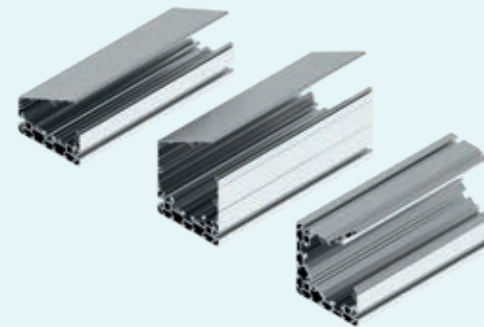
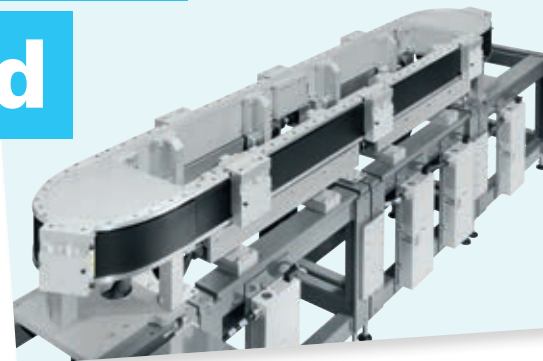


# Assembly technology modular, ergonomic, connected



# Assembly technology by Rexroth – everything you need for efficient production



**WE MOVE.  
YOU WIN.**



## ASSEMBLY TECHNOLOGY OVERVIEW

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# Use us to take the lead – as soon as tomorrow

**When it comes to driving, controlling and moving, companies around the world rely on Rexroth's expertise. A one-of-a-kind, comprehensive range of inter-connecting technologies, the key role in Industry 4.0 solutions and in-depth industry expertise have made us the leader in numerous sectors.**

**i4.0**  
CONNECTED  
INDUSTRY



**However, close partnerships with our customers which are based on mutual trust and transparency in all processes are much more important to us. This is how we take the lead together.**



Everything we do is aimed to meet the specific requirements of our customers. In cooperation with our partners, we support you in designing and planning ergonomic and efficient assembly systems to ensure lean production. Whatever the application area, we always work together with you to find the most practical and future-proof solution – from tried and tested standard designs to a customized, fully connected high-end system that can still be modernized and scaled or connected to new data structures, even after many years.

We think in terms of integration and interconnectability. We act with focus on solutions, performance and results. Flexibility, energy efficiency and sustainability are decisive factors in our forward-looking strategy.

#### **Transportation solutions for all requirements**

With our versatile assembly technology, we develop sustainable solutions to meet your particular needs, drawing from our years of extensive experience in production across a wide range of industries. You benefit from the advantages of our unique, comprehensive product range of components for driving, controlling and moving.

What's special about our approach? Every technology used interacts perfectly across the system thanks to its integrated applications – from the electric drives and controls to the hydraulics, down to the linear motion and assembly technology. Only Rexroth offers this kind of complexity, allowing our customers to always take the lead, anywhere.

# Perfect for your requirements – anything is possible

**Product life cycles continue to shrink in many industries. Innovations are ready for serial production faster than ever. Assembly technology has to keep up with the increasing speed of development and production. Flexible solutions that can be converted or expanded easily and without a lot of work are in demand, even – or especially – in times of Open Standards, IoT or Connected Automation. Make yourself ready today with assembly technology by Rexroth.**



## **SUSTAINABLY EQUIPPED FOR A FAST-PACED MARKET**



Quickly and easily scalable system solutions



Short, efficient project planning process with the user-friendly MTpro software



Modular system for rapid implementation



Standard systems and custom solutions



Comprehensive Industry 4.0 portfolio

## **Integrating versatility as early as the planning stage**

You can use our complete range of systems that has been under continuous development, expansion and optimization for many years to cover a wide spectrum of requirements. You also benefit from our leading role as a market operator and user in Industry 4.0.

## **From manual to fully automated**

Years of experience in assembly technology and detailed industry knowledge let us create economic and productive systems in no time. From the ergonomic manual workplace to the fully automated Industry 4.0 production system, we provide a tailored solution to achieve your goals quickly, reliably and safely.



Depending on the annual production quantity, a different degree of automation may be recommended. We help you find the best system to meet your needs, from basic elements, such as enclosures and work tables, to individually configured transfer systems, chain conveyor systems and identification systems.

#### **Higher productivity, less effort**

Finely coordinated, individual components and integrated systems work perfectly together, simplifying even the development and design process.

#### **Lean production for higher efficiency**

Lean, waste-free production begins with the efficient, low-waste planning of production lines tailored according to customer requirements. Activities that do not add value are minimized continuously.

#### **Ergonomics increase performance**

Ergonomically designed workstations and user-friendly production systems ensure that your employees can efficiently manage and focus on workflows.

#### **Ideal for ESD, cleanrooms or dry rooms**

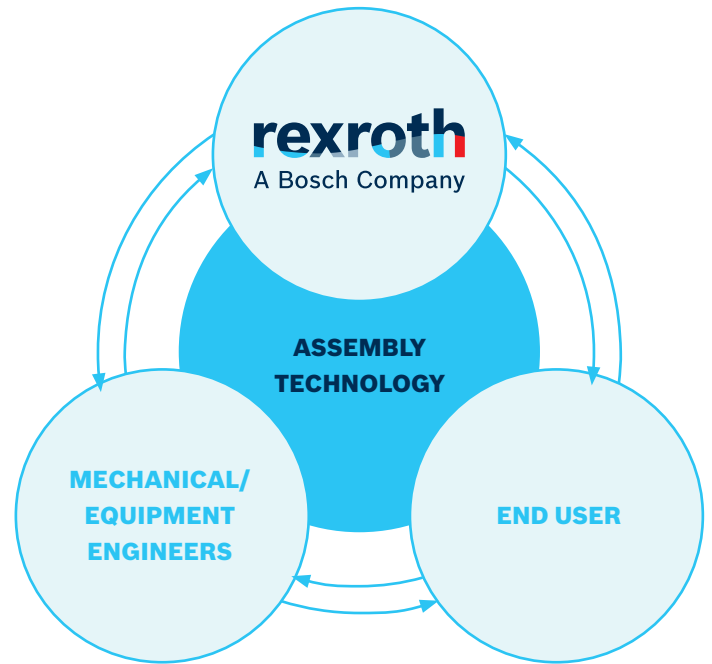
We meet the requirements of special production conditions, such as those found in ESD-sensitive, cleanroom and dry room environments. Contact us directly for product details.

#### **Networking for greater transparency**

The fusion of production IT and enterprise IT, the synchronization of processes and machines that autonomously make decisions in real time all allow for efficient and customized manufacturing.

# Customer orientation and industry expertise – our experience gives you a leg-up

**Customer relationships couldn't be more dynamic: Bosch Rexroth maintains close relationships with mechanical and equipment engineers who develop and construct powerful all-in-one solutions for their customers using our components. At the same time, we directly assist end users in expanding their systems with single components or entire assemblies, meaning they benefit both from the equipment manufacturer's expertise and from direct support from the assembly technology experts at Rexroth.**



## Short planning and implementation times

Even if manufacturing conditions need to be adapted quickly to meet new demands, changes to products are underway or different lot sizes are needed – Rexroth assembly technology and the MTpro planning software help you set up your system for new processes in no time. The tremendous dynamics of the market demand the necessary manufacturing systems be implemented immediately after they are acquired. Rexroth helps you achieve this with short delivery times and rapid, uncomplicated startup. The finely coordinated system components are installed and ready for use in no time.

## Productivity

Minimal assembly effort, perfect interaction of all components, and the ease of use of Rexroth systems lay an excellent foundation for efficient, time-saving and resource-saving production.

## Always ready for something new

Shorter product life cycles require versatile assembly technology. The Rexroth modular system allows for quick and cost-efficient modification for manufacturing the next generation of a product.





### **Track production flow**

We provide the systems (e.g. RFID) you need for tracking products and production data in detail, allowing you maximum transparency for optimal quality management.

### **Energy efficiency**

A broad range of innovative drive and control concepts covers virtually every need in the widest variety of industries. All systems interact with one another perfectly and are designed from the start based on Rexroth's 4EE principle for maximum productivity with the least amount of energy possible.

## **ASSEMBLY TECHNOLOGY – RIGHT AT HOME IN MANY INDUSTRIES**

Complete line of products and systems available globally through subsidiaries and sales partners for

- ▶ Automotive
- ▶ Battery production
- ▶ Electrical and electronics industry
- ▶ Consumer goods manufacturing
- ▶ Mechanical engineering
- ▶ Medical technology and pharmaceutical industry
- ▶ Assembly and handling
- ▶ Food industry
- ▶ Solar panel manufacturing
- ▶ Packaging industry
- ▶ And many more!



# Basic Mechanic Elements – the versatile comprehensive range

**The assembly system from its inventor – uncompromising flexibility. The more precisely work environments are tailored to their specific application, the more efficient they are. Rexroth's flexible assembly system offers a quick and complete solution to every task in your industry.**



Launched over 30 years ago, the Rexroth modular system for assembly technology is continuously being expanded and optimized. It currently consists of over 1,500 components for every area of production: from simple frames to enclosures, to standard and special-purpose machinery, to ESD-compatible systems and manual workstations or material supply and linking lines.

The basics of the system are impressively simple: plain, yet extremely sturdy aluminum profiles with an “unending” longitudinal slot. Together with the free MTpro planning software and our comprehensive service, the modular assembly technology system offers everything you need to design efficient work environments.

### Aluminum strut profiles

With its broad selection of profile cross-sections, Rexroth's modular aluminum strut profile system is the most comprehensive and versatile of its kind in the world. Along with the basic elements, you can create frames, enclosures, protective fences and work tables with minimal planning required. Every component is extremely sturdy and corrosion-resistant.

The modular profile system becomes even more flexible when used with the EcoShape tubular framing system for features such as workstations, flow racks or material shuttles.

### Connectors and accessories

A multitude of different connection elements make practically anything possible when implementing your custom system, and make your flow racks, enclosures or workstations fully ESD-compatible. The profiles can be delivered cut to length and finished, saving you serious implementation time.

### Quick & Easy profile finishing

Thanks to 500,000 options, features such as holes, recesses, threads and miter cuts can be included with ease. The Quick & Easy configuration tool for our eShop or the MTpro planning software lets you plan your custom profile finishing. In addition to the order string, you can get a CAD model or dimensional drawing. Then just submit your order and receive your delivery in no time.

## BENEFITS FOR YOU



- ▶ Largest modular profile system in the world
- ▶ Low planning costs
- ▶ Short assembly time
- ▶ Few tools required
- ▶ Flexible expansion and conversion
- ▶ Reusable
- ▶ Finished surfaces
- ▶ Liability safe: compliant with all important certificates



- ▶ Wide variety of parts
- ▶ Designed for strut profiles
- ▶ ESD-compatible components
- ▶ Complete linear guides
- ▶ LF-MGE Linear Motion Designer planning tool



- ▶ Numerous finishing options at virtually every point along the profile
- ▶ Easy to configure via eShop and MTpro
- ▶ Simple logistics and very short delivery times

# Basic Mechanic Elements: Safety with the system



## UNCOMPROMISINGLY SAFE

**Equipment needs to be safe. Accidents can be really expensive for you as the liable manufacturer of equipment or plant operator. The more precisely work environments are tailored to their specific application, the safer they are.**

**The basic element modular system doesn't just offer quick and highly-flexible solutions for every task, it also offers solutions which conform with legal provisions. So, you're always on the safe side – with all the necessary certificates and supporting documentation – even when it comes to liability.**



### Safe from the very start!

You can use our planning tool MTpro to lay the foundations for designing and procuring safe equipment. Multilingual and with needs-based functions, e.g. comprehensive calculation programs, you can easily create CE-compliant products in accordance with current standards.



### You're in the best hands!

At Rexroth, you can benefit from the expertise of highly technically trained employees and certified processes. Our professionals are happy to assist you in word and deed from your first request through to the completed documentation. Training programs and tried-and-tested product training prepare you in terms of safety.



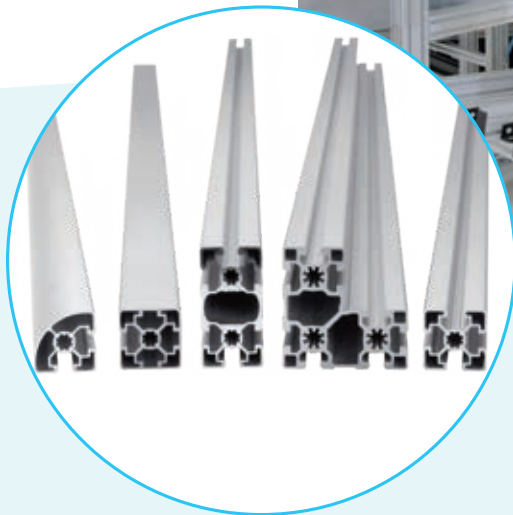
### Rexroth – your system partner!

You can cover yourself against every eventuality with our consistent equipment systems. Consistent use of all the elements in the Rexroth module is the simplest and most efficient way to guarantee the equipment is configured safely. Safety with the system.

# Basic Mechanic Elements: Aluminum strut profiles

## LIMITLESS FLEXIBILITY

With well over 100 profile cross-sections, we offer the world's largest modular strut profile system for a wide variety of applications. Finely tuned grids, versatile connection elements and accessories let you turn any idea into reality. And another plus: our profiles are all mutually compatible.



### **+** Benefits

- ▶ Most extensive range of products on the market
- ▶ Heavy-duty standard profiles
- ▶ Innovative special profiles
- ▶ Profiles with closed slots
- ▶ Guaranteed performance data, highest stability criteria
- ▶ Quick & Easy custom profile finishing
- ▶ Available worldwide



### Key technical data

- ▶ Approx. 140 profile cross-sections
- ▶ Ultra-fine profile dimensions (20, 30, 40, 45, 50, 60, 80, 90, 100 mm)
- ▶ 3 slot systems: 6, 8 and 10 mm with slot-independent connectors
- ▶ Slot pull-out forces up to 24,000 N



### Customer applications

- ▶ For all industries, especially assembly and handling
- ▶ Frame assembly, equipment manufacturing, special-purpose equipment and mechanical engineering

# Basic Mechanic Elements: Connection technology

## RELIABLE, SECURE AND STABLE

The right connection element for any application – no problem with the modular profile system from Bosch Rexroth. Create reliable solutions with our sophisticated connection technology.



### Benefits

- ▶ Heavy-duty connection technology with/without profile finishing
- ▶ Innovative product features, such as position detection, centering lugs, extremely scratch-resistant paint, etc.
- ▶ Guaranteed performance data
- ▶ Available worldwide



### Key technical data

- ▶ 28 connector types, 280 variants
- ▶ Profile size ranges: 6, 8 and 10 mm with slot-independent connectors
- ▶ Slot pull-out forces up to 24,000 N
- ▶ Displacement forces up to 15,000 N
- ▶ Universal ESD-compatibility
- ▶ High-quality appearance with gray or black plastic parts



### Customer applications

- ▶ Technical and design-oriented solutions
- ▶ For all industries, especially assembly and handling
- ▶ Frame assembly, equipment manufacturing, special-purpose equipment and mechanical engineering

# Basic Mechanic Elements: *designLINE*

## PERFECT COMBINATION OF QUALITY AND FUNCTION

The *designLINE* version of our proven die-cast connectors features an impressive, high-quality appearance that goes perfectly with our strut profiles. Special, aluminum-colored paint enhances the overall appearance of your application, whether that's for a trade fair exhibit or applications in manufacturing, assembly, or other spaces.



### Benefits

- ▶ Scratch-resistant paint
- ▶ ESD-compatibility
- ▶ Color matches aluminum profiles
- ▶ High-quality appearance



### Key technical data

- ▶ Same load values as standard connectors



### Customer applications

- ▶ Frame assembly, enclosures, workstations

# Basic Mechanic Elements: Accessories

## ADAPTED FOR THE PROFILE SYSTEM AND UNIQUELY VARIABLE

Along with the right profile cross-sections and multi-purpose connection elements, versatile accessories let you turn any idea into reality. A large number of hinges, sliders, clamping elements, feet and rollers, installation and air-supply elements, as well as cover and mounting rim profiles makes countless design options possible.



As the only modular profile system on the market, Rexroth offers the choice between standard accessories in gray and ESD accessories in black. The gray accessories give the frame a high-quality, harmonious appearance through discreet contrast with the profile. The showstopper: Black ESD components make it easy to visually distinguish ESD applications from non-ESD applications.



### Benefits

- ▶ Large product variety
- ▶ Harmonious and high-quality appearance
- ▶ Universal ESD compatibility



### Key technical data

- ▶ Approx. 1,000 accessories
- ▶ Designed for 6, 8 and 10 mm slot systems and cross-system compatible
- ▶ Application-oriented ESD compatibility



### Customer applications

- ▶ Frame assembly, enclosures, workstations

# Basic Mechanic Elements: Quick & Easy profile finishing

## CUSTOMIZED FINISHING

With Quick & Easy, we make it possible to order and receive custom-configured profiles and finishes with a large number of combination options, expanding the proven modular profile system with a multitude of customization options.



### **+** Benefits

- ▶ Customer-friendly configuration
- ▶ Drawing-free ordering
- ▶ Attractive finishing prices
- ▶ Very short delivery time

### **✓** Key technical data

- ▶ Over 500,000 combination options
- ▶ 30 different finishes per profile
- ▶ Can be configured via the eShop, MTpro or manually



### **Customer applications**

- ▶ Standard finishing for using form-locking connectors
- ▶ Basic nomenclature for drawing-free ordering
- ▶ Miter cuts

# Basic Mechanic Elements: EcoSafe protective fence

## MAXIMUM SAFETY AND RAPID SETUP

Stay on the safe side with guard components by Rexroth. EcoSafe protective fence components can be used flexibly and enable compliance with current standards and guidelines. Thanks to its modularity, EcoSafe can be extended with ease and modified at any time with subsequent attachments and alterations.



### Benefits

- ▶ Simple planning with standardized kits
- ▶ Rapid setup with pre-assembled protective frames
- ▶ Flexible, modular design
- ▶ Attractive appearance; color versions available
- ▶ Compliance with standards:
  - Machinery Directive (2006/42/EC)
  - DIN EN ISO 12100, 13857 and 14120
  - DIN EN 953



### Key technical data

- ▶ Approx. 50 standard components as well as customizable protective frame versions
- ▶ Some kits also support doors
- ▶ Woven wire grilles also available in signal colors



### Customer applications

- ▶ Automotive
- ▶ Safety equipment
- ▶ Logistics
- ▶ Automation

# Basic Mechanic Elements:

## FIP – Function-integrated profiles

### ALL CABLES INTERNAL – ALL FREEDOMS IN THE DESIGN

Finally, more space for your ideas: The completely internal cable guide allows for all cables to be laid in a safe and space-saving way – and they can even be laid through profile connectors for the first time. This simplifies and speeds up not only the design process, but also assembly and maintenance. With few parts and high variance – and full compatibility with standard profiles.



#### **+** Benefits

- ▶ Completely integrated wiring in the frame construction
- ▶ Unique profile joints with internal cable guide
- ▶ High flexibility with low component diversity (only 4 profile cross-sections)
- ▶ Exclusive design: sealed outer surfaces, accentuated plastic parts
- ▶ Minimal assembly
- ▶ Saves time and money: easy design, installation and maintenance



#### **Key technical data**

- ▶ Grid dimension 40
- ▶ Profile slot 10 mm
- ▶ Profile cross-section 40 x 120 x 120, 120 x 120, 60 x 120, 120 x 120 6N
- ▶ Usable interior space 600 mm<sup>2</sup> to 4,000 mm<sup>2</sup>
- ▶ Compatible with aluminium modular profile system
- ▶ VDE certified
- ▶ Suitable for EPA



#### **Customer applications**

- ▶ For all industries, especially assembly and handling
- ▶ Frame assembly, equipment manufacturing, special-purpose equipment and mechanical engineering

# Manual Production Systems – ideal conditions for lean production



**Just like your individual requirements and productivity goals, efficiency and cost-effectiveness are a top priority for us, and we offer both with our modular assembly solutions. These can be freely configured to suit your needs – flexibly and efficiently.**



Manual Production Systems by Rexroth are designed from ground up for use in lean production. With their three pillars – workstations, material supply, and linking, these Manual Production Systems follow a holistic concept that is designed purely for efficiency and the avoidance of waste.

With our Manual Production Systems, you can design ergonomic workstations or entire production lines that are perfectly suited for your application and for maximum productivity, all with minimum effort. Our intuitive MTpro planning software supports you all the way from planning to the implementation of your custom system.

**Workstation design**

Rexroth gives you flexibility in designing your custom workstation solution. You can choose between custom products by putting together the perfect solution for you from a variety of parameters and standard products with set dimensions. Our overall product range is supplemented by an extensive line of accessories, consisting of workstation lighting, energy supply, on-hand information and tool positioning, ESD components and swivel work chairs.



- ▶ Targeted, optimal capacity utilization
- ▶ Effortless working
- ▶ Increased productivity
- ▶ Motivated employees

**Material flow and manual linking**

Whether it's a flow rack system, material shuttle, FiFo station or manual linking system – with Rexroth components and systems, you can supply materials and containers in a large variety of ways, regardless of which industry, or whether it's for commerce, trades, or industry.

Flow rack systems by Rexroth can be used as central supermarket shelves or directly at a workstation to supply containers, offering you maximum cost-effectiveness and future usability. With an extensive, all-in-one product range for supplying materials for your production and at workstations, you have everything you need. Achieve short material supply routes and readily adapt to changing needs.



- ▶ Various conveyor tracks and rollers
- ▶ Custom features and dimensions
- ▶ Easy conversion and trouble-free expandability
- ▶ Efficiency with FiFo method

**Information flow**

The fusion of production IT and enterprise IT, the synchronization of processes and machines that autonomously make decisions in real time all allow for efficient and customized manufacturing. With Rexroth, you have a production system that places equal importance on ergonomics, lean production and networking.



- ▶ More transparency for optimized production
- ▶ Digital assembly instructions for variance in manufacturing systems
- ▶ Real-time production data processing and visualization

**BENEFITS FOR YOU**

# Manual Production Systems: Workstations

## ERGONOMICS AND FLEXIBILITY AT THE HIGHEST LEVEL

Ergonomically perfect work conditions are achieved through the use of customized, height-adjustable workstations of variable dimensions and with versatile components for flexible design. Height-adjustable workstations can be adjusted to the height of your employees. Simply switching between standing and sitting avoids repetitive strain and the early onset of fatigue.



### Benefits

- ▶ Large number of adjustment options for high versatility
- ▶ Freely selectable geometry and functionality
- ▶ Height of material feeds and table tops can be adjusted independently of each other



### Key technical data

- ▶ Fully assembled or as a kit for self-assembly
- ▶ Allows for the addition of any desired modules, including cross ties and conveyor tracks as well as individual components
- ▶ Supports up to 400 kg
- ▶ Electric height adjustment



### Customer applications

- ▶ Shift workstations
- ▶ Assembly
- ▶ Packaging
- ▶ Inspection stations

# Manual Production Systems:

## Swivel work chairs

### HEALTHY, FUNCTIONAL SITTING

You can easily optimize the ergonomics of your workstations with functional swivel work chairs – specially adapted for each work situation. These chairs effectively cushion the unique physical strain caused by repetitive movements. They provide custom support for each employee to ensure a healthy posture throughout their shift.



#### **+** Benefits

- ▶ Dynamic sitting supports employee's movements
- ▶ Ergonomic handles for easy adjustment
- ▶ Optimal lumbar support



#### **Key technical data**

- ▶ Tapered backrest
- ▶ Ergonomic seat
- ▶ Synchronous technology with continuous contact
- ▶ Weight adjustment
- ▶ 2 height versions: low 460 to 610 mm, high 580 to 820 mm
- ▶ Version: fabric, PU, ESD, synthetic leather and cleanroom



#### **Customer applications**

- ▶ Electronics
- ▶ Automotive
- ▶ Use in EPAs (Electrostatic Protection Area)
- ▶ Optimal ergonomics
- ▶ Dynamic sitting

# Manual Production Systems: Workstation lighting

## THE RIGHT LIGHT FOR TOP WORK QUALITY

Ideal lighting conditions prevent early onset fatigue, improve concentration and reduce the risk of errors. Rexroth's system lamp range provides you with glare-free and flicker-free light of the highest quality. Depending on the task, you can select a single lamp or combine and arrange any number of lamps.



### + Customer applications

- ▶ Assembly and manual workstations
- ▶ Inspection workstations
- ▶ Packaging workstations

### + Benefits of LED system lamps

- ▶ Glare-free thanks to a parabolic louver and diffuser sheeting
- ▶ Up to 60 % energy savings
- ▶ 60,000 h service life
- ▶ Up to 1,500 lux at a color temperature of 5,000 K

### + Benefits of LEDeconomic system lamps

- ▶ Compact dimensions and low weight
- ▶ For workstations with a width of up to 1,600 mm
- ▶ High light output of ~140 lm/W
- ▶ Up to 700 lux at a color temperature of 5,000 K

### ↓ Benefits of electronic system lamps

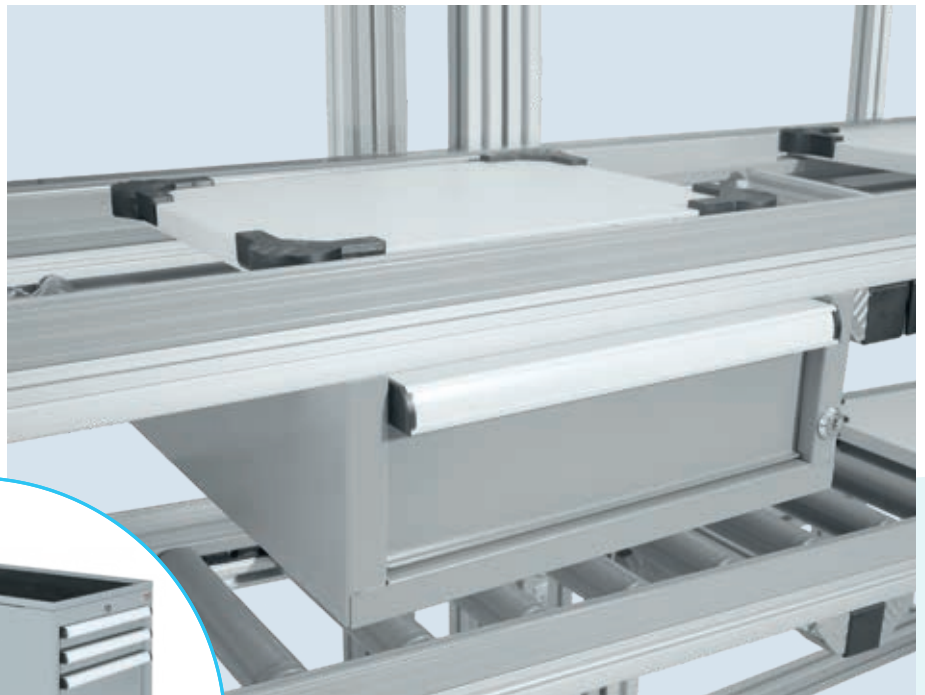
- ▶ Up to 25 % energy savings thanks to electronic lamp ballasts
- ▶ Quick installation and startup
- ▶ Up to 1,500 lux at color temperature of 4,000 K

# Manual Production Systems:

## Drawer cabinet range

### VERSATILE AND FUNCTIONAL

Rexroth's range of eight fixed drawer cabinets offers you the highest standard of functionality. A functional system for storing tools and supplies promotes orderliness and cleanliness at the workstation, increasing employee motivation and performance, and eliminating time spent looking for items.



#### **Benefits**

- ▶ Functional and custom workstation layout
- ▶ Defined storage areas, ergonomic aluminum handle bars with label area
- ▶ Work processes are supported, transparency increased
- ▶ Full-extension, easy-closing drawers

#### **Key technical data**

- ▶ Soft-closing drawer with ball bearing and automatic closing feature
- ▶ Permissible load per drawer: 350 N
- ▶ Available in ESD versions
- ▶ All drawers can be locked at same time
- ▶ Various drawer dividers available as accessories

#### **Customer applications**

- ▶ Assembly and manual workstations

# ActiveCockpit interactive communication platform: real-time production data processing and visualization

## CONSTANT IMPROVEMENT OF PRODUCTION PROCESSES

Ideal failure and deviation management means users need to quickly access complete data. As a communication platform, ActiveCockpit makes these rapid response times possible with minimal effort – on the production line and at the company.



### Detect deviations on site

- ▶ An intuitive user interface instantly displays process deviations on site
- ▶ Improvement processes can be started without delay by forwarding data directly to the appropriate employees
- ▶ Malfunctions can be detected on site and shared with colleagues, e.g., a photo of defective components
- ▶ Improvements can be implemented faster and increase productivity

### Industry 4.0: Production and IT growing together

- ▶ Production data is compiled and visualized on site in the factory in real time.
- ▶ Optimization measures can be quickly discussed within the team.
- ▶ Clear identification of deviations in the production process allows for quicker decision-making
- ▶ Standardize the meeting process: attendees, structure of key figures, automatic minutes

### In-process queries

- ▶ Employees can access their task list on the production line and update its completion status.
- ▶ Cancellation and prioritization notifications are sent to the relevant departments in a single click by using the Note function or via e-mail
- ▶ Widgets make deviations from quality and safety standards immediately visible
- ▶ Quick communication with the team



### **Benefits**

Current and consistent key figures allow decisions to be made quickly and efficiently on the shop floor.

- ▶ Time saved, and errors avoided through direct connection to back-end systems (ERP, MES)
- ▶ Custom web applications integrated as widgets
- ▶ Communication and information tool for employees at all levels
- ▶ Structured and documented team meetings
- ▶ Simple configuration thanks to intuitive web application
- ▶ Time-saving automatic minutes function
- ▶ Space-saving

### **Key technical data**

- ▶ Browser-based software, can be extended via apps/widgets
- ▶ Connection to MES/ERP back-end systems via i4.0 interface
- ▶ Scalable end devices: tablets, PCs, touchscreens
- ▶ Intuitive user interface: custom configuration by administrator
- ▶ Functional data management: supports structured data storage and quick retrieval

# ActiveAssist assistance system: installing variants safely – modular, connected, interactive

## SIMPLE STEP-BY-STEP ASSEMBLY

The ActiveAssist assistance system makes varied assembly tasks significantly easier thanks to interactive instructions. The web-based software makes all information available to employees at all times and indicates errors. This is how “one-piece flow” works. Intuitive to use and completely connected, you increase process reliability, minimize waste and final inspections – and increase quality.



### Diversity of options: batch sizes of 1 as inexpensive as mass production

With ActiveAssist, you can produce customer specific products and efficiently manage the diversity of options: An intuitive configuration menu makes commissioning and modifying the workstation incomparably easy and saves time and money. Hardware can be easily integrated into the open system using standardized interfaces. Integrated data management makes it easier to manage orders and also offers role-based user management.



### **+** Benefits

- ▶ Interactive step-by-step guide: guides employees through the assembly process with precision
- ▶ Modular design: future-proof thanks to upgradeable functions
- ▶ Web-based configuration: intuitive assembly process learning, online and offline
- ▶ Hand tracking via 3D camera: reliable detection of hand movements without a distracting sensor

### **✓** Key technical data

- ▶ Web-based configuration tool
- ▶ Data management: User management, order management
- ▶ Communication with MES/ERP systems via XML interface
- ▶ Context-based information provision
- ▶ Hardware solutions: e.g. depth-sensing camera, projector, pick-to-light

# Manual Production Systems: On-hand information

## IMPORTANT INFORMATION ON SITE

Using components for information provision, you provide all important information right at the workstation and in production. Your employees can then make the right decisions and take immediate action. Information provision guarantees high transparency and is essential for certification according to DIN ISO 9000 ff.



### Benefits

- ▶ High transparency
- ▶ Increased efficiency through clear structure
- ▶ High stability



### Key technical data

- ▶ Can be mounted horizontally or vertically
- ▶ ESD version
- ▶ A4/US format, 2x A4
- ▶ Up to 18 reinforced transparent plastic sleeves



### Customer applications

- ▶ Assembly and manual workstations
- ▶ Safety instructions on machines

# Manual Production Systems:

## Tool storage

### REDUCED ASSEMBLY TIMES DUE TO TOOLS BEING CLOSER TO EMPLOYEES

The ergonomic storage of tools and parts forms the basis for efficient workstation design. Easy access to tools avoids repetitive, burdensome and unnecessary movements.



#### **+** Benefits

- ▶ Space-saving and ergonomic storage
- ▶ Faster assembly time
- ▶ Modular design
- ▶ Standard parts for individual solutions

#### **✓** Key technical data

- ▶ ESD version
- ▶ MTM-optimized
- ▶ Fastening kit included

#### **↓** Customer applications

- ▶ Assembly and manual workstations

# Manual Production Systems:

## Electric case lifter

### RELIEF IN LIFTING AND LOWERING LOADS

Case lifters are used for ergonomic parts supply at workstations. To keep the physical strain on your employees as low as possible, the case lifter lifts and lowers loads, preventing improper working posture and excessive strain. Your employees can then concentrate on value-creating activities.



#### Benefits

- ▶ Ergonomic parts supply
- ▶ Reduced parts supply and removal times
- ▶ Automatic stacking/unstacking



#### Key technical data

- ▶ Lift: 900/1,300 mm
- ▶ Lifting speed: 25 mm/s
- ▶ Permissible load  $F_{\max}$ : 2,200 N
- ▶ ESD version



#### Customer applications

- ▶ Assembly and manual workstations

# Manual Production Systems: Lean/Xlean flow rack systems

## REDUCED STOCKS THROUGH EFFICIENT MATERIAL SUPPLY

Well-structured and clearly organized material supply promotes transparency and helps you reduce your stocks. Rexroth's flow rack systems offer users in commerce, trades and industry a wide range of important benefits.



### **+** Benefits

- ▶ Stock reduction
- ▶ Reduction in setup times
- ▶ Easy conversion and attachment, expansion
- ▶ Stock visualization (Kanban color signal)
- ▶ Materials used in specified order (FiFo method)

### **✓** Key technical data

- ▶ ESD version
- ▶ Rapid planning with MTpro

### **↓** Customer applications

- ▶ Assembly and manual workstations
- ▶ Supermarkets
- ▶ Logistics

# Manual Production Systems: FiFo station and material shuttles

## INTEGRATED KANBAN SUPPLY SYSTEM

Standardized material supply in production using defined delivery areas creates clarity and a high degree of transparency. Complying with the FiFo principle facilitates simple traceability in the case of material faults or disruptions in the process. The FiFo station can be compared to a supermarket for floor rollers, material shuttles and commissioning shuttles.



### Benefits

- ▶ Clearly organized and transparent production operations through standardized delivery areas
- ▶ Clear visualization to help minimize stocks
- ▶ Modular rail system design
- ▶ 5S support for material supply



### Key technical data

- ▶ Plastic guides
- ▶ Inclusion of flow rack systems, information boards and height limits by integrating 30 x 30 profiles
- ▶ Guide rails glued/screwed onto floor

### Customer applications



- ▶ FiFo station
- ▶ Logistics station
- ▶ Stock visualization

# Manual Production Systems: EcoFlow

## MANUAL LINKING ELEMENTS BRINGS EVERYTHING CLOSER

Manually linking workstations with Eco-Flow eases employee strain because products and workpiece pallets are conveyed on manual slide sections. At the same time, investment in this linking remains low since the EcoFlow conveyor tracks work without any electric drive systems or controllers.



### **+** Benefits

- ▶ Economic linking of different work steps
- ▶ Employee relief: no carrying heavy loads
- ▶ Pre-assembled conveyor tracks available
- ▶ Can be combined with Rexroth's power-driven transfer systems

### **✓** Key technical data

- ▶ ESD version
- ▶ Aluminum profile conveyor track
- ▶ Full-width rollers available in plastic, steel or stainless steel
- ▶ High design flexibility

### **↓** Customer applications

- ▶ FiFo transport of parts up to 10 kg

# Manual Production Systems: EcoShape tubular framing system

## VERSATILE, SIMPLE, EFFICIENT

With EcoShape, build custom solutions from just a few components. Not only is planning easy thanks to the MTpro planning software, assembly is also a breeze since the standard components feature a poka-yoke design for rapid, trouble-free building.



### Benefits

- ▶ High stability with sophisticated connection technology
- ▶ Extend existing production lines with ease
- ▶ Just cut to size, assemble and handle
- ▶ Combine with modular aluminum framing system for heavier loads
- ▶ On-site configuration and assembly



### Key technical data

- ▶ ESD version
- ▶ Die-cast zinc



### Customer applications

- ▶ Workstations
- ▶ Material shuttles
- ▶ Flow and transport racks
- ▶ Assembly islands
- ▶ Design solutions

# Manual Production Systems: Grab containers, grab ledges

## EFFICIENT AND EASY GRAB-BING OF SMALL PARTS

Rexroth's ergonomically shaped grab containers customize your workstations and assembly areas, eliminating unnecessary and unproductive movements through shorter grab distances. This saves you valuable production time while also minimizing strain on your employees.



### **+** Benefits

- ▶ Ergonomic, handy supply of small parts such as screws, nuts and washers
- ▶ Ergonomically designed removal areas
- ▶ Grab things quickly and safely
- ▶ Combined system (grab containers, grab ledges, covers)

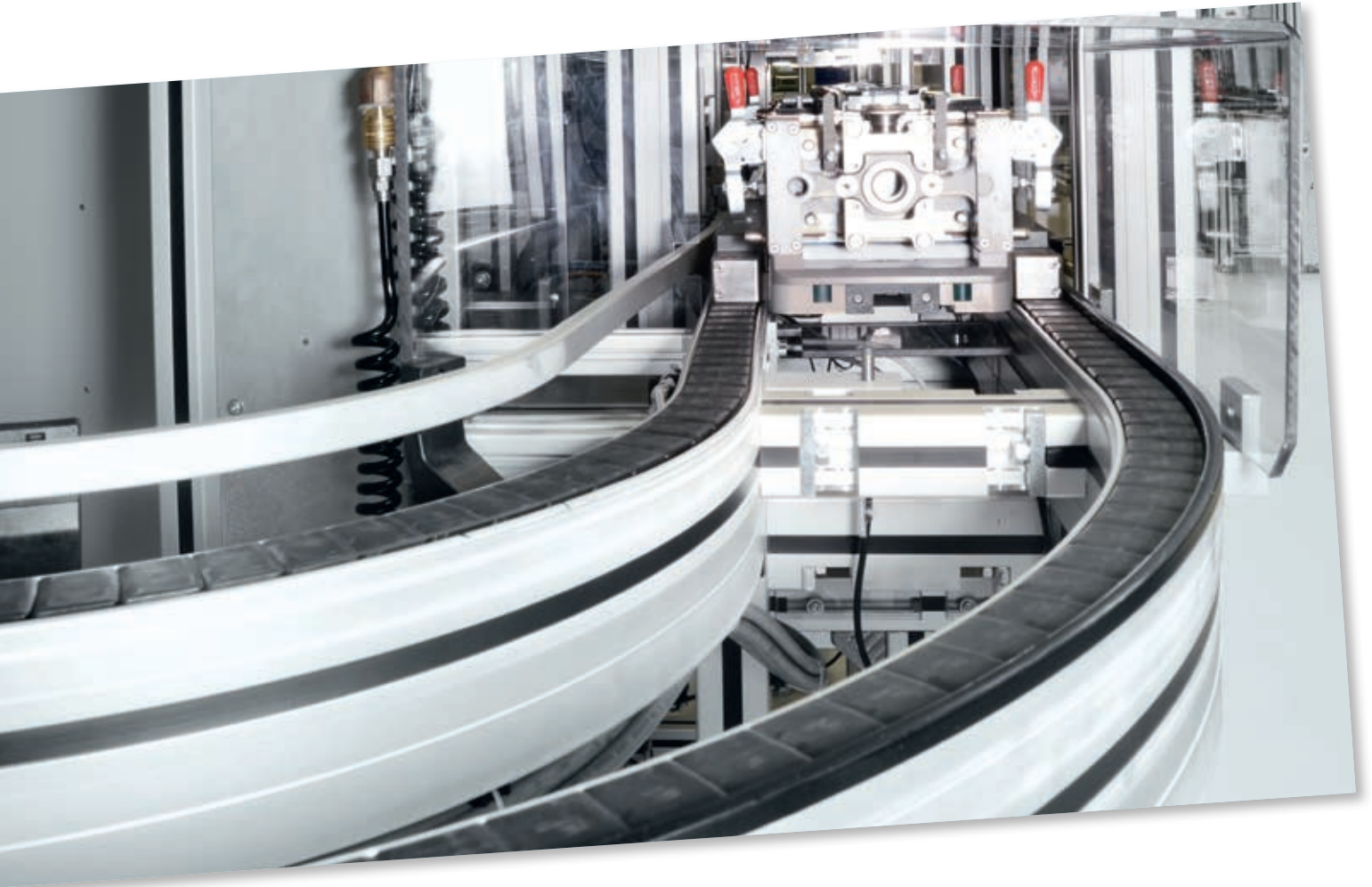
### **✓** Key technical data

- ▶ Stable, compact stacking connections
- ▶ Variety of sizes, flexible design
- ▶ Available in ESD versions
- ▶ MTM-optimized

### **↓** Customer applications

- ▶ Assembly and manual workstations

## Material and information flow technology – sturdy, economical and universally modular



**Cost-effectiveness in investment and operation, reliability, and adaptability are the essential criteria. Experience and expertise from countless projects with wide variety of requirements make Rexroth your partner of choice.**

The demands are challenging: high quantities with short cycle times through full automation or small batch sizes with a large range of variation in partially automated systems with manual workstations. With its proven transfer and chain conveyor systems, Rexroth offers economical material flow solutions that can be scaled as needed for almost any application.

Benefits for you: All systems are designed for modular flexibility. This speeds up planning – and allows you to easily upgrade or modify existing systems. Sturdy products and innovative technology ensure high reliability at low maintenance costs.

**Transfer systems**

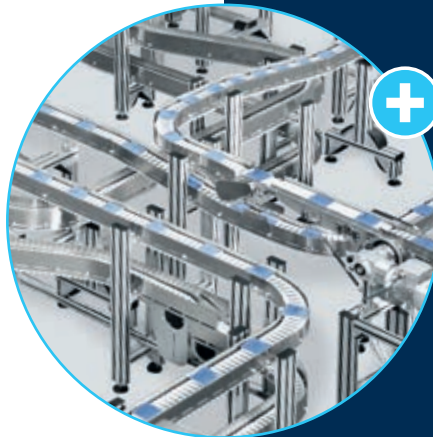
Whether transporting small, sensitive products weighing just a few grams or large products weighing several hundred kilos, whether in a cleanroom or an oily environment, the TS 1 to TS 5 transfer systems by Rexroth are proven in numerous sectors and are always the right choice.



- ▶ For workpiece weights of a few grams up to 400 kg
- ▶ High throughput due to short cycle times
- ▶ Versatile combination options with individual modular components

**Chain conveyor systems**

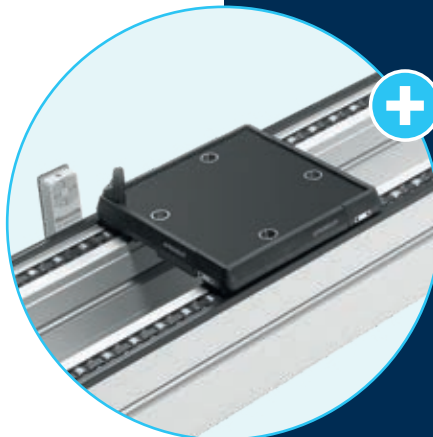
Rexroth chain conveyor systems meet hygiene requirements in the food and packaging industry, transport even small parts directly on the virtually sealed chain surface and deal with inclines and declines with ease – critical aspects for linking machines in numerous sectors of industry.



- ▶ Modular design for the simple implementation of custom routing
- ▶ High chain tensile forces up to 1,250 N minimize the number of drives
- ▶ 6 standard widths – the right size for any product

**RFID systems**

Identification and data carrier systems ensure the flow of information with goods on the assembly lines. Object-related data enables the targeted control of process and processing steps, as well as the type-dependent or version-dependent, inbound and outbound transfer of workpiece pallets during the production of product variants on branched, flexible assembly systems. Documenting all process steps and production data enables traceability even when errors occur.



- ▶ Quick and easy workpiece identification
- ▶ Suitable solutions for all Rexroth transfer systems
- ▶ Flexibility through extensive variety of attachments and assembly kits

**BENEFITS FOR YOU**

# Material and information flow technology: ActiveMover transfer system

## THE STANDARD IN SHORT CYCLE – MORE PRECISE, FASTER, MORE HEAVY-DUTY

Wherever products need to be transported and positioned with extra precision, speed and flexibility, the Rexroth transfer system sets the standard: With a unique combination of precision, speed, power and flexibility, you can increase process quality, productivity and even cost-effectiveness.



### Benefits

- ▶ No additional indexing needed
- ▶ Broad spectrum of uses
- ▶ Low-vibration transport of sensitive products
- ▶ Freely programmable and easily changeable workpiece pallets
- ▶ Connect any controller
- ▶ Low-wear



### Special components

- ▶ AMpro software: system configuration and programming-free startup
- ▶ Identification system: unique workpiece pallet identification



### Key technical data

- ▶ High repeat accuracy of  $\pm 0.01$  mm
- ▶ Speed of up to 150 m/min
- ▶ Acceleration of  $40 \text{ m/s}^2$  with 1 kg load,  $10 \text{ m/s}^2$  with 10 kg payload
- ▶ Load per workpiece pallet of up to 10 kg
- ▶ Workpiece pallet width of 165 mm, up to 500 mm for intake
- ▶ Sturdy design
- ▶ Reversible operation
- ▶ Asynchronous and synchronous operation
- ▶ Open interface: Ethernet/IP, PROFINET, EtherCAT, Sercos, etc.



### Customer applications

Assembly lines in key sectors:

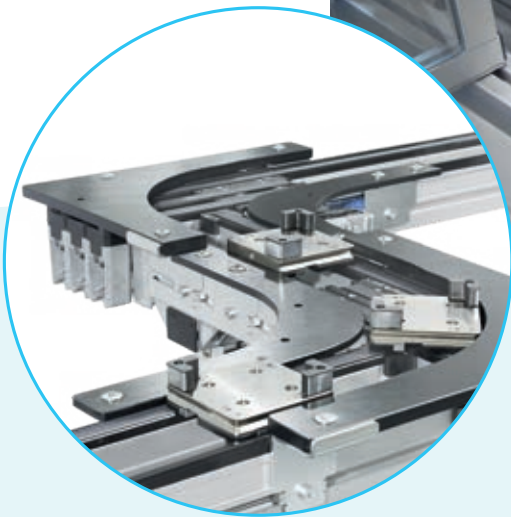
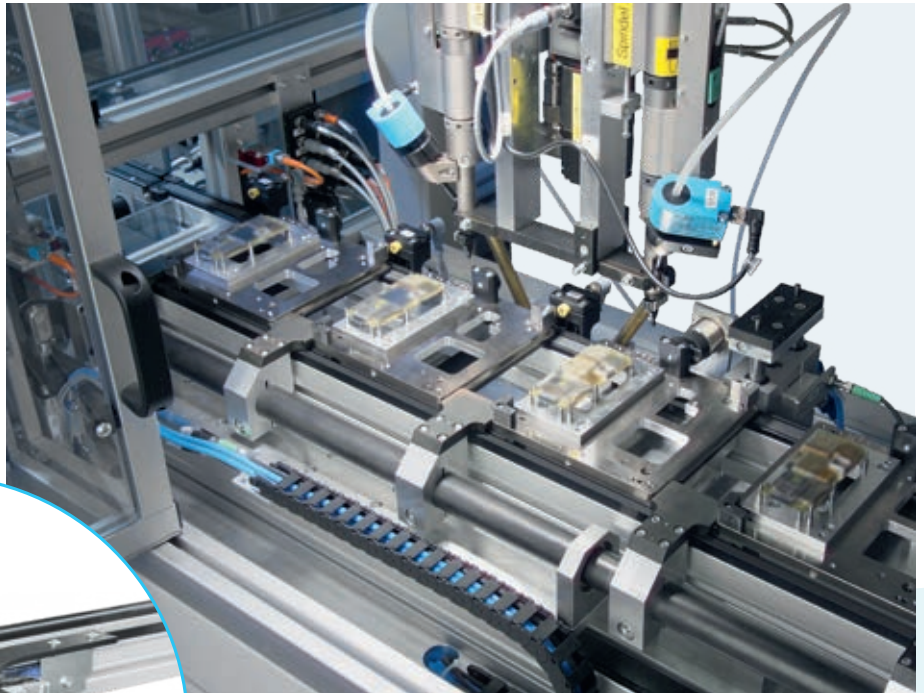
- ▶ Electronic controller parts
- ▶ Printed circuit boards for electronics manufacturing
- ▶ Pharmaceutical and cosmetic industries
- ▶ Syringes in the medical technology sector
- ▶ Components for electric motor production



# Material and information flow technology: TS 1 transfer system

## PRECISE ASSEMBLY AND RAPID PROCESSES

When it comes to the efficient production of small products or modules, the Rexroth TS 1 transfer system is the right decision. It is specially tailored to the precise assembly of complex products. The ability to integrate into the pre-assembly and subassembly of a higher-level system is one of its strengths.



### Benefits

- ▶ Compact design requires less space
- ▶ Suitable for EPAs, cleanrooms and dry rooms
- ▶ MTpro planning tool with Layout Designer and automatic parts list generation



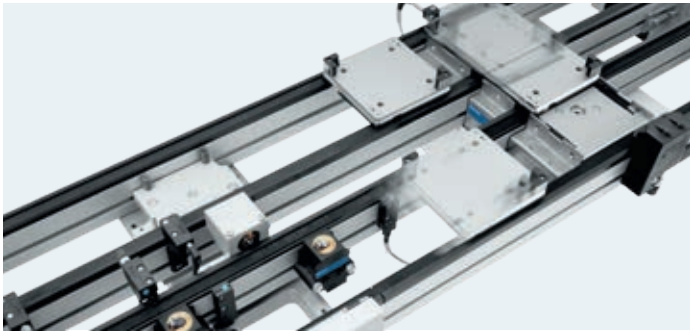
### Special components

- ▶ Accumulation curves for short throughput times
- ▶ Positioning unit for top repeat accuracy and quick workpiece pallet changeover



### Key technical data

- ▶ Workpiece pallet weight up to 3 kg
- ▶ Workpiece pallet sizes 80 x 80 mm, 120 x 120 mm, 160 x 160 mm
- ▶ Workpiece pallet varieties: plastic, plastic/steel and aluminum
- ▶ Conveyor media: belt, toothed belt
- ▶ Conveyor speed: 6, 9, 12, 15, 18 m/min
- ▶ High repeat accuracy of  $\pm 0.015$  mm
- ▶ Suitable for Class 6 cleanrooms (EN ISO 14644-1)
- ▶ Suitable for dry rooms (up to approx. 1 % relative humidity)



### **Customer applications**

Assembly lines in key sectors:

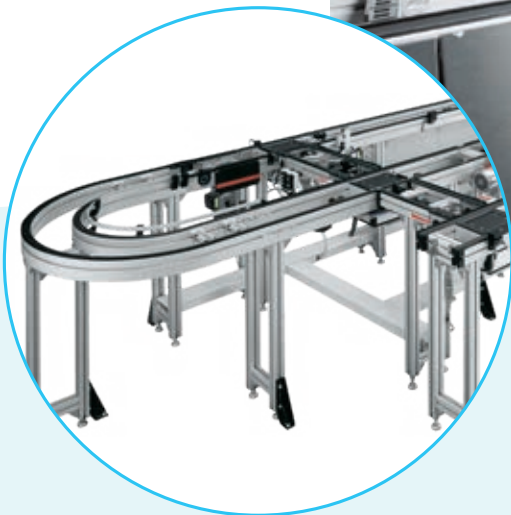
- ▶ Automotive
- ▶ ESD-sensitive electronics
- ▶ Medical technology
- ▶ Optics industry
- ▶ Automotive battery production
- ▶ Components for electric motor production



# Material and information flow technology: TS 2plus transfer system

## ALL-ROUND TALENT FOR A BROAD SPECTRUM OF USES

The TS 2plus is an all-round talent for economical assembly systems that has proven itself for decades in thousands of applications. Workpiece pallets from 160 x 160 mm to 1,200 x 1,200 mm and several combinable conveyor media form a flexible, modular system that allows you to easily implement a wide range of system layouts.



### + Benefits

- ▶ Highly cost-effective due to perfected components that have been proven for years
- ▶ Can be perfectly adapted to customer requirements thanks to the largest product range on the market and various conveyor media
- ▶ Suitable for EPAs, cleanrooms and dry rooms
- ▶ Low operating costs thanks to low maintenance costs and coordinated material combinations
- ▶ High availability due to consistent monitoring
- ▶ MTpro planning tool with Layout Designer and automatic parts list generation



### Special components

- ▶ 6 different conveyor media
- ▶ Wide range of transverse lifting units, positioning units and transportation control components
- ▶ Very extensive range of modifications



### Key technical data

- ▶ Workpiece pallet weight: max. 240 kg
- ▶ Pallet sizes: 160 x 160 to 1,200 x 1,200 mm
- ▶ Pallet types: steel or aluminum carrying plates; open frame made of aluminum profiles available
- ▶ Conveyor media: toothed belt, belt, flat top chain, accumulation roller chain, Vplus chain, duplex chain
- ▶ Conveyor speed: 6, 9, 12, 15, 18 m/min
- ▶ Section load: max. cumulative load of 200 kg/m
- ▶ Suitable for Class 7 cleanrooms (EN ISO 14644-1)
- ▶ Suitable for dry rooms (up to approx. 1 % relative humidity)



### **Customer applications**

Assembly lines in key sectors:

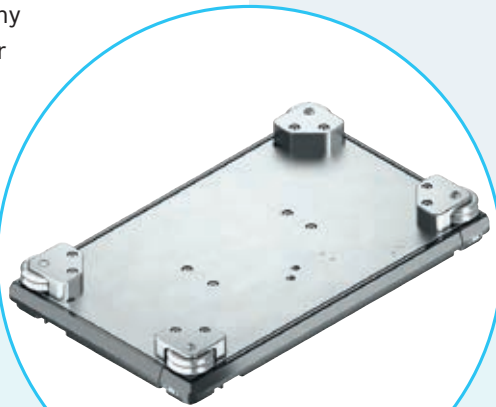
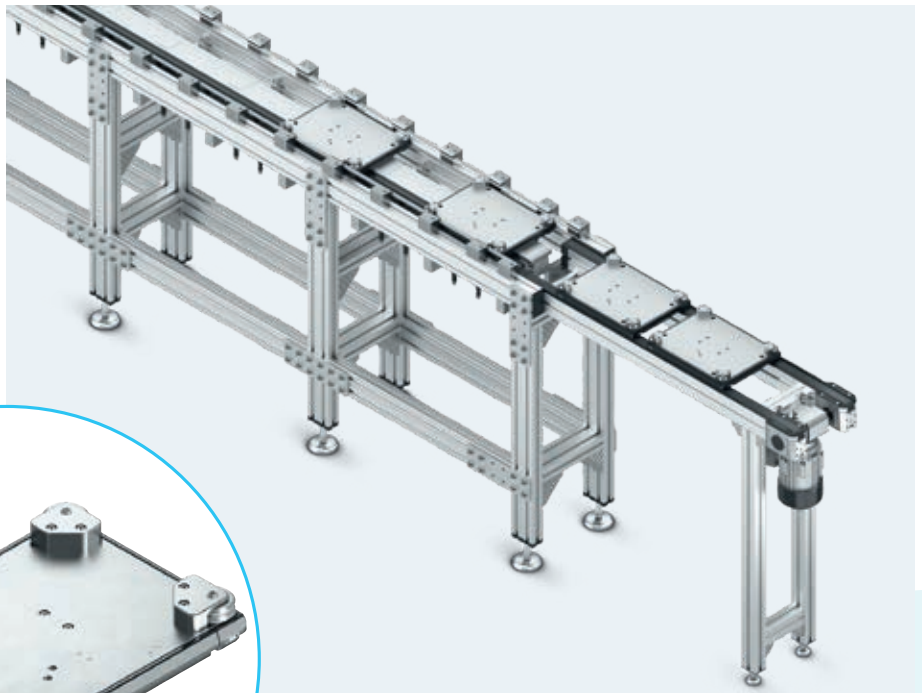
- ▶ Automotive
- ▶ Electric motor production
- ▶ Automotive battery production
- ▶ Electrical devices
- ▶ Electronics (EPA-compatible)
- ▶ Medical technology and public health



# Material and information flow technology: TS 2plus workpiece pallet booster

## TEN TIMES QUICKER IN SHORT CYCLE TRANSFERS

The innovative workpiece pallet booster reduces cycle times to a minimum. That means unproductive times before and between individual stations are significantly reduced: Depending on the application, the booster is up to ten times quicker than standard transfers, with accelerations of up to 3 g. Highly precise and without any indexing. As a modular application in the Rexroth TS 2plus transfer system, it gives your processes a boost in no time.



### + Benefits

- ▶ Quick: gain in productivity thanks to short pallet changeover times
- ▶ Precise: exact workpiece pallet positioning without additional indexing
- ▶ Flexible: individual startup in various positions – independently of pallets
- ▶ Gentle: stopping delicate products without any impacts
- ▶ Compatible: save on assembly time and assembly costs due to standardized and pre-configured modules and the use of the standard pallet WT 2
- ▶ Modular: flexible section within the TS 2plus transfer system

### Key technical data

- ▶ Acceleration max. 3 g/30 m/s<sup>2</sup>
- ▶ Speed max. 3 m/s (180 m/min)
- ▶ Workpiece pallet lengths from 160 mm up to 640 mm
- ▶ Workpiece pallet widths from 160 mm up to 400 mm
- ▶ Workpiece pallet changeover time 0.5 s for workpiece pallet lengths of 160 mm
- ▶ Loads up to 40 kg/pallet
- ▶ Positioning accuracy up to ±10 µm



### Customer applications

- ▶ Electrical equipment and electronics
- ▶ Automotive
- ▶ Medical technology
- ▶ Healthcare

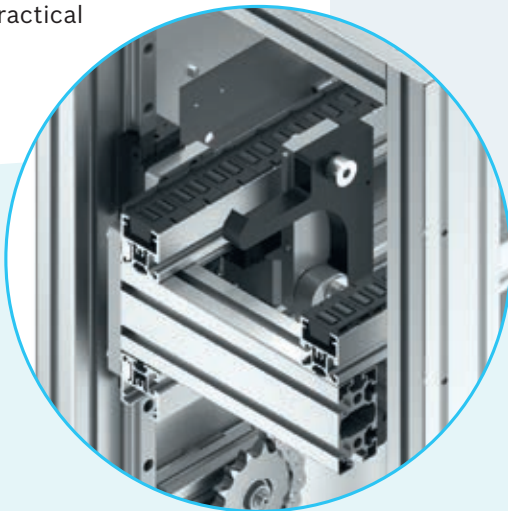
# Material and information flow technology:

## EcoLift EL 2

### SIMPLE TRANSPORT VERTICALLY OR HORIZONTALLY

Workpieces can be moved vertically or horizontally extremely economically with the EcoLift. Because it manages with just one drive and a few moving parts, the EL 2 is especially low-wear, maintenance friendly and quick to set up. This saves costs and reduces unproductive transport times.

An extremely practical addition to the TS *2plus*.



### + Benefits

- ▶ Especially economical: only one drive necessary for horizontal and vertical movements
- ▶ Quick and easy to assemble: no expensive safety equipment required
- ▶ Low-wear and maintenance friendly: only a few moving parts
- ▶ Quick to integrate: modular and flexible assembly within the TS *2plus* transfer system, fully built and assembled



### Key technical data

- ▶ Scalable for pallets up to 800 x 800 mm
- ▶ Suitable for pallets weighing up to 60 kg
- ▶ Transport height from 290 mm to 1,790 mm
- ▶ Lift up to approx. 1,500 mm
- ▶ Cycle times 8 seconds and up
- ▶ Integrated safety function and protective casing
- ▶ Drive: IndraDyn S servo motor with absolute encoder
- ▶ Direction of motion can be easily modified – up-down/down-up
- ▶ Plug-in connectors for encoder connection and power connection
- ▶ ESD-capable



### Customer applications

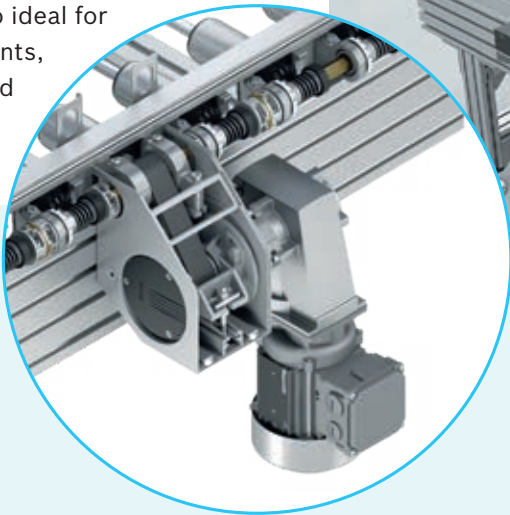
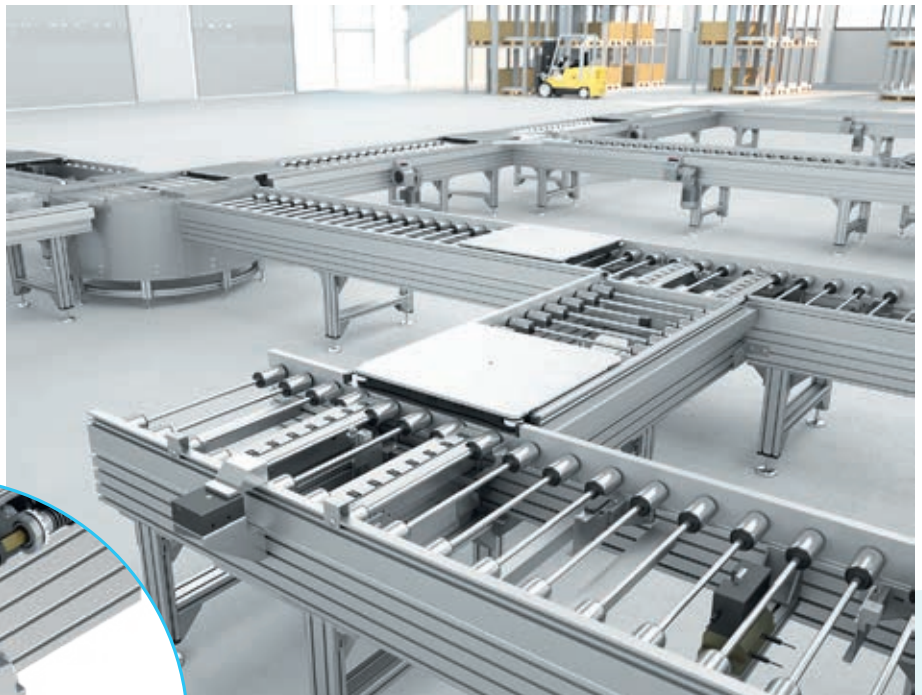
- ▶ Automotive
- ▶ Electrical drives
- ▶ Electrical equipment and electronics
- ▶ Healthcare

# Material and information flow technology: TS 5 transfer system

## MODULAR AND LOW- MAINTENANCE FOR LOADS OVER 400 KG

The heavyweight in the Rexroth product line shines thanks to its tremendous cost-effectiveness and consistent quality. With its king shaft drive, the TS 5 stands out as a rugged pacemaker even in the harshest manufacturing environments – and the greatest possible degrees of freedom for you when it comes to layout planning and use of space.

The TS 5 is also ideal for ESD environments, clean rooms and dry rooms.



### + Benefits

- ▶ Modular: modular system with a wide range of applications
- ▶ Reliable: drive concept with minimal maintenance and long service life
- ▶ Efficient: easy and fast planning, components with top quality and energy efficiency
- ▶ Suitable for EPAs, cleanrooms and dry rooms
- ▶ MTpro planning tool with Layout Designer and automatic parts list generation



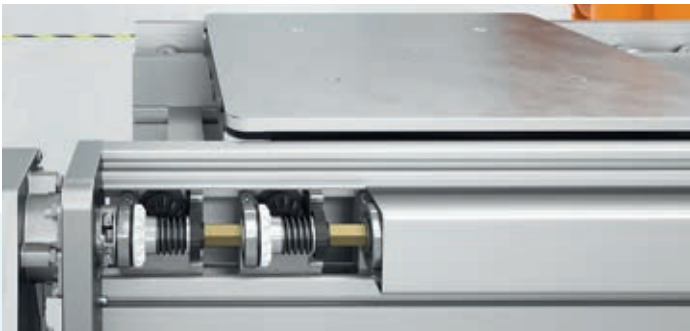
### Special components

- ▶ Low-maintenance, energy-efficient drive concept with king shaft
- ▶ “Open Center” open conveyor section for easy access to the workpiece from below

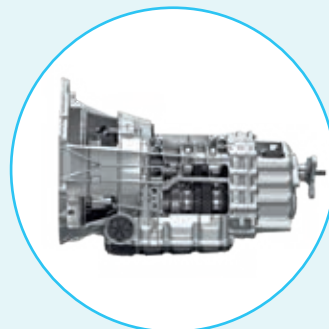


### Key technical data

- ▶ Workpiece pallet weight: max. 50 kg per roller
- ▶ Workpiece pallet sizes: 455 mm to 1,040 mm (standard widths)
- ▶ Roller diameter: 60 mm
- ▶ Roller spacing: 130, 195, 260, 325 mm
- ▶ Conveyor speed: 2–18 m/min
- ▶ Approved for Class 8 cleanrooms in accordance with DIN EN ISO 14644-1

**Customer applications**

- ▶ Powertrain assembly lines (axles, transmissions, engines)
- ▶ Electric and hybrid vehicle battery assembly
- ▶ Electrical appliance assembly



# Material and information flow technology: TS 2pv transfer system

## GENTLE, CLEAN, ECONOMICAL – IDEAL FOR MODULES

Solar module manufacturing is an extremely sensitive, complex process that is highly demanding on material transport as the glass panels are large, fragile and extremely sensitive to contamination. The TS 2pv meets these strict requirements while also being highly economical.



### + Benefits

- ▶ Shock and vibration-free transport
- ▶ Gentle module transfer from longitudinal to transverse sections
- ▶ Soft braking and accelerating
- ▶ Suitable for EPAs, cleanrooms and dry rooms
- ▶ Low operating costs thanks to low maintenance costs and coordinated material combinations
- ▶ High availability due to consistent monitoring
- ▶ MTpro planning tool with Layout Designer and automatic parts list generation

### ! Special components

- ▶ All components for sensitive transport of glass panels and modules
- ▶ Components for high-friction transport without guide rails
- ▶ Transverse lifting unit
- ▶ Application-specific toothed belts for various environmental conditions

### ✓ Key technical data

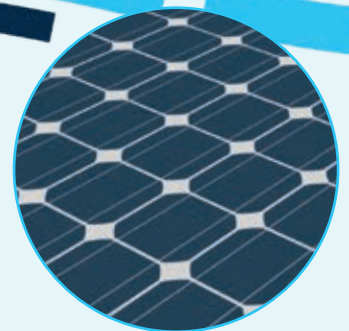
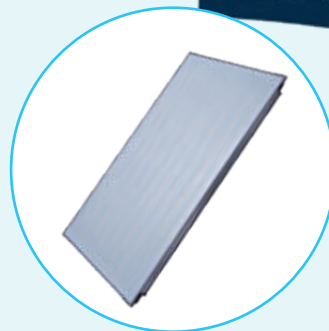
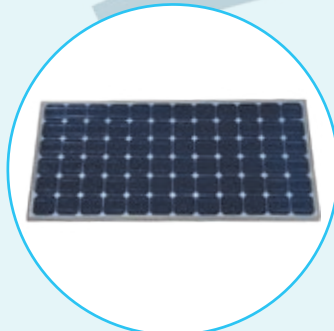
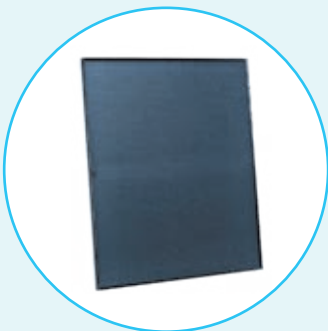
- ▶ Panel weight up to 120 kg
- ▶ Panels up to 2,200 mm in length along the edge
- ▶ For transporting hot glass modules up to 150 °C
- ▶ Completely silicon-free, no exposed grease or oils
- ▶ Available in 2, 3, 4 and 5-track versions
- ▶ Suitable for Class 7 cleanrooms (EN ISO 14644-1)
- ▶ Suitable for dry rooms (up to approx. 1 % relative humidity)



### **Customer applications**

Module production

- ▶ Crystalline solar modules
- ▶ Thin-film solar modules



# Material and information flow technology: VarioFlow *plus* chain conveyor system

## FLEXIBLE TRANSPORT SYSTEM FOR EFFICIENT OPERATION

Today, user requirements for transport solutions are more demanding than ever. With VarioFlow *plus*, Rexroth offers a powerful and versatile conveyor system. Create your custom conveyor solution from our extensive modular system. Even in close quarters and in the most demanding spatial conditions, VarioFlow *plus* can meet any challenge.



### Benefits

- ▶ Simple assembly: fast, fail-safe setup due to smart connection technology and lateral slide rail mounting
- ▶ Quiet operation: optimized sliding properties only require a few drives and guarantee energy efficient operation
- ▶ High flexibility and planning freedom: sophisticated drive power allows for a large degree of planning freedom



### Special components

- ▶ Patented chain design for reduced noise
- ▶ Unfinished sliding surfaces through lateral mounting
- ▶ Bilateral motor interface in drive and return unit
- ▶ Optional workpiece pallet system



### Key technical data

- ▶ Chain tensile force: max. 1,250 N (ESD 600 N)
- ▶ Conveyance speed: max. 60 m/min (100 m/min on request)
- ▶ Chain width: 65, 90, 120, 160, 240, 320 mm
- ▶ Noise level during operation: typically < 70 dbA at 30 m/min
- ▶ Versions: aluminum or stainless-steel design



### Customer applications

Conveyor system for horizontal and vertical transport in key sectors:

- ▶ Food, packaging
- ▶ Pharmaceutical and cosmetic industries
- ▶ ESD-sensitive electronics
- ▶ Automotive
- ▶ Interlinking machines



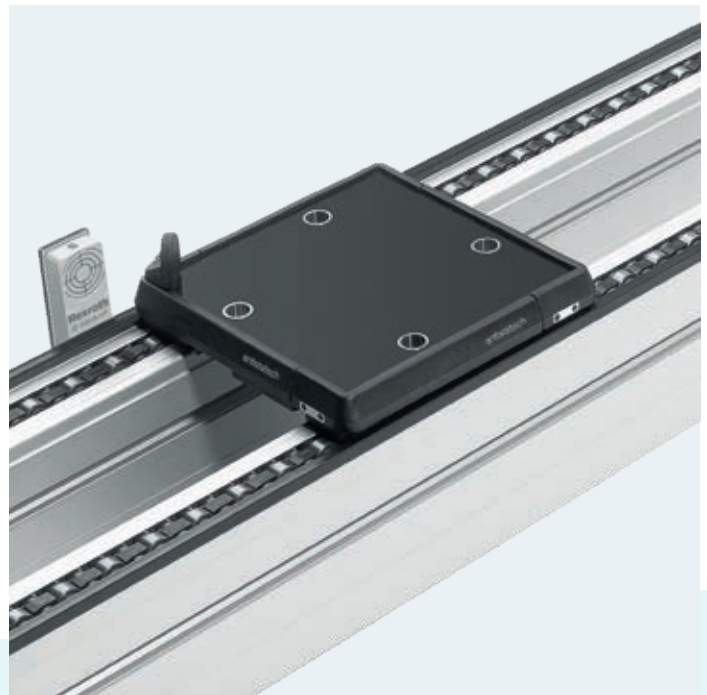
# Material and information flow technology: RFID identification systems

## SECURE AND RELIABLE DATA COMMUNICATION

RFID systems are cost-effective, reliable solutions for implementing the flow of information with goods in assembly systems. Product and order-related data can be saved directly in the data carrier (data-on-chip) or in a central database (data-on-network).



All Rexroth RFID systems are write/read systems and support common field buses. They are perfectly matched to the transfer system and VarioFlow. ID 200 is the ideal system for Ethernet-based communication using standardized ISO 15693 data carriers. With its compact size, ID 15 is perfect for small systems and central data storage.



### ID 200 – Technical data

- |                          |                                                                          |
|--------------------------|--------------------------------------------------------------------------|
| ▶ Interfaces             | PROFIBUS DPV0,<br>RS232, PROFINET,<br>Ethernet/IP, TCP/IP,<br>Modbus/TCP |
| ▶ Transmission frequency | 125 kHz (LF),<br>13.56 MHz<br>(HF, ISO 15693)                            |
| ▶ Transmission distance  | Max. 35 mm (HF)<br>Max. 15 mm (LF)                                       |
| ▶ Storage capacity       | 2 kB FRAM,<br>5 bytes EEPROM                                             |
| ▶ Data carrier           |                                                                          |

**ID 15 – Technical data**

- ▶ Interfaces ASI
  - ▶ Transmission frequency 125 kHz
  - ▶ Transmission distance Max. 20 mm
  - ▶ Storage capacity 15 bits EEPROM
- Data carrier

# ActiveShuttle – highly flexible fleet, clever system

## WITH PLUG & GO START QUICKLY AND MOVE SAFELY

The autonomous transport system ActiveShuttle is already making entry into the factory of the future: it is implemented quickly without adapting your existing factory infrastructure, intuitive to operate, completely connected and safe for people to use!



### ActiveShuttle

ActiveShuttle automates and standardizes your in-house material and goods flow. From now on, transport your dollies that are loaded with Small Load Carriers (SLC) in a highly flexible and secure manner. ActiveShuttle implements many transport concepts, from cyclical to consumption-based material supply systems. With automated loading and unloading, manual handling tasks are a thing of the past!

### ActiveShuttle Management System (AMS)

The ActiveShuttle Management System is the heart of the entire system and overtakes the central control of the complete ActiveShuttle fleet. As a control software, AMS displays the live status of your fleet, assigns the pending transport orders to the available vehicles and lets the user control and flexibly configure the logistics scenarios during productive operation. The result is a highly flexible order management system that allows orders to be entered manually or fed in automatically via third-party systems.



## BENEFITS FOR YOU

### ! AMS functions

- ▶ Order management: prioritizing and distributing pending transport orders to available ActiveShuttles
- ▶ Transport management: transport control center ensures coordinated and smooth transport operation
- ▶ Obstacle management: navigate safely around obstacles
- ▶ AMS Live Map: changes in the factory environment are automatically detected by the operating vehicles and communicated to the entire ActiveShuttle fleet
- ▶ Energy management: fully automated charging process
- ▶ Web application: intuitive and user-friendly user interface

### ✓ Key AGV technical data

- ▶ ActiveShuttle (L x W x H): 1,015 x 405 x 731 mm
- ▶ Transporting dollies: 600 x 400 mm
- ▶ Transport weight: max 260 kg
- ▶ Drive speed: max 1 m/s (3.6 km/h)
- ▶ Navigation technology: laser navigation
- ▶ Safety laser scanner: Type 3, SIL2, performance level d
- ▶ Gradients: yes
- ▶ ESD (electrostatic discharge)
- ▶ CE
- ▶ Lithium-ion battery (48 V, 17 Ah)
- ▶ Data transfer: Wi-Fi IEEE 802.11

- + Plug & Go: implemented fast and easily, without adapting the existing factory infrastructure
- + Automated materials transport with fully automated loading and unloading
- + Navigate safely around obstacles
- + Easily create and configure logistics scenarios using AMS
- + Return on Investment (ROI) within two years
- + Comprehensive safety concept, designed for continuous 24/7 mixed operation with people and machines
- + Employee relief
- + Standard interface for connection to third-party systems

# Nexeed Fleet Analytics – the comprehensive intralogistics management tool



**Optimal capacity for optimized processes:**  
with Nexeed Fleet Analytics by Rexroth, you  
can monitor all your vehicles and routes in real  
time and exercise full control over your intra-  
logistics.



Finally, full transparency: with Fleet Analytics, you can keep an eye on your entire intralogistics fleet in real time for the first time. From driverless ActiveShuttles to other intralogistics vehicles – the cloud-based solution from Bosch Rexroth connects all vehicle data in your warehouse and their work in process, analyzes them and makes the analysis available to you in a graphical format. In clear live maps, route maps, heat maps and usage analyses. Plus individual reporting with the integrated business intelligence tool.

At a glance, identify all positions, movements, statuses, bottlenecks and danger zones. Compare the use, utilization and downtime of different vehicle types and manufacturers. Perfect your ActiveShuttle usage, particularly in mixed operation with other vehicles. Fleet Analytics brings your fleet of vehicles to the next level – efficient and practical. The result: better utilization, a better degree of use and optimized processes. So intralogistics grows smart and the Factory of the Future becomes a reality faster.

## BENEFITS FOR YOU

-  Optimizes intralogistics processes with ActiveShuttles and other vehicles
-  Maximum transparency in real time
-  Efficient use of your entire fleet of vehicles, particularly in mixed operation
-  Easy comparison of vehicle types and manufacturers
-  Faster process integration for vehicles via the implementation support and monitoring tool
-  Investment protection via better degree of use and data protection

# MTpro planning software – optimal layouts for assembly systems



**MTpro is an intuitive piece of software used for planning assembly systems. It assists you from selection and configuration through to ordering components.**

With MTpro, you can plan, calculate and document your assembly systems in just a few steps. Whether it's a transfer system, profile frame or Manual Production System – the intuitive operating concept of the Layout Designer lets you create even complex designs and system layouts in no time at all.

Components can be selected from the range of products using drag & drop and assembled quickly and easily using the snap function. You can then conveniently order the components needed for your configuration online. With the automatic parts list pricing feature, you'll always have a handle on costs. Numerous interfaces allow the planning data to be used by other departments, such as Design, Purchasing and Service.

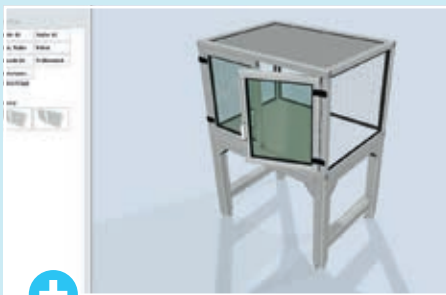
**Everything's well in hand with MTpro**

From technical data to ordering information and CAD models through to assembly instructions and spare parts illustrations, the MTpro planning software shows you everything you need to plan and design frames, enclosures, flow racks, workstations or transfer systems at a glance.

Intuitively assemble your system on screen using drag & drop and the snap function – no complicated CAD program required. Optimize the ergonomics of your design with ease using the integrated ManModel. Generate entire parts lists, including accessories and all small parts, at the push of a button and then submit your order online. Versatile interfaces allow layouts, CAD models and order data to be conveniently used elsewhere.

**Suitable for the whole range of assembly technology.**

MTpro helps you to both design frames and enclosures with basic assembly elements, and to plan and ergonomically design Manual Production Systems. You can also produce layouts for entire chain conveyors and transfer systems in no time at all.

**Design frames and enclosures made from Basic Mechanic Elements****Benefits**

- ▶ Quickly plan complete frames without CAD software
- ▶ Easy assembly via drag & drop
- ▶ Library for reusing your previous modules and layouts

**Design ergonomic Manual Production Systems with ManModel****Benefits**

- ▶ Simulation of grab areas and fields of view using standardized human models for optimal workstation ergonomics
- ▶ Female and male models, small, medium and tall in stature

**Plan transfer system layouts****Benefits**

- ▶ Layout Designer for planning complete conveyor systems
- ▶ Assembly logic assists in quick and flawless component assembly
- ▶ System environment factored in with the option of adding room elements

# Electric tightening systems: process reliability for all industrial applications



## **Nexo cordless Wi-Fi nutrunner**

- ▶ Maximum process reliability due to torque and angle monitoring
- ▶ High degree of interconnectivity due to integrated controller and amplifier, reliable data transfer and data storage
- ▶ Work is made easy even in hard to reach areas

## **Handheld nutrunner ErgoSpin**

- ▶ High level of process reliability due to precise measurement of all tightening parameters and digital data transfer
- ▶ Reduced operator fatigue through ergonomic design
- ▶ Simple operation due to clear layout of control and indicator elements

## **Tightening spindles**

- ▶ Meets the highest safety requirements with redundancy measurements conforming to VDI standards
- ▶ High performance for the most demanding applications in either hand-guided or automated assembly systems

**Handheld, hand-guided, semi or fully automatic – electric tightening systems by Rexroth are the efficient and safe solution for your production needs.**

Process control, accuracy and the highest level of functionality are critical components to every production and assembly line. The right bolt must be tightened at the correct angle and with the correct torque. Only then does an assembly reliably and safely meet the quality standards for the final product.

Requirements concerning tightening systems in the automotive industry as well as in plant and mechanical engineering are clearly defined by VDI/VDE 2862. Thanks to the accuracy of electric tightening systems by Rexroth and the option of documenting each and every screw fitting, as well as compiling statistics for quality assurance, you can rest assured that your process is reliable.



**Compact systems**

- ▶ Available for both handheld tools and mounted spindles
- ▶ Display and status LEDs provide clear information for operators
- ▶ Easy programming via an intuitive operating system
- ▶ Protection class IP54, highest immunity to electromagnetic disturbances (EMC level IV)



**Modular systems**

- ▶ For handheld nutrunners, tightening spindles, or mixed operation
- ▶ Supports a wide range of communication protocols for flexible system integration
- ▶ Available as system box (IP54) or as control rack for switch cabinet
- ▶ Up to 40 tightening channels can be combined by linking multiple systems



**Operating systems**

- ▶ Icon-based programming and intuitive interface make it easy to learn and easy to use
- ▶ Automatic detection of electronic components
- ▶ Transparent tightening case analysis thanks to clear graphic display

# Automatic production assistants: Intelligent systems for the adaptable Factory 4.0



**From quick, high-precision image processing assistants to safe, collaborative robots – automatic production assistants (APAS) help take the burden of repetitive, ergonomically unfavorable assembly work off your shoulders and ensure error-free, reliable production.**

Turn your manual processes into efficient, automated process in a snap with the help of automatic production assistants (APAS). The collaborative robots provide efficient automation solutions, especially for classic pick & place tasks.

The various models of the **APAS assistant** make tasks such as machine loading/unloading, sorting and workpiece aligning easier. Thanks to their unique, capacitive sensor skin, man and machine can work together without the need for a protective fence.

The automation of demanding surface inspections by the **APAS inspector** is a logical addition to these applications. With objective workpiece inspection, results remain consistent even over extended periods. In addition, the versatile, manually interchangeable inspection modules can be adapted to a wide range of inspection duties. This allows you to increase your efficiency, quality and productivity over the long term.

**APAS components**

Based on the needs of your application, you and your processes are supported by our automatic production assistants, especially for simple, repetitive or ergonomically unfavorable work movements. Whether it's an unfenced robot or an industrial image processing assistant – our components are easy to integrate into your system and automate your handling and inspection tasks with high precision and efficiency.



- ▶ Variable: integrated or mobile
- ▶ Easy: integrate into your systems with open interfaces
- ▶ Flexible: intuitive control platform or familiar, independent robot programming (FANUC/KUKA)
- ▶ Modular: optional components

**Automation solutions**

Describe your application – together we will develop your custom, overall application solution, then help you put together the right components and integrate them into your existing production environment. This allows you to bundle and accelerate your processes as well as reduce your production times.



- ▶ Efficient: automate entire work processes
- ▶ Space-saving: capacitive sensor skin, slim design
- ▶ Safe: comprehensive Bosch safety concept
- ▶ Custom: versatile options for use

**Services**

Beyond our portfolio, we offer comprehensive services that make it possible to achieve maximum utilization and efficiency of our products across their entire life cycle.

- ▶ Feasibility studies for your application
- ▶ Training center: custom-designed workshops and training on our products
- ▶ Issuance of CE conformity: even for applications not created by Bosch
- ▶ Flexible business models: one-time purchase or leasing of our products



- ▶ Custom: application-based training options
- ▶ Supportive: takeover of engineering tasks (e.g., CE)
- ▶ Realistic: feasibility studies for your application

# Connected assembly and logistics: From customer-specific solution to turnkey project



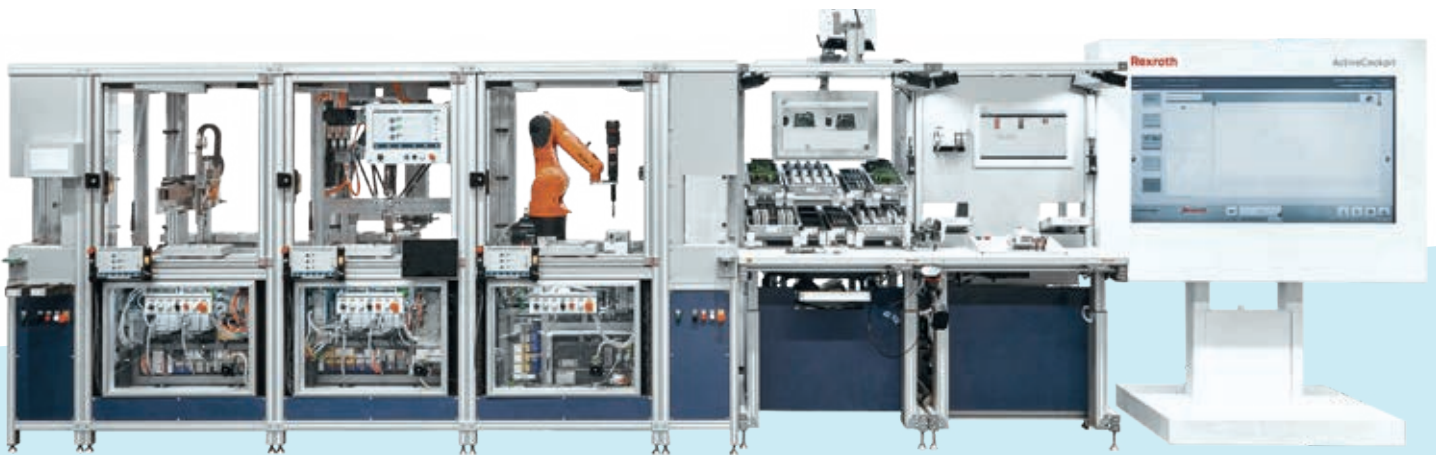
**From consulting and total installation acceptance through to personnel training: Rexroth is there for you around the globe in every phase of planning, designing and implementing your factory automation projects focusing on connected assembly and logistics.**

## CUSTOMIZED AND APPLICATION-ORIENTED

When developing the most cost-effective and productive solutions, we turn to our field-tested digitization/Industry 4.0 technologies and innovations. These include collaborative robotics systems and intelligent software solutions, e.g. for employee guidance and support, performance management and quality assurance. To accomplish this, we also integrate systems into your IT infrastructure and ensure interfaces are designed effectively (e.g. for connecting to MES and ERP systems).

At Bosch Rexroth, Industry 4.0 is already a living reality: We are simultaneously the leading provider of components and systems on the market and the leading user in over 270 Bosch plants worldwide. Benefit from our extensive expertise and the wealth of experience that makes its way into our products and your projects.

Our skilled customer consulting is informed by this understanding and even factors in every aspect of modern, lean and scalable production design. The result of our services are overall solutions that meet all of your needs and will continue to do so into the future. With our global network, we will always be at your side as a reliable, long-term partner.



## OUR SERVICES – OUR APPROACH

### PLANNING



**Active collaboration in the planning phase**  
Value stream analysis

### DESIGN



**Concept development**  
Value stream and IT design  
Layout and processes

### IMPLEMENTATION



**Engineering and design**  
**Production, procurement, assembly**  
**Installation, startup and IT integration**

### SERVICE



**Comprehensive services**  
Production optimization



## BENEFITS FOR YOU

- ▶ Everything from a single source; turnkey assemblies
- ▶ Total project planning and management across all assemblies
- ▶ Value stream-optimized layout based on extensive production experience
- ▶ Reliable partner with an international presence
- ▶ Subassembly delivery based on project progress
- ▶ Transparent quality management/documentation, incl. safety assessment of overall system
- ▶ Transfer of risk at destination on request
- ▶ Project-specific warranty and service agreements

## Sample projects

**Linkage of TS  
2plus and TS 1  
for plant  
transport**



**Industry 4.0  
assembly line**



**Linkage of  
VarioFlow 90  
for automotive  
transmission  
chip removal**



**Linkage of TS 2pv  
for solar panel  
manufacturing**



# Rexroth Service – your key to higher productivity



**Maximum system availability and top efficiency throughout the entire life cycle of your machinery and systems: These key factors determine the productivity of your production processes. Rexroth provides comprehensive services that allow you to achieve these goals regardless of location, sector or equipment.**

**Put together your custom service package – from simple spare parts supply to predictive services in the ODiN online diagnostics network. We're here for you.**

With our modular service portfolio, we reduce the complexity and thus the costs of maintenance and repair for your production equipment. Our qualified technicians are guaranteed to be ready to assist rapidly. With our expertise in drive and control technology, we will fulfill your needs quickly and reliably. We ensure precise diagnostics and rapid spare part delivery. At the same time, we reduce costs through standardized processes and testing methods, as well as through the potential connection to our online services for status-based maintenance at the highest level. All this implemented by our highly qualified personnel in 80 countries.

If you desire, we will keep your machinery in peak condition over its entire life cycle and increase your efficiency to the latest standard. Together with you, we will analyze your upgrade and retrofitting potential, and also take practical steps to implementing it. Your operating costs will drop dramatically thanks to higher productivity, greater energy efficiency and ideal safety standards. Increase the productivity of your machinery and systems for good with Rexroth as your service partner.

You can find detailed information  
on Rexroth services at  
[www.boschrexroth.com/service](http://www.boschrexroth.com/service)







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**Further information online:**

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<https://addresses.boschrexroth.com>



**At the Bosch Rexroth website**  
[www.boschrexroth.com/assembly-technology](http://www.boschrexroth.com/assembly-technology)



**Rexroth media directory**  
Commercial media and technical documentation is  
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[www.boschrexroth.com/mediadirectory](http://www.boschrexroth.com/mediadirectory)

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