

Case note

Variable speed AC drives help keep farm produce fresh



JMC's high-tech storage facilities use ABB drives to keep farm produce fresh.

Based in Washington state, USA, JMC Ventilation Refrigeration specializes in the design and manufacture of custom ventilation and refrigeration systems for potato and onion storage. JMC is using ABB's advanced drive technologies to provide precise, on-site and remote environmental control that helps ensure vegetable quality and reduce mass loss (shrinkage), while saving energy.

Company founder Joel Micka says: "Each potato and onion variety has its own temperature and humidity requirements for optimum quality and our systems need to hold very accurate settings – within a tenth of a degree – to allow food storage up to 12 months."

To achieve this, JMC uses ABB general purpose drives to control fan-motor speed and airflow, keeping temperature and humidity at precise settings. Incorporating drives enables the fans to run more efficiently by matching air volume precisely to demand. When air demand decreases, the variable speed AC drive slows the motor down, saving energy and helping farmers maximize their sales margins.

In a typical installation, used in an onion store, six 18.6 kW/ 25 hp drives use about 19.2 kWh at 100 percent speed. If the fans are reduced to 50 percent speed in the winter, when storage volumes are down and the outside temperatures are low, each of the fans use about 2.8 kWh. All six fans at 50 percent speed use less energy than one fan at 100 percent speed. If the six fans are kept at 50 percent during a one month period, savings of 70,848 kWh or \$5,667 per month can be made.



Inside the facility, conditions are kept just right to prolong the life of onions and other crops.

Remote control improves safety and efficiency

Even more important than the energy savings is the safety and efficiency the new systems provide through remote control and monitoring, because storage facilities are often located many miles from the main offices. Says Micka: "With the old systems using traditional motor contactors, if the motor current increased to a level that was too high, it would trip and shut down the motor and then shut down the whole system until someone checked on the building and restarted it."

With the optional intelligent ethernet module, the drives can be monitored remotely, either through a modem or via the Internet, allowing faults to be quickly diagnosed and solved, without the need to visit the storage site. Communications can be set up to send an alert via e-mail to the operators to warn them when a fault trip occurs. JMC integrates all of the systems components, refrigeration units, fans, drives and doors, into a network operated through a remotely accessible control panel.

Problem solved

- Keeping farm produce fresh while being stored for extended periods

Solution

- Variable speed drives control ventilation fans to keep stored produce at correct conditions of temperature and humidity

Benefit

- Vegetables can be stored for up to 12 months without a reduction in quality
- Variable speed drives can save energy by reducing speed of fans to take account of storage volumes and ambient temperature
- Remote control of drives via optional intelligent ethernet module allows fast and efficient solution of problems



The ABB drives control the storage facilities from an electrical control room.

For more information please contact:

www.abb.com/drives

www.abb.com/drivespartners

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