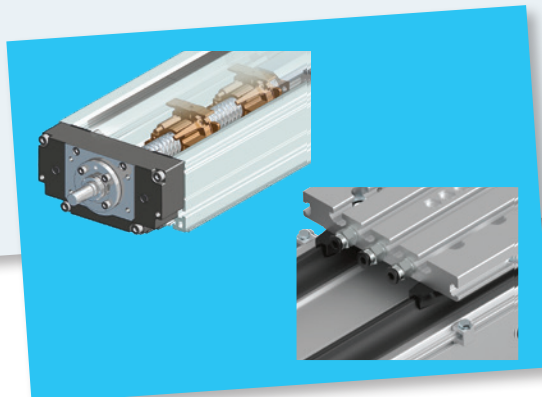
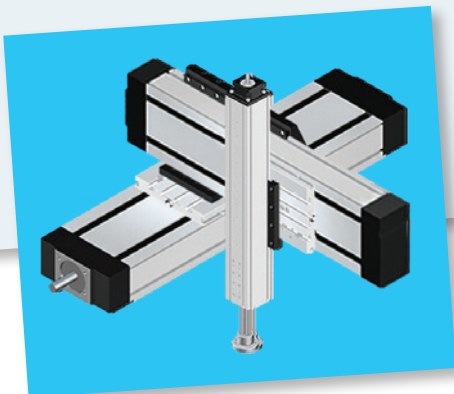
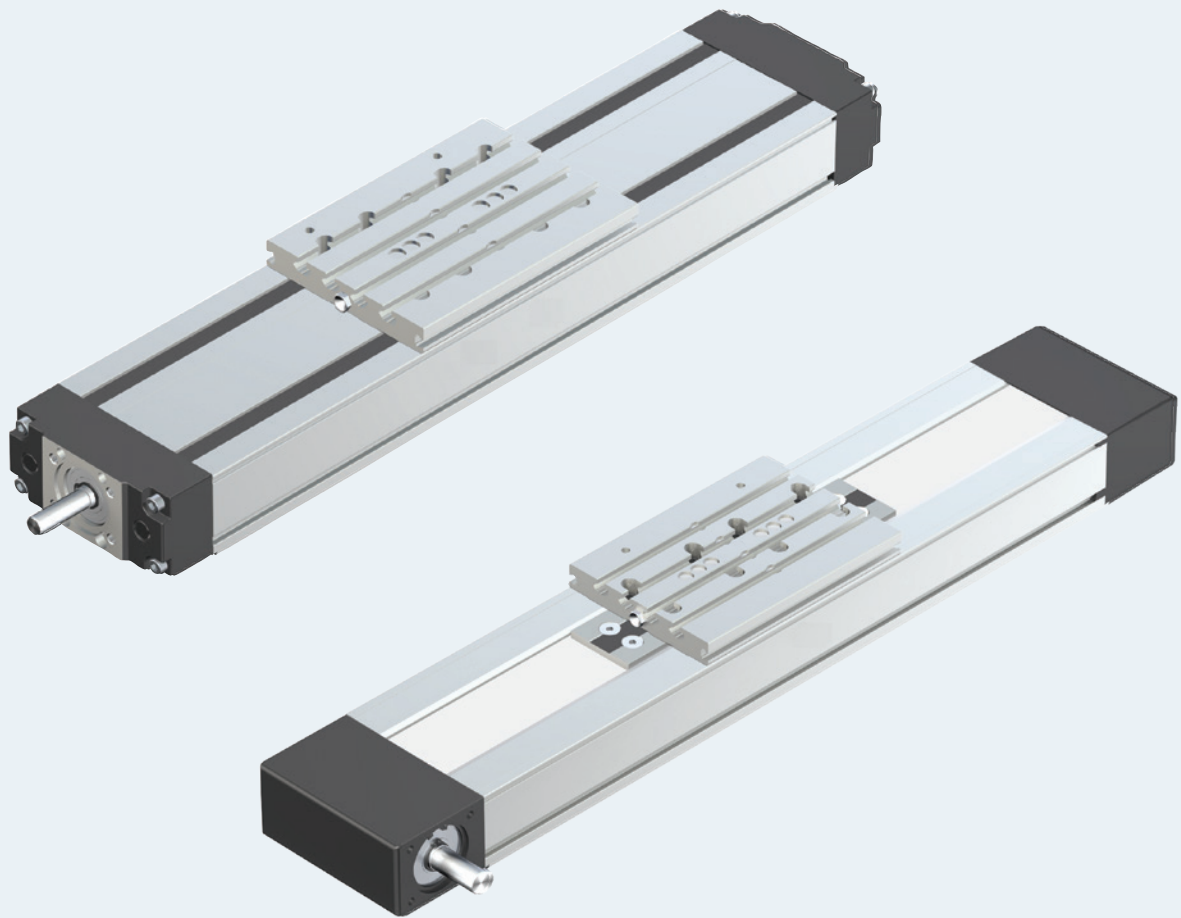


Compact modules CKK/CKR



Identification system for short product names

Compact modules are identified by the type designation and size.

Example		C	K	K	-	110	-	NN	-	1
System	=	Compact module (<u>C</u>)								
Guideway	=	Ball rail system (<u>K</u>)								
Drive	=	Ball screw assembly (<u>K</u>) Toothed belt drive (<u>R</u>)								
Size	=	070 / 090 / <u>110</u> / 145 / 200 / 280								
Version	=	Standard version (<u>N</u>)								
Generation	=	Product generation <u>1</u>								

Changes/additions at a glance

- ▶ CKR-280-DB-1 added

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Product description

Characteristic features

- ▶ Six fine-tuned sizes based on a compact precision aluminum profile with two integrated preloaded ball rail systems
- ▶ Identical external dimensions between compact module types CKK and CKR.
- ▶ Four different lube versions (see the following pages and the chapter "Lubrication")
- ▶ Ready-to-install compact modules in any length up to L_{\max}
- ▶ Aluminum carriages available in different versions depending on load

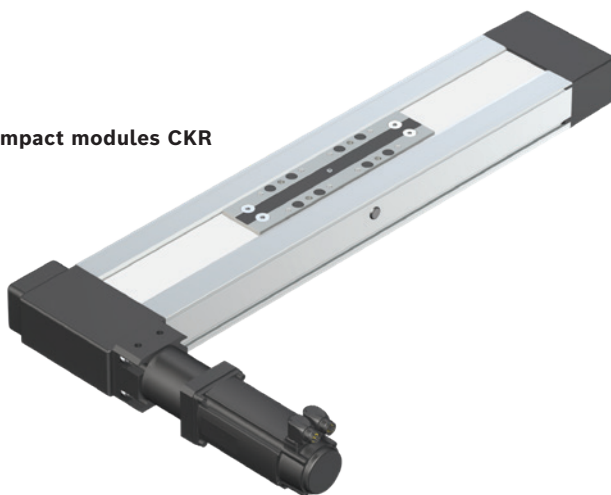
Further highlights

- ▶ Flexible thanks to options
- ▶ Ready-to-install with various attachment parts
- ▶ Centering holes for simple combination with other linear motion systems and connection elements
- ▶ Economical maintenance thanks to one-point lubrication feature (grease lubrication) from both sides or via the carriage or via a connection plate

Compact modules CKK



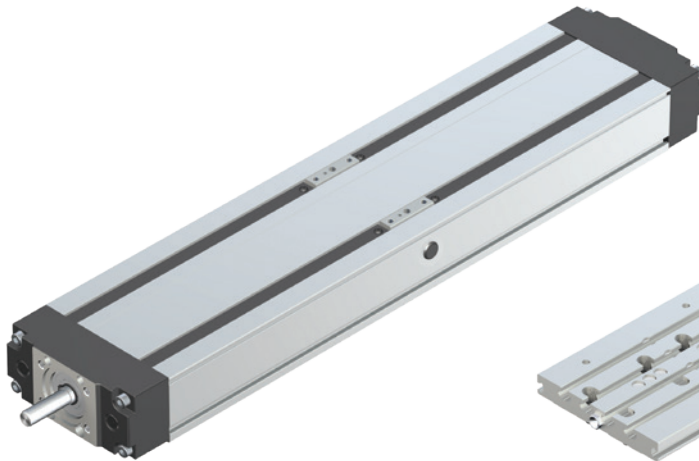
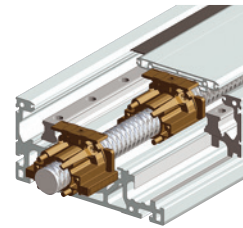
Compact modules CKR



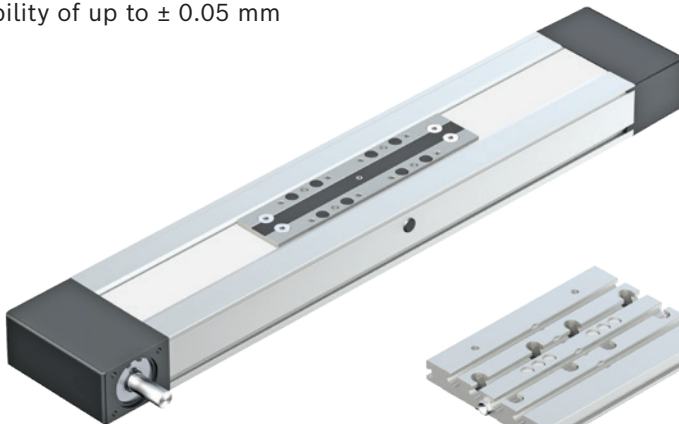
Compact modules are available as complete solutions with motor, controller, and control system. For more information, see the "Axis / drive / software" chapter.

Compact modules CKK**with ball rail system and ball screw assembly**

- ▶ Drive via precision ball screw assembly
- ▶ Screw support for the realization of high speeds on long assembly lengths for CKK-200/-280
- ▶ Protection of installation elements through a cover plate and two cover strips;
Optionally increased protection thanks to "Resist" cover
- ▶ Repeatability of up to ± 0.005 mm

**"Resist" cover****Connection plates****Screw support SPU for
CKK-200/-280****Compact modules CKR****with ball rail system and toothed belt drive**

- ▶ Realization of greater lengths of up to 10,000 mm
- ▶ Preloaded toothed belt
- ▶ Intelligent toothed belt guide protects inner components
- ▶ Repeatability of up to ± 0.05 mm

**Connection plates**

Axis / drive / software

**SIMPLY SAVE TIME AND MONEY:
EVERYTHING FROM A SINGLE SOURCE.
WITH A SINGLE MATERIAL NUMBER.**

So that you can realize fully automated movements with single axes faster, all components are now available in one package.

With just a few clicks, you can design and configure motor, drive controller, mains filter and cable online.

Ordered with just one material number, your solution will be available to you in now time – and immediately ready for operation thanks to the axis parameters stored in the motor. If necessary, the proven Rexroth service is always available to assist you.

Really everything from a single source.
Can it be easier?



Faster automation: single axis + drive + software in one package.



2 ORDERING OPTIONS, ALL FREEDOMS:

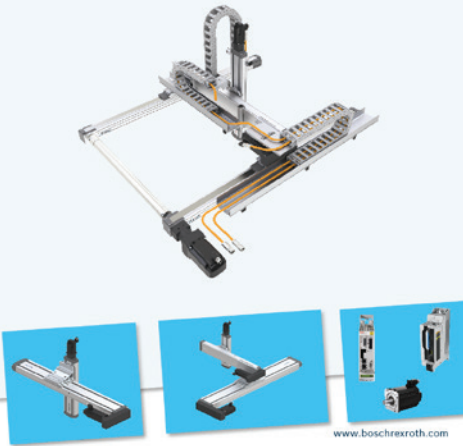
1. **Single axis**
2. **Single axis + drive**
(incl. mains filter/cable)

► For further information see chapter "Configuration and ordering" and chapter "Automation package".

Mehrachssysteme/Smart Function Kits



Multi-axis systems



Further information on
multi-axis systems



Product overview

LINEAR MOTION TECHNOLOGY ONE GENERATION AHEAD: COMPLETE SOLUTION - MINIMAL ENGINEERING:

The Factory of the Future will be more profitable, sustainable and future-proof – despite increasingly individual and flexible production processes. The requirements are therefore defined. As a leading supplier of linear motion technology and mechatronic systems, Bosch Rexroth is already providing the answers today: with quick click product selection, simple configuration & ordering processes, and intuitive commissioning of complete solutions without any programming knowledge. This ensures an extremely short time-to-market and high productivity during operation, even for today's highly complex Today.

Factory of the future

Now. Next. Beyond.

NEARLY UNLIMITED
FIELDS OF APPLICATION
FOR MULTI-AXIS SYSTEMS



Pick & place



Positioning




Palletizing



Feeding



Moving



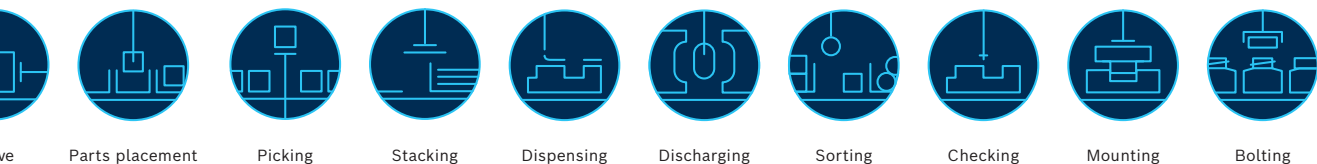
New standard for ready-to-install sub-systems: easier to select and configure, faster to install and get started

MULTI-AXIS SYSTEMS MADE EASY. EVERYTHING FROM A SINGLE SOURCE

Bosch Rexroth now makes the path to a ready-to-install sub-system unbeatably simple. More than 30 years of linear axis expertise have gone into the new multi-axis modular system and the completely revised LinSelect selection tool. There is no easier or faster way to select, configure and commission Cartesian multi-axis systems from standardized best-in-class components. You'll benefit from the latest generation of multi-axis systems from Bosch Rexroth: You'll receive ready-to-install, scalable positioning, handling and dispensing solutions made of proven and perfectly matched components, including all attachments, cable systems, motors and drive controllers – all from a single source, all from one company.

And if your fully assembled, fully integrable sub-system needs to be able to do even more, then take a look at the next step: Smart MechatroniX (see Smart Function Kits chapter) expands the components to include sensors, electronics and software – with completely new solution approaches and business models.

WE MOVE. YOU WIN.



ve

Parts placement

Picking

Stacking

Dispensing

Discharging

Sorting

Checking

Mounting

Bolting

Lubrication versions

Two drive versions:

- ▶ Compact modules CKK with ball rail system and ball screw assembly
- ▶ Compact modules CKR with ball rail system and toothed belt drive

Four different lube versions (depending on size)

- ▶ Standard lubrication (LSS)
- ▶ Preserved (LPG)
- ▶ Carriage with connection plate prepared for connection to central lubrication systems for liquid grease (LCF)
- ▶ Carriage with connection plate prepared for connection to central lubrication systems for oil (LCO)

Versions for oil and liquid grease lubrication prepared for connection to central lubrication systems

- ▶ High operational reliability through automated relubrication
- ▶ Need-based maintenance reduces consumption of lubricant, while ensuring high availability
- ▶ More degrees of freedom as lubrication is not dependent on position and installation location
- ▶ Low-cost unmanned maintenance

Notes:

LSS:

- ▶ Initial lubrication by Bosch Rexroth
- ▶ Relubrication using manual grease gun

LPG:

- ▶ Ball rail system and ball screw assembly only with corrosion prevention
- ▶ Relubrication using manual grease gun
- ▶ Basic lubrication required

LCF:

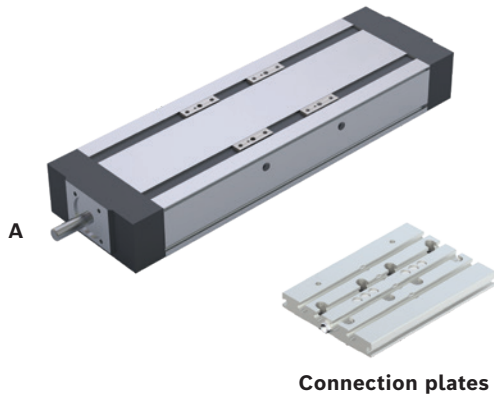
- ▶ Prepared for connection to central lubrication systems for liquid grease (grade NLGI 00 in accordance with DIN 51818)
- ▶ Lubrication with liquid grease only via single-line piston distributor system
- ▶ Basic lubrication required

LCO:

- ▶ Prepared for connection to central lubrication systems for oil
- ▶ Oil lubrication only via single-line piston distributor system
- ▶ Runner block and ball screw assembly nut with integrated non-return valves
- ▶ Basic lubrication required

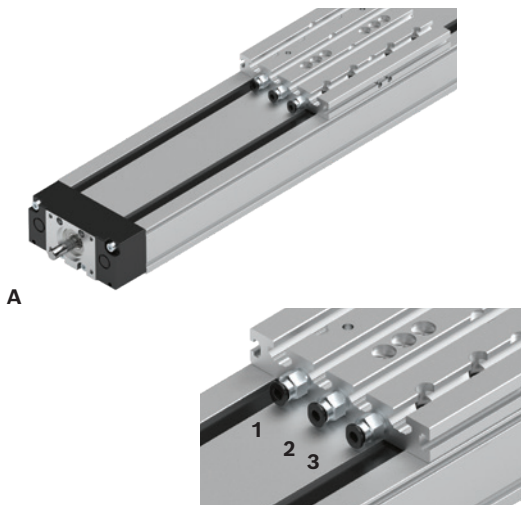
Compact modules CKK
Lubrication version LSS, LPG

- Grease lubrication with manual grease gun via frame, carriage or via connection plate



Lubrication version LCF, LCO

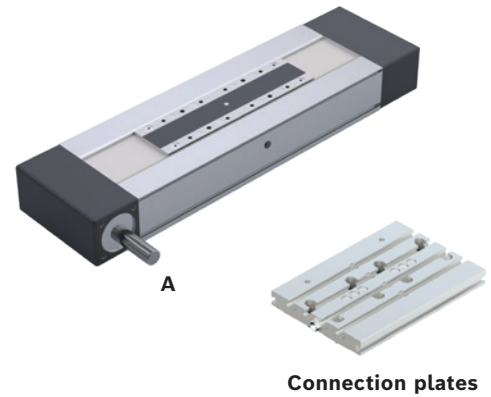
- 3 lube fittings
- Prepared for connection to central lubrication systems



- A** Drive side
1 Lube connection, runner block left
2 Lube connection, runner block right
3 Lube connection, ball screw assembly

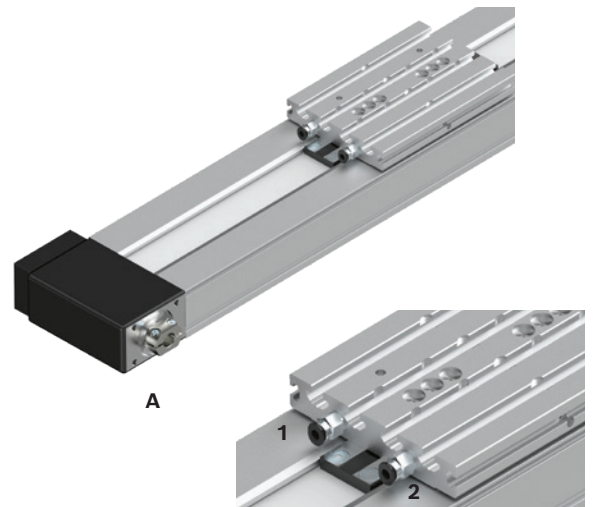
Compact modules CKR
Lubrication version LSS, LPG

- Grease lubrication with manual grease gun via frame, carriage or via connection plate



Lubrication version LCF, LCO

- 2 lube fittings
- Prepared for connection to central lubrication systems



- A** Drive side
1 Lube connection, runner block left
2 Lube connection, runner block right

Form of delivery

Compact modules with ball rail system and ball screw or toothed belt drive are delivered completely assembled.

Motor attachment

If a combination of motor and motor attachment has been selected, then the components are attached as shown in the figure, which also shows the location of the motor connector.

When ordering motor attachments without motor, not all parts can be mounted.

Final assembly must then be carried out by the customer.

All necessary instructions and parameters for professional assembly are included.

Available options

Cable duct, mounting duct, switch, switching cam and socket with connector are included as loose parts.

Lubrication

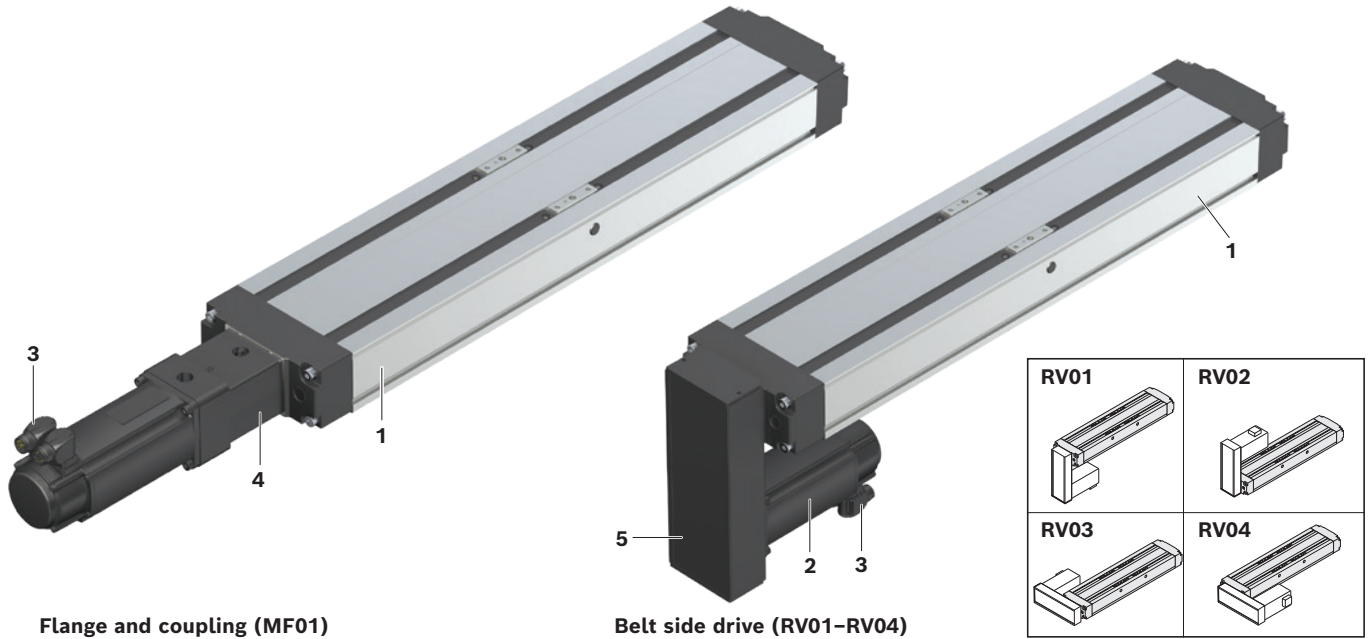
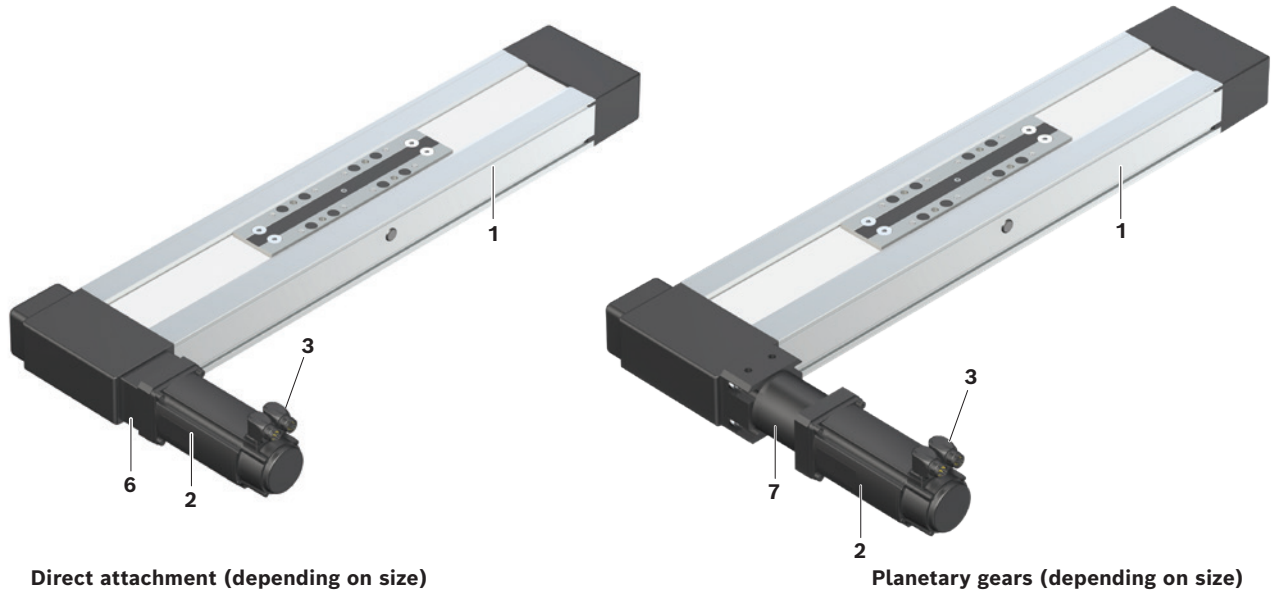
Compact modules are delivered with initial greasing, depending on the lubricant used.

For more information on lubricants, see Chapter "Lubrication".

Documentation

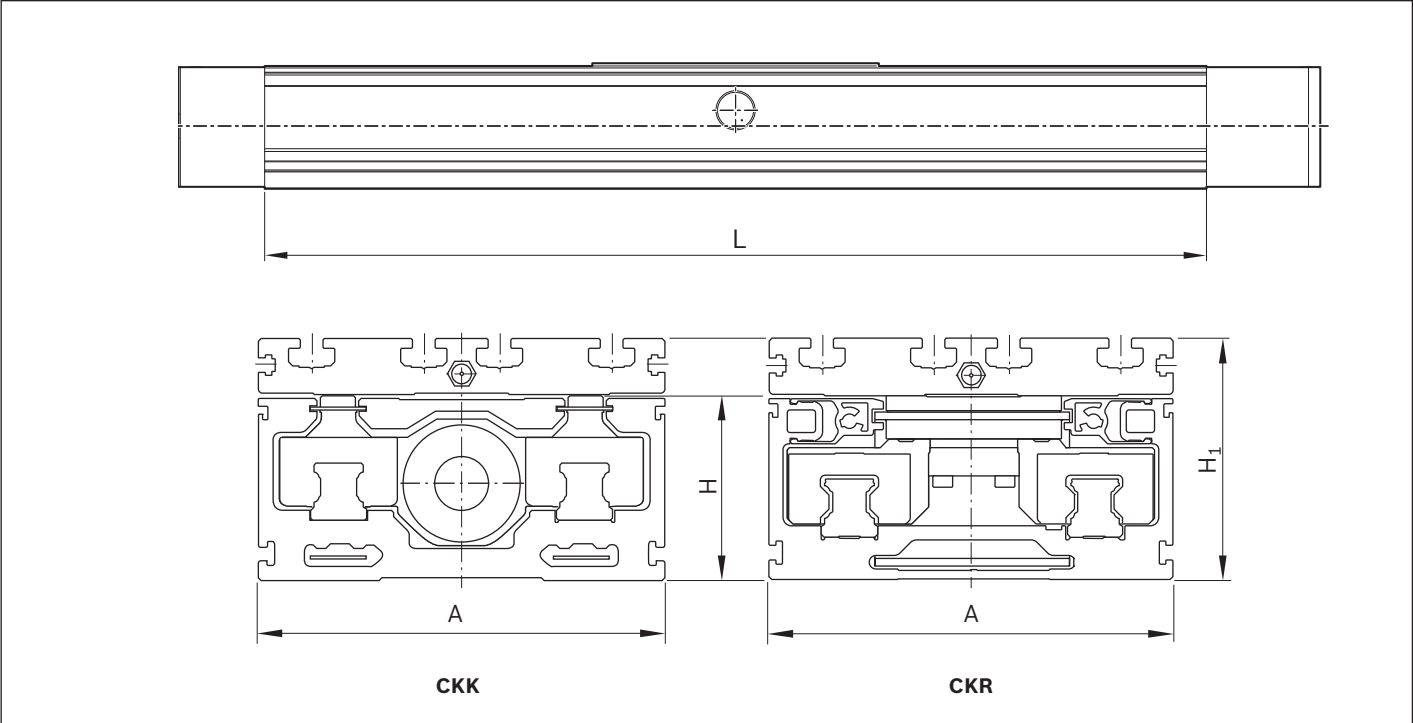
Each compact module is supplied with the accompanying documentation.

All CKK and CKR versions that have been configured with "Carriage with connection plate" are supplied without the lube ports in the frame. All configured compact modules with carriages without connection plate are still supplied with lube ports in the frame.

CKK**CKR**

- 1** Linear motion system
- 2** Motor
- 3** Motor connector
- 4** Flange and coupling
- 5** Belt side drive
- 6** Direct attachment (flange)
- 7** Gearing

Overview of types with load capacities



Compact modules	Type	Guideway	Drive	
	CKK	 Ball rail system	 Ball screw assembly	
	CKR	 Ball rail system	 Toothed belt drive	

Note on dynamic load capacities and moments

Determination of the dynamic load capacities and moments 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	070			090			110			145			200			280		
	Dimensions (mm)	A	H	H ₁	A	H	H ₁	A	H	H ₁	A	H	H ₁	A	H	H ₁	A	H	H ₁
		70	32	44.5	90	40	56	110	50	66	145	65	85	200	100	127	280	160	190
	L _{max} (mm)	650			750			1,500			1,800			2,200 ¹⁾			2,500 ¹⁾		
	Dynamic load capacity C _{gw} ²⁾ (N)	3,830			7,505			32,035			76,025			121,185			216,700		
	L _{max} (mm)	1,500			5,500			5,500			5,500			10,000			5,500		
	Dynamic load capacity C _{gw} ²⁾ (N)	3,830			7,505			32,035			76,025			121,185			216,700		

¹⁾ Up to 5,500 mm are possible with screw support (SPU).

²⁾ The maximum permitted dynamic values are specified here.
They vary depending on the carriage length.

Compact modules with ball screw assembly (CKK)

Product overview

Features

- ▶ Six fine-tuned sizes based on a compact precision aluminum profile with two integrated preloaded ball rail systems
- ▶ Four different lube versions
- ▶ Ready-to-install compact modules in any length up to L_{\max}
- ▶ Driven by precision ball screw assembly in rolled design tolerance grade T7 in accordance with DIN 69051 with single nut set to zero-clearance
- ▶ High travel speeds thanks to large leads with high precision over long lengths
- ▶ Aluminum carriages available in different lengths
- ▶ Protection of installation elements through a cover plate and two cover strips; optionally increased protection thanks to "Resist" cover
- ▶ Low-cost maintenance
- ▶ Repeatability of up to ± 0.005 mm

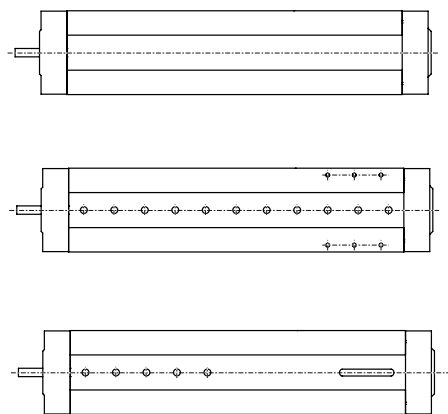
Further highlights

- ▶ Flexible thanks to selectable options
- ▶ Centering holes for simple combination with other linear motion systems and connection elements
- ▶ Extensive accessories for connection and clamping units
- ▶ Nameplate with parameters for easy commissioning

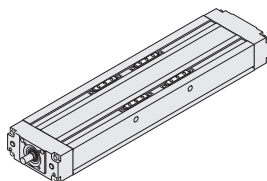
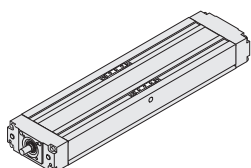
Attachments

- ▶ Motor attachments with flange and coupling or via a belt side drive
- ▶ Motor attachment kits according to customer specification
- ▶ Maintenance-free servo motors with selectable brake and attached feedback
- ▶ Magnetic sensors, switch activation without additional switching cam
- ▶ Socket and connector
- ▶ Cable duct made of aluminum for sensors

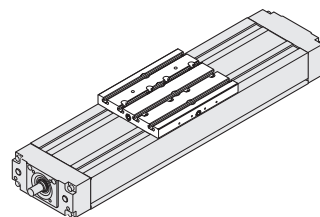
Design/options for guideway (frame), carriages, connection plates



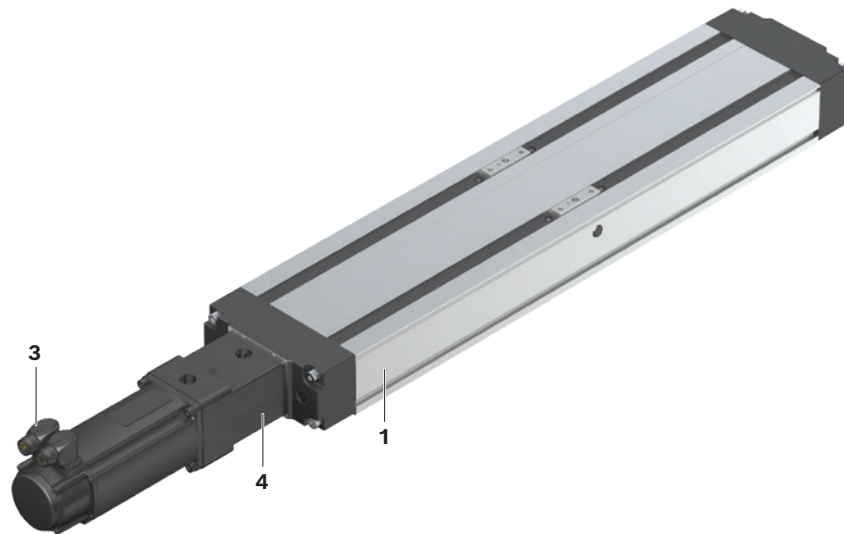
Guideway (frame)



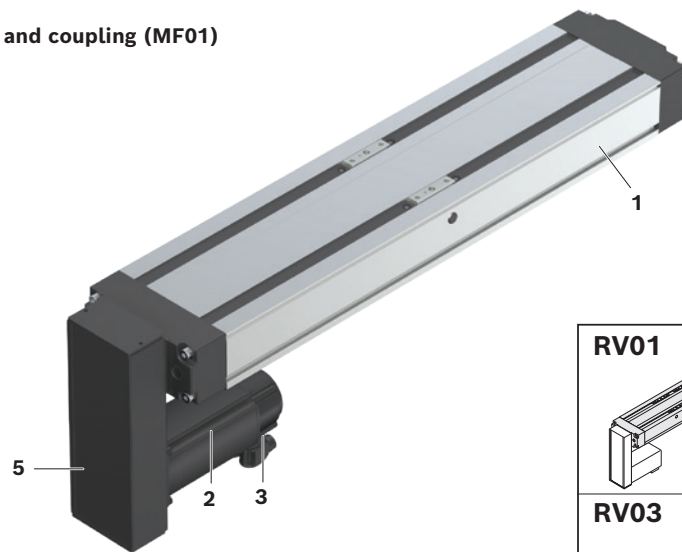
Carriages



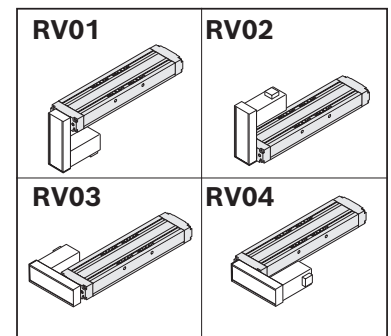
Connection plates



Flange and coupling (MF01)



Belt side drive (RV01-RV04)



- 1 Linear motion system
- 2 Motor
- 3 Motor connector
- 4 Flange and coupling
- 5 Belt side drive

Screw support for compact module CKK-200/-280

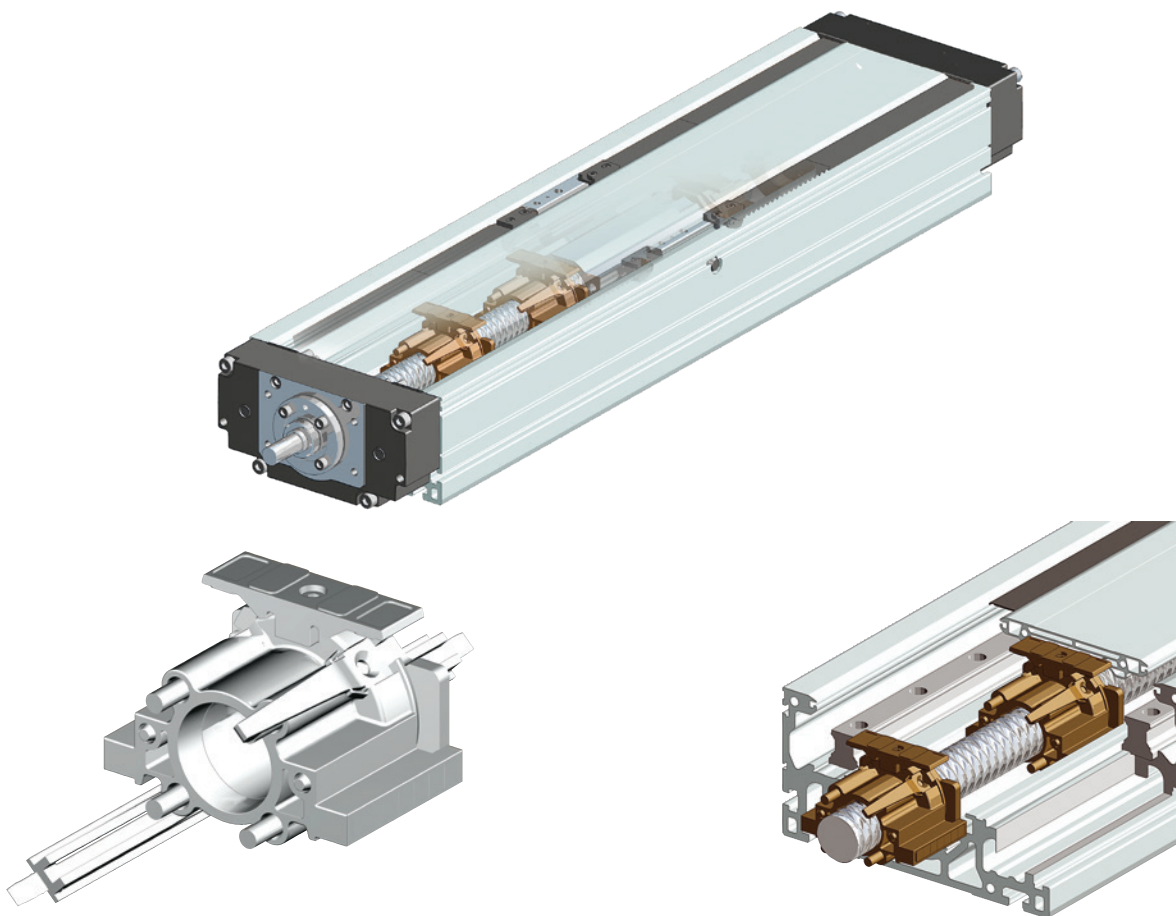
Structural design:

- Guidance of the screw supports in the frame.

Features:

- High speed over longer lengths of up to 5,500 mm.
- Elastomer buffer provides cushioning between carriage and screw supports.
- Screw supports are maintenance-free.
- Screw supports are protected by the cover plate and two cover strips.
- The screw supports prevent the cover plate from sagging in all directions.

 **Screw support suitable for horizontal operation only**



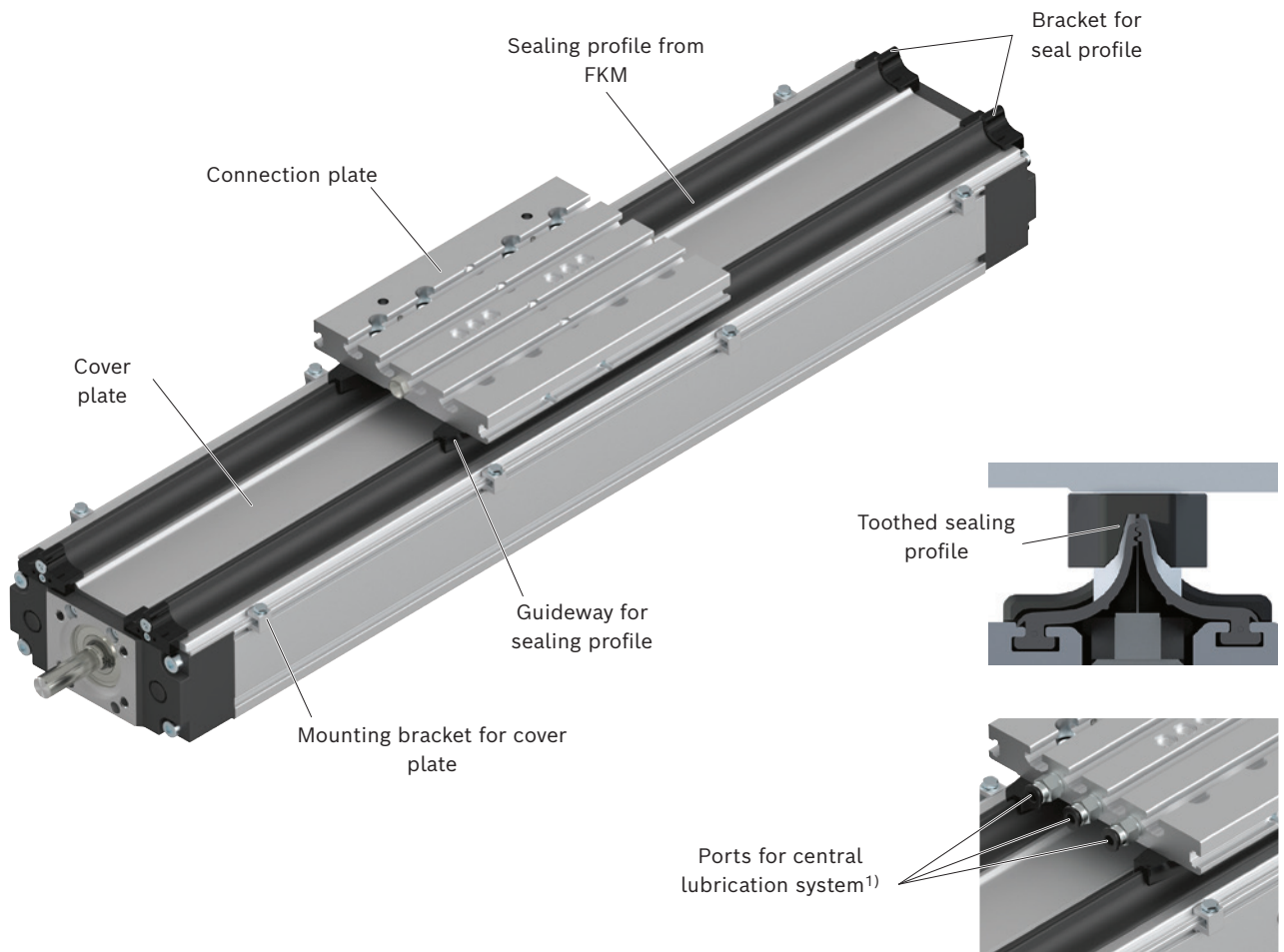
"Resist" cover

Structural design:

- ▶ Sizes: CKK-110/-145/-200
- ▶ Possible for version with connection plate

Features:

- ▶ Increased protection thanks to the toothed sealing profile
- ▶ The integrated guideway on the carriage ensures the sealing profile interlocks perfectly
- ▶ Sealing profile made of flexible FKM – material
- ▶ Free of LABS (substances harmful to paint structure)
- ▶ Replaceable sealing profile
- ▶ The sealing profile has a short-term temperature resistance of up to 300°C
- ▶ Suitable for exposure to dry chips with broken chips of aluminum and component handling during welding application
- ▶ Selectable with all lube versions



¹⁾ See chapter "Lubrication"

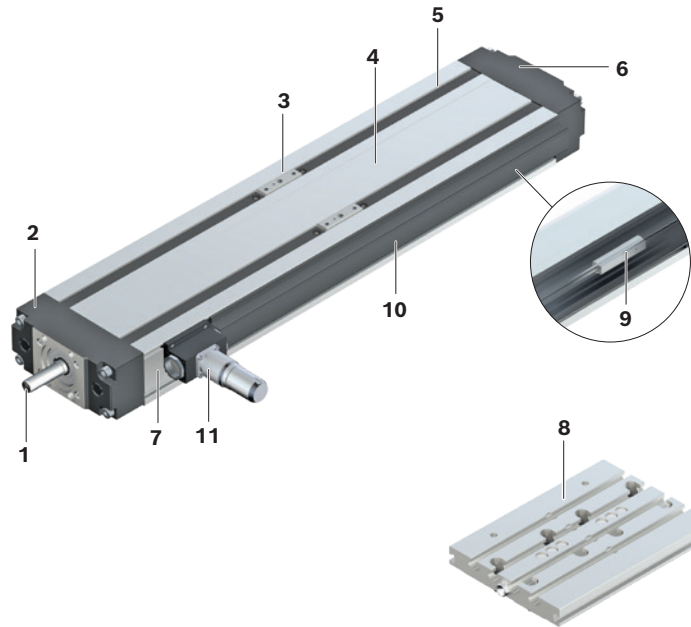
Structural design

Structural design CKK

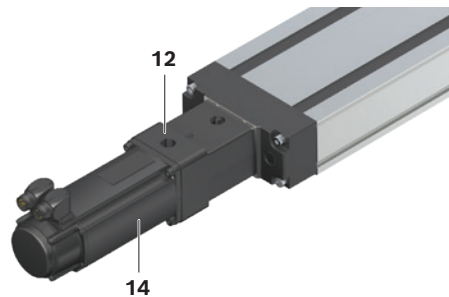
- 1** Ball screw assembly with zero-backlash single nut
- 2** Drive side cross tie
- 3** Carriage with integrated runner block
- 4** Cover plate
- 5** Cover strip made of reinforced strip PU
- 6** End block
- 7** Frame

Attachments:

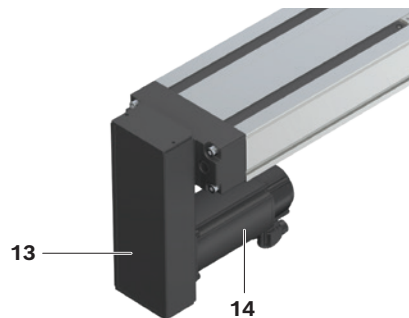
- 8** Connection plate
- 9** Magnetic sensor
- 10** Cable duct
- 11** Socket/connector
- 12** Flange and coupling
- 13** Belt side drive
- 14** Motor



Motor attachment – flange and coupling



Motor attachment – belt side drive



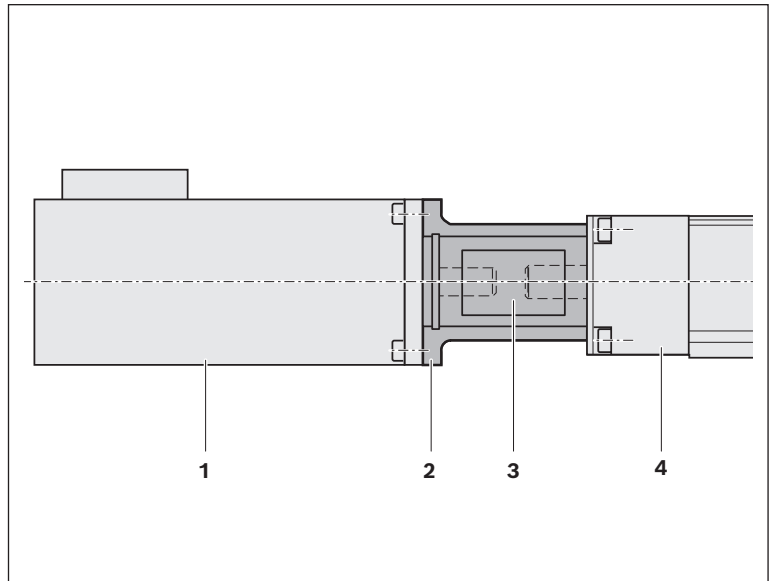
Structure of flange and coupling

A motor can be attached to all compact modules with ball screw assembly by means of a flange and coupling.

The flange serves to fasten the motor to the compact module and acts as a closed housing for the coupling. The motor's drive torque is transmitted stress-free through the coupling to the compact module's drive journal.

Our standard couplings compensate for the system's thermal expansion.

- 1 Motor
- 2 Flange
- 3 Coupling
- 4 Compact module



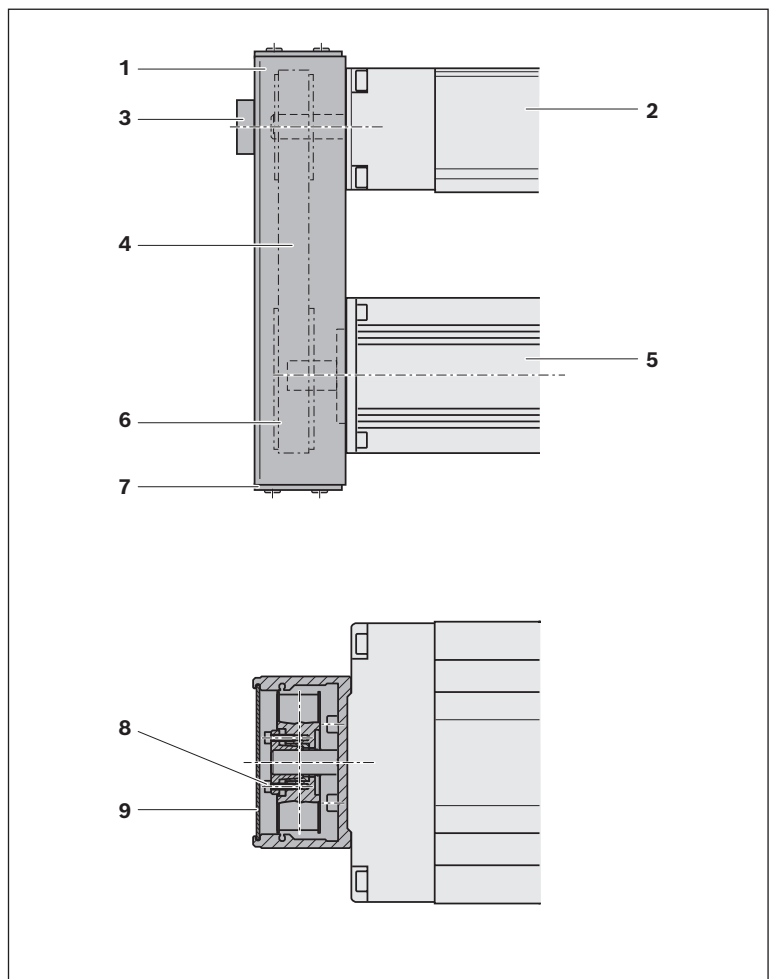
Structure of belt side drive

All compact modules with ball screw assembly offer the option of attaching the motor via a belt side drive. This makes the overall length shorter than when attaching the motor with flange and coupling. The space-saving, closed pulley housing serves as protection for the belt and as a motor bracket. In addition, various gear ratios are also available (depending on size).

The belt side drive can be mounted in four different directions:

- Below, above (RV01 and RV02)
- Left, right (RV03 and RV04)

- 1 Pulley housing made of anodized aluminum frame
- 2 Compact module
- 3 Support bearing at the screw journal in size CKK-070
- 4 Toothed belt drive
- 5 Motor
- 6 Toothed belt drive
- 7 Cover
- 8 Belt pulleys with tensioning units
- 9 Cover plate



Technical data

General technical data

Observe the "Project planning/calculation" chapter.

CKK	Carriage			Additional length		Min. travel range	Max. length	BASA	Dynamic characteristic values							
	Connection plate		$L_W^{3)}$	Connection plate					Load capacities			Load moments				
	without ¹⁾	with ²⁾		without	with				C_{gw}	C_{bs}	C_{fb}	M_t	$M_t^{5)}$			
	L_{ca} (mm)	L_{ca} (mm)	$L_W^{3)}$ (mm)	L_{ad} (mm)	L_{ad} (mm)	$s_{min}^{4)}$ (mm)	L_{max} (mm)	$d_0 \times P$ (mm)	C_{gw} (N)	C_{bs} (N)	C_{fb} (N)	M_t (Nm)	$M_t^{5)}$ (Nm)			
-070	32	60	–	30	2	40	650	8 x 2.5	2,360	2 250	1 600	47	7			
					8 x 5			2500								
	73	95			8			8 x 2.5	3,830	2 250		77	111			
								8 x 5		2500						
-090	35	60	–	50	25	40	750	12 x 2	4,620	2,420	6,900	125	16			
								12 x 5		4,100						
								12 x 10		2,700						
	100	125	–	50	25	40	750	12 x 2	7,505	2,420	6,900	203	244			
															12 x 5	4,100
															12 x 10	2,700
	variable min. 101 max. 235	–	variable min. 66 max. 200	50	–	40	750	12 x 2	7,505	2,420	6,900	203	3.75 x L_W			
															12 x 5	4,100
															12 x 10	2,700
	-110	39	60	–	51	30	50	1,500	16 x 5	19,720	13,320	13,400	651	136		
									16 x 10		10,350					
									16 x 16		6,800					
124		155	85	51	20	50	1,500	16 x 5	32,035	13,320	13,400	1,057	1,361			
															16 x 10	10,350
															16 x 16	6,800
variable min. 125 max. 289		–	variable min. 86 max. 250	51	–	50	1,500	16 x 5	32,035	13,320	13,400	1,057	16.01 x L_W			
															16 x 10	10,350
															16 x 16	6,800
-145		49	80	–	61	30	60	1,800	20 x 5	46,800	15,480	17,000	2,059	400		
									20 x 20		9,810					
									20 x 40		12,600					
			25 x 10						16,920							
	149	190	100	61	20	60	1,800	20 x 5	76,025	15,480	17,000	3,345	3,801			
															20 x 20	9,810
															20 x 40	12,600
															25 x 10	16,920
	variable min. 150 max. 349	–	variable min. 101 max. 300	61	–	60	1,800	20 x 5	76,025	15,480	17,000	3,345	38.01 x L_W			
															20 x 20	9,810
															20 x 40	12,600
															25 x 10	16,920

Size -200/-280 ➔ next page

¹⁾ In the "without connection plate" version, carriage length L_{ca} corresponds to the dimension of the outer edge to outer edge of the fastening bridges.

Dynamic characteristic values and maximum permissible loads are valid only when connecting the fastening bridges via customer-built attachment.

²⁾ The connection plate is mounted on the "without connection plate" carriage version.

In the "with connection plate" version, carriage length L_{ca} corresponds to the length of the connection plate.

³⁾ A variable center-to-center distance L_W is only possible for the "without connection plate" carriage design.

The variable center-to-center distance is freely selectable between minimum and maximum distance in millimeters steps.

⁴⁾ Minimum required travel range to ensure a reliable lubrication distribution.

⁵⁾ For the variable L_W , M_l , $M_{y \max}$ and $M_{z \max}$ must be determined according to the selected centerline-to-centerline distance L_W .

⁶⁾ ➔ "Resist chapter".

	Maximum permissible loads						Planar moments of inertia		Point of force application	
	Moments			Forces			I_y (cm ⁴)	I_z (cm ⁴)	Connection plate without	with
	$M_{x \max}$ (Nm)	$M_{y \max}^{5)}$ (Nm)	$M_{z \max}^{5)}$ (Nm)	$F_{y \max}$ (N)	$F_{z1 \max}$ (N)	$F_{z2 \max}$ (N)			Z_1 (mm)	Z_1 (mm)
	47	7	7	1,270	2,360	2,360	5,72	50,0	19.20	31.7
	77	111	60	2070	3830	3830				
	112	16	16	2,490	4,620	4,140	14,90	140,40	23.20	39.2
	203	244	132	4,050	7,505	7,505				
	203	3.75 x L _W	2.03 x L _W	4,050	7,505	7,505				
	198	32	32	3,480	6,000	6,000	40,90	373,70	26.70	42.7 (60.7) ⁶⁾
	396	510	240	5,650	12,000	12,000				
	396	6 x L _W	2.82 x L _W	5,650	12,000	12,000				
	634	100	100	8,410	14,400	14,400	125,40	1,150.00	31.60	51.6 (71.6) ⁶⁾
	1,267	1,440	683	13,660	28,800	28,800				
	1,267	14.4 x L _W	6.83 x L _W	13,660	28,800	28,800				

CKK	Carriage			Additional length		Min. travel range	Max. length	BASA	Dynamic characteristic values					
	Connection plate without ¹⁾		L _W ³⁾	Connection plate with					Load capacities			Load moments		
	L _{ca} (mm)	L _{ca} (mm)		L _{ad} (mm)	L _{ad} (mm)				C _{gw} (N)	C _{bs} (N)	C _{fb} (N)	M _t (Nm)	M _t ⁵⁾ (Nm)	
-200	79.5	190	–	120.5	10	80	2,200	32 x 5	74,600	23,310	26,000	4,849	1,053	
								32 x 10		34,200				
								32 x 20		21,240				
								32 x 32		21,060				
	254.5	305	175	120.5	70	80	2,200	32 x 5	121,185	23,310	26,000	7,877	10,604	
								32 x 10		34,200				
								32 x 20		21,240				
								32 x 32		21,060				
	variable min. 255.5 max. 429.5	–	variable min. 176 max. 350	120.5	–	80	2,200	32 x 5	121,185	23,310	26,000	7,877	60.59 x L _W	
								32 x 10		34,200				
								32 x 20		21,240				
								32 x 32		21,060				
-280	330	375	200	120	75	105	2,500	40 x 5	216,700	31,410	54,000	19,500	21,670	
								40 x 10		54,000				
								40 x 20		40,950				
								40 x 40		39,960				
	variable min. 331 max. 505	-	variable- min. 201 max. 375"	120	-	105	2,500	40 x 5	216,700	31,410	54,000	19,500	108.35 x L _W	
								40 x 10		54,000				
								40 x 20		40,950				
								40 x 40		39,960				

¹⁾ In the "without connection plate" version, carriage length L_{ca} corresponds to the dimension of the outer edge to outer edge of the fastening bridges.

Dynamic characteristic values and maximum permissible loads are valid only when connecting the fastening bridges via customer-built attachment.

²⁾ The connection plate is mounted on the "without connection plate" carriage version.

In the "with connection plate" version, carriage length L_{ca} corresponds to the length of the connection plate.

³⁾ A variable center-to-center distance L_W is only possible for the "without connection plate" carriage design.

The variable center-to-center distance is freely selectable between minimum and maximum distance in millimeters steps.

⁴⁾ Minimum required travel range to ensure a reliable lubrication distribution.

⁵⁾ For the variable L_W, M_L, M_{y max} and M_{z max} must be determined according to the selected centerline-to-centerline distance L_W.

⁶⁾ ➔ "Resist chapter".

	Maximum permissible loads						Planar moments of inertia		Point of force application	
	Moments			Forces			I_y (cm ⁴)	I_z (cm ⁴)	Connection plate without	with
	$M_{x \max}$ (Nm)	$M_{y \max}^{5)}$ (Nm)	$M_{z \max}^{5)}$ (Nm)	$F_{y \max}$ (N)	$F_{z1 \max}$ (N)	$F_{z2 \max}$ (N)			Z_1 (mm)	Z_1 (mm)
	1,375	299	299	12,265	21,150	21,150	550.50	3,897.00	36.0	63.0 (86.4) ⁶⁾
	2,750	3,701	1,744	19,925	42,300	42,300				
	2,750	21.14 x L_W	9.97 x L_W	19,925	42,300	42,300				
	5,400	6,000	5,517	55,170	86,685	60,000	2,683.00	15,638.00	71.5	101.5
	5,400	30 x L_W	27.58 x L_W	55,170	86,685	60,000				

Drive data

Observe the "Project planning/calculation" chapter.

CKK	BASA	Carriage		Constant weight calculation		Moved mass of system	
		Connection plate without	with	$k_{g \text{ fix}}$ (kg)	$k_{g \text{ var}}$ (kg/mm)	Connection plate without ¹⁾	with
	$d_0 \times P$ (mm)	L_{ca} (mm)	L_{ca} (mm)			m_{ca} (kg)	m_{ca} (kg)
-070	8 x 2.5	32	60	0.29	0.0038	0.15	0.26
		73	95			0.25	0.42
	8 x 5	32	60			0.15	0.26
		73	95			0.25	0.42
-090	12 x 2	35	60	0.50	0.0054	0.36	0.54
		100	125			0.59	0.96
	12 x 5	35	60			0.36	0.54
		100	125			0.59	0.96
	12 x 10	35	60			0.36	0.54
		100	125			0.59	0.96
-110	16 x 5	39	60	0.91	0.0094	0.52	0.75
		124	155			0.86	1.45
	16 x 10	39	60			0.52	0.75
		124	155			0.86	1.45
	16 x 16	39	60			0.52	0.75
		124	155			0.86	1.45
-145	20 x 5	49	80	1.91	0.0179	1.21	1.71
		149	190			2.06	3.26
	20 x 20	49	80			1.21	1.71
		149	190			2.06	3.26
	20 x 40	49	80			1.21	1.71
		149	190			2.06	3.26
	25 x 10	49	80			1.21	1.71
		149	190			2.06	3.26
-200	32 x 5	79.5	190	4.06	0.0296	3.20	5.50
		254.5	305			5.20	8.90
	32 x 10	79.5	190			3.20	5.50
		254.5	305			5.20	8.90
	32 x 20	79.5	190			3.20	5.50
		254.5	305			5.20	8.90
	32 x 32	79.5	190			3.20	5.50
		254.5	305			5.20	8.90
-280	40 x 5	330	375	20.75	0.0497	14.77	22.04
	40 x 10					15.04	22.31
	40 x 20					15.02	22.29
	40 x 40					15.74	23.01

¹⁾ To the carriage version with variable center-to-center distance L_w , the larger value applies

	Constant mass moment of inertia				Friction torque ¹⁾ M_{Rs} (Nm)	Max. acceleration a_{max} (m/s ²)	Max. speed v_{max} (m/s)	Max. drive torque M_P (Nm)
	Connection plate		k_{J var} (kg/mm)	k_{J m} (mm ²)				
	without¹⁾ k_{J fix} (kg/mm ²)	with k_{J fix} (kg/mm ²)						
	0.769	0.786	0.004	0.158	0.07	50.0	See "Diagrams" chapter	See "Diagrams" chapter
	0.785	0.812						
	0.840	0.910		0.633				
	0.903	1.011						
	1.279	1.298	0.013	0.101	0.13	48.4		
	1.303	1.340			0.14			
	1.454	1.568	0.011	0.633	0.15	50.0		
	1.599	1.834			0.16			
	2.138	2.594	0.011	2.533	0.18	50.0		
	2.720	3.658			0.20			
	5.088	5.234	0.031	0.633	0.37	50.0		
	5.303	5.677			0.40			
	6.076	6.658	0.031	2.533	0.40	50.0		
	6.937	8.432			0.43			
	8.161	9.652	0.034	6.485	0.42	50.0		
	10.365	14.191			0.48			
	22.564	22.880	0.084	0.633	0.48	39.8		
	23.102	23.862			0.52			
	34.029	39.950	0.081	10.132	0.60	50.0		
	42.641	54.800			0.68			
	70.856	91.120	0.086	40.528	0.70	50.0		
	105.305	153.939			0.86			
	26.335	27.601	0.239	2.533	0.60	50.0		
	28.488	31.528			0.65			
	71.348	72.867	0.605	0.633	1.10	17.9		
	72.741	75.147			1.20			
	76.612	82.691	0.640	2.533	1.10	30.7		
	82.185	91.810			1.20			
	93.299	117.676	0.639	10.132	1.15	50.0		
	115.590	154.092			1.25			
	127.391	189.642	0.617	25.938	1.25	50.0		
	184.455	283.020			1.35			
	247.114	252.259	1.564	0.633	2.20	12.2		
	271.987	292.566	1.355	2.533	2.70	16.8		
	386.004	466.119	1.352	10.132	2.50	33.8		
	871.492	1166.296	1.342	40.528	2.90	50.0		

Drive data for CKK with Resist cover

Observe the "Project planning/calculation" chapter.

CKK	BASA	Carriage with Connection plate	Constant weight calculation		Moved mass of system	
			$k_{g\text{ fix}}$ (kg)	$k_{g\text{ var}}$ (kg/mm)		
-110	16 x 5	155	1.02	0.0111	1.59	
	16 x 10					
	16 x 16					
-145	20 x 5	190	2.06	0.0202	3.49	
	20 x 20					
	20 x 40					
	25 x 10					
-200	32 x 5	305	4.23	0.0334	9.46	
	32 x 10					
	32 x 20					
	32 x 32					

	Constant mass moment of inertia			Friction torque	Max. acceleration	Max. speed	Max. drive torque
	$k_{J\text{ fix}}$ (kgmm ²)	$k_{J\text{ var}}$ (kgmm)	$k_{J\text{ m}}$ (mm ²)	M_{Rs} (Nm)	a_{max} (m/s ²)	v_{max} (m/s)	M_P (Nm)
	5.835	0.031	0.633	0.40	50.0	See "Diagrams" chapter	See "Diagrams" chapter
	9.065	0.031	2.533	0.43	50.0		
	15.812	0.034	6.485	0.48	50.0		
	24.099	0.084	0.633	0.52	39.8		
	55.749	0.081	10.132	0.68	50.0		
	157.738	0.086	40.528	0.86	50.0		
	32.479	0.239	2.533	0.65	50.0		
	75.610	0.605	0.633	1.20	17.9		
	93.660	0.640	2.533	1.20	30.7		
	161.490	0.639	10.132	1.25	50.0		
	301.930	0.617	25.983	1.35	50.0		

Technical data for CKK with screw support

General technical data

Observe the "Project planning/calculation" chapter.

CKK	Carriage		BASA	SPU	Max. length	Additional length		Dynamic characteristic values					
	Connection plate without ¹⁾	with ²⁾				without	with	Load capacities			Load moments		
	L _{ca} (mm)	L _{ca} (mm)	d ₀ x P (mm)		L _{max} (mm)	L _{ad} (mm)	L _{ad} (mm)	C _{gw} (N)	C _{bs} (N)	C _{fb} (N)	M _t (Nm)	M _L (Nm)	
-200	79.5	-	32 x 5	1	1,500 < L ≤ 3,500	235.5	-	74,600	23,310	26,000	4,849	1,053	
				2	2,000 < L ≤ 4,600	360.5							
				3	2,600 < L ≤ 5,500	485.5							
			32 x 10	1	1,500 < L ≤ 3,500	235.5							
				2	2,000 < L ≤ 4,600	360.5							
				3	2,600 < L ≤ 5,500	485.5							
			32 x 20	1	1,500 < L ≤ 3,500	235.5							
				2	2,000 < L ≤ 4,600	360.5							
				3	2,600 < L ≤ 5,500	485.5							
			32 x 32	1	1,500 < L ≤ 3,500	235.5							
				2	2,000 < L ≤ 4,600	360.5							
				3	2,600 < L ≤ 5,500	485.5							
	254.5	305	32 x 5	1	1,500 < L ≤ 3,600	235.5	185	121,185	23,310	26,000	7,877	10,604	
				2	2,000 < L ≤ 4,700	360.5	310						
				3	2,600 < L ≤ 5,500	485.5	435						
			32 x 10	1	1,500 < L ≤ 3,600	235.5	185						
				2	2,000 < L ≤ 4,700	360.5	310						
				3	2,600 < L ≤ 5,500	485.5	435						
			32 x 20	1	1,500 < L ≤ 3,600	235.5	185						
				2	2,000 < L ≤ 4,700	360.5	310						
				3	2,600 < L ≤ 5,500	485.5	435						
			32 x 32	1	1,500 < L ≤ 3,600	235.5	185						
				2	2,000 < L ≤ 4,700	360.5	310						
				3	2,600 < L ≤ 5,500	485.5	435						
-280	330.0	375	40 x 5	1	1,500 < L ≤ 3,900	329.0	284	216,700	31,410	29,000	19,500	21,670	
				2	2,000 < L ≤ 5,100	454.0	409						
				3	2,600 < L ≤ 5,500	579.0	534						
			40 x 10	1	1,500 < L ≤ 3,900	329.0	284						
				2	2,000 < L ≤ 5,100	454.0	409						
				3	2,600 < L ≤ 5,500	579.0	534						
			40 x 20	1	1,500 < L ≤ 3,900	329.0	284						
				2	2,000 < L ≤ 5,100	454.0	409						
				3	2,600 < L ≤ 5,500	579.0	534						
			40 x 40	1	1,500 < L ≤ 3,900	329.0	284						
				2	2,000 < L ≤ 5,100	454.0	409						
				3	2,600 < L ≤ 5,500	579.0	534						

¹⁾ In the "without connection plate" version, carriage length L_{ca} corresponds to the dimension of the outer edge to outer edge of the fastening bridges.
Dynamic characteristic values and maximum permissible loads are valid only when connecting the fastening bridges via customer-built attachment.

²⁾ The connection plate is mounted on the "without connection plate" carriage version.
In the "with connection plate" version, carriage length L_{ca} corresponds to the length of the connection plate.

	Maximum permissible loads						Constants		Planar moments of inertia		Point of force application	
	Moments			Forces			Mass calculation		l _y (cm ⁴)	l _z (cm ⁴)	Connection plate	
	M _x max (Nm)	M _y max (Nm)	M _z max (Nm)	F _y max (N)	F _{z1} max (N)	F _{z2} max (N)	k _g fix (kg)	k _g var (kg/mm)			without Z ₁ (mm)	with Z ₁ (mm)
	1,375	299	299	12,265	21,150	21,150	4.06	0.0296	550.5	3,897	36.0	63.0
	2,750	3,701	1,744	19,925	42,300	42,300	4.06	0.0296	550.5	3,897	36.0	63.0
	5,400	6,000	5,517	55,170	86,685	60,000	20.75	0.0497	2,683	15,638	71.5	101.5

Drive data

Observe the "Project planning/calculation" chapter.

CKK	BASA	SPU	Carriage		Constant mass calculation		Moved mass of system		
			Connection plate				Connection plate		
			without	with	without	with			
	$d_0 \times P$ (mm)		L_{ca} (mm)	L_{ca} (mm)	$k_g \text{ fix}$ (kg)	$k_g \text{ var}$ (kg/mm)	m_{ca} (kg)	m_{ca} (kg)	
-200	32 x 5	1	79.5	–	4.06	0.0296	3.40	–	
		2					3.60		
		3					3.80		
		1	254.5	305			5.40	9.10	
		2					5.60	9.30	
		3					5.80	9.50	
	32 x 10	1	79.5	–			3.40	–	
		2					3.60		
		3					3.80		
		1	254.5	305			5.40	9.10	
		2					5.60	9.30	
		3					5.80	9.50	
	32 x 20	1	79.5	–			3.40	–	
		2					3.60		
		3					3.80		
		1	254.5	305			5.40	9.10	
		2					5.60	9.30	
		3					5.80	9.50	
	32 x 32	1	79.5	–			3.40	–	
		2					3.60		
		3					3.80		
		1	254.5	305			5.40	9.10	
		2					5.60	9.30	
		3					5.80	9.50	
-280	40 x 5	1	330.0	375	20.75	0.0497	15.93	23.20	
		2					16.45	23.73	
		3					16.98	24.26	
	40 x 10	1					16.20	23.47	
		2					16.72	24.00	
		3					17.25	24.53	
	40 x 20	1					16.18	23.45	
		2					16.70	23.98	
		3					17.23	24.51	
	40 x 40	1					16.90	24.17	
		2					17.42	24.70	
		3					17.95	25.23	

	Constant mass moment of inertia				Friction torque ¹⁾	Max. acceleration	Max. speed	Max. drive torque
	Connection plate		$k_{J \text{ var}}$ (kgmm)	$k_{J \text{ m}}$ (mm ²)				
	without $k_{J \text{ fix}}$ (kgmm ²)	with $k_{J \text{ fix}}$ (kgmm ²)						
	M_{Rs} (Nm)	a_{max} (m/s ²)	v_{max} (m/s)	M_p (Nm)				
	71.474	–	0.605	0.633	1.20	17.9	siehe Kapitel „Diagramme“	siehe Kapitel „Diagramme“
	71.601	–			1.20			
	71.728	–			1.40			
	72.867	75.274	0.605	0.633	1.30			
	72.994	75.400			1.30			
	73.121	75.527			1.50			
	77.119	–	0.640	2.533	1.20	30.7		
	77.625	–			1.40			
	78.132	–			1.50			
	82.691	92.317	0.640	2.533	1.30			
	83.198	92.823			1.50			
	83.705	93.330			1.60			
	95.326	–	0.639	10.132	1.30	50.0		
	97.352	–			1.50			
	99.378	–			1.70			
	117.676	156.118	0.639	10.132	1.40			
	119.643	158.145			1.60			
	121.669	160.171			1.80			
	132.578	–	0.617	25.938	1.40	50.0		
	137.766	–			1.70			
	142.953	–			1.90			
	189.642	288.207	0.617	25.938	1.50			
	194.830	293.395			1.80			
	200.018	298.583			2.00			
	247.847	252.454	1.564	0.633	2.4	12.2		
	248.182	252.788			2.5			
	248.516	253.122			2.5			
	274.921	293.346	1.355	2.533	3.0	16.8		
	276.258	294.683			3.0			
	277.595	296.021			3.1			
	397.737	471.439	1.352	10.132	2.8	33.8		
	403.087	476.788			2.9			
	408.437	482.138			3.0			
	918.424	1 213.228	1.342	40.528	3.3	50.0		
	939.823	1 234.627			3.5			
	961.222	1 256.030			3.7			

Technical data

Drive data for motor attachment via belt side drive

Observe the "Project planning/calculation" chapter.

CKK	Motor	BASA (mm)	up to L ¹⁾ (mm)	M _{sd} ²⁾ (Nm)		J _{sd} (10 ⁻⁶ kgm ²)		M _{Rsd} (Nm)	m _{sd} (kg)		B _t	
		d ₀ x P		i = 1	i = 1.5	i = 1	i = 1.5		i = 1	i = 1.5	i = 1	i = 1.5
-070	MSM019B	8 x 2.5	450	0.71	0.47	10.70	4.10	0.06	0.28	0.26	6 AT3	6 AT3
	MS2N03-B	8 x 2.5	450	0.71	0.47	34.77	13.05	0.15	0.66	0.63	10 AT3	10 AT3
	MSM031B	8 x 2.5	450	0.71	0.47	34.77	13.05	0.15	0.66	0.63	10 AT3	10 AT3
	MSM019B	8 x 5	450	1.31	0.87	10.70	4.10	0.06	0.28	0.26	6 AT3	6 AT3
	MS2N03-B	8 x 5	450	1.41	0.94	34.77	13.05	0.15	0.66	0.63	10 AT3	10 AT3
-090	MS2N03-B MSM031C	12 x 2	750	0.79	0.53	38.00	14.00	0.15	0.53	0.48	10 AT3	10 AT3
		12 x 5	750	2.39	1.59							
		12 x 10	750	2.73	1.82							
	-110	MS2N03-B MSM031C	16 x 5	1,250	3.17	2.11	41.00	16.00	0.15	0.53	0.48	10 AT3
16 x 10			1,500	3.17	2.11							
16 x 16			1,500	3.17	2.11							
MS2N04 MSM041B		16 x 5	850	6.76	4.51	240.00	82.00	0.40	1.34	1.24	16 AT5	16 AT5
		16 x 10	1,150	7.66	5.11							
		16 x 16	1,450	7.66	5.11							
-145	MS2N04 MSM041B	20 x 5	1,350	8.22	5.48	250.00	85.00	0.40	1.42	1.31	16 AT5	16 AT5
		20 x 20	1,800	8.22	5.48							
		20 x 40	1,800	8.22	5.48							
		25 x 10	1,800	8.22	5.48							

CKK	Motor	BASA (mm)	up to L ¹⁾ (mm)	M _{sd} ²⁾ (Nm)		J _{sd} (10 ⁻⁶ kgm ²)		M _{Rsd} (Nm)	m _{sd} (kg)		B _t	
		d ₀ x P		i = 1	i = 2	i = 1	i = 2		i = 1	i = 2	i = 1	i = 2
-145	MS2N05	20 x 5	1,150	11.00	5.50	1,310	217	0.45	3.50	3.10	25 AT5	25 AT5
		20 x 20	1,800	17.73	8.87							
		20 x 40	1,800	17.73	8.87							
		25 x 10	1,800	17.73	8.87							
-200	MS2N06	32 x 5	2,200	19.00	9.50	1,400	260	0.50	3.80	3.50	25 AT5	32 AT5
		32 x 10	2,200	19.21	12.30							
		32 x 20	2,200	19.21	12.30							
		32 x 32	2,200	19.21	12.30							
-280	MS2N07	40 x 5	2,500	27.70	13.85	7,780	1,260	0.60	8.90	7.60	50 AT10	50 AT10
		40 x 10	2,500	72.20	36.10							
		40 x 20	2,500	96.90	48.45							
		40 x 40	2,500	101.50	50.75							

¹⁾ For greater lengths, the permissible drive torque is determined from the length-variable value M_p of the linear motion system in accordance with the graph
➔ Chapter "Project planning/calculation"

²⁾ Values for M_{sd} do not factor in motor torque.

Drive data for motor attachment via flange and coupling

CKK	Motor	Coupling		Flange and coupling
		M_{cN} (Nm)	J_c (10^{-6} kgm ²)	
-070	MS2N03-B	3.7	7.00	0.30
	MSM019B	1.9	2.10	0.15
	MSM031B	3.7	7.00	0.30
-090	MS2N03-B	13.0	12.20	0.30
	MSM031C	13.0	12.20	0.35
-110	MS2N03-B	13.0	12.20	0.45
	MS2N03-D	14.0	12.20	0.45
	MS2N04	14.0	12.20	0.60
	MSM031C	14.0	12.20	0.45
	MSM041B	29.4	42.29	0.65
-145	MS2N04	26.1	42.29	0.80
	MS2N05	26.1	42.29	1.00
	MSM041B	26.1	42.29	0.80
-200	MS2N06	50.0	210.00	1.80
	MS2N07	98.0	390.00	2.25
-280	MS2N07	115.0	390.00	2.80

Diagrams

Permissible drive torque

The values shown for M_p apply under the following conditions:

- Screw journal without keyway
- No radial loads on screw journal

⚠ Keep in mind the rated torque of the coupling being used! Keep in mind the minimum travel range s_{min} !

⚠ Screw journal with keyway

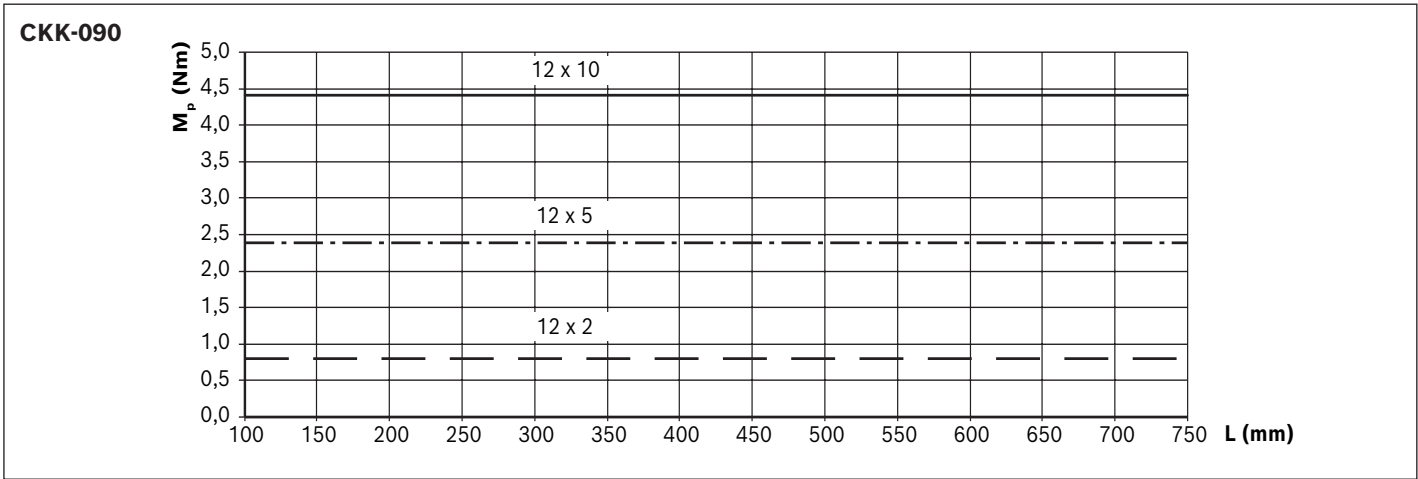
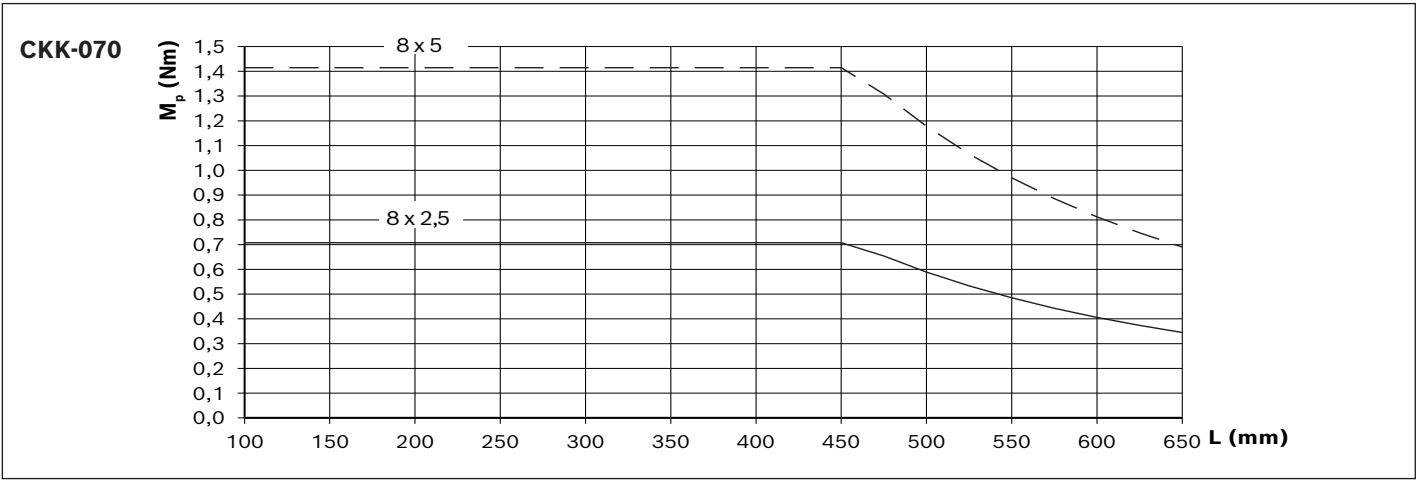
For reasons of stress concentration and a reduction of the effective diameter, observe the maximum values for drive torque!

CKK	M_p (Nm)
-110 / -145	No reduction
-200	48.6

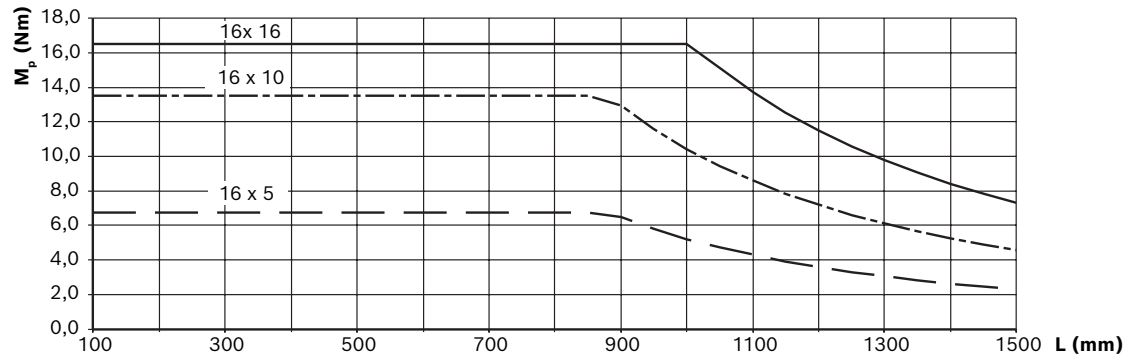
⚠ For ball screw assemblies with keyway, the smallest value from the diagrams and the table is valid.

Example:

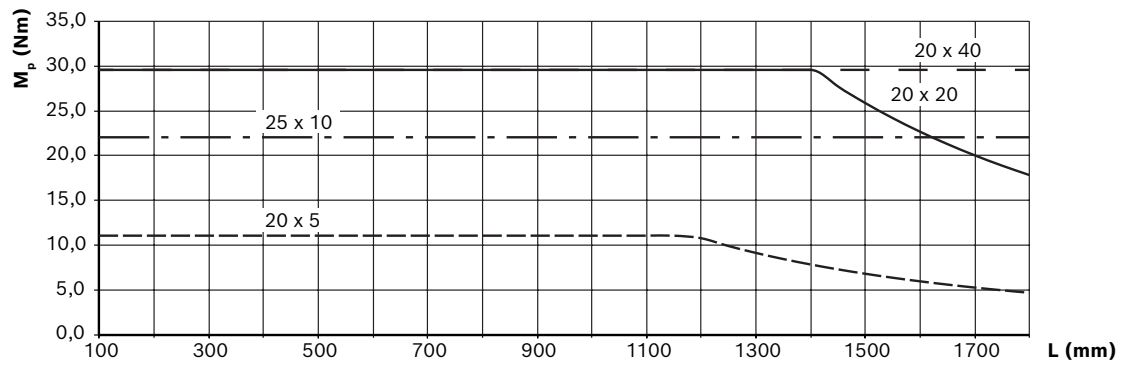
CKK-200	$(d_0 \times P)$	
	32 x 32	32 x 10
Length (mm)	1,500	1,500
M_p from diagram (Nm)	58.5	39.0
M_p maximum (Nm)	48.6	48.6
Value for sizing	48.6	39.0



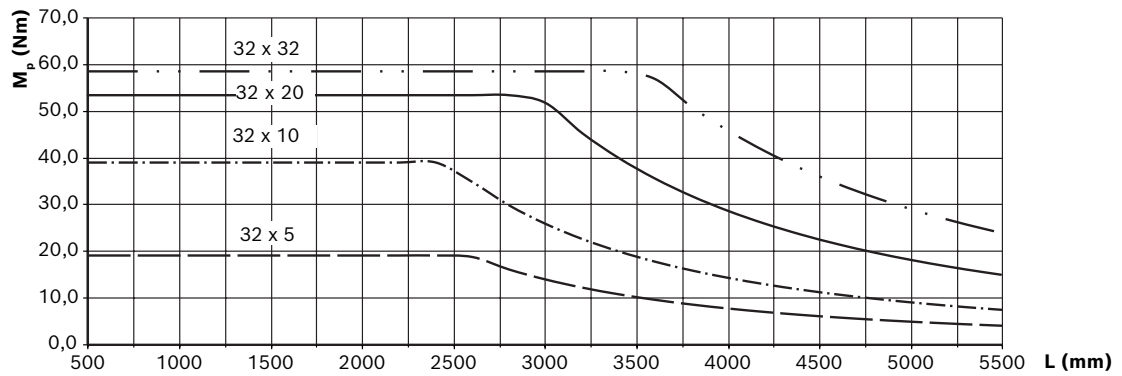
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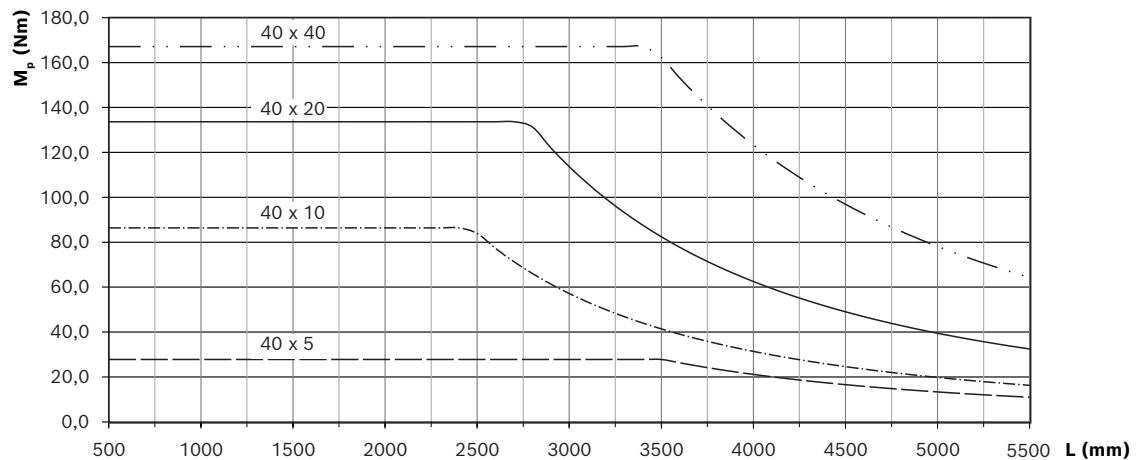
CKK-145



CKK-200

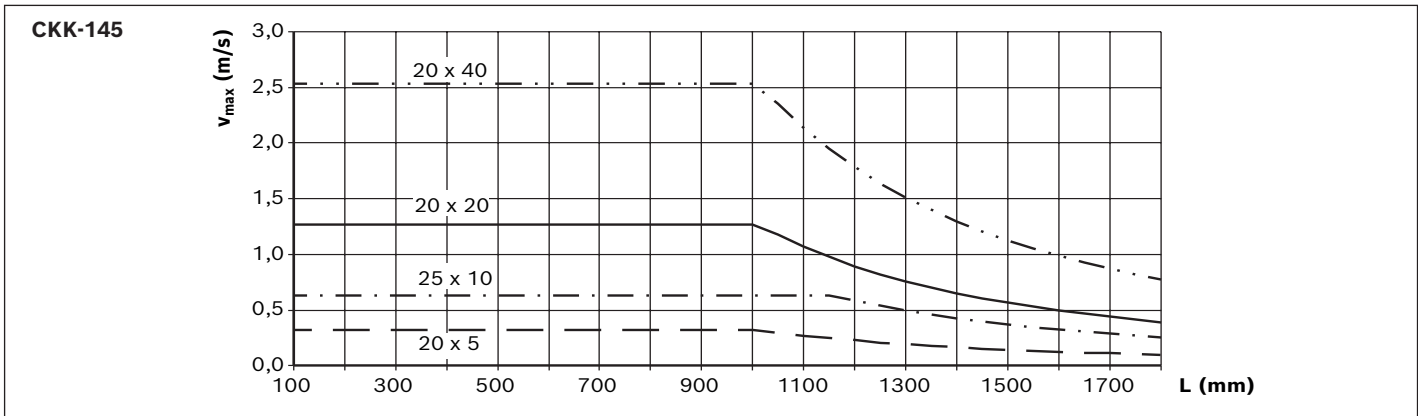
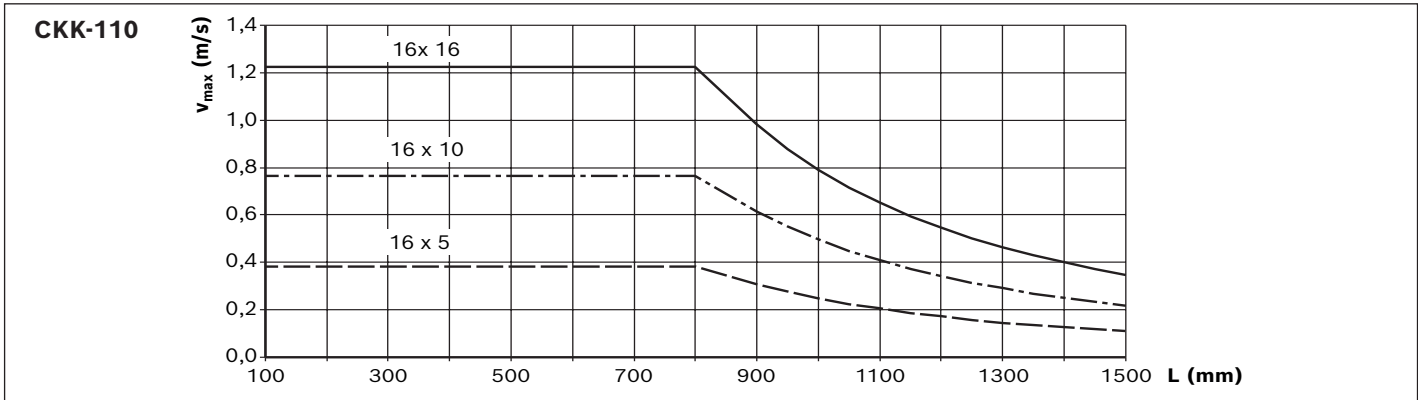
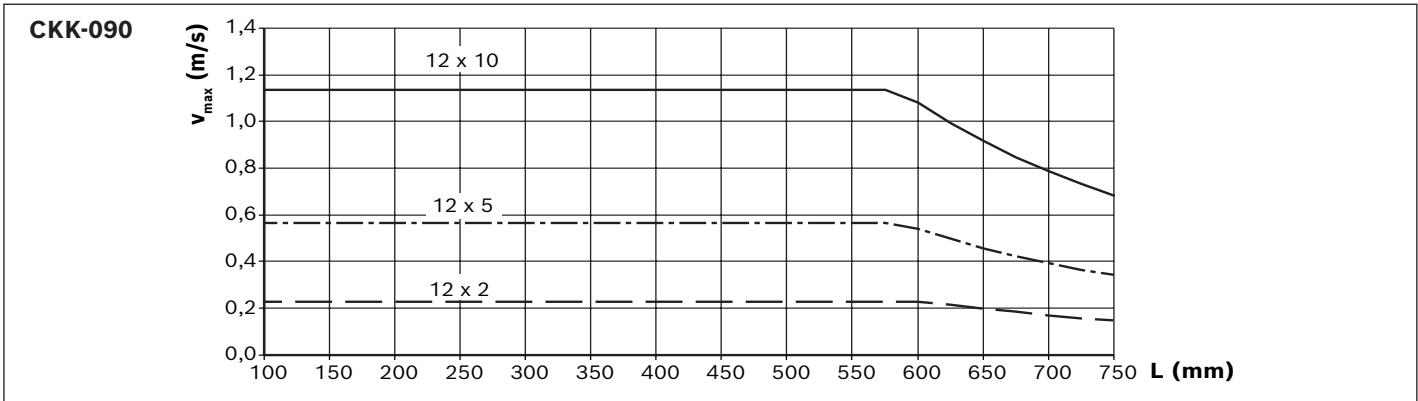
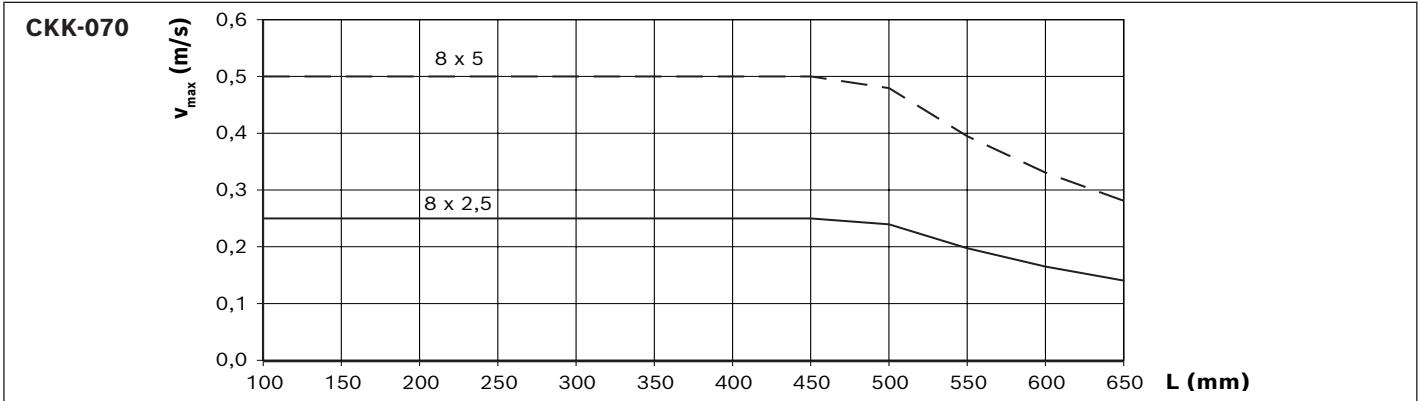


CKK-280



Permissible speed

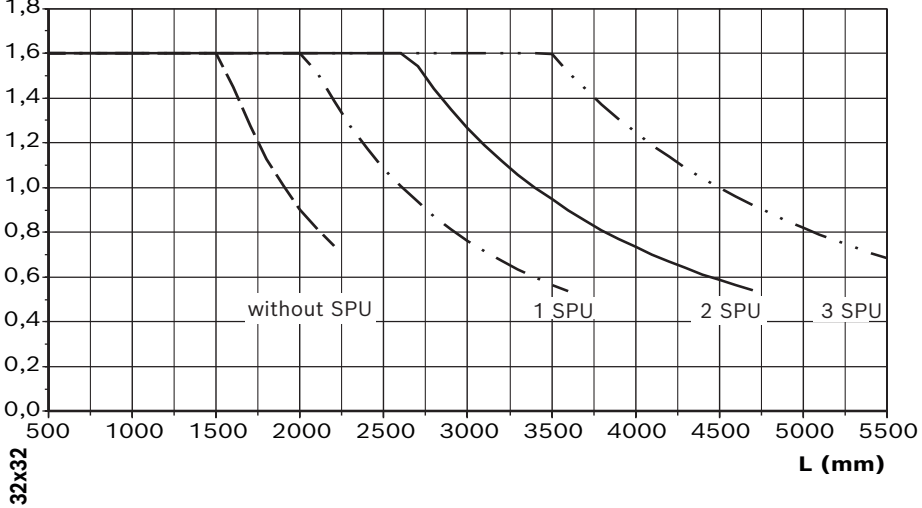
Observe motor speed! Keep in mind the minimum travel range s_{min} !



CKK-200

v_{max} (m/s)

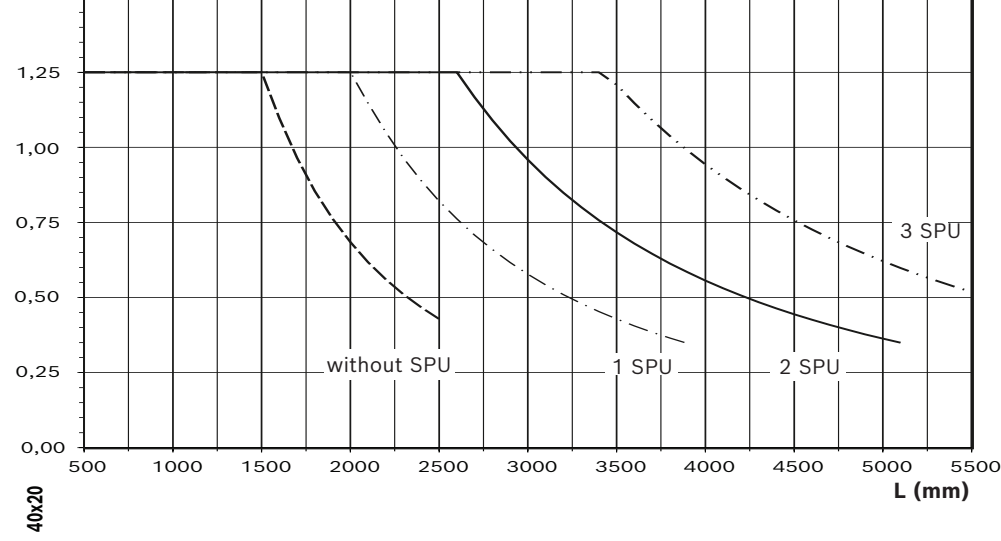
0,250	0,500	1,00
0,190	0,375	0,75
0,125	0,250	0,50
0,060	0,125	0,25
0,000	0,000	0,00
32x5	32x10	32x20
32x32		



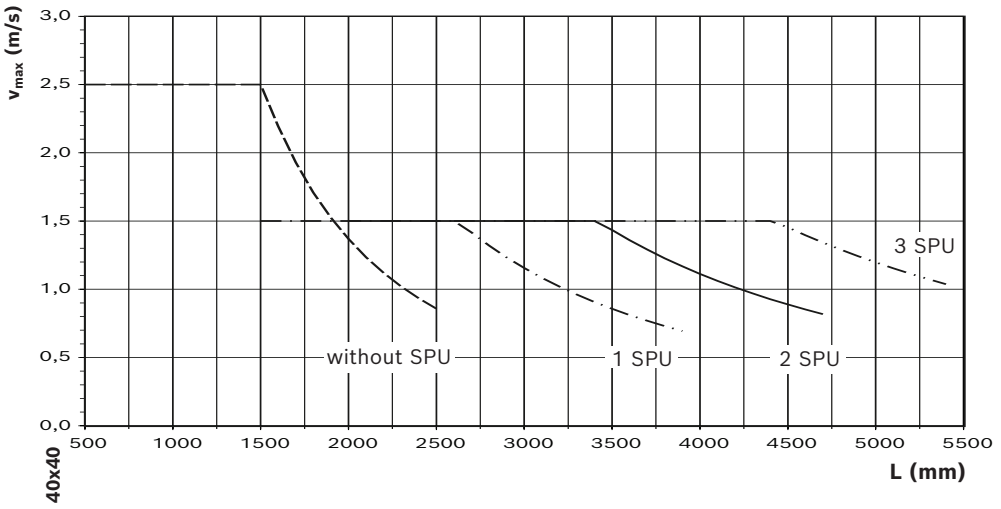
CKK-280

v_{max} (m/s)

0,31	0,63
0,25	0,50
0,19	0,38
0,13	0,25
0,06	0,13
0,00	0,00
40x5	40x10
40x20	

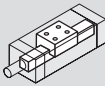

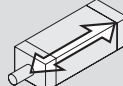
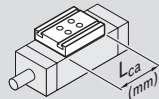
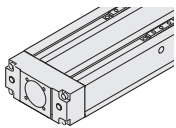

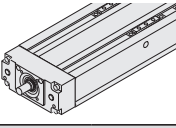
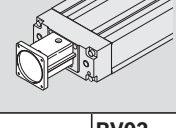
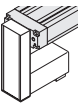
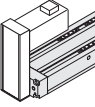
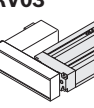
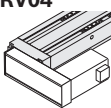


CKK-280



Configuration, order

CKK-070

Short product name, length ¹⁾ CKK-070-NN-1, ... mm			Guideway			Lubri- cation ³⁾	Drive			Carriage				
														
			Standard	Centering holes ²⁾			Screw journal (mm)	BASA d ₀ x P (mm)		Connection plate without L _{ca} (mm)		with L _{ca} = (mm)		
Version							8 x 2.5	8 x 5	32	73	60	95		
Without drive	OA01 		001	003	004	LSS	-	050	050	001	002	040	041	
		LPG				-				302	-	341		
Without attachment	OF01 					LSS	Ø6	001	002	01	002	040	041	
Flange/ coupling	MF01 													
Belt side drive	RV01 	RV02 				LPG	Ø6	031	032	-	302	-	341	
	RV03 	RV04 												

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (see dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame

Option 004: with centering holes and long hole in the ground area of the frame; selectable starting from length L ≥ 300 mm up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit also available without motor. When ordering, enter the motor type "000"!

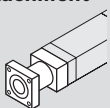
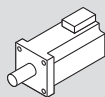

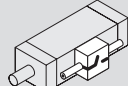

Attachment kits according to customer specifications ⇒ Chapter "Attachment Kits for Motors according to Customer Specifications"

⁵⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

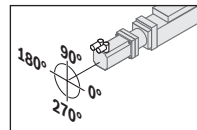
⁶⁾ More information ⇒ Chapter "Switching system"

⁷⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

⁸⁾ Measurement report: 001 = standard report; 002 = Measurement of frictional torque; 003 = Lead deviation (see also "Documentation" chapter)

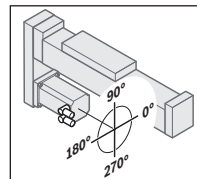
Motor attachment			Motor ⁵⁾							Cover		Switching system ⁶⁾		Automation package		Doc. ⁸⁾	
																	
i =	Attachment kit ⁴⁾	Motor code	2 cables		1 cable		Motor connector position		Cover strip				Controller	Cable			
			without brake	with brake	without brake	with brake			without	with							
	OA01	-	000	-	000				-	001	002	Without		"Automation package" chapter	001		
												- Switch	000				
	OF01	-	000	-	000				-			Magnetic sensor					
												REED, changeover (NC: C+NC, NO: C+NO)	021				
	MF01	-	001	MS2N03-B0BYN	-	-	203	204	000			Hall, PNP normally closed (NC)	022			002	
			003	MSM031B-0300	136	137	-	-				Hall, PNP normally open (NO)	023				
			005	MSM019B-0300	134	135	-	-				Cable duct	025				
												Socket-connector	028				
		RV01 - RV04	1	017	MS2N03-B0BYN	-	-	203	204			090	Magnetic sensor with connector ⁷⁾				
				019	MSM031B-0300	136	137	-	-				REED, changeover (NC: C+NC, NO: C+NO)				058
	015			MSM019B-0300	134	135	-	-	180	Hall, PNP normally closed (NC)	059						
	1.5		018	MS2N03-B0BYN	-	-	203	204	270								
			020	MSM031B-0300	136	137	-	-									
			016	MSM019B-0300	134	135	-	-									

Flange	Motor connector position			
	0°	90°	180°	270°
MF01	000	090 ★	180	270



Example:
Flange MF01
Motor connector position 90°

Belt side drive	Motor connector position			
	0°	90°	180°	270°
RV01	000	-	180	270 ★
RV02	000	090 ★	180	-
RV03	000 ★	090	-	270
RV04	-	090	180 ★	270

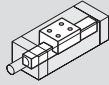

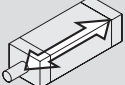
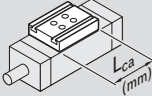
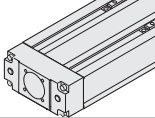

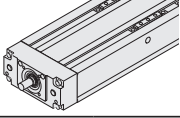
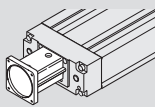
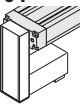
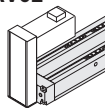
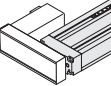
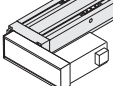


Example:
Belt side drive RV01
Motor connector position 180°

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

CKK-090

Short product name, length ¹⁾ CKK-090-NN-1, ... mm		Guideway			Lubri- cation ³⁾		Drive				Carriage				
															
Version		Standard	Centering holes ²⁾				Screw journal (mm)	BASA d ₀ x P (mm)			Connection plate without L _{ca} = (mm)			with L _{ca} = (mm)	
								12 x 2	12 x 5	12 x 10	35	100	variable ³⁾	60	125
Without drive	OA01 	001	003	004		LSS	-	050			001	002	005	040	041
											-	302	305	-	341
Without attachment	OF01 					LSS	Ø8	003	001	002	001	002	005	040	041
Flange/ coupling	MF01 					LPG	Ø8	031	032	033	-	302	305	-	341
Belt side drive	RV01 					LCF	Ø8	003	001	002	-			141	
	RV02 														
	RV03 					LCO	Ø8	021	022	023	-			241	
	RV04 														

¹⁾ Length calculation of the linear motion system ➔ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (see dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame

Option 004: with centering holes and long hole in the ground area of the frame; selectable starting from length L ≥ 300 mm up to length L_{max}

³⁾ Lubrication ➔ Chapter "Lubrication".

⁴⁾ Attachment kit also available without motor. When ordering, enter the motor type "000"!

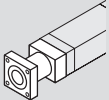
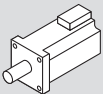

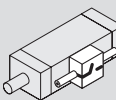

Attachment kits according to customer specifications ➔ Chapter "Attachment Kits for Motors according to Customer Specifications"

⁵⁾ Recommended motor, motor data and type designations ➔ Chapter "Motors"

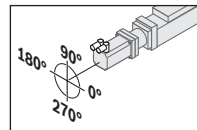
⁶⁾ More information ➔ Chapter "Switching system"

⁷⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

⁸⁾ Measurement report: 001 = standard report; 002 = Measurement of frictional torque; 003 = Lead deviation (see also "Documentation" chapter)

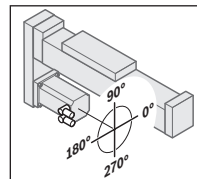
	Motor attachment			Motor ⁵⁾						Cover		Switching system ⁶⁾		Automation package		Doc. ⁸⁾
																
	i =	Attachment kit ⁴⁾	Motor code	2 cables		1 cable		Motor connector position	Cover strip					Controller	Cable	
				without brake	with brake	without brake	with brake		without	with						
	OA01	-	000	-	000			-	001	002	Without		"Automation package" chapter		001	
	OF01										- Switch - Cable duct - Socket-connector					000
	MF01	-	001	MS2N03-B0BYN	-	-	203	204			Magnetic sensor					
			005	MSM031C-0300	138	139	-	-			REED, changeover (NC: C+NC, NO: C+NO)	021				
	RV01 - RV04	1	011	MS2N03-B0BYN	-	-	203	204			Hall, PNP normally closed (NC)	022				
			013	MSM031C-0300	138	139	-	-			Hall, PNP normally open (NO)	023				
		1.5	021	MS2N03-B0BYN	-	-	203	204			Cable duct	025				
			23	MSM031C-0300	138	139	-	-			Socket-connector	017				
			Magnetic sensor with connector ⁷⁾													
			REED, changeover (NC: C+NC, NO: C+NO)	058												
			Hall, PNP normally closed (NC)	059												

Flange	Motor connector position			
	0°	90°	180°	270°
MF01	000	090 ★	180	270



Example:
Flange MF01
Motor connector position 90°

Belt side drive	Motor connector position			
	0°	90°	180°	270°
RV01	000	–	180	270 ★
RV02	000	090 ★	180	–
RV03	000 ★	090	–	270
RV04	–	090	180 ★	270

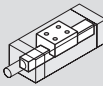

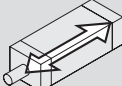
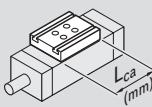
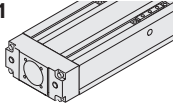
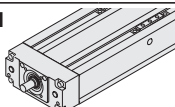
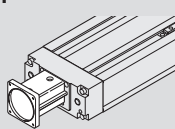
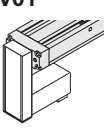
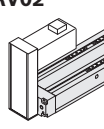
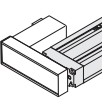
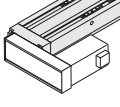


Example:
Belt side drive RV01
Motor connector position 180°

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

CKK-110

Short product name, length ¹⁾ CKK-110-NN-1, ... mm			Guideway		Lubri- cation ³⁾	Drive				Carriage							
																	
Version			Standard	Centering holes ²⁾		Screw journal (mm)	BASA d ₀ x P (mm)			Connection plate without L _{ca} = (mm)			with L _{ca} = (mm)				
						16 x 5	16 x 10	16 x 16	39	124	variable ³⁾	60	155				
Without drive	OA01		001	003	004	LSS	-	050		001	002	005	040	041			
		LPG				-				302	305	-	341				
Without attachment	OF01					LSS	Ø11 with keyway (OF01)	011	012	013	001	002	005	040		041	
Flange/ coupling	MF01					LSS	Ø11	001	002	003	001	002	005	040		041	
						LPG	Ø11	031	032	033	-	302	305	-		341	
	Belt side drive	RV01					LCF	Ø11	001	002	003	-				141	
		RV02															
RV03						LCO	Ø11	001	002	003	-			241			
	RV04																

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame

Option 004: with centering holes and long hole in the ground area of the frame; selectable starting from length L ≥ 300 mm up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit also available without motor. When ordering, enter the motor type "000"!

Attachment kits according to customer specifications ⇒ Chapter "Attachment Kits for Motors according to Customer Specifications"

⁵⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

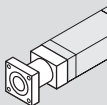
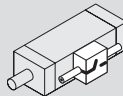

⁶⁾ Only possible with version Carriage with connection plate L_{ca} = 155 mm;

Switch mounting only possible with magnetic sensor with connector. (It may be necessary to move the mounting brackets for Resist cover)

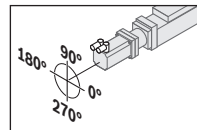
⁷⁾ More information ⇒ Chapter "Switching system"

⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

⁹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; 003 = Lead deviation (⇒ Chapter "Documentation")

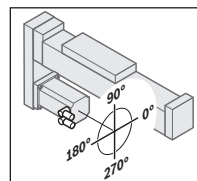
Motor attachment		Motor ⁵⁾							Cover		Switching system ⁷⁾		Automation package		Doc. ⁹⁾				
		Attachment kit ⁴⁾	Motor code	2 cables		1 cable		Motor connector position	Cover strip				Controller	Cable					
i =				without brake	with brake	without brake	with brake		without	with	Resist ⁶⁾								
RV01 - RV04	OA01	-	000	-	000				-	001	002	012			"Automation package" chapter	001			
	OF01												Without				- Switch - Cable duct - Socket-connector		000
	MF01	-	001	MS2N03-B0BYN	-	-	203	204	000				Magnetic sensor			REED, changeover (NC: C+NC, NO: C+NO)		021	002
			007	MS2N03-D0BYN	-	-	207	208					Hall, PNP normally closed (NC)			022			
			003	MS2N04-C0BTN	-	-	215	216					Hall, PNP normally open (NO)			023			
			003	MS2N04-D0BQN	-	-	219	220					Cable duct			025			
			005	MSM031C-0300	138	139	-	-					Socket-connector			017			
			006	MSM041B-0300	140	141	-	-					Magnetic sensor with connector ⁸⁾						
	RV01 - RV04	1	011	MS2N03-B0BYN	-	-	203	204	090				REED, changeover (NC: C+NC, NO: C+NO)			058	003		
			013	MS2N04-C0BTN	-	-	215	216					Hall, PNP normally closed (NC)			059			
			015	MSM031C-0300	138	139	-	-											
			017	MSM041B-0300	140	141	-	-											
		1.5	021	MS2N03-B0BYN	-	-	203	204	270										
			023	MS2N04-B0BTN	-	-	211	212											
			025	MSM031C-0300	138	139	-	-											
			027	MSM041B-0300	140	141	-	-											

Flange	Motor connector position			
	0°	90°	180°	270°
MF01	000	090 ★	180	270



Example:
Flange MF01
Motor connector position 90°

Belt side drive	Motor connector position			
	0°	90°	180°	270°
RV01	000	-	180	270 ★
RV02	000	090 ★	180	-
RV03	000 ★	090	-	270
RV04	-	090	180 ★	270


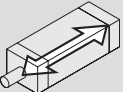
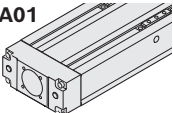
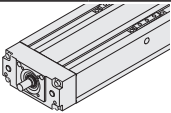
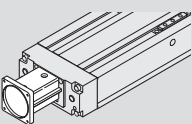
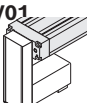
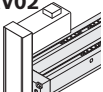
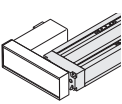
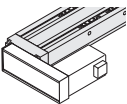


Example:
Belt side drive RV01
Motor connector position 180°

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

CKK-145

Short product name, length ¹⁾ CKK-145-NN-1, ... mm			Guideway		Lubri- cation ³⁾	Drive				Carriage							
			Standard	Centering holes ²⁾			BASA d ₀ x P (mm)				Connection plate without L _{ca} = (mm)			with L _{ca} = (mm)			
Version							20 x 5	20 x 20	25 x 10	20 x 40	49	149	variable ¹⁾	80	190		
Without drive	OA01 		001	003	004	LSS	-	050				001	002	005	040	041	
	LPG	-				302						305	-	341			
Without attachment	OF01 					LSS	Ø14 with keyway (OF01)	014	015	016	-	001	002	005	040	041	
	-					017		006	007	010	008	009					
Flange/ coupling	MF01 					LSS	Ø14	021	022	023	-	001	002	005	040	041	
	-					024		006	007	010	008	009					
Belt side drive	RV01 	RV02 				LPG	Ø14	031	032	033	-	-	302	305	-	341	
						-			034	-	307	310	-	309			
	RV03 	RV04 				LCF	Ø14	021	022	023	-	-				141	
						-			024	-				109			
							LCO	Ø14	021	022	023	-	-				241
							-			024	-				209		

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame

Option 004: with centering holes and long hole in the ground area of the frame; selectable starting from length L ≥ 300 mm up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit also available without motor. When ordering, enter the motor type "000"!

Attachment kits according to customer specifications ⇒ Chapter "Attachment Kits for Motors according to Customer Specifications"

⁵⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

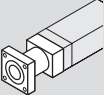
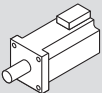

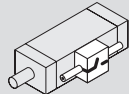

⁶⁾ Only possible with version Carriage with connection plate L_{ca} = 190 mm;

Switch mounting only possible with magnetic sensor with connector. (It may be necessary to move the mounting brackets for Resist cover)

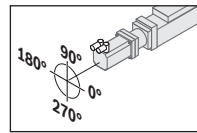
⁷⁾ More information ⇒ Chapter "Switching system"

⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

⁹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; 003 = Lead deviation (⇒ Chapter "Documentation")

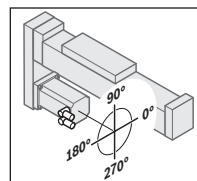
Motor attachment		Motor ⁵⁾		Cover		Switching system ⁷⁾		Auto- mation package		Doc. ⁹⁾				
														
i =	Attachment kit ⁴⁾	Motor code	2 cables		1 cable		Motor connector position	Cover strip	Resist ⁶⁾	Controller	Cable			
			without brake	with brake	without brake	with brake		without	with					
OA01 OF01 MF01 RV01 - RV04	-	000	-				-	001	002	012	Without		"Automation package" chapter	001
			- Switch		000									
	- Cable duct													
	- Socket-connector													
	Magnetic sensor				REED, changeover (NC: C+NC, NO: C+NO)		021							
					Hall, PNP normally closed (NC)		022							
					Hall, PNP normally open (NO)		023							
					Cable duct		025							
					Socket-connector		017							
	Magnetic sensor with connector ⁸⁾				REED, changeover (NC: C+NC, NO: C+NO)		058							
					Hall, PNP normally closed (NC)		059							
	1	011	MS2N04-C0BTN	-	-	215	216				000			
			MS2N04-D0BQN	-	-	219	220							
		035	MS2N05-D0BRN	-	-	231	232							
		017	MSM041B-0300	140	141	-	-							
			MS2N04-B0BTN	-	-	211	212							
		021	MS2N04-C0BTN	-	-	215	216							
			MS2N04-D0BQN	-	-	219	220							
			MSM041B-0300	140	141	-	-							
	2	036	MS2N05-B0BTN	-	-	223	224							

Flange	Motor connector position			
	0°	90°	180°	270°
MF01	000	090 ★	180	270



Example:
Flange MF01
Motor connector position 90°

Belt side drive	Motor connector position			
	0°	90°	180°	270°
RV01	000	-	180	270 ★
RV02	000	090 ★	180	-
RV03	000 ★	090	-	270
RV04	-	090	180 ★	270



Example:
Belt side drive RV01
Motor connector position 180°

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

CKK-200

Short product name, length ¹⁾ CKK-200-NN-1, ... mm			Guideway		Lubri- cation ³⁾	Drive					Carriage						
Version			Standard	Centering holes ²⁾		Screw journal (mm)	BASA d ₀ x P (mm)				SPU number	Connection plate without			with		
							32 x 5	32 x 10	32 x 20	32 x 32		L _{ca} = (mm)			L _{ca} = (mm)		
Without drive	OA01	001	003	004	LSS	-	050				-	001	011	018	040	041	
	LPG				-		-	311	318	-	341						
Without attachment	OF01				LSS	Ø16 with keyway	011	012	013	014	0	001	011	018	040	041	
	Ø16					001	002	003	004	1		002	012	-	-	026	
										2		003	013	-	-	027	
3										004		014	-	-	028		
Flange/ coupling	MF01				LPG	Ø16	031	032	033	034	0	-	311	318	-	341	
	1										-	312	-	-	326		
	2											313			327		
	3											314			328		
Belt side drive	RV01				RV02	LCF	Ø16	001	002	003	004	0	-	-	-	-	141
	RV03				RV04							1					126
												2					127
												3					128
							LCO	Ø16	001	002	003	004	0	-	-	-	-
	1				226												
	2				227												
	3				228												

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame; selectable up to length L ≤ 2000 mm

Option 004: with centering holes and long hole in the ground area of the frame; selectable starting from length L ≥ 300 mm up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit also available without motor. When ordering, enter the motor type "000"!

Attachment kits according to customer specifications ⇒ Chapter "Attachment Kits for Motors according to Customer Specifications"

⁵⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁶⁾ Only possible with version Carriage with connection plate L_{ca} = 305 mm;

Switch mounting only possible with magnetic sensor with connector. (It may be necessary to move the mounting brackets for Resist cover)

⁷⁾ More information ⇒ Chapter "Switching system"

⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

⁹⁾ Switch configuration with magnetic sensor and mechanical/proximity switch together on one side is not possible.

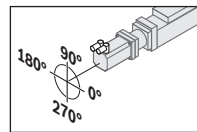
Assembly contains 1 x sensor, 1 x switch mounting plate including mounting material

¹⁰⁾ Switching cam can be attached only in conjunction with connection plate

¹¹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; 003 = Lead deviation (⇒ Chapter "Documentation")

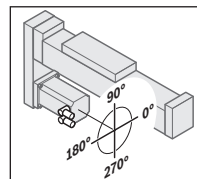
	Motor attachment		Motor ⁵⁾						Cover		Switching system ⁷⁾		Auto- mation package		Doc. ¹¹⁾	
	i =	Attachment kit ⁴⁾	Motor code	without brake	with brake	without brake	with brake	Motor connector position	without	with	Resist ⁶⁾		Controller	Cable		
RV01 - RV04	OA01	-	000	-	000				-	001	002	012			"Automation package" chapter ➡	001
					Without											
	- Switch		000													
	- Cable duct															
	- Socket-connector															
	Magnetic sensor															
	REED, changeover (NC: C+NC, NO: C+NO)		021													
	Hall, PNP normally closed (NC)		022													
	Hall, PNP normally open (NO)		023													
	Cable duct		025													
	Socket-connector		017													
	Magnetic sensor with connector ⁸⁾															
	REED, changeover (NC: C+NC, NO: C+NO)		058													
	Hall, PNP normally closed (NC)		059													
	Proximity / mechanical switches ⁹⁾															
	Mechanical		015													
	Proximity – PNP NC contact		011													
	Proximity – PNP NO contact		013													
	Cable duct		020													
	Switching cam ¹⁰⁾		1	016												
		2	026													
Socket-connector		017														
OF01				000				-	001	002	012			002		
				Without												
MF01	-	003	MS2N06-D0BRN	-	-	243	244	000								
			MS2N06-E0BRN	-	-	251	252									
		004	MS2N07-C0BQN	-	-	259	260									
			090													
			180													
			270													
RV01 - RV04	1	027	MS2N06-B1BNN	-	-	235	236	000								
			MS2N06-D1BNN	-	-	247	248									
	2	028	MS2N06-C0BTN	-	-	239	240									
			090													
			180													
			270													
			090													
			180													
			270													
			090													
			180													
			270													
090																
180																

Flange	Motor connector position			
	0°	90°	180°	270°
MF01	000	090 ★	180	270



Example:
Flange MF01
Motor connector
position 90°

Belt side drive	Motor connector position			
	0°	90°	180°	270°
RV01	000	-	180	270 ★
RV02	000	090 ★	180	-
RV03	000 ★	090	-	270
RV04	-	090	180 ★	270


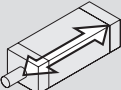
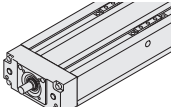
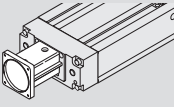
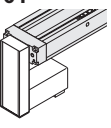
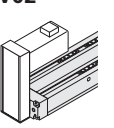
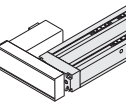
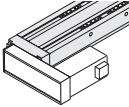


Example:
Belt side drive RV01
Motor connector
position 180°

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

CKK-280

Short product name, length ¹⁾ CKK-280-NN-1, mm		Guideway		Lubri- cation ³⁾	Drive				Carriage								
		Standard	Centering holes ²⁾			BASA d ₀ x P (mm)				SPU number	Connection plate without L _{ca} = 330 mm					with L _{ca} = 375 mm	
						Screw journal (mm)	40 x 5	40 x 10	40 x 20		40 x 40	variabel ¹⁾	BASA				
Version													40 x 5	40 x 10	40 x 20	40 x 40	40 x 5
Without drive	OF01 	001	003	004	LSS	Ø25	001	002	003	004	0	018	011	011	041	041	
Flange/ coupling	MF01 										1	–	012	032	026	046	
											2	–	013	033	027	047	
											3	–	014	034	028	048	
Belt side drive	RV01 				LPG	Ø25	031	032	033	034	0	318	311	311	341	341	
	RV02 										1	–	312	332	326	346	
	RV03 										2	–	313	333	327	347	
	RV04 										3	–	314	334	328	348	

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).
Option 003: with centering holes and fastening threads in the ground area of the frame. Selectable up to a length of L ≤ 2000 mm
Option 004: with centering holes and long hole in the ground area of the frame. Selectable up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit also available without motor. When ordering, enter the motor type "000"!

Attachment kits according to customer specifications ⇒ Chapter "Attachment Kits for Motors according to Customer Specifications"

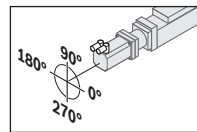
⁵⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁶⁾ More information ⇒ Chapter "Switching system"

⁷⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; 003 = Lead deviation (⇒ Chapter "Documentation")

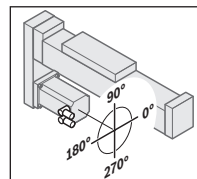
	Motor attachment			Motor ⁵⁾				Cover		Switching system ⁶⁾		Automation package		Doc. ⁷⁾
	i =	Attachment kit ⁴⁾	Motor code	without brake	with brake	without brake	with brake	without	with			Controller	Cable	
	OF01	–	000	–	000		–	001	002	<div>Without</div> <div>- Switch 000</div> <div>- Cable duct</div> <div>Magnetic sensor</div> <div>Hall, PNP-normally closed (NC) 120</div> <div>Hall, NPN-normally closed (NC) 121</div> <div>Hall, PNP-normally open (NO) 122</div> <div>Hall, NPN-normally open (NO) 123</div> <div>Cable duct 020</div>		"Automation package" chapter		001
	MF01	–	004	MS2N07-B1BNN	–	–	255 256							002
				MS2N07-C1BRN	–	–	263 264							003
				MS2N07-D1BNN	–	–	269 270							003
	RV01 - RV04	1	026	MS2N07-B1BNN	–	–	255 256							002
				MS2N07-C1BRN	–	–	263 264							
				MS2N07-D1BNN	–	–	269 270							
		2	029	MS2N07-B1BNN	–	–	255 256							
				MS2N07-C1BRN	–	–	263 264							
				MS2N07-D1BNN	–	–	269 270							

Flange	Motor connector position			
	0°	90°	180°	270°
MF01	000	090 ★	180	270



Example:
Flange MF01
Motor connector
position 90°

Belt side drive	Motor connector position			
	0°	90°	180°	270°
RV01	000	–	180	270 ★
RV02	000	090 ★	180	–
RV03	000 ★	090	–	270
RV04	–	090	180 ★	270



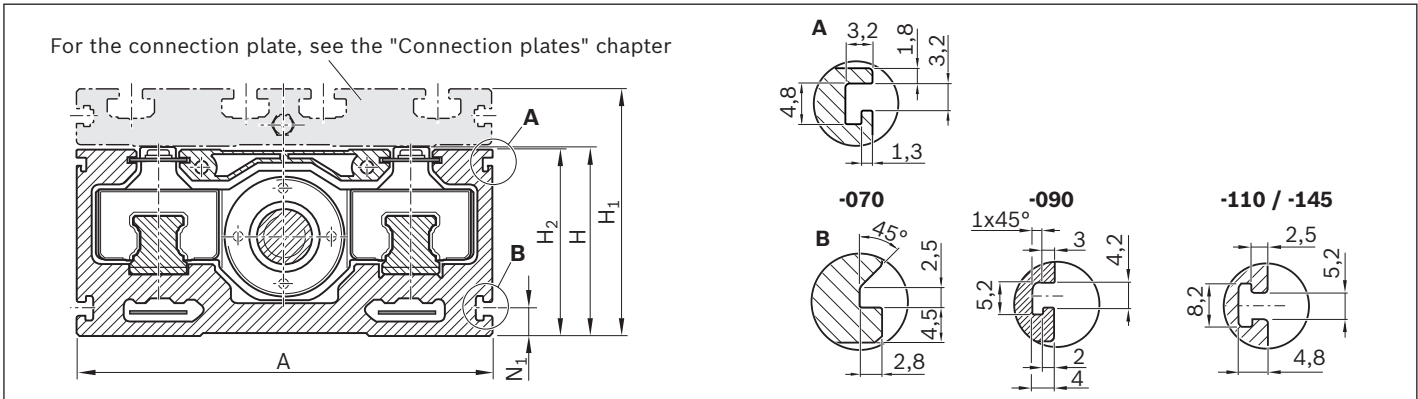
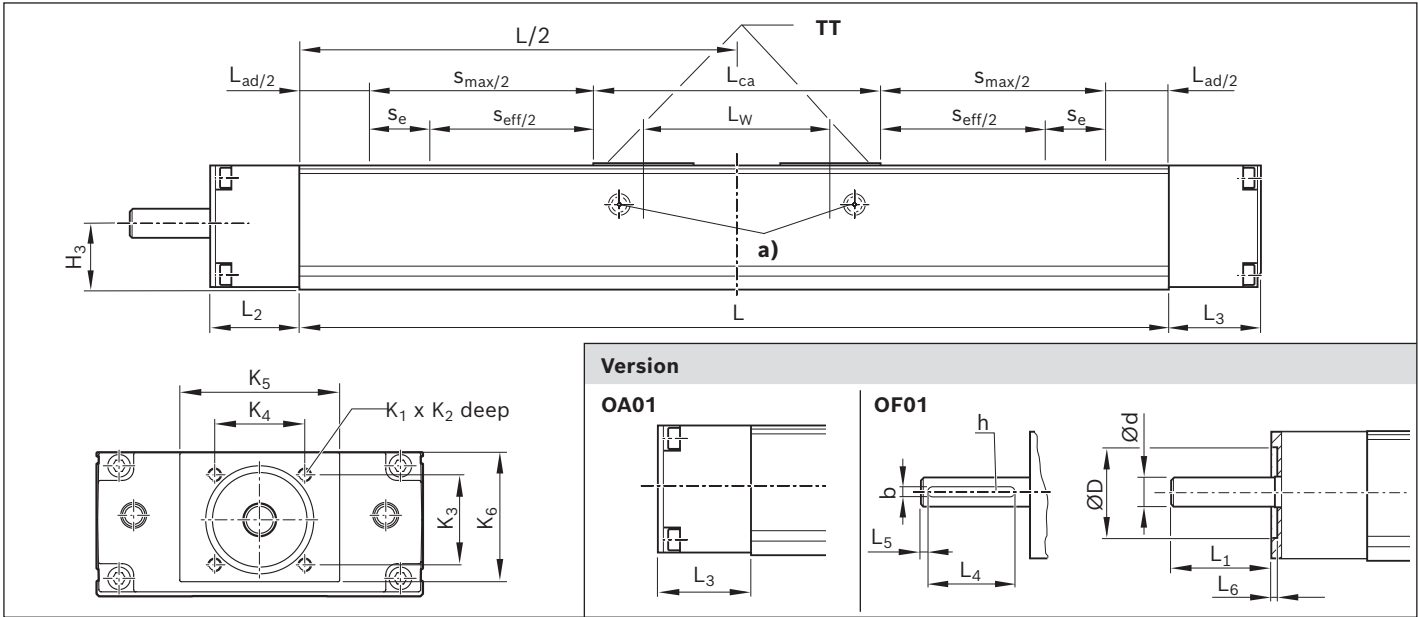
Example:
Belt side drive RV01
Motor connector
position 180°

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

Dimension drawings

Frame **CKK-070/-090/-110/-145**



CKK	Dimensions (mm)											
	A	B	b ^{P9}	H	H ₁	H ₂	H ₃	h	ØD ^{H7}	ØD ₁ ^{-0.01}	ØD ₂	Ød _{h7}
-070	70	–	–	32	44.5	31.3	16.0	–	28	–	–	6
-090	90	–	–	40	56.0	39.0	21.0	–	28	–	–	8
-110	110	–	4	50	66.0	49.0	25.5	2.5	40	–	–	11
-145	145	–	5	65	85.0	64.0	34.0	3.0	48	–	–	14
-200	200	150	5	100	127.0	98.5	56.0	3.0	–	68	32	16

a) Lube port on both sides (grease lubrication). ➔ Chapter "Lubrication".

Straightness and flatness tolerance in accordance with DIN EN 12020-2.

Note: all dimensions in mm. Drawings not schematically to scale.

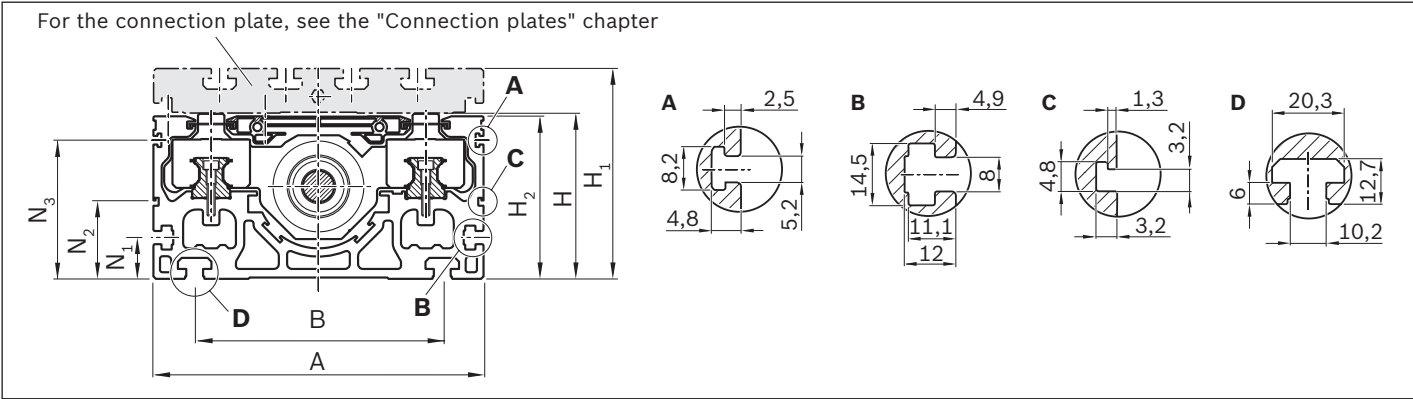
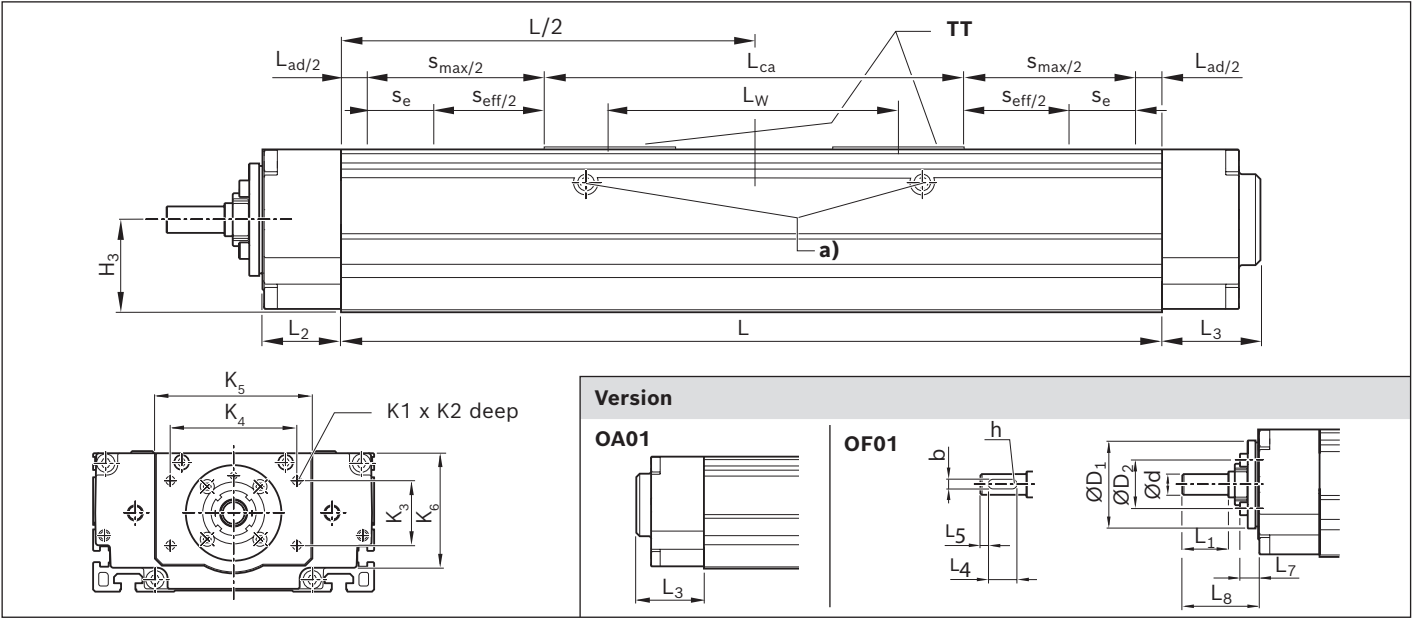
Exact contours and dimensions can be found in the CAD model.

CAD configurator available on the Internet at www.boschrexroth.com "Product configurators".

See following pages for dimension drawings for frames, carriages and motor attachment.

Length calculation of the linear motion system ➔ Chapters "Technical data" and "Project planning/calculation".

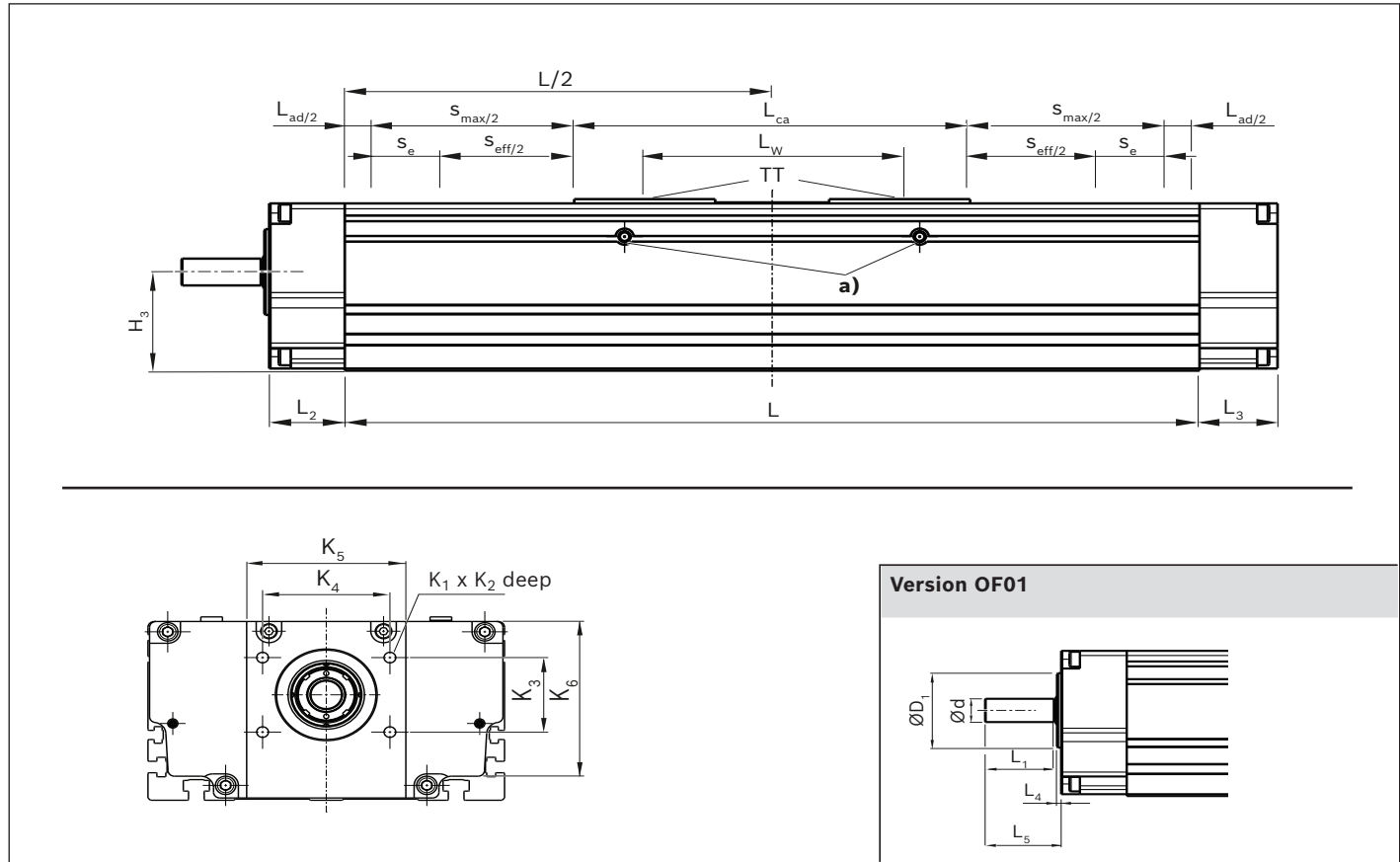
Frame CKK-200



K ₁	K ₂	K ₃	K ₄	K ₅	K ₆	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	L ₇	L ₈	N ₁	N ₂	N ₃
M4	8	23	33	44	31.3	18	22.0	29.0	–	–	2.5	–	–	–	–	–
M4	9	29	41	50	39.0	20	32.0	33.5	–	–	2.5	–	–	7.6	–	–
M6	12	28	40	56	49.0	32	36.0	38.0	20	3.0	2.5	–	–	9.5	–	–
M6	12	40	40	71	57.5	44	43.5	45.0	25	10.0	2.5	–	–	9.5	–	–
M8	12	46	90	112	85.5	35	47.5	59.5	28	3.5	–	14	58	25.0	47.5	84

- A** For switch mounting arrangements
B For mounting with clamping fixtures
C For cable duct
D For fastening with sliding blocks
TT = Carriage

Frame
 CKK-280



CKK	Dimensions (mm)							
	A	B	H	H ₁	H ₂	H ₃	ØD ₁ -0,01	Ød _{h7}
-280	280	204	160	190	156	92	80	25

a) Lube port on both sides (grease lubrication). ➡ Chapter "Lubrication".

Straightness and flatness tolerance in accordance with DIN EN 12020-2.

Note: all dimensions in mm. Drawings not schematically to scale.

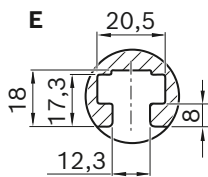
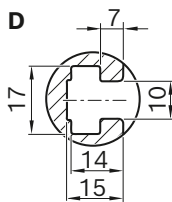
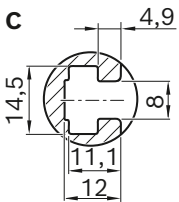
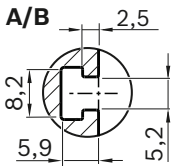
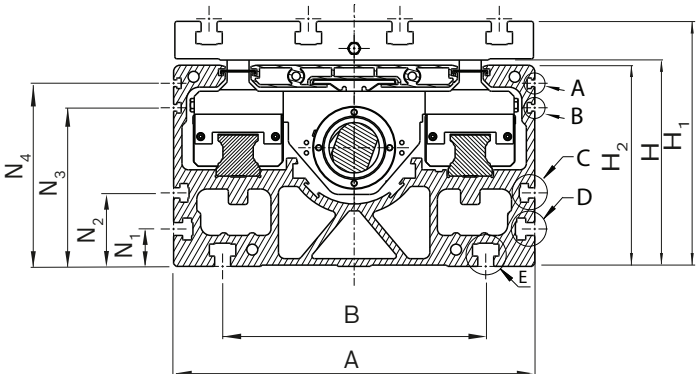
Exact contours and dimensions can be found in the CAD model.

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See following pages for dimension drawings for frames, carriages and motor attachment.

Length calculation of the linear motion system ➡ Chapters "Technical data" and "Project planning/calculation".

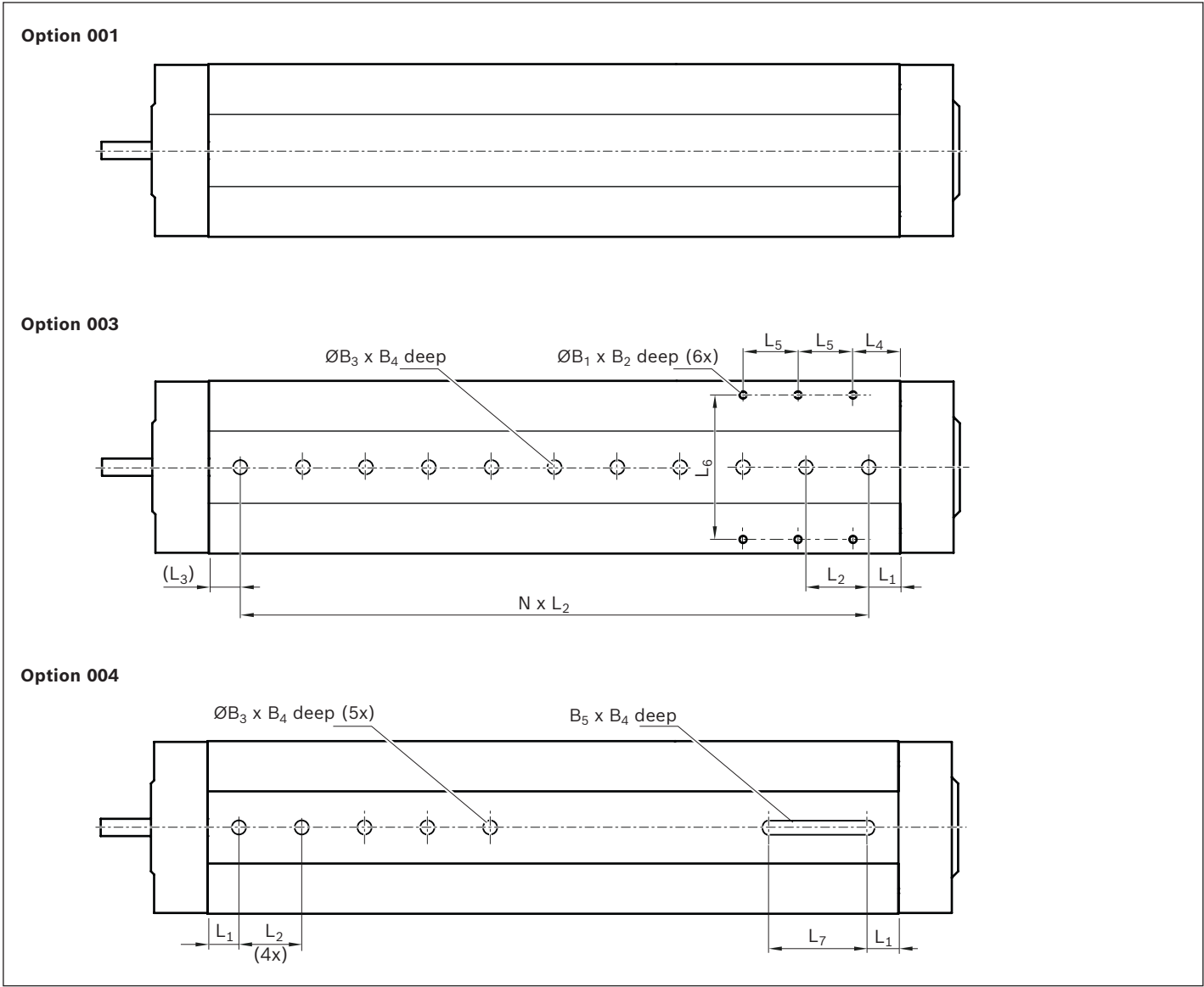
For the connection plate, see the "Connection plates" chapter



K_1	K_2	K_3	K_4	K_5	K_6	L_1	L_2	L_3	L_4	L_5	N_1	N_2	N_3	N_4
M10	20	65	100	125	154.0	68	63	65.0	4	73	29.0	57.0	123	142

- A** Usable by customers
 - B** For switch mounting arrangements / cable duct
 - C** Usable by customers
 - D** For mounting with clamping fixtures
 - E** For fastening with sliding blocks
- TT = Carriage

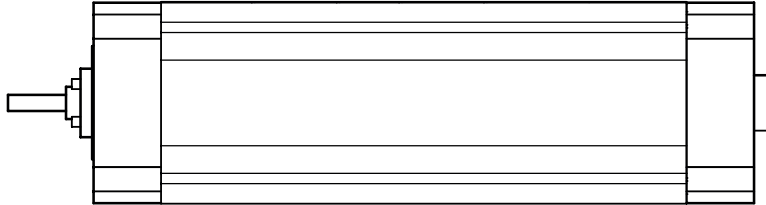
Frame
 CKK-070/-090/-110/-145



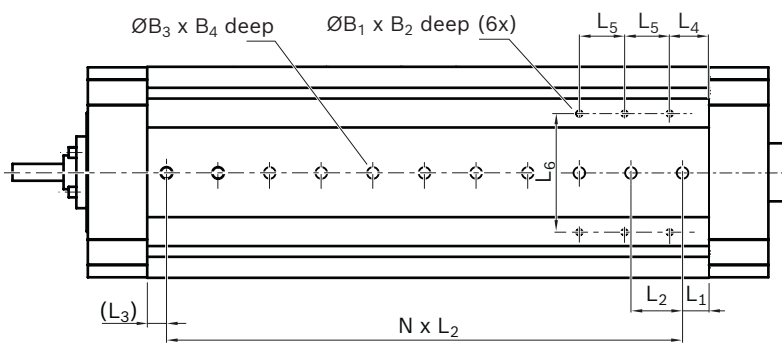
CKK	Option	Dimensions (mm)					L ₁	L ₂ ±0.01	L ₃ (min)	L ₄	L ₅	L ₆	L ₇
		B ₁	B ₂	ØB ₃ ^{H7}	B ₄	B ₅ ^{H8}							
-070	003	M3	6	7	1.6	–	20	40	10	15	25	59	–
	004	–	–			7			–	–	–	–	60
-090	003	M4	7.5	9	2.1	–			10	30	35	76	–
	004	–	–			9			–	–	–	–	60
-110	003	M5	9	9	2.1	–			10	30	35	92	–
	004	–	–			9			–	–	–	–	60
-145	003	M6	13	12	2.1	–			10	30	35	124	–
	004	–	–			12			–	–	–	–	60
-200	003	M8	12	16	3.1	–			10	35	40	119	–
	004	–	–			16			–	–	–	–	60
-280	003	M10	15	16	3,1	–			10	35	40	242	–
	004	–	–			16			–	–	–	–	60

Frame CKK-200/-280

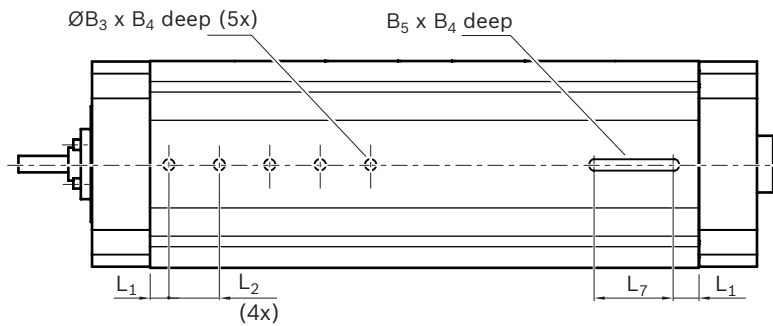
Option 001



Option 003



Option 004



Views from below (ground area)

Option 001 / standard

Option 003 / with centring holes

Option 004 / with centring holes and long hole

Carriages CKK-070/-090/-110/-145/-200/-280

Carriage without connection plate

Fig. 1:
CKK-070/-090/-110/-145/-200

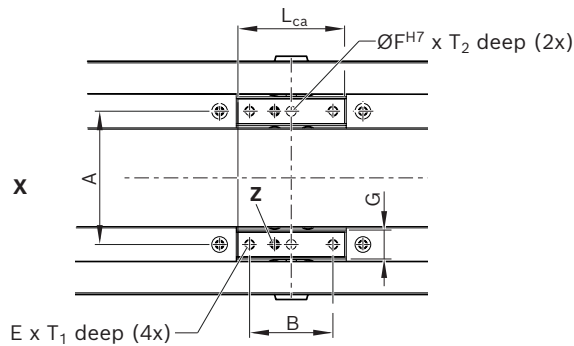


Fig. 2:
CKK-070/-090

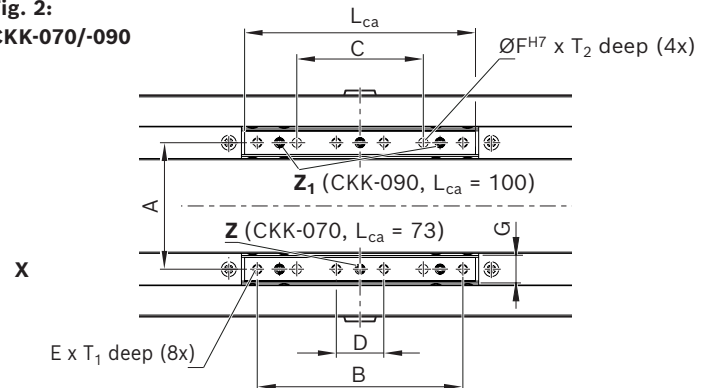
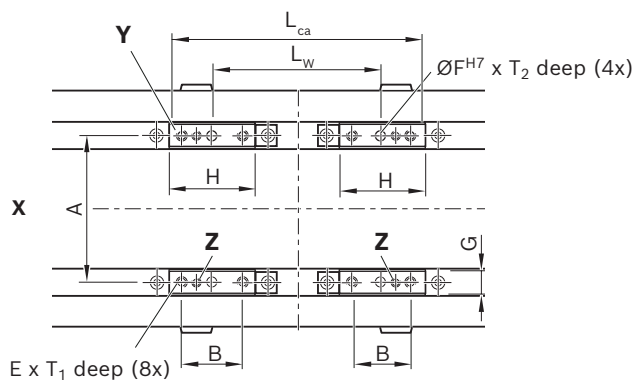
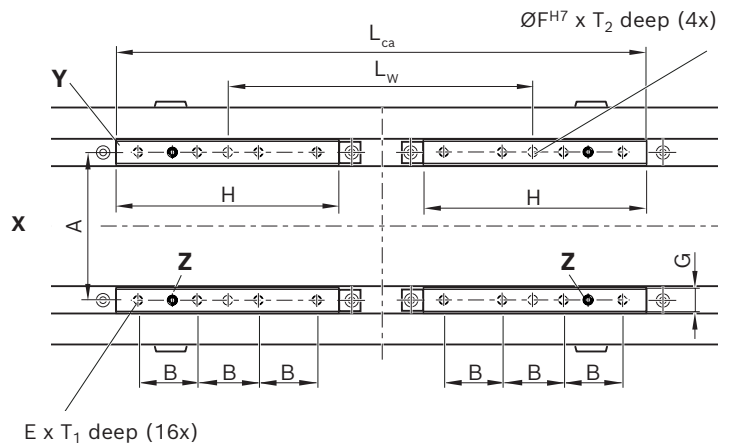


Fig. 3:
CKK-090/-110/-145/-200



CKK-280



- X** Drive side
- Y** Drive carriage
- Z/Z₁** Lubrication point for grease; sealed with set screw.
Supplementary information for lubrication
➔ Chapter "Lubrication".

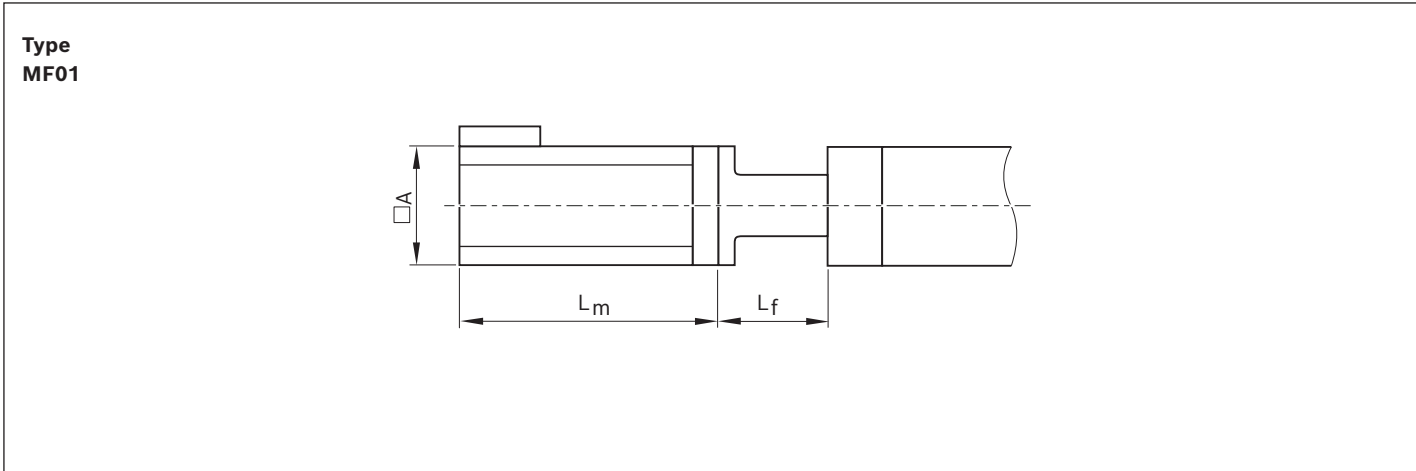
CKK	Figure	Dimensions (mm)		A	B	C	D	E	ØF ^{H7}	G	H	T ₁	T ₂
		L _{ca}	L _W										
-070	1	32	–	40	25	–	–	M3	3	7.5	–	5	5
	2	73			65	40	15						
-090	1	35	–	54	27	–	–	M4	4	8.0	35	7	6
	2	100			92	65	38						
	3	variable min. 101 max. 235	min. 66 max. 200		27	–	–						
-110	1	39	–	66	30	–	–	M5	5	10.0	39	10	8
	3	124	85										
	3	variable min. 125 max. 289	min. 86 max. 250										
-145	1	49	–	88	36	–	–	M6	6	12.0	49	12	10
	3	149	100										
	3	variable min. 150 max. 349	min. 101 max. 300										
-200	1	79.5	–	130	60	–	–	M8	8	16.0	79.5	16	12
	3	254.5	175										
	3	variable min. 255.5 max. 429.5	min. 176 max. 350										
-280	3	330	200	180	28	–	–	M8	8	17.0	117,5	16	13
	3	variable min. 331 max. 505	variable min. 201 max. 375										

Carriage with connection plate¹⁾



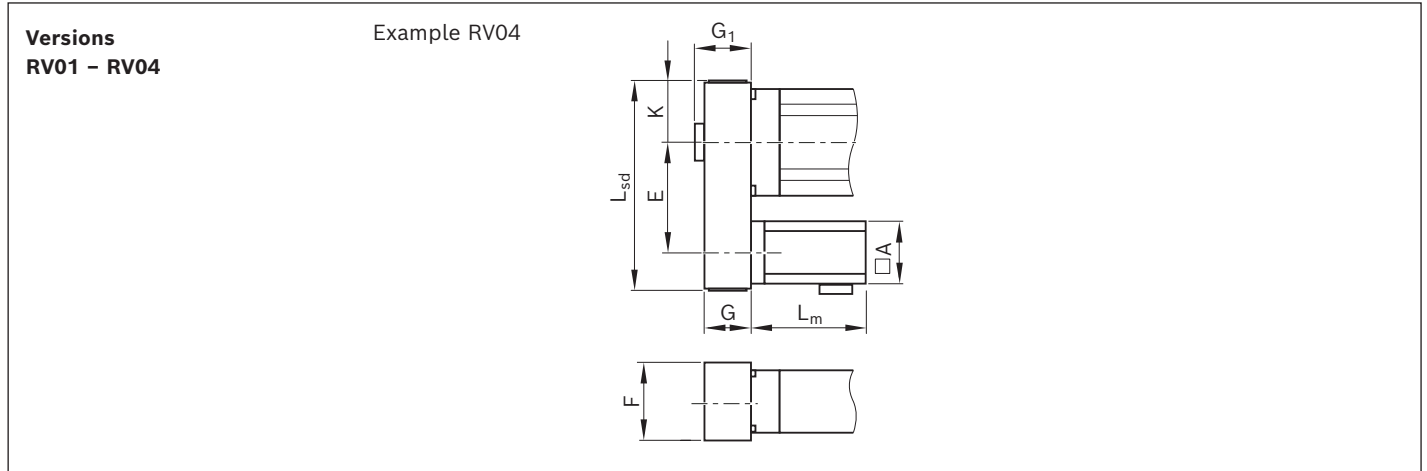
¹⁾ Dimension drawings ➔ Chapter "Connection plates"

Motor attachment with flange and coupling



CKK	Motor code	Dimensions (mm)		
		L _f	L _m	□A
-070	MS2N03-B0BYN	50.0	⇒ Chapter "Motors"	
	MSM031B-0300			
	MSM019B-0300	45.0		
-090	MS2N03-B0BYN	70.0		
	MSM031C-0300	71.5		
-110	MS2N03-B0BYN	75.0		
	MS2N03-D0BYN			
	MS2N04-C0BTN	77.5		
	MS2N04-D0BQN			
	MSM031C-0300	72.0		
	MSM041B-0300	83.0		
-145	MS2N04-C0BTN	85.0		
	MS2N04-D0BQN			
	MSM041B-0300	90.0		
	MS2N05-B0BTN	95.0		
	MS2N05-C0BTN			
MS2N05-D0BRN				
-200	MS2N06-D0BRN	125.0		
	MS2N06-E0BRN			
	MS2N07-C0BQN	133.0		
	MS2N07-D0BRN			
-280	MS2N07-B1BNN	140.0		
	MS2N07-C1BRN			
	MS2N07-D1BNN			

Motor attachment with belt side drive



CKK	Motor code	Dimensions (mm)										L _{sd}	L _m	□A
		i=1	i=1.5	E i=2	F	G	G ₁	K	i=1	i=1.5	i= 2			
-070	MS2N03-B0BYN	103.5	89.5	–	64.5	37.0	44.0	33.5	179	165	–			
	MSM031B-0300								182	168				
	MSM019B-0300	76.5	76.5	–	48.0	27.5	28.0	27.5	139					
-090	MS2N03-B0BYN	103.5	89.5	–	64.5	37.0	–	33.0	179	165	–			
	MSM031C-0300													
-110	MS2N03-B0BYN	103.5	115.0	–	64.5	37.0	–	33.0	179	191	–			
	MS2N04-B0BTN	–	139.5		88.0	51.0		43.5	–	250				
	MS2N04-C0BTN	145.0	–		88.0	51.0		43.5	250	–				
	MSM031C-0300	103.5	115.0		64.5	37.0		33.0	179	191				
	MSM041B-0300	145.0	139.5		88.0	51.0		43.5	250	250				
-145	MS2N04-B0BTN	–	162.0	–	88.0	51.0	–	43.5	–	267	–			
	MS2N04-C0BTN	157.5	162.0	–	88.0	51.0	–	43.5	267	267	–			
	MS2N04-D0BQN													
	MS2N05-B0BTN	165.0	–	162	116.0	66.0	–	56.0	297	–	297			
	MS2N05-D0BRN													
	MSM041B-0300	157.5	162.0	–	88.0	51.0	–	43.5	267	267	–			
-200	MS2N06-B1BNN	267.5	–	–	116.0	66.0	–	59.0	403	–	–			
	MS2N06-D1BNN													
	MS2N06-C0BTN	–	–	265	116.0	66.0	–	59.0	–	–	403			
-280	MS2N07-B1BNN	260.0	–	253	160.0	90.0	–	77.0	430	–	430			
	MS2N07-C1BRN													
	MS2N07-D1BNN													

Chapter "Motors"

Compact modules with toothed belt drive (CKR-070 up to CKR-280)

Product overview

Features

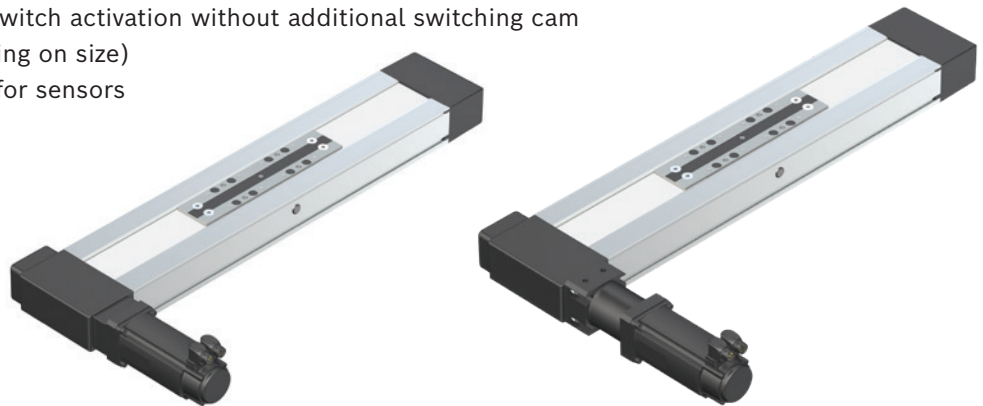
- ▶ Six fine-tuned sizes based on a compact precision aluminum profile with two integrated preloaded ball rail systems
- ▶ Four different lube versions
- ▶ Ready-to-install compact modules in any length up to L_{max} .
- ▶ Realization of greater lengths of up to 10,000 mm
- ▶ Preloaded toothed belt
- ▶ Aluminum carriages available in different lengths
- ▶ Intelligent toothed belt guide protects inner components
- ▶ Low-cost maintenance
- ▶ Repeatability of up to ± 0.05 mm

Further highlights

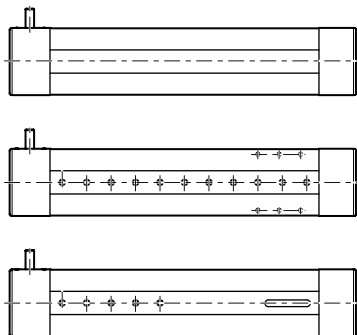
- ▶ Flexible thanks to selectable options
- ▶ Centering holes for simple combination with other linear motion systems and connection elements
- ▶ Extensive accessories for connection and clamping units
- ▶ Nameplate with parameters for easy commissioning

Attachments

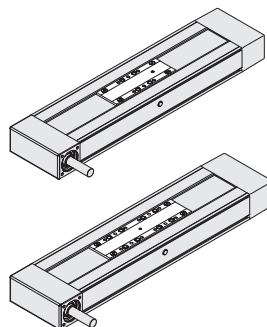
- ▶ Planetary gear with various gear ratios
- ▶ Maintenance-free servo motors with selectable brake and attached feedback
- ▶ Switches (magnetic sensors), switch activation without additional switching cam
- ▶ Socket and connector (depending on size)
- ▶ Cable duct made of aluminum for sensors



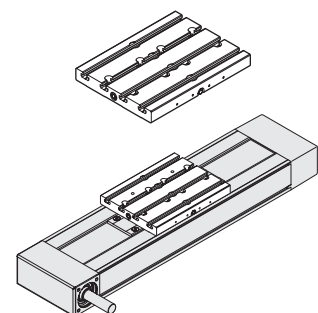
Design/options for guideway (frame), carriages, connection plates



Guideway (frame)



Carriages



Connection plates

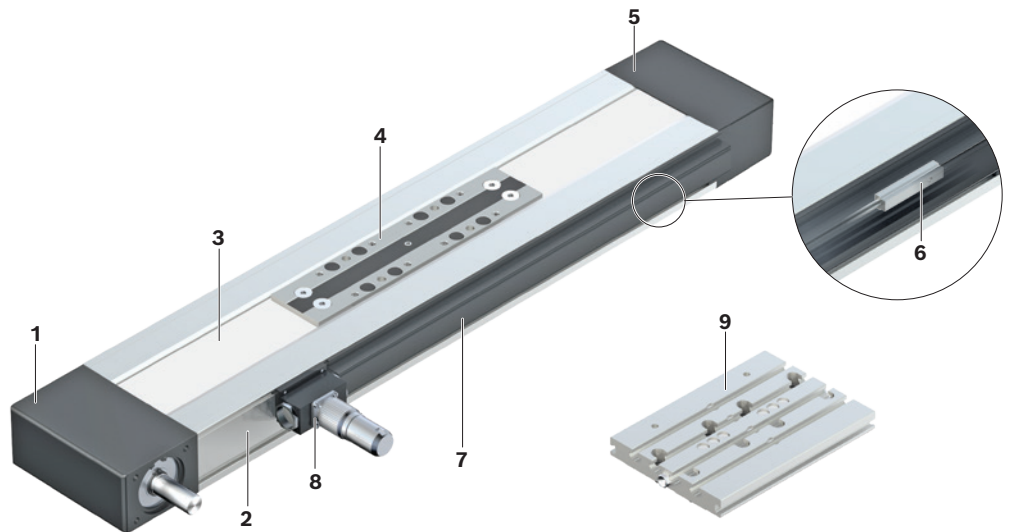
Structural design

Structural design CKR

- 1 Drive end enclosure
- 2 Frame
- 3 Toothed belt drive
- 4 Carriage
- 5 Idler end enclosure

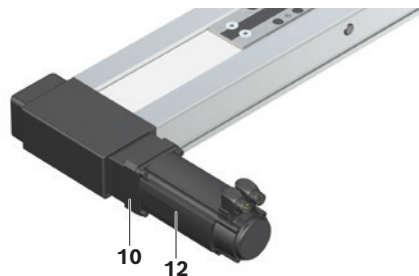
Attachments:

- 6 Magnetic sensor
- 7 Cable duct
- 8 Socket/connector
- 9 Connection plate
- 10 Flange
- 11 Planetary gear
- 12 Motor



Motor attachment – direct attachment with $i = 1$ (depending on size)

The motor is attached directly to the compact module's drive end enclosure via a flange.



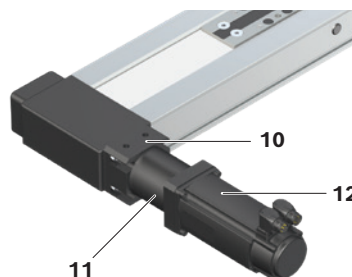
Motor attachment – with gear (depending on size)

The planetary gear is attached by means of a flange.

The flange serves to fasten the gearbox to the CRK and as a closed housing.

Due to the connection without coupling, the drive torque is transferred to the drive shaft of the compact module in a torsionally stiff manner.

Available gear ratios → "configuration, ordering".



Technical data

General technical data

Observe the "Project planning/calculation" chapter.

CKR	Carriage		Additional length		Min. travel range	Max. length	Dynamic characteristic values		
	Connection plate without ¹⁾	with ²⁾	Connection plate without	with			Load capacities	Load moments	
	L _{ca} (mm)	L _{ca} (mm)	L _{ad} (mm)	L _{ad} (mm)	s _{min} ³⁾ (mm)	L _{max} (mm)	C _{gw} (N)	M _t (Nm)	M _L (Nm)
-070	80	60	10	30	40	1,500	2,360	47	7
	108	95	10	23			3,830	77	94
-090	102	60	25	67	40	5,500	4,620	125	16
	156	125	25	56			7,505	203	244
-110	170	110	25	85	50	5,500	19,720	651	136
	215	155	25	85			32,035	1,057	1,361
-145	180	125	25	80	60	5,500	46,800	2,059	400
	240	190	25	75			76,025	3,345	3,801
-200	265	190	25	100	80	10,000	74,600	4,849	1,053
	405	305	25	125			121,185	7,877	10,604
-280	485	375	25	135	195	5, 500	216,700	19,500	21,670

Drive data

Observe the "Project planning/calculation" chapter.

CKR	Gearing	Gear ratio	Max. drive torque	Feed constant	Max. speed	Carriage		Moved mass of system	
						Connection plate without	with	Connection plate without	with
		i (-)	M _p (Nm)	u (mm/rev)	v _{max} (m/s)	L _{ca} (mm)	L _{ca} (mm)	m _{ca} (kg)	m _{ca} (kg)
-070	-	1	3.00	72.00	3.00	80	60	0.12	0.23
		5	0.62	14.40	1.92				
		10	0.31	7.20	0.96				
-090	-	1	8.00	90.00	3.00	102	60	0.32	0.50
		5	1.65	18.00	3.00				
		10	0.82	9.00	1.50				
-110	-	1	13.50	120.00	5.00	170	60	0.52	0.90
		5	2.72	24.00	4.40				
		10	1.26	12.00	2.20				
-145	-	1	32.50	165.00	5.00	180	125	0.99	1.80
		3	11.00	55.00	5.00				
		5	6.70	33.00	5.00				
		10	3.35	16.50	2.92				
-200	-	1	112.70 99.80 ⁶⁾	250.00	5.00	265	190	2.40	4.60
		3	38.73	83.33	5.00				
		5	20.62	50.00	5.00				
		10	9.28	25.00	2.92				
		3	38.73	83.33	5.00	405	305	4.30	7.90
		5	23.24	50.00	5.00				
		10	11.62	25.00	2.50				
-280	ohne	1	300.00	390.00	5.00	485	375	19.48	26.75
		9	33.00	43.33	3.97				
		12	25.00	32.50	2.98				
		16	18.00	24.38	2.23				

¹⁾ In the "without connection plate" carriage version, carriage length L_{ca} corresponds to the length of the clamping surface.

²⁾ The connection plate is mounted on the "without connection plate" carriage version.

In the "with connection plate" carriage version, the carriage length corresponds to the length of the connection plate.

³⁾ Minimum required travel range to ensure a reliable lubrication distribution.

⁴⁾ Maximum force that can be transmitted via the teeth meshing with the belt pulley.

Maximum permissible loads							Planar moments of inertia		Point of force application	
Moments			Forces				I_y (cm ⁴)	I_z (cm ⁴)	Connection plate	
$M_{x \max}$ (Nm)	$M_{y \max}$ (Nm)	$M_{z \max}$ (Nm)	$F_{y \max}$ (N)	$F_{z1 \max}$ (N)	$F_{z2 \max}$ (N)				without Z_1 (mm)	with Z_1 (mm)
47	7	7	1,270	2,360	2,360		5.62	51.6	20.0	32.5
77	94	51	2,070	3,830	3,830					
112	16	16	2,490	4,620	4,620		13.49	139.7	24.0	40.0
203	244	132	4,050	7,505	7,505					
198	32	32	3,480	6,000	6,000		36.17	361.0	28.7	44.7
396	510	240	5,650	12,000	12,000					
634	100	100	8,410	14,400	14,400		91.28	1049.0	37.5	57.5
1,267	1,440	683	13,660	28,800	28,800					
1,375	299	299	12,265	21,150	21,150		500.80	4,022.0	45.5	72.5
2,750	3,701	1,744	19,925	42,300	42,300					
5,400	6,000	5,517	55,170	86,685	60,000		2,242.00	15,802.0	78.5	108.5

	Constant mass calculation		Constant mass moment of inertia				Friction torque	Belt pulley diameter	Belt type	Max. belt drive transmission force	Belt elasticity limit	Max. acceleration
			Connection plate									
	$k_{g \text{ fix}}$ (kg)	$k_{g \text{ var}}$ (kg/mm)	without $k_{J \text{ fix}}$ (kg/mm ²)	with $k_{J \text{ fix}}$ (kg/mm ²)			$k_{J \text{ var}}$ (kg/mm)	$k_{J \text{ m}}$ (mm ²)	M_{Rs} (Nm)	d_3 (mm)	B_t	$F_{bp}^{4)}$ (N)
	0.50	0.00284	22.32	36.77	0.0142	131.11	0.23	22.92	25 AT3	260	1,100	50
			43.14	65.46			0.25					
	0.70	0.00440	92.45	129.38	0.0320	205.21	0.57	28.65	35 AT3	560	1,600	
			139.64	215.57			0.58					
	1.27	0.00739	266.45	405.08	0.1364	364.81	1.04	38.20	50 AT5	705	4,200	
			391.07	602.66			1.42					
	2.54	0.01222	1,024.28	1,582.85	0.3172	689.59	1.46	52.52	70 AT5	1,235	4,800	
			1,621.61	2,276.71			2.04					
	7.83	0.02328	6,140.67	9,623.81	1.8397	1,583.24	4.55	79.58	100 AT10	2,830	17,000	
			9,020.05	14,719.73			5.69					
	30.55	0.04568	97,687.84	125,816.29	6.4648	3,852.68	12.97	124.14	150 AT10	4,867	22,000	

⁵⁾ The maximum permissible tensile load on the belt cross section (belt elasticity limit) is given here for easier comparability.
This value represents the load limit in terms of plastic deformation and may not be used to calculate the maximum permissible drive torque.

⁶⁾ Version with keyway

Gear data

Observe the "Project planning/calculation" chapter.

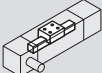
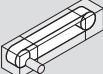

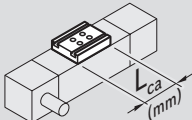
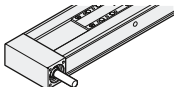

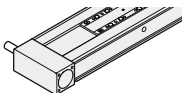
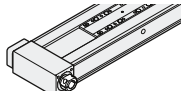
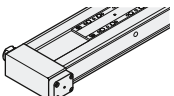
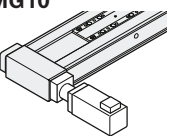
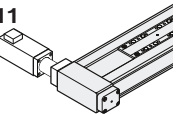
CKR	Gearing Type	Gear ratio i (–)	Max. acceleration torque ¹⁾ (at the gear output) M _{ge} (Nm)	Base frictional torque M _{Rge} (Nm)	Max. drive speed n _{ge} (min ⁻¹)	
-070	PG040	5	14	0.06	9.000	
		10	13	0.05	9.000	
-090	PG050	5	14	0.09	10.000	
		10	13	0.08	10.000	
-110	PG050	5	14	0.09	10.000	
		10	13	0.08	10.000	
-145	PG070	3	32	0.24	8.000	
		5	40	0.17	8.000	
		10	35	0.12	8.000	
-200	PG090	3	125	0.38	7.000	
		5	100	0.26		
		10	90	0.17		
	PG120	3	200	1.00	6.000	
		5	250	0.76		
		10	220	0.58		
-280	PG115	9	305	1.30	5.500	
		12		1.10		
		16		0.98		

¹⁾ The limits of the linear motion system must not be exceeded ➡ "Drive data / project planning/calculation".

	Motor	Mass moment of inertia	Weight
		J_{ge} (kgm ²)	m_{ge} (kg)
	MS2N03-B	0.0000040	0.50
	MSM019-B		
	MS2N03-B	0.0000030	0.70
	MSM019-B		
	MS2N03-B	0.0000030	0.70
	MS2N03-D	0.0000050	0.70
	MSM031-C	0.0000130	1.20
	MS2N03-B	0.0000020	0.70
	MS2N03-D	0.0000040	0.70
	MSM031-C	0.0000130	1.20
	MS2N03-B	0.0000030	0.70
	MS2N03-D	0.0000050	0.70
	MS2N04	0.0000130	1.20
	MSM031-C	0.0000130	1.20
	MS2N03-B	0.0000020	0.70
	MS2N03-D	0.0000040	0.70
	MS2N04	0.0000130	1.20
	MSM031-C	0.0000130	1.20
	MS2N04	0.0000320	1.90
	MS2N05	0.0000530	3.00
	MSM041-B	0.0000530	3.00
	MS2N04	0.0000270	1.90
	MS2N05	0.0000460	3.00
	MSM041-B	0.0000460	3.00
	MS2N04	0.0000220	1.90
	MS2N05	0.0000430	3.00
	MSM041-B	0.0000430	3.00
	MS2N06	0.0001800	4.70
		0.0001600	
		0.0001500	
	MS2N07	0.0007200	9.40
		0.0005900	
		0.0005400	
	MS2N07	0.0008000	9.60
		0.0007800	
		0.0007900	

Configuration, order

CKR-070

Short product name, length ¹⁾ CKR-070-NN-1, ... mm		Guideway		Drive		Lubrication ³⁾	Carriage									
																
		Standard	Centering holes ²⁾	without keyway	for gear unit ⁴⁾		Connection plate without	with								
Version				i = 1			L _{ca} = (mm)	L _{ca} = (mm)								
							80	108	60	95						
Drive journal	MA01 	001	003	004	001		LSS	001	002	040	041					
	MA02 				002											
Clamping hub	MA05 				006											
	MA06 				007											
Gear attachment	MG10 				008							LPG	-	302	-	341
	MG11 				009											

¹⁾ Length calculation of the linear motion system ➔ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (➔ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame.

Option 004: with centering holes and long hole in the ground area of the frame. Selectable starting from length $L \geq 300$ mm up to length L_{max}

³⁾ Lubrication ➔ Chapter "Lubrication".

⁴⁾ Attachment kit for gear attachment

⁵⁾ If a module has been ordered with an attached servo motor, it will only be delivered with the motor mounting shown in the chapter "Form of delivery" (note position of motor connector).

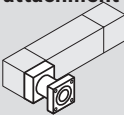
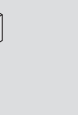
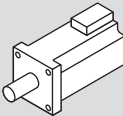
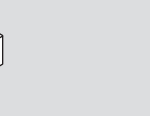
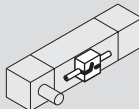

⁶⁾ Recommended motor, motor data and type designations ➔ Chapter "Motors"

⁷⁾ More information ➔ Chapter "Switching system".

⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

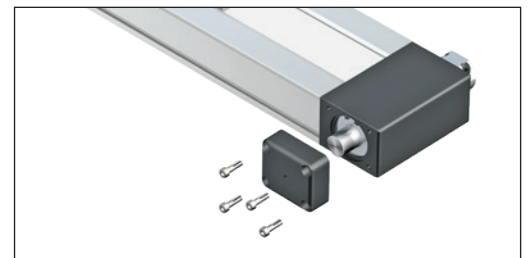
⁹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; (➔ Chapter "Documentation")

¹⁰⁾ Motor attachment consisting of: Adapter flange for gear unit, however "without gear unit". No motor connector position selectable.

Motor attachment ⁵⁾				Motor ⁶⁾						Switching system ⁷⁾		Automation package		Doc. ⁹⁾
														
Direct drive		Gear unit		2 cables		1 cable		Motor connector position		Controller	Cable			
i = 1	i = 5	i = 10	Motor code	without brake	with brake	without brake	with brake							
MA01	MA02	MA05	MA06	000	000				000	Without		"Automation package" chapter ➔	001	
										- Switch				000
										- Cable duct				
										- Socket-connector				
MG10 / MG11	-	000 ¹⁰⁾		000				000 090 180 270	Magnetic sensor			002		
		011	012	MS2N03-B0BYN	-	-	203		204	REED, changeover (NC: C+NC, NO: C+NO)			021	
										Hall, PNP normally closed (NC)				022
		Hall, PNP normally open (NO)		023										
		Cable duct			025									
		Socket-connector		017										
		Magnetic sensor with connector ⁸⁾			058									
		REED, changeover (NC: C+NC, NO: C+NO)		059										
		Hall, PNP normally closed (NC)												

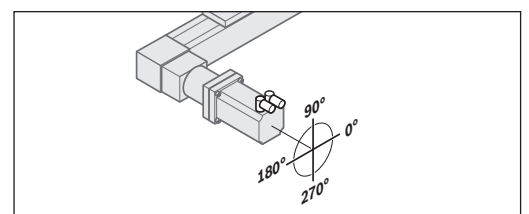
Drive end enclosure with additional drive journal

In the versions MA05, MA06, MG10 and MG11, a second drive journal can be made available by removing the screws and cover.




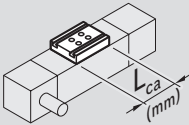
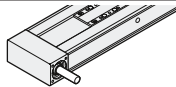

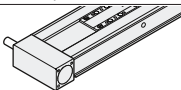
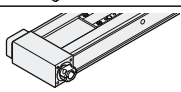
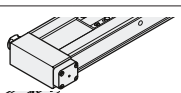
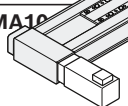
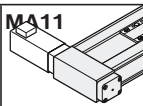
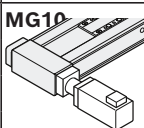
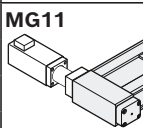
Version	Motor connector position			
	0°	90°	180°	270°
MG10 / MG11	000	090 ★	180	270

★ Standard delivery



Explanation of the order parameters and ordering example ➔ Chapter "Ordering example".

CKR-090

Short product name, length ¹⁾ CKR-090-NN-1, ... mm		Guideway		Drive			Lubrication ³⁾	Carriage								
Version		Standard	Centering holes ²⁾		without keyway i = 1	with keyway i = 1	for gear unit ⁴⁾			Connection plate						
									without L _{ca} = (mm)	with L _{ca} = (mm)						
									102	156	60	125				
Drive journal	MA01 	001	003	004		001	003		LSS	001	002	040	041			
	MA02 															
Clamping hub	MA05 						006		–	–	LPG	–	302	–	341	
	MA06 															
Direct attachment	MA10 								006	–	–	LCF	–		141	
	MA11 															
Gear attachment	MG10 								–	–	008	LCO	–		241	
	MG11 															

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame. Selectable up to a length of $L \leq 2000$ mm

Option 004: with centering holes and long hole in the ground area of the frame. Selectable starting from length $L \geq 300$ mm up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit for gear attachment

⁵⁾ If a module has been ordered with an attached servo motor, it will only be delivered with the motor mounting shown in the chapter "Form of delivery" (note position of motor connector).

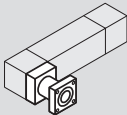
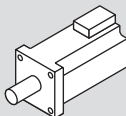
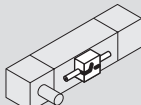

⁶⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁷⁾ More information ⇒ Chapter "Switching system".

⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

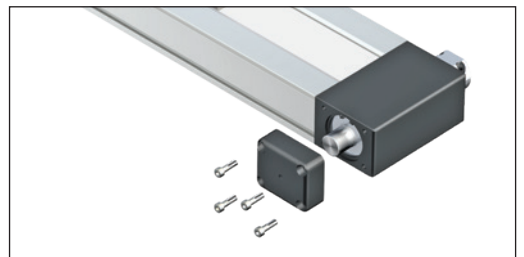
⁹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; (⇒ Chapter "Documentation")

¹⁰⁾ Motor attachment consisting of: Adapter flange for gear unit, however "without gear unit". No motor connector position selectable.

Motor attachment ⁵⁾				Motor ⁶⁾						Switching system ⁷⁾		Automation package		Doc. ⁹⁾
														
Direct drive		Gear unit		2 cables		1 cable		Motor connector position		Controller	Cable			
i = 1	i = 5	i = 10	Motor code	without brake	with brake	without brake	with brake							
MA01	000			000						Without		"Automation package" chapter ➡	001	
MA02										- Switch	000			
MA05										- Cable duct				
MA06										- Socket-connector				
MA11	001	-	MS2N04-D0BQN	-	-	219	220	000	Magnetic sensor		002			
MG10 / MG11	-	000 ¹⁰⁾		000				090	REED, changeover (NC: C+NC, NO: C+NO)	021				
		015	016	MS2N03-B0BYN	-	-	203		204	Hall, PNP normally closed (NC)			022	
		013	014	MS2N03-D0BYN	-	-	207		208	Hall, PNP normally open (NO)			023	
		033	034	MSM031C-0300	138	139	-		-	Cable duct			025	
								270	Socket-connector	017				
									Magnetic sensor with connector ⁸⁾					
									REED, changeover (NC: C+NC, NO: C+NO)	058				
									Hall, PNP normally closed (NC)	059				

Drive end enclosure with additional drive journal

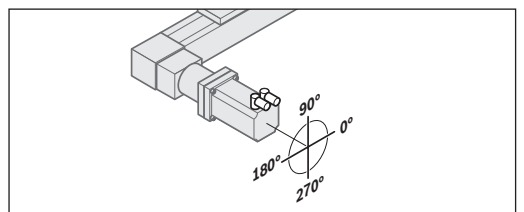
In the versions MA05, MA06, MA10, MA11, MG10 and MG11, a second drive journal can be made available by removing the screws and cover.



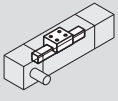
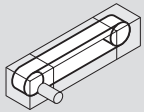

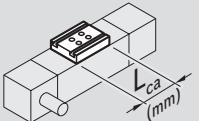
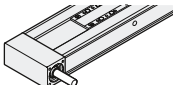

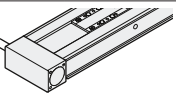
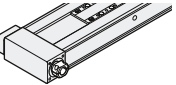
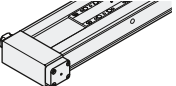
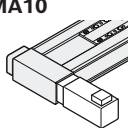
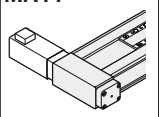
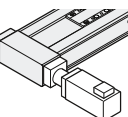
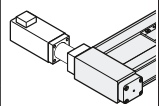
Version	Motor connector position			
	0°	90°	180°	270°
MA10 / MA11 MG10 / MG11	000	090 ★	180	270

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".



CKR-110

Short product name, length ¹⁾ CKR-110-NN-1, ... mm		Guideway		Drive			Lubrication ³⁾	Carriage			
											
		Standard	Centering holes ²⁾	without keyway i = 1	with keyway i = 1	for gear unit ⁴⁾		Connection plate without L _{ca} = (mm)	with L _{ca} = (mm)		
Version								170	215	110	155
Drive journal	MA01 	001	003	004							
	MA02 				001	003		LSS	001	002	040 041
Clamping hub	MA05 										
	MA06 				006	–		LPG	–	302	– 341
Direct attachment	MA10 										
	MA11 				006	–		LCF	–		141
Gear attachment	MG10 										
	MG11 				–	–		LCO	–		241

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame. Selectable up to a length of $L \leq 2000$ mm

Option 004: with centering holes and long hole in the ground area of the frame. Selectable starting from length $L \geq 300$ mm up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit for gear attachment

⁵⁾ If a module has been ordered with an attached servo motor, it will only be delivered with the motor mounting shown in the chapter "Form of delivery" (note position of motor connector).

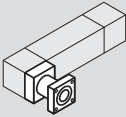
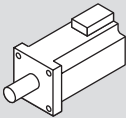
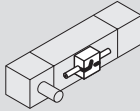

⁶⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁷⁾ More information ⇒ Chapter "Switching system".

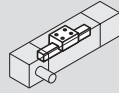
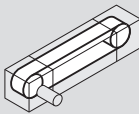

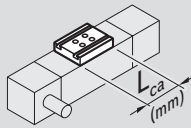
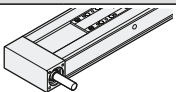

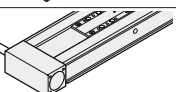
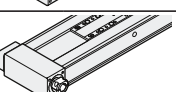
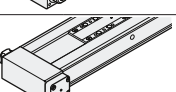
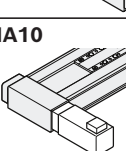
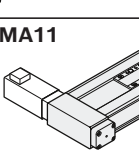
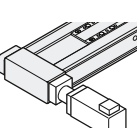
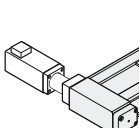
⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

⁹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; (⇒ Chapter "Documentation")

¹⁰⁾ Motor attachment consisting of: Adapter flange for gear unit, however "without gear unit". No motor connector position selectable.

Motor attachment ⁵⁾				Motor ⁶⁾								Switching system ⁷⁾		Automation package		Doc. ⁹⁾			
																			
Direct drive		Gear unit		2 cables		1 cable		Motor connector position				Controller		Cable					
i = 1	i = 5	i = 10	without brake	with brake	without brake	with brake													
Motor code																			
MA01	MA02	MA05	MA06	000		000								Without		"Automation package" chapter	001		
														- Switch				000	
														- Cable duct					
														- Socket-connector					
														Magnetic sensor					
														REED, changeover (NC: C+NC, NO: C+NO)				021	
														Hall, PNP normally closed (NC)				022	
														Hall, PNP normally open (NO)				023	
														Cable duct				025	
														Socket-connector				017	
MA10 / MA11				001	-	MS2N05-D0BRN		-	-	231	232	000			"Automation package" chapter	002			
												Magnetic sensor with connector ⁸⁾							
												REED, changeover (NC: C+NC, NO: C+NO)		058					
												Hall, PNP normally closed (NC)		059					
MG10 / MG11	-	000 ¹⁰⁾		000								090							
		015	016	MS2N03-B0BYN	-	-	203	204	180										
		013	014	MS2N03-D0BYN	-	-	207	208											
		023	024	MS2N04-B0BTN	-	-	211	212	270										
				MS2N04-C0BTN	-	-	215	216											
033	34	MSM031C-0300	138	139	-	-													

CKR-145

Short product name, length ¹⁾ CKR-145-NN-1, ... mm			Guideway			Drive			Lubrication ³⁾	Carriage				
														
Version			Standard	Centering holes ²⁾		without keyway i = 1	with keyway i = 1	for gear unit ⁴⁾		Connection plate without L _{ca} = (mm)		with L _{ca} = (mm)		
										180	240	125	190	
Drive journal	MA01 		001	003	004					LSS	001	002	040	041
	MA02 					001	003	-						
Clamping hub	MA05 									LPG	-	302	-	341
	MA06 					006	-	-						
Direct attachment	MA10 	MA11 								LCF	-			141
						006	-	-						
Gear attachment	MG10 	MG11 								LCO	-			241
						-	-	008						

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame. Selectable up to a length of $L \leq 2000$ mm

Option 004: with centering holes and long hole in the ground area of the frame. Selectable starting from length $L \geq 300$ mm up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit for gear attachment

⁵⁾ If a module has been ordered with an attached servo motor, it will only be delivered with the motor mounting shown in the chapter "Form of delivery" (note position of motor connector).

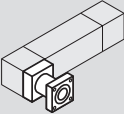
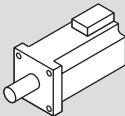
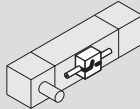

⁶⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁷⁾ More information ⇒ Chapter "Switching system".

⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws

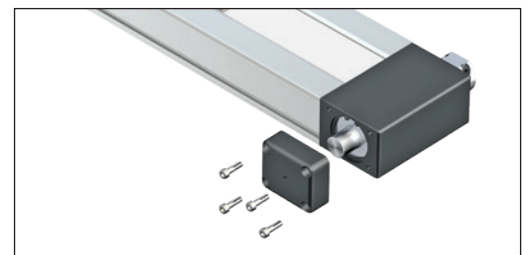
⁹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; (⇒ Chapter "Documentation")

¹⁰⁾ Motor attachment consisting of: Adapter flange for gear unit, however "without gear unit". No motor connector position selectable.

Motor attachment ⁵⁾					Motor ⁶⁾							Switching system ⁷⁾		Auto- mation package		Doc. ⁹⁾			
																			
Direct drive i = 1		Gear unit			2 cables		1 cable		Motor connector position			Controller	Cable						
		i = 3	i = 5	i = 10	without brake	with brake	without brake	with brake											
Motor code																			
MA01	MA02	MA05	MA06	MA10 / MA11	001	-	-	-	MS2N06-D1BNN	-	-	247	248	000	Without		"Automation package" chapter	001	
															- Switch				000
															- Cable duct				
															- Socket-connector				
				Magnetic sensor				REED, changeover (NC: C+NC, NO: C+NO)		021			002						
				Hall, PNP normally closed (NC)		022													
				Hall, PNP normally open (NO)		023													
				Cable duct		025													
				Socket-connector		017													
				Magnetic sensor with connector ⁸⁾															
				REED, changeover (NC: C+NC, NO: C+NO)		058													
				Hall, PNP normally closed (NC)		059													
MG10 / MG11	-	000 ¹⁰⁾			000				000			090			180				
		013	014	015	MS2N04-C0BTN	-	-	215		216									
					MS2N04-D0BQN	-	-	219		220									
		043	044	045	MS2N05-B0BTN	-	-	223		224									
					MS2N05-C0BTN	-	-	227		228									
		033	034	035	MSM041B-0300	140	141	-		-									

Drive end enclosure with additional drive journal

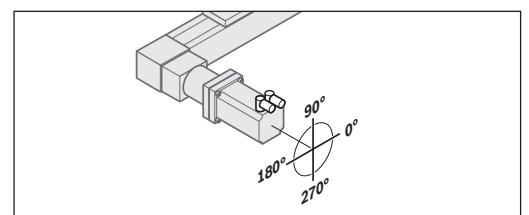
In the versions MA05, MA06, MA10, MA11, MG10 and MG11, a second drive journal can be made available by removing the screws and cover.




Version	Motor connector position			
	0°	90°	180°	270°
MA10 / MA11 MG10 / MG11	000	090 ★	180	270

★ Standard delivery

Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".



CKR-200

Short product name, length ¹⁾ CKR-200-NN-1, ... mm		Guideway		Drive		Lubrication ³⁾	Carriage						
Version		Standard	Centering holes ²⁾		without keyway i = 1	with keyway i = 1	for gear unit ⁴⁾		Connection plate without		with		
									L _{ca} = (mm)		L _{ca} = (mm)		
									265	405	190	305	
Drive journal	MA01	001	003	004	001	003	-		LSS	001	002	040	041
	MA02												
	MA03				002	004			LPG	-	302	-	341
MG01	MG02				-	-	PG090 010		LCF	-		141	
							PG120 012						
MG03	MG04				-	-	PG090 011		LCO	-		241	
							PG120 013						

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).
Option 003: with centering holes and fastening threads in the ground area of the frame. Selectable up to a length of L ≤ 2000 mm
Option 004: with centering holes and long hole in the ground area of the frame. Selectable up to a length of L ≤ 5500 mm

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit for gear attachment

⁵⁾ If a module has been ordered with an attached servo motor, it will only be delivered with the motor mounting shown in the chapter "Form of delivery" (note position of motor connector).

⁶⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁷⁾ More information ⇒ Chapter "Switching system".

⁸⁾ Assembly contains 1 x sensor, 1 x switch mounting plate including set screws and square nuts as well as 3 x cable holders including set screws


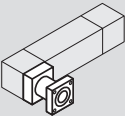
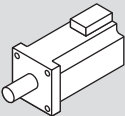
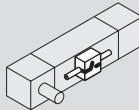
⁹⁾ Switch configuration with magnetic sensor and mechanical/proximity switch together on one side is not possible.

Assembly contains 1 x sensor, 1 x switch mounting plate including mounting material

¹⁰⁾ Switching cam can be attached only in conjunction with connection plate

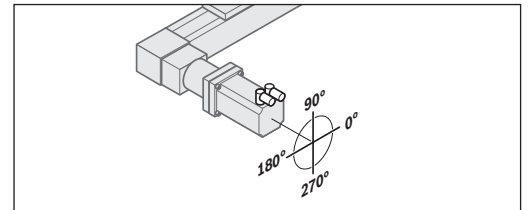
¹¹⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; (⇒ Chapter "Documentation")

¹²⁾ Motor attachment consisting of: Adapter flange for gear unit, however "without gear unit". No motor connector position selectable.

Motor attachment ⁵⁾			Motor ⁶⁾							Switching system ⁷⁾			Auto- mation package		Doc. ¹¹⁾ 
															
Gear unit			Motor code							Motor connector position			Controller		
i = 3 i = 5 i = 10			2 cables		1 cable								Cable		
			without brake		with brake		without brake		with brake						

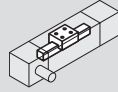
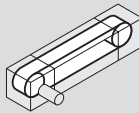

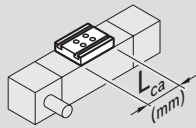
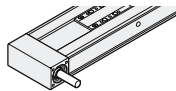
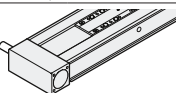
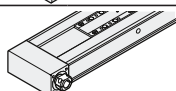
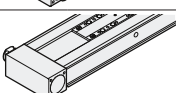
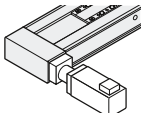
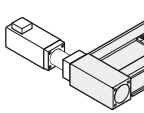
Version	Motor connector position			
	0°	90°	180°	270°
MG01-MG04	000	090 ★	180	270

★ Standard delivery



Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

CKR-280

Short product name, length ¹⁾ CKR-280-NN-1, mm		Guideway		Drive		Lubrication ³⁾	Carriage				
											
		Standard	Centering holes ²⁾	without keyway	for gear unit ⁴⁾		Connection plate without	with			
Version				i = 1			L _{ca} = (mm)	L _{ca} = (mm)			
Drive journal	MA01 	001	003	004	001	—	LSS	002	041		
	MA02 										
Clamping hub	MA07 				007	—	LPG	302	341		
	MA08 										
Gear attachment	MG01 				—	010					
	MG02 										

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).
Option 003: with centering holes and fastening threads in the ground area of the frame. Selectable up to a length of L ≤ 2000 mm
Option 004: with centering holes and long hole in the ground area of the frame. Selectable up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit for gear attachment

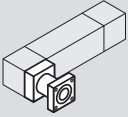
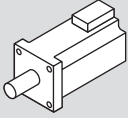
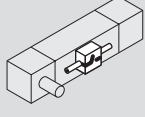

⁵⁾ If a module has been ordered with an attached servo motor, it will only be delivered with the motor mounting shown in the chapter "Form of delivery" (note position of motor connector).

⁶⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁷⁾ More information ⇒ Chapter "Switching system".

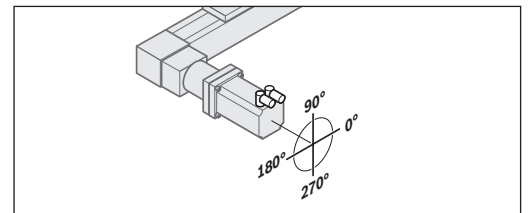
⁸⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; (⇒ Chapter "Documentation")

⁹⁾ Motor attachment consisting of: Adapter flange for gear unit, however "without gear unit". No motor connector position selectable.

Motor attachment ⁵⁾				Motor ⁶⁾								Switching system ⁷⁾		Auto- mation package		Doc. ⁸⁾
																
Gear unit				2 cables				1 cable		Motor connector position		Controller Cable				
i = 9	i = 12	i = 16	without brake	with brake	without brake	with brake										
Motor code																
MA01 MA02 MA07 MA08 MG02 / MG01	000			000								<div>Without</div> <div>- Switch</div> <div>- Cable duct</div> <div>000</div> <div>Magnetic sensor</div> <div>Hall, PNP-normally closed (NC)</div> <div>120</div> <div>Hall, NPN-normally closed (NC)</div> <div>121</div> <div>Hall, PNP-normally open (NO)</div> <div>122</div> <div>Hall, NPN-normally open (NO)</div> <div>123</div> <div>Cable duct</div> <div>020</div>		"Automation package" chapter ➡	001	
	000 ⁹⁾			000					000							
	013	014	015	MS2N07-B1BNN	-	-	255	256	090							
				MS2N07-C1BRN	-	-	263	264	180							
				MS2N07-D1BNN	-	-	269	270	270							

Version	Motor connector position			
	0°	90°	180°	270°
MG01-MG02	000	090 ★	180	270

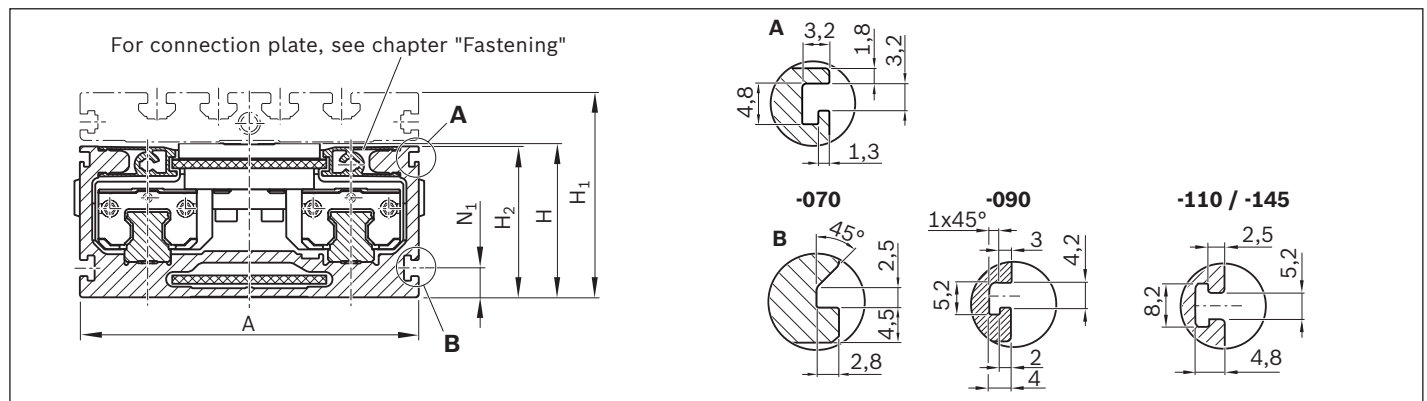
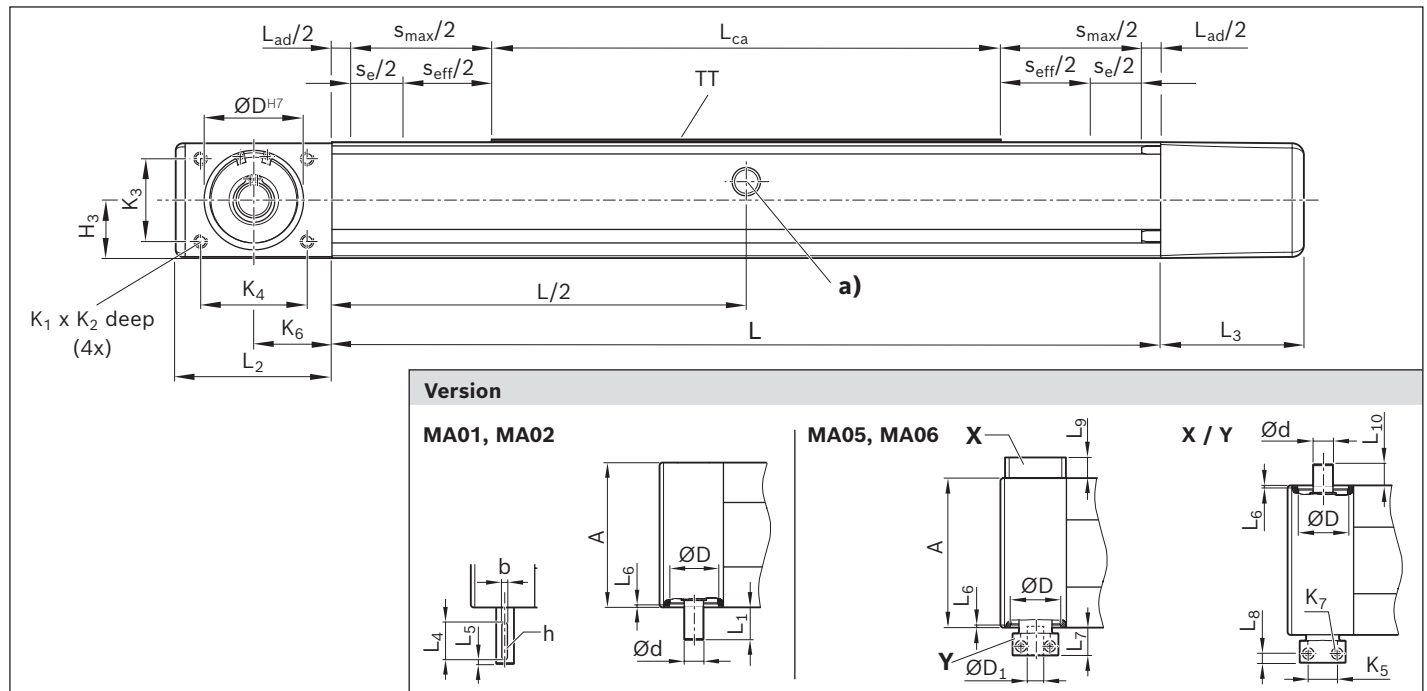
★ Standard delivery



Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

Dimension drawings

Frame CKR-070/-090/-110/-145



CKR	Dimensions (mm)														
	A	B	b ^{P9}	H	H ₁	H ₂	H ₃	h	ØD H7	ØD ₁ ¹⁾ H7	deep	h7	Ød h6	K ₁	K ₂
-070	70	–	–	32	44.5	31.3	16.30	–	26.5	10	12	8	–	M3	6
-090	90	–	3	40	56.0	39.0	19.50	1.8	34.0	14	20	10	–	M4	8
-110	110	–	5	50	66.0	49.0	24.50	3.0	42.0	19	20	14	–	M5	10
-145	145	–	6	65	85.0	64.0	32.00	3.5	49.0	24	26	19	–	M6	12
-200	200	150	8	100	127.0	98.5	49.25	4.0	68.0	–	–	–	24	M8	15

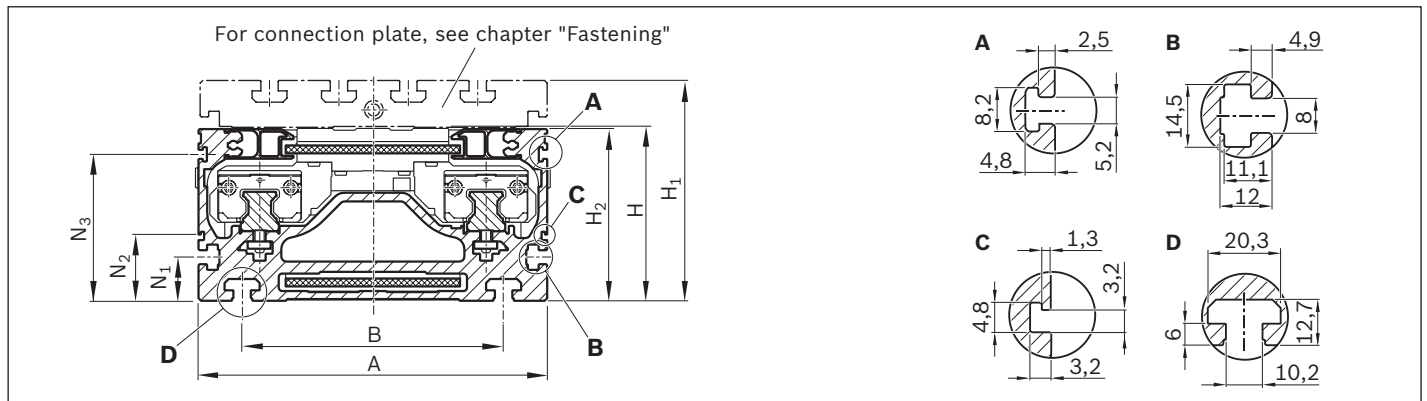
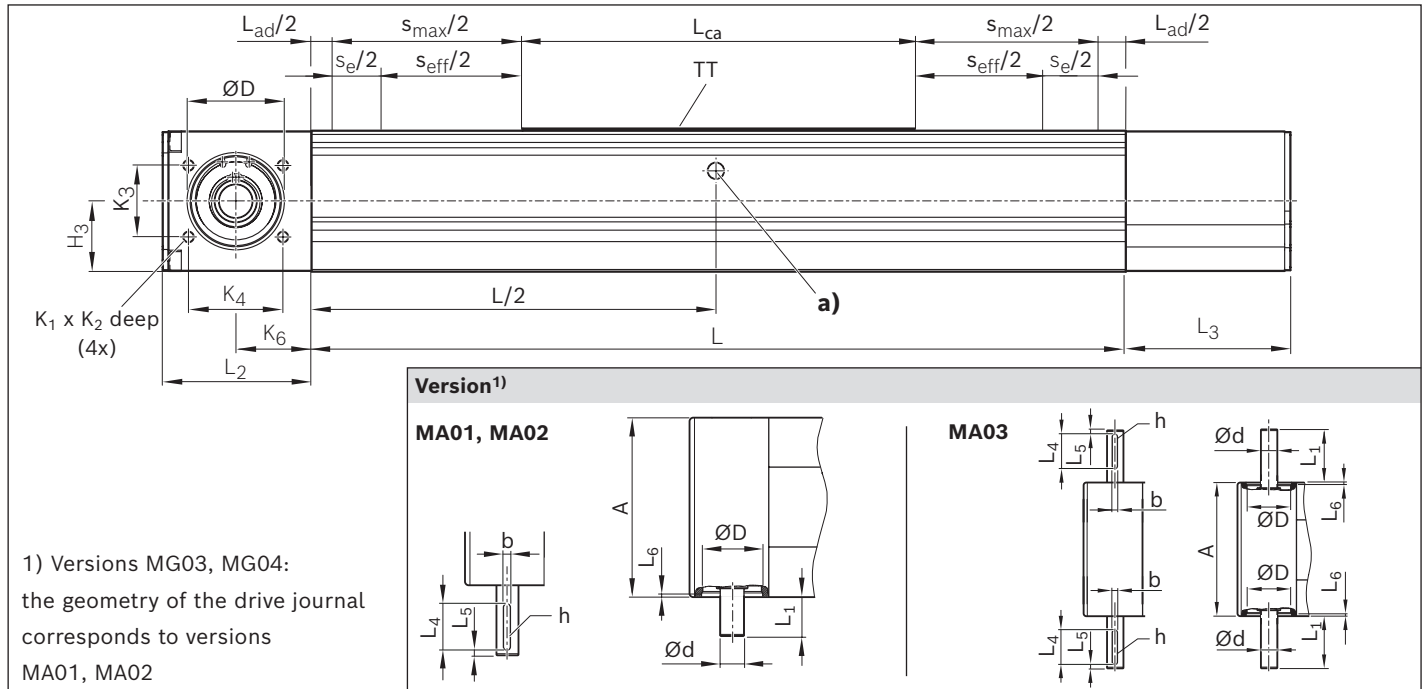
¹⁾ Recommended shaft fitting k6

b) Lube port on both sides (grease lubrication). ➔ Chapter "Lubrication".

Straightness and flatness tolerance in accordance with DIN EN 12020-2.

Note: all dimensions in mm. Drawings not schematically to scale. Exact contours and dimensions can be found in the CAD model. CAD configurator available on the Internet at www.boschrexroth.com "Product configurators".

Frame CKR-200



K ₃	K ₄	K ₅ ± 0.1	K ₆	K ₇	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	L ₇	L ₈	L ₉	L ₁₀	N ₁	N ₂	N ₃
12	29	14.4	18	M2.5 (ISO 4762)	14.5	36	42.0	–	–	3.0	14.5	5 ± 0.2	15	12.0	–	–	–
28	40	20.0	28	M4 (DIN 6912)	31.5	59	49.5	25	2	1.8	20.5	8 ± 0.2	15	12.5	7.6	–	–
35	45	25.0	33	M4 (ISO 4762)	31.5	66	60.5	25	2	2.0	22.0	8 ± 0.2	20	17.5	9.5	–	–
45	45	30.5	30	M5 (ISO 4762)	61.0	64	71.5	40	2	2.5	27.5	9 ± 0.1	20	17.5	9.5	–	–
50	66	–	53	–	61.0	104	115.0	40	3	2.5	–	–	–	–	25.0	38	84

See following pages for dimension drawings for frames,
carriages and motor attachment.

Length calculation of the linear motion system ➔ Chapters
"Technical data" and "Project planning/calculation".

A For switch mounting arrangements

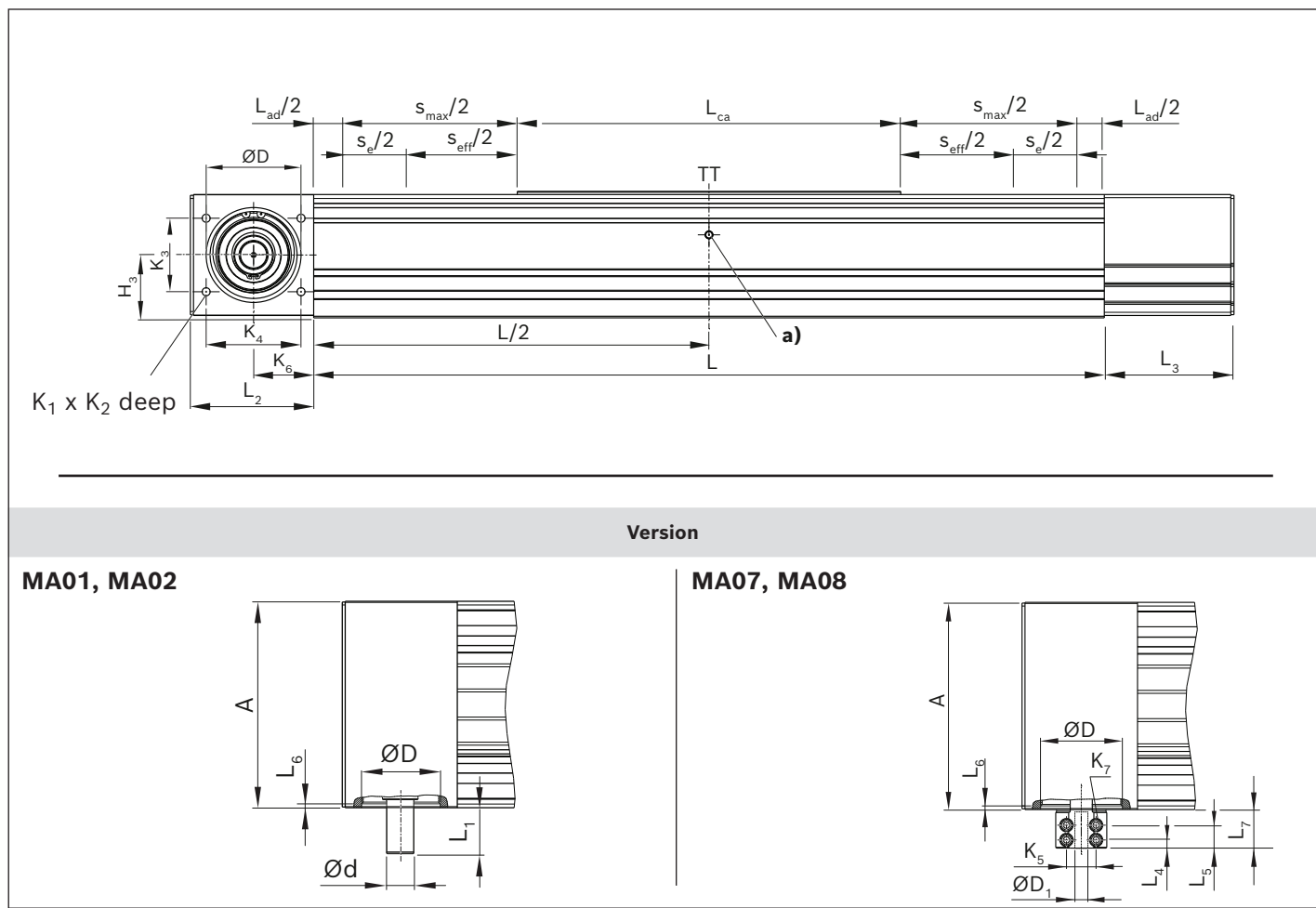
B For mounting with clamping fixtures

C For cable duct

D For fastening with sliding blocks

TT = Carriage

Frame CKR-280



CKR	Dimensions (mm)														
	A	B	H	H ₁	H ₂	H ₃	ØD H7	ØD ₁ H7	deep	Ød h6	K ₁	K ₂	K ₃	K ₄	K ₅ ± 0,1
-280	280	204	160	190	156	79,5	120	25	50	35	M12	28	93	120	40

a) Lube port on both sides (grease lubrication). ➡ Chapter "Lubrication".

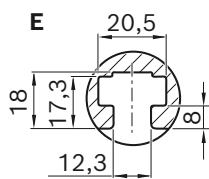
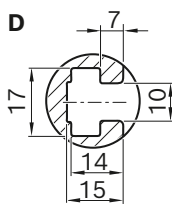
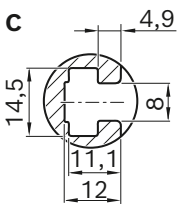
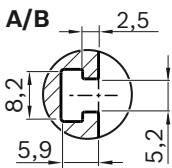
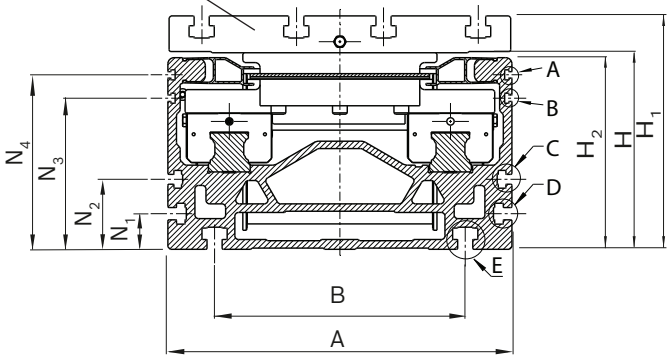
Straightness and flatness tolerance in accordance with DIN EN 12020-2.

Note: all dimensions in mm. Drawings not schematically to scale. Exact contours and dimensions can be found in the CAD model. CAD configurator available on the Internet at www.boschrexroth.com "Product configurators".

See following pages for dimension drawings for frames, carriages and motor attachment.

Length calculation of the linear motion system ➡ Chapters "Technical data" and "Project planning/calculation".

For connection plate, see chapter "Fastening"

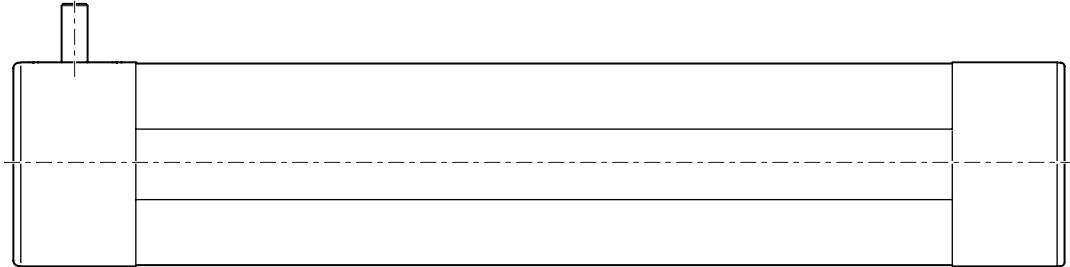


	K ₆	K ₇	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	L ₇	N ₁	N ₂	N ₃	N ₄
	76	M10 (ISO 4762)	72	156	164	11	20	4	52	29	57	123	142

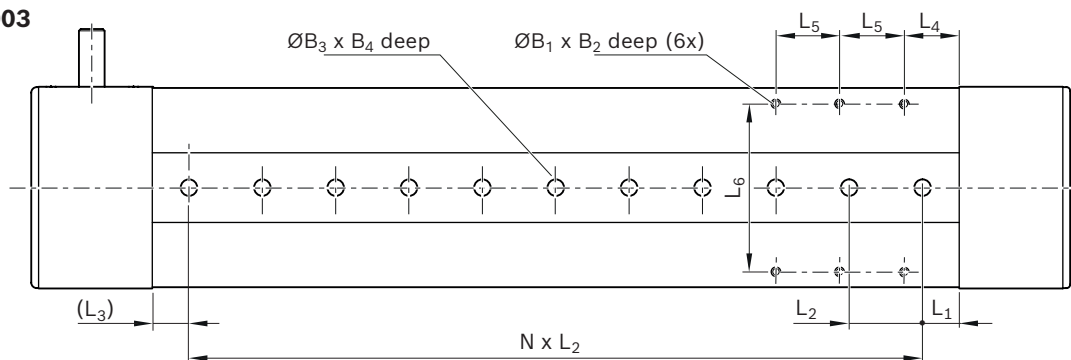
- A** Usable by customer
B For switch mounting arrangements / cable duct
C Usable by customer
D For mounting with clamping fixtures
E For fastening with sliding blocks
TT = Carriage

Frame CKR-070/-090/-110/-145

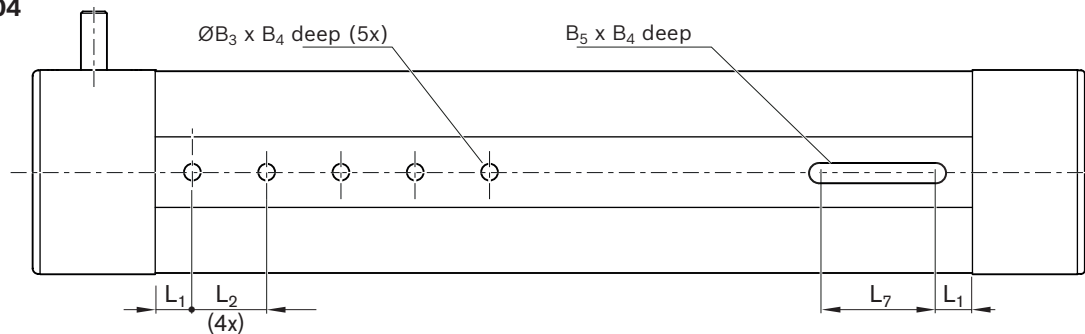
Option 001



Option 003



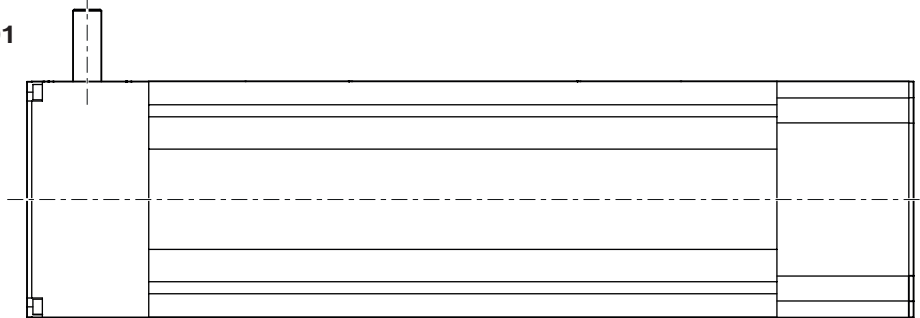
Option 004



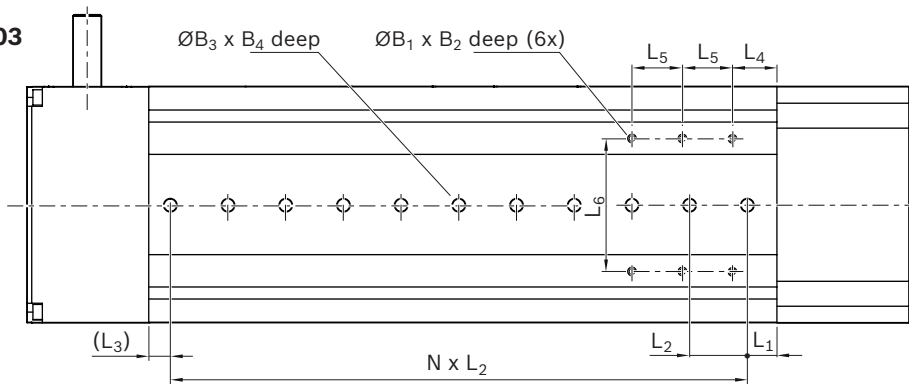
CKR	Option	Dimensions (mm)					L ₁	L ₂ ± 0.01	L ₃ (min)	L ₄	L ₅	L ₆	L ₇
		B ₁	B ₂	ØB ₃ ^{H7}	B ₄	B ₅ ^{H8}							
-070	003	M3	6.0	7	1.6	–	20	40	10	15	25	59	–
	004	–	–			7			–	–	–	–	60
-090	003	M4	7.5	9	2.1	–			10	30	35	76	–
	004	–	–			9			–	–	–	–	60
-110	003	M5	9.0	9	2.1	–			10	30	35	92	–
	004	–	–			9			–	–	–	–	60
-145	003	M6	13.0	12	2.1	–			10	30	35	124	–
	004	–	–			12			–	–	–	–	60
-200	003	M8	12.0	16	3.1	–			10	35	40	119	–
	004	–	–			16			–	–	–	–	60
-280	003	M10	15.0	16	3,1	–			10	35	40	242	–
	004	–	–			16			–	–	–	–	60

Frame CKR-200/-280

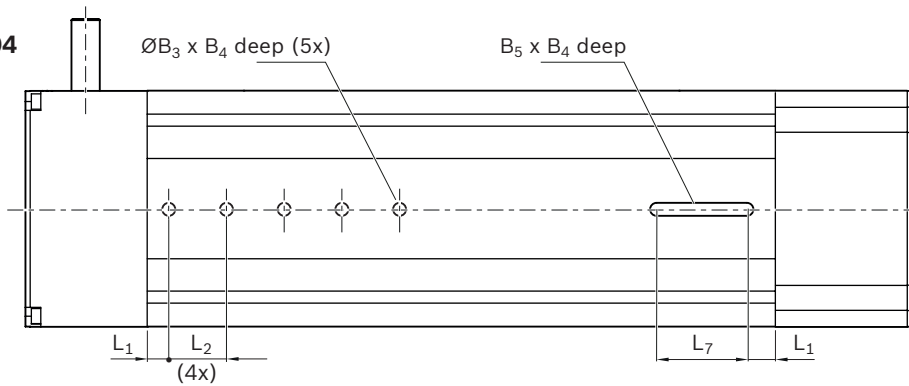
Option 001



Option 003



Option 004



Views from below (ground area)

Option 001 / standard

Option 003 / with centering holes

Option 004 / with centering holes and long hole

Carriages CKR-070/-090/-110/-145/-200

Carriages without connection plate

Fig. 1

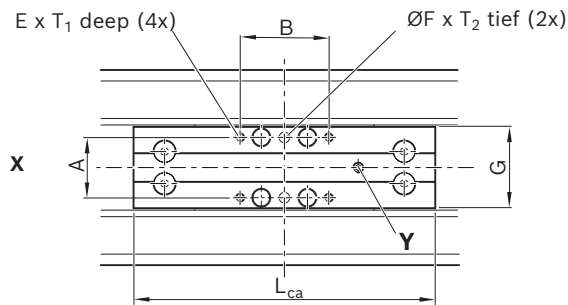


Fig. 2

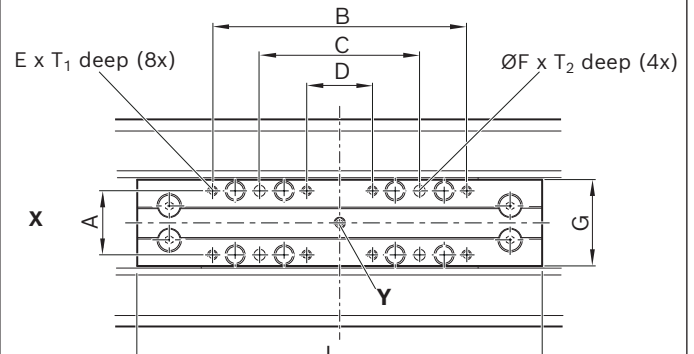


Fig. 3

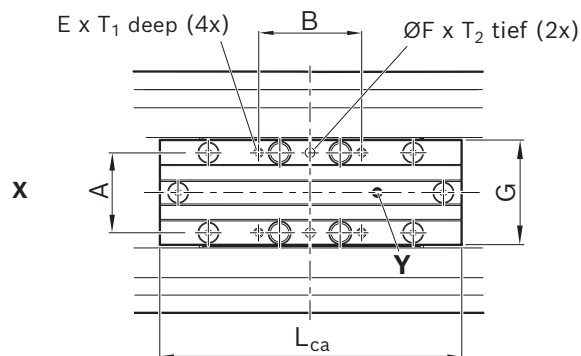


Fig. 4

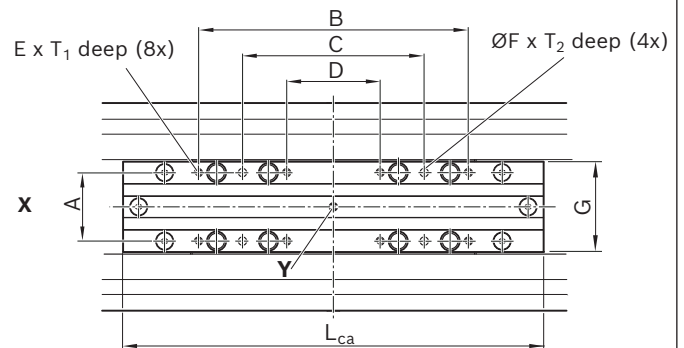
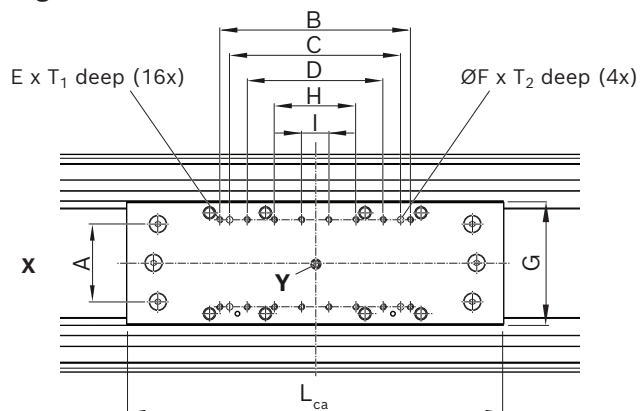


Fig. 5



X Drive side

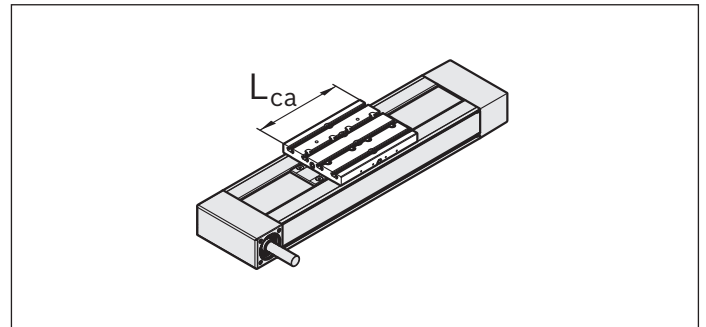
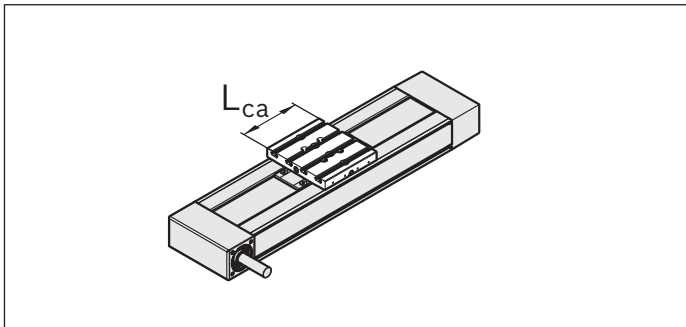
Y Lubrication point for grease; sealed with set screw.

Supplementary information for lubrication

► Chapter "Lubrication".

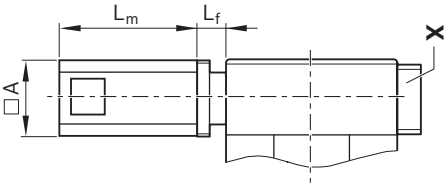
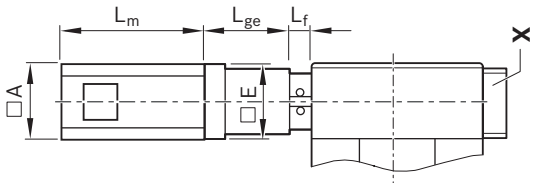
CKR	Figure	Dimensions (mm)											
		L _{ca}	A	B	C	D	E	ØF ^{H7}	G	H	I	T ₁	T ₂
-070	1	80	13,5	25	–	–	M3	3	21	–	–	6	6,0
	2	108		65	40	15							
-090	1	102	20	27	–	–	M4	4	27	–	–	8	6.5
	2	156		92	65	38							
-110	1	170	34	50	–	–	M5	6	46	–	–	10	6.5
	2	215		135	85	35							
-145	1	180	48	60	–	–	M6	6	62	–	–	12	7.5
	2	240		160	100	40							
-200	3	265	66	85	–	–	M8	8	87	–	–	16	10,0
	4	405		260	175	90							
-280	5	485	112	245	220	175	M8	8	158	105	35	16	10,0

Carriages with connection plate¹⁾

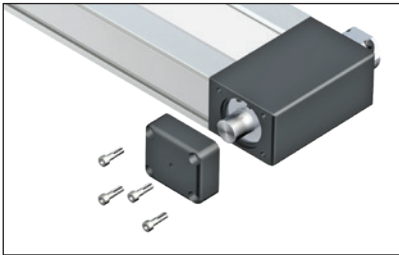


¹⁾ Dimension drawings ➔ Chapter "Connection plates"

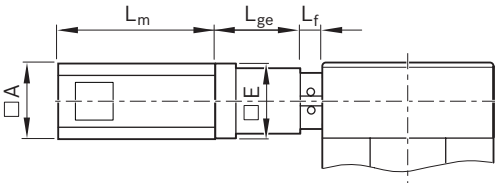
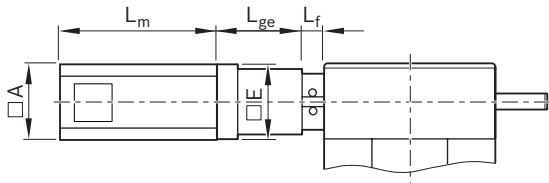
Motor attachment CKR-070/-090/-110/-145

Version	
MA10, MA11	MG10, MG11
	

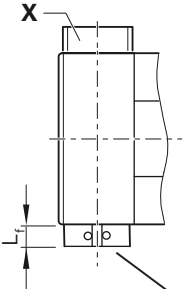
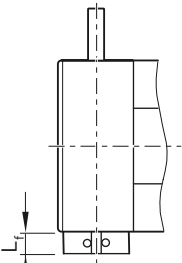
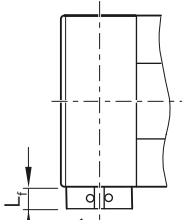
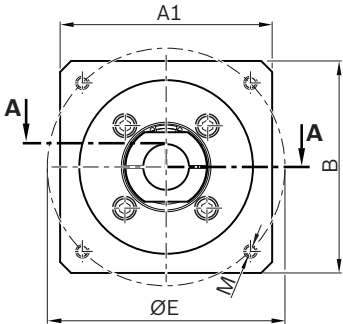
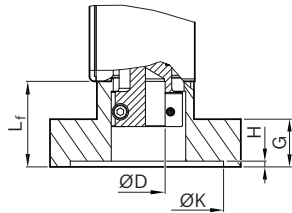
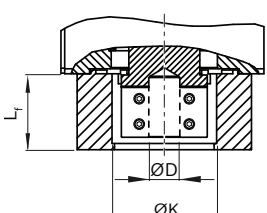
X: Drive end enclosure with additional drive journal
In the versions MA10, MA11, MG10 and MG11, a second drive journal can be made available by removing the screws and cover.



Motor attachment CKR-200/-280

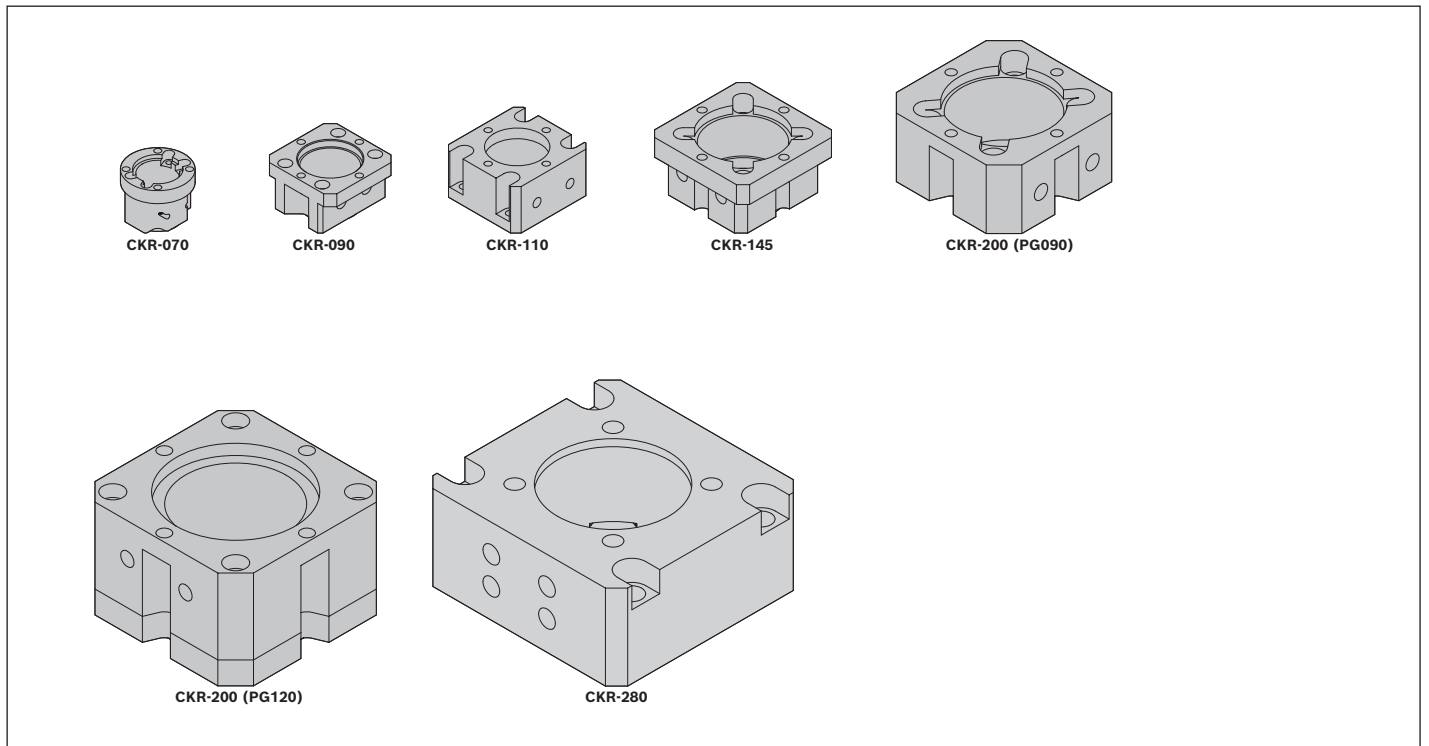
Version	
CKR -200/-280	MG03, MG04
	

Motor attachment Option 000 (adapter flange for customer-side gear attachment)

Version			
CKR -070/-090/-110/-145	CKR -200	CKR -200/-280	Y
MG10, MG11	MG03, MG04	MG01, MG02	
			
			
			

CKR	Version	Motor code	Dimensions (mm)					A1	B	Ø E	G	H	Ø D	Ø K	Ø M
			□ E	L _f	L _{ge}	L _m	□ A								
-070	MG10, MG11	MS2N03-B0BYN	55	29.5	60.7	See chapter "Motors"	Ø 40		34	8.5	2.5	10 ^{H7}	27 ^{+0.2}	4.3	
		MSM019B-0300	40												
-090	MA10, MA11	MS2N04-D0BQN	–	34.5	–		51	51	44	8.5	4.5	14 ^{H7}	35.1 ^{+0.3}	4.5	
	MG10, MG11	MS2N03-B0BYN	55	28.0	68.0										
		MS2N03-D0BYN	70												75.0
		MSM031C-0300													
-110	MA10, MA11	MS2N05-D0BRN	55	46.0	–		57	55	44	–	7 ^{+0.4}	19 ^{H7}	35 ^{H7}	4.5	
	MG10, MG11	MS2N03-B0BYN	55	30.5	68.0										
		MS2N03-D0BYN													
		MS2N04-B0BTN	80												75.0
		MS2N04-C0BTN													
		MSM031C-0300	70												
-145	MA10, MA11	MS2N06-D1BNN	55	52.0	–		72	72	62	13	5.5 ^{+0.3}	24 ^{H7}	53 ^{+0.4}	5.5	
	MG10, MG11	MS2N04-C0BTN	80	37.0	92.0										
		MS2N04-D0BQN													
		MS2N05-B0BTN	100												101.0
		MS2N05-C0BTN													
		MS2N05-D0BRN													
		MSM041B-0300													
-200	MG01, MG02, MG03, MG04	MS2N06-D1BNN	120	45.0	124.5		95	95	80	–	6	22 ^{F7}	68.3 ^{+0.2}	6.6	
		MS2N07-B1BNN	150	75.0	154.0		120	120	108	–	8	32 ^{F7}	90.3 ^{+0.2}	9.0	
		MS2N07-C1BRN													
		MS2N07-D1BNN													
		MS2N07-E1BNN													
-280	MG01, MG02	MS2N07-B1BNN	150	61,0	171,7		140	135	100	–	5	25 ^{H7}	80 ^{H7}	11.0	
		MS2N07-C1BRN													
		MS2N07-D1BNN													

Adapter flange



CKR-280-DB

Product overview

Features

- ▶ 2 drives: 2 independently movable carriages with connecting plates made of aluminum through separate and pre-tensioned toothed belt drives
- ▶ Precision aluminum profile with two integrated preloaded ball rail systems
- ▶ Two different lube versions
- ▶ Ready-to-install compact modules in any length up to Lmax.
- ▶ Realization of greater lengths of up to 5,000 mm
- ▶ Low-cost maintenance
- ▶ Repeatability of up to ± 0.05 mm

Further highlights

- ▶ Flexible thanks to selectable options
- ▶ Centering holes for simple combination with other linear motion systems and connection elements
- ▶ Extensive accessories for connection and clamping units
- ▶ Nameplate with parameters for easy commissioning

Attachments

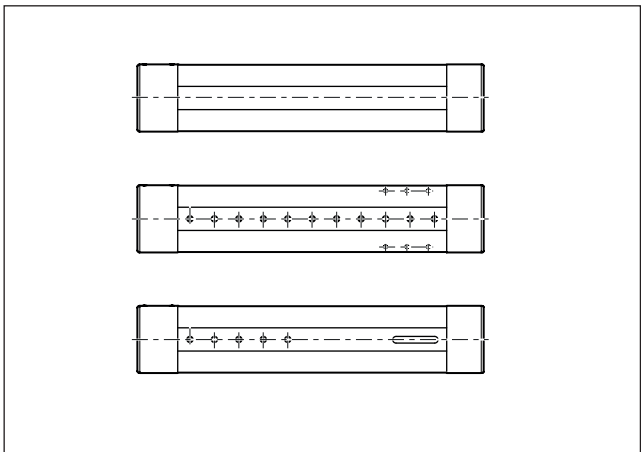
- ▶ Planetary gear with various gear ratios
- ▶ Maintenance-free servo motors with selectable brake and attached feedback
- ▶ Switches (magnetic sensors), switch activation without additional switching cam
- ▶ Cable duct made of aluminum for sensors

Version/options drive

MA21 <div> </div>	MG21 <div> </div>
MA23 <div> </div>	MG23 <div> </div>
MA24 <div> </div>	MG24 <div> </div>

1/2: Related components

Version/options guide (frame)



Motor attachment – with gear: (MG21 / MG23 / MG24)

The planetary gear is attached by means of a flange. The flange serves to fasten the gearbox to the CRK and as a closed housing. Due to the connection without coupling, the drive torque is transferred to the drive shaft of the compact module in a torsionally stiff manner.

Available gear ratios → "cfiguration, orderring".

Structural design

Structural design CKR

- 1 Drive end enclosure (1.1/1.2)
- 2 Frame
- 3 Toothed belt drive (3.1/3.2)
- 4 Carriages with connecting plates (4.1/4.2)
- 5 Idler end enclosure (5.1/5.2)
- 6 Sensor slot

Attachments:

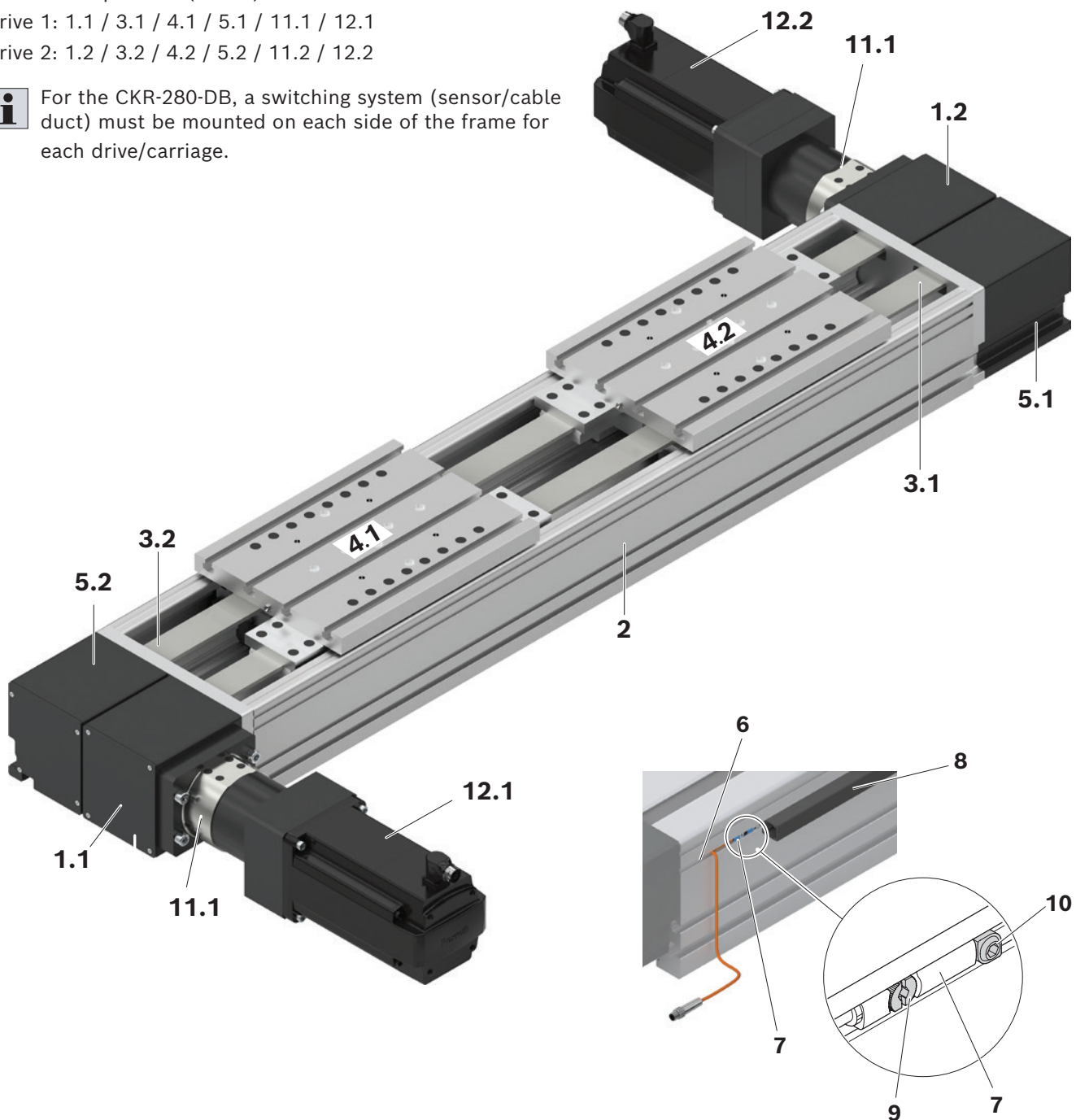
- 7 Magnetic sensor
- 8 Cable duct
- 9 Clamping screw
- 10 Sliding block (only required for repeatable mounting of the sensor)
- 11 Flange with planetary gear
- 12 Motor (12.1/12.2)

Related components (MG23):

Drive 1: 1.1 / 3.1 / 4.1 / 5.1 / 11.1 / 12.1

Drive 2: 1.2 / 3.2 / 4.2 / 5.2 / 11.2 / 12.2

i For the CKR-280-DB, a switching system (sensor/cable duct) must be mounted on each side of the frame for each drive/carriage.




Technical data

General technical data*)

CKR	Carriage		Additional length		Min. travel range	Max. length	Dynamic characteristic values	
	with Connection plate					Load capacities	Load moments	
	L_{ca} (mm)	L_w (mm)	L_{ad} (mm)	$s_{min}^{1)}$ (mm)	L_{max} (mm)	C_{gw} (N)	M_t (Nm)	M_L (Nm)
-280-DB	375	min. 485	135	195	5,500	216,700	19,500	21,670

Drive data*)

CKR	Gearing	Gear ratio	Max. drive torque	Feed constant	Max. speed		Carriage with Connection plate	Moved mass of system	
		i (-)	M_P (Nm)	u (mm/U)	v_{max} (m/s)		L_{ca} (mm)	m_{ca} (kg)	
-280-DB	ohne	1	250.00	390.00	5.00		375	27.20	
	PG115	5	50.00	78.00	4.55				
		12	20.83	32.05	1.90				
		16	15.63	24.38	1.42				

Gear data*)

CKR	Gearing Type	Gear ratio	Max. acceleration torque ⁴⁾ (at the gear output)	Base frictional torque	Max. drive speed	
		i (-)	M _{ge} (Nm)	M _{Rge} (Nm)	n _{ge} (min ⁻¹)	
-280-DB	PG115	5	195	0.90	5 500	
		12	260	0.95		
		16				

*) Observe the "Project planning/calculation" chapter.

1)

Minimum required travel range to ensure a reliable lubrication distribution.

2)

Maximum force that can be transmitted via the teeth meshing with the belt pulley.

3)

The maximum permissible tensile load on the belt cross section (belt elasticity limit) is given here for easier comparability.
This value represents the load limit in terms of plastic deformation and may not be used to calculate the maximum permissible drive torque.

4)

The limits of the linear motion system must not be exceeded ➡ "Drive data / project planning/calculation".

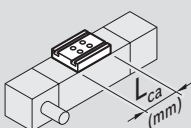
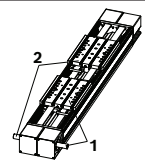
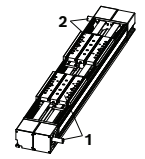
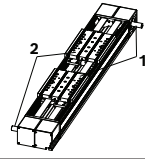
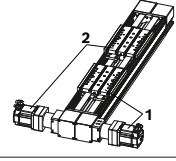
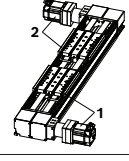
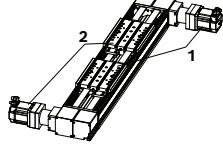
Maximum permissible loads							Planar moments of inertia		Point of force application
Moments			Forces				I_y	I_z	Z_1
$M_{x \max}$ (Nm)	$M_{y \max}$ (Nm)	$M_{z \max}$ (Nm)	$F_{y \max}$ (N)	$F_{z1 \max}$ (N)	$F_{z2 \max}$ (N)		(cm ⁴)	(cm ⁴)	(mm)
5,400	6,000	5,517	55,170	86,685	60,000		2,242.00	15,802.0	108.5

Constant mass calculation		Constant mass moment of inertia			Friction torque	Belt pulley diameter	Belt type	Max. belt drive transmission force	Belt elasticity limit	Max. acceleration
$k_{g \text{ fix}}$ (kg)	$k_{g \text{ var}}$ (kg/mm)	$k_{J \text{ fix}}$ (kgmm ²)	$k_{J \text{ var}}$ (kgmm)	$k_{J \text{ m}}$ (mm ²)	M_{Rs} (Nm)	d_3 (mm)	B_t	$F_{bp}^{2)}$ (N)	$F_{t \text{ zul}}^{3)}$ (N)	a_{\max} (m/s ²)
14.95	0.0448	107,812.77	3.375	3,852.68	12.25	124.14	50ATS15	4,046	13,530	50

Motor	Mass moment of inertia	Weight
	J_{ge} (kgm ²)	m_{ge} (kg)
MS2N07	0.0003995	7.4
	0.0004586	9.6
	0.0004108	

Configuration, order

CKR-280-DB

Short product name, length ¹⁾ CKR-280-DB-1, mm			Guideway		Drive		Carriage		
									
Version			Standard	Centering holes ²⁾		without keyway i = 1	for gear unit ⁴⁾	Lubrication ³⁾	
								LSS	LPG
Drive journal		MA21	001	003	004	021	—	041	341
		MA23							
		MA24							
Gear attachment		MG21	001	003	004	—	026	041	341
		MG23							
		MG24							

¹⁾ Length calculation of the linear motion system ⇒ "Project planning/calculation" chapter.

²⁾ Centering holes for simple combination with other linear motion systems and connection elements (⇒ Dimension drawings).

Option 003: with centering holes and fastening threads in the ground area of the frame. Selectable up to a length of $L \leq 2000 \text{ mm}$
Option 004: with centering holes and long hole in the ground area of the frame. Selectable up to length L_{max}

³⁾ Lubrication ⇒ Chapter "Lubrication".

⁴⁾ Attachment kit for gear attachment

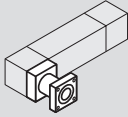
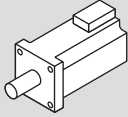
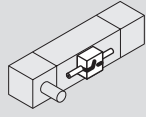

⁵⁾ If a module has been ordered with an attached servo motor, it will only be delivered with the motor mounting shown in the chapter "Form of delivery" (note position of motor connector).

⁶⁾ Recommended motor, motor data and type designations ⇒ Chapter "Motors"

⁷⁾ Switching system (sensors/cable duct) will be delivered in double quantity. More information ⇒ Chapter "Switching system".

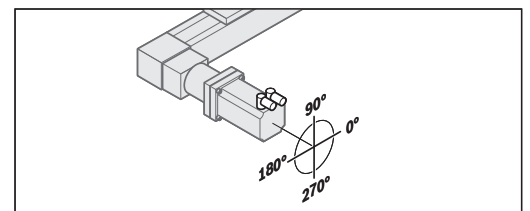
⁸⁾ Measurement report: 001 = Standard report; 002 = Measurement of frictional torque; (⇒ Chapter "Documentation")

⁹⁾ Motor attachment consisting of: Adapter flange for gear unit, however "without gear unit". No motor connector position selectable.

	Motor attachment ⁵⁾			Motor ⁶⁾						Switching system ⁷⁾		Auto- mation package		Doc. ⁸⁾															
																													
	Gear unit			Motorcode	2 cables		1 cable		Motor connec- tor position	Controller	Cable																		
i = 5	i = 12	i = 16	without brake		with brake	without brake	with brake																						
	MA21	000			000						<table><tr><th colspan="2">Without</th></tr><tr><td>- Switch</td><td rowspan="2">000</td></tr><tr><td>- Cable duct</td></tr><tr><th colspan="2">Magnetic sensor</th></tr><tr><td>Hall, PNP-normally closed (NC)</td><td>120</td></tr><tr><td>Hall, NPN-normally closed (NC)</td><td>121</td></tr><tr><td>Hall, PNP-normally open (NO)</td><td>122</td></tr><tr><td>Hall, NPN-normally open (NO)</td><td>123</td></tr><tr><td>Cable duct</td><td>020</td></tr></table>		Without		- Switch	000	- Cable duct	Magnetic sensor		Hall, PNP-normally closed (NC)	120	Hall, NPN-normally closed (NC)	121	Hall, PNP-normally open (NO)	122	Hall, NPN-normally open (NO)	123	Cable duct	020
	Without																												
	- Switch												000																
- Cable duct																													
Magnetic sensor																													
Hall, PNP-normally closed (NC)	120																												
Hall, NPN-normally closed (NC)	121																												
Hall, PNP-normally open (NO)	122																												
Hall, NPN-normally open (NO)	123																												
Cable duct	020																												
	MA23																												
	MA24																												
		MG21	000 ⁹⁾			000				000																			
023		024	025	MS2N07-B1BNN	-	-	255	256																					
				MS2N07-C1BRN	-	-	263	264																					
	MG24				MS2N07-D1BNN	-	-	269	270	270																			

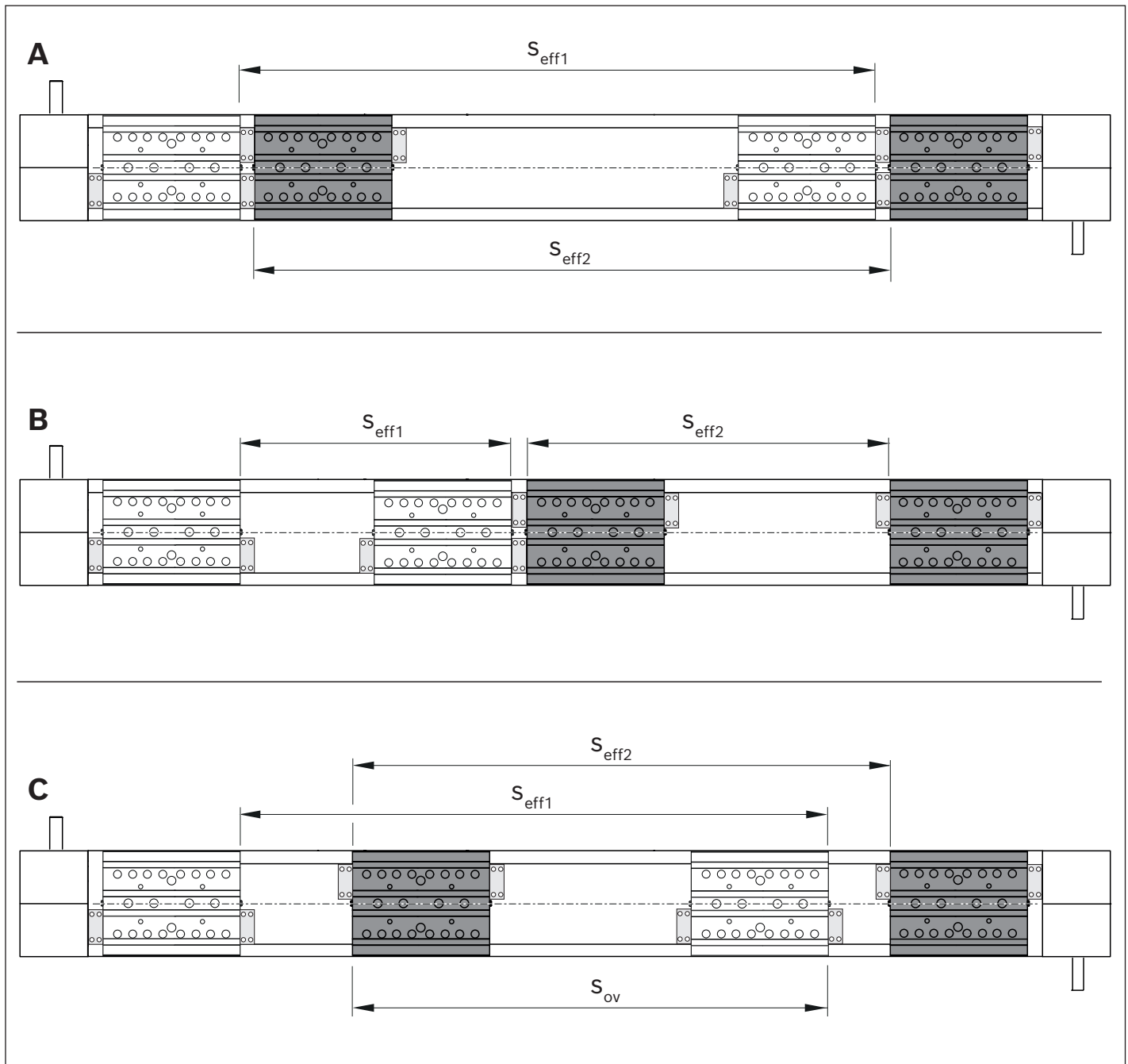
Version	Motor connector position			
	0°	90°	180°	270°
MG21/23/24	000	090 ★	180	270

★ Standard delivery



Explanation of the order parameters and ordering example ➡ Chapter "Ordering example".

Definition of "Travel ranges CKR-280-DB"



For S_{max} , see name plate. Graphic representation of S_{eff} without stroke reserve S_e

Further information ► See the chapters "Dimension Drawings", "Design/Calculation", and "Abbreviations"

A

Both carriages can alternately move to the end position and each use the maximum available travel distance

$$S_{\max} = S_{\text{eff1}} + S_e = S_{\text{eff2}} + S_e$$

B

Both carriages have the same or different travel distance and share the maximum available travel distance **without** overlap (S_{ov}).

$$S_{\max} = S_{\text{eff1}} + S_{\text{eff2}} + S_e$$

C

Both carriages have the same or different travel distance and share the maximum available travel distance **with** overlap (S_{ov}).

$$S_{\max} = S_{\text{eff1}} + S_{\text{eff2}} - S_{\text{ov}} + S_e$$

Further information:

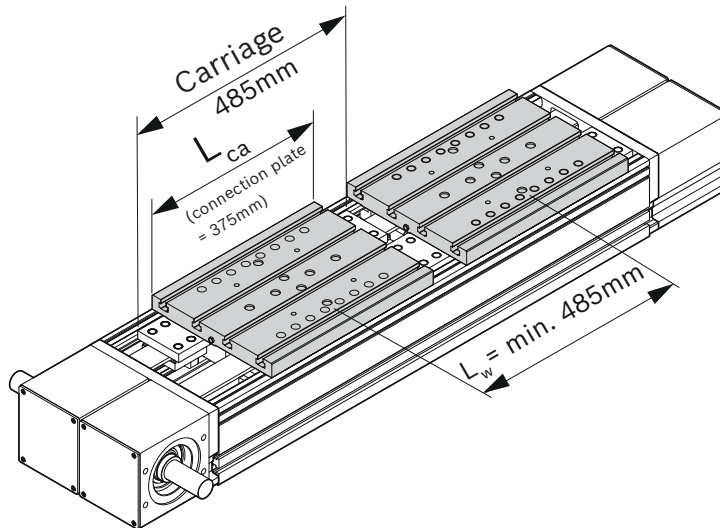
The stroke reserve (S_e) is required, for example, for overruns, lubrication strokes, tool changes, maintenance, interference contours, compensation of assembly tolerances, etc.

The final verification/determination of the stroke reserve must be carried out by the user.

The following stroke reserves are recommended:

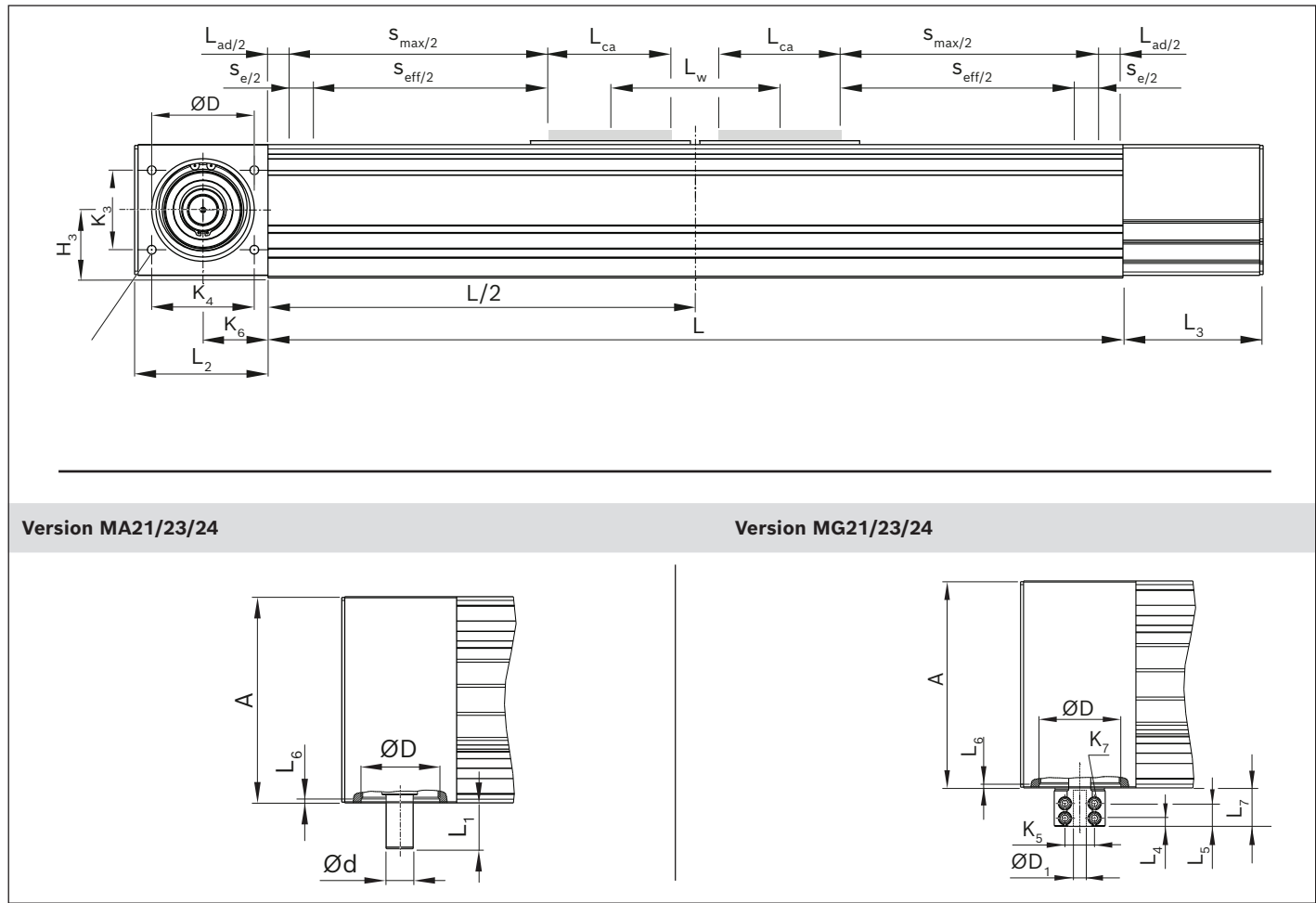
Linear systems:	$S_e = 20 \text{ mm}$
Multi-axis systems:	$S_e = 20 \text{ mm}$
Electromechanical cylinders:	$S_e = 10 \text{ mm}$

⚠ If no stroke reserve ($S_e = 0 \text{ mm}$) is specified, the effective stroke (S_{eff}) corresponds to the maximum travel distance (S_{\max}) of the system. There is no clearance to the mechanical end position, thus creating a risk of mechanical damage.



Dimension drawings

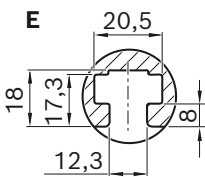
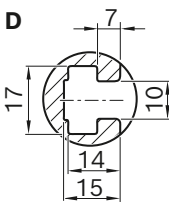
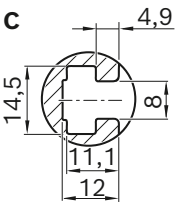
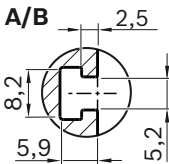
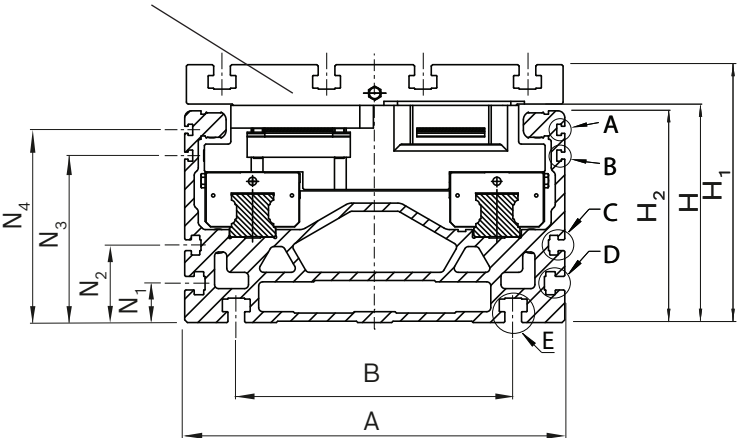
Frame CKR-280-DB



CKR	Dimensions (mm)														
	A	B	H	H ₁	H ₂	H ₃	ØD H7	ØD ₁ H7	tief	Ød h6	K ₁	K ₂	K ₃	K ₄	K ₅ ± 0,1
-280-DB	280	204	160	190	156	79,5	120	25	50	35	M12	26	93	120	40

Straightness and flatness tolerance in accordance with DIN EN 12020-2.
 Note: all dimensions in mm. Drawings not schematically to scale.
 Exact contours and dimensions can be found in the CAD model.
 CAD configurator available on the Internet at www.boschrexroth.com "Product configurators".
 For dimension drawings of the frame, carriages/connecting plates and motor attachment, see the following pages
 Length calculation of the linear system ! see chapters "Technical Data" and "Project Planning/Calculation."

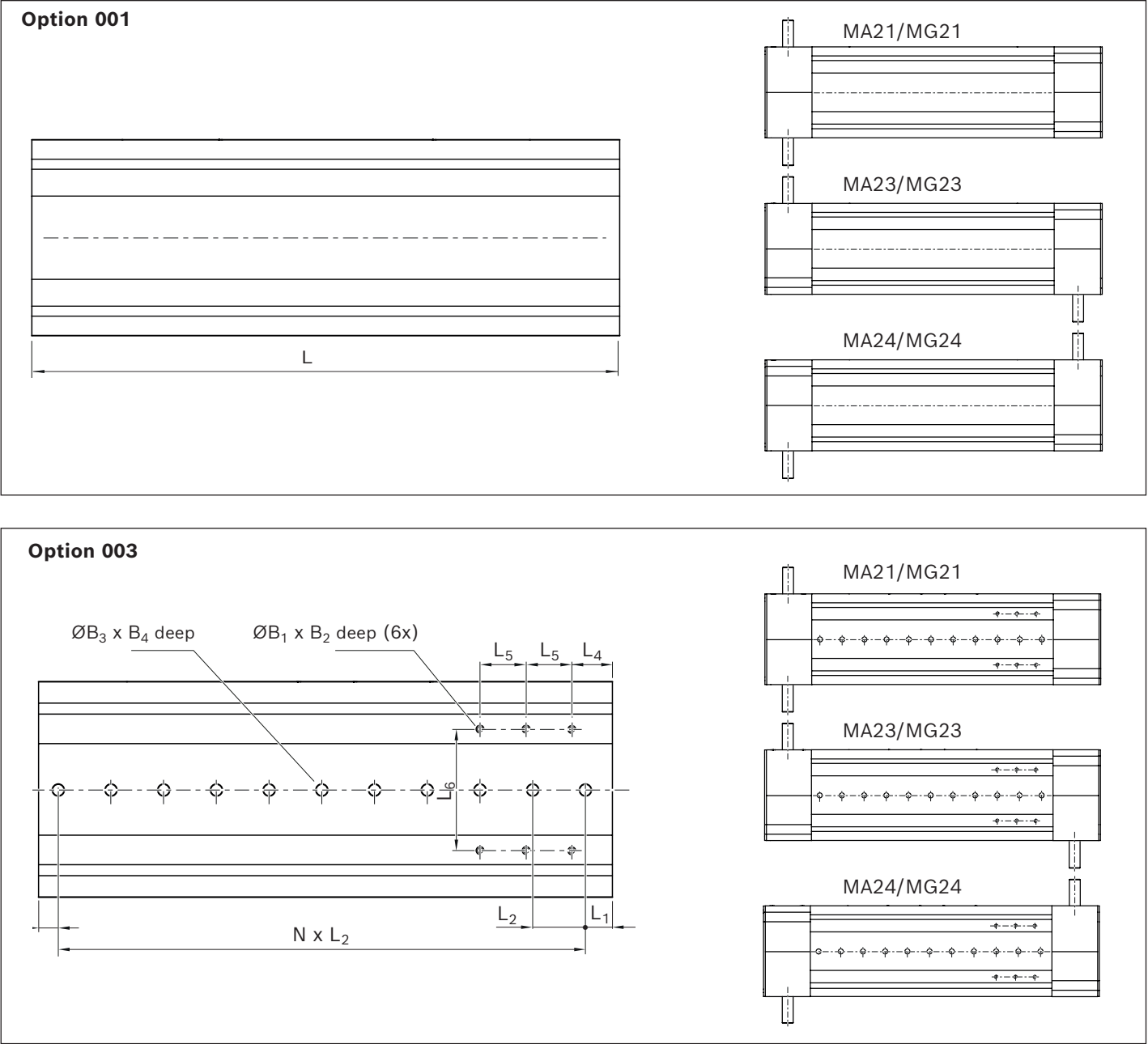
Connecting plate see chapter “CKR-280-DB connecting plate”



	K ₆	K ₇	L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	L ₇	N ₁	N ₂	N ₃	N ₄
	102	M10 (ISO 4762)	72	185	185	11	20	4	52	29	57	123	142

- A Usable by customer
- B For switch mounting arrangements / cable duct
- C Usable by customer
- D For mounting with clamping fixtures
- E For fastening with sliding blocks

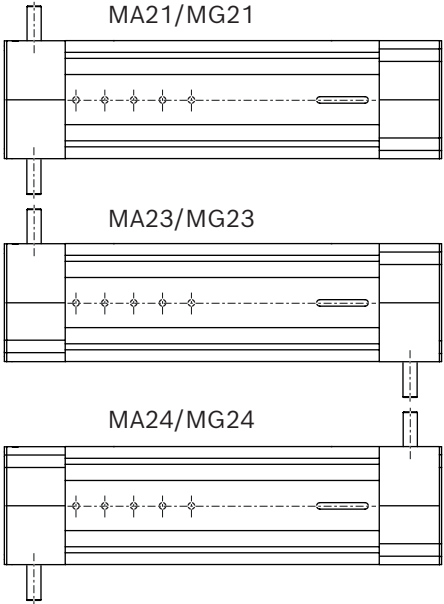
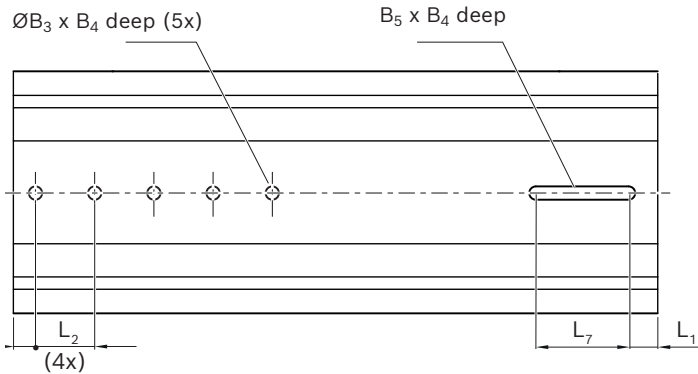
Frame CKR-280-DB



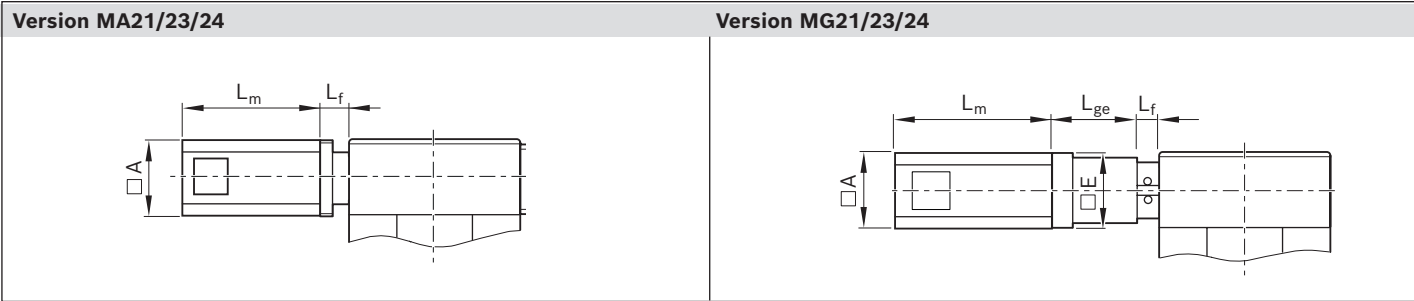
Views from below (ground area)
 Option 001 / standard
 Option 003 / with centering holes
 Option 004 / with centering holes and long hole

CKR	Option	Dimensions (mm)											
		B ₁	B ₂	ØB ₃ ^{H7}	B ₄	B ₅ ^{H8}	L ₁	L ₂ ± 0,01	L ₃ (min)	L ₄	L ₅	L ₆	L ₇
-280-DB	003	M10	15.0	16	3.1	–	20	40	10	35	40	242	–
	004	–	–			16			–	–	–	–	60

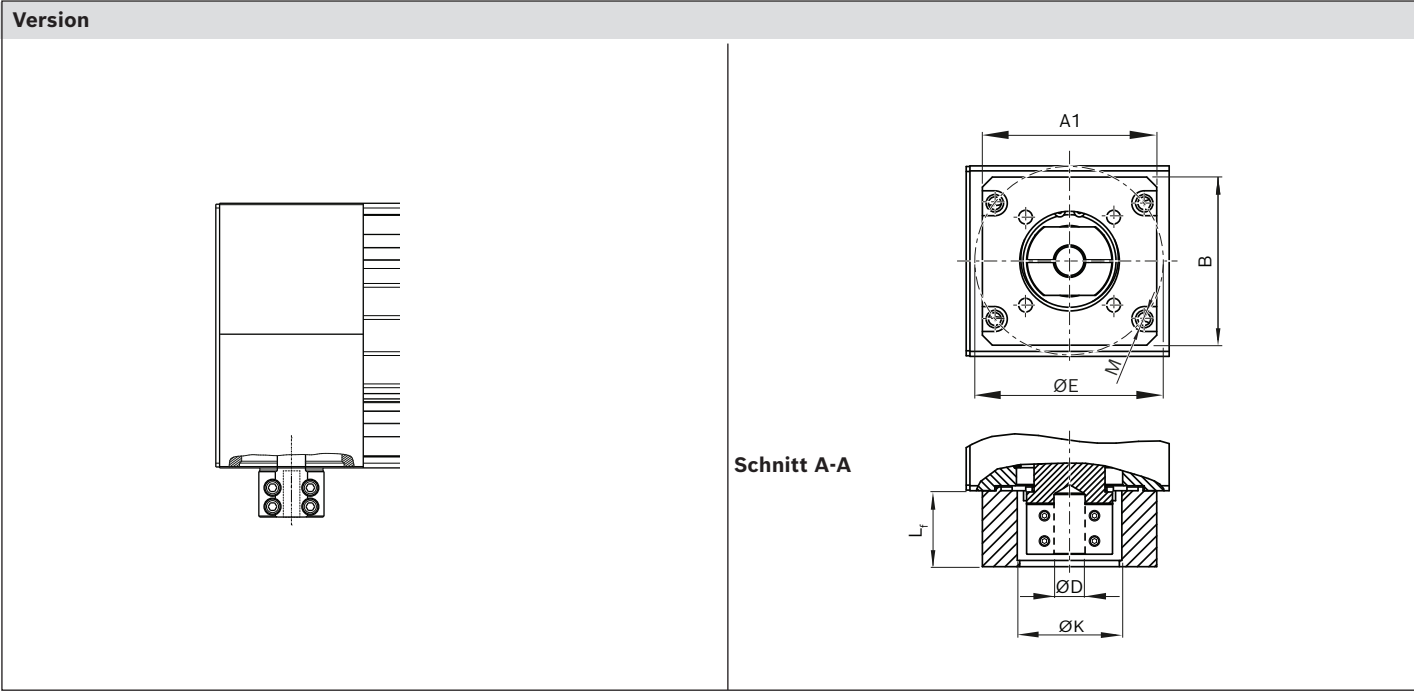
Option 004



Motor attachment CKR-280-DB

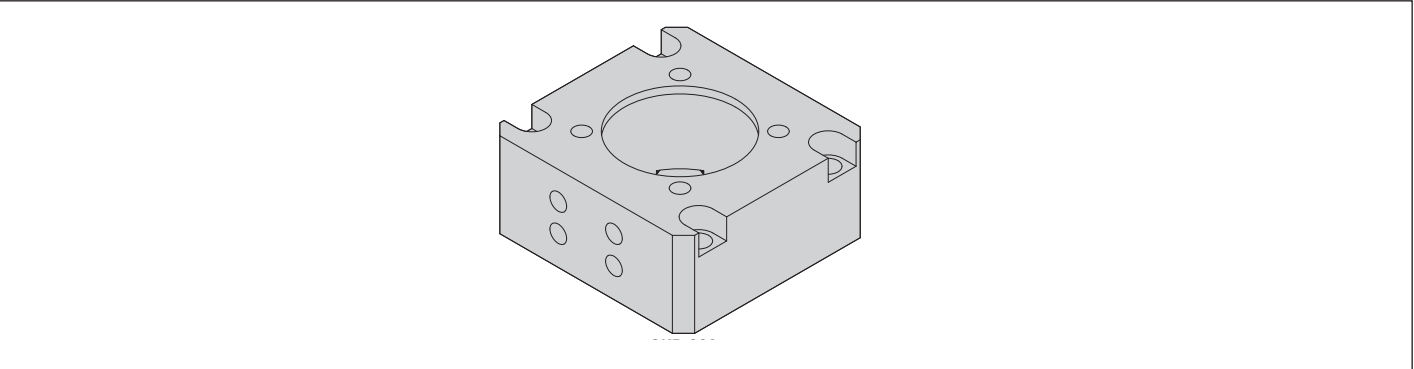


Motor attachment Option 000 (adapter flange for customer-side gear attachment)

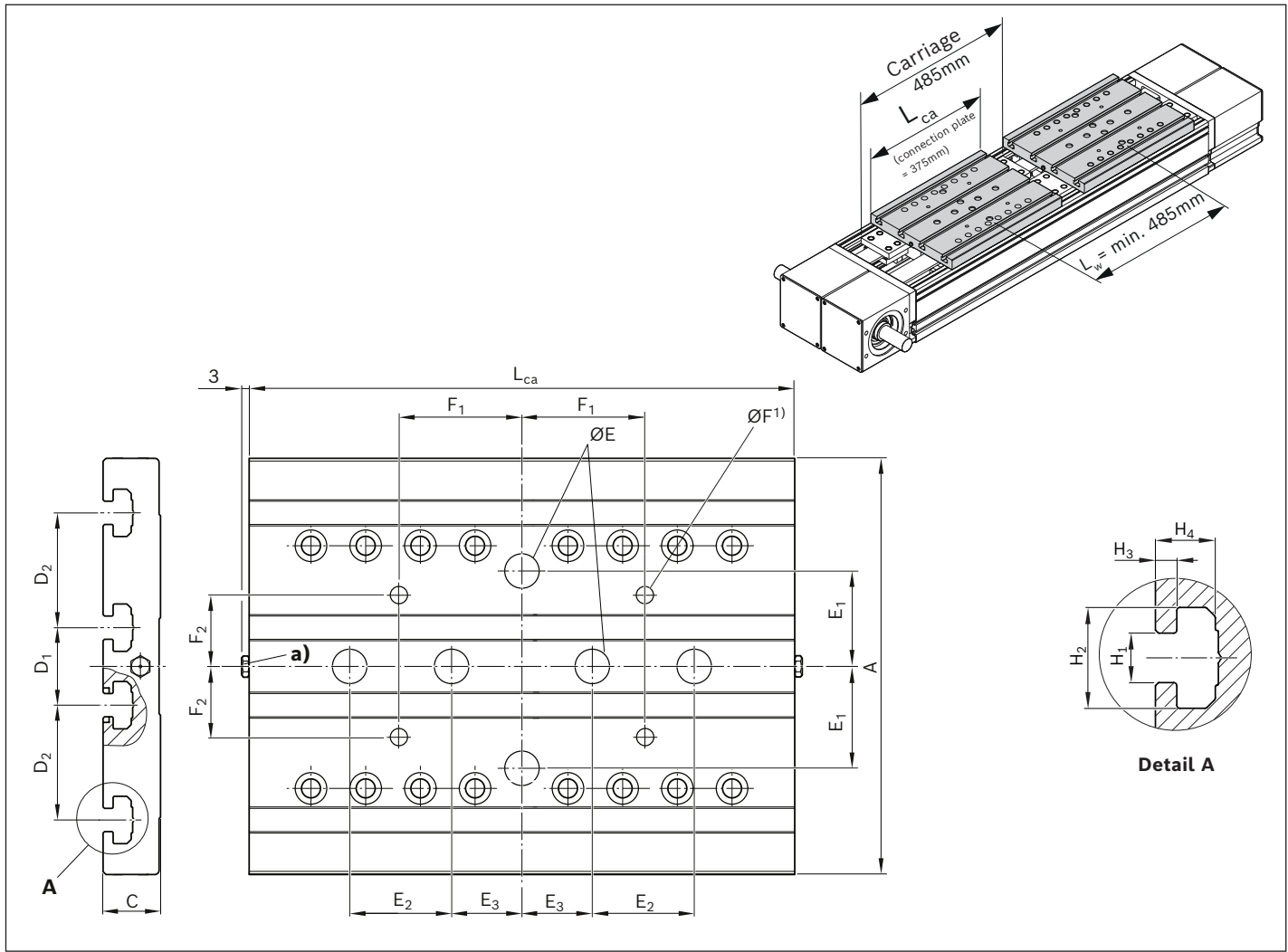


CKR	Version	Motorcode	Dimensions (mm)												
			□ E	L _f		L _{ge}	L _m	□ A	A1	B	Ø E	G	H	Ø D	Ø K
-280-DB	MG01, MG02	MS2N07-B1BNN	140	61.0	i: 5 =147.0 i: 12/16 =174.5	See chap- ter "Mo- tors"		140	135	100	–	5	25 ^{H7}	80 ^{H7}	11.0
		MS2N07-C1BRN													
		MS2N07-D1BNN													

Adapter flange



Connection plate



- 1) For customer-built attachment
- a) Funnel-type lube nipple AM8 x 1 for lube version LSS/LPG; lubrication points from two sides (central lubrication only necessary with grease gun on one of the two sides).

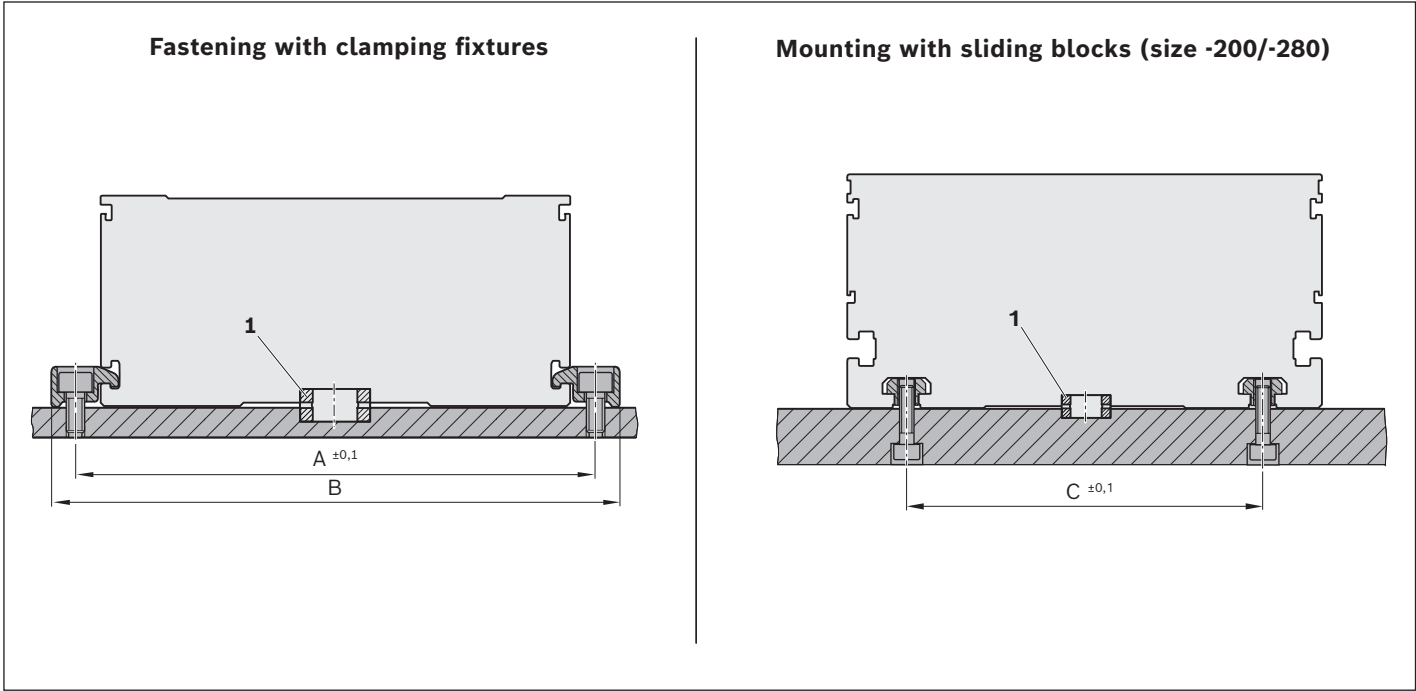
Function:

- Fastening of attachments (with sliding blocks)
 - Lubrication of the ball rail system possible via the connection plate
 - For lube version LSS, LPG
- The assembly consists of: Connection plate, Mounting accessories for fastening to the carriages, Sliding blocks are not included with delivery

CKR	Dimensions (mm)																Mass (kg)	Material number
	L _{ca}	A	C	D ₁	D ₂	ØE ^{H7}	E ₁	E ₂	E ₃	ØF ^{H7}	F ₁	F ₂	H ₁	H ₂	H ₃	H ₄		
-280-DB	375	278	30	71	112.5	16 - 3.1 deep	80	60	40	8 - 16 deep	50.0	60	12.3	20.5	8.0	17.3	7,02	R0375 700 25

Attachments and accessories

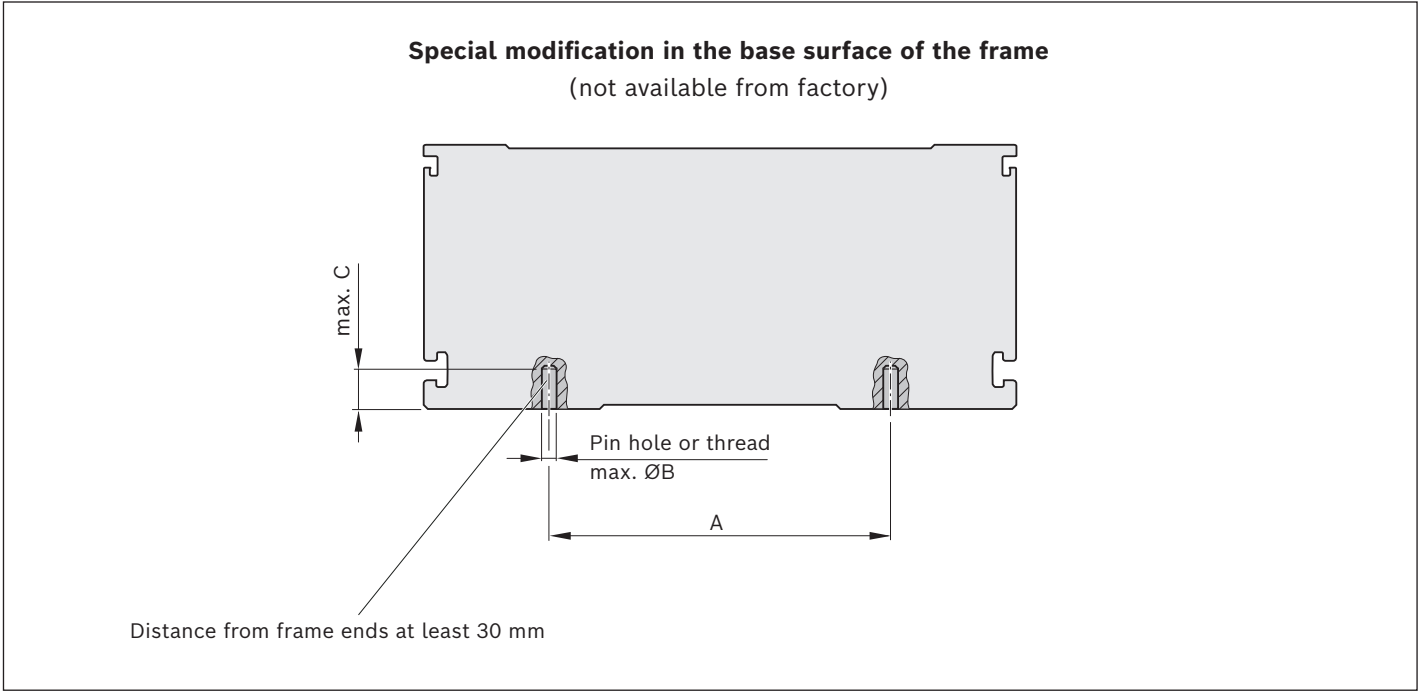
Mounting/mounting accessories



1 For compact modules with centering holes in the ground area (selection via the guideway option):
Use centering rings to better align to other linear motion systems and connection elements.

⚠ Do not fasten or support the compact module at the end enclosures! The frame is the load-bearing part!

Size	Dimensions (mm)			
	A	B	C	
-070	82	95	-	
-090	102	112	-	
-110	126	140	-	
-145	161	175	-	
-200	222	240	150	
-280	310	336	204	



Mounting by means of special modification in the base surface of the frame is possible

⚠ Option guideway 003 already includes threaded holes in the ground area of the frame (see dimension drawings).

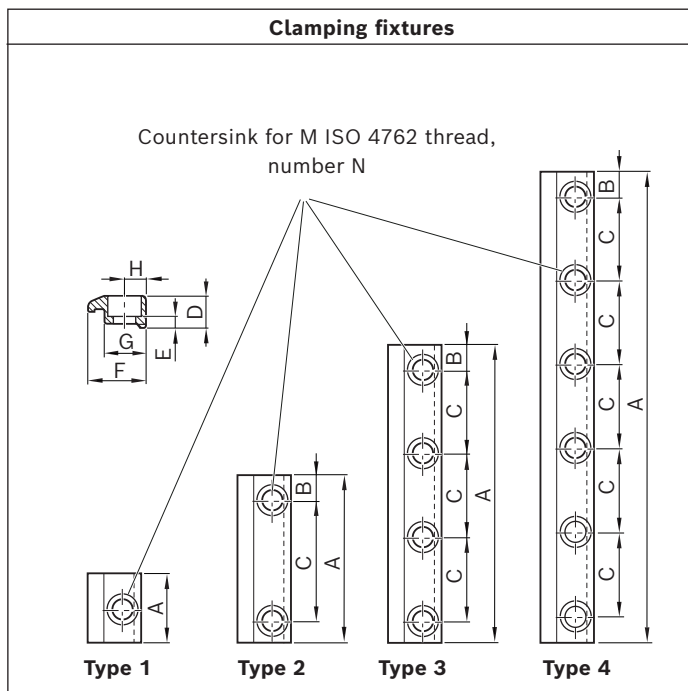
Size	Dimensions (mm)		
	A	B	C
-070	59	3	7.5
-090	76	4	7.5
-110	92	5	9.0
-145	124	6	13.0
-200	119	8	12.0
-280	242	15	10.0

Mounting accessories

Recommended number of clamping fixtures:

- Type 1: 6/3¹⁾ pieces per meter and side
- Type 2: 4 pieces per meter and side
- Type 3: 3 pieces per meter and side
- Type 4: 3 pieces per meter and side

¹⁾ For size 070

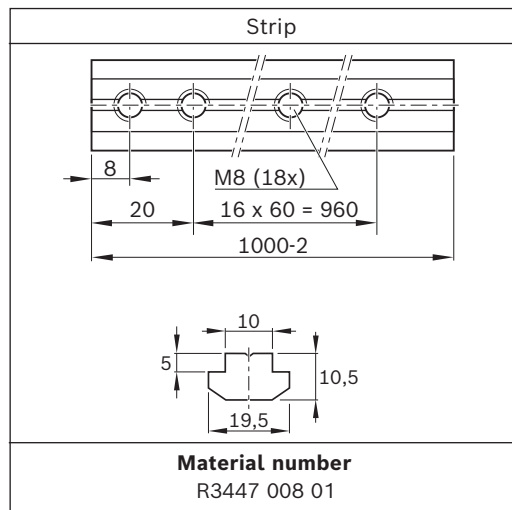


Size	For thread	Type	Number of bores N	Dimensions (mm)								Material number
				A	B	C	D	E	F	G	H	
-070	M5	1	1	22	–	–	10.0	4.8	15.0	12.2	6.5	R1419 010 01
		2	2	57	8.5	40	10.0	4.8	15.1	12.2	6.5	R1419 010 43
-090	M4	1	1	25	–	–	9.0	4.6	14.5	10.5	5.0	R0375 310 00
		3	4	87	6.0	25						R0375 310 02
		3	4	107	8.5	30						R0375 310 03
		2	2	72	11.0	50						R0375 310 32
		2	2	62	11.0	40						R0375 310 33
		3	4	87	13.5	20						R0375 310 38
		4	6	107	8.5	18						R0375 310 41
-110 / -145	M5	3	4	107	8.5	30	11.5	4.8	19.3	14.0	7.0	R0375 410 02
		3	4	77	8.5	20						R0375 410 26
		4	6	107	8.5	18						R0375 410 41
	M6	1	1	25	–	–	11.5	5.3	19.3	14.0	7.0	R0375 510 00
		3	4	142	11.0	40						R0375 510 02
		2	2	72	11.0	50						R0375 510 33
		2	2	62	11.0	40						R0375 510 34
		2	2	47	8.5	30						R0375 510 23
		4	6	142	8.5	25						R0375 510 41
-200	M8	2	2	108	19.0	70	27.5	16.3	29	19.0	9.0	R1175 290 26
		2	2	88	19.0	50		14.8				R1175 290 96
		2	2	78	19.0	40		14.8				R1175 290 97
-280	M10	2	2	163	29.0	105	32.0	18.5	41	25	13.0	R1175 290 44

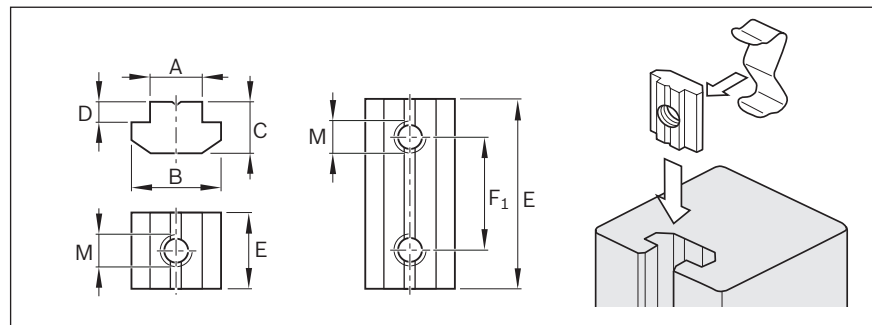
Compact modules CKR: When mounting the clamping fixtures, observe a minimum distance of 10 mm to the end face of the frame.

Sliding blocks, springs and strips

Recommended number of sliding blocks:
with 1 thread, 6 pieces per meter and side



For fastening attachments on the connection plate.
The spring serves as assembly and positioning aid.



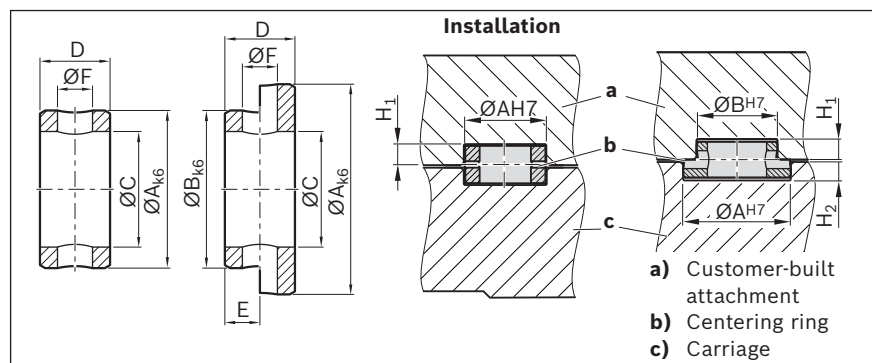
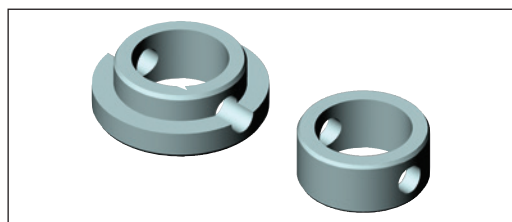
Size	Thread	Dimensions (mm)						Material number	
		A	B	C	D	E	F ₁	Sliding block	Spring
-070	M4 (1x)	4	7,8	3,9	0,4	10	–	R0375 210 20	–
	M4 (2x)					19	10	R0375 210 21	–
-090 / -110	M4 (1x)	6	11,5	4,0	1,0	12	–	R3447 014 01	R3412 010 02
	M5 (2x)					45	30	R0391 710 09	–
	M5 (1x)					12	–	R3447 015 01	R3412 010 02
	M4 (1x)					16	–	R3447 017 01	R3412 011 02
-145	M5 (1x)	8	16,0	6,0	2,0	16	–	R3447 018 01	R3412 011 02
	M6 (1x)					16	–	R3447 019 01	R3412 011 02
	M6 (2x)					50	36	R0391 710 08	–
	M8 (1x)					16	–	R3447 020 01	R3412 011 02
	M4 (1x)					20	–	R3447 012 01	R3412 009 02
-200	M5 (1x)	10	19,5	10,5	5,0	20	–	R3447 011 01	R3412 009 02
	M6 (1x)					20	–	R3447 010 01	R3412 009 02
	M8 (1x)					20	–	R3447 009 01	R3412 009 02
	M8 (2x)					90	70	R0391 710 07	–
	M8 (2x)					50	30	R0391 710 61	–
-280	M10 (4x)	12	18,0	14,0	7,0	108	30	R0391 710 84	–

Centering rings

The centering ring serves as a positioning aid and for positive locking when mounting customer-built attachments to the carriage and the frame.

It creates a positive-locking connection with good reproducibility.

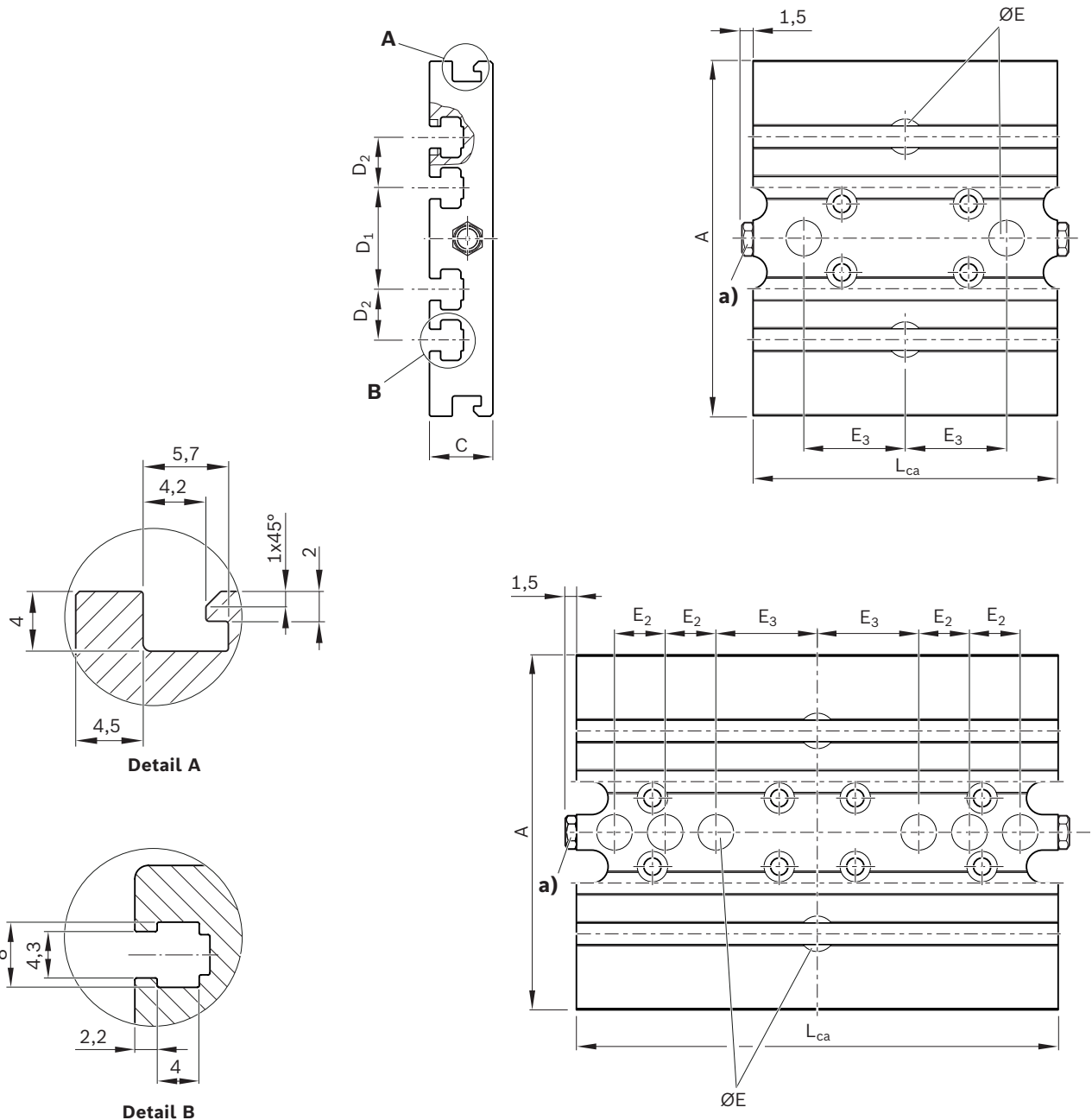
Material: Steel



Ø Size (mm)	Dimensions (mm)								Material number
	A	B	C ±0.1	D -0.2	E +0.2	ØF	H ₁ +0.2	H ₂ +0.2	
5	5	–	3.4	3.0	–	1.6	1.6	–	R0396 605 42
7	7	–	5.5	3.0	–	1.6	1.6	–	R0396 605 43
9	9	–	6.6	4.0	–	2.0	2.1	–	R0396 605 44
12	12	–	9.0	4.0	–	2.0	2.1	–	R0396 605 45
16	16	–	11.0	6.0	–	3.0	3.1	–	R0396 605 46
7 - 5	7	5	3.4	3.0	1.5	1.6	1.6	1.6	R0396 605 47
9 - 5	9	5	3.4	3.5	1.5	1.6	2.1	1.6	R0396 605 48
9 - 7	9	7	5.5	3.5	1.5	1.6	2.1	1.6	R0396 605 49
12 - 9	12	9	6.6	4.0	2.0	2.0	2.1	2.1	R0396 605 50
16 - 12	16	12	9.0	5.0	2.0	2.0	2.1	3.1	R0396 605 51

Connection plates

CKK/CKR -070



The connection plates differ in appearance in the representation.

- a)** Funnel-type lube nipple DIN 3405-D4; lubrication points from two sides (central lubrication only necessary with grease gun on one of the two sides).

Function:

- ▶ Fastening of attachments (with sliding blocks)
- ▶ Lubrication of the ball rail system and the ball screw assembly possible via the connection plate
- ▶ For lube version LSS, LPG

The assembly consists of:

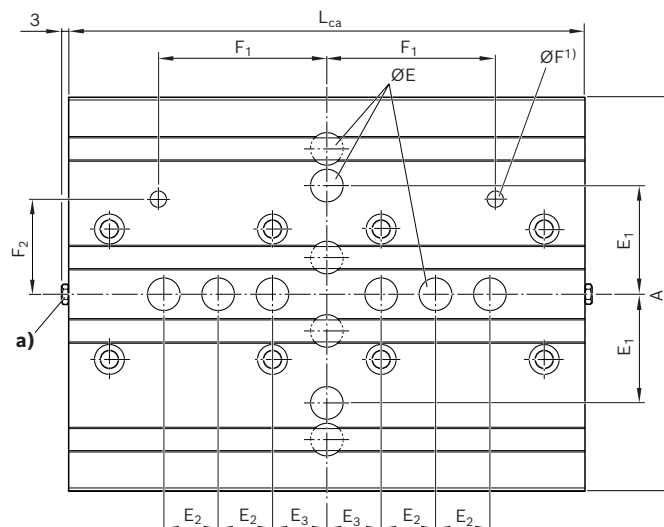
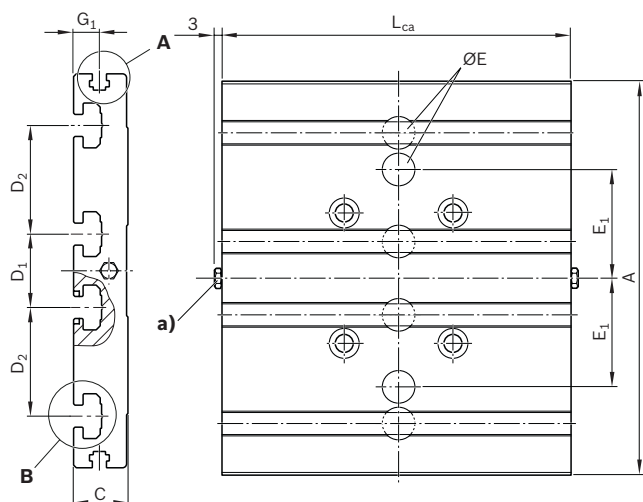
- ▶ Connection plate
- ▶ Mounting accessories for fastening to the carriages
- ▶ Sliding blocks are not included with delivery

CKK/CKR	Dimensions (mm)		A	C	D ₁	D ₂	ØE ^{H7}	E ₂ ±0.01	E ₃
	CKK	L _{ca} CKR							
-070	60	60	70	12.5	20	10	7 - 1.6 ^{+0.2} deep	10	20
	95	95							

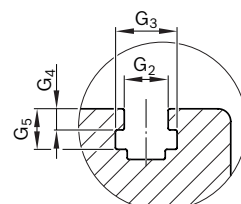
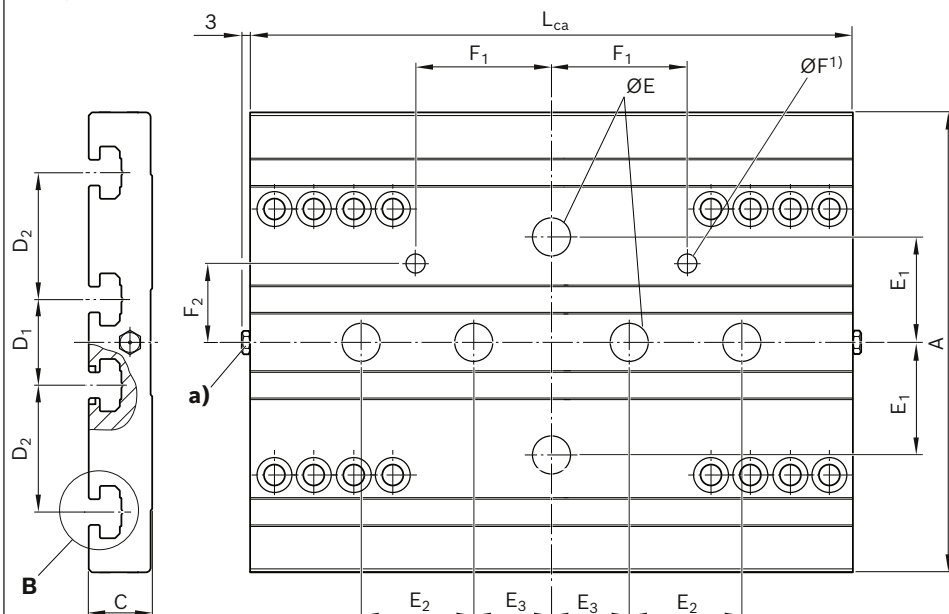
CKK/CKR	L _{ca} (mm)	Material number		Mass (kg)
		CKK	CKR	
-070	60	R0375 200 15	R0375 200 16	0.11
	95	R0375 200 10	R0375 200 11	0.17

CKK / CKR

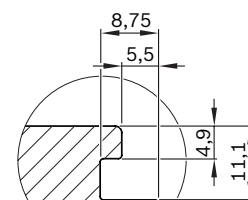
CKK / CKR -090, -110, -145, -200



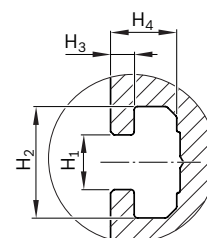
CKK / CKR -280



Detail A
Größe -090,-110,-145

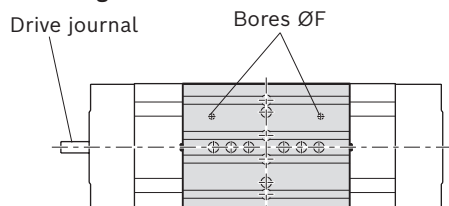


Detail A
Größe-200



Detail B

Mounting orientation



The connection plates differ in appearance in the representation. Shown here is the connection plate for CKK-145.

¹⁾ For customer-built attachment

a) Funnel-type lube nipple AM8 x 1 for lube version LSS/LPG; lubrication points from two sides (central lubrication only necessary with grease gun on one of the two sides). Lube fittings for lube versions LCF/LCO see next page.

Function:

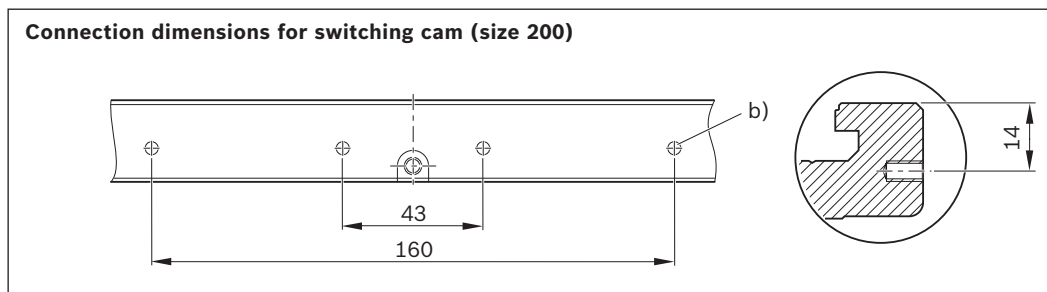
- Fastening of attachments (with sliding blocks)
- Lubrication of the ball rail system and the ball screw assembly possible via the connection plate
- For lube version LSS, LPG

The assembly consists of:

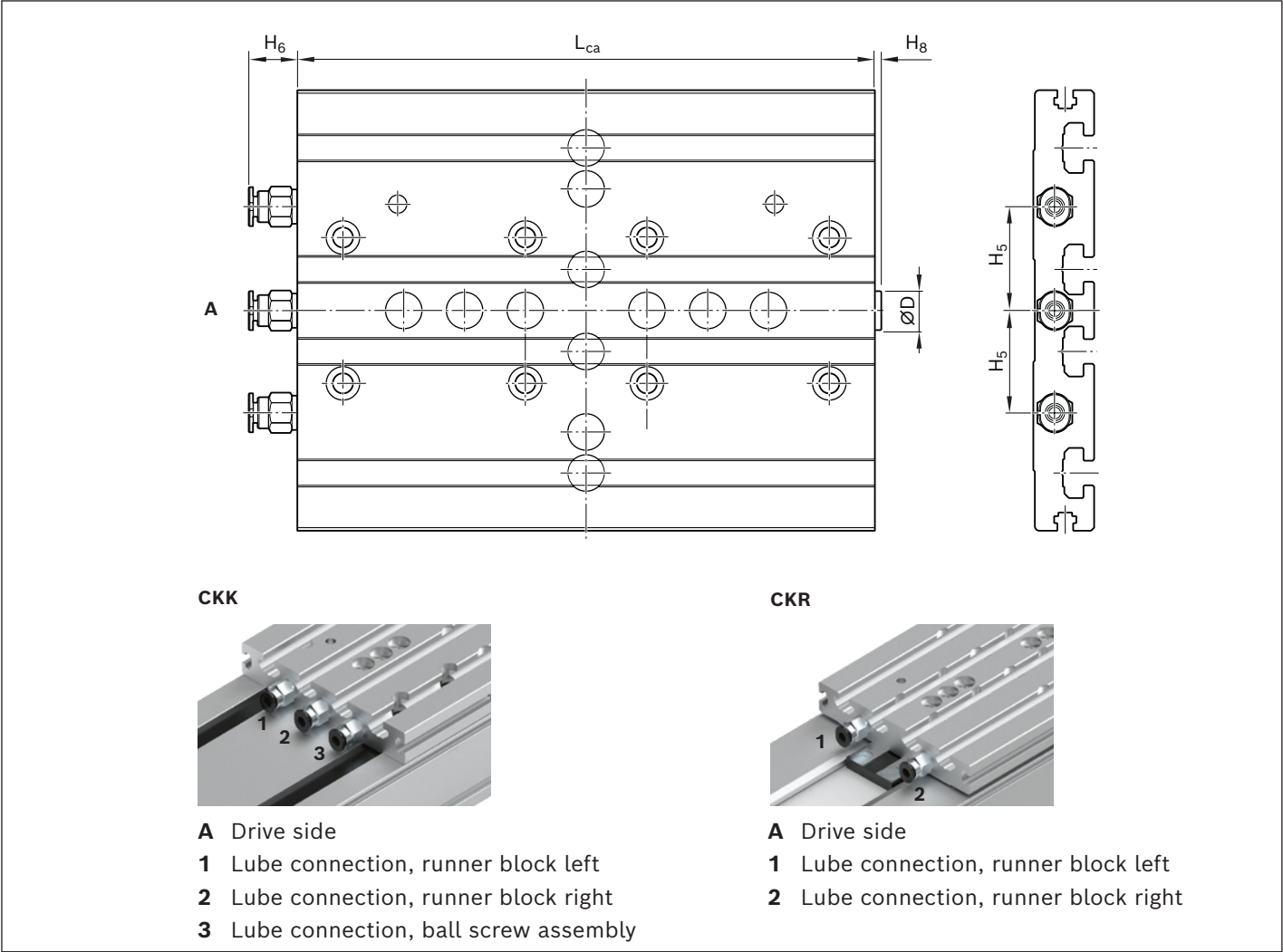
- Connection plate
- Mounting accessories for fastening to the carriages
- Sliding blocks are not included with delivery

CKK/ CKR	Dimensions (mm) (mm)																					
	L _{ca}		A	C	D ₁	D ₂	ØE ^{H7}	E ₁	E ₂	E ₃	ØF ^{H7}	F ₁	F ₂	G ₁	G ₂	G ₃	G ₄	G ₅	H ₁	H ₂	H ₃	H ₄
	CKK	CKR																				
-090	60		90	16	20	20	9 - 2.1 deep	-	-	20	-	-	-	7.6	4.2	7.3	2.0	4.3	6.0	12.0	3.5	7.7
	125								10		4 - 6 deep	38.0	20									
-110	60	110	110	16	20	20	9 - 2.1 deep	-	-	20	-	-	-	9.5	5.2	7.3	2.5	4.8	6.0	12.0	3.5	7.7
	155								10		5 - 6.5 deep	46.0	42									
-145	80	125	145	20	27	40	12 - 2.1 deep	40	-	20	-	-	-	9.5	5.2	7.3	2.5	4.8	8.0	16.5	3.5	9.8
	190								20		6 - 12 deep	62.0	35									
-200	190		200	27	40	40	16 - 3.1 deep	-	-	20	-	-	-	-	-	-	-	-	10.0	20.1	6.0	12.5
	305								20		8 - 16 deep	59.5	41									
-280	375		278	30	71	112.5	16 - 3.1 deep	80	60	40	8 - 16 deep	50.0	60	-	-	-	-	-	12.3	20.5	8.0	17.3

CKK/ CKR	L _{ca} (mm)		Material number		Mass (kg)	
	CKK	CKR	CKK	CKR	CKK	CKR
-090	60		R0375 300 15	R0375 300 16	0.18	
	125		R0375 300 10	R0375 300 11	0.37	
-110	60	110	R0375 400 15	R0375 400 16	0.23	0.38
	155		R0375 400 10	R0375 400 11	0.59	0.58
-145	80	125	R0375 500 15	R0375 500 16	0.50	0.81
	190		R0375 500 10	R0375 500 11	1.20	1.15
-200	190		R0375 600 15	R0375 600 16	2.20	2.20
	305		R0375 600 10	R0375 600 11	3.60	3.60
-280	375		R0375 710 28	R0375 740 28	6.93	7.02



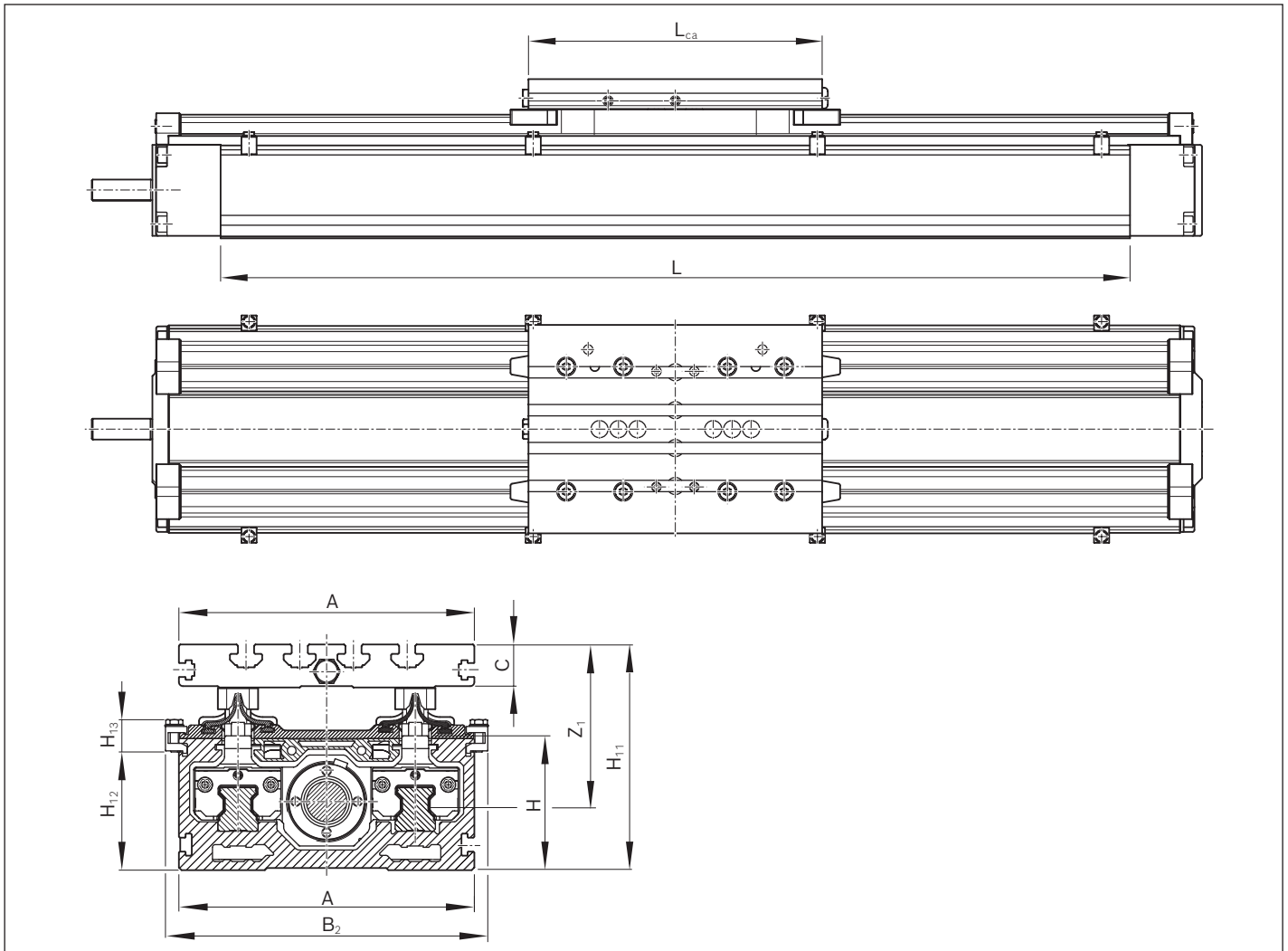
For lube version LCF/LCO



CKK/CKR	Dimensions (mm)					
	$\varnothing D$	CKK	H ₅ CKR	H ₆	H ₈	L _{ca}
-070	–	–	–	–	–	–
-090	8.5	19	19	12.5	3	125
-110	8.5	20	40		3	155
-145	–	26	42		–	190
-200	–	31	55		–	305

More dimensions ➔ Chapter "Connection plates".
Lube fittings: Straight connector (SW 9), for \varnothing 4 mm plastic tubes and metal pipes

Resist cover



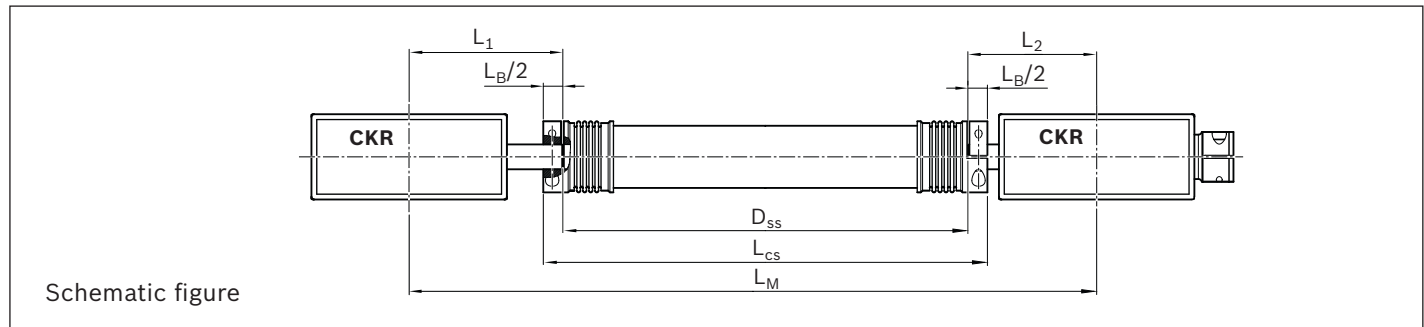
CKK	Dimensions (mm)								
	A	B ₂	C	H	H ₁₁	H ₁₂	H ₁₃	L _{ca}	Z ₁
-110	100	120	16	50	84	44	12	155	60.7
-145	145	155	20	65	105	59	12	190	71.6
-200	200	212	27	100	150	82	24	305	86.4

Z₁ = Application point of the effective force

Connecting shafts

Features

- Bridge large distances between axes
- Can be mounted radially by split clamping hub
- Mounting and dismounting without shifting the aligned axes
- Backlash-free and torsionally stiff



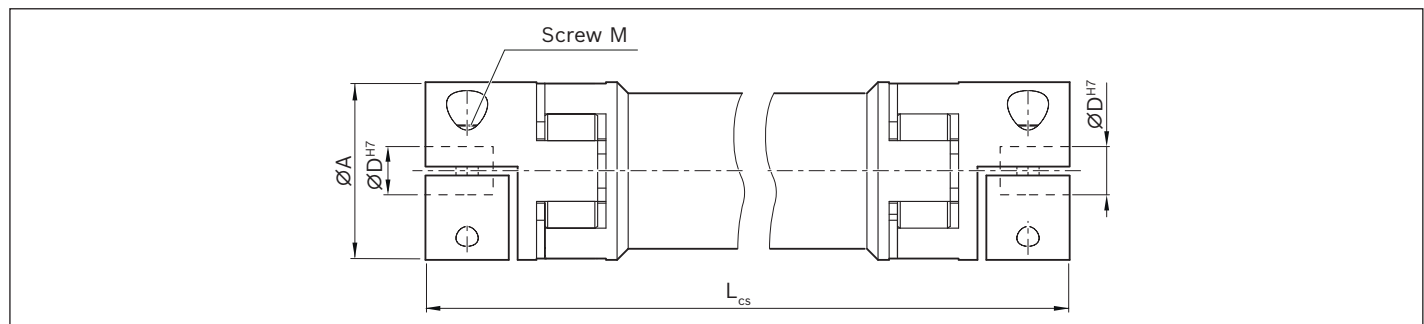
CKR-070

Material

Coupling hub: high-strength aluminum

Elastomer circle: precision manufactured, extremely wear resistant, and thermally stable plastic

Connecting tube: high-precision aluminum tube

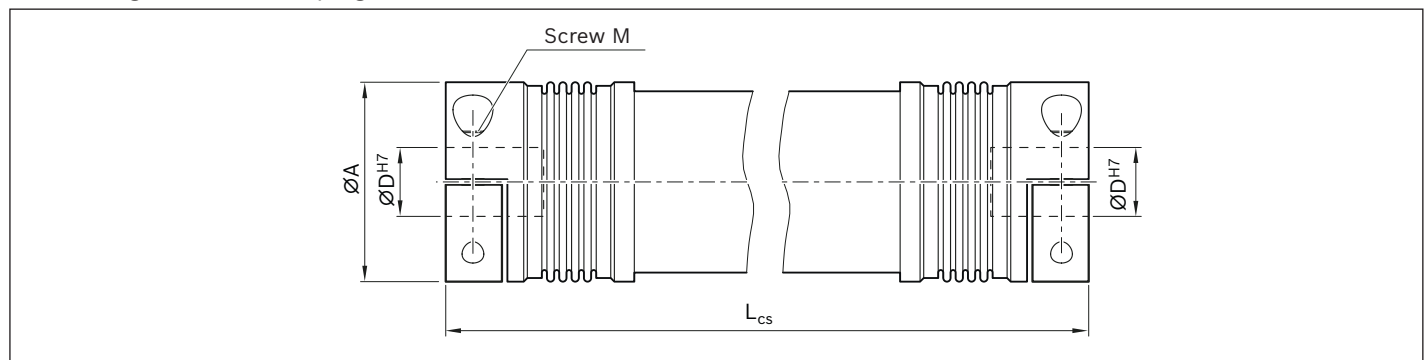


CKR-090, -110, -145, -200

Material

Bellows: highly flexible stainless steel

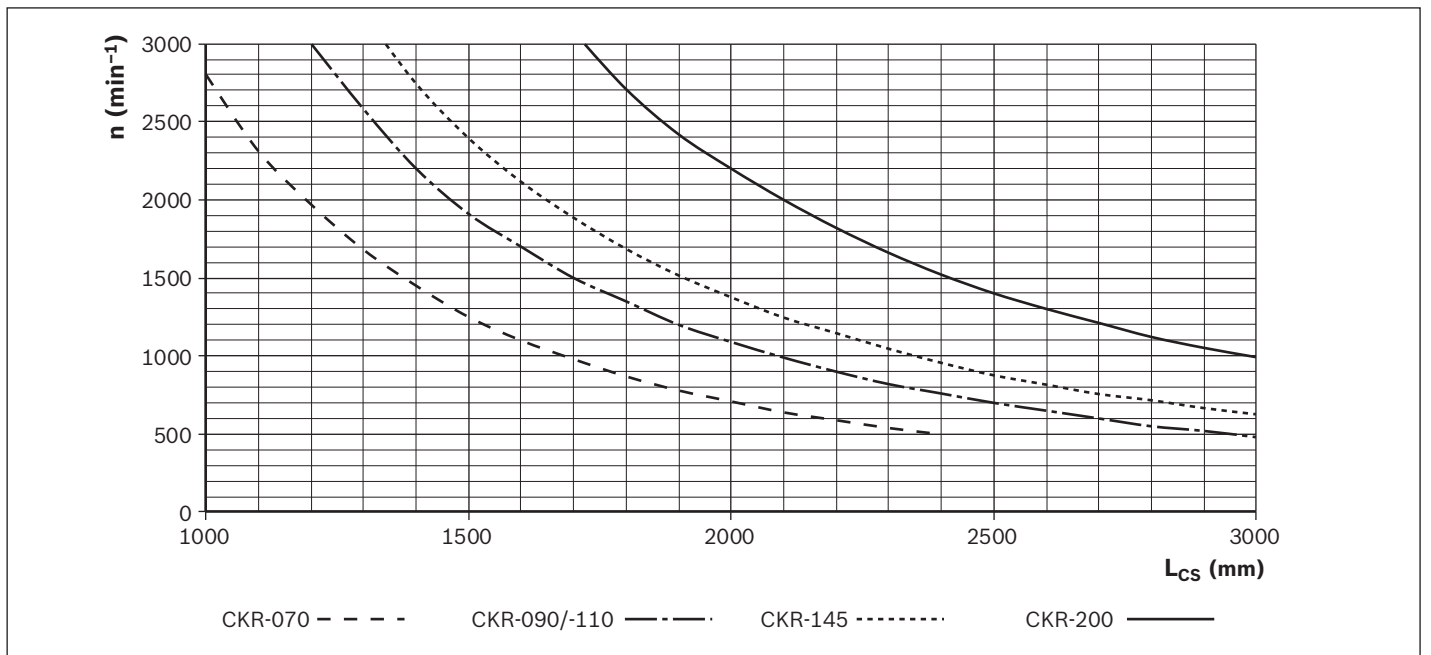
Connecting tube and clamping hub: Aluminum



Size	Material number	Dimensions (mm)						M_A (Nm)
		A	D	M	L_B	$L_{cs \min}$	$L_{cs \max}$	
-070	R0391 510 22	30	8	M4	21	95	2,400	4
-090	R0391 510 16	40	10	M4	22	105	3,000	5
-110	R0391 510 20	40	14	M4	22	105	3,000	5
-145	R0391 510 18	55	19	M6	32	150	3,000	15
-200	R0391 510 19	83	24	M10	50	200	3,000	70

Size	M_S (Nm)	M_{cs} (Nm)	Mass moment of inertia (10^{-6} kgm^2)	Weight (kg)
-070	25	12.5	$0.090 \cdot (L_{cs} \text{ (mm)} - 80) + 30$	$0.00054 \cdot (L_{cs} \text{ (mm)} - 80) + 0.12$
-090	17	10.0	$0.032 \cdot (L_{cs} \text{ (mm)} - 80) + 68.2$	$0.00090 \cdot (L_{cs} \text{ (mm)} - 80) + 0.21$
-110	17	10.0	$0.032 \cdot (L_{cs} \text{ (mm)} - 80) + 68.2$	$0.00090 \cdot (L_{cs} \text{ (mm)} - 80) + 0.21$
-145	45	30.0	$0.670 \cdot (L_{cs} \text{ (mm)} - 118) + 246$	$0.00120 \cdot (L_{cs} \text{ (mm)} - 118) + 0.62$
-200	170	170.0	$4.500 \cdot (L_{cs} \text{ (mm)} - 160) + 2,000$	$0.00320 \cdot (L_{cs} \text{ (mm)} - 160) + 2.00$

Bending-critical speed



Order

Please state the material number and length L_{cs} .
e.g.: R0391 510 20, $L_{cs} = 550 \text{ mm}$

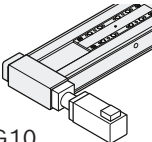
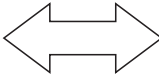
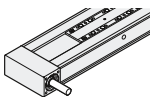
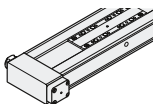
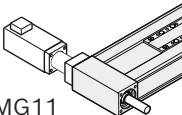
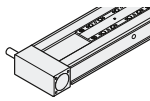
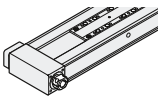
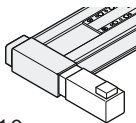
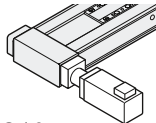
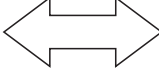
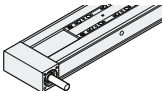
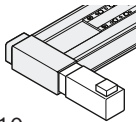
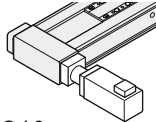
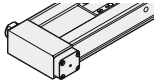
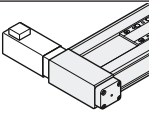
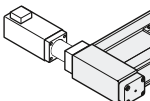
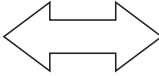
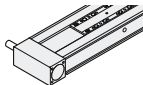
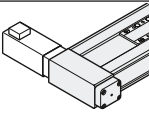
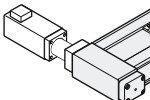
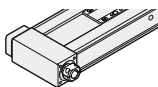
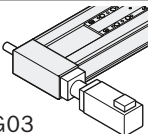
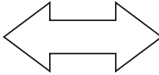
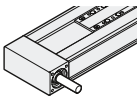
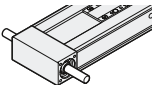
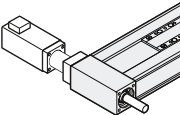
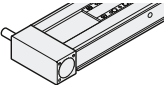
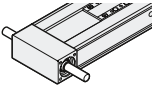
$$L_{cs} = D_{SS} + L_B$$

$$D_{SS} = L_M - L_1 - L_2$$

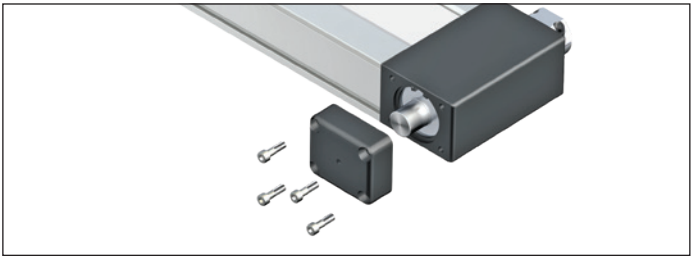
L_1/L_2 : For the calculation, refer to the dimension drawings

D_{SS} = Distance drive journals
 L_{cs} = Overall length of the connecting shaft
 L_M = Centerline-to-centerline distance between compact modules
 M_A = Tightening torque of screws
 M_{cs} = Rated torque of connecting shaft
 M_S = Peak torque of connecting shaft
 n = Rotary speed (rpm)
 L_{cs} = Overall length of the connecting shaft (mm)

Combination possibilities for multi-axis systems with connecting shaft

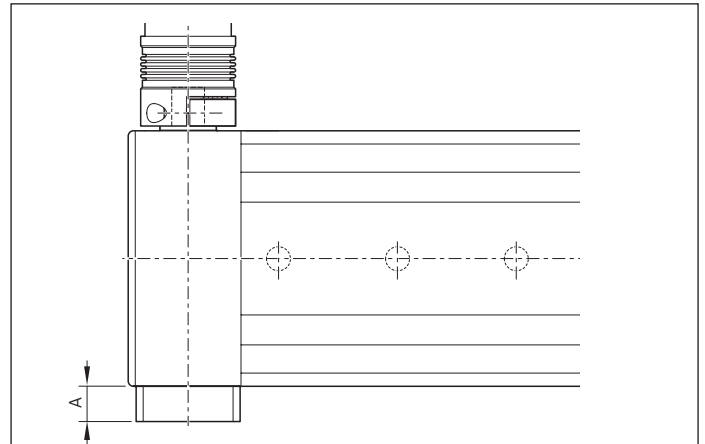
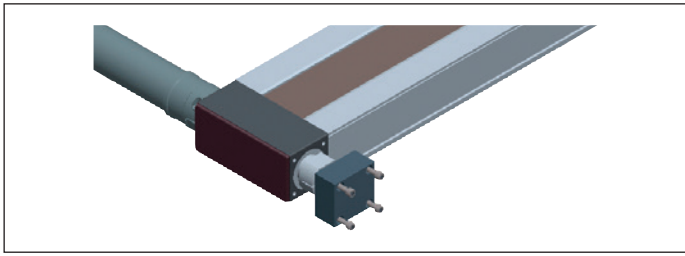
Size	Version				
-070	 MG10			 MA01	 MA06
	 MG11			 MA02	 MA05
-090 -110 -145	 MA10	 MG10		 MA01	
	 MA10	 MG10		 MA06	
	 MA11	 MG11		 MA02	
	 MA11	 MG11		 MA05	
-200	 MG03			 MA01	 MA03
	 MG04			 MA02	 MA03

Drive end enclosure with additional drive journal
In the versions MA05, MA06, MA10, MA11, MG10 and MG11, a second drive journal can be made available by removing the screws and cover.



Cover

By attaching the cover, the open end of the drive (clamping hub) is closed.
This means there is no longer any risk of injury from the rotating motor holder.



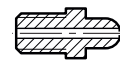
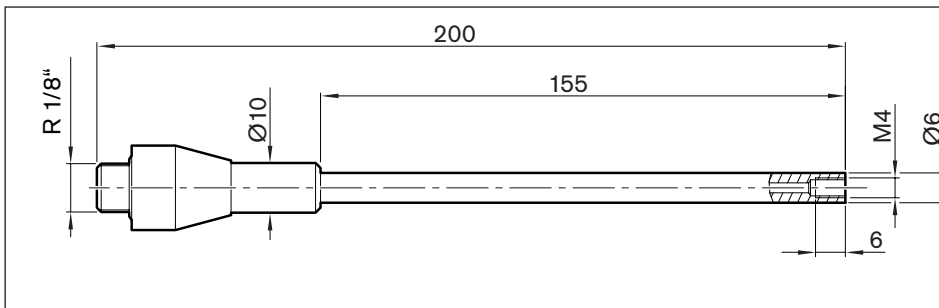
Size	Dimension (mm)	Material number
	A	
-070	20	R0375 200 09
-090	24	R0375 300 09
-110	26	R0375 400 09
-145	31	R0375 500 09

Nozzle pipe

For manual grease guns. For the lubrication of funnel-type and ball-type lube nipples.

Scope of delivery:

Nozzle pipe, interchangeable insert A for funnel-type lube nipple, interchangeable insert B for ball-type lube nipple.



Interchangeable insert A
for funnel-type lube nipple



Interchangeable insert B
for ball-type lube nipple

Material number	Mass (g)
R345503106	158

Frequency meter

for checking the toothed belt pretension on linear axes with a toothed belt drive as well as the adjustment of the toothed belt pretension when driven via a belt side drive.

The compact IGAT measuring device TECO-PRO enables easy measurement of the pretension of standard belt systems. Equipped with the latest microprocessor technology, the measuring device enables precise adjustment of all V-belts, toothed belts and power belts that need to be tensioned in the measuring range between 10 and 600 Hz. Belt construction, color and material of the belt as well as the influence of light have no effect on the measurement result because the acoustic principle is used.

Scope of delivery:

The device is delivered with a permanently installed gooseneck. A leather belt bag is included. The device is delivered with a USB charging cable and a euro plug in a sturdy hard box.



Source: <https://www.igat.net>

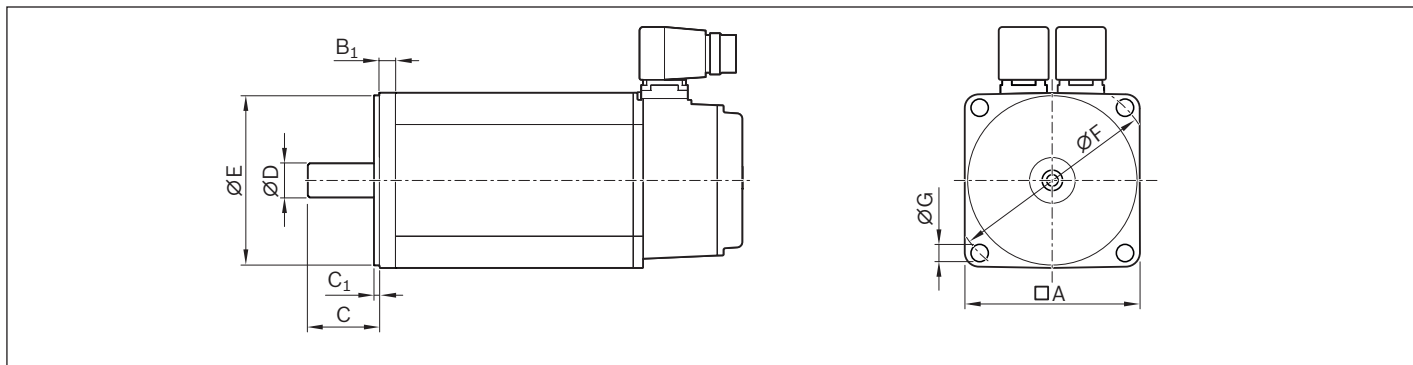
Material number
R913057897

Motors

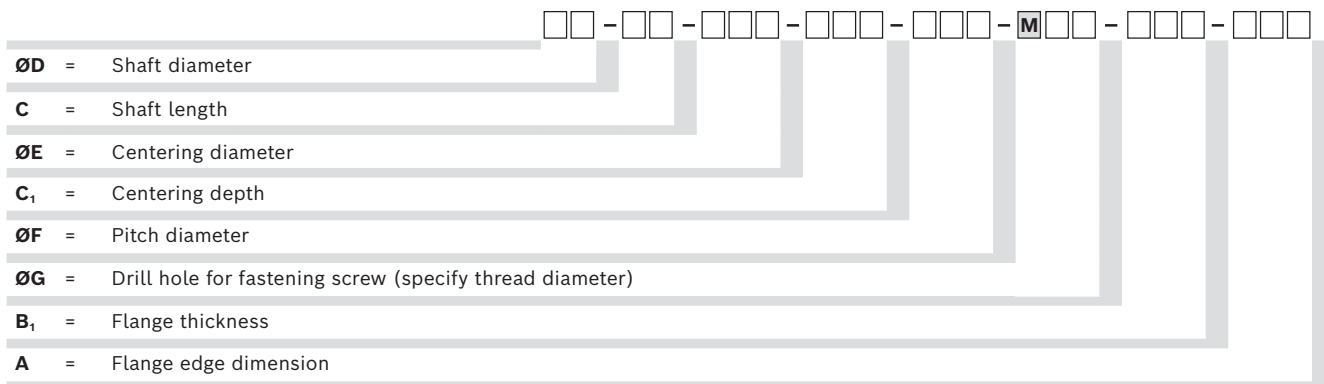
Motor attachment kits according to customer spec.

The motor of linear motion systems with ball screw assembly is attached by either an attachment kit with flange and coupling (MF) or a belt side drive (RV).

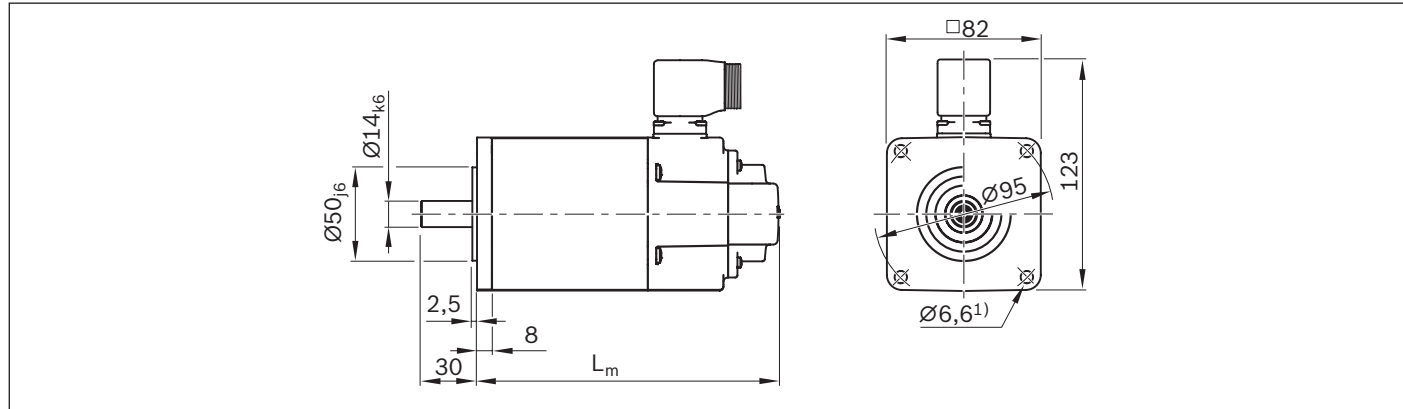
The available combinations are shown in the "Configuration and ordering" selection tables for each size. In addition to attachment kits for Rexroth motors, attachment kits for motors according to customer specification are also available. In order to determine the appropriate attachment kit, the connection geometry of the motor is crucial. Characteristics required to clearly determine motor geometry are shown below.



The dimensions queried result in a unique "motor geometry code":



Example illustration of servo motor IndraDyn S type MS2N04



1 4 - 3 0 - 0 5 0 - 2 . 5 - 0 9 5 - M 0 6 - 0 0 8 - 0 8 2

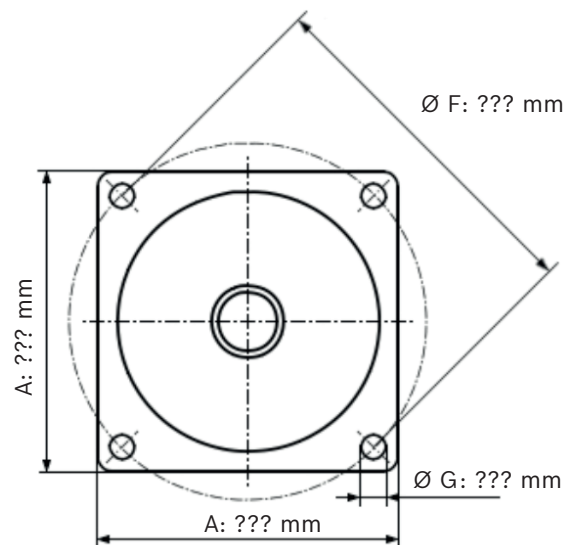
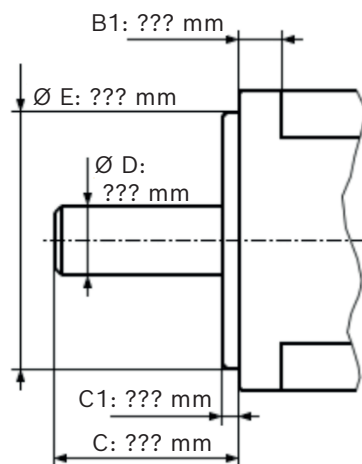
¹⁾ The drill hole Ø 6.6 mm results in the type designation M06 for the geometry motor code (nominal thread diameter fastening screw M6).

Motor attachment kits for motors according to customer specification can be configured using the online configurator in the eShop. To do this, select the "Attachment kits for motors according to customer specification" option. Enter motor geometry in the input dialog box. The dimensions can be entered directly or by using a drop-down menu.

Size of customer motor

Motor manufacturer ▼

Motor type ▼

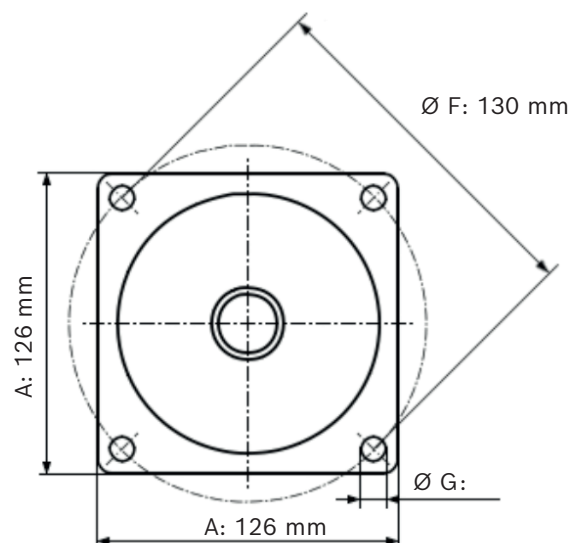
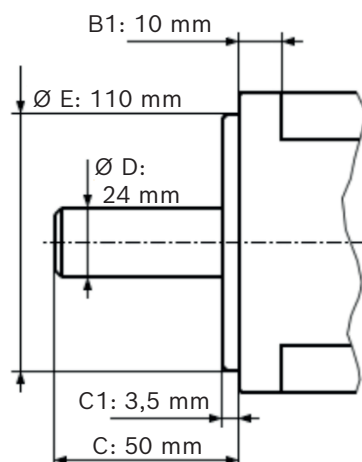


Example

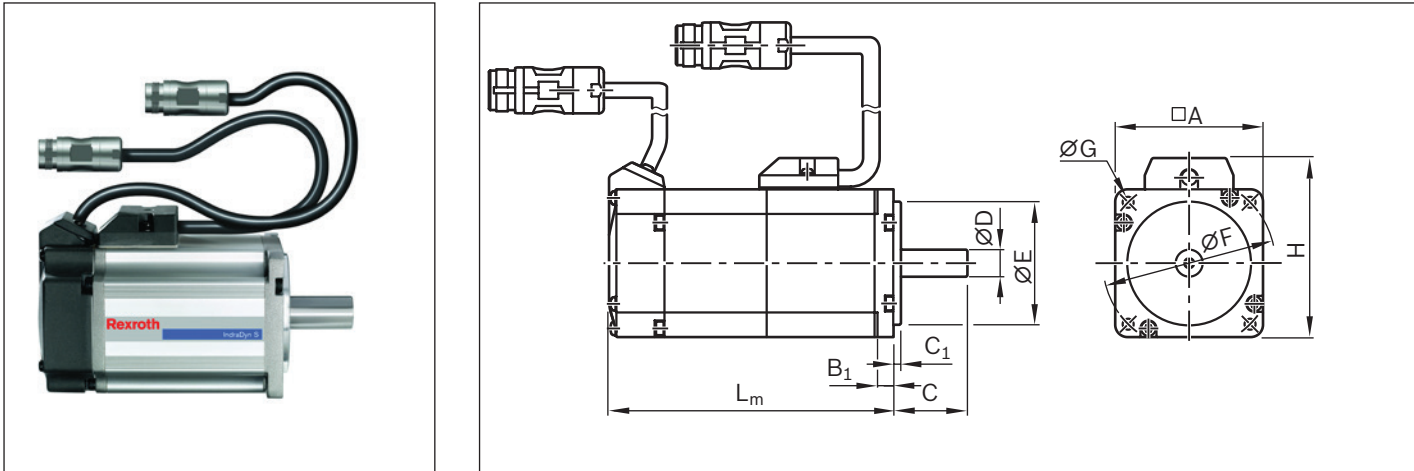
Size of customer motor

Motor manufacturer ▼

Motor type ▼



IndraDyn S - Servo motors MSM



Motor schematic

Motor code	Dimensions (mm)										
	A	B ₁	C	C ₁	Ø D	Ø E	Ø F	Ø G	H	L _m	
					h6	h7				Brake without	with
MSM 019A-0300	38	6.0	25	3	8	30	45	3.4	51	72.0	102.0
MSM 019B-0300	38	6.0	25	3	8	30	45	3.4	51	92.0	122.0
MSM 031B-0300	60	6.5	30	3	11	50	70	4.5	73	79.0	115.5
MSM 031C-0300	60	6.5	30	3	14	50	70	4.5	73	98.5	135.0
MSM 041B-0300	80	8.0	35	3	19	70	90	6.0	93	112.0	149.0

Version:

- Plain shaft without shaft seal
- M5 multi-turn absolute encoder (20-bit, absolute encoder function only available with backup battery)
- Cooling system: natural convection
- IP54 protection class (shaft IP40)
- With or without holding brake
- M17 metal round connector

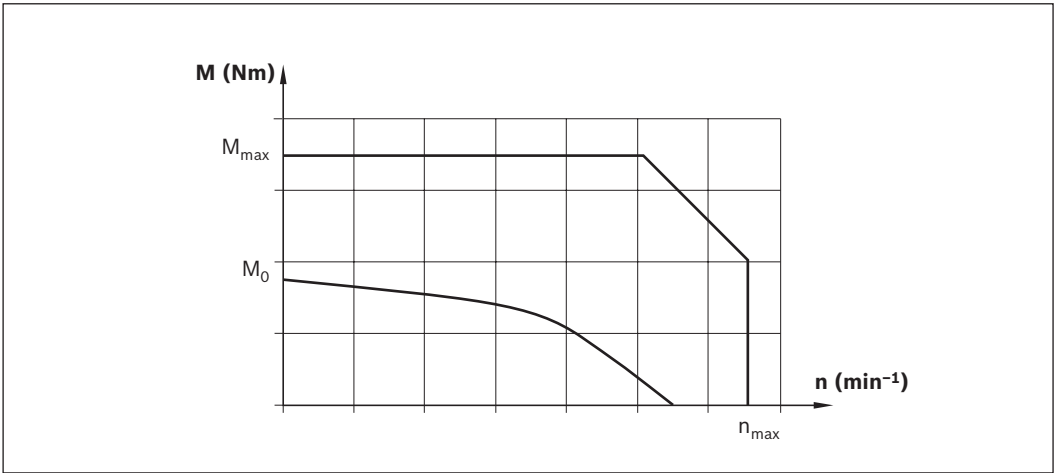
Note

Motors are available with controllers and control systems. For more information on motors, controllers and control systems, please refer to the Rexroth automation solutions ➡ Chapter "Further information"

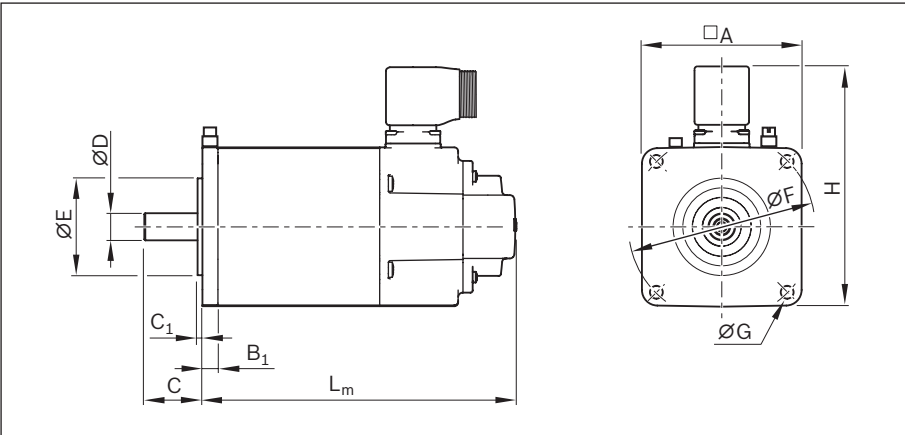
Motor data									Motor connection 1/2 cable(s)	Holding brake	Type code	Material number
n_{\max} (rpm)	M_0 (Nm)	M_{\max} (Nm)	M_{br} (Nm)	J_m (kgm ²)	J_{br} (kgm ²)	m_m (kg)	m_{br} (kg)					
5,000	0.16	0.48	0.29	0.0000025	0.0000002	0.32	0.21	2		N	MSM 019A-0300-NN-M5-MH0	R911344209
										Y	MSM 019A-0300-NN-M5-MH1	R911344210
5,000	0.32	0.95	0.29	0.0000051	0.0000002	0.47	0.21	2		N	MSM 019B-0300-NN-M5-MH0	R911344211
										Y	MSM 019B-0300-NN-M5-MH1	R911344212
5,000	0.64	1.91	1.27	0.0000140	0.0000018	0.82	0.48	2		N	MSM 031B-0300-NN-M5-MH0	R911344213
										Y	MSM 031B-0300-NN-M5-MH1	R911344214
5,000	1.30	3.80	1.27	0.0000260	0.0000018	1.20	0.50	2		N	MSM 031C-0300-NN-M5-MH0	R911344215
										Y	MSM 031C-0300-NN-M5-MH1	R911344216
4 500	2.40	7.10	2.45	0.0000870	0.0000075	2.30	0.80	2		N	MSM 041B-0300-NN-M5-MH0	R911344217
										Y	MSM 041B-0300-NN-M5-MH1	R911344218

For abbreviations, see chapter “Service and Information”

Motor characteristic
(Schematic)



IndraDyn S - Servo motors MS2N



Motor schematic

Dimensions / motor data

Motor code	Dimensions (mm)												
	□ A	B ₁	C	C ₁	Ø D _{k6}	Ø E _{j6}	Ø F	Ø G	Cabel 2	H 1	Brake without	L _m with	
MS2N03-B0BYN	58	7,5	20	2,5	9	40	63	4,5	84	99	163	192	
MS2N03-D0BYN	58	7,5	23	2,5	11	40	63	4,5	84	99	203	232	
MS2N04-B0BTN	82	8	30	2,5	14	50	95	6,6	108	123	162	194,5	
MS2N04-C0BTN	82	8	30	2,5	14	50	95	6,6	108	123	194	226,5	
MS2N04-D0BQN	82	8	30	2,5	14	50	95	6,6	108	123	226	258,5	
MS2N05-B0BTN	98	9	40	3	19	95	115	9	124	139	188	218	
MS2N05-C0BTN	98	9	40	3	19	95	115	9	124	139	224	254	
MS2N05-D0BRN	98	9	40	3	19	95	115	9	124	139	260	290	
MS2N06-B1BNN	116	14	50	3	24	95	130	9	156	156	164	201	
MS2N06-C0BTN	116	14	50	3	24	95	130	9	156	156	184	202	
MS2N06-D0BRN	116	14	50	3	24	95	130	9	156	156	224	261	
MS2N06-D1BNN	116	14	50	3	24	95	130	9	156	156	224	261	
MS2N06-E0BRN	116	14	50	3	24	95	130	9	156	156	264	301	

MS2N07/ MS2N10 see next page

The table lists motors that might not be used with this product

Version

- Plain shaft without shaft seal ring
- Multi-turn encoder
- Advanced encoder (B) in conjunction with 1-cable connector (AcuroLink interface)
- IP64 protection class
- With or without holding brake
- Special ground connection terminal near motor flange (used as needed)

Note

Motors are available with controllers and control systems. For more information on motors, controllers and control systems, please refer to the Rexroth automation solutions ➡ Chapter "Further information". For further information on the type code, see chapter "Type code".

	Motor data								Motor connection 1 / 2 cable	Holding brake	Type code	Material number
	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)				
	9 000	0,73	3,46	1,8	0,000023	0,000007	1,4	0,4	1	N	MS2N03-B0BYN-CMSH0-NNNNE-NN	R911384767
									1	Y	MS2N03-B0BYN-CMSH1-NNNNE-NN	R911384769
	9 000	1,15	6,8	1,8	0,000037	0,000007	2,0	0,4	1	N	MS2N03-D0BYN-CMSH0-NNNNE-NN	R911384772
									1	Y	MS2N03-D0BYN-CMSH1-NNNNE-NN	R911384773
	6 000	1,75	5,9	5,0	0,000070	0,000040	2,7	0,7	1	N	MS2N04-B0BTN-CMSH0-NNNNE-NN	R911384527
									1	Y	MS2N04-B0BTN-CMSH1-NNNNE-NN	R911384528
	6 000	2,80	12,0	5,0	0,000110	0,000050	3,7	0,7	1	N	MS2N04-C0BTN-CMSH0-NNNNE-NN	R911384531
									1	Y	MS2N04-C0BTN-CMSH1-NNNNE-NN	R911384532
	6 000	3,85	18,1	5,0	0,000160	0,000040	4,7	0,7	1	N	MS2N04-D0BQN-CMSH0-NNNNE-NN	R911384535
									1	Y	MS2N04-D0BQN-CMSH1-NNNNE-NN	R911384536
	6 000	3,75	10,6	10,0	0,000170	0,000110	4,0	1,1	1	N	MS2N05-B0BTN-CMSH0-NNNNE-NN	R911384542
									1	Y	MS2N05-B0BTN-CMSH1-NNNNE-NN	R911384543
	6 000	6,10	20,8	10,0	0,000290	0,000110	5,9	1,1	1	N	MS2N05-C0BTN-CMSH0-NNNNE-NN	R911384546
									1	Y	MS2N05-C0BTN-CMSH1-NNNNE-NN	R911384547
	6 000	7,90	31,3	10,0	0,000400	0,000110	7,3	1,1	1	N	MS2N05-D0BRN-CMSH0-NNNNE-NN	R911384550
									1	Y	MS2N05-D0BRN-CMSH1-NNNNE-NN	R911384551
	6 000	3,25	9,5	10,0	0,000480	0,000110	5,1	1,1	1	N	MS2N06-B1BNN-CMSH0-NNNNE-NN	R911384929
									1	Y	MS2N06-B1BNN-CMSH1-NNNNE-NN	R911384930
	6 000	6,00	16,0	10,0	0,000390	0,000110	6,4	1,0	1	N	MS2N06-C0BTN-CMSH0-NNNNE-NN	R911384933
									1	Y	MS2N06-C0BTN-CMSH1-NNNNE-NN	R911384934
	6 000	9,70	32,0	15,0	0,000650	0,000140	9,0	1,5	1	N	MS2N06-D0BRN-CMSH0-NNNNE-NN	R911384937
									1	Y	MS2N06-D0BRN-CMSH2-NNNNE-NN	R911384938
	6 000	9,00	38,4	15,0	0,001400	0,000140	9,0	1,5	1	N	MS2N06-D1BNN-CMSH0-NNNNE-NN	R911384941
									1	Y	MS2N06-D1BNN-CMSH2-NNNNE-NN	R911384942
	6 000	13,0	49,0	15,0	0,000890	0,000140	11,5	1,5	1	N	MS2N06-E0BRN-CMSH0-NNNNE-NN	R911384945
									1	Y	MS2N06-E0BRN-CMSH2-NNNNE-NN	R911384946

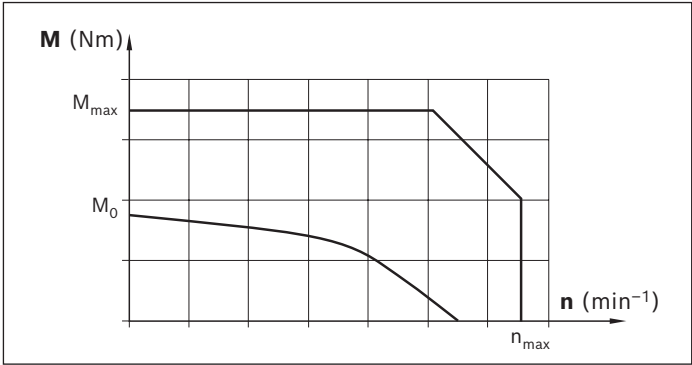
Motor code	Dimensions (mm)												
	□ A	B ₁	C	C ₁	Ø D _{k6}	Ø E _{j6}	Ø F	Ø G	H		L _m		
									Cabel 2	1	Brake without	with	
MS2N07-B1BNN	140	18	58	4	32	130	165	11	180	180	176	230	
MS2N07-C0BQN	140	18	58	4	32	130	165	11	180	180	205	259	
MS2N07-C1BRN	140	18	58	4	32	130	165	11	180	180	205	259	
MS2N07-D0BHA	140	18	58	4	32	130	165	11	203	-	384	438	
MS2N07-D0BRN	140	18	58	4	32	130	165	11	180	-	263	317	
MS2N07-D1BNN	140	18	58	4	32	130	165	11	180	180	263	317	
MS2N07-E0BQN	140	18	58	4	32	130	165	11	203	-	321	375	
MS2N07-E1BNN	140	18	58	4	32	130	165	11	203	-	321	375	
MS2N10-C0BNN	196	20	80	4	38	180	215	14	270	-	238	298	
MS2N10-D0BHA	196	20	80	4	38	180	215	14	274	-	394	454	
MS2N10-E0BHA	196	20	80	4	38	180	215	14	274	-	452	512	
MS2N10-E0BNA	196	20	80	4	38	180	215	14	270		452	512	
MS2N10-F1BHA	196	20	80	4	38	180	215	14	276		510	570	

The table lists motors that might not be used with this product

	Motor data								Motor connection 1 / 2 cable	Holding brake	Type code	Material number
	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)				
	6 000	7,40	21,0	20,0	0,001970	0,000260	9,5	2,0	1	N	MS2N07-B1BNN-CMSH0-NNNNE-NN	R911384951
									1	Y	MS2N07-B1BNN-CMSH1-NNNNE-NN	R911384952
	6 000	12,8	35,7	20,0	0,001200	0,000260	12,0	2,0	1	N	MS2N07-C0BQN-CMSH0-NNNNE-NN	R911384955
									1	Y	MS2N07-C0BQN-CMSH1-NNNNE-NN	R911384956
	6 000	11,50	42,2	20,0	0,003050	0,000260	12,0	2,0	1	N	MS2N07-C1BRN-CMSH0-NNNNE-NN	R911384959
									1	Y	MS2N07-C1BRN-CMSH1-NNNNE-NN	R911384960
	4 000	35,5	73,2	36,0	0,00210	0,000410	20,0	2,5	2	N	MS2N07-D0BHA-CMVH0-NNNNE-NN	R914503253
									2	Y	MS2N07-D0BHA-CMVH2-NNNNE-NN	R914503254
	6 000	22,0	73,2	36,0	0,002100	0,000410	17,5	2,5	2	N	MS2N07-D0BRN-CMVH0-NNNNE-NN	R914504164
									2	Y	MS2N07-D0BRN-CMVH2-NNNNE-NN	R911394492
	6 000	18,90	84,8	36,0	0,005290	0,000410	17,5	2,5	1	N	MS2N07-D1BNN-CMSH0-NNNNE-NN	R911384965
									1	Y	MS2N07-D1BNN-CMSH2-NNNNE-NN	R911384966
	6 000	29,2	109,5	36,0	0,003000	0,000410	23,0	3,0	2	N	MS2N07-E0BQN-CMVH0-NNNNE-NN	R914501679
									2	Y	MS2N07-E0BQN-CMVH2-NNNNE-NN	R914504165
	6 000	25,8	128,5	36,0	0,007520	0,000410	23,0	3,0	2	N	MS2N07-E1BNN-CMVH0-NNNNE-NN	R914504166
									2	Y	MS2N07-E1BNN-CMVH2-NNNNE-NN	R914504167
	6 000	30,2	70,5	53,0	0,004800	0,001470	23,5	5,0	2	N	MS2N10-C0BNN-CMVH0-NNNNE-NN	R914503255
									2	Y	MS2N10-C0BNN-CMVH2-NNNNE-NN	R914503256
	4 000	82,4	142,0	53,0	0,008100	0,001470	35,0	5,0	2	N	MS2N07-D0BHA-CMVH0-NNNNE-NN	R914503257
									2	Y	MS2N07-D0BHA-CMVH2-NNNNE-NN	R914503258
	6 000	119,0	214,0	90,0	0,011400	0,002700	46,0	7,0	2	N	MS2N10-E0BHA-CMAH0-NNNNE-NN	R914503270
									2	Y	MS2N10-E0BHA-CMAH3-NNNNE-NN	R914503271
	6 000	119	214	90	0,011400	0,002700	46,0	7,0	2	N	MS2N10-E0BNA-CMAH0-NNNNE-NN	R914509918
										Y	MS2N10-E0BNA-CMAH3-NNNNE-NN	R914502696
	4 000	145	333	90	0,032900	0,002700	60	7,0	2	N	MS2N10-F1BHA-CMAH0-NNNNE-NN	R914509919
										Y	MS2N10-F1BHA-CMAH3-NNNNE-NN	R914509920

For abbreviations, see chapter “Service and Information”

Motor characteristic
(Schematic)



Automation package

2 ORDERING OPTIONS

- Single axis
- Single axis + drive (incl. mains filter/cable (optional))

Ordering options	System	Options				
		Motor MS2N	Drive controller		Cable	Mains filter
			Indra-Drive HCS	ctrlX Drive		
1	CKK / CKR	—	—	—	—	—
	MKK / MKR	✓	—	—	—	—
2	EMC	✓	✓	—	Optional	Included
	EMC-HP		—	✓	Optional	Included

Motor/controller combinations

Several motor-controller combinations are available in order to provide the most cost-effective solution for every customer application. When dimensioning the drive, always consider the motor-controller combination.

For more information on motors, controllers and control systems, please refer to the Rexroth automation solutions

➡ Chapter "Further information".

IndraDrive drive family

The converters of the IndraDrive C series generate a DC link direct voltage from the grid supply voltage and from it a controlled AC output voltage with variable amplitude and frequency for operation of a servo motor.

The compact format contains additional mains connection components, making it particularly suitable for single-axis applications.

Version

- ▶ Basic Universal or Basic Universal with Safe Motion
- ▶ Multi-Ethernet for communication with a superior controller
- ▶ More interfaces or integrated controls available
- ▶ For the converter HCS01, a smart function kit for pressing and joining applications is available
- ▶ Brake resistor included
- ▶ Adapters included
- ▶ Separate mains filter included



IndraDrive Cs
HCS01.1E-W0054



IndraDrive C
HCS03.1E-W0100

ctrlX drive family

With ctrlX DRIVE, Bosch Rexroth has developed the most compact, modular drive system worldwide for their customers. In addition to space-saving dimensions and maximum scalability, an almost unlimited number of combination options for the user, mature engineering tools and high energy efficiency are among the advantages of ctrlX DRIVE. The Bosch Rexroth servo motors are the perfect team players in the ctrlX DRIVE portfolio.


With compact dimensions, they combine highest dynamics with maximum accuracy for the position, rotary speed and torque values.

- ▶ EtherCAT SOE with Safe Torque Off or EtherCAT SOE with safe field bus
- ▶ Multi-Ethernet for communication with a superior controller
- ▶ More interfaces or integrated controls available
- ▶ Adapters included
- ▶ Separate mains filter included



ctrlX Drive (XCS)

Motor/controller combinations

Motor				Drive controller				
	Brake			Without controller	HCS	Controller option		
	Without	With				BASIC		
						UNIVERSAL		
						MultiEthernet		
						(B-ET) + L3	(B-ET) + S4	
						Safe torque off	Safe motion	
Without motor	000			000	Without	000	000	
Motor not listed								
MS2N03-B0BYN-CMSHx	203	204	1 cable		HCS01-W0008	102	101	
MS2N03-D0BYN-CMSHx	207	208			HCS01-W0018	302	301	
MS2N04-B0BTN-CMSHx	211	212						
MS2N04-C0BTN-CMSHx	215	216						
MS2N04-D0BQN-CMSHx	219	220			HCS01-W0028	402	401	
MS2N05-B0BTN-CMSHx	223	224						
MS2N05-C0BTN-CMSHx	227	228			HCS01-W0028	402	401	
MS2N05-D0BRN-CMSHx	231	232			HCS01-W0008	102	101	
MS2N06-B1BNN-CMSHx	235	236			HCS01-W0028	402	401	
MS2N06-C0BTN-CMSHx	239	240						
MS2N06-D0BRN-CMSHx	243	244			HCS01-W0054	502	501	
MS2N06-D1BNN-CMSHx	247	248						
MS2N06-E0BRN-CMSHx	251	252						
MS2N07-B1BNN-CMSHx	255	256			HCS01-W0018	302	301	
MS2N07-C0BQN-CMSHx	259	260			HCS01-W0028	402	401	
MS2N07-C1BRN-CMSHx	263	264			HCS01-W0054	502	501	
MS2N07-D1BNN-CMSHx	269	270						
MS2N07-D0BHA-CMVHx	287	288	2 cables		HCS03-W0100	702	701	
MS2N07-D0BRN-CMVHx	295	296						
MS2N07-E1BNN-CMVHx	299	300						
MS2N07-E0BQN-CMVHx	297	298			HCS01-W0054	502	501	
MS2N10-C0BNN-CMVHx	289	290						
MS2N10-D0BHA-CMVHx	291	292			HCS03-W0100	702	701	
MS2N10-E0BHA-CMAHx	293	294						
MS2N10-E0BNA-CMAHx	301	302			-	-	-	
MS2N10-F1BHA-CMAHx	303	304			-	-	-	


The table lists motors that might not be used with this product.

¹⁾ Further related information ➔ Smart Function Kit Handling (SFK-H)

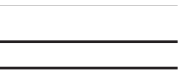
				Cable option						
	XCS2	Controller option		Without	Controller HCS / XCS2					
	MultiEthernet		1 cable			2 cables				
	CAT SOE		5 m		10 m	15 m	5 m	10 m	15 m	
	+ T0	+FSoE + M5								
	Safe torque off	Safe motion								
	Without	000	000	000	000	000	000	000	000	000
	XCS2-W0023	2100	2130		105	110	115	-	-	-
	XCS2-W0054	3100	3130							
	XCS2-W0023	2100	2130							
	XCS2-W0054	3100	3130							
	XCS2-W0023	2100	2130							
	XCS2-W0054	3100	3130							
	XCS2-W0070	4100	4130							
	XCS2-W0054	3100	3130							
	XCS2-W0070	4100	4130							
	XCS2-W0100	5100	5130							
	XCS2-W0100	5100	5130		-	-	-	205	210	215
	XCS2-W0150	7100	7130							

Motor/controller/cable combinations

Hybrid cable (power and encoder cable combined, 1 cable)



Motor	Drive controller	Technical data						
		Cable designation Part number	Cable weight (approx- imately) kg/m	Cable outside diameter D (mm)	Bending radius minimum Fixed installation Flexible installation		Bending cycle	
MS2N03-B0BYN-CMSHx	HCS01.1E-W0008	RH2-021DBB-NN-xxx,x	0.26	13.0 +/- 0.3	5 x D	7.5 x D	> 5 mill.	
MS2N06-B1BNN-CMSHx		5m R911372050 10m R911372052 15m R911372053						
MS2N03-D0BYN-CMSHx		HCS01.1E-W0018						
MS2N04-B0BTN-CMSHx								
MS2N04-C0BTN-CMSHx								
MS2N04-D0BQN-CMSHx								
MS2N05-B0BTN-CMSHx								
MS2N07-B1BNN-CMSHx								
MS2N05-C0BTN-CMSHx	HCS01.1E-W0028	5m R911372062 10m R911372064 15m R911372065						
MS2N05-D0BRN-CMSHx								
MS2N06-C0BTN-CMSHx								
MS2N06-D0BRN-CMSHx								
MS2N06-D1BNN-CMSHx								
MS2N07-C0BQN-CMSHx								
MS2N06-E0BRN-CMSHx	HCS01.1E-W0054	RH2-024DBB-NN-xxx,x						
MS2N07-C1BRN-CMSHx		5m R911374454 10m R911379794 15m R911379795						
MS2N07-D1BNN-CMSHx								
MS2N03-B0BYN-CMSHx	XCS2-W0023	RHB2-021DCB-NN-xxx,x						
MS2N03-D0BYN-CMSHx								
MS2N04-B0BTN-CMSHx								
MS2N04-C0BTN-CMSHx								
MS2N04-D0BQN-CMSHx								
MS2N05-B0BTN-CMSHx								
MS2N05-C0BTN-CMSHx								
MS2N05-D0BRN-CMSHx								
MS2N06-B1BNN-CMSHx								
MS2N06-C0BTN-CMSHx								
MS2N06-D1BNN-CMSHx								
MS2N07-B1BNN-CMSHx								
MS2N07-C0BQN-CMSHx								
MS2N06-D0BRN-CMSHx	XCS2-W0054	RHB2-022DCB-NN-xxx,x						
MS2N06-E0BRN-CMSHx		5m R914508036 10m R914508046 15m R914508052						
MS2N07-C1BRN-CMSHx								
MS2N07-D1BNN-CMSHx								





The table lists motors that might not be used with this product.



Motor/controller/cable combinations

Power and encoder cable separate, 2 cables

Motor	Drive controller	Technical data power cable						
		Cable designation Part number	Cable weight (approx- imately) kg/m	Cable outside diameter D (mm)	Bending radius minimum		Bending cycle	
					Fixed installation	Flexible installation		
MS2N07-D0BHA-CMVHx MS2N07-E1BNN-CMVHx	HCS01.1E-W0054	RL2-044DBB-NN-xxx,x 5m R911374900 10m R911379527 15m R911379528	0.23	12.2 +/- 0.5	5 x D	7.5 x D	> 5 mill.	
MS2N07-D0BRN-CMVHx MS2N10-C0BNN-CMVHx MS2N10-D0BHA-CMVHx	HCS01.1E-W0054	RL2-044EBB-NN-xxx,x 5m R911374902 10m R911384595 15m R911384596	0.33	14.8 +/- 0.5				
MS2N07-E0BQN-CMVHx	HCS03.1E-W0100	RL2-046EBB-NN-xxx,x 5 m R911376628 10m R911376666 15m R911376667						
MS2N10-E0BHA-CMAHx	HCS03.1E-W0100	RL2-066HBB-NN-xxx,x 5m R911373948 10m R911375037 15m R911375038	0.84	22.2 +/- 1.0				
MS2N07-D0BHA-CMVHx	XCS2-W0054	RLB2-042DBB-NN-xxx,x 5m R911397223 10m R911397225 15m R911397226	0.23	12.2 +/- 0.5	5 x D	7.5 x D	> 5 mill.	
MS2N07-E1BNN-CMVHx	XCS2-W0070	RLB2-042ECB-NN-xxx,x 5m R911396693 10m R911396695 15m R911396696	0.33	14.8 +/- 0.5				
MS2N07-D0BRN-CMVHx MS2N10-C0BNN-CMVHx	XCS2-W0054	RLB2-042GDB-NN-xxx,x 5m R911397170 10m R911397173 15m R911397174"	0.58	18.2 +/- 0.6				
MS2N10-D0BHA-CMVHx	XCS2-W0070	RLB2-063HDB-NN-xxx,x 5m R911395186 10m R911395188 15m R911395189"	0.84	22.2 +/- 1.0				
MS2N10-E0BHA-CMAHx	XCS2-W0100	RLB2-063JEB-NN-xxx,x 5m R911395201 10m R911395203 15m R911395204	1,2	25,5+/-1,0				
MS2N10-E0BNA-CMAHx	XCS2-W0100	RLB2-064JEB-NN-xxx,x 5m R914503275 10m R914503276 15m R914510782						
MS2N10-F1BHA-CMAHx	XCS2-W0150							

Technical data encoder cable							
	Cable designation Part number	Cable weight (approx- imately) kg/m	Cable outside diameter D (mm)	Bending radius minimum		Bending cycle	
				Fixed installation	Flexible installation		
	RG2-002AAB-NN-XXX,X 5 m R911371232 10m R911371935 15m R911371936	0.08	7.2 +/-0.2	4 x D	7.5 x D	> 5 mill.	
	RG2-007AAB-NN-XXX,X 5m R911382615 10m R911382617 15m R911382618						
	RG2-007AAB-NN-XXX,X 5m R911382615 10m R911382617 15m R911382618						

MS2N05 type designation / features (example)

		MS2N 05 - C 0 B N N - A S D H 0 - N N N N N - N N																		
1	Product																			
2	Size																			
3	Overall length																		Special version	17
4	Rotor inertia																		Other version	16
5	Winding																		Coating	15
6	Cooling type																		Format	14
7	Encoder performance																		Bearings	13
8	Encoder version																		Flange accuracy	12
9	Electrical connection																		Holding brake	11
																			Shaft	10

Description / options

1	Product	MS2N
2	Size	05
3	Overall length	B, C, D, E
4	Rotor inertia	0 = low inertia / 1 = mean inertia
5	Winding	BY = 9000 1/min / BT = 6000 1/min / BR = 4500 1/min / BQ = 4000 1/min BN = 3000 1/min / BH = 2000 1/min
6	Cooling type	N = self-cooling / A = external cooling axial 230 V/50 Hz
7	Encoder performance	Basic - 16 signal periods, Hiperface® = A Standard - 128 signal periods, Hiperface® (SIL2, PL d)= B Advanced - 20-bit, ACURO®Link (SIL2, PL d)= C Advanced - 20-bit, ACURO®Link (SIL2, PL e)= H
8	Encoder version	Single-turn - 1 revolution absolute = S Multi-turn - 4096 revolutions absolute = M
9	Electrical connection	Two-cable connection 2x M17, rotatable = D Single-cable connection M17, rotatable = H Single-cable connection M23, rotatable = S
10	Shaft	Smooth, without shaft seal ring = H / Smooth, with shaft seal ring = G Keyway, half-spine balancing without shaft seal ring = L Keyway, half-spine balancing with shaft seal ring = K
11	Holding brake	Without holding brake = 0 / size 1, electrically releasing = 1
12	Flange accuracy	Standard = N
13	Bearings	Standard bearing = N
14	Format	B5 / IM3001, PT1000 = N
15	Coating	Standard painting RAL 9005 black = N
16	Other version	None = N / Additional earthing connection = E / Sealing air connection = P
17	Special version	None = NN

► Further information on MS2N synchronous servo motors ► Chapter "Further information"

Type designation controller HCS01 (example)

		HCS 01 . 1 E - W 0013 - A - 02 - E - S3 - EC - NN - NN - NN - FW									
1	Product										
2	Series										
3	Version										
4	Power supply unit										Firmware 14
5	Cooling type										Other version 13
6	Maximum current										Interface 3 12
7	Protection class										Interface 2 11
8	Mains connection voltage										Interface 1 10
											Control component / communication design 9

Description / options

1	Product	HCS
2	Series	01
3	Version	1
4	Power supply unit	E = infeed
5	Cooling type	W = air, internal
6	Maximum current	02:0003 = 3 A / 0006 = 6 A / 0009 = 9 A / 0013 = 13 A / 0018 = 18 A 03: 0005 = 5 A / 0008 = 8 A / 0018 = 8 A / 0028 = 28 A / 0054 = 54 A
7	Protection class	A = IP20
8	Mains connection voltage	02 = 3 x AC 110...230 V / 03 = 3 x AC 200...500 V
9	Control component version Communication	A-CC = Advanced Sercos III Master / B-ET = Basic Multi-Ethernet/ E-S3 = Economy Sercos III
11	Interface 1	EC = Encoder IndraDyn / Hiperface / 1VSS / TTL / Endat 2.1/2.2
12	Interface 2	CN = CANopen / EC = Multi-encoder interface / EM = Encoder emulation / ET = Multi-Ethernet NN = Not equipped / PB = PROFIBUS
13	Interface 3	L3 = STO (Safe Torque Off) L4 = STO (Safe Torque Off) and SBC (Safe Brake Control) NN = Not equipped / S4 = Safe Motion
14	Other version	NN = None
15	Firmware	

► Further information on the controller ➡ Chapter "Further information"

Type designation controller XCS2 (example)

	XCS2	-	W	0100	A	B	N	-	01	N	ET	T0	EC	NN	-	S	03	RS	N	1	NNN	N	0	NN		
1	Product																								Other Version	21
2	Cooling type																								Range of functions SM	20
3	Maximum current																								Range of functions RT	19
4	Protection class																								Technology function	18
5	Power unit options																								Protocol - communication	17
6	Connector set																								Subject to export approval	16
7	Control component																								Runtime release	15
8	Panel																								Runtime version	14
9	Communication																								Runtime type	13
10	Hardware option 1																								Hardware option 3	12
11	Hardware option 2																									

Description / options

1	Product	1: X = ctrlX DRIVE / 2: C = converter, feed-in / 3: S = single axis / 4: 2 = generation 2; 1 = generation 1
2	Cooling type	W = air, internal
3	Maximum current	0100 = 100 A (example) / 23, 54, 70, 100 ...
4	Protection class	A = IP20, 3 x AC 200...500 V
5	Power unit options	B = Brake transistor (XCS ≥ W0100) / R = Brake transistor/brake resistor integrated (XCS ≤ W0070)
6	Connector set	N = Without motor connector set
7	Control component	01 = ctrlX DRIVE / 02 = ctrlX DRIVEplus
8	Panel	N = Without panel / A = With panel
9	Communication	ET = Multi-Ethernet (RJ45) / X3 = ctrlX Core
10	Hardware option 1	T0 = Safe Torque Off (STO) / M5 = SafeMotion (M5)
11	Hardware option 2	EC = Multi-encoder interface / NN = Not equipped
12	Hardware option 3	ET = Multi-Ethernet / DA = I/O extension digital/analog / NN = Not equipped
13	Runtime type	S = Standard
14	Runtime version	02 = Version 02 (XCS1) / 03 = Version 03 (XCS2)
15	Runtime release	RS = Current release
16	Subject to export approval	N = No (maximum output frequency < 599 Hz)
17	Protocol - communication	0 = Defined via ctrlX CORE apps (XCS2) 1 = Sercos III / 2 = EtherCAT (SoE) / 4 = PROFINET IO
18	Technology function	NNN = None TF1 = Install technology apps (XCS2) TE1 = Install/program technology apps (XCS2) TX1 = Install/program technology apps incl. LIBs (Bosch Rexroth libraries) (XCS2)
19	Range of functions RT	N = DRIVE Runtime P = DRIVE Runtime Productivity
20	Range of functions SafeMotion	0 = Hardware option / 1 ≠ SafeMotion 3 = SafeMotion Speed / 5 = SafeMotion Position
21	Other Version	NN = No

► Further information on the controller ➡ Chapter "Further information"

Mains filter



Controller / mains filter option						
Controller	Option		Weight (kg)	Mains filter		Material number
				Option	Weight (kg)	
HCS01-W0008	100 / 101 / 102	1.3	NFD03.1-480-007	007	0.88	R911286917
HCS01-W0018	300 / 301 / 302	2.1	NFD03.1-480-007	007	0.88	R911286917
HCS01-W0028	400 / 401 / 402	2.1	NFD03.1-480-016	016	1.00	R911286918
HCS01-W0054	500 / 501 / 502	4.6	NFD03.1-480-030	030	1.67	R911286919
HCS03-W0100	700 / 701 / 702	8.0	NFD03.1-480-055	055	2.21	R911286920
CtrlX Drive XCS2-W0023A	2100 / 2130	3.0	NFD03.1-480-016	016	1.00	R911286918
	2160 / 2161					
CtrlX Drive XCS2-W0054A	3100 / 3130	6.3	NFD03.1-480-030	030	1.67	R911286919
	3160 / 3161					
CtrlX Drive XCS2-W0070A	4100 / 4130	6.3	NFD03.1-480-055	055	2.21	R911286920
CtrlX Drive XCS2-W0100A	5100 / 5130	18.1	NFD03.1-480-055	055	2.21	R911286920

Mains filter option

Assembly	R039949992
----------	------------

Option	Material number	Type
000	Without mains filter	
001	Only CMS: with mains filter	
007	R911286917	NFD03.1-480-007 = 7 A
016	R911286918	NFD03.1-480-016 = 16A
030	R911286919	NFD03.1-480-030 = 30A
055	R911286920	NFD03.1-480-055 = 55A
100	R911383506	XNF1-1A-0100N = 100A

► Further information on the controller ► Chapter "Further information"

Switching system

Socket-connector

Notes:

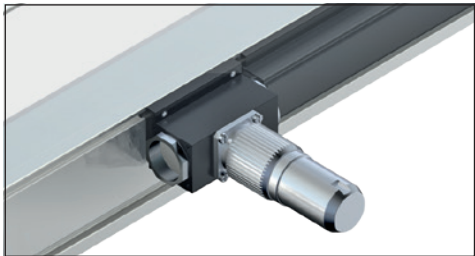
The socket and connector are not pre-wired.

This allows optimal assignment of switch activation points during commissioning.

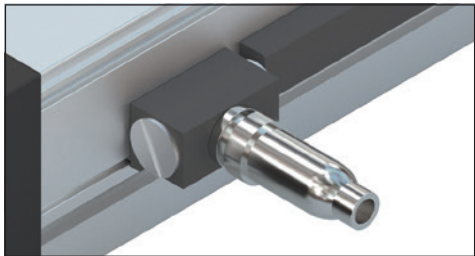
One connector is included.

The connector can be mounted in three directions.

For further information, see the section "Socket-connector".



Socket-connector	
Compact module	Material number
CKK/CKR: 070	R117560102
CKK/CKR: 090, 110, 145	R037540000



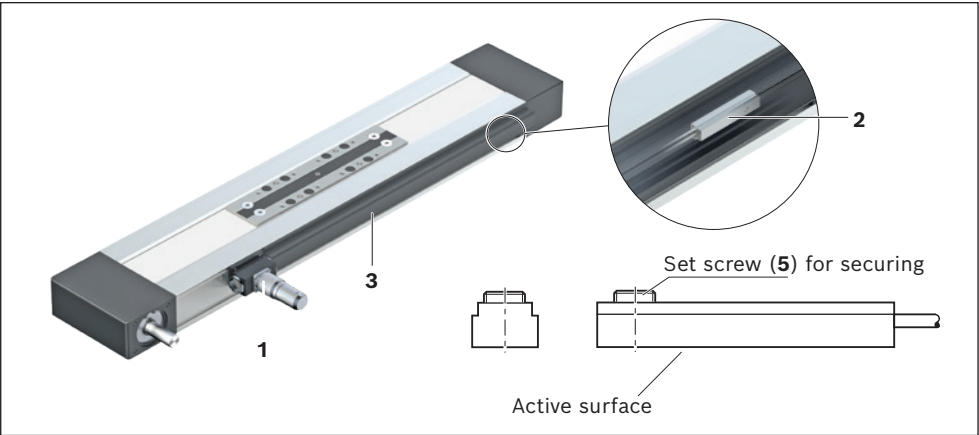
Socket-connector	
Compact module	Material number
CKK/CKR: 200	R037540000

Overview of attachment variants

Magnetic sensor with free cable end

- 1 Socket and connector
- 2 Sensor
- 3 Cable duct

Alternatively, the sensor can also be fastened by switch mounting plate and cable holder. See the magnetic sensor with connector.



Attachment/actuation

A cable duct is needed to fasten the sensors and for cable routing. This is suspended at the side in a slot at the compact module and fastened with set screws (4).

The set screws are included.

The sensors are pushed into the upper T-slot (CKK/CKR-090,-110 and CKK-145) or into the lower T-slot (CKR-145, CKK/CKR-200) of the cable duct and secured with set screws (5). Switch activation is done by magnets in the carriage.

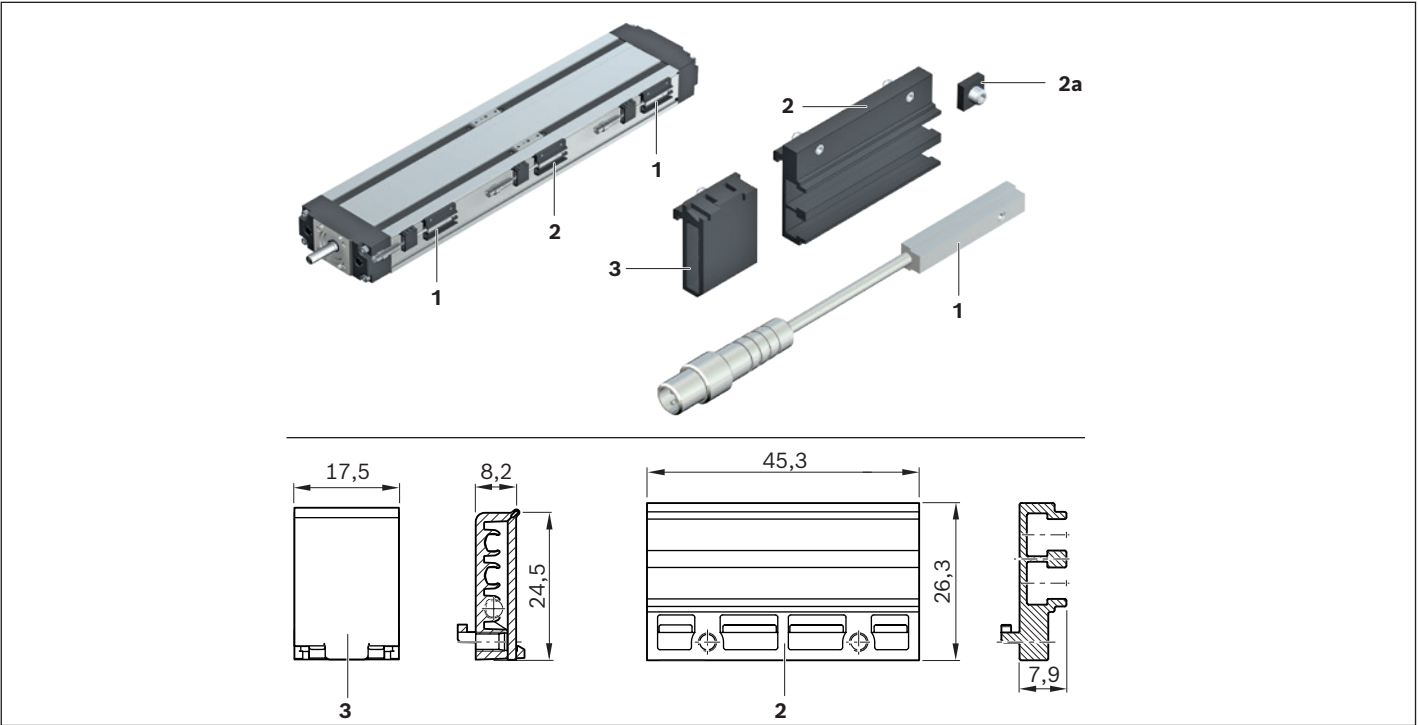
CKK/CKR-070	CKK/CKR-090 CKK/CKR-110 CKK-145	CKR-145	CKK/CKR-200

Cable duct		
Compact module	Material number	Length calculation
CKK/CKR: 070	R039662026	$L_K = L - 5$
CKK: 090, 110, 145, 200	R039662018	$L_K = L - 5$
CKR: 090, 110, 145, 200	R039662018	$L_K = L - 10$

L_K = Length of the cable duct (mm)
 L = Length of the linear motion system (mm)

Magnetic sensor with connector

- 1
- Sensor (Material number see chapter sensors and accessories)
- 2
- Switch mounting plate including set screws (loose) and square nut **(2a)** (Material number R037530021)
- 3
- Cable holder including set screw (loose) (Material number R037530022)



Attachment/actuation

A switch mounting plate (2) is required to fasten the sensors. This is suspended in the slot on the compact module and fastened with set screws (4). The sensors are pushed into the respective slot on the switch mounting plate and secured with one set screw. The square nut with set screw (2a) serves as a positive stop for the sensor (switch activation point when changing sensors). Parts are included in the scope of delivery of the sensor mounting kit. Switch activation is done by magnets in the carriage.

CKK/CKR-070	CKK/CKR-090, -110, CKK-145	CKR-145	CKK/CKR-200

Magnetic sensor with connector (only for CKK/CKR -280)

- 1 Sensor (Material number see chapter sensors and accessories)
- 2 Cable duct $L_K = XX \text{ mm}$ (R039662017)
- 3 Clamping screw
- 4 Sliding block (R117509008)

Attachment/actuation

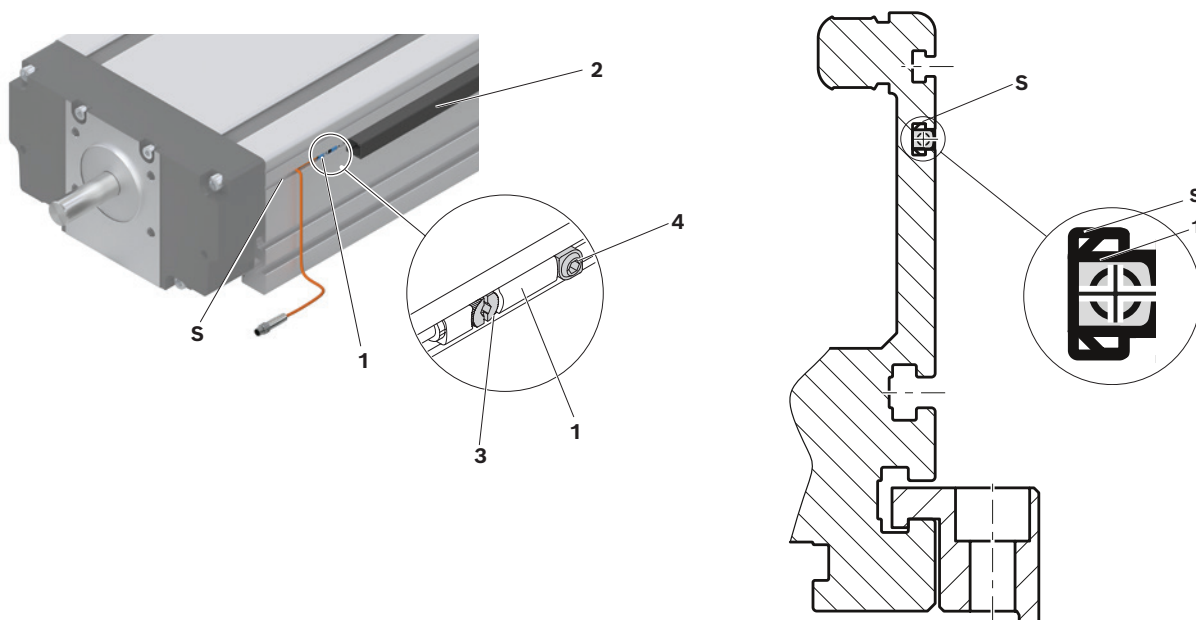
The switch activator is a magnet (on both sides) that is integrated in the carriage (no switching cam necessary).

The switch activation points can be positioned anywhere along the stroke.

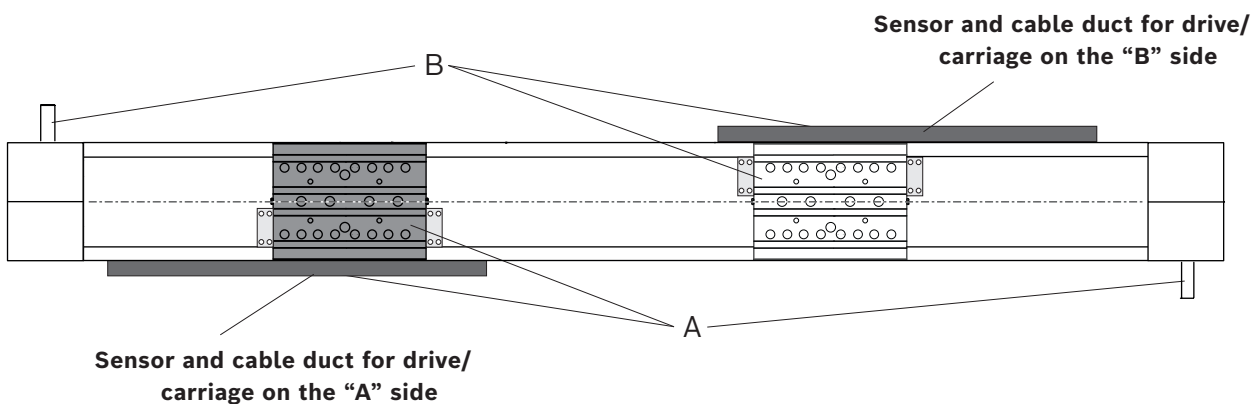
The magnetic sensor is positioned in the corresponding sensor slot (S) and fixed by turning the clamping screw (3)

The sliding block (4) is not necessarily required for mounting, it is only required for repeatable mounting of the sensor.

CKK/CKR -280



For the CKR-280-DB (Compact Module CKR with 2 motor attachments), a switching system (sensor/cable duct) for each drive/carriage must be mounted on each side of the frame.

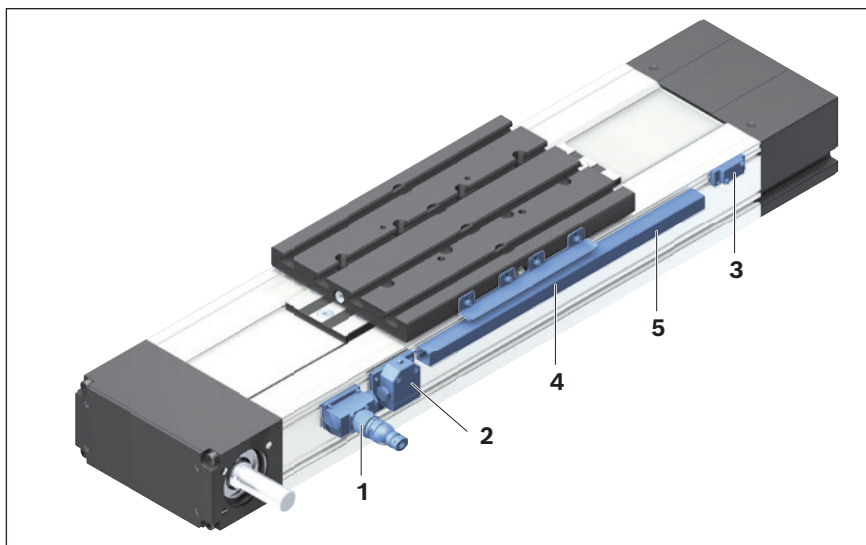


Inductive sensors and mechanical switches for CKK/CKR-200

- 1 Socket and connector
- 2 Mechanical switch (with attachments)
- 3 Inductive sensor (with attachments)
- 4 Switching cam (attachment only at the connection plate)
- 5 Cable duct

Alternatively, the connection line of the switches can also be fastened by cable holder.

See "Switching system".

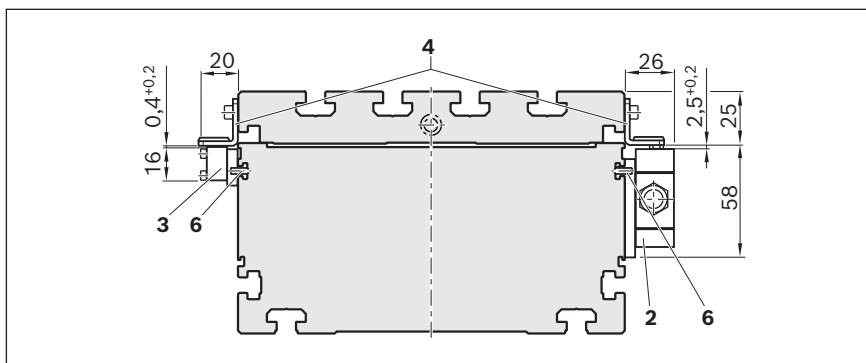


Attachment/actuation

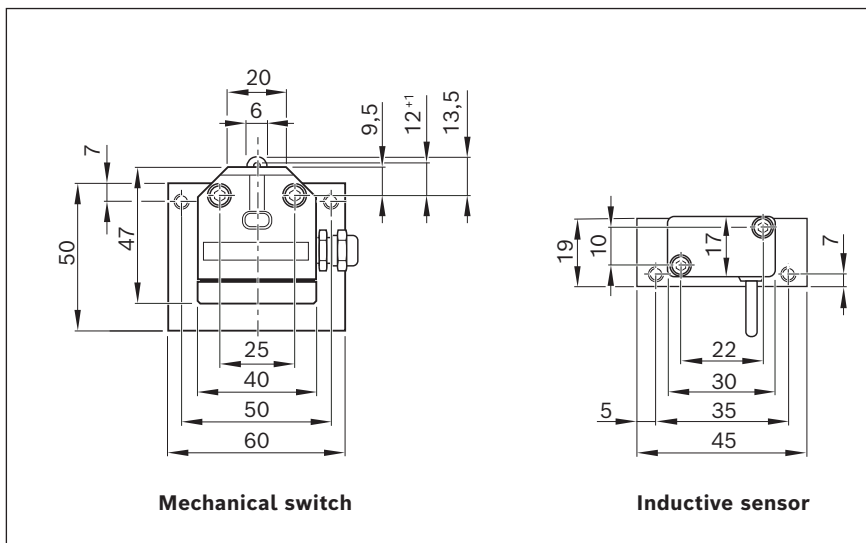
The switches are suspended in the upper slot on the compact module and fastened with set screws (6).

The actuation is done using switching cams (4). This is fastened with the screws to the connection plate.

Fastening screws are included.



Switch with attachment

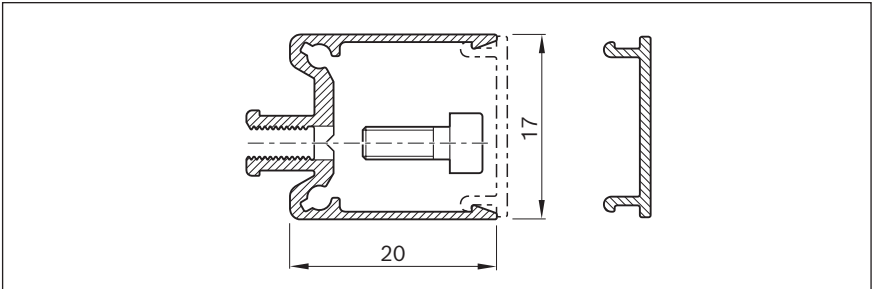


Cable duct

The cable duct is fastened in the lateral slots of the frame. Fastening screws widen the profile and ensure that the cable duct is securely mounted.

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

Fastening screws are included.



Cable duct

Compact module	Length calculation
CKK 200	$L_K = L - 5$
CKR 200	$L_K = L - 10$

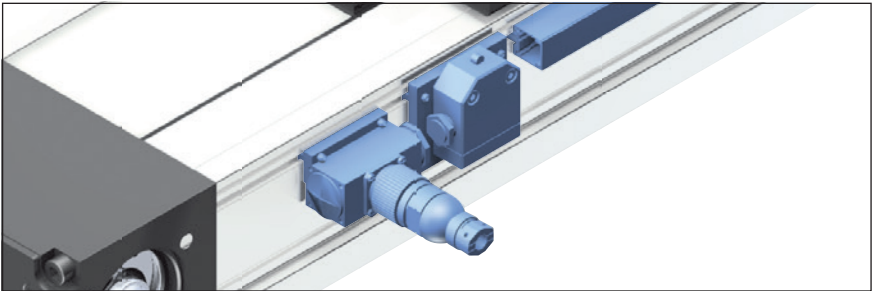
L_K = Length of the fastening and the cable duct (mm)
 L = Length of the linear motion system (mm)

Socket-connector

Notes:

The socket and connector are not pre-wired. This allows optimal assignment of switch activation points during commissioning. One connector is included.

The connector can be mounted in three directions.



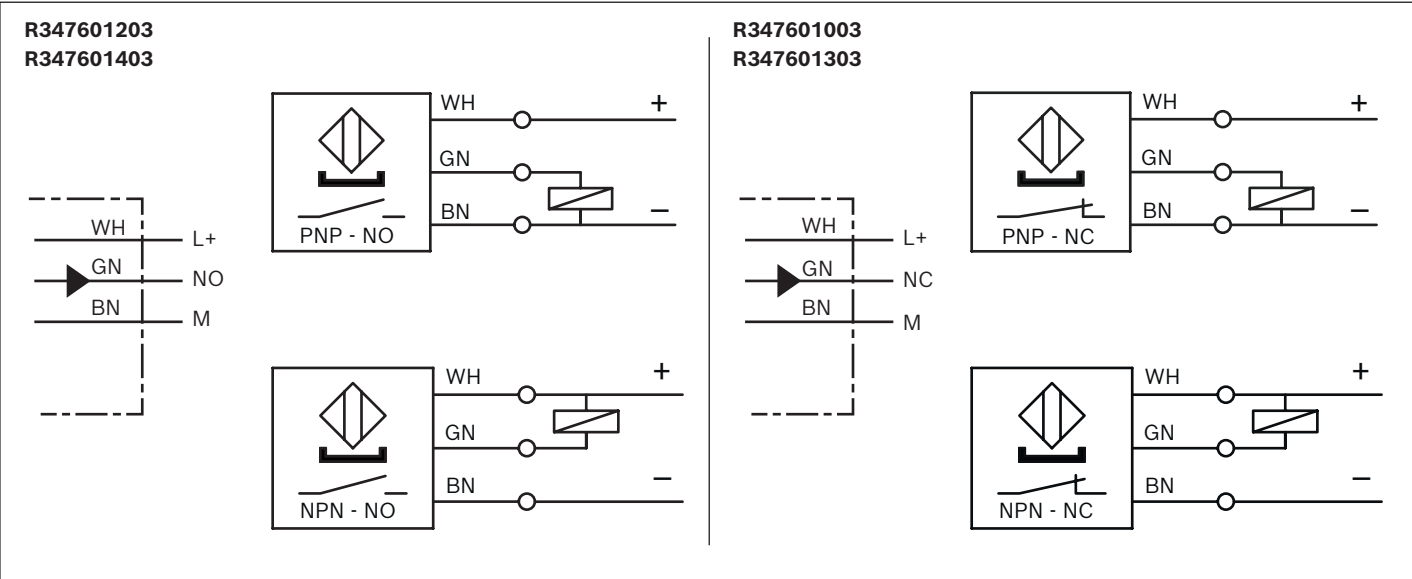
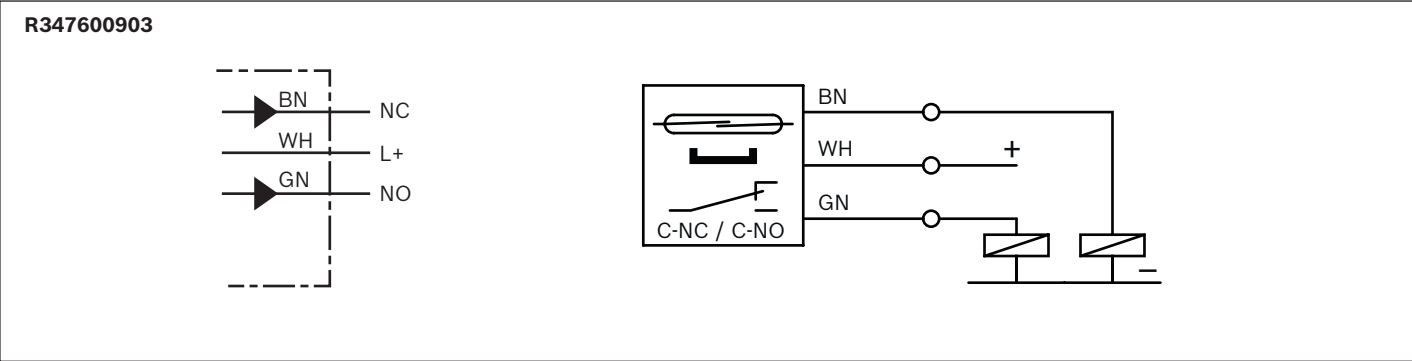
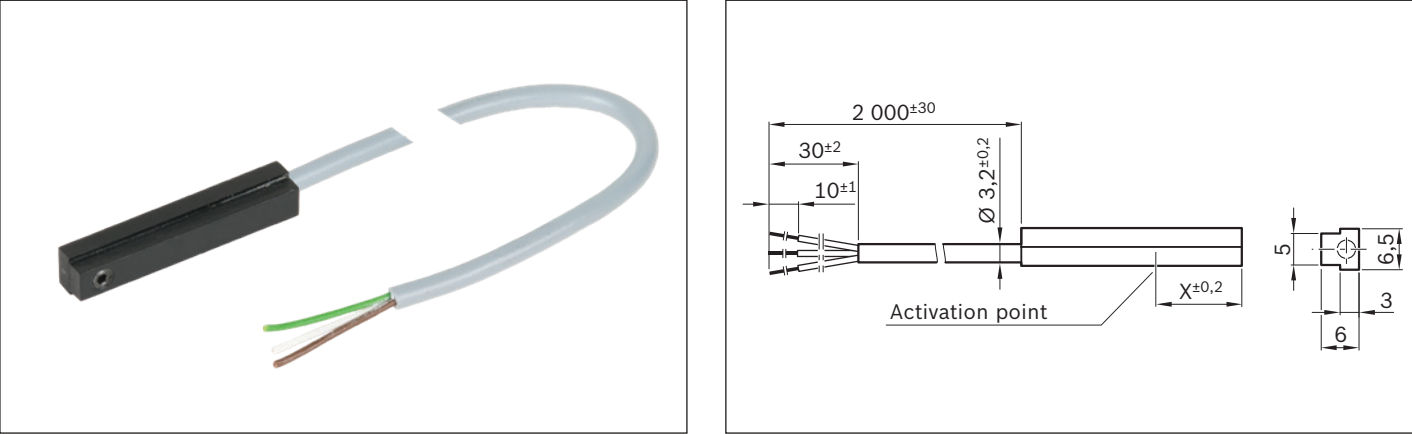
Switches and attachments

Item		Material numbers
1	Socket-connector	R117500153
2	Mechanical switch	See the chapter on sensors and accessories
	– Attachments without switch	R117500165
3	Inductive sensor	See the chapter on sensors and accessories
	– Attachments without sensor	R117500152
4	Switching cam ¹⁾	R117500150
5	Cable duct $L_K = XX$ mm	R039662017

¹⁾ Size 200 switching cam attachment is only possible on connection plate, otherwise customer-designed solution.

Sensors

Magnetic sensor with free cable end



Material number R347600903

Use	Reference, limit switch
Material number	R347600903
Designation	R12212
Functional principle	magnetic
Operating voltage	max. 30 V DC
Load current	500 mA
Switching function	REED/changeover contact: (NC: C+NC, NO: C+NO)
Activation point (dimension "X")	9 mm

Material numbers R347601003 / R347601203 / R347601403 / R347601303

Use	Limit switch	Reference switch	Limit switch	Reference switch
Material number	R347601003	R347601203	R347601303	R347601403
Designation	H14118	H15637	H15638	H15080
Functional principle	magnetic			
Operating voltage	3.8 - 30 V DC			
Load current	≤ 20 mA			
Switching function	Hall PNP/NC	Hall PNP/NO	Hall NPN/NC	Hall NPN/NO
Activation point dimension "X"	13.65 mm			

Technical data for R347600903 / R347601003 / R347601203 / R347601403 / R347601303

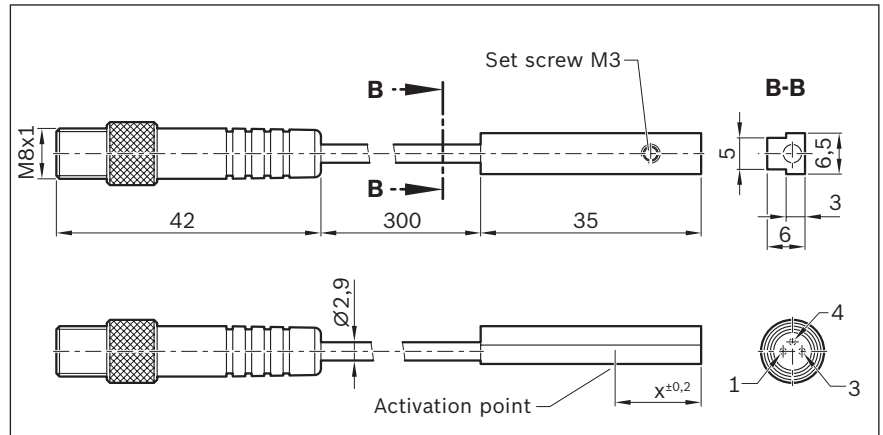
Connection type	Cable 2.0 m, 3-pin
Galvanized connection ends	✓
Function indicator	—
Short-circuit protection	—
Reverse polarity protection	—
Switch-on suppression	—
Switching frequency	2.5 kHz
Pulse elongation (off delay)	—
Max. permissible starting speed	2 m/s
Suitable for drag chains¹⁾	—
Torsion-resistant¹⁾	—
Welding spark-resistant*	—
Cable cross-section*	3 x 0.14 mm ²
Cable diameter D	3.2 ±0.20 mm
Static bending radius¹⁾	—
Dynamic bending radius¹⁾	—
Bending cycles¹⁾	—
Maximum permissible travel speed¹⁾	—
Max. permissible acceleration¹⁾	—
Ambient temperature	-40 °C to +85 °C
Protection class	IP66
MTTFd (per EN ISO 13849-1)	—
Certifications and approvals²⁾	—

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

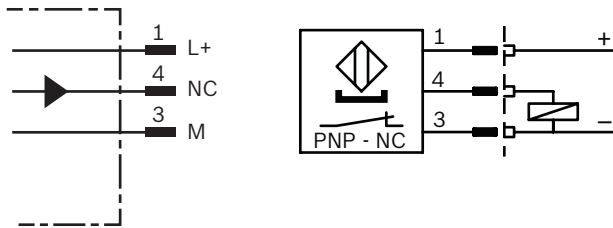
The available extension cables offer even better performance, e.g., when using a cable drag chain (see following pages).

²⁾ No (CCC) certificate is required to introduce these products to the Chinese market.

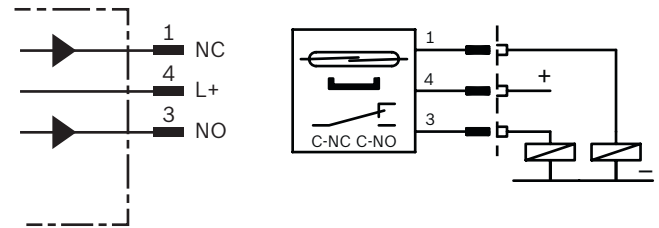
Magnetic sensor with M8x1 connector



R347602403



R347602303



Material numbers/technical data

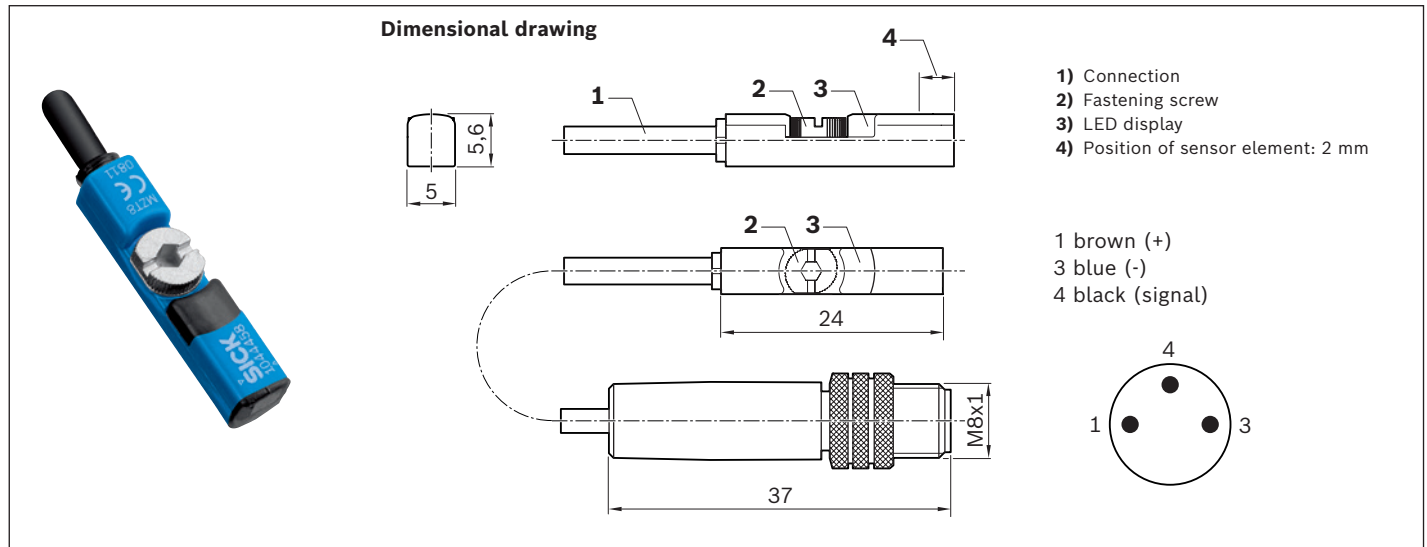
Use	Reference / limit switch	Limit switch
Material number	R347602403	R347602303
Designation	H10706	R10705
Functional principle	magnetic	
Operating voltage	3.8 - 30 V DC	30 V DC
Load current	≤ 20 mA	500 mA
Switching function	Hall PNP/NC	REED/single-pole changeover (NC: C+NC, NO: C+NO)
Activation point dimension "X"	13.65 mm	9 mm
Connection type	0.3 m cable and M8x1 connector, 3-pin with knurled screw connection	
Function indicator	—	
Short-circuit protection	—	
Reverse polarity protection	—	
Switch-on suppression	—	
Switching frequency	2.5 kHz	
Pulse elongation (off delay)	—	
Max. permissible starting speed	2 m/s	
Suitable for drag chains¹⁾	—	
Torsion-resistant¹⁾	—	
Weld spark-resistant¹⁾	—	
Cable cross-section¹⁾	3 x 0.14 mm ²	
Cable diameter D¹⁾	3.2 ±0.20 mm	
Static bending radius¹⁾	—	
Dynamic bending radius¹⁾	—	
Bending cycles¹⁾	—	
Maximum permissible travel speed¹⁾	—	
Max. permissible acceleration¹⁾	—	
Ambient temperature	-40 °C to +85 °C	
Protection class	IP66	
MTTFd (per EN ISO 13849-1)	—	
Certifications and approvals²⁾	—	

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

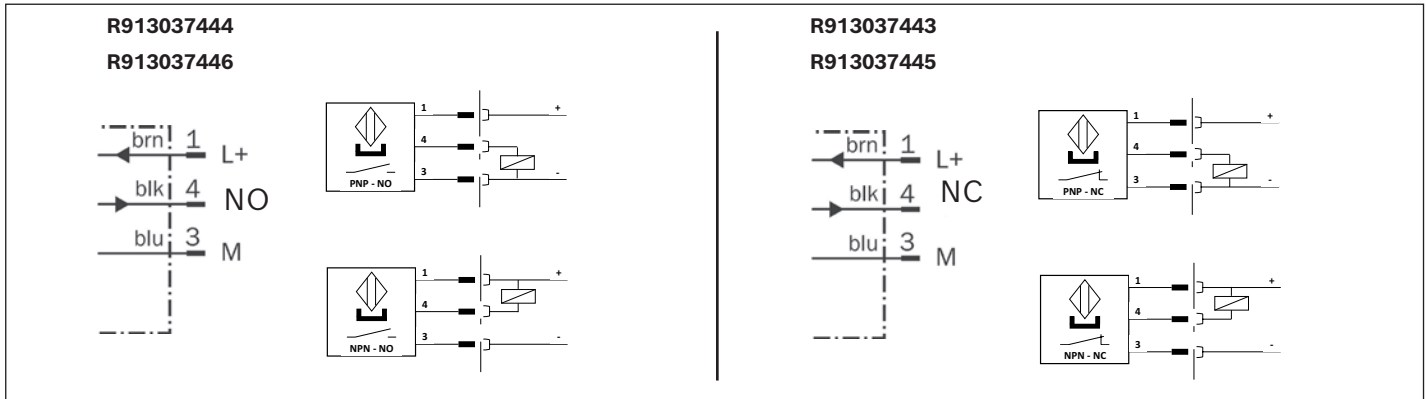
The available extension cables offer even better performance, e.g., when using a cable drag chain (see following pages).

²⁾ No (CCC) certificate is required to introduce these products to the Chinese market.




Magnetic switches with M8x1 connector (only for CKK/CKR-280)




Connection diagram



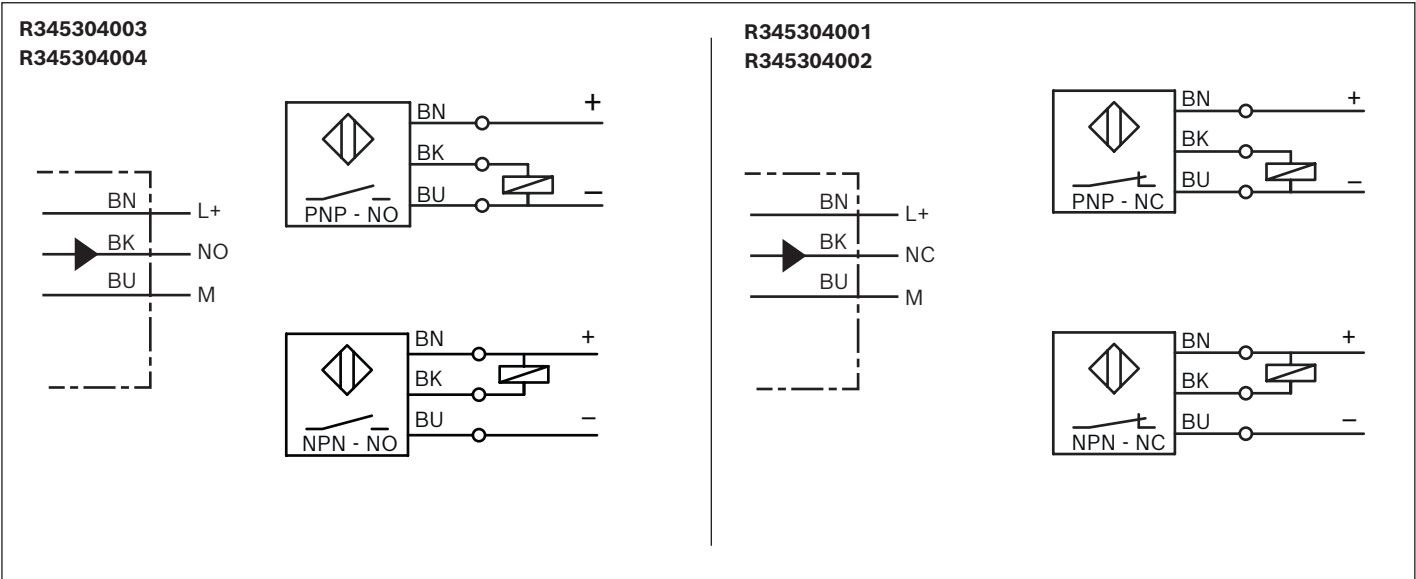
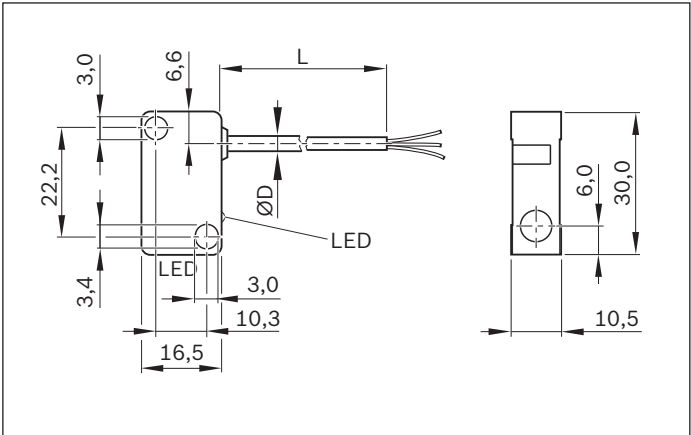
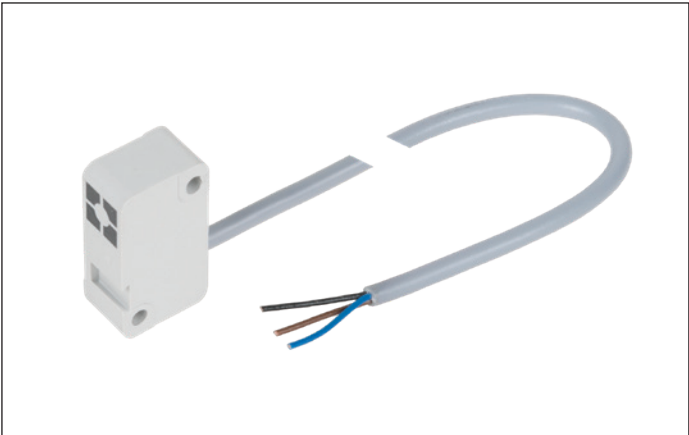
Material numbers / technical data

Use	Limit switch	Reference switch	Limit switch	Reference switch
Material number	R913037445	R913037444	R913037443	R913037446
Designation	MZT8-03VPO-KRDS14	MZT8-03VPS-KRDS13	MZT8-03VNO-KRDS16	MZT8-03VNS-KRDS15
Functional principle	Magnetic			
Operating voltage	10 - 30 VDC			
Load current	≤ 200 mA			
Switching function	PNP/NC	PNP/NO	NPN/NC	NPN/NO
Connection type	0.5 m cable and M8x1 plug, 3-pin with knurled screw connection			
Function indicator	✓			
Short-circuit protection	✓			
Reverse polarity protection	✓			
Switch-on suppression	✓			
Switching frequency	3 kHz			
Pulse elongation (off delay)	20 ms			
Max. permissible starting speed	5 m/s			
Suitable for drag chains*	✓			
Torsion-resistant*	✓			
Welding spark-resistant*	—			
Cable cross-section*	3x0.14 mm ²			
Cable diameter D*	2.9 ±0.15 mm			
Static bending radius*	≥ 5xD			
Dynamic bending radius*	≥ 10xD			
Bending cycles*	> 2 Mio.			
Max. permissible travel speed*	5 m/s			
Max. permissible acceleration*	≤ 5 m/s ²			
Ambient temperature	-30 °C to +80 °C			
Protection class	IP 68			
MTTFd (per EN ISO 13849-1)	MTTFd = 2,339.0 years			
Certifications and approvals**	  			




*) Technical data only for the cast-on connection line (0.5 m) on the magnetic sensor. Available extension cables offer even more performance, e.g. for use in a cable drag chain (see below).

**) No certificate for import to the  Chinese market required for these products. Document "Sales information CCC" available on request.

Inductive sensor with free line end



Material numbers/technical data

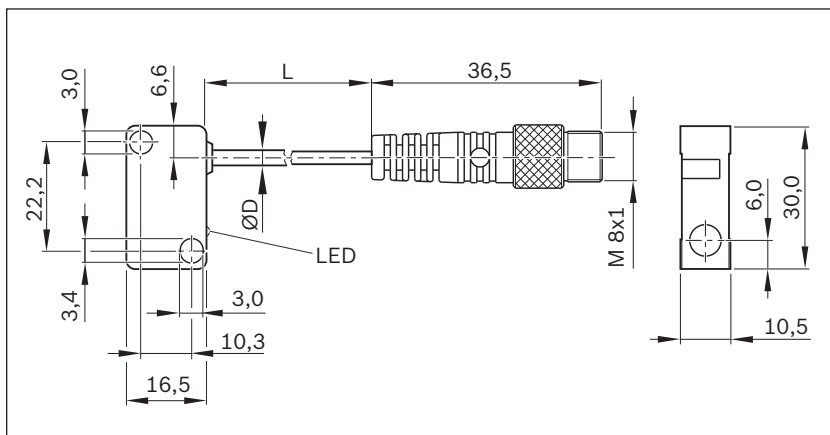
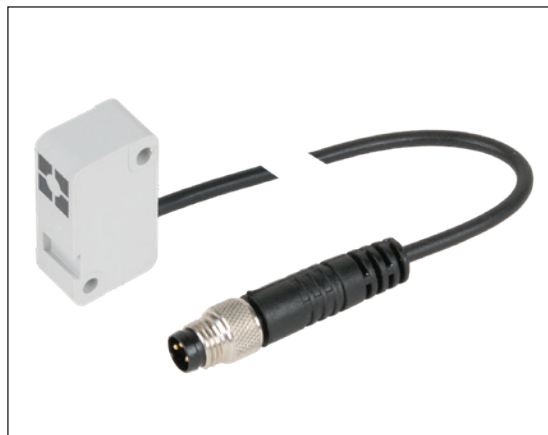
Use	Limit switch	Reference switch	Limit switch	Reference switch
Material number	R345304001	R345304003	R345304002	R345304004
Designation	BES 517-351-NO-C-03	BES 517-398-NO-C-03	BES 517-352-NO-C-03	BES 517-399-NO-C-03
Functional principle	inductive			
Operating voltage	10–30 V DC			
Load current	≤ 200 mA			
Switching function	PNP/NC	PNP/NO	NPN/NC	NPN/NO
Connection type	Line 3 m, 3-pin, free line end			
Function indicator	✓			
Short-circuit protection	✓			
Reverse polarity protection	✓			
Switching frequency	2.5 kHz			
Max. perm. starting speed	depending on the length of the switching cam			
Suitable for drag chains ¹⁾	—			
Torsion-resistant ¹⁾	—			
Weld spark-resistant ¹⁾	—			
Cable cross-section ¹⁾	3 x 0.14 mm ²			
Cable diameter D ¹⁾	3.5 ±0.15 mm			
Static bending radius ¹⁾	12 mm			
Dynamic bending radius 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⁾	  			

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

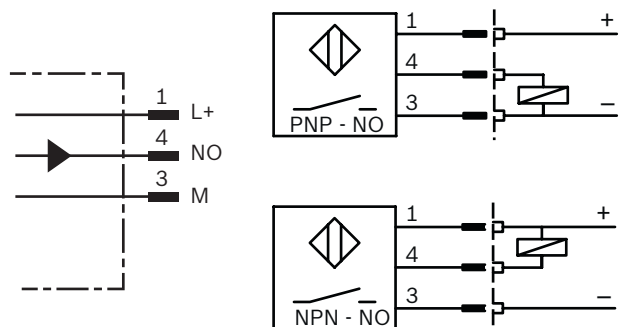
The available extension cables offer even better performance, e.g., when using a cable drag chain (see following pages).

²⁾ No (CCC) certificate is required to introduce these products to the Chinese market.

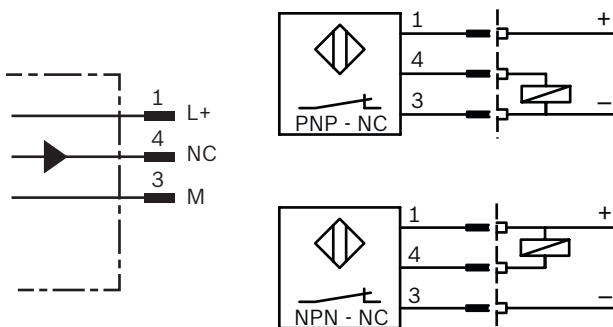
Inductive sensor with M8x1 connector






R901420156
R901420158



R901420149
R901420152




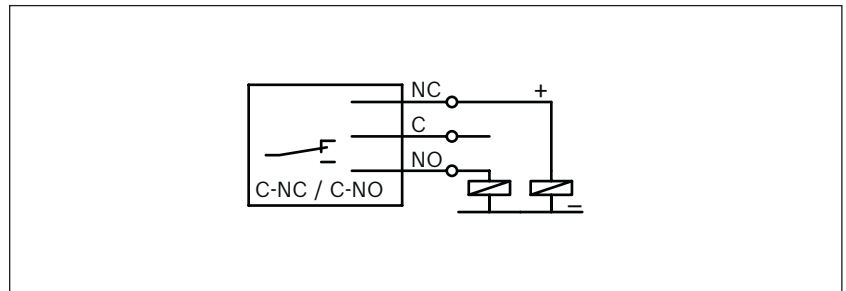
Material numbers/technical data








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	inductive			
Operating voltage	10–30 V DC			
Load current	≤ 200 mA			
Switching function	PNP/NC	PNP/NO	NPN/NC	NPN/NO
Connection type	Cable 0.2 m and connector M8 x 1, 3-pin with knurled screw			
Function indicator	✓			
Short-circuit protection	✓			
Reverse polarity protection	✓			
Switching frequency	2.5 kHz			
Max. permissible starting speed	depending on the length of the switching cam			
Suitable for drag chains ¹⁾	—			
Torsion-resistant ¹⁾	—			
Weld spark-resistant ¹⁾	—			
Cable cross-section ¹⁾	3x0.14 mm ²			
Cable diameter D ¹⁾	3.5 ±0.15 mm			
Static bending radius ¹⁾	12 mm			
Dynamic bending radius ¹⁾	12 mm			
Bending cycles ¹⁾	—			
Ambient temperature	-40 °C to +70 °C			
Protection class	IP65			
MTTFd (per EN ISO 13849-1)	MTTFd = 830 years		MTTFd = 585 years	
Certifications and approvals ²⁾	<div><div></div><div></div><div></div></div>			

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

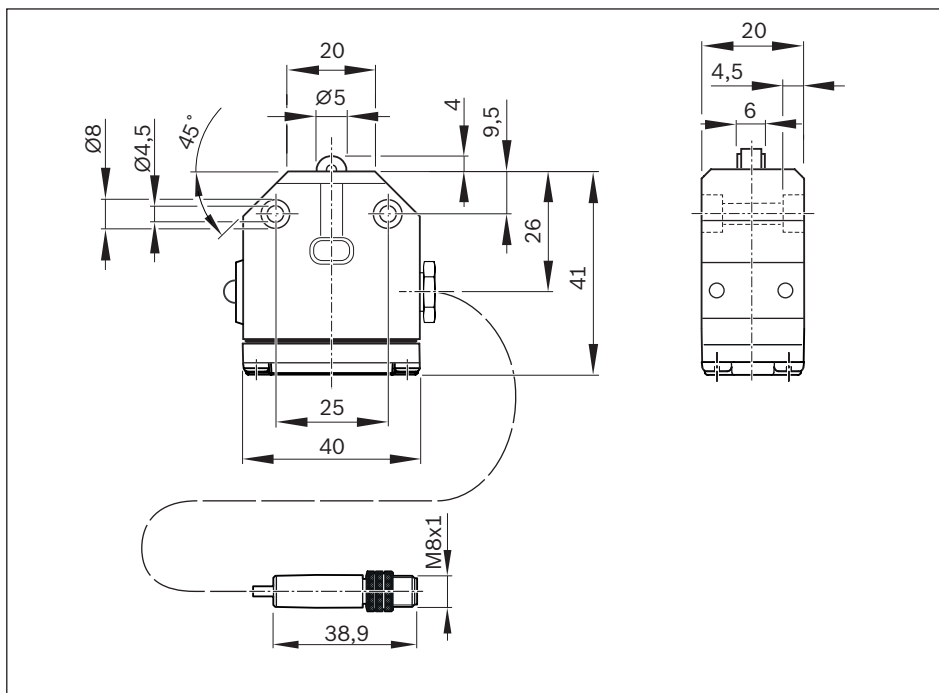
The available extension cables offer even better performance, e.g., when using a cable drag chain (see following pages).

²⁾ No  certificate is required to introduce these products to the Chinese market.

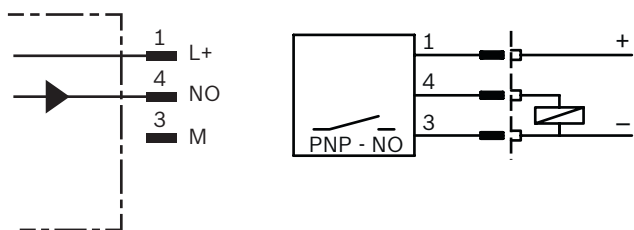


Material numbers/technical data		
Use	Limit switch	
Material number	R345304016 ¹⁾	R347600305 ²⁾
Designation	BNS 819-X496-99-R-11	BNS 819-X510-99-R-10
Functional principle	mechanical, roller	
Operating voltage	250 V AC	
Load current	≤ 5 A	
Switching function	single-pole changeover/ (NC: C+NC, NO: C+NO)	
Connection type	Screw connection, without line	
Function indicator	–	
Switching frequency	3.3 Hz	
Max. permissible starting 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	   	

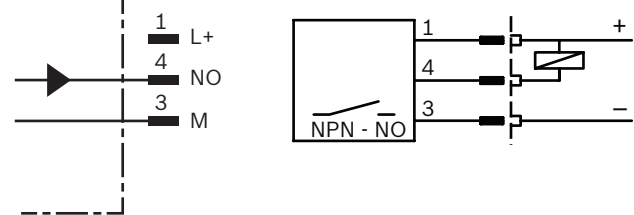
Mechanical switch with M8x1 connector



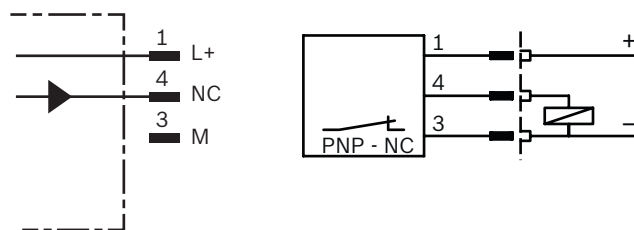
R913048214



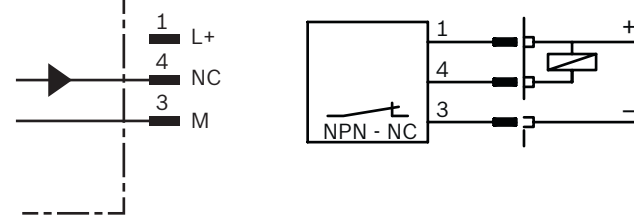
R913048216






R913048215



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/NC	PNP/NO	NPN/NC	NPN/NO
Connection type	Cable 0.2 m and connector M8 x 1, 3-pin with knurled screw			
Function indicator	—			
Short-circuit protection	—			
Reverse polarity protection	—			
Switching frequency	3.3 Hz			
Max. perm. starting speed	1 m/s			
Suitable for drag chains¹⁾	—			
Torsion-resistant¹⁾	—			
Weld spark-resistant¹⁾	—			
Cable cross-section¹⁾	3x0.14 mm ²			
Cable diameter D¹⁾	4.3 ±0.2 mm			
Static bending radius¹⁾	12 mm			
Dynamic bending radius¹⁾	12 mm			
Bending cycles¹⁾	—			
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 approvals²⁾	  			


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

The available extension cables offer even better performance, e.g., when using a cable drag chain (see following pages).

²⁾ No  certificate is required to introduce these products to the Chinese market.

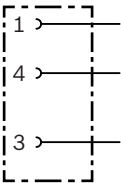
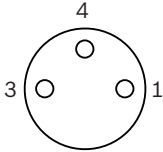
Extensions

Assembled on one end

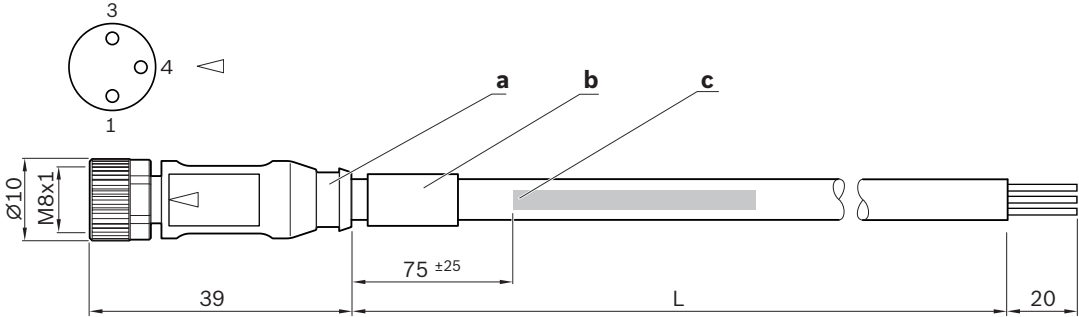


Connection diagram

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



Dimensional drawing

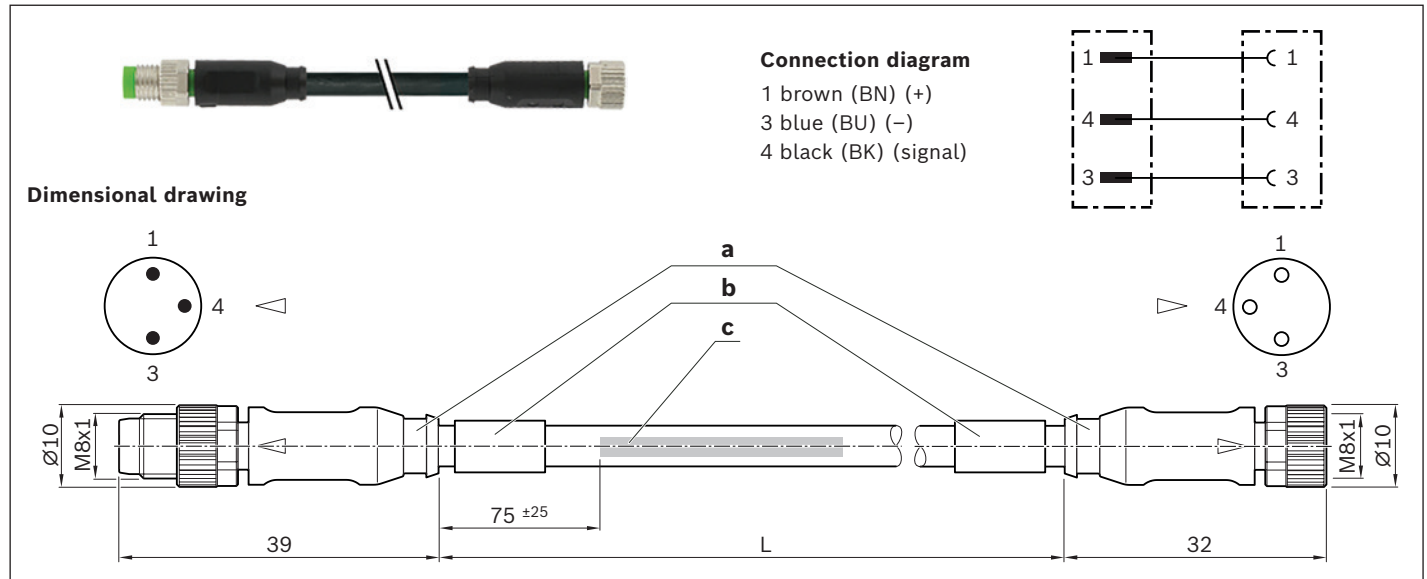


Material numbers

Use	Extension cable		
Material number	R911344602	R911344619	R911344620
Designation	7000-08041-6500500	7000-08041-6501000	7000-08041-6501500
Length (L)	5.0 m	10.0 m	15.0 m
Connection type 1	Female connector, straight, M8x1, 3-pin		
Connection type 2	Unassembled cable end		

- a) Contour for 6.5 mm corrugated tube (inner diameter)
b) Cable grommet
c) Cable printing per printing specification

Assembled on two sides



Material numbers

Use	Extension cable				
Material number	R911344621	R911344622	R911344623	R911344624	R911344625
Designation	7000-88001-6500050	7000-88001-6500100	7000-88001-6500200	7000-88001-6500500	7000-88001-6501000
Length (L)	0.5 m	1.0 m	2.0 m	5.0 m	10.0 m
Connection type 1	Female connector, straight, M8x1, 3-pin				
Connection type 2	Connector, straight, M8x1, 3-pin				

Technical data for extensions pre-assembled on one or two sides


Function indicator	–
Operating voltage indicator	–
Operating voltage	10–30 V DC
Type of cable	PUR black
Suitable for drag chains	✓
Torsion-resistant	✓
Weld spark-resistant	✓
Cable cross-section	3x0.25 mm ²
Cable diameter D	4.1 ±0.2 mm
Static bending radius	≥ 5xD
Dynamic bending radius	≥ 10xD
Bending cycles	> 10 mil.
Max. permissible travel speed	3.3 m/s for 5 m travel range (typ.), up to 5 m/s for 0.9 m travel range
Max. permissible acceleration	≤ 30 m/s ²
Ambient temperature fixed ext.	-40°C to +85°C
Ambient temperature flexible ext.	-25°C to +85°C
Protection class	IP68
Certifications and approvals	    

a) Contour for 6.5 mm corrugated tube (inner diameter)

b) Cable grommet

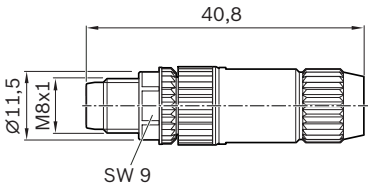
c) Cable printing per printing specification

Connectors

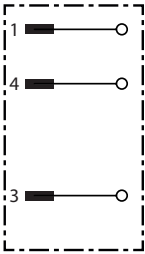


R901388333

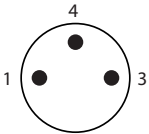
Dimensional drawing




Connection diagram



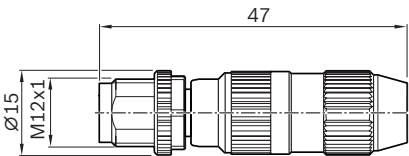
View
Connector side



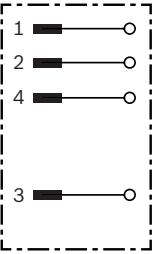


R901388352

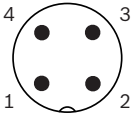
Dimensional drawing






Connection diagram




View
Connector side



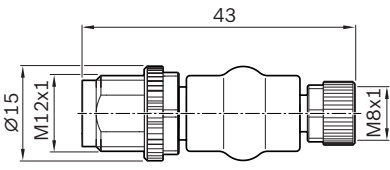
Material numbers/technical data		
Use	Connector, single	
Material number	R901388333	R901388352
Designation	7000-08331-0000000	7000-12491-0000000
Version	straight	
Operating current per contact	max. 4 A	
Operating voltage	max. 32 V AC/DC	
Connection type	Straight connector, M8x1, 3-pin, IDC, self-locking screw	Straight connector, M12x1, 4-pin, IDC, self-locking screw
Function indicator	-	
Operating voltage indicator	-	
Connection cross-section	0.14 ... 0.34 mm ²	
Ambient temperature	-25°C to +85°C	
Protection class	IP67 (inserted and bolted)	
Certifications and approvals	<div></div>	

Adapters

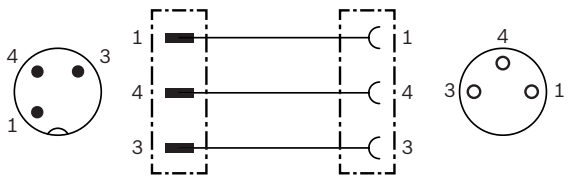



R911344591

Dimensional drawing



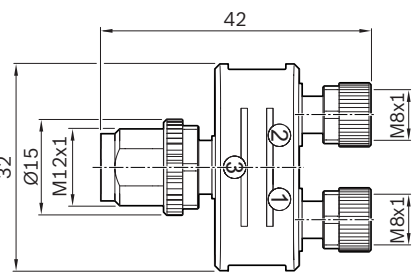
Connection diagram



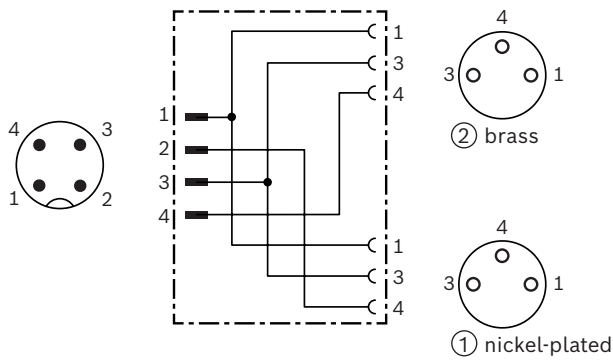


R911344592





Dimensional drawing



Connection diagram




Material numbers/technical data


Use	Adapters		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		
Connection type 1	Straight female connector, M8x1, 3-pin, self-locking screw thread		2 X female connectors, straight, M8x1, 3-pin, self-locking screw thread
Connection type 2	Male connector, straight, M12x1, 3-pin, self-locking screw thread		Straight connector, M12x1, 4-pin, IDC, self-locking screw thread
Function indicator	-		
Operating voltage indicator	-		
Connection cross-section	-		
Ambient temperature	-25°C to +85°C		
Protection class	IP67 (inserted and bolted)		
Certifications and approvals			  

Distributors


Passive distributor



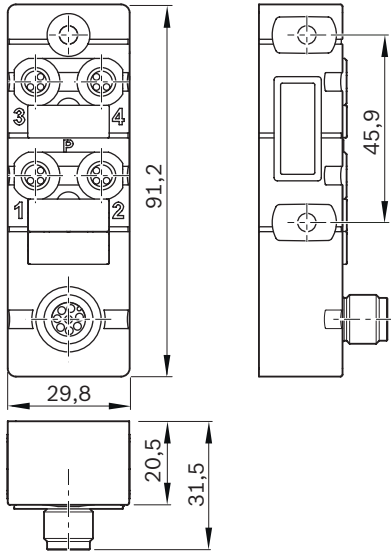
R901425737

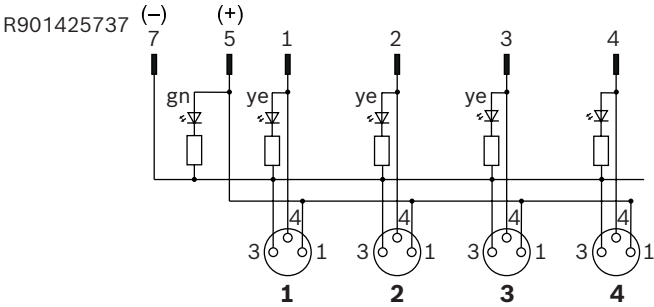
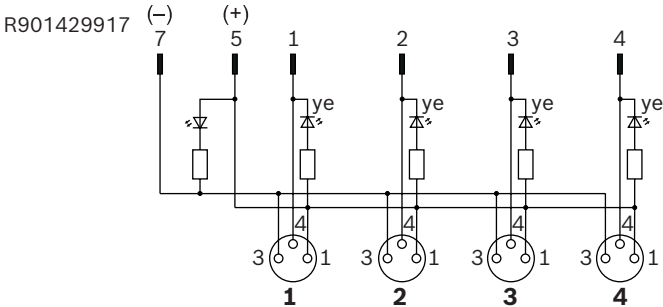


R901429917






R911344592



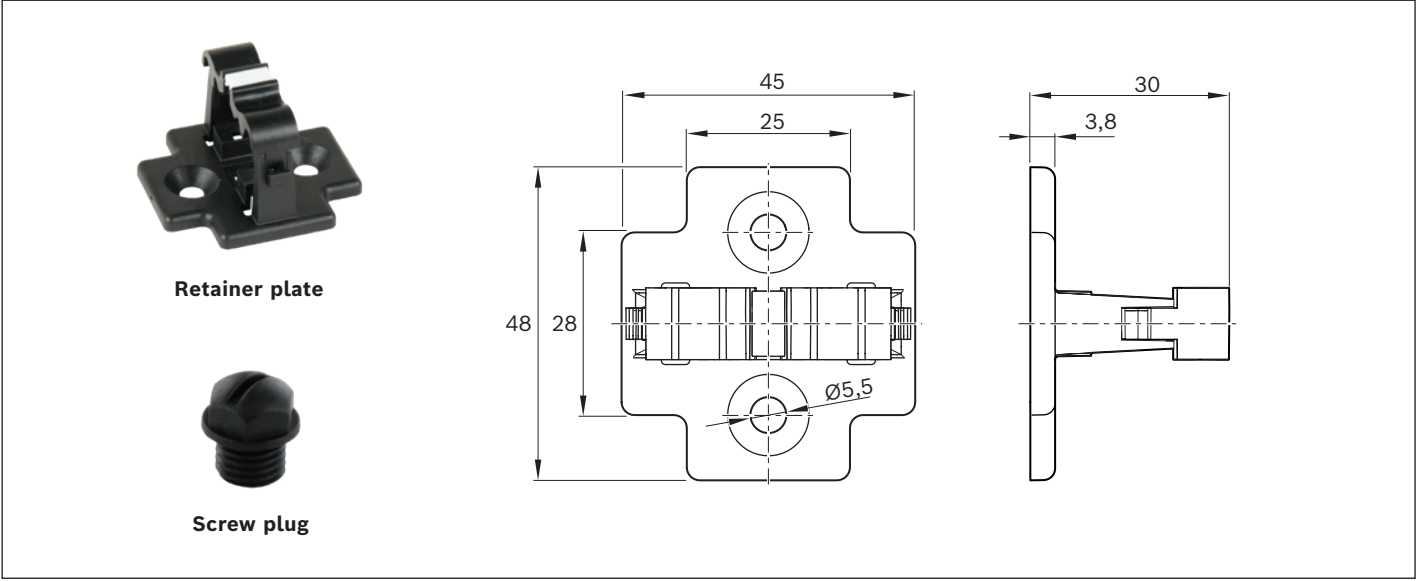



Material numbers/technical data

Use	Passive distributor		
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 VDC		
Switching logic	PNP	NPN	
Connection type 1	4x female connectors, straight, M8x1, 3-pin, self-locking screw thread		
Connection type 2	Male connector, straight, M12x1, 8-pin, IDC, self-locking screw thread		
Function indicator	✓		
Operating voltage indicator	✓		
Connection cross-section	-		
Ambient temperature	-20 °C to +70 °C		
Protection class	IP67 (inserted and bolted)		
Certifications and approvals	<div>    </div>		

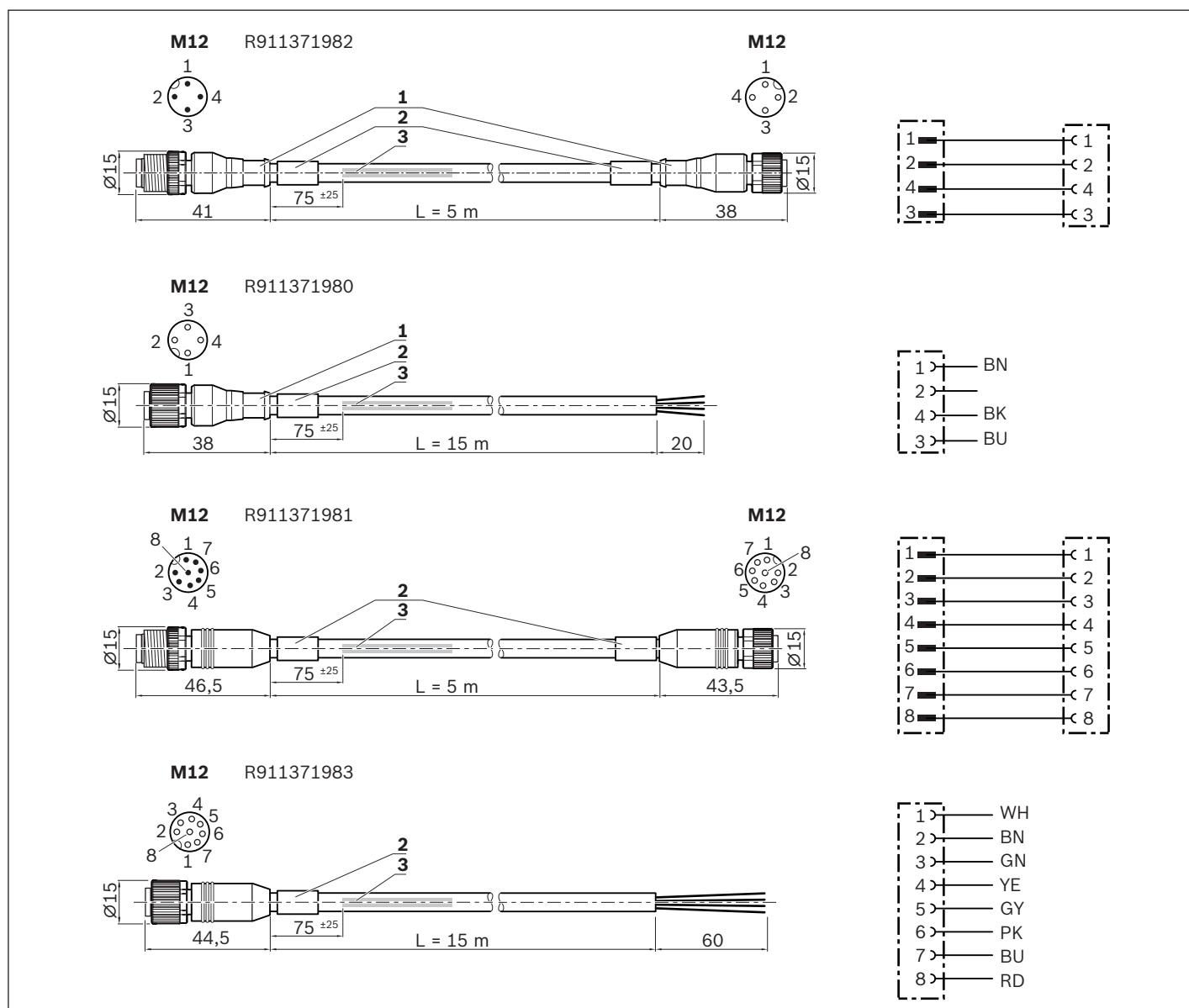
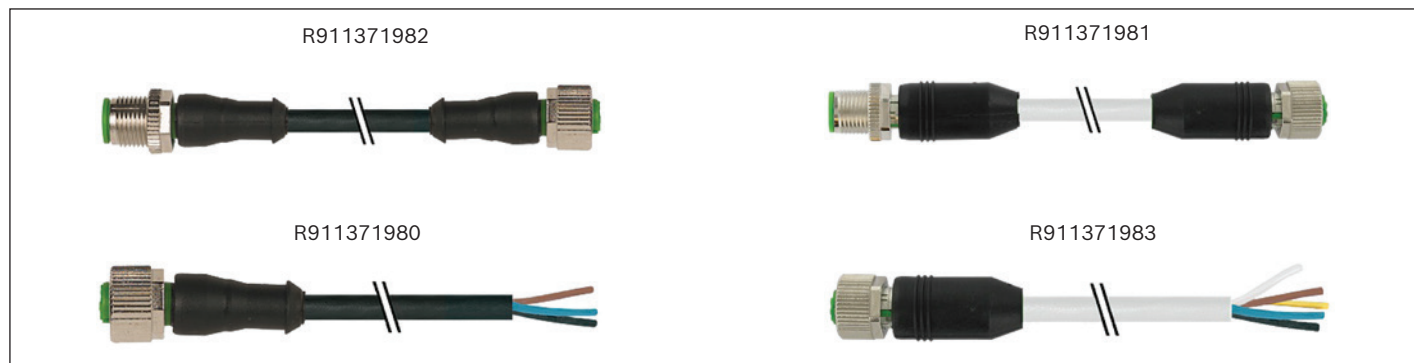
For technical data and dimensional drawings, see adapter

Accessories for passive distributors








Material numbers/technical data		
Use	For passive distributor R911344592	For passive distributors R901425737 / R901429917
Retainer plate	R913047341	–
Designation	7000-99061-0000000	–
Set	1 unit	–
Screw plug	–	R913047322
Designation	–	3858627
Set	–	10 units

Extensions for passive distributors

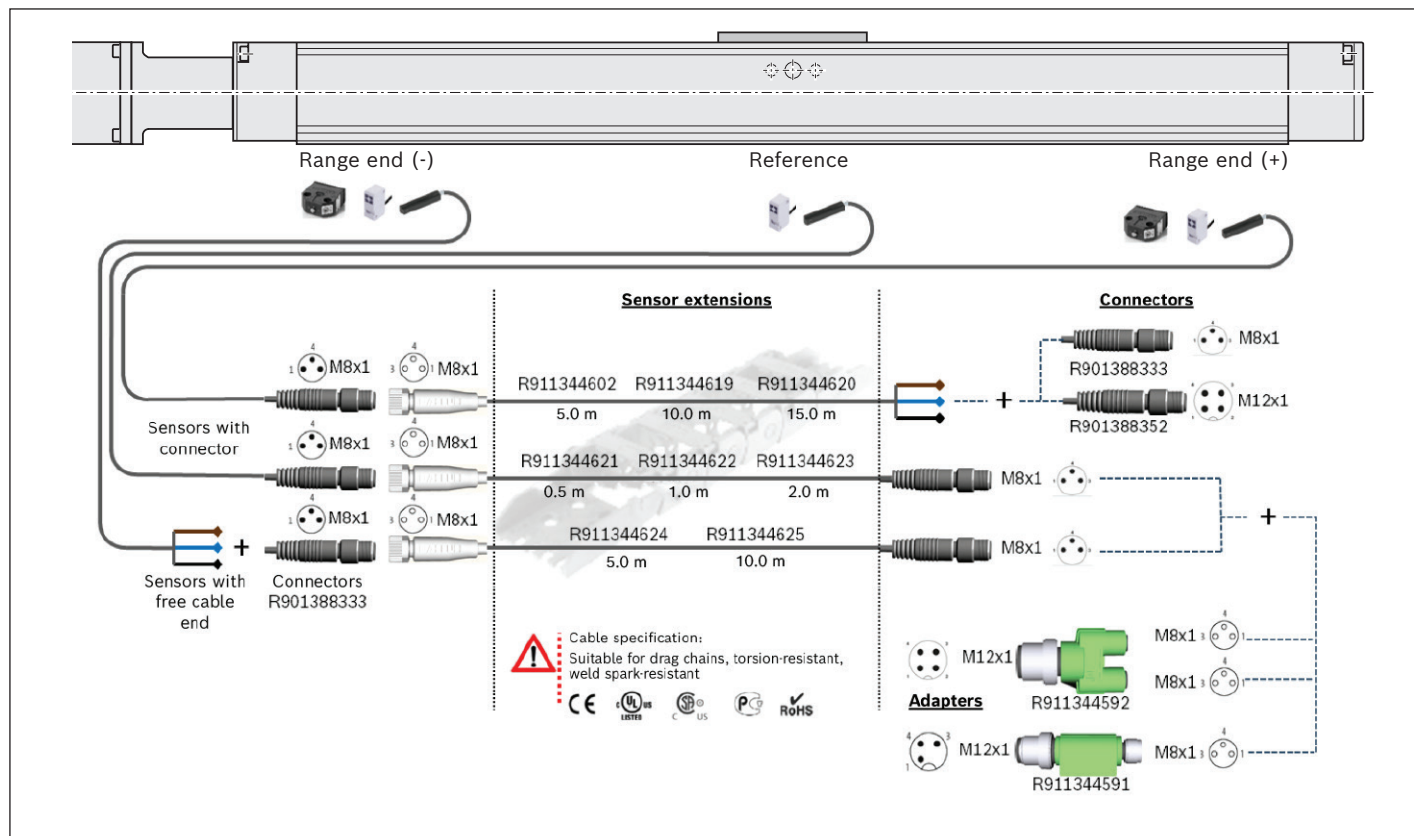


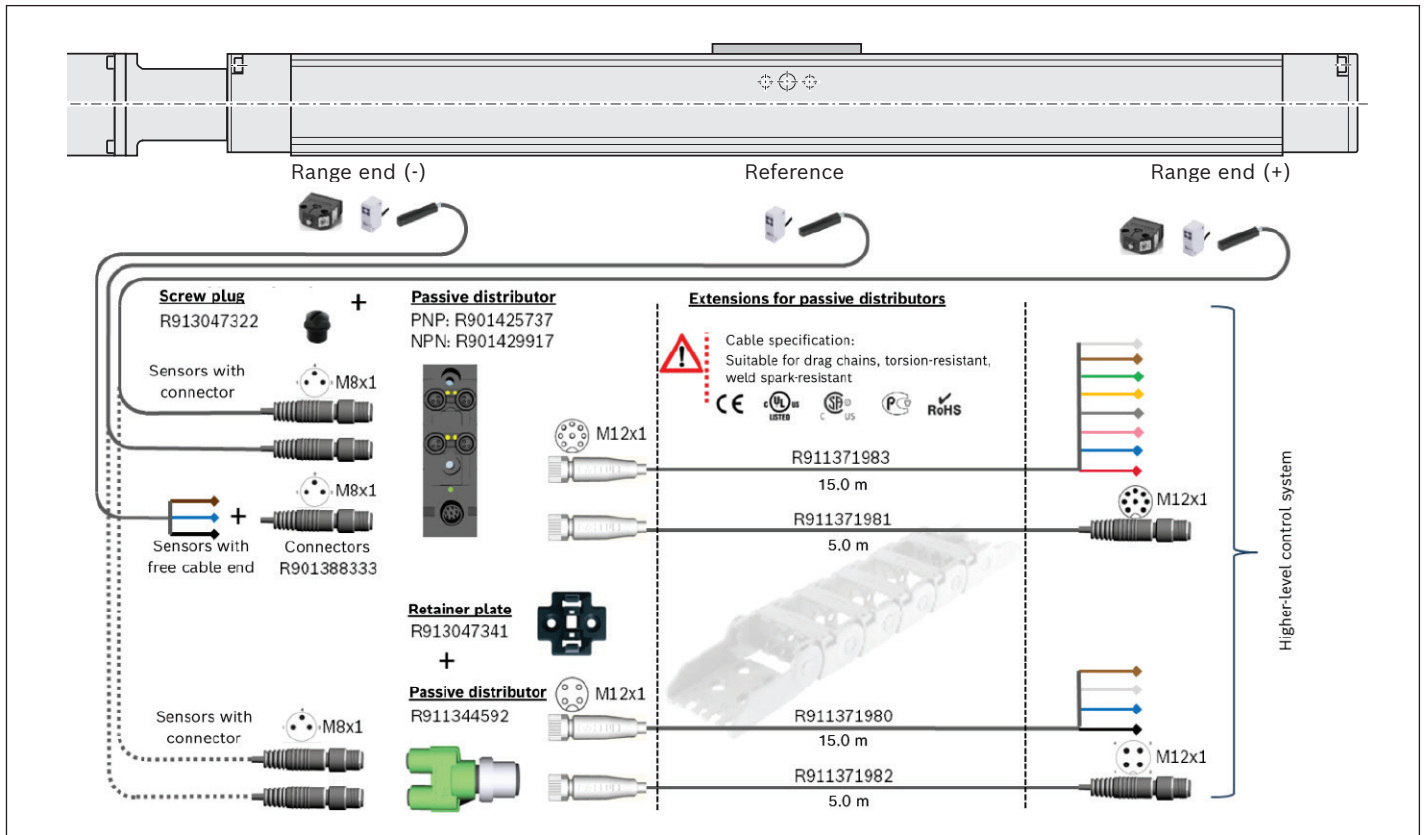
- 1) Contour for conduit pipe with inner diameter of 10
2) Cable grommet
3) Cable print per ordering specification 7000-08001

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
Connection type 1	Female connector, straight, M12x1, 4-pin		Female connector, straight, M12x1, 8-pin	
Connection type 2	Male connector, straight, M12x1, 4-pin	Unassembled cable end	Male connector, straight, M12x1, 8-pin	Unassembled cable end
Function indicator	–			
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	✓			
Torsion-resistant	✓			
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	
Static bending radius	≥ 5 x D			
Dynamic bending radius	≥ 10 x D			
Bending cycles	> 10 mil.			
Max. permissible travel speed	3.3 m/s for 5 m travel range (typ.), up to 5 m/s for 0.9 m travel distance			
Max. permissible acceleration	≤ 30 m/s ²			
Ambient temperature fixed ext.	–40°C to +80°C (90° max. 10,000h)			
Ambient temperature flexible ext.	–25°C to +80°C (90° max. 10,000h)			
Protection class	IP67 (inserted and bolted)			
Certifications and approvals	<div><div></div><div></div><div></div><div></div><div></div></div>			

Combination examples




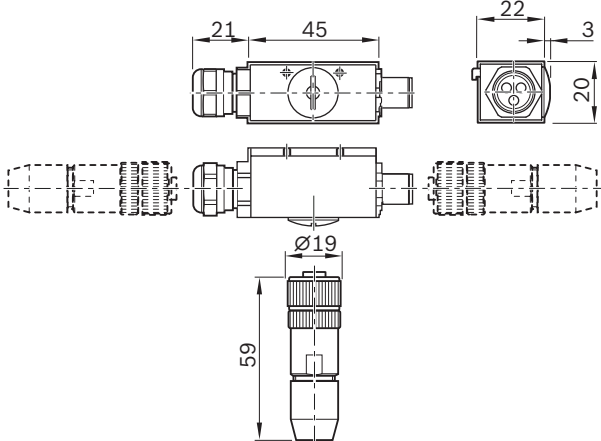


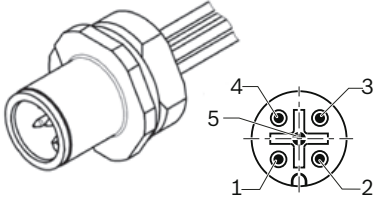
Socket and connector

Attach the socket on the side with the magnetic sensors. The socket and connector are not pre-wired. The variable sliding attachment allows switch activation points to be optimized during commissioning. The connector can be mounted in three directions.

R117560102




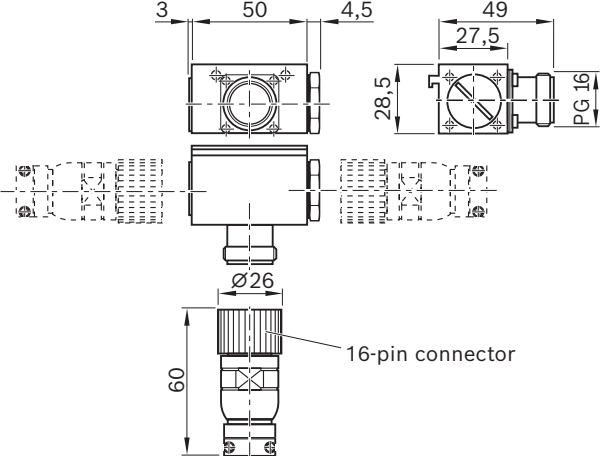


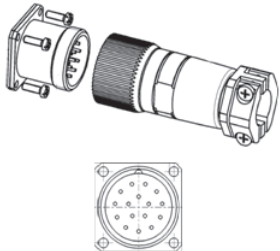


Pin		Color
1	BN	brown
2	WH	white
3	BU	blue
4	BK	black
5	GY	gray


R037540000

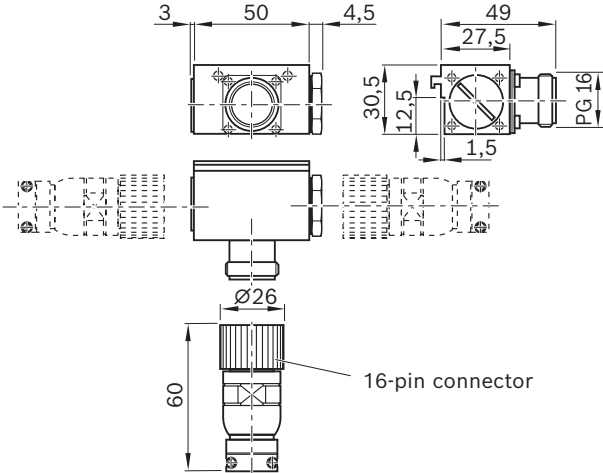


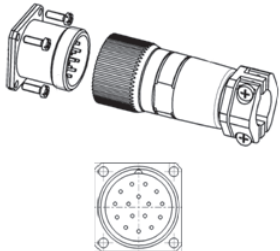




R117500153







Use	Socket and connector	
Material number	R117560102	R037540000 / R117500153
Designation	for CKK / CKR-070	for CKK / CKR-090, -110, -145, -200
Version	angled, for suspension in the lateral slot of the linear motion system	
Operating current per contact	max. 4 A	max. 8 A
Operating voltage	10–30 V DC	150V AC/DC
Connection type 1	Male connector, straight, M12x1, 5-pin, spring-cage connection	Male connector, straight, 16-pin, soldered connection
Connection type 2	Coupling / flange socket M12x1, 5-pin, with 0.5 m cable	Coupling / flange socket, 16-pin, soldered connection
Cable bushing Housing	Cable gland M16x1.5 with seal (bore 3x3.5 mm) incl. cap and blind plug	1 seal with bore 2x5.5 mm, 1x3.5 mm 1 adaptable seal, max. 14 mm diameter incl. cap and blind plug
Cable bushing, connector	Bolting with pull relief	
Connection cross-section	0.14 ... 0.5 mm	0.14 ... 1 mm
Cable diameter	4 ... 8 mm	10 ... 14 mm
Ambient temperature	-25°C to +85°C	-20°C to +125°C
Protection class	—	
Certifications and approvals	—	

Service and information

Operating conditions

Normal operating conditions

Ambient temperature with Bosch Rexroth servo motor	0 °C ... 40 °C, loss of performance above 40 °C
Ambient temperature for mechanical system (no undershooting the dew point)	-10 °C ... 60 °C
Travel range s_{min} ¹⁾	See the CKK/CKR "technical data" table
Soiling	Not permissible

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

Required and supplementary documentation

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

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

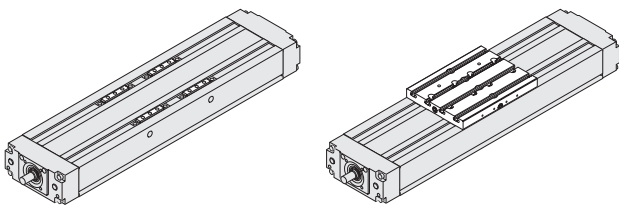
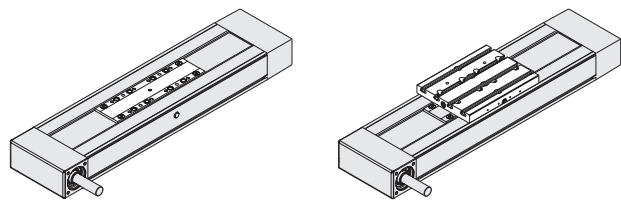
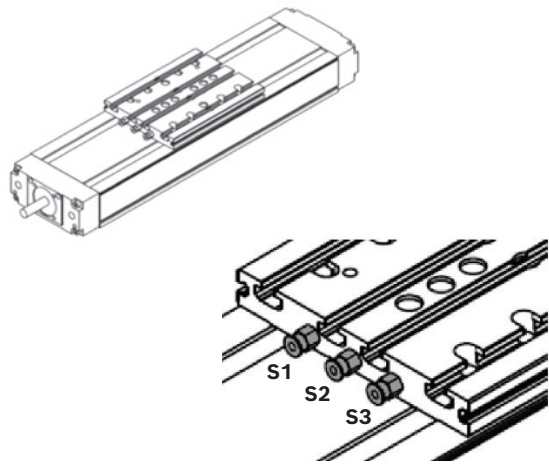
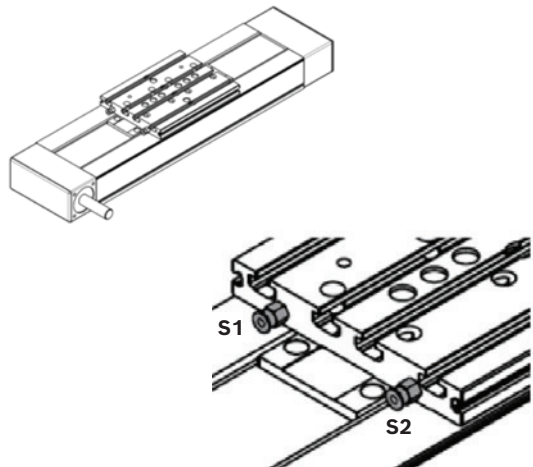
We would also be happy to send you the documents that you want.

If you are unsure about using this product, please contact Bosch Rexroth.

Lubrication

The profiled rail system and the ball screw assembly must be lubricated (compact modules CKK). The basic lubrication of all other components, e.g. deep-groove ball bearings, cover strips, gear units, etc. is done by the manufacturer.

Overview of lubrication versions

<p>Compact modules CKK Lubrication version LSS, LPG</p> <ul style="list-style-type: none"> ► Grease lubrication using manual grease gun via <ul style="list-style-type: none"> - Frame - Carriage - Connection plate  <p style="text-align: center;">with connection plate</p>	<p>Compact modules CKR Lubrication version LSS, LPG</p> <ul style="list-style-type: none"> ► Grease lubrication using manual grease gun via <ul style="list-style-type: none"> - Frame - Carriage - Connection plate  <p style="text-align: center;">with connection plate</p>
<p>Lubrication version LCF, LCO</p> <ul style="list-style-type: none"> ► 3 lube fittings ► Prepared for connection to central lubrication systems 	<p>Lubrication version LCF, LCO</p> <ul style="list-style-type: none"> ► 2 lube fittings ► Prepared for connection to central lubrication systems 

- Further information on the lubrication versions ➡ Page 9
- Further information on lubrication points, lubrication intervals and lubrication quantities, etc. ➡ Instruction compact modules R320103178 ➡ Chapter "Further information"

Lubricants

Lubrication version	LSS		LPG		
Size	CKx-110, -145, -200, -280	CKx-070, -090	CKx-110, -145, -200, -280	CKx-070, -090	
Basic lubrication	Dynalub 510	Dynalub 520	Preserved, basic lubrication required (see instructions)		
Consistency class	NLGI 2 (DIN 51818)	NLGI 00 (DIN 51818)	–		
Identification	KP2K-20 (DIN 51825)	GP00K-20 (DIN 51826)	–		
Lubrication with grease gun	yes	yes	yes		
Prepared for connection to central lubrication systems	–	–	–		
Recommended lubricants	Dynalub 510 (grease lubricant) (NLGI2 DIN 51818)	Dynalub 520 (liquid grease) (NLGI00 DIN 51818)	Dynalub 510 (grease lubricant) (NLGI2 DIN 51818)	Dynalub 520 (liquid grease) (NLGI00 DIN 51818)	
Features	<ul style="list-style-type: none"> • Good water resistance • Corrosion protection • Temperature range: –20 to +80 °C 		<ul style="list-style-type: none"> • Good water resistance • Corrosion protection • Temperature range: –20 to +80 °C 		
Material numbers	R3416 037 00 (400 g cartridge)	R3416 043 00 (400 g cartridge)	R3416 037 00 (400 g cartridge)	R3416 043 00 (400 g cartridge)	
	R3416 035 00 (25 kg container)	R3416 042 00 (5 kg bucket)	R3416 035 00 (25 kg container)	R3416 042 00 (5 kg bucket)	
Alternative lubricants	<ul style="list-style-type: none"> • Tribol GR 100-2 PD • Elkalub GLS 135/N2 	<ul style="list-style-type: none"> • Tribol GR 100-00 PD • Elkalub GLS 135/N00 	<ul style="list-style-type: none"> • Tribol GR 100-2 PD • Elkalub GLS 135/N2 • Tribol GR 100-00 PD • Elkalub GLS 135/N00 • Dynalub 520 	<ul style="list-style-type: none"> • Tribol GR 100-00 PD • Elkalub GLS 135/N00 	
Alternative lubricants with H1 approval	–	–	<ul style="list-style-type: none"> • Berulub FG H2 SL • Cassida Grease EPS2 • VP 874 	<ul style="list-style-type: none"> • Berulub FB 34-00 • Elkalub GLS 367/N00 	

Notes on lubrication

- ▶ Follow the product instructions.
- ▶ Do not use lubricants with solid particles (e.g. graphite or MoS₂).
- ▶ If you use different lubricants than the ones specified, relubrication intervals may be shorter and performance may decrease with short stroke and load ratio; in addition, chemical interactions can take place between the plastics, lubricants and preservative agents. Single-line central lubrication systems also need to be able to pump these lubricants.
- ▶ If using a central lubrication system, make sure all lines and elements are filled with lubricant all the way to the connection to the consumer (carriage) and that there are no air bubbles.
- ▶ Lubricant reservoirs should contain an agitator to ensure the lubricant can flow (avoids hardening in the reservoir).
- ▶ For relubrication, it is not possible to switch from grease to oil lubrication and vice-versa.
- ▶ If environmental factors such as contamination, vibrations, impact loads, etc. are present, we recommend shorter relubrication intervals. Even under normal operating conditions, relubrication is required every two years due to grease aging.
- ▶ Rexroth recommends piston distributors by SKF. These should be installed as close to the carriage lube fittings as possible. Avoid long lines (no longer than 1 m) and narrow line diameters. Install the lines at a gradient.
- ▶ If other consumers are connected to the single-line lubrication system, the weakest link in this chain determines the lubrication cycle.
- ▶ Excess lubricant can accumulate inside of the compact module or flow out and may lead to contamination of the environment
- ▶ Never put a compact module into operation without basic lubrication.

	LCF	LCO
	CKx-090, -110, -145, -200	CKx-090, -110, -145, -200
	required, see instructions	required, see instructions
	NLGI 00 (DIN 51818)	–
	GP00K-20 (DIN 51826)	–
	–	–
	<ul style="list-style-type: none"> • only via single-line piston distributor system • smallest permissible piston distributor size: CKx-090, -110, -145, -200: 0.2 cm³ 	<ul style="list-style-type: none"> • only via single-line piston distributor system • smallest permissible piston distributor size: CKx-090, -110: 0.2 cm³; CKx-145: 0.4 cm³; CKx-200: 0.6 cm³
	Dynalub 520 (liquid grease) (NLGI00 DIN 51818)	Shell Tonna S3 M220 (lubricant oil)
	<ul style="list-style-type: none"> • Good water resistance • Corrosion protection • Temperature range: –20 to +80 °C 	<ul style="list-style-type: none"> • Special demulsifying oil CLP or CGLP as per DIN 51517-3 for machine bed tracks and tool guides • A blend of highly refined mineral base oils and additives • Can be used even when mixed with significant quantities of metalworking fluids
	R3416 043 00 (400 g cartridge)	–
	R3416 042 00 (5 kg bucket)	–
	<ul style="list-style-type: none"> • Tribol GR 100-00 PD • Elkalub GLS 135/N00 	<ul style="list-style-type: none"> • Special demulsifying oil CLP or CGLP as per DIN 51517-3 for machine bed tracks and tool guides
	–	–

Use of lubricants with H1 approval:

Loss of H1 approval

H1 lubricants or release agents (preservative agents) only have H1 approval if they are separated and unmixed (including at the lubrication point). A blend of two H1 approval lubricants or separating agents does not have H1 approval.

No approval or authorization for use in the food industry

Because of the use of H1 lubricants, the compact modules do not have authorization or approval for the food industry.

Components lubricated at the factory

Components lubricated by the manufacturer at the factory such as deep-groove ball bearings, cover strips, gears, etc. do not use H1 lubricants.

Compact modules with Dynalub 520 (NLGI 00 consistency class) initial greasing must not be pre-lubricated with lubricants of NLGI 2 consistency class!

For relubrication quantity and relubrication position ⇒ see Compact modules CKK / Compact modules CKR instructions.

Relubrication interval

When using the standard lubrication from the manufacturer:

Relubrication interval ⇒ see Compact modules CKK / Compact modules CKR instructions.

Use of Dynalub 520 (NLGI 00) instead of Dynalub 510 (NLGI 2):

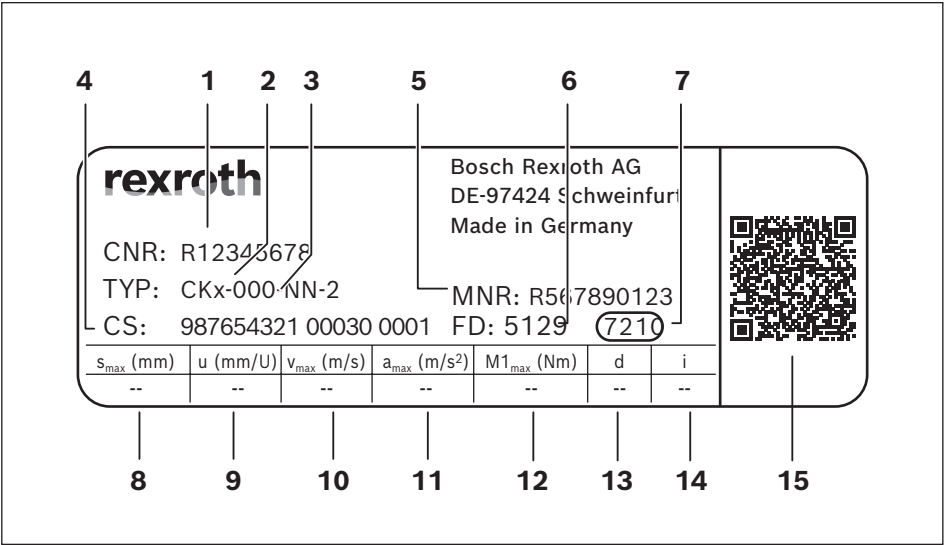
The relubrication interval is 75% of the standard relubrication interval ⇒ CKK/CKR instructions.

Use of lubricants with H1 approval:

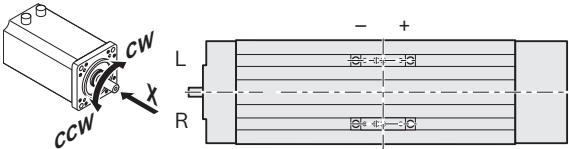
First relubrication takes place after 20 km. As a guideline value for relubrication intervals, 50% of the standard relubrication intervals must be applied ⇒ See Compact modules CKK / Compact modules CKR instructions.

Parameterization (commissioning)

The nameplate contains reference information on the production of the linear motion system as well as technical commissioning parameters.



1	CNR	Customer's material number
2	TYP	Short product name
3	110	Size
4	CS	Customer information
5	MNR	Material number
6	FD	Date of manufacture
7	7210	Manufacturing location
8	s _{max}	Maximum travel range
9	u	Feed constant without motor attachment
10	v _{max}	Maximum speed
11	a _{max}	Maximum acceleration rate
12	M1 _{max}	Maximum drive torque at motor journal
13	d	Direction of motor rotation to travel in positive (+) direction CW = Clockwise CCW = Counterclockwise
14	i	Gear ratio
15		QR code



Documentation

Standard report

Option 001

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.

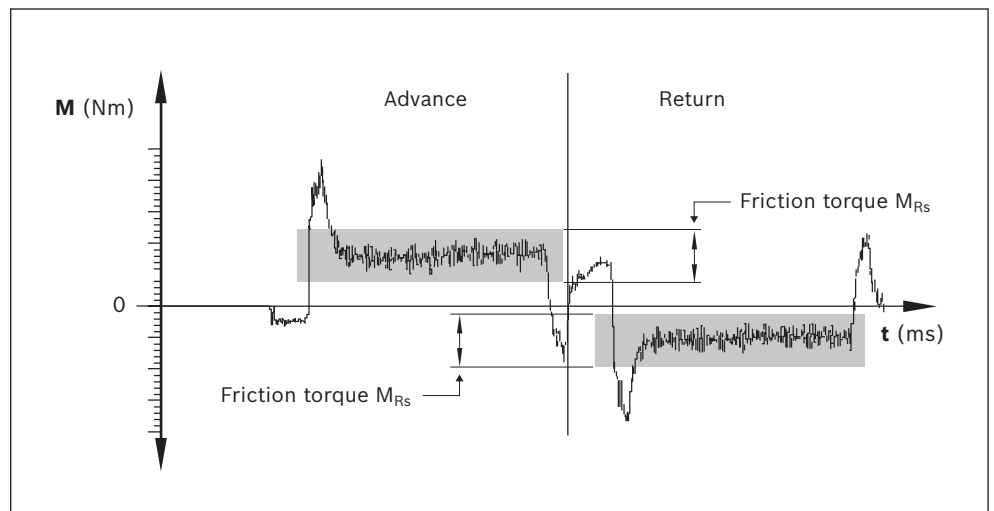
Checks listed in the standard report:

- Functional checks of mechanical components
- Functional checks of electrical components
- Design as per order confirmation

Measurement of frictional torque of complete system

Option 002 (includes option 001)

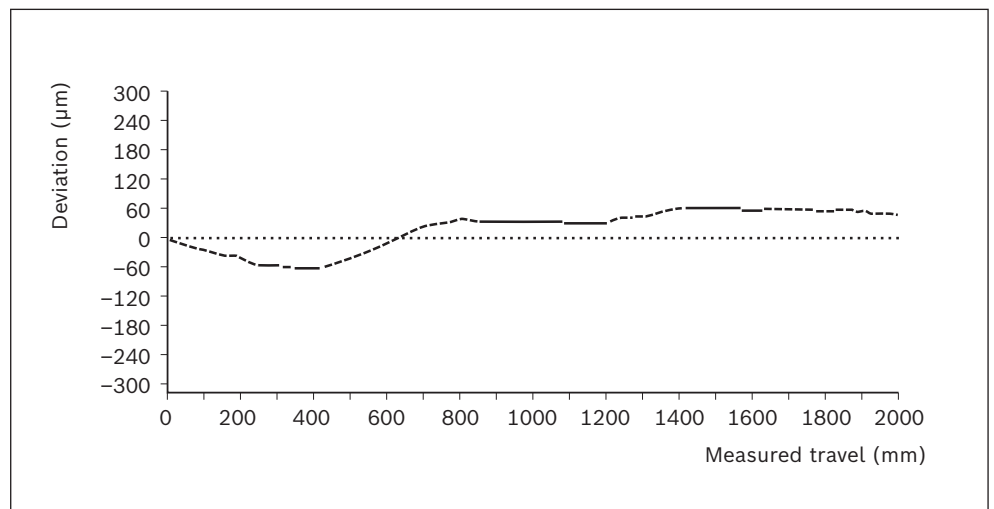
The friction torque is measured over the entire travel range.



Lead deviation of the ball screw assembly with compact modules CKK

Option 003 (includes option 001)

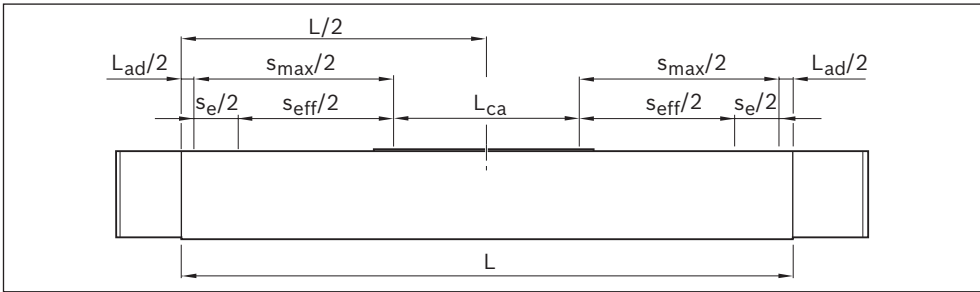
In addition to graphical representation (see illustration), a measurement report is supplied in table form.



Project planning/calculation
Calculation principles

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Length calculation
of the linear motion system



For length calculation values, see chapter "Technical Data" of the relevant compact module (CKK/CKR)

The stroke reserve (S_e) is required, for example, for overruns, lubrication strokes, tool changes, maintenance, interference contours, compensation of assembly tolerances, etc.The final verification/determination of the stroke reserve must be carried out by the user.

The following stroke reserves are recommended:

- Linear systems: S_e = 20 mm
- Multi-axis systems: S_e = 20 mm
- Electromechanical cylinders: S_e = 10 mm

⚠ If no stroke reserve (S_e = 0 mm) is specified, the effective stroke (S_{eff}) corresponds to the maximum travel distance (S_{max}) of the system. There is no clearance to the mechanical end position, thus creating a risk of mechanical damage.

CKx-070, -090, -110, -145, -200, -280

$$L = s_{eff} + s_e + L_{ca} + L_{ad}$$

CKR-280-DB

$$L = s_{eff} + s_e + L_{ca} + L_w + L_{ad}$$

Effective stroke

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

Stroke: maximum distance from carriage center to the outer-most switch activation points.

Mass of the linear motion system

Weight calculation:

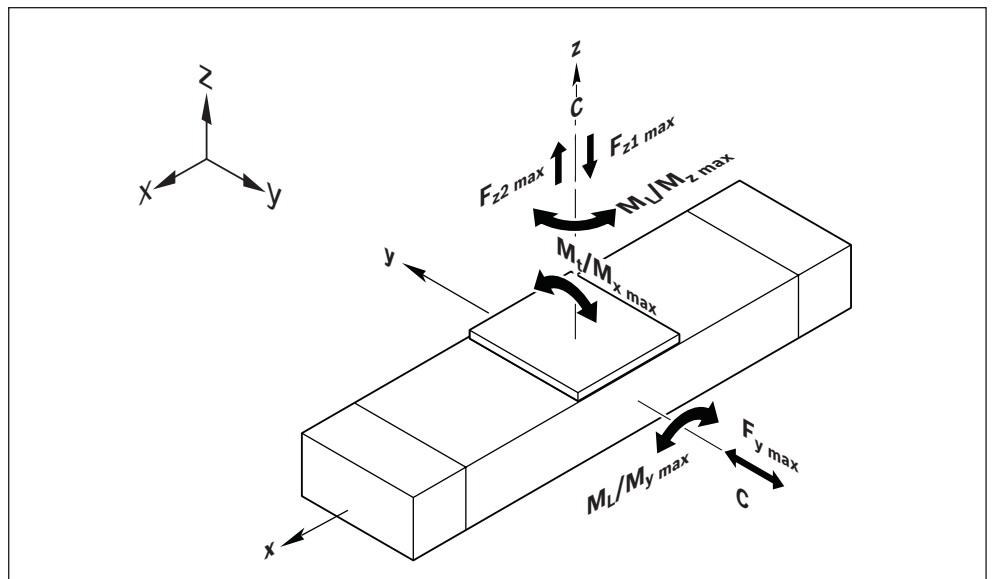
- ▶ without motor
- ▶ without switch mounting
- ▶ without motor attachment

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

Note on dynamic load capacities and moments

Determination of the dynamic load capacities and moments 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.

Suitable loads

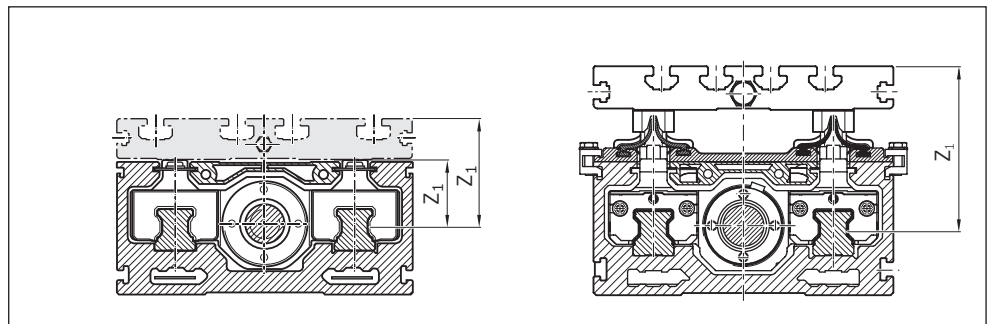


Regarding the desired service life, general loads for F_{mgw} , F_{mbs} should not exceed around 20% of the dynamic characteristic values (C_{gw} , C_{bs}).

See "Project planning" chapter.

Do not exceed the technical data for the linear motion system.

Application point of the effective force (Z_1)



Modulus of elasticity E

$$E = 70,000 \text{ N/mm}^2$$

Maximum permissible load

When selecting linear motion systems, it is essential to consider the maximum permissible load and force tolerances according to the table. The values depend on the system. In other words, the tolerances are determined not only by the load capacities of the bearing points but are also based on design and material.

Conditions for combined loads:

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

Life expectancy calculation of the linear guide

The service life of the rolling bearing points contained in a linear motion system can be calculated using the formulas given below. The roller bearing points that determine the life of a linear motion system with ball screw assembly are the linear guide, the ball screw assembly (nut) and the fixed bearing. The linear guide in the linear motion system must withstand the load as well as any process forces that occur.

⚠ The calculated service life specification for the linear motion system is determined by the shortest of the separately determined service life values for linear guide, ball screw assembly or fixed bearing.

Where the operating conditions vary (speed and load), the service life must be calculated using the average values v_{mgw} and F_{mgw} .

Nominal service life in meters:

$$L_{gw} = \left(\frac{C_{gw}}{F_{mgw}} \right)^3 \cdot 10^5$$

Nominal service life in hours:

$$L_{hgw} = \frac{L_{gw}}{3600 \cdot v_{mgw}}$$

Dynamically equivalent load on bearing of the guideway:

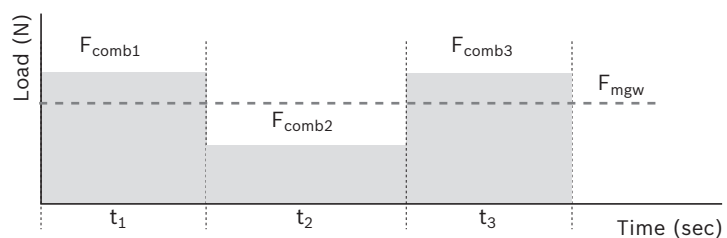
$$F_{mgw} = \sqrt[3]{|F_{eff1}|^3 \cdot \frac{q_{t1}}{100\%} + |F_{eff2}|^3 \cdot \frac{q_{t2}}{100\%} + |F_{eff3}|^3 \cdot \frac{q_{t3}}{100\%} + |F_{effn}|^3 \cdot \frac{q_{tn}}{100\%}}$$

The following applies to linear motion systems:

$$F_{eff} = F_{comb}$$

Combined equivalent bearing load:

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



Average linear speed of the guideway:

$$v_{mgw} = \frac{|v_1| \cdot q_{t1} + |v_2| \cdot q_{t2} + \dots + |v_n| \cdot q_{tn}}{100\%}$$

Service life of ball screw assembly or fixed bearing

Where the operating conditions vary (rotary speed and load), the service life must be calculated using the average values F_{mbs} and n_m .

Nominal service life in revolutions:

$$L_{bs} = \left(\frac{C_{bs}}{F_{mbs}} \right)^3 \cdot 10^6$$

Nominal service life in hours:

$$L_{hbs} = \frac{L_{bs}}{60 \cdot n_m}$$

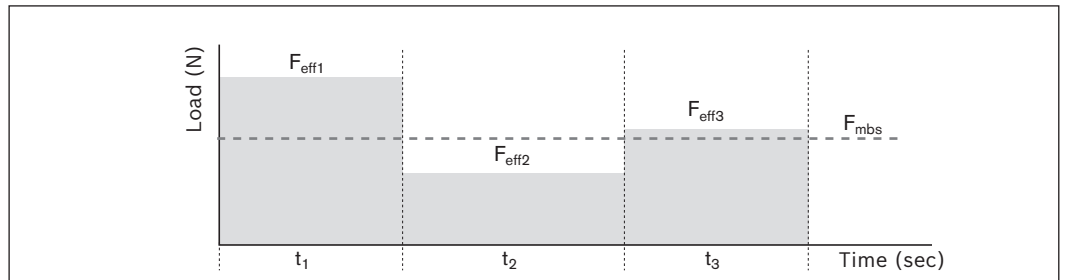
Dynamically equivalent load on bearing of the ball screw assembly:

$$F_{mbs} = \sqrt[3]{|F_{eff1}|^3 \cdot \frac{|n_1|}{n_m} \cdot \frac{q_{t1}}{100\%} + |F_{eff2}|^3 \cdot \frac{|n_2|}{n_m} \cdot \frac{q_{t2}}{100\%} + |F_{eff3}|^3 \cdot \frac{|n_3|}{n_m} \cdot \frac{q_{t3}}{100\%} + \dots + |F_{effn}|^3 \cdot \frac{|n_n|}{n_m} \cdot \frac{q_{tn}}{100\%}}$$

The following applies to the axial load F_n for linear motion systems:

$$F_{eff} = |F_n|$$

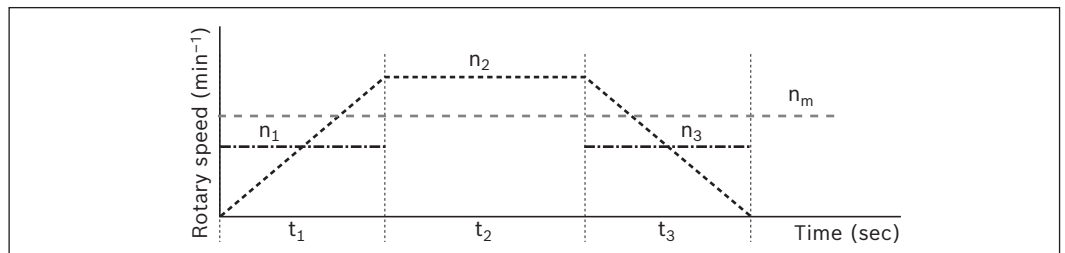
When both the load and the rotary speed vary, the average load F_{mbs} is calculated as follows:



Average rotary speed of the screw:

$$n_m = \frac{|n_1| \cdot q_{t1} + |n_2| \cdot q_{t2} + \dots + |n_n| \cdot q_{tn}}{100\%} = \frac{v_{mgw} \cdot 60\,000}{P}$$

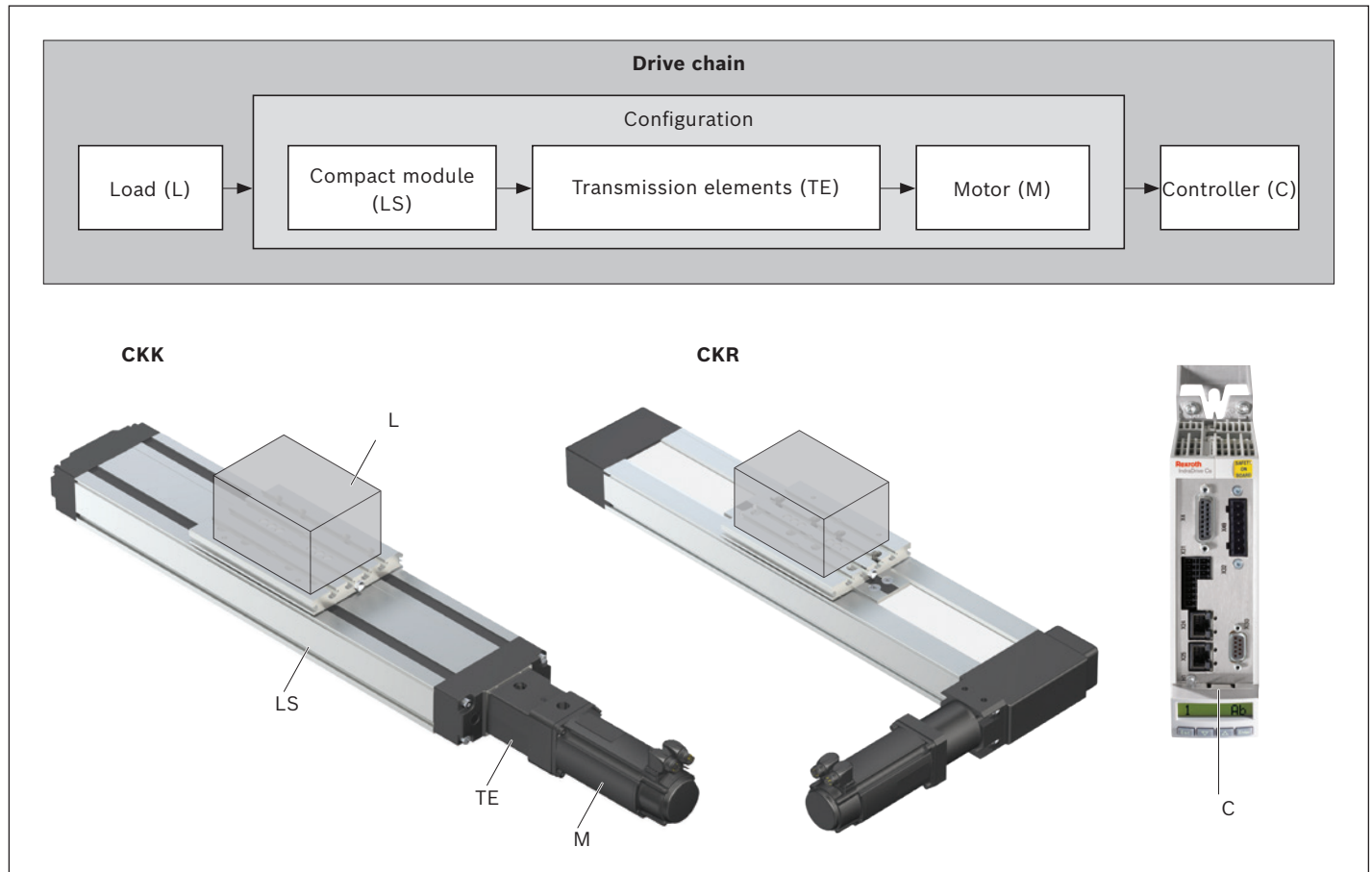
If rotary speed varies, average rotary speed n_m is calculated as follows:



Rotary speed in acceleration and braking phases $n_1 \dots n$:

$$n_1 \dots n = \frac{n_{A1 \dots n} + n_{E1 \dots n}}{2}$$

Drive sizing



The correct dimensioning and assessment of an application requires structured consideration of the drive chain as a whole.

The basic element of the drive chain is the configuration – made up of the linear motion system, the transmission element (coupling, belt side drive or gear unit) and the motor – which can be ordered in that constellation in the catalog.

Basic principles

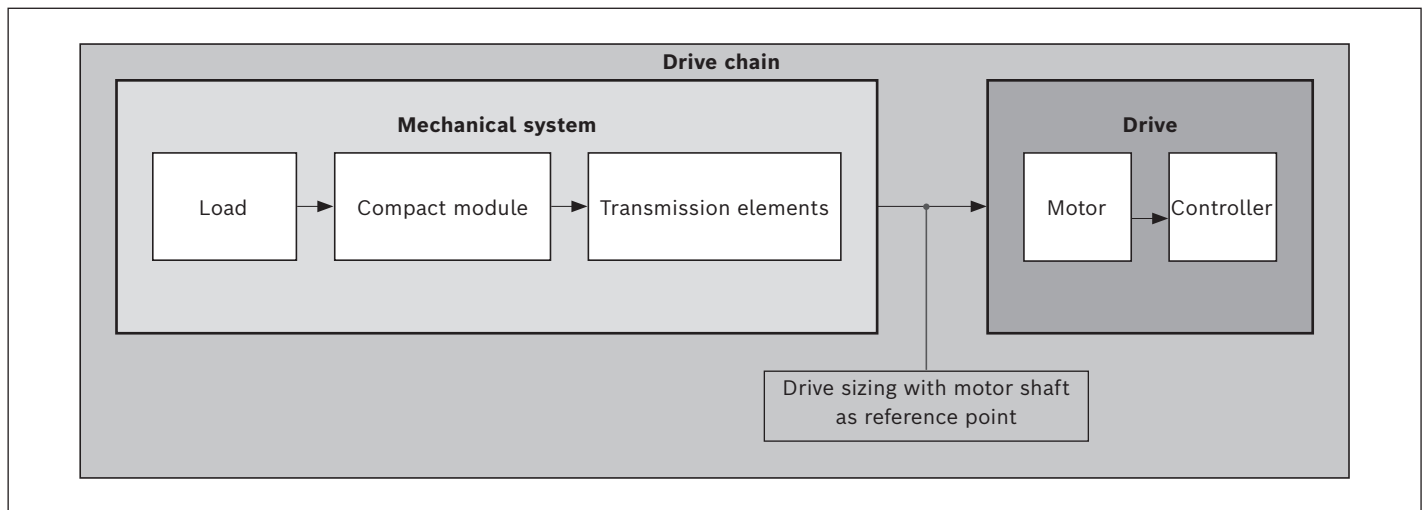
For drive sizing, the drive chain can be divided into mechanical system and drive system.

The **mechanical** system includes the physical components – linear motion system and the transmission elements (belt side drive, coupling) – and the load to be carried.

The electric **drive** is a motor-controller combination with corresponding performance data.

The sizing and/or dimensioning of the electric drive is done taking the motor shaft as a reference point.

For drive sizing, limits must be taken into account as well as base values. The limits must not be exceeded in order to avoid damaging the mechanical components.



Technical data and formula symbols for the mechanical system

For every component (linear motion system, coupling, belt side drive, gear unit), the corresponding maximum permissible limits for drive torque and speed, and the base values for friction torque and mass moment of inertia have to be used.

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 chapter "Technical Data" or is determined using formulas based on the descriptions on the following pages.

		Mechanical system				
		Load	Linear motion system	Transmission element		
				Coupling	Belt side drive	Gearing
Weight moment	(Nm)	$M_g^{5)}$	—	—	—	—
Friction torque	(Nm)	— ⁴⁾	$M_{Rs}^{3)}$	—	$M_{Rsd}^{3)}$	$M_{Rge}^{3)}$
Mass moment of inertia	(kgm ²)	$J_t^{1)}$	$J_s^{2)}$	$J_c^{3)}$	$J_{sd}^{3)}$	$J_{ge}^{3)}$
Max. permissible speed	(m/s)	—	$v_{max}^{3)4)}$	—	—	—
Max. permissible rotary speed	(rpm)	—	$n_p^{1)}$			$n_{ge}^{3)}$
Max. permissible drive torque	(Nm)	—	$M_p^{3)4)}$	$M_{cN}^{3)}$	$M_{sd}^{3)}$	$M_{ge}^{3)}$

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⁾ CKK: Length-dependent value, to be read off the graph

⁵⁾ Any additional process forces are to be taken into consideration as load moments

⁶⁾ For vertical installation position: Determine the value using the appropriate formula

Drive sizing with motor shaft as reference point

When sizing the drive, all relevant design calculation values for the mechanical components in the drive chain have to be determined and be expressed/reduced to the motor shaft. For a combination of mechanical components within the drive chain, this will result in one value for each of the following:

- Friction torque M_R
- Mass moment of inertia J_{ex}
- Max. permissible speed v_{mech} (maximum permissible rotary speed n_{mech})
- Max. permissible drive torque M_{mech}

Determination of the values for each mechanical component in the drive chain based on the motor shaft as a reference point

Compact modules CKK

Friction torque M_R

For motor attachment via flange and coupling

$$M_R = M_{Rs}$$

For motor attachment via belt side drive

$$M_R = M_{Rsd} + \frac{M_{Rs}}{i}$$

Mass moment of inertia J_{ex}

For motor attachment via flange and coupling

$$J_{ex} = J_s + J_t + J_c$$

For motor attachment via belt side drive

$$J_{ex} = J_{sd} + \frac{(J_s + J_t)}{i^2}$$

Compact modules CKR

Friction torque M_R

For motor attachment via gear

$$M_R = M_{Rge} + \frac{M_{Rs}}{i}$$

Mass moment of inertia J_{ex}

For direct motor attachment (without gear)

$$J_{ex} = J_s + J_t$$

For motor attachment via gear

$$J_{ex} = J_{ge} + \frac{(J_s + J_t)}{i^2}$$

Mass moment of inertia of linear motion system

$$J_s = (k_{J \text{ fix}} + k_{J \text{ var}} \cdot L) \cdot 10^{-6}$$

Determination of translative mass moment of inertia of the external load

$$J_t = m_{ex} \cdot k_{Jm} \cdot 10^{-6}$$

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

The lowest of all the values for permissible speed or rotary speed of all mechanical components contained in the drive chain determines the maximum permissible speed of the mechanical system which has to be taken into consideration as the upper limit for the drive when sizing the motor.

Depending on the system, the maximum permissible speed/rotary speed of the linear motion system with ball screw assembly is always below the limits for the coupling or belt side drive components, meaning it determines the maximum permissible speed of the mechanical system.

Compact modules CKK

Maximum permissible speed

$$v_{\text{mech}} = v_{\text{max}}$$

Maximum permissible rotary speed

For motor attachment via flange and coupling

$$n_{\text{mech}} = \frac{v_{\text{mech}} \cdot 1\,000 \cdot 60}{P}$$

For motor attachment via belt side drive

$$n_{\text{mech}} = \frac{v_{\text{mech}} \cdot i \cdot 1\,000 \cdot 60}{P}$$

Compact modules CKR

Maximum permissible speed

For direct motor attachment (without gear)

$$v_{\text{mech}} = v_{\text{max}}$$

$$v_{\text{mech}} = \frac{n_{\text{mech}} \cdot \pi \cdot d_3}{1\,000 \cdot 60}$$

For motor attachment via gear

$$v_{\text{mech}} = \frac{n_{\text{mech}} \cdot \pi \cdot d_3}{i \cdot 1\,000 \cdot 60}$$

Maximum permissible rotary speed

For direct motor attachment (without gear)

$$n_{\text{mech}} = \frac{v_{\text{mech}} \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$$

$$n_{\text{mech}} = n_p$$

For motor attachment via gear

$$n_p = \frac{v_{\text{max}} \cdot 1\,000 \cdot 60}{\pi \cdot d_3}$$

$$n_{\text{mech}} = \text{minimum } (n_p \cdot i ; n_{\text{ge}})$$

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 chain 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.

Compact modules CKK

For motor attachment via flange and coupling

$$M_{\text{mech}} = \text{minimum} (M_{\text{cN}}; M_{\text{p}})$$

For motor attachment via belt side drive

$$M_{\text{mech}} = \text{minimum} (M_{\text{sd}}; \frac{M_{\text{p}}}{i})$$

Compact modules CKR

For direct motor attachment (without gear)

$$M_{\text{mech}} = M_{\text{p}}$$

For motor attachment via gear

$$M_{\text{mech}} = \text{minimum} (\frac{M_{\text{ge}}}{i}; \frac{M_{\text{p}}}{i})$$

⚠ When considering the complete drive chain (mechanical system + motor/controller), the maximum torque of the motor can lie below the upper limit for the mechanical system (M_{mech}) and thus limit the maximum permissible drive torque of the overall drive chain.

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 permissible value for the mechanical system.

General motor preselection

The motor can be generally preselected using the following conditions.

Condition 1:

The rotary speed of the motor must be greater than or equal to the rotary speed required for the mechanical system (but not exceeding the maximum permissible limit value).

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

Condition 2:

Consideration of the ratio of mass moments of inertia of the mechanical system and the motor. The ratio of the mass moments of inertia serves as an indicator for the control performance of a motor-controller combination.

The mass moment of inertia of the motor is directly related to the motor size.

Ratio of mass moments of inertia.

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
Machining	≤ 1.5

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

Condition 3:

Estimation of the ratio of the static load moment to the continuous torque of the motor. The torque ratio must be less than or equal to an empirical value of 0.6. This condition roughly factors in the missing dynamic characteristics of an exact motion profile with the required motor torques.

Torque ratio

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

Static load moment

$$M_{stat} = M_R + M_g$$

Compact modules CKK

Weight moment

For vertical installation position only!

For motor attachment via flange
and coupling: $i = 1$

$$M_g = \frac{P \cdot (m_{ex} + m_{ca}) \cdot g}{2\,000 \cdot \pi \cdot i}$$

Compact modules CKR

Weight moment For vertical
installation position only!

$$M_g = \frac{d_3 \cdot (m_{ex} + m_{ca}) \cdot g}{2\,000 \cdot i}$$

In the chapter titled ➡ "Configuration and ordering", users can put together standard configurations, including motor attachment, gears and motor, for the various linear motion system sizes by selecting the appropriate options. By checking the above 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 sizing

Preselecting the motor according to this rough guide is no substitute for the required precise design calculations for the drive, taking all moments/torques and rotary speed levels into account. For precise calculation of the electric drive, including consideration of the specific motion profile, please refer to the performance data in the catalog "Rexroth drive technology". When sizing the drive, the maximum permitted values for linear speed, drive torque and acceleration must not be exceeded, in order to avoid damaging the mechanical system.

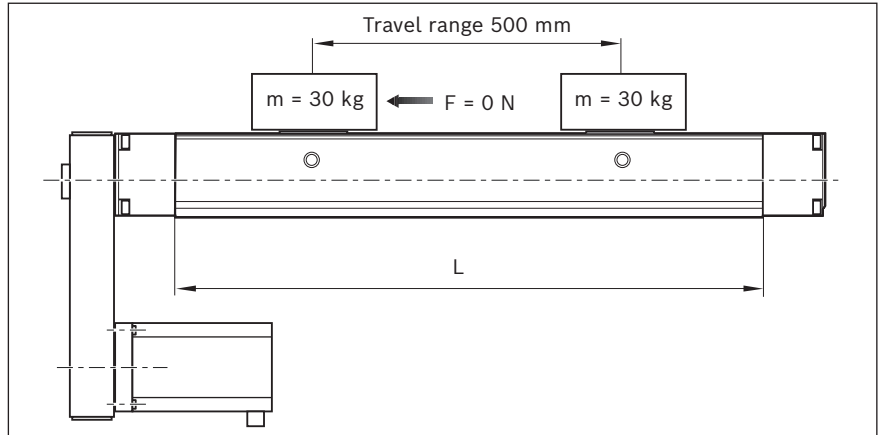
Calculation example CKK

Given data

In a handling task, a mass of 30 kg is to be moved horizontally by 500 mm at a travel speed of 0.5 m/s. The following was selected based on the technical data and the installation space:

Compact module CKK-110

- Carriage with connection plate
 $L_{ca} = 155 \text{ mm}$
- With cover strip
- Motor attachment via belt side drive,
 $i = 1.5$
- With motor MS2N04-B0BTN with brake



Calculation of length L

Excess travel:	$s_e = 20 \text{ mm}$
Max. travel range:	$s_{max} = s_{eff} + s_e$
	$= 500 + 20 = 520 \text{ mm}$
Length:	$L = 520 + 155 + 20 = 695 \text{ mm}$

Selection of the ball screw assembly

(Better to choose the lowest lead as this is favorable in terms of resolution, braking distance, length.)

Permissible ball screw assemblies according to "Permissible speed" graph with given $v = 0.5 \text{ m/s}$ and $L = 695 \text{ mm}$:

BASA 16 x 10 and BASA 16 x 16

Selected ball screw assembly (lower lead):

BASA 16 x 10

Maximum permissible speed for BASA 16 x 10 from graph:

$$v_{max} = 0.77 \text{ m/s}$$

Friction moment M_R

(motor attachment via belt side drive)

	$M_R = M_{Rsd} + \frac{M_{Rs}}{i}$
Compact module:	$M_{Rs} = 0.43 \text{ Nm}$
Belt side drive:	$M_{Rsd} = 0.40 \text{ Nm} (i = 1.5)$
Friction torque:	$M_R = 0.40 + \frac{0.43}{1.5} = 0.69 \text{ Nm}$

Mass moment of inertia J_{ex}

(motor attachment via belt side drive)

$$\begin{aligned}
 J_{ex} &= J_{sd} + \frac{(J_s + J_t)}{i^2} \\
 \text{Belt side drive: } J_{sd} &= 82 \cdot 10^{-6} \text{ kgm}^2 \\
 \text{Compact module: } J_s &= (k_{J \text{ fix}} + k_{J \text{ var}} \cdot L) \cdot 10^{-6} \\
 &= (8.432 + 0.031 \cdot 715) \cdot 10^{-6} \\
 &= 29.977 \cdot 10^{-6} \text{ kgm}^2 \\
 \text{External load: } J_t &= m_{ex} \cdot k_{J \text{ m}} \cdot 10^{-6} \\
 &= 30 \cdot 2.533 \cdot 10^{-6} \\
 &= 75.99 \cdot 10^{-6} \text{ kgm}^2 \\
 \text{Mass moment of inertia: } J_{ex} &= 82 \cdot 10^{-6} + \frac{(29.977 \cdot 10^{-6} + 75.99 \cdot 10^{-6})}{1.5^2} \\
 &= 129.096 \cdot 10^{-6} \text{ kgm}^2
 \end{aligned}$$

Maximum permissible rotary speed n_{mech}

(motor attachment via belt side drive)
mechanical system limit

$$\begin{aligned}
 n_{mech} &= \frac{(0.77 \cdot 1.5 \cdot 1\,000 \cdot 60)}{10} \\
 \text{Max. permissible speed: } v_{mech} &= v_{max} = 0.77 \text{ m/s} \\
 \text{Max. permissible rotary speed: } n_{mech} &= \frac{(v_{mech} \cdot i \cdot 1\,000 \cdot 60)}{P} \\
 &= 6\,930 \text{ min}^{-1}
 \end{aligned}$$

Maximum rotary speed of the application n_{mech}

(motor attachment via belt side drive)
application limit

$$\begin{aligned}
 \text{Speed: } v_{mech} &= 0.5 \text{ m/s} \\
 \text{Rotary speed: } n_{mech} &= \frac{0.5 \cdot 1.5 \cdot 1\,000 \cdot 60}{10} \\
 &= 4\,500 \text{ min}^{-1}
 \end{aligned}$$

Calculation example CKK

Maximum permissible

drive torque M_{mech}

(motor attachment via belt side drive)
mechanical system limit

$$M_{\text{mech}} = \text{Minimum} \left(M_{\text{sd}}; \frac{M_{\text{p}}}{i} \right)$$

Belt side drive: $M_{\text{sd}} = 5.11 \text{ Nm}$ (gear ratio $i = 1.5$ for MS2N04-B0BTN)

Compact module: $M_{\text{p}} = 13.51 \text{ Nm}$

Drive torque: $M_{\text{mech}} = \text{Minimum} \left(5.11; \frac{13.51}{1.5} \right)$
 $= \text{Minimum} (5.11; 9.0)$
 $= 5.11 \text{ Nm}$

Motor preselection check

Selected motor:

MS2N04-B0BTN with brake

Condition 1:

Rotary speed: $n_{\text{max}} \geq n_{\text{mech}}$
 $6,000 \geq 4500$ condition met – motor selection OK

Condition 2:

Mass moment of inertia ratio: $V = \frac{J_{\text{ex}}}{J_{\text{m}} + J_{\text{br}}}$

Motor inertia: $J_{\text{m}} = 70 \cdot 10^{-6} \text{ kgm}^2$

Brake moment of inertia: $J_{\text{br}} = 40 \cdot 10^{-6} \text{ kgm}^2$

Moment of inertia ratio: $V = \frac{129.096 \cdot 10^{-6}}{(70 \cdot 10^{-6} + 40 \cdot 10^{-6})} = 1.17$

Handling condition: $V \leq 6$
 $1.17 \leq 6$ condition met
– motor selection OK

Condition 3:

Torque ratio: $\frac{M_{\text{stat}}}{M_0} \leq 0.6$

Static load moment: $M_{\text{stat}} = M_{\text{R}} + M_{\text{g}}$ (installed horizontally $M_{\text{g}} = 0$)
 $= 0.69 \text{ Nm}$

Continuous motor torque: $M_0 = 1.75 \text{ Nm}$

Torque ratio: $\frac{0.69}{1.75} = 0.39$
 $0.39 \leq 0.6$ condition met
– motor selection OK

All three conditions met ⇒ Selected motor is suitable for the application.

Result

Compact module CKK-110

Length: $L = 695 \text{ mm}$
 Max. travel range: $s_{\max} = 520 \text{ mm}$
 Carriage length: $L_{\text{ca}} = 155 \text{ mm}$
 Ball screw assembly: Nominal diameter: $d_0 = 16 \text{ mm}$
 Lead: $P = 10 \text{ mm}$

With cover strip

Motor attachment via belt side drive, gear ratio $i = 1.5$

Motor preselection: MS2N04-B0BTN with brake

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:

Friction torque: $M_R = 0.69 \text{ Nm}$
 Mass moment of inertia: $J_{\text{ex}} = 129.096 \cdot 10^{-6} \text{ kgm}^2$
 Speed: $v_{\text{mech}} = 0.5 \text{ m/s}$ ($n_{\text{mech}} = 4\,500 \text{ rpm}$)
 Drive torque limit: $M_{\text{mech}} = 5.11 \text{ Nm}$

➡ The motor torque must be limited to 5.11 Nm on the drive side!

Acceleration limit: $a_{\max} = 50 \text{ m/s}^2$
 Limit for speed: $v_{\max} = 0.77 \text{ m/s}$ ($n_{\text{mech}} = 6\,930 \text{ rpm}$)

Besides the preferred type MS2N04-B0BTN, other motors with identical connection dimensions can be adapted while taking care not to exceed the calculated limit values.

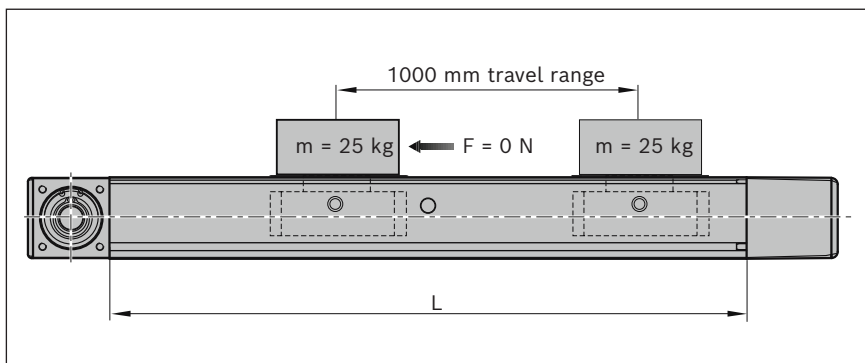
Calculation example CKR

Given data

In a handling task, a mass of 25 kg is to be moved horizontally by 1000 mm at a travel speed of 1.5 m/s. The following was selected based on the technical data and the installation space:

compact module CKR-145

- Carriage length = 190 mm
- With connection plate
- Motor attachment via planetary gear, $i = 5$
- With motor MS2N04-D0BQN without brake



Calculation of length L

$$\begin{aligned}
 L &= s_{\max} + L_{ca} + L_{ad} \\
 \text{Stroke reserve: } s_e &= 20 \text{ mm} \\
 \text{Max. travel range: } s_{\max} &= s_{\text{eff}} + s_e \\
 &= 1\,000 + 20 = 1\,020 \text{ mm} \\
 \text{Length: } L &= 1\,020 + 190 + 75 = 1\,285 \text{ mm}
 \end{aligned}$$

Friction torque M_R

$$\begin{aligned}
 M_R &= M_{Rge} + \frac{M_{Rs}}{i} \\
 \text{Compact module: } M_{Rs} &= 2.04 \text{ Nm} \\
 \text{Gear: } M_{Rge} &= 0.17 \text{ Nm} \\
 \text{Friction torque: } M_R &= 0.17 + \frac{2.04}{5} = 0.58 \text{ Nm}
 \end{aligned}$$

Mass moment of inertia J_{ex}

$$\begin{aligned}
 J_{ex} &= J_{ge} + \frac{(J_s + J_t)}{i^2} \\
 \text{Gear: } J_{ge} &= 27 \cdot 10^{-6} \\
 \text{Compact module: } J_s &= (k_{J \text{ fix}} + k_{J \text{ var}} \cdot L) \cdot 10^{-6} \\
 &= (2\,276.71 + 0.3172 \cdot 1\,285) \cdot 10^{-6} \\
 &= 2\,684.312 \cdot 10^{-6} \text{ kgm}^2 \\
 \text{External load: } J_t &= m_{ex} \cdot k_{Jm} \cdot 10^{-6} \\
 &= 25 \cdot 689.59 \cdot 10^{-6} \\
 &= 17\,239.75 \cdot 10^{-6} \text{ kgm}^2 \\
 \text{Mass moment of inertia: } J_{ex} &= 27 \cdot 10^{-6} + \frac{(2\,684.312 \cdot 10^{-6} + 17\,239.75 \cdot 10^{-6})}{5^2} \\
 &= 823.962 \cdot 10^{-6} \text{ kgm}^2
 \end{aligned}$$

Maximum permissible rotary speed n_{mech}

(Motor attachment via gear reducer,
without considering the motor)

Limit for mechanical system

$$\begin{aligned}
 n_{\text{mech}} &= \text{Minimum} (n_p \cdot i ; n_{\text{ge}}) \\
 \text{Compact module: } n_p &= \frac{(v_{\text{max}} \cdot 1\,000 \cdot 60)}{\pi \cdot d_3} \\
 &= \frac{(5 \cdot 1\,000 \cdot 60)}{\pi \cdot 52.52} \\
 &= 1\,818 \text{ rpm} \\
 \text{Gear: } n_{\text{ge}} &= 8\,000 \text{ rpm} \\
 \text{Max. permissible rotary speed: } n_{\text{mech}} &= \text{Minimum} (1\,818 \cdot 5 ; 8\,000) \\
 &= \text{Minimum} (9\,090 ; 8\,000) \\
 &= 8\,000 \text{ rpm}
 \end{aligned}$$

Maximum permissible speed v_{mech}

(Motor attachment via gear reducer,
without considering the motor)

Limit for mechanical system

$$\begin{aligned}
 v_{\text{mech}} &= \frac{(n_{\text{mech}} \cdot \pi \cdot d_3)}{i \cdot 1\,000 \cdot 60} \\
 \text{Max. permissible speed: } v_{\text{mech}} &= \frac{(8\,000 \cdot \pi \cdot 52.52)}{5 \cdot 1\,000 \cdot 60} \\
 &= 4.4 \text{ m/s}
 \end{aligned}$$

Maximum permitted rotary speed of the application n_{mech}

(Motor attachment via gear reducer,
without considering the motor)

Application tolerance

$$\begin{aligned}
 \text{Speed: } v_{\text{mech}} &= 1.5 \text{ m/s} \\
 \text{Rotary speed: } n_{\text{mech}} &= \frac{(1.5 \cdot 5 \cdot 1\,000 \cdot 60)}{\pi \cdot 52.52} \\
 &= 2\,727 \text{ rpm}
 \end{aligned}$$

Maximum permissible drive torque M_{mech}

(Motor attachment via gear reducer,
without considering the motor)

Limit for mechanical system

$$\begin{aligned}
 M_{\text{mech}} &= \text{Minimum} \left(\frac{M_{\text{ge}}}{i} ; \frac{M_p}{i} \right) \\
 \text{Compact module: } M_p &= 32.5 \text{ Nm} \\
 \text{Gear: } M_{\text{ge}} &= 40 \text{ Nm} \\
 \text{Drive torque: } M_{\text{mech}} &= \text{Minimum} \left(\frac{40}{5} ; \frac{32.5}{5} \right) \\
 &= \text{Minimum} (8.0 ; 6.5) \\
 &= 6.5 \text{ Nm}
 \end{aligned}$$

Calculation example CKR

Motor preselection check

Selected motor:

MS2N04-D0BQN without brake

Condition 1:

$$\begin{aligned} \text{Rotary speed: } n_{\max} &\geq n_{\text{mech}} \\ 6,000 &\geq 2727 \text{ condition met – motor selection OK} \end{aligned}$$

Condition 2:

$$\begin{aligned} \text{Mass moment of inertia ratio: } V &= \frac{J_{\text{ex}}}{J_{\text{m}} + J_{\text{br}}} \\ \text{Motor inertia: } J_{\text{m}} &= 160 \cdot 10^{-6} \text{ kgm}^2 \\ \text{Brake moment of inertia: } J_{\text{br}} &= 0 \text{ kgm}^2 \text{ (without brake)} \\ \text{Moment of inertia ratio: } V &= \frac{823.962 \cdot 10^{-6}}{160 \cdot 10^{-6}} \\ &= 5.15 \\ \text{Handling condition: } V &\leq 6 \\ 5.15 &\leq 6 \text{ condition met} \\ &\text{– motor selection OK} \end{aligned}$$

Condition 3:

$$\begin{aligned} \text{Torque ratio: } \frac{M_{\text{stat}}}{M_0} &\leq 0.6 \\ \text{Static load moment: } M_{\text{stat}} &= M_{\text{R}} + M_{\text{g}} \text{ (installed horizontally } M_{\text{g}} = 0) \\ &= \frac{0.58}{3.85} = 0.58 \text{ Nm} \\ \text{Continuous torque of the motor: } M_0 &= 3.85 \text{ Nm} \\ \text{Torque ratio: } &= 0.15 \\ 0.15 &\leq 0.6 \text{ condition met} \\ &\text{– motor selection OK} \end{aligned}$$

All three conditions met ⇒ selected motor is suitable for the application.

Result

compact module CKR-145

Length $L = 1\,285\text{ mm}$

Max. travel range $s_{\max} = 1\,020\text{ mm}$

Carriage length $L_{\text{ca}} = 190\text{ mm}$

Toothed belt drive

With connection plate

Motor attachment via planetary gear, gear ratio $i = 5$

Motor preselection: MS2N04-D0BQN without brake

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

When doing this, the following data must be considered.

Friction torque $M_R = 0.58\text{ Nm}$

Mass moment of inertia $J_{\text{ex}} = 823.962 \cdot 10^{-6}\text{ kgm}^2$

Travel speed $v_{\text{mech}} = 1.5\text{ m/s}$ ($n_{\text{mech}} = 2\,727\text{ min}^{-1}$)

Drive torque limit $M_{\text{mech}} = 6.5\text{ Nm}$

➡ The motor torque must be limited to 6.5 Nm on the drive side!

Acceleration limit $a_{\max} = 50\text{ m/s}^2$

Limit for travel speed $v_{\max} = 3.3\text{ m/s}$ ($n_{\max} = 6\,000\text{ min}^{-1}$)

After determining the emergency-stop stopping distance during precise sizing, the selected excess travel must be checked to see whether it is sufficient and adjusted if necessary.

Besides the preferred type MS2N04-D0BQ, other motors with identical connection dimension can be adapted while taking care not to exceed the calculated limits.

Abbreviations

Abbreviation/ index	Designation	Unit
a	Acceleration	(m/s ²)
a_{max}	Maximum acceleration rate	(m/s ²)
BASA	Ball screw assembly	(–)
B_t	Belt type	(–)
c_{spe}	Specific spring rate	(N)
C_{gw}	Dynamic load capacity, guideway	(N)
C_{bs}	Dynamic load capacity, ball screw assembly	(N)
C_{fb}	Dynamic load capacity, fixed bearing	(N)
d₀	Nominal diameter, ball screw assembly	(mm)
d₃	Belt pulley diameter	(mm)
f_w	Load factor	(–)
F_n	Axial load of the ball screw assembly	(N)
F_{eff}	Effective equivalent axial load	(N)
F_{bp}	Max. belt drive transmission force	(N)
F_{comb}	Combined equivalent bearing load	(N)
F_{mbs}	Dynamically equivalent load on bearing of the ball screw assembly	(N)
F_{mgw}	Dynamically equivalent load on bearing of the guideway	(N)
F_n	Axial load of the ball screw assembly	(N)
F_{t zul}	Belt elasticity limit	(N)
F_y	Load due to a resulting force in the y-direction	(N)
F_{y max}	Maximum dynamic load in y-direction	(N)
F_z	Load due to a resulting force in the z-direction	(N)
F_{z max}	Maximum dynamic load in z-direction	(N)
g	Gravitational acceleration (= 9.81)	(m/s ²)
i	Gear ratio	(–)
I_y	Planar moment of inertia about the y-axis	(cm ⁴)
I_z	Planar moment of inertia about the z-axis	(cm ⁴)
J_{br}	Mass moment of inertia of the motor brake	(kgm ²)
J_c	Mass moment of inertia of the coupling	(kgm ²)
J_{dc}	Mass moment of inertia of the drive train	(kgm ²)
J_{ex}	Mass moment of inertia of the mechanical system	(kgm ²)
J_{ge}	Mass moment of inertia of the gear about the motor journal	(kgm ²)
J_m	Mass moment of inertia of the motor	(kgm ²)
J_s	Mass moment of inertia of the linear motion system	(kgm ²)
J_{sd}	Mass moment of inertia of the belt side drive about the motor journal	(kgm ²)
J_t	Translative mass moment of inertia of external load based on the linear motion system screw journal	(kgm ²)
k_{g fix}	Constant for fixed portion of mass	(kg)
k_{g var}	Constant for variable-length portion of mass	(kg/mm)

Abbreviation/ index	Designation	Unit
k_{J fix}	Constant for fixed portion of mass moment of inertia	(kg/mm 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	(kg/mm)
L	Length of the linear motion system	(mm)
L_{ad}	Additional length	(mm)
L_{ca}	Carriage length	(mm)
L_{bs}	Nominal service life (ball screw assembly, fixed bearing)	(rpm)
L_{hbs}	Nominal service life (ball screw assembly, fixed bearing)	(h)
L_{gw}	Nominal service life of the guideway	(m)
L_{hgw}	Nominal service life of the guideway	(h)
L_m	Length of the motor	(mm)
L_{max}	Max. length	(mm)
L_w	Centerline-to-centerline distance between carriages	(mm)
m_{br}	Holding brake mass	(kg)
m_{ca}	Moved mass of system of carriage	(kg)
m_{ex}	Moved external load	(kg)
m_{fc}	Mass of flange and coupling	(kg)
m_m	Mass of the motor	(kg)
m_s	Mass of the linear system (without attachments)	(kg)
m_{sd}	Mass of the timing belt side drive	(kg)
M₀	Continuous motor torque	(Nm)
M_{cN}	Rated torque of coupling	(Nm)
M_g	Weight moment at motor journal	(Nm)
M_{ge}	Maximum permissible acceleration torque of the gear (at the output drive)	(Nm)
M_L	Dynamic longitudinal moment load capacity	(Nm)
M_m	Equivalent dynamic torque	(Nm)
M_{max}	Max. possible motor torque	(Nm)
M_{mech}	Maximum permissible drive torque for mechanical system	(Nm)
M_p	Maximum permissible drive torque (at drive journal)	(Nm)
M_R	Frictional torque at motor journal	(Nm)
M_{Rge}	Friction torque of gear at motor journal	(Nm)
M_{Rs}	Friction torque of system	(Nm)
M_{Rsd}	Friction torque of belt side drive at motor journal	(Nm)
M_{sd}	Maximum permissible drive torque of the belt side drive	(Nm)
M_{stat}	Static load moment	(Nm)
M_t	Dynamic torsional moment load capacity	(Nm)
M_x	Dynamic torsional moment around the x-axis	(Nm)
M_{x max}	Maximum permissible torsional moment around the x-axis	(Nm)

Abbreviation/ index	Designation	Unit
M_y	Dynamic torsional moment around the y-axis	(Nm)
$M_{y \max}$	Maximum permissible torsional moment around the y-axis	(Nm)
M_z	Dynamic torsional moment around the z-axis	(Nm)
$M_{z \max}$	Maximum permissible torsional moment around the z-axis	(Nm)
n	Rotary speed of the ball screw assembly	(rpm)
$n_1, n_2, \dots n_n$	Rotary speed in acceleration and braking phases	(rpm)
$n_{A1 \dots n}$	Starting speed in phase 1 ... n	(rpm)
$n_{E1 \dots n}$	Ending speed in phase 1 ... n	(rpm)
n_{ge}	Maximum permissible rotary speed of the gear	(rpm)
n_m	Average rotary speed of the ball screw assembly	(rpm)
n_{mech}	Maximum permissible rotary speed for mechanical system	(rpm)
n_{max}	Max. motor speed	(rpm)
n_p	Maximum permissible rotary speed of the linear motion system	(rpm)
P	Screw lead	(mm)
P_{app}	Effective power in application	(W)
Keyway	Keyway	(—)
$q_{t1..n}$	Time step of the phases	(%)
s_a	Acceleration travel	(mm)
s_e	Stroke reserve	(mm)
s_{eff}	Effective stroke	(mm)
s_{min}	Minimum travel range	(mm)
s_{max}	Maximum travel	(mm)
s_{ov}	Overlap travel	(mm)
SPU	Screw support	
t_a	Acceleration/braking time	(s)
$t_1, t_2, \dots t_n$	Time for phase 1 ... n	(s)
u	Feed constant	(mm/rev)
$v_1, v_2, \dots v_n$	Speed in phase 1 ... n	(m/s)
v_{max}	Maximum permissible speed	(m/s)
v_{mech}	Maximum permissible speed of mechanical system	(m/s)
v_{mgw}	Average linear speed of the guideway	(m/s)
V	Ratio of mass moments of inertia of drive chain and motor	(—)
z_1	Application point of the effective force	(mm)

Ordering example CKK





Ordering data		Explanation
Compact module	CKK-110-NN-1	Compact module with ball screw assembly CKK-110-NN-1
Length L	715	Length = 715 mm
Version	RV01	Belt side drive
Guideway	001	Standard main body
Lubrication ¹⁾	LSS	Standard lubrication
Drive		
BASA (ball screw assembly d ₀ x P)	002	Nominal diameter = 16 mm, lead = 10 mm
Carriage		
Carriage ²⁾	041	Carriage with connection plate, L _{ca} = 155 mm
Carriage centerline-to-centerline distance L _w	–	Only necessary with carriages with variable center-to-center distance
Motor attachment		
Gear ratio	–	Without gear ratio
Attachment kit ³⁾	023	Motor attachment for MS2N04-C0BTN servo motor
Motor		
Motor code	212	MS2N04-B0BTN, 1 cable, with brake
Motor connector position	270	Motor connector position = 270°
Cover		
Cover	002	With cover strip
Switching system (max. 6 switches/sensors selectable)		
Sensor 1	021	REED, changeover contact (NC: C+NC, NO: C+NO)
Sensor 2	022	Hall, PNP normally closed (NC)
Sensor 3	021	REED, changeover contact (NC: C+NC, NO: C+NO)
Cable duct / cable channel	025	Cable duct
Socket-connector	017	Socket-connector
Automation package (Controller, Cable)		➡ Chapter "Automation package"
Documentation	001	Standard report

¹⁾ Not part of the option key

²⁾ For the permissible values see "General technical data"

³⁾ The motor geometry code is required for motors according to customer specifications

Further information

<u>Bosch Rexroth Linear Motion Technology homepage</u>	
<u>Compact module product information (instruction, configurator, store, etc.)</u>	
<u>Smart Function Kit Handling (SFK-H)</u>	
<u>Product overview, automation solutions (motors, drives, control systems, etc.)</u>	

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