Symbio® Chiller Control Comparison

Trane pneumatic panels were offered on water-cooled CenTraVac™ chillers built from mid 1950 through 1980. 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 latching shutdown that required a manual restart of the chiller, which for unmanned equipment rooms often lead to an extended outage of chilled water production.

Pneumatic

AdaptiView™

Features	Pneumatic Control Panel	Symbio® Controller	Symbio® Benefits
Base Technology	Discrete electromechanical relays, timers and analog electronic temperature controls.	Networked digital sensors and display controlled by Symbio digital controller and AdaptiView color graphic display.	Provides fast accurate control and monitoring not possible with pneumatic controls.
Primary Repair Components	These electromechanical components have not been used on new chillers for more than 25 years.	Modular digital component design that minimizes cost of servicing individual parts. 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	No digital communication with Trane building automation systems.	Compatible with 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	Pneumatic proportional control.	Feedforward Adaptive Control uses 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 setpoint and proportional error seen with pneumatic controls, often resulting in 4-6% efficiency improvements.
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. Variable-flow compensation improves the ability of the chiller to accommodate variable flow, even in combination with an Adaptive Frequency™ Drive (AFD).	Varying the water flow reduces the energy consumed by pumps and can be a significant source of energy savings, depending on the application.
Chiller Protective Control Strategy	Electromechanical refrigerant temperature and pressure safety controls. Setpoints are fixed. Controls do not have phase imbalance protections.	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 electromechanically controlled chillers.

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Motor/Power Protective Control Strategy	Electromechanical “dashpot” type current overloads; No other protections. Original load limit relay no longer available.	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 much more accurate and faster than electromechanical overload controls. Also, the addition of phase, voltage, momentary power loss and dry run protections address important causes of chiller failures.
Unit Startup Strategy	Pneumatic controls load chiller to 100% at startup.	The chiller controller uses soft loading except during manual operation. Large adjustments due to load or setpoint changes are made gradually.	Soft start prevents the compressor from cycling unnecessarily. Also it prevents demand peaks that can occur during morning startups without false starts.
Power Failure Recovery Strategy	Electromechanical controls lock out operation. Manual reset is required to restart chiller.	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 requires an operator restart.
Performance Monitoring Capability	No monitoring of conditions.	Capable of measuring tons, power consumption, power factor (uncorrected), compressor phase amps, and compressor phase voltage.	Allows users to monitor and diagnose chiller operation trends.
Logging and Reporting	No logging of conditions.	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 safety controls. Setpoints are fixed. Controls do not have phase imbalance protections.	All unit configurations and setpoints are recorded digitally allowing complete backup and restore of unit operating parameters.	Speeds replacement and assures accuracy in the case the panel require repair.

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