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Printed in Germany
HL 12056984 176806 WS 07120.5
Dispo 21715 c4bs 1429
Order no.: A19100-V620-B126-V1-7600

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The information in this document contains
general descriptions of the technical options
available, which do not always have to be pres-
ent in individual cases. The required features
should therefore be specified in each individual
case at the time of closing the contract.

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Components and systems for advanced rail vehicles

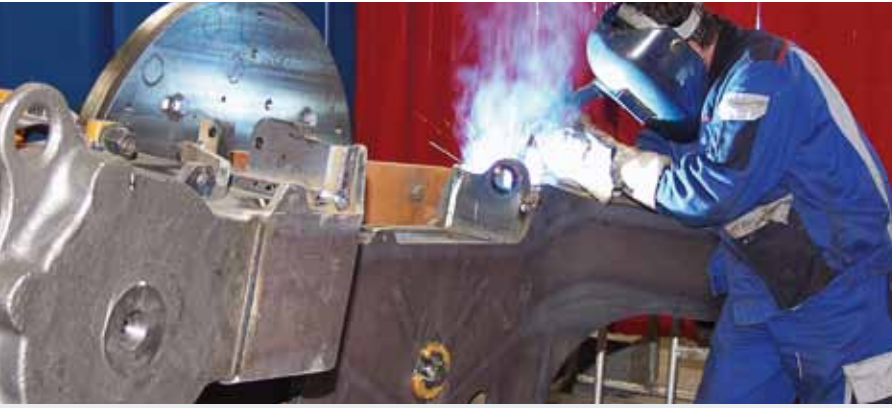
World-class portfolio from electric traction to bogies

Combined know-how

Expertise that gets you ahead

Bogies, converters, drives, controllers, and on-board power supply systems are the heart of every rail vehicle. Whether it's multiple units, locomotives, metros or trams, only highly reliable, energy-efficient, low-maintenance components can perform traction operations to our customers' full satisfaction.





As the inventor of electric traction and as a rail vehicle manufacturer with over 130 years of experience, we know this better than anyone. We are also in the best position to know your requirements, which is why we offer proven, energy-efficient components that you and your customers can rely on right from the start – today, tomorrow, and beyond. Take advantage of the comprehensive component expertise of a first-class, experienced supplier. Our product portfolio covers the entire range, from electric traction systems to bogies.

Systems from a single source

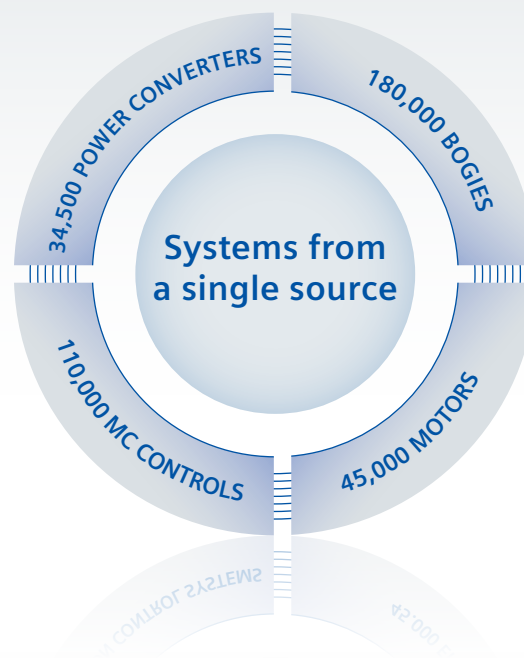
We offer you innovative and reliable system solutions for drive, bogie, and on-board power converter technology as well as vehicle control systems from a single source of supply. Our solutions are perfectly coordinated and tailored to meet your specific requirements. From complete and partial systems to individual components, we supply it all – and with no interface problems. As your partner, we are with you every step of the way, from the design phase to commissioning, homologation and after-sales service.

Drive and control technology from the experts

At Siemens, development, design and production go hand in hand. We develop and manufacture motors, converters, and control systems for rail applications at our plants around the world, and we test every component thoroughly before delivering it for use in vehicles worldwide. Such close cooperation ensures quality and flexibility – flexibility, that even allows us to adapt service proven technologies to customer-specific requirements. The results are individualized, tried-and-tested solutions tailored to your traction needs.

Worldwide competence in bogie technology

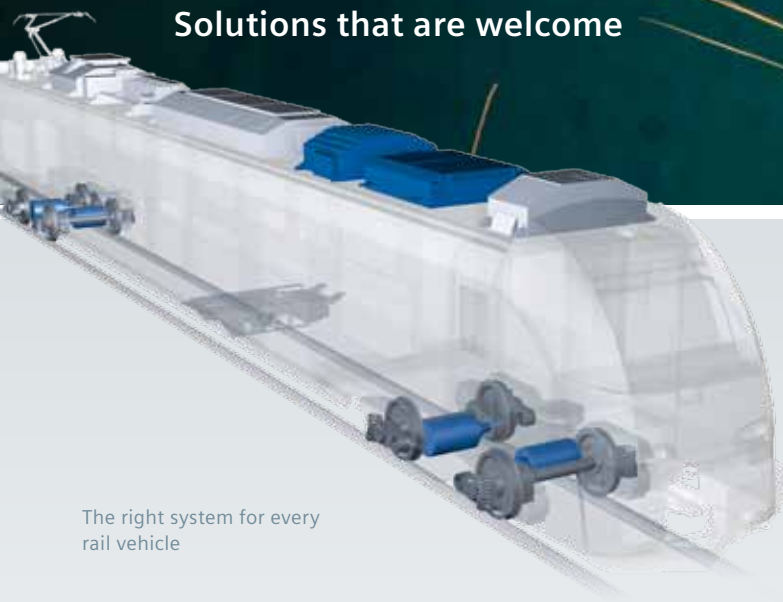
Our center of excellence in Graz is one of the largest development and production facilities for bogies in the world, with a production capacity of up to 4,000 bogies per year. Our ability to produce such enormous quantities is primarily due to the extremely high degree of automation in production, which guarantees the highest quality – a level of productivity that also benefits our customers and allows us to offer high-volume production of our components. The same applies to our series-produced spare parts, greatly reducing the life cycle costs (LCC) of a vehicle.



World-class components for over 130 years

Custom-fit portfolio

Solutions that are welcome



The right system for every rail vehicle

Traction converters and control systems

We offer compact, highly-developed traction converter technology with high availability and optimum efficiency in all typical voltage classes and cooling configurations. Thanks to our expertise and our extensive experience in technically sophisticated, complete vehicle projects at Siemens, we can also reliably implement complex multisystem solutions. Our proven Sibas control system with Sitrac drive control is always on board, providing perfect slip and slide protection even without a speed sensor.

Drives and traction motors

Whether for individual traction motors or complete drive trains including coupling and gearbox, we design an optimum solution for you from our broad portfolio of proven drive components. We can provide all standard gear configurations and cooling media, depending on the service conditions. In addition to conventional AC induction motors, we also offer innovative permanent-magnet synchronous motors, including gearless direct drives.

Bogies

Bogies from Siemens offer an attractive combination of high operating safety, quiet operation, a very high rate of reliability and low life cycle costs (LCC). From the very start, our bogies are designed and built on a modular basis, making it very easy for us and for you to adapt them to your specific requirements, as well as increasing the efficiency of every individual solution. If requested, support is provided throughout the bogies' entire service life, including modernization.

On-board converters/power supply systems

Siemens offers customized solutions for all types of on-board power supply systems – both for new vehicles and for refurbishments. Our range of power supply systems is based on the very latest IGBT power semiconductor modules and Sibcos microprocessor controls with precise diagnostics. Used in main line rail traffic, they manage a power range of up to 1,000 kVA and at the same time are suitable for single or multisystem vehicles. The concept includes natural cooling, forced-air cooling, or water cooling. Naturally, special features such as the powering of multiple devices via a shared three-phase busbar can also be implemented. With a parallel power feed, there is no need for the devices to communicate with one another, offering many advantages in terms of availability, power consumption, and price.

Passenger coaches





Multiple units

Locomotives

Metros

Light rail vehicles and trams



Traction converters and control systems



Drives and traction motors



Bogies



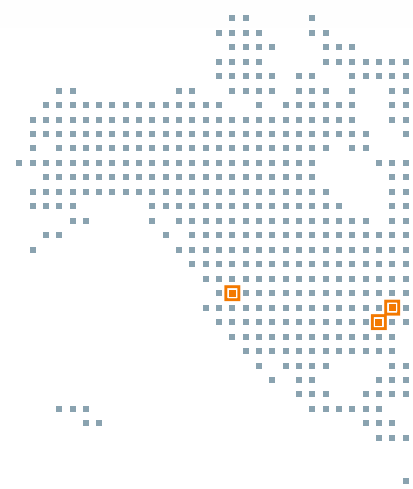
On-board converters/ power supply systems



Continuous innovation

Experience that paves the way

As a single source of supply for market-driven, future-oriented system solutions, we are shaping the evolution of drive technology in rail transportation – and have been for over 130 years. Our experts in Germany and Austria are constantly working on groundbreaking technologies that focus on growing demands for energy and resource efficiency, leading to innovations on the highest technical level.



Production plants around the world

We not only offer drive technology and bogies from a single source, but have production plants worldwide. For you, this means that we also produce all components locally and can thus guarantee fast delivery.

State-of-the-art production methods and processes also contribute to highest quality and on-time delivery.



1879
First electric train



1896
First electric metro in Budapest



1903
Milestone: 200 km/h exceeded



1957
First silicon rectifier



1965
First thyristor chopper

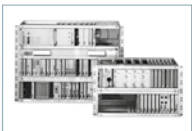


1978
First metro with three-phase drive technology

Innovation is a Siemens tradition



Our headquarters are in Germany and Austria and we manufacture traction products and bogies at 16 production sites all over the world.



1981
First digital micro-processor control with Sibas 16



1988
First GTO chopper used in light rail vehicles



1990
First traction converter with IGBT



1991
First multisystem locomotive with GTO



Today
Sitrans ESM
Air- and water-cooled energy storage modules

The energy storage system enables:

- energy savings through full use of braking energy
- partial or complete operation without overhead lines

