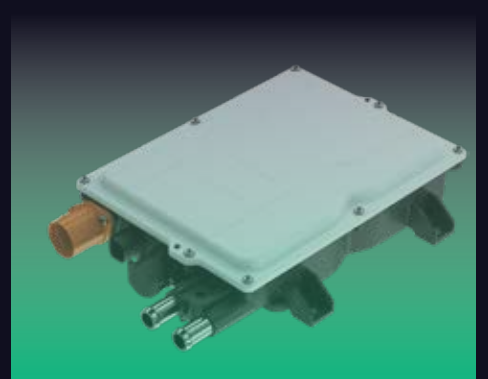




eLION

Electrification of Off-Highway Machinery



rexroth
A Bosch Company

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eLION Solutions

A solutions based approach to electrification of off-highway machinery. Each component perfectly pairs with one another to provide a simple and comprehensive approach for electric and hybrid conversion as well as new machine builds.

- Functional safety
- Wheel-driven solutions
- Axle-driven solutions
- Implement and Sytronix solutions
- Perfectly-paired solutions

eLION Portfolio

The eLION portfolio offers a comprehensive range of components designed to electrify off-highway machinery. Each component is engineered for high efficiency, robustness, and easy integration, ensuring optimal performance in demanding environments.

- eLION Motor
- eLION Inverter
- eLION Gear Technology
- eLION Onboard Charger
- eLION DC/DC Converter
- eLION Cables

2

eLION Services

Just like our traditional hydraulic solutions, Bosch Rexroth offer a complete EV solution that includes engineering, training and commissioning.

- Engineering
- Training
- Commissioning

3

Products



Lorem ipsum

eLION Electric Motor

The eLION Electric Motor range are permanent magnet synchronous reluctance motors (PMSRM). There are currently over 80 motor variants available for both low & high-power applications that are both modular and scalable. Two popular variants are listed below. For additional applications, contact our eLION expert team.

	EMSI 1-10		EMSI 1-20	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit
Power Range	7	74	72	229
Torque Range	33	343	735	2,520
Speed Range	0 rpm	12,000 rpm	0 rpm	10,500 rpm
Operational efficiency max	>96%			
Ambient Temperature Range	-40oc	>+100oc	-40oc	>+100oc
Protection Class	IP6K7 & IP6K9K			

Products



eLION Electric Inverters, On Board Charger and DC Converter.

The eLION Electric Inverter is a pulse-width modulation inverter for motor & generator operation. Compact and modular in design for ease of power scaling, it perfectly pairs with the eLION motor range. 2 other inverter sizes will be available for market shortly.

The on board charger is galvanically insulated and the converter is widely compatible with various off-highway vehicles, making them a perfect pairing for our range of motors and gearboxes.

	Inverter EDS1		On Board Charger EOBC1		DC Converter EDCC1	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit
Operating Voltage	270V	800V	240 VAC @ 80amp	415 VAC @ 32amp	350V	890V
Nominal Output	15kw	200kw	19kw	22kw	12v @ 250amp	24v @ 143amps
Safety Functions	According to ISO 13849 and ISO 25119					
Comms	Electrical safety according to EN 61800-5-1					
Cooling	Nominal temperature ranges of -35 °C to +65 °C					
Software	Onboard PCL IEC61131-3, CODESYS V3					

eLION Power, Encoder, and Engineering Cable

Contact Bosch Rexroth to discover our range of eLION cables.



Products

eLION Electric Gearboxes

eLION Electric Gearboxes are designed for wheel and axel-driven mobile solutions. Our compact and space saving three-or-four-stage planetary gearboxes were engineered to suit high-speed electric motors (eLION motors). They are available in a range of sizes depending on the off-highway vehicle type and requirements.



	1-Speed Spur Gear Drive ROTATRAC eGFZ9115 Series 10	1-Speed Spur Gear Drive ROTATRAC eGFZ9125	2-Speed Spur Gear Drive ROTATRAC eGFZ9275	1-Speed Spur Gear Drive ROTATRAC eGFZ9175 Series 10
Gear Ratio	2.5...3.78	4...6	Multiple Variants	Multiple Variants
Max. Output Torque	2000 Nm	3800 Nm	7650 Nm	3175 Nm
Max. Input Speed	16 000 min ⁻¹	16 000 min ⁻¹	14 000 min ⁻¹	10 500 min ⁻¹
Continuous Performance	100 kW	120 kW	180 kW	180 kW
Ambient Temp. Range	-20 °C to +70 °C			
Cooling	Water glycol mixture / optional oil			Water glycol mix
Oil Pump	Integrated			
Heat Exchange	Integrated			

Solutions

Perfectly-paired solutions adapted to market standards, seamlessly fitting to various off-highway vehicle types.

Functional Safety

- ▶ According to ISO 13849-1, 25119 and 19014 for off-highway machinery
- ▶ Safety level up to Category 3, PL d and AgPL d
- ▶ Fast local reaction time (< 5 ms)
- ▶ Safe torque off, communication, local I/O, and actual values
- ▶ HV Interlock

Wheel-Driven Solutions

- ▶ Compact 3 or 4 stage planetary gearbox
- ▶ Integrated static, hydraulic operated parking brake
- ▶ Output torque up to 42,000 Nm
- ▶ Designed for high-speed electric motors
- ▶ Optional mechanical disconnection

Axle-Driven Solutions

- ▶ 1 and 2 speed gearbox (dropbox)
- ▶ Max. output torque up to 7,650 Nm
- ▶ Fast and smooth shifting (<< 1 sec)
- ▶ Designed for high-speed electric motors
- ▶ Minimum installation effort and flexible alignment

Implement and Sytronix Solutions

- ▶ Direct pump and motor coupling
- ▶ Standardized pump interfaces according to SAE J744 and ANSI B92.1
- ▶ Variable displacement
- ▶ Pressure, power, and flow control
- ▶ Single- or multiple-pump assemblies

Perfectly-Paired Solutions

- ▶ Electric components paired perfectly with one another
- ▶ Protection class up to IP6K9K
- ▶ Compact and modular for power and torque scaling
- ▶ Wide range of power (up to 200 kW) - perfect for many vehicle functions
- ▶ CAN J1939 interfaces



Service

Services offered, in addition to components and systems, to assist you in all steps of electrifying your off-highway vehicle.

Engineering



- ▶ **Components with Optimized Off-Highway Technology:** Utilizing advanced technology tailored for off-highway applications to enhance performance and efficiency.
- ▶ **Customized Solution Layouts:** Offering bespoke designs to meet the specific requirements of each vehicle, ensuring optimal integration and functionality.
- ▶ **Software Functions Adapted to Each Vehicle:** Developing and implementing software solutions tailored to the unique needs of different types of vehicles, enhancing control and performance.

▶ **Component and System Use Instruction:** Detailed training on the proper use of each component and system, ensuring users can operate the equipment effectively and safely.

▶ **Component and System Maintenance Instruction:** Guidance on the maintenance of components and systems to ensure longevity and reliability, reducing downtime and repair costs.

Training



- ▶ **Component Installation:** Expert assistance in installing components correctly to ensure they function as intended.
- ▶ **System Testing:** Rigorous testing procedures to verify that the systems are working properly and efficiently before full deployment.
- ▶ **System Calibration:** Fine-tuning systems to ensure they meet the required performance standards and operate within specified parameters.

Commissioning



BODAS

Open, scalable and easy accessible mobile electronics platform consisting of control units, connectivity devices, sensors and human machine interfaces (joysticks, displays, pedals) for mobile machines. Individual BODAS Hardware components are freely programmable and ready for BODAS Connect.



Controllers

The controllers are a state-of-the-art, automotive technology based, scalable, and pin-for-pin compatible platform, ready to be programmed with your application solution.

Sensors

We provide a comprehensive sensor family, offering an innovative portfolio with the highest accuracy over the lifetime of your machine, ready for use in various safety applications.

Human-Machine Interfaces

Our HMI portfolio includes displays, EH-joysticks, and pedals. All components are harmonized with the BODAS ecosystem to ease integration into your machine.

Telematic Control Unit

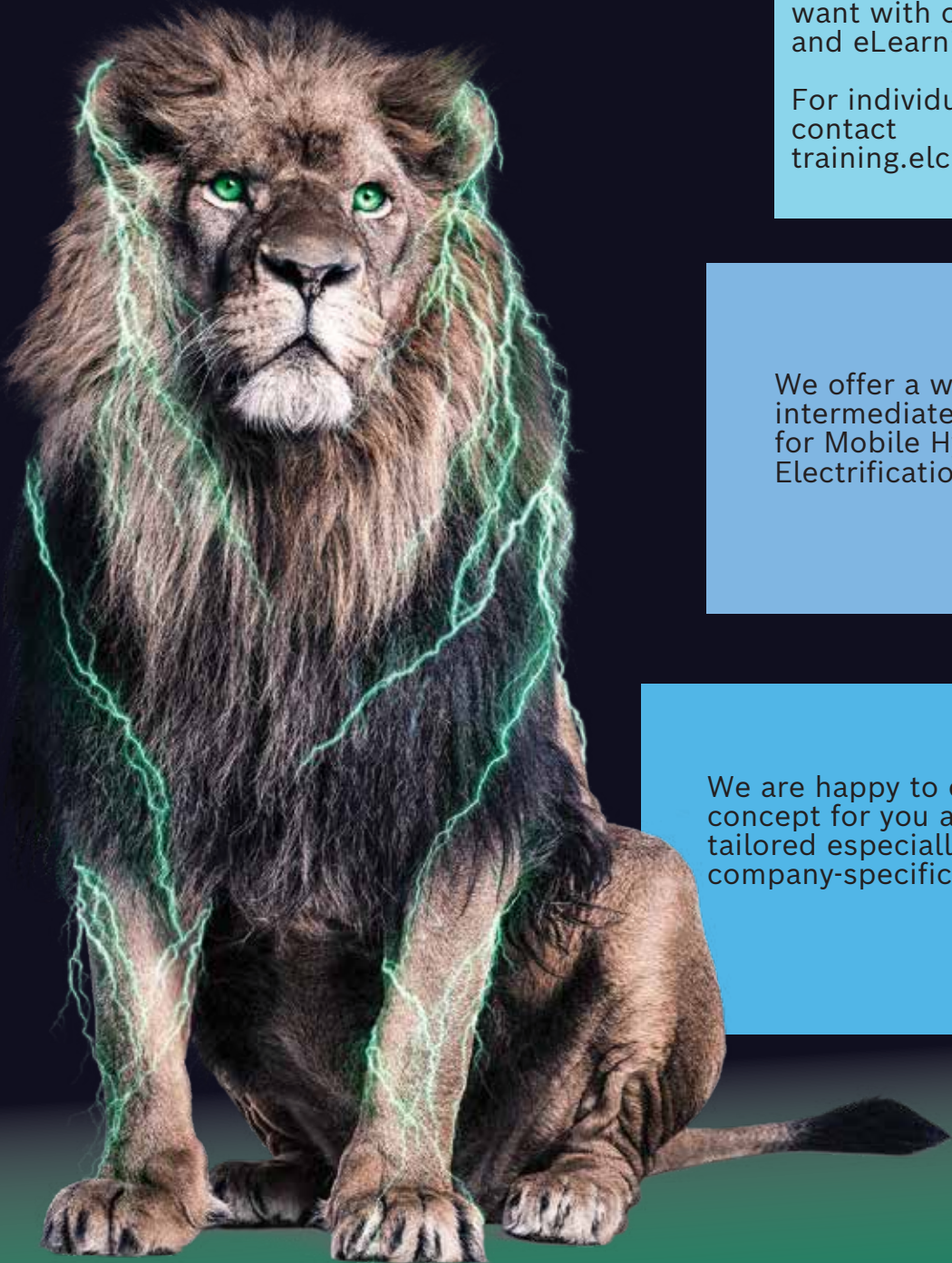
Connect your machines to the Bosch (or any other) IoT infrastructure. Based on micro-processor technology with a Linux operating system, these units ensure flexibility and readiness for future requirements.

Surround Sensing

Offers sensor-supported control of the environment for assisted vehicle movement and operations.



Training



Online training

Learn whatever, wherever, whenever you want with our variety of live online trainings and eLearnings!

For individual online trainings please contact training.elchingen@boschrexroth.de

Standard training

We offer a wide variety of basic, intermediate and advanced training courses for Mobile Hydraulics, Electronics and Electrification!

Individual training

We are happy to create a personal training concept for you and your employees that is tailored especially to your applications and company-specific needs.

Training

Mobile Electronics

Electronics in mobile applications psum

This training course is intended to provide experienced and new employees with insights into the electrification of hydraulic applications and systems. You will become familiar with the components used. Handling project planning tools and application software will be presented.

Introduction to the CAN standard SAE J1939

The CAN bus is a serial communications technology, which is increasingly used for the reliable exchange of data between electronic control units in mobile working machines. This training course will provide basic knowledge regarding the CAN standards SAE J 1939 as well as the related evaluation software.

Electronic drive control eDA

You will be introduced to the eDA electro-hydraulic system and gain practical experience with the components and application software. By using BODAS-service a drive control solution will be configured. You will test your configuration in a test environment.

Programming of series 40 RC controllers with C

In this training course, you will learn how to develop the application software and the service app for the Rexroth controllers of series 40. You will also learn how they can be flashed onto the control units

Programming of series 40 RC controllers with CODESYS

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BODAS-service 4.0 flash and service tool for controllers of the series 40

This training course is intended to show you how to work with BODAS-service for Rexroth controllers of the series 40. You will learn how to load a software onto a controller. By means of examples and exercises, you will learn about the parameterization, analysis, troubleshooting and guided commissioning with RC control units of series 40.

Training

Mobile Electronics

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Practice day –Electronic drive control eDA

This training course addresses how to parameterize a wheel loader. Once a parameters file is created, it will be uploaded to a control unit, installed in a wheel loader. By extensive tests, the operation will then be optimized.

Electronified open circuit–eOC pump control

You will explore the eOCelectro-hydraulic system, gaining hands-on experience with components and application software. Using BODAS-service, you configure a drive control solution, test it in a simulation model, upload a parameter file to a control unit, and optimize the interaction between application software and the hydraulic pump on our test bench.

Training

Mobile Electronics - eLearnings

Functional safety in electronic control units of mobile hydraulics systems

In this eLearning course, you will learn the basics of functional safety with respect to mobile work machinery. The structured procedure “10 steps to performance level” will help you to implement the resulting requirements according to the standards DIN EN ISO 13849, ISO 25119 and ISO !

IoT solutions for mobile working machines

In this eLearning, the characteristic challenges in IoT for mobile machines will be explained from a technical perspective. You will learn about the most important IoT elements and experience them live.

Electrification

eLION Basics –Electrification of mobile applications

Rexroth offers solutions with coordinated hardware and software for electrification of mobile off-highway machines. In this eLearning, you will learn the basics of electrification and the used components.

BODAS controller series 40 - Development environment

The eLearning course is intended to enable you to work with Rexroth controllers of the series 40. A hardware overview and a comparison to series 30 are included in the training. You will receive insights into the ecosystem of the RC40 series and the necessary tools.

Training on the machine in the TechPark

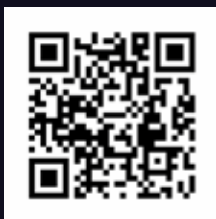
Commissioning of electro-hydraulic hitch and auxiliary valves for tractors

This training course provides knowledge about the setup and function of the Rexroth Software EHC40 in tractor applications. The control of electromechanical and CAN controlled hitch valves and CAN controlled auxiliary valves will be learned at the tractor directly. Self-guided practical exercises reinforce learning content.



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Learn more here

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