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.

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

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

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

Service
Our experts take care of your handling systems. From commissioning and training to after-sales service, we are there to help.
... and fully networked, right up to the cloud.

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!
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.

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.

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 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. With EPLAN, you can design and document circuit diagrams quickly and easily. This shortens the time-to-market for you or your users.
Overview of the different handling systems

### Complete ready-to-install system solutions ...

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Three-dimensional gantry
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Handling modules HSP/HSW for pick & place
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Handling systems

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Highly dynamic handling systems

Stacking battery cells: YXML Page 22

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<td>EHPS</td>
</tr>
<tr>
<td></td>
<td>HGPLE</td>
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</table>

## Suction cups

| Vacuum |
|-----------------|----------|
|                 | Suction grippers | Suction cup holders | Vacuum generators | Intelligent vacuum generators |
|                 | ESG variants | VAL/LJK | VN variants | OVEEM |
|                 | ESH | | | OVEL |

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<td>DRRD with energy through-feed</td>
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The system components in detail

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<td>CPX-MPA</td>
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<td>CPX-CMAX</td>
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<td>VABP</td>
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www.festo.com/catalogue/...
Electric systems

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

Cylinders and cantilever axes
EPCO  EPCC  ESBF  ELCC  EHMH

Slides
EGSL  EGSC

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

Gear unit
EMGA/EMGB

Servo drives
CMMT-AS  CMMP-AS  CMMT-ST  CMMS-ST  EMCA

Axial and parallel kits
EAMM-U  EAMM-A
### Overview of standardised peripherals

#### Motion control and software

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<td>Motion controller CPX-CEC-M1</td>
<td>CPX-E-CEC-M1</td>
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</table>

Software

Conceptualise and design
Handling Guide Online: select, configure

Installation and commissioning
Festo Automation Suite: commissioning

Electric Motion Sizing: for sizing servo drive packages

Festo Positioning Basic Lib with function modules

CPX-E motion licence

CART licence
Cartesian linear and circular interpolation

PTP licence
Point-to-point interpolation

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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
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<th>System size</th>
<th>Possible axes</th>
<th>Max. working stroke (mm)</th>
<th>Max. payload</th>
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<td>EGC-120-TB-KF</td>
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<td>EGC-HD-220-TB-KF</td>
<td>3000</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.

YXCL

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

YXCL-B

Applications:
Cost-effective implementation of vertical 2D movements for simple handling tasks such as small parts handling.

Features and benefits:
- Spindle or toothed belt axes combined with mini slides for vertical 2D working space
- Free choice of axial or parallel motor connection for the best use of the installation space
- Energy chain made of ESD material
<table>
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<tr>
<th>System size</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>
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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

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]

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

You can use the planar surface gantry YXCF 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.

YXCF

**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
- Coupled X-axes with connecting shaft for high precision and large Y spans

YXCF-B

**Applications:**
- Low-cost handling system in a compact format for small parts handling and simple tasks.
- Positioning end effectors for example in test and inspection systems.

**Features and benefits:**
- Freely positionable electric axes with any intermediate positions
- Drive axis and guide unit in X direction for absorbing forces and torques in the gantry structure
- Clean look axes with weight-optimised design
- Energy chain made of ESD material
<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>
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<td>YXCF-1-B</td>
<td>EGC-50/70-TB-KF</td>
<td>EGC-50/70-TB-KF</td>
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<td>EGC-80-TB/BS-KF</td>
<td>EGC-80-TB/BS-KF</td>
<td>X: 1000 Y: 800</td>
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**Additional requirements**
- EGC-80-TB-KF
- ELGA-80-TB-KF
- EGCI-185-TB-KF
- EGCI-225-TB-KF
- DGC(I)-40/63-KF
- DGC-40-KF

**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)
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>
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<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 Vertical: 30</td>
<td>Horizontal mounting position: 5</td>
<td>4</td>
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<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 Vertical: 30</td>
<td>Horizontal mounting position: 5</td>
<td>6</td>
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</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

Planar surface gantry YXMF based on EXCM-30

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.

The kinematic chain:
- Two fixed servo motors M1 and M2
- One 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

Maximum working space and installation 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>
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<tbody>
<tr>
<td>YXMF-1*</td>
<td>EXCM-30</td>
<td>133</td>
<td>122</td>
<td>X: 90…700</td>
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<td>1</td>
<td>3</td>
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<tr>
<td>YXMF-2*</td>
<td>EXCM-40</td>
<td>382</td>
<td>360</td>
<td>X: 200…2000</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>± 0.1</td>
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</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
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.

YXCR

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, sturdy design and coupled X-axes
- 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

YXCR-B

Applications:
Extremely compact 3D gantry system with attractive price/performance ratio, for example for simple assembly tasks and small parts handling in the electronics industry.

Features and benefits:
- Spindle and toothed belt axes with internal, protected recirculating ball bearing guide
- Free choice of axial or parallel motor connection for the best use of the installation space
- Pneumatic and electric components can be freely combined
- Energy chain made of ESD material
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<thead>
<tr>
<th>System size</th>
<th>Axis type X direction</th>
<th>Axis type Y direction</th>
<th>Axis type Z direction</th>
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<td>• EGC-60-TB-KF</td>
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</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

Three-dimensional gantry YXMR:
XY: EXCM-30, Z: EGSC-32

<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>
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</thead>
<tbody>
<tr>
<td>YXMF-1*</td>
<td>EXCM-30</td>
<td>EGSC-25/32</td>
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<td></td>
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<td>DGSL-8/10/12</td>
<td>Y: 110...510</td>
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<td>Z: 150</td>
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<td>YXMF-2*</td>
<td>EXCM-40</td>
<td>EGSL-45</td>
<td>X: 200...2000</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DGSL-16</td>
<td>Y: 200...1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Z: 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional requirements</td>
<td>Other requirements available on request</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 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

<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</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</td>
<td>X: 200...2000 Y: 200...1000 Z: 200</td>
<td>5</td>
<td>1</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
Cantilever system YXCA

The Cartesian robot YXCA for three-dimensional movements in space is ideal for use in linear assembly units, in assembly tasks and in small parts handling. The cantilever Y-axis allows the work space to be accessed from three sides and makes the best use of the installation space.

With matching stepper and servo motors, servo drives and the integrated energy supply concept, you get a reliable, ready-to-install solution.

YXCA-B

Applications:
Extremely compact 3D system with attractive price/performance ratio, for example for simple assembly tasks and small parts handling in the electronics industry. Ideal for use in linear assembly processes or desktop applications.

Features and benefits:
- Work space free of interference contours accessible from 3 sides
- Spindle and toothed belt axes with internal, protected recirculating ball bearing guide
- Free choice of axial or parallel motor connection for the best use of the installation space
- Pneumatic and electric components can be freely combined
- Energy chain made of ESD material
- Meets the basic requirements of the electronics industry

Additional requirements, for example increased payload, available on request
<table>
<thead>
<tr>
<th>System size</th>
<th>Axis type XY 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>YXCA-1-B (standard)</td>
<td>• ELGC-60-BS-KF</td>
<td>• ELGC-45-BS-KF</td>
<td>• EGSC-32 • DGST-8/12</td>
<td>X: 800 Y: 300 Z: 150</td>
<td>Dependent on the selected dynamic response</td>
<td>Horizontal</td>
</tr>
<tr>
<td>YXCA-2-B (standard)</td>
<td>• ELGC-80-BS-KF</td>
<td>• ELGC-60-BS-KF</td>
<td>• EGSC-45 • DGST-12/16</td>
<td>X: 1000 Y: 400 Z: 200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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)
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>&lt;br&gt;• Compact&lt;br&gt;• Powerful&lt;br&gt;• Dual-core architecture&lt;br&gt;• SoftMotion for 3D path applications&lt;br&gt;• Image processing function&lt;br&gt;• High connectivity thanks to numerous interfaces</td>
<td><strong>Planar surface gantry</strong>&lt;br&gt;• Based on EXCM-30&lt;br&gt;• Compact and flat&lt;br&gt;• For very small installation spaces&lt;br&gt;• Scalable stroke lengths&lt;br&gt;  – X: 90...700 mm&lt;br&gt;  – Y: 110...510 mm&lt;br&gt;• Motors with integrated controller and frequency converter&lt;br&gt;• Clean look</td>
<td><strong>Included:</strong> Festo Positioning Desktop Library&lt;br&gt;Motion control for kinematics&lt;br&gt;<strong>Optional:</strong> Festo Condition Monitoring Library&lt;br&gt;Monitoring of operating parameters</td>
</tr>
<tr>
<td><strong>PLC</strong></td>
<td><strong>Vision</strong></td>
<td><strong>Motion</strong></td>
</tr>
</tbody>
</table>

Just add a front unit – done!

Screwing in  
Gripping  
Glueing  
Soldering  
Dispensing
Highlight: the sequencer
The processes are automatically generated in the background using the graphical user interface of the sequencer. This makes application programming easy, quick and completely intuitive – without the need for any programming skills.

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

Transparency of maintenance requirements, energy consumption and manufacturing process in one software package!
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 YMXx, 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

Software available in the Festo App World
www.festo.com/appworld
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**

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

**Pick & place solutions with DGSL/DGST and EGSL/EGSC**

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

...
... 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.

Control system CPX-E
High-performance automation system as an EtherCAT master controller and motion controller to IP20 or as a low-cost remote I/O.
- Comprehensive PLC functions, multi-axis applications with interpolation
- Easy to integrate in host systems or as a controller for decentralised automation solutions
- For Industry 4.0 host environments: cloud and digitalisation concepts, OPC UA client and server functions

Electrical terminal CPX
CPX is used as a modular and flexible automation platform, including embedded CODESYS controller, or as a versatile remote I/O in IP65 for scalable installation concepts. For universal communication via fieldbus/Ethernet.
- For decentralised and networked intelligence
- Industry 4.0 thanks to OPC UA and CODESYS V3
- Optimised versions for IP20 and potentially explosive environments
- Diagnostics and condition monitoring, also via IoT gateway and Festo Cloud

Compact controller CECC
The versatile controller with CODESYS is ideal for simple control of electric and pneumatic drives. CECC stand-alone or as part of mechatronic solutions enables interpolating motion control for up to 3 axes.
- IO-Link® variant with master and device interface
- Direct connection of the Simplified Motion Series via IO-Link®
- Integrated IO-Link® interface for connecting Festo valve terminals, electric drives, sensors
- Digital I/O

Operator unit CDPX
The front end display CDPX with touchscreen visualises data and simplifies the communication with machines and systems. Project engineering and programming are easy and intuitive.
- CODESYS controller, CANopen master, digital and analogue I/O modules for easier control at field level
- Optional: digital and analogue I/O

Permitted axes: individual axes open in accordance with EtherCAT® specification or 16 interpolating axes

Permitted axes: 128 individual axes or 31 interpolating axes

Permitted axes: 4 axes

Permitted axes: 8 axes

C1: Single axis

C1: Single axis

Single axis (PTP asynchronous)

Single axis (PTP asynchronous)

Robotics (3D)

M1: Interpolation (3D)
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.

**Properties and features:**
- 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

**Convenient programming with the Festo Teach Language FTL!**
The software FTL is included in the CPX-E motion licences. It provides a variety of functions for programming motion and actuating I/Os. Thanks to its simple design and intuitive operation, programming motions is very quick and requires no extensive programming skills or special training. This means the programmer can focus fully on the application.

With the software licence “Motion and robotics” for the controller CPX-E-CEC-M1-xx, you get a user-friendly solution that enables you to design handling quickly and conveniently. The two licences are available in the Festo AppWorld

→ www.festo.com/appworld

**PTP licence**
- Point-to-point interpolation
- Actuation of simple kinematic systems
- Graphic visualisation for handheld operator unit CDSA-D3-RV
- Teach-in function in combination with visualisation
- For applications such as pick & place, loading/unloading

**CP licence**
- Cartesian linear and circular interpolation
- Interpolation of orientation
- Contour applications
- Graphic visualisation for handheld operator unit CDSA-D3-RV
- Teach-in function in combination with visualisation
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.

The 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.

User interface with a uniform look

Features and benefits:
• Topology Editor: clear visualisation of all devices in the project and their connections
• Data import: find the right drive configuration quickly by importing sizing data, for example from the Handling Guide Online
• Commissioning wizard: only a few steps to get a drive system up and running with the CMMT-AS
• 2 clicks instead of 100: greatly simplified integration of the servo drive CMMT-AS into the control program with CPX-E
• Customisable thanks to device-specific plug-ins and add-ons

Integrated controller programming with CODESYS

Download for free:
→ www.festo.com/AutomationSuite
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.

**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

Interpolated motions with the Festo Positioning Basic Library

**Controllers for the Festo Positioning Basic Lib**

CECC-X  CPX-E-CEC-M1-PN  CPX-CEC-M1-V3

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

EtherCAT,
EtherNet/IP
OPC UA
PROFINET
IP
Frames

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

Floor mounting with levelling feet

Transport lug permanently welded, optional ring eyelets

Reinforcing brace for optimum application of force

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

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

**Standard aluminium frames**

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

Direct connection without additional mounting bracket

Typical connecting component: cross brace/main profile

Simple cross-bracing with profile material

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

Floor mounting with levelling feet
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 on site or via remote support.

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 remotely or on site for single-axis to three-axis systems, and a “SafetyPackage” version is available for axis systems with safety module.

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