**Change History**

| Date | Description of Change | Pages / Sections Modified | Change Approver Initials |
|---|---|---|---|
| 6/15/16 | Updated division section from 16950 to 26 27 13, removed references to other section numbers | - | mgl44 |
| 11/21/14 | Amend section F for clarity and inclusion of two meter types/uses: Insert subparagraph a.; sequence subparagraph b.; amend subparagraph b for clarification. | 2>3 -16950, F. #1.a. & b. (Electrical Utility Metering; Equipment) | SO |
| 10/17/14 | Remove the "- New" text following the spec number | 1 - 16950, ID (Electrical Utility Metering) | SO |
| 10/17/14 | Amend text in section F (Materials), subparagraph #1.b. for clarification. | 3 - 16950, F. #1. b (Electrical Utility Metering; Equipment) | SO |
| 10/17/14 | Amend text in section H (Special Requirements), paragraphs #1, #2 and #4 for correction of wire size. | 4 – 16950, H. #1., #2 & #4. (Electrical Utility Metering; Special Requirements) | SO |
| 10/17/14 | Add paragraph #6 to section H (Special Requirements) | 4 – 16950, H. #6 (Electrical Utility Metering; Special Requirements) | SO |

# A. Summary


This section summarizes the design criteria for electrical utility metering systems which include utility meters, current transformers, potential transformers, wirings, and metering communication systems.


# B. System Design and Performance Requirements

1. The minimum accuracy of the electrical utility meters shall be +/- 0.2 percent.
2. The minimum accuracy of the metering current transformer shall be 0.3 percent with burden B-0.1 to B – 2.0.

# C. Submittals

Submit the following design and construction documents to Yale University. Make this section of standards part of Section : Secondary Unit Substation and Section : Transfer Switch if it is called for in the construction documents.

## 1. Construction Documents

a. Submit the following construction documents:

- Shop drawings and product data

- Operation and maintenance manuals
- Certificate of Warranty

b. Factory test reports

- Certified factory test report of current transformer accuracy
- Certified factory test report of meter accuracy

## D. Product Standards

The following products are standard for Yale University:

- Underwriters Laboratories
- ANSI/NEMA 70: National Electrical Code
- ANSI/IEEE C12.10 Watthour Meters
- ANSI/IEEE C57.13 – Instrument Transformers
- ANSI/ISA
- OPC Object Process Control consists of a standard set of interfaces, properties, and methods for use in process-control and manufacturing-automation applications

## E. Manufacturers

Provide following power and energy meter and current transformer products offered by specific manufacturers.

1. Schneider/Square D PowerLogic. There will be no substitute (meter).
2. ITI Current Transformers (CT)
3. GE Current Transformers (CT )

## F. Equipment

1. Provide the following power and energy meter and current transformer products offered by specific manufacturers.

   a. The power and energy meter for all building services shall be an ION 7000 series.

      1) The ION 7550 shall be installed in all Substations (Section Transmission

Distribution) and will be connected through Ethernet with the Yale iFix data collection system and the Building Automation System. Each 480 V low voltage switchgear section shall be equipped with Schneider/Square D PowerLogic ION meter system Cat # S7550A0C0B6C1A0A. There will be no substitute.

a) The ION 7550 meter system part number / spec is as follows: S7550 - ION 7550 meter

A0 - Integrated Display with Optical port

C - 5A Current Input

0 - Standard Voltage Input

B - Standard Power Supply

6 - Standard System Frequency (50-60 HZ)

C1 - Standard plus Ethernet Communication and universal modem functions

A - 8 Digital Inputs

0 - Password Protected, no security lock

A - No Special Order Option

2) The ION 7330 shall be installed in all Transfer Switches (Section 16415) and any other application not included in Standard Electric Utility Metering F.1.a.1) a) above, and will be connected serially with the Yale iFix data collection system. The load side of each transfer switch shall be equipped with Schneider/Square D PowerLogic ION meter system Cat # S7330A0B0B0E0A0A-AA027. There will be no substitute.

b) a) The ION 7330 meter system part number / spec is as follows: S73330 -ION 7330 meter

A0 - Integrated Display with Optical port

B - Standard Current Input

0 - Standard Voltage Input

A - Standard Power Supply

0 - Standard System Frequency (50-60 HZ)

E0 - Standard plus Ethernet Communication

A - No I/O option

0 - Password Protected, no security lock

A - No Special Order Option -

AA027 - Yale Framework of Meter registers

These meters shall be integrated display with optical port, 5A inputs, standard power supply, standard comms, (two RS-485 ports) plus 10BaseT Ethernet.

b. Current transformers (CT's) shall be relay class 20 for the 100/5 ratio Ion Meter using ItI or GE model #143, 145, 685 or 785. CT's shall be relay class 50 for the 200/5 ratio Ion Meter using ItI or GE model #143, 145, 307, 309, 389, 685 or 785.

CT's shall be relay class 100 for the 400/5 ratio Ion Meter using ItI or GE model # 143, 145, 307, 309, 389, 685 or 785.

CT's shall be relay class 200 for the 600/5 and 800/5 ratio Ion Meter using ItI or GE model # 143, 145, 307, 309, 389, 685 or 785.

CT's shall be relay class 200 and 400 for the 1000/5 and 1200/5 ratio respectively using ItI or GE model # 143, 145, 307, 309, 389, 685 or 785.

CT's shall be relay class 400 for the 1600/5 ratio Ion Meter using ItI or GE model # 143, 145, 307, 309, 389, 685 or 785.

CT's shall be relay class 800 for the 2000/5 ratio Ion Meter using ItI or GE model # 145, 307 and 309.

c. All wiring for Ct's shall be #10 AWG stranded SIS type wire.

d. All Ion meters CT's wiring shall be wired to shorting blocks before being wired to the ABB test block. All wiring from the test block to the meter shall be tagged per the Vendor supplied interconnection drawings. Test block shall be ABB style FT- 1 and Cat # 129A514G01 with clear covers.

2. Meter data acquisition shall be carried through Yale standard communication i-Fix SCADA server using modbus-RTU driver.

## H. Special Requirements

1. Current transformer frames shall be grounded individually with a minimum #10 copper wire.

2. Current transformer secondary neutrals shall be grounded with a minimum #10 copper wire. The lengths of these ground connections shall be as short as possible.

3 No other device other revenue meters shall be allowed to be connected with these current transformers.

4. Secondary wiring from current transformers shall be terminated at terminal block provided with shorting screws, before connecting with meter, with #10 AWG size conductors. All secondary wirings shall use ring type connectors.

5. From PowerLogic ION meters data output to Yale standard communication i-Fix server shall be carried out through Cat 3 or Cat 5 UTP with 22 AWG Ethernet cables.

6. Contractor shall run raceway from the campus iFix network within the building to each substation and each transfer switch that has an ION meter.

## I. Installation Guidelines

1. If this is a standalone installation, not a part of unit substation project, electrical contractor shall follow manufacturer's recommendation method of installation.

2. Electrical contractor shall keep fully informed of size, shape and location of installation.

3. All hardware including support rods, nuts, bolts, screws shall be of a galvanized or other approved material with rust-inhibiting coating.

## J. Quality Control

1. **Field Quality Control Testing**

a. Yale University will retain the services of a qualified, independent testing laboratory to perform meter testing at the end of construction.

b. Follow the instructions of testing recommended by manufacturer.

**"END OF SECTION"**