Central Plant Measurements – Cooling Towers

Cooling towers provide heat rejection for chillers. If a cooling tower is working properly, the sump temperature will be low and the chiller will work as efficiently as possible. Cooling towers, by themselves, do not consume a lot of energy, but if they're operating inefficiently, the chillers will consume far more energy. Measuring the cooling tower inlet and outlet temperatures, the outdoor wet bulb temperature, and fan electrical power will give you the data required to determine how well your cooling tower is operating.

Notes on Fluid Measurement

Standard Fluid Measurements – Monitoring of Central Plant equipment will require that you monitor fluid temperatures. These fluid measurements are typically made in three different ways:

1. **Thermowell** – If thermowells are present, you can remove the thermometer and insert a temperature sensor (S-TMB-M002, -M006, or -M017) into the well. Using some heat sink compound on the sensor can aid in temperature transmission.

2. **Pete's Plug** – Most piping systems integrate Pete's Plugs for insertion into the pipes. At this time, a Pete's Plug type temperature sensor is not available as part of the Smart Sensor equipment; however, if you have an insertion-type temperature sensor, it might be used with the Energy Logger Pro with the Analog Module (S-FS-CVIA) which can connect 4-20 mA signals, as well as 0-5 V, 0-10 V, and 0-20 V signals to the Energy Logger Pro.

3. **Surface** – If neither a thermowell nor a Pete's Plug is available for your use, good measurements are still possible. Attach a temperature sensor (S-TMB-M002, -M006, or -M017) to the side of the pipe using metallic tape and some heat sink compound, and wrap the pipe and sensor with insulation a foot up and down stream, or a couple of pipe diameters, whichever is greater. This will permit you to take a temperature reading that will closely reflect actual fluid temperature.

Cooling Towers

QUESTIONS:

1. Is it an open-loop or closed-loop system? If closed loop, you will need point 5; if open loop, you will not need point 5.

Item Description	Qty	Part Number(s)
1. Outlet water temperature	1	S-TMB-Mxxx
2. Inlet water temperature	1	S-TMB-Mxxx
3. Fan current	# fans	CTS-xxxx-yyy and S-FS-TRMSA module for each
4. Circulation pump current	# pumps	CTS-xxxx-yyy and S-FS-TRMSA module for each
5. Sump water temperature	1	S-TMB-Mxxx

Cooling Tower Measurement Notes:

- S-TMB-Mxxx refers to Temperature Smart Sensor where “xxx” indicates sensor cable length.
- CTS-xxxx-yyy refers to Current Transformers where “xxxx” indicates opening size (0750 = 0.75”, 1250 = 1.25”, and 2000 = 2.0”) and “yyy” indicates rated amperage.
- Additional steps may need to be taken to ensure that your data logger is not exposed to humidity, temperature, or condensation conditions outside of its operating parameters.

Basic Logger Equipment

The list below consists of the basic equipment that you'll need to do any data logging:

- Energy Logger Pro,
- Serial cable to program the logger and download data, and
- AC power adapters to keep the logger plugged in to an AC outlet, and
- HOBOware software.

Item Description	Qty	Part Number(s)
Energy Logger Pro	1	H22-001
Serial interface cable	1	CABLE-PC-3.5
AC Power Adapter	1	PAC-1 or ONS-AC-POWER-USA
HOBOware Pro version 2.2 or Higher	1	BHW-PC or BHW-MAC

NOTE: Reference materials for all equipment used in monitoring applications should be reviewed to ensure proper use and safety precautions are observed.