ANSI C37.45-1981(R1992)
(Revision of ANSI C37.45-1969)

American National Standard Specifications for Distribution Enclosed Single-Pole Air Switches

Approved 5/22/80

American National Standards Institute, Inc.

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

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Foreword

(This Foreword is not a part of American National Standard Specifications for Distribution Enclosed Single-Pole Air Switches, ANSI C37.45-1981.)

This standard is a revision of American National Standard Specifications for Distribution Enclosed Single-Pole Air Switches, ANSI C37.45-1969, to bring it up to date and in line with present day requirements for high-voltage fuses and switches.

This standard was prepared by the C37 Subcommittee on High-Voltage Fuses with cooperation from the IEEE Subcommittee on High-Voltage Fuses and from NEMA. Liaison was maintained with EEI and IEC during the revision process in order to incorporate the latest thinking up to the time of publication.

This publication is one of a series of complementary American National Standards covering various types of high-voltage fuses and switches, so arranged that certain of the standards apply to all devices, while each of the other standards provides additional specifications for a particular device. For any device, ANSI/IEEE C37.40-1981, ANSI/IEEE C37.41-1981, plus the additional standard covering that device constitute a complete standard for the device. In addition, ANSIC 37.48-1969 is an application, operation, and maintenance guide for all the devices.

The following American National Standards make up this series:

American National Standard Service Conditions and Definitions for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories, ANSI/IEEE C37.40-1981

American National Standard Design Tests for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories, ANSI/IEEE C37.41-1981

American National Standard Specifications for Distribution Cutouts and Fuse Links, ANSI C37.42-1981 [This revision includes pertinent data formerly contained in ANSI C37.43. The C37.43 standard is dropped as redundant.]

American National Standard Specifications for Distribution Oil Cutouts and Fuse Links, ANSI C37.44-1981

American National Standard Specifications for Distribution Enclosed Single-Pole Air Switches, ANSI C37.45-1981

American National Standard Specifications for Power Fuses and Fuse Disconnecting Switches, ANSI C37.46-1981

American National Standard Specifications for Distribution Fuse Disconnecting Switches, Fuse Supports, and Current Limiting Fuses, ANSI C37.47-1981

American National Standard Guide for Application, Operation, and Maintenance of Distribution Cutouts and Fuse Links, Secondary Fuses, Distribution Enclosed Single-Pole Air Switches, Power Fuses, Fuse Disconnecting Switches, and Accessories, ANSI C37.48-1969

Suggestions for improvement of this standard will be welcome. They should be sent to the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

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American National Standard Specifications for Distribution Enclosed Single-Pole Air Switches

1. Scope

This standard applies to:

1) Distribution enclosed single-pole air switches
2) Supports, mountings, fuse hooks, tongs, all of the type used exclusively with distribution enclosed single-pole air switches

2. Rating

2.1 Rating Information

2.1.1 Ratings

The ratings of distribution enclosed air switches shall include:

1) Rated continuous current, determined by the temperature-rise design tests at the rated continuous current specified in 3.4. These tests shall be made under the usual service conditions specified in Section 2 of American National Standard Service Conditions and Definitions for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories, ANSI/IEEE C37.40-1981.
2) Rated maximum voltages, determined by the dielectric design tests specified in 3.1 at altitudes up to 3300 feet (1000 meters), as specified in Section 2 of ANSI/IEEE C37.40-1981.
3) Rated frequency, as specified in 2.5.
4) Basic impulse insulation level (BIL), determined by the impulse withstand tests specified in 3.1.
5) Rated short-time currents, momentary and 3-second, determined by the design tests specified in 3.3.

2.1.2 Performance Characteristics

The performance characteristics of distribution enclosed air switches shall include:

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1) Normal-frequency dry- and wet-withstand voltages, as specified in 3.1.
2) Temperature-rise limitations, as specified in 3.4 and in Section 3 of ANSI/IEEE C37.40-1981.
3) Radio-influence levels, as specified in 3.2.

2.2 Rated Continuous Current

The rated continuous currents of distribution enclosed air switches shall be 200, 400, and 600 amperes.

2.3 Overload and Thermal Ratings

Overload and thermal ratings are not applicable to distribution enclosed air switches.

2.4 Rated Maximum Voltage

The rated maximum voltage of distribution enclosed air switches shall be 7.8 kV.

2.5 Rated Frequency

The frequency rating of distribution enclosed air switches shall be 50 Hz or 60 Hz, or both.

2.6 Basic Impulse Insulation Level (BIL)

The basic impulse insulation level of distribution enclosed air switches shall be 75 kV.

2.7 Rated Short-Time Currents

The rated short-time currents of distribution enclosed air switches shall be as given in Table 1.

3. Design Test Requirements

3.1 Dielectric Tests

Distribution enclosed air switches shall be capable of withstanding the test voltages specified in 3.1.1 when tested as specified in 4.1 of American National Standard Design Tests for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories, ANSI/IEEE C37.41-1981.

3.1.1 Test Voltages

The withstand test voltages to be applied to switches shall be as given in Table 2.

3.1.2 Number of Samples

The tests shall be made on three switches.

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3.2 Radio-Influence Tests

Distribution enclosed air switches, when new and clean and when tested at the point of manufacture as specified in Section 9 of ANSI/IEEE C37.41-1981, shall be capable of meeting the limits of radio-influence voltage at the test voltages specified in Table 3.

Table 1— Rated Short-Time Currents

Rated Continous Current of Air Switches (amperes)	Short-Time Current Ratings of Air Switches (amperes)	
	Rated Momentary Current	Rated 3-s Current
200	10,000	6,250
400	20,000	12,500
600	20,000	12,500

Table 2— Terminal-to-Ground and Terminal-to-Terminal Dielectric Test Voltages

	Withstand Voltages		
Rated Maximum Voltage of Air Switch (kV)	Normal-Frequency Dry Test, 1 min (kV, rms)	Normal-Frequency Wet Test, 10 s (kV, rms)	Impulse Test (BIL), 1.2 × 50 μs Wave (kV, crest)
7.8	27	24	75

Table 3— Limits of Radio-Influence Voltage

Rated Maximum Voltage of Air Switch (kV)	Test Voltage (volts)	Limit of Radio-Influence Voltage (μV at 1 MHz)
7.8	8320	250

3.3 Short-Time Current Tests

Distribution enclosed air switches shall carry the rated short-time currents given in Table 1 when tested as specified in Section 10 of ANSI/IEEE C37.41-1981.

3.4 Temperature-Rise Limitations

Distribution enclosed air switches shall be capable of carrying their rated continuous current when tested as specified in Section 11 of ANSI/IEEE C37.41-1981 and as follows. After carrying the rated continuous current for the duration specifed in 11.2.1 of ANSI/IEEE C37.41-1981, the temperature rise of the switch shall not exceed the values listed in Section 3. of ANSI/IEEE C37.41-1981 when tested within the ambient temperature range of 10 °C to 40 °C, as specified in Section 11 of ANSI/IEEE C37.41-1981. There shall be no deterioration of any part of the switch.

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4. Conformance Tests

Conformance tests as defined in Section 3. of ANSI/IEEE C37.41-1981 for distribution enclosed air switches shall consist of a normal-frequency dry-withstand test. The test shall be conducted as specified in 3.1 above and in 4.2.1 of ANSI/IEEE C37.41-1981.

5. Construction Requirements

5.1 Terminal Dimensions

The dimensions of the terminals for distribution enclosed air switches shall be such as to accommodate the range of conductor sizes given in Table 4.

Table 4— Range of Conductor Sizes

Rated Continuous Current (amperes)	Terminal Size				
	Minimum Copper Conductor Size Which Terminal Must Clamp, Stranded unless Marked S			Maximum Diameter Conductor Which Shall Freely Enter Terminal	
	AWG*	mm^2	Diameter (mm)	Inches	Millimeters
200	No. 4 S	21	5.2	0.528	13.4
400	No. 2 S	34	6.5	0.814	20.6
600	No. 2/0	67	10.6	0.998	25.3

*American Wire Gage.

6. Nameplate Marking

The following minimum information shall be placed on all distribution enclosed air switches:

1) Manufacturer’s name or trademark (or monogram)
2) Manufacturer’s type or identification number
3) Rated continous current
4) Rated maximum voltage

7. Application Requirements

See also Section 48 of NEMA SG2-1976, High-Voltage Fuses,[1] and ANSI C37.48-1969.

[1]Available from the National Electrical Manufacturers Association, 2101 L Street, NW, Washington, D.C. 20037.

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7.1 Load-Break Ability

A distribution enclosed air switch, unless incorporating load-breaking means, has no load-break rating and is not intended to be used to interrupt current except relatively low current such as charging current.

NOTES:

1 — Disconnecting switches have some inherent load-break ability, which can best be evaluated by the user, based on experience under operating conditions.

2 — To prevent accumulated damage to main contacts by the arcs under repeated operations, use a quick-break switch.

8. Revision of American National Standards Referred to in This Document

When the following American National Standards referred to in this document are superseded by a revision approved by the American National Standards Institute, Inc, the revision shall apply:

American National Standard Design Tests for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories, ANSI/IEEE C37.41-1981

American National Standard Service Conditions and Definitions for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories, ANSI/IEEE C37.40-1981

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