

Machine-based Energy Management

Solution for energy saving
on press drives

Benefits:

- High plant availability, even with unstable power supplies and in case of power failures. This prevents damage to the press.
- Maximum flexibility due to scalable products, systems, and solutions.
- Modular concept permits central and distributed configurations of large crossbar transfer presses and press lines.
- 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

metal forming SOLUTIONS

Would you like to reduce the life-cycle costs of your press line, minimize downtimes and make an important contribution toward reducing CO₂ emissions by applying an optimized concept and selecting specific systems and products? Then you should calculate precisely. Because high energy costs increase the operating costs considerably. If you reduce the energy costs, profitability increases and your production process becomes more environmentally

friendly at the same time. 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 calculate for you how much you actually benefit from this.



SIEMENS

Machine-based Energy Management

Reduced life-cycle costs

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?

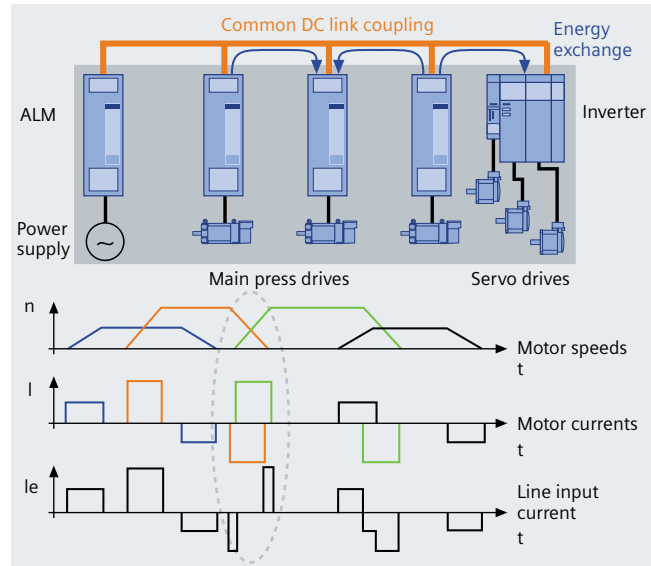
Without the safety concept, in the worst case scenario, the mechanical components required for transporting parts could be severely damaged. This in turn would cause long production downtimes.

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 plant to be stopped in a controlled manner. And this, of course, reduces production downtimes.

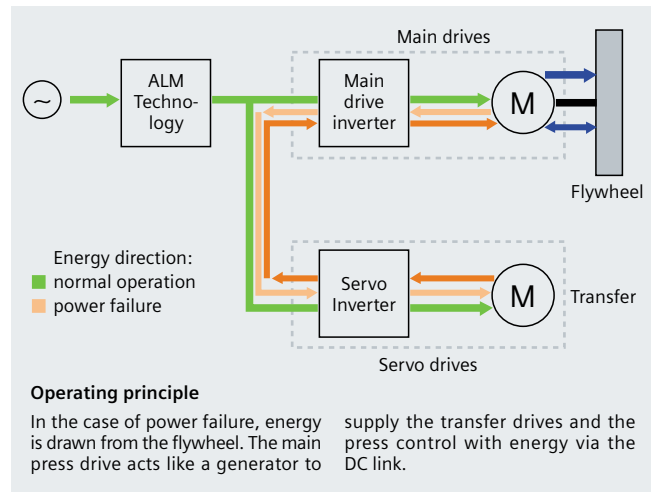
Increased profitability – less scrap

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 self-commutating, pulsed feed/feedback units (with IGBTs in the feed/feedback 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 already, also compared to standard DC technology (independent of the drive power).

The result: Less scrap, increased profitability and effectiveness of the press line.



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



Kinetic energy buffering on presses: operating principle and systems

Highlights of energy management with SINAMICS S120

- Increased effectiveness 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.

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