

HVAC control

Application: commercial kitchens

Regulate kitchen exhaust hood speed according to temperature

“ My restaurant’s exhaust hood is always running at full speed, even when my cooking equipment isn’t being used. I’d like to find a way to reduce the amount of energy wasted and lower my utility bills. ”

Solution

The solution consists in using variable speed drives (VSD) to adjust exhaust operation to the amount of activity in the kitchen.

Fan speed is controlled according to air temperature. A sensor inside the exhaust hood detects air temperature, and an Altivar 12 variable speed drive adjusts the exhaust fan motor speed.

The cooler the air, the slower the fan runs, down to a minimum ventilation level. The exhaust hood is automatically turned up or down to meet actual needs, resulting in substantial savings.

An optical smoke sensor can be added to boost the system’s regulation capabilities. This configuration requires an additional control system.

Benefits

For the user

> **Energy savings of 20% to 50%, depending on use:** maximum exhaust hood operation is usually limited to just a few hours a day

> **Fast ROI,** usually within 18 to 24 months

> **Quieter operation**

- Lowering fan speed by 20% reduces noise by 20%
- Reducing speed by half virtually eliminates noise

> **Lower maintenance costs**

For professionals

+ Design

- Simple and economical: the VSD picks up the signal directly from the temperature sensor
- Reduced maintenance: the VSD can be mounted right on the fan, eliminating maintenance-intensive gearboxes
- Easy design and upgrades

+ Installation

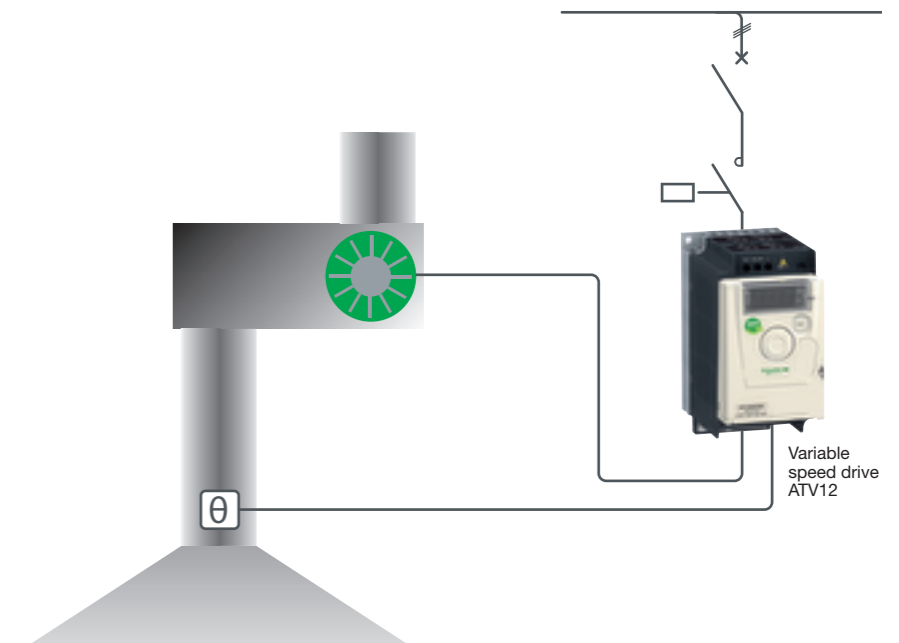
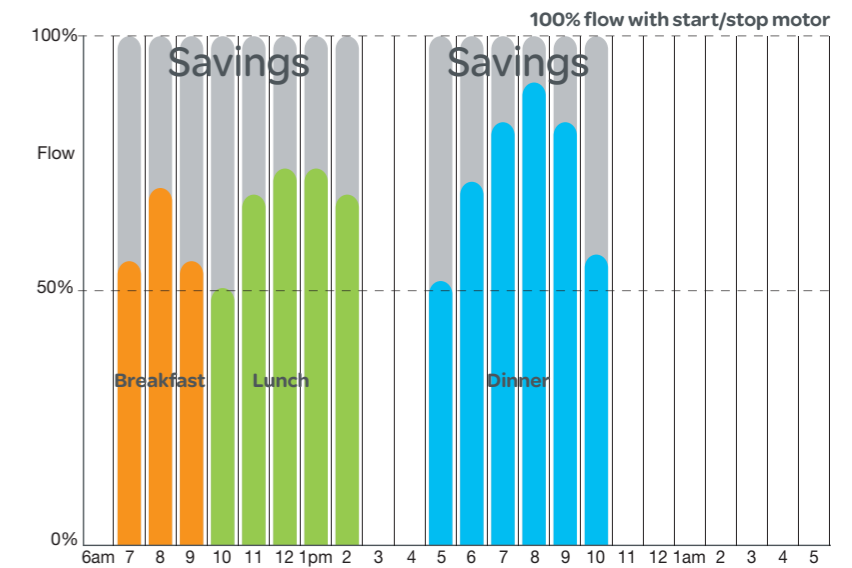
- Complies with international standards
- Integrated EMC filter
- Simple, beltless system
- Easy installation thanks to plug-and-play design

Projects

> **United States:** VSDs were installed on 12 exhaust hoods at a university kitchen. A VSD controls the speed of each exhaust fan via smoke and temperature sensors. The system is expected to generate annual savings of 126,244 kWh.

- Measure
- Reduce energy consumption
- Reduce energy costs

Installing a VSD can reduce energy consumption (in grey below) by up to 40% compared to a traditional start/stop motor, reducing total consumption by about 25%.



The Altivar 12

Variable speed drive for small machines and applications with three-phase 240 V asynchronous motor 0.18 to 0.75 kW, 120 V single-phase power supply 0.18 to 2.2 kW, 240 V single-phase power supply 0.18 to 4 kW, 240 V three-phase power supply

- Can be configured in its packaging
- Quick start option requiring no adjustment
- Intuitive navigation
- Even more compact
- Category 1 EMC filter
- Local control on the front panel
- Modbus serial link
- Resistant to harsh operating environments
- Integration of Standard (U/f),
- Performance (sensorless flux vector control, or SVC) and Pump/Fan (quadratic profile Kn²) control profiles
- High dynamic performance on acceleration as well as on braking
- Excellent speed regulation on machine load surges