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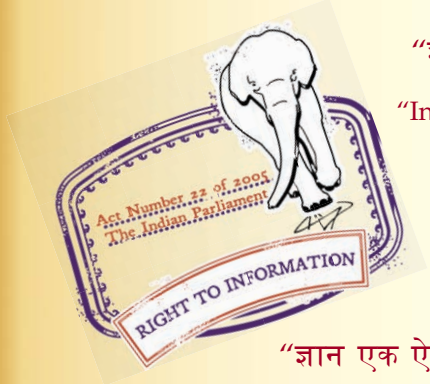
IS 13384-2 (1997): Cathode-ray tube based data display monitor, Part 2: Monochrome [LITD 16: Computer Hardware, Peripherals and Identification Cards]



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"Knowledge is such a treasure which cannot be stolen"

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IS 13384 (Part 2) : 1997
(Reaffirmed 2001)

भारतीय मानक

केथोड किरण ट्यूब से बना आँकड़ाप्रदर्श — विशिष्टि

भाग 2 एकक्रोमी

Indian Standard

CATHODE RAY TUBE BASED DATA DISPLAY MONITOR — SPECIFICATION

PART 2 MONOCHROME

ICS 35.180

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 1997

Price Group 3

FOREWORD

This Indian Standard (Part 2) was adopted by the Bureau of Indian Standards, after the draft finalized by the Computer Peripherals and Media Sectional Committee had been approved by the Electronics and Telecommunication Division Councils.

The objects of this standard is to laydown general and performance requirements for cathode ray tube based monochrome data display monitors. The limits for various requirements have been so chosen as to provide maximum flexibility to the designer and the manufacturers. The standard is designed to serve the public interest through eliminating misunderstandings between the manufacturers and the purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in obtaining with minimum delay the proper products for his/her particular need.

This standard is largely based on document DOE/STQC/COMPUTER/6/92 — Specifications for Monochrome Video Monitor issued by the Standardization, Testing and Quality Certification (STQC) Directorate of Department of Electronics.

Some general information on the common types of video monitors and their characteristics is given in Annex A.

This standard (Part 2) covers cathode ray tube based monochrome data display monitors.

Part 1 of this standard covers 'cathode ray tube based colour data display monitors.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CATHODE RAY BASED DATA DISPLAY MONITOR — SPECIFICATION

PART 2 MONOCHROME

1 SCOPE

This standard specifies general and performance requirements for cathode ray tube based monochrome data display monitor.

2 REFERENCES

The Indian Standards given in Annex B are necessary adjuncts to this standard.

3 TERMINOLOGY

For the purpose of this standard the term and definitions given in IS 1885 (Part 52/Sec 2 to 15) and IS 4545 (Part 1) shall apply.

4 GENERAL REQUIREMENTS

4.1 Power Supply Requirements

4.1.1 The power supply shall be an integral part of the monitor and shall be capable of giving regulated output for mains voltage 240V ± 10 percent with mains frequency 50 Hz ± 3 percent.

4.1.2 The maximum power consumption shall be specified by the manufacturer.

4.2 Controls

4.2.1 The following controls normally accessible to the user shall be provided:

a) Brightness,

b) Contrast, and

c) Power On-Off switch.

4.2.2 The following pre-set controls may also be provided for adjustment at the time of servicing:

a) Focus,

b) Sync-control – horizontal and vertical,

c) Width control,

d) Linerity control – horizontal and vertical, and

e) Height control.

5 SAFETY REQUIREMENTS

The monitor shall conform to the following safety requirements. These tests shall be carried out in accordance with IS 13252 and shall meet the requirements specified therein:

a) Ionizing (X-Ray) Radiation (*see* **4.3.12** of IS 13252),

b) Protection against electric shock and energy harzards (*see* **2.1** of IS 13252),

c) Insulation (*see* **2.2** of IS 13252), and

d) Machanical strength of cathode ray tubes and protection against effects of implosion (*see* **4.2.8** of IS 13252).

NOTE — In case of availability of certificate regarding implosion proofness from picture tube manufacturer, this test may not be carried out.

6 EMI / EMC REQUIREMENTS

The conducted emission and radiated emission shall be limited to the requirements specified in Table 16 and Table 18 respectively for class A equipments in IS 6842 (with Amendment No. 2). However, the equipment shall meet the limits for class B equipments if it is to be used in residential areas.

7 PERFORMANCE REQUIREMENTS

The performance requirements of the video monitors shall be in accordance with Table 1.

8 OPERATING AND INSTRUCTION MANUAL

An operation and instruction manual containing information relating to installation, operation, routine maintenance and safety precautions shall be made available with each monitor. The manufacturer would particularly specify the particular component for which adequate care needs to be taken to ensure proper replacement at the time of servicing.

9 TEST

9.1 Classification of Tests

9.1.1 *Type Tests*

The tests specified in Table 2 shall constitute type tests and shall be carried out in the sequence mentioned therein.

Table 1 Performance Requirements
(*Clause* 7)

Sl No.	Characteristics	Requirements
(1)	(2)	(3)
i)	a) Visual examination	The monitor shall be free from workmanship defects sharp edges, burrs, scratches, nicks, poweron blemishes, missing phosphor dots, bubbles and any other visible defect. All fasteners shall be fixed properly. All steel chassis parts shall be coated to prevent rust and corrosion. All frame parts shall have conductive surfaces
	b) Controls	All external controls shall perform intended functions and shall be clearly and indelibly marked
ii)	Geometric distortion	
	a) Picture outline distortion	Not more than 6 percent in each direction (vertical and horizontal) to be tested in accordance with **4.4** of IS 4545 (Part 3)
	b) Non-linearity due to scanning	Total distortion not more than 10 percent in each direction. To be tested in accordance with **4.3** of IS 4545 (Part 3)
iii)	Ripple distortion due to mains	0.5 percent of picture tube width for a difference of 1 Hz between mains and frame frequency to be tested in accordance with **4.2** of IS 4545 (Part 3)
iv)	Picture size stability	Better than 3 percent in both directions over range of brightness control to be tested in accordance with **2.1** of IS 4545 (Part 3)
v)	Hum-bar	Not more than 5 percent when measured as a percentage of voltage amplitude of video signal to be tested in accordance with **15** of IS 4545 (Part 4)
vi)	EHT Voltage	Not more than 20 kV
vii)	Power interrupt response	The monitor shall meet the functional performance requirements after the following sequence: a) Switch on the power b) Interrupt the power to the monitors 100 times at the rate of 6 operations per minute c) Check functional performance

NOTE — Other performance requirements may be agreed to between the manufacturer and the buyer.

9.1.1.1 *Number of samples*

For type tests, number of samples shall be three of the same model, type and make of the monitor selected preferably at random from a regular production lot. The samples shall be distributed for various tests as specified in Table 2.

9.1.1.2 *Criteria for acceptance*

There shall be no failure in any of the type tests. In case of failure, twice the number of samples shall be taken and subjected to the tests in which failure has occured and other tests that have a bearing on the test results. No failure shall be permitted in the re-tests.

9.1.2 *Routine Tests*

The following shall constitute routine tests:

a) Check for operation of the monitor;
b) Check safety requirements as per **5**; and
c) Check for performance requirements as per Sl No. (i), (ii) and (iv) of Table 1.

9.1.3 *Acceptance Tests*

The following shall constitute acceptace tests:

a) Check for operation of the monitor;
b) Check as per **11**, **4** and **5**; and
c) Check as per Sl No. (i), (ii), (iv) and (vii) of Table 1.

The sampling plan and AQL shall be as agreed to between the manufacturer and the buyer and shall be selected from IS 10673.

Table 2 Schedule for Type Tests

(*Clauses* 9.1.1*and* 9.1.1.1)

Group	Test	Clause Reference	No. of Samples
(1)	(2)	(3)	(4)
0	Check for marking requirements	11	3
	Check for general requirements	4	3
	Check for safety requirements	5	3
	Check for EMI/EMC requirements	6	3
	Check for perform-ance requirements	7	3
1	Bump	10.1	1
2	Vibration	10.2	1
	Dry heat	10.4	1
	Damp heat	10.5	1
	Cold	10.6	1
3	Burn-in	10.3	1

10 ENVIRONMENTAL TESTS

10.1 Bump

The monitor shall be subjected to Bump test carried out in accordance with IS 9000 (Part 7/Sec 2) : 1979 in packed condition, with the following severties:

a) Number of bumps : 1 000 ± 10

b) Peak acceleration : 40 g

c) Number of attitudes : 1 (Normal axis as indicated by an arrow or by indicating the side which is 'up' on the packing).

10.2 Vibration

The monitor shall be subjected to vibration test in packed conditions at a frequency of 10 to 55 Hz and acceleration 2 g for 105 min in accordance with IS 9000 (Part 8).

10.3 Burn-in

The monitor shall be subjected to burn-in at ambient temperature for 240 h with power on and with a test pattern as given in Fig. 1.

The pattern shall alternate between Fig. 1 (a) and Fig. 1 (b) at least once every ten seconds.

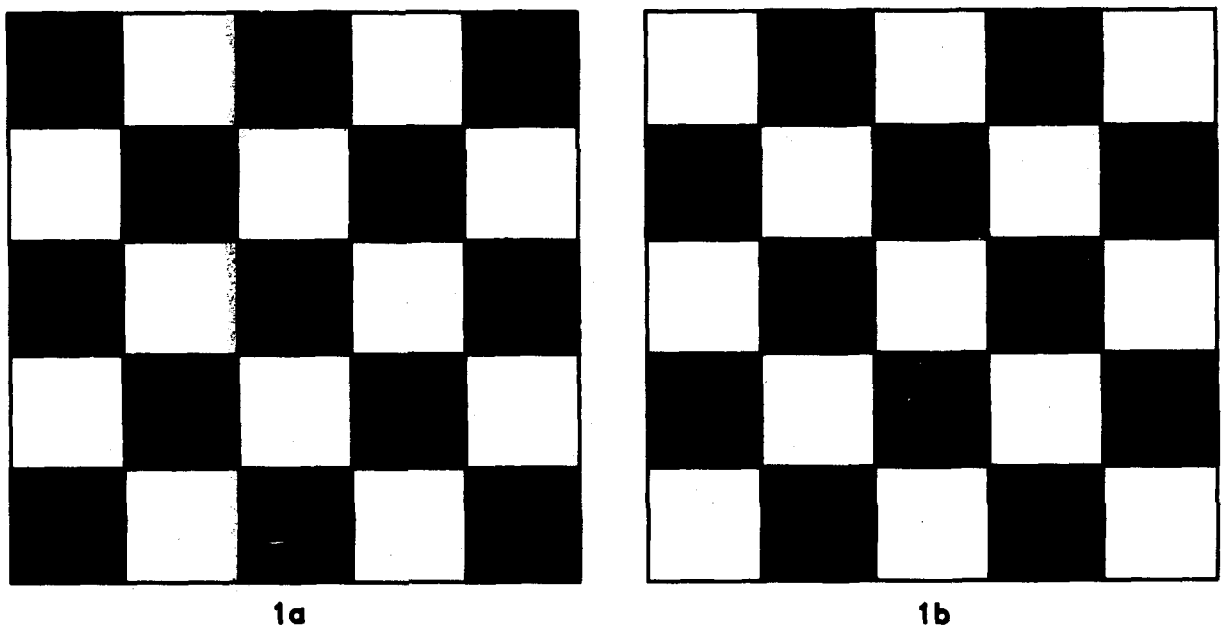

FIG. 1 TEST PATTERN FOR BURN-IN TEST

10.4 Dry Heat

The monitor shall be subjects to dry heat test under power-on condition with severity 40°C for 16 h in accordance with IS 9000 (Part 3/Sec 5).

10.5 Damp Heat Cyclic

The monitor shall be subjected to damp heat cyclic test in power-off condition carried out in accordance with IS 9000 (Part 5/Sec 2) at a temperature of 40°C for two cycles.

10.6 Cold

The monitor shall be subjected to cold test in power-off condition with severity – 10°C for 2 h carried out in accordance with IS 9000 (Part 2/Sec 4).

10.7 Functional Checks

After each environmental/durability test, the performance of the monitors shall be checked using standard test patterns of the type specified in **2.12** of IS 4545 (Part 1). At the end of all environmental/ durability tests, performance check shall be conducted as per Sl No. (i), (ii) and (iv) of Table 1.

11 MARKING

11.1 Each monitor shall be legibly and indelibly marked with atleast the following:

a) Source of manufacturer,

b) Model designation and serial number,

c) Additional markings for safety such as high voltage points with there voltage range,

d) Mains supply voltage range and mains frequency,

e) Fuse and its rating,

f) Input/Output points,

g) Maximum power consumption, and

h) Country of manufacture.

11.2 Letter symbols and Graphical symbols used in the markings shall be as per IS 3722 (Parts 1 and 2) and IS 12032 (Parts 2 to 11), respectively. Symbols not defined in the standards mentioned and all other markings shall be clearly identified by the manufacturer in the manual supplied with the equipment.

11.3 A precautionary note as follows, shall appear on the outer surface of the back cover prominently:

'Do not remove the back cover without totally disconnecting mains supply.'

11.4 The monitor may also be marked with the Standard Mark.

11.4.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. Details of conditions under which a license for the use of the Standard Mark may be granted to the manufacturers or producers may be obtained from the Bureau of Indian Stnadard.

ANNEX A

(Foreword)

TYPES OF MONITORS AND THEIR CHARACTERISTICS

A-1 GENERAL

This Annex is intended for providing general Information of the common types of video monitors and their characteristics. The types covered are not comprehensive but have been chosen in view of their usage in the country. It is recommended that the different types of Video Monitors conform to the characteristics as specified in this Annex.

A-2 DIMENSIONS

The diagonal screen of the video monitors may have one of the following dimensions:

a) 304.8 mm (12 in),

b) 355.6 mm (14 in), and

c) 482.6 mm (19 in).

A-3 OTHER CHARACTERISTICS

Table 3 details the characteristics of the following types of video monitors depending on the graphic adaptor used:

a) C. G. A. (Colour Graphic Adaptor),

b) E. G. A. (Enhanced Graphic Adaptor), and

c) V. G. A (Video Graphic Adaptor).

Table 3 Characteristics of Video Monitors

(*Clause* A-3)

Sl No.	Characteristic	C. G. A	E. G. A	V. G. A
1	Resolution (*Min*) Horizontal (Pixels) × Vertical (Lines)	640 × 200 (optionally for specific application 320×200)	640×300	640×480
2	Tube Dot Pitch (*Max*) in mm.	0.51	0.38 for 12 in screen 0.39 for 14 in screen 0.47 for 19 in screen	0.31 for 12 in. screen 0.39 for 14 in. screen 0.47 for 19 in. screen
3	Video input	TTL	TTL	Analog with 0.7 RGB
4	Sync	Composite sync (TTL level negative) or separate sync (TTL level)	Compostite sync (TTL level negative) or separate sync (TTL level)	Compostite sync (TTL level negative) or separate sync (TTL level) or sync on green (–ve 0.3 V)
5	Connector	9 Pin D type or 15 Pin D type or BNC		
6	Horizontal frequency	15.5 KHz ± 0.5 KHz	21.8 KHz ± 0.5 KHz	31.5 KHz ± 0.5 KHz
7	Vertical frequency	60 Hz	60 Hz	50/60/70 Hz
8	Band width (*Min*)	10 MHz	20 MHz	30 MHz
	Brightness (at maximum setting of brightness control)	← Greater than 40 Nits →		

ANNEX B

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
1885 (Part 52/Sec 2 to 15)	Electrotechnical vocabulary : Part 52 Data processing
3722 (Parts 1 and 2): 1983	Letter symbols and signs used in electircal technology
4545 (Part 1) : 1983	Methods of measurement on receivers for television broadcast transmissions: Part 1 General considerations (*first revision*)
4545 (Part 3) : 1983	Methods of measurement on receivers for television broadcast transmissions: Part 3 Geometrical properties of the picture (*first revision*)
4545 (Part 4) : 1983	Methods of measurement on receivers for television broadcast transmissions: Part 4 Synchronizing quality (*first revision*)

IS No.	*Title*
6842 : 1977	Limits for electromagnetic interference (*first revision*)
9000 (Part 2/Sec 4) : 1977	Basic environmental testing procedure for electronic and electrical items: Part 2 Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature
9000 (Part 3/Sec 5) : 1977	Basic environmental testing procedure for electronic and electrical items: Part 3 Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature
9000 (Part 5/Sec 2) : 1981	Basic environmental testing procedure for electronic and electrical items: Part 5 Damp heat (cyclic) test, Section 2 12 + 12 h cycle
9000 (Part 7/Sec 2) : 1979	Basic environmental testing procedure for electronic and electrical items: Part 7 Impact test, Section 2 Bump
9000 (Part 8) : 1981	Basic environmental testing procedure for electronic and electrical items: Part 8 Vibration (sinusoidal) test
12032 (Parts 2 to 11)	Graphical symbols for diagrams in the field of electrotechnology
10673 : 1983	Sampling plans and procedure for inspection by attributes for electronic items
13252 : 1992	Safety of information technology equipment including electrical business equipment

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

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