NEMA Standards Publication

NEMA ICS 20-2009 (R2015)

Informational Guide to Electrical Industrial Topics

National Electrical Manufacturers Association

NEMA Standards Publication ICS 20-2009 (R2015)

Informational Guide to Electrical Industrial Topics

Published by

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, Virginia 22209

www.nema.org

NOTICE AND DISCLAIMER

The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among every person participating in the development of this document.

NEMA standards and guideline publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. While NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the document and it does not independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in its standards and guideline publications. NEMA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document.

NEMA disclaims and makes no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any of your particular purposes or needs. NEMA does not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide.

In publishing and making this document available, NEMA is not undertaking to render professional or other services for or on behalf of any person or entity, nor is NEMA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Information and other standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

NEMA has no power, nor does it undertake to police or enforce compliance with the contents of this document. NEMA does not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health- or safety-related information in this document shall not be attributable to NEMA and is solely the responsibility of the certifier or maker of the statement.

CONTENTS

FOREWORD

As a result of increased activity in the field of harmonization, primarily involving North American and IEC based standards for electrical equipment, new topics and terminology continue to surface that are increasingly confronting the public and users at large, but which may not be clearly understood.

This informational guide was created to provide additional background information on various key topics of interest related to the application and proper usage of electrical equipment in the global marketplace.

The topics in this document do not contain all the details and variations of all the mentioned equipment. However, Standard and Code references have been included in the different sections with the intent that users reference them as necessary.

In addition, we recommend that you contact the product manufacturer for any product-specific questions that are not covered in this informational guideline. Referenced Standards are intended to be those of the latest revision or latest edition.

NEMA publications are subject to periodic review. Any comments or proposed revisions to this guide should be submitted to:

Senior Technical Director, Operations
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, Virginia 22209

This Standards Publication was developed by the Industrial Automation Control Products and Systems Section. Section approval of the standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Group/Section was composed of the following members:

ABB Inc.
Carlo Gavazzi Automation Components
Cooper Bussmann
Cummins, Inc.
Eaton Electrical, Inc.
Electro Switch Corporation
Emerson Electric Co.
Everlite Hybrid Industries Inc.
GE
Hubbell Incorporated
Joslyn Clark Controls, Inc.
L-3 Communications, Power Paragon
Master Control Systems, Inc.
Metron, Inc.
Mitsubishi Electric Automation, Inc.
Eaton Electric
Omron Electronics LLC
Phoenix Contact, Inc.
Post Glover Resistors, Inc.
Reliance Controls Corporation
Rockwell Automation
Russelectric, Inc.
SEW-Eurodrive, Inc.
Siemens Industry, Inc.
Square D Company
Torna Tech Inc.
Toshiba International Corporation
Tyco Electronics/AMP
WAGO Corporation
Yaskawa Electric America, Inc.