NEMA Standards Publication

ANSI C12.1-2014

American National Standard for Electric Meters—Code for Electricity Metering

National Electrical Manufacturers Association

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Secretariat:

National Electrical Manufacturers Association

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American National Standards Institute, Inc.

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FOREWORD (This foreword is not part of American National Standard C12.1-2014)

This version of C12.1 has been modified in several areas in an effort to respond to a changing industry and to improve the clarity of some of the tests. This standard continues to form the basic requirement for all kilowatt-hour metering devices—both electronic and electromechanical. Another standard in this series, ANSI C12.20, provides different test tolerances and a few different tests that are required for higher accuracy meters that adhere to Blondel's theorem. To offer an option for non-Blondel meter forms, tolerance specifications for 0.5% accuracy class meters have been added to this standard.

Most other specifications have been retained from the previous edition. Changes to the temperature rise test were made to make testing consistent with the tests in the meter socket standard, ANSI C12.7. Section 5, Standards for New and In-Service Performance, and Appendix D were extensively updated to reflect current practices. For several of the tests, specific details for successful tolerance criteria have been modified, and test requirements for bidirectional metering have been added. Some definitions were also added and references to external documents were updated.

The Secretariat of the Accredited Standards Committee on Electricity Metering, C12, is held by the National Electrical Manufacturers Association (NEMA) and the National Institute of Standards and Technology. At the time this standard was processed and approved, the C12 Committee had the following members:

Tom Nelson, Chairman
Paul Orr, Secretary

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Trilliant Networks	Michel Veillette
Tucker Engineering	Richard Tucker
Underwriters Laboratory, LLC	Scott Hunter
Watthour Engineering	Lea Wren
Xcel Energy	Dan Nordell

The following members of the C12.1 Committee were actively involved in the revision of this standard:

S. Weikel, Past-Chairman
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In addition, the Editorial Committee for the current Revision of C12.1 includes the following:

William Hardy
Gordon Belcher
Curt Crittenden
Frank Boudreau
Scott Weikel

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SCOPE AND REFERENCES

1.1 Scope

This code establishes acceptable performance criteria for new types of ac watthour meters, demand meters, demand registers, pulse devices, and auxiliary devices. It describes acceptable in-service performance levels for meters and devices used in revenue metering. It also includes information on related subjects, such as recommended measurement standards, installation requirements, test methods, and test schedules. This Code for Electricity Metering is designed as a reference for those concerned with the art of electricity metering, such as utilities, manufacturers, and regulatory bodies.

1.2 References

The following publications shall be used in conjunction with this standard. When they are superseded by an approved revision, the revision shall apply:

ANSI C12.7-2005, *Requirements for Watthour Meter Sockets*

ANSI/IEEE C63.4-2009, *Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*

ASQ Z1.4-2008*, Sampling Procedures and Tables for Inspection by Attributes*

ASQ Z1.9-2008, *Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming*

ASTM B117-2011, *Standard Practice for Operating Salt Spray (Fog) Apparatus*

ASTM G155 2013, *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*

Code of Federal Regulations (Telecommunication) CFR 47, *Part 15—Radio Frequency Devices, Subparts A—General and B—Unintentional Radiators*

Chapter 13 “The Customers’ Premises, Service and Installations”, *Handbook for Electricity Metering, 10th Edition, Washington, D.C.: Edison Electric Institute, 2002*

IEEE 1-2000, *IEEE Recommended Practice: General Principles for Temperature Limits in the Rating of Electric Equipment and for the Evaluation of Electrical Insulation*

IEEE Std 100-2000, *The Authoritative Dictionary of IEEE Standards Terms*

IEEE C37.90.1-2012, *IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems Associated with Electric Power Apparatus*

IEEE C57.13-2008, IEEE *Standard Requirements for Instrument Transformers*

IEEE C62.41.1-2002, *IEEE Guide on the Surge Environment in Low-Voltage (1000 V and less) AC Power Circuits*