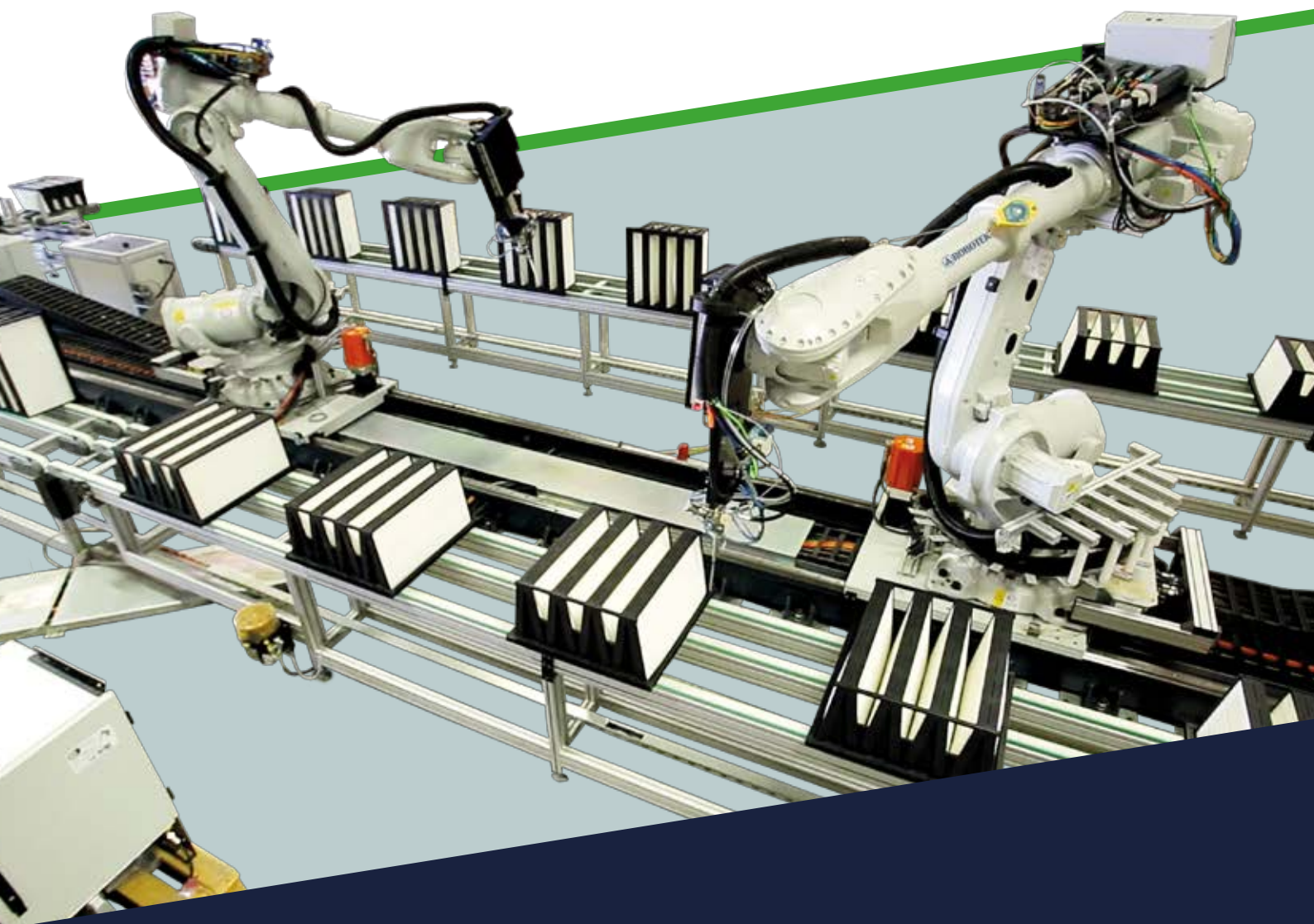


COMMITTED
TO **INNOVATION**

**DISPENSING
TECHNOLOGY**



About Us



Precisely engineered, competitive and reliable solutions
from a **creative team of experts**

Robotek is committed to deliver one or two components polyurethane and silicon dispensing systems with innovative design and efficient performance to customers around the world. Regardless of how complex the dispensing requirements, Robotek experts are ready to serve you. Many years of experience in a broad range of industries and extensive applications knowledge allow Robotek to deliver precisely customised solutions. Either an individual dispensing machine or up to fully automated robot cells or turn-key integrated production lines, our solutions are carefully configured to match your specific needs.

Products & Solutions

Dosing & Dispensing Units



General Description

One or two components polyurethane or silicon is metered, mixed and dispensed into a groove, onto a flat surface or in a mould and cured at room temperature or higher temperatures for fast curing. Polyurethane and silicon compounds are used in wide variety of applications in the processes of sealing, bonding, potting and encapsulation.

The robotic dispensing system is a sealing, bonding, potting and encapsulation solution for electrical enclosures, automotive parts, air filters, luminaries, drum lids, electronic components and many more. The standard configuration includes a low pressure dosing and dispensing unit, cartesian or 6 DOF robot, a dispensing table and a temperature conditioning unit. There are wide range of options and automation solutions available to configure the ideal solution for your applications.



DDx12 Series Dosing and Dispensing Unit

Low pressure dosing and dispensing unit is consist of a mixing head, component daily tanks, temperature conditioning unit, metering and recirculation pumps, process control instrumentation, control electronics and user interface.

Pressurized daily tanks for A and B components with 40 litres capacity are made in stainless steel, double walled and thermally isolated for controlled temperature. A component tank is equipped with speed controlled agitator. High precision and speed controlled metering and recirculation pumps are installed to convey material components from pressurized tanks to mixing head. The sophisticated sensor technology enables all process parameters to be monitored and controlled for a smooth operation of the system.



DHx15 Series Dynamic Mixing Head

Based on process requirements, our dispensing solution is configured with one-component dispenser or multi-component dynamic or static-mixing head. Dynamic mixing head consists of valves, mixing chamber, mixer, electric motor, nozzle, anti-dripping system and automatic flushing and drying system.

Four pneumatic actuated needle seat valves are for materials, cleaning agent and air. Dynamic mixer rotates in the mixing chamber and its speed can be electronically adjusted between 0-9000 rpm. Valves, mixer and the mixing chamber are made of stainless steel.

Temperature of the mixing chamber is stabilised with the heating and cooling function of the temperature conditioning system to stabilize the reaction.

With the variations of accessories and pumps, the mixing head output capacity ranges from 0.3 to 100 g/s with a dosing accuracy of $\pm 1\%$. Customised mixer designs are also available. Material components from liquid to high viscous polymeric reactive materials being dosed in the mixing head are always homogeneous and equally conditioned in correct mixing ratio. By these features, optimized production process is successfully achieved and broad range of applications is easily covered.

The simplicity of DHx15 series mixing head, resulting from its modular and flexible design, enables onsite self-maintenance by customers in case of complicated service requirement while many others in the market requires factory level maintenance.



SHx12 Series Static Mixing Head

Static mixing head is consists of valves and a static mixer. Depending on process requirements, the number of valves and static mixer size may vary. Components encounter at the valve outlets and mixed in the static mixer. Mixing head is equipped with automatic flushing and drying system. Disposable static mixers used in dispensing systems are discarded after a period of use.

Environmentally Friendly Recirculating Cleaning System

Environmentally friendly recirculating cleaning system is used with biodegradable cleaning agent. The cleaning agent is filtered and waste particles are separated. Rejuvenated cleaning agent recycled and used over and over again. No methylene chloride, no contaminated water is discharged. It is a proven alternative to conventional cleaning systems in terms of performance, economy and greatly improved environmental health and safety.



High Performance Process Control

The system is equipped with sophisticated process control technology that ensures dispensing stability. Ultrasonic type, non-contact, continuous level sensors feedback component levels to the automatic refilling system. High precision regulators control the air pressure of the tanks. Material line pressure is measured by precise pressure sensors, monitored by system controller and displayed in the user interface. In case of any deviation that exceeds set pressure limits, the system controller takes necessary measures. Materials temperatures are measured by sensors in daily component tanks to ensure that the recommended process temperature is maintained. Pressurised tanks are furnished with safety relief valves. High precision dosing pumps meter the materials in required mixing ratios. Recirculation pumps always keep the materials inside the hoses conditioned according to the process requirements. High tensile steel-reinforced polyamide high pressure component hoses are used in the system. Component hoses are covered by isolation materials and protective nets are used for isolation materials.



Products & Solutions

Dosing & Dispensing Units

System Control

The system control is based on a stand-alone powerful industrial CNC unit with linear, circular and helical interpolation. The CNC unit is programmed in G code according to DIN 66025. Special dispensing software that has a library including several ready to use dispensing routes is also available. Recipe management, teach mode programming and simulation mode are other advantages of the system. The system consists of 15" touch screen industrial panel PC as operator interface with simplified menu based programming. This panel PC is used also for data transfer via ETHERNET, USB or Serial Interface. Menu based programming and advanced help pages enable to achieve intense programming tasks and set up all of the process parameters easily. System has remote diagnostics and maintenance function via the Internet for an immediate response to customer service requirements.



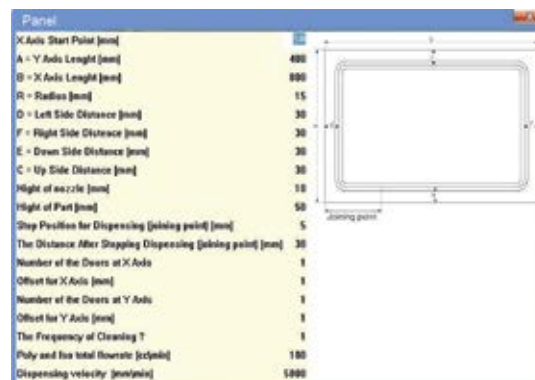
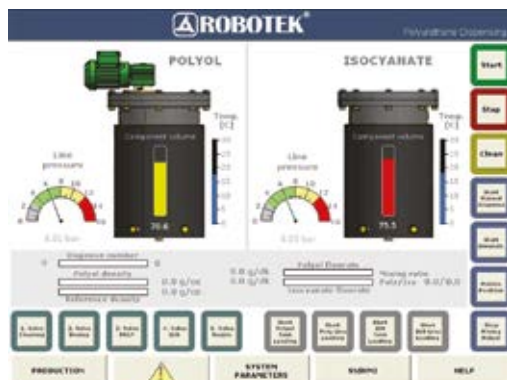
User Interface

The system has operator friendly and graphics based user interface for monitoring and setting up system parameters easily. The user interface incorporates dynamic icons for component levels, temperatures and line pressures; bars for dispense number, components' flow rate and mixing ratio; buttons for system control, system diagnostics interface, menu based programming interface, CNC HMI interface and advanced help interface. User interface language is available in English, German, Spanish, Turkish, French, Italian, Russian, Chinese, Arabic and other languages are upon request.



Easy Dispensing Software

Easy dispensing software has a library including several ready to use dispensing routes for wide range of applications as a standard feature. This is especially suitable for manufacturers having products with various ranges of dimensions and needs quick programming. Special dispensing software offers great flexibility and reduces system programming and setup time dramatically. Operator fills in dispensing data on "dispensing set-up-page" in a couple of minutes and the software generate the necessary G codes automatically.



Options For Low pressure dosing and dispensing units

Automatic Refilling Solutions

With automatic refilling, there is no need to open the cover of the tanks for manual refilling. Compared to manual refilling, it brings advantage of preventing exposure to or contamination with the component being filled.

Also, any risk of opening pressurised daily tanks' covers and possible damages to the instruments installed on the cover are prevented. In our option package, we offer two types of automatic refilling solutions.

Embedded Automatic Refilling System

It is an ideal solution for small or medium volume manufacturers such as some electrical enclosure manufacturers that look for an economical and environmentally friendly solution against manual refilling.

Automatic Supply Station

It is an ideal solution for medium or high volume manufacturers such as automotive, packing, household appliance and air filter manufacturers that look for refilling system from barrels, drums or IBC tanks. This option eliminates interruptions caused by manual refilling. Low pressure dosing and dispensing unit loads components automatically from the stations to daily tanks when the levels decrease lower than pre-set value.



Temperature Conditioning System

Optimal chemical reaction is achieved under certain temperature conditions. If there is no suitable ambient temperature for a process at the production area, we offer temperature conditioning system with heating and cooling features. It ensures that the temperature of components in the tanks and mixing head meet the process requirement.

Additional Component Tanks

In case of multipurpose or combined usage of the dispensing system we offer additional component tanks. In multipurpose use, customer may switch between different dispensing types such as thixotropic gasket, liquid gasket, gluing and potting. Additional component tank option is offered in order to avoid emptying and refilling of daily tanks when switching between different chemicals.

In combined usage additional component tanks can be installed to combine two or more of production processes together such as sealing, bonding, potting and encapsulation. Gasket and glue dispensing for server cabinet front door with glass is an example for this application where glass is bonded on metal part of the front door by glue dispensing after gasket dispensing in the same production cycle. Another example is air filter production that requires gluing and gasketing for the same work part in the same production cycle.

Thanks to the modularly extendable design that enables additional component tanks and relevant process equipment to be installed later into an existing system providing greater flexibility in terms of production planning and budgeting.



Other Options

- Mixing chambers with different volumes
- Nozzles in different sizes
- Nucleation control of foam materials
- Coloured seal
- Magnetic couplings for pumps
- More options on request

Products & Solutions

Robots



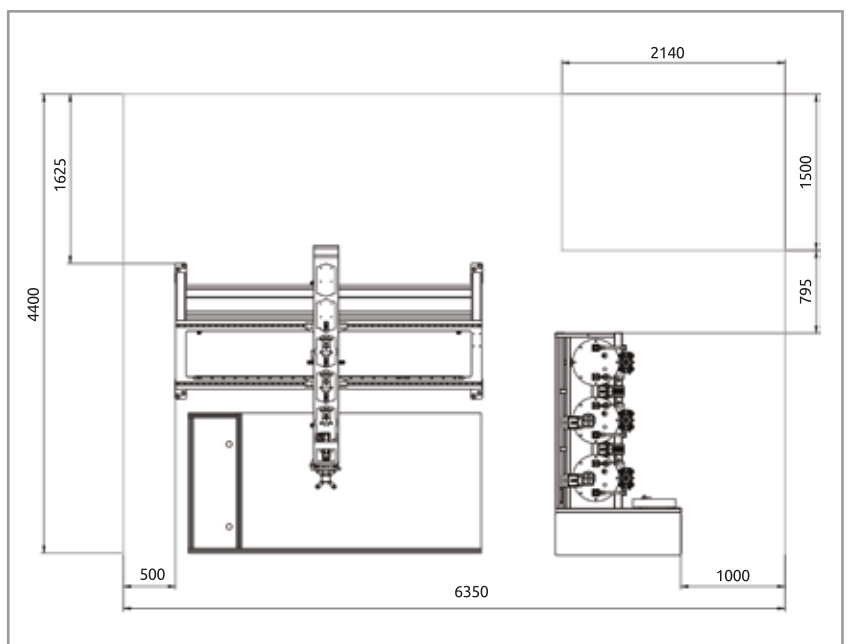
HSx12 Series Cartesian Robot

HS series robot is designed especially for high speed and precise three dimensional dispensing of gaskets, glues and encapsulants. Robust welded steel frame construction with high dynamics servo motors, low backlash gearboxes and high precision tooth & rack drives on all axes provide high acceleration rates, high traversing speeds and precise contour tracking. The state-of-the-art design concept ensures to achieve shorter process time, smooth and precise dispensing.

Technical Values

- Electrical design: According to EN60204-1 and EN61439-1
- Mains connection: 3x400 V AC, 50/60 Hz
- Rated power approx.: 10kVA
- Compressed air consumption approx.: 1,5 l/m@6-7 bar
- Manipulator: 3 degrees of freedom cartesian robot with robust welded steel frame construction
- Maximum axis speed: 60 m/min
- Maximum acceleration: 8 m/s²
- Standard displacements: X=2250mm, Y=1250mm, Z=300mm (customized displacements are on request)
- Positioning accuracy (X,Y,Z): +/- 50 µm according to ISO 9283
- Repeatability (X,Y,Z): +/- 50 µm according to ISO 9283
- Mixing ratio: infinitely adjustable
- Dosing: High precision pumps for dosing, transfer pumps for recirculation
- Output quantity: 0,3-100 g/s

Basic Dimensions





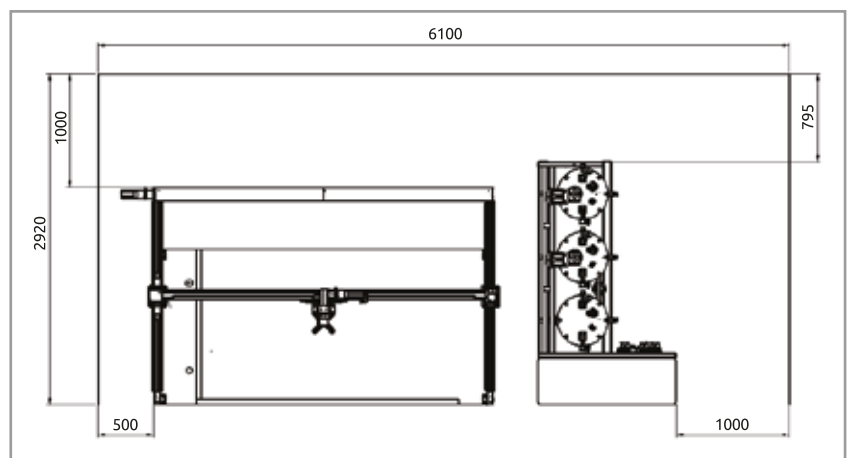
ECOx07 Series Cartesian Robot

ECO series robot is a cost-effective solution especially for high speed and precise three dimensional dispensing of gaskets, glues and encapsulants. System mechanics consist of maintenance-free ball circulating linear guides for extended life time, timing belt linear motion modules for high speed and high acceleration/deceleration rates and maintenance free servo motors and precision gearboxes.

Technical Values

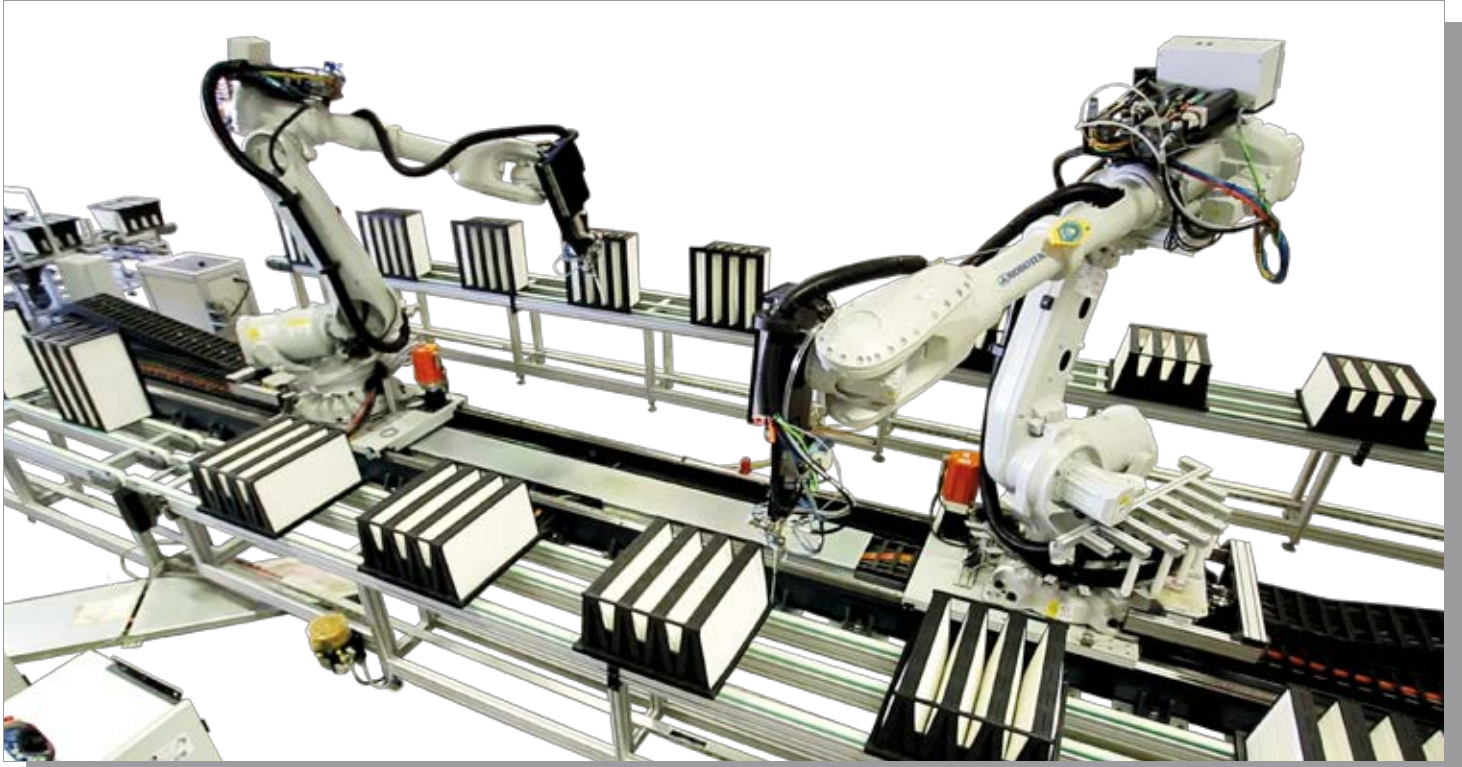
- Electrical design: According to EN60204-1 and EN61439-1
- Mains connection: 3x400 V AC, 50/60 Hz
- Rated power approx.: 8 kVA
- Compressed air consumption approx.: 1,5 l/m @6-7 bar
- Manipulator: 3 degrees of freedom cartesian robot constructed by aluminium alloy profiles
- Maximum axis speed: 30 m/min
- Maximum acceleration: 2 m/s²
- Standard displacements: X=2250mm, Y=1250mm, Z=300mm (customized displacements are on request)
- Positioning accuracy (X,Y,Z): +/- 250 µm according to ISO 9283
- Repeatability (X,Y,Z): +/- 250 µm according to ISO 9283
- Mixing ratio: infinitely adjustable
- Dosing: High precision pumps for dosing
- Output quantity: 5-100g/s

Basic Dimensions



Products & Solutions

Robots

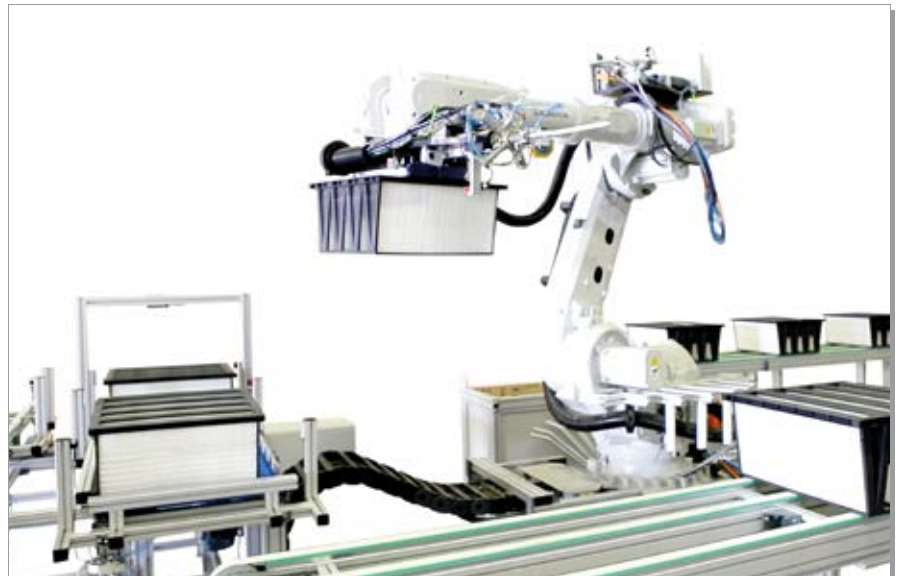


6 DOF Industrial Robot

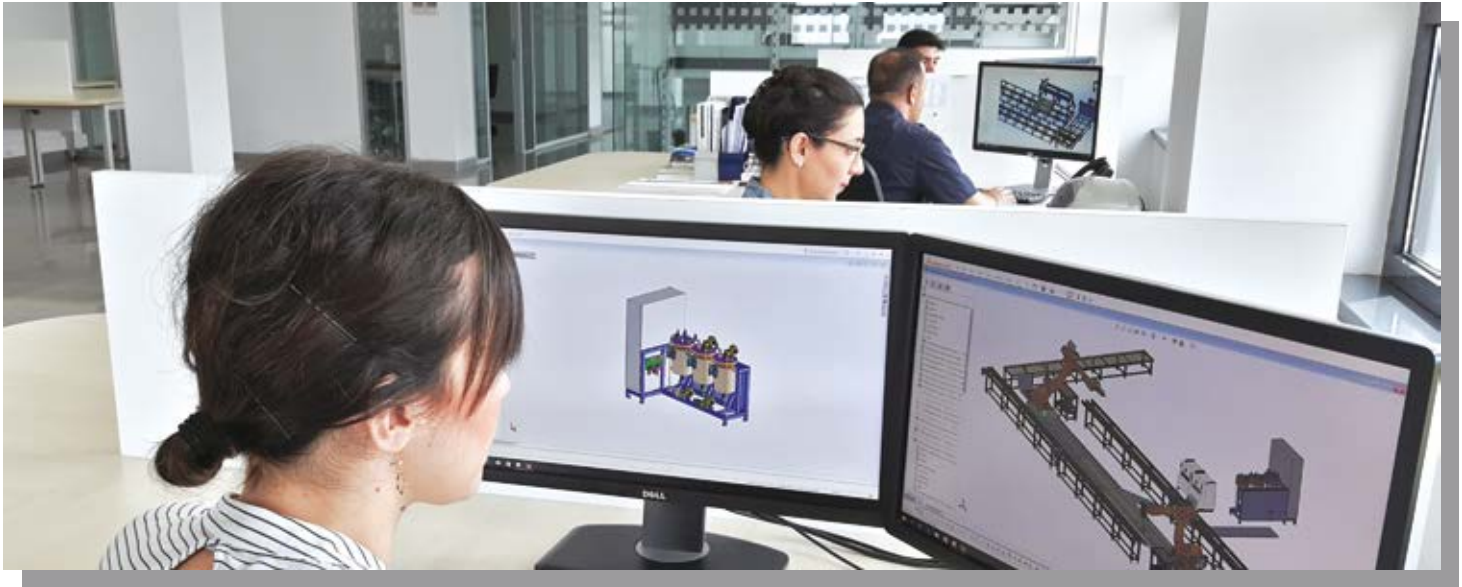
Systems with six degrees of freedom industrial robots integrated with mixing and dispensing unit are developed for applications requiring more flexibility and more complicated three dimensional trajectory tracking. In dispensing applications perspective, suitable industrial robots and its' specifications, such as work space, pay load, speed, acceleration, precision and repeatability, are selected by detailed engineering work according to application requirements.

Advantages of using 6 DOF robots for dispensing applications;

- Dispensing on complicated 3D and complex trajectories
- Dispensing on different sides of the same work part
- Designing more compact dispensing work cells
- Dispensing by turning and moving the work part under the stationary mixing head
- One robot to facilitate multi-purpose operations such as dispensing, loading, unloading, positioning and turning the work part



Automation Solutions



Complementary Automation and Solutions Examples

From synergy
to **innovation**

Our deep knowledge and extensive industrial experience in the fields of Robotics and Motion Techniques enable us to support our customers with complementary automation solutions. Robotek's engineering approach is to innovate the most efficient and productive solutions for customers' requirements considering economic aspects and environmental sustainability.

From an individual dispensing machine to fully automated robot cells or turn-key integrated production lines or new systems to be integrated into existing production lines, a broad line of automation solutions is available to meet your production demands.

Automation Solution Options

- Turn tables
- Shuttle tables
- Conveyors
- Lifting systems
- Work part locating systems
- Work part fixtures
- Work part grippers
- Vacuum clamps
- Vacuum suction plates
- Linear and rotary storage systems
- Multi-storey waiting systems for drying and curing lines
- Indexing systems
- Machine vision
- Barcode system integration
- Robotic cells
- Assembly lines

For tailor made turn-key automation solutions and complex production systems please contact our sales department.

Advanced Tools and Software

Robotek utilizes advanced software, hardware and manufacturing facilities to design, manufacture and implement dispensing automation solutions. Our in-house mechanical, electrical and electronic manufacturing and software development ability provide greater flexibility and fast response to our customers' requirements. The multi-disciplinary team of engineers collaborate with our customers to tailor projects to meet individual process requirements of wide range of industrial applications.

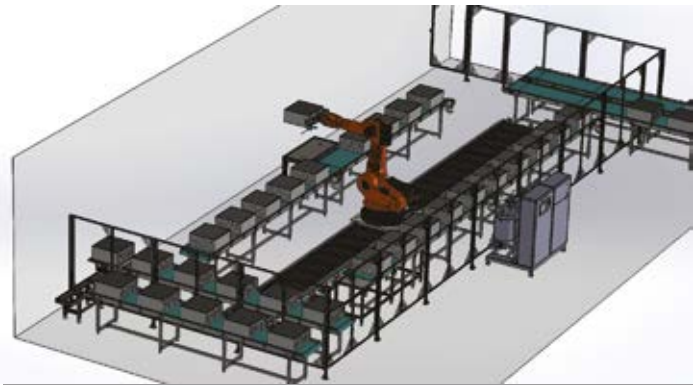
Products & Solutions

Automation Solutions



Fully Automated Robotic Cell For Filter Paper Gluing Application

The system was developed for air filter production. It consists of 3 components low pressure dosing and dispensing unit, an industrial robot with an end-effector (gripper) designed according to various types of air filters, a carrier axis to move the robot and a conveyor system. In the solution the robot is used for handling and dispensing tasks.





Robotic Gluing And Gasketing Line For Air Filter Production

Start Production And Turn The Lights Off

Robotek brings the most advanced production line concept in a compact design for gluing and gasketing of V-Filters. The production line has been developed in an approach towards the creation of dark factories within Industry 4.0. The system consists of a high precision dosing and dispensing machine, conveyors and two 6 DOF robots moving on a common linear track to perform handling, gluing and gasketing tasks. The production line guarantees significantly reduced manufacturing defects and higher quality with less raw material consumption compared to conventional production methods. Another key advantages of the system are mixed and small batch production availability that comes from flexible and chaotic production approach of the concept.



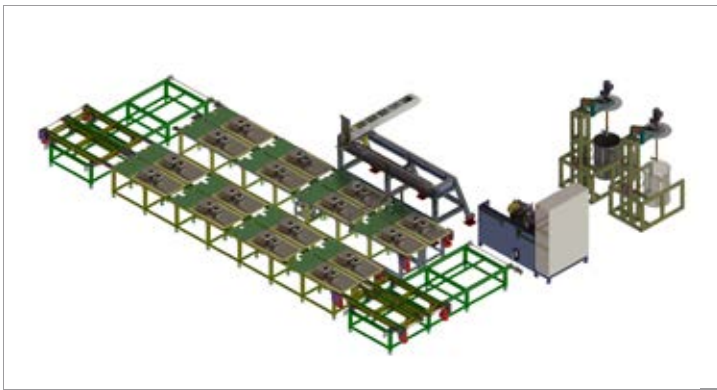
Products & Solutions

Automation Solutions



Robotic Gasketing Line For Kitchen Sinks

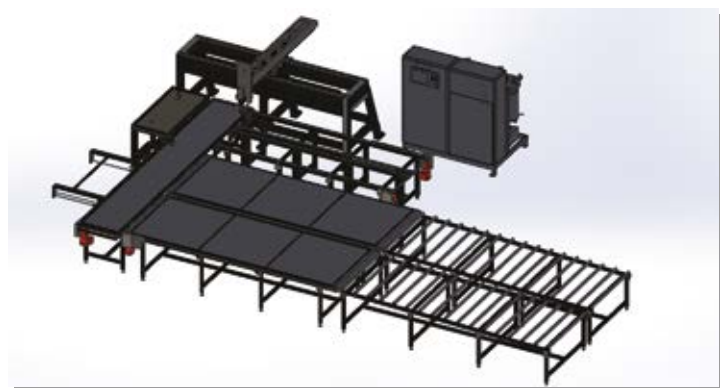
The robotic gasketing line is designed for kitchen sinks. The solution consists of 2 components low pressure dosing and dispensing unit, 3 degrees of freedom cartesian robot, a loading-unloading conveyor, two dispensing conveyors, a transfer conveyor and two curing conveyors. In this concept, only one operator located in front of the loading-unloading conveyor can operate the complete line.





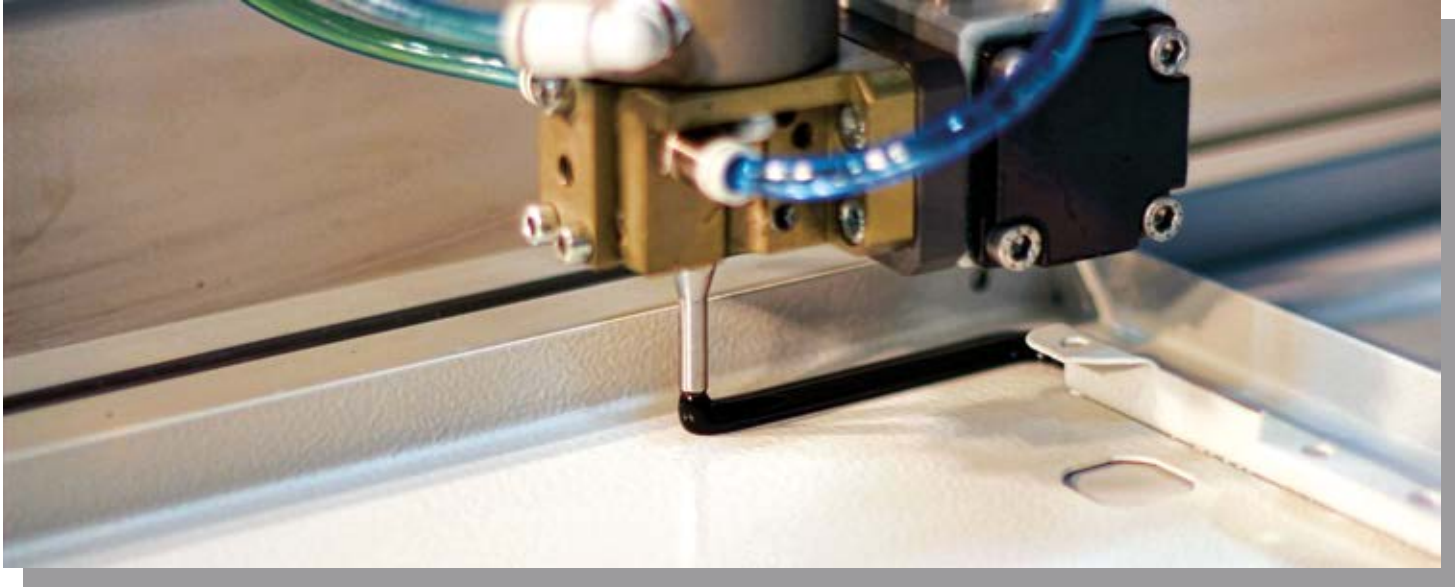
Polyurethane Dispensing System with Conveyors and Curing Lines for Drum Lids Production

The system was developed for drum lids gasketing. The solution consists of 2 components low pressure dosing and dispensing unit, 3 degrees of freedom cartesian robot, dispensing conveyors, a stacker and curing system. In the solution, the cartesian robot continuously dispenses gasket into grooves of drums' lids. The conveyor system transports the lids into dispensing zone and then to curing system.



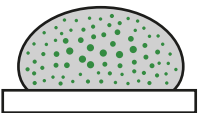
Products & Solutions

Chemicals

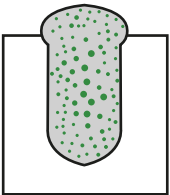


Sealing / Gasketing

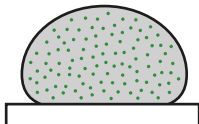
One or two component, moisture or heat cured polyurethane and silicon materials are used in cured in place dispensing systems. Curing happens before or after assembly of work parts depending on application. Strip, die cut and moulded gaskets are replaced by cured in place gaskets increasingly because of many advantages such as better compression set, uniform structure at the joining point, suitability for automation, lower material and labour cost.



Thixotropic Foam Gaskets (FIPFG: Formed-In-Place-Foam-Gasket): High-thixotropic gasket system is suitable for three dimensional surfaces. With its thixotropic properties, it is ideal for work parts with level and inclined surfaces.



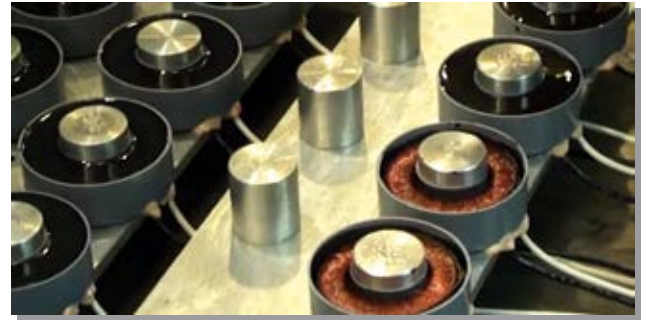
Liquid Foam Gaskets (FIPFG: Formed-In-Place-Foam-Gasket): Liquid foam gasket system is used for gaps and grooves with its fluidity and self-levelling properties.



Compact Gaskets (FIPG: Formed-In-Place-Gasket): Compact gaskets are dispensed in place to produce unfoamed gaskets.

Potting / Encapsulation

Electrical and electronic components' connections or terminations are partially or completely covered with potting or encapsulating processes. Process materials are one or two component resins such as epoxy, silicone or polyurethane. These methods are used to protect electrical and electronic components against environmental effects such as moisture, dirt, oil, chemicals, shock and vibration. The processes are performed at atmospheric pressure or under vacuum for void-free production. In the potting process, electronic and electrical components are located in a plastic or a metal enclosure and the resin material is poured over it. In encapsulation process, electronic and electrical devices are located in a mould and the resin material poured in it. After releasing from the mould, a resilient cast is created.



Bonding

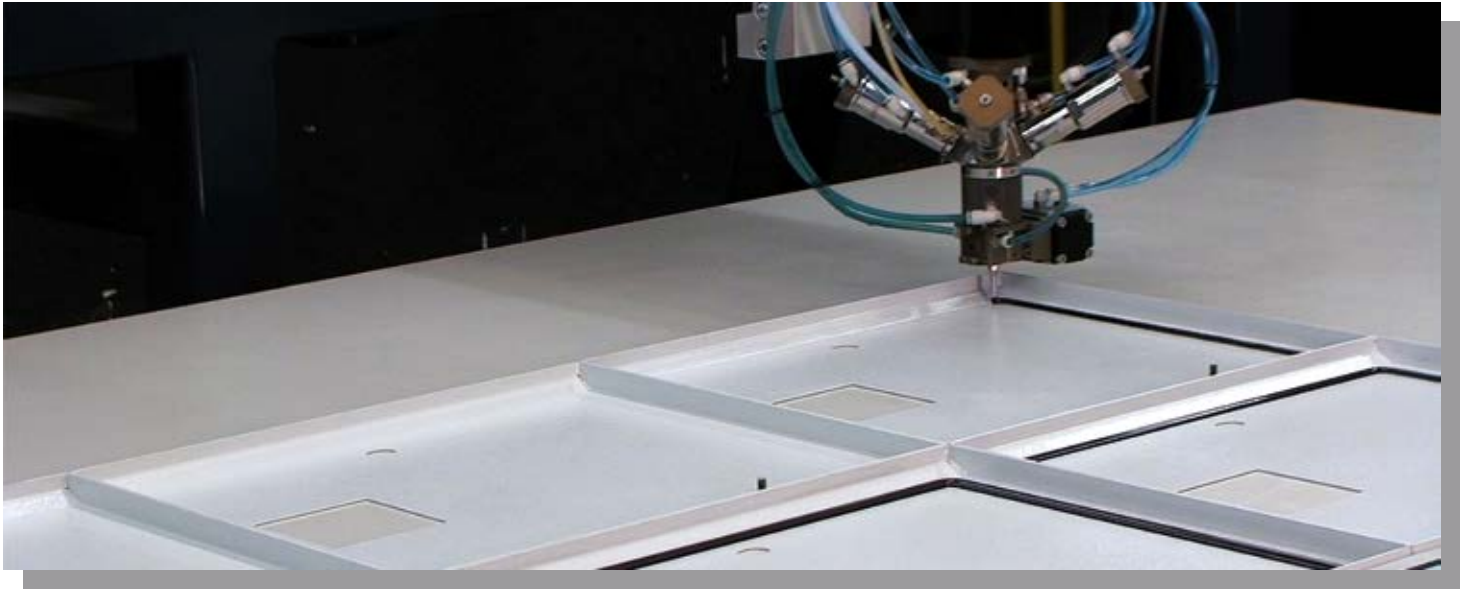
Adhesive bonding is an alternative technique in manufacturing processes to reduce or eliminate the requirement for conventional joining methods such as welding, bolting and riveting. Adhesive material is applied between surfaces of work parts or on joining lines of work parts. It simplifies manufacturing operations, reduces cost, increases safety and efficiency.



Partner for Chemicals

We collaborate with Frechem GmbH & Co. KG to combine best in class solutions in our fields. Frechem is specialized in developing and manufacturing polyurethane and silicon compounds for sealing, bonding, potting and encapsulating applications. Working together at planning, design, system configuration and sample production stages ensures our products and services leverage each other's strengths. This collaboration provides our customers an absolute solution in one stop. With perfect combination of chemicals and machinery, our customers have full advantages of system guarantee.

Subcontracting & Service



Excellent in-house facilities for an individual prototype
to high-volume **production**

Robotek offers subcontracting service for companies who wish to outsource sealing, bonding, potting and encapsulation processes. This service is performed in our facilities and available from an individual prototype to large batch production numbers. With our technical knowledge and practical experience, we support our customers at designing, prototyping, manufacturing and quality control stages.



Applications



Our know-how is the key strength
to address your **challenges**

Robotek dispensing systems has been being used in wide range of industries such as automotive, electrical and electronics, filtration, household appliance, packaging, medical and many more. Since its founding in 1996, Robotek has been developing customized solutions and implementing applications for the industry that deliver productivity gains and significant cost savings. For any other application not specified in this brochure, please consult our Sales Department.

Applications

Examples

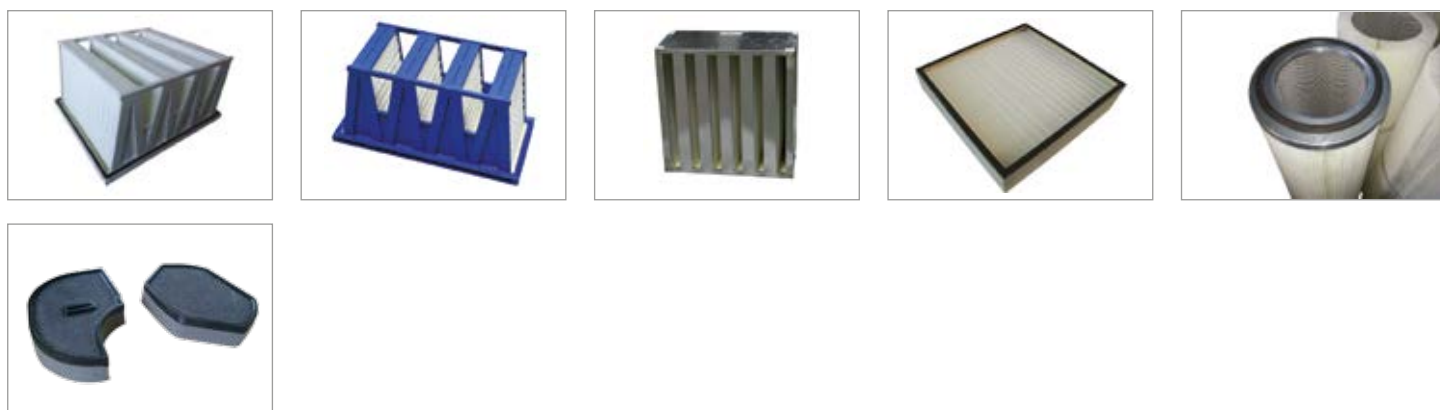
Electrical and Electronics

Housing of sensitive electrical and electronic assemblies needs to be constructed to comply with the protection levels described by IEC, IP, NEMA and UL ratings. Protection against dust, water, corrosive atmospheres, risk of explosion, moisture or corrosive vapours, stands as the challenges of the industry. For protection against moisture, dirt, oil, chemicals, shock and vibration, electrical and electronic components partially or completely encapsulated by potting process using one or two component resins such as epoxy, silicone or polyurethane.



Filtration

Filtration systems are used to separate unwanted particles from fluids (liquid or gas), preventing them from entering a system or an area and possibly causing a damage. Air filtration systems are used in environments that rely on high clean air standards such as surgical rooms, laboratories, computer rooms and sensitive manufacturing and assembly areas. Air filters are also used in vacuum cleaners and automotive industry. Sealing and bonding play an important role for the construction of filters.



Appliance

Polyurethane and silicon systems are used in the highly demanding household appliance industry for sealing and bonding processes.



Packaging

Steel and plastic drums are used for transporting hazardous or non-hazardous goods all over the world. High production rates, reliability and safety requirements makes polyurethane dispensing systems ideal solution for this industry.



Lighting Armatures

Exposure to environmental conditions such as water, chemicals, oil, sun light (UV), dust, etc. are the key issues when designing an indoor or outdoor lighting armature with isolation to guarantee long service life, high production rates, reliability and safety requirements makes polyurethane and silicon dispensing systems ideal for this industry.



Automotive

Automotive industry is one of the most demanding and dynamic sectors and achieving excellence in this challenging industry is not just a competitive advantage but also imperative.



Support & Service



Robotek is your partner for **SUCCESS**

We provide our customers with comprehensive after-sales-service and support to ensure their machinery has maximum efficiency and life time. With a team of expert designers, application engineers, sales specialists and service technicians, Robotek is your partner for success.

Service, Maintenance & Repair

Continuous and efficient production is maintained with globally rapid response to remote or on-site service, maintenance and repair requirements and availability of all essential spares in the company stocks for quick delivery. Our high skilled team of service engineers provides application, maintenance and repair services remotely on phone or via the Internet and on-site.



Training

In addition to trainings for operation, application and maintenance during factory or site acceptance, our training programs are available anytime upon request. These programs include theoretical and practical trainings for dispensing technology. They are designed to suit individual requirements to ensure our customers utilize full potential of our systems. Comprehensive product manuals and training documents are available in the training programs.



Consulting

With our extensive engineering knowledge and industrial experience, we serve as a consultant partner and advise our customers for planning, design and execution of sealing, bonding, potting, encapsulation and as well as robotics and automation projects.





Committed
to **innovation**

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Robotek reserves the right to make alterations to the product resulting from technical developments.
