

## **Calibrating AHU Models Using Whole Building Cooling and Heating Energy Consumption Data**

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Calibrated building system models have been used for projecting potential energy savings of retrofits, identifying operating problems, and optimizing system operation. The calibrations are performed often by modifying simulation inputs until the outputs closely agree with the measured whole building energy consumption data, such as the monthly utility bills.

Very sophisticated software has been developed and used for modeling building energy use in the last 30 years. Model calibration remains an important topic for both researchers and practitioners in the HVAC field. One of the major issues of interest is the calibration of models to the heating and cooling energy consumption data. Calibration of somewhat simplified building and HVAC systems models, present the energy signatures for typical air handling units (AHUs), with a two-level graphic procedure for calibrating building AHU heating and cooling energy consumption models.

Real system operating performance must be modeled in order to accurately and quickly calibrate simulation output to measured data. Modeling of real system performance is done and solutions are provided using an existing program to simulate real system operation. Graphic signatures are provided to help the simulation engineer identify appropriate parameters to be modified. A two-zone model is suggested for real system simulation. A two-step method is recommended to simplify the calibration process.