



The New Standard in Adaptive-Logic
Real-Time System Optimization



Ultra-Efficient all variable speed controls for
EnviroSep central chilled water, hot water and distribution plants.

includes... **PumpTrax**

Manufactured and supported by



Your building is an organism...

...a structure and “systems” connecting human spaces, equipment and utility infrastructure. From an energy standpoint, it has ever changing nuances in load and energy requirements caused by occupancy, density, weather, seasons, humidity, usage, time of day, human and machine heat loads in varying levels of criticality and rate of change. Add nuances in utility rates, peak use and equipment amortization schedules.

The Magic of Adaptive Logic and Smart Applications

Until the advent of adaptive logic, many of our best approaches to building “system” energy optimization have been limited to high efficiency HVAC compressors, perhaps with VFD tower fans and later as heat transfer surface allowed, variable flow of chilled water and more recently condenser water due to advances in cooling tower spray nozzle designs. And while this smart optimization of mechanical equipment such as chillers, tower fans, pumps and free-cooling is admirable, it is predominantly based on static knowledge of manufacturers efficiency curves and chiller part-load energy tables, not encompassing the rest of the organism nuances, and because of this pre-determined approach, the controls can never “learn” a system and accurately predict and execute superior energy optimizations.

Now, modern engineering leveraging Adaptive Logic on hardened PLCs with intensive computational capabilities unlocks further possibilities for systemic energy optimizations, possibilities that **EnviroSmart** now addresses. In partnership with large facility owners and engineers known as experts in whole system optimization, **EnviroSmart** provides a more comprehensive approach, encompassing the entire environment with air handlers, weather variances, thermal energy storage, ground-source loops, free-cooling systems, real-time feedback loops and floating set-points for equipment sequencing and temperature set points to achieve reliable operation and energy savings not possible with static approaches.

True Industrial Quality System Approach and Reliability

EnviroSmart is built on true industrial-grade PLC hardware with hardened execution logic without an underlying OS that robs speed, decreases reliability and slows resources. The **EnviroSmart** System Controller with our proven **PumpTrax** real-time pump energy feedback and control system is available on all EnviroSep Modular Packaged Chiller Plants and modular skids. It is not available as a stand-alone Controller.



Developed and supported by EnviroSep with decades of advanced controls experience for industrial & HVAC applications.

Whole plant efficiencies of .55 kW/ton and better is possible.

Ideal for all variable-speed control including variable primary and variable primary, variable secondary systems.

Large size, menu driven touch-screen color interface shows system piping and instrumentation display.

True industrial PLC hardware with hardened adaptive-logic execution code.

Automatically operates and optimizes chillers, heat recovery, pumps, fans, valves, boilers, separator. Parallel and series counter flow are supported.

Real-Time feedback loop from chillers, pumps, fans, sensors.

Comprehensive trending with user settable time frames.

SMART floating set points for equipment sequencing and temperature/flow variables.

Set point and ranges are tailored to each system type of chillers, pumps, towers, etc.

Single and fully redundant controller options for critical duty applications.

Instantaneous and cumulative cooling load, kW/ton, system and component energy and flow. Standard Wire to Water and Flow Economy Ratio displays.

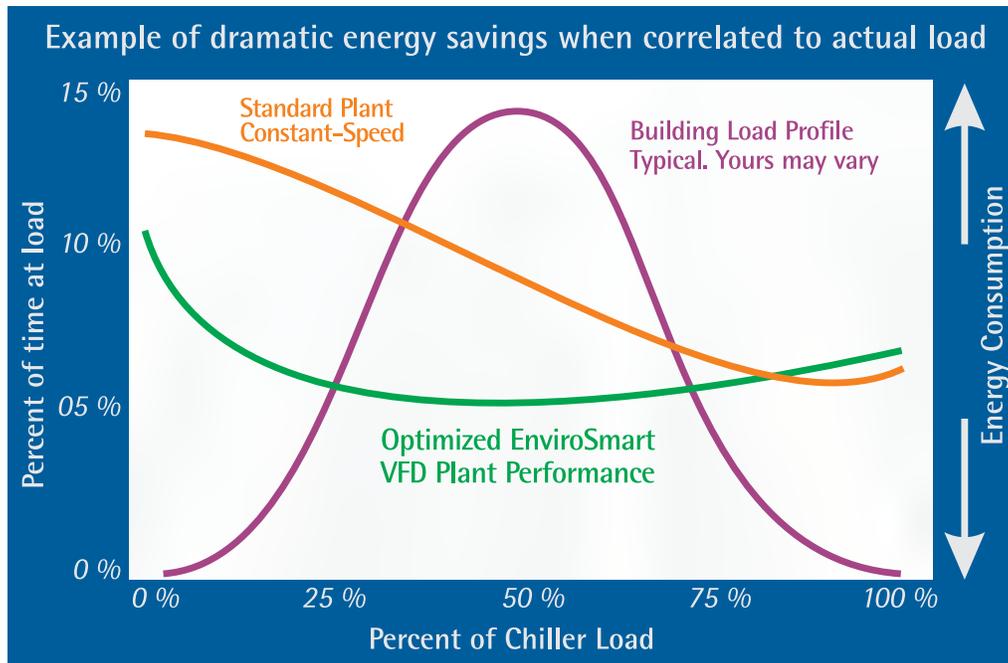
Built in Ethernet and Serial for Internet and BMS systems. All major protocols supported.

Automated server monitoring, threshold based alerting and remote control available.

Advanced “Thermal-Effect” distributed billing available.

EnviroSmart

...combines the *ultra-efficient* capabilities of EnviroSep with Adaptive Real-Time Controls enabling the worlds most efficient approaches to total "system" optimization.



Ultra-Efficiency is available. Expand the scope of optimization.

EnviroSmart uses adaptive logic to continuously monitor system and weather parameters and make real-time fine adjustments to VFD speeds, system set points, and equipment sequence points to assure the lowest kW per ton of output.

Series chillers can enable the lowest flow at light loads. Dual Series counter-flow chillers can offer energy advantages by reducing system "lift".

EnviroSmart optimizes these technologies, especially where the more narrow flow range is possible.

Adaptive logic advances previous techniques that focus only on "right-now". Learned systems develop a trajectory for what is coming and can gradually pull-down system temps while it is less expensive and then adjust flows to provide reliable comfort cooling as loads quickly increase.

The included **PumpTrax** module provides real-time feedback used to calculate the optimal staging points of

ALL pumps at the lowest possible kW. Pumps operate at their optimal points, reducing the stresses that cause seal wear, so maintenance may be reduced.

Centrifugal chillers are most efficient at higher chilled water temperatures, lower condenser water temperature and in the lower load range. By continuously monitoring and optimizing the system, **EnviroSmart** can reduce variable speed centrifugal chiller energy while fully serving cooling zones.

EnviroSmart can create real time load profiles and capture relevant data points. Because VFDs can mask systemic delta-t syndrome, we can utilize adaptive logic to indicate system inefficiencies against a baseline.

EnviroSmart can minimize tower fan and condenser pump energy while minimizing chiller lift and the energy imposed by changes. These values changes seasonally and according to wet bulb. We monitor conductivity and control tower blow-down operation.

EnviroSmart reset strategies include increasing chilled water set point when occupancy is low, and chilled water temperature and differential pressure set point when the load is changing.

Optimizing positive displacement heat recovery chillers with centrifugal primary chillers can offer the advantages of delivering 140°F hot water while reducing the load on the larger HP chilled water centrifugal.

EnviroSmart can monitor and modify AHU air temperature and static pressure in response to changes in cooling load at that zone. We modify the flow rate to the AHU in response to changes and chilled water set point as required.

By optimizing dual oversized cooling tower cells, the amount of water to be cooled is distributed across a greater surface which decreases the amount of heat rejection from each tower, and can decrease the condenser water temperature and reduce chiller energy which can reduce required fan speed.

Reasons to Package your Plant

REDUCES COST, TIME and RISK ACROSS DISCIPLINES

Pre-engineered packaging reduces the cost and risk of maintaining engineering intent through construction and final commissioning. It is the most efficient and direct way of properly integrating all the plant equipment, meeting all the nuances of highly optimized efficiency across brands, types, functions and controls. EnviroSep's experience assures that customers may achieve their bold-est energy and TCO objectives. Significant amortization incentives from 29 years down to 7 years for complete modular systems.

COMBINES DESIGN and CONSTRUCTION. INCREASES VALUE

By integrating the engineering details of the plant with its layout, construction and deployment, time and cost are reduced, flexibility and quality are increased. Packaging is a more sure path to obtaining maximum initial value and long term results, and ready on time. Being self contained and controlled, automatic optimization and free-cooling is more reliable, delivering better seasonal and long term energy efficiency.

ENABLES COMPRESSED CONSTRUCTION SCHEDULES

Because the entire plant is delivered as complete modules, site coordination is greatly simplified and faster, being reduced to assuring the concrete, electrical and connective piping is ready just before EnviroSep modules arrive. Your engineers and general contractors will agree that there is much less site coordination, so mechanical contractors can concentrate on higher value tasks that can only be performed on site.

DIRECT SINGLE-SOURCE COMMUNICATIONS

Single source efficiency in communications, documentation, knowledge transfer and support is always more efficient and less costly than coordinating details among a number of independent contractors and their subs. Delays caused by inter-company hiccups are eliminated, resulting in a higher probability of meeting project time lines.

FREES EXPENSIVE INTERIOR SPACE and REDUCES EQUIPMENT NOISE

Enables placing large noisy equipment in self contained, low noise, compact engineered buildings, freeing up expensive and noise sensitive indoor space. Modules allow easier access in less space.

REDUCES UNKNOWN INTEGRATING COMPLEX EQUIPMENT

Pre-engineered plants reduce the unknowns that occur between disciplines in field built systems. System piping and VSD controls for the chillers, boilers, pumps, tower fans and steam systems are always correct for fluid velocities, pressure drops and manufacturers specifications. This is always met with pre-engineered plants and often less optimized in plant room implementations. This is especially important for high efficiency packages to assure energy efficiency targets are met and maintained. The entire EnviroSep plant is UL Listed, not just components.

REDUCES ENGINEERING COMPLEXITY, TASKS and COSTS

Modular or pre-engineered central plants offer an attractive alternative to field-constructed mechanical rooms. It simplifies everything from concept to engineering layouts and final integration. Single point UL electrical and plumbing simplifies site work. Pre engineered modules are invariably more compact than most other approaches. Modular plants enable phased facility expansions. EnviroSep quality of work provides high assurance in achieving facility energy and maintenance goals.



EnviroSep
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