This is a preview of "NECA 230-2003". Click here to purchase the full version from the ANSI store.



Standard for Selecting, Installing, and Maintaining

Electric Motors and Motor Controllers



Published by National Electrical Contractors Association



NECA 230-2003

Standard for Selecting, Installing, and Maintaining

Electric Motors and Motor Controllers

An American National Standard



This is a preview of "NECA 230-2003". Click here to purchase the full version from the ANSI store.

NOTICE OF COPYRIGHT

This document is copyrighted by NECA

Reproduction of these documents either in hard copy or soft (including posting on the web) is prohibited without copyright permission. For copyright permission to reproduce portions of this document, please contact NECA Standards & Safety at (301) 657-3110 ext. 546, or send a fax to (301) 215-4500.

OR

National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, Maryland 20814 (301) 657-3110

Organizations may obtain permission to reproduce a limited number of copies by entering into a license agreement. For information, contact:

Global Engineering Documents 15 Iverness Way East Englewood, CO 80112-5704 or call 1-800-854-7179 (USA and Canada) (303) 397-7956 (International)

Table of Contents

	Foreword
1. 1.1 1.2	ScopeProducts and Applications IncludedRegulatory and Other Requirements
2. 2.1 2.2 2.3 2.4	Receiving and Storage 2 Packaged Units 2 Loose Motors 2 Motor Controls 2 Physical Damage and Moisture Protection 2
3. 3.1 3.2	Motor Selection3Power Supply Characteristics3Motor Design Characteristics3
4. 4.1 4.2 4.3 4.4 4.5 4.6 4.7	Motor Branch Circuit Conductors5Single Motor5Several Motors5Full-Load Current Rating5Motor Nameplate5Full-Load Current Tables5Full-Load Current Values5Conductor Temperature Rating6
5. 5.1 5.2 5.3 5.4 5.5	Motor Branch-Circuit Short-Circuit and Ground-Fault Protection7Locked-Rotor Current7Rating or Setting7Individual Motor Circuit7Taps from Feeders7More Than One Motor or Motor(s) and Other Loads8
6. 6.1 6.2 6.3 6.4	Motor and Branch-Circuit Overload Protection9Continuous Duty Motors9Separate Overload Devices9Service Factor9Motor Temperature Ratings9
7. 7.1 7.2 7.3	Disconnecting Means Location 10 Motor 10 Controller 10 Types of Disconnects 10

NECA 230 Standard for Selecting, Installing, and Maintaining Electric Motors and Motor Controllers

8. 8.1 8.2 8.3 8.4	Motor Control Circuits Source of Supply Overcurrent Protection Control Circuit Transformer Disconnection	. 11 . 11 . 11
9.	Motor Controllers	
9.1	Rating	
9.2	Controller Enclosure	
9.3	Controller Classification	. 13
10.	Motor Terminal Housings	14
10.1	Dimensions and Space	
10.2	Equipment Grounding C onnections	
11.	Motor Wiring Connections	
11.1	High-Voltage Connections	
11.2	Low-Voltage Connections	
11.3	Motor Rotation	. 15
12.	Installing a 3-Phase Motor	. 16
13.	Electric Motor Maintenance	18
13.1	Lubrication and Bearings	
13.2	Cleaning	
13.3	Protection	
13.4	Disconnection	
Anne	x A: Tables	
	Motor Starter Selection Data Sheet (Courtesy Square D Company)	
	NEC Table 310.16 (Courtesy National Fire Protection Association)	
	NEC Table 430.10(B) (Courtesy National Fire Protection Association)	
	NEC Table 430.12(B) (Courtesy National Fire Protection Association)	
	NEC Table 430.52 (Courtesy National Fire Protection Association)	
	NEC Table 430.72(B) (Courtesy National Fire Protection Association)	
	NEC Table 430.148 (Courtesy National Fire Protection Association)	
	NEC Table 430.150 (Courtesy National Fire Protection Association)	
	NEC Table 430.151(B) (Courtesy National Fire Protection Association)	24
Δnne	x B: Wiring Diagrams	25
WIII IC	Wiring Diagram: High Voltage and Low Voltage Delta Motor Windings	
	Wiring Diagram: High Voltage and Low Voltage Star (Y) Motor Windings	
	Wiring Diagram: One Three-Wire Stop-Start Station	
	Wiring Diagram: Two Three-Wire Stop-Start Stations	
	Wiring Diagram: Hand-Off Automatic Control	
	One Line Diagram: Motor Installation	
Anne	x C: Reference Standards	. 30

(This foreword is not a part of the standard)

Foreword

National Electrical Installation Standards® are intended to improve communication among specifiers, purchasers, and suppliers of electrical construction services. They define a minimum baseline of quality and workmanship for installing electrical products and systems. NEIS® are intended to be referenced in contract documents for electrical construction projects. The following language is recommended:

Electric motors and motor controllers rated 600 volts or less shall be installed and maintained in accordance with NECA 230-2003, Standard for Selecting, Installing, and Maintaining Electric Motors and Motor Controllers (ANSI).

Use of NEIS is voluntary, and the National Electrical Contractors Association assumes no obligation or liability to users of this publication. Existence of a standard shall not preclude any member or nonmember of NECA from specifying or using alternate construction methods permitted by applicable regulations.

This publication is intended to comply with the edition of the National Electrical Code (NEC) in effect at the time of publication. Because they are quality standards, NEIS may in some instances go beyond the minimum requirements of the NEC. It is the responsibility of users of this publication to comply with state and local electrical codes when installing electrical products and systems.

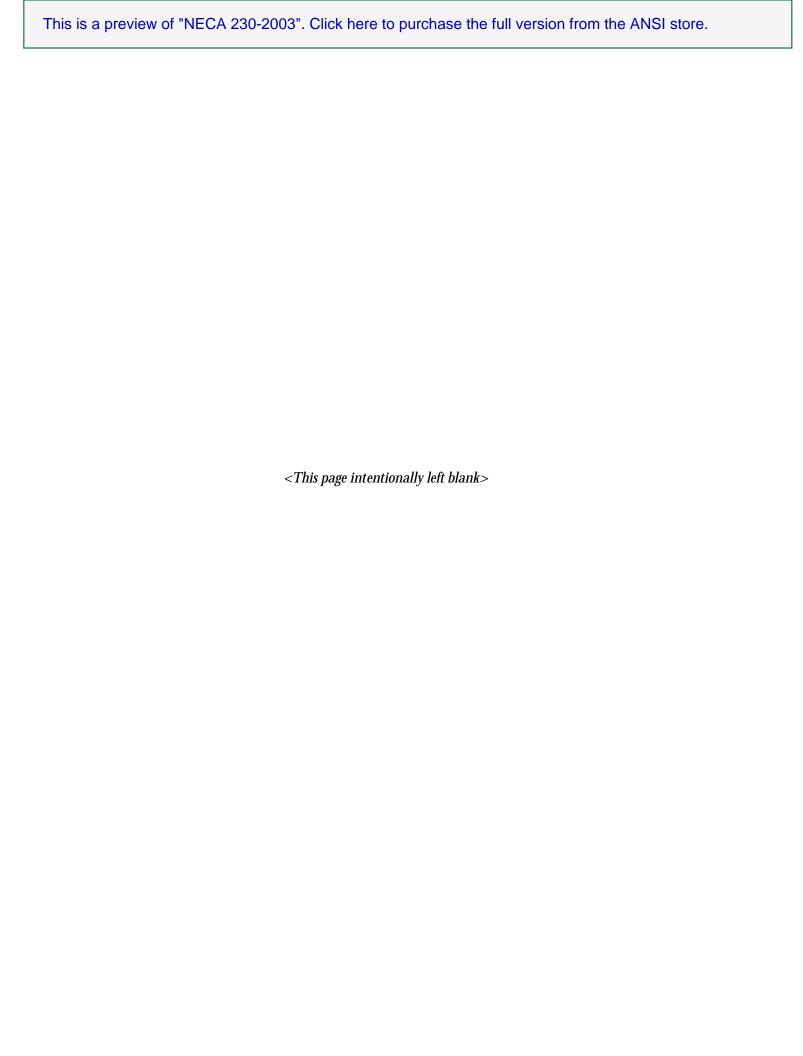
Suggestions for revisions and improvements to this standard are welcome. They should be addressed to:

> **NECA Standards & Safety** 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814 (301) 215-4521 Telephone (301) 215-4500 Fax neis@necanet.org www.neca-neis.org

To purchase National Electrical Installation Standards, contact the NECA Order Desk at (301) 215-4504 tel, (301) 215-4500 fax, or orderdesk@necanet.org. NEIS can also be purchased in .pdf download format from www.neca-neis.org/standards.

Copyright © 2003, National Electrical Contractors Association. All rights reserved. Unauthorized reproduction prohibited.

National Electrical Installation Standards, NEIS, and the NEIS logo are registered trademarks of the National Electrical Contractors Association. National Electrical Code and NEC are registered trademarks of the National Fire Protection Association, Quincy, Massachusetts.



1. Scope

1.1 Products and Applications Included

This standard describes recommended procedures for selecting and installing stationary electric motors and motor controllers rated 600 volts or less. It also covers routine maintenance procedures to be followed after the installation is complete.

1.2 **Regulatory and Other Requirements**

This recommended practice is intended to define what is meant by installing equipment in a "neat and workmanlike manner" as required by the National Electrical Code 110.12.

All information in this publication is intended to conform to the National Electrical Code®

(ANSI/NFPA 70). Installers should always follow the NEC, applicable state and local codes, manufacturers' instructions, and project specifications when installing motors and motor controllers.

Only qualified persons familiar with the installation, construction, and operation of motors should perform the work described in this publication.

Other National Electrical Installation Standards provide additional guidance for installing particular types of electrical products and systems. A complete list of *NEIS* is provided in Annex C.