Subject: Cooling Tower Fan Overview	Product: E7 and P7 Drives	Doc#: AO.AFD.60
Title: Cooling Tower Fan		

Cooling Tower Fan

Application Overview

A cooling tower extracts heat from process cooling water. Common applications for cooling towers provide cooled water for air conditioning, manufacturing and electric power generation.

Application Challenges:

- Energy savings
- Reduce maintenance requirements (personnel and equipment replacement costs)
- Precisely control process water temperature stabilization

Yaskawa Products:

Product	Feature	Benefit
E7 Drive Family or P7 Drive	Built-in PID control	Operate the drive directly with built-in 4-20 mA terminals. Maintain temperature and lower energy consumption.
	Maintain a minimum speed.	Set the frequency reference lower limit.
	Switch to a line power supply.	Operation is not interrupted.
	Continue running after momentary power loss.	The motor continues running even after a (2 sec) momentary power loss.
	Motor preheat	Eliminate condensation in the motor.

Application Details:

A starter and a control unit to provide start/stop control and speed control are required for cooling tower fan operation. Yaskawa AC variable frequency drives are equipped with built-in PID control and speed search technology to restart the drive after a momentary power loss.

For maximum energy savings, the drive should provide the coldest temperature that the system will tolerate before reducing motor speed. Variable frequency drives can be the solution in noise sensitive applications. Soft starting and gradual speed changes make cooling tower noise less noticeable and reduces mechanical wear.

A variable frequency drive can correctly identify the cooling tower fan rotation, slow the motor speed to zero (when opposite rotation is detected), and accelerate the fan in the correct direction. The VFD drive eliminates brakes, anti-ratcheting devices and time delays. Running the fan slower, which raises tower and water temperatures, can prevent icing in cold weather. A VFD can reverse a cooling tower fan and keep the heat in the tower, if necessary. In warm weather, fans can be run faster, providing additional cooling capacity.