RUSSELL K MARCKS, P.E.

Professor Marcks is the HVAC&R lead Instructor at Sinclair and coordinates Thermodynamic, Fluids, and Analytical Tools courses for the MET program. He has taught for 30 years and has been the Dayton SAC for 25 years. Oh Yah! He likes dogs and dogs like him.

CONTACT

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FUNDING

ASHRAE Grant	$5,000
Region V Opportunity Fund	$1,800
College Contribution	$4,700
Industry Donation	$12,100
Anonymous Donation	$400

PARTNERSHIPS

Waibel Energy Systems
AHU, RF, Coils, VAV Box donations
Reduced cost control components

Belimo USA
Actuator and Valve donations

WRP of Cincinnati
ABB VFD donations

Chapter Members on Advisory Board
Mentorship

DURATION

18 mo.: Design, Build, Commission and a perpetual commissioning project

TWO-ZONE AIR HANDLER WITH CHILLED WATER COIL AND VAV REHEAT

Sinclair Community College

OUR STORY

My previous 'air handler' was a model built from an NSF grant. It used two fans, three dampers, ducting, VFD's, and controls mounted on the side of a large plywood box. I could teach very basic economizer and building pressurization. However, members of my advisory committee were not impressed. My students were simply not exposed to a 'real' AHU. A local supporter offered an AHU donation. At that point, I went through my local process to obtain an ASHRAE Equipment Grant and make this project happen. The project is described below.

OUR PROJECT

This project is designed to operate as a two-zone VAV or CAV AHU. It is equipped with a central CW coil with HW reheat at the VAV boxes. It also has a CW and HW coil on the OA intake to simulate various OA temperatures allowing for DB economizer strategy. A future improvement will add steam injection at the OA to handle enthalpy economizer strategies. One zone of the AHU discharges into a closed box to allow development of building pressurization strategies. The box is also equipped with CO2 injection to allow for demand control ventilation. I also plan on developing hands-on psychrometric instruction using this unit. The entire system is controlled via a JACE 8000, appropriate control components including safety-chain sensors, and an interface with touchscreen graphics. Design, installation, and commissioning were done by my students. This system is one of three systems I use to teach commissioning procedures.