



Driving electrification forward

In an environmentally conscious world, it isn't only cars that need to go electric. We spoke to Matthias Kielbassa, Vice President of the Electrification of Off-Highway Mobile Machines at Bosch Rexroth, about developments in mobile machines.

Before we talk about the work you've been doing, perhaps we should clarify the relevant terms. So, what do you mean by 'the electrification of mobile machines'?

By mobile machines, we at Bosch Rexroth mean off-highway vehicles. For instance, construction equipment such as excavators, agricultural equipment such as tractors, and material handling equipment such as forklifts.

When we talk about electrification, in general, we have different topologies in mind – for example hybrid or battery-electric solutions. For all of these solutions, our new electrification portfolio supports the OEM in electrifying the drivetrain, the implementation, as well as further auxiliaries.

The core elements of our new portfolio are high-voltage motor-generators and inverters, combined with our gear units and hydraulics, and complemented by software.

How do you go about developing a new mobile machinery product range like this?

One of our strengths is our deep application know-how concerning mobile machines in the off-highway market. So, we started with the application, then we derived the technical specification of the new electrical portfolio.

Another strength is the diversity of our company. People who work in different parts of the business collaborate with each other. For example, our factory automation division, with its deep technology expertise in electrics, contributed a lot to the development of our new electric motors and inverters. Let me give you an example. The ISO 13849 norm for functional safety applies for factory automation and for off-highway vehicles as well. And guess what? Functional safety is one of the highlights of our new inverter portfolio.



Matthias Kielbassa with colleague and off-highway vehicle

Did you draw on the expertise of colleagues in other Bosch departments?

Absolutely. While our focus is on off-highway mobile machinery, the core DNA of Bosch is automotive and commercial vehicles. That means there are Bosch business units with a lot of knowledge in powertrain technology, including solutions for electrification. The information and experience we can all exchange with one another is considerable. I'd say this breadth is probably unique in the market.

The range was developed at Bosch Rexroth's new Customer and Innovation Center in Ulm. How was this beneficial to the process?

Our new facility in Ulm is very important to us. It's a forum for the continuous exchange of information and of shared best practice with other parts of the business. Importantly, it's also a place where our customers will be able to come and experience our solutions for themselves.

There are practical, physical benefits as well. We have a dedicated test bench for electrification and a full test environment. We're also in the process of building a test track.

What did you enjoy most about working on this project?

It was the energy and entrepreneurial spirit. It was like having the 'can-do', trail-blazing atmosphere of a start-up, but backed by an established, highly efficient organization. Here we were, starting something new, but with a fully empowered team that has a broad spread of age groups, nationalities and languages.

“One of the greatest challenges is that this is a new field of business – I should say new territory.”

We have all this unbeatable expertise, from within our own business unit, from other parts of Bosch Rexroth, from the broader Bosch group, and also from new people coming from outside – all working together at our new center in Ulm. People are all able to play to their strengths.

Were there any big issues or challenges that you had to overcome?

One of the greatest challenges is that this is a new field of business – I would say new territory. The market for electric solutions is being developed from scratch, and we’re not alone in working on it.

At Bosch Rexroth, we’re at the forefront of development and innovation, which means we’re also at the forefront of risk. So yes, it’s a challenge, but it’s a promising new area of technology with a clear market need. That’s why we decided to invest and create dedicated solutions for the off-highway mobile machinery market.



Bosch Rexroth colleagues working on mobile machines solutions

What do you think is the most important customer benefit of the new range?

Just one? I think I’ll allow myself three, if I may!

First of all, it’s the dedicated off-highway design. That means a robust specification in order to cope with the harsh environmental conditions – such as ambient temperatures, protection classes, and shock and vibration resistance for the integrated electric components.

Then it’s the scalability. There are many different applications, such as wheel loaders and telehandlers. There are many different functions, such as driving and working. And last but not least, there are different machine sizes. As a consequence, the requirements on the speed, torque and power of the electric components are very different. You need a scalable solution, a “one fits all” solution is not possible. That’s why we decided on a configurable portfolio with motor-generators in different diameters, lengths and stator winding variants, and inverters in different power classes to fulfill the market expectations.

The third benefit is electrical and functional safety. We call it “Safety on Board” and it contributes to the OEM’s overall machine safety concept, with safety features according to ISO 13849.



Members of the Bosch Rexroth mobile machines team

Have you had any feedback from customers yet?

Yes, indeed. I’m glad to say they’re impressed by the benefits I just described. They like the robust off-highway design, the scalability and the safety features. And they rely on our application expertise. There’s a great deal of trust that we’ll understand their needs.

When will the new range be available?

We’re already in the market entry process. Customers can come and see it at our new Customer and Innovation Center in Ulm. We’re ready to support OEMs in upcoming electrification projects.

Or let me say it in a different way – let us transform mobile machines.



Matthias Kielbassa



Bosch Rexroth Corporation

14001 South Lakes Drive
Charlotte, NC 28273
Telephone: (800) REXROTH
(800) 739-7684

www.boschrexroth-us.com



www.facebook.com/BoschRexrothUS



www.twitter.com/BoschRexrothUS



www.youtube.com/BoschRexrothUS



www.linkedin.com/company/bosch-rexroth