



3.1 Overview

Low-backlash helical-geared precision planetary geared motors

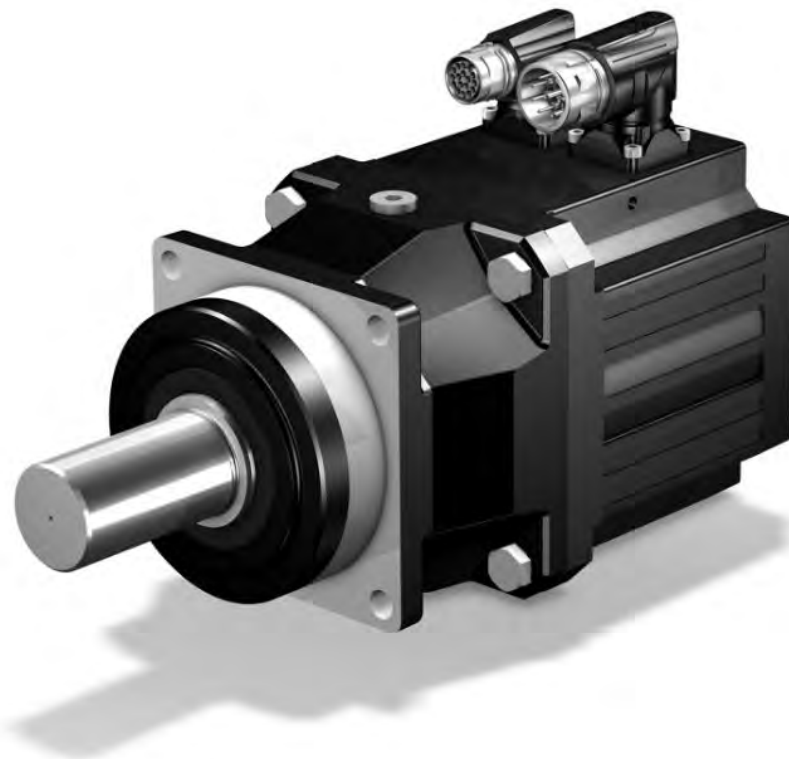
Technical data

i	3 – 100
M _{2acc}	15 – 1600 Nm
Δφ ₂	1 – 3 arcmin
η	≤ 95 – 97 %

Features

Power density	★★★★☆
Backlash	★★★★★
Price category	€€€
Shaft load	★★★★☆
Smooth operation	★★★★★
Torsional stiffness	★★★★☆
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any installation position	✓
Continuous operation without cooling (FKM seal ring at the input and output)	✓
Axially reinforced output bearing, ideally suited for helical-geared rack and pinion drives	✓
Compact and highly dynamic due to direct motor attachment	✓

Key: ★☆☆☆☆ good | ★★★★★ excellent





3.2 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_{1maxDB}	min^{-1}	Maximum permitted input speed of the gear unit in continuous operation (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.



3 PA planetary geared motors

3.2 Selection tables

PA



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max}	n_{1max}	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DB	ZB	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA3 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 65$ Nm)															
60	44	45	1.3	1.0	PA322_0500 EZ301U	65	130	50.00	50/1	4500	8000	0.20	3	4.5	3.6
75	35	36	1.6	1.2	PA322_0400 EZ301U	65	130	40.00	40/1	4500	8000	0.20	3	4.4	3.6
86	31	32	1.6	1.5	PA322_0350 EZ301U	65	130	35.00	35/1	4500	8000	0.21	3	4.6	3.6
94	28	29	1.9	1.4	PA322_0320 EZ301U	50	100	32.00	32/1	4500	8000	0.23	3	4.1	3.6
107	25	25	1.8	1.8	PA322_0280 EZ301U	65	130	28.00	28/1	4500	8000	0.21	3	4.5	3.6
107	42	45	3.0	1.1	PA322_0280 EZ302U	65	130	28.00	28/1	4500	8000	0.31	3	4.5	4.2
120	22	23	1.9	2.0	PA322_0250 EZ301U	65	130	25.00	25/1	4500	8000	0.22	3	4.6	3.6
120	38	40	3.2	1.2	PA322_0250 EZ302U	65	130	25.00	25/1	4500	8000	0.32	3	4.6	4.2
150	18	18	2.1	2.5	PA322_0200 EZ301U	53	130	20.00	20/1	4500	8000	0.24	3	4.6	3.6
150	30	32	3.6	1.5	PA322_0200 EZ302U	65	130	20.00	20/1	4500	8000	0.34	3	4.6	4.2
150	39	42	4.7	1.1	PA322_0200 EZ303U	65	130	20.00	20/1	4500	8000	0.45	3	4.6	4.7
188	14	14	2.4	3.2	PA322_0160 EZ301U	43	130	16.00	16/1	4500	8000	0.24	3	4.5	3.6
188	24	26	4.0	1.9	PA322_0160 EZ302U	65	130	16.00	16/1	4500	8000	0.34	3	4.5	4.2
188	31	33	5.2	1.4	PA322_0160 EZ303U	65	130	16.00	16/1	4500	8000	0.45	3	4.5	4.7
250	11	11	4.1	2.8	PA322_0120 EZ301U	32	120	12.00	12/1	4500	8000	0.24	3	4.3	3.6
250	18	19	7.0	1.7	PA322_0120 EZ302U	50	120	12.00	12/1	4500	8000	0.34	3	4.3	4.2
250	24	25	9.1	1.3	PA322_0120 EZ303U	50	120	12.00	12/1	4500	8000	0.45	3	4.3	4.7
300	9.0	9.2	0.6	2.9	PA321_0100 EZ301U	27	100	10.00	10/1	4500	8000	0.21	2	4.0	3.0
300	15	16	0.9	1.7	PA321_0100 EZ302U	49	100	10.00	10/1	4500	8000	0.31	2	4.0	3.6
300	20	21	1.2	1.3	PA321_0100 EZ303U	50	100	10.00	10/1	4500	8000	0.42	2	4.0	4.1
375	7.2	7.4	0.5	4.8	PA321_0080 EZ301U	22	100	8.000	8/1	4500	8000	0.21	2	4.2	3.0
375	12	13	0.9	2.8	PA321_0080 EZ302U	39	100	8.000	8/1	4500	8000	0.31	2	4.2	3.6
375	16	17	1.2	2.2	PA321_0080 EZ303U	50	100	8.000	8/1	4500	8000	0.42	2	4.2	4.1
375	22	23	1.6	1.6	PA321_0080 EZ401U	50	100	8.000	8/1	4500	8000	0.95	2	4.2	5.5
429	11	11	1.0	3.6	PA321_0070 EZ302U	34	130	7.000	7/1	4500	8000	0.32	2	4.4	3.6
429	14	15	1.3	2.8	PA321_0070 EZ303U	48	130	7.000	7/1	4500	8000	0.43	2	4.4	4.1
429	19	20	1.7	2.1	PA321_0070 EZ401U	58	130	7.000	7/1	4500	8000	0.96	2	4.4	5.5
429	32	35	2.9	1.2	PA321_0070 EZ402U	60	130	7.000	7/1	4500	8000	1.7	2	4.4	6.6
600	10	11	1.9	3.9	PA321_0050 EZ303U	34	110	5.000	5/1	4000	7000	0.48	2	5.1	4.1
600	14	15	2.6	2.9	PA321_0050 EZ401U	41	130	5.000	5/1	4000	7000	1.0	2	5.1	5.5
600	21	23	3.9	1.9	PA321_0050 EZ501U	65	130	5.000	5/1	4000	7000	3.0	2	5.1	6.5
600	23	25	4.3	1.7	PA321_0050 EZ402U	65	130	5.000	5/1	4000	7000	1.7	2	5.1	6.6
600	33	42	6.3	1.2	PA321_0050 EZ404U	65	130	5.000	5/1	4000	7000	3.1	2	5.1	8.7
600	36	39	6.8	1.1	PA321_0050 EZ502U	65	130	5.000	5/1	4000	7000	5.3	2	5.1	8.0
750	8.0	8.5	2.5	4.9	PA321_0040 EZ303U	27	85	4.000	4/1	3700	6500	0.52	2	5.3	4.1
750	11	12	3.3	3.6	PA321_0040 EZ401U	33	130	4.000	4/1	3700	6500	1.1	2	5.3	5.5
750	17	18	5.1	2.4	PA321_0040 EZ501U	62	130	4.000	4/1	3700	6500	3.0	2	5.3	6.5
750	18	20	5.6	2.2	PA321_0040 EZ402U	62	130	4.000	4/1	3700	6500	1.8	2	5.3	6.6
750	27	33	8.2	1.5	PA321_0040 EZ404U	65	130	4.000	4/1	3700	6500	3.1	2	5.3	8.7
750	29	31	8.8	1.4	PA321_0040 EZ502U	65	130	4.000	4/1	3700	6500	5.3	2	5.3	8.0
750	38	43	12	1.0	PA321_0040 EZ503U	65	130	4.000	4/1	3700	6500	7.7	2	5.3	9.5
1000	6.0	6.4	5.2	4.4	PA321_0030 EZ303U	20	64	3.000	3/1	3500	6000	0.60	2	5.7	4.1
1000	8.1	8.7	7.1	3.2	PA321_0030 EZ401U	25	120	3.000	3/1	3500	6000	1.1	2	5.7	5.5
1000	13	14	11	2.1	PA321_0030 EZ501U	47	120	3.000	3/1	3500	6000	3.1	2	5.7	6.5
1000	14	15	12	1.9	PA321_0030 EZ402U	47	120	3.000	3/1	3500	6000	1.8	2	5.7	6.6
1000	20	25	17	1.3	PA321_0030 EZ404U	50	120	3.000	3/1	3500	6000	3.2	2	5.7	8.7
1000	22	23	19	1.2	PA321_0030 EZ502U	50	120	3.000	3/1	3500	6000	5.4	2	5.7	8.0
PA3 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 65$ Nm)															
171	30	32	1.5	1.5	PA322_0350 EZ301U	65	130	35.00	35/1	4500	8000	0.21	3	4.6	3.6
188	27	29	1.8	1.5	PA322_0320 EZ301U	50	100	32.00	32/1	4500	8000	0.23	3	4.1	3.6
214	24	25	1.8	1.8	PA322_0280 EZ301U	65	130	28.00	28/1	4500	8000	0.21	3	4.5	3.6
214	40	45	3.0	1.1	PA322_0280 EZ302U	65	130	28.00	28/1	4500	8000	0.31	3	4.5	4.2
240	21	23	1.8	2.1	PA322_0250 EZ301U	65	130	25.00	25/1	4500	8000	0.22	3	4.6	3.6
240	36	40	3.0	1.3	PA322_0250 EZ302U	65	130	25.00	25/1	4500	8000	0.32	3	4.6	4.2
300	17	18	2.0	2.7	PA322_0200 EZ301U	53	130	20.00	20/1	4500	8000	0.24	3	4.6	3.6
300	29	32	3.4	1.6	PA322_0200 EZ302U	65	130	20.00	20/1	4500	8000	0.34	3	4.6	4.2
300	37	43	4.4	1.2	PA322_0200 EZ303U	65	130	20.00	20/1	4500	8000	0.45	3	4.6	4.7
375	14	14	2.4	3.2	PA322_0160 EZ301U	43	130	16.00	16/1	4500	8000	0.24	3	4.5	3.6
375	23	26	4.0	1.9	PA322_0160 EZ302U	65	130	16.00	16/1	4500	8000	0.34	3	4.5	4.2

3 PA planetary geared motors

3.2 Selection tables



STÖBER

n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DB	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA3 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 65$ Nm)															
375	30	34	5.2	1.4	PA322_0160 EZ303U	65	130	16.00	16/1	4500	8000	0.45	3	4.5	4.7
500	10	11	3.9	3.0	PA322_0120 EZ301U	32	120	12.00	12/1	4500	8000	0.24	3	4.3	3.6
500	17	19	6.6	1.8	PA322_0120 EZ302U	50	120	12.00	12/1	4500	8000	0.34	3	4.3	4.2
500	22	26	8.6	1.3	PA322_0120 EZ303U	50	120	12.00	12/1	4500	8000	0.45	3	4.3	4.7
600	8.6	9.2	0.7	2.4	PA321_0100 EZ301U	27	100	10.00	10/1	4500	8000	0.21	2	4.0	3.0
600	15	16	1.1	1.4	PA321_0100 EZ302U	49	100	10.00	10/1	4500	8000	0.31	2	4.0	3.6
600	19	22	1.5	1.1	PA321_0100 EZ303U	50	100	10.00	10/1	4500	8000	0.42	2	4.0	4.1
750	6.9	7.4	0.7	4.0	PA321_0080 EZ301U	22	100	8.000	8/1	4500	8000	0.21	2	4.2	3.0
750	12	13	1.1	2.4	PA321_0080 EZ302U	39	100	8.000	8/1	4500	8000	0.31	2	4.2	3.6
750	15	17	1.4	1.8	PA321_0080 EZ303U	50	100	8.000	8/1	4500	8000	0.42	2	4.2	4.1
750	18	22	1.7	1.6	PA321_0080 EZ401U	50	100	8.000	8/1	4500	8000	0.95	2	4.2	5.5
750	27	38	2.6	1.0	PA321_0080 EZ402U	50	100	8.000	8/1	4500	8000	1.7	2	4.2	6.6
857	10	11	1.2	3.1	PA321_0070 EZ302U	34	130	7.000	7/1	4500	8000	0.32	2	4.4	3.6
857	13	15	1.5	2.3	PA321_0070 EZ303U	48	130	7.000	7/1	4500	8000	0.43	2	4.4	4.1
857	16	19	1.8	2.0	PA321_0070 EZ401U	58	130	7.000	7/1	4500	8000	0.96	2	4.4	5.5
857	24	33	2.7	1.3	PA321_0070 EZ402U	60	130	7.000	7/1	4500	8000	1.7	2	4.4	6.6
1200	7.3	8.1	1.7	4.3	PA321_0050 EZ302U	24	110	5.000	5/1	4000	7000	0.37	2	5.1	3.6
1200	9.5	11	2.3	3.3	PA321_0050 EZ303U	34	110	5.000	5/1	4000	7000	0.48	2	5.1	4.1
1200	11	14	2.6	2.8	PA321_0050 EZ401U	41	130	5.000	5/1	4000	7000	1.0	2	5.1	5.5
1200	16	21	3.9	1.9	PA321_0050 EZ501U	65	130	5.000	5/1	4000	7000	3.0	2	5.1	6.5
1200	17	24	4.0	1.8	PA321_0050 EZ402U	65	130	5.000	5/1	4000	7000	1.7	2	5.1	6.6
1200	25	38	6.0	1.2	PA321_0050 EZ502U	65	130	5.000	5/1	4000	7000	5.3	2	5.1	8.0
1200	28	41	6.7	1.1	PA321_0050 EZ404U	65	130	5.000	5/1	4000	7000	3.1	2	5.1	8.7
1500	7.6	8.7	3.0	4.1	PA321_0040 EZ303U	27	85	4.000	4/1	3700	6500	0.52	2	5.3	4.1
1500	8.9	11	3.5	3.5	PA321_0040 EZ401U	33	130	4.000	4/1	3700	6500	1.1	2	5.3	5.5
1500	13	17	5.1	2.4	PA321_0040 EZ501U	62	130	4.000	4/1	3700	6500	3.0	2	5.3	6.5
1500	14	19	5.3	2.3	PA321_0040 EZ402U	62	130	4.000	4/1	3700	6500	1.8	2	5.3	6.6
1500	20	30	7.8	1.5	PA321_0040 EZ502U	65	130	4.000	4/1	3700	6500	5.3	2	5.3	8.0
1500	23	33	8.7	1.4	PA321_0040 EZ404U	65	130	4.000	4/1	3700	6500	3.1	2	5.3	8.7
1500	24	41	9.3	1.3	PA321_0040 EZ503U	65	130	4.000	4/1	3700	6500	7.7	2	5.3	9.5
2000	4.4	4.9	4.8	4.8	PA321_0030 EZ302U	15	64	3.000	3/1	3500	6000	0.49	2	5.7	3.6
2000	5.7	6.5	6.2	3.6	PA321_0030 EZ303U	20	64	3.000	3/1	3500	6000	0.60	2	5.7	4.1
2000	6.7	8.1	7.3	3.1	PA321_0030 EZ401U	25	120	3.000	3/1	3500	6000	1.1	2	5.7	5.5
2000	9.9	13	11	2.1	PA321_0030 EZ501U	47	120	3.000	3/1	3500	6000	3.1	2	5.7	6.5
2000	10	14	11	2.0	PA321_0030 EZ402U	47	120	3.000	3/1	3500	6000	1.8	2	5.7	6.6
2000	15	23	17	1.4	PA321_0030 EZ502U	50	120	3.000	3/1	3500	6000	5.4	2	5.7	8.0
2000	17	24	18	1.2	PA321_0030 EZ404U	50	120	3.000	3/1	3500	6000	3.2	2	5.7	8.7
2000	18	31	20	1.2	PA321_0030 EZ503U	50	120	3.000	3/1	3500	6000	7.8	2	5.7	9.5
PA4 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 120$ Nm)															
38	71	72	0.7	1.1	PA422_0800 EZ301U	100	200	80.00	80/1	4500	8000	0.21	3	9.2	6.0
43	62	63	0.7	1.4	PA422_0700 EZ301U	110	240	70.00	70/1	4500	8000	0.21	3	9.6	6.0
54	49	51	0.8	1.6	PA422_0560 EZ301U	100	200	56.00	56/1	4500	8000	0.23	3	9.2	6.0
60	44	45	0.8	1.9	PA422_0500 EZ301U	120	240	50.00	50/1	4500	8000	0.21	3	10	6.0
60	76	80	1.4	1.1	PA422_0500 EZ302U	120	240	50.00	50/1	4500	8000	0.31	3	10	6.6
75	35	36	0.9	2.4	PA422_0400 EZ301U	110	240	40.00	40/1	4500	8000	0.21	3	10	6.0
75	60	64	1.5	1.4	PA422_0400 EZ302U	120	240	40.00	40/1	4500	8000	0.31	3	10	6.6
75	79	83	2.0	1.1	PA422_0400 EZ303U	120	240	40.00	40/1	4500	8000	0.42	3	10	7.1
86	31	32	0.9	2.7	PA422_0350 EZ301U	93	240	35.00	35/1	4500	8000	0.23	3	11	6.0
86	53	56	1.6	1.6	PA422_0350 EZ302U	120	240	35.00	35/1	4500	8000	0.33	3	11	6.6
86	69	73	2.1	1.2	PA422_0350 EZ303U	120	240	35.00	35/1	4500	8000	0.44	3	11	7.1
94	28	29	1.1	2.8	PA422_0320 EZ301U	85	200	32.00	32/1	3700	6500	0.32	3	9.2	6.0
94	48	51	1.8	1.7	PA422_0320 EZ302U	100	200	32.00	32/1	3700	6500	0.42	3	9.2	6.6
94	63	67	2.3	1.3	PA422_0320 EZ303U	100	200	32.00	32/1	3700	6500	0.53	3	9.2	7.1
107	25	25	1.1	3.4	PA422_0280 EZ301U	74	240	28.00	28/1	4500	8000	0.23	3	10	6.0
107	42	45	1.8	2.0	PA422_0280 EZ302U	120	240	28.00	28/1	4500	8000	0.33	3	10	6.6
107	55	58	2.4	1.5	PA422_0280 EZ303U	120	240	28.00	28/1	4500	8000	0.44	3	10	7.1
107	74	80	3.2	1.1	PA422_0280 EZ401U	120	240	28.00	28/1	4500	8000	0.97	3	10	8.5
120	22	23	1.1	3.8	PA422_0250 EZ301U	67	240	25.00	25/1	4000	7000	0.27	3	11	6.0
120	38	40	1.9	2.3	PA422_0250 EZ302U	120	240	25.00	25/1	4000	7000	0.37	3	11	6.6



3 PA planetary geared motors

3.2 Selection tables

PA



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max}	n_{1max}	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DB	ZB	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA4 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 120$ Nm)															
120	49	52	2.5	1.7	PA422_0250 EZ303U	120	240	25.00	25/1	4000	7000	0.48	3	11	7.1
120	67	71	3.4	1.3	PA422_0250 EZ401U	120	240	25.00	25/1	4000	7000	1.0	3	11	8.5
150	18	18	1.3	4.8	PA422_0200 EZ301U	53	240	20.00	20/1	3700	6500	0.32	3	11	6.0
150	30	32	2.1	2.8	PA422_0200 EZ302U	95	240	20.00	20/1	3700	6500	0.42	3	11	6.6
150	39	42	2.8	2.2	PA422_0200 EZ303U	120	240	20.00	20/1	3700	6500	0.53	3	11	7.1
150	53	57	3.8	1.6	PA422_0200 EZ401U	120	240	20.00	20/1	3700	6500	1.1	3	11	8.5
150	82	89	5.8	1.0	PA422_0200 EZ501U	120	240	20.00	20/1	3700	6500	3.0	3	11	9.5
188	24	26	2.4	3.5	PA422_0160 EZ302U	76	240	16.00	16/1	3700	6500	0.43	3	11	6.6
188	31	33	3.1	2.7	PA422_0160 EZ303U	110	240	16.00	16/1	3700	6500	0.54	3	11	7.1
188	43	46	4.2	2.0	PA422_0160 EZ401U	120	240	16.00	16/1	3700	6500	1.1	3	11	8.5
188	65	71	6.5	1.3	PA422_0160 EZ501U	120	240	16.00	16/1	3700	6500	3.0	3	11	9.5
188	71	79	7.1	1.2	PA422_0160 EZ402U	120	240	16.00	16/1	3700	6500	1.8	3	11	9.6
250	11	11	2.8	4.7	PA422_0120 EZ301U	32	240	12.00	12/1	3700	6500	0.36	3	9.9	6.0
250	18	19	4.7	2.8	PA422_0120 EZ302U	57	240	12.00	12/1	3700	6500	0.46	3	9.9	6.6
250	24	25	6.1	2.1	PA422_0120 EZ303U	80	240	12.00	12/1	3700	6500	0.57	3	9.9	7.1
250	32	34	8.3	1.6	PA422_0120 EZ401U	97	240	12.00	12/1	3700	6500	1.1	3	9.9	8.5
250	49	54	13	1.0	PA422_0120 EZ501U	100	240	12.00	12/1	3700	6500	3.1	3	9.9	9.5
300	27	29	1.0	1.9	PA421_0100 EZ401U	82	200	10.00	10/1	4000	7000	0.97	2	9.0	6.6
300	42	46	1.6	1.3	PA421_0100 EZ501U	100	200	10.00	10/1	4000	7000	2.9	2	9.0	7.6
300	46	50	1.7	1.2	PA421_0100 EZ402U	100	200	10.00	10/1	4000	7000	1.7	2	9.0	7.7
375	22	23	1.0	3.2	PA421_0080 EZ401U	66	200	8.000	8/1	4000	7000	0.99	2	9.5	6.6
375	33	36	1.5	2.1	PA421_0080 EZ501U	100	200	8.000	8/1	4000	7000	3.0	2	9.5	7.6
375	36	40	1.7	1.9	PA421_0080 EZ402U	100	200	8.000	8/1	4000	7000	1.7	2	9.5	7.7
375	54	67	2.5	1.3	PA421_0080 EZ404U	100	200	8.000	8/1	4000	7000	3.0	2	9.5	9.8
375	57	62	2.6	1.2	PA421_0080 EZ502U	100	200	8.000	8/1	4000	7000	5.3	2	9.5	9.1
429	19	20	1.1	3.9	PA421_0070 EZ401U	58	240	7.000	7/1	4000	7000	1.0	2	10	6.6
429	29	32	1.7	2.5	PA421_0070 EZ501U	110	240	7.000	7/1	4000	7000	3.0	2	10	7.6
429	32	35	1.9	2.3	PA421_0070 EZ402U	110	240	7.000	7/1	4000	7000	1.7	2	10	7.7
429	47	58	2.7	1.6	PA421_0070 EZ404U	110	240	7.000	7/1	4000	7000	3.1	2	10	9.8
429	50	54	2.9	1.5	PA421_0070 EZ502U	110	240	7.000	7/1	4000	7000	5.3	2	10	9.1
429	66	75	3.8	1.1	PA421_0070 EZ503U	110	240	7.000	7/1	4000	7000	7.7	2	10	11
600	21	23	2.5	3.6	PA421_0050 EZ501U	78	240	5.000	5/1	3700	6500	3.1	2	12	7.6
600	23	25	2.8	3.3	PA421_0050 EZ402U	78	240	5.000	5/1	3700	6500	1.8	2	12	7.7
600	33	42	4.1	2.2	PA421_0050 EZ404U	120	240	5.000	5/1	3700	6500	3.2	2	12	9.8
600	36	39	4.4	2.1	PA421_0050 EZ502U	120	240	5.000	5/1	3700	6500	5.4	2	12	9.1
600	36	40	4.4	2.1	PA421_0050 EZ701U	97	240	5.000	5/1	3700	6500	8.7	2	12	11
600	47	54	5.7	1.6	PA421_0050 EZ503U	120	240	5.000	5/1	3700	6500	7.8	2	12	11
600	58	70	7.1	1.3	PA421_0050 EZ702U	120	240	5.000	5/1	3700	6500	14	2	12	13
600	65	78	8.0	1.1	PA421_0050 EZ505U	120	240	5.000	5/1	3700	6500	12	2	12	14
750	17	18	3.3	4.5	PA421_0040 EZ501U	62	240	4.000	4/1	3300	6000	3.2	2	12	7.6
750	18	20	3.6	4.1	PA421_0040 EZ402U	62	200	4.000	4/1	3300	6000	1.9	2	12	7.7
750	27	33	5.3	2.8	PA421_0040 EZ404U	110	240	4.000	4/1	3300	6000	3.3	2	12	9.8
750	29	31	5.7	2.6	PA421_0040 EZ502U	120	240	4.000	4/1	3300	6000	5.5	2	12	9.1
750	29	32	5.7	2.6	PA421_0040 EZ701U	78	240	4.000	4/1	3300	6000	8.8	2	12	11
750	38	43	7.5	2.0	PA421_0040 EZ503U	120	240	4.000	4/1	3300	6000	7.9	2	12	11
750	47	56	9.3	1.6	PA421_0040 EZ702U	120	240	4.000	4/1	3300	6000	14	2	12	13
750	52	62	10	1.4	PA421_0040 EZ505U	120	240	4.000	4/1	3300	6000	12	2	12	14
750	64	81	13	1.2	PA421_0040 EZ703U	120	240	4.000	4/1	3300	6000	22	2	12	15
1000	13	14	8.0	3.5	PA421_0030 EZ501U	47	240	3.000	3/1	3000	5500	3.6	2	13	7.6
1000	14	15	8.7	3.2	PA421_0030 EZ402U	47	150	3.000	3/1	3000	5500	2.3	2	13	7.7
1000	20	25	13	2.2	PA421_0030 EZ404U	84	240	3.000	3/1	3000	5500	3.7	2	13	9.8
1000	22	23	14	2.0	PA421_0030 EZ502U	90	240	3.000	3/1	3000	5500	5.9	2	13	9.1
1000	22	24	14	2.0	PA421_0030 EZ701U	58	240	3.000	3/1	3000	5500	9.2	2	13	11
1000	28	32	18	1.5	PA421_0030 EZ503U	100	240	3.000	3/1	3000	5500	8.3	2	13	11
1000	35	42	22	1.3	PA421_0030 EZ702U	100	240	3.000	3/1	3000	5500	14	2	13	13
1000	39	47	25	1.1	PA421_0030 EZ505U	100	240	3.000	3/1	3000	5500	13	2	13	14
PA4 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 120$ Nm)															
900	46	74	6.4	1.4	PA421_0050 EZ505U	120	240	5.000	5/1	3700	6500	12	2	12	14
1125	37	59	8.4	1.8	PA421_0040 EZ505U	120	240	4.000	4/1	3300	6000	12	2	12	14



3 PA planetary geared motors

3.2 Selection tables



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DB	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA4 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 120$ Nm)															
1125	47	78	11	1.4	PA421_0040 EZ703U	120	240	4.000	4/1	3300	6000	22	2	12	15
1500	28	45	20	1.4	PA421_0030 EZ505U	100	240	3.000	3/1	3000	5500	13	2	13	14
1500	35	58	26	1.1	PA421_0030 EZ703U	100	240	3.000	3/1	3000	5500	22	2	13	15
PA4 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 120$ Nm)															
75	68	72	0.6	1.2	PA422_0800 EZ301U	100	200	80.00	80/1	4500	8000	0.21	3	9.2	6.0
86	59	63	0.6	1.4	PA422_0700 EZ301U	110	240	70.00	70/1	4500	8000	0.21	3	9.6	6.0
107	47	51	0.8	1.7	PA422_0560 EZ301U	100	200	56.00	56/1	4500	8000	0.23	3	9.2	6.0
120	42	45	0.8	2.0	PA422_0500 EZ301U	120	240	50.00	50/1	4500	8000	0.21	3	10	6.0
120	71	80	1.3	1.2	PA422_0500 EZ302U	120	240	50.00	50/1	4500	8000	0.31	3	10	6.6
150	34	36	0.9	2.4	PA422_0400 EZ301U	110	240	40.00	40/1	4500	8000	0.21	3	10	6.0
150	57	64	1.5	1.4	PA422_0400 EZ302U	120	240	40.00	40/1	4500	8000	0.31	3	10	6.6
150	74	86	2.0	1.1	PA422_0400 EZ303U	120	240	40.00	40/1	4500	8000	0.42	3	10	7.1
171	30	32	0.9	2.9	PA422_0350 EZ301U	93	240	35.00	35/1	4500	8000	0.23	3	11	6.0
171	50	56	1.5	1.7	PA422_0350 EZ302U	120	240	35.00	35/1	4500	8000	0.33	3	11	6.6
171	65	75	2.0	1.3	PA422_0350 EZ303U	120	240	35.00	35/1	4500	8000	0.44	3	11	7.1
188	27	29	1.0	3.0	PA422_0320 EZ301U	85	200	32.00	32/1	3700	6500	0.32	3	9.2	6.0
188	46	51	1.7	1.8	PA422_0320 EZ302U	100	200	32.00	32/1	3700	6500	0.42	3	9.2	6.6
188	60	68	2.2	1.3	PA422_0320 EZ303U	100	200	32.00	32/1	3700	6500	0.53	3	9.2	7.1
214	24	25	1.0	3.6	PA422_0280 EZ301U	74	240	28.00	28/1	4500	8000	0.23	3	10	6.0
214	40	45	1.7	2.1	PA422_0280 EZ302U	120	240	28.00	28/1	4500	8000	0.33	3	10	6.6
214	52	60	2.2	1.6	PA422_0280 EZ303U	120	240	28.00	28/1	4500	8000	0.44	3	10	7.1
214	61	74	2.6	1.4	PA422_0280 EZ401U	120	240	28.00	28/1	4500	8000	0.97	3	10	8.5
240	21	23	1.1	4.0	PA422_0250 EZ301U	67	240	25.00	25/1	4000	7000	0.27	3	11	6.0
240	36	40	1.8	2.4	PA422_0250 EZ302U	120	240	25.00	25/1	4000	7000	0.37	3	11	6.6
240	47	53	2.4	1.8	PA422_0250 EZ303U	120	240	25.00	25/1	4000	7000	0.48	3	11	7.1
240	55	67	2.8	1.6	PA422_0250 EZ401U	120	240	25.00	25/1	4000	7000	1.0	3	11	8.5
300	29	32	2.0	3.0	PA422_0200 EZ302U	95	240	20.00	20/1	3700	6500	0.42	3	11	6.6
300	37	43	2.6	2.3	PA422_0200 EZ303U	120	240	20.00	20/1	3700	6500	0.53	3	11	7.1
300	44	53	3.1	1.9	PA422_0200 EZ401U	120	240	20.00	20/1	3700	6500	1.1	3	11	8.5
300	65	84	4.6	1.3	PA422_0200 EZ501U	120	240	20.00	20/1	3700	6500	3.0	3	11	9.5
375	23	26	2.3	3.7	PA422_0160 EZ302U	76	240	16.00	16/1	3700	6500	0.43	3	11	6.6
375	30	34	3.0	2.9	PA422_0160 EZ303U	110	240	16.00	16/1	3700	6500	0.54	3	11	7.1
375	35	43	3.5	2.4	PA422_0160 EZ401U	120	240	16.00	16/1	3700	6500	1.1	3	11	8.5
375	52	67	5.1	1.6	PA422_0160 EZ501U	120	240	16.00	16/1	3700	6500	3.0	3	11	9.5
375	53	74	5.3	1.6	PA422_0160 EZ402U	120	240	16.00	16/1	3700	6500	1.8	3	11	9.6
500	10	11	2.6	4.9	PA422_0120 EZ301U	32	240	12.00	12/1	3700	6500	0.36	3	9.9	6.0
500	17	19	4.4	2.9	PA422_0120 EZ302U	57	240	12.00	12/1	3700	6500	0.46	3	9.9	6.6
500	22	26	5.8	2.2	PA422_0120 EZ303U	80	240	12.00	12/1	3700	6500	0.57	3	9.9	7.1
500	26	32	6.8	1.9	PA422_0120 EZ401U	97	240	12.00	12/1	3700	6500	1.1	3	9.9	8.5
500	39	50	10	1.3	PA422_0120 EZ501U	100	240	12.00	12/1	3700	6500	3.1	3	9.9	9.5
500	40	56	10	1.3	PA422_0120 EZ402U	100	240	12.00	12/1	3700	6500	1.8	3	9.9	9.6
600	22	27	1.1	1.9	PA421_0100 EZ401U	82	200	10.00	10/1	4000	7000	0.97	2	9.0	6.6
600	33	43	1.6	1.3	PA421_0100 EZ501U	100	200	10.00	10/1	4000	7000	2.9	2	9.0	7.6
600	34	48	1.6	1.2	PA421_0100 EZ402U	100	200	10.00	10/1	4000	7000	1.7	2	9.0	7.7
750	18	22	1.0	3.1	PA421_0080 EZ401U	66	200	8.000	8/1	4000	7000	0.99	2	9.5	6.6
750	26	34	1.5	2.1	PA421_0080 EZ501U	100	200	8.000	8/1	4000	7000	3.0	2	9.5	7.6
750	27	38	1.6	2.0	PA421_0080 EZ402U	100	200	8.000	8/1	4000	7000	1.7	2	9.5	7.7
750	40	61	2.3	1.4	PA421_0080 EZ502U	100	200	8.000	8/1	4000	7000	5.3	2	9.5	9.1
750	45	65	2.6	1.2	PA421_0080 EZ404U	100	200	8.000	8/1	4000	7000	3.0	2	9.5	9.8
857	16	19	1.1	3.8	PA421_0070 EZ401U	58	240	7.000	7/1	4000	7000	1.0	2	10	6.6
857	23	30	1.7	2.6	PA421_0070 EZ501U	110	240	7.000	7/1	4000	7000	3.0	2	10	7.6
857	24	33	1.7	2.5	PA421_0070 EZ402U	110	240	7.000	7/1	4000	7000	1.7	2	10	7.7
857	35	53	2.6	1.7	PA421_0070 EZ502U	110	240	7.000	7/1	4000	7000	5.3	2	10	9.1
857	39	57	2.9	1.5	PA421_0070 EZ404U	110	240	7.000	7/1	4000	7000	3.1	2	10	9.8
857	42	72	3.1	1.4	PA421_0070 EZ503U	110	240	7.000	7/1	4000	7000	7.7	2	10	11
1200	16	21	2.5	3.6	PA421_0050 EZ501U	78	240	5.000	5/1	3700	6500	3.1	2	12	7.6
1200	17	24	2.6	3.5	PA421_0050 EZ402U	78	240	5.000	5/1	3700	6500	1.8	2	12	7.7
1200	25	38	3.9	2.3	PA421_0050 EZ502U	120	240	5.000	5/1	3700	6500	5.4	2	12	9.1
1200	25	38	3.9	2.3	PA421_0050 EZ701U	97	240	5.000	5/1	3700	6500	8.7	2	12	11



3 PA planetary geared motors

3.2 Selection tables

PA



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max}	n_{1max}	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DB	ZB	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA4 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 120$ Nm)															
1200	28	41	4.3	2.1	PA421_0050 EZ404U	120	240	5.000	5/1	3700	6500	3.2	2	12	9.8
1200	30	51	4.6	2.0	PA421_0050 EZ503U	120	240	5.000	5/1	3700	6500	7.8	2	12	11
1200	35	69	5.4	1.7	PA421_0050 EZ702U	120	240	5.000	5/1	3700	6500	14	2	12	13
1500	13	17	3.3	4.5	PA421_0040 EZ501U	62	240	4.000	4/1	3300	6000	3.2	2	12	7.6
1500	14	19	3.4	4.3	PA421_0040 EZ402U	62	200	4.000	4/1	3300	6000	1.9	2	12	7.7
1500	20	30	5.1	2.9	PA421_0040 EZ502U	120	240	4.000	4/1	3300	6000	5.5	2	12	9.1
1500	20	31	5.1	2.9	PA421_0040 EZ701U	78	240	4.000	4/1	3300	6000	8.8	2	12	11
1500	23	33	5.6	2.6	PA421_0040 EZ404U	110	240	4.000	4/1	3300	6000	3.3	2	12	9.8
1500	24	41	6.0	2.5	PA421_0040 EZ503U	120	240	4.000	4/1	3300	6000	7.9	2	12	11
1500	28	55	7.0	2.1	PA421_0040 EZ702U	120	240	4.000	4/1	3300	6000	14	2	12	13
PA5 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 300$ Nm)															
43	186	200	0.9	1.1	PA522_0700 EZ401U	270	600	70.00	70/1	4000	7000	0.98	2	26	11
54	149	160	1.1	1.3	PA522_0560 EZ401U	250	500	56.00	56/1	4000	7000	1.0	2	25	11
60	133	143	1.1	1.6	PA522_0500 EZ401U	300	600	50.00	50/1	4000	7000	0.98	2	27	11
60	204	223	1.7	1.0	PA522_0500 EZ501U	300	600	50.00	50/1	4000	7000	3.0	2	27	12
75	106	114	1.2	1.9	PA522_0400 EZ401U	300	600	40.00	40/1	4000	7000	0.98	2	26	11
75	163	179	1.9	1.2	PA522_0400 EZ501U	300	600	40.00	40/1	4000	7000	3.0	2	26	12
75	179	198	2.1	1.1	PA522_0400 EZ402U	300	600	40.00	40/1	4000	7000	1.7	2	26	12
86	93	100	1.3	2.3	PA522_0350 EZ401U	280	600	35.00	35/1	4000	7000	1.0	2	28	11
86	143	156	2.0	1.5	PA522_0350 EZ501U	300	600	35.00	35/1	4000	7000	3.0	2	28	12
86	156	173	2.2	1.3	PA522_0350 EZ402U	300	600	35.00	35/1	4000	7000	1.7	2	28	12
94	85	91	1.4	2.4	PA522_0320 EZ401U	250	500	32.00	32/1	3300	6000	1.2	2	25	11
94	131	143	2.2	1.5	PA522_0320 EZ501U	250	500	32.00	32/1	3300	6000	3.2	2	25	12
94	143	158	2.4	1.4	PA522_0320 EZ402U	250	500	32.00	32/1	3300	6000	1.9	2	25	12
107	74	80	1.4	2.8	PA522_0280 EZ401U	230	600	28.00	28/1	4000	7000	1.0	2	27	11
107	114	125	2.2	1.8	PA522_0280 EZ501U	300	600	28.00	28/1	4000	7000	3.0	2	27	12
107	125	138	2.4	1.7	PA522_0280 EZ402U	300	600	28.00	28/1	4000	7000	1.7	2	27	12
107	184	229	3.5	1.1	PA522_0280 EZ404U	300	600	28.00	28/1	4000	7000	3.1	2	27	14
107	197	213	3.8	1.1	PA522_0280 EZ502U	300	600	28.00	28/1	4000	7000	5.3	2	27	14
120	67	71	1.5	3.2	PA522_0250 EZ401U	200	600	25.00	25/1	3700	6500	1.1	2	28	11
120	102	112	2.3	2.1	PA522_0250 EZ501U	300	600	25.00	25/1	3700	6500	3.1	2	28	12
120	112	124	2.6	1.9	PA522_0250 EZ402U	300	600	25.00	25/1	3700	6500	1.8	2	28	12
120	164	204	3.7	1.3	PA522_0250 EZ404U	300	600	25.00	25/1	3700	6500	3.2	2	28	14
120	176	190	4.0	1.2	PA522_0250 EZ502U	300	600	25.00	25/1	3700	6500	5.4	2	28	14
120	176	197	4.0	1.2	PA522_0250 EZ701U	300	600	25.00	25/1	3700	6500	8.7	2	28	15
150	53	57	1.7	3.9	PA522_0200 EZ401U	160	600	20.00	20/1	3300	6000	1.2	2	28	11
150	82	89	2.6	2.6	PA522_0200 EZ501U	300	600	20.00	20/1	3300	6000	3.2	2	28	12
150	89	99	2.9	2.4	PA522_0200 EZ402U	300	600	20.00	20/1	3300	6000	1.9	2	28	12
150	131	163	4.2	1.6	PA522_0200 EZ404U	300	600	20.00	20/1	3300	6000	3.3	2	28	14
150	141	152	4.5	1.5	PA522_0200 EZ502U	300	600	20.00	20/1	3300	6000	5.5	2	28	14
150	141	158	4.5	1.5	PA522_0200 EZ701U	300	600	20.00	20/1	3300	6000	8.8	2	28	15
150	184	211	5.9	1.1	PA522_0200 EZ503U	300	600	20.00	20/1	3300	6000	7.9	2	28	15
188	43	46	1.9	4.9	PA522_0160 EZ401U	130	600	16.00	16/1	3300	6000	1.3	2	28	11
188	65	71	2.9	3.2	PA522_0160 EZ501U	240	600	16.00	16/1	3300	6000	3.2	2	28	12
188	71	79	3.2	2.9	PA522_0160 EZ402U	240	600	16.00	16/1	3300	6000	2.0	2	28	12
188	105	131	4.7	2.0	PA522_0160 EZ404U	300	600	16.00	16/1	3300	6000	3.3	2	28	14
188	112	122	5.0	1.9	PA522_0160 EZ502U	300	600	16.00	16/1	3300	6000	5.5	2	28	14
188	112	126	5.0	1.9	PA522_0160 EZ701U	300	600	16.00	16/1	3300	6000	8.8	2	28	15
188	147	169	6.6	1.4	PA522_0160 EZ503U	300	600	16.00	16/1	3300	6000	7.9	2	28	15
188	182	219	8.1	1.2	PA522_0160 EZ702U	300	600	16.00	16/1	3300	6000	14	2	28	18
250	32	34	3.8	3.8	PA522_0120 EZ401U	97	460	12.00	12/1	3300	6000	1.3	2	27	11
250	49	54	5.9	2.4	PA522_0120 EZ501U	180	460	12.00	12/1	3300	6000	3.3	2	27	12
250	54	59	6.4	2.2	PA522_0120 EZ402U	180	460	12.00	12/1	3300	6000	2.0	2	27	12
250	79	98	9.5	1.5	PA522_0120 EZ404U	200	460	12.00	12/1	3300	6000	3.3	2	27	14
250	84	91	10	1.4	PA522_0120 EZ502U	200	460	12.00	12/1	3300	6000	5.6	2	27	14
250	84	95	10	1.4	PA522_0120 EZ701U	200	460	12.00	12/1	3300	6000	8.9	2	27	15
250	111	127	13	1.1	PA522_0120 EZ503U	200	460	12.00	12/1	3300	6000	7.9	2	27	15
300	42	46	1.8	2.9	PA521_0100 EZ501U	160	500	10.00	10/1	3700	6500	3.0	1	25	9.4
300	72	78	3.1	1.7	PA521_0100 EZ502U	250	500	10.00	10/1	3700	6500	5.3	1	25	11

3 PA planetary geared motors

3.2 Selection tables



STÖBER

n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DB	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA5 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 300$ Nm)															
300	72	81	3.1	1.7	PA521_0100 EZ701U	190	500	10.00	10/1	3700	6500	8.6	1	25	13
300	94	108	4.1	1.3	PA521_0100 EZ503U	250	500	10.00	10/1	3700	6500	7.7	1	25	12
300	116	140	5.1	1.1	PA521_0100 EZ702U	250	500	10.00	10/1	3700	6500	14	1	25	15
375	57	62	2.9	3.0	PA521_0080 EZ502U	240	500	8.000	8/1	3700	6500	5.4	1	26	11
375	57	64	2.9	3.0	PA521_0080 EZ701U	160	500	8.000	8/1	3700	6500	8.7	1	26	13
375	75	86	3.8	2.3	PA521_0080 EZ503U	250	500	8.000	8/1	3700	6500	7.8	1	26	12
375	93	112	4.7	1.9	PA521_0080 EZ702U	250	500	8.000	8/1	3700	6500	14	1	26	15
375	105	124	5.3	1.7	PA521_0080 EZ505U	250	500	8.000	8/1	3700	6500	12	1	26	15
375	128	161	6.4	1.4	PA521_0080 EZ703U	250	500	8.000	8/1	3700	6500	22	1	26	17
429	50	54	3.2	3.7	PA521_0070 EZ502U	210	600	7.000	7/1	3700	6500	5.5	1	28	11
429	50	56	3.2	3.7	PA521_0070 EZ701U	140	600	7.000	7/1	3700	6500	8.8	1	28	13
429	66	75	4.2	2.8	PA521_0070 EZ503U	270	600	7.000	7/1	3700	6500	7.8	1	28	12
429	81	98	5.2	2.3	PA521_0070 EZ702U	270	600	7.000	7/1	3700	6500	14	1	28	15
429	92	109	5.9	2.0	PA521_0070 EZ505U	270	600	7.000	7/1	3700	6500	12	1	28	15
429	112	141	7.2	1.6	PA521_0070 EZ703U	270	600	7.000	7/1	3700	6500	22	1	28	17
600	47	54	6.3	3.9	PA521_0050 EZ503U	210	430	5.000	5/1	3500	6000	8.2	1	31	12
600	58	70	7.8	3.2	PA521_0050 EZ702U	200	600	5.000	5/1	3500	6000	14	1	31	15
600	65	78	8.8	2.8	PA521_0050 EZ505U	300	600	5.000	5/1	3500	6000	13	1	31	15
600	80	101	11	2.3	PA521_0050 EZ703U	300	600	5.000	5/1	3500	6000	22	1	31	17
600	103	146	14	1.8	PA521_0050 EZ705U	300	600	5.000	5/1	3500	6000	35	1	31	23
600	108	180	15	1.7	PA521_0050 EZ802U	300	600	5.000	5/1	3500	6000	59	1	31	31
750	38	43	8.3	4.9	PA521_0040 EZ503U	170	350	4.000	4/1	3000	5000	8.6	1	32	12
750	47	56	10	3.9	PA521_0040 EZ702U	160	600	4.000	4/1	3000	5000	15	1	32	15
750	52	62	11	3.5	PA521_0040 EZ505U	260	600	4.000	4/1	3000	5000	13	1	32	15
750	64	81	14	2.9	PA521_0040 EZ703U	250	600	4.000	4/1	3000	5000	23	1	32	17
750	83	117	18	2.2	PA521_0040 EZ705U	300	600	4.000	4/1	3000	5000	35	1	32	23
750	87	144	19	2.1	PA521_0040 EZ802U	300	600	4.000	4/1	3000	5000	59	1	32	31
1000	22	23	16	4.9	PA521_0030 EZ502U	90	260	3.000	3/1	2500	4500	8.0	1	36	11
1000	22	24	16	4.9	PA521_0030 EZ701U	58	460	3.000	3/1	2500	4500	11	1	36	13
1000	28	32	20	3.7	PA521_0030 EZ503U	130	260	3.000	3/1	2500	4500	10	1	36	12
1000	35	42	25	3.0	PA521_0030 EZ702U	120	460	3.000	3/1	2500	4500	17	1	36	15
1000	39	47	28	2.7	PA521_0030 EZ505U	190	460	3.000	3/1	2500	4500	15	1	36	15
1000	48	61	35	2.2	PA521_0030 EZ703U	190	460	3.000	3/1	2500	4500	24	1	36	17
1000	62	88	45	1.7	PA521_0030 EZ705U	200	460	3.000	3/1	2500	4500	37	1	36	23
1000	65	108	47	1.6	PA521_0030 EZ802U	200	460	3.000	3/1	2500	4500	61	1	36	31
PA5 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 300$ Nm)															
450	92	148	4.6	1.2	PA521_0100 EZ505U	250	500	10.00	10/1	3700	6500	12	1	25	15
563	74	119	4.2	2.1	PA521_0080 EZ505U	250	500	8.000	8/1	3700	6500	12	1	26	15
563	94	155	5.4	1.6	PA521_0080 EZ703U	250	500	8.000	8/1	3700	6500	22	1	26	17
643	65	104	4.7	2.5	PA521_0070 EZ505U	270	600	7.000	7/1	3700	6500	12	1	28	15
643	82	136	6.0	2.0	PA521_0070 EZ703U	270	600	7.000	7/1	3700	6500	22	1	28	17
900	46	74	7.1	3.5	PA521_0050 EZ505U	300	600	5.000	5/1	3500	6000	13	1	31	15
900	51	167	7.8	3.1	PA521_0050 EZ802U	300	600	5.000	5/1	3500	6000	59	1	31	31
900	59	97	9.0	2.7	PA521_0050 EZ703U	300	600	5.000	5/1	3500	6000	22	1	31	17
900	80	146	12	2.0	PA521_0050 EZ705U	300	600	5.000	5/1	3500	6000	35	1	31	23
1125	37	59	9.3	4.3	PA521_0040 EZ505U	260	600	4.000	4/1	3000	5000	13	1	32	15
1125	41	134	10	3.9	PA521_0040 EZ802U	300	600	4.000	4/1	3000	5000	59	1	32	31
1125	47	78	12	3.4	PA521_0040 EZ703U	250	600	4.000	4/1	3000	5000	23	1	32	17
1125	64	116	16	2.5	PA521_0040 EZ705U	300	600	4.000	4/1	3000	5000	35	1	32	23
1500	28	45	23	3.3	PA521_0030 EZ505U	190	460	3.000	3/1	2500	4500	15	1	36	15
1500	31	100	25	3.0	PA521_0030 EZ802U	200	460	3.000	3/1	2500	4500	61	1	36	31
1500	35	58	29	2.6	PA521_0030 EZ703U	190	460	3.000	3/1	2500	4500	24	1	36	17
1500	48	87	40	1.9	PA521_0030 EZ705U	200	460	3.000	3/1	2500	4500	37	1	36	23
PA5 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 300$ Nm)															
86	153	186	0.7	1.4	PA522_0700 EZ401U	270	600	70.00	70/1	4000	7000	0.98	2	26	11
107	122	149	0.9	1.6	PA522_0560 EZ401U	250	500	56.00	56/1	4000	7000	1.0	2	25	11
120	109	133	0.9	1.8	PA522_0500 EZ401U	300	600	50.00	50/1	4000	7000	0.98	2	27	11
120	162	209	1.4	1.2	PA522_0500 EZ501U	300	600	50.00	50/1	4000	7000	3.0	2	27	12
150	87	106	1.3	1.8	PA522_0400 EZ401U	300	600	40.00	40/1	4000	7000	0.98	2	26	11



3 PA planetary geared motors

3.2 Selection tables

PA



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max}	n_{1max}	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DB	ZB	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA5 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 300$ Nm)															
150	129	167	1.9	1.2	PA522_0400 EZ501U	300	600	40.00	40/1	4000	7000	3.0	2	26	12
150	133	186	2.0	1.2	PA522_0400 EZ402U	300	600	40.00	40/1	4000	7000	1.7	2	26	12
171	76	93	1.1	2.7	PA522_0350 EZ401U	280	600	35.00	35/1	4000	7000	1.0	2	28	11
171	113	146	1.6	1.9	PA522_0350 EZ501U	300	600	35.00	35/1	4000	7000	3.0	2	28	12
171	116	163	1.6	1.8	PA522_0350 EZ402U	300	600	35.00	35/1	4000	7000	1.7	2	28	12
188	70	85	1.2	2.9	PA522_0320 EZ401U	250	500	32.00	32/1	3300	6000	1.2	2	25	11
188	103	134	1.7	1.9	PA522_0320 EZ501U	250	500	32.00	32/1	3300	6000	3.2	2	25	12
188	106	149	1.8	1.9	PA522_0320 EZ402U	250	500	32.00	32/1	3300	6000	1.9	2	25	12
214	61	74	1.2	3.4	PA522_0280 EZ401U	230	600	28.00	28/1	4000	7000	1.0	2	27	11
214	90	117	1.7	2.3	PA522_0280 EZ501U	300	600	28.00	28/1	4000	7000	3.0	2	27	12
214	93	130	1.8	2.3	PA522_0280 EZ402U	300	600	28.00	28/1	4000	7000	1.7	2	27	12
214	138	207	2.7	1.5	PA522_0280 EZ502U	300	600	28.00	28/1	4000	7000	5.3	2	27	14
214	154	223	3.0	1.4	PA522_0280 EZ404U	300	600	28.00	28/1	4000	7000	3.1	2	27	14
240	55	67	1.2	3.8	PA522_0250 EZ401U	200	600	25.00	25/1	3700	6500	1.1	2	28	11
240	81	105	1.8	2.6	PA522_0250 EZ501U	300	600	25.00	25/1	3700	6500	3.1	2	28	12
240	83	116	1.9	2.5	PA522_0250 EZ402U	300	600	25.00	25/1	3700	6500	1.8	2	28	12
240	124	185	2.8	1.7	PA522_0250 EZ502U	300	600	25.00	25/1	3700	6500	5.4	2	28	14
240	124	188	2.8	1.7	PA522_0250 EZ701U	300	600	25.00	25/1	3700	6500	8.7	2	28	15
240	138	200	3.1	1.5	PA522_0250 EZ404U	300	600	25.00	25/1	3700	6500	3.2	2	28	14
300	44	53	1.4	4.8	PA522_0200 EZ401U	160	600	20.00	20/1	3300	6000	1.2	2	28	11
300	65	84	2.1	3.3	PA522_0200 EZ501U	300	600	20.00	20/1	3300	6000	3.2	2	28	12
300	67	93	2.1	3.2	PA522_0200 EZ402U	300	600	20.00	20/1	3300	6000	1.9	2	28	12
300	99	148	3.2	2.1	PA522_0200 EZ502U	300	600	20.00	20/1	3300	6000	5.5	2	28	14
300	99	150	3.2	2.1	PA522_0200 EZ701U	300	600	20.00	20/1	3300	6000	8.8	2	28	15
300	110	160	3.5	1.9	PA522_0200 EZ404U	300	600	20.00	20/1	3300	6000	3.3	2	28	14
300	118	201	3.8	1.8	PA522_0200 EZ503U	300	600	20.00	20/1	3300	6000	7.9	2	28	15
375	52	67	2.3	4.1	PA522_0160 EZ501U	240	600	16.00	16/1	3300	6000	3.2	2	28	12
375	53	74	2.4	3.9	PA522_0160 EZ402U	240	600	16.00	16/1	3300	6000	2.0	2	28	12
375	79	119	3.5	2.7	PA522_0160 EZ502U	300	600	16.00	16/1	3300	6000	5.5	2	28	14
375	79	120	3.5	2.7	PA522_0160 EZ701U	300	600	16.00	16/1	3300	6000	8.8	2	28	15
375	88	128	3.9	2.4	PA522_0160 EZ404U	300	600	16.00	16/1	3300	6000	3.3	2	28	14
375	94	161	4.2	2.2	PA522_0160 EZ503U	300	600	16.00	16/1	3300	6000	7.9	2	28	15
375	109	217	4.9	1.9	PA522_0160 EZ702U	300	600	16.00	16/1	3300	6000	14	2	28	18
500	26	32	3.2	4.6	PA522_0120 EZ401U	97	460	12.00	12/1	3300	6000	1.3	2	27	11
500	39	50	4.7	3.1	PA522_0120 EZ501U	180	460	12.00	12/1	3300	6000	3.3	2	27	12
500	40	56	4.8	3.0	PA522_0120 EZ402U	180	460	12.00	12/1	3300	6000	2.0	2	27	12
500	59	89	7.1	2.0	PA522_0120 EZ502U	200	460	12.00	12/1	3300	6000	5.6	2	27	14
500	59	90	7.1	2.0	PA522_0120 EZ701U	200	460	12.00	12/1	3300	6000	8.9	2	27	15
500	66	96	8.0	1.8	PA522_0120 EZ404U	200	460	12.00	12/1	3300	6000	3.3	2	27	14
500	71	121	8.5	1.7	PA522_0120 EZ503U	200	460	12.00	12/1	3300	6000	7.9	2	27	15
600	33	43	1.8	2.9	PA521_0100 EZ501U	160	500	10.00	10/1	3700	6500	3.0	1	25	9.4
600	50	76	2.8	1.9	PA521_0100 EZ502U	250	500	10.00	10/1	3700	6500	5.3	1	25	11
600	50	77	2.8	1.9	PA521_0100 EZ701U	190	500	10.00	10/1	3700	6500	8.6	1	25	13
600	60	103	3.3	1.6	PA521_0100 EZ503U	250	500	10.00	10/1	3700	6500	7.7	1	25	12
600	70	139	3.9	1.4	PA521_0100 EZ702U	250	500	10.00	10/1	3700	6500	14	1	25	15
750	40	61	2.5	3.4	PA521_0080 EZ502U	240	500	8.000	8/1	3700	6500	5.4	1	26	11
750	40	61	2.5	3.4	PA521_0080 EZ701U	160	500	8.000	8/1	3700	6500	8.7	1	26	13
750	48	82	3.0	2.9	PA521_0080 EZ503U	250	500	8.000	8/1	3700	6500	7.8	1	26	12
750	56	111	3.5	2.5	PA521_0080 EZ702U	250	500	8.000	8/1	3700	6500	14	1	26	15
857	35	53	2.9	4.1	PA521_0070 EZ502U	210	600	7.000	7/1	3700	6500	5.5	1	28	11
857	35	54	2.9	4.1	PA521_0070 EZ701U	140	600	7.000	7/1	3700	6500	8.8	1	28	13
857	42	72	3.4	3.5	PA521_0070 EZ503U	270	600	7.000	7/1	3700	6500	7.8	1	28	12
857	49	97	3.9	3.0	PA521_0070 EZ702U	270	600	7.000	7/1	3700	6500	14	1	28	15
1200	30	51	5.1	4.8	PA521_0050 EZ503U	210	430	5.000	5/1	3500	6000	8.2	1	31	12
1200	35	69	5.9	4.2	PA521_0050 EZ702U	200	600	5.000	5/1	3500	6000	14	1	31	15
PA7 ($n_{1N} = 2000$ rpm, $M_{2acc,max} = 700$ Nm)															
400	212	321	14	2.1	PA721_0050 EZ805U	700	1400	5.000	5/1	3000	5500	135	1	58	54
500	170	256	19	2.6	PA721_0040 EZ805U	700	1380	4.000	4/1	2500	4500	136	1	60	54
667	127	192	41	2.2	PA721_0030 EZ805U	500	1040	3.000	3/1	2200	3700	141	1	65	54

3 PA planetary geared motors

3.2 Selection tables



STÖBER

n_{2N}	M_{2N}	$M_{2.0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DB	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA7 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 700$ Nm)															
38	327	357	0.8	1.2	PA722_0800 EZ501U	500	1000	80.00	80/1	3700	6500	3.1	2	52	18
43	286	313	0.8	1.5	PA722_0700 EZ501U	650	1250	70.00	70/1	3700	6500	3.1	2	53	18
54	229	250	1.0	1.7	PA722_0560 EZ501U	500	1000	56.00	56/1	3700	6500	3.2	2	52	18
60	204	223	0.9	2.2	PA722_0500 EZ501U	700	1400	50.00	50/1	3700	6500	3.1	2	53	18
60	352	380	1.6	1.3	PA722_0500 EZ502U	700	1400	50.00	50/1	3700	6500	5.4	2	53	19
60	352	394	1.6	1.3	PA722_0500 EZ701U	700	1400	50.00	50/1	3700	6500	8.7	2	53	21
75	163	179	1.1	2.7	PA722_0400 EZ501U	610	1380	40.00	40/1	3700	6500	3.1	2	52	18
75	281	304	1.8	1.6	PA722_0400 EZ502U	700	1380	40.00	40/1	3700	6500	5.4	2	52	19
75	281	315	1.8	1.6	PA722_0400 EZ701U	700	1380	40.00	40/1	3700	6500	8.7	2	52	21
75	369	422	2.4	1.2	PA722_0400 EZ503U	700	1380	40.00	40/1	3700	6500	7.8	2	52	21
86	143	156	1.1	3.1	PA722_0350 EZ501U	530	1400	35.00	35/1	3700	6500	3.2	2	53	18
86	246	266	1.9	1.8	PA722_0350 EZ502U	700	1400	35.00	35/1	3700	6500	5.5	2	53	19
86	246	276	1.9	1.8	PA722_0350 EZ701U	670	1400	35.00	35/1	3700	6500	8.8	2	53	21
86	323	369	2.5	1.4	PA722_0350 EZ503U	700	1400	35.00	35/1	3700	6500	7.9	2	53	21
86	399	479	3.2	1.1	PA722_0350 EZ702U	700	1400	35.00	35/1	3700	6500	14	2	53	24
94	131	143	1.3	3.1	PA722_0320 EZ501U	490	1000	32.00	32/1	3000	5000	3.9	2	52	18
94	225	243	2.2	1.8	PA722_0320 EZ502U	500	1000	32.00	32/1	3000	5000	6.2	2	52	19
94	225	252	2.2	1.8	PA722_0320 EZ701U	500	1000	32.00	32/1	3000	5000	9.5	2	52	21
94	295	337	2.9	1.4	PA722_0320 EZ503U	500	1000	32.00	32/1	3000	5000	8.5	2	52	21
107	114	125	1.3	3.8	PA722_0280 EZ501U	430	1380	28.00	28/1	3700	6500	3.3	2	53	18
107	197	213	2.2	2.2	PA722_0280 EZ502U	700	1380	28.00	28/1	3700	6500	5.6	2	53	19
107	197	221	2.2	2.2	PA722_0280 EZ701U	530	1380	28.00	28/1	3700	6500	8.9	2	53	21
107	258	295	2.9	1.7	PA722_0280 EZ503U	700	1380	28.00	28/1	3700	6500	7.9	2	53	21
107	319	383	3.5	1.4	PA722_0280 EZ702U	700	1380	28.00	28/1	3700	6500	14	2	53	24
107	359	426	4.0	1.2	PA722_0280 EZ505U	700	1380	28.00	28/1	3700	6500	13	2	53	24
120	102	112	1.3	4.3	PA722_0250 EZ501U	380	1400	25.00	25/1	3500	6000	3.6	2	54	18
120	176	190	2.3	2.5	PA722_0250 EZ502U	700	1400	25.00	25/1	3500	6000	5.9	2	54	19
120	176	197	2.3	2.5	PA722_0250 EZ701U	480	1400	25.00	25/1	3500	6000	9.2	2	54	21
120	230	264	3.0	1.9	PA722_0250 EZ503U	700	1400	25.00	25/1	3500	6000	8.2	2	54	21
120	285	342	3.7	1.5	PA722_0250 EZ702U	700	1400	25.00	25/1	3500	6000	14	2	54	24
120	321	380	4.2	1.4	PA722_0250 EZ505U	700	1400	25.00	25/1	3500	6000	13	2	54	24
120	392	494	5.1	1.1	PA722_0250 EZ703U	700	1400	25.00	25/1	3500	6000	22	2	54	26
150	141	152	2.6	3.1	PA722_0200 EZ502U	590	1400	20.00	20/1	3000	5000	6.2	2	54	19
150	141	158	2.6	3.1	PA722_0200 EZ701U	380	1400	20.00	20/1	3000	5000	9.5	2	54	21
150	184	211	3.4	2.4	PA722_0200 EZ503U	700	1400	20.00	20/1	3000	5000	8.6	2	54	21
150	228	274	4.2	1.9	PA722_0200 EZ702U	700	1400	20.00	20/1	3000	5000	15	2	54	24
150	257	304	4.7	1.7	PA722_0200 EZ505U	700	1400	20.00	20/1	3000	5000	13	2	54	24
150	314	395	5.7	1.4	PA722_0200 EZ703U	700	1400	20.00	20/1	3000	5000	23	2	54	26
188	112	122	2.9	3.9	PA722_0160 EZ502U	470	1340	16.00	16/1	3000	5000	6.3	2	54	19
188	112	126	2.9	3.9	PA722_0160 EZ701U	300	1380	16.00	16/1	3000	5000	9.6	2	54	21
188	147	169	3.8	3.0	PA722_0160 EZ503U	650	1340	16.00	16/1	3000	5000	8.7	2	54	21
188	182	219	4.7	2.4	PA722_0160 EZ702U	620	1380	16.00	16/1	3000	5000	15	2	54	24
188	205	243	5.2	2.1	PA722_0160 EZ505U	700	1380	16.00	16/1	3000	5000	13	2	54	24
188	251	316	6.4	1.8	PA722_0160 EZ703U	700	1380	16.00	16/1	3000	5000	23	2	54	26
188	324	459	8.3	1.4	PA722_0160 EZ705U	700	1380	16.00	16/1	3000	5000	35	2	54	31
250	84	91	5.2	3.3	PA722_0120 EZ502U	350	1000	12.00	12/1	3000	5000	6.6	2	53	19
250	84	95	5.2	3.3	PA722_0120 EZ701U	230	1040	12.00	12/1	3000	5000	9.9	2	53	21
250	111	127	6.8	2.5	PA722_0120 EZ503U	490	1000	12.00	12/1	3000	5000	9.0	2	53	21
250	137	164	8.5	2.0	PA722_0120 EZ702U	470	1040	12.00	12/1	3000	5000	15	2	53	24
250	154	182	9.5	1.8	PA722_0120 EZ505U	500	1040	12.00	12/1	3000	5000	14	2	53	24
250	188	237	12	1.5	PA722_0120 EZ703U	500	1040	12.00	12/1	3000	5000	23	2	53	26
250	243	344	15	1.2	PA722_0120 EZ705U	500	1040	12.00	12/1	3000	5000	35	2	53	31
300	72	81	1.8	3.7	PA721_0100 EZ701U	190	1000	10.00	10/1	3300	6000	9.0	1	50	17
300	116	140	2.9	2.3	PA721_0100 EZ702U	400	1000	10.00	10/1	3300	6000	14	1	50	19
300	160	202	3.9	1.6	PA721_0100 EZ703U	500	1000	10.00	10/1	3300	6000	22	1	50	21
300	207	293	5.1	1.3	PA721_0100 EZ705U	500	1000	10.00	10/1	3300	6000	35	1	50	27
300	216	360	5.3	1.2	PA721_0100 EZ802U	500	1000	10.00	10/1	3300	6000	59	1	50	35
375	93	112	2.8	3.8	PA721_0080 EZ702U	320	1000	8.000	8/1	3300	6000	15	1	53	19
375	128	161	3.9	2.7	PA721_0080 EZ703U	500	1000	8.000	8/1	3300	6000	22	1	53	21



3 PA planetary geared motors

3.2 Selection tables

PA



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max}	n_{1max}	J_1	$\Delta\varphi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DB	ZB	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA7 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 700$ Nm)															
375	165	234	5.0	2.1	PA721_0080 EZ705U	500	1000	8.000	8/1	3300	6000	35	1	53	27
375	173	288	5.2	2.0	PA721_0080 EZ802U	500	1000	8.000	8/1	3300	6000	59	1	53	35
429	81	98	3.0	4.7	PA721_0070 EZ702U	280	1250	7.000	7/1	3300	6000	15	1	55	19
429	112	141	4.1	3.4	PA721_0070 EZ703U	440	1250	7.000	7/1	3300	6000	23	1	55	21
429	145	205	5.3	2.7	PA721_0070 EZ705U	650	1250	7.000	7/1	3300	6000	35	1	55	27
429	151	252	5.6	2.5	PA721_0070 EZ802U	650	1250	7.000	7/1	3300	6000	59	1	55	35
600	80	101	6.2	4.8	PA721_0050 EZ703U	320	900	5.000	5/1	3000	5500	24	1	58	21
600	103	146	7.9	3.7	PA721_0050 EZ705U	500	1400	5.000	5/1	3000	5500	36	1	58	27
600	108	180	8.3	3.6	PA721_0050 EZ802U	490	1400	5.000	5/1	3000	5500	60	1	58	35
600	129	234	9.9	3.0	PA721_0050 EZ803U	700	1400	5.000	5/1	3000	5500	85	1	58	41
750	83	117	10	4.7	PA721_0040 EZ705U	400	1380	4.000	4/1	2500	4500	38	1	60	27
750	87	144	11	4.4	PA721_0040 EZ802U	390	1380	4.000	4/1	2500	4500	62	1	60	35
750	103	187	13	3.7	PA721_0040 EZ803U	560	1380	4.000	4/1	2500	4500	87	1	60	41
1000	62	88	23	3.9	PA721_0030 EZ705U	300	1040	3.000	3/1	2200	3700	42	1	65	27
1000	65	108	24	3.8	PA721_0030 EZ802U	290	1040	3.000	3/1	2200	3700	66	1	65	35
1000	77	140	29	3.2	PA721_0030 EZ803U	420	1040	3.000	3/1	2200	3700	92	1	65	41
PA7 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 700$ Nm)															
129	316	509	2.5	1.4	PA722_0350 EZ505U	700	1400	35.00	35/1	3700	6500	12	2	53	24
161	253	407	2.8	1.7	PA722_0280 EZ505U	700	1380	28.00	28/1	3700	6500	13	2	53	24
161	322	532	3.6	1.4	PA722_0280 EZ703U	700	1380	28.00	28/1	3700	6500	22	2	53	26
180	226	363	3.0	2.0	PA722_0250 EZ505U	700	1400	25.00	25/1	3500	6000	13	2	54	24
180	287	475	3.8	1.5	PA722_0250 EZ703U	700	1400	25.00	25/1	3500	6000	22	2	54	26
225	181	291	3.3	2.4	PA722_0200 EZ505U	700	1400	20.00	20/1	3000	5000	13	2	54	24
225	230	380	4.2	1.9	PA722_0200 EZ703U	700	1400	20.00	20/1	3000	5000	23	2	54	26
281	144	233	3.7	3.0	PA722_0160 EZ505U	700	1380	16.00	16/1	3000	5000	13	2	54	24
281	160	524	4.1	2.8	PA722_0160 EZ802U	700	1380	16.00	16/1	3000	5000	59	2	54	40
281	184	304	4.7	2.4	PA722_0160 EZ703U	700	1380	16.00	16/1	3000	5000	23	2	54	26
281	249	456	6.4	1.8	PA722_0160 EZ705U	700	1380	16.00	16/1	3000	5000	35	2	54	31
375	108	174	6.7	2.6	PA722_0120 EZ505U	500	1040	12.00	12/1	3000	5000	14	2	53	24
375	138	228	8.5	2.0	PA722_0120 EZ703U	500	1040	12.00	12/1	3000	5000	23	2	53	26
375	187	342	12	1.5	PA722_0120 EZ705U	500	1040	12.00	12/1	3000	5000	35	2	53	31
450	102	335	2.9	2.2	PA721_0100 EZ802U	500	1000	10.00	10/1	3300	6000	59	1	50	35
450	117	194	3.3	2.0	PA721_0100 EZ703U	500	1000	10.00	10/1	3300	6000	22	1	50	21
450	159	291	4.5	1.4	PA721_0100 EZ705U	500	1000	10.00	10/1	3300	6000	35	1	50	27
563	81	268	2.8	3.7	PA721_0080 EZ802U	500	1000	8.000	8/1	3300	6000	59	1	53	35
563	94	155	3.2	3.3	PA721_0080 EZ703U	500	1000	8.000	8/1	3300	6000	22	1	53	21
563	127	233	4.4	2.4	PA721_0080 EZ705U	500	1000	8.000	8/1	3300	6000	35	1	53	27
643	71	234	3.0	4.7	PA721_0070 EZ802U	650	1250	7.000	7/1	3300	6000	59	1	55	35
643	82	136	3.5	4.1	PA721_0070 EZ703U	440	1250	7.000	7/1	3300	6000	23	1	55	21
643	111	204	4.7	3.0	PA721_0070 EZ705U	650	1250	7.000	7/1	3300	6000	35	1	55	27
900	80	146	7.0	4.2	PA721_0050 EZ705U	500	1400	5.000	5/1	3000	5500	36	1	58	27
PA7 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 700$ Nm)															
75	258	334	0.7	1.5	PA722_0800 EZ501U	500	1000	80.00	80/1	3700	6500	3.1	2	52	18
86	226	293	0.6	1.9	PA722_0700 EZ501U	650	1250	70.00	70/1	3700	6500	3.1	2	53	18
107	181	234	0.8	2.2	PA722_0560 EZ501U	500	1000	56.00	56/1	3700	6500	3.2	2	52	18
120	162	209	0.7	2.7	PA722_0500 EZ501U	700	1400	50.00	50/1	3700	6500	3.1	2	53	18
120	247	371	1.1	1.8	PA722_0500 EZ502U	700	1400	50.00	50/1	3700	6500	5.4	2	53	19
120	247	375	1.1	1.8	PA722_0500 EZ701U	700	1400	50.00	50/1	3700	6500	8.7	2	53	21
120	295	504	1.4	1.5	PA722_0500 EZ503U	700	1400	50.00	50/1	3700	6500	7.7	2	53	21
150	129	167	1.0	2.9	PA722_0400 EZ501U	610	1380	40.00	40/1	3700	6500	3.1	2	52	18
150	198	296	1.5	1.9	PA722_0400 EZ502U	700	1380	40.00	40/1	3700	6500	5.4	2	52	19
150	198	300	1.5	1.9	PA722_0400 EZ701U	700	1380	40.00	40/1	3700	6500	8.7	2	52	21
150	236	403	1.8	1.6	PA722_0400 EZ503U	700	1380	40.00	40/1	3700	6500	7.8	2	52	21
171	113	146	0.9	3.9	PA722_0350 EZ501U	530	1400	35.00	35/1	3700	6500	3.2	2	53	18
171	173	259	1.4	2.5	PA722_0350 EZ502U	700	1400	35.00	35/1	3700	6500	5.5	2	53	19
171	173	263	1.4	2.5	PA722_0350 EZ701U	670	1400	35.00	35/1	3700	6500	8.8	2	53	21
171	206	352	1.6	2.1	PA722_0350 EZ503U	700	1400	35.00	35/1	3700	6500	7.9	2	53	21
171	239	475	1.9	1.8	PA722_0350 EZ702U	700	1400	35.00	35/1	3700	6500	14	2	53	24
214	90	117	1.0	4.9	PA722_0280 EZ501U	430	1380	28.00	28/1	3700	6500	3.3	2	53	18

3 PA planetary geared motors

3.2 Selection tables



STÖBER

n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max} DB	n_{1max} ZB	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			[rpm]	[rpm]	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA7 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 700$ Nm)															
214	138	207	1.5	3.2	PA722_0280 EZ502U	700	1380	28.00	28/1	3700	6500	5.6	2	53	19
214	138	210	1.5	3.2	PA722_0280 EZ701U	530	1380	28.00	28/1	3700	6500	8.9	2	53	21
214	165	282	1.8	2.7	PA722_0280 EZ503U	700	1380	28.00	28/1	3700	6500	7.9	2	53	21
214	192	380	2.1	2.3	PA722_0280 EZ702U	700	1380	28.00	28/1	3700	6500	14	2	53	24
240	124	185	1.6	3.6	PA722_0250 EZ502U	700	1400	25.00	25/1	3500	6000	5.9	2	54	19
240	124	188	1.6	3.6	PA722_0250 EZ701U	480	1400	25.00	25/1	3500	6000	9.2	2	54	21
240	147	252	1.9	3.0	PA722_0250 EZ503U	700	1400	25.00	25/1	3500	6000	8.2	2	54	21
240	171	340	2.2	2.6	PA722_0250 EZ702U	700	1400	25.00	25/1	3500	6000	14	2	54	24
600	50	77	1.6	4.1	PA721_0100 EZ701U	190	1000	10.00	10/1	3300	6000	9.0	1	50	17
600	70	139	2.2	3.0	PA721_0100 EZ702U	400	1000	10.00	10/1	3300	6000	14	1	50	19
750	56	111	2.1	5.0	PA721_0080 EZ702U	320	1000	8.000	8/1	3300	6000	15	1	53	19
PA8 ($n_{1N} = 2000$ rpm, $M_{2acc,max} = 1600$ Nm)															
125	664	1005	10	1.2	PA822_0160 EZ805U	1600	3180	16.00	16/1	2500	4500	137	2	169	74
167	498	754	12	1.6	PA822_0120 EZ805U	1200	2400	12.00	12/1	2500	4500	138	2	156	74
200	424	641	4.2	1.7	PA821_0100 EZ805U	1200	2400	10.00	10/1	2800	4500	135	1	153	64
250	339	513	4.8	2.4	PA821_0080 EZ805U	1200	2400	8.000	8/1	2800	4500	136	1	166	64
286	297	449	4.5	3.4	PA821_0070 EZ805U	1390	2800	7.000	7/1	2800	4500	138	1	177	64
400	212	321	6.8	4.7	PA821_0050 EZ805U	990	2900	5.000	5/1	2500	4000	142	1	194	64
500	170	256	11	4.7	PA821_0040 EZ805U	800	2330	4.000	4/1	2200	3500	149	1	205	64
PA8 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 1600$ Nm)															
38	562	631	0.8	1.4	PA822_0800 EZ701U	1200	2400	80.00	80/1	3300	6000	9.0	2	159	37
43	492	552	0.7	2.0	PA822_0700 EZ701U	1330	2800	70.00	70/1	3300	6000	9.0	2	165	37
43	798	958	1.1	1.3	PA822_0700 EZ702U	1400	2800	70.00	70/1	3300	6000	14	2	165	39
54	394	442	0.9	2.0	PA822_0560 EZ701U	1060	2400	56.00	56/1	3300	6000	9.7	2	159	37
54	638	766	1.5	1.3	PA822_0560 EZ702U	1200	2400	56.00	56/1	3300	6000	15	2	159	39
60	352	394	0.8	2.8	PA822_0500 EZ701U	950	3200	50.00	50/1	3300	6000	9.1	2	168	37
60	570	684	1.3	1.8	PA822_0500 EZ702U	1600	3200	50.00	50/1	3300	6000	14	2	168	39
60	784	988	1.7	1.3	PA822_0500 EZ703U	1600	3200	50.00	50/1	3300	6000	22	2	168	41
75	281	315	1.1	2.8	PA822_0400 EZ701U	760	3180	40.00	40/1	3300	6000	9.2	2	163	37
75	456	547	1.8	1.8	PA822_0400 EZ702U	1560	3180	40.00	40/1	3300	6000	14	2	163	39
75	627	790	2.4	1.3	PA822_0400 EZ703U	1600	3180	40.00	40/1	3300	6000	22	2	163	41
86	246	276	0.9	4.1	PA822_0350 EZ701U	670	3200	35.00	35/1	3300	6000	9.7	2	170	37
86	399	479	1.5	2.5	PA822_0350 EZ702U	1360	3200	35.00	35/1	3300	6000	15	2	170	39
86	549	692	2.1	1.8	PA822_0350 EZ703U	1600	3200	35.00	35/1	3300	6000	23	2	170	41
86	708	1004	2.7	1.4	PA822_0350 EZ705U	1600	3200	35.00	35/1	3300	6000	35	2	170	47
86	741	1234	2.8	1.3	PA822_0350 EZ802U	1600	3200	35.00	35/1	3300	6000	59	2	170	55
94	225	252	1.2	3.6	PA822_0320 EZ701U	610	2400	32.00	32/1	2500	4500	12	2	159	37
94	365	438	2.0	2.2	PA822_0320 EZ702U	1200	2400	32.00	32/1	2500	4500	17	2	159	39
94	502	632	2.7	1.6	PA822_0320 EZ703U	1200	2400	32.00	32/1	2500	4500	25	2	159	41
94	648	918	3.5	1.2	PA822_0320 EZ705U	1200	2400	32.00	32/1	2500	4500	37	2	159	47
107	197	221	1.3	4.1	PA822_0280 EZ701U	530	3180	28.00	28/1	3300	6000	9.8	2	166	37
107	319	383	2.1	2.5	PA822_0280 EZ702U	1090	3180	28.00	28/1	3300	6000	15	2	166	39
107	439	553	2.9	1.8	PA822_0280 EZ703U	1600	3180	28.00	28/1	3300	6000	23	2	166	41
107	567	803	3.7	1.4	PA822_0280 EZ705U	1600	3180	28.00	28/1	3300	6000	35	2	166	47
107	593	987	3.9	1.3	PA822_0280 EZ802U	1600	3180	28.00	28/1	3300	6000	59	2	166	55
120	285	342	1.8	3.5	PA822_0250 EZ702U	970	3200	25.00	25/1	3000	5500	16	2	171	39
120	392	494	2.4	2.6	PA822_0250 EZ703U	1540	3200	25.00	25/1	3000	5500	24	2	171	41
120	506	717	3.2	2.0	PA822_0250 EZ705U	1600	3200	25.00	25/1	3000	5500	36	2	171	47
120	530	881	3.3	1.9	PA822_0250 EZ802U	1600	3200	25.00	25/1	3000	5500	60	2	171	55
120	632	1145	3.9	1.6	PA822_0250 EZ803U	1600	3200	25.00	25/1	3000	5500	86	2	171	61
150	228	274	2.0	4.4	PA822_0200 EZ702U	780	3200	20.00	20/1	2500	4500	17	2	172	39
150	314	395	2.7	3.2	PA822_0200 EZ703U	1240	3200	20.00	20/1	2500	4500	25	2	172	41
150	405	574	3.5	2.5	PA822_0200 EZ705U	1600	3200	20.00	20/1	2500	4500	38	2	172	47
150	424	705	3.7	2.4	PA822_0200 EZ802U	1600	3200	20.00	20/1	2500	4500	62	2	172	55
150	505	916	4.4	2.0	PA822_0200 EZ803U	1600	3200	20.00	20/1	2500	4500	87	2	172	61
188	182	219	2.8	4.4	PA822_0160 EZ702U	620	2790	16.00	16/1	2500	4500	18	2	169	39
188	251	316	3.8	3.2	PA822_0160 EZ703U	990	2790	16.00	16/1	2500	4500	26	2	169	41
188	324	459	4.9	2.5	PA822_0160 EZ705U	1580	3180	16.00	16/1	2500	4500	38	2	169	47
188	339	564	5.2	2.4	PA822_0160 EZ802U	1520	3180	16.00	16/1	2500	4500	62	2	169	55



3 PA planetary geared motors

3.2 Selection tables

PA



n_{2N}	M_{2N}	$M_{2,0}$	a_{th}	S	Type	M_{2acc}	M_{2NOT}	i	i_{exakt}	n_{1max}	n_{1max}	J_1	$\Delta\phi_2$	C_2	m
[rpm]	[Nm]	[Nm]				[Nm]	[Nm]			DB	ZB	[10 ⁻⁴ kgm ²]	[arcmin]	[Nm/ arcmin]	[kg]
PA8 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 1600$ Nm)															
188	404	733	6.2	2.0	PA822_0160 EZ803U	1600	3180	16.00	16/1	2500	4500	88	2	169	61
250	188	237	4.4	4.3	PA822_0120 EZ703U	740	2090	12.00	12/1	2500	4500	27	2	156	41
250	243	344	5.7	3.3	PA822_0120 EZ705U	1190	2400	12.00	12/1	2500	4500	40	2	156	47
250	254	423	6.0	3.1	PA822_0120 EZ802U	1140	2400	12.00	12/1	2500	4500	64	2	156	55
250	303	549	7.1	2.6	PA822_0120 EZ803U	1200	2400	12.00	12/1	2500	4500	89	2	156	61
300	216	360	2.5	2.8	PA821_0100 EZ802U	970	2400	10.00	10/1	2800	4500	60	1	153	45
300	258	468	2.9	2.4	PA821_0100 EZ803U	1200	2400	10.00	10/1	2800	4500	86	1	153	51
375	173	288	2.8	4.0	PA821_0080 EZ802U	780	2400	8.000	8/1	2800	4500	62	1	166	45
375	206	374	3.4	3.4	PA821_0080 EZ803U	1130	2400	8.000	8/1	2800	4500	87	1	166	51
429	181	327	3.2	4.8	PA821_0070 EZ803U	980	2800	7.000	7/1	2800	4500	88	1	177	51
PA8 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 1600$ Nm)															
90	575	950	1.3	1.7	PA822_0500 EZ703U	1600	3200	50.00	50/1	3300	6000	22	2	168	41
113	460	760	1.8	1.7	PA822_0400 EZ703U	1600	3180	40.00	40/1	3300	6000	22	2	163	41
113	623	1140	2.4	1.3	PA822_0400 EZ705U	1600	3180	40.00	40/1	3300	6000	35	2	163	47
129	349	1147	1.3	2.9	PA822_0350 EZ802U	1600	3200	35.00	35/1	3300	6000	59	2	170	55
129	402	665	1.5	2.5	PA822_0350 EZ703U	1600	3200	35.00	35/1	3300	6000	23	2	170	41
129	545	998	2.1	1.8	PA822_0350 EZ705U	1600	3200	35.00	35/1	3300	6000	35	2	170	47
141	368	608	2.0	2.2	PA822_0320 EZ703U	1200	2400	32.00	32/1	2500	4500	25	2	159	41
141	499	912	2.7	1.6	PA822_0320 EZ705U	1200	2400	32.00	32/1	2500	4500	37	2	159	47
161	279	918	1.8	2.9	PA822_0280 EZ802U	1600	3180	28.00	28/1	3300	6000	59	2	166	55
161	322	532	2.1	2.5	PA822_0280 EZ703U	1600	3180	28.00	28/1	3300	6000	23	2	166	41
161	436	798	2.9	1.8	PA822_0280 EZ705U	1600	3180	28.00	28/1	3300	6000	35	2	166	47
180	249	819	1.6	4.0	PA822_0250 EZ802U	1600	3200	25.00	25/1	3000	5500	60	2	171	55
180	287	475	1.8	3.5	PA822_0250 EZ703U	1540	3200	25.00	25/1	3000	5500	24	2	171	41
180	390	713	2.4	2.6	PA822_0250 EZ705U	1600	3200	25.00	25/1	3000	5500	36	2	171	47
225	230	380	2.0	4.4	PA822_0200 EZ703U	1240	3200	20.00	20/1	2500	4500	25	2	172	41
225	312	570	2.7	3.2	PA822_0200 EZ705U	1600	3200	20.00	20/1	2500	4500	38	2	172	47
281	184	304	2.8	4.4	PA822_0160 EZ703U	990	2790	16.00	16/1	2500	4500	26	2	169	41
281	249	456	3.8	3.2	PA822_0160 EZ705U	1580	3180	16.00	16/1	2500	4500	38	2	169	47
375	187	342	4.4	4.3	PA822_0120 EZ705U	1190	2400	12.00	12/1	2500	4500	40	2	156	47
PA8 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 1600$ Nm)															
60	494	751	0.6	1.4	PA822_1000 EZ701U	1200	2400	100.0	100/1	3300	6000	9.0	2	148	37
75	395	600	0.5	2.0	PA822_0800 EZ701U	1200	2400	80.00	80/1	3300	6000	9.0	2	159	37
86	346	525	0.5	2.9	PA822_0700 EZ701U	1330	2800	70.00	70/1	3300	6000	9.0	2	165	37
86	479	951	0.6	2.1	PA822_0700 EZ702U	1400	2800	70.00	70/1	3300	6000	14	2	165	39
107	277	420	0.6	2.9	PA822_0560 EZ701U	1060	2400	56.00	56/1	3300	6000	9.7	2	159	37
107	383	761	0.9	2.1	PA822_0560 EZ702U	1200	2400	56.00	56/1	3300	6000	15	2	159	39
120	247	375	0.5	4.0	PA822_0500 EZ701U	950	3200	50.00	50/1	3300	6000	9.1	2	168	37
120	342	679	0.8	2.9	PA822_0500 EZ702U	1600	3200	50.00	50/1	3300	6000	14	2	168	39
150	198	300	0.8	4.0	PA822_0400 EZ701U	760	3180	40.00	40/1	3300	6000	9.2	2	163	37
150	274	543	1.1	2.9	PA822_0400 EZ702U	1560	3180	40.00	40/1	3300	6000	14	2	163	39
171	239	475	0.9	4.2	PA822_0350 EZ702U	1360	3200	35.00	35/1	3300	6000	15	2	170	39
214	192	380	1.3	4.2	PA822_0280 EZ702U	1090	3180	28.00	28/1	3300	6000	15	2	166	39





3.3 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

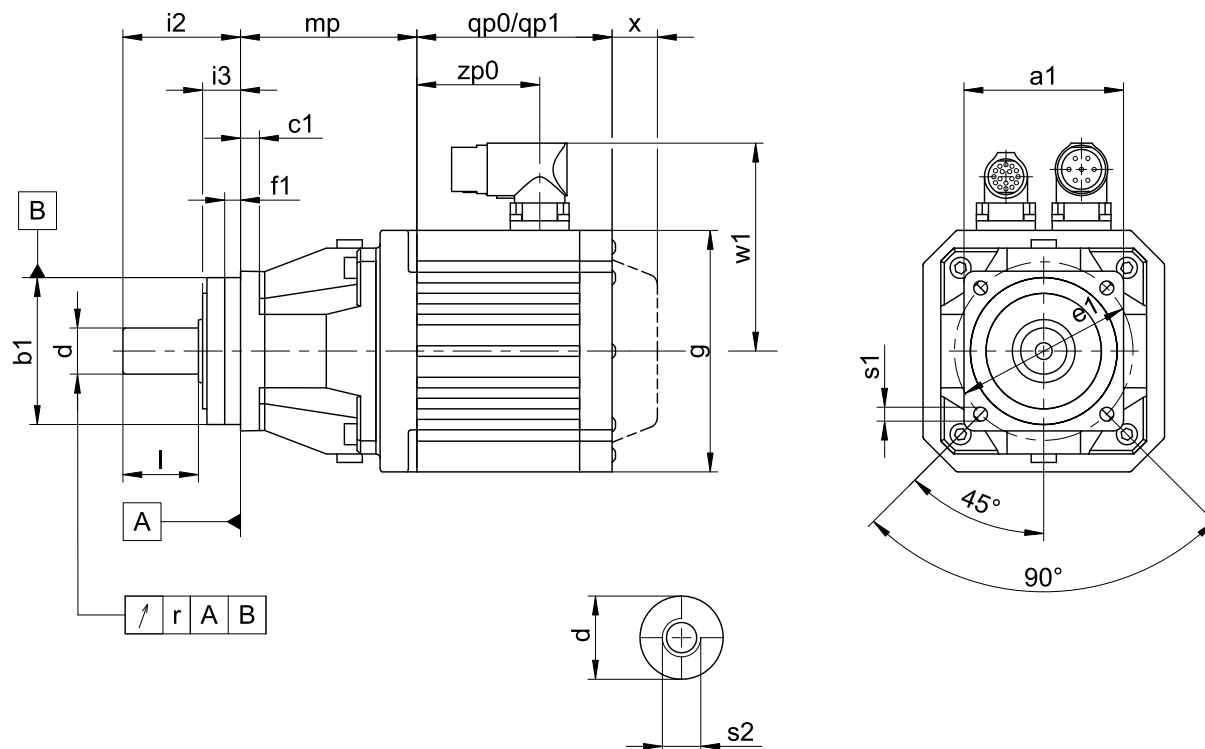
Solid shaft	Tolerance
Fit of shaft end $\varnothing \leq 50$ mm	DIN 748-1, ISO k6
Fit of shaft end $\varnothing > 50$ mm	DIN 748-1, ISO m6
Feather keys	DIN 6885-1, high form A
Balance quality	Q 2.5 (balanced with half feather key)

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



3.3.1 G shaft design (solid shaft without feather key)



qp0	Applies to motors without brake.	qp1	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	Øb1	c1	Ød	Øe1	f1	i2	i3	l	r	Øs1	s2
PA321	72	60 _{h6}	7	16 _{k6}	75	7.5	48	18	28	0.025	5.5	M5
PA322	72	60 _{h6}	7	16 _{k6}	75	7.5	48	18	28	0.025	5.5	M5
PA421	76	70 _{h6}	9	22 _{k6}	85	7.5	56	18	36	0.025	6.6	M8
PA422	76	70 _{h6}	9	22 _{k6}	85	7.5	56	18	36	0.025	6.6	M8
PA521	101	90 _{h6}	10	32 _{k6}	120	15.0	88	28	58	0.030	9.0	M12
PA522	101	90 _{h6}	10	32 _{k6}	120	15.0	88	28	58	0.030	9.0	M12
PA721	145	130 _{h6}	15	40 _{k6}	165	3.5	112	27	82	0.035	11.0	M16
PA722	145	130 _{h6}	15	40 _{k6}	165	3.5	112	27	82	0.035	11.0	M16
PA821	190	160 _{h6}	15	55 _{k6}	215	10.0	112	27	82	0.035	13.5	M20
PA822	190	160 _{h6}	15	55 _{k6}	215	10.0	112	27	82	0.035	13.5	M20



Dimensions of motors

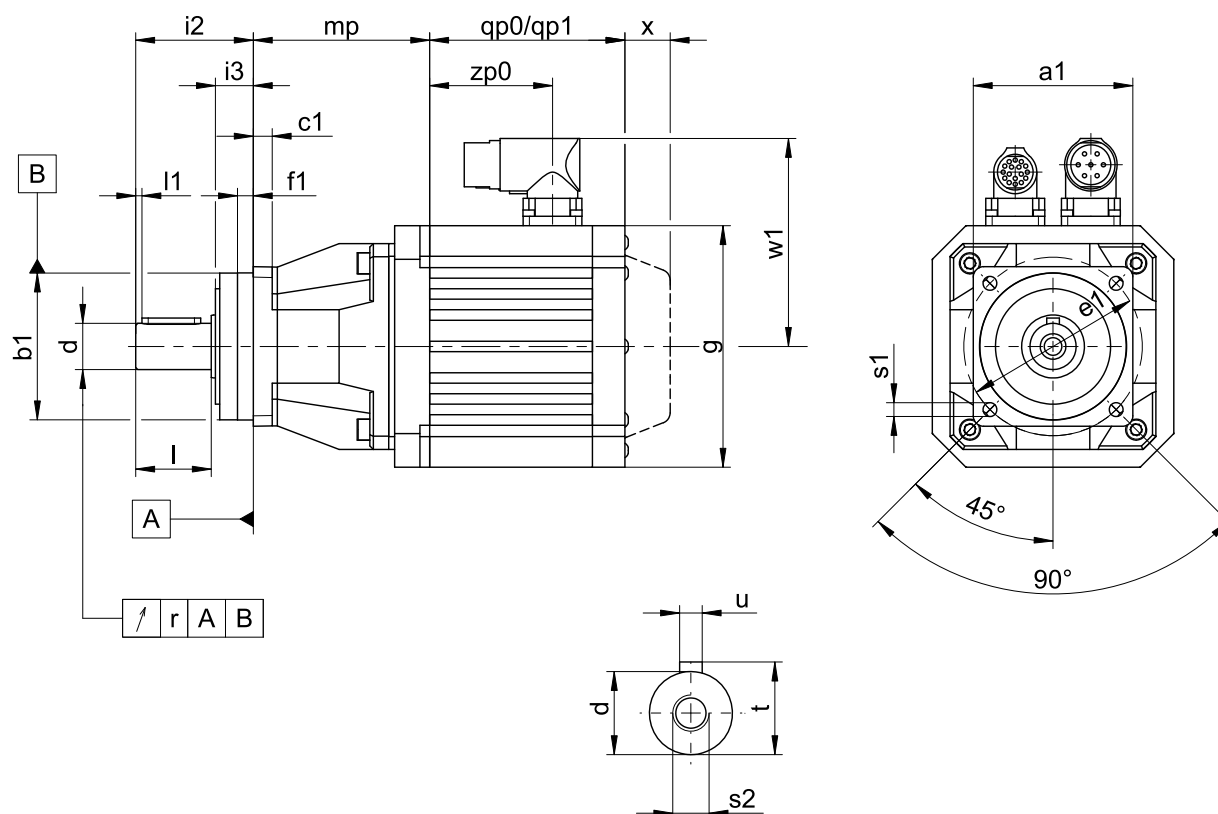
Type	□g	qp0	qp1	w1	x	zp0
EZ301U	72	90	130.0	55.5	21	54.5
EZ302U	72	112	152.0	55.5	21	76.5
EZ303U	72	134	174.0	55.5	21	98.5
EZ401U	98	98	146.5	91.0	22	56.0
EZ402U	98	123	171.5	91.0	22	81.0
EZ404U	98	173	221.5	91.0	22	131.0
EZ501U	115	93	147.5	100.0	22	58.5
EZ502U	115	118	172.5	100.0	22	83.5
EZ503U	115	143	197.5	100.0	22	108.5
EZ505U	115	193	247.5	100.0	22	158.5
EZ701U	145	102	161.0	115.0	22	64.0
EZ702U	145	127	186.0	115.0	22	89.0
EZ703U	145	152	211.0	115.0	22	114.0
EZ705U	145	207	266.0	134.0	22	165.0
EZ802U	190	197	274.0	156.5	22	143.0
EZ803U	190	238	315.0	156.5	22	184.0
EZ805U	190	320	397.0	156.5	22	266.0

Dimensions of geared motors

Type	EZ3 mp	EZ4 mp	EZ5 mp	EZ7 mp	EZ8 mp
PA321	73.5	70.0	72.5	–	–
PA322	113.5	–	–	–	–
PA421	–	79.0	81.5	87.5	–
PA422	131.0	127.5	130.0	–	–
PA521	–	–	81.0	87.0	102.0
PA522	–	136.5	139.0	145.0	–
PA721	–	–	–	98.0	113.0
PA722	–	–	158.0	164.0	179.0
PA821	–	–	–	–	137.0
PA822	–	–	–	206.5	221.5



3.3.2 P shaft design (solid shaft with feather key)



qp0	Applies to motors without brake.	qp1	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	Øb1	c1	Ød	Øe1	f1	i2	i3	l	l1	Øs1	s2	t	u
PA321	72	60 _{h6}	7	16 _{k6}	75	7.5	48	18	28	2	5.5	M5	18.0	A5x5x22
PA322	72	60 _{h6}	7	16 _{k6}	75	7.5	48	18	28	2	5.5	M5	18.0	A5x5x22
PA421	76	70 _{h6}	9	22 _{k6}	85	7.5	56	18	36	3	6.6	M8	24.5	A6x6x28
PA422	76	70 _{h6}	9	22 _{k6}	85	7.5	56	18	36	3	6.6	M8	24.5	A6x6x28
PA521	101	90 _{h6}	10	32 _{k6}	120	15.0	88	28	58	3	9.0	M12	35.0	A10x8x50
PA522	101	90 _{h6}	10	32 _{k6}	120	15.0	88	28	58	3	9.0	M12	35.0	A10x8x50
PA721	145	130 _{h6}	15	40 _{k6}	165	3.5	112	27	82	4	11.0	M16	43.0	A12x8x70
PA722	145	130 _{h6}	15	40 _{k6}	165	3.5	112	27	82	4	11.0	M16	43.0	A12x8x70
PA821	190	160 _{h6}	15	55 _{k6}	215	10.0	112	27	82	6	13.5	M20	59.0	A16x10x70
PA822	190	160 _{h6}	15	55 _{k6}	215	10.0	112	27	82	6	13.5	M20	59.0	A16x10x70



Dimensions of motors

Type	□g	qp0	qp1	w1	x	zp0
EZ301U	72	90	130.0	55.5	21	54.5
EZ302U	72	112	152.0	55.5	21	76.5
EZ303U	72	134	174.0	55.5	21	98.5
EZ401U	98	98	146.5	91.0	22	56.0
EZ402U	98	123	171.5	91.0	22	81.0
EZ404U	98	173	221.5	91.0	22	131.0
EZ501U	115	93	147.5	100.0	22	58.5
EZ502U	115	118	172.5	100.0	22	83.5
EZ503U	115	143	197.5	100.0	22	108.5
EZ505U	115	193	247.5	100.0	22	158.5
EZ701U	145	102	161.0	115.0	22	64.0
EZ702U	145	127	186.0	115.0	22	89.0
EZ703U	145	152	211.0	115.0	22	114.0
EZ705U	145	207	266.0	134.0	22	165.0
EZ802U	190	197	274.0	156.5	22	143.0
EZ803U	190	238	315.0	156.5	22	184.0
EZ805U	190	320	397.0	156.5	22	266.0

Dimensions of geared motors

Type	EZ3 mp	EZ4 mp	EZ5 mp	EZ7 mp	EZ8 mp
PA321	73.5	70.0	72.5	-	-
PA322	113.5	-	-	-	-
PA421	-	79.0	81.5	87.5	-
PA422	131.0	127.5	130.0	-	-
PA521	-	-	81.0	87.0	102.0
PA522	-	136.5	139.0	145.0	-
PA721	-	-	-	98.0	113.0
PA722	-	-	158.0	164.0	179.0
PA821	-	-	-	-	137.0
PA822	-	-	-	206.5	221.5



3.4 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

PA	4	2	2	S	G	D	0200	EZ401U
----	---	---	---	---	---	---	------	--------

Explanation

Code	Designation	Design
PA	Type	Low-backlash planetary gear unit
4	Size	4 (example)
2	Generation	Generation 2
1	Stages	Single-stage
2		Two-stage
S	Housing	Standard
G	Shaft	Solid shaft without feather key
P		Solid shaft with feather key
D	Bearing	Axially reinforced bearing
0200	Transmission ratio (i x 10)	i = 20 (example)
EZ401U	Motor	EZ synchronous servo motor

In order to complete the type designation, also specify:

- A detailed type designation of the motor, see Chapter [▶ 22]
- The position of the plug connectors, see Chapter [▶ 3.5.3]
- For reverse operation of the output shaft at $\pm 20^\circ$ to $\pm 90^\circ$ and horizontal installation, note Chapter [▶ 3.6.4]

3.5 Product description

3.5.1 Installation conditions

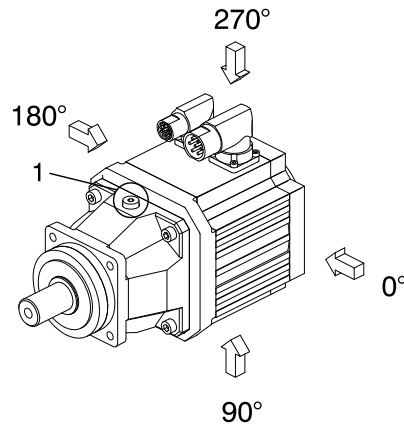
The specified torques and forces only apply when attaching gear units at the machine side using screws of quality 10.9. In addition, the gear housing must be adjusted at the pilot (H7).

3.5.2 Lubricants

STÖBER fills the gear units with the amount and type of lubricant specified on the nameplate. Lubricant filling quantities for gear units, document ID 441871, can be found online at <http://www.stoeber.de>



3.5.3 Position of the plug connectors



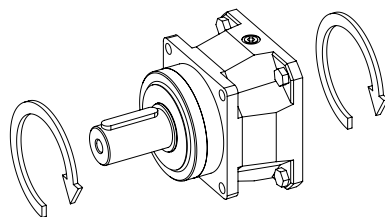
In the standard version, the plug connectors are attached in the 270° position (relative to the oil filler/drain plug (1) of the planetary gear unit). Indicate variations for your geared motor in the purchase order.

3.5.4 Other product features

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

3.5.5 Direction of rotation

The input and output rotate in the same direction.



3.6 Project configuration

Project your drive using our SERVOfsoft designing software. You can receive SERVOfsoft 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 $K_{mot,th}$
ED	%	Duty cycle relative to 20 minutes
fB_{op}	–	Operating mode operating factor

¹ Observe the protection class of all the components.



Formula symbol	Unit	Explanation
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
$M_{2k,acc,1}^*$	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



Formula symbol	Unit	Explanation
n_{1m^*}	rpm	Actual average input speed
n_{1max^*}	rpm	Actual maximum input speed
n_{1maxDB}	min^{-1}	Maximum permitted input speed of the gear unit in continuous operation
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

3.6.1 Calculation of the operating point

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

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

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

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

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

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

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

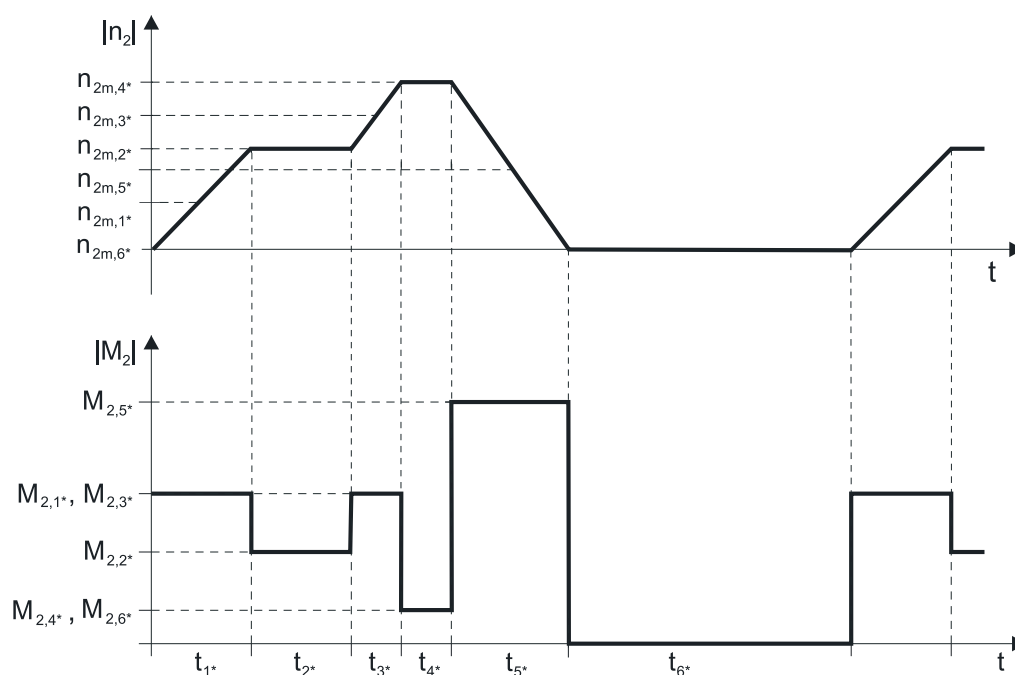
The values for n_{1maxDB} , n_{1maxZB} , M_{2acc} , M_{2NOT} , M_{2N} and S can be found in the selection tables.

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_{2th} 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

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

Calculation of the actual equivalent torque

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

Calculation of the thermal limit torque

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

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

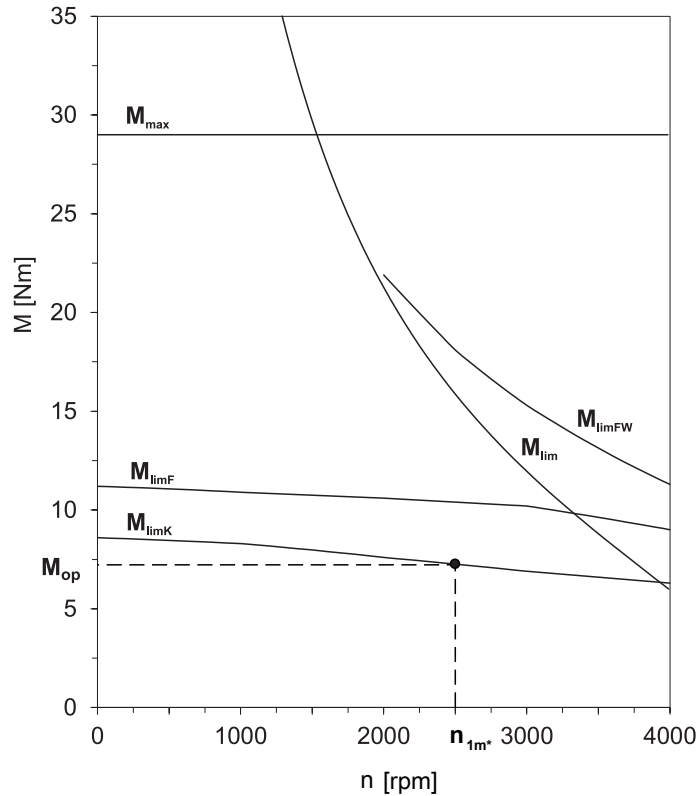
$$K_{mot,th} = 0,95 - \frac{a_{th}}{1000} \cdot fB_T \cdot \left(\frac{n_{1m^*}}{1000}\right)^3$$

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

The values for fB_T can be found in the corresponding table 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

Operating mode		fB_{op}
Uniform continuous operation		1.00
Cyclic operation		1.00
Reversing load cyclic operation		1.00
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.

3.6.2 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 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]
PA3	24.0	1400	2750	2750	105	105
PA4	25.0	2250	4500	5000	194	215
PA5	29.0	3500	7000	8000	406	464
PA7	31.0	4500	9000	10000	648	720
PA8	35.0	7500	15000	18000	1140	1368

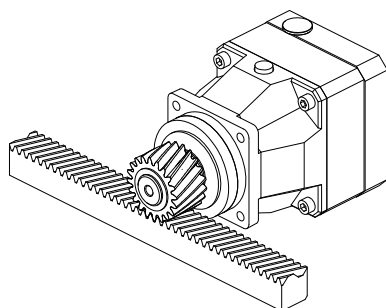


Fig. 1: Recommendation for bearing assignment D

For other output speeds, download diagrams at <http://products.stoerber.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.

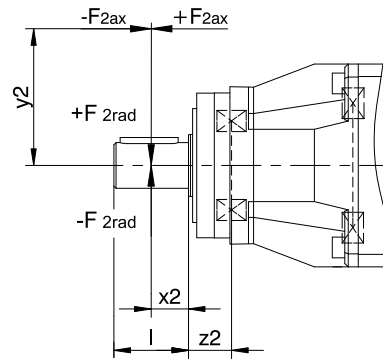


Fig. 2: Force application points

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:

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



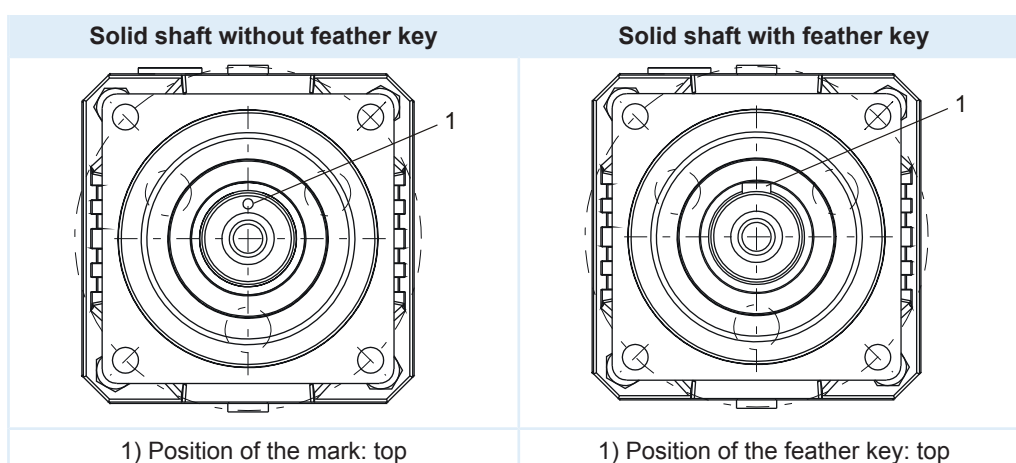
3.6.3 Radial shaft seal rings

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.

3.6.4 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.

3.7 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