Intelligent digital positioner in the steam distribution of a paper machine

Optimal energy efficiency and cost savings as a result thanks to high-precision control.

Introduction

Paper machines have steam systems used for drying paper during the production process. Depending on the thickness of the paper, the production speed and width of the paper web, in many cases well over 100 t of steam per hour is needed for the drying process. A ton of steam costs about € 25 on average. With approx. 8,000 operating hours per year, a total of about € 20,000,000 per year needs to be expended for the required steam.

Challenge

If the positioners used in the feeder to the main steam distributor and in the branches to the drying groups have a permanent control deviation of 1 %, then this already adds up at this point to additional costs of approx. € 200,000 per year.
The solution

The intelligent TZIDC and EDP300 digital positioners significantly contribute to optimized energy efficiency and product quality based on their outstanding control characteristics and accuracy. The control algorithm of the positioner avoids overshoot during the positioning of the valve, such that the reduced valve movement has an advantageous effect on maintenance costs and the overall lifecycle of the control valves. These positioners have been proving their worth for years especially in harsh ambient conditions with high temperatures, high humidity and heavy vibrations.

Steam distribution on the paper machine

1. Steam from the power station
2. Valve with TZIDC positioner
3. Flow measuring point
4. Main steam distributor
5. Drying groups
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Paper machines have steam systems used for drying paper during the production process. Depending on the thickness of the paper, the production speed and width of the paper web, in many cases well over 100 t of steam per hour is needed for the drying process. In addition, a significant amount of steam is also used for the process air. A paper machine with an annual capacity of 800,000 tons produces about 20,000 metric tons per year of process air. This corresponds to about 12 t of steam per hour. Therefore, the energy costs for the process air and the drying process add up to maximally 8,000 operating hours per year, a total of about € 20,000,000 per year needs to be expended for the required steam.

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