

PRESS INFORMATION

High speeds for greater sustainability

Manuela Kessler | 17.04.2023 | Lohr am Main / Germany | PI 018/23

Bosch Rexroth presents the highly efficient A3V pump platform for medium-pressure industrial hydraulics applications.

- High-efficiency pumps for speed-controlled, cyclic applications
- Sustainable energy savings thanks to speed control of a variable pump
- Downsizing the electric drive conserves resources



First size of the highly efficient pump platform: The new A3V2Q045 medium-pressure pump achieves an efficiency of 93 percent at 4,000 rpm. (Image source: Bosch Rexroth AG)

With high-speed variable displacement pumps for medium-pressure applications, Bosch Rexroth is making a further contribution towards greater sustainability in industrial hydraulics. The new A3V pump platform allows presses, injection molding machines and other cyclic applications to save up to 80 percent energy compared to constant-speed systems. The A3V2Q045, a 45 cc 2-quadrant pump, is the first product in the medium-pressure range for flows up to 300 l/min and it is available with flows up to 180 l/min. Compared to previous medium-pressure variable displacement pumps, its efficiency is five percentage points higher. The high speeds allow a 30 percent reduction in torque at the same flow. Downsizing the electric drive in this way reduces the investment costs.

Speed-controlled drives make a significant contribution towards sustainable industrial hydraulics. In addition to the energy savings through speed control, the variable displacement pumps driven by servo motors can operate in various states by changing their swivel angle. As a result, typical cycle phases such as prolonged pressure holding can be achieved with significantly lower motor torque and lower energy consumption than with fixed displacement pumps.

The new A3V2Q045 self-priming variable displacement pump was specially designed for energy-efficient and cyclic applications. The hydrostatic drive is suitable for pump and motor operation (recuperation). If the hydraulic pump is driven backwards by the medium flowing through it, e.g. when lowering a lifting platform or counterholding a die cushion, it can drive the coupled servo motor as a generator. The electricity generated by recuperation can then be used in the intermediate circuit for other work functions or fed back into the grid.

In addition, the recuperation capability of the new variable displacement pump also shortens the cycle time. In injection molding, for example, the pressure reduction after the holding phase is accelerated by controlled reversing of the motor.

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Downsizing reduces overall costs

Thanks to the higher speeds, the A3V2Q045 variable displacement pump can achieve the same volume flows with 30 percent less motor torque. This means that a smaller servo motor can be used, which reduces the investment and operating costs. Additional downsizing potential results from the demand-based adjustment of the displacement. After all, the torque can be reduced by an additional 30 percent in many cyclic applications simply by carrying out adjustments. As a result, the converter can also be sized smaller, which saves additional energy and resources.

Optimum system efficiency in all operating states

With a nominal pressure of 315 bar and up to 4,000 rpm, the new medium-pressure pump generates a variable flow of up to 180 l/min, which can be adjusted precisely and, in an energy-optimized manner via the combination of speed and swivel angle. Bosch Rexroth offers a wide range of controllers for adjusting the swivel angle as required.

Thanks to an extended operating range, the A3V2Q045 consistently achieves over 90 percent efficiency at high speeds in the typical application range of 100 to 300 bar. The maximum value of 93 percent is five percentage points higher than the figure for previous medium-pressure variable displacement pumps.

The new A3V2Q045 medium-pressure pump will be launched in the second half of 2023. There are plans to launch a 4Q-version with two high pressure sides in the following year. Further nominal sizes are also planned.

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 more than 32,000 associates generated sales revenue of around 7.0 billion euros in 2022.

Basic Information Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 420,000 associates worldwide (as of December 31, 2022). According to preliminary figures, the company generated sales of 88.4 billion euros in 2022. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations

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worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company's future growth is its innovative strength. At 128 locations across the globe, Bosch employs some 85,000 associates in research and development, of which nearly 44,000 are software engineers.

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