MARTECH
SALES & ASSOCIATES INC.

www.martechsales.com
Tel: 905 716-5856
Email: info@martechsales.com

UNIMOTION

MCE and MSCE

MINI ELECTRIC CYLINDERS and SLIDERS

About Us

UNIMOTION is a leading company in the industrial automation field, at a global level. Combining innovative engineering solutions – Unimotion helps companies of all sizes across a wide range of industrial segments. Unimotion develops Industry 4.0-enabled products and systems with leading quality, performance and value. Engineering, Production, Construction, Warehouse, Research & Development department; all this can be found under one roof. Thanks to years of experience and a consistent focus on automation technology, we are continually improving our products and implementing innovations that provide customers with many technical advantages. Our core values are precision, innovation, passion, and integrity. At Unimotion, our main goal is the satisfaction of every single customer with a commitment to deliver the impossible.

Unimotion sales team, technicians and experts are at your disposal to provide customized expertise and support. We look forward to meeting you and work on your special project.

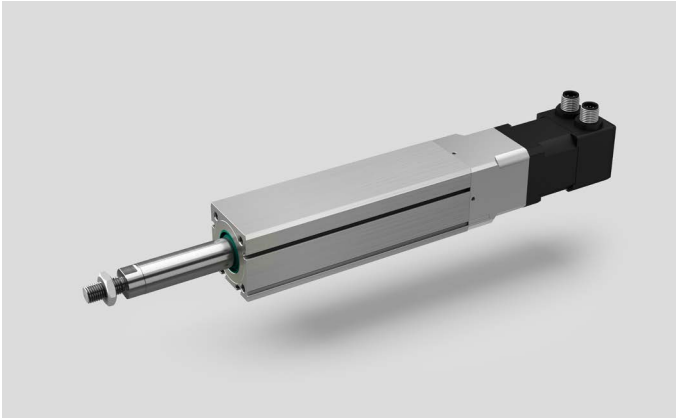
Follow UNIMOTION on different social platforms and subscribe to our latest news

Table of Contents

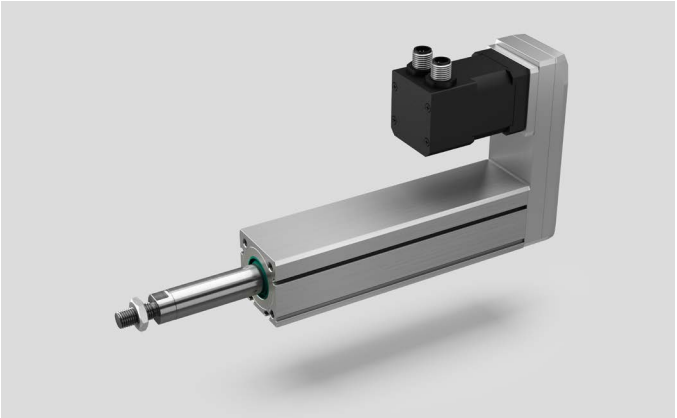
Overview

MINI ELECTRIC CYLINDER – MCE

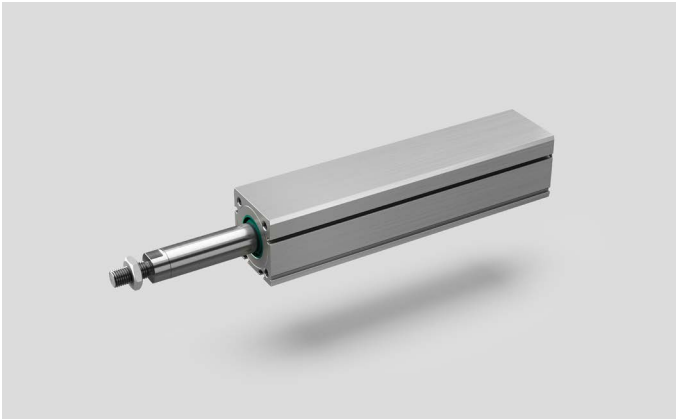
Combination with a standard motor and a motor adapter VK



Combination with a standard motor and a motor side drive MSD



Without a motor



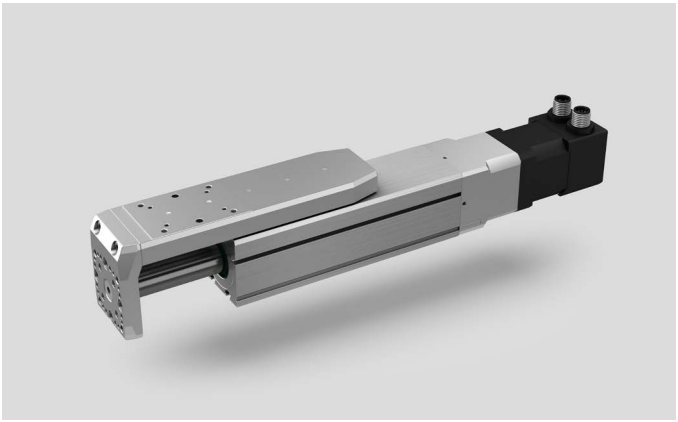
Basic technical data

MCE	Maximum permissible axial load [N]	Maximum travel speed [m/s]	Maximum stroke [mm]	Maximum repeatability [mm]**	Dimensions	
					Width [mm]*	Height [mm]*
25	170	0,45	200	±0,015	25,0	25,0
32	375	0,60	200	±0,015	32,0	32,0
45	695	0,75	200	±0,015	45,0	45,0

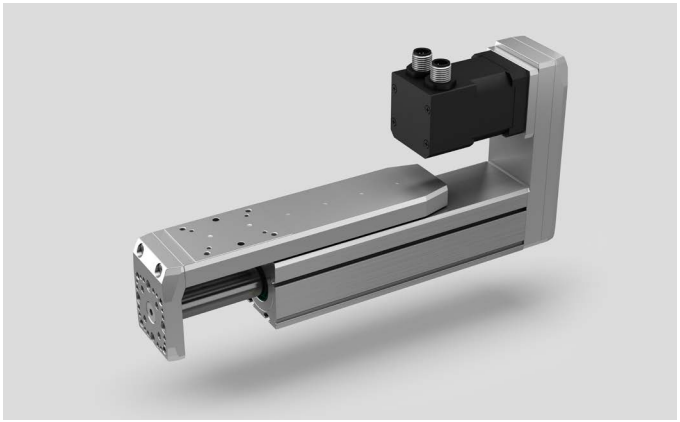
* Cylinder profile.
** Valid for one-directional axial load.

MINI ELECTRIC SLIDER – MSCE

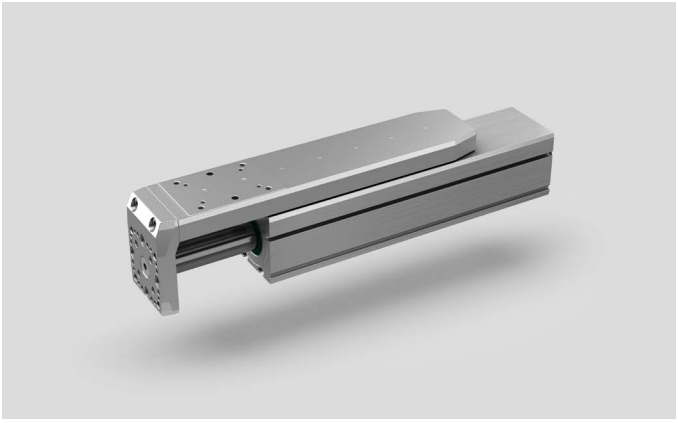
Combination with a standard motor and a motor adapter VK



Combination with astandard motor and amotor side drive MSD



Without a motor



Basic technical data

MSCE	Maximum permissible axial load [N]	Maximum travel speed [m/s]	Maximum stroke [mm]	Maximum repeatability [mm]***	Dimensions	
					Width [mm]*	Height [mm]**
25	170	0,45	200	±0,015	25,0	36,5
32	375	0,60	200	±0,015	32,0	45,0
45	695	0,75	200	±0,015	45,0	60,5

* Base profile.
** Base profile + slide.
*** Valid for one-directional axial load.

Mini electric cylinder – MCE

CHARACTERISTICS

Mini electric cylinder MCE is a mini linear drive with a piston rod. By using an integrated precision ball screw drive, the rotary motion (rotation) of the drive shaft is converted to the linear motion (translation) of the piston rod with high mechanical efficiency and low internal friction.

High-performance features such as high speed, good positioning accuracy, and high repeatability are ensured through a precision ball screw drive and an anti-rotating piston rod device.

A preassembled standard motor (in-line with a motor adapter and a coupling or in-parallel with a motor side drive and a timing belt) together with the standard drive, makes the system plug and play ready. Compact dimensions and optimally selected motor combinations cover a wide range of applications.

The aluminium cylinder profile includes T-slots on the bottom for fixing the electric cylinder, as well as side slots for clamping fixtures and magnetic field sensors.

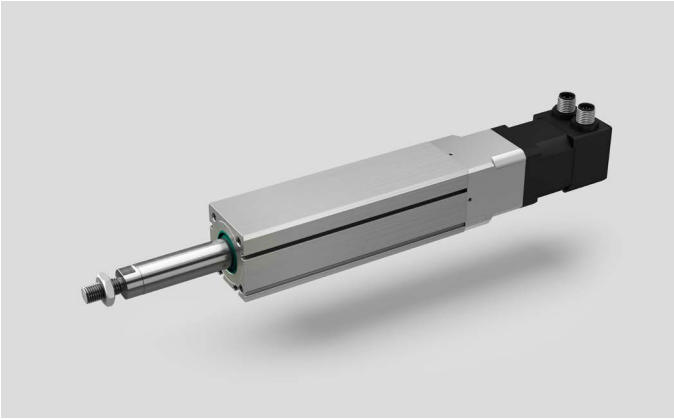
Options, such as female piston rod end and extended piston rod, together with a wide range of accessories make this product highly flexible. There is also an option of the mini electric cylinder without the preassembled motor if an individual motor is required.

For applications, where higher resistance to lateral loads or torsional moments is required, a guiding unit GUC can be used. By using the guiding unit, which offers high precision guiding and positioning, the mini electric cylinders can easily be combined to the multi-axis systems.

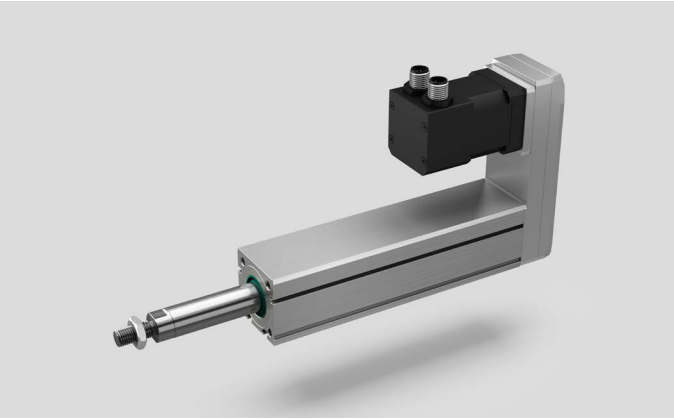
Excellent price-performance ratio and a quick delivery time, due to standard lengths, are ensured.

Each MCE is optimally pre-lubricated and ready for a maintenance-free operating process. MCE allows relatively high load capacities and optimal cycles for moving the larger payloads at high speeds in both horizontal and vertical directions.

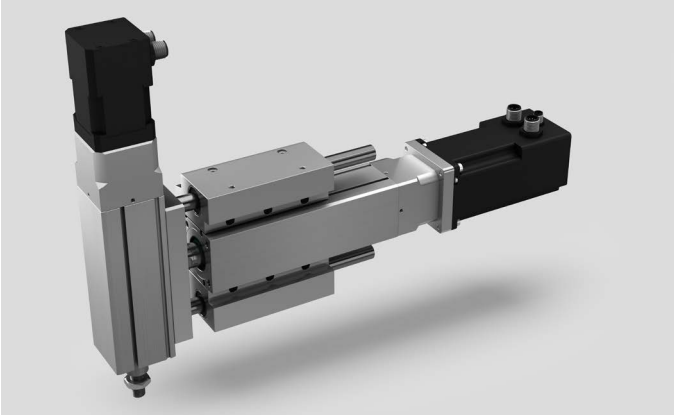
The aluminium profiles are manufactured according to the medium EN 12020-2 standard



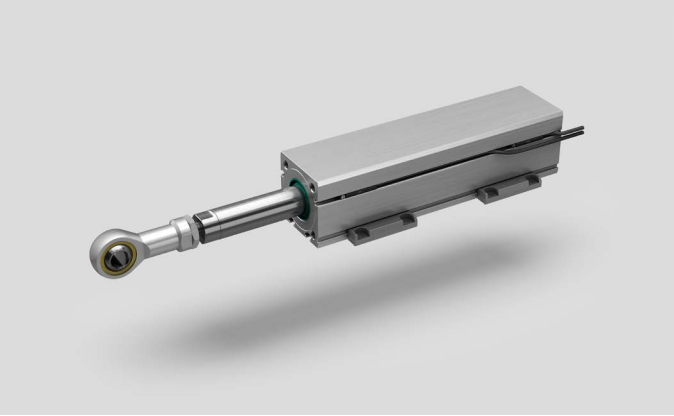
Motor adapter VK with a coupling and a motor



Motor side drive with timing a belt and a motor



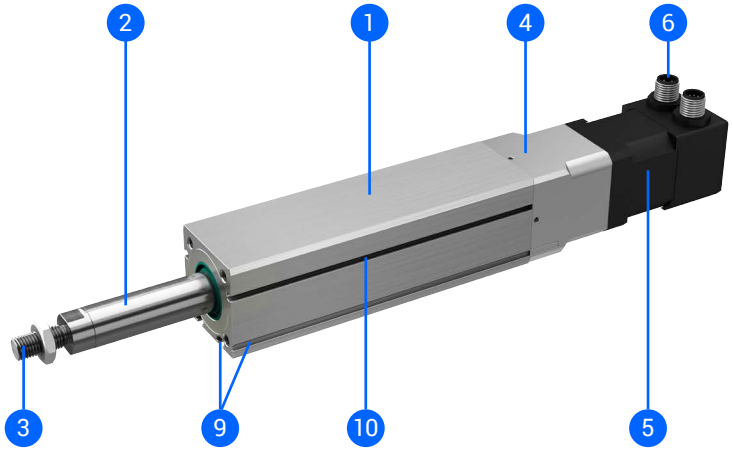
Multi-axis system (guiding unit GUC is used)



Accessories, MCE without a preassembled motor

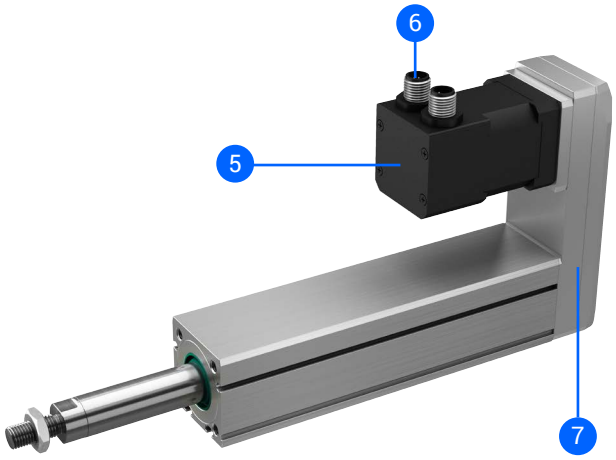
STRUCTURAL DESIGN

Combination with a standard motor and a motor adapter VK

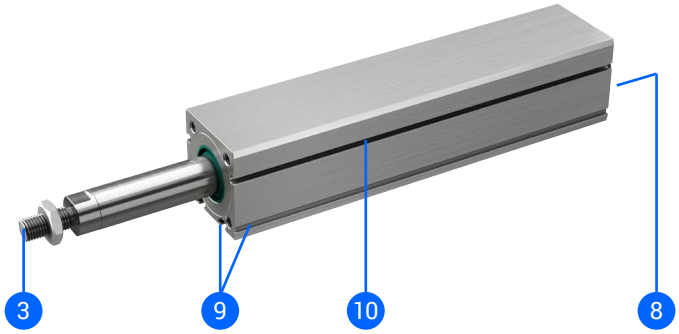


1 – Compact aluminium cylinder profile
2 – Piston rod (stainless steel) with an anti-rotation device
3 – Piston rod end (optionally a female thread is available)
4 – Motor adapter VK with a coupling
5 – Preassembled motor (with/without brake)
6 – Standard connectors (motor, encoder and brake – optionally)
7 – Motor side drive with a timing belt
8 – Drive shaft of a precision ball screw drive
9 – Slots for mounting
10 – Slots for the magnetic field sensors (size 32 and 45) or mounting the sensor holder (size 25)

Combination with a standard motor and a motor side drive MSD



Without a motor



HOW TO ORDER

MCE - 45 - 1003 - 150 - F - E20 - 0 - AB - AU - AA - AB - AA

Series:
MCE

Size:
– 25
– 32
– 45

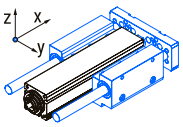
Ball screw size:
– MCE 25: Ø6 × 2, Ø6 × 6
– MCE 32: Ø8 × 2, Ø8 × 8
– MCE 45: Ø10 × 3, Ø10 × 10

Absolute stroke [mm]:
(Absolute stroke = Effective stroke + 2 × Safety stroke)
– 25, 50, 75, 100, 125, 150, 175, 200

Option 1:
– Leave blank: Standard (male thread)
– F: Female thread

Option 2:
– Leave blank: Without
– Extended piston rod E [mm]
(Max. extended piston rod: E_{max} = 100 mm)

Guiding unit:
– 0: Without a guiding unit
– B: With a guiding unit GUC (ball bushes)



Guiding unit GUC requires a female thread on the piston rod end (Option 1 → F).

Motor type and size:
– Leave blank: Without a motor

A B

Motor type:
– A: Stepper motor without a brake
– B: Stepper motor with a brake

Motor size □:
– A: 28 mm (Available soon)
– B: 42 mm
– C: 56 mm

Available sizes:
– MCE 25: 28
– MCE 32: 28, 42
– MCE 45: 42, 56

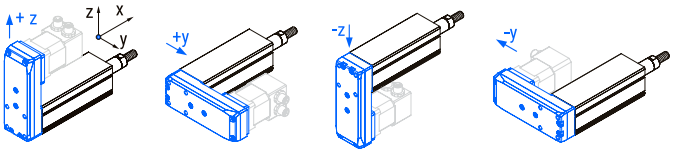
For more details please refer to the section “Electrical data → Motor types and sizes”

Motor mounting option:
– Leave blank: Without a motor

A U

Mounting option:
– A: With a motor adapter VK
– B: With a motor side drive MSD facing up
– C: With a motor side drive MSD facing right
– D: With a motor side drive MSD facing down
– E: With a motor side drive MSD facing left

Up Right Down Left

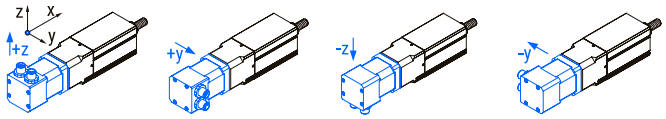


If a guiding unit GUC is considered, the motor side drive MSD can only be facing in the up or down directions, otherwise, the motor and the guiding unit may collide!

Direction of the motor connectors:
– U: Connectors facing up
– R: Connectors facing right
– D: Connectors facing down
– L: Connectors facing left

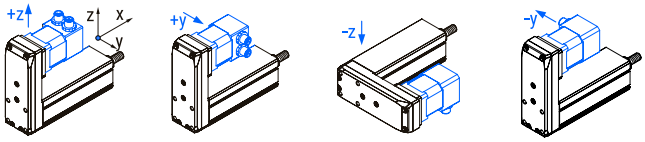
In combination with a motor adapter VK

Up Right Down Left



In combination with a motor side drive MSD

Up Right Down Left



When using the motor side drive MSD, the connectors can not be facing the MCE otherwise, the connectors and MCE may collide. These combinations are: BD, CL, DU and ER.

Drive option:
– Leave blank: Without a motor or drive

A A

Drive type:
– A: Stepper

For more details please refer to the section “Electrical data → Drive types”

Drive protocol/control:
– A: EtherCAT
– B: Ethernet based communication
– C: Pulse/direction control

Drive-motor cables option:
– Leave blank: Without a motor or drive
– 00: Without the cables

A B

Cables type:
– A: Robotic with a straight plug
– B: Robotic with an angled plug

Cables Length:
– A: 3 m
– B: 5 m
– C: 10 m

For more details please refer to the section “Electrical data → Drive-motor cables”

Power and signal cables:
– Leave blank: Without a motor or drive

A A

Power cable:
– 0: Without a power cable
– A: With a power cable

Length of the cable = 2 m

For more details please refer to the section “Electrical data → Power and signal cables”

Signal cable:
– 0: Without a signal cable
– A: With a signal cable

Length of the cable = 2 m
Signal cable is mandatory for the following cases:
– If a motor with a brake is used
– If a pulse/direction drive control is used
– If the limit switches are used

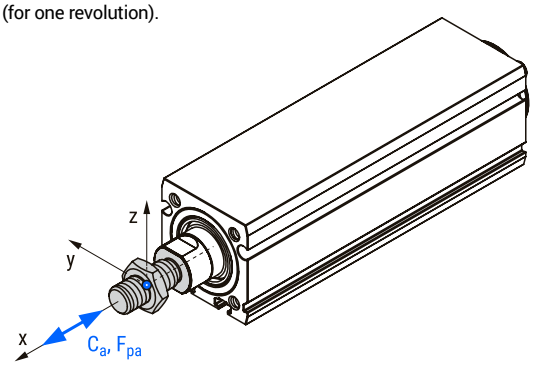
For more details please refer to the section “Electrical data → Power and signal cables”

TECHNICAL DATA

General technical data

MCE	Ball screw[4]	Dynamic axial load capacity[1]	Axial backlash (BS)[2]	Max. angle of piston rod rotation[3]	Max. repeatability[5]	Absolute stroke
	d × l [mm]	C_a [N]	[mm]	[°]	[mm]	[mm]
25	6 × 2	1900	≤ 0,05	≤ ±1	±0,015	25, 50, 75, 100, 125, 150, 175, 200
	6 × 6	1700				
32	8 × 2	2000	≤ 0,06	≤ ±1	±0,015	25, 50, 75, 100, 125, 150, 175, 200
	8 × 8	1500				
45	10 × 3	3500	≤ 0,06	≤ ±1	±0,015	25, 50, 75, 100, 125, 150, 175, 200
	10 × 10	3200				

[1] Dynamic axial load capacity of the ball screw drive. This value is the basis for calculating the service life.
[2] Valid for ball screw drive in new condition.
[3] Regarding to anti-rotation piston rod device in new condition.
[4] d = ball screw nominal diameter, l = ball screw lead (for one revolution).
[5] Valid for one-directional axial load.



Drive data

Combination with a standard motor and a motor adapter VK

MCE + motor and VK	Ball screw	Motor		Max. permissible axial load[1, 2]	Max. permissible payload[1]		Max. travel speed[2]	Max. rotational speed	Max. acceleration
					Horizontal[2, 3]	Vertical[2]			
	d × l [mm]	Type	Size □ [mm]	F_{pa} [N]	m_{ph} [kg]	m_{pv} [kg]	v_{max} [m/s]	n_{max} [rev/min]	a_{max} [m/s²]
25	6 × 2	Stepper	28	170	57	14	0,100	3000	20
	6 × 6			90	13	7,4	0,300		
32	8 × 2		28	215	72	18	0,094	2810	20
			42	375	126	31	0,100	3000	
	8 × 8		28	50	6,6	4,0	0,400		
			42	200	35	17	0,400		
45	10 × 3		42	465	156	39	0,150	3000	20
			56	695	233	58	0,150		
	10 × 10		42	135	21	11	0,492	2950	
			56	580	133	49	0,500	3000	

[1] This value depends on the selected motor, travel speed and acceleration of the piston rod (see the following diagrams).
[2] Valid for the entire stroke range. Guiding unit GUC is not taken into consideration.
[3] Valid for the payload supported by an external guiding (coefficient of friction 0,1 is taken into consideration).
Maximum unsupported payload (lateral load) is presented on the following diagrams.

Combination with a standard motor and a motor side drive MSD

MCE + motor and MSD	Ball screw	Motor		Max. permissible axial load[1, 2]	Max. permissible payload[1]		Max. travel speed[2]	Max. rotational speed	Max. acceleration
					Horizontal[2, 3]	Vertical[2]			
	d × l [mm]	Type	Size □ [mm]	F_{pa} [N]	m_{ph} [kg]	m_{pv} [kg]	v_{max} [m/s]	n_{max} [rev/min]	a_{max} [m/s²]
25	6 × 2	Stepper	28	170	57	14	0,100	3000	20
	6 × 6			90	13	7,4	0,300		
32	8 × 2		28	180	60	15	0,064	1920	20
			42	375	126	31	0,100	3000	
	8 × 8		28	40	6,8	3,1	0,208	1560	
			42	175	35	15	0,400	3000	
45	10 × 3		42	400	134	33	0,148	2960	20
			56	695	233	58	0,150	3000	
	10 × 10		42	120	20	10	0,477	2860	
			56	450	133	38	0,500	3000	

Without a motor

MCE without a motor	Ball screw	Max. permissible axial load[2]	Max. permissible payload		Max. drive torque	No load torque	Max. permissible radial load on shaft	Max. travel speed[2]	Max. rotational speed	Max. acceleration
			Horizontal[2, 3]	Vertical[2]						
	d × l [mm]	F_{pa} [N]	m_{ph} [kg]	m_{pv} [kg]	M_p [Nm]	M_0 [Nm]	F_{pr} [N]	v_{max} [m/s]	n_{max} [rev/min]	a_{max} [m/s²]
25	6 × 2	170	57	14	0,06	0,02	25	0,150	4500	20
	6 × 6	90	30	7	0,10	0,02		0,450		
32	8 × 2	375	126	31	0,13	0,04	50	0,150	4500	20
	8 × 8	375	126	31	0,53	0,05		0,600		
45	10 × 3	695	233	58	0,37	0,07	100	0,225	4500	20
	10 × 10	695	233	58	1,23	0,09		0,750		

[1] This value depends on the selected motor, travel speed and acceleration of the piston rod (see the following diagrams).
[2] Valid for the entire stroke range. Guiding unit GUC is not taken into consideration.
[3] Valid for the payload supported by an external guiding (coefficient of friction 0,1 is taken into consideration).
Maximum unsupported payload (lateral load) is presented on the following diagrams.

Operating conditions

Ambient temperature	0 °C ~ +50 °C
Ambient temperature without a motor	0 °C ~ +60 °C
Protection class	IP40
Duty cycle	100 %
Maintenance	Life-time pre-lubricated

Recommended values of loads:
All the data of the dynamic load capacities (ball screw drive) stated in the tables above are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety and service life.

We recommend a minimum dynamic safety factor of 5,0 or more. Please refer to page 95, where calculation of the safety factor of the ball screw drive and how the applied load affects the service life are presented.

Mass and mass moment of inertia

MCE without a motor	Ball screw	Moved mass*	Mass of the mini electric cylinder**	Mass moment of inertia
	d × l [mm]	$m_{m,\,MCE}$ [kg]	m_{MCE} [kg]	J_{MCE} [10^{-2} kg cm^2]
25	6 × 2	0,06 + 0,0004 × Abs. stroke + 0,0004 × E	0,15 + 0,0013 × Abs. stroke + 0,0004 × E	0,28 + 0,0007 × Abs. stroke + 0,00004 × E + 0,1013 × m_{load}
	6 × 6			0,33 + 0,0011 × Abs. stroke + 0,00036 × E + 0,9119 × m_{load}
32	8 × 2	0,12 + 0,0005 × Abs. stroke + 0,0005 × E	0,31 + 0,0023 × Abs. stroke + 0,0005 × E	0,70 + 0,0025 × Abs. stroke + 0,00005 × E + 0,1013 × m_{load}
	8 × 8			0,88 + 0,0033 × Abs. stroke + 0,00077 × E + 1,6211 × m_{load}
45	10 × 3	0,20 + 0,0010 × Abs. stroke + 0,0010 × E	0,67 + 0,0043 × Abs. stroke + 0,0010 × E	2,77 + 0,0057 × Abs. stroke + 0,00022 × E + 0,2280 × m_{load}
	10 × 10			3,23 + 0,0081 × Abs. stroke + 0,00249 × E + 2,5330 × m_{load}

* The moved mass is already considered in the equation for calculating the mass of the mini electric cylinder m_{MCE} and the mass moment of inertia J_{MCE}. The moved mass includes the mass of the piston rod with the internal anti-rotation device and ball nut.
** For combination with standard motor and motor adapter VK or motor side drive MSD this mass m_{MCE} should be increased by m_{VK+m} or m_{MSD+m} respectively, see the table below.

Mass and moved mass of the guiding unit GUC are not included in the moved mass $m_{m,MCE}$, in the mass m_{MCE} and in the mass moment of inertia J_{MCE}. Please refer to the Guiding unit section for more information.

Abs. stroke	Absolute stroke	[mm]
E	Extended piston rod	[mm]
m_{load}	Applied mass to be moved	[kg]

Additional mass of an electric cylinder when combining the motor with the motor adapter VK or the motor side drive MSD

MCE	Motor		Motor without a brake		Motor with a brake	
			Mass of the motor and motor adapter VK	Mass of the motor and motor side drive MSD	Mass of the motor and motor adapter VK	Mass of the motor and motor side drive MSD
	Type	Size □ [mm]	$m_{VK\,+\,m}$ [kg]	$m_{MSD\,+\,m}$ [kg]	$m_{VK\,+\,m}$ [kg]	$m_{MSD\,+\,m}$ [kg]
25	Stepper	28	Available soon			
32		28				
		42	0,42	0,52	1,22	1,32
45		42	0,47	0,61	1,27	1,41
		56	0,59	0,77	1,50	1,68

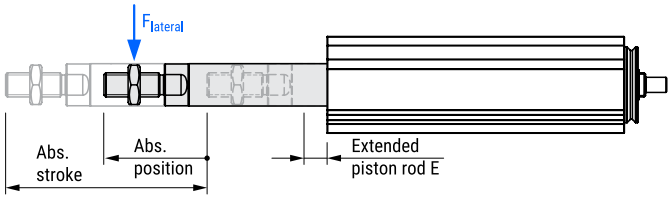
Planar moment of inertia

MCE	Cylinder profile	
	I_y [cm^4]	I_z [cm^4]
25	2,10	1,98
32	6,42	6,58
45	25,37	25,16

Holding torque of a motor brake

Motor		Holding torque (brake) [Nm]
Type	Size □ [mm]	
Stepper	28	Available soon
	42	0,4
	56	1,0

Maximum lateral loading as a function of the piston rod absolute position

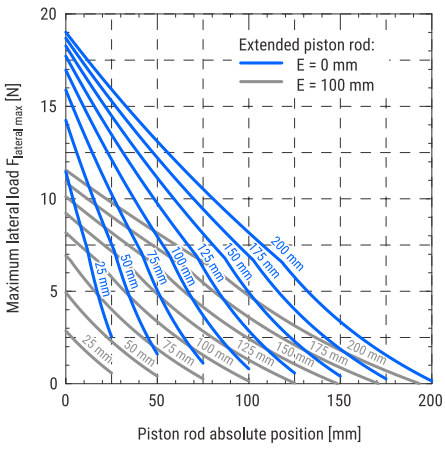


On the following diagrams, the maximum lateral loads acting on the piston rod end as a function of the piston rod absolute position for different values of the absolute stroke are presented. There is also an extended piston rod (E) taken into consideration.

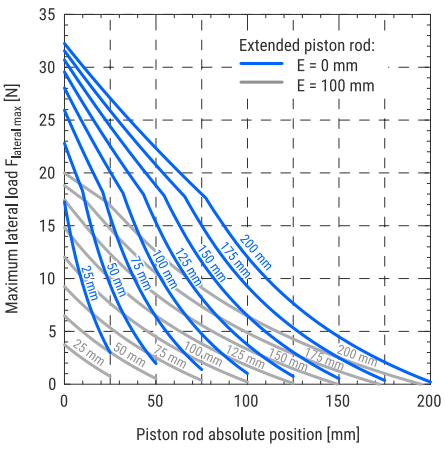
Values on the curves represent an absolute stroke of the cylinder.

Diagrams consider the maximum travel speed of the particular size of the cylinder. When operating with lower travel speeds, the maximum lateral load may be higher.

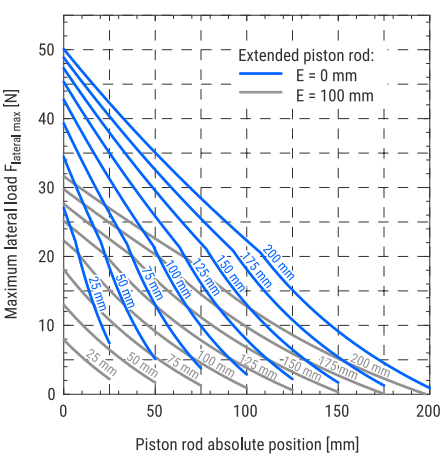
MCE 25



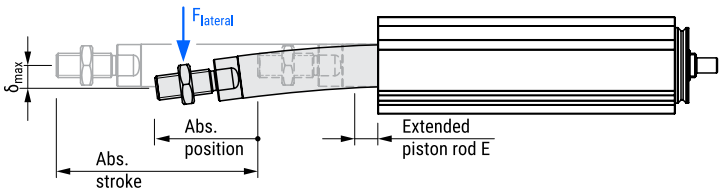
MCE 32



MCE 45



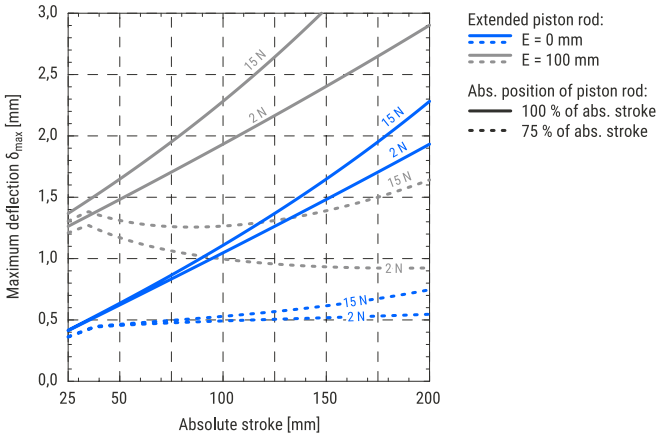
Maximum deflection of the piston rod end as a function of the cylinder absolute stroke



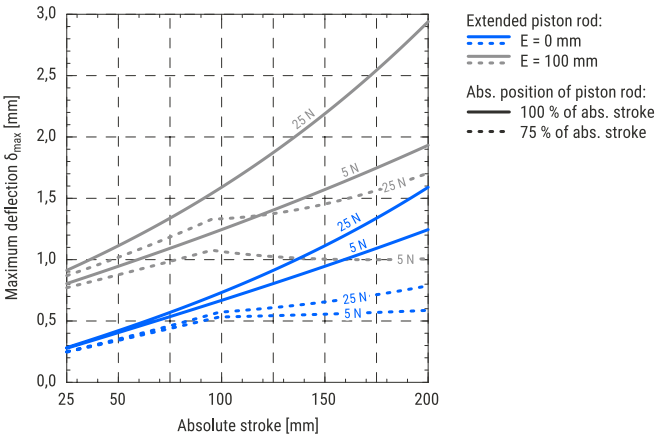
On the following diagrams, the maximum deflections of the piston rod end subjected to different lateral loads for different absolute positions (defined as a portion of the absolute stroke) are presented. There is also an extended piston rod (E) taken into consideration.

Values on the curves represent lateral load applied to the piston rod end.

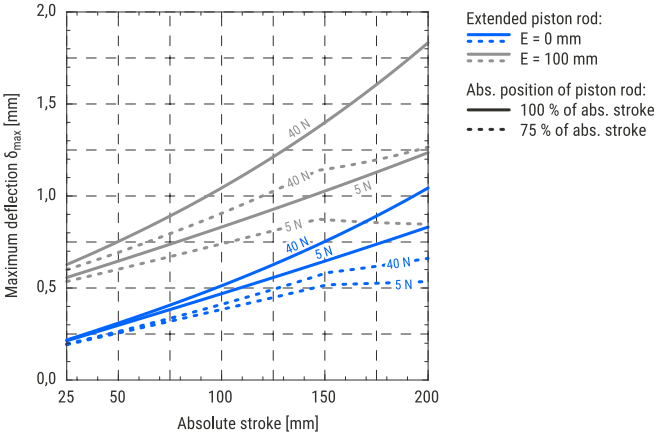
MCE 25



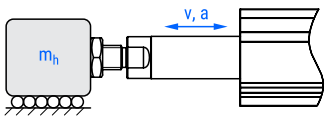
MCE 32



MCE 45



Maximum horizontal payload as a function of the travel speed and acceleration of the piston rod



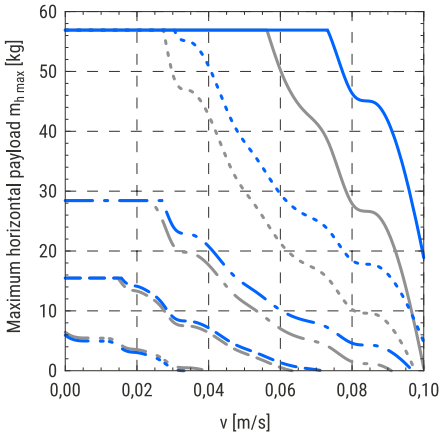
On the following diagrams, the maximum horizontal payloads applied to the piston rod as a function of the travel speed for different accelerations, different ball screw leads and different combinations of the standard motors are presented. Motor adapter VK and a motor side drive MSD are also considered.

Diagrams are valid when the payload is supported by an external guiding (coefficient of friction 0,1 has been considered).

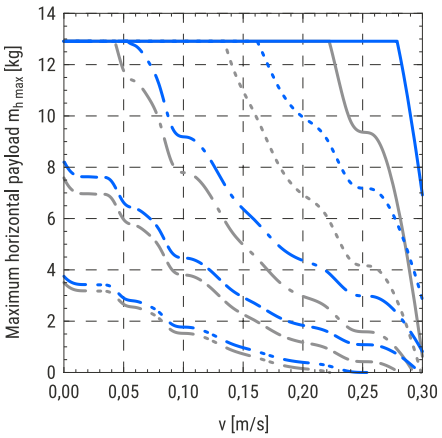
It should be noted that the diagrams are also valid for the case where a guiding unit GUC is considered.

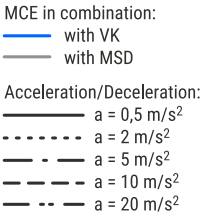
MCE 25

6 × 2 with a stepper motor □28



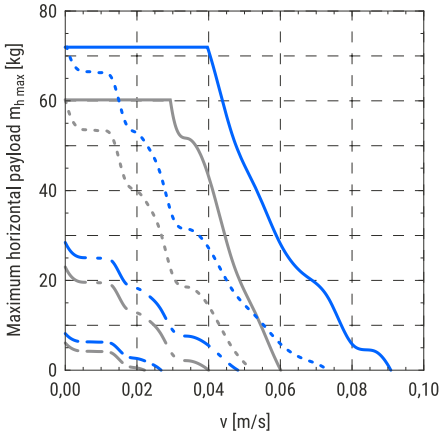
6 × 6 with a stepper motor □28



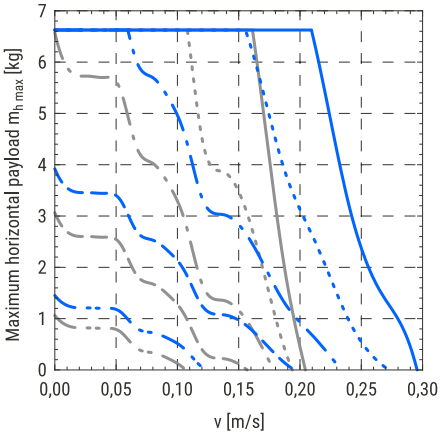


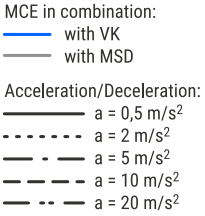
MCE 32

8 × 2 with a stepper motor □28

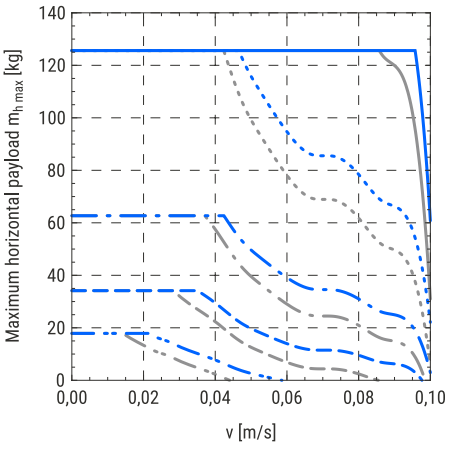


8 × 8 with a stepper motor □28

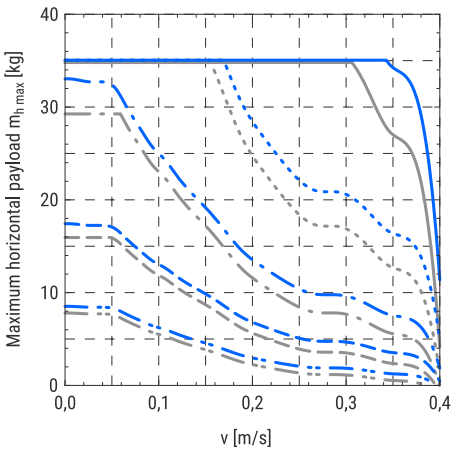


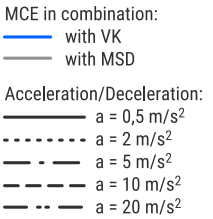


8 × 2 with a stepper motor □42



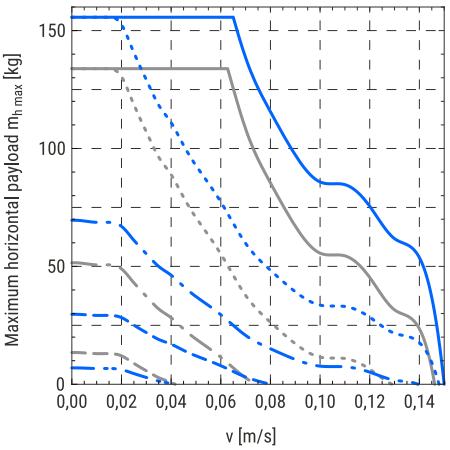
8 × 8 with a stepper motor □42



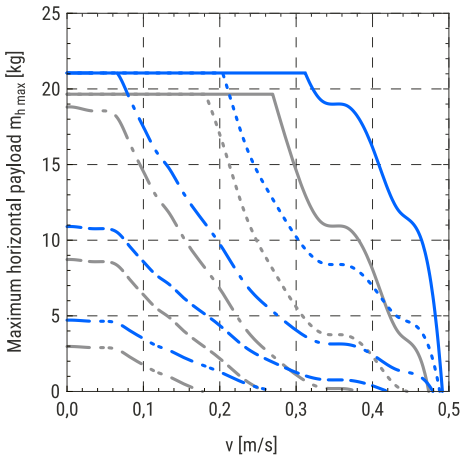


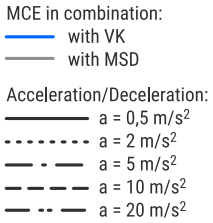
MCE 45

10 × 3 with a stepper motor □42

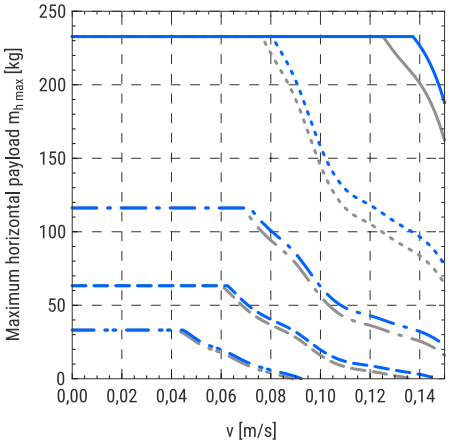


10 × 10 with a stepper motor □42

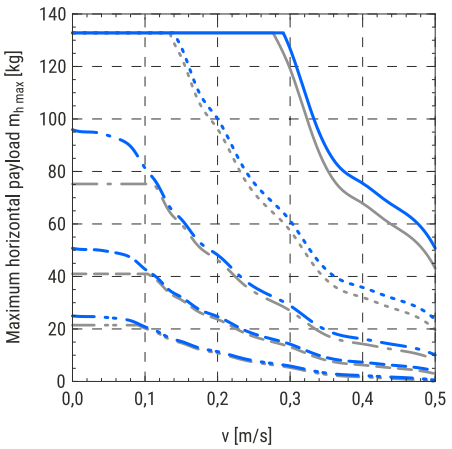


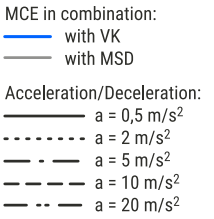


10 × 3 with a stepper motor □56

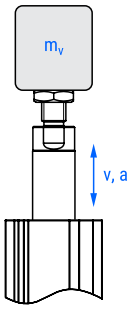


10 × 10 with a stepper motor □56





Maximum vertical payload as a function of the travel speed and acceleration of the piston rod

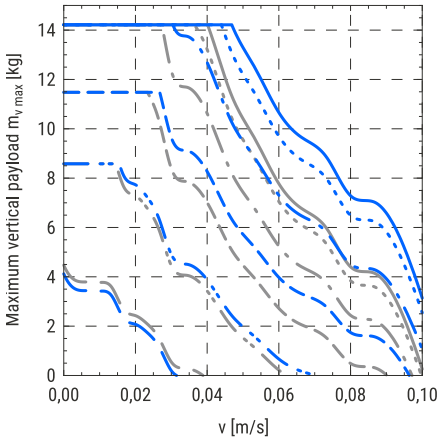


On the following diagrams, the maximum vertical payloads applied to the piston rod as a function of the travel speed for different accelerations, different ball screw leads and different combinations of the standard motors are presented. Motor adapter VK and a motor side drive MSD are also considered.

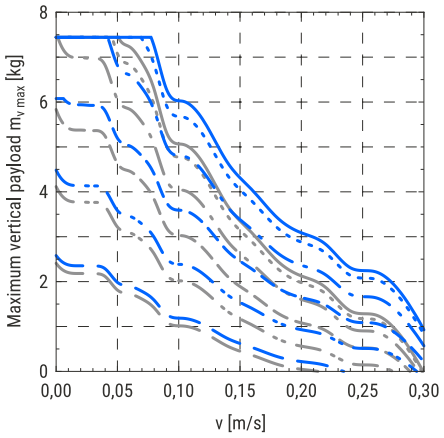
For the case that guiding unit GUC is taken into consideration, the value obtained from the diagram should be decreased by the moving mass of the guiding unit (please refer to the Guiding unit section).

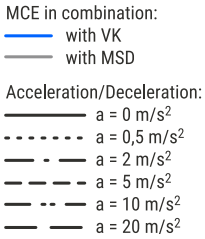
MCE 25

6 × 2 with a stepper motor □28



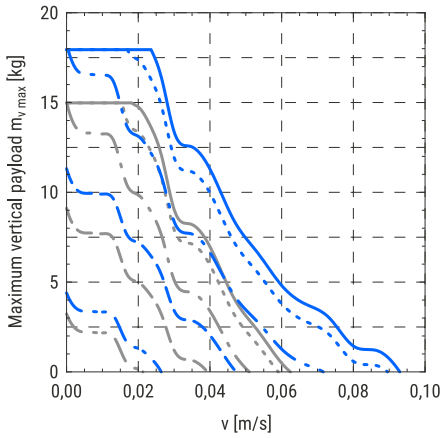
6 × 6 with a stepper motor □28



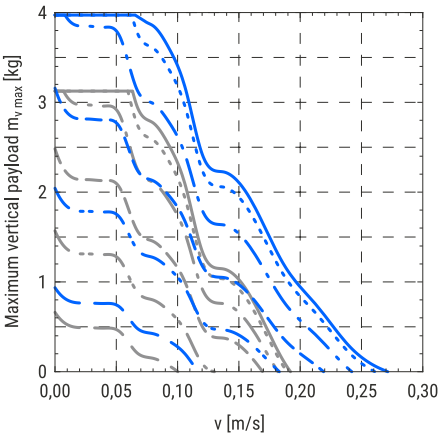


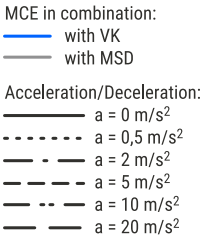
MCE 32

8 × 2 with a stepper motor □28

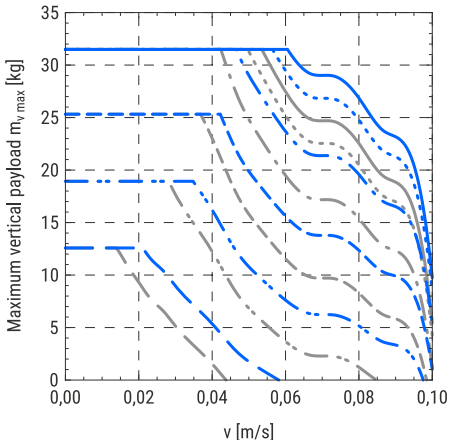


8 × 8 with a stepper motor □28

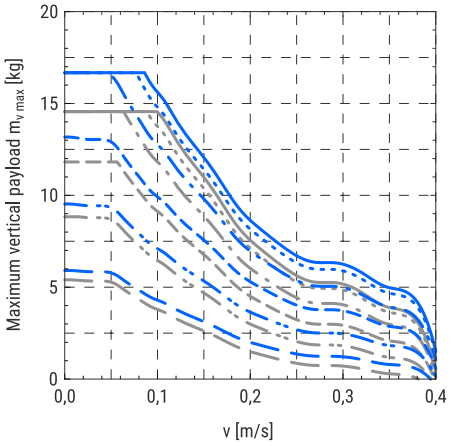


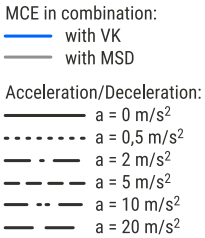


8 × 2 with a stepper motor □42



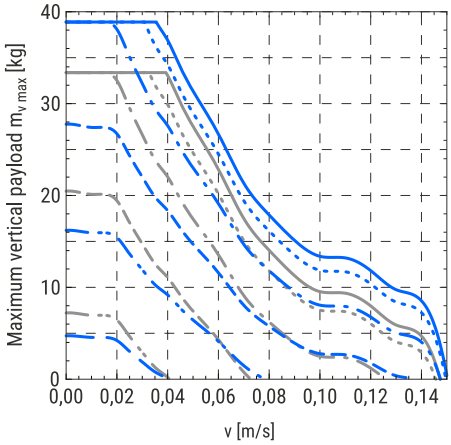
8 × 8 with a stepper motor □42



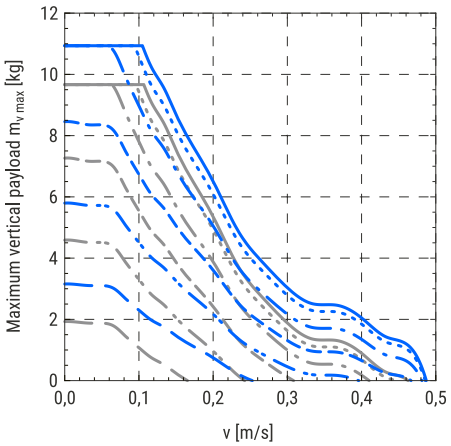


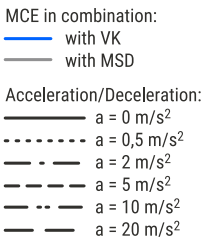
MCE 45

10 × 3 with a stepper motor □42

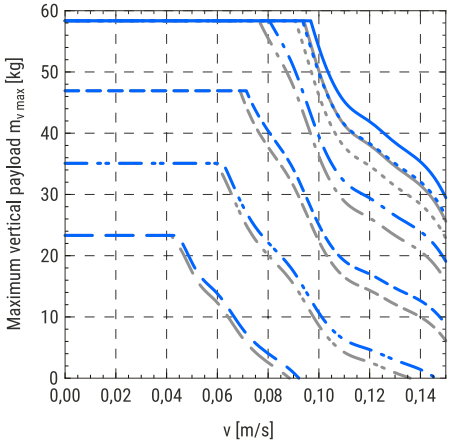


10 × 10 with a stepper motor □42

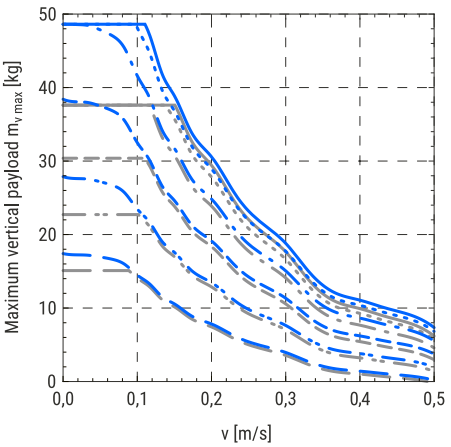


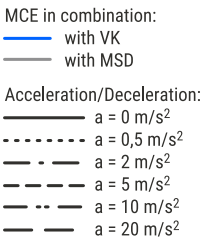


10 × 3 with a stepper motor □56

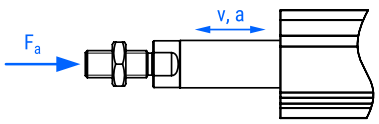


10 × 10 with a stepper motor □56





Maximum axial load as a function of the travel speed and acceleration of the piston rod

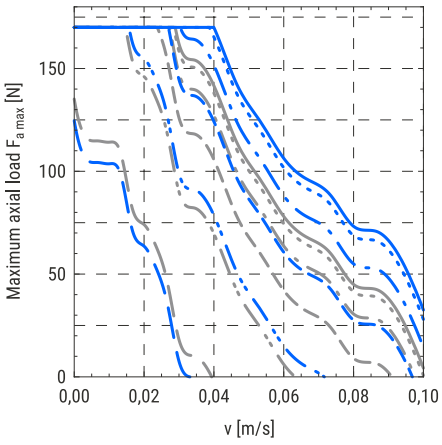


On the following diagrams, the maximum axial load applied to the piston rod as a function of the travel speed for different accelerations, different ball screw leads and different combinations of the standard motors is presented. Motor adapter VK and a motor side drive MSD are also considered.

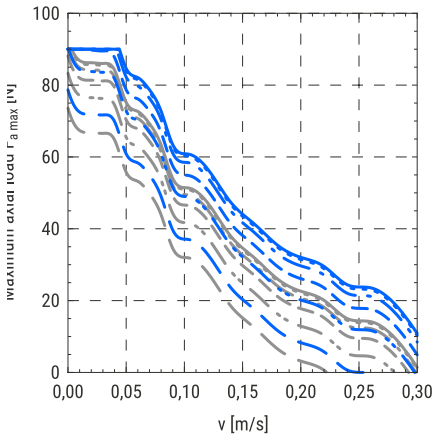
For the case where a guiding unit GUC is used, the value obtained from the diagram should be decreased by the moving mass of the guiding unit (please refer to the Guiding unit section) multiplied by the acceleration of the piston rod.

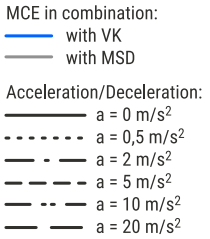
MCE 25

6 × 2 with a stepper motor □28



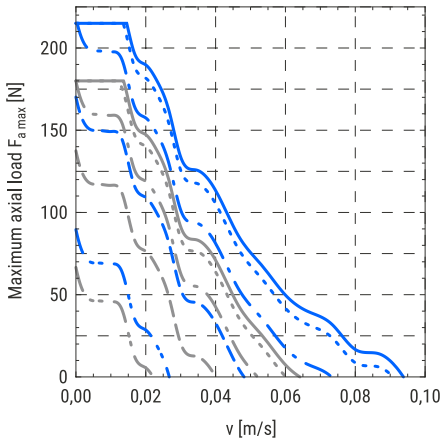
6 × 6 with a stepper motor □28



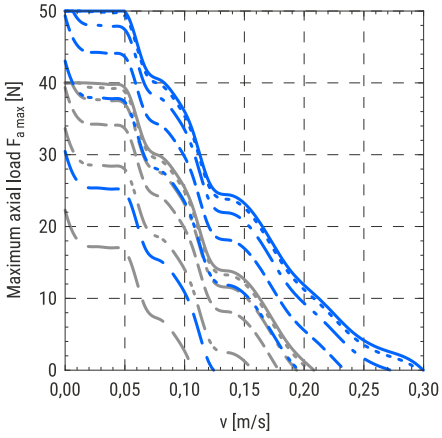


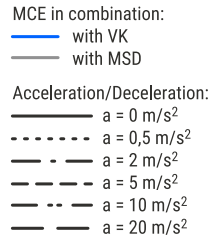
MCE 32

8 × 2 with a stepper motor □28

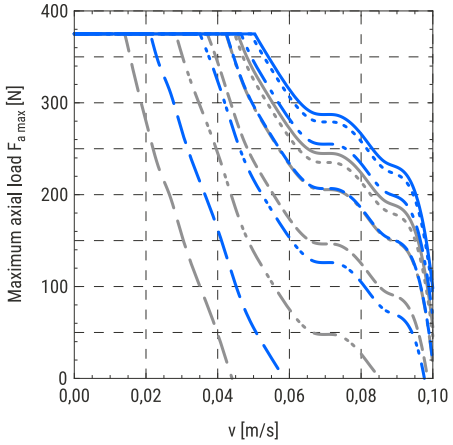


8 × 8 with a stepper motor □28

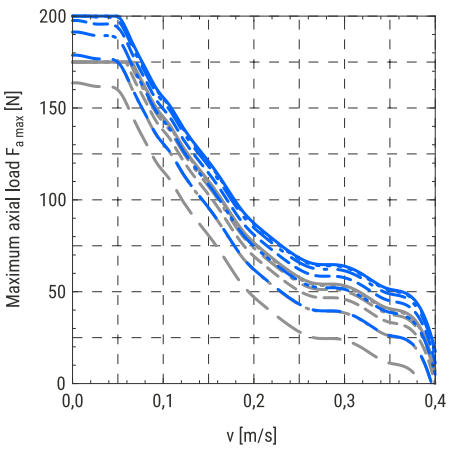




8 × 2 with a stepper motor □42

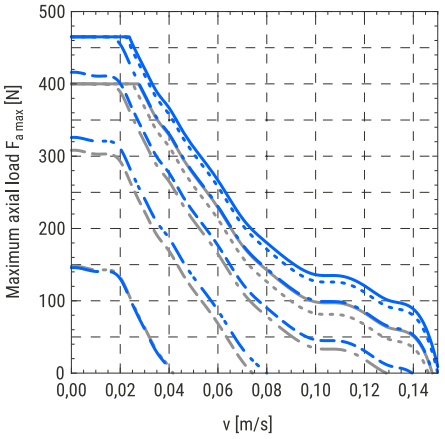


8 × 8 with a stepper motor □42

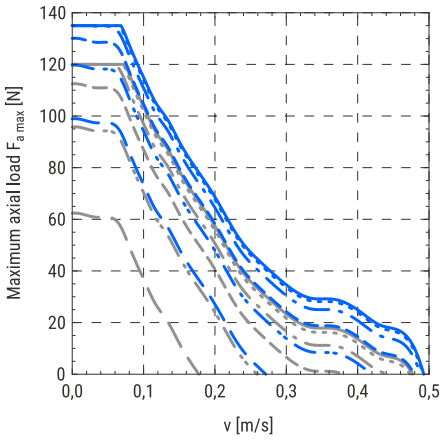


MCE 45

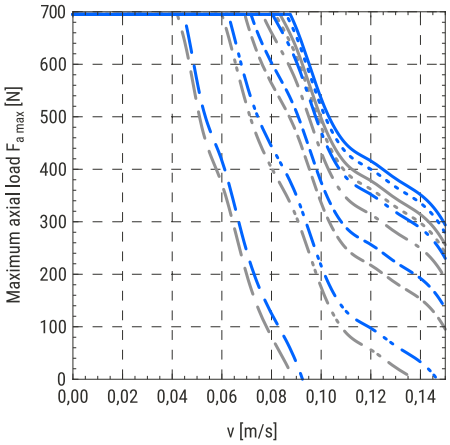
10 × 3 with a stepper motor □42



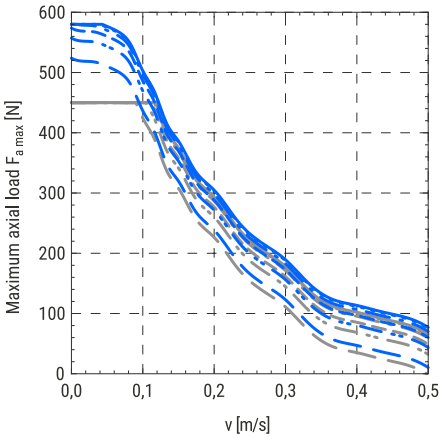
10 × 10 with a stepper motor □42



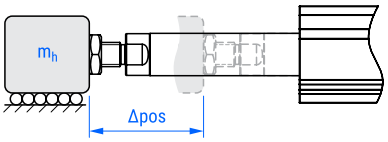
10 × 3 with a stepper motor □56



10 × 10 with a stepper motor □56



Maximum horizontal payload as a function of change of the position and positioning time of the piston rod



The following diagrams show the maximum payload that can be moved by a certain horizontal distance within a positioning time frame. Acceleration/deceleration time of 100 ms is taken into account.

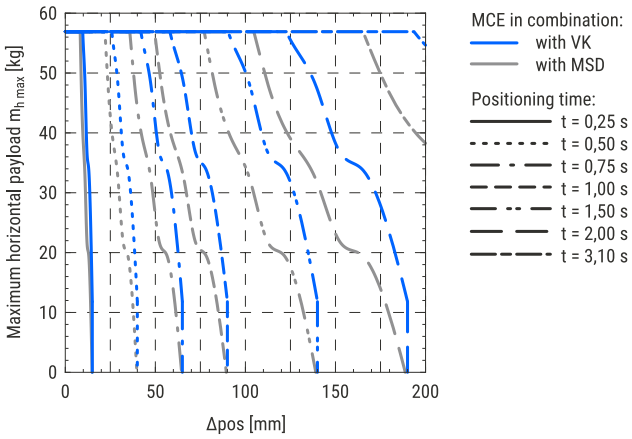
Diagrams depend on the ball screw leads and different combinations of the standard motors. Motor adapter VK and a motor side drive MSD are also considered.

Diagrams are valid when the payload is supported by an external guiding (coefficient of friction 0,1 has been considered).

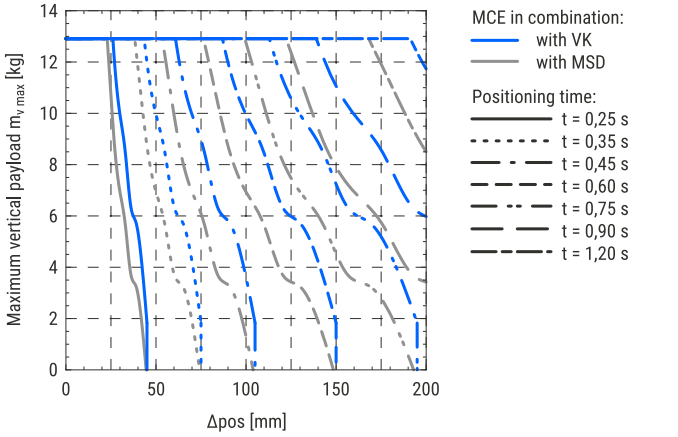
It should be noted that the diagrams are also valid for the case where a guiding unit GUC is considered.

MCE 25

6 × 2 with a stepper motor □28

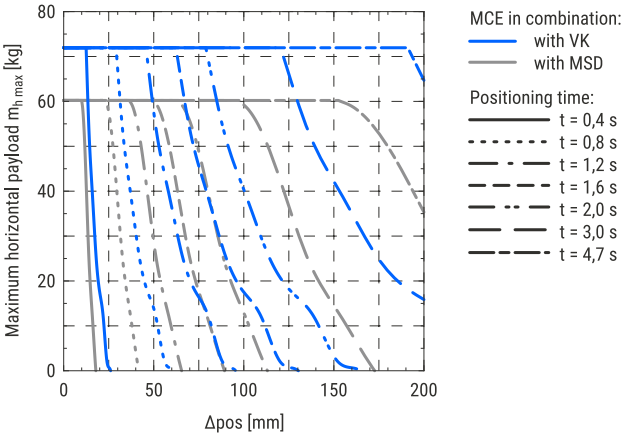


6 × 6 with a stepper motor □28

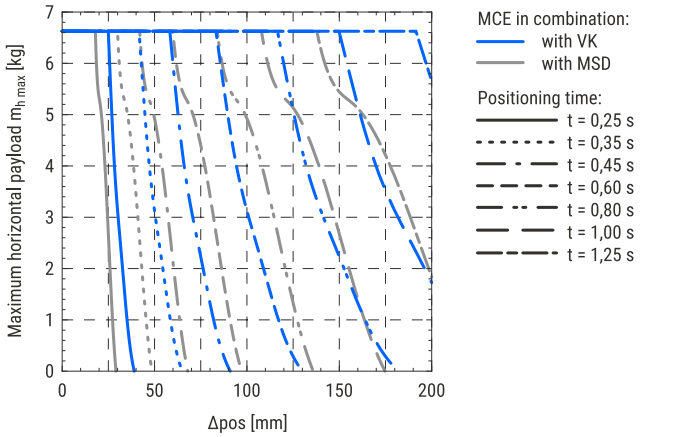


MCE 32

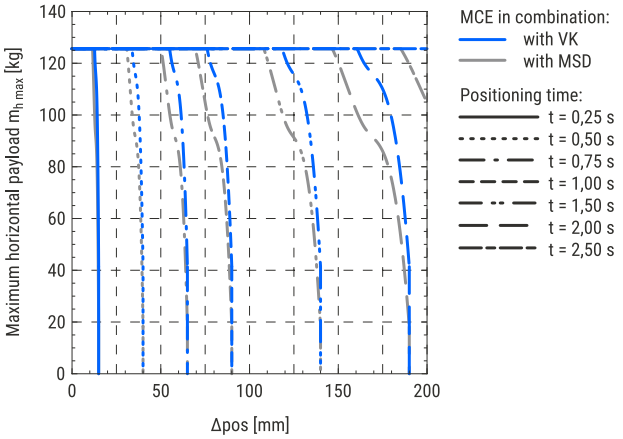
8 × 2 with a stepper motor □28



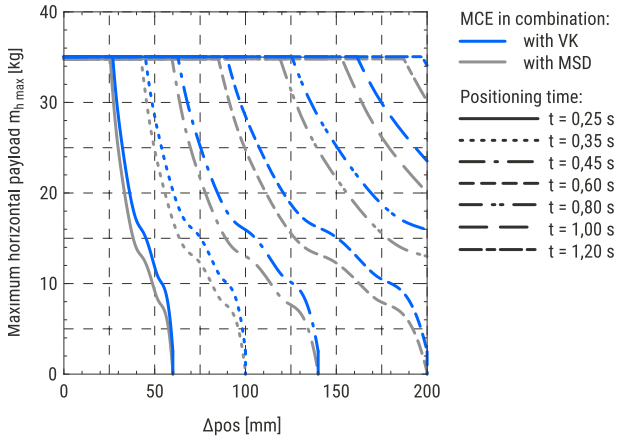
8 × 8 with a stepper motor □28



8 × 2 with a stepper motor □42

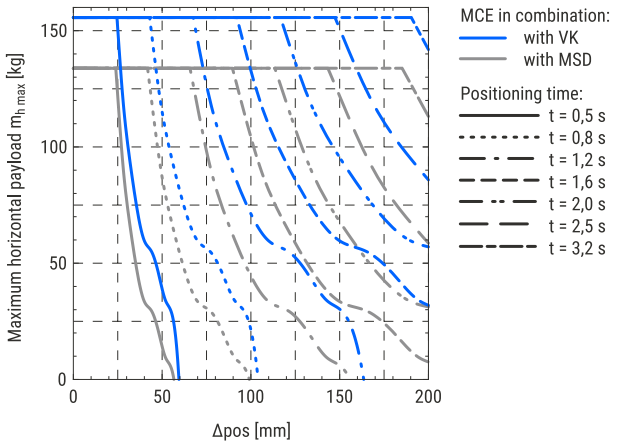


8 × 8 with a stepper motor □42

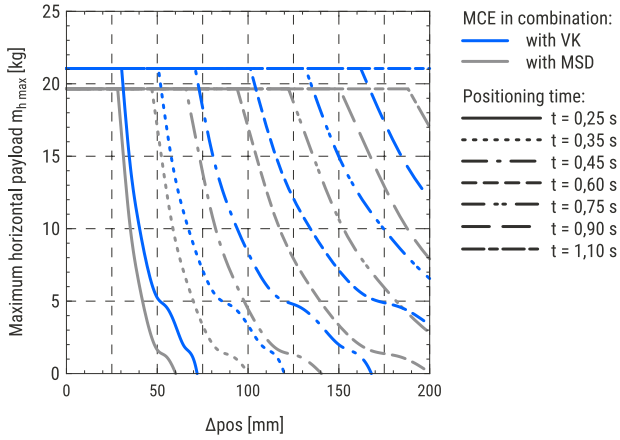


MCE 45

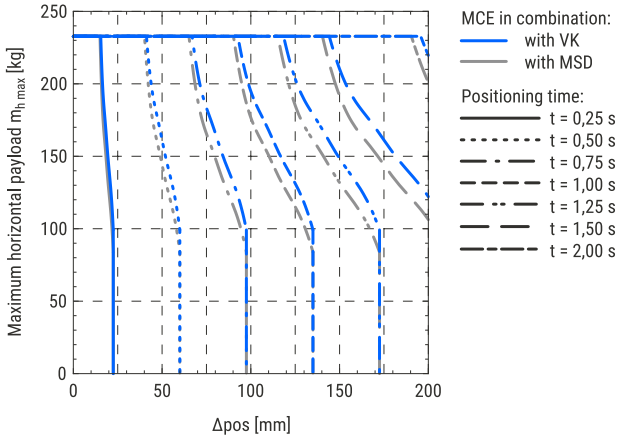
10 × 3 with a stepper motor □42



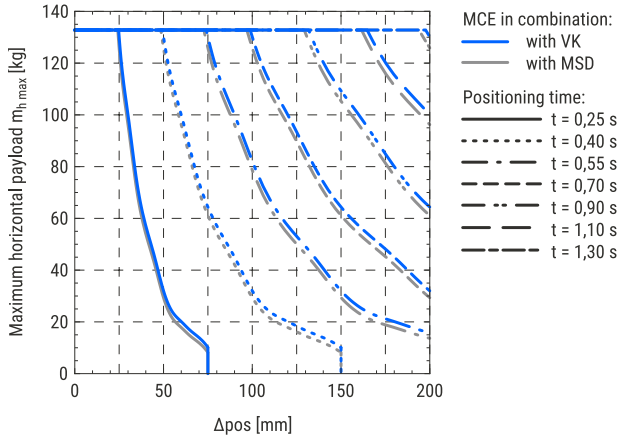
10 × 10 with a stepper motor □42



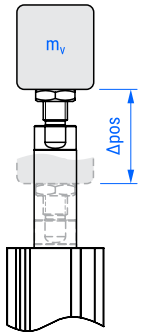
10 × 3 with a stepper motor □56



10 × 10 with a stepper motor □56



Maximum vertical payload as a function of change of the position and positioning time of the piston rod



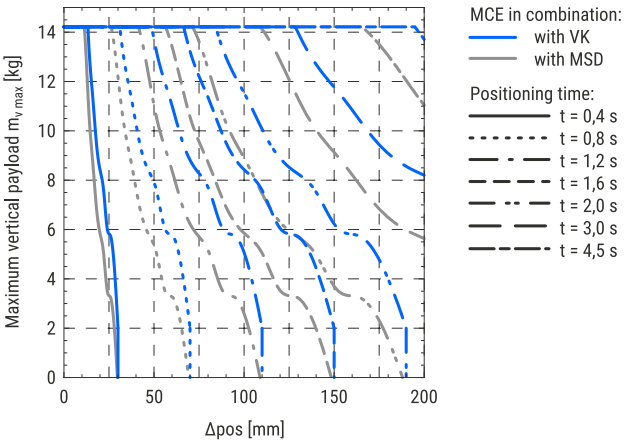
The following diagrams show the maximum payload that can be moved by a certain vertical distance within a positioning time frame. Acceleration/deceleration time of 100 ms is taken into account.

Diagrams depend on the ball screw leads and different combinations of the standard motors. Motor adapter VK and a motor side drive MSD are also considered.

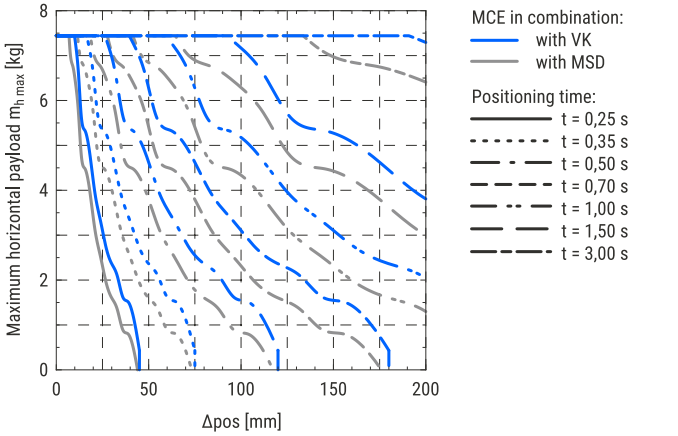
For the case where a guiding unit GUC is used, the value obtained from the diagram should be decreased by the moving mass of the guiding unit (please refer to the Guiding unit section).

MCE 25

6 × 2 with a stepper motor □28

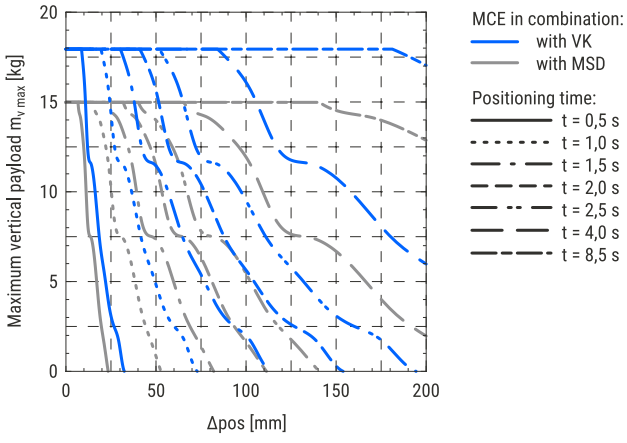


6 × 6 with a stepper motor □28

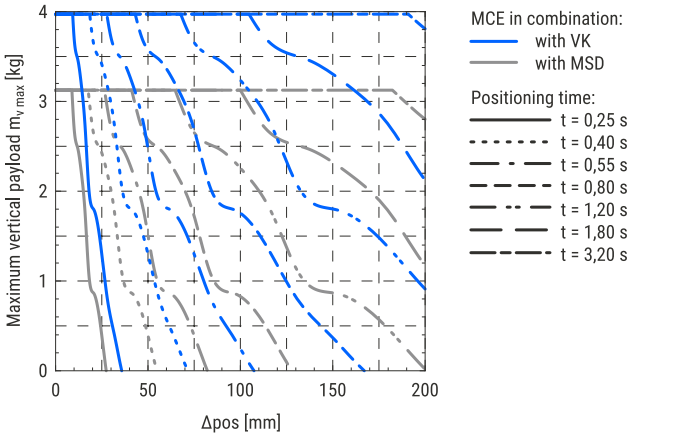


MCE 32

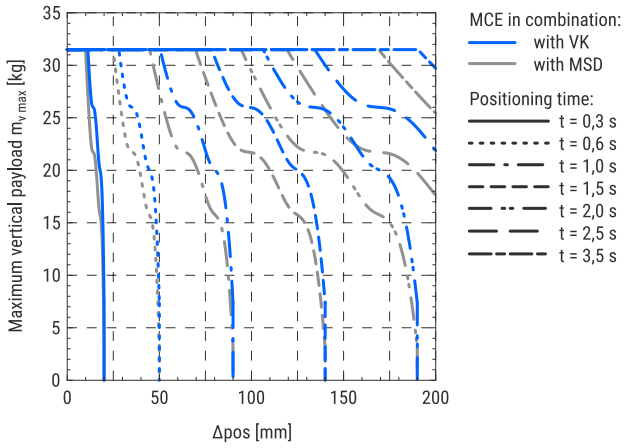
8 × 2 with a stepper motor □28



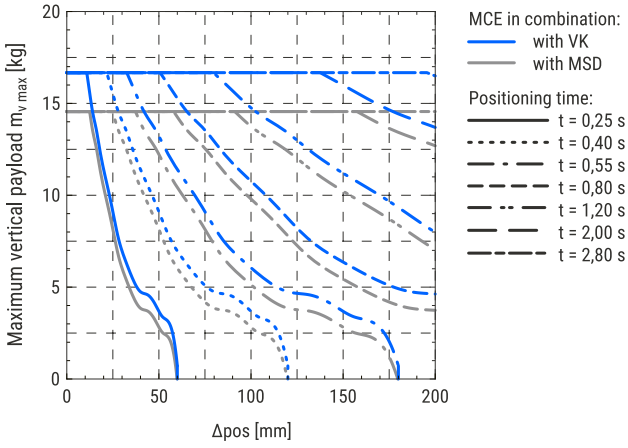
8 × 8 with a stepper motor □28



8 × 2 with a stepper motor □42

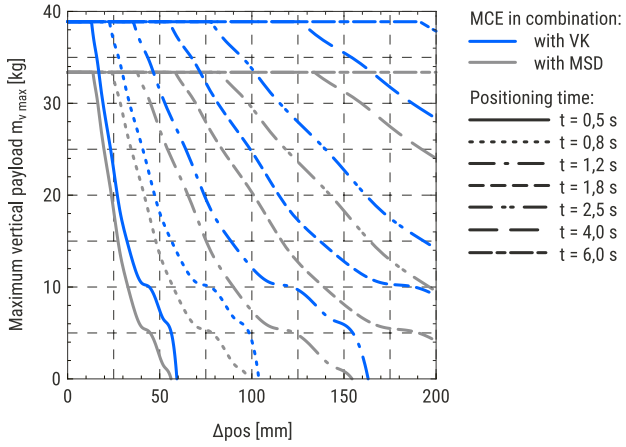


8 × 8 with a stepper motor □42

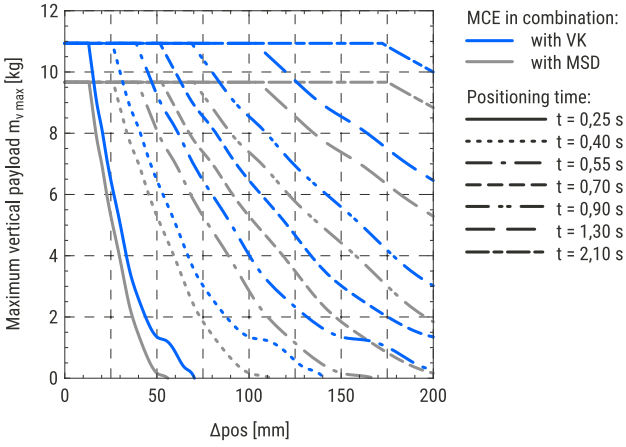


MCE 45

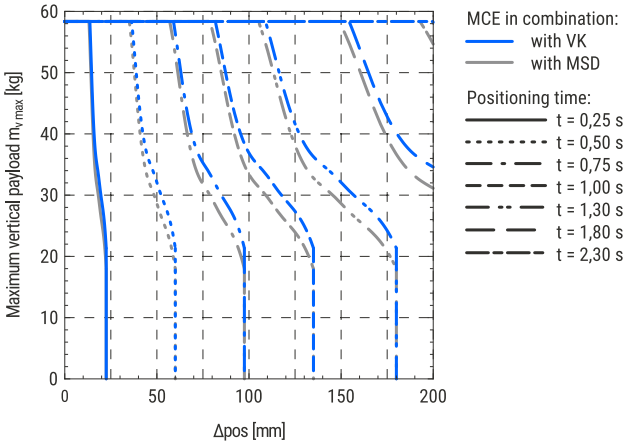
10 × 3 with a stepper motor □42



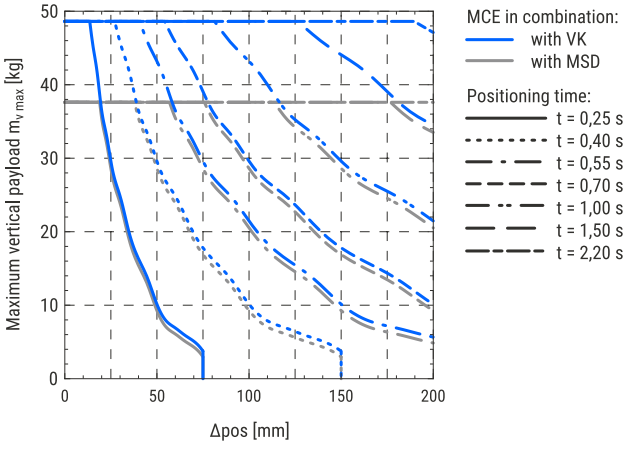
10 × 10 with a stepper motor □42



10 × 3 with a stepper motor □56



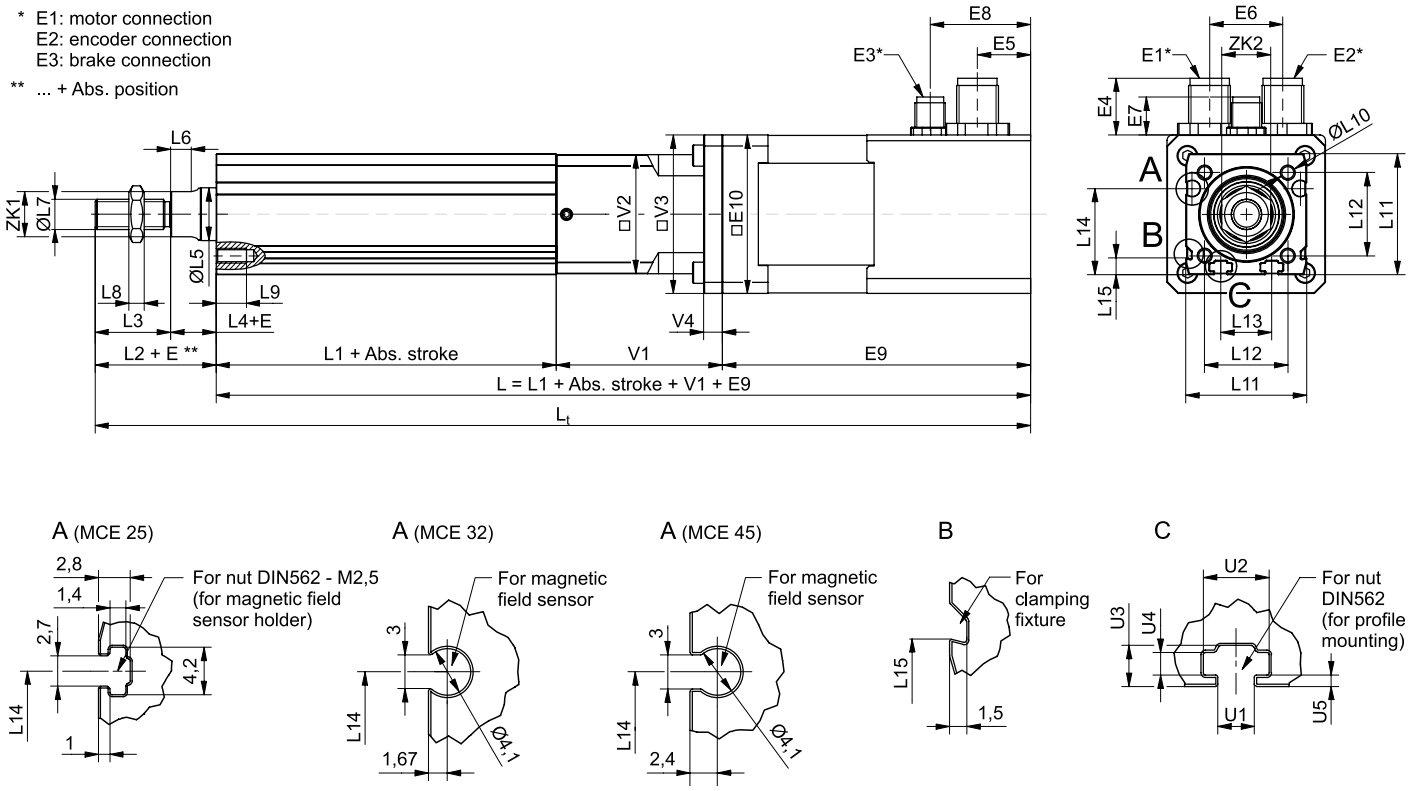
10 × 10 with a stepper motor □56



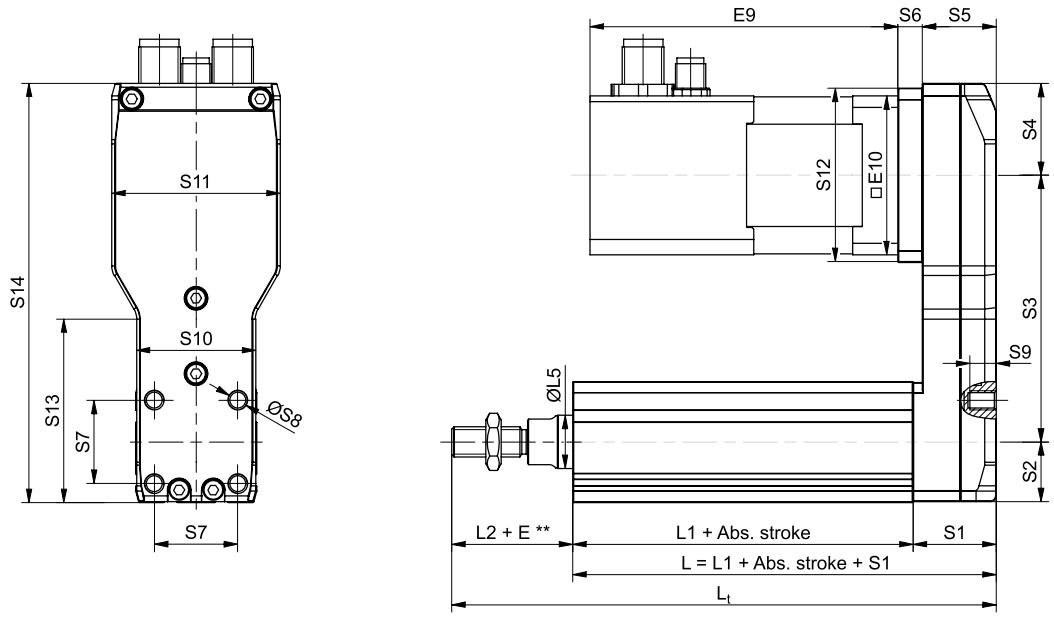
DIMENSIONS

All dimensions are in mm. The scale of the drawings may not be equal.

MCE in combination with a standard motor and a motor adapter VK

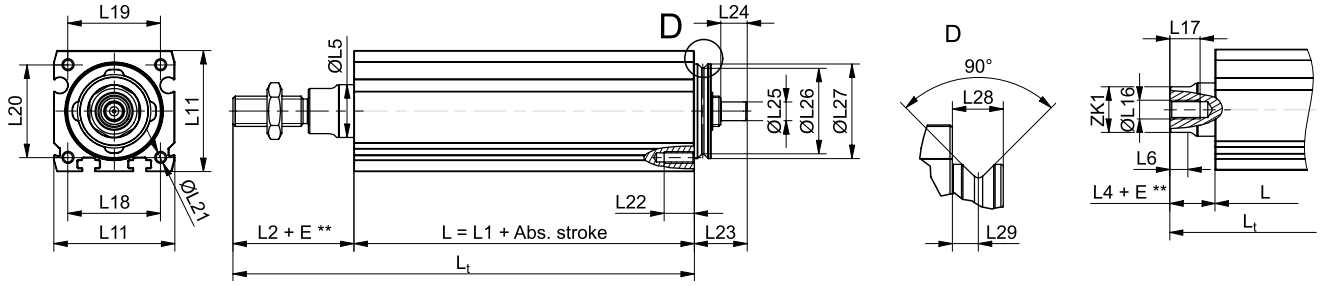


MCE in combination with a standard motor and a motor side drive MSD



MCE without a motor

Female thread



MCE dimensions

MCE	L1	L2	L3	L4	ØL5	L6	ØL7	L8	L9	ØL10	L11	L12	L13	L14	L15	ØL16	L17	L18	L19	L20	ØL21	L22	L23	L24	ØL25 (h7)	ØL26	ØL27 (h7)
25	50	26	16	10	12	3,5	M6 x 1	3,2	8	M2,5	25	21	13,5	19,25	4,4	M4	8	19	17	18	M2,5	8	14	7	5	17,6	20
32	65	32	20	12	14	5,5	M8 x 1,25	4	8	M4	32	22	13,5	22,8	4,4	M5	8	24,5	24,5	24,5	M3	8	14	7	5	22,6	25
45	80	38	22	16	18	7	M10 x 1,25	5	12	M6	45	32	20	30,5	4,4	M6	12	34	34	34	M4	10	16	8	8	31,6	34

MCE	L28	L29	ZK1	ZK2	U1	U2	U3	U4	U5
25	4,5	2,3	10	10	2,2	4,2	2,8	1,4	1
32	4,5	2,3	12	13	3,2	5,8	3,6	2	1
45	4,5	2,3	16	17	4,2	7,5	4,7	2,5	1,2

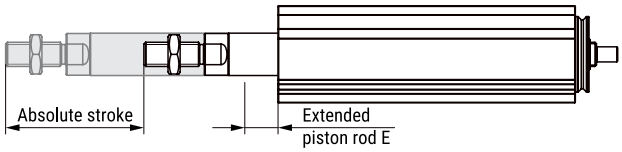
Motor adapter VK and a motor side drive MSD dimensions

MCE	Motor		V1	□V2	□V3	V4	S1	S2	S3 (±0,5)	S4	S5	S6	S7	ØS8	S9	S10	S11	S12	S13	S14
	Type	Size □ [mm]																		
25	Stepper	28	35	24,5	28	5,5	22	12,5	52,5	18,25	19,5	5,5	18	M4	6	24,5	31,5	34	38,5	83,25
32		28	35	31,5	31,5	0	22	16,0	52,5	18,25	19,5	5,5	22	M5	7	31,5	31,5	34	0	86,75
		42	40	31,5	42	5,5	22	16,0	70,5	24,25	19,5	6,5	22	M5	7	31,5	44,5	46	48	110,75
45		42	42	44,5	44,5	0	27,5	22,5	81	24,75	24,5	6,5	32	M6	7	44,5	44,5	46	0	128,25
		56	46	44,5	56,4	9,5	27,5	22,5	88,5	33,25	24,5	6	32	M6	7	44,5	59,5	59,5	64,5	144,25

Motor dimensions

Motor			E1	E2	E3	E4 (±1)	E5 (±0,3)	E6	E7 (±1)	E8 (±0,3)	E9 (±1)	□E10
Type	Size □ [mm]	Brake										
Stepper	28	–	Available soon									
	28	with										
	42	–	M12 5-pole	M12 8-pole	–	14	14	19,5	–	–	70,4	42,3
	42	with	M12 5-pole	M12 8-pole	M8 3-pole	14	14	19,5	9	27	106,4	42,3
	56	–	M12 5-pole	M12 8-pole	–	14	13,4	23	–	–	98	56,4
	56	with	M12 5-pole	M12 8-pole	M8 3-pole	14	52,4	23	9	12	138	56,4

Absolute stroke and length of the MCE definition



Absolute stroke definition
Absolute stroke = Effective stroke + 2 × Safety stroke

The electric cylinder MCE does not include any safety stroke.

Length definition
L_t = L + L2 + E + Abs. position

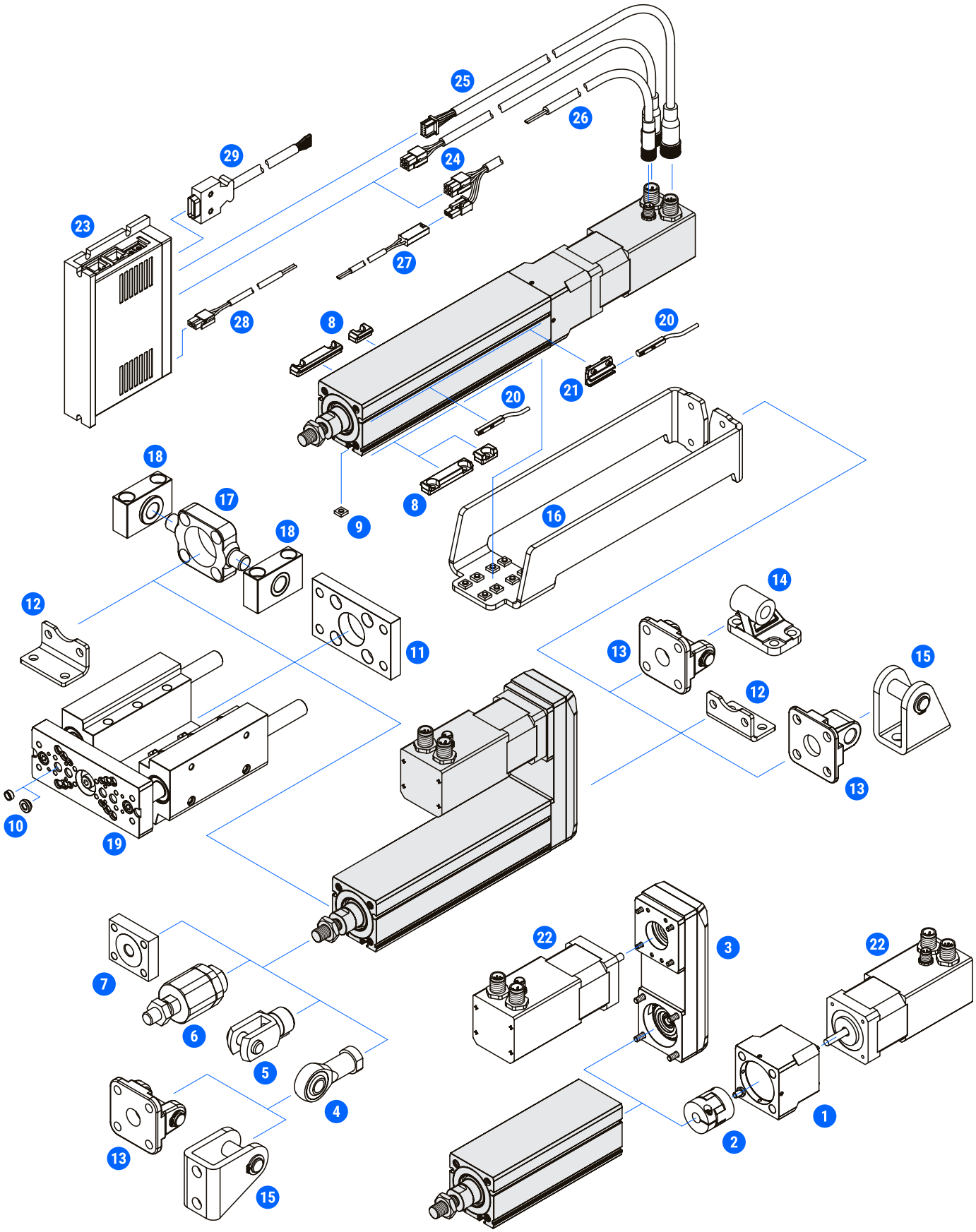
Female thread:
L_t = L + L4 + E + Abs. position

Length L and L_t are defined as it is presented on the dimensional drawings above, where lengths of a motor, a motor adapter VK and a motor side drive MSD are also considered.

Abs. stroke	Absolute stroke	[mm]
Abs. position	Absolute position	[mm]
E	Extended piston rod	[mm]
L	Length	[mm]
L_t	Total length	[mm]

E_{max} = 100 mm.

ACCESSORIES



#	Accessories	Compatible with MCE size			Page	
		25	32	45		
1	Motor adapter VK	•	•	•	68	Motor adapeters
2	Coupling	•	•	•	69	Elastomer couplings
3	Motor side drive MSD	•	•	•	70	Motor side drives
4	Rod eye SGS	•	•	•	72	Piston rod accessories
5	Rod clevis SG	•	•	•	72	
6	Self-aligning joint FK	•	•	•	73	
7	Coupling piece KSZ	•	•	•	73	
8	Clamping fixture	•	•	•	74	Mounting attachement accessories
9	Slot nut	•	•	•	75	
10	Centering ring	•	•	•	75	
11	Flange mounting MAFL	•	•	•	76	
12	Foot mounting MAHP	•	•	•	76	
13	Swivel/clevis mount MASU	•	•	•	77	
14	Swivel foot mounting MLG	—	—	•	78	
15	Clevis foot mounting MLBU	•	•	—	78	
16	Back mount ABM	•	•	•	79	
17	Trunnion mount MZK	—	•	•	79	
18	Trunnion support MLZ	—	•	•	80	
19	Guiding unit GUC	•	•	•	80	Guiding units
20	Magnetic field sensor	•	•	•	83	Limit switches
21	Sensor holder HMG	•	—	—	83	
22	Motor	•	•	•	85	Motors
23	Drive	•	•	•	85	Drives
24	Motor cable	•*	•*	•	86	Cables
25	Encoder cable	•	•	•	86	
26	Brake cable	•*	•*	•	86	
27	Brake to terminal cable*	•	•	—	86	
28	Power cable	•	•	•	88	
29	Signal cable	•	•	•	88	

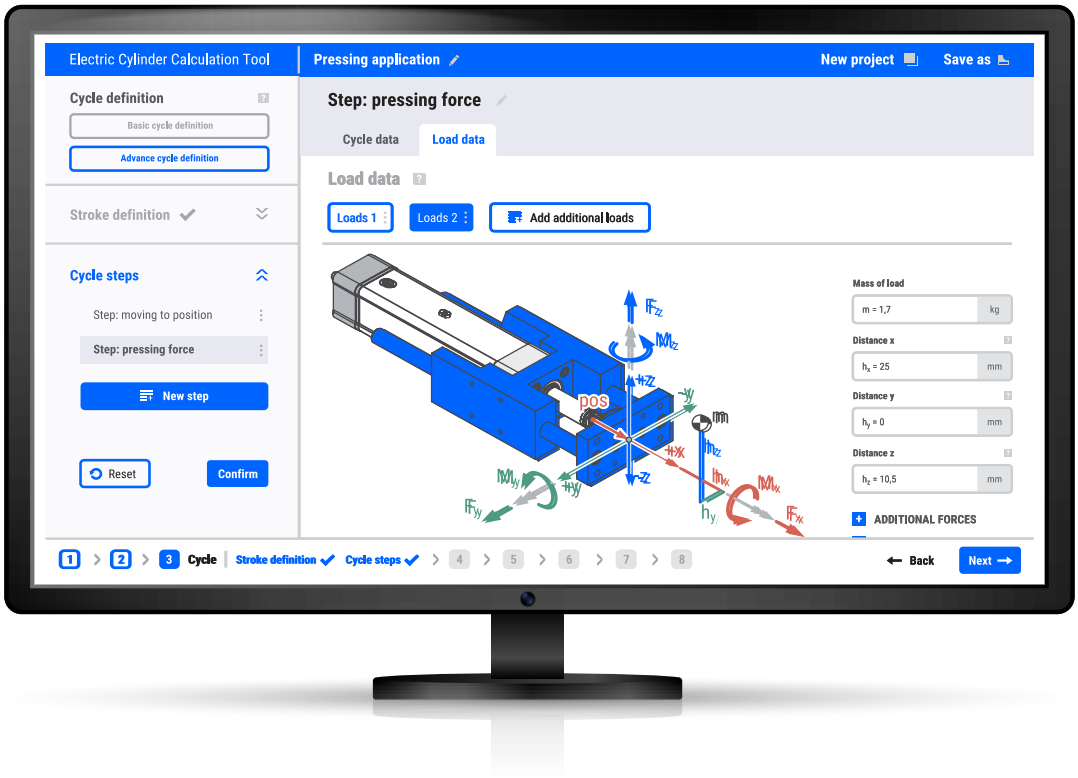
* For the stepper motor size of 28, the motor and the brake cables are combined into one cable. For connectivity between the brake and the terminal, an additional brake to terminal cable is used.

UNIMOTION

CALCULATE AND CONFIGURE YOUR OWN SOLUTION

The ELECTRIC CYLINDER CALCULATION TOOL is an online application that enables quick and easy selection of a suitable product, with the possibility of achieving the optimal ratio between the given capacity and the price, including 3D CAD models.

For more information please contact us or visit our website.



Mini electric slider – MSCE

CHARACTERISTICS

Mini electric slider MSCE is a mini linear drive with an integrated linear guiding system and slide. By using an integrated precision ball screw drive, the rotary motion (rotation) of the drive shaft is converted to the linear motion (translation) of the slide with high mechanical efficiency and low internal friction.

High-performance features such as high speed, good positioning accuracy, and high repeatability are ensured through a precision ball screw drive and a linear guiding system.

A preassembled standard motor (in-line with a motor adapter and a coupling or in-parallel with a motor side drive and a timing belt) together with the standard drive, makes the system plug and play ready. Compact dimensions and optimally selected motor combinations cover a wide range of applications.

The aluminium base profile includes T-slots on the bottom for fixing the electric slider, as well as side slots for clamping fixtures and magnetic field sensors.

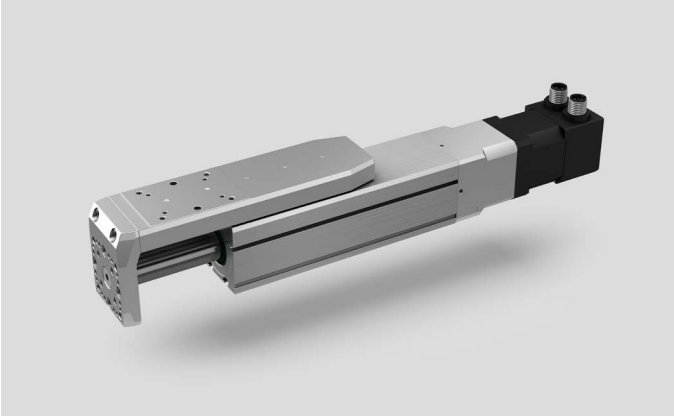
The aluminium slide and the front plate of the electric slider allow a wide range of options for mounting the working tools and attaching additional accessories. There are prepared connection holes on the slide and the front plate for an easy combination of the MSCEs to the multi-axis system, which makes this product highly flexible. There is also an option of the mini electric slider without the preassembled motor if an individual motor is required.

Positioning rod together with the rod seal ensures the protection of the ball screw drive from dust and other contamination.

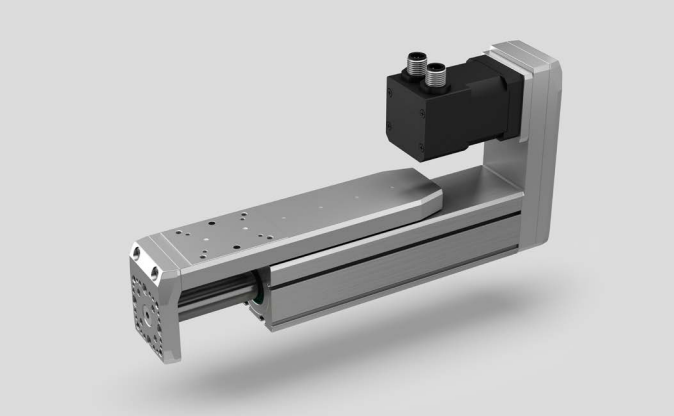
Excellent price-performance ratio and a quick delivery time, due to standard lengths, are ensured.

Each MSCE is optimally pre-lubricated and ready for a maintenance-free operating process. MSCE allows relatively high load capacities (axial, lateral, and torsional) and optimal cycles for moving the larger payloads at high speeds in both horizontal and vertical directions.

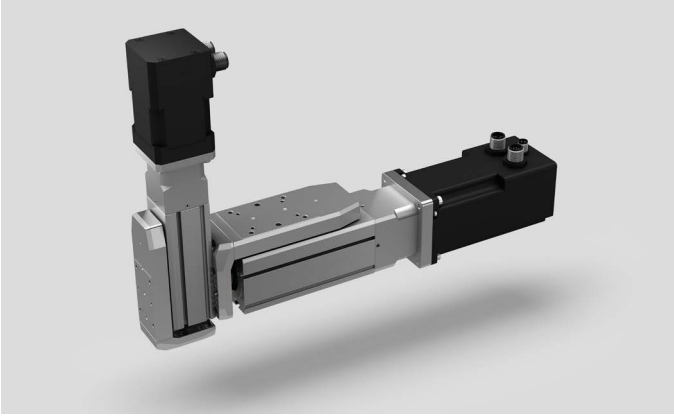
ⓘ The aluminium profiles are manufactured according to the medium EN 12020-2 standard



Motor adapter VK with a coupling and a motor



Motor side drive with a timing belt and a motor

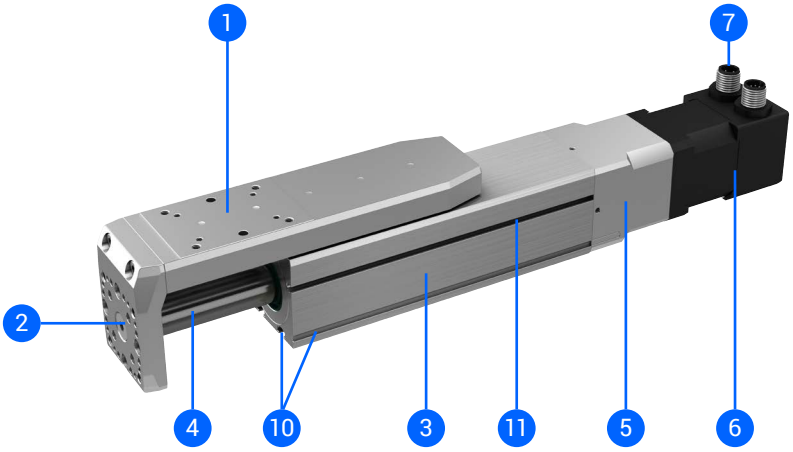


Multi-axis system

Accessories, MSCE without a preassembled motor

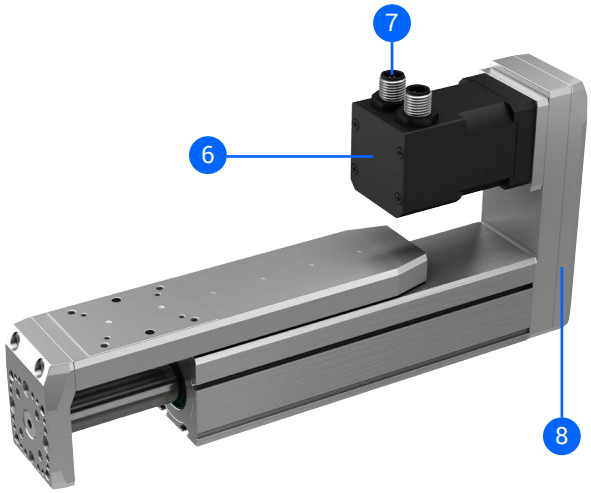
STRUCTURAL DESIGN

Combination with a standard motor and a motor adapter VK

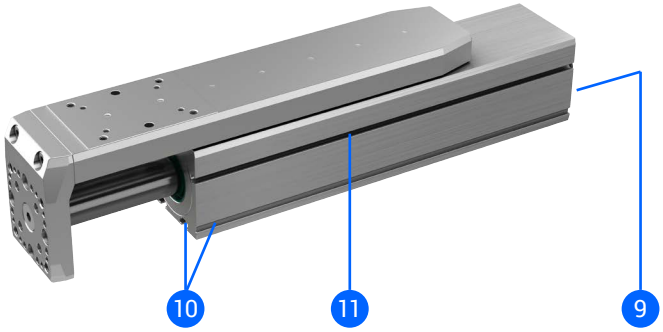


1 – Aluminium slide with an integrated linear guiding system
2 – Front plate
3 – Compact aluminium base profile
4 – Positioning rod
5 – Motor adapter VK with a coupling
6 – Preassembled motor (with/without a brake)
7 – Standard connectors (motor, encoder and a brake – optionally)
8 – Motor side drive with a timing belt
9 – Drive shaft of a precision ball screw drive
10 – Slots for mounting
11 – Slots for the magnetic field sensors (size 32 and 45) or mounting the sensor holder (size 25)

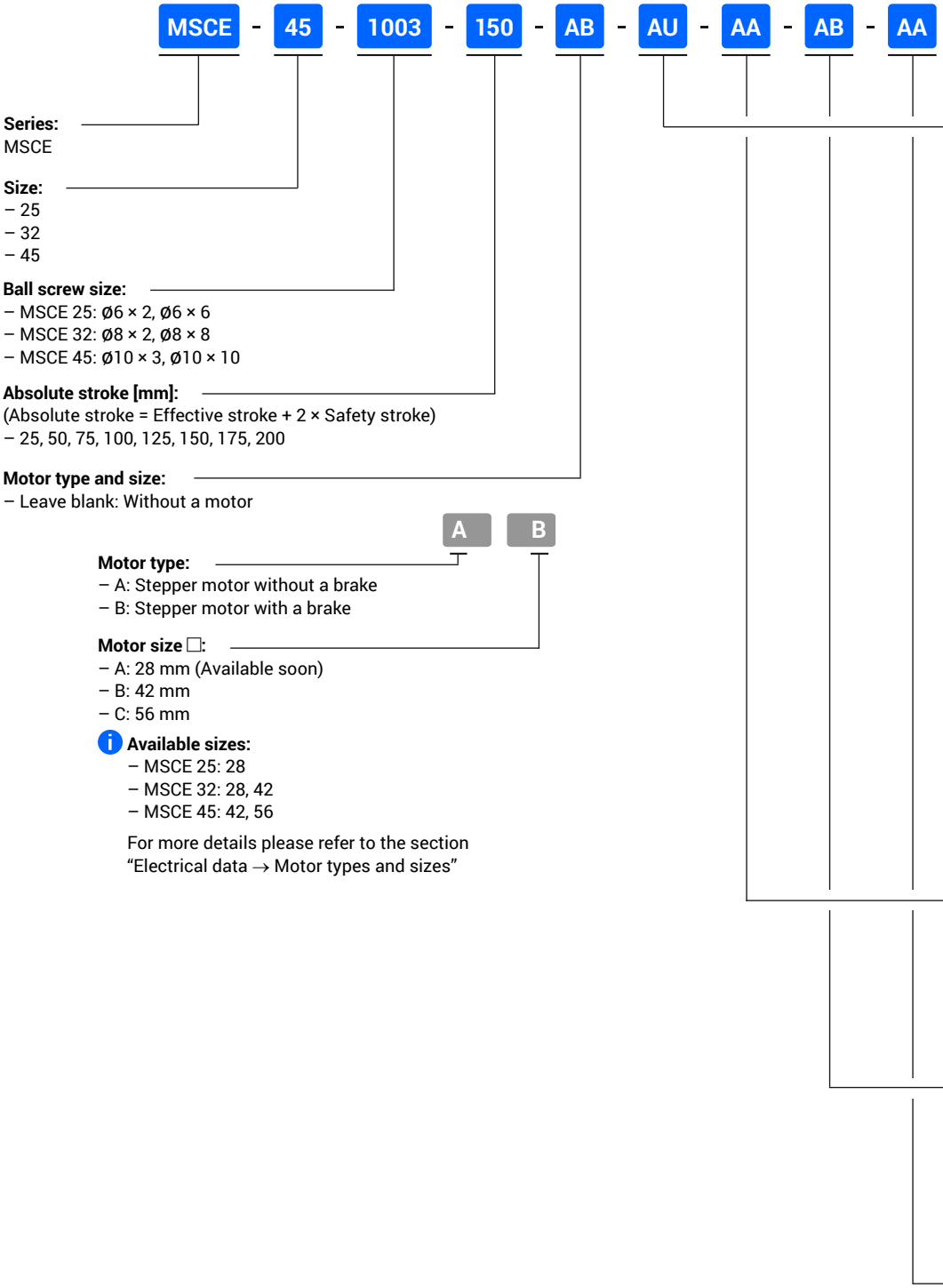
Combination with a standard motor and a motor side drive MSD



Without a motor



HOW TO ORDER

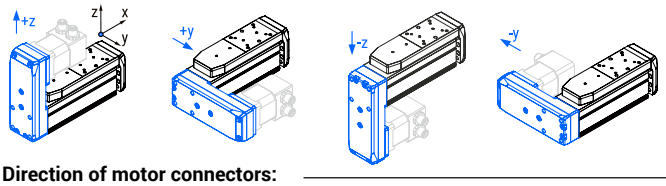


Motor mounting option:
– Leave blank: Without a motor

A U

Mounting option:
– A: With a motor adapter VK
– B: With a motor side drive MSD facing up
– C: With a motor side drive MSD facing right
– D: With a motor side drive MSD facing down
– E: With a motor side drive MSD facing left

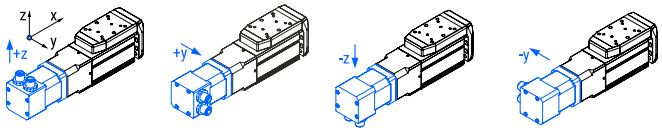
Up Right Down Left



Direction of motor connectors:
– U: Connectors facing up
– R: Connectors facing right
– D: Connectors facing down
– L: Connectors facing left

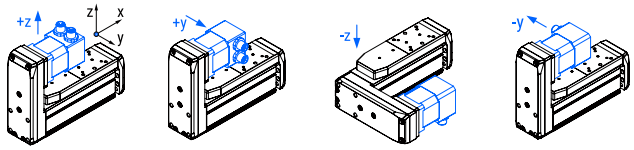
In combination with a motor adapter VK

Up Right Down Left



In combination with a motor side drive MSD

Up Right Down Left



When using the motor side drive MSD, the connectors can not be facing the MSCE otherwise, the connectors and MSCE may collide. These combinations are: BD, CL, DU and ER.

Drive option:
– Leave blank: Without a motor or drive

A A

Drive type:
– A: Stepper

For more details please refer to the section “Electrical data → Drive types”

Drive protocol/control:
– A: EtherCAT
– B: Ethernet based communication
– C: Pulse/direction control

Drive-motor cables option:
– Leave blank: Without a motor or drive
– 00: Without the cables

A B

Cables type:
– A: Robotic with a straight plug
– B: Robotic with an angled plug

Cables Length:
– A: 3 m
– B: 5 m
– C: 10 m

For more details please refer to the section “Electrical data → Drive-motor cables”

Power and signal cables:
– Leave blank: Without a motor or drive

A A

Power cable:
– 0: Without a power cable
– A: With a power cable

Length of the cable = 2 m

For more details please refer to the section “Electrical data → Power and signal cables”

Signal cable:
– 0: Without a signal cable
– A: With a signal cable

Length of the cable = 2 m
Signal cable is mandatory for the following cases:
– If a motor with a brake is used
– If a pulse/direction drive control is used
– If the limit switches are used

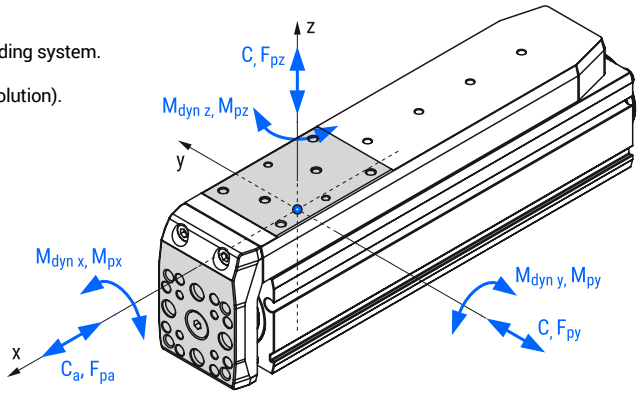
For more details please refer to the section “Electrical data → Power and signal cables”

TECHNICAL DATA

General technical data

MSCE	Ball screw[4]	Dynamic axial load capacity[1]	Dynamic load capacity[3]	Dynamic moments[3]			Max. permissible loads					Axial backlash (BS)[2]	Max. repeatability[5]	Absolute stroke
							Forces		Moments					
	d × l [mm]	C_a [N]	C [N]	$M_{dyn\,x}$ [Nm]	$M_{dyn\,y}$ [Nm]	$M_{dyn\,z}$ [Nm]	F_{py} [N]	F_{pz} [N]	M_{px} [Nm]	M_{py} [Nm]	M_{pz} [Nm]	[mm]	[mm]	[mm]
25	6 × 2	1900	1310	4,8	4,1		280	580	4,8	4,1	4,1	≤ 0,05	±0,015	25, 50, 75, 100, 125, 150, 175, 200
	6 × 6	1700												
32	8 × 2	2000	2135	10,0	6,8		860	860	10,0	6,8	6,8	≤ 0,06	±0,015	25, 50, 75, 100, 125, 150, 175, 200
	8 × 8	1500												
45	10 × 3	3500	3240	20,1	17,4		1000	1000	16,3	16,3	16,3	≤ 0,06	±0,015	25, 50, 75, 100, 125, 150, 175, 200
	10 × 10	3200												

[1] Dynamic axial load capacity of the ball screw drive.
This value is the basis for calculating the service life.
[2] Valid for ball screw drive in new condition.
[3] Dynamic load capacity and dynamic moments of the linear guiding system.
These values are the basis for calculating the service life.
[4] d = ball screw nominal diameter, l = ball screw lead (for one revolution).
[5] Valid for one-directional axial load.



Drive data

Combination with a standard motor and a motor adapter VK

MSCE + motor and VK	Ball screw	Motor		Max. permissible axial load[1, 2]	Max. permissible payload[1]		Max. travel speed[2]	Max. rotational speed	Max. acceleration
					Horizontal[2, 3]	Vertical[2]			
	d × l [mm]	Type	Size □ [mm]	F_{pa} [N]	m_{ph} [kg]	m_{pv} [kg]	v_{max} [m/s]	n_{max} [rev/min]	a_{max} [m/s²]
25	6 × 2	Stepper	28	170	57	14	0,100	3000	20
	6 × 6			90	13	7,3	0,300		
32	8 × 2		28	185	62	15	0,075	2240	20
			42	375	125	31	0,100	3000	
	8 × 8		28	45	6,4	3,4	0,229	1720	
			42	190	35	16	0,400	3000	
45	10 × 3		42	450	150	37	0,149	2980	20
			56	695	233	58	0,150	3000	
	10 × 10		42	125	21	10	0,485	2910	
			56	575	132	48	0,500	3000	

[1] This value depends on the selected motor, travel speed and acceleration of the slide (see the following diagrams).
[2] Valid for the entire stroke range.
[3] Valid for the payload to be pushed and supported by an external guiding (coefficient of friction 0,1 is taken into consideration).
Maximum unsupported payload (lateral load) is presented on the following diagrams.

Combination with a standard motor and a motor side drive MSD

MSCE + motor and MSD	Ball screw	Motor		Max. permissible axial load[1, 2]	Max. permissible payload[1]		Max. travel speed[2]	Max. rotational speed	Max. acceleration
					Horizontal[2, 3]	Vertical[2]			
	d × l [mm]	Type	Size □ [mm]	F_{pa} [N]	m_{ph} [kg]	m_{pv} [kg]	v_{max} [m/s]	n_{max} [rev/min]	a_{max} [m/s²]
25	6 × 2	Stepper	28	170	57	14	0,094	2810	20
	6 × 6			80	13	6,5	0,281	2810	
32	8 × 2		28	150	50	12	0,052	1560	20
			42	375	125	31	0,100	3000	
	8 × 8		28	35	6,6	2,5	0,173	1300	
			42	175	35	14	0,400	3000	
45	10 × 3		42	380	127	31	0,146	2920	20
			56	695	233	58	0,150	3000	
	10 × 10		42	115	19	9	0,457	2740	
			56	450	132	37	0,500	3000	

Without a motor

MSCE without a motor	Ball screw	Max. permissible axial load[2]	Max. permissible payload		Max. drive torque	No load torque	Max. permissible radial load on shaft	Max. travel speed[2]	Max. rotational speed	Max. acceleration
			Horizontal[2, 3]	Vertical[2]						
	d × l [mm]	F_{pa} [N]	m_{ph} [kg]	m_{pv} [kg]	M_p [Nm]	M_0 [Nm]	F_{pr} [N]	v_{max} [m/s]	n_{max} [rev/min]	a_{max} [m/s²]
25	6 × 2	170	57	14	0,06	0,03	25	0,150	4500	20
	6 × 6	90	30	7	0,10	0,03		0,450		
32	8 × 2	375	125	31	0,13	0,05	50	0,150	4500	20
	8 × 8	375	125	31	0,53	0,06		0,600		
45	10 × 3	695	233	58	0,37	0,08	100	0,225	4500	20
	10 × 10	695	233	58	1,23	0,10		0,750		

[1] This value depends on the selected motor, travel speed and acceleration of the slide (see the following diagrams).
[2] Valid for the entire stroke range.
[3] Valid for the payload to be pushed and supported by an external guiding (coefficient of friction 0,1 is taken into consideration). Maximum unsupported payload (lateral load) is presented on the following diagrams.

Operating conditions

Ambient temperature	0 °C ~ +50 °C
Ambient temperature without a motor	0 °C ~ +60 °C
Protection class	IP40
Duty cycle	100 %
Maintenance	Life-time pre-lubricated

Recommended values of loads:
All the data of the dynamic load capacities (linear guiding system and ball screw drive) stated in the tables above are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety and service life.

We recommend a minimum dynamic safety factor of 5,0 or more. Please refer to pages 93 and 95, where the calculation of the safety factor of the ball screw drive and the linear guiding system and how the applied load affects the service life are presented.

Mass and mass moment of inertia

MSCE without a motor	Ball screw	Moved mass*	Mass of the mini electric slider**	Mass moment of inertia
	d × l [mm]	$m_{m,\ MSCE}$ [kg]	m_{MSCE} [kg]	J_{MSCE} [10^{-2} kg cm^2]
25	6 × 2	0,10 + 0,0010 × Abs. stroke	0,20 + 0,0019 × Abs. stroke	0,29 + 0,0007 × Abs. stroke + 0,1013 × m_{load}
	6 × 6			0,36 + 0,0016 × Abs. stroke + 0,9119 × m_{load}
32	8 × 2	0,18 + 0,0013 × Abs. stroke	0,40 + 0,0032 × Abs. stroke	0,71 + 0,0026 × Abs. stroke + 0,1013 × m_{load}
	8 × 8			0,99 + 0,0047 × Abs. stroke + 1,6211 × m_{load}
45	10 × 3	0,36 + 0,0025 × Abs. stroke	0,88 + 0,0059 × Abs. stroke	2,81 + 0,0061 × Abs. stroke + 0,2280 × m_{load}
	10 × 10			3,63 + 0,0121 × Abs. stroke + 2,5330 × m_{load}

* The moved mass is already considered in the equation for calculating the mass of the mini electric slider m_{MSCE} and the mass moment of inertia J_{MSCE}. The moved mass includes the mass of the aluminium slide together with the front plate and positioning rod with the ball nut.
** For combination with standard motor and motor adapter VK or motor side drive MSD this mass m_{MSCE} should be increased by m_{VK+m} or m_{MSD+m} respectively, see the table below.

Abs. stroke	Absolute stroke	[mm]
m_{load}	Applied mass to be moved	[kg]

Additional mass of the electric slider when combining the motor with the motor adapter VK or the motor side drive MSD

MSCE	Motor		Motor without a brake		Motor with a brake	
			Mass of the motor and motor adapter VK	Mass of the motor and motor side drive MSD	Mass of the motor and motor adapter VK	Mass of the motor and motor side drive MSD
	Type	Size □ [mm]	$m_{VK\ +\ m}$ [kg]	$m_{MSD\ +\ m}$ [kg]	$m_{VK\ +\ m}$ [kg]	$m_{MSD\ +\ m}$ [kg]
25	Stepper	28	Available soon			
32		28				
		42	0,42	0,52	1,22	1,32
45		42	0,47	0,61	1,27	1,41
		56	0,59	0,77	1,50	1,68

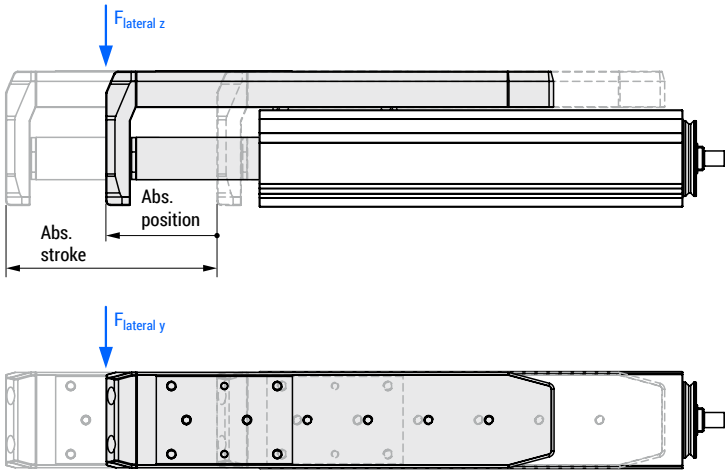
Planar moment of inertia

MSCE	Slide		Base profile	
	I_y [cm^4]	I_z [cm^4]	I_y [cm^4]	I_z [cm^4]
25	0,08	0,88	2,10	1,98
32	0,18	2,16	6,42	6,58
45	0,40	7,34	25,37	25,16

Holding torque of a motor brake

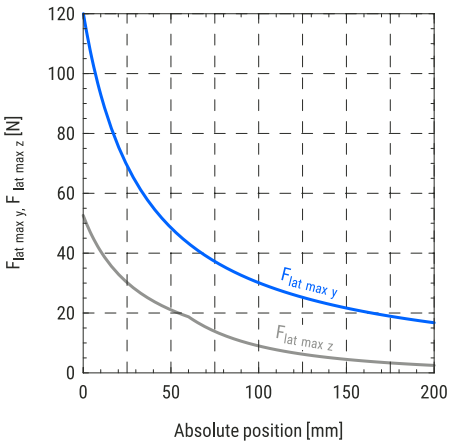
Motor		Holding torque (brake) [Nm]
Type	Size □ [mm]	
Stepper	28	Available soon
	42	0,4
	56	1,0

Maximum lateral loading as a function of the slide absolute position

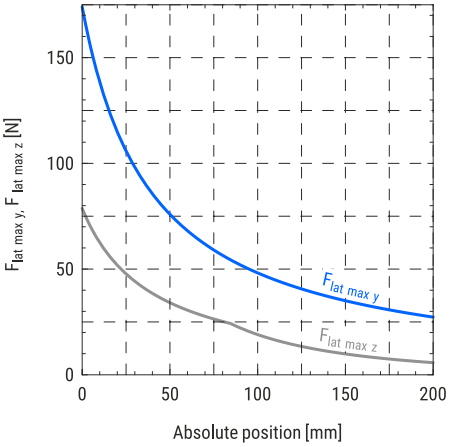


On the following diagrams, the maximum lateral loads acting on the front plate as a function of the slide absolute position are presented. Both lateral loads in y and z directions are considered.

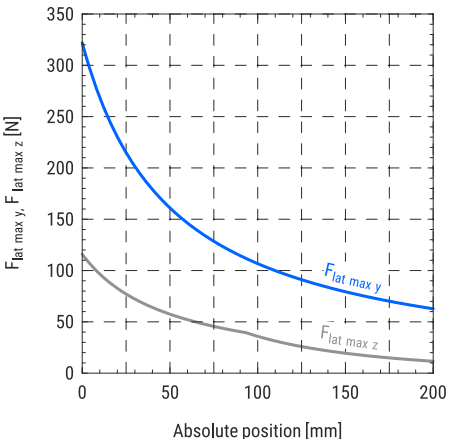
MSCE 25



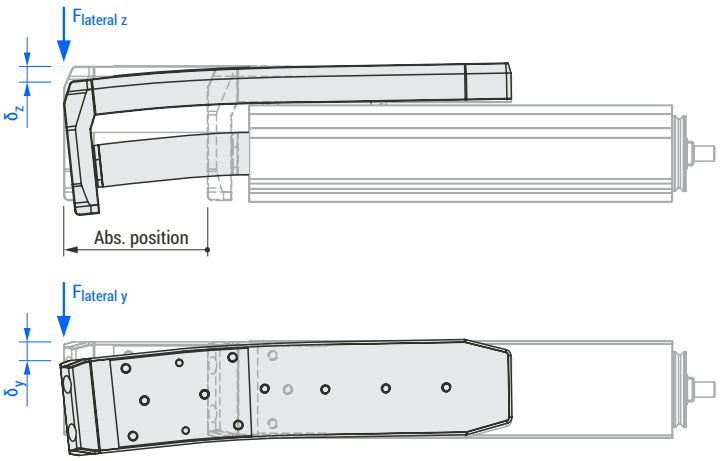
MSCE 32



MSCE 45



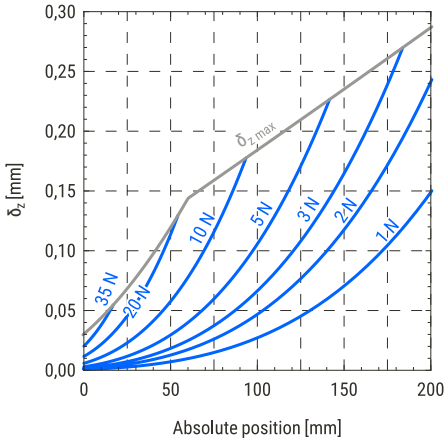
Deflections of the front plate as a function of the slide absolute position

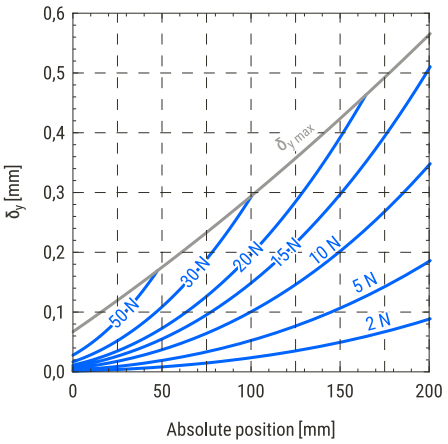


On the following diagrams, deflections of the front plate subjected to the different lateral loads at different absolute positions of the slide are presented. Both lateral loads in y and z directions are considered. Values on the curves represent the lateral load applied to the front plate.

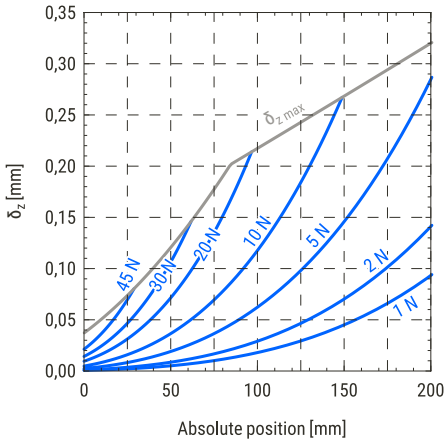
The maximum permissible deflection ($\delta_{z\,max}$ or $\delta_{y\,max}$) must not be exceeded.

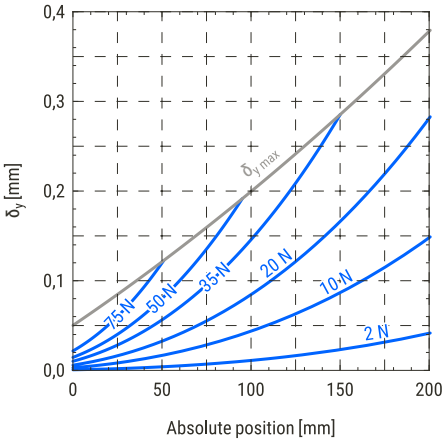
MSCE 25



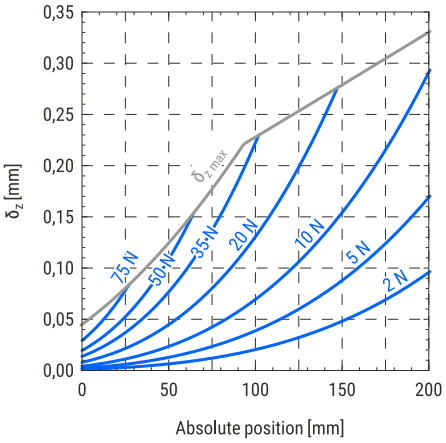


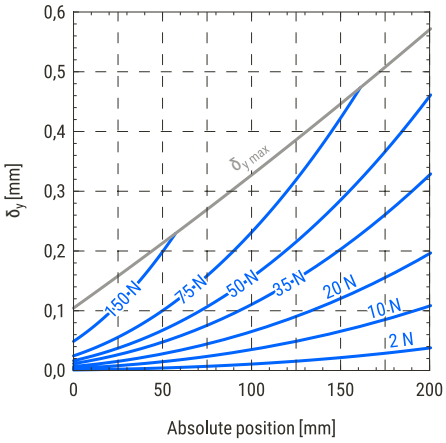
MSCE 32



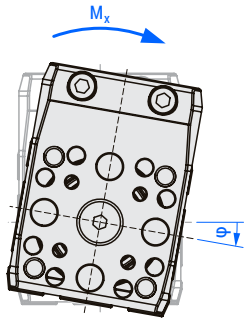


MSCE 45





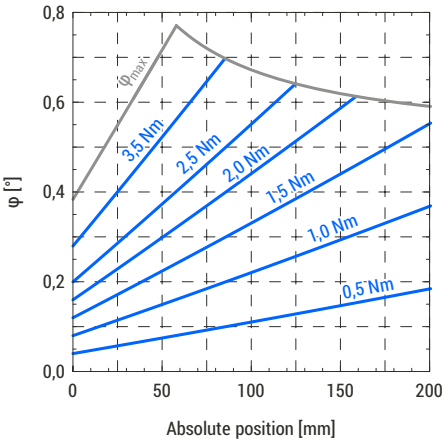
Angular deflections of the front plate as a function of the slide absolute position



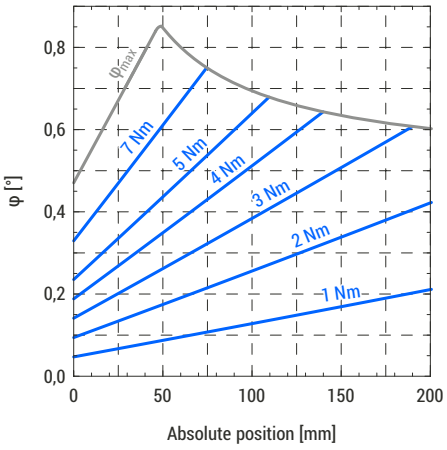
On the following diagrams, angular deflections of the front plate subjected to the different torsional moments at different absolute positions of the slide are presented. Values on the curves represent the moment about the x-axis applied to the front plate.

The maximum permissible angular deflection φ_{max} must not be exceeded.

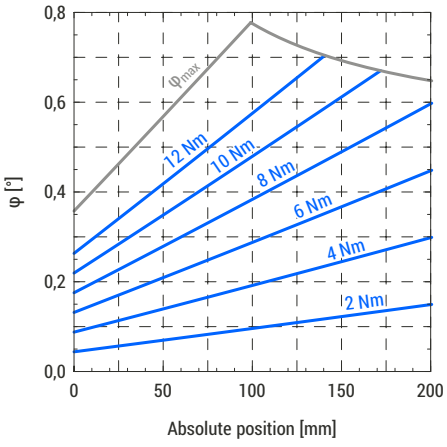
MSCE 25



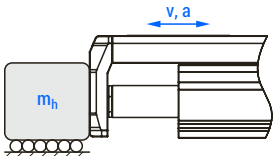
MSCE 32



MSCE 45



Maximum horizontal payload as a function of the travel speed and acceleration of the front plate

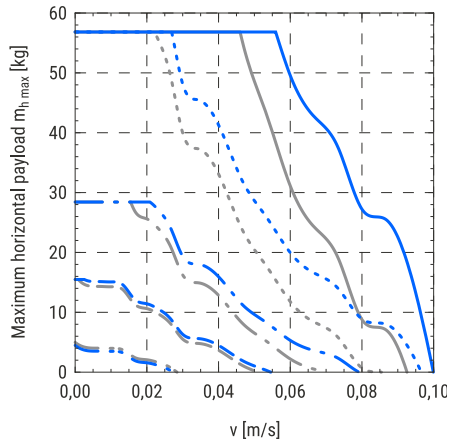


On the following diagrams, the maximum horizontal payloads applied to the front plate as a function of the travel speed for different accelerations, different ball screw leads, and different combinations of the standard motors are presented. Motor adapter VK and a motor side drive MSD are also considered..

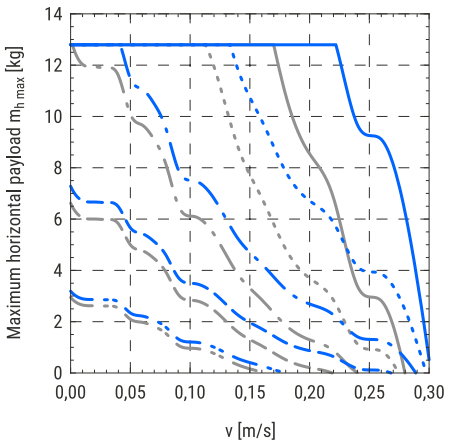
Curves are valid for the payload to be pushed and supported by an external guiding (coefficient of friction 0,1 is taken into consideration).

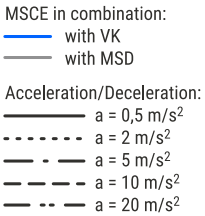
MSCE 25

6 × 2 with a stepper motor □28



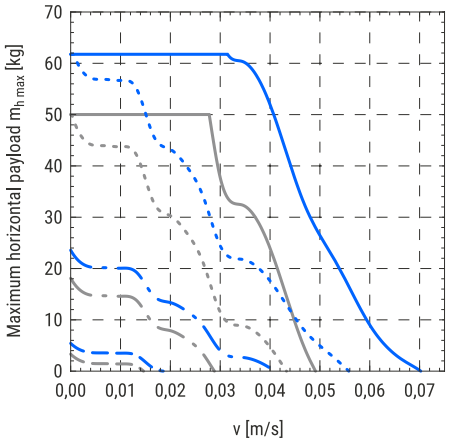
6 × 6 with a stepper motor □28



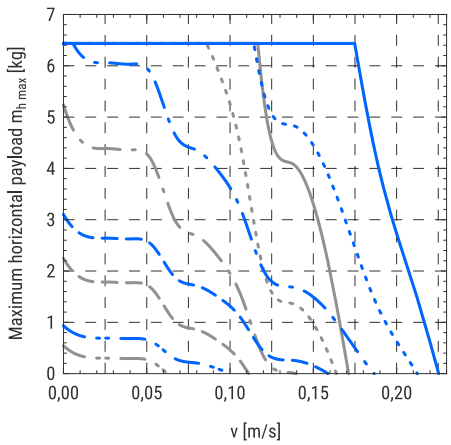


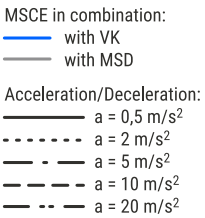
MSCE 32

8 × 2 with a stepper motor □28

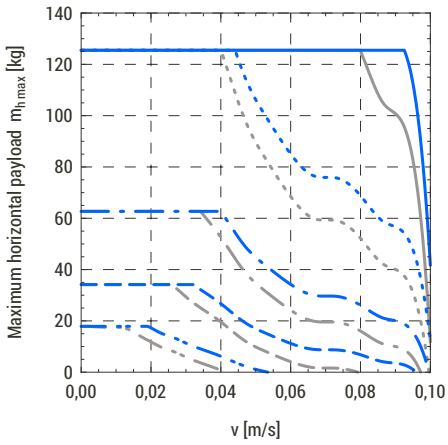


8 × 8 with a stepper motor □28

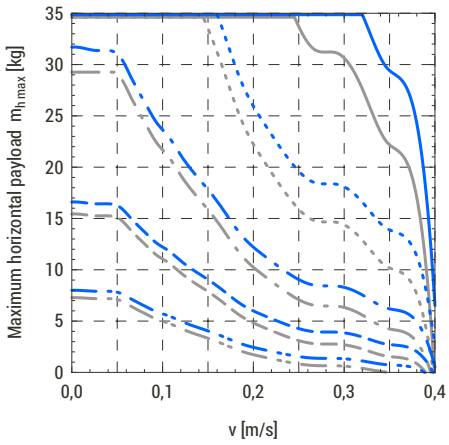




8 × 2 with a stepper motor □42



8 × 8 with a stepper motor □42

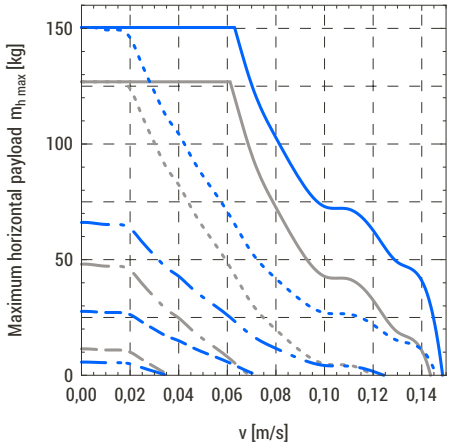


MSCE in combination:
- with VK
- with MSD

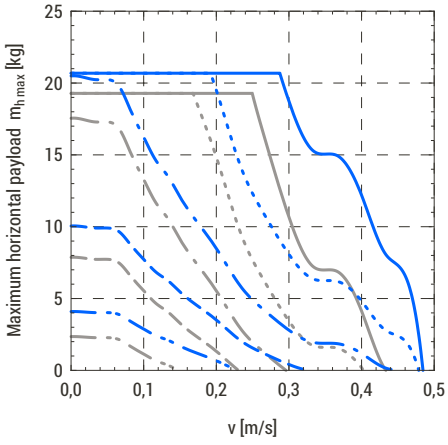
Acceleration/Deceleration:
- a = 0,5 m/s²
- a = 2 m/s²
- a = 5 m/s²
- a = 10 m/s²
- a = 20 m/s²

MSCE 45

10 × 3 with a stepper motor □42



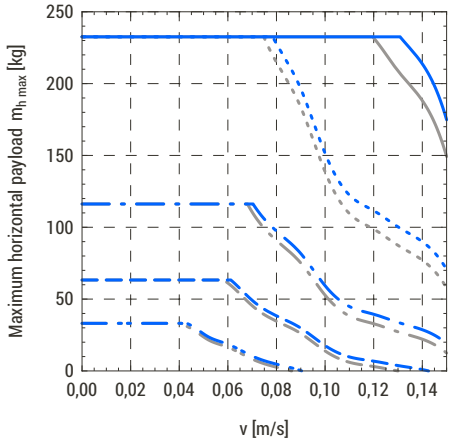
10 × 10 with a stepper motor □42



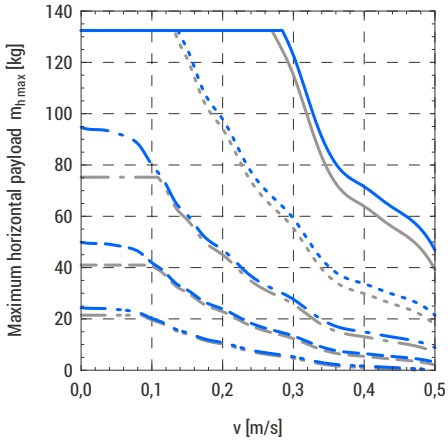
MSCE in combination:
- with VK
- with MSD

Acceleration/Deceleration:
- a = 0,5 m/s²
- a = 2 m/s²
- a = 5 m/s²
- a = 10 m/s²
- a = 20 m/s²

10 × 3 with a stepper motor □56



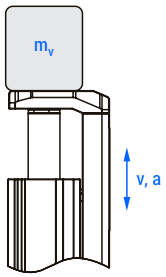
10 × 10 with a stepper motor □56



MSCE in combination:
- with VK
- with MSD

Acceleration/Deceleration:
- a = 0,5 m/s²
- a = 2 m/s²
- a = 5 m/s²
- a = 10 m/s²
- a = 20 m/s²

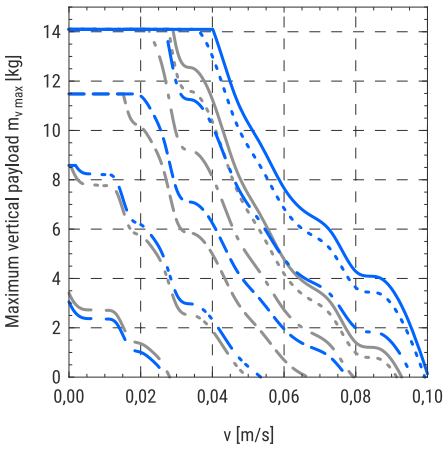
Maximum vertical payload as a function of the travel speed and acceleration of the front plate



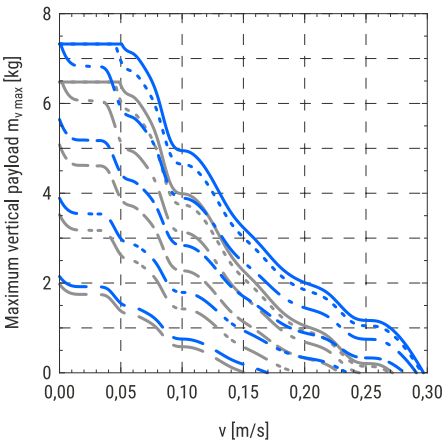
On the following diagrams, the maximum vertical payloads applied to the front plate as a function of the travel speed for different accelerations, different ball screw leads, and different combinations of the standard motors are presented. Motor adapter VK and a motor side drive MSD are also considered.

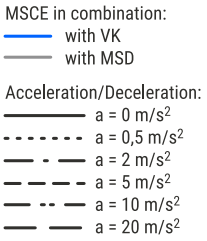
MSCE 25

6 × 2 with a stepper motor □28



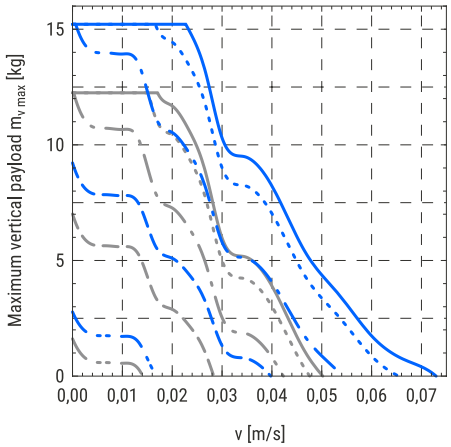
6 × 6 with a stepper motor □28



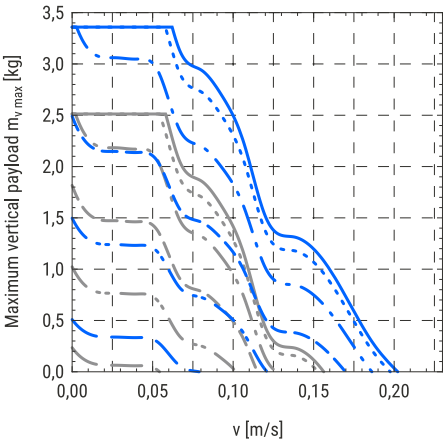


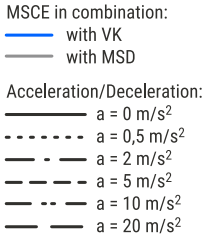
MSCE 32

8 × 2 with a stepper motor □28

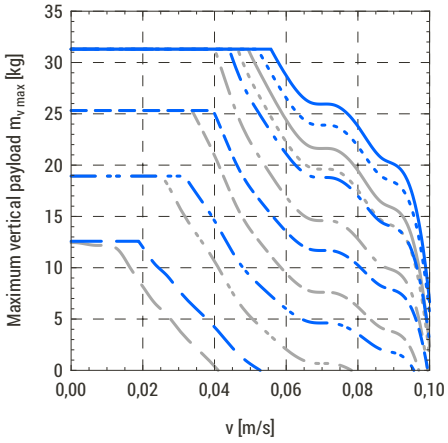


8 × 8 with a stepper motor □28

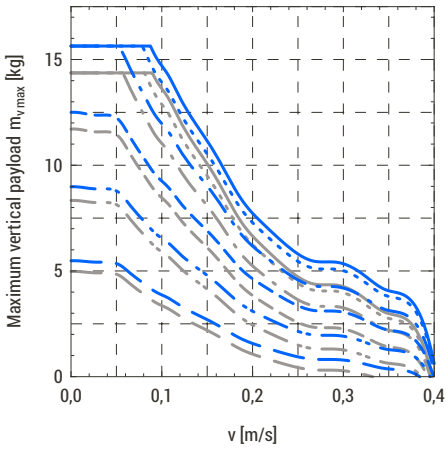




8 × 2 with a stepper motor □42



8 × 8 with a stepper motor □42

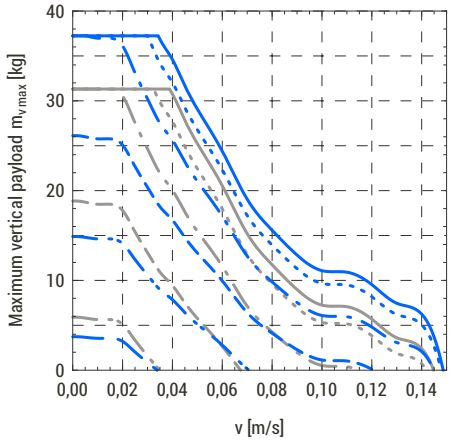


MSCE in combination:
- with VK
- with MSD

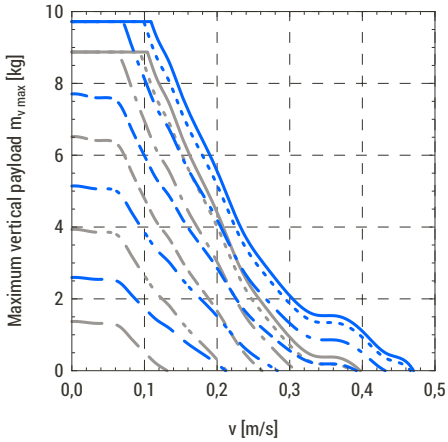
Acceleration/Deceleration:
- a = 0 m/s²
- a = 0,5 m/s²
- a = 2 m/s²
- a = 5 m/s²
- a = 10 m/s²
- a = 20 m/s²

MSCE 45

10 × 3 with a stepper motor □42



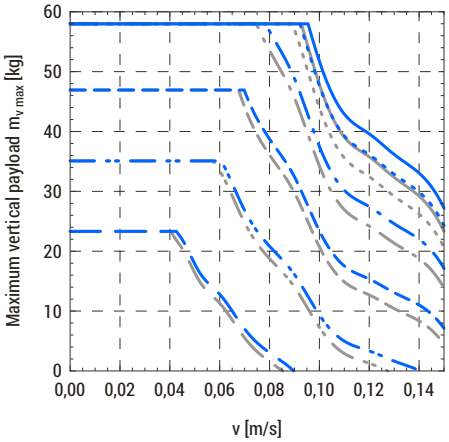
10 × 10 with a stepper motor □42



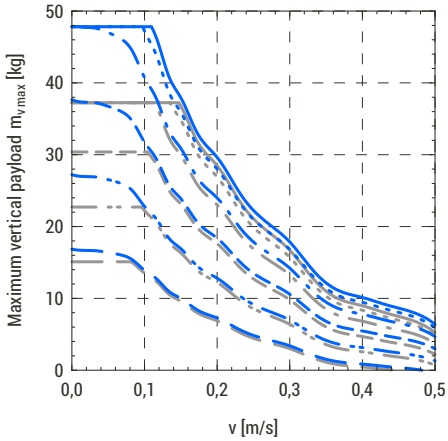
MSCE in combination:
- with VK
- with MSD

Acceleration/Deceleration:
- a = 0 m/s²
- a = 0,5 m/s²
- a = 2 m/s²
- a = 5 m/s²
- a = 10 m/s²
- a = 20 m/s²

10 × 3 with a stepper motor □56



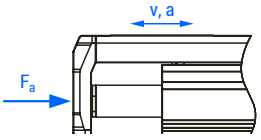
10 × 10 with a stepper motor □56



MSCE in combination:
- with VK
- with MSD

Acceleration/Deceleration:
- a = 0 m/s²
- a = 0,5 m/s²
- a = 2 m/s²
- a = 5 m/s²
- a = 10 m/s²
- a = 20 m/s²

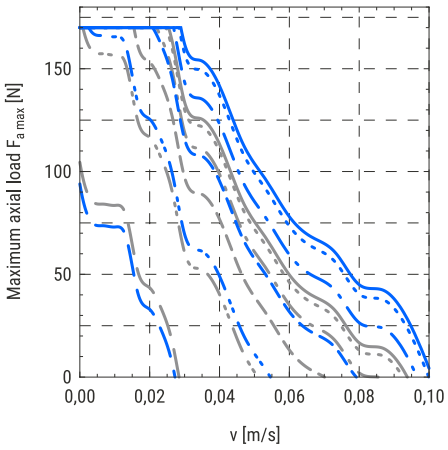
Maximum axial load as a function of the travel speed and acceleration of the front plate



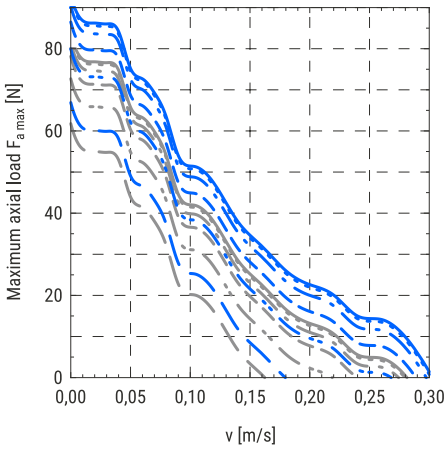
On the following diagrams, the maximum axial load applied to the front plate as a function of the travel speed for different accelerations, different ball screw leads and different combinations of the standard motors is presented. Motor adapter VK and a motor side drive MSD are also considered.

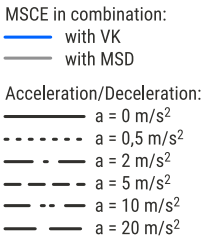
MSCE 25

6 × 2 with a stepper motor □28



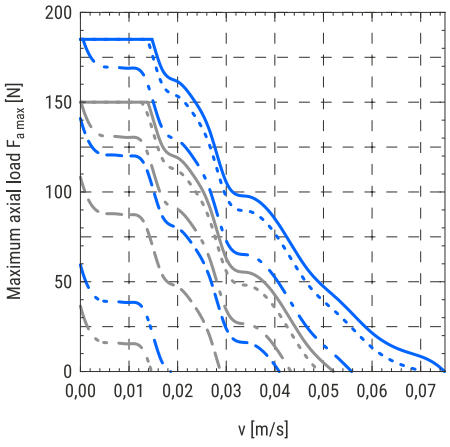
6 × 6 with a stepper motor □28



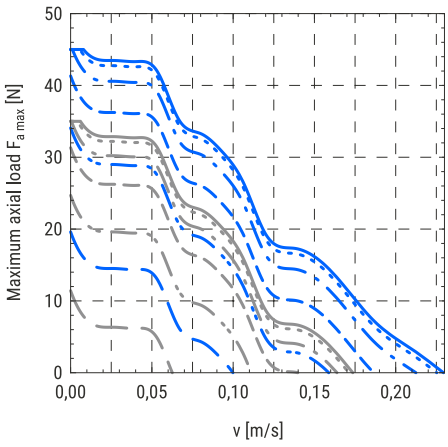


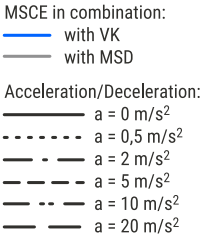
MSCE 32

8 × 2 with a stepper motor □28

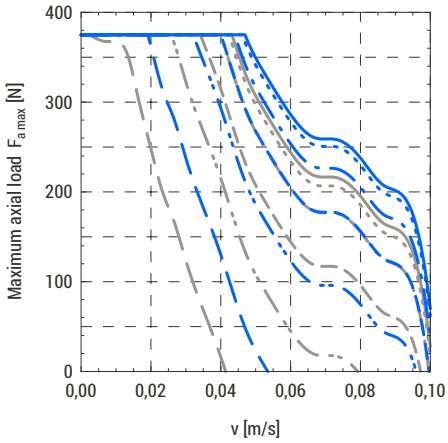


8 × 8 with a stepper motor □28

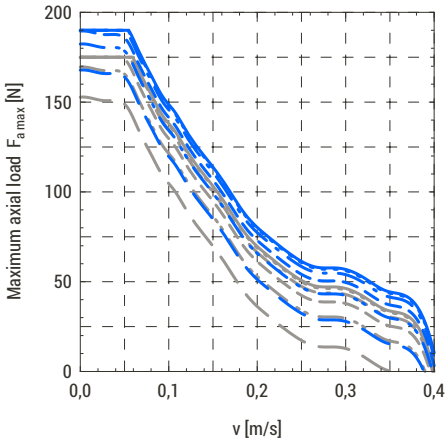




8 × 2 with a stepper motor □42



8 × 8 with a stepper motor □42

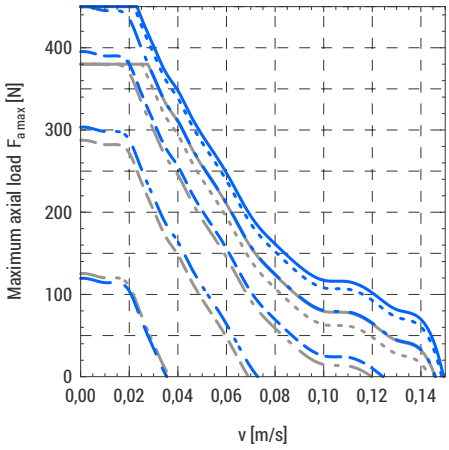


MSCE in combination:
with VK
with MSD

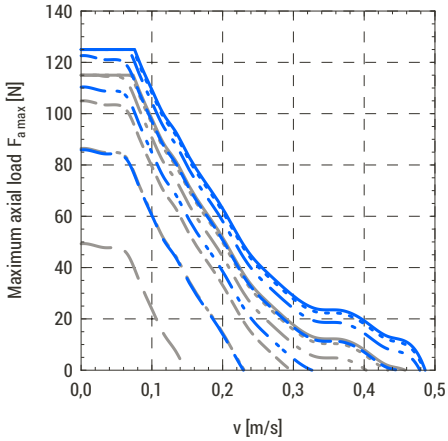
Acceleration/Deceleration:
a = 0 m/s²
a = 0,5 m/s²
a = 2 m/s²
a = 5 m/s²
a = 10 m/s²
a = 20 m/s²

MSCE 45

10 × 3 with a stepper motor □42



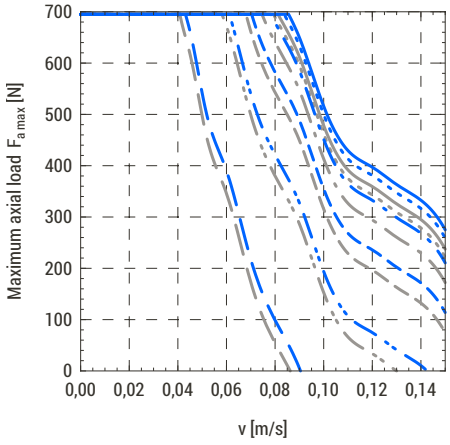
10 × 10 with a stepper motor □42



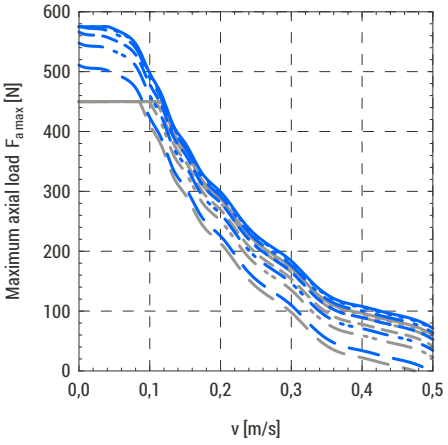
MSCE in combination:
with VK
with MSD

Acceleration/Deceleration:
a = 0 m/s²
a = 0,5 m/s²
a = 2 m/s²
a = 5 m/s²
a = 10 m/s²
a = 20 m/s²

10 × 3 with a stepper motor □56



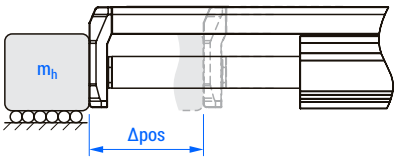
10 × 10 with a stepper motor □56



MSCE in combination:
with VK
with MSD

Acceleration/Deceleration:
a = 0 m/s²
a = 0,5 m/s²
a = 2 m/s²
a = 5 m/s²
a = 10 m/s²
a = 20 m/s²

Maximum horizontal payload as a function of change of the position and positioning time of the front plate



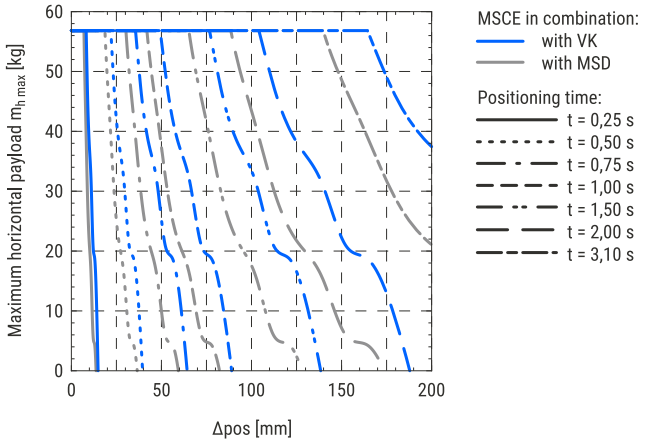
The following diagrams show the maximum payload that can be moved by a certain horizontal distance within a positioning time frame. Acceleration/deceleration time of 100 ms is taken into account.

Diagrams depend on the ball screw leads and different combinations of the standard motors. Motor adapter VK and a motor side drive MSD are also considered.

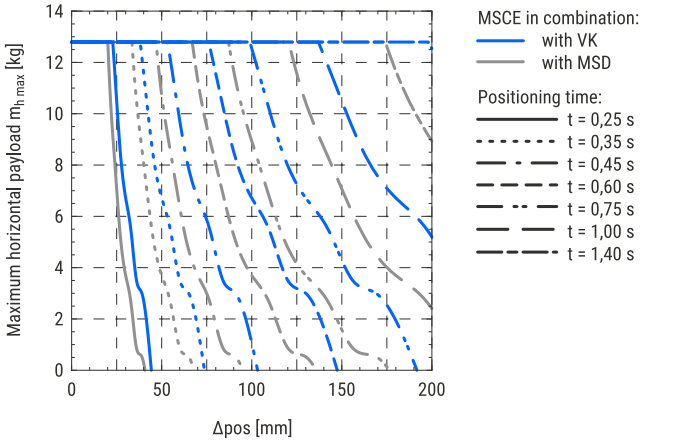
Curves are valid for the payload to be pushed and supported by an external guiding (coefficient of friction 0,1 is taken into consideration).

MSCE 25

6 × 2 with a stepper motor □28

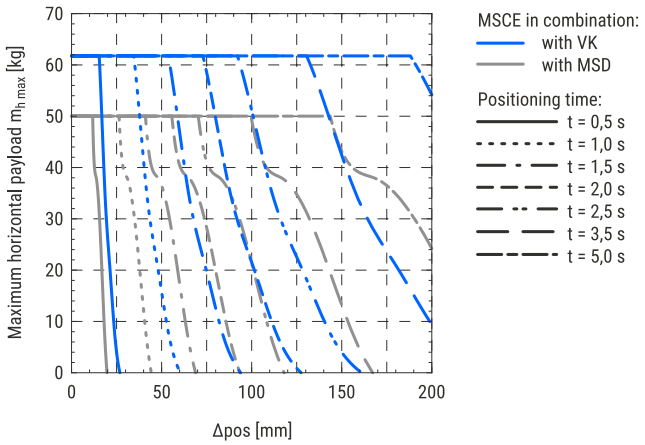


6 × 6 with a stepper motor □28

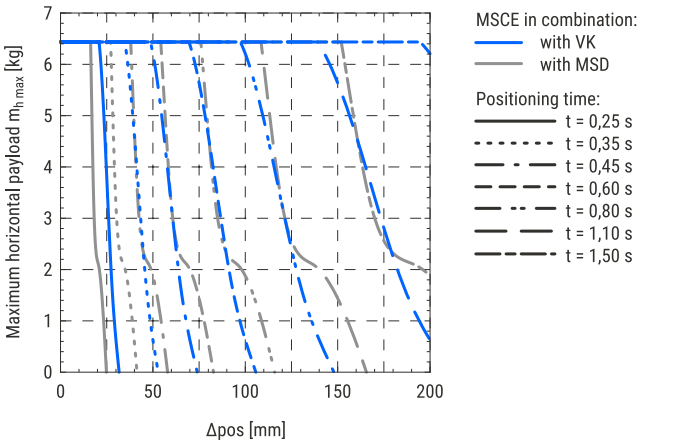


MSCE 32

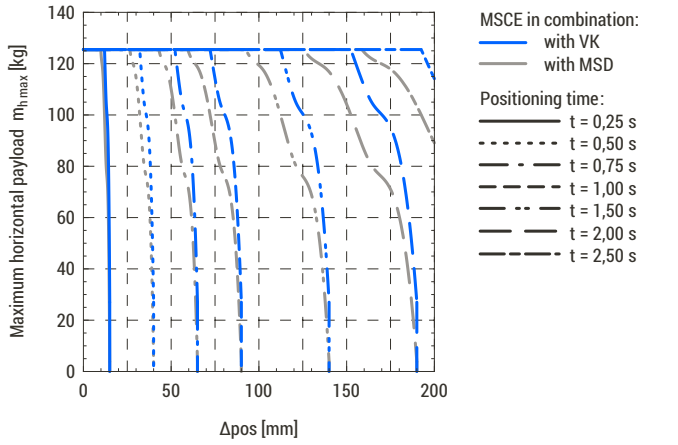
8 × 2 with a stepper motor □28



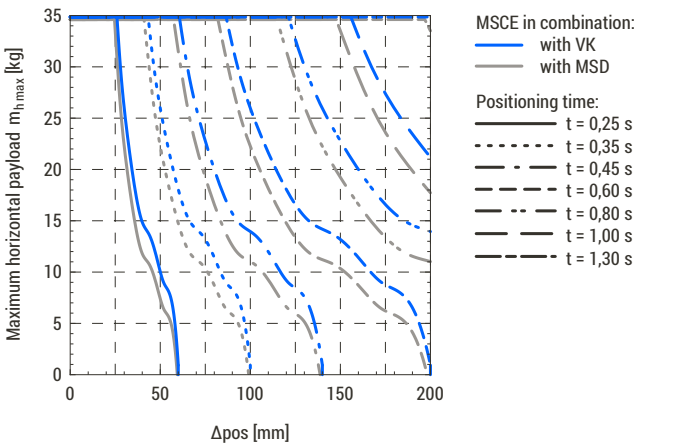
8 × 8 with a stepper motor □28



8 × 2 with a stepper motor □42

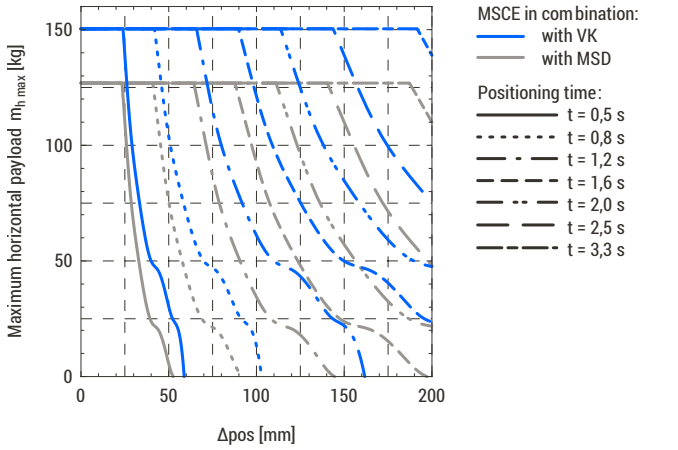


8 × 8 with a stepper motor □42

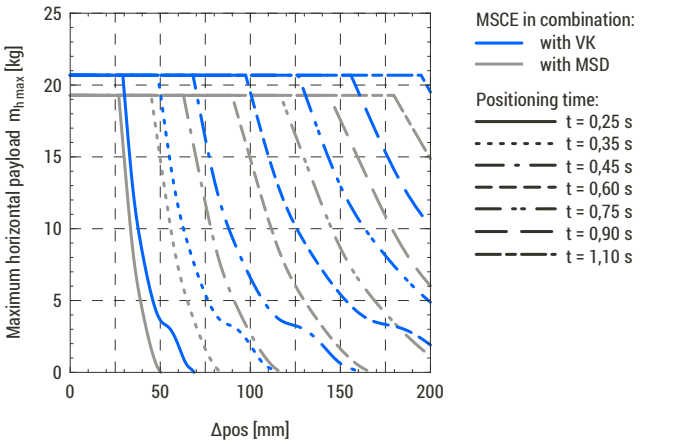


MSCE 45

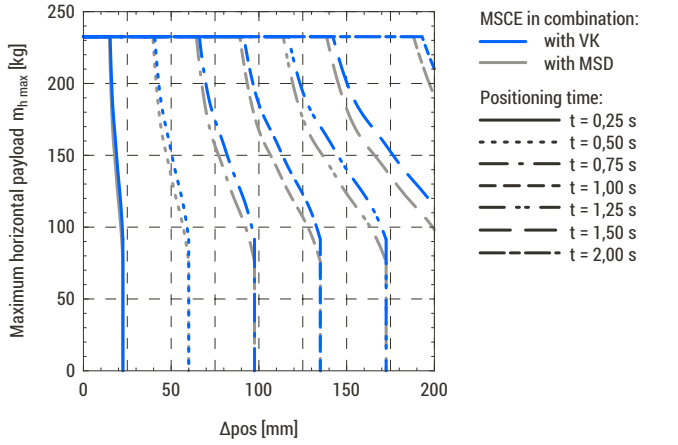
10 × 3 with a stepper motor □42



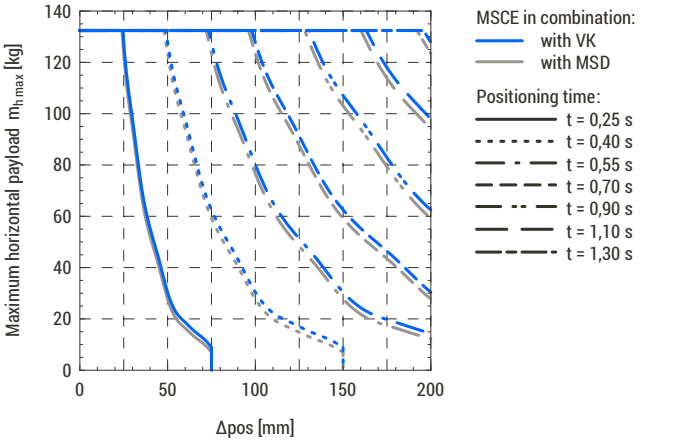
10 × 10 with a stepper motor □42



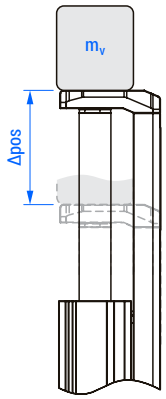
10 × 3 with a stepper motor □56



10 × 10 with a stepper motor □56



Maximum vertical payload as a function of change of the position and positioning time of the front plate

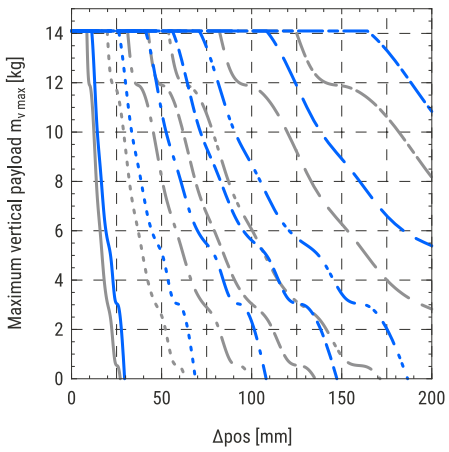


The following diagrams show the maximum payload that can be moved by a certain vertical distance within a positioning time frame. Acceleration/deceleration time of 100 ms is taken into account.

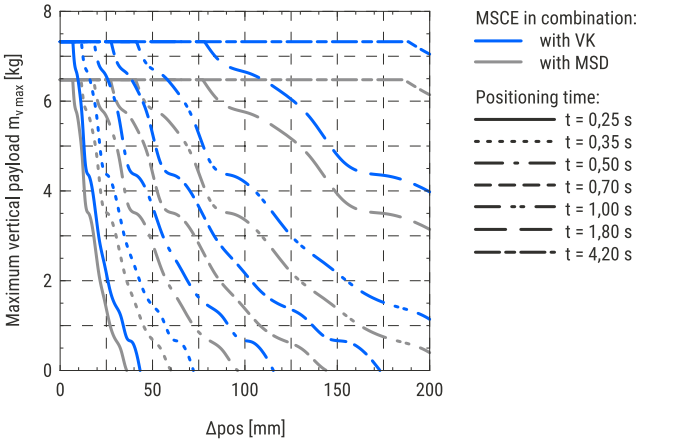
Diagrams depend on the ball screw leads and different combinations of the standard motors. Motor adapter VK and a motor side drive MSD are also considered.

MSCE 25

6 × 2 with a stepper motor □28

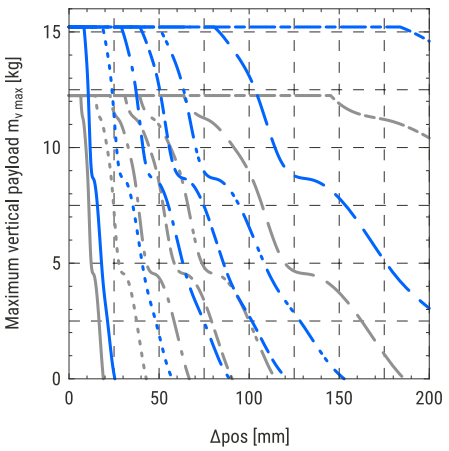


6 × 6 with a stepper motor □28

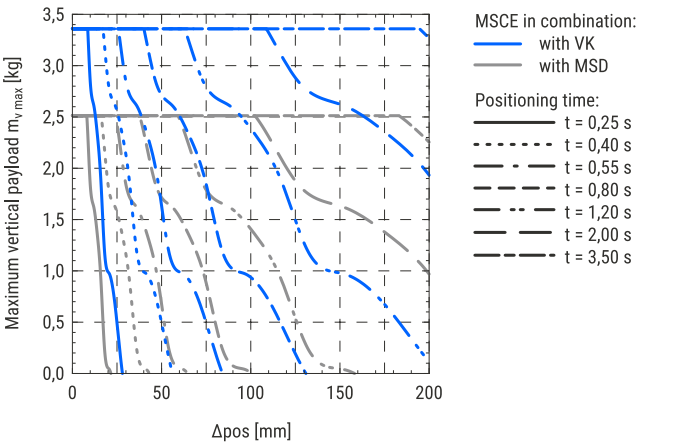


MSCE 32

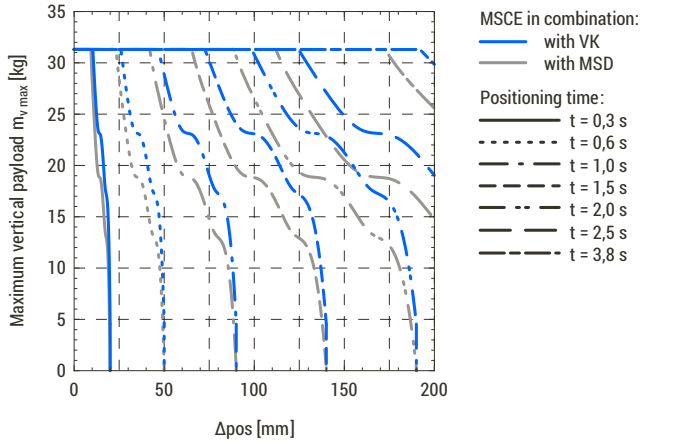
8 × 2 with a stepper motor □28



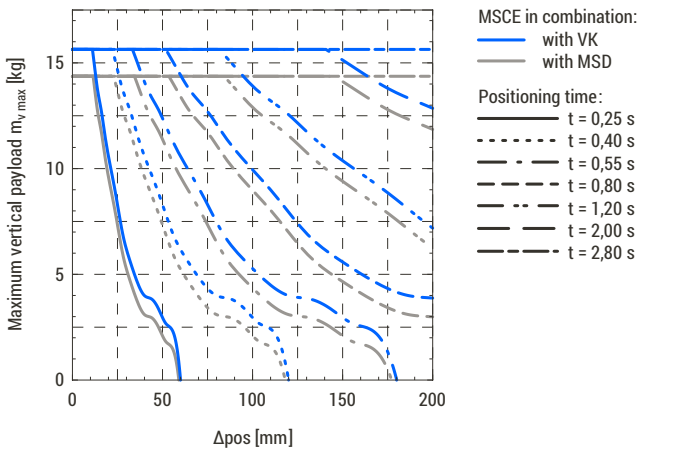
8 × 8 with a stepper motor □28



8 × 2 with a stepper motor □42

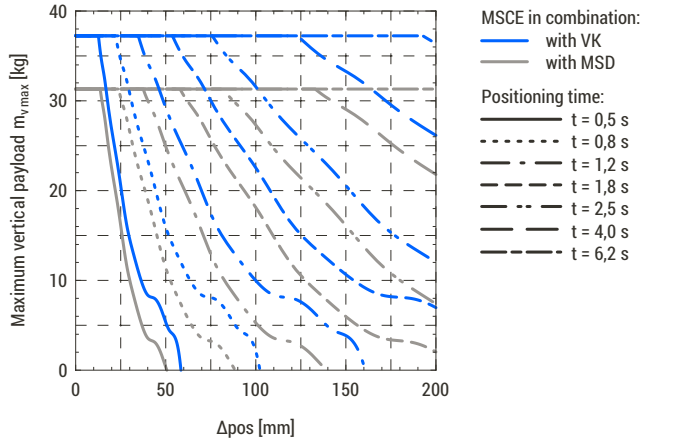


8 × 8 with a stepper motor □42

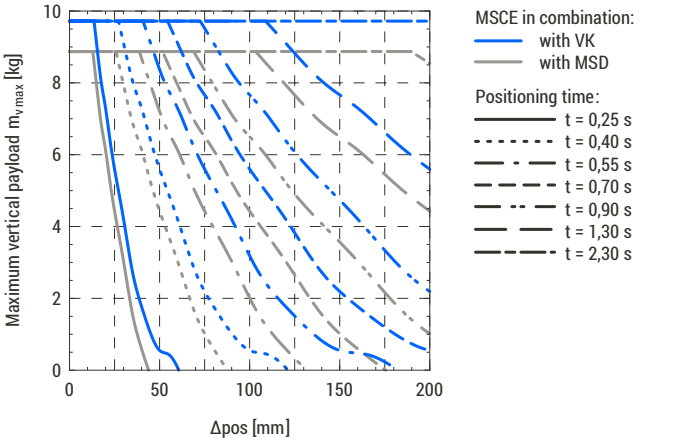


MSCE 45

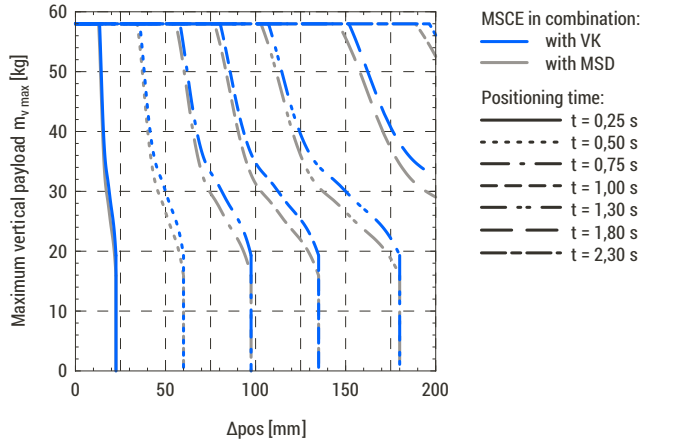
10 × 3 with a stepper motor □42



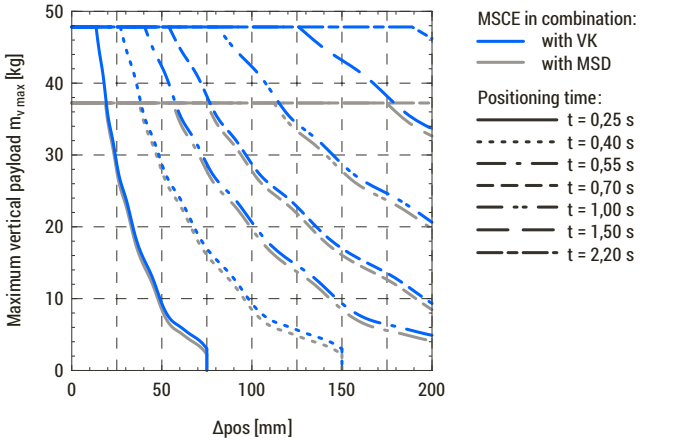
10 × 10 with a stepper motor □42



10 × 3 with a stepper motor □56



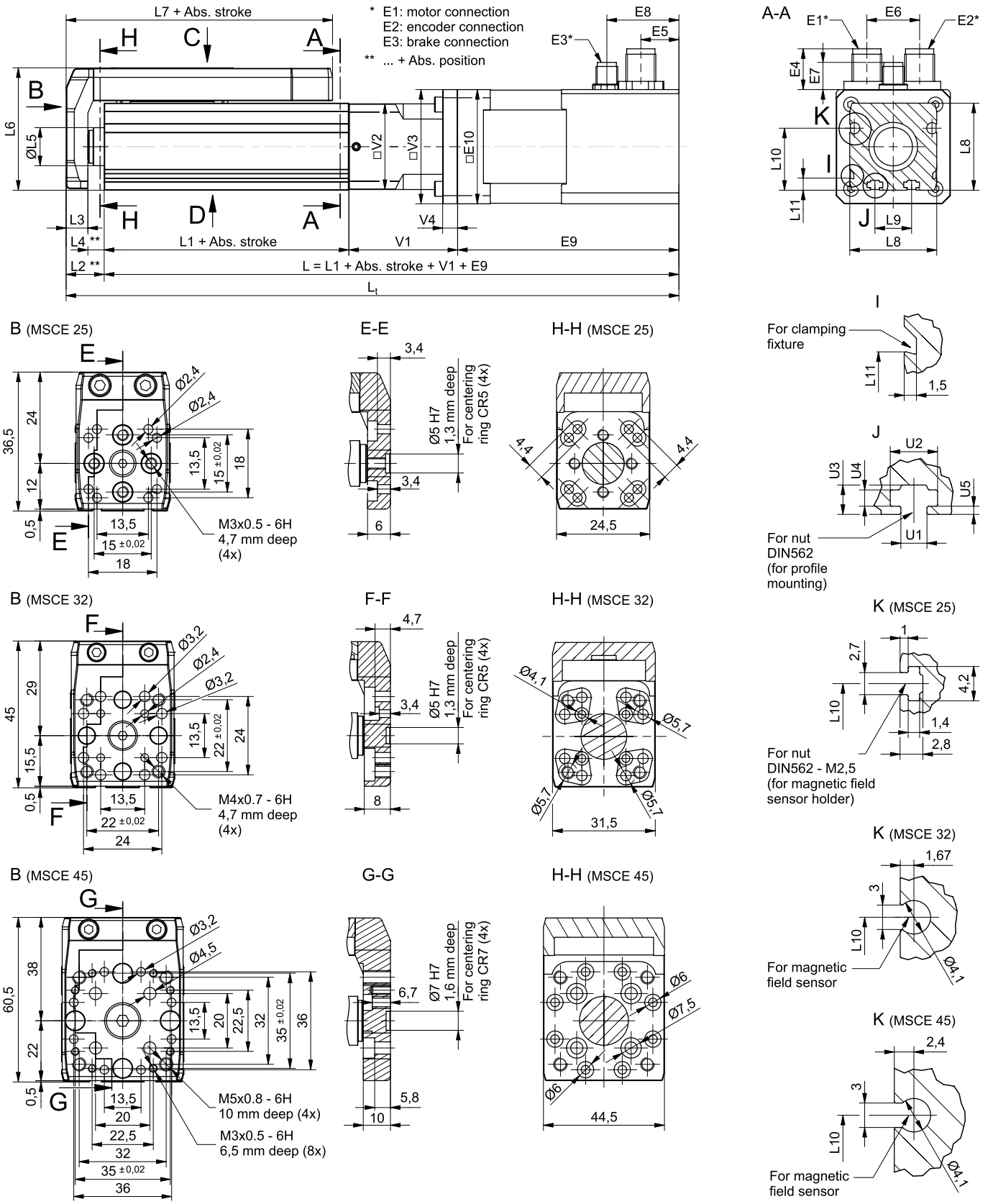
10 × 10 with a stepper motor □56



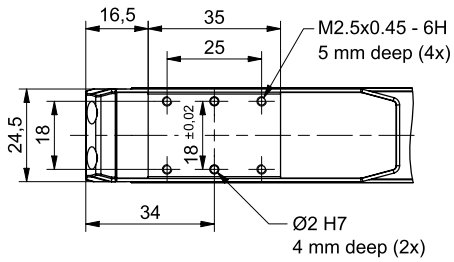
DIMENSIONS

All dimensions are in mm. The scale of the drawings may not be equal.

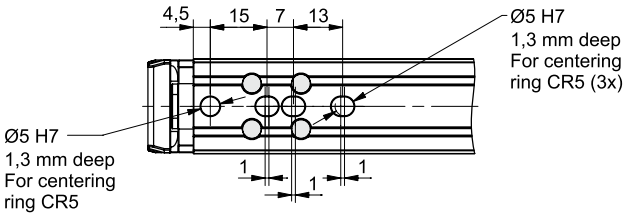
MSCE in combination with a standard motor and a motor adapter VK



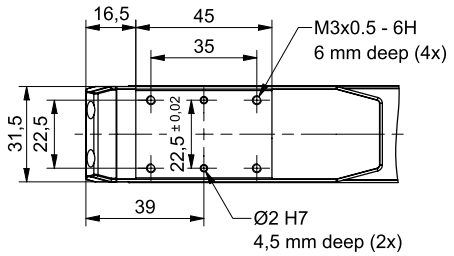
C (MSCE 25)



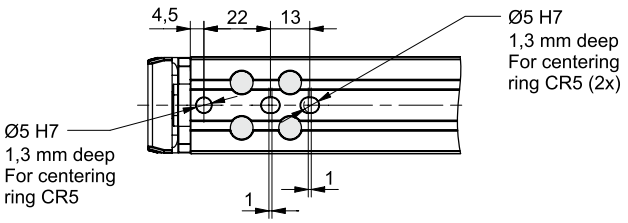
D (MSCE 25)



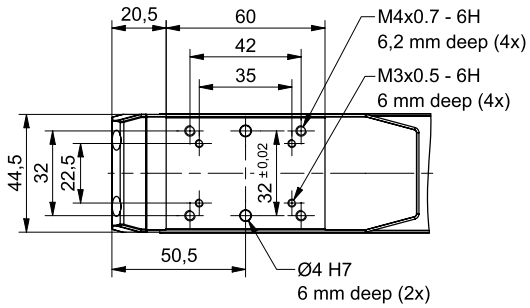
C (MSCE 32)



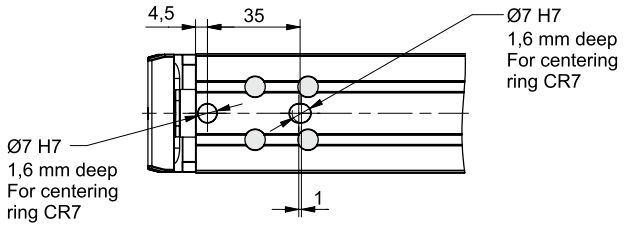
D (MSCE 32)



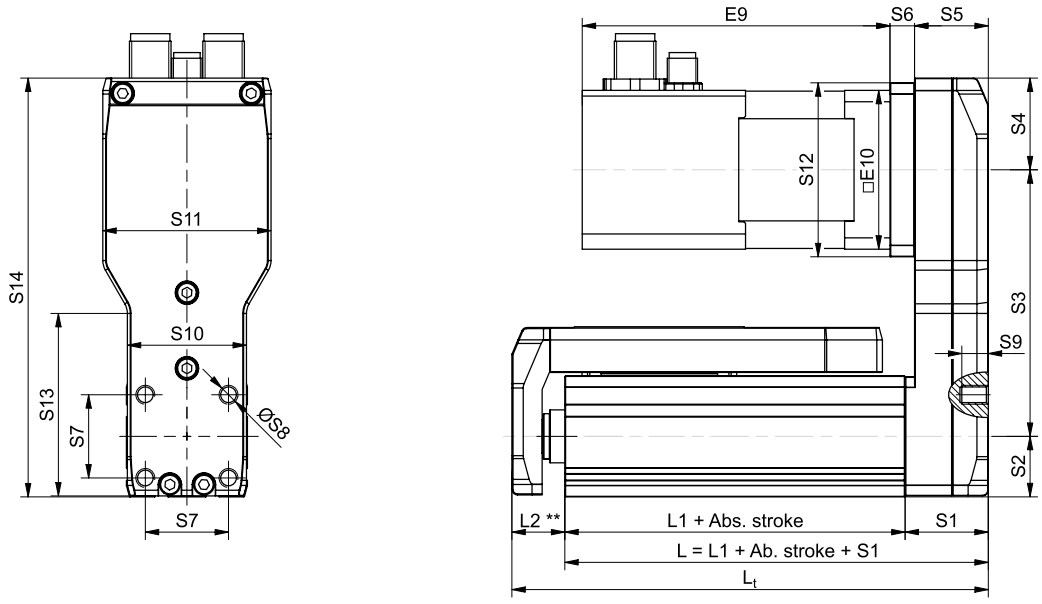
C (MSCE 45)



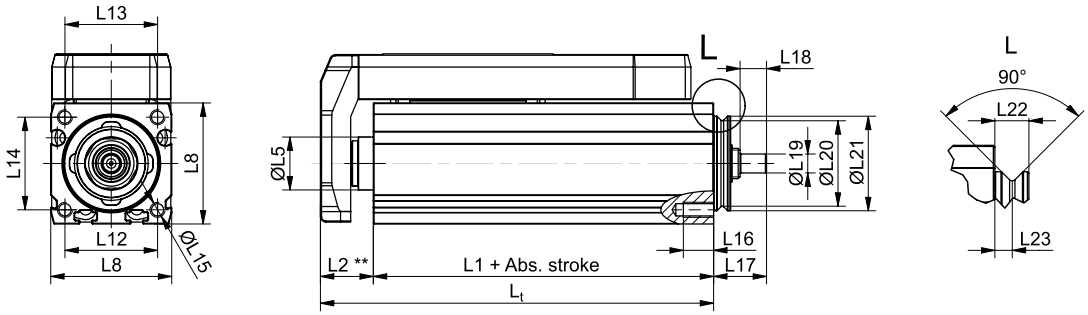
D (MSCE 45)



MSCE in combination with a standard motor and a motor adapter MSD



MSCE without a motor



MSCE dimensions

MSCE	L1	L2	L3	L4	ØL5	L6	L7	L8	L9	L10	L11	L12	L13	L14	ØL15	L16	L17	L18	ØL19 (h7)	ØL20	ØL21 (h7)
25	50	12	6	6	12	36,5	58	25	13,5	19,25	4,4	19	17	18	M2,5	8	14	7	5	17,6	20
32	65	14	8	6	14	45	73	32	13,5	22,8	4,4	24,5	24,5	24,5	M3	8	14	7	5	22,6	25
45	80	18	10	8	18	60,5	91	45	20	30,5	4,4	34	34	34	M4	10	16	8	8	31,6	34

MSCE	L22	L23	U1	U2	U3	U4	U5
25	4,5	2,3	2,2	4,2	2,8	1,4	1
32	4,5	2,3	3,2	5,8	3,6	2	1
45	4,5	2,3	4,2	7,5	4,7	2,5	1,2

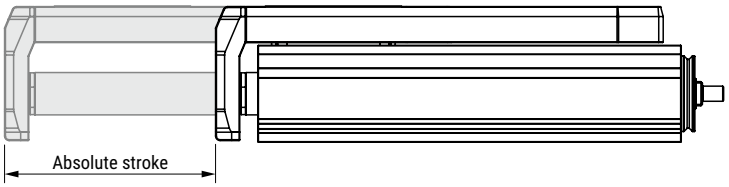
Motor adapter VK and a motor side drive MSD dimensions

MSCE	Motor		V1	□V2	□V3	V4	S1	S2	S3 (±0,5)	S4	S5	S6	S7	ØS8	S9	S10	S11	S12	S13	S14
	Type	Size □ [mm]																		
25	Stepper	28	35	24,5	28	5,5	22	12,5	52,5	18,25	19,5	5,5	18	M4	6	24,5	31,5	34	38,5	83,25
32		28	35	31,5	31,5	0	22	16,0	52,5	18,25	19,5	5,5	22	M5	7	31,5	31,5	34	0	86,75
		42	40	31,5	42	5,5	22	16,0	70,5	24,25	19,5	6,5	22	M5	7	31,5	44,5	46	48	110,75
45		42	42	44,5	44,5	0	27,5	22,5	81,0	24,75	24,5	6,5	32	M6	7	44,5	44,5	46	0	128,25
		56	46	44,5	56,4	9,5	27,5	22,5	88,5	33,25	24,5	6,0	32	M6	7	44,5	59,5	59,5	64,5	144,25

Motor dimensions

Motor			E1	E2	E3	E4 (±1)	E5 (±0,3)	E6	E7 (±1)	E8 (±0,3)	E9 (±1)	□E10
Type	Size □ [mm]	Brake										
Stepper	28	–	Available soon									
	28	with										
	42	–	M12 5-pole	M12 8-pole	–	14	14	19,5	–	–	70,4	42,3
	42	with	M12 5-pole	M12 8-pole	M8 3-pole	14	14	19,5	9	27	106,4	42,3
	56	–	M12 5-pole	M12 8-pole	–	14	13,4	23	–	–	98	56,4
	56	with	M12 5-pole	M12 8-pole	M8 3-pole	14	52,4	23	9	12	138	56,4

Absolute stroke and length of the MSCE definition



Absolute stroke definition

Absolute stroke = Effective stroke + 2 × Safety stroke

The electric slider MSCE does not include any safety stroke.

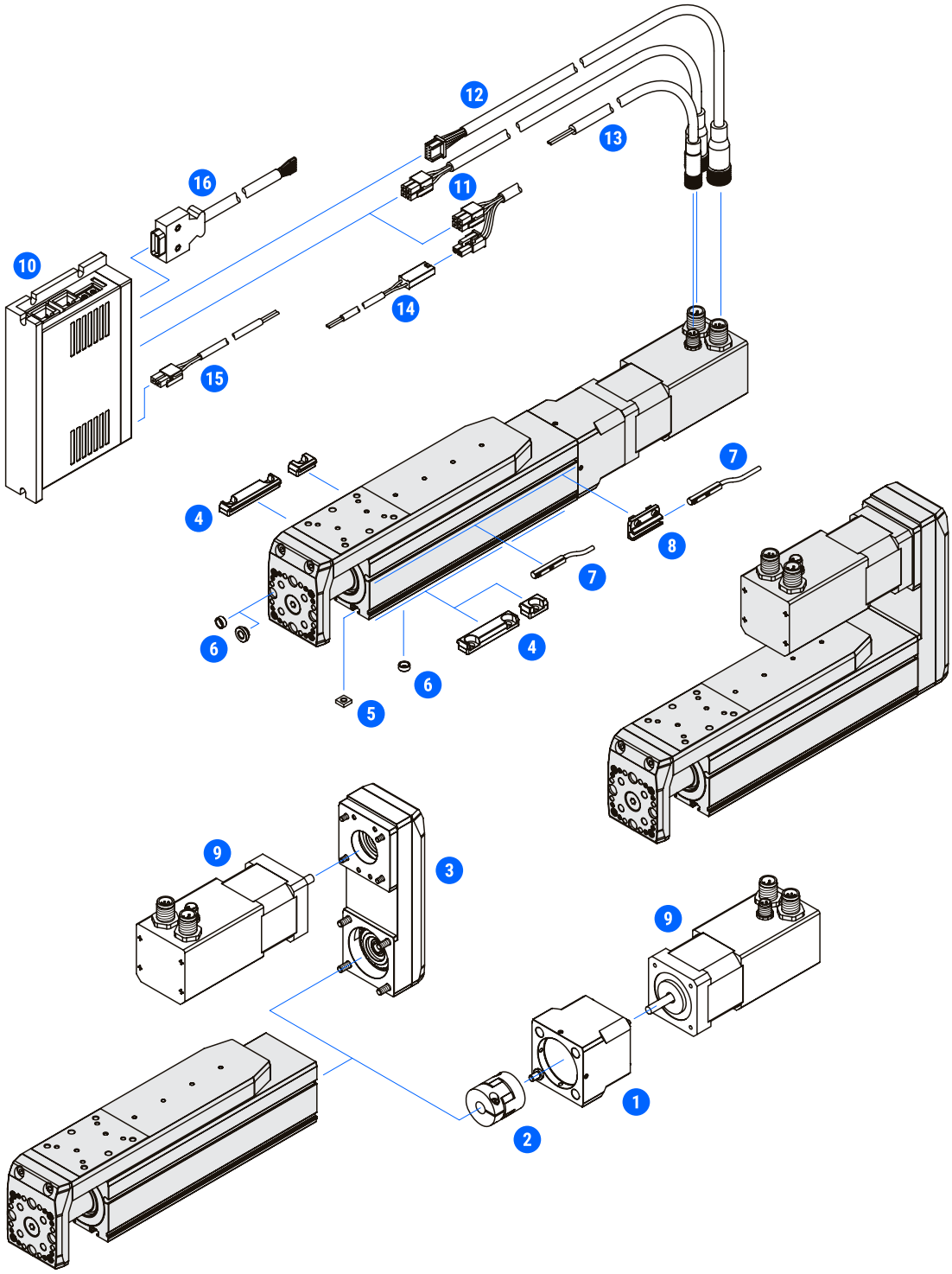
Length definition

L_t = L + L2 + Abs. position

Length L and L_t are defined as it is presented on the dimensional drawings above, where lengths of a motor, motor adapter VK, and motor side drive MSD are also considered.

Abs. stroke	Absolute stroke	[mm]
Abs. position	Absolute position	[mm]
L	Length	[mm]
L_t	Total length	[mm]

ACCESSORIES



#	Accessories	Compatible with MSCE size			Page	
		25	32	45		
1	Motor adapter VK	•	•	•	68	Motor adapeters
2	Coupling	•	•	•	69	Elastomer couplings
3	Motor side drive MSD	•	•	•	70	Motor side drives
4	Clamping fixture	•	•	•	74	Mounting attachement accessories
5	Slot nut	•	•	•	75	
6	Centering ring	•	•	•	75	
7	Magnetic field sensor	•	•	•	83	Limit switches
8	Sensor holder HMG	•	—	—	83	
9	Motor	•	•	•	85	Motors
10	Drive	•	•	•	85	Drives
11	Motor cable	•*	•*	•	86	Cables
12	Encoder cable	•	•	•	86	
13	Brake cable	•*	•*	•	86	
14	Brake to terminal cable*	•	•	—	86	
15	Power cable	•	•	•	88	
16	Signal cable	•	•	•	88	

* For the stepper motor size of 28, the motor and the brake cables are combined into one cable. For connectivity between the brake and the terminal, an additional brake to terminal cable is used.

Electrical data

MOTOR TYPES AND SIZES

Motor identification

Motor			Motor code
Type	Size ☐ [mm]	Brake	
Stepper	28	–	**STMN-28-L-E ***
		with	**STMN-28-L-E-B ***
	42	–	**STMN-42-L-E**
		with	**STMN-42-L-E-B**
	56	–	**STMN-56-L-E**
		with	**STMN-56-L-E-B**

* Available soon

Motor pin allocation

Stepper motor size of 28 mm

Available soon

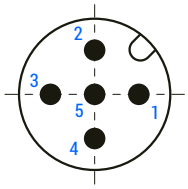
Stepper motor size of 42 and 56 mm

Valid for the stepper motors:

- STMN-42-…
- STMN-56-…

Motor connector

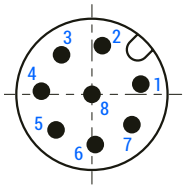
Connector type: M12 5-pole



Pin	Function
1	A/
2	A
3	B
4	B/
5	Housing

Encoder connector

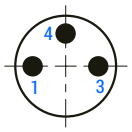
Connector type: M12 8-pole



Pin	Function
1	A
2	A/
3	B
4	B/
5	GND
6	I/
7	I
8	VCC (5 V)
Housing	GND/shielding

Brake connector

Connector type: M8 3-pole



Pin	Function
1	Brake +24 V
3	Brake/GND
4	NC

Valid only for the motors with a brake: STMN-…-B

Technical data

Motor

Motor	Motor			
	Type	Stepper		
	Size □ [mm]	28	42	56
	Code	STMN-28-L-...	STMN-42-L-...	STMN-56-L-...
Voltage	[V DC]	Available soon	3,15	2,4
Current per phase	[A]		1,8	4,2
Mass moment of inertia	[10^{-2} kg cm^2]		8,2 (9,5*)	48 (50,1*)
Holding torque	[Nm]		0,5	1,87
Step angle	[°]		1,8 ± 5 %	1,8 ± 5 %
Resistance per phase	[Ohm]		1,75 ± 10 %	0,58 ± 15 %
Inductance per phase	[mH]		3,3 ± 20 %	1,9 ± 20 %
Voltage constant	[mV/min^{-1}]		23	32,5
Mass	[kg]		0,34 (0,42*)	1,14 (1,33*)

* Valid for a motor with a brake.

Encoder

Encoder	Motor			
	Type	Stepper		
	Size □ [mm]	28	42	56
	Code	STMN-28-L-...	STMN-42-L-...	STMN-56-L-...
Type		Available soon	Incremental	
Measuring principle			Opto-electrical	
Interface			Line drive	
Resolution	[ppr]		500	
Operating voltage	[V DC]		5	

Brake

Brake	Motor			
	Type	Stepper		
	Size □ [mm]	28	42	56
	Code	STMN-28-L-...	STMN-42-L-...	STMN-56-L-...
Operating voltage	[V DC]	Available soon	24 (+6/−10 %)	
Rated output	[W]		8	10
Holding torque	[Nm]		0,4	1,0
Mass moment of inertia	[10^{-2} kg cm^2]		1,3	2,1

Operating conditions

Ambient temperature	−10 °C ~ +50 °C
Ambient humidity	max. 85 % (non-condensing)
Protection class*	IP65
Duty cycle	100 %

* Except the shaft output.

Dimensions

Please refer to the section “Mini electric cylinder – MCE → Dimensions” or “Mini electric slider - MSCE → Dimensions”.

Detailed informations

Please refer to the Unimotion documentation related to the motors.

DRIVE TYPES

Drive identification and compatibility

Drive		Motor			Drive code
Type	Protocol/control	Type	Size □ [mm]	Code	
Stepper	EtherCAT	Stepper	28	STMN-28-L-...	**STDF-28-A-EC***
			42	STMN-42-L-...	**STDF-42-A-EC**
			56	STMN-56-L-...	**STDF-56-A-EC**
	Ethernet based communication		28	STMN-28-L-...	**STDF-28-A-EN***
			42	STMN-42-L-...	**STDF-42-A-EN**
			56	STMN-56-L-...	**STDF-56-A-EN**
	Pulse/direction control		28	STMN-28-L-...	**STDF-28-A-PD***
			42	STMN-42-L-...	**STDF-42-A-PD**
			56	STMN-56-L-...	**STDF-56-A-PD**

* Available soon.

Technical data

	Drive			
	Type	Stepper		
	Protocol/control	EtherCAT	Ethernet based communication	Pulse/direction control
	Code	STDF-...-EC	STDF-...-EN	STDF-...-PD
Operating voltage	[V DC]	24 ± 10 %		
Current consumption*	[mA]	max. 500		
Rotational speed	[rpm]	0 ~ 3000		
Supported resolution **	[ppr]	500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000		
Input signals		3 dedicated inputs (LIMIT+, LIMIT–, ORIGIN)		Position command pulse
		7 user inputs (Photocoupler)	9 Programmable inputs (Photocoupler)	Servo on/off
				Alarm reset (Photocoupler input)
Output signals		6 user outputs (Photocoupler)	1 dedicated output (Compare out)	In-position
			9 programmable outputs (Photocoupler)	Alarm (Photocoupler output)
		Brake	Brake	Encoder signal, brake

* Except the motor current.
** For the case that resolution is higher than the encoder's resolution, the motor shall operate by micro-step between pulses.

Operating conditions

Ambient temperature	0 °C ~ +50 °C
Ambient humidity	35 % ~ 85 % (non-condensing)
Vibration resistance	0,5 G
Duty cycle	100 %

Dimensions

Please refer to the section “Accessories → Drive”.

Detailed informations

Please refer to the Unimotion documentation related to the drives.

DRIVE-MOTOR CABLES

Drive to motor cables in general consist of:

- a motor cable
- an encoder cable
- a brake cable (only if a motor with a brake is used).

For the stepper motor size of 28 motor and brake cables are combined in one cable.
Additional cable, i.e. brake to terminal cable is included for the case of the motor (□28) with the brake.

Cables identification and compatibility

Motor				Drive			Drive to motor cable code			
Type	Size □ [mm]	Brake	Code	Type	Protocol/control	Code	Motor	Brake	Encoder	Brake to terminal
Stepper	28	–	STMN-28-...	Stepper	• EtherCAT, • Ethernet based communication, • Pulse/direction control	STDF-...	STCF-M-_8-... *		STCF-E-_8-...*	–
		with	STMN-28-...-B							STCF-BT-02*
	42	–	STMN-42-...				STCF-M-_12-...	–	STCF-E-_12-...	–
		with	STMN-42-...-B					STCF-B-_8-...		
	56	–	STMN-56-...					–		
		with	STMN-56-...-B					STCF-B-_8-...		

* Available soon.

Technical data

Stepper motor size of 28 mm

Available soon.

Stepper motor size of 42 and 56 mm

Cable	Drive to motor cable			
	Type	Motor	Brake	Encoder
	Code	STCF-M-_12-...	STCF-B-_8-...	STCF-E-_12-...
Length	[m]	3, 5, 10		
Cable diameter D	[mm]	5,1	4,5	6,7
Material, color		TPE, black		
Bending radius (dyn.)	[mm]	min. 7,5 × D		
Shielded?		yes		

Operating conditions

Ambient temperature (fixed laying)	–40 °C ~ +70 °C
Ambient temperature (flexible application)	5 °C ~ +70 °C

Dimensions

Please refer to the section "Accessories → Drive-motor cables".

POWER AND SIGNAL CABLES

Power cable is used for supplying the power from power supply to the drive.
Signal cable is mandatory for the following cases:

- If a motor with a brake is used
- If a pulse/direction drive control is used
- If the limit switches are used.

Cables identification and compatibility

Drive			Cable code	
Type	Protocol/control	Code	Power	Signal
Stepper	EtherCAT	STDF-...-EC	STCF-P-02	STCF-S-EC-02
	Ethernet based communication	STDF-...-EN		STCF-S-EN-02
	Pulse/direction control	STDF-...-PD		STCF-S-PD-02

Technical data

Cable	Type	Power cable	Signal cable		
	Code	STCF-P-02	STCF-S-EC-02	STCF-S-EN-02	STCF-S-PD-02
Length	[m]	2			
Cable diameter	[mm]	4,6	6,4	6,9	6,4
Material, color		PVC, black			
Shielded?		yes			

Dimensions

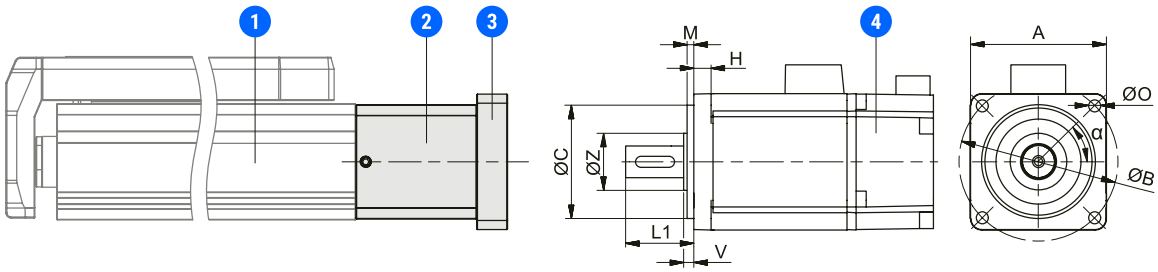
Please refer to the section "Accessories → Power and signal cables".

Detailed informations

Please refer to the Unimotion documentation related to the drives.

Accessories

MOTOR ADAPTER



1 – MCE/MSCE
2 – Motor adapter housing
3 – Motor adapter flange
4 – Motor

Motor adapter VK

Coupling is not included.

Motor adapters VK are compatible with the following MCE/MSCE and couplings sizes:

MCE/MSCE	VK	Coupling
25	MG 25	EKL 2
32	MG 32	
45	MG 45	EKL 5

For more information about the couplings, please refer to the section “Couplings”.

How to order

VK - MG 32 - 42,3 - 43,8 - 22 - 2 - 24 - 4,5 - M3 - 0 - 0 - 45

Motor adapter

Mini series:
– MG

Size:
– 25
– 32
– 45

Motor dimensions [mm]: A, ØB, ØC, M, L1, H, ØO, V, ØZ

[°]: α

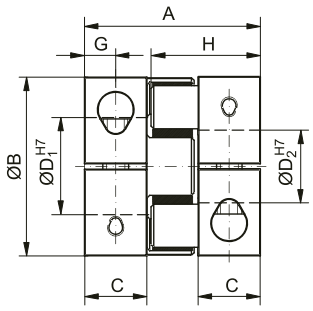
Dimension ØO is also used for tapped holes. In case of tapped holes, prefix M must be applied.

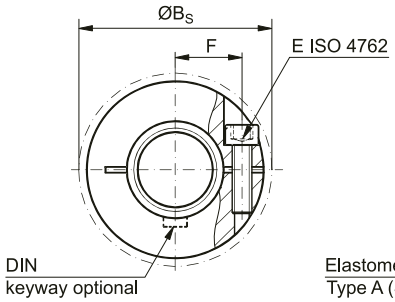
Compatibility of the standard motor adapters VK with the MCE/MSCE and the standard motors

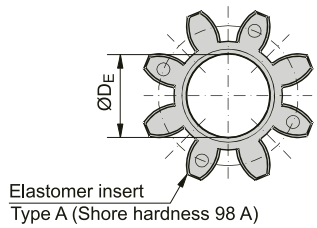
MCE/MSCE	Motor			Motor shaft length		Motor shaft diameter [mm]	Motor mounting holes	Motor adapter VK	Code	Mass
Size	Type	Size □ [mm]	Standard	L1 [mm]			diameter × depth			m_{VK} [kg]
				min	max		ØO × H [mm]			
25	Stepper	28	NEMA 11	15	20	5,0	M2,5 × 2,5 (min.)	**VK MG 25 T1**	**108256**	0,04
32								**VK MG 32 T1**	**108257**	0,06
		42	NEMA 17	20	25	5,0	M3 × 4,5 (min.)	**VK MG 32 T2**	**108258**	0,09
45								**VK MG 45 T1**	**108259**	0,14
		56	NEMA 23	20	25	6,35	5 × 10,0 (max.)	**VK MG 45 T2**	**108260**	0,18

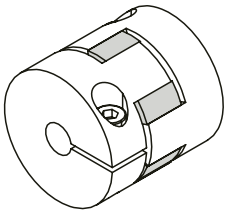
The standard motor adapter VK is made out of one piece. It is important to note when ordering it, that the coupling is included.
For dimensions of the standard motor adapters VK please refer to the section “Mini electric cylinder – MCE → Dimensions” or “Mini electric slider – MSCE → Dimensions”.

COUPLINGS









Technical data and dimensions

EKL			2	5
Rated torque	[Nm]	T_{KN}	2	9
Maximum torque*	[Nm]	T_{MAX}	4	18
Overall length	[mm]	A	20	26
Outside diameter	[mm]	B	16	25
Outside diameter with the screw head	[mm]	BS	17	25
Mounting length	[mm]	C	6	8
Inside diameter (H7)	[mm]	D_1, D_2	3–8	4–12,7
Inside diameter of the elastomer	[mm]	D_E	6,2	10,2
Clamping screw (ISO 4752)		E	M2	M3
Tightening torque of the clamping screw	[Nm]		0,6	2
Distance between the centerlines	[mm]	F	5,5	8
Distance	[mm]	G	3	4
Hub length	[mm]	H	12	16,7
Moment of inertia per hub	[10^{-3} kg m^2]	J_1, J_2	0,0003	0,002
Approximate weight	[kg]		0,008	0,02
Speed standard	[min^{-1}]		15000	15000

* Maximum transmittable torque of the clamping hub depends on the bore diameter.

Maximum transmittable and drive torque $M_{p,c}$ [Nm] depends on the bore diameter [mm]

EKL	Ø3	Ø4	Ø5	Ø8	Ø10	Ø12,7
2	0,2	0,8	1,5	2,5	–	–
5	–	1,5	2	8	8	10

Maximum transmittable and drive torque $M_{p,c}$ [Nm] limited to the size of the MCE/MSCE

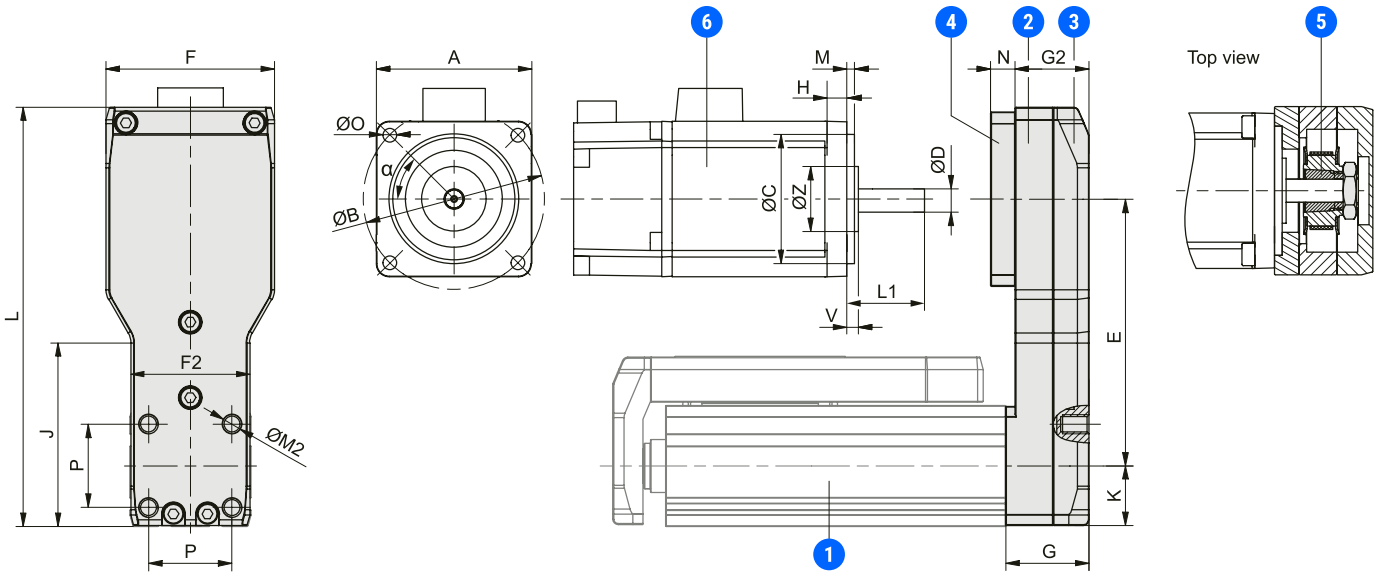
EKL	MCE/MSCE		
	25	32	45
2	0,1	0,53	–
5	–	–	1,23

How to order

COUPLING - **EKL5** - **A** - **F5** - **F6PFN**

- **Coupling**
- **Coupling type/size:** – 2 – 5
- **Elastomer insert type:** – A
- **Hole diameter** [mm]
- **Option:** – PFN: with the keyway – Leave blank: without the keyway

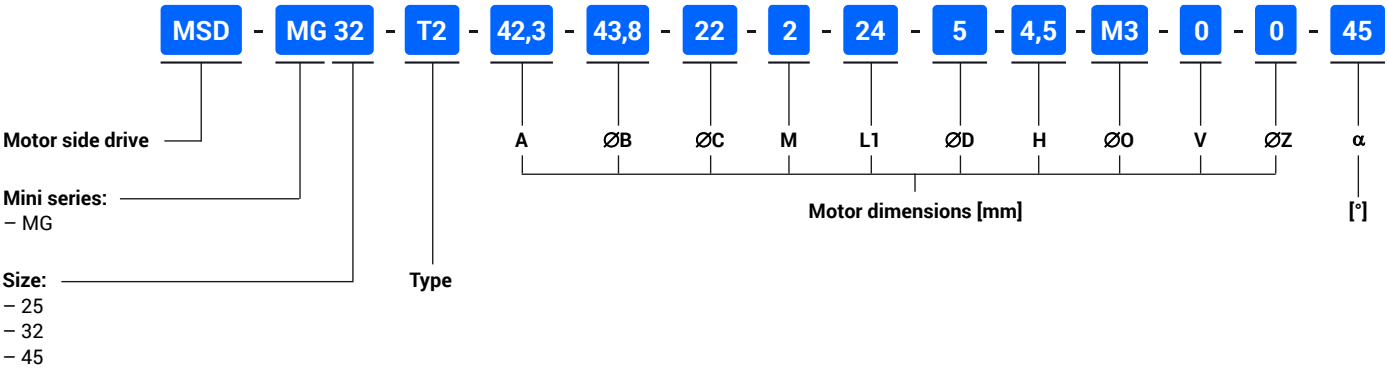
MOTOR SIDE DRIVE MSD WITH A TIMING BELT



1 – MCE/MSCE
2 – Motor side drive housing
3 – Motor side drive cap
4 – Motor side drive tensioning plate
5 – Clamping set
6 – Motor

Motor side drive MSD

How to order



Dimension ØO is also used for tapped holes. In case of tapped holes, prefix M must be applied.

Compatibility of the standard motor side drives MSD with the MCE/MSCE and the standard motors

MCE/MSCE	Motor			Motor shaft length		Motor shaft diameter [mm]	Motor mounting holes	Motor side drive MSD	Code	Mass
Size	Type	Size □ [mm]	Standard	L1 [mm]			diameter × depth			m_{MSD} [kg]
				min	max		ØO × H [mm]			
25	Stepper	28	NEMA 11	14	20	5,0	M2,5 × 2,5 (min.)	**MSD MG 25 T1**	**108261**	0,10
32				14	20			**MSD MG 32 T1**	**108262**	0,12
		42	NEMA 17	17,5	24	5,0	M3 × 4,5 (min.)	**MSD MG 32 T2**	**108263**	0,18
45				20,5	28			**MSD MG 45 T1**	**108264**	0,28
		56	NEMA 23	20	28	6,35	5 × 4,5 (min.) ~ 5,5 (max.)	**MSD MG 45 T2**	**108265**	0,36

Technical data

MCE/ MSCE	Type	Gear ratio	Max. drive torque	Max. radial load on shaft*	No load torque	Mass moment of inertia	Mass ***	Motor size limits [mm]					
								A	ØB	ØC	L1		ØD
		i	$M_{p, MSD}$	$F_{r, MSD}$	$M_{0, MSD}$	J_{MSD}	m_{MSD}	max	max	max	min	max	max
			[Nm]	[N]	[Nm]	[10^{-6} kg m^2]	[kg]			*****	Clamping set****		
25	T1	1	0,10	15	0,010	0,39	0,10	34	35	25		20	6,35
32	T1	1	0,10	15	0,015	0,39	0,12	34	35	25		20	6,35
	T2	1	0,25	15	0,015	1,04	0,18	46	50	36	**	24	8
45	T1	1	0,30	15	0,020	4,16	0,28	46	50	36		28	8
	T2	1	0,80	45	0,020	4,20	0,36	59,5	70	50		28	12,7

* This is the load which is linearly dependent on the maximum drive torque $M_{p, MSD}$ and is generated by the correct pretension of the belt. This load needs to be reduced in accordance with the capabilities of the motor.
** Minimum dimension L1 depends on the size of particular clamping set. Values can be found on the following table.
*** This is an average value. It could differ depending to the motor dimensions.
**** Keyway is not valid.
***** Higher value is also possible with thicker tensioning plate (dimension N increases).

Dimensions

MCE/ MSCE	Type	Gear ratio	E (±0,5)	F	F2	G	G2	N*	J	K	L	P	ØM2
		i	[mm]										
25	T1	1	52,5	31,5	24,5	22	19,5	5,5	38,5	12,25	83	18	M4×6
32	T1	1	52,5	31,5	31,5	22	19,5	5,5	0	15,75	86,5	22	M5×7
	T2	1	70,5	44,5	31,5	22	19,5	6,5	48	15,75	110,5	22	M5×7
45	T1	1	81	44,5	44,5	27,5	24,5	6,5	0	22,25	128	32	M6×7
	T2	1	88,5	59,5	44,5	27,5	24,5	6,0	64,5	22,25	144	32	M6×7

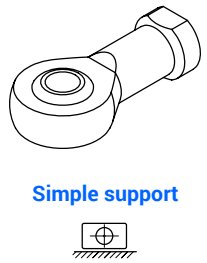
* This is a standard value. It could differ depending to the motor dimensions M and L1.

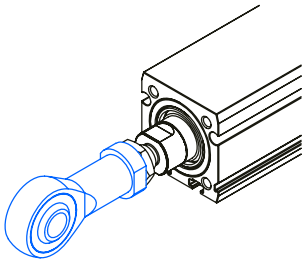
Minimum dimension L1 [mm] depends on the motor shafts diameter ØD

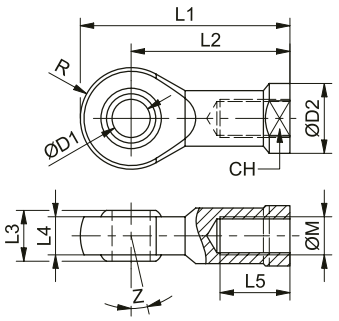
MCE/ MSCE	Type	Gear ratio	ØD [mm]											
		i	4	5	6	6,35	7	8	9	9,52	10	11	12	12,7
25	T1	1	14	14	14	14	–	–	–	–	–	–	–	–
32	T1	1	14	14	14	14	–	–	–	–	–	–	–	–
	T2	1	–	17,5	17,5	17,5	17,5	17,5	–	–	–	–	–	–
45	T1	1	–	20,5	20,5	20,5	20,5	20,5	–	–	–	–	–	–
	T2	1	–	20	20	20	20	20	20,5	20,5	20,5	20,5	20,5	20,5

ROD EYE SGS

Material: galvanized steel





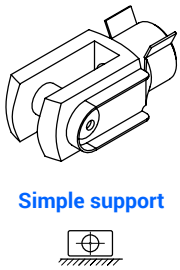


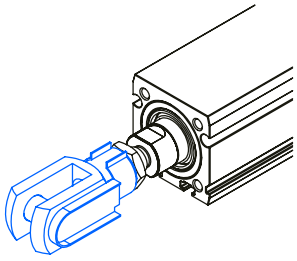
Dimensions and ordering codes

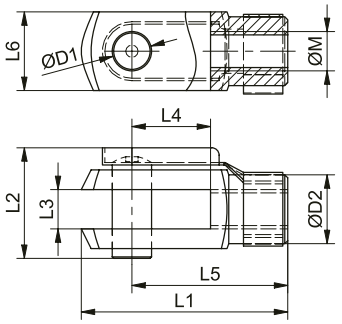
SGS		ØM	L1	L2	L3	L4	L5	ØD1 (H7)	ØD2	R	CH	Z	m	F_{max}
Size	Code	[mm]										[°]	[kg]	[N]
25	9215	M6	40	30	9	6,75	12	6	13	10	11	13	0,03	F_{MCE}
32	9216	M8	48	36	12	9,00	16	8	16	12	14	14	0,05	F_{MCE}
45	9206	M10x1,25	57	43	14	10,50	20	10	19	14	17	13	0,08	F_{MCE}

ROD CLEVIS SG

Material: galvanized steel





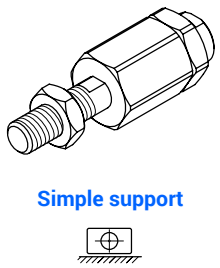


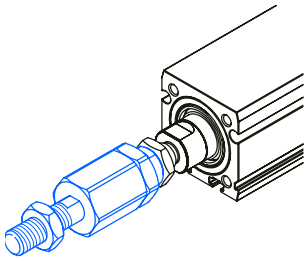
Dimensions and ordering codes

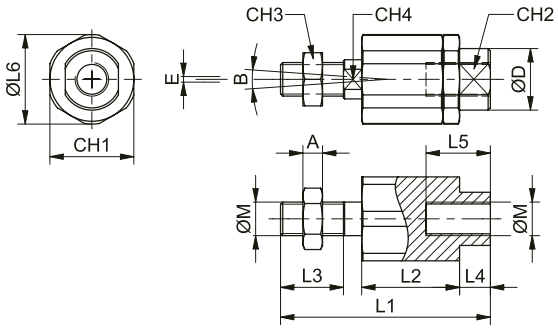
SG		ØM	L1 (±0,5)	L2	L3 (B13)	L4 (±0,5)	L5	L6 (h11)	ØD1 (H9)	ØD2	m	F_{max}
Size	Code	[mm]									[kg]	[N]
25	9196	M6	31	16	6	12	24	12	6	10	0,02	F_{MCE}
32	9197	M8	42	22	8	16	32	16	8	14	0,05	F_{MCE}
45	9186	M10x1,25	52	26	10	20	40	20	10	18	0,09	F_{MCE}

SELF-ALIGNING JOINT FK

Material: galvanized steel





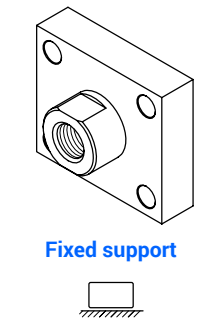


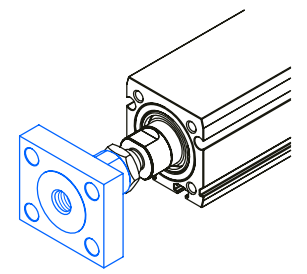
Dimensions and ordering codes

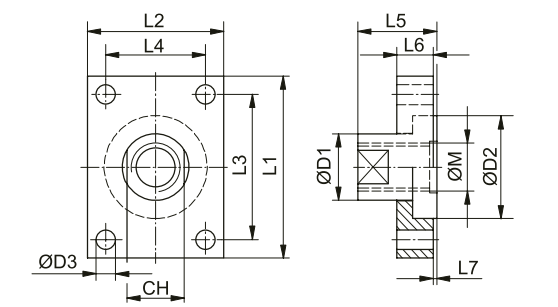
FK		ØM	L1	L2	L3	L4	L5	ØL6	A	ØD	CH1	CH2	CH3	CH4	E	B	m	F_{max}
Size	Code	[mm]														[°]	[kg]	[N]
25	5473	M6	35	17,5	11	4	12,5	14,5	4	8,5	13	7	10	5	1	6	0,03	F_{MCE}
32	5474	M8	57	26	21	5	16	19	5	12,5	17	11	13	7	2	8	0,06	F_{MCE}
45	5466	M10x1,25	71,5	35	20	9	22	32	6	22	30	19	17	12	2	8	0,22	F_{MCE}

COUPLING PIECE KSZ

Material: galvanized steel







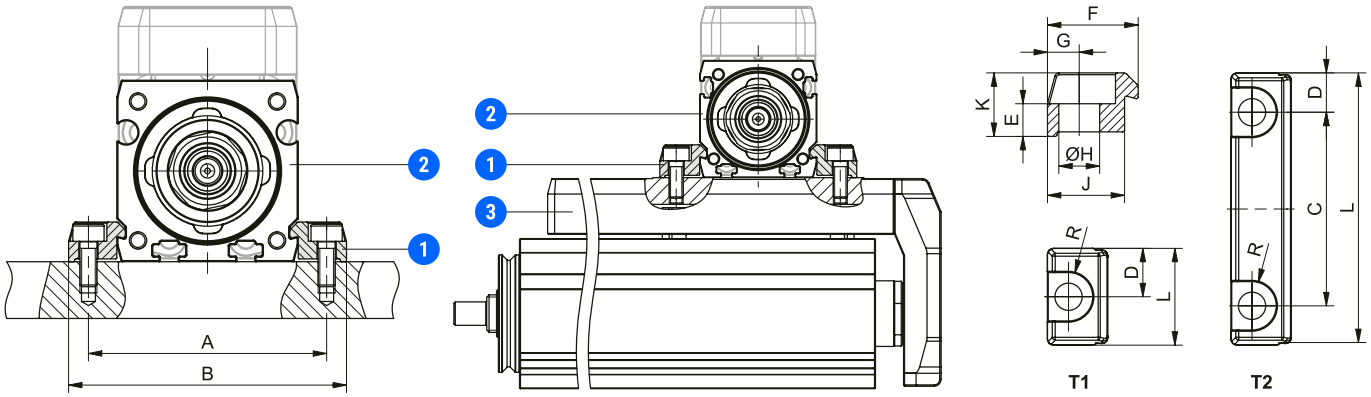
Dimensions and ordering codes

KSZ		ØM	L1	L2	L3	L4	L5	L6	L7 (min.)	ØD1	ØD2	ØD2 (H13)	CH	m	F_{max}
Size	Code	[mm]												[kg]	[N]
25	5227	M6	30	25	20	15	16	8	0,1	$12^{-0,1}$	18	5,5	10	0,05	F_{MCE}
32	5228	M8	35	30	25	20	22	8	0,1	$14^{-0,1}$	20	5,5	13	0,07	F_{MCE}
45	5229	M10 x 1,25	40	35	30	25	20	10	0,1	$17^{-0,2}$	26	5,5	15	0,11	F_{MCE}

CLAMPING FIXTURE

Mini electric cylinder and slider can be mounted by using the clamping fixtures which are placed in the slot on the side of the profile. Clamping fixtures can also be mounted to the slide of the mini electric sliders MSCE (e.i. for multi-axis systems).

Material: powder coated zinc alloy



1 – Clamping fixture
2 – Profile of the MCE/MSCE
3 – Slide of the MSCE

The scale of the drawings may not be equal.

Dimensions and ordering codes

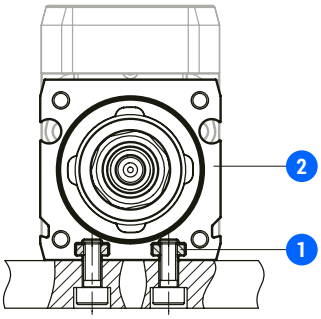
MCE/ MSCE	Clamping fixture			Mounting distance [mm]		Dimensions [mm]										Mounting to MSCE slide*	m [g]	Code
	For screw	Type	L [mm]	A (±0,1)	B	C	D	E	F	G	ØH	J	K	R	Countersink for	For MCE/ MSCE		
25	M3	T1	16	35	42	–	8	3,6	10	3,5	3,4	8,5	7	3,25	DIN 912	–	6	108216
	M3	T2	32			22,5	4,75										12	108218
	M4	T1	16			–	8	2,5			4,5			4			5	108217
	M4	T2	45			32	6,5										16	108219
32	M3	T1	16	42	49	–	8	3,6	10	3,5	3,4	8,5	7	3,25	DIN 912	25	6	108216
	M3	T2	32			22,5	4,75										12	108218
	M4	T1	16			–	8	2,5			4,5			4		–	5	108217
	M4	T2	45			32	6,5										16	108219
45	M3	T1	16	55	62	–	8	3,6	10	3,5	3,4	8,5	7	3,25	DIN 912	25	6	108216
	M3	T2	32			22,5	4,75										12	108218
	M4	T1	16			–	8	2,5			4,5			4		32	5	108217
	M4	T2	45			32	6,5										16	108219

* For more information, please refer to the section “Mounting examples”.

SLOT NUT

Mini electric cylinder and slider can be mounted by using the slot nuts which are placed in the slots on the bottom side of the profile.

Material: galvanized steel



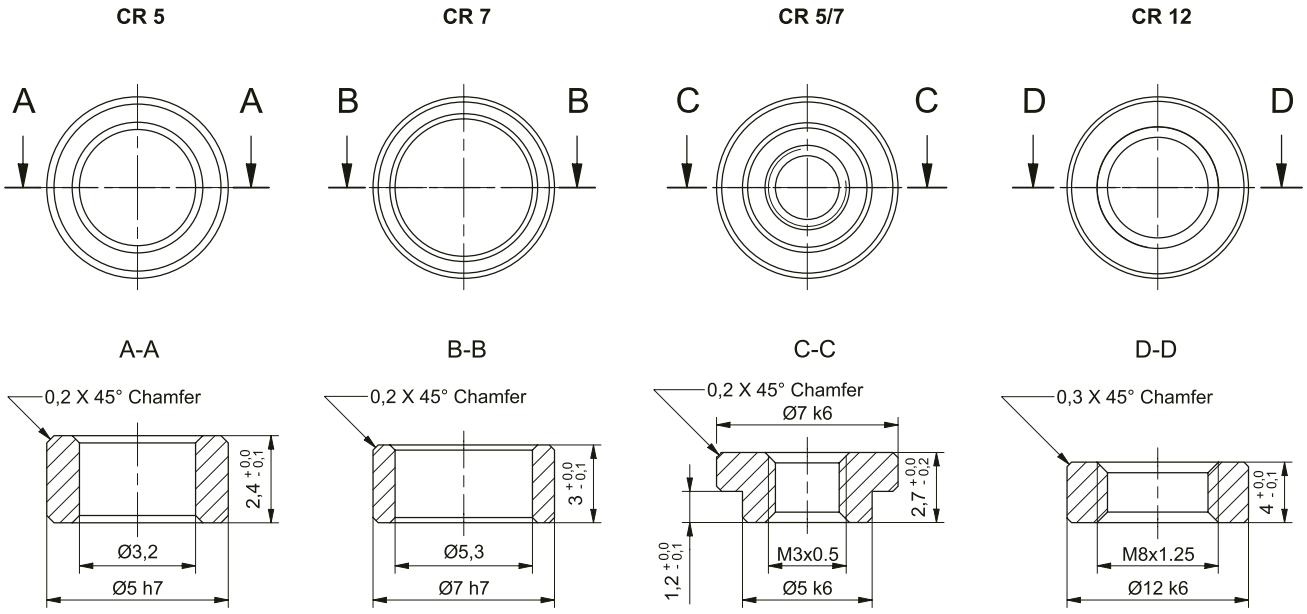
1 – Slot nut
2 – Profile of the MCE/MSCE

Nut types and ordering codes

MCE/MSCE	Nut type	m [g]	Code
25	DIN562 – M2	0,013	107082
32	DIN562 – M3	0,035	37303
45	DIN562 – M4	0,064	40682

CENTERING RING

Material: stainless steel



The scale of the drawings may not be equal.

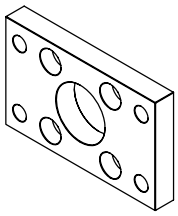
Ordering codes

CR	m [g]	Code
5	0,2	107094
7	0,4	23332
5/7	0,5	107095
12	2,4	49049

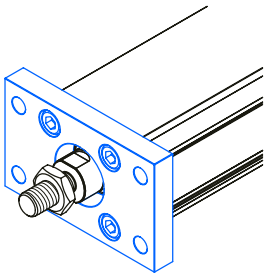
FLANGE MOUNTING MAFL

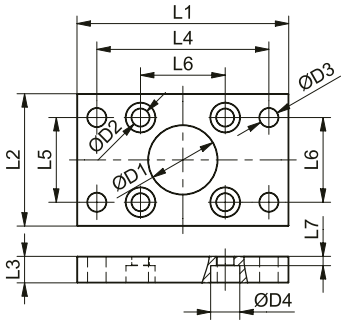
Material: anodized aluminium

Mounting screws are included.



Fixed support





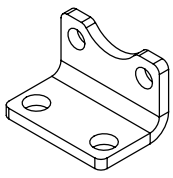
Dimensions and ordering codes

MAFL		L1	L2	L3	L4	L5	L6	L7	ØD1	ØD2	ØD3	ØD4	m	F_{max}
Size	Code	[mm]											[kg]	[N]
25	108624	55	29	8	43	–	21	5,1	18	2,9	5,5	5,5	0,03	F_{MCE}
32	108625	70	36	10	55	–	22	5,5	20	4,5	6,5	8,0	0,06	F_{MCE}
45	108626	80	50	10	65	32	32	3,5	26	6,6	7,0	11,0	0,11	F_{MCE}

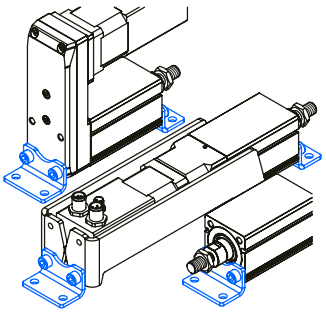
FOOT MOUNTING MAHP

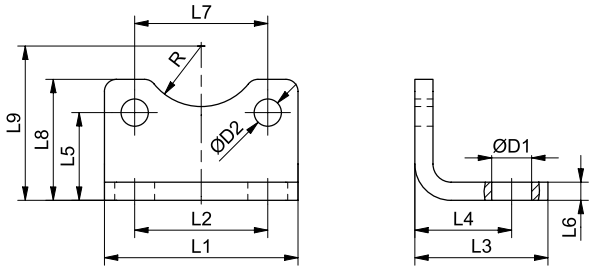
Material: stainless steel

Set contains 2 pcs (i.e. for both front and rear mounting). Mounting screws are included.



Fixed support





Dimensions and ordering codes

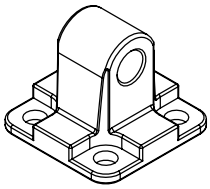
MAHP		L1	L2	L3	L4	L5		L6	L7		L8	L9	ØD1	ØD2		R	m	F_{max}
						Front	Rear		Front	Rear				Front	Rear			
Size	Code	[mm]															[kg]	[N]
25	108253	25	18	17,5	13	11,5	13	3	21	18	17,5	22,0	5,5	2,8	4,5	9	0,04	F_{MCE}
32	108254	32	22	22,0	16	14,5		3	22		20,0	25,5	6,6	4,5	5,5	10	0,06	F_{MCE}
45	108255	45	32	26,0	18	16		3	32		24,0	32,0	6,6	6,6		13	0,11	F_{MCE}

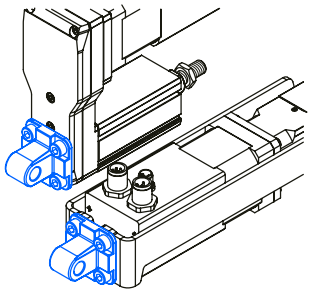
SWIVEL/CLEVIS MOUNT MASU

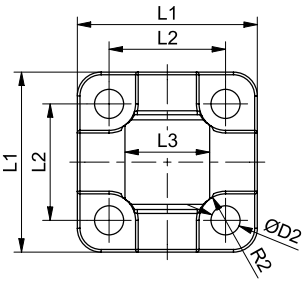
Material: aluminium, MASU 45 – aluminium + galvanized steel

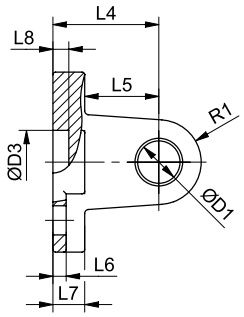
Mounting screws are included.

Size 25, 32

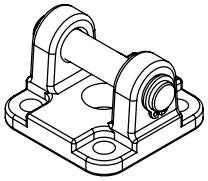




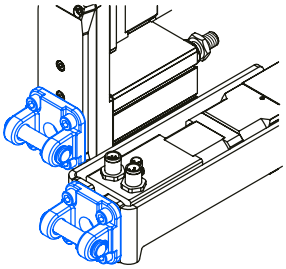


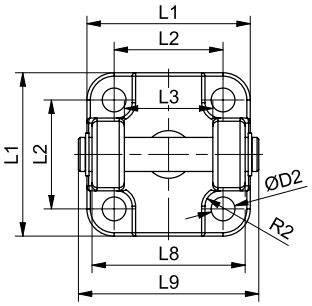


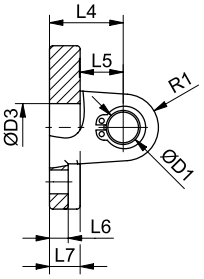
Size 45



Simple support





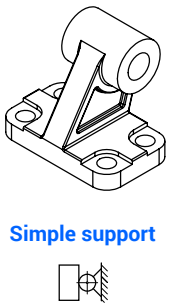


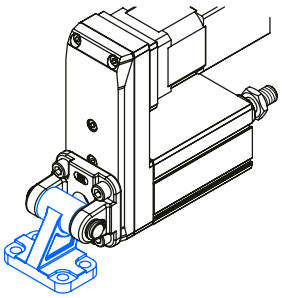
Dimensions and ordering codes

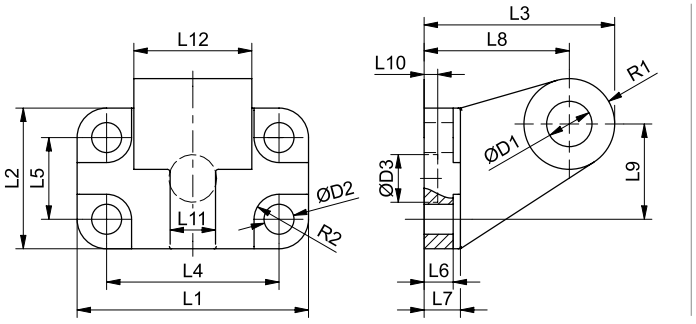
MASU		L1 (±0,2)	L2	L3	L4 (±0,2)	L5	L6	L7	L8	L9	R1	R2	ØD1	ØD2	ØD3 (H11)	m	F_{max}
Size	Code	[mm]														[kg]	[N]
25	108243	27	18	12	16	10	2,6	6	3	–	6	4,5	6	4,5	10	0,02	F_{MCE}
32	108244	34	22	16	20	14	2,6	6	3	–	8	5,0	8	5,5	12	0,03	F_{MCE}
45	108245	48	32	26	22	13	5,5	9	45	53	10	5,5	10	6,6	14	0,12	F_{MCE}

SWIVEL FOOT MOUNTING MLG

Material: aluminium





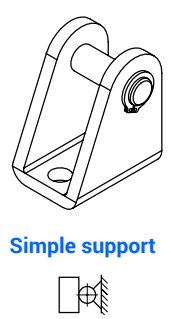


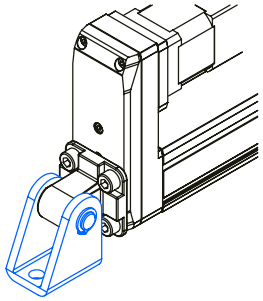
Dimensions and ordering codes

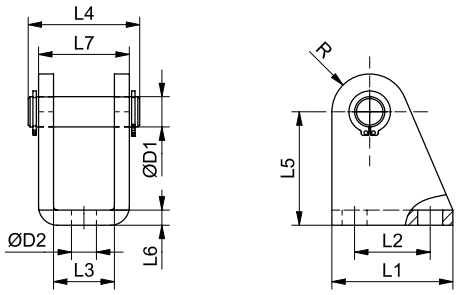
MLG		L1	L2	L3	L4	L5	L6	L7	L8	L9	L10 (+0,5/0)	L11	L12	ØD1 (H9)	ØD2 (H13)	ØD3 (+0,5/0)	R1	R2	m	F_{max}
Size	Code	[mm]																	[kg]	[N]
45	108233	51	31	42	38	18	6,4	8	32	21	3	10	26	10	6,6	10,5	10	5,5	0,08	F_{MCE}

CLEVIS FOOT MOUNTING MLBU

Material: galvanized steel







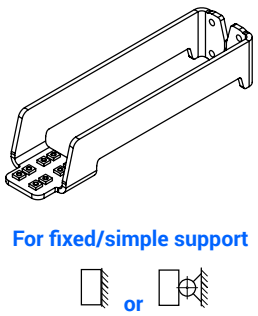
Dimensions and ordering codes

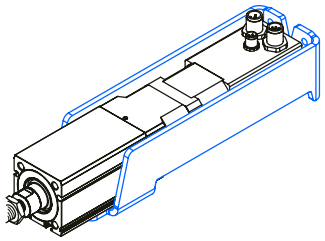
MLBU		L1	L2	L3	L4 (+0,3/0)	L5 (±0,2)	L6 (±0,2)	L7	ØD1 (f7)	ØD2	R	m	F_{max}
Size	Code	[mm]										[kg]	[N]
25	108227	25	15	12,1	23,0	27	3	18	6	5,5	7	0,04	F_{MCE}
32	108226	32	20	16,1	29,5	30	4	24	8	6,6	10	0,08	F_{MCE}

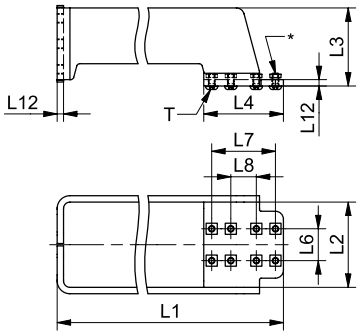
BACK MOUNT ABM

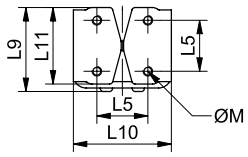
Material: stainless steel

Mounting screws and nuts are included.









* MCE/MSCE mounting nuts and screws

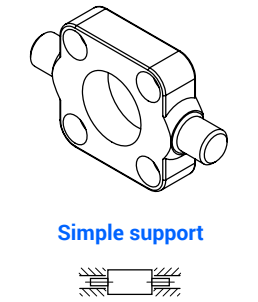
Dimensions and ordering codes

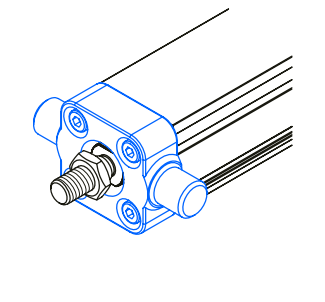
ABM			Compatibility (motor)		L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	ØM	T	m	F_{max}
Size	Type	Code	Type	Size □ [mm]	[mm]													[Nm]	[kg]	[N]
25	T1	108239	Stepper	28	165	30,5	27,5	35	18	13,5	28	12	29,8	35,5	27	2,5	M4	0,3	0,14	F_{MCE}
32	T1	108237		28	170	38,5	35,0	40	22	13,5	28	12	37,7	44,5	34	3,0	M5	1,2	0,24	F_{MCE}
	T2	108238		42	200	46,0								52,0					0,29	F_{MCE}
45	T1	108235		42	210	53,5	49,0	50	32	20,0	40	16	52,7	61,5	48	4,0	M6	2,2	0,62	F_{MCE}
	T2	105320		56	245	64,9								72,9					0,72	F_{MCE}

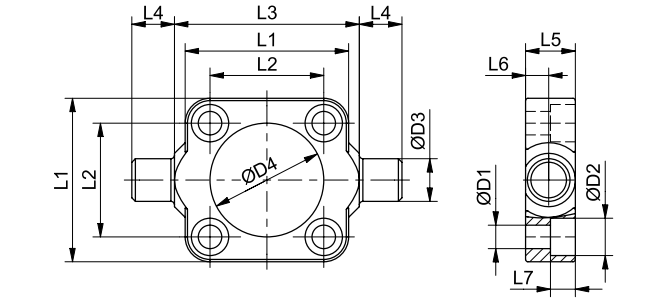
TRUNNION MOUNT MZK

Material: galvanized steel

Mounting screws are included.







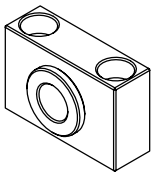
Dimensions and ordering codes

MZK		L1	L2	L3 (h14)	L4 (h14)	L5	L6 (+0,3/0)	L7 (±0,2)	ØD1	ØD2	ØD3 (e9)	ØD4	m	F_{max}
Size	Code	[mm]											[kg]	[N]
32	108230	35	22	38	12	14	6,5	6	5,5	10,0	12	18	0,12	F_{MCE}
45	108231	46	32	52	12	14	6,5	7	6,6	10,5	12	32	0,17	F_{MCE}

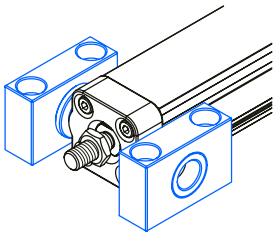
TRUNNION SUPPORT MLZ

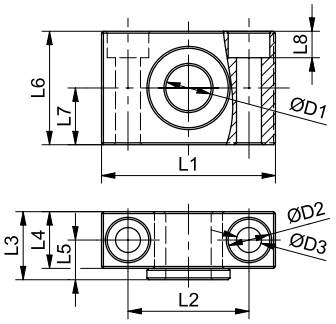
Material: galvanized steel + sinterized bronze

Set contains 2 pcs.



Simple support





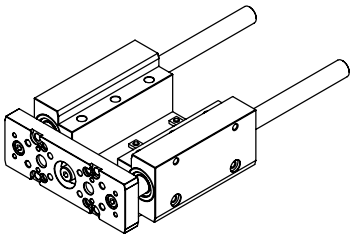
Dimensions and ordering codes

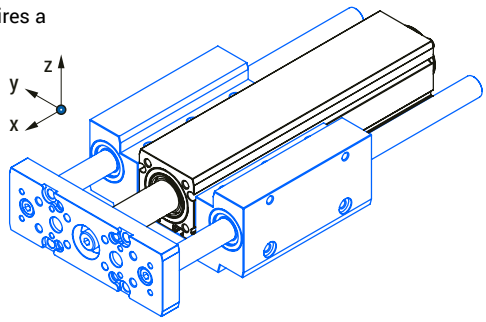
MLZ		L1	L2 (±0,2)	L3	L4	L5	L6	L7 (±0,1)	L8 (±0,5)	ØD1 (F7)	ØD2	ØD3	m	F_{max}
Size	Code	[mm]											[kg]	[N]
32/45	108234	46	32	18	15	10,5	30	15	7	12	11	6,6	0,2	F_{MCE}

GUIDING UNIT GUC

Material: body and plate – anodized aluminium, guides – hardened steel

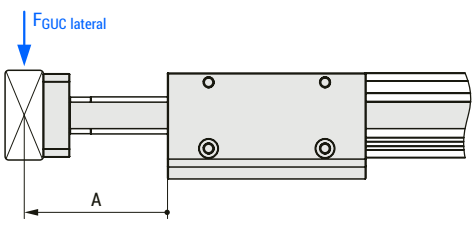
Mounting (on the MCE profile) screws and nuts are included. Guiding unit GUC requires a female thread on the piston rod end.

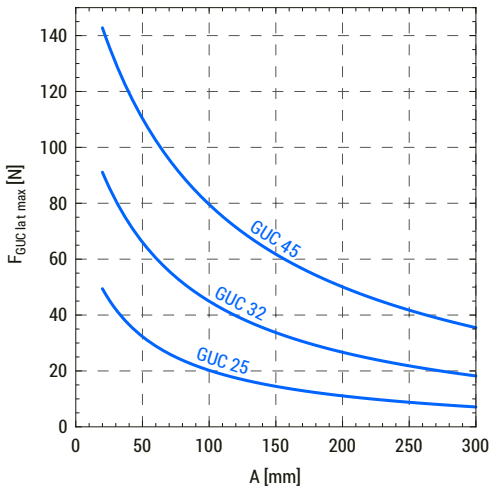




Technical data

Maximum lateral loading (in y and z directions) as a function of a load position





Mass and moved mass

GUC	Mass of GUC	Moved mass of GUC*
	m_{GUC} [kg]	$m_{m,\ GUC}$ [kg]
25	0,30 + 0,0008 × (Abs. stroke + E)	0,10 + 0,0008 × (Abs. stroke + E)
32	0,65 + 0,0013 × (Abs. stroke + E)	0,20 + 0,0013 × (Abs. stroke + E)
45	1,30 + 0,0018 × (Abs. stroke + E)	0,42 + 0,0018 × (Abs. stroke + E)

* Moved mass of GUC is already considered in the equation for calculating the mass of GUC m_{GUC}.

Abs. stroke	Absolute stroke	[mm]
E	Extended piston rod	[mm]

Displacement (friction) force

GUC	Displacement force [N]
	GUC with ball bushes
25	3
32	3
45	3

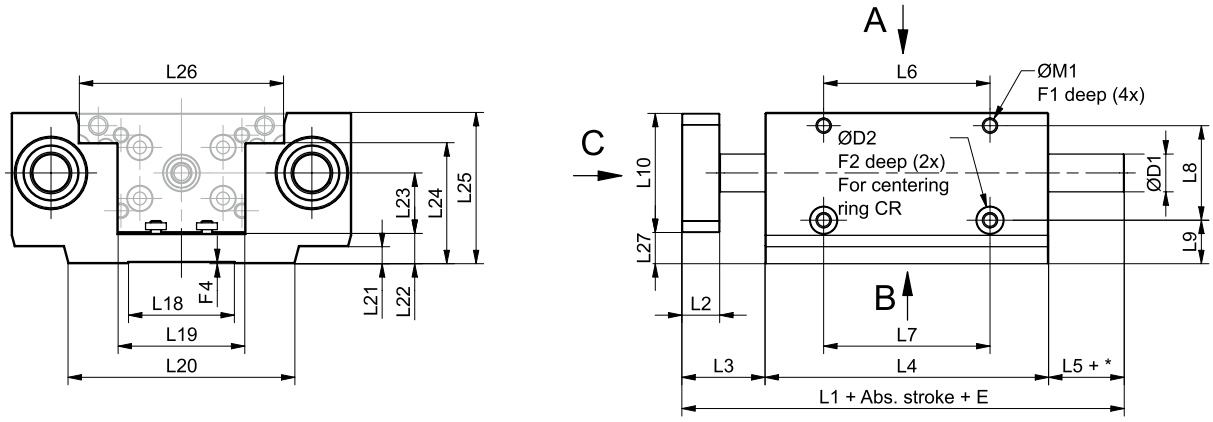
How to order

GUC - 32 - 125 - BB

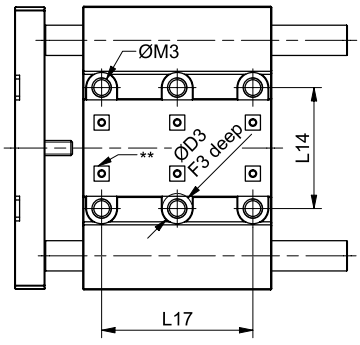
- **Guiding unit**
- **Size:** – 25 – 32 – 45
- **GUC stroke: absolute stroke + extendend piston rod E [mm]**
- **Option:** – BB: with the ball bushes

GUC stroke: absolute stroke + extended piston rod E = max. 300 mm. For the guiding unit stroke over 300 mm, please contact us.

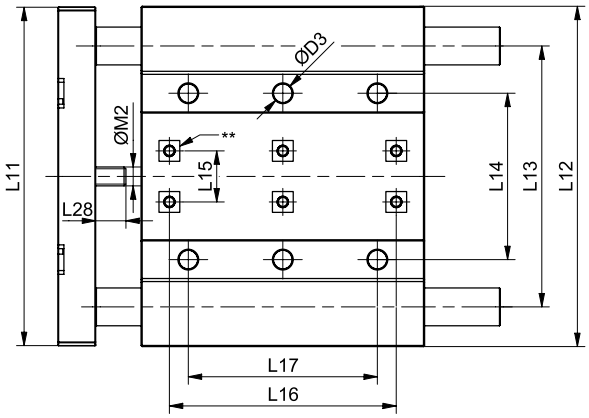
Dimensions



A (GUC 25)



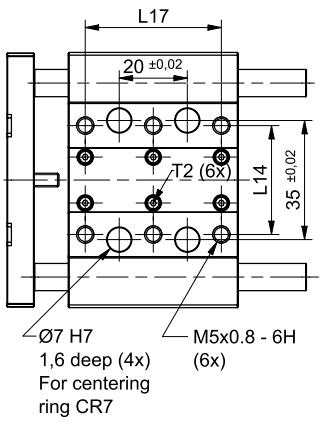
A (GUC 32, 45)



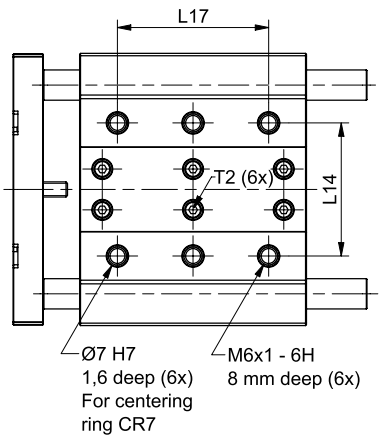
* ... + Abs. stroke + E

** MCE mounting nuts and screws (6x)

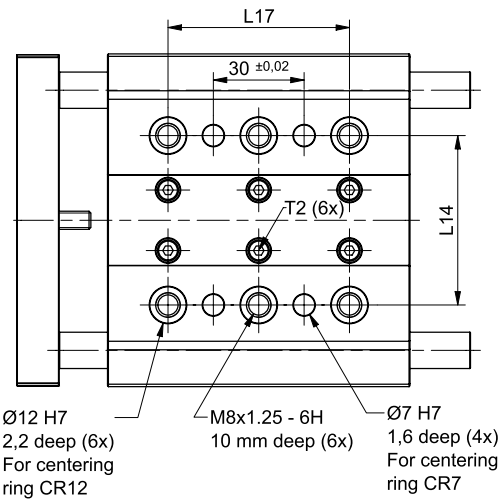
B (GUC 25)



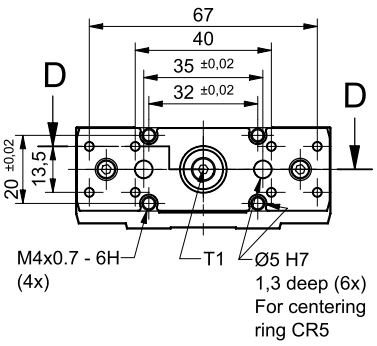
B (GUC 32)



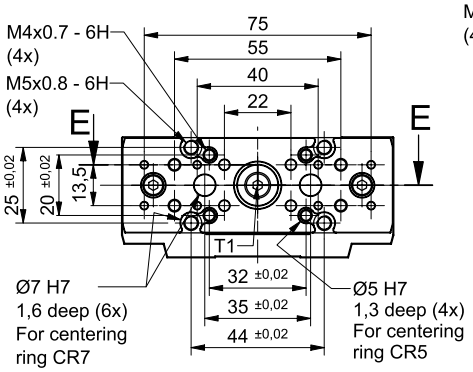
B (GUC 45)



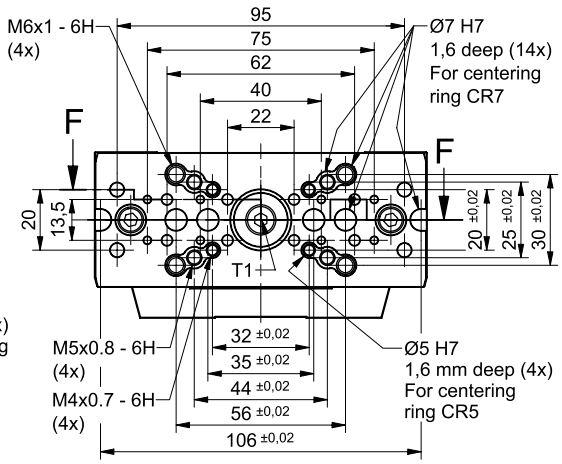
C (GUC 25)



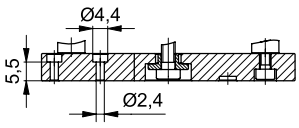
C (GUC 32)



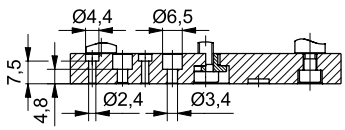
C (GUC 45)



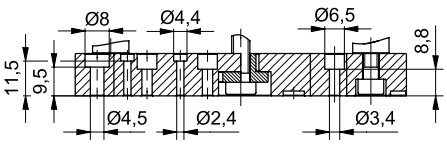
D-D



E-E



F-F



GUC	L1	L2	L3	L4	L5	L6	L7 (±0,02)	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	L20
	[mm]																			
25	88	8	18	50	20	32	32	20	7,5	24,5	74,5	75	57	32	13,5	40	40	19	25,5	45
32	117	10	22	75	20	44	44	25	11,5	31,5	89,5	90	69	44 ± 0,02	13,5	60	50 ± 0,02	28	33,5	60
45	150	14	30	100	20	56	56	30	17,5	44,5	109,5	110	86	56 ± 0,02	20,0	60	60 ± 0,02	38	46,5	80

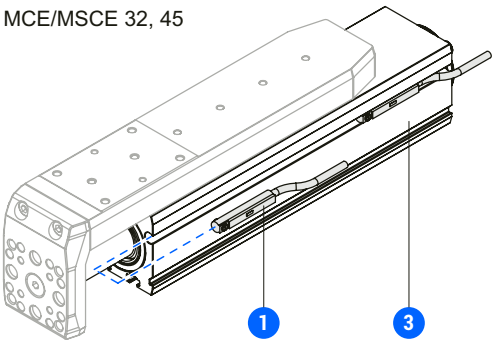
GUC	L21	L22	L23	L24	L25	L26	L27	L28	F1	F2	F3	F4	ØD1	ØD2 (H7)	ØD3	ØM1	ØM2	ØM3	T1	T2
	[mm]																		[Nm]	
25	1,5	5	12,5	12,5	30	39	5,25	7,3	12	1,3	4,5	0,3	8	5	8,0	M3	M4	M5	2,8	0,3
32	4,5	8	16,0	32,0	40	54	8,25	8,0	12	1,6	–	0,3	10	7	5,1	M4	M5	–	5,6	1,2
45	10,5	10	22,5	47,0	55	67	10,25	10,5	12	1,6	–	0,3	12	7	6,6	M5	M6	–	9,6	2,2

MAGNETIC FIELD SENSOR AND THE SENSOR HOLDER HMG

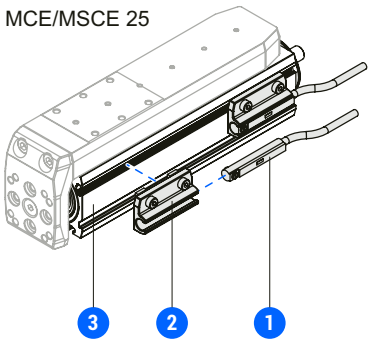
Magnetic field sensors can be mounted by using the slot for the magnetic field sensor placed on the sides of the MCE/MSCE profile.

For the MCE/MSCE size of 25, mounting of the magnetic field sensor requires an HMG sensor holder.

MCE/MSCE 32, 45



MCE/MSCE 25



1 – Magnetic field sensor.
2 – Sensor holder HMG.
3 – Profile of the mini electric cylinder MCE or slider MSCE.

Magnetic field sensors

Technical data

Characteristics	SMO 40 TP K NC	SMO 40 TP K NO
Function principle	Magnetic	
Switching function	NC-normally close	NO-normally open
Wiring method	3-wire type	
Sensor type	PNP current sourcing	
Operating voltage	5 ~ 30 V DC	
Switching current	200 mA max.	
Contact rating	6 W max.	
Voltage drop	0,5 V @ 200 mA max.	
Current consumption	6 mA @ 24 V DC max.	
Leakage current	0,01 mA max.	
Operating frequency	1000 Hz max.	
Ambient temperature	–10 ~ +70 °C	
Shock / Vibration	50 G / 9 G	
Protection class	IP67	
LED indicator	Green	
Electrical connection	M8, 3-pin	
Cable (diameter, material, length)	Ø2,8 mm, PUR, 150 mm	
Extension cable	Energy chain compliant	

Ordering codes and compatibility

Magnetic field sensor

Type	Code	Compatibility
SMO 40 TP K NC	109125	MCE/MSCE series*
SMO 40 TP K NO	12259	

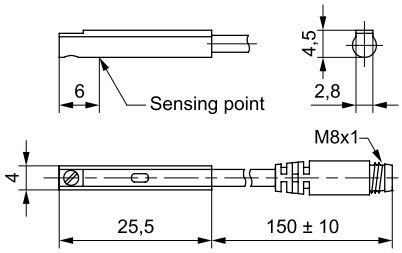
* Mounting of the magnetic field sensor on the MCE/MSCE 25 requires an HMG sensor holder.

Extension cable

Type	Connector	Length [m]	Code	Compatibility
Extension cable	**Straight**	**2**	**8146**	**SMO 40 TP K NC/NO**
		5	**8147**	
	Angled	**2**	**9017**	
		5	**9019**	

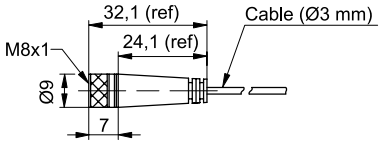
Dimensions

Magnetic field sensor SMO 40 TP K NO/NC

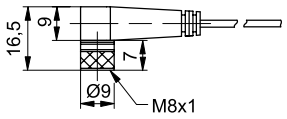


Extension cable

Straight connector



Angled connector



Sensor holder HMG

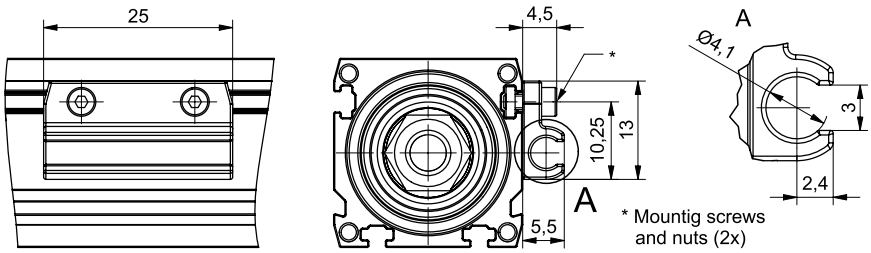
Material: powder coated zinc alloy

Mounting (on the MCE/MSCE profile) screws and nuts are included.

Ordering codes and compatibility

Type	Code	Compatibility	m [g]
HMG sensor holder	109101	MCE/MSCE 25	9

Dimensions



MOTOR

How to order

Stepper motors

STMN - 42 - L - E - B

Stepper motor series

Motor size □ [mm]:
– 28 (Available soon)
– 42
– 56

Motor length:
– L: Long

Encoder:
– E: With

Brake:
– Leave blank: Without
– B: With

Dimensions

Please refer to the section “Mini electric cylinder – MCE → Dimensions” or “Mini electric slider – MSCE → Dimensions”.

More information

Please refer to the section “Electrical data” or Unimotion documentation related to the motors.

DRIVE

How to order

Drives for the stepper motors (only for the STMN motors)

STDF - 42 - A - EC

Stepper drive series

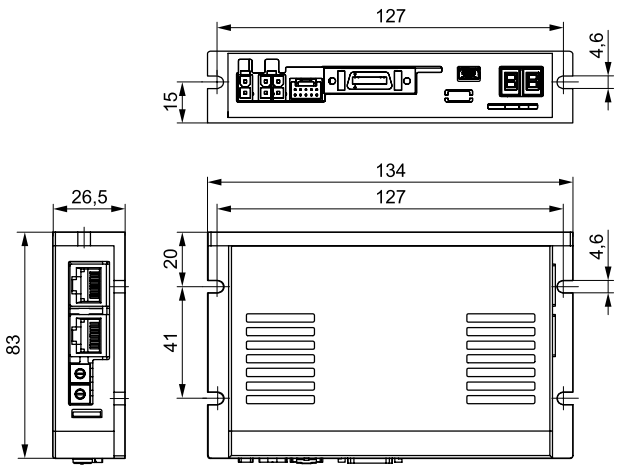
For motor size □ [mm]:
– 28 (Available soon)
– 42
– 56

Operating voltage [V DC]:
– A: 24

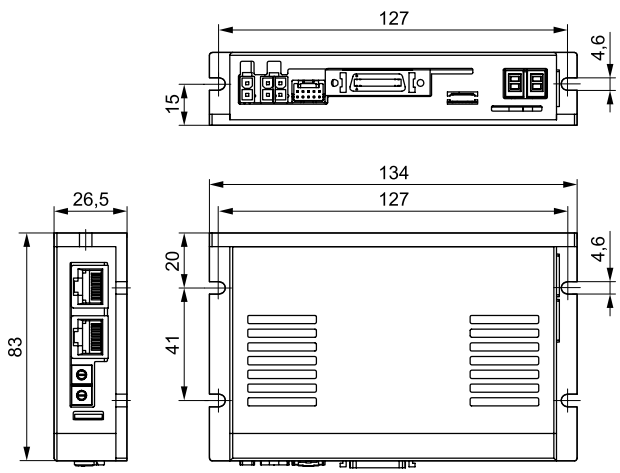
Protocol/control:
– EC: EtherCAT
– EN: Ethernet based communication
– PD: Pulse/direction control

Dimensions

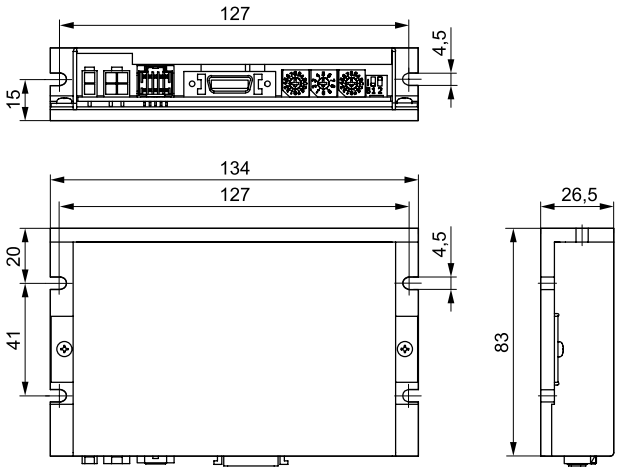
Stepper drive → EtherCAT protocol



Stepper drive → Ethernet based communication



Stepper drive → Pulse/direction control



More information

Please refer to the section “Electrical data” or the Unimotion documentation related to the drives.

DRIVE-MOTOR CABLES

How to order

Drive to motor cables for the stepper motors (only for the STDF and the STMN motors)

Motor, encoder and brake cables

STCF - E - A8 - 05

Stepper drive/motor cable series

Type:
– M: Motor cable
– E: Encoder cable
– B: Brake cable

Connector type and size:

A 8

Connector type:
– S: Straight
– A: Angled

Connector size:
– 8: M8
– 12: M12

Cable length:
– 03: 3 m
– 05: 5 m
– 10: 10 m

Please see the following table, where the possible cable combinations and compatibility with the motors and the drives are presented.

Brake to terminal cables

STCF - BT - 02

Stepper drive/motor cable series

Type:
– BT: Brake to terminal cable

Cable length:
– 02: 2 m

Possible cable combinations and compatibility with the motors and the drives

Motor				Drive			Drive to motor cable code			
Type	Size □ [mm]	Brake	Code	Type	Protocol/control	Code	Motor	Brake	Encoder	Brake to terminal
Stepper	28	–	STMN-28-...	Stepper	• EtherCAT, • Ethernet based communication, • Pulse/direction control	STDF-...	STCF-M-_8-... *		STCF-E-_8-...*	–
		with	STMN-28-...-B							STCF-BT-02*
	42	–	STMN-42-...				STCF-M-_12-...	–	STCF-E-_12-...	–
		with	STMN-42-...-B					STCF-B-_8-...		
	56	–	STMN-56-...					–		
		with	STMN-56-...-B					STCF-B--_8-...		

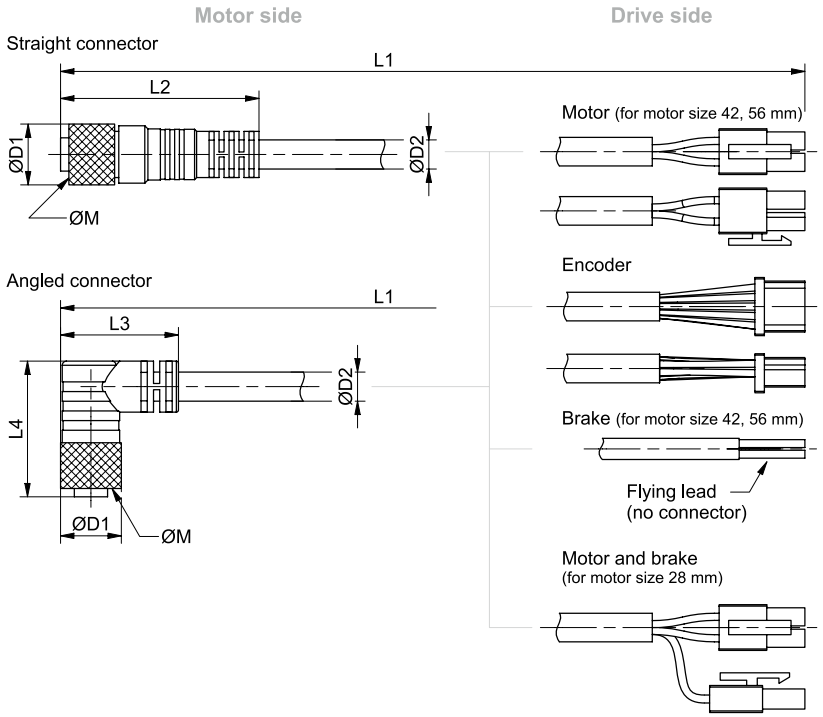
* Available soon.

Dimensions

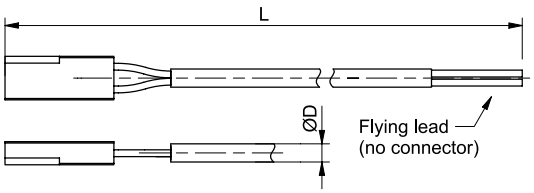
Drive to motor cables for the stepper motors (only for the STDF and the STMN motors)

Motor, encoder and brake cables

Dimensions	Drive to motor cable					
	Type	Motor		Brake	Encoder	
	Code	STCF-M-_8-…	STCF-M-_12-…	STCF-B-_8-…	STCF-E-_8-…	STCF-E-_12-…
L1	[m]	3, 5, 10				
L2	[mm]	Available soon	47,7	41,7	Available soon	47,7
L3	[mm]		28,4	30,9		28,4
L4	[mm]		32,6	25,2		32,6
ØD1	[mm]		14,6	9,9		14,6
ØD2	[mm]		5,1	4,5		6,7
ØM	[mm]		M12	M8		M12



Brake to terminal cables



Dimensions	Drive to motor cable	
	Type	Brake to terminal
	Code	STCF-BT-02
L	[m]	2
ØD	[mm]	Available soon

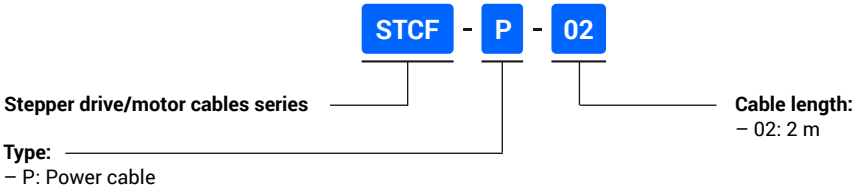
More information

Please refer to the section “Electrical data”.

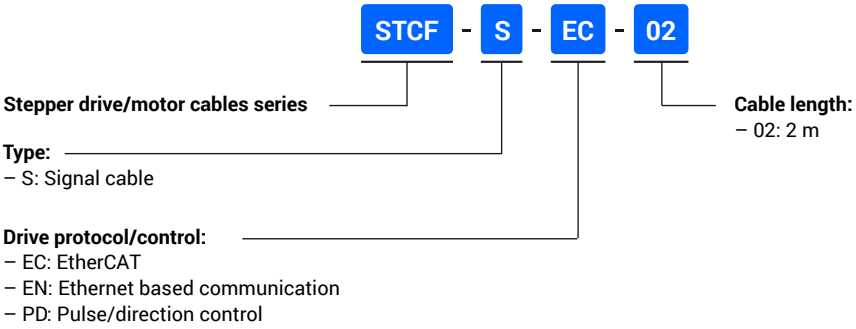
POWER AND SIGNAL CABLES

How to order

Power cables for the stepper drives (only for the STDF drives)

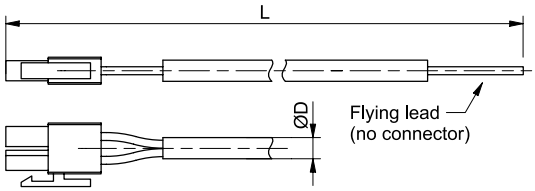


Signal cables for the stepper drives (only for the STDF drives)



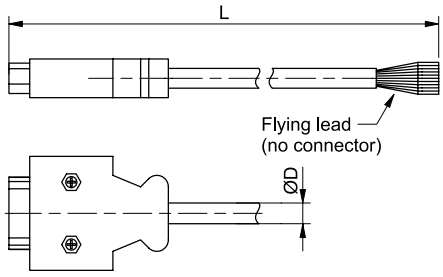
Dimensions

Power cables for the stepper motors (only for the STDF drives)



Dimensions	Type	Power cable
	Code	STCF-P-02
L	[m]	2
ØD	[mm]	4,6

Signal cables for the stepper motors (only for the STDF drives)



Dimensions	Type	Signal cable		
	Code	STCF-S-EC-02	STCF-S-EN-02	STCF-S-PD-02
L	[m]	2		
ØD	[mm]	6,4	6,9	6,4

More information

Please refer to the section “Electrical data”.

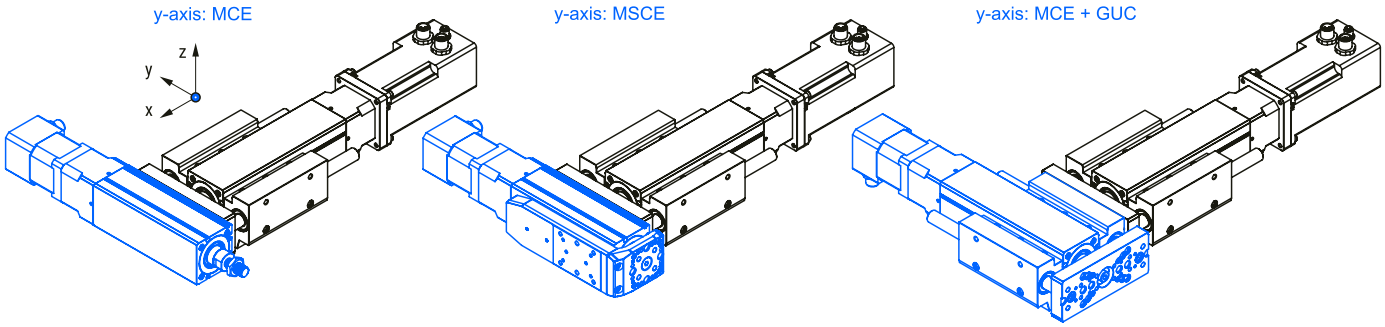
Mounting examples

Mini electric cylinders MCE and sliders MSCE can easily be combined to the multi-axis systems by using the standard accessories. Already prepared mounting holes on the front plate/slide of the MSCE, guiding unit GUC, and mounting slots on the profiles allow various combinations of MCE and MSCE without additional connection plates.

In the following, compatibility of the mini electric cylinders and sliders are presented.

For non-standard combinations, configurations, or custom connection elements, please contact us.

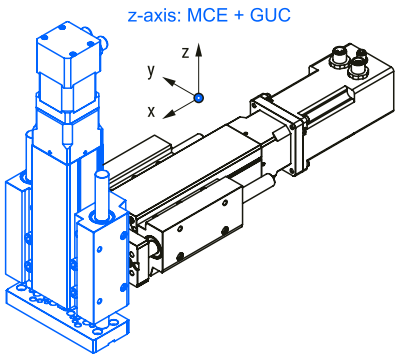
X–Y CONFIGURATION WITH THE X-AXIS: MCE + THE GUIDING UNIT GUC



Mini electric cylinders and sliders can be combined by using the slot nuts together with the standard screws. For the case, where the y-axis is MCE+GUC, only the standard screws can be used.

Configuration		y-axis								
		MCE			MSCE			MCE + GUC		
x-axis	Size	25	32	45	25	32	45	25	32	45
MCE + GUC	25	•	—	—	•	—	—	•	—	—
	32	•	•	—	•	•	—	•	•	—
	45	•	•	•	•	•	•	•	•	•

X–Z CONFIGURATION WITH THE X-AXIS: MCE + THE GUIDING UNIT GUC

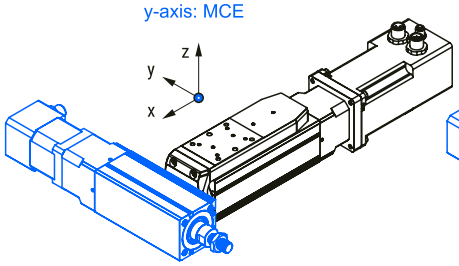


Mini electric cylinders with GUC can be combined by using the standard screws.

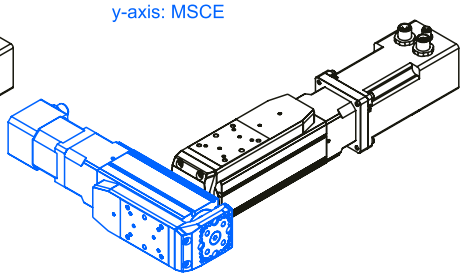
Configuration		z-axis		
		MCE + GUC		
x-axis	Size	25	32	45
MCE + GUC	25	•	—	—
	32	•	•	—
	45	•	•	•

X–Y CONFIGURATION WITH THE X-AXIS: MSCE (Y-AXIS IS MOUNTED TO THE FRONT PLATE)

y-axis: MCE



y-axis: MSCE

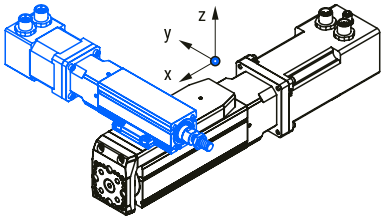


Mini electric cylinders and sliders can be combined by using the slot nuts together with the standard screws.

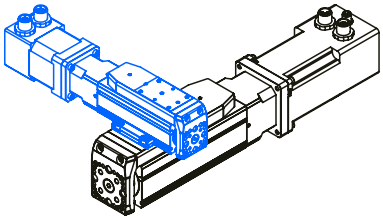
Configuration		y-axis					
		MCE			MSCE		
x-axis	Size	25	32	45	25	32	45
MSCE: front plate	25	•	—	—	•	—	—
	32	•	•	—	•	•	—
	45	•	•	•	•	•	•

X–Y CONFIGURATION WITH THE X-AXIS: MSCE (Y-AXIS IS MOUNTED TO THE SLIDE)

y-axis: MCE



y-axis: MSCE

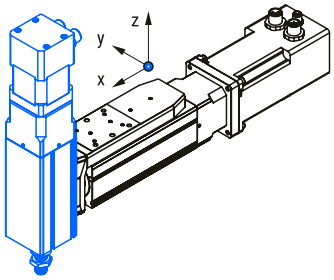


Mini electric cylinders and sliders can be combined by using the clamping fixtures together with the standard screws.

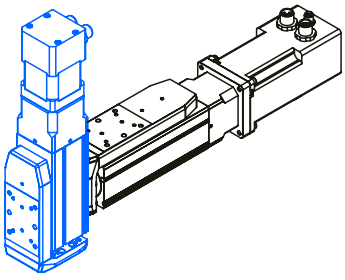
Configuration		y-axis					
		MCE			MSCE		
x-axis	Size	25	32	45	25	32	45
MSCE: slide	25	—	—	—	—	—	—
	32	•	—	—	•	—	—
	45	•	•	—	•	•	—

X–Z CONFIGURATION WITH THE X-AXIS: MSCE (Z-AXIS IS MOUNTED TO THE FRONT PLATE)

z-axis: MCE



z-axis: MSCE



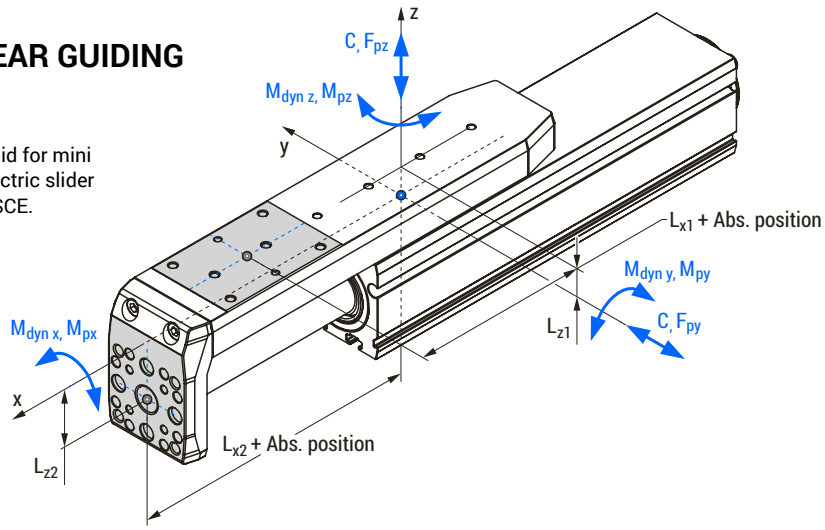
Mini electric cylinders and sliders can be combined by using the slot nuts together with the standard screws.

Configuration		z-axis					
		MCE			MSCE		
x-axis	Size	25	32	45	25	32	45
MSCE: front plate	25	•	—	—	•	—	—
	32	•	•	—	•	•	—
	45	•	•	•	•	•	•

Service life

LINEAR GUIDING

Valid for mini electric slider MSCE.



Dynamic load capacity, dynamic moments and maximum permissible loads of the linear guiding system integrated into the mini electric slider refer to the centre of the linear guides.

The applied loading condition needs to be calculated, with respect to the centre of the linear guides. The presented attachment distances, measured from the centre of the linear guides, together with an absolute position of the slider must be taken into consideration.

MSCE	Attachment distances			
	Slide		Front plate	
	L_{x1} [mm]	L_{z1} [mm]	L_{x2} [mm]	L_{z2} [mm]
25	0,0	7,5	34,0	−16,5
32	0,0	7,7	39,0	−21,3
45	0,0	10,6	50,5	−27,4

Abs. position	Absolute position	[mm]
C	Dynamic load capacity	[N]
$M_{dyn\,x}$	Dynamic moment about the x axis	[Nm]
$M_{dyn\,y}$	Dynamic moment about the y axis	[Nm]
$M_{dyn\,z}$	Dynamic moment about the z axis	[Nm]
F_{py}	Max. permissible force in the y direction	[N]
F_{pz}	Max. permissible force in the z direction	[N]
M_{px}	Max. permissible moment about the x axis	[Nm]
M_{py}	Max. permissible moment about the y axis	[Nm]
M_{pz}	Max. permissible moment about the z axis	[Nm]

Permissible load

Permissible load factor $f_{p\,g}$

$$f_{p\,g} = \frac{|F_y|}{F_{py}} + \frac{|F_z|}{F_{pz}} + \frac{|M_x|}{M_{px}} + \frac{|M_y|}{M_{py}} + \frac{|M_z|}{M_{pz}} \leq 1$$

A permissible load factor of the linear guiding system $f_{p\,g}$ must never exceed the value of 1.

$f_{p\,g}$	Permissible load factor	
F_y	Applied force in the y direction	[N]
F_z	Applied force in the z direction	[N]
M_x	Applied moment about the x axis	[Nm]
M_y	Applied moment about the y axis	[Nm]
M_z	Applied moment about the z axis	[Nm]

Service life

Service life calculation

$$L_{km\,g} = \left(\frac{1}{f_{vm\,g}}\right)^3 \cdot 10^2$$

$L_{km\,g}$	Service life of the linear guiding system	[km]
$f_{vm\,g}$	Mean load comparison factor	

Mean load comparison factor $f_{vm\,g}$ as a function of service life $L_{km\,g}$

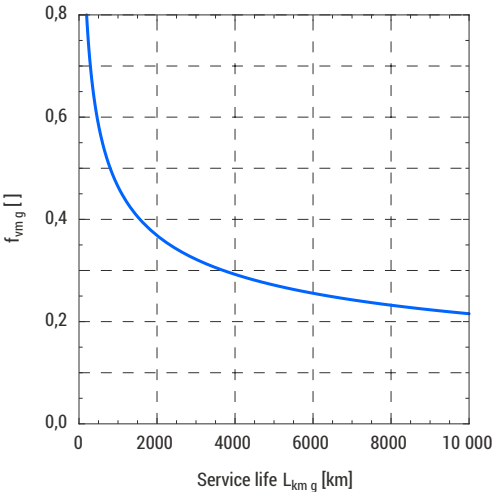


Diagram represents the theoretically determined service life of the linear guiding system when the mean load comparison factor $f_{vm\,g}$ is considered.

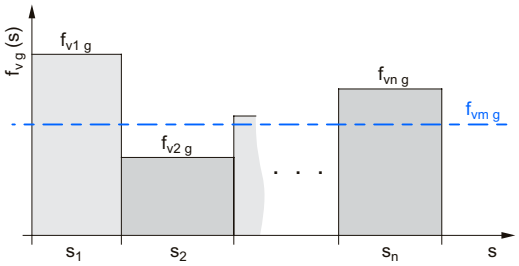
It should be noted that the application conditions may have a significant effect on the service life.

Mean load comparison factor $f_{vm\,g}$

$$f_{vm\,g} = \sqrt[3]{\frac{f_{v1\,g}{}^3 \cdot s_1 + f_{v2\,g}{}^3 \cdot s_2 + \cdots + f_{vn\,g}{}^3 \cdot s_n}{s_1 + s_2 + \cdots + s_n}}$$

$f_{vi\,g}$	i-th load comparison factor of a given loading regime $f_{v\,g}$ (s), i ∈ {1, 2, ..., n}
s_i	i-th travel path of a given loading regime $f_{v\,g}$ (s), i ∈ {1, 2, ..., n}

Loading regime $f_{v\,g}$ (s)



Load comparison factor $f_{v\,g}$

$$f_{v\,g} = \frac{|F_y|}{C} + \frac{|F_z|}{C} + \frac{|M_x|}{M_{dyn\,x}} + \frac{|M_y|}{M_{dyn\,y}} + \frac{|M_z|}{M_{dyn\,z}}$$

$f_{v\,g}$	Load comparison factor

Mean dynamic safety factor $f_{sm\,g}$

$$f_{sm\,g} = \frac{1}{f_{vm\,g}}$$

$f_{sm\,g}$	Mean dynamic safety factor

The safety factor depends on the application and its requested safety. A minimum dynamic safety factor of 5,0 or more is recommended.

BALL SCREW DRIVE

Valid for the mini electric cylinder MCE and the slider MSCE.

Permissible load

Permissible load factor $f_{p\,bs}$

$$f_{p\,bs} = \frac{|F_x|}{F_{pa}} \leq 1$$

A permissible load factor of the ball screw drive $f_{p\,bs}$ must never exceed the value of 1.

$f_{p\,bs}$	Permissible load factor	
F_{pa}	Max. permissible axial load	[N]
F_x	Applied force in the x direction	[N]

Service life

Service life calculation

$$L_{km\,bs} = \left(\frac{1}{f_{vm\,bs}}\right)^3 \cdot l$$

$L_{km\,bs}$	Service life	[km]
$f_{vm\,bs}$	Mean load comparison factor	
l	Ball screw lead	[mm]

Mean load comparison factor $f_{vm\,bs}$ as a function of service life $L_{km\,bs}$

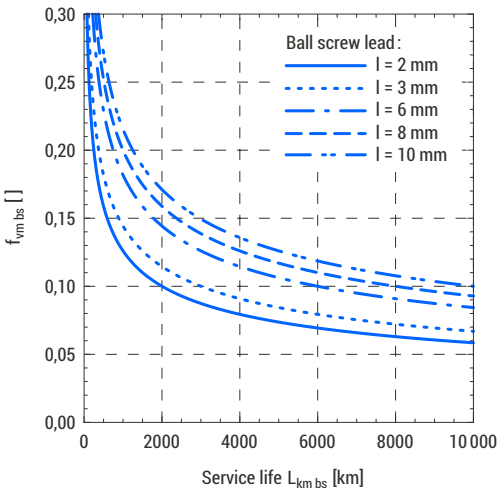


Diagram represents the theoretically determined service life of the ball screw drive when the mean load comparison factor $f_{vm\,bs}$ is considered.

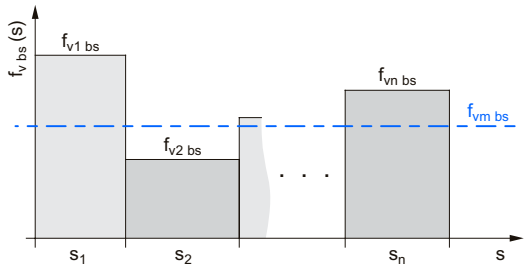
It should be noted that the application conditions may have a significant effect on the service life.

Mean load comparison factor $f_{vm\,bs}$

$$f_{vm\,bs} = \sqrt[3]{\frac{f_{v1\,bs}{}^3 \cdot s_1 + f_{v2\,bs}{}^3 \cdot s_2 + \cdots + f_{vn\,bs}{}^3 \cdot s_n}{s_1 + s_2 + \cdots + s_n}}$$

$f_{vi\,bs}$	i-th load comparison factor of a given loading regime $f_{v\,bs}$ (s), $i \in \{1, 2, ..., n\}$
s_i	i-th travel path of a given loading regime $f_{v\,bs}$ (s), $i \in \{1, 2, ..., n\}$

Loading regime $f_{v\,bs}$ (s)



Load comparison factor $f_{v\,bs}$

$$f_{v\,bs} = \frac{|F_x|}{C_a}$$

$f_{v\,bs}$	Load comparison factor	
C_a	Dynamic axial load capacity	[N]

Mean dynamic safety factor $f_{sm\,bs}$

$$f_{sm\,bs} = \frac{1}{f_{vm\,bs}}$$

The safety factor depends on the application and its requested safety. A minimum dynamic safety factor of 5,0 or more is recommended.

$f_{sm\,bs}$	Mean dynamic safety factor

MINI ELECTRIC CYLINDER MCE

Service life of the mini electric cylinder is the calculated service life of the ball screw drive $L_{km\,bs}$.

$L_{km} = L_{km\,bs}$

L_{km}	Service life of the mini electric cylinder or slider	[km]

MINI ELECTRIC SLIDER MSCE

Service life of the mini electric slider is the minimum value between the calculated service life of the linear guiding system $L_{km\,g}$ and the ball screw drive $L_{km\,bs}$.

$L_{km} = \text{Min}\,[L_{km\,g}, L_{km\,bs}]$

L_{km}	Service life of the mini electric cylinder or slider	[km]

Calculations

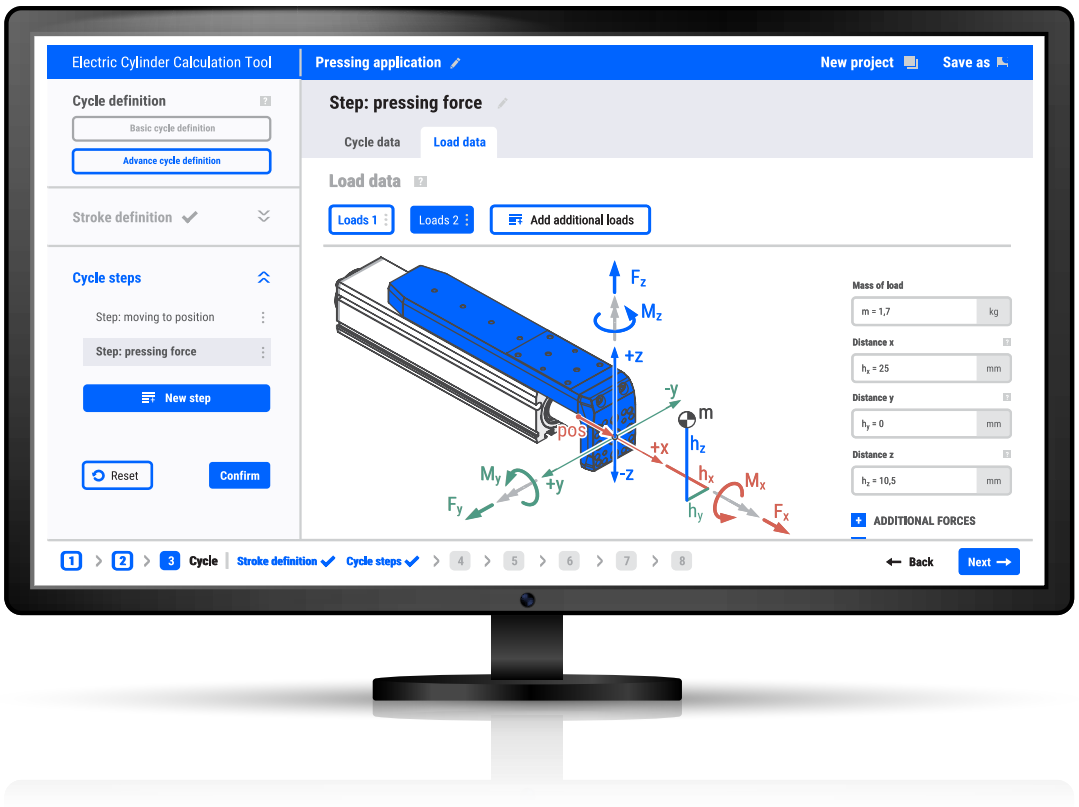
LOAD TORQUE

The load torque is a function of an applied axial load (force) to the mini electric cylinder or slider and can be calculated as follows:

$$M_{load} = \frac{F_x \cdot l}{2000 \cdot \pi \cdot \eta}$$

M_{load}	Load torque	[Nm]
F_x	Applied axial force	[N]
l	Ball screw lead	[mm]
η	Mechanical efficiency ≈ 0,9	

It should be noted that the load torque M_{load} must never exceed the maximum drive torque M_p (or $M_{p, MSD}$ if a motor side drive MSD is taken into consideration).



UNIMOTION

We cover all major markets. If you wish to contact us, send us an enquiry and we would be happy to assist you.

GERMANY

Unimotion GmbH
Waldstrasse 20
D - 78736 Epfendorf

T +49 (0) 7404 930 85 60
F +49 (0) 7404 930 85 61

www.unimotion.de
vertrieb@unimotion.de

NORTH AMERICA

Unimotion North America, Inc.
3952 Ben Hur Ave, Unit 5
Willoughby, OH 44094

T: +1 440-525-9106

www.unimotionusa.com
info@unimotionusa.com

Unimotion: December 2020