

Subject: Air Handler Overview	Product: Z1000 and P1000 Drives	Doc#: AO.AFD.58
Title: Air Handler		

Air Handler

Application Overview

Air handlers are used in buildings to control air supply pressure. They include a blower or fan driven by an electric motor, heating and cooling coils, a filter and controls, all housed in a sealed sheet metal enclosure located in a mechanical room, on the roof, or along side the building. They supply conditioned air to the building occupied spaces. Building air volume can be controlled mechanically using dampers or guide vanes; or electrically by controlling blower speed.

HVAC systems are sized for the maximum volume requirement making it necessary to reduce blower or fan volume most of the time. Using a Variable Frequency Drive on the air handler to control motor speed reduces the electrical energy consumed by the motor.

Application Challenges:

- Reduce energy costs - Motors use less energy as speed is reduced.
- Reduce demand charges - Drives reduce motor starting current 8-10 times.
- Reduce noise in buildings - Airflow noise decreases by eliminating starts and stops and reducing airflow.
- Reduce shock and vibration - Drive avoids running at speeds near system resonant frequency.
- Increased life of motor belts - Drives provide low torque starts reducing stress on belts, pulleys and keys.

Yaskawa Products:

Product	Feature	Benefit
Z1000 Drive Family or P1000 Drives	Bi-directional start	Start a blower already spinning in either direction due to residual air flow.
	Motor preheat	Eliminates condensation in motors.
	Energy savings output	Drives output voltage adjusts automatically to motor load, reducing motor energy use.
	Output frequency and speed can be displayed in various units	Customer choice of rpm, cfm, psi, %
	Built-in automation protocols (APOGEE FLN and Metasys N2). Others optional.	Versatility and simplicity of integrating into building systems
	Bypass Packages	For critical applications where shutdown is not tolerable
	Smoke Purge	Emergency override for critical situations

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	Damper Control	Prevent system from running when dampers are closed
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Application Details:

The air handler is part of a system to control building temperature and humidity. There are many variations but the system will always have air handlers. The air handler supplies conditioned air through duct work to individual VAV boxes which control the volume of supply air into the occupied space to regulate the temperature. The air handler fan or blower changes speed to maintain a constant pressure in the duct work as the volume of air through the blower is controlled by the VAV boxes. The temperature of the water in the heating and cooling coils controls the temperature of the air supplied by the air handler. The air from the occupied space is returned to the air handler through the return air duct by a return fan or blower controlled by a drive. The motor is a standard 3 phase, 230/460 volt, 1800 rpm, 1.15 service factor , inverter duty motor sized for the blower horsepower. The blower is sized for the amount of cubic feet per minute needed to control the temperature of the occupied space.

The Yaskawa P1000 and Z1000 drives enable air handlers to meet all system requirements.