

Solutions for the Food and Packaging Industries

One-Stop Shopping for Automation





Detect Trends in Good Time

Always pay close attention to consumers, detect trends in good time and quickly turn these trends into up-to-date products: Manufacturers of foodstuffs, semi-luxury foods, beverages, pharmaceuticals and cosmetics are enduring tough competition with increasingly shorter product life cycles. The rapid changes in consumer desires are following discernible world-wide mega-trends which will shape consumption patterns to an even greater extent in future.

The rules are being continuously altered due to **demographic change** in nearly every industrial nation. More and more people are living in cities and in increasingly smaller households. The number of elderly people in the population is also rising. This is leading to greater demand for **smaller portion packages** and meals that can be quickly prepared. The proportion of frozen food and ready-to-serve meals on supermarket shelves is increasing. In particular, **convenience products** are very much in vogue in our fast-moving times.

Despite all this convenience, **consumers** throughout the world are becoming more **health-conscious**. They are increasingly questioning the composition of food and are demanding the highest possible quality standards. Brand awareness is also increasing. Only strong clearly positioned **brands** can create this trust among consumers and attain market success.

However, visual aspects are still a decisive factor when it comes to making purchases. Attractive packaging arouses attention and attracts purchasers. Constantly new packaging types and materials present products in a more interesting light and perform an **increasing number of functions**. These functions also include sustainability through the use of recyclable materials.

One important factor for the food and packaging industries: Innovative automation solutions through which manufacturers can quickly, flexibly and economically transform requirements into products.

- **Demographic change**
- **Smaller portion packages**
- **Convenience products**
- **Increasing health consciousness**
- **Increasing brand awareness**
- **Packaging containing additional functions**
- **Green Thinking**
- **Minimizing waste at all stages**

Challenges for Automation



Mega-trends are calling the tune. The manufacture of food and packaging will call for increasingly more efficient solutions in future.

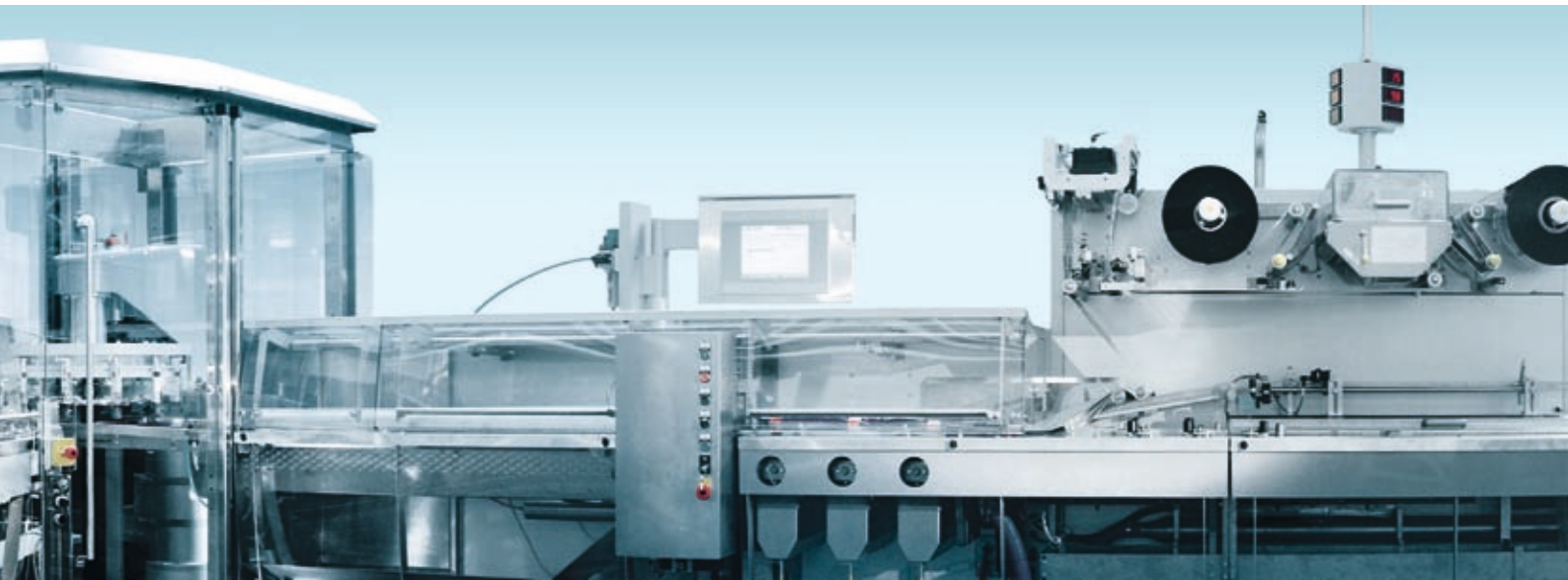
Flexibility: Experts agree: Batch sizes in future will drop to a few minutes or hours. Short retooling times will be the only way to attain a level of high productivity under these conditions.

Simplicity: Intuitively operated open loop controls, short training times and long maintenance periods simplify daily handling of machines. This means that fewer operators can look after more machines.

Quality: Just like in in-house production, the food and packaging industries place the highest possible demands on the quality and reliability of all components and machines. The food and packaging industries favor suppliers who can provide documentary evidence of systematic quality assurance which is geared towards the high requirements of these industries.

Productivity: More and more manufacturers are attaining the shortest possible cycle times coupled with high product quality thanks to flexible integration of





machines and modules as complete production lines. Certified safety systems also ensure that production can be restarted as quickly as possible in the event of faults. This necessitates open constant automation concepts and standardized solutions.

Hygiene: Strict national and international hygiene specifications and standards provide a clear framework: Process requirements with intensive cleaning cycles can only be permanently fulfilled if the materials and construction of the automation components and machines are

designed in accordance with these hygiene specifications and standards.

Energy efficiency: At least the same level of productivity with lower energy consumption: By using efficiency optimized drive solutions, intelligent closed loop controls and the recovery of brake energies, machine manufacturers can now already substantially improve energy efficiency. Considerable savings in energy consumption can be achieved by optimization of the pneumatic system to eliminate wasting of compressed air.

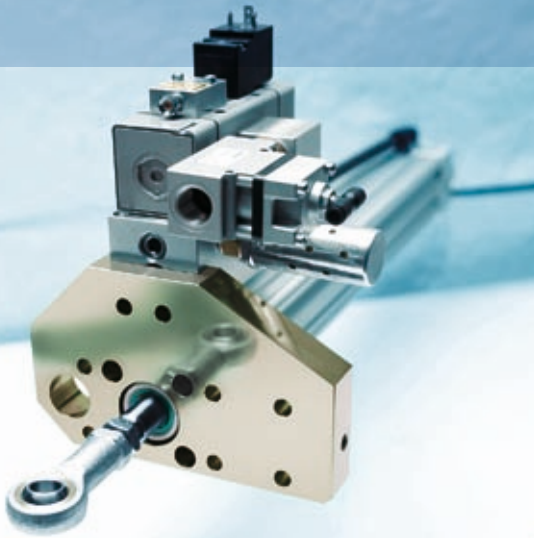
Total cost of ownership: Actual availability, even with small batch sizes due to a quick format change, productivity, energy efficiency and maintenance requirements account for the largest proportion of costs over the entire life cycle of a machine or system.

Global partnership: Worldwide operating manufacturers in the food and packaging industries are looking for automation partners who support them at every location in the world and therefore obtain globality advantages.



Our Recipe for Success: Economic Solutions from a Single Source

The Rexroth range of products is always exactly as large as you need. From individual components through to complete system solutions. Cost-efficiency throughout the entire life cycle is always the focal point in this case.



Up to 2,000 cycles per hour: stretching cylinder units for blow molding machines

Availability, output and quality: An increasing number of end customers are using these three key values to calculate overall equipment efficiency, i.e. total availability of their machines and systems. New standards are set here by Rexroth's extensive automation modular system containing electric drives, open loop controls, linear and assembly technology, and pneumatics.

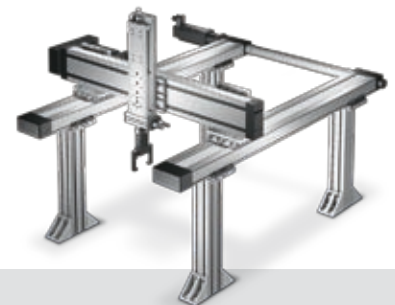
Intelligent drives and innovative control functions speed up product and format change, and reduce retooling times to a minimum. The functional safety systems integrated at all automation levels also lead to quicker fault elimination and shorter setup times. State diagnosis of complete axes and pneumatic sensors, which simultaneously transmit process and diagnosis data, prevent unplanned machine failures. The result: Much higher availability.



IndraControl L and IndraControl V – platform for controlling, operating and monitoring



ICS cylinders: optimized pneumatic damping for precision and longevity



camoLine: pneumatic and electric actuators – freely combinable



Perfect interaction:
higher efficiency through
compatible automation
solutions

Perfectly coordinated components
in mechatronic units fully exploit
the efficiency of every single
automation technology. Form-fit
connection technology with an
Easy-2-combine interface and
standardized structural dimen-
sions enable pneumatic and elec-
tric drives to be freely combined.

Constantly open software and
communication standards and
finely scalable system solutions
open up additional degrees of
freedom for the modularization
of machines and flexible integra-
tion of production lines. The right
ingredients and application know-
how from Rexroth: The successful
recipe for economic automation
is ready.



Clean Line: valve carrier system
with integrated fieldbus



IndraDrive: finely scalable in
functionality and performance



VarioFlow: flexible
material-handling equipment

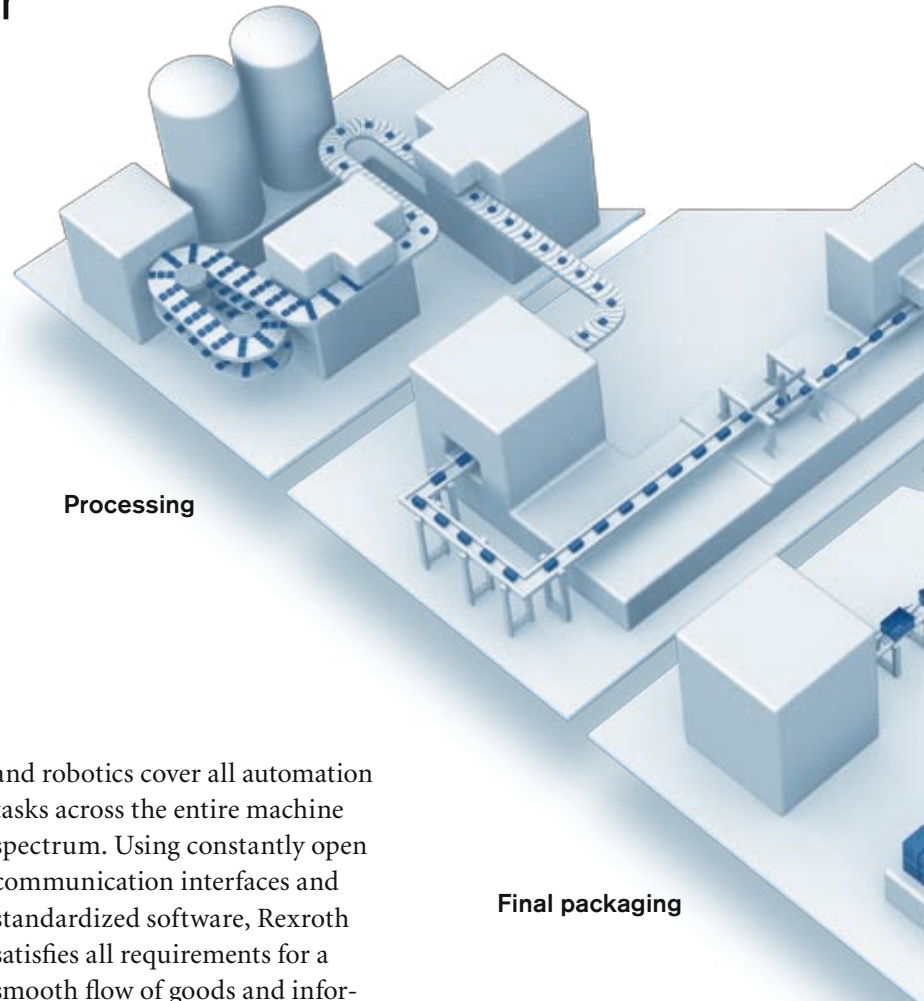
Rexroth: A Partner for All Processes

The whole is more than the sum of the individual parts. This is especially true in the food and packaging industries since users must integrate different process steps and machines in a harmonious production sequence.

Conveying, mixing, processing, pouring, filling, repacking and palletizing: The large number of different processes involved in the manufacture of food, beverages, pharmaceuticals, cosmetics and semi-luxuries places high demands on automation. That's because every process step must be smoothly integrated in the overall sequence from the raw materials through to the palletized consignment. In its capacity as an automation partner, Rexroth makes this task much easier: Predefined functionalities for PLC, motion

and robotics cover all automation tasks across the entire machine spectrum. Using constantly open communication interfaces and standardized software, Rexroth satisfies all requirements for a smooth flow of goods and information.

Rexroth also offers consistency and scalability at the hardware level: Productivity is increased in



Processing

Final packaging

Dry foods



Confectionery



Liquid food

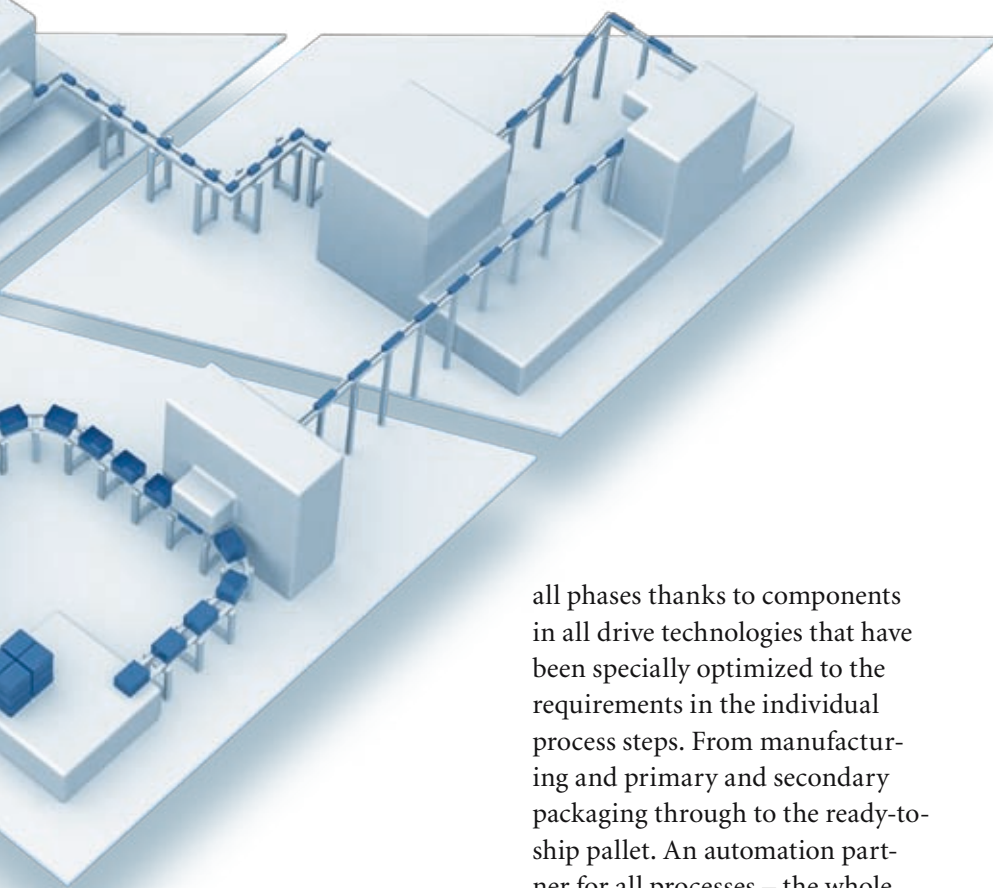


Beverages



Primary packaging

Secondary packaging



all phases thanks to components in all drive technologies that have been specially optimized to the requirements in the individual process steps. From manufacturing and primary and secondary packaging through to the ready-to-ship pallet. An automation partner for all processes – the whole therefore produces more than the sum of the individual parts.



Molding equipment for bar chocolate

Pharmaceutical products

Cosmetics

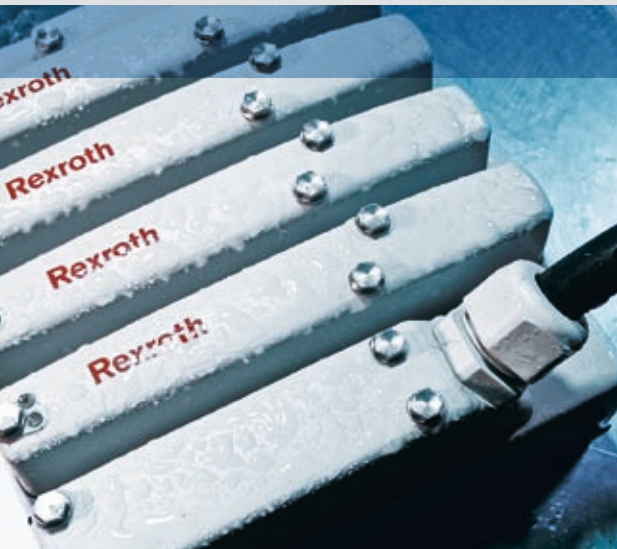


You can find extensive information on Rexroth's range of solutions in the detailed brochures:

- Dry food and confectionery
- Liquid food and beverages
- Cosmetics and pharmaceuticals

Clean Movements: Designed for Maximum Hygiene

A genuine endurance test: Only components specially developed for the food and packaging industries can permanently survive frequent cleaning cycles with high pressure, hot temperatures and aggressive detergents.



Clean, hygienic CL03 valve carrier system with multi-pin connector

From a single source: optimum components for every need

Smooth surfaces, sealed joints, corrosion-resistant materials and lubricants suitable for use with food: Even during the product development phase, Rexroth complies with international hygienic design directives: Non-corroding pneumatic cylinders for wash-down applications are ideally suited for direct contact with food and other sensitive products.

The Clean Line valve carrier system complies with protection class IP69K thanks to the use of special materials and seals. Designers can therefore directly integrate the valve carrier system in the system with no indirect routing via the switchgear cabinet. The proximity to the actuators

reduces the amount of tubing and wiring required – an additional simplification of the design.

A wide range of linear guidance systems made of corrosion-resistant materials ensures clean movements at all times. Lubricants suitable for use with food also open up sensitive application areas. The VarioFlow stainless steel chain conveyor system ensures hygienically perfect transportation between the individual processing stations: Clean solutions for all automation tasks from a single source.



Hygienic design: MKR linear module

VarioFlow system: high degree of freedom



Higher Energy Efficiency with the Same Productivity: Less is More

Savings with every cycle: Energy-efficient products and solutions from Rexroth continually reduce power consumption in production and help to quickly cut costs.

When it comes to higher energy efficiency, there is a need to look at the whole picture. The already existing potential can only be fully exploited by systematically combining high efficiencies with intelligent closed loop controls. When placed very close to the actuators, compact and very light pneumatic components reduce the tube lengths substantially. An even greater effect is created by combining cylinder/valve units with high functional density because they

Decentral servo drives revolutionize automation



Movement optimization saves energy

replace tubing almost completely. Electropneumatic pressure control valves from the ED Series lead to another saving. They divide the motion sequence into different phases with their own pressure profiles. Even over very short distances, this intelligent closed loop control produces considerable energy savings with almost unchanged dynamics.

Efficiency optimized electric motors and the IndraDrive MI (innovative integration of servomotors and controllers) reduce consumption with every revolution. The recirculating servo drives can do

even more: They recover energy with every axis braking. For this purpose, they switch the motors to generator operation and feed hitherto unused energy back into the network or the DC bus.

Rexroth is also starting to increase efficiency at the open loop control level. Due to optimized movement control of all axes through pre-defined movement modules and needs-related control, the system solutions substantially reduce the energy consumption of the complete machine.

Rexroth: Systematic Automation

Pick-and-place system
for filling trays

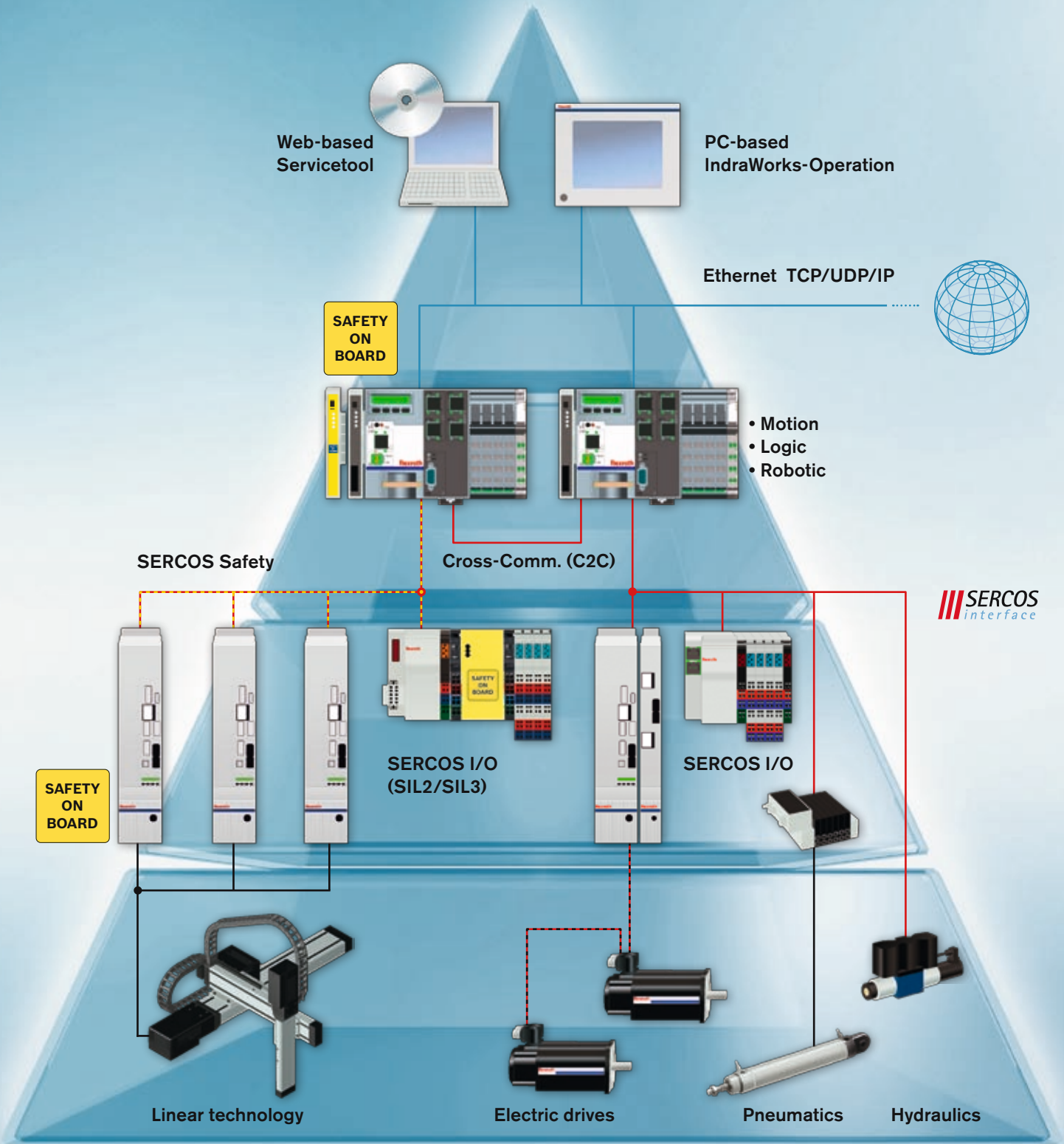


Automation technology must make the task simpler, not more complicated. The extensive Rexroth modular system for every drive and open control loop technology for the food and packaging industries opens up all possibilities in this case.

The coordinated components and interfaces ideally complement one another and develop, when combined, the specific advantages of every technology. Rexroth's system solutions facilitate transparent data access from company software and open control loops and intelligent actuators through to field devices on standard Ethernet

physics. SERCOS III, the internationally standardized universal bus, also permits real-time cross-communication between the individual open control loops and therefore creates the requirements for flexible combination of different modules and machines as highly flexible production lines.





In its capacity as a one-stop shopping partner, Rexroth therefore markedly reduces engineering complexity and provides assembly groups and system solutions

which save designers from having to perform time-consuming routine tasks. This creates freedom to concentrate on core competencies, i.e. systematic automation.

Energizing System Partnership: Experience for Fast Results

The industry specialists from Rexroth pool their worldwide application experience and are familiar with the special challenges which the food and packaging industries pose for automation technology.



As industry insiders, the specialists from Rexroth are aware of the special requirements relating to the automation of food and packaging machines. These specialists cooperate closely with Rexroth's worldwide organization in more than 80 countries. Since Rexroth technologies enjoy an excellent reputation with end customers, the company's specialists regularly exchange information on the latest developments and challenges in the plants. Working closely with machine manufacturers, the industry specialists from Rexroth continually develop innovative solutions. Even after commissioning, the worldwide sales and service network of Rexroth monitors the entire life cycle of machines all over the world.

Rexroth helps end customers to coordinate complex international projects. Projects are managed reliably through the combined resources of Rexroth. Permanent contact partners ensure that the project runs smoothly and is completed on time.

The automation solutions tailored perfectly to the particular tasks and the company's worldwide organization are important requirements. However, Rexroth's highly qualified industry specialists for all drive and open control loop technologies promise more: Experience for efficient results.

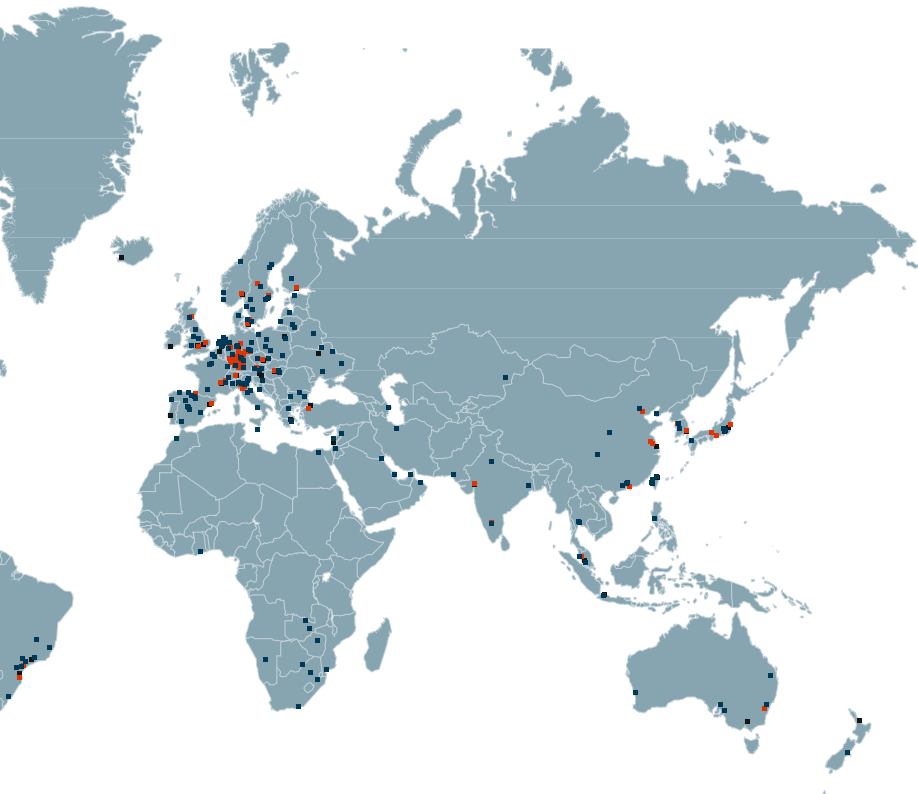


Bosch Rexroth. The Drive & Control Company



Bosch Rexroth AG is one of the world's leading specialists in drive and control technology. Under the brand name of Rexroth, tailor-made solutions are created for over 500,000 customers in the areas of drive, control and motion of machines and plants that are used in industrial and factory

automation as well as mobile applications. As „The Drive & Control Company,“ Bosch Rexroth develops, produces and markets its components and systems in more than 80 countries. The Bosch Group company achieved profits of around 5.4 billion euro in 2007 with nearly 33,000 employees.



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