

NEMA Standards Publication



ANSI C12.7-2014

American National Standard for Requirements for Watt-hour Meter Sockets

National Electrical Manufacturers Association





ANSI C12.7-2014
Revision of ANSI C12.7-2005

*American National Standard for
Requirements for Watthour Meter Sockets*

Secretariat:

National Electrical Manufacturers Association

Approved August 14, 2014

American National Standards Institute

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 ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

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 use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute 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. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of approval. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

Published by

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

© 2014 National Electrical Manufacturers Association. All rights, 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 part of American National Standard C12.7-2014.)

This standard was developed by subcommittee 15 and balloted by the Accredited Standards Committee on Electricity Metering, C12, for full consensus approval as an American National Standard. This revised version supersedes ANSI C12.7-2005. Certain performance requirements covered by the latest revision of Underwriters Laboratories Standard for Safety on Meter Sockets have been adopted and referred to in this standard. Information on subsequent revisions of these provisions can be obtained through the Underwriters Laboratories Subscription Revision Service.*

This standard covers the dimensions and functions of meter test switches for transformer-rated watt-hour meters when used in conjunction with instrument transformers.

Suggestions for improvements of this standard are welcome. They should be in the form of a proposed change of text, together with appropriate supporting comments.

Comments on standards and requests for interpretations should be addressed to:

ANSI Committee C12 Secretary
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209

At the time this standard was completed, the American National Standards Committee C12 had the following membership:

Tom Nelson, Chairman
Paul Orr, Secretary

<i>Organization Represented:</i>	<i>Name of Representative:</i>
Alabama Power Co.	Derl Rhoades
Ameren Services	James West
Baltimore Gas and Electric Co.	Jim Thurber
Center for Neighborhood Technology	Lawrence Kotewa
Central Hudson Gas & Electric	Brett Arteta
Consumers Energy	David Jirikovic
DTE Energy	Kostas Tolios
Duke Energy	Tim Morgan
Elster Solutions	Scott Weikel
EnerNex Corporation	Aaron Snyder
Florida Power & Light Co	Jim DeMars
Future DOS R&D Inc.	Avygdor Moise

* Available from Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, USA

GE Energy	Curt Crittenden
Itron, Inc.	Brent Cain
JECARRCO, LLC	Jack, Carr
Landis+Gyr	John Voisine
MET Laboratories, Inc.	Jim Reed
Millbank Manufacturing Co.	Shawn Glasgow
NIST	Tom Nelson
Oncor	Brad Johnson
Pacific Gas and Electric Co.	D. Young Nguyen
Power Measurements	William Hardy
Public Service Electric & Gas	David Ellis
Radian Research, Inc.	Shannon Edwards
SAIC	David Scott
Schweitzer Engineering Labs	Travis Mooney
Sensus Metering	Kenny O'Dell
Silver Spring Networks	Kam Oza
Technology for Energy Corporation	Steve Hudson
TESCO	Tom Lawton
Trilliant Networks	Michel Veillette
Tucker Engineering	Richard Tucker
Underwriters Laboratories	Scott Hunter
Watthour Engineering	Lea Wren
Xcel Energy	Dan Nordell

At the time this standard was completed, Subcommittee 15 of ANSI Committee C12, which developed and revised this standard, had the following membership:

Shawn Glasgow, Chairman
Paul Orr, Secretary

Organization Represented:

Name of Representative:

Central Hudson Gas & Electric
DTE Energy
Duke Energy
Elevate Energy
Elster Solutions
EnerNex Corporation
Florida Power & Light Co.
GE Energy
ITI
Landis+Gyr
Milbank Manufacturing Co.
NIST
Oncor
Pacific Gas & Electric Co.
Power Measurements
Public Service Electric & Gas
Siemens Industry, Inc.
Technology for Energy Corporation
The Durham Company

B. Arteta
K. Tolios
R. Wesley
L. Kotewa
S. Weikel
A. Snyder
J. DeMars
C. Crittenden
B. Sonnenberg
J. Voisine
S. Glasgow
T. Nelson
B. Johnson
D. Young Nguyen
W. Hardy
D. Ellis
W. Rose
S. Hudson
M. Shoemaker

TABLE OF CONTENTS

Foreword	ii
1 Scope	1
2 References.....	1
3 Definitions	1
3.1 circuit bypass means (bypass)	1
3.2 continuous-duty current rating	1
3.3 continuous load.....	1
3.4 meter socket (socket):	1
3.5 meter support.....	1
3.6 ringless-type meter socket.....	1
3.7 ring-type meter socket	1
3.8 socket cover.....	1
3.9 socket rim	1
3.10 socket sealing ring.....	1
4 Electrical Ratings.....	2
4.1 Current ratings	2
4.2 Voltage ratings.....	2
5 Performance Requirements	2
6 Construction Requirements	2
6.1 Construction and workmanship	2
6.2 Marking	2
6.3 Enclosures	2
6.3.1 Protection	2
6.3.2 Construction	3
6.3.3 Enclosure materials.....	3
6.3.4 Mounting bosses	3
6.3.5 Wiring space.....	3
6.4 Conduit connections and knockouts.....	3
6.5 Limiting dimensions and relative locations of functional parts	5
6.6 Terminal connectors	5
6.7 Circuit closing means (bypass).....	6
6.7.1 Horn bypass	6
6.8 Sealing.....	6
6.9 Sectional and multiple-opening trough-type sockets.....	6
6.9.1 Structural types.....	6
6.9.2 Covers	6
6.9.3 Meter position spacings.....	6

6.10	Socket sealing.....	6
6.10.1	General.....	6
6.10.2	Dimensions and tolerances.....	7
6.10.3	Facilities for sealing.....	7
6.11	Watt-hour meter/ringless socket interface.....	7
6.12	Metric conversion.....	7
6.13	Safety alert markings.....	7

Tables

Table 1	300 V Rating.....	2
Table 2	600 V Rating.....	2
Table 3	Knockout and Bushing Dimensions.....	4
Table 4	Limiting Dimensions and Tolerances.....	5

Figures

Figure 1	Limiting Dimensions of Socket Rim.....	8
Figure 2	Limiting Dimensions and Positions of Socket Jaws.....	9
Figure 3	Location of Socket Jaws (Front View).....	10
Figure 4	Socket-Jaw Position Identification.....	11
Figure 5	Internal Voltage Connections of 13-, 14-, and 15-Jaw Sockets.....	12
Figure 6	Socket-Sealing Ring Dimensions.....	13
Figure 7	Hole Dimensions to Accommodate Sealing Means.....	14
Figure 8	Provisions for Interchangeable Gasketless Hubs.....	15
Figure 9	Horn Bypass.....	16

1 Scope

This standard covers the general requirements and pertinent dimensions applicable to watt-hour meter sockets rated up to and including 600 V and up to and including 320 A continuous duty per socket opening.

2 References

This standard shall be used in conjunction with the following standards. When the following standards are superseded by an approved revision, the revision shall apply.

ANSI C12.10-2011, *American National Standard for Electromechanical Watt-hour Meters*

ANSI Z535.4-2011, *Product Safety Signs and Labels*

ANSI/UL 50-2012, *Enclosure for Electrical Equipment*

ANSI/UL 414-2009, *Safety Standard for Meter Sockets*

NEMA 250-2008, *Enclosures for Electrical Equipment (1000 V Maximum)*

3 Definitions

- 3.1 circuit bypass means (bypass):** An assembly of parts which, when properly operated, closes the circuit between the line and load jaws.
- 3.2 continuous-duty current rating:** The rating in amperes that a meter socket will carry continuously under stated conditions without exceeding the allowable temperature rise.
- A multiposition trough socket has an additional current rating that denotes the maximum ampere capacity of the line buses.
- 3.3 continuous load:** A load where the current continues for 3 hours or more.
- 3.4 meter socket (socket):** An enclosure that has matching jaws to accommodate the bayonet-type (blade) terminals of a detachable watt-hour meter and has a means of connection for the termination of the circuit conductors. It may be a single-position socket for one meter or a multiposition trough socket for two or more meters.
- 3.5 meter support:** That part of a ringless-type meter socket that positions and supports a detachable watt-hour meter.
- 3.6 ringless-type meter socket:** A meter socket that has no provision for a socket sealing ring but has other means of holding a detachable watt-hour meter in place, such as a cover that is secured in place by a latch.
- 3.7 ring-type meter socket:** A meter socket that has a socket rim.
- 3.8 socket cover:** The removable portion of the enclosure that provides access to the meter socket wiring.
- 3.9 socket rim:** That part of a ring-type meter socket that is required to accommodate the socket sealing ring that holds a detachable watt-hour meter in place.
- The socket rim may be a part of the cover that is secured in place by a fastener such as a latch or crossbar.
- 3.10 socket sealing ring:** A ring used to overlap the socket rim and the detachable watt-hour meter cover ring to hold and provide means for sealing a detachable watt-hour meter in place.