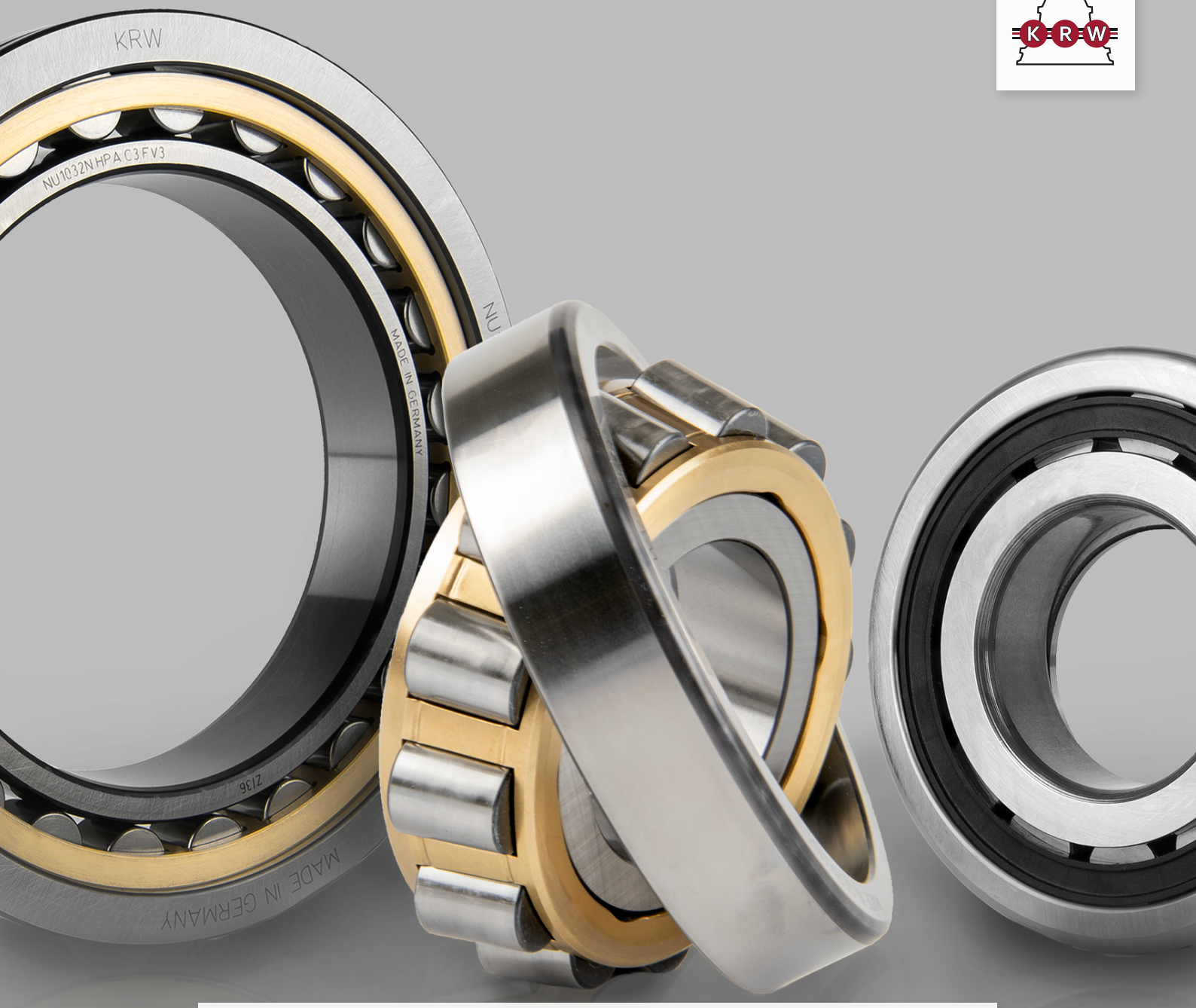

Bearing Tolerances

Tolerances for
Radial and Thrust Bearings

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1 Basic information

Codes and tolerance values have been defined in accordance with the amended standards DIN 620 (1988-02) and DIN ISO 1132 (1982-06). This regulation specifies a standard for terms and codes of the tolerances and thus ensures a rolling bearing design of Kugel- und Rollelagerwerk Leipzig GmbH that conforms to standards.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

At KRW drawing bearings, unless otherwise agreed, tolerances are defined in accordance with this regulation.

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Bore Diameter

d	Nominal diameter of the bore
d_1	Diameter of the theoretical taper surface at the wide end of a tapered bore
d_2	Nominal diameter of the bore of the shaft located washer of a double direction bearing
Δd_s	Deviation of a single shoulder diameter
Δd_{mp}	Deviation of a mean shoulder diameter in one plane
Δd_{1mp}	Deviation of a mean shoulder diameter for the theoretical taper surface at the wide end of a tapered bore
Δ_{d2mp}	Deviation of the mean bore diameter of the shaft locating washer in one plane of a double direction bearing
V_{dp}	Variation of the single bore diameters in a radial plane
V_{dmp}	Variation of the mean bore diameter
α	Nominal taper angle

Width and Height

B, C, C_1	Nominal width of inner ring, outer ring and flange
Δ_{Bs}, Δ_{Cs}	Deviation of a single inner ring width and outer ring width
V_{Bs}, V_{Cs}, V_{C1s}	Variation of the inner ring width, outer ring width and flange width
Δ_{C1s}	Deviation of a single flange width from nominal dimension
T	Nominal width of the bearing
T_1	Nominal width of the inner ring with rolling element set on the tapered roller bearing, measured above standard outer ring
T_2	Nominal width of the outer ring of the tapered roller bearing, measured over a standard of the inner ring and rolling element set
Δ_{T1}, Δ_{T2}	Algebraic difference between the largest and smallest fixed individual dimension for T_1 or T_2
Δ_{T1s}	Deviation of the actual effective width of the inner ring with rolling element set from the effective nominal width

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Δ_{T2s}	Deviation of the actual effective width of the outer ring from the effective nominal width
T, T_2	(Thrust) Nominal height of a single direction bearing
Δ_{TS}	(Thrust) Deviation of the bearing height of a single direction bearing
T_1, T_3	(Thrust) Nominal height of a single direction, double direction bearing with washers
Δ_{T1s}, Δ_{T2s}, Δ_{T3s}	(Thrust) Deviation of the bearing height of a single direction and double direction bearing with and without washers
T_4	(Thrust) Nominal height of a single direction spherical roller bearing
Δ_{T4s}	Deviation in bearing height of a single direction spherical roller thrust bearing

Outer Diameter

D	Nominal outer diameter
D_1	Flange outer diameter
Δ_{Ds}	Deviation of a single outer diameter
Δ_{D1s}	Deviation of a single flange outer diameter
Δ_{Dmp}	Deviation of a mean outer diameter in one plane
Δ_{Dp}	Variation of the outer diameter in one plane
V_{Dmp}	Variation of the mean outer diameter

Run-out Tolerance

K_{ia}	Radial run-out of the inner ring of the assembled bearing
K_{ea}	Radial run-out of the outer ring of the assembled bearing
S_d	Axial run-out of the end face in relation to the bore
S_D	Variation of the inclination of the shell, relative to the reference lateral surface
S_{D1}	Variation of the inclination of the shell, relative to the internal flange face
S_{ia}	Axial run-out of the end face in relation to the raceway of the inner ring of the assembled bearing

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S_{ea}	Axial run-out of the end face in relation to the raceway of the outer ring of the assembled bearing
S_i	Variation in the thickness of the shaft locating washer
$S_{i.1}$	Wall thickness variation in the contact angle measured generally for angular contact thrust ball bearings, spherical roller thrust bearings and tapered roller thrust bearings (profiled washers)
S_e	Variation of the thickness of the housing disk
$S_{e.1}$	Wall thickness variation in the contact angle measured generally for angular contact thrust ball bearings, spherical roller thrust bearings and tapered roller thrust bearings (profiled washers)

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2 Tolerances for radial bearings

2.1 Radial bearings, metric (without tapered roller bearing)

2.1.1 Tolerance class PN (normal tolerance)

Table 1: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		V_{dp} for diameter series according to DIN 616			V_{dmp}	K_{ia}	S_d	S_{ia}	Δ_{Bs}				V_{Bs}
				7, 8, 9	0, 1	2, 3, 4									
over	until	above	less than	max.			max.	max.	max.	max.	above	less than	above	less than	max.
0.6[1]	2.5	0	-8	10	8	6	6	10	15	20	0	-40	-	-	12
2.5	10	0	-8	10	8	6	6	10	15	20	0	-120	0	-250	15
10	18	0	-8	10	8	6	6	10	20	20	0	-120	0	-250	20
18	30	0	-10	13	10	8	8	13	20	25	0	-120	0	-250	20
30	50	0	-12	15	12	9	9	15	20	25	0	-120	0	-250	20
50	80	0	-15	19	19	11	11	20	25	30	0	-150	0	-380	25
80	120	0	-20	25	25	15	15	25	25	35	0	-200	0	-380	25
120	180	0	-25	31	31	19	19	30	30	40	0	-250	0	-500	30
180	250	0	-30	38	38	23	23	40	30	50	0	-300	0	-500	30
250	315	0	-35	44	44	26	26	50	35	55	0	-350	0	-500	35
315	400	0	-40	50	50	30	30	60	40	65	0	-400	0	-630	40
400	500	0	-45	56	56	34	34	65	45	75	0	-450	-	-	50
500	630	0	-50	63	63	38	38	70	50	85	0	-500	-	-	60
630	800	0	-75	94	94	54	55	80	60	100	0	-750	-	-	70
800	1000	0	-100	124	124	74	75	90	70	120	0	-1000	-	-	80
1000	1250	0	-125	154	154	94	95	100	80	140	0	-1250	-	-	100
1250	1600	0	-160	200	200	120	120	120	90	160	0	-1600	-	-	120
1600	2000	0	-200	250	250	150	150	140	110	190	0	-2000	-	-	140

[1] This diameter is included.
[2] Only for bearings that are specially made for paired arrangement.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 2: Outer ring (tolerance values in µm)

D mm over	D mm until	Δ_{Dmp} Dimension above	Δ_{Dmp} Dimension less than	V_{Dp} [2] for diameter series according to DIN 616: 7, 8, 9 max.	V_{Dp} [2] 0, 1 max.	V_{Dp} [2] 2, 3, 4 max.	V_{Dp} [2] Bearings with cover washers or sealing washers 2, 3, 4 max.	V_{Dmp} [2] max.	K_{ea} max.	S_D max.	S_{ea} max.	Δ_{Cs} Δ_{C1s}	V_{Cs} V_{C1s}
2.5[1]	6	0	-8	10	8	6	10	6	15	20	25	see note 3)	
6	18	0	-8	10	8	6	10	6	15	20	25		
18	30	0	-9	12	9	7	12	7	15	20	25		
30	50	0	-11	14	11	8	16	8	20	20	28		
50	80	0	-13	16	13	10	20	10	25	22	32		
80	120	0	-15	19	19	11	26	11	35	25	38		
120	150	0	-18	23	23	14	30	14	40	28	45		
150	180	0	-25	31	31	19	38	19	45	28	50		
180	250	0	-30	38	38	23	44	23	50	33	60		
250	315	0	-35	44	44	26	52	26	60	40	70		
315	400	0	-40	50	50	30	60	30	70	45	80		
400	500	0	-45	56	56	34	68	34	80	55	90		
500	630	0	-50	63	63	38	-	38	100	65	110		
630	800	0	-75	94	94	55	-	55	120	75	130		
800	1000	0	-100	125	125	75	-	75	140	85	150		
1000	1250	0	-125	154	154	94	-	95	160	100	180		
1250	1600	0	-160	200	200	120	-	120	190	120	220		
1600	2000	0	-200	250	250	150	-	150	220	140	260		
2000	2500	0	-250	314	314	190	-	190	250	160	300		

[1] This diameter is included.
[2] Applies before assembling the bearing and after removing inner and/or outer snap rings.
[3] Identical to Δ_{Bs} and V_{Bs} for inner ring of the same bearing (see Table 1)
Note: Tolerances for the flange diameter see Table 35

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.1.2 Tolerance class P6

Table 3: Inner ring (tolerance values in µm)

d		Δ_{dmp}		V_{dp} for diameter series according to DIN 616			V_{dmp}	K_{ia}	S_d	S_{ia}	Δ_{Bs}				V_{Bs}
mm		Dimension		7, 8, 9	0, 1	2, 3, 4					Dimension		modified[2] Dimen-sion		
over	until	above	less than		max.		max.	max.	max.	max.	ab-ove	less than	ab-ove	less than	max.
0.6[1]	2.5	0	-7	9	7	5	5	5	10	12	0	-40	-	-	12
2.5	10	0	-7	9	7	5	5	6	10	12	0	-120	0	-250	15
10	18	0	-7	9	7	5	5	7	12	12	0	-120	0	-250	20
18	30	0	-8	10	8	6	6	8	12	15	0	-120	0	-250	20
30	50	0	-10	13	10	8	8	10	12	15	0	-120	0	-250	20
50	80	0	-12	15	15	9	9	10	15	17	0	-150	0	-380	25
80	120	0	-15	19	19	11	11	13	15	20	0	-200	0	-380	25
120	180	0	-18	23	23	14	14	18	18	23	0	-250	0	-500	30
180	250	0	-22	28	28	17	17	20	18	27	0	-300	0	-500	30
250	315	0	-25	31	31	19	19	25	21	32	0	-350	0	-500	35
315	400	0	-30	38	38	23	23	30	25	38	0	-400	0	-630	40
400	500	0	-35	44	44	26	26	35	30	45	0	-450	-	-	45
500	630	0	-40	50	50	30	30	40	35	50	0	-500	-	-	50
630	800	0	-50	64	64	38	38	45	40	60	0	-750	-	-	55
800	1000	0	-65	80	80	50	50	50	45	70	0	-1000	-	-	60
1000	1250	0	-80	100	100	60	60	60	55	80	0	-1250	-	-	70
1250	1600	0	-100	126	126	76	75	70	65	90	0	-1600	-	-	80
1600	2000	0	-130	164	164	100	100	80	75	100	0	-2000	-	-	100
2000	2500	0	-160	200	200	120	120	90	90	120	0	-2500	-	-	120

[1] This diameter is included.
[2] Only for bearings that are specially made for paired arrangement.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 4: Outer ring (tolerance values in µm)

D mm over	D mm until	Δ_{Dmp} Dimension above	Δ_{Dmp} Dimension less than	V_{Dp} 2) for diameter series according to DIN 616: 7, 8, 9 max.	V_{Dp} 2) 0, 1 max.	V_{Dp} 2) 2, 3, 4 max.	V_{Dp} 2) 0, 1, 2, 3, 4 (Bearings with cover washers or sealing washers) max.	V_{Dmp} 2) max.	K_{ea} max.	S_D max.	S_{ea} max.	Δ_{Cs} Δ_{C1s}	V_{Cs} V_{C1s}
2.5 1)	6	0	-7	9	7	5	9	5	8	13	15	see note 3)	
6	18	0	-7	9	7	5	9	5	8	13	15		
18	30	0	-8	10	8	5	10	6	9	13	15		
30	50	0	-9	11	9	7	13	7	10	13	15		
50	80	0	-11	14	11	8	16	8	13	13	16		
80	120	0	-13	16	16	10	20	10	18	15	18		
120	150	0	-15	19	19	11	25	11	20	18	20		
150	180	0	-18	23	23	14	30	14	23	18	23		
180	250	0	-20	25	25	15	34	15	25	21	27		
250	315	0	-25	31	31	19	41	19	30	25	33		
315	400	0	-28	35	35	21	48	21	35	30	40		
400	500	0	-33	41	41	25	56	25	40	35	45		
500	630	0	-38	48	48	29	-	29	50	40	55		
630	800	0	-45	56	56	34	-	34	60	45	65		
800	1000	0	-60	75	75	45	-	45	75	55	80		
1000	1250	0	-80	100	100	60	-	60	85	65	95		
1250	1600	0	-100	126	126	76	-	75	100	75	110		
1600	2000	0	-130	164	164	100	-	100	120	85	130		
2000	2500	0	-160	200	200	120	-	120	140	100	150		

1) This diameter is included.
2) Applies before assembling the bearing and after removing inner and/or outer snap rings.
3) Identical to Δ_{Bs} and V_{Bs} for inner ring of the same bearing (see Table 3)
Note: Tolerances for the flange diameter see Table 35

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.1.3 Tolerance class P5

Table 5: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		V_{dp} for diameter series according to DIN 616		V_{dmp}	K_{ia}	S_d	S_{ia} [2]	Δ_{Bs} Dimension		Δ_{Bs} modified[3] Dimension		V_{Bs}
				7, 8, 9	0, 1, 2, 3, 4									
over	until	above	less than	max.		max.	max.	max.	max.	above	less than	above	less than	max.
0.6[1]	2.5	0	-5	5	4	3	4	7	7	0	-40	0	-250	5
2.5	10	0	-5	5	4	3	4	7	7	0	-40	0	-250	5
10	18	0	-5	5	4	3	4	7	7	0	-80	0	-250	5
18	30	0	-6	6	5	3	4	8	8	0	-120	0	-250	5
30	50	0	-8	8	6	4	5	8	8	0	-120	0	-250	5
50	80	0	-9	9	7	5	5	8	8	0	-150	0	-250	6
80	120	0	-10	10	8	5	6	9	9	0	-200	0	-380	7
120	180	0	-13	13	10	7	8	10	10	0	-250	0	-380	8
180	250	0	-15	15	12	8	10	11	13	0	-300	0	-500	10
250	315	0	-18	18	14	9	13	13	15	0	-350	0	-500	13
315	400	0	-23	23	18	12	15	15	20	0	-400	0	-630	15
400	500	0	-27	26	20	14	17	18	25	0	-450	-	-	18
500	630	0	-30	32	24	17	19	22	30	0	-500	-	-	22
630	800	0	-40	40	30	20	22	26	35	0	-750	-	-	26
800	1000	0	-50	50	38	25	26	32	40	0	-1000	-	-	32
1000	1250	0	-65	64	50	35	30	38	45	0	-1250	-	-	38
1250	1600	0	-80	80	60	40	35	45	50	0	-1600	-	-	45
1600	2000	0	-100	100	74	50	40	55	60	0	-2000	-	-	55
2000	2500	0	-120	120	90	60	45	65	70	0	-2500	-	-	65

[1] This diameter is included.
[2] For deep groove ball bearings only.
[3] Only for bearings that are specially made for paired arrangements.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 6: Outer ring (tolerance values in µm)

D mm over	D mm until	Δ_{Dmp} Dimension above	Δ_{Dmp} Dimension less than	V_{Dp} [2] for diameter series according to DIN 616 7, 8, 9 max.	V_{Dp} [2] for diameter series according to DIN 616 0, 1, 2, 3, 4 max.	V_{Dmp} max.	K_{ea} max.	S_D S_{D1} max.	S_{ea} [3] max.	Δ_{Cs} Δ_{C1s}	V_{Cs} V_{C1s} max.
2.5[1]	6	0	-5	5	4	3	5	8	8	see note 4)	5
6	18	0	-5	5	4	3	5	8	8		5
18	30	0	-6	6	5	3	6	8	8		5
30	50	0	-7	7	5	4	7	8	8		5
50	80	0	-9	9	7	5	8	8	10		5
80	120	0	-10	10	8	5	10	9	11		6
120	150	0	-11	11	8	6	11	10	13		8
150	180	0	-13	13	10	7	13	10	14		8
180	250	0	-15	15	11	8	15	11	15		10
250	315	0	-18	18	14	9	18	13	18		11
315	400	0	-20	20	15	10	20	13	20		13
400	500	0	-23	23	17	12	23	15	23		15
500	630	0	-28	28	21	14	25	18	25		18
630	800	0	-35	35	26	18	30	20	30		20
800	1000	0	-45	44	34	23	35	25	35		24
1000	1250	0	-55	54	40	30	40	30	45		28
1250	1600	0	-70	70	54	35	45	35	55		32
1600	2000	0	-85	84	64	45	55	40	65		38
2000	2500	0	-110	110	84	55	65	50	75		45

[1] This diameter is included.
[2] No values are specified for bearings with cover washers or sealing washers.
[3] For deep groove ball bearings only.
[4] Identical to Δ_{Bs} for inner ring of the same bearing (see Table 5)
Note: Tolerances for the flange diameter see Table 35

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.1.4 Tolerance class P4

Table 7: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		Δ_{ds} for diameter series according to DIN 616 0, 1, 2, 3, 4 Dimension		V_{dp} 7,8,9	V_{dp} 0, 1, 2, 3, 4	V_{dmp}	K_{ia}	S_d	S_{ia} [2]	Δ_{Bs} Dimension		Δ_{Bs} modified[3] Dimension		V_{Bs}
over	until	above	less than	above	less than	max.		max.	max.	max.	max.	above	less than	above	less than	max.
0.6[1]	2.5	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	0	-250	2.5
2.5	10	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	0	-250	2.5
10	18	0	-4	0	-4	4	3	2	2.5	3	3	0	-80	0	-250	2.5
18	30	0	-5	0	-5	5	4	2.5	3	4	4	0	-120	0	-250	2.5
30	50	0	-6	0	-6	6	5	3	4	4	4	0	-120	0	-250	3
50	80	0	-7	0	-7	7	5	3.5	4	5	5	0	-150	0	-250	4
80	120	0	-8	0	-8	8	6	4	5	5	5	0	-200	0	-380	4
120	180	0	-10	0	-10	10	8	5	6	6	7	0	-250	0	-380	5
180	250	0	-12	0	-12	12	9	6	8	7	8	0	-300	0	-500	6
250	315	0	-15	0	-15	15	12	8	9	8	10	0	-350	-	-	8
315	400	0	-19	0	-19	19	14	10	10	10	12	0	-400	-	-	10
400	500	0	-23	0	-23	22	17	12	12	12	15	0	-450	-	-	12
500	630	0	-26	0	-26	26	20	13	14	14	18	0	-500	-	-	14
630	800	0	-32	0	-32	32	24	16	17	17	21	0	-750	-	-	17
800	1000	0	-40	0	-40	40	30	20	20	21	25	0	-1000	-	-	21
1000	1250	0	-50	0	-50	50	38	25	23	25	30	0	-1250	-	-	25
1250	1600	0	-65	0	-65	64	50	35	26	30	35	0	-1600	-	-	30
1600	2000	0	-80	0	-80	80	30	40	30	35	40	0	-2000	-	-	35

[1] This diameter is included.
[2] For deep groove ball bearings only.
[3] Only for bearings that are specially made for paired arrangements.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 8: Outer ring (tolerance values in µm)

D mm over	D mm until	Δ_{Dmp} Dimension above	Δ_{Dmp} Dimension less than	Δ_{Ds} for diameter series according to DIN 616 0, 1, 2, 3, 4 above	Δ_{Ds} for diameter series according to DIN 616 0, 1, 2, 3, 4 less than	V_{Dp} [2] for diameter series according to DIN 616 7,8,9 max.	V_{Dp} [2] for diameter series according to DIN 616 0, 1, 2, 3, 4 max.	V_{Dmp} max.	K_{ea} max.	S_D S_{D1} max.	S_{ea} [3] max.	Δ_{Cs} Δ_{C1s}	V_{Cs} V_{C1s} max.
2.5[1]	6	0	-4	0	-4	4	3	2	3	4	5		2.5
6	18	0	-4	0	-4	4	3	2	3	4	5		2.5
18	30	0	-5	0	-5	5	4	2.5	4	4	5		2.5
30	50	0	-6	0	-6	6	5	3	5	4	5		2.5
50	80	0	-7	0	-7	7	5	3.5	5	4	5		3
80	120	0	-8	0	-8	8	6	4	6	5	6		4
120	150	0	-9	0	-9	9	7	5	7	5	7		5
150	180	0	-10	0	-10	10	8	5	8	5	8		5
180	250	0	-11	0	-11	11	8	6	10	7	10	see	7
250	315	0	-13	0	-13	13	10	7	11	8	10	note 4)	7
315	400	0	-15	0	-15	15	11	8	13	10	13		8
400	500	0	-18	0	-18	18	14	9	15	11	15		9
500	630	0	-22	0	-22	22	17	11	17	13	18		11
630	800	0	-26	0	-26	26	20	13	20	15	22		13
800	1000	0	-33	0	-33	32	26	17	23	17	26		15
1000	1250	0	-40	0	-40	40	30	20	26	20	30		18
1250	1600	0	-50	0	-50	50	38	25	30	23	35		21
1600	2000	0	-65	0	-65	62	50	35	35	27	40		25
2000	2500	0	-80	0	-80	80	60	40	40	32	50		29

[1] This diameter is included.
[2] No values are specified for bearings with cover washers or sealing washers.
[3] For deep groove ball bearings only.
[4] Identical to Δ_{Bs} for inner ring of the same bearing (see Table 7)
Note: Tolerances for the flange diameter see Table 35

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.1.5 Tolerance class P2

Table 9: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		Δ_{ds} Dimension		V_{dp}	V_{dmp}	K_{ia}	S_d	S_{ia} [2]	Δ_{Bs} Dimension		Δ_{Bs} modified Dimension		V_{Bs}
over	until	above	less than	above	less than	max.	max.	max.	max.	max.	above	less than	above	less than	max.
0.6[1]	2.5	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-40	0	-250	1.5
2.5	10	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-40	0	-250	1.5
10	18	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	0	-80	0	-250	1.5
18	30	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2.5	0	-120	0	-250	1.5
30	50	0	-2.5	0	-2.5	2.5	1.5	2.5	1.5	2.5	0	-120	0	-250	1.5
50	80	0	-4	0	-4	4	2	2.5	1.5	2.5	0	-150	0	-250	1.5
80	120	0	-5	0	-5	5	2.5	2.5	2.5	2.5	0	-200	0	-380	2.5
120	150	0	-7	0	-7	7	3.5	2.5	2.5	2.5	0	-250	0	-380	2.5
150	180	0	-7	0	-7	7	3.5	5	4	5	0	-300	0	-380	4
180	250	0	-8	0	-8	8	4	5	5	5	0	-350	0	-500	5
250	315	0	-10	0	-10	10	5	6	6	7	0	-450	-	-	6
315	400	0	-12	0	-12	12	6	7	7	9	0	-600	-	-	7
400	500	0	-15	0	-15	16	8	8	8	11	0	-750	-	-	8
500	630	0	-19	0	-19	20	10	9	10	13	0	-900	-	-	10
630	800	0	-24	0	-24	24	12	10	12	15	0	-1250	-	-	12
800	1000	0	-30	0	-30	30	15	12	14	18	0	-1500	-	-	14
1000	1250	0	-36	0	-36	36	18	14	17	21	0	-2000	-	-	17
1250	1600	0	-45	0	-45	46	23	16	20	25	0	-2500	-	-	20
1600	2000	0	-55	0	-55	56	30	19	24	30	0	-3000	-	-	24

[1] This diameter is included.
[2] For deep groove ball bearings only.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 10: Outer ring (tolerance values in µm)

D mm over	D mm until	Δ_{Dmp} Dimension above	Δ_{Dmp} Dimension less than	Δ_{Ds} Dimension above	Δ_{Ds} Dimension less than	V_{Dp} [2] max.	V_{Dmp} max.	K_{ea} max.	S_D S_{D1} max.	S_{ea} [3] max.	$\Delta_{Cs}, \Delta_{C1s}$ Dimension above	$\Delta_{Cs}, \Delta_{C1s}$ Dimension less than	$\Delta_{Cs}, \Delta_{C1s}$ modified Dimension above	$\Delta_{Cs}, \Delta_{C1s}$ modified Dimension less than	V_{Cs} V_{C1s} max.
2.5[1]	6	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5	see note 4)				1.5
6vv	18	0	-2.5	0	-2.5	2.5	1.5	1.5	1.5	1.5					1.5
18	30	0	-4	0	-4	4	2	2.5	1.5	2.5					1.5
30	50	0	-4	0	-4	4	2	2.5	1.5	2.5					1.5
50	80	0	-4	0	-4	4	2	4	1.5	4					1.5
80	120	0	-5	0	-5	5	2.5	5	2.5	5					2.5
120	150	0	-5	0	-5	5	2.5	5	2.5	5					2.5
150	180	0	-7	0	-7	7	3.5	5	2.5	5					2.5
180	250	0	-8	0	-8	8	4	7	4	7					4
250	315	0	-8	0	-8	8	4	7	5	7					5
315	400	0	-10	0	-10	10	5	8	7	8					7
400	500	0	-12	0	-12	12	6	9	8	10					7
500	630	0	-15	0	-15	16	8	11	9	12					8
630	800	0	-19	0	-19	20	10	13	10	14					9
800	1000	0	-24	0	-24	24	12	15	12	17					11
1000	1250	0	-30	0	-30	30	15	17	14	20					13
1250	1600	0	-40	0	-40	40	20	20	16	24					15
1600	2000	0	-50	0	-50	50	25	23	19	29					17
2000	2500	0	-60	0	-60	60	30	26	22	34					20

[1] This diameter is included.
[2] No values are specified for bearings with cover washers or sealing washers.
[3] For deep groove ball bearings only.
[4] Identical to Δ_{Bs} for inner ring of the same bearing (see table 9)
Note: Tolerances for the flange diameter see Table 35

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.1.6 Tolerance class SP

Series NN30, NNU48 and NNU49

Series N10 and N19 for inner ring up to d<250mm and for outer ring D<315 mm

Table 11: Inner ring (tolerance values in µm)

d		Cylindrical bore				Tapered bore					K_{ia}	S_d	S_{ia}	Δ_{Bs}		V_{Bs}
		Δ_{ds}, Δ_{dmp}		V_{dp}	V_{dmp}	Δ_{ds}, Δ_{dmp}		V_{dp}	Δ_{d1mp} - Δ_{dmp}							
mm		Dimension				Dimension			Dimension					Dimension		
over	until	above	less than	max.	max.	above	less than	max.	above	less than	max.	max.	max.	above	less than	max.
18[1]	30	0	-6	3	3	+10	0	3	+4	0	3	8	8	0	-100	5
30	50	0	-8	4	4	+12	0	4	+6	0	4	8	8	0	-120	5
50	80	0	-9	5	5	+15	0	5	+6	0	4	8	8	0	-150	6
80	120	0	-10	5	5	+20	0	5	+8	0	5	9	9	0	-200	7
120	180	0	-13	7	7	+25	0	7	+8	0	6	10	10	0	-250	8
180	250	0	-15	8	8	+30	0	8	+10	0	8	11	13	0	-300	10
250	315	0	-18	9	9	+35	0	9	+12	0	8	13	15	0	-350	13
315	400	0	-23	12	12	+40	0	12	+12	0	10	15	20	0	-400	15
400	500	0	-28	14	14	+45	0	14	+15	0	10	17	23	0	-450	17
500	630	0	-35	18	18	+50	0	18	+17	0	12	20	25	0	-500	20
630	800	0	-40	20	20	+65	0	20	+18	0	15	23	30	0	-750	30
800	1000	0	-50	26	25	+75	0	26	+20	0	17	30	40	0	-1000	33
1000	1250	0	-65	34	33	+90	0	34	+24	0	20	40	50	0	-1250	40
1250	1600	0	-80	40	40	+105	0	40	+28	0	25	60	60	0	-1600	60
1600	2000	0	-100	50	50	+110	0	50	+36	0	30	70	75	0	-2000	70

[1] This diameter is included.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 12: Outer ring (tolerance values in µm)

D mm over	D mm until	Δ_{Ds}, Δ_{Dmp} Dimension above	Δ_{Ds}, Δ_{Dmp} Dimension less than	V_{Dp} max.	V_{Dmp} max.	K_{ea} max.	S_D max.	S_{ea} max.	Δ_{Cs} Dimension above	Δ_{Cs} Dimension less than	V_{Cs} max.
30[1]	50	0	-7	4	4	5	8	8	see note 2)		
50	80	0	-9	5	5	5	8	10			
80	120	0	-10	5	5	6	9	11			
120	150	0	-11	6	6	7	10	13			
150	180	0	-13	7	7	8	10	14			
180	250	0	-15	8	8	10	11	15			
250	315	0	-18	9	9	11	13	18			
315	400	0	-20	10	10	13	13	20			
400	500	0	-23	12	12	15	15	23			
500	630	0	-28	14	14	17	18	25			
630	800	0	-35	18	18	20	20	30			
800	1000	0	-40	20	20	25	30	40			
1000	1250	0	-50	26	25	30	40	55			
1250	1600	0	-65	34	33	30	50	70			
1600	2000	0	-80	40	40	30	60	90			
2000	2500	0	-100	50	50	40	80	110			

[1] This diameter is included.
[2] Identical to Δ_{Bs} and V_{Bs} for inner ring of the same bearing (see table 11)
Note: Tolerances for the flange diameter see Table 35

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.1.7 Tolerance class UP
Series NN30, NNU48 and NNU49
Series N10 and N19 for inner ring up to d<250mm and for outer ring D<315 mm

Table 13: Inner ring (tolerance values in µm)

d mm		Cylindrical bore				Tapered bore										
		Δ_{ds}, Δ_{dmp} Dimension		V_{dp}	V_{dmp}	Δ_{ds}, Δ_{dmp} Dimension		V_{dp}	Δ_{d1mp} - Δ_{dmp} Dimension		K_{ia}	S_d	S_{ia}	Δ_{Bs} Dimension		V_{Bs}
over	until	above	less than	max.	max.	above	less than	max.	above	less than	max.	max.	max.	above	less than	max.
18[1]	30	0	-5	3	3	+6	0	3	+2	0	1.5	3	3	0	-25	1.5
30	50	0	-6	3	3	+7	0	3	+3	0	2	3	3	0	-30	2
50	80	0	-7	4	4	+8	0	4	+3	0	2	4	3	0	-40	3
80	120	0	-8	4	4	+10	0	4	+4	0	3	4	4	0	-50	3
120	180	0	-10	5	5	+12	0	5	+4	0	3	5	6	0	-60	4
180	250	0	-12	6	6	+14	0	6	+5	0	4	6	7	0	-75	5
250	315	0	-15	8	8	+15	0	8	+6	0	4	6	8	0	-100	5
315	400	0	-19	10	10	+17	0	10	+6	0	5	7	9	0	-100	6
400	500	0	-23	12	12	+19	0	12	+7	0	5	8	10	0	-100	7
500	630	0	-26	14	13	+20	0	14	+8	0	6	9	12	0	-125	8
630	800	0	-34	18	17	+22	0	18	+9	0	7	11	18	0	-125	11
800	1000	0	-40	20	20	+25	0	20	+10	0	9	12	19	0	-125	12
1000	1250	0	-55	28	28	+30	0	28	+12	0	10	15	23	0	-125	15
1250	1600	0	-65	34	33	+35	0	34	+14	0	15	19	26	0	-150	22
1600	2000	0	-80	40	40	+40	0	40	+18	0	18	23	30	0	-150	26

[1] This diameter is included.
Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 14: Outer ring (tolerance values in µm)

D mm over	D mm until	Δ_{Ds}, Δ_{Dmp} Dimension above	Δ_{Ds}, Δ_{Dmp} Dimension less than	V_{Dp} max.	V_{Dmp} max.	K_{ea} max.	S_D max.	S_{ea} max.	Δ_{Cs} Dimension above	Δ_{Cs} Dimension less than	V_{Cs} max.
30[1)]	50	0	-5	3	2	3	2	4	see note 2)		
50	80	0	-6	3	2	3	2	4			
80	120	0	-7	4	3	3	3	5			
120	150	0	-8	4	3	4	3	6			
150	180	0	-9	5	3	4	3	7			
180	250	0	-10	5	4	5	4	9			
250	315	0	-12	6	4	6	4	9			
315	400	0	-14	7	5	7	5	12			
400	500	0	-17	9	5	8	5	12			
500	630	0	-20	10	6	9	6	14			
630	800	0	-25	13	7	11	7	17			
800	1000	0	-30	16	10	12	10	21			
1000	1250	0	-36	18	12	15	12	26			
1250	1600	0	-48	24	15	19	15	34			
1600	2000	0	-60	30	20	23	20	45			
2000	2500	0	-70	36	25	30	25	50			35

[1)] This diameter is included. [2)] Identical to Δ_{Bs} and V_{Bs} for inner ring of the same bearing (see Table 13)
Note: Tolerances for the flange diameter see Table 35
Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.2 Tapered bore

2.2.1 Taper 1:12

Table 15: Taper 1:12 (tolerance values in µm)

d mm over	until	Δ_{dmp} [1] P0, P6, P5 Dimension above	less then	$\Delta_{d1mp}-\Delta_{dmp}$ [2] P0, P6 Dimension above	less then	V_{dp} [3),4)] P0 max.
-	10	+15	0	+15	0	10
10	18	+18	0	+18	0	10
18	30	+21	0	+21	0	13
30	50	+25	0	+25	0	15
50	80	+30	0	+30	0	19
80	120	+35	0	+35	0	25
120	180	+40	0	+40	0	31
180	250	+46	0	+46	0	38
250	315	+52	0	+52	0	44
315	400	+57	0	+57	0	50
400	500	+63	0	+63	0	56
500	630	+70	0	+70	0	62
630	800	+80	0	+80	0	94
800	1000	+90	0	+90	0	124
1000	1250	+105	0	+105	0	154
1250	1600	+125	0	+125	0	200
1600	2000	+150	0	+150	0	250

[1] Deviation of the mean diameter from the theoretical narrow diameter of the bore. [2] Deviation of the mean diameter from the theoretical large diameter of the bore minus the deviation of the mean diameter from the theoretical narrow diameter of the bore. [3] Applies in any radial section of the bore. [4] Does not apply to diameter series 7 and 8.
Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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2.2.2 Taper 1:30

Table 16: Taper 1:30 (tolerance values in µm)

d mm over	d mm until	Δ_{dmp} [1] P0, P6, P5, P4 Dimension above	Δ_{dmp} [1] P0, P6, P5, P4 Dimension less then	$\Delta_{d1mp}-\Delta_{dmp}$ [2] P0, P6 Dimension above	$\Delta_{d1mp}-\Delta_{dmp}$ [2] P0, P6 Dimension less then	V_{dp} [3),4)] P0 max.
50	**80**	+15	0	+35	0	19
80	**120**	+20	0	+40	0	25
120	**180**	+25	0	+50	0	31
180	**250**	+30	0	+55	0	38
250	**315**	+35	0	+60	0	44
315	**400**	+40	0	+65	0	50
400	**500**	+45	0	+75	0	56
500	**630**	+50	0	+85	0	63
630	**800**	+75	0	+100	0	94
800	**1000**	+100	0	+100	0	124
1000	**1250**	+125	0	+115	0	154
1250	**1600**	+160	0	+125	0	200
1600	**2000**	+200	0	+150	0	250

[1] Deviation of the mean diameter from the theoretical narrow diameter of the bore. [2] Deviation of the mean diameter from the theoretical large diameter of the bore minus the deviation of the mean diameter from the theoretical narrow diameter of the bore. [3] Applies in any radial section of the bore. [4] Does not apply to diameter series 7 and 8.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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3. Tolerances for tapered roller bearings

3.1 Tapered roller bearing, metric

3.1.1 Tolerance class PN (normal tolerance)

Table 17: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		V_{dp}	V_{dmp}	K_{ia}	S_d	S_{ia}
over	until	above	less than	max.	max.	max.	max.	max.
10[1)]	**18**	0	-12	12	9	15	20	20
18	**30**	0	-12	12	9	18	20	25
30	**50**	0	-12	12	9	20	20	25
50	**80**	0	-15	15	11	25	25	30
80	**120**	0	-20	20	15	30	25	35
120	**180**	0	-25	25	19	35	30	40
180	**250**	0	-30	30	23	50	30	50
250	**315**	0	-35	35	26	60	35	55
315	**400**	0	-40	40	30	70	40	65
400	**500**	0	-45	44	34	80	45	75
500	**630**	0	-50	50	38	95	50	85
630	**800**	0	-75	74	55	110	60	100
800	**1000**	0	-100	100	75	130	70	120
1000	**1250**	0	-125	124	95	150	80	140
1250	**1600**	0	-160	160	120	180	90	160
1600	**2000**	0	-200	200	150	210	110	190
2000	**2500**	0	-250	250	190	240	130	220

[1)] This diameter is included. Note: Inner rings of series 320X, 329, 330, 331 and 332 up to bore diameter ≤200 mm, see P6X.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 18: Outer ring (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp}	V_{Dmp}	K_{ea}	S_D S_{D1}	Δ_{D1s}	
over	until	above	less than	max.	max.	max.	max.	above	less than
18[1)]	30	0	-12	12	9	18	20	0	-52
30	50	0	-14	14	11	20	20	0	-62
50	80	0	-16	16	12	25	22	0	-74
80	120	0	-18	18	14	35	25	0	-87
120	150	0	-20	20	15	40	28	0	-100
150	180	0	-25	25	19	45	28	0	-100
180	250	0	-30	30	23	50	33	0	-115
250	315	0	-35	35	26	60	40	0	-130
315	400	0	-40	40	30	70	45	0	-140
400	500	0	-45	45	34	80	55	0	-155
500	630	0	-50	50	38	100	65	0	-175
630	800	0	-75	74	55	120	75	0	-200
800	1000	0	-100	100	75	140	85	0	-230
1000	1250	0	-125	124	95	160	100	0	-260
1250	1600	0	-160	160	120	190	120	0	-310
1600	2000	0	-200	200	150	220	140	0	-370
2000	2500	0	-250	250	190	250	160	0	-440

[1)] This diameter is included.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 19: Bearing width and ring width (tolerance values in µm)

d mm		Δ_{Bs} Dimension		Δ_{Cs} Δ_{C1s} Dimension		Δ_{Ts} Dimension		Δ_{T1s} Dimension		Δ_{T2s} Dimension		Δ_{Ts} [2] Dimension		Δ_{Ts} [3] Dimension	
over	until	above	less than	above	less than	above	less than	above	less than	above	less than	above	less than	above	less than
10[1]	18	0	-120	see note 4)		+200	0	+100	0	+100	0	+400	0	+250	0
18	30	0	-120			+200	0	+100	0	+100	0	+400	0	+250	0
30	50	0	-120			+200	0	+100	0	+100	0	+400	0	+250	0
50	80	0	-150			+200	0	+100	0	+100	0	+400	0	+250	0
80	120	0	-200			+200	-200	+100	-100	+100	-100	+400	-400	+250	0
120	127	0	-250			+350	-250	+150	-150	+200	-100	+700	-500	+250	0
127	180	0	-250			+350	-250	+150	-150	+200	-100	+700	-500	+750	0
180	250	0	-300			+350	-250	+150	-150	+200	-100	+700	-500	+750	0
250	315	0	-350			+350	-250	+150	-150	+200	-100	+700	-500	+750	0
315	400	0	-400			+400	-400	+200	-200	+200	-200	+800	-800	+750	0
400	500	0	-450			+450	-450	+200	-200	+250	-250	+900	-900	+750	0
500	630	0	-500			+500	-500	+250	-250	+250	-250	+1000	-1000	+750	0
630	800	0	-750			+600	-600	+300	-300	+300	-300	+1200	-1200	-	-
800	1000	0	-1000			+750	-750	+350	-350	+400	-400	+1500	-1500	-	-
1000	1250	0	-1250			+1000	-1000	+500	-500	+500	-500	+2000	-2000	-	-
1250	1600	0	-1600			+1500	-1500	+750	-750	+750	-750	+3000	-3000	-	-
1600	2000	0	-2000			+1500	-1500	+750	-750	+750	-750	+3000	-3000	-	-

[1] This diameter is included.
[2] Applies to non-replaceable metric tapered roller bearings (exceptions design KNA), double row
[3] Applies to non-replaceable metric tapered roller bearings of design KNA, double row
[4] Identical to Δ_{Bs} for inner ring of the same bearing (see table 19) // Note: Applies to replaceable metric bearings. Bearing widths according to tolerance classes PN; exceptions are 320X, 329, 330, 331 up to bore diameter <=200 mm.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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3.1.2 Tolerance class P6X

The diameter tolerances and run-out tolerances of the inner ring and outer ring correspond to tolerance class PN (taper roller bearings), see section 3.1.1.

Table 20: Bearing width and ring width , for bearings without flange on the outer ring (tolerance values in µm)

d mm		Δ_{Bs} Dimension		Δ_{Cs} Dimension		Δ_{C1s} Dimension		Δ_{Ts} Dimension		Δ_{T1s} Dimension		Δ_{T2s} Dimension	
over	until	above	less than	above	less than	above	less than	above	less than	ab-ove	less than	above	less than
10[1)]	18	0	-50	0	-100	0	-120	+100	0	+50	0	+50	0
18	30	0	-50	0	-100	0	-120	+100	0	+50	0	+50	0
30	50	0	-50	0	-100	0	-120	+100	0	+50	0	+50	0
50	80	0	-50	0	-100	0	-150	+100	0	+50	0	+50	0
80	120	0	-50	0	-100	0	-200	+100	0	+50	0	+50	0
120	180	0	-50	0	-100	0	-250	+150	0	+50	0	+100	0
180	250	0	-50	0	-100	0	-300	+150	0	+50	0	+100	0
250	315	0	-50	0	-100	0	-350	+200	0	+100	0	+100	0
315	400	0	-50	0	-100	0	-400	+200	0	+100	0	+100	0
400	500	0	-50	0	-100	0	-450	+250	0	+100	0	+150	0
500	630	0	-100	0	-100	0	-500	+250	0	+100	0	+150	0
630	800	0	-150	0	-100	0	-750	+300	0	+150	0	+150	0
800	1000	0	-150	0	-150	0	-1000	+400	0	+200	0	+200	0
1000	1250	0	-200	0	-150	0	-1250	+500	0	+250	0	+250	0
1250	1600	0	-300	0	-200	0	-1600	+750	0	+350	0	+400	0
1600	2000	0	-300	0	-200	0	-2000	+750	0	+350	0	+400	0
2000	2500	0	-400	0	-300	0	-2500	-	-	-	-	-	-

[1)] This diameter is included.
Note: - Applies as standard to bearings of series 320X, 329, 330, 331 and 332 up to bore diameter <=200 mm.
- Not permitted for rolling bearings with a flange on the outer ring.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 21: Bearing width and ring width , for bearings with flange on the outer ring (tolerance values in µm)

d mm		Δ_{Ts} Dimension		Δ_{T1s} Dimension		Δ_{T2s} Dimension	
over	until	above	less than	above	less than	above	less than
10	18	+200	0	+50	0	+100	0
18	30	+200	0	+50	0	+100	0
30	50	+200	0	+50	0	+100	0
50	80	+200	0	+50	0	+100	0
80	120	+200	-200	+50	0	+100	-100
120	180	+350	-250	+50	0	+150	-100
180	250	+350	-250	+50	0	+150	-100
250	315	+350	-250	+100	0	+200	-100
315	400	+400	-400	+100	0	+200	-200
400	500	+450	-450	+100	0	+200	-250
500	630	+500	-500	+100	0	+250	-250
630	800	+600	-600	+150	0	+250	-300
800	1000	+750	-750	+200	0	+300	-400
1000	1250	+1000	-1000	+250	0	+400	-500
1250	1600	+1500	-1500	+350	0	+500	-750
1600	2000	+1500	-1500	+350	0	+750	-750
2000	2500	-	-	-	-	-	-

[1] This diameter is included.
Note: - Applies to replaceable metric bearings with flange on outer ring of series 320X, 329, 330, 331 and 332 up to bore diameter <=200 mm.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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3.1.3 Tolerance class P6

Table 22: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		V_{dp}	V_{dmp}	K_{ia}	S_d	S_{ia}	Δ_{Bs} Dimension	
over	until	above	less than	max.	max.	max.	max.	max.	above	less than
10[1)]	18	0	-7	7	5	7	10	14	0	-120
18	30	0	-8	8	6	8	10	16	0	-120
30	50	0	-10	10	8	10	12	16	0	-120
50	80	0	-12	15	9	10	12	16	0	-150
80	120	0	-15	19	11	13	15	20	0	-200
120	180	0	-18	22	14	18	15	25	0	-250
180	250	0	-22	28	17	20	15	25	0	-300
250	315	0	-25	30	19	25	18	30	0	-350
315	400	0	-30	38	23	30	20	35	0	-400
400	500	0	-35	44	26	35	25	45	0	-450
500	630	0	-40	50	30	40	30	50	0	-500
630	800	0	-50	64	38	50	40	60	0	-750
800	1000	0	-65	80	50	60	50	75	0	-1000

[1)] This diameter is included.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

Table 23: Outer ring (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp}	V_{Dmp}	K_{ea}	S_D S_{D1}	Δ_{D1s}		Δ_{Cs} Δ_{C1s}
over	until	above	less than	max.	max.	max.	max.	above	less than	
18[1)]	30	0	-8	8	6	9	10	0	-52	see note 2)
30	50	0	-9	10	7	10	12	0	-62	
50	80	0	-11	11	8	13	12	0	-74	
80	120	0	-13	16	10	18	15	0	-87	
120	150	0	-15	19	11	20	15	0	-100	
150	180	0	-18	22	14	23	15	0	-100	
180	250	0	-20	24	15	25	15	0	-115	
250	315	0	-25	30	19	30	18	0	-130	
315	400	0	-28	34	21	35	20	0	-140	
400	500	0	-33	40	25	40	25	0	-155	
500	630	0	-38	48	29	50	30	0	-175	
630	800	0	-45	56	34	60	40	0	-200	
800	1000	0	-60	74	45	75	50	0	-230	

[1)] This diameter is included.
[2)] Identical to Δ_{Bs} for inner ring of the same bearing (see table 22)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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3.1.4 Tolerance class P5

Table 24: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		V_{dp}	V_{dmp}	K_{ia}	S_d	S_{ia}	Δ_{Bs} Dimension	
over	until	above	less than	max.	max.	max.	max.	max.	above	less than
10[1]	18	0	-7	5	5	5	7	7	0	-200
18	30	0	-8	6	5	5	8	8	0	-200
30	50	0	-10	8	5	6	8	8	0	-240
50	80	0	-12	9	6	7	8	8	0	-300
80	120	0	-15	11	8	8	9	9	0	-400
120	180	0	-18	14	9	11	10	10	0	-500
180	250	0	-22	17	11	13	11	13	0	-600
250	315	0	-25	19	13	16	13	15	0	-700
315	400	0	-30	22	15	19	15	20	0	-800
400	500	0	-35	26	18	22	18	25	0	-900
500	630	0	-40	30	20	26	22	30	0	-1000
630	800	0	-50	38	25	30	26	35	0	-1500
800	1000	0	-65	50	35	35	32	40	0	-2000

[1] This diameter is included.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

Table 25: Outer ring (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp}	V_{Dmp}	K_{ea}	S_D S_{D1}	Δ_{D1s}		Δ_{Cs} Δ_{C1s}
over	until	above	less than	max.	max.	max.	max.	above	less than	
18[1]	30	0	-8	6	5	6	8	0	-52	see note 2)
30	50	0	-9	7	5	7	8	0	-62	
50	80	0	-11	8	6	8	8	0	-74	
80	120	0	-13	10	7	10	9	0	-87	
120	150	0	-15	11	8	11	10	0	-100	
150	180	0	-18	14	9	13	10	0	-100	
180	250	0	-20	15	10	15	11	0	-115	
250	315	0	-25	19	13	18	13	0	-130	
315	400	0	-28	22	14	20	13	0	-140	
400	500	0	-33	24	17	23	15	0	-155	
500	630	0	-38	28	19	25	18	0	-175	
630	800	0	-45	34	23	30	20	0	-200	
800	1000	0	-60	44	30	35	25	0	-230	
1000	1250	0	-80	60	40	40	30	0	-260	
1250	1600	0	-100	74	50	45	35	0	-310	

[1] This diameter is included; [2] Identical to Δ_{Bs} for inner ring of the same bearing (see table 24)
Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 26: Bearing width and ring width (tolerance values in µm)

d mm		Δ_{Ts} Dimension		Δ_{T1s} Dimension		Δ_{T2s} Dimension		Δ_{Ts} [2] Dimension	
over	until	above	less than	above	less than	above	less than	above	less than
10[1]	18	+200	-200	+100	-100	+100	-100	+400	-400
18	30	+200	-200	+100	-100	+100	-100	+400	-400
30	50	+200	-200	+100	-100	+100	-100	+400	-400
50	80	+200	-200	+100	-100	+100	-100	+400	-400
80	120	+200	-200	+100	-100	+100	-100	+400	-400
120	127	+350	-250	+150	-150	+200	-100	+700	-700
127	180	+350	-250	+150	-150	+200	-100	+700	-700
180	250	+350	-250	+150	-150	+200	-100	+700	-700
250	315	+350	-250	+150	-150	+200	-100	+700	-700
315	400	+400	-400	+200	-200	+200	-200	+800	-800
400	500	+450	-450	+200	-200	+250	-250	+900	-900
500	630	+500	-500	+250	-250	+250	-250	+1000	-1000
630	800	+600	-600	+300	-300	+300	-300	+1200	-1200
800	1000	+750	-750	+350	-350	+400	-400	+1500	-1500
1000	1250	+1000	-1000	+500	-500	+500	-500	+2000	-2000
1250	1600	+1500	-1500	+750	-750	+750	-750	+3000	-3000
1600	2000	-	-	-	-	-	-	+3000	-3000

[1] This diameter is included.
[2] Applies to non-replaceable metric tapered roller bearings (also of design KNA), double row

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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3.1.5 Tolerance class P4

Table 27: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} Dimension		Δ_{ds} Dimension		V_{dp}	V_{dmp}	K_{ia}	S_d	S_{ia}	Δ_{Bs} Dimension		Δ_{Ts} Dimension		Δ_{Ts} [2] Dimension	
over	until	above	less than	above	less than	max.	max.	max.	max.	max.	above	less than	above	less than	above	less than
10[1]	18	0	-5	0	-5	4	4	3	3	3	0	-200	+200	-200	+400	-400
18	30	0	-6	0	-6	5	4	3	4	4	0	-200	+200	-200	+400	-400
30	50	0	-8	0	-8	6	5	4	4	4	0	-240	+200	-200	+400	-400
50	80	0	-9	0	-9	7	5	4	5	4	0	-300	+200	-200	+400	-400
80	120	0	-10	0	-10	8	5	5	5	5	0	-400	+200	-200	+400	-400
120	127	0	-13	0	-13	10	7	6	6	7	0	-500	+350	-250	+700	-700
127	180	0	-13	0	-13	10	7	6	6	7	0	-500	+350	-250	+700	-700
180	250	0	-15	0	-15	11	8	8	7	8	0	-600	+350	-250	+700	-700
250	315	0	-18	0	-18	14	9	9	8	10	0	-700	+350	-350	+700	-700
315	400	0	-23	0	-23	17	12	11	10	12	0	-800	+400	-400	+800	-800
400	500	0	-27	0	-27	20	14	13	12	15	0	-900	+450	-450	+900	-900
500	630	0	-33	0	-33	24	17	15	14	18	0	-1000	+500	-500	+1000	-1000
630	800	0	-40	0	-40	30	20	18	17	21	0	-1500	+600	-600	+1200	-1200
800	1000	0	-50	0	-50	36	25	21	21	25	0	-2000	+750	-750	+1200	-1200
1000	1250	-	-	-	-	-	-	-	-	-	-	-	+1000	-1000	+1500	-1500
1250	1600	-	-	-	-	-	-	-	-	-	-	-	+1500	-1500	+2000	-2000
1600	2000	-	-	-	-	-	-	-	-	-	-	-	+1500	-1500	+3000	-3000

[1] This diameter is included.
[2] Applies to non-replaceable metric tapered roller bearings (also of design KNA), double row
Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 28: Outer ring (tolerance values in µm)

D		Δ_{Dmp}		Δ_{Ds}		V_{Dp}	V_{Dmp}	K_{ea}	S_D S_{D1}	S_{ea}	Δ_{D1s}		Δ_{Cs} Δ_{C1s}
mm		Dimension		Dimension									
over	until	above	less than	above	less than	max.	max.	max.	max.	max.	above	less than	
18[1]	30	0	-6	0	-6	5	4	4	4	5	0	-52	see note 2)
30	50	0	-7	0	-7	5	5	5	4	5	0	-62	
50	80	0	-9	0	-9	7	5	5	4	5	0	-74	
80	120	0	-10	0	-10	8	5	6	5	6	0	-87	
120	150	0	-11	0	-11	8	6	7	5	7	0	-100	
150	180	0	-13	0	-13	10	7	8	5	8	0	-100	
180	250	0	-15	0	-15	11	8	10	7	10	0	-115	
250	315	0	-18	0	-18	14	9	11	8	10	0	-130	
315	400	0	-20	0	-20	15	10	13	10	13	0	-140	
400	500	0	-23	0	-23	17	12	15	11	15	0	-155	
500	630	0	-28	0	-28	20	14	17	13	18	0	-175	
630	800	0	-35	0	-35	26	18	20	15	22	0	-200	
800	1000	0	-45	0	-45	34	23	23	17	26	0	-230	
1000	1250	0	-55	0	-55	40	30	26	20	30	0	-260	
1250	1600	0	-70	0	-70	54	35	30	23	35	0	-310	

[1] This diameter is included.
[2] Identical to Δ_{Bs} for inner ring of the same bearing (see table 27)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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3.1.6 Tolerance class SP

Table 29: Inner ring (tolerance values in µm)

d mm		Δ_{dmp} / Δ_{ds} Dimension		V_{dsp}	V_{dmp}	K_{ia}	S_d	S_{ia}	Δ_{Bs} Dimension		V_{Bs}	Δ_{Ts} Dimension		Δ_{Ts} [2] Dimension	
over	until	above	less than	max.	max.	max.	max.	max.	above	less than	max.	above	less than	above	less than
10[1]	18	0	-11	10	5	4	4	4	0	-250	2	+200	-200	+400	-400
18	30	0	-11	10	5	4	4	4	0	-250	2	+200	-200	+400	-400
30	50	0	-11	10	5	4	4	4	0	-250	2	+200	-200	+400	-400
50	80	0	-11	10	5	4	4	4	0	-250	2	+200	-200	+400	-400
80	120	0	-11	10	5	4	4	4	0	-250	2	+200	-200	+400	-400
120	150	0	-11	10	5	4	4	4	0	-250	2	+200	-200	+400	-400
150	180	0	-13	12	6	4	6	6	0	-300	3	+200	-200	+400	-400
180	250	0	-13	12	6	4	6	6	0	-300	3	+200	-200	+400	-400
250	315	0	-13	12	6	4	7	8	0	-350	5	+200	-200	+400	-400
315	400	0	-20	20	10	9	8	10	0	-400	7	+200	-200	+400	-400
400	500	0	-20	20	10	9	8	10	0	-400	7	+200	-200	+400	-400
500	630	0	-25	22	12	9	10	13	0	-600	10	+380	-380	+760	-760
630	710	0	-25	22	12	9	10	13	0	-600	10	+380	-380	+760	-760

[1] This diameter is included; [2] Also applies to non-interchangeable metric tapered roller bearings for design KNA, double row. Note Δ_{Ts} applies to non-interchangeable metric and inch bearings.
Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

Table 30: Outer ring (tolerance values in µm)

D mm		Δ_{Dmp} / Δ_{Ds} Dimension		V_{Dop}	V_{Dmp}	K_{ea}	S_D S_{D1}	Δ_{D1s}		Δ_{Cs} Δ_{C1s}	V_{Cs}
over	until	above	less than	max.	max.	max.	max.	above	less than		max.
18[1]	30	0	-11	10	5	4	4	0	-500		2
30	50	0	-11	10	5	4	4	0	-500		2
50	80	0	-11	10	5	4	4	0	-500		2
80	120	0	-11	10	5	4	4	0	-500		2
120	150	0	-11	10	5	4	4	0	-500		2
150	180	0	-13	12	6	4	6	0	-500	see note 2)	3
180	250	0	-13	12	6	4	6	0	-500		3
250	315	0	-13	12	6	4	7	0	-500		5
315	400	0	-20	20	10	7	8	0	-750		7
400	500	0	-20	20	10	7	8	0	-750		7
500	630	0	-25	24	12	9	10	0	-750		10
630	900	0	-38	38	19	18	20	0	-1000		20

[1] This diameter is included.
[2] Identical to Δ_{Bs} for inner ring of the same bearing (see table 29)
Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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4 Tolerances for Thrust Bearings

4.1 Thrust bearings, metric

4.1.1 Tolerance class PN

Table 31: Shaft locating washer (tolerance values in µm)

d, d_2 mm		Δ_{dmp} Δ_{d2mp} Dimension		V_{dp} V_{d2p}	$S_i.1$ [1]	S_i [2] $S_i.1$	Δ_{Bs} [3] Dimension		Δ_{FBs} [4] Dimension		$\Delta_{FB1.1s}$ [3] Dimension		Δ_{ICs} [5] Dimension		Δ_{IUs} [6] Dimension	
over	until	above	less than	max.	max.	max.	above	less than	above	less than	above	less than	above	less than	above	less than
-	18	0	-8	6	15	10	0	-100	0	-100	+104	-120	0	-100	+60	0
18	30	0	-10	8	15	10	0	-100	0	-100	+104	-120	0	-100	+60	0
30	50	0	-12	9	15	10	0	-150	0	-100	+104	-120	0	-100	+60	0
50	80	0	-15	11	15	10	0	-150	0	-120	+104	-160	0	-120	+60	0
80	120	0	-20	15	20	15	0	-200	0	-120	+140	-160	0	-120	+80	0
120	180	0	-25	19	20	15	0	-250	0	-160	+140	-160	0	-160	+80	0
180	250	0	-30	23	25	20	0	-300	0	-160	+176	-160	0	-160	+100	0
250	315	0	-35	26	30	25	0	-350	0	-160	+248	-160	0	-160	+100	0
315	400	0	-40	30	40	30	0	-400	0	-200	+248	-160	0	-200	+100	0
400	500	0	-45	34	40	30	0	-450	0	-200	+280	-320	0	-200	+140	0
500	630	0	-50	38	45	35	0	-500	0	-240	+352	-320	0	-240	+160	0
630	800	0	-75	54	50	40	0	-750	0	-300	+424	-320	0	-300	+200	0
800	1000	0	-100	74	55	45	0	-1000	0	-400	+496	-320	0	-400	+240	0
1000	1250	0	-125	94	60	50	0	-1250	0	-560	+640	-320	0	-560	+280	0
1250	1600	0	-160	120	75	60	0	-1250	0	-720	+784	-320	0	-720	+360	0
1600	2000	0	-200	150	85	75	0	-1500	0	-880	+928	-320	0	-880	+440	0

[1] Fluctuation in shoulder thickness measured at the contact angle (for spherical roller thrust bearings and tapered roller thrust bearings).
[2] Wall thickness variation for centre washer according to bore diameter d of the corresponding single row bearing.
[2] Wall thickness variation measured in contact angle, S_i for cylindrical roller thrust bearings V_{FBs} equals S_i.
[3] for thrust ball bearings.
[4] for thrust ball bearings and cylindrical roller thrust bearings.
[5] for thrust ball bearings (Δ_{ICs} for housing disc).
[6] Δ_{IUs} …Washer for thrust ball bearings
Note: Tolerance class is not valid for angular contact thrust ball bearings of series 7602.., 7603.., L20DD.., L20DF.., L20DG.., L20DZ.., L21DZ..

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 32: Housing disk (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp} [1]	S_e [2] $S_e.1$ [2]	Δ_{CSs} [3] Dimension		Δ_{ECs} [4] Dimension		Δ_{ICs} [3] Dimension	
over	until	above	less than	max.	max.	above	less than	above	less than	above	less than
10	18	0	-11	8	see note 2)	see note 5)		see note 5)		see note 5)	
18	30	0	-13	10							
30	50	0	-16	12							
50	80	0	-19	14							
80	120	0	-22	17							
120	180	0	-25	19							
180	250	0	-30	23							
250	315	0	-35	26							
315	400	0	-40	30							
400	500	0	-45	34							
500	630	0	-50	38							
630	800	0	-75	55							
800	1000	0	-100	75							
1000	1250	0	-125	94							
1250	1600	0	-160	120							
1600	2000	0	-200	150							

[1] Drawing specification roundness according to DIN ISO 1101.
[2] Wall thickness variation measured in contact angle.
[2] Identical to S_i or $S_{i.1}$ for shaft locating washer of the same bearing. For cylindrical roller thrust bearings applies $V_{ECs} = S_i$
[3] For thrust ball bearings.
[4] For thrust ball bearings and cylindrical roller thrust bearings.
[5] Identical to Δ_{Bs}, Δ_{FBs} and Δ_{IUs} for shaft locating washer of the same bearing (see Table 31)
Note: Tolerance class is not valid for angular contact thrust ball bearings of series 7602.., 7603.., L20DD.., L20DF.., L20DG.., L20DZ.., L21DZ..

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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4.1.2 Tolerance class P6

Table 33: Shaft locating washer (tolerance values in µm)

d, d_2 mm		Δ_{dmp} Δ_{d2mp} Dimension		V_{dp} V_{d2p}	S_i-1[1]	S_i[2] S_i-1	Δ_{Bs}[3] Dimension		Δ_{FBs}[4] Dimension		$\Delta_{FB1.1s}$[3] Dimension		Δ_{ICs}[3] Dimesion		Δ_{IUs}[3] Dimension	
over	until	above	less than	max.	max.	max.	above	less than	above	less than	above	less than	above	less than	above	less than
-	18	0	-8	6	-	5	0	-100	0	-100	+104	-120	0	-100	+60	0
18	30	0	-10	8	-	5	0	-100	0	-100	+104	-120	0	-100	+60	0
30	50	0	-12	9	-	6	0	-120	0	-100	+104	-120	0	-100	+60	0
50	80	0	-15	11	10	7	0	-150	0	-120	+104	-160	0	-120	+60	0
80	120	0	-20	15	12	8	0	-200	0	-120	+140	-160	0	-120	+80	0
120	180	0	-25	19	14	9	0	-250	0	-160	+140	-160	0	-160	+80	0
180	250	0	-30	23	15	10	0	-300	0	-160	+176	-160	0	-160	+100	0
250	315	0	-35	26	18	13	0	-350	0	-160	+248	-160	0	-160	+100	0
315	400	0	-40	30	20	15	0	-400	0	-200	+248	-160	0	-200	+100	0
400	500	0	-45	34	23	18	0	-450	0	-200	+280	-320	0	-200	+140	0
500	630	0	-50	38	26	21	0	-500	0	-240	+352	-320	0	-240	+160	0
630	800	0	-75	54	30	25	0	-750	0	-300	+424	-320	0	-300	+200	0
800	1000	0	-100	74	40	30	0	-1000	0	-400	+496	-320	0	-400	+240	0
1000	1250	0	-125	94	45	35	0	-1250	0	-560	+640	-320	0	-560	+280	0
1250	1600	0	-160	120	50	40	0	-1250	0	-720	+784	-320	0	-720	+360	0
1600	2000	0	-200	150	50	50	0	-1500	0	-880	+928	-320	0	-880	+440	0

[1] Fluctuation in shoulder thickness measured at the contact angle (for spherical roller thrust bearings).
[2] Wall thickness variation for centre washer according to bore diameter d of the corresponding single row bearing.
[2] S_i. Wall thickness variation raceway run-out measured at contact angle.
[3] for thrust ball bearings.
[4] for thrust ball bearings and cylindrical roller thrust bearings.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 34: Housing disk (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp} [1]	S_e [2] $S_e.1$ [2]	Δ_{CSs} [3] Dimension		Δ_{ECs} [4] Dimension		Δ_{ICs} [3] Dimension	
over	until	above	less than	max.	max.	above	less than	above	less than	above	less than
10	18	0	-11	8	see note 2)	see note 5)		see note 5)		see note 5)	
18	30	0	-13	10							
30	50	0	-16	12							
50	80	0	-19	14							
80	120	0	-22	17							
120	180	0	-25	19							
180	250	0	-30	23							
250	315	0	-35	26							
315	400	0	-40	30							
400	500	0	-45	34							
500	630	0	-50	38							
630	800	0	-75	55							
800	1000	0	-100	75							
1000	1250	0	-125	94							
1250	1600	0	-160	120							
1600	2000	0	-200	150							

[1] Drawing specification roundness according to DIN ISO 1101.
[2] Wall thickness variation measured in contact angle.
[2] Identical to S_i or $S_{i.1}$ for shaft locating washer of the same bearing. For cylindrical roller thrust bearings applies $V_{ECs}=S_i$
[3] For thrust ball bearings.
[4] For thrust ball bearings and cylindrical roller thrust bearings.
[5] Identical to Δ_{Bs}, Δ_{FBs} and Δ_{IUs} for shaft locating washer of the same bearing (see Table 33)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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4.1.3 Tolerance class P5

Table 35: Shaft locating washer (tolerance values in µm)

d, d_2 mm		Δ_{dmp} Δ_{d2mp} Dimension		V_{dp} V_{d2p}	S_i.1[1]	S_i[2] S_i.1	Δ_{Bs}[3] Dimension		Δ_{FBs}[4] Dimension		$\Delta_{FB1.1s}$[3] Dimension		Δ_{ICs}[3] Dimension		Δ_{IUs}[3] Dimension	
over	until	above	less than	max.	max.	max.	above	less than	above	less than	above	less than	above	less than	above	less than
-	18	0	-8	6	-	3	0	-100	0	-100	+104	-120	0	-100	+60	0
18	30	0	-10	8	-	3	0	-100	0	-100	+104	-120	0	-100	+60	0
30	50	0	-12	9	-	3	0	-120	0	-100	+104	-120	0	-100	+60	0
50	80	0	-15	11	7	4	0	-150	0	-120	+104	-160	0	-120	+60	0
80	120	0	-20	15	7	4	0	-200	0	-120	+140	-160	0	-120	+80	0
120	180	0	-25	19	8	5	0	-250	0	-160	+140	-160	0	-160	+80	0
180	250	0	-30	23	8	5	0	-300	0	-160	+176	-160	0	-160	+100	0
250	315	0	-35	26	10	7	0	-350	0	-160	+248	-160	0	-160	+100	0
315	400	0	-40	30	10	7	0	-400	0	-200	+248	-160	0	-200	+100	0
400	500	0	-45	34	14	9	0	-450	0	-200	+280	-320	0	-200	+140	0
500	630	0	-50	38	16	11	0	-500	0	-240	+352	-320	0	-240	+160	0
630	800	0	-75	54	18	13	0	-750	0	-300	+424	-320	0	-300	+200	0
800	1000	0	-100	74	20	15	0	-1000	0	-400	+496	-320	0	-400	+240	0
1000	1250	0	-125	94	23	18	0	-1250	0	-560	+640	-320	0	-560	+280	0
1250	1600	0	-160	120	25	21	0	-1250	0	-720	+784	-320	0	-720	+360	0
1600	2000	0	-200	150	30	25	0	-1500	0	-880	+928	-320	0	-880	+440	0

[1] Fluctuation in shoulder thickness measured at the contact angle (for spherical roller thrust bearings).
[2] Wall thickness variation for centre washer according to bore diameter d of the corresponding single row bearing.
[2] S_i. Wall thickness variation raceway run-out measured at contact angle.
[3] for thrust ball bearings.
[4] for thrust ball bearings and cylindrical roller thrust bearings.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 36: Housing disk (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp} 1)	S_e 2) $S_e.1$ 2)	Δ_{CSs} 3) Dimension		Δ_{ECs} 4) Dimension		Δ_{ICs} 3) Dimension	
over	until	above	less than	max.	max.	above	less than	above	less than	above	less than
10	18	0	-11	8	see note 2)	see note 5)		see note 5)		see note 5)	
18	30	0	-13	10							
30	50	0	-16	12							
50	80	0	-19	14							
80	120	0	-22	17							
120	180	0	-25	19							
180	250	0	-30	23							
250	315	0	-35	26							
315	400	0	-40	30							
400	500	0	-45	34							
500	630	0	-50	38							
630	800	0	-75	55							
800	1000	0	-100	75							
1000	1250	0	-125	94							
1250	1600	0	-160	120							
1600	2000	0	-200	150							

1) Drawing specification roundness according to DIN ISO 1101.
2) Wall thickness variation measured in contact angle.
2) Identical to S_i or $S_{i.1}$ for shaft locating washer of the same bearing. For cylindrical roller thrust bearings applies $V_{ECs} = S_i$
3) For thrust ball bearings.
4) For thrust ball bearings and cylindrical roller thrust bearings.
5) Identical to Δ_{Bs}, Δ_{FBs} and Δ_{IUs} for shaft locating washer of the same bearing (see Table 40)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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4.1.4 Tolerance class P4

Table 37: Shaft locating washer (tolerance values in µm)

d, d_2 mm		Δ_{dmp} Δ_{d2mp} Dimension		V_{dp} [1] V_{d2p} [1]	S_i [2] $S_i.1$ [2]	Δ_{Bs} [3] Dimension		Δ_{FBs} [4] Dimension		$\Delta_{FB1.1s}$ [3] Dimension		Δ_{IUs} [3] Dimension	
over	until	above	less than	max.	max.	above	less than	above	less than	above	less than	above	less than
-	18	0	-7	5	2	0	-100	0	-100	+104	-120	see note 5)	
18	30	0	-8	6	2	0	-100	0	-100	+104	-120		
30	50	0	-10	8	2	0	-120	0	-100	+104	-120		
50	80	0	-12	9	3	0	-150	0	-120	+104	-160		
80	120	0	-15	11	3	0	-200	0	-120	+140	-160		
120	180	0	-18	14	4	0	-250	0	-160	+140	-160		
180	250	0	-22	17	4	0	-300	0	-160	+176	-160		
250	315	0	-25	19	5	0	-350	0	-160	+248	-160		
315	400	0	-30	22	5	0	-400	0	-200	+248	-160		
400	500	0	-35	26	6	0	-450	0	-200	+280	-320		
500	630	0	-40	30	7	0	-500	0	-240	+352	-320		
630	800	0	-50	38	8	0	-750	0	-300	+424	-320		
800	1000	0	-65	50	10	0	-1000	0	-400	+496	-320		
1000	1250	0	-80	60	12	0	-1250	0	-560	+640	-320		
1250	1600	0	-100	74	14	0	-1250	0	-720	+784	-320		
1600	2000	0	-130	100	17	0	-1500	0	-880	+928	-320		

[1] Drawing specification Roundness according to DIN ISO 1101.
[2] Wall thickness variation for centre washer according to bore diameter d of the corresponding single row bearing.
[2] Wall thickness variation measured in contact angle.
[3] For thrust ball bearings.
[4] For thrust ball bearings and cylindrical roller thrust bearings.
[5] Identical to Δ_{IUs} for shaft locating washer of the same bearing (tolerance class PN) (see Table 31)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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Table 38: Housing disk (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp} [1]	S_e [2] $S_e.1$ [2]	Δ_{CSs} [3] Dimension		Δ_{ECs} [4] Dimension		Δ_{ICs} [3] Dimension	
over	until	above	less than	max.	max.	above	less than	above	less than	above	less than
10	18	0	-7	5	see note 2)	see note 5)		see note 5)		see note 5)	
18	30	0	-8	6							
30	50	0	-9	7							
50	80	0	-11	8							
80	120	0	-13	10							
120	180	0	-15	14							
180	250	0	-20	15							
250	315	0	-25	19							
315	400	0	-28	20							
400	500	0	-33	24							
500	630	0	-38	28							
630	800	0	-45	34							
800	1000	0	-60	44							
1000	1250	0	-80	60							
1250	1600	0	-100	74							
1600	2000	0	-130	100							

[1] Drawing specification roundness according to DIN ISO 1101.
[2] Wall thickness variation measured in contact angle.
[2] Identical to Si or Si.1 for shaft locating washer of the same bearing. For cylindrical roller thrust bearings applies $V_{ECs} = S_i$
[3] For thrust ball bearings.
[4] For thrust ball bearings and cylindrical roller thrust bearings.
[5] Identical to Δ_{Bs}, Δ_{FBs} and Δ_{IUs} for shaft locating washer of the same bearing (see Table 37)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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4.2 Tolerances for angular contact thrust ball bearings design 2344...2347...

4.2.1 Tolerance class SP

Table 39: Shaft locating washer (tolerance values in µm)

d mm		Δ_{dmp} Dimension		V_{dp} [1]	V_{dmp} [2]	S_i-1 [3]	Δ_{Bs} Dimension	
over	until	above	less than	max.	max.	max.	above	less than
0	30	0	-8	3	3	3	0	-120
30	50	0	-10	3	3	3	0	-120
50	80	0	-12	3	3	4	0	-125
80	120	0	-15	4	4	4	0	-125
120	180	0	-18	5	5	5	0	-125
180	250	0	-18	5	5	5	0	-125
250	315	0	-22	7	7	5	0	-150
315	400	0	-25	8	8	7	0	-150
400	500	0	-30	9	9	7	0	-200

[1] Drawing specification roundness according to DIN ISO 1101.
[2] Drawing specification parallelism according to DIN ISO 1101.
[3] Wall thickness variation measured in contact angle.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

Table 40: Housing disk (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp} [1]	V_{Dmp} [2]	S_e-1 [3]	Δ_{Cs} Dimension	
over	until	above	less than	max.	max.	max.	above	less than
30	50	-20	-36	4	4	see note 3)	see note 4)	
50	80	-24	-43	4	4			
80	120	-28	-50	5	5			
120	180	-33	-58	6	6			
180	250	-37	-66	7	7			
250	315	-41	-73	8	8			
315	400	-46	-82	9	9			
400	500	-50	-90	11	11			
500	630	-55	-99	11	11			

[1] Drawing specification roundness according to DIN ISO 1101.
[2] Drawing specification parallelism according to DIN ISO 1101.
[3] Wall thickness variation measured in contact angle.
[3] Identical to Si or $Si._1$ for shaft locating washer of the same bearing.
[4] Identical to Δ_{Bs} for shaft locating washer of the same bearing (see Table 39)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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4.2.2 Tolerance class UP

Table 41: Shaft locating washer (tolerance values in µm)

d mm		Δ_{dmp} Dimension		V_{dp} [1]	V_{dmp} [2]	S_i.1 [3]	Δ_{Bs} Dimension	
over	until	above	less than	max.	max.	max.	above	less than
0	30	0	-6	2	2	1.5	0	-120
30	50	0	-8	2	2	1.5	0	-120
50	80	0	-9	2	2	2	0	-125
80	120	0	-10	3	3	2	0	-125
120	180	0	-13	4	4	3	0	-125
180	250	0	-15	5	5	3	0	-150
250	315	0	-18	6	6	4	0	-150
315	400	0	-23	7	7	4	0	-200

[1] Drawing specification roundness according to DIN ISO 1101.
[2] Drawing specification parallelism according to DIN ISO 1101.
[3] Wall thickness variation measured in contact angle.

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

Table 42: Housing disk (tolerance values in µm)

D mm		Δ_{Dmp} Dimension		V_{Dp} [1]	V_{Dmp} [2]	S_e.1 [3]	Δ_{Cs} Dimension	
over	until	above	less than	max.	max.	max.	above	less than
30	50	-20	-36	4	4	see note 3)	see note 4)	
50	80	-24	-43	4	4			
80	120	-28	-50	5	5			
120	180	-33	-58	6	6			
180	250	-37	-66	7	7			
250	315	-41	-73	8	8			
315	400	-46	-82	9	9			
400	500	-50	-90	11	11			
500	630	-55	-99	11	11			

[1] Drawing specification roundness according to DIN ISO 1101.
[2] Drawing specification parallelism according to DIN ISO 1101.
[3] Wall thickness variation measured in contact angle.
[3] Identical to Si or $Si._1$ for shaft locating washer of the same bearing.
[4] Identical to Δ_{Bs} for shaft locating washer of the same bearing (see Table 41)

Tolerance values highlighted in blue in the tolerance tables are not part of the standards DIN 620 (1988-02) or DIN ISO 1132 (1982-06). These values were determined in accordance with KRW's internal regulations.

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