



TESCO METERING

ANSI C12: 2024 UPDATES THAT AFFECT METERING DEPARTMENTS

Prepared by Tom Lawton, TESCO
TESCO Metering



*North Carolina Meter School
Management
Wednesday, June 12, 2024
1:00 PM*

➤ American National Standard Institute, Inc.

- Not a government agency
- Standards do not have force of Law
- All compliance is voluntary
- ANSI generates standards through the use of a sponsoring organization called the “secretariat” who actually publishes the Standard.
 - For C12.1 NEMA (National Electrical Manufacturer’s Association) is the secretariat.
 - NEMA has seven sections one of which is for Utility Products and Systems. All meter manufacturers and manufacturers involved in electric metering are either members of NEMA or are eligible to be members.
 - Paul Orr has been the NEMA’s secretary assigned to C12 for over ten years providing continuity to the process. NEMA Manufacturing members determine which efforts will be funded and which will not be funded.



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➤ American National Standard Institute, Inc.

- NEMA organizes committees to propose and review standards
- Standards are republished approximately every five (5) years and abandoned if not updated or reaffirmed once every ten (10) years.
- Standards codify consensus approaches in common practice
- In recent years the ANSI committee has had to deal with breaking new ground as well as several controversial issues
 - This is unusual for the committee and the committee has responded by no longer being reluctant to address them, staying more on point during contentious debates, and moving through the work required in a far more efficient manner. Another example of how AMI is changing everything in our industry.

- All ANSI Standards related to Electric Metering are in the ANSI C12 group of Standards
- C12 Main Committee
 - General makeup has expanded slightly over last few years
 - 30 voting members with representation from three groups (no one group can have more than 40%):
 - 11 - Manufacturers: Meter, Socket, Test Equipment, etc.
 - 11 - Users: Utilities
 - 8 - General Interest: PUC, UL, IEEE, Consultants, etc.
 - Meets twice a year in conjunction with EEI/AEIC Meter conference.



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➤ C12 Main Committee

- Has final approval for all activities on any C12 family standard
- Establishes Subcommittees (SC) and Working Groups (WG) to address various standards and issues
- Sub committees and Working Groups also meet twice a year in conjunction with EEl Transmission, Distribution and Metering Conference and also hold regular or ad hoc conference calls throughout the year as members put together drafts and other technical material for consideration at the next face to face meeting.

➤ C12 Subcommittees

- Various subcommittees have been organized to review specific standards
- **This is where the work is really done**
- Each operates slightly differently
- Each meets on a schedule of its own choosing
- Most meet at EEI Biannual Transmission, Distribution and Metering Meetings
- Communication WG meets more often and longer
- Various subgroups meet frequently by teleconference



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ANSI C12 – SUB-COMMITTEES

Sub-Committee	Standards
C12 SC1	C12.1, C12.4, C12.5, C12.10
C12 SC15	C12.6, C12.7, C12.8, C12.9, C12.11
C12 SC16	C12.20, C12.24
C12 SC17	C12.18, C12.19, C12.21, C12.22, C12.23, C12.26
C12 SC29	C12.29 Standard for Field Testing of Metering Sites
C12 SC24	C12.31 VA Measurement Standard
C12 SC46	C12.46 American National Standard for Electricity Meters - 0.1, 0.2 and 0.5 Accuracy Classes for the Measurement of Active, Apparent and Reactive Power



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ANSI STANDARDS RELATED TO ELECTRIC METERING

ANSI C12 Standards Status – April 11, 2024

Designation	Final Action Date	Title	Responsible Subcommittee	Responsible NEMA Section	Project Action
ANSI C12.1-2022	6/9/2022	Electricity Metering, Code for	SC 1	8EI – 1	C12.20 now merged into C12.1 Last Published August 31, 2022 New Revision with Temp Rise Update passed ballot. Now in Public review. PR ended May 27. Ballot passed.
ANSI C12.4-1984 (R2002, R2011)	5/19/2011	Registers, Mechanical Demand	SC 1	8EI – 1	Withdrawn 7/10/20
ANSI C12.5-1978 (R2002)	5/19/2011	Meters, Thermal Demand	SC 1	8EI – 1	Withdrawn 7/10/20
ANSI C12.6-1987 (R2016)	01/12/17	Phase-Shifting Devices Used in Metering, Marking and Arrangement of Terminals for	SC 15	8EI – 3	Published Jan 10, 2018 Submitted PINS for Reaffirmation 8-14-23 Stabilized maintenance (10 years no need for admin action)
ANSI C12.7-2022	11/17/22	Requirements for Watthour Meter Sockets	SC 15	8EI – 3	Figure from C12.8 brought into C12.7 Published March 14, 2023
ANSI C12.8-1981 (R2021)	6/8/21	Watthour Meters, Test Blocks and Cabinets for Installation of Self-Contained “A” Base	SC 15	8EI – 3	Published Dec. 18, 2012 Plan to have C12.8 withdrawn after figure needed from C12.8 is placed in C12.7. Withdrawn 08-14-23



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➤ C12.1 Code for Electricity Metering - Sub Committee Work

- C12.20 has now been merged into C12.1.
- Demand Type Test working group – they are grappling with the reckoning of time for type testing. Demand type testing has never been defined to everyone's satisfaction (meter manufacturers and Utilities). Demand is making good progress. Demand WG is working on tests. Time of use won't be included right away.
- Continuing to work with harmonization of C12.1, C12.10 and C12.46. Had report outs from the various WGs.
- Volt interruption now moved to C12 SC46.
- UL 2735 is in ballot.
- Harmonic WG now moved under SC46.
- Multiport work progressing. Roadmap has been updated. Timeline moved out about 6 months.
- Motion was made to adjust wording to accept single phase in Table 30.



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➤ C12.10 Physical Aspects of Watthour Meters – Safety Standard - Sub Committee Work

- C12.10 has been being converted into a Stand-alone safety document.
- There was a request for 2 new meter forms 1 L and 12 L (L for load profile). Aclara will provide more documentation.
- Also asked Aclara to look at DIN style. Physical aspects will be recirculated.
- Construction and safety draft is making good progress.
- Labelling WG making progress.



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ANSI C12 Standards Status – April 11, 2024					
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ANSI C12.9-2014 (R2021)	8/5/21	Test Switches for Transformer-Rated Meters	SC 15	8EI – 3	Approved on Sept. 17, 2014 Published Mar. 12, 2015 Reaffirmation Published 10-10-21
ANSI C12.10-2011 (R2021)	5/11/21	Physical Aspects of Watthour Meters – Safety Standard	SC 1	8EI –1	Reaffirmation Published 7-13-21 Technical Revision Ballot issued Will be recirculated after comment resolution
ANSI C12.11-2006 (R2019)	9/23/19	Instrument Transformers for Revenue Metering, 10 kV BIL through 350 kV BIL (0.6 kV NSV through 69 kV NSV)	SC 15	8EI-3	Approved May 27, 2014 Published July 29, 2014. Published 8-24-20 In review for revision, reaff, or withdrawal
ANSI C12.14-1982 (R1993)	8/14/2002 WITHDRAWN	Electricity Meters, Magnetic Tape Pulse Recorders for	SC 1	8EI –1	Withdrawn 2002
ANSI C12.17-1991	8/14/2002 WITHDRAWN	Cartridge-Type Solid-State Pulse Recorder for Electricity Metering	SC 1	8EI –1	Withdrawn 2002



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➤ C12.15 Sub Committee work on ANSI C12.6; 12.7; 12.8; 12.9; 12.11

- Working on C12.11 to be balloted this year.
- Temp Rise WG2 Test no. 9 has been approved. Good discussion about a new test socket. Will doodle poll for another meeting in 4-6 weeks.
- Meter Socket adapters topic was discussed. Not clear about the use of the correction factor. Need for language in C12.10 for MSA use.
- Rejection clip was discussed. NEMA white paper has been published. Up to utilities now.
- Task group working on Enclosures for streetlight poles.



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ANSI STANDARDS RELATED TO ELECTRIC METERING (CONT.)

ANSI C12.18-2006 (R2016)	3/16/17	Protocol Specification for ANSI Type 2 Optical Port	SC 17 WG4	8EI-1	Reaff Balloted 1/30/23 Ballot passed. Submitted for BSR 8 to ANSI. Approved 10/31/23 Published Jan 2024
ANSI C12.19-2022	10/18/21	Utility Industry End Device Data Tables	SC 17 WG2	8EI-1	Published May 6, 2015 PINS Filed for Rev 7-24-19 Published Jan 13, 2022.
ANSI C12.20-2015	1/24/17	0.1, 0.2 and 0.5 Accuracy Class	SC 1 Formerly was in SC20*	8EI-1	ANSI Approved 1/24/17 Published April 27, 2017 Will be withdrawn after contents merged into C12.1. Standard withdrawn
ANSI C12.21-2006 (R2016)	10/18/21	Protocol Specification for Telephone Modem Communication	SC 17 WG4	8EI-1	Reaff Balloted 1/30/23 Ballot passed. Submitted for BSR 8 to ANSI. Approved 10/31/23 Published Jan 2024
ANSI C12.22-2012(R2020)	6/18/20	Protocol Specification for Interfacing to Data Communication Networks	SC 17 WG1	8EI-1	BSR 9 Submitted March 29, 2015 Published July 15, 2015 Published 09-24-20
C12.23-201X	On hold	AMR Device Compliance Test Standards	SC 17 WG3	8EI-1	MOU signed – Work on hold as of spring 2015
NEMA C12.24 TR -2022 ANSI Registered Tech Report	Feb 10, 2021	Definitions for Calculations of VA, VAh, VAR, and VARh for Poly-Phase Electricity Meters	C12 Main	8EI-1	Published May 13, 2022



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ANSI C12 SC17

- C12.17 Sub Committee Work on C12.18, C12.19, C12.21, C12.22, C12.23, C12.26 (Data Communications Protocols)
 - C12.18 – Published Jan 2024
 - C12.21 – Published Jan 2024
 - C12 Main committee response to:
 - Ballot to Approve C12 iec62056-6-1 ED4.
 - Ballot to Approve C12 iec62056-6-2 ED4.
 - Ballot to Approve C12 iec62056-8-8 ED1.
 - Ballot to Approve C12 iec62056-5-3 ed 4.0
 - Met this week. Had presentation by Sergio from DLMS UA on the 2 Generic Companion Profiles recently published. One is for a metrologically valid remote display and the other is for an EV charging station.
 - Several additions/updates were outlined for work on C12.18, 12.19 and C12.22, related to labeling items, Bluetooth communications and security. WG 1 and 2 meetings will be scheduled by the end of May to meet to address them.
 - A standalone document (possibly a guide) in ANSI C12 on the “Protection of Metrological Quantities” is being looked at for development.
 - A new segment of information passing should be integrated into SC17 work allowing for separate aps loaded into a meter and report the data back in a different means.



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ANSI STANDARDS RELATED TO ELECTRIC METERING (CONT.)

ANSI C12.29 TR-2022		Field Testing of Metering Sites Technical Report	SC29 Hardy	8EI-1	Published March 21, 2023.
ANSI C12.30-2022	12-5-22	Test Requirements for: Metering Devices Equipped with Service Switches	SC1	8EI-1	Standard Published 4-3-23, Technical Report Withdrawn
C12.31G TR C12.31 TR	 In progress	Guide for the Measurement of Voltage, Current, Power, Energy, and Power Factor Understanding and Applying C12.31G	SC 31	8EI-1	C12.31G Published Jan 31, 2024 2021-notified of a patent
ANSI C12.32	3/4/21	DC Metering	SC 32		Pins Filed April 2019 ANSI Approved 3/4/21– Published May 14, 2021



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➤ C12 SC 24 Work on C12.31 (Guide for the Measurement of Voltage, Current, Power, Energy, and Power Factor)

- As C12.31 comes into publication will it yield any revision to NEMA C12.24TR? May want to edit the title and scope of NEMA C12.24 TR to clarify (especially for the international community) that it is a compendium of equations and not a standard.
- NEMA C12.31G TR guide has been published (definitions). Will begin work on the explanatory document. Folks should send any implementation questions into subcommittee as they can use to help develop the explanatory document.



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➤ C12 SC 29 Work on C12.29 (Field Testing of Meters)

- Published as a Technical Report and not a Standard. No further action. Will be moved into C12.46.



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➤ C12 SC 32 Work on C12.32 (DC Metering)

- Monthly meetings. Added some European manufacturers that provide good insight on high accuracy metering. Making adjustments to draft of revised document to align with C12.46.

ANSI STANDARDS RELATED TO ELECTRIC METERING (CONT.)

C12.33 Transducer WG	New	DC Voltage and Current Transducer Standard	SC 32		Draft in Work. PINS filled 3-1-22
C12.46 (Placeholder)	In progress	OIML	SC46	8EI-1	Developing Draft
ANSI C12/IEC 62056-5-3 ED3		ELECTRICITY METERING DATA EXCHANGE - THE DLMS/COSEM SUITE - Part 5-3:DLMS/COSEM application layer	USNC TC 13/C12	8EI-1	PINS filed April 2018 Published Oct 2019 PINS filed 4-21-23
ANSI C12/IEC 62056-6-1 ED3		ELECTRICITY METERING DATA EXCHANGE - THE DLMS/COSEM SUITE - Part 6-1: Object Identification System (OBIS)	USNC TC 13/C12	8EI-1	PINS filed April 2018 Published Oct 2019 PINS filed 4-21-23
ANSI C12/IEC 62056-6-2 ED3		ELECTRICITY METERING DATA EXCHANGE - THE DLMS/COSEM SUITE - Part 6-2: COSEM interface classes	USNC TC 13/C12	8EI-1	PINS filed April 2018 Published Oct 2019 PINS filed 4-21-23
C12/IEC 62056-8-8-202x		Electricity metering data exchange - The DLMS/COSEM suite - Part 8-8: Communication profile for ISO/IEC 14908 series networks	USNC TC 13/C12	8EI-1	PINS filed 11-28-22

*Note C12 SC20 Disbanded April 9, 2020 at C12 Main meeting



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➤ C12 SC 33 Work on C12.33 (DC Transducers)

- Meeting regularly. Nailed down standard outputs for active transducers. 2 types of outputs. Can be a voltage output or a current output.
- NEMA submeter Program Manager Andrei M. noted there is an ANSI Standard SM 31000-7. Concern of scope conflict/confusion. Wants us to change our title to be Utility Type energy meter. Will meet with Andrei and discuss further.
- Kevin Fitzmaurice noted ANSI 136.50 has some similar ref. wording.



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➤ C12 SC 46 Work on C12.46 (Harmonized Standard for Electricity Meters)

- Working to get all standards consistent. Pulling standard definitions together.
- This will eventually become C12.1

ANSI STANDARDS RELATED TO ELECTRIC METERING (CONT.)

ADDED IEC 62056-8-11:2023		Electricity metering data exchange – Part 8-11: Communication profile for Wi-SUN field area mesh networks	USNCTC C12/C17	8EI-1T	PINS filed 4-28-23
ANSI C12/IEC TS 62056-8-20 ED 1.0		ELECTRICITY METERING DATA EXCHANGE - THE DLMS/COSEM SUITE - Part 8-20: Mesh communication profile for neighbourhood networks,	USNC TC 13/C12	8EI-1	PINS filed April 2018 Published Oct 2019 PINS Filed for revision 12-2-22 This has not been updated by IEC so no action at this time.
ANSI C12/IEC 62056-9-7 ED 1.0		ELECTRICITY METERING DATA EXCHANGE – Communication profile for TCP-UDP/IP networks	USNC TC 13/C12	8EI-1	PINS filed April 2018 Published Oct 2019
OTHER Standards					
SG AMI-1		Meter Upgradeability Standard		8EI-1	Reaffirmation– Passed. Published 4/1/21 Decision made to reaffirm Plan to ballot 2024

*Note C12 SC20 Disbanded April 9, 2020 at C12 Main meeting

- The International Organization of Legal Metrology was formed in 1955. By Treaty 86% of the world's population is covered and 96% of the world's economy.
- The Group works with the International Bureau of Weights and Measures and the International Organization for Standardization (ISO) to ensure compatibility between each organizations work.
- Once again this organization has no legal authority to impose solutions on the members but the recommendations are typically used by the member states as part of their own domestic law.



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UL 2735 AND UL 2735C

- Harmonized document (UL 2735 and 2735C ballot closed May 21, 2024. UL conducting gap analysis on Listings.
- Once gap analysis completed can be reviewed for compliance/agreement with C12.46

Tom Lawton

President

tom.lawton@tescometering.com



TESCO Metering *Bristol, PA*

215.228.0500

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