LAYTON®
Contempo

Precision Environmental Control

Free-Cool Economizer Systems

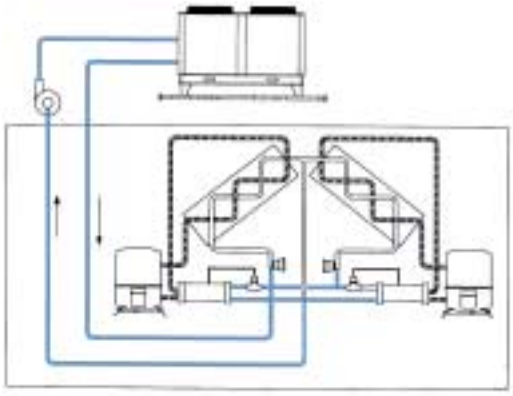
Free-Cool is a glycol-cooled Layton® Contempo system which provides cooling without the use of the refrigeration compressors during cool weather. It is capable of matching the cooling performance of the refrigeration system at outdoor temperatures of 42°F to 47°F (50°F to 55°F entering glycol temperature) depending on the unit selection and room heat load. As in all Layton® Contempo systems, Free-Cool provides the highest possible sensible cooling capacity at rated room temperatures.

Traditional precision air conditioning systems use the economizer coil to precool the air upstream of the evaporator. This lowers the suction pressure, resulting in reduced compressor efficiency (EER) while reducing the total refrigeration capacity and increasing latent cooling. Hot-gas bypass valves are sometimes necessary to prevent the evaporator from freezing, and larger blower motors are necessary to overcome the resistance of the economizer coil.

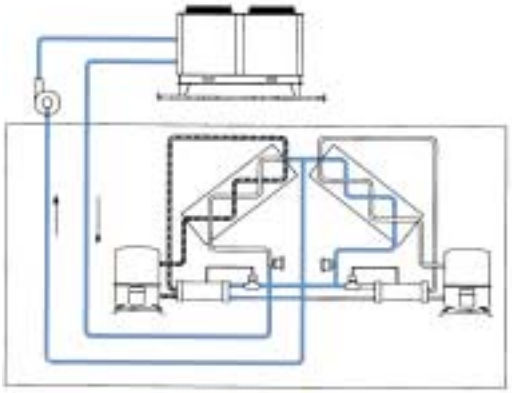
The Layton® Contempo Free-Cool system eliminates all of these problems with a specially designed, proprietarydual-circuit Free-Cool coil. Although the Free-Cool system contains all of the standard features found in the glycol-cooled unit, the circuits of each Free-Cool coil have been fully interlaced with the refrigeration circuit. This greatly increases the effective surface area, providing increased Free-Cool capacity and dual Free-Cool circuits for staged cooling. Each glycol circuit is controlled by an independent solenoid valve which, in conjunction with the Laytonaire controls, prevents simultaneous operation of the Free-Cool and refrigeration circuits.

This unique Free-Cool system has been engineered for total energy savings throughout the year. Unnecessary dehumidification and subsequent rehumidification has been eliminated during the Free-Cool cycle. Compressor EER has been maintained and the need for hot-gas bypass valves eliminated. The integrated coil allows the standard fan motors to provide rated air flow, eliminating the need for increased fan motor horsepower.

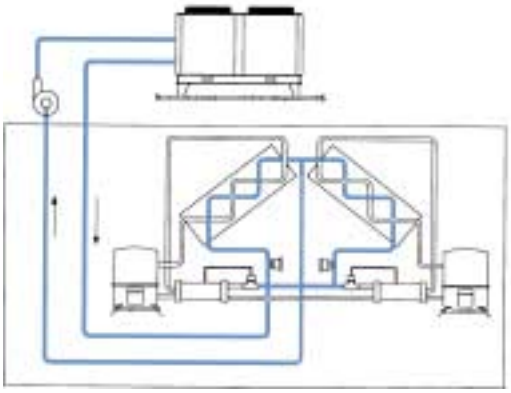
When the outdoor air temperature is above 60°F (70°F entering glycol temperature), the Free-Cool solenoid valves are closed. The compressors cycle with the room load, and the glycol pump is activated whenever either compressor is on. Condensing temperature is maintained by two-way, head-pressure-controlled glycol regulating valves.



At outside temperatures below 60°F, compressors 1 and 2 energize as necessary to meet the room load. Whenever either compressor cycles off, the corresponding Free-Cool solenoid valve opens, allowing glycol to flow through the interlaced coil, extending the compressor "off" cycle. The pump is activated whenever the Supervisaire® senses a room load.



At outside temperatures below 40°F to 45°F (depending on unit selection and room load) the Free-Cool system will match the capacity of the refrigeration system: both compressors are off, the glycol pump is on, and the glycol solenoid valves respond to room load.



LAYTON®

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