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*Preventive Maintenance of
Industrial Control and Systems Equipment*

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Foreword

This technical publication was prepared by a technical committee of the NEMA Industrial Automation Control Products and Systems Section. It was approved in accordance with the bylaws of NEMA and supersedes the indicated NEMA technical publication. This technical publication supersedes NEMA ICS 1.3-1986 (R2020).

The purpose of this technical publication is to assist those responsible for maintenance and repair of industrial control and systems equipment.

Effective preventive maintenance is essential to the satisfactory and safe operation of electrical and electronic equipment, and to the minimization of downtime associated with unscheduled corrective maintenance.

This publication covers maintenance practices that are common to most industrial control and systems equipment. It is intended to supplement more specific maintenance instructions that may be provided for particular product lines and specific products in other NEMA standards and manufacturers' publications. It also covers general safety precautions for preventive maintenance activities.

NEMA technical publications are subject to periodic review. They are revised frequently to reflect user input, changing conditions, and technical progress.

Proposed revisions to this technical publication should be submitted to

NEMA Technical Operations Department
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209

This technical 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 Industrial Automation Control Products and Systems Section consisted of the following members:

ABB, Inc.—Cary, NC
ASCO Power Technologies—Florham Park, NJ
Carlo Gavazzi, Inc.—Barrington Grove, IL
Cummins, Inc.—Minneapolis, MN
Danfoss Drives—Clemensburg, PA
Delta Electronics (Americas) Ltd.—Research Triangle Park, NC
E+I Engineering U.S. Corporation—Anderson, SC
Eaton—Milwaukee, WI
Electro Switch Corporation—Weymouth, MA
Elliott Control Company, Ltd.—Willis, TX
Franklin Control Systems—Hillsboro, OR
Fuji Electric Corporation of America—Roanoke, VA
Generac Power Systems—Waukesha, WI
Hubbell Industrial Controls, Inc.—Archdale, NC
Joslyn Clark Controls, Inc.—Elizabethtown, NC
Master Control Systems, Inc.—Lake Bluff, IL
Mitsubishi Electric Automation, Inc.—Vernon Hills, IL
NORD Gear Corporation—Waunakee, WI
Phoenix Contact, Inc.—Middletown, PA

Post Glover Resistors, Inc.—Erlanger, KY
Reliance Controls Corporation—Racine, WI
Rockwell Automation—Milwaukee, WI
Schneider Electric—Lexington, KY
SEW-Eurodrive, Inc.—Lyman, SC
Siemens Industry, Inc.—Norcross, GA
Software Motor Corporation—Sunnyvale, CA
TE Connectivity—Harrisburg, PA
Toshiba International Corporation USA—Houston, TX
WAGO Corporation—Germantown, WI
Weidmuller Inc.—Richmond, VA
Yaskawa America, Inc. Drives and Motor Division—Waukegan, IL

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1 General

1.1 Referenced Standards

The following publications are adopted, in whole or in part, as indicated by reference in this technical publication and are available from the organizations and addresses shown below.

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

NEMA 10250-2020 (Formerly NEMA 250)	<i>Enclosures for Electrical Equipment (1000 Volts Maximum)</i>
ICS 1-2022	<i>General Requirements</i>
ICS 1.1-1984 (R2020)	<i>Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control</i>
ICS 2-2000 (R2020)	<i>Controllers, Contactors, and Overload Relays Rated 600 Volts</i>
ICS 5-2017	<i>Control-Circuit and Pilot Devices</i>
ICS 6-1993 (R2016)	<i>Enclosures</i>
ICS 7-2020	<i>Adjustable-Speed Drives</i>
ICS 8-2019	<i>Crane and Hoist Controllers</i>
ICS 10, Part 1-2020	<i>Transfer Switch Equipment</i>

**National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169**

NFPA 70-2023	<i>National Electrical Code®</i>
NFPA 70B-2023	<i>Standard for Electrical Equipment Maintenance</i>
NFPA 70E-2021	<i>Standard for Electrical Safety in the Workplace</i>

1.2 Scope

This technical publication covers fundamental principles, safety precautions, and common guidelines for prevention and maintenance of products in the NEMA Industrial Automation Control Products and Systems Section. The products of the Industrial Automation Control Products and Systems Section are identified in NEMA ICS 1, ICS 2, ICS 5, ICS 6, ICS 7, ICS 8, and ICS 10.

This publication is intended as a guideline only, and cannot cover all possible variations and combinations of specific equipment. Manufacturer's instructions take precedence in the event that they conflict with these guidelines. ANSI/NFPA Publications 70B and 70E should also be used as applicable. For additional information, refer to the individual NEMA product standards listed above.