Adaptive Frequency™ Drive Compact Unit-Mounted Drive

CenTraVac™ chiller models CVHE/CVHF 460/480V and 575/600V 60 Hz applications

While chiller efficiencies have improved dramatically over the past twenty years, for most commercial buildings the single largest energy user is still the chilled water system. A Trane® Adaptive Frequency Drive (AFD) can improve chilled water system efficiency without sacrificing comfort. Adaptive Frequency is a trademarked term for a Trane variable speed drive which is made to Trane specifications and uses proprietary control logic.

The primary purpose of an AFD is to reduce energy consumption by changing the speed of the motor, but other benefits include improved power factor and soft starts.

Features and benefits

Energy reduction

Conventional chillers use inlet guide vanes to provide stable operation at partload conditions. Capacity is reduced by closing the vanes while maintaining a constant motor speed. A variable speed drive maximizes chiller efficiency and reduces power consumption by adapting the compressor motor speed and inlet guide vanes to the chiller operating temperatures.

While AFDs can increase the off-design efficiency of chillers, adding them for every application may not be the appropriate solution. Intelligent control of the condenser and chilled water temperatures are crucial for AFD savings in chiller system applications.

As with any chiller plant design strategy, it's important to look at various system alternatives and to use evaluation tools such as Trane System Analyzer™ or TRACE™ 700 to determine the best overall chiller plant design strategy.

The myPLV™ Chiller Performance Evaluation Tool provides a simple tool for quick and reliable chiller economic comparisons considering both full and part load ratings. To learn more or to download a free copy of the myPLV tool, please visit www.trane.com/myPLV.

Patented adaptive control

The combination of speed control and inlet guide vane position is optimized mathematically and controlled simultaneously to meet the dual requirements of water temperature control and efficiency.

The chiller controller will adjust speed as needed to track changing water-loop conditions. At the same time, it adjusts the inlet guide vanes to prevent the water temperature from deviating from its setpoint.

Tracer AdaptiView™ AFD control reaches the optimum speed faster, responds to changes more quickly, and provides improved water temperature stability. The chiller controller reduces speed to the surge boundary based on the current differential operating pressure, making instantaneous corrections to speed and vane settings as conditions change, while optimizing chiller efficiency.

Compact, factory-installed air-cooled AFD

This smaller footprint air-cooled AFD provides a factory-mounted solution for CenTraVac chillers less than 500 tons. Offering reliability through simplicity in design and fewer components, it delivers a more compact chiller footprint for job sites where chiller width is a concern, particularly in replacement and retrofit applications.

The low profile drive has a DC link choke that minimizes harmonic distortion and results in a Total Demand Distortion (TDD) of approximately 30%.

Design information

Tonnage range: CenTraVac chillers, 120-500 tons.

Voltage: 460/480V and 575/600V 60 Hz input power, ±10%.

Efficiency: Minimum efficiency of 97% at rated load.

Power factor: Displacement power factor of 0.96 at all loads.

Enclosure: NEMA 1 ventilated enclosure with tested short circuit current rating (SCCR) of 65,000 amps. Includes padlockable door-mounted circuit breaker/ shunt trip with ampere interrupting capacity (AIC) rating of 65,000 amps.1 The entire package is UL/CUL listed.

1 SCCR/AIC of 65,000 amps standard for 460/480V with option for 100,000 amps.

- A User Interface Control Panel
- B Circuit Breaker Handle
- C Low Voltage Access
- D Top Line Power Entry
- E Circuit Breaker
- F Control Power Transformer
- G AFD with Rectifier, Capacitor Bank and Inverter

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