

LEAVE YOUR HVAC SYSTEM ON AND SAVE MORE



WITH **ULTRA HIGH PERFORMANCE HVAC** FROM OPTIMUM ENERGY

The common myth says that to save on electrical use, one must switch off the power. In reality, each situation has a set of unique characteristics. Large commercial HVAC systems operate more efficiently when resources are minimized rather than eliminated.

OptimumHVAC software provides the necessary programming, as a scalable and fully integrated product, to manage HVAC systems, specifically centrifugal chiller plants and air handling units.

Affinity Law

There is a law in physics called the Affinity Law and it states that the energy used is proportional to the cube of the speed of the motor. So reducing the speed by half reduces the energy used to 1/8th of full speed.

A key to realizing the benefits of the affinity law is the knowledge behind the sequences being sent to the VFD's. This is exactly what OptimumHVAC does. The mathematical equations used by OptimumHVAC deliver the required demand-based operational directions to the plant's components, maximizing the affinity law efficiency opportunities.

The OptimumHVAC system operates chillers, pumps and fans at varying speeds, thus eliminating excessive resources and the associated costs.

In order to achieve various motor speeds, variable frequency drives (VFD's) need to be installed. The VFD's allow for the speed of the motors to

be altered based on the relational demand placed on the system. As the heating/cooling demand increases and decreases the speed of the motors driving the equipment increase and decrease in a relational partnership. This is based on how the patented algorithms calculate the optimum speed and sequences required to meet the building demand.

Benefits to variable speed and variable flow HVAC systems are:

- Lower HVAC energy consumption by a proven 30% to 60%.
- Considerable reduction of CO₂ and other greenhouse gasses.
- LEED points and carbon trading credits.
- Improved indoor air quality.
- Increased occupant productivity.
- Enhanced occupant comfort year round.

OptimumHVAC software communicates with the various components on how and when they are needed. This allows for a soft start that creates less wear on the equipment as opposed to a line start, which shocks the motor into operation.

As an example, two chillers operating at 50% capacity require 26% of the power of one chiller operating at 100% capacity. In either situation, the building's demands are met, one method uses 74% less energy.

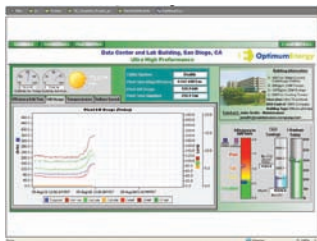
THE INSTALLATION OF OptimumHVAC COMBINED WITH RETROFITTING THE PLANT WITH PROPER VARIABLE FLOW, VARIABLE SPEED DRIVES (VFD'S), ALLOWS THE PLANT'S COMPONENTS TO WORK HARMONIOUSLY WITH EACH OTHER...



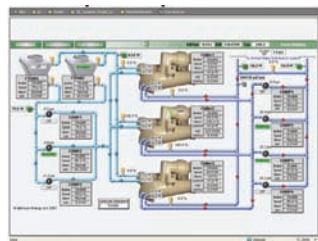
START WITHOUT STARTING OVER WITH OPTIMUM ENERGY.

Natural Curve Sequencing of Chiller Pumps and Towers

Optimum Energy's all-variable speed chiller plants attain optimum performance when the equipment is operating at a specific part load that depends on the current external conditions. OptimumHVAC is the patented control methodology that's employed to sequence equipment so that plant operation is always as close as possible to the natural curves of the equipment contained in the plant.



The "natural curve" dashboard screen shot shows the curve of the loading at which each variable speed component achieves maximum efficiency.



The plant overview dashboard shows the individual components and their current status, providing verification of proper sequencing and troubleshooting inconsistencies in operations.

Affinity Law Table

Speed	Flow	Required Power
100%	100%	100%
90%	90%	73%
80%	80%	50%
70%	70%	34%
60%	60%	22%
50%	50%	13%
40%	40%	6%
30%	30%	3%

The Affinity Law table shows the relationship between speed, flow and the required power (energy) to maintain operation.

Control your energy costs

The installation of OptimumHVAC combined with retrofitting the plant with proper VFD's, allows the plant's components to work harmoniously with each other, delivering heating and cooling on demand. OptimumHVAC software guarantees a reduction in HVAC energy consumption, lower operating and maintenance costs and lowers the carbon footprint of the facility. Give us a call today and gain control of your energy costs.

Optimum Energy Motto:

Do Good. Do Well. And Prove It.

 **OptimumEnergy™**
Replacing Energy with Software Intelligence

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