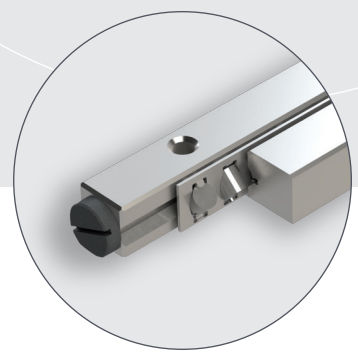
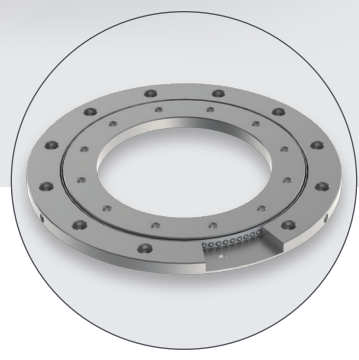
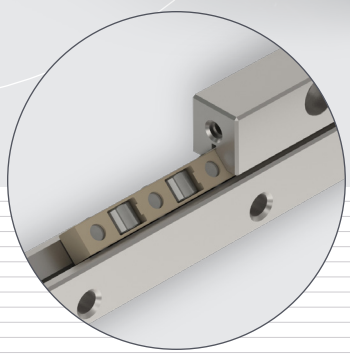
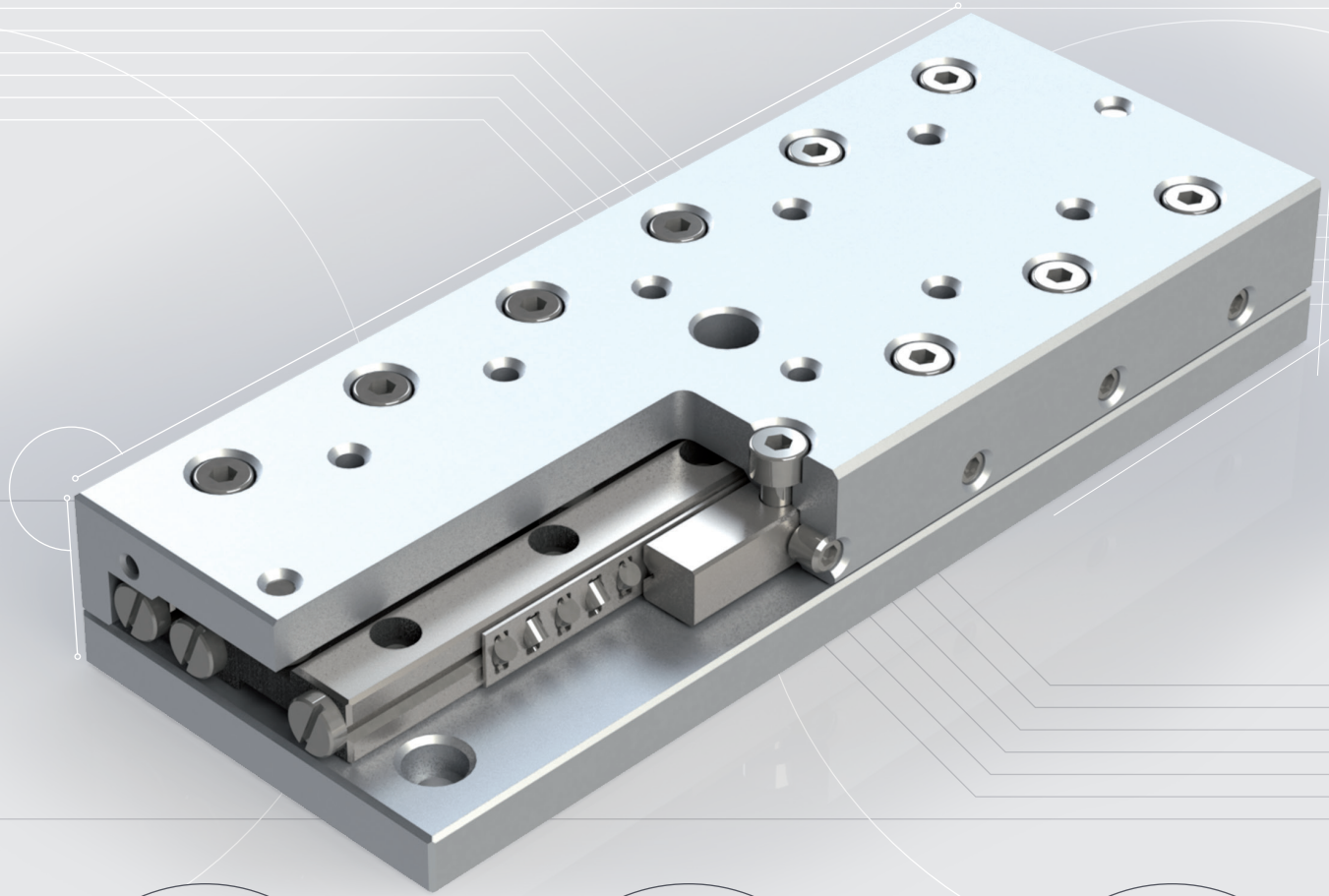


OVER  
**50**  
YEARS  
*of success*



# LINEAR BEARINGS TYPE RNG



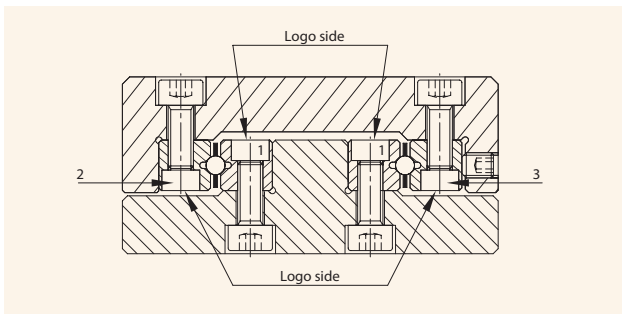
# ASSEMBLY PROCEDURE

## BEFORE START ASSEMBLY

PM linear bearings are precision components; they have to be handled with meticulous care. To achieve a perfect linear bearing, please pay due attention to the following notes:

- Be careful in handling the components. Do not drop it or hit it with anything like a hammer. Damages on the rail surface will have his impact on the running performance and operation life.
- Keep out any foreign material when mounting the rails.
- During assembly, all linear bearing components must have the same room temperature.
- For an uniform tightening of the bolts the use of a torque screw driver is recommended. Various models and bits are available. Please consult PM.

## ASSEMBLY LINEAR BEARINGS



For a satisfying installation of all types of linear bearings in this catalog, the following should be observed:

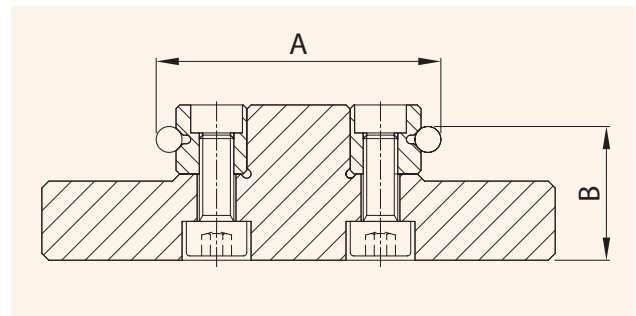
- 1) Fixing holes in the support structure (slide-base) should be "spotted through" from the holes in the rails. This is highly desirable as the original pitch of individual holes may have altered during hardening by as much as 0.4 mm. To compensate this, in part at least, special attachment screws type GD or GDN can be supplied. The dimensions of these are listed in the tables under the relative linear bearings for sizes.
- 2) Carefully de-burr and clean all constructional elements, to ensure a flat surface and a perfect seating of the rails.
- 3) The inner rail-pair (1), mounted "shoulder-to-shoulder" should be bolted down first, as follows: The base and reference face 1 of the linear bearing rails should be lightly oiled before they are clamped

against the mounting and reference shoulder.

They should then be bolted down by tightening up progressively, starting from one end and working to the other.

- 4) Parallelism of the V-tracks of the rails (A and B) should be checked. The tolerance must be within the tolerance of the linear bearings (page 14). When this has been done, the slide element in question is now ready for assembly.

*Parallelism of rails V-track:  $\Delta A$  und  $\Delta B$*



- 4.1) The slide top can now be assembled. The fixed bearing rail (2) should be mounted as described at 3.1 above, but the adjustable rail (3) should only be screwed down lightly, to leave a gap between V-tracks for the insertion of ball-, roller- or needle cages.
- 5) This point only in cases where end stops are already inserted in the rail ends. Remove the end stop screws.
- 6) Carefully insert the cages. When the cages are exact in position, bolt down the adjustable V-rail lightly, until the screws are finger-tight.
- 7) Fit the end stop screws or end pieces.
- 8) The linear bearing set can now be play-free adjusted using the lateral preload setscrews. (chapter Preload Setting Linear Bearings, page 18).
- 9) Secure the attachment screws on the adjusting rail.
- 10) When assembly is finished, the linear bearings must be inspected for absence of play and for running the accuracy.



# TABLES

## RECOMMENDED PRELOAD SETTINGS

Table 1 Linear bearings RSD with roller cages

Roller size (mm)	Pitch cage (mm)	Setscrew	Pitch* (mm)	Preload (Ncm)
1.5	3	M 2.5	10	0.75
2	4	M3	15	1.50
3	5	M5	25	4.50
4	7	M5	40	11.50
6	12	M6	100	18.50
9	14	M8	100	105.50
12	22	M10	100	176.50
15	20	M12	100	370.00

Table 2 Linear bearings RSD with ball cages

Roller size (mm)	Pitch cage (mm)	Setscrew	Pitch* (mm)	Preload (Ncm)
1.5	3	M 2.5	10	0.20
2	4	M3	15	0.40
3	5	M5	25	1.10
4	7	M5	40	2.70
6	9	M6	50	4.00
9	14	M8	100	11.70
12	15.5	M10	100	25.00
15	20	M12	100	34.50

Table 3 Linear bearings RSDE with roller cages

Roller size (mm)	Pitch cage (mm)	Setscrew	Pitch* (mm)	Preload (Ncm)
3	3.3	M5	25	16
4	4.4	M5	40	41
6	6.6	M6	50	86
9	On request			

Table 4 Linear bearings RNG with roller cages

Roller size (mm)	Pitch cage (mm)	Setscrew	Pitch* (mm)	Preload (Ncm)
4	4.4	M3	25	14
6	6.6	M4	25	25

Table 5 Linear Bearings N/O and M/V with needle cages

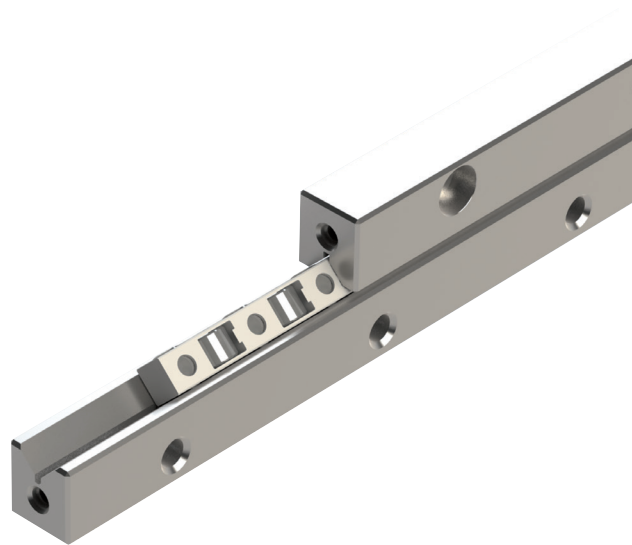
Roller size (mm)	Pitch cage (mm)	Setscrew	Pitch* (mm)	Preload (Ncm)
2	4.5	M6	50	1.05
2	4.5	M8	100	1.30
2.5	5	M8	100	2.70
2.5	5.5	M8	100	2.90
3	6	M12	100	5.70
3.5	7	M14	100	7.70

## RECOMMENDED TIGHTENING TORQUE FOR ATTACHMENT SCREWS

Table 6 Tightening torque strength grade 12.9

Max. Tightening torques (Ncm)		
Size	Tightening Torque DIN 912	Attachment screws GD and GDN
M2	0.60	0.48
M3	2.00	1.60
M4	4.90	3.92
M5	9.60	7.68
M6	17.00	13.60
M8	41.00	32.80
M10	79.00	63.20
M12	140.00	112.00
M14	220.00	176.00

\*pitch between the preload setscrews



*Compact, reliable and suitable for high loads.*

*Linear bearings type RNG in size 4 and 6 mm are a further development on the RSDE type. This results in advantages as significantly higher load ratings and stiffness but also more compact installation dimensions by optimizing the internal geometry of the groove. Roller cages type KRE are available in POM and PEEK material.*

### STRUCTURE AND FEATURES

The construction exists of two pairs linear bearings; one pair consists of two similar 90° V-groove, through-hardened and precision ground, fitted with a crossed roller cage in-between (KRE cage: rollers retained). The rails are equipped with countersunk-bored attachment holes, according to a standard configuration.

Key-features are:

- Load capacity approx. 3 x higher than competitors
- Stiffness is doubled, due to the enlarged contact area of the running surface
- **Compact design**, the space between the rails is reduced to a minimum
- Accept high accelerations and speed

Threaded holes in ends for fixing end screws GBN.

For assembly of the rails, special screws type GDN can be ordered separately.

Anti-cage creep technology is available for linear bearings type RNG.

### NOTES BY ORDERING

One set linear bearings RNG consists of: 4 pcs. rails (=2 pairs) RNG, 2 pcs. cages KRE and 8 pcs. end pieces and screws GBN

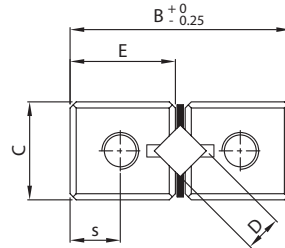
By ordering please specify the following:

- Quantity and type of rails
- Quantity, type and length of cages or max. stroke
- Quantity and type of end pieces with or without wipers

#### **Example:**

To order one linear bearing set of 150 mm length, size 4 mm einem for a 60 mm in standard quality please specify:

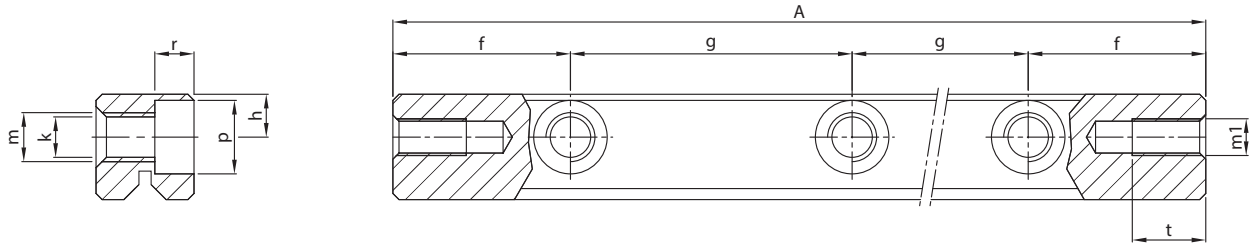
- 4 pcs. rails RNG-4150
- 2 pcs. roller cages KRE4x27 (length 130mm)
- 8 pcs. end pieces GBN-4



Rail type		Main dimensions					Mounting holes						
Standard	Stainless steel	A	B	C	E	D	f	g	h	k	m	p	
<b>RNG-4050</b>	RNG-4050-SS	50						1x25					
<b>RNG-4075</b>	RNG-4075-SS	75						2x25					
<b>RNG-4100</b>	RNG-4100-SS	100						3x25					
<b>RNG-4125</b>	RNG-4125-SS	125						4x25					
<b>RNG-4150</b>	RNG-4150-SS	150						5x25					
<b>RNG-4175</b>	RNG-4175-SS	175	19	9	9	4	12.5	6x25	3.5 <sup>±0.2</sup>	2.65	M3	5.5	
<b>RNG-4200</b>	RNG-4200-SS	200						7x25					
<b>RNG-4225</b>	RNG-4225-SS	225						8x25					
<b>RNG-4250</b>	RNG-4250-SS	250						9x25					
RNG-4275	RNG-4275-SS	275						10x25					
RNG-4300	RNG-4300-SS	300						11x25					
<b>RNG-6100</b>	RNG-6100-SS	100						3x25					
<b>RNG-6150</b>	RNG-6150-SS	150						5x25					
<b>RNG-6200</b>	RNG-6200-SS	200						7x25					
<b>RNG-6250</b>	RNG-6250-SS	250	25	12	12	6	12.5	9x25	5 <sup>±0.2</sup>	3.3	M4	7	
RNG-6300	RNG-6300-SS	300						11x25					
RNG-6350	RNG-6350-SS	350						13x25					
RNG-6400	RNG-6400-SS	400						15x25					

**Bold** = Short lead time item

Regular = Long lead time item - please request for price and delivery time



r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
2.7	M3	3.5	6	27	<b>RNG-4050</b>	Cage: KRE End pieces: GBN Attachment screw: Type GDN-4
				41	<b>RNG-4075</b>	
				55	<b>RNG-4100</b>	
				69	<b>RNG-4125</b>	
				83	<b>RNG-4150</b>	
				97	<b>RNG-4175</b>	
				111	<b>RNG-4200</b>	
				125	<b>RNG-4225</b>	
				139	<b>RNG-4250</b>	
				153	RNG-4275	
167	RNG-4300					
3.2	M3	3.5	6	92	<b>RNG-6100</b>	Cage: KRE, KREV End pieces: GBN Attachment screw: Type GDN-6
				138	<b>RNG-6150</b>	
				184	<b>RNG-6200</b>	
				230	<b>RNG-6250</b>	
				276	RNG-6300	
				322	RNG-6350	
				368	RNG-6400	

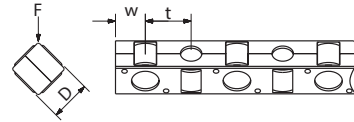
Units: mm

# ACCESSORIES

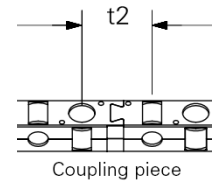
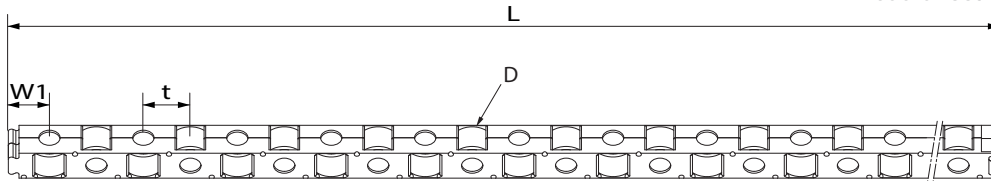
## FOR RAILS TYPE RNG

### Roller cage type KRE + KREV, size 4 and 6 mm

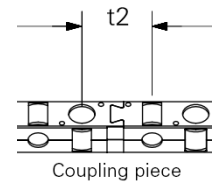
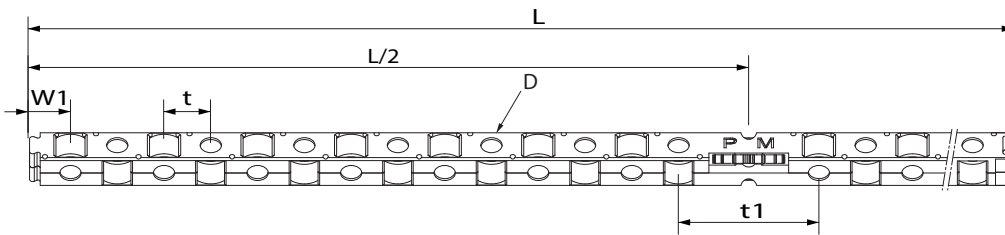
- Snap-on cage, rollers retained
- For horizontal and vertical application
- KRE Material POM
- KREV Material PEEK (suitable for UHV application)



F = Load direction according to picture.



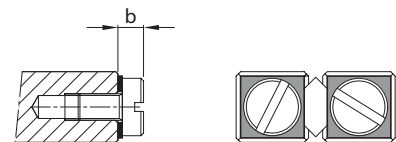
### Roller cages with Anti-Cage Creep KRE-ACC



Cage type		Main dimensions							Accessories	
Standard	Stainless steel	D	t	t1	t2	w	w1	L	Suitable for rail	End pieces
R4xKRE	R4xKRE-SS	4	4.4	-	6.7	2.8	3.85	135.3	RNG-4	GBN
R4xKRE-ACC	R4xKRE-SS-ACC	4	4.4	13.2	6.7	2.8	3.85	135.3		GBN
R4xKREV	R4xKREV-SS	4	4.5	-	6.7	2.8	on request			GBN
R4xKREV-ACC	R4xKREV-SS-ACC	4	4.5	13.2	6.7	2.8	on request			GBN
R6xKRE	R6xKRE-SS	6	6.6	-	10.6	4.3	6.3	204	RNG-6	GBN
R6xKRE-ACC	R6xKRE-SS-ACC	6	6.6	19.8	10.6	4.3	6.3	204		GBN
R6xKREV	R6xKREV-SS	6	6.7	-	10.6	4.3	6.3	204		GBN
R6xKREV-ACC	R6xKREV-SS-ACC	6	6.7	19.8	10.6	4.3	on request			GBN

### End pieces GBN, size 4 - 6 mm

- For horizontal and vertical application
- For cages type KRE, KREV
- For rails type RNG

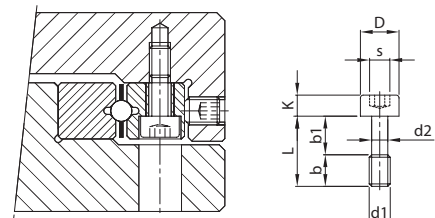


b = 4 mm for RNG-4 and RNG-6

### Attachment screw GDN, size 4 - 6 mm

- For compensation of pitch distances between mounting holes
- Recommended for the installation of the preload rail
- For rails RNG

Type	Size								Max. Tightening torque (Nm) <sup>1</sup>
	L	b	b1	D	d1	d2	K	s	
GDN-4	12	5	7	4.5	M2.5	1.85	2.5	2	0.60
GDN-6	16	5	11	5.5	M3	2.3	3	2.5	1.60



<sup>1</sup> Strength class 12.9

# PM RESEARCH AND PRODUCTION FACILITY



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