Handling systems
You need complete systems. You want reduced complexity. We are your dependable solutions partner.

→ WE ARE THE ENGINEERS OF PRODUCTIVITY.
Handling systems from Festo: versatile, economical, perfectly fitting. And always very productive.

Precisely fitting, economical, dynamic and flexible: create the perfect system using the extensive range of handling systems from Festo, from standard solutions for common applications through to customised solutions for very specific requirements.

And our ready-to-install systems, software and services reduce engineering time and effort. We support you from the design stage through to installation and commissioning. That allows you to concentrate entirely on your core business and increase your productivity.

Festo – the right partner for your new handling system.
Simply complete: everything from a single source ...

Optimally coordinated hardware, software and services from one supplier: Festo. The complete, worry-free package extends from design engineering and advice on hardware to application-specific commissioning and after-sales service and training. It will enable you to quickly put your handling system to optimum use, lower your process costs and increase system availability.

Kinematics

Our highly dynamic mechanical systems with integrated energy chain are available in numerous sizes and stroke ranges.

Cameras

Intelligent compact vision system for optimum quality inspection and conveyor tracking.

Frames

Tested frames you can rely on. Designed to match every kinematic system and application, in aluminium or steel.

Controllers

For centralised control directly in the installation or decentralised control in the control cabinet.

Front unit

Rotating, gripping or vacuum: you receive lightweight, precise and powerful solutions.

Service

Our experts take care of your handling systems. From commissioning and training to after-sales service, we are there to help.
We provide support at all levels as you get started with perfect connectivity – universal, intelligent, electrical and mechanical. And with Festo as a partner, you can expand your automation expertise across all areas, from a wide range of durable components and complete systems to monitoring and control solutions. The universal interfaces help you to reach your ambitious goals step by step. That’s how you get your production ready for Industry 4.0 – with compatible components, future-proof systems and everything from a single source! ... and fully networked, right up to the cloud.
Why is it worthwhile to use Cartesian robots?

The answer is simple: Cartesian robots from Festo offer many benefits. They are always exactly right for the task and are never oversized. In addition, the use of electric and pneumatic technologies or a mix of the two also makes them very flexible and offers excellent value for money. Moreover, the high-speed variants and compact handling systems offer full flexibility when it comes to load, dynamic response, working space and mechanical design.

The space-optimised systems with freely scalable strokes are designed specifically for the application. They require less space for movement and lend themselves more easily to customised and modular adaptation to application conditions. This enables maximum working space coverage.

Their mechanical design makes the systems easy to program; for example, only one axis needs to be activated for vertical movements.

Benefits

Fast: the right handling system in just 20 minutes including CAD model and commissioning file.

Intuitive: the Handling Guide Online is very easy to use and features structured data prompts.

Efficient: greatly reduces engineering time and effort since the design is ready in just a few minutes.

Planning reliability: the net price is displayed immediately, allowing you to calculate your costs with certainty.

Shorter time-to-market: only around 3 weeks from configuration and ordering to delivery and installation. It helps you reach your goal more quickly.

Versatile: the Handling Guide Online now includes highly dynamic and compact handling systems. So nothing is left to be desired. If you still cannot find what you need, we will design it for you.

The quickest way ever to the right handling system

There really is no quicker or easier way: the Handling Guide Online considerably increases your engineering efficiency and gives you the certainty that your system is correctly sized. From design to delivery and installation only takes around three weeks.
The Handling Guide Online – the right handling system in just three steps

The Handling Guide Online is an all-in-one configuration and ordering system and is integrated into our online product catalogue. This unique online engineering tool helps you to configure and order your handling system. It reduces your engineering time and effort to a minimum and guides you to the right handling system in record time.

Three steps to your handling system:

1st step: Choose the type of handling system and enter your application data into the Handling Guide Online. The tool calculates appropriate handling systems, including price.

2nd step: Select the most suitable handling system from the list of suggestions. The correctly configured CAD model and the data sheet with all the relevant figures are immediately available for download.

3rd step: You can use additional options to configure your selected system in accordance with your requirements. Then add the preferred handling system to your shopping basket and confirm your order. Festo will deliver a ready-to-install system, including all user documentation in accordance with the EC Machinery Directive, as quickly as possible.

Efficient commissioning:
The commissioning files are custom created in the Handling Guide Online on the basis of user input and the calculated system. They can be loaded directly into the servo drive. The sets of values are individually adapted to the handling system and consist of axis dimensions, motor characteristics, feed constants and dynamic data. A special feature is that the controller settings are automatically calculated based on the payload, the dead weight and the system dynamics entered by the user. This shortens the time-to-market for you or your users.
Overview of the different handling systems

Basic solution

Spindle and toothed belt axis ELGC and mini slide EGSC
Page 18

Low-cost alternative for
• Single-axis system
• Linear gantry
• Cantilever system
• Three-dimensional gantry
• Pick & place

Complete ready-to-install system solutions ...

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2D handling systems

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2D handling systems

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Handling systems

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Stacking sheet metal plates: YXCL Page 22

Highly dynamic handling systems

Stacking battery cells: YXML Page 24
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<td>DSM-ERMO</td>
<td>DHGT with E ...</td>
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The system components in detail

Drives, axes and cylinders

### Pneumatics

**Piston rod cylinders**
- ADN
- DSBC

**Guided drives**
- DFM
- DFM-YSRW

**Rodless cylinders**
- DGC-GF
- DGC-KF
- DGC-HD

**Slides**
- DGSL
- DGST

### Servo-pneumatics

**Drives with piston rod and displacement encoder**
- DNCI
- DDPC

**Rodless drives with displacement encoder**
- DGCI
- DDLI

**Rotary drive**
- DSGI

**Position controllers and end-position controllers**
- CPX-CMAX
- CPX-CMPX

**Proportional valve**
- VPWP

**Sub-base**
- VABP

→ www.festo.com/catalogue/...
## Electric systems

### Gantry axes and guide axes
- EGC-TB/BS-KF
- EGC-FA
- ELGA-TB-G
- ELGA-TB-RF
- ELGA-TB/BS-KF
- ELFA-RF
- EGC-HD-TB/BS-KF
- ELGR
- ELGG
- EGSK
- DGE-RF
- ELGC

### Cylinders and cantilever axes
- EPCO
- ESBF
- ELCC
- EHMH

### Slides
- EGSL
- EGSC

### Servo and stepper motors
- EMMS-AS
- EMME-AS
- EMMS-ST
- EMMT-AS

### Gear unit
- EMGA/EMGB

### Servo drives
- CMMP-AS
- CMM5-ST
- CMMO-ST
- CMMT-AS
- EMCA

### Axial and parallel kits
- EAMM-U
- EAMM-A
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#### Motion control

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## Complete solutions and software

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<td>Checkbox Compact CHB-C-N</td>
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The simple handling solution for desktop applications: Spindle and toothed belt axis ELGC with mini slide EGSC

The smallest of dimensions call for handling systems with an optimum installation/working space ratio, such as the optimised and economical linear axes ELGC and mini slide EGSC. These all share the same system approach and platform architecture, and the connections are largely adapterless. In line with the “one-size-down” assembly system, this handling system can be easily assembled.

Spindle and toothed belt axes ELGC
The interior, protected recirculating ball bearing guide is ideal for XY movements and vertical Z movements.

Mini slide EGSC
The powerful and resilient mini slide with smooth spindle operation is ideal for vertical Z movements or guided linear individual movements in any mounting position.

“One-size-down” mounting system:
Our new handling systems are now really easy to combine and assemble without the need for adapter plates, or any special expertise or tools – and it is all thanks to the universal profile mounting that allows you to combine a small structural axis with a large base axis.
Start off with a low-cost, compact solution: from individual axes to a complete handling system

**Single-axis system**
Precision positioning and alignment of workpieces even with high loads:
- Adapterless direct mounting of mini slide and rotary drive
- Also available as linear-rotary Z-axis in 2D and 3D systems

**Pick & place solution**
Compact answer to simple requirements:
- Adapterless, cost-effective direct mounting of mini slides and rotary drives
- Mechanically rigid and sturdy design with precision positioning

**Linear gantry**
Vertical 2D movements for simple handling tasks can be realised at low cost:
- Spindle or toothed belt axes combined with mini slides for vertical 2D working space
- Space-optimised and easy to assemble

**Cantilever**
Installation-space optimised, robust 3D handling unit for higher loads:
- Spindle or toothed belt axes combined with mini slides for the Z-axis
- Additional 90° adapter for greater rigidity during higher loads

**Three-dimensional gantry**
Extremely compact 3D system with attractive price/performance ratio
- Maximum working space coverage by combining the small-scale gantry EXCM and the mini-slide for the Z-axis
- Configurable length and width and with different Z strokes

**Cantilever**
Compact, low cost system with increased guidance
- Combined spindle or toothed belt axes for 3D motion with longer Y stroke
- Two axes installed in parallel, including guide axis ELFC, to absorb increased torque and provide improved guidance of the cantilever axis
Single-axis system YXCS

The single-axis system YXCS is characterised by its high mechanical rigidity and sturdy design, which are ideal for long, one-dimensional strokes and large loads. With coordinated stepper and servo motors, servo drives and the integrated energy supply concept, you get a reliable, ready-to-install solution.

Applications:
- For any single-axis movement
- Ideal for long gantry strokes and heavy loads

Features and benefits:
- High mechanical rigidity and sturdy design
- Process reliability thanks to the use of tried-and-tested axes
- Ready-to-install complete systems, including energy chains for cables and tubing as well as matching motors and servo drives

Single-axis system YXCS: designed using standard modules. In this example: Y: ECG 120

For additional requirements: with individually selected axis
<table>
<thead>
<tr>
<th>System size</th>
<th>Possible axes</th>
<th>Max. working stroke (mm)</th>
<th>Max. payload</th>
<th>Mounting position</th>
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<td>EGC-185-TB-KF</td>
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<td>EGC-HD-220-TB-KF</td>
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Additional requirements: Customised on request

Drive package depends on the configuration selected.
Configure your system yourself in the Handling Guide Online:

[www.festo.com/handling-guide](http://www.festo.com/handling-guide)
Linear gantry YXCL

The linear gantry YXCL combines two axis modules for two-dimensional vertical motion. High mechanical rigidity makes it reliable and precise, even with very long strokes of up to 3000 mm in the Y direction.

Applications:
For long gantry strokes up to 3000 mm in the Y direction and large loads, e.g. for feeding and loading. Suitable for a wide range of applications thanks to different sizes and variants.

Features and benefits:
• High mechanical rigidity and sturdy design
• User-friendly mounting and installation, even during servicing
• Ready-to-install complete system, including energy chain for cables and tubing as well as matching motor and servo drive

Linear gantry YXCL: designed using standard modules. In this example: Y: EGC-120, Z: EGC-80

Variants on request
For example, the heavy-duty variant with axis EHMH for payloads up to 200 kg. Other variants on request
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Drive package depends on the configuration selected.
Configure your system yourself in the Handling Guide Online:
→ www.festo.com/handling-guide
Highly dynamic linear gantry YXML

The Cartesian high-speed robot offers maximum dynamic response with max. 95 picks/minute, high flexibility and a compact design. Its mechanical design is based on the linear gantry EXCT. As a dynamic alternative to conventional serial kinematic individual axes, this linear gantry features an impressive parallel kinematic drive concept with a recirculating toothed belt and two fixed motors.

Applications:
- For rapid processes with high cycle rates
- Fast repositioning of parts and modules in a large, rectangular working space, such as pick & place, feeding, stacking, packaging and filling tasks

Features and benefits:
- Extremely high dynamic response and efficient operation up to max. 95 picks/minute thanks to low moving mass and inertia of the Z-axis: for precision positioning with high acceleration and deceleration, as well as minimal vibration
- Long service life thanks to tried-and-tested series components, drastically reduced vibrations and optimal running performance
- Flexible working space through scalable strokes in the Y and Z direction
- Minimum space requirement thanks to the compact design
- Universal: front unit interface for mechanical or vacuum-assisted rotating and gripping solutions
- Integrated energy chain concept for easy and safe installation, even in the event of subsequent modification or expansion
- Optimal actuation: the coordinate transformation required to actuate the gantry is already included in the Festo Positioning Basic Lib. Programming is quick and easy when used together with the CPX-E-CEC-M1 controller, for example.
The kinematics in detail:
- By synchronising the two motors the front plate can be moved in the Y and Z direction
- Both motors together ensure maximum acceleration and speed for exclusive movement of the front plate in the Y or Z direction

Working space and installation space

The kinematic chain:
- Two fixed servo motors M₁ and M₂
- One recirculating toothed belt ZR
- One very rigid Y-axis, one rigid yet lightweight Z-axis

Pick rate as a function of the payload and horizontal stroke
- The specified cycle rate refers to a double stroke
- Gripping and waiting times are not taken into consideration
- Double-stroke cycle [mm]

<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type</th>
<th>L₁ (mm)</th>
<th>L₂ (mm)</th>
<th>Max. working stroke (mm)</th>
<th>Max. acceleration (m/s²)</th>
<th>Max. speed (m/s)</th>
<th>Rated load for max. dynamic response (kg)</th>
<th>Repetition accuracy (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YXML-1</td>
<td>EXCT-15</td>
<td>326</td>
<td>361.5</td>
<td>Y: 100...1000</td>
<td>Z: 100, 200</td>
<td>50</td>
<td>4.8</td>
<td>1.5</td>
</tr>
<tr>
<td>YXML-2</td>
<td>EXCT-30</td>
<td>443.5</td>
<td>454</td>
<td>Y: 100...1500</td>
<td>Z: 250, 500</td>
<td>50</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>YXML-3</td>
<td>EXCT-100</td>
<td>455.5</td>
<td>511</td>
<td>Y: 100...2000</td>
<td>Z: 250, 500, 800</td>
<td>30</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

Additional requirements
- Electric 360° rotary unit with optional pneumatic processing
- Other requirements available on request

Drive package depends on the configuration selected.
Configure your system yourself in the Handling Guide Online:
→ www.festo.com/handling-guide
Planar surface gantry XYCF

You can use the planar surface gantry XYCF in a wide variety of applications thanks to its high mechanical rigidity and sturdy design. These Cartesian robots skilfully master both light and heavy workpieces or payloads and long strokes. You can approach any position in a horizontal, rectangular 2D working space. Your complete system then comprises three linear axes with precision guides. Your planar surface gantries are set up using a serial design.

Applications:
- For any movements in 2D space
- Universal for low to high payloads
- For very high requirements in terms of precision and/or very heavy workpieces
- For very long strokes
- Positioning of end effectors like grippers and vacuum systems or workpieces

Features and benefits:
- High mechanical rigidity and sturdy design
- Coordinated drive package with stepper and servo motors, as well as powerful servo drives
- As an electrical solution – freely positionable/any intermediate positions

Other requirements available on request
<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type X direction</th>
<th>Axis type Y direction</th>
<th>Max. working stroke (mm)</th>
<th>Max. payload</th>
<th>Mounting position</th>
</tr>
</thead>
<tbody>
<tr>
<td>YXCF-1 (standard)</td>
<td>• EGC-50-TB-KF</td>
<td>• EGC-50-TB-KF</td>
<td>X: 1900 Y: 1900</td>
<td></td>
<td>Horizontal</td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-50/70/80-TB-KF</td>
<td>• EGC-50/70/BS-KF</td>
<td>X: 5,000 Y: 1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ELGA-70-TB-RF</td>
<td>• ELGA-70-TB/BS-KF/RF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• DGC-12/18-KF</td>
<td>• DGC-I-18-KF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-80-TB-KF</td>
<td>• EGC-80-TB-KF</td>
<td>X: 8500 Y: 1500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ELGA-70-TB-RF</td>
<td>• ELGA-70-TB/BS-KF/RF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• EGC-HD-125-TB-KF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-80-/120-TB-KF</td>
<td>• EGC-80-TB-KF</td>
<td>X: 8500 Y: 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ELGA-80/120-TB-KF/RF</td>
<td>• ELGA-120-TB-KF/RF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• EGC-HD-160-TB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-185-TB-KF</td>
<td>• EGC-185-TB-KF</td>
<td>X: 8500 Y: 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ELGA-120-TB-KF</td>
<td>• ELGA-185-TB/BS-KF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• EGC-HD-220-TB-KF/RF</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional requirements**

**ELGC**

- • ELGC-TB-KF-45 X: 1500 Y: 800
- • ELGC-TB-KF-60 X: 2000 Y: 1500

Additional requirements Other requirements available on request

Drive package depends on the configuration selected. Configure your system yourself in the Handling Guide Online:

> www.festo.com/handling-guide
Highly dynamic planar surface gantry YXMF

The Cartesian planar surface gantry, which has a mechanical design that is based on the EXCH series, is a high-speed system with a very large rectangular working space. The handling system provides a true cost-saving alternative to conventional robotic systems that require the working space of two SCARA robots. You get an affordable system with a long service life and low power consumption.

Applications:
- For optimum dynamic response with up to 100 picks/minute in a rectangular installation space
- Loading and unloading
- Packaging and sorting
- Display and solar wafer handling
- Assembly

Features and benefits:
- Parallel kinematic drive concept for high dynamic response
- Optimal use of installation space: extremely compact and flat with scalable working space in the X and Y direction
- 30% more performance due to a lower moving mass as the drive for positioning the front plate is omitted
- Universal: front unit interface for mechanical or vacuum-assisted rotating and gripping solutions
- Low centre of gravity: minimal overshoot, enhanced positioning accuracy and reduced demands on the frame
- Integrated energy chain concept for easy and safe installation, even in the event of subsequent modification or expansion
The kinematic chain:
- Two fixed, high-performing servo motors M1 and M2
- One H-shaped recirculating toothed belt ZR
- Two very rigid X-axes, one very rigid Y-axis

The kinematics in detail:
- By synchronising the two motors the front plate can be moved in the Y and Z direction
- Both motors together ensure maximum acceleration and speed for moving the front plate in the X or Y direction

<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Max. working stroke (mm)</th>
<th>Max. acceleration (m/s²)</th>
<th>Max. speed (m/s)</th>
<th>Rated load for max. dynamic response (kg)</th>
<th>Repetition accuracy (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YXMF-2</td>
<td>EXCH-40</td>
<td>382</td>
<td>360</td>
<td>X: 200…2000 Y: 200…1000</td>
<td>Horizontal mounting position: 50</td>
<td>Horizontal mounting position: 5</td>
<td>4</td>
<td>±0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vertical: 30</td>
<td>Vertical: 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YXMF-3</td>
<td>EXCH-60</td>
<td>643</td>
<td>507</td>
<td>X: 500…2500 Y: 500…1500</td>
<td>Horizontal mounting position: 50</td>
<td>Horizontal mounting position: 5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vertical: 30</td>
<td>Vertical: 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional requirements
Other requirements available on request

Drive package depends on the configuration selected.
Configure your system yourself in the Handling Guide Online:
→ www.festo.com/handling-guide
Compact planar surface gantry YXMF

When every millimetre counts, the compact planar surface gantry YXMF, based on the EXCM series, shows its advantages. It combines outstanding functionality with an extremely compact, flat design and maximum working space coverage. It includes a coordinated drive package that contains stepper motors with optical encoders and the double servo drive CMXH for position-controlled closed-loop operation.

Applications:
- For desktop applications in small parts assembly, electronics manufacture and laboratory processes
- For extremely small working spaces

Features and benefits:
- Maximum functionality thanks to parallel kinematic drive concept
- Flat and compact for optimum use of space
- Clean look
- High payload
- Festo plug & work including pre-parameterisation
- Configurable length and width
- Flexible 3D energy chain
- Optional adjusting kit

EXCM-40
High performance thanks to 48 V supply voltage. For loads of up to 4 kg with extensive working space coverage.
Functional principle
The EXCM can travel to any position within a working space. The recirculating toothed belt, driven by fixed motors, moves the slide within a two-dimensional space.

<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Max. working stroke (mm)</th>
<th>Max. acceleration (m/s²)</th>
<th>Max. speed (m/s)</th>
<th>Rated load for max. dynamic response (kg)</th>
<th>Repetition accuracy (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YXMF-1*</td>
<td>EXCM-30</td>
<td>133</td>
<td>122</td>
<td>X: 90...700 Y: 110...510</td>
<td>20</td>
<td>1</td>
<td>3</td>
<td>± 0.05</td>
</tr>
<tr>
<td>YXMF-2*</td>
<td>EXCM-40</td>
<td>382</td>
<td>360</td>
<td>X: 200...2000 Y: 200...1000</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>± 0.1</td>
</tr>
</tbody>
</table>

Additional requirements
Other requirements available on request

* Not suitable for Positioning Basic Lib

Drive package depends on the configuration selected. Configure your system yourself in the Handling Guide Online:

→ www.festo.com/handling-guide
Three-dimensional gantry YXCR

The Cartesian robot YXCR for three-dimensional movement in the working space is ideal for very long strokes up to 3000 mm in the X direction, even with high loads. The combination of several axis modules means it can be used anywhere, for light to heavy workpieces or large payloads. A three-dimensional gantry that is perfectly tailored to the requirements of a great number of applications.

Applications:
- For any movements in 3D space
- Can be used universally for handling light to heavy workpieces or high payloads
- For very high requirements for precision and/or very heavy workpieces combined with long strokes

Features and benefits:
- Reliable and precise thanks to high mechanical rigidity and sturdy design
- Pneumatic and electric components can be freely combined
- Extremely precise with a high load capacity, even with very long strokes
- With matching Festo motor and servo drive package and energy chain

Additional requirements available on request, e.g. heavy-duty
<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type X direction</th>
<th>Axis type Y direction</th>
<th>Axis type Z direction</th>
<th>Max. working stroke [mm]</th>
<th>Max. payload</th>
<th>Mounting position</th>
</tr>
</thead>
<tbody>
<tr>
<td>YXCR-1 (standard)</td>
<td>• EGC-50-TB-KF</td>
<td>• EGC-50-TB-KF</td>
<td>• EGSL-35</td>
<td>X: 1900</td>
<td>Y: 1900</td>
<td>Z: 50</td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-50/70/80-TB-KF</td>
<td>• EGC-50/70-TB/BS-KF</td>
<td>• ELGA-70-TB-RF</td>
<td>• DGSL-6/8/10</td>
<td>• DFM-12</td>
<td></td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-80-TB-KF</td>
<td>• EGC-80-TB-RF</td>
<td>• ELGA-70-TB/BS-KF</td>
<td>• DGCL-18-KF</td>
<td>• DGCL-12/18-KF</td>
<td></td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-120/120-TB-KF</td>
<td>• EGC-120-TB/BS-KF</td>
<td>• ELGA-80/120-TB-KF</td>
<td>• DGCL-80/120-KF</td>
<td>• DGC(1)-40/60-KF</td>
<td></td>
</tr>
<tr>
<td>Additional requirements</td>
<td>• EGC-185-TB-KF</td>
<td>• EGC-120-TB/BS-KF</td>
<td>• ELGA-185-TB/BS-KF</td>
<td>• DGCL(1)-60-KF</td>
<td>• DGC(1)-90-KF</td>
<td></td>
</tr>
<tr>
<td>Additional requirements Heavy-duty</td>
<td>• ELGR</td>
<td>• ELCC</td>
<td>• Y: 8500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional requirements ELGC</td>
<td>• ELGC-TB-KF-45/60/80</td>
<td>• ELGC-BS-KF-32</td>
<td>• Y: 2000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drive package depends on the configuration selected.

Configure your system yourself in the Handling Guide Online:

→ www.festo.com/handling-guide
Compact three-dimensional gantry YXMR

The extremely space-saving 3D system is excellent at absorbing high forces and torques. It offers the same smooth running characteristics and high positioning precision. Both the electric mini slide EGSC with recirculating ball bearing guide and the pneumatic mini slide DGSL can be connected to the compact gantry EXCM-30.

Thanks to the parallel kinematic drive concept with recirculating toothed belt and two fixed stepper motors, the YXMR needs minimal installation space and offers very low moving masses and maximum functionality. The stepper motors with optical encoders enable position-controlled closed-loop operation. The compact three-dimensional gantry YXMR is the ideal solution if you want to reliably position high payloads within an extremely small working space.

Applications:
- For desktop applications in small parts assembly, electronics manufacture and laboratory processes
- For extremely small working spaces

Features and benefits:
- Flat and compact for optimised use of space
- High payload
- Festo plug & work including pre-parameterisation
- Configurable length and width

<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type XY direction</th>
<th>Axis type Z direction</th>
<th>Max. working stroke (mm)</th>
<th>Max. acceleration (m/s²)</th>
<th>Max. speed (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YXMF-1*</td>
<td>EXCM-30</td>
<td>EGSC-25/32 DGSL-8/10/12</td>
<td>X: 90...700 Y: 110...510 Z: 150</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>YXMF-2*</td>
<td>EXCM-40</td>
<td>EGSL-45 DGSL-16</td>
<td>X: 200...2000 Y: 200...1000 Z: 200</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Additional requirements
Other requirements available on request

* Not suitable for Positioning Basic Lib

Drive package depends on the configuration selected.
Configure your system yourself in the Handling Guide Online:

→ www.festo.com/handling-guide
Highly dynamic three-dimensional gantry YXMR

With up to 100 picks/min, the three-dimensional gantry based on the EXCH is highly dynamic. It makes optimal use of its working space thanks to the parallel kinematic drive concept: the YXMR is extremely compact and flat, and the working space is scalable in the X and Y direction.

Optional additional movement can be achieved using the front plate. The front plate accommodates the Z-axis or rotary-lifting module for free movement in 3D space. The clear design provides an improved overview of your system, and the lower moving mass enables 30% more performance.

---

**Applications:**
- For optimum dynamic response with up to 100 picks/minute in a rectangular installation space
- Perfect for assembly or test cells and a clear overview of the system
- Assembly, packaging and sorting

**Features and benefits:**
- Optimum dynamic response with up to 100 picks/minute in a rectangular installation space
- Clear overview of the system
- 30% more efficient due to a lower moving mass: drive for positioning the front plate is omitted
- Universal: front unit interface for mechanical or vacuum-assisted rotating and gripping solutions
- Low centre of gravity: minimal overshoot, enhanced positioning accuracy and reduced demands on the frame
- Integrated energy chain concept for easy and safe installation, even in the event of subsequent modification or expansion

---

### System specifications

<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type XY direction</th>
<th>Axis type Z direction</th>
<th>Max. working stroke (mm)</th>
<th>Max. acceleration (m/s²)</th>
<th>Max. speed (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YXMF-2</td>
<td>EXCM-40</td>
<td>EGSC-45, DGSL-16</td>
<td>X: 90...700, Y: 110...510, Z: 200</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>YXMF-3</td>
<td>EXCM-60</td>
<td>EGSL-55, DGSL-20</td>
<td>X: 200...2000, Y: 200...1000, Z: 200</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Additional requirements: Other requirements available on request

Drive package depends on the configuration selected.
Configure your system yourself in the Handling Guide Online:

→ [www.festo.com/handling-guide](http://www.festo.com/handling-guide)
The compact handling system YXMx. From kinematics ...

Screwing in, dispensing, testing, soldering, gripping, opening and closing containers and much more: the compact handling system YXMx forms the basis for a wide variety of desktop applications. The system kit comprising kinematics, controller and software saves you money and reduces your time to market – from development to programming and commissioning.

<table>
<thead>
<tr>
<th>1. Control technology</th>
<th>2. Scalable hardware</th>
<th>3. Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controller</strong></td>
<td><strong>Planar surface gantry</strong></td>
<td><strong>Included:</strong> Festo Positioning Desktop Library</td>
</tr>
<tr>
<td>• Compact</td>
<td>• Based on EXCM-30</td>
<td>Motion control for kinematics</td>
</tr>
<tr>
<td>• Powerful</td>
<td>• Compact and flat</td>
<td><strong>Optional:</strong> Festo Condition Monitoring Library</td>
</tr>
<tr>
<td>• Dual-core architecture</td>
<td>• For very small installation spaces</td>
<td>Monitoring of operating parameters</td>
</tr>
<tr>
<td>• SoftMotion for 3D path applications</td>
<td>• Scalable stroke lengths – X: 90...700 mm – Y: 110...510 mm</td>
<td></td>
</tr>
<tr>
<td>• Image processing function</td>
<td>• Motors with integrated controller and frequency converter</td>
<td></td>
</tr>
<tr>
<td>• High connectivity thanks to numerous interfaces</td>
<td>• Clean look</td>
<td></td>
</tr>
<tr>
<td><strong>Optional:</strong></td>
<td><strong>Optional:</strong></td>
<td><strong>Included:</strong></td>
</tr>
<tr>
<td>• USB remote camera</td>
<td>• Z-axis: precision spindle axis with 75 mm or 125 mm stroke</td>
<td>Festo accessories:</td>
</tr>
<tr>
<td><strong>Festo accessories:</strong></td>
<td></td>
<td>• Adjusting kit</td>
</tr>
<tr>
<td>• USB remote camera</td>
<td></td>
<td>• 3D energy chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Universal flange adapter</td>
</tr>
</tbody>
</table>

Just add a front unit – done!

Screwing in  
Gripping  
Glueing  
Soldering  
Dispensing
The reliable, quick and easy way to your goal with the software module for motion control!

The software is pre-installed on the controller and based on the Festo Positioning Basic Library. In addition to basic functions for commissioning and positioning handling systems (for detailed information see page 42), it also provides the following extra functions:

- Plug-and-play function for automatic detection and configuration of motors
- Defined interface for communication with the host system via TCP/IP
- Sequence processing

Added value on request: Festo Condition Monitoring Library

Nowadays, all system equipment and machinery are expected to provide maximum availability and reliability. The additional condition monitoring software module monitors the operating parameters and current values of the YXMx, such as the running performance, supply pressure, air and energy consumption and much more besides. As a result, it can help you plan your maintenance work professionally while at the same time cutting the associated costs. In addition, it allows you to analyse the production process and offers comprehensive energy monitoring. The software is based on VDMA standard 24582. It includes a basic visualisation component for viewing status messages in the web browser. Using the open interfaces, data can be displayed in customer systems, e.g. by connecting to the cloud via OPC UA.

- Easy to integrate into higher-level systems
- Intuitive user interface
- Customised dashboards on request
Advanced handling solutions

From standard ...

With their extremely short cycle times, these compact and cost-effective pick & place handling modules are ideal for automatic feeding and removal of small parts in very tight spaces. This is achieved by a force-guided swivel and linear motion sequence, forming a complete pick & place cycle.

Pick & place handling modules HSP/HSW

Handling module HSP

Handling module HSW

Technical data, Variants and options can be found in the Festo online catalogue.

Pick & place solutions with DGSL and EGSL

Pick & place variants (as an example)

- High mechanical rigidity and sturdy design
- Pneumatic and electric components can be freely combined
- As an electrical solution – freely positionable

Operating range

- Payload up to 6 kg
- Stroke ranges up to 400 mm
- For applications where the gripper unit has to be retracted from the working area
... to customised solutions

Gantry solution with flexible frames for vacuum gripping

Main components:
• Gripping: ESS-20-CN, VN-10
• Workpiece detection: ADN-20
• Z-axis: DGEA-40
• Y-axis: EGC-120-TB

Technical features:
• Repositioning thin workpieces/materials such as cardboard, plastic and metal sheets, etc.
• Stack detection using simple sensors
• Reliable stacking guaranteed thanks to extensive gripping tests prior to the project

Double gantry system

Main components:
• Z-axis: non-Festo product
• Y-axis: EGC-120-TB

Technical features:
• Workpiece load: 30 kg per gantry
• Steel frame: 8 metres long, 3 metres high
• Integration of non-Festo products, e.g. vertical gear rack axes
• Special requirements such as clamping unit, central lubrication
• Specific interface for customer’s gripping system and motor mounting
### Controllers

The comprehensive motion control solutions from Festo enable a wide variety of solutions for industrial automation tasks. Supported by innovative software solutions for engineering and configuration.

<table>
<thead>
<tr>
<th>Module</th>
<th>Compact controller</th>
<th>Integrated controller</th>
<th>CPX terminal</th>
<th>Modular controller</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controller CECC-D CECC-LK</td>
<td>CODESYS controller in CPX</td>
<td>CODESYS controller CPX-CEC-C1</td>
<td>Motion controller CPX-CEC-M1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Modular controller CPX-E-CEC-C1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functionality</th>
<th>ptp = point-to-point</th>
<th>Single axis (ptp asynchronous)</th>
<th>Single axis (ptp asynchronous)</th>
<th>C1: single axis</th>
<th>M1: interpolation (2D)</th>
<th>Single axis (ptp asynchronous)</th>
<th>Interpolation (3D)</th>
</tr>
</thead>
</table>

**Motion control**

The comprehensive motion control solutions from Festo enable a wide variety of solutions for industrial automation tasks. Supported by innovative software solutions for engineering and configuration.
Compact, cost-effective and powerful for your handling system:
the modular control system CPX-E

The automation system is designed as a central control system for handling technology, with an EtherCAT® master controller and a motion controller with IP20 protection.

**Powerful control:**
In addition to comprehensive PLC functions and multi-axis applications with interpolation, the CPX-E can be easily integrated into existing host systems using the EtherCAT® master interface, the integrated PROFINET device interface or the EtherNet/IP slave interface. The OPC UA client and server functions ensure easy integration and interoperability in Industry 4.0 host environments with cloud and digitalisation concepts.

**Complete solution for a large number of applications:**
As an integrated solution, the CPX-E features specific software functions tailored to many products and system solution packages from Festo, e.g. for:
- Parts handling
- Assembly systems
- Palletising
- Glueing and dispensing

The CPX-E can also be used to completely automate universal tasks, such as packaging machines (flow wrapper), palletising systems, selective soldering systems or waver handling units.

**Features and benefits:**
- EtherCAT® master interface as well as PROFINET and EtherNet/IP bus slave interface
- Standardised CODESYS V3 programming interface as of SP10
- Integrated motion functions such as SoftMotion
- Optional display
- Certifications: UL/CSA, C-Tick, IEC Ex
- Uniform data management using the Festo Automation Suite software
Festo Automation Suite commissioning software

The PC-based Festo Automation Suite software combines the parameterisation, programming and maintenance of Festo components in one program. It enables the entire drive package, from the mechanical system to the controller, to be commissioned. Perfect for making industrial automation simple, efficient and seamless.

Basic functionalities of all Festo components are already integrated in the software. To customise the software, plug-ins or add-ons can be installed directly via the program. Device information, manuals and application descriptions can also be downloaded conveniently from the software without having to open a web browser every time.

Features and benefits:
- Commissioning wizard: only five steps to get a drive system up and running with the CMMT-AS
- Two clicks instead of 100: greatly simplified integration of the servo drive CMMT-AS into the control program with CPX-E
- Customisable through device-specific plug-ins and add-ons
- Integrated controller programming with CODESYS
- Access to device information and instructions directly from the software

Download for free:
www.festo.com/AutomationSuite
Function modules for CODESYS – with the Festo Positioning Basic Library

The Festo Positioning Basic Library provides basic functions that make commissioning and positioning Festo handling systems much easier and faster. With the CODESYS function blocks and a corresponding basic project with web visualisation, you can program and commission the handling systems in no time. The Positioning Basic Library is available for free from the Festo App World.

Functions
- System configuration
- Homing
- Jogging/inching/stepping
- Point-to-point motions
- Execution of CNC programs generated in CODESYS
- Execution of CNC programs as G code from text files
- Message system

Controllers for the Festo Positioning Basic Lib

Interpolated motions with the Festo Positioning Basic Library

Software available in the Festo App World
www.festo.com/appworld
Image processing systems

Match input and output by using machine vision systems. Industrial image processing systems monitor your processes, whether by scanning codes or checking position and quality in the handling system.

Smart camera SBPD

Demanding requirements
The two-in-one image processing system with high-resolution cameras, the specially designed machine vision controller with PROFINET interface and the powerful image processing software open up new possibilities in automation and robotics – with the proven performance levels you would expect from Festo. The lightweight and ultra-compact USB cameras SBPD deliver monochrome or colour images with a resolution up to 5 megapixels.

Multi-camera tasks
The two camera interfaces allow inspections to be carried out from several perspectives or with a large field of view.

Get your images up and running:
Camera Configuration Studio for SBPD

Flexible operation combined with a variety of test options: the image processing software Camera Configuration Studio for the smart camera SBPD delivers fast and reliable results for your camera tasks. You can configure test programs and define, log and adjust all processes from image recording to input and output parameters – and simulate them on the PC before starting.

Test programs and functions
- ROI
- Circle and edge finder
- Blob finder
- Pattern matching
- Simple measuring
- Multiple measurements
- Beam tool
- Brightness inspection
- Colour check
- Coordinate transformation
- Data matrix code reader
- Barcode reader
- Text recognition (OCR)
**Vision sensors SBSx**

**Simple applications**
Fast and inexpensive for simple camera applications – even without expert knowledge. The vision sensors are available as:
- Object sensors for simple quality inspection
- Code readers for 1D/2D codes
- Colour sensors for powerful object detection including colour detection
- Universal sensors as combined code readers and object sensors

**Application example: scanning 2D codes**
The code reader scans the data matrix code and can also check its quality in accordance with ISO 15415 or AIM DPM 2006.

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**Checkbox Compact CHB-C-N**

**Optimum inspection of workpieces in rapid conveying technology**
For contactless checking of the position and quality of small parts, e.g. screws, springs, bolts, as they pass through on a conveyor belt.

**Application example: position and quality inspection of inner pins**
The Checkbox CHB-C-N checks the inner pins and controls the entire infeed process.
Festo handling systems with compatible control cabinet solutions offer control, motion and handling as an integrated package

The matching control cabinet for your handling system for simple control tasks, pick & place applications or complex control systems for coordinated, highly dynamic and precise movement sequences with up to 6 axes. Festo control cabinets for controllers provide protection for control components for single-axis and multi-axis systems.

Designed and built specifically for your application, they contain the latest products and technologies. Of course, the special requirements of your industry such as hygiene regulations are also taken into account. Safety concepts that conform to the EC Machinery Directive are provided if needed, e.g. safe stop SS1 to EN 60204-1 in automatic mode with PL d, cat. 3.

Take advantage of our specialists' many years of experience and expertise and describe your project requirements to us. We will take care of the rest.

Scope of services:
- Custom engineering to suit your handling system
- Complete system for immediate operation – Festo plug and work
- Activation of up to six axes
- Preprogrammed basic projects in CODESYS
- 3D path control, optionally available with integrated PLC
- Safe stop SS1 in automatic mode with PLd
- Easy integration into the customer's safety hierarchy
- Additional digital inputs and outputs optional
- Degree of protection IP54
- Space-saving: precise fit with the frame of the respective kinematics
- Complete system has a user-friendly and maintenance-friendly design
Quick to configure and integrate:
- Function components for motion applications
- Host modules for easy integration into your control environment

![Images of gantry systems]

- Single-axis system
- Linear gantry
- Planar surface gantry
- Three-dimensional gantry
- Highly dynamic linear gantry
- Highly dynamic planar surface gantry
- Compact planar surface gantry
- Compact three-dimensional gantry
Festo offers tested frames you can rely on for your handling system. Designed to match every kinematic system and application, in aluminium or steel.

**Standard steel frames**

Frames (LP-ST) for linear gantries up to 6 m long and 2.5 m high

Transport lug permanently welded, optional ring eyelets

Reinforcing brace for optimum application of force

**Frames (LP-AL)** for linear gantries up to 6 m long and 2 m high

Floor mounting with levelling feet

Interface with the handling system, unmachined, adjustment on the handling system

**Frames (RP-ST)** for three-dimensional gantries up to 2 m wide, 5 m long and 2.5 m high

**Standard aluminium frames**

Frames (LP-AL) for linear gantries up to 6 m long and 2 m high

Typical connecting component: cross brace/main profile

Floor mounting with levelling feet

Simple cross-bracing with profile material

Direct connection without additional mounting bracket

Frames (RP-ST) for three-dimensional gantries up to 2 m wide, 3 m long and 1.5 m high
Servo-pneumatics

Are you looking for an individual solution that is precise and position-controlled, gentle and yet powerful? Then why not use servo-pneumatics from Festo? The extremely versatile and modular drive system for servo-pneumatics is especially useful for high moving masses and small installation spaces. With a servo-pneumatic system, you can move a pneumatic cylinder to a preset target position in a position-controlled manner or generate a preset target force in a force-controlled manner.

Applications:
- For high moving masses and small installation spaces
- Gentle and smooth motions for careful processing of workpieces

Features and benefits:
- Affordable especially for moving masses from 5 kg
- High dynamic response
- Positioning and force control
Worldwide, competent, to the point: all-in service and support for your handling system

We support you throughout the entire product life cycle of your handling system, from engineering and operation to modernisation. The services are carried out by trained, professional staff. That gives you planning reliability and ensures that your handling system will be ready for use in a very short space of time. It also frees up your own staff.

The benefit to you: less effort, greater reliability, shorter time to market!

Creative, customer-oriented and reliable conceptualisation and design!

We support you with several online engineering tools, such as the Handling Guide Online for example, for planning, conceptualising, designing and simulating your solution. They will help you find the right solution quickly and easily. Everything will be correctly sized and comply with the relevant standards and guidelines. The CAD data can be applied directly to your plans. Or use the engineering service offered by our specialists and project engineers.

Cost-effective, fast and efficient procurement and delivery!

Pneumatic or electric? At Festo, you can get over 33,000 pneumatic and electronic products from a single source. That means you have one order, one invoice and one contact person, so you can save time and cut your procurement costs. It’s even easier with the Online Shop: available 24/7, with up-to-date prices and delivery times as well as order tracking.
Time-saving and simple installation and commissioning!
Use our helpful software tools and application notes to get your ready-to-install handling system up and running quickly and easily. Our local service specialists ensure optimal integration with your overall system.

Simple self-help video tutorials
Our YouTube channel “Festo Service” offers practical and intuitive step-by-step instructions on popular topics such as repairs, configuration, commissioning and modifications.

www.youtube.com/FestoService

Commissioning service for handling systems
- For reliable operation: checking the wiring, connections, motion paths and energy chains
- For optimum path travel: configuring and parameterising the axes
- For maximum performance: optimising the control parameters and homing

The commissioning service is available for one- to three-axis systems, including for axis systems with a safety module in the “Safety Package”.

Application programming
- Adjustment of parameters for system components
- Creation of program sequences in the controller
- Creation of visualisation
- Integrating additional components
- Connecting to the master controller

Technical training
- Fundamentals of handling automation
- Motion control solution
- Maintenance and service of specific handling systems

The benefit to you: maximum system productivity!

Reliable and future-proof operation and modernisation!
When it comes to maximum system availability and service life, it’s a good idea to rely on our maintenance service. Thanks to quickly available spare parts, our repair service and qualified service technicians offer fast on-site help in an emergency and reduce your downtime to a minimum. Use our machine optimisation and energy saving services to increase energy efficiency and overall system effectiveness and make the most of your investments.
Maximum productivity is a question of ambition
Do you share this attitude? We will be glad to help you achieve this goal – through our four outstanding qualities:
• Security • Efficiency • Simplicity • Competency

We are the engineers of productivity.

Discover new dimensions for your company:
www.festo.com/whyfesto