Press release
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Knorr-Bremse PowerTech at InnoTrans 2018: Innovations boost power supply efficiency

- **New PowerBriX converter generation with silicon carbide (SiC) semiconductors**
- **Power density increased by up to 50%**
- **Complete systems solutions reduce integration effort for vehicle builders and increase reliability and efficiency of on-board power supply**

Munich, September 20, 2018 – At the InnoTrans trade fair, Knorr-Bremse PowerTech, a subsidiary of Knorr-Bremse, the global market leader for braking systems and a leading provider of subsystems for rail and commercial vehicles, is showcasing customized solutions for efficient on-board power supply in rail vehicles.

On-board auxiliary converters supply electrical power for safety functions, on-board restaurants, HVAC systems, power sockets and passenger information displays. With growing demand for greater comfort on trains, the power requirements of individual consumers are also on the increase. “More than any other company in this sector, Knorr-Bremse PowerTech stands for efficient energy supply,” says Harald Schneider, Managing Director of Knorr-Bremse Systeme für Schienenfahrzeuge GmbH. “We use state-of-the-art power electronics, look at electrical consumers holistically, and combine individual components to form complete systems.”

New PowerBriX converter generation
PowerBriX is a prime example of an efficient, modularized, compact power supply system. The example of this new product family on view in Hall 17 (Booth 208) and Hall 1.2. (Booth 106) is based on the latest silicon carbide (SiC) power semiconductors. In combination with an optimized system architecture, this has increased power density by some 50% compared with previous product generations.

The background: SiC power semiconductors enable higher switching frequencies, resulting in lighter and smaller magnetic components and ultra-compact on-board converters. The unit on display at InnoTrans is 30% lighter than its predecessors and some 35% smaller. PowerTech has deployed this technology for the first time in the power class up to 55 kVA and 750 V DC input voltage – ideal for use in light rail vehicles and metros.

The PowerBriX family of converters is based on a newly-developed system made up of standardized, type-tested modules. Within the foreseeable future, PowerTech will be able to cater for all current market requirements. Depending on the particular application concerned, the individual modules can be rapidly and flexibly combined into an overall converter system and configured according to customer requirements. Vehicle builders benefit from a significant overall reduction in the amount of project planning and configuration required.

Vehicle operators also benefit: “The combination of standardization, modularization and ultra-compact design boosts the energy efficiency of the auxiliary power supply and at the same time facilitates maintenance. Both these factors help to save resources across the entire lifecycle,” says Jure Mikolčić, Managing Director of Knorr-Bremse PowerTech.

New plug-and-play DC power management system

In Hall 17 (Booth 208) PowerTech is also showcasing its new DC power management system. This combines formerly separate components – battery charger, vehicle battery and DC power supply – into a single compact and efficient system that also controls and monitors the DC on-board power distribution.

“The vehicle builder calculates the required capacity and we look after integration and interaction of the components,” explains Mikolčić. The pre-assembled, pre-tested units are then supplied on a just-in-time basis to the vehicle manufacturer’s assembly line, where the engineers merely have to attach the bracket to the vehicle, connect up the energy supply and plug in the various consumers. “Combining these elements into a plug-and-play system considerably simplifies the previously complex vehicle integration process,” adds Mikolčić. The system is scheduled to go into regular operation on the London Elizabeth Line and London Overground trains by the end of this year.

New, decentralized power supply LITE

The new power supply system LITE (Light Integrated Train Energy) uses additional power inverters with variable voltage and frequency (VVVF) output to precisely match the energy requirements of consumers with high power consumption rates such as HVAC systems or compressors.

LITE supplies the inverters of the individual consumers via its own 680-volt DC on-board power network. This enables the number of power conversions to be reduced. “It means we have been able to reduce the hardware components of both the central auxiliary power converter and the individual consumers,” explains Mikolčić. This significantly improves the system’s reliability and the energy conversion efficiency – and also has a positive effect on the vehicle’s environmental impact and life-cycle. In a six-car metro train, for example, it enables transformation losses to be reduced by up to 30%. LITE is currently undergoing extensive field-testing on a Chinese metro.

Bildunterschrift 1: The new PowerBriX converter generation increases power density by up to 50%. | © Knorr-Bremse

Under the Knorr-Bremse PowerTech brand name, the Knorr-Bremse Group offers an extensive portfolio of power supply systems. At six sites on four continents, more than 500 employees develop and produce cutting-edge solutions for a range of functions related to power conversion. The Knorr-Bremse PowerTech portfolio includes converters and electrical equipment for rail vehicles, power generation and energy storage systems, various industrial applications and highly dynamic engine and transmission test benches.

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