

LINEAR BEARING TYPE RSD



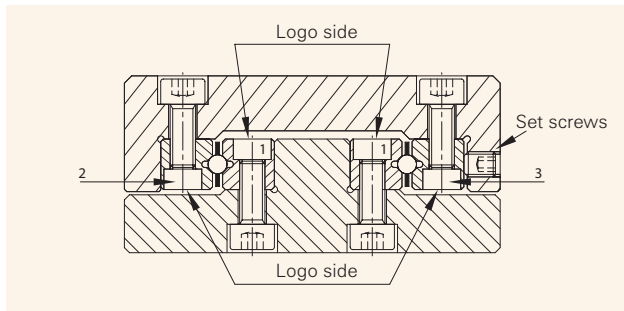
ASSEMBLY PROCEDURE

PRIOR TO ASSEMBLY

PM linear bearings are precision components; they have to be handled with meticulous care. To achieve a perfect linear bearing, it is necessary to respect the following guidelines:

- When handling the components. Damage on the rail surface will impact the running performance and operational lifetime
- Prevent contact with any foreign materials when mounting the rails
- During assembly, ensure that all linear bearing components have the same temperature
- For uniform tightening of the bolts the use of a torque screw driver is recommended. Various models are available.

ASSEMBLY LINEAR BEARINGS



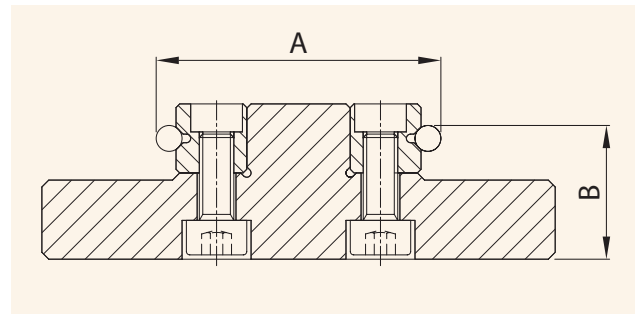
For satisfactory installation of all types of linear bearings in this catalogue, it is necessary to consider the following points:

- 1) To determine the location of fixing holes in the support structure (slide base) the holes in the rails should be taken as a reference and "copied" onto the support structure. 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, special type GD or GDN attachment screws can be supplied. The dimensions of these screws are listed in the tables at the end of each chapter.
- 2) Carefully de-burr and clean all elements, to ensure a flat surface and a perfect fit of the rails.
- 3) Now, as a required first step, to fasten the inner rail pair (marked as 1 in figure above) 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. Subsequently,

they can be fastened by starting from one end and working towards the opposite end.

- 4) Parallelism of the V-groove of the rails (A and B) should be checked to ensure they don't exceed the tolerance of the linear bearings (page 14). After these steps have been followed, the slide element is ready for assembly.

Parallelism of rails V-groove: ΔA and ΔB



- 4.1) The fixed bearing rail (2) should be mounted as described under step 3 above, but care should be taken not to tighten the adjustable rail (marked as 3 in figure on the left side) too much, so as to leave a gap between the V-grooves for the insertion of ball cages, roller cages or needle cages.
- 5) If any end stop screws are present, remove them now.
- 6) Carefully insert the cages. When placed in their exact position, lightly secure the adjustable rail until the screws are finger-tight.
- 7) Fit the end screws or end pieces.
- 8) The linear bearing set is now ready to be backlash free-adjusted using the lateral preload set screws (page 18, Preload Settings). The amount of preload is given in the tables at page 21.
- 9) Secure the attachment screws on the adjusting rail.
- 10) When assembly is complete, the linear bearings must be checked for absence of play and inspected for running quality.



TABLES

RECOMMENDED PRELOAD SETTINGS

Table 1 Linear bearings type RSD with roller cages

Roller size (mm)	Pitch cage (mm)	Set screw	Pitch* (mm)	Preload (Ncm)
1.5	3	M2.5	10	0.75
2	4	M3	15	1.50
3	5	M5	25	4.50
4	7	M5	40	11.50
6	9	M6	100	18.50
9	14	M8	100	105.50
12	18	M10	100	176.50
15	20	M12	100	370.00

Table 2 Linear bearings type RSD with ball cages

Roller size (mm)	Pitch cage (mm)	Set screw	Pitch* (mm)	Preload (Ncm)
1.5	3	M2.5	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	18	M10	100	25.00
15	20	M12	100	34.50

Table 3 Linear bearings type RSDE with roller cages

Roller size (mm)	Pitch cage (mm)	Set screw	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 type RNG with roller cages

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

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

Roller size (mm)	Pitch cage (mm)	Set screw	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 (Nm)		
Size	Tightening Torque DIN 912	Attachment screws type 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	19.20
M10	79.00	38.40
M12	140.00	66.40
M14	220.00	105.60

*pitch between the preload setscrews



Our RSD linear bearings are compact rails for precise linear motion providing high accuracy and superior reliability. Depending on the load requirements they can be equipped either with ball or roller cages. Benefiting from many years of development, RSD bearings are the global standard for use in high-tech applications requiring first class quality and performance at a minimal cost.

STRUCTURE AND FEATURES

Depending on the construction, the linear bearing can be equipped with ball or roller cages with alternately crossed rollers. The set consists of two pairs of linear bearings; one pair consists of two similar 90° V-groove rails, through hardened and precision ground, equipped with a cage in between. Crossed roller cages are used in high load and high precision applications (note: good dust protection is required). Cages equipped with balls are used in applications requiring lower capacity, low friction resistance, or where dust and dirt are likely to gather in the rails. Balls are affected by dust and dirt to a lesser extend, owing to their self-cleaning properties.

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

Rail ends come with threaded holes for fixing end pieces and wipers.

For the attachment of the rails, special type GD screws are available to order separately (see page 37).

On request we supply linear bearings with roller size \varnothing 18 mm and \varnothing 24 mm. Please contact us for further information.

For long travel purpose type RSD rails can be combined with recirculating units type UK and UR, listed on page 97.

ORDER NOTES

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

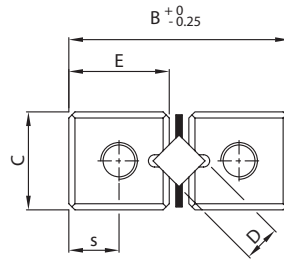
Please specify the following in your order:

- 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 (eg: in case of GC and GC-A, only 4 pieces 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 as follows:

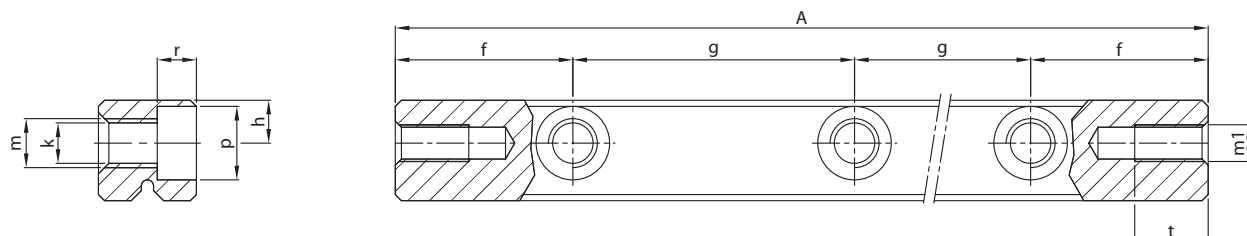
- 4 pcs. Rails type RSD-6300
- 2 pcs. Roller cages type R6x26AA
- 8 pcs. End screws type GA-6



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±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±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				

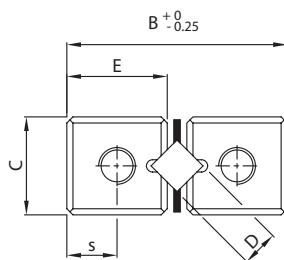
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r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
1.4	M1.8	1.95	3.1	3	RSD-1520	Cages: AA, KZR, JJ, KKLK End pieces: GA, GB
				4	RSD-1530	
				5	RSD-1540	
				6	RSD-1550	
				7	RSD-1560	
				8	RSD-1570	
				9	RSD-1580	
				10	RSD-1590	
				12	RSD-15100	
				14	RSD-15120	
				16	RSD-15140	
2	M2.5	2.75	4.5	8	RSD-2030	Cages: 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	

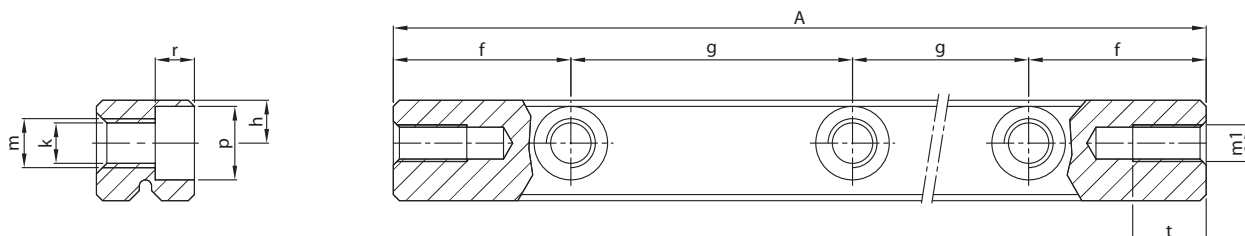
Units: mm



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	18	8	8.25	3	12.5	1x25	$3.5^{±0.2}$	3.2	M4	6
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						6x25				
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	22	11	10	4	20	1x40	$4.5^{±0.2}$	4.3	M5	7.5
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						6x40				
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				

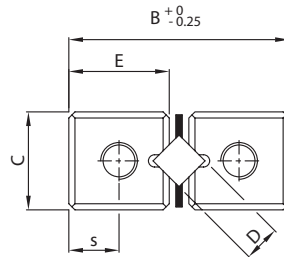
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r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
3.2	M3	4.1	5.5	22	RSD-3050	Cages: AA, KZR, JJ, KCLK End pieces: GA, GB, GC, GCA-wiper Attachment screws: GD-3
				33	RSD-3075	
				44	RSD-3100	
				55	RSD-3125	
				66	RSD-3150	
				77	RSD-3175	
				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	Cages: AA, JJ End pieces: GA, GB, GC, GCA-wiper Attachment screws: 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	

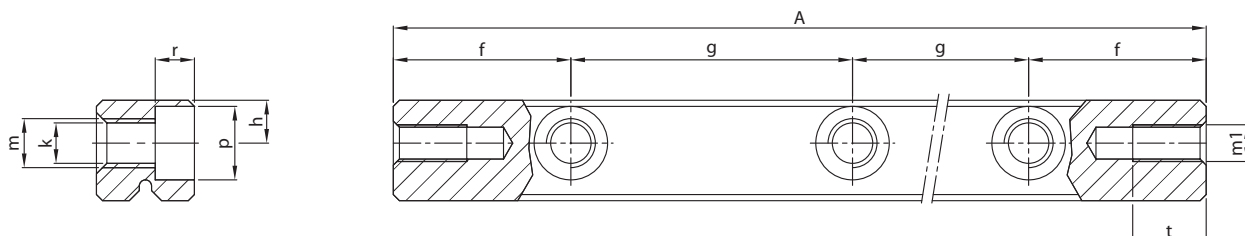
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Rail type		Main dimensions					Mounting holes					
Standard	Stainless steel	A	B	C	E	D	f	g	h	k	m	p
RSD-6100	RSD-6100-SS	100						1x50				
RSD-6150	RSD-6150-SS	150						2x50				
RSD-6200	RSD-6200-SS	200						3x50				
RSD-6250	RSD-6250-SS	250						4x50				
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	$6^{\pm 0.2}$	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	$9^{\pm 0.2}$	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				

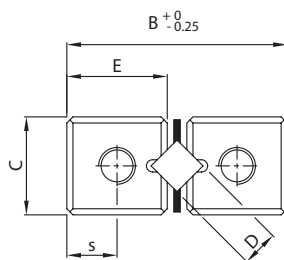
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r	End holes			Weight (g)	Type	Accessories
	m1	s	t			
5.2	M5	7	8.5	142	RSD-6100	Cages: AA, AL, KZR, JJ, KCLK End pieces: GA, GB, GC, GCA-wiper Attachment screws: GD-6
				213	RSD-6150	
				288	RSD-6200	
				360	RSD-6250	
				432	RSD-6300	
				504	RSD-6350	
				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	Cages: AA, AL, KZR, JJ, KCLK End pieces: GA, GB, GC, GCA-wiper Attachment screws: 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	

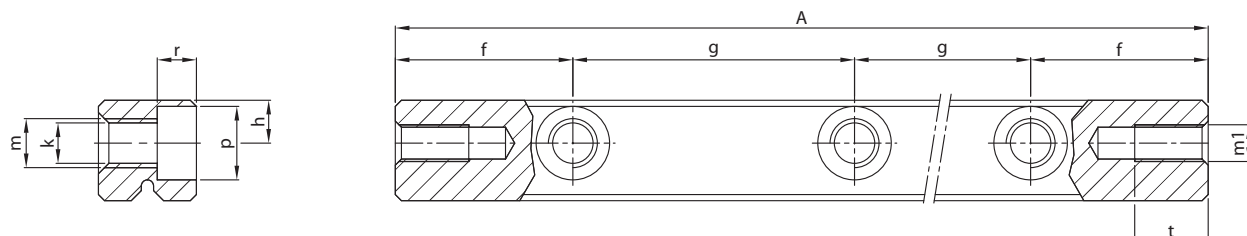
Units: mm



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	Cages: AA, AL, JJ, KKLK End pieces: GA, GB, GC, GCA-wiper Attachment screws: 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	Cages: AA, AL, JJ End pieces: GA, GB, GC, GCA-wiper Attachment screws: 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	

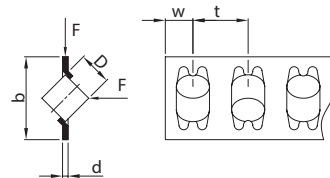
Units: mm

ACCESSORIES

FOR LINEAR BEARINGS TYPE RSD AND DS

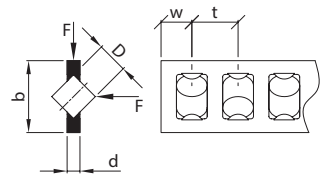
Roller cage type AA, size 1.5 - 15 mm

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



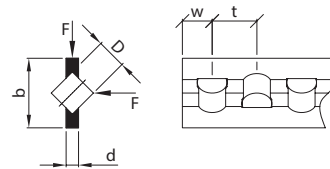
Roller cage type AL, size 4 - 15 mm

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



Roller cage type KZR, size 1.5 - 9 mm

- Rollers retained
- For horizontal and vertical application
- Cage material plastic (reinforced cages available in size 6 and 9 mm)
- Max. roller amount of 24 for 1.5 and 2 mm cages
- Suitable for protruding cages

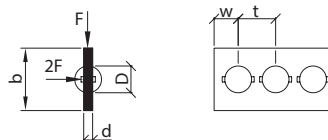


Cage type		Main dimensions					Accessories	
Standard	Stainless steel	D	b	d	t	w	Suitable for rail	End pieces
R1.5xAA	R1.5xAA-SS	1.5	3.8	0.2	2.5	2	RSD-1.5	GA
R1.5xKZR	R1.5xKZR-SS		3.86	0.5	3	2		GB
K1.5xJJ	K1.5xJJ-SS		3.5	0.5	3	1.5		GB
K1.5xKKLK	K1.5xKKLK-SS		3.5	0.45	2.2	1.5		GB
R2xAA	R2xAA-SS	2	5.6	0.3	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
K4xAL	K4xAL-SS		10	1.0	7	5		GB, GC
K4xJJ	K4xJJ-SS		10	1.0	7	5		GB, GC

F = For load direction please refer to picture provided

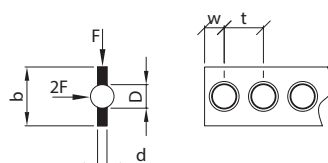
Ball cage type KCLK, size 1.5 - 12 mm

- Balls retained
- For horizontal and vertical application
- Material plastic
- Suitable for protruding cages



Ball cage type JJ, size 1.5 - 15 mm

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



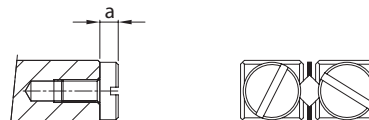
Cage type		Main dimensions					Accessories	
Standard	Stainless steel	D	b	d	t	w	Suitable for rail	End pieces
R6xAA	R6xAA-SS	6	14	0.75	9	6	RSD-6	GA
R6xAL	R6xAL-SS		14	2.5	9	6		GB, GC
R6xKZR	R6xKZR-SS		14	2.5	8.5	6		GB, GC
K6xJJ	K6xJJ-SS		14	2.5	9	6		GB, GC
K6xKCLK	K6xKCLK-SS		14	2.5	9	6		GB, GC
R9xAA	R9xAA-SS	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
K9xKCLK	K9xKCLK-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
K12xKCLK			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 = For load direction please refer to picture provided

Units: mm

End screws type GA, size 1.5 - 15 mm

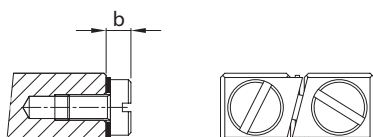
- For horizontal application
- For cages type AA
- For rails type RSD



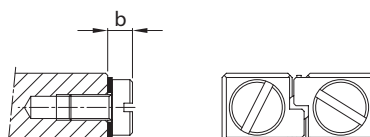
End pieces type GB, size 1.5 - 15 mm

- For horizontal and vertical application
- For cages type AL, KZR, JJ, KCLK
- For rails type RSD

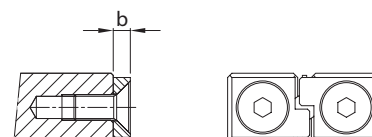
Size 1.5 mm



Size 2 mm

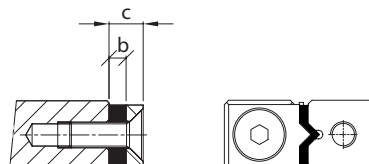


Size 3-15 mm



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

- For horizontal and vertical application
- For cages type AL, KZR, JJ, KCLK
- For rails type RSD
- Suitable for protruding cages
- 4 pcs. per set are needed



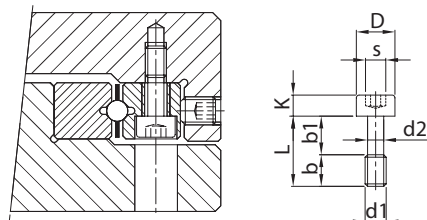
Dimensions	Size							
	1.5	2	3	4	6	9	12	15
a	1.5	2	2.4	2.7	3.7	4.2	5.3	5.3
b	2	2.6	2	2.5	3.2	4.2	5.2	6.3
c	-	-	5	2.7	6.2	7.2	8.2	9.3

Order template (adjust as needed): 8 pcs. End screws type GA-6

Stainless steel: 8 pcs. End screws type GA-6-SS

Attachment screws type GD, size 3 - 15 mm

- To compensate for pitch distances between mounting holes
- Recommended for application of preload rail
- For rails type RSD



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	19.20
GD-15	45	16	29	13.9	M10	7.9	10	8	38.40

¹ Strength class 12.9

Units: mm

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