

Food and Beverage Applications For ABB Adjustable Speed AC Drives

Adjustable Speed AC Drive of a steam fan improves milk powder quality

ABB AC Drives

Objective

The power of a dairy fan's evaporator was regulated by guide vane control. The control method caused throttling losses, which resulted in high energy consumption. The inefficient control method also led to poor quality milk powder.

Guide vane control caused problems

The milk is evaporated in heat exchangers. During the evaporation, a heat insulating layer was formed on the inner surfaces of the heat exchangers and less evaporation occurred. The guide vane control did not take into account the increased need for heating steam, so the quality of the produced milk powder deteriorated. The evaporator's production life was short because the heat exchangers had to be cleaned often to minimize quality variations.

Adjustable speed AC drive improves production process

The steam fan's guide vane control was replaced with an AC squirrel cage motor and an ABB AC Drive. The ABB Drive now controls the motor speed.

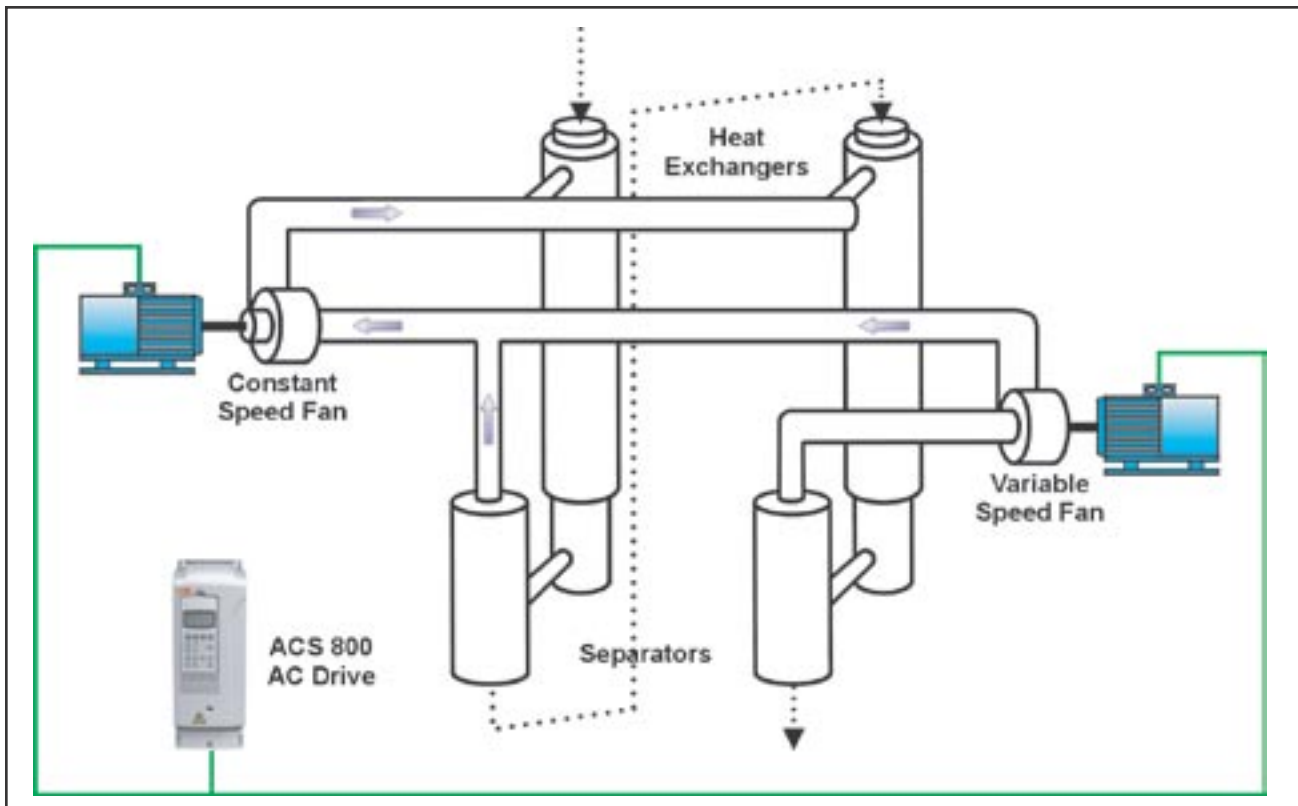
When the surfaces of the heat exchangers become dirty, the ABB Drive automatically increases the speed of the fan motor. The temperature inside the heat exchangers is kept constant and even evaporation occurs. Thanks to the ABB Drive, the evaporator can be used continuously for over 20 hours and the milk powder quality is high throughout the entire production phase. The Drive's large control range also allows for a wider selection of products.

Operation of the steam fan

In the dairy's two-stage evaporator, the dry matter content of the milk is increased up to 50%.

The fan evaporator includes heat exchangers, separators, a variable speed fan whose motor is controlled by ABB AC Drive and a constant speed fan (which can be started using the same ABB AC Drive).





The milk flows in the pipes of the heat exchangers. The hot steam surrounding the pipes makes the water evaporate from the milk. The evaporated water is separated from the milk in the separator. The steam is compressed by the fan and is fed back into the heat exchangers.

Reduced energy costs

The AC Drive starts the motors slowly so starting current is kept low. Elimination of current peaks reduces energy costs. In addition, the ABB Drive optimizes the fan motor speed so the operating costs are lower than running a motor across the line.

AC Drive control improves productivity

Since the ABB AC Drive starts the motor slowly, and controls its speed smoothly in response to process conditions, mechanical stresses on machines and equipment is reduced and service costs are minimized. The extended operating period also helps increase the dairy's overall productivity.



Total Customer Satisfaction

The quality of ABB drives is backed by a company-wide commitment to total customer satisfaction. ABB's 24-hour customer support line, plus an extensive sales and service network, provide a wealth of drives applications expertise and personalized assistance that will ensure your continued success.

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