Intelligent energy management on mechanical presses
Increased efficiency and operational reliability thanks to SINAMICS

Would you like to reduce the life-cycle costs of your press line, minimize downtimes and make an important contribution towards reducing CO₂ emissions? You can by applying an optimized concept and selecting specific systems and products! If you reduce the energy costs, profitability increases and your production process becomes more environmentally friendly. The high-performance drive system SINAMICS® S120 is the main component required for the energy management of a press.

And best of all: due to the controlled DC link voltage, the number of drops in speed is reduced while the dynamic drive response is extremely high. Additional synergy effects can be expected for the entire press line.

We’ll gladly help you calculate how much you can benefit from an optimized system.

Reduced operating costs

Electrical power is the most important resource in industry and ensures that motors are running and plants are manufacturing. In industrial applications, two thirds of the power is consumed by electrical drives. The savings potential is considerable in this field, especially in times when energy costs are on the rise. The main “energy saving levers” are multi-motor drive systems based on the SINAMICS S120 drive platform. In this case, several inverters are connected to a common DC bus. The individual motor currents are superimposed in the common DC link. If some press main and servo drives are accelerating while others are braking, the line input current is lower or even zero. The load on the power system is thus lower in total than with single converters and there are fewer system disturbances and losses. You benefit from lower operating costs and an amortization period of only a few years – while your plant continues to save during its entire service life.

Increased production reliability

In the case of older transfer presses, the press slides and the part transfer system are mechanically coupled to each other. Even in the event of a power system failure, this ensures that movement is always synchronized without any collision of the mechanical components. In new presses, all the movements are implemented by autonomous drive units that are interlinked through an electronic master value.
What happens in case of a power failure?

Without the safety concept, the worst case scenario, the mechanical components required for transporting parts could be severely damaged. This in turn would cause long production downtimes. With SINAMICS S120 and the concept of kinetic energy buffering, the kinetic energy stored in the flywheel is converted into electric energy in case of a power failure. In conjunction with multi-motor drives, all drives and the control system will have sufficient electrical power to allow the press to be stopped in a controlled manner. And this, of course, reduces production downtimes.

Increased profitability – less scrap

Machine-based energy management on presses means: Saving energy and targeted utilization of energy for press drives. The central energy management component is the ALM technology. SINAMICS S120 Active Line Modules (ALM) are selfcommutating, pulsed infeed/regen units (with IGBTs in the infeed/regen device) to generate a controlled DC link voltage. Thus, the connected motor modules are decoupled from the supply voltage. Power variances within the permitted tolerance range do not affect the motor voltage. In combination with the Clean Power Filter, harmonics are suppressed to a large extent. The investment in ALM technology amortizes after approx. 2 years compared to standard DC technology (independent of the drive power). The result: Less scrap, increased profitability and efficiency of the press line.

Features

- Sinusoidal supply current injection using the Active Line Module and Clean Power Filter
- Energy exchange within multi-motor drive systems
- Reduced life-cycle costs
- Almost no reactive power consumption
- Increased efficiency of the overall plant
- Safe operation of the press in case of power failures and external disturbances thanks to kinetic energy buffering. This prevents damage to the press and production outages
- Integrated overall solution with standard components
- Modular concept permits central and distributed configuration for large crossbar transfer presses and press lines
- Reduced infrastructure costs for mechanical and electrical components

Energy-saving by means of common DC link for multi-motor drive systems

Kinetic energy buffering on presses: operating principle and systems

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