



15.1 Overview

Helical-geared precision right-angle planetary geared motors

Technical data

i	12 – 486
M_{2acc}	68 – 2700 Nm
$\Delta\varphi_2$	3.5 – 5 arcmin
η	$\leq 94\%$

Features

Power density	★★★★☆
Backlash	★★★★☆
Price category	€€€
Shaft load	★★★★☆
Smooth operation	★★★★☆
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Continuous operation without cooling	✓
Reinforced output bearing	✓ (optional)
Compact and highly dynamic due to direct motor attachment	✓

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Key: ★☆☆☆☆ good | ★★★★★ excellent





15.2 Selection tables

The technical data specified in the selection tables applies to:

- Installation altitudes up to 1000 m above sea level
- Surrounding temperatures from 0 °C to 40 °C
- Drives with convection-cooled motors (e.g. EZ401U)

You can calculate the technical data for drives with forced ventilated motors (for example EZ401B) at <http://products.stoeber.de>.

Formula symbol	Unit	Explanation
a_{th}	–	Parameter for calculating $K_{mot,th}$
C_2	Nm/ arcmin	Torsional stiffness of gear unit (final stiffness) relative to the gear unit output
$\Delta\varphi_2$	arcmin	Backlash at the output shaft with a blocked input
η	%	Efficiency
i	–	Gear ratio
i_{exakt}	–	Mathematically exact gear ratio
J_1	10^{-4}kgm^2	Mass moment of inertia relative to the gear unit input
m	kg	Weight
$M_{2,0}$	Nm	Stall torque on the gear unit output
M_{2acc}	Nm	Maximum permitted acceleration torque on the gear unit output
$M_{2acc,max}$	Nm	Maximum permitted acceleration torque of a group of geared motors whose size and nominal torque n_{1N} are the same
M_{2N}	Nm	Nominal torque on the gear unit output (relative to n_{1N})
M_{2NOT}	Nm	Gear unit emergency-off torque on the gear unit output for max. 1000 load changes
$n_{1maxDBH}$	rpm	Maximum permitted input speed of the gear unit in continuous operation Installation positions EL1, EL2 (at surrounding temperature of 20 °C)
$n_{1maxDBV}$	rpm	Maximum permitted input speed of the gear unit in continuous operation Installation positions EL3, EL4, EL5, EL6 (at surrounding temperature of 20 °C)
n_{1maxZB}	min^{-1}	Maximum permitted input speed of the gear unit in cyclic operation (at surrounding temperature of 20 °C)
n_{1N}	min^{-1}	Nominal speed at the gear unit input
n_{2N}	min^{-1}	Nominal speed at the gear unit output
S	–	Load value: Quotient of gear unit and motor nominal torque without regard to the thermal performance limit. Represents a value for the reserve of the geared motor.



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15.2 Selection tables



n_{2N} [rpm]	M_{2N} [Nm]	$M_{2,0}$ [Nm]	a_{th}	S	Type	M_{2acc} [Nm]	M_{2NOT} [Nm]	i	i_{exakt}	n_{1max} DBH [rpm]	n_{1max} DBV [rpm]	n_{1max} ZB [rpm]	J_1 [10 ⁻⁴ kgm ²]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/ arcmin]	m [kg]
P5K ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 300$ Nm)																
13	205	210	12	1.0	P521_0050 K102VF0470 EZ301U	300	600	234.6	11495/49	4000	4000	6000	0.22	4	26	17
17	154	157	11	1.4	P521_0050 K102VF0350 EZ301U	300	600	175.5	3686/21	4000	4000	6000	0.23	4	26	17
21	123	125	11	1.7	P521_0050 K102VF0280 EZ301U	300	600	140.2	2945/21	4000	4000	6000	0.26	4	26	17
21	210	222	18	1.0	P521_0050 K102VF0280 EZ302U	300	600	140.2	2945/21	4000	4000	6000	0.36	4	26	18
26	102	104	10	2.1	P521_0050 K102VF0230 EZ301U	300	600	116.3	5700/49	4000	4000	6000	0.28	4	26	17
26	174	184	18	1.2	P521_0050 K102VF0230 EZ302U	300	600	116.3	5700/49	4000	4000	6000	0.38	4	26	18
34	77	78	9.6	2.7	P521_0050 K102VF0175 EZ301U	230	600	87.82	10450/119	4000	3800	5500	0.32	4	26	17
34	131	139	16	1.6	P521_0050 K102VF0175 EZ302U	300	600	87.82	10450/119	4000	3800	5500	0.42	4	26	18
34	171	181	21	1.2	P521_0050 K102VF0175 EZ303U	300	600	87.82	10450/119	4000	3800	5500	0.53	4	26	18
43	62	63	9.1	3.4	P521_0050 K102VF0140 EZ301U	190	530	70.57	494/7	4000	3800	5500	0.37	4	26	17
43	106	112	16	2.0	P521_0050 K102VF0140 EZ302U	300	530	70.57	494/7	4000	3800	5500	0.47	4	26	18
43	137	145	20	1.5	P521_0050 K102VF0140 EZ303U	300	530	70.57	494/7	4000	3800	5500	0.58	4	26	18
43	186	199	27	1.1	P521_0050 K102VF0140 EZ401U	300	600	70.57	494/7	4000	3800	5500	1.1	4	26	19
52	51	52	8.6	4.2	P521_0050 K102VF0115 EZ301U	150	430	57.83	1330/23	3600	3300	5000	0.43	4	26	17
52	87	91	15	2.4	P521_0050 K102VF0115 EZ302U	270	430	57.83	1330/23	3600	3300	5000	0.53	4	26	18
52	113	119	19	1.9	P521_0050 K102VF0115 EZ303U	300	430	57.83	1330/23	3600	3300	5000	0.64	4	26	18
52	152	163	26	1.4	P521_0050 K102VF0115 EZ401U	300	600	57.83	1330/23	3600	3300	5000	1.2	4	26	19
65	69	73	14	3.0	P521_0050 K102VF0092 EZ302U	220	350	46.25	8740/189	3600	3300	5000	0.62	4	26	18
65	90	95	18	2.3	P521_0050 K102VF0092 EZ303U	260	350	46.25	8740/189	3600	3300	5000	0.73	4	26	18
65	122	131	25	1.7	P521_0050 K102VF0092 EZ401U	300	600	46.25	8740/189	3600	3300	5000	1.3	4	26	19
65	187	205	38	1.1	P521_0050 K102VF0092 EZ501U	300	600	46.25	8740/189	3600	3300	5000	3.2	4	26	20
65	205	226	41	1.0	P521_0050 K102VF0092 EZ402U	300	600	46.25	8740/189	3600	3300	5000	2.0	4	26	21
72	62	66	14	3.4	P521_0050 K102VF0083 EZ302U	200	310	41.55	1911/46	3600	3300	5000	0.59	4	26	18
72	81	86	18	2.6	P521_0050 K102VF0083 EZ303U	230	310	41.55	1911/46	3600	3300	5000	0.70	4	26	18
72	109	117	24	1.9	P521_0050 K102VF0083 EZ401U	300	600	41.55	1911/46	3600	3300	5000	1.2	4	26	19
72	168	184	37	1.2	P521_0050 K102VF0083 EZ501U	300	600	41.55	1911/46	3600	3300	5000	3.2	4	26	20
72	184	203	40	1.1	P521_0050 K102VF0083 EZ402U	300	600	41.55	1911/46	3600	3300	5000	1.9	4	26	21
90	50	53	13	3.8	P521_0050 K102VF0066 EZ302U	160	250	33.22	299/9	3600	3300	5000	0.71	4	26	18
90	65	68	17	2.9	P521_0050 K102VF0066 EZ303U	190	250	33.22	299/9	3600	3300	5000	0.82	4	26	18
90	88	94	23	2.4	P521_0050 K102VF0066 EZ401U	270	500	33.22	299/9	3600	3300	5000	1.3	4	26	19
90	134	147	35	1.6	P521_0050 K102VF0066 EZ501U	300	600	33.22	299/9	3600	3300	5000	3.3	4	26	20
90	147	163	38	1.4	P521_0050 K102VF0066 EZ402U	300	500	33.22	299/9	3600	3300	5000	2.0	4	26	21
100	45	47	13	3.8	P521_0050 K102VF0060 EZ302U	140	230	30.00	30/1	3300	2800	4500	0.78	4	26	18
100	58	62	16	2.9	P521_0050 K102VF0060 EZ303U	170	230	30.00	30/1	3300	2800	4500	0.89	4	26	18
100	79	85	22	2.7	P521_0050 K102VF0060 EZ401U	240	450	30.00	30/1	3300	2800	4500	1.4	4	26	19
100	121	133	34	1.7	P521_0050 K102VF0060 EZ501U	300	600	30.00	30/1	3300	2800	4500	3.4	4	26	20
100	133	147	37	1.6	P521_0050 K102VF0060 EZ402U	300	450	30.00	30/1	3300	2800	4500	2.1	4	26	21
100	209	226	58	1.0	P521_0050 K102VF0060 EZ502U	300	600	30.00	30/1	3300	2800	4500	5.7	4	26	22
108	42	44	12	3.8	P521_0050 K102VF0056 EZ302U	130	210	27.84	7600/273	3300	2800	4500	0.97	4	26	18
108	54	57	16	2.9	P521_0050 K102VF0056 EZ303U	160	210	27.84	7600/273	3300	2800	4500	1.1	4	26	18
108	73	79	22	2.9	P521_0050 K102VF0056 EZ401U	220	420	27.84	7600/273	3300	2800	4500	1.6	4	26	19
108	113	123	33	1.9	P521_0050 K102VF0056 EZ501U	300	600	27.84	7600/273	3300	2800	4500	3.6	4	26	20
108	123	136	36	1.7	P521_0050 K102VF0056 EZ402U	300	420	27.84	7600/273	3300	2800	4500	2.3	4	26	21
108	181	225	53	1.2	P521_0050 K102VF0056 EZ404U	300	600	27.84	7600/273	3300	2800	4500	3.7	4	26	23
108	194	210	57	1.1	P521_0050 K102VF0056 EZ502U	300	600	27.84	7600/273	3300	2800	4500	5.9	4	26	22
108	194	217	57	1.1	P521_0050 K102VF0056 EZ701U	300	600	27.84	7600/273	3300	2800	4500	9.2	4	26	24
150	39	41	15	2.9	P521_0050 K102VF0040 EZ303U	110	150	20.00	20/1	3300	2800	4500	1.3	4	26	18
150	53	56	20	4.0	P521_0050 K102VF0040 EZ401U	160	300	20.00	20/1	3300	2800	4500	1.8	4	26	19
150	81	88	31	2.6	P521_0050 K102VF0040 EZ501U	300	600	20.00	20/1	3300	2800	4500	3.8	4	26	20
150	88	98	34	2.4	P521_0050 K102VF0040 EZ402U	230	300	20.00	20/1	3300	2800	4500	2.5	4	26	21
150	130	162	49	1.6	P521_0050 K102VF0040 EZ404U	300	600	20.00	20/1	3300	2800	4500	3.9	4	26	23
150	139	151	53	1.5	P521_0050 K102VF0040 EZ502U	300	600	20.00	20/1	3300	2800	4500	6.1	4	26	22
150	139	156	53	1.5	P521_0050 K102VF0040 EZ701U	300	600	20.00	20/1	3300	2800	4500	9.4	4	26	24
150	183	209	69	1.2	P521_0050 K102VF0040 EZ503U	300	600	20.00	20/1	3300	2800	4500	8.5	4	26	23
188	31	33	12	2.9	P521_0040 K102VF0040 EZ303U	90	120	16.00	16/1	3300	2800	4500	1.3	4.5	25	18
188	42	45	17	4.3	P521_0040 K102VF0040 EZ401U	130	240	16.00	16/1	3300	2800	4500	1.9	4.5	25	19
188	65	71	26	3.1	P521_0040 K102VF0040 EZ501U	240	480	16.00	16/1	3300	2800	4500	3.8	4.5	25	20
188	71	78	28	2.6	P521_0040 K102VF0040 EZ402U	180	240	16.00	16/1	3300	2800	4500	2.6	4.5	25	21
188	104	129	41	1.9	P521_0040 K102VF0040 EZ404U	300	480	16.00	16/1	3300	2800	4500	3.9	4.5	25	23

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15.2 Selection tables

n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{zacc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1 [10 ⁻⁴ kgm ²]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/ arcmin]	m [kg]
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]				
P5K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 300$ Nm)																
188	111	120	44	1.8	P521_0040 K102VF0040 EZ502U	300	480	16.00	16/1	3300	2800	4500	6.1	4.5	25	22
188	111	125	44	1.8	P521_0040 K102VF0040 EZ701U	300	480	16.00	16/1	3300	2800	4500	9.4	4.5	25	24
188	146	167	58	1.4	P521_0040 K102VF0040 EZ503U	300	480	16.00	16/1	3300	2800	4500	8.5	4.5	25	23
250	23	25	15	2.9	P521_0030 K102VF0040 EZ303U	68	90	12.00	12/1	3300	2800	4500	1.4	5	23	18
250	32	34	21	3.8	P521_0030 K102VF0040 EZ401U	96	180	12.00	12/1	3300	2800	4500	2.0	5	23	19
250	49	53	32	2.5	P521_0030 K102VF0040 EZ501U	180	360	12.00	12/1	3300	2800	4500	3.9	5	23	20
250	53	59	35	2.3	P521_0030 K102VF0040 EZ402U	140	180	12.00	12/1	3300	2800	4500	2.7	5	23	21
250	78	97	52	1.5	P521_0030 K102VF0040 EZ404U	200	360	12.00	12/1	3300	2800	4500	4.0	5	23	23
250	84	90	55	1.4	P521_0030 K102VF0040 EZ502U	200	360	12.00	12/1	3300	2800	4500	6.2	5	23	22
250	84	94	55	1.4	P521_0030 K102VF0040 EZ701U	200	360	12.00	12/1	3300	2800	4500	9.5	5	23	24
250	110	125	73	1.1	P521_0030 K102VF0040 EZ503U	200	360	12.00	12/1	3300	2800	4500	8.6	5	23	23
P5K ($n_{1N} = 6000$ rpm, $M_{zacc,max} = 300$ Nm)																
26	196	210	12	1.1	P521_0050 K102VF0470 EZ301U	300	600	234.6	11495/49	4000	4000	6000	0.22	4	26	17
34	147	157	11	1.4	P521_0050 K102VF0350 EZ301U	300	600	175.5	3686/21	4000	4000	6000	0.23	4	26	17
43	117	125	10	1.8	P521_0050 K102VF0280 EZ301U	300	600	140.2	2945/21	4000	4000	6000	0.26	4	26	17
43	198	222	17	1.1	P521_0050 K102VF0280 EZ302U	300	600	140.2	2945/21	4000	4000	6000	0.36	4	26	18
52	97	104	9.9	2.2	P521_0050 K102VF0230 EZ301U	300	600	116.3	5700/49	4000	4000	6000	0.28	4	26	17
52	164	184	17	1.3	P521_0050 K102VF0230 EZ302U	300	600	116.3	5700/49	4000	4000	6000	0.38	4	26	18
P7K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 700$ Nm)																
7.6	344	351	8.6	1.3	P721_0070 K102VF0560 EZ301U	580	770	392.7	1178/3	4000	4000	6000	0.21	4	47	21
9.1	287	294	8.2	1.5	P721_0070 K102VF0470 EZ301U	650	1250	328.4	2299/7	4000	4000	6000	0.22	4	47	21
11	247	252	8.3	1.7	P721_0070 K102VF0400 EZ301U	420	560	282.1	2821/10	4000	4000	6000	0.21	4	47	21
11	245	251	15	1.2	P721_0100 K102VF0280 EZ301U	500	1000	280.5	5890/21	4000	4000	6000	0.26	3.5	46	21
11	415	439	12	1.1	P721_0050 K202VF0560 EZ302U	700	1400	277.7	6665/24	4000	3900	5500	0.34	4	47	29
12	215	220	7.6	2.0	P721_0070 K102VF0350 EZ301U	650	1250	245.7	3686/15	4000	4000	6000	0.23	4	47	21
12	368	388	13	1.2	P721_0070 K102VF0350 EZ302U	650	1250	245.7	3686/15	4000	4000	6000	0.33	4	47	22
13	206	211	7.5	2.1	P721_0070 K102VF0340 EZ301U	590	1050	235.9	4719/20	4000	4000	6000	0.22	4	47	21
13	353	373	13	1.2	P721_0070 K102VF0340 EZ302U	590	1050	235.9	4719/20	4000	4000	6000	0.32	4	47	22
13	204	208	14	1.5	P721_0100 K102VF0230 EZ301U	500	1000	232.7	11400/49	4000	4000	6000	0.28	3.5	46	21
13	346	365	11	1.3	P721_0050 K202VF0460 EZ302U	700	1320	231.1	1849/8	4000	3900	5500	0.36	4	47	29
15	172	175	7.2	2.6	P721_0070 K102VF0280 EZ301U	520	1220	196.3	589/3	4000	4000	6000	0.26	4	47	21
15	294	310	12	1.5	P721_0070 K102VF0280 EZ302U	650	1220	196.3	589/3	4000	4000	6000	0.36	4	47	22
15	382	405	16	1.2	P721_0070 K102VF0280 EZ303U	650	1220	196.3	589/3	4000	4000	6000	0.47	4	47	22
17	154	158	7.0	2.8	P721_0070 K102VF0250 EZ301U	470	1010	176.5	8827/50	4000	4000	6000	0.24	4	47	21
17	264	279	12	1.7	P721_0070 K102VF0250 EZ302U	650	1010	176.5	8827/50	4000	4000	6000	0.34	4	47	22
17	344	364	16	1.3	P721_0070 K102VF0250 EZ303U	650	1010	176.5	8827/50	4000	4000	6000	0.45	4	47	22
17	258	273	10	1.7	P721_0050 K202VF0350 EZ302U	700	1100	172.8	9675/56	4000	3900	5500	0.41	4	47	29
17	336	356	13	1.3	P721_0050 K202VF0350 EZ303U	700	1100	172.8	9675/56	4000	3900	5500	0.52	4	47	30
18	143	146	6.9	3.1	P721_0070 K102VF0230 EZ301U	430	1150	162.9	1140/7	4000	4000	6000	0.28	4	47	21
18	244	257	12	1.8	P721_0070 K102VF0230 EZ302U	650	1150	162.9	1140/7	4000	4000	6000	0.38	4	47	22
18	317	336	15	1.4	P721_0070 K102VF0230 EZ303U	650	1150	162.9	1140/7	4000	4000	6000	0.49	4	47	22
18	429	460	21	1.0	P721_0070 K102VF0230 EZ401U	650	1250	162.9	1140/7	4000	4000	6000	1.0	4	47	24
21	123	126	6.6	3.6	P721_0070 K102VF0200 EZ301U	370	870	141.1	2821/20	4000	4000	6000	0.27	4	47	21
21	211	223	11	2.1	P721_0070 K102VF0200 EZ302U	650	870	141.1	2821/20	4000	4000	6000	0.37	4	47	22
21	275	291	15	1.6	P721_0070 K102VF0200 EZ303U	650	870	141.1	2821/20	4000	4000	6000	0.48	4	47	22
21	372	398	20	1.2	P721_0070 K102VF0200 EZ401U	650	1250	141.1	2821/20	4000	4000	6000	1.0	4	47	24
21	209	221	9.8	2.1	P721_0050 K202VF0280 EZ302U	660	1040	139.8	559/4	4000	3900	5500	0.47	4	47	29
21	272	288	13	1.6	P721_0050 K202VF0280 EZ303U	700	1040	139.8	559/4	4000	3900	5500	0.58	4	47	30
21	368	394	17	1.2	P721_0050 K202VF0280 EZ401U	700	1400	139.8	559/4	4000	3900	5500	1.1	4	47	31
24	108	110	6.4	4.1	P721_0070 K102VF0175 EZ301U	320	920	122.9	2090/17	4000	3800	5500	0.32	4	47	21
24	184	194	11	2.4	P721_0070 K102VF0175 EZ302U	580	920	122.9	2090/17	4000	3800	5500	0.42	4	47	22
24	239	253	14	1.8	P721_0070 K102VF0175 EZ303U	650	920	122.9	2090/17	4000	3800	5500	0.53	4	47	22
24	324	347	19	1.4	P721_0070 K102VF0175 EZ401U	650	1250	122.9	2090/17	4000	3800	5500	1.1	4	47	24
26	102	105	6.3	4.3	P721_0070 K102VF0165 EZ301U	310	820	117.0	1171/1	4000	4000	6000	0.29	4	47	21
26	175	185	11	2.5	P721_0070 K102VF0165 EZ302U	550	820	117.0	1171/1	4000	4000	6000	0.39	4	47	22
26	228	241	14	1.9	P721_0070 K102VF0165 EZ303U	620	820	117.0	1171/1	4000	4000	6000	0.50	4	47	22
26	308	330	19	1.4	P721_0070 K102VF0165 EZ401U	650	1250	117.0	1171/1	4000	4000	6000	1.0	4	47	24
26	173	183	9.3	2.5	P721_0050 K202VF0230 EZ302U	550	870	115.9	14835/128	4000	3900	5500	0.53	4	47	29
26	226	239	12	1.9	P721_0050 K202VF0230 EZ303U	650	870	115.9	14835/128	4000	3900	5500	0.64	4	47	30



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15.2 Selection tables



n _{2N}	M _{2N}	M _{2,0}	a _{th}	S	Type	M _{2acc}	M _{2NOT}	i	i _{exakt}	n _{1max}	n _{1max}	n _{1max}	J ₁	Δφ ₂	C ₂	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DBH	DBV	ZB	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/arcmin]	[kg]
P7K (n _{1N} = 3000 rpm, M _{2acc,max} = 700 Nm)																
26	305	327	16	1.4	P721_0050 K202VF0230 EZ401U	700	1400	115.9	14835/128	4000	3900	5500	1.2	4	47	31
26	101	103	12	3.0	P721_0100 K102VF0115 EZ301U	300	870	115.7	2660/23	3600	3300	5000	0.43	3.5	46	21
26	173	183	21	1.7	P721_0100 K102VF0115 EZ302U	500	870	115.7	2660/23	3600	3300	5000	0.53	3.5	46	22
26	225	238	27	1.3	P721_0100 K102VF0115 EZ303U	500	870	115.7	2660/23	3600	3300	5000	0.64	3.5	46	22
30	86	88	6.1	3.0	P721_0070 K102VF0140 EZ301U	260	350	98.80	494/5	4000	3800	5500	0.37	4	47	21
30	148	156	10	3.0	P721_0070 K102VF0140 EZ302U	460	740	98.80	494/5	4000	3800	5500	0.47	4	47	22
30	192	204	14	2.3	P721_0070 K102VF0140 EZ303U	560	740	98.80	494/5	4000	3800	5500	0.58	4	47	22
30	260	279	18	1.7	P721_0070 K102VF0140 EZ401U	650	1250	98.80	494/5	4000	3800	5500	1.1	4	47	24
30	400	437	28	1.1	P721_0070 K102VF0140 EZ501U	650	1250	98.80	494/5	4000	3800	5500	3.1	4	47	25
30	437	483	31	1.0	P721_0070 K102VF0140 EZ402U	650	1250	98.80	494/5	4000	3800	5500	1.8	4	47	25
32	138	146	20	2.2	P721_0100 K102VF0092 EZ302U	440	690	92.49	17480/189	3600	3300	5000	0.62	3.5	46	22
32	180	191	25	1.7	P721_0100 K102VF0092 EZ303U	500	690	92.49	17480/189	3600	3300	5000	0.73	3.5	46	22
32	244	261	34	1.2	P721_0100 K102VF0092 EZ401U	500	1000	92.49	17480/189	3600	3300	5000	1.3	3.5	46	24
34	77	79	5.9	3.0	P721_0070 K102VF0125 EZ301U	230	310	88.33	3003/34	4000	3800	5500	0.35	4	47	21
34	132	140	10	3.3	P721_0070 K102VF0125 EZ302U	420	660	88.33	3003/34	4000	3800	5500	0.45	4	47	22
34	172	182	13	2.6	P721_0070 K102VF0125 EZ303U	500	660	88.33	3003/34	4000	3800	5500	0.56	4	47	22
34	233	249	18	1.9	P721_0070 K102VF0125 EZ401U	650	1250	88.33	3003/34	4000	3800	5500	1.1	4	47	24
34	357	391	27	1.2	P721_0070 K102VF0125 EZ501U	650	1250	88.33	3003/34	4000	3800	5500	3.1	4	47	25
34	391	432	30	1.1	P721_0070 K102VF0125 EZ402U	650	1250	88.33	3003/34	4000	3800	5500	1.8	4	47	25
34	131	138	8.7	3.4	P721_0050 K202VF0175 EZ302U	410	660	87.35	2795/32	3900	3500	5000	0.66	4	47	29
34	170	180	11	2.6	P721_0050 K202VF0175 EZ303U	490	660	87.35	2795/32	3900	3500	5000	0.77	4	47	30
34	230	247	15	1.9	P721_0050 K202VF0175 EZ401U	700	1310	87.35	2795/32	3900	3500	5000	1.3	4	47	31
34	353	386	24	1.2	P721_0050 K202VF0175 EZ501U	700	1400	87.35	2795/32	3900	3500	5000	3.3	4	47	32
34	386	427	26	1.1	P721_0050 K202VF0175 EZ402U	700	1310	87.35	2795/32	3900	3500	5000	2.0	4	47	32
36	124	131	19	2.4	P721_0100 K102VF0083 EZ302U	390	620	83.09	1911/23	3600	3300	5000	0.58	3.5	46	22
36	162	171	25	1.9	P721_0100 K102VF0083 EZ303U	470	620	83.09	1911/23	3600	3300	5000	0.69	3.5	46	22
36	219	235	34	1.4	P721_0100 K102VF0083 EZ401U	500	1000	83.09	1911/23	3600	3300	5000	1.2	3.5	46	24
37	71	72	5.8	3.0	P721_0070 K102VF0115 EZ301U	210	280	80.96	1862/23	3600	3300	5000	0.44	4	47	21
37	121	128	9.9	3.6	P721_0070 K102VF0115 EZ302U	380	610	80.96	1862/23	3600	3300	5000	0.54	4	47	22
37	158	167	13	2.8	P721_0070 K102VF0115 EZ303U	460	610	80.96	1862/23	3600	3300	5000	0.65	4	47	22
37	213	229	17	2.1	P721_0070 K102VF0115 EZ401U	650	1210	80.96	1862/23	3600	3300	5000	1.2	4	47	24
37	328	358	27	1.3	P721_0070 K102VF0115 EZ501U	650	1250	80.96	1862/23	3600	3300	5000	3.1	4	47	25
37	358	396	29	1.2	P721_0070 K102VF0115 EZ402U	650	1210	80.96	1862/23	3600	3300	5000	1.9	4	47	25
42	106	112	9.6	3.8	P721_0070 K102VF0100 EZ302U	330	530	70.98	3549/50	4000	3800	5500	0.51	4	47	22
42	138	146	12	2.9	P721_0070 K102VF0100 EZ303U	400	530	70.98	3549/50	4000	3800	5500	0.62	4	47	22
42	187	200	17	2.4	P721_0070 K102VF0100 EZ401U	570	1060	70.98	3549/50	4000	3800	5500	1.2	4	47	24
42	287	314	26	1.5	P721_0070 K102VF0100 EZ501U	650	1250	70.98	3549/50	4000	3800	5500	3.1	4	47	25
42	314	347	28	1.4	P721_0070 K102VF0100 EZ402U	650	1060	70.98	3549/50	4000	3800	5500	1.9	4	47	25
43	104	109	8.2	3.8	P721_0050 K202VF0140 EZ302U	330	520	69.26	14405/208	3900	3500	5000	0.80	4	47	29
43	135	143	11	2.9	P721_0050 K202VF0140 EZ303U	390	520	69.26	14405/208	3900	3500	5000	0.91	4	47	30
43	182	195	14	2.4	P721_0050 K202VF0140 EZ401U	550	1040	69.26	14405/208	3900	3500	5000	1.4	4	47	31
43	280	306	22	1.6	P721_0050 K202VF0140 EZ501U	700	1400	69.26	14405/208	3900	3500	5000	3.4	4	47	32
43	306	339	24	1.4	P721_0050 K202VF0140 EZ402U	700	1040	69.26	14405/208	3900	3500	5000	2.1	4	47	32
45	99	105	18	3.0	P721_0100 K102VF0066 EZ302U	310	500	66.44	598/9	3600	3300	5000	0.70	3.5	46	22
45	129	137	23	2.3	P721_0100 K102VF0066 EZ303U	380	500	66.44	598/9	3600	3300	5000	0.81	3.5	46	22
45	175	188	32	1.7	P721_0100 K102VF0066 EZ401U	500	1000	66.44	598/9	3600	3300	5000	1.3	3.5	46	24
45	269	294	49	1.1	P721_0100 K102VF0066 EZ501U	500	1000	66.44	598/9	3600	3300	5000	3.3	3.5	46	25
45	294	325	53	1.0	P721_0100 K102VF0066 EZ402U	500	1000	66.44	598/9	3600	3300	5000	2.0	3.5	46	25
46	97	102	9.3	3.8	P721_0070 K102VF0092 EZ302U	300	490	64.74	1748/27	3600	3300	5000	0.63	4	47	22
46	126	133	12	2.9	P721_0070 K102VF0092 EZ303U	370	490	64.74	1748/27	3600	3300	5000	0.74	4	47	22
46	171	183	16	2.6	P721_0070 K102VF0092 EZ401U	520	970	64.74	1748/27	3600	3300	5000	1.3	4	47	24
46	262	286	25	1.7	P721_0070 K102VF0092 EZ501U	650	1250	64.74	1748/27	3600	3300	5000	3.2	4	47	25
46	286	317	28	1.5	P721_0070 K102VF0092 EZ402U	650	970	64.74	1748/27	3600	3300	5000	2.0	4	47	25
50	90	95	18	3.3	P721_0100 K102VF0060 EZ302U	280	450	60.00	60/1	3300	2800	4500	0.78	3.5	46	22
50	117	124	23	2.6	P721_0100 K102VF0060 EZ303U	340	450	60.00	60/1	3300	2800	4500	0.89	3.5	46	22
50	158	169	31	1.9	P721_0100 K102VF0060 EZ401U	480	900	60.00	60/1	3300	2800	4500	1.4	3.5	46	24
50	243	265	47	1.2	P721_0100 K102VF0060 EZ501U	500	1000	60.00	60/1	3300	2800	4500	3.4	3.5	46	25
50	265	294	52	1.1	P721_0100 K102VF0060 EZ402U	500	900	60.00	60/1	3300	2800	4500	2.1	3.5	46	25
52	87	92	9.1	3.8	P721_0070 K102VF0083 EZ302U	270	440	58.16	13377/230	3600	3300	5000	0.59	4	47	22

PK



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{zacc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1 [10^{-4} kgm ²]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/arcmin]	m [kg]
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]				
P7K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 700$ Nm)																
52	113	120	12	2.9	P721_0070 K102VF0083 EZ303U	330	440	58.16	13377/230	3600	3300	5000	0.70	4	47	22
52	153	164	16	2.9	P721_0070 K102VF0083 EZ401U	470	870	58.16	13377/230	3600	3300	5000	1.2	4	47	24
52	235	257	25	1.9	P721_0070 K102VF0083 EZ501U	650	1250	58.16	13377/230	3600	3300	5000	3.2	4	47	25
52	257	285	27	1.7	P721_0070 K102VF0083 EZ402U	650	870	58.16	13377/230	3600	3300	5000	1.9	4	47	25
52	378	471	39	1.2	P721_0070 K102VF0083 EZ404U	650	1250	58.16	13377/230	3600	3300	5000	3.3	4	47	27
52	405	438	42	1.1	P721_0070 K102VF0083 EZ502U	650	1250	58.16	13377/230	3600	3300	5000	5.5	4	47	26
52	405	454	42	1.1	P721_0070 K102VF0083 EZ701U	650	1250	58.16	13377/230	3600	3300	5000	8.8	4	47	28
52	86	91	7.8	3.8	P721_0050 K202VF0115 EZ302U	270	430	57.73	6235/108	3500	3100	4500	0.97	4	47	29
52	112	119	10	2.9	P721_0050 K202VF0115 EZ303U	330	430	57.73	6235/108	3500	3100	4500	1.1	4	47	30
52	152	163	14	2.9	P721_0050 K202VF0115 EZ401U	460	870	57.73	6235/108	3500	3100	4500	1.6	4	47	31
52	234	255	21	1.9	P721_0050 K202VF0115 EZ501U	700	1400	57.73	6235/108	3500	3100	4500	3.6	4	47	32
52	255	282	23	1.7	P721_0050 K202VF0115 EZ402U	650	870	57.73	6235/108	3500	3100	4500	2.3	4	47	32
52	375	467	34	1.2	P721_0050 K202VF0115 EZ404U	700	1400	57.73	6235/108	3500	3100	4500	3.7	4	47	34
52	402	435	36	1.1	P721_0050 K202VF0115 EZ502U	700	1400	57.73	6235/108	3500	3100	4500	5.9	4	47	34
52	402	451	36	1.1	P721_0050 K202VF0115 EZ701U	700	1400	57.73	6235/108	3500	3100	4500	9.2	4	47	35
54	83	88	17	3.6	P721_0100 K102VF0056 EZ302U	260	420	55.68	15200/273	3300	2800	4500	0.96	3.5	46	22
54	108	115	22	2.8	P721_0100 K102VF0056 EZ303U	310	420	55.68	15200/273	3300	2800	4500	1.1	3.5	46	22
54	147	157	30	2.0	P721_0100 K102VF0056 EZ401U	450	840	55.68	15200/273	3300	2800	4500	1.6	3.5	46	24
54	225	246	47	1.3	P721_0100 K102VF0056 EZ501U	500	1000	55.68	15200/273	3300	2800	4500	3.6	3.5	46	25
54	246	272	51	1.2	P721_0100 K102VF0056 EZ402U	500	840	55.68	15200/273	3300	2800	4500	2.3	3.5	46	25
65	70	74	9.1	3.8	P721_0070 K102VF0066 EZ302U	220	350	46.51	2093/45	3600	3300	5000	0.71	4	47	22
65	91	96	12	2.9	P721_0070 K102VF0066 EZ303U	260	350	46.51	2093/45	3600	3300	5000	0.82	4	47	22
65	123	131	16	3.4	P721_0070 K102VF0066 EZ401U	370	700	46.51	2093/45	3600	3300	5000	1.4	4	47	24
65	188	206	25	2.2	P721_0070 K102VF0066 EZ501U	650	1250	46.51	2093/45	3600	3300	5000	3.3	4	47	25
65	206	228	27	2.0	P721_0070 K102VF0066 EZ402U	530	700	46.51	2093/45	3600	3300	5000	2.1	4	47	25
65	302	376	39	1.4	P721_0070 K102VF0066 EZ404U	650	1250	46.51	2093/45	3600	3300	5000	3.4	4	47	27
65	324	350	42	1.3	P721_0070 K102VF0066 EZ502U	650	1250	46.51	2093/45	3600	3300	5000	5.6	4	47	26
65	324	363	42	1.3	P721_0070 K102VF0066 EZ701U	650	1250	46.51	2093/45	3600	3300	5000	8.9	4	47	28
65	89	95	9.6	2.9	P721_0050 K202VF0092 EZ303U	260	340	45.95	11395/248	3500	3100	4500	1.3	4	47	30
65	121	130	13	3.6	P721_0050 K202VF0092 EZ401U	370	690	45.95	11395/248	3500	3100	4500	1.9	4	47	31
65	186	203	20	2.4	P721_0050 K202VF0092 EZ501U	690	1380	45.95	11395/248	3500	3100	4500	3.8	4	47	32
65	203	225	22	2.2	P721_0050 K202VF0092 EZ402U	520	690	45.95	11395/248	3500	3100	4500	2.6	4	47	32
65	298	372	32	1.5	P721_0050 K202VF0092 EZ404U	700	1380	45.95	11395/248	3500	3100	4500	3.9	4	47	34
65	320	346	34	1.4	P721_0050 K202VF0092 EZ502U	700	1380	45.95	11395/248	3500	3100	4500	6.1	4	47	34
65	320	359	34	1.4	P721_0050 K202VF0092 EZ701U	700	1400	45.95	11395/248	3500	3100	4500	9.4	4	47	35
65	419	480	45	1.0	P721_0050 K202VF0092 EZ503U	700	1380	45.95	11395/248	3500	3100	4500	8.5	4	47	35
71	63	66	9.2	3.8	P721_0070 K102VF0060 EZ302U	200	320	42.00	42/1	3300	2800	4500	0.79	4	47	22
71	82	87	12	2.9	P721_0070 K102VF0060 EZ303U	240	320	42.00	42/1	3300	2800	4500	0.90	4	47	22
71	111	119	16	3.6	P721_0070 K102VF0060 EZ401U	340	630	42.00	42/1	3300	2800	4500	1.4	4	47	24
71	170	186	25	2.4	P721_0070 K102VF0060 EZ501U	630	1250	42.00	42/1	3300	2800	4500	3.4	4	47	25
71	186	205	27	2.2	P721_0070 K102VF0060 EZ402U	470	630	42.00	42/1	3300	2800	4500	2.1	4	47	25
71	273	340	40	1.5	P721_0070 K102VF0060 EZ404U	650	1250	42.00	42/1	3300	2800	4500	3.5	4	47	27
71	292	316	43	1.4	P721_0070 K102VF0060 EZ502U	650	1250	42.00	42/1	3300	2800	4500	5.7	4	47	26
71	292	328	43	1.4	P721_0070 K102VF0060 EZ701U	650	1250	42.00	42/1	3300	2800	4500	9.0	4	47	28
71	383	439	56	1.0	P721_0070 K102VF0060 EZ503U	650	1250	42.00	42/1	3300	2800	4500	8.1	4	47	28
71	82	87	9.4	2.9	P721_0050 K202VF0084 EZ303U	240	310	41.99	12470/297	3500	3100	4500	1.2	4	47	30
71	111	119	13	4.0	P721_0050 K202VF0084 EZ401U	340	630	41.99	12470/297	3500	3100	4500	1.7	4	47	31
71	170	186	20	2.6	P721_0050 K202VF0084 EZ501U	630	1260	41.99	12470/297	3500	3100	4500	3.7	4	47	32
71	186	205	21	2.4	P721_0050 K202VF0084 EZ402U	470	630	41.99	12470/297	3500	3100	4500	2.4	4	47	32
71	273	340	31	1.6	P721_0050 K202VF0084 EZ404U	700	1260	41.99	12470/297	3500	3100	4500	3.8	4	47	34
71	292	316	34	1.5	P721_0050 K202VF0084 EZ502U	700	1260	41.99	12470/297	3500	3100	4500	6.0	4	47	34
71	292	328	34	1.5	P721_0050 K202VF0084 EZ701U	700	1400	41.99	12470/297	3500	3100	4500	9.3	4	47	35
71	383	438	44	1.1	P721_0050 K202VF0084 EZ503U	700	1260	41.99	12470/297	3500	3100	4500	8.4	4	47	35
75	78	82	21	2.9	P721_0100 K102VF0040 EZ303U	230	300	40.00	40/1	3300	2800	4500	1.3	3.5	46	22
75	105	113	28	2.8	P721_0100 K102VF0040 EZ401U	320	600	40.00	40/1	3300	2800	4500	1.8	3.5	46	24
75	162	177	43	1.9	P721_0100 K102VF0040 EZ501U	500	1000	40.00	40/1	3300	2800	4500	3.8	3.5	46	25
75	177	196	47	1.7	P721_0100 K102VF0040 EZ402U	450	600	40.00	40/1	3300	2800	4500	2.5	3.5	46	25
75	260	324	69	1.2	P721_0100 K102VF0040 EZ404U	500	1000	40.00	40/1	3300	2800	4500	3.9	3.5	46	27
75	279	301	74	1.1	P721_0100 K102VF0040 EZ502U	500	1000	40.00	40/1	3300	2800	4500	6.1	3.5	46	26



15 PK right-angle planetary geared motors

15.2 Selection tables



n _{2N}	M _{2N}	M _{2,0}	a _{th}	S	Type	M _{2acc}	M _{2NOT}	i	i _{exakt}	n _{1max} DBH	n _{1max} DBV	n _{1max} ZB	J ₁	Δφ ₂	C ₂	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
P7K (n _{1N} = 3000 rpm, M _{2acc,max} = 700 Nm)																
75	279	312	74	1.1	P721_0100 K102VF0040 EZ701U	500	1000	40.00	40/1	3300	2800	4500	9.4	3.5	46	28
77	58	62	9.2	3.8	P721_0070 K102VF0056 EZ302U	180	290	38.98	1520/39	3300	2800	4500	0.98	4	47	22
77	76	80	12	2.9	P721_0070 K102VF0056 EZ303U	220	290	38.98	1520/39	3300	2800	4500	1.1	4	47	22
77	103	110	16	3.8	P721_0070 K102VF0056 EZ401U	310	580	38.98	1520/39	3300	2800	4500	1.6	4	47	24
77	158	172	25	2.5	P721_0070 K102VF0056 EZ501U	590	1170	38.98	1520/39	3300	2800	4500	3.6	4	47	25
77	172	191	27	2.3	P721_0070 K102VF0056 EZ402U	440	580	38.98	1520/39	3300	2800	4500	2.3	4	47	25
77	253	315	40	1.5	P721_0070 K102VF0056 EZ404U	650	1170	38.98	1520/39	3300	2800	4500	3.7	4	47	27
77	271	293	43	1.4	P721_0070 K102VF0056 EZ502U	650	1170	38.98	1520/39	3300	2800	4500	5.9	4	47	26
77	271	304	43	1.4	P721_0070 K102VF0056 EZ701U	650	1170	38.98	1520/39	3300	2800	4500	9.2	4	47	28
77	356	407	56	1.1	P721_0070 K102VF0056 EZ503U	650	1170	38.98	1520/39	3300	2800	4500	8.3	4	47	28
90	65	69	8.9	2.9	P721_0050 K202VF0067 EZ303U	190	250	33.42	11395/341	3500	3100	4500	1.5	4	47	30
90	88	94	12	4.3	P721_0050 K202VF0067 EZ401U	270	500	33.42	11395/341	3500	3100	4500	2.1	4	47	31
90	135	148	18	3.3	P721_0050 K202VF0067 EZ501U	500	1000	33.42	11395/341	3500	3100	4500	4.0	4	47	32
90	148	163	20	2.6	P721_0050 K202VF0067 EZ402U	380	500	33.42	11395/341	3500	3100	4500	2.8	4	47	32
90	217	270	30	2.0	P721_0050 K202VF0067 EZ404U	700	1000	33.42	11395/341	3500	3100	4500	4.1	4	47	34
90	233	252	32	1.9	P721_0050 K202VF0067 EZ502U	700	1000	33.42	11395/341	3500	3100	4500	6.3	4	47	34
90	233	261	32	1.9	P721_0050 K202VF0067 EZ701U	630	1400	33.42	11395/341	3500	3100	4500	9.6	4	47	35
90	305	349	42	1.4	P721_0050 K202VF0067 EZ503U	700	1000	33.42	11395/341	3500	3100	4500	8.7	4	47	35
90	377	453	52	1.2	P721_0050 K202VF0067 EZ702U	700	1400	33.42	11395/341	3500	3100	4500	15	4	47	38
90	424	503	58	1.0	P721_0050 K202VF0067 EZ505U	700	1400	33.42	11395/341	3500	3100	4500	13	4	47	38
100	79	85	12	4.3	P721_0050 K202VF0060 EZ401U	240	450	30.00	30/1	3000	2600	4000	2.7	4	47	31
100	121	133	18	3.6	P721_0050 K202VF0060 EZ501U	450	900	30.00	30/1	3000	2600	4000	4.6	4	47	32
100	133	147	20	2.6	P721_0050 K202VF0060 EZ402U	340	450	30.00	30/1	3000	2600	4000	3.4	4	47	32
100	195	243	29	2.3	P721_0050 K202VF0060 EZ404U	680	900	30.00	30/1	3000	2600	4000	4.7	4	47	34
100	209	226	31	2.1	P721_0050 K202VF0060 EZ502U	680	900	30.00	30/1	3000	2600	4000	6.9	4	47	34
100	209	234	31	2.1	P721_0050 K202VF0060 EZ701U	560	1400	30.00	30/1	3000	2600	4000	10	4	47	35
100	274	313	41	1.6	P721_0050 K202VF0060 EZ503U	680	900	30.00	30/1	3000	2600	4000	9.3	4	47	35
100	339	406	50	1.3	P721_0050 K202VF0060 EZ702U	700	1400	30.00	30/1	3000	2600	4000	15	4	47	38
100	381	452	56	1.2	P721_0050 K202VF0060 EZ505U	700	1400	30.00	30/1	3000	2600	4000	14	4	47	38
107	55	58	12	2.9	P721_0070 K102VF0040 EZ303U	160	210	28.00	28/1	3300	2800	4500	1.3	4	47	22
107	74	79	17	4.3	P721_0070 K102VF0040 EZ401U	220	420	28.00	28/1	3300	2800	4500	1.9	4	47	24
107	113	124	26	3.1	P721_0070 K102VF0040 EZ501U	420	840	28.00	28/1	3300	2800	4500	3.8	4	47	25
107	124	137	28	2.6	P721_0070 K102VF0040 EZ402U	320	420	28.00	28/1	3300	2800	4500	2.6	4	47	25
107	182	227	41	1.9	P721_0070 K102VF0040 EZ404U	630	840	28.00	28/1	3300	2800	4500	3.9	4	47	27
107	195	211	44	1.8	P721_0070 K102VF0040 EZ502U	630	840	28.00	28/1	3300	2800	4500	6.1	4	47	26
107	195	219	44	1.8	P721_0070 K102VF0040 EZ701U	530	840	28.00	28/1	3300	2800	4500	9.4	4	47	28
107	256	292	58	1.4	P721_0070 K102VF0040 EZ503U	630	840	28.00	28/1	3300	2800	4500	8.5	4	47	28
116	105	114	17	4.2	P721_0050 K202VF0052 EZ501U	390	780	25.89	10535/407	3000	2600	4000	4.6	4	47	32
116	168	209	28	2.6	P721_0050 K202VF0052 EZ404U	580	780	25.89	10535/407	3000	2600	4000	4.7	4	47	34
116	180	195	30	2.4	P721_0050 K202VF0052 EZ502U	580	780	25.89	10535/407	3000	2600	4000	6.9	4	47	34
116	180	202	30	2.4	P721_0050 K202VF0052 EZ701U	490	1400	25.89	10535/407	3000	2600	4000	10	4	47	35
116	236	270	39	1.9	P721_0050 K202VF0052 EZ503U	580	780	25.89	10535/407	3000	2600	4000	9.3	4	47	35
116	292	351	48	1.5	P721_0050 K202VF0052 EZ702U	700	1400	25.89	10535/407	3000	2600	4000	15	4	47	38
116	329	390	54	1.3	P721_0050 K202VF0052 EZ505U	700	1400	25.89	10535/407	3000	2600	4000	14	4	47	38
116	402	507	67	1.1	P721_0050 K202VF0052 EZ703U	700	1400	25.89	10535/407	3000	2600	4000	23	4	47	40
150	53	56	11	4.3	P721_0050 K202VF0040 EZ401U	160	300	20.00	20/1	3000	2600	4000	3.5	4	47	31
150	81	88	16	2.8	P721_0050 K202VF0040 EZ501U	230	300	20.00	20/1	3000	2600	4000	5.4	4	47	32
150	88	98	18	2.6	P721_0050 K202VF0040 EZ402U	230	300	20.00	20/1	3000	2600	4000	4.2	4	47	32
150	130	162	26	3.4	P721_0050 K202VF0040 EZ404U	450	600	20.00	20/1	3000	2600	4000	5.5	4	47	34
150	139	151	28	3.2	P721_0050 K202VF0040 EZ502U	450	600	20.00	20/1	3000	2600	4000	7.7	4	47	34
150	139	156	28	3.2	P721_0050 K202VF0040 EZ701U	380	1400	20.00	20/1	3000	2600	4000	11	4	47	35
150	183	209	37	2.4	P721_0050 K202VF0040 EZ503U	450	600	20.00	20/1	3000	2600	4000	10	4	47	35
150	226	271	45	1.9	P721_0050 K202VF0040 EZ702U	700	1400	20.00	20/1	3000	2600	4000	16	4	47	38
150	254	301	51	1.7	P721_0050 K202VF0040 EZ505U	700	1400	20.00	20/1	3000	2600	4000	15	4	47	38
150	310	391	62	1.4	P721_0050 K202VF0040 EZ703U	700	1400	20.00	20/1	3000	2600	4000	24	4	47	40
188	42	45	10	4.3	P721_0040 K202VF0040 EZ401U	130	240	16.00	16/1	3000	2600	4000	3.6	4.5	44	31
188	65	71	16	2.8	P721_0040 K202VF0040 EZ501U	180	240	16.00	16/1	3000	2600	4000	5.5	4.5	44	32
188	71	78	17	2.6	P721_0040 K202VF0040 EZ402U	180	240	16.00	16/1	3000	2600	4000	4.3	4.5	44	32
188	104	129	26	3.4	P721_0040 K202VF0040 EZ404U	360	480	16.00	16/1	3000	2600	4000	5.6	4.5	44	34





15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{zacc}	M_{zNOT}	i	i_{exakt}	n_{1max}	n_{1max}	n_{1max}	J_1	$\Delta\varphi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DBH	DBV	ZB	[10^{-4} kgm 2]	[arcmin]	[Nm/arcmin]	[kg]
P7K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 700$ Nm)																
188	111	120	27	3.2	P721_0040 K202VF0040 EZ502U	360	480	16.00	16/1	3000	2600	4000	7.8	4.5	44	34
188	111	125	27	3.2	P721_0040 K202VF0040 EZ701U	300	1200	16.00	16/1	3000	2600	4000	11	4.5	44	35
188	146	167	36	2.5	P721_0040 K202VF0040 EZ503U	360	480	16.00	16/1	3000	2600	4000	10	4.5	44	35
188	181	217	45	2.0	P721_0040 K202VF0040 EZ702U	620	1200	16.00	16/1	3000	2600	4000	16	4.5	44	38
188	203	241	50	1.8	P721_0040 K202VF0040 EZ505U	680	1200	16.00	16/1	3000	2600	4000	15	4.5	44	38
188	248	313	61	1.4	P721_0040 K202VF0040 EZ703U	680	1200	16.00	16/1	3000	2600	4000	24	4.5	44	40
250	32	34	10	4.3	P721_0030 K202VF0040 EZ401U	96	180	12.00	12/1	3000	2600	4000	3.8	4.5	39	31
250	49	53	16	2.8	P721_0030 K202VF0040 EZ501U	140	180	12.00	12/1	3000	2600	4000	5.8	4.5	39	32
250	53	59	17	2.6	P721_0030 K202VF0040 EZ402U	140	180	12.00	12/1	3000	2600	4000	4.5	4.5	39	32
250	78	97	26	3.4	P721_0030 K202VF0040 EZ404U	270	360	12.00	12/1	3000	2600	4000	5.9	4.5	39	34
250	84	90	27	3.2	P721_0030 K202VF0040 EZ502U	270	360	12.00	12/1	3000	2600	4000	8.1	4.5	39	34
250	84	94	27	3.2	P721_0030 K202VF0040 EZ701U	230	900	12.00	12/1	3000	2600	4000	11	4.5	39	35
250	110	125	36	2.5	P721_0030 K202VF0040 EZ503U	270	360	12.00	12/1	3000	2600	4000	10	4.5	39	35
250	135	163	45	2.0	P721_0030 K202VF0040 EZ702U	460	900	12.00	12/1	3000	2600	4000	17	4.5	39	38
250	152	181	50	1.8	P721_0030 K202VF0040 EZ505U	500	900	12.00	12/1	3000	2600	4000	15	4.5	39	38
250	186	235	61	1.4	P721_0030 K202VF0040 EZ703U	500	900	12.00	12/1	3000	2600	4000	25	4.5	39	40
P7K ($n_{1N} = 4500$ rpm, $M_{zacc,max} = 700$ Nm)																
135	299	481	41	1.5	P721_0050 K202VF0067 EZ505U	700	1400	33.42	11395/341	3500	3100	4500	13	4	47	38
P7K ($n_{1N} = 6000$ rpm, $M_{zacc,max} = 650$ Nm)																
15	329	351	8.2	1.3	P721_0070 K102VF0560 EZ301U	580	770	392.7	1178/3	4000	4000	6000	0.21	4	47	21
17	294	314	15	1.0	P721_0100 K102VF0350 EZ301U	500	1000	351.1	7372/21	4000	4000	6000	0.23	3.5	46	21
18	275	294	7.8	1.6	P721_0070 K102VF0470 EZ301U	650	1250	328.4	2299/7	4000	4000	6000	0.22	4	47	21
21	236	252	8.0	1.8	P721_0070 K102VF0400 EZ301U	420	560	282.1	2821/10	4000	4000	6000	0.21	4	47	21
21	235	251	14	1.3	P721_0100 K102VF0280 EZ301U	500	1000	280.5	5890/21	4000	4000	6000	0.26	3.5	46	21
24	206	220	7.3	2.1	P721_0070 K102VF0350 EZ301U	650	1250	245.7	3686/15	4000	4000	6000	0.23	4	47	21
24	347	388	12	1.3	P721_0070 K102VF0350 EZ302U	650	1250	245.7	3686/15	4000	4000	6000	0.33	4	47	22
25	198	211	7.2	2.2	P721_0070 K102VF0340 EZ301U	590	1050	235.9	4719/20	4000	4000	6000	0.22	4	47	21
25	333	373	12	1.3	P721_0070 K102VF0340 EZ302U	590	1050	235.9	4719/20	4000	4000	6000	0.32	4	47	22
26	195	208	14	1.5	P721_0100 K102VF0230 EZ301U	500	1000	232.7	11400/49	4000	4000	6000	0.28	3.5	46	21
31	164	175	6.9	2.7	P721_0070 K102VF0280 EZ301U	520	1220	196.3	589/3	4000	4000	6000	0.26	4	47	21
31	277	310	12	1.6	P721_0070 K102VF0280 EZ302U	650	1220	196.3	589/3	4000	4000	6000	0.36	4	47	22
31	362	416	15	1.2	P721_0070 K102VF0280 EZ303U	650	1220	196.3	589/3	4000	4000	6000	0.47	4	47	22
34	148	158	6.7	3.0	P721_0070 K102VF0250 EZ301U	470	1010	176.5	8827/50	4000	4000	6000	0.24	4	47	21
34	249	279	11	1.8	P721_0070 K102VF0250 EZ302U	650	1010	176.5	8827/50	4000	4000	6000	0.34	4	47	22
34	326	374	15	1.4	P721_0070 K102VF0250 EZ303U	650	1010	176.5	8827/50	4000	4000	6000	0.45	4	47	22
34	382	465	17	1.2	P721_0070 K102VF0250 EZ401U	650	1250	176.5	8827/50	4000	4000	6000	0.98	4	47	24
37	136	146	6.6	3.2	P721_0070 K102VF0230 EZ301U	430	1150	162.9	1140/7	4000	4000	6000	0.28	4	47	21
37	230	257	11	1.9	P721_0070 K102VF0230 EZ302U	650	1150	162.9	1140/7	4000	4000	6000	0.38	4	47	22
37	300	345	14	1.5	P721_0070 K102VF0230 EZ303U	650	1150	162.9	1140/7	4000	4000	6000	0.49	4	47	22
37	352	429	17	1.2	P721_0070 K102VF0230 EZ401U	650	1250	162.9	1140/7	4000	4000	6000	1.0	4	47	24
43	118	126	6.4	3.7	P721_0070 K102VF0200 EZ301U	370	870	141.1	2821/20	4000	4000	6000	0.27	4	47	21
43	199	223	11	2.2	P721_0070 K102VF0200 EZ302U	650	870	141.1	2821/20	4000	4000	6000	0.37	4	47	22
43	260	299	14	1.7	P721_0070 K102VF0200 EZ303U	650	870	141.1	2821/20	4000	4000	6000	0.48	4	47	22
43	305	372	16	1.4	P721_0070 K102VF0200 EZ401U	650	1250	141.1	2821/20	4000	4000	6000	1.0	4	47	24
51	98	105	6.1	4.5	P721_0070 K102VF0165 EZ301U	310	820	117.0	117/1	4000	4000	6000	0.29	4	47	21
51	165	185	10	2.7	P721_0070 K102VF0165 EZ302U	550	820	117.0	117/1	4000	4000	6000	0.39	4	47	22
51	216	248	13	2.0	P721_0070 K102VF0165 EZ303U	620	820	117.0	117/1	4000	4000	6000	0.50	4	47	22
51	253	308	16	1.7	P721_0070 K102VF0165 EZ401U	650	1250	117.0	117/1	4000	4000	6000	1.0	4	47	24
51	374	484	23	1.2	P721_0070 K102VF0165 EZ501U	650	1250	117.0	117/1	4000	4000	6000	3.0	4	47	25
P8K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 1600$ Nm)																
6.2	727	768	8.4	1.2	P821_0070 K202VF0690 EZ302U	1080	1910	486.0	46655/96	4000	3900	5500	0.33	3.5	132	42
6.5	692	731	14	1.0	P821_0100 K202VF0460 EZ302U	1200	2400	462.3	1849/4	4000	3900	5500	0.36	3.5	134	42
7.7	582	615	7.1	1.7	P821_0070 K202VF0560 EZ302U	1290	1980	388.8	9331/24	4000	3900	5500	0.35	3.5	132	42
7.7	757	801	9.3	1.3	P821_0070 K202VF0560 EZ303U	1290	1980	388.8	9331/24	4000	3900	5500	0.46	3.5	132	43
8.5	529	559	11	1.2	P821_0070 K202VF0500 EZ302U	780	1390	353.4	46655/132	4000	3900	5500	0.33	3.5	132	42
8.7	517	546	13	1.4	P821_0100 K202VF0350 EZ302U	1200	2210	345.5	9675/28	4000	3900	5500	0.41	3.5	134	42
8.7	673	712	17	1.0	P821_0100 K202VF0350 EZ303U	1200	2210	345.5	9675/28	4000	3900	5500	0.52	3.5	134	43
9.3	484	511	6.8	2.1	P821_0070 K202VF0460 EZ302U	1390	1850	323.6	12943/40	4000	3900	5500	0.37	3.5	132	42
9.3	630	667	8.9	1.6	P821_0070 K202VF0460 EZ303U	1390	1850	323.6	12943/40	4000	3900	5500	0.48	3.5	132	43



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
P8K ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 1600$ Nm)																
9.3	852	913	12	1.2	P821_0070 K202VF0460 EZ401U	1400	2800	323.6	12943/40	4000	3900	5500	1.0	3.5	132	44
11	423	447	8.4	1.9	P821_0070 K202VF0400 EZ302U	940	1440	282.8	9331/33	4000	3900	5500	0.35	3.5	132	42
11	551	583	11	1.4	P821_0070 K202VF0400 EZ303U	940	1440	282.8	9331/33	4000	3900	5500	0.46	3.5	132	43
11	418	442	12	1.7	P821_0100 K202VF0280 EZ302U	1200	2080	279.5	559/2	4000	3900	5500	0.47	3.5	134	42
11	544	576	16	1.3	P821_0100 K202VF0280 EZ303U	1200	2080	279.5	559/2	4000	3900	5500	0.58	3.5	134	43
11	417	440	5.6	2.4	P821_0050 K302VF0560 EZ302U	1120	1490	278.5	12255/44	3800	3500	5000	0.41	4	132	47
11	542	574	7.3	1.8	P821_0050 K302VF0560 EZ303U	1120	1490	278.5	12255/44	3800	3500	5000	0.52	4	132	48
11	734	786	9.9	1.4	P821_0050 K302VF0560 EZ401U	1540	2730	278.5	12255/44	3800	3500	5000	1.0	4	132	49
12	362	382	6.3	2.8	P821_0070 K202VF0350 EZ302U	1140	1550	241.9	1935/8	4000	3900	5500	0.42	3.5	132	42
12	471	498	8.3	2.1	P821_0070 K202VF0350 EZ303U	1160	1550	241.9	1935/8	4000	3900	5500	0.53	3.5	132	43
12	637	683	11	1.6	P821_0070 K202VF0350 EZ401U	1400	2800	241.9	1935/8	4000	3900	5500	1.1	3.5	132	44
12	979	1070	17	1.0	P821_0070 K202VF0350 EZ501U	1400	2800	241.9	1935/8	4000	3900	5500	3.0	3.5	132	45
13	352	372	6.3	2.8	P821_0070 K202VF0340 EZ302U	1010	1350	235.3	12943/55	4000	3900	5500	0.37	3.5	132	42
13	458	485	8.2	2.2	P821_0070 K202VF0340 EZ303U	1010	1350	235.3	12943/55	4000	3900	5500	0.48	3.5	132	43
13	620	664	11	1.6	P821_0070 K202VF0340 EZ401U	1250	2220	235.3	12943/55	4000	3900	5500	1.0	3.5	132	44
13	347	366	12	2.0	P821_0100 K202VF0230 EZ302U	1090	1740	231.8	14835/64	4000	3900	5500	0.53	3.5	134	42
13	451	478	15	1.6	P821_0100 K202VF0230 EZ303U	1200	1740	231.8	14835/64	4000	3900	5500	0.64	3.5	134	43
13	611	654	21	1.1	P821_0100 K202VF0230 EZ401U	1200	2400	231.8	14835/64	4000	3900	5500	1.2	3.5	134	44
13	346	365	5.4	2.7	P821_0050 K302VF0460 EZ302U	930	1240	231.1	1849/8	3800	3500	5000	0.45	4	132	47
13	450	476	7.0	2.1	P821_0050 K302VF0460 EZ303U	930	1240	231.1	1849/8	3800	3500	5000	0.56	4	132	48
13	609	652	9.4	1.6	P821_0050 K302VF0460 EZ401U	1600	2630	231.1	1849/8	3800	3500	5000	1.1	4	132	49
13	935	1022	15	1.1	P821_0050 K302VF0460 EZ501U	1600	2900	231.1	1849/8	3800	3500	5000	3.1	4	132	50
15	293	309	6.0	3.4	P821_0070 K202VF0280 EZ302U	920	1460	195.7	3913/20	4000	3900	5500	0.47	3.5	132	42
15	381	403	7.8	2.6	P821_0070 K202VF0280 EZ303U	1100	1460	195.7	3913/20	4000	3900	5500	0.58	3.5	132	43
15	515	552	11	1.9	P821_0070 K202VF0280 EZ401U	1400	2730	195.7	3913/20	4000	3900	5500	1.1	3.5	132	44
15	792	865	16	1.3	P821_0070 K202VF0280 EZ501U	1400	2800	195.7	3913/20	4000	3900	5500	3.1	3.5	132	45
15	865	957	18	1.2	P821_0070 K202VF0280 EZ402U	1400	2730	195.7	3913/20	4000	3900	5500	1.8	3.5	132	45
17	263	278	5.9	3.2	P821_0070 K202VF0250 EZ302U	830	1120	175.9	1935/11	4000	3900	5500	0.43	3.5	132	42
17	343	362	7.6	2.5	P821_0070 K202VF0250 EZ303U	850	1120	175.9	1935/11	4000	3900	5500	0.54	3.5	132	43
17	463	497	10	2.2	P821_0070 K202VF0250 EZ401U	1400	2170	175.9	1935/11	4000	3900	5500	1.1	3.5	132	44
17	712	778	16	1.4	P821_0070 K202VF0250 EZ501U	1400	2800	175.9	1935/11	4000	3900	5500	3.0	3.5	132	45
17	778	861	17	1.3	P821_0070 K202VF0250 EZ402U	1400	2170	175.9	1935/11	4000	3900	5500	1.8	3.5	132	45
17	261	276	11	2.7	P821_0100 K202VF0175 EZ302U	820	1310	174.7	2795/16	3900	3500	5000	0.66	3.5	134	42
17	340	360	14	2.1	P821_0100 K202VF0175 EZ303U	990	1310	174.7	2795/16	3900	3500	5000	0.77	3.5	134	43
17	460	493	19	1.5	P821_0100 K202VF0175 EZ401U	1200	2400	174.7	2795/16	3900	3500	5000	1.3	3.5	134	44
17	260	274	5.0	3.4	P821_0050 K302VF0350 EZ302U	820	1170	173.7	4515/26	3800	3500	5000	0.55	4	132	47
17	338	358	6.5	2.6	P821_0050 K302VF0350 EZ303U	880	1170	173.7	4515/26	3800	3500	5000	0.66	4	132	48
17	457	490	8.8	2.2	P821_0050 K302VF0350 EZ401U	1390	2200	173.7	4515/26	3800	3500	5000	1.2	4	132	49
17	703	768	14	1.4	P821_0050 K302VF0350 EZ501U	1600	2900	173.7	4515/26	3800	3500	5000	3.2	4	132	50
17	768	850	15	1.3	P821_0050 K302VF0350 EZ402U	1600	2200	173.7	4515/26	3800	3500	5000	1.9	4	132	50
18	243	256	5.7	3.8	P821_0070 K202VF0230 EZ302U	760	1220	162.3	20769/128	4000	3900	5500	0.53	3.5	132	42
18	316	334	7.5	2.9	P821_0070 K202VF0230 EZ303U	920	1220	162.3	20769/128	4000	3900	5500	0.64	3.5	132	43
18	427	458	10	2.3	P821_0070 K202VF0230 EZ401U	1300	2430	162.3	20769/128	4000	3900	5500	1.2	3.5	132	44
18	656	718	16	1.5	P821_0070 K202VF0230 EZ501U	1400	2800	162.3	20769/128	4000	3900	5500	3.1	3.5	132	45
18	718	794	17	1.4	P821_0070 K202VF0230 EZ402U	1400	2430	162.3	20769/128	4000	3900	5500	1.9	3.5	132	45
21	213	225	5.6	3.7	P821_0070 K202VF0200 EZ302U	670	1060	142.3	7826/55	4000	3900	5500	0.49	3.5	132	42
21	277	293	7.2	2.9	P821_0070 K202VF0200 EZ303U	800	1060	142.3	7826/55	4000	3900	5500	0.60	3.5	132	43
21	375	402	9.8	2.7	P821_0070 K202VF0200 EZ401U	1140	1990	142.3	7826/55	4000	3900	5500	1.1	3.5	132	44
21	576	629	15	1.7	P821_0070 K202VF0200 EZ501U	1400	2800	142.3	7826/55	4000	3900	5500	3.1	3.5	132	45
21	629	696	16	1.6	P821_0070 K202VF0200 EZ402U	1400	1990	142.3	7826/55	4000	3900	5500	1.8	3.5	132	45
21	991	1071	26	1.0	P821_0070 K202VF0200 EZ502U	1400	2800	142.3	7826/55	4000	3900	5500	5.4	3.5	132	47
22	209	220	4.7	3.8	P821_0050 K302VF0280 EZ302U	660	1050	139.4	17845/128	3800	3500	5000	0.66	4	132	47
22	272	287	6.2	2.9	P821_0050 K302VF0280 EZ303U	790	1050	139.4	17845/128	3800	3500	5000	0.77	4	132	48
22	367	394	8.3	2.7	P821_0050 K302VF0280 EZ401U	1110	2090	139.4	17845/128	3800	3500	5000	1.3	4	132	49
22	564	617	13	1.8	P821_0050 K302VF0280 EZ501U	1600	2900	139.4	17845/128	3800	3500	5000	3.3	4	132	50
22	617	682	14	1.6	P821_0050 K302VF0280 EZ402U	1570	2090	139.4	17845/128	3800	3500	5000	2.0	4	132	50
22	905	1128	21	1.1	P821_0050 K302VF0280 EZ404U	1600	2900	139.4	17845/128	3800	3500	5000	3.4	4	132	52
22	971	1049	22	1.0	P821_0050 K302VF0280 EZ502U	1600	2900	139.4	17845/128	3800	3500	5000	5.6	4	132	52
22	971	1089	22	1.0	P821_0050 K302VF0280 EZ701U	1600	2900	139.4	17845/128	3800	3500	5000	8.9	4	132	53

PK



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{zacc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
P8K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 1600$ Nm)																
22	207	219	10	3.4	P821_0100 K202VF0140 EZ302U	650	1040	138.5	14405/104	3900	3500	5000	0.80	3.5	134	42
22	270	285	13	2.6	P821_0100 K202VF0140 EZ303U	780	1040	138.5	14405/104	3900	3500	5000	0.91	3.5	134	43
22	365	391	18	1.9	P821_0100 K202VF0140 EZ401U	1110	2080	138.5	14405/104	3900	3500	5000	1.4	3.5	134	44
22	560	613	28	1.2	P821_0100 K202VF0140 EZ501U	1200	2400	138.5	14405/104	3900	3500	5000	3.4	3.5	134	45
22	613	678	30	1.1	P821_0100 K202VF0140 EZ402U	1200	2080	138.5	14405/104	3900	3500	5000	2.1	3.5	134	45
25	183	193	5.4	3.8	P821_0070 K202VF0175 EZ302U	580	920	122.3	3913/32	3900	3500	5000	0.67	3.5	132	42
25	238	252	7.0	2.9	P821_0070 K202VF0175 EZ303U	690	920	122.3	3913/32	3900	3500	5000	0.78	3.5	132	43
25	322	345	9.4	3.1	P821_0070 K202VF0175 EZ401U	980	1830	122.3	3913/32	3900	3500	5000	1.3	3.5	132	44
25	495	541	14	2.0	P821_0070 K202VF0175 EZ501U	1400	2800	122.3	3913/32	3900	3500	5000	3.3	3.5	132	45
25	541	598	16	1.8	P821_0070 K202VF0175 EZ402U	1380	1830	122.3	3913/32	3900	3500	5000	2.0	3.5	132	45
25	794	989	23	1.3	P821_0070 K202VF0175 EZ404U	1400	2800	122.3	3913/32	3900	3500	5000	3.4	3.5	132	47
25	851	920	25	1.2	P821_0070 K202VF0175 EZ502U	1400	2800	122.3	3913/32	3900	3500	5000	5.6	3.5	132	47
25	851	955	25	1.2	P821_0070 K202VF0175 EZ701U	1400	2800	122.3	3913/32	3900	3500	5000	8.9	3.5	132	48
25	177	187	5.3	3.8	P821_0070 K202VF0170 EZ302U	560	890	118.0	20769/176	4000	3900	5500	0.57	3.5	132	42
25	230	243	6.9	2.9	P821_0070 K202VF0170 EZ303U	670	890	118.0	20769/176	4000	3900	5500	0.68	3.5	132	43
25	311	333	9.3	3.2	P821_0070 K202VF0170 EZ401U	940	1770	118.0	20769/176	4000	3900	5500	1.2	3.5	132	44
25	477	522	14	2.1	P821_0070 K202VF0170 EZ501U	1400	2800	118.0	20769/176	4000	3900	5500	3.2	3.5	132	45
25	522	577	16	1.9	P821_0070 K202VF0170 EZ402U	1330	1770	118.0	20769/176	4000	3900	5500	1.9	3.5	132	45
25	766	955	23	1.3	P821_0070 K202VF0170 EZ404U	1400	2800	118.0	20769/176	4000	3900	5500	3.3	3.5	132	47
25	822	888	25	1.2	P821_0070 K202VF0170 EZ502U	1400	2800	118.0	20769/176	4000	3900	5500	5.5	3.5	132	47
25	822	922	25	1.2	P821_0070 K202VF0170 EZ701U	1400	2800	118.0	20769/176	4000	3900	5500	8.8	3.5	132	48
26	174	184	4.5	3.8	P821_0050 K302VF0230 EZ302U	550	870	116.5	2795/24	3800	3500	5000	0.79	4	132	47
26	227	240	5.9	2.9	P821_0050 K302VF0230 EZ303U	660	870	116.5	2795/24	3800	3500	5000	0.90	4	132	48
26	307	329	8.0	3.3	P821_0050 K302VF0230 EZ401U	930	1750	116.5	2795/24	3800	3500	5000	1.4	4	132	49
26	471	515	12	2.1	P821_0050 K302VF0230 EZ501U	1600	2900	116.5	2795/24	3800	3500	5000	3.4	4	132	50
26	515	570	13	1.9	P821_0050 K302VF0230 EZ402U	1310	1750	116.5	2795/24	3800	3500	5000	2.1	4	132	50
26	756	942	20	1.3	P821_0050 K302VF0230 EZ404U	1600	2900	116.5	2795/24	3800	3500	5000	3.5	4	132	52
26	811	877	21	1.2	P821_0050 K302VF0230 EZ502U	1600	2900	116.5	2795/24	3800	3500	5000	5.7	4	132	52
26	811	909	21	1.2	P821_0050 K302VF0230 EZ701U	1600	2900	116.5	2795/24	3800	3500	5000	9.0	4	132	53
26	173	183	9.8	3.8	P821_0100 K202VF0115 EZ302U	540	870	115.5	6235/54	3500	3100	4500	0.97	3.5	134	42
26	225	238	13	2.9	P821_0100 K202VF0115 EZ303U	650	870	115.5	6235/54	3500	3100	4500	1.1	3.5	134	43
26	304	326	17	2.3	P821_0100 K202VF0115 EZ401U	920	1730	115.5	6235/54	3500	3100	4500	1.6	3.5	134	44
26	467	511	27	1.5	P821_0100 K202VF0115 EZ501U	1200	2400	115.5	6235/54	3500	3100	4500	3.6	3.5	134	45
26	511	565	29	1.4	P821_0100 K202VF0115 EZ402U	1200	1730	115.5	6235/54	3500	3100	4500	2.3	3.5	134	45
31	145	153	5.3	3.8	P821_0070 K202VF0140 EZ302U	460	730	96.96	20167/208	3900	3500	5000	0.82	3.5	132	42
31	189	200	6.9	2.9	P821_0070 K202VF0140 EZ303U	550	730	96.96	20167/208	3900	3500	5000	0.93	3.5	132	43
31	255	274	9.4	3.7	P821_0070 K202VF0140 EZ401U	780	1450	96.96	20167/208	3900	3500	5000	1.5	3.5	132	44
31	392	429	14	2.4	P821_0070 K202VF0140 EZ501U	1400	2800	96.96	20167/208	3900	3500	5000	3.4	3.5	132	45
31	429	474	16	2.2	P821_0070 K202VF0140 EZ402U	1090	1450	96.96	20167/208	3900	3500	5000	2.2	3.5	132	45
31	629	785	23	1.5	P821_0070 K202VF0140 EZ404U	1400	2800	96.96	20167/208	3900	3500	5000	3.5	3.5	132	47
31	675	730	25	1.4	P821_0070 K202VF0140 EZ502U	1400	2800	96.96	20167/208	3900	3500	5000	5.7	3.5	132	47
31	675	757	25	1.4	P821_0070 K202VF0140 EZ701U	1400	2800	96.96	20167/208	3900	3500	5000	9.0	3.5	132	48
31	885	1013	32	1.1	P821_0070 K202VF0140 EZ503U	1400	2800	96.96	20167/208	3900	3500	5000	8.1	3.5	132	48
33	179	189	12	2.9	P821_0100 K202VF0092 EZ303U	520	690	91.90	11395/124	3500	3100	4500	1.3	3.5	134	43
33	242	259	16	2.9	P821_0100 K202VF0092 EZ401U	730	1380	91.90	11395/124	3500	3100	4500	1.9	3.5	134	44
33	372	406	25	1.9	P821_0100 K202VF0092 EZ501U	1200	2400	91.90	11395/124	3500	3100	4500	3.8	3.5	134	45
33	406	450	28	1.7	P821_0100 K202VF0092 EZ402U	1040	1380	91.90	11395/124	3500	3100	4500	2.6	3.5	134	45
33	597	744	40	1.2	P821_0100 K202VF0092 EZ404U	1200	2400	91.90	11395/124	3500	3100	4500	3.9	3.5	134	47
33	640	692	43	1.1	P821_0100 K202VF0092 EZ502U	1200	2400	91.90	11395/124	3500	3100	4500	6.1	3.5	134	47
33	640	718	43	1.1	P821_0100 K202VF0092 EZ701U	1200	2400	91.90	11395/124	3500	3100	4500	9.4	3.5	134	48
34	133	141	5.4	3.8	P821_0070 K202VF0125 EZ302U	420	670	88.94	3913/44	3900	3500	5000	0.73	3.5	132	42
34	173	183	7.0	2.9	P821_0070 K202VF0125 EZ303U	500	670	88.94	3913/44	3900	3500	5000	0.84	3.5	132	43
34	234	251	9.4	3.9	P821_0070 K202VF0125 EZ401U	710	1330	88.94	3913/44	3900	3500	5000	1.4	3.5	132	44
34	360	393	15	2.6	P821_0070 K202VF0125 EZ501U	1340	2670	88.94	3913/44	3900	3500	5000	3.3	3.5	132	45
34	393	435	16	2.3	P821_0070 K202VF0125 EZ402U	1000	1330	88.94	3913/44	3900	3500	5000	2.1	3.5	132	45
34	577	720	23	1.6	P821_0070 K202VF0125 EZ404U	1400	2670	88.94	3913/44	3900	3500	5000	3.4	3.5	132	47
34	619	669	25	1.5	P821_0070 K202VF0125 EZ502U	1400	2670	88.94	3913/44	3900	3500	5000	5.6	3.5	132	47
34	619	695	25	1.5	P821_0070 K202VF0125 EZ701U	1400	2800	88.94	3913/44	3900	3500	5000	8.9	3.5	132	48
34	812	929	33	1.1	P821_0070 K202VF0125 EZ503U	1400	2670	88.94	3913/44	3900	3500	5000	8.0	3.5	132	48



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
P8K ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 1600$ Nm)																
35	228	244	7.4	4.3	P821_0050 K302VF0175 EZ401U	690	1300	86.47	7955/92	3500	3100	5000	1.7	4	132	49
35	350	382	11	2.9	P821_0050 K302VF0175 EZ501U	1300	2590	86.47	7955/92	3500	3100	5000	3.7	4	132	50
35	382	423	12	2.6	P821_0050 K302VF0175 EZ402U	980	1300	86.47	7955/92	3500	3100	5000	2.4	4	132	50
35	561	700	18	1.8	P821_0050 K302VF0175 EZ404U	1600	2590	86.47	7955/92	3500	3100	5000	3.8	4	132	52
35	602	651	20	1.7	P821_0050 K302VF0175 EZ502U	1600	2590	86.47	7955/92	3500	3100	5000	6.0	4	132	52
35	602	675	20	1.7	P821_0050 K302VF0175 EZ701U	1600	2900	86.47	7955/92	3500	3100	5000	9.3	4	132	53
35	789	903	26	1.3	P821_0050 K302VF0175 EZ503U	1600	2590	86.47	7955/92	3500	3100	5000	8.4	4	132	53
35	976	1172	32	1.0	P821_0050 K302VF0175 EZ702U	1600	2900	86.47	7955/92	3500	3100	5000	15	4	132	56
36	164	173	12	2.9	P821_0100 K202VF0084 EZ303U	470	630	83.97	24940/297	3500	3100	4500	1.2	3.5	134	43
36	221	237	16	3.2	P821_0100 K202VF0084 EZ401U	670	1260	83.97	24940/297	3500	3100	4500	1.7	3.5	134	44
36	340	371	25	2.1	P821_0100 K202VF0084 EZ501U	1200	2400	83.97	24940/297	3500	3100	4500	3.7	3.5	134	45
36	371	411	27	1.9	P821_0100 K202VF0084 EZ402U	950	1260	83.97	24940/297	3500	3100	4500	2.4	3.5	134	45
36	545	679	39	1.3	P821_0100 K202VF0084 EZ404U	1200	2400	83.97	24940/297	3500	3100	4500	3.8	3.5	134	47
36	585	632	42	1.2	P821_0100 K202VF0084 EZ502U	1200	2400	83.97	24940/297	3500	3100	4500	6.0	3.5	134	47
36	585	656	42	1.2	P821_0100 K202VF0084 EZ701U	1200	2400	83.97	24940/297	3500	3100	4500	9.3	3.5	134	48
37	121	128	5.4	3.8	P821_0070 K202VF0115 EZ302U	380	610	80.82	8729/108	3500	3100	4500	0.99	3.5	132	42
37	157	167	7.0	2.9	P821_0070 K202VF0115 EZ303U	460	610	80.82	8729/108	3500	3100	4500	1.1	3.5	132	43
37	213	228	9.5	4.2	P821_0070 K202VF0115 EZ401U	650	1210	80.82	8729/108	3500	3100	4500	1.6	3.5	132	44
37	327	357	15	2.7	P821_0070 K202VF0115 EZ501U	1220	2420	80.82	8729/108	3500	3100	4500	3.6	3.5	132	45
37	357	395	16	2.5	P821_0070 K202VF0115 EZ402U	910	1210	80.82	8729/108	3500	3100	4500	2.3	3.5	132	45
37	525	654	23	1.7	P821_0070 K202VF0115 EZ404U	1400	2420	80.82	8729/108	3500	3100	4500	3.7	3.5	132	47
37	563	608	25	1.6	P821_0070 K202VF0115 EZ502U	1400	2420	80.82	8729/108	3500	3100	4500	5.9	3.5	132	47
37	563	631	25	1.6	P821_0070 K202VF0115 EZ701U	1400	2800	80.82	8729/108	3500	3100	4500	9.2	3.5	132	48
37	738	844	33	1.2	P821_0070 K202VF0115 EZ503U	1400	2420	80.82	8729/108	3500	3100	4500	8.3	3.5	132	48
43	105	111	5.5	3.8	P821_0070 K202VF0100 EZ302U	330	530	70.51	20167/286	3900	3500	5000	0.91	3.5	132	42
43	137	145	7.1	2.9	P821_0070 K202VF0100 EZ303U	400	530	70.51	20167/286	3900	3500	5000	1.0	3.5	132	43
43	186	199	9.6	4.3	P821_0070 K202VF0100 EZ401U	560	1060	70.51	20167/286	3900	3500	5000	1.6	3.5	132	44
43	285	312	15	3.0	P821_0070 K202VF0100 EZ501U	1060	2120	70.51	20167/286	3900	3500	5000	3.5	3.5	132	45
43	312	345	16	2.6	P821_0070 K202VF0100 EZ402U	800	1060	70.51	20167/286	3900	3500	5000	2.3	3.5	132	45
43	458	571	24	1.9	P821_0070 K202VF0100 EZ404U	1400	2120	70.51	20167/286	3900	3500	5000	3.6	3.5	132	47
43	491	531	25	1.7	P821_0070 K202VF0100 EZ502U	1400	2120	70.51	20167/286	3900	3500	5000	5.8	3.5	132	47
43	491	551	25	1.7	P821_0070 K202VF0100 EZ701U	1330	2800	70.51	20167/286	3900	3500	5000	9.1	3.5	132	48
43	644	736	33	1.3	P821_0070 K202VF0100 EZ503U	1400	2120	70.51	20167/286	3900	3500	5000	8.2	3.5	132	48
43	796	955	41	1.1	P821_0070 K202VF0100 EZ702U	1400	2800	70.51	20167/286	3900	3500	5000	14	3.5	132	51
43	282	308	11	3.5	P821_0050 K302VF0140 EZ501U	1050	2090	69.68	7525/108	3500	3100	5000	4.0	4	132	50
43	452	564	17	2.2	P821_0050 K302VF0140 EZ404U	1570	2090	69.68	7525/108	3500	3100	5000	4.1	4	132	52
43	485	524	19	2.1	P821_0050 K302VF0140 EZ502U	1570	2090	69.68	7525/108	3500	3100	5000	6.3	4	132	52
43	485	544	19	2.1	P821_0050 K302VF0140 EZ701U	1310	2900	69.68	7525/108	3500	3100	5000	9.6	4	132	53
43	636	728	24	1.6	P821_0050 K302VF0140 EZ503U	1570	2090	69.68	7525/108	3500	3100	5000	8.7	4	132	53
43	787	944	30	1.3	P821_0050 K302VF0140 EZ702U	1600	2900	69.68	7525/108	3500	3100	5000	15	4	132	56
43	885	1049	34	1.1	P821_0050 K302VF0140 EZ505U	1600	2900	69.68	7525/108	3500	3100	5000	13	4	132	56
45	130	138	11	2.9	P821_0100 K202VF0067 EZ303U	380	500	66.83	22790/341	3500	3100	4500	1.5	3.5	134	43
45	176	189	15	4.0	P821_0100 K202VF0067 EZ401U	530	1000	66.83	22790/341	3500	3100	4500	2.1	3.5	134	44
45	270	296	23	2.6	P821_0100 K202VF0067 EZ501U	1010	2000	66.83	22790/341	3500	3100	4500	4.0	3.5	134	45
45	296	327	25	2.4	P821_0100 K202VF0067 EZ402U	750	1000	66.83	22790/341	3500	3100	4500	2.8	3.5	134	45
45	434	541	37	1.6	P821_0100 K202VF0067 EZ404U	1200	2000	66.83	22790/341	3500	3100	4500	4.1	3.5	134	47
45	465	503	40	1.5	P821_0100 K202VF0067 EZ502U	1200	2000	66.83	22790/341	3500	3100	4500	6.3	3.5	134	47
45	465	522	40	1.5	P821_0100 K202VF0067 EZ701U	1200	2400	66.83	22790/341	3500	3100	4500	9.6	3.5	134	48
45	610	698	52	1.1	P821_0100 K202VF0067 EZ503U	1200	2000	66.83	22790/341	3500	3100	4500	8.7	3.5	134	48
47	125	133	7.2	2.9	P821_0070 K202VF0092 EZ303U	360	480	64.33	15953/248	3500	3100	4500	1.4	3.5	132	43
47	169	182	9.7	4.3	P821_0070 K202VF0092 EZ401U	510	960	64.33	15953/248	3500	3100	4500	1.9	3.5	132	44
47	260	284	15	3.2	P821_0070 K202VF0092 EZ501U	970	1930	64.33	15953/248	3500	3100	4500	3.9	3.5	132	45
47	284	315	16	2.6	P821_0070 K202VF0092 EZ402U	730	960	64.33	15953/248	3500	3100	4500	2.6	3.5	132	45
47	418	521	24	2.0	P821_0070 K202VF0092 EZ404U	1400	1930	64.33	15953/248	3500	3100	4500	4.0	3.5	132	47
47	448	484	26	1.8	P821_0070 K202VF0092 EZ502U	1400	1930	64.33	15953/248	3500	3100	4500	6.2	3.5	132	47
47	448	502	26	1.8	P821_0070 K202VF0092 EZ701U	1210	2800	64.33	15953/248	3500	3100	4500	9.5	3.5	132	48
47	587	672	34	1.4	P821_0070 K202VF0092 EZ503U	1400	1930	64.33	15953/248	3500	3100	4500	8.6	3.5	132	48
47	726	872	42	1.1	P821_0070 K202VF0092 EZ702U	1400	2800	64.33	15953/248	3500	3100	4500	15	3.5	132	51
47	817	968	47	1.0	P821_0070 K202VF0092 EZ505U	1400	2800	64.33	15953/248	3500	3100	4500	13	3.5	132	51

PK



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{zacc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1 [10 ⁻⁴ kgm ²]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/ arcmin]	m [kg]
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]				
P8K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 1600$ Nm)																
50	158	169	15	4.3	P821_0100 K202VF0060 EZ401U	480	900	60.00	60/1	3000	2600	4000	2.7	3.5	134	44
50	243	265	23	2.9	P821_0100 K202VF0060 EZ501U	900	1800	60.00	60/1	3000	2600	4000	4.6	3.5	134	45
50	265	294	25	2.6	P821_0100 K202VF0060 EZ402U	680	900	60.00	60/1	3000	2600	4000	3.4	3.5	134	45
50	390	486	36	1.8	P821_0100 K202VF0060 EZ404U	1200	1800	60.00	60/1	3000	2600	4000	4.7	3.5	134	47
50	418	452	39	1.7	P821_0100 K202VF0060 EZ502U	1200	1800	60.00	60/1	3000	2600	4000	6.9	3.5	134	47
50	418	469	39	1.7	P821_0100 K202VF0060 EZ701U	1130	2400	60.00	60/1	3000	2600	4000	10	3.5	134	48
50	548	627	51	1.3	P821_0100 K202VF0060 EZ503U	1200	1800	60.00	60/1	3000	2600	4000	9.3	3.5	134	48
50	677	813	63	1.0	P821_0100 K202VF0060 EZ702U	1200	2400	60.00	60/1	3000	2600	4000	15	3.5	134	51
51	114	121	7.2	2.9	P821_0070 K202VF0084 EZ303U	330	440	58.78	17458/297	3500	3100	4500	1.2	3.5	132	43
51	155	166	9.8	4.3	P821_0070 K202VF0084 EZ401U	470	880	58.78	17458/297	3500	3100	4500	1.8	3.5	132	44
51	238	260	15	3.4	P821_0070 K202VF0084 EZ501U	880	1760	58.78	17458/297	3500	3100	4500	3.7	3.5	132	45
51	260	288	16	2.6	P821_0070 K202VF0084 EZ402U	660	880	58.78	17458/297	3500	3100	4500	2.5	3.5	132	45
51	382	476	24	2.1	P821_0070 K202VF0084 EZ404U	1330	1760	58.78	17458/297	3500	3100	4500	3.8	3.5	132	47
51	409	442	26	2.0	P821_0070 K202VF0084 EZ502U	1330	1760	58.78	17458/297	3500	3100	4500	6.0	3.5	132	47
51	409	459	26	2.0	P821_0070 K202VF0084 EZ701U	1110	2800	58.78	17458/297	3500	3100	4500	9.3	3.5	132	48
51	536	614	34	1.5	P821_0070 K202VF0084 EZ503U	1330	1760	58.78	17458/297	3500	3100	4500	8.4	3.5	132	48
51	664	796	42	1.2	P821_0070 K202VF0084 EZ702U	1400	2800	58.78	17458/297	3500	3100	4500	15	3.5	132	51
51	747	885	47	1.1	P821_0070 K202VF0084 EZ505U	1400	2800	58.78	17458/297	3500	3100	4500	13	3.5	132	51
52	235	257	10	4.3	P821_0050 K302VF0115 EZ501U	870	1740	58.05	1161/20	3200	2800	4200	4.3	4	132	50
52	377	470	16	2.7	P821_0050 K302VF0115 EZ404U	1310	1740	58.05	1161/20	3200	2800	4200	4.4	4	132	52
52	404	437	18	2.5	P821_0050 K302VF0115 EZ502U	1310	1740	58.05	1161/20	3200	2800	4200	6.6	4	132	52
52	404	453	18	2.5	P821_0050 K302VF0115 EZ701U	1090	2900	58.05	1161/20	3200	2800	4200	9.9	4	132	53
52	530	606	23	1.9	P821_0050 K302VF0115 EZ503U	1310	1740	58.05	1161/20	3200	2800	4200	9.0	4	132	53
52	655	787	29	1.5	P821_0050 K302VF0115 EZ702U	1600	2900	58.05	1161/20	3200	2800	4200	15	4	132	56
52	737	874	32	1.4	P821_0050 K302VF0115 EZ505U	1600	2900	58.05	1161/20	3200	2800	4200	14	4	132	56
52	901	1136	39	1.1	P821_0050 K302VF0115 EZ703U	1600	2900	58.05	1161/20	3200	2800	4200	23	4	132	58
58	209	229	22	3.3	P821_0100 K202VF0052 EZ501U	780	1550	51.77	21070/407	3000	2600	4000	4.6	3.5	134	45
58	336	419	35	2.1	P821_0100 K202VF0052 EZ404U	1170	1550	51.77	21070/407	3000	2600	4000	4.7	3.5	134	47
58	360	390	38	1.9	P821_0100 K202VF0052 EZ502U	1170	1550	51.77	21070/407	3000	2600	4000	6.9	3.5	134	47
58	360	404	38	1.9	P821_0100 K202VF0052 EZ701U	970	2400	51.77	21070/407	3000	2600	4000	10	3.5	134	48
58	472	541	49	1.5	P821_0100 K202VF0052 EZ503U	1170	1550	51.77	21070/407	3000	2600	4000	9.3	3.5	134	48
58	585	701	61	1.2	P821_0100 K202VF0052 EZ702U	1200	2400	51.77	21070/407	3000	2600	4000	15	3.5	134	51
58	658	779	68	1.1	P821_0100 K202VF0052 EZ505U	1200	2400	51.77	21070/407	3000	2600	4000	14	3.5	134	51
60	202	220	15	3.8	P821_0070 K202VF0071 EZ501U	750	1490	49.83	14749/296	3000	2600	4000	4.3	3.5	132	45
60	323	403	24	2.3	P821_0070 K202VF0071 EZ404U	1130	1490	49.83	14749/296	3000	2600	4000	4.4	3.5	132	47
60	347	375	26	2.2	P821_0070 K202VF0071 EZ502U	1130	1490	49.83	14749/296	3000	2600	4000	6.6	3.5	132	47
60	347	389	26	2.2	P821_0070 K202VF0071 EZ701U	940	2800	49.83	14749/296	3000	2600	4000	9.9	3.5	132	48
60	455	520	34	1.7	P821_0070 K202VF0071 EZ503U	1130	1490	49.83	14749/296	3000	2600	4000	9.0	3.5	132	48
60	563	675	42	1.4	P821_0070 K202VF0071 EZ702U	1400	2800	49.83	14749/296	3000	2600	4000	15	3.5	132	51
60	633	750	48	1.2	P821_0070 K202VF0071 EZ505U	1400	2800	49.83	14749/296	3000	2600	4000	14	3.5	132	51
64	91	96	7.4	2.9	P821_0070 K202VF0067 EZ303U	260	350	46.78	15953/341	3500	3100	4500	1.6	3.5	132	43
64	123	132	10	4.3	P821_0070 K202VF0067 EZ401U	370	700	46.78	15953/341	3500	3100	4500	2.1	3.5	132	44
64	189	207	15	3.9	P821_0070 K202VF0067 EZ501U	700	1400	46.78	15953/341	3500	3100	4500	4.1	3.5	132	45
64	207	229	17	2.6	P821_0070 K202VF0067 EZ402U	530	700	46.78	15953/341	3500	3100	4500	2.8	3.5	132	45
64	304	379	25	2.4	P821_0070 K202VF0067 EZ404U	1060	1400	46.78	15953/341	3500	3100	4500	4.2	3.5	132	47
64	326	352	26	2.3	P821_0070 K202VF0067 EZ502U	1060	1400	46.78	15953/341	3500	3100	4500	6.4	3.5	132	47
64	326	365	26	2.3	P821_0070 K202VF0067 EZ701U	880	2800	46.78	15953/341	3500	3100	4500	9.7	3.5	132	48
64	427	489	35	1.7	P821_0070 K202VF0067 EZ503U	1060	1400	46.78	15953/341	3500	3100	4500	8.8	3.5	132	48
64	528	634	43	1.4	P821_0070 K202VF0067 EZ702U	1400	2800	46.78	15953/341	3500	3100	4500	15	3.5	132	51
64	594	704	48	1.3	P821_0070 K202VF0067 EZ505U	1400	2800	46.78	15953/341	3500	3100	4500	13	3.5	132	51
64	726	916	59	1.0	P821_0070 K202VF0067 EZ703U	1400	2800	46.78	15953/341	3500	3100	4500	23	3.5	132	53
65	301	375	16	3.3	P821_0050 K302VF0093 EZ404U	1050	1390	46.34	5375/116	3200	2800	4200	5.0	4	132	52
65	323	349	17	3.1	P821_0050 K302VF0093 EZ502U	1050	1390	46.34	5375/116	3200	2800	4200	7.2	4	132	52
65	323	362	17	3.1	P821_0050 K302VF0093 EZ701U	870	2900	46.34	5375/116	3200	2800	4200	11	4	132	53
65	423	484	22	2.4	P821_0050 K302VF0093 EZ503U	1050	1390	46.34	5375/116	3200	2800	4200	9.6	4	132	53
65	523	628	27	1.9	P821_0050 K302VF0093 EZ702U	1600	2900	46.34	5375/116	3200	2800	4200	16	4	132	56
65	589	698	30	1.7	P821_0050 K302VF0093 EZ505U	1600	2900	46.34	5375/116	3200	2800	4200	14	4	132	56
65	719	907	37	1.4	P821_0050 K302VF0093 EZ703U	1600	2900	46.34	5375/116	3200	2800	4200	24	4	132	58
71	111	119	10	4.3	P821_0070 K202VF0060 EZ401U	340	630	42.00	42/1	3000	2600	4000	2.7	3.5	132	44



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1 [10 ⁻⁴ kgm ²]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/ arcmin]	m [kg]
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]				
P8K ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 1600$ Nm)																
71	170	186	15	4.2	P821_0070 K202VF0060 EZ501U	630	1260	42.00	42/1	3000	2600	4000	4.7	3.5	132	45
71	186	205	17	2.6	P821_0070 K202VF0060 EZ402U	470	630	42.00	42/1	3000	2600	4000	3.4	3.5	132	45
71	273	340	25	2.6	P821_0070 K202VF0060 EZ404U	950	1260	42.00	42/1	3000	2600	4000	4.8	3.5	132	47
71	292	316	27	2.5	P821_0070 K202VF0060 EZ502U	950	1260	42.00	42/1	3000	2600	4000	7.0	3.5	132	47
71	292	328	27	2.5	P821_0070 K202VF0060 EZ701U	790	2800	42.00	42/1	3000	2600	4000	10	3.5	132	48
71	383	439	35	1.9	P821_0070 K202VF0060 EZ503U	950	1260	42.00	42/1	3000	2600	4000	9.4	3.5	132	48
71	474	569	43	1.5	P821_0070 K202VF0060 EZ702U	1360	2800	42.00	42/1	3000	2600	4000	16	3.5	132	51
71	533	632	48	1.3	P821_0070 K202VF0060 EZ505U	1360	2800	42.00	42/1	3000	2600	4000	14	3.5	132	51
71	652	822	59	1.1	P821_0070 K202VF0060 EZ703U	1360	2800	42.00	42/1	3000	2600	4000	23	3.5	132	53
75	105	113	13	4.3	P821_0100 K202VF0040 EZ401U	320	600	40.00	40/1	3000	2600	4000	3.5	3.5	134	44
75	162	177	20	4.3	P821_0100 K202VF0040 EZ501U	600	1200	40.00	40/1	3000	2600	4000	5.5	3.5	134	45
75	177	196	22	2.6	P821_0100 K202VF0040 EZ402U	450	600	40.00	40/1	3000	2600	4000	4.2	3.5	134	45
75	260	324	33	2.7	P821_0100 K202VF0040 EZ404U	900	1200	40.00	40/1	3000	2600	4000	5.5	3.5	134	47
75	279	301	35	2.5	P821_0100 K202VF0040 EZ502U	900	1200	40.00	40/1	3000	2600	4000	7.8	3.5	134	47
75	279	312	35	2.5	P821_0100 K202VF0040 EZ701U	750	2400	40.00	40/1	3000	2600	4000	11	3.5	134	48
75	365	418	46	1.9	P821_0100 K202VF0040 EZ503U	900	1200	40.00	40/1	3000	2600	4000	10	3.5	134	48
75	452	542	57	1.6	P821_0100 K202VF0040 EZ702U	1200	2400	40.00	40/1	3000	2600	4000	16	3.5	134	51
75	508	602	64	1.4	P821_0100 K202VF0040 EZ505U	1200	2400	40.00	40/1	3000	2600	4000	15	3.5	134	51
75	621	783	78	1.1	P821_0100 K202VF0040 EZ703U	1200	2400	40.00	40/1	3000	2600	4000	24	3.5	134	53
81	257	289	16	3.7	P821_0050 K302VF0074 EZ701U	700	2770	36.96	2365/64	2700	2300	3800	11	4	132	53
81	417	501	27	2.3	P821_0050 K302VF0074 EZ702U	1430	2770	36.96	2365/64	2700	2300	3800	17	4	132	56
81	469	556	30	2.1	P821_0050 K302VF0074 EZ505U	1600	2770	36.96	2365/64	2700	2300	3800	15	4	132	56
81	574	723	37	1.7	P821_0050 K302VF0074 EZ703U	1600	2770	36.96	2365/64	2700	2300	3800	24	4	132	58
83	147	160	16	4.7	P821_0070 K202VF0052 EZ501U	550	1090	36.24	14749/407	3000	2600	4000	4.7	3.5	132	45
83	235	293	25	2.9	P821_0070 K202VF0052 EZ404U	820	1090	36.24	14749/407	3000	2600	4000	4.8	3.5	132	47
83	252	273	27	2.7	P821_0070 K202VF0052 EZ502U	820	1090	36.24	14749/407	3000	2600	4000	7.0	3.5	132	47
83	252	283	27	2.7	P821_0070 K202VF0052 EZ701U	680	2720	36.24	14749/407	3000	2600	4000	10	3.5	132	48
83	331	378	35	2.1	P821_0070 K202VF0052 EZ503U	820	1090	36.24	14749/407	3000	2600	4000	9.4	3.5	132	48
83	409	491	44	1.7	P821_0070 K202VF0052 EZ702U	1290	2720	36.24	14749/407	3000	2600	4000	16	3.5	132	51
83	460	546	49	1.5	P821_0070 K202VF0052 EZ505U	1290	2720	36.24	14749/407	3000	2600	4000	14	3.5	132	51
83	563	709	60	1.2	P821_0070 K202VF0052 EZ703U	1290	2720	36.24	14749/407	3000	2600	4000	23	3.5	132	53
98	80	86	10	4.3	P821_0070 K202VF0044 EZ401U	240	460	30.55	336/11	3000	2600	4000	3.3	3.5	132	44
98	124	135	16	2.8	P821_0070 K202VF0044 EZ501U	340	460	30.55	336/11	3000	2600	4000	5.2	3.5	132	45
98	135	149	17	2.6	P821_0070 K202VF0044 EZ402U	340	460	30.55	336/11	3000	2600	4000	4.0	3.5	132	45
98	198	247	25	3.3	P821_0070 K202VF0044 EZ404U	690	920	30.55	336/11	3000	2600	4000	5.3	3.5	132	47
98	213	230	27	3.0	P821_0070 K202VF0044 EZ502U	690	920	30.55	336/11	3000	2600	4000	7.5	3.5	132	47
98	213	239	27	3.0	P821_0070 K202VF0044 EZ701U	570	2290	30.55	336/11	3000	2600	4000	11	3.5	132	48
98	279	319	36	2.3	P821_0070 K202VF0044 EZ503U	690	920	30.55	336/11	3000	2600	4000	9.9	3.5	132	48
98	345	414	44	1.9	P821_0070 K202VF0044 EZ702U	1180	2290	30.55	336/11	3000	2600	4000	16	3.5	132	51
98	388	460	50	1.7	P821_0070 K202VF0044 EZ505U	1220	2290	30.55	336/11	3000	2600	4000	14	3.5	132	51
98	474	598	61	1.4	P821_0070 K202VF0044 EZ703U	1220	2290	30.55	336/11	3000	2600	4000	24	3.5	132	53
100	195	243	16	3.5	P821_0050 K302VF0060 EZ404U	680	900	30.00	30/1	2700	2300	3800	6.7	4	132	52
100	209	226	17	3.2	P821_0050 K302VF0060 EZ502U	680	900	30.00	30/1	2700	2300	3800	9.0	4	132	52
100	209	234	17	4.3	P821_0050 K302VF0060 EZ701U	560	2250	30.00	30/1	2700	2300	3800	12	4	132	53
100	274	313	22	2.5	P821_0050 K302VF0060 EZ503U	680	900	30.00	30/1	2700	2300	3800	11	4	132	53
100	339	406	27	2.7	P821_0050 K302VF0060 EZ702U	1160	2250	30.00	30/1	2700	2300	3800	17	4	132	56
100	381	452	30	2.4	P821_0050 K302VF0060 EZ505U	1600	2250	30.00	30/1	2700	2300	3800	16	4	132	56
100	466	587	37	1.9	P821_0050 K302VF0060 EZ703U	1600	2250	30.00	30/1	2700	2300	3800	25	4	132	58
100	601	852	48	1.5	P821_0050 K302VF0060 EZ705U	1600	2900	30.00	30/1	2700	2300	3800	38	4	132	63
107	74	79	10	4.3	P821_0070 K202VF0040 EZ401U	220	420	28.00	28/1	3000	2600	4000	3.6	3.5	132	44
107	113	124	16	2.8	P821_0070 K202VF0040 EZ501U	320	420	28.00	28/1	3000	2600	4000	5.6	3.5	132	45
107	124	137	17	2.6	P821_0070 K202VF0040 EZ402U	320	420	28.00	28/1	3000	2600	4000	4.3	3.5	132	45
107	182	227	26	3.4	P821_0070 K202VF0040 EZ404U	630	840	28.00	28/1	3000	2600	4000	5.7	3.5	132	47
107	195	211	27	3.2	P821_0070 K202VF0040 EZ502U	630	840	28.00	28/1	3000	2600	4000	7.9	3.5	132	47
107	195	219	27	3.2	P821_0070 K202VF0040 EZ701U	530	2100	28.00	28/1	3000	2600	4000	11	3.5	132	48
107	256	292	36	2.5	P821_0070 K202VF0040 EZ503U	630	840	28.00	28/1	3000	2600	4000	10	3.5	132	48
107	316	379	45	2.0	P821_0070 K202VF0040 EZ702U	1080	2100	28.00	28/1	3000	2600	4000	16	3.5	132	51
107	356	422	50	1.8	P821_0070 K202VF0040 EZ505U	1180	2100	28.00	28/1	3000	2600	4000	15	3.5	132	51
107	435	548	61	1.4	P821_0070 K202VF0040 EZ703U	1180	2100	28.00	28/1	3000	2600	4000	24	3.5	132	53

PK



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{zacc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1 [10 ⁻⁴ kgm ²]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/ arcmin]	m [kg]
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]				
P8K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 1600$ Nm)																
112	187	210	17	4.6	P821_0050 K302VF0054 EZ701U	510	2020	26.88	215/8	2700	2300	3800	12	4	132	53
112	303	364	27	2.9	P821_0050 K302VF0054 EZ702U	1040	2020	26.88	215/8	2700	2300	3800	17	4	132	56
112	341	405	31	2.5	P821_0050 K302VF0054 EZ505U	1520	2020	26.88	215/8	2700	2300	3800	16	4	132	56
112	417	526	38	2.1	P821_0050 K302VF0054 EZ703U	1520	2020	26.88	215/8	2700	2300	3800	25	4	132	58
150	226	271	28	3.5	P821_0050 K302VF0040 EZ702U	770	1500	20.00	20/1	2700	2300	3800	19	4	132	56
150	254	301	31	3.1	P821_0050 K302VF0040 EZ505U	1130	1500	20.00	20/1	2700	2300	3800	18	4	132	56
150	310	391	38	2.5	P821_0050 K302VF0040 EZ703U	1130	1500	20.00	20/1	2700	2300	3800	27	4	132	58
150	401	568	50	2.0	P821_0050 K302VF0040 EZ705U	1480	2900	20.00	20/1	2700	2300	3800	40	4	132	63
188	181	217	28	3.5	P821_0040 K302VF0040 EZ702U	620	1200	16.00	16/1	2700	2300	3800	20	4	115	56
188	203	241	31	3.1	P821_0040 K302VF0040 EZ505U	900	1200	16.00	16/1	2700	2300	3800	18	4	115	56
188	248	313	38	2.5	P821_0040 K302VF0040 EZ703U	900	1200	16.00	16/1	2700	2300	3800	28	4	115	58
188	321	455	50	2.0	P821_0040 K302VF0040 EZ705U	1190	2330	16.00	16/1	2700	2300	3800	40	4	115	63
250	135	163	28	3.5	P821_0030 K302VF0040 EZ702U	460	900	12.00	12/1	2700	2300	3800	21	4.5	89	56
250	152	181	31	3.1	P821_0030 K302VF0040 EZ505U	680	900	12.00	12/1	2700	2300	3800	20	4.5	89	56
250	186	235	38	2.5	P821_0030 K302VF0040 EZ703U	680	900	12.00	12/1	2700	2300	3800	29	4.5	89	58
250	240	341	50	2.0	P821_0030 K302VF0040 EZ705U	890	1760	12.00	12/1	2700	2300	3800	41	4.5	89	63
P8K ($n_{1N} = 4500$ rpm, $M_{zacc,max} = 1600$ Nm)																
64	630	1015	37	1.2	P821_0070 K202VF0100 EZ505U	1400	2800	70.51	20167/286	3900	3500	5000	13	3.5	132	51
65	623	1003	24	1.6	P821_0050 K302VF0140 EZ505U	1600	2900	69.68	7525/108	3500	3100	5000	13	4	132	56
70	575	926	38	1.3	P821_0070 K202VF0092 EZ505U	1400	2800	64.33	15953/248	3500	3100	4500	13	3.5	132	51
77	525	846	38	1.3	P821_0070 K202VF0084 EZ505U	1400	2800	58.78	17458/297	3500	3100	4500	13	3.5	132	51
96	418	673	39	1.6	P821_0070 K202VF0067 EZ505U	1400	2800	46.78	15953/341	3500	3100	4500	13	3.5	132	51
96	533	880	49	1.2	P821_0070 K202VF0067 EZ703U	1400	2800	46.78	15953/341	3500	3100	4500	23	3.5	132	53
P9K ($n_{1N} = 2000$ rpm, $M_{zacc,max} = 2700$ Nm)																
65	1256	1900	64	1.5	P921_0070 K402VF0044 EZ805U	2700	5400	30.55	336/11	2600	2200	3500	142	3.5	271	126
71	1151	1741	65	1.6	P921_0070 K402VF0040 EZ805U	2700	5400	28.00	28/1	2600	2200	3500	143	3.5	271	126
P9K ($n_{1N} = 3000$ rpm, $M_{zacc,max} = 2700$ Nm)																
7.7	1578	1724	12	1.3	P921_0070 K402VF0560 EZ501U	2700	5400	389.9	17157/44	3600	3300	5000	3.1	3.5	271	85
8.5	1428	1561	12	1.3	P921_0070 K402VF0500 EZ501U	2200	3110	353.0	38829/110	3600	3300	5000	3.1	3.5	271	85
9.3	1311	1433	11	1.5	P921_0070 K402VF0460 EZ501U	2700	5400	324.2	4214/13	3600	3300	5000	3.2	3.5	271	85
11	1147	1254	11	1.7	P921_0070 K402VF0410 EZ501U	2510	4450	283.6	34314/121	3600	3300	5000	3.1	3.5	271	85
12	984	1076	10	2.0	P921_0070 K402VF0350 EZ501U	2700	5400	243.3	29197/120	3600	3300	5000	3.4	3.5	271	85
12	1694	1831	18	1.2	P921_0070 K402VF0350 EZ502U	2700	5400	243.3	29197/120	3600	3300	5000	5.7	3.5	271	87
12	1694	1900	18	1.2	P921_0070 K402VF0350 EZ701U	2700	5400	243.3	29197/120	3600	3300	5000	9.0	3.5	271	89
13	954	1043	10	2.1	P921_0070 K402VF0340 EZ501U	2700	5160	235.7	33712/143	3600	3300	5000	3.2	3.5	271	85
13	1641	1775	18	1.2	P921_0070 K402VF0340 EZ502U	2700	5160	235.7	33712/143	3600	3300	5000	5.5	3.5	271	87
13	1641	1841	18	1.2	P921_0070 K402VF0340 EZ701U	2700	5160	235.7	33712/143	3600	3300	5000	8.8	3.5	271	89
15	787	860	9.8	2.5	P921_0070 K402VF0280 EZ501U	2700	5380	194.4	9331/48	3600	3300	5000	3.6	3.5	271	85
15	1354	1463	17	1.5	P921_0070 K402VF0280 EZ502U	2700	5380	194.4	9331/48	3600	3300	5000	5.9	3.5	271	87
15	1354	1518	17	1.5	P921_0070 K402VF0280 EZ701U	2700	5400	194.4	9331/48	3600	3300	5000	9.2	3.5	271	89
15	1774	2030	22	1.1	P921_0070 K402VF0280 EZ503U	2700	5380	194.4	9331/48	3600	3300	5000	8.2	3.5	271	88
17	716	783	9.5	2.8	P921_0070 K402VF0250 EZ501U	2660	4240	177.0	29197/165	3600	3300	5000	3.4	3.5	271	85
17	1232	1332	16	1.6	P921_0070 K402VF0250 EZ502U	2700	4240	177.0	29197/165	3600	3300	5000	5.7	3.5	271	87
17	1232	1382	16	1.6	P921_0070 K402VF0250 EZ701U	2700	5400	177.0	29197/165	3600	3300	5000	9.0	3.5	271	89
17	1615	1848	21	1.2	P921_0070 K402VF0250 EZ503U	2700	4240	177.0	29197/165	3600	3300	5000	8.1	3.5	271	88
18	660	721	9.3	3.0	P921_0070 K402VF0230 EZ501U	2450	4890	163.0	3913/24	3600	3300	5000	3.8	3.5	271	85
18	1135	1227	16	1.8	P921_0070 K402VF0230 EZ502U	2700	4890	163.0	3913/24	3600	3300	5000	6.1	3.5	271	87
18	1135	1273	16	1.8	P921_0070 K402VF0230 EZ701U	2700	5400	163.0	3913/24	3600	3300	5000	9.4	3.5	271	89
18	1488	1703	21	1.3	P921_0070 K402VF0230 EZ503U	2700	4890	163.0	3913/24	3600	3300	5000	8.5	3.5	271	88
21	572	625	9.0	3.5	P921_0070 K402VF0200 EZ501U	2130	3910	141.4	9331/66	3600	3300	5000	3.7	3.5	271	85
21	984	1064	15	2.0	P921_0070 K402VF0200 EZ502U	2700	3910	141.4	9331/66	3600	3300	5000	6.0	3.5	271	87
21	984	1104	15	2.0	P921_0070 K402VF0200 EZ701U	2660	5400	141.4	9331/66	3600	3300	5000	9.3	3.5	271	89
21	1290	1477	20	1.6	P921_0070 K402VF0200 EZ503U	2700	3910	141.4	9331/66	3600	3300	5000	8.3	3.5	271	88
21	1596	1916	25	1.3	P921_0070 K402VF0200 EZ702U	2700	5400	141.4	9331/66	3600	3300	5000	14	3.5	271	91
25	493	539	8.7	4.1	P921_0070 K402VF0175 EZ501U	1830	3660	121.8	731/6	3400	3000	4500	4.3	3.5	271	85
25	848	917	15	2.4	P921_0070 K402VF0175 EZ502U	2700	3660	121.8	731/6	3400	3000	4500	6.6	3.5	271	87
25	848	951	15	2.4	P921_0070 K402VF0175 EZ701U	2290	5400	121.8	731/6	3400	3000	4500	9.9	3.5	271	89
25	1112	1272	20	1.8	P921_0070 K402VF0175 EZ503U	2700	3660	121.8	731/6	3400	3000	4500	9.0	3.5	271	88
25	1376	1651	24	1.5	P921_0070 K402VF0175 EZ702U	2700	5400	121.8	731/6	3400	3000	4500	15	3.5	271	91



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
P9K ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 2700$ Nm)																
25	1548	1834	27	1.3	P921_0070 K402VF0175 EZ505U	2700	5400	121.8	731/6	3400	3000	4500	14	3.5	271	91
25	480	524	8.6	4.2	P921_0070 K402VF0170 EZ501U	1790	3560	118.6	3913/33	3600	3300	5000	3.9	3.5	271	85
25	826	893	15	2.4	P921_0070 K402VF0170 EZ502U	2680	3560	118.6	3913/33	3600	3300	5000	6.2	3.5	271	87
25	826	926	15	2.4	P921_0070 K402VF0170 EZ701U	2230	5400	118.6	3913/33	3600	3300	5000	9.5	3.5	271	89
25	1082	1238	19	1.8	P921_0070 K402VF0170 EZ503U	2680	3560	118.6	3913/33	3600	3300	5000	8.6	3.5	271	88
25	1339	1607	24	1.5	P921_0070 K402VF0170 EZ702U	2700	5400	118.6	3913/33	3600	3300	5000	15	3.5	271	91
25	1506	1785	27	1.3	P921_0070 K402VF0170 EZ505U	2700	5400	118.6	3913/33	3600	3300	5000	13	3.5	271	91
31	677	759	14	3.0	P921_0070 K402VF0140 EZ701U	1830	5400	97.20	9331/96	3400	3000	4500	11	3.5	271	89
31	1097	1317	23	1.8	P921_0070 K402VF0140 EZ702U	2700	5400	97.20	9331/96	3400	3000	4500	16	3.5	271	91
31	1235	1463	26	1.6	P921_0070 K402VF0140 EZ505U	2700	5400	97.20	9331/96	3400	3000	4500	14	3.5	271	91
31	1509	1902	31	1.3	P921_0070 K402VF0140 EZ703U	2700	5400	97.20	9331/96	3400	3000	4500	24	3.5	271	93
34	617	667	14	3.2	P921_0070 K402VF0125 EZ502U	2000	2660	88.61	2924/33	3400	3000	4500	6.9	3.5	271	87
34	617	692	14	3.2	P921_0070 K402VF0125 EZ701U	1670	5400	88.61	2924/33	3400	3000	4500	10	3.5	271	89
34	809	925	18	2.5	P921_0070 K402VF0125 EZ503U	2000	2660	88.61	2924/33	3400	3000	4500	9.2	3.5	271	88
34	1000	1201	22	2.0	P921_0070 K402VF0125 EZ702U	2700	5400	88.61	2924/33	3400	3000	4500	15	3.5	271	91
34	1125	1334	25	1.8	P921_0070 K402VF0125 EZ505U	2700	5400	88.61	2924/33	3400	3000	4500	14	3.5	271	91
34	1376	1734	31	1.5	P921_0070 K402VF0125 EZ703U	2700	5400	88.61	2924/33	3400	3000	4500	23	3.5	271	93
37	561	630	13	3.6	P921_0070 K402VF0115 EZ701U	1520	5400	80.63	645/8	3000	2600	4000	11	3.5	271	89
37	910	1092	22	2.2	P921_0070 K402VF0115 EZ702U	2700	5400	80.63	645/8	3000	2600	4000	16	3.5	271	91
37	1024	1214	25	2.0	P921_0070 K402VF0115 EZ505U	2700	5400	80.63	645/8	3000	2600	4000	15	3.5	271	91
37	1252	1578	30	1.6	P921_0070 K402VF0115 EZ703U	2700	5400	80.63	645/8	3000	2600	4000	24	3.5	271	93
42	492	552	13	4.1	P921_0070 K402VF0100 EZ701U	1330	5300	70.69	9331/132	3400	3000	4500	11	3.5	271	89
42	798	958	21	2.5	P921_0070 K402VF0100 EZ702U	2700	5300	70.69	9331/132	3400	3000	4500	16	3.5	271	91
42	898	1064	24	2.2	P921_0070 K402VF0100 EZ505U	2700	5300	70.69	9331/132	3400	3000	4500	15	3.5	271	91
42	1097	1383	29	1.8	P921_0070 K402VF0100 EZ703U	2700	5300	70.69	9331/132	3400	3000	4500	24	3.5	271	93
42	1417	2009	38	1.4	P921_0070 K402VF0100 EZ705U	2700	5400	70.69	9331/132	3400	3000	4500	36	3.5	271	99
46	450	505	13	4.4	P921_0070 K402VF0092 EZ701U	1220	4850	64.67	16555/256	3000	2600	4000	12	3.5	271	89
46	730	876	21	2.7	P921_0070 K402VF0092 EZ702U	2490	4850	64.67	16555/256	3000	2600	4000	17	3.5	271	91
46	821	974	23	2.4	P921_0070 K402VF0092 EZ505U	2700	4850	64.67	16555/256	3000	2600	4000	16	3.5	271	91
46	1004	1266	28	2.0	P921_0070 K402VF0092 EZ703U	2700	4850	64.67	16555/256	3000	2600	4000	25	3.5	271	93
46	1296	1837	37	1.5	P921_0070 K402VF0092 EZ705U	2700	5400	64.67	16555/256	3000	2600	4000	38	3.5	271	99
51	408	458	12	4.9	P921_0070 K402VF0084 EZ701U	1100	4400	58.64	645/11	3000	2600	4000	12	3.5	271	89
51	662	794	20	3.0	P921_0070 K402VF0084 EZ702U	2260	4400	58.64	645/11	3000	2600	4000	17	3.5	271	91
51	745	883	23	2.7	P921_0070 K402VF0084 EZ505U	2700	4400	58.64	645/11	3000	2600	4000	15	3.5	271	91
51	910	1148	28	2.2	P921_0070 K402VF0084 EZ703U	2700	4400	58.64	645/11	3000	2600	4000	25	3.5	271	93
51	1175	1666	36	1.7	P921_0070 K402VF0084 EZ705U	2700	5400	58.64	645/11	3000	2600	4000	37	3.5	271	99
51	1230	2047	37	1.6	P921_0070 K402VF0084 EZ802U	2700	5400	58.64	645/11	3000	2600	4000	61	3.5	271	107
57	589	707	20	3.4	P921_0070 K402VF0075 EZ702U	2010	3910	52.19	12943/248	2600	2200	3500	19	3.5	271	91
57	663	786	22	3.0	P921_0070 K402VF0075 EZ505U	2700	3910	52.19	12943/248	2600	2200	3500	17	3.5	271	91
57	810	1021	27	2.5	P921_0070 K402VF0075 EZ703U	2700	3910	52.19	12943/248	2600	2200	3500	27	3.5	271	93
57	1046	1483	35	1.9	P921_0070 K402VF0075 EZ705U	2700	5400	52.19	12943/248	2600	2200	3500	39	3.5	271	99
57	1095	1822	36	1.8	P921_0070 K402VF0075 EZ802U	2700	5400	52.19	12943/248	2600	2200	3500	63	3.5	271	107
64	531	637	19	3.7	P921_0070 K402VF0067 EZ702U	1810	3530	47.03	1505/32	3000	2600	4000	18	3.5	271	91
64	597	708	22	3.3	P921_0070 K402VF0067 EZ505U	2660	3530	47.03	1505/32	3000	2600	4000	17	3.5	271	91
64	730	920	27	2.7	P921_0070 K402VF0067 EZ703U	2660	3530	47.03	1505/32	3000	2600	4000	26	3.5	271	93
64	943	1336	35	2.1	P921_0070 K402VF0067 EZ705U	2700	5400	47.03	1505/32	3000	2600	4000	39	3.5	271	99
64	987	1642	36	2.0	P921_0070 K402VF0067 EZ802U	2700	5400	47.03	1505/32	3000	2600	4000	63	3.5	271	107
71	292	316	12	3.2	P921_0070 K402VF0060 EZ502U	950	1260	42.00	42/1	2600	2200	3500	12	3.5	271	87
71	292	328	12	3.2	P921_0070 K402VF0060 EZ701U	790	1260	42.00	42/1	2600	2200	3500	16	3.5	271	89
71	383	439	16	2.5	P921_0070 K402VF0060 EZ503U	950	1260	42.00	42/1	2600	2200	3500	15	3.5	271	88
71	474	569	20	4.0	P921_0070 K402VF0060 EZ702U	1620	3150	42.00	42/1	2600	2200	3500	21	3.5	271	91
71	533	632	22	3.5	P921_0070 K402VF0060 EZ505U	2370	3150	42.00	42/1	2600	2200	3500	19	3.5	271	91
71	652	822	27	2.9	P921_0070 K402VF0060 EZ703U	2370	3150	42.00	42/1	2600	2200	3500	29	3.5	271	93
71	842	1193	35	2.2	P921_0070 K402VF0060 EZ705U	2700	5400	42.00	42/1	2600	2200	3500	41	3.5	271	99
71	881	1466	37	2.1	P921_0070 K402VF0060 EZ802U	2700	5400	42.00	42/1	2600	2200	3500	65	3.5	271	107
71	1051	1905	44	1.8	P921_0070 K402VF0060 EZ803U	2700	5400	42.00	42/1	2600	2200	3500	91	3.5	271	113
79	429	514	20	4.3	P921_0070 K402VF0054 EZ702U	1460	2850	37.95	12943/341	2600	2200	3500	20	3.5	271	91
79	482	571	22	3.8	P921_0070 K402VF0054 EZ505U	2140	2850	37.95	12943/341	2600	2200	3500	19	3.5	271	91
79	589	743	27	3.1	P921_0070 K402VF0054 EZ703U	2140	2850	37.95	12943/341	2600	2200	3500	28	3.5	271	93

PK



15 PK right-angle planetary geared motors

15.2 Selection tables



n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DBH	n_{1max} DBV	n_{1max} ZB	J_1 [10 ⁻⁴ kgm ²]	$\Delta\phi_2$ [arcmin]	C_2 [Nm/ arcmin]	m [kg]
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[rpm]				
P9K ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 2700$ Nm)																
79	761	1078	35	2.4	P921_0070 K402VF0054 EZ705U	2700	5400	37.95	12943/341	2600	2200	3500	41	3.5	271	99
79	796	1325	37	2.3	P921_0070 K402VF0054 EZ802U	2700	5400	37.95	12943/341	2600	2200	3500	65	3.5	271	107
79	950	1721	44	1.9	P921_0070 K402VF0054 EZ803U	2700	5400	37.95	12943/341	2600	2200	3500	90	3.5	271	113
98	213	230	12	3.2	P921_0070 K402VF0044 EZ502U	690	920	30.55	336/11	2600	2200	3500	14	3.5	271	87
98	213	239	12	3.2	P921_0070 K402VF0044 EZ701U	570	920	30.55	336/11	2600	2200	3500	18	3.5	271	89
98	279	319	16	2.5	P921_0070 K402VF0044 EZ503U	690	920	30.55	336/11	2600	2200	3500	17	3.5	271	88
98	345	414	20	4.9	P921_0070 K402VF0044 EZ702U	1180	2290	30.55	336/11	2600	2200	3500	23	3.5	271	91
98	388	460	23	4.4	P921_0070 K402VF0044 EZ505U	1720	2290	30.55	336/11	2600	2200	3500	21	3.5	271	91
98	474	598	28	3.6	P921_0070 K402VF0044 EZ703U	1720	2290	30.55	336/11	2600	2200	3500	31	3.5	271	93
98	612	868	36	2.8	P921_0070 K402VF0044 EZ705U	2700	5400	30.55	336/11	2600	2200	3500	43	3.5	271	99
98	641	1066	38	2.6	P921_0070 K402VF0044 EZ802U	2700	5400	30.55	336/11	2600	2200	3500	67	3.5	271	107
98	765	1385	45	2.2	P921_0070 K402VF0044 EZ803U	2700	5400	30.55	336/11	2600	2200	3500	93	3.5	271	113
107	316	379	20	5.0	P921_0070 K402VF0040 EZ702U	1080	2100	28.00	28/1	2600	2200	3500	24	3.5	271	91
107	356	422	23	4.4	P921_0070 K402VF0040 EZ505U	1580	2100	28.00	28/1	2600	2200	3500	23	3.5	271	91
107	435	548	28	3.6	P921_0070 K402VF0040 EZ703U	1580	2100	28.00	28/1	2600	2200	3500	32	3.5	271	93
107	561	796	36	2.9	P921_0070 K402VF0040 EZ705U	2700	5400	28.00	28/1	2600	2200	3500	45	3.5	271	99
107	587	977	38	2.8	P921_0070 K402VF0040 EZ802U	2630	5400	28.00	28/1	2600	2200	3500	69	3.5	271	107
107	701	1270	45	2.4	P921_0070 K402VF0040 EZ803U	2700	5400	28.00	28/1	2600	2200	3500	94	3.5	271	113
P9K ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 2700$ Nm)																
32	1264	2035	20	1.6	P921_0070 K402VF0200 EZ505U	2700	5400	141.4	9331/66	3600	3300	5000	13	3.5	271	91
37	1089	1754	19	1.8	P921_0070 K402VF0175 EZ505U	2700	5400	121.8	731/6	3400	3000	4500	14	3.5	271	91
38	1060	1707	19	1.9	P921_0070 K402VF0170 EZ505U	2700	5400	118.6	3913/33	3600	3300	5000	13	3.5	271	91
46	869	1399	18	2.3	P921_0070 K402VF0140 EZ505U	2700	5400	97.20	9331/96	3400	3000	4500	14	3.5	271	91
46	1107	1829	23	1.8	P921_0070 K402VF0140 EZ703U	2700	5400	97.20	9331/96	3400	3000	4500	24	3.5	271	93
51	792	1276	18	2.5	P921_0070 K402VF0125 EZ505U	2700	5400	88.61	2924/33	3400	3000	4500	14	3.5	271	91
51	1009	1667	23	2.0	P921_0070 K402VF0125 EZ703U	2700	5400	88.61	2924/33	3400	3000	4500	23	3.5	271	93
64	632	1018	17	3.1	P921_0070 K402VF0100 EZ505U	2700	5300	70.69	9331/132	3400	3000	4500	15	3.5	271	91
64	805	1330	22	2.4	P921_0070 K402VF0100 EZ703U	2700	5300	70.69	9331/132	3400	3000	4500	24	3.5	271	93
64	1091	1995	29	1.8	P921_0070 K402VF0100 EZ705U	2700	5400	70.69	9331/132	3400	3000	4500	36	3.5	271	99



15.3 Dimensional drawings

In this chapter you can find the dimensions of the geared motors.

There is a dimensional drawing for every possible shaft/housing design, each with the tables for gear unit dimensions, motor dimensions and geared motor dimensions.

Dimensions can exceed the specifications of ISO 2768-mK due to casting tolerances or accumulation of individual tolerances.

We reserve the right to make dimensional changes due to ongoing technical development.

You can download CAD models of our standard drives at <http://cad.stoeber.de>.

Combination options and the dimensions of forced ventilated geared motors can be found at <http://cad.stoeber.de>.

Tolerances

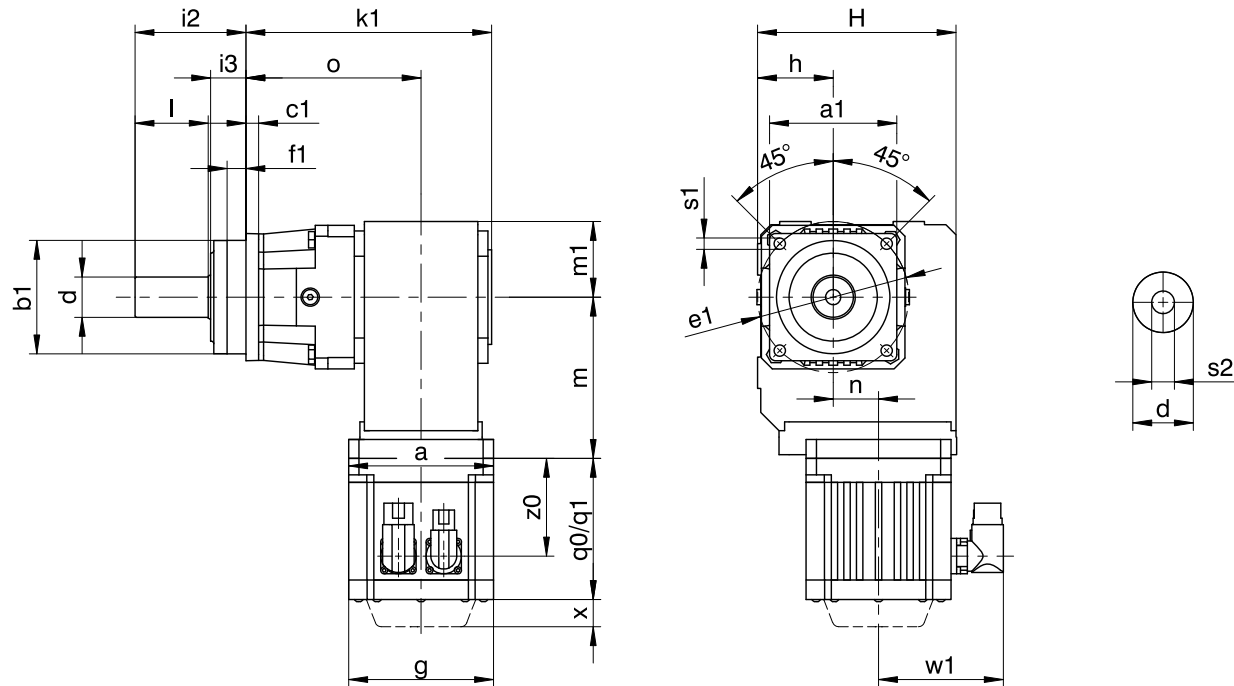
Solid shaft	Tolerance
Fit of shaft end $\varnothing \leq 50$ mm	DIN 748-1, ISO k6
Fit of shaft end $\varnothing > 50$ mm	DIN 748-1, ISO m6
Feather keys	DIN 6885-1, high form A
Balance quality	Q 2.5 (balanced with half feather key)

Centering holes in solid shafts in accordance with DIN 332-2, DR form

Thread size	M4	M5	M6	M8	M10	M12	M16	M20	M24
Gewindetiefe	10	12.5	16	19	22	28	36	42	50



15.3.1 G shaft design (solid shaft without feather key)



q0	Applies to motors without brake.	q1	Applies to motors with brake.
x	Applies to encoders using an optical measuring concept.	w1	For variation for One Cable Solution (OCS), see Chapter [22.4]

Dimensions of gear units

Type	□a1	∅b1	c1	∅d	∅e1	f1	h	H	i2	i3	k1	l	m1	o	∅s1	s2
P521_K102_	101	90 _{h6}	10	32 _{k6}	120	15.0	60	160	88	28	195.0	58	60	139.0	9.0	M12
P721_K102_	145	130 _{h6}	15	40 _{k6}	165	3.5	60	160	112	27	206.0	82	60	150.0	11.0	M16
P721_K202_	145	130 _{h6}	15	40 _{k6}	165	3.5	65	190	112	27	234.0	82	65	164.0	11.0	M16
P821_K202_	190	160 _{h6}	15	55 _{k6}	215	10.0	65	190	112	27	272.5	82	65	202.5	13.5	M20
P821_K302_	190	160 _{h6}	15	55 _{k6}	215	10.0	75	213	112	27	286.0	82	75	210.0	13.5	M20
P921_K402_	212	180 _{h6}	17	75 _{k6}	250	10.0	90	240	143	34	347.5	105	90	257.5	17.5	M20

Dimensions of motors

Type	□g	q0	q1	w1	x	z0
EZ301U	72	114.0	154.0	55.5	21	78.5
EZ302U	72	136.0	176.0	55.5	21	100.5
EZ303U	72	158.0	198.0	55.5	21	122.5
EZ401U	98	118.5	167.0	91.0	22	76.5
EZ402U	98	143.5	192.0	91.0	22	101.5
EZ404U	98	193.5	242.0	91.0	22	151.5
EZ501U	115	112.0	166.5	100.0	22	77.5
EZ502U	115	137.0	191.5	100.0	22	102.5
EZ503U	115	162.0	216.5	100.0	22	127.5
EZ505U	115	212.0	266.5	100.0	22	177.5
EZ701U	145	125.0	184.0	115.0	22	87.0
EZ702U	145	150.0	209.0	115.0	22	112.0
EZ703U	145	175.0	234.0	115.0	22	137.0
EZ705U	145	230.0	289.0	134.0	22	188.0
EZ802U	190	232.5	309.5	156.5	22	178.5
EZ803U	190	273.5	350.5	156.5	22	219.5
EZ805U	190	355.5	432.5	156.5	22	301.5



Dimensions of geared motors

Type	EZ3			EZ4			EZ5			EZ7			EZ8		
	a	m	n	a	m	n	a	m	n	a	m	n	a	m	n
P521_K102_	□72	124	36.0	□98	124	36.0	□115	128	36.0	□145	130	36.0	-	-	-
P721_K102_	□72	124	36.0	□98	124	36.0	□115	128	36.0	□145	130	36.0	-	-	-
P721_K202_	□72	143	46.0	□98	143	46.0	□115	147	46.0	□145	149	46.0	-	-	-
P821_K202_	□72	143	46.0	□98	143	46.0	□115	147	46.0	□145	149	46.0	-	-	-
P821_K302_	∅140	163	52.5	∅140	163	52.5	□115	167	52.5	□145	169	52.5	-	-	-
P921_K402_	-	-	-	-	-	-	∅160	187	60.0	□145	189	60.0	□190	192	60.0

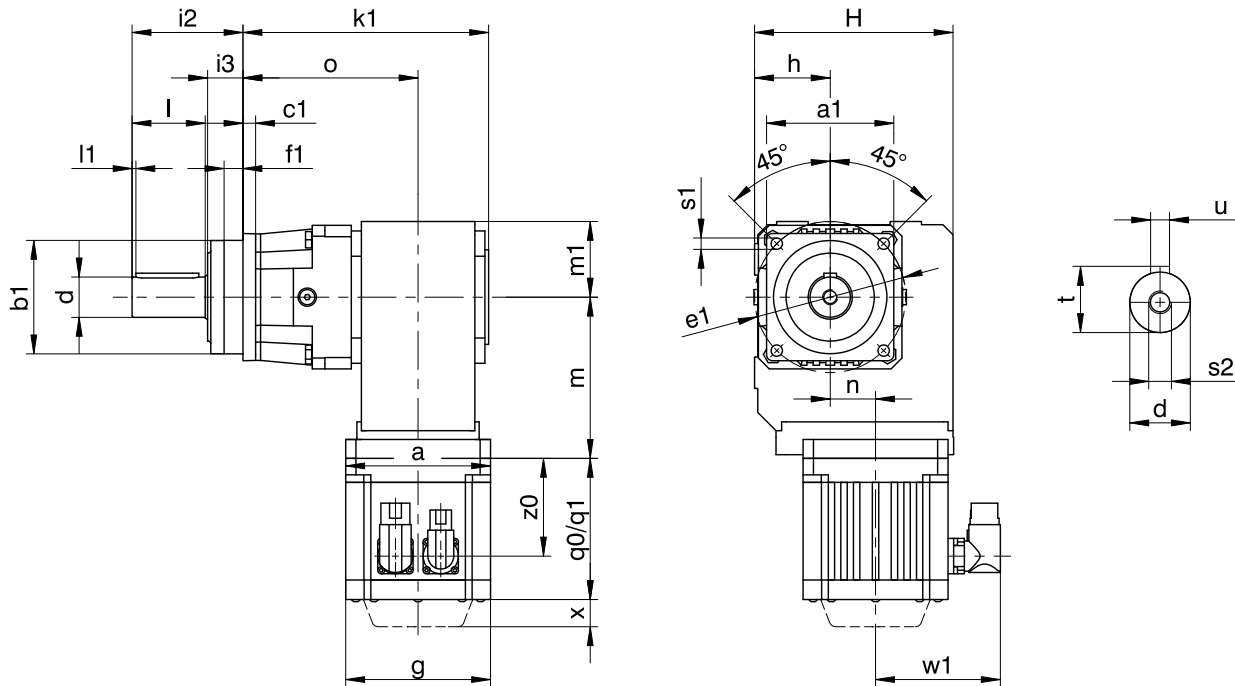


15 PK right-angle planetary geared motors

15.3 Dimensional drawings



15.3.2 P shaft design (solid shaft with feather key)



q0	Applies to motors without brake.	q1	Applies to motors with brake.
x	Applies to encoders using an optical measuring concept.	w1	For variation for One Cable Solution (OCS), see Chapter [22.4]

Dimensions of gear units

Type	□a1	∅b1	c1	∅d	∅e1	f1	h	H	i2	i3	k1	l	l1	m1	o	∅s1	s2	t	u
P521_K102_	101	90 _{h6}	10	32 _{k6}	120	15.0	60	160	88	28	195.0	58	3	60	139.0	9.0	M12	35.0	A10x8x50
P721_K102_	145	130 _{h6}	15	40 _{k6}	165	3.5	60	160	112	27	206.0	82	4	60	150.0	11.0	M16	43.0	A12x8x70
P721_K202_	145	130 _{h6}	15	40 _{k6}	165	3.5	65	190	112	27	234.0	82	4	65	164.0	11.0	M16	43.0	A12x8x70
P821_K202_	190	160 _{h6}	15	55 _{k6}	215	10.0	65	190	112	27	272.5	82	6	65	202.5	13.5	M20	59.0	A16x10x70
P821_K302_	190	160 _{h6}	15	55 _{k6}	215	10.0	75	213	112	27	286.0	82	6	75	210.0	13.5	M20	59.0	A16x10x70
P921_K402_	212	180 _{h6}	17	75 _{k6}	250	10.0	90	240	143	34	347.5	105	7	90	257.5	17.5	M20	79.5	A20x12x90

Dimensions of motors

Type	□g	q0	q1	w1	x	z0
EZ301U	72	114.0	154.0	55.5	21	78.5
EZ302U	72	136.0	176.0	55.5	21	100.5
EZ303U	72	158.0	198.0	55.5	21	122.5
EZ401U	98	118.5	167.0	91.0	22	76.5
EZ402U	98	143.5	192.0	91.0	22	101.5
EZ404U	98	193.5	242.0	91.0	22	151.5
EZ501U	115	112.0	166.5	100.0	22	77.5
EZ502U	115	137.0	191.5	100.0	22	102.5
EZ503U	115	162.0	216.5	100.0	22	127.5
EZ505U	115	212.0	266.5	100.0	22	177.5
EZ701U	145	125.0	184.0	115.0	22	87.0
EZ702U	145	150.0	209.0	115.0	22	112.0
EZ703U	145	175.0	234.0	115.0	22	137.0
EZ705U	145	230.0	289.0	134.0	22	188.0
EZ802U	190	232.5	309.5	156.5	22	178.5
EZ803U	190	273.5	350.5	156.5	22	219.5
EZ805U	190	355.5	432.5	156.5	22	301.5



Dimensions of geared motors

Type	EZ3			EZ4			EZ5			EZ7			EZ8		
	a	m	n	a	m	n	a	m	n	a	m	n	a	m	n
P521_K102_	□72	124	36.0	□98	124	36.0	□115	128	36.0	□145	130	36.0	-	-	-
P721_K102_	□72	124	36.0	□98	124	36.0	□115	128	36.0	□145	130	36.0	-	-	-
P721_K202_	□72	143	46.0	□98	143	46.0	□115	147	46.0	□145	149	46.0	-	-	-
P821_K202_	□72	143	46.0	□98	143	46.0	□115	147	46.0	□145	149	46.0	-	-	-
P821_K302_	∅140	163	52.5	∅140	163	52.5	□115	167	52.5	□145	169	52.5	-	-	-
P921_K402_	-	-	-	-	-	-	∅160	187	60.0	□145	189	60.0	□190	192	60.0

15.4 Type designation

In this chapter, you can find an explanation of the type designation with the associated options. Additional ordering information not included in the type designation can be found at the end of the chapter.

Sample code

P	5	2	1	S	G	R	0050	K102VF	0060	EZ401U
----------	----------	----------	----------	----------	----------	----------	-------------	---------------	-------------	---------------

Explanation

Code	Designation	Design
P	Type	Planetary gear unit
5	Size	5 (example)
2	Generation	Generation 2
1	Stages	Single-stage
S	Housing	Standard
G P	Shaft	Solid shaft without feather key Solid shaft with feather key
R D Z	Bearing	Standard bearing Axially reinforced bearing Radially reinforced bearing
0050	Transmission ratio of output (i x 10)	i = 5 (example)
K102VF	Input	K1 right-angle geared motor (example)
0060	Transmission ratio of input (i x 10)	i = 6 (example)
EZ401U	Motor	EZ synchronous servo motor

PK

In order to complete the type designation, also specify:

- A detailed type designation of the motor, see Chapter [▶ 22](#)
- The installation position, see Chapter [▶ 15.5.2](#)
- Output gear unit side 3 or 4, see Chapter [▶ 15.5.2](#)
- Radial shaft seal rings at the output made of FKM or NBR, see Chapter [▶ 15.6.3](#)
- The position of the plug connectors, see Chapter [▶ 15.5.4](#)
- For reverse operation of the output shaft at $\pm 20^\circ$ to $\pm 90^\circ$ and horizontal installation, note Chapter [▶ 15.6.4](#)



15.5 Product description

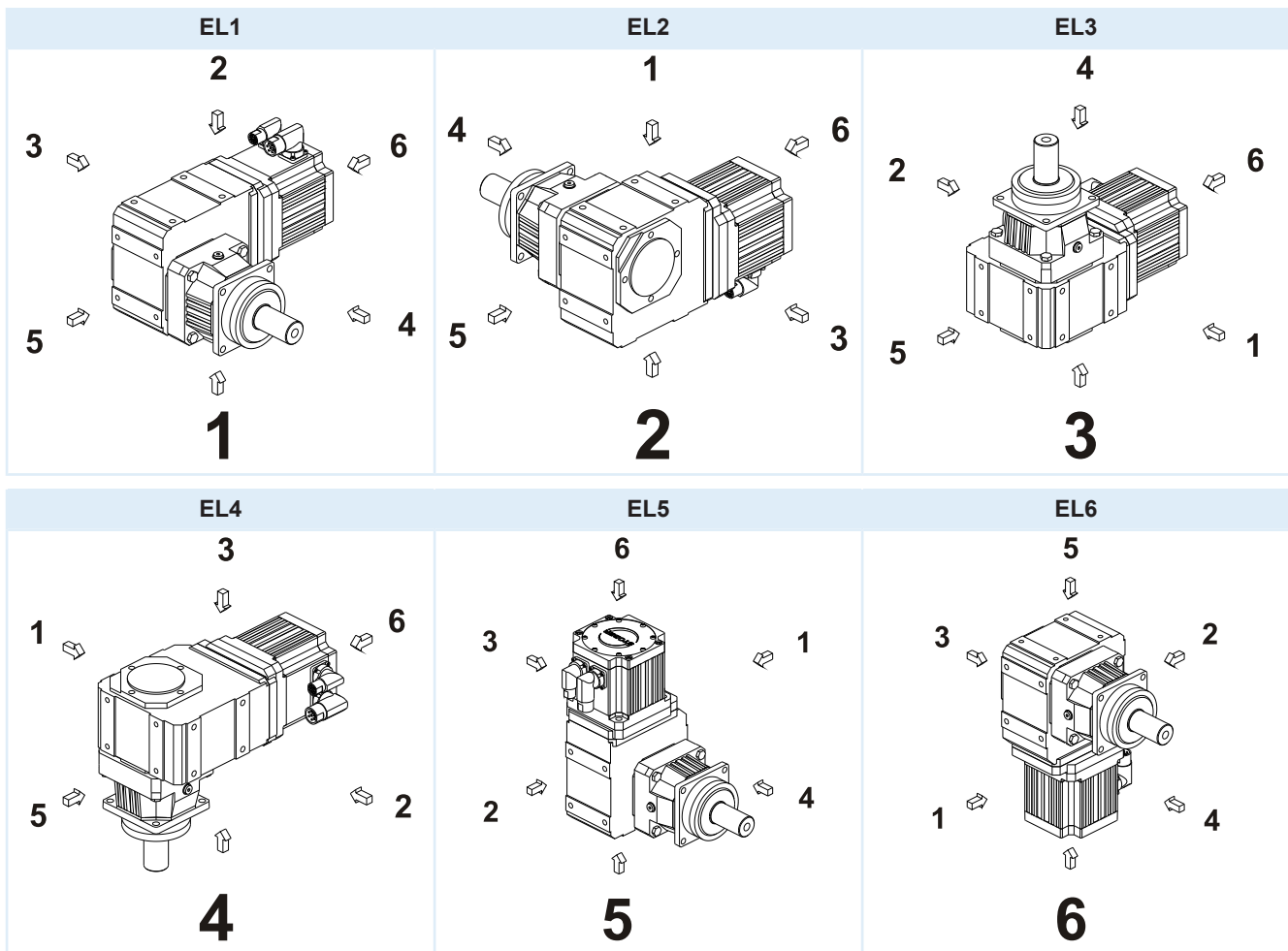
15.5.1 Installation conditions

The specified torques and forces only apply when attaching gear units at the machine side using screws of quality 10.9. In addition, the gear housing must be adjusted at the pilot (H7).

15.5.2 Installation positions

The following table shows the standard installation positions.

The numbers identify the gear unit sides. The installation position is defined by the gear side facing downwards.



Since the lubricant filling volume of the gear unit depends on the installation position, the installation position must be specified when ordering.

15.5.3 Lubricants

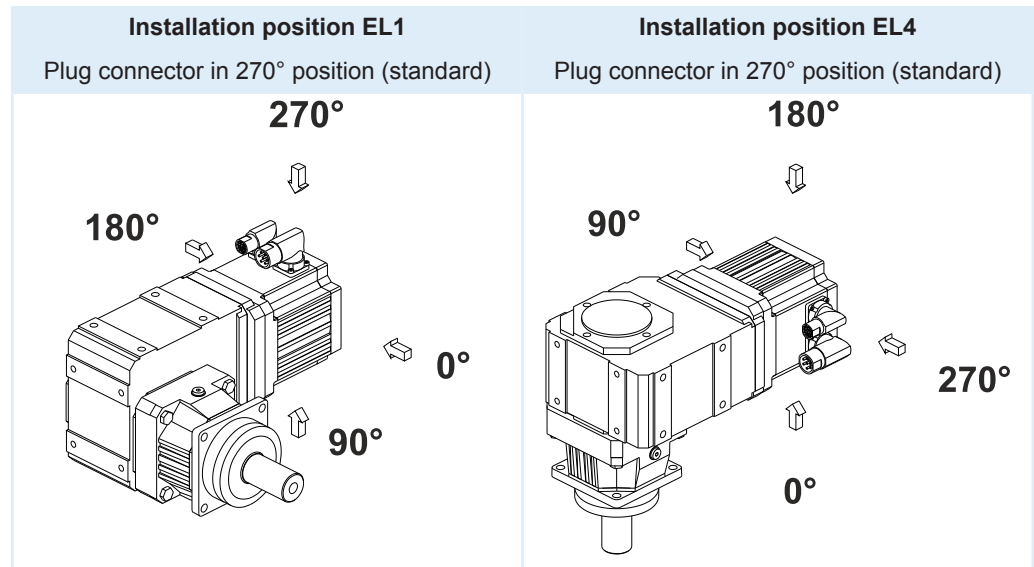
STÖBER fills the gear units with the amount and type of lubricant specified on the nameplate. The filling volume and the structure of the gear units depend on the installation position.

Only install the gear units in the intended installation position! Reposition the gear units only after consulting STÖBER. Otherwise, STÖBER assumes no liability for the gear units.

Lubricant filling quantities for gear units, document ID 441871, can be found online at <http://www.stoerber.de>



15.5.4 Position of the plug connectors



Indicate variations for your geared motor in the purchase order.

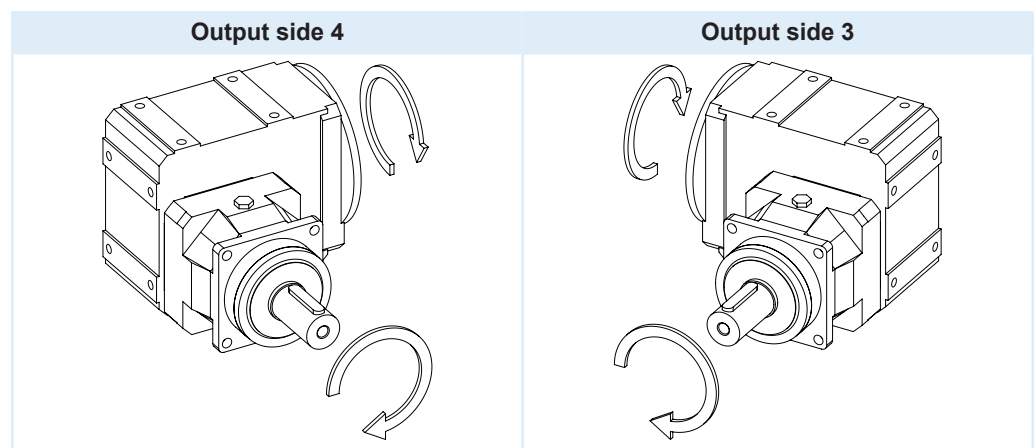
Note that the plug connector position rotates along with the geared motor if the geared motor is in another installation position.

15.5.5 Other product features

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Feature	Value
Max. permitted gear unit temperature (on the surface of the gear unit)	≤ 90 °C
Paint	Black RAL 9005
(ATEX) Directive 2014/34/EU	Not suitable
Protection class: ¹	
Gear unit	IP65
Motor	IP56, optionally IP66

15.5.6 Direction of rotation



The pictures show installation position EL1.

¹ Observe the protection class of all the components.



15.6 Project configuration

Project your drive using our SERVOnsoft designing software. You can receive SERVOnsoft for free from your adviser at one of our sales centers. Observe the limit conditions in this chapter to ensure a safe design for your drives.

The formula symbols for values actually present in the application are marked with *.

Formula symbol	Unit	Explanation
a_{th}	–	Parameter for calculating $K_{mot,th}$
a_{thEL}	–	Parameters for calculating $K_{mot,th}$ (dependent on the installation position)
ED	%	Duty cycle relative to 20 minutes
fB_{op}	–	Operating mode operating factor
fB_t	–	Run-time operating factor
fB_T	–	Temperature operating factor
F_{2ax}^*	N	Actual axial force at the gear unit output
F_{2ax100}	N	Permitted axial force at the gear unit output for $n_{2m} \leq 100$ rpm
F_{2axN}	N	Permitted nominal axial force at the gear unit output
$F_{2rad,acc}$	N	Permitted radial acceleration force at the gear unit output
$F_{2rad,acc}^*$	N	Actual radial acceleration force at the gear unit output
$F_{2rad,acc,1}^*$	N	Actual radial acceleration force at the gear unit output in the first time segment
$F_{2rad,acc,n}^*$	N	Actual radial acceleration force at the gear unit output in the n-th time segment
$F_{2rad,eq}^*$	N	Actual equivalent force at the gear unit output
$F_{2rad100}$	N	Permitted radial force at the gear unit output for $n_{2m} \leq 100$ rpm
F_{2radN}	N	Permitted nominal radial force at the gear unit output
i	–	Gear ratio
$K_{mot,th}$	–	Factor for determining the thermal limit torque
l	mm	Length of the output shaft
L_{10h}	h	Bearing service life
M_{op}	Nm	Torque of motor at the operating point from the motor characteristic curve at n_{1m}^*
$ M_2 $	Nm	Amount of torque on the output
$M_{2,1}^* - M_{2,6}^*$	Nm	Actual torque in the respective time segment (1 to 6)
$M_{2,n}^*$	Nm	Actual torque in the n-th time segment
M_{2acc}	Nm	Maximum permitted acceleration torque on the gear unit output
M_{2acc}^*	Nm	Actual acceleration torque on the gear unit output
M_{2eff}^*	Nm	Actual effective torque on the gear unit output
M_{2eq}^*	Nm	Equivalent torque present on the gear unit output
M_{2k100}	Nm	Permitted breakdown torque on the gear unit output for $n_{2m} \leq 100$ rpm
M_{2kN}	Nm	Permitted nominal breakdown torque on the gear unit output
M_{2k}^*	Nm	Actual breakdown torque on the gear unit output
$M_{2k,acc}$	Nm	Permitted acceleration breakdown torque on the gear unit output
$M_{2k,acc}^*$	Nm	Actual acceleration breakdown torque on the gear unit output



Formula symbol	Unit	Explanation
$M_{2k,acc,1^*}$	Nm	Actual acceleration breakdown torque on the gear unit output in the first time segment
M_{2k,acc,n^*}	Nm	Actual acceleration breakdown torque on the gear unit output in the n-th time segment
M_{2k,eq^*}	Nm	Actual equivalent breakdown torque on the gear unit output
M_{2N}	Nm	Nominal torque on the gear unit output (relative to n_{1N})
M_{2NOT}	Nm	Gear unit emergency-off torque on the gear unit output for max. 1000 load changes
M_{2NOT^*}	Nm	Actual emergency off torque for the gear unit on the gear unit output
M_{2th}	Nm	Thermal limit torque on the gear unit output
n_{1m^*}	rpm	Actual average input speed
n_{1max^*}	rpm	Actual maximum input speed
$n_{1maxDBH}$	rpm	Maximum permitted input speed of the gear unit in continuous operation Installation positions EL1, EL2
$n_{1maxDBV}$	rpm	Maximum permitted input speed of the gear unit in continuous operation Installation positions EL3, EL4, EL5, EL6
n_{1maxZB}	min ⁻¹	Maximum permitted input speed of the gear unit in cyclic operation
$ n_2 $	rpm	Value of output speed
n_{2m^*}	rpm	Actual average output speed
$n_{2m,1^*} - n_{2m,6^*}$	rpm	Actual average output speed in the respective time segment (1 to 6)
n_{2m,n^*}	rpm	Actual average output speed in the n-th time segment
t	s	Time
$t_1 - t_6$	s	Duration of the respective time segment (1 to 6)
t_n	s	Duration of the n-th time segment
S	–	Load value: Quotient of gear unit and motor nominal torque without regard to the thermal performance limit. Represents a value for the reserve of the geared motor.
x_2	mm	Distance of the shaft shoulder to the force application point
y_2	mm	Distance of the shaft axis to the axial force application point
z_2	mm	Distance of the shaft shoulder to the middle of the output bearing

PK

15.6.1 Calculation of the operating point

Check the following conditions for operating points other than the nominal point M_{2N} specified in the selection tables.

For continuous operation in installation positions EL1, EL2:

$$n_{1m^*} \leq \frac{n_{1maxDBH}}{fB_T}$$

For continuous operation in installation positions EL3, EL4, EL5, EL6:

$$n_{1m^*} \leq \frac{n_{1maxDBV}}{fB_T}$$



For all installation positions:

$$n_{1\max^*} \leq \frac{n_{1\max ZB}}{fB_T}$$

$$M_{2\text{eff}^*} \leq M_{2\text{th}}$$

$$M_{2\text{acc}^*} \leq M_{2\text{acc}}$$

$$M_{2\text{NOT}^*} \leq M_{2\text{NOT}}$$

$$M_{2\text{eq}^*} \leq M_{2N} \cdot \frac{S}{fB_{\text{op}} \cdot fB_t}$$

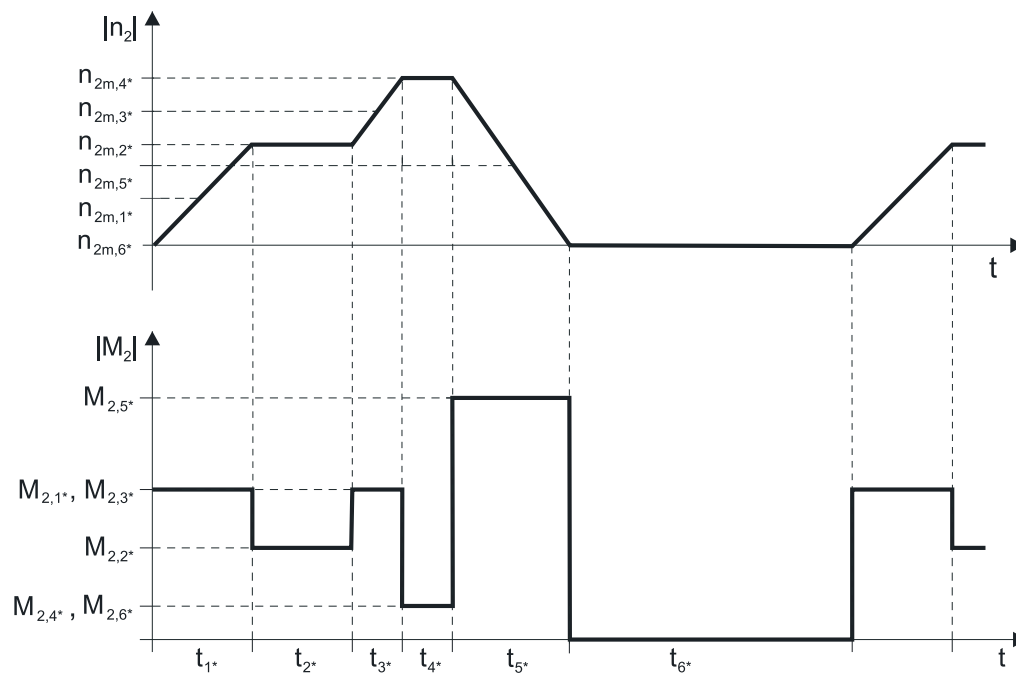
The values for $n_{1\max DBH}$ and $n_{1\max DBV}$, $n_{1\max ZB}$, $M_{2\text{acc}}$, $M_{2\text{NOT}}$, M_{2N} and S can be found in the selection tables.

The values for fB_T , fB_{op} and fB_t can be found in the corresponding tables in this chapter.

Calculate the thermal limit torque $M_{2\text{th}}$ for a duty cycle > 50%.

Example of cycle sequence

The following calculations are based on a representation of the power taken from the output based in accordance with the following example:



Calculation of the actual average input speed

$$n_{1m^*} = n_{2m^*} \cdot i$$

$$n_{2m^*} = \frac{|n_{2m,1^*}| \cdot t_{1^*} + \dots + |n_{2m,n^*}| \cdot t_{n^*}}{t_{1^*} + \dots + t_{n^*}}$$

If $t_{1^*} + \dots + t_{5^*} \geq 20$ min, calculate n_{2m^*} without the rest phase t_{6^*} .

The values for the ratio i can be found in the selection tables.



Calculation of the actual effective torque

$$M_{2\text{eff}^*} = \sqrt{\frac{t_{1^*} \cdot M_{2,1^*}^2 + \dots + t_{n^*} \cdot M_{2,n^*}^2}{t_{1^*} + \dots + t_{n^*}}}$$

Calculation of the actual equivalent torque

$$M_{2\text{eq}^*} = \sqrt[3]{\frac{|n_{2m,1^*}| \cdot t_{1^*} \cdot |M_{2,1^*}|^3 + \dots + |n_{2m,n^*}| \cdot t_{n^*} \cdot |M_{2,n^*}|^3}{|n_{2m,1^*}| \cdot t_{1^*} + \dots + |n_{2m,n^*}| \cdot t_{n^*}}}$$

Calculation of the thermal limit torque

Calculate the thermal limit torque $M_{2\text{th}}$ for a duty cycle $ED > 50\%$ and the actual average input speed n_{1m^*} . (At $K_{\text{mot,th}} \leq 0$ you must reduce the average input speed n_{1m^*} accordingly or select another geared motor size.)

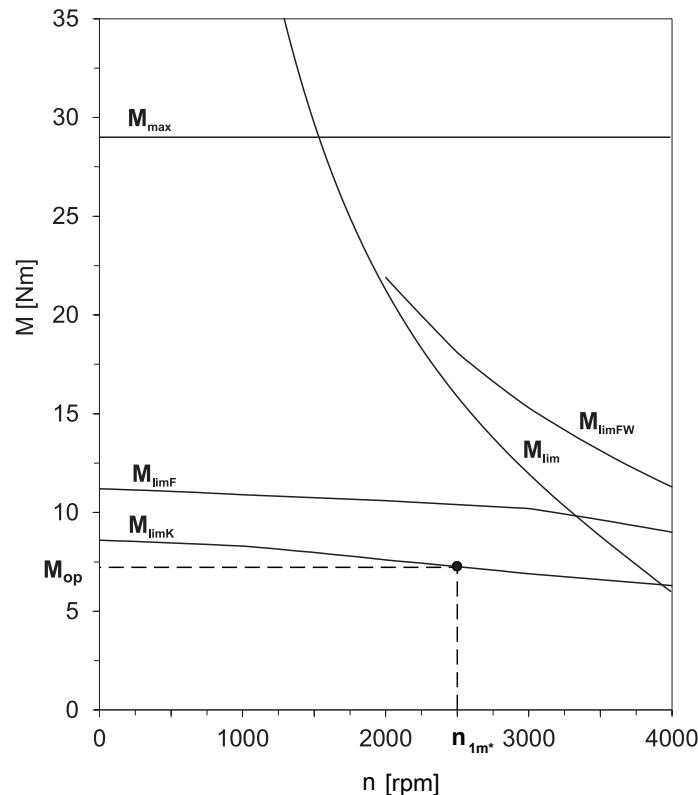
$$M_{2\text{th}} = M_{\text{op}} \cdot i \cdot K_{\text{mot,th}}$$

$$K_{\text{mot,th}} = 0,95 - \frac{a_{\text{th}}}{1000} \cdot \text{athEL} \cdot \text{fB}_T \cdot \left(\frac{n_{1m^*}}{1000}\right)^2$$

The values for i and a_{th} can be found in the selection tables.

The values for a_{thEL} and fB_T can be found in the corresponding tables in this chapter.

The value for the torque of the motor at operating point M_{op} with the determined average input speed n_{1m^*} can be found in the motor curve of Chapter [\[22.3 \]](#). Note the size, nominal speed n_N and cooling type of the motor. The figure below shows an example of reading the torque M_{op} of a motor with convection cooling at the operating point.





Operating factors

Parameter a_{thEL}

Installation position		a_{thEL}
EL1, 2		1.0
EL3, 4, 5, 6		1.1
Operating mode		fB_{op}
Uniform continuous operation		1.00
Cyclic operation		1.25
Reversing load cyclic operation		1.40
Run time		fB_t
Daily run time ≤ 8 h		1.00
Daily run time ≤ 16 h		1.15
Daily run time ≤ 24 h		1.20
Temperature		fB_T
Motor cooling	Surrounding temperature	
Motor with forced ventilation	≤ 20 °C	0.9
	≤ 30 °C	1.0
	≤ 40 °C	1.15
Motor with convection cooling	≤ 20 °C	1.0
	≤ 30 °C	1.1
	≤ 40 °C	1.25

Notes

- The maximum permitted gear unit temperature (see the "Other product features" chapter) must not be exceeded. Doing so may result in damage to the geared motor.
- For braking from full speed (for example when the power fails or when setting up the machine), note the permitted gear unit torques (M_{2acc} , M_{2NOT}) in the selection tables.
- The values specified in the selection tables for M_{2acc} refer to the gear units with a solid shaft design without feather key (G). We recommend this shaft design in general for cyclic operation.

15.6.2 Permitted shaft loads for the output shaft

The values specified in the tables apply to the permitted shaft loads:

- For shaft dimensions in accordance with the catalog
- For output speeds $n_{2m} \leq 100$ rpm ($F_{2axN} = F_{2ax100}$; $F_{2radN} = F_{2rad100}$; $M_{2kN} = M_{2k100}$)
- Only if transverse forces on the gear unit are supported via its pilots (housing, flange shaft)

Permitted shaft loads for standard bearing R

Type	z_2 [mm]	F_{2ax100} [N]	$F_{2rad100}$ [N]	$F_{2rad,acc}$ [N]	M_{2k100} [Nm]	$M_{2k,acc}$ [Nm]
P2	17.0	500	1200	1300	34	36
P3	21.0	1000	2500	2500	88	88
P4	22.0	1500	4000	4500	160	180
P5	23.0	2300	6500	7000	338	364
P7	26.0	2900	8000	9000	536	603



Type	z_2 [mm]	F_{2ax100} [N]	$F_{2rad100}$ [N]	$F_{2rad,acc}$ [N]	M_{2k100} [Nm]	$M_{2k,acc}$ [Nm]
P8	28.0	4700	13000	18000	897	1242
P9	40.0	6000	18000	27000	1665	2498

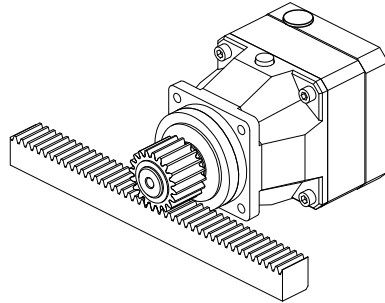


Fig. 1: Recommendation for bearing assignment R

Permitted shaft loads for axially reinforced bearing D

Type	z_2 [mm]	F_{2ax100} [N]	$F_{2rad100}$ [N]	$F_{2rad,acc}$ [N]	M_{2k100} [Nm]	$M_{2k,acc}$ [Nm]
P3	24.0	1400	2750	2750	105	105
P4	25.0	2250	4500	5000	194	215
P5	29.0	3500	7000	8000	406	464
P7	31.0	4500	9000	10000	648	720
P8	35.0	7500	15000	18000	1140	1368
P9	51.0	10000	20000	30000	2070	3105

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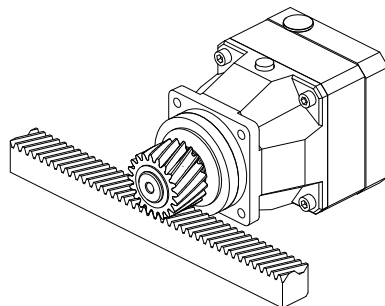


Fig. 2: Recommendation for bearing assignment D

Permitted shaft loads for radially reinforced bearing Z

Type	z_2 [mm]	F_{2ax100} [N]	$F_{2rad100}$ [N]	$F_{2rad,acc}$ [N]	M_{2k100} [Nm]	$M_{2k,acc}$ [Nm]
P3	21.0	600	3000	3000	105	105
P4	22.0	1000	5000	5000	200	200
P5	23.0	1600	8000	8000	416	416
P7	26.0	2000	10000	10000	670	670
P8	28.0	3600	18000	18000	1242	1242
P9	40.0	5000	27000	35000	2500	3238

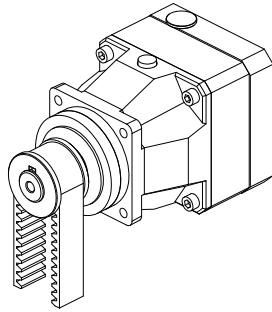


Fig. 3: Recommendation for bearing assignment Z

For other output speeds, download diagrams at <http://products.stoeber.de>.

The following applies to output speeds $n_{2m^*} > 100$ rpm:

$$F_{2axN} = \frac{F_{2ax100}}{\sqrt[3]{\frac{n_{2m^*}}{100 \text{ rpm}}}} \quad F_{2radN} = \frac{F_{2rad100}}{\sqrt[3]{\frac{n_{2m^*}}{100 \text{ rpm}}}} \quad M_{2kN} = \frac{M_{2k100}}{\sqrt[3]{\frac{n_{2m^*}}{100 \text{ rpm}}}}$$

The values for F_{2ax100} , $F_{2rad100}$ and M_{2k100} can be found in the table "Permitted shaft loads" in this chapter.

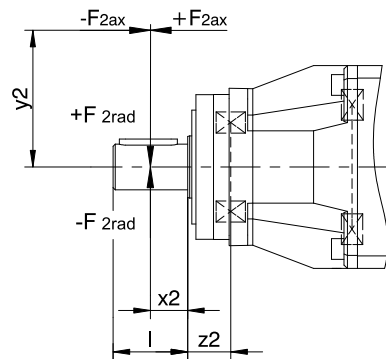


Fig. 4: Force application points

The specified values for $F_{2rad100}$ and $F_{2rad,acc}$ refer to an application of force at the center of the output shaft: $x_2 = l/2$.

Shaft dimensions can be found in the "Dimensional drawings" chapter.

The following applies to other force application points:

$$M_{2k,acc^*} = \frac{2 \cdot F_{2ax^*} \cdot y_2 + F_{2rad,acc^*} \cdot (x_2 + z_2)}{1000} \leq M_{2k,acc}$$

$$F_{2rad,acc^*} \leq F_{2rad,acc}$$

$$F_{2ax^*} \leq F_{2axN}$$

The values for $F_{2rad,acc}$ and $M_{2k,acc}$ can be found in the table "Permitted shaft loads" in this chapter.

For applications with multiple axial and/or radial forces, you must add the forces as vectors.

In the event of EMERGENCY OFF operation (max. 1000 load changes), you can multiply the permitted forces and torques for F_{2ax100} , $F_{2rad100}$ and M_{2k100} by a factor of two.



Also note the calculation for equivalent values:

$$M_{2k,eq^*} = \sqrt[3]{\frac{|n_{2m,1^*}| \cdot t_{1^*} \cdot |M_{2k,acc,1^*}|^3 + \dots + |n_{2m,n^*}| \cdot t_{n^*} \cdot |M_{2k,acc,n^*}|^3}{|n_{2m,1^*}| \cdot t_{1^*} + \dots + |n_{2m,n^*}| \cdot t_{n^*}}} \leq M_{2kN}$$

$$F_{2rad,eq^*} = \sqrt[3]{\frac{|n_{2m,1^*}| \cdot t_{1^*} \cdot |F_{2rad,acc,1^*}|^3 + \dots + |n_{2m,n^*}| \cdot t_{n^*} \cdot |F_{2rad,acc,n^*}|^3}{|n_{2m,1^*}| \cdot t_{1^*} + \dots + |n_{2m,n^*}| \cdot t_{n^*}}} \leq F_{2radN}$$

The following apply to the bearing service life L_{10h} (duty cycle $\leq 40\%$):

$$L_{10h} > 10000 \text{ h with } 1 < M_{2kN}/M_{2k^*} < 1.25$$

$$L_{10h} > 20000 \text{ h with } 1.25 < M_{2kN}/M_{2k^*} < 1.5$$

$$L_{10h} > 30000 \text{ h with } 1.5 < M_{2kN}/M_{2k^*}$$

For different duty cycles:

$$L_{10h} > L_{10h(ED=40\%)} \cdot \frac{40\%}{ED}$$

15.6.3 Recommendation for radial shaft seal rings

For a duty cycle $> 60\%$, we recommend radial shaft seal rings made of FKM.

Properties:

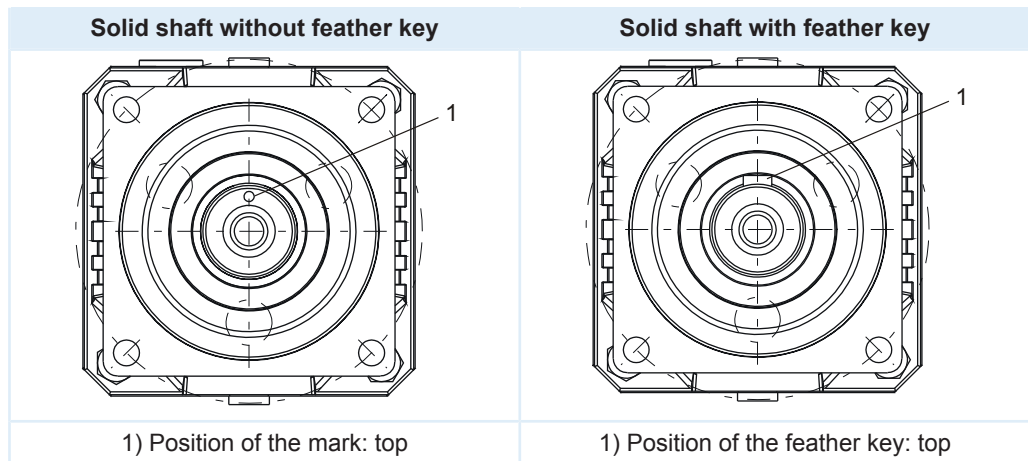
- Excellent temperature resistance
- High chemical stability
- Very good resistance to aging
- Excellent resistance to mineral oils and greases
- For use in the food, beverage and pharmaceutical industries

Leak-proofness

Our gear units are equipped with high-quality radial shaft seal rings and checked for leak-proofness. However, a leak cannot be fully ruled out over the length of use of the gear unit. If you use the gear unit with goods incompatible with the lubricant, you must take measures to prevent direct contact with the gear unit lubricant in case of a leak.

15.6.4 Reverse operation

To ensure lubrication of circulating geared parts during cyclic reverse operation from $\pm 20^\circ$ to $\pm 90^\circ$, pay careful attention to the position of the output shaft if the gear unit is installed horizontally as shown in the images below. The images show the center position of reverse operation. Cyclic reverse operation $\leq \pm 20^\circ$ on request.



Notes

- If you use the solid shaft without a feather key (G) with a mark, note the position of the mark during assembly.
- As an alternative, you can use the solid shaft with a feather key (P) and clamp. In that case, the feather key functions for position orientation.

15.7 Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/download>

Enter the ID of the documentation in the Search... field.

Documentation	ID
Operating manual for planetary gear units and motors	441957
Lubricant filling quantities for gear units	441871