SRI LANKA STANDARD 948 : PART 3 : 1991

UDC 621 . 316 . 541

SPECIFCATION FOR

THREE PIN PLUGS, SOCKET - OUTLETS AND SOCKET - OUTLET ADAPTORS

PART 3 – SWITCHED SOCKET - OUTLETS

SRI LANKA STANDARDS INSTITUTION

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SPECIFICATION FOR THREE-PIN PLUGS, SOCKET-OUTLETS AND SOCKET-OUTLET ADAPTORS

PART 3 : SWITCHED SOCKET-OUTLETS

SLS 948:Part 3:1991

(Attached AMD 272 and AMD 350)

Gr. 6

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SRI LANKA STANDARD

SPECIFICATION FOR THREE-PIN PLUGS, SOCKET-OUTLETS AND SOCKET-OUTLET ADAPTORS

PART 3 : SWITCHED SOCKET-OUTLETS

FOREWORD

This standard was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 1991.12.31, after the draft, finalized by the Drafting Committee on Electrical accessories, had been approved by the Electrical Engineering Divisional Committee.

This standard supersedes SLS 512 : 1981, and is presented in three parts, namely;
Part 1 Plugs, socket-outlets and adaptors,
Part 2 Plugs made of resilient materials and
Part 3 Switched socket-outlets.

All values given in this specification are in SI Units.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the results of a test or an analysis shall be rounded off in accordance with CS 102. The number of figures to be retained in the rounded off values shall be the same as that of the specified value in this standard.

The Sri Lanka Standards Institution gratefully acknowledges the use of the publications of the British Standards Institution in the preparation of this standard.

1 SCOPE

This specification relates to 5-ampere and 15-ampere socket-outlets which contain a switch connected between the current carrying contact(s) of the socket-outlet and the relevant supply terminal(s) for use in a.c. circuits only.

2 REFERENCES

CS 102	Presentation of numerical values
SLS 268	ISO metric screw threads. Part 6 Limits of sizes for commercial bolts and nuts
SLS 879	PVC insulated flexible cords. Part 1 Requirements.
SLS 948	Three-pin plugs, socket-outlets and socket-outlet adaptors Part 1 Plugs socket outlets and adaptors.

3 DEFINITIONS

In addition to the definitions of Clause 3 of **SLS 948 : Part 1 : 1991** the following definitions shall apply :

3.1 **switched socket-outlet** : A socket-outlet with an associated switch to disconnect the supply to the line socket contact or to both line and neutral socket contacts.

3.2 **actuating member** : That part which is moved, e.g. pulled, pushed or turned by the user to operate the switch mechanism.

4 GENERAL REQUIREMENTS

4.1 Switched socket-outlets conforming to this specification shall comply with all the Clauses of **SLS 948 : Part 1 : 1991** relating to socket-outlets except where stated below:

4.2 Engagement of pins and contacts
The following additional requirement shall apply. (see Clause 4.5 of **SLS 948 : Part 1 : 1991**)

Any part of the actuating member in any position it may occupy shall not lie within the circle having a radius given in Table 3 of **SLS 948 : Part 1 : 1991**. For 15-ampere switched socket-outlets the radius of engagement circle as shown in Table 3 of **SLS 948 : Part 1 : 1991** shall be reduced to 29.5 mm (1.160 in).

Compliance shall be checked by inspection and measurement.

4.3 Clearance and creepage
The following additional requirement shall apply.(See Clause 4.8 of **SLS 948 : Part 1 : 1991**)

The minimum clearance between switch contacts in the open position shall be 1.2 mm (0.047 inches).

Compliance shall be checked by inspection and measurement.

4.4 Materials for component parts
The following amendment shall apply. See Table 5 of **SLS 948 : Part 1 : 1991.**

Item 2 in Column 1 shall read :
Socket-outlet cover (or plate) and actuating member.

4.5 Construction of socket contacts and terminals
Clause 6.2 of **SLS 948 : Part 1 : 1991** shall be replaced by 5 TERMINALS of this specification.

4.6 Marking
Clause 8 of **SLS 948 : Part 1 : 1991** shall be replaced by 11 MARKING of this specification.

4.7 Interchangeability
The following additional notes shall apply. (See Clause 9.1 of SLS 948 : Part 1 : 1991)

NOTES

1. For switched socket-outlets. Although the switch actuating member is outside the radius of engagement (see 9) it may still prevent full engagement of the gauge specified in Appendix A of SLS 948:Part 1:1991. In this circumstance the projecting switch actuating member may be removed.

2. When checking the requirements of Appendix A providing the switch actuating member lies outside the radius of engagement circle specified in Table 3 the projecting switch operating member may be removed.

4.8 Effectiveness of contact
The following additional requirement applies. See Clause 9.2 of SLS 948 : Part 1 :1991

For switched socket-outlets the voltage drop in a switched pole measured from the terminal of the switched socket-outlet to the corresponding plug pin shall not exceed 60 millivolts at rated current.

4.9 Insulation resistance
The following additional requirement shall apply. See Clause 9.4 of SLS 948 : Part 1 : 1991.

Across switch contacts with the switch open (for switched socket-outlets) the value shall be not less than 50 megaohm.

4.10 High-voltage test
The following additional requirement shall apply. See Clause 9.5 of SLS 948 : Part 1 : 1991.

For switched socket-outlets, switches shall be tested in the closed position followed by tests with the switch contacts in the open position.

4.11 Current-breaking capability
The following additional requirement shall apply. See Clause 9.6 of SLS 948 : Part 1 : 1991)

Switched socket-outlets shall be tested in a substantially non-inductive a.c. circuit as follows :

a) For socket contacts as described in Clause 9.6 of SLS 948 : Part 1 : 1991 as modified above.

b) For switch contacts with the switched socket-outlet plates in position and with all metal parts not in contact with live contacts connected to the earthed pole of the test circuit. The switch shall make and break the specified current in a substantially non-inductive a.c. circuit ten times in succession at intervals of 30 seconds. After the tests the switched socket-outlet shall be in a serviceable condition.

5 TERMINALS

Terminals shall be of such design and dimension that under normal conditions of use they do not overheat.

In pillar-type terminals the screws shall be of sufficient length to ensure that the screws or intermediate clamping members extend to the far side of the terminal hole. The screws and the surface on which the conductor is clamped shall be so shaped that the conductor may be securely held and not unduly deformed. The sizes of the conductor hole and the clamping screw shall be such that the clearance between the sides of the major diameter of the clamping screw and the conductor hole does not exceed 0.6 mm.

Terminals, unless of a form which will prevent conductor strands from spreading shall be fitted with special washers or other suitable devices to control such spreading and shall be suitable for repeated use.

Terminals shall accept two conductors appropriate to the rated current of the accessory. The clearance of any live part of the terminal from any non-current carrying metal part shall comply with the dimensions given in Clause 4.8 of **SLS 948 : Part 1 : 1991**, when the terminal is fitted with the maximum size or number of conductors which it will accommodate when effectively clamped.

Terminal screws used in making electrical connections shall have a root area not less than that of the appropriate screws in **Table 1** of this specification. The terminals and screws shall withstand the torques detailed in Table 1 of this specification. If ISO metric screws are used they shall be in accordance with **SLS 268**.

Pillar terminals may as an alternative meet the requirements given in Clause 6.2 Table 12 of **SLS 948 : Part 1 : 1991**.

Compliance shall be checked by inspection and the temperature rise test of 8.

TABLE 1 - Terminal screw size and torque

current rating of accessory	Minimum nominal diameter of ISO metric screws and torques			
	single screw with head		single screw without head	
	size	torque	size*	torque*
A (1)	mm (2)	N m (3)	mm (4)	N m (5)
5	2.5	0.4	2.5	0.2
over 5 and up to 15	3.0	0.5	3.0	0.5

** These values only apply if the screw, when tightened, does not protrude from the hole, otherwise the values for screws with head apply.*

6 PRECAUTIONS AGAINST REVERSAL OF POLARITY

Internal connections shall be so arranged that correct polarity is maintained.

Compliance shall be checked by inspection.

7 SWITCH ACTION

The actuating member of a switch shall not remain at rest in the off position whilst the switch contacts remain closed.

The actuating mechanism shall be so constructed that when operated the switch can remain only in a position giving adequate contact or adequate separation of the contacts.

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

Switches shall disconnect at least the supply to the line socket contact.

Double pole switches shall make or break each pole with one movement of the actuator.

Compliance shall be checked by inspection and by the following test.

Following the test described in Clause 9.6 of SLS 948 : Part 1 : 1991 , the circuit is broken a further 10 times, each time moving the actuating member by hand over a period of 2 seconds in a manner such as to attempt to stop the moving contact in an intermediate position causing arcing. The actuating member shall be released after 2 seconds and any arcing shall cease.

8 TEMPERATURE RISE

Switched socket-outlets shall not attain excessive temperature in normal use.

Compliance shall be checked by a temperature rise at rated current with the switched socket-outlet mounted and wired as in normal use in surroundings free from external drafts. The temperature rise of any terminal shall not exceed 35 ^{0}C after a sufficient time has elapsed for the temperature rise to become stable.

For the purpose of the test, wiring shall be of PVC insulated (non-sheathed) cable with a cross-sectional area of 1 square millimetre (up to 10 ampere) or 2.5 square millimetres (over 10 amperes and up to 15 amperes). The cables shall be bunched together for a distance of 1 metre from the cable entry which shall be plugged to prevent the free circulation of air.

The load shall be connected using a non-fused plug complying with SLS 948 : Part 1 : 1991 fitted with 1 metre of appropriately sized cord complying with Table 3 of SLS 879 : Part 1 : 1989.

9 ELECTRICAL ENDURANCE OF SWITCHES

The electrical endurance of switches shall be adequate

Compliance shall be checked by testing the capacity to make and break rated current at 250 volts 15,000 times (30000 movements) in a substantially non-inductive a.c. circuit at a rate of six complete cycles per minute at regular intervals. The periods during which the switches are On and OFF shall be approximately equal.

Metallic switched socket-outlet plates and all non-current-carrying metal parts that are normally exposed when the switched socket-outlet plate is not in position and that may become live in the event of failure of insulation shall be connected to the earthed pole of the test circuit. The connection to earth may be through a fine wire fuse.

The means used for operating the switches shall be such as to move the actuating member at a speed of approximately 305 mm per second both in making and in breaking the circuit and shall be so disposed in relation to the actuating member that the normal action of the mechanism as a whole is not interfered with in any way.

At the end of the test the switch shall be capable of making and breaking its rated current at rated voltage and furthermore the voltage drop across each pole at rated current shall not exceed 75 mV. In addition the switch shall comply with the requirements of Clause 9.4 and Clause 9.5 of SLS 948 : Part 1 : 1991 as modified in 9.4 and 9.5 of this specification. However, the values of insulation resistance shall be reduced from 100 megaohm to 5 megaohm and from 50 megaohm to 2 megaohm respectively.

10 MOISTURE RESISTANCE

Switched socket-outlets shall be proof against humid conditions which may occur in normal use.

Compliance shall be checked by the following humidity treatment.

Vitrified ceramic material, which after 24 hours immersion in water has not increased in weight by more than 0.5 per cent after all the moisture has been removed from its surface shall not be subjected to further tests. Providing the resistance to water of the material does not depend on glaze or varnish.

To suit the ambient conditions at the time of test, a convenient temperature T between 20 ^{0}C and 30 ^{0}C, shall be chosen as a reference temperature. The samples shall be brought to a temperature of between T ^{0}C and T + 4 ^{0}C and placed in a humidity cabinet containing air with a relative humidity maintained between 91 per cent and 95 per cent. The temperature of the air at all positions within the cabinet where samples can be placed shall be kept within 1 ^{0}C of the chosen value T.

The sample shall be kept in the cabinet for 48 hours.

NOTE

In most cases samples may be brought to the chosen reference temperature by keeping them at this temperature for at least 4 hours before the humidity treatment.

A relative humidity of between 91 per cent and 95 per cent can be obtained by placing in the humidity cabinet a saturated solution of potassium nitrate (KNO_3) or sodium sulphate (Na_2SO_4) in water having sufficiently large contact surface with the air.

In order to achieve the specified conditions within the cabinet it is necessary to ensure constant circulation of the air within the cabinet and, in general, to use a cabinet which is thermally insulated.

Immediately after this treatment, samples shall not show any appreciable damage, within the meaning of the specification, and, in addition, the switch shall comply with the requirements of Clause 9.4 and Clause 9.5 of SLS 948 : Part 1 : 1991 which shall be made in the humidity cabinet or in a room where the specified temperature is maintained. However, the values of insulation resistance shall be reduced from 100 magaohms to 5 megaohms and 50 megaohms to 2 megaohms respectively.

11 MARKING

Switched socket-outlets shall be clearly marked with the following information which shall not be placed on screws, removable washers or other removable parts, or upon parts intended for separate sale.

a) The name or trade mark of the manufacturer or responsible vendor.

b) The rated current in amperes, e.g. 5 amperes.

c) The rated voltage in volts. i.e. 250 volts.

d) Nature of supply, i.e. ~ (Preferred) or a.c.

e) The terminals for the connection of line and neutral conductors shall be identified by their respective symbols L and N. The symbol used for the protective conductor terminal shall be ⏚ which (which is preferred) or ⏚ or E.

For the marking of the rated current and rated voltage, figures alone may be used. The rated current shall be placed before or above that for the rated voltage and separated from the latter by a line. The nature of supply shall be placed next to the marking for rated current and rated voltage. e.g. :

15A250Va.c. or 15/250 ~ or $\frac{15}{250}$ ~

12 SAMPLING AND CRITERIA FOR CONFORMITY

Clause 10 of SLS 948 : Part 1 : 1991 shall apply.

AMENDMENT NO. 1 APPROVED ON 2000-12-27
TO SLS 948 : PART 3 : 1991

SRI LANKA STANDARD SPECIFICATION FOR THREE PIN PLUGS SOCKET - OUTLETS AND SOCKET - OUTLET ADAPTORS

PART 3 : SWITCHED SOCKET OUTLETS

1. Clause 1 Scope

Add the following paragraph at the end of the text.

This standard also applies to switched socket–outlets incorporating pilot lights.

2. Clause 3 DEFINITIONS

Add the following sub-clause.

3.3 pilot light: Device incorporating a light source either integral or designed to be installed with the switch and intended to give an indication of the switch state.

3. Clause 4 GENERAL REQUIREMENTS

Add the following paragraph immediately after the title
4 GENERAL REQUIREMENTS

Switched socket outlets having provision for pilot lights shall be tested with pilot lights fitted, unless otherwise stated. The results of the tests shall be considered to apply to switched socket-outlets, which do not have pilot lights.

4. Clause 4.9 Insulation resistance

Add the following sentence at the end of the first paragraph.

One pole of any pilot light is disconnected for this test.

5. Clause 4.10 High – voltage test

Add the following sentence at the end of the first paragraph.

One pole of any pilot light is disconnected for this test.

6. Clause 4.11 Current-breaking capability

Add the following sentence at the end of the first paragraph.

Disconnect the pilot lights for the purpose of this test.

7 Clause 8 Temperature rise

Add the following as the fifth paragraph.

The pilot light shall constantly be illuminated during this test.

NOTE

Pilot lights using neon lamps are not tested.

8 Clause 9 Electrical endurance of switches

Add the following at the end of the first paragraph.

Disconnect the pilot lights for the purpose of this test.

AMENDMENT NO. 2 APPROVED ON 2006-11-29
TO SLS 948 : PART 3 : 1991

SRI LANKA STANDARD SPECIFICATION FOR THREE-PIN PLUGS, SOCKET-OUTLETS AND SOCKET-OUTLET ADAPTORS

PART 3 : SWITCHED SOCKET-OUTLETS

Clause 4.1

Delete this clause entirely

Clause 4.6

Delete this clause entirely

Clause 11

Delete this clause entirely

Clause 4.9

Delete the text of the existing clause including amendment no. 1 and substitute with the following :

Disconnect the pilot lights for the purpose of this test. The following additional requirements shall apply. See clause **9.6** of **SLS 948 : Part 1 : 1991**.

a) For socket contacts as described in clause **9.6** of **SLS 948 : Part 1 : 1991**

b) For switch contacts with the switched socket-outlet plates in position and with all metal parts not in contact with live contacts connected to the earthed pole of the test circuit. The switch shall make and break the specified current in a substantially non-inductive a.c. circuit ten times in succession at intervals of 30 seconds. After the tests the switched socket-outlet shall be in a serviceable condition.

SRI LANKA STANDARDS INSTITUTION

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