Planar surface gantries EXCM

FESTO

Planar surface gantries EXCM

Features

At a glance

General remarks

- A gantry that is characterised by high functionality in compact installation spaces
- The drive concept provides a low moving mass.
- Perfectly matching drive and controller package
- The kinematics are actuated via 2 stepper motors with integrated optical encoder (closed loop) and one matching two-axis controller
- Can be actuated using two operating modes:
  - Direct mode via Ethernet and CAN
  - Record selection via digital I/O, Ethernet and CAN
- EXCM-30/-40 permits flexible motor mounting

Sample applications

- Feeding, pressing, joining components
- Dispensing liquid media
- Mounting electronic components

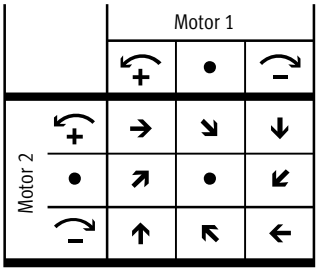
EXCM-10

EXCM-30

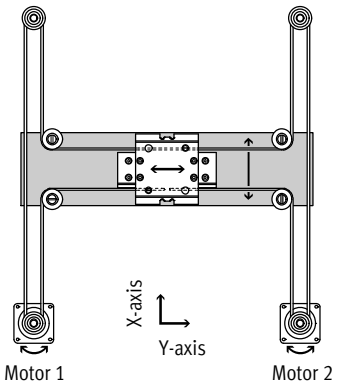
EXCM-40

Operating principle

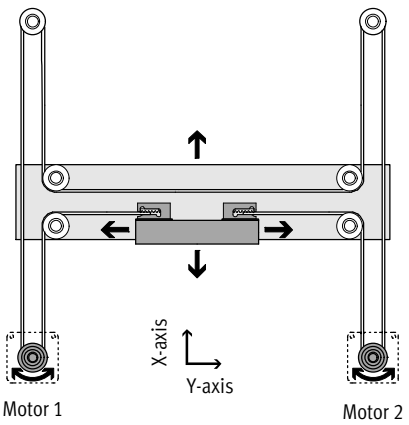
A slide is moved in a two-dimensional space (X-axis/Y-axis) via a toothed belt. The system is powered via 2 fixed motors in position-controlled operation (closed loop). The motors are coupled to the toothed belt. The belt is guided via guide pulleys so that the slide can move to any position in a working space when the motors are actuated accordingly.



EXCM-10/-30



EXCM-40



Planar surface gantries EXCM

Key features

Planar surface gantry				
Type		EXCM-10	EXCM-30	EXCM-40
Guide		Plain-bearing guide	Recirculating ball bearing guide	Recirculating ball bearing guide
Stroke of the				
X-axis	[mm]	150, 260, 300, 360, 460, 700	100, 150, 200, 300, 400, 500	–
		–	90 ... 700	200 ... 2000
Y-axis	[mm]	110	110, 160, 210, 260, 310, 360, 410, 460, 510	–
		–	110 ... 510	200 ... 1000
Rated load for max. dynamic response[1]	[kg]	0.5	2/3[2]	4
Repetition accuracy	[mm]	±0.1	±0.05	±0.1
Mounting position		Horizontal	Any	Horizontal
Controller		Attached	Separate	Separate
Further technical data		→ 6	→ 12	→ 28

1) Rated load = tool load (attachment components) + payload
2) Vertical/horizontal mounting position

Controller				
For planar surface gantry		EXCM-10	EXCM-30	EXCM-40
Can be ordered through modular product system EXCM-...-E				
Load voltage	[V DC]	24		–
Nominal current	[A]	2.8	6	–
Switching logic		NPN		–
Safety function to EN 61800-5-2		–		–
Configuration support		FCT (Festo Configuration Tool) with plug-in EXCM		–
Technical data		→ 47		–
Can be ordered through modular product system EXCM-...-PF				
Load voltage	[V DC]	–	48 or 24	48
Nominal current	[A]	–	10	
Switching logic		–	PNP	
Safety function to EN 61800-5-2		–	Safe torque off (STO)	
Configuration support		–	FCT (Festo Configuration Tool) with plug-in CMXH	
Technical data		–	→ Internet: cmxh	

FCT software – Festo Configuration Tool

Software platform for electric drives from Festo

- All drives in a system can be managed and saved in a common project
- Project and data management for all supported type of equipment
- Easy to use thanks to graphically supported parameter entry
- Universal mode of operation for all drives
- Work offline at your desk or online at the machine

Record table

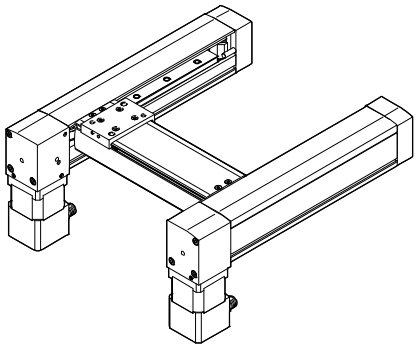
- 31 records ensure flexible positioning
- The following parameters can be set flexibly for each application:
  - Position
  - Speed
  - Acceleration
  - Return (only with controller CMXH)
- Absolute or relative positioning values can be used
- Complete performance test

EXCM-30 – Motor mounting variants

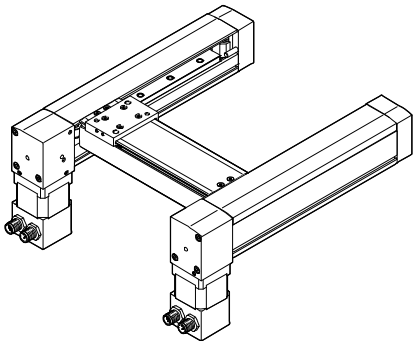
Further technical data ➔ 12

Underneath

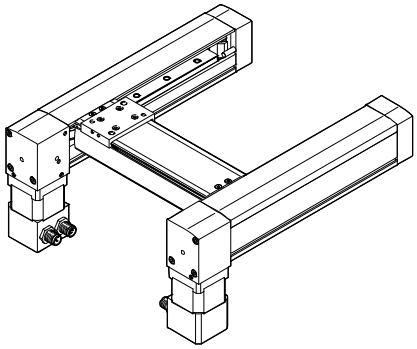
EXCM-30-...-B1 – Cable outlet at front



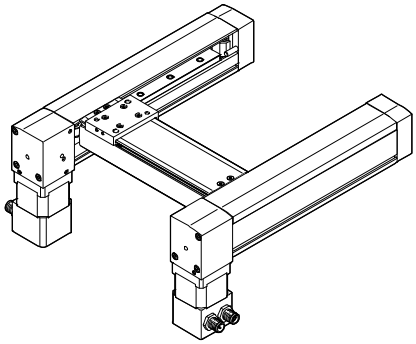
EXCM-30-...-B2 – Cable outlet at rear



EXCM-30-...-B3 – Cable outlet inside

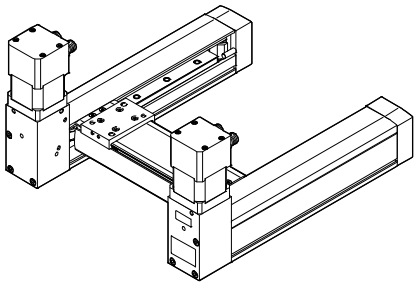


EXCM-30-...-B4 – Cable outlet outside

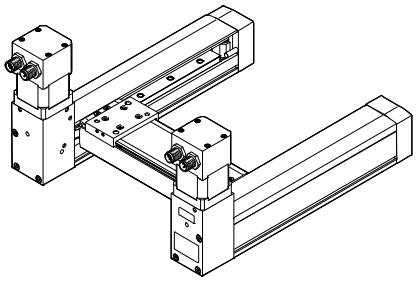


Top

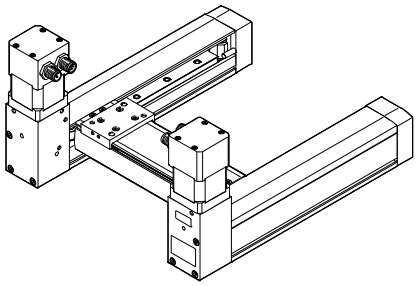
EXCM-30-...-T1 – Cable outlet at front



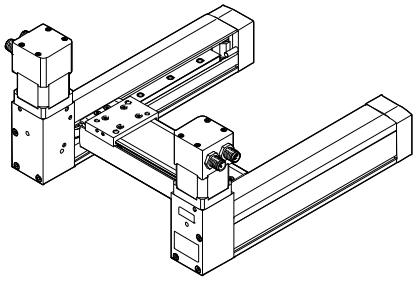
EXCM-30-...-T2 – Cable outlet at rear



EXCM-30-...-T3 – Cable outlet inside

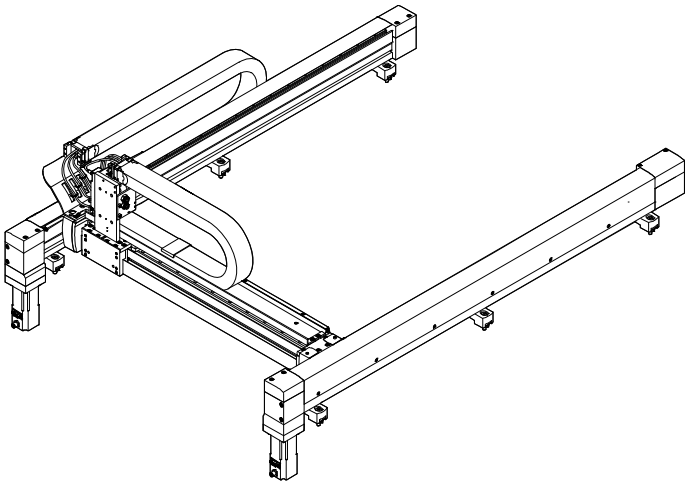


EXCM-30-...-T4 – Cable outlet outside

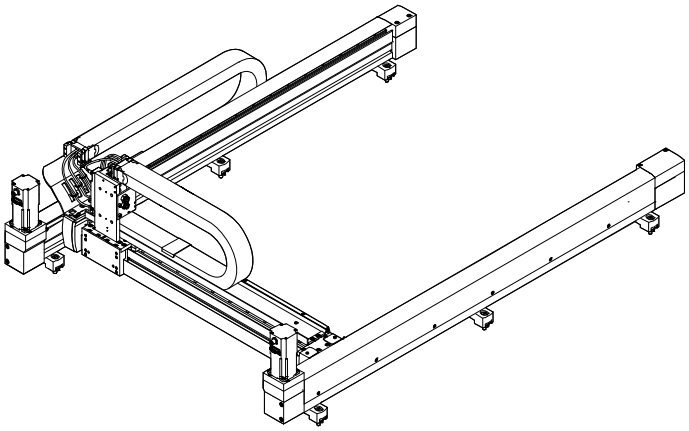


EXCM-40 – Motor mounting variants Further technical data ➔ 28

EXCM-40-...-B – Motor underneath

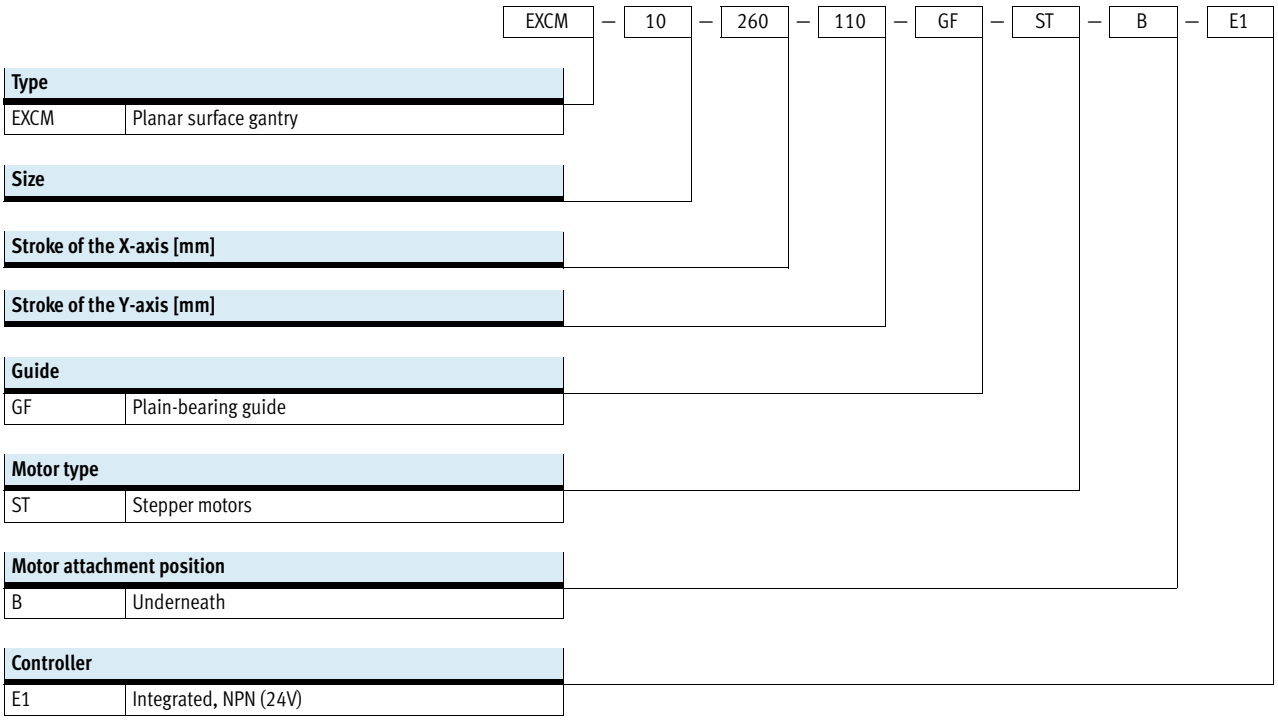


EXCM-40-...-T – Motor on top



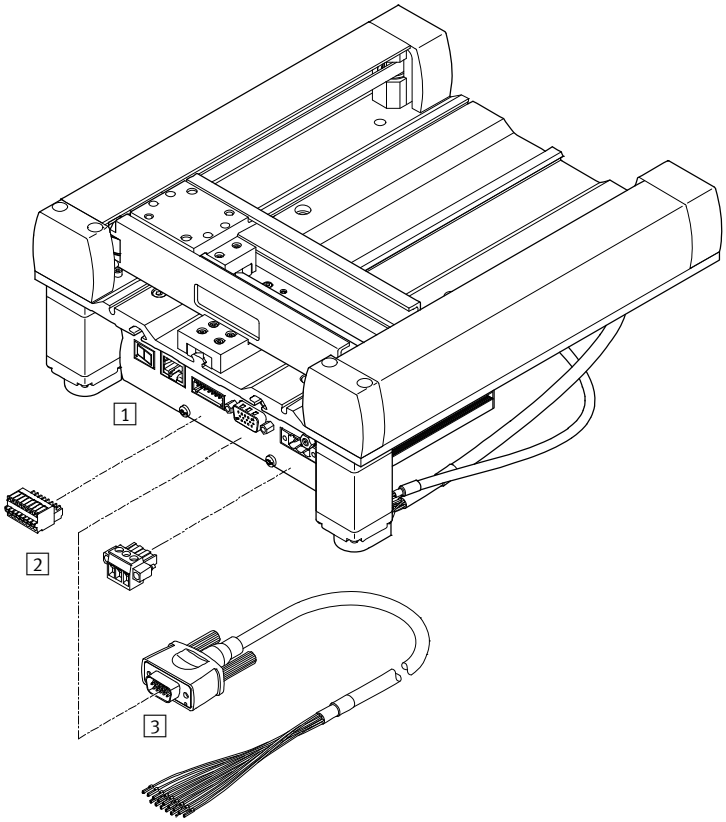
Planar surface gantries EXCM-10

Type codes



- Note

Ordering data ➔ 11



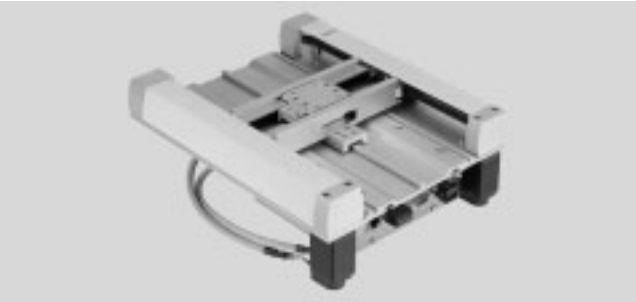
Accessories		
Type	Description	➔ Page/Internet
1 Drive package comprising controller, motor, motor cable	Included in the scope of delivery of the planar surface gantry	11
3 Control cable NEBC-S1H15	For I/O interface to any controller	57
2 Plug connector	Included in the scope of delivery of the planar surface gantry	–

Note

Technical data for controller ➔47

Planar surface gantries EXCM-10

Technical data

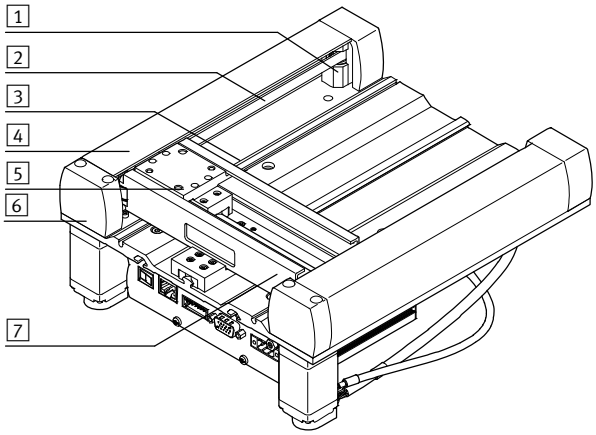


General technical data		
Design		Planar surface gantry
Guide		Plain-bearing guide
Stroke of the		
X-axis	[mm]	150, 260, 300, 360, 460, 700
Y-axis	[mm]	110
Rated load for max. dynamic response[1)]	[kg]	0.5
Nominal torque of motor	[Nm]	0.127
Motor holding torque	[Nm]	0.127
Max. acceleration	[m/s^2]	3
Max. speed	[m/s]	0.3
Repeat accuracy	[mm]	±0.1
Mounting position		Horizontal
Type of mounting		Via through-hole and screw

1) Rated load = tool load (attachment components) + payload

Operating and environmental conditions		
Degree of protection		IP20
Ambient temperature	[°C]	+10 ... +45
Storage temperature	[°C]	–10 ... +60
Relative humidity	[%]	0 ... 90 (non-condensing)
Noise level	[dB(A)]	38
Duty cycle	[%]	100
CE marking (see declaration of conformity)		To EC Machinery Directive

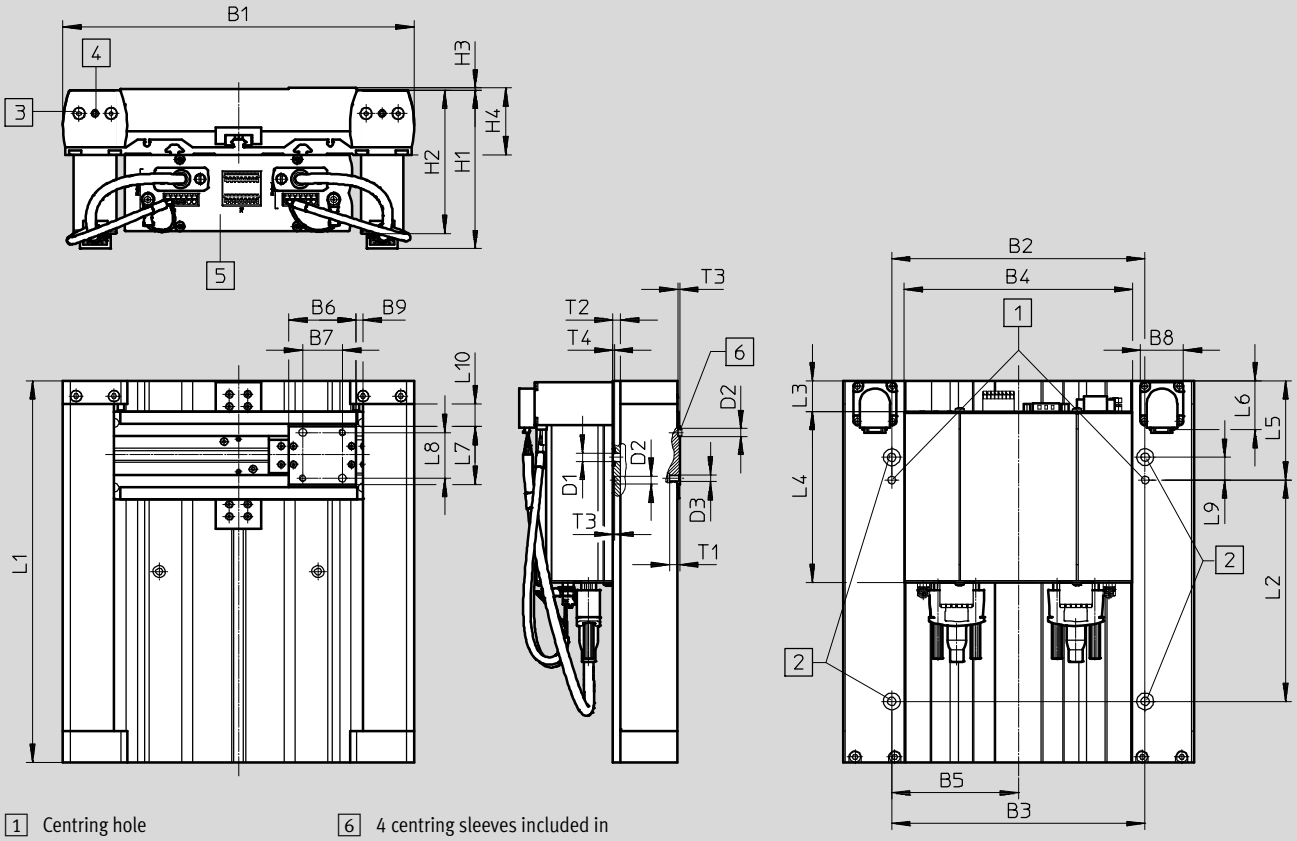
Materials



Materials		
1	Guide pulley	Aluminium
2	Toothed belt	Polychloroprene with glass cord
3	Base plate	Aluminium
4	Cover	
	X-axis	Polymer
	Y-axis	Polymer
5	Slides	Aluminium
6	End cap	Aluminium
7	Y-traverse	Aluminium
–	Guide	Aluminium
	Ball bearings	Steel
	Note on materials	RoHS compliant
		Contains paint-wetting impairment substances

Weight [g]		
Product weight with stroke (with motors and controller)		
X-axis	Y-axis	
150	110	3300
260	110	3800
300	110	4000
360	110	4200
460	110	4700
700	110	5700

Dimensions Download CAD data ➔ **www.festo.com**



1 Centring hole
2 Mounting hole
3 Screw for setting the toothed belt tension
4 Threaded pin for securing the adjusting screws
5 Controller
6 4 centring sleeves included in the scope of delivery of the planar surface gantry
– 2 centring sleeves for the mounting hole
– 2 centring sleeves for mounting on the slide

Planar surface gantries EXCM-10

Technical data

Type	B1	B2 ±0.03	B3 ±0.2	B4	B5 ±0.2	B6	B7 ±0.03	B8	B9
EXCM-10-...	230	166	166	149	83	44	26	28	4.7

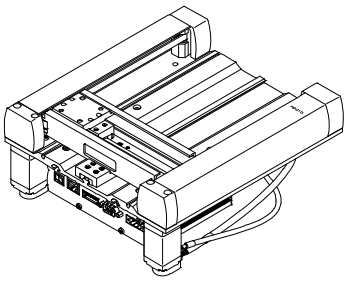
Type	D1 ∅	D2 ∅ H7	D3	H1 +1.35/–1.15	H2	H3	H4 ±1	L3	L4
EXCM-10-...	5.5	5	M4	103.7	93.2	1.6	44.8	0 ... 50	112

Type	L5 ±0.1	L6	L7	L8 ±0.03	L9 ±0.1	L10	T1	T2	T3 +0.3	T4
EXCM-10-...	65	32	38	30	15	14.8	6.7	5	1.2	1

Stroke-dependent dimensions

Type	L1 +0.4	L2 ±0.2
EXCM-10-150-110-...	250	145
EXCM-10-260-110-...	360	255
EXCM-10-300-110-...	400	295
EXCM-10-360-110-...	460	355
EXCM-10-460-110-...	560	455
EXCM-10-700-110-...	800	695

Ordering data

EXCM-10	Stroke (X-axis) [mm]	Part No.	Type
	150	**1801920**	**EXCM-10-150-110-GF-ST-B-E1**
	260	**1801915**	**EXCM-10-260-110-GF-ST-B-E1**
	300	**1801917**	**EXCM-10-300-110-GF-ST-B-E1**
	360	**1801918**	**EXCM-10-360-110-GF-ST-B-E1**
	460	**1801916**	**EXCM-10-460-110-GF-ST-B-E1**
	700	**1801919**	**EXCM-10-700-110-GF-ST-B-E1**

New
Key feature P8

Planar surface gantries EXCM-30

Type codes

EXCM	–	30	–	300	–	210	–	KF	–	ST	–		–	B1

Type	
EXCM	Planar surface gantry

Size

Stroke of the X-axis [mm]

Stroke of the Y-axis [mm]

Guide	
KF	Recirculating ball bearing guide

Motor type	
ST	Stepper motors
SB	Stepper motors with brake
W	Without stepper motors

Protection against particles	
–	Standard
P8	Protected version

Motor attachment position	
B	Underneath
B1	Underneath, cable outlets to the front
B2	Underneath, cable outlets to the rear
B3	Underneath, cable outlets inwards
B4	Underneath, cable outlets outwards
T	Top
T1	On top, cable outlets to the front
T2	On top, cable outlets to the rear
T3	On top, cable outlets inwards
T4	On top, cable outlets outwards

Planar surface gantries EXCM-30

Type code

–	E	4	–	

Controller	
–	Without
E	Remote, NPN (24 V)
PF	Remote, PNP (24/48 V)

Line length	
–	Without
2	Motor and encoder cable 0.5 m
3	Motor and encoder cable 1 m
4	Motor and encoder cable 1.5 m
5	Motor and encoder cable 2 m

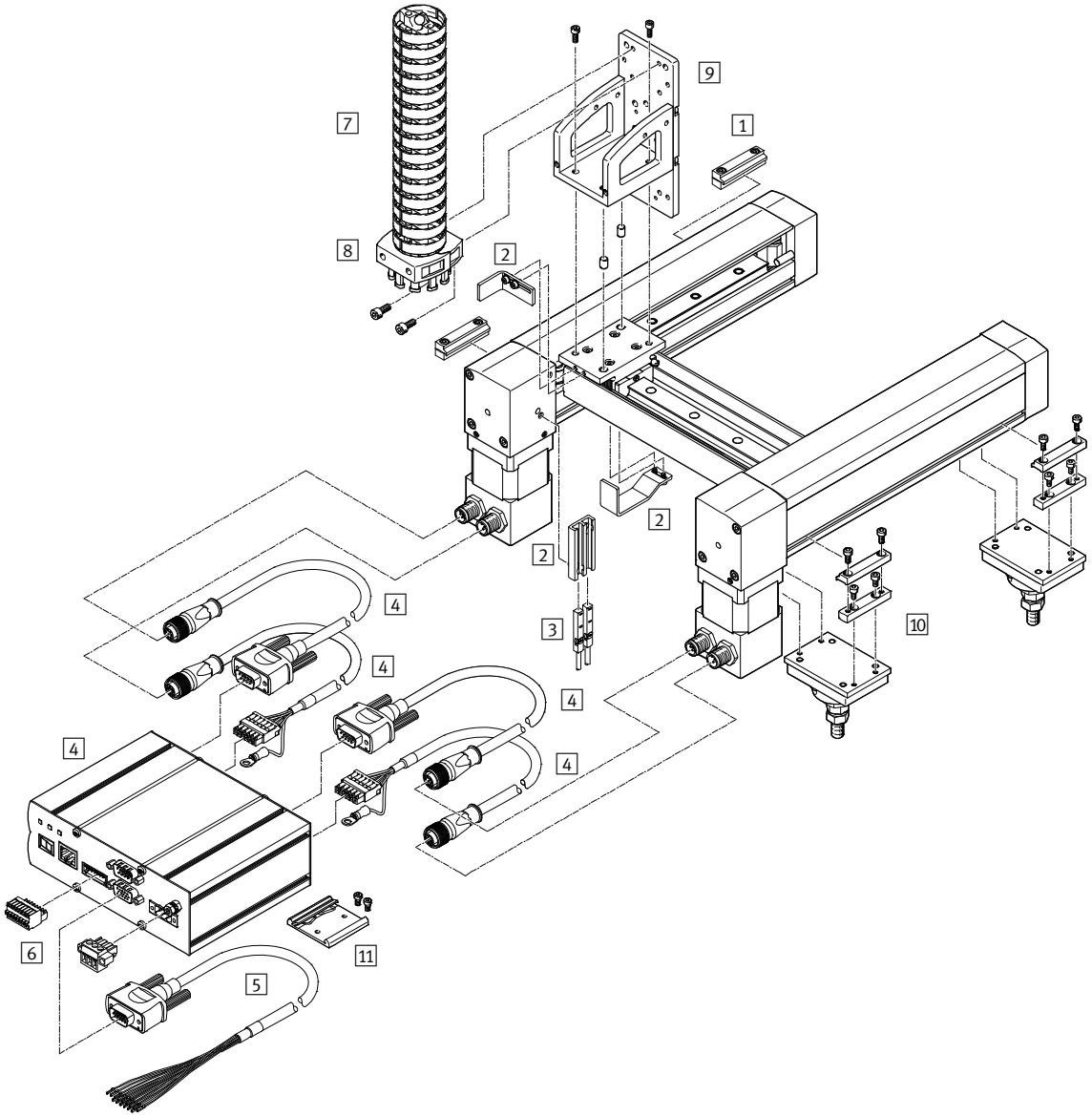
Document language	
DE	German
EN	English
ES	Spanish
FR	French
IT	Italian
RU	Russian
ZH	Chinese

Note

Ordering data ➔ 26

Planar surface gantries EXCM-30

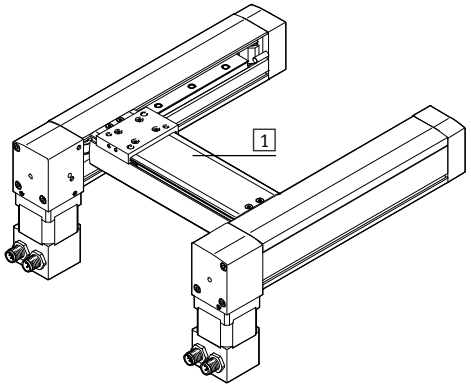
Peripherals overview



Variants and accessories

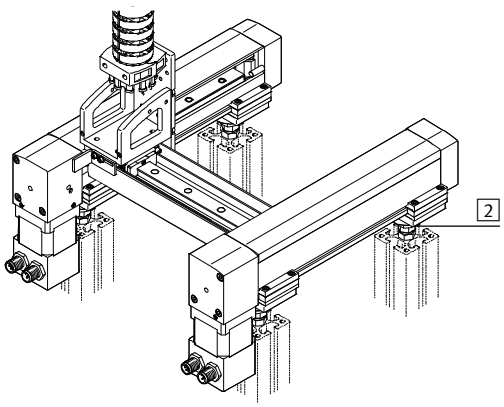
1 With protection against particles EXCM-...-P8

The cover protects the guide of the Y-axis against contamination.



2 With adjusting kit EADC-E11

With the adjusting kit, the gantry can be aligned after installation.



Planar surface gantries EXCM-30

Peripherals overview

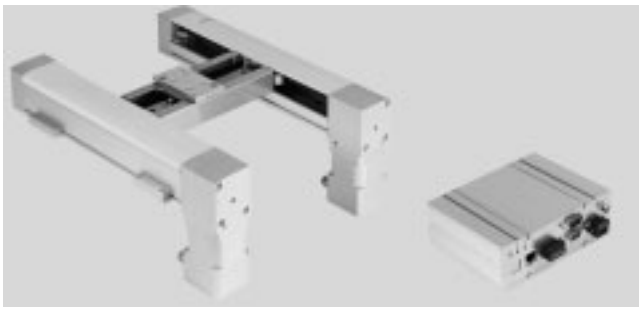
Accessories			
Type		Description	➔ Page/Internet
1	Profile mounting MUE	Included in the scope of delivery of the planar surface gantry: • X-stroke < 500 mm: 2 pairs • X-stroke ≥ 500 mm: 3 pairs	50
2	Sensor mounting EAPR	For homing in combination with third-party motors	52
3	Proximity sensor SIES-8M		56
4	Drive package comprising controller, motor, motor cable	Available with or without drive package	26
5	Control cable NEBC-S1H15	For the I/O interface to any controller	57
6	Plug connector	Included in the scope of delivery of the drive package	–
7	Energy chain EADH-U-3D	For the cable routing of the Z-axis	53
8	Connection set	Holder for mounting the energy chain Included in the scope of delivery: • 2 connectors • 4 socket head screws M4x10	53
9	Mounting kit EAHT-E9	Mounting kit for the energy chain and a Z-axis, like EGSL, DGSL, EGSK Stroke reduction in combination with mounting kit EAHT ➔ 21	51
10	Adjusting kit EADC-E11	Height-adjustable mounting kit	50
11	H-rail mounting CAFM-D3	For mounting the controller to an H-rail to EN 50022	49

Note

Homing is always carried out using the mechanical stop in combination with the drive package from Festo; the sensor mounting and proximity sensor are not required in this case.

Planar surface gantries EXCM-30

Technical data

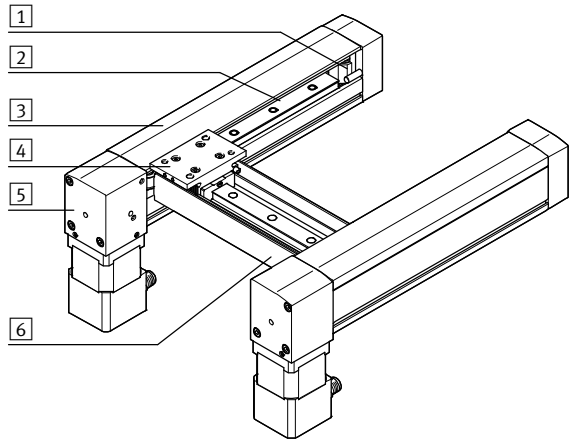


General technical data		
Design		Planar surface gantry
Guide		Recirculating ball bearing guide
Stroke of the		
X-axis	[mm]	100, 150, 200, 300, 400, 500
		90 … 700
Y-axis	[mm]	110, 160, 210, 260, 310, 360, 410, 460, 510
		110 … 510
Rated load for max. dynamic response[1]	[kg]	2/3[2]
Max. process force[3]	[N]	100
Max. torque		→ 18
Max. no-load torque		→ 18
Nominal torque of motor	[Nm]	0.5
Motor holding torque	[Nm]	0.5
Max. acceleration		
EXCM-…-E	[m/s²]	10
EXCM-…-PF	[m/s²]	20/10[4]
Max. speed		
EXCM-…-E	[m/s]	0.5
EXCM-…-SB-…-PF	[m/s]	0.5
EXCM-…-ST-…-PF	[m/s]	1.0/0.5[4]
Repeat accuracy	[mm]	±0.05
Mounting position		Any[5]
Type of mounting		
Planar surface gantry		With profile mounting
Controller		Via H-rail, on base plate

1) Rated load = tool load (attachment components) + payload
2) Vertical/horizontal mounting position. Applies to EXCM-…-E with stroke of the Y-axis of 360 mm → 17
3) Perpendicular to working plane, at standstill
4) In case of a load supply of 48 V/24 V
5) Motors with brake must be used in the case of vertical installation

Operating and environmental conditions		
Degree of protection		IP20
Ambient temperature	[°C]	+10 … +45
Storage temperature	[°C]	–10 … +60
Relative humidity	[%]	0 … 90 (non-condensing)
Noise level	[dB(A)]	52
Duty cycle	[%]	100
CE marking (see declaration of conformity)		To EU Machinery Directive

Materials



Size		30
1	Guide pulley	Aluminium
2	Toothed belt	Polychloroprene with glass cord
3	Cover	
	X-axis	Polymer
	Y-axis	Stainless steel
4	Slides	Aluminium
5	End cap	Aluminium
6	Y-traverse	Aluminium
–	Guide	Steel
	Ball bearings	Steel
	Note on materials	RoHS compliant
		Contains paint-wetting impairment substances

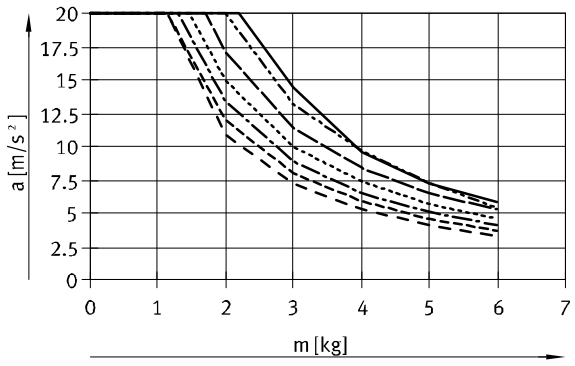
Weight [kg]

Product weight with 0 mm stroke (without rated load, motors and controllers)	
EXCM-...	1.73
EXCM-...-P8	1.80
Y-axis (without slide)	0.34/0.4[1)]
Additional weight per 50 mm stroke	
X-axis	0.237
Y-axis	0.120/0.132[1)]
Weight	
2 motors	0.9
2 motors with brake	1.5
Controller	0.65

1) Standard/with protection against particles P8

Acceleration a as a function of the payload m and stroke of the Y-axis

The following data applies to a horizontal mounting position and refers to the service life of the mechanical system of 3,500 km. For vertical installation positions, please get in touch with your local contact at Festo.
The centre of gravity of the slide is at the height of the slide in the Z-direction and in the centre of the slide in the X-/Y-directions.



Stroke, Y-axis = 110/160/210 mm
Stroke, Y-axis = 260 mm
Stroke, Y-axis = 310 mm
Stroke, Y-axis = 360 mm
Stroke, Y-axis = 410 mm
Stroke, Y-axis = 460 mm
Stroke, Y-axis = 510 mm

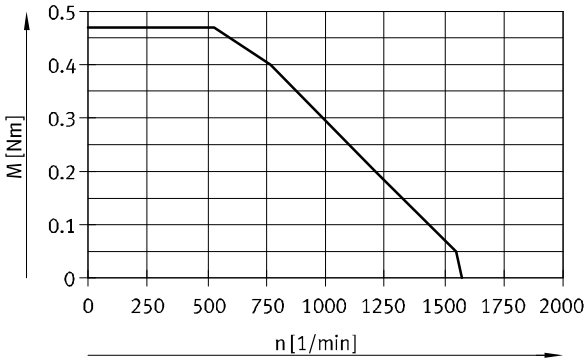
Planar surface gantries EXCM-30

Technical data

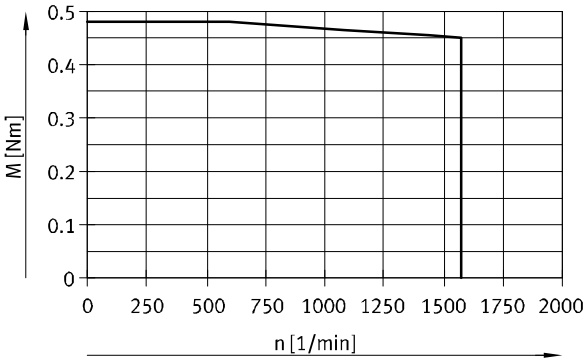
Torque M as a function of rotational speed n

Typical motor characteristic curve with nominal voltage and optimal controller.

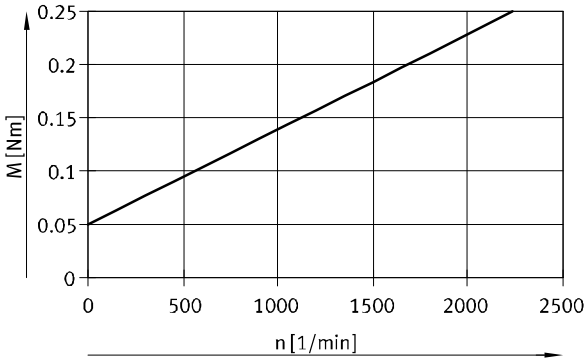
In combination with:
EXCM-...-ST-...-E or EXCM-...-ST-...-PF (at 24 V)
EXCM-...-SB-...-PF (at 48 V)



In combination with:
EXCM-...-ST-...-PF (at 48 V)



No-load torque M as a function of speed n



Characteristic load values

The centre of gravity of the slide is at the height of the slide in the Z-direction and in the centre of the slide in the X-/Y-directions.
The system is subject to the greatest load in the case of 45° travel.
The following data apply in this case:

Formula for calculating the required torque M and the required rotational speed n

$$M_{45°} = a \times (4.28 \times m_L + 2.14 \times m_{Ay} + 23.38 \times J_m + 0.56) \times 10^{-3} + M_R$$

$$n_{45°} = 2232 \times v$$

a = acceleration [m/s²]
v = speed [m/s]
m_{Ay} = product weight of the Y-axis [kg]
➔ 17
m_L = attachment component (Z-axis) [kg] with payload
J_m = moment of inertia of motor [kgcm²]
➔ table below
M_R = no-load torque [Nm]
➔ 18
$n_{45°}$ = rotational speed at 45° travel [rpm]

Combination of planar surface gantry with stepper motor for X-/Y-axis

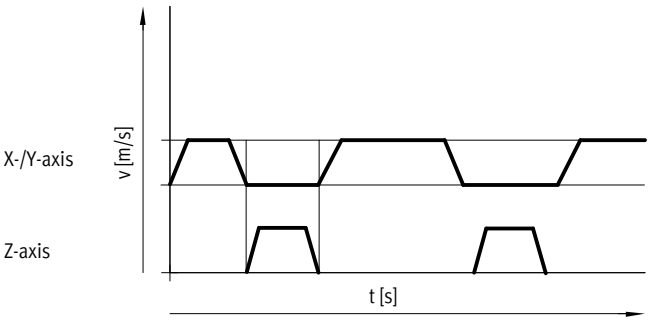
Planar surface gantry	Motor	Moment of inertia of the motor [kgcm²]
EXCM-30-...-ST	EMMS-ST-42-...	0.082
EXCM-30-...-SB	EMMS-ST-42-...	0.095

Sample calculation

Given:

Planar surface gantry
EXCM-30-700-410-KF-ST-...-E

a_{max} = 10 m/s²
v_{max} = 0.35 m/s
Payload = 2 kg

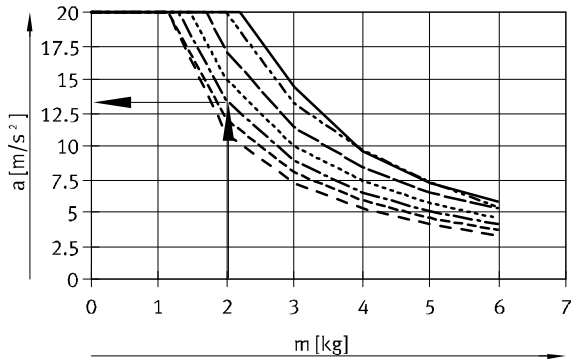


Calculation:

1. What is the max. acceleration permitted by the mechanical system?

Moving mass m_L at the Y-axis:
m_L = 2 kg

Stroke of the Y-axis:
410 mm



- Stroke, Y-axis = 110/160/210 mm
- Stroke, Y-axis = 260 mm
- Stroke, Y-axis = 310 mm
- Stroke, Y-axis = 360 mm
- Stroke, Y-axis = 410 mm
- Stroke, Y-axis = 460 mm
- Stroke, Y-axis = 510 mm

Result:

In case of a moving mass m_L of 2 kg the maximum permissible acceleration is 13 m/s².
The required acceleration of 10 m/s² is therefore permissible.

Note

The following information applies to a horizontal mounting position. For vertical installation positions, please get in touch with your local contact at Festo.
The centre of gravity of the slide is at the height of the slide in the Z-direction and in the centre of the slide in the X-/Y-directions.

Sample calculation

2. Is the attached motor sufficient for this load?

Given:

a_{max} = 10 m/s²
v_{max} = 0.35 m/s
m_{Ay} = 1.32 kg
m_L = 2 kg
J_m = 0.082 kgcm²

$$M_{45°} = a \times (4.28 \times m_L + 2.14 \times m_{Ay} + 23.38 \times J_m + 0.56) \times 10^{-3} + M_R$$

$$n_{45°} = 2232 \times v$$

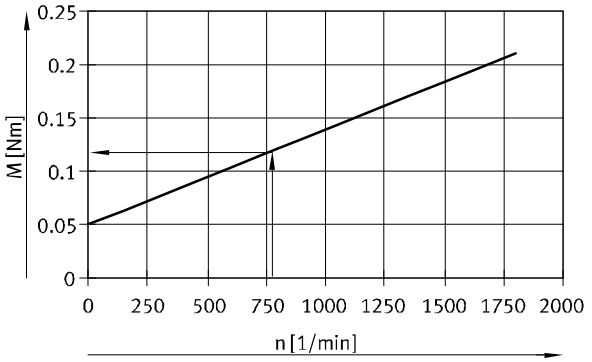
a = acceleration [m/s²]
v = speed [m/s]
m_{Ay} = product weight of the Y-axis [kg] ➔ 17
m_L = payload
J_m = moment of inertia of motor [kgcm²] ➔ 18
M_R = no-load torque [Nm] ➔ 18
$n_{45°}$ = rotational speed at 45° travel [rpm]

Note

These requirements for the dynamic response apply to 45° travel.
For travel only in the X- or Y-direction, the dynamic values may be higher.

Determination of M_R:

$$n_{45°} = 2232 \times 0,35 \text{ m/s} = 781,2 \text{ 1/min}$$



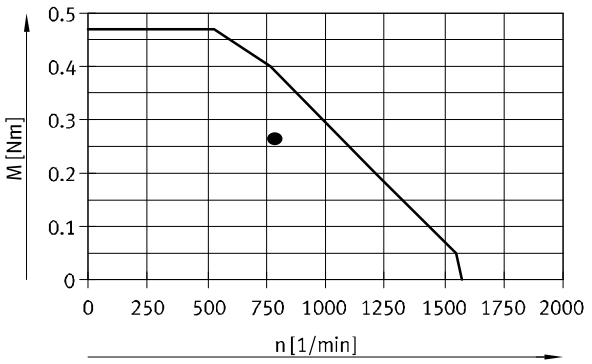
No-load torque:
EXCM-30

M_R = 0.12 Nm

$$M_{45°} = a \times (4.28 \times m_L + 2.14 \times m_{Ay} + 23.38 \times J_m + 0.56) \times 10^{-3} + M_R$$

$$M_{45°} = 10 \frac{m}{s^2} \times (4.28 \times 2 \text{ kg} + 2.14 \times 1.32 \text{ kg} + 23.38 \times 0.082 \text{ kgcm}^2 + 0.56) \times 10^{-3} + 0.12 \text{ Nm} = 0.26 \text{ Nm}$$

Result:

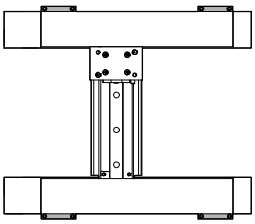


The value for the torque lies below the motor characteristic curve.
The design is thus acceptable.

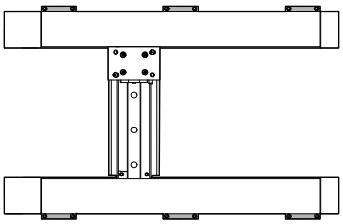
Minimum number of profile mountings

Different numbers of profile mountings must be used as a function of the mounting position and stroke of the X-axis.

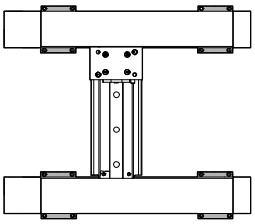
Horizontal mounting position
Stroke < 500 mm



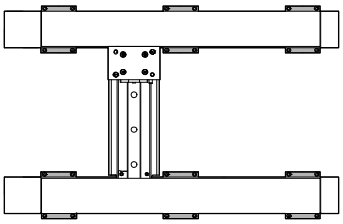
Stroke ≥ 500 mm



Vertical mounting position
Stroke < 500 mm



Stroke ≥ 500 mm



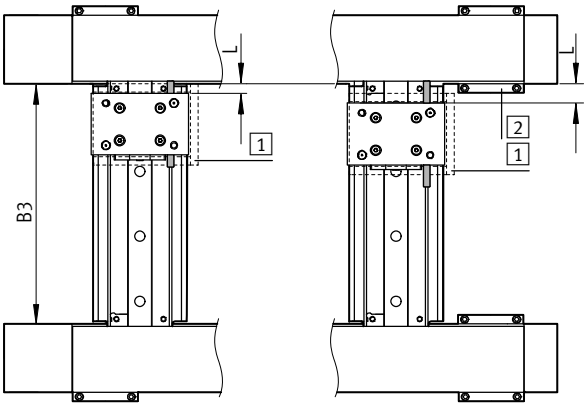
Stroke of the X-axis [mm]	Number of profile mountings	
	Horizontal mounting position	Vertical mounting position
100 … 499	2 per profile, inside or outside	4 per profile, inside and outside
500 … 700	3 per profile, inside or outside	6 per profile, inside and outside

Stroke reduction in combination with mounting kit EAHT-E9

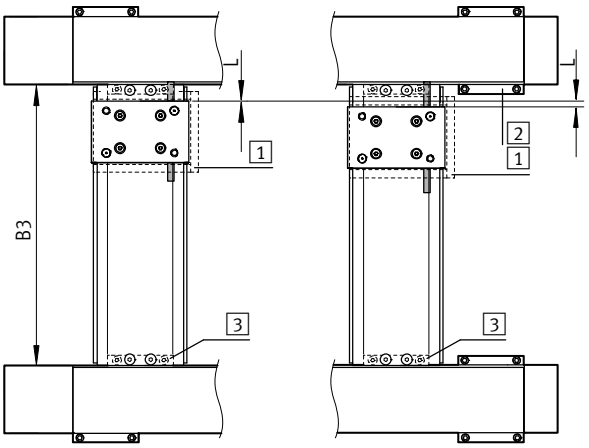
The reduction is influenced by the following factors:

- 1 The mounting kit EAHT-E9 is wider than the slide of the Y-axis.
- 2 Through the adjusting kit EADC-E11 or profile mounting MUE mounted on the inside of the X-axis
- 3 Through an additional mounting surface for the cover in combination with EXCM-...-P8 (with protection against particles)

EXCM-...



EXCM-...-P8



	B3 (➔ as of page 22)		L	
	For EXCM-...	For EXCM-...-P8	For EXCM-...	For EXCM-...-P8
With mounting kit EAHT-E9	38 + stroke	63 + stroke	2x 8 mm	No stroke reduction
With mounting kit EAHT-E9 and adjusting kits EADC-E11/profile mounting MUE			2x 16 mm	2x 4 mm

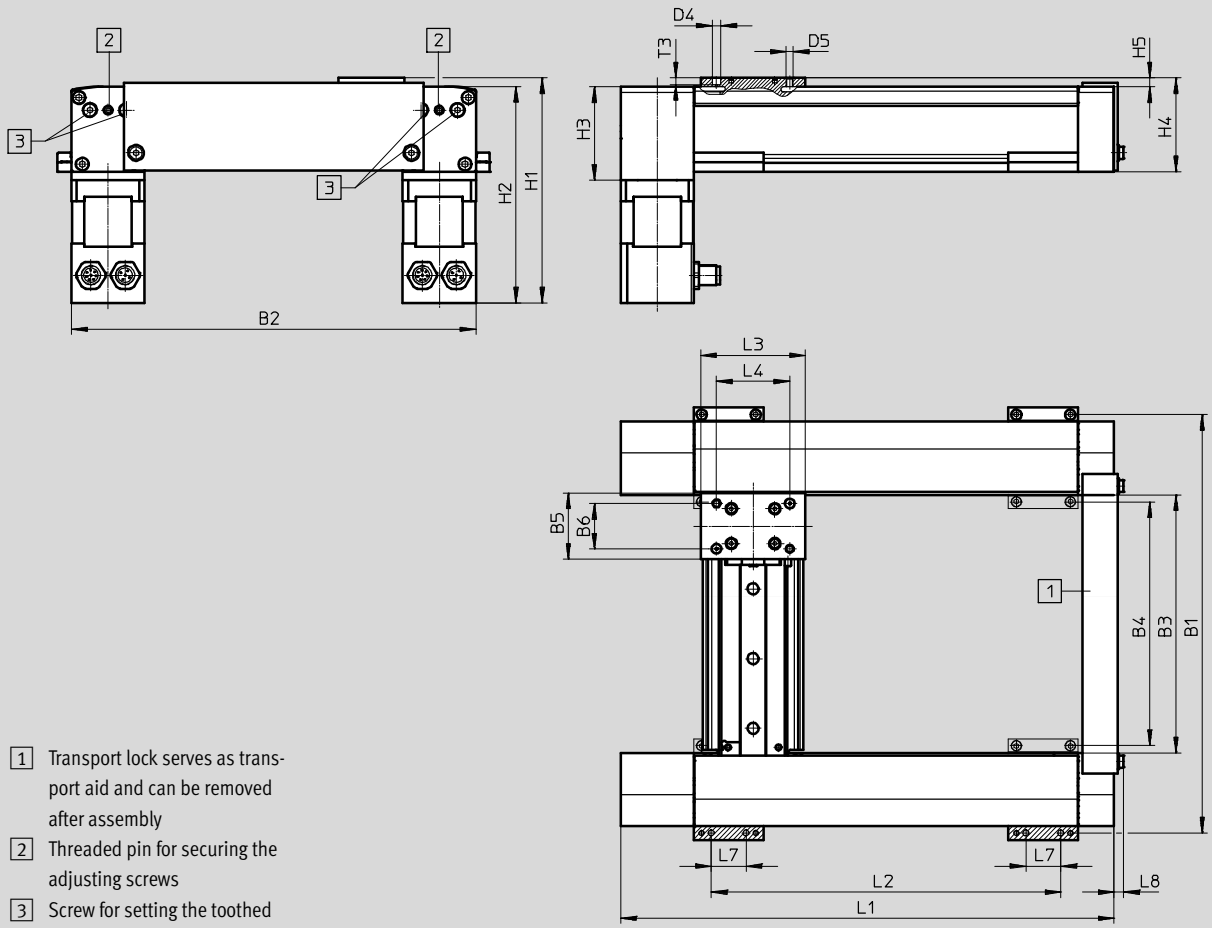
Planar surface gantries EXCM-30

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

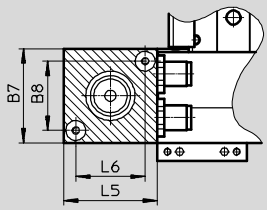
EXCM-30-... and EXCM-30-...-P8

Motor attachment position – Underneath

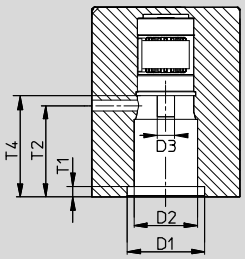


1 Transport lock serves as transport aid and can be removed after assembly
2 Threaded pin for securing the adjusting screws
3 Screw for setting the toothed belt tension

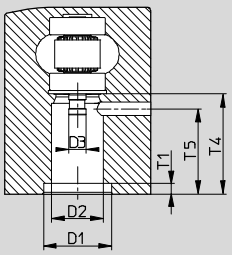
Motor interface



Coupling interface with radial threaded pins



Coupling interface with tangential clamping screws



Planar surface gantries EXCM-30

Technical data

Type	B5	B6 ±0.03	B7	B8 ±0.1	D1 ∅ H7	D2 ∅	D3 ∅ F8	D4 ∅ H8	D5
EXCM-30-...	38	26	42	31	22	16	5	5	M4
EXCM-30-...-P8	38	26	42	31	22	16	5	5	M4

Type	H1		H2		H3	H4	H5	L3	L4 ±0.03
	EXCM-...-ST	EXCM-...-SB	EXCM-...-ST ±0.7	EXCM-...-SB					
EXCM-30-...	129.2	186.2	124.2	181.2	53.8	54	5	60	42
EXCM-30-...-P8	131.2	188.2	124.2	181.2	53.8	56	7	60	42

Type	L5	L6 ±0.1	L7	L8	T1	T2	T3	T4	T5
EXCM-30-...	42	31	20	5.6	3	26	3.7	28.7	24.5
EXCM-30-...-P8	42	31	20	5.6	3	26	3.7	28.7	24.5

Stroke-dependent dimensions

Stroke of the X-axis	L1	L2 ±0.2
100	233	150.5
150	283	200.5
200	333	250.5
300	433	350.5
400	533	450.5
500	633	550.5
90 ... 700	133 + stroke	50.5 + stroke

Stroke of the Y-axis	B1		B2		B3		B4	
	EXCM-30-...-		EXCM-30-...-		EXCM-30-...-		EXCM-30-...-	
		P8		P8		P8		P8
110	240	265	232	257	148	173	140	165
160	290	315	282	307	198	223	190	215
210	340	365	332	357	248	273	240	265
260	390	415	382	407	298	323	290	315
310	440	465	432	457	348	373	340	365
360	490	515	482	507	398	423	390	415
410	540	565	532	557	448	473	440	465
460	590	615	582	607	498	523	490	515
510	640	665	632	657	548	573	540	565
110 ... 510	130 + stroke	155 + stroke	122 + stroke	147 + stroke	38 + stroke	63 + stroke	30 + stroke	55 + stroke

Planar surface gantries EXCM-30

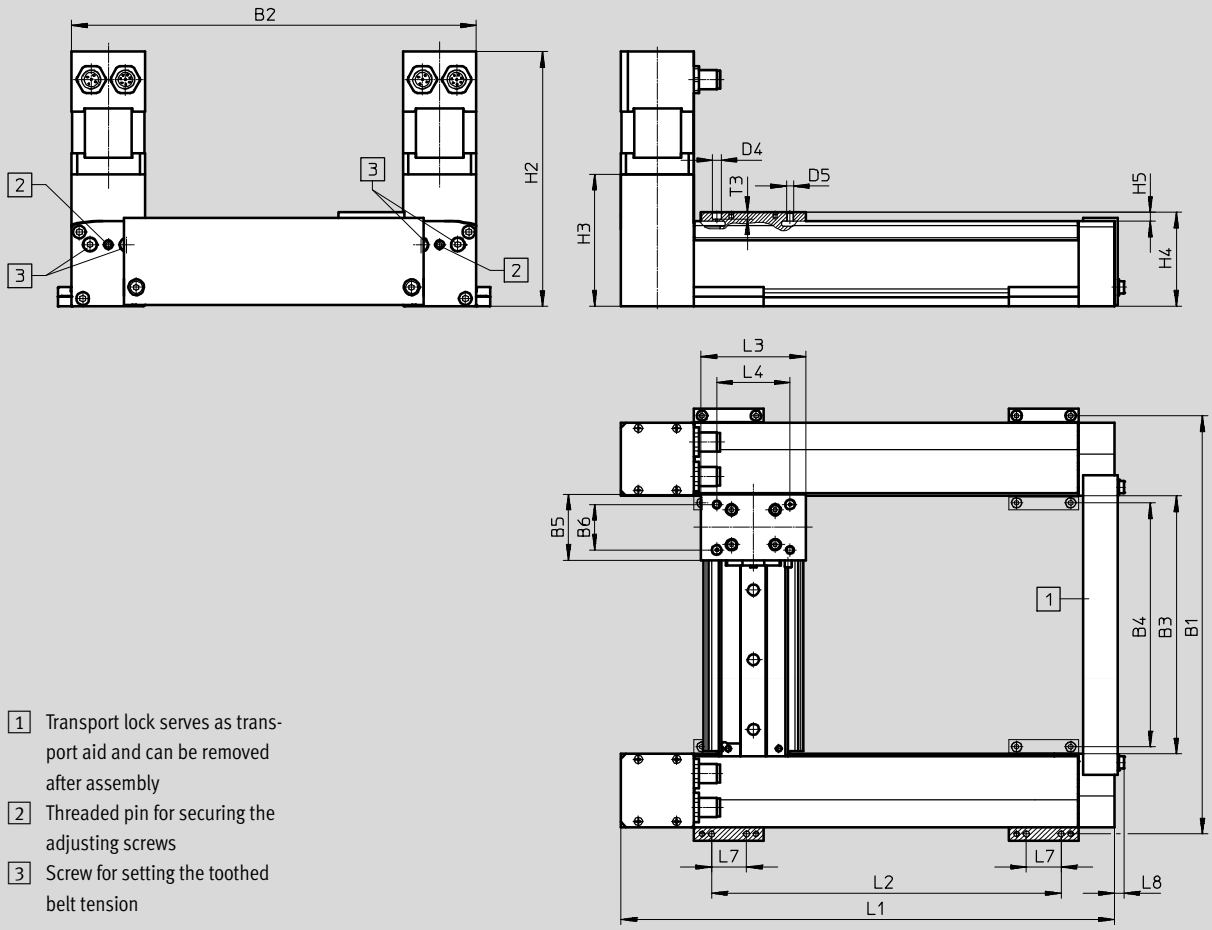
Technical data

FESTO

Dimensions Download CAD data ➔ **www.festo.com**

EXCM-30-... and EXCM-30-...-P8

Motor attachment position – On top

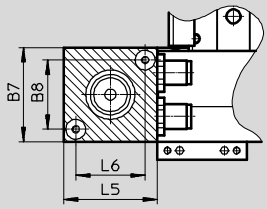


1 Transport lock serves as transport aid and can be removed after assembly

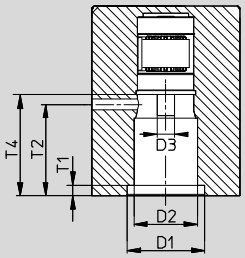
2 Threaded pin for securing the adjusting screws

3 Screw for setting the toothed belt tension

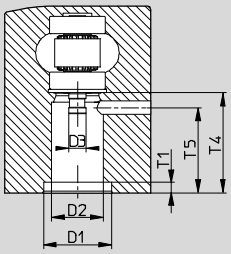
Motor interface



Coupling interface with radial threaded pins



Coupling interface with tangential clamping screws



Planar surface gantries EXCM-30

Technical data

Type	B5	B6 ±0.03	B7	B8 ±0.1	D1 ∅ H7	D2 ∅	D3 ∅ F8	D4 ∅ H8
EXCM-30-...	38	26	42	31	22	16	5	5
EXCM-30-...-P8	38	26	42	31	22	16	5	5

Type	D5	H2		H3	H4	H5	L3	L4
		EXCM-...-ST ±1	EXCM-...-SB					±0.03
EXCM-30-...	M4	146.2	203.2	75.6	54	5	60	42
EXCM-30-...-P8	M4	146.2	203.2	75.6	56	7	60	42

Type	L5	L6 ±0.1	L7	L8	T1	T2	T3	T4	T5
EXCM-30-...	42	31	20	5.6	3	26	3.7	28.7	24.5
EXCM-30-...-P8	42	31	20	5.6	3	26	3.7	28.7	24.5

Stroke-dependent dimensions

Stroke of the X-axis	L1	L2 ±0.2
100	233	150.5
150	283	200.5
200	333	250.5
300	433	350.5
400	533	450.5
500	633	550.5
90 ... 700	133 + stroke	50.5 + stroke

Stroke of the Y-axis	B1		B2		B3		B4	
	EXCM-30-...-		EXCM-30-...-		EXCM-30-...-		EXCM-30-...-	
		P8		P8		P8		P8
110	240	265	232	257	148	173	140	165
160	290	315	282	307	198	223	190	215
210	340	365	332	357	248	273	240	265
260	390	415	382	407	298	323	290	315
310	440	465	432	457	348	373	340	365
360	490	515	482	507	398	423	390	415
410	540	565	532	557	448	473	440	465
460	590	615	582	607	498	523	490	515
510	640	665	632	657	548	573	540	565
110 ... 510	130 + stroke	155 + stroke	122 + stroke	147 + stroke	38 + stroke	63 + stroke	30 + stroke	55 + stroke

New
Key feature P8

Planar surface gantries EXCM-30

Ordering data – Modular product system

FESTO

Ordering table

Size			30	Condi-tions	Code	Entry code
M	Module no.		**2226101**			
	Product type		EXCM series M		**EXCM**	EXCM
	Size		30		**-30**	30
	Stroke of the X-axis	[mm]	100		**-100**	
		[mm]	150		**-150**	
		[mm]	200		**-200**	
		[mm]	300		**-300**	
		[mm]	400		**-400**	
		[mm]	500		**-500**	
		[mm]	90 ... 700		**-...**	
	Stroke of the Y-axis	[mm]	110		**-110**	
		[mm]	160		**-160**	
		[mm]	210		**-210**	
		[mm]	260		**-260**	
		[mm]	310		**-310**	
		[mm]	360		**-360**	
		[mm]	410		**-410**	
		[mm]	460		**-460**	
		[mm]	510		**-510**	
		[mm]	110 ... 510		**-...**	
	Guide		Recirculating ball bearing guide		**-KF**	KF
	Motor type		Stepper motors		**-ST**	
			Stepper motors with brake		**-SB**	
			Without stepper motors	1	**-W**	
	Protection against particles		Standard			
			Protected version		**-P8**	
	Motor attachment position		Underneath	2	**-B**	
			Underneath, cable outlets to the front		**-B1**	
			Underneath, cable outlets to the rear		**-B2**	
			Underneath, cable outlets inwards		**-B3**	
			Underneath, cable outlets outside		**-B4**	
			Top	2	**-T**	
			On top, cable outlets to the front		**-T1**	
			On top, cable outlets to the rear		**-T2**	
			On top, cable outlets inwards		**-T3**	
			On top, cable outlets outside		**-T4**	

1 **W** In combination with "Without stepper motors" W, controllers E and PF are not required

2 **B, T** Not in combination with stepper motors ST and SB. Option if third-party motors are mounted

Transfer order code

	EXCM	–	30	–		–		–	KF	–		–		–	

Planar surface gantries EXCM-30

FESTO

Ordering data – Modular product system

Ordering table

Size		30	Condi-tions	Code		Entry code
O	Controller	Without				
		Remote, NPN (24 V)		**-E**		
		Remote, PNP (24/48 V)		**-PF**		
	Cable length	Without				
		Motor and encoder cable 0.5 m	3	**2**		
		Motor and encoder cable 1 m	3	**3**		
		Motor and encoder cable 1.5 m	3	**4**		
		Motor and encoder cable 2 m	3	**5**		
M	Document language	German		**-DE**		
		English		**-EN**		
		Spanish		**-ES**		
		French		**-FR**		
		Italian		**-IT**		
		Russian		**-RU**		
		Chinese		**-ZH**		

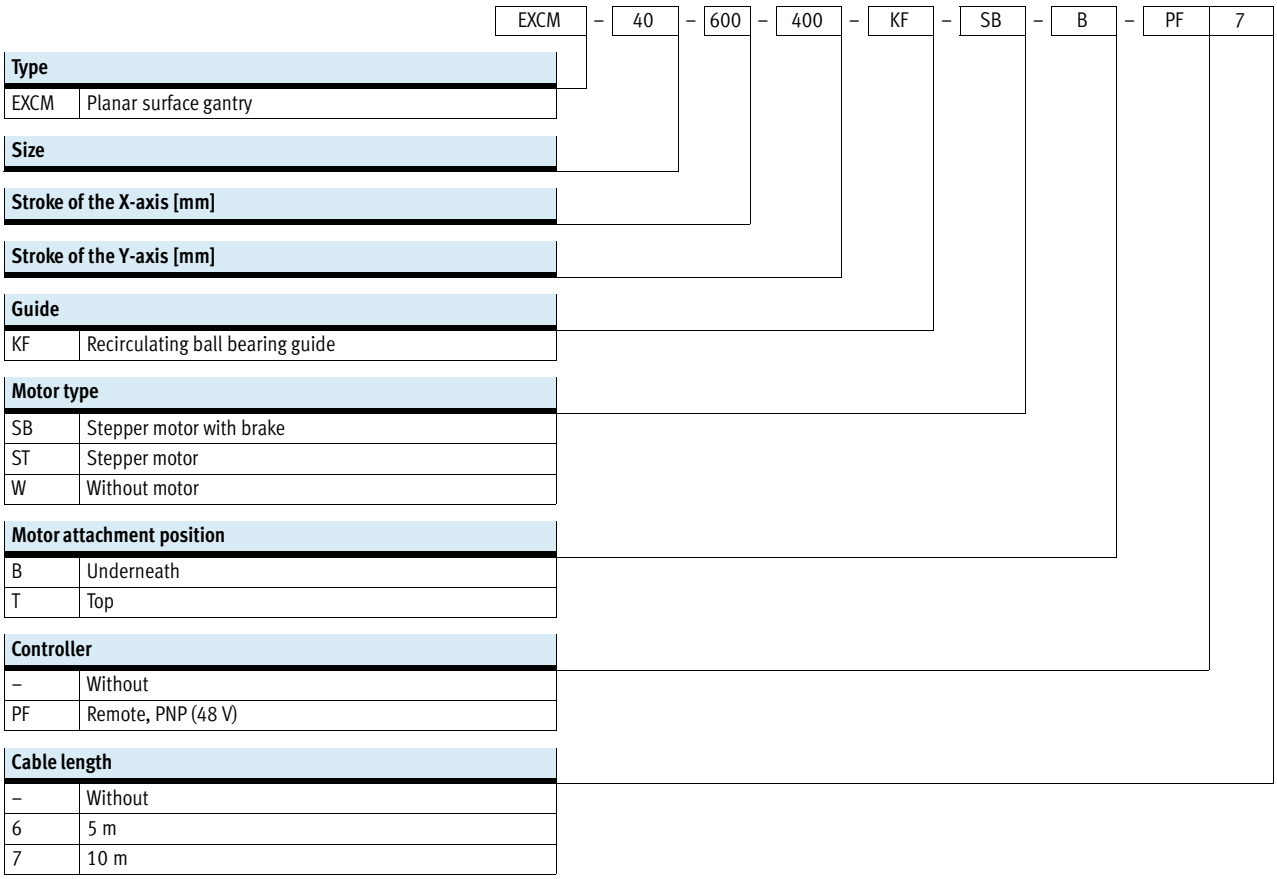
3 **2, 3, 4, 5** Mandatory in combination with controllers E and PF

Transfer order code

– | | – | | – | |

Planar surface gantries EXCM-40

Type codes



Type	
EXCM	Planar surface gantry

Size	

Stroke of the X-axis [mm]	

Stroke of the Y-axis [mm]	

Guide	
KF	Recirculating ball bearing guide

Motor type	
SB	Stepper motor with brake
ST	Stepper motor
W	Without motor

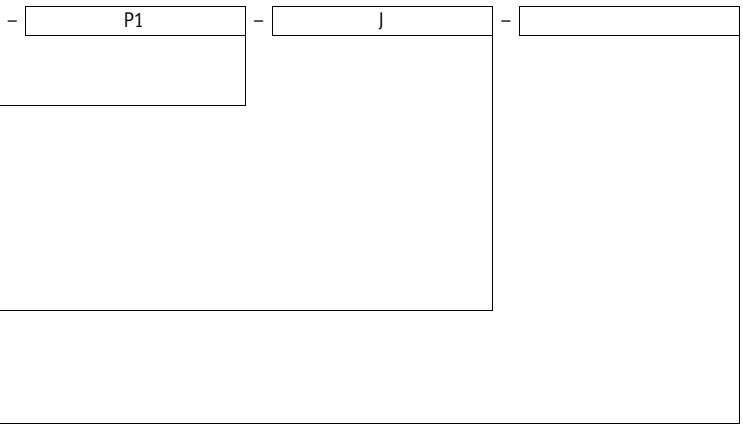
Motor attachment position	
B	Underneath
T	Top

Controller	
–	Without
PF	Remote, PNP (48 V)

Cable length	
–	Without
6	5 m
7	10 m

Planar surface gantries EXCM-40

Type codes



Attachment components	
–	Without
HE1	Electric lifting unit, 100 mm stroke
P1	Pneumatic lifting unit, 50 mm stroke
P2	Pneumatic lifting unit, 100 mm stroke
P3	Pneumatic lifting unit, 150 mm stroke

Mounting kit	
–	With mounting component
J	With adjusting kit

Document language	
DE	German
EN	English
ES	Spanish
FR	French
IT	Italian
RU	Russian
ZH	Chinese

Note

Ordering data ➔ 46

Planar surface gantries EXCM-40

Key features

Selection of attachment components

The following variants for the Z-axis can optionally be ordered using the modular product system ➔ 46:

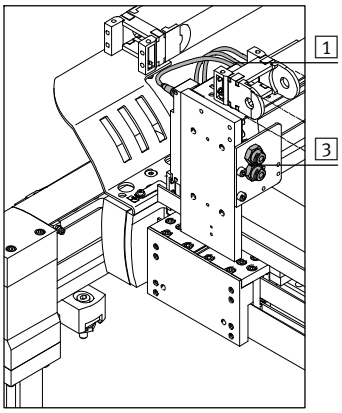
- Without attachment component
- With pneumatic attachment component (mini slide DGSL)
- With electric attachment component (mini slide EGSL)

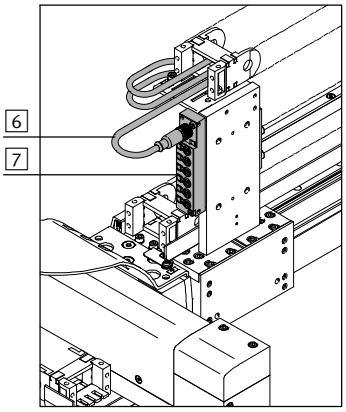
The drives are fully connected on delivery. Cables and tubes are routed as far as the output of the energy chain (X-axis).

EXCM-... (without attachment component)

The following are pre-installed:

- 2 supply ports for e.g. Z-axis
- Multi-pin plug distributor for bundling signals:
  - E.g. proximity sensor



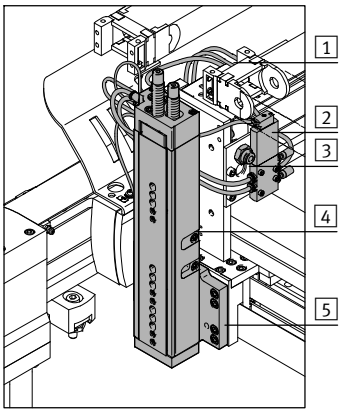


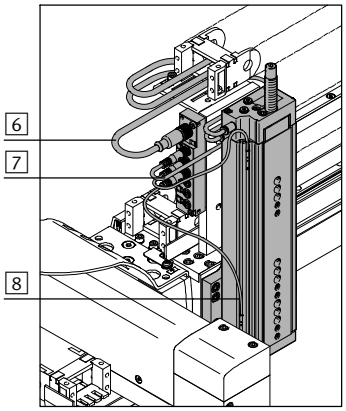
Components		Number of components
1	Tubing	2
3	Bulkhead fitting	2
6	Plug socket with cable	1
7	Multi-pin plug distributor (6-way)	1
–	Earthing cable	2

EXCM- ... -P... (pneumatic attachment component)

The following are pre-installed:

- Solenoid valve for controlling the drive
- 1 supply port for e.g. gripper
- Proximity sensor for end position sensing
- Multi-pin plug distributor for bundling signals:
  - For mini slide DGSL:
    - 2 proximity sensors
    - 1 solenoid valve
  - 3 ports are available





Components		Number of components
1	Tubing	2
2	Solenoid valve	1
3	Bulkhead fitting	1
4	Mini slide DGSL-...-Y3A[1]	1
5	Adapter plate	1
6	Plug socket with cable	1
7	Multi-pin plug distributor (6-way)	1
8	Proximity sensor	2
–	Earthing cable	2

1) For EXCM-40, the mini slide DGSL-16 is used with progressive shock absorbers. Further information ➔ Internet: dgsl

Planar surface gantries EXCM-40

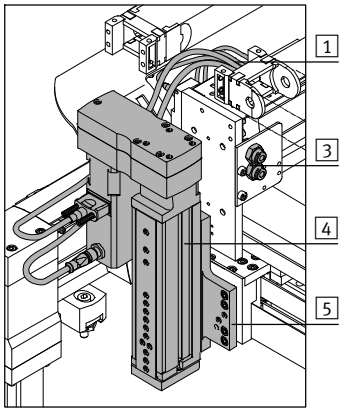
Key features

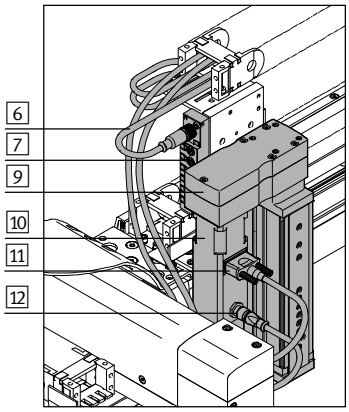
Selection of attachment components

EXCM-...-HE1 (electric attachment component)

The following are pre-installed:

- 2 supply ports for e.g. gripper
- Multi-pin plug distributor for bundling signals:
  - E.g. proximity sensor



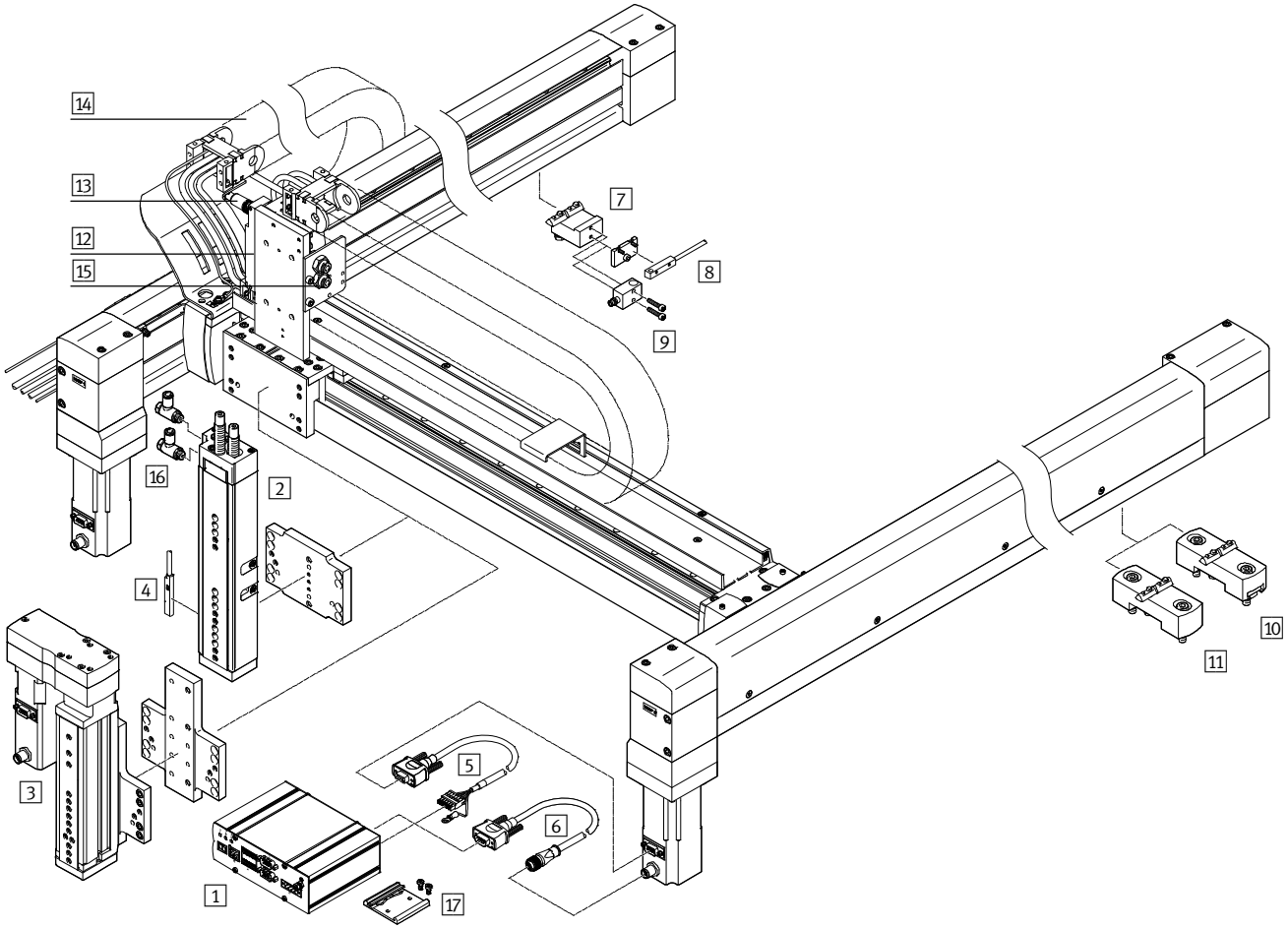


Components		Number of components
1	Tubing	2
3	Bulkhead fitting	2
4	Mini slide EGSL[1)]	1
5	Adapter plate	1
6	Plug socket with cable	1
7	Multi-pin plug distributor (6-way)	1
9	Parallel kit	1
10	Motor	1
11	Motor cable	1
12	Encoder cable	1
–	Earthing cable	2

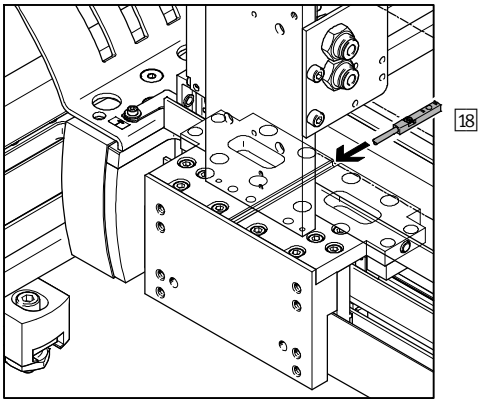
1) For EXCM-40, the mini slide EGSL-45 is used with a lead of 10 mm.
Further information ➔ Internet: egsl

Planar surface gantries EXCM-40

Peripherals overview



Proximity sensor for sensing the position of the slide on the Y-axis



Planar surface gantries EXCM-40

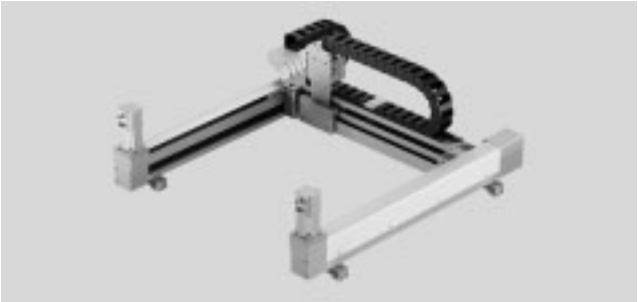
Peripherals overview

FESTO

Attachments and accessories			
Type		Description	➔ Page/Internet
1	Controller CMXH	• For controlling the planar surface gantry	cmxh
2	Mini slides P1, P2, P3	• Pneumatic attachment component (mini slide DGSL) for the Z-axis	46
3	Mini slides HE1	• Electric attachment component (mini slide EGSL) with motor cable NEBM and encoder cable NEBM for the Z-axis	46
4	Proximity sensor SME-10M/SIES-8M	• For position sensing on the Z-axis • Included in the scope of delivery of the planar surface gantry EXCM-...-P...	56
5	Motor cable NEBM	• Connecting cable between motor and controller CMXH-ST2 • Included in the scope of delivery of the planar surface gantry EXCM-...-ST/-SB	46
6	Encoder cable NEBM	• Connecting cable between encoder and controller CMXH-ST2 • Included in the scope of delivery of the planar surface gantry EXCM-...-ST/-SB	46
7	Sensor mounting EAPR	• For mounting the proximity sensors SIES-Q8B, SIES-V3B on the X-axis • Not included in the scope of delivery of the planar surface gantry	55
8	Proximity sensor SIES-Q8B	• For position sensing on the X-axis • Not included in the scope of delivery of the planar surface gantry	57
9	Proximity sensor SIES-V3B	• For position sensing on the X-axis • Not included in the scope of delivery of the planar surface gantry	57
10	Adjusting kit EADC-12	• Height-adjustable mounting kit for the planar surface gantry • Included in the scope of delivery of the planar surface gantry. If no adjusting kit is selected in the modular product system, the mounting kit will automatically be delivered	54
11	Mounting kit EAHM-E12	• Non-height-adjustable mounting kit for the planar surface gantry	54
12	Multi-pin plug distributor NEDU	• For connecting up to 6 inputs/outputs • Included in the scope of delivery of the planar surface gantry	nedu
13	Plug socket with cable SIM	• Connecting cable between multi-pin plug distributor NEDU and the controller • Included in the scope of delivery of the planar surface gantry	sim
14	Energy chain	• For EXCM-40: type IGUS 2500.03.075.0	–
15	Plastic tubing PUN-H-6x1	• Two pieces of tubing are connected to the bulkhead fittings and routed in the energy chains at delivery (for pneumatic Z-axis, one tube on the valve and one on the bulkhead fitting)	pun
16	One-way flow control valve GRLA	• For speed regulation • Included in the scope of delivery of the planar surface gantry EXCH-...-P...	46
17	H-rail mounting CAFM-D3	For mounting the controller to an H-rail to EN 50022	49
18	Proximity sensor SIES-8M	• For position sensing on the Y-axis • Not included in the scope of delivery of the planar surface gantry	56
–	Motor cable NEBM-S1G9	• Connecting cable between the motor on the Z-axis and the motor controller CMMS-ST • The motor controller and connecting cable are included in the scope of delivery of the planar surface gantry EXCM-...-HE1	57
	Encoder cable NEBM-M12G8	• Connecting cable between the encoder on the Z-axis and the motor controller CMMS-ST • The motor controller and connecting cable are included in the scope of delivery of the planar surface gantry EXCM-...-HE1	57

Planar surface gantries EXCM-40

Technical data



General technical data		
Size		40
Design		Planar surface gantry
Guide		Recirculating ball bearing guide
Stroke of the		
X-axis	[mm]	200 … 2000
Y-axis	[mm]	200 … 1000
Z-axis	[mm]	50, 100, 150
EXCM-…-HE1	[mm]	100
EXCM-…-P1	[mm]	50
EXCM-…-P2	[mm]	100
EXCM-…-P3	[mm]	150
Rated load for max. dynamic response[1]	[kg]	4
Process force in Z direction	[N]	450
Max. torque[2]		→ 37
Max. no-load torque[2][3]		→ 37
Max. acceleration[4]		
With motor and controller	[m/s²]	→ 37
Purely mechanical system	[m/s²]	20
Max. speed[4]		
With motor and controller	[m/s]	1
Purely mechanical system	[m/s]	2
Repetition accuracy	[mm]	±0.1
Mounting position		Horizontal
Type of mounting		Mounting kit, adjusting kit

1) Rated load = tool load (attachment component (Z-axis) + gripper, for example) + payload
2) These values must also be complied with during installation of third-party motors
3) At v=0.2 m/s and 45° travel.
4) These data apply only under ideal conditions.
For a precise configuration, please consult a sales engineer from Festo.
Further information → 37

Operating and environmental conditions		
Size		40
Degree of protection		IP40
Ambient temperature[1]	[°C]	+10 … +50
Storage temperature	[°C]	–10 … +60
Relative humidity	[%]	0 … 90 (non-condensing)
Noise level	[dB(A)]	65
Duty cycle	[%]	100
CE marking (see declaration of conformity)		To EC Machinery Directive

1) Note operating range of proximity sensors and motors

Planar surface gantries EXCM-40

Technical data

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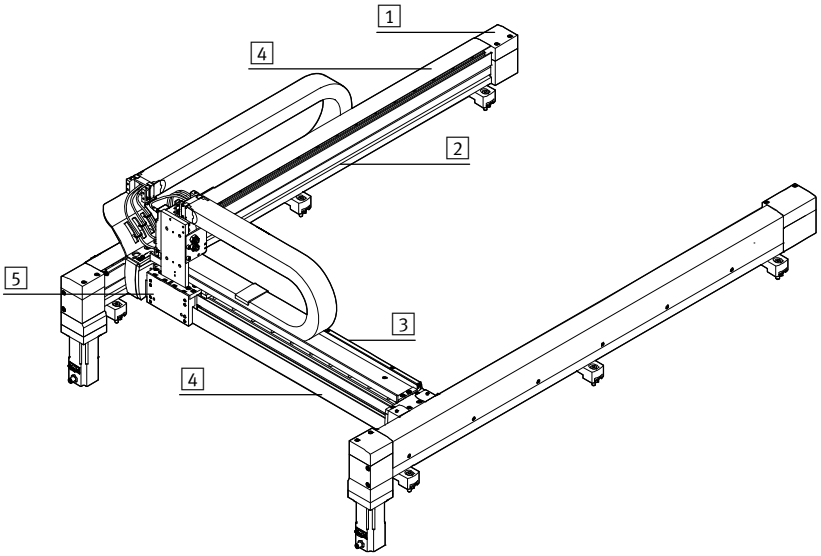
Materials



Size		40
1	Drive and end caps	Aluminium
2	Profiles of the X-axis	Aluminium
3	Profile of the Y-axis	Aluminium
4	Cover	
	X-axis	Aluminium
	Y-axis	Aluminium
5	Slides	Aluminium
–	Coupling	Aluminium with elastomer ring gear
	Guide	Steel
	Drive pinion	Steel
	Ball bearings	Steel
	Toothed belt	PU with steel cord
	Note on materials	RoHS compliant
		Contains paint-wetting impairment substances

Planar surface gantries EXCM-40

Technical data

Weight [kg]	
Size	40
Product weight with 0 mm stroke (without rated load, motors, axial kits, mounting kits)	
EXCM-...-W-T	16.7
EXCM-...-W-B	17.5
X-axis (2x)	8.5
Y-axis (without slide)	6.2
Additional weight per 100 mm stroke	
X-axis	1.75
Y-axis	0.89
Axial kit[1)]	
For EMMS-ST-57-M	0.54
Motor[1)]	
EXCM-...-ST (without brake)	1.2
EXCM-...-SB (with brake)	1.38
Attachment component (Z-axis)	
Electrical	
EXCM-...-HE1	3.3
Pneumatic	
EXCM-...-P1	1.8
EXCM-...-P2	2.4
EXCM-...-P3	2.7
Mounting kit for X-axis	
Adjusting kit[1)]	0.78
Mounting kit[1)]	0.33

1) Weight per component

Planar surface gantries EXCM-40

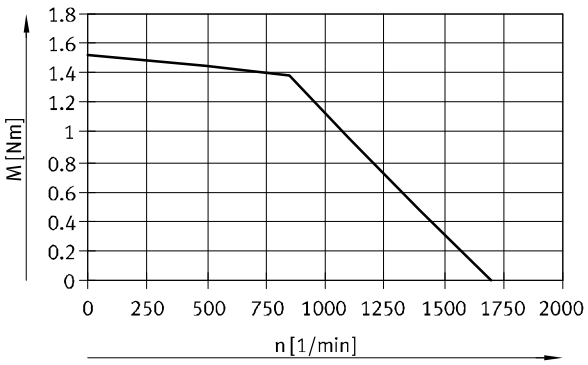
Technical data

FESTO

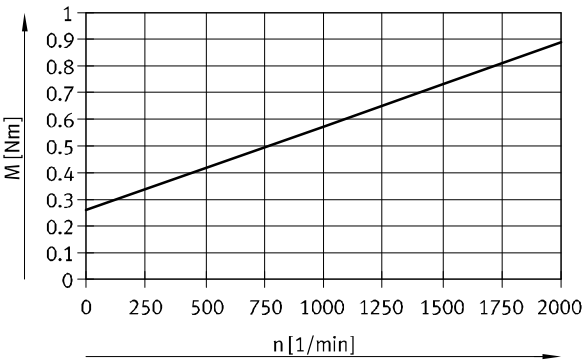
Torque M as a function of rotational speed n

Typical motor characteristic curve with nominal voltage and optimal controller.

In conjunction with:
EXCM-...-ST-...-PF (at 48 V) or EXCM-...-SB-...-PF (at 48 V)



No-load torque M as a function of speed n



Characteristic load values

The centre of gravity of the slide is at the height of the slide in the Z-direction and in the centre of the slide in the X-/Y-directions.
The system is subject to the greatest load in the case of 45° travel.
The following data apply in this case:

Formula for calculating the required torque M and the required rotational speed n

$$M_{45°} = a \times (9.79 \times m_L + 4.89 \times m_{Ay} + 10.21 \times J_m + 19.58) \times 10^{-3} + M_R$$

$$n_{45°} = 975 \times v$$

a = acceleration [m/s²]
v = speed [m/s]
m_{Ay} = product weight of the Y-axis [kg] ➔ 36
m_L = attachment component (Z-axis) [kg] with payload
J_m = moment of inertia of the motor [kgcm²] ➔ table below
M_R = no-load torque [Nm] ➔ 37
$n_{45°}$ = rotational speed at 45° travel [rpm]

Combination of planar surface gantry with servo motor for X-/Y-axis

Planar surface gantry	Motor	Moment of inertia of motor [kgcm²]
EXCM-40-...-ST	EMMS-ST-57-M-SE-G2	0.48
EXCM-40-...-SB	EMMS-ST-57-M-SEB-G2	0.5

Planar surface gantries EXCM-40

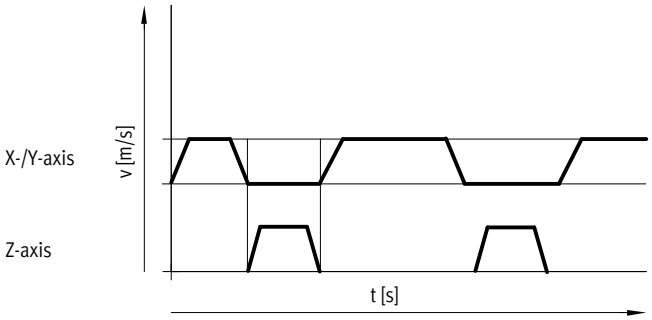
Technical data

Sample calculation

Given:

Planar surface gantry
EXCM-40-1000-500-KF-SB-B-PF7-HE1-...
with attached motor
EMMS-ST-57-M-SEB-G2

a_{max} = 2 m/s²
v_{max} = 0.5 m/s
Payload = 0.5 kg
Attachment component Z-axis: EGSL-BS-45-100-10P



Is the attached motor sufficient for this load?

Given:

a_{max} = 2 m/s²
v_{max} = 0.5 m/s
m_{Ay} = 10.65 kg
m_L = 3.80 kg
J_m = 0.5 kgcm²

$$M_{45°} = a \times (9.79 \times m_L + 4.89 \times m_{Ay} + 10.21 \times J_m + 19.58) \times 10^{-3} + M_R$$

$$n_{45°} = 975 \times v$$

a = acceleration [m/s²] ➔ 34
v = speed [m/s]
m_{Ay} = product weight of the Y-axis [kg] ➔ 36
m_L = attachment component (Z-axis) [kg] with payload
J_m = moment of inertia of the motor [kgcm²] ➔ 37
M_R = no-load torque [Nm] ➔ 37
$n_{45°}$ = rotational speed at 45° travel [rpm]

Note

These requirements for the dynamic response apply to 45° travel.
For travel only in the X- or Y-direction, the dynamic values may be higher.

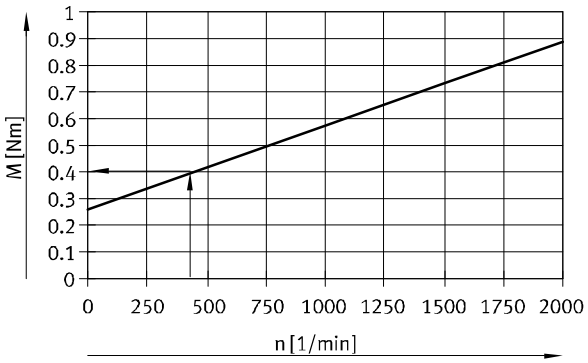
Planar surface gantries EXCM-40

Technical data

Sample calculation

Determination of M_R:

$n_{45°} = 975 \times 0.5\ m/s = 487.5\ 1/min$



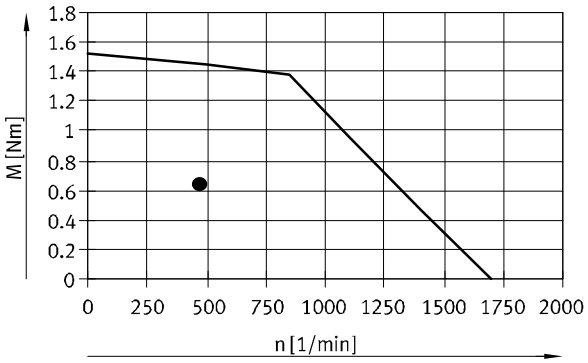
No-load torque:
EXCM-40

$M_R = 0.4\ Nm$

$M_{45°} = a \times (9.79 \times m_L + 4.89 \times m_{Ay} + 10.21 \times J_m + 19.58) \times 10^{-3} + M_R$

$M_{45°} = 2\ \frac{m}{s^2} \times (9.79 \times 3.80\ kg + 4.89 \times 10.65\ kg + 10.21 \times 0.5\ kgcm^2 + 19.58) \times 10^{-3} + 0.4\ Nm = 0.63\ Nm$

Result:



The value for the torque lies below the motor characteristic curve.
The design is thus acceptable.

Planar surface gantries EXCM-40

Technical data

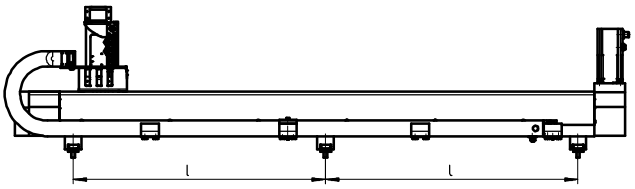
Minimum number of profile mountings

Irrespective of the mounting position, a different number of profile mountings needs to be used depending on the stroke of the X-axis. The item is delivered with the required number attached.

Stroke of the X-axis [mm]	Number of profile mountings per axis
200 ... 499	2
500 ... 899	2
900 ... 1799	3
1800 ... 2000	4

Distances between the profile mountings

The profile mountings must be evenly spaced by distance l.

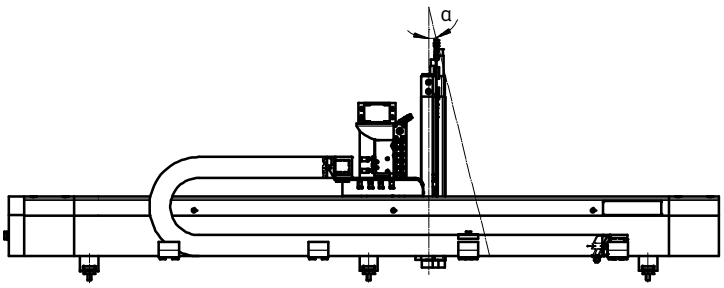


Distance $l = \frac{\text{Stroke} + 141}{n - 1}$

n = number of profile mountings per axis

Mounting position of the Z-axis

Owing to manufacturing tolerances and the backlash in the guides, the angle between the X- and Z-axes may not be exactly 90° in certain circumstances.
Max. deviation:
α = ±1.1°



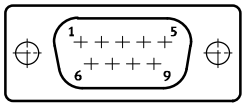
Planar surface gantries EXCM-40

Technical data

Pin allocations

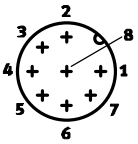
Motors on the X-/Y- and Z-axes

Motor



PIN	Function
1	String A
2	String A/
3	String B
4	String B/
5	n.c.
6	n.c.
7	Brake (24 V)
8	Brake (0 V)
9	–

Encoder

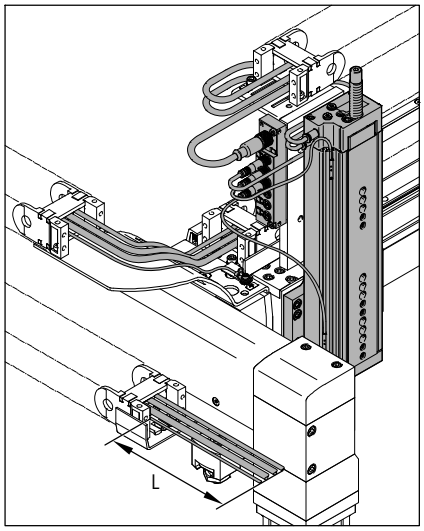


PIN	Function
1	Signal trace A
2	Signal trace A/
3	Signal trace B
4	Signal trace B/
5	0 V
6	Signal trace N
7	Signal trace N/
8	5 V

Selection of cable lengths

2 cable lengths (5 m or 10 m) can be selected using the modular product system ➔46. This specification relates to the output of the energy chain at the X-axis (dimension L) and describes the minimum length by which the cables and tubing protrude. The selected length applies to the following components:

- Tubing
- Plug sockets with cable
- Motor cables
- Encoder cables
- Earthing cables

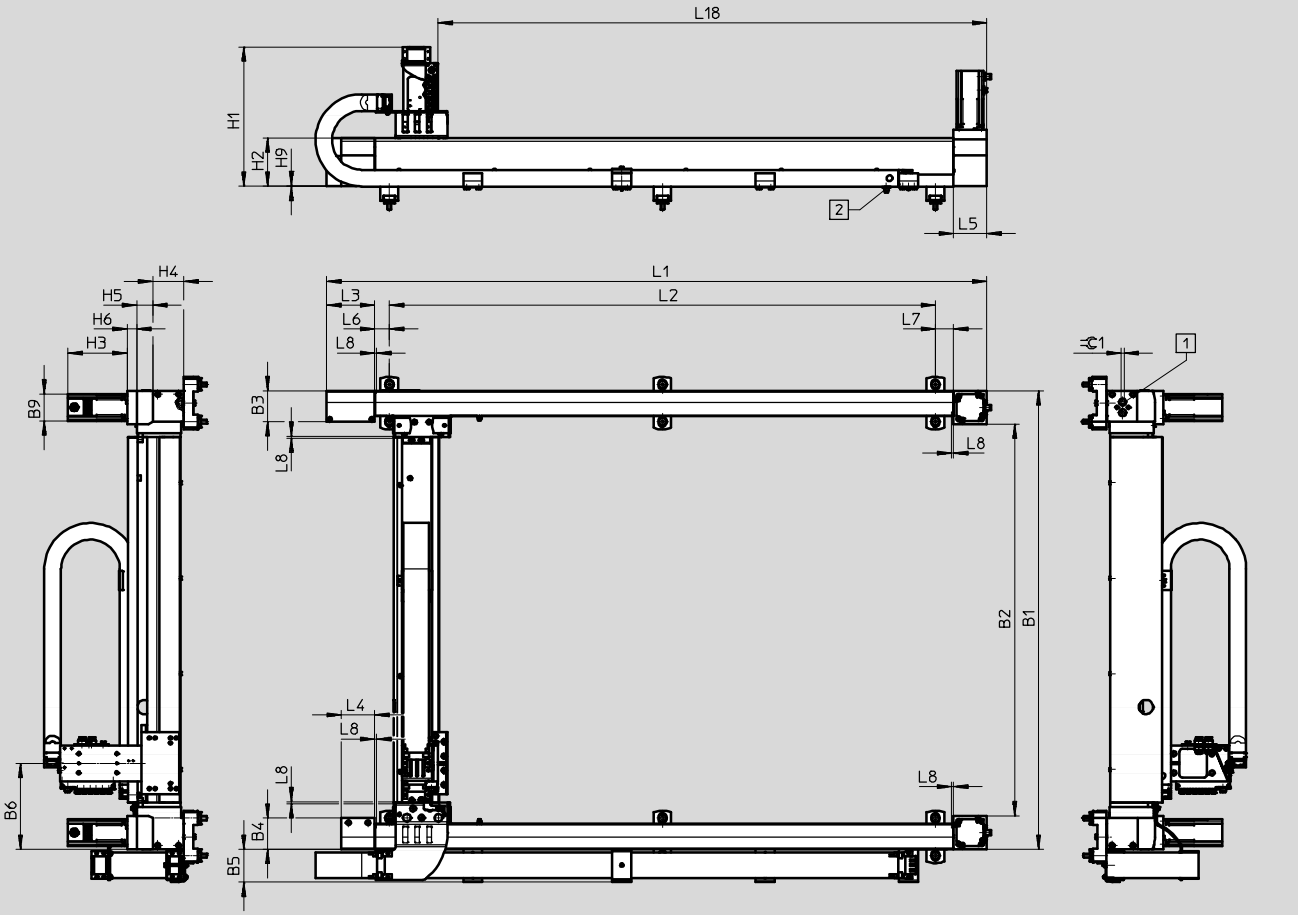


Planar surface gantries EXCM-40

Technical data

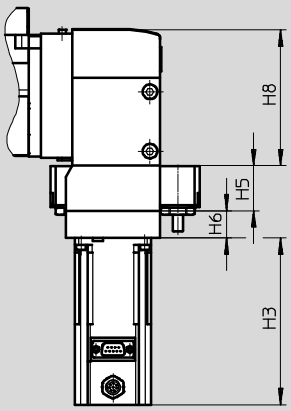
Dimensions Download CAD data ➔ **www.festo.com**

EXCM-40-...-T – Motor attachment position on top

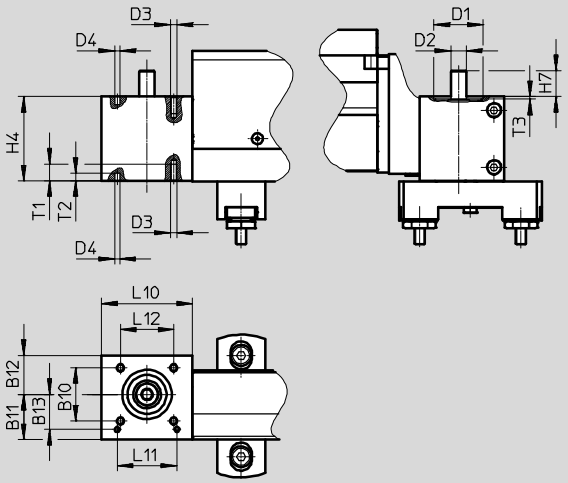


1 Screw for toothed belt tension
2 Earthing point
L8 Safety distance per side

EXCM-40-...-B – Motor attachment position underneath



EXCM-40-... – Motor interface

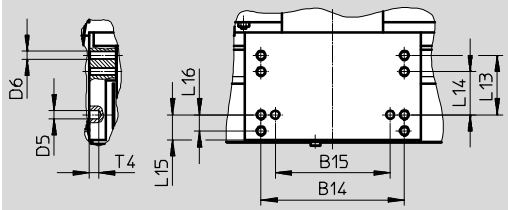


Planar surface gantries EXCM-40

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

EXCM-40-... – Slide



Type	B3	B4	B5	B6	B9	B10	B11	B12	B13 ±0.05	B14 ±0.1
EXCM-40	65	65	69	179.9	56.4	41	35	30	27	106

Type	B15 ±0.03	D1 ∅ H7	D2 ∅ H6	D3	D4 ∅ H7	D5 ∅ H7	D6	H1	H2	H3
EXCM-40	85	38	12	M5	4	6	M6	Approx. 293	100.8	124/159.5[1)]

Type	H4	H5	H6	H7	H8	H9	L3	L4	L5	L6	L7	L8
EXCM-40	65	33.6	20	20	100.3	0.5	101	70	70	30.5	37.5	6

Type	L10	L11 ±0.03	L12	L13 ±0.1	L14 ±0.1	L15	L16 ±0.1	T1	T2	T3	T4	⌯1
EXCM-40	70	46	41	44	32	18.5	12	12	6	1.9	7	6

Stroke-dependent dimensions

Stroke of the X-axis	L1	L2	L18	Stroke of the Y-axis	B1	B2
200 ... 2000	382+stroke	➔ 40	167.2+stroke	200 ... 1000	360+stroke	230+stroke

1) With brake

Note

Depending on the stroke of the X-axis, a varying number of profile mountings is required. The distance between the profile mountings must always be the same (➔ 40).

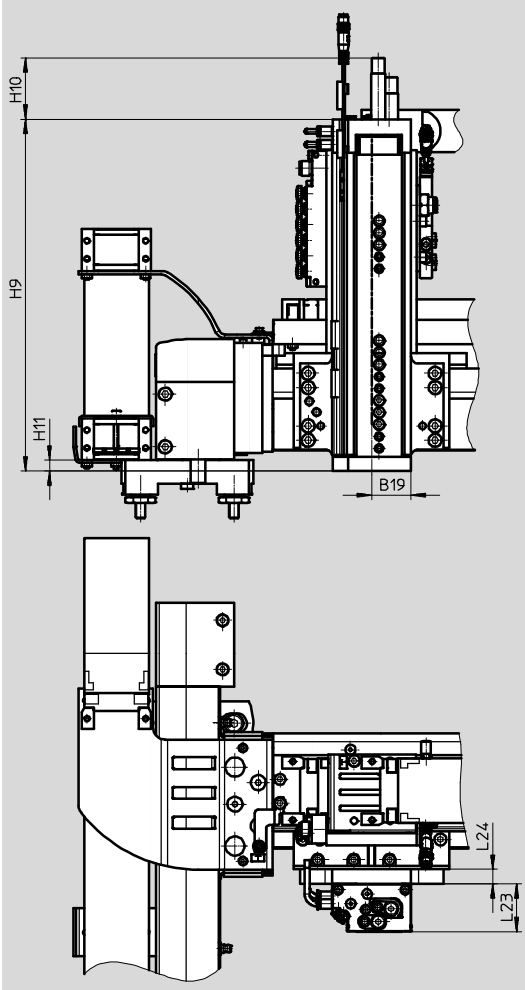
The tension of the toothed belt must be set before commissioning. The tools required to do this (e.g. frequency meter) are not included in the scope of delivery.

Planar surface gantries EXCM-40

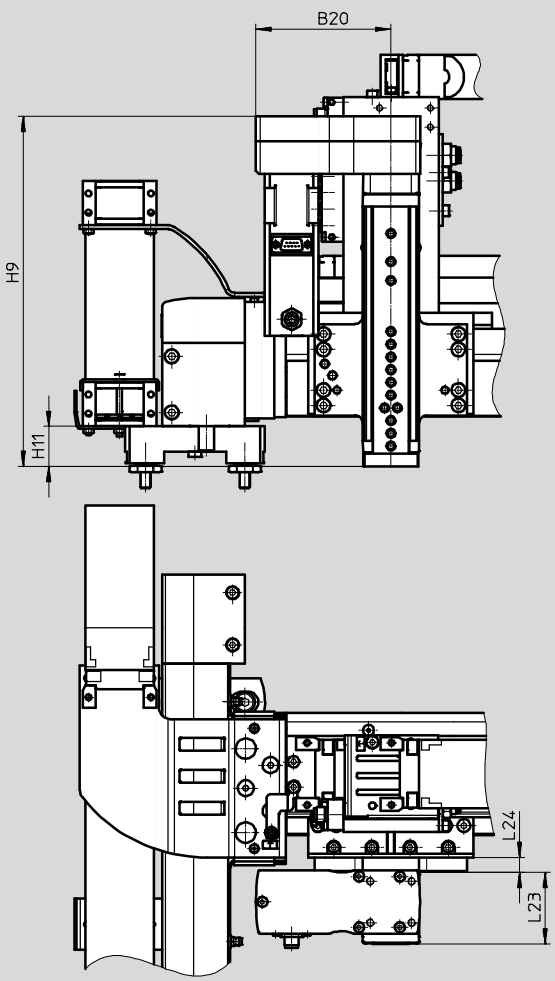
Technical data

Dimensions Download CAD data ➔ **www.festo.com**

EXCM-40-...-P...
With pneumatic attachment component (mini slide DGSL)



EXCM-40-...-E...
With electric attachment component (mini slide EGSL)



Type	B19	B20	H9	H10 max.	H11	L23	L24
With pneumatic attachment component (mini slide DGSL)							
EXCM-40-...-P1	33	–	164.6	51.9	9.1	40±0.08	12
EXCM-40-...-P2			243.6				
EXCM-40-...-P3			293.6				
With electric attachment component (mini slide EGSL)							
EXCM-40-...-E1	–	106	275	–	31.5	56	12

Planar surface gantries EXCM-40

Technical data

Allocation of planar surface gantry to servo motor for X-/Y-axis	
Planar surface gantry	Motor
EXCM-40-...-ST	EMMS-ST-57-M-SE-G2
EXCM-40-...-SB	EMMS-ST-57-M-SEB-G2

Allocation of planar surface gantry to servo motor for Z-axis	
Planar surface gantry	Motor
EXCM-40-...-HE1	EMMS-ST-42-S-SEB-G2

Note

Third-party motors with a driving torque that is too high can damage the planar surface gantry. When selecting the motors, please observe the limits specified in the technical data.

Planar surface gantries EXCM-40

Ordering data – Modular product system

FESTO

Ordering table

	Size		40	Conditions	Code		Entry code
M	Module no.		**3741955**				
	Product type		EXCM series M		**EXCM**		EXCM
	Size		40		**-40**		-40
	Stroke of the X-axis	[mm]	200 ... 2000				
	Stroke of the Y-axis	[mm]	200 ... 1000				
	Guide		Recirculating ball bearing guide		**-KF**		-KF
	Motor type		Stepper motor with brake		**-SB**		
			Stepper motor		**-ST**		
			Without motor		**-W**		
	Motor attachment position		Underneath		**-B**		
			Top		**-T**		
O	Controller		Without				
			Remote, PNP (48 V)		**-PF**		
	Cable length		Without				
			5 m		**6**		
			10 m		**7**		
	Attachment components		None				
			Electric lifting unit, 100 mm stroke		**-HE1**		
			Pneumatic lifting unit, 50 mm stroke		**-P1**		
			Pneumatic lifting unit, 100 mm stroke		**-P2**		
			Pneumatic lifting unit, 150 mm stroke		**-P3**		
	Mounting kit		With mounting kit				
			With adjusting kit		**-J**		
M	Document language		German		**-DE**		
			English		**-EN**		
			Spanish		**-ES**		
			French		**-FR**		
			Italian		**-IT**		
			Russian		**-RU**		
			Swedish		**-SV**		
			Chinese		**-ZH**		

Note

In combination with key feature W (without motor), the EXCM planar surface gantry is provided without a coupling housing and without a coupling.

Note

The planar surface gantry can only be operated with the controller CMXH and a load voltage of 48 V.

Transfer order code

	EXCM	–	40	–		–		–	KF	–		–		–		–		–		–		–	

Controller EXCM-...-E...
For sizes 10 and 30

Configuration support
via FCT plug-in EXCM
Technical data ➔ table below

Controller EXCM-...-PF...
Configuration support
via FCT plug-in CMXH
Technical data ➔ Internet: cmxh

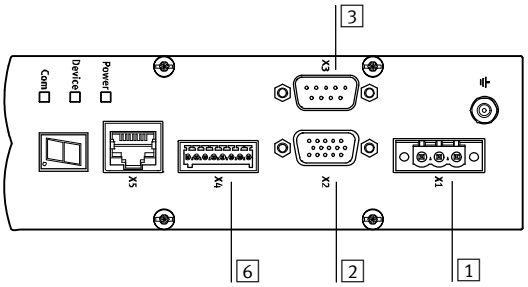
Technical data – Controller		
Operational principle		Cascade controller P position controller, PI speed controller, PI current regulator; Current regulation inside the cascade controller
		PWM MOSFET power output stage
Operating mode		Direct operation
		Set selection
Rotary position encoder		Optical encoder, 2000 steps/rev.
Status display		7-segment display
		LED
Encoder interface input		RS422
Adjustable current reduction		Via software
Nominal current setting		Via software
Step adjustment		Via software
Braking resistor	[Ω]	15
Mains filter		Integrated

Electrical data – Controller			
For EXCM size		10	30
Load supply			
Nominal voltage	[V DC]	24 ±15%	
Nominal current	[A]	2.8	6
Maximum peak current	[A]	8	
Logic supply			
Nominal voltage	[V DC]	24 ±15%	
Maximum peak current	[A]	0.3	
Maximum peak current per digital output	[A]	0.1	
Characteristics of digital logic outputs		Not galvanically isolated	
Characteristics of logic inputs		Galvanically connected to logic potential	
Logic input specification		Based on IEC 61131-2	
Switching logic		NPN (negative switching)	
Protective function		I^2t monitoring, following error monitoring, software end-position detection, voltage failure detection, current monitoring, temperature monitoring	

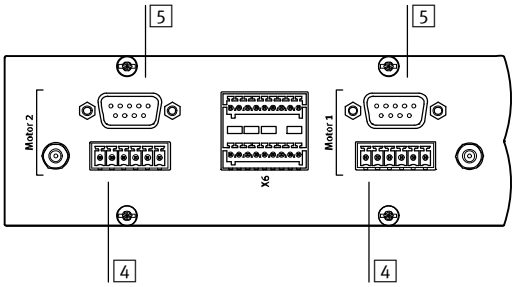
Technical data – Fieldbus interface				
Interfaces		I/O	CANopen	Ethernet
Number of digital logic outputs		5		
Number of digital logic inputs		9		
Operating range of logic inputs	[V DC]	8 ... 30		
Process interfacing		31 records		
Communication profile		–	FHPP	FHPP (via TCP/IP – CVE)
Max. fieldbus transmission rate	[Mbit/s]	–	1	100
Bus connection		Bushing, 15-pin, Sub-D	Plug connector, 9-pin, Sub-D	RJ45

Pin allocation

Front plate



Reverse side



1 X1 Power supply

PIN	Function	
1	+24 V logic	Logic supply
2	+24 V load	Load supply
3	0 V	Reference potential

2 X2 I/O interface

PIN	Function	
1	+24 V Ready	Ready for communication
2	In 1	Positioning record bit 1
3	In 2	Positioning record bit 2
4	In 3	Positioning record bit 3
5	In 4	Positioning record bit 4
6	In 5	Positioning record bit 5
7	In 6	Not used
8	Start	Move to the right
9	Enable	Enable input
10	Reset	Reset input
11	Ready	Ready output
12	Fault	Fault output
13	Acknowledge	Acknowledge output
14	MC	Motion complete
15	0 V	Reference potential

3 X3 CAN interface

PIN	Function	
1	n.c.	
2	CAN_L	CAN low
3	GND	Reference potential
4	n.c.	
5	Screening	
6	n.c.	
7	CAN_H	CAN high
8	n.c.	
9	n.c.	

4 Motor connection – supply

PIN	Function	
1	A	String A
2	A/	String A/
3	B	String B
4	B/	String B/
5	BR+	24 V brake connection
6	BR–	0 V brake connection

5 Motor connection – encoder

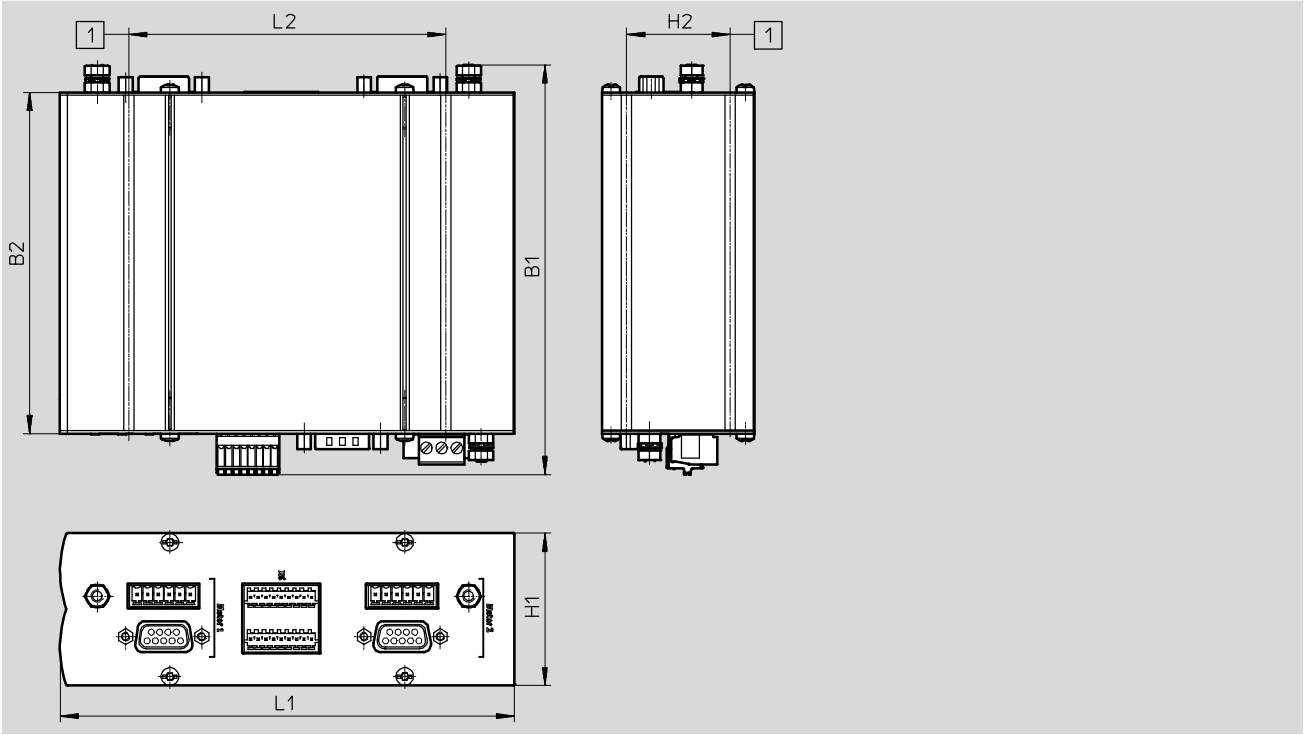
PIN	Function	
1	0	
2	B	
3	N	
4	0 V	Reference potential for encoder
5	5 V	Auxiliary supply for encoder
6	A/	
7	B/	
8	N/	
9	n.c.	

6 X4 Emergency stop interface

PIN	Function	
1	+24 V logic	Logic supply
2	TO	Interrupt motor voltage (at 0 V)
3	ES	Trigger braking ramp (at 0 V)
4	RB	Release brake (at 24 V)
5	FAULT	Fault
6	DIAG1	
7	DIAG2	
8	0 V	Reference potential

Dimensions Download CAD data ➔ **www.festo.com**

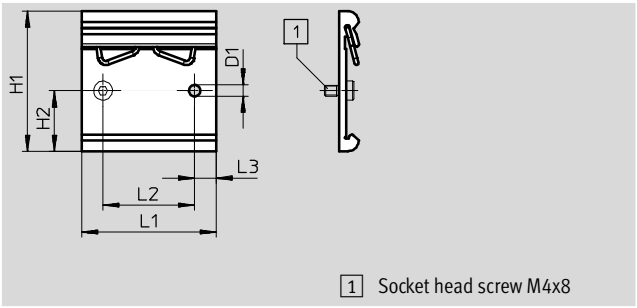
Controller



B1	B2	H1	H2	L1	L2
134.4	112	50	34	149	104

H-rail mounting CAFM
for H-rail to EN 50022

Materials:
Anodised aluminium
RoHS-compliant



Dimensions and ordering data

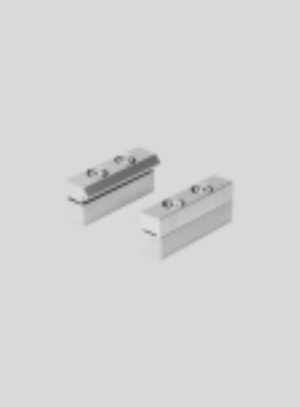
D1 ∅	H1	H2	L1	L2	L3	Weight [g]	Part No.	Type
4.2	52	22.5	50	34	8	29	**4135048**	**CAFM-D3-H**

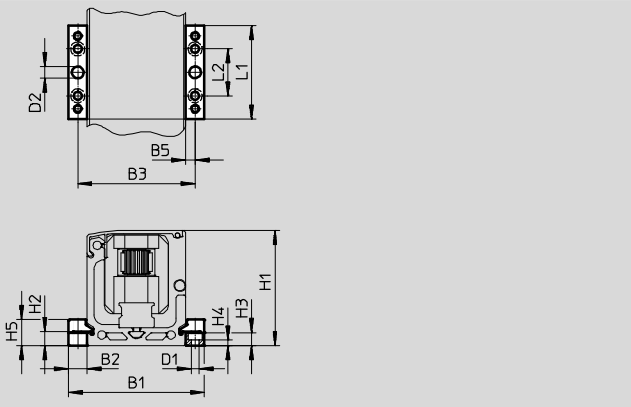
Profile mounting MUE
For size 30

Materials:
Anodised aluminium
RoHS-compliant

For mounting the planar surface gantry (scope of delivery: 1 pair)

Included in the scope of delivery of the planar surface gantry:
X-stroke < 500 mm: 2 pairs
X-stroke ≥ 500 mm: 3 pairs





Dimensions and ordering data

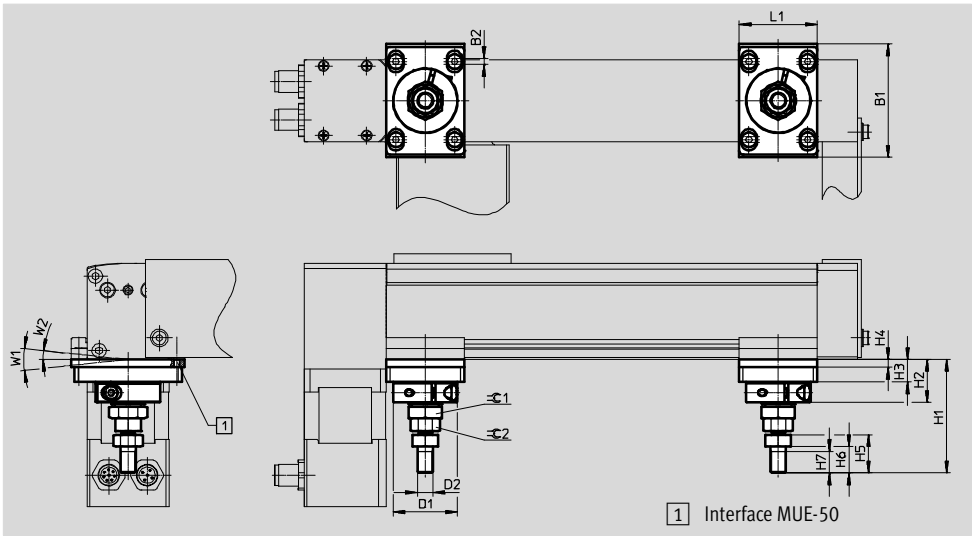
For size	B1	B2	B3	B5	D1 ∅	D2 ∅ H7	H1	H2	H3
30	58	8	50	4	3.4	5	49	6	5.5

For size	H4	H5	L1	L2	Weight [g]	Part No.	Type
30	2.3	11	40	20	20	**558042**	**MUE-50**

Adjusting kit EADC-E11
For size 30

Materials:
Anodised aluminium
RoHS compliant

For mounting and aligning the planar surface gantry. The kit is height adjustable.



Dimensions and ordering data

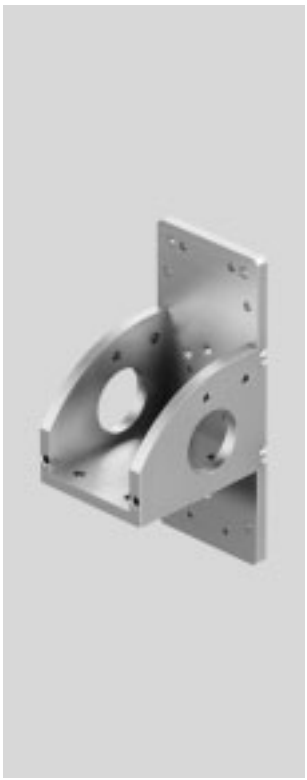
For size	B1	B2	D1 ∅	D2	H1 +12/−2	H2	H3	H4	H5	H6	H7
30	58	3	33	M8	58	22	11.5	4	19.5	13.5	11

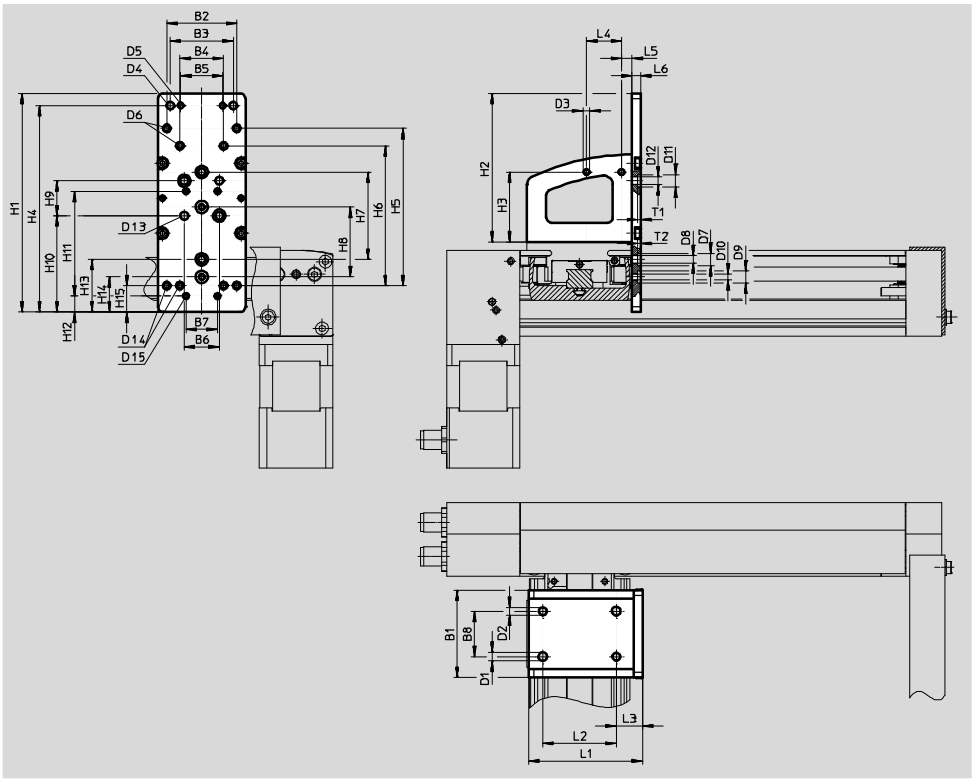
For size	L1	W1	W2	⌯C1	⌯C2	Weight [g]	Part No.	Type
30	40	12°	6°	17	13	160	**4706964**	**EADC-E11-30**

Mounting kit EAHT-E9
For size 30

Materials:
Anodised aluminium
RoHS-compliant

Prepared hole pattern for:
- Mini slides EGSL-35
- Mini slides DGSL-8/-10/-12
- Electric slide EGSK-20/-26





Dimensions and ordering data

For size	B1	B2	B3	B4	B5	B6	B7	D1 ∅ H7	D2 ∅	D3
30	50	40	36	25	24	20	18	5	4.5	M4

For size	D4	D5	D6	D7 ∅ H7	D8	D9 ∅ H7	D10	D11 ∅ H7	D12 ∅	D13 ∅
30	M5	M4	M4	7	M5	7	M4	7	4.5	4.5

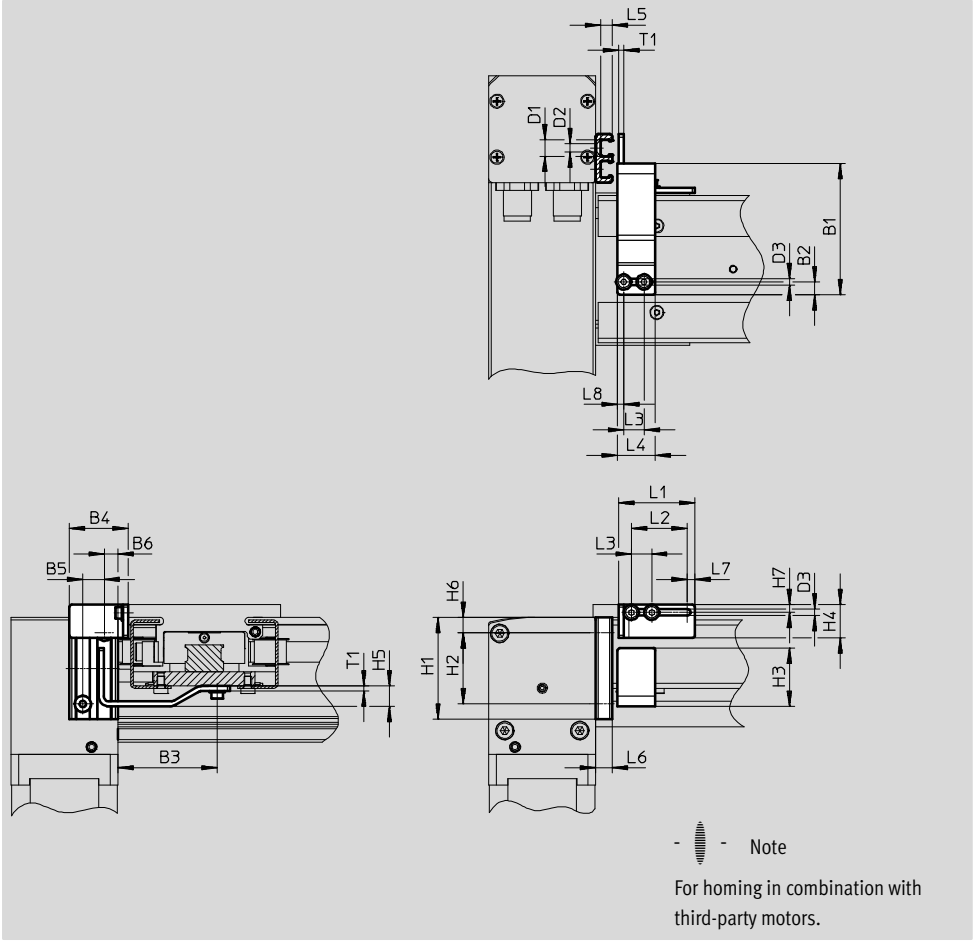
For size	D14	D15	H1	H2	H3	H4 ±0.2	H5	H6	H7	H8
30	M4	M3	125	85	40	118	90	80	50	40

For size	H9	H10	H11	H12	H13	H14	H15	L1	L2	L3
30	20	55	60	9	30	20	15	65	42	15

For size	L4	L5	L6	T1 ±0.1	T2 ±0.1	Weight [g]	Part No.	Type
30	20	6	5	1.6	1.6	165	**4070088**	**EAHT-E9-FB-3D-30**

Sensor mounting EAPR
For size 30
(incl. switch lug)

Materials:
Holder: Wrought aluminium alloy
Switch lug: Steel
RoHS compliant



Note
For homing in combination with third-party motors.

Dimensions and ordering data

For size	B1	B2	B3	B4	B5	B6	D1 ∅	D2 ∅	D3 ∅	H1
30	51.5	5	39	23	8.4	5.3	6.5	3.4	2.6	40

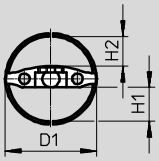
For size	H2	H3	H4	H5	H6	H7	L1	L2	L3	L4
30	28	23	13	8	6	3	30	22	8	15

For size	L5	L6	L7	L8	T1	Weight [g]	Part No.	Type
30	4.5	6.5	3	2.5	2	330	**2319236**	**EAPR-E11-30**

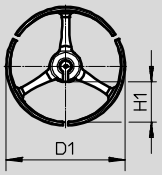
Energy chain and connection kit for size 30

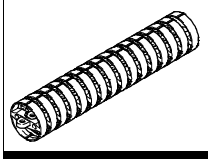
Ordering data – Energy chain

EADH-U-3D-30



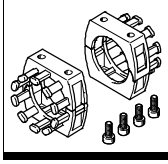
EADH-U-3D-40



Type		D1 ∅	H1	H2
	EADH-U-3D-30	34.5	12.5	11
	EADH-U-3D-40	45	15	–

For size	Max. bending radius [mm]	Length [mm]	Weight [g]	Part No.	Type
30	50	Approx. 500	75	**8059999**	**EADH-U-3D-30**
	58	Approx. 500	100	**8060324**	**EADH-U-3D-40**

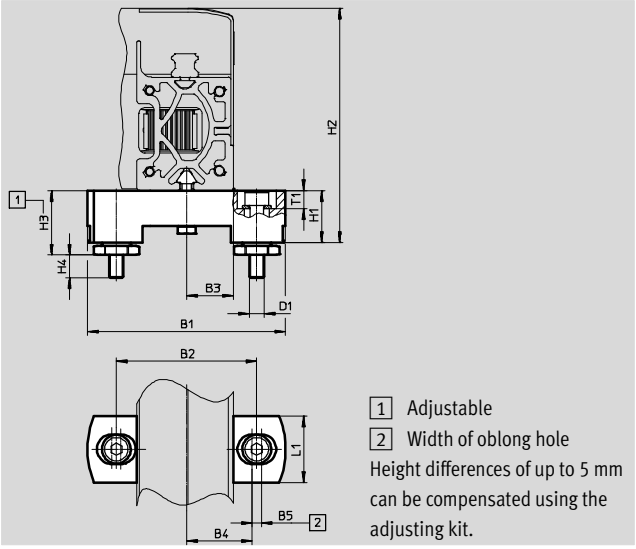
Ordering data – Connection kit

	For energy chain	Description	Part No.	Type
	EADH-U-3D-30	For mounting the energy chain. Included in the scope of delivery: • 2 connectors • 4 socket head screws M4x10	**8060325**	**EAHT-AE-3D-30**
	EADH-U-3D-40		**8060326**	**EAHT-AE-3D-40**

Adjusting kit EADC-E12
For size 40

Materials:
Anodised aluminium
RoHS compliant

For mounting and aligning the planar surface gantry. The kit is height adjustable.



1 Adjustable
2 Width of oblong hole
Height differences of up to 5 mm can be compensated using the adjusting kit.

Dimensions and ordering data

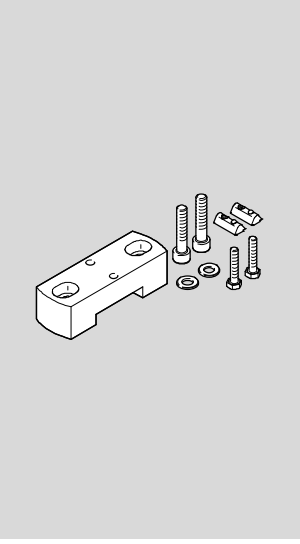
For size	B1	B2	B3	B4 ±0.2	B5	D1	H1	H2
40	110	78	26	36.5	5	M8	29	129.8

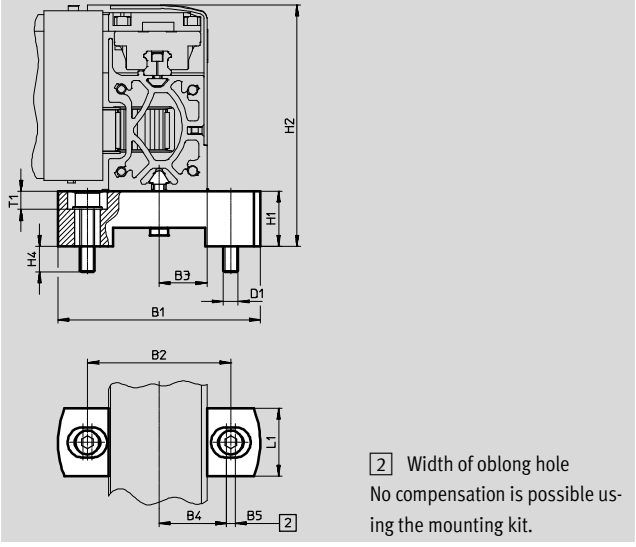
For size	H3		H4	L1	T1	Weight	Part No.	Type
	Min.	max.	max.		±0.1	[g]		
40	34.8	39.8	14	37	10	800	**8029165**	**EADC-E12-40**

Mounting kit EAHM-E12
For size 40

Materials:
Anodised aluminium
RoHS compliant

For mounting of the planar surface gantry. The kit is not height adjustable.





2 Width of oblong hole
No compensation is possible using the mounting kit.

Dimensions and ordering data

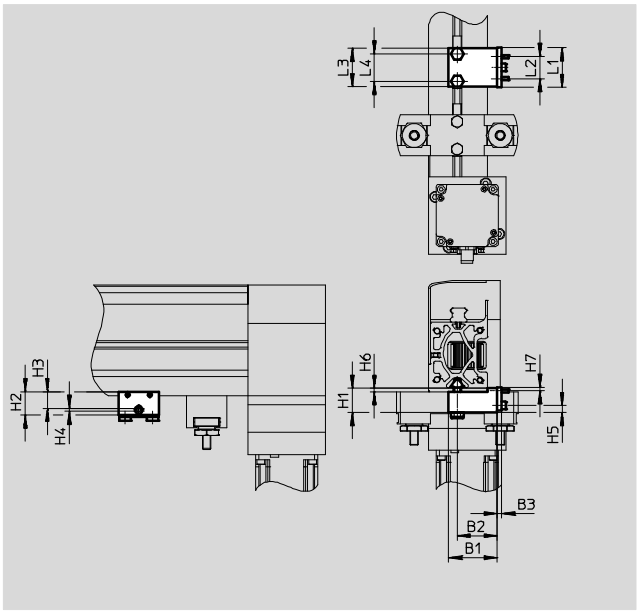
For size	B1	B2	B3	B4 ±0.2	B5	D1	H1 ±0.2
40	110	78	26	36.5	5	M8	30

For size	H2	H4 max.	L1	T1 ±0.1	Weight [g]	Part No.	Type
40	131.3	14	37	10	330	**3489340**	**EAHM-E12-K-40**

Sensor mounting EAPR
For size 40

Materials:
Switch lug: Steel
Sensor bracket: Wrought aluminium alloy
RoHS-compliant

For proximity sensor
SIES-V3B and SIES-Q8B
(for sensing the slide position on the X-axis)



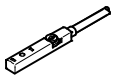
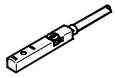
Dimensions and ordering data

For size	B1	B2	B3	H1	H2	H3 ±0.1	H4	H5	H6 -0.1	H7 -0.2
40	44	36.3	4	21.8	21	15	2.5	6.1	3.1	3

For size	L1	L2	L3	L4	Weight [g]	Part No.	Type
40	36	20	35	25	120	**2536353**	**EAPR-E12-40**

Proximity sensors for size 30

Ordering data – Proximity sensor for T-slot, inductive — Technical data ➔ Internet: sies

	Type of mounting	Electrical connection	Switching output	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with the cylinder profile	Cable, 3-wire	PNP	7.5	**551386**	**SIES-8M-PS-24V-K-7,5-OE**
		Plug connector M8x1, 3-pin		0.3	**551387**	**SIES-8M-PS-24V-K-0,3-M8D**
		Cable, 3-wire	NPN	7.5	**551396**	**SIES-8M-NS-24V-K-7,5-OE**
		Plug connector M8x1, 3-pin		0.3	**551397**	**SIES-8M-NS-24V-K-0,3-M8D**
N/C contact						
	Insertable in the slot from above, flush with the cylinder profile	Cable, 3-wire	PNP	7.5	**551391**	**SIES-8M-PO-24V-K-7,5-OE**
		Plug connector M8x1, 3-pin		0.3	**551392**	**SIES-8M-PO-24V-K-0,3-M8D**
		Cable, 3-wire	NPN	7.5	**551401**	**SIES-8M-NO-24V-K-7,5-OE**
		Plug connector M8x1, 3-pin		0.3	**551402**	**SIES-8M-NO-24V-K-0,3-M8D**

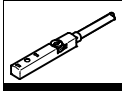
Note

For homing in combination with third-party motors.

Proximity sensors for size 40

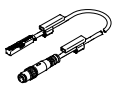
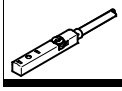
Permissible proximity sensor for sensing the position of the slide on the Y-axis

Ordering data – Proximity sensors for T-slot, inductive — Technical data ➔ Internet: sies

	Type of mounting	Electrical connection	Switching output	Cable length [m]	Part No.	Type
	Inserted in the slot from above, flush with the cylinder profile	Plug connector M8x1, 3-pin	PNP, N/O contact	0.3	**551387**	**SIES-8M-PS-24V-K-0,3-M8D**

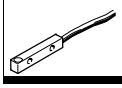
Permissible proximity sensors for sensing the positions on the Z-axis

Ordering data – Proximity sensors for T-slot — Technical data ➔ Internet: smt

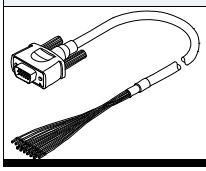
	Type of mounting	Electrical connection	Switching output	Cable length [m]	Part No.	Type
With mini slide DGSL (magneto-resistive)						
	Inserted in the slot from above, flush with the cylinder profile	Plug connector M8x1, 3-pin	PNP, N/O contact	0.3	**551367**	**SME-10M-DS-24V-E-0,3-L-M8D**
With mini slide EGSL (inductive)						
	Inserted in the slot from above, flush with the cylinder profile	Plug connector M8x1, 3-pin	PNP, N/O contact	0.3	**551387**	**SIES-8M-PS-24V-K-0,3-M8D**

Permissible proximity sensors in combination with sensor mounting EAPR-E12

Ordering data – Proximity sensors Technical data ➔ Internet: sies

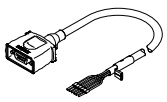
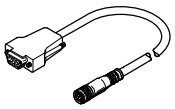
	Type of mounting	Electrical connection	Switching output	Part No.	Type
N/O contact					
	Screwed on	Plug connector M8x1, 3-pin	PNP	**150491**	**SIES-V3B-PS-S-L**
N/C contact					
	Screwed on	Cable, 3-wire	NPN	**174550**	**SIES-Q8B-NO-K-L**

Ordering data

	Description	Cable length [m]	Part No.	Type
Control cable NEBC				
	For the I/O interface to any controller	1	**2307459**	**NEBC-S1H15-E-1.0-N-LE15**
		2.5	**2052917**	**NEBC-S1H15-E-2.5-N-LE15**
		5	**2052918**	**NEBC-S1H15-E-5.0-N-LE15**
		10	**2052919**	**NEBC-S1H15-E-10.0-N-LE15**

Cables for Z-axis for size 40

Ordering data

	Description	Cable length [m]	Part No.	Type
Motor cable NEBM				
	– Min. bending radius: 62 mm – Suitable for use with energy chains – Ambient temp.: –40 … +80 °C	10	**1450372**	**NEBM-S1G9-E-10-Q5-LE6**
Encoder cable NEBM				
	– Min. bending radius: 51 mm – Suitable for use with energy chains – Ambient temp.: –40 … +70 °C	10	**550749**	**NEBM-M12G8-E-10-S1G9**
		15	**550750**	**NEBM-M12G8-E-15-S1G9**