

भारतीय मानक

व्यक्तिगत कंप्यूटर — विशिष्टि

Indian Standard

PERSONAL COMPUTER — SPECIFICATION

ICS 35.160

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FOREWORD

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

The objective of this standard is to lay down performance requirements for ensuring quality and reliability of personal computer (PC). This standard is designed to serve public interest through eliminating any communication gap between the manufacturers and the purchasers and also facilitating interchangeability and improvement of products and to provide assistance to the purchaser in obtaining the appropriate product for his particular need.

The technical committee responsible for the preparation of this standard has reviewed the provisions of the following IEC Publication and has decided that it may be used in conjunction with this standard to carry out tests given in 6.2 (c) of this standard till Indian Standard on this subject is published.

IEC 61000 (Part 4/Sec 5) : 1995 Electromagnetic Compatibility (EMC) Part 4: Testing and Measurement Techniques Section 5 : Surge Immunity Test

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

PERSONAL COMPUTER — SPECIFICATION

1 SCOPE

This standard covers the general and performance requirements of the personal computer. Personal computer covered by this standard may comprise of the following:

- a) Personal computer module comprising of central processing unit (CPU), memory and various interfaces;
- b) Switch mode power supply (SMPS) unit;
- c) Keyboard (integral/detachable); and
- d) Floppy disk drive, hard disk drive and other secondary storage devices as per configuration supplied by manufacturer.

2 REFERENCES

The standards indicated in Annex A contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

3.1 For purpose of this standard, the terms and definitions as given in IS 1885 (Part 52) shall apply in addition to the following.

3.1.1 *Personal Computer*

An 8-bit, 16-bit, 32-bit or 64-bit microcomputer for individual use in applications such as office, small business, school, home, etc.

4 GENERAL REQUIREMENTS

4.1 Personal Computer

4.1.1 Undermentioned features of the micro-processor shall be specified by the manufacturers:

- a) Microprocessor used,
- b) RAM expansion capacity,
- c) Clock rate, and
- d) RAM capacity.

4.2 External and Internal Interfaces

These shall be as specified by the manufacturer.

NOTE — The external and internal interfaces may include printer interface, serial interface, secondary storage interfaces such as floppy disk interface, harddisk interface, tape drive and cassette interfaces (optional), etc.

4.3 Display

The personal computer monitor shall be capable of performing as specified in IS 13384 (Part 1) and in IS 13384 (Part 2).

4.4 Keyboard

The personal computer keyboard shall be capable of performing as specified in IS 14441.

4.5 Power Supply

The power supply may be an integral part of the PC or may be a separate unit. Maximum power consumption shall not exceed the value specified by the manufacturer.

5 SAFETY REQUIREMENTS

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

- a) Earth leakage current test shall be carried out according to 5.2 of IS 13252.
- b) Dielectric test as per 5.3 of IS 13252.

6 EMI/EMC REQUIREMENTS

6.1 The conducted emission and the radiated emission shall be limited to the requirements specified in Table 2, Table 4 and Table 6 for Class B equipment in IS 6873(Part 7).

6.2 Conducted Susceptibility Test

The following tests shall be carried out:

- a) Electrostatic discharge test — As per IS 14700 (Part 4/Sec 2),
- b) Electrical fast transient/burst test — As per IS 14700 (Part 4/Sec 4), and
- c) Surge/spike test — As per IEC 61000 (Part 4/Sec 5).

7 PERFORMANCE REQUIREMENTS

The performance requirements for personal computer shall be as specified in Table 1.

Table 1 Performance Requirements
(Clause 7)

SI Parameters No.		Requirements
(1)	(2)	(3)
i)	Visual examination	a) The personal computer shall be free from workmanship defects, cracks, scratches, nicks, burrs, sharp edges, etc. All the fasteners shall be properly screwed. The identification marks for all the interfaces/connectors shall be clearly visible. High voltage areas should be marked, with adequate 'CAUTION' labels. b) The availability of the input/output port (serial port and parallel port) applicable to external and internal interfaces shall be checked.
ii)	Functional performance	As specified by the manufacturer.
iii)	Effect of power supply variations	The personal computer shall meet the functional requirements when operated from 170 volts to 270 volts AC and for frequency variation from 47 Hz to 53 Hz.

8 MARKING

8.1 Each personal computer shall be legibly and indelibly marked with at least the following information:

- a) Manufacturer's name or trademark;
- b) Model designation and serial number;
- c) Additional markings for safety, such as high voltage points with their voltage value;
- d) Country of manufacture;
- e) Input AC voltage range and input frequency;
- f) Fuse and its rating (if readily accessible to the user); and
- g) Input/output points.

Compliance is checked by inspection and by rubbing the marking by hand for 15 s with a piece of cloth soaked with water and again for 15 s with a piece of cloth soaked with kerosene. After the test, the marking shall be legible; it shall not be easily possible to remove marking plates and it shall show no curling.

8.2 The personal computer may also be marked with the Standard Mark.

8.2.1 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 manufacturers or producers may be obtained from the Bureau of Indian Standards.

9 USER MANUAL

A user manual (either in hard copy or soft copy) containing information relating to installation, operation, routine maintenance and safety precautions shall be made available with each personal computer. The manufacturer would particularly specify the critical components for which adequate care needs to be taken to ensure proper replacement at the time of servicing.

10 TESTS

10.1 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 Number of Samples

For type tests, number of samples shall be three of the same model. Type and make of the personal computer shall be selected at random, preferably from a regular production.

Table 2 Schedule of Type Tests
(Clause 10.1)

Group	Tests	Clause Ref	No. of Samples
(1)	(2)	(3)	(4)
0	Check for general requirements	4	3
	Check for performance requirements	Table 1	
	Check for EMI/EMC requirements	6	
	Check for safety requirements	5	
	Check for marking requirements	8	
1	Drop (Free fall) test	10.4.6	1
	Bump test	10.4.7	
2	Vibration test	10.4.1	1
	Dry heat test	10.4.3	
	Damp heat test	10.4.4	
	Cold test	10.4.5	
3	Burn-in test	10.4.2	1

10.1.2 Criteria of 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 bearing on the test results. No failure should be there in the retests.

10.2 Routine Tests

The following shall constitute routine tests:

- a) Visual examination as per Table 1,
- b) Functional performance as per Table 1,

- c) Earth leakage current test as per 5.2 of IS 13252, and
- d) Dielectric test as per 5.3 of IS 13252.

10.3 Acceptance Tests

The following shall constitute acceptance tests:

- a) All tests listed under Table 1, and
- b) All tests listed in 5.1.

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

10.4 Environmental Tests

10.4.1 Vibration Test

The personal computer in unpacked and shipable condition with power 'OFF' shall be subjected to vibration test at a frequency of 10 to 55 Hz and acceleration 1g (peak-to-peak) for 45 minutes on each axis (X, Y, Z) in accordance with IS 9000 (Part 8).

10.4.2 Burn-in Test

The personal computer shall be subjected to burn-in at a temperature of 45°C for 48 hours with power 'ON'.

10.4.3 Dry Heat

The PC in unpacked condition with power 'OFF' shall be subjected to dry heat test of severity of 55°C for 16 hours in accordance with IS 9000 (Part 3/Sec 5).

10.4.4 Damp Heat Cyclic Test

The personal computer in unpacked condition with power 'OFF' shall be subjected to damp heat cyclic

test carried out in accordance with IS 9000 (Part 5/Sec 1), at a temperature of 40°C and a relative humidity not less than 90 percent for two cycles.

10.4.5 Cold Test

The PC in unpacked condition with power 'OFF' shall be subjected to cold test of severity of -10°C for 2 hours carried out in accordance with IS 9000 (Part 2/Sec 4). The duration of recovery shall be 1-2 hours. To avoid condensation, equipment to be brought to ambient temperature in a controlled environment.

10.4.6 Free Fall Test

The PC shall be subjected to free fall test from a height of 25 mm in accordance with IS 9000 (Part 7/Sec 4). Total number of falls shall be 8 (4 corners + 4 edges) in unpacked condition.

10.4.7 Bump Test

The PC shall be subjected to bump test carried out in accordance with IS 9000 (Part 7/Sec 2), the number of bumps being 1 000 and with acceleration 40g under packed condition in normal direction.

10.4.8 After each environmental and mechanical endurance test, the functional performance as given in SI No. 1 and 2 of Table 1 shall be carried out after recovery of 1 to 2 hours and following tests shall be carried out after damp heat and cold test.

- a) Earth leakage current test as per 5.2 of IS 13252.
- b) Dielectric test as per 5.3 of IS 13252.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
1885 (Part 52) : 1980	Electrotechnical vocabulary: Part 52 Data processing	9000 (Part 5/ Sec 1) : 1981	Part 5 Damp heat (cyclic) test, Section 1 16 + 8h cycle
6873 (Part 7) : 1999	Limits and methods of measure- ments of radio disturbance charac- teristics: Part 7 Information technology equipment (<i>first revision</i>)	10673 : 1983	Sampling plans and procedures for inspection by attributes for electronic items
9000	Basic environmental testing proce- dures for electronic and electrical items:	13252 : 1992	Safety of information technology equipment including electrical business equipment
(Part 7/ Sec 2) : 1979	Part 7 Impact test, Section 2 Bump	13384	Cathode ray tube based data display monitor:
(Part 7/ Sec 4) : 1979	Part 7 Impact test, Section 4 Free fall	(Part 1) : 1992	Colour
(Part 8) : 1981	Vibration (sinusoidal) test	(Part 2) : 1997	Monochrome
(Part 2/ Sec 4) : 1977	Part 2 Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature	14441 : 1997	Specification for keyboard
(Part 3/ Sec 5) : 1977	Part 3 Dry heat test, Section 5 Dry heat test for heat dissipating items with sudden change of temperature	14700	Electromagnetic Compatibility (EMC):
		(Part 4/ Sec 2) : 1999	Part 4 Testing and measurement techniques, Section 2 Electrostatic discharge immunity test
		(Part 4/ Sec 4) : 1999	Part 4 Testing and measurement techniques, Section 4 Electrical fast transient/ burst immunity test

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Review of Indian Standards

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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Amendments Issued Since Publication

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