

Australian/New Zealand Standard™

**Approval and test specification—
Air-break switches**



AS/NZS 3133:2013

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-004, Electrical Accessories. It was approved on behalf of the Council of Standards Australia on 18 July 2013 and on behalf of the Council of Standards New Zealand on 5 August 2013.

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The following are represented on Committee EL-004:

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Australian Industry Group
Consumer Electronics Suppliers Association
Consumers Federation of Australia
Electrical Compliance Testing Association
Electrical Regulatory Authorities Council
Engineers Australia
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Australian/New Zealand Standard™

Approval and test specification— Air-break switches

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-004, Electrical Accessories, to supersede AS/NZS 3133:2008, *Approval and test specification—Air-break switches*, from the date of publication except Clause 12.2(a) becomes applicable 3 years from the date of publication.

This Standard incorporates Amendment No. 1 (November 2014). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to provide Australian and New Zealand electrical industries with electrical safety requirements and test methods for air-break switches. This Standard does not apply to cord-line switches within the scope of AS/NZS 3127, *Approval and test specification—Cord-line switches*.

This Standard is one of a series of approval and test specifications to be read in conjunction with AS/NZS 3100, *Approval and test specification—General requirements for electrical equipment*. The purpose of this series is to outline the conditions that must be met to secure approval for the sale and use of electrical accessories in Australia and New Zealand. Only safety matters and related conditions are covered.

The essential safety requirements in AS/NZS 3820, *Essential safety requirements for electrical equipment*, that could be applicable to switches are covered by this Standard, taken in conjunction with any other relevant requirements affecting safety.

This Standard was revised to introduce requirements and location of markings for the name or registered trade name or mark of the manufacturer or of the responsible vendor.

This Standard does not include all the necessary provisions of a contract.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Approval and test specification—Air-break switches****1 SCOPE AND REFERENCED DOCUMENTS****1.1 Scope**

This Standard applies to air-break switches having current ratings not exceeding 125 A for use in electrical circuits and equipment operating at low voltage but not exceeding 500 V and intended for household or similar use and for use in indoor and outdoor electrical installations.

This Standard does not apply to cord-line switches as defined in AS/NZS 3127.

NOTE: See Clause 3.3 for other relevant Standards covering switches that may affect the application of this Standard.

1.2 Referenced documents

The following documents are referred to in this Standard:

AS

- 1931 High-voltage test techniques
- 1931.1 Part 1: General definitions and test requirements
- 60529 Degrees of protection provided by enclosures (IP Code)

AS/NZS

- 3100 Approval and test specification—General requirements for electrical equipment
- 3121 Approval and test specification—Insulating mouldings
- 3127 Approval and test specification—Cord-line switches
- 3947 Low-voltage switchgear and controlgear
- 3947.3 Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
- 60335 Household and similar electrical appliances—Safety
- 60335.1 Part 1: General requirements (IEC 60335-1 Ed 5, MOD)
- 61058 Switches for appliances
- 61058.1 Part 1: General requirements (IEC 61058-1, Ed. 3.1 (2000), MOD)

IEC

- 60669 Switches for household and similar fixed-electrical installations (all parts)

2 DEFINITIONS

For the purpose of this Standard, the definitions below apply:

2.1 Air-break switch

A mechanical device for making and breaking in air a circuit carrying a load current.

For the purpose of this Standard, an air-break switch is referred to as a switch.

2.2 Flush switch

A switch for mounting behind or incorporated with a switch plate, the back of the plate being flush with the surface of the wall or enclosure.

2.3 Intermediate switch

A switch for controlling a circuit where more than two positions of control are required. Such a switch generally occupies an intermediate position between the other switches it is used in conjunction with.

2.4 Isolating switch

A switch that when in the open position complies with the requirements specified for the isolating function.

2.5 Number of ways (of a switch)

The number of conducting paths (outputs) provided for each pole. Ways may also be called throws.

2.6 Operation

The transfer of moving contact(s) from one position to an adjacent position.

2.7 Operating cycle

A succession of operations from one position to another and back to the first position through all other positions, if any.

2.8 Pole(s)

The number of electrically separated inputs.

2.9 Recovery voltage

The r.m.s. value of the normal frequency voltage, or d.c. voltage, as appropriate, that exists across the terminals of each pole of the switch after final arc extinction.

2.10 Surface switch

A switch provided with a seating surface so that when mounted it projects wholly above the surface on which it is mounted.

2.11 Switch arrangements

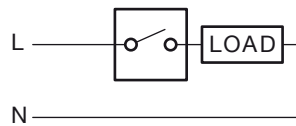
Switch arrangements as shown in Figure 1.

2.12 Switch assemblies

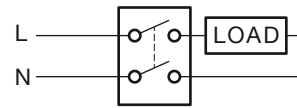
An assembly of switches that can be configured by the installer into a single face plate.

2.13 Wall switch

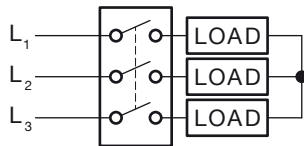
A switch primarily intended for mounting on, or in, a wall or related part of a building structure.



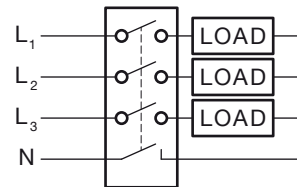
(i) Single-pole



(ii) Double-pole

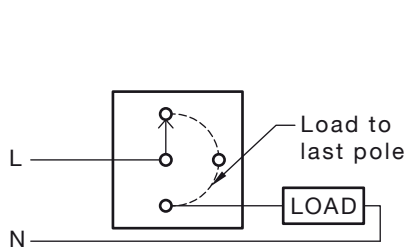


(iii) 3-pole

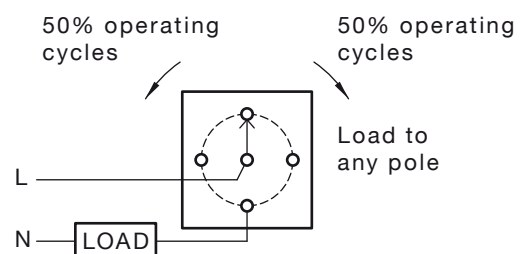


(iv) 4-pole (3PH with neutral switching pole)

(a) Single-way switches

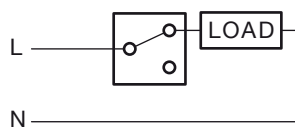


(i) Less than 360° of rotation

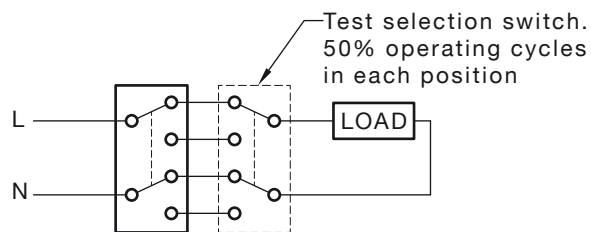


(ii) 360° of rotation

(b) Rotary switches

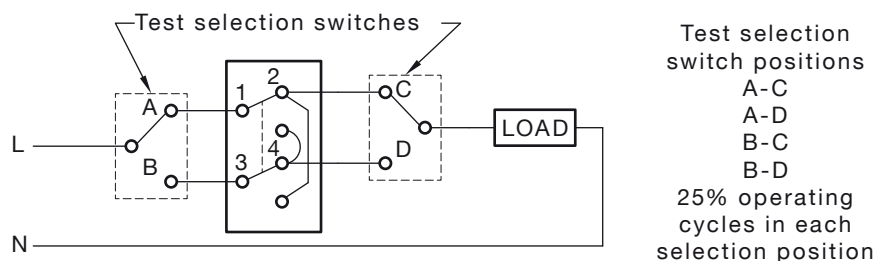


(i) Single-pole



(ii) Double-pole

(c) Two-way switches



(d) Intermediate switch

FIGURE 1 SOME COMMON SWITCH CIRCUITS

3 COMPLIANCE WITH STANDARDS

3.1 General requirements of AS/NZS 3100

This Standard shall be read in conjunction with AS/NZS 3100 and the appropriate provisions of that Standard shall apply to the construction of the switch and the insulation and safeguarding of parts that normally carry current.

3.2 Specific requirements of this Standard

A switch shall be deemed to comply with this Standard only if it complies with all the appropriate requirements of this Standard and passes the tests specified herein.

Additional requirements for isolating switches are provided in Appendix A.

3.3 Requirements of other Standards

3.3.1 *AS/NZS 3947.3 utilization categories*

Switches having current ratings greater than 63 A but not exceeding 300 A that comply with AS/NZS 3947.3 for utilization categories AC-21, AC-22, AC-23, DC-21, DC-22 and DC-23 shall be deemed to comply with the requirements of this Standard.

3.3.2 *IEC 60669 series*

Switches complying with IEC 60669, Parts 2.2, 2.3 and 2.4, in conjunction with AS/NZS 60669.1, or AS/NZS 60669.1 and AS/NZS 60669.2.1, are deemed to comply with the requirements of this Standard. Switches for motors shall, in addition to the requirements in IEC 60669 and AS/NZS 60669 series Standards, pass the motor control test (M-rating) herein (see Clause 13.13).

3.3.3 *AS/NZS 61058.1 switches*

Switches intended to be incorporated in, on or with an appliance may comply with AS/NZS 61058.1 in lieu of this Standard.

4 ENCLOSURE

Any enclosure provided for a switch shall be of robust construction and designed to prevent the emission of arcs, flame, molten metal or hot particles. Any insulating material used in the construction of the enclosure shall be not inferior to the class of material specified in AS/NZS 3121 in relation to the temperature at which the material is required to operate when the switch is tested in accordance with Clause 13.6.

Where an IP rating is claimed for a switch, it shall comply with Clause 13.12.

5 INSULATING MATERIALS

Except for ceramic material, all insulating material shall comply with the requirements of Clause 13.10. Any insulating material used as basic insulation shall have adequate mechanical and electrical strength.

Ceramic material shall be of a type that does not increase in mass by more than 2% after being immersed in water for a period of 48 h. This is determined after removal of surface moisture.

Other insulating material shall be not inferior to the class of material specified in AS/NZS 3121 in relation to the temperature at which the material is required to operate when the switch is tested in accordance with Clause 13.6.

6 FORM AND ACTION OF CONTACTS

Unless switches are marked 'a.c.', effective means shall be provided to prevent excessive arcing or sustained partial contact that would result in burning of the switch contacts under the conditions of use. The switch shall open with a rapid action that is independent of the rate of movement of the operating means.

7 SEQUENCE OF OPERATION

The moving contacts of all poles of a multiple-pole switch, including a switch with a pole that operates in the neutral, shall be mechanically coupled in such a way that all poles make and break substantially together. If a switch has a switched neutral pole without the same making and breaking capacity as the active poles, the switched neutral pole shall not open before and shall not close after the other pole(s).

8 ACTUATING MECHANISM

The actuating mechanism shall be constructed so that the switch contacts can only remain in the completely closed or the completely open position when the switch is operated in the normal manner. Operation of the switch to obtain a position of the contact between the completely open and the closed positions shall not be regarded as normal operation.

9 EARTHING FACILITIES

Facilities shall be provided for the earthing of any exposed metal parts. Such facilities shall take the form of a suitable terminal, which, unless its function as an earthing terminal is clearly evident, shall be legibly and durably marked in accordance with the requirements for the 'Marking of earth connections' described in AS/NZS 3100.

For switches that are intended to be mounted in equipment, a separate earthing terminal shall not be required if the fixing means of the switch are such that they will provide good electrical continuity between exposed metal parts of the switch and metal parts of the equipment to which the switch is to be fixed.

All exposed metal parts of a switch shall be in effective electrical connection with such facilities.

10 PROHIBITED ARRANGEMENTS

A wall switch, or its face plate, shall not incorporate a connecting device for television or radio aerial wiring, telecommunications wiring or similar wiring systems.

11 FLUORESCENT LAMP LOAD RATING

All single-pole, single-way and single-pole, two-way switches [see Figure 1 (a)(i) and (c)(i)] with a current rating up to and including 10 A shall have a fluorescent lamp load current rating equal to their current rating.

Other switches may have an optional fluorescent lamp load rating of any value in accordance with Clause 13.14.

12 MARKING

12.1 Information required

Except as indicated in Clause 12.4, switches shall be marked, in accordance with AS/NZS 3100, with the following information:

- (a) The name, or registered trade name, or mark, of the manufacturer or responsible vendor.