

LINEAR BEARINGS TYPE RSD



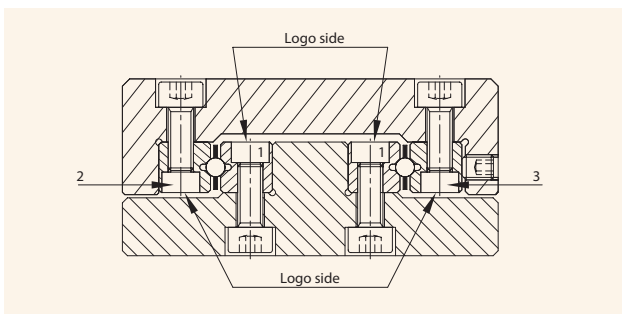
ASSEMBLY PROCEDURE

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:

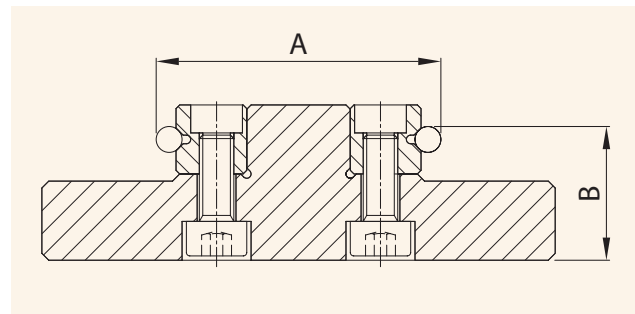
- 1) Fixing holes in the support structure (slide-base) should be "spotted through" from the holes in the rails. This is highly desirable as the original pitch of individual holes may have altered during hardening by as much as 0.4 mm. To compensate this, in part at least, special attachment screws type 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: ΔA und ΔB



- 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



Linear bearings type RSD are compact guides for precise linear motion providing high accuracy and an outstanding reliability. Depending on the load requirements they can be fitted either with ball or roller cages. With many years of experience RSD-bearings are the world-wide standard in hightech applications requiring first class performances and quality with minimum cost.

STRUCTURE AND FEATURES

Depending on the construction, the linear bearing can be fitted with ball- or roller cages with alternately crossed rollers. The construction consists of two pairs linear bearings; one pair consists of two similar 90° V-groove rails, through-hardened and precision ground, fitted with a cage in-between. Crossed roller cages are used in high-load and high-precision applications (note: good dust protection is in this case required). Cages fitted with balls are used in applications which require less capacity, low friction resistance, or where dust and dirt are likely to penetrate into the rails (balls are affected less by dust or dirt, due to a self-cleaning effect of the balls).

Rails are equipped with countersunk attachment holes, bored according to a standard configuration.

Threaded holes in ends for fixing end pieces and wipers.

For the attachment of the rails, special screws type GD can be ordered separately. (see page 35)

On request we supply linear bearings with roller size \varnothing 18 mm and \varnothing 24 mm.

NOTES BY ORDERING

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

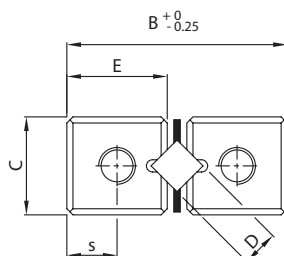
By ordering please specify the following:

- Quantity and type of rails
- Quantity, type and length of cages or max. stroke
- Direction of movement (eg: horizontal, vertical or in-between)
- Quantity and type of end screws or end pieces with or without wipers. (in case of GC and GC-A, only 4 pcs are needed)

Example:

To order one linear bearing set of 300 mm length, size 6 mm for a 120 mm long horizontal stroke in standard quality please specify.

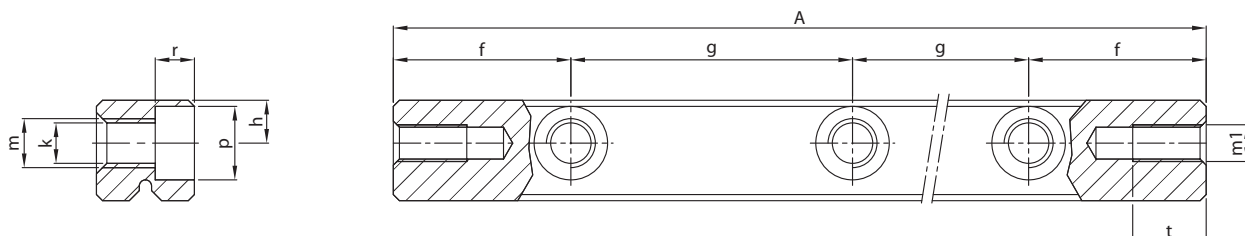
- 4 pcs. rails RSD-6300
- 2 pcs. roller cages R6x20AA
- 8 pcs. end screws GA-6



Rail type		Main dimensions					Mounting holes					
Standard	Stainless steel	A	B	C	E	D	f	g	h	k	m	p
RSD-1520	RSD-1520-SS	20						1x10				
RSD-1530	RSD-1530-SS	30						2x10				
RSD-1540	RSD-1540-SS	40						3x10				
RSD-1550	RSD-1550-SS	50						4x10				
RSD-1560	RSD-1560-SS	60						5x10				
RSD-1570	RSD-1570-SS	70	8.5	4	3.9	1.5	5	6x10	1.8 \pm 0.1	1.6	M2	3
RSD-1580	RSD-1580-SS	80						7x10				
RSD-1590	RSD-1590-SS	90						8x10				
RSD-15100	RSD-15100-SS	100						9x10				
RSD-15120	RSD-15120-SS	120						11x10				
RSD-15140	RSD-15140-SS	140						13x10				
RSD-2030	RSD-2030-SS	30						1x15				
RSD-2045	RSD-2045-SS	45						2x15				
RSD-2060	RSD-2060-SS	60						3x15				
RSD-2075	RSD-2075-SS	75						4x15				
RSD-2090	RSD-2090-SS	90						5x15				
RSD-2105	RSD-2105-SS	105	12	6	5.5	2	7.5	6x15	2.5 \pm 0.1	2.5	M3	4.3
RSD-2120	RSD-2120-SS	120						7x15				
RSD-2135	RSD-2135-SS	135						8x15				
RSD-2150	RSD-2150-SS	150						9x15				
RSD-2165	RSD-2165-SS	165						10x15				
RSD-2180	RSD-2180-SS	180						11x15				

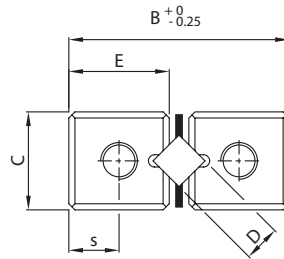
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r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
1.4	M1.8	1.95	3.1	3	RSD-1520	Cage: AA, KZR, JJ, KKLK End pieces: GA, GB
				4	RSD-1530	
				5	RSD-1540	
				6	RSD-1550	
				7	RSD-1560	
				8	RSD-1570	
				9	RSD-1580	
				10	RSD-1590	
				12	RSD-15100	
				14	RSD-15120	
				16	RSD-15140	
2	M2.5	2.75	4.5	8	RSD-2030	Cage: AA, KZR, JJ, KKLK End pieces: GA, GB
				11	RSD-2045	
				14	RSD-2060	
				17	RSD-2075	
				20	RSD-2090	
				23	RSD-2105	
				26	RSD-2120	
				30	RSD-2135	
				34	RSD-2150	
				37	RSD-2165	
				40	RSD-2180	

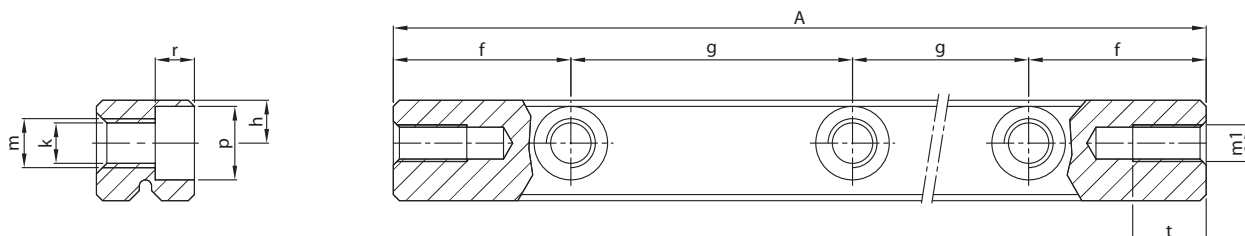
Units: mm



Rail type		Main dimensions				D	Mounting holes					
Standard	Stainless steel	A	B	C	E		f	g	h	k	m	p
RSD-3050	RSD-3050-SS	50						1x25				
RSD-3075	RSD-3075-SS	75						2x25				
RSD-3100	RSD-3100-SS	100						3x25				
RSD-3125	RSD-3125-SS	125						4x25				
RSD-3150	RSD-3150-SS	150						5x25				
RSD-3175	RSD-3175-SS	175	18	8	8.25	3	12.5	6x25	3.5 \pm 0.2	3.2	M4	6
RSD-3200	RSD-3200-SS	200						7x25				
RSD-3225	RSD-3225-SS	225						8x25				
RSD-3250	RSD-3250-SS	250						9x25				
RSD-3275	RSD-3275-SS	275						10x25				
RSD-3300	RSD-3300-SS	300						11x25				
RSD-3350	RSD-3350-SS	350						13x25				
RSD-4080	RSD-4080-SS	80						1x40				
RSD-4120	RSD-4120-SS	120						2x40				
RSD-4160	RSD-4160-SS	160						3x40				
RSD-4200	RSD-4200-SS	200						4x40				
RSD-4240	RSD-4240-SS	240						5x40				
RSD-4280	RSD-4280-SS	280	22	11	10	4	20	6x40	4.5 \pm 0.2	4.3	M5	7.5
RSD-4320	RSD-4320-SS	320						7x40				
RSD-4360	RSD-4360-SS	360						8x40				
RSD-4400	RSD-4400-SS	400						9x40				
RSD-4440	RSD-4440-SS	440						10x40				
RSD-4480	RSD-4480-SS	480						11x40				

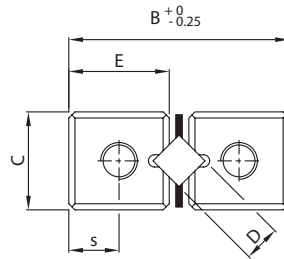
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r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
3.2	M3	4.1	5.5	22	RSD-3050	Cage: AA, KZR, JJ, KKLK End pieces: GA, GB, GC, GCA-Swiper Attachment screw: Type GD-3
				33	RSD-3075	
				44	RSD-3100	
				55	RSD-3125	
				66	RSD-3150	
				77	RSD-3175	
				88	RSD-3200	
				99	RSD-3225	
				110	RSD-3250	
				121	RSD-3275	
				132	RSD-3300	
				155	RSD-3350	
4.1	M3	5	7	64	RSD-4080	Cage: AA, JJ End pieces: GA, GB, GC, GCA-Swiper Attachment screw: Type GD-4
				96	RSD-4120	
				120	RSD-4160	
				160	RSD-4200	
				192	RSD-4240	
				224	RSD-4280	
				256	RSD-4320	
				288	RSD-4360	
				320	RSD-4400	
				352	RSD-4440	
				384	RSD-4480	

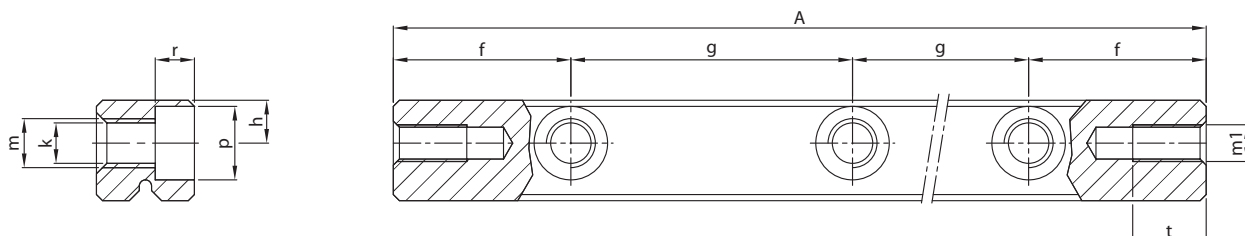
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Rail type		Main dimensions					Mounting holes					
Standard	Stainless steel	A	B	C	E	D	f	g	h	k	m	p
RSD-6100	RSD-6100-SS	100						1x50				
RSD-6150	RSD-6150-SS	150						2x50				
RSD-6200	RSD-6200-SS	200						3x50				
RSD-6250	RSD-6250-SS	250						4x50				
RSD-6300	RSD-6300-SS	300						5x50				
RSD-6350	RSD-6350-SS	350						6x50				
RSD-6400	RSD-6400-SS	400						7x50				
RSD-6450	RSD-6450-SS	450	31	15	14	6	25	8x50	$6^{±0.2}$	5.2	M6	9.5
RSD-6500	RSD-6500-SS	500						9x50				
RSD-6600	RSD-6600-SS	600						11x50				
RSD-6700	RSD-6700-SS	700						13x50				
RSD-6800	RSD-6800-SS	800						15x50				
RSD-6900	RSD-6900-SS	900						17x50				
RSD-61000	RSD-61000-SS	1000						19x50				
RSD-61100	RSD-61100-SS	1100						21x50				
RSD-61200	RSD-61200-SS	1200						23x50				
RSD-9100	RSD-9100-SS	100					25	1x50				
RSD-9200	RSD-9200-SS	200						1x100				
RSD-9300	RSD-9300-SS	300						2x100				
RSD-9400	RSD-9400-SS	400						3x100				
RSD-9500	RSD-9500-SS	500						4x100				
RSD-9600	RSD-9600-SS	600	44	22	19.8	9	50	5x100	$9^{±0.2}$	6.8	M8	11
RSD-9700	RSD-9700-SS	700						6x100				
RSD-9800	RSD-9800-SS	800						7x100				
RSD-9900	RSD-9900-SS	900						8x100				
RSD-91000	RSD-91000-SS	1000						9x100				
RSD-91100	RSD-91100-SS	1100						10x100				
RSD-91200	RSD-91200-SS	1200						11x100				

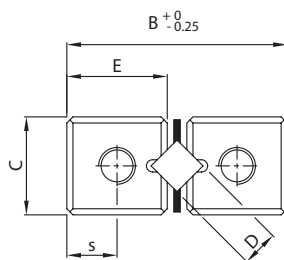
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r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
5.2	M5	7	8.5	142	RSD-6100	Cage: AA, AL, KZR, JJ, KCLK End pieces: GA, GB, GC, GCA-Swiper Attachment screw: Type GD-6
				213	RSD-6150	
				288	RSD-6200	
				360	RSD-6250	
				432	RSD-6300	
				504	RSD-6350	
				576	RSD-6400	
				648	RSD-6450	
				720	RSD-6500	
				864	RSD-6600	
				1008	RSD-6700	
				1152	RSD-6800	
				1296	RSD-6900	
				1440	RSD-61000	
				1584	RSD-61100	
				1728	RSD-61200	
6.2	M6	9.9	10	306	RSD-9100	Cage: AA, AL, KZR, JJ, KCLK End pieces: GA, GB, GC, GCA-Swiper Attachment screw: Type GD-9
				616	RSD-9200	
				926	RSD-9300	
				1236	RSD-9400	
				1546	RSD-9500	
				1856	RSD-9600	
				2166	RSD-9700	
				2476	RSD-9800	
				2786	RSD-9900	
				3096	RSD-91000	
				3406	RSD-91100	
				3716	RSD-91200	

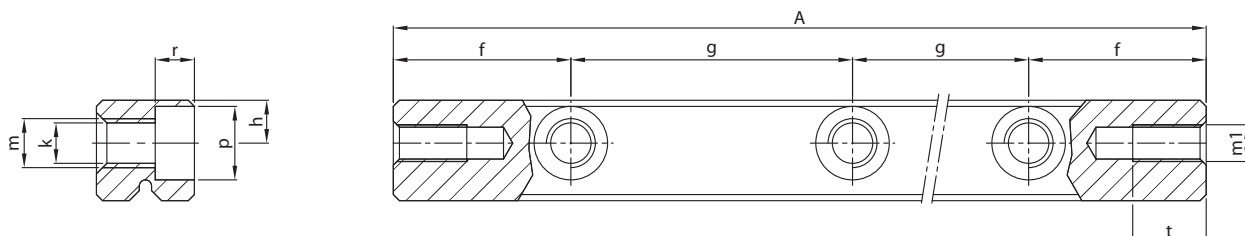
Units: mm



Rail type		Main dimensions					Mounting holes					
Standard	Stainless steel	A	B	C	E	D	f	g	h	k	m	p
RSD-12200	on request	200						1x100				
RSD-12300		300						2x100				
RSD-12400		400						3x100				
RSD-12500		500						4x100				
RSD-12600		600						5x100				
RSD-12700		700	58	28	25.9	12	50	6x100	12 \pm 0.2	8.5	M10	13.5
RSD-12800		800						7x100				
RSD-12900		900						8x100				
RSD-121000		1000						9x100				
RSD-121100		1100						10x100				
RSD-121200		1200						11x100				
RSD-121400		1400						13x100				
RSD-15300	on request	300						2x100				
RSD-15400		400						3x100				
RSD-15500		500						4x100				
RSD-15600		600						5x100				
RSD-15700		700						6x100				
RSD-15800		800	71	36	31.9	15	50	7x100	14 \pm 0.2	10.3	M12	16.5
RSD-15900		900						8x100				
RSD-151000		1000						9x100				
RSD-151100		1100						10x100				
RSD-151200		1200						11x100				
RSD-151400		1400						13x100				

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r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
8.3	M8	12.95	15	1011	RSD-12200	Cage: AA, AL, JJ, KCLK End pieces: GA, GB, GC, GCA-Swiper Attachment screw: Type GD-12
				1525	RSD-12300	
				2039	RSD-12400	
				2553	RSD-12500	
				3067	RSD-12600	
				3581	RSD-12700	
				4095	RSD-12800	
				4609	RSD-12900	
				5123	RSD-121000	
				5637	RSD-121100	
				6151	RSD-121200	
				7693	RSD-121400	
10.3	M8	15.95	15	2426	RSD-15300	Cage: AA, AL, JJ End pieces: GA, GB, GC, GCA-Swiper Attachment screw: Type GD-15
				3221	RSD-15400	
				4027	RSD-15500	
				4833	RSD-15600	
				5639	RSD-15700	
				6445	RSD-15800	
				7251	RSD-15900	
				8057	RSD-151000	
				8863	RSD-151100	
				9669	RSD-151200	
				10475	RSD-151400	

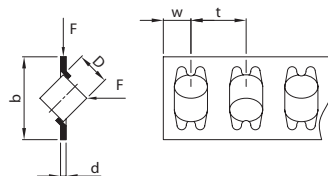
Units: mm

ACCESSORIES

FOR LINEAR BEARINGS TYPE RSD

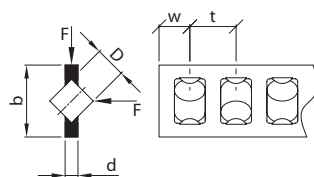
Roller cage AA, size 1.5 - 15 mm

- Rollers retained
- For horizontal installation
- Material steel, 1.5 - 6 mm cage material stainless steel 304



Roller cage AL, size 6 - 15 mm

- Rollers retained
- For horizontal and vertical installation
- Suitable for protruding cages
- Cage material aluminum

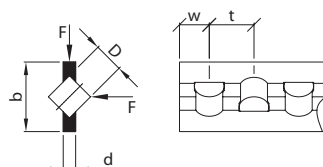


Cage type		Main dimensions					Accessories	
Standard	Stainless steel	D	b	d	t	w	Suitable for rail	End pieces
R1.5xAA	R1.5xAA-SS	1.5	3.8	0.2	2.5	2	RSD- 1.5	GA
R1.5xKZR	R1.5xKZR-SS		3.8	0.5	3	2		GB
K1.5xJJ	K1.5xJJ-SS		3.5	0.5	3	1.5		GB
K1.5xKKLK	K1.5xKKLK-SS		3.5	0.45	2.2	1.5		GB
R2xAA	R2xAA-SS	2	5.6	0.3	4	2	RSD- 2	GA
R2xKZR	R2xKZR-SS		5.5	0.7	4	2		GB
K2xJJ	K2xJJ-SS		5.5	0.8	4	2		GB
K2xKKLK	K2xKKLK-SS		5	0.75	3.9	3		GB
R3xAA	R3xAA-SS	3	7.5	0.5	5	2.5	RSD- 3	GA
R3xKZR	R3xKZR-SS		7	1	5	2.5		GB, GC
K3xJJ	K3xJJ-SS		7.5	1.2	5	2.5		GB, GC
K3xKKLK	K3xKKLK-SS		7	1	4.2	2.7		GB, GC
R4xAA	R4xAA-SS	4	10	0.5	7	5	RSD- 4	GA
K4xJJ	K4xJJ-SS		10	1.0	7	5		GB, GC

F = Load direction according to picture.

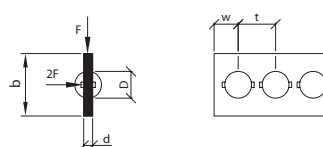
Roller cage KZR, size 1.5 - 9 mm

- Rollers retained
- For horizontal and vertical installation
- Cage material plastic (reinforced cages available in size 6 and 9 mm)
- Max. roller amount of 24 with 1,5 and 2 mm cages
- In case of protruding cages please consult PM



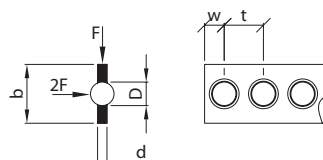
Ball cage KKLK, size 1.5 - 12 mm

- Balls retained
- For horizontal and vertical installation
- Material plastic
- In case of protruding cages please consult PM



Ball cage JJ, size 1.5 - 15 mm

- Balls retained (size 6 - 15 mm)
- For horizontal and vertical installation
- Cage material brass



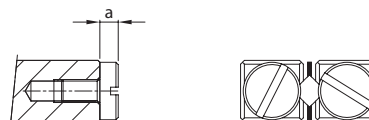
Cage type		Main dimensions					Accessories	
Standard	Stainless steel	D	b	d	t	w	Suitable for rail	End pieces
R6xAA	R6xAA-SS	6	14	0.75	9	6	RSD-6	GA
R6xAL	R6xAL-SS		14	2.5	9	6		GB, GC
R6xKZR	R6xKZR-SS		14	2.5	8.5	6		GB, GC
K6xJJ	K6xJJ-SS		14	2.5	9	6		GB, GC
K6xKKLK	K6xKKLK-SS		14	2.5	9	6		GB, GC
R9xAA	R9xAA-SS	9	20	1	14	9	RSD-9	GA
R9xAL	R9xAL-SS		20	4	14	9		GB, GC
R9xKZR	R9xKZR-SS		20	3	14	9		GB, GC
K9xJJ	K9xJJ-SS		20	4	14	9		GB, GC
K9xKKLK	K9xKKLK-SS		20	3.5	14	9		GB, GC
R12xAA	on request	12	26	1.2	18	11	RSD-12	GA
R12xAL			25	5	18	11		GB, GC
K12xJJ			25	5	18	11		GB, GC
K12xKKLK			20	4	15.5	11		GB, GC
R15xAA	on request	15	35	1.2	20	12	RSD-15	GA
R15xAL			35	5	20	12		GB, GC
K15xJJ			35	5	20	12		GB, GC

F = Load direction according to picture.

Units: mm

End screws GA, size 1.5 - 15 mm

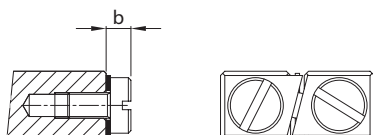
- For horizontal and vertical installation
- For cage AA
- For rails RSD



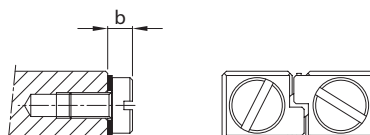
End pieces GB, size 1.5 - 15 mm

- For horizontal and vertical installation
- For cage AL, KZR, JJ, KKLK, KRE, KREV
- For rails RSD+RSDE

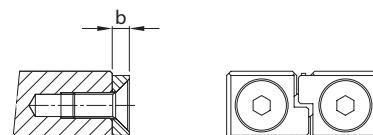
Size 1.5 mm



Size 2 mm

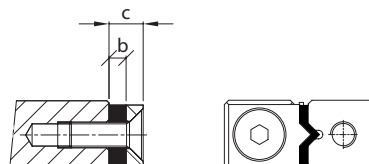


Size 3-15 mm



End pieces GC + wipers GCA, size 3 - 15 mm

- For horizontal and vertical installation
- For cage AL, KZR, JJ, KKLK, KRE, KREV
- For rails RSD + RSDE
- For protruding cages
- For one set linear bearings 4 end pieces are used

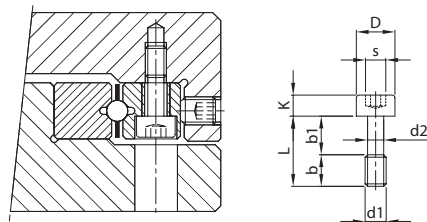


Dimensions	Size							
	1.5	2	3	4	6	9	12	15
a	1.5	2	2.4	2.7	3.7	4.2	5.3	5.3
b	2	2.6	2	2.5	3.2	4.2	5.2	6.3
c	-	-	5	2.7	6.2	7.2	8.2	9.3

Order example: 4 pieces End screws GA-6
Stainless steel: 8 pieces End screws GA-6-SS

Attachment screws GD, size 3 - 15 mm

- For compensation of pitch distances between mounting holes
- Recommended for the installation of the pre-load rail
- For rails RSD and RSDE



Type	Size								Max. Tightening torque (Nm) ¹
	L	b	b1	D	d1	d2	K	s	
GD-3	12	5	7	5	M3	2.3	3	2.5	1.60
GD-4	16	7	9	6.5	M4	3	4	3	3.92
GD-6	20	8	12	8	M5	3.9	5	4	7.68
GD-9	30	12	18	8.5	M6	4.6	6	5	13.60
GD-12	40	17	23	11.3	M8	6.2	8	6	32.80
GD-15	45	16	29	13.9	M10	7.9	10	8	63.20

¹ Strength class 12.0

Units: mm

PM RESEARCH AND PRODUCTION FACILITY



PM B.V.

Galileistraat 2
NL-7701 SK, Dedemsvaart
Niederlande

Tel: +31 523 61 22 58
info@pm.nl

WWW.PM.NL

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