

AUTOMATION

by Emerson

New frequency inverters and motors result in energy savings

The specialist textile manufacturer Textilwerke Emsdetten Vliesstoffwerke GmbH & Co. KG (twe) group is one of the top 10 manufacturers in the field of non-woven fabrics. With over 1,100 employees across nine different locations, it produces customized non-wovens for the automotive industry and the hygiene sector as well as insulation products for the construction industry, filtration materials, cleaning products and even insulation materials for the clothing industry.

The challenge

In compliance with ISO 50001 guidelines and internal corporate requirements, the twe group has set itself the target of reducing the enormous consumption of energy used in the manufacturing processes by two per cent every year.

twe's ventilators were previously operated on the mains using fixed-speed 75kW asynchronous motors with V-belt pulleys, which was not only inefficient, but also extremely intensive in terms of maintenance. Due to the greater air flow required as a result of the plant conversion, the aim was to modify the system to create the necessary energy savings and significantly increase the efficiency of the ventilator.

The solution

The air flow required by the ventilator would have to be increased from the previous rate of 700 Pa to 1000 Pa, resulting in an increase in speed from 1500 rpm to 1800 rpm. Therefore the drive would have to be replaced by a 110 kW asynchronous motor. A team of employees from Anton Uhlenbrock GmbH and Emerson Industrial Automation analysed the processes and recommended the complete replacement of the ventilator drive in order to achieve the desired optimisations. The existing motor was replaced by an energy-saving permanent magnet-excited synchronous motor (LSRPM) together with a Unidrive M600 for controlling the speed.

The benefits

"Thanks to the new design of the plant, we are not only able to post energy savings of 35% but we now have significantly greater availability", states Sebastian Müllman, technical lead for electrical engineering at twe. By removing the maintenance-intensive V-belt pulley, it has been possible to increase the operational reliability of the ventilator and to significantly reduce downtimes. The Unidrive M600 frequency inverter also makes the performance data of the ventilator available via the existing interface, thus enabling continuous monitoring of the operation.

In addition to the greater efficiency of the energy-saving permanently excited synchronous motor, further energy is saved through variable speed control, since the frequency inverter enables the ventilator to be set to the minimum speed required. Thus only the energy needed to drive the ventilator is drawn from the mains. The air flow of the ventilator is also regulated by means of air flow measurement in line with the requirements of the plant.

Uhlenbrock not only planned the conversion of the plant in meticulous detail but also managed to complete the work in less than two days, with plant production being halted for just four hours. As Rolf Hundeler, project manager at Anton Uhlenbrock GmbH pointed out, "This is an example of where good preparation and a good team went hand in hand."

KEY BENEFITS

- Significant energy savings
- Payback within one year
- Increased plant availability and productivity
- Reduced maintenance costs

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