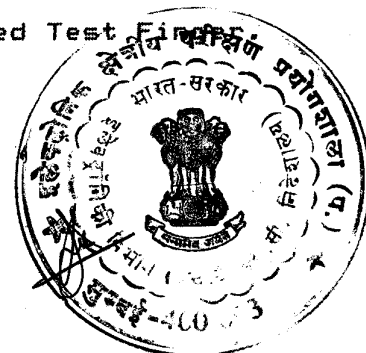
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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.0	<u>Protection against electric shock</u>		
6.1	Protection against electric shock shall be maintained in NORMAL CONDITION and FAULT CONDITION. Compliance is checked by 6.2, 6.3, 6.4 to 6.12.		Complied
6.1.1	Exceptions - Parts of lamps, sockets - Battery Terminals - Terminals & sockets of operating & measuring circuits.		Not Applicable
6.2	<u>General Examination</u> Determination of Accessible parts. Jointed test finger Rigid test finger		Not Applicable
6.2.2	Openings above parts which are hazardous live. Test with 100 mm X 4 mm test pin		Not Applicable
6.2.3	Openings for present controls. Test with 3 mm test pin		Not Applicable

Comments :

6.2 Live parts are not accessible with Jointed Test Finger



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.3	<u>Permissible limits for accessible parts</u>		
6.3.1	Values in NORMAL CONDITION less than given below <ul style="list-style-type: none"> - Voltage \leq 30V rms/42.4 V peak / 60 V DC - Current \leq 0.5 mA rms/0.7 mA peak/ 2 mA DC - Capacitance 40 uC/350 mJ 		Complied
6.3.2	Values in SINGLE FAULT CONDITION are less than given below <ul style="list-style-type: none"> - Voltage \leq 50 V rms/70 V Peak / 120 V DC - Current: \leq 3.5 mA/5 mA Peak/15 m DC with A2 - \leq 500 mA rms with A-3. - Capacitance see fig. 2 		Complied

Comments :

- 6.3 Live parts are not accessible.
See Engineering considerations on Report Cover Pages.



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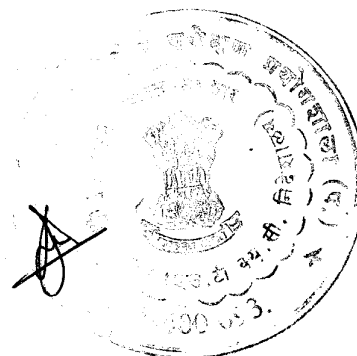
IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.4	<p>Protection in NORMAL CONDITION.</p> <p>Protected by one or more of following</p> <p>Basic Insulation</p> <p>Enclosures or Barriers</p> <p>Protective Impedances</p> <p>Compliance is by:</p> <p>Determining 6.2</p> <p>Test of 6.8 dielectric strength for Basic insulation</p> <p>Test of 8.1 for rigidity of enclosure and barriers.</p>	Re-inforced	Complied

Comments :

6.4 All live parts are reliably enclosed in the plastic enclosure. Insulation is provided by 1.5 mm thick plastic enclosure.

Front panel is the only the accessible part and withstands the Dielectric strength Test for Reinforce Insulation and Test of 8.1 for Rigidity of enclosure.



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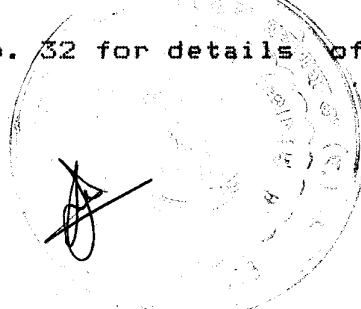
IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.5	Protection in SINGLE FAULT CONDITION.		
6.5.1	Protective Earthing		Not Applicable
6.5.1.1	Protective Bonding		Not Applicable
6.5.1.2	Bonding Impedance of Plug Connected Equipment		Not Applicable
	- Bonding Impedance shall not exceed 0.1 ohms.		
6.5.1.3	Bonding Impedance of Permanently Connected Equipment		Not Applicable
6.5.1.4	Indirect bonding for measuring and test equipment		Not Applicable
	a) Voltage limiting devices		
	b) Voltage sensitive tripping devices		
6.5.2	Double and reinforced insulation		Complied
6.5.3	Protective impedance		Not Applicable
	Single fault condition as per 4.4.2.1 followed by 6.3 measurement		
6.5.4	Built-In panel meters		Complied
	- No accessible conductive parts		
	- Basic insulation		
	- Reinforce insulation		

Comments:

6.5.4 The product complies with creepage distances, clearances and thickness for Reinforced Insulation. The product withstands dielectric strength test for Reinforced Insulation. In an event of single fault condition, hazardous live parts are not accessible.

Refer Additional Sheet on page No. 32 for details of single fault conditions.

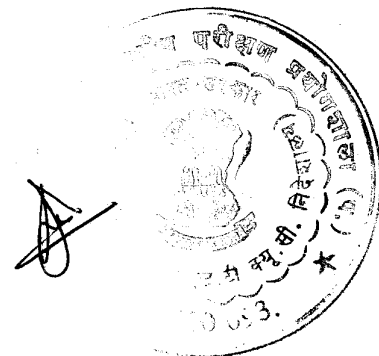


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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.6	<u>External Circuit.</u>		
6.6.1	Separation of internal circuits Internal circuits protected from other internal circuit by Double/Reinforced protective impedance. Basic Insulation & Screening etc.		Not Applicable
6.6.2	Terminals for external circuits - Protective conductor terminals - Functional earth terminals - Terminals for headphones Shall not be hazardous live. Internal capacitor charge on the terminals shall not be hazardous live 10 s. after interruption of the supply		Not Applicable
6.6.3	Circuits with terminals which are hazardous live		Not Applicable

Comments :



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.7	<p>Clearance and Creepage distances.</p> <p>Creepage and Clearance distances between circuits and parts complying applicable clauses and table of annexure 'D'.</p> <p>Table D7 to D10 for Double or Reinforced Insulation</p> <p>Table D1 to D6 for Basic Insulation</p>		Complied



Comments:

6.7 The distance between live parts and operator accessible parts is 50 mm.

For Compliance Table D10 is considered.



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.8	Dielectric strength test.		Complied
6.8.1	Reference test earth		
6.8.2	Humidity preconditioning - 92.5% \pm 2.5% RH - 40 deg.C \pm 2 deg.C - 48 hr. - Preconditioning - 42 deg.C \pm 2 deg.C - 4 hr.		Conditioned
6.8.3	Conduct of test - After 2 hr. recovery period		Conditioned
6.8.4	Voltage tests Table D1 to D6 for Basic Insulation Table D7 to D1 for Double or Reinforced Insulation		Complied

Comments:

6.8.4 2300 V AC for 1 minute between terminals shorted and metal foil wrapped around operators accessible front panel.

No breakdown/flashover observed.



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.9	Constructional requirement for protection against electric shock.		Complied
6.9.1	General		
6.9.2	Enclosures of equipment with double or reinforced insulation.		Complied
6.9.3	Equipment with protective bonding.		Not Applicable
6.9.4	Over-range indication		Not Applicable



Comments :

6.9.2 Non-metallic enclosure provides Double/Reinforced Insulation.
Enclosure thickness 1.5 mm.
Front glass thickness 2.0 mm.



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.10	Connection to mains supply source and between parts of equipment.		
6.10.1	Mains supply cords <ul style="list-style-type: none"> - Shall meet the requirement of IEC227 or IEC245. - Green/Yellow coloured conductors for protective conductor terminals. - Degree of insulation. - Detachable mains supply cords with mains connectors shall comply with IEC799. 		Not Applicable
6.10.2	Fitting of non-detachable mains supply cord		Not Applicable
6.10.2.1	Cord entry <ul style="list-style-type: none"> - Bushing - Fixed cord guard 		Not Applicable

Comments :

6.10 See Engineering considerations given on Report Cover Pages.



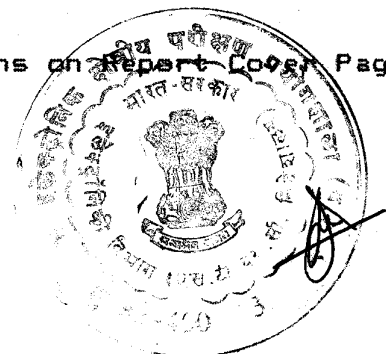
IEC 1010-1 1990 + Am. 1 & 2

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Para	Prescribed	Measured	Observed
6.10.2.2	<p>Cord anchorage</p> <ul style="list-style-type: none"> - Shall not be clamped by screws. - Knots in the cord shall not be used. - Shall not be possible to push the cord in the equipment. - Failure of the cord insulation in the cord anchorage. - Compression bushing - Cord replacement - Pull test: 25 times at 100 N. - Torque test: Immediately after pull test at 0.35 Nm 		Not Applicable
6.10.3	<p>Plugs and connectors</p> <ul style="list-style-type: none"> a) Connection of equipment to the mains supply. b) Equipment designed to be supplied only at voltages below the level for normal condition. c) Charge from internal capacitors. d) Mains socket outlet accessory. 		Not Applicable

Comments :

6.10.2.2 & 6.10.3 See Engineering considerations on Report Cover Pages.



Para	Prescribed	Measured	Observed
6.11	Terminals.		Not Applicable
6.11.1	Accessible terminals for flexible cord		
6.11.2	Protective conductor terminal		
6.11.3	Functional earth terminals		

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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
6.12	Disconnection from supply source		Not Applicable
6.12.1	General check 6.12.1.1 to 6.12.3		
6.12.1.1	Exceptions		
6.12.2	Requirements according to type of equipment		
	Check by 6.12.2.1 to 6.12.2.3		
6.12.2.1	Permanently connected equipment		
6.12.2.2	Single-phase cord-connected equipment		
6.12.2.3	Hazards arising from function		
6.12.3	Disconnecting devices		
6.12.3.1	Switches and circuit-breakers		
6.12.3.2	Appliance couplers and plugs		

Comments :

6.12 See Engineering considerations given on Report Cover Pages.



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
7.0	<u>Protection against mechanical hazards</u>		
7.1	General		
	- Handling during normal use Check by 7.2 to 7.5		
7.2	Moving parts		Not Applicable
	- Moving parts shall not be able to crush, cut or pierce parts of the body of the operator likely to contact them, nor severely pinch the operator skin.		
7.3	Stability		Not Applicable
	Equipment shall be physically stable in normal use when not secured to the building structure.		
	- Shall be stable at an tilt angle of 10 deg.		
	- For equipment of height more than 1 m and mass more than 25 kg. Force of 250 N or 20% of the mass to be applied at the top of the equipment not more than 2 m.		
7.4	Provisions for lifting and carrying		Not Applicable
	- Test handles, grips, if provided with 4 times the weight of equipment		
	- Equipment having weight 18 kg. or more provided with means for lifting and carrying.		
7.5	Expelled parts		Not Applicable
	- The means of protection against expelled parts not removable without the aid of a tool.		

Comments :

- 7.2 No moving parts exist.
- 7.3 Product is panel mounted type.



IEC 1010-1 1990 + Am. 1 & 2

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Para	Prescribed	Measured	Observed
8.0	<u>Mechanical resistance to shock, and impact.</u>		
8.1	Rigidity test - 30 N force applied in the ready to use condition.		Complied
8.2	Impact hammer test - Three blows with an energy 0.5 J - Test exempted for glass parts which do not form a part of an enclosure.		Not Applicable
8.4	Drop test		
8.4.1	Equipment other than HAND-HELD EQUIPMENT - Test for corner drop or face drop test		Not Applicable
8.4.1.1	Corner Drop Test - For equipments with a mass of 20 kg. and less		Not Applicable
8.4.1.2	Face Drop Test - For equipments with a mass exceeding 20 kg.		Not Applicable
8.4.2	HAND-HELD EQUIPMENT - The equipment is dropped once through a distance of 1 m.		Not Applicable

Comments :

8.2 to 8.4 See Engineering considerations given on Report Cover Pages.



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
9.0	Equipment temperature limits and protection against the spread of fire.		
9.1	General - Any heating shall not cause a hazard in normal condition of in single fault condition, nor shall it cause spread of fire outside the equipment		Complied
9.2	Temperature tests Temperature of various components, parts measured after steady state shall not exceed limits given in table 3.		Complied
9.2.1	Heating equipment Test corner Normal mounting		Not Applicable
9.2.2	Equipment intended for installation in a cabinet or a wall 10 mm thick black painted plywood or 20 mm thick black painted plywood as cabinet or wall.		Complied
9.3	Guards Does temperature exceeds 100 deg.C ? Marking for hot surface.		Not Applicable

9.2 Temperature Test

Sr. No.	Location	Measured temp. rise	Limit temp. rise	Remark
1.	Capacitor C-2	47	85	OK
2.	Plastic part supporting moving coil assembly	46	80	OK

Temperature is measured at an ambient of 40 deg C.

Comments :

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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
9.4	Field-wiring terminal boxes Does temperature exceeds 60 deg.C ? Marking for hot surface.		Not Applicable
9.5	Over temperature protection devices Provision of over temperature protective device. Does it operates in single fault condition ? It shall not operate in normal use.		Not Applicable
9.6	Overcurrent protection Protected by fuse/circuit breaker/thermal cutout/impedance limiting/similar means.		Not Applicable
9.6.1	Permanently connected equipment Over current protection is optional sufficient marking for protection, if not provided.		Not Applicable
9.6.2	Other equipment Not used in protective conductor. Not fitted in neutral conductor.		Not Applicable

Comments :



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
10.0	Resistance to heat		
10.1	Integrity of Clearances and Creepage distances Creepage & clearances at 40 deg.C shall meet requirements of 6.7 & annex. 'D' Measurement of temperature of non metallic enclosure for 10.2.		Complied
10.2	Resistance to heat of non-metallic enclosures Non operative treatment 70 deg.C for 7 hr. or maximum temperature noticed plus 10 deg.C for 7 hr. After above test equipment shall show no hazard and shall meet tests of 6.8.		Complied
10.3	Resistance to heat of insulating material Insulating parts which support mains part/live part which carry currents more than 0.5 A shall comply vicat softening test as per ISO-306 method A at 130 deg.C.		Not Applicable

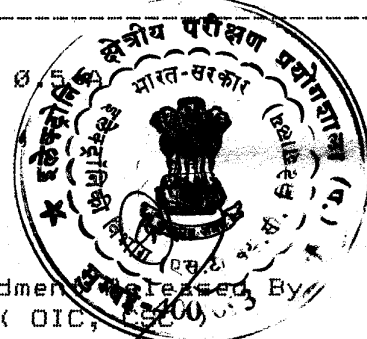
Comments: 10.3 Input current is less than 0.5 A

Amendment Approved By
(Head Test Operation)

Amendment Released By
(OIC, 15400)

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This is an amended version of page 25 of Test Report No. 98SAF0046
issued on 09/10/1998



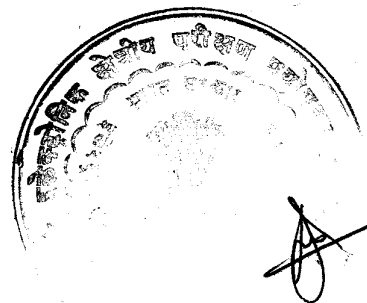
9 OCT 1998

IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
10.0	<u>Resistance to heat</u>		
10.1	Integrity of Clearances and Creepage distances Creepage & clearances at 40 deg.C shall meet requirements of 6.7 & annex. 'D' Measurement of temperature of non metallic enclosure for 10.2.		Complied
10.2	Resistance to heat of non-metallic enclosures Non operative treatment 70 deg.C for 7 hr. or maximum temperature noticed plus 10 deg.C for 7 hr. After above test equipment shall show no hazard and shall meet tests of 6.8.		Complied
10.3	Resistance to heat of insulating material Insulating parts which support mains part/live part which carry currents more than 0.5 A shall comply vicat softening test as per ISO-360 method A at 130 deg.C.		Not Applicable

Comments:

10.3 Input current is less than 0.5 A

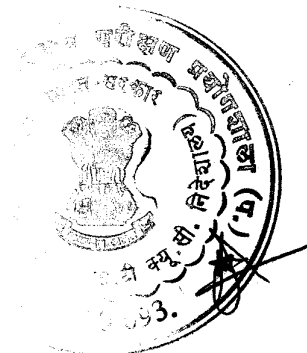


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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
11.0	<u>Protection Against Hazard from Liquid.</u>		Not Applicable
11.1	General		
11.2	Cleaning		
11.3	Spillage		
11.4	Overflow		
11.5	Liquid leakage		
11.5.1	Equipment containing liquid		
11.5.2	Battery electrolyte		
11.6	Specially protected equipment		

Comments :

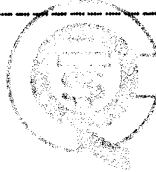


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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
12.0	<u>Protection against radiation, including laser sources, and against sonic and ultrasonic pressure</u>		Not Applicable
12.1	Ionizing radiation		
12.2.2	Accelerated electrons		
12.3	Ultra-violet radiation		
12.4	Microwave radiation		
12.5	Sonic and ultrasonic pressure		
12.5.1	Sound pressure level		
12.5.2	Ultrasonic pressure		
12.6	Laser sources		

Comments :



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
13.0	<u>Protection against liberated gases, explosion and implosion</u>		Not Applicable
13.1	Poisonous and injurious gases		
13.2	Explosion and implosion		
	Check by 13.2.1 to 13.2.2		
13.2.1	Components		
13.3	Implosion of high-vacuum devices		
	Cathode ray tube of 160 mm dimension comply IEC-65 Standard requirement.		

Comments :



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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
14.0	Components		
14.1	General		Not Applicable
14.2	Motors		Not Applicable
14.2.1	Motor temperature		Not Applicable
14.2.2	Series excitation motors		Not Applicable
14.3	Over temperature protection devices		Not Applicable
14.4	Fuse holders		Not Applicable
	Test with jointed test finger		
14.5	Mains voltage selecting devices		Not Applicable
14.6	High integrity components		Not Applicable
14.7	Mains transformers		Not Applicable
14.7.1	Short-circuit tests		Not Applicable
	Shorting of secondary windings one at a time		
14.7.2	Overload tests		Not Applicable
	Overloading of individual winding with normal load on other windings.		
	After 14.7.1 & 14.7.2 check complains by 4.4.4		
14.8	Over pressure safety devices		Not Applicable

Comments :



Para	Prescribed	Measured	Observed
15.0	<u>Protection by interlocks</u>		Not Applicable
15.1	General		
15.2	Prevention of re-activation		
15.3	Reliability		

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IEC 1010-1 1990 + Am. 1 & 2

Para	Prescribed	Measured	Observed
16.0	Measuring circuits		Not Applicable
16.1	Current measuring circuits		
	Current measuring circuits intended to be connected to current transformer protected adequately.		



Comments :



Additional Sheet

Single Fault Condition
(Clause 6.5)

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IEC 1010-1 1990 + Am. 1 & 2

Input : 440 V AC, 50 Hz

Sr. No.	Fault	Test Time	Mains Power / temperature	Result
01	Bridge Rectifier diode short	1/2 hr.	Temperature of Capacitor C2 Stabilized to 41 Deg.C	Complied
02	Series Resistor R1 Short	1 hr.	Temperature of Capacitor C2 Stabilized to 41 Deg.C	Complied
03	Capacitor C2 short	2 hr.	Temperature of R1 & C2 stabilized to 44 Deg. C.	Complied
04	Output of 15 V Regulator Short	2 hr.	Temperature of IC1 stabilized to 42 Deg. C.	Complied

Comments : Temperature is measured at an ambient of 40 deg C.



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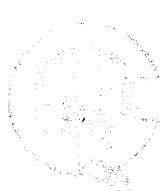
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SUBJECT: SAFETY TESTING OF ANALOG FREQUENCY METER	DATE	PAGE	OF
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3.0 General Remarks : Nil.



Report Approved By

Report Released By

K. Murari
(K. MURARI)

Head, Test operations

[Signature]

JOIC, Planning & Co ordination

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Annexure: A - 1

Equipment Calibration Details

<u>Sr.No.</u>	<u>Name</u>	<u>Model</u>	<u>Code</u>	<u>Cal. Validity</u>
1.	4 1/2 Digit DMM	700T	SAF/068	Aug. 99
2.	Digital Power Meter (YOKOGAWA)	2533	SAF/064	Nov. 98
3.	Digital Force Gauge	DRC500N	SAF/046	Dec. 98
4.	Withstanding Voltage Tester (Kikusui)	T088750	SAF/024	Aug. 99
5.	Hybrid Recorder (Yokogawa)	3081	SAF/004	Feb. 99
6.	Humidity Chamber (Weiss-tek)	---	ENV/050	Apr. 99



OUR ACCREDITATION STATUS

- ERTL (West) set up under the STQC Directorate, Dept. of Electronic, Govt. of India has been accredited under number of national / international systems.
- ERTL test reports have a wide acceptance in Govt. Departments, Private and Public Sector units in India.
- Besides, ERTL also have following accreditations.

SYSTEM	AREA	STATUS
IECQ, Geneva (International Electrotechnical Commission System for Component Qualification Approval)	Component Testing * Resistors (Fixed) * Capacitors (Fixed)	Accredited as ITL (Independent Test Laboratory)
NABL (C), India [National Accreditation Board for Test & Calibration Laboratories (Calibration System)]	Calibration * Electronic Measurements * Electrical Measurements	Accredited as Echelon II level Calibration Laboratory
NABL (T), India [National Accreditation Board for Test & Calibration Laboratories (Testing System)]	Components & Equipments	Recommended for Accreditation
UL, U.S.A. (Underwriters Laboratory)	Safety Testing of * Information Technology Products * Audio Video Products. * Picture Tubes * H. V. Products	Facilities Approved
UL, I.I.S.	Follow-up Services Inspection in Electrical Product (s)	International Inspection Centre - 512
IECEE - CB Scheme	* Information Technology Products * Mains Operated Electronic Consumer Products * Safety critical components such as Switches Cables Fuses Capacitors	Approved as a CB test Laboratory