



**ANSI C12.1-2008**

American National Standard  
for Electric Meters

**Code for Electricity Metering**

Secretariat:

**National Electrical Manufacturers Association**

Approved June 27, 2008

**American National Standards Institute, Inc.**

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## TABLE OF CONTENTS

	Foreword .....	vii
1	Scope and references .....	1
	1.2 References .....	1
2	Definitions .....	3
3	Standards and standardizing equipment .....	10
	3.1 Scope .....	10
	3.2 Final authority .....	10
	3.3 Traceability paths to NIST .....	10
	3.3.1 Direct transfer .....	10
	3.4 Meter laboratory .....	11
	3.4.1 Laboratory conditions .....	11
	3.4.2 Reference temperature and humidity .....	12
	3.4.3 Laboratory power sources .....	12
	3.5 Meter shop .....	12
	3.6 Laboratory standards .....	12
	3.6.1 Basic reference standards .....	12
	3.6.2 Transport standards .....	12
	3.7 Periodic verification of reference standards .....	12
	3.8 Portable/field/working standard watt-hour meters .....	12
	3.9 Performance records .....	12
	3.10 Performance requirements for standard watt-hour meters .....	13
	3.10.1 General test conditions .....	13
	3.10.2 Accuracy tests for portable and reference standards .....	13
4	Acceptable performance of new types of electricity metering devices and associated equipment .....	15
	4.1 General .....	15
	4.1.1 Acceptable metering devices .....	15
	4.1.2 Adequacy of testing laboratory .....	15
	4.1.3 Retesting of new meter type .....	15
	4.1.4 Test documentation .....	15
	4.1.5 Test device .....	15
	4.1.6 Tests performed in series .....	15
	4.1.7 Handling of failed device .....	15
	4.1.8 Restart testing .....	15
	4.1.9 Reporting of test metering devices .....	16
	4.2 Types of metering devices .....	16
	4.2.1 Basic type .....	16
	4.2.2 Variations within the basic type .....	16
	4.2.3 Type designation .....	16
	4.2.4 Acceptance of basic types in whole or part .....	16
	4.2.5 Minor variations .....	16
	4.2.6 Special types .....	16
	4.3 Specifications for design and construction .....	16
	4.3.1 Sealing .....	16
	4.3.2 Enclosures .....	16
	4.3.3 Terminals and markings .....	17
	4.3.4 Construction and workmanship .....	17
	4.3.5 Provision for adjustment .....	17
	4.4 Selection of metering devices for approval tests .....	17

4.4.1	Samples to be representative of the basic type.....	17
4.4.2	Number to be tested .....	17
4.5	Conditions of test .....	17
4.5.1	Tests to be applied.....	17
4.5.2	Configuration.....	17
4.5.3	Metering devices for special services .....	18
4.5.4	Metering devices of non-standard classes .....	18
4.5.5	Metering devices with wide voltage range.....	18
4.6	Rules governing the acceptance of types.....	18
4.6.1	Tolerances .....	18
4.6.2	Determination of Failure and Rejection .....	18
4.7	Performance requirements .....	19
4.7.1	Test conditions.....	19
4.7.2	Accuracy Tests—Internal Influences .....	21
4.7.3	Accuracy tests – external influences performance verification.....	36
5	Standards for in-service performance.....	54
5.1	Watt-hour meters and electronic registers .....	54
5.1.1	Purpose.....	54
5.1.2	Accuracy requirements .....	54
5.1.3	Tests .....	54
5.1.4	Performance tests.....	55
5.1.5	Determination of average percentage registration .....	56
5.2	Demand registers and pulse recorders .....	57
5.2.1	Accuracy requirements .....	57
5.3	Instrument transformers (magnetic).....	57
5.3.1	Pre-installation tests, (section 5. shall apply) .....	57
5.3.2	Instrument transformers removed from service.....	57
5.3.3	Performance tests.....	58
5.4	Coupling-capacitor voltage transformers .....	58
5.4.1	Performance tests.....	58
6	Auxiliary pulse devices for electricity metering .....	59
6.1	General .....	59
6.1.1	Information to be shown on pulse initiator .....	59
6.1.2	Information to be shown on pulse amplifier or relay .....	59
6.1.3	Information to be shown on pulse totalizers .....	59
6.2	Tests to be applied.....	59
6.3	Performance requirements .....	59
6.3.1	Test conditions.....	59
6.3.2	Initial conditions .....	60
6.3.3	Mechanical load .....	60
6.3.4	Insulation.....	60
6.3.5	Performance test.....	60
6.3.6	Sunlight interference test – pulse devices containing optical sensors .....	61

**APPENDICES**

A.....	64
B.....	74
C.....	93
D.....	95
E.....	96
F.....	97

**TABLES**

1	Portable and Reference Standards Percent Errors .....	14
2	Table of Failures Based on the Number of Metering Devices Tested .....	19
3	List of Tests .....	20
4	Starting Load Test.....	21
5	Load Performance Test .....	21
6	Effect of Variation of Power Factor for Single-Element Meters .....	22
7	Effect of Power Factor for Two-Element Meters:.....	22
8	Effect of Variation of Power Factor for Two-Element Three-Phase Four-Wire Wye Meters .....	23
9	Effect of Variation of Power Factor for Three-Element Three-Phase Four-Wire Wye Meters .....	23
10	Effect of Variation of Voltage .....	24
11	Effect of Variation of Voltage on Solid-State Auxiliary Devices .....	24
12	Effects of Variation of Frequency .....	25
13	Equality of Current Circuits in the Three-Wire Element for Single-Element Meters.....	25
14	Equality of Current Circuits in the Three-Wire Element for Multi-Element .....	26
15	Equality of Current Circuits between Elements for Multi-Element Meters .....	26
16	Temperature-Rise Test Specifications.....	27
17	Effect of Internal Heating .....	32
18	Effect of Tilt .....	33
19	Test for Independence of Elements in Two-Element Meters.....	35
20	Test for Independence of Elements in Three-Element Meters .....	36
21	Effect of External Magnetic Field .....	38
22	Effect of Variation of Ambient Temperature.....	39
23	Effect of Variation of Temperature on Solid-State Auxiliary Devices.....	40
24	Effect of Temporary Overloads on Accuracy .....	40
25	Effect of Current Surge in Ground Conductor.....	41
26	Test Modes, Voltage, and Application for Each External Connection Group—Oscillatory Test .....	44
27	Variable Interval Plan .....	56
28	Performance Test—Pulse Devices.....	60
29	Portable Standard Watthour Meter .....	90
30	Reference Standard Watthour Meters .....	92

**FIGURES**

1	Dimensions for jumper bars of simulated meter temperature-rise test for single-phase and polyphase meters (maximum rating 100 A) .....	29
2	Dimensions for jumper bars of simulated meter temperature-rise test for single-phase and polyphase meters (maximum rating 101 – 200 A rating).....	30
3	Dimensions for jumper bars of simulated meter temperature-rise test for single-phase and polyphase meters (maximum rating 201 – 320 A rating).....	31
4	Electrical Fast Transient/Burst Test # 25 .....	42
5	Electrical Fast Transient/Burst Test # 25 .....	43
6	Typical test layout for radiated susceptibility—Test 26 and radiated and conducted emissions—Test 27 .....	46
7	Typical wiring detail for self contained meters for radiated susceptibility —Test 26 and radiated and conducted emissions —Test 27 .....	47
8	Typical wiring detail for transformer rated meters for radiated susceptibility —Test 26 and radiated and conducted emissions —Test 27 .....	48
9	Typical GTEM test layout for Radiated Susceptibility Test.....	49
10	Sunlight Interference Test.....	62
11	Variable Angles Sunlight Interference Test .....	63
B.1	Traceability path diagram.....	76

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## **FOREWORD (This Foreword is not part of American National Standard C12.1-2008)**

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. The changes, while not extensive, aim to improve the consistency of test procedures and improve the quality of the metering products. This standard continues to form the basic requirement for all kilowatt-hour metering instruments – 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 metering devices.

Most of the meter specifications have been retained from the previous edition. Comments about the significant changes follow. To help insure that new electronic equipment is as dependable as possible, an oscillatory surge withstand test was added. Also, the requirement when retesting a new meter type was made more restrictive. Minor changes to the temperature rise test were made to make testing more uniform. Supplementary information was added to the equality of current circuits test, the electrostatic discharge test, and the relative humidity test to clarify the testing process. For several of the tests specific details for successful passing criteria have been included. 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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Measurement Canada (Liaison No Vote)	Vuong Nguyen

National Institute of Standards And Technology	Tom Nelson
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Schweitzer Engineering Labs	Bob Hughes
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In addition, the following comprised the Editorial Committee for the current Revision of C12.1:

- L. Barto
- E. Malemezian
- P. Orr
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## Code For Electricity Metering

### 1 Scope and references

This Code establishes acceptable performance criteria for new types of ac watt-hour 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/IEEE C63.4-2003, *Methods of Measurement of Radio-Noise Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*

ASQ Z1.4-2003, *Sampling Procedures and Tables for Inspection by Attributes*

ASQ Z1.9-2003, *Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming*

ASTM B117-2003, *Standard Practice for Operating Salt Spray (Fog) Apparatus*

ASTM G155 2005, *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 C37.90.1-2002, *IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems Associated with Electric Power Apparatus*

IEEE C57.13-1993, *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*

IEEE C62.41.2-2002, *IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits*

IEC 60068-2-6 (1995), *Environmental Testing - Part 2: Tests, Test Fc: Vibration (Sinusoidal)*