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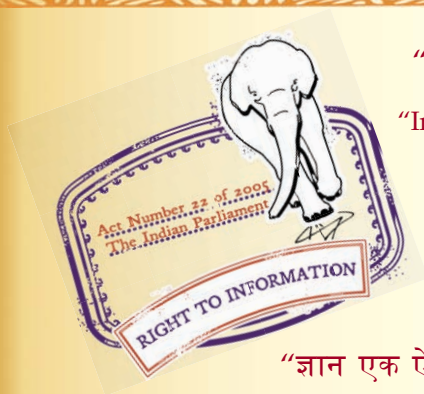
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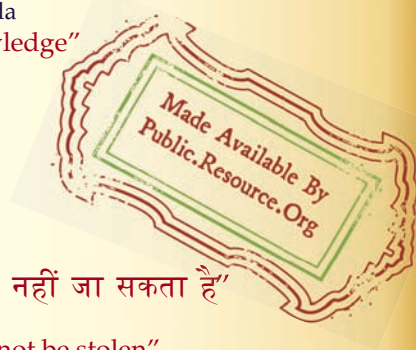
IS 13384-1 (1992): Cathode Ray Tube Based Data Display Monitor, Part 1: Colour [LITD 16: Computer Hardware, Peripherals and Identification Cards]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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की विशिष्टि

भाग 1 रंग

Indian Standard

CATHODE RAY TUBE BASED DATA
DISPLAY MONITOR — SPECIFICATION

PART 1 COLOUR

UDC 621'3'066 : 535'6

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

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Price Group 3

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft Finalized by the Computer Media Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

*Indian Standard***CATHODE RAY TUBE BASED DATA DISPLAY
MONITOR — SPECIFICATION****PART 1 COLOUR****1 SCOPE**

This standard specifies the general and performance requirements for Cathode Ray Tube based Colour Data Display Monitor.

2 REFERENCES

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

3 TERMINOLOGY

For the purpose of this standard the terms and definitions given in IS 1885 (Part 52/Sec 1 to 15) and IS 4545 (Part 1) : 1983 shall apply.

4 MARKING

4.1 Each product shall be legibly and indelibly marked with at least the following:

- a) Manufacturer's name or trade-mark,
- b) Model designation and serial number,
- c) Additional markings for safety such as high voltage points with their voltage range,
- d) Country of manufacture,
- e) Mains supply voltage range and mains frequency,
- f) Fuse and its rating,
- g) Input/output points, and
- h) Maximum power consumption.

4.2 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.

4.3 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.'

5 GENERAL REQUIREMENTS**5.1 Power Supply Requirements**

5.1.1 The power supply shall be an integral part of the monitor and shall be capable of giving regulated output for mains voltage $240\text{ V} \pm 10\text{ percent}$ with mains frequency $50\text{ Hz} \pm 3\text{ percent}$.

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

5.2 Controls

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

- a) Brightness
- b) Contrast
- c) Power On-Off switch

5.2.2 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) RGB gain control
- d) Width control
- e) Linearity control — horizontal and vertical
- f) Height control
- g) Black level control for red, blue and green

5.3 Degaussing : Automatic at switch-on**6 SAFETY REQUIREMENTS**

The monitor shall conform to the following safety requirements. These tests shall be carried out in accordance with IS 13252 : 1991 and shall meet the requirements specified therein.

- a) Ionizing (X-Ray) Radiation (4.3.12 of IS 13252 : 1991).
- b) Protection against electric shock and energy hazards (12.1 of IS 13252 : 1991).
- c) Insulation (12.2 of IS 13252 : 1991).
- d) Mechanical strength of cathode ray tubes and protection against effects of implosion (14.2.8 of IS 13252 : 1991).
- e) The monitor tube should have an antiglare coating or other treatment to prevent glare of the operator.

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

7 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 equipment in IS 6842 : 1977 (with Amendment 2). However, the equipment shall meet the limits for Class B equipment if it is to be used in residential areas.

8 PERFORMANCE REQUIREMENTS

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

9 OPERATING AND INSTRUCTION MANUAL

An operating 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.

10 TESTS

10.1 Classification of Tests

10.1.1 Type Tests

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

10.1.1.1 Number of samples

For types 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.

10.1.1.2 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 occurred and other tests that have a bearing on the test results. No failure shall be permitted in the re-tests.

Table 1 Performance Requirements

Sl No.	Characteristics	Requirements
1)	i) Visual examination	The monitor shall be free from workmanship defects, sharp edges, burrs, scratches, nicks, power-on 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.
	ii) Controls	All external controls shall perform intended functions and shall be clearly and indelibly marked.
2)	Gemoetric 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) : 1983.
	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) : 1983.
3)	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) : 1983.
4)	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) : 1983.
5)	Hum-bar	Not more than 5 percent when measured as a percentage of voltage amplitude of video signal to be tested in accordance with 1.5 of IS 4545 (Part 4) : 1983.
6)	EHT voltage	Not more than 30 kV.
7)	Power interrupt response	The mointor shall meet the functional performance requirements after the following sequence : i) Switch on the power ii) Interrupt the power to the monitor 100 times at the rate of 6 operations per minute. iii) Check functional performance.
		NOTE — Other performance requirements may be agreed to between the manufacturer and the buyer.

10.1.2 Routine Tests

The following shall constitute routine tests :

- i) Check for operation of the monitor
- ii) Check safety requirements as per 6
- iii) Check for performance requirements as per 1, 2 and 4 of Table 1.

10.1.3 Acceptance Tests

The following shall constitute acceptance tests :

- i) Check for operation of the monitor.
- ii) Check as per 4, 5 and 6.
- iii) Check as per 1, 2, 4 and 7 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 : 1983.

11 ENVIRONMENTAL TESTS

11.1 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 severities :

- a) Number of bumps : $1\ 000 \pm 10$
- 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.)

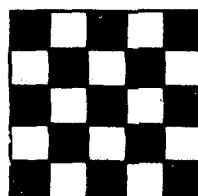
11.2 Vibration

The monitor shall be subjected to vibration test in packed condition at a frequency of 10 to 55 Hz, and

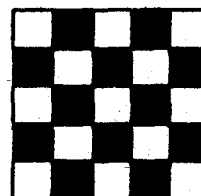
acceleration 2 g for 105 minutes in accordance with IS 9000 (Part 8) : 1981.

11.3 Burn-In

The monitor shall be subjected to Burn-in at ambient temperature for 240 hours with power on and with a test pattern as given below:



(a)



(b)

FIG. 1 BURN-IN PATTERN

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

11.4 Dry Heat

The monitor shall be subjected to dry heat test under power-on condition with severity 40 degree centigrade for 16 hours in accordance with IS 9000 (Part 2/Sec 5) : 1977.

11.5 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) : 1981 at a temperature of 40 degree centigrade for two cycles.

Table 2 Schedule for Type Tests
(Clause 10.1.1.1)

Group	Test	Clause Reference	No. of Samples
0)	Check for marking requirements	4	3
	Check for general requirements		
	Check for safety requirements	5	3
	Check for EMI/EMC requirements	6	3
	Check for performance requirements	7	3
		8 (Table 1)	3
		11.1	1
1)	Bump	11.2	1
2)	Vibration		
	Dry heat	11.4	1
	Damp heat	11.5	1
	Cold	11.6	1
3)	Burn-in	11.3	1

11.6 Cold

The monitor shall be subjected to Cold test in power-off condition with severity minus 10 degree centigrade for two hours carried out in accordance with IS 9000 (Part 2/Sec 4) : 1977.

11.7 Functional Checks

After each environmental/durability test, the performance of the monitor shall be checked using standard test patterns of the type specified in 2.12 of IS 4545 (Part 1) : 1983. At the end of all environmental/durability tests, performance check shall be conducted as per 1, 2 and 4 of Table 1.

ANNEX A

(Clause 3)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
1885 (Part 52/ Sec 1 to 15)	Electrotechnical vocabulary : Part 52 Data processing	Part 2/Sec 4 : 1977	Part 2 Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature
3722 (Parts 1 and 2)	Letter symbols and signs used in electrical technology: Part 1 General guidance on symbols and subscripts (<i>first revision</i>) Part 2 Reference tables for symbols and subscripts (<i>first revision</i>)	Part 3/Sec 5 : 1977	Part 3 Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature
4545	Methods of measurement on receivers for television broadcast transmissions: Part 1 : 1983 General considerations (<i>first revision</i>) Part 3 : 1983 Geometrical properties of the picture (<i>first revision</i>)	Part 5/Sec 2 : 1981	Part 5 Damp heat (cyclic) test, Section 2 12 + 12h cycle
6842 : 1977	Limits for electromagnetic interference (<i>first revision</i>)	Part 7/Sec 2 : 1979	Part 7 Impact test, Section 2 Bump
3000	Basic environmental testing procedures for electronic and electrical items	Part 8 : 1981	Part 8 Vibration (sinusoidal) test
		12032 (Parts 2 to 11)	Graphical symbols for diagrams in the field of electrotechnology
		10673 : 1983	Sampling plans and procedures for inspection by attributes for electronic items
		IS 13252 : 1991 IEC Pub 950 (1986)	'Safety of Information Technology Equipment including Electrical Business Equipment'

ANNEX B

TYPES OF COLOUR MONITORS AND THEIR CHARACTERISTICS

B-1 GENERAL

B-1.1 This Annex is intended for providing general information on the common types of colour 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 Colour Video Monitors conform to the characteristics as specified in this Annex.

B-2 DIMENSIONS

B-2.2 The diagonal screen of the video monitor may have one of the following dimensions :

- a) 304.8 mm (12 in)
- b) 355.6 mm (14 in)
- c) 482.6 mm (19 in)

B-3 OTHER CHARACTERISTICS

B-3.1 Table 3 details the characteristics of the following types of colour video monitors depending on the graphic adaptor used :

- a) C.G.A (Colour Graphic Adaptor)
- b) E.G.A (Enhanced Graphic Adaptor)
- c) V.G.A (Video Graphic Adaptor)

Table 3

Characteristic	C.G.A	E.G.A.	V.G.A
1) Resolution (<i>Min</i>) Horizontal (pixels) $\times$ vertical (lines)	640 $\times$ 200 (optionally for specific applications 320 $\times$ 200)	640 $\times$ 300	640 $\times$ 480
2) Tube dot pitch (<i>Max</i>) 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 18 in screen
3) Video input	TTL	TTL	Analog with 0.7 RGB
4) Sync	Composite sync (TTL level negative) or separate sync (TTL level)	Composite sync (TTL level negative) or separate sync (TTL level)	Composite 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 $\pm$ 0.5 KHz	21.8 KHz $\pm$ 0.5 KHz	31.5 KHz $\pm$ 0.5 KHz
7) Vertical frequency	60 Hz	60 Hz	50/60/70 Hz
8) Band width (min)	10 MHz	20 MHz	30 MHz
9) Brightness (at maximum setting of brightness control)	Greater than 40 Nits	Greater than 40 Nits	Greater than 40 Nits

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