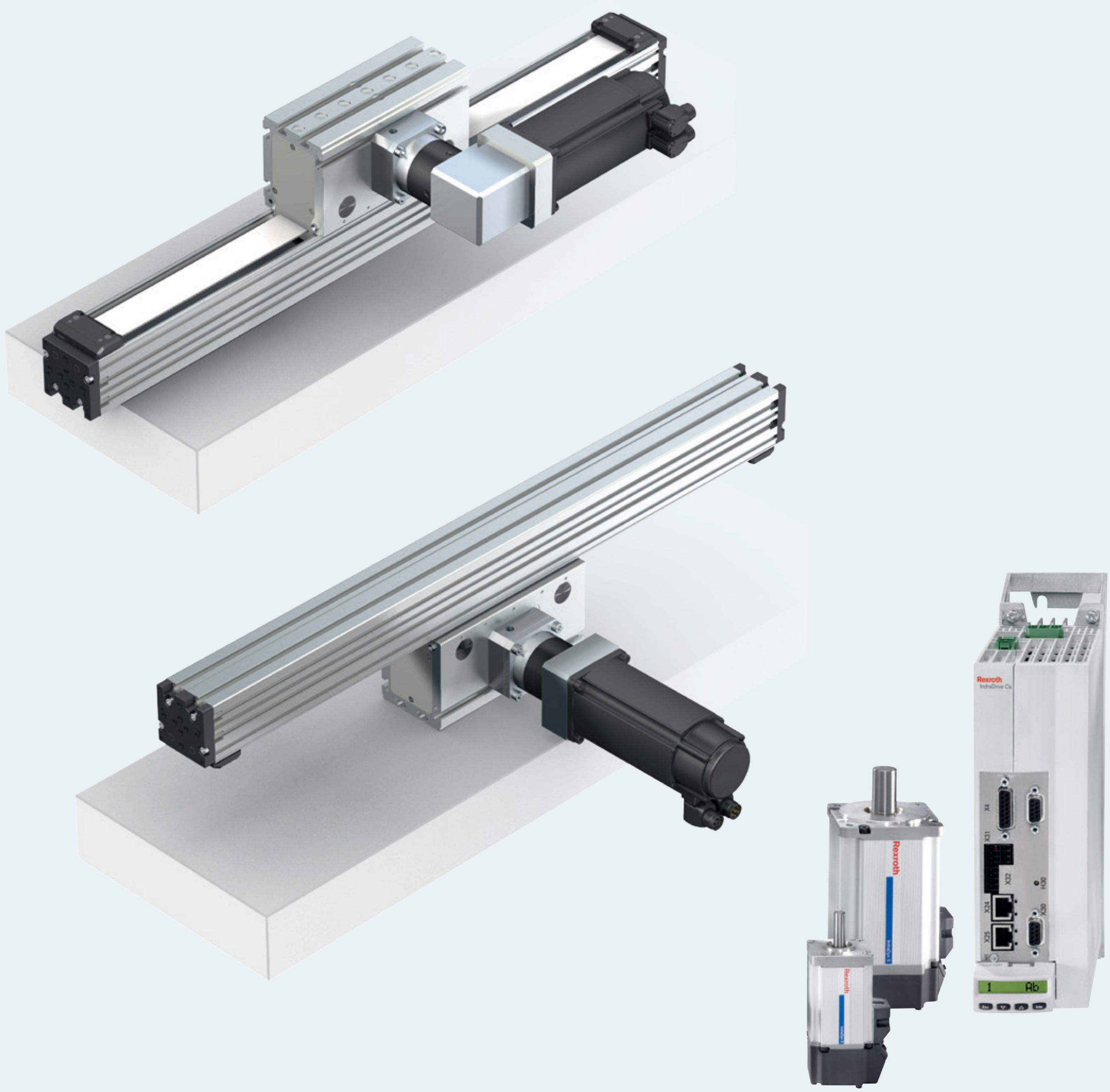
The Drive & Control Company

Omega Modules OBB



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Identification system for short product names

Short product name	Example:	O	B	B	-	085	-	N N	-	1
System	= **O**mega module									
Guideway	= **B**all Rail System									
Drive	= Toothed **B**elt Drive									
Size	= 055 / **085** / 120									
Version	= **S**tandard model									
Generation	= Product generation **1**									

Short product name
Using the short product name, Rexroth linear axes can be identified according to their product family, size, version and product generation.

Changes/amendments at a glance

Catalog structure
- New catalog number
- New product designation
- Revised dimensional drawings
- "Delivery form" additional chapter
- "Calculation" expanded chapter
- "EasyHandling" additional chapter
- Additional chapters "Switches", "Extensions" and "Distributors"
- "Power cable chains" chapter deleted

Technical modifications
- Increase of the dynamic load capacities and moments
- Revised table structure of the tech. data tables and drive data
- Integration of new motor types (MSM)
- Technical details of clamping element (LKPS)
- Chapters "Operating conditions" and "Lubrication" revised
- "Parameterization" chapter amended
- Order example
- Query sheet

Omega modules OBB

Product overview

Product description

Omega modules (OBB) with ball rail systems and toothed belt drive for travel speeds up to 5.0 m/s.
Omega modules are ready-to-install linear axes for any desired mounting orientation in freely configurable lengths up to 5500 mm.

Due to the design, Omega modules are particularly well suited for applications where the frame enters the working area.

Characteristic features:

- Extremely compact precision aluminum profile with integrated Rexroth ball rail system for optimal travel
- Carriage with one-point lubrication
- With locating holes in the carriage and on the end plates
- Driven with toothed belts for high dynamics and high travel speed
- Mountable switches
- Available complete with motor, controller and control unit
- With planetary gearbox (PG) or angular planetary gearbox (WPG) with different gear ratios
- Pneumatic clamping elements (optional)
- Extensive range of accessories available

Sectors:

- Handling and assembly
- Electronics and semiconductor industry
- Automotive suppliers and OEMs
- Robotics and automation
- Special-purpose machines
- Packaging technology
- Building services
- Plastics processing
- Textile industry

Application areas:

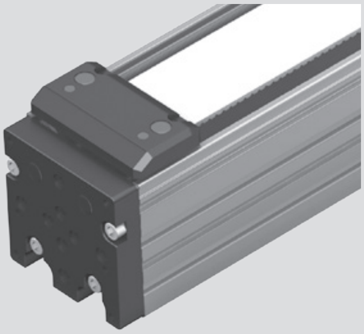
- Pick and place
- Handling systems
- Component assembly systems, palletizers
- Feed units for machine tools
- Testing and analysis systems
- Feed units in transfer lines
- Load shifters

For mounting, maintenance and start-up, see the Instructions.

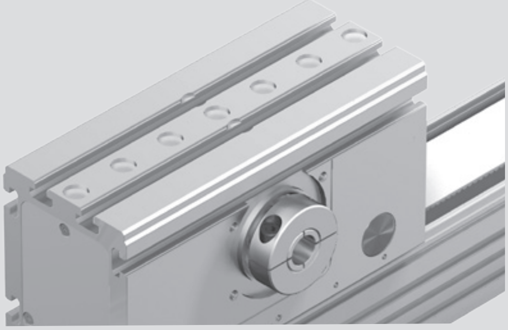
Mounting option

Fastening thread and locating holes

Versatile mounting options are provided by the fastening threads and locating holes on the two end plates of the frame.

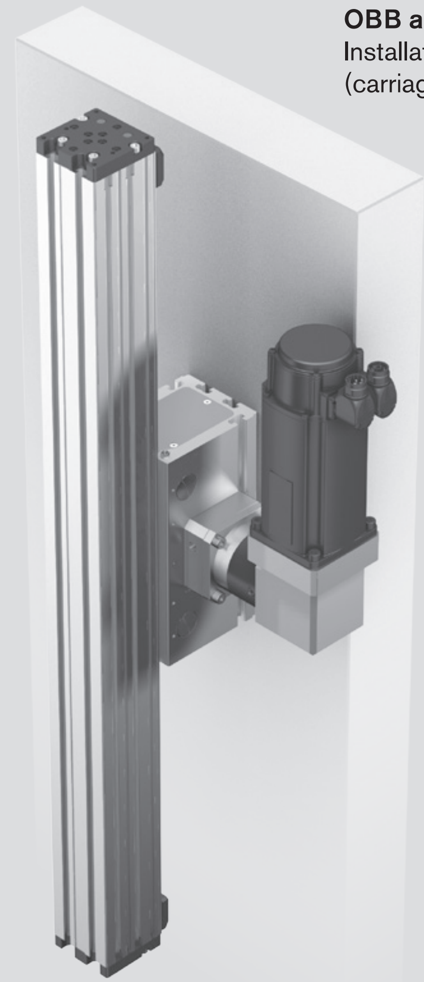


Easy mounting thanks to locating holes in the carriage

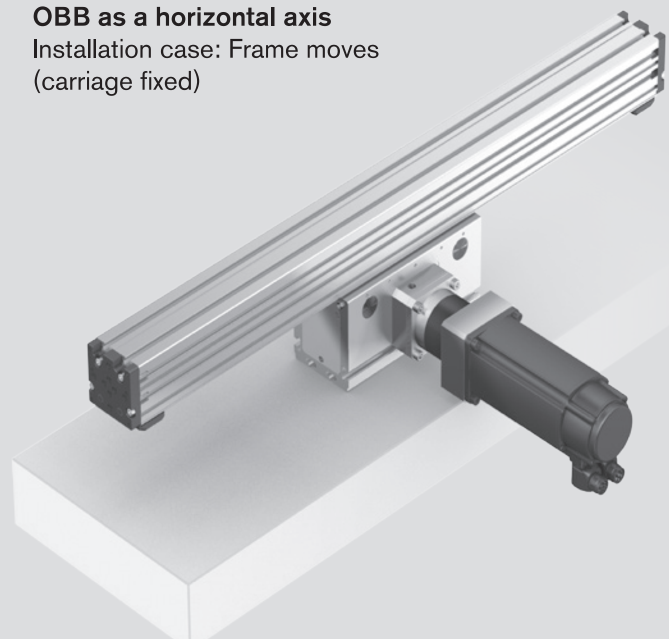


Frame HK moves

OBB as a vertical axis
Installation case: Frame moves
(carriage fixed)

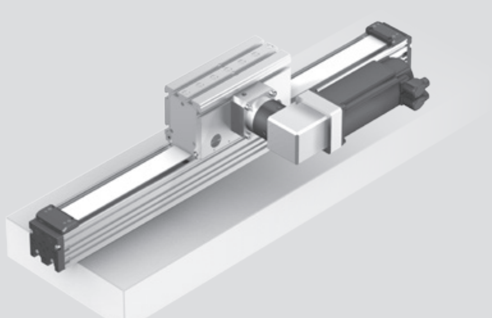


OBB as a horizontal axis
Installation case: Frame moves
(carriage fixed)



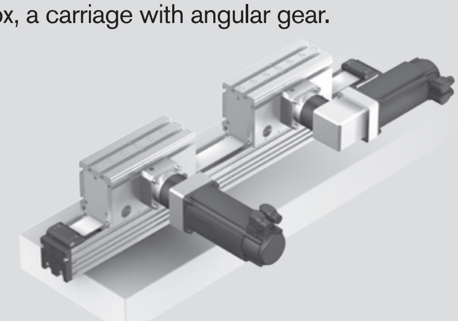
Carriage TT moves

OBB as a horizontal axis
Installation case: Carriage moves
(frame mounted)



On request:

OBB as horizontal axis with two carriages
Installation case: Carriages move independently of each other (frame fixed).
Representation (example): a carriage with planetary gearbox, a carriage with angular gear.

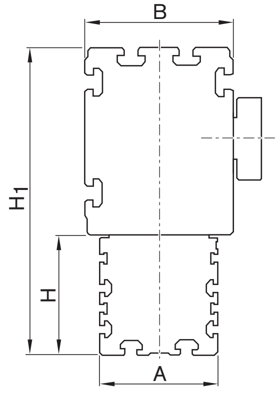


Product overview

Load ratings and sizes

Note on dynamic load ratings and torques:

Determination of the dynamic load ratings and torques is based on a total travel of 100,000 m. Often only 50,000 m of total travel are actually stipulated.
For comparison: Multiply values C, M_t and M_L by a factor of 1.26.



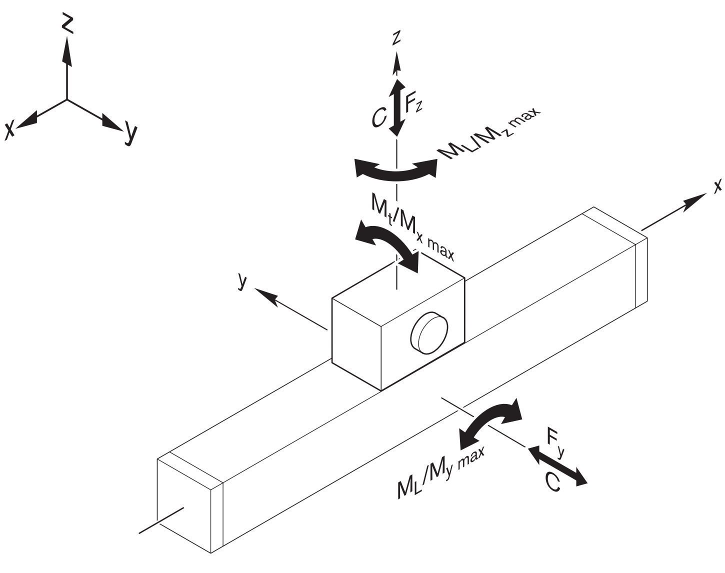
Size	Dimensions (mm)				Load ratings
	A/H	B	H_1	L_{max}	C (N)
OBB-055	55	75	135	5 500	20 790
OBB-085	85	107	222		60 600
OBB-120	120	135	285		96 200

C = dynamic load rating
L_{max} = maximum length of the linear motion system

Suitable loads (Recommended values based on experience)

As far as the desired service life is concerned, loads of up to approximately 20 % of the dynamic characteristic values (**C**, $\mathbf{M_t}$, $\mathbf{M_L}$) have proved acceptable.

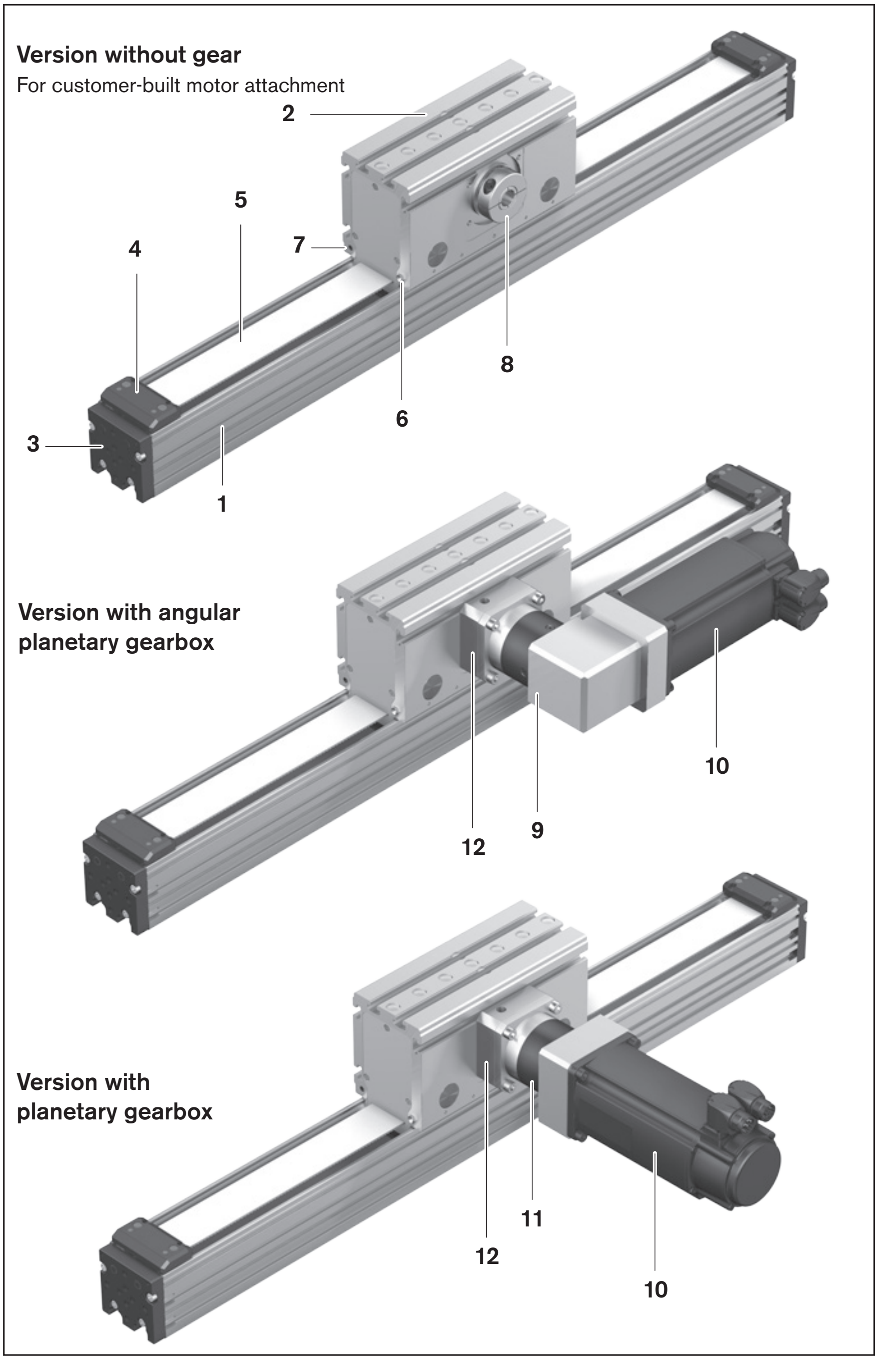
Here the following must not be exceeded:
- The maximum permissible drive torque
- The maximum permissible load
- The maximum permissible travel speed
- The maximum permissible acceleration



Structural design

Design (without switches)

1 Frame
2 Carriage
3 End plate
4 Belt clamp
5 Toothed belt
6 Lube port
(at both end faces)
7 Air port
(for carriage with clamping element)
8 Clamping hub for motor attachment
9 Angular planetary gearbox (WPG)
10 Motor
11 Planetary gearbox (PG)
12 Mounting flange



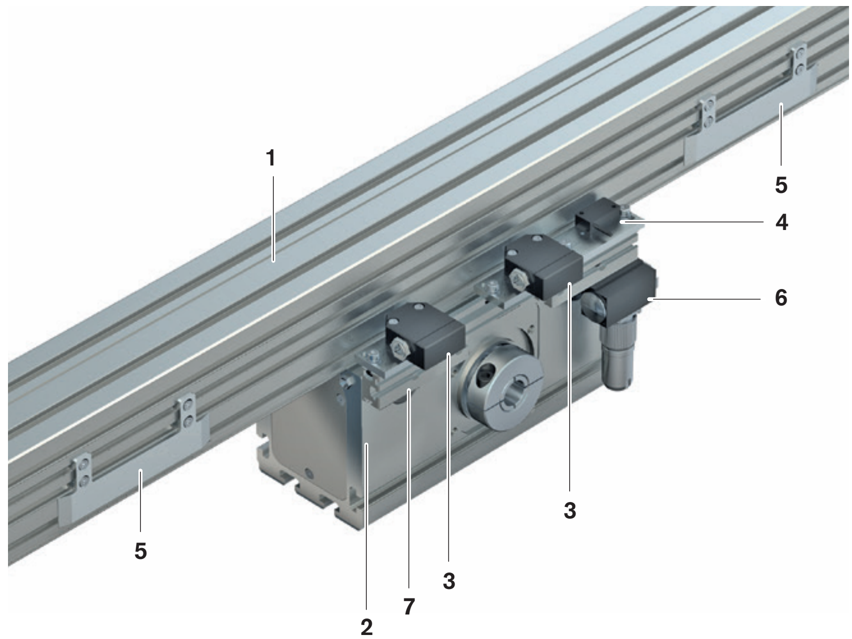
Product overview

Structural design

Attachments

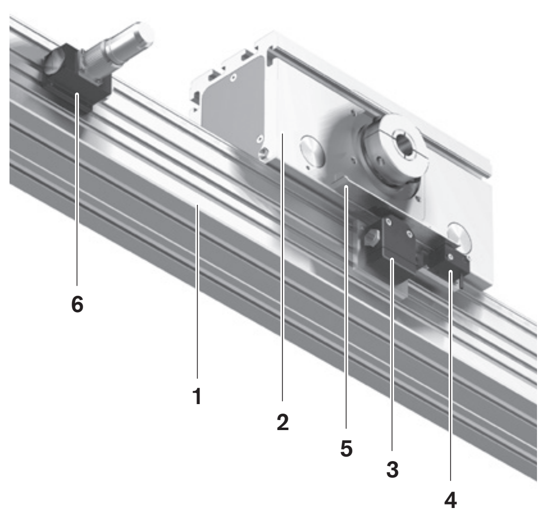
Frame moves (carriage fixed)

1 Frame
2 Carriage
3 Mechanical switches (with attachments)
4 Proximity switch (with attachments)
5 Control strip on the frame
6 Socket and plug
7 Switch mounting profile



Carriage moves (frame fixed)

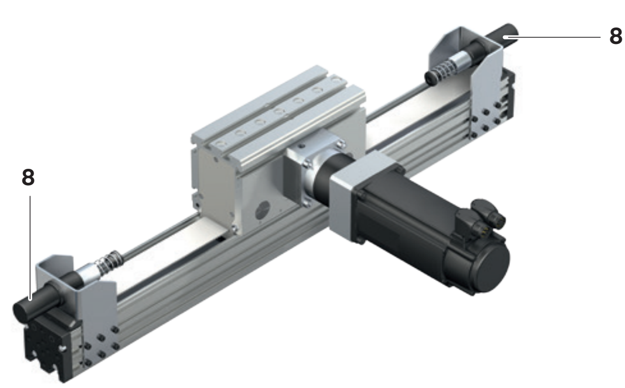
1 Frame
2 Carriage
3 Mechanical switch (with attachments)
4 Proximity switch (with attachments)
5 Switching angle (on the carriage)
6 Socket and plug



Accessories

8 Shock absorber

Shock absorbers are available as accessories and can be ordered separately with the relevant material number (see page 72).



Delivery form

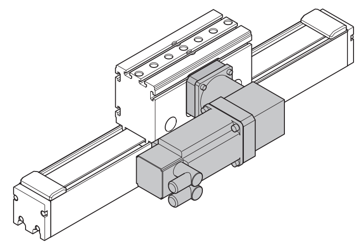
Version

Omega modules are delivered completely ready-mounted. In addition to the Omega module itself, the assembly also includes the motor attachment and motor options if they were included in the order.

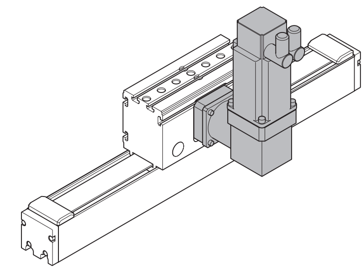
Motor attachment

If a combination of motor and motor attachment has been selected, then the attachment of the components is done as shown in the figure which also shows the location of the motor connector. The motor attachment version is selected or defined during the product configuration and is part of the order code.

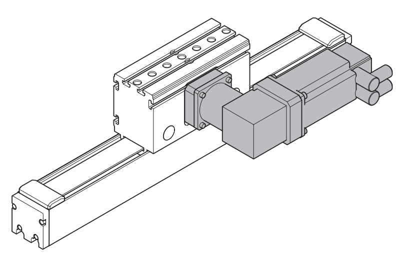
MG01



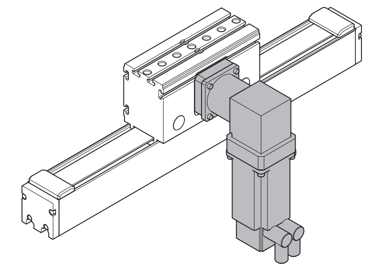
MG02



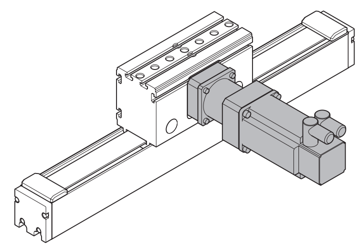
MG03



MG04



MG10



Accessories

Optional accessories like the cable duct, switch, switching angles and socket with plugs are included as loose parts in the delivery.

Lubrication

Omega modules are delivered with initial greasing. Information about lubricants can be found in the section “Lubrication”.

Documentation

The manual, safety information and a declaration of incorporation required for assembly and maintenance are included with each Omega module.

Technical data

General technical data

Observe the “Calculation” page 20 section!

Size	Carriage	Dynamic characteristic values			Maximum permissible loads					Clamping element	
	L_{ca}	C Guideway	M_t	M_L	$M_{x\,max}$	$M_{y\,max}$	$M_{z\,max}$	$F_{y\,max}$	$F_{z\,max}$	Version Carriage	Holding force
	(mm)	(N)	(Nm)	(Nm)	(Nm)	(Nm)	(Nm)	(N)	(N)		(N)
OBB-055	230	20 790	195	1 400	62	440	440	6 500	6 500	without	–
										with	370
OBB-085	260	60 600	860	4 610	280	1 500	1 500	19 760	19 760	without	–
	308	60 600	860	6 100	280	1 960	1 960	19 760	19 760	with	690
OBB-120	330	96 200	2360	10 390	776	3 424	3 424	31 700	31 700	without	–
										with	1 200

Drive data

Size	Gear type	i	M_P 3)	u 3)	v_{max} 3)	M_{Rs} 3)	Moved part (carriage TT / frame HK)	$k_{J\,fix}$ 3)	$k_{J\,var}$ 3)	$k_{J\,m}$ 3)	d_3	Belt type	F_{bp} 1)	$F_{t\,perm}$ 2)	a_{max}
			(Nm)	(mm/rev)	(m/s)	(Nm)		(kgmm²)	(kgmm)	(mm²)	(mm)		(N)	(N)	(m/s²)
OBB-055	without	1	12.0	165.00	5.00	1.10	TT	3 249.16	0.0000	689.59	52.52	25AT5	460	1 750	50
							HK	718.37	2.9825						
	PG	3	4.0	55.00	4.12	0.52	TT	458.80	0.0000	76.62					
							HK	93.32	0.3314						
		5	2.4	33.00	2.47	0.32	TT	168.11	0.0000	27.58					
							HK	36.53	0.1193						
		8	1.5	20.63	1.55	0.24	TT	69.12	0.0000	10.77					
							HK	17.72	0.0466						
	WPG	3	4.0	55.00	4.12	0.67	TT	531.20	0.0000	76.62					
							HK	104.42	0.3314						
		5	2.4	33.00	2.47	0.47	TT	201.28	0.0000	27.58					
							HK	47.63	0.1193						
		8	1.5	20.63	1.55	0.34	TT	88.84	0.0000	10.77					
							HK	28.82	0.0466						
OBB-085	without	1	40.0	255.00	5.00	3.00	TT	20 052.44	0.0000	1 647.14	81.17	50AT5	992	3 500	50
							HK	2 724.50	18.0527						
	PG	5	8.0	51.00	3.40	1.00	TT	1 077.70	0.0000	65.89					
							HK	153.98	0.7221						
		8	5.0	31.88	2.13	0.63	TT	442.40	0.0000	25.74					
							HK	81.57	0.2821						
	WPG	5	8.0	51.00	2.85	1.30	TT	1 271.13	0.0000	65.89					
							HK	195.88	0.7221						
		8	5.0	31.88	2.13	0.93	TT	543.49	0.0000	25.74					
							HK	123.47	0.2821						
OBB-120	without	1	154.0	340.00	5.00	6.00	TT	62 121.14	0.0000	2 928.43	108.23	70AT10	2 844	11 750	50
							HK	13 655.57	50.1933						
	PG	9	17.1	37.78	2.20	1.57	TT	1 310.92	0.0000	36.15					
							HK	430.59	0.6197						
	WPG	9	17.1	37.78	1.86	2.02	TT	1 838.85	0.0000	36.15					
							HK	741.59	0.6197						

1) Maximum power that can be transmitted through the engaging teeth that are in the belt pulley.
2) The permissible tensile load of the belt cross section (belt elasticity limit) is specified for better comparability. This value represents the load limit with respect to the plastic deformation and may not be used to determine the maximum permitted drive torque.
3) The specified values apply for the relevant combination shown (OBB without gear or OBB with gear) and are shown reduced based on the motor shaft. For information on the use of the values, see section “Calculation”.

Length L_{ad} [2] (mm)	s_{min} [1] (mm)	L_{max} (mm)	Version	Mass carriage m_{ca} (kg), Clamping element: without	Mass carriage m_{ca} (kg), Clamping element: with	Mass frame $k_{g\ fix}$ (kg)	Mass frame $k_{g\ var}$ (kg/mm)	I_y (cm⁴)	I_z (cm⁴)
130	110	5 500	Drive i=1	3.82	4.01	0.55	0.004	24	39
166			with PG	5.13	5.32				
			with WPG	5.93	6.12				
120	160	5 500	Drive i=1	9.56	11.25	1.05	0.011	148	244
156			with PG	13.38	15.07				
			with WPG	15.68	17.37				
170	135	5 500	Drive i=1	17.70	18.45	3.08	0.017	664	725
206			with PG	27.48	28.23				
			with WPG	34.08	34.83				

1) Minimum required travel distance to ensure a reliable lubrication distribution, see “Operating conditions”. For short-stroke applications with travel distances $< s_{min}$, please ask.
2) The dimension L_{ad} is required for the length calculation (see section “Configuration and ordering” for the relevant sizes)

PG = planetary gearbox
WPG = angular planetary gearbox
TT = carriage
HK = frame

Note
Values for the gear are not listed in the “Technical data” tables, as the gear is part of the linear motion system and is already taken into account in the technical values.

Mass of the Omega module

Weight calculation does not include motor or switch.

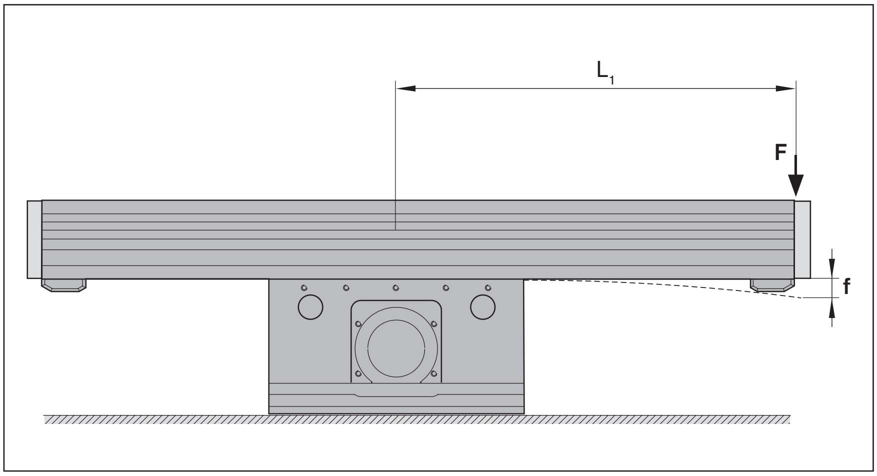
$$m_s = k_{g\ fix} + k_{g\ var} \cdot L + m_{ca}$$

$k_{g\ fix}$ = constant for fixed-length portion of the mass (kg)
$k_{g\ var}$ = constant for the variable-length portion of the mass (kg/mm)
L = length of frame (mm)
m_s = mass of the linear motion system (kg)
m_{ca} = mass of the carriage (kg)

a_{max} = maximum permissible acceleration
C = dynamic load rating
d_3 = diameter of belt pulley
F_{bp} = maximum belt drive transmission force
$F_{t\ perm}$ = permissible cable pull strength
$F_{y\ max}$, $F_{z\ max}$ = maximum permissible load in y- or z-direction
I_y, I_z = planar moment of inertia
i = gear ratio
$k_{J\ fix}$ = constant for fixed-length portion of mass moment of inertia
$k_{J\ var}$ = constant for length-variable portion of mass moment of inertia
$k_{J\ m}$ = constant for mass-specific portion of mass moment of inertia
L_{ca} = carriage length
L_{ad} = additional length
L_{max} = maximum length of the linear motion system
M_t, M_L = dynamic load moment
$M_{x\ max}$, $M_{y\ max}$, $M_{z\ max}$ = maximum permitted torsional moment around the x-, y-, z-axis
M_L = dynamic longitudinal moment load capacity
M_t = dynamic torsional moment load capacity
M_p = maximum permissible drive torque
M_{Rs} = frictional torque of system (on the drive journal)
m_{ca} = moved mass of carriage
s_{min} = minimum required travel distance
u = lead constant
v_{max} = maximum permissible travel speed

Deflection

A special feature of Omega modules is the possibility to mount them by the carriage, which remains stationary while the frame moves.
If a force acts on the overhanging frame in the area of the end plate (**F**) (direction of force transverse to the travel direction **X**), the frame undergoes a deflection (**f**) dependent on the length (**L_1**) (distance from the center of the carriage to the end of the frame).
When the OBB is used as a vertical axis in a portal, a deflection of the frame occurs due to the acceleration forces of the horizontal axes.
This deflection is reversible, i.e. deflection occurs for as long as the acceleration forces are acting.



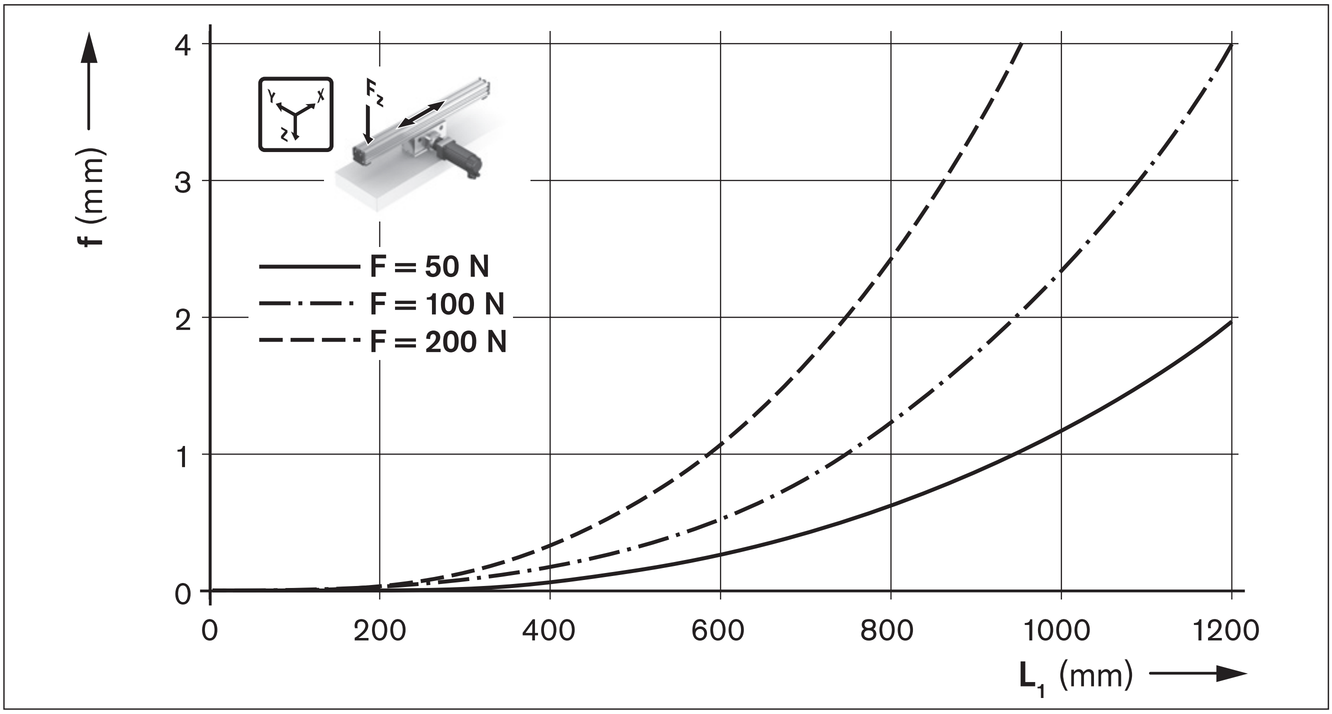
Example

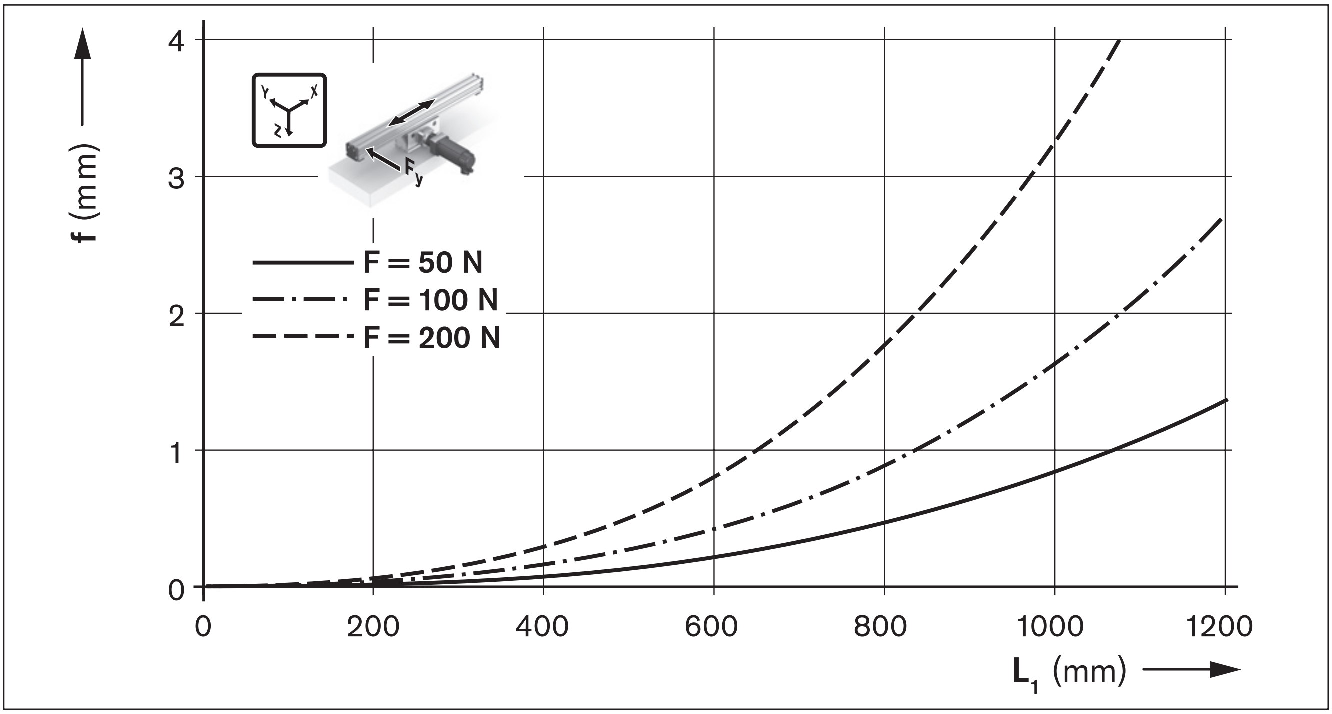
Omega module OBB-055:
L_1 = 800 mm
F = 100 N, force acting in z-direction
f = 1.2 mm

Deflection charts for loads from the z and y directions

OBB-055

The following charts apply for a carriage fixed to the mounting base over the entire area (see section “Mounting by the carriage” on page 66).
For larger lengths or loads, please ask.





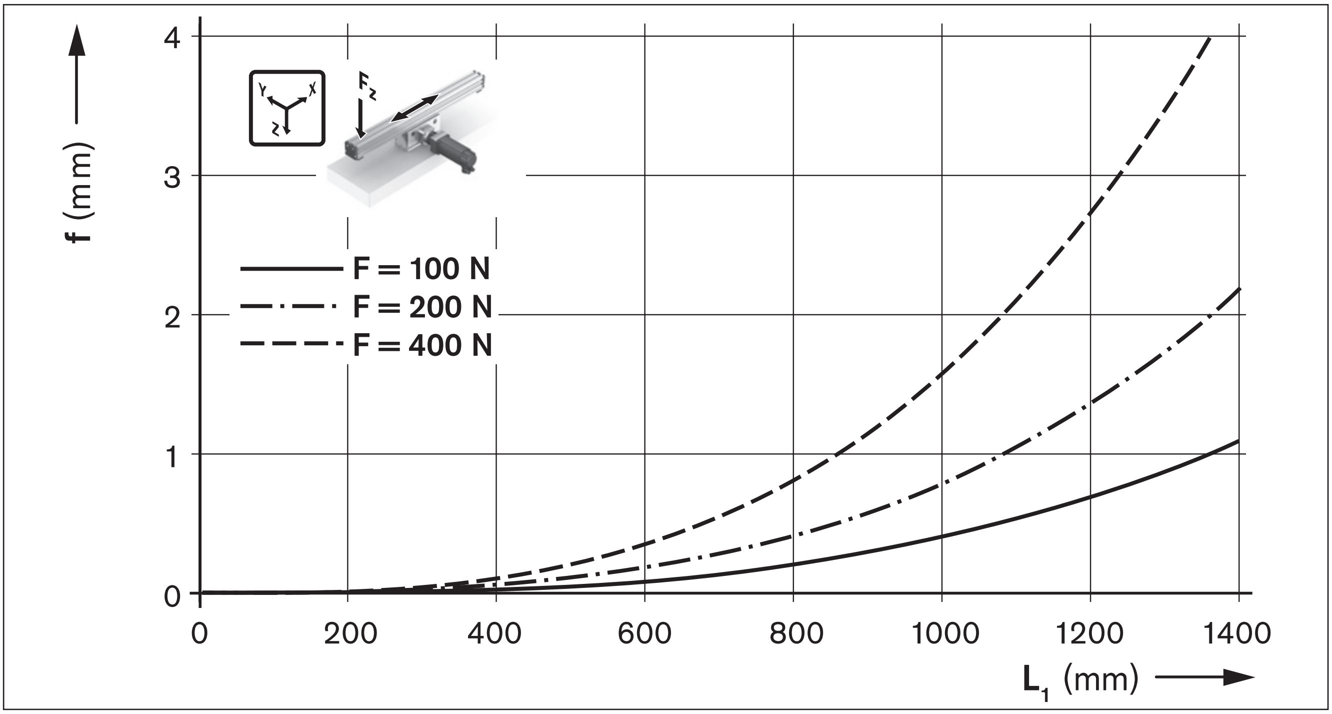
Technical data

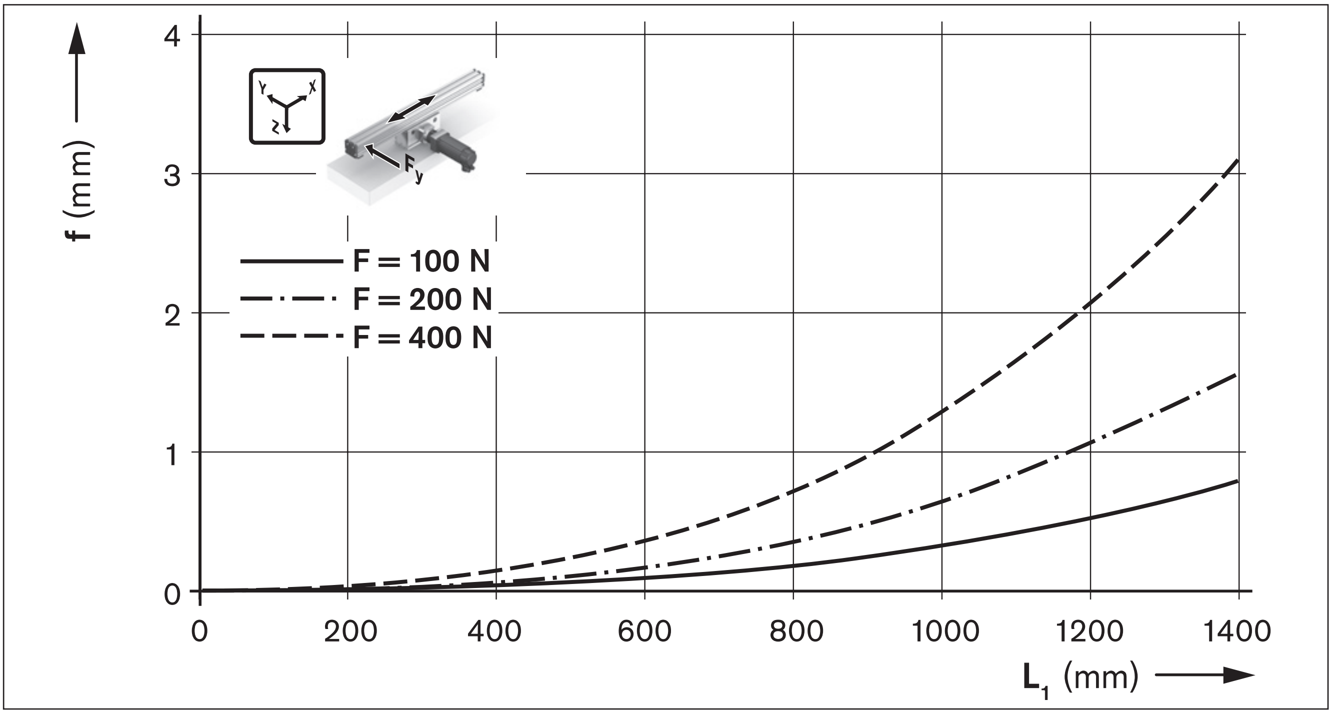
Deflection

Deflection charts for loads from the z and y directions

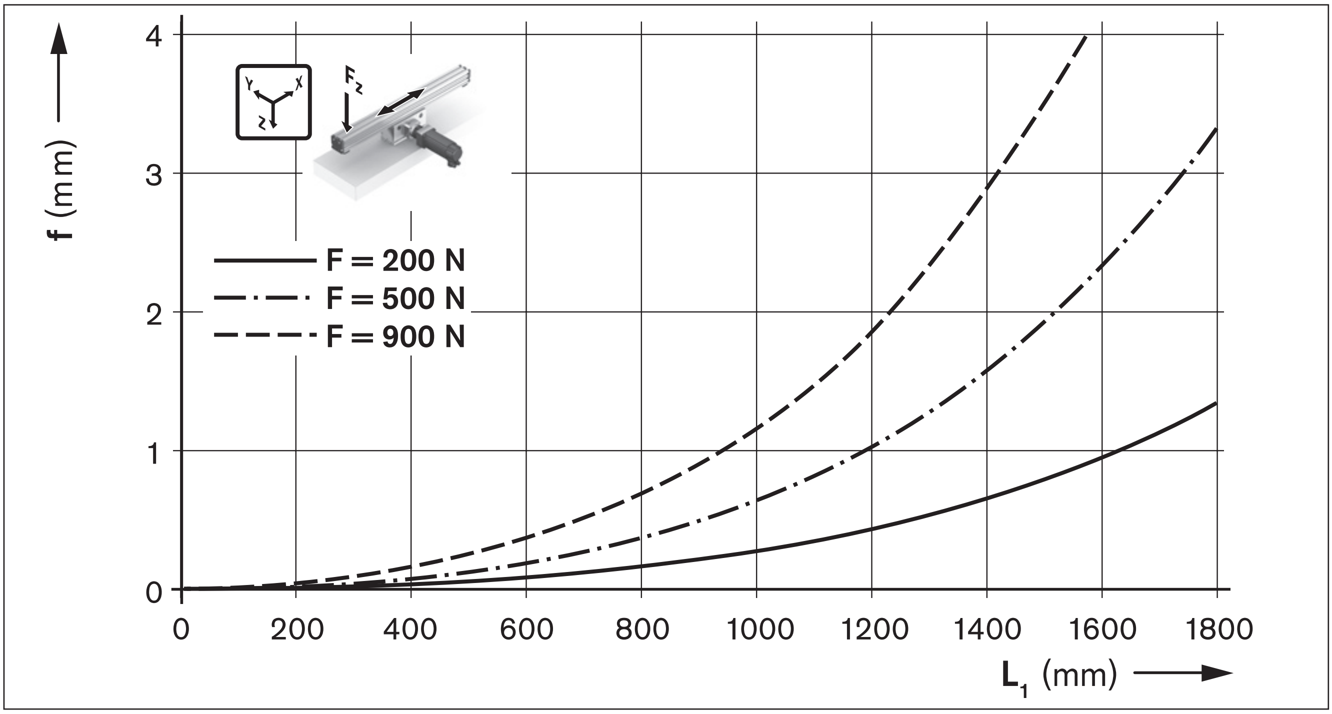
OBB-085

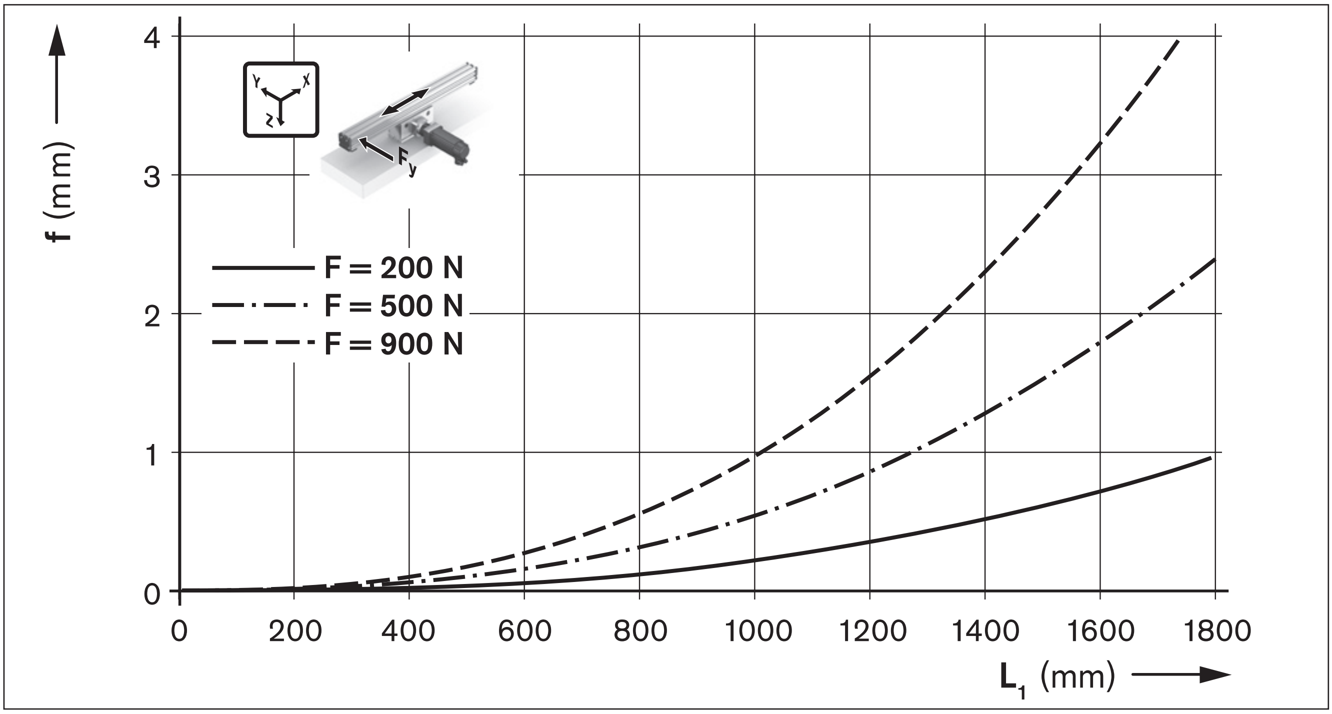
The following charts apply for a carriage fixed to the mounting base over the entire area (see section “Mounting by the carriage” on page 66).
For larger lengths or loads, please ask.





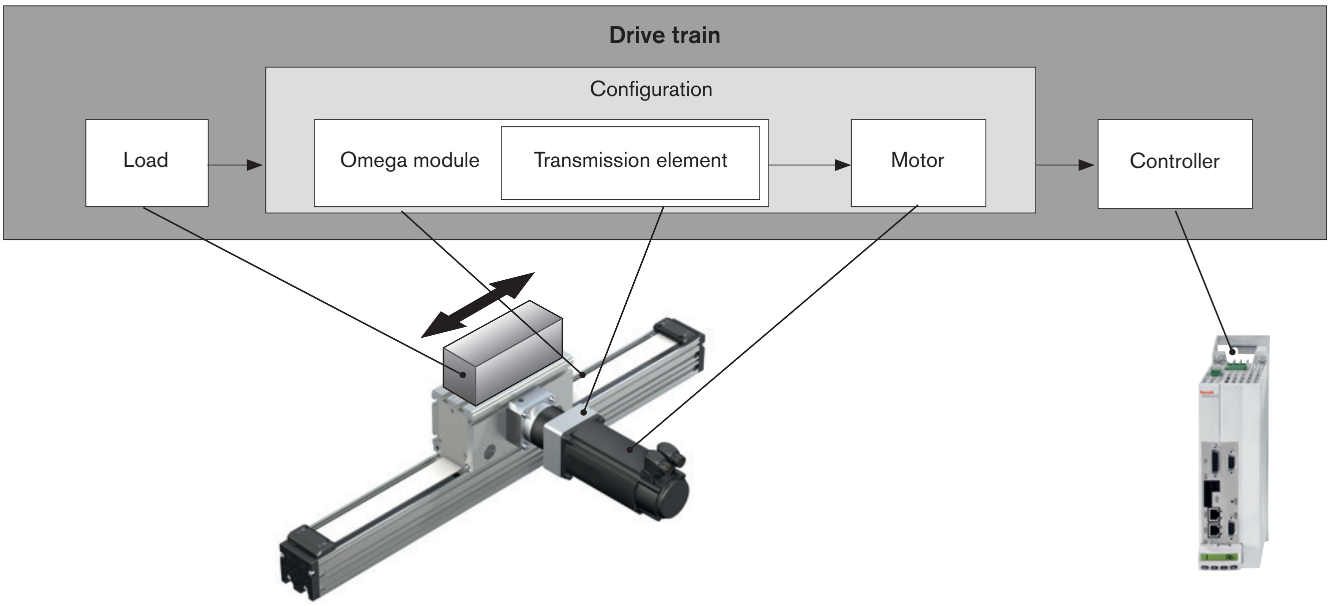
OBB-120

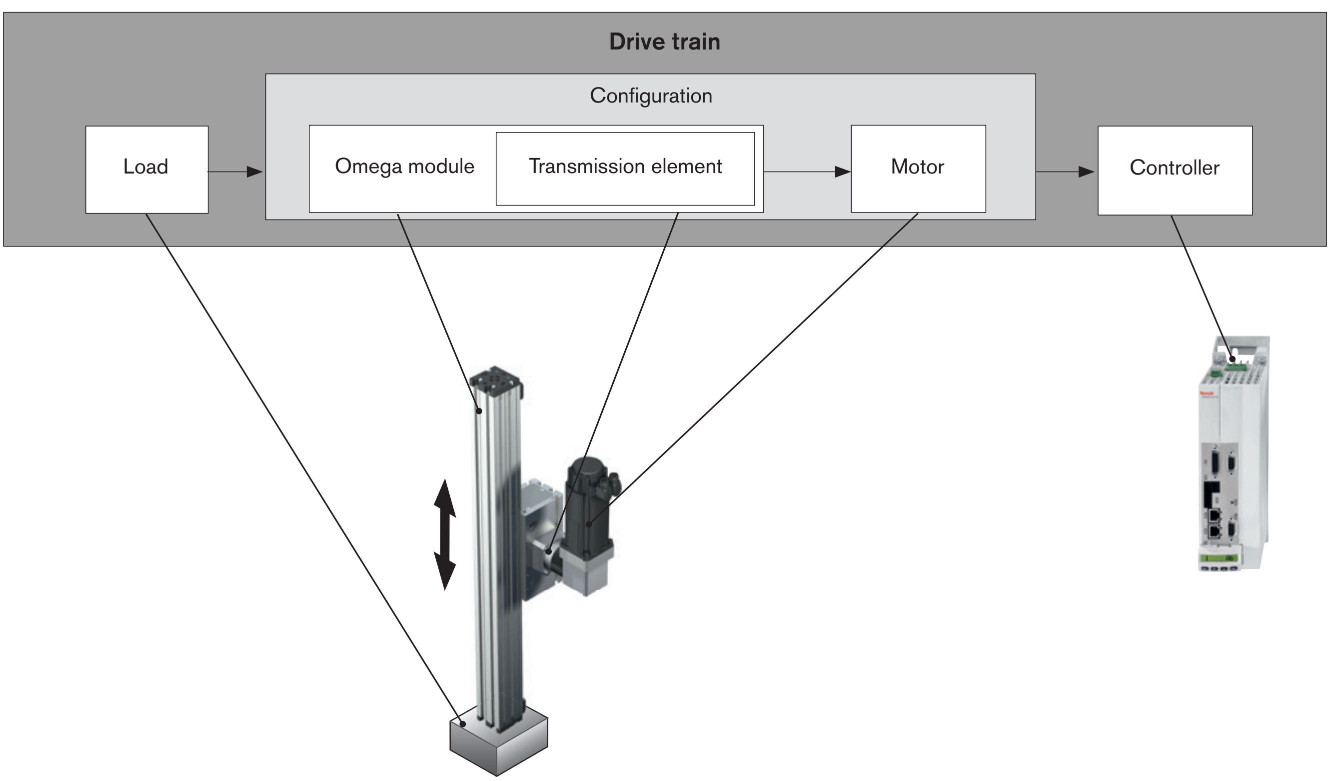

f (mm)
4
3
2
1
0
F_z
F = 200 N
F = 500 N
F = 900 N
0
200
400
600
800
1000
1200
1400
1600
1800
L_1 (mm)


f (mm)
4
3
2
1
0
F_y
F = 200 N
F = 500 N
F = 900 N
0
200
400
600
800
1000
1200
1400
1600
1800
L_1 (mm)

Calculation principles

The correct dimensioning and assessment of an application requires structured consideration of the drive train as a whole. The basic element of the drive train is the configuration – comprising the linear motion system, the transmission element (gear) and the motor – which can be ordered in that constellation in the catalog.





Maximum permissible load

When selecting linear motion systems, it is essential to consider the upper limits for permissible loads and forces, as specified in the section “"General technical data" on page 10. The values stated there are system-related. In other words, the upper. limits are determined not only by the load ratings of the bearing points but also include structural design and material-related considerations.

Conditions for combined loads:

$$\frac{|F_y|}{F_{y\,max}} + \frac{|F_z|}{F_{z\,max}} + \frac{|M_x|}{M_{x\,max}} + \frac{|M_y|}{M_{y\,max}} + \frac{|M_z|}{M_{z\,max}} \leq 1$$

Service life

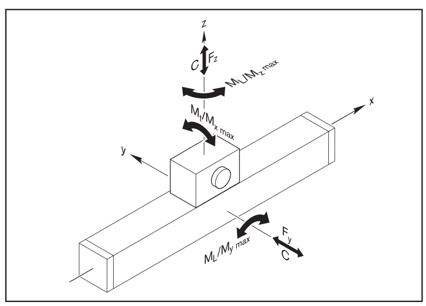
The service life of the rolling bearing points contained in a linear motion system can be calculated using the formulas given below.
The rolling bearing point that is relevant to the service life in a linear motion system with toothed belt drive is generally the linear guide.
The calculated service life specification for the linear motion system is determined by the service life value of the linear guide.

Service life of the linear guide

The linear guide of a linear motion system must bear the load, the side torques of the motor attachment / motor and any processing forces.

Combined equivalent load on bearing of the linear guide:

$$F_{comb} = F_y + F_z + C \cdot \frac{|M_x|}{M_t} + C \cdot \frac{|M_y|}{M_L} + C \cdot \frac{|M_z|}{M_L}$$



C	=	dynamic load rating	(N)
F_{comb}	=	combined equivalent load on bearing	(N)
F_y	=	force in y-direction	(N)
F_z	=	force in z-direction	(N)
L	=	nominal life in meters	(m)
L_h	=	nominal life in hours	(h)
M_L	=	dynamic longitudinal moment load capacity	(Nm)
M_t	=	dynamic torsional moment load capacity	(Nm)
M_x	=	torsional moment about the x-axis	(Nm)
M_y	=	torsional moment about the y-axis	(Nm)
M_z	=	torsional moment about the z-axis	(Nm)
v_m	=	average travel speed	(m/s)

Nominal life

Nominal life in meters:

$$L = \left(\frac{C}{F_{comb}}\right)^3 \cdot 10^5$$

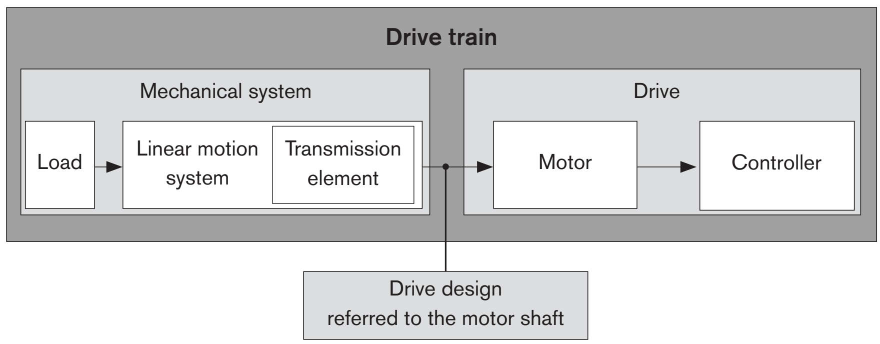
Nominal life in hours:

$$L_h = \frac{L}{3\,600 \cdot v_m}$$

General

Drive design - Basic principles

When calculating the required size of drive, the drive train can be subdivided into the mechanical system and the drive itself.
The **mechanical system** includes the linear motion system component (including transmission element gear), as well as taking into account the load.
The electric **drive** is a motor-controller combination with the appropriate performance data. The sizing or dimensioning of the electric drive is done taking the motor shaft as a reference point.
When sizing the drive, limit values must be taken into account as well as basic values. The limit values are to be observed in order to avoid damaging the mechanical components.



Technical data and formula symbols for the mechanical system

The technical values for the linear motion system already include the relevant gear data and take into account the gear ratio. In other words, the corresponding maximum permissible limits for torque and speed, as well as the underlying friction torque and mass moment of inertia with respect to the motor shaft are reduced and can be taken directly from the tables (see section "Drive data").

The following technical data with the associated formula symbols are used when considering the basic mechanical system requirements in the design calculations for sizing the drive. The data listed in the table below can be found in the section "Technical data" or they are determined using the formulas described on the following pages.

	Mechanical system	
	Load	**Linear motion system incl. transmission element gear**
Weight moment (Nm)	M_g 5)	–
Frictional torque (Nm)	– 4)	M_{Rs} 3)
Mass moment of inertia (kgm²)	J_t 1)	J_S 2)
Max. permissible travel speed (m/s)	–	v_{max} 3)
Max. permissible rotary speed (min⁻¹)	–	n_P 1)
Max. permissible drive torque (Nm)	–	M_P 3)

1) Determine the value using the appropriate formula
2) Length-dependent value, determined using the appropriate formula
3) Use the value from the table
4) Any additional process forces are to be taken into consideration as load moments
5) For vertical mounting position: Determine the value using the appropriate formula

Drive sizing referred to the motor shaft:

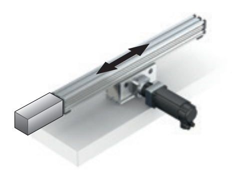
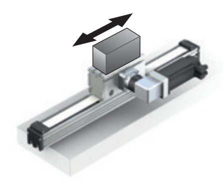
For the drive configuration, all the relevant design calculation values for the mechanical components contained in the drive train must be determined – and be expressed in terms of or reduced to – the motor shaft. In other words, for a combination of mechanical components within the drive train, this will result in one value for each of the following:

- Frictional torque M_R
- Mass moment of inertia J_{ex}
- Maximum permissible travel speed v_{mech} or maximum permissible rotary speed n_{mech}
- Maximum permissible drive torque M_{mech}

The determination of the values for the **mechanics** in the drive chain based on the reference point motor shaft differs with regard to the “frame moves” and “carriage moves” constellation and is compared with the relevant formula to highlight the differences. For better transparency, the installation orientations “**horizontal**” and “**vertical**” are addressed and outlined in different sections.

Calculations

Mounting orientation HORIZONTAL

	Frame moves	Carriage moves
Installation case		

Frictional torque M_R

The value for the frictional torque of the linear motion system already includes the friction for an appropriately configured gear unit and has been reduced with reference to the motor shaft.

	Frame moves	Carriage moves	
Frictional torque	$M_R = M_{Rs}$	$M_R = M_{Rs}$	M_R = frictional torque at motor journal (Nm) M_{Rs} = frictional torque of system (Nm)

Mass moment of inertia J_{ex}

The constants used in the formulas $k_{J\,fix}$, $k_{J\,var}$ and $k_{J\,m}$ are determined dependent on the installation case “frame moves” or “carriage moves” and can be found in the table "Drive data" on page 10. The inertia of a configured gear is therefore already taken into account and reduced based on the motor shaft.

	Frame moves	Carriage moves
Mass moment of inertia of the mechanical system	$J_{ex} = J_s + J_t$	$J_{ex} = J_s + J_t$
Mass moment of inertia of the linear motion system	$J_s = (k_{J\,fix} + k_{J\,var} \cdot L) \cdot 10^{-6}$	$J_s = (k_{J\,fix} + k_{J\,var} \cdot L) \cdot 10^{-6}$
Translatory mass moment of inertia of the additional masses to be moved	$J_t = m_{ex} \cdot k_{J\,m} \cdot 10^{-6}$	$J_t = (m_{ex} + m_m + m_{br}) \cdot k_{J\,m} \cdot 10^{-6}$

J_{ex} = mass moment of inertia of mechanical system (kgm^2)
J_s = mass moment of inertia of linear motion system (without external load) (kgm^2)
J_t = translatory mass moment of inertia of external load referred to the drive journal (kgm^2)
$k_{J\,fix}$ = constant for fixed-length portion of mass moment of inertia ($kgmm^2$)
$k_{J\,m}$ = constant for mass-specific portion of mass moment of inertia (mm^2)
$k_{J\,var}$ = constant for variable-length portion of mass moment of inertia (kgmm)
L = length of the linear motion system (mm)
m_{br} = mass of the holding brake (kg)
m_m = mass of motor (kg)
m_{ex} = moved external load (kg)

Maximum permissible travel speed v_{mech} or maximum permissible rotary speed n_{mech}

The value for the maximum permissible travel speed of the linear motion system already includes the permissible rotary speed for any gear configured accordingly.

	Frame moves	Carriage moves
Maximum permissible speed	$v_{mech} = v_{max}$	$v_{mech} = v_{max}$
Maximum permissible rotary speed	$n_{mech} = \frac{v_{mech} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$	$n_{mech} = \frac{v_{mech} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$

v_{max} = maximum permissible travel speed of the linear motion system (m/s)
v_{mech} = maximum permissible travel speed of mechanical system (m/s)
n_{mech} = maximum permissible rotary speed of mechanical system (min^{-1})
d_3 = diameter of belt pulley (mm)
π = pi (–)
i = gear ratio (–)

Maximum permissible drive torque M_{mech}

The lowest (minimum) of all the values for permissible drive torque of all mechanical components contained in the drive train determines the maximum permissible drive torque of the mechanical system which has to be taken into consideration as the upper limit for the drive when sizing the motor.

	Frame moves	Carriage moves
Maximum permissible drive torque	$M_{mech} = M_p$	$M_{mech} = M_p$

M_p = maximum permissible drive torque of the linear motion system (Nm)
M_{mech} = maximum permissible drive torque of mechanical system (Nm)

⚠ When considering the complete drive train (mechanical system + motor/controller), the maximum torque of the motor can lie below the maximum value for the mechanical system (Mmech) and thus limit the maximum permissible drive torque of the overall drive train.
If the maximum torque of the motor lies above the upper limit for the mechanical system (Mmech), the maximum motor torque must be limited to the permitted value for the mechanical system.

Rough guide for pre-selection of the motor
The following conditions can be used as a rough guide for pre-selecting the motor.

Condition 1
The speed of the motor must be the same as or higher than the rotary speed for the mechanical system (but not exceeding the maximum permissible value).

$$n_{max} \geq n_{mech}$$

n_{max} = maximum rotary speed of motor (min^{-1})
n_{mech} = maximum permissible rotary speed of mechanical system (min^{-1})

Calculations

Mounting orientation HORIZONTAL

Condition 2

Consideration of the ratio of mass moments of inertia of the mechanical system and the motor. The mass moment of inertia ratio serves as an indicator for the control performance of a motor-controller combination.
The mass moment of inertia of the motors is directly related to the motor size.

$$V = \frac{J_{ex}}{J_m + J_{br}}$$

V = ratio of mass moments of inertia of drive train and motor (–)
J_{ex} = mass moment of inertia of mechanical system (kgm^2)
J_m = mass moment of inertia, motor (kgm^2)
J_{br} = mass moment of inertia, motor brake (kgm^2)

For preselection, experience has shown that the following ratios will result in high control performance. These are not rigid limits, but values exceeding them will require closer consideration of the specific application.

Application area	V
Handling	≤ 6.0
Processing	≥ 1.5

Condition 3

Estimation of the ratio of the static load torque to the continuous torque of the motor.
The torque ratio must be smaller than or equal to the empirical value of 0.6.
By looking at the required motor torque levels, this estimation roughly covers the dynamic characteristics which still have to be determined by plotting an exact movement profile.

$$\frac{M_{stat}}{M_0} \leq 0.6$$

M_0 = continuous motor torque (Nm)
M_{stat} = static load torque (Nm)

	Frame moves	Carriage moves
Static load torque	$M_{stat} = M_R$	$M_{stat} = M_R$

M_R = frictional torque at motor journal (Nm)

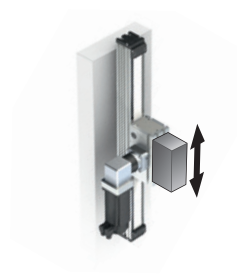
Any additional forces arising from the use of power cable chains, for example, are not included in the observation of the moving total mass and must be taken into account additionally in the calculation where applicable.

In the overview **Configuration and ordering**, users can put together standard configurations, including gears and motor, for the various linear motion system sizes by selecting the appropriate options. By fulfilling the three conditions it is possible to see whether a standard motor selected in a particular configuration will generally be of a suitable size for the specific application.

Precise drive design

Pre-selecting the motor according to this rough guide is no substitute for the precise design calculations required for the drive, where all moments/torques and speed levels are taken into account. For precise calculation of the electric drive, including consideration of the specific movement profile, please refer to the performance data in the catalogs **IndraDrive Cs** and **IndraDrive C**.
When sizing the drive, the maximum permitted values for speed, drive torque and acceleration must not be exceeded, in order to avoid damaging the mechanical system!

Mounting orientation VERTICAL

	Frame moves	Carriage moves
Installation case		

Frictional torque M_R

The value for the frictional torque of the linear motion system already includes the friction for an appropriately configured gear unit and has been reduced with reference to the motor shaft.

	Frame moves	Carriage moves
Frictional torque	$M_R = M_{Rs}$	$M_R = M_{Rs}$

M_R = frictional torque at motor journal (Nm)
M_{Rs} = frictional torque of system (Nm)

Mass moment of inertia J_{ex}

The constants used in the formulas $k_{J\,fix}$, $k_{J\,var}$ and $k_{J\,m}$ are determined dependent on the installation case "frame moves" or "carriage moves" and can be found in the table "Drive data" on page 10. The inertia of a configured gear is therefore already taken into account and reduced based on the motor shaft.

	Frame moves	Carriage moves
Mass moment of inertia of the mechanical system	$J_{ex} = J_s + J_t$	$J_{ex} = J_s + J_t$
Mass moment of inertia of the linear motion system	$J_s = (k_{J\,fix} + k_{J\,var} \cdot L) \cdot 10^{-6}$	$J_s = (k_{J\,fix} + k_{J\,var} \cdot L) \cdot 10^{-6}$
Translatory mass moment of inertia of the additional masses to be moved	$J_t = m_{ex} \cdot k_{J\,m} \cdot 10^{-6}$	$J_t = (m_{ex} + m_m + m_{br}) \cdot k_{J\,m} \cdot 10^{-6}$

J_{ex} = mass moment of inertia of mechanical system (kgm^2)
J_s = mass moment of inertia of linear motion system (without external load) (kgm^2)
J_t = translatory mass moment of inertia of external load referred to the drive journal (kgm^2)
$k_{J\,fix}$ = constant for fixed-length portion of mass moment of inertia ($kgmm^2$)
$k_{J\,m}$ = constant for mass-specific portion of mass moment of inertia (mm^2)
$k_{J\,var}$ = constant for variable-length portion of mass moment of inertia (kgmm)
L = length of the linear motion system (mm)
m_{br} = mass of the holding brake (kg)
m_m = mass of motor (kg)
m_{ex} = moved external load (kg)

Calculations

Mounting orientation VERTICAL

Maximum permissible travel speed v_{mech} or maximum permissible rotary speed n_{mech}

The value for the maximum permissible travel speed of the linear motion system already includes the permissible rotary speed for any gear configured accordingly.

	Frame moves	Carriage moves
Maximum permissible speed	$v_{mech} = v_{max}$	$v_{mech} = v_{max}$
Maximum permissible rotary speed	$n_{mech} = \frac{v_{mech} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$	$n_{mech} = \frac{v_{mech} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$

v_{max} = maximum permissible travel speed of the linear motion system (m/s)
v_{mech} = maximum permissible travel speed of mechanical system (m/s)
n_{mech} = maximum permissible rotary speed of mechanical system (min^{-1})
d_3 = diameter of belt pulley (mm)
π = pi (–)
i = gear ratio (–)

Maximum permissible drive torque M_{mech}

The lowest (minimum) of all the values for permissible drive torque of all mechanical components contained in the drive train determines the maximum permissible drive torque of the mechanical system which has to be taken into consideration as the upper limit for the drive when sizing the motor.

	Frame moves	Carriage moves
Maximum permissible drive torque	$M_{mech} = M_p$	$M_{mech} = M_p$

M_p = maximum permissible drive torque of the linear motion system (Nm)
M_{mech} = maximum permissible drive torque of mechanical system (Nm)

⚠ When considering the complete drive train (mechanical system + motor/controller), the maximum torque of the motor can lie below the maximum value for the mechanical system (M_{mech}) and thus limit the maximum permissible drive torque of the overall drive train.
If the maximum torque of the motor lies above the upper limit for the mechanical system (M_{mech}), the maximum motor torque must be limited to the permitted value for the mechanical system.

Rough guide for pre-selection of the motor
The following conditions can be used as a rough guide for pre-selecting the motor.

Condition 1
The speed of the motor must be the same as or higher than the rotary speed for the mechanical system (but not exceeding the maximum permissible value).

$$n_{max} \geq n_{mech}$$

n_{max} = maximum rotary speed of motor (min^{-1})
n_{mech} = maximum permissible rotary speed of mechanical system (min^{-1})

Condition 2
Consideration of the ratio of mass moments of inertia of the mechanical system and the motor. The mass moment of inertia ratio serves as an indicator for the control performance of a motor-controller combination.
The mass moment of inertia of the motors is directly related to the motor size.

$$V = \frac{J_{ex}}{J_m + J_{br}}$$

V = ratio of mass moments of inertia of drive train and motor (–)
J_{ex} = mass moment of inertia of mechanical system (kgm^2)
J_m = mass moment of inertia, motor (kgm^2)
J_{br} = mass moment of inertia, motor brake (kgm^2)

For preselection, experience has shown that the following ratios will result in high control performance. These are not rigid limits, but values exceeding them will require closer consideration of the specific application.

Application area	V
Handling	≤ 6.0
Processing	≥ 1.5

Condition 3

Estimation of the ratio of the static load torque to the continuous torque of the motor.
The torque ratio must be smaller than or equal to the empirical value of 0.6.
By looking at the required motor torque levels, this estimation roughly covers the dynamic characteristics which still have to be determined by plotting an exact movement profile.

$$\frac{M_{stat}}{M_0} \leq 0.6$$

M_0 = continuous motor torque (Nm)
M_{stat} = static load torque (Nm)

	Frame moves	Carriage moves
Static load torque	$M_{stat} = M_R + M_g$	$M_{stat} = M_R + M_g$
Weight moment	$M_g = d_3 \cdot \frac{m_{tot\ mb} \cdot g}{2\,000 \cdot i}$	$M_g = d_3 \cdot \frac{m_{tot\ ca} \cdot g}{2\,000 \cdot i}$
Moved total mass	$m_{tot\ mb} = m_{ex} + m_{mb}$ $m_{mb} = k_{g\ fix} + k_{g\ var} \cdot L$	$m_{tot\ ca} = m_{ex} + m_{ca} + m_m + m_{br}$

d_3 = diameter of belt pulley (mm)
M_R = frictional torque at journal (Nm)
$m_{tot\ ca}$ = total mass with moving carriage (kg)
$m_{tot\ mb}$ = total mass with moving frame (kg)
m_{mb} = mass of the moving frame (kg)
$k_{g\ fix}$ = fixed mass proportion on the frame (kg)
$k_{g\ var}$ = variable mass proportion on the frame (kg/mm)
M_g = weight moment (Nm)
m_{ca} = mass of the carriage incl. gear (kg)
m_{ex} = moved external load (kg)
m_m = mass of motor (kg)
m_{br} = mass of the holding brake (kg)

Any additional forces arising from the use of power cable chains, for example, are not included in the observation of the moving total mass and must be taken into account additionally in the calculation where applicable.

In the overview **Configuration and ordering**, users can put together standard configurations, including gears and motor, for the various linear motion system sizes by selecting the appropriate options. By fulfilling the three conditions it is possible to see whether a standard motor selected in a particular configuration will generally be of a suitable size for the specific application.

Precise drive design

Pre-selecting the motor according to this rough guide is no substitute for the precise design calculations required for the drive, where all moments/torques and speed levels are taken into account. For precise calculation of the electric drive, including consideration of the specific movement profile, please refer to the performance data in the catalogs **IndraDrive Cs** and **IndraDrive C**. When sizing the drive, the maximum permitted values for speed, drive torque and acceleration must not be exceeded, in order to avoid damaging the mechanical system!

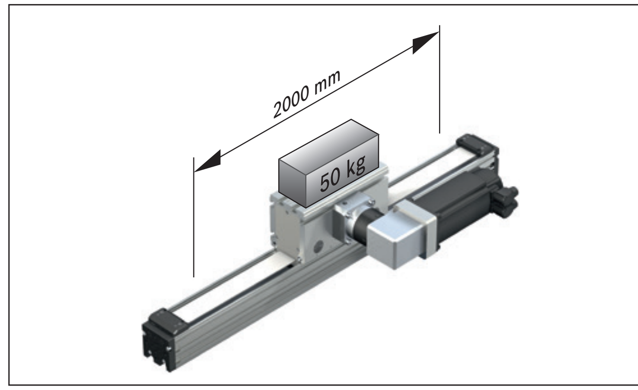
Calculations

Calculation example

Mounting orientation HORIZONTAL

Arrangement: Carriage moves
(frame mounted on the mounting base)

Output data
In a handling task in horizontal installation position, a mass of 50 kg is to be moved by 2000 mm at a travel speed of 1.5 m/s. The frame should be mounted on the mounting base (carriage moves). No additional axial forces act. The selection was made based on the technical data and the installation space:



Omega module OBB-120:
- Carriage length = 330 mm (without clamping element)
- Motor attachment via angular planetary gearbox, i = 9
- with servo motor MSK 076C without brake

Module length L:
(In most cases, the recommended limit for excess travel is 2x lead constant. The excess travel must be greater than the excess travel stopping distance, which is calculated for an exact design of the electrical drive.)

	L	$= s_{max} + L_{ca} + L_{ad}$
Excess travel:	s_e	$= 2 \cdot u = 2 \cdot 37.78 = 75.74 = 76$ mm
Max. travel distance:	s_{max}	$= s_{eff} + 2 \cdot s_e$
		$= 2\,000 + 2 \cdot 76 = 2\,152$ mm
Module length:	L	$= 2\,152 + 330 + 170 = 2\,652$ mm

Frictional torque M_R:
(including the gear with gear ratio i = 9)

	M_R	$= M_{Rs}$
Linear module:	M_{Rs}	$= 2.02$ Nm

Mass moment of inertia J_{ex}:
(including the gear with gear ratio i = 9)

	J_{ex}	$= J_s + J_t$
Linear module:	J_s	$= (k_{J\,fix} + k_{J\,var} + L) \cdot 10^{-6}$
		$= (1\,838.85 + 0 \cdot 2\,652) \cdot 10^{-6}$
		$= 1\,838.85 \cdot 10^{-6}$ kgm^2
External load:	J_t	$= (m_{ex} + m_m + m_{br}) \cdot k_{J\,m} \cdot 10^{-6}$
		$= (50 + 13.8 + 0) \cdot 36.15 \cdot 10^{-6}$
		$= 2\,306.37 \cdot 10^{-6}$ kgm^2
Moment of inertia:	J_{ex}	$= 1\,838.85 \cdot 10^{-6} + 2\,306.37 \cdot 10^{-6}$
		$= 4\,145.22 \cdot 10^{-6}$ kgm^2

Maximum permissible rotary speed n_{mech}:
(Motor attachment via gear, without consideration of the motor)
Limit value application

$n_{mech} = (V_{mech} \cdot i \cdot 1\,000 \cdot 60) / \pi \cdot d_3$

Max. permissible travel speed:

$V_{mech} = V_{max} = 1.86$ m/s

Max. permissible rotary speed:

$n_{mech} = (1.86 \cdot 9 \cdot 1\,000 \cdot 60) / \pi \cdot 108.23)$

$= 2\,954$ min^{-1}

Maximum speed of the application M_{mech}:
(Motor attachment via gear)
Limit value application

Speed:	v_{mech}	$= 1.5$ m/s
Speed:	n_{mech}	$= (1.5 \cdot 9 \cdot 1\,000 \cdot 60) / \pi \cdot 108.23)$
		$= 2\,382$ min^{-1}

Maximum permissible drive torque M_{mech}:
(Motor attachment via gear)
Limit value application

	M_{mech}	$= M_P$
Drive torque:	M_{mech}	$= 17.1$ Nm

Checking the motor preselection:
selected motor MSK 076C without brake

Condition 1:

Speed:	n_{max}	$\geq n_{mech}$
	4 500	≥ 2 382
condition fulfilled – motor size OK		

Condition 2:

Mass moment of inertia ratio:	V	$= J_{ex} / (J_m + J_{Br})$
Motor inertia:	J_m	$= 4\ 300 \cdot 10^{-6}$ kgm²
Brake moment of inertia:	J_{Br}	= 0 kgm² (without brake)
Inertia ratio:	V	$= 4\ 145.22 \cdot 10^{-6}/(4\ 300 \cdot 10^{-6} + 0 \cdot 10^{-6})$
		= 0.96
Condition for handling:	V	≤ 6
	0.96 ≤ 6	
condition fulfilled – motor size OK		

Condition 3:

Torque ratio:	$M_{stat} / M_0 \leq 0.6$	
Static Load torque:	M_{stat}	$= M_R + Mg$
Weight moment:	M_g	= 0 Nm (horizontal mounting orientation)
Static Load torque:	M_{stat}	= 2.02 Nm
Continuous motor torque:	M_0 = 12 Nm	
Torque ratio:	2.02 / 12 = 0.17	
	0.17	≤ 0.6
condition fulfilled – motor size OK		

Result:

Omega module OBB-120

Length	L	= 2 652 mm
Max. travel distance	s_{max}	= 2 152 mm
Carriage length	L_{ca}	= 330 mm
Drive	toothed belt drive	
Motor mounting	via angular planetary gearbox	
Gear ratio	i = 9	
Preselected motor:	MSK 076C without brake	
Arrangement:	Frame mounted on the mounting base, carriage moving Mounting orientation horizontal	

For precise sizing of the electric drive, the motor-controller combination must always be considered, as the performance data (e.g. maximum useful speed and maximum torque) will depend on the controller used.

When doing this, the following data must be considered:

- Frictional torque: M_R = 2.02 Nm
- Mass moment of inertia: $J_{ex} = 4\ 145.22 \cdot 10^{-6}$ kgm²
- Speed: v_{mech} = 1.5 m/s
  (n_{mech} = 2 382 min^{-1})
- Limit value for Drive torque: M_{mech} = 17.1 Nm

The motor torque must be limited to 17.1 Nm on the drive side!

- Limit value for acceleration: a_{max} = 50 m/s²
- Limit value for speed: v_{mech} = 1.86 m/s
  (n_{mech} = 2 954 min^{-1})

After the excess travel stopping distance has been determined during the exact design, check whether the selected excess travel is sufficient or whether, if appropriate, an adjustment must be made. Besides the preferred type MSK 076C, other motors with identical connection dimensions can be adapted while taking care not to exceed the calculated limits.

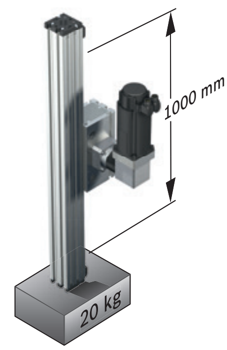
Calculations

Calculation example

Mounting orientation VERTICAL

Arrangement: Frame moves
(carriage mounted on the mounting base)

Output data
In a handling task in vertical installation position, a mass of 20 kg is to be moved by 1 000 mm at a travel speed of 1.5 m/s. No additional axial forces act. The frame should enter the working range (frame moves). The selection was made based on the technical data and the installation space:



Omega module OBB-085:
- Carriage length = 260 mm (without clamping element
- Motor attachment via angular planetary gearbox, i = 8
- with servo motor MSK 050C wit brake

Module length L:
(In most cases, the recommended limit for excess travel is 2x lead constant. The excess travel must be greater than the excess travel stopping distance, which is calculated for an exact design of the electrical drive.)

$L = s_{max} + L_{ca} + L_{ad}$

Excess travel: $s_e = 2 \cdot u = 2 \cdot 31.88 = 63.76 = 64$ mm

Max. travel distance: $s_{max} = s_{eff} + 2 \cdot s_e$
$= 1\,000 + 2 \cdot 64 = 1\,128$ mm

Module length: $L = 1\,128 + 260 + 130 = 1\,518$ mm

Frictional torque M_R:
(including the gear with gear ratio i = 8)

$M_R = M_{Rs}$

Linear module: $M_{Rs} = 0.93$ Nm

Mass moment of inertia J_{ex}:
(including the gear with gear ratio i = 8)

$J_{ex} = J_s + J_t$

Linear module: $J_s = (k_{J\,fix} + k_{J\,var} + L) \cdot 10^{-6}$
$= (123.47 + 0.2821 \cdot 1\,518) \cdot 10^{-6}$
$= 551.657 \cdot 10^{-6}$ kgm^2

External load: $J_t = m_{ex} \cdot k_{J\,m} \cdot 10^{06}$
$= 20 \cdot 25.74 \cdot 10^{-6}$ kgm^2
$= 514.732 \cdot 10^{-6}$ kgm^2

Moment of inertia: $J_{ex} = 551.657 \cdot 10^{-6} + 514.732 \cdot 10^{-6}$
$= 1\,066.389 \cdot 10^{-6}$ kgm^2

Maximum permissible rotary speed n_{mech}:
(Motor attachment via gear,
without consideration of the motor)
Limit for mechanical system

$n_{mech} = (V_{mech} \cdot i \cdot 1\,000 \cdot 60) / \pi \cdot d_3$

Max. permissible travel speed:
$V_{mech} = V_{max} = 2.13$ m/s

Max. permissible rotary speed:
$n_{mech} = (2.13 \cdot 8 \cdot 1\,000 \cdot 60) / \pi \cdot 81.17)$
$= 4\,009$ min^{-1}

Maximum speed of the application M_{mech}:
(Motor attachment via gear)
Limit value application

Speed: $v_{mech} = 1.5$ m/s
Speed: $n_{mech} = (1.5 \cdot 8 \cdot 1\,000 \cdot 60) / \pi \cdot 81.17)$
$= 2\,823$ min^{-1}

Maximum permissible drive torque M_{mech}:
(Motor attachment via gear)
Limit for mechanical system

$M_{mech} = M_P$

Drive torque: $M_{mech} = 5$ Nm

Checking the motor preselection:
selected motor MSK 050C with brake

Condition 1:

Speed: $n_{max} \geq n_{mech}$
6 000 ≥ 2 823

condition fulfilled – motor size OK

Condition 2:

Mass moment of inertia ratio: $V = J_{ex} / (J_m + J_{Br})$
Motor inertia: $J_m = 330 \cdot 10^{-6}$ kgm²
Brake moment of inertia: $J_{Br} = 107 \cdot 10^{-6}$ kgm² (with brake)
Inertia ratio: $V = 1\,066.389 \cdot 10^{-6} / (330 \cdot 10^{-6} + 107 \cdot 10^{-6})$
$= 2.44$
Condition for handling: $V \leq 6$
$2.44 \leq 6$

condition fulfilled – motor size OK

Condition 3:

Torque ratio: $M_{stat} / M_0 \leq 0.6$
Static Load torque: $M_{stat} = M_R + M_g$
Weight moment: $M_g = d_3 \cdot (m_{ex} + m_{mb}) \cdot g / 2\,000 \cdot i$
Mass of the moving frame:
$m_{mb} = k_{g\,fix} + k_{g\,var} \cdot L$
$= 1.05 + 0.0108 \cdot 1\,518$
$= 17.44$ kg
Moved external load $m_{ex} = 20$ kg
$M_g = 81.17 \cdot (17.44 + 20) \cdot 9.81 / 2\,000 \cdot 8$
$= 1.86$ Nm
Static Load torque: $M_{stat} = 0.93 + 1.86 = 2.79$ Nm
Continuous motor torque: $M_0 = 5$ Nm
Torque ratio: $2.79/5 = 0.56$
$0.56 \leq 0.6$

condition fulfilled – motor size OK

Result:

Omega module OBB-085

Length	$L = 1\,518$ mm
Max. travel distance	$s_{max} = 1\,128$ mm
Carriage length	$L_{ca} = 260$ mm
Drive	toothed belt drive
Motor mounting	via angular planetary gearbox
Gear ratio	$i = 8$
Preselected motor:	MSK 050C with brake
Arrangement:	Carriage fixed on the mounting base, frame moves Mounting orientation vertical

For precise sizing of the electric drive, the motor-controller combination must always be considered, as the performance data (e.g. maximum useful speed and maximum torque) will depend on the controller used.

When doing this, the following data must be considered:

- Frictional torque: $M_R = 0.93$ Nm
- Mass moment of inertia: $J_{ex} = 1\,066.389 \cdot 10^{-6}$ kgm²
- Speed: $v_{mech} = 1.5$ m/s ($n_{mech} = 2\,823$ min^{-1})
- Limit value for Drive torque: $M_{mech} = 5$ Nm

The motor torque must be limited to 5 Nm on the drive side!

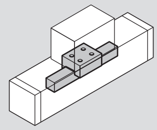
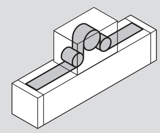
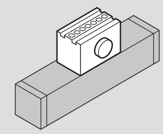
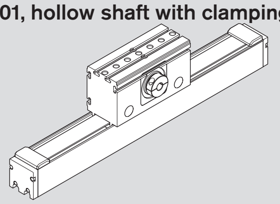
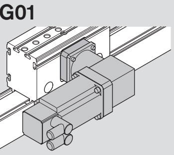
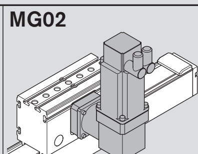
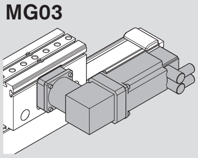
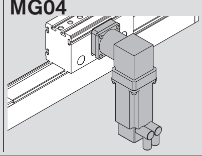
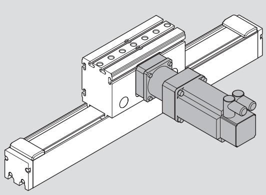
- Limit value for acceleration: $a_{max} = 50$ m/s²
- Limit value for speed: $v_{mech} = 2.13$ m/s ($n_{mech} = 4\,009$ min^{-1})

After the excess travel stopping distance has been determined during the exact design, check whether the selected excess travel is sufficient or whether, if appropriate, an adjustment must be made.
Besides the preferred type MSK 050C, other motors with identical connection dimensions can be adapted while taking care not to exceed the calculated limits.

Configuration and ordering

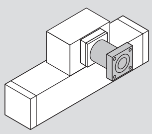
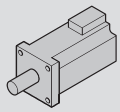
OBB-055

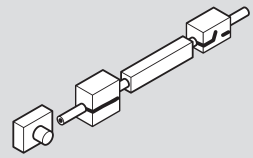
Configuration and ordering

Short product name, length OBB-055-NN-1, ... mm Version[2)]		Guideway 	Drive  Reduction i = 1	i = 3	i = 5	i = 8	Carriage  L_{ca} = 230 mm without	 with
					Clamping element	
with drive (MA), without gear i = 1	MA01, hollow shaft with clamping hub 	01	01	–	01	02
with gear (MG), angular planetary gearbox WPG	MG01  MG02  MG03  MG04 	01	–	10	01	02
with gear (MG), planetary gearbox PG	MG10 	01	–	10	01	02

Ordering example: see "Inquiry/order"

Note:
When a shock absorber is used, the maximum travel distance is reduced due to the construction (s_{max}). For the calculation, the maximum travel distance must therefore be reduced by the value s_{red} per side or per shock absorber, see section "Accessories".

Motor attachment				Motor	
					
Speed reduction i =	Attachment kit[3] with gear MG01 MG03	MG02 MG04	for motor	without Brake	with Brake
–	00		–	00	
i = 3	45	55	MSK 040C	86	87
i = 5	47	57			
i = 5	46	56	MSM 031C	138	139
i = 8	44	54			
i = 3	41		MSK 040C	86	87
i = 5	43				
i = 5	42		MSM 031C	138	139
i = 8	40				

Switching system[4]	
	
Without switch and without cable duct	00
Carriage moves	
Switch:	
– PNP NC	71
– PNP NO	73
– Mechanical	75
Cable duct[1]	20
Socket-plug	17
Switching angle	36
Frame moves	
Switch:	
– PNP NC	61
– PNP NO	63
– Mechanical	65
Socket-plug	17
Two control strips	39

Documentation
standard report
01

1) The delivery length of the cable duct corresponds to the length of the profiled support. For a different length, please order the cable duct as a single item (ordering "Switches and attachments" page 44)
2) When the servo motor is mounted, the delivery is only made in accordance with the motor assembly shown in the "Delivery form" section (note the position of the motor connectors)!
3) Attachment kit can also be delivered without motor. When ordering, enter the motor type "00"!
4) The switches are selected according to the installation situation (carriage / frame moves)! See section "Switch mounting".

Length L (mm):

$$L = s_{max} + L_{ca} + L_{ad}$$

$$s_{max} = s_{eff} + 2 \cdot s_e$$

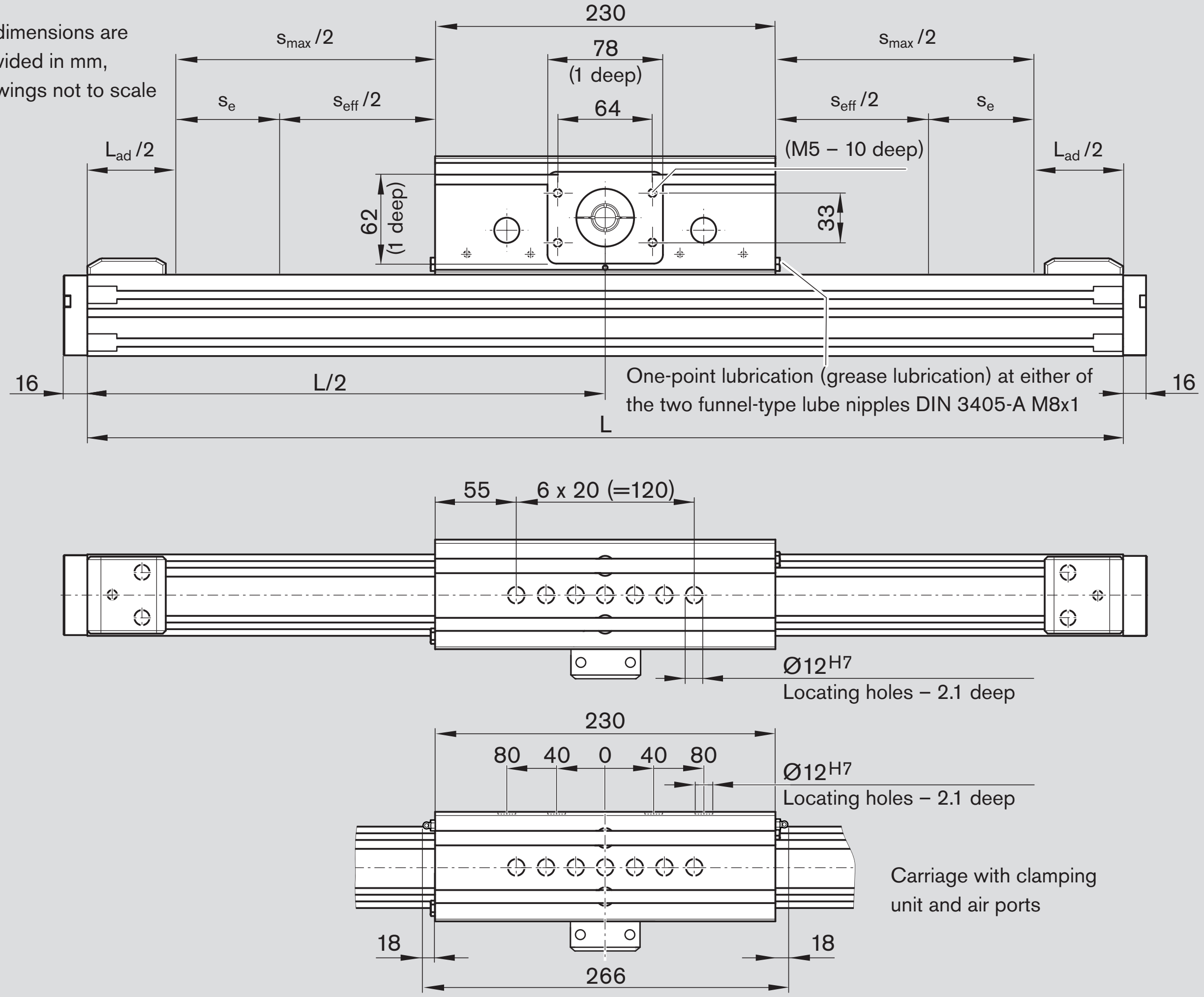
L_{ca} = carriage length (mm)
L_{ad} = additional length (mm) (for the value, see the table in the section "General technical data")
s_{max} = maximum travel distance (mm)
s_{eff} = effective travel distance (mm)
s_e = excess travel (mm)

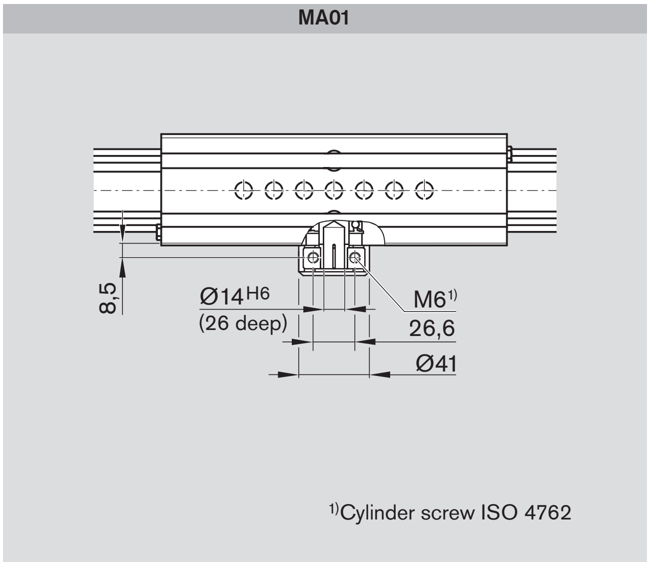
Configuration and ordering

OBB-055

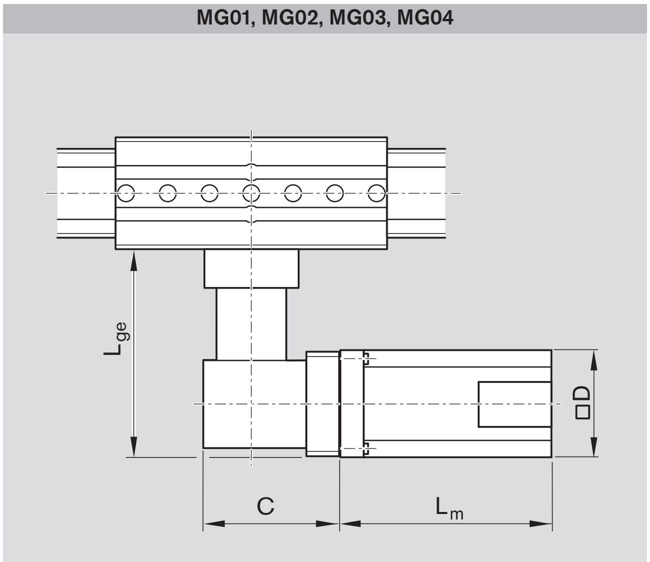
Dimensions

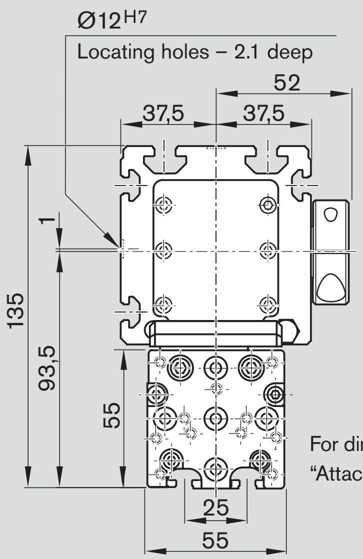
All dimensions are provided in mm, drawings not to scale



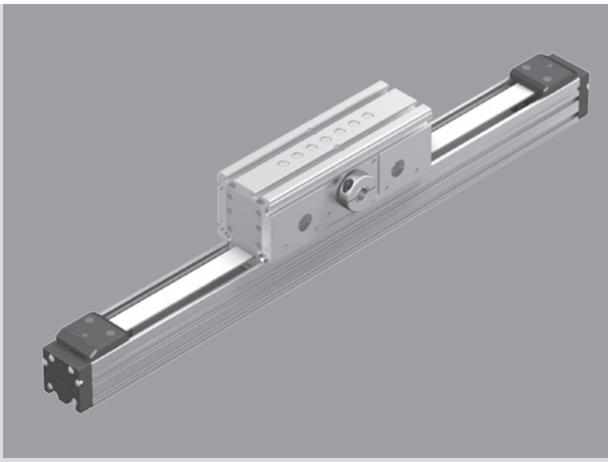


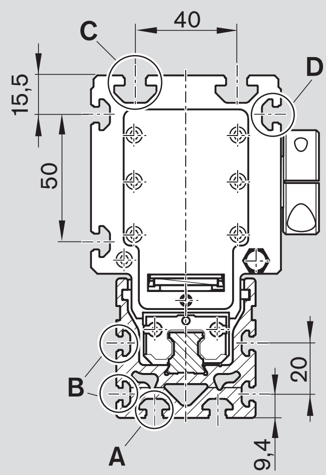
[1]Cylinder screw ISO 4762

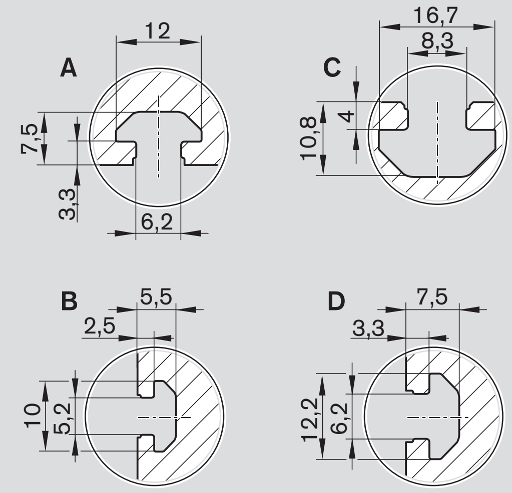


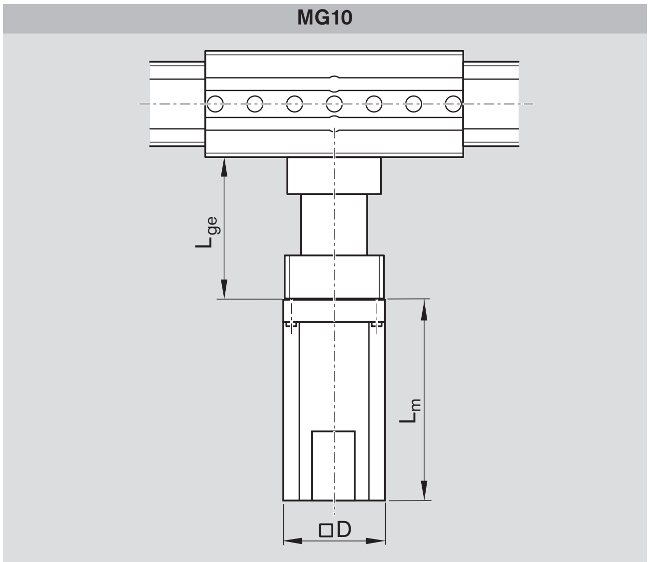


For dimensions of end plate, see section "Attachment of additional devices"









Motor[1)]	Dimensions (mm)					
	Gear unit			Motor		
	MG 01/02/03/04		MG 10	D	L_m	
					without brake	with brake
	L_{ge}	C	L_{ge}			
MSK 040C	150.5	97.5	111.5	82	185.5	215.5
MSM 031C	135.5	97.5	111.5	60	98.5	135.0

1) For the connector position of the motor, observe section "Delivery form"

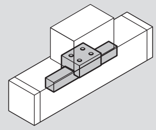
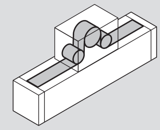
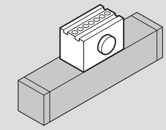
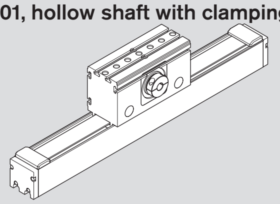
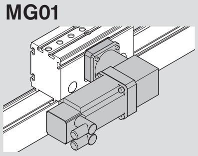
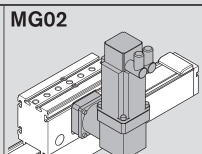
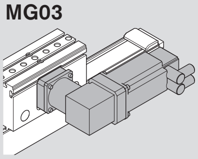
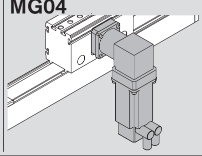
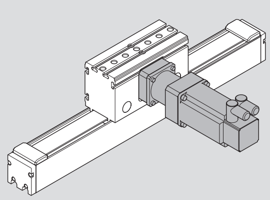
L = length
C = gear height
L_{ge} = gear length
D = motor width
L_m = motor length

L_{ca} = carriage length (mm)
L_{ad} = additional length (mm)
(for the value, see the table in the section "General technical data")
s_{max} = maximum travel distance (mm)
s_{eff} = effective travel distance (mm)
s_e = excess travel (mm)

Configuration and ordering

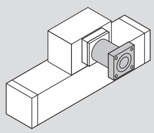
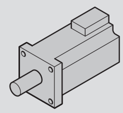
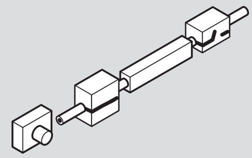
OBB-085

Configuration and ordering

Short product name, length OBB-085-NN-1, ... mm		Guideway	Drive			Carriage	
							
			Reduction			L_{ca} = 260 mm	L_{ca} = 308 mm
Version[2]						without	with
			i = 1	i = 5	i = 8	Clamping element	
with drive (MA), without gear i = 1	MA01, hollow shaft with clamping hub 	01	01	–		01	02
with gear (MG), angular planetary gearbox WPG	MG01  MG02  MG03  MG04 	01	–	10		01	02
with gear (MG), planetary gearbox PG	MG10 	01	–	10		01	02

Ordering example: see “Inquiry/order”

Note:
When a shock absorber is used, the maximum travel distance is reduced due to the construction (s_{max}). For the calculation, the maximum travel distance must therefore be reduced by the value s_{red} per side or per shock absorber, see section “Accessories”.

Motor attachment				Motor		Switching system[4)]		Documentation
								
Speed reduction i =	Attachment kit[3)] with gear MG01 MG03	MG02 MG04	for motor	without brake	with brake			standard report
–	00		–	00		**Without switch and without cable duct**	00	01
i = 5	33	43	MSK 050C	88	89	**Carriage moves**		
i = 8	35	45	MSK 050C	88	89	**Switch:** – PNP NC	71	
i = 8	34	44	MSM 041B	140	141	– PNP NO	73	
i = 5	30		MSK 050C	88	89	– Mechanical	75	
i = 8	32		MSK 050C	88	89	**Cable duct[1)]**	20	
i = 8	31		MSM 041B	140	141	**Socket-plug**	17	
						Switching angle	36	
						Frame moves		
						Switch: – PNP NC	61	
						– PNP NO	63	
						– Mechanical	65	
						Socket-plug	17	
						Two control strips	41	

1) The delivery length of the cable duct corresponds to the length of the profiled support. For a different length, please order the cable duct as a single item (ordering "Switches and attachments" page 44)
2) When the servo motor is mounted, the delivery is only made in accordance with the motor assembly shown in the "Delivery form" section (note the position of the motor connectors)!
3) Attachment kit can also be delivered without motor. When ordering, enter the motor type "00"!
4) The switches are selected according to the installation situation (carriage / frame moves)! See section "Switch mounting".

Length L (mm):

$$L = s_{max} + L_{ca} + L_{ad}$$

$$s_{max} = s_{eff} + 2 \cdot s_e$$

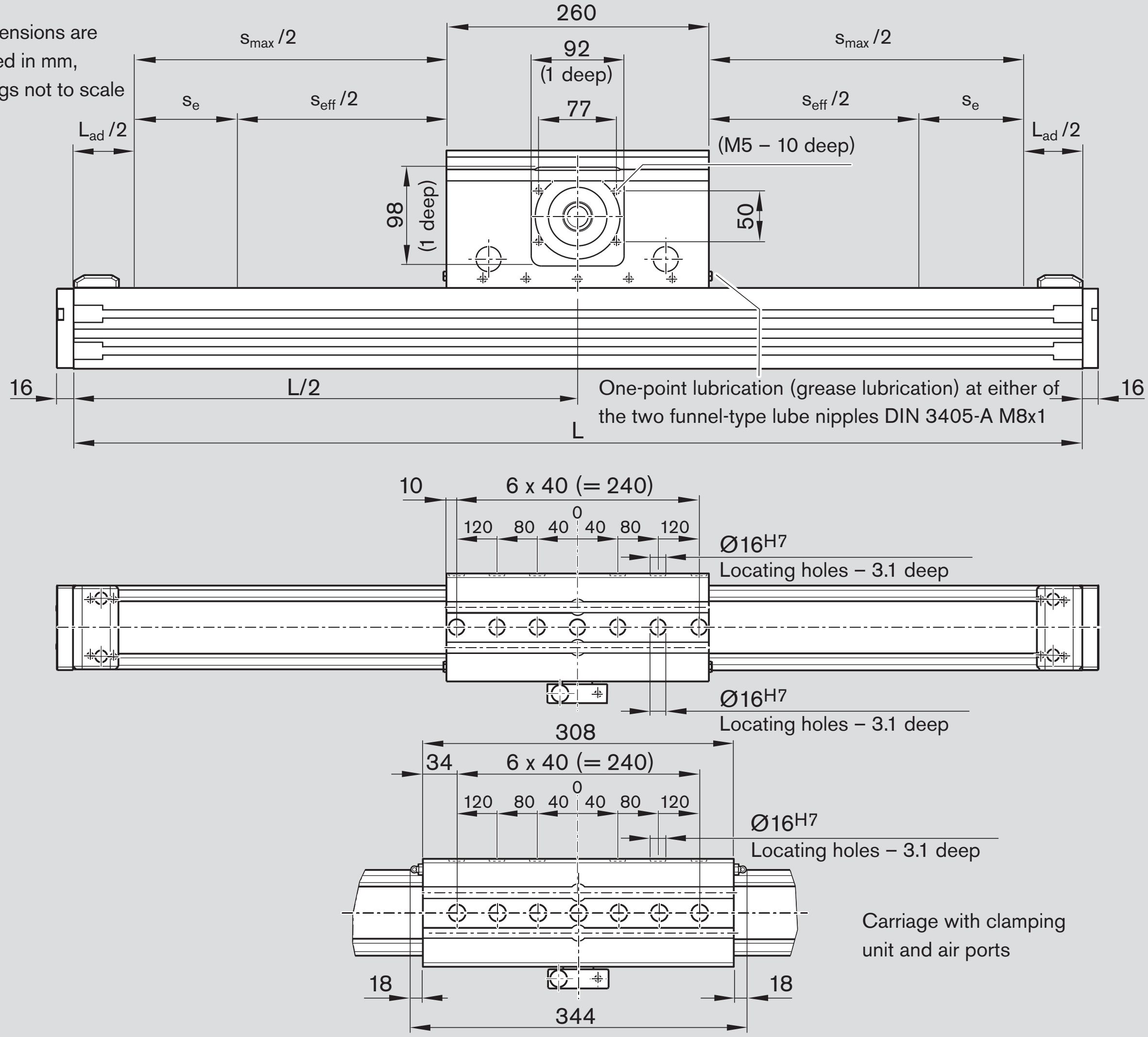
L_{ca} = carriage length (mm)
L_{ad} = additional length (mm) (for the value, see the table in the section "General technical data")
s_{max} = maximum travel distance (mm)
s_{eff} = effective travel distance (mm)
s_e = excess travel (mm)

Configuration and ordering

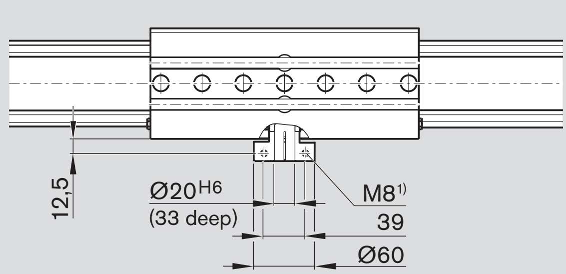
OBB-085

Dimensions

All dimensions are provided in mm, drawings not to scale

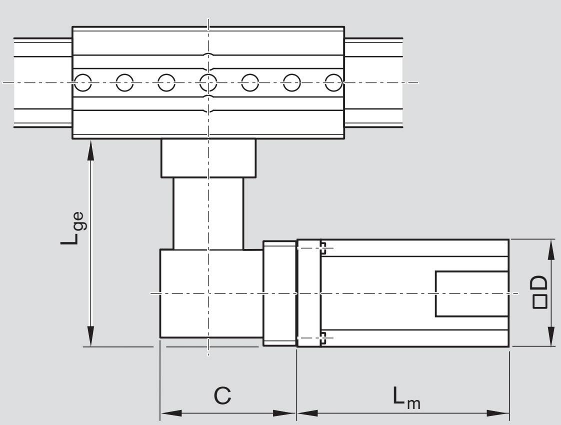


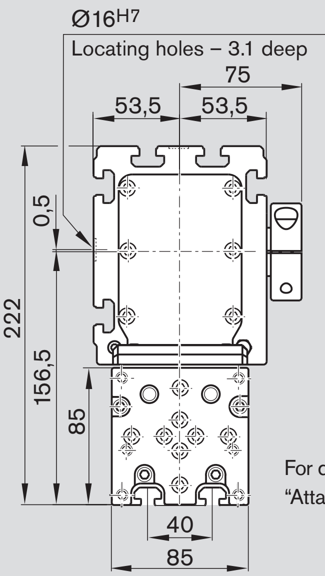
MA01

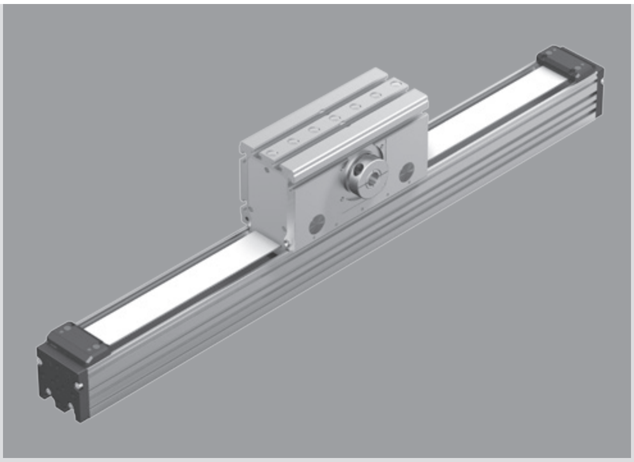


1)Cylinder screw ISO 4762

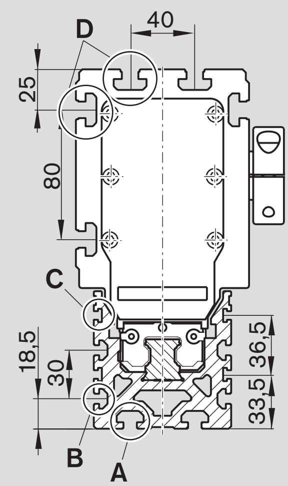
MG01, MG02, MG03, MG04

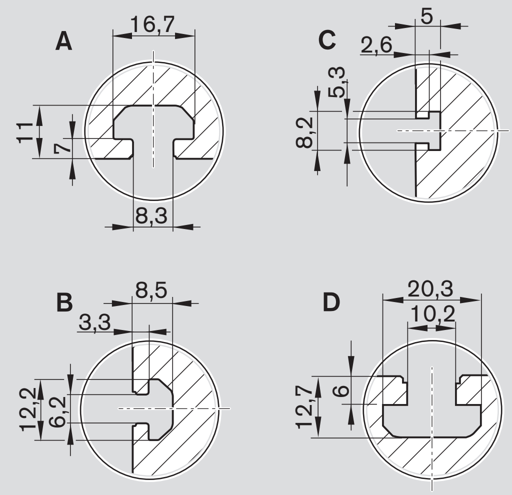




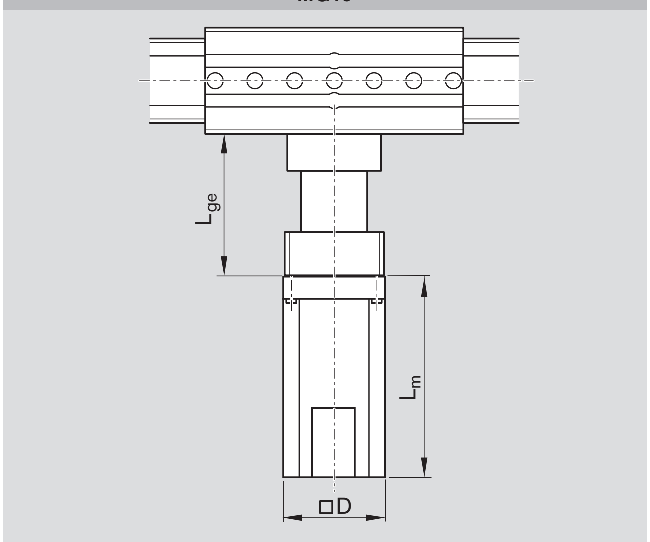


For dimensions of end plate, see section “Attachment of additional devices”





MG10



Motor[1)]	Dimensions (mm)					
	Gear unit			Motor		
	MG 01/02/03/04		MG 10	D	L_m	
	L_{ge}	C	L_{ge}		without brake	with brake
MSK 050C	192.5	124.5	142	98	203.0	233.0
MSM 041B	187.5	124.5	142	80	112.0	149.0

1) For the connector position of the motor, observe section “Delivery form”

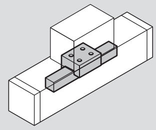
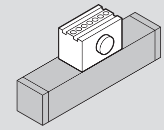
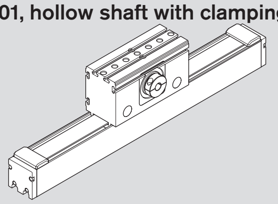
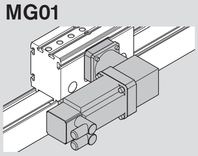
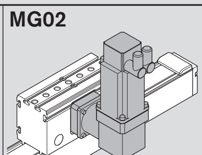
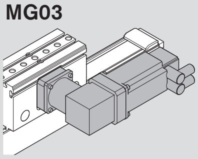
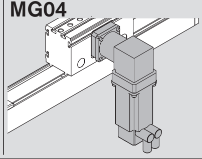
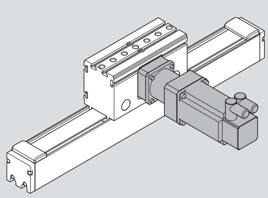
L = length
C = gear height
L_{ge} = gear length
D = motor width
L_m = motor length

L_{ca} = carriage length (mm)
L_{ad} = additional length (mm) (for the value, see the table in the section “General technical data”)
s_{max} = maximum travel distance (mm)
s_{eff} = effective travel distance (mm)
s_e = excess travel (mm)

Configuration and ordering

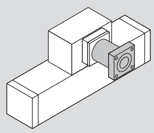
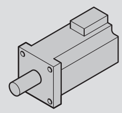
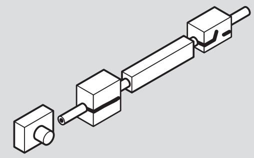
OBB-120

Configuration and ordering

Short product name, length OBB-120-NN-1, ... mm		Guideway	Drive		Carriage	
			Reduction		 L_{ca} = 330 mm	
Version[2)]			i = 1	i = 9	without (Clamping element)	with (Clamping element)
with drive (MA), without gear i = 1	MA01, hollow shaft with clamping hub 	01	01	–	01	02
with gear (MG), angular planetary gearbox WPG	MG01  MG02  MG03  MG04 	01	–	10	01	02
with gear (MG), planetary gearbox PG	MG10 	01	–	10	01	02

Ordering example: see "Inquiry/order"

Note:
When a shock absorber is used, the maximum travel distance is reduced due to the construction (s_{max}). For the calculation, the maximum travel distance must therefore be reduced by the value s_{red} per side or per shock absorber, see section "Accessories".

Motor attachment				Motor		Switching system[4)]	Documentation
							
Speed reduction i =	Attachment kit[3)] with gear MG01 MG03	Attachment kit[3)] with gear MG02 MG04	for motor	without brake	with brake		standard report
–	00		–	00		see below	01
i = 9	31	32	MSK 076C	92	93		
i = 9	30		MSK 076C	92	93		

Switching system[4)]	
Without switch and without cable duct	00
Carriage moves	
Switch:	
– PNP NC	71
– PNP NO	73
– Mechanical	75
Cable duct[1)]	20
Socket-plug	17
Switching angle	36
Frame moves	
Switch:	
– PNP NC	61
– PNP NO	63
– Mechanical	65
Socket-plug	17
Two control strips	43

1) The delivery length of the cable duct corresponds to the length of the profiled support. For a different length, please order the cable duct as a single item (ordering "Switches and attachments" page 44)
2) When the servo motor is mounted, the delivery is only made in accordance with the motor assembly shown in the "Delivery form" section (note the position of the motor connectors)!
3) Attachment kit can also be delivered without motor. When ordering, enter the motor type "00"!
4) The switches are selected according to the installation situation (carriage / frame moves)! See section "Switch mounting".

Length L (mm):

$$L = s_{max} + L_{ca} + L_{ad}$$

$$s_{max} = s_{eff} + 2 \cdot s_e$$

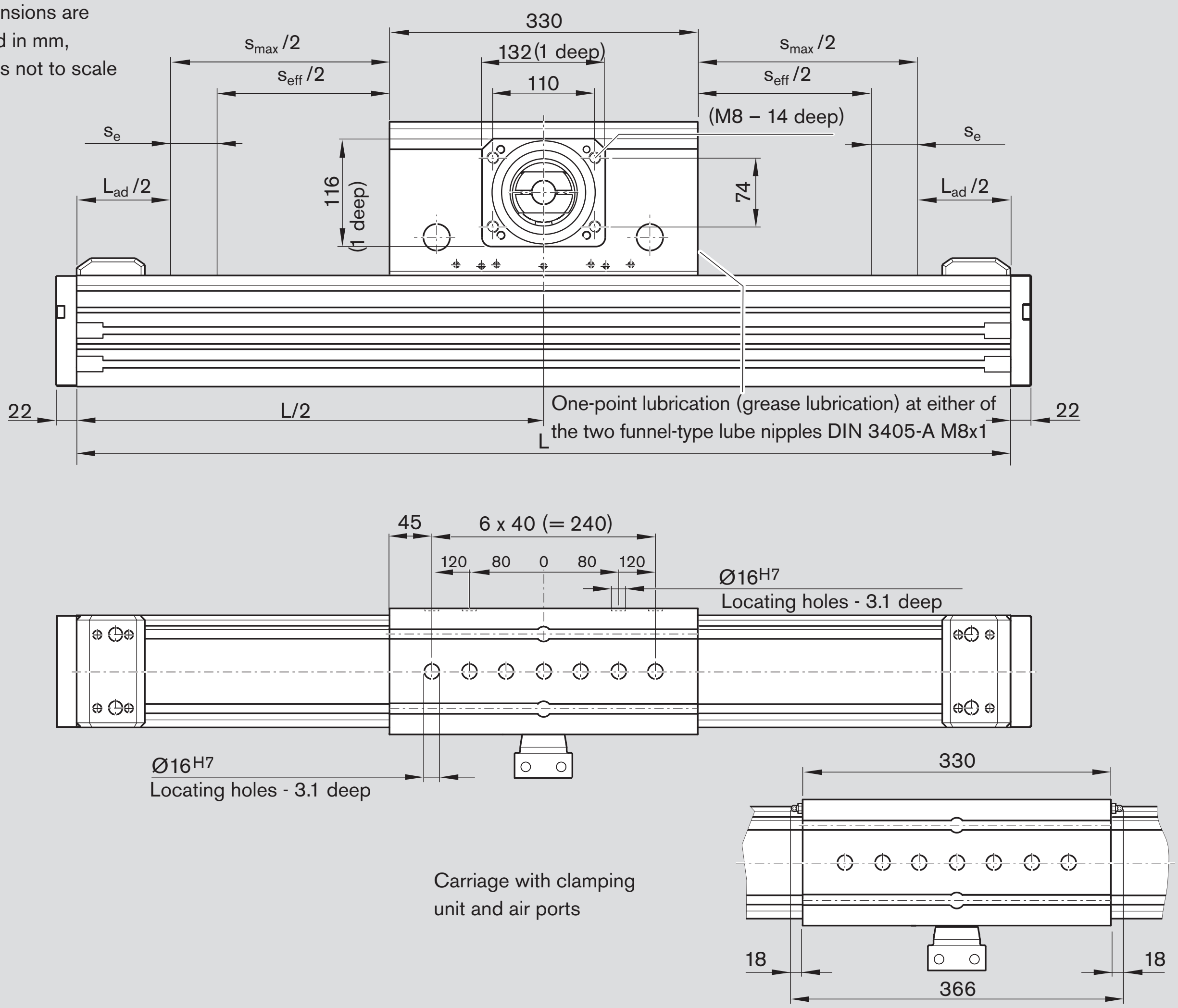
L_{ca} = Carriage length (mm)
L_{ad} = additional length (mm) (for the value, see the table in the section "General technical data")
s_{max} = maximum travel distance (mm)
s_{eff} = effective travel distance (mm)
s_e = excess travel (mm)

Configuration and ordering

OBB-120

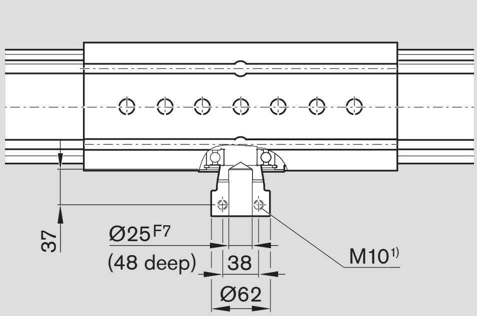
Dimensions

All dimensions are provided in mm, drawings not to scale



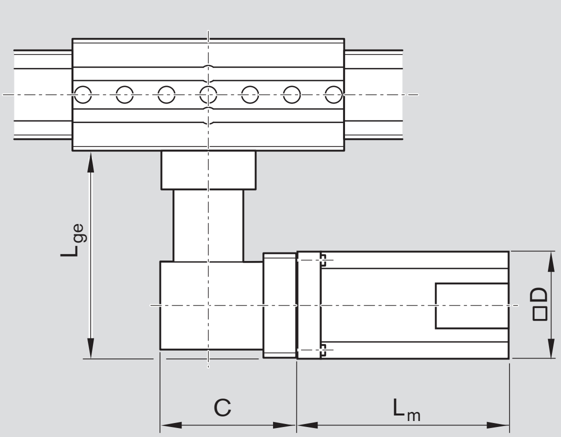
Carriage with clamping unit and air ports

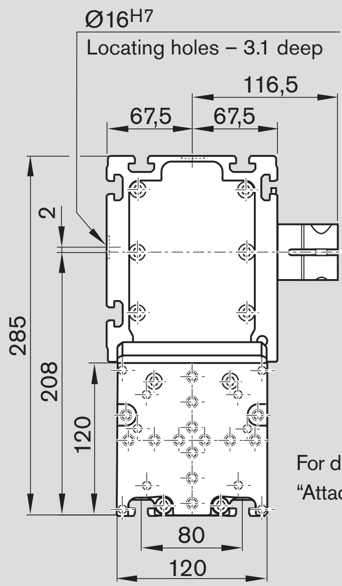
MA01



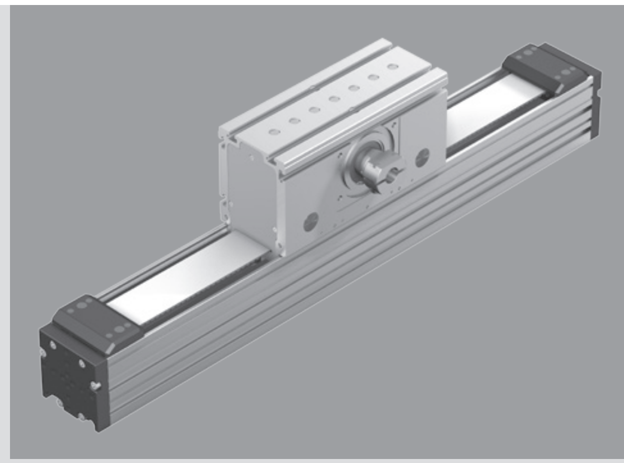
1)Cylinder screw ISO 4762

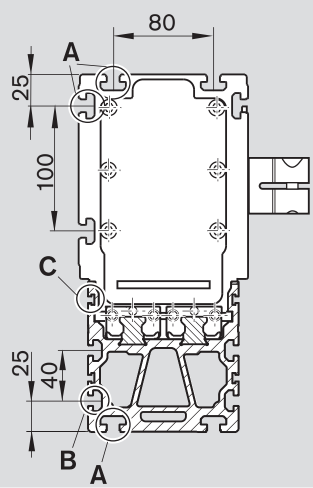
MG01, MG02, MG03, MG04

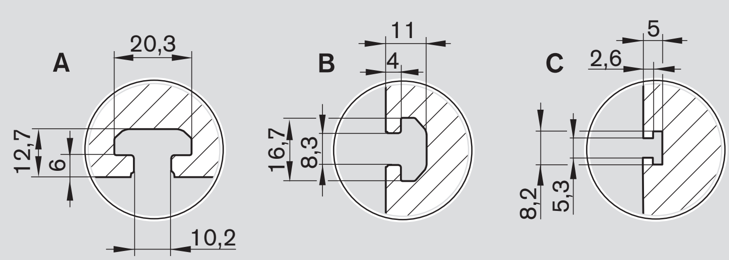


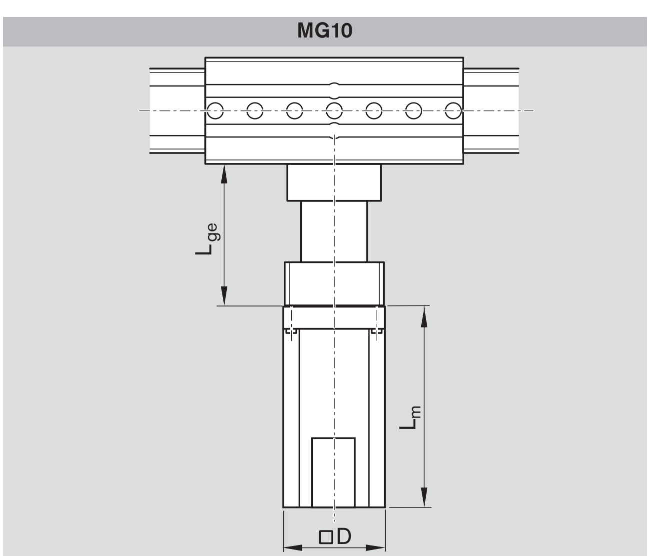


For dimensions of end plate, see section "Attachment of additional devices"









Motor[1)]	Dimensions (mm)					
	Gear unit			Motor		
	MG 01/02/03/04		MG 10	D	L_m	
	L_{ge}	C	L_{ge}		without brake	with brake
MSK 076C	287.5	155.5	212	140	292.5	292.5

1) For the connector position of the motor, observe section "Delivery form"

L = length
C = gear height
L_{ge} = gear length
D = motor width
L_m = motor length

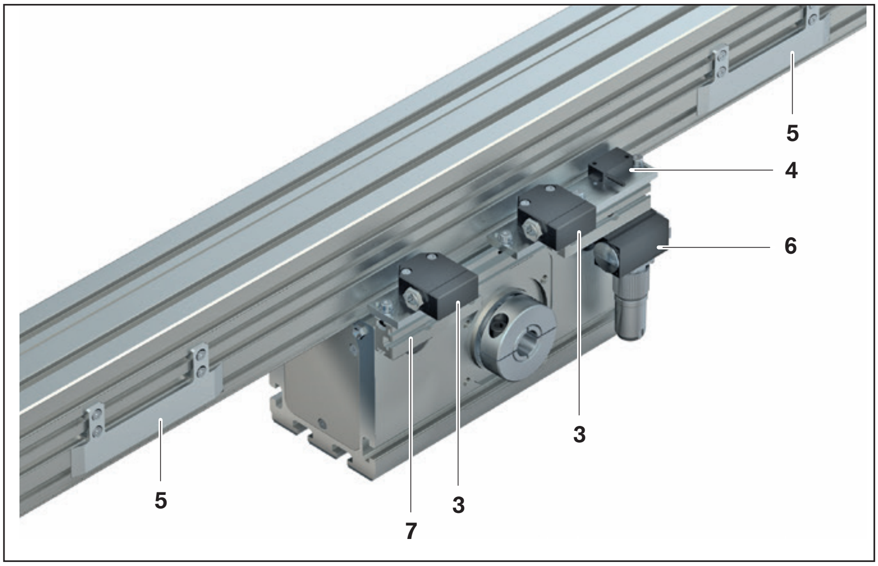
L_{ca} = carriage length (mm)
L_{ad} = additional length (mm) (for the value, see the table in the section "General technical data")
s_{max} = maximum travel distance (mm)
s_{eff} = effective travel distance (mm)
s_e = excess travel (mm)

Attachments and accessories

Switch mounting – frame moves (carriage fixed)

Switching principle

- Proximity or mechanical switches on the carriage (TT)
- Switch activation via control strip on the frame (HK)



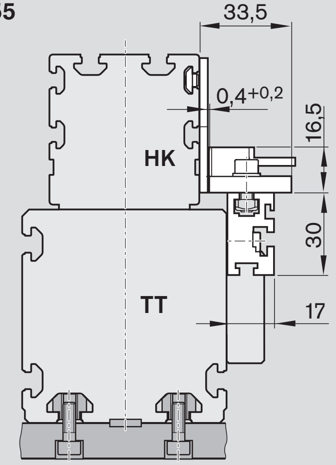
Overview of switching system

3 Mechanical switches (with attachments)
4 Proximity switch (with attachments)
5 Control strip on the frame
6 Socket and plug
7 Switch mounting profile

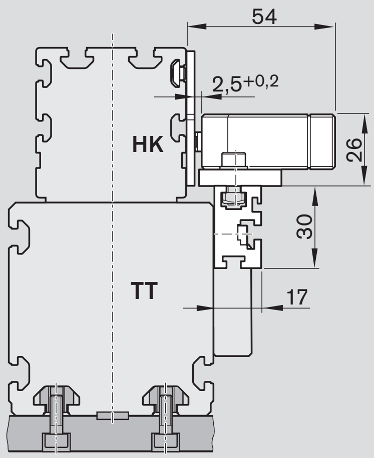
Pos.	Description	OBB-055 Material number included in (option[1])		OBB-085 Material number included in (option[1])		OBB-120 Material number included in (option[1])	
3	Mechanical switch with attachments	R1175 001 62	(65)	R1175 001 62	(65)	R1175 001 62	(65)
	Mechanical switch	R3453 040 16	(65)	R3453 040 16	(65)	R3453 040 16	(65)
4	Proximity switch, PNP NC	R3453 040 01	(61)	R3453 040 01	(61)	R3453 040 01	(61)
	Proximity switch, PNP NO	R3453 040 03	(63)	R3453 040 03	(63)	R3453 040 03	(63)
	Attachments for proximity switch	R1175 001 63	(61), (63)	R1175 001 63	(61), (63)	R1175 001 63	(61), (63)
5	2 control strips with attachments	R1175 001 59	(39)	R1175 001 60	(41)	R1175 001 61	(42)
6	Socket + plug	R1175 001 53	(17)	R117 5001 53	(17)	R1175 001 53	(17)
7	Switch mounting profile with attachments	R1175 001 64	(39)	R1175 001 64	(41)	R1175 001 64	(42)

1) For options, see “Configuration and ordering”

OBB-055

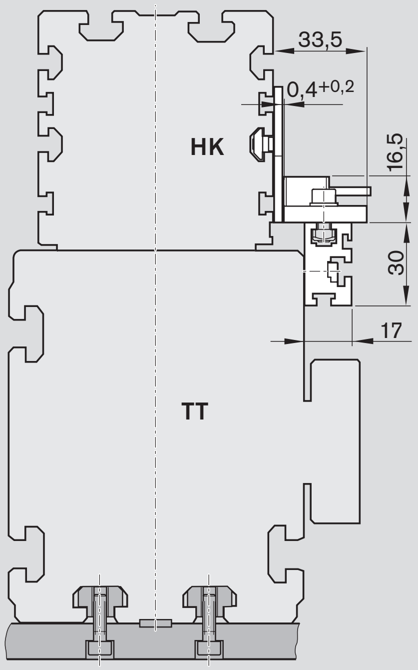


Proximity switches with attachments

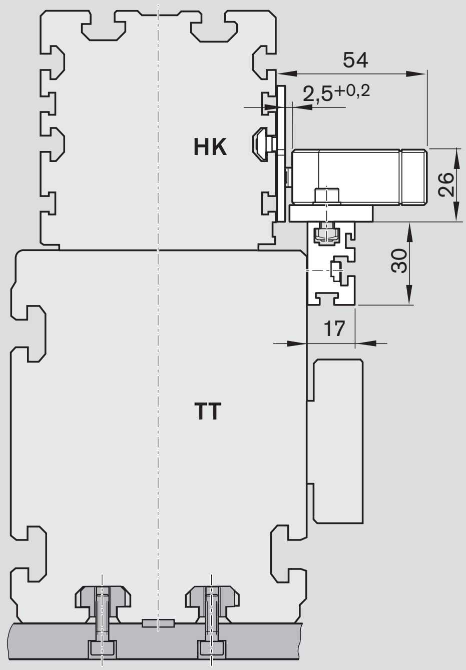


Mechanical switches with attachments

OBB-085

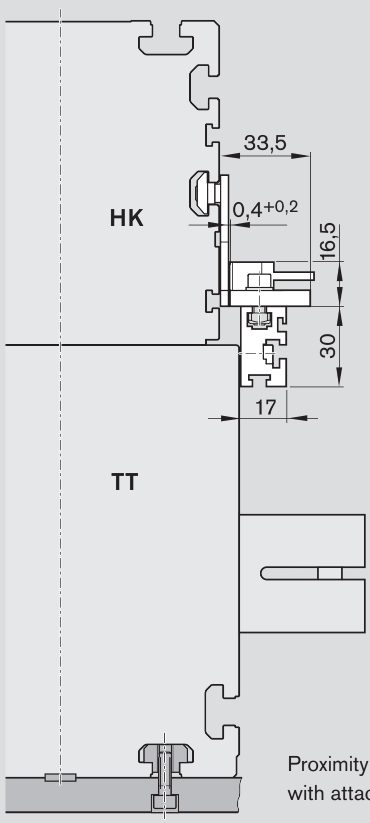


Proximity switches with attachments

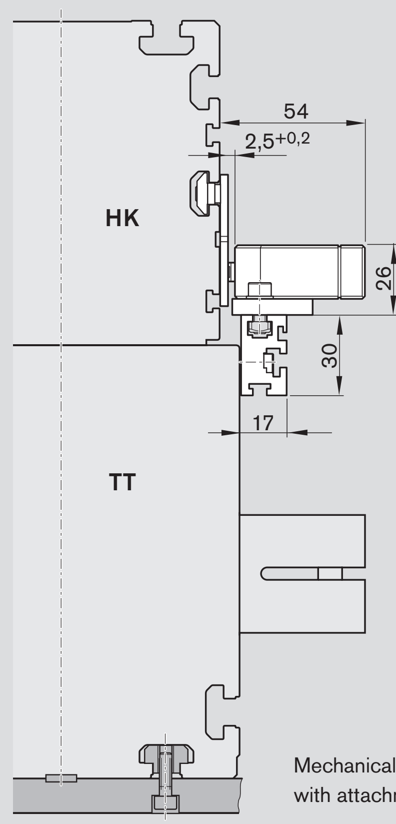


Mechanical switches with attachments

OBB-120



Proximity switches with attachments



Mechanical switches with attachments

Attachments and accessories

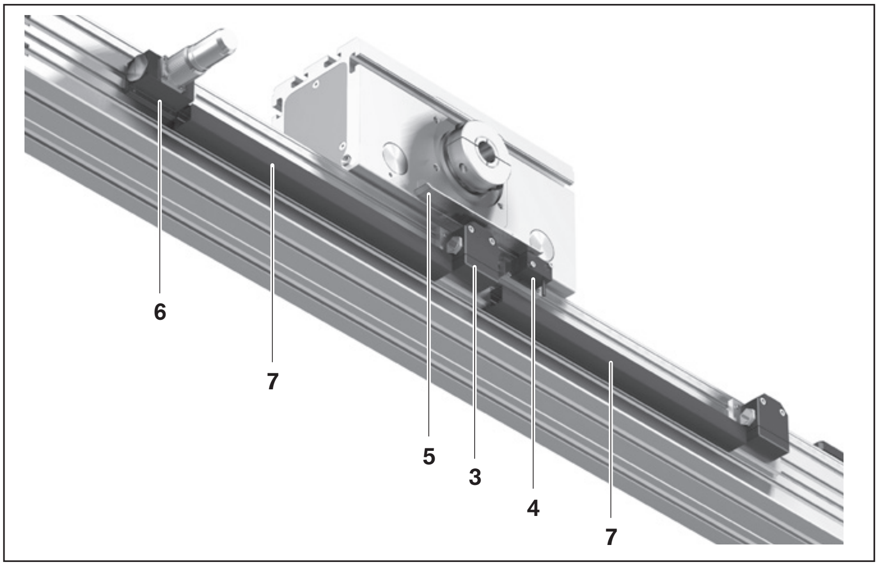
Switch mounting – carriage moves (frame fixed)

Switching principle

- Proximity or mechanical switches on the frame (HK)
- Switch activation via switching angle on the carriage (TT)

Overview of switching system

3 Mechanical switch (with attachments)
4 Proximity switch (with attachments)
5 Switching angle
6 Socket and plug
7 Cable duct

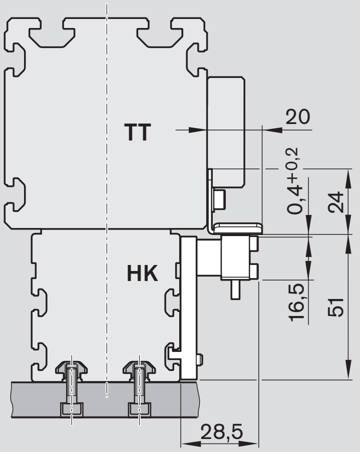


Pos.	Description	OBB-055 Material number included in (option[1])		OBB-085 Material number included in (option[1])		OBB-120 Material number included in (option[1])	
3	Mechanical switch with attachments	R1175 001 51	(75)	R1175 001 51	(75)	R1175 001 51	(75)
	Mechanical switch without attachments	R3453 040 16	(75)	R3453 040 16	(75)	R3453 040 16	(75)
4	Proximity switch, PNP NC	R3453 040 01	(61)	R3453 040 01	(61)	R3453 040 01	(61)
	Proximity switch, PNP NO	R3453 040 03	(63)	R3453 040 03	(63)	R3453 040 03	(63)
	Attachments for proximity switch	R1175 001 57	(71), (73)	R1175 001 58	(71), (73)	R1175 001 58	(71), (73)
5	Switching angle with attachments	R1175 001 56	(36)	R1175 001 56	(36)	R1175 001 56	(36)
6	Socket + plug	R1175 001 53	(7)	R1175 001 53	(17)	R1175 001 53	(17)
7	Cable duct, L_K =	R0396 620 17 [2]	(20)	R0396 620 17 [2]	(20)	R0396 620 17 [2]	(20)

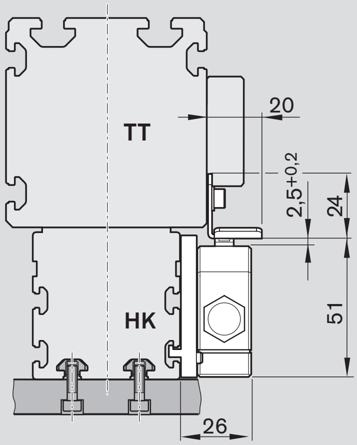
1) For options, see “Configuration and ordering”
2) A length must always be specified when ordering cable ducts.
For example “R0396 620 17, 285 mm”.

L_K = length of the cable duct (mm)

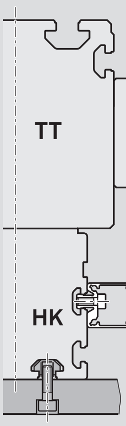
OBB-055



Proximity switches with attachments

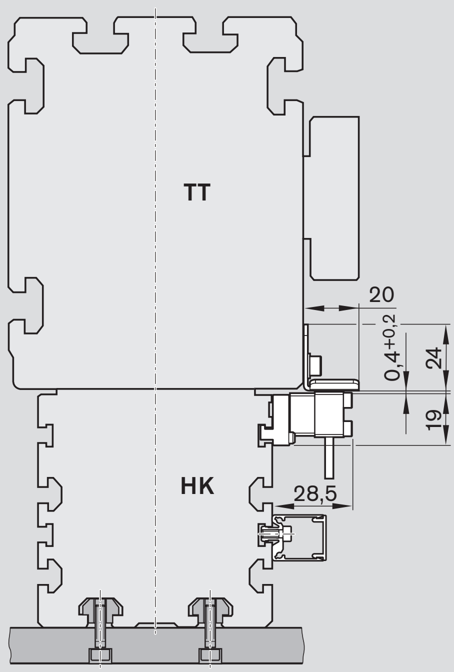


Mechanical switches with attachments

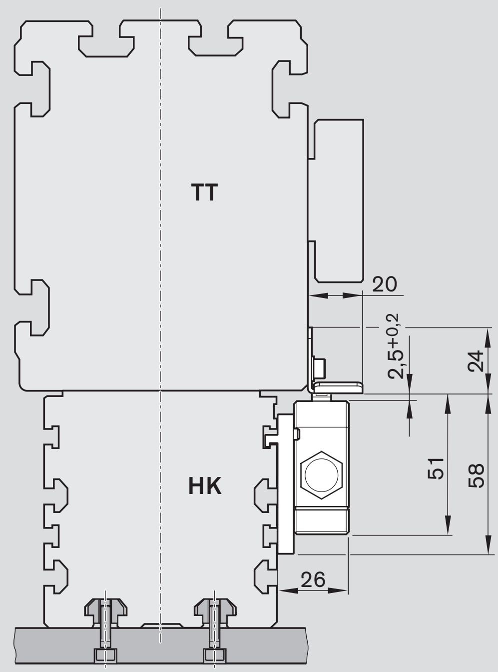


Cable duct

OBB-085

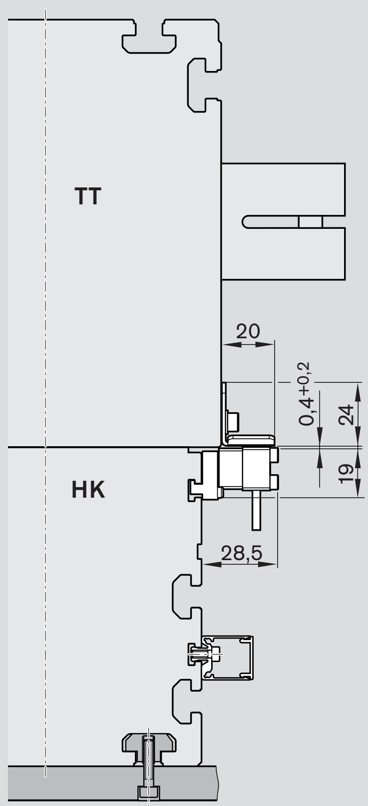


Proximity switches with attachments / cable duct

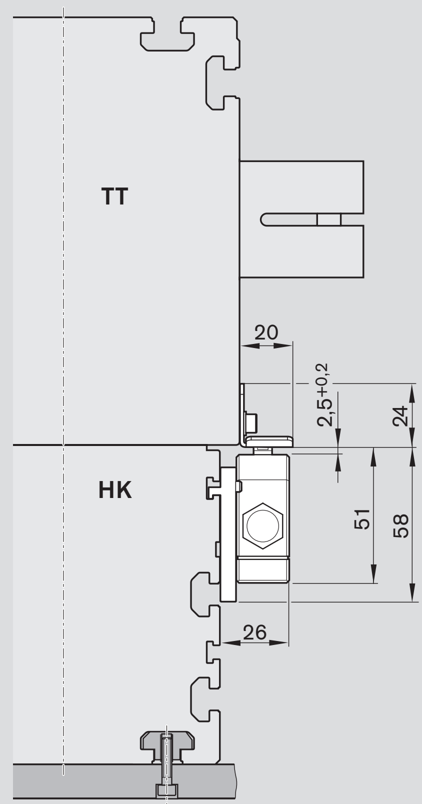


Mechanical switches with attachments

OBB-120



Proximity switches with attachments / cable duct



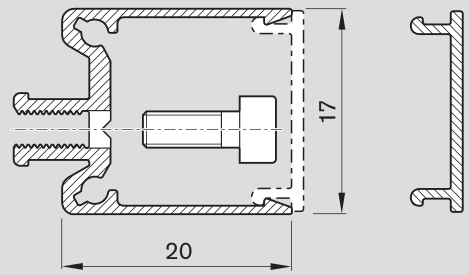
Mechanical switches with attachments

Attachments and accessories

Cable duct

- The cable duct is fastened in the T-slots on the side of the frame. Fastening screws widen the profile and give the cable duct a secure hold.

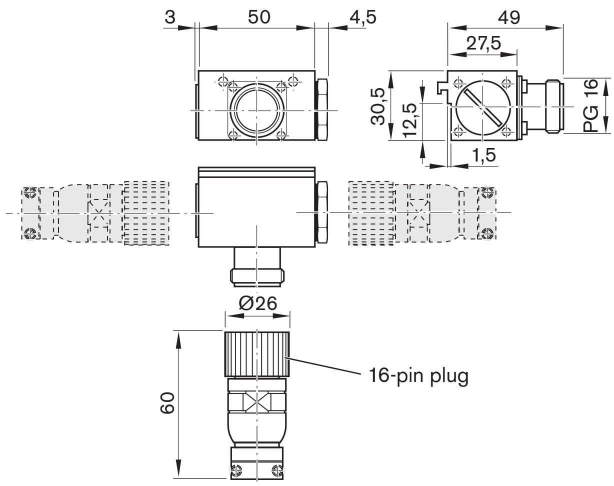
For the slot position, see "Configuration and ordering" tables and "Dimension drawings".
The cable duct will accommodate up to two cables for mechanical switches and three cables for proximity switches.
Fastening screws and cable grommets are included.

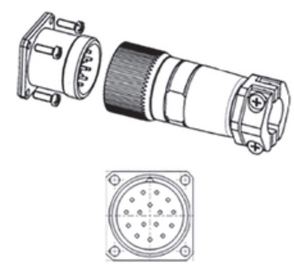


Socket and plug

Attach the socket at the end with the sensors or switches. The socket and plug are not pre-wired. Since the mounting arrangements allow shifting of the switches, the switch activation points can be optimized during commissioning. The plug can be mounted in three directions.

R117500153



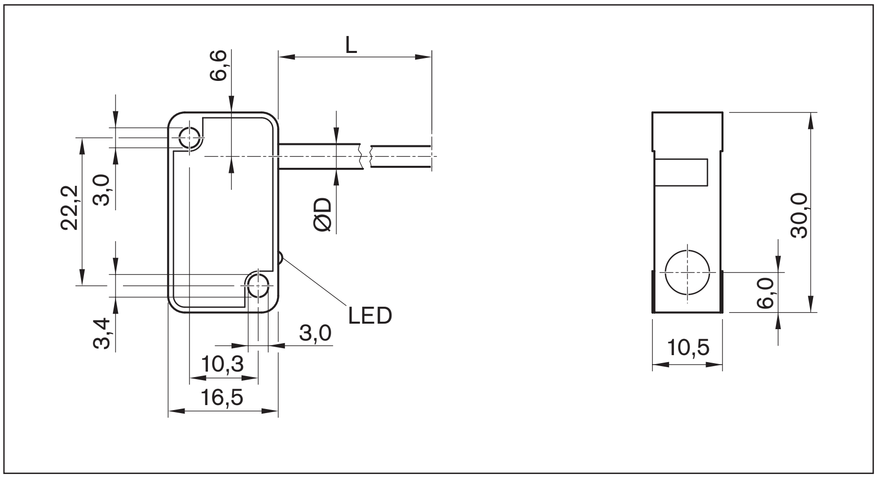


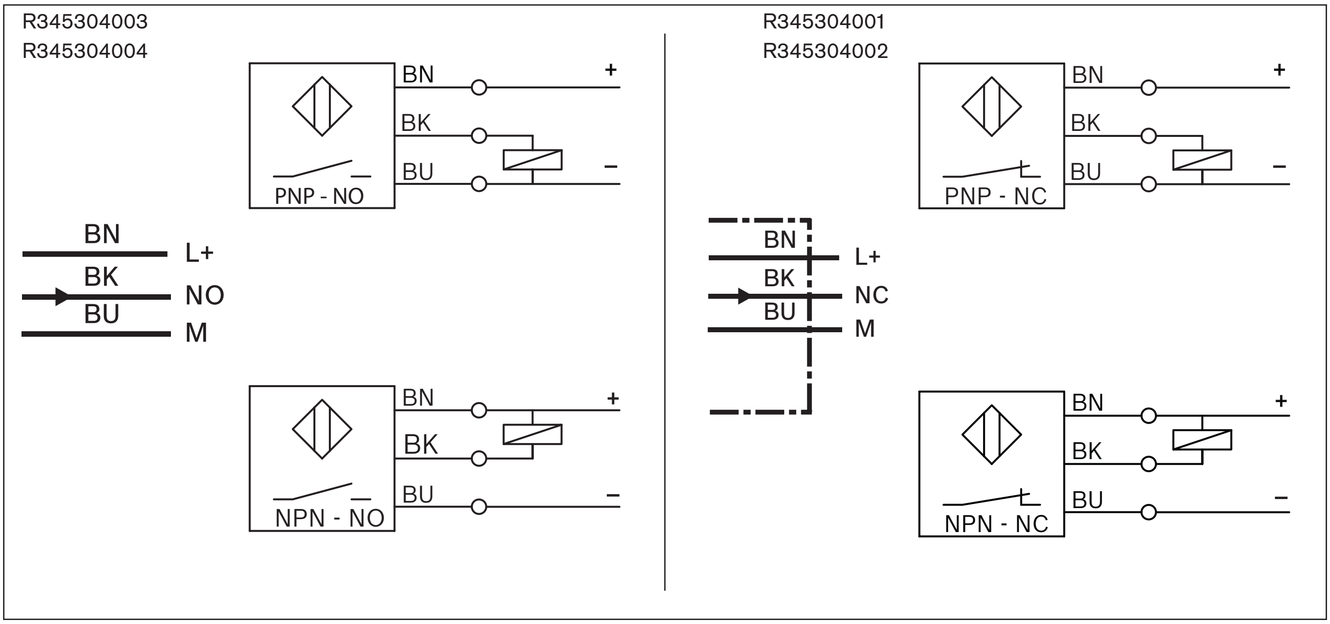
Use	Socket and plug
Material number	R117500153
Designation	for OBB-055, -085, -120
Version	angled, for suspension in the lateral slot of the OBB
Operating current per contact	max. 8 A
Operating voltage	150 V AC/DC
1. Connection type	Straight socket, 16-pin, soldered connection
2. Connection type	Coupling / flange socket, 16-pin, soldered connection
Cable bushing, housing	1 seal with hole 2x5.5 mm, 1x3.5 mm 1 adaptable seal, max. 14 mm diameter incl. cap and blind plug
Cable bushing, plug	Bolting with strain relief
Connection cross-section	0.14 … 1 mm
Cable diameter	10 … 14 mm
Ambient temperature	-20 °C to +125 °C
Protection class	–
Certifications and approvals	–

Attachments and accessories

Sensors

Proximity sensor with free line end





Material numbers / technical data

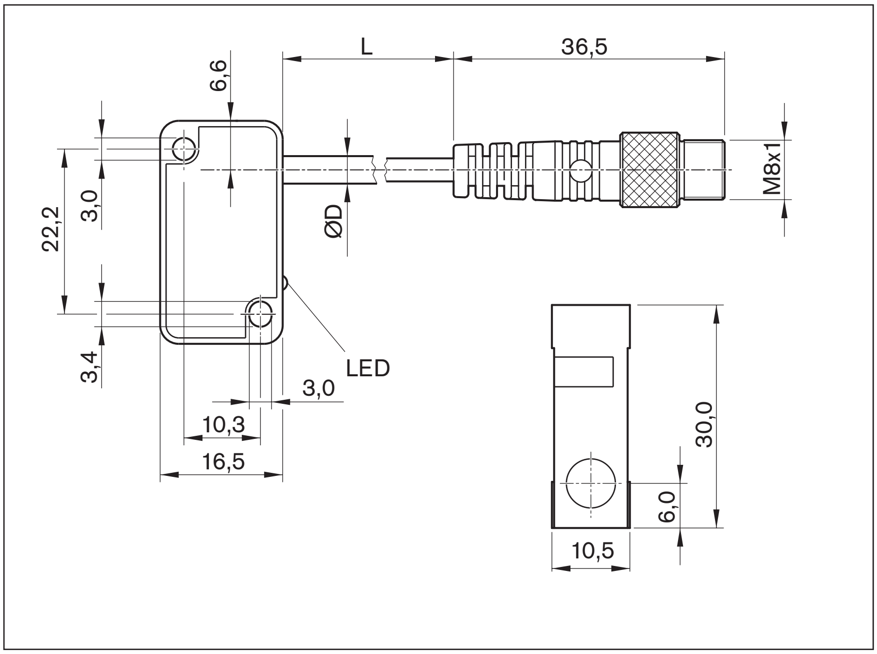
Use	Limit switch	Reference switch	Limit switch	Reference switch
Material number	R345304001	R345304003	R345304002	R345304004
Designation	BES 517-351-NO-C-03	BES 517-398-NO-C-03	BES 517-352-NO-C-03	BES 517-399-NO-C-03
Functional principle	proximity			
Operating voltage	10 - 30 V DC			
Load current	≤ 200 mA			
Switching function	PNP/normally closed (NC)	PNP/normally open (NO)	NPN/normally closed (NC)	NPN/normally open (NO)
Connection type	Line 3 m, 3-pin, free line end			
Function indication	✓			
Short-circuit protection	✓			
Reverse polarity protection	✓			
Switching frequency	2.5 kHz			
Max. perm. approach speed	depending on the switch flag length			
Suitable for drag chains[1]	–			
Can withstand torsion[1]	–			
Weld spark resistant[1]	–			
Cable cross-section[1]	3x0.14 mm^2			
Cable diameter D[1]	$3.5^{\pm 0.13}$ mm			
Bending radius, static[1]	12 mm			
Bending radius, dynamic[1]	12 mm			
Bending cycles[1]	–			
Ambient temperature	-40 °C to +70 °C			
Protection class	IP65			
MTTFd (acc. to EN ISO 13849-1)	MTTFd = 830 years		MTTFd = 585 years	
Certifications and approvals[2]	CE, cULus LISTED, RoHS			

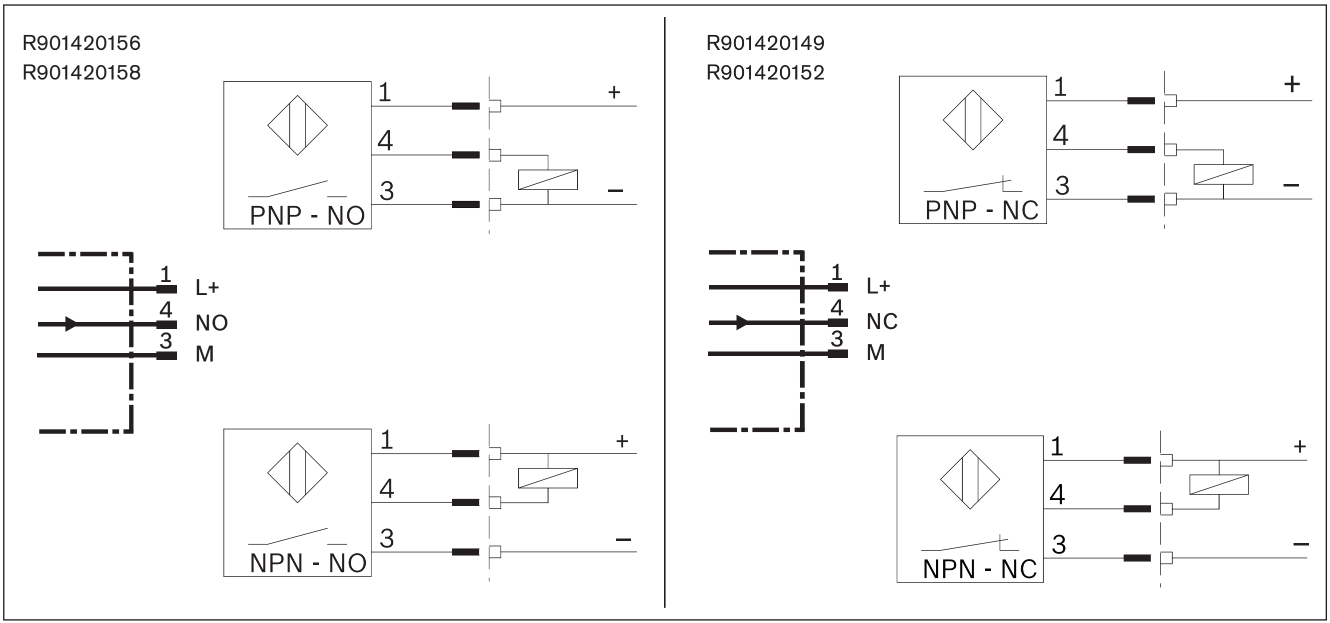
1) Technical data only for the cast-on connection line at the proximity sensor.
Even more performance, e.g. extension cables are offered for use in a power cable chain (see the following pages).

2) For these products no CCC certificate is necessary for introduction into the Chinese market.

Sensors

Proximity sensor with M8x1 plug





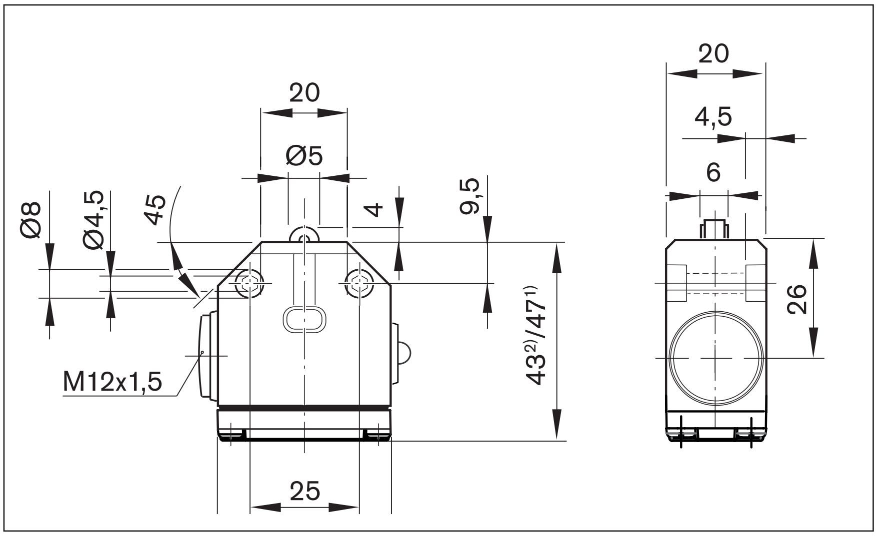
Material numbers / technical data

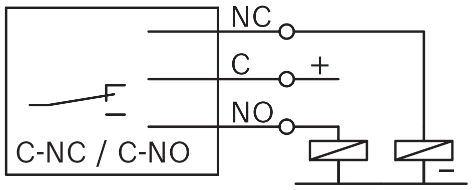
Use	Limit switch	Reference switch	Limit switch	Reference switch
Material number	R901420149	R901420156	R901420152	R901420158
Designation	BES 517-351-NO-C-S49-00.2	BES 517-398-NO-C-S49-00.2	BES 517-352-NO-C-S49-00.2	BES 517-399-NO-C-S49-00.2
Functional principle	proximity			
Operating voltage	10 - 30 V DC			
Load current	≤ 200 mA			
Switching function	PNP/normally closed (NC)	PNP/normally open (NO)	NPN/normally closed (NC)	NPN/normally open (NO)
Connection type	Cable 0.2 m and plug M8 x 1, 3-pin with knurled screw			
Function indication	✓			
Short-circuit protection	✓			
Reverse polarity protection	✓			
Switching frequency	2.5 kHz			
Max. permissible approach speed	depending on the switch flag length			
Suitable for drag chains[1]	–			
Can withstand torsion[1]	–			
Weld spark resistant[1]	–			
Cable cross-section[1]	3x0.14 mm^2			
Cable diameter D[1]	3.5 $^{\pm 0.15}$ mm			
Bending radius, static[1]	12 mm			
Bending radius, dynamic[1]	12 mm			
Bending cycles[1]	–			
Ambient temperature	-40 °C to +70 °C			
Protection class	IP65			
MTTFd (acc. to EN ISO 13849-1)	MTTFd = 830 years		MTTFd = 585 years	
Certifications and approvals[2]	CE cULus LISTED RoHS			

1) Technical data only for the cast-on connection line at the proximity sensor.
Even more performance, e.g. extension cables are offered for use in a power cable chain (see the following pages).
2) For these products no CCC certificate is necessary for introduction into the Chinese market.

Switches

Mechanical switch



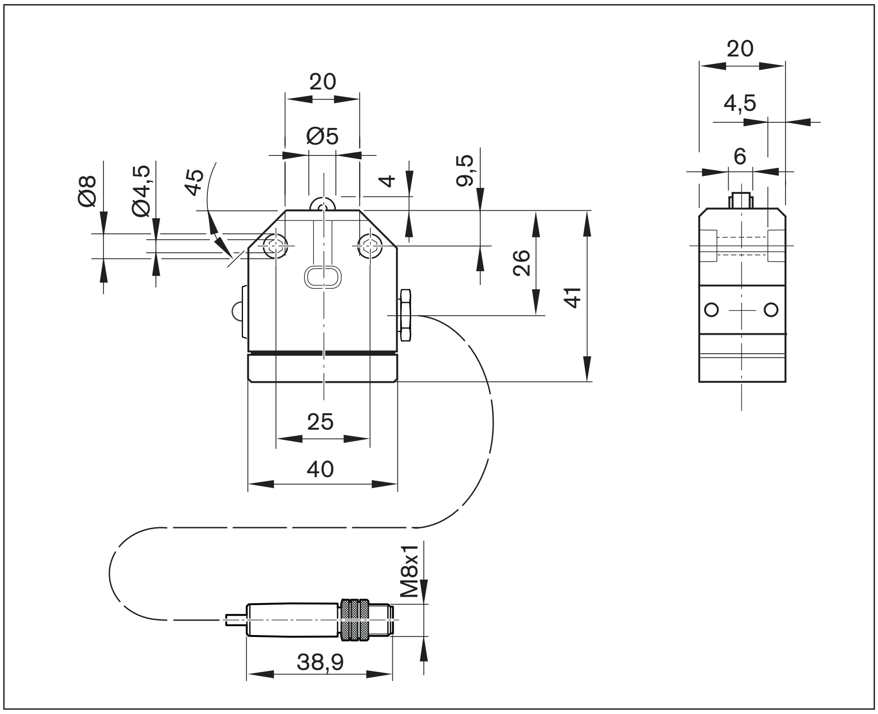


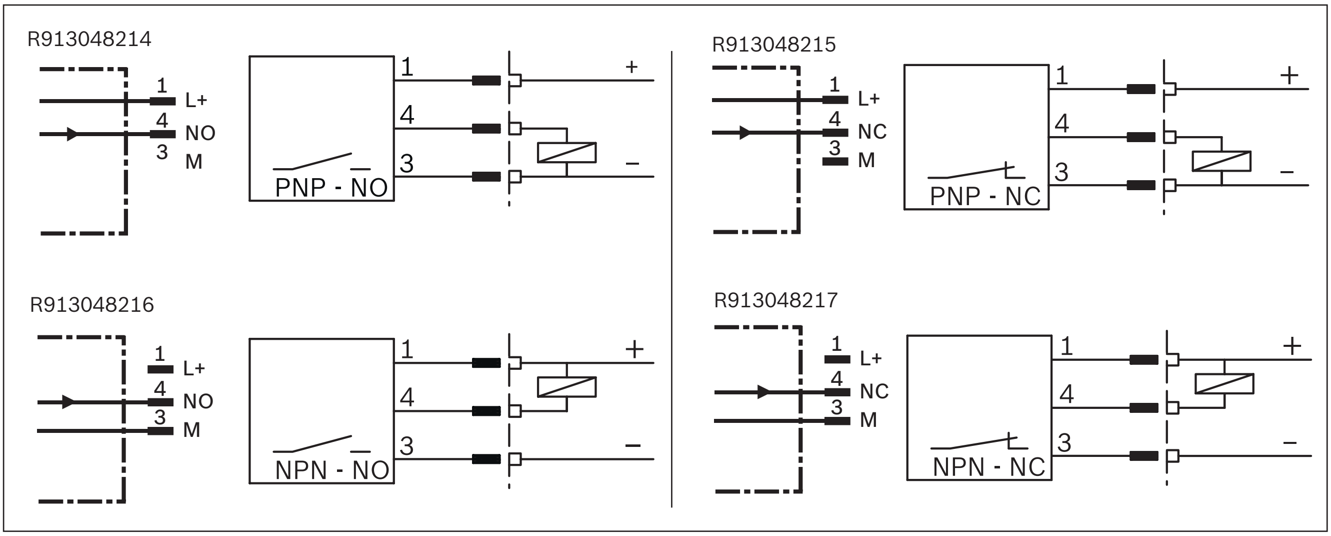
Material numbers / technical data		
Use	Limit switch	
Material number	R345304016[1]	R347600305[2]
Designation	BNS 819-X496-99-R-11	BNS 819-X510-99-R-10
Functional principle	Mechanical, roller	
Operating voltage	250 V AC	
Load current	≤ 5 A	
Switching function	Single-pole changeover/ (NC: C+NC, NO: C+NO)	
Connection type	Screw connection, without line	
Function indication	–	
Switching frequency	3.3 Hz	
Max. permissible approach speed	1 m/s	
Ambient temperature	-5 °C to +85 °C	
Protection class	IP67	
B10d value	$5x10^6$ (wet area); $10x10^6$ (dependent on current load (dry area))	
Certifications and approvals, housing	CE, CCC, RoHS	
Certifications and approvals, switching element	CE, CCC, CSA, RoHS	

Attachments and accessories

Switches

Mechanical sensor with M8x1 plug





Material numbers / technical data

Use	Limit switch	Reference switch	Limit switch	Reference switch
Material number	R913048215	R913048214	R913048217	R913048216
Designation	BNS 819-X1002-99-R-10	BNS 819-X1001-99-R-10	BNS 819-X1004-99-R-10	BNS 819-X1003-99-R-10
Functional principle	Mechanical, roller			
Operating voltage	10 - 30 VDC			
Load current	≤ 200 mA			
Switching function	PNP/normally closed (NC)	PNP/normally open (NO)	NPN/normally closed (NC)	NPN/normally open (NO)
Connection type	Cable 0.2 m and plug M8 x 1, 3-pin with knurled screw			
Function indication	–			
Short-circuit protection	–			
Reverse polarity protection	–			
Switching frequency	3.3 Hz			
Max. perm. approach speed	1 m/s			
Suitable for drag chains[1)]	–			
Can withstand torsion[1)]	–			
Weld spark resistant[1)]	–			
Cable cross-section[1)]	3x0.14 mm^2			
Cable diameter D[1)]	4.3 $^{\pm 0.2}$ mm			
Bending radius, static[1)]	12 mm			
Bending radius, dynamic[1)]	12 mm			
Bending cycles[1)]	–			
Ambient temperature	–5 °C to +70 °C			
Protection class	IP65			
B10d value	5x10^6 (wet area); 10x10^6 dependent on current load (dry area)			
Certifications and approvals[2)]	CE SP RoHS			

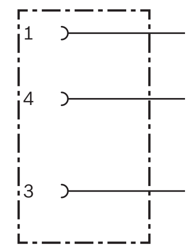
1) Technical data only for the cast-on connection line at the mechanical switch.
Even more performance, e.g. extension cables are offered for use in a power cable chain (see the following pages).
2) For these products no CCC certificate is necessary for introduction into the Chinese market.

Extension pieces

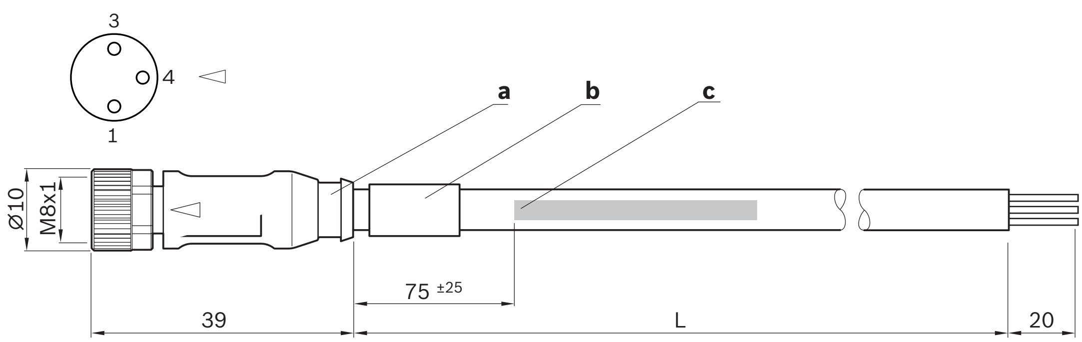
Assembled single-sided

Connection scheme

1 brown (BN) (+)
3 blue (BU) (–)
4 black (BK) (signal)



Drawing



Material numbers

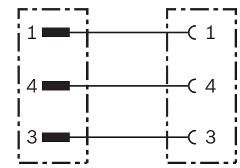
Use	Extension cable		
Material number	R911344602	R911344619	R911344620
Designation	7000-08041-6500500	7000-08041-6501000	7000-08041-6501500
Length (L)	5.0 m	10.0 m	15.0 m
1. Connection type	Straight socket, M8 x 1, 3-pin		
2. Connection type	free line end		

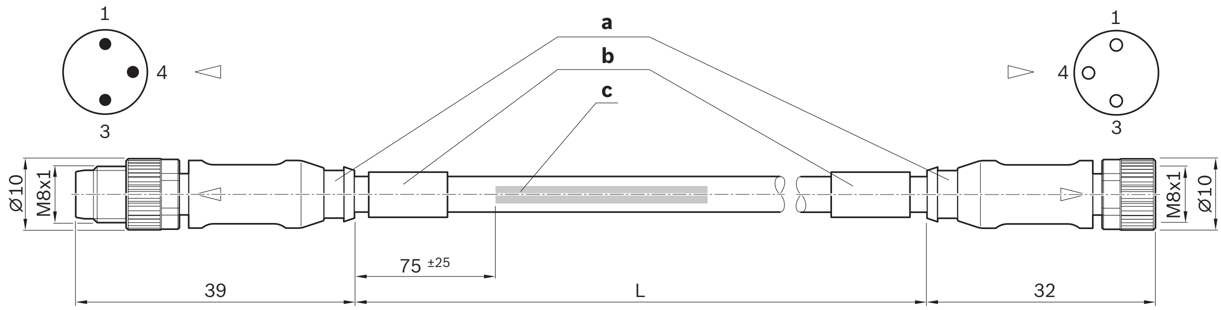
Assembled double-sided

Drawing

Connection scheme

1 brown (BN) (+)
3 blue (BU) (–)
4 black (BK) (signal)





Material numbers

Use	Extension cable			
Material number	R911344621	R911344622	R911344623	R911344624
Designation	7000-88001-6500050	7000-88001-6500100	7000-88001-6500200	7000-88001-6500500
Length (L)	0.5 m	1.0 m	2.0 m	5.0
1. Connection type	Straight socket, M8x1, 3-pin			
2. Connection type	Straight socket, M8x1, 3-pin			

Technical data for single and double-sided pre-assembled extensions

Function indication	–
Operating voltage indicator	–
Operating voltage	10 - 30 V DC
Type of cable	PUR black
Suitable for drag chains	✓
Can withstand torsion	✓
Weld spark resistant	✓
Cable cross-section	3x0.25 mm²
Cable diameter D	4.1 $^{\pm 0.2}$ mm
Bending radius, static	5xD
Bending radius, dynamic	10xD
Bending cycles	> 10 million
Max. perm. travel speed	3.3 m/s - at 5 m travel distance (typ.) to 5 m/s - at 0.9 m travel distance
Max. perm. acceleration	30 m/s²
Ambient temperature, fixed lay	-40 °C to +85 °C
Ambient temperature, flexible lay	-25 °C to +85 °C
Protection class	IP68
Certifications and approvals	CE, c UL us LISTED, C SA US, PCT, RoHS

a) Contour for corrugated tube inner diameter 6.5 mm
b) Cable grommet
c) Cable label in accordance with labeling directive

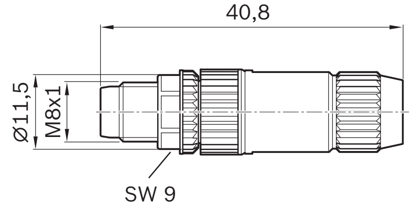
Attachments and accessories

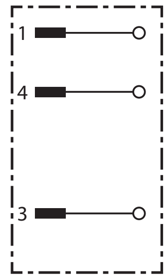
Extension pieces

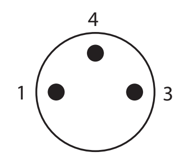
Plug

Drawing | Connection scheme | View Plug side

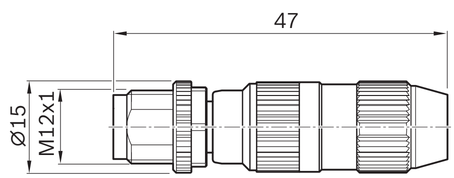
R901388333

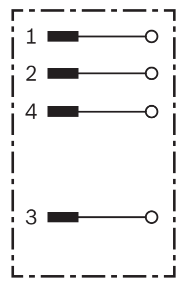


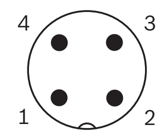




R901388352





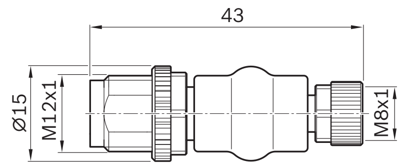


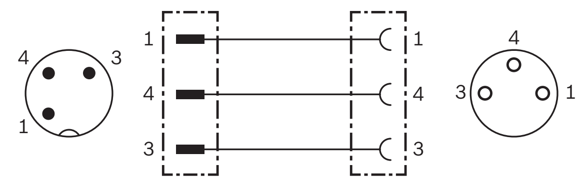
Material numbers / technical data		
Use	Plug, single	
Material number	R901388333	R901388352
Designation	7000-08331-0000000	7000-12491-0000000
Version	straight	
Operating current per contact	max. 4 A	
Operating voltage	max. 32 V AC/DC	
Connection type	Straight socket, M8x1, 3-pin Insulation displacement contact technology, self-locking screw thread	Straight socket, M12x1, 4-pin Insulation displacement contact technology, self-locking screw thread
Function indication	-	
Operating voltage indicator	-	
Connection cross-section	0.14 ... 0.34 mm²	
Ambient temperature	-25 °C to +85 °C	
Protection class	IP67 (plugged in & screwed down)	
Certifications and approvals	c UL us, PC, RoHS	

Adapter

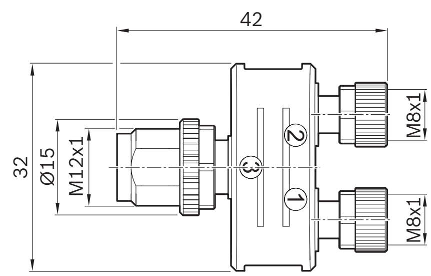
Drawing **Connection scheme**

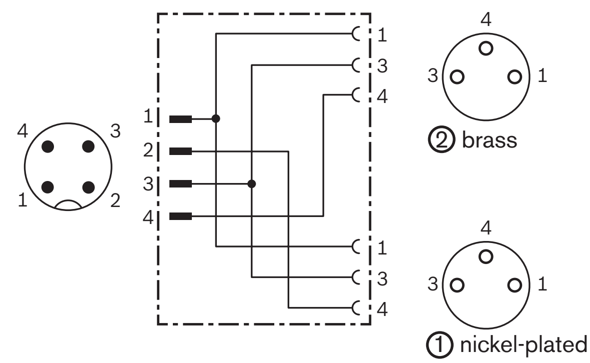
R911344591





R911344592





Material numbers / technical data

Use	Adapter	Adapter or distributor
Material number	R911344591	R911344592
Designation	7000-42201-0000000	7000-41211-0000000
Version	straight for 1 sensor	straight, for 1 - 2 sensors
Operating current per contact	max. 4 A	
Operating voltage	max. 32 V AC/DC	
1. Connection type	Straight socket, M8x1, 3-pin, self-locking screw thread	2 x straight sockets, M8x1, 3-pin, self-locking screw thread
2. Connection type	Straight plug, M12x1, 3-pin, self-locking screw thread	Straight plug, M12x1, 4-pin, self-locking screw thread
Function indication	–	
Operating voltage indicator	–	
Connection cross-section	–	
Ambient temperature	-25 °C to +85 °C	
Protection class	IP67 (plugged in & screwed down)	
Certifications and approvals	RoHS	c UL us LISTED, RoHS

Attachments and accessories

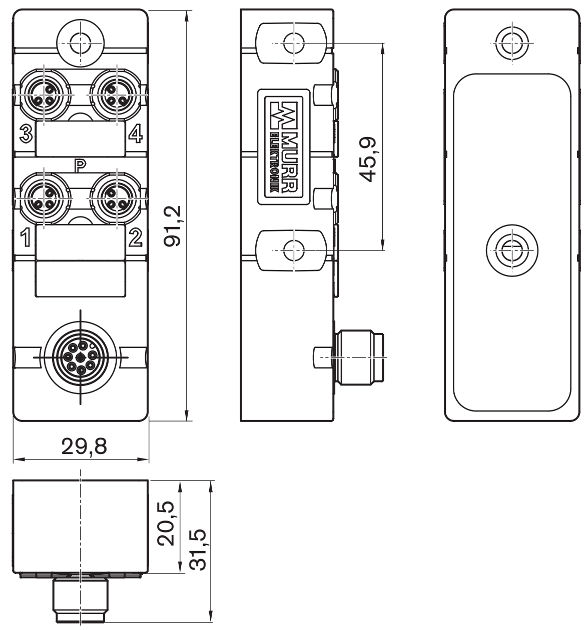
Distributors

Passive distributors

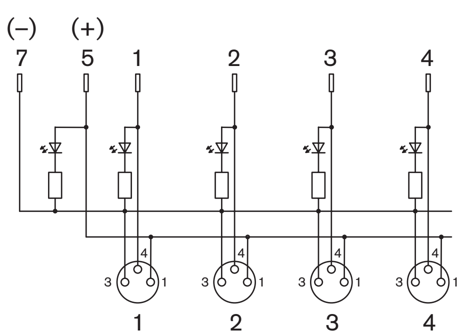
R901425737

R901429917

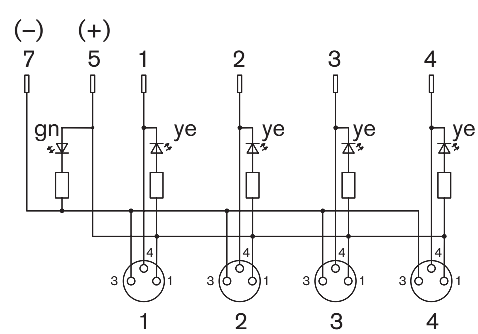
R911344592



R901425737



R901429917



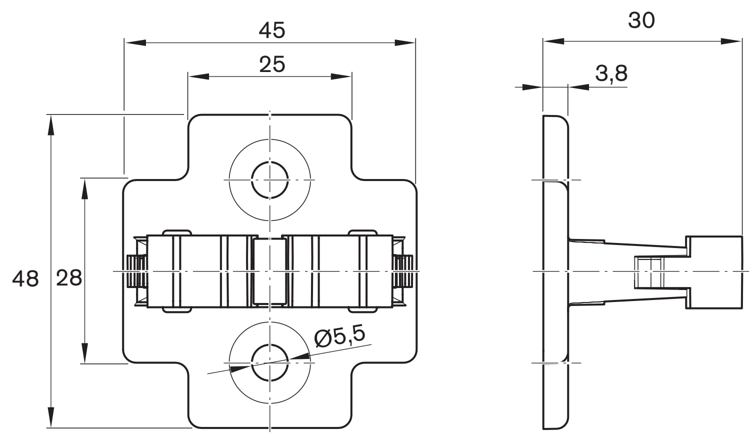
Material numbers / technical data

Use	Passive distributors		
Material number	R901425737	R901429917	R911344592
Designation	8000-84070-0000000	8000-84071-0000000	See the adapter for technical data and drawing
Version	straight, for 1 - 4 sensors		
Operating current per contact	max. 2 A		
Operating voltage	24 V DC		
Switching logic	PNP	NPN	
1. Connection type	4x straight socket, M8x1, 3-pin, self-locking screw thread		
2. Connection type	Straight plug, M12x1, 8-pin, self-locking screw thread		
Function indication	✓		
Operating voltage indicator	✓		
Connection cross-section	-		
Ambient temperature	–20° to +70 °C		
Protection class	IP67 (plugged in and screwed down)		
Certifications and approvals			

Accessories for passive distributors

Holding plate

Screw plug



Material numbers / technical data

Use	For passive distributor R911344592	For passive distributors R901425737/ R901429917
Holding plate	R913047341	–
Designation	7000-99061-0000000	–
Packaging unit	1 pc.	–
Screw plug	–	R913047322
Designation	–	3858627
Packaging unit	–	10 pc.

Extensions for passive distributors

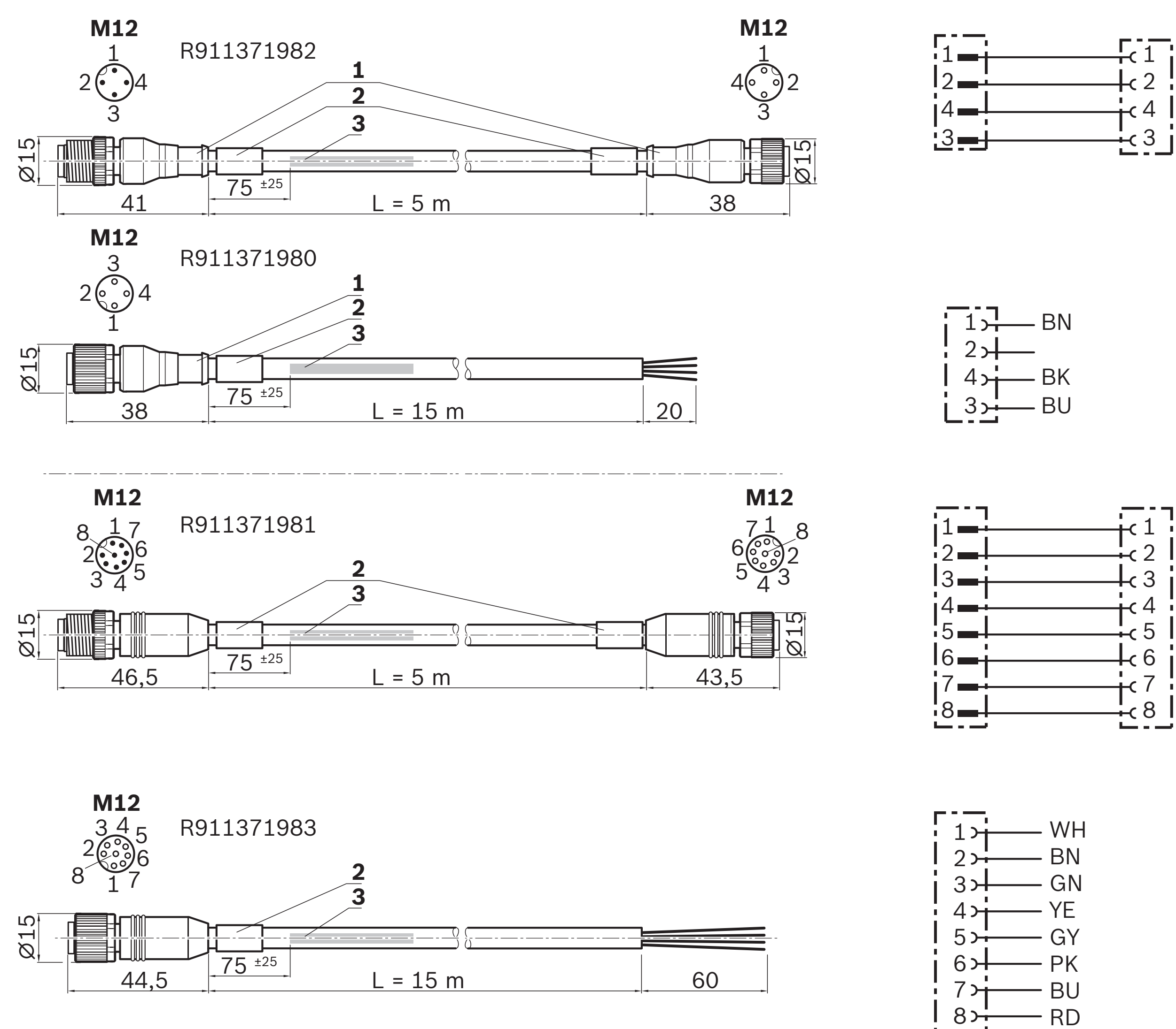
Extensions for passive plugs

R911371982

R911371981

R911371980

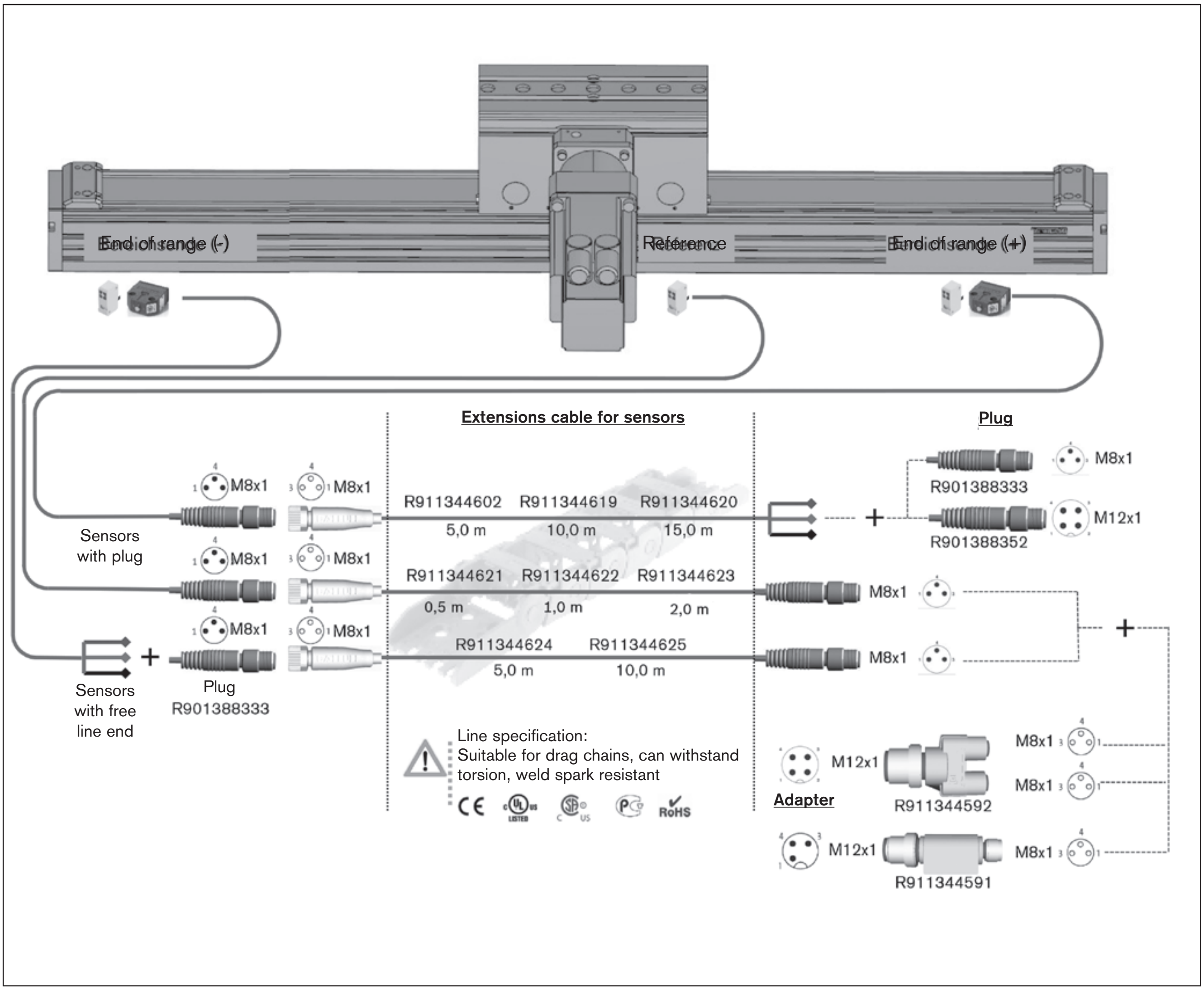
R911371983

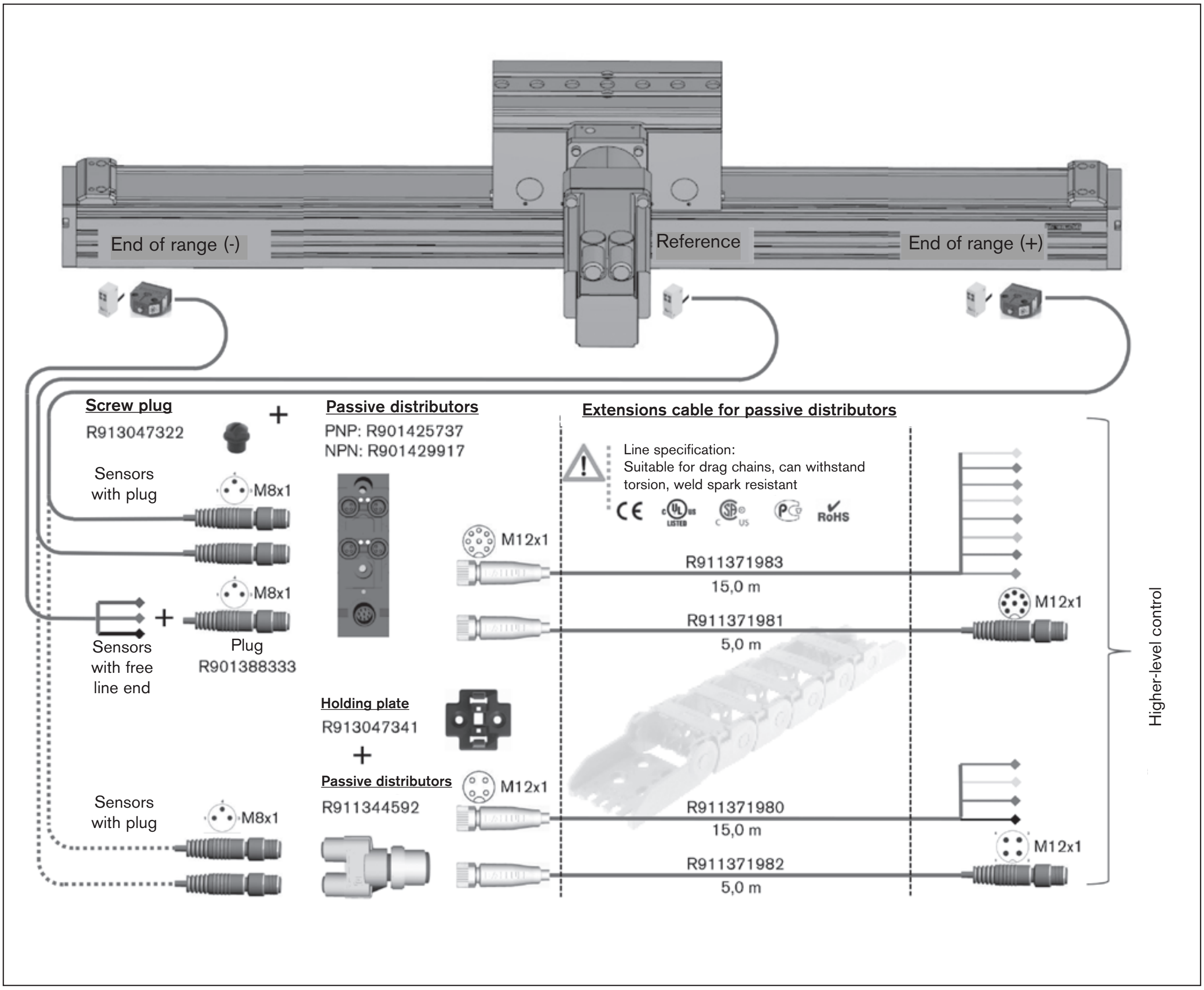


Material numbers / technical data

Use	Extension cable for passive distributor R911344592		Extension cable for passive distributors R901425737 / R901429917	
Material number	R911371982	R911371980	R911371981	R911371983
Designation	7000-40021-6540500	7000-12221-6541500	7000-48001-3770500	7000-17041-3771500
Length	5.0 m	15.0 m	5.0 m	15.0 m
1. Connection type	Straight socket, M12x1, 4-pin		Straight socket, M12x1, 8-pin	
2. Connection type	Straight plug, M12x1, 4-pin	free line end	Straight plug, M12x1, 8-pin	free line end
Function indication	–			
Operating voltage indicator	–			
Type of cable	PUR black		PUR gray	
Operating voltage	30 V AC/DC			
Operating current per contact	max. 4 A per contact		max. 2 A per contact	
Suitable for drag chains	✓			
Can withstand torsion	✓			
Weld spark resistant	✓			
Cable cross-section	4x0.34 mm²		8x0.34 mm²	
Cable diameter D	4.7 $^{\pm 0.2}$ mm		6.2 $^{\pm 0.3}$ mm	
Bending radius, static	≥ 5 x D			
Bending radius, dynamic	≥ 10 x D			
Bending cycles	> 10 million			
Max. perm. travel speed	3.3 m/s - at 5 m travel distance (typ.) to 5 m/s - at 0.9 m travel distance			
Max. perm. acceleration	≤ 30 m/s²			
Ambient temperature, fixed lay	–40 °C to +80 °C (90 °C max. 10 000 h)			
Ambient temperature, flexible lay	-25 °C to +80 °C (90 °C max. 10 000 h)			
Protection class	IP67 (plugged in & screwed down)			
Certifications and approvals	CE, cULus LISTED, CSA C US, PCT, RoHS			

Combination examples




End of range (-)
Reference
End of range (+)
Screw plug
R913047322
Passive distributors
PNP: R901425737
NPN: R901429917
Extensions cable for passive distributors
Line specification:
Suitable for drag chains, can withstand torsion, weld spark resistant
Sensors with plug
M8x1
M12x1
R911371983
15,0 m
R911371981
5,0 m
Sensors with free line end
Plug
R901388333
Holding plate
R913047341
Passive distributors
R911344592
R911371980
15,0 m
R911371982
5,0 m
Higher-level control

Attachments and accessories

Mounting

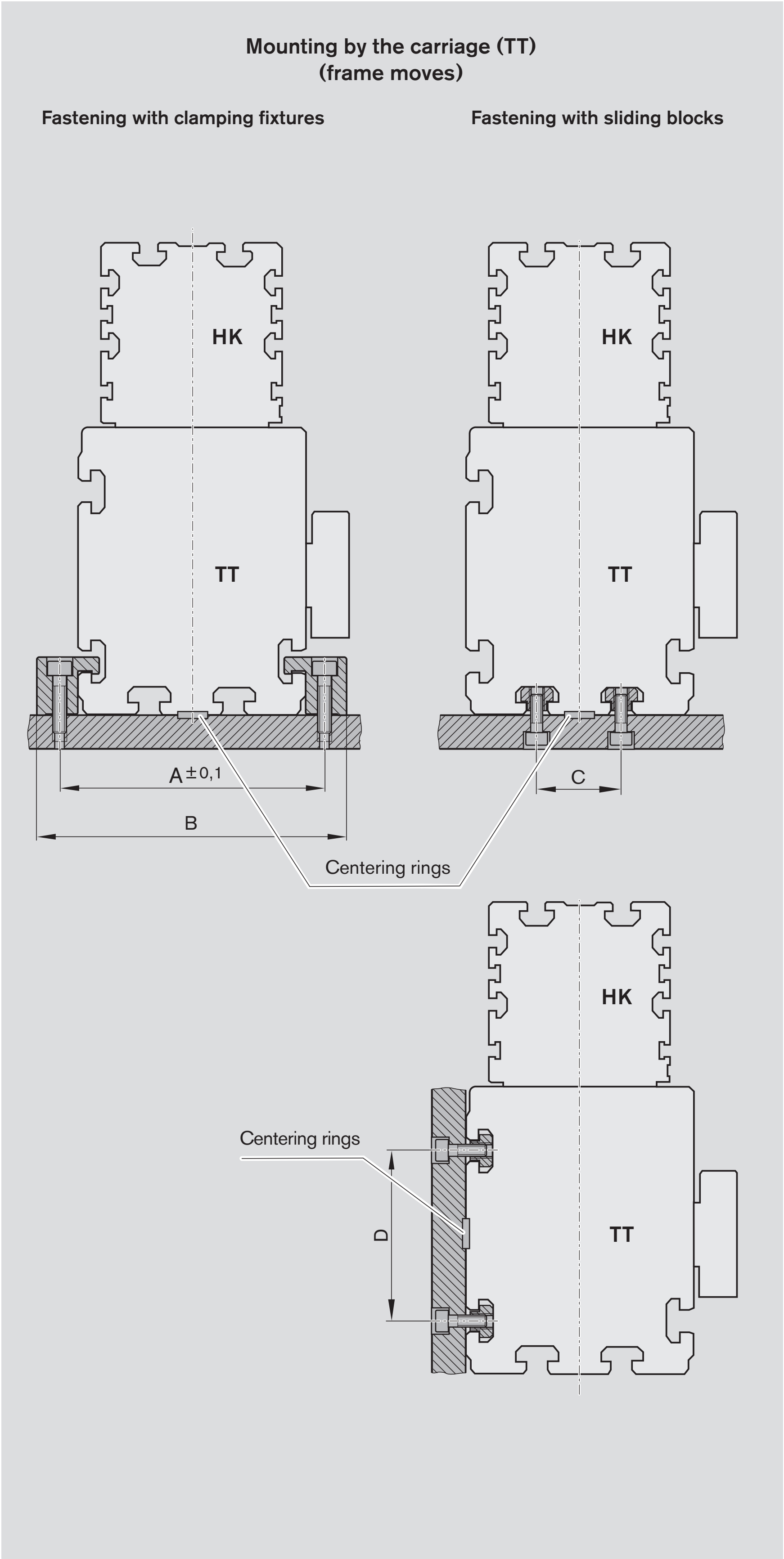
General notes

The Omega modules are mounted using various fastening elements:
- Clamping fixtures
- Sliding blocks
- Square nuts
- Screws for T-slots as per DIN 787 (not shown).
- Centering rings on carriage as positioning aids

Length dependent on base.

Mounting by the carriage (frame moves)

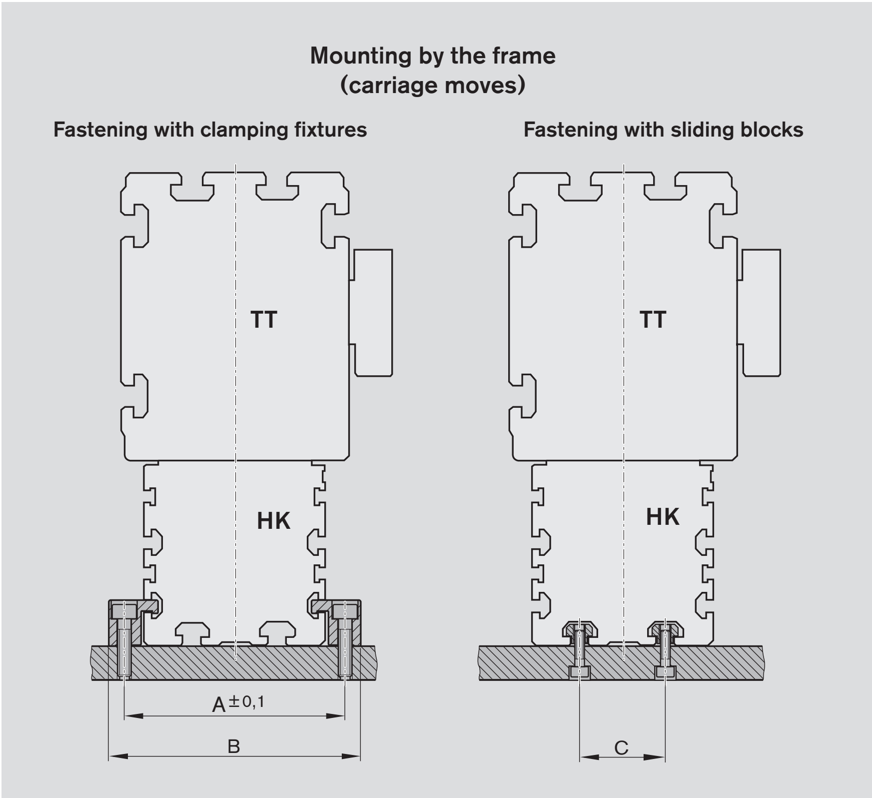
OBB	A (mm)	B (mm)	C (mm)	D (mm)
55	91	105	40	50
85	130	148	40	80
120	157	175	80	100



Mounting by the frame (HK)
(carriage moves)

⚠ Do not fix the Omega module at the end plates!
The frame is the main load-bearing part!

OBB	A (mm)	B (mm)	C (mm)
55	71	85	25
85	101	115	40
120	144	162	80



Attachments and accessories

Mounting

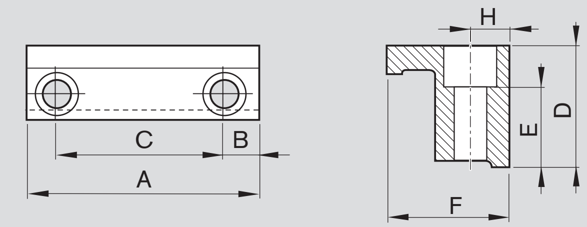
Clamping fixtures

Recommended number of clamping fixtures for the installation case carriage moves (frame fixed):

- 3 pieces on side opposite motor
- 2 pieces on motor side

Recommended number of clamping fixtures for the installation case frame moves (carriage fixed):

- 4 pieces per side/m

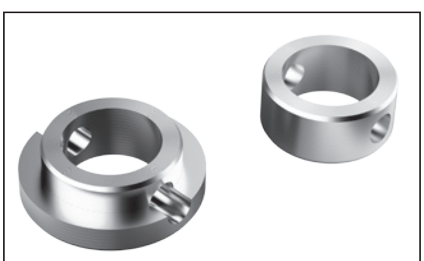


Type 2

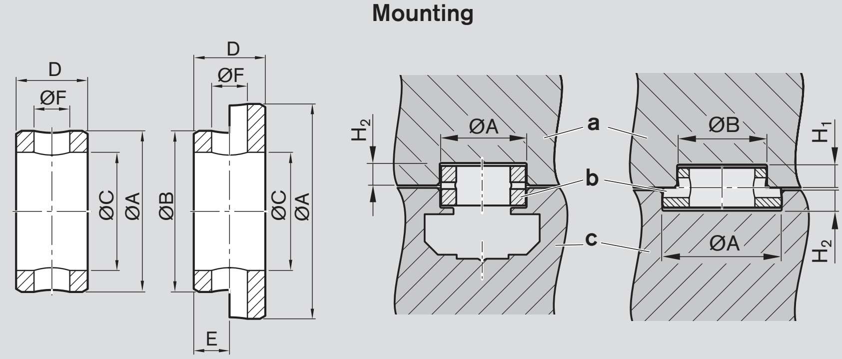
Size	Mounting on…	Countersink ISO 4762 for	Number Holes N	Dimensions (mm) A	B	C	D	E	F	H	Material number
OBB-055	Carriage	M6	2	65	12.5	40	17.0	10.2	21.0	7	R1175 192 04
	Frame	M6	2	72	11.0	50	11.5	5.3	19.3	7	R0375 510 33
OBB-085	Carriage	M8	2	68	15.0	38	27.5	18.0	30.0	9	R0375 410 52
	Frame	M6	2	78	14.0	50	20.0	11.3	21.0	7	R1175 390 30
OBB-120	Carriage	M8	2	88	19.0	50	27.5	18.0	30.0	9	R0375 410 50
	Frame	M8	2	108	19.0	70	27.5	16.3	29.0	9	R1175 290 26

Centering rings

The centering ring serves as a positioning aid and for positive locking when mounting customer attachments to the carriage. It creates a positive-locking connection with good reproducibility.
Material: Steel (stainless)



Mounting

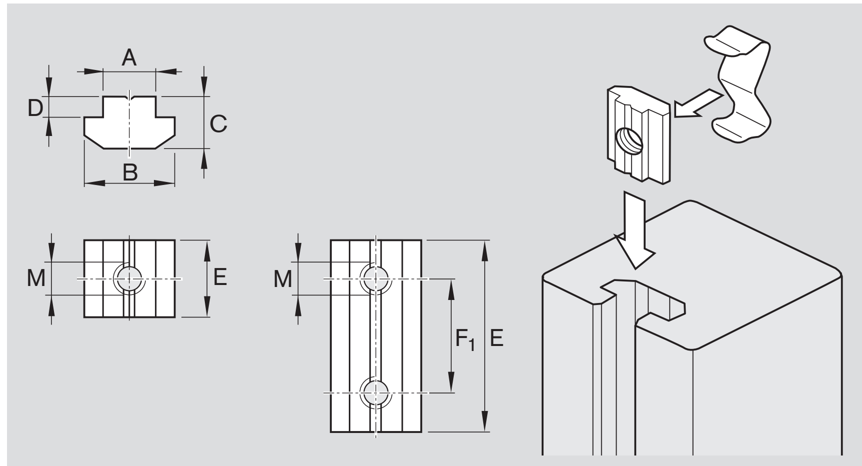


a) Customer attachment
b) Centering ring
c) Carriage

	OBB	Size Ø (mm)	Dimensions (mm) ØA H7/k6	ØB H7/k6	C ±0.1	D -0.2	E +0.2	ØF	H_1 +0.2	H_2 +0.2	Material number
Carriage	055	12	12	–	9.0	4.0	–	2.0	–	2.1	R0396 605 45
		12 - 7	12	7	5.5	3.5	1.5	1.6	1.6	2.1	R0396 605 77
		12 - 9	12	9	6.6	4.0	2.0	2.0	2.1	2.1	R0396 605 50
	085,	16	16	–	11.0	6.0	–	3.0	–	3.1	R0396 605 46
	120	16 - 12	16	12	9.0	5.0	2.0	2.0	2.1	3.1	R0396 605 51
End plate	055,	9	9	–	6.6	4.0	–	2.0	–	2.1	R0396 605 44
	085	9 - 5	9	5	3.4	3.5	1.5	1.6	1.6	2.1	R0396 605 48
		9 - 7	9	7	5.5	3.5	1.5	1.6	1.6	2.1	R0396 605 49
	120	12	12	–	9.0	4.0	–	2.0	–	2.1	R0396 605 45
		12 - 7	12	7	5.5	3.5	1.5	1.6	1.6	2.1	R0396 605 77
		12 - 9	12	9	6.6	4.0	2.0	2.0	2.1	2.1	R0396 605 50

Sliding blocks and springs

The spring serves as a mounting and positioning aid.
(only for OBB-085 and OBB-120)

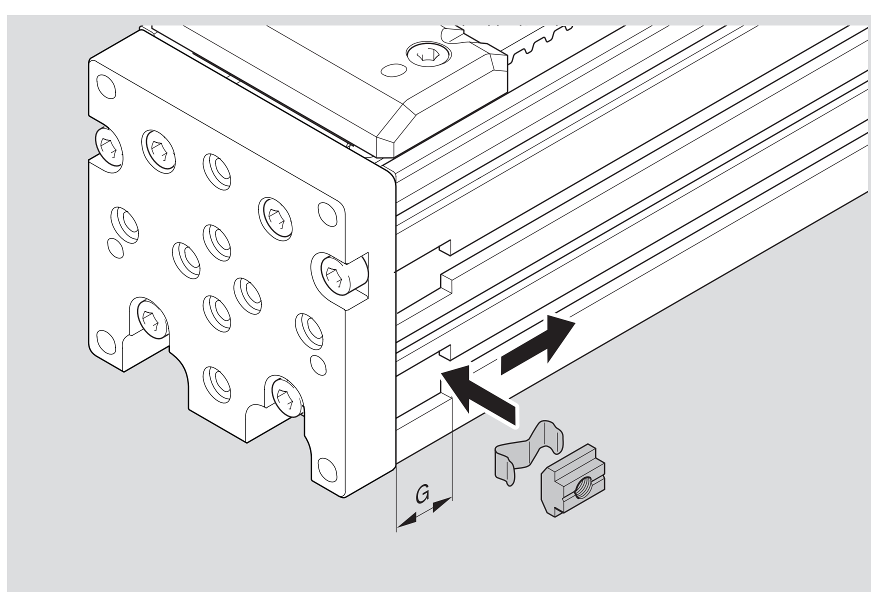


Overview of sliding blocks

Dimensions (mm)						for thread	Material number Sliding block	Material number Spring
A	B	C	D	E	F_1			
5	9.2	4.0	1.7	10	–	M4	R0391 710 38	–
6	11.5	4.0	1.0	12	–	M4	R3447 014 01	R3412 010 02
				12	–	M5	R3447 015 01	R3412 010 02
				45	30	M5	R0391 710 09	–
8	16.0	6.0	2.0	16	–	M4	R3447 017 01	R3412 011 02
				16	–	M5	R3447 018 01	R3412 011 02
				16	–	M6	R3447 019 01	R3412 011 02
				16	–	M8	R3447 020 01	R3412 011 02
				50	36	M6	R0391 710 08	–
10	19.5	10.5	5.0	20	–	M4	R3447 012 01	R3412 009 02
				20	–	M5	R3447 011 01	R3412 009 02
				20	–	M6	R3447 010 01	R3412 009 02
				20	–	M8	R3447 009 01	R3412 009 02
				90	70	M8	R0391 710 07	–

Sliding blocks for lateral mounting on frame

Size	A (mm)	E (mm)	G (mm)
OBB-055	5	10	12
OBB-085	6	12	14
OBB-120	8	16	18

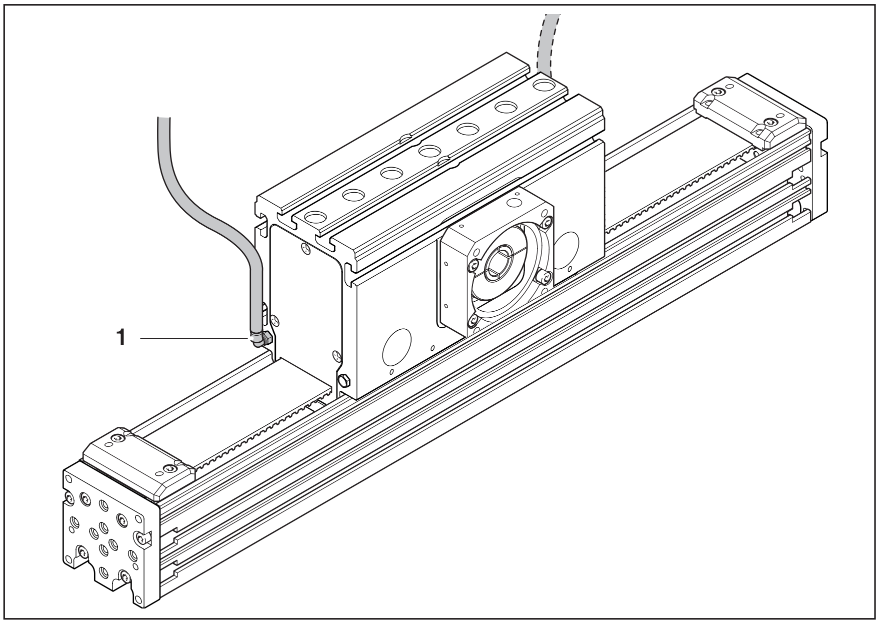


Attachments and accessories

Carriage with clamping element

Carriage

For carriages with integrated clamping element there is a standard air port (1) at each end face of the carriage opposite the lube nipples. Connection on an air port is sufficient.



Clamping element (LKPS)

The clamping element is only used for clamping (static holding) linear axes

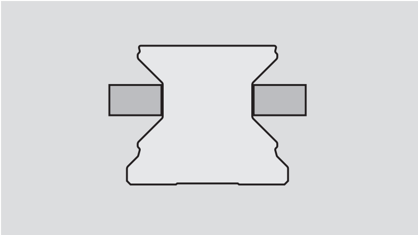
It is closed in deenergized state due to the spring energy accumulator (NC).

The clamping element can be used as a tried-and-tested part in conjunction with a suitable function test and in category 1 control units in accordance with DIN EN ISO 13849-1:2006.

If the risk assessment of the user specifies a Performance Level (s. Appendix A, DIN EN ISO 13849-1:2006) that requires a higher category, additional measures are required in the control technology to ensure that the start-up from the rest position is upheld or prevented safely.

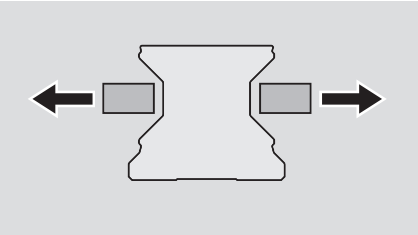
For further instructions and information, please refer to documentation belonging to this product.

⚠ **The clamping element may only be used when the axis is at a standstill!**
The clamping element may not be used as a braking unit!
Use for emergency braking of a moving mass is not permitted!
Clamping actions while the mass is moving may result in the clamping element and the linear guide being destroyed!



Air pressure: 0 bar

Clamping by spring force
When the pressure drops, the clamping profiles are pressed against the guide rail by means of a spring energy accumulator. A quick venting valve is required for fast response.



Air pressure: 5.5 - 8 bar

Release by air pressure
The clamping profiles are held apart by compressed air.
– Allows free movement

Size	OBB-055	OBB-085	OBB-120
Holding force 1)	400 N	750 N	1300 N
Pressure min. (release pressure)	5.5 bar		
Pressure max.	8.0 bar		
Spring energy accumulator	✓		
Clamping cycles	up to 5 mill. (B10d value)2)		
Braking cycles	not permitted		
Connector connection for tubing	Ø 4 mm		
Actuation	pneumatic		
theor. air consumption per cycle at 6 bar	23 cm^3	54 cm^3	74 cm^3
Air quality	lubricated air in accordance with ISO 8573-1 class 4, filter mesh size 25 µm		

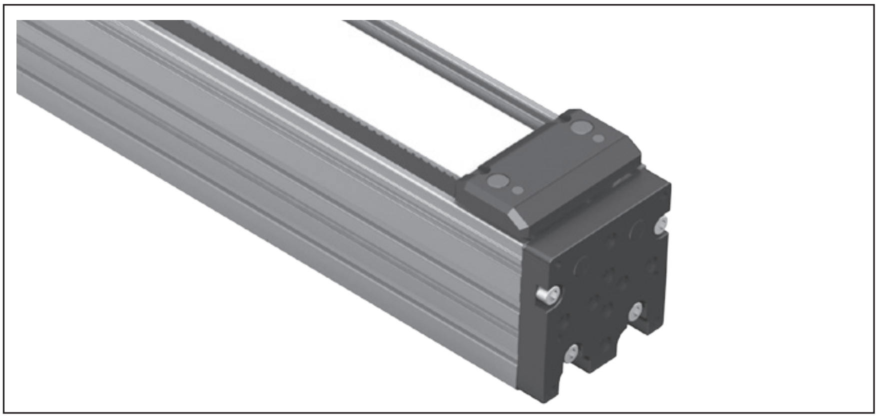
1) Static holding of the Omega module carriage or frame with axial forces up to the relevant specified value.
2) The B10d-value specifies the number of switching cycles, until 10% of the components have failed dangerously.

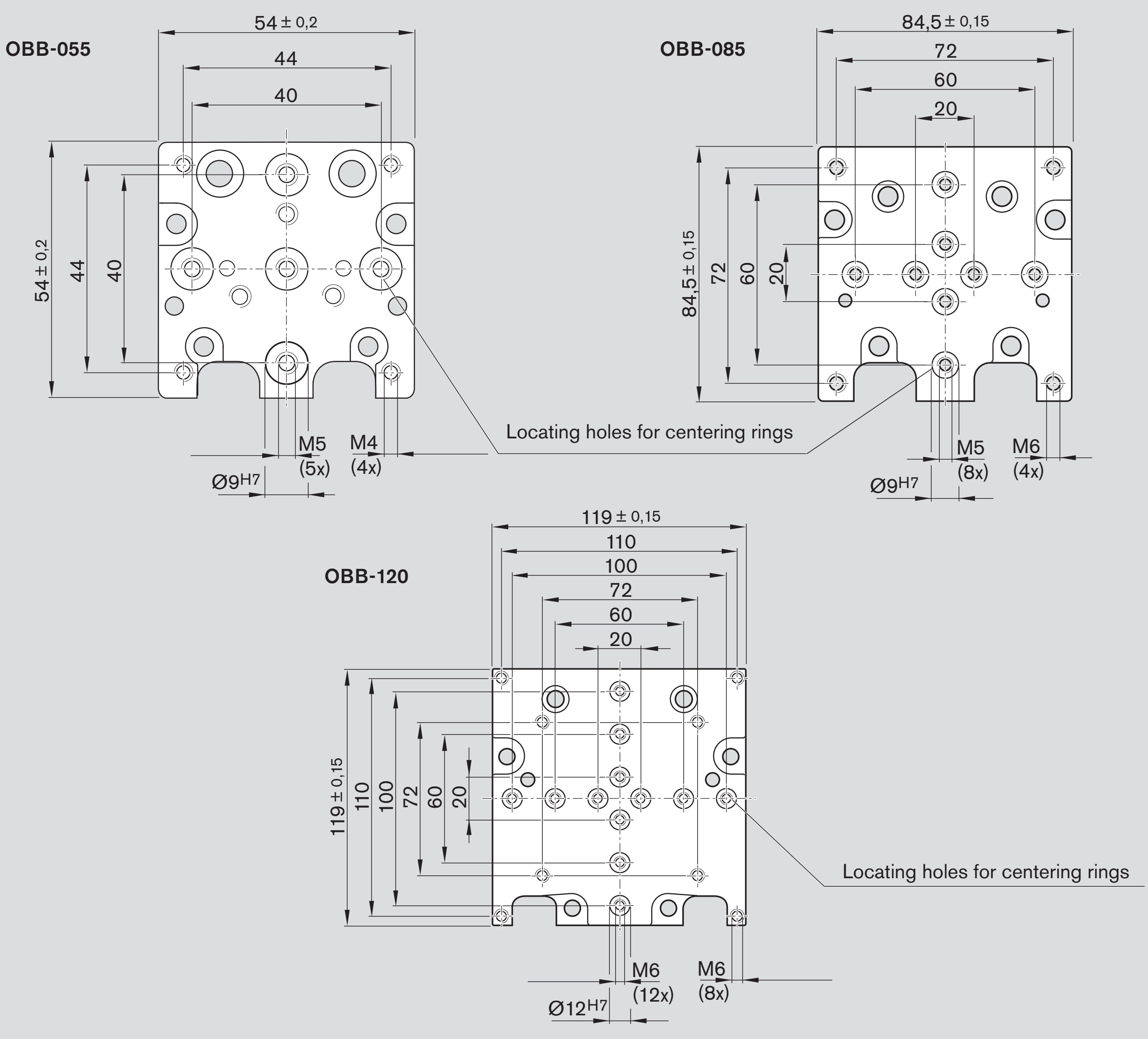
Attachment of additional devices

End plate for attachment

The end plates of the Omega modules feature mounting holes, threads and locating holes for attachment of additional devices.

Further information on possible combinations with the Omega module OBB is available in the catalog "Connection technology for linear motion systems".

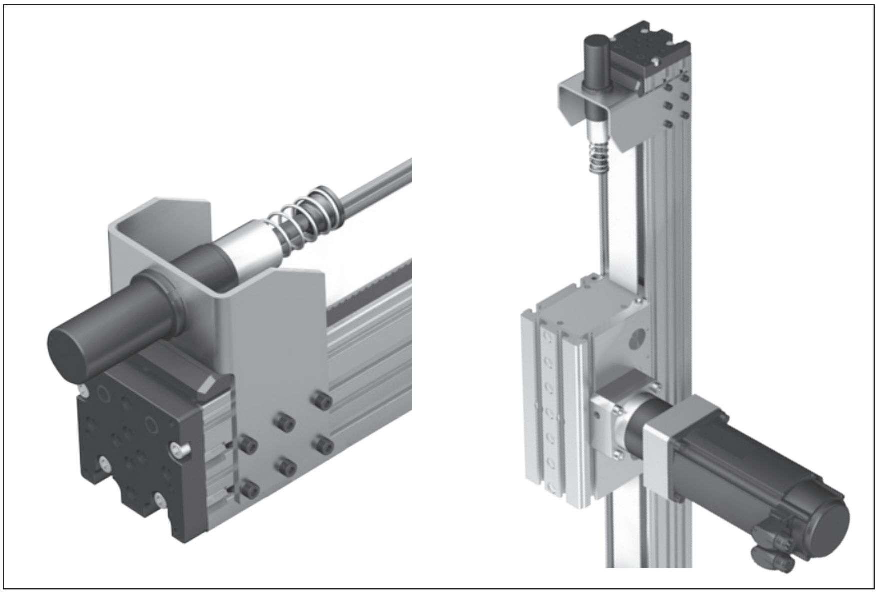




Attachments and accessories

Shock absorber

Suitable shock absorbers are available for end position cushioning of the Omega module.
The shock absorber serves to avoid damage in the event of uncontrolled movements. It is not suitable for continuous operation.

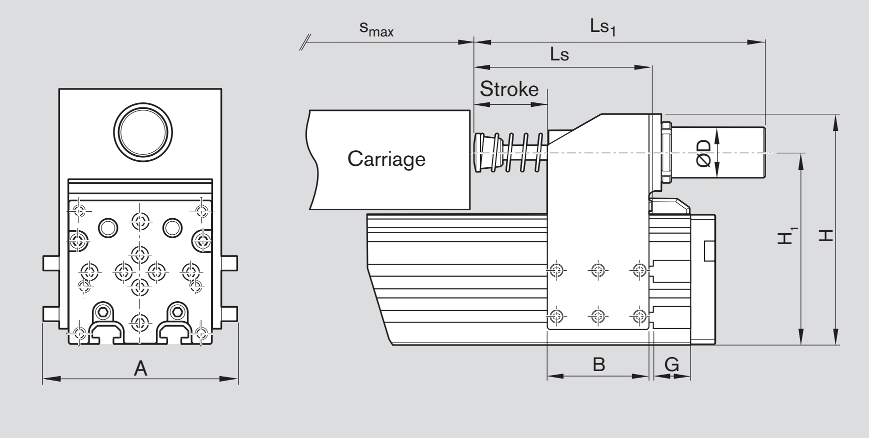


Notes
Follow the mounting instructions.

Shortened stroke

⚠ The maximum travel distance is shortened if a shock absorber is installed.

Note:
When a shock absorber is used, the maximum travel distance is reduced due to the construction (s_{max}). For the calculation, the maximum travel distance must therefore be reduced by the value s_{red} per side or per shock absorber.
If the carriage is at the end of the maximum travel distance, the front face of the carriage is on the damper head.



Mounting bracket

Size	Material number[1]	Dimensions (mm)									
		A	B	H	H_1	L_S[2]	L_S	L_{S1}	Stroke	Ø D	G
OBB-055	R1175 101 17	70	56.5	113	90.5	133	133	189	50	M33 x 1.5	12
OBB-085	R1175 301 17	104	68.0	150	125.0	149	149	209	50	M33 x 1.5	14
OBB-120	R1175 601 17	145	99.0	210	210.0	206	205	246	75	M45 x 1.5	16

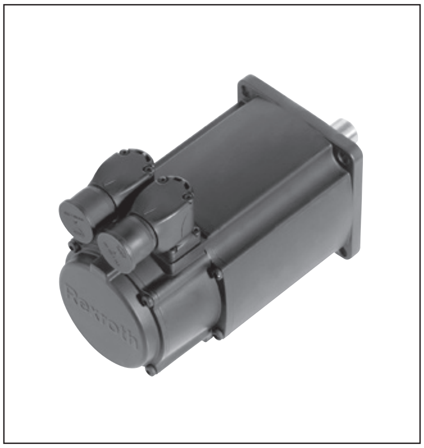
1) Scope of delivery: holding ring, shock absorber and mounting material
2) Carriage with clamping element

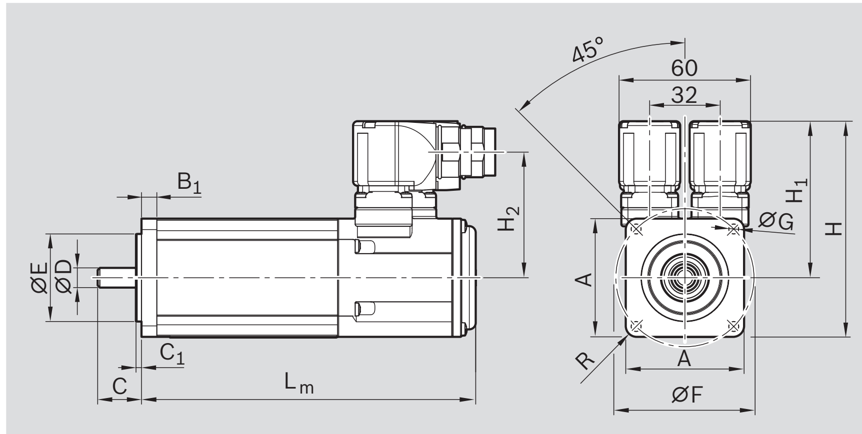
Shock absorber

Size	Max. mass to be braked (kg)	Energy absorption (Nm/stroke)	s_{red}[1] (mm)	Weight (Mounting bracket and shock absorber) (kg)
OBB-055	20	620	62	0.95
OBB-085	43	1 125	85	1.62
OBB-120	90	2 040	121	4.00

1) Reduction of the maximum travel distance of the Omega module (minimum value per side or damper)

IndraDyn S servo motors MSK





Schematic motor illustration

Motor	Dimensions (mm)												
	A	B_1	C	C_1	ØD k6	ØE j6	ØF	ØG	H	H_1	H_2	L_m without holding brake	L_m with holding brake	R
MSK 040C-0600	82	8.0	30	2.5	14	50	95	6.6	124.5	83.5	69.0	185.5	215.5	R8
MSK 050C-0600	98	9.0	40	3.0	19	95	115	9.0	134.5	85.5	71.0	203.0	233.0	R8
MSK 076C-0450	140	14.0	50	4.0	24	110	165	11.0	180.0	110.0	95.6	292.5	292.5	R12

Motor data

Motor	n_{max} (min^{-1})	M_0 (Nm)	M_{max} (Nm)	M_{br} (Nm)	J_m (kgm^2)	J_{br} (kgm^2)	m_m (kg)	m_{br} (kg)
MSK 040C-0600	7 500	2.7	8.1	4	0.000140	0.000023	3.6	0.3
MSK 050C-0600	6 000	5.0	15.0	5	0.000330	0.000107	5.4	0.7
MSK 076C-0450	5 000	12.0	43.5	11	0.004300	0.000360	13.8	1.1

Motor data independent of the Omega module

J_{br} = mass moment of inertia of holding brake
J_m = mass moment of inertia of the motor
L_m = length of the motor
M_0 = torque at standstill
M_{br} = holding torque of holding brake when switched off
M_{max} = maximum possible motor torque
m_m = mass of motor
m_{br} = mass of the holding brake
n_{max} = maximum speed

Option number[1)]	Motor	Material number	Version		Type designation
			Holding brake		
			Without	With	
86	MSK040C-0600	R911306060	X		MSK040C-0600-NN-M1-UG0-NNNN
87		R911306061		X	MSK040C-0600-NN-M1-UG1-NNNN
88	MSK050C-0600	R911298354	X		MSK050C-0600-NN-M1-UG0-NNNN
89		R911298355		X	MSK050C-0600-NN-M1-UG1-NNNN
92	MSK076C-0450	R911318098	X		MSK076C-0450-NN-M1-UG0-NNNN
93		R911315713		X	MSK076C-0450-NN-M1-UG1-NNNN

1) From “Configuration and ordering” table

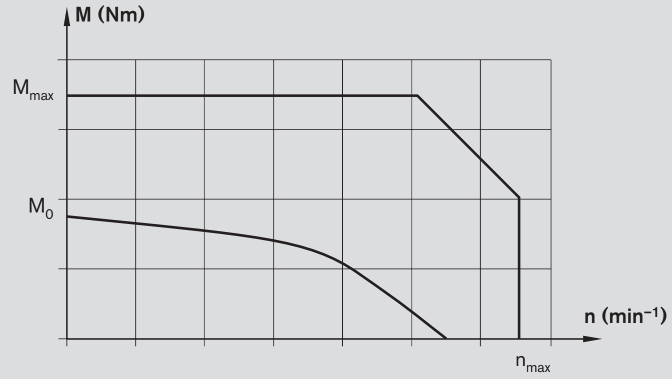
Version
- Plain shaft with shaft seal
- Multi-turn absolute encoder M1 (Hiperface)
- Cooling system: natural convection
- Protection class IP65 (housing)
- With or without holding brake

Notes
The motors can be supplied complete with controllers and control units. For further motor types and more information on motors, controllers and control units, please refer to the following Rexroth catalogs on drive technology:
- Drive System Rexroth IndraDrive, R999000018
- Automation systems and control components, R999000026
- Rexroth IndraDyn S Synchronous Motors MSK, R911296288

Recommended motor/controller combination

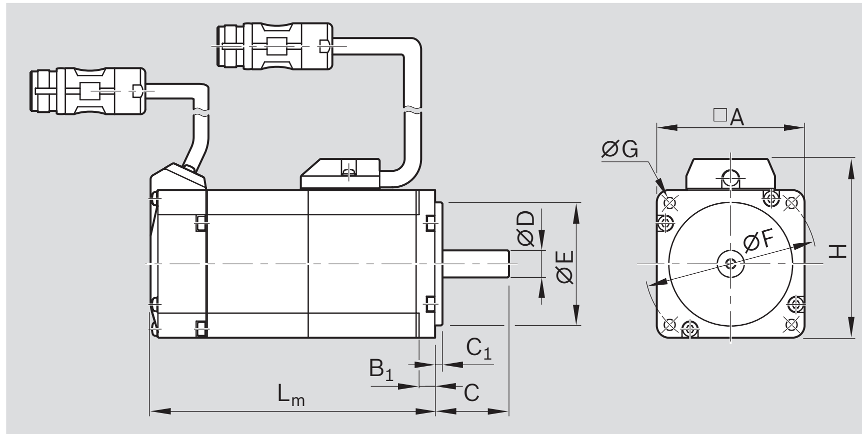
Motor	Controller
MSK 040C-0600	HCS 01.1E-W0008
MSK 040C-0600	HCS 01.1E-W0018
MSK 050C-0600	HCS 01.1E-W0028
MSK 076C-0450	HCS 01.1E-W0054

Torque/speed characteristic (schematic)



Attachments and accessories

IndraDyn S servo motors MSM



Schematic motor illustration

Motor	Dimensions (mm)									
	A	B_1	C	C_1	ØD k6	ØE j6	ØF	ØG	H	L_m Without holding brake	L_m With holding brake
MSM 031C-0300	60	6.5	30	3	14	50	70	4.5	73	98.5	135.0
MSM 041B-0300	80	6.0	35	3	19	70	90	6.0	93	112.0	149.0

Motor data

Motor	n_{max} (min^{-1})	M_0 (Nm)	M_{max} (Nm)	M_{br} (Nm)	J_m (kgm^2)	J_{br} (kgm^2)	m_m (kg)	m_{br} (kg)
MSM 031C-0300	5 000	1.30	3.80	1.27	0.0000260	0.0000018	1.20	0.50
MSM 041B-0300	4 500	2.40	7.10	2.45	0.0000870	0.0000075	2.30	0.80

J_{br} = mass moment of inertia of holding brake
J_m = mass moment of inertia of the motor
L_m = length of the motor
M_0 = torque at standstill
M_{br} = holding torque of the holding brake (normally closed)
M_{max} = maximum possible motor torque
m_m = mass of motor
m_{br} = mass of holding brake
n_{max} = maximum speed

Option number[1]	Motor	Material number	Version Holding brake		Type designation
			Without	With	
138	**MSM 031C-0300**	R911344215	X		MSM 031C-0300-NN-M5-MH0
139		R911344216		X	MSM 031C-0300-NN-M5-MH1
140	**MSM 041B-0300**	R911344217	X		MSM 041B-0300-NN-M5-MH0
141		R911344218		X	MSM 041B-0300-NN-M5-MH1

1) From “Configuration and ordering” table

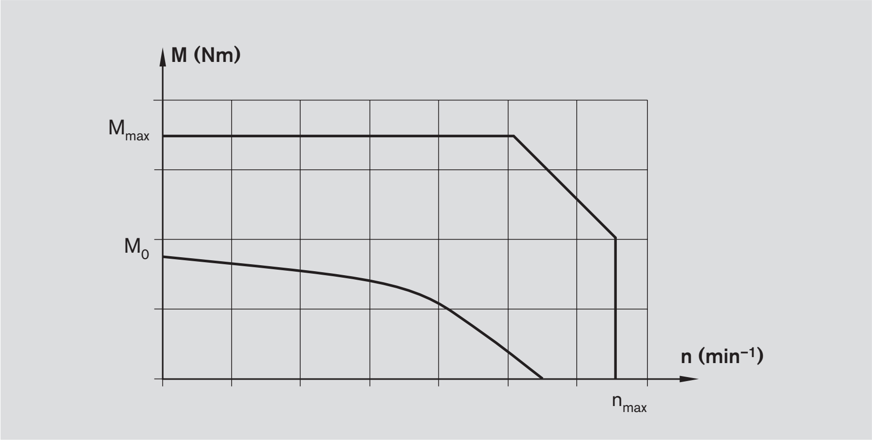
Version:
- Plain shaft without shaft seal
- Mutiturn absolute encoder M5 (20 bit, absolute encoder function only available with buffer battery)
- Cooling system: natural convection
- Protection class IP54 (shaft IP40)
- With or without holding brake
- Metal round connector M17

Notes
The motors can be supplied complete with controllers and control units. For further motor types and more information on motors, controllers and control units, please refer to the following Rexroth catalogs:
- Drive System Rexroth IndraDrive, R999000018
- Automation systems and control components, R999000026
- Rexroth IndraDyn S Synchronous Motors MSM R911329337

Recommended motor/controller combination

Motor	Controller
MSM 031C-0300	HCS 01.1E-W0009
MSM 041B-0300	HCS 01.1E-W0013

Torque/speed characteristic (schematic)

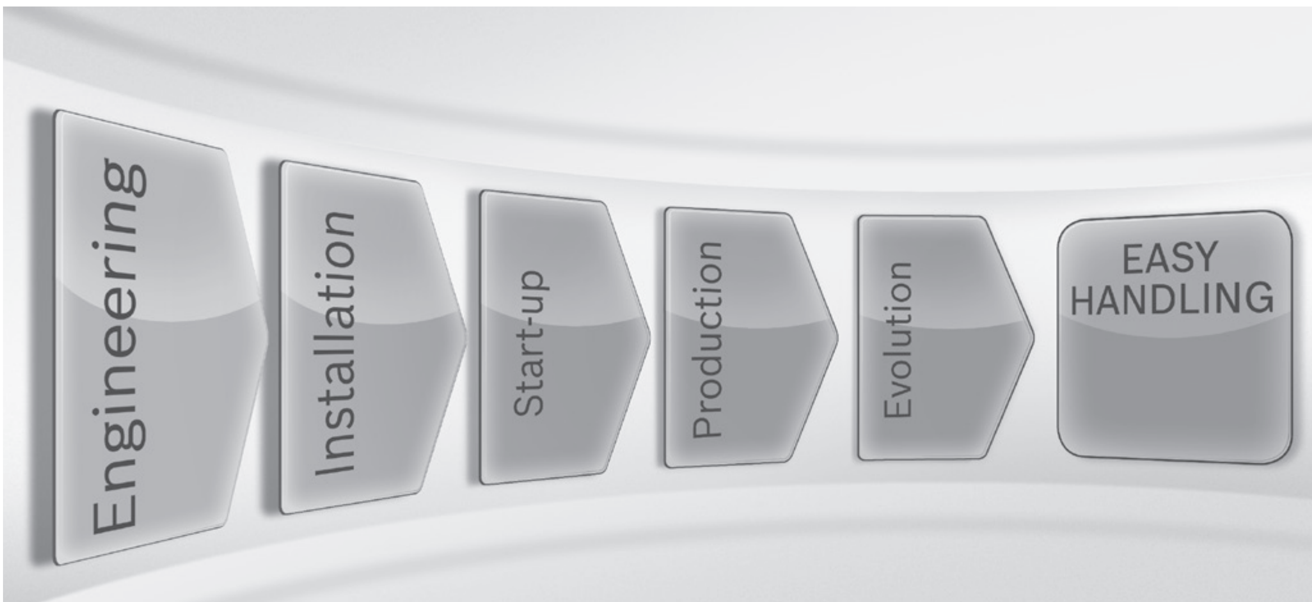


EasyHandling

The perfect system solution for every application

Efficient production processes are the key to your success in the marketplace. Today’s environment, defined by rapid change and short product cycles, demands flexible systems with an optimal design and configuration. EasyHandling gives you the tools you need to automate your handling applications with greater ease, speed, and efficiency. EasyHandling is more than just a modular collection of mechanical components; it takes an evolutionary step forward by providing an all-inclusive system solution – our best solution for your requirements.

EasyHandling – Easier. Faster. More Economical.



Easier
to get results that fit
Tailor-made solutions just like that – with support throughout.

Faster
route to your ideal application
Effortless adaptation, even to future requirements – fast and flexible scalability.

More economical
through unparalleled efficiency
Optimizes processes from project planning through to operations – with significant savings on resources.

Engineering – up to 70% faster
EasyHandling tools help users right from the component selection stage, proposing solutions with all the necessary information on parts lists, technical data and CAD drawings.

Installation – saves up to 60% on time
Thanks to positive-locking interfaces, the mechanical components are perfectly aligned and accurately connected right away.

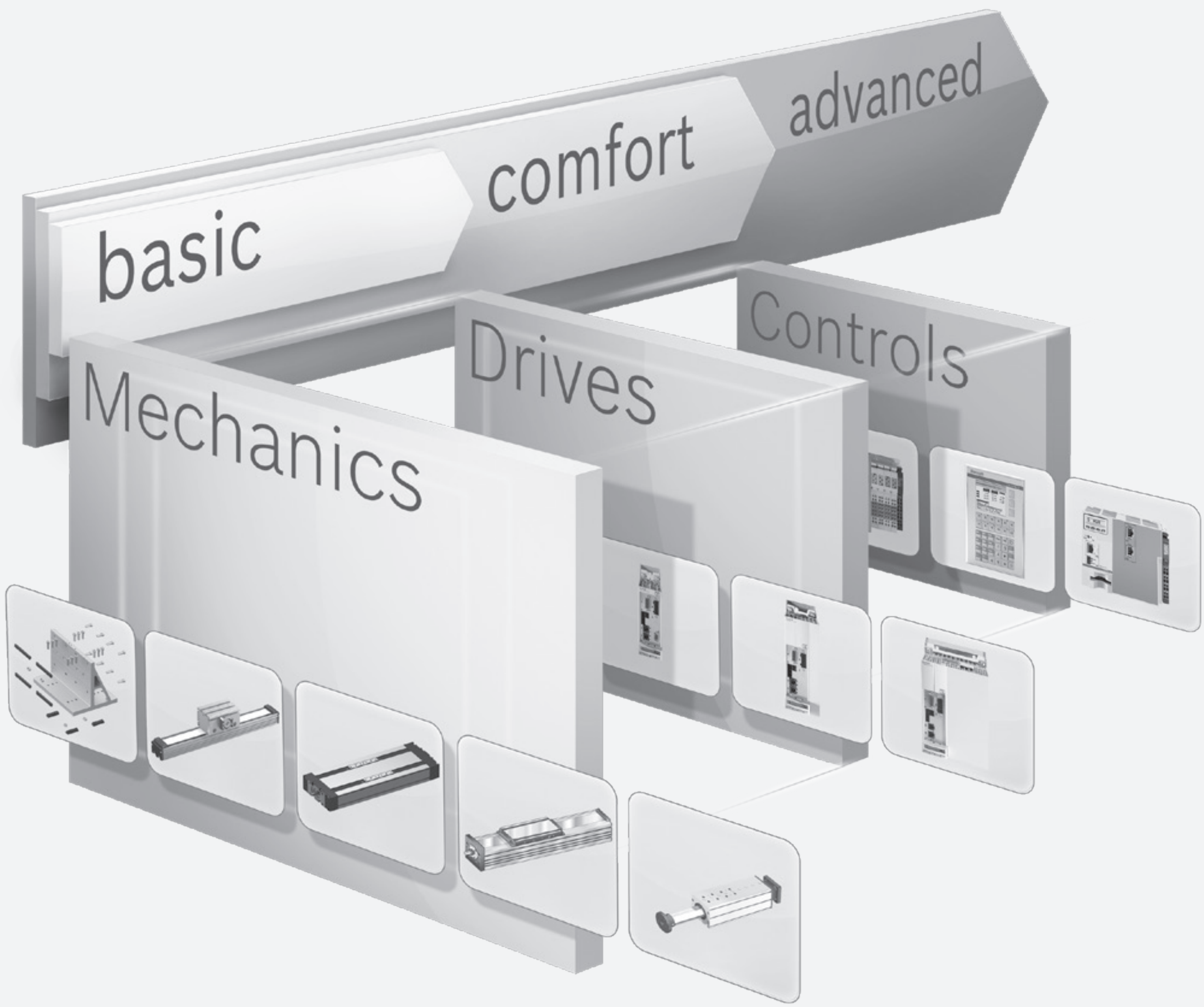
Start-up – reduces your effort by up to 90%
With the smart start-up assistant EasyWizard, parameterization and configuration become child's play. Your handling system will be ready to go in just a few clicks.

Production – more economical and more efficient
Rexroth enhances the system effectiveness still further with smart application tools: The drive controller software outputs maintenance-related messages to the user based on operating hours and travel to help schedule servicing at the right intervals. The result: longer life and reduced risk of failure.

Future developments – continuous improvement
Prepare for future market developments now: One of the great features of EasyHandling systems is their systematic openness. The flexibility of the mechanical and electrical components allows you to adapt quickly and efficiently to new production requirements.

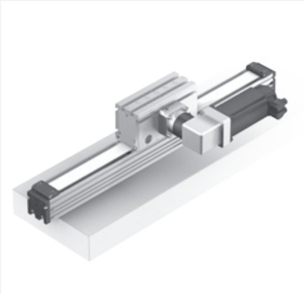
EasyHandling – more than just a kit of components

The modular system concept that ideally builds on itself



basic – Made-to-measure mechanics

EasyHandling basic contains all the mechatronic components you need to build complete, **single- or multi-axis systems** to match your individual needs. All of the component interfaces are systematically standardized, making it possible to combine them at will. Practical tools and aids make selection and configuration even easier.



comfort – Getting started even faster

EasyHandling comfort expands the Basic component range by adding **powerful servo drives with multiple protocol capability**. The universal, smart control units are ideally suited for a variety of handling tasks. Unique: with the **EasyWizard start-up assistant**, linear systems are ready to use after entering just a few product-specific parameters.

advanced – Controls for demanding requirements

With the **freely scalable, high-performing motion logic control system**, EasyHandling advanced makes configuration and handling even easier. Predefined functions covering more than 90 percent of all handling applications eliminate the need for lengthy programming.

For more information about EasyHandling, see the brochure “EasyHandling – more than just a kit of components” R999000044.

Operating conditions

Normal operating conditions

Ambient temperature No passing below the dew point	0 °C ... 40 °C	ϑ
Load	≤ 0.2 C	
Travel distance s_{min} 1)	OBB-055 ≥ 110 mm	
	OBB-085 ≥ 160 mm	
	OBB-120 ≥ 135 mm	
Contamination	Not permitted	

1) Minimum travel distance to ensure a reliable lubrication distribution.

Design notes

⚠ Moved parts:
Safety devices and guards necessary

⚠ For vertical installations:
Arresting devices necessary to protect against falling loads

Required and supplementary documentation

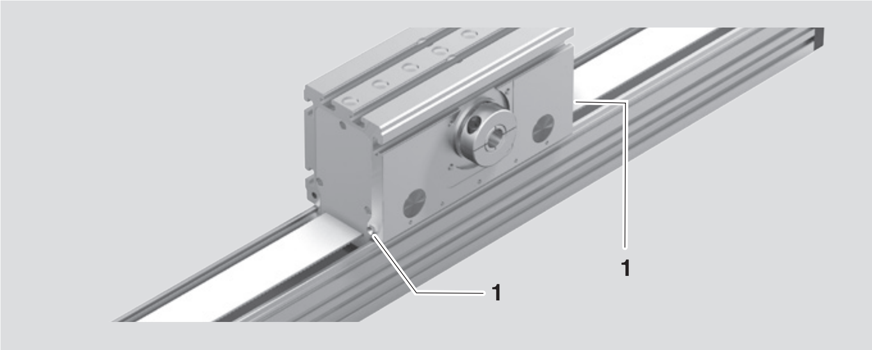
For further instructions and information, please refer to documentation belonging to this product. “Safety Instructions for Linear Motion Systems”

– You can find PDF files of these documents in the Internet at www.boschrexroth.com/mediadirectory

We would also be pleased to send you the documents.
If you are unsure about using this product, please contact Bosch Rexroth.

Lubrication

Lubrication notes
Omega modules receive basic lubrication with Dynalub 510 and are only designed for grease lubrication using a manual grease gun.
The only maintenance required is relubrication of the integrated Ball Rail System via one of the two funnel-type lube nipples (**1**).



Lubrication point
1 Funnel-type lube nipple DIN 3405 Type D1

Lubricants

For lubricant quantities and intervals, see “Instructions for Omega Modules”.

Size	Grease	Material number
OBB-055 **OBB-085** **OBB-120**	Dynalub 510 (Bosch Rexroth) NLGI grade 2 lithium-based high-performance grease as per DIN 51818 (KP2K-20 as per DIN 51825)	R3416 037 00 (Cartridge 400 g)
	Alternative greases	
	Elkalub GLS 135 / N2 (Chemie-Technik)	
	Castrol Longtime PD2 (Castrol)	

⚠ Do not use greases containing solid particles (e.g. graphite or MoS_2)!

⚠ For lubrication in short-stroke applications (travel path < s_{min}), please consult us.

Documentation

Standard report
Option 01

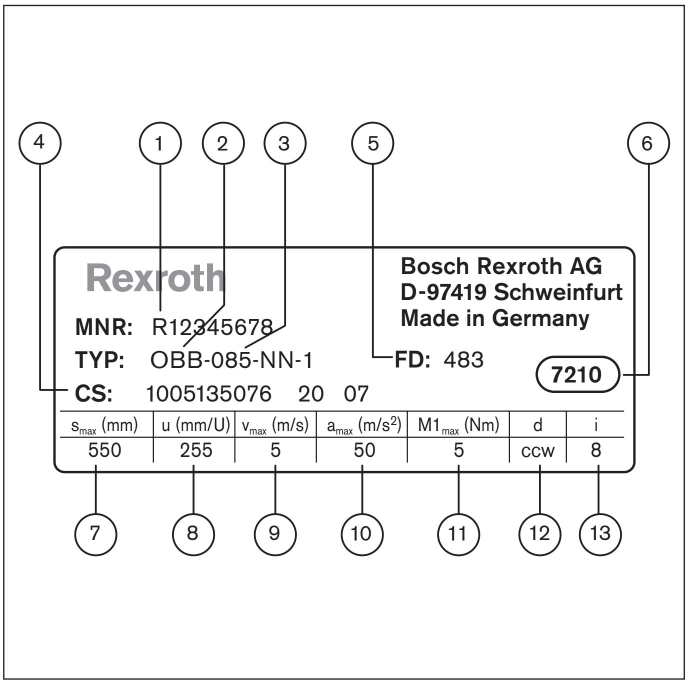
The standard report serves to confirm that the checks listed in the report have been carried out and that the measured values lie within the permissible tolerances.

Controls listed in the standard report:
- functional checks of mechanical components
- functional checks of electrical components
- design is in accordance with order confirmation

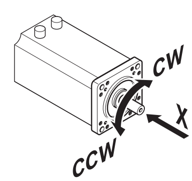
Service and information

Parameterization (commissioning)

Besides reference information for the production of the linear motion system, there are also technical parameters specified for commissioning on the nameplate.



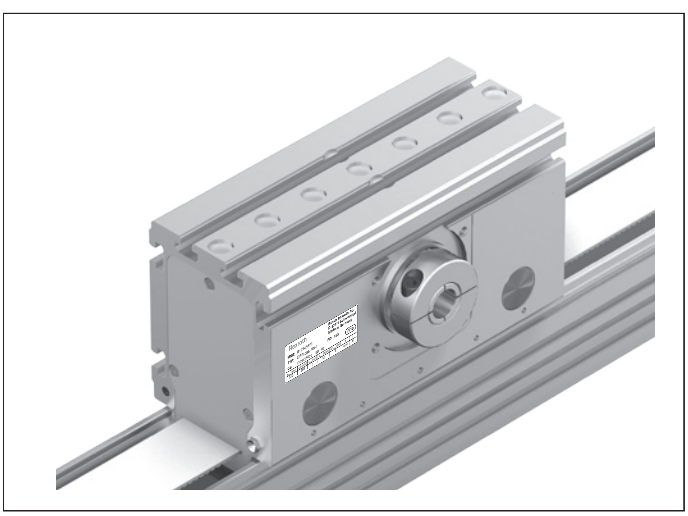
1 Material number
2 Type designation
3 Size
4 Customer information
5 Date of manufacture
6 Manufacturing location
7 s_{max} = max. travel range (mm)
8 u = lead constant (mm/rev)
9 v_{max} = max. speed (m/s)
10 a_{max} = max. acceleration (m/s²)
11 $M1_{max}$ = max. drive torque at motor journal (Nm)
12 d = rotational direction of the motor to move in positive direction



Clockwise
Counter clockwise

13 i = gear ratio

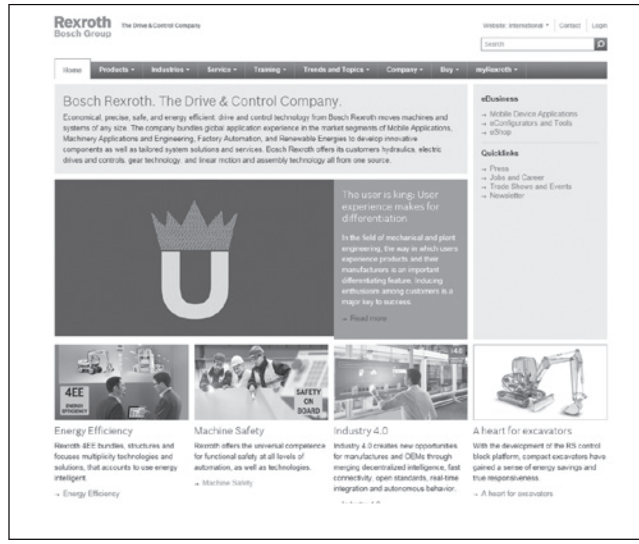
For Omega modules, the nameplate is mounted on the carriage on the drive side. (See fig.)



Further information

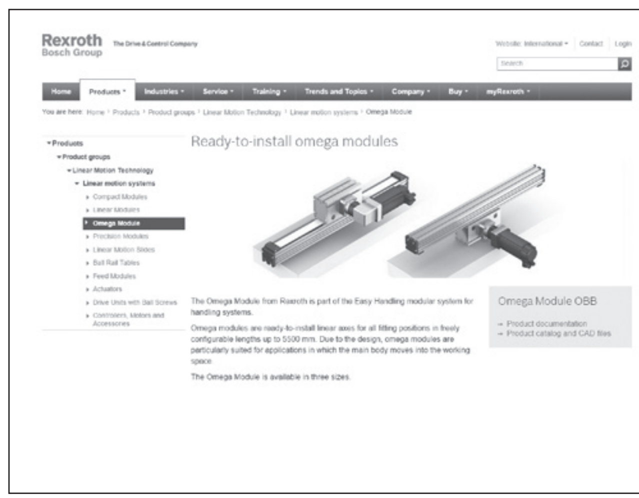
Bosch Rexroth homepage:

http://www.boschrexroth.com



Omega module
product information:

http://www.boschrexroth.com/en/xc/products/product-groups/linear-motion-technology/linear-motion-systems/omega-module/index

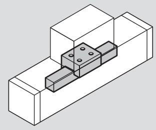


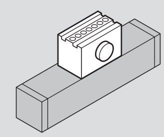
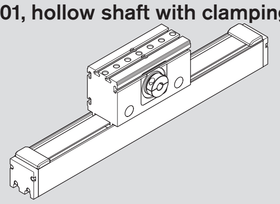
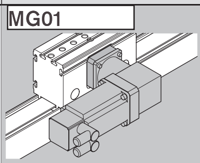
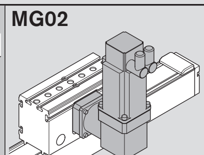
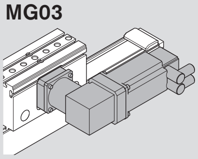
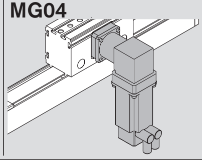
Service and information

Ordering example OBB-085

Configuration and ordering

<table>
<tr><th colspan="2">Short product name, length
OBB-085-NN-1, ... mm

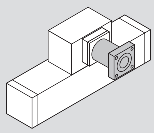
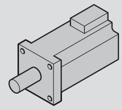
Version[2)]</th><th>Guideway
</th><th colspan="3">Drive

Reduction</th><th colspan="2">Carriage
</th></tr>
<tr><th></th><th></th><th></th><th>i = 1</th><th>i = 5</th><th>i = 8</th><th>L_{ca} = 260 mm
without</th><th>L_{ca} = 308 mm
with</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Clamping element</td></tr>
<tr><td>with drive (MA), without gear i = 1</td><td>MA01, hollow shaft with clamping hub
</td><td>01</td><td>01</td><td colspan="2">–</td><td>01</td><td>02</td></tr>
<tr><td>with gear (MG), Angular planetary gearbox WPG</td><td>MG01

MG02

MG03

MG04
</td><td>01</td><td>–</td><td colspan="2">10</td><td>01</td><td>02</td></tr>
<tr><td></td><td>MG10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

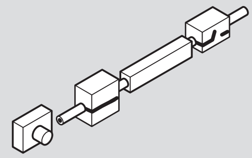
(grey box) = Mark of the selection area to the decision about version

(empty box) = Selected option that is to be entered at “Inquiry/Order” in the the order form at the end of the catalog

Ordering data	Option	Description
Omega module		
Short product name, length	OBB-085-NN-1, 910 mm	Length 910 mm
Version	MG01	Omega module with angular planetary gearbox, mounted as shown in fig. MG01
Guideway	01	Ball Rail System
Drive	10	Toothed belt drive
Carriage	01	Carriage with length L_{ca} = 260 mm (without clamping element)
Motor attachment	33	with angular planetary gearbox, i = 5, for motor MSK 050C
Motor	89	Motor MSK 050C with brake
1. Switch	61	PNP NC (frame moves)
2. Switch	65	Mechanical switch (frame moves)
Socket-plug	17	Socket-plug on the switch side (frame moves)
Control strip	42	Two control strips on the frame (frame moves)
Documentation	01	Standard report

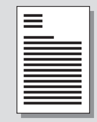
Motor attachment				Motor	
					
Speed reduction i =	Attachment kit[3] MG01 MG03	Attachment kit[3] MG02 MG04	for motor	without brake	with brake
–	00		–	00	
i = 5	33	43	MSK 050C	88	89
i = 8	35	45	MSK 050C	88	89
i = 8	34	44	MSM 041B	140	141
	30		MSK 050C	88	89
			B	140	141

Switching system[4]



Switching system	
Without switch and without cable duct	00
Carriage moves	
Switch:	
– PNP NC	71
– PNP NO	73
– Mechanical	75
Cable duct[1]	20
Socket-plug	17
Switching angle	36
Frame moves	
Switch:	
– PNP NC	61
– PNP NO	63
– Mechanical	65
Socket-plug	17
Two control strips	41

Documentation



standard report
01

Service and information

Inquiry/order form

Find your local contact person here:
www.boschrexroth.com/adressen

Rexroth – Omega Modules

Ordering example

Ordering data	Option	Description
Omega module OBB-085		
Short product name, length		OBB-085-NN-1, 910 mm
Version	MG01	Omega module with angular gear, mounted as shown in fig. MG01
Guideway	01	Ball Rail System
Drive	10	Toothed belt drive
Carriage	01	Carriage with length L_{ca} = 260 mm (without clamping element)
Motor attachment	33	with angular planetary gearbox, i = 5, for motor MSK 050C
Motor	89	Motor MSK 050C with brake
1. Switch	61	Proximity switch, PNP NC (frame moves)
2. Switch	65	Mechanical switch (frame moves)
3. Switch	65	Mechanical switch (frame moves)
Cable duct	00	without cable duct
Socket-plug	17	Socket-plug (frame moves)
Control strip	41	Two control strips (frame moves)
Documentation	01	Standard report

To be completed by the customer: Inquiry ☐ / Order ☐

Omega module

Short product name: ____________________________,

length __________mm

Version = ☐☐☐☐
Guideway = ☐☐
Drive = ☐☐
Carriage = ☐☐
Motor attachment = ☐☐
Motor = ☐☐
1. Switch = ☐☐
2. Switch = ☐☐
3. Switch = ☐☐
Cable duct = ☐☐
Socket-plug = ☐☐
Control strip = ☐☐
Documentation = ☐☐

Quantity Order of:____ pcs, _____ per month, ______ per year, per order, or ____________________

Comments:

Sender

Company: ______________________
Address: ______________________

Name: ______________________
Department: ______________________
Telephone: ______________________
Telefax: ______________________

The Drive & Control Company

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R999001179 (2016-05)