



# Bosch solutions for theaters



When you choose Bosch as a supplier of products and solutions for theaters, you can be assured of cutting-edge technologies from a global provider. True to our company slogan "Invented for life", our products and solutions are designed with our customers in mind. As a leading global supplier of technology and services, Bosch understands that professionals need to be able to rely on their industry partners for technical expertise and innovative thinking.

Bosch provides a comprehensive range of products and solutions for theaters across the world, has a choice of products that are commonplace across the industry requirements, whether it is energy-efficient heating and hot-water systems, building and parking solutions or a comprehensive security system.

### All solutions for theaters

### SAFETY & SECURITY



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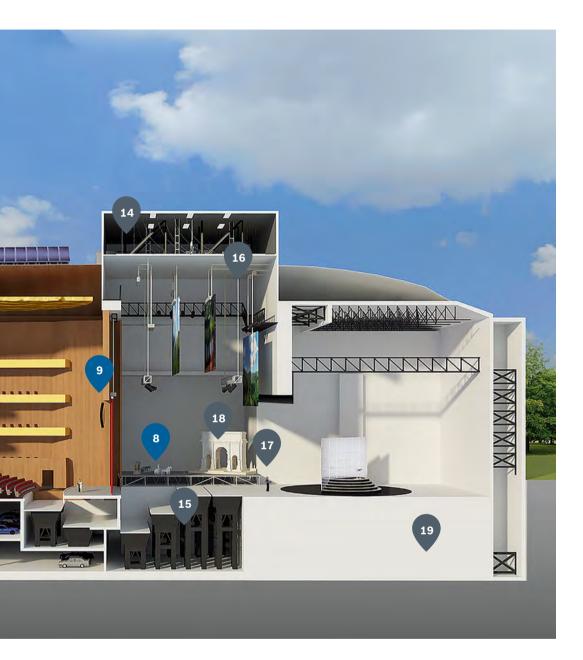


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### Security and life safety

The safety requirements for infrastructures and buildings are increasing worldwide. The goal: People and values are protected as much as possible. Trust the Bosch long-standing expertise in consulting, planning, implementing and operating your individual security and life safety solution.

#### **Benefits**

- Minimize risks, maximize security: no matter what your security task looks like, Bosch offers the best solution for every building.
- + Bosch offers comprehensive services and consultancy for monitoring, maintenance, modernization, and operation as well as attractive and flexible rental and operator models.
- → Bosch assists in all project phases and finds therefore the best solution for you: Planning, realization and operation complement each other perfectly, creating maximum security.

Bosch implements special requirements for a safe, economic, and comfortable building and offers a broad spectrum of services for it: from video surveillance, access control, fire-, evacuation-, and speech-alarm systems, robbery and break-in notification systems via networked time and building management systems, up to energy solutions. As an installer, service provider and consultant, Bosch supports in multifaceted challenges and provides customers with networked and intelligent overall solutions for safety and security from a single source. The Bosch experts have specific industry expertise and create individual solutions with future-oriented products and services that always focuses on the customers needs and requirements.



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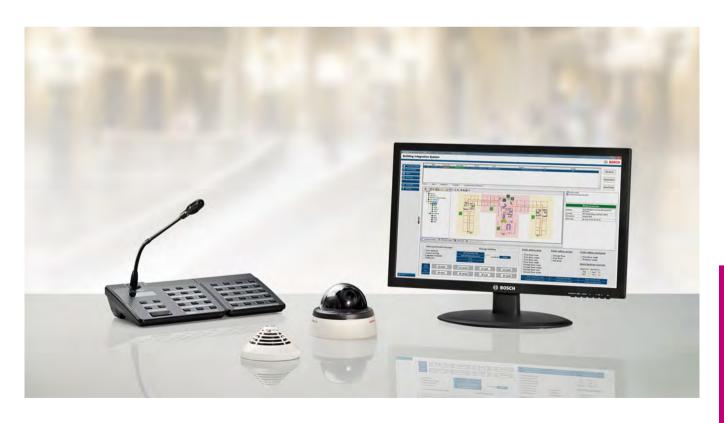
### Fire alarm and voice evacuation systems

The Bosch portfolio covers the most reliable systems that include fire sensors, voice evacuation and control software to quickly locate, detect, verify and to contain fires. The systems are comprehensive, tailor-made solutions for almost any project. They fulfill and even exceed aesthetic standards and market requirements.

Bosch systems can quickly and accurately locate a fire and trigger immediate evacuation. At the same time, advanced technology minimizes false alarms. The public address system allows the operator to guide theatergoers to safety and avoid danger areas. Surveillance cameras can monitor evacuation proceedings and help the authorities coordinate rescue operations. All these systems incorporate high levels of redundancy and can be integrated centrally using the Bosch building integration system to ensure seamless operation under any situation.

#### **Benefits**

- + Superior fire protection with intelligent solutions
- + Advanced public address and voice evacuation systems
- + Solutions range from simple installations to highly complex applications



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### Video systems

In a theater, it's of great importance to maintain an open and inviting atmosphere, yet safety and security must be guaranteed. That's why Bosch offers video security solutions that are built to suit your needs, allowing visitors to have a carefree time while their safety is ensured.



Bosch provides a portfolio of reliable video surveillance products that allow you to keep a welcoming and pleasant atmosphere in your theater. Bosch offers a wide variety of both fixed and moving cameras, different form factors and excellent image quality. Moreover, all cameras as of the IP 4000 series have video analytics at the edge built-in as a standard. This ensures that you are alerted when needed, if potential hazards are identified in the reception area or the entrance driveway. It even goes beyond security, as it can deliver business intelligence. For example, it can count the amount of people going through the entrance during a certain time period.

#### **Benefits**

- + Video analytics built-in as standard as of the IP 4000 cameras
- + Reduce bitrate up to 80% and save storage costs without compromising video quality
- → Integrated hardware and software measures to keep video data secure, such as a built in trusted platform module

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### Intrusion alarm systems

From single applications to extensive projects, Bosch provides solutions that are fully integrated and meet the highest security standards. The Bosch detectors and panels offer a finely-tuned balance between quick response to real security breaches and ignoring costly false alarm triggers.



Theaters have a considerable number of restricted areas such as props rooms, ticket offices, and store rooms. Bosch offers a complete range of intrusion alarm panels and detectors for applications of all kinds. State-of-the-art readers and controllers restrict access to critical areas, buildings, and facilities. All unauthorized access attempts are monitored and can be watched using nearby surveillance cameras. If a detector picks up a possible threat, the Bosch video management system comes into play with high-resolution video surveillance cameras and intelligent video analysis to verify the alarm and enable subsequent forensic searches for identifying and detaining intruders.

- + Portfolio covers panels, detectors, communicators and accessories
- + Scalable intrusion solutions for various needs
- + Reliable intrusion detection with decades of experience

### Access control systems

Flexible access control systems allow workers to get on with their jobs, while protecting staff from uninvited guests and public buildings from property and information theft. Bosch offers integrated systems for many different applications.

Bosch access control systems guarantee reliable access management both indoors and outdoors. State-of-the-art readers and controllers restrict access to non-public areas such as equipment and locker rooms to ensure that only authorized individuals get in. Video cameras located in the vicinity monitor and observe any unauthorized access attempts.

### **Benefits**

- + Complete Bosch access control solution covering software, controllers and a variety of readers and credentials
- + Comprehensive system with many features and possible integration with third-party devices
- + Easy to install and maintain thanks to its modular concept



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### Management software

Bosch management software is specialized in complex enterprise solutions. The management software portfolio covers video and alarm management such as the building integration system or the Bosch video management system. The Bosch building integration system offers a tool box to allow integration with third party applications via open standards (OPC, ONVIF, OSDP) and software development kits.



The building integration system provides a single web-based control point for monitoring all security, safety, and facility management systems. This includes alarm management, fast alarm identification via location maps and follow-up procedures. It seamlessly integrates fire and intrusion alarms, evacuation, access control, video surveillance and building automation systems into a single platform. The building integration system enables a single operator to monitor and control all security systems, as well as to respond faster to emergencies and achieve greater overall effectiveness. The Bosch video management system provides seamless management of digital video, audio and data across an IP network.

#### **Benefits**

- → Seamless integration of all Bosch safety and security subsystems as well as third party applications via SDK and open interfaces
- + Easy to operate, increasing operator efficiency, and allowing for a faster emergency response
- One complete solution to enhance security, including a fully embedded access control

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### Energy services

Global energy consumption is continuously increasing and buildings are the number one consumer of energy. Bosch's energy services contribute to enhance energy efficiency, saving operating costs and reducing the carbon footprint.

With a combination of customized system solutions, services and modern technology, Bosch provides a comprehensive portfolio on energy services. All measures are always perfectly matched in order to save energy and operating costs. The Bosch range of services comprises energy analysis, planning and implementation of supply solutions and efficient long-term operation of energy systems.

#### **Benefits**

- → Increasing energy efficiency, reducing operating costs Bosch develops tailor-made and future-proof energy solutions for buildings.
- + An attrachtive business model ensures that Bosch is a reliable long-term energy partner.
- + Bosch assists in all project phases and can therefore find the best solution for the customer: Analysis, planning, installation and operation complement each other perfectly, creating maximum efficiency.



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## Energy-efficient heating, domestic hot water solutions and cogeneration

Bosch's modular and comprehensive product portfolio provides the optimum solution meeting the specific requirements of theaters. Key benefits of Bosch systems are outstanding efficiency, reliability and innovative control systems.

#### **Benefits**

- Maximum reliability of heating and hot water supply by using different energy sources. Integration of renewable energies for a carbon footprint that sets an example in ecological terms.
- → Intelligent controls balance the different energy sources in the most cost and energy effective way. Secure remote access allows the personnel to monitor the plant anywhere and anytime to make use of the remote support of a Bosch service engineer if required.
- → Bosch's modular product portfolio enables quick installation, low cost of ownership and high reliability. Experienced Bosch experts support along the whole product life cycle – from planning, to commissioning to 24/7 support and remote connectivity.

Modern building complexes comprehend decentral power generation with CHP's. This can save up to 76% on electricity bills and reduces the building's carbon footprint significantly. CHP isolated solutions provide electricity also during power blackouts, e.g. for critical systems, servers, lighting, and ventilation. Surplus heat from the cogeneration is used for heating and domestic hot water. Efficient heating boilers cover peak loads with up to 110% efficiency and are supported by solar thermal systems.



### Energy and building solutions

As a reliable partner, Bosch provides connected and integrated solutions which make buildings safer, more comfortable and more efficient. The Bosch experts support as consultants, installers and service providers. They have an extensive expertise and integrated solutions based on the latest technologies. Bosch offers integrated solutions for building security, building automation and energy services. All of Bosch's services are provided from a single source: from consulting and planning across implementation to operation. This enables Bosch to comprehensively meet the customers' needs. Bosch is active at more than 60 locations in Europe, the U.S. and Asia Pacific, and more than 100,000 customers benefit from experts' know-how.



#### **Benefits**

- → Due to Bosch's long-standing competence, buildings will be made fit for the future with a targeted approach and experienced staff.
- → Short distances, competent teams and local contacts ensure professional consultation, optimal project implementation and long-term on-site support.
- → Bosch offers integrated overall solutions and attractive financing and operating models, are optimally tailored to every individual requirement.

Scarce resources, climate change, urbanization, demographic shifts, digitalization, and demands for greater quality of life the mega-issues of our time require major changes in the infrastructures and commercial buildings. The need for security, efficiency, and comfort is rising, as well as the demand for connected overall solutions. The Internet of Things is opening up many new possibilities and opportunities. Connectivity is bringing scores of new developments! One of it is that key areas of building services will be closely interconnected in the future. Leveraging and applying all the synergies in a sustainable way requires an integrated approach and course of action. Bosch has the essential areas of expertise needed to integrate all key aspects into a single solution. Bosch is focused on a clear vision — to be the number-one choice for the technologies and services that make buildings more secure. more comfortable and more efficient.

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### Professional power tools for trade and industry

A craftsman puts his heart and soul into his projects. Expectations are high: client requirements, appointments and construction challenges. That's what drives a professional to maintain high standards, deliver the best possible result and work with uncompromising efficiency. For that, skills and robust tools are needed. Bosch Professional offers the best support with innovative technologies and smart solutions. From planning and organizing to successful completion, Bosch provides an intelligent range of products and services with the quality to rely on.

Bosch professional power tools are engineered for excellence, meeting the highest standards in speed, precision and robustness for consistent, professional results. Therefore, Bosch Professional Power Tools is a competent partner for all craftsmen.





As one of the world's leading manufacturers of power tools and accessories, Bosch offers professionals virtually every tool they could ever need, from state-of-the-art lithium-ion cordless (battery-powered) to class-leading corded products. Bosch Professional Power Tools focuses on providing the trust a craftsman relies on when it comes to his tools and accessories.

Bosch power tools is consistently expanding its expertise in connected measuring and power tools for professionals: from 2017 onwards the new tools are available for trades-people, from laser measures with integrated Bluetooth modules to angle grinders, lights and drill drivers.

With these tools, Bosch is driving the trend of digitization and is offering professionals a system, from products to inventory management, that optimizes processes and enables all tradespeople to work more efficient.

#### **Benefits**

- + Bosch provides services and consulting for all professional power tools and measuring tools beyond the legal warranty period. From online information to a dedicated team of trained customer service personnel.
- + Bosch ensures an excellent availability of spare parts and a fast turnaround time for warranty and chargeable repairs.

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Solution provided by: Bosch Power Tools

### Professional sound

Incorporating the latest technologies for fixed installation and live sound applications proven at the highest level, our professional systems portfolio offers excellent audio quality and user-friendly operation. The Bosch portfolio includes innovative sound solutions, using state-of-the-art engineering and design, such as loudspeakers, amplifiers, digital signal processors, control and supervision software.

### **Benefits**

- + Loudspeakers, amplifiers, digital signal processors, control and supervision software for excellent audio quality
- + Innovative sound solutions using state-of-the-art engineering and design
- → Networked IP-based intercom system solutions, scalable for applications of all sizes

Powerful, clear sound is often underrated as an important factor for creating a good atmosphere and unforgettable moments for the audience. EN-certified one-stop solutions from Bosch meet all security, safety, and communication requirements for theaters. Electro-Voice and Dynacord professional sound reinforcement systems provide a full range of highly specialized equipment including microphones, amplifiers, signal processors, and speakers. RTS intercom systems secure flawless communication between the stage manager and the crew.



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### Automated valet parking

As a pioneer of automated mobility, Bosch has developed a driverless system that employs connected technology to save drivers not just the wearisome search for a parking space, but also the parking maneuver itself. Thanks to automated valet parking, every experience begins more convenient – whether it's flying off on holiday or going to a concert. Therefore, the driver simply drops off the vehicle at the drop-off area. Then the vehicle will be navigated to a free parking space with the help of the intelligent sensor technology.



Automated valet parking is made possible by combining the intelligent sensor system supplied by Bosch with the automotive technology. The sensors, guiding the vehicle, are installed in the parking garage monitor, the driving corridor and its surroundings. Hereby, Bosch provides the system for both the parking provider and the car manufacturer.

The usage of the intelligent parking garage sensor systems automated driving. The intelligent infrastructure allows mixed traffic of automated and manual driving vehicles and passengers in the parking garage, hence, allowing an incremental implementation of automated valet parking vehicles.

#### **Benefits**

- + Automated valet parking offers the car driver comfort and saving of time, as the vehicle takes over the driverless parking maneuver itself. Meanwhile, the driver can already proceed to his destination. Getting in and out of the vehicles takes place in comfortable and safe transfer areas. In addition, precise automated guidance eliminates the risk of incidents and damages while parking.
- → Automated valet parking increases efficiency due to the optimization of the parking garage capacity. The premium service opens up a range of additional potential service offerings, like a car wash, which excites the customers. The infrastructure based approach allows mixed traffic in the parking garage.

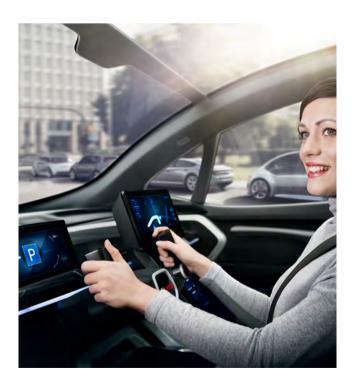


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### Community-based parking

With community-based parking Bosch simplifies the search for free parking spaces in the cities. Thereby, car drivers will be navigated straight to the next free parking space. This happens with the help of the ultrasonic parking sensors of the cars which detect free parking spaces on the street. The received information will be processed in the cloud and provided to drivers seeking a parking space.

Community-based parking includes drivers actively seeking a parking space, as well as those who are simply making their way around the city. The transmitter vehicle identifies empty parking spaces on the street as it drives past them. This data is anonymized and sent to the cloud. There, it is collected, aggregated, and processed further into digital parking maps. Based on the processed data, the receiving vehicle is given precise information on where free parking spaces are. The required connectivity hardware and the ultrasonic parking sensors of the car are already widely spread and facilitate a realization of community-based parking based on the latest technology.



**bosch-mobility-solutions.com**Solution provided by: Connected Mobility Solutions



- → Thanks to community-based parking the traffic of searching for parking spaces decreases significantly. In addition, the environment benefits from the direct and shorter drive to a free parking space.
- + Community-based parking enables car drivers to drive directly and relaxed to a free parking space. Thereby, the drivers save time time. Furthermore, the on-board instruments indicate specific parking spaces (e.g. E-charging stations or disabled parking spaces).

### Upper stage machinery

State-of-the-art and bespoke technology for maximum safety and flexibility – this is what characterizes Bosch's solutions for upper stage machinery. The drives enable high dynamic movements as well as reliable smooth and safe behavior in all kinds of operation modes. With the new load limiter, safety for man and machine can be significantly increased.



Bosch Rexroth has previously installed all kind of upper stage machinery, ranging from single shaft hoist to installations with over 200 point- and bar-hoists. Electromechanical drives have been established as standard, also at Rexroth. However linear drives still play an essential role. No other technology is more appropriate than hydraulics when safety problems are really taken care of seriously. The load limiter reduces the forces during emergency stops. This provides additional safety and highly dynamic machines can even be retrofitted in buildings whose structure is not designed for this purpose. In the variable version, the load limiter can even limit accelerations at lower loads, particular suitable for performer flying applications.



- + High dynamics combined with the highest safety standards
- + Modular and compact winch design with low weight
- + High reliability and availability

### Lower stage machinery

Bosch offers bespoke lower stage machineries adapted to the customers' requirements. Besides the platform and transport systems, the portfolio also includes in-house developed trap lifts and turntables. With regard to drive technology, Bosch always offers the most suitable solution. In addition to the electromechanical drive systems, Bosch is the only stage technology supplier providing hydraulic and electrical drives from our own production.





Hydraulic drive systems are powerful, quiet, compact, reliable and safe. As they are generally smaller than electromechanical drives, they offer significant space savings. Moreover, hydraulic drives can execute highly dynamic movements with high loads silently and with astonishing smoothness without any limitation in safety. Only hydraulics enables controlled and smooth braking even in case of power failure.

Depending on the application, established as well as innovative electromechanical drives are also used. In-house developed systems such as turntables, stage wagons and trap lifts are assembled, tested and approved in our own factories.

#### **Benefits**

- + Customized and bespoke solutions with hydraulic and electro-mechanical drive systems
- + Highest safety standard without making any compromises
- + High reliability and availability

#### boschrexroth.com

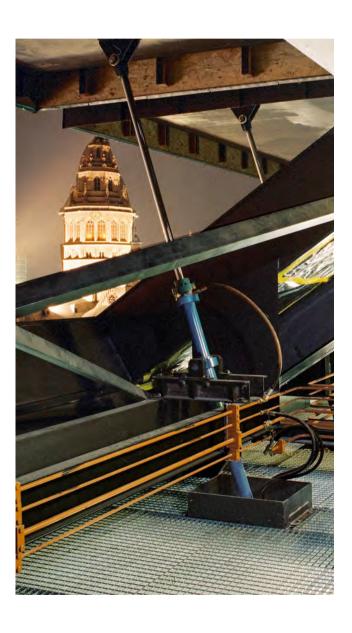
Solution provided by: Bosch Rexroth

### Safety installations

Safety Installations in theater applications are mainly related to fire protecting and fire-fighting issues. Devices such as smoke hatches, smoke vents and fire curtains represent the basis of a comprehensive safety concept in opera houses, theaters, convention centers and all kinds of venues.

The fire curtain is not a simply fire protection door, but a fire wall replacement. It separates the stage area from the auditorium by creating individual fire zones in order to prevent the fire from spreading into other parts of the building and thus ensuring a safe escape of the spectators. Smoke vents and hatches are also part of the venue's safety strategy. They are installed in the upper part both in the stage tower and in the auditorium. They will be opened automatically in case of overpressure caused by fire. It is common use to operate safety devices hydraulically or electro-mechanically in combination with hydraulic components due to reliable emergency behavior, particularly in case of power failure.

- + Designated control system for all safety devices along with emergency release panels for the fire inspector.
- + Smooth and 100% reliable operation of safety devices in all kinds of operating and emergency cases.
- + Protection of human beings, technical equipment and the building.



### Stage control systems

SYB 3.0 – Bosch Rexroth's latest generation of stage control systems combines innovation and safety functions (SIL3) with over 40 years of experience in stage automation. The system supports the synchronization of up to 200 axes possible. In particular SYB 3.0 offers the possibility of programming, simulating (3D) and archiving individual movement sequences for an unlimited number of cues and complete performances.

Real-time-communication via SYBNet improves the bandwidth and allows connection of up to 700 drive units and 16 control panels. 22" multi-touch SCIV control panels with intuitive operation guarantees an easy way of working. More than 20 safety functions as well as additional anti-collision features are implemented in our control system. During programming, collision control feature already indicates hazardous Situations and warns the operator prior to the execution of a cue. Tailor-made user interface based on the customers' needs, for instance bar chart layout or complete upper and lower stage topographies.





### **Benefits**

- + High availability due to two-channel axis processor and star layout network. Silent and maintenance-free thanks to fanless cooling concept.
- + 22"multi-touch screen with gesture control and full HD resolution.
- + Safety Integrity Level 3 (SIL 3) in accordance with EN 61508. 21 certified safety functions. Collision Control. Fast remote diagnostics via a secure Internet connection.

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Solution provided by: Bosch Rexroth

### Special sets

Sophisticated scenery that cannot be accomplished solely with the permanently installed stage machinery often forms the highlight of theatrical productions. Such sets inevitably require comprehensive system solution capabilities combined with profound application know-how. Integration of non-standard applications in standardized and safety optimized control system is the demanding challenge.



Based on the results of a risk assessment, Bosch Rexroth develops suitable, cross-technology solutions as well as a high degree of functional safety. Drawing on our extensive experience and wide-ranging know-how we combine your ideas and the technically necessary requirements in a customized system. The adaptable drive technology from Rexroth offers the ideal solution. Thanks to the low noise level, special decorations can be moved without interrupting the performance. The movements are carried out smoothly and without jerks.

- + Comprehensive system solutions with many features and options for integration with third-party devices.
- + Risk assessment results are incorporated into the mechanical design and implemented in the control system.
- + Applications range from simple installations to highly sophisticated solutions.



**boschrexroth.com**Solution provided by: Bosch Rexroth

### Hydraulic power supply

Supply, storage and availability of energy in all operation and emergency cases give the operator the opportunity to cope with all conceivable situations. Especially while using hydraulic actuators the energy being needed to serve defined duty cycles can be easily stored in optimized accumulator stations. Even in case of complete failure of energy supply a complete duty cycle can be executed.



Energy efficiency lowers operating costs and reduces carbondioxide emissions. That helps to protect the environment. Bosch Rexroth systematically develops energy-efficient solutions for all drive technologies and thus creates an overall potential for economic savings and ecological sustainability.



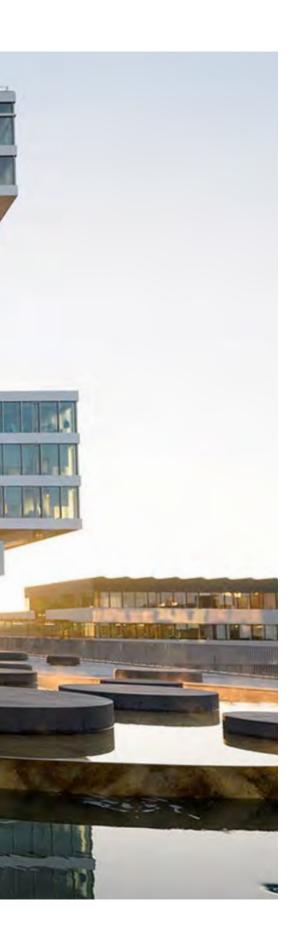
### **boschrexroth.com**Solution provided by: Bosch Rexroth

- + High dynamics with smooth and precise movements, especially at high loads and high speeds
- + Centralised power supply based on a hydraulic power and accumulator station. High power density of hydraulics only require small spaces for installation.
- + High energy efficiency resulting in reduced operating costs.

### Bosch divisions for selected verticals

	셈 Airport facilities	15 Automotive industry	Commercial buildings	Entertainment facilities	Food and confectionery industry	हुँ 🏢 Hotel facilties	Mining Mining	Pharmaceutical industry	Railways and train station facilities	Residental buildings	Theaters
PROVIDER											
<b>Building Technologies</b>											•
Thermotechnology											
Power Tools											
Household Appliances											
Service Solutions		•									
Connected Mobility											
Rexroth											
Automotive Aftermarket											
Packaging Technology											
Smart Home											
Software Innovations											
Bosch Engineering											
Integrated Solutions											





### The Bosch Group

The Bosch Group is a leading global supplier of technology and services. Its operations are divided into four business sectors: Mobility solutions, industrial technology, consumer goods, and energy and building technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected manufacturing. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life". The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 120 locations across the globe, Bosch employs a huge number of associates in research and development.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861-1942) as "Workshop for Precision Mechanics and Electrical Engineering". The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant up-front investments in the safeguarding of its future. Ninety-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.

More information is available online at www.bosch.com www.bosch-press.com

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