



RK ROSE+KRIEGER

A Phoenix Mecano Company

RK DuoLine Clean

The industry benchmark
...now also for clean rooms



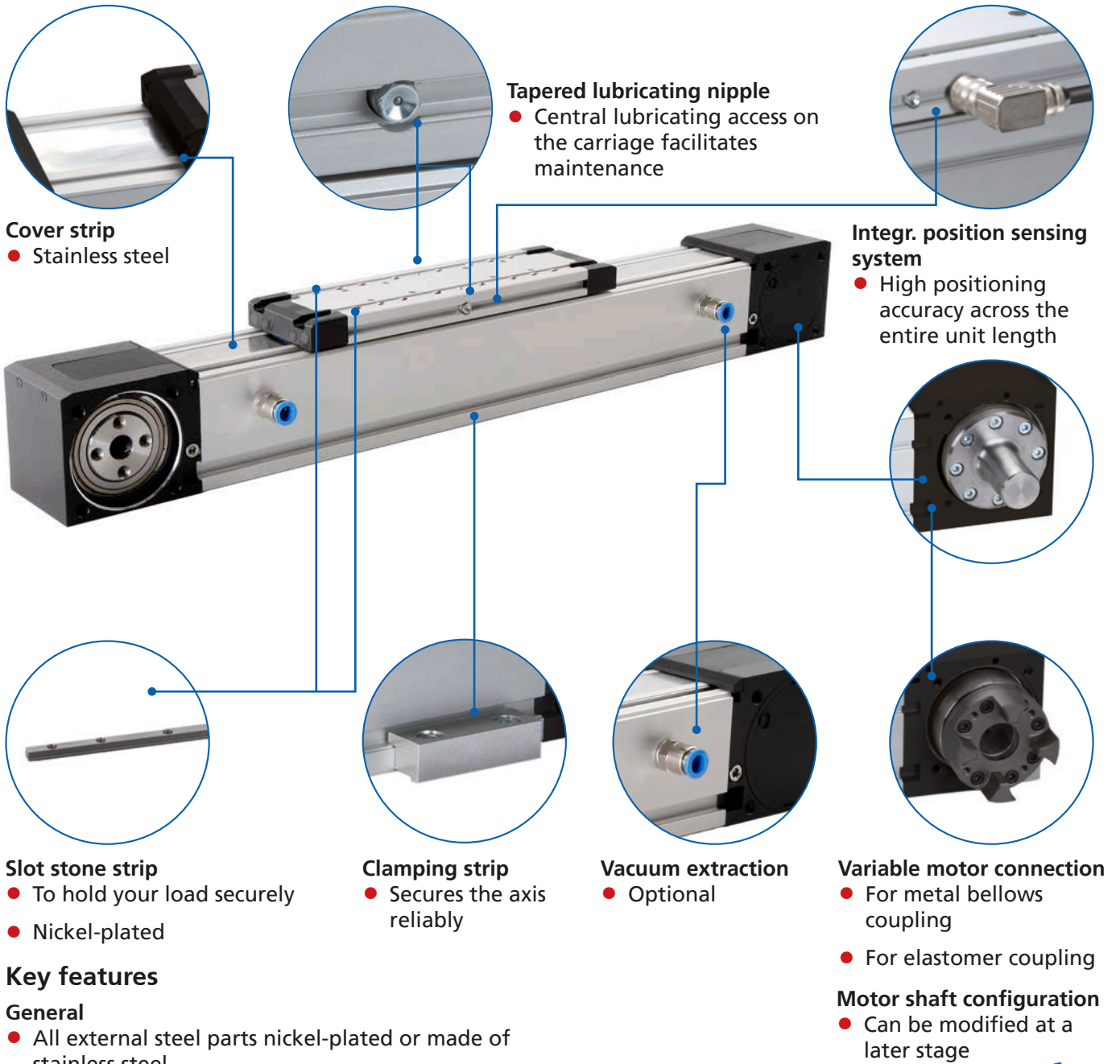
Fraunhofer

**TESTED[®]
DEVICE**

RK Rose+Krieger GmbH
RK DuoLine 580 Clean
Report No. RK 2011-1187



Key features / technical benefits



Cover strip
 ● Stainless steel

Tapered lubricating nipple
 ● Central lubricating access on the carriage facilitates maintenance

Integr. position sensing system
 ● High positioning accuracy across the entire unit length

Slot stone strip
 ● To hold your load securely
 ● Nickel-plated

Clamping strip
 ● Secures the axis reliably

Vacuum extraction
 ● Optional

Variable motor connection
 ● For metal bellows coupling
 ● For elastomer coupling

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

Motor shaft configuration
 ● Can be modified at a later stage

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)

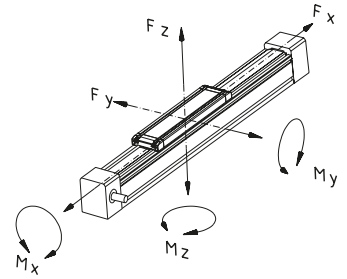
- Cover band made from stainless steel
- Flexible positioning of motor thanks to pulley boxes with hollow shafts
- Repeat accuracy ± 0.05 mm

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Technical data

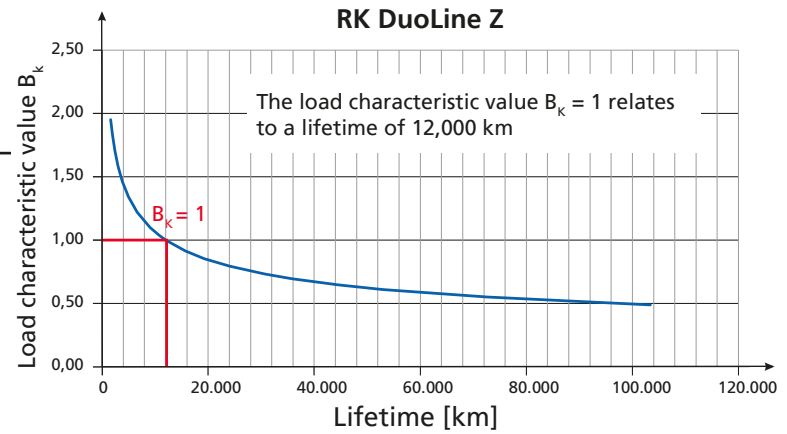
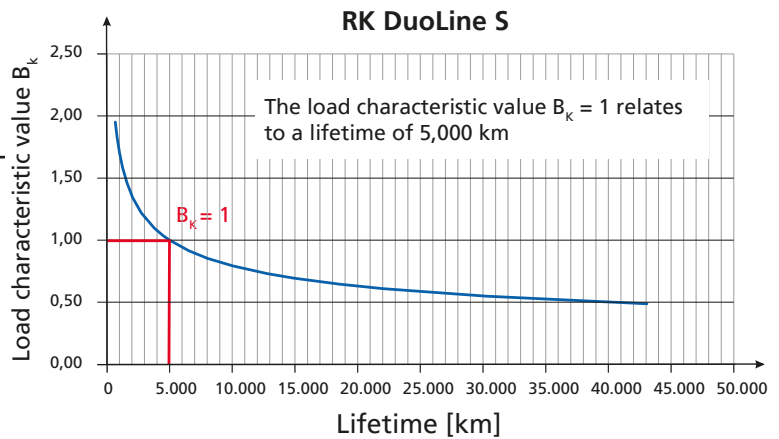
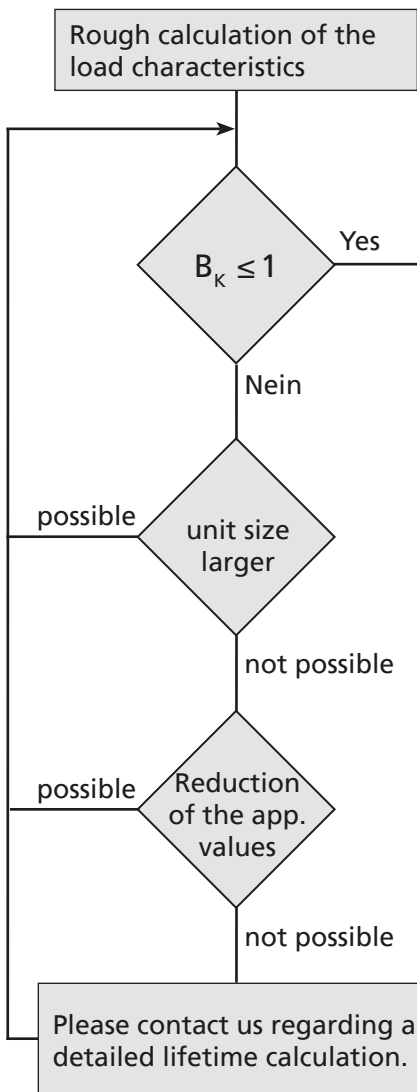
Calculation of the load characteristic to define the lifetime

- 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.



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

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



At a load characteristic value of $B_k < 1$ higher theoretical lifetime can be achieved. The illustration is intended as an approximate reflection of the expected lifetime depending on the load characteristic value B_k . Increased speeds, short-stroke, vibrations, impacts, insufficient lubrication or other specific conditions are not taken into account.

Please contact us regarding a detailed lifetime calculation.

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: $B_k = 0.55$.

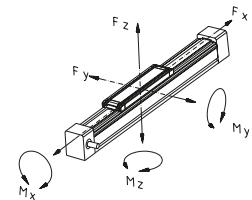
General information / operating conditions

	RK DuoLine Z 60 Clean	RK DuoLine Z 80 Clean
Guidance system	1 Ball rail system	
Installation position	any position	
Max. driving torque	17 Nm	46 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	Fx*	Fy	Fz	Mx	My	Mz
Standard guide carriage						
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

*Initial tension of the timing belt 0,8 x Fx

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

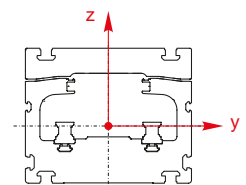
You find the documents and certificates with the test parameters on the website www.rk-rose-krieger.com

Type	Clean room categories				
	ISO 1	ISO 3	ISO 5	ISO 6	ISO 7
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; 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	1,0 m/s			

Geometric moment of inertia

[cm⁴]

	Iy	Iz
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



Technical data

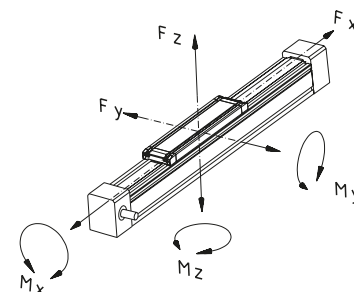
General information / operating conditions

	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

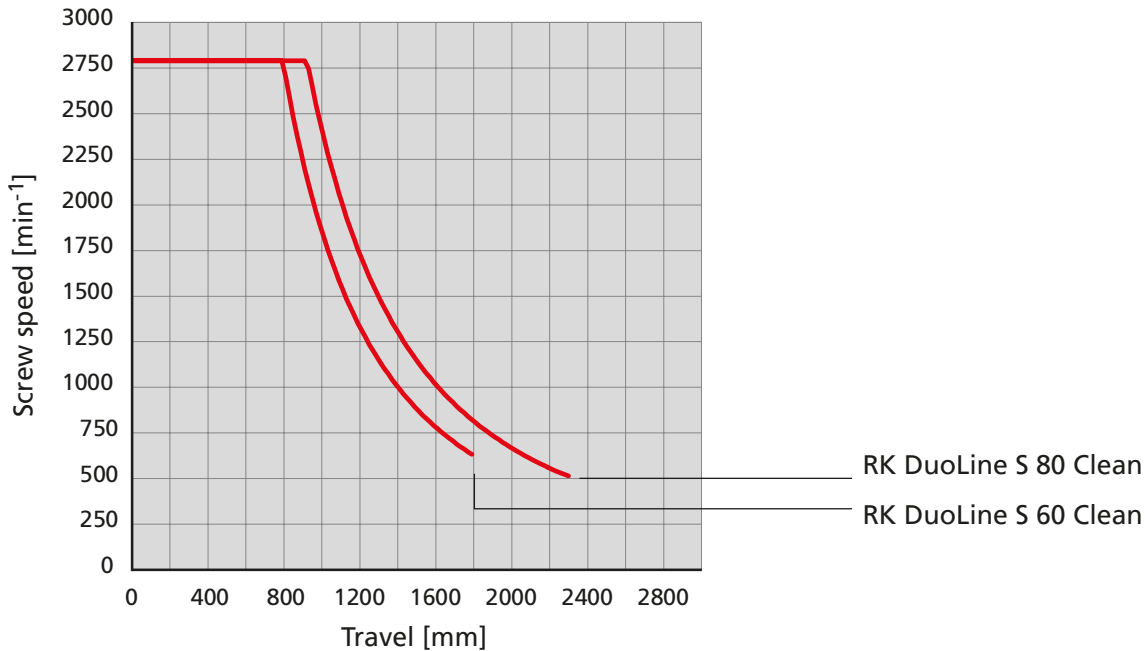
Force [N]

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)



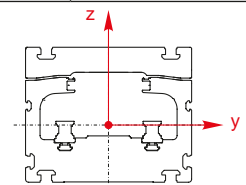
Suitable for use in air purity levels according to EN ISO 14644-1

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

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

Geometric moment of inertia

	[cm ⁴]	
	ly	Iz
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



Dimensions / ordering data

Order instructions:

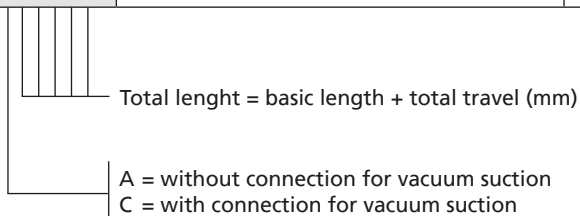
- Longer travel lengths on request
- Integrated linear encoder as Option for size 80

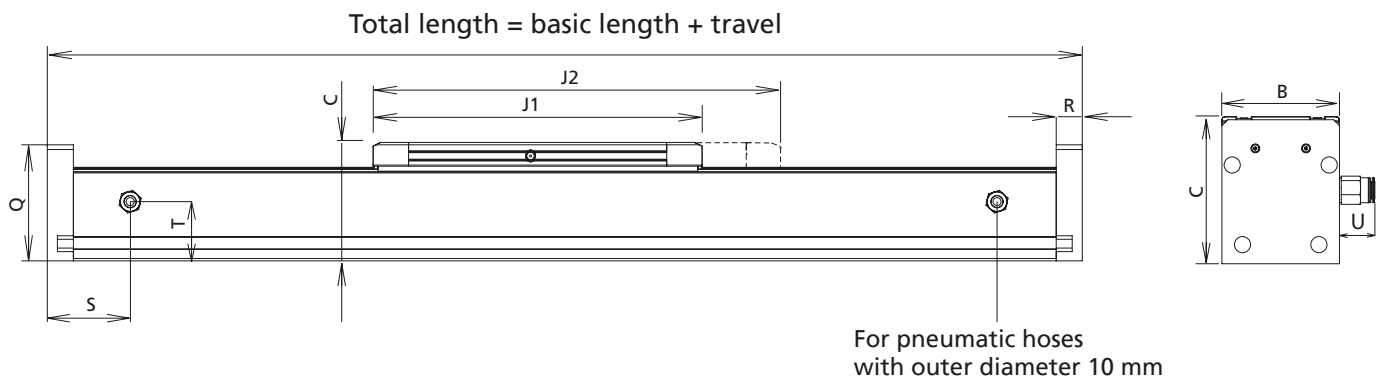
Version: Guide

- 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		





[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	-	98	22	72	50	24	7692	5,22	0,83
-	410						7560	6,89	0,83

Dimensions / ordering data

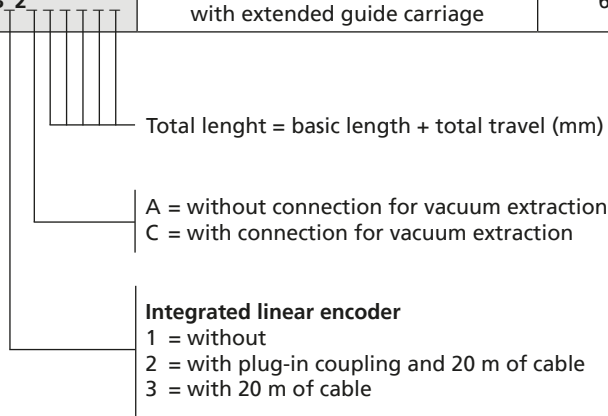
Timing-belt unit RK DuoLine Z Clean

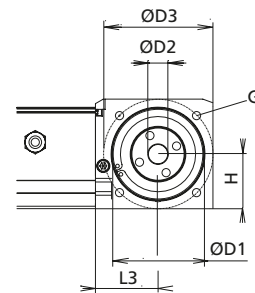
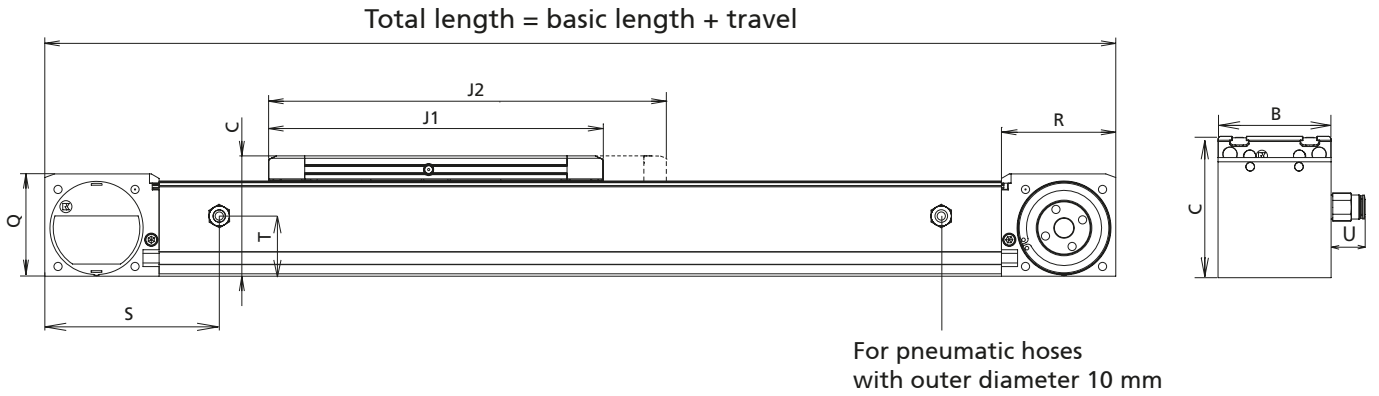
Order instructions:

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



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								5665	5,38
90,5±0,2	M8-12 deep	40,1	278	–	52	85	95	145	50	24	7722	7,84	0,83
			–	410								7590	9,51

Dimensions / ordering data

Order instructions:

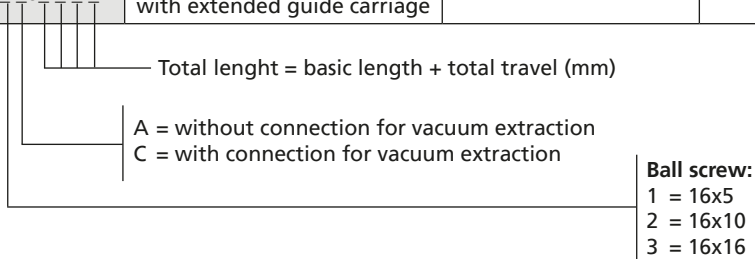
- Second loose carriage on request
- Also available without screw drive as a torque support
- Version with vacuum extraction as option

Spindle unit RK DuoLine S Clean with ball screw

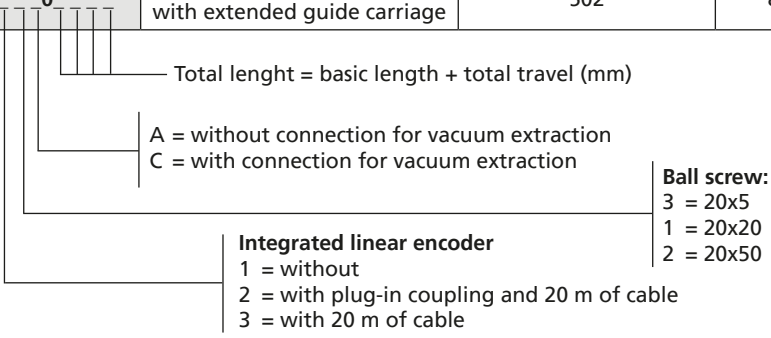


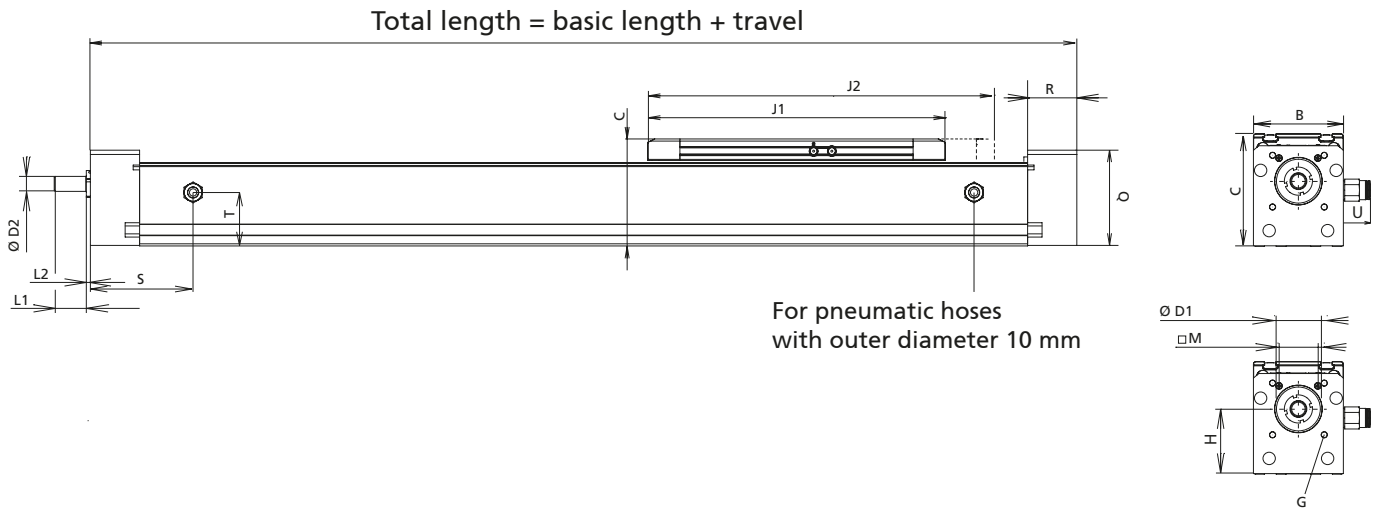
Vacuum extraction optional

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				



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}





[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										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

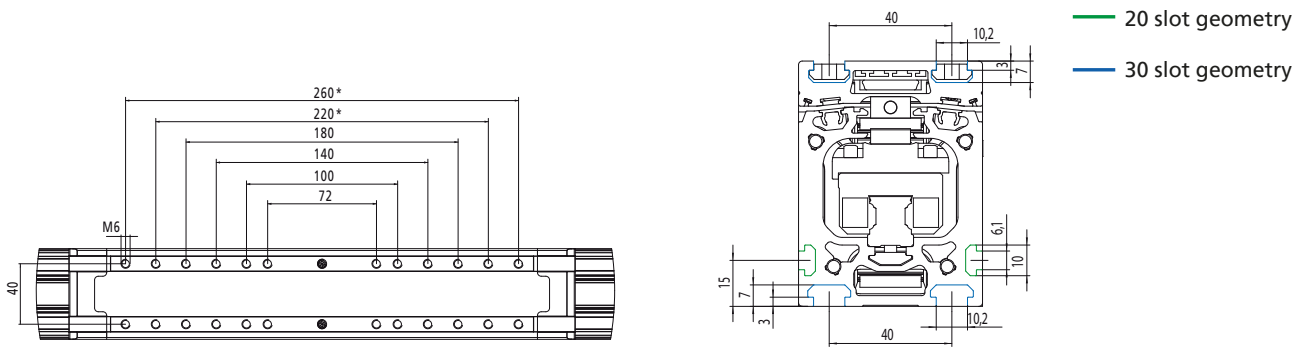
Fixation

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

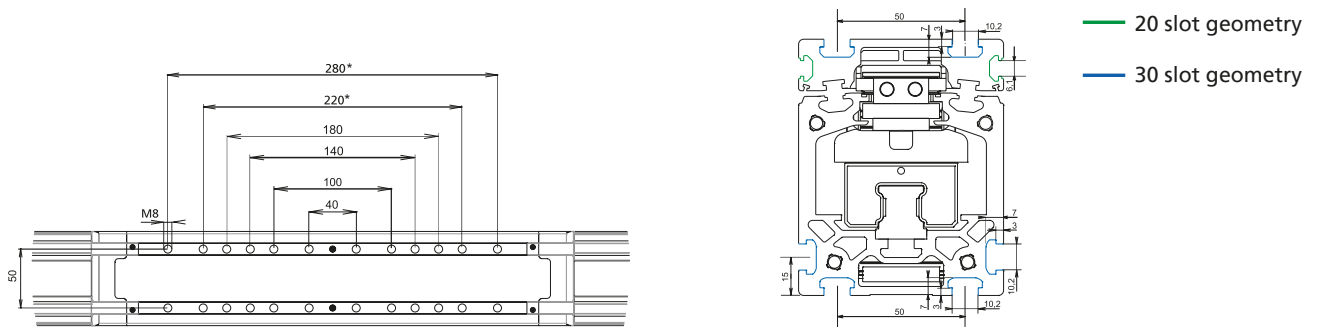
RK DuoLine R/S/Z 60

*only with version with extended guide carriage



RK DuoLine R/S/Z 80

*only with version with extended guide carriage



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

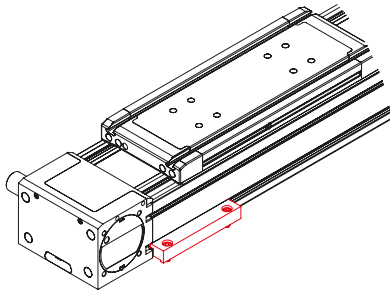


Fig. 1: Ground assembly

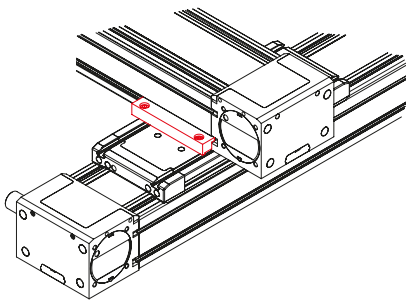
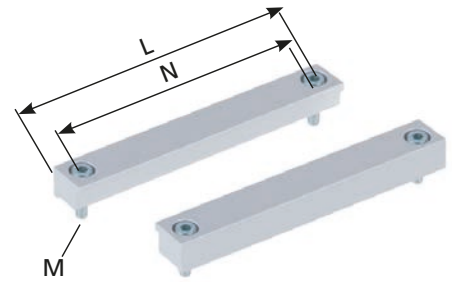
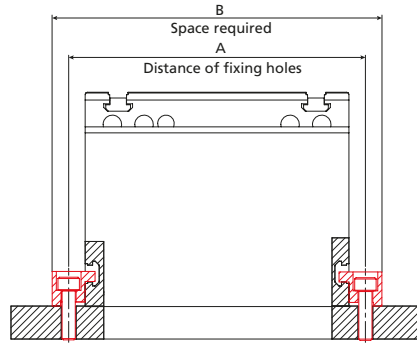


Fig. 2: Crossing units



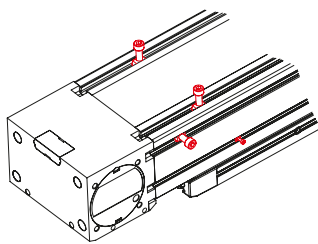
Code No.	Type	Fig.	A	B	L	M	N
91819	RK DuoLine 60 ground assembly	1	72	91	57	M6	40
	RK DuoLine 60 crossing to 60	2					
91809	RK DuoLine 80 ground assembly	1	100	122	76	M8	50
	RK DuoLine 80 crossing to 80	2					

[mm]

Slot stones

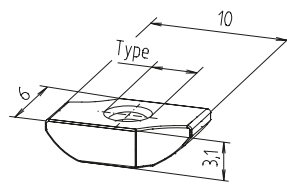
- Slot stones can be inserted and positioned at the guide profile and guide carriage

Material: Steel, nickel-plated or stainless steel

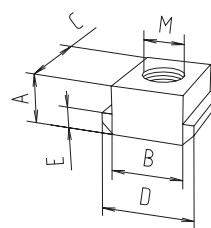


View of DuoLine from below

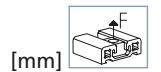
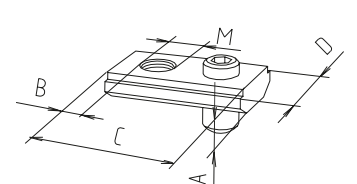
Slot stone -B-
can be swivelled into the slot



Slot stone -N-
can be slid into the slot



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



Code No.	Type	lot sizes	Material	Slot geometry	A	B	C	D	E	M	F [N]
Slot stone -B-											
E00017CSE	M3	-	Nickel-plated	20							
E00058CSE	M4	-	Nickel-plated	20							
Slot stone -N-											
400B202	M8	-	Nickel-plated	30	5	10	13	13	3	M8	4000
40092021	M8	-	Stainless steel	30	5	10	13	13	3	M8	4000
Slot stone -P- Version K											
4009214	M5	-	Stainless steel	30	4	7	20	12	-	M5	5000
4009216	M6	-	Stainless steel	30	4	7	20	12	-	M6	5000

Fixation

Centering Sets for RK DuoLine Clean

- The following positions could be defined exactly during the design process per set
 - Load capacity
 - Linear unit
- Reproducible position of the load capacity
- Reduced assembly/disassembly time of the load capacity or the linear unit
- Accuracy of the centering bolts h6
- To use for all RK DuoLine Clean linear units from March 2021 production date

Material:
Stainless steel
Scope of delivery per set:
2 centering bolts and fixing material

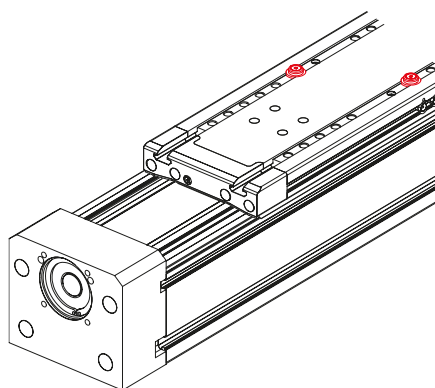


Fig. 1: Slide centering

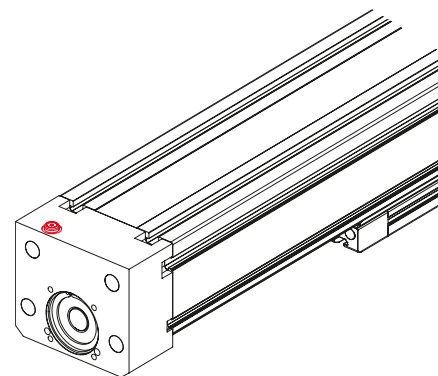
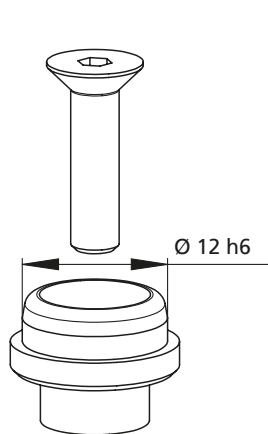
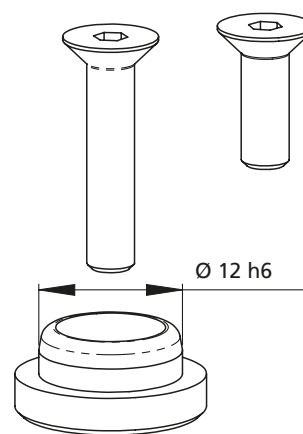


Fig. 2: Base centering

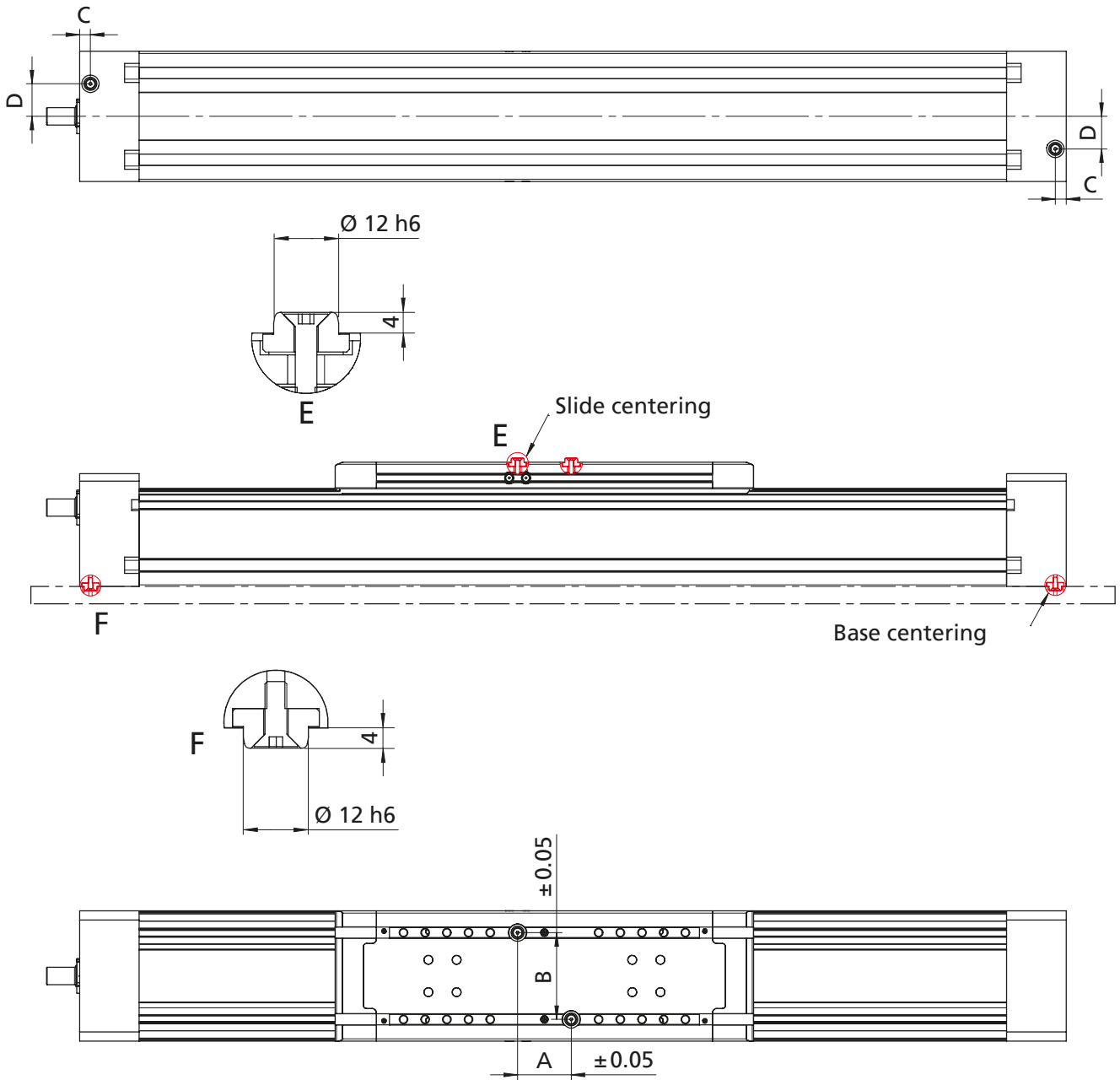


Size -A-



Size -B-

Code No.	Type	Use for
91810	Centering Set Size -A-	Slide centering RK DuoLine S+Z 60; S+Z 80
91817	Centering Set Size -B-	Base centering RK DuoLine S+Z 60; S+Z 80



Type	A	B	C	D
RK DuoLine S + Z 60	42	40	10	0
RK DuoLine S + Z 60 with extended guide carriage	48	40	10	0
RK DuoLine Z 80	65	50	10	15
RK DuoLine S 80	*	*	10	15
RK DuoLine S + Z 80 with extended guide carriage	70	50	10	15

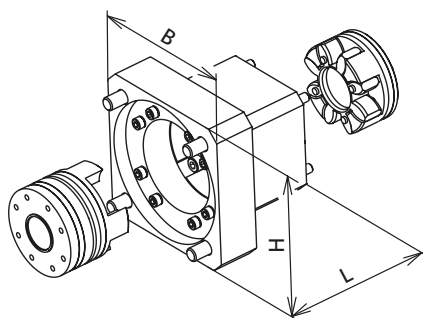
*Note: Centering on request only with special drill holes in the slide/clamp strips possible

Drive

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	–

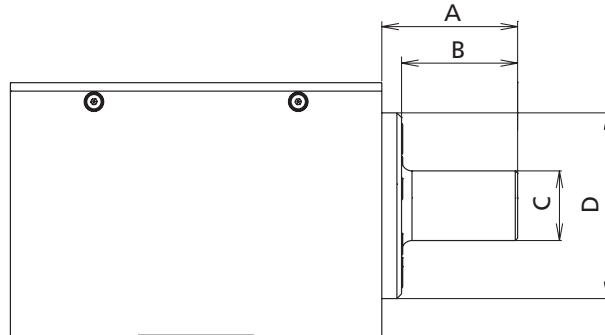
Drive shaft

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

Material:
Stainless steel drive shaft and fastening material
Scope of delivery per set:
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

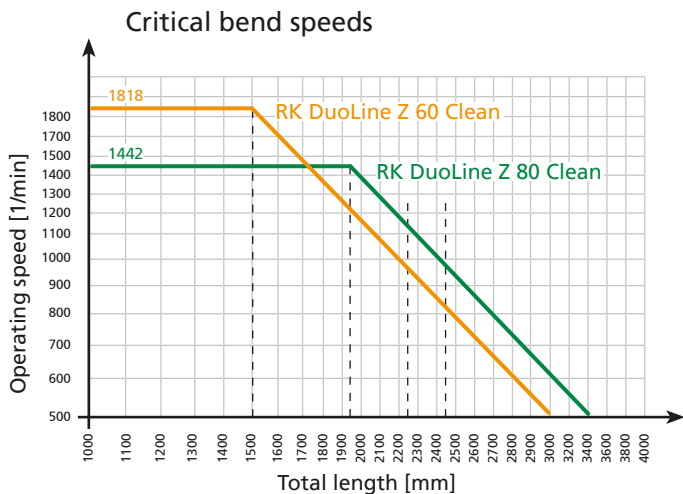
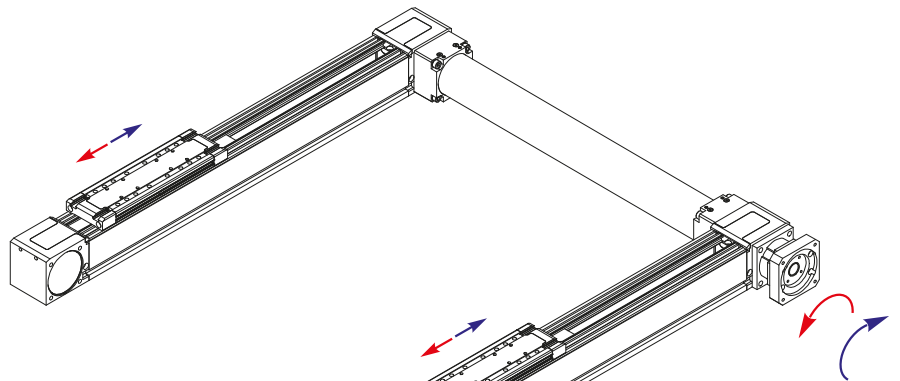
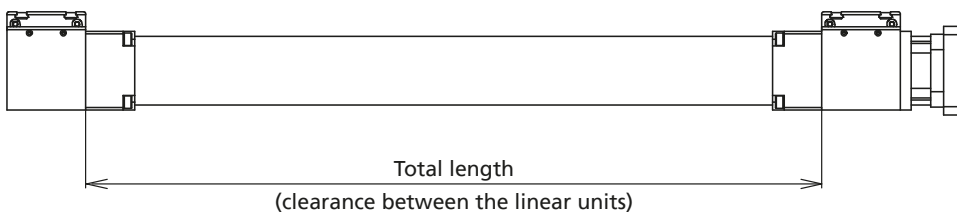
Synchronisation shaft

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

Scope of delivery:
Synchronisation shaft with fixation material

Max. transfer torque:

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

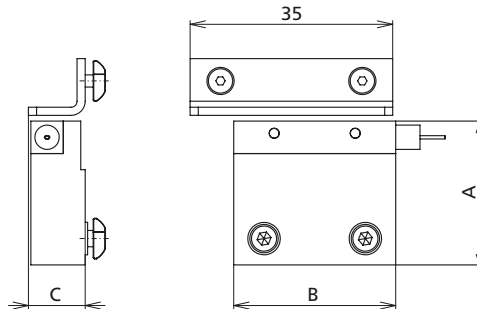
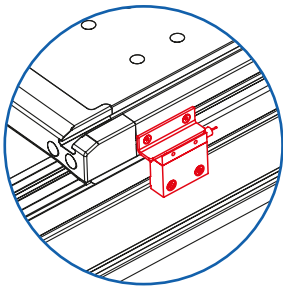


Code No.	Type	Basic length (minimum length)	Max. length (clearance)	Weight [kg]	
				Basic length	per 100 mm travel
92521740_ _ _ _	Synchronisation shaft RK DuoLine Z 60 Clean	127	2985	1,0	0,24
92521750_ _ _ _	Synchronisation shaft RK DuoLine Z 80 Clean	157	3400	1,96	0,29

External inductive limit switch

- External fixation on the guide profile

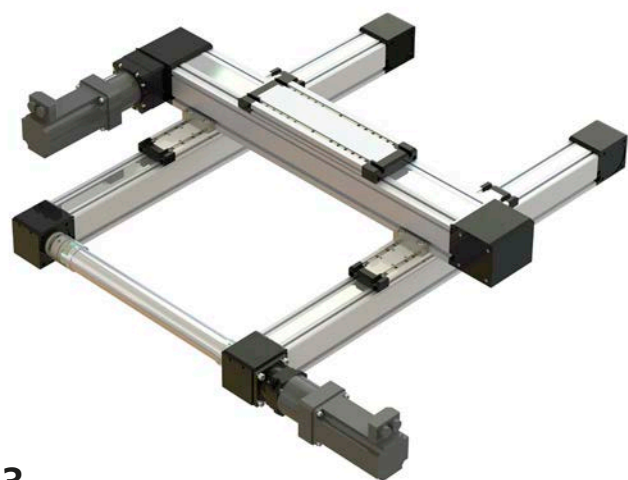
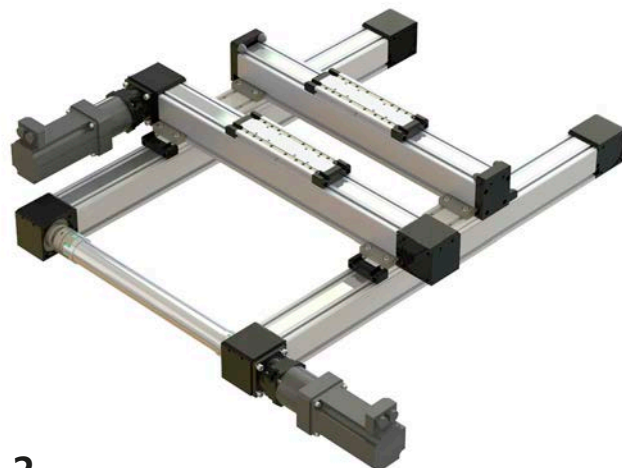
Scope of delivery:
Limit switch with set of fixing items



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 ROSE+KRIEGER



Fraunhofer

**TESTED[®]
DEVICE**

RK Rose+Krieger GmbH
RK DuoLine S80 Clean
Report No. RK 2011-1187





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