

## FOREWORD

This Indian Standard (First Revision) would be 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 was first published in 2008 which was technically equivalent with IEC 60884-2-3:1989 'Specification for plugs and socket outlets for household and similar purposes - Part 2-3: Particular requirements for switched socket-outlets with interlock for fixed installation'. This revision has been undertaken to make it inline with latest practices.

This part applies to switched socket-outlets without interlock, for fixed installation, for a.c. only, with or without earthing contact, with a rated voltage not exceeding 440 V and a rated current not exceeding 32A, intended for household and similar purposes, either indoors or outdoors.

This standard shall be used in conjunction with IS 1293. This standard supplements or modifies the corresponding clauses in IS 1293, so as to convert that publication into the Standard: Particular requirements for adaptors. Where this standard states "addition", "modification" or "replacement", the relevant requirement, test specifications or explanatory matter in IS 1293 shall be adapted accordingly. Sub clauses, figures, tables or notes which are additional to those in IS 1293 are numbered starting from 101.

This standard is based on IEC 60884-2-3 (2006) 'Plugs and socket-outlets for household and similar purposes - Part 2-3: Particular requirements for switched socket-outlets without interlock for fixed installations.

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 : 1960 'Rules of 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.

**Switched Socket-Outlets Without Interlock For Fixed  
Installations- Particular Requirements  
(First révision)**

## **1 Scope**

This clause of IS 1293 is applicable except as follows.

*Replacement of the first paragraph:*

This part applies to switched socket-outlets without interlock, for fixed installation, for a.c. only, with or without earthing contact, with a rated voltage not exceeding 440 V and a rated current not exceeding 32A, intended for household and similar purposes, either indoors or outdoors.

**NOTE 101** Switched socket-outlets can also be produced by combining a socket-outlet of IS 1293 and a switch of IS 3854 .

## **2 Normative References**

This clause of IS 1293 is applicable.

## **3 Definitions**

This clause of IS 1293 is applicable except as follows.

*Addition:*

### **3.101 Switched Socket-Outlet**

factory assembled unit consisting of a socket-outlet with a switch controlling the socket-outlet

### **3.102 Multiple Switched Socket-Outlet**

accessory incorporating more than one switched socket-outlet, each socket-outlet being controlled by its own switch

### **3.103 Switch**

device designed to make or break the current in one or more electric circuits

### **3.104 One Operation**

transfer of the moving contacts from one operating position to another

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<sup>1)</sup> IS 3854, *Switches for household and similar fixed-electrical installations - IS 1293: General requirements*

## **4 General Requirements**

This clause of IS 1293 is applicable.

## **5 General Notes on Tests**

This clause of IS 1293 is applicable.

## **6 Ratings**

This clause of IS 1293 is applicable except as follows.

*Addition:*

### **6.101**

Switches of switched socket-outlets shall have current and voltage ratings not less than the socket-outlets they control.

## **7 Classification**

This clause of IS 1293 is applicable except as follows.

**7.2** *Addition:*

**7.2.101** Switched socket-outlets are classified:

**7.2.101.1** According to the method of actuating the switch:

- rotary switches;
- tumbler switches;
- rocker switches;
- push-button switches;
- cord-operated switches.

**7.2.101.2** According to the switching of the neutral:

- switched neutral;
- unswitched neutral.

## **8 Marking**

This clause of IS 1293 is applicable except as follows.

**8.1** *Addition after the seventh dash:*

- symbol for mini-gap construction, if applicable.

## 8.2 Addition before the first note:

- Mini gap construction .....m
- Open position (off) ..... O
- Close position (on) ..... I

*Addition:*

**8.101** Terminals intended for the connection of line conductors shall be identified unless the method of connection is not important, is self-evident or is indicated on a wiring diagram. Such identification may take the form of a letter L or, in the case of more than one such terminal, the letters L1, L2, L3, etc., which may be accompanied by an arrow or arrows pointing to the relevant terminal or terminals.

For two-, three-, and four-pole switches, terminals associated with any one pole shall have similar identification, if applicable, differing from that of the terminals associated with the other poles, unless the relationship is self-evident.

These indications shall not be placed on screws or any other easily removable parts.

*Compliance is checked by inspection.*

**8.102** Two-, three-, and four-pole switches and switches having a rated voltage exceeding 250 V or a rated current exceeding 16 A shall be so marked that either the direction of movement of the actuating member to its different positions or the actual switch position is clearly indicated.

The indications shall be clearly visible on the front of the switched socket-outlet when fitted with its cover or cover plate. If these indications are placed on the cover or cover plate, it shall not be possible to fix it in a position such that the indications are incorrect.

For the indication of direction of movement of the operating means, symbols may be used. The closed position (on) shall be clearly indicated.

*Compliance is checked by inspection.*

## 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:*

**10.101** Knobs, operating levers, push-buttons, rockers and the like, for operating switches in switched socket-outlets, shall be of insulating material, unless their accessible metal parts are separated from the metal parts of the mechanism by double insulation or reinforced insulation or, as an alternative, they are reliably connected to earth.

*Compliance is checked by inspection and by the tests of Clauses 17 and 21.*

**10.102** Metal parts of the switch mechanism, such as the spindle or the pivot of the dolly or rocker, that are not insulated from live parts, shall not protrude from the enclosure.

*Compliance is checked by inspection, if necessary, after the actuating member has been removed or broken.*

**NOTE** If the actuating member has to be broken, compliance is checked after the test of Clause 28.

**10.103** Metal parts of the switch mechanism, such as the spindle or the pivot of the dolly or rocker shall not be accessible when the switched socket-outlet is fixed as in normal use.

In addition, they shall be insulated from accessible metal parts, including metal frames supporting the base of flush-type switched socket-outlets, liable to be mounted in a metal box, and from screws for fixing the base to its support.

The additional requirement does not apply if the metal parts of the mechanism are separated from live parts in such a way that the creepage distances and clearances have at least twice the values specified in 27.1 or alternatively, if they are reliably connected to earth.

*Compliance is checked by inspection and if necessary by measurement and by tests of Clauses 17 and 20.*

## **11 Provision for Earthing**

This clause of IS 1293 is applicable.

## **12 Terminals and Terminations**

This clause of IS 1293 is applicable.

### 13 Construction of Fixed Socket-outlets

This clause of IS 1293 is applicable except as follows.

*Addition:*

**13.101** Switches shall be constructed to match the number of poles on the socket-outlet, except that the neutral pole is not switched in unswitched neutral socket-outlets.

The earthing contact is not considered as a pole and the earth circuit shall not be switched.

The position of the switch-operating member shall be such that it does not prevent, nor shall its correct operation be prevented by, the proper insertion of the corresponding plug or plugs.

**13.102** Knobs of rotary switches shall be securely coupled to the shaft or part operating the mechanism.

*The knob is subjected for 1 min to an axial pull of 100 N.*

*After this, knobs of switches having only one direction of operation are turned, if possible, without undue force, 100 times in the reverse direction.*

*During the test, the knob shall not become detached.*

**13.103** The actuating member of a switch, when released, shall automatically take up the position corresponding to that of the moving contacts, except that, for those with a single push-button, the actuating member may take up a single rest position.

*Compliance is checked by inspection and by manual test.*

**13.104** Switches shall be so constructed that the moving contacts can come to rest only in the "on" or "off" position, an intermediate position being, however, permissible if it corresponds to the intermediate position of the actuating member, and if the insulation between the fixed and moving contacts is then adequate.

*Compliance is checked by inspection and if necessary by the test of 17.2 with the voltage applied between the fixed and moving contacts when in intermediate position.*

**13.105** Switches shall be constructed so that undue arcing cannot occur when the switch is operated slowly.

*Compliance is checked by actuating the switch, at the end of the test of Clause 21, to break the circuit a further ten times, the actuating member being, however, moved steadily by hand over a period of 2 s. If possible, the contacts shall be stopped in an intermediate position, the actuating member then being released.*

*During the tests, no sustained arcing shall occur.*

**13.106** Switched socket-outlets with switches operating more than one pole shall make and break all poles substantially simultaneously, except that for multi-pole switches with switched neutral, the neutral shall not make after or break before other poles.

*Compliance is checked by inspection and by manual test.*

**13.107** The action of the mechanism, if the covers or cover plate are removable for installation purposes, shall be independent of the presence of the covers or cover plate.

*Compliance is checked by connecting the switch, without cover or cover plate fitted, in series with a lamp and by operating the actuating member without undue force as in normal use.*

*During the test, the lamp shall not flicker.*

## **14 Construction of plugs and portable socket-outlets**

This clause of IS 1293 is not applicable.

## **15 Interlocked socket-outlets**

This clause of IS 1293 is not applicable.

## **16 Resistance to ageing, protection provided by enclosures, and resistance to humidity**

This clause of IS 1293 is applicable.

## **17 Insulation resistance and electric strength**

This clause of IS 1293 is applicable except as follows.

### **17.1** *Replacement of the last sentence:*

*The insulation resistance shall be not less than 5 M $\Omega$ , except for items g) and h) of 17.1.1, where the resistance shall not be less than 2 M $\Omega$ .*

#### **17.1.1** *Addition after Note 2:*

*For switches of switched socket-outlets, the insulation resistance is measured consecutively*

- f) between all poles connected together and the body, with the switch in the closed position (on);*
- g) between each pole in turn and all others connected to the body, with the switch in the closed position (on);*
- h) between the terminals which are electrically connected together when the switch is in the closed position (on), the switch being in the open position (off).*

The term "body" used in f) and g) includes accessible metal parts, metal frames supporting the base of flush type switched socket-outlets, operating keys, metal foil in contact with the outer surface of accessible external parts and operating keys of insulation material, the point of anchorage of the cord, chain or rod for switches operated by such means, fixing screws of bases or covers and cover plates, external assembly screws, earthing terminals and any metal part of the mechanism if required to be insulated from live parts (see 10.102).

## **18 Operation of Earthing Contacts**

This clause of IS 1293 is applicable.

## **19 Temperature Rise**

This clause of IS 1293 is applicable.

## **20 Breaking Capacity**

This clause of IS 1293 is applicable except as follows.

*Addition:*

Switches incorporated in switched socket-outlets shall have adequate making and breaking capacity.

*The tests are made by means of an apparatus, the principle of which is as shown in Figure 101 and which is arranged to simulate normal operation.*

*Switches are fitted with conductors as for the test of Clause 19.*

*Switches are tested at 1,1 times the rated voltage and 1,25 times the rated current. They are subjected to 200 operations at a uniform rate of:*

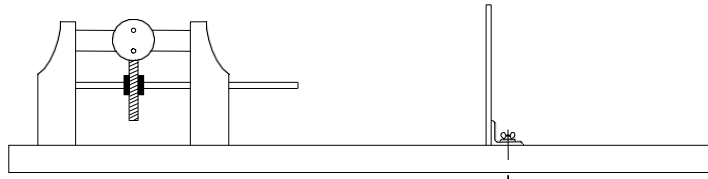
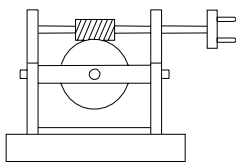
- 30 operations per minute, if the rated current does not exceed 10 A;*
- 15 operations per minute, if the rated current exceeds 10 A but is less than 25 A;*
- 7,5 operations per minute, if the rated current is 25 A or more.*

*For rotary switches intended to be operated in either direction, the actuating member is turned in one direction for half the total number of operations, and in the reverse direction for the remainder.*

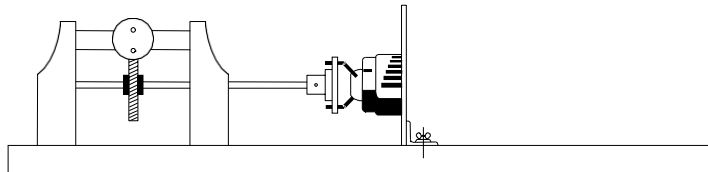
*The test is carried out by using an alternating current ( $\cos \phi = 0,6 \pm 0,05$ ). During the test no sustained arcing shall occur.*

*After the test, the specimen shall show no damage which may impair its further use.*

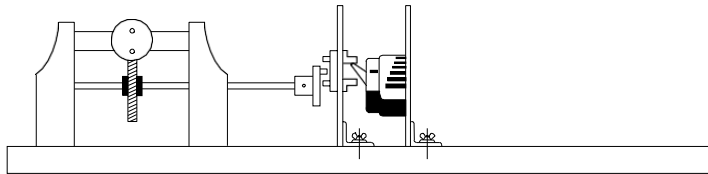




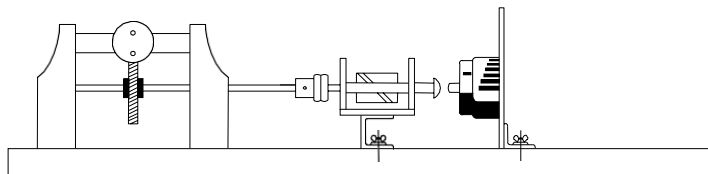
Driving mechanism



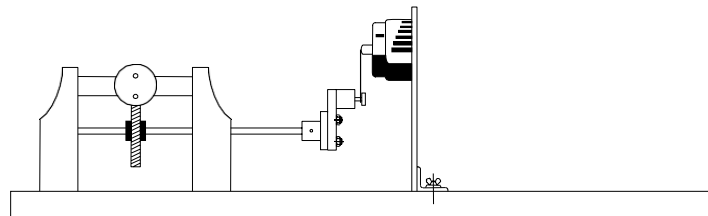
Arrangement for rotary switches



Arrangement for tumbler switches



Arrangement for rocker switches and push-button switches



Arrangement for cord-operated switches

IEC 1793/06

**Figure 101 – Example of apparatus for testing the making and breaking capacity and the normal operation of switches in switched socket-outlets**

## 21 Normal Operation

This clause of IS 1293 is applicable except as follows.

*Addition:*

Switches of switched socket-outlets shall withstand, without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use.

*Compliance is checked by the following test:*

*The switches are tested at rated voltage and rated current ( $\cos \phi = 0,8 \pm 0,05$ ) in the apparatus as specified in Clause 20.*

*The number of operations is as shown in Table 101.*

**Table 101 – Number of operations for normal operation test**

<b>Rated current</b>	<b>Number of operations</b>
Up to and including 16 A for switches having a rated voltage not exceeding 250 V a.c.	40 000
Up to and including 16 A for switches having a rated voltage exceeding 250 V a.c	20 000
Over 16 A up to and including 32 A	10 000

*The rate of operations is according to Clause 20.*

*For rotary switches intended to be operated in either direction, three-quarters of the total number of operations shall be in the clockwise direction and the remainder in the reverse direction.*

*During the test, the specimens shall function correctly.*

*After the test, the specimens shall withstand an electric strength test as specified in Clause 17, and a temperature rise test as specified in Clause 19, the test current however being reduced to the rated current.*

*The specimens shall then not show*

- wear impairing their further use;*
- discrepancy between the position of the actuating member and that of the moving contacts, if the position of the actuating member is indicated;*
- deterioration of enclosures, insulating linings or barriers to such an extent that the switch cannot be further operated or that the requirements of Clause 10 are no longer complied with;*
- loosening of electrical or mechanical connections;*
- seepage of sealing compound;*

– *relative displacement of the moving contacts of switches.*

*The humidity treatment according to 16.3 is not repeated before the dielectric strength test of this subclause. During the test, the specimens are not lubricated.*

## **22 Force Necessary to Withdraw The Plug**

This clause of IS 1293 is applicable.

## **23 Flexible Cables and their Connection**

This clause of IS 1293 is not applicable.

## **24 Mechanical Strength**

This clause of IS 1293 is applicable.

## **25 Resistance to Heat**

This clause of IS 1293 is applicable.

## **26 Screws, Current-Carrying Parts and Connections**

This clause of IS 1293 is applicable.

## **27 Creepage Distances, Clearances and Distances Through Sealing Compound**

This clause of IS 1293 is applicable except as follows.

*Addition:*

**27.101** For switches incorporated in switched socket-outlets, creepage distances, clearances and distances through sealing compound shall be not less than the values shown in Table 102.

**Table 102 – Creepage Distances, Clearances and Distances Through Sealing Compound**

<b>Descript ion</b>	<b>mm</b>
<b>Creepage distance</b>	
1) Between live parts which are separated when the contacts are open	3
2) Between live parts and: – metal parts of the mechanism, if required to be insulated from live parts (see 10.102)	3
3) Between metal parts of the mechanism, if required to be insulated from accessible metal parts (see 10.103) and: – screws or devices for fixing bases, covers or cover plates – metal frames supporting the base of flush-type switched socket-outlets – accessible metal parts	3
<b>Clearance</b>	
4) Between live parts which are separated when the contacts are open	3*
5) Between live parts and metal parts of the mechanism, if required to be insulated from live parts (see 10.102)	3
6) Between metal parts of the mechanism, if required to be insulated from accessible metal parts (see 10.103) and: – screws or devices for fixing bases, covers or cover plates – metal frames supporting the base of flush-type switched socket-outlets – accessible metal parts	3
* This value is reduced to 1,2 mm when the contacts are open, for live parts of switches of mini-gap construction which are moved during the separation of the contacts.	

*Compliance is checked by measurement.*

**28 Resistance of Insulating Material To Abnormal Heat, To Fire And To Tracking**

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.

