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(Revision of ANSI C37.63-1984)

IEEE Standard Requirements for Overhead, Pad-Mounted, Dry-Vault, and Submersible Automatic Line Sectionalizers for AC Systems

Sponsor

**Switchgear Committee
of the
IEEE Power Engineering Society**

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Abstract: Required definitions (for cutout type sectionalizers), ratings, procedures for performing design tests and production tests, constructional requirements, and application considerations for overhead and pad-mounted, dry-vault, and submersible automatic line sectionalizers for ac systems are specified.

Keywords: sectionalizers, cutout type; sectionalizers, dry-vault; sectionalizers, pad-mounted; sectionalizers, submersible

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Introduction

(This introduction is not part of IEEE Std C37.63-1997, IEEE Standard Requirements for Overhead, Pad-Mounted, Dry-Vault, and Submersible Automatic Line Sectionalizers for AC Systems.)

This standard is a revised and updated version of ANSI C37.63-1984 (Reaff 1990), which incorporates significant improvements that reflect the present state of the art in automatic line sectionalizers. These improvements include changes and additions in the following areas:

- a) New cutout type sectionalizers are applied in a distribution cutout mounting.
- b) Safety provisions are now a subclause of application considerations.
- c) The temperature rise table has been split into two tables.
- d) Rating definitions were reviewed for consistency with other standards.
- e) Table 5 was revised for consistency with other standards.

Also included is the recognition of the need for partial discharge tests for some types of sectionalizers. While the procedure and related requirements have not yet been finalized (see 6.7), an effort is under way to develop this information, and it will be published after it has been completed and has gone through the full approval process.

The preparation of IEEE Std C37.63-1997 was the cooperative work of the IEEE Switchgear Committee (Reclosers and Sectionalizer Subcommittee), the National Electrical Manufacturers Association (NEMA) Switchgear Section (SG 13—Automatic Circuit—Reclosers Technical Committee), and the C37 Subcommittee on Automatic Circuit Reclosers and Line Sectionalizers.

Upon recommendation of this latter subcommittee, the proposed American National Standard was voted on by the Standards Committee on Power Switchgear, C37, and was subsequently approved as an American National Standard.

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CLAUSE	PAGE
1. Overview	1
1.1 Scope	1
2. References	1
3. Definitions	2
4. Service conditions	2
4.1 Usual service conditions	2
4.2 Unusual service conditions	3
5. Rating	3
5.1 Rating information	3
5.2 Rated maximum voltage	4
5.3 Rated frequency	4
5.4 Rated continuous current	6
5.5 Rated minimum actuating current	8
5.6 Rated symmetrical interrupting (load current switching) current (manual operation only)	8
5.7 Rated making current	8
5.8 Rated momentary current	9
5.9 Rated 1 s current	9
5.10 Rated 10 s current	9
5.11 Rated dielectric withstand levels	9
5.12 Overload rating	9
5.13 Rated control voltage and ranges	9
5.14 Rated cable charging interrupting current (where applicable)	10
6. Design tests	10
6.1 General	11
6.2 Insulation (dielectric tests)	11
6.3 Interrupting tests	12
6.4 Standard operating duty tests	17
6.5 Making and momentary current tests	18
6.6 Minimum actuating current tests	18
6.7 Partial discharge tests	18
6.8 Radio influence voltage (RIV) tests	18
6.9 Short-Time current tests	20
6.10 Surge current test—Series coil sectionalizers	21
6.11 Temperature rise test	21
6.12 Mechanical operation test	23
6.13 Control elements surge withstand capability tests	23
7. Production tests	25
7.1 Counting and overcurrent trip calibration	26
7.2 Control, secondary wiring, and accessory devices check tests	26
7.3 Dielectric withstand test—1 min dry power frequency	26
7.4 Mechanical operation tests	26
7.5 Leak test	26

CLAUSE	PAGE
8. Construction requirements	26
8.1 Tank construction.....	26
8.2 Grounding provisions.....	27
8.3 Insulating medium quantity indicators (submersible sectionalizers).....	27
8.4 Oil sampling provisions (submersible sectionalizers)	27
8.5 Manual operating provision	27
8.6 Position indicator	27
8.7 Nameplate markings	28
8.8 Stored energy mechanism charge indicator	28
8.9 Separate mounting of control apparatus.....	28
8.10 Counters	28
8.11 Conductor terminal sizes.....	28
8.12 Vacuum interrupters.....	28
9. Application considerations.....	29
9.1 Safety provisions.....	29

IEEE Standard Requirements for Overhead, Pad-Mounted, Dry-Vault, and Submersible Automatic Line Sectionalizers for AC Systems

1. Overview

1.1 Scope

This standard applies to all overhead, pad-mounted, dry-vault, and submersible single-pole or multipole alternating current automatic line sectionalizers for rated maximum voltages above 1000 Vac.

In order to simplify the vocabulary of this standard, the term *sectionalizer* has been substituted for *automatic line sectionalizer* wherever possible.

2. References

This standard shall be used in conjunction with the following references:

ANSI C37.85-1989 (Reaff 1995), American National Standard Safety Requirements for X-Radiation Limits for AC High-Voltage Power Vacuum Interrupters Used in Power Switchgear.¹

IEEE Std 4-1995, IEEE Standard Techniques for High-Voltage Testing (ANSI).²

IEEE Std 386-1995, IEEE Standard for Separable Insulated Connectors for Power Distribution Systems Above 600 V (ANSI).

¹ANSI publications are available from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

²IEEE publications are available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

IEEE Std C37.09-1979 (Reaff 1988), IEEE Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis (ANSI).

IEEE Std C37.24-1986 (Reaff 1991), IEEE Guide for Evaluating the Effect of Solar Radiation on Outdoor Metal-Enclosed Switchgear (ANSI).

IEEE Std C37.100-1992, IEEE Standard Definitions for Power Switchgear (ANSI).

NEMA 107-1988 (Reaff 1993), Methods of Measurement of Radio Influence Voltage (RIV) of High-Voltage Apparatus.³

NEMA SG 13-1958, Automatic Circuit Reclosures—Automatic Line Sectionalizers and Oil-Filled Capacitor Switches for Alternating Current Systems.⁴

3. Definitions

The definitions of terms contained in this standard or in other standards referred to in this standard are not intended to embrace all legitimate meanings of the terms. They are applicable to the subject treated in this standard. If a term is not defined in this standard, the definition in IEEE Std C37.100-1992 applies.

A dagger (†) following the definition indicates that while the term is defined in IEEE Std C37.100-1992, the two definitions are not identical.

An asterisk (*) indicates that at this time this standard was approved, there were no corresponding definitions in IEEE Std C37.100-1992.

3.1 cutout type sectionalizers: A single-phase automatic line sectionalizer that is very similar in outward appearance to a distribution open dropout type fuse cutout and is used in a distribution cutout mounting.(*)

4. Service conditions

4.1 Usual service conditions

Sectionalizers conforming to this standard shall be suitable for operation at their standard rating provided that

- a) The temperature of the cooling air (ambient temperature) surrounding the enclosure is not above 40 °C or below –30 °C.
- b) The altitude does not exceed 1000 m (3300 ft).
- c) For submersible units, the water head does not exceed 3 m (10 ft) above the base of the enclosure during occasional submersion. Exposure to chemical or electrochemical reactions may be encountered in a subgrade environment.
- d) The effect of solar radiation is not significant. (The principles stated in IEEE Std C37.24-1986⁵ may be used for guidance.)
- e) Unusual service conditions, such as those outlined in 4.2, do not prevail.

³NEMA publications are available from the National Electrical Manufacturers Association, 1300 N. 17th St., Ste. 1847, Rosslyn, VA 22209, USA.

⁴This standard was rescinded by the NEMA Switchgear Committee in 1962. Archive copies are available from NEMA.

⁵Information about references is provided in Clause 2.

4.2 Unusual service conditions

4.2.1 Abnormal ambient temperatures

Sectionalizers may be applied at higher or lower ambient temperatures than specified, but performance may be affected. Special consideration shall be given to these applications.

4.2.2 Altitudes above 1000 m (3300 ft)

Sectionalizers that depend on air for their insulating and cooling medium will have a higher temperature rise and lower dielectric withstand capability when operated at higher altitudes above values specified in 4.1b). The values of altitude correction factors are being studied by the Working Group on Common Clauses (Chair, L. V. MacCall) and will be incorporated after approval.

4.2.3 Other conditions that may affect design and applications

Where other unusual conditions exist, they should be brought to the attention of those responsible for the manufacture of the equipment.

Examples of such conditions include

- a) Abnormal vibrations, shocks, or tilting
- b) Unusual transportation or storage conditions
- c) Unusual operating duty, frequency of operation, inadequate maintenance, or special insulation requirements
- d) For overhead, pad-mounted, and dry-vault sectionalizers, exposure to damaging fumes or vapors; excessive or abrasive dust; explosive mixtures of dust or gases; salt air; or extreme humidity
- e) For submersible sectionalizers, exposure to tidal water; highly acidic water; water containing abnormal amounts of dissolved road salt or fertilizer; continuous submersion; or stray direct currents

5. Rating

5.1 Rating information

The rating shall include the following:

- a) Rated maximum voltage
- b) Rated frequency
- c) Rated continuous current
- d) Rated minimum actuating current
- e) Rated symmetrical interrupting (load current switching) current (where designed for this operation)
- f) Rated asymmetrical making current (where designed for this operation)
- g) Rated momentary current, asymmetrical
- h) Rated 1 s current
- i) Rated 10 s current
- j) Rated dielectric withstand voltage
- k) Rated control voltage (where applicable)
- l) Rated cable charging interrupting current (where designed for this application)

5.2 Rated maximum voltage

The rated maximum voltage of sectionalizers is the highest rms voltage for which the equipment is designed and is the upper limit for operation. The rated values are the values shown in Table 1, column (2).(*)

Table 1— Preferred ratings and performance characteristics of automatic line sectionalizers

ID no.	Rated maximum voltage	Rated impulse withstand voltage	Power frequency insulation withstand voltage tests *		dc 15 min withstand	Current [†]	
			(kV rms)			(Amperes)	
	(kV rms)	(kV crest)	1 min dry	10 s wet	(kV)	Maximum continuous current	Symm. int. (load current switching) rms
Col. (1)	Col. (2)	Col. (3)	Col. (4)	Col. (5)	Col. (6)	Col. (7)	Col. (8)
Single-Phase sectionalizers							
1	15.0	95	35	30	53	200	440
2	15.0	125	42	36	53	200	200
3	15.0	125	42	36	53	200	440
4	27.0	125	60	50	78	200	—
Three-Phase sectionalizers							
5	15.5	110	50	45	53	200	440
6	15.5	110	50	45	53	400	880
7	15.5	110	50	45	53	600	1320
8	38.0	150	70	60	103	400	880
NOTE — For cutout type sectionalizers, the preferred ratings are the same as the distribution cutout mounting in which they are applied.							

*These are performance characteristics specified as test requirements in this standard.

†See Table 2 for data on current ratings for all continuous current ratings.

5.3 Rated frequency

The rated frequency of the sectionalizers is the frequency of the circuit for which the sectionalizer is designed. Ratings are based on a frequency of 60 Hz.(+)