IS 14896:2001

*भारतीय मानक*

*व्यक्तिगत कम्प्युटर – विशीष्टि*

*Indian Standard*

PERSONAL COMPUTER — SPECIFICATION

ICS 35.160

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**BUREAU OF IN DIAN STANDARDS**

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Computer Hardware Sectional Committee, LTD 37

FOREWORD

(Formal Clauses to be added later)

This Indian Standard *may be* 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 10provide 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/See 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:

1. Personal computer module comprising of central processing unit (CPU), memory and various interfaces;
2. Switch mode power supply (SMPS) unit;
3. Keyboard (integral/detachable); and
4. Hard disk drive, Solid-State 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 su5ject 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 ISO 2382 shall apply in addition to the following.

**3.1.1** Personal Computer

computer that is primarily intended for stand-alone use by an individual

**3.1.2** Computer

A functional unit that can perform data processing

**4 GENERAL REQUIREMENTS**

**4.1** Personal Computer

**4.1.1** Undermentioned features of the microprocessor shall be specified by the manufacturers:

a) Microprocessor used,

b) RAM expansion capacity,

c) Data Transfer speed, 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 hard disk drive, solid state drive, USB, Ethernet port, etc

**4.3 Display**

The personal computer monitor shall be capable of performing as specified in IS/IEC 61747-1-1 and IS/IEC 62314-1-1.

**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.

Note: Applicable Power supply shall comply to the requirements of IS 14886.

**5 SAFETY REQUIREMENTS**

**5.1** The personal computer shall conform to safety requirements, these tests shall be carried out in accordance with IS 13252: Part 1 and shall meet the requirements specified therein for following tests:

1. Earth leakage current test shall be carried out according to 5.2 of IS 13252: Part 1.
2. Dielectric test as per 5.3 of IS 13252: part 1.
3. Switches and relays as per 2.8.7 of IS 13252: Part 1

**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/CISPR 32.

**6.2** Conducted Susceptibility Test

The following tests shall be carried out:

1. Electrostatic discharge test— As per IS 14700 (Part 4/Sec 2),
2. Electrical fast transient/burst test — As per IS 14700 (Part 4/Sec 4),
3. Surge/spike test — As per IEC 61000 (Part 4/See 5)
4. voltage dips short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase – as per IS 14700 (Part 4/Sec 11) and
5. Surge immunity test- as per IS 14700 (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)**

| **Sl. No** | **Parameters** | **Requirements** |
| --- | --- | --- |
|  | Visual examination | 1. 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. 2. The availability of the input/output port (serial port and parallel port) applicable to external and internal interfaces shall be checked. |
|  | Functional performance | As specified by the manufacturer |
|  | Effect of power supply variations | The personal computer shall meet the functional requirements when operated from 170volts 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:

1. Manufacturer’s name or trademark;
2. Model designation and serial number;
3. Additional markings for safety, such as high voltage points with their voltage value;
4. Country of manufacture;
5. Input AC voltage range and input frequency;
6. Fuse and its rating (if readily accessible to the user); and
7. 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, 2016* 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 |
| --- | --- | --- | --- |
| 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 |
| 4 | Bum-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:

1. Visual examination as per Table 1,
2. Functional performance as per Table 1,
3. Earth leakage current test as per 5.2 of IS 13252: Part 1, and
4. Dielectric test as per 5.30f IS 13252: Part 1.

**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 IEC 60410 or ISO 2859-1 and agreed to between the manufacturer and the buyer.

**10.4 Environmental Tests**

**10.4.1** *Vibration Test*

The personal computer in unpacked and shippable 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/IEC 60068-2-6.

**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 seventy of –10”C for 2 hours carried out in accordance with IS/IEC 60068-2-1. The duration of recovery shall be 1-2hours. 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 3). Total number of falls shall be 8 (4 comers + 4 edges) in unpacked condition.

**10.4.7** *Shock Test*

The PC shall be subjected to Shock test carried out in accordance with IS 9000: Part 7: Sec 1.

**10.4.8** After each environmental and mechanical endurance test, the functional performance as given in Sl 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**

| **IS No./ISO/IEC No.** | ***Title*** | **IS No./ISO/IEC No.** | ***Title*** |
| --- | --- | --- | --- |
| IS/ISO/IEC 2382 : 2015 | Information Technology- Vocabulary ( First Revision ) | ISO 2859-1:1999 | Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection |
| IS/CISPR 32:2015 | Electromagnetic Compatibility of Multimedia Equipment Emission Requirements | *IS 13252:Part 1: 2010* | Information technology  Equipment — safety  Part 1 general requirements  ( second revision ) |
| IS 9000 | Basic environmental testing procedures  for electronic and electrical items: | 13384 | Cathode ray tube based data display monitor |
| (Part 7/  Sec 2) :1979 | Part 7 Impact test, Section 2 Bump | (Part 1): 1992 | Colour |
| (Part 7/  Sec 4) :1979 | Part 7 Impact test, Section 4 Free fall | (Part 2): 1997 | Monochrome |
| (Part 8): 1981 | Vibration (sinusoidal) test | 14441:1997 | Specification for keyboard |
| (Part 21  Sec 4) :1977 | Part *2* Cold test, Section 4 Cold test for heat dissipating items with  gradual change of temperature | 14700 | Electromagnetic Compatibility (EMC): |
| (Part *31*  *Sec 5): 1977* | Part 3 Dry heat test, Section 5 Dry  heat test for heat dissipating items  with sudden change of temperature | (Part 4/Sec 2): 1999 | Part 4 Testing and measurement  techniques, Section 2 Electrostatic  discharge immunity test |
| 9000 (Part 5/  Part 52 Data processing Sec 1): 1981 | Part 5 Damp heat (cyclic) test, Section 1 16+ 8h cycle | (Part 4/  *Sec 4) :1999* | Part 4 Testing and measurement  techniques, Section 4 Electrical fast  transient burst immunity test |

**ANNEX A**

*(Clause* **2 ]**

**LIST OF REFERRED INDIAN STANDARDS**

| **IS No./ISO/IEC No.** | ***Title*** | **IS No./ISO/IEC No.** | ***Title*** |
| --- | --- | --- | --- |
| IS 2382 : 1970 | Mounting Dimensions of Loudspeakers | IEC 61747-1-1:2014 | Liquid crystal display devices - Part 1-1: Generic - Generic specification |
| IS/IEC 62314 : 2006 | Solid-state relays | IS 14441 : [1997](https://archive.org/search.php?query=date:1997) | Specification for keyboard |
| IS 14886:2000 | SWITCH MODE POWER SUPPLY — SPECIFICATION | IS 13252 (Part 1) : 2010 IEC 60950-1 | INFORMATION TECHNOLOGY EQUIPMENT — SAFETY |
| IS 14700-4-2: [2008](https://archive.org/search.php?query=date:2008) | Electromagnetic Compatibility (EMC), Part 4: Testing and Measurement Techniques, Section 2 : Electrostatic Discharge Immunity Test | IS 14700 -4- 4 :2008 | PART4 TESTINGAND MEASUREMENTTECHNIQUES Section 4 Electrical Fast Transient/Burst Immunity Test |
| IEC 61000-4-5:2014+AMD1:2017 CSV Consolidated version | Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test | IS 14700-4-11:2008 | Electromagnetic compatibility (EMC) : Part 4 Testing and measurement techniques, Section 11: Voltage dips, short interruptions and voltage variations immunity tests |
| IS 14700-4-5 : 2019 | Electromagnetic Compatibility (EMC) Part 4 Testing and Measurement Techniques Section 5 Surge immunity test ( First Revision | [CISPR 32:2015](https://infostore.saiglobal.com/en-us/standards/cispr-32-2015-rlv-567032_saig_iec_iec_1293853/) | Electromagnetic compatibility of multimedia equipment - Emis... |
| IEC 60410 |  | ISO 2859-1:1999(en) | Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection |
| IS/IEC 60068-2-6. | Sinusoidal Vibration Testing | IEC 60068-2-1:2007 | Environmental testing - Part 2-1: Tests - Test A: Cold |
| IS 9000-7-3 : [1977](https://archive.org/search.php?query=date:1977) | Basic environmental testing procedures for electronic and electrical items, Part 7: Impact test, Section 1-5 | IS 9000 -3-5: 1977 (R2004) | BASIC ENVIRONMENTAL TESTING PROCEDURES FOR ELECTRONIC AND ELECTRICAL ITEMS - PART 3: DRY HEAT TEST |
| IS 9000-7-1: : 2006 | BASIC ENVIRONMENTAL TESTING PROCEDURES FOR ELECTRONIC AND ELECTRICAL ITEMS | IS 9000-5-1and 2:1981 | Basic environmental testing procedures for electronic and electrical items, Part 5: Damp heat (cyclic) test |
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