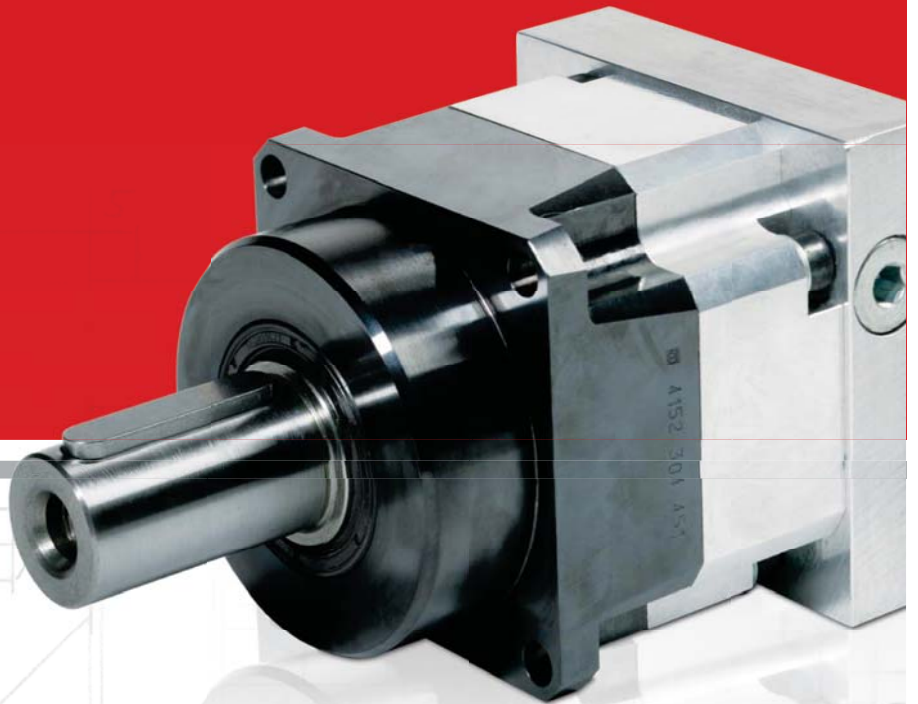


Power transmission technology

Low backlash planetary gearheads

Low backlash planetary gearheads



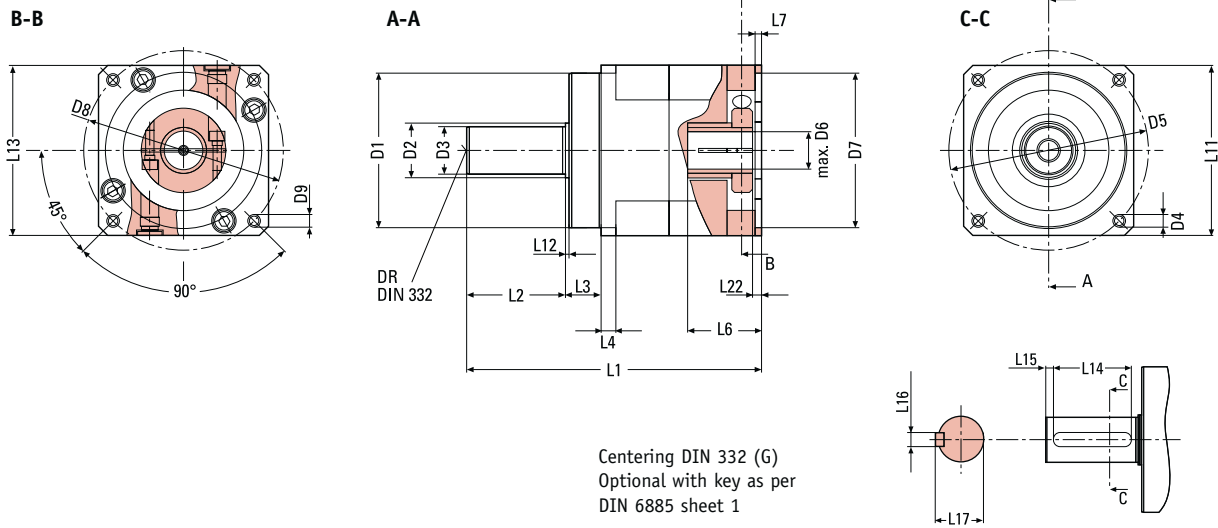
planetdrive[®] PDH



PDH

DIMENSION SHEET

» picture 1



Planetary gearheads, one-stage

» table 1

Dimensions [mm]		Size					
		PDH 25/1	PDH 100/1	PDH 200/1	PDH 500/1	PDH 1200/1	PDH 3000/1
DR		M5	M8	M12	M16	M20	M20
D1 (g6)		60	70	90	130	160	200
D2		20	28	40	45	60	95
D3 (k6)		16	22	32	40	55	85
D4		5,5	6,6	9	11	13	17
D5		68	85	120	165	215	290
D6 (F7) ①	min.	6	14	19	24	32	42
	max.	14	24	32	38	48	60
L1 ①		129,5	155,7	193,1	245,6	290	399,5
L2 (+0.5)		28	36	58	82	82	130
L3		20	20	30	30	30	40
L4		7,7	8	10	12,5	22	30
L6 ①	min.	15	23	30	32	45	55
	max.	30	40	50	60	82	110
L7 ①		3,5	4,5	5,5	5,3	8	8
L11		62	76	101	141	182	242
L12		2	2	2	3	3	3
L13 ①	min.	62	80	106	141	182	242
L14		22	28	50	70	70	110
L15		3	4	4	5	5	7,5
L16		5	6	10	12	16	22
L17		18	24,5	35	43	59	90
L22 ①		4,5	7,5	8,5	7,5	9	10
D7/D8/D9		Adaptations available for all common servomotors					

① Dimensions depend on motor connection dimensions

Planetary gearheads, one-stage

» table 2

Power values		Size						
		i ^⑦	PDH 25/1	PDH 100/1	PDH 200/1	PDH 500/1	PDH 1200/1	PDH 3000/1
Nominal output torque Also applicable for S1 operation	T _{2N} [Nm]	3	-	-	120	280	720	1800
		4	25	85	170	420	1020	2500
		5	25	100	200	500	1200	3000
		7	25	85	170	420	1020	2500
		10	20	60	120	280	720	1800
max. acceleration torque ^②	T _{2B} [Nm]	3	-	-	220	560	1440	3000
		4	50	170	340	840	2040	5000
		5	50	200	400	1000	2400	6000
		7	50	170	340	840	2040	5000
		10	40	110	220	560	1440	3000
Emergency stop torque ^①	T _{2NOT} [Nm]	3	-	-	400	840	2160	5400
		4	100	280	560	1260	3060	7500
		5	100	330	660	1500	3600	9000
		7	80	280	560	1260	3060	7500
		10	80	200	400	840	2160	5400
Moment of inertia	I ₁ [kgcm ²]	3	-	-	2,8	8,2	36	128
		4	0,16	0,55	2,0	6,75	24,5	97,6
		5	0,16	0,47	1,64	5,54	18,8	76,4
		7	0,15	0,41	1,36	4,59	14,5	59,9
		10	0,14	0,38	1,22	4,1	12,3	51,1
Backlash standard reduced ^③	[arcmin]	-	≤ 6	≤ 6	≤ 4	≤ 4	≤ 4	≤ 4
		-	≤ 3	≤ 3	≤ 2	≤ 2	≤ 2	≤ 2
Torsional rigidity	C _t [Nm/arcmin]	-	3,5	8,2	24	48	149	340
Efficiency ^⑧	η [%]	-	≥ 97	≥ 97	≥ 97	≥ 97	≥ 97	≥ 97
Nominal input speed	n _{1N} [rpm]	3	-	-	2300	1800	1300	800
		4	3000	3000	2500	2000	1500	1000
		5	4000	4000	3000	2500	2000	1200
		7	5000	5000	4000	3000	2500	1500
		10	6000	6000	5000	4000	3000	2000
max. input speed ^⑤	n _{1Max} [rpm]	3	-	-	4000	3200	2500	2000
		4	5000	5000	4000	3200	2500	2000
		5	6300	6300	5000	4000	3200	2500
		7	8000	8000	6300	5000	4000	3000
		10	10000	10000	8000	6300	5000	3500
max. radial force ^④	F _R [N]	-	2700	3700	6700	9200	14000	21000
max. axial force	F _A [N]	-	3200	4500	7000	10000	15000	22000
Weight approx.	m [kg]	-	1,6	2,9	5,7	11,5	27	62
Service life	L _h [h]	-	> 20000	> 20000	> 20000	> 20000	> 20000	> 20000
Operating noise at (n ₁ = 3000 rpm) ^⑥	L _P [dB (A)]	-	≤ 63	≤ 68	≤ 68	≤ 72	≤ 72	≤ 72

Lubrication	Lifetime lubrication, closed system
Surface protection	Aluminium respectively steel, galvanically treated
Mounting positions	Optional, variable at any time
Operating temperature	-10 °C to +90 °C
Direction of rotation	Input and output in the same direction
Protective system	IP 65

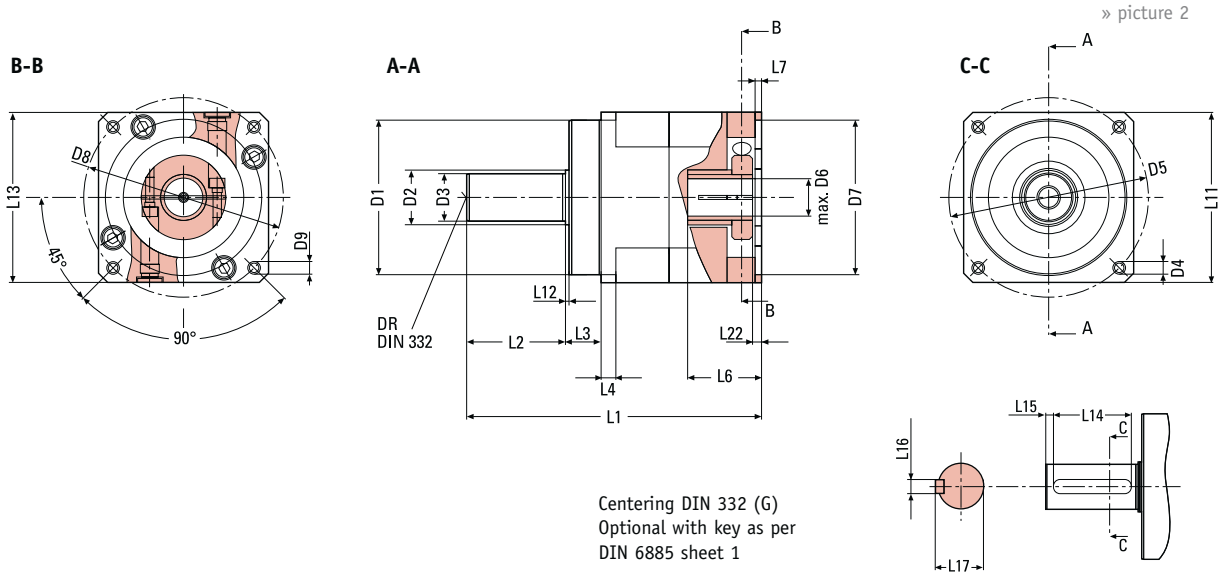
- ① Up to a maximum of 1000 times permissible during gearbox service life
 ② At a maximum of 1000 cycles per hour
 Percentage of the total running time less than 5 % and duration of the impulse less than 0.3 seconds

- ③ Optional
 ④ Point of application is the center of output shaft at output speed 300 rpm
 ⑤ For cyclic duty only

- ⑥ At i=3: + 4 db(A)
 ⑦ i = ratio
 ⑧ With full load

PDH

DIMENSION SHEET



Planetary gearheads, two-stage

Dimensions [mm]		Size				
		PDH 25/2	PDH 100/2	PDH 200/2	PDH 500/2	PDH 1200/2
DR		M5	M8	M12	M16	M20
D1 (g6)		60	70	90	130	160
D2		20	28	40	45	60
D3 (k6)		16	22	32	40	55
D4		5,5	6,6	9	11	13
D5		68	85	120	165	215
D6 (F7) ①	min.	6	11	14	19	19
	max.	14	24	32	38	38
L1 ①		153,0	182,2	236,0	296,0	335,2
L2 (+0.5)		28	36	58	82	82
L3		20	20	30	30	30
L4		7,7	8	10	12,5	22
L6 ①	min.	15	23	30	32	45
	max.	30	40	50	60	82
L7 ①		3,5	4,5	5,5	5,3	8
L11		62	76	101	141	182
L12		2	2	2	3	3
L13 ①	min.	62	80	106	141	182
L14		22	28	50	70	70
L15		3	4	4	5	5
L16		5	6	10	12	16
L17		18	24,5	35	43	59
L22 ①		4,5	7,5	8,5	7,5	9
D7/D8/D9		Adaptations available for all common servomotors				

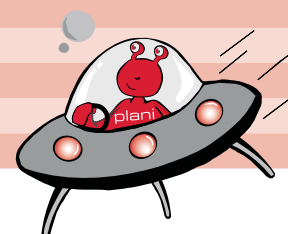
① Dimensions depend on motor connection dimensions

Planetary gearheads, two-stage

» table 4

Power values		Size					
		i ⑦	PDH 25/2	PDH 100/2	PDH 200/2	PDH 500/2	PDH 1200/2
Nominal output torque Also applicable for S1 operation	T _{2N} [Nm]	20, 35, 40, 70,	25	85	170	420	1020
		25, 50,	25	100	200	500	1200
		100	20	60	120	280	720
max. acceleration torque ②	T _{2B} [Nm]	20, 35, 40, 70,	50	170	340	840	2040
		25, 50,	50	200	400	1000	2400
		100	40	110	220	560	1440
Emergency stop torque ①	T _{2NOT} [Nm]	20, 35, 40, 70,	100	280	560	1260	3060
		25, 50,	100	330	660	1500	3600
		100	80	200	400	840	2160
Moment of inertia	I _I [kgcm ²]	20	0,12	0,47	1,56	5,29	6,95
		25	0,12	0,47	1,54	5,25	6,70
		35	0,12	0,47	1,53	5,21	6,53
		40	0,10	0,47	1,44	4,96	5,51
		50	0,10	0,47	1,44	4,96	5,45
		70	0,10	0,46	1,44	4,94	5,42
		100	0,10	0,46	1,44	4,94	5,39
Backlash standard reduced ③	[arcmin]	-	≤ 8	≤ 8	≤ 6	≤ 6	≤ 6
		-	≤ 6	≤ 6	≤ 4	≤ 4	≤ 4
Torsional rigidity	C _t [Nm/arcmin]	-	3,5	8,2	24	48	149
Efficiency ⑧	η [%]	-	≥ 94	≥ 94	≥ 94	≥ 94	≥ 94
Nominal input speed	n _{1N} [rpm]	20, 25, 35,	4000	4000	3000	2500	2000
		40, 50, 70, 100	6000	6000	5000	4000	3000
max. input speed ⑤	n _{1Max} [rpm]	20, 25, 35,	6300	6300	5000	4000	3200
		40, 50, 70, 100	10000	10000	8000	6300	5000
max. radial force ④	F _R [N]	-	2700	3700	6700	9200	14000
max. axial force	F _A [N]	-	3200	4500	7000	10000	15000
Weight approx.	m [kg]	-	2,2	3,8	7,5	15	35
Service life	L _h [h]	-	> 20000	> 20000	> 20000	> 20000	> 20000
Operating noise at (n ₁ = 3000 rpm) ⑥	L _p [dB (A)]	-	≤ 63	≤ 68	≤ 68	≤ 72	≤ 72

Lubrication	Lifetime lubrication, closed system
Surface protection	Aluminium respectively steel, galvanically treated
Mounting positions	Optional, variable at any time
Operating temperature	-10 °C to +90 °C
Direction of rotation	Input and output in the same direction
Protective system	IP 65

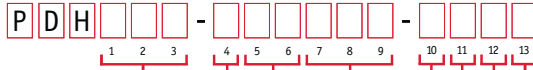


- ① Up to a maximum of 1000 times permissible during gearbox service life
 ② At a maximum of 1000 cycles per hour
 Percentage of the total running time less than 5 % and duration of the impulse less than 0.3 seconds

- ③ Optional
 ④ Point of application is the center of output shaft at output speed 300 rpm
 ⑤ For cyclic duty only

- ⑥ At i=3: + 4 db(A)
 ⑦ i = ratio
 ⑧ With full load

Overview ordering number



» table 5

Size	Size
	Code
PDH 25/1, PDH 25/2	002
PDH 100/1, PDH 100/2	010
PDH 200/1, PDH 200/2	020
PDH 500/1, PDH 500/2	050
PDH 1200/1, PDH 1200/2	120
PDH 3000/1, PDH 3000/2	300

Size	Flange code	D7	D8	D9	L6	L6	L7	L22
		[mm]	[mm]	[mm]	min. [mm]	max. [mm]	[mm]	[mm]
	AA	30,0	45,0	M3	15	30	4	4,5
	AB	30,0	46,0	M4	15	30	4	4,5
	AC	36,0	70,7	M4	15	30	4	4,5
	AD	40,0	63,0	M4	15	30	3,5	4,5
	AE	40,0	63,0	M5	15	30	3,5	4,5
	AF	40,0	70,0	M4	15	30	3,5	4,5
	AG	50,0	60,0	M4	15	30	3,5	4,5
	AH	50,0	65,0	D5,5	15	30	3,5	4,5
	AI	50,0	70,0	M4	15	30	3,5	4,5
PDH 25/1	AJ	50,0	70,0	M5	15	30	3,5	4,5
PDH 25/2	AK	50,0	80,0	M5	15	30	4	4,5
	AL	50,0	95,0	M6	15	30	4	4,5
	AM	50,0	100,0	M6	15	30	3,5	4,5
	AN	60,0	75,0	M5	15	30	3,5	4,5
	AO	60,0	90,0	M5	15	30	4	4,5
	AP	70,0	90,0	M5	17	32	4	6,5
	AQ	70,0	90,0	M5	19	34	5,5	8,5
	AR	70,0	90,0	M6	15	30	3,5	4,5
	AS	73,05	98,5	M5	15	30	3	4,5
	AT	80,0	100,0	M6	15	30	3,5	4,5
	AA	50,0	95,0	M6	23	40	5,5	7,5
	AB	50,0	100,0	M6	23	40	5,5	7,5
	AC	60,0	75,0	M5	23	40	4,3	7,5
	AD	60,0	99,0	M6	23	40	4,3	7,5
	AE	70,0	90,0	M5	23	40	4,3	7,5
	AF	70,0	90,0	M6	23	40	4,3	7,5
	AG	80,0	100,0	M6	23	40	4,3	7,5
PDH 100/1	AH	95,0	115,0	M8	23	40	4,3	7,5
PDH 100/2	AI	95,0	130,0	M8	23	40	4,3	7,5
	AJ	110,0	130,0	M8	23	40	4,3	7,5
	AK	110,0	130,0	M8	34	51	4,3	18,5
	AL	110,0	145,0	M8	23	40	4,3	7,5
	AM	110,0	145,0	M8	34	51	6,5	18,5
	AN	110,0	145,0	M8	41	58	6,5	25,5
	AO	110,0	165,0	M10	34	51	4,3	18,5
	AP	80,0	100,0	M6	41	58	4,3	25,5
	AQ	95	115,0	M8	41	58	4,3	25,5
	AR	95	115,0	M8	27	44	6,3	11,5
	AA	95,0	115,0	M8	30	50	5,5	8,5
	AB	95,0	130,0	M8	30	50	5,5	8,5
	AC	110,0	130,0	M8	30	50	5,5	8,5
PDH 200/1	AD	110,0	145,0	M8	30	50	6,5	8,5
PDH 200/2	AE	110,0	145,0	M8	40	60	6,5	18,5
	AG	110,0	145,0	M8	45	65	6,5	23,5
	AH	110,0	165,0	M10	30	50	6,5	8,5
	AI	130,0	165,0	M10	40	60	6,5	18,5
	AJ	80,0	100,0	M6	30	50	5,5	8,5
	AA	110,0	145,0	M8	32	60	6,5	7,5
	AB	110,0	145,0	M8	38	66	6,3	13,5
	AC	110,0	165,0	M10	32	60	5,3	7,5
	AD	114,3	200,0	M12	32	60	5,3	7,5
PDH 500/1	AE	114,3	200,0	M12	52	80	7,5	27,5
PDH 500/2	AF	130,0	165,0	M10	32	60	5,3	7,5
	AG	130,0	165,0	M10	38	66	5,3	13,5
	AH	130,0	215,0	M12	32	60	5,3	7,5
	AI	180,0	215,0	M12	32	60	5,3	7,5
	AJ	180,0	215,0	M12	52	80	5,3	27,5
	AA	114,3	200,0	M12	45	82	8	9
	AB	114,3	200,0	M12	76	113	8	40
	AC	130,0	215,0	M12	45	82	8	9
	AD	180,0	215,0	M12	45	82	8	9
PDH 1200/1	AE	200,0	235,0	M12	45	82	8	9
	AF	200,0	235,0	M12	79	116	8	43
	AG	230,0	265,0	M12	45	82	8	9
	AH	250,0	300,0	M16	45	82	8	9
	AI	250,0	300,0	M16	73	110	8	37
	AJ	110,0	145,0	M8	32	60	6,5	7,5
	AK	110,0	145,0	M8	38	66	6,3	13,5
	AL	110,0	165,0	M10	32	60	5,3	7,5
	AM	114,3	200,0	M12	32	60	5,3	7,5
	AN	114,3	200,0	M12	52	80	7,5	27,5
PDH 1200/2	AO	130,0	165,0	M10	32	60	5,3	7,5
	AP	130,0	165,0	M10	38	66	6,3	13,5
	AQ	130,0	215,0	M12	32	60	5,3	7,5
	AR	180,0	215,0	M12	32	60	5,3	7,5
	AS	180,0	215,0	M12	52	80	5,3	27,5
	AA	200,0	235,0	M12	61	116	8	15
	AB	242,0	300,0	M16	61	116	8	15
PDH 3000/1	AC	250,0	300,0	M16	55	110	8	9
	AD	300,0	350,0	M16	55	110	8	9
	AE	300,0	350,0	M16	85	140	8	39

Ratio	Code
3	003 ①
4	004
5	005
7	007
10	010
20	020
25	025
35	035
40	040
50	050
70	070
100	100

Size	D6	Motor shaft
	[mm]	Code
	6,0	A
	7,0	B
	8,0	C
PDH 25/1	9,0	D
PDH 25/2	10,0	E
	11,0	F
	12,0	G
	12,7	H
	14,0	I
	14,0	A
	15,0	B
PDH 100/1	16,0	C
PDH 100/2	19,0	D
	22,0	E
	24,0	F
	11,0	G
	19,0	A
	22,0	B
PDH 200/1	24,0	C
PDH 200/2	28,0	D
	32,0	E
	14,0	F
	22,0	A
	24,0	B
PDH 500/1	28,0	C
PDH 500/2	32,0	D
	35,0	E
	38,0	F
	19,0	G
	32,0	A
	35,0	B
PDH 1200/1	38,0	C
	42,0	D
	48,0	E
	22,0	F
PDH 1200/2	24,0	G
	28,0	H
	32,0	I
	35,0	J
	38,0	K
	19,0	L
	42,0	A
PDH 3000/1	48,0	B
	55,0	C
	60,0	D

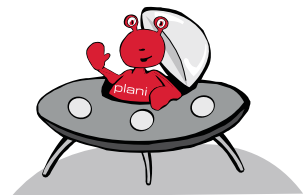
Output shaft	Form
	Code
Plain	0
Key	1

Backlash	Backlash
	Code
Standard	A
Reduced	B

Output flange	Type Code
Standard	A
Substitute	B

Version
0

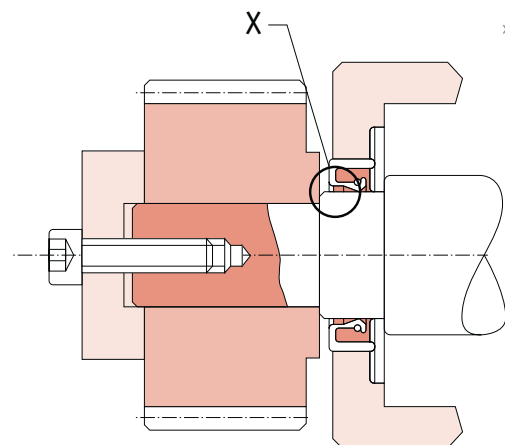
① Available for gearhead size
 PDH 200/1
 PDH 500/1
 PDH 1200/1
 PDH 3000/1



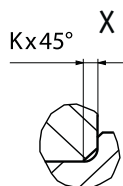
Gearhead output shaft

» table 6

Thread	Size					
	PDH	PDH	PDH	PDH	PDH	PDH
	25/1	100/1	200/1	500/1	1200/1	3000/1
K min. [mm]	0,8	1,4	1,4	0,8	0,8	1,4
K max. [mm]	1,0	1,6	1,6	1,0	1,0	1,6



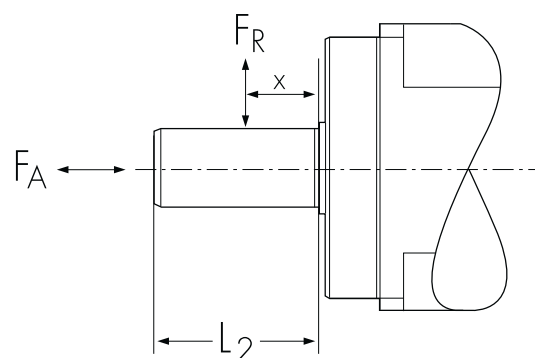
» picture 3



The connecting part on the gearhead output shaft must have a chamfer "K" (high of chamfer see table) on the contact pattern to the gearhead.

Permissible shaft loads

The permissible shaft loads in axial or radial direction correspond to a nominal bearing service life of 15000 operating hours at a constant output shaft speed of 300 rpm.



» picture 4

Force (load) application points on gearhead output shaft:
 F_A = permitted axial force; F_R = permitted radial force
 x = distance

» picture 5



- High radial forces and an extreme resistance against tilt through large-dimensioned taper roller bearings.
- High torsional rigidity thanks to an optimized sungear with a stable two-sided support for the planetary gears.
- Highest positional accuracy is achieved by using ground and highly accurated gears.

- Low running noise thanks to an optimized gear tooth shape.
- High quality shaft seals ensure a permanent and save sealing.

Contact

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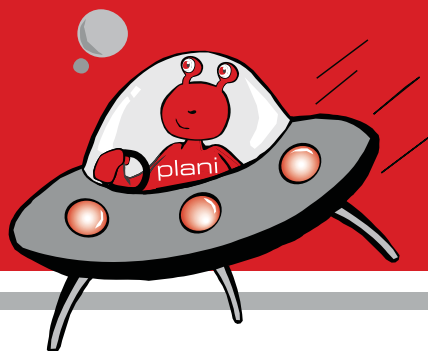
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