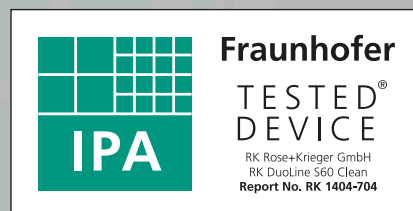




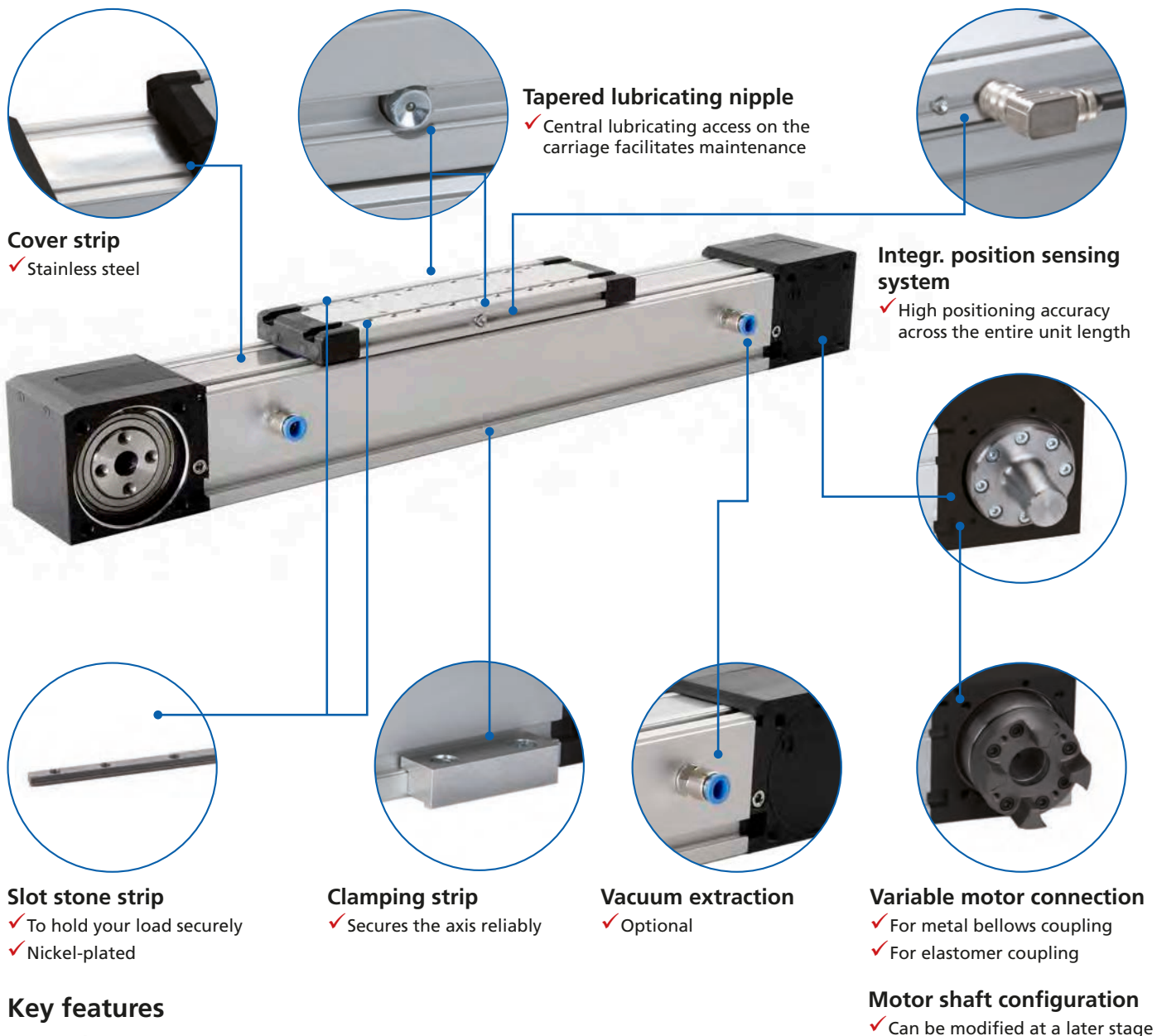
The industry benchmark

...now also for clean rooms



RK DuoLine Clean

Key features / technical benefits



Key features

General

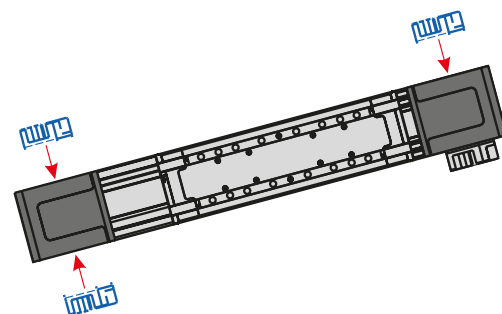
- All external steel parts nickel-plated or made of stainless steel
- Suitability according to EN ISO 14644-1 for clean rooms
- Optionally with or without vacuum extraction
- High efficiency
- Low no-load torque
- Central lubricating access on the carriage facilitates maintenance

RK DuoLine S Clean (spindle drive)

- Cover band made from stainless steel
- Positioning accuracy ± 0.05 mm when using an integrated linear encoder

RK DuoLine Z Clean (toothed-belt drive)

- Cover band made from stainless steel
- Flexible positioning of motor thanks to pulley boxes with hollow shafts
- Repeat accuracy ± 0.05 mm



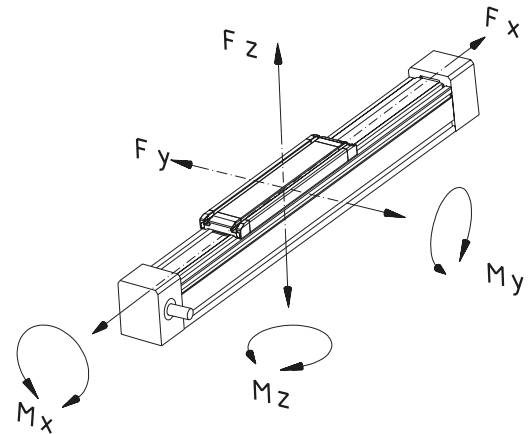
RK DuoLine - Table of contents

Properties / Technical data		■ Load characteristic 4 ■ General informations/operation conditions..... 5 ■ Cleanroom air categories 7
Version (Dimensions, order numbers)	Place-Tec	■ RK DuoLine R 60/80 Clean 8 ■ RK DuoLine Z 60 Clean 10 ■ RK DuoLine Z 80 Clean 10
	Control-Tec	■ RK DuoLine S 60 Clean..... 12 ■ RK DuoLine S 80 Clean..... 12
Accessories	Fixing	■ Fixation of payload 14 ■ Clamping strips..... 15 ■ Slot stones 15
	Drive	■ Motor adapter kit 16 ■ Drive shaft 17 ■ Synchronising shaft..... 18
	Position determination	■ Limit switch 19

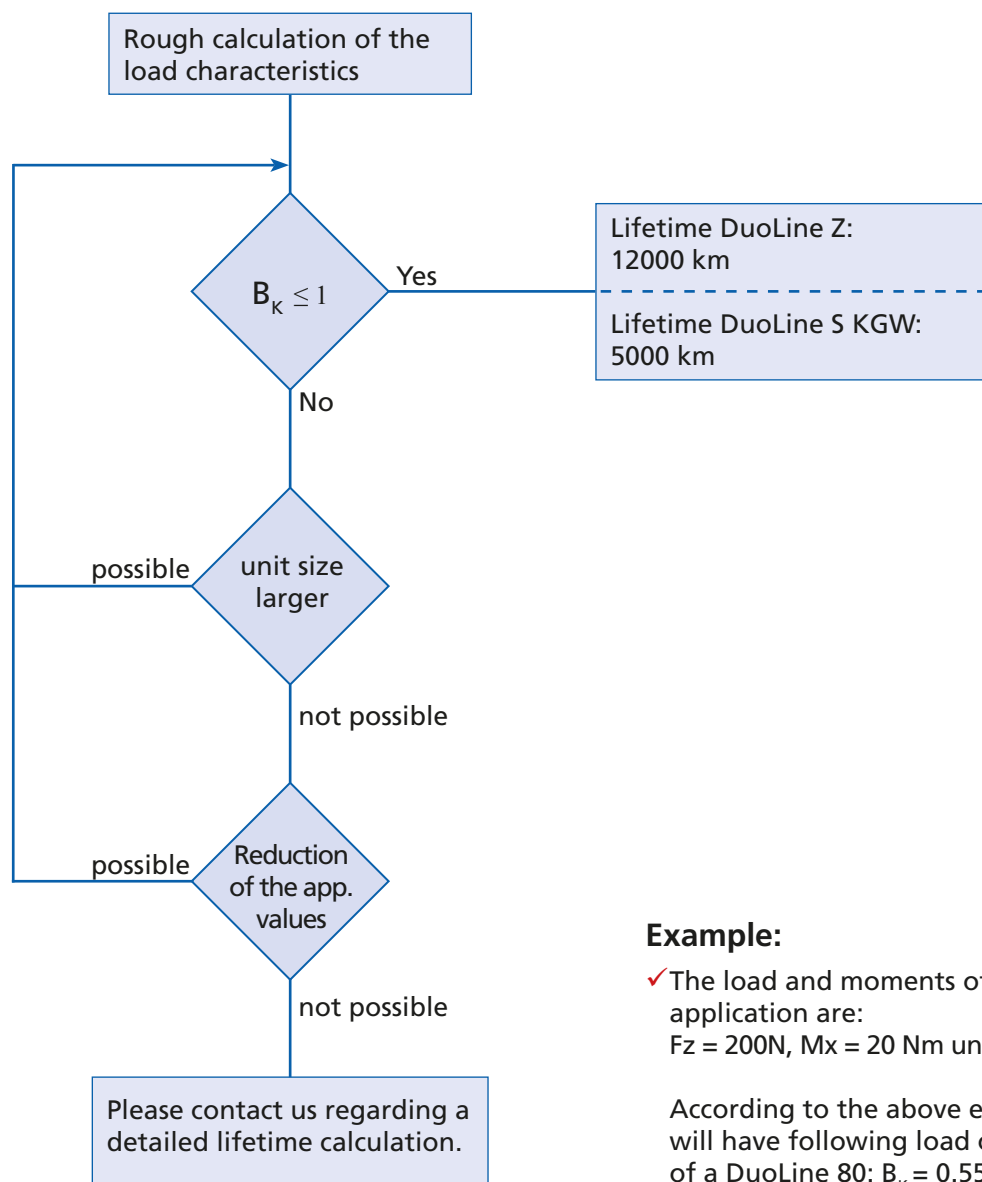
Calculation of the load characteristic to define the lifetime

- The lifetime of linear units are in accordance with the average loads and moments of an application. The load characteristic can approximately calculated by following equation with simultaneously appearing load and moments.

$$\text{Load characteristic} = \frac{\text{Application values (z.B. } F_y)}{\text{Catalog values (z.B. } F_{y_{\max}})}$$



$$\text{Load characteristic } B_k = \frac{F_y}{F_{y_{\max}}} + \frac{F_z}{F_{z_{\max}}} + \frac{M_x}{M_{x_{\max}}} + \frac{M_y}{M_{y_{\max}}} + \frac{M_z}{M_{z_{\max}}} \leq 1$$



Example:

- ✓ The load and moments of the application are:
 $F_z = 200\text{N}$, $M_x = 20\text{ Nm}$ und $M_z = 45\text{ Nm}$

According to the above equation you will have following load characteristic of a DuoLine 80: $B_k = 0.55$.

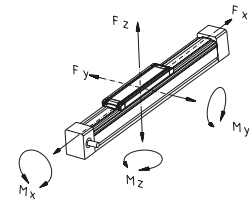
General information / operating conditions

	RK DuoLine Z 60 Clean	RK DuoLine Z 80 Clean
Guidance system	1 Ball rail system	
Installation position	any position	
Max. driving torque	28 Nm	67 Nm
Max. speed	1 m/s	2 m/s
Max. acceleration	4 m/s ²	5 m/s ²
Repeat accuracy	± 0,05 mm	± 0,05 mm
Positioning accuracy	only without integrated linear encoder ± 0,1/300 mm	with integrated linear encoder ± (0.025 + 0.01 x L) mm; L = travel in meters
Max. no-load torque	2 Nm	2,2 Nm
Drive	HTD-Belts from polyurethan, Pitch 5 mm, Width 20 mm	HTD-Belts from polyurethan, Pitch 8 mm, Width 30 mm
Active Ø pulley wheel	52,52 mm	66,21 mm
Pulley wheel circumference	165 mm	208 mm
Ambient temperature	0 to +60°C	0 to +60°C

Dynamic load data

Force [N]

Torque [Nm]



Toothed-belt drive						
Load data	F _x	F _y	F _z	M _x	M _y	M _z
Standard guide carriagew						
RK DuoLine Z 60 Clean	630	700	2500	48	160	140
RK DuoLine Z 80 Clean	1400	1000	4100	100	340	300
Extended guide carriage						
RK DuoLine Z 60 Clean	630	700	2500	48	250	220
RK DuoLine Z 80 Clean	1400	1000	4100	100	590	520

Suitable for use in air purity levels according to EN ISO 14644 - 1

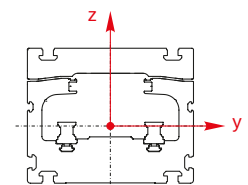
You find the documents and certificates with the test parameters on the website www.rk-rose-krieger.com

Type	Clean room categories				
	ISO 1	ISO 5	ISO 6	ISO 7	ISO 8
RK DuoLine Z 60 Clean without suction			0,25 m/s	0,5 m/s	1 m/s
RK DuoLine Z 60 Clean with suction	0,25 m/s; 0,5 m/s and 1,0 m/s				
RK DuoLine Z 80 Clean without suction		0,5 m/s	1 m/s	2 m/s	
RK DuoLine Z 80 Clean with suction	0,25 m/s; 0,5 m/s and 1,0 m/s				

Geometric moment of inertia

[cm⁴]

	I _y	I _z
RK DuoLine Z 60 Clean	52,54 cm ⁴	67,41 cm ⁴
RK DuoLine Z 80 Clean	127,90 cm ⁴	172,80 cm ⁴



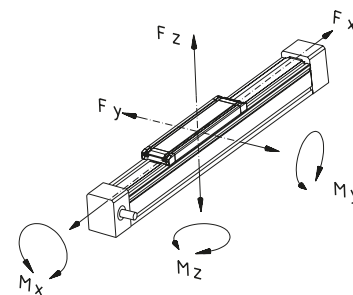
General information / operating conditions

	RK DuoLine S 60 Clean	RK DuoLine S 80 Clean
Guidance system	1 Ball rail system	
Installation position	any position	
Max. driving torque	3,4 Nm	17 Nm
Max. speed	0,5 m/s	0,5 m/s
Max. acceleration	4 m/s ²	4 m/s ²
Repeat accuracy	± 0,04 mm	± 0,04 mm
Positioning accuracy	only without integrated linear encoder ± 0,1/300 mm	with integrated linear encoder ± (0.025 + 0.01 x L) mm; L = travel in meters
Max. no-load torque	0,4 Nm	0,6 Nm
Drive	Ball-and-screw Ø16, Pitch 5, 10, 16mm	Ball-and-screw Ø20, Pitch 5, 20 or 50 mm, on the right
Pitch accuracy	T5 (± 0,023 / 300 mm)	T5 (± 0,023 / 300 mm)
Duty cycle	S3 100%	S3 100%
Ambient temperature	0 to +60°C	0 to +60°C

Dynamic load data

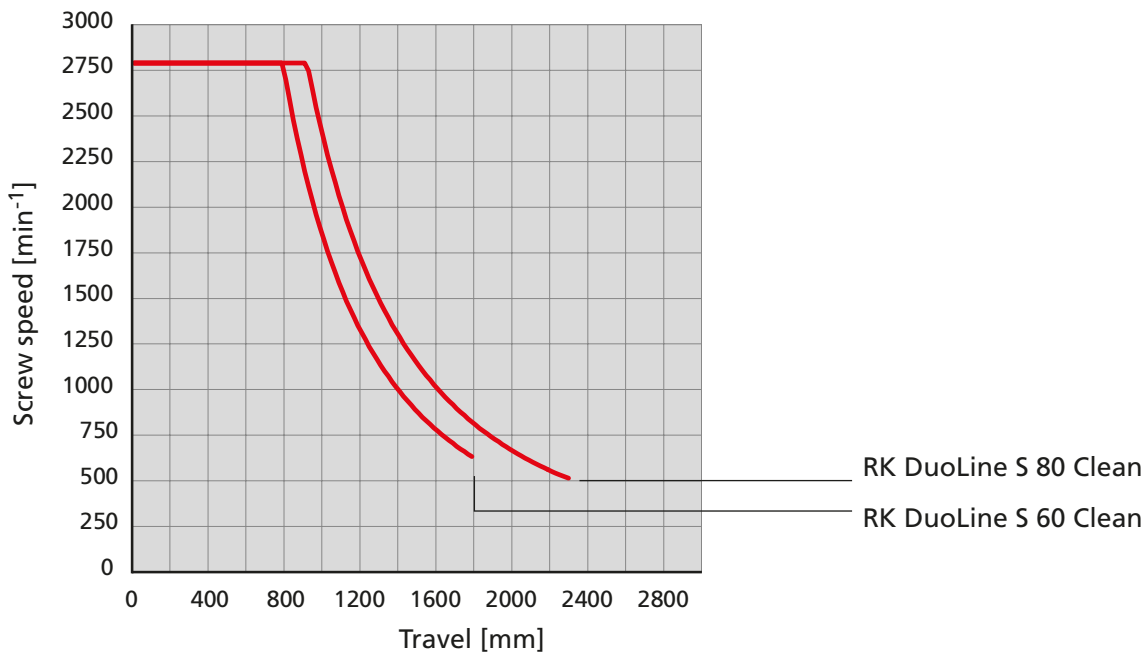
Force [N]

Torque [Nm]



Toothed-belt drive							
Load data	Screw	Fx	Fy	Fz	Mx	My	Mz
Standard guide carriagew							
RK Duoline S 60	16x5	840	700	2500	48	160	140
	16x10	1300					
	16x16	1300					
RK Duoline S 80	20x5	950	1000	4100	100	380	350
	20x20	1420					
	20x50	2250					
Extended guide carriage							
RK Duoline S 60	16x5	840	700	2500	48	250	220
	16x10	1300					
	16x16	1300					
RK Duoline S 80	20x5	950	1000	4100	100	620	550
	20x20	1420					
	20x50	2250					

Control of Screw speed (Critical screw speed)



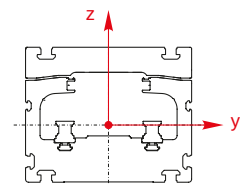
Suitable for use in air purity levels according to EN ISO 14644-1

You find the documents and certificates with the test parameters on the website www.rk-rose-krieger.com

Type	Clean room categories					ISO 8
	ISO 1	ISO 2	ISO 5	ISO 6	ISO 7	
RK DuoLine S 60 Clean without suction			0,1 m/s	0,25 m/s	0,5 m/s	
RK DuoLine S 60 Clean with suction	0,1 m/s; 0,25 m/s and 0,5 m/s					
RK DuoLine S 80 Clean without suction					0,1 m/s	0,25 m/s; 0,5 m/s
RK DuoLine S 80 Clean with suction	0,1 m/s	0,25 m/s; 0,5 m/s				

Geometric moment of inertia

	I_y	I_z
RK DuoLine S 60 Clean	48,97 cm ⁴	61,84 cm ⁴
RK DuoLine S 80 Clean	116,76 cm ⁴	165,75 cm ⁴



RK DuoLine R 60 / 80 Clean – Versions

Order information:

- Longer travel lengths on request
- Integrated linear encoder as Option for size 80

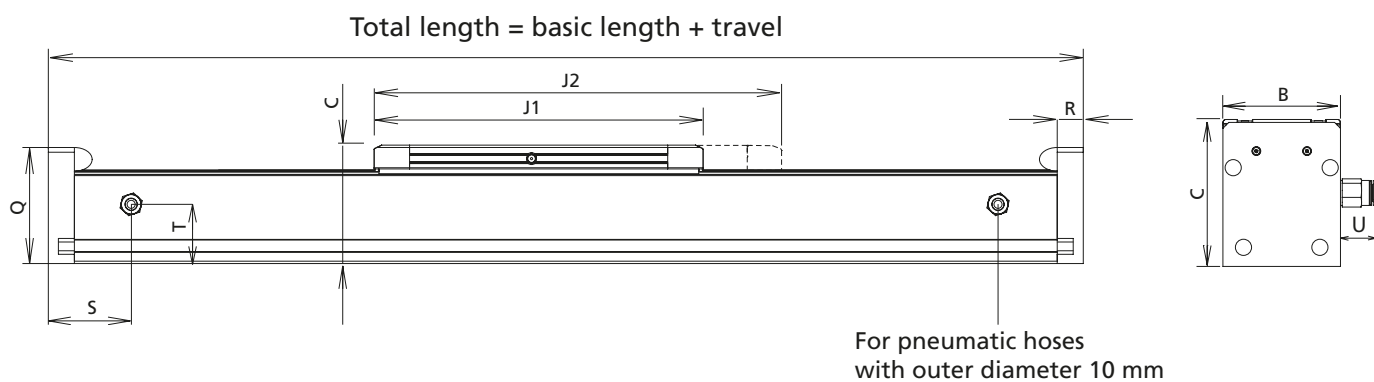
Version: ■ Guide

Ideal as additional / secondary support for the DuoLine with toothed belt or spindle.
Identical construction to Z/S 60 and 80, but without drive



Code No.	Type	Basic length	B	C
TD17A5T1A11_0 _ _ _ _	RK DuoLine R 60 Clean	295	60	80
TD17A5T1B11_0 _ _ _ _	RK DuoLine R 60 Clean with extended guide carriage	385		
TD17A2T1A11_0 _ _ _ _	RK DuoLine R 80 Clean	352	80	100
TD17A2T1B11_0	RK DuoLine R 80 Clean with extended guide carriage	484		

$\text{Total length} = \text{basic length} + \text{total travel (mm)}$
 A = without connection for vacuum suction
 C = with connection for vacuum suction



[mm]

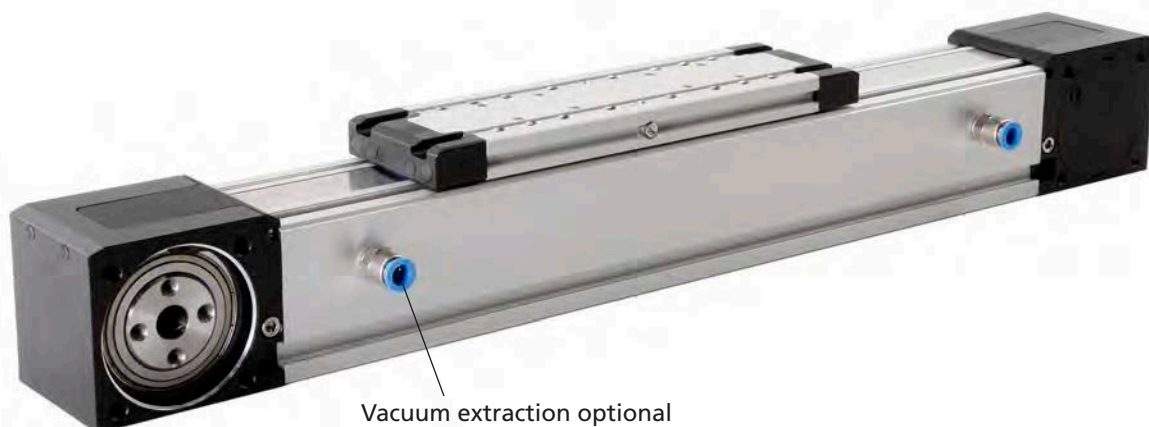
J1	J2	Q	R	S	T	U	Max. travel	Mass [kg]	
								Basic length	per 100 mm travel
245	–	70	22	72	38	24	3587	3,73	0,54
–	335						3497	4,46	0,54
278	–	97	22	72	50	24	7692	5,22	0,83
–	410						7560	6,89	0,83

Dimensions / ordering data

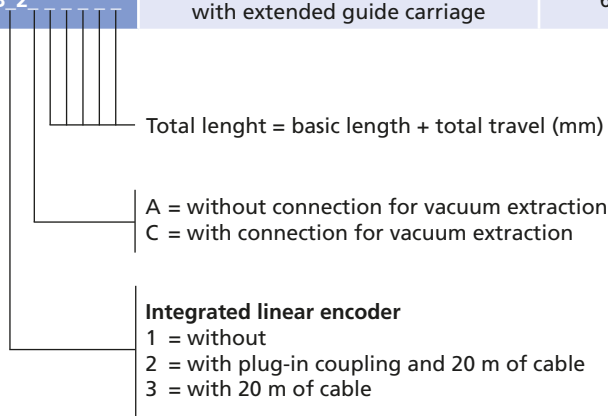
Order information:

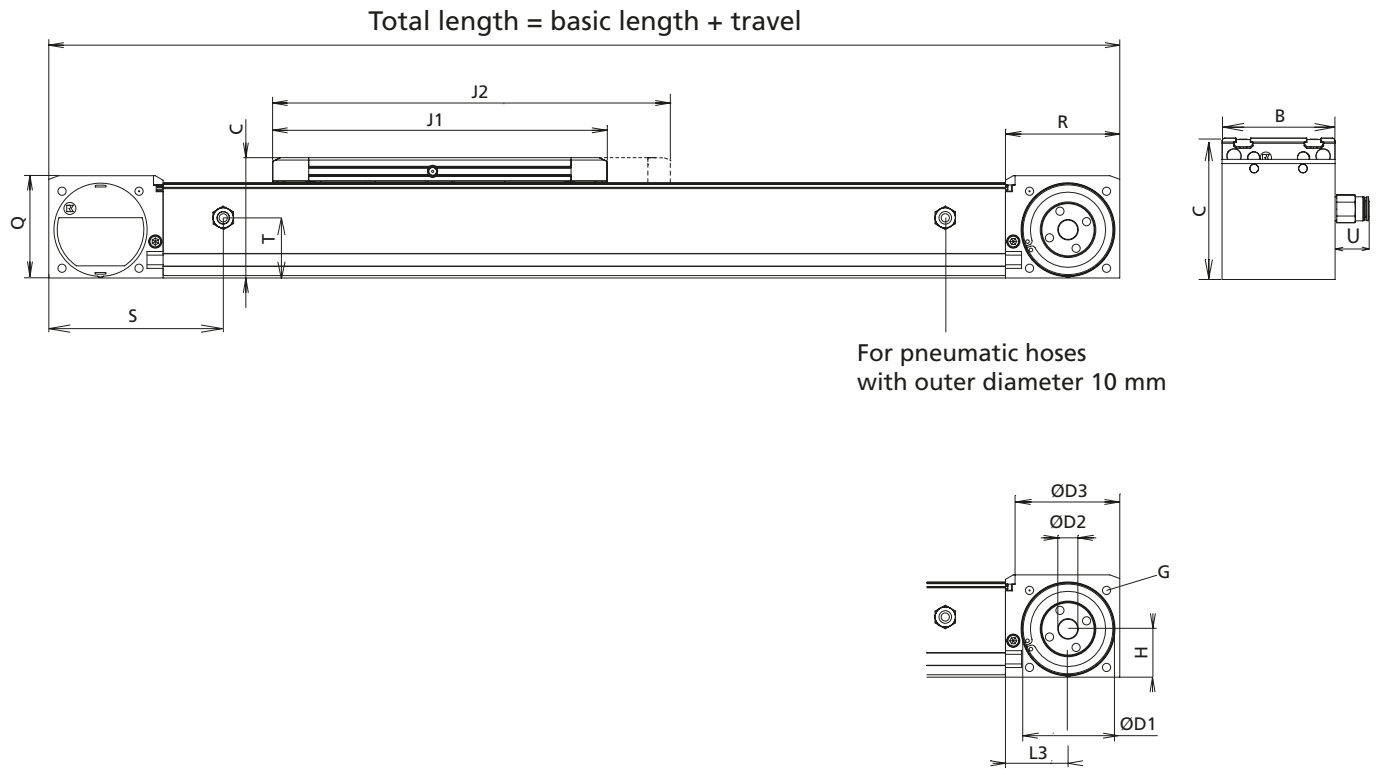
- Longer travel lengths on request
- Also available without screw drive as a torque support
- Version with vacuum extraction as option

Timing-belt unit RK DuoLine Z Clean



Code No.	Type	Basic length	B	C	D1	D2
TD15A5F1A12_0_ _ _ _	RK DuoLine Z 60 Clean	405	60	80	62 ^{H7} 5 deep	15 ^{H6}
TD15A5F1B12_0_ _ _ _	RK DuoLine Z 60 Clean with extended guide carriage	495				
TD15A2F1A_2_ _ _ _ _	RK DuoLine Z 80 Clean	468	80	100	75 ^{H7} 7 deep	16 ^{H6}
TD15A2F1B_2_ _ _ _ _	RK DuoLine Z 80 Clean with extended guide carriage	600				





[mm]

D3	G	H	J1	J2	L3	Q	R	S	T	U	max. travel	Mass [kg]	
												Basic length	per 100 mm travel
72,1±0,2	M6-12 deep	33,8	245	–	44	70	80	130	38	24	5753	4,65	0,54
			–	335								5,38	0,54
90,5±0,2	M8-12 deep	40,1	278	–	52	85	95	145	50	24	7722	7,84	0,83
			–	410								9,51	0,83

Dimensions / ordering data

Order information:

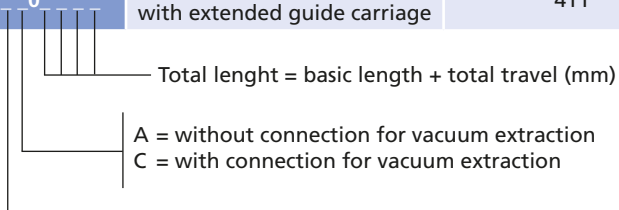
- Longer travel lengths on request
- Also available without screw drive as a torque support
- Version with vacuum extraction as option

Spindle unit RK DuoLine S Clean with ball screw



Vacuum extraction optional

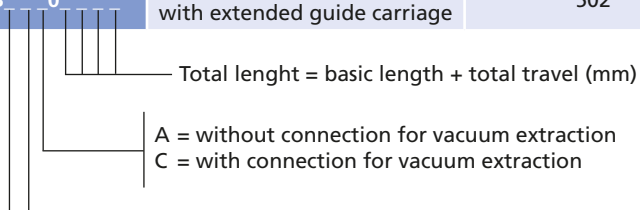
Code No.	Type	Basic length	B	C	D1	D2
TD16A5A1A1 _ 0 _ _ _	RK DuoLine S 60 Clean	321	60	80	Ø32 ^{H7} 2,3 deep	Ø10 _{k7}
TD16A5A1B1 0	RK DuoLine S 60 Clean with extended guide carriage	411				



Ball screw:

- 1 = 16x5
- 2 = 16x10
- 3 = 16x16

Code No.	Type	Basic length	B	C	D1	D2
TD16A2A1A _ 0 _ _ _	RK DuoLine S 80 Clean	370	80	100	Ø42 ^{H7} 2,3 deep	Ø14 _{k7}
TD16A2A1B 0	RK DuoLine S 80 Clean with extended guide carriage	502	80	100	Ø42 ^{H7} 2,3 deep	Ø14 _{k7}

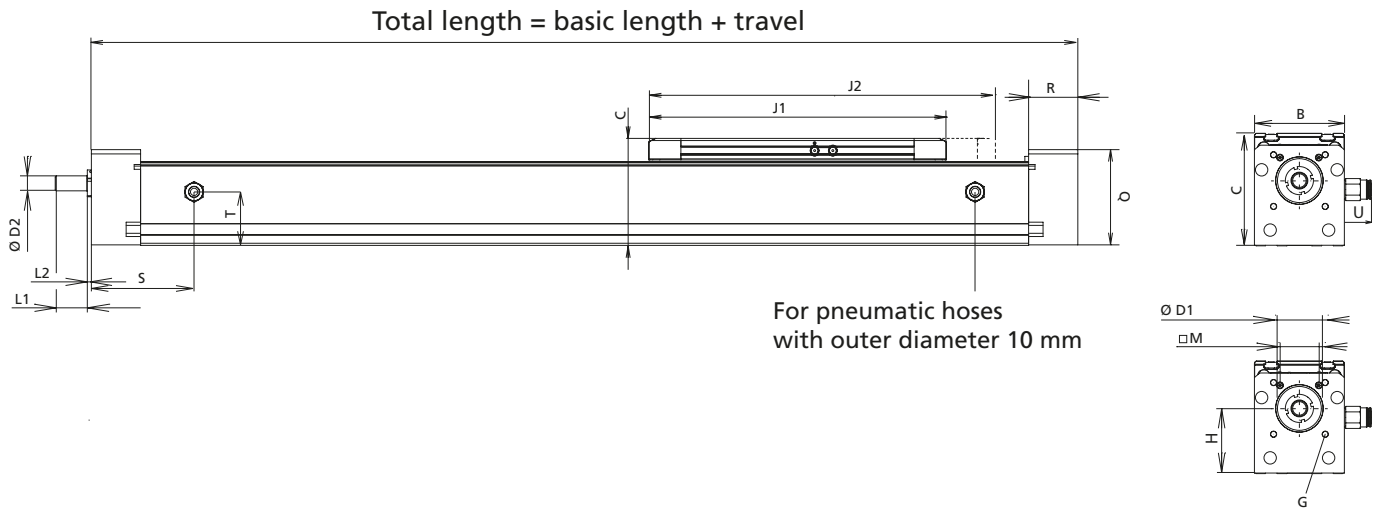


Ball screw:

- 3 = 20x5
- 1 = 20x20
- 2 = 20x50

Integrated linear encoder

- 1 = without
- 2 = with plug-in coupling and 20 m of cable
- 3 = with 20 m of cable



[mm]

G	H	J1	J2	L1	L2	M	Q	R	S	T	U	max. travel	Mass [kg]	
													Basic length	per 100 mm travel
M5-10 deep	47,7	245	-	17,2	2,8	33x24	72,2	38	88	38	24	1800	3,44	0,60
		-	335									1710	4,26	0,60

[mm]

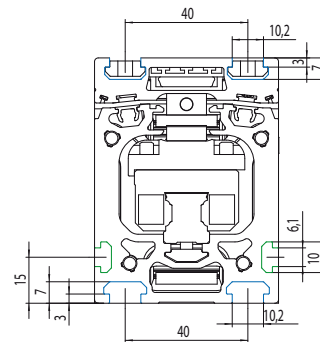
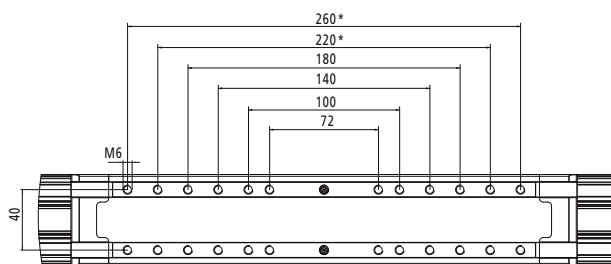
G	H	J1	J2	L1	L2	M	Q	R	S	T	U	max. travel	Mass [kg]	
													Basic length	per 100 mm travel
M6-18 deep	57,5	278	-	30	3,8	□46±0,2	89	46	96	50	24	1930	6,74	0,96
M6-18 deep	57,5	-	410	30	3,8	□46±0,2	89	46				1798	8,01	0,96

Fixation of payload

- Two slot stone strips have been inserted in the guide carriage on which fittings can be securely attached in a variety of ways
- Profile slots in the guide carriage and guide profiles facilitate fixation

RK DuoLine R/S/Z 60

*only with version with extended guide carriage

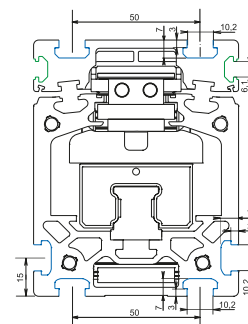
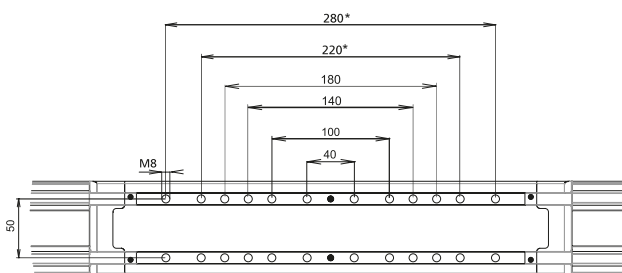


— 20 slot geometry

— 30 slot geometry

RK DuoLine R/S/Z 80

*only with version with extended guide carriage



— 20 slot geometry

— 30 slot geometry

Clamping strips

- Clamping strips facilitate fixation of the linear unit to the chassis or two units to a crossing table

Material:

Natural anodised aluminium, fixation material stainless steel or nickel-plated

Scope of delivery:

2 clamping strips with fixation material

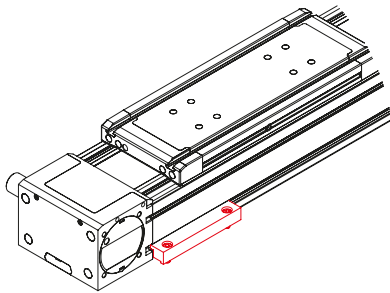


Fig.1: Ground assembly

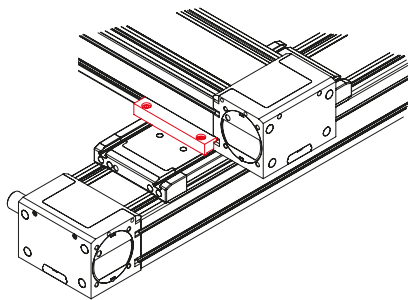
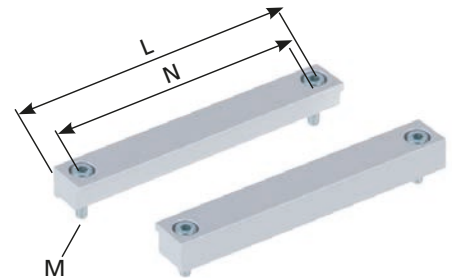
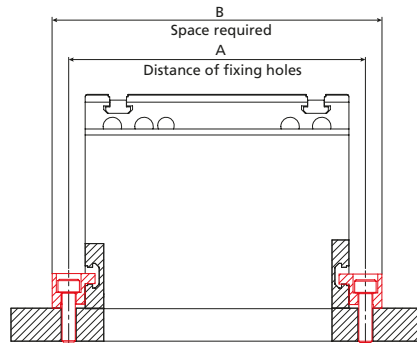


Fig.2: Crossing units

Code No.	Type	Fig.	A	B	L	M	N
91819	RK DuoLine 60 ground assembly	1	72	91	57	M6	40
	RK DuoLine 60 crossing to 60	2					
91809	RK DuoLine 80 ground assembly	1	100	122	76	M8	50
	RK DuoLine 80 crossing to 80	2					

[mm]

Order instruction slot stones:

- Purchase only in lot sizes and a multiple of that, see product table below

- Slot stones can be inserted and positioned at the guide profile and guide carriage

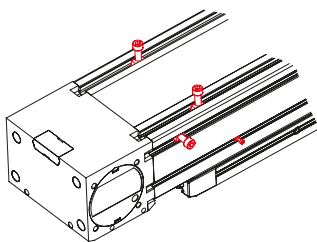
Material: Steel, nickel-plated or stainless steel

Slot stones

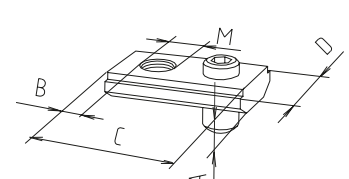
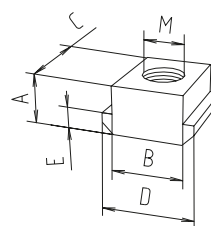
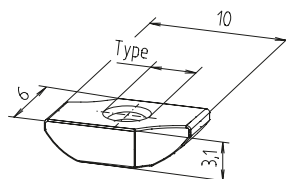
Slot stone -B- can be swivelled into the slot

Slot stone -N- can be slid into the slot

Slot stone -P- Version K can be slid into the slot



View of DuoLine from below



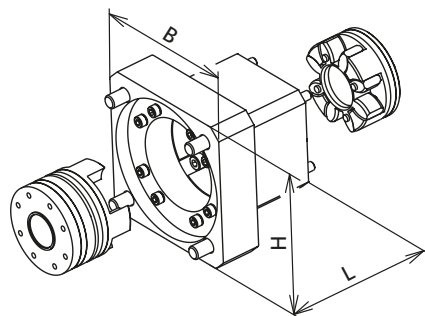
[mm]

Code No.	Type	lot sizes	Material	Slot geometry	A	B	C	D	E	M	F [N]
Slot stone -B-											
E00017CEE	M3	10, 20, 30... pcs	Nickel-plated	20							
E00058CEE	M4	10, 20, 30... pcs	Nickel-plated	20							
Slot stone -N-											
400B202	M8	–	Nickel-plated	30	5	10	13	13	3	M8	4000
40092021	M8	10, 20, 30... pcs	Stainless steel	30	5	10	13	13	3	M8	4000
Slot stone -P- Version K											
4009214	M5	10, 20, 30... pcs	Stainless steel	30	4	7	20	12	-	M5	5000
4009216	M6	10, 20, 30... pcs	Stainless steel	30	4	7	20	12	-	M6	5000

Motor adapter kit for RK AC servomotors

- Servomotors from the RK standard range can be easily connected
- Complete motor adapter kits manufactured to your specifications on request

Scope of delivery:
Motor adapter kit, elastomer coupling and fixation material



Type	Servo motors without gearbox		
	RK-AC 118	RK-AC 240	RK-AC 470
DuoLine Z 60 Clean	–	949458	–
DuoLine Z 80 Clean	–	–	949461
DuoLine S 60 Clean	949465	949466	–
DuoLine S 80 Clean	–	949468	949469

Type	Servo motors with gearbox		
	RK-AC 112	RK-AC 260 RK-AC 280	RK-AC 345
DuoLine Z 60 Clean	949459	949460	–
DuoLine Z 80 Clean	949462	949463	949464
DuoLine S 60 Clean	949467	–	–
DuoLine S 80 Clean	949470	949471	–

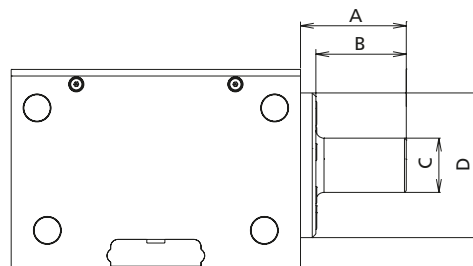
Drive shaft

- The RK DuoLine Z is fitted as standard with a hollow shaft
- This can be retrofitted with a drive shaft as an optional extra

Scope of delivery:
Drive shaft with fixation material



For metal bellows coupling



[mm]

Code No.	Type	Version	A	B	C	D
91325	RK DuoLine Z 60 Clean	Drive shaft for metal bellows coupling	28,6	25	16	44
91326	RK DuoLine Z 80 Clean		35	31,5	20	52

Drive / Position determination

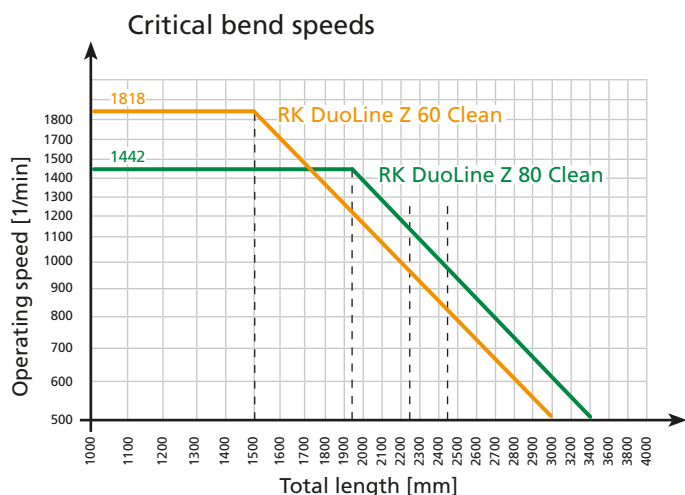
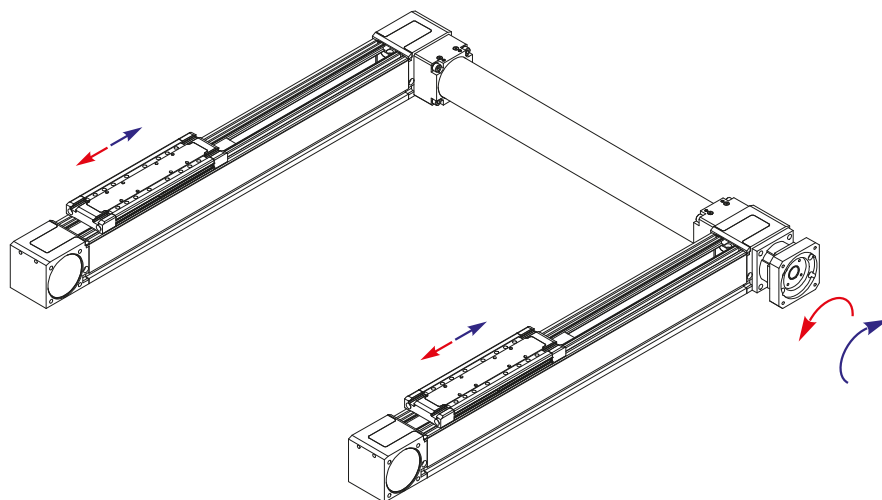
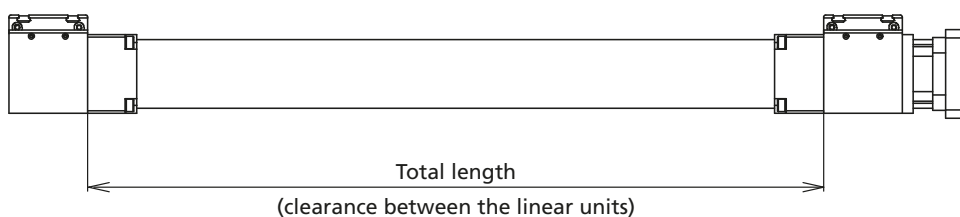
Synchronising shaft

- For torque transmission with parallel linear units
- Synchronisation of the guide carriages by zero point alignment

Scope of delivery:
Synchronising shaft with fixation material

Max. transfer torque:

RK DuoLine Z 60 Clean 28 Nm
RK DuoLine Z 80 Clean 67 Nm

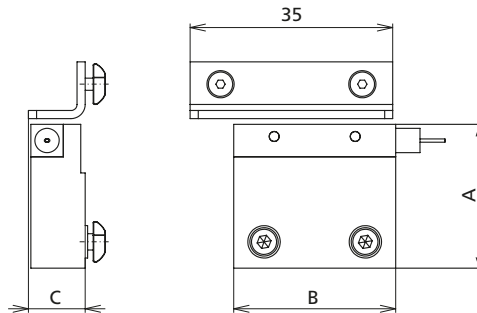
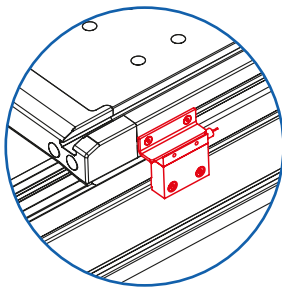


Code No.	Type	Basic length (minimum length)	Max. length (clearance)	Weight [kg]	
				Basic length	per 100 mm travel
92521740_ _ _ _	Synchronising shaft RK DuoLine Z 60 Clean	118	2985	1,0	0,24
92521750_ _ _ _	Synchronising shaft RK DuoLine Z 80 Clean	144	3400	1,96	0,29

External inductive limit switch

- External fixation on the guide profilev

Scope of delivery:
Limit switch with set of fixing items

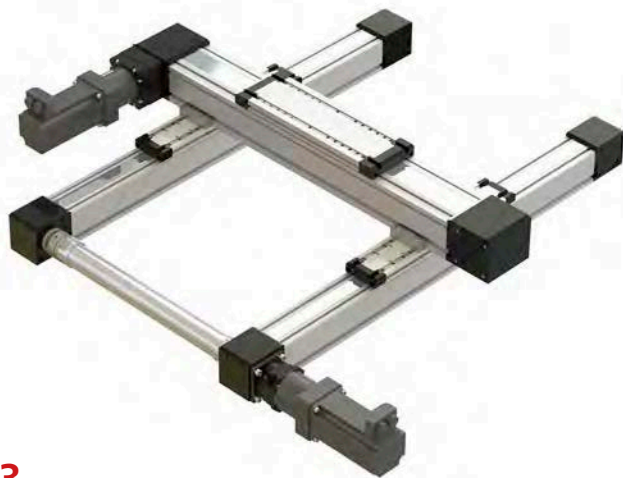
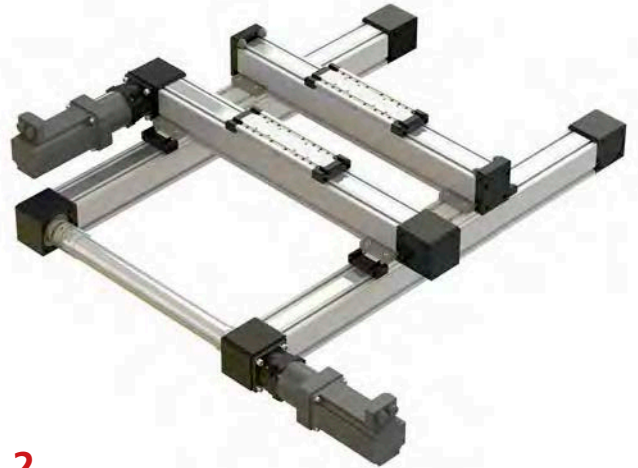


Limit switch	external
Voltage	10...30 VDC
Max. switching current	100 mA
Operating frequency	max. 5 kHz
Mechanical lifetime	independent of operating cycles
Operating distance	1,5 mm
Degree of protection	IP 67
Cable length	5 m
Ambient temperature	-25°C to +70°C

Code No.	Type	A	B	C	Version
92839	RK DuoLine 60 Clean	52,8	25	10	NO, Internal inductive limit switch
92821	RK DuoLine 80 Clean	71,5	25	10	

Assembly examples

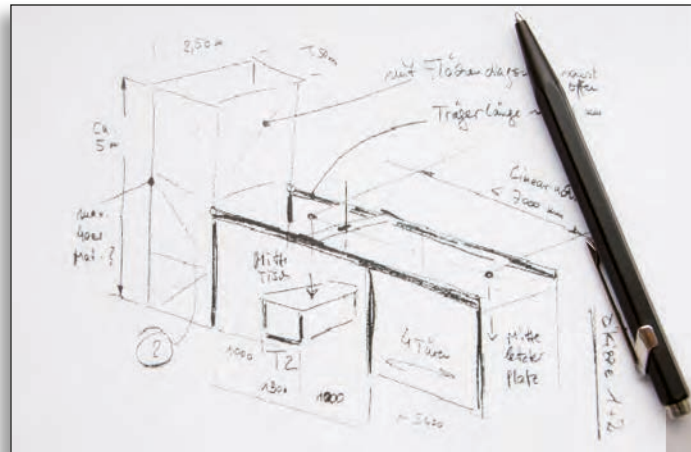
RK DuoLine Clean



What we can do for you

Do you need to focus your resources on other tasks and are you looking for a competent partner you can rely on? Working in close collaboration with you, our specialists will develop solutions tailor-made to meet your needs. If you wish, we can also assemble and commission the units on site.

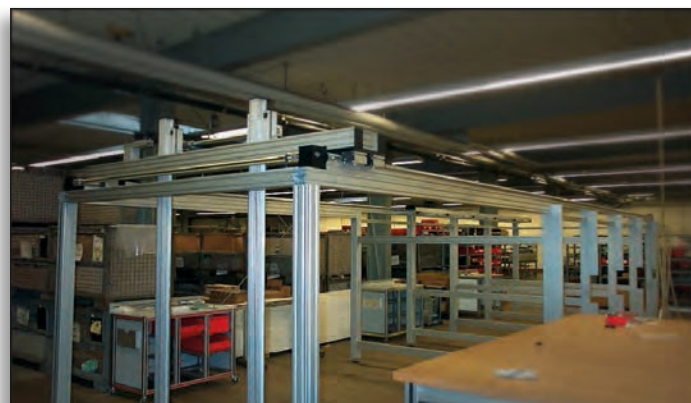
- Just make a sketch of your requirements

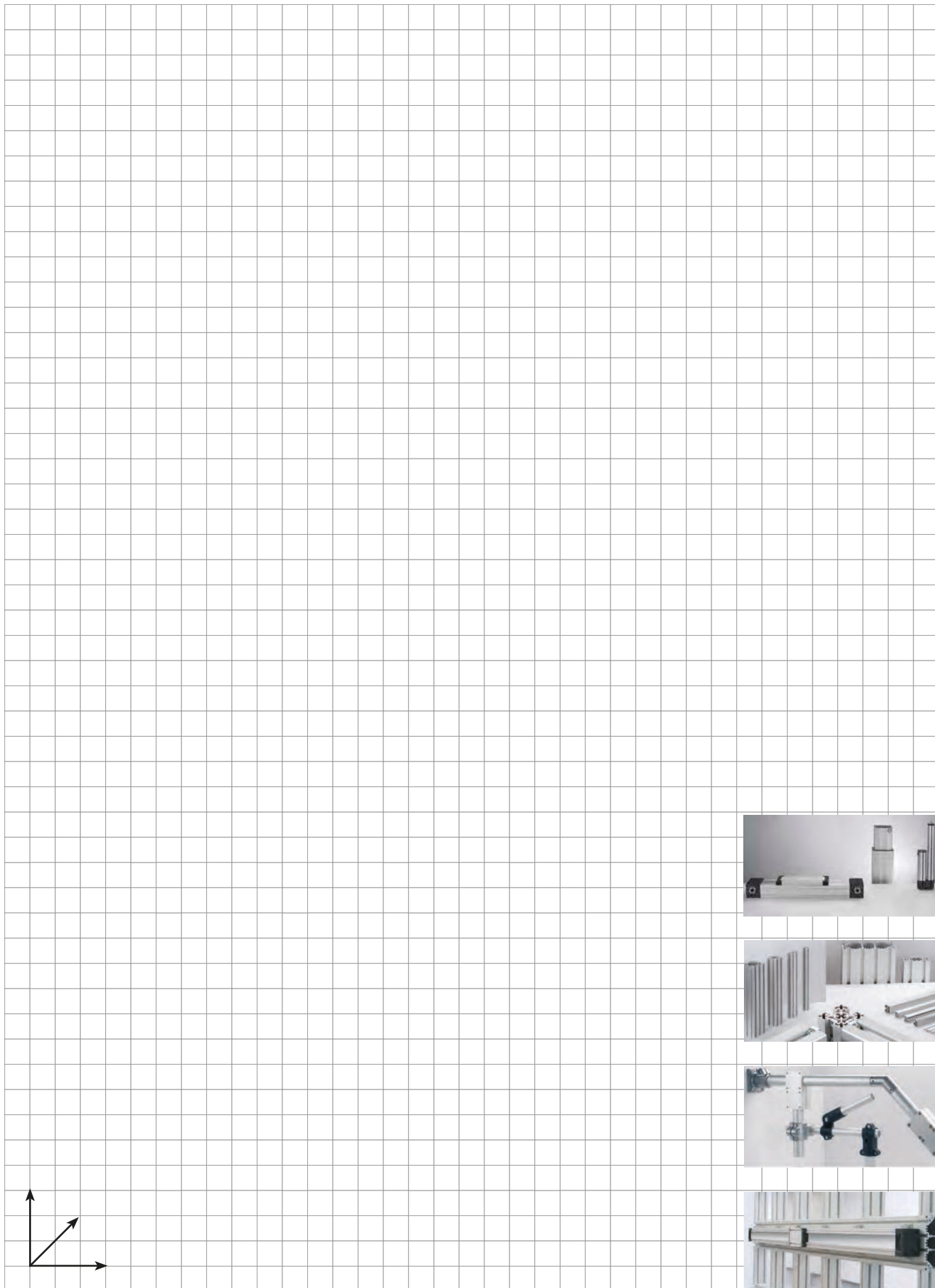


- Our product specialists will devise a solution for you



- We can deliver your turnkey solution or assemble and commission it for you on site







RK ROSE+KRIEGER



Fraunhofer

**TESTED[®]
DEVICE**

RK Rose+Krieger GmbH
RK DuoLine S60 Clean
Report No. RK 1404-704



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Connecting and positioning systems

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