

## Section 337233-Electric Utility Metering Standard

**A. General**

1. Project Engineer of Record shall submit - peak electrical building load projections to facilitate meter and CT sizing for the electrical utility connections during the design development phase of the project.
2. Electric meters must be operational and be able to be manually read before utility systems are energized and providing service to the facility.
3. All meter locations need to be coordinated with the Central Utilities Utility System Manager, as well as the Energy Operations Group. The Electric Meter must be located in an easily accessible location, with the meter display and buttons must be read-able and reachable from the ground without using a ladder.
4. Meter commissioning reports are due to CU/EOG and CPD&CM prior to utility system operation.
5. All electrical meters shall be provided per this specification. Any electrical meters that are not integral to the electrical service or switchgear will be provided by the by the DDC controls contractor. The exception to this are the electrical meters contained within electrical switch gear as these meters are an integral part of the gear. Electrical meters contained within switchgear will be provided by the manufacturer.
6. The construction contractor shall provide one electric meter suitable to record the total electrical consumption of the construction site. The contractor is responsible for the proper connection and installation of the meter and associated sources of current and potential.

**B. Applicable Standards**

The electrical metering system; which includes the electric meter, current transformers, potential transformers, wirings, terminal decks and fusing shall conform to the following industrial standards:

1. ANSI/NEMA 70: National Electrical Code
2. ANSI/IEEE C12.10 Watt hour Meters
3. ANSI/IEEE C57.13 – Instrument Transformers
4. Underwriters Laboratories

**C. Approved Meter Manufacturers**

The Contractor has the choice to provide either electrical meter offered by these two manufacturers:

1. Electro Industries Shark 100 Meter Model SHARK 100-60-10-V3-D2-485P-X
2. SATEC PM 130EHPlus-60Hz-5-ACDC.

**D. Submittals**

The Contractor must submit the following factory test reports, design and construction documents to Central Utilities and CPD&CM.

1. Metering System One Line Drawing.
2. Certified factory test reports of the current transformer accuracy.
3. Certified factory test report of meter accuracy.

**E. Metering System Design Criteria**

This section summarizes the design criteria for the electrical metering systems which include: the electric meter, current transformers, potential transformers, wire, shorting decks, fuses and fuse block and communication systems. Refer to Figure #1.

## **F. Current Transformers (CTs)**

1. Current transformer secondary neutrals shall be grounded with a minimum #14 copper wire. The lengths of these ground connections shall be as short as possible.
2. No other devices other than CU (revenue) meters shall be allowed to be connected with these current transformers.
3. Secondary wiring from current transformers shall be terminated at a GE-25 terminal board; Model EB27B06S provided with shorting means, before connecting with meter, with #14 AWG SIS size conductors. All secondary wirings shall use ring type connectors.
4. The minimum accuracy of the metering current transformer shall be 0.3 percent with burden B-0.1 to B – 2.0.

## **G. Potential Transformers (PTs)**

Secondary wiring from Potential Transformers shall be terminated at a Ferraz Shawmut Fuse Block; Model USCC1 B213441, before connecting with meter, with #14 AWG SIS size conductors.

## **H. Communications**

Each individual meter specified must have communications capability. The communications shall be MODBUS RTU via a combination of serial RS-485 over 18 AWGA twisted pair or MODBUS TCP/IP Ethernet. The final design configuration shall be determined by EOG.

1. All meters must be installed fully functional and reading in the University PI system before any project can be turned over.
2. All network drops required for meters shall be operational before project can be turned over. Each I/P Address shall be provided by the BAS contractor to the Energy Operations Group.
3. All meter data shall be directly transferred from the meter into the BAS and named in the BAS per the University BAS point naming standard.
4. The BAS vendor shall provide the names and value ranges of all of the points included with the meter installation on a project via submittal process including CPDCM to the Energy Operations Group (EOG). This shall be done as early as is possible in the project to allow EOG to input points into the University PI system for remote meter reading.
5. No calculations shall be done in the BAS for flow or totalization or any other conversions. All data must be passed as it comes from the meter directly through the BAS to the PI system. In other words, the BAS will only act as the conduit for information and will not calculate any metering data values.
6. The BAS vendor shall create and/or modify a graphic through which flows and totals of each meter are displayed for each building associated with the project within their BAS.
7. The BAS contractor is responsible to ensure that each meter is reading accurately and is scaled correctly. All start up, functional checkout, and commissioning activities will be the responsibility of the BAS contractor.

**CENTRAL UTILITIES ELECTRICAL METER CONNECTION DIAGRAM FIGURE #1**

