भारतीय मानक **IS 18830 : 2024**

Indian Standard

कॉर्ड एक्सटेंशन सेट्स — विशिष्टि

(IEC 60884-2-7 : 2011 + AMD 1 : 2013, संशोधित)

Cord Extension Sets — Specifications

(IEC 60884-2-7 : 2011 + AMD 1 : 2013, MOD)

ICS 29.120.30

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Electrical Wiring Accessories Sectional Committee, ETD 14

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Electrical Wiring Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

This standard specifies requirements for cord extension sets. This standard is to be read in conjunction with IS 1293 : 2019 'Plugs and socket — Outlets of rated voltage up to and including 250 volts and rated current up to and including 16 amperes — Specification (*third revision*)'. For the sake of convenience, the clauses of this standard corresponds to those of IS 1293. Wherever possible instead of reproducing full text of each clause, clauses of IS 1293, which are applicable (which means that relevant provisions of the clause apply) or not applicable and the sub-clauses or portion there of which are not applicable are indicated as under:

a) In case of a clause where it is applicable/not applicable, the wording used is 'this clause of IS 1293 is applicable/not applicable'; and

b) In case of sub-clause or part there of is not applicable, the wording used is 'Not applicable'.

Wherever a sub-clause of IS 1293 is to be replaced by a new text, it has been indicated as under:

a) Replacement or modification — Followed by the new text;

b) Any addition to the existing provision of a sub-clause of IS 1293 has been indicated as under:

   Addition — Followed by the text of the additional matter;

c) Any deletion to the existing provision of a sub-clause of IS 1293 has been indicated as under:

   Delete — Followed by content to be deleted; and

d) Clauses/Tables which are additional to those of IS 1293 are numbered starting from 101 and additional sub-clauses are numbered with the main clause number followed by 101, 102, etc for example, **7.101**, Should however, any deviation exist between IS 1293 and this standard, the provision of the latter shall apply.

This standard is based on IEC 60884-2-7 'Plugs and socket-outlets for household and similar purposes — Part 2-7: Particular requirements for cord extension sets'.

The composition of the Committee responsible for the formulation of this standard is given in Annex CC.

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 or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. 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

CORD EXTENSION SETS — SPECIFICATIONS

(IEC 60884-2-7 : 2011 + AMD 1 : 2013, MOD)

1 SCOPE

This clause of IS 1293 is replaced by the following:

This standard applies to cord extension sets, rewireable, non-rewireable and integrated, with or without earthing contact, with a rated voltage greater than 50 V but not exceeding 250 V and a rated current not exceeding 16 A, intended for household and similar purposes, either indoors or outdoors.

This standard does not apply to cord extension sets with means for reeling.

This standard also applies to cord extension sets which are intended to be used in a cable reel, and which therefore become cable reels with a detachable flexible cable. For the combination of the cord extension set, the reel requirements and tests of IS 15368 have to be fulfilled in addition.

Cord extension sets are suitable for use at ambient temperatures not normally exceeding + 45 ºC, but their average over a period of 24 h does not exceed + 40 °C, with a lower limit of the ambient air temperature of – 5 °C.

2 REFERENCES

This clause of IS 1293 is applicable except as follows:

Addition:

IS No./Other Standards	*Title*
IS 1293 : 2019	Plugs and socket-outlets for household and similar purposes of rated voltage up to and including 250 V and rated current up to and including 16 A — Specification (*fourth revision*)
IS 13252 (Part 1) : 2010	Information technology equipment — Safety: Part 1 General requirements (*second revision*)
IS 15368 : 2003	Cable reels for household and similar purposes
IEC 60884-2-1	Plugs and socket-outlets for household and similar purposes — Part 2-1: Particular requirements for fused plugs

3 DEFINITIONS

This clause of IS 1293 is applicable except as follows.

Replacement of Note 3 after first Paragraph:

NOTE — 3 The term “accessory”, "portable accessory" covers plugs, single and multiple portable socket-outlets. Examples of the use of accessories are shown in Fig. 1A) of IS 1293.

3.13 Cord Extension Set

Addition:

NOTES

1 101 The term “plug” covers plugs and fused plugs. The term “socket-outlet” covers also socket-outlet with incorporated components such as switches and fuses etc (*see* 4).

2 102 Portable socket outlets covers single and multiple portable socket outlets.

3 103 General purpose tool will include screwdriver set, iron solder.

4 104 Component will include switches, plugs, socket outlets, USB, fuse and like

5 105 Cord extension will cover all types as specified in 7.1.4.

3.13.101 *Rewireable Cord Extension Set*

Cord extension set so constructed that any of the accessory and the flexible cable can be replaced with the aid of a general-purpose tool

3.13.102 *Non-Rewireable Cord Extension Set*

Cord extension set so constructed that it forms a complete unit with the flexible cable, the plug and socket-outlet after connection and assembly by the manufacturer, the disassembly of which makes it permanently unfit for any further use.

3.13.103 *Integrated Cord Extension Set*

Cord extension set so constructed that only flexible

cable and/or plug can be replaced with general purpose tool, however replacement of socket outlets is not possible and such attempt will make it permanently unfit for further use.

3.13.104 *Base Plane*

The plane on which base of cord extension set lies.

3.13.105 *Mounting Plane*

The plane on which that surface lies where base of cord extension set is placed as per normal use.

3.13.106 *Engagement Plane*

The plane on which engagement face of socket outlet and plug to be engaged lies.

4 GENERAL REQUIREMENTS

This clause of IS 1293 is applicable except as follows:

Addition:

Components such as USB outlets, plugs, socket-outlets (including multiple socket- outlets), flexible cables switches, fuses, overload protectors of the cord extension sets shall be fully compliant as per relevant Indian Standard if any.

Incorporated components shall be so rated or so protected that overloading of either of the component or the plug or the socket cannot occur in normal use.

Requirements of switches incorporated in cord extension set are detailed in Annex D.

5 GENERAL REMARKS ON TESTS

This clause of IS 1293 is applicable except as follows:

5.1 *Replacement:*

Tests shall be made to prove compliance with the requirements laid down in this standard.

Rewirable cord extension sets are made by assembling of individual components (plugs, socket outlets and flexible cables etc) which must be compliant to relevant Indian standard, if any. No extra requirements for such components have to be applied and the relevant tests shall not be repeated.

However, validation of compliance is to be done for individual components of Integrated and Non-rewirable cord extension sets by the tests prescribed in this standard or relevant Indian standard of the component, if any.

In case of multiple portable socket outlets, one socket outlet of each type and rating to be validated to ensure compliance to this standard.

Apart from individual components compliance, complete cord extension sets of all types as specified in **7.1.4** to be additionally validated for ensuring compliance to relevant clauses (for complete product) as laid down in this standard.

Tests are made as follows:

a) type tests shall be made on representative specimens of each assembly; and

b) routine tests shall be made on each assembly manufactured according to this standard.

Sub-clauses **5.2** to **5.5** are applicable to type tests and schedule of routine, acceptance and type test given in **31**.

5.2 *Replacement:*

Unless otherwise specified, Cord extension sets are tested as delivered.

5.3 *Replacement:*

Unless otherwise specified, the tests are carried out in the order of the clauses, at an ambient temperature between 15 °C and 40 °C.

In case of doubt, the tests are made at an ambient temperature of (27 ± 5) °C.

5.4 *Replacement*:

Three specimens are subjected to all the relevant tests (*see* Annex BB).

5.5 *Replacement:*

The specimens are submitted to all the relevant tests and the requirements are satisfied if all the tests are met.

If one specimen does not satisfy a test due to a manufacturing cord extension sets process fault, that test and any preceding one which may have influenced the results of the test shall be repeated, and also the tests which follow shall be made in the required sequence on another full set of specimens, all of which shall comply with the requirements.

NOTE — The applicant may submit, together with a number of specimens specified in **5.4**, the additional set of specimens which may be required, should one specimen fail. The testing station will then, without further request, test the additional specimens and will only reject them if a further failure occurs. If the additional set of specimens is not submitted at the same time, the failure of one specimen will entail rejection.

5.5.101 Safety related routine tests are specified in Annex AA.

6 RATINGS

This clause of IS 1293 is applicable except as follows:

Replacement:

6.2 The rated current of the cord extension set shall be the lowest value from:

a) the rated current of the plug; or
b) the arithmetic sum of the highest rated currents of all plugs which can be inserted into the cord extension set; or
c) the rated current of the overcurrent protective device having the smallest rated current.

The rated voltage of the cord extension set is that of the plug.

Compliance is checked by inspection of the marking.

7 CLASSIFICATION

This clause of IS 1293 is applicable except as follows:

7.1 Accessories Classification

This clause of IS 1293 is not applicable except for **7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.2**.

Replacement of the title:

7.1.4 Classification according to the method of fixing of accessory and flexible cable.

Addition:

c) Integrated cord extension set

7.2 Socket-Outlets Classification

Addition:

This clause of IS 1293 is applicable for integrated and non-rewirable cord extension sets.

7.3 Plug Classification

This clause of IS 1293 is not applicable.

7.1.101 *Classification According to Method of Connecting Flexible Cable*

a) Flexible cable connected through screw type terminal on socket;
b) Flexible cable connected through soldering on terminal of socket; and
c) Flexible cable connected through non replaceable permanent terminations.

8 MARKING

This clause of IS 1293 is applicable except as follows.

8.1 *Addition of the following paragraphs after the Part h*):

All marking shall be on main body of cord extension set.

For a cord extension set, the type reference, which may be a catalogue number, shall be placed on the smallest packaging unit.

Addition at the end:

In case of multiple portable socket-outlets or when there is an overcurrent protective device, the power in watts to be mentioned and part a) is not applicable.

Addition at the end:

The marking for power shall be completed by the word MAX. This marking shall be durable and easily legible with normal or corrected vision, without additional magnification.

The power is calculated using the nominal supply voltage in volts and a power factor cos φ = 1.

NOTE — These markings may be shown as in the following examples:

MAX 2000 W or 2000 W MAX

The maximum admissible power marking shall not be hidden by any inserted plug.

9 CHECKING OF DIMENSIONS

This clause of IS 1293 is applicable.

10 PROTECTION AGAINST ELECTRIC SHOCK

This clause of IS 1293 is applicable except as follows

Addition:

Cord extension set are tested as delivered and mounted on surface as per normal use.

10.101 Cord extension sets shall be so designed and constructed that after they are wired and assembled as for normal use, live parts are not accessible, even after removal of parts which can be removed without the use of a tool.

Compliance is checked by inspection and, if necessary, by the following test.

The standard test finger, test probe B of IS 1401, is applied in every possible position, an electrical indicator with a voltage between 40 V and 50 V being used to show contact with the relevant parts.

10.102 Cord extension sets shall be so designed and constructed that after they are wired and assembled as for normal use, live parts are not accessible, even after removal of parts, which can be removed without the use of a tool.

Compliance is checked by inspection and by applying with a test wire of 1.0 mm diameter.

(*see* Fig. 10 of IS 1293) a force of 1 N is applied, where the cable enters the plug and the portable socket outlet in every possible position.

During this test, it shall not be possible to touch live parts with the gauge.

An electrical indicator with a voltage between 40 V and 50 V shall be used.

Replacement:

10.1 For cord extension set where use of elastomeric or thermoplastic material is likely to influence the requirement, the test of 10.101 is repeated at an ambient temperature of 40 °C ± 2 °C, cord extension set being at this temperature.

During this test the cord extension sets are subjected for 1 min to a force of 75N applied through the tip of straight unjointed test finger, test probe 11 of IS 1401 of the same dimensions as the standard test finger. This finger with an electrical indicator as described above is applied to all places where yielding of the insulating material could impair the safety, but it is not applied to membranes or like and is applied to thin walled knock outs with a force of 10 N. Samples shall not show any deformation which would result in undue alteration of dimensions of socket outlets shown in Annex B of IS 1293 and live parts shall not be accessible.

Each Cord extension set is pressed between two flat surfaces with a force of 150 N for 5 min as shown in Fig. 8. Fifteen minutes after removal of the test apparatus, the samples shall not show any deformation which would result in undue alteration of dimensions of socket outlets as shown in Annex B of IS 1293.

10.2 *Replacement:*

Parts of cord extension set with the exception of small screws and like, isolated from live parts, for fixing main parts and cover or cover plates of cord extension set shall be made of insulating material. However accessible parts of cord extension set may be made of metal if the requirements given in **10.2.1** or **10.2.2** are fulfilled.

Replacement:

10.2.1 Accessible metal parts are protected by supplementary insulation made by insulating lining or insulating barrier fixed to cover or cover plates or to the body of cord extension set in such a way that the insulating linings or barriers cannot be removed without being permanently damaged or so designed that they cannot be replaced in an incorrect position and that if they are omitted ,cord extension set are rendered inoperable or manifestly incomplete and there is no risk of accidental contact between live parts and accessible metal cover and cover plates for example through their fixing screws even if a conductor should come away from its terminal and if precautions are taken in order to keep creepage or clearances becoming less than the values specified in Table 102 .

In case of single pole insertion, the requirements given in **10.3** apply.

Compliance is checked by inspection.

The above lining or barriers shall comply with the test of **17** and **27**.

10.2.2 *Replacement*

Accessible metal covers or cover-plates are reliably connected, through, a low resistance connection; to the earth during fixing of the cover or the cover-plate itself. The creepage distances and the clearances between the live pins of a plug when fully inserted and the earthed metal cover of a socket-outlet shall comply with items 2) and 6) and Table 102 respectively; in addition, for the case of single pole insertion, the requirement given in **10.3** applies.

NOTE — Fixing screws or other means are allowed. Compliance is checked by inspection and by the test of **11.5**. In the case of single pole insertion, the requirement given in **10.3** applies.

10.3 *Replacement:*

It shall not be possible to make connection between a pin of a plug and a live socket contact of a non rewireable and Integrated cord extension set while other pin is accessible. Compliance is checked by manual test and by means of the gauges in Annex B of IS 1293 whose dimensions are less favourable for this kind of test. Tolerances of gauges shall be as specified in **9.1**.

For cord extension set with enclosures or bodies of thermoplastic material the test is made at an ambient temperature of 35 °C ± 2 °C, both the accessory and the gauge being at this temperature.

For cord extension set with enclosures or bodies of rubber or polyvinyl chloride, the gauge is applied with a force of 75 N for 1 min.

11 PROVISION FOR EARTHING

This clause of IS 1293 is applicable except as follows:

11.1 This clause of IS 1293 is applicable.

11.2 This clause of IS 1293 is applicable except as follows

Replacement:

Earthing terminal of socket outlets of integrated cord extension set having Flexible cable connected through screw type terminal on socket shall comply with the appropriate requirements of **12**.

Earthing terminals shall be reliably fixed and the connection shall be ensured under all conditions which may occur in normal use including loosening of cover fixing screws, careless mounting of the cover etc.

11.3 This clause of IS 1293 is not applicable.

11.4 This clause of IS 1293 is not applicable

11.5 This clause of IS 1293 is not applicable.

12 TERMINALS

This clause of IS 1293 is applicable except as follows

Replacement:

12.1.1 Socket outlets of integrated cord extension set shall have screw type terminal or terminals with a separate projected part for soldering of conductor of flexible cable. This projection should not be in line with vertical axis of socket contacts, so that the impact of plug in shall not be transferred to soldering joint in a manner which impairs the performance of soldered joint for further use.

Replacement:

12.1.2 Socket outlets of non-rewirable cord extension sets shall be provided with soldered, welded, crimped or equally effective permanent connections screwed or snap on connections shall not be used.

Connection made by crimping a pre-soldered flexible conductor are not permitted unless the soldered area is outside the crimping area.

Replacement:

12.1.3 For Integrated cord extension set with:

a) Flexible cable connected through screw type terminal on socket, compliance is checked by test of **12.2**; and

b) Flexible cable connected through soldering on terminals of socket, compliance is checked by inspection of soldered joints after test of **21** and **22**. There shall be no loosening or breakage of flexible cable connection from the terminal.

12.2 Terminal with Screw Clamping for External Copper Conductors

This clause of IS 1293 is applicable except as follows:

Addition in starting:

Wherever test requires fitting of conductors, flexible conductors are to be used except for **12.2.8** where solid conductors are to be used.

12.3 This clause of IS 1293 is not applicable.

13 CONSTRUCTION OF FIXED SOCKET-OUTLETS

This clause of IS 1293 is not applicable.

Replacement of the title:

14 CONSTRUCTION OF CORD EXTENSION SETS

This clause of IS 1293 is applicable except as follows:

14.1 This clause of IS 1293 is not applicable.

14.2 This clause of IS 1293 is not applicable.

14.3 This clause of IS 1293 is not applicable.

Replacement:

14.4 Earthing contact phase contact and neutral contact of socket outlets of non-rewireable and integrated cord extension set shall be locked against rotation.

Compliance is checked by inspection and for

non-rewireable and integrated cord extension set with single socket outlet by the test of 24.2.

Replacement:

14.7 The enclosure of rewireable and integrated cord extension sets shall completely enclose the terminals and the ends of flexible cable.

Replacement:

14.8 Rewireable and integrated cord extension set with shall be so designed in such a way that terminal screws, nuts or soldering residues cannot become loose and fall out of position in such a way that they establish electrical connection between live parts and the earthing terminal or metal parts connected to earthing terminal.

Compliance with the requirements of 14.7 and 14.8 is checked by inspection and by manual test.

Replacement:

14.9 Rewireable and integrated cord extension sets with earthing contacts shall be so designed that there is ample slack for earthing conductor in such a way that if strain relief is rendered inoperative, the connection of earthing conductor is subjected to strain after the connection of current carrying conductors. In case of excessive stresses, the earthing conductor will break after current carrying conductor.

There must be provision of accommodating extra 8 mm length of earthing conductor than what is required for connection of conductor through shortest possible path.

Compliance is checked by inspection after making connections through shortest possible path keeping extra 8mm slack for earthing conductor and thereby assembling the product.

In case of multiple portable socket outlets validation of compliance is done by connections of conductors on socket outlet nearest to flexible cable.

In non-rewirable cord extension sets with earthing contacts the length of conductor between the terminations and cord anchorage shall be so adjusted that the current carrying conductor is stressed before earthing conductor if flexible cable slips in its anchorage.

Compliance is checked by inspection.

Replacement:

14.10 Terminal and terminations of cord extension sets shall be so located or shielded in such a way that live wire in the cord extension set will not present a risk of electric shock. All the connections must be intact.

There should be no possibility that any live wire may touch accessible metal parts or are itself accessible after the sample is completely assembled.

Compliance is checked by inspection.

14.10.1 This clause of IS 1293 is not applicable.

14.10.2 This clause of IS 1293 is not applicable.

Replacement of first line:

14.11 For rewireable and integrated cord extension sets.

Replacement:

14.12 For cord extension set, it shall not be possible to remove the cover or cover plates or parts of them intended to ensure protection against electric shock without the use of tool. For this purpose, such parts must be fixed by screw type fixing.

Compliance is checked by inspection.

14.13 This clause of IS 1293 is not applicable.

14.15 This clause of IS 1293 is not applicable.

Replacement:

14.16 Socket outlets of non-rewireable and integrated cord extension set shall be so designed that the full engagement of associated plugs is not prevented by any projection from their engagement face.

Compliance is checked by determining that the gap between engagement face of socket outlet and the plug, which should not exceed 1 mm when the plug is inserted into socket outlet as far as it go.

Replacement of first paragraph:

14.18 Cord extension set for having means for suspension from a wall or other mounting surfaces shall be so designed that the suspension means do not allow access to live parts.

14.19 This clause of IS 1293 is not applicable.

Replacement:

14.21 Plugs classified as plugs for equipment's of Class II, if incorporated in cord extension set then

cord extension set shall be provided with socket outlet for equipment's of Class II only.

Plugs classified as plugs for equipment's of Class I, if incorporated in cord extension set, then cord extension set shall be provided with socket outlet for equipment's of Class II or Class I or both.

Delete: Note in the last.

14.22 This clause of IS 1293 is not applicable.

14.23 This clause of IS 1293 is not applicable.

14.24 This clause of IS 1293 is not applicable.

14.25 This clause of IS 1293 is not applicable.

14.26 This clause of IS 1293 is not applicable.

Addition:

14.101 Fused plugs shall comply with IEC 60884-2-1.

Flexible cables shall comply with IS 694 or IS 9968 (Part 1).

The flexible cable shall have the same number of conductors as the poles in the socket-outlet(s) with maximum number of poles. Earthing contacts, if any, are considered as one pole.

Where an earthing contact is provided in the socket-outlet it shall be connected to the corresponding earthing contact of the plug.

Compliance is checked by inspection.

14.102 Screws or other means for mounting socket outlet on rewirable cord extension set shall be accessible from the front. These means shall not serve any other fixing purpose.

14.103 Rewirable and integrated Multiple socket outlets with a common base shall be provided with fixed links/jumper for interconnection of contacts in parallel. The conductor cross sectional area for links/jumpers shall be as prescribed in Table 101. The fixing of these links shall be independent from connection of supply wires.

14.104 Rewirable and integrated Multiple socket outlets comprising of separate bases shall be so designed that the correct position of each base is ensured. The fixing of each base shall be independent of the combination to the mounting surface. Cross sectional areas of conductor jumpers for interconnection of contacts in parallel shall be as prescribed in Table 101.

Compliance with the requirements of **14.2.102** to **14.2.104** is checked by inspection.

14.105 The type, length of the flexible cable and nominal cross-sectional area of the conductors of cord extension sets shall comply with Table 101.

The length of the cable is measured between the operating faces of the plug and the socket-outlet. In the case of multiple socket-outlets the measurement is taken to the socket-outlet closest to the plug.

Table 101 Type, Length of the Flexible Cable and Nominal Cross-Sectional Area of the Conductors of Cord Extension Sets

(*Clauses* 14.103, 14.104 *and* 14.105)

Sl No.	Rated Current A	Lightest Type of Flexible Cable	Minimum Nominal Cross-Sectional Area of the Conductors mm^2	Maximum Length of the Flexible Cable M
(1)	(2)	(3)	(4)	(5)
i)	2.5	IS 694	0.50	2
		IS 694	0.75	30
ii)	6	IS 694	0.50	2
		IS 694	0.75	5
		IS 694	1.00	30
iii)	16	IS 694 IS 9968 (Part 1)	1.00	2
			1.50	30

Compliance is checked by inspection and measurement.

14.106 The rated current of the plug shall not be lower than the rated current of the socket-outlet.

In a cord extension set protected against overload (for example having a fused plug or a protective overcurrent device), the rated current of the plug shall not be lower than the rated current of the protective overcurrent device.

For a cord extension set with a multiple portable socket-outlet and not incorporating a protective overcurrent device, the rated current of the plug shall be at least the arithmetic sum of the highest rated currents of all plugs which can be inserted into the cord extension set or the same as the rated current of highest rated socket outlet of cord extension set, whichever is the lower.

Any other incorporated component shall have rated current equal to or less than the rated current of cord extension set.

Compliance is checked by inspection or if necessary by testing the component according to Indian Standard, if any.

14.107 The rated voltage of the plug and the socket-outlet shall be the same. The rated voltage of the cable shall not be less than the rated voltage of the plug and socket-outlet.

Compliance is checked by inspection.

14.108 The base of the cord extension set shall not have any projected parts and the specimen be such that it can be placed on the surface or suspended with stability. Decorative parts if any shall not cause any instability after placing cord extension set as per normal use.

Compliance is checked by the following test:

Cord extension set are placed on a plane wooden surface as per normal use:

a) A force of 20 N is applied at the four corners and middle of four edges at that face of cord extension set which is on the engagement plane of cord extension set, the base of cord extension shall remain stable and there shall not be any angular deviation between mounting plane and base plane of cord extension set. The force is applied perpendicular to engagement plane in the direction of engagement of plug in the socket outlets (*see* Fig. 101A); and

b) A force upto 20 N is applied at three highest points (with reference to the base) on those faces of cord extension set which are on a plane perpendicular to mounting plane, the base of cord extension shall remain stable and there shall not be any angular deviation between mounting plane and base plane of cord extension set. The force is applied perpendicular to the face and parallel to engagement plane (*see* Fig. 101B).

The highest points chosen shall be most unfavorable points.

If application of force of less than 20 N starts causing sliding of cord extension set on mounting plane without angular deviation, then it will be considered as compliance to this clause.

The force is applied for 30 s at each point through the tip of straight unjointed test finger, test probe 11 of IS 1401 of the same dimensions as the standard test finger (*see* Fig. 101A and Fig. 101B).

14.109 There shall not be appearance of stray voltage in earthing and neutral contact of socket outlets due to any electronic components incorporated in the cord extension set.

Compliance is checked by measurement of earth and neutral contact voltage of socket outlet with reference to earthing and neutral respectively of fixed supply.

15 INTERLOCKED SOCKET-OUTLETS

This clause of IS 1293 is not applicable.

16 RESISTANCE TO AGEING, TO ARMFUL INGRESS OF WATER AND TO HUMIDITY

This clause of IS 1293 is applicable except as follows:

Replacement:

16.1 Cord extension sets are mounted as for normal use are subjected to a test in a heating cabinet having circulation and pressure of natural air.

While the cord extension sets are kept in the heating cabinet, its socket of each type and rating are engaged with plugs of same system.

Samples are kept for 7 days (168 h) in the cabinet with a temperature of 70 °C ± 2 °C.

After the treatment, samples are removed from the cabinet and kept at room temperature of 4 days (96 h).

The samples shall show no crack with normal or corrected vision without additional magnification nor shall the material have become sticky or greasy, this being judged by following test:

a) With forefinger wrapped in a dry piece of rough cloth the sample is pressed with a force of 5 N; and

b) No traces of cloth shall remain on the sample and the material shall not stick to the cloth.

There shall be no damage which would lead to non-compliance to this standard.

After having withdrawn the test plugs from socket outlets the contact pressure of contact assembly must ensure compliance to **22.2**.

Parts intended for decorative purpose can be removed and are not subjected to this test.

Replacement:

16.2 The protection degree of the cord extension set is the same as the lowest protection degree of the individual components of the cord extension set.

17 INSULATION RESISTANCE AND ELECTRIC STRENGTH

This clause of IS 1293 is applicable except as follows.

Addition:

NOTE — Incorporated component apart from plug and socket, if part of cord extension set, must be shorted or bypassed before performing this test.

Addition after first paragraph:

17.1.1 For socket outlet of Rewirable Cord Extension set Part d) and e) are applicable.

For socket outlet of non-rewirable cord extension set Part a), b), c) are applicable. For socket outlet of integrated cord extension set Part a), b), c), d), e) are applicable.

17.1.2 This clause of IS 1293 is not applicable.

18 OPERATION OF EARTHING CONTACTS

This clause of IS 1293 is applicable.

19 TEMPERATURE RISE

This clause of IS 1293 is applicable except as follows:

Replacement:

Non-rewirable and integrated cord extension set is placed as per manufacturers instruction or in the absence of such instruction, in the position of normal use to give the most onerous condition. Cord extension sets are tested as delivered.

The test plug with brass pins having minimum specified dimensions as per IS 1293 is permissible. The test plug is inserted into socket outlet of cord extension set and an alternating current as specified in Table 16 is passed for 60 min + 5 min. Temperature rise is measured for all the poles including earthing and circuit for the test is completed by short circuiting suitable terminals of test plug thereby allowing flow of current through live and neutral and for sockets with three poles test is repeated by allowing flow of current through live and earthing.

For integrated cord extension set with flexible cable connected through soldering and for non-rewirable cord extension set, measurement of temperature rise is done by placing thermocouples in socket contact part before insertion of test plug. For integrated cord extension set with flexible cable connected through screw type terminal measurement of temperature rise is done by tightening the thermocouple with flexible cable in the terminal.

Temperature rise shall not exceed 45 °C.

In addition to verification of socket terminal/contact part temperature rise, the maximum temperature rise of accessible metal parts shall be measured and shall not be higher than 30 °C and of accessible non-metallic parts not higher than 40 °C.

20 BREAKING CAPACITY

This clause of IS 1293 is applicable.

21 NORMAL OPERATION

This clause of IS 1293 is applicable.

22 FORCE NECESSARY TO WITHDRAW THE PLUG

This clause of IS 1293 is applicable.

22.1 Verification of the Maximum Withdrawal Force

This clause of IS 1293 is applicable except as follows:

22.1.1 *Replacement of the word "socket-outlet" in first line of first paragraph:*

Rewirable and integrated cord extension set.

22.1.2 This clause of IS 1293 is not applicable.

23 FLEXIBLE CABLES AND THEIR CONNECTION

This clause of IS 1293 is applicable except as follows:

Replacement:

23.1 Rewirable and integrated cord extension sets shall be provided with a cord anchorage such that the conductors are relieved from strain, including twisting when they are connected to the terminals or terminations and their covering is protected from abrasion.

The sheath if any of the flexible cable shall be clamped within cord anchorage. Compliance is checked by inspection and by the test of **23.2**.

Non rewirable cord extension set shall be designed in such a way that the cable is maintained in position and the termination are relieved from strain and twisting.

The sheath if any of the flexible cable shall be clamped within cord anchorage. Compliance is checked by inspection and by the test of **23.2** and **23.4.**

Replacement:

23.2 The effectiveness of retention of flexible cable by cord anchorage is checked by the following test by means of an apparatus shown in Fig. 23.

Non rewirable cord extension sets are tested as delivered.

For rewirable and Integrated cord extension sets, Cord anchorage is used in normal way, clamping screws, if any, being tightened with a torque equal to two-third of specified in Table 1.

After reassembly of the specimen the component parts shall fit snugly, and it shall not be possible to push the cable into the sample to any appreciable extent.

The specimen is placed in the test apparatus so that the axis of flexible cable is vertical where it enters the cord extension set.

The flexible cable is then subjected 100 times to a pull of:

a) 50 N if the rated current of cord extension set is 2.5 A; and

b) 60 N if rated current of cord extension set is above 2.5 A.

The pulls are applied practically without jerk each time for 1 s.

Immediately afterwards, the flexible cable is subjected for 1 min to a torque as specified in Table 20.

After the test, flexible cable shall not have displaced by more than 2 mm, there shall be no break in electrical connection.

For measurement of longitudinal displacement, a mark is made on flexible cable at a distance of approximately 20 mm from end of cord extension set or flexible cable guard or at suitable point on specimen before it is subjected to pull. The displacement of mark is then measured with respect to the reference point after completion of the test.

Table 20 Torque Test Values for Cord Anchorage

(*Clause* 23.2)

Table 20 of IS 1293 is applicable except as follows:

Replacement:

Title of col (2) of Table 20 to be modified to rating of cord extension set.

23.3 This clause of IS 1293 is not applicable.

Replacement of first paragraph:

23.4 Non rewirable cord extension set shall be so designed that the flexible cable is protected against excessive bending where it enters the cord extension set.

Addition after seventh paragraph, part b)

For multiple socket outlet, plug is inserted in socket outlet nearest to flexible cable

24 MECHANICAL STRENGTH

This clause of IS 1293 is not applicable except **24.1**, **24.2**, **24.4**, **24.5**, **24.8**, **24.9**, **24.11**, **24.12** and **24.13** as follows:

Replacement of first and second paragraph:

Cord extension set shall have adequate mechanical strength so as to withstand stresses imposed during use.
Compliance is checked by part (c), (d), (h) and (k) as follows:

a) Cord extension sets of all types as specified in **7.1.4** are subjected to the tests of **24.1**, **24.4**, **24.5**, **24.9**, **24.11**, **24.12**, **24.13** as a complete product;

b) Socket outlets of non-rewirable and Integrated cord extension sets are additionally subjected to the test of **24.8**; and

c) Cord extension sets of all types as specified in **7.1.4**, with single socket outlet are subjected to the test of **24.2**.

Addition in the starting

24.1 Cord extension sets are mounted on the plywood as in normal use.

Replacement of paragraph two three and four:

24.2 Cord extension sets are tested as delivered, the flexible cable being cut so that the free length of about 100 mm projects from the cord extension set.

Addition after second paragraph:

24.4 In case of multiple socket outlets, weight is allowed to fall on one socket outlet of each type and rating.

Replacement of second paragraph:

24.5 Cord extension sets are tested as delivered.

The cord extension sets are first placed in a position of normal use and the force is applied for 1 min. They are then placed in a position by rotating the specimen by 90° along the horizontal axis and again subjected to the force for 1 min.

Replacement of first paragraph:

24.9 Rewirable and integrated cord extension sets are tested as delivered.

Addition after first paragraph:

24.13 In case of multiple socket outlets maximum withdrawal force value for highest rating socket is used for applying pull force.

25 RESISTANCE TO HEAT

This clause of IS 1293 is applicable except as follows:

Addition in the last:

Compliance is checked by appropriate test from **25.1** to **25.4.**

a) Cord extension set of all types as specified in **7.1.4** are subjected to the test of **25.1**, **25.3**, **25.4** as complete product;

b) Socket outlets of non rewirable and integrated cord extension sets are additionally subjected to the test of **25.2**; and

c) Cords are not subjected to the test.

25.4 This clause of IS 1293 is applicable except as follows.

Addition in the last:

In case of multiple socket outlets application of force shall be on one socket outlet of each type and rating.

26 SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS

This clause of IS 1293 is applicable.

27 CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND

Replacement of title of the clause:

27 CREEPAGE DISTANCES AND CLEARANCES

27.1 This clause of IS 1293 is applicable except as follows

Replacement of the text:

Creepage and clearances in cord extension sets as specified in **7.1.4** shall not be less than as specified in Table 102.

Cord extension sets are tested as delivered

Apart from complete products creepage and clearance verification, socket outlet of Non rewirable and integrated cord extension sets are additionally tested when in engagement with a plug and also without plug.

27.2 This clause of IS 1293 is not applicable.

27.3 This clause of IS 1293 is not applicable.

Table 102 Creepage Distances, Clearances

(*Clauses* 10.2.1, 10.2.2 *and* 27.1)

a Creepage Distance:	
1 between live parts of different polarity	**3**
2 between live parts and	
– accessible surface of parts of insulating material of cord extension set	**3**
– earthed metal parts including parts of earthing circuit of cord extension set	**3**
– Screws for assembling cord extension set	**3**
3 between the accessible unearthed metal parts with exception of screws and like of sockets of cord extension set and a fully engaged plug of the same system having pins and metal parts connected to them made according to the most unfavourable construction[c]	**4.5**
4 between live parts of a socket outlet of cord extension set without a plug and their accessible unearthed or functionally earthed metal parts with exception of screws and the like.	**4.5**
b Clearances:	
5 between live parts of different polarity	**3**
6 between live parts and	
– accessible surface of parts of insulating material of cord extension set	**3**
– earthed metal parts including parts of earthing circuit of cord extension set not mentioned in Item 7	**3**
– Screws for assembling cord extension set	**3**
7 between live parts and	
– accessible unearthed or functionally earthed metal parts of socket outlet of cord extension set with exception of screws and like.	**6**
6 between live parts and the surfaces on which cord extension is intended to be placed or suspended in normal use.	**6**
c The most unfavourable construction may be checked by means of a gauge which is based on the standard sheets relevant to the system concerned.	

28 RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING

This clause of IS 1293 is applicable except as follows

Replacement of second paragraph:

Compliance is checked by means of the test as per **28.1.1**. Cord extension sets are tested as delivered.

Test is performed:

a) Only on body on which socket outlets of rewirable cord extension sets are assembled;

b) On socket outlets of non rewirable and integrated cord extension sets as well as body of cord extension set; and

c) Cords are not subjected to this test.

28.1.1 *Delete:* Part a)

28.1.2 This clause of IS 1293 is applicable.

28.2 This clause of IS 1293 is applicable.

29 RESISTANCE TO RUSTING

This clause of IS 1293 is applicable.

30 ADDITIONAL TESTS ON PINS PROVIDED WITH INSULATING SLEEVES

This clause of IS 1293 is not applicable.

Addition:

101 EMC REQUIREMENTS

101.1 Immunity

The operation of cord extension sets within the scope of this standard, in normal use, is not affected by electromagnetic disturbances.

101.2 Emission

Cord extension sets within the scope of this standard are intended for continuous use; in normal use they do not generate electromagnetic disturbances.

Test for validation of compliance is under consideration.

31 TESTS

This clause of IS 1293 is applicable except as follows:

Addition in the last:

31.3 Additional requirement for routine test is given in Annex AA.

ANNEX AA

(*Clauses* 5.5.101 *and* 31.3)

SAFETY-RELATED ROUTINE TESTS FOR FACTORY-WIRED PORTABLE ACCESSORIES (PROTECTION AGAINST ELECTRIC SHOCK AND CORRECT POLARITY)

AA-1 All factory-wired cord extension sets shall be subjected to the following tests, as appropriate. A diagrammatic representation is shown in Table AA-1.

The test equipment or manufacturing systems shall be such that failed products are either made unfit for use or separated from satisfactory products in such a way that they cannot be released for sale.

NOTE — "Unfit for use" means that the accessory is treated in such a way that it cannot fulfil the intended function.

It is, however, accepted that repairable products (by a reliable system) may be repaired and re- tested.

It shall be possible by process or manufacturing system to identify that accessories released for sale have been subjected to all the appropriate tests.

AA-2 POLARIZED SYSTEM, PHASE (L) AND NEUTRAL (N)-CORRECT CONNECTION

For polarized systems the test shall be made using SELV applied for a period of not less than 2 s:

NOTE — The period of 2 s may be reduced to not less than 1 s on test equipment with automatic timing.

For cord extension sets, between the L and N pin of plug at one end of the cable and the last corresponding L and N contact of the portable socket-outlet at the other end of the cable. In case of doubt all the connections shall be verified.

Polarity shall be correct.

AA-3 EARTH CONTINUITY

The test shall be made using SELV applied for a period of not less than 2 s:

NOTE — The period of 2 s may be reduced to not less than 1 s on test equipment with automatic timing.

for cord extension sets, between the corresponding earth pin or earthing contact of the plug and the last earthing contact or pin of the portable socket-outlet at the other end of the cable. In case of doubt all the connections shall be verified.

AA-4 SHORT-CIRCUIT/ WRONG CONNECTION AND REDUCTION OF CREEPAGE DISTANCE AND CLEARANCES BETWEEN PHASE (L) OR NEUTRAL (N) TO EARTH (⏚)

The test shall be made by applying 2 000 V ± 10 % at the supply end, for example to a plug, for a period of not less than 2 s:

NOTES

1 The period of 2 s may be reduced to not less than 1 s on test equipment with automatic timing.

2 L and N may be connected together for this test. No flashover shall occur.

Table AA-1 Diagrammatic Representation of Routine Tests to be Applied to Factory Wired Portable Accessories

(*Clause* AA-1)

Sl No.	Clause	Number of Poles	
		2	More than 2
(1)	(2)	(3)	(4)
i)	**AA-2**	X	X
ii)	**AA-3**	-	X
iii)	**AA-4**	-	X

ANNEX BB

(*Clause* 5.4)

SURVEY OF SPECIMENS NEEDED FOR TESTS

The number of specimens needed for the tests according to **5.4** are as follows:

Sl No.	*Clause No.*	*Clauses and Sub-clauses*	*Number of Specimens of Cord Extension Set*
(1)	(2)	(3)	(4)
i)	**6**	Ratings	A
ii)	**7**	Classification	A
iii)	**8**	Marking	A
iv)	**9**	Checking of dimensions	A B C
v)	**10**	Protection against electric shock	A B C [a]
vi)	**11**	Provision for earthing	A B C
vii)	**12**	Terminals	A B C
viii)	**14**	Construction of cord extension sets	A B C
ix)	**16**	Resistance to ageing, to harmful ingress of water and to humidity	A B C
x)	**17**	Insulation resistance and electric strength	A B C
xi)	**18**	Operation of earthing contacts	A B C
xii)	**19**	Temperature rise	A B C
xiii)	**20**	Breaking capacity	A B C
xiv)	**21**	Normal operation	A B C
xv)	**22**	Force necessary to withdraw the plug	A B C
xvi)	**23**	Flexible cables and their connection	A B C [e]
xvii)	**24**	Mechanical strength	A B C [f]
xviii)	**25**	Resistance to heat	A B C [i j]
xix)	**26**	Screws, current-carrying parts, and connections	A B C
xx)	**27**	Creepage distances, clearances	A B C
xxi)	**29**	Resistance to rusting	A B C
xxii)	**28.1.1**	Resistance to abnormal heat and to fire	D E F

NOTE — For Validation of compliance of socket outlets, in case of multiple socketoutlets, tests are carried out on one socket outlet of each type and rating.

[a] One extra set of specimens is needed for the test of **10.6**.
[e] One extra set of specimens is needed for **23.2** and **23.4**.
[f] One extra set of specimens is needed for **24.8** for shuttered sockets in cordextension sets
[i] One extra set of aged specimens may be used for the tests of **25.2** and **25.3**.
[j] One set of extra aged specimen may be used for the test of **25.4**, for validation of compliance of socket outlet of different rating in case of multiple socket outlets

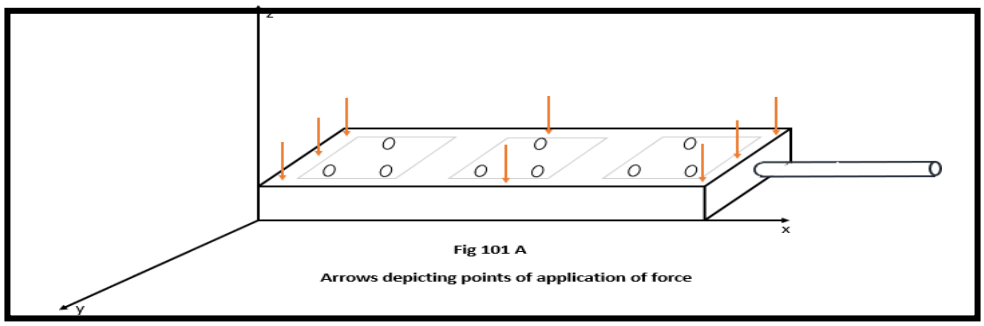

FIG. 101 A

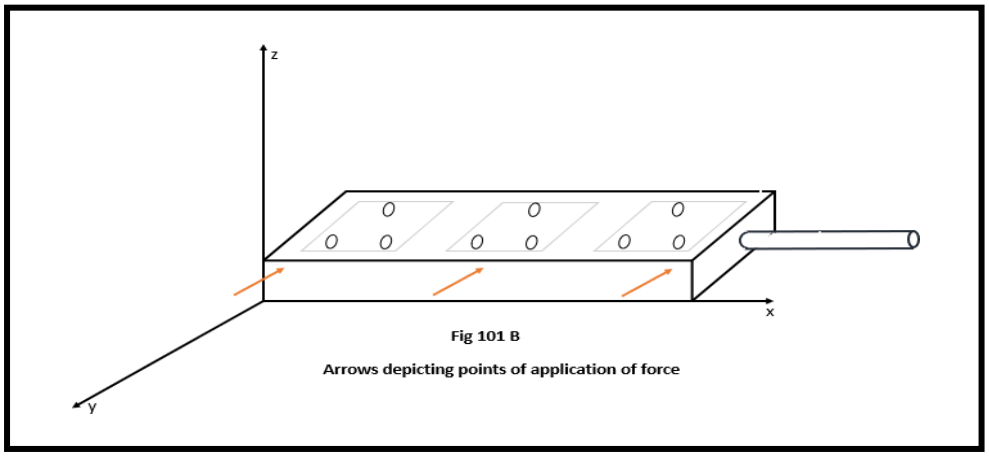

FIG. 101 B

Highest point — It is the point on the body of cord extension set which is at maximum height from its base.

Fig. 101 A and Fig. 101 B — Verification of stability of cord extension set, clause **14.108**.

Annex CC

(*Foreword*)

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