

NEMA ICS 5-2017

Standard for Industrial Control and Systems: Control-Circuit and Pilot Devices



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*Industrial Control and Systems:
Control-Circuit and Pilot Devices*

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Foreword

This standards 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 standards publication. This standards publication supersedes ICS 5-2000 (R2005, R2010).

This standards publication provides practical information concerning ratings, construction, test, performance, and manufacture of industrial control equipment. These standards are used by the electrical industry to provide guidelines for the manufacture and proper application of reliable products and equipment and to promote the benefits of repetitive manufacturing and widespread product availability.

NEMA standards represent the result of many years of research, investigation, and experience by the members of NEMA, its predecessors, and its Sections and Committees. They have been developed through continuing consultation among manufacturers, users, and national engineering societies and have resulted in improved serviceability of electrical products with economies to manufacturers and users.

One of the primary purposes of this standards publication is to encourage the production of reliable control equipment that, in itself, functions in accordance with these accepted standards. Some portions of these standards, such as electrical spacings and interrupting ratings, have a direct bearing on safety; almost all of the items in this publication, when applied properly, contribute to safety in one way or another.

Properly constructed industrial control equipment is, however, only one factor in minimizing the hazards that may be associated with the use of electricity. The reduction of hazard involves the joint efforts of the various equipment manufacturers, the system designer, the installer, and the user. Information is provided herein to assist users and others in the proper selection of control equipment.

The industrial control manufacturer has limited or no control over the following factors that are vital to a safe installation:

- a. Environmental conditions
- b. System design
- c. Equipment selection and application
- d. Installation
- e. Operating practices
- f. Maintenance

This publication is not intended to instruct the user of control equipment with regard to these factors except insofar as suitable equipment to meet needs can be recognized in this publication and some application guidance is given.

This standards publication is necessarily confined to defining the construction requirements for industrial control equipment and providing recommendations for proper selection for use under normal or certain specific conditions. Since any piece of industrial control equipment can be installed, operated, and maintained in such a manner that hazardous conditions may result, conformance with this publication does not by itself ensure a safe installation. When, however, equipment conforming with these standards is properly selected and is installed in accordance with the *National Electrical Code*[®] and properly maintained, the hazards to persons and property will be reduced.

To continue to serve the best interests of users of industrial control and systems equipment, the Industrial Automation Control Products and Systems Section is actively cooperating with other standardization organizations in the development of simple and more universal metrology practices. In this publication, the U.S. customary units are gradually being supplemented by those of the modernized metric system known as the International System of Units (SI). This transition involves no changes in standard dimensions, tolerances, or performance specifications.

NEMA standards publications are subject to periodic review. They are revised frequently to reflect user input and meet changing conditions and technical progress. Proposed revisions to this standards publication should be submitted to:

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WAGO Corporation
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Part 1 General Standards for Control-Circuit and Pilot Devices

1 General

1.1 Referenced Standards

In this NEMA standards publication, reference is made to the standards listed below. Copies are available from the indicated sources.

National Electrical Manufacturers Association

1300 North 17th Street, Suite 900
Rosslyn, VA 22209

NEMA ICS 1-2000	<i>Industrial Control and Systems: General Requirements</i>
NEMA ICS 1.1-1984 (R1998)	<i>Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control</i>
ICS 1.3-1986 (R2001)	<i>Preventive Maintenance of Industrial Control and Systems Equipment</i>
ICS 6-1993 (R2001)	<i>Industrial Control and Systems: Enclosures</i>

Underwriters Laboratories Inc.

333 Pfingsten Road
Northbrook, IL 60062

UL 310-1995	<i>Electrical Quick-Connect Terminals</i>
UL 353-1994	<i>Limit Controls</i>
UL 486E-1994	<i>Equipment Wiring Terminals for Use With Aluminum and/or Copper Conductors</i>
UL 508-1999	<i>Industrial Control Equipment</i>
UL 698-1995	<i>Industrial Control Equipment for Use in Hazardous (Classified) Locations</i>
UL 873-1994	<i>Temperature-Indicating and -Regulating Equipment</i>

1.2 Scope

The standards in this part apply to general-purpose mechanical, electromechanical, and solid-state devices that are principally used in industrial applications for control-circuit switching and the control of solenoids rated not more than 600 volts.

1.3 Normative References

The definitions and standards of NEMA standards publications No. 250, ICS 1, and ICS 6 also apply to this part unless otherwise stated.

2 Definitions

For the purposes of this part, the following definitions apply.