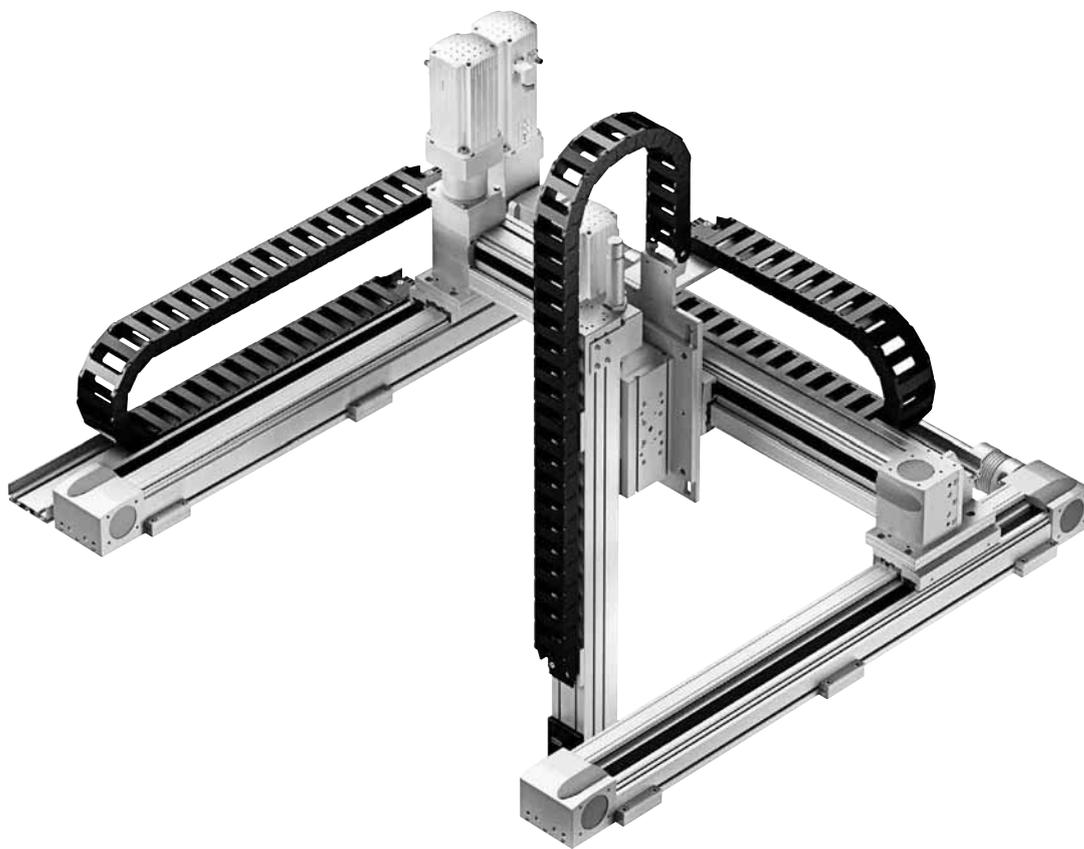




## Three-dimensional gantries



**A three-dimensional gantry consists of horizontal gantry axes and a vertical drive.**

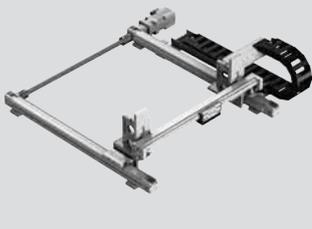
- Can be used universally for handling light to heavy workpieces or high effective loads
- Ideal for very long strokes
- High mechanical rigidity and sturdy design
- Pneumatic and electrical components – freely combinable
- As electrical solution – variable positioning/any desired intermediate positions

### Range of application:

- For any movement in 3D space
- Very high requirements on precision and/or very heavy workpieces, with long strokes at the same time

### Planar surface gantry

The planar surface gantry is equivalent to a three-dimensional gantry, but without a Z-axis and allows free movement in the plane.



### Example: automotive industry

Load handling in assembly system for solenoids



### Requirements

- Flexible positioning
- High speed and long horizontal strokes
- Fast system availability
- Complete documentation of process values

### Solution

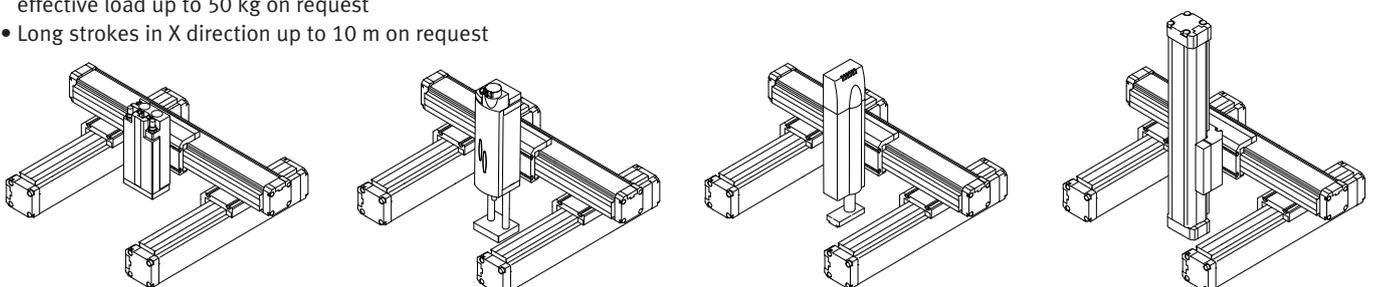
Three-dimensional gantry with toothed belt axes DGE from the multi-axis modular system



Type	Important characteristics	Axis design	Effective load	Max. effective strokes	Components
 <ul style="list-style-type: none"> <li>• Three-dimensional gantry as mono axis</li> <li>• Free movement of Z-axis in the available space (3D)</li> </ul>	<ul style="list-style-type: none"> <li>• Compact design</li> <li>• High process reliability thanks to installation integration</li> <li>• Pneumatic and electric drives</li> <li>• Repetition-accurate, centralised direct axis connections</li> <li>• Pneumatic and electric drives (with freely programmable positions in X and Y)</li> <li>• Very high dynamic response and precision</li> </ul>	X: Gantry axes Y: Gantry axes Z: <b>Slides</b> <b>Cantilever axis</b>	Mono: 0 to 6 kg	X: Up to 8500 mm Y: Up to 1500 mm Z: Up to 300 mm	X: DGE/ <b>EGC</b> Y: DGE/ <b>EGC</b> DGC/DGPL Z: DGSL EGSA
 <ul style="list-style-type: none"> <li>• See above</li> </ul>	<ul style="list-style-type: none"> <li>• See above, points 1–5</li> <li>• Z-axis with optional intermediate position (can be passed through) and clamping unit</li> </ul>	X: Gantry axes Y: Gantry axes Z: <b>Cantilever axis</b>	Mono: 0 to 5 kg	X: Up to 8500 mm Y: Up to 1500 mm Z: Up to 200 mm	X: DGE/ <b>EGC</b> Y: DGE/ <b>EGC</b> DGC/DGPL Z: HMPL
 <ul style="list-style-type: none"> <li>• See above</li> </ul>	<ul style="list-style-type: none"> <li>• See above, points 1–5</li> <li>• Z-axis with optional intermediate position and clamping unit</li> </ul>	X: Gantry axes Y: Gantry axes Z: <b>Cantilever axis</b>	Mono: 0 to 10 kg*	X: Up to 8500 mm Y: Up to 2000 mm Z: Up to 400 mm	X: DGE/ <b>EGC</b> Y: DGE/ <b>EGC</b> DGC/DGPL Z: HMP
 <ul style="list-style-type: none"> <li>• Three-dimensional gantry as mono or duo axis</li> <li>• Free movement of Z-axis in the available space (3D)</li> </ul>	<ul style="list-style-type: none"> <li>• See above, points 1–5</li> <li>• Z-axis alternative guides and drive concepts (motors)</li> </ul>	X: Gantry axes Y: Gantry axes Z: <b>Cantilever axis</b>	Mono: 0 to 15 kg Duo: 0 to 25 kg	X: Up to 8500 mm Y: Up to 2000 mm Z: Up to 900 mm	X: DGE/ <b>EGC</b> Y: DGE/ <b>EGC</b> DGC/DGPL Z: DGEA

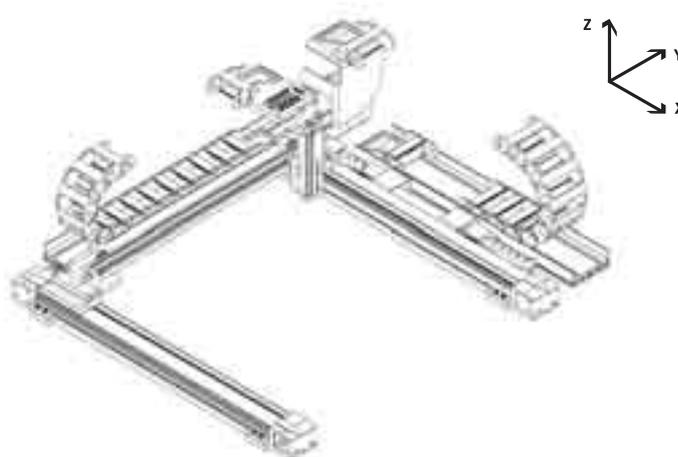
- System solution for standardised three-dimensional gantries with effective load up to 50 kg on request
- Long strokes in X direction up to 10 m on request

\* With the pneumatic drive DGC, can be used as duo axis



## Standard 3D gantry RP 0.5

Effective load up to 0.5 kg



### Technical data

		Stroke/mm	Intermed. position	Repetition accuracy/mm	
Z-axis 				End position	Intermediate position
P	DGSL-8	0 ... 80	–	± 0.01**	–
Y-axis 					
ZR	1 x EGC-50-TB-KF	0 ... 1000	Any	± 0.08	± 0.08
P	DGC-12	0 ... 1000	–	± 0.02*	–
X-axis 					
ZR	EGC-70-TB-KF	0 ... 5000	Any	± 0.08	± 0.08

\* With shock absorber YSR/YSRW

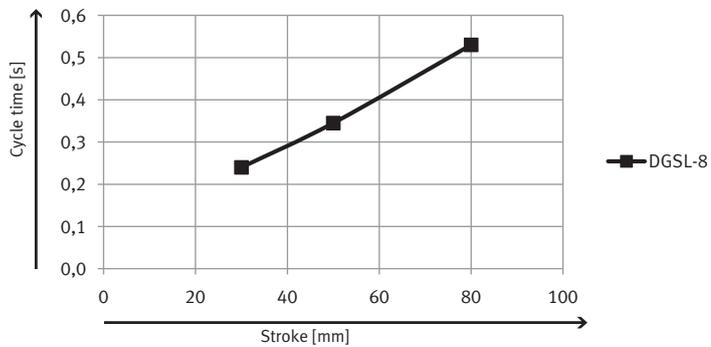
\*\* With cushioning P1/Y3

Grey shading: drive components in the illustration

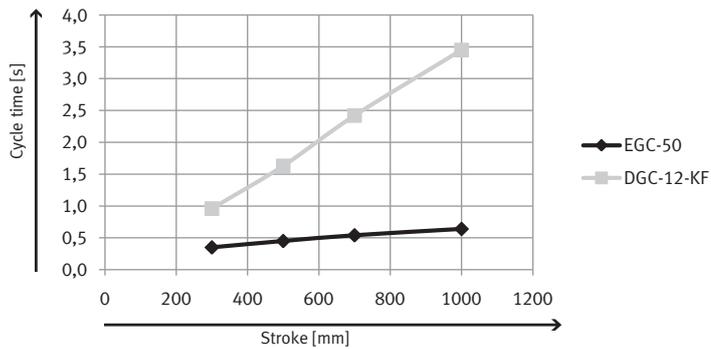
EGC-HD: available end of 2011

## Reference for cycle times

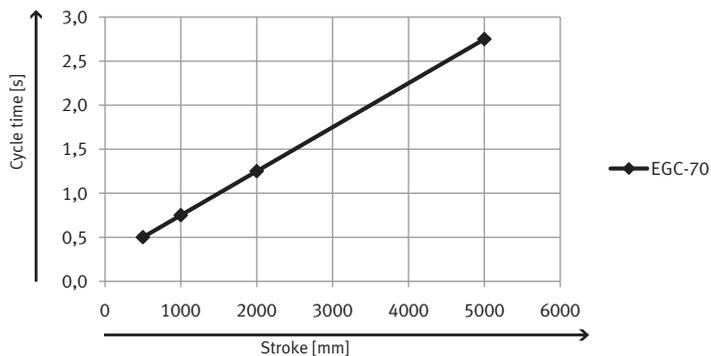
Z-axis



Y-axis



X-axis



### Note

#### Selection matrix

Types of handling units

→ Pages 6 to 9

#### Handling components

→ Page 95

#### Gripping/rotating

Adaptation options

→ Page 71

#### Control cabinets

→ Page 92

#### Frames

→ Page 78

#### CAD drawings/

#### CAD hotline

2D and 3D drawings

→

Tel. +49 (0)711 347-4667

#### Individual project engineering and cycle time calculation

→

Tel. +49 (0)711 347-4381

#### Fax enquiry

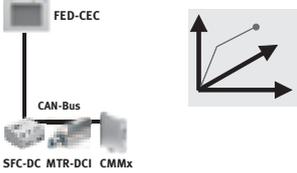
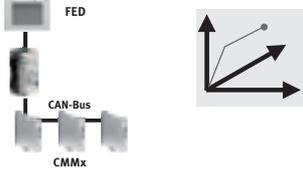
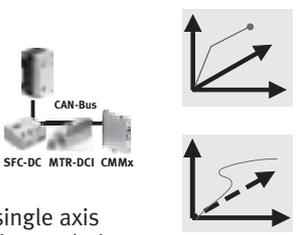
Form

→ Page 101

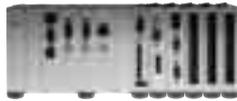
### Note

An operating pressure of 6 bar is assumed for all the pneumatic drives shown here.

# Overview of Festo control products

	<b>FED-CEC</b> 	<b>CPX terminal</b> 	
	Integrated controller FED-CEC	CoDeSys controller CPX-CEC-C1	Motion controller CPX-CEC-M1
			
	Single axis (point-to-point asynchronous)	C1: single axis M1: interpolation	C1: single axis M1: interpolation
<b>Maximum number of possible axes</b>	Recommended: 8 axes Note: one axis is treated as a CANopen node. 128 nodes are possible (as defined by CANopen specifications).	Recommended: 8 axes Note: one axis is treated as a CANopen node. 128 nodes are possible (as defined by CANopen specifications).	Recommended: 8 axes Note: one axis is treated as a CANopen node. 128 nodes are possible (as defined by CANopen specifications).
<b>Motion</b>	<ul style="list-style-type: none"> <li>• Point-to-point asynchronous</li> <li>• Every axis moves with its own pre-defined parameter</li> <li>• The axes do not reach their end positions at the same time and the path is not defined</li> </ul>		
			<ul style="list-style-type: none"> <li>• 2.5D interpolation</li> <li>• PLC Open</li> </ul>
<b>Special features</b>	Integrated controller in a display screen	Function integration on the CPX valve platform	
			<ul style="list-style-type: none"> <li>• CNC editor</li> <li>• DXF import</li> <li>• Cam disk editor</li> </ul>
<b>Application examples</b>	<ul style="list-style-type: none"> <li>• Handling systems</li> <li>• Pick &amp; place, palletising</li> </ul>	Path control, bonding, cutting, handling, flying saw, cam disk	
<b>Programming environment</b>	CoDeSys	CoDeSys	CoDeSys + Softmotion

**Modular control**



Modular control		CMXR robotic controller	
Modular controller CECX-C1	Motion controller CECX-M1	CMXR-C1 (Basic)	CMXR-C2 (Advanced)
<p>Single axis (point-to-point asynchronous)</p>	<p>Interpolation (2.5D)</p>	<p>Robotics (3D)</p>	<p>Robotics (3D)</p>
<p>Recommended: 8 axes Note: one axis is treated as a CANopen node. 128 nodes are possible (as defined by CANopen specifications).</p>		<p>Max. 6 interpolated axes, of which max. 3 basic axes and 1 orientation axis and max. 3 dependent auxiliary axes that are interpolated together with the kinematics system.</p>	
			<p>Additional single axes (not interpolated together with others) can be controlled via the integrated CoDeSys PLC. Recommended: 16 axes.</p>
		<p>3D contour interpolation with an orientation axis for kinematics systems with up to 4 degrees of freedom. E.g. 3D gantry with an axis of rotation on the front end.</p>	
	<ul style="list-style-type: none"> <li>• 2.5D interpolation</li> <li>• PLC Open</li> </ul>		<p>CoDeSys control: point-to-point asynchronous</p>
<ul style="list-style-type: none"> <li>• Powerful PLC</li> <li>• Encoder interface</li> <li>• Interrupt function</li> <li>• Fast clock pulse inputs</li> <li>• Profibus master</li> <li>• Two Canbus masters</li> <li>• RS 232/ RS 485-A/422-A</li> </ul>		<ul style="list-style-type: none"> <li>• Economical design and configuration with the Festo Configuration Tool (FCT)</li> <li>• Simple programming of motions with Festo Teach Language (FTL), no specialist expertise required</li> <li>• Optional teach pendant with 2-channel permission button</li> <li>• Reduced speed in manual override mode</li> <li>• Automatic repositioning when continuing interrupted motions</li> <li>• Simple teaching of positions</li> <li>• Definition of tools, allowing easy use of multiple grippers</li> <li>• Real orientation axes on the front end</li> <li>• Integrated kinematics models e.g. for Cartesian systems, tripod, H- and T-gantries</li> </ul>	
	<ul style="list-style-type: none"> <li>• CNC editor</li> <li>• DXF import</li> <li>• Cam disk editor</li> </ul>		<ul style="list-style-type: none"> <li>• Increased flexibility with the integrated CoDeSys PLC, e.g. for the integration of vision systems</li> <li>• Tracking function for applications involving selecting items from a conveyor belt</li> <li>• Speed-independent path switching points with time compensation, e.g. for bonding applications</li> <li>• Complete automation of a cell is possible</li> </ul>
<ul style="list-style-type: none"> <li>• Handling systems</li> <li>• Pick &amp; place, palletising</li> </ul>	<p>Path control, bonding, cutting, handling, flying saw, cam disk</p>	<p>Handling, palletising, bonding, metered dispensing, painting, cutting</p>	<p>Tracking applications such as processing of moving parts on a conveyor belt or synchronised kinematics movement with up to 6D</p>
<p>CoDeSys</p>	<p>CoDeSys + Softmotion</p>	<p>Festo Teach Language (FTL)</p>	<p>FTL + CoDeSys</p>