

BUILDING METERING STANDARDS

- 1) Utilities to be metered, and types of meters:
 - a. Electric meters shall be one of the following:
 - i. H8163 with optional communication card by Veris Industries
 - ii. PowerLogic Energy Meter with communication card by SquareD (actually made by Veris)
 - iii. Siemens Building Technology, DEM
 - b. Condensate meters:
 - i. Meter shall be sized for the pump GPM, and not based on pipe size.
 - ii. The standard UI installation detail shall be used.
 - iii. Meter must provide a dry-contact pulse output for totalizing gallons. Note this is not a pulse proportional to flow!
 - c. Water meters for both domestic and irrigation shall be installed for all new building and major remodel projects. The installation detail and dry-contact requirement is the same as described above for condensate meters.
 - d. Chilled Water meters shall be installed for all new building and major remodel projects that have chilled water cooling.
 - i. We have standardized on the Onicon F-1200 series, with optional hot-tap installation hardware kit required.
 - e. Heating Water meters normally are only used where sub-meters for hydronic heating of a specific area of the building is required. Where they are needed, the same meter and requirements for chilled water meters apply.
 - f. All of the above meters shall be connected to the Siemens EMS as follows:
 - i. For meters with dry-contact pulse output, the output signal must be connected to a Logical Pulse Accumulator Input (LPACI) DI-point
 - ii. Meters provided directly by Siemens such as a DEM are connected as an FLN device.
 - iii. Chilled Water and Heating Water meters are actually a flow meter and two temperature sensors, which require three AI-points on the EMS and program code to calculate accumulated Ton-Hrs, or Btus.
 - iv. In all cases where meters are connected to the EMS, program code must be provided to daily trend-log metered. As the values in the field cabinets are erased whenever there is a cold-boot, we have established program code which includes the following:
 1. Each metered point in field cabinet is backed up daily into two virtual points.

2. Each day, if the value of the virtual backup point is greater than the field cabinet point, then the value in the field cabinet is overwritten with the value of the backup point, otherwise the value of the backup point is overwritten with the value in the field cabinet.
 3. Daily trend-log each metered point in a common text file for each meter type.
 4. All three point values for each meter are displayed on insight graphic display.
 - g. For buildings where there is no EMS the meter must provide a dry-contact pulse output as described above. We have developed a system to collect metered data through the campus LAN, so for non-EMS buildings all meters must provide this type of output.
- 2) Energy Recovery from exhaust air, for HVAC systems with high % outside air.
 - a. ASHRAE 90.1 (energy standard) requires Exhaust Air Energy Recovery for systems => 5,000 cfm and 70% min OA. It also specifies a minimum 50% efficiency for the recovery unit
 - b. A heat-pipe type system is our standard.
- 3) HVAC EMS control sequences. As less than a handful of HVAC system types will cover over 90% of new installations, we can effectively address this issue by addressing only a few specific system types.
 - a. Identify a standard occupied and unoccupied control sequence for each system type. This would also include naming conventions used in the control code.
 - b. A standard method for Supply Air temperature reset shall be established.
 - c. A standard method for establishing the Mixed Air temperature setpoint must be established.
- 4) Problem Zones on large HVAC systems: A typical example of this type of problem, (very common in UI buildings), occurs when a computer lab, ITS room, or lab with fume hood, is served by a central system.
 - a. These types of areas have a radically different load and occupied hour profiles from the other zones on the system, which severely restricts the possible central system control options and usually forces the entire system to be very energy inefficient.
 - b. Specific types of spaces that require special treatment must be identified, and the problem described above must be adequately addressed.