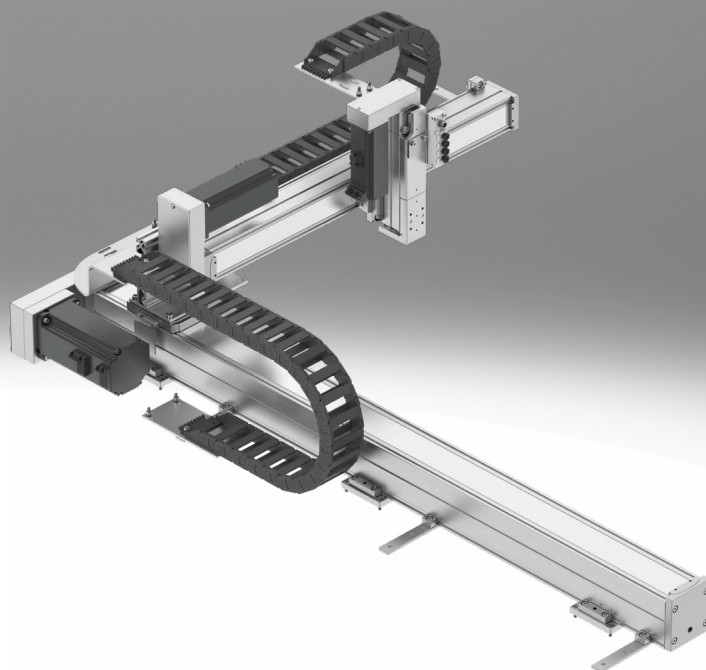


## Cantilever systems

**FESTO**



## Key features

### At a glance

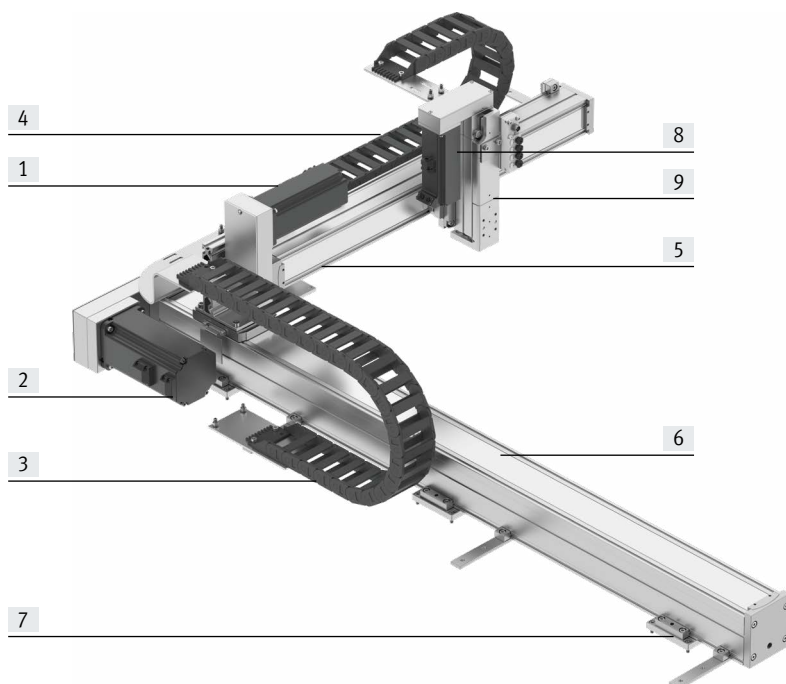
The cantilever system facilitates movement in 3D space. The cantilever system is composed of several axis modules depending on the requirements. These are all tried-and-tested components from Festo.

- Can be used universally for handling light to medium-weight workpieces or payloads
- Optimum ratio of installation space to working space
- Working space with minimal interfering contours – freely accessible from three sides

- Pneumatic and electric components are freely combinable
- As an electrical solution it is freely positionable/any intermediate positions

Range of applications:

- For any movements in 3D space
- Ideal for line assembly processes
- Cost-effective handling unit in a compact format for small parts handling and simple tasks (YXCR-B)



- [1] Servo motor for the X-module
- [2] Servo motor for the Y-module
- [3] Energy chain for the X-module
- [4] Energy chain for the Y-module
- [5] Y-axis
- [6] X-axis
- [7] Profile mounting/adjusting kit
- [8] Servo motor for the Z-module
- [9] Z-axis

### Description of the modules

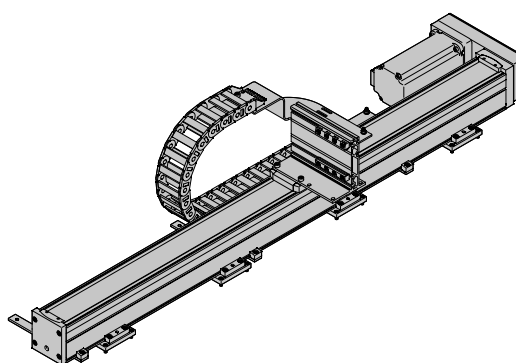
#### X-module

Design:

The X-module EHM-X-AS comprises a linear axis which is powered by a servo or stepper motor. Adapters are mounted on the slide of the X-axis to connect the Y-module. The position of the motor and energy chain can be selected using the configurator. The following components are located on the motor side:

- Energy chain (optional)
- Multi-pin plug distributor for proximity switch (if a sensor package has been selected)

Sample image:



## Key features

### Description of the modules

#### Y-module

##### Design:

The Y-module EHYM comprises a linear axis which is powered by a servo or stepper motor.

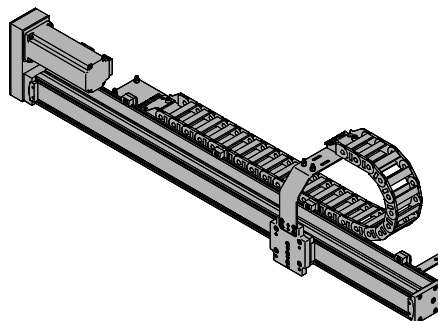
Adapters are mounted on the slide of the Y-axis to connect the Z-module.

The position of the motor and energy chain is dependent on the position of the motor on the X-module.

The following components are located on the motor side:

- Energy chain (optional)
- Multi-pin plug distributor for proximity switch (if a sensor package has been selected)

##### Sample image:



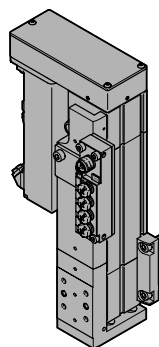
#### Z-module

##### Design:

The Z-module EHZM comprises an electric drive, the DHMZ comprises a pneumatic drive. Based on the configuration, an energy chain is optionally installed as a cable guide depending on the axis type and stroke.

The Z-module can be selected using the configurator, depending on the application.

##### Sample image:



Key features

**Dispatch options**

Fully assembled:

The cantilever system is fully assembled. All cables and tubing are installed and connected. The system is already set up on delivery, but must be adapted to the particular mounting surface during installation.

Note flatness → table below.

Partially assembled:

The cantilever system is delivered partially assembled. This means that all three axis modules (X-/Y-/Z-axis) are assembled, each with the optional motors. The partially assembled system must be completed by the customer. Help can be found in the assembly instructions provided.

Optional accessories (→ page 9) are enclosed.

Note flatness → table below.

System overview <sup>1)</sup>		
Size	YXCA-1-B	YXCA-2-B
Max. working stroke	X: 800 mm Y: 300 mm Z: 150 mm	X: 1000 mm Y: 400 mm Z: 200 mm
Max. payload	Dependent on the selected dynamic response	
Required flatness of the mounting surface	≤ 0.1 mm/m	
Mounting position	Horizontal	

1) Drive package depends on the configuration selected.

## Key features

### Configurator: Handling Guide Online (HGO)

#### Selecting a handling system

Planning complex handling systems takes a lot of time. You can use the configurator "Handling Guide Online" (HGO) to design a customised handling system for your application in just a few steps.

You can choose from the following systems:

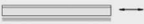




- Single-axis system
- 2D linear gantry
- 2D planar surface gantry
- Three-dimensional gantry
- 3D cantilever system

#### Advantages:

- Automatic selection of all relevant components
- Automatic design and calculation of the workload
- Quote created automatically
- CAD model available immediately
- Configuration-specific parameters for servo drives available immediately
- Complete Eplan project can be ordered according to the individual configuration
- Fully automated processing
- You can order fully or partially assembled systems through the Online Shop
- Lots of possible options

### Selecting the handling solution

Select your handling system

<input type="radio"/> Single-axis system		Single-axis movement: Single-axis module as a complete system. Easy to connect to your own front unit. <input type="checkbox"/> Animation
<input type="radio"/> 2D linear gantry		Movements in 2D in the vertical working space: Linear gantries as complete systems. Electric and pneumatic axes can be combined <input type="checkbox"/> Animation
<input type="radio"/> 2D gantry		Movements in 2D in the horizontal working space: Planar surface gantries as complete systems. Combining electric axes. Easy to connect to your own Z unit. <input type="checkbox"/> Animation
<input type="radio"/> 3D gantry		Movements in 3D: Three-dimensional gantries as complete systems. Electric and pneumatic axes can be combined <input type="checkbox"/> Animation
<input type="radio"/> 3D cantilever system		Movements in 3D: Cantilever system as complete system. Electric and pneumatic axes can be combined

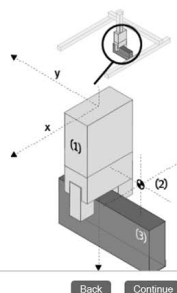
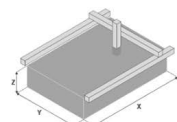
### Entering the application data

- Payload
- Drive system of the axis
- Distance from the centre of the load
- Working stroke
- Reference cycle

### Axis definition and payload

Axis definition

Drive system of the axis	X Electric: several positions
	Y Electric: several positions
	Z Electric: several positions <input type="checkbox"/>
Required working stroke	i X <input type="text" value="100"/> mm
	i Y <input type="text" value="120"/> mm
Working stroke in Z direction	i Z <input type="text" value="50"/> mm
Take the stroke reserve into account in your specification	
Payload	
Sum of the weight of the front unit and the workpiece	<input type="text" value="2"/> kg
Distance from the centre of the load	i X <input type="text"/> mm
	i Y <input type="text"/> mm
	i Z <input type="text"/> mm



Back Continue

Key features

Configurator: Handling Guide Online (HGO)  
Result of the calculation

You will be offered a selection of systems that have been calculated based on the application data you entered.

The following are available immediately:

- CAD model
- Datasheet of the selected system
- Price information

Result of calculation

Select the appropriate system and continue with the configuration:

Selection Filter

No.	System series	System workload i	Repetition accuracy (+/-)	Your price
<input checked="" type="checkbox"/>	1 YXCR-1	91 %	0.11 mm	
<input type="checkbox"/>	3 YXCR-2	46 %	0.11 mm	
<input type="checkbox"/>	5 YXCR-2	52 %	0.11 mm	
<input type="checkbox"/>	7 YXCR-2	32 %	0.11 mm	
<input type="checkbox"/>	26 YXMR-2	48 %	0.1 mm	

Requires additional motion controller for interpolation ( e.g. CPX-E-CEC-M1-... )

3D gantry YXCR-1: #1

Drive module	X module: toothed belt axis EGC-50	Y module: toothed belt axis EGC-50	Z module: Electric mini slide EGSL-35
Kinematics type	Serial kinematics	Serial kinematics	Serial kinematics
Stroke	200 mm	200 mm	50 mm
Repetition accuracy (+/-)	0.08 mm	0.08 mm	0.02 mm
Gear unit	5:1	5:1	Without
Type of motor	Servo motor EMME-AS	Servo motor EMME-AS	Servo motor EMME-AS
Motor position	Right	Right	Top

Data protection Back Continue

System overview

You will be given an overview of the complete system.

You will also have the following options:

- Show price
- Send request
- Add to basket

Your handling solution

Your selected system overview:

Exemplary representation

Update CAD Preview

Your system ID: **C1374165**

Your next step:

Show priceSend requestAdd to basket

Your entriesYour systemYour options

Feature	Value
Handling type	2D gantry
Payload	2 kg
Drive system of the X-axis	Electric: several positions
Drive system of the Y-axis	Electric: several positions

Data protection Back

## Key features

### Standard components within the handling system

The handling system comprises a number of tried-and-tested standard components from Festo. Different components are used depending on the configuration. The single axes installed will be displayed in the configurator HGO on the "Result of calculation" page.

#### Drives/axes

##### X-axis

#### Ball screw axis ELGC-BS



- Electrical
- Optimal installation space to working space ratio
- Protected against external influences by internal guide
- Various spindle pitches

##### Y-axis

#### Ball screw axis ELGC-BS



- Electrical
- Optimal installation space to working space ratio
- Protected against external influences by internal guide
- Various spindle pitches

##### Z-axis

#### Mini slide EGSC



- Electrical
- Compact design
- High load capacity
- Precision guide and ball screw
- Easy adjustment of end positions

#### Mini slide DGST



- Pneumatic
- Precise and resilient roller bearing guide
- Slide and yoke plate as a single component
- High dynamic response

#### Possible axis combinations<sup>1)</sup>

Size	X-module	Y-module	Z-module
YXCA-1-B	<ul style="list-style-type: none"> <li>• Ball screw axis ELGC-60-BS</li> </ul>	<ul style="list-style-type: none"> <li>• Ball screw axis ELGC-45-BS</li> </ul>	<ul style="list-style-type: none"> <li>• Mini slide pneumatic: DGST-8/12 electric: EGSC-32</li> </ul>
YXCA-2-B	<ul style="list-style-type: none"> <li>• Ball screw axis ELGC-80-BS</li> </ul>	<ul style="list-style-type: none"> <li>• Ball screw axis ELGC-60-BS</li> </ul>	<ul style="list-style-type: none"> <li>• Mini slide pneumatic: DGST-12/16 electric: EGSC-45</li> </ul>

1) Drive package depends on the configuration selected.

## Key features

### Standard components within the handling system

The handling system comprises a number of tried-and-tested standard components from Festo. Different components are used depending on the configuration. You can alter the scope and design of the drive package in the configurator HGO on the "System configuration" page.

### Motors and controllers

#### Servo motors EMMB-AS



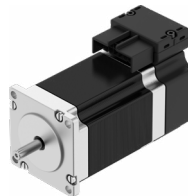
- Dynamic, brushless, permanently excited servo motor
- Digital absolute displacement encoder in single-turn or multi-turn version
- With optional brake

#### Stepper motors EMMT-ST



- Two-phase hybrid technology
- Digital absolute displacement encoder in single-turn or multi-turn version
- Simple connection technology (OCP: one cable plug) – hybrid cable: motor cable and connecting cable for supply and encoder in one
- Plug can be rotated 310°
- With optional brake

#### Stepper motors EMMB-ST



- Two-phase hybrid technology
- Digital absolute displacement encoder in single-turn or multi-turn version
- Simple connection technology (OCP: one cable plug) – hybrid cable: motor cable and connecting cable for supply and encoder in one
- Can be positioned to the front or the rear
- With optional brake

#### Servo drive CMMT-AS, for servo motor



- Universal servo drive
- For synchronous servo motors
- Integrated EMC filters
- Integrated brake chopper
- Integrated braking resistor
- Position controller
- Speed controller
- Force controller
- Range of control functions

#### Options:

- Safety function: safe torque off (STO)/category 4, Performance Level e
- Safe stop 1 (SS1)
- Safe brake control (SBC) up to SIL3/category 3, Performance Level e

- Bus protocols
  - EtherCAT®
  - PROFINET RT/IRT
  - EtherNet/IP
  - Modbus TCP

#### Servo drive CMMT-ST, for stepper motor



- Servo drive for operating stepper motors and brushless direct current motors
- Options for point-to-point and interpolating motion and for precise positioning
- Primary voltage from 24 ... 48 V DC
- Position controller
- Speed controller
- Force controller
- Range of control functions

#### Options:

- Safety function: safe torque off (STO)/category 3, Performance Level e
- Safe stop 1 time controlled (SS1-t)

- Bus protocols
  - EtherCAT®
  - PROFINET RT/IRT
  - EtherNet/IP
  - Modbus TCP



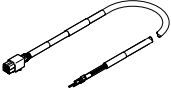
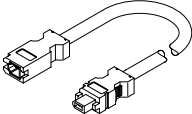
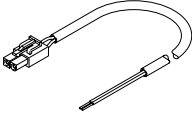
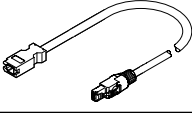
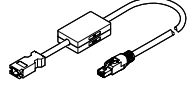
## Ordering data – Accessories

### Module/motor combinations

We recommend that the three-dimensional gantry is operated with the proposed motors from Festo. These precisely match the mechanical system. When using third-party motors, it is essential that the technical limits are observed.

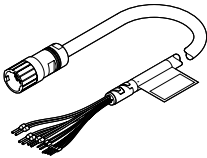
Module	Motor	
	Servo motor	Stepper motor
<b>X-module</b>		
EHMX-ELGC-60-BS	EMMB-AS-80-07	EMMT-ST-57-L
EHMX-ELGC-80-BS	EMMB-AS-80-07	EMMT-ST-87-M
<b>Y-module</b>		
EHMY-RP-ELGC-45-BS	EMMB-AS-40-01	EMMT-ST-42-L
EHMY-RP-ELGC-60-BS	EMMB-AS-60-04	EMMT-ST-57-L
<b>Z-module</b>		
EHMZ-EGSC-32	EMMB-AS-40-01	EMMT-ST-42-L
EHMZ-EGSC-45	EMMB-AS-40-01	EMMT-ST-42-L

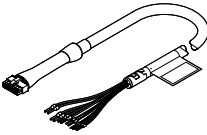
## Ordering data – Accessories

Ordering data		Cable length [m]	Part no.	Type
For servo motor EMMB-AS				
Motor cable				
	• For EMMB-AS-40/60/80 with CMMT-AS	2.5	5219197	NEBM-H6G4-E-2.5-Q13N-LE4
		5	5219198	NEBM-H6G4-E-5-Q13N-LE4
		7.5	5219199	NEBM-H6G4-E-7.5-Q13N-LE4
		10	5219200	NEBM-H6G4-E-10-Q13N-LE4
		15	8097203	NEBM-H6G4-E-15-Q13N-LE4
Encoder cable				
	• For EMMB-AS-40/60/80 with CMMT-AS	2.5	5219213	NEBM-REG6-E-2.5-Q14N-REG6
		5	5219214	NEBM-REG6-E-5-Q14N-REG6
		7.5	5219215	NEBM-REG6-E-7.5-Q14N-REG6
		10	5219216	NEBM-REG6-E-10-Q14N-REG6
		15	8097200	NEBM-REG6-E-15-Q14N-REG6
Connecting cable for brake				
	• For EMMB-AS-40/60/80 with CMMT-AS	2.5	5219205	NEBM-H7G2-E-2.5-Q14N-LE2
		5	5219206	NEBM-H7G2-E-5-Q14N-LE2
		7.5	5219207	NEBM-H7G2-E-7.5-Q14N-LE2
		10	5219208	NEBM-H7G2-E-10-Q14N-LE2
		15	8097206	NEBM-H7G2-E-15-Q14N-LE2
Adapter for encoder cable (absolutely essential)				
	• For EMMB-AS-40/60/80 with CMMT-AS	For single-turn version with CMMT-AS		
		0.5	8097197	NEFM-REG6-K-0.5-R3G8
	• For EMMB-AS-40/60/80 with CMMT-AS	For multi-turn version with CMMT-AS <sup>1)</sup>		
		0.5	8097195	NEFM-REG6-K-0.5-B-R3G8
		For multi-turn version with CMMB-AS <sup>1)</sup>		
		0.5	8097196	NEFM-REG6-K-0.5-B-REG6

1) The required battery is not included in the scope of delivery

## Ordering data – Accessories

Designation	Description	Cable length [m]	Part no.	Type
<b>For stepper motor EMMT-ST</b>				
<b>Motor cable</b>				
	• For EMMT-ST-42-... with CMMT-ST	2.5	8181670	NEBM-M17G12-EH-2.5-Q6N-LE12
		5	8181668	NEBM-M17G12-EH-5-Q6N-LE12
		7	8190096	NEBM-M17G12-EH-7.5-Q6N-LE12
		10	8195457	NEBM-M17G12-EH-10-Q6N-LE12
		15	8214679	NEBM-M17G12-EH-15-Q7N-LE12
	• For EMMT-ST-57-... with CMMT-ST	2.5	8181670	NEBM-M17G12-EH-2.5-Q6N-LE12
		5	8181668	NEBM-M17G12-EH-5-Q6N-LE12
		7	8195460	NEBM-M17G12-EH-7.5-Q7N-LE12
		10	8195461	NEBM-M17G12-EH-10-Q7N-LE12
		15	8214683	NEBM-M17G12-EH-15-Q9N-LE12
	• For EMMT-ST-87-... with CMMT-ST	2.5	8195458	NEBM-M17G12-EH-2.5-Q7N-LE12
		5	8195459	NEBM-M17G12-EH-5-Q7N-LE12
		7	8214681	NEBM-M17G12-EH-7.5-Q9N-LE12
		10	8214682	NEBM-M17G12-EH-10-Q9N-LE12
		15	8214683	NEBM-M17G12-EH-15-Q9N-LE12

Designation	Description	Cable length [m]	Part no.	Type
<b>For stepper motor EMMB-ST</b>				
<b>Motor cable</b>				
	• For EMMB-ST-42-... with CMMT-ST	2.5	8181675	NEBM-L5G14-EH-2.5-Q6N-LE12
		5	8181664	NEBM-L5G14-EH-5-Q6N-LE12
		7	8181676	NEBM-L5G14-EH-7.5-Q6N-LE12
		10	8181672	NEBM-L5G14-EH-10-Q6N-LE12
		15	8214680	NEBM-L5G14-EH-15-Q6N-LE12
	• For EMMB-ST-57-... with CMMT-ST	2.5	8181677	NEBM-L10G14-EH-2.5-Q6N-LE12
		5	8181667	NEBM-L10G14-EH-5-Q6N-LE12
		7	8181674	NEBM-L10G14-EH-7.5-Q7N-LE12
		10	8181673	NEBM-L10G14-EH-10-Q7N-LE12
		15	8214689	NEBM-L10G14-EH-15-Q9N-LE12
	• For EMMB-ST-87-... with CMMT-ST	2.5	8181666	NEBM-L10G14-EH-2.5-Q7N-LE12
		5	8181671	NEBM-L10G14-EH-5-Q7N-LE12
		7	8214687	NEBM-L10G14-EH-7.5-Q9N-LE12
		10	8214688	NEBM-L10G14-EH-10-Q9N-LE12
		15	8214689	NEBM-L10G14-EH-15-Q9N-LE12

## Possible cable and tube lengths

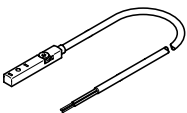
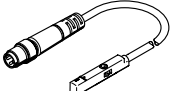
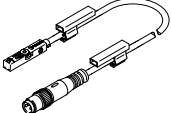
- Cables and tubing are selected so that the length specified when ordering will be the minimum connection length from the energy chain output.
- Cables and tubing are only available in fixed lengths as stated in the table below. This can mean that the cable plugs of the different cables do not end at the same point.

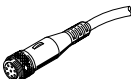
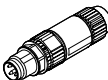
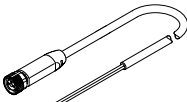
Length	1 m	2 m	5 m	7 m	10 m
Motor cable	–	■	■	■	■
Encoder cable	–	■	■	■	■
Multi-pin plug connecting cable	–	■	■	■	■
Tubing (for DHMZ only)	■	■	■	–	–

## Ordering data – Accessories

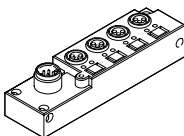

## Standard components within the handling system

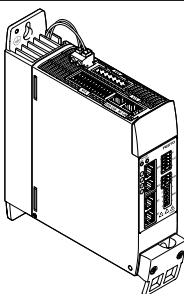
The handling system comprises a number of tried-and-tested standard components from Festo. Different components are used depending on the configuration. You can alter the scope and design of the accessories in the configurator HGO on the "System configuration" page.

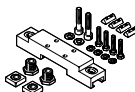
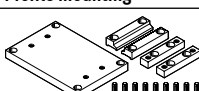
Designation	Description	Cable length	Part no.	Type	
Proximity switch (inductive) for sensing the position of the slide on the X-/Y-/Z-axis					
	<b>Cable with open end</b> <ul style="list-style-type: none"><li>For ball screw axis ELGC-BS</li><li>For mini slide EGSC</li><li>For DC voltage</li></ul> Included if the "Festo sensor package" is selected: <ul style="list-style-type: none"><li>For ELGC: 2 pieces</li><li>For EGSC: 1 piece</li></ul>	PNP, N/C contact	7.5 m	551391	SIES-8M-PO-24V-K-7.5-OE
		PNP, N/O contact	7.5 m	551386	SIES-8M-PS-24V-K-7.5-OE
		NPN, N/C contact	7.5 m	551401	SIES-8M-NO-24V-K-7.5-OE
		NPN, N/O contact	7.5 m	551396	SIES-8M-NS-24V-K-7.5-OE
Proximity switches (magneto-resistive) for sensing the position of the slide on the Z-axis					
	<ul style="list-style-type: none"><li>For mini slide DGST-8/-12</li><li>For DC voltage</li></ul> Included if the "Festo sensor package" is selected: <ul style="list-style-type: none"><li>2 pieces</li></ul>	PNP, N/O contact	2.5 m	551375	SMT-10M-PS-24V-E-0.3-L-M8D
		NPN, N/O contact	2.5 m	551379	SMT-10M-NS-24V-E-0.3-L-M8D
	<ul style="list-style-type: none"><li>For mini slide DGST-16/-20</li><li>For DC voltage</li></ul> Included if the "Festo sensor package" is selected: <ul style="list-style-type: none"><li>2 pieces</li></ul>	PNP, N/O contact	2.5 m	574334	SMT-8M-A-PS-24V-E-0.3-M8D
		NPN, N/O contact	2.5 m	574339	SMT-8M-A-NS-24V-E-0.3-M8D

Designation	Description	Cable length	Part no.	Type
Plug socket with cable				
	• Connection between multi-pin plug distributor NEDU and control cabinet	5 m	525618	SIM-M12-8GD-5-PU
		10 m	570008	SIM-M12-8GD-10-PU
Plug				
	• For connection to the multi-pin plug distributor NEDU / distributor NEDY	–	562024	NECU-S-M8G3-HX
Connecting cable				
	• Connection between distributor NEDY and control cabinet	2.5	8078227	NEBA-M8G4-U-2.5-N-LE4
		5	8078228	NEBA-M8G4-U-5-N-LE4
		7.5	8215486	NEBA-M8G4-U-7.5-N-LE4
		10	8078229	NEBA-M8G4-U-10-N-LE4
		15	8215487	NEBA-M8G4-U-15-N-LE4

## Ordering data – Accessories

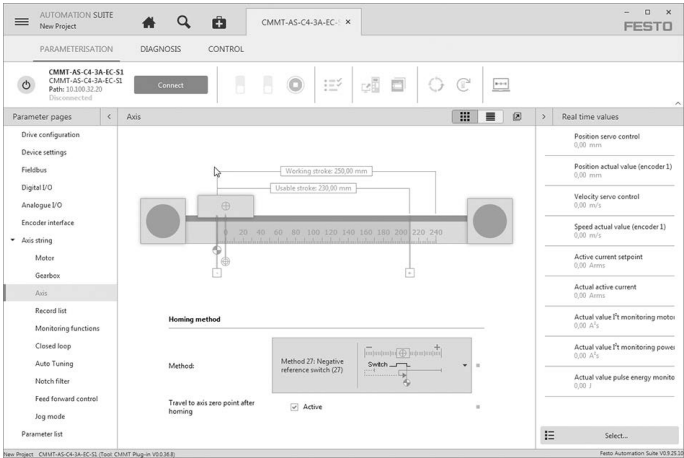
Designation	Description	Cable length	Part no.	Type
<b>Multi-pin plug distributor</b>				
	<ul style="list-style-type: none"> <li>With the help of the multi-pin plug distributor, all electrical signals such as for end-position sensing can be transferred</li> <li>– 4 individual connections</li> </ul>	–	<b>574586</b>	<b>NEDU-L4R1-M8G3L-M12G8</b>
	<ul style="list-style-type: none"> <li>With the help of the distributor, all electrical signals such as for end-position sensing can be transferred</li> <li>– 2 individual connections</li> </ul>	–	<b>8005312</b>	<b>NEDY-L2R1-V1-M8G3-N-M8G4</b>

Designation	Description
<b>Motor controller/servo drive</b>	
	<p>The accessories for the relevant motor controllers/servo drives can be found at:</p> <ul style="list-style-type: none"> <li><a href="http://www.festo.com/catalogue/cmmt">www.festo.com/catalogue/cmmt</a></li> </ul>

Designation	Description	Part no.	Type	
Adjusting kit				
	<ul style="list-style-type: none"><li>Used to mount the handling system on the supporting surface</li><li>Can be used to easily compensate for any unevenness in the bearing surface</li></ul>	EHMX-...-ELGC-60-BS	8142650	EADC-E15-60-E22
		EHMX-...-ELGC-80-BS	8142651	EADC-E15-80-E22
Profile mounting				
	<ul style="list-style-type: none"><li>Used to mount the handling system on the supporting surface</li><li>It is not height-adjustable</li></ul>	EHMX-...-ELGC-60-BS	8142652	EAHM-E15-60-E22
		EHMX-...-ELGC-80-BS	8142653	EAHM-E15-80-E22

Programming aid

**Festo Automation Suite**  
Parameterisation and programming software for electronic devices from Festo



- Parameterisation, programming and commissioning in a clear and user-friendly interface
- Optimum support for complex processes thanks to guided wizards (e.g. for commissioning, drive configuration, etc.)
- Fast access to the required documents and additional information
- Easy integration of electric drives in the controller programming