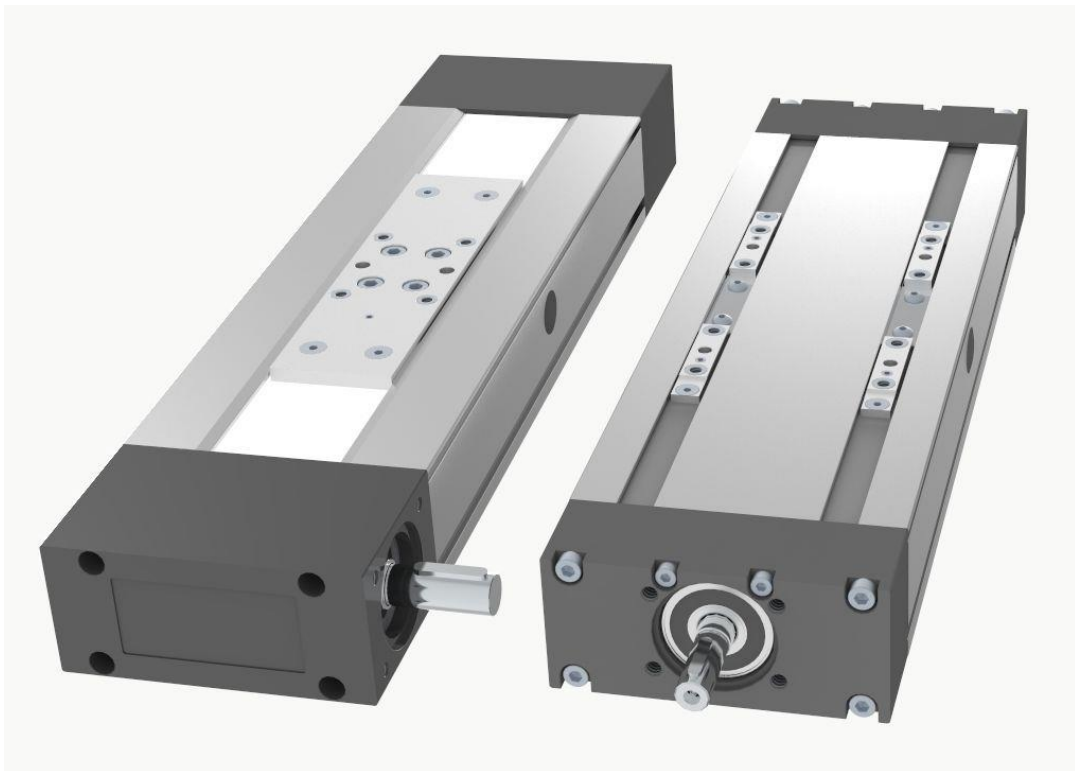




Gesellschaft für innovative Automationstechnik mbH

Compact linear unit KK and KR



Preface

To realise automation solutions in a technically and economically efficient way, it is essential to trust in the competence and experience of specialists.

We consequently follow the idea of systems to offer a comprehensive range of standardised automation solutions with which line and gantry robots, palletisers and manipulators can be realised in an economically efficient way.

Take advantage of our experience and our specialist's know-how! Benefit from our innovative technologies for economical, user-oriented solutions. Wherever custom-tailored and individual automation solutions are required – we are your competent partner!

Although this catalogue was compiled with the greatest care and checked for errors, we cannot take any liability for incomplete or incorrect data.

Due to the permanent technical progress all data given in this catalogue are subject to change without notice. Printing or copying the catalogue or excerpts of it, no matter how or by what means, is only allowed with written permission by GiA mbH.

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Linear stages KR and KK – General instructions

Fields of application

The great variety of linear units with their various kinds of guide systems, drives and mounting parts provides the user with a broad range of solutions.

The systems allow the realisation of one-axis systems as well as two or three-dimensional multi-axis systems in a technically and economically reasonable way. We recommend them especially for the following fields of application:

- Handling systems
- Palettisers
- Packaging machines
- Feed systems
- Test and control units
- and many more

Kinds of drives

Belt drive:

The belt drive is preferably used for tasks requiring high speed with medium loads and precision. The belt is guided through flaps on the sides and prestressed at the guide carriage. Special antiturn washers make sure the drive is backlash-free and therefore guarantee high repeatability even in case of long ways and high speed. The toothed belt is made of polyurethane (type AT5 or AT10) and features tensile members made of steel braids – providing sufficient safety for higher loads. Nevertheless we do not recommend toothed belt drives for vertical applications (danger through broken belts).

Ball screw drives:

Ball screw drives can be found wherever high feed forces and precision with medium speed are required. The ball screws are available with low or no backlash and thus consider the respective requirements. There are precision ball bearings at both ends of the ball screw.

Trapezoidal screw drives:

Trapezoidal screw drives are recommended solutions for medium precision and speed. The duty cycle should not exceed 20 % per hour. Precision ball bearings are at both ends of the trapezoidal screw. Trapezoidal screws are only partly retained by friction.

Covers

As a standard the linear stages are protected against dirt with two plastic cover bands. As desired the units can be equipped with an additional steel cover band.



Compact liner units KR and KK – General instructions

Safety instructions

All sizes are not or only partly self-locking and therefore require motors with holding brake especially for vertical application. Screw drives are preferable for vertical application. Make sure, the application poses no danger to people or material or clearly indicate remaining risks.

Profile

The aluminium profile is an extrusion profile with tolerances in straightness and torsion. The tolerances are regulated according to DIN 17615. Our profiles usually have a better accuracy as the required tolerances.

Mounting

The linear units are mounted at the bottom of the profile using T-nuts or T-bolts or at the sides using clamping strips. In order to achieve the desired accuracy of the guide the linear unit has to be aligned by means of levelling plates or by mounting them to a specially machined mounting face (flatness tolerance <0,2 mm/m).

The load can be securely mounted to the carriage by means of screws. The linear unit should regularly be cleaned from dust and dirt.

Commissioning

During commissioning make sure the permissible loads are not exceeded and the permissible distances are kept (don't drive against mechanical stop). The end positions should be equipped with limit switches and external dampers as emergency stoppers.

Lubrication and maintenance

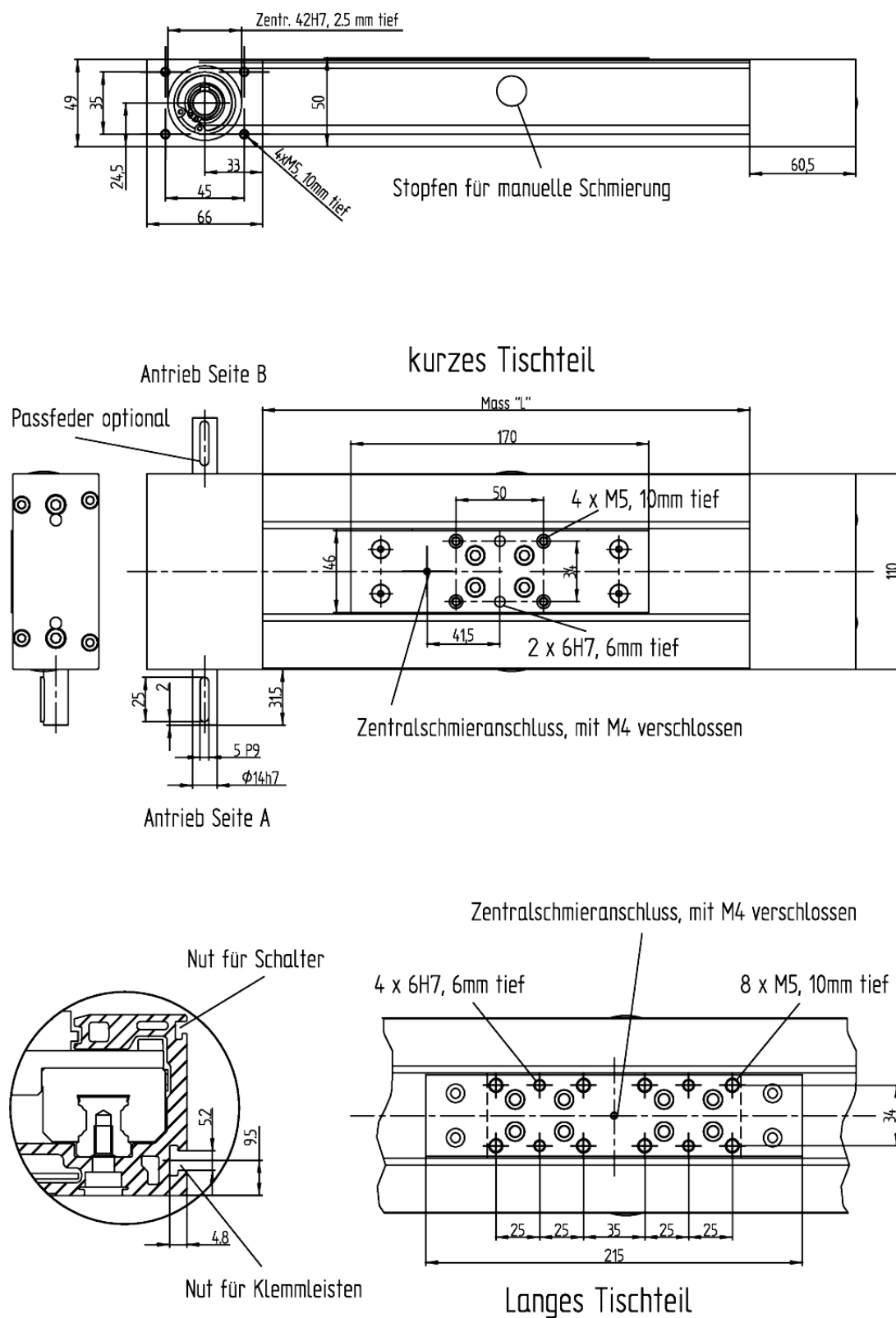
The linear units are delivered ready-to-mount and lubricated with lithium complex soap thickened grease. Lubrication nipples mounted on the sides allow central relubrication for maintenance. All bearings are sealed and maintenance-free. Every 400 operating hours at the latest or every six months the linear recirculating ball bearings and the screw should be relubricated by means of a suitable grease. If other greases are used check the miscibility. It is recommended to rather grease several times with small amounts than to grease once when the maintenance interval expires.

The maintenance intervals depend on the ambient conditions and the application.

Amounts for relubrication

	Linear stages KR15 and KK15	Linear stages KR20 and KK20	Linear stages KR25 and KK25
With toothed belt drive KR	6 - 8 g	8 - 10 g	12 - 14 g
With screw KK	14 - 16 g	16 - 18 g	20 - 22 g

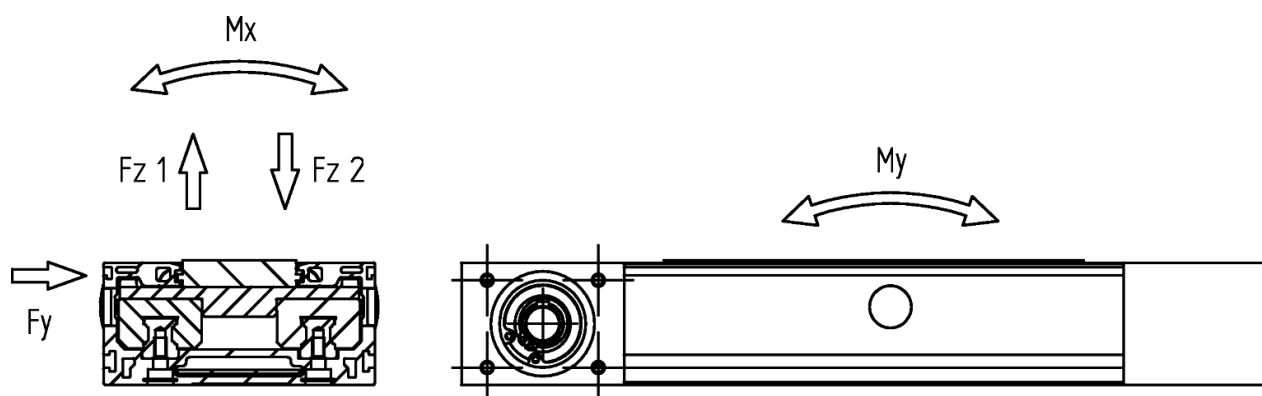
KR 15 – Compact linear unit with toothed belt



KR 15 – Compact linear unit with toothed belt

Performance data/order code

	Order name linear stage	Dyn. static load rating ¹⁾ of the guide	Permissible forces in N			Max. permissible moment loads in Nm	
		C _{dyn.} [kN]	Fz1	Fz2	Fy	Mx	My
short carriage	KR 1501	15.6	5600	11200	3240	40	180
long carriage	KR 1502	27.0	9090	18190	5270	380	300



Max. length of the profile	5600 mm		Moment of inertia of the profile	Jx = 42.69 cm ⁴	
Speed	max. 5 m/s			Jy = 237.23 cm ⁴	
Repeatability²⁾	± 0.08 mm		Weight in kg	KR1501	KR1502
Feed per revolution	120 mm		Carriage	0.91	1.25
Max. operational force of belt³⁾	715 N		Unit without stroke	4.73	5.40
Max. drive torque	13.5 Nm		Per 100 mm stroke	0.75	0.75

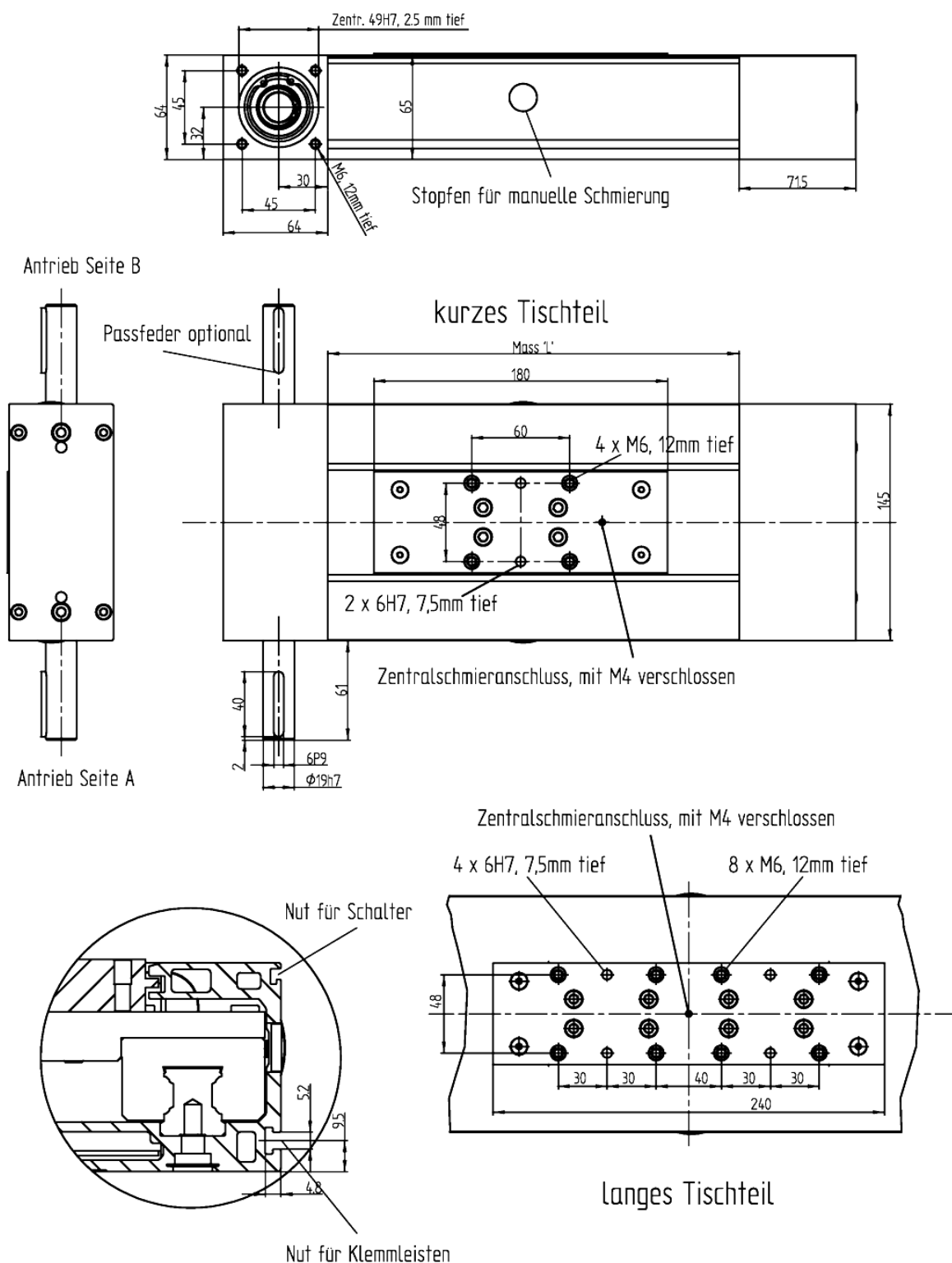
- High speed
- Long strokes
- Four-row linear recirculating ball bearing, size 15
- Central lubrication nipple at carriage
- Central manual lubrication fitting on both sides of the profile
- T-grooves for clamping strips on the sides

1) Vertically on the carriage

2) Dependent on load, speed, delay, direction and temperature

3) Dependent on the speed

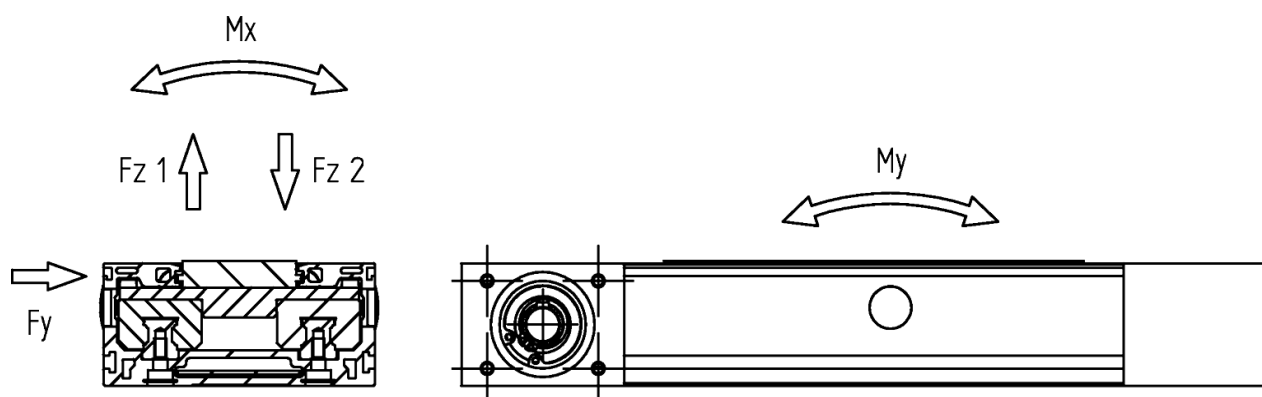
KR 20 – Compact linear unit with toothed belt



KR 20 – Compact linear unit with toothed belt

Performance data/order name

	Order name linear stage	Dyn. static load rating ¹⁾ of the guide	Permissible forces in N			Max. permissible moment loads in Nm	
		C _{dyn.} [kN]	Fz1	Fz2	Fy	Mx	My
short carriage	KR 2001	34.8	26760	13380	7760	580	130
long carriage	KR 2002	56.5	43470	21730	12600	950	1080



Max. length of the profile	5600 mm		Moment of inertia	Jx = 112.98 cm ⁴	
Speed	max. 5 m/s		of the profile	Jy = 582.73 cm ⁴	
Repeatability²⁾	± 0.08 mm		Weight in kg	KR2001	KR2002
Feed per revolution	165 mm		Carriage	1.91	2.87
Max. operational force of belt³⁾	1220 N		Unit without stroke	8.56	9.53
Max. drive torque	32.5 Nm		Per 100 mm stroke	1.01	1.01

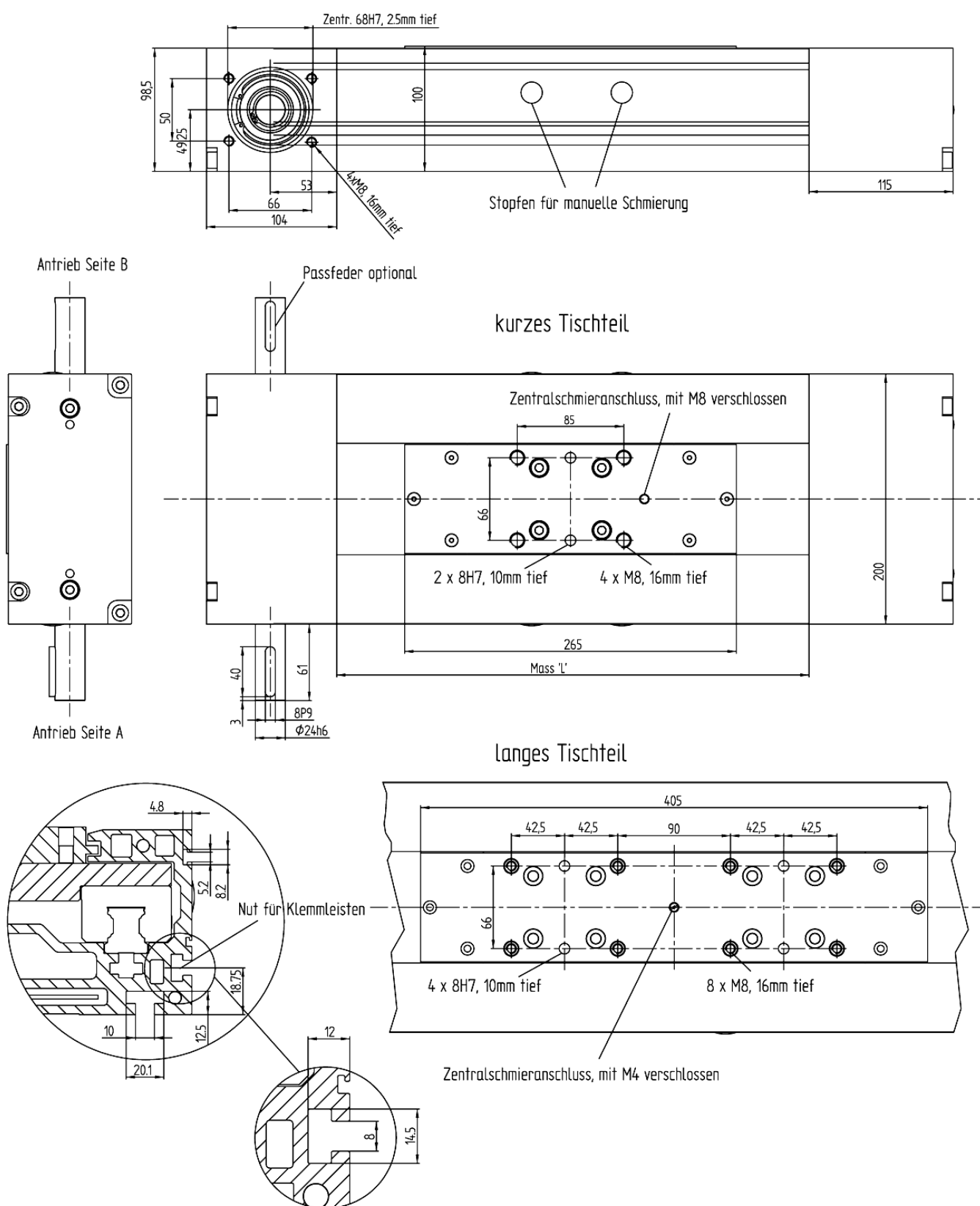
- High speed
- Long strokes
- Four-row linear recirculating ball bearing, size 20
- Central lubrication nipple at carriage.
- Central manual lubrication fitting on both sides of the profile
- T-grooves for clamping strips on the sides

1) Vertically on the carriage

2) Dependent on load, speed, delay, direction and temperature

3) Dependent on the speed

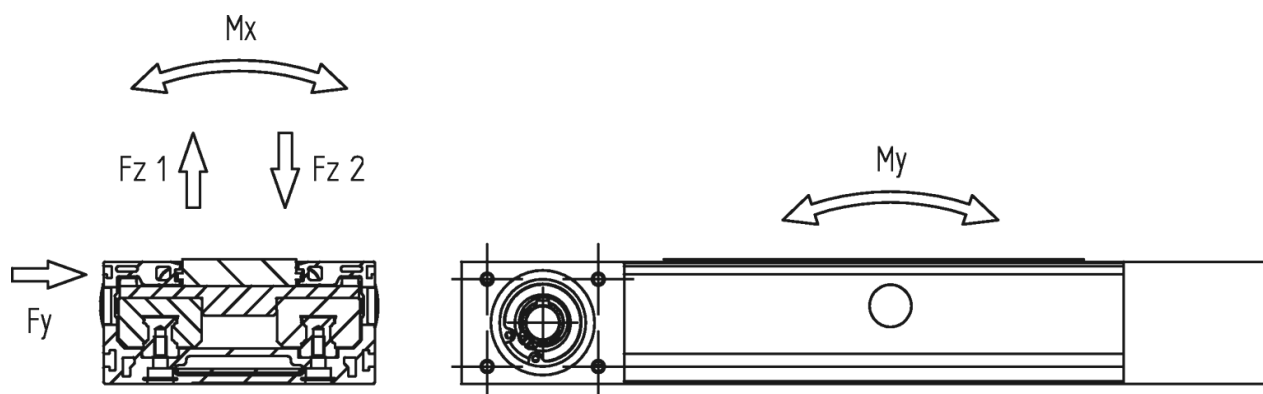
KR 25 – Compact linear unit with toothed belt



KR 25 – Compact linear unit with toothed belt

Performance data/order code

	Order name linear stage	Dyn. static load rating ¹⁾ of the guide	Permissible forces in N			Max. permissible moment loads in Nm	
		C _{dyn.} [kN]	Fz1	Fz2	Fy	Mx	My
short carriage	KR 2501	34.8	42300	21150	12260	1370	180
long carriage	KR 2502	56.5	68710	34350	19920	2230	3000



Max. length of the profile	5600 mm		Moment of inertia of the profile	Jx = 587.61 cm ⁴	
Speed	max. 5 m/s			Jy = 2818.07 cm ⁴	
Repeatability²⁾	± 0.08 mm		Weight in kg	KR2501	KR2502
Feed per revolution	250 mm		Carriage	5.75	7.59
Max. operational force of belt³⁾	2845 N		Unit without stroke	2.84	26.26
Max. drive torque	95.5 Nm		Per 100 mm stroke	2.26	2.26

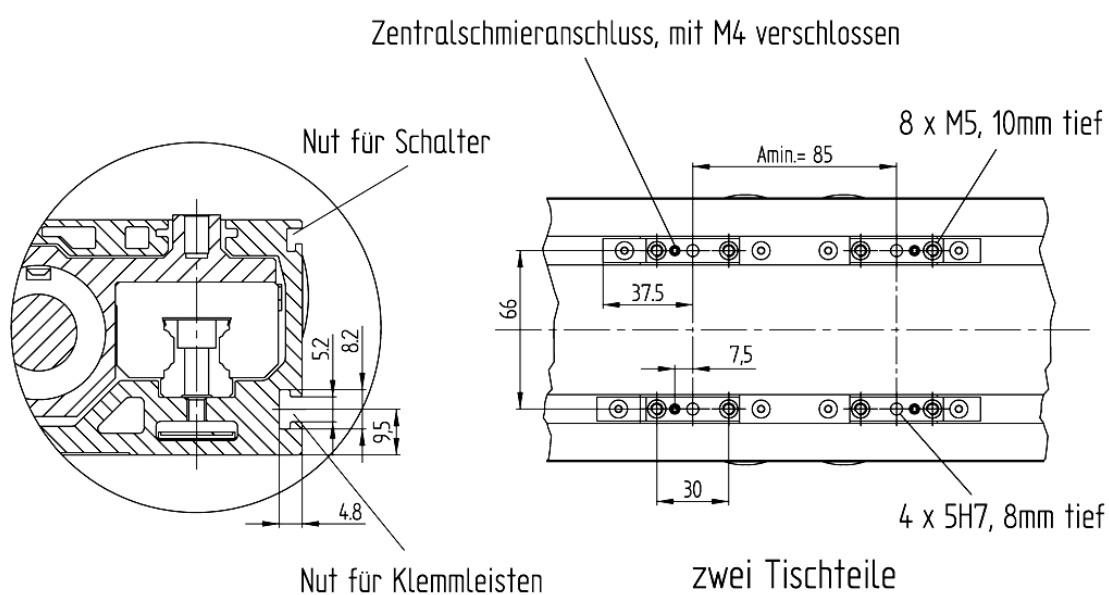
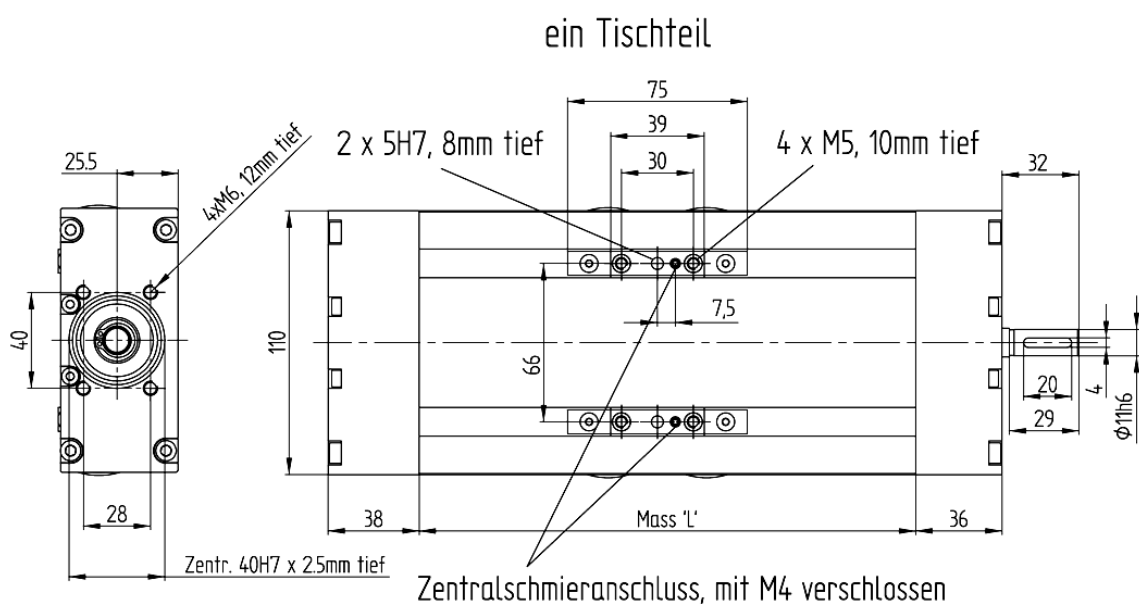
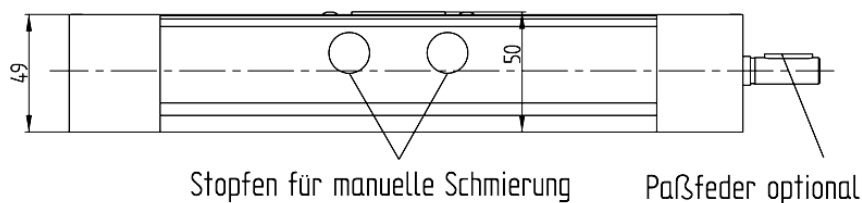
- High speed
- Long strokes
- Four-row linear recirculating ball bearing, size 25
- Central lubrication nipple at carriage.
- Central manual lubrication fitting on both sides of the profile
- T-grooves for clamping strips on the sides

1) Vertically on the carriage

2) Dependent on load, speed, delay, direction and temperature

3) Dependent on the speed

KK 15 – Compact linear unit with ball screw

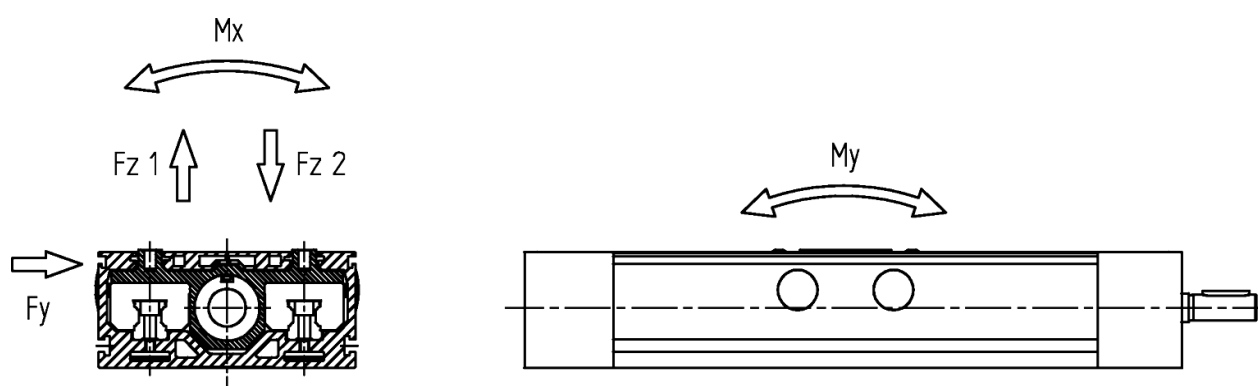


Dimension "L" and "A" have to be specified by order !!

KK15 - Compact linear unit with ball screw

Performance data/order name

	Order name linear stage	dyn. static load rating ¹⁾ of the guide	Permissible forces in N			Max. permissible moment loads in Nm	
		C _{dyn.} [kN]	Fz1	Fz2	Fy	Mx	My
one carriage	KK 1501	15.60	12000	6000	3480	31	198
two carriages A = 85 mm	KK 1502	25.34	19490	9740	5650	322	414



Max. length of the profile⁴⁾	1600 mm
Speed⁵⁾	max. 0.6 m/s
Repeatability	± 0.03 mm
Feed per revolution²⁾	5, 10, 16 mm
Screw pitches³⁾	5, 10, 16 mm
Screw diameter	16 mm
Max. drive torque	5 Nm

C_{dyn} block bearing	13.4 kN	
Moment of inertia of the profile	Jx = 32.91 cm ⁴	
	Jy = 231.42 cm ⁴	
Weight in kg	KK1501	KK1502
Carriage	0.82	1.41
Unit without stroke	3.58	4.18
per 100 mm stroke	0.92	0.92

- High acceleration
- Stroke length limited by screw length, contact us!
- Four-row linear recirculating ball bearing, size 15
- Central lubrication nipple at carriage.
- Central manual lubrication fitting on both sides of the profile
- T-grooves for clamping strips on the sides

1) Vertically on the carriage

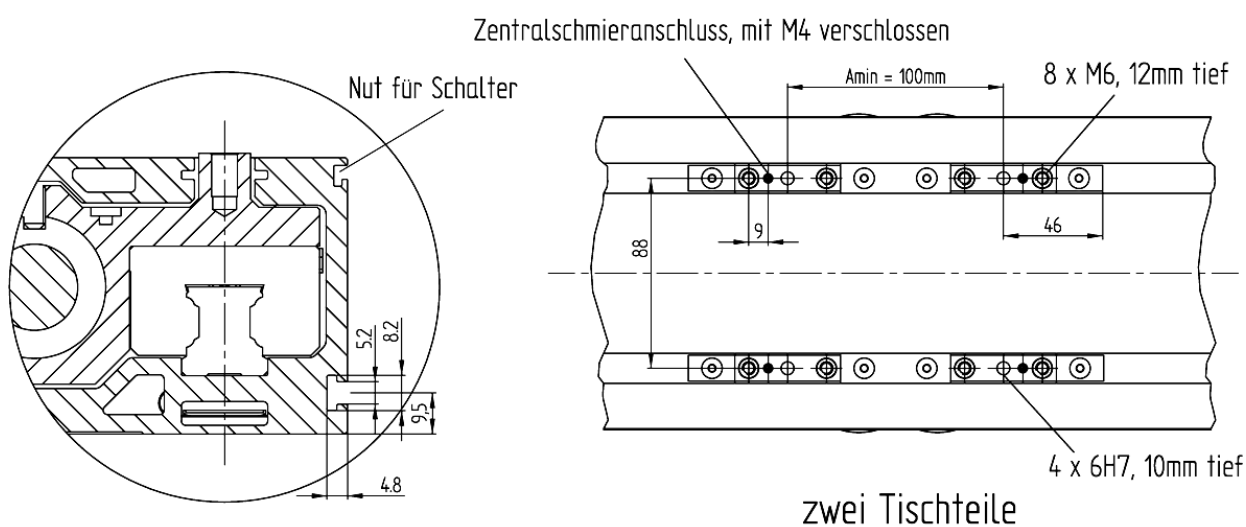
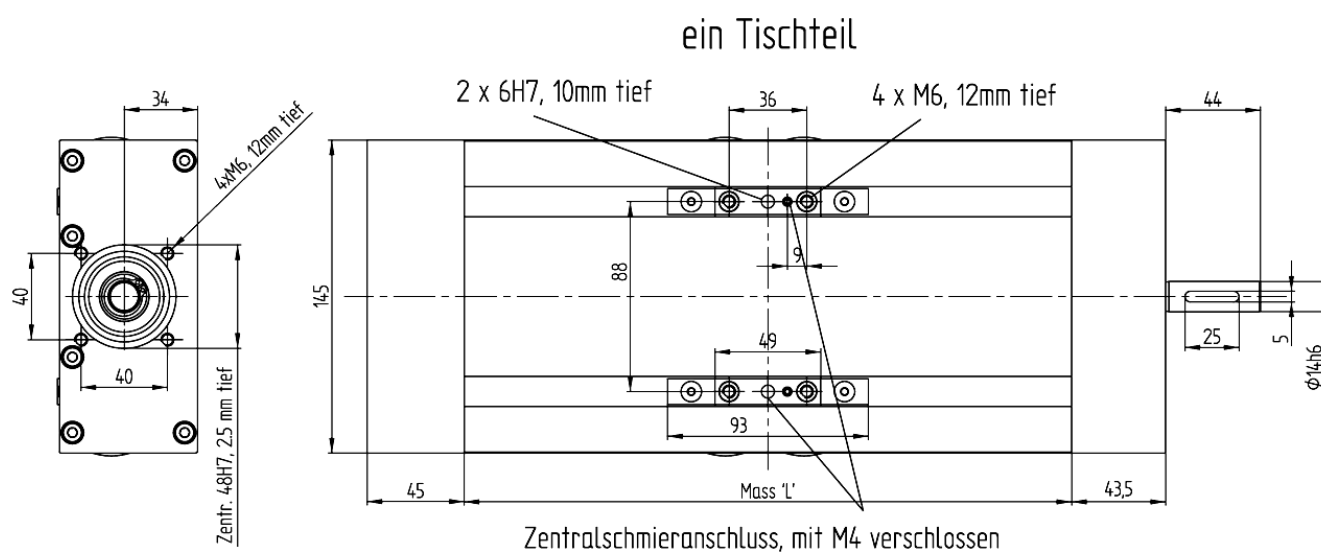
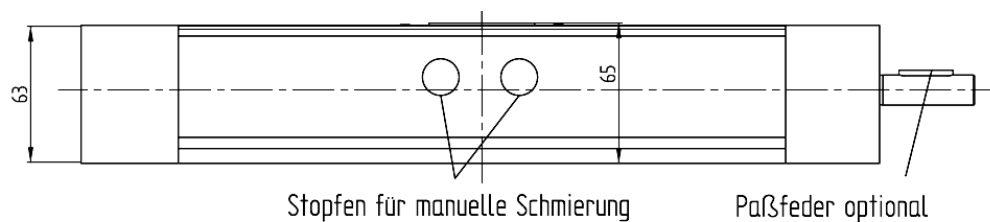
2) Dependent on pitch and length of screw

3) Special pitches available

4) Dependent on screw speed, longer screws on demand

5) Dependent on pitch and length of screw, please contact us!

KK20 – Compact linear unit with ball screw

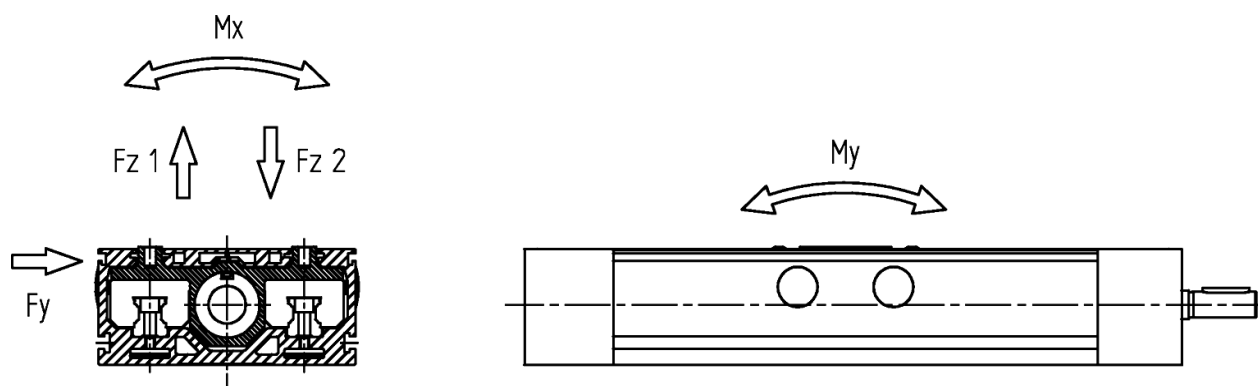


Dimension "L" and "A" have to be specified by order !!

KK20 - Linear stage with ball screw

Performance data/order name

	Order name linear stage	dyn. static load rating ¹⁾ of the guide	Permissible forces in N			Max. permissible moment loads in Nm	
		C _{dyn.} [kN]	Fz1	Fz2	Fy	Mx	My
one carriage	KK 2001	37.60	29000	14500	8410	638	100
two carriages A=100 mm	KK 2002	61.08	47110	23550	13660	1030	1180



Max. length of the profile⁴⁾	1850 mm
Speed⁵⁾	max. 1 m/s
Repeatability	± 0.03 mm
Feed per revolution²⁾	5, 10, 20, 50 mm
Screw pitches³⁾	5, 10, 20, 50 mm
Screw diameter	20, 25 mm
Max. drive torque	11.5 Nm

C_{dyn} block bearing	17.0 kN	
Moment of inertia of the profile	Jx = 104.07 cm ⁴	
	Jy = 697.52 cm ⁴	
Weight in kg	KK2001	KK2002
Carriage	1.35	2.33
Unit without stroke	6.57	7.91
Per 100 mm stroke	1.52	1.52

- High acceleration
- Stroke length limited by screw length, contact us!
- Four-row linear recirculating ball bearing, size 20
- Central lubrication nipple at carriage.
- Central manual lubrication fitting on both sides of the profile
- T-grooves for clamping ledges on the sides

1) Vertically on the carriage

2) Dependent on pitch and length of screw

3) Special pitches available

4) Dependent on screw speed, longer screws on demand

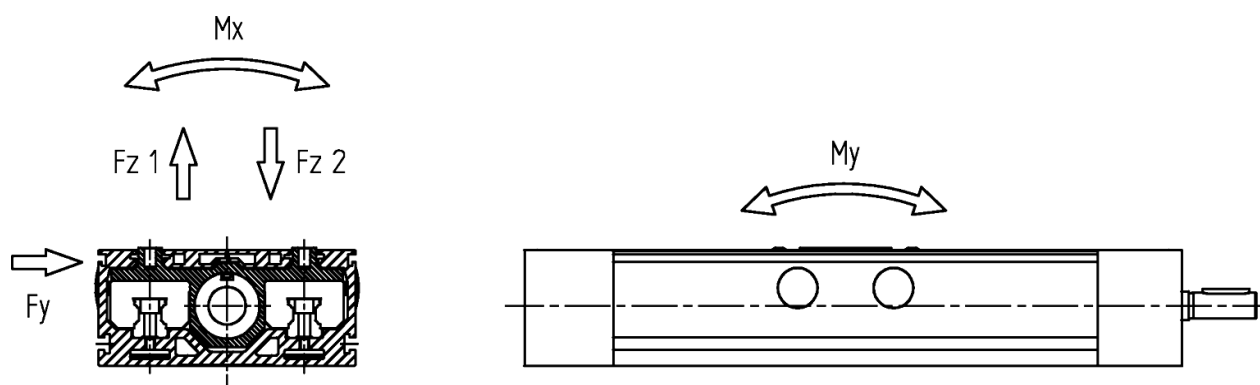
5) Dependent on pitch and length of screw, please contact us!



KK25 - Linear stage with ball screw

Performance data/order name

	Order name linear stage	Dyn. static load rating ¹⁾ of the guide	Permissible forces in N			Max. permissible moment loads in Nm	
		C _{dyn.} [kN]	Fz1	Fz2	Fy	Mx	My
one carriage	KK 2501	55.00	29000	14500	8410	638	100
two carriages A=100 mm	KK 2502	89.34	47110	23550	13660	1030	1180



Max. length of the profile⁴⁾	2500 mm
Speed⁵⁾	max. 0.8 m/s
Repeatability	± 0.03 mm
Feed per revolution²⁾	5, 10, 20, 32 mm
Screw pitches³⁾	5, 10, 20, 32 mm
Screw diameter	32 mm
Max. drive torque	18 Nm

C_{dyn} block bearing	26.0 kN	
Moment of inertia of the profile	Jx = 394.53 cm ⁴	
	Jy = 2845.12 cm ⁴	
Weight in kg	KK2501	KK2502
Carriage	2.88	4.63
Unit without stroke	16.57	19.27
per 100 mm stroke	2.84	2.84

- High acceleration
- Stroke length limited by screw length, contact us!
- Four-row linear recirculating ball bearing, size 25
- Central lubrication nipple at carriage.
- Central manual lubrication fitting on both sides of the profile
- T-grooves for clamping ledges on the sides

1) Vertically on the carriage

2) Dependent on pitch and length of screw

3) Special pitches available

4) Dependent on screw speed, longer screws on demand

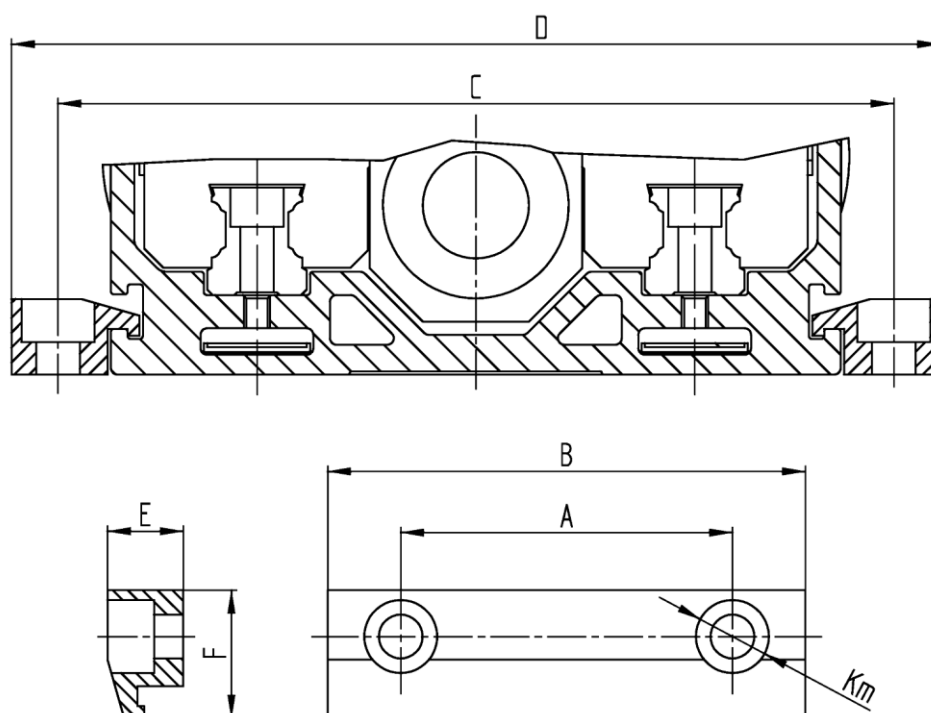
5) Dependent on pitch and length of screw, please contact us!

Accessory for linear stages KK and KR

Clamping strips – KL

Use clamping strips to mount the linear stages

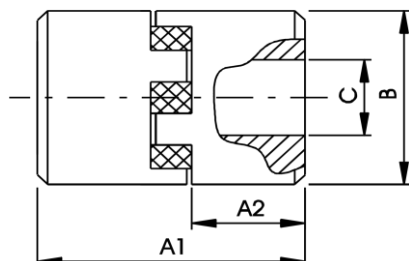
to a mounting face. The number of clamping ledges required depends on the load and the total length of the stage. The last column of the table below recommends the number required.



Linear stage	A	B	C	D	E	F	Km	Number Km	Ledges per meter	Order code ledge
KK15 / KR15 KK20 / KR20	50	70	126 161	140 175	11.5	19	M6	2	4	KL706
KK15 / KR15 KK20 / KR20	40	54	126 161	140 175	11.5	19	M6	2	4	KL546
KK15 / KR15 KK20 / KR20	40	140	126 161	140 175	11.5	19	M6	4	3	KL1406
KK25 / KR25	50	70	222	240	27	29	M8	2	4	KL708
KK25 / KR25	40	140	222	240	27	29	M8	4	3	KL1408

Accessory for linear stages KK and KR

Elastic coupling - EK



The couplings are torsionally elastic, transmit the torque positively and are puncture-proof.

Vibrations or bumps occurring during operation are effectively dampened and reduced.

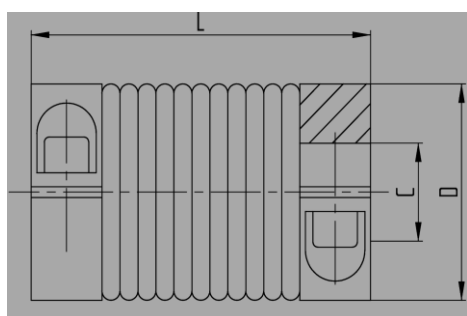
Order name	M_{rated} [Nm]	M_{max} [Nm]	A1	A2	ØB	ØC _{min}	ØC _{max}
EK 14	12.5	25	35 (50) ¹⁾	11 (18.5) ¹⁾	30	6	14
EK 19	17	34	66	25	40	6	24
EK 24	60	120	78	30	55	8	28
EK 28	160	320	90	35	65	10	38

1) only with clamping ring hub type

[mm]

Types of mounting holes: key groove/clamping collar/clamping ring hub/slip clutch

Metal bellow coupling - MBK



The special geometric shape of the bellow guarantees high resistance against torsion. At the same time it allows compensation of axial, radial or angular misalignment of the shaft. The bellows are made of stainless steel. They are connected to the coupling with a clamping collar or nonpositively with key groove.

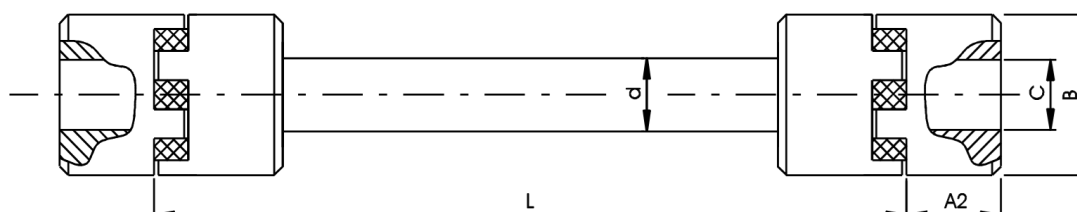
Order name	M_{rated} [Nm]	L	D	ØC _{min}	ØC _{max}
MBK 1	0.5	23	15	3	8
MBK 2	2	30	19	3	12
MBK 3	4.5	48	32	6	18
MBK 4	10	55	40	6	24

[mm]

Types of mounting holes: key groove/clamping collar

Accessory for linear stages KK and KR

Connecting shaft - VW

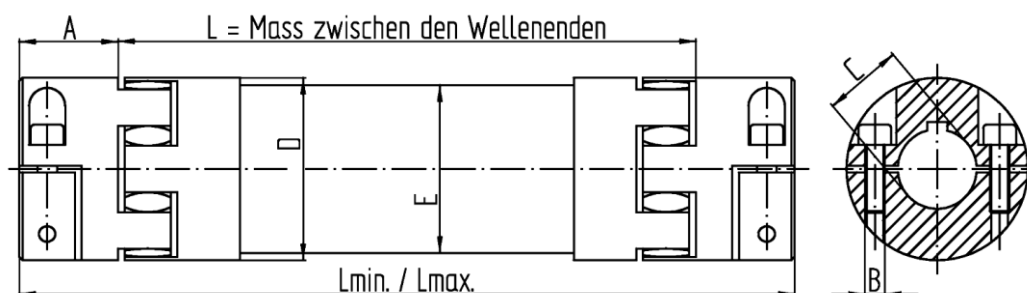


Order code	M _{rated} [Nm]	M _{max} [Nm]	A2	ØB	Ød	ØC _{min}	ØC _{max}
VW 20	17	34	25	40	20	6	24
VW 25	60	120	30	55	25	8	18
VW 30	160	320	35	65	30	10	38

[mm]

Please note dim. "L" on enquiries and orders (distance between journal ends).

Tube coupling - RK



Order code	M _{max.} [Nm] feather key	M _{max.} [Nm] clamping collar	A	B	C _{min.}	C _{max.}	D	E	L _{min.}	L _{max.}
RK1	12.5	6.1	11	M4	4	12	30	30	101	2000
RK2	17	42	25	M6	8	20	40	35	135	2500
RK3	59	60	30	M6	10	28	55	50	157	3000
RK4	160	148	35	M8	14	38	65	60	181	3500
RK5	60	40	45	M8	18	45	80	75	229	4000

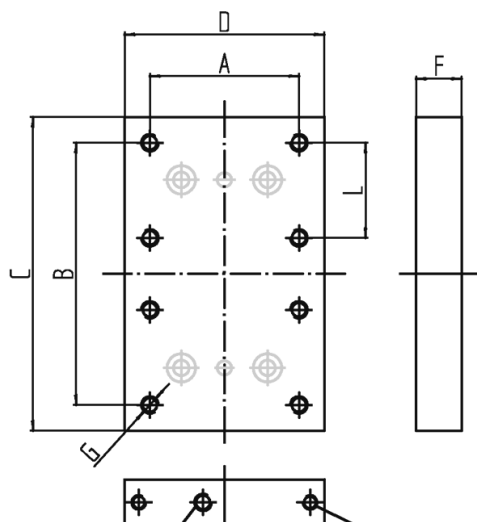
[mm]

Please note dim. "L" on enquiries and orders (distance between journal ends).

Accessory for linear stages KK and KR

Carriage plates SP for KR and KK

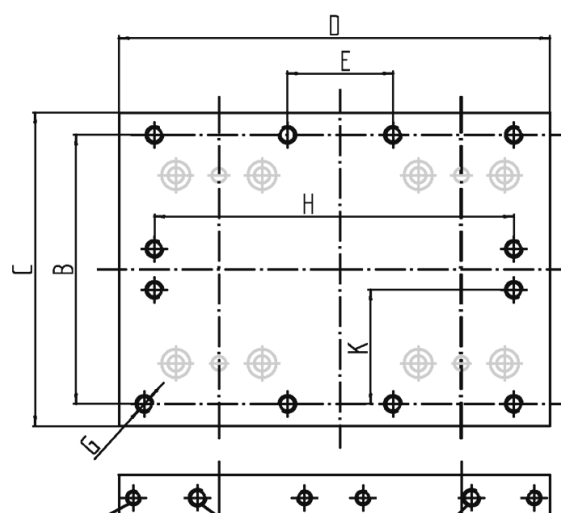
Kurze Schlittenplatte KR
1 Tischteil KK



Schmierbohrung
M6 beidseitig

Bohrungen für
Schaltfahne
beidseitig

Lange Schlittenplatte KR
2 Tischteile KK



Schmierbohrung
M6 beidseitig

	A	B	C	D	E	F	G	H	K	L	Order name Slide plate
KR 15 short carriage plate KK 15 1 runner block	52	95	110	70		16	M6				SP0115 SP0115
KR 15 long carriage plate KK 15 2 runner blocks		95	110	155	37	16	M6	126	40 ¹⁾		SP0215 SP0215
KR 20 short carriage plate KK 20 1 runner block	74	129	145	90		20	M6			40	SP0120 SP0120
KR 20 long carriage plate KK 20 2 runner blocks		129	145	190	40	20	M6	161	40 ¹⁾		SP0220 SP0220
KR 25 short carriage plate KK 25 1 runner block	110	180	200	130		25	M8			50	SP0125 SP0125
KR 25 long carriage plate KK 25 2 runner blocks		180	200	260	100	25	M8	222	50 ²⁾		SP0225 SP0225

[mm]

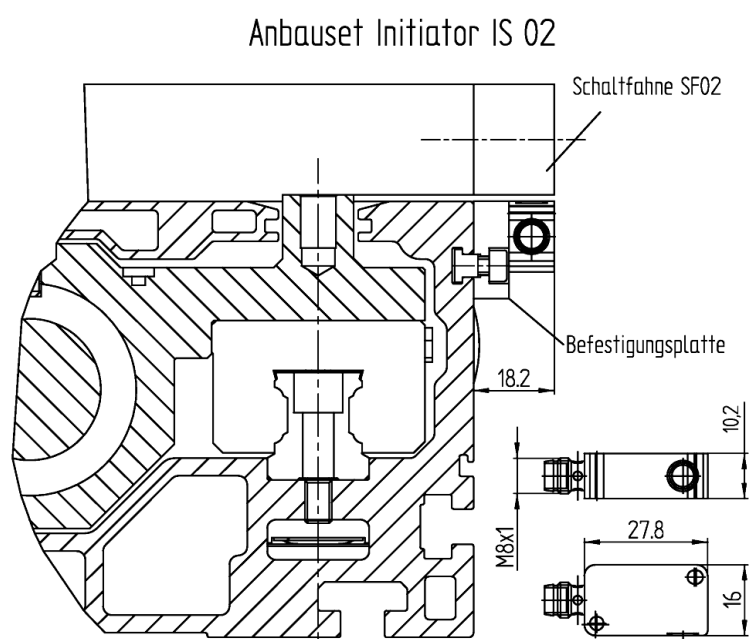
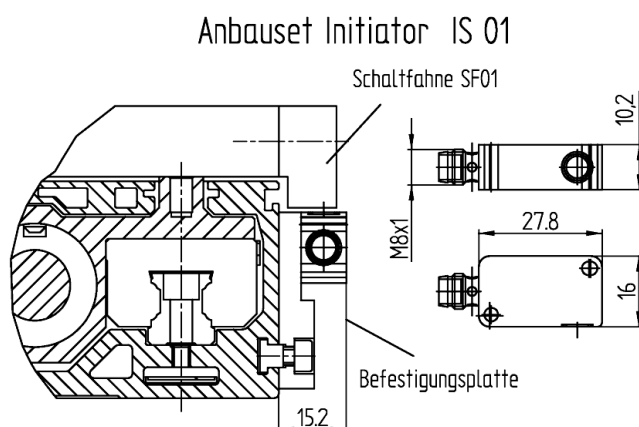
1) Mounting holes for clamping strips KL54-M6 for crosswise connection of two KR-KK 15/20 units

2) Mounting holes for clamping strips KL70-M8 for crosswise connection of two KR-KK 25 units

Accessory for Compact linear units KK and KR

Mounting kit proximity switch - IS

(Proximity switch + mounting plate + mounting material)



Technical data proximity switch

Electr. design: DC PNP

Voltage: 10-36 VDC

Switch distance: 4 mm

Current consumption: 15 mA / 24 V

Initial function: break/make

Ambient temp.: -25 to +70 °C

Overload protection: yes

Insulation class: IP 67

Anbauart: nicht bündig
for integration

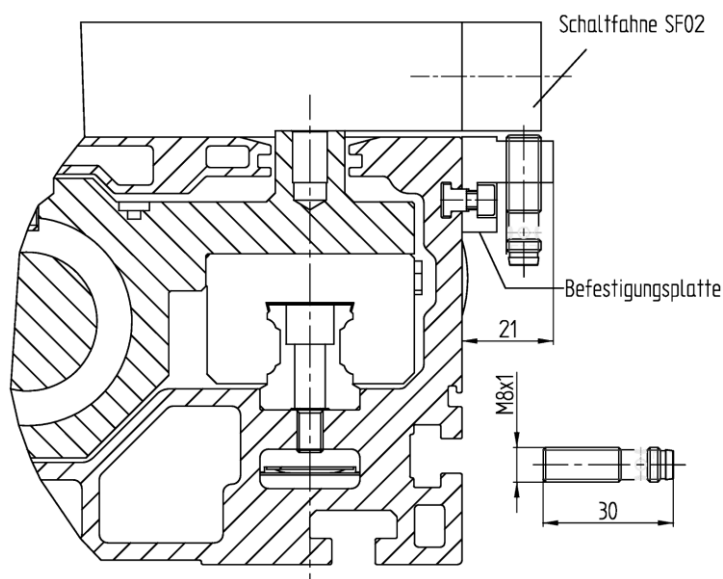
Other proximity switches or limit switches can be mounted. Contact us.

Accessory for linear stages KK and KR

Mounting kit proximity sensor - IS

(Proximity sensor + mounting plate + mounting material)

Anbauset Initiator IS 03



Technical data proximity sensor

Electr. design: DC PNP

Voltage: 10-30 VDC

Switching distance: 4 mm

Current consumption: 15 mA / 24 V

Initial function: make/break

Ambient temp.: -20 to +70° C

Overload protection: yes

Insulation class: IP 67

Anbauart: nicht bündig
For integration

Linear stage	Order name proximity sensor kit ¹⁾	Name ²⁾ Cable with straight connector		Name ²⁾ Cable with angular connector		Name cam switch
		5m	10m	5m	10m	
KK 15, KR 15, KK 20, KR 20	IS01	C5	C10	CW5	CW10	SF01
KK 25, KR 25	IS02	C5	C10	CW5	CW10	SF02
KK25, KR25	IS03	C5	C10	CW5²⁾	CW10	SF02

1) Please note the number of proximity switch kits in front of the order code (e. g. 3IS01)

2) Please note the number of cables in front of the order code (e. g. 3CW5)

Other proximity sensors or limit switches can be mounted. Contact us.



Accessory for Compact linear units KK and KR

Motor/gear mounting – MG

All linear units are available with premounted gear, motor or rotary encoder.

Please note on enquiry. We are happy to assist you with the dimensioning of the required mounting parts and workout an individual quotation to your application. We only use components of well-known manufacturers.

Order codes Compact linear units

Example 1:

KR1501 – **500** – **710** – **A/B** – **3IS01** – **SF01** – **3CW5** – **EK14** – **MG**

KR1501	-	Product name	Compact linear unit size15 with toothed belt, short carriage
500	-	Stroke	max. stroke
710	-	Length of the profile L	
A/B	-	Drive side/shaft ends	Shaft ends on sides A and B
3IS01	-	3 pcs. proximity sensor kit	3 pcs. proximity sensor kit 01
SF01	-	Cam switch	1 pc. cam switch SF01
3CW5	-	3 pcs. proximity sensor cables	3 pcs. cables with angular connector, 5 m
EK14	-	Coupling	Coupling EK14 for your motor
MG	-	Motor flange for mounting ...	Name your motor

1) Recommended length of profile stroke + length of the slide plate + 2 x safety stroke (500+170+2x20)

Example 2:

KK1502 – **200** – **385** – **1605** – **100** – **SP0215** – **3C10** – **EK24** – **MG**

KK1502	-	Product name	Compact linear unit size 15 with ball screw and 2 carriages
200	-	Stroke	max. stroke
385	-	Length of the profile " L " ¹⁾	
1605	-	Dim. ball screw	Diameter 16 mm, pitch 5mm
100	-	Dim. "A"	Distance between the carriages
SP0215	-	Slide plate	Long carriage plate for 2 carriages
SF02	-	Cam switch	1 pc. cam switch SF02
3IS03	-	3 pcs. proximity sensor kit	3 pcs. proximity sensor 03
3C10	-	3 pcs. proximity sensor cables	3 pcs. cables with angular connector, 10 m
EK24	-	Coupling	Coupling EK24 for your motor
MG	-	Motor flange for mounting ...	Name of your motor

1) Recommended length of profile stroke b + length of the slide plate + dim. "A" + 2 x pitch (200+75+100+10)

Range of products

Drives and stages

- Linear stages
- Linear positioning tables with/without drive
- Precision positioning tables
- Ball screws and roller screws
- Trapezoidal screws
- Screw jacks
- Electromechanical cylinders
- Bevel gears
- Planetary gears

Linear guides

- Linear ball or roller guides
- Precision shafts
- Linear ball bearings
- Glide bushings

Roller bearings

Drives and accessory

- Three-phase asynchronous motors
- Worm geared motors
- Spur gear motors
- Servo drives
- Stepper drives
- DC motors
- Frequency changers
- Controllers
- Switches, proximity sensors

Links

- Couplings
- Universal shafts
- Cardan shafts
- Clamps

Custom-tailored solutions

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