

Symbio® Chiller Control Comparison



Trane UCP1 panels were offered on water- and air-cooled CenTraVac™ chillers built from mid 1985 through 1993. These panels relied upon fixed control alarm setpoints that did not allow adaptive protection from faults. In addition, the event of a power outage resulted in a fixed time shutdown that could be as long as 30 minutes. Such delays often resulted in an extended outage of chilled water production.



UCP1



AdaptiView™

Features	UCP1 Control Panel	Symbio Controller	Symbio® Benefits
Base Technology	Single module for unit and starter control. Has 2 digit alpha-numeric display for operator interface.	Networked digital sensors and display, controlled by Symbio digital controller and AdaptiView color graphic display.	Provides unit control flexibility and monitoring not possible with early generation digital controls.
Primary Repair Components	Most failures require replacement of complete module. Module designed in 1982 have not been used on new Trane chillers for 15 years.	Modular digital component design that minimizes cost of individual service parts and all components are used in Trane present production equipment.	Repair components are in stock and affordable.
Remote Monitoring	No remote monitoring capability.	Enables remote connectivity to monitor, analyze and maximize your building's performance.	Symbio 800 unit controllers integrate seamlessly and securely with Tracer or non-Trane building automation systems for simplified equipment monitoring and management.
Trane Communications Capability	Com 2 Trane digital communication - Not compatible with current Trane building automation systems.	Compatible with current Tracer building automation system.	Communicates with Tracer systems which allows advanced energy saving strategies such as Tracer chiller plant optimization.
Facility Communications Capability	No digital communication with facility communications systems.	There are a variety of chiller communication options depending on the application requirements. Native LonTalk™, BACnet, Modbus®, and Air-Fi communications capability.	Communicates with leading commercial and industrial building management systems.
Temperature Control Strategy	Modified proportional control.	Feedforward Adaptive Control is an open-loop, PID - predictive control strategy designed to anticipate and compensate for load changes. It uses evaporator entering-water temperature as an indication of load change.	Responds faster and maintains stable leaving-water temperatures. It also eliminates the inherent proportional error seen with deadband controls.

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System Control Strategy	Does not support variable pumping control strategies.	Variable Primary Control - The Symbio 800 chiller controller uses a patented, variable, water-flow compensation algorithm to maintain stable, precise capacity control. Variable-flow compensation is a new, optional, control feature that includes water differential-pressure-sensor transducers. Variableflow compensation improves the ability of the chiller to accommodate variable flow, even in combination with an Adaptive Frequency™ Drive (AFD) for centrifugal chillers.	Varying the water flow reduces the energy consumed by pumps, which can be a significant source of energy savings, depending on the application.
Chiller Protective Control Strategy	Has fixed set point refrigerant temperature and refrigerant pressure safety controls.	Adaptive protection strategies - The Symbio controller monitors chiller refrigerant temperatures, refrigerant pressures and electrical phase imbalances and adjusts chiller operation when conditions approach alarm limits. An example of such a condition is when there is a partial failure of a cooling tower, limiting total capacity.	Maximizes the ability to keep the chiller running under conditions that would shut down UCP1 controlled chillers.
Motor/Power Protective Control Strategy	Digital current overloads, phase imbalance, phase loss and momentary power loss protections.	Advanced motor/power protection - Digital control protection from current overload, phase imbalance, phase loss, momentary power loss, and over and under voltage variations. It also has a self diagnosing starter “dry run” feature.	Digital controls are more accurate and faster than analog overload controls. Symbio provides voltage imbalance and dry run protections that addresses important causes of chiller failures.
AFD Control Capabilities	Existing Trane UCP1 chiller controllers are not compatible with Trane AFD.	Symbio provides the most advanced generation of control for Trane AFD chillers. An AFD upgrade will typically improve chiller efficiency 15 to 25%.	Once upgraded to Symbio, the chiller controls are fully compatible with Trane AFD operation.
Unit Startup Strategy	Soft loading strategies. Large adjustments due to load or setpoint changes are made gradually.	The chiller controller uses soft loading except during manual operation. Large adjustments due to load or setpoint changes are made gradually.	Soft start adjusts the start rate to conditions and does not extend pull down unnecessarily. Soft start prevents overshoot and protects the compressor from cycling unnecessarily. Also it prevents demand peaks that can occur during morning startups without false starts.
Power Failure Recovery Strategy	Upon shutdown, fixed anti-recycle timer prevents restart by up to 30 minutes.	Fast Restart - The controller allows the CenTraVac chiller to restart during the postlube process. If the chiller shuts down on a nonlatching diagnostic, the diagnostic has 30–60 seconds to clear itself and initiate a fast restart. This includes momentary power losses.	Typically restarts 30-60 seconds after a power failure, compared to older chillers that require up to 30 minutes for a restart.
Performance Monitoring Capability	Monitors entering and leaving water, oil temperature, and phase amps.	Capable of measuring heat exchanger approach, tons, power consumption, power factor (uncorrected), compressor phase amps, and compressor phase voltage.	Allows users to monitor and diagnose chiller operation trends. An unnoticed 4 degree fouling of heat exchangers costs 6% or more in lost efficiency.
Logging and Reporting	Current status and alarm indicated on 2 digit LED display.	Recorded data logs include ASHRAE 3 report, Custom report, Graphical custom historical data log, purge report, and 50 alarm log.	Allows users to monitor and diagnose chiller operation trends.
Setpoint Saving and Backup	Mechanically set parameters.	All unit configurations and setpoints are recorded digitally allowing complete backup and restoring of unit operating parameters.	Speeds replacement and assures accuracy in case the panel requires repair.



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