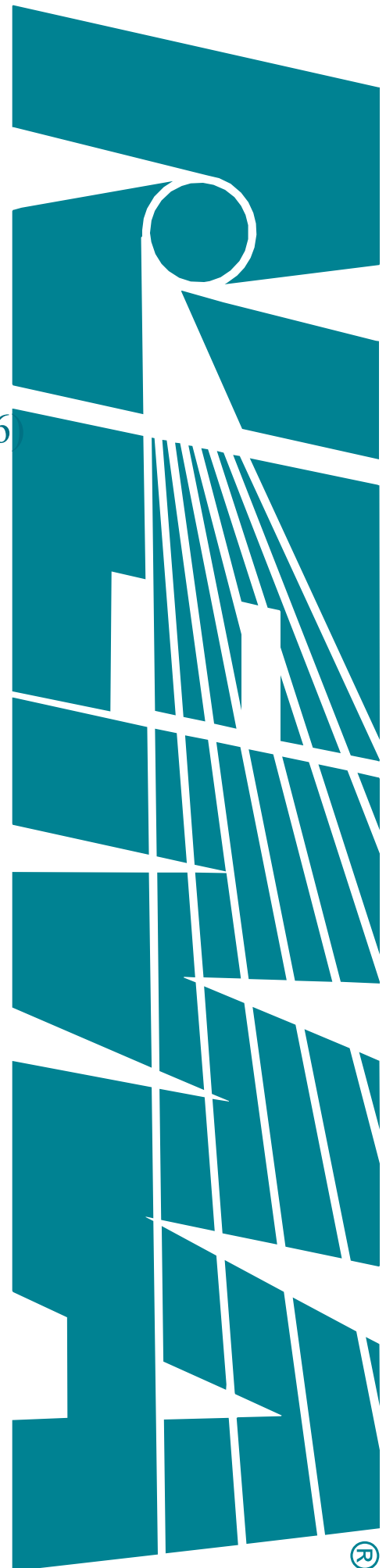




ANSI/NEMA C12.6-1987 (R2002, 2012, 2016)

American National
Standard for
Phase-Shifting
Devices Used In
Metering, Marking
and
Arrangement of
Terminals



National Electrical Manufacturers Association
1300 North 17th Street, Suite 900 • Rosslyn, VA 22209
www.NEMA.org





ANSI C12.6-1987 (R2002, 2012, 2016)
Reaffirmation of ANSI C12.6-1987

*American National Standard for
Phase-Shifting Devices Used In Metering, Marking and
Arrangement of Terminals*

Secretariat:

National Electrical Manufacturers Association

Approved January 27, 2017

American National Standards Institute, Inc.

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.

ANSI 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 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, expressed 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.

AMERICAN NATIONAL STANDARD

Approval of an American National Standard requires verification by The American National Standards Institute, Inc. (ANSI) that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer. An American National Standard implies a consensus of those substantially concerned with its scope and provisions. Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly, and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered and that a concerted effort be made toward their resolution.

The existence of an American National Standard does not in any respect preclude anyone, whether s/he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards. It is intended as a guide to aid the manufacturer, the consumer, and the general public.

The American National Standards Institute, Inc., does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute, Inc. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on this title page.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute, Inc. require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, Inc.

Published by

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

© 2017 National Electrical Manufacturers Association
All rights reserved including translation into other languages, reserved under the Universal Copyright Convention, the Berne Convention for the Protection of Literary and Artistic Works, and the International and Pan American Copyright Conventions.

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.

Printed in the United States of America

Foreword

This foreword is not a part of ANSI C12.6-1987, American National Standard for Marking and Arrangement of Terminals for Phase-Shifting Devices Used in Metering.

This standard was developed by the Accredited Standards Committee on Electricity Metering, C12, for full consensus approval as an American National Standard. This revised version supersedes ANSI C12.6-1978.

Suggestions for improvements to this standard are welcome. They should be sent to:

American National Standards Institute
1430 Broadway
New York, NY 10018

Subcommittee 15 of ANSI Committee C12, which developed and revised this standard, had the following members:

F.A. Marta, Chairman

A.G. Aschenbeck
F.W. Bagley
W.C. Busch
J.T. Donahue
M.F. Faser

F. Huber, Jr, Secretary

J. Foster
C.R. Green
C.F. Hawkes
W.R. Keyes
C. Ivan

J.H. Keeler
C.R. Mudnerback
S.D. Murphy
T.G. Willis
J. Young

At the time this standard was processed and approved, the American National Standards Committee C12 had the following members:

R.S. Turgel, Chairman

F. Huber, Jr, Secretary

Organization Represented

Name of Representative

Institute of Electrical and Electronics Engineers

F.J. Levitsky
R. Hopkins

National Bureau of Standards

R.S. Turgel

National Electrical Manufacturers Association

T.C. Drew
L. Struchtemeyer
J.H. Keeler, Jr
R.M. Walden (Alt)
F.A. Marta
R.H. Stevens (Alt)
J.C. Reich (Alt)
H.L. Friend
J.A. Gauthier (Alt)
W.J. Zisa (Alt)

Electric Light and Power Group

W.C. Busch
D.B. Berry
D. Dassman
C.R. Jones
R.M. Reeseey
D.E. Soffrin (Alt)

Commissions

Public Service
C.J. Six
G.F. Walsh

Rural Electrification

P.F.B. Jackson

American Public Power Association

C.R. Gomez
H. Carey Jones

Underwriters Laboratories, Inc.

W. Menuz
J.W. Hogg (Alt)

< This page left blank intentionally. >

CONTENTS

1 Scope 1

2 Terminal Marking..... 1

 2.1 Devices for Specific Types of Services 1

 2.2 Universal Devices..... 1

3 Terminal Arrangements..... 1

4 Character of Terminal Markings..... 1

5 Number of Terminals..... 2

6 Diagrams of Internal Connections..... 2

FIGURES

Figure 1 Standardized Terminal Markings for Phase-Shifting Devices Designed for Application
on Specific Types of Services 3

Figure 2 Application of a Universal Phase-Shifting Device on Common Types of Services..... 4

Figure 3 Standardized Terminal Arrangements for Phase-Shifting Devices 5

< This page left blank intentionally. >

1 Scope

This specification applies to phase-shifting devices designed to provide the proper lagged voltages required for kvar and kVA measurement.

2 Terminal Marking

2.1 Devices for Specific Types of Services

Phase-shifting devices designed primarily for use on a specific type of circuit shall be so connected internally that the external marked terminals will satisfy the conditions of Fig. 1 for the common types of services shown as examples. For types of circuits not shown, the same general system of corresponding voltages shall also be applied for 1-2-3 phase sequence and lagging current. That is:

- a. Terminals marked 4 to 5 shall provide the voltage of proper magnitude and phasor relationship with respect to supply voltage 1 to 2 or 1 to 0.
- b. Terminals marked 6 to 7 shall provide the proper voltage with respect to 3 to 2 or 2 to 0.
- c. Terminals marked 8 to 9 shall provide the proper voltage with respect to 3 to 0.
- d. Where one voltage element is to be omitted in metering a 4-wire service, terminals marked 4 to 5, and 8 to 9 shall still provide the proper remaining two voltages, with the voltages, with the voltages 2 to 0 and 6 to 7 considered eliminated

2.2 Universal Devices

Phase-shifting devices designed for use on a variety of circuits shall be so connected internally that the external marked terminals will satisfy the conditions shown under the 3-phase, 3-wire type of service in Fig.1 and 2.

Examples of other applications of a typical universal phase-shifting device are shown in Fig. 2, but details of internal connections and methods need not conform to those indicated for these other types of services.

3 Terminal Arrangements

External terminal of phase-shifting devices shall be arranged in the sequence and general position shown in Fig. 3(a). Where the phase-shifting device is designed in a simple level-plan manner on a panel baseboard with a built-in test switch, the terminals may be arranged as shown in Fig. 3(b).

4 Character of Terminal Markings

The identification numerals shall be marked legibly and durably on the base or enclosure of the phase-shifting device. The markings shall be so placed adjacent to the terminals that they unmistakably identify the proper terminals. Terminals may be arranged in columns or groups, which shall be identified in a clear and unmistakable manner.