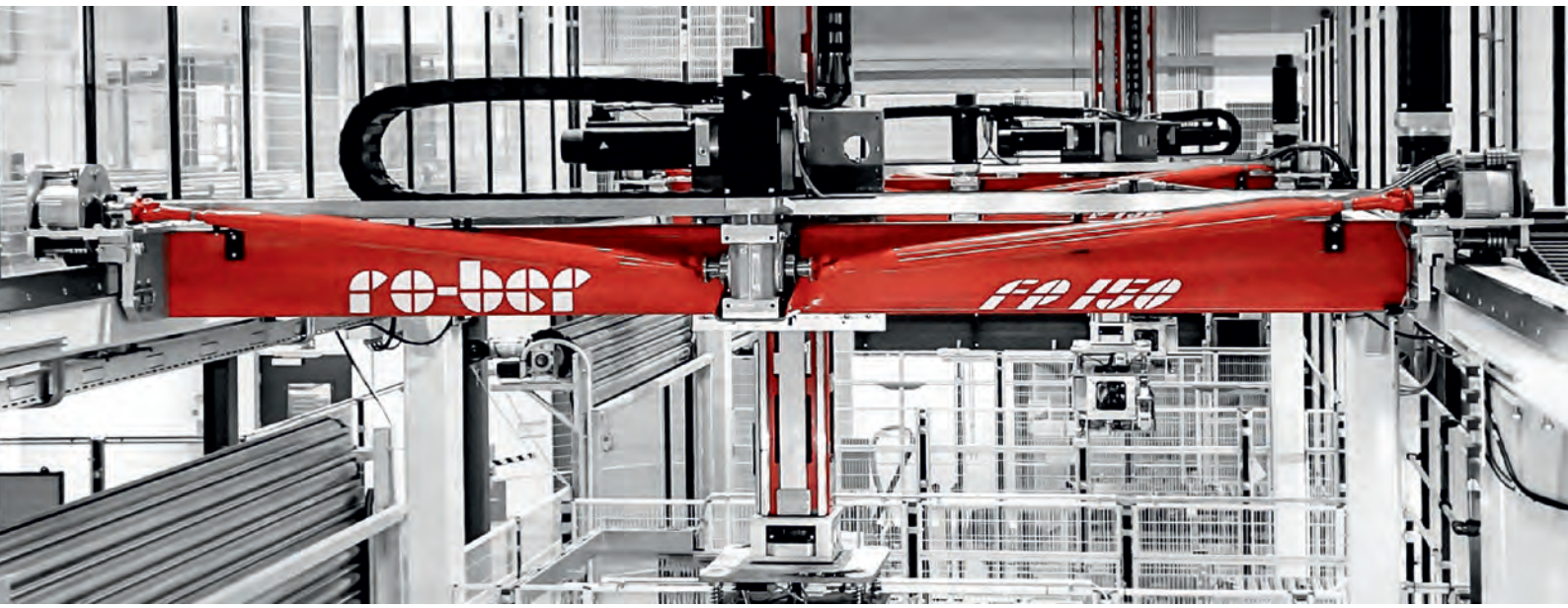
INDUSTRIEROBOTER GMBH



GANTRY ROBOTS FOR INTRALOGISTICS

- Palletising
- De-palletising
- Order Picking
- Storing
- Buffering
- Connecting
- Handling

RO-BER: SUCCESSFUL TEAM PLAYERS

Innovation driven by passion

The development, machining and installation of complex Robotic Systems is what drives us. It's second nature to us to view the process to be automated as a whole.

At Ro-ber, tailored solutions that pay are always found by working closely as a team with you, our customer, our engineers and technicians.

The RO-BER name has always stood for innovation and industry wide expertise in handling the most varied products.

CONTENTS

Gantry Robots for Intralogistics

RO-BER INDUSTRIAL ROBOTS GMBH

From start-up to International High Tech Company

RO-BER's core competencies are the development, engineering, manufacture and installation of gantry robots for de-/palletising and order picking as well as storing, buffering and transfer.

The range covers standardised modular robotic systems through to automation of complex logistic and materials handling operations in which gantry robots play a central role.

In co-operation with our customers across the globe, we strive for long term partnerships. This is, amongst other things, borne out in our well-oiled service organisation. Our service team are ready to tailor a package to your requirements: from maintenance, spares, training through to a round the clock hotline contract.

1983
Founding of RO-BER Industrieboter GmbH in Berlin. Manufacture of articulated arm robots

1992
Company moves from Berlin to Kamen. Focus shifts to the building of gantry robots

1996
First official order picking system

1997
Introduction of Control system RO-ENC

2001
Move to the new site at Felix-Wankel-Straße, Kamen

2006
Introduction of the new GENIX-series

2008
First GIGANT with payload of 1,000 Kg is built

2013
Delivery of 750th Robot system

2016
Introduction of RO-CX control system

2017
First 14m wide robot

GANTRY ROBOTS

Technology and Applications

Due to their robust modular design, RO-BER gantry robots are suitable for a wide range of applications. The ease in which the working area can be scaled to suit the application makes them particularly suited to intra-logistic tasks such as palletising, de-palletising, order picking and buffering of the most varied products.
All moving components are rigorously designed to minimise weight and drag when accelerating and decelerating. The two or three movement axes, as well as other optional axes, are powered by maintenance free AC servo drives. These highly dynamic drives operate at a nearly constant torque across the full range of their positions. Pinpoint accurate position control is achieved by using high resolution resolvers.

RO-BER gantry robots are delivered with an independent, user friendly control system. This control system is compatible with higher level warehouse management or other material flow systems. Consequently the system can be configured to suit a wide range of applications, from independent applications with as few as one destination to gantry warehouses with hundreds of destinations and multiple robots.

Scaling and Redundancy

The Gantry Robots GENIX and GIGANT are also available with multiple robots in the same Gantry, either from the outset or as a retrofit, as volumes dictate. As well as the obvious increase in output that additional robots add, the added redundancy increases system availability. A further robot may be able to take on the tasks of a robot that is down. In many applications the working areas of the robots overlap thus maximising space utilisation (e.g by providing common access to a stack of empty pallets).

Benefits

- Expandability by retrospectively increasing the size of the gantry
- Variable, maximised working areas
- Scaling of output by use of multiple robots in the same gantry frame
- Optimal use of the floor space due to minimal obstacles on the site floor
- Unencumbered layout possibilities for the arrangement of pallet and product
- Gentle product handling due to linear movements without centrifugal forces
- Highly dynamic, repeatable and accurate positioning

Gantry Structure

YZ Linear Gantry / 2 axes system

XYZ Area Gantry / 3 axes system

Paylods

150 kg

300 kg

1000 kg

Options

Telescopic Axis

Rotary Axis

Pan Axis

Transfer Axis

GENIX SERIES FP150 - LP150

Dynamic gantry robots for many applications

Technical Specifications

Payload:	150 daN
Axes (Fp150):	3 (X/Y/Z)
Axes (Lp150):	2 (Y,Z)
Telescopic Axis (Z) :	Optional for LP/FP
Rotational Axis (C):	Optional for LP/FP
Pan Axis (B):	Optional for LP/FP
Transfer Axis (T):	Primarily optional for LP
Drives: (X/Y/Z/C/B):	Servo driven
Speed (X):	up to 3.4 m/s
Acceleration (X)*:	up to 5.0 m/s^2
Speed (Y):	up to 3.4 m/s
Acceleration (Y)*:	up to 5.0 m/s^2
Speed (Z):	up to 3.2 m/s
Acceleration (Z)*:	up to 10.0 m/s^2
Positional accuracy:	+/- 0.5 mm
Repeatability:	+/- 0.4 mm
Length of X Carriage (FP):	max 10 m
X range (FP):	from 3 – 50 m (Longer on request)
Y range (LP):	from 3 – 50 m (Longer on request)
Expansion of carriage:	Optional for LP/FP
Control System:	RO-CX

We reserve the right to make changes to the technical specification. All specifications are dependent on the application in hand. (* Z axis values based on 500 mm movements)

The shortest cycle times are achieved by the high performance GENIX FL/LP-150 robots. With a payload of 150 Kg, they can even handle multiple products per grip quickly and precisely. The linear and area gantries of this series are optimised specifically for applications in goods distribution. The linear gantry is well placed as a competitively priced palletiser for single palletising positons or as a central palletiser with more than 60 destinations, while the area gantries are mostly used for more complex tasks. The X-carriage's up to 10 m span combined with the gantries length of up to 50 m can cover extremely large areas in applications such as de-palletising, order picking or as compact gantry warehouses. Both variants can be fitted with telescopic axes when room height is limited or rotational and pan axes as required. Optionally the linear gantry can be fitted with a transfer axis, mounted under the Z-axis, to widen the working area.

Due to their modular design, both robot types can be expanded in the future to suit your changing needs. This may be accomplished by integrating an additional robot into the existing gantry, thus increasing the output, or to increase the working area by lengthening the gantry to accommodate, for example, the incorporation of additional lines or palletising positions.

GIGANT SERIES FP300/1000 – LP300/1000

Linear Gantries / Area Gantries for high payloads

In contrast to the GENIX series, the GIGANT series is defined by its heavy payloads and wide spans. This series of Robots was specially developed for use in materials handling applications for which the accurate and fast movement of heavy loads is critical.
The GIGANT FP-1000 demonstrates this particularly well in order picking applications, where whole layers can be exchanged, or stacks of products can be gripped at once and placed into storage positions inside a gantry warehouse.

To accommodate the heavy loads to be handled, all moving parts of the robot are robustly built and the X-axis carriage is designed as a double beam able to span up to 14 m in width. The robot is driven by digital servo drives that can accelerate rapidly within short response times. Product handling is gentle due to the ability to define movement ramps. All this is possible whilst maintaining highly accurate and repeatable product positioning.

The "Heavy Payload" construction of the GIGANT can, like the other series, grow with your requirements. After many years it is still possible to expand the modules. As increased output is required it is possible to add robots to the existing gantry. Should the working area need to grow, this can be accomplished by lengthening the gantry.

Technical Specifications

Payload:	300 – 1000 daN
Axes (FP300/1000):	3 (X/Y/Z)
Axes (LP300/1000):	2 (Y,Z)
Telescopic Axis (Z) :	Optional for LP/FP
Rotational Axis (C):	Optional for LP/FP
Pan Axis (B):	Optional for LP/FP
Transfer Axis (T):	Primarily optional for LP
Drives:(X/Y/Z/C/B) :	Servo driven
Speed (X):	up to 3.4 m/s
Acceleration (X)*:	up to 3.0 m/s^2
Speed (Y):	up to 3.6 m/s
Acceleration (Y)*:	up to 3.0 m/s^2
Speed (Z):	up to 1.75 m/s
Acceleration (Z)*:	up to 7.0 m/s^2
Positional accuracy:	+/- 1 mm
Repeatability:	+/- 0.8 mm
Length of X Carriage (FP):	max 14 m
X Range (FP):	from 3 – 50 m (Longer on request)
Y Range (LP):	from 3 – 50 m (Longer on request)
Expansion of Carriage:	Optional for LP/FP
Control System:	RO-CX

We reserve the right to make changes to the technical specification. All specifications are dependent on the application in hand. (* Z axis values based on 500 mm movements)

RO-BER GRIPPERS

Flexible Grippers for your Robotic System

Forward Looking and Innovative

The gripper lies at the heart of the every system. RO-BER grippers are built using proven, reliable technologies, fused with creative solutions and tailored to the customer's specific handling requirements. Maximising output is as important as safe and gentle product handling; whether picking products singly, in multiples or as layers.

Subject to the product being handled, it may be appropriate to use a mechanical gripper, vacuum gripper or even a magnetic gripper. As required these can be fitted with units to handle interlayers and empty pallets.

In-house Gripper Development at RO-BER

Clamping Grippers
Horizontal or vertical clamping grippers with or without supporting forks e.g. to handle open trays with nesting features

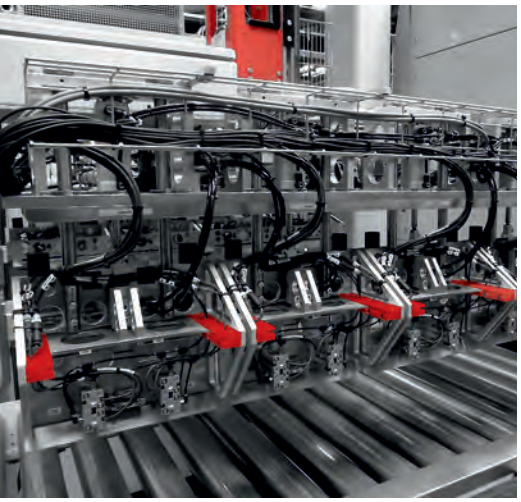
Mass Vacuum and Suction Grippers
e.g. to handle individual cases or to pick up a whole layer

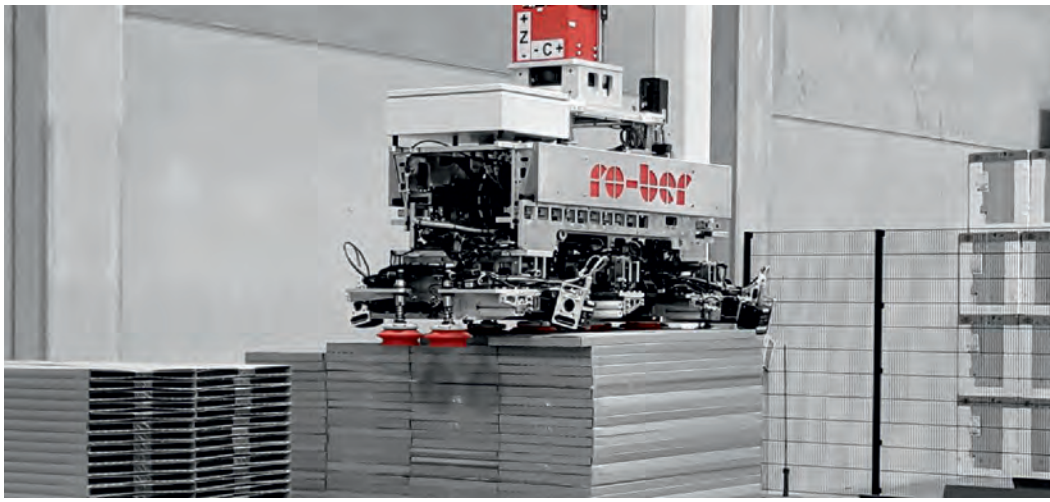
Magnetic Gripper
Pneumatic or electrically switched to handle tin plate cans, kegs or other metal products

Mandrel Gripper
With stay, e.g. to pick up reels

A combination of gripper types is possible giving rise to a unique gripper designs matched to the specific flexibility requirements of a given project

Automatic gripper exchange systems are available as and when the product range requires them and the required throughput allows them





CONTROL SYSTEM AND INTEGRATION RO-CX

More than just a robot control system

The RO-CX series robot PLC integrates motion, logic and safety features with Windows applications into one system. The system reliably meets the highest performance and safety requirements. It is flexible and equipped to meet future requirements. The RO-CX series controller compliments the robots hardware architecture to create a durable, high performance system that will allow you, the customer, to maximise your productivity and competitive edge.

Communication can take place over TCP/IP ethernet protocols, not limited to a specific manufacturer, to facilitate integration into your IT infrastructure. Interfaces are available to allow integration with your ERP, warehouse management or other systems (e.g. SAP, NAVISION, ORACLE Etc.). Use of switching technology makes it possible to segregate office and production environments.

A windows based IPC with high resolution touch screen lies at the heart of the user interface. The touch screen and graphics make interaction easy. Programming is according to IEC 61131-3. All standardised types of programming are possible (ST, FBD, IL, LD, SFC).

A motion controller for up to 64 axes ensures accurate movements. The function libraries are based on DIN66025 with an increased number of functions.

All required tools for configuration, parametrisation and programming, from drive to operator and HMI, are installed on the central operator and program panel from the outset.

The following technology bundles complete the RO-CX series:

RO-CONNECTIVITY: Remote access to all control hard and software elements.

RO-PACK: Automatic graphic packing layout generation for palletising of homogenous products.

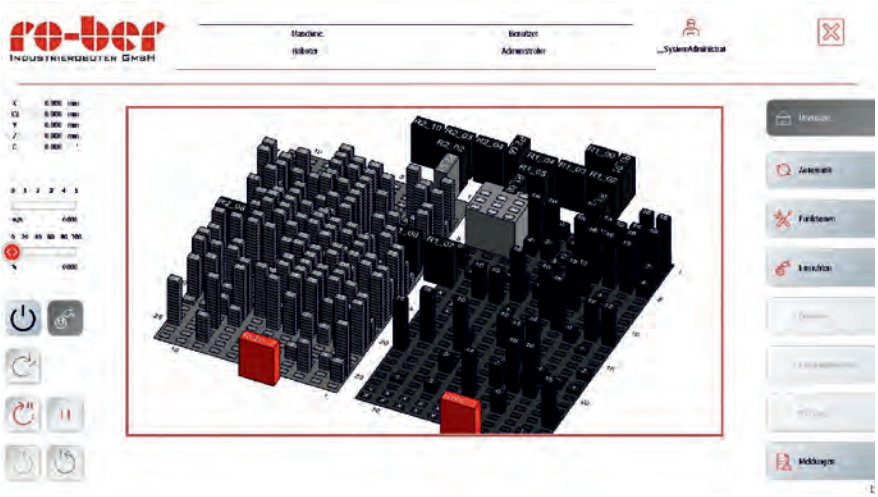
RO-MIX: For optimisation of the packing layout in order picking applications.

RO-SI: The RO-BER standard interface for communication with the most common external systems.

RO-BERTA: The reporting tool to evaluate production processes and to calculate output and performance data.

RO-STORE: It is possible to use the gantry system as a store through the use of RO-BERs own warehouse management and material flow system RO-STORE. RO-STORE is modular with regard to goods in, out (including order management, picking and dispatch), data management, inventory and transfer management.

RO-VISION: The „eye of the robot“ for product, sample and store recognition in order picking, depalletising and palletising applications.



SYSTEM SOLUTIONS FOR INTRA-LOGISITICS

Complex Robotic systems with flexible peripheries

The integration of a new robot system into the material flow of your production or logistic operation requires consideration not only of the software integration but also of hardware integration to production lines or warehouses.

As principal supplier RO-BER offers turn-key solutions including the required peripheries such as pallet and product transport, labellers, load stabilisation features, cameras and much more. In these projects Ro-ber also takes responsibility for electrical and software integration including the control of whole system. In this way we are able to deliver a handling system that is tailored perfectly to your process, your products and our robots, whilst maximising system availability.

The options for the placement of conveyor elements inside the gantry robots working area is, unlike for conventional systems, nearly unlimited since both linear and area gantries are mounted above the product and pallet conveyors and create no obstructions.

This benefit allows almost complete freedom in planning the area.

Integration of additional Components

Product Transport
Roller conveyors, chain conveyors, belt conveyors, pushing and turning units, pushers forming units, vertical conveyors, lifts

Stacking of Containers
Fully automatic stacking systems for plastic totes, trays and much more

Pallet Transport
Roller conveyors, chain conveyors, angled transfers, turn tables, lifting tables, shuttle cars, empty pallet magazines

Load Stabilising
Fully automatic pallet wrappers, hood applicators and banders.

Labeling Systems
Product- and Pallet-labeling-systems

Visions Systems and Scanners
Camera systems to recognise identifiers or position, scanners for product identification.

REFERENCES

A good choice!

RO-BER has supported its customers with automated solutions around palletising, de-palletising, order picking and storing since 1983.

You too can benefit from our expertise and project knowledge in the following industries:

- **Food and Beverage**
- **Distribution, Logistics**
- **Chemical, Pharmaceutical, Cosmetics**
- **Packaging**
- **Paper and Print**
- **Timber Products**
- **Electronics**
- **Plastics**
- **Automotive**
- **Manufacturing**

Application Examples

- De-palletising of cases singly or in multiples
- De-palletising of stacks of totes, crates or other plastic containers
- Handling of pre-stacked beverage crates
- Palletising of trays with nesting features
- Layer wide order picking of shrink packaged goods, cases and crates
- Mixed pallet creation for distribution to branches
- Storage and sequenced retrieval of car tyres
- Re-packing/order picking of large format empty pallets including camera recognition of products and store
- Buffering of empty pallet stacks of various sizes with highly flexible dynamic position control
- Building of mixed pallets on the fly after product measurement using a highly dynamic pack scheme generator

ro-ber
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