THE UNIVERSITY OF CHICAGO Facilities Services

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# Guidelines for Utility Meters and Control Wiring Installation

## A. Purpose

To provide requirements to project teams, project managers and contractors on steps required to ensure full installation of utility metering systems for the University of Chicago from physical placement of the meter to programming of software.

## B. Physical Location/Installation of Meters

For buildings connected to either of the University of Chicago's central utility systems (steam and/or chilled water), a means of measuring the consumption in the facility is mandatory. The building's function and usage will dictate the choice of metering schemes.

It is required that both steam and condensate meters be installed.
The University standard steam meter is either Rosemount 3095MV flow meter with an Annubar (Rosemount requires an analog input) or GE Panametrics GS868 (GE requires a digital input). Steam meters must have RTD temperature sensors. For Rosemount contact Chanelle Ambrose at 708-478-5410. For GE contact Dan Kilpatrick at 773-728-2373.
The pump room will have the Steam line PRV station and the steam meter (FM2) which should be located on the inside wall where the steam line enters the building. Layouts must show PRV and FM2. There should be an FM2 (steam meter) on the incoming steam **prior to** the PRV station, PRV station should be labeled on this riser.

For condensate, the standard is the Niagara flow meter WPX 210 with calibrated contact closure requires 1 input. Condensate meter should be labeled FM3; the following check valve should be used at the building main condensate receiver discharge pipe by the condensate meter
Durabla SCV Check Valve:
Tight Shut-Off
1/2" to 3" Line size
750 to 3600 CWP
NPT & SW ends
316 Stainless steel construction
Inconel X-750 spring
Spring-assisted silent closing
Body guided disc

For chilled water, the University standard is the GE Panameterics DF868 requires 1 input. For all GE products contact Dan Kilpatrick with GE at 773-728-2373. Require two thermal wells and RTD's (± 0.2°F accuracy) temperature elements. Flow meters at chilled water supply line upstream of chilled water bridge cross over piping. Provide 10" straight pipe upstream and 5" straight pipe downstream with no components in between. Contractor to coordinate with the Piping Sub-Contractor prior to piping installation.
Outside of the building the chilled water line is 10" HDPE direct bury. Chilled water flow and temp switch should be located once the chilled water line enters the building along with chilled water flow meter (FM1) near the sensors.

Electric metering may be required, but this will typically occur only if a need for sub-metering has been identified for recharge purposes preference is the **manufacturer?** 7650 series.
All utilities meters must be hooked up and commissioned prior to utility use this includes Electric, Gas, Steam, Chilled water, Condensate and domestic water. Contractor should be carrying additional warrantee period from start up to substantial completion of these items. The FY11 university utility rates for steam is $15.80 per M-lb and for chilled water is $0.18 per ton-hour, Contractor is responsible to pay for all utilities during construction including Electric, Gas, Steam, Chilled water, and domestic water.

All of these devices must be commissioned by the Project commissioning agent in conjunction with the Manufacturer.

**Tasks for the A/E Team and Installation Team**

1. Identify type/number of steam/condensate/chilled water/electric meters required based on building type and usage
2. Determine model of meters (these are given above?)
3. Determine physical location of meters, ensuring that sensor/probe locations in/on the pipes to meet manufacturer and University requirements.
4. Procure and Installation of piping, meters, sensors, probes, etc. (Installation team)
5. Provide a factory validation/check-out sheet for EACH individual meter that was completed by the factory technician. Onicon, Niagara and Rosemount are done at the factory; GE does on-site. (Installation Team)
6. Commissioning of the new meters must be coordinated through the BAS Shop (A/E Team, Project Commissioning Agent, University personnel, Manufacturers, Installation team)

## C. ION Meter Panel Installation

All newly installed meters will be connected to the UC ION energy management system. This ion meter panel allows for continuous recording of usage data and eliminates the need for manual meter reads. The ION panel is often referred to as a "meter", but this device is actually a data collection/transfer point. Refer to the website for product information - http://global.powerlogic.com/products.
ION meter model # 7650 by Square-D and the usual part number is 9761E75RTUA1D3 with an Ethernet communication card and an option card that has Analog Input spots. Square D shall be the subcontractor used for all ION-related applications.
The ION meter panel is connected to the building BAS system.

Contractor to procure and install: the ION/BAS panels, all the meters, terminate meters wiring to ION panel, install ION panels, provide for Ethernet drops for NSIT connection, program ION panels. Re-configuration of UC ION database with new ION panels and meters, re-configuration of UC BAS system with new BAS panels and meters is performed by the BAS Shop. Coordinate testing and commissioning of controls with the BAS Shop and NSIT. All meters purchased and installed by contractor NOT BY UC OR OWNER.
The Installation Team shall be the combination of contractors and sub-contractors required to perform the task. The University personnel will oversee the contractors and sub-contractors work and verify that it meets University requirements. .

**Tasks for the A/E Team and Installation Team**

1. Determine appropriate ION panel model (A/E) (we have listed that above?)
2. Connect physical meter to ION panel (Installation Team)
3. Put in a request to UC NSIT for an IP address and an Ethernet drop(Installation Team)
4. Connect ION panel to campus Ethernet (Installation Team)
5. Program IP address for ION site (Installation Team)
6. Provide a factory validation/check-out sheet for EACH individual meter that was completed by the factory technician. (Installation Team)
7. Commissioning of ION meter panel (A/E Team, Project Commissioning Agent, University personnel, Manufacturers, Installation team)

## D. ION System Programming

Programming the ION system will be required to ensure that live data from the meters reaches the ION server located in the Building Automation System (BAS) workshop in Regenstein Library. Without this programming, the meter will not register on the ION's graphical user interface and thus the collected data will remain inaccessible to UC personnel. This data can be viewed graphically by two means: ION WebReach and ION Enterprise Energy Manager (EEM). WebReach allows the user to see real-time data through a graphical user-interface that includes a virtual map of the campus. ION EEM is a more robust data analysis tool that allows Facilities personnel and building owners to trend and analyze usage.

**Tasks for Installation Team**

1. Program meters into ION server(Installation Team)
2. Re-configuration of the University Ion system to accept the new panel (Installation team)
3. Create building/meter locations in WebReach and EEM(Installation Team)
4. Make sure ALL meter have some sort of way to cycle power without needing to undo wires. (For example, installing a toggle switch in-line when installing a GE CHW meter.) (Installation Team)
5. Provide a factory validation/check-out sheet for EACH individual meter that was completed by the factory technician. (Installation Team)
6. Commissioning of the new meters (A/E Team, Project Commissioning Agent, University personnel, Manufacturers, Installation team)

Attached is the typical BAS/ION panel riser. All items on the riser are procured and installed by Contractor. University BAS shop will oversee installation. Project Commissioning agent, Manufacturer and Installation Team are responsible for commissioning the system.

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