

**Application Example – VLT HVAC Drive
Parameter set-up for Cooling Tower Fan Control**



In large commercial buildings with central air conditioning provided by water cooled chillers, a cooling tower removes the heat absorbed by the chiller and rejects it to the atmosphere. In most climates, cooling towers provide the most energy efficient method of removing heat from the chillers condenser water.

Fan Speed Control

Cooling towers encounter substantial changes in outdoor wet-bulb temperature and building load during normal operation. Therefore, some form of capacity control is required to maintain the desired condensing water temperature.

Frequency converters provide infinite motor speed control to vary capacity and provide the most energy savings. The life of the fan and drive assemble is extended compared to fan cycling with one or two-speed motors. A frequency converter eliminates the high starting currents and peaks created when two-speed motors are used along with the cost of a special starter and cable work. Stress on the motor, bearings and drives are also greatly reduced resulting in lower maintenance and installation costs.

Figure 2 shows a basic cooling tower fan application. A frequency converter controls the exact fan speed required for cooling, by utilizing a temperature sensor in the cooling tower water basin or the condenser water return piping. For this example, a standard temperature transducer is wired directly to the drive.

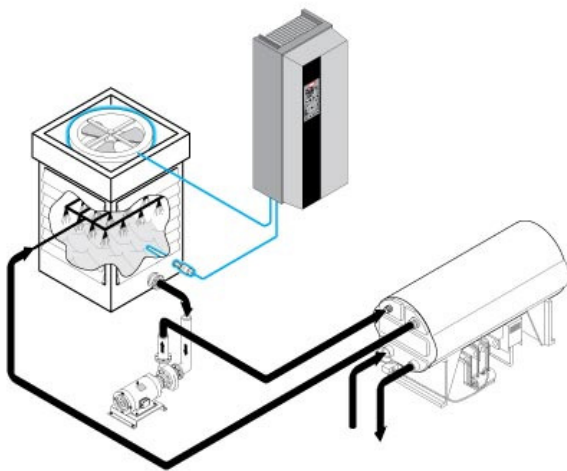


Figure 2: Cooling Tower and Chiller Condenser System with Frequency Converter

Once the optimum water temperature has been determined, the frequency converter can maintain the temperature as the system loads and conditions change.

The user will need to enter motor parameter data in addition to the parameters listed below. Motor is assumed to have a base speed of 1750 rpm at 60 Hz. Parameter values listed below are suggested and may not match user requirements.

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The VLT® HVAC Drive Features

The VLT HVAC Drive has the following software features incorporated, as standard, to optimize cooling tower fan performance.

ID	Name	Setup 1	Unit
100	Configuration Mode	Closed Loop	
103	Torque Characteristics	AEO VT	
302	Minimum Reference	0	F
303	Maximum Reference	100	F
315	Reference 1 Source	No Function	
412	Motor Speed Low Limit [Hz]	24	Hz
414	Motor Speed High Limit [Hz]	60	Hz
453	Warning Speed High	1800	rpm
510	Terminal 18 Digital Input	Start	
511	Terminal 19 Digital Input	Reverse	
512	Terminal 27 Digital Input	Coast inverse	
622	Terminal 54 Low Current	4	mA
623	Terminal 54 High Current	20	mA
624	Terminal 54 Low Ref./Feedb. Value	0	F
625	Terminal 54 High Ref./Feedb. Value	100	F
2000	Feedback 1 Source	Analog input 54	
2012	Reference/Feedback Unit	F	
2021	Setpoint 1	50	F
2081	PID Normal/ Inverse Control	Inverse	
2093	PID Proportional Gain	0.5	
2094	PID Integral Time	15	s

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