

IEEE Std 303™-2004

(Revision of
IEEE Std 303-1991)

IEEE Standards

303™

IEEE Recommended Practice for Auxiliary Devices for Rotating Electrical Machines in Class I, Division 2 and Zone 2 Locations

IEEE Industry Applications Society

Sponsored by the
Petroleum and Chemical Industry Committee



3 Park Avenue, New York, NY 10016-5997, USA

17 December 2004

Print: SH95243

PDF: SH95243



Documents

Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on March 07, 2026 at 00:12:37 UTC from IEEE Xplore. Restrictions apply.

Full document details: [IEEE 303-2004](#)

IEEE Recommended Practice for Auxiliary Devices for Rotating Electrical Machines in Class I, Division 2 and Zone 2 Locations

Sponsor

**Petroleum and Chemical Industry Committee
of the
Industry Applications Society**

Approved 24 June 2004
Reaffirmed 7 December 2011

IEEE-SA Standards Board

Abstract: This recommended practice applies to the application and installation procedures of auxiliary devices in or on electric rotating machines that are employed in hazardous locations classified as Class I, Division 2 or Class I Zone 2 under commonly used worldwide regulations. These regulations are: the National Electrical Code (United States); the Canadian Electrical Code, Part 1 (Canada); and combined practices of the International Electrotechnical Commission (IEC), the European Committee for Electrotechnical Standardization (CENELEC), and Standards Australia / Standards New Zealand (AS/NZS). Included is a list of source documents, definitions and nomenclature. Devices include terminal housings, heaters, surge protection, power factor correction capacitors, shaft grounding, and enclosures. Special marking requirements are also discussed.

Keywords: auxiliary devices, Class I Division 2, Class I Zone 2, arcing/sparking component, rotating electrical machine

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

Copyright © 2004 by the Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 17 December 2004. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by the Institute of Electrical and Electronics Engineers, Incorporated.

National Electric Code and NEC are both registered trademarks of the National Fire Protection Association, Inc.

Print: ISBN 0-7381-4106-2 SH95243
PDF: ISBN 0-7381-4107-0 SS95243

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 Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

Use of an IEEE Standard is wholly voluntary. The IEEE disclaims liability for any personal injury, property or other damage, of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance upon this, or any other IEEE Standard document.

The IEEE does not warrant or represent the accuracy or content of the material contained herein, and expressly disclaims any express or implied warranty, including any implied warranty of merchantability or fitness for a specific purpose, or that the use of the material contained herein is free from patent infringement. IEEE Standards documents are supplied “**AS IS.**”

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, or every ten years for stabilization. When a document is more than five years old and has not been reaffirmed, or more than ten years old and has not been stabilized, 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.

In publishing and making this document available, the IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity. Nor is the IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing this, and any other IEEE Standards document, should rely upon his or her independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

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 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. A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal interpretation of the IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position, explanation, or interpretation of the IEEE.

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. Recommendations to change the status of a stabilized standard should include a rationale as to why a revision or withdrawal is required. Comments and recommendations on standards, and requests for interpretations should be addressed to:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854
USA

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; +1 978 750 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 303-2004, IEEE Recommended Practice for Auxiliary Devices for Rotating Electrical Machines in Class I, Division 2 and Zone 2 Locations.

This standard was originally published in 1969, revised in 1984 and reaffirmed in 1991. In keeping with the goals of maintaining progressive standards, in 2000 the standards group of the IEEE Petroleum and Chemical Industry Committee assigned a task force to revise and update this standard. References to other documentation were corrected. The wording in this standard was modified to reflect worldwide standards and to promote uniform application of such devices in petroleum and chemical industry facilities.

Notice to users

Errata

Errata, if any, for this and all other standards can be accessed at the following URL: <http://standards.ieee.org/reading/ieee/updates/errata/index.html>. Users are encouraged to check this URL for errata periodically.

Interpretations

Current interpretations can be accessed at the following URL: <http://standards.ieee.org/reading/ieee/interp/index.html>.

Patents

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 patents or patent applications for which a license may be required to implement an IEEE standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Participants

At the time this standard was completed, the working group had the following membership:

Travis Griffith, *Chair and Secretary*

Richard H. Hulett, *PCIC Standards Liaison*

Paul Anderson	Paul Kelly	John C. Rama
Frederick Bried	Bob Keough	Scott W. Shannon
Michael Costello	Royce M. King	Rudi Stromer
Gabriele D'Alleva	Norbert Klekowski	Michael Toney
Richard L. Doughty	William Lockley	Richard Virgillio
James Dymond	John Malinowski	Dennis Voss
Carl J. Fredericks	Daleep C. Mohla	David Waddington
David Hulford	Raymond Ong	Barry M. Wood

The following members of the [individual, entity, or individual and entity] balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Paul Anderson	John Griffith	Funso Olorunyomi
Keith Chow	Richard Hulett	Lorraine Padden
Roger Daugherty	Robert J. Keough	John Propst
Gary Donner	Royce M. King	James Ruggieri
Donald Dunn	Bill Lockley	Chet Sandberg
James Dymond	John Malinowski	Robert Seitz
Kimberly Eastwood	Daleep Mohla	James Wilson
Amir El-Sheikh	Paul Myers	Barry Wood
Carl Fredericks	Art Neubauer	

When the IEEE-SA Standards Board approved this standard on 24 June 2004, it had the following membership:

Don Wright, *Chair*

Steve M. Mills, *Vice Chair*

Judith Gorman, *Secretary*

Chuck Adams	Raymond Hapeman	T. W. Olsen
H. Stephen Berger	Richard J. Holleman	Ronald C. Petersen
Mark D. Bowman	Richard H. Hulett	Gary S. Robinson
Joseph A. Bruder	Lowell G. Johnson	Frank Stone
Bob Davis	Joseph L. Koepfinger*	Malcolm V. Thaden
Roberto de Boisson	Hermann Koch	Doug Topping
Julian Forster*	Thomas J. McGean	Joe D. Watson
Arnold M. Greenspan	Daleep C. Mohla	
Mark S. Halpin	Paul Nikolich	

*Member Emeritus

Also included are the following nonvoting IEEE-SA Standards Board liaisons:

Satish K. Aggarwal, *NRC Representative*

Richard DeBlasio, *DOE Representative*

Alan Cookson, *NIST Representative*

Michael D. Fisher

IEEE Standards Project Editor

Contents

1.	Overview.....	1
1.1	Scope.....	1
1.2	Purpose.....	1
2.	References.....	1
3.	Definitions and acronyms	5
3.1	Definitions	5
3.2	Acronyms	8
4.	Auxiliary device categories	9
4.1	Protection devices containing an arcing/sparking component and/or a make-and-break contact	9
4.2	Protection devices without an arcing/sparking component or a make-and-break contact	10
5.	Wiring methods and materials	11
5.1	NFPA requirements	11
5.2	Canadian requirements	11
6.	Device and component installation recommendations	11
6.1	Terminal housings.....	11
6.2	Space heaters.....	12
6.3	Bearing oil heaters	14
6.4	Surge Protection.....	15
6.5	Power Factor Correction Capacitors	15
6.6	Shaft grounding.....	15
7.	Enclosures	16
7.1	Multi-sectioned requirements	16
7.2	Purging or pressurizing components.....	16
8.	Marking.....	16
8.1	CSA requirements	16

