National Electrical Manufacturers Association

Summary of ANSI C12 Standards

C12.1-2014, *Code for Electricity Metering*: 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.

C12.2 - unassigned

C12.3 – unassigned

C12.4-1984 (R2011), *Registers – Mechanical Demand*: Covers the voltage and frequency rating, full-scale values, scale classes, demand intervals, multiplying constants, timing mechanism and other general features of mechanical demand registers required for use on watthour meters.

C12.5-1978 (R2002), *Thermal Demand Meters*: Covers the class designations, voltage and frequency ratings, scale values, demand internals, multiplying constants, mounting dimensions, terminal arrangements, and other features of general-service-type thermal watt demand meters and watthour-thermal watt demand meters.

C12.6-1987 (R2016), *Phase-Shifting Devices Used In Metering, Marking and Arrangement of Terminals*: Applies to phase-shifting devices designed to provide the proper lagged voltages required for kvar and kVA measurement.

C12.7-2005, *Requirements for Watthour Meter Sockets*: Covers the general requirements and pertinent dimensions applicable to watthour meter sockets rated up to and including 600 V and up to and including 320 A continuous duty per socket opening.

C12.8-1981 (R2012), *Test Blocks and Cabinets for Installation of Self-Contained "A" Base Watthour Meters*: Covers the dimensions and functions of test blocks and cabinets used with self-contained A-based watthour meters.

C12.9-2014, *Test Switches and Plugs for Transformer-Rated Meters*: Encompass the dimensions and functions of meter test switches used with transformer-rated watthour meters in conjunction with instrument transformers and test plugs used in conjunction with the test switch.

C12.10-2011, *Physical Aspects of Watthour Meters—Safety Standard*: Covers the physical aspects of both detachable and bottom-connected watthour meters and associated registers. These include ratings, internal wiring arrangements, pertinent dimensions, markings, and other general specifications.

C12.11-2006 (R2014), *Instrument Transformers for Revenue Metering*: Covers the general requirements, metering accuracy, thermal ratings, and dimensions applicable to current transformers and inductively coupled voltage transformers for revenue metering, 10 kV basic lightning impulse insulation level (BIL) through 350 kV BIL for 0.6 kV nominal system voltage (NSV) through 69 kV NSV.

C12.12 - unassigned

C12.13-1991 (Rescinded), *Electronic Time of Use Registers for Electricity Meters*

C12.14-2002 (Rescinded), *Electricity Meters, Magnetic Tape Pulse Recorders*

C12.15-1990 (Rescinded), *Electricity Metering Solid-State Demand Registers for Electromechanical Watthour Meters*

C12.16-1991 (Rescinded), *Electricity Metering Solid-State Electricity Meters*

C12.17-1991 (Rescinded), *Electricity Metering Cartridge-Type Solid- State Pulse Recorders for Electricity Metering*

C12.18-2006 (R2016)/IEEE 1701, *Protocol Specification for ANSI Type 2 Optical Port*: Details the criteria required for communications between a C12.18 Device and a C12.18 Client via an optical port. The C12.18 Client may be a handheld reader, a portable computer, a master station system or some other electronic communications device. This standard also provides details for a complete implementation of an OSI 7-layer model.

C12.19-2012/IEEE 1377, *Utility Industry End Device Data Tables*: Defines a Table structure for utility application data to be passed between an End Device and any other device.

C12.20-2015, *Electricity Meters 0.1, 0.2 and 0.5 Accuracy Classes*: Establishes the physical aspects and acceptable performance criteria for 0.1, 0.2, and 0.5 accuracy class electricity meters meeting Blondel's Theorem. Where differences exist between the requirements of this standard and the most current version of ANSI C12.1 and ANSI C12.10, the requirements of this standard shall prevail.

C12.21-2006 (R2016)/IEEE 1702, *Protocol Specification For Telephone Modem Communication*: Details the criteria required for communications between a C12.21 Device and a C12.21 Client via a modem connected to the switched telephone network. The C12.21 Client could be a laptop or portable computer, a master station system, or some other electronic communications device.

C12.22-2012, *Protocol Specification for Interfacing to Data Communication Networks*: Extends the concepts of ANSI C12.18/MC12.18/IEEE 1701, ANSI C12.21/MC12.18/IEEE 1702, and ANSI C12.19/MC12.19/IEEE 1377 standards to allow transport of Table data over any reliable networking communications system. In addition, this standard describes an optionally exposed point-to-point interface between a C12.22 Device and a C12.22 Communications Module designed to attach to "any" network. Furthermore, this standard defines a methodology to capture, translate, and transmit one-way device messages (blurts).

C12.23 – Unassigned

C12.24TR-2011, *Definitions for Calculations of VA, VAh, VAR, and VARh for Poly-Phase Electricity Meters*: Establishes names and mathematical definitions for the Volt-Ampere (VA), Volt-Ampere hours (VAh), Volt-Amperes Reactive (VAR), and Volt-Ampere Reactive hours (VARh) formulae used by poly-phase electricity meters.

C12.25 – Unassigned

C12.26 – Unassigned

C12.27 – Unassigned

C12.28 – Unassigned

C12.29 – Unassigned

C12.30TR-2013, *Test Requirements for Metering Devices Equipped with Service Switches*: Identifies test requirements for meters containing a Service Switch.

UL 2735, *Standard for Electric Utility Meters*: Covers the electrical safety of electric utility (revenue) meters rated up to 600 V, which measure, monitor, record, transmit, or receive electrical energy generation or consumption information. Also covers socket mounted plug-in (Type S) utility meters; non-socket mounted, bottom connected (Type A) utility meters, intended for installation in ordinary (non-classified) locations; and revenue meters that are not socket mounted (Type S) or bottom connected (Type A) meters, including those that are intended for factory installation as components within the enclosure of complete equipment.

NEMA SG-AMI 1-2009 (R2015): Defines requirements for smart meter firmware upgradeability in the context of an advanced metering infrastructure system for industry stakeholders such as regulators, utilities and vendors.

IEC 62056-5-3:2017, *The DLMS/ COSEM Suite Part 5-3:DLMS/COSEM Application Layer*: Specifies the DLMS/COSEM application layer in terms of structure, services and protocols for DLMS/COSEM clients and servers, and defines rules to specify the DLMS/COSEM communication profiles. It defines services for establishing and releasing application associations, and data communication services for accessing the methods and attributes of COSEM interface objects, defined in IEC 62056-6-2 using either logical name (LN) or short name (SN) referencing.

IEC 62056-6-1:2017, *The DLMS/ COSEM Suite Part 6-1: Object Identification System (OBIS)*: Specifies the overall structure of the OBject Identification System (OBIS) and the mapping of all commonly used data items in metering equipment to their identification codes. This third edition cancels and replaces the second edition of IEC 62056-6-1, published in 2015. It constitutes a technical revision.

IEC 62056-6-2:2017, *The DLMS/ COSEM Suite Part 6-2: COSEM Interface Classes:* Specifies a model of a meter as it is seen through its communication interface(s). Generic building blocks are defined using object-oriented methods, in the form of interface classes to model meters from simple up to very complex functionality.

IEC TS 62056-8-20:2016, *The DLMS/ COSEM Suite Part 8-20: Mesh Communication Profile for Neighbourhood Networks*: Specifies a DLMS/COSEM communication profile that can be used in a smart metering system in which the Neighbourhood Networks (NN) are mesh networks. This profile may be considered as an adaptation and extension of the UDP/IP communication profile specified in IEC 62056-9-7:2013. It specifies a number of features essential to the efficient operation of a large scale AMI using mesh NNs.

IEC 62056-9-7:2013, *The DLMS/COSEM Suite Part 9-7: Communication Profile for TCP-UDP/IP Networks*: Specifies the DLMS/COSEM communication profile for TCP-UDP/IP networks.

IEEE C57.13-2008, *IEEE Standard Requirements for Instrument Transformers*: Covers electrical, dimensional, and mechanical characteristics for current and inductively coupled voltage transformers of types generally used in the measurement of electricity and the control of equipment associated with the generation, transmission, and distribution of alternating current.