

bauma: 800-volt electric drive from Bosch for construction machinery with high power requirements

February 25, 2025
PI11929 BEG MBC/Cd

Electrification enables construction applications with zero local emissions

- ▶ Electric drive system with high power density and optimum efficiency
- ▶ Compact dimensions enable conversion of existing device platforms to electric drives
- ▶ High robustness, reliability, and durability thanks to transfer of technology from automotive volume production
- ▶ Modern construction sites: lower exhaust and noise emissions are particularly beneficial to densely populated residential areas
- ▶ High flexibility thanks to combination with tailored transmission solutions from Bosch Rexroth

Abstatt – In the face of growing environmental awareness and ever more stringent legal regulations, construction machines are increasingly being equipped with electric drives. This concept allows work to be completed with zero local emissions and thereby reduces the exhaust and noise levels that have become commonplace, for example, on construction sites in densely populated residential areas as well as in city centers. Another use case for this technology is in machinery and devices for underground mining. Such applications frequently require complex technical solutions in order to remove the exhaust gases and heat produced by internal-combustion engines. At bauma, Bosch Engineering is presenting a newly developed high-performance solution for battery voltages of up to 800 volts, which further increases the range of applications for construction machinery. “The latest generation of our powerful electric drive system combines high power density, compact dimensions, and optimum efficiency. As a result, even construction machinery with high power requirements and limited installation space, such as wheel loaders, can now be equipped with electric drives,” explains Philipp Kurek, who is responsible for off-highway and maritime solutions at Bosch Engineering. The improved overall efficiency results in a reduced total cost of

ownership (TCO) of the construction machine across its service life. Depending on the application profile, electrification thus also provides potential financial benefits over diesel-hydraulic powertrains. In addition, the electrification solution from Bosch Engineering offers great flexibility in combination with tailored transmission solutions from Bosch Rexroth, such as the new eGFV9100 coaxial gearbox.

The 800-volt drive system consists of the Bosch electric motor SMG230 and a highly efficient inverter equipped with silicon carbide power modules. The motor is designed for system voltages of 400 to 850 volts. In an ideal voltage and temperature range, it offers a continuous power output of up to 200 kilowatts and around 250 newton meters of torque. Up to 550 newton meters of peak torque can be delivered on a short-term basis. Thanks to the 800-volt technology, the power density has also been increased significantly. The new motor delivers up to 80 kilowatts more power than a comparable 400-volt machine with identical weight or, with the same level of performance, boasts more compact dimensions and a much lower weight. The 800-volt inverter with silicon carbide semiconductors, which was tailored to the exact requirements of the SMG230, boasts an impressive efficiency of more than 99 percent. The silicon carbide semiconductors in the power modules enable faster switching operations and steeper switching slopes, meaning that significantly less energy is lost in the form of heat.

The electrification components from Bosch Engineering for construction machinery applications are designed to be extremely robust, reliable, and durable. The safety and diagnostic concept is based on established standards from the automotive domain and has been adapted to the specific requirements of mobile machinery. The compact dimensions enable straightforward integration even into tight installation spaces, meaning that existing device platforms can also be converted to eco-friendly electric drives. What is more, Bosch Engineering supports its customers in integrating the drive system into their machinery as well as with the actual application of the system.

The new Rexroth eGFV9100 coaxial gearbox fitted to the SMG230 will be unveiled at **bauma at booth A3/327**.

In addition, in cooperation with Bosch Rexroth, Bosch Engineering supports its customers in integrating the drive into the construction machine, including application development, based on the open ECOSystem BODAS.

Press photos are available on the Bosch Media Service at www.bosch-press.com.

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About Bosch Engineering GmbH

Bosch Engineering GmbH is a wholly owned subsidiary of Robert Bosch GmbH and is headquartered in Abstatt, Germany. As a systems development partner to the automotive industry since 1999, the company with its more than 3,200 associates offers development services for powertrains, safety and convenience systems, and electrical and electronic systems – from the original concept to series production. Specialized in electronics and software, it draws on Bosch's proven large-scale series production technology to develop tailored solutions for a wide variety of applications in passenger cars, commercial vehicles, off-highway and recreational vehicles, and in rail applications, ships, and industry. Bosch Engineering GmbH also coordinates all the Bosch Group's motorsports activities. Additional information can be accessed at www.bosch-engineering.com.

Mobility is the largest Bosch Group business sector. According to preliminary figures, it generated sales of 55.9 billion euros in 2024, and thus contributed around 62 percent of total sales. This makes the Bosch Group one of the leading mobility suppliers. Bosch Mobility pursues a vision of mobility that is safe, sustainable, and exciting. For its customers, the outcome is integrated mobility solutions. The business sector's main areas of activity are electrification, software and services, semiconductors and sensors, vehicle computers, advanced driver assistance systems, systems for vehicle dynamics control, repair-shop concepts, as well as technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 417,900 associates worldwide (as of December 31, 2024). According to preliminary figures, the company generated sales of 90.5 billion euros in 2024. 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, 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 86,900 associates in research and development, of which nearly 48,000 are software engineers.

Additional information is available online at www.bosch-press.com, www.bosch-mobility.com, www.bosch.com.