

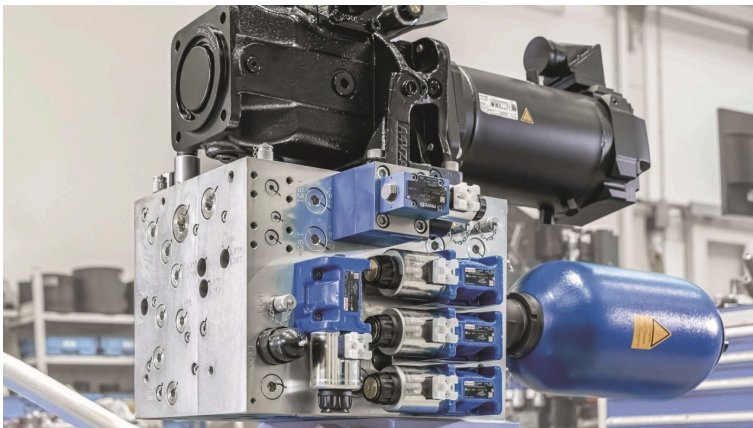
PRESS INFORMATION

Energy efficiency booster for deep drawing presses

Manuela Kessler | 11.09.2024 | Lohr am Main / Germany | PI 027/24

Servo-hydraulic drive solution from Bosch Rexroth increases energy efficiency of deep drawing presses and conserves resources

- Up to 30 percent energy savings through recuperation
- More flexibility thanks to modular approach for die cushion and upper ram
- Higher productivity and process quality, digitalization options



Efficient sheet metal forming: The servo-hydraulic drive solution from Bosch Rexroth increases the energy efficiency of deep drawing presses. (Image source: Bosch Rexroth AG)

With its servo-hydraulic drive solution, Bosch Rexroth is increasing efficiency in sheet metal forming. Recuperation (energy recovery) can increase the energy efficiency of deep drawing presses by up to 30 percent. The modular design simplifies engineering and installation for the machine manufacturer. End customers also benefit from reduced oil volume and smaller installation space. Sheet metal can be formed with increased productivity and quality. At the same time, the solution opens up more opportunities for digitalization. End users can minimize downtimes with condition monitoring, for example.

Modern deep drawing presses should form sheet metal with consistently high quality and productivity and require as little energy as possible. At the same time, machine manufacturers require standardized drive concepts in order to be able to implement a wide range of applications economically. In particular, engineering and installation costs need to be reduced.

The servo-hydraulic drive solution from Bosch Rexroth offers many advantages here. The modules comprising a servo-hydraulic pump unit and control block can be used to supply the die cushion and upper ram as required. If both servo-hydraulic solutions are operated with a common electric drive system, such a deep-drawing press achieves energy savings of up to 30 percent compared to a conventional hydraulic press with valve control.

The significant increase in energy efficiency is made possible on the one hand by the speed-controlled servomotor pump unit for the upper ram, which provides the exact power required at every point in the press cycle. On the other hand, during deep drawing, part of the process

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energy can be recovered via the servomotor pump unit in the die cushion, which regulate the die cushion force instead of a valve control. The recovered electrical energy can either be fed back into the grid or provided to the upper ram via the common DC bus. This reduces the energy consumption of the machine directly during the drawing process.

Furthermore, the servo-hydraulic drive solution opens up additional possible savings by minimizing the cooling requirements of the hydraulic unit. The reason for this is the high level of efficiency and the drastic reduction in throttle losses, which leads to less heating of the hydraulic oil. As a result, the power unit can be designed smaller and in some cases it can work without any cooling at all, which further reduces investment and operating costs.

More productivity, quality and transparency

The digital control of the servo-hydraulic drive has a positive effect on process quality and transparency as well as productivity. As the individual pressures, positions, velocities and forces can be controlled very precisely, sheet metal parts can be produced with repeated accuracy and higher quality. For example, the upper ram drive can also operate at very low motor speeds of just a few rotations per minute. At the same time, the fast-reacting servomotors enable shorter cycle times and higher output. Various pump options with 2-point or proportional adjustment systems through to multi-quantum control further expand the design scope, making the energy-saving drive concept attractive for many other applications.

The servo-hydraulic drive also enables data-based analyses for process optimization and condition monitoring to minimize downtimes.

Basic Information Bosch Rexroth

As one of the world's leading suppliers of drive and control technologies, Bosch Rexroth ensures efficient, powerful and safe movement in machines and systems of any size. The company bundles global application experience in the market segments of Mobile and Industrial Applications as well as Factory Automation. With its intelligent components, customized system solutions, engineering and services, Bosch Rexroth is creating the necessary environment for fully connected applications. Bosch Rexroth offers its customers hydraulics, electric drive and control technology, gear technology and linear motion and assembly technology, including software and interfaces to the Internet of Things. With locations in over 80 countries, around 33,800 associates generated sales revenue of 7.6 billion euros in 2023.

Basic Information Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 429,000 associates worldwide (as of December 31, 2023). The company generated sales of 91.6 billion euros in 2023. Its operations are divided into four business sectors: Mobility, Industrial Technology, Consumer Goods, and Energy and Building Technology. With its business activities, the company aims to use technology to help shape universal trends such as automation, electrification, digitalization, connectivity, and an orientation to sustainability. In this context, Bosch's broad diversification across regions and industries strengthens its innovativeness and robustness. Bosch uses its proven expertise in sensor technology, software, and services to offer customers cross-domain solutions from a single source. It also applies its expertise in connectivity and artificial intelligence in order to develop and manufacture user-friendly,

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sustainable products. With technology that is “Invented for life,” Bosch wants to help improve quality of life and conserve natural resources. The Bosch Group comprises Robert Bosch GmbH and its roughly 470 subsidiary and regional companies in over 60 countries. Including sales and service partners, Bosch’s global manufacturing, engineering, and sales network covers nearly every country in the world. Bosch’s innovative strength is key to the company’s further development. At 136 locations across the globe, Bosch employs some 90,000 associates in research and development, of which nearly 48,000 are software engineers.

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