Self-aligning linear ball bearings

Light range – metric sizes

"THE NEW KS"
Maximum benefit, minimum cost

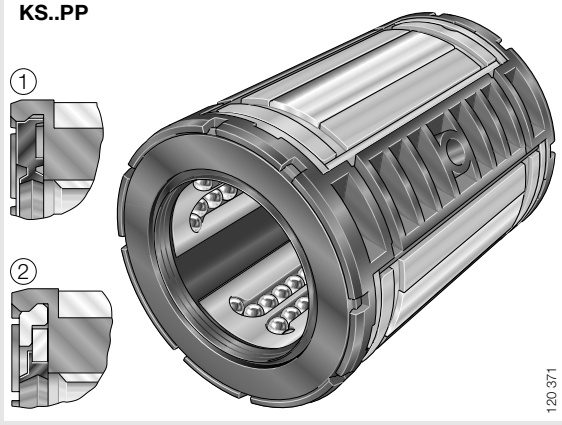
Features

Self-aligning linear ball bearings

- are units comprising a housing, movable segments and seals
  - housing in closed or open design
  - segments comprise a segment upper section, load plate, rolling elements (balls) and a segment lower section including the ball recirculation tracks
- automatically compensate misalignments of the bearing central axis due to the movable segments. Shaft misalignments of up to max. ±40 angular minutes are therefore possible without impairing the bearing load carrying capacity or operating life
- have no reduction in load ratings due to edge pressure within the shaft misalignment tolerance, and can therefore support considerably higher loads than non-aligning linear ball bearings of the same diameter
- run very quietly and with very low friction due to
  - the automatic compensation of misalignments
  - ground rolling element raceways in the load plates
- run without stick-slip – as compared with plain bearings – and are therefore suitable even for applications requiring high positional accuracy
- allow high speeds up to 5 m/s and accelerations up to 100 m/s^2
- allow the construction of linear guidance systems with unlimited travel
- are sealed on both sides by gap seals or contact seals with a floating support arrangement
  - open linear ball bearings also have integral sealing strips on both sides
- sealed versions are supplied greased and are maintenance-free in many applications due to the integral lubricant reservoir
- are dimensioned so that they can replace conventional linear ball bearings even in existing applications
- can be supplied combined with housings as housing units
- are suitable for use with supported shafts in the open version and with the appropriate housing
- have adjustable clearance and can be preloaded in conjunction with open, slotted housings
- can be combined with INA housings and shafts or shaft and support rail units to achieve optimally matched, ready-to-fit, particularly cost-effective complete linear solutions with a long operating life
- are also produced in inch dimensions (series KX, KXO, see *INA Market Information MAI 70*).

Self-aligning linear ball bearings

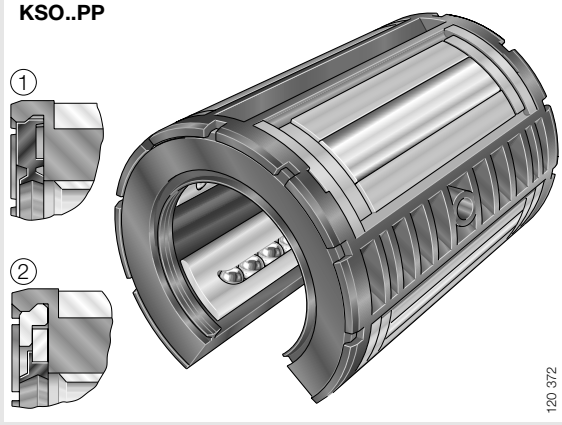
KS
KS..PP



- self-aligning linear ball bearings, closed design
- KS with gap seals ① on both sides
  KS..PP with lip seals ② on both sides
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 50 mm

6

KSO
KSO..PP

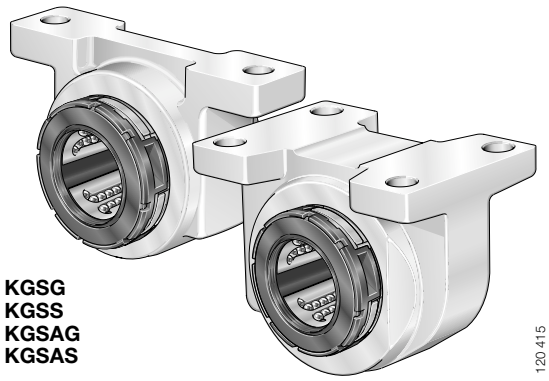


- self-aligning linear ball bearings, open design, for supported shafts
- KSO with gap seals ① on both sides
  KSO..PP with lip seals ② on both sides
- integral gap type sealing strips
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 50 mm

6

Self aligning linear ball bearing and housing units

Units



KGSG
KGSS
KGSAG
KGSAS

120 415

- housing pressure diecast, fitted with self-aligning linear ball bearing KS..PP
- KGSS, KGSAS slotted and with adjustable clearance
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 50 mm

8/10

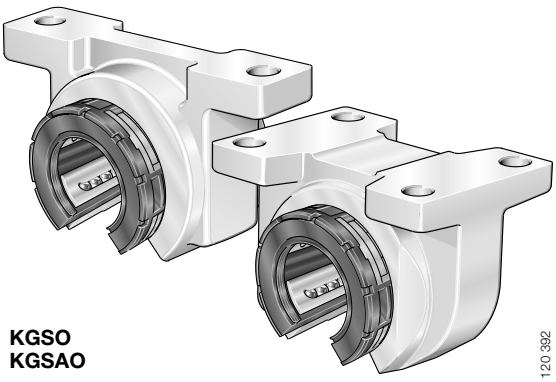
Units – tandem arrangement

KTSG
KTSS

120 381

- housing made from high strength aluminium alloy, fitted with two self-aligning linear ball bearings KS..PP in tandem arrangement, bearings can be relubricated
- KTSS slotted and with adjustable clearance
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 30 mm

16



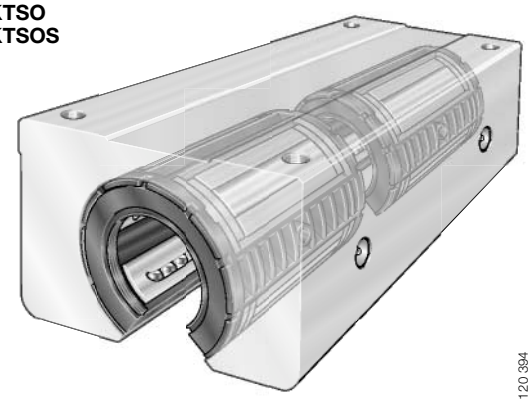
KGSO
KGSAO

120 392

- housing pressure diecast, open design, suitable for supported shafts, fitted with self-aligning linear ball bearing KSO..PP
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 50 mm

8/10

KTSO
KTSOS



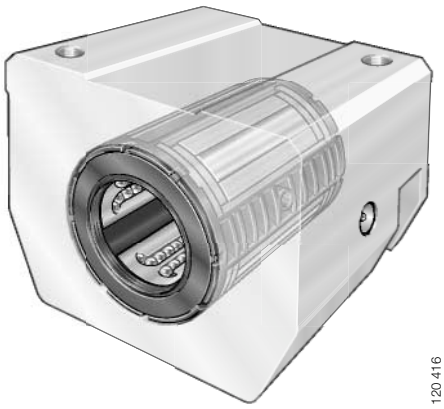
120 394

- housing made from high strength aluminium alloy, open design, suitable for supported shafts, fitted with two self-aligning linear ball bearings KSO..PP in tandem arrangement, bearings can be lubricated
- KTSOS slotted and with adjustable clearance
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 30 mm

18

Units

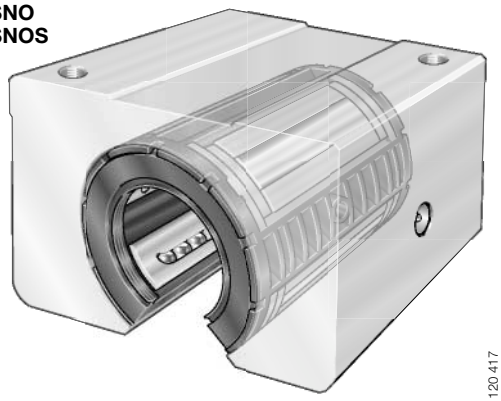
KGSNG
KGSNS



- housing made from high strength aluminium alloy, fitted with self-aligning linear ball bearing KS..PP, bearing can be relubricated
- KGSNS slotted and with adjustable clearance
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 50 mm

16

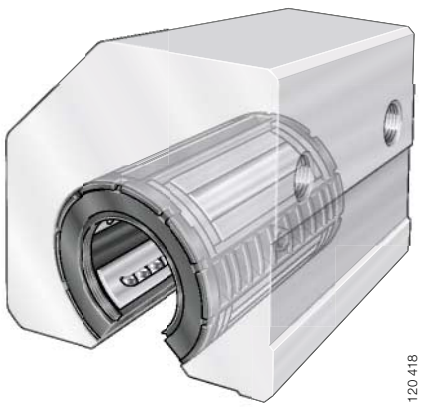
KGSNO
KGSNOS



- housing made from high strength aluminium alloy, open design, suitable for supported shafts, fitted with self-aligning linear ball bearing KSO..PP, bearing can be lubricated
- KGSNOS slotted and with adjustable clearance
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 50 mm

18

KGSC
KGSCS

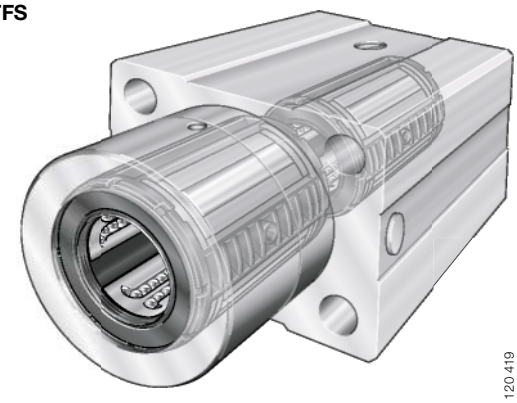


- housing made from high strength aluminium alloy, open design, suitable for supported shafts, fitted with self-aligning linear ball bearing KSO..PP, bearing can be lubricated
- KGSCS slotted and with adjustable clearance
- for operating temperatures up to +80 °C
- for shaft diameters from 20 mm to 50 mm

20

Units – tandem arrangement

KTFS



- housing made from high strength aluminium alloy, fitted with two self-aligning linear ball bearings KS..PP in tandem arrangement, bearings can be relubricated
- for operating temperatures up to +80 °C
- for shaft diameters from 12 mm to 30 mm

22

Shafts

Features

Shafts

- are precision raceways for INA linear ball bearings
- are made from quenched and tempered steel with a surface hardness of 670 +170 HV (59 +6 HRC)
  - the uniform hardness depth ensures a smooth transition from the hardened surface layer to the tough core
- can be loaded up to the full basic load rating of INA self-aligning linear ball bearings
- are produced as standard in tolerance class h6
- have high accuracy (roundness and parallelism)
- can be supplied in single pieces up to 6 000 mm in length – depending on the diameter
  - longer lengths are available by agreement
  - the shaft ends are chamfered after cutting to length
- can also be supplied in a special version with ends that differ from the standard version
- can be produced with axial or radial threaded holes for fixing (see *Threaded holes)*
- allow the construction of linear guidance systems with high load carrying capacity, high rigidity, high accuracy and a long operating life
- can be combined with INA linear ball bearings or INA linear ball bearing units to achieve optimally matched, ready-to-fit, particularly cost-effective shaft guidance systems
- are used not only as raceways for INA linear ball bearings but also as:
  - guide rods for plain bushes
  - column guides for stud and yoke type track rollers
  - drawing and straightening rollers
  - shafts and axles in a wide variety of different applications.

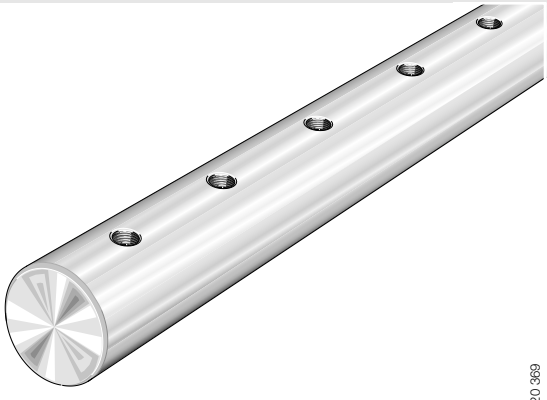
Shafts

W

- high precision solid shaft made from quenched and tempered steel
- standard tolerance h6
  - special tolerances available by agreement
- diameters from 5 mm to 80 mm

24

Threaded holes



- recommended radial and axial threaded holes for fixing of high precision solid shafts W
  - for possible combinations see *Dimension table*
- shaft diameters from 5 mm to 80 mm

25

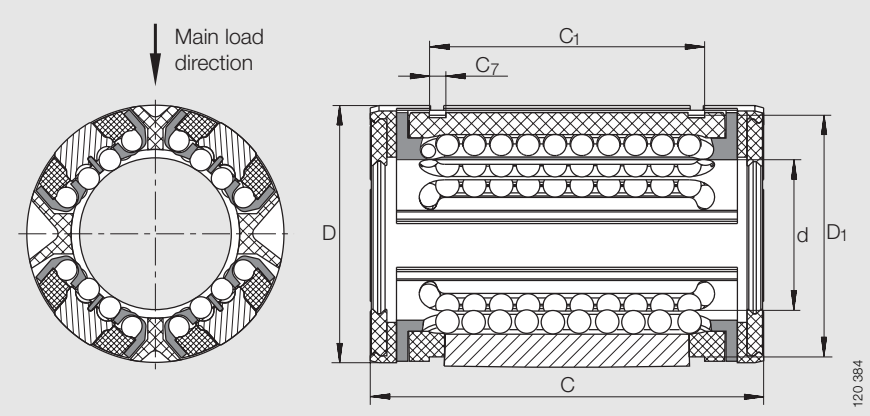
Dimension tables

Self-aligning linear ball bearings

Light range – metric sizes

closed and open designs
gap seals or
contact seals on both sides

Series KS
KS..PP
KSO
KSO..PP

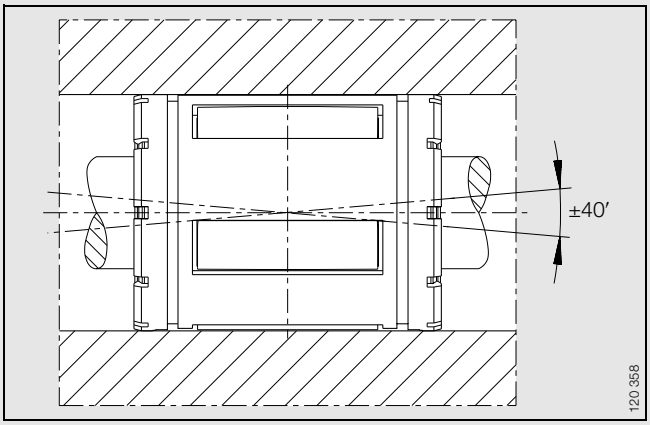


KS, KS..PP

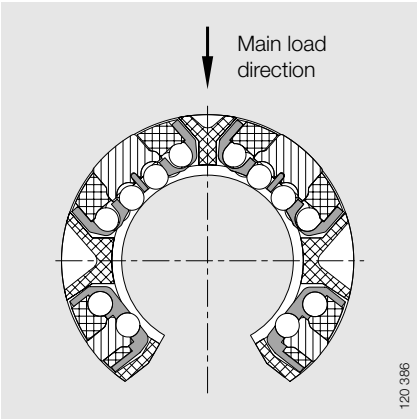
Dimension table · Dimensions in mm

Shaft diameter	Series				Mass	Dimensions			Mounting dimensions	
	KS[1]	KS..PP[2]	KSO[1]	KSO..PP[2]		d	D	C	A_6[3]	C_1
d	Designation	Designation	Designation	Designation	≈kg					H13
12	**KS 12**	**KS 12 PP**	**–**	**–**	0,018	12	22	32	–	22,6
	–	**–**	**KSO 12**	**KSO 12 PP**	0,013	12	22	32	7,6	–
16	**KS 16**	**KS 16 PP**	**–**	**–**	0,028	16	26	36	–	24,6
	–	**–**	**KSO 16**	**KSO 16 PP**	0,019	16	26	36	10,1	–
20	**KS 20**	**KS 20 PP**	**–**	**–**	0,051	20	32	45	–	31,2
	–	**–**	**KSO 20**	**KSO 20 PP**	0,038	20	32	45	10	–
25	**KS 25**	**KS 25 PP**	**–**	**–**	0,102	25	40	58	–	43,7
	–	**–**	**KSO 25**	**KSO 25 PP**	0,075	25	40	58	12,5	–
30	**KS 30**	**KS 30 PP**	**–**	**–**	0,172	30	47	68	–	51,7
	–	**–**	**KSO 30**	**KSO 30 PP**	0,135	30	47	68	14,3	–
40	**KS 40**	**KS 40 PP**	**–**	**–**	0,335	40	62	80	–	60,3
	–	**–**	**KSO 40**	**KSO 40 PP**	0,259	40	62	80	18,2	–
50	**KS 50**	**KS 50 PP**	**–**	**–**	0,589	50	75	100	–	77,3
	–	**–**	**KSO 50**	**KSO 50 PP**	0,454	50	75	100	22,7	–

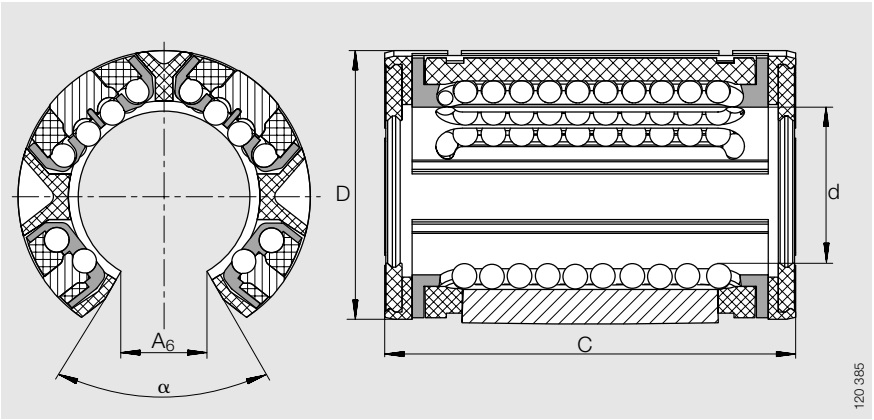
1) Gap seals on both sides.
2) Contact seals on both sides.
3) Dimension A_6 on diameter d.
4) Hole arrangement symmetrical with bearing width C.
5) The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways. Basic load ratings in accordance with DIN 636-1.
6) Basic load rating in main load direction.



Compensation of misalignments ±40′

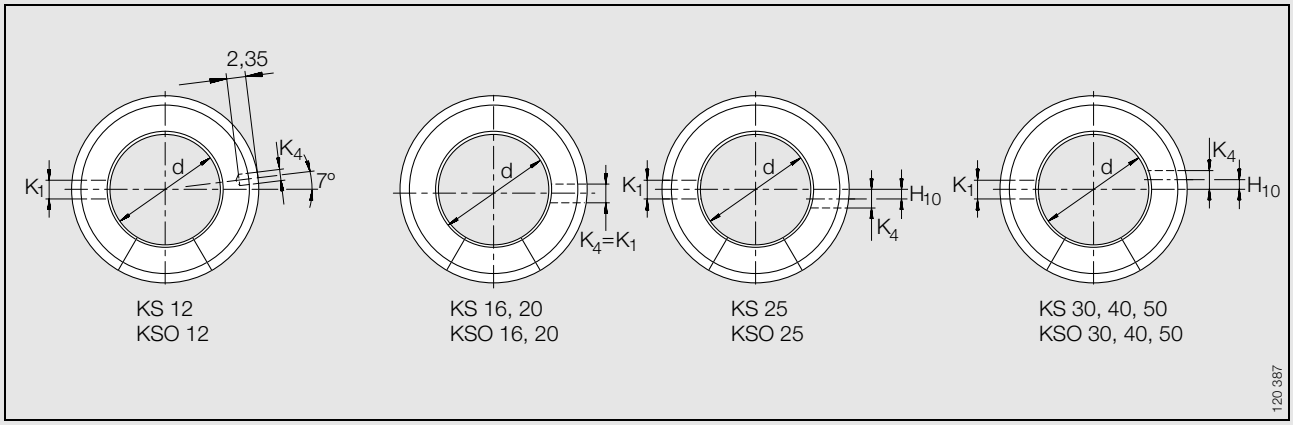


KSO, KSO..PP
Main load direction



KSO, KSO..PP

						Ball rows	Basic load ratings[5)6)]		Suitable snap ring to DIN 471	Shaft diameter
C_7	D_1	H_{10}	K_1[4)]	K_4[4)]	α	Quantity	dyn. C_{max}	stat. $C_{0\,max}$		
					Degrees		kN	kN		d
1,3	21	–	3	–	–	8	0,9	0,81	22×1,2	***12***
–	–	–	3	3	78	6	0,9	0,81	–	
1,3	25	–	3	–	–	8	1,43	1,16	26×1,2	***16***
–	–	–	3	3	78	6	1,43	1,16	–	
1,6	30,7	–	3	–	–	8	2,2	1,73	32×1,5	***20***
–	–	–	3	3	60	6	2,2	1,73	–	
1,85	38	–	3,5	–	–	8	3,95	3,25	42×1,75	***25***
–	–	1,5	3,5	3	60	6	3,95	3,25	–	
1,85	44,7	–	3,5	–	–	8	5,9	4,5	48×1,75	***30***
–	–	2	3,5	3	57	6	5,9	4,5	–	
2,15	59,4	–	3,5	–	–	8	10,2	7,2	63×2	***40***
–	–	1,5	3,5	3	54	6	10,2	7,2	–	
2,65	71,4	–	4,5	–	–	8	15,1	10,4	75×2,5	***50***
–	–	2,5	4,5	5	54	6	15,1	10,4	–	



KS 12
KSO 12

KS 16, 20
KSO 16, 20

KS 25
KSO 25

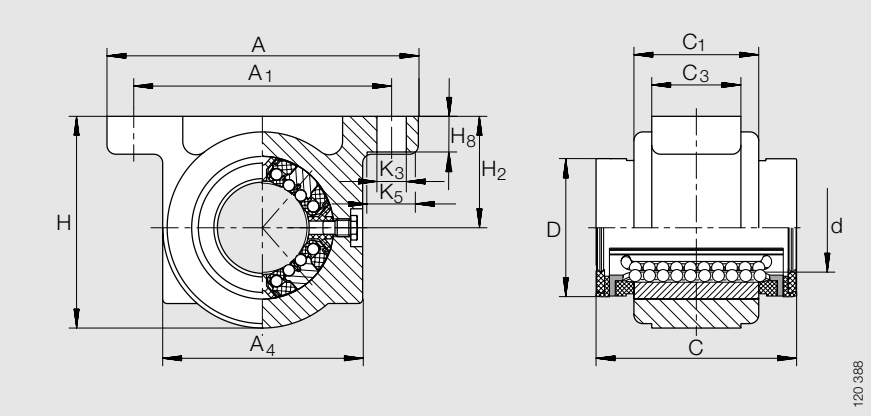
KS 30, 40, 50
KSO 30, 40, 50

Fixing holes

Linear ball bearing units

closed and open designs
contact seals on both sides

Series KGSG..PP
KGSS..PP
KGSO..PP



KGSG..PP

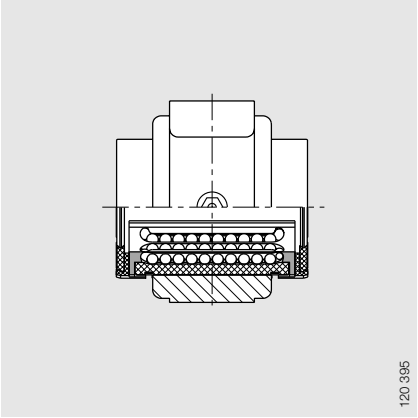
Dimension table · Dimensions in mm

Shaft diameter	Series			Mass	Dimensions				Mounting dimensions		
	KGSG..PP	KGSS..PP	KGSO..PP		d	A	C	H	A_1	A_4	A_6 [1]
d	Designation	Designation	Designation	≈kg					±0,15		
12	**KGSG 12 PP**	**–**	**–**	0,08	12	52	32	35,8	42	31,6	–
	–	**KGSS 12 PP**	**–**	0,08	12	52	32	35,8	42	31,6	–
	–	**–**	**KGSO 12 PP**	0,07	12	52	32	–	42	31,6	7,6
16	**KGSG 16 PP**	**–**	**–**	0,13	16	56	36	37,5	46	35	–
	–	**KGSS 16 PP**	**–**	0,13	16	56	36	37,5	46	35	–
	–	**–**	**KGSO 16 PP**	0,12	16	56	36	–	46	35	10,1
20	**KGSG 20 PP**	**–**	**–**	0,27	20	70	45	47,5	58	45	–
	–	**KGSS 20 PP**	**–**	0,27	20	70	45	47,5	58	45	–
	–	**–**	**KGSO 20 PP**	0,23	20	70	45	–	58	45	10
25	**KGSG 25 PP**	**–**	**–**	0,51	25	80	58	57,5	68	55	–
	–	**KGSS 25 PP**	**–**	0,51	25	80	58	57,5	68	55	–
	–	**–**	**KGSO 25 PP**	0,44	25	80	58	–	68	55	12,5
30	**KGSG 30 PP**	**–**	**–**	0,83	30	88	68	66,5	76	63	–
	–	**KGSS 30 PP**	**–**	0,83	30	88	68	66,5	76	63	–
	–	**–**	**KGSO 30 PP**	0,73	30	88	68	–	76	63	13,6
40	**KGSG 40 PP**	**–**	**–**	1,21	40	108	80	83,5	94	77	–
	–	**KGSS 40 PP**	**–**	1,21	40	108	80	83,5	94	77	–
	–	**–**	**KGSO 40 PP**	1,05	40	108	80	–	94	77	18,2
50	**KGSG 50 PP**	**–**	**–**	2,53	50	135	100	98	116	96	–
	–	**KGSS 50 PP**	**–**	2,53	50	135	100	98	116	96	–
	–	**–**	**KGSO 50 PP**	1,98	50	135	100	–	116	96	22,7

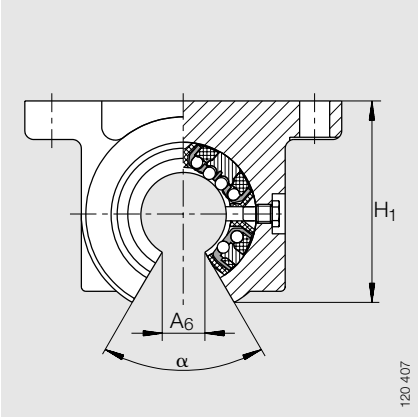
[1] Dimensions A_6 on diameter d.

[2] For fixing screws to EN ISO 4762-8.8.
If there is a possibility of settling, the fixing screws should be secured against rotation.

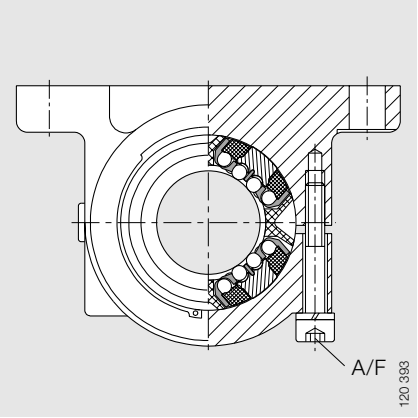
[3] The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.
Basic load ratings in accordance with DIN 636-1.



KGSO..PP



KGSO..PP



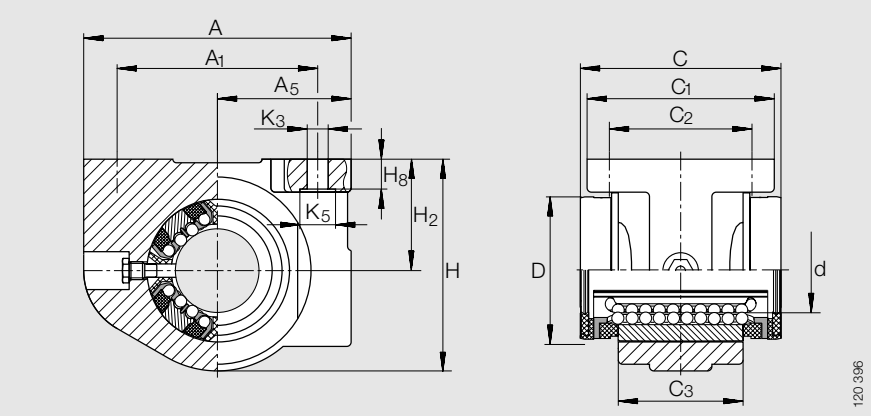
KGSS..PP

										Ball rows	Basic load ratings[3]		Shaft diameter
C_1	C_3	D	H_1	H_2 ±0,015	H_8	K_3[2]	K_5[2]	α Degrees	A/F	Quantity	dyn. C_{max} kN	stat. $C_{0\,max}$ kN	d
20	12	22	–	20	6	5,5	10	–	–	8	0,9	0,81	***12***
20	12	22	–	20	6	5,5	10	–	2	8	0,9	0,81	
20	12	22	32,3	20	6	5,5	10	78	–	6	0,9	0,81	
22	15	26	–	20	6	5,5	10	–	–	8	1,43	1,16	***16***
22	15	26	–	20	6	5,5	10	–	2	8	1,43	1,16	
22	15	26	33,6	20	6	5,5	10	78	–	6	1,43	1,16	
28	20	32	–	25	8	6,6	11	–	–	8	2,2	1,73	***20***
28	20	32	–	25	8	6,6	11	–	3	8	2,2	1,73	
28	20	32	44,5	25	8	6,6	11	60	–	6	2,2	1,73	
40	28	40	–	30	10	6,6	11	–	–	8	3,95	3,25	***25***
40	28	40	–	30	10	6,6	11	–	3	8	3,95	3,25	
40	28	40	53,8	30	10	6,6	11	60	–	6	3,95	3,25	
48	32	47	–	35	10	6,6	11	–	–	8	5,9	4,5	***30***
48	32	47	–	35	10	6,6	11	–	4	8	5,9	4,5	
48	32	47	63,1	35	10	6,6	11	54	–	6	5,9	4,5	
56	40	62	–	45	12	9	15	–	–	8	10,2	7,2	***40***
56	40	62	–	45	12	9	15	–	4	8	10,2	7,2	
56	40	62	79,3	45	12	9	15	54	–	6	10,2	7,2	
72	52	75	–	50	14	11	18	–	–	8	15,1	10,4	***50***
72	52	75	–	50	14	11	18	–	5	8	15,1	10,4	
72	52	75	92,8	50	14	11	18	54	–	6	15,1	10,4	

Linear ball bearing units

closed and open designs
contact seals on both sides

Series KGSAG..PP
KGSAS..PP
KGSAO..PP



KGSAG..PP

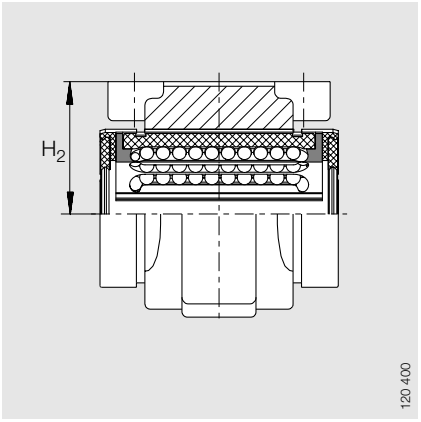
Dimension table · Dimensions in mm

Shaft diameter	Series			Mass	Dimensions				Mounting dimensions		
	KGSAG..PP	KGSAS..PP	KGSAO..PP		d	A	C	H	A_1	A_5	A_6 [1]
d	Designation	Designation	Designation	≈kg					±0,15		
12	**KGSAG 12 PP**	**–**	**–**	0,06	12	42	32	34	32	21	–
	–	**KGSAS 12 PP**	**–**	0,06	12	42	32	34	32	21	–
	–	**–**	**KGSAO 12 PP**	0,05	12	42	32	–	32	21	7,6
16	**KGSAG 16 PP**	**–**	**–**	0,11	16	50	36	41	40	25	–
	–	**KGSAS 16 PP**	**–**	0,11	16	50	36	41	40	25	–
	–	**–**	**KGSAO 16 PP**	0,1	16	50	36	–	40	25	10,1
20	**KGSAG 20 PP**	**–**	**–**	0,17	20	60	45	47,5	45	30	–
	–	**KGSAS 20 PP**	**–**	0,17	20	60	45	47,5	45	30	–
	–	**–**	**KGSAO 20 PP**	0,15	20	60	45	–	45	30	10
25	**KGSAG 25 PP**	**–**	**–**	0,34	25	74	58	60	60	37	–
	–	**KGSAS 25 PP**	**–**	0,34	25	74	58	60	60	37	–
	–	**–**	**KGSAO 25 PP**	0,3	25	74	58	–	60	37	12,5
30	**KGSAG 30 PP**	**–**	**–**	0,54	30	84	68	67	68	42	–
	–	**KGSAS 30 PP**	**–**	0,54	30	84	68	67	68	42	–
	–	**–**	**KGSAO 30 PP**	0,48	30	84	68	–	68	42	13,6
40	**KGSAG 40 PP**	**–**	**–**	0,98	40	108	80	87	86	54	–
	–	**KGSAS 40 PP**	**–**	0,98	40	108	80	87	86	54	–
	–	**–**	**KGSAO 40 PP**	0,84	40	108	80	–	86	54	18,2
50	**KGSAG 50 PP**	**–**	**–**	1,63	50	130	100	98	108	65	–
	–	**KGSAS 50 PP**	**–**	1,63	50	130	100	98	108	65	–
	–	**–**	**KGSAO 50 PP**	1,17	50	130	100	–	108	65	22,7

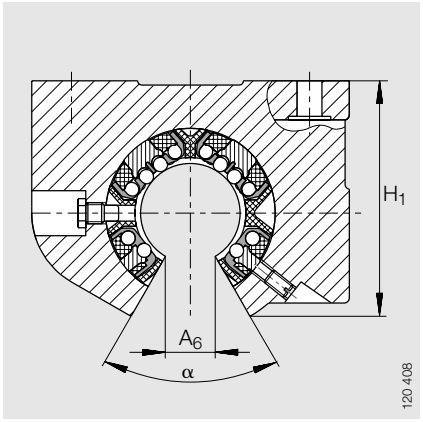
[1] Dimensions A_6 on diameter d.

[2] For fixing screws to EN ISO 4762-8.8.
If there is a possibility of settling, the fixing screws should be secured against rotation.

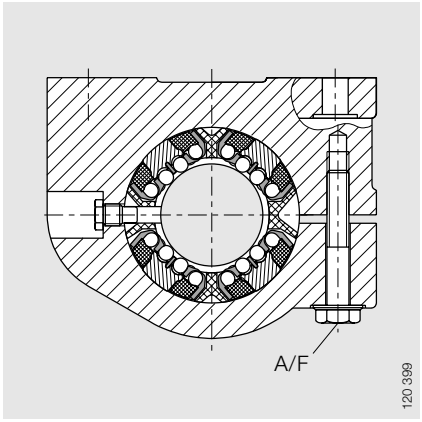
[3] The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.
Basic load ratings in accordance with DIN 636-1.



KGSAO..PP



KGSAO..PP



KGSAS..PP

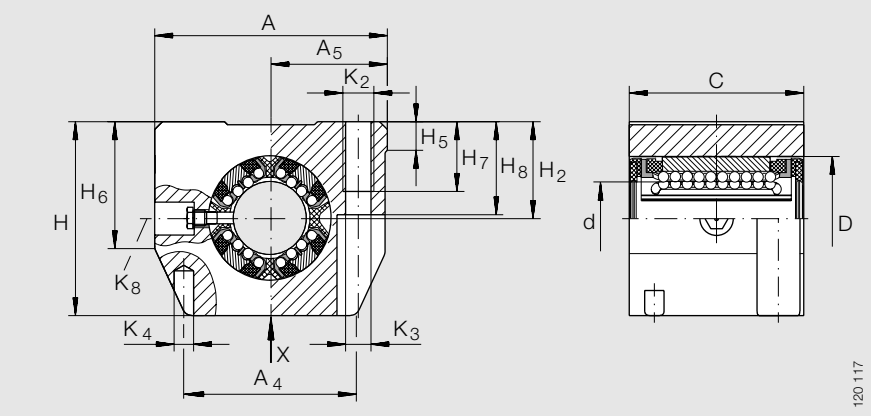
											Ball rows	Basic load ratings[3]		Shaft diameter
C_1	C_2 ±0,15	C_3	D h5	H_1	H_2 ±0,01	H_8 –0,5	K_3[2]	K_5[2]	α Degrees	A/F	Quantity	dyn. C_{max} kN	stat. $C_{0\,max}$ kN	d
32	23	20	22	–	18	4,8	4,7	8	–	–	8	0,9	0,81	***12***
32	23	20	22	–	18	4,8	4,7	8	–	7	8	0,9	0,81	
32	23	20	22	30,4	18	4,8	4,7	8	78	–	6	0,9	0,81	
35	26	22	26	–	22	5,4	4,7	8	–	–	8	1,43	1,16	***16***
35	26	22	26	–	22	5,4	4,7	8	–	7	8	1,43	1,16	
35	26	22	26	36,8	22	5,4	4,7	8	78	–	6	1,43	1,16	
42	32	28	32	–	25	6,7	4,7	8	–	–	8	2,2	1,73	***20***
42	32	28	32	–	25	6,7	4,7	8	–	7	8	2,2	1,73	
42	32	28	32	44,5	25	6,7	4,7	8	60	–	6	2,2	1,73	
54	40	40	40	–	30	7,8	5,7	10	–	–	8	3,95	3,25	***25***
54	40	40	40	–	30	7,8	5,7	10	–	8	8	3,95	3,25	
54	40	40	40	56	30	7,8	5,7	10	60	–	6	3,95	3,25	
60	45	48	47	–	35	8,7	6,8	11	–	–	8	5,9	4,5	***30***
60	45	48	47	–	35	8,7	6,8	11	–	10	8	5,9	4,5	
60	45	48	47	63,5	35	8,7	6,8	11	54	–	6	5,9	4,5	
78	58	56	62	–	45	11	9,2	15	–	–	8	10,2	7,2	***40***
78	58	56	62	–	45	11	9,2	15	–	13	8	10,2	7,2	
78	58	56	62	82,4	45	11	9,2	15	54	–	6	10,2	7,2	
70	50	72	75	–	50	12,5	9,2	15	–	–	8	15,1	10,4	***50***
70	50	72	75	–	50	12,5	9,2	15	–	13	8	15,1	10,4	
70	50	72	75	92,8	50	12,5	9,2	15	54	–	6	15,1	10,4	

Linear ball bearing units

Light range – metric sizes

sealed, greased,
with relubrication facility

Series KGSNG..PP AS
KGSNS..PP AS



KGSNG..PP AS

Dimension table · Dimensions in mm

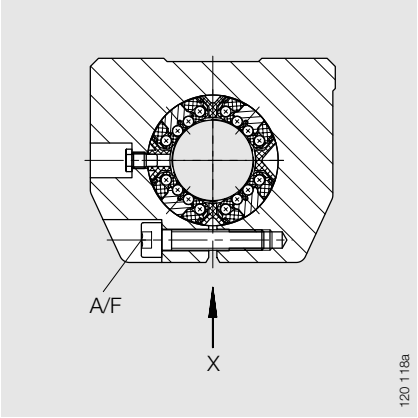
Shaft diameter	Series		Mass	Dimensions				Mounting dimensions				
	KGSNG..PP AS	KGSNS..PP AS		d	A	C	H	A_1	A_4	A_5	C_2[1]	D
d	Designation	Designation	≈kg					±0,15		±0,01	±0,15	
12	**KGSNG 12 PP AS**	**–**	0,1	12	43	32	35	32	34	21,5	23	22
	–	**KGSNS 12 PP AS**	0,1	12	43	32	35	32	34	21,5	23	22
16	**KGSNG 16 PP AS**	**–**	0,17	16	53	37	42	40	40	26,5	26	26
	–	**KGSNS 16 PP AS**	0,17	16	53	37	42	40	40	26,5	26	26
20	**KGSNG 20 PP AS**	**–**	0,27	20	60	45	50	45	44	30	32	32
	–	**KGSNS 20 PP AS**	0,27	20	60	45	50	45	44	30	32	32
25	**KGSNG 25 PP AS**	**–**	0,56	25	78	58	60	60	59,4	39	40	40
	–	**KGSNS 25 PP AS**	0,56	25	78	58	60	60	59,4	39	40	40
30	**KGSNG 30 PP AS**	**–**	0,83	30	87	68	70	68	63	43,5	45	47
	–	**KGSNS 30 PP AS**	0,83	30	87	68	70	68	63	43,5	45	47
40	**KGSNG 40 PP AS**	**–**	1,55	40	108	80	90	86	76	54	58	62
	–	**KGSNS 40 PP AS**	1,55	40	108	80	90	86	76	54	58	62
50	**KGSNG 50 PP AS**	**–**	2,7	50	132	100	105	108	90	66	50	75
	–	**KGSNS 50 PP AS**	2,7	50	132	100	105	108	90	66	50	75

[1] Dimension C_2 and lubrication hole symmetrical with bearing width C.

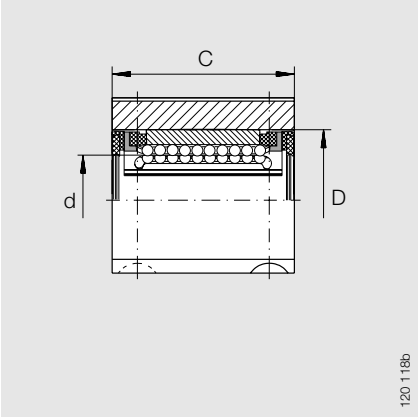
[2] For fixing screws to EN ISO 4762-8.8.
If there is a possibility of settling, the fixing screws should be secured against rotation.

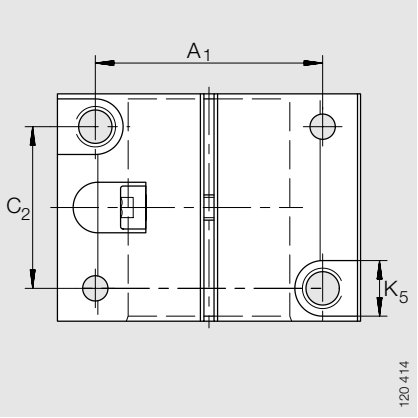
[3] Centring for dowel hole.

[4] The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.



KGSNS..PP AS





View X (rotated 90°)

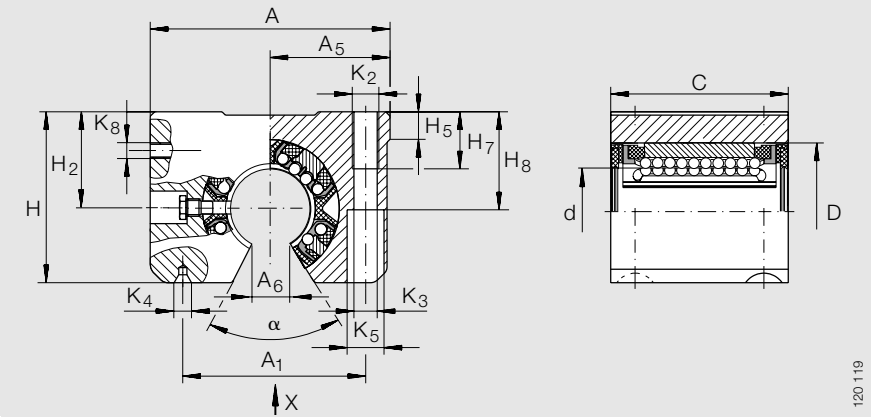
											Ball rows	Basic load ratings[4]		Shaft diameter
H_2 +0,008 –0,016	H_5	H_6	H_7	H_8	K_2	K_3[2]	K_4[3]	K_5[2]	K_8[1]	A/F	Quantity	dyn. C_{max} kN	stat. $C_{0\,max}$ kN	d
18	5,4	25,3	11	16,5	M 5	4,3	4	8	NIP 4 MZ	–	8	0,9	0,81	***12***
18	5,4	25,3	11	16,5	M 5	4,3	4	8	NIP 4 MZ	2,5	8	0,9	0,81	
22	6,9	28	13	21	M 6	5,3	4	10	NIP 4 MZ	–	8	1,43	1,16	***16***
22	6,9	28	13	21	M 6	5,3	4	10	NIP 4 MZ	3	8	1,43	1,16	
25	7,4	32,8	18	24	M 8	6,6	5	11	NIP 4 MZ	–	8	2,2	1,73	***20***
25	7,4	32,8	18	24	M 8	6,6	5	11	NIP 4 MZ	4	8	2,2	1,73	
30	8,3	40	22	29	M10	8,4	6	15	NIP 5 MZ	–	8	3,95	3,25	***25***
30	8,3	40	22	29	M10	8,4	6	15	NIP 5 MZ	5	8	3,95	3,25	
35	9,3	44,7	22	34	M10	8,4	6	15	NIP 5 MZ	–	8	5,9	4,5	***30***
35	9,3	44,7	22	34	M10	8,4	6	15	NIP 5 MZ	5	8	5,9	4,5	
45	11,7	55,9	26	44	M12	10,5	8	18	NIP 5 MZ	–	8	10,2	7,2	***40***
45	11,7	55,9	26	44	M12	10,5	8	18	NIP 5 MZ	6	8	10,2	7,2	
50	10,6	60	35	49	M16	13,5	10	20	NIP 6 MZ	–	8	15,1	10,4	***50***
50	10,6	60	35	49	M16	13,5	10	20	NIP 6 MZ	8	8	15,1	10,4	

Linear ball bearing units

Light range – metric sizes

sealed, greased,
with relubrication facility

Series KGSNO..PP AS
KGSNOS..PP AS



KGSNO..PP AS

Dimension table · Dimensions in mm

Shaft diameter	Series		Mass	Dimensions				Mounting dimensions				
	KGSNO..PP AS	KGSNOS..PP AS		d	A	C	H	A_1	A_5	A_6 [1]	C_2 [2]	D
d	Designation	Designation	≈kg					±0,15	±0,01		±0,15	
12	**KGSNO 12 PP AS**	**–**	0,09	12	43	32	28	32	21,5	7,6	23	22
	–	**KGSNOS 12 PP AS**	0,09	12	43	32	28	32	21,5	7,6	23	22
16	**KGSNO 16 PP AS**	**–**	0,15	16	53	37	35	40	26,5	8,9	26	26
	–	**KGSNOS 16 PP AS**	0,15	16	53	37	35	40	26,5	8,9	26	26
20	**KGSNO 20 PP AS**	**–**	0,25	20	60	45	42	45	30	9,2	32	32
	–	**KGSNOS 20 PP AS**	0,25	20	60	45	42	45	30	9,2	32	32
25	**KGSNO 25 PP AS**	**–**	0,52	25	78	58	51	60	39	11,9	40	40
	–	**KGSNOS 25 PP AS**	0,52	25	78	58	51	60	39	11,9	40	40
30	**KGSNO 30 PP AS**	**–**	0,76	30	87	68	60	68	43,5	14,3	45	47
	–	**KGSNOS 30 PP AS**	0,76	30	87	68	60	68	43,5	14,3	45	47
40	**KGSNO 40 PP AS**	**–**	1,4	40	108	80	77	86	54	18,8	58	62
	–	**KGSNOS 40 PP AS**	1,4	40	108	80	77	86	54	18,8	58	62
50	**KGSNO 50 PP AS**	**–**	2,4	50	132	100	88	108	66	22,7	50	75
	–	**KGSNOS 50 PP AS**	2,4	50	132	100	88	108	66	22,7	50	75

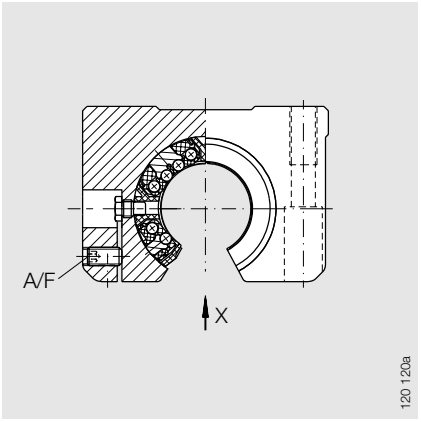
[1] Dimension A_6 on diameter d.

[2] Dimension C_2 and lubrication hole symmetrical with bearing width C.

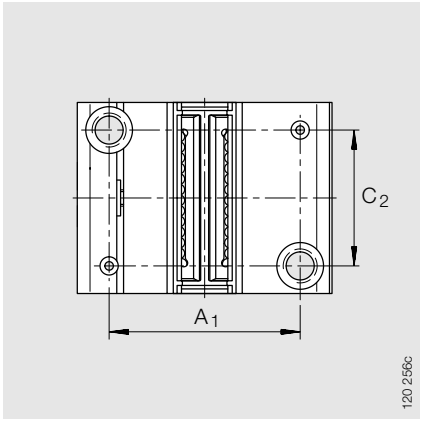
[3] For fixing screws to EN ISO 4762-8.8.
If there is a possibility of settling, the fixing screws should be secured against rotation.

[4] The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.

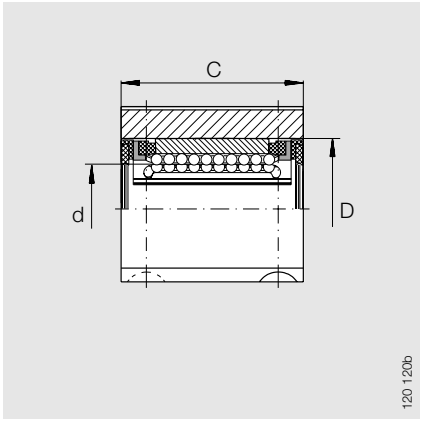
[5] Centring hole to DIN 332, type A.



KGSNOS..PP AS



View X (rotated 90°)

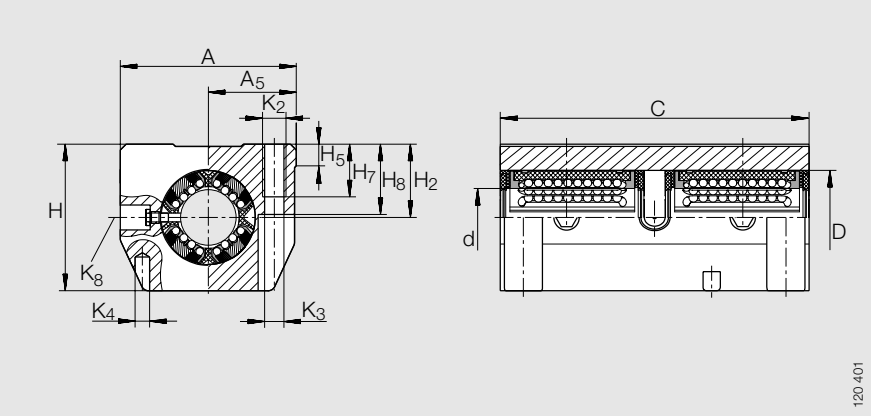


H_2 +0,008 –0,016	H_5	H_7	H_8	K_2	K_3[3]	K_4[5]	K_5[3]	K_8[2]	A/F	α Degrees	Ball rows Quantity	Basic load ratings[4] dyn. C_{max} kN	stat. $C_{0\,max}$ kN	Shaft diameter d
18	6,1	11	16,5	M 5	4,3	1,6 ×3,35	8	NIP 4 MZ	–	78	6	0,9	0,81	***12***
18	6,1	11	16,5	M 5	4,3	1,6 ×3,35	8	NIP 4 MZ	2,5	78	6	0,9	0,81	
22	7,5	13	21	M 6	5,3	1,6 ×3,35	10	NIP 4 MZ	–	68	6	1,43	1,16	***16***
22	7,5	13	21	M 6	5,3	1,6 ×3,35	10	NIP 4 MZ	2,5	68	6	1,43	1,16	
25	8	18	24	M 8	6,6	2 ×4,25	11	NIP 4 MZ	–	55	6	2,2	1,73	***20***
25	8	18	24	M 8	6,6	2 ×4,25	11	NIP 4 MZ	2,5	55	6	2,2	1,73	
30	8,8	22	29	M10	8,4	2,5 ×5,3	15	NIP 5 MZ	–	57	6	3,95	3,25	***25***
30	8,8	22	29	M10	8,4	2,5 ×5,3	15	NIP 5 MZ	3	57	6	3,95	3,25	
35	9,7	22	34	M10	8,4	2,5 ×5,3	15	NIP 5 MZ	–	57	6	5,9	4,5	***30***
35	9,7	22	34	M10	8,4	2,5 ×5,3	15	NIP 5 MZ	3	57	6	5,9	4,5	
45	12,4	26	44	M12	10,5	3,15 ×6,7	18	NIP 5 MZ	–	56	6	10,2	7,2	***40***
45	12,4	26	44	M12	10,5	3,15 ×6,7	18	NIP 5 MZ	4	56	6	10,2	7,2	
50	11,1	35	49	M16	13,5	4 ×8,5	20	NIP 6 MZ	–	54	6	15,1	10,4	***50***
50	11,1	35	49	M16	13,5	4 ×8,5	20	NIP 6 MZ	5	54	6	15,1	10,4	

Linear ball bearing units

closed and open designs
contact seals on both sides

Series KTSG..PP AS
KTSS..PP AS



KTSG..PP AS

Dimension table · Dimensions in mm

Shaft diameter	Series		Mass	Dimensions				Mounting dimensions				
	KTSG..PP AS	KTSS..PP AS		d	A	C	H	A_1	A_5	C_2 [1]	C_3 [1]	D
d	Designation	Designation	≈kg					±0,15	±0,01	±0,15		
12	**KTSG 12 PP AS**	**–**	0,21	12	43	70	35	32	21,5	56	24	22
	–	**KTSS 12 PP AS**	0,21	12	43	70	35	32	21,5	56	24	22
16	**KTSG 16 PP AS**	**–**	0,38	16	53	78	42	40	26,5	64	26	26
	–	**KTSS 16 PP AS**	0,38	16	53	78	42	40	26,5	64	26	26
20	**KTSG 20 PP AS**	**–**	0,55	20	60	96	50	45	30	76	33	32
	–	**KTSS 20 PP AS**	0,55	20	60	96	50	45	30	76	33	32
25	**KTSG 25 PP AS**	**–**	1,13	25	78	122	60	60	39	94	44	40
	–	**KTSS 25 PP AS**	1,13	25	78	122	60	60	39	94	44	40
30	**KTSG 30 PP AS**	**–**	1,78	30	87	142	70	68	43,5	106	54	47
	–	**KTSS 30 PP AS**	1,78	30	87	142	70	68	43,5	106	54	47

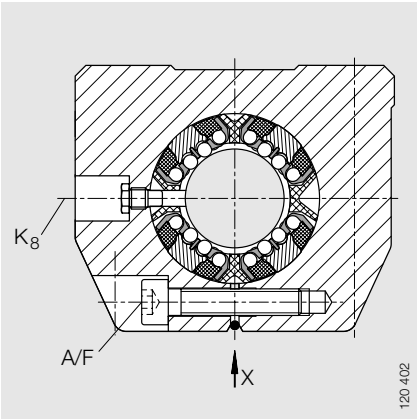
1) Dimensions and lubrication hole symmetrical with bearing width C.

2) For fixing screws to EN ISO 4762-8.8.
If there is a possibility of settling, the fixing screws should be secured against rotation.

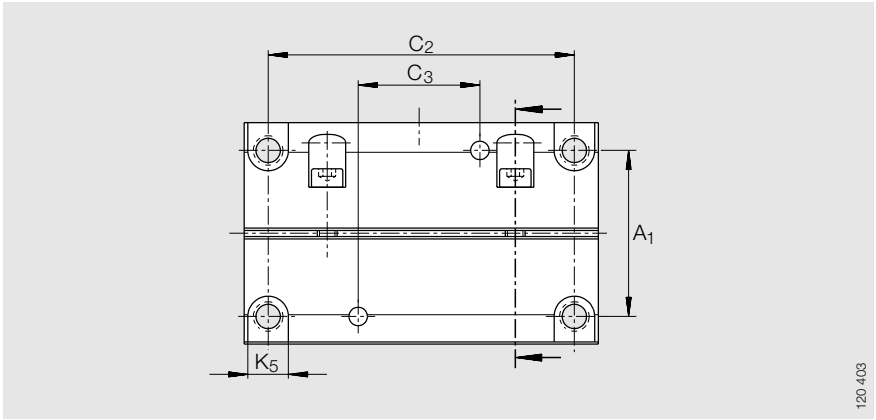
3) Centring for dowel hole.

4) Lubrication nipple.

5) The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.
Basic load ratings in accordance with DIN 636-1.



KTSS..PP AS
(same dimensions as KTSG..PP AS)



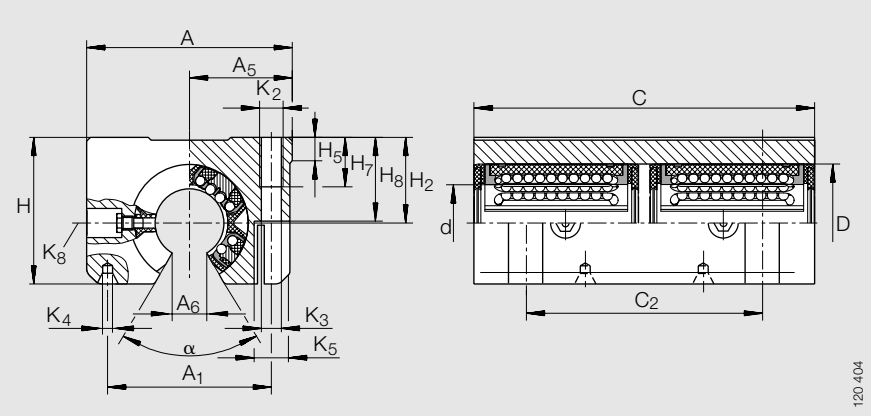
View X (rotated 90°)

H_2 +0,008 –0,016	H_5	H_6	H_7	H_8	K_2	K_3 [2]	K_4 [3]	K_5 [2]	K_8 [4]	A/F	Ball rows Quantity	Basic load ratings [5] dyn. C_{max} kN	stat. $C_{0\,max}$ kN	Shaft diameter d
18	6	25,3	11	16,5	M 5	4,3	4	8	NIP 4 MZ	–	8	1,46	1,62	***12***
18	6	25,3	11	16,5	M 5	4,3	4	8	NIP 4 MZ	2,5	8	1,46	1,62	
22	7,5	28	13	21	M 6	5,3	4	10	NIP 4 MZ	–	8	2,33	2,32	***16***
22	7,5	28	13	21	M 6	5,3	4	10	NIP 4 MZ	3	8	2,33	2,32	
25	8	32,8	18	24	M 8	6,6	5	11	NIP 4 MZ	–	8	3,65	3,45	***20***
25	8	32,8	18	24	M 8	6,6	5	11	NIP 4 MZ	4	8	3,65	3,45	
30	9	40	22	29	M10	8,4	6	15	NIP 5 MZ	–	8	6,4	6,5	***25***
30	9	40	22	29	M10	8,4	6	15	NIP 5 MZ	5	8	6,4	6,5	
35	10	44,7	22	34	M10	8,4	6	15	NIP 5 MZ	–	8	9,6	9	***30***
35	10	44,7	22	34	M10	8,4	6	15	NIP 5 MZ	5	8	9,6	9	

Linear ball bearing units

open design
contact seals on both sides

Series KTSO..PP AS
KTSOS..PP AS



KTSO..PP AS

Dimension table · Dimensions in mm

Shaft diameter	Series		Mass	Dimensions				Mounting dimensions					
	KTSO..PP AS	KTSOS..PP AS		d	A	C	H	A_1	A_5	A_6[1]	C_2[2]	C_3[2]	D
d	Designation	Designation	≈kg					±0,15	±0,01		±0,15		
12	**KTSO 12 PP AS**	**–**	0,176	12	43	70	28	32	21,5	6,5	56	24	22
	–	**KTSOS 12 PP AS**	0,18	12	43	70	28	32	21,5	6,5	56	24	22
16	**KTSO 16 PP AS**	**–**	0,34	16	53	78	35	40	26,5	8,9	64	26	26
	–	**KTSOS 16 PP AS**	0,34	16	53	78	35	40	26,5	8,9	64	26	26
20	**KTSO 20 PP AS**	**–**	0,51	20	60	96	42	45	30	9,2	76	33	32
	–	**KTSOS 20 PP AS**	0,51	20	60	96	42	45	30	9,2	76	33	32
25	**KTSO 25 PP AS**	**–**	1,03	25	78	122	51	60	39	11,9	94	44	40
	–	**KTSOS 25 PP AS**	1,03	25	78	122	51	60	39	11,9	94	44	40
30	**KTSO 30 PP AS**	**–**	1,8	30	87	142	60	68	43,5	14,3	106	54	47
	–	**KTSOS 30 PP AS**	1,8	30	87	142	60	68	43,5	14,3	106	54	47

1) Dimensions A_6 on diameter d.

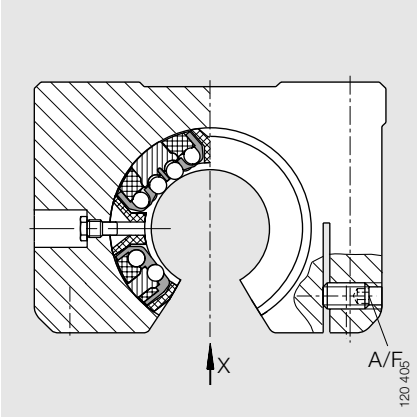
2) Dimensions and lubrication hole symmetrical with bearing width C.

3) For fixing screws to EN ISO 4762-8.8.
If there is a possibility of settling, the fixing screws should be secured against rotation.

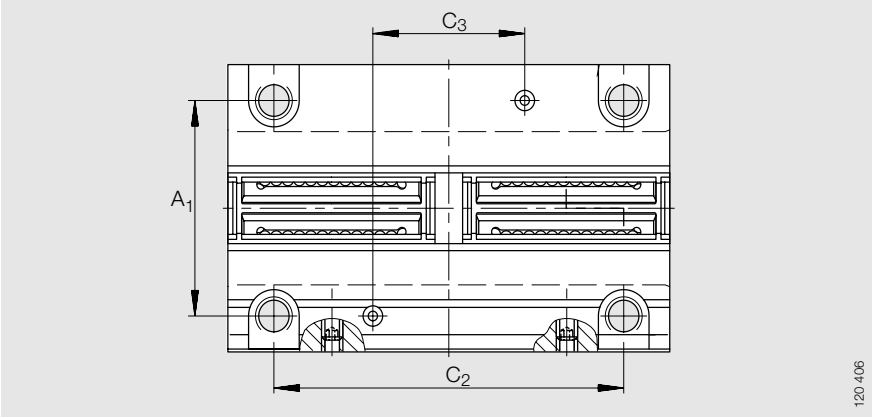
4) Lubrication nipple.

5) The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.
Basic load ratings in accordance with DIN 636-1.

6) Centring hole to DIN 332, type A.



KTSOS..PP AS
(same dimensions as KTSO..PP AS)



View X (rotated 90°)

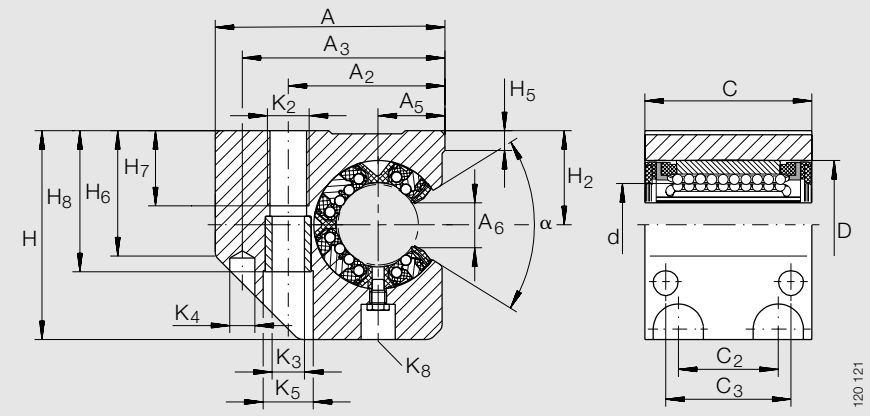
											Ball rows	Basic load ratings[5]		Shaft diameter
H_2 +0,008 –0,016	H_5	H_7	H_8	K_2	K_3[3]	K_4[6]	K_5[3]	K_8[4]	A/F	α Degrees	Quantity	dyn. C_{max} kN	stat. $C_{0\,max}$ kN	d
18	6,1	11	16,5	M 5	4,3	1,6×3,35	8	NIP 4 MZ	–	66	6	1,46	1,62	***12***
18	6,1	11	16,5	M 5	4,3	1,6×3,35	8	NIP 4 MZ	2,5	66	6	1,46	1,62	
22	7,5	13	21	M 6	5,3	1,6×3,35	10	NIP 4 MZ	–	68	6	2,33	2,32	***16***
22	7,5	13	21	M 6	5,3	1,6×3,35	10	NIP 4 MZ	2,5	68	6	2,33	2,32	
25	8	18	24	M 8	6,6	2,0×4,25	11	NIP 4 MZ	–	55	6	3,65	3,45	***20***
25	8	18	24	M 8	6,6	2,0×4,25	11	NIP 4 MZ	2,5	55	6	3,65	3,45	
30	8,8	22	29	M10	8,4	2,5×5,3	15	NIP 5 MZ	–	57	6	6,4	6,5	***25***
30	8,8	22	29	M10	8,4	2,5×5,3	15	NIP 5 MZ	3	57	6	6,4	6,5	
35	9,7	22	34	M10	8,4	2,5×5,3	15	NIP 5 MZ	–	57	6	9,6	9	***30***
35	9,7	22	34	M10	8,4	2,5×5,3	15	NIP 5 MZ	3	57	6	9,6	9	

Linear ball bearing units

Light range – metric sizes

sealed, greased,
with relubrication facility

Series KGSC..PP AS
KGSCS..PP AS



KGSC..PP AS

Dimension table · Dimensions in mm

Shaft diameter	Series		Mass	Dimensions				Mounting dimensions					
	KGSC..PP AS	KGSCS..PP AS		d	A	C	H	A_2	A_3	A_5	A_6[1]	C_2[2]	C_3[2]
d	Designation	Designation	≈kg					±0,15		±0,01		±0,15	
20	**KGSC 20 PP AS**	**–**	0,35	20	60	47	60	39	51	17	9,2	30	36
	–	**KGSCS 20 PP AS**	0,35	20	60	47	60	39	51	17	9,2	30	36
25	**KGSC 25 PP AS**	**–**	0,68	25	75	58	72	49	64	21	12	36	45
	–	**KGSCS 25 PP AS**	0,68	25	75	58	72	49	64	21	12	36	45
30	**KGSC 30 PP AS**	**–**	1	30	86	68	82	59	76	25	14,3	42	52
	–	**KGSCS 30 PP AS**	1	30	86	68	82	59	76	25	14,3	42	52
40	**KGSC 40 PP AS**	**–**	1,8	40	110	80	100	75	97	32	18,8	48	60
	–	**KGSCS 40 PP AS**	1,8	40	110	80	100	75	97	32	18,8	48	60
50	**KGSC 50 PP AS**	**–**	2,9	50	127	100	115	88	109	38	22,7	62	80
	–	**KGSCS 50 PP AS**	2,9	50	127	100	115	88	109	38	22,7	62	80

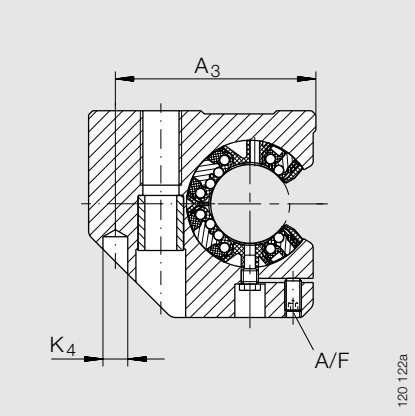
1) Dimension A_6 on diameter d.

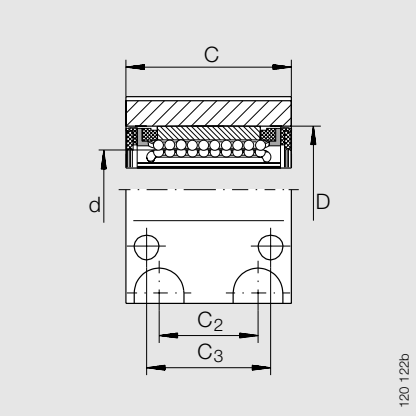
2) Dimension C_2 and lubrication hole symmetrical with bearing width C.

3) Centring for dowel hole.

4) For fixing screws to EN ISO 4762-8.8.
If there is a possibility of settling, the fixing screws should be secured against rotation.

5) The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.





KGSCS..PP AS

D	H_2 +0,008 –0,016	H_5	H_6	H_7	H_8	K_2	K_3 [3]	K_4 [4]	K_5 [3]	K_8 [2]	A/F	α Degrees	Ball rows Quantity	Basic load ratings [5] dyn. C_{max} kN	stat. $C_{0\,max}$ kN	Shaft diameter d
32	30	8,3	37,5	18	42,6	M10	8,4	6	15	NIP 4 MZ	–	55	6	2,2	1,73	***20***
32	30	8,3	37,5	18	42,6	M10	8,4	6	15	NIP 4 MZ	2,5	55	6	2,2	1,73	
40	35	8,2	45	22	50,6	M12	10,5	8	18	NIP 5 MZ	–	57	6	3,95	3,25	***25***
40	35	8,2	45	22	50,6	M12	10,5	8	18	NIP 5 MZ	3	57	6	3,95	3,25	
47	40	9	52	29	55,6	M16	13,5	10	20	NIP 5 MZ	–	57	6	5,9	4,5	***30***
47	40	9	52	29	55,6	M16	13,5	10	20	NIP 5 MZ	3	57	6	5,9	4,5	
62	45	9,5	60	36	67,6	M20	15,5	12	24	NIP 5 MZ	–	56	6	10,2	7,2	***40***
62	45	9,5	60	36	67,6	M20	15,5	12	24	NIP 5 MZ	4	56	6	10,2	7,2	
75	50	8,6	70	36	78,8	M20	17,5	12	26	NIP 6 MZ	–	54	6	15,1	10,4	***50***
75	50	8,6	70	36	78,8	M20	17,5	12	26	NIP 6 MZ	5	54	6	15,1	10,4	

Linear
ball bearing units

Light range – metric sizes

sealed, greased,
with relubrication facility

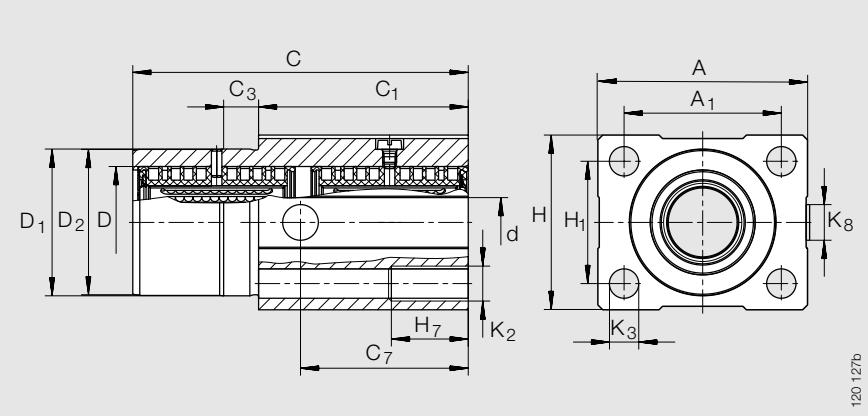
Series KTFS..PP AS

Dimension table · Dimensions in mm

Shaft diameter	Series KTFS..PP AS	Mass	Dimensions				Mounting dimensions				
			d	A	C	H	A_1	C_1	C_3	C_7	D
d	Designation	≈kg					±0,15				
12	**KTFS 12 PP AS**	0,2	12	41	70	34	32	40	10	35	22
16	**KTFS 16 PP AS**	0,3	16	50	78	40	38	50	10	39	26
20	**KTFS 20 PP AS**	0,5	20	60	96	50	45	60	10	48	32
25	**KTFS 25 PP AS**	1	25	74	122	60	56	73	10	61	40
30	**KTFS 30 PP AS**	1,4	30	84	142	70	64	82	10	71	47

1) Recommendation: locating bore D_1 H7.

2) The basic load ratings apply only to hardened (670 +170 HV) and ground shaft raceways.

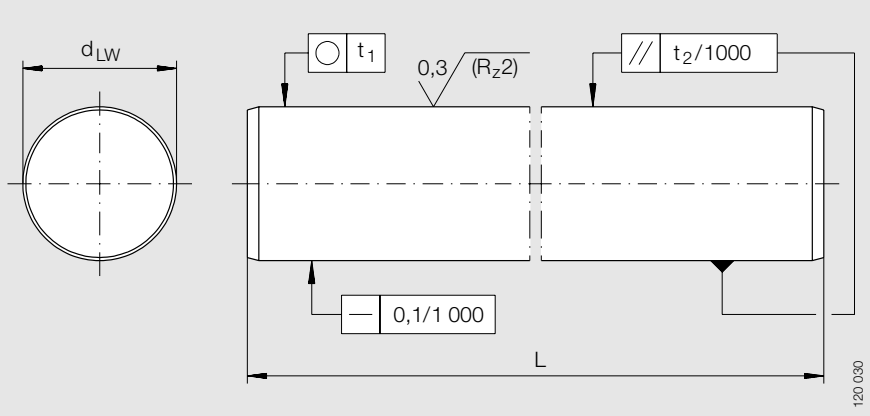


KTFS..PP AS

							Ball rows	Basic load ratings[2]		Shaft diameter
D_1[1]	D_2	H_1	H_7	K_2	K_3	K_8	Quantity	dyn. C_{max}	stat. $C_{0\,max}$	
g7	–0,1 –0,3	±0,15						kN	kN	d
30	30	24	13	M 6	5,3	M8×1	8	1,46	1,62	***12***
35	35	28	18	M 8	6,6	M8×1	8	2,33	2,32	***16***
42	42	35	22	M10	8,4	M8×1	8	3,65	3,45	***20***
52	52	42	26	M12	10,5	M8×1	8	6,4	6,5	***25***
61	61	50	35	M16	13,5	M8×1	8	9,6	9	***30***

Shafts

Series W



W

Dimension table · Dimensions in mm

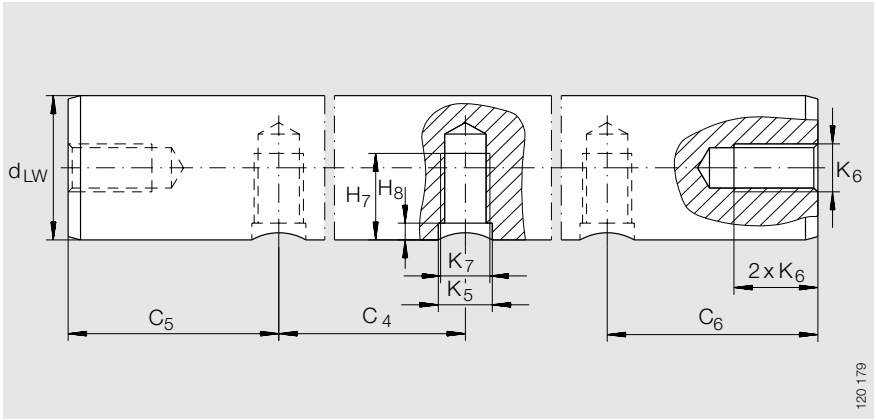
Shaft diameter	Designation	Mass	Length	Tolerances in µm			Roundness	Parallelism	Surface hardness depth
				Standard tolerance	Special tolerances[1]				
d_{LW}			L_{max}	h6	j5	f7	t_1	t_2[2]	Rht[3]
		kg/m					µm	µm	min.
5	**W 5**	0,15	3 600	0– 8	–	–	4	5	0,4
6	**W 6**	0,22	4 000	0– 8	–	–	4	5	0,4
8	**W 8**	0,39	4 000	0– 9	–	–	4	6	0,4
10	**W 10**	0,61	4 000	0– 9	–	–	4	6	0,4
12	**W 12**	0,89	6 000	0–11	+5–3	–16–34	5	8	0,6
14	**W 14**	1,21	6 000	0–11	+5–3	–16–34	5	8	0,6
15	**W 15**	1,37	6 000	0–11	–	–16–34	5	8	0,6
16	**W 16**	1,57	6 000	0–11	+5–3	–16–34	5	8	0,6
18	**W 18**	1,98	6 000	0–11	–	–16–34	5	8	0,6
20	**W 20**	2,45	6 000	0–13	+5–4	–20–41	6	9	0,9
24	**W 24**	3,55	6 000	0–13	–	–	6	9	0,9
25	**W 25**	3,83	6 000	0–13	+5–4	–20–41	6	9	0,9
30	**W 30**	5,51	6 000	0–13	+5–4	–20–41	6	9	0,9
32	**W 32**	6,3	6 000	0–16	–	–25–50	7	11	1,5
40	**W 40**	9,8	6 000	0–16	+6–5	–	7	11	1,5
50	**W 50**	15,3	6 000	0–16	+6–5	–	7	11	1,5
60	**W 60**	22,1	6 000	0–19	–	–	8	13	2,2
80	**W 80**	39,2	6 000	0–19	–	–	8	13	2,2

[1] Only for shafts made from quenched and tempered steel.

[2] Measured diameter variation.

[3] According to DIN 6 773, Part 3.

Recommended threaded holes



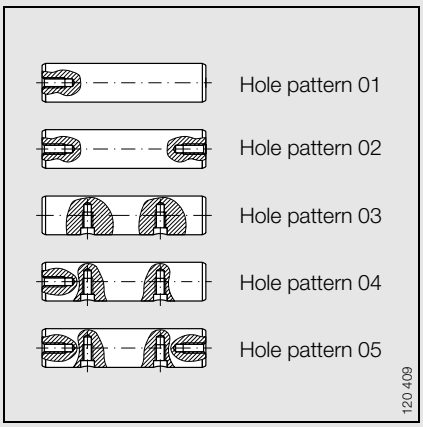
Recommended threaded holes for shafts W

Dimension table · Dimensions in mm

Shaft diameter[1]	Axial threaded hole										Radial threaded hole								
	K_6										Dimensions								
											C_4			$C_{5\,min}$, $C_{6\,min}$[2]		H_7	H_8	K_5	K_7
														03	04–05				
W 8	M3	–	–	–	–	–	–	–	–	–	–	–	–	–	$3\times K_6 + K_7$	–	–	–	–
W 10	M3	M4	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
W 12	–	M4	M5	–	–	–	–	–	–	–	75	–	120	10		7	2	5	M4
W 14	–	M4	M5	M6	–	–	–	–	–	–	–	–	–	–		–	–	–	–
W 15	–	–	M5	M6	M8	–	–	–	–	–	–	–	–	–		–	–	–	–
W 16	–	–	M5	M6	M8	–	–	–	–	–	75	100	150	15		9	2,5	6	M5
W 18	–	–	–	M6	M8	M10	–	–	–	–	–	–	–	–		–	–	–	–
W 20	–	–	–	–	–	–	–	–	–	–	–	–	150	15		9	2,5	6	M5
W 20	–	–	–	M6	M8	M10	–	–	–	–	75	100	150	15		11	3	7	M6
W 24	–	–	–	–	M8	M10	M12	–	–	–	–	–	–	–		–	–	–	–
W 25	–	–	–	–	–	–	–	–	–	–	–	–	150	15		11	3	7	M6
W 25	–	–	–	–	M8	M10	M12	–	–	–	75	120	200	15		15	3	9	M8
W 30	–	–	–	–	–	–	–	–	–	–	–	–	150	15		11	3	7	M6
W 30	–	–	–	–	–	M10	M12	M16	–	–	100	150	200	20		17	3,5	11	M10
W 32	–	–	–	–	–	M10	M12	M16	–	–	–	–	–	–		–	–	–	–
W 40	–	–	–	–	–	M10	M12	M16	–	–	150	200	300	20		19	4	11	M10
W 40	–	–	–	–	–	M10	M12	M16	–	–	100	–	–	20		21	4	13	M12
W 50	–	–	–	–	–	–	–	–	–	–	–	–	150	20		19	4	11	M10
W 50	–	–	–	–	–	–	M12	M16	M20	–	–	200	300	20		21	4	13	M12
W 50	–	–	–	–	–	–	M12	M16	M20	–	100	–	–	20		25	4	15	M14
W 60	–	–	–	–	–	–	–	M16	M20	M24	–	–	–	–		–	–	–	–
W 80	–	–	–	–	–	–	–	M16	M20	M24	–	–	–	–		–	–	–	–

[1] For dimensions, see page 24.

[2] C_5 and C_6 are dependent on the shaft length.
For versions with hole patterns 04 and 05,
the axial threaded hole must be taken into consideration.



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