

IEEE Loading Guide for AC High-Voltage Air Switches (in Excess of 1000 V)

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

Approved 20 June 1996
IEEE Standards Board

Abstract: An aid to users to determine (1) the allowable continuous current class (ACCC), (2) the continuous load current capabilities of air switches under various conditions of ambient temperature, and (3) the emergency load current capabilities of air switches under various conditions of ambient temperature, is provided. This guide does not apply to switches used in enclosures covered by IEEE Std C27.20.2-1993, IEEE Std C37.20.3-1996, IEEE Std C37.23-1987, IEEE Std C37.71-1984, and ANSI C37.72-1987.

Keywords: ACCC, allowable continuous current class, current capabilities, emergency loading, high-voltage air switches, outdoor switches

The Institute of Electrical and Electronics Engineers, Inc.
345 East 47th Street, New York, NY 10017-2394, USA

Copyright © 1996 by the Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 1996. Printed in the United States of America.

ISBN 1-55937-828-X

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Board. Members of the committees serve voluntarily and without compensation. They are not necessarily members of the Institute. The standards developed within IEEE represent a consensus of the broad expertise on the subject within the Institute as well as those activities outside of IEEE that have expressed an interest in participating in the development of the standard.

Use of an IEEE Standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation. When a document is more than five years old and has not been reaffirmed, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE Standard.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretations is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of all concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration.

Comments on standards and requests for interpretations should be addressed to:

Secretary, IEEE Standards Board
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
USA

Note: Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. The IEEE shall not be responsible for identifying all patents for which a license may be required by an IEEE standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Authorization to photocopy portions of any individual standard for internal or personal use is granted by the Institute of Electrical and Electronics Engineers, Inc., provided that the appropriate fee is paid to Copyright Clearance Center. To arrange for payment of licensing fee, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; (508) 750-8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Introduction

[This introduction is not part of IEEE Std C37.37-1996, IEEE Loading Guide for AC High-Voltage Air Switches (in Excess of 1000 V).]

IEEE Std C37.37-1996 is a loading guide that designates the continuous and emergency load current capabilities of air switches over a range of ambient temperatures. This is accomplished through a family of loadability factor curves.

The Standards Committee on Power Switchgear, C37, which reviewed and approved this standard, had the following personnel at the time of approval:

E. Byron, Chair
M. Calwise, Secretary
A. K. McCabe (*Executive Vice-Chair of High-Voltage Switchgear Standards*)
J. C. Scott (*Executive Vice-Chair of Low-Voltage Switchgear Standards*)
D. L. Swindler (*Executive Vice-Chair of IEC Activities*)

<i>Organization Represented</i>	<i>Name of Representative</i>
Association of Iron and Steel Engineers	(vacant)
Electric Light and Power Group	M. C. Mingoia D. J. Borchart T. E. Bruck J. H. Provanzana J. D. Stewart G. R. Brandenberger (<i>Alt.</i>) A. K. McCabe (<i>Alt.</i>)
Institute of Electrical and Electronics Engineers	D. F. Peelo L. B. Beard H. L. Bowles P. W. Dwyer A. Monroe D. Signon S. C. Atkinson (<i>Alt.</i>) D. G. Kumbera (<i>Alt.</i>) L. V. McCall (<i>Alt.</i>)
National Electrical Manufacturers Association	R. Garzon W. Kracht H. L. Miller T. Olson S. Stone E. Byron (<i>Alt.</i>) G. T. Jones (<i>Alt.</i>) G. Sakats (<i>Alt.</i>) D. L. Swindler (<i>Alt.</i>)
Tennessee Valley Authority	D. N. Reynolds
Testing Laboratory Group	L. Frier P. Notarian
U.S. Department of the Army, Office of the Chief of Engineers.....	J. A. Gilson
U.S. Department of the Interior, Bureau of Reclamation	R. Arnold
U.S. Department of the Navy, Naval Construction Battalion Center	R. L. Clark
Western Area Power Administration	G. D. Birney

The following is a list of participants in the Air Switch Working Group:

Alexander Dixon, Chair

Cary J. Ahrano
John Angelis
Lee Bennett
Harvey L. Bowels
Robert A. Brown
Michael L. Dunagin

Charles L. Hand
Carlos R. Isaac
P. L. Kolarik
Donald L. Lott
Elmer L. Luehring
Don C. Mills

Alec C. Monroe
James C. Ransom
David N. Reynolds
Ronald J. Reynolds
Devki N. Sharma
John G. Wood

The following persons were on the balloting committee:

Roy W. Alexander
J. G. Angelis
Richard H. Arndt
Steve Atkinson
L. Ronald Beard
Harvey L. Bowles
Matthew Brown
John H. Brunke
Raymond L. Capra
Alexander Dixon
J. J. Dravis
C. J. Dvorak
Peter W. Dwyer
Ruben D. Garzon
Louis W. Gausa
Keith I. Gray
Kenneth Hendrix
H. L. Hess
P. L. Kolarik

David G. Kumbera
Stephen R. Lambert
Ward E. Laubach
John G. Leach
George N. Lester
Don Lott
E. L. Luehring
P. C. Mayo
Andrew K. McCabe
Lawrence V. McCall
William C. McKay
Jerry Merabek
Don C. Mills
Alec C. Monroe
Georges F. Montillet
F. J. Muench
James F. O'Donnell
Raymond P. O'Leary
A. F. Parks

David F. Peelo
G. O. Perkins
R. Kris Ranjan
J. C. Ransom
David N. Reynolds
H. C. Ross
Tim E. Royster
L. H. Schmidt
E. W. Schmunk
C. A. Schwalbe
Devki N. Sharma
Guy St. Jean
D. L. Swindler
John S. Tannery
S. H. Telander
Frederick C. Teufel
Thomas J. Tobin
Edward F. Veverka
Charles L. Wagner

When the IEEE Standards Board approved this standard on 20 June 1996, it had the following membership:

Donald C. Loughry, Chair
Richard J. Holleman, Vice Chair
Andrew G. Salem, Secretary

Gilles A. Baril
Clyde R. Camp
Joseph A. Cannatelli
Stephen L. Diamond
Harold E. Epstein
Donald C. Fleckenstein
Jay Forster*
Donald N. Heirman
Ben C. Johnson

E. G. "Al" Kiener
Joseph L. Koepfinger*
Stephen R. Lambert
Lawrence V. McCall
L. Bruce McClung
Marco W. Migliaro
Mary Lou Padgett
John W. Pope

Jose R. Ramos
Arthur K. Reilly
Ronald H. Reimer
Gary S. Robinson
Ingo Rüschi
John S. Ryan
Chee Kiow Tan
Leonard L. Tripp
Howard L. Wolfman

*Member Emeritus

Also included are the following nonvoting IEEE Standards Board liaisons:

Satish K. Aggarwal

Alan H. Cookson

Chester C. Taylor

Rochelle Stern
IEEE Standards Project Editor

CLAUSE	PAGE
1. Overview	1
1.1 Scope.....	1
1.2 Purpose.....	1
2. References.....	1
3. Definitions.....	3
4. General application conditions.....	3
5. Application considerations for continuous load current capability	5
5.1 Allowable continuous current	5
5.2 Switch part class designation	5
5.3 Allowable continuous current class (ACCC) designation	6
5.4 Exceptions to temperature limitations.....	6
5.5 Precautions	6
6. Application considerations for emergency load current capability	7
6.1 Considerations.....	7
6.2 Capabilities.....	7
Annex A (informative) Bibliography.....	9

IEEE Loading Guide for AC High-Voltage Air Switches (in Excess of 1000 V)

1. Overview

1.1 Scope

This loading guide applies to ac high-voltage air switches in excess of 1000 V rated in accordance with IEEE Std C37.30-1992.¹ This standard does not apply to switches used in enclosures covered by IEEE Std C37.20.2-1993, IEEE Std C37.20.3-1996, IEEE Std C37.23-1987, IEEE Std C37.71-1984, and ANSI C37.72-1987. Moreover, interrupter switches covered by IEEE Std C37.39 are excluded from the scope of this standard. If an air switch is equipped with a load-break device or interrupter, it may not successfully interrupt currents above the nameplate rating.

1.2 Purpose

The purpose of this guide is to aid users and manufacturers in the determination of:

- a) The allowable continuous current class (ACCC) designations.
- b) The continuous load current capabilities of air switches under various conditions of ambient temperature.
- c) The emergency load current capabilities of air switches under various conditions of ambient temperature.

2. References

This recommended practice shall be used in conjunction with the following publications:

Accredited Standards Committee C2-1997, National Electrical Safety Code® (NESC®) (ANSI).²

ANSI C29.1-1988, Test Methods for Electrical Power Insulators.³

¹Information on references can be found in clause 2.

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

³ANSI publications are available from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.