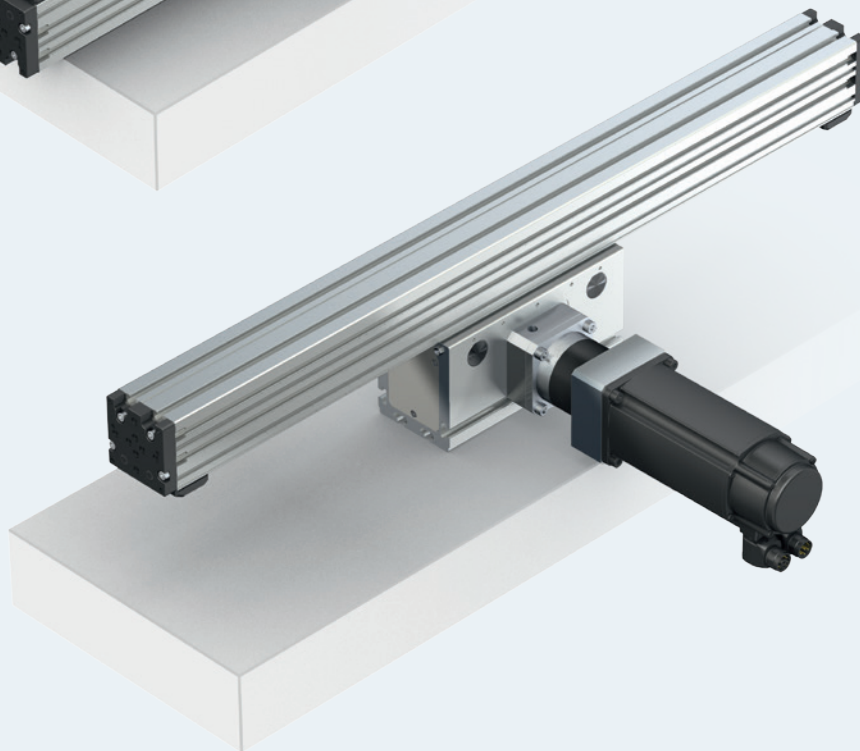
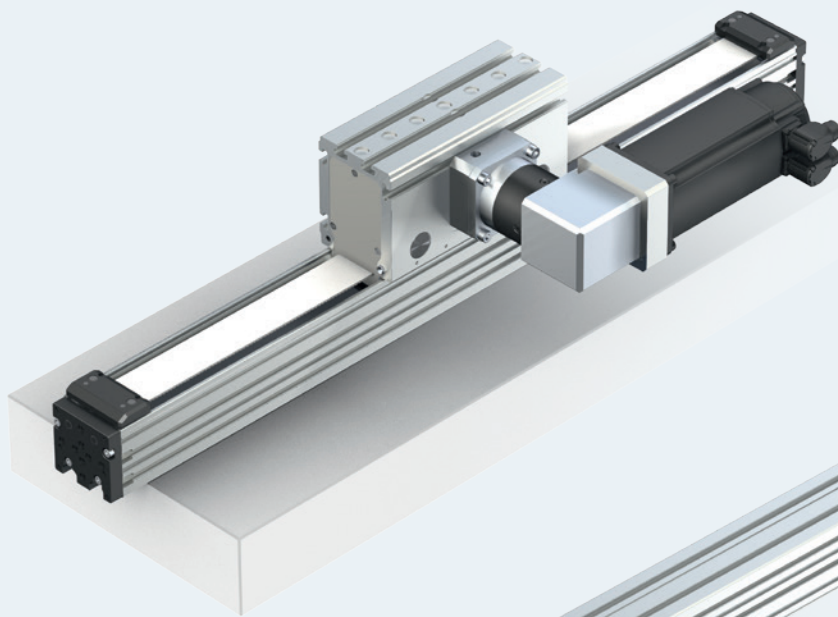


Omega Modules OBB



Identification system for short product names

Short product name	Example:	O	B	B	-	085	-	N	N	-	1
System	=	Omega module									
Guideway	=	Ball Rail System									
Drive	=	Toothed Belt Drive									
Size	=	055 / 085 / 120									
Version	=	Standard 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			4
	Product description		4
	Load ratings and sizes		6
	Structural design		7
	Delivery form		9
Technical data	General technical data	Drive data	10
	Deflection		12
		Deflection charts	13
Calculations	Calculation principles	Mounting orientation HORIZONTAL	20
		Mounting orientation VERTICAL	23
	Calculation example	Mounting orientation HORIZONTAL	26
		Mounting orientation VERTICAL	28
Configuration and ordering	OBB-055	Configuration and ordering	30
		Dimensions	32
	OBB-085	Configuration and ordering	34
		Dimensions	36
	OBB-120	Configuration and ordering	38
		Dimensions	40
Attachments and accessories	Switch mounting – frame moves (carriage fixed)		42
	Switch mounting – carriage moves (frame fixed)		44
	Cable duct		46
	Socket and plug		47
	Switches		52
	Extension pieces		56
	Distributors		60
	Extensions for passive distributors		62
	Combination examples		64
	Mounting		66
	Carriage with clamping element	Carriage	70
		Clamping element (LKPS)	70
	Attachment of additional devices	End plate for attachment	71
	Shock absorber		72
	IndraDyn S servo motors MSK		74
	IndraDyn S servo motors MSM		76
EasyHandling			78
Service and information	Operating conditions	Normal operating conditions	82
		Design notes	82
		Required and supplementary documentation	82
	Lubrication		83
	Documentation		83
	Parameterization		84
	Further information		85
	Ordering example OBB-085	Configuration and ordering	86
	Inquiry/order form		88

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:

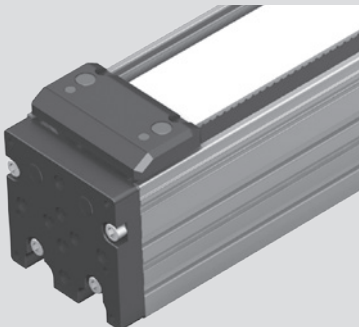
- Pick and place
- Handling systems
- Component assembly systems, palletizers
- Feed units for machine tools
- Testing and analysis systems
- Feed units in transfer lines
- Load shifters

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

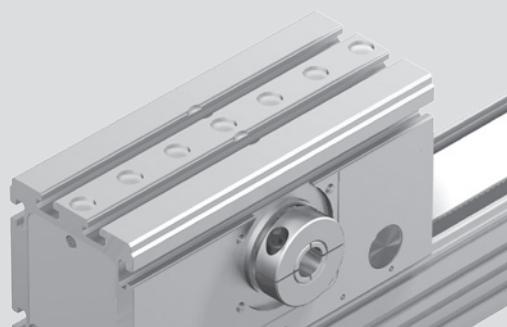
Mounting option

Fastening thread and locating holes

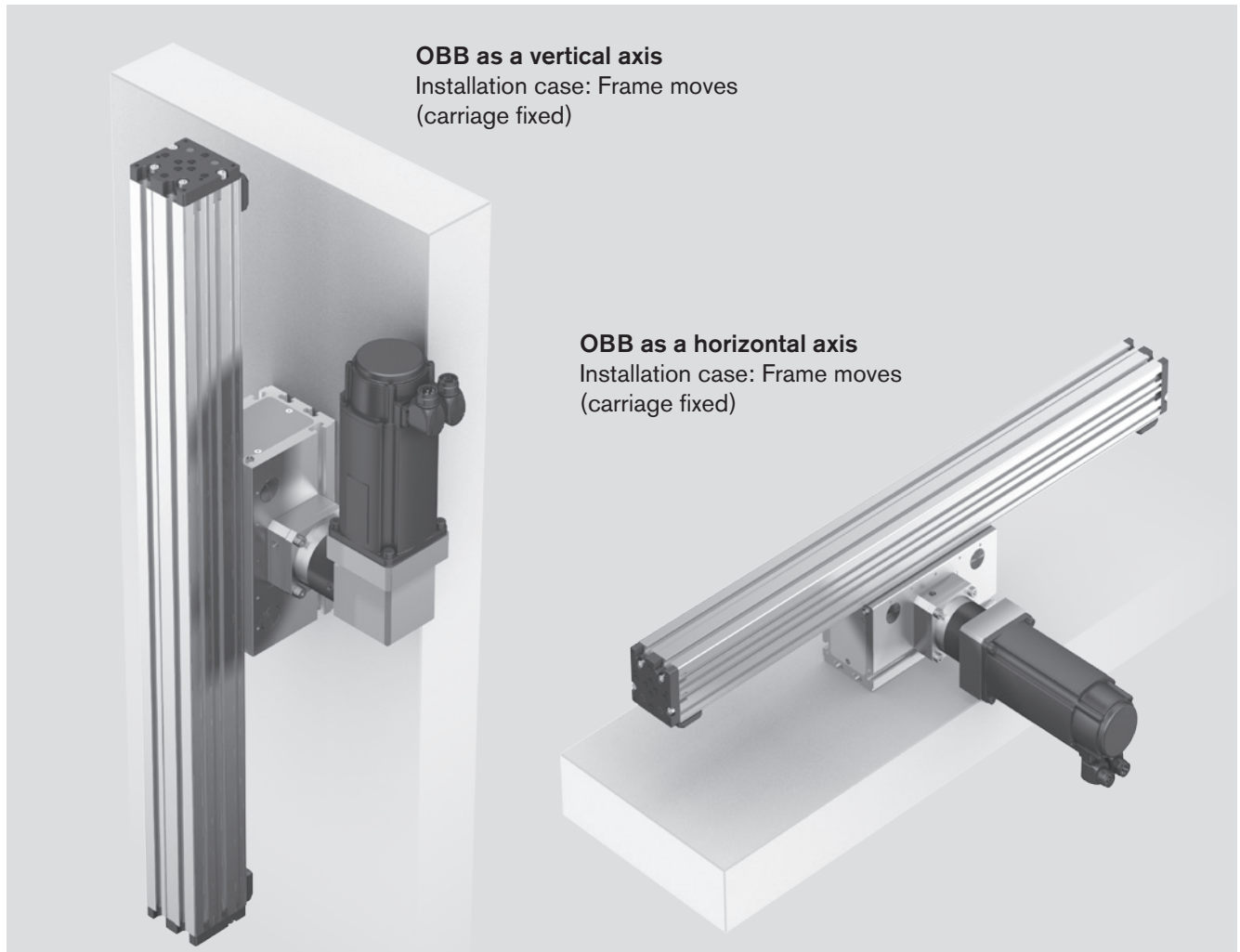
Versatile mounting options are provided by the fastening threads and locating holes on the two end plates of the frame.



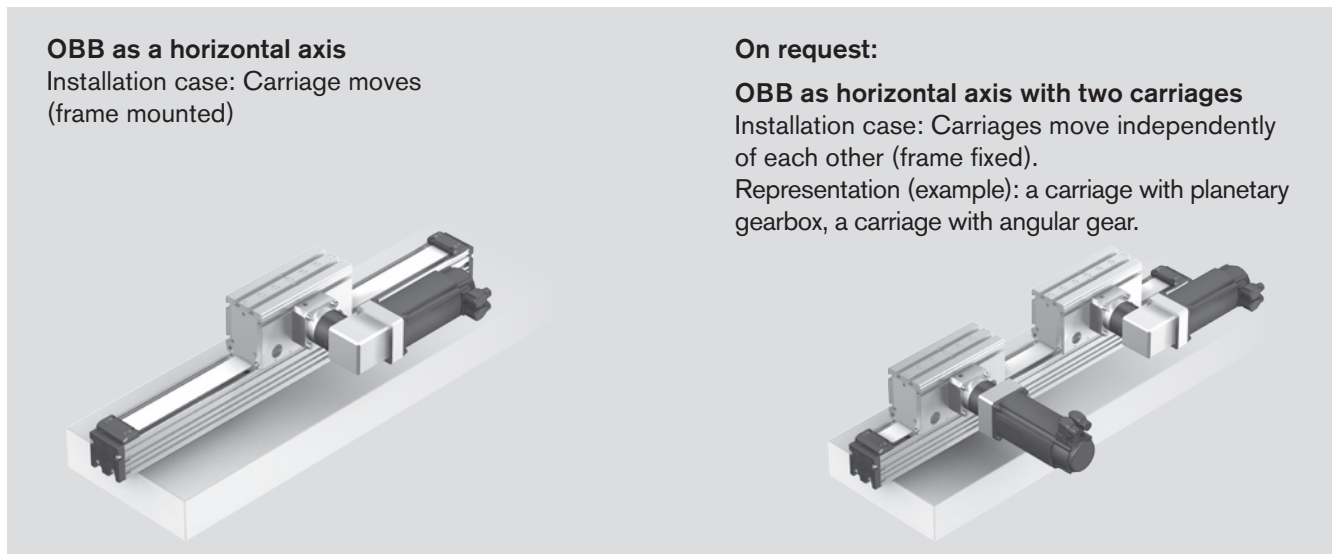
Easy mounting thanks to locating holes in the carriage



Frame HK moves



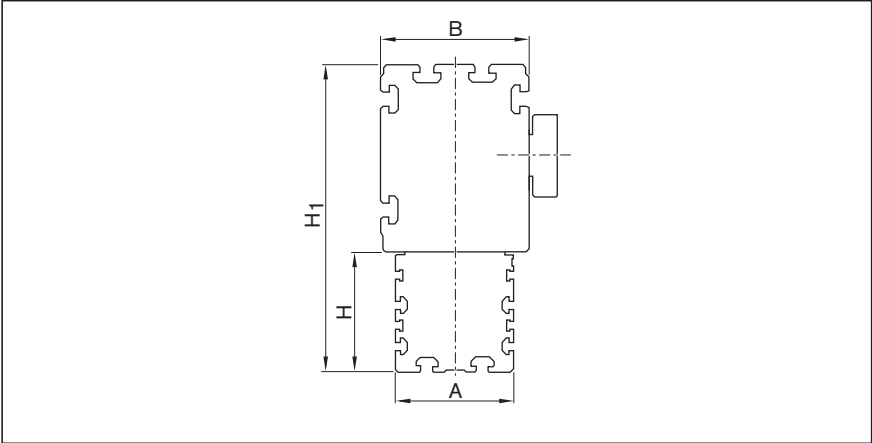
Carriage TT moves



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.



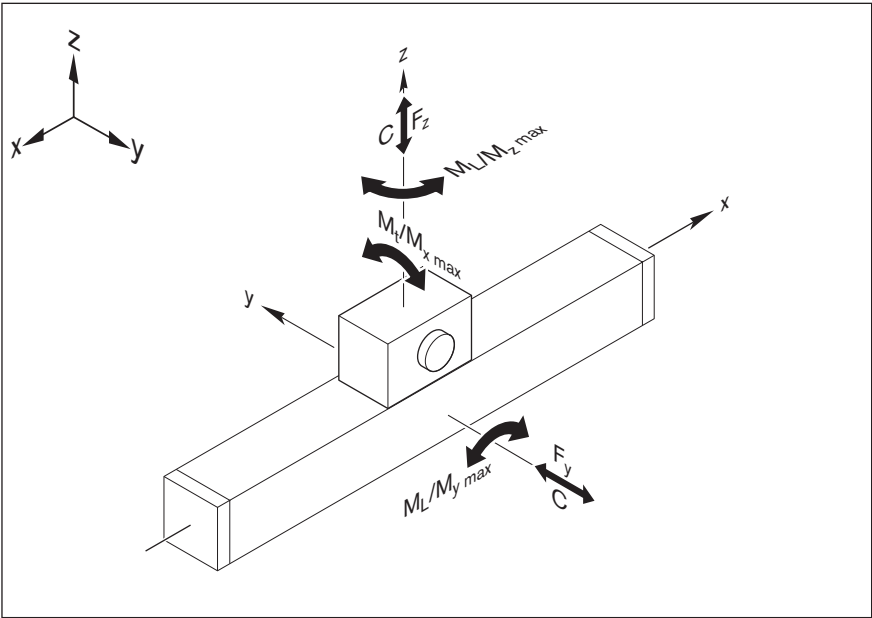
Size	Dimensions (mm)			L_{max}	Load ratings C (N)
	A/H	B	H_1		
OBB-055	55	75	135	5 500	20 790
OBB-085	85	107	222		60 600
OBB-120	120	135	285		96 200

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 , M_t , 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



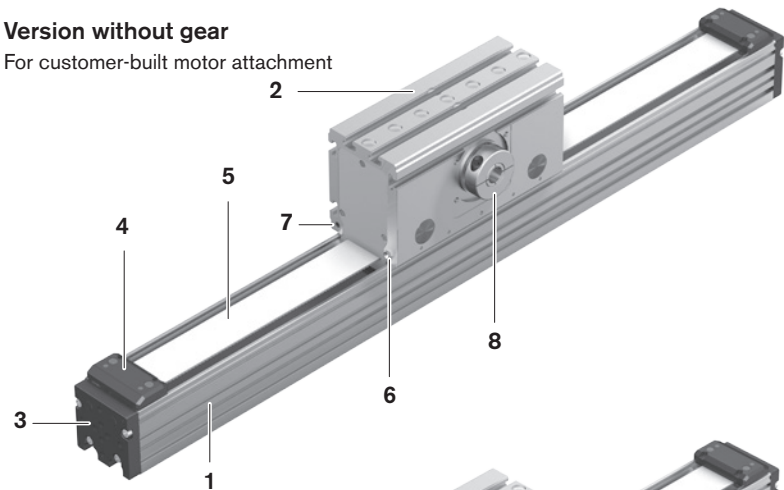
Structural design

Design (without switches)

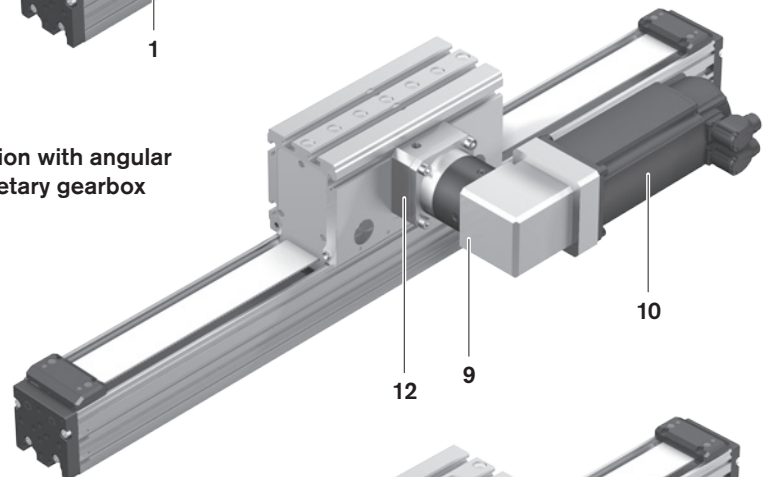
- 1 Frame
- 2 Carriage
- 3 End plate
- 4 Belt clamp
- 5 Toothed belt
- 6 Lube port
- 7 Air port
- 8 Clamping hub for motor attachment
- 9 Angular planetary gearbox (WPG)
- 10 Motor
- 11 Planetary gearbox (PG)
- 12 Mounting flange

Version without gear

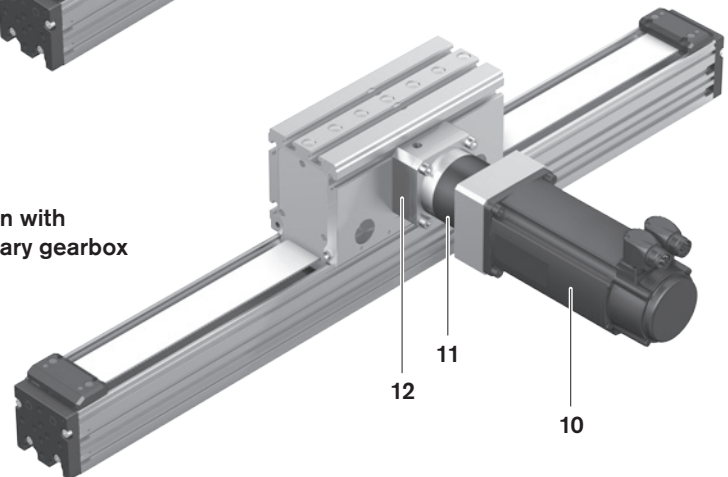
For customer-built motor attachment



Version with angular planetary gearbox



Version with planetary gearbox

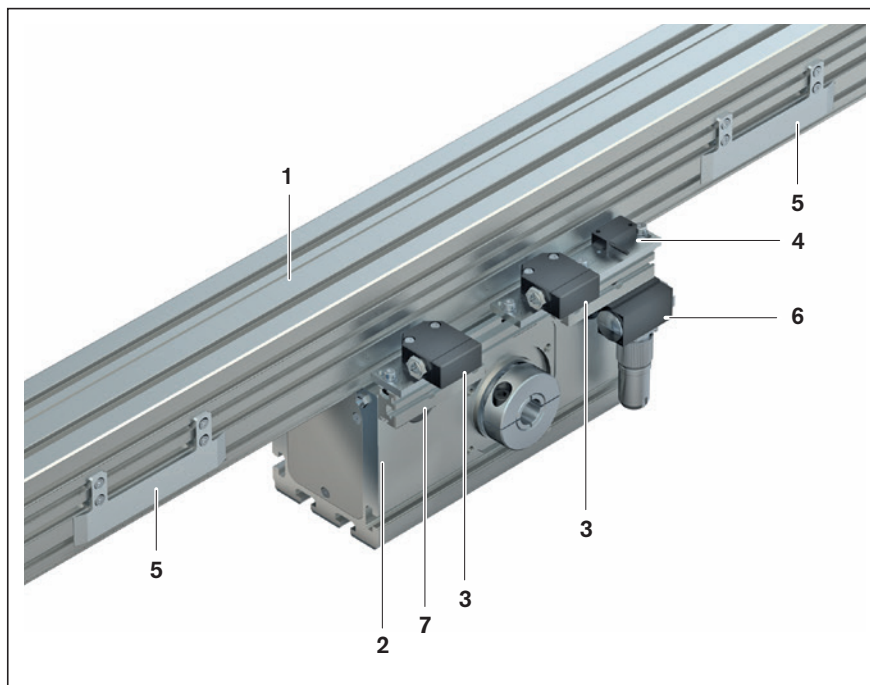


Product overview

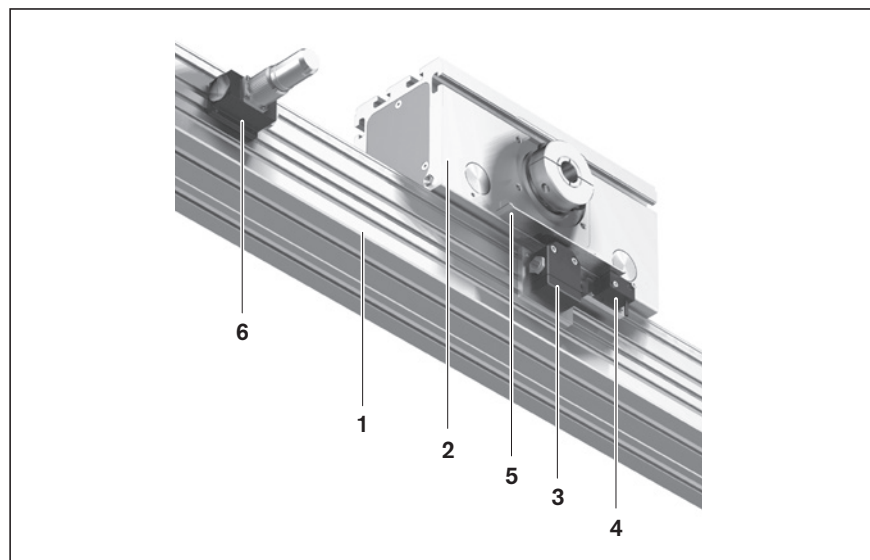
Structural design

Attachments**Frame moves
(carriage fixed)**

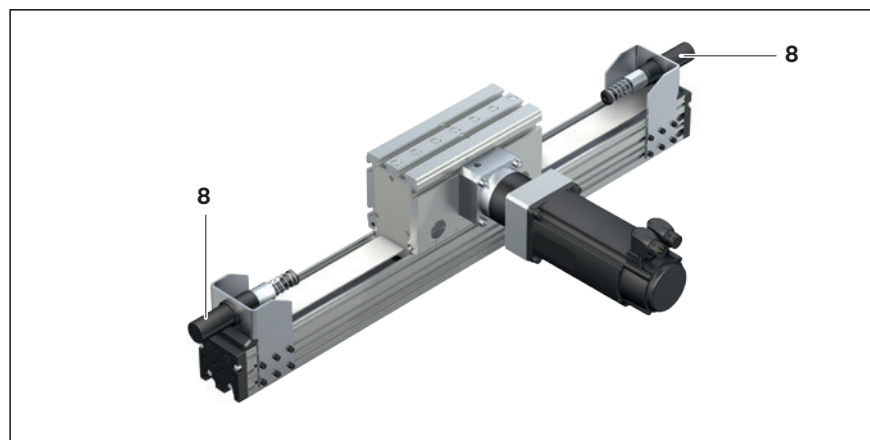
- 1 Frame
- 2 Carriage
- 3 Mechanical switches
(with attachments)
- 4 Proximity switch (with attachments)
- 5 Control strip on the frame
- 6 Socket and plug
- 7 Switch mounting profile

**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

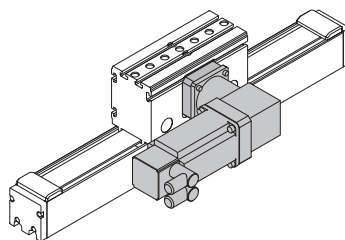
Version

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.

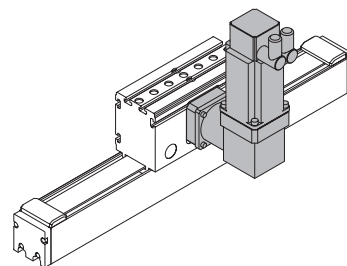
Motor attachment

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.

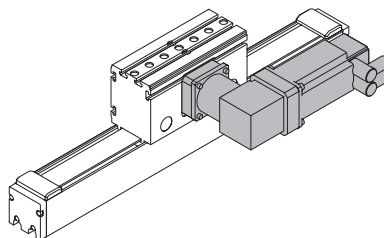
MG01



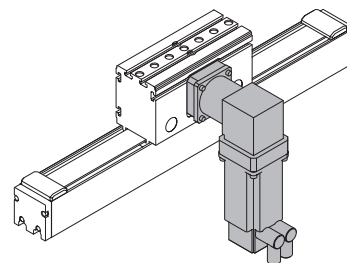
MG02



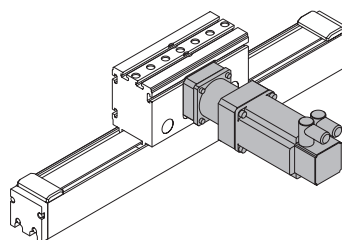
MG03



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 L_{ca}	Dynamic characteristic values			Maximum permissible loads					Clamping element	
		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)		(kgmm ²)	(kgmm)	(mm ²)	(mm)		(N)	(N)	(m/s ²)
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			Version	Mass carriage		Mass frame		I_y	I_z
	$L_{ad}^{2)}$	$s_{min}^{1)}$	L_{max}		m_{ca} (kg)		k_g fix	k_g var		
	(mm)	(mm)	(mm)		Clamping element		(kg)	(kg/mm)	(cm ⁴)	(cm ⁴)
	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.

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

$k_{g \text{ fix}}$ = constant for fixed-length portion of the mass (kg)
 $k_{g \text{ var}}$ = 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
 $F_{t \text{ perm}}$ = permissible cable pull strength
 $F_{y \text{ max}}, F_{z \text{ max}}$ = maximum permissible load in y- or z-direction
 I_y, I_z = planar moment of inertia
i = gear ratio
 $k_{J \text{ fix}}$ = constant for fixed-length portion of mass moment of inertia
 $k_{J \text{ var}}$ = constant for length-variable portion of mass moment of inertia
 $k_{J \text{ m}}$ = 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
 $M_{x \text{ max}}, M_{y \text{ max}}, M_{z \text{ max}}$ = 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

Technical data

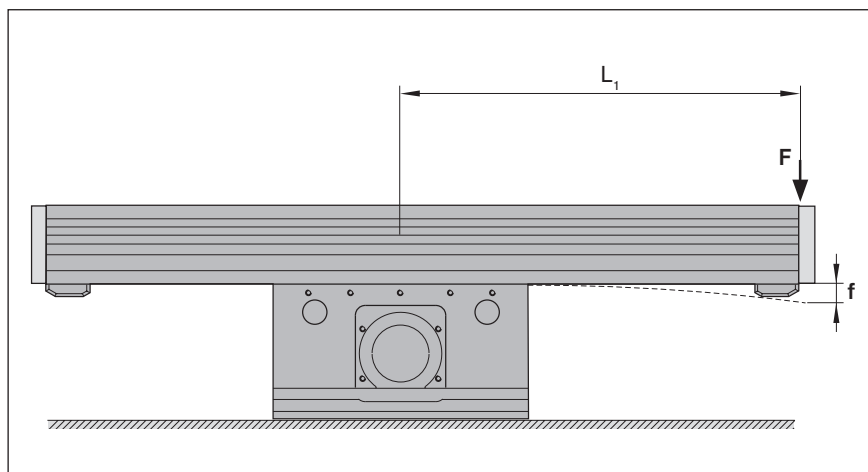
Deflection

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:

$L_1 = 800 \text{ mm}$

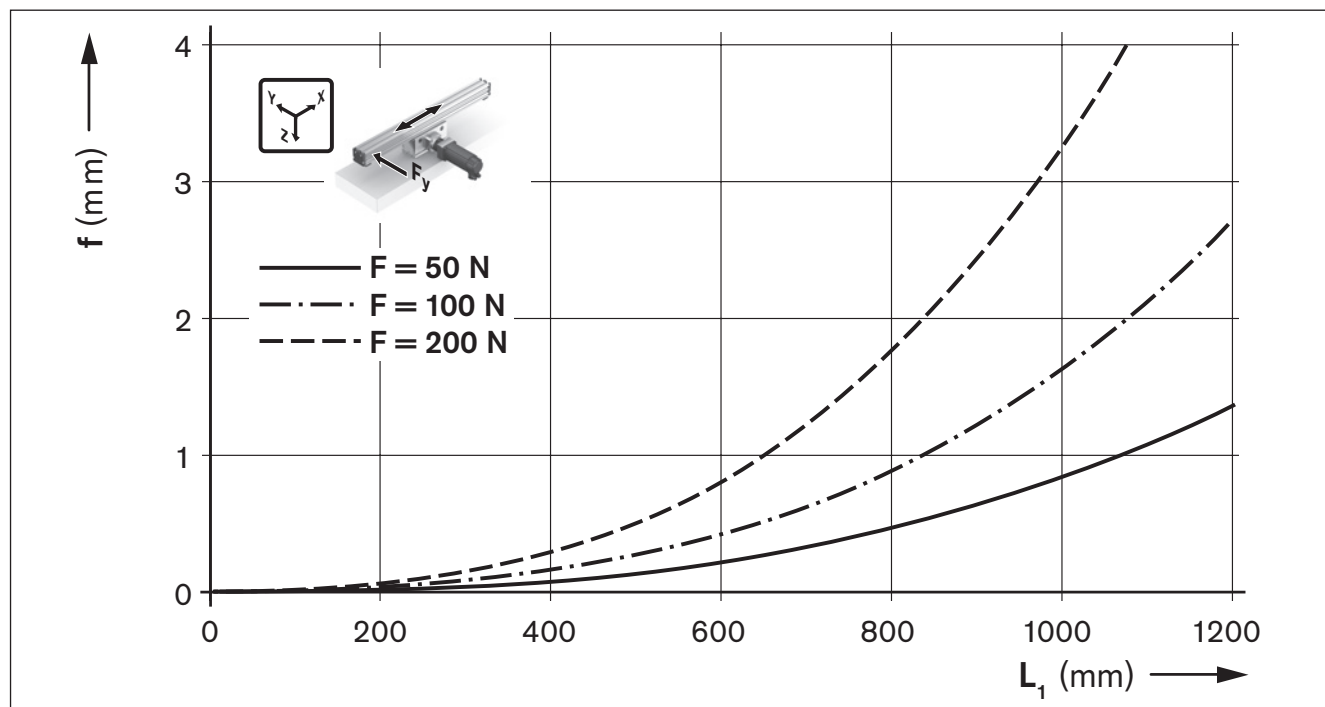
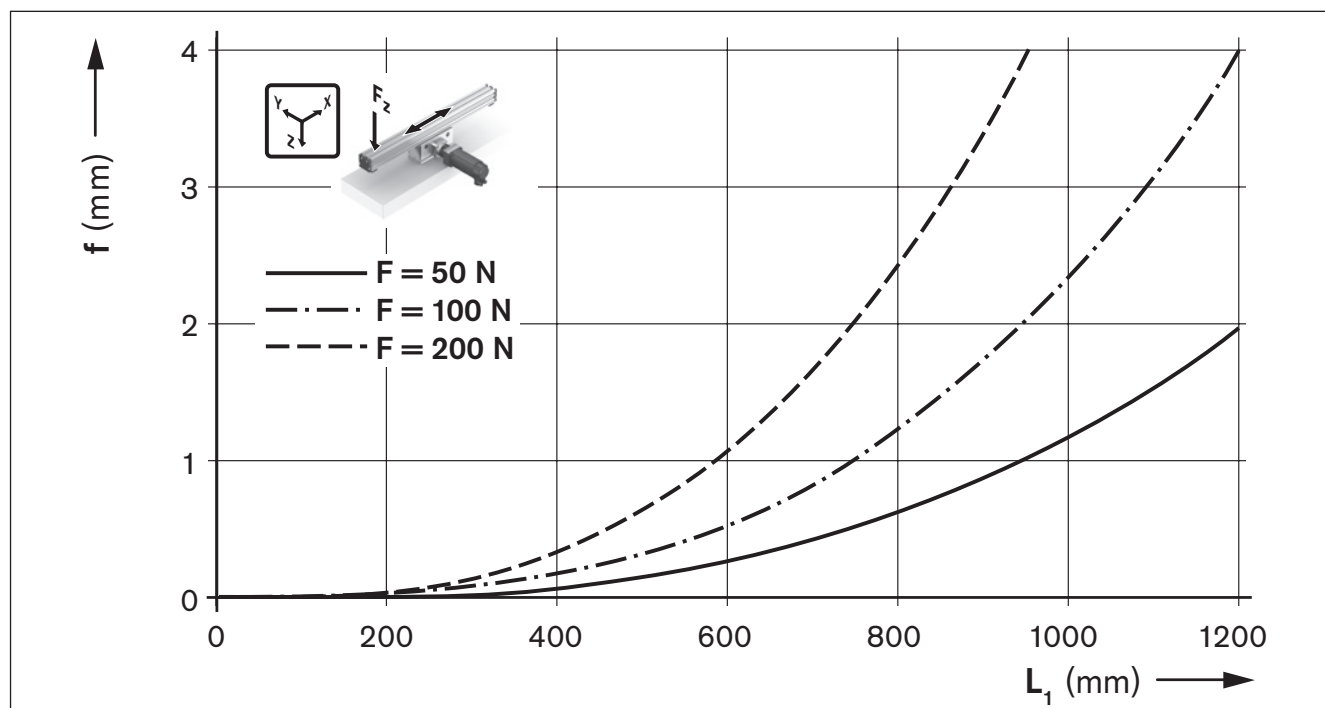
$F = 100 \text{ N}$, force acting in z-direction

$f = 1.2 \text{ mm}$

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.



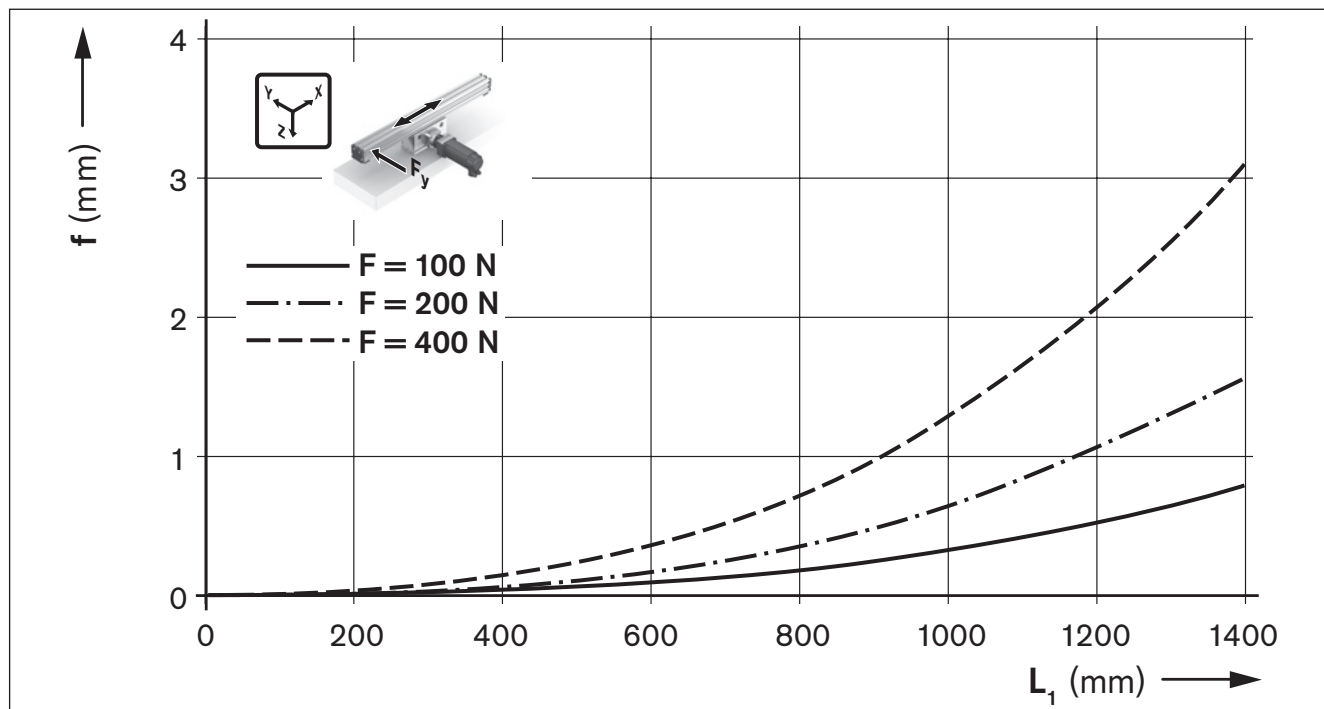
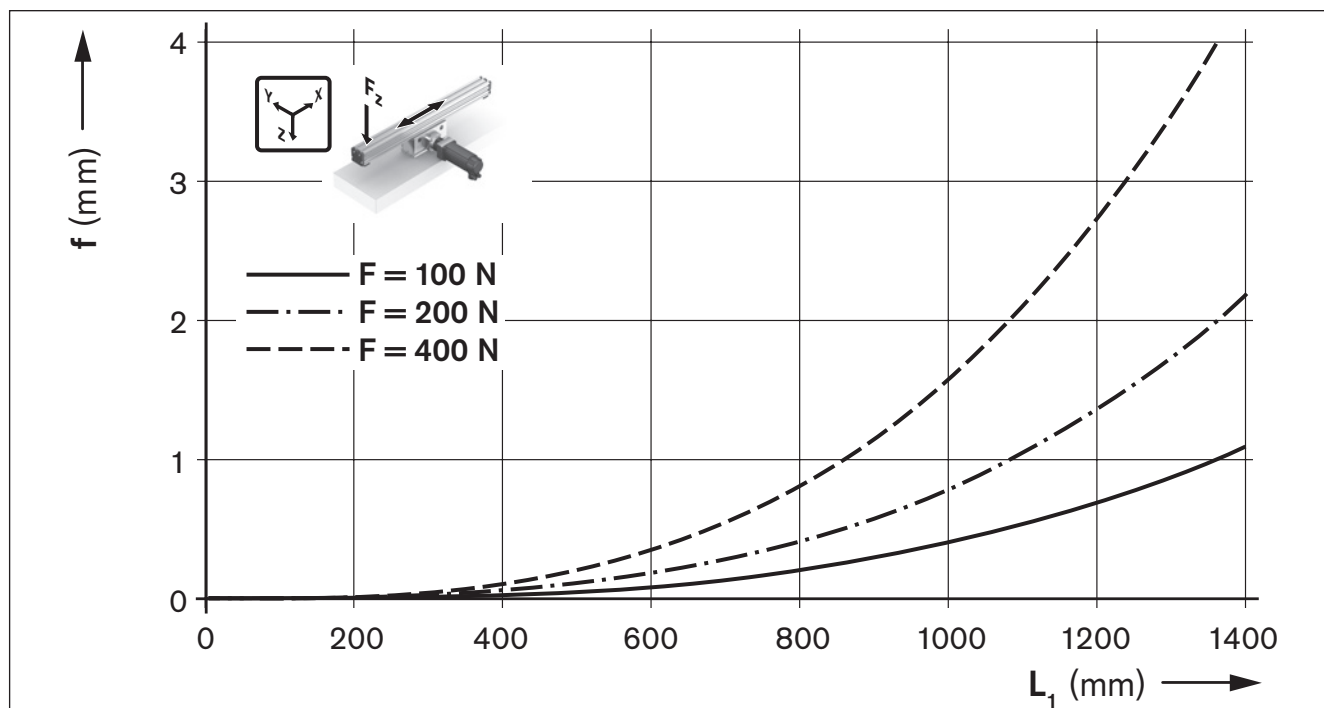
Technical data

Deflection

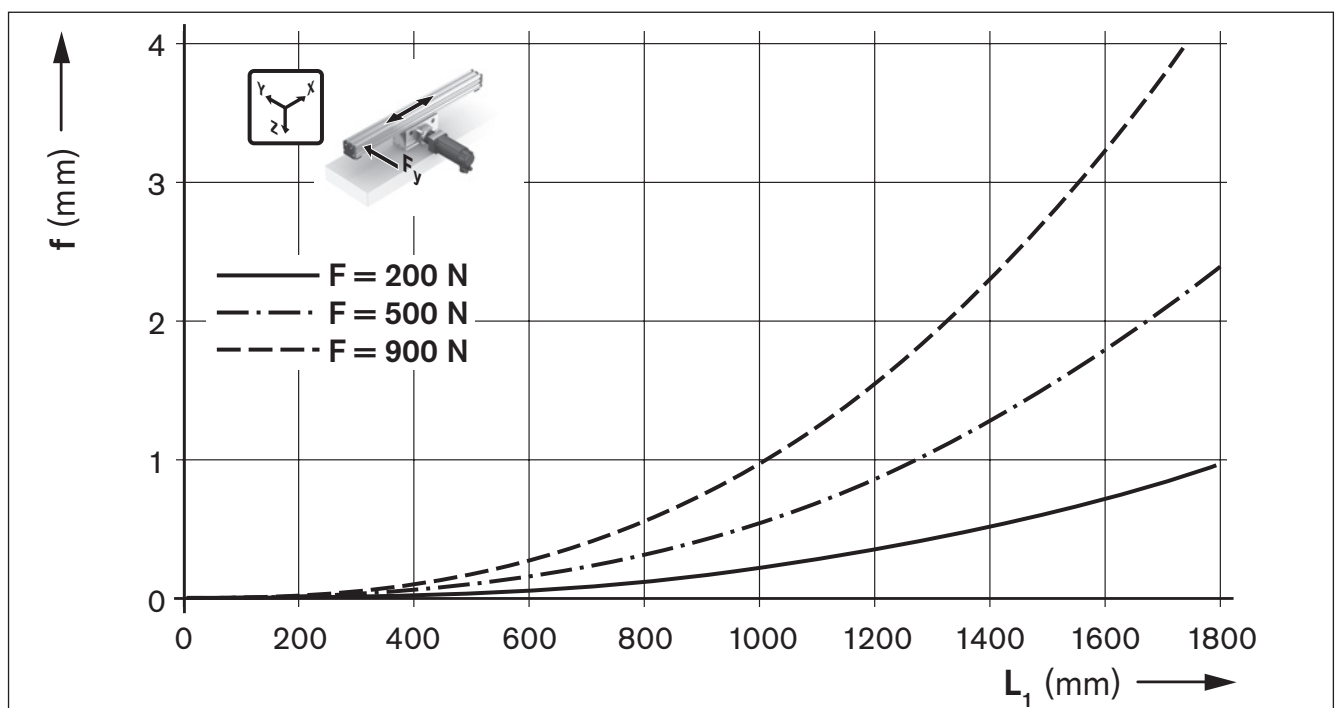
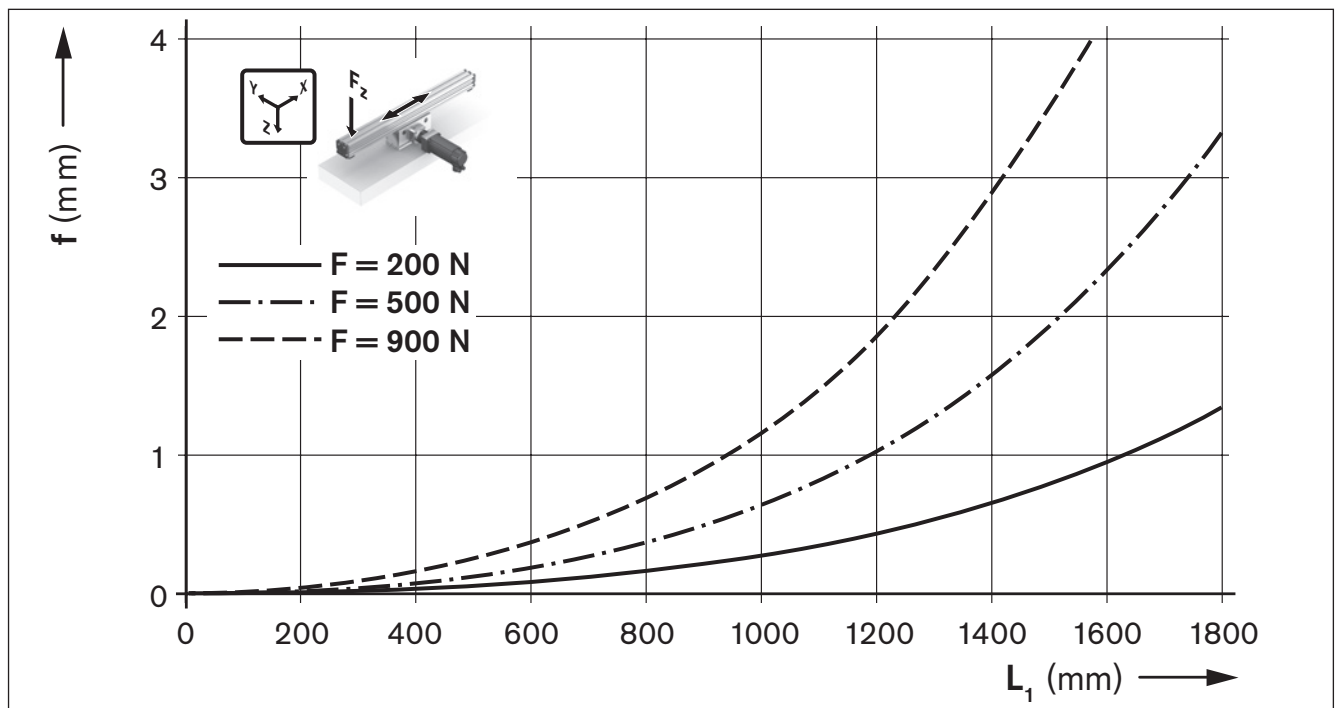
Deflection charts for loads from the z and y directions

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.



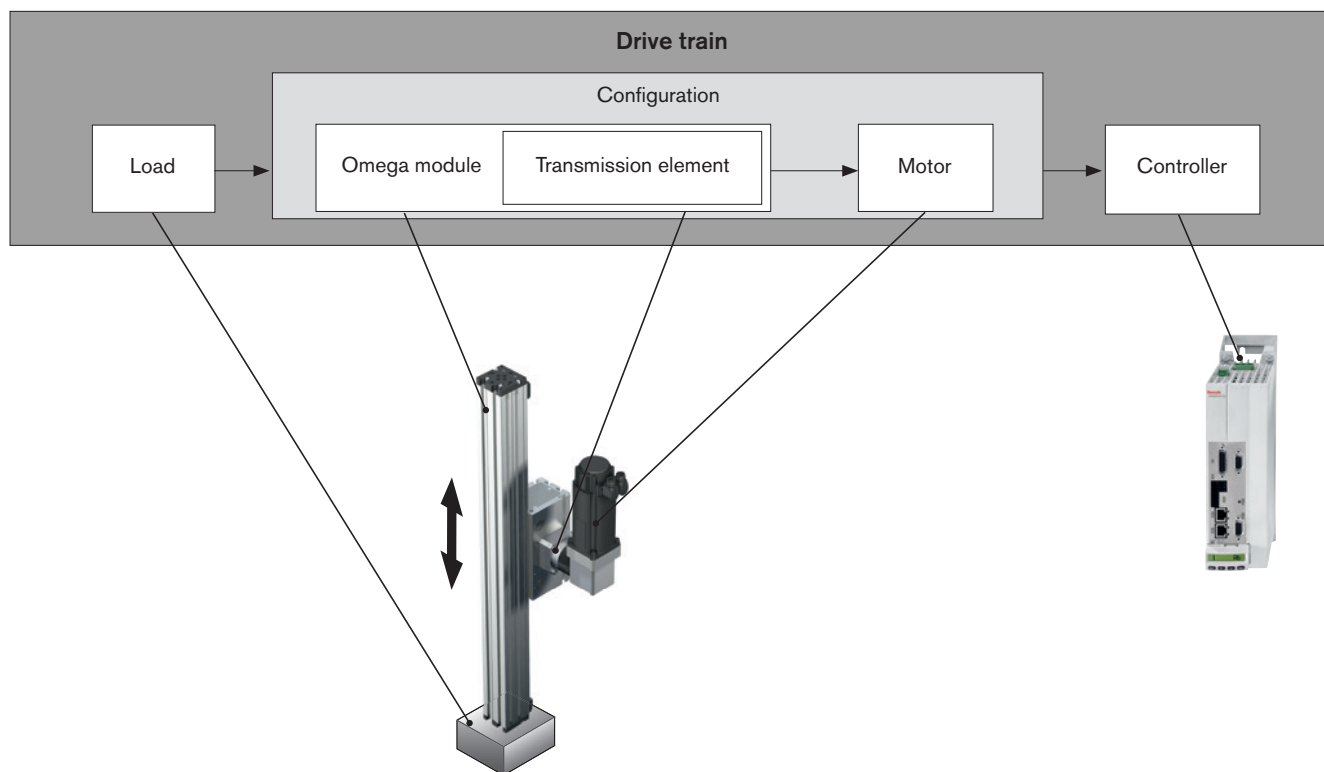
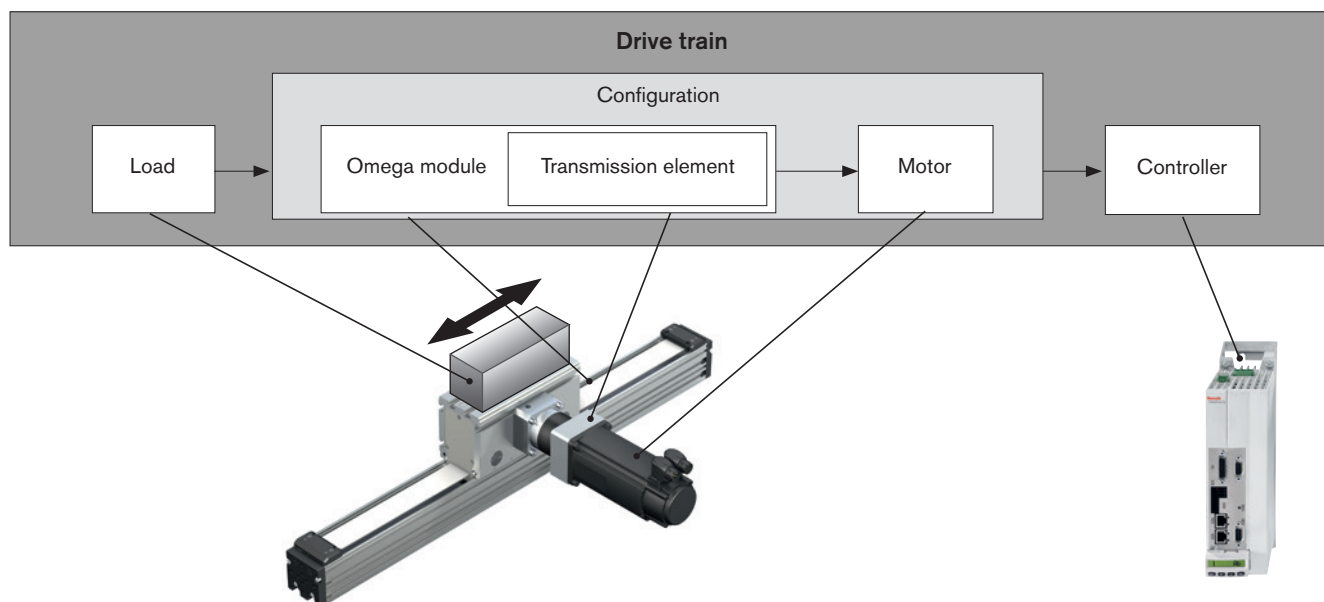
OBB-120



Calculations

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.

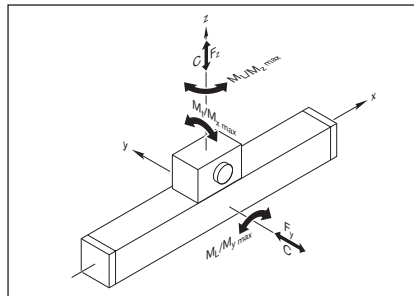
The calculated service life specification for the linear motion system is determined by the service life value of the linear guide.

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:

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



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:

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

Nominal life in hours:

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

General

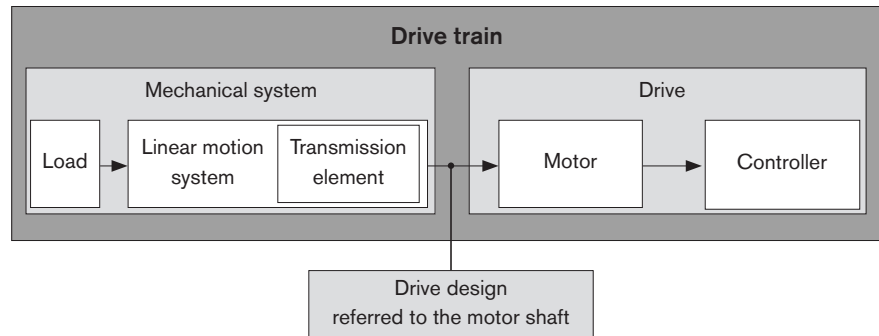
Drive design - Basic principles

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 (kgm ²)	$J_t^{1)}$	$J_S^{2)}$
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

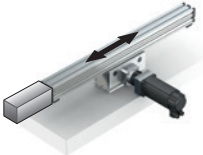
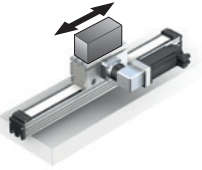
- Drive sizing referred to the motor shaft:** For the drive configuration, all the relevant design calculation values for the mechanical components contained in the drive train must be determined – and be expressed in terms of or reduced to – the motor shaft. In other words, for a combination of mechanical 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

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	$J_{ex} = J_s + J_t$	$J_{ex} = J_s + J_t$	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)
Mass moment of inertia of the linear motion system	$J_s = (k_{J_{fix}} + k_{J_{var}} \cdot L) \cdot 10^{-6}$	$J_s = (k_{J_{fix}} + k_{J_{var}} \cdot L) \cdot 10^{-6}$	$k_{J_{fix}}$ = 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)
Translatory mass moment of inertia of the additional masses to be moved	$J_t = m_{ex} \cdot k_{J_m} \cdot 10^{-6}$	$J_t = (m_{ex} + m_m + m_{br}) \cdot k_{J_m} \cdot 10^{-6}$	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	$v_{\text{mech}} = v_{\text{max}}$	$v_{\text{mech}} = v_{\text{max}}$	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)
Maximum permissible rotary speed	$n_{\text{mech}} = \frac{v_{\text{mech}} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$	$n_{\text{mech}} = \frac{v_{\text{mech}} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$	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	$M_{\text{mech}} = M_p$	$M_{\text{mech}} = M_p$	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).

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

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

Calculations

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.

$$V = \frac{J_{\text{ex}}}{J_{\text{m}} + J_{\text{br}}}$$

V = ratio of mass moments of inertia of drive train and motor (–)
 J_{ex} = mass moment of inertia of mechanical system (kgm²)
 J_{m} = mass moment of inertia, motor (kgm²)
 J_{br} = mass moment of inertia, motor brake (kgm²)

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.

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

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

	Frame moves	Carriage moves	
Static load torque	$M_{\text{stat}} = M_{\text{R}}$	$M_{\text{stat}} = M_{\text{R}}$	M_{R} = frictional torque at motor journal (Nm)

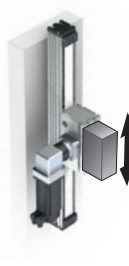
Any additional forces arising from the use of power cable chains, for example, are not included in the observation of the moving total mass and must be taken into account additionally in the calculation where applicable.

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

Installation case	Frame moves	Carriage moves
		

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.

Frictional torque	Frame moves	Carriage moves	
	$M_R = M_{Rs}$	$M_R = M_{Rs}$	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 $k_{J\text{ fix}}$, $k_{J\text{ var}}$ and $k_{J\text{ m}}$ 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.

Mass moment of inertia of the mechanical system	Frame moves	Carriage moves	
	$J_{ex} = J_s + J_t$	$J_{ex} = J_s + J_t$	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)
Mass moment of inertia of the linear motion system	Frame moves	Carriage moves	
	$J_s = (k_{J\text{ fix}} + k_{J\text{ var}} \cdot L) \cdot 10^{-6}$	$J_s = (k_{J\text{ fix}} + k_{J\text{ var}} \cdot L) \cdot 10^{-6}$	$k_{J\text{ fix}}$ = constant for fixed-length portion of mass moment of inertia (kgmm ²) $k_{J\text{ m}}$ = constant for mass-specific portion of mass moment of inertia (mm ²) $k_{J\text{ var}}$ = constant for variable-length portion of mass moment of inertia (kgmm) L = length of the linear motion system (mm)
Translatory mass moment of inertia of the additional masses to be moved	Frame moves	Carriage moves	
	$J_t = m_{ex} \cdot k_{J\text{ m}} \cdot 10^{-6}$	$J_t = (m_{ex} + m_m + m_{br}) \cdot k_{J\text{ m}} \cdot 10^{-6}$	m_{br} = mass of the holding brake (kg) m_m = mass of motor (kg) m_{ex} = moved external load (kg)

Calculations

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	$v_{\text{mech}} = v_{\text{max}}$	$v_{\text{mech}} = v_{\text{max}}$	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)
Maximum permissible rotary speed	$n_{\text{mech}} = \frac{v_{\text{mech}} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$	$n_{\text{mech}} = \frac{v_{\text{mech}} \cdot i \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$	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	$M_{\text{mech}} = M_p$	$M_{\text{mech}} = M_p$	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).

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

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.

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

V = ratio of mass moments of inertia of drive train and motor (-)
 J_{ex} = mass moment of inertia of mechanical system (kgm²)
 J_m = mass moment of inertia, motor (kgm²)
 J_{br} = mass moment of inertia, motor brake (kgm²)

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.

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

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

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.

	Frame moves	Carriage moves	
Static load torque	$M_{\text{stat}} = M_R + M_g$	$M_{\text{stat}} = M_R + M_g$	d_3 = diameter of belt pulley (mm) M_R = frictional torque at journal (Nm) $m_{\text{tot ca}}$ = total mass with moving carriage (kg) $m_{\text{tot mb}}$ = total mass with moving frame (kg) m_{mb} = mass of the moving frame (kg) $k_{g \text{ fix}}$ = fixed mass proportion on the frame (kg) $k_{g \text{ var}}$ = 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)
Weight moment	$M_g = d_3 \cdot \frac{m_{\text{tot mb}} \cdot g}{2\,000 \cdot i}$	$M_g = d_3 \cdot \frac{m_{\text{tot ca}} \cdot g}{2\,000 \cdot i}$	
Moved total mass	$m_{\text{tot mb}} = m_{\text{ex}} + m_{\text{mb}}$ $m_{\text{mb}} = k_{g \text{ fix}} + k_{g \text{ var}} \cdot L$	$m_{\text{tot ca}} = m_{\text{ex}} + m_{\text{ca}} + m_m + m_{\text{br}}$	

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

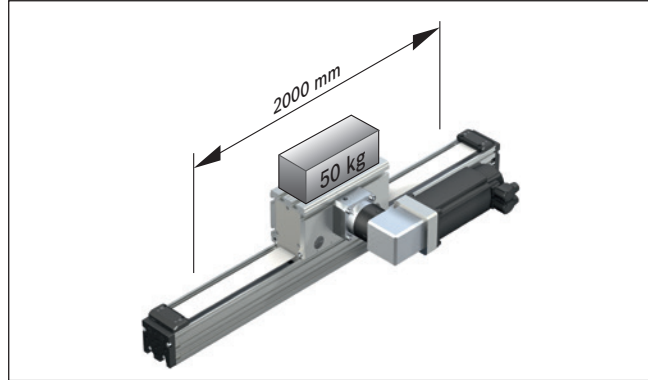
Calculation example

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.)

$$\begin{aligned} L &= s_{\max} + L_{ca} + L_{ad} \\ \text{Excess travel: } s_e &= 2 \cdot u = 2 \cdot 37.78 = 75.74 = 76 \text{ mm} \\ \text{Max. travel distance: } s_{\max} &= s_{\text{eff}} + 2 \cdot s_e \\ &= 2000 + 2 \cdot 76 = 2152 \text{ mm} \\ \text{Module length: } L &= 2152 + 330 + 170 = 2652 \text{ mm} \end{aligned}$$

Frictional torque M_R :

(including the gear with gear ratio $i = 9$)

$$\begin{aligned} M_R &= M_{Rs} \\ \text{Linear module: } M_{Rs} &= 2.02 \text{ Nm} \end{aligned}$$

Mass moment of inertia J_{ex} :

(including the gear with gear ratio $i = 9$)

$$\begin{aligned} J_{ex} &= J_s + J_t \\ \text{Linear module: } J_s &= (k_{J_{fix}} + k_{J_{var}} + L) \cdot 10^{-6} \\ &= (1838.85 + 0 + 2652) \cdot 10^{-6} \\ &= 4490.85 \cdot 10^{-6} \text{ kgm}^2 \\ \text{External load: } J_t &= (m_{ex} + m_m + m_{br}) \cdot k_{J_m} \cdot 10^{-6} \\ &= (50 + 13.8 + 0) \cdot 36.15 \cdot 10^{-6} \\ &= 2306.37 \cdot 10^{-6} \text{ kgm}^2 \\ \text{Moment of inertia: } J_{ex} &= 4490.85 \cdot 10^{-6} + 2306.37 \cdot 10^{-6} \\ &= 6797.22 \cdot 10^{-6} \text{ kgm}^2 \end{aligned}$$

Maximum permissible rotary speed n_{mech} :

(Motor attachment via gear, without consideration of the motor)
Limit value application

$$\begin{aligned} n_{\text{mech}} &= (V_{\text{mech}} \cdot i \cdot 1000 \cdot 60) / \pi \cdot d_3 \\ \text{Max. permissible travel speed: } V_{\text{mech}} &= V_{\max} = 1.86 \text{ m/s} \\ \text{Max. permissible rotary speed: } n_{\text{mech}} &= (1.86 \cdot 9 \cdot 1000 \cdot 60) / \pi \cdot 108.23 \\ &= 2954 \text{ min}^{-1} \end{aligned}$$

Maximum speed of the application M_{mech} :

(Motor attachment via gear)
Limit value application

$$\begin{aligned} \text{Speed: } v_{\text{mech}} &= 1.5 \text{ m/s} \\ \text{Speed: } n_{\text{mech}} &= (1.5 \cdot 9 \cdot 1000 \cdot 60) / \pi \cdot 108.23 \\ &= 2382 \text{ min}^{-1} \end{aligned}$$

Maximum permissible drive torque M_{mech} :

(Motor attachment via gear)
Limit value application

$$\begin{aligned} M_{\text{mech}} &= M_P \\ \text{Drive torque: } M_{\text{mech}} &= 17.1 \text{ Nm} \end{aligned}$$

Checking the motor preselection:

selected motor MSK 076C without brake

Condition 1:

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

Condition 2:

Mass moment of inertia ratio:	$V = J_{\text{ex}} / (J_{\text{m}} + J_{\text{Br}})$
Motor inertia:	$J_{\text{m}} = 4\,300 \cdot 10^{-6} \text{ kgm}^2$
Brake moment of inertia:	$J_{\text{Br}} = 0 \text{ kgm}^2 \text{ (without brake)}$
Inertia ratio:	$V = 4\,145.22 \cdot 10^{-6} / (4\,300 \cdot 10^{-6} + 0 \cdot 10^{-6})$ $= 0.96$
Condition for handling:	$V \leq 6$ $0.96 \leq 6$
condition fulfilled – motor size OK	

Condition 3:

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

Result:**Omega module OBB-120**

Length	$L = 2\,652 \text{ mm}$
Max. travel distance	$s_{\max} = 2\,152 \text{ mm}$
Carriage length	$L_{\text{ca}} = 330 \text{ mm}$
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: $M_{\text{R}} = 2.02 \text{ Nm}$
 - Mass moment of inertia: $J_{\text{ex}} = 4\,145.22 \cdot 10^{-6} \text{ kgm}^2$
 - Speed: $v_{\text{mech}} = 1.5 \text{ m/s}$
($n_{\text{mech}} = 2\,382 \text{ min}^{-1}$)
 - Limit value for Drive torque: $M_{\text{mech}} = 17.1 \text{ Nm}$
- The motor torque must be limited to 17.1 Nm on the drive side!
- Limit value for acceleration: $a_{\max} = 50 \text{ m/s}^2$
 - Limit value for speed: $v_{\text{mech}} = 1.86 \text{ m/s}$
($n_{\text{mech}} = 2\,954 \text{ min}^{-1}$)

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 with 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.)

Frictional torque M_R :

(including the gear with gear ratio $i = 8$)

Mass moment of inertia J_{ex} :

(including the gear with gear ratio $i = 8$)

Maximum permissible rotary speed n_{mech} :

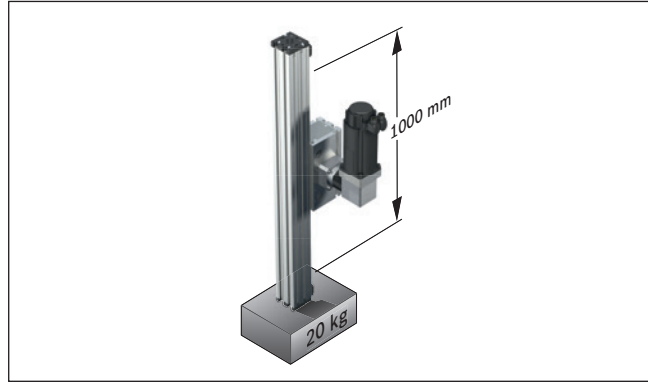
(Motor attachment via gear,
without consideration of the motor)
Limit for mechanical system

Maximum speed of the application M_{mech} :

(Motor attachment via gear)
Limit value application

Maximum permissible drive torque M_{mech} :

(Motor attachment via gear)
Limit for mechanical system



$$\begin{aligned} L &= s_{max} + L_{ca} + L_{ad} \\ \text{Excess travel: } s_e &= 2 \cdot u = 2 \cdot 31.88 = 63.76 = 64 \text{ mm} \\ \text{Max. travel distance: } s_{max} &= s_{eff} + 2 \cdot s_e \\ &= 1\,000 + 2 \cdot 64 = 1\,128 \text{ mm} \\ \text{Module length: } L &= 1\,128 + 260 + 130 = 1\,518 \text{ mm} \end{aligned}$$

$$\begin{aligned} M_R &= M_{Rs} \\ \text{Linear module: } M_{Rs} &= 0.93 \text{ Nm} \end{aligned}$$

$$\begin{aligned} J_{ex} &= J_s + J_t \\ \text{Linear module: } J_s &= (k_{J_{fix}} + k_{J_{var}} + L) \cdot 10^{-6} \\ &= (123.47 + 0.2821 \cdot 1\,518) \cdot 10^{-6} \\ &= 551.657 \cdot 10^{-6} \text{ kgm}^2 \\ \text{External load: } J_t &= m_{ex} \cdot k_{J_m} \cdot 10^{-6} \\ &= 20 \cdot 25.74 \cdot 10^{-6} \text{ kgm}^2 \\ &= 514.732 \cdot 10^{-6} \text{ kgm}^2 \\ \text{Moment of inertia: } J_{ex} &= 551.657 \cdot 10^{-6} + 514.732 \cdot 10^{-6} \\ &= 1\,066.389 \cdot 10^{-6} \text{ kgm}^2 \end{aligned}$$

$$\begin{aligned} n_{mech} &= (V_{mech} \cdot i \cdot 1\,000 \cdot 60) / \pi \cdot d_3 \\ \text{Max. permissible travel speed: } V_{mech} &= V_{max} = 2.13 \text{ m/s} \\ \text{Max. permissible rotary speed: } n_{mech} &= (2.13 \cdot 8 \cdot 1\,000 \cdot 60) / \pi \cdot 81.17 \\ &= 4\,009 \text{ min}^{-1} \end{aligned}$$

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

$$\begin{aligned} M_{mech} &= M_P \\ \text{Drive torque: } M_{mech} &= 5 \text{ Nm} \end{aligned}$$

Checking the motor preselection:

selected motor MSK 050C with brake

Condition 1:

$$\begin{aligned} \text{Speed:} \quad n_{\max} &\geq n_{\text{mech}} \\ 6\,000 &\geq 2\,823 \end{aligned}$$

condition fulfilled – motor size OK

Condition 2:

$$\begin{aligned} \text{Mass moment of inertia ratio:} \quad V &= J_{\text{ex}} / (J_{\text{m}} + J_{\text{Br}}) \\ \text{Motor inertia:} \quad J_{\text{m}} &= 330 \cdot 10^{-6} \text{ kgm}^2 \\ \text{Brake moment of inertia:} \quad J_{\text{Br}} &= 107 \cdot 10^{-6} \text{ kgm}^2 \text{ (with brake)} \\ \text{Inertia ratio:} \quad V &= 1\,066.389 \cdot 10^{-6} / (330 \cdot 10^{-6} + 107 \cdot 10^{-6}) \\ &= 2.44 \\ \text{Condition for handling: } V &\leq 6 \\ 2.44 &\leq 6 \end{aligned}$$

condition fulfilled – motor size OK

Condition 3:

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

condition fulfilled – motor size OK

Result:**Omega module OBB-085**

Length	$L = 1\,518 \text{ mm}$
Max. travel distance	$s_{\max} = 1\,128 \text{ mm}$
Carriage length	$L_{\text{ca}} = 260 \text{ mm}$
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: $M_{\text{R}} = 0.93 \text{ Nm}$
 - Mass moment of inertia: $J_{\text{ex}} = 1\,066.389 \cdot 10^{-6} \text{ kgm}^2$
 - Speed: $v_{\text{mech}} = 1.5 \text{ m/s}$
($n_{\text{mech}} = 2\,823 \text{ min}^{-1}$)
 - Limit value for Drive torque: $M_{\text{mech}} = 5 \text{ Nm}$
- The motor torque must be limited to 5 Nm on the drive side!
- Limit value for acceleration: $a_{\max} = 50 \text{ m/s}^2$
 - Limit value for speed: $v_{\text{mech}} = 2.13 \text{ m/s}$
($n_{\text{mech}} = 4\,009 \text{ min}^{-1}$)

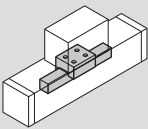
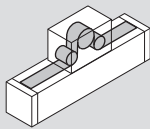
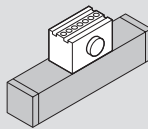
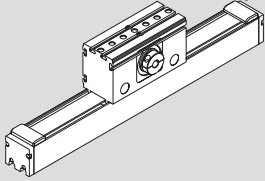
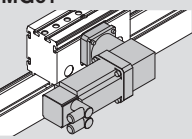
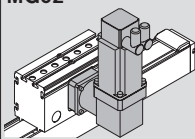
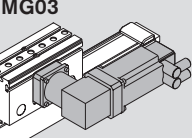
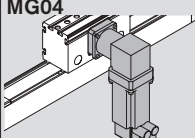
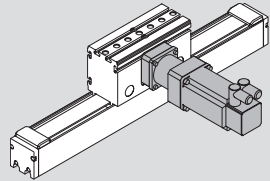
After the excess travel stopping distance has been determined during the exact design, check whether the selected excess travel is sufficient or whether, if appropriate, an adjustment must be made.

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

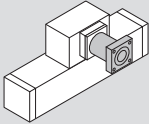
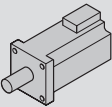
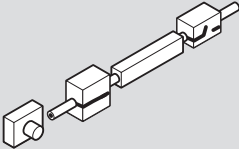
Configuration and ordering

Short product name, length OBB-055-NN-1, mm		Guideway	Drive				Carriage	
Version ²⁾								
			Reduction				$L_{ca} = 230 \text{ mm}$	
			i = 1	i = 3	i = 5	i = 8	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 	01	–	10			01	02
	MG02 							
	MG03 	01	–	10			01	02
	MG04 							
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
							 standard report
Speed reduction $i =$	Attachment kit ³⁾ for motor with gear			without	with		
	MG01 MG03	MG02 MG04			Brake		
–	00	–	00			Without switch and without cable duct 00	01
						Carriage moves	
						Switch:	
						– PNP NC	
						– PNP NO	
						– Mechanical	
						Cable duct¹⁾	
						Socket-plug	
						Switching angle	
						Frame moves	
						Switch:	
						– PNP NC	
						– PNP NO	
						– Mechanical	
						Socket-plug	
						Two control strips	
$i = 3$	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						

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):

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

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

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)

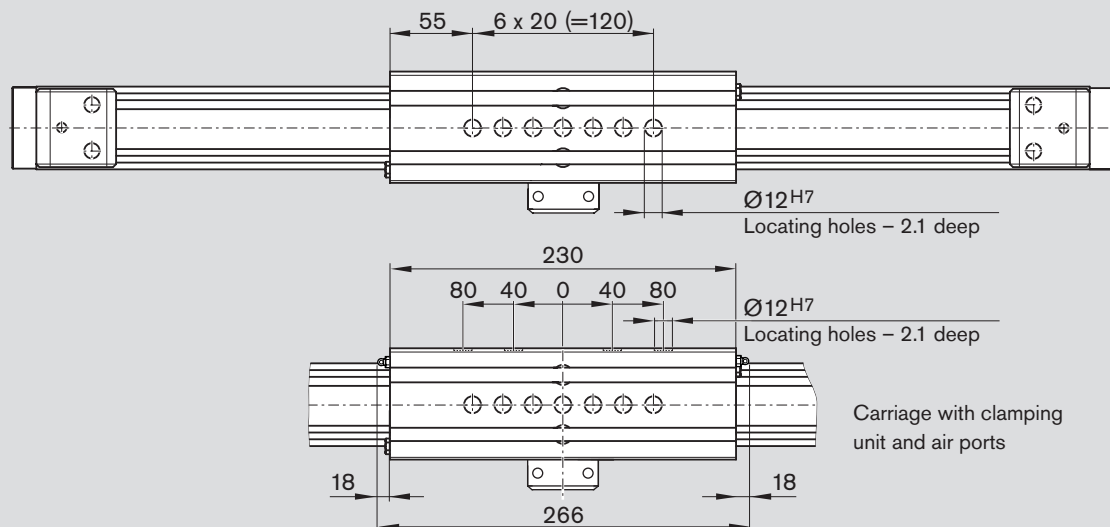
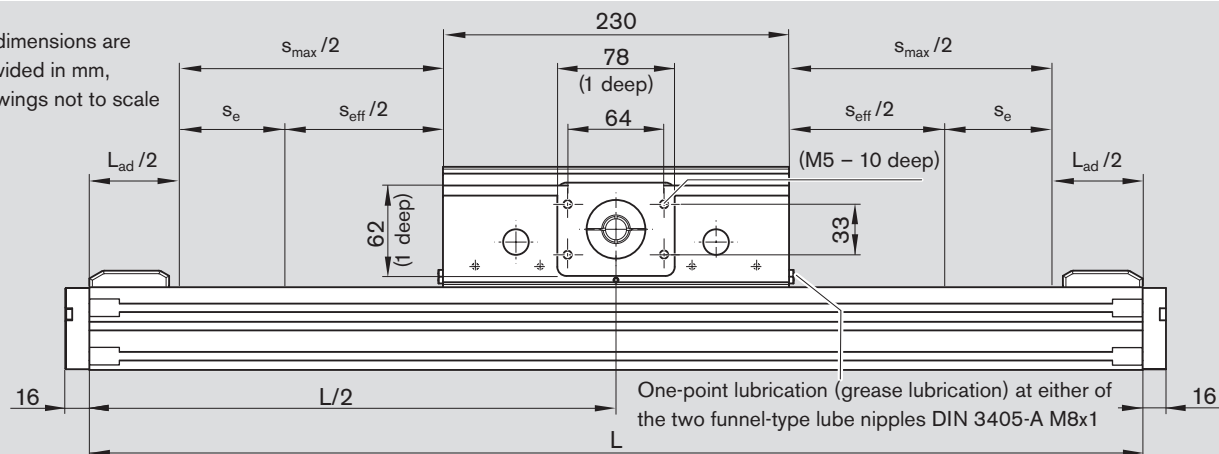
s_e = excess travel (mm)

Configuration and ordering

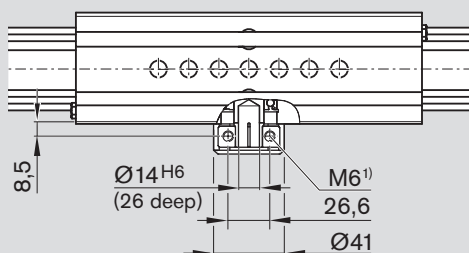
OBB-055

Dimensions

All dimensions are provided in mm,
drawings not to scale

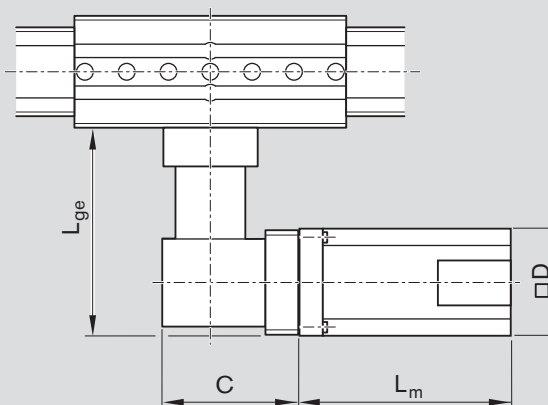


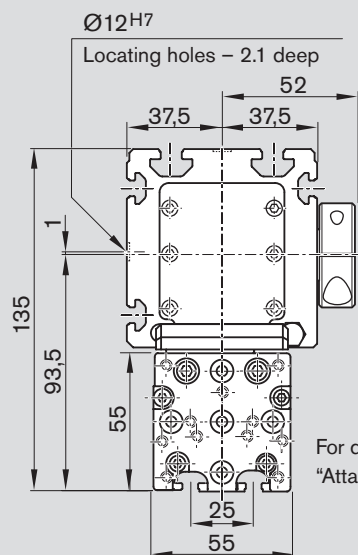
MA01



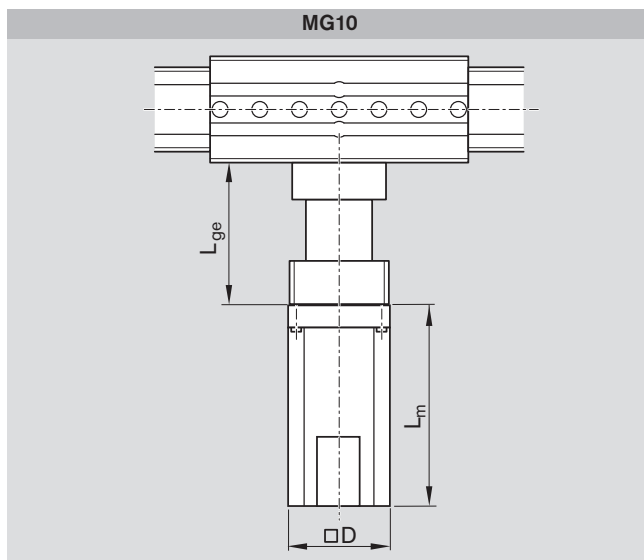
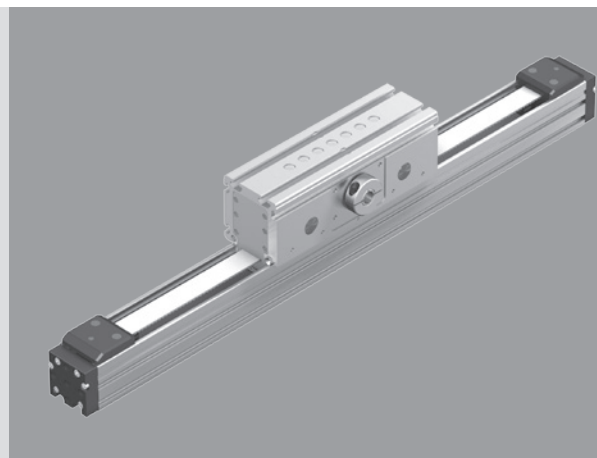
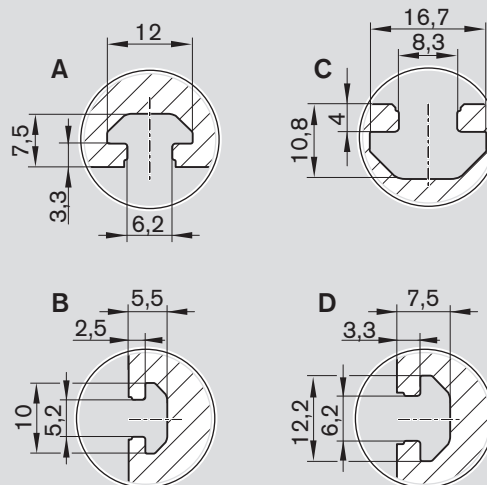
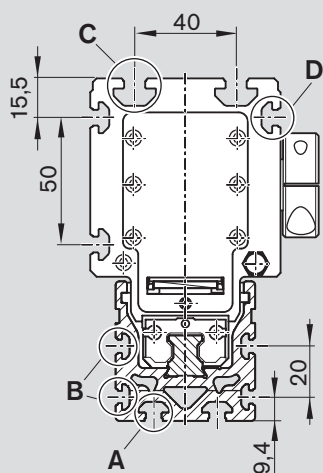
¹⁾Cylinder screw ISO 4762

MG01, MG02, MG03, MG04





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



Motor ¹⁾	Dimensions (mm)					
	Gear unit			Motor		
	MG		MG	D	L _m	
	01/02/03/04	10				
	L _{ge}	C	L _{ge}	without brake	with brake	
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 D = motor width
 C = gear height L_m = motor length
 L_{ge} = gear 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)

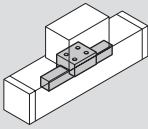
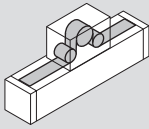
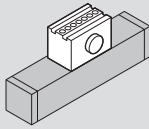
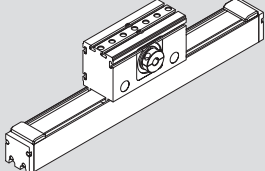
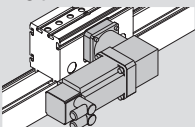
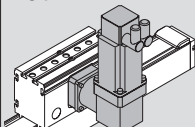
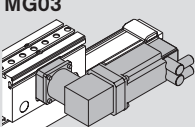
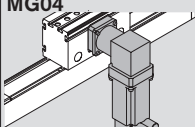
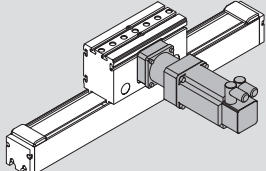
s_{eff} = effective travel distance (mm)

s_e = excess travel (mm)

Configuration and ordering

OBB-085

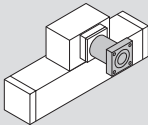
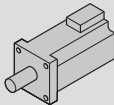
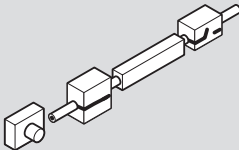
Configuration and ordering

Short product name, length OBB-085-NN-1, mm		Guideway	Drive			Carriage	
Version ²⁾							
			Reduction			L _{ca} = 260 mm L _{ca} = 308 mm	
			i = 1	i = 5	i = 8	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 	01	—	10		01	02
	MG02 						
	MG03 						
	MG04 						
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		for motor	without	with			standard report	
		MG01	MG02			brake				
		MG03	MG04							
	–	00		–	00		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	

- 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):

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

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

L_{ca} = carriage length (mm)

L_{ad} = additional length (mm)

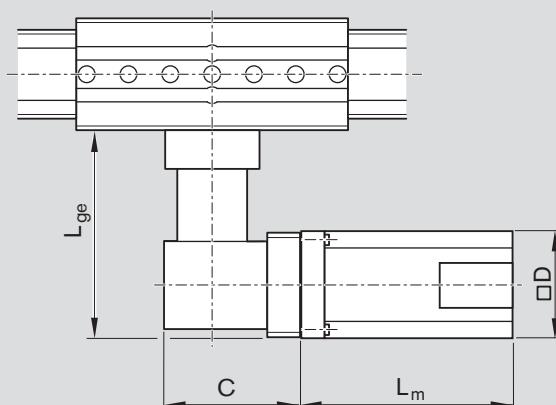
(for the value, see the table in the section "General technical data")

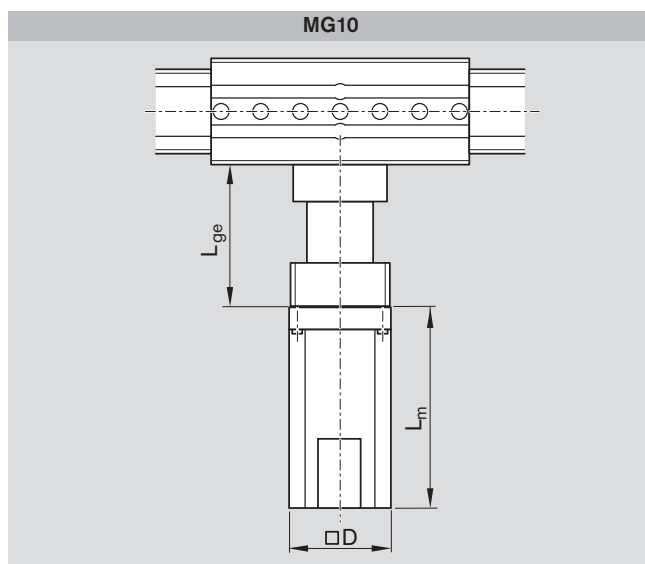
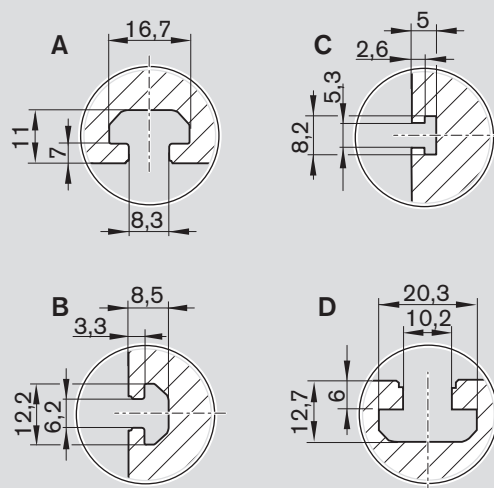
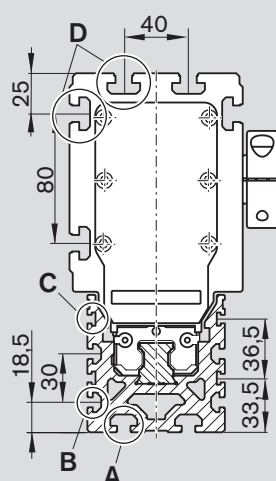
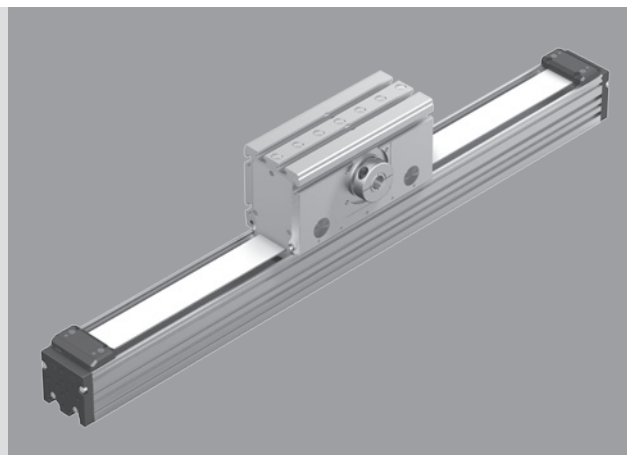
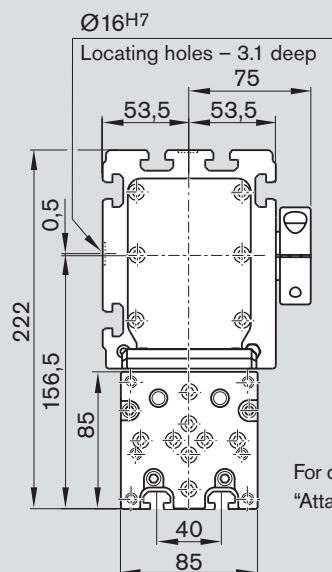
$s_{\max}$ = maximum travel distance (mm)

s_{eff} = effective travel distance (mm)

s_e = excess travel (mm)

OBB-085





Motor ¹⁾	Dimensions (mm)					
	Gear unit		Motor			
	MG		MG	D	L _m	
	01/02/03/04	10			without brake	with brake
	L _{ge}	C	L _{ge}			
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"

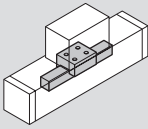
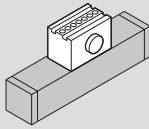
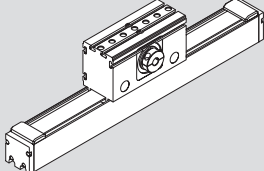
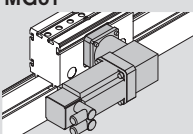
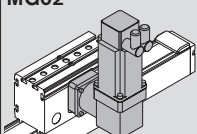
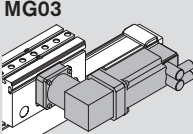
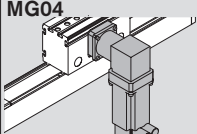
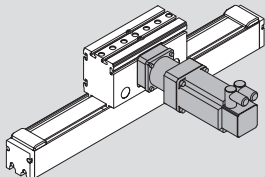
L = length
C = gear height
L_{ge} = gear length
D = motor width
L_m = motor length

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

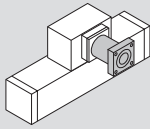
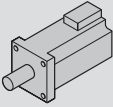
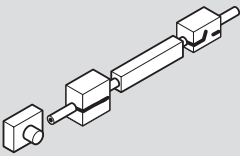
Configuration and ordering

Short product name, length OBB-120-NN-1, mm		Guideway	Drive		Carriage	
Version ²⁾			Reduction		 $L_{ca} = 330 \text{ mm}$	
			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
							 standard report
Speed reduction i =	Attachment kit ³⁾ with gear		for motor	without brake	with brake		
	MG01 MG03	MG02 MG04					
–	00		–	00		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	01
i = 9	31	32	MSK 076C	92	93		
i = 9	30		MSK 076C	92	93		

- 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):

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

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

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)

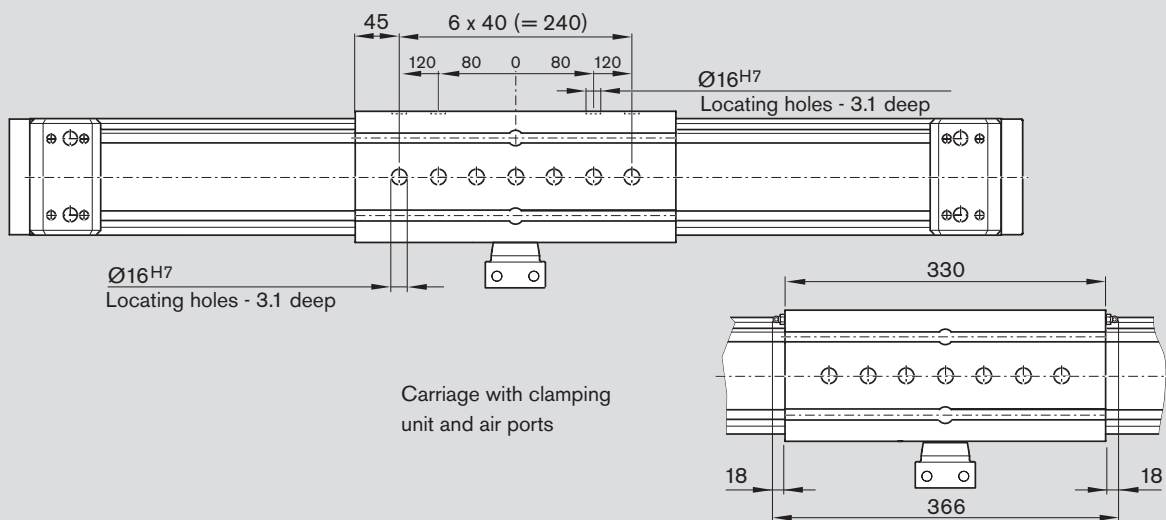
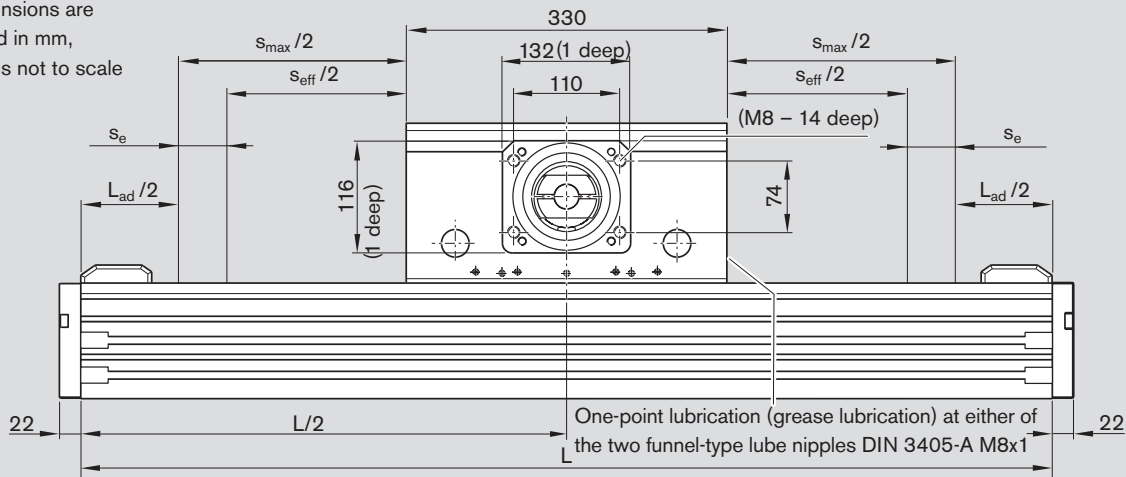
s_e = excess travel (mm)

Configuration and ordering

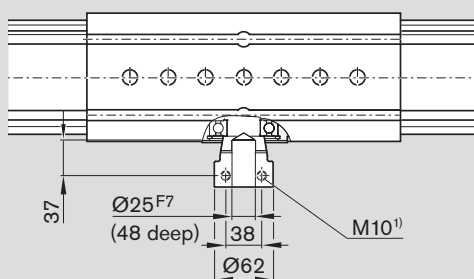
OBB-120

Dimensions

All dimensions are
provided in mm,
drawings not to scale

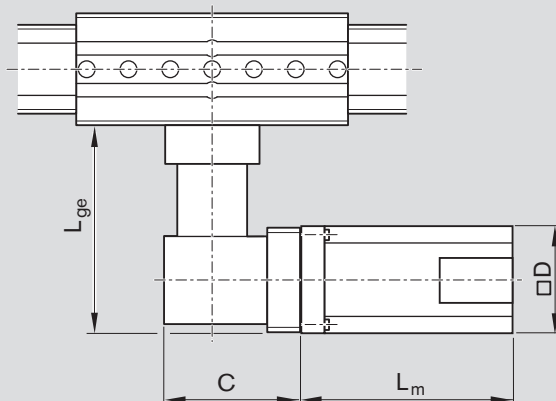


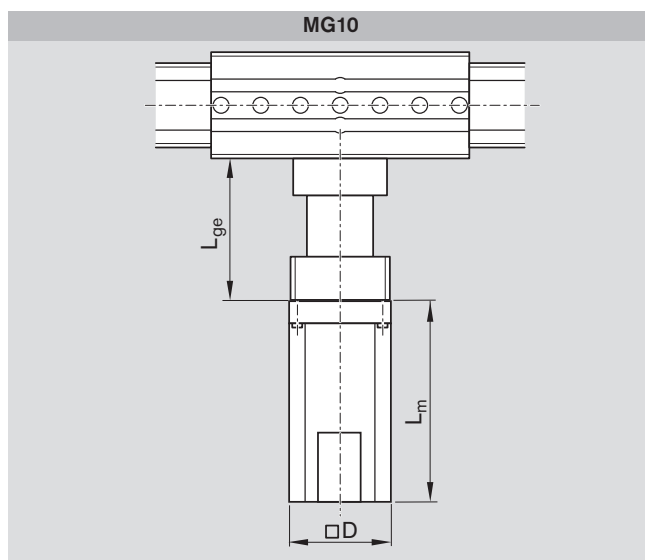
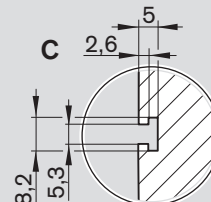
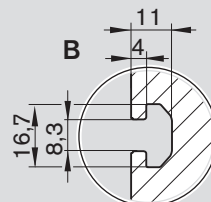
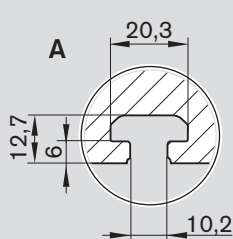
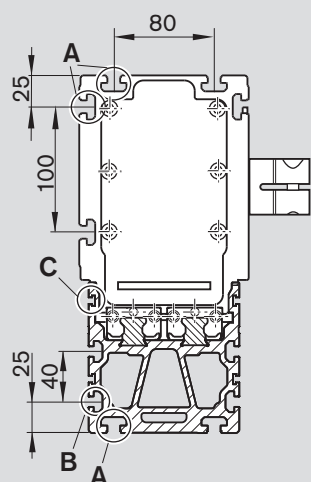
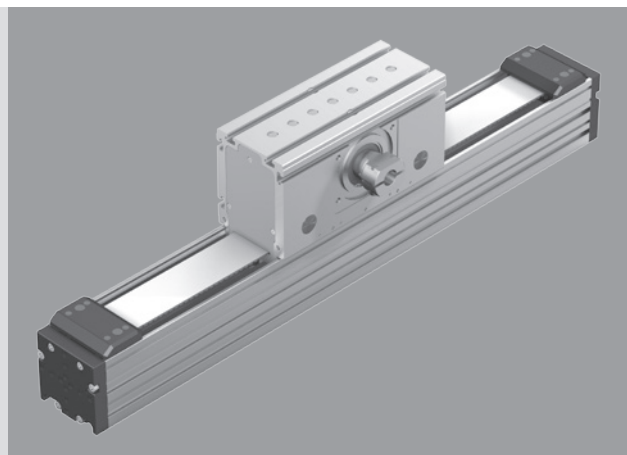
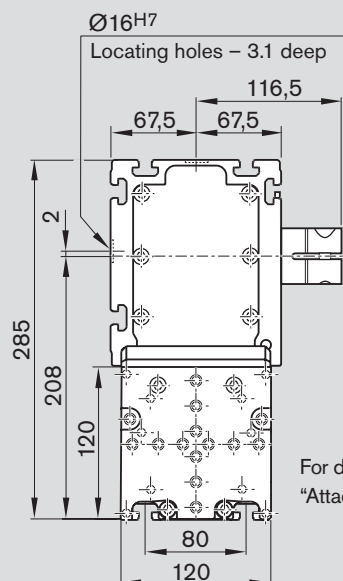
MA01



¹⁾Cylinder screw ISO 4762

MG01, MG02, MG03, MG04





Motor ¹⁾	Dimensions (mm)					
	Gear unit			Motor		
	MG		MG	D	L _m	
	01/02/03/04	C	10		without brake	with brake
	L _{ge}		L _{ge}			
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

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

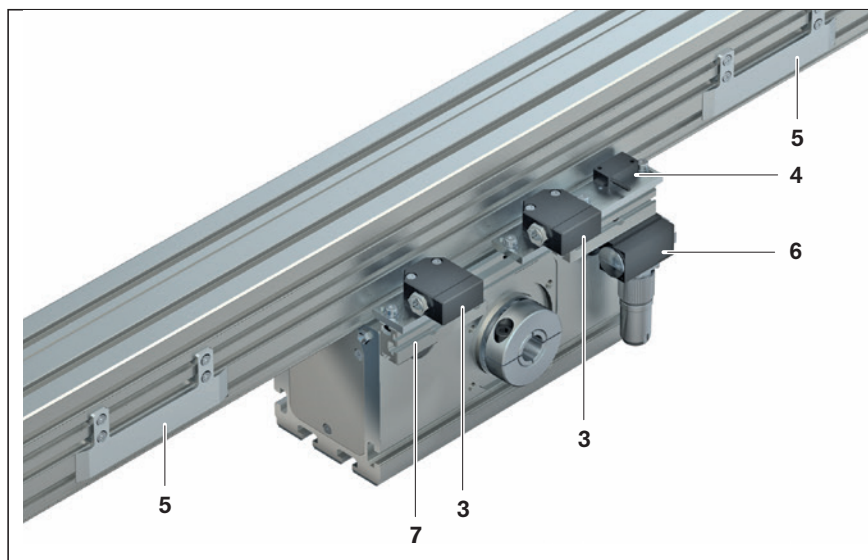
Switch mounting – frame moves (carriage fixed)

Switching principle

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

Overview of switching system

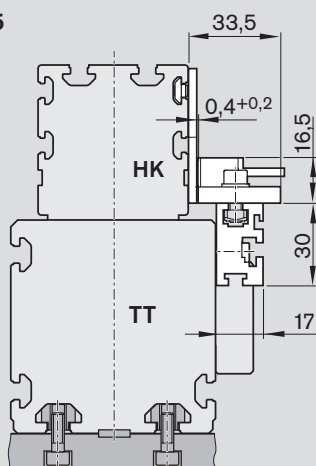
- 3 Mechanical switches (with attachments)
- 4 Proximity switch (with attachments)
- 5 Control strip on the frame
- 6 Socket and plug
- 7 Switch mounting profile



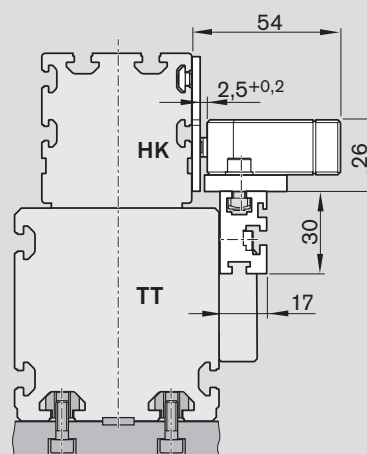
Pos.	Description	OBB-055 Material number included in (option ¹⁾)		OBB-085 Material number included in (option ¹⁾)		OBB-120 Material number included in (option ¹⁾)	
3	Mechanical switch with attachments	R1175 001 62	(65)	R1175 001 62	(65)	R1175 001 62	(65)
	Mechanical switch	R3453 040 16	(65)	R3453 040 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

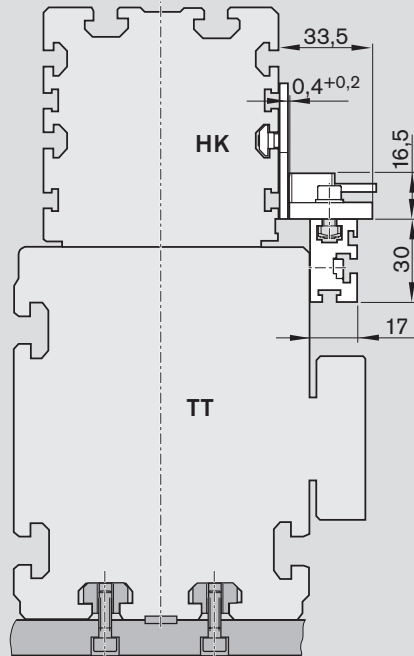
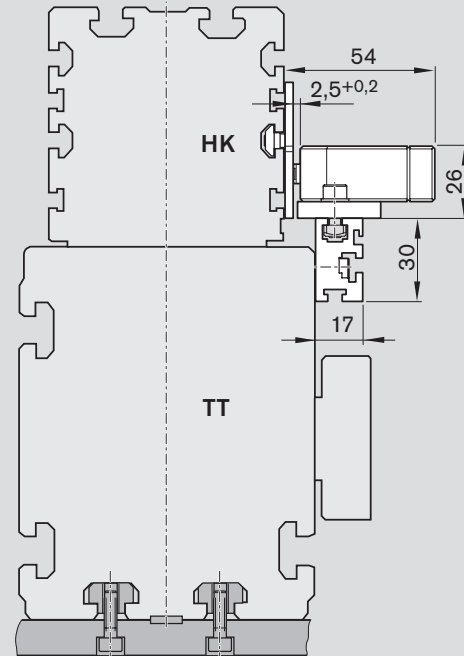


Proximity switches
with attachments

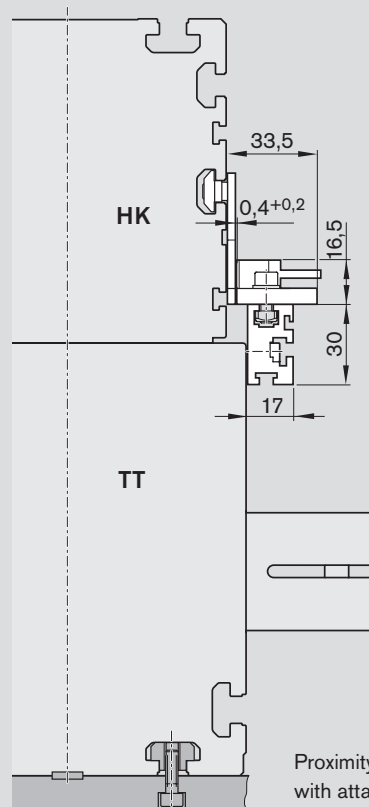
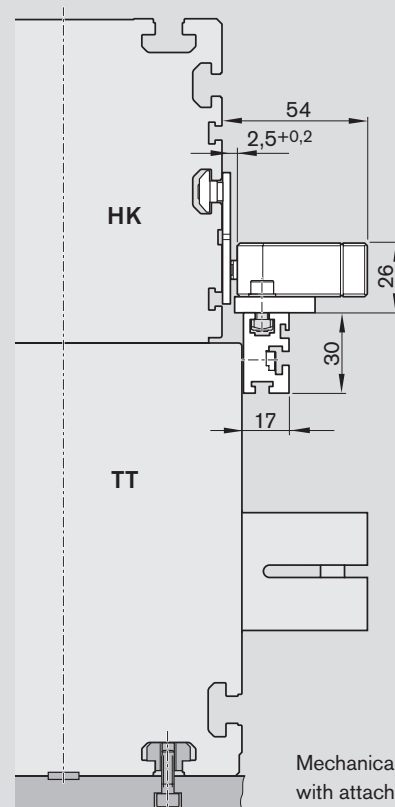


Mechanical switches
with attachments

OBB-085

Proximity switches
with attachmentsMechanical switches
with attachments

OBB-120

Proximity switches
with attachmentsMechanical switches
with attachments

Attachments and accessories

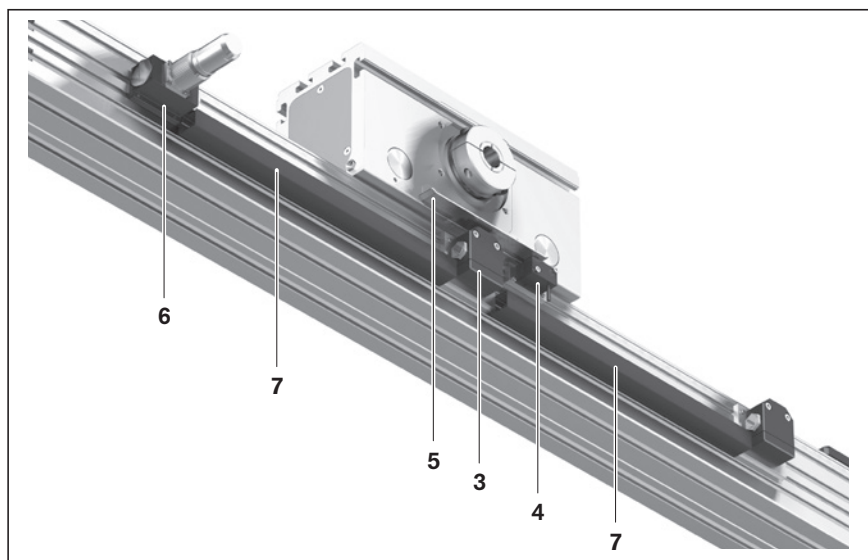
Switch mounting – carriage moves (frame fixed)

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)

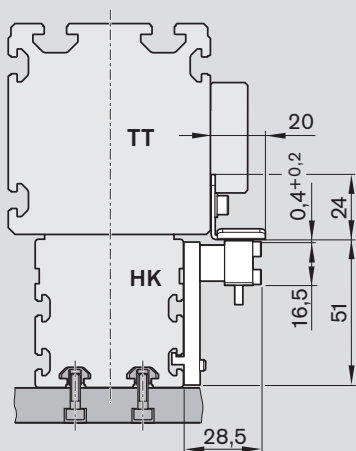
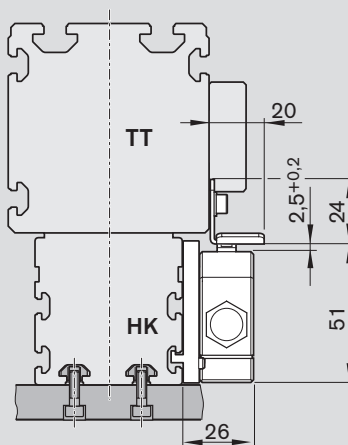
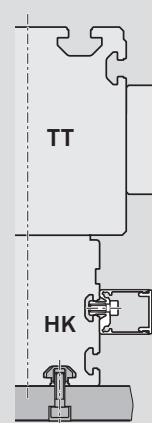
1) For options, see "Configuration and ordering"

 L_K = length of the cable duct (mm)

2) A length must always be specified when ordering cable ducts.

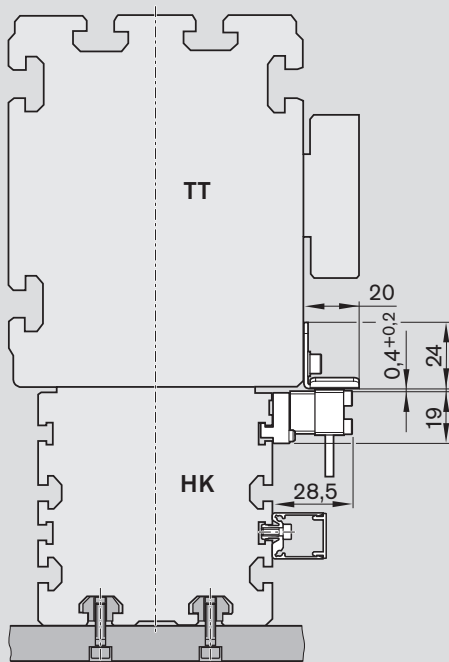
For example "R0396 620 17, 285 mm".

OBB-055

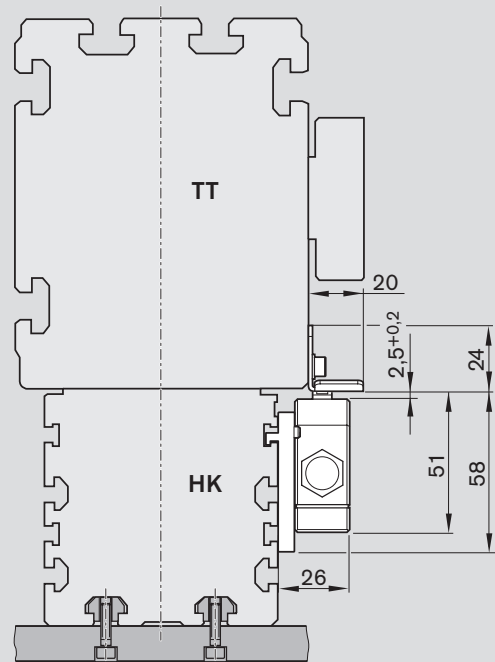
Proximity switches
with attachmentsMechanical switches
with attachments

Cable duct

OBB-085

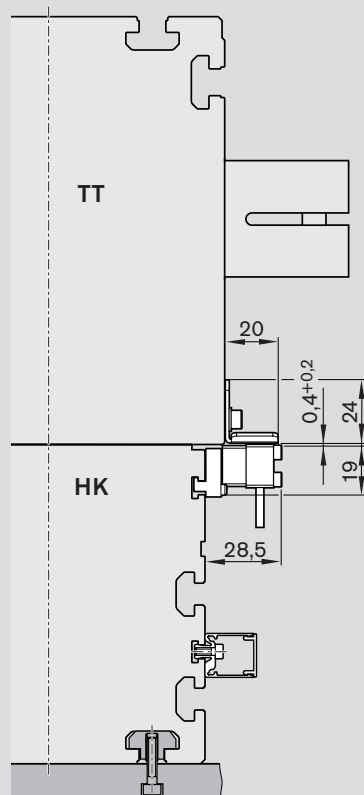


Proximity switches with attachments / cable duct

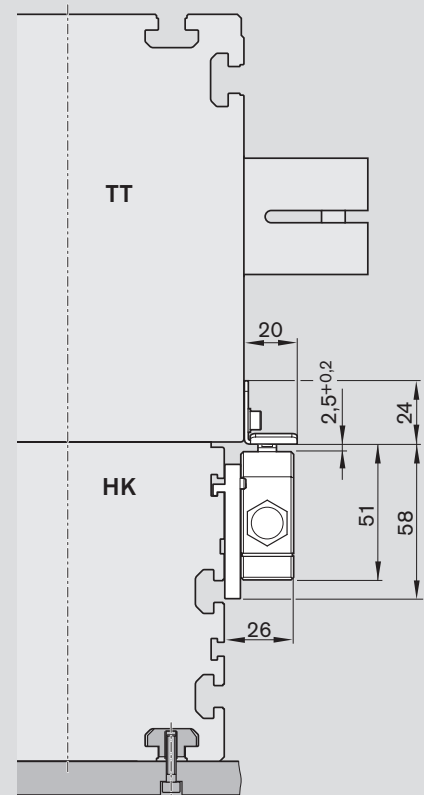


Mechanical switches with attachments

OBB-120



Proximity switches with attachments / cable duct



Mechanical switches with attachments

Attachments and accessories

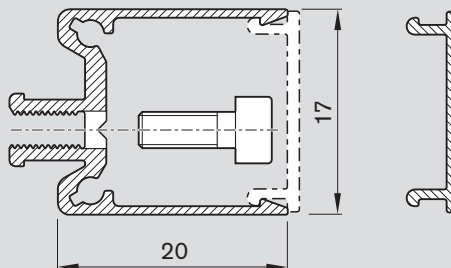
Cable duct

- 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”.

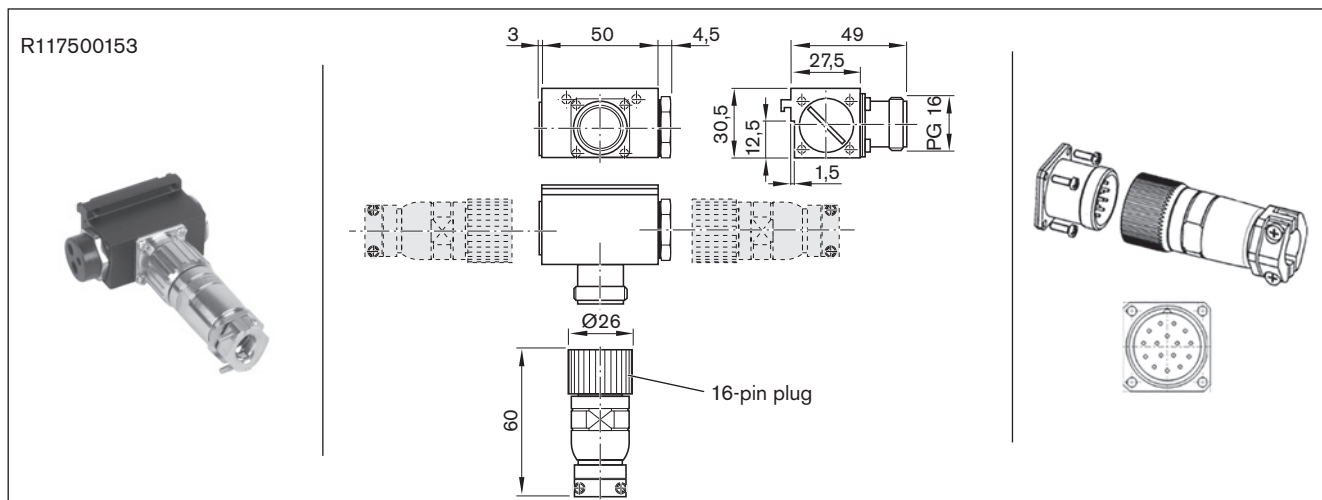
The cable duct will accommodate up to two cables for mechanical switches and three cables for proximity switches.

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.

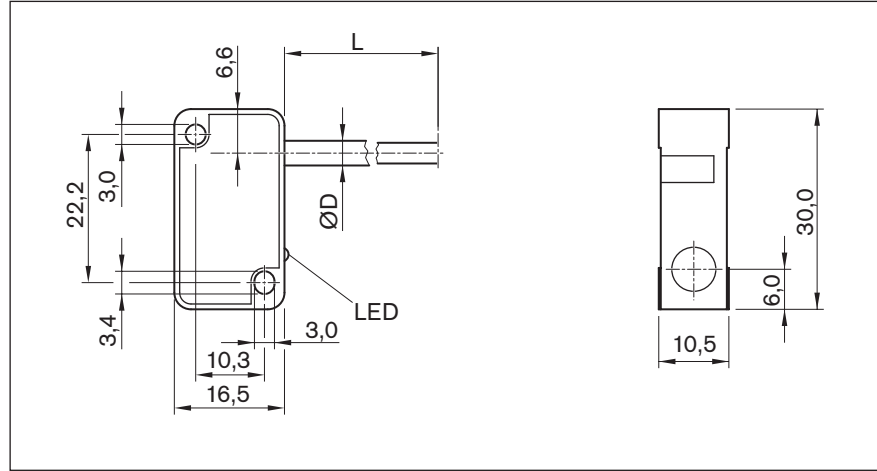


Use	Socket and plug
Material number	R117500153
Designation	for OBB-055, -085, -120
Version	angled, for suspension in the lateral slot of the OBB
Operating current per contact	max. 8 A
Operating voltage	150 V AC/DC
1. Connection type	Straight socket, 16-pin, soldered connection
2. Connection type	Coupling / 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	—

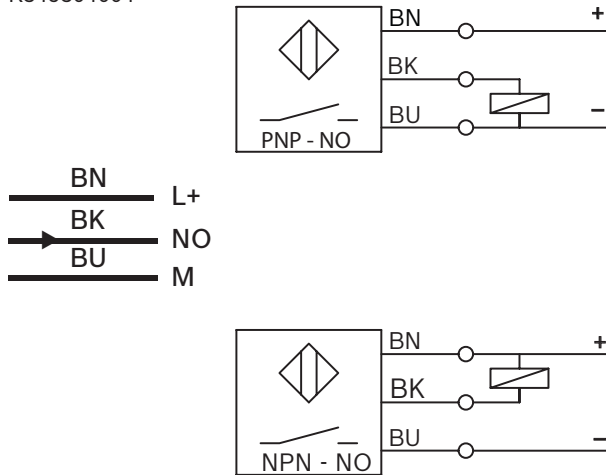
Attachments and accessories

Sensors

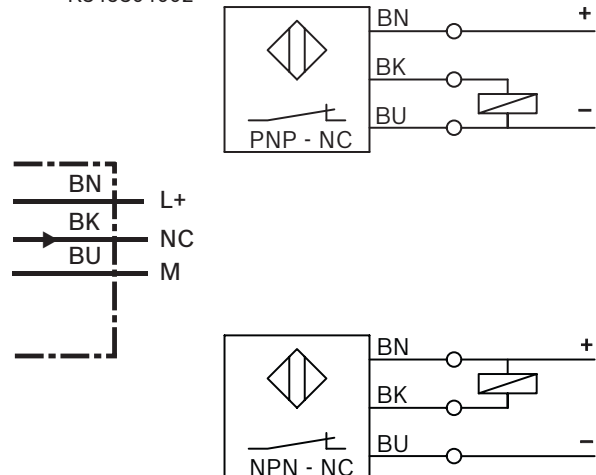
Proximity sensor with free line end



R345304003
R345304004



R345304001
R345304002



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 ±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 UL LISTED RoHS			

1) Technical data only for the cast-on connection line at the proximity sensor.

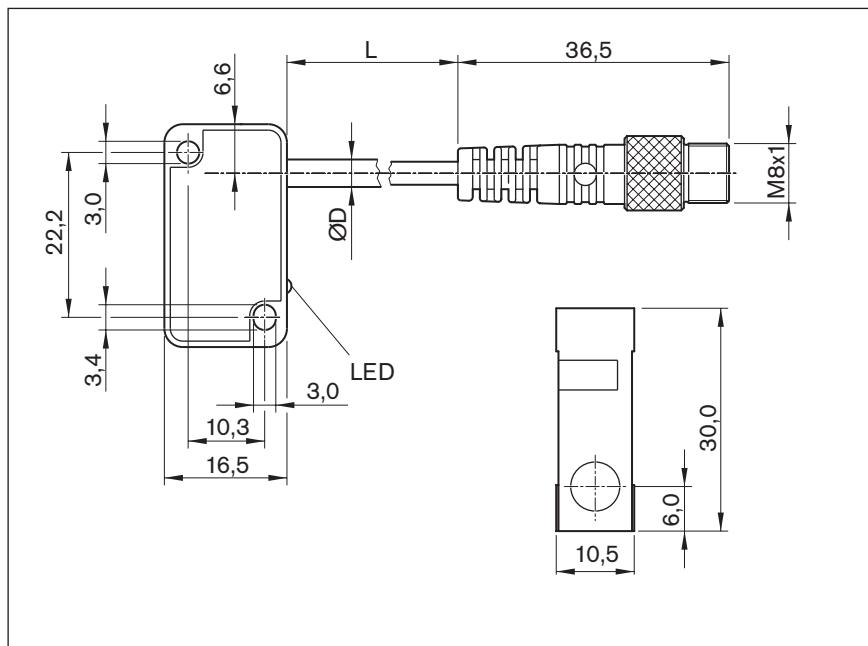
Even more performance, e.g. extension cables are offered for use in a power cable chain (see the following pages).

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

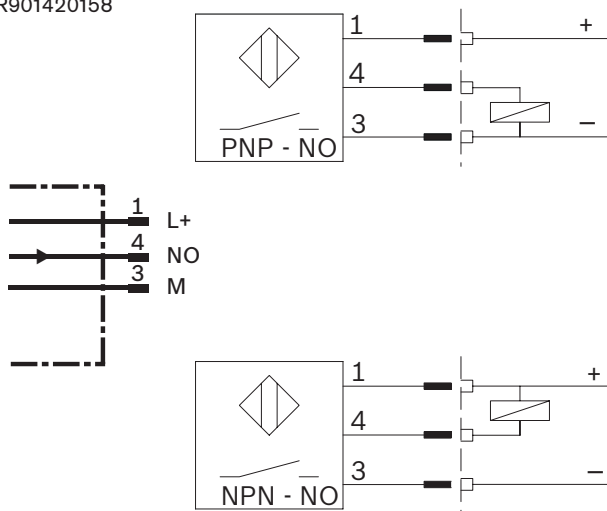
Attachments and accessories

Sensors

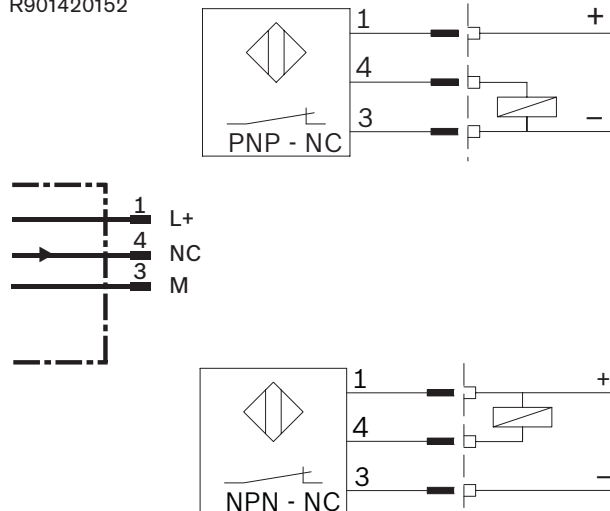
Proximity sensor with M8x1 plug



R901420156
R901420158



R901420149
R901420152



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 ±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 UL LISTED RoHS			

1) Technical data only for the cast-on connection line at the proximity sensor.

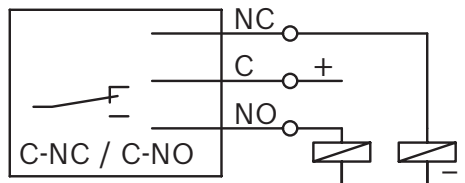
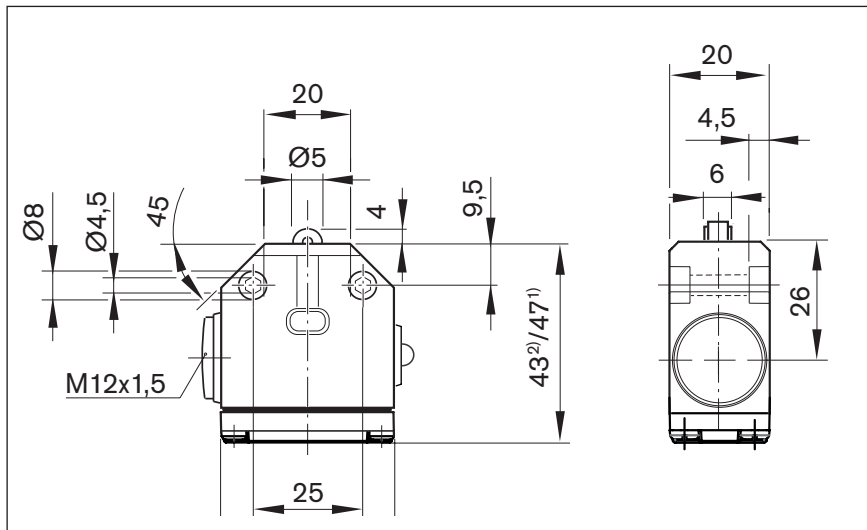
Even more performance, e.g. extension cables are offered for use in a power cable chain (see the following pages).

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

Attachments and accessories

Switches

Mechanical switch

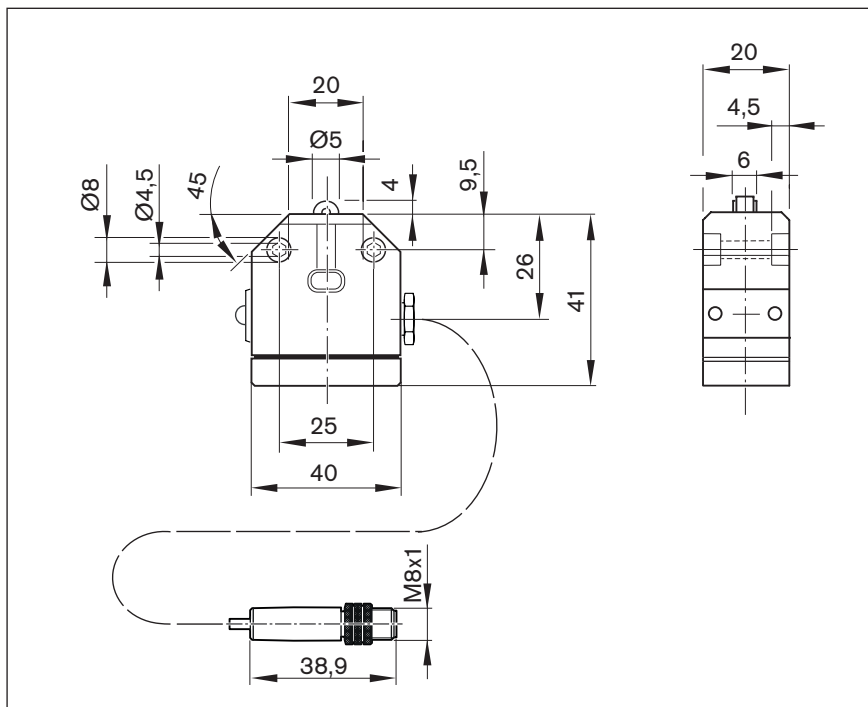


Material numbers / technical data		
Use	Limit switch	
Material number	R345304016 ¹⁾	R347600305 ²⁾
Designation	BNS 819-X496-99-R-11	BNS 819-X510-99-R-10
Functional principle	Mechanical, roller	
Operating voltage	250 V AC	
Load current	≤ 5 A	
Switching function	Single-pole changeover/ (NC: C+NC, NO: C+NO)	
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	  	
Certifications and approvals, switching element	   	

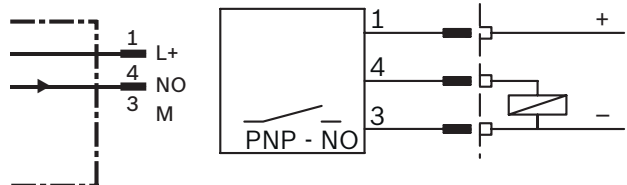
Attachments and accessories

Switches

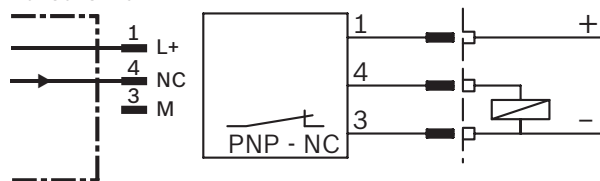
Mechanical sensor with M8x1 plug



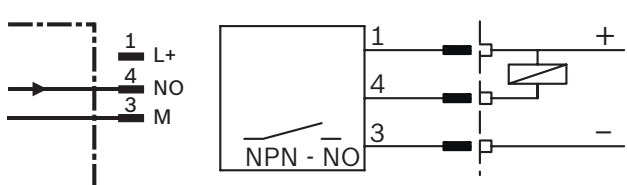
R913048214



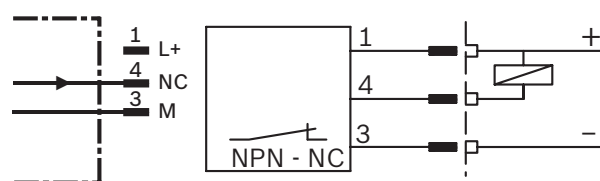
R913048215



R913048216



R913048217



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 ±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⁾	  			

1) Technical data only for the cast-on connection line at the mechanical switch.

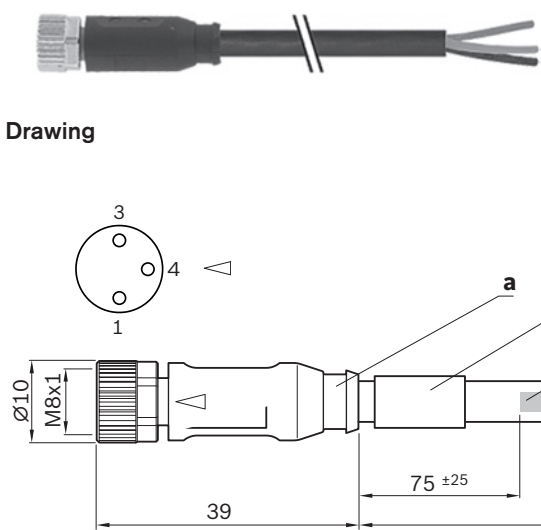
Even more performance, e.g. extension cables are offered for use in a power cable chain (see the following pages).

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

Attachments and accessories

Extension pieces

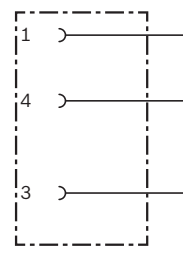
Assembled single-sided



Drawing

Connection scheme

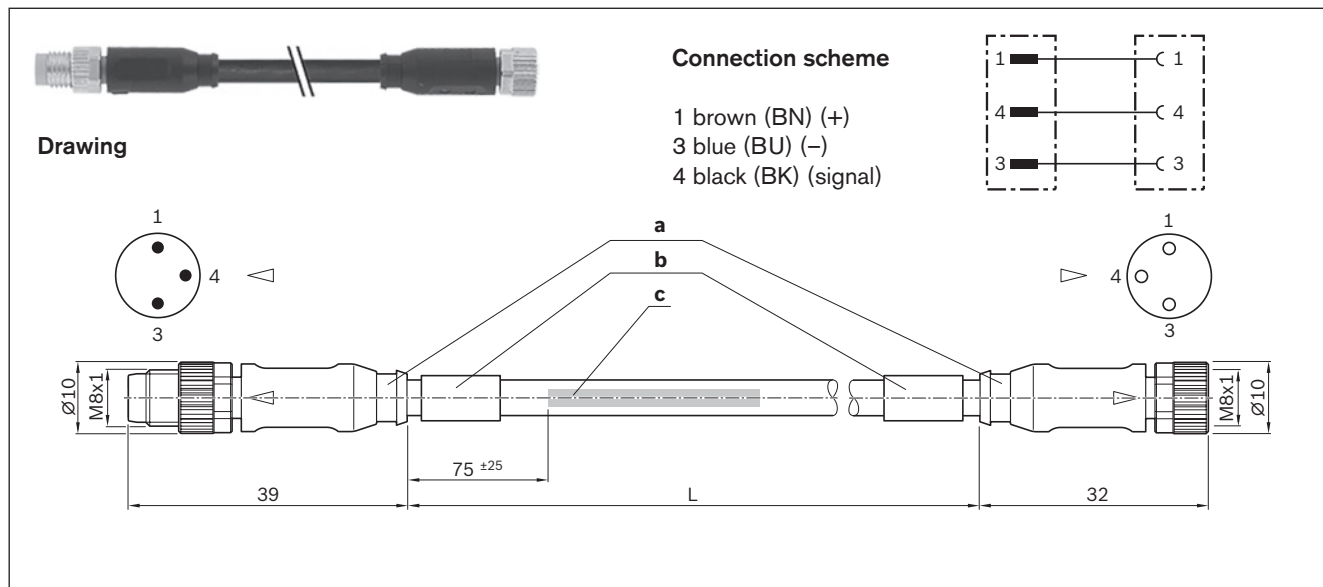
1 brown (BN) (+)
3 blue (BU) (-)
4 black (BK) (signal)



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



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 mm ²
Cable diameter D	4.1 ±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/s ²
Ambient temperature, fixed lay	-40 °C to +85 °C
Ambient temperature, flexible lay	-25 °C to +85 °C
Protection class	IP68
Certifications and approvals	    

a) Contour for corrugated tube inner diameter 6.5 mm

b) Cable grommet

c) Cable label in accordance with labeling directive

Attachments and accessories

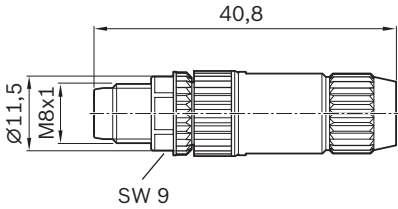
Extension pieces

Plug

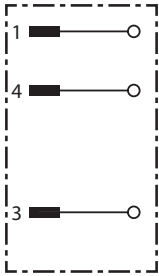


R901388333

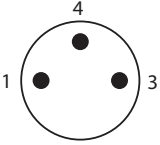
Drawing



Connection scheme



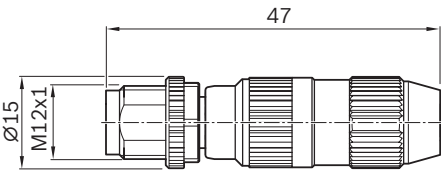
View Plug side



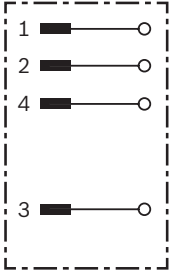


R901388352

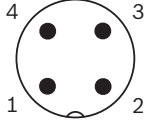
Drawing



Connection scheme

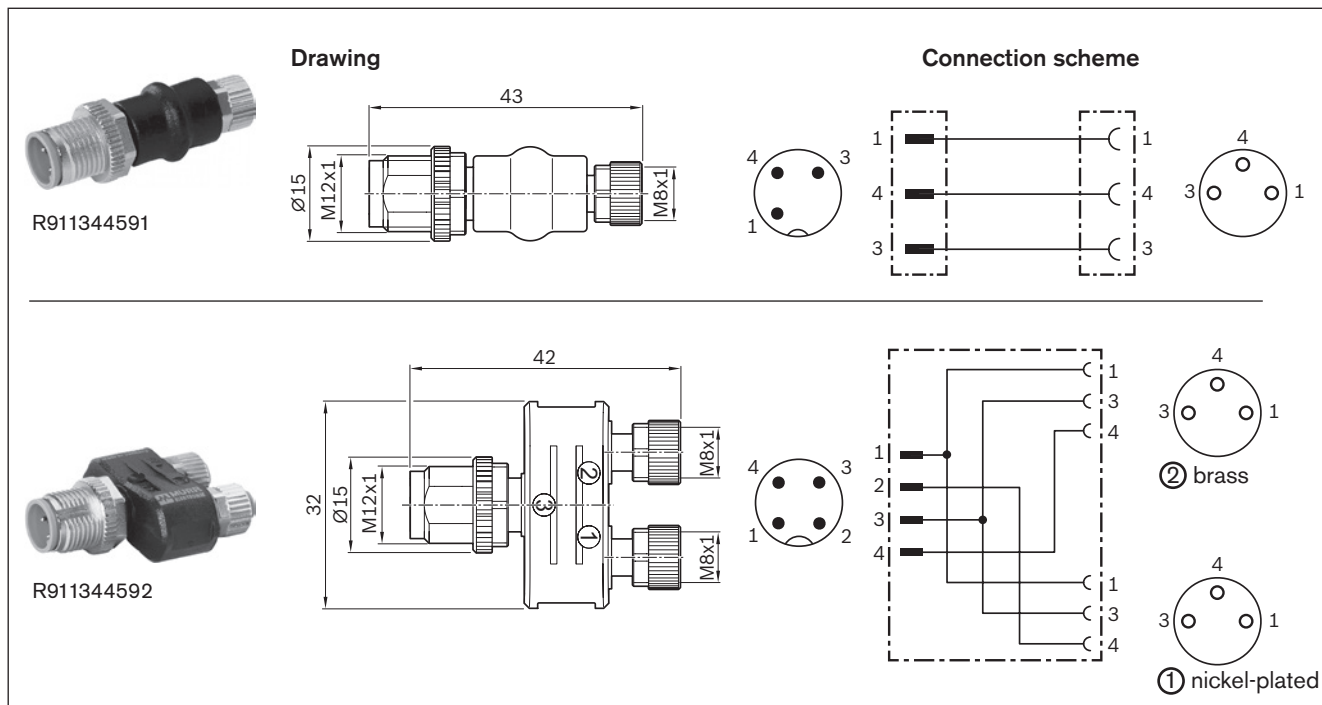


View Plug side



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 mm ²	
Ambient temperature	-25 °C to +85 °C	
Protection class	IP67 (plugged in & screwed down)	
Certifications and approvals	  	

Adapter



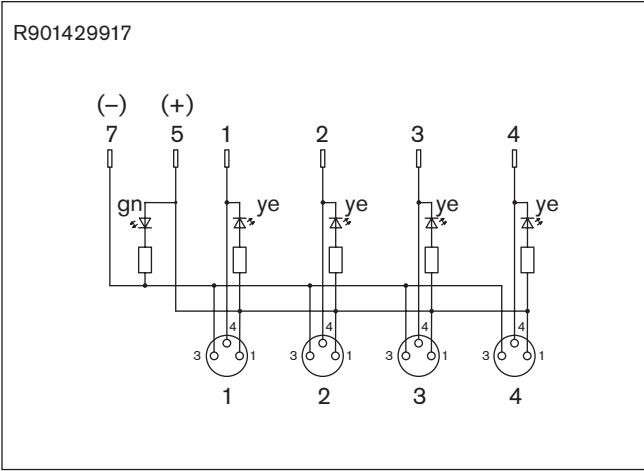
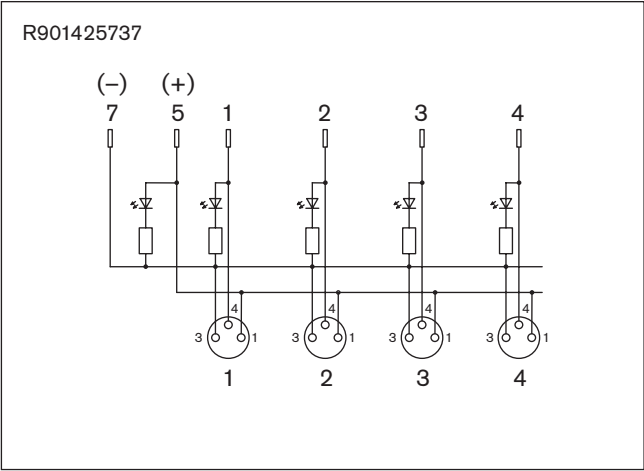
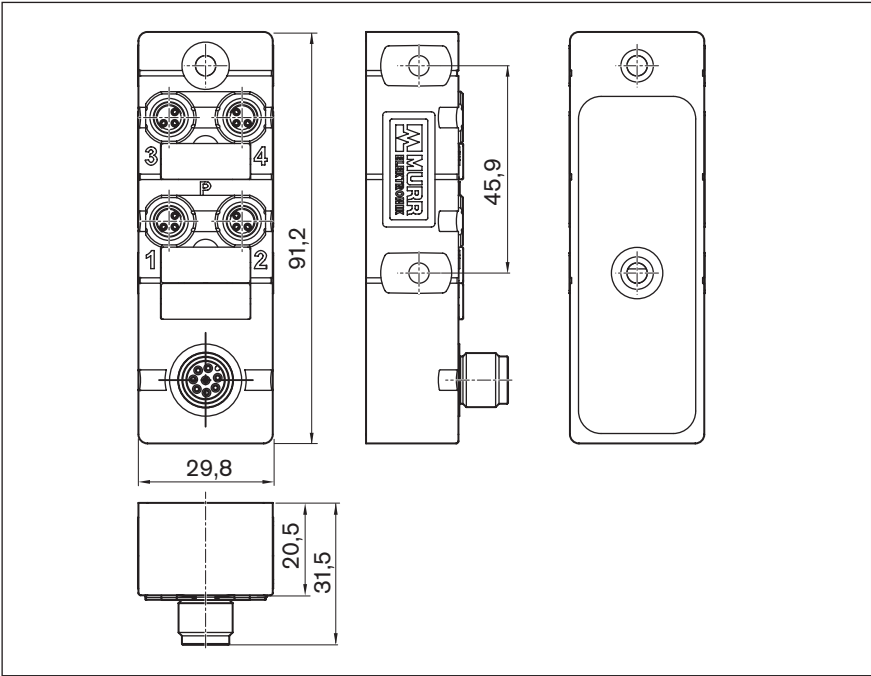
Material numbers / technical data

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		  

Attachments and accessories

Distributors

Passive distributors

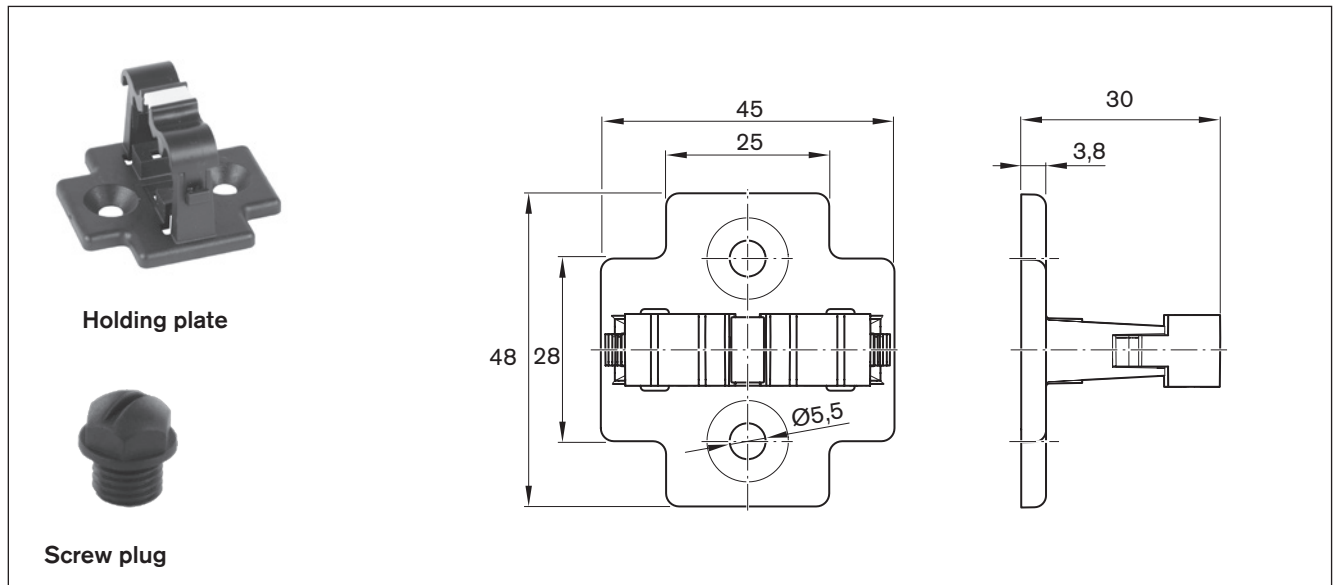


Material numbers / technical data

Use	Passive distributors		
Material number	R901425737	R901429917	R911344592
Designation	8000-84070-0000000	8000-84071-0000000	
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			

See the adapter for technical data and drawing

Accessories for passive distributors



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.

Attachments and accessories

Extensions for passive distributors

Extensions for passive plugs

R911371982



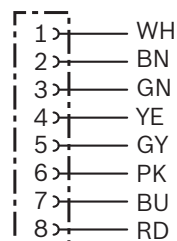
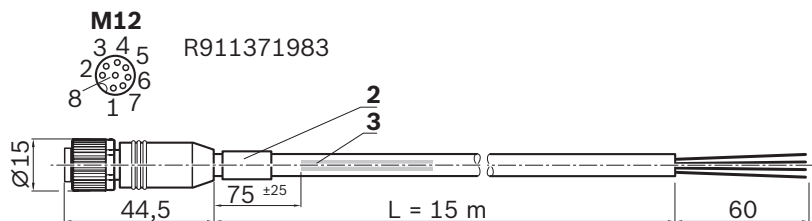
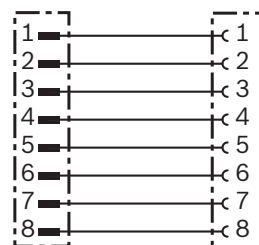
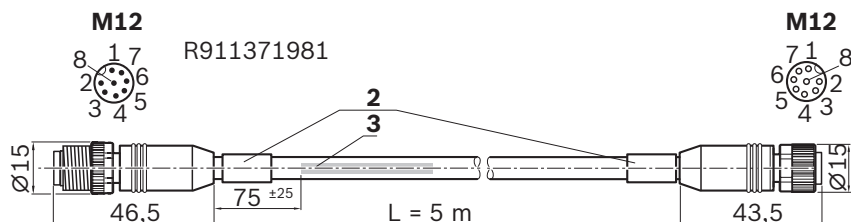
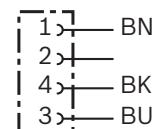
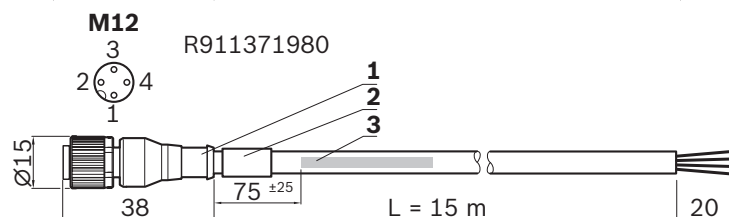
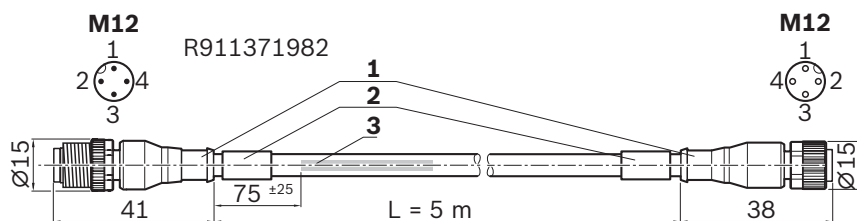
R911371981



R911371980



R911371983

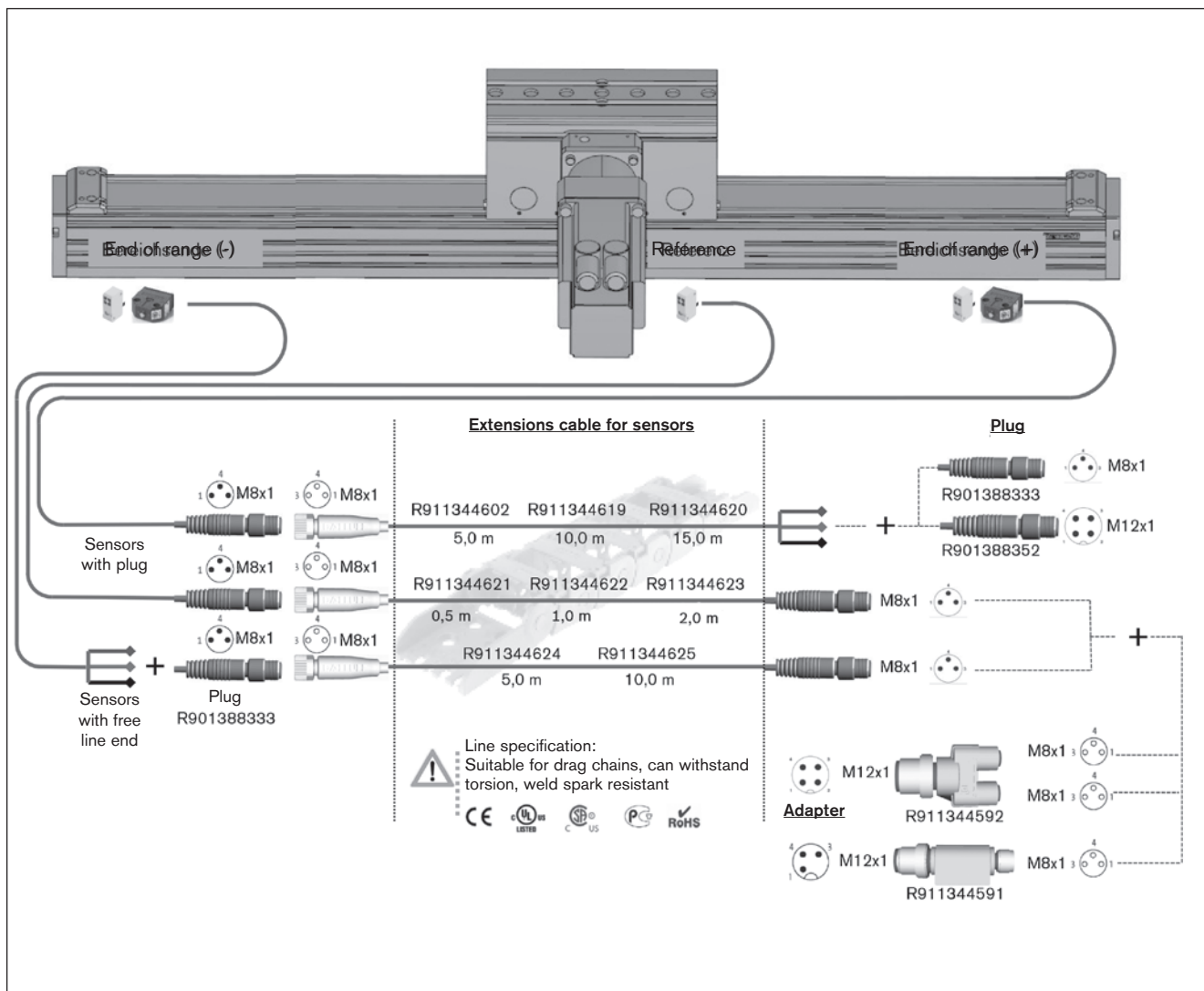


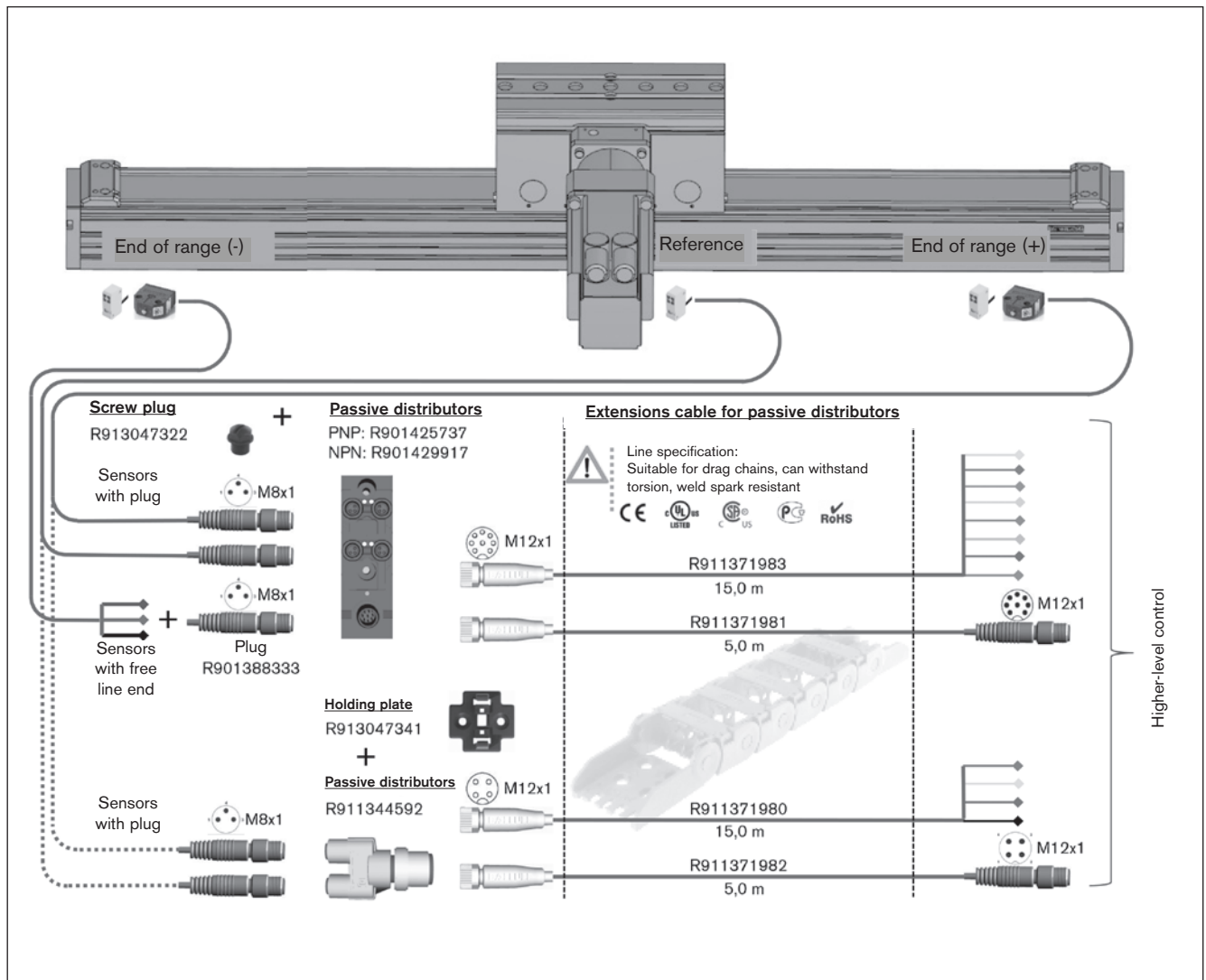
Material numbers / technical data

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 mm ²		8x0.34 mm ²	
Cable diameter D	4.7 ±0.2 mm		6.2 ±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/s ²			
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	    			

Attachments and accessories

Combination examples





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.

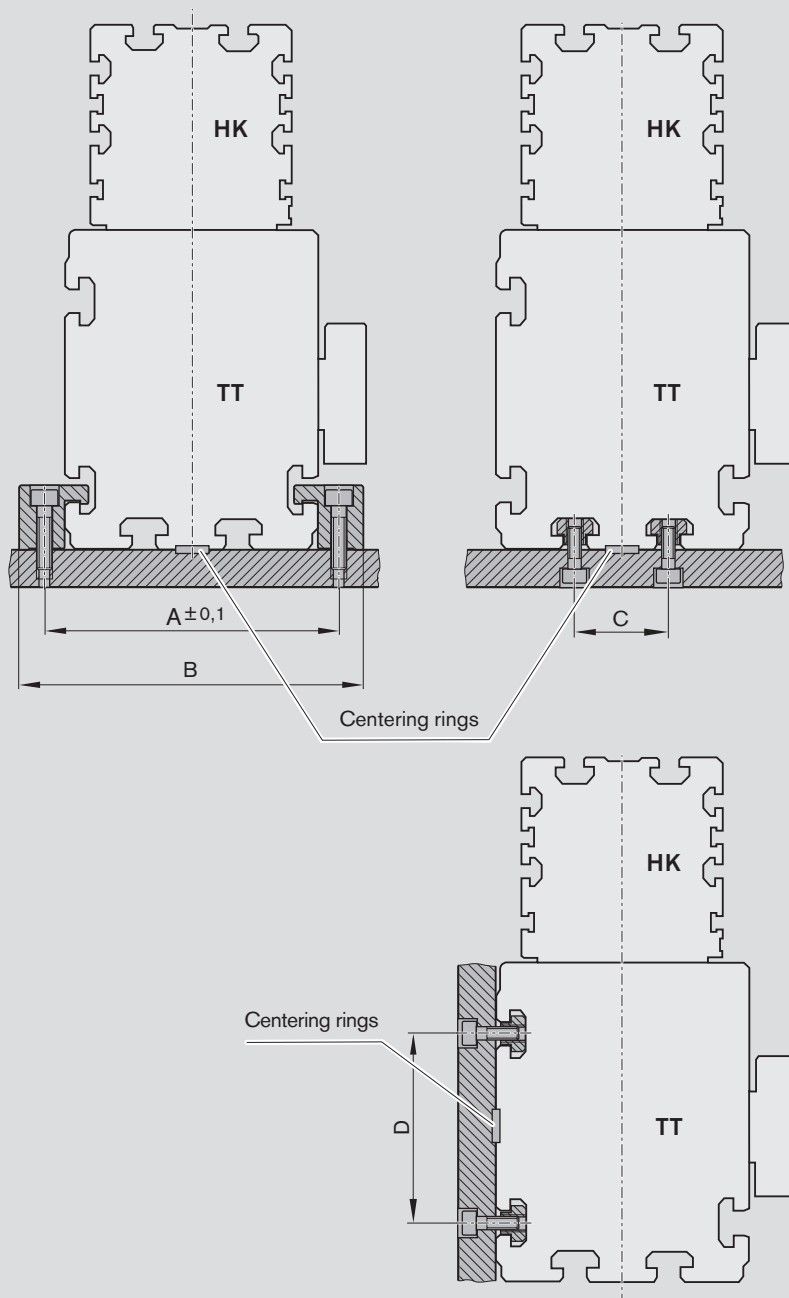
Mounting by the carriage (frame moves)

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 carriage (TT) (frame moves)

Fastening with clamping fixtures

Fastening with sliding blocks



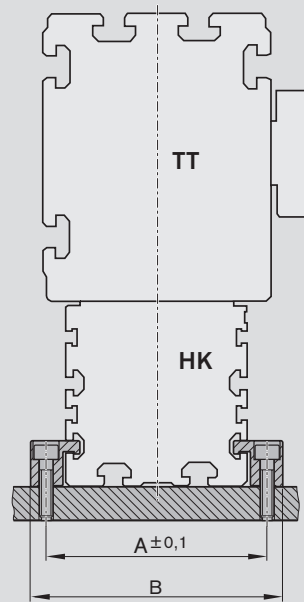
Mounting by the frame (HK) (carriage moves)

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

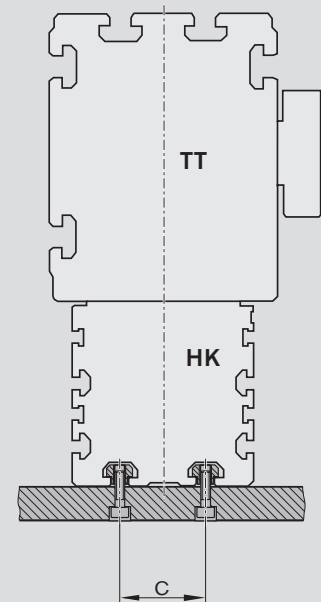
OBB	A (mm)	B (mm)	C (mm)
55	71	85	25
85	101	115	40
120	144	162	80

Mounting by the frame (carriage moves)

Fastening with clamping fixtures



Fastening with sliding blocks



Attachments and accessories

Mounting

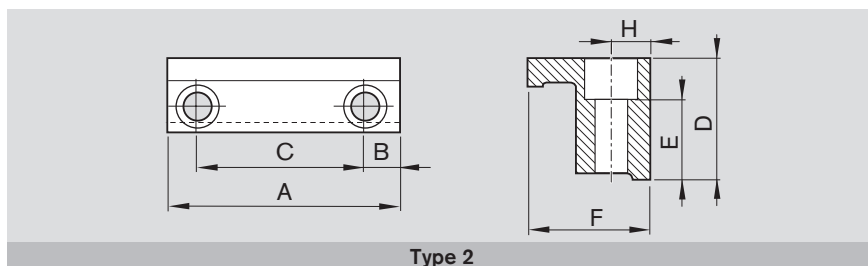
Clamping fixtures

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

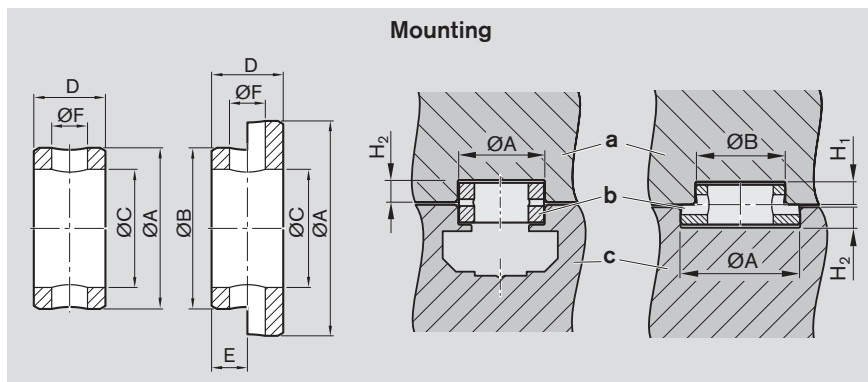
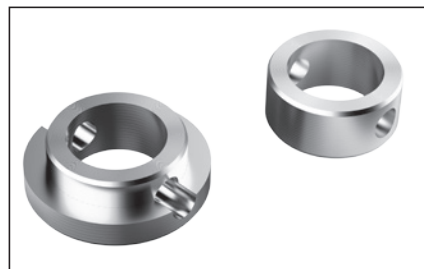


Type 2

Size	Mounting on...	Countersink ISO 4762 for	Number Holes N	Dimensions (mm)							Material number
				A	B	C	D	E	F	H	
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)

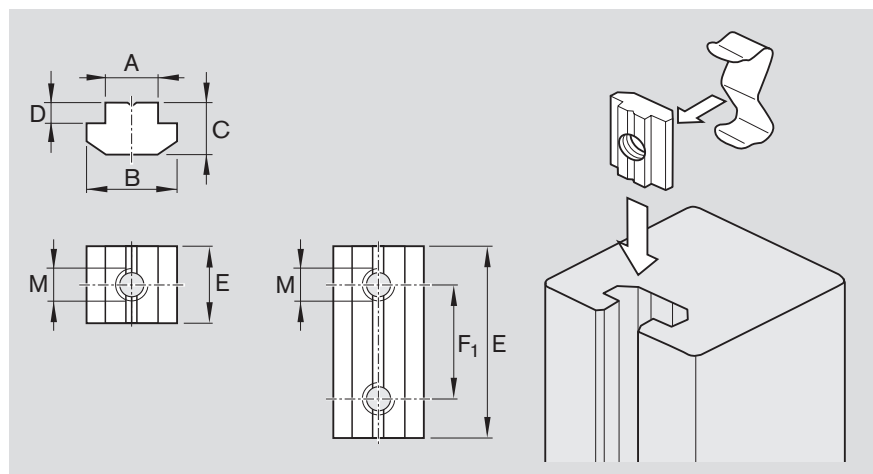


- a) Customer attachment
b) Centering ring
c) Carriage

	OBB	Size Ø (mm)	Dimensions (mm)								Material number
			ØA H7/k6	ØB H7/k6	C ±0.1	D -0.2	E +0.2	ØF	H ₁ +0.2	H ₂ +0.2	
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, 120	16	16	–	11.0	6.0	–	3.0	–	3.1	R0396 605 46
		16 - 12	16	12	9.0	5.0	2.0	2.0	2.1	3.1	R0396 605 51
End plate	055, 085	9	9	–	6.6	4.0	–	2.0	–	2.1	R0396 605 44
		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)

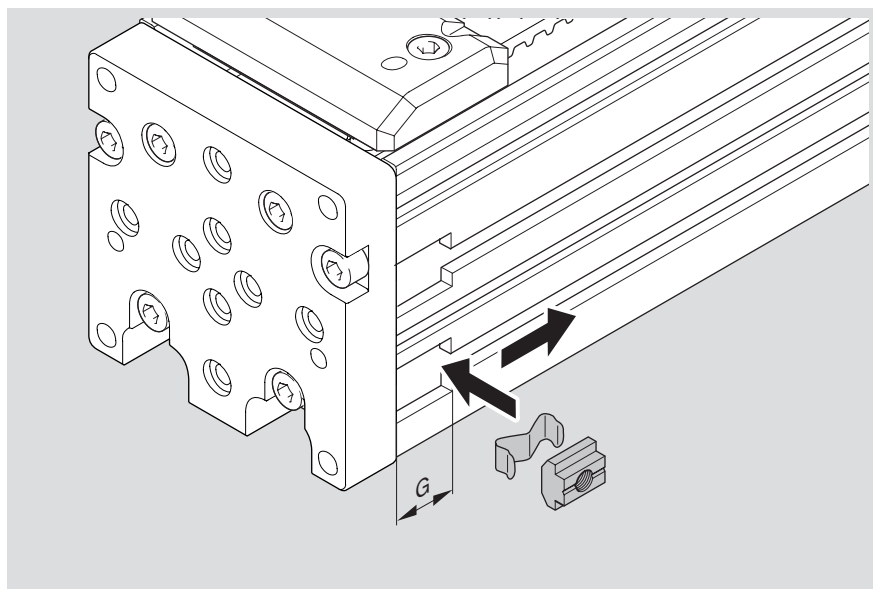


Overview of sliding blocks

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



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.

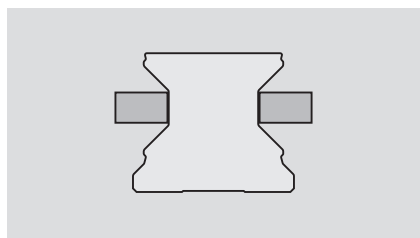
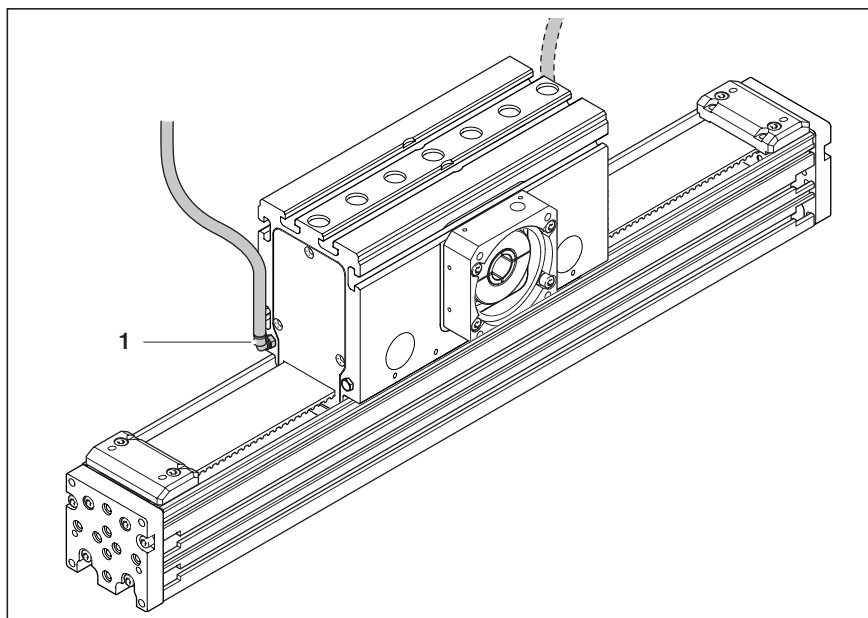
For further instructions and information, please refer to documentation belonging to this product.

⚠ 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!

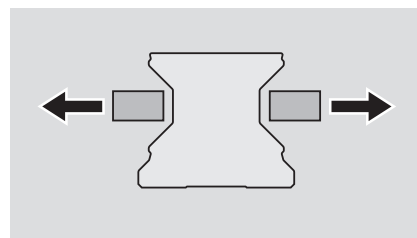
Clamping actions while the mass is moving may result in the clamping element and the linear guide being destroyed!



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.

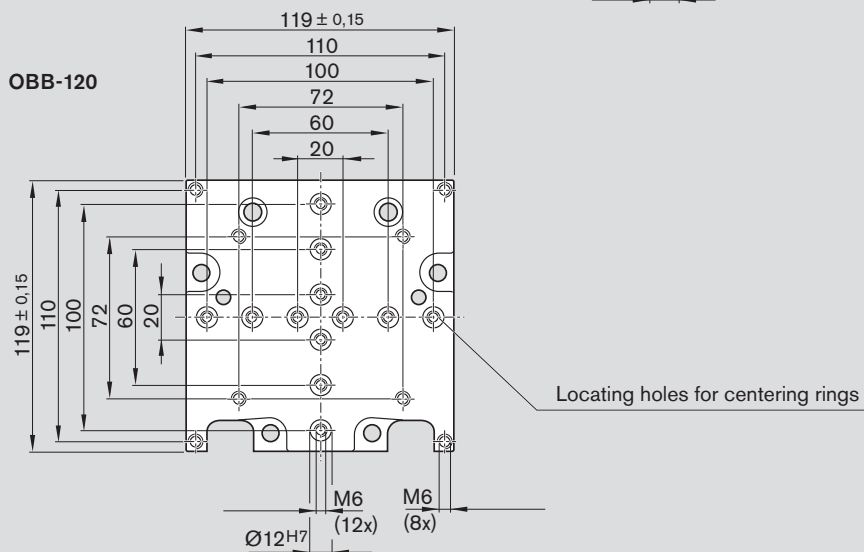
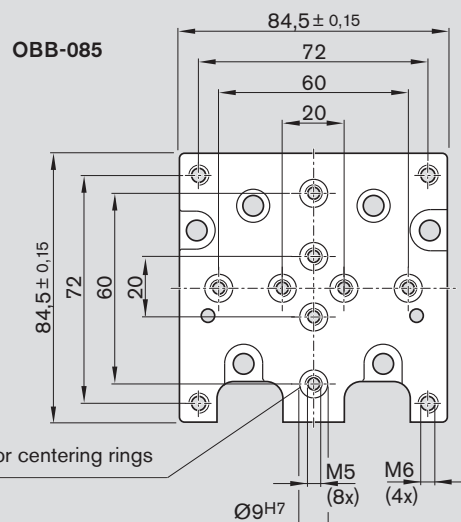
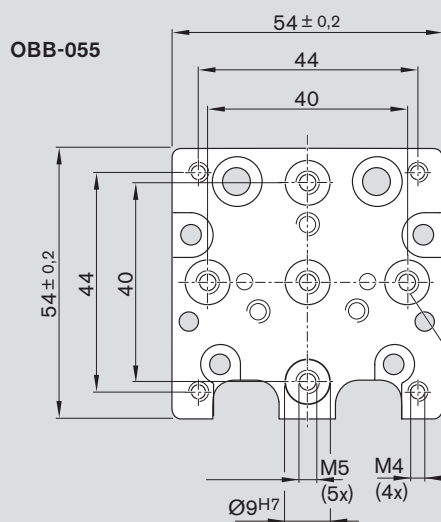
2) The B10d-value specifies the number of switching cycles, until 10% of the components have failed dangerously.

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.

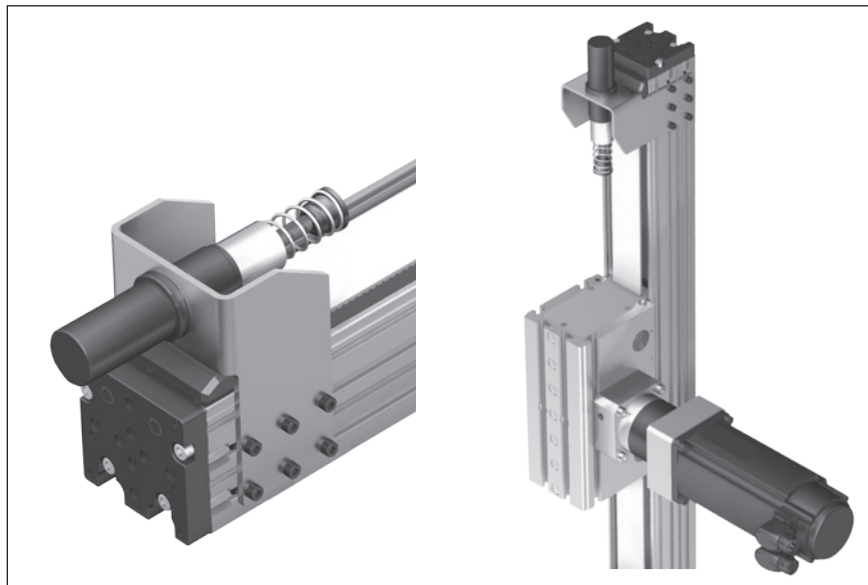
The shock absorber serves to avoid damage in the event of uncontrolled movements. It is not suitable for continuous operation.

Notes

Follow the mounting instructions.

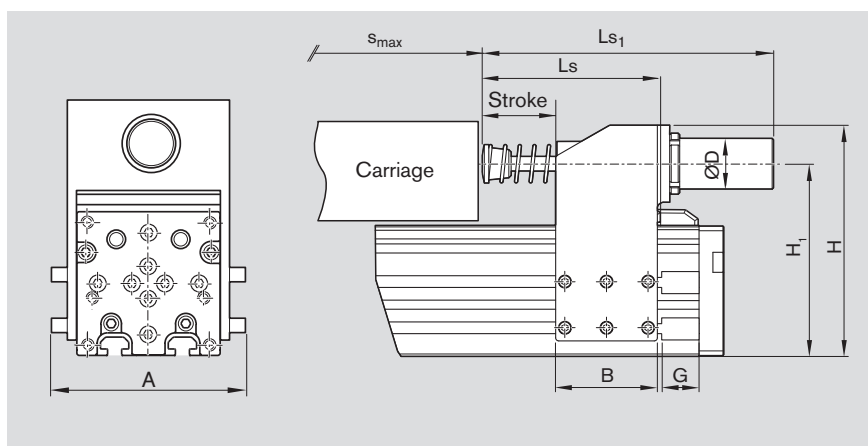
Shortened stroke

⚠ 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	L _S	L _{S1}	Stroke	Ø D	G
OBB-055	R1175 101 17	70	56.5	113	90.5	115	133	189	50	M33 x 1.5	12
OBB-085	R1175 301 17	104	68.0	150	125.0	131	149	209	50	M33 x 1.5	14
OBB-120	R1175 601 17	145	99.0	210	210.0	188	205	246	75	M45 x 1.5	16

1) Scope of delivery: holding ring, shock absorber and mounting material

Shock absorber

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

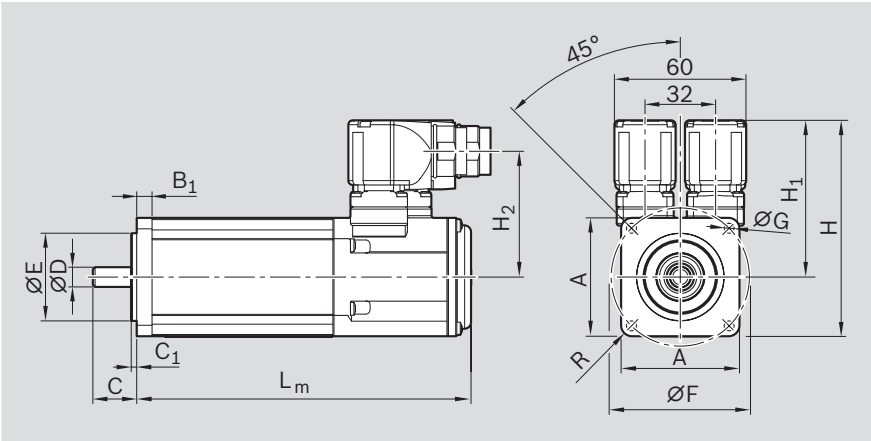
1) Reduction of the maximum travel distance of the Omega module (minimum value per side or damper)

Attachments and accessories

IndraDyn S servo motors MSK



Schematic motor illustration



Motor	Dimensions (mm)														R
	A	B ₁	C	C ₁	ØD k6	ØE j6	ØF	ØG	H	H ₁	H ₂		without holding brake	L _m with holding brake	
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
- M₀

= 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:

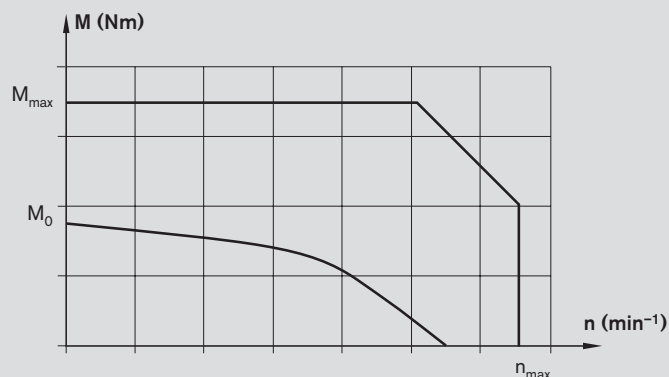
- Drive System Rexroth IndraDrive, R999000018
- Automation systems and control components, R999000026
- Rexroth IndraDyn S Synchronous Motors MSK, R911296288

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)

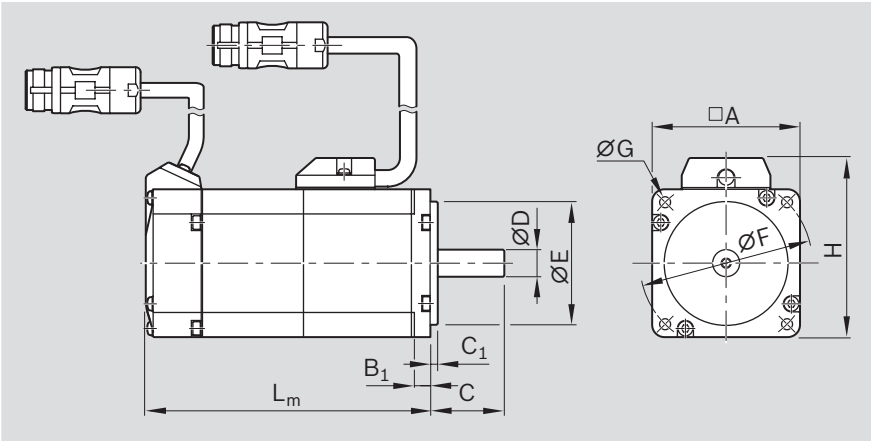


Attachments and accessories

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
- M₀ = 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		Type designation
			Holding brake		
			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:

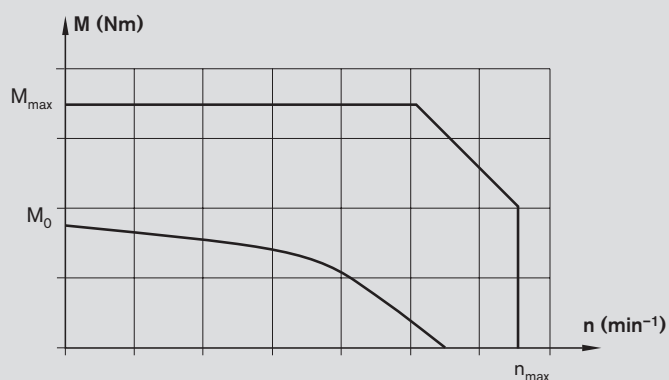
- Drive System Rexroth IndraDrive, R999000018
- Automation systems and control components, R999000026
- Rexroth IndraDyn S Synchronous Motors MSM R911329337

Recommended motor/controller combination



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

Torque/speed characteristic (schematic)



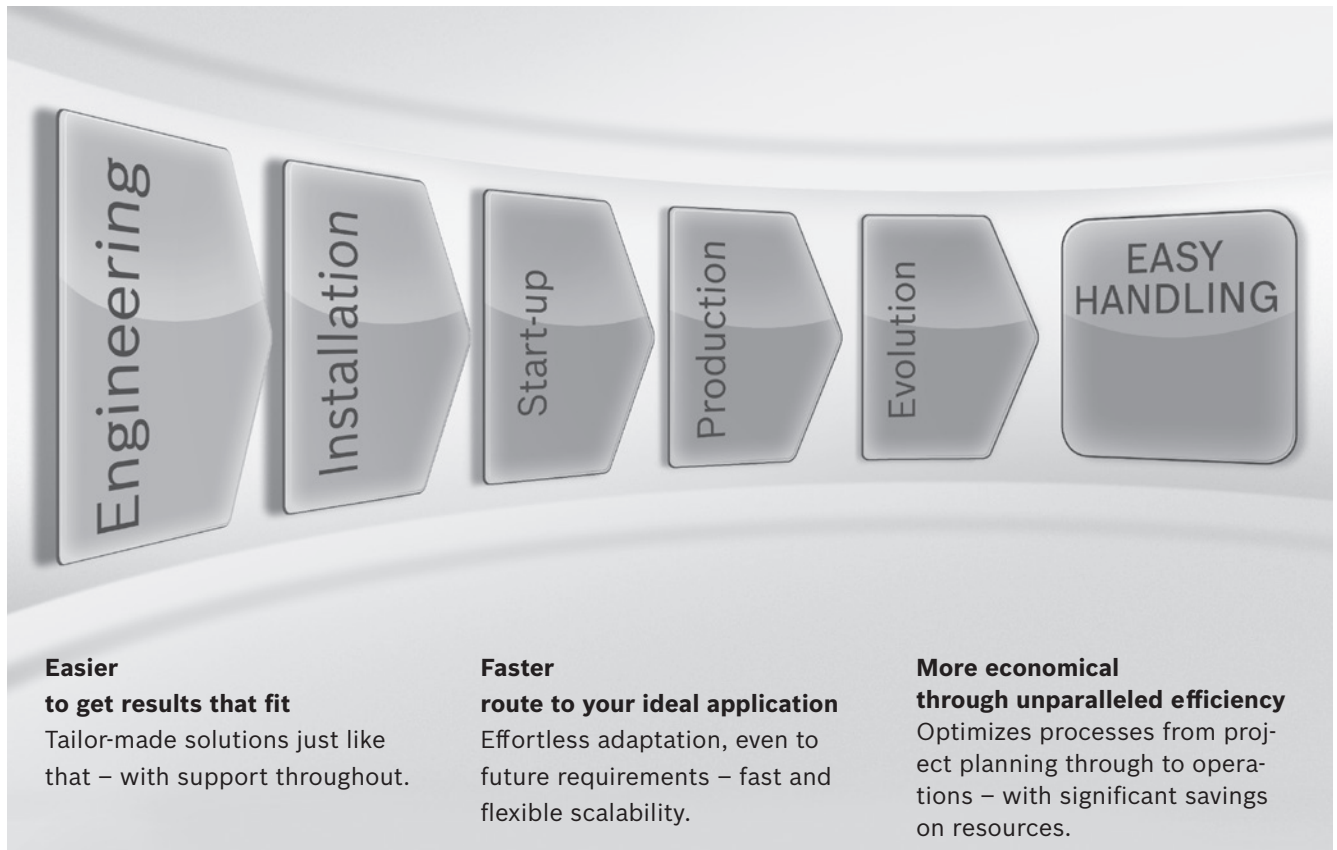
EasyHandling

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.



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

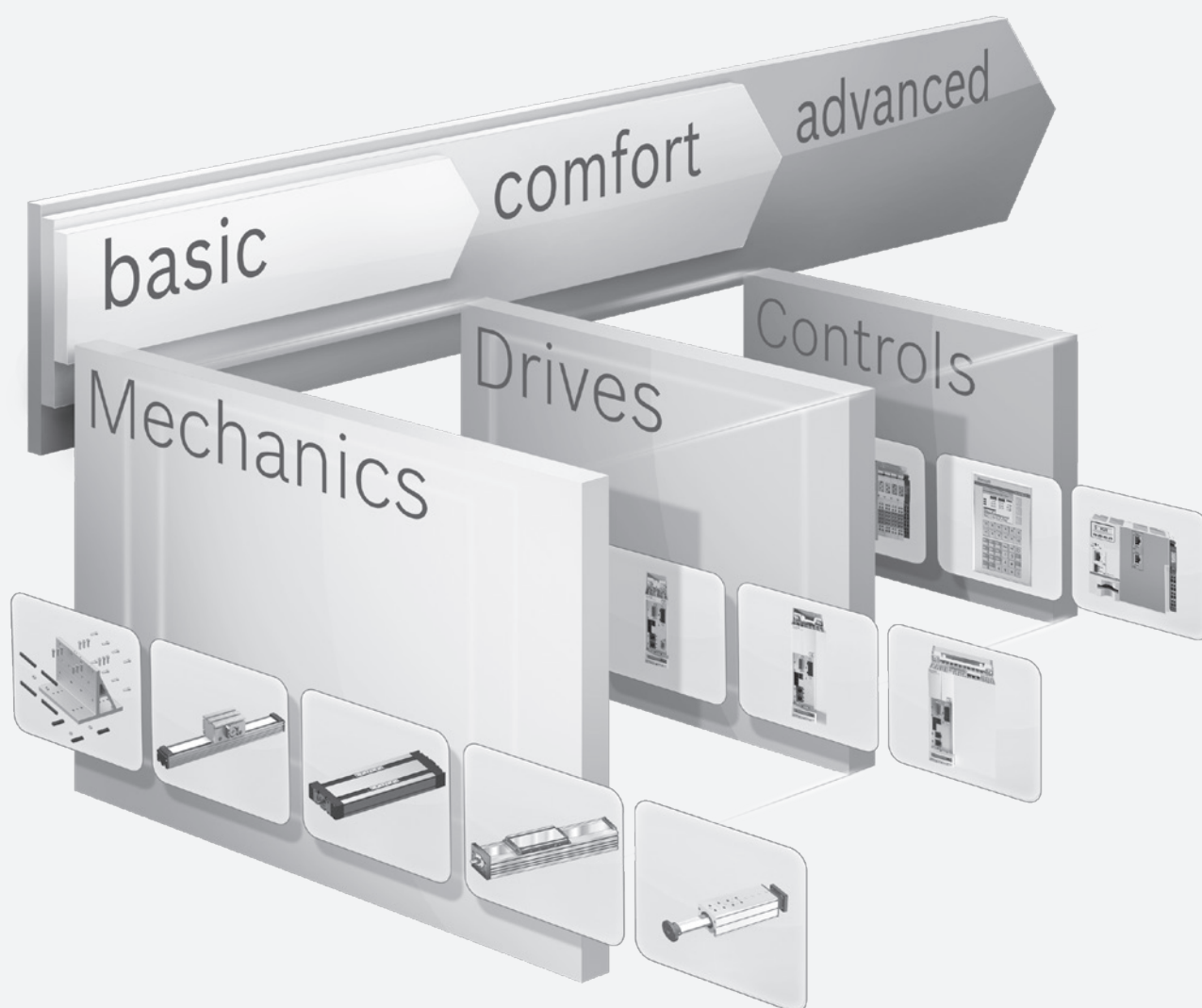
Rexroth enhances the system effectiveness still further with smart application tools: The drive controller software outputs maintenance-related messages to the user based on operating hours and travel to help schedule servicing at the right intervals. The result: longer life and reduced risk of failure.

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.

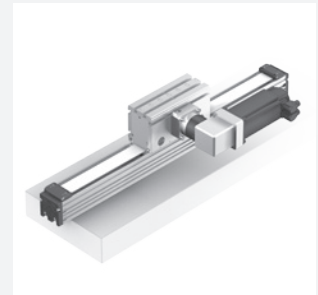
EasyHandling – more than just a kit of components

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.



Service and information

Operating conditions

Normal operating conditions

Ambient temperature No passing below the dew point	0 °C ... 40 °C	 9
Load	$\leq 0.2 \text{ C}$	
Travel distance $s_{\min}$ ¹⁾	OBB-055 $\geq 110 \text{ mm}$	
	OBB-085 $\geq 160 \text{ mm}$	
	OBB-120 $\geq 135 \text{ mm}$	
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.

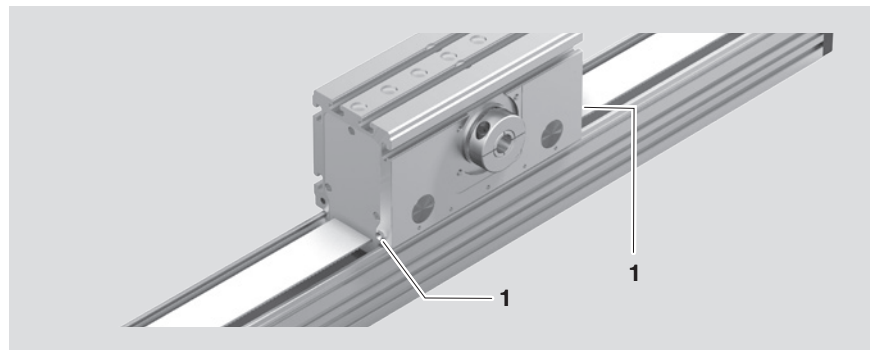
The only maintenance required is relubrication of the integrated Ball Rail System via one of the two funnel-type lube nipples (1).

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

⚠ Do not use greases containing solid particles (e.g. graphite or MoS₂)!

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

Documentation

Standard report
Option 01

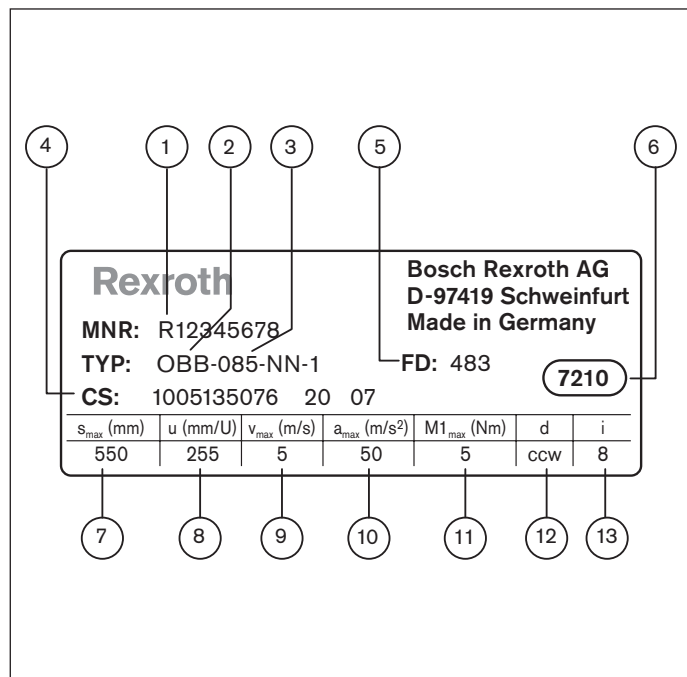
The standard report serves to confirm that the checks listed in the report have been carried out and that the measured values lie within the permissible tolerances.

Controls listed in the standard report:

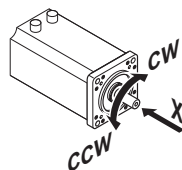
- functional checks of mechanical components
- functional checks of electrical components
- design is in accordance with order confirmation

Parameterization (commissioning)

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



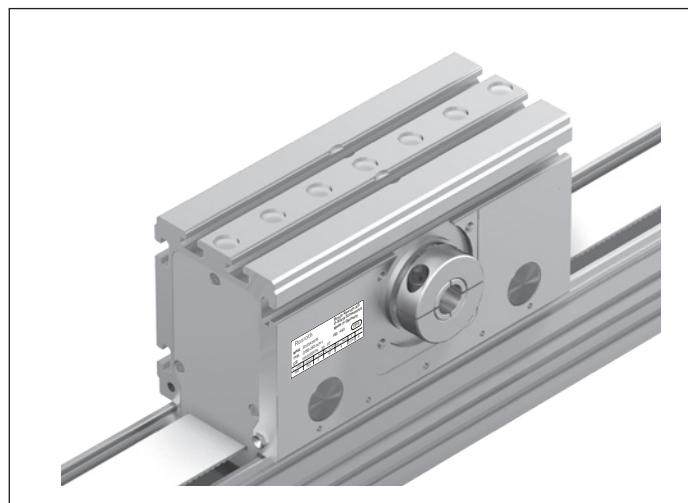
- 1** Material number
- 2** Type designation
- 3** Size
- 4** Customer information
- 5** Date of manufacture
- 6** Manufacturing location
- 7** s_{max} = max. travel range (mm)
- 8** u = lead constant (mm/rev)
- 9** v_{max} = max. speed (m/s)
- 10** a_{max} = max. acceleration (m/s²)
- 11** $M1_{max}$ = 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

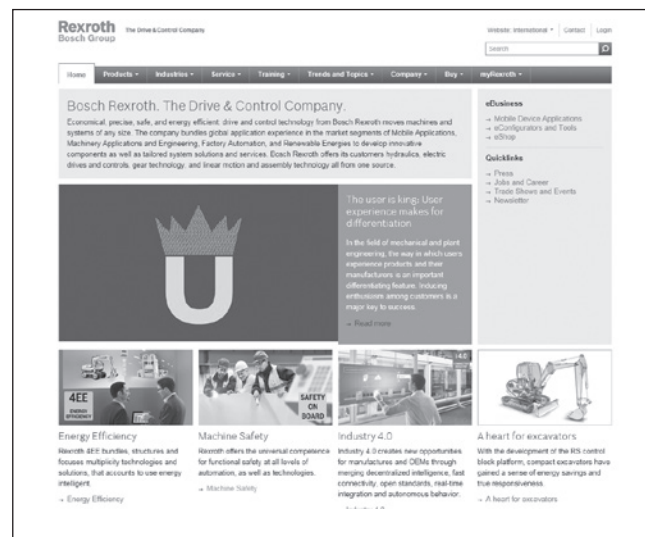
For Omega modules, the nameplate is mounted on the carriage on the drive side. (See fig.)



Further information

Bosch Rexroth homepage:

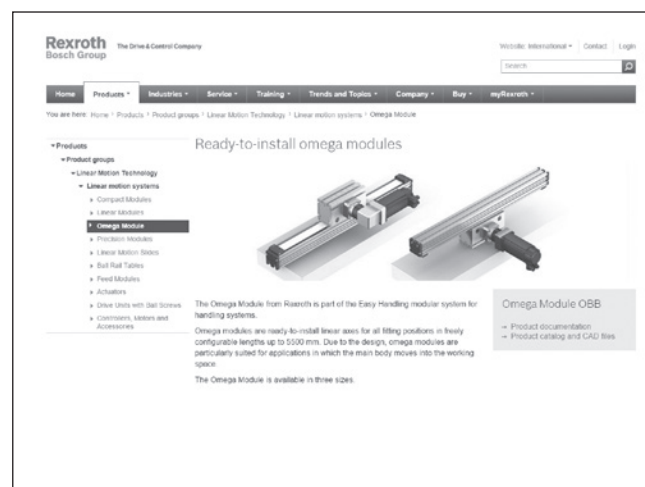
<http://www.boschrexroth.com>



Omega module

product information:

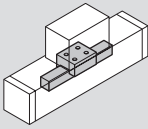
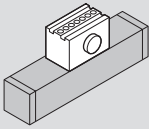
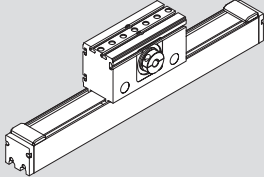
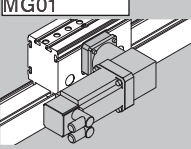
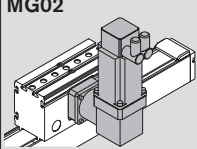
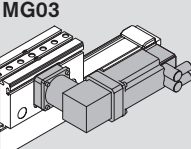
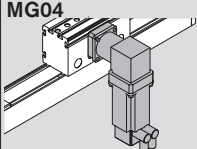
<http://www.boschrexroth.com/en/xc/products/product-groups/linear-motion-technology/linear-motion-systems/omega-module/index>



Service and information

Ordering example OBB-085

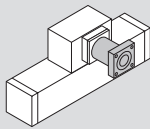
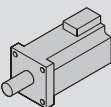
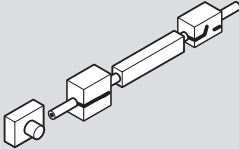
Configuration and ordering

Short product name, length OBB-085-NN-1, mm		Guideway	Drive			Carriage		
Version ²⁾			Reduction i = 1 i = 5 i = 8			 L _{ca} = 260 mm L _{ca} = 308 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 	01	–	10		01	02	
	MG02 							
	MG03 							
	MG04 							
MG10								

 = Mark of the selection area to the decision about version

 = 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		Switching system ⁴⁾		Documentation	
									
Speed reduction $i =$	Attachment kit ³⁾ MG01 MG02 MG03 MG04		for motor	without	with brake			standard report	
–	00		–	00		Without switch and without cable duct 00		01	
						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			
$i = 5$	33	43	MSK 050C	88	89				
$i = 8$	35	45							
$i = 8$	34	44	MSM 041B	140	141				
$i = 30$			MSK 050C	88	89				
			MSM 041B	140	141				

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: _____

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www.boschrexroth.com/contact

