

6 Planetary geared motors

PHQ

6.1 Overview

Quattro-Power for maximum power density

Features

Power density	★★★★★
Backlash	★★★★☆
Price category	€€€€
Shaft load	★★★★★
Smooth operation	★★★★☆
Torsional stiffness	★★★★★
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any installation position (single/two stage)	✓
High power density	✓
(four-stage planetary system)	
Continuous operation without cooling	✓
(FKM sealing ring at the input)	
Pretensioned angular contact ball bearings at the output in an O-arrangement, ideally suited for helical-gear rack and pinion drives	✓
Compact and highly dynamic due to direct motor attachment	✓

Key: ★☆☆☆☆ good | ★★★★★ excellent
 € Economy | €€€€€ Premium

Technical data

i	5.5 – 600
M_{2acc}	84 – 22000 Nm
$\Delta\phi_2$	3 arcmin
η_{get}	≤ 96 %

6.2 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>.

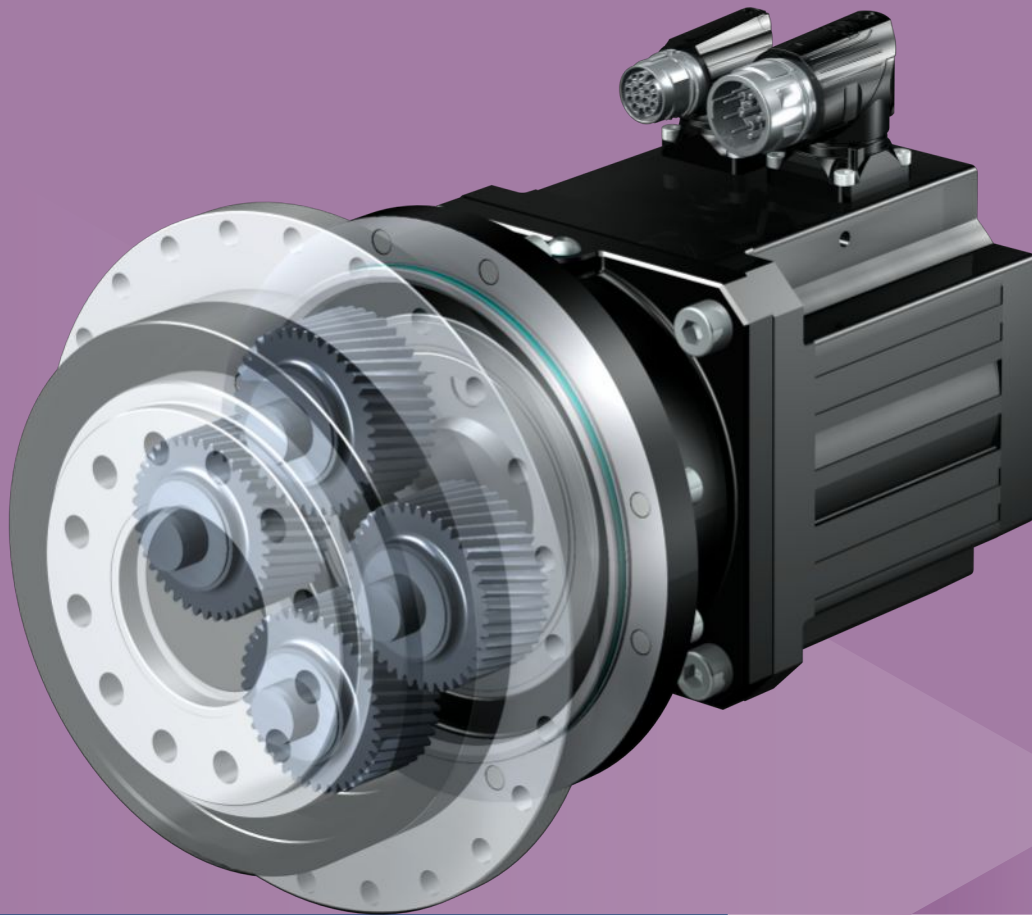
An explanation of the formula symbols can be found in Chapter [▶ 29.1](#).

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	[arcmin]	[Nm/	[kg]
										[rpm]	[rpm]	kgm ²]		arcmin]	
PHQ4 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 170$ Nm)															
55	48	49	0.6	2.5	PHQ422_0550 EZ301U	140	300	55.00	55/1	4500	8000	0.21	3	35	5.3
55	81	86	1.0	1.5	PHQ422_0550 EZ302U	170	300	55.00	55/1	4500	8000	0.31	3	35	5.9
55	106	112	1.4	1.1	PHQ422_0550 EZ303U	170	300	55.00	55/1	4500	8000	0.42	3	35	6.4
78	33	34	0.7	3.6	PHQ422_0390 EZ301U	100	300	38.50	77/2	4500	8000	0.24	3	37	5.3
78	57	60	1.3	2.1	PHQ422_0390 EZ302U	170	300	38.50	77/2	4500	8000	0.34	3	37	5.9
78	74	78	1.6	1.6	PHQ422_0390 EZ303U	170	300	38.50	77/2	4500	8000	0.45	3	37	6.4
78	100	107	2.2	1.2	PHQ422_0390 EZ401U	170	300	38.50	77/2	4500	8000	0.98	3	37	7.8
109	41	43	1.5	3.0	PHQ422_0280 EZ302U	130	300	27.50	55/2	4000	7000	0.38	3	37	5.9
109	53	56	1.9	2.3	PHQ422_0280 EZ303U	170	300	27.50	55/2	4000	7000	0.49	3	37	6.4
109	72	77	2.6	1.7	PHQ422_0280 EZ401U	170	300	27.50	55/2	4000	7000	1.0	3	37	7.8
109	110	120	4.0	1.1	PHQ422_0280 EZ501U	170	300	27.50	55/2	4000	7000	3.0	3	37	8.8
136	33	34	1.7	3.7	PHQ422_0220 EZ302U	100	300	22.00	22/1	3700	6500	0.44	3	37	5.9
136	42	45	2.2	2.8	PHQ422_0220 EZ303U	140	300	22.00	22/1	3700	6500	0.55	3	37	6.4
136	57	61	2.9	2.1	PHQ422_0220 EZ401U	170	300	22.00	22/1	3700	6500	1.1	3	37	7.8
136	88	96	4.5	1.4	PHQ422_0220 EZ501U	170	300	22.00	22/1	3700	6500	3.1	3	37	8.8
136	96	106	4.9	1.2	PHQ422_0220 EZ402U	170	300	22.00	22/1	3700	6500	1.8	3	37	8.9
545	23	25	4.8	4.2	PHQ421_0055 EZ501U	84	300	5.500	11/2	2000	6000	3.2	3	42	7.5
545	36	45	7.7	2.6	PHQ421_0055 EZ404U	150	300	5.500	11/2	2000	6000	3.2	3	42	9.7
545	39	42	8.2	2.4	PHQ421_0055 EZ502U	160	300	5.500	11/2	2000	6000	5.5	3	42	9.0
545	51	59	11	1.9	PHQ421_0055 EZ503U	170	300	5.500	11/2	2000	6000	7.8	3	42	11
545	71	84	15	1.3	PHQ421_0055 EZ505U	170	300	5.500	11/2	2000	6000	12	3	42	13
PHQ4 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 170$ Nm)															
109	46	49	0.6	2.4	PHQ422_0550 EZ301U	140	300	55.00	55/1	4500	8000	0.21	3	35	5.3
109	77	86	1.1	1.4	PHQ422_0550 EZ302U	170	300	55.00	55/1	4500	8000	0.31	3	35	5.9
109	100	115	1.4	1.1	PHQ422_0550 EZ303U	170	300	55.00	55/1	4500	8000	0.42	3	35	6.4
156	32	34	0.7	3.8	PHQ422_0390 EZ301U	100	300	38.50	77/2	4500	8000	0.24	3	37	5.3
156	54	60	1.2	2.2	PHQ422_0390 EZ302U	170	300	38.50	77/2	4500	8000	0.34	3	37	5.9
156	70	81	1.5	1.7	PHQ422_0390 EZ303U	170	300	38.50	77/2	4500	8000	0.45	3	37	6.4
156	82	100	1.8	1.5	PHQ422_0390 EZ401U	170	300	38.50	77/2	4500	8000	0.98	3	37	7.8
218	38	43	1.4	3.1	PHQ422_0280 EZ302U	130	300	27.50	55/2	4000	7000	0.38	3	37	5.9
218	50	58	1.8	2.4	PHQ422_0280 EZ303U	170	300	27.50	55/2	4000	7000	0.49	3	37	6.4
218	59	72	2.1	2.0	PHQ422_0280 EZ401U	170	300	27.50	55/2	4000	7000	1.0	3	37	7.8
218	87	113	3.2	1.4	PHQ422_0280 EZ501U	170	300	27.50	55/2	4000	7000	3.0	3	37	8.8
218	90	125	3.3	1.3	PHQ422_0280 EZ402U	170	300	27.50	55/2	4000	7000	1.7	3	37	8.9
273	31	34	1.6	3.9	PHQ422_0220 EZ302U	100	300	22.00	22/1	3700	6500	0.44	3	37	5.9
273	40	46	2.0	3.0	PHQ422_0220 EZ303U	140	300	22.00	22/1	3700	6500	0.55	3	37	6.4
273	47	57	2.4	2.6	PHQ422_0220 EZ401U	170	300	22.00	22/1	3700	6500	1.1	3	37	7.8
273	70	90	3.5	1.7	PHQ422_0220 EZ501U	170	300	22.00	22/1	3700	6500	3.1	3	37	8.8
273	72	100	3.6	1.7	PHQ422_0220 EZ402U	170	300	22.00	22/1	3700	6500	1.8	3	37	8.9
1091	18	23	4.8	4.2	PHQ421_0055 EZ501U	84	300	5.500	11/2	2000	6000	3.2	3	42	7.5
1091	27	41	7.3	2.8	PHQ421_0055 EZ502U	160	300	5.500	11/2	2000	6000	5.5	3	42	9.0
1091	31	44	8.1	2.5	PHQ421_0055 EZ404U	150	300	5.500	11/2	2000	6000	3.2	3	42	9.7
1091	33	56	8.7	2.3	PHQ421_0055 EZ503U	170	300	5.500	11/2	2000	6000	7.8	3	42	11
PHQ5 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 430$ Nm)															
55	143	153	0.9	1.9	PHQ522_0550 EZ401U	430	800	55.00	55/1	4000	7000	0.97	3	87	11
55	220	240	1.4	1.3	PHQ522_0550 EZ501U	430	800	55.00	55/1	4000	7000	2.9	3	87	12
55	240	266	1.5	1.2	PHQ522_0550 EZ402U	430	800	55.00	55/1	4000	7000	1.7	3	87	12
78	100	107	1.0	2.8	PHQ522_0390 EZ401U	300	800	38.50	77/2	4000	7000	1.0	3	92	11
78	154	168	1.6	1.8	PHQ522_0390 EZ501U	430	800	38.50	77/2	4000	7000	3.0	3	92	12
78	168	186	1.8	1.7	PHQ522_0390 EZ402U	430	800	38.50	77/2	4000	7000	1.7	3	92	12
78	247	308	2.6	1.1	PHQ522_0390 EZ404U	430	800	38.50	77/2	4000	7000	3.1	3	92	14
78	265	286	2.8	1.1	PHQ522_0390 EZ502U	430	800	38.50	77/2	4000	7000	5.3	3	92	13

6.2 Selection tables 6 PHQ planetary geared motors

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]
PHQ5 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 430$ Nm)															
109	72	77	1.2	3.9	PHQ522_0280 EZ401U	220	800	27.50	55/2	3700	6500	1.1	3	94	11
109	110	120	1.9	2.5	PHQ522_0280 EZ501U	410	800	27.50	55/2	3700	6500	3.1	3	94	12
109	120	133	2.1	2.3	PHQ522_0280 EZ402U	410	800	27.50	55/2	3700	6500	1.8	3	94	12
109	176	220	3.1	1.6	PHQ522_0280 EZ404U	430	800	27.50	55/2	3700	6500	3.2	3	94	14
109	189	205	3.3	1.5	PHQ522_0280 EZ502U	430	800	27.50	55/2	3700	6500	5.4	3	94	13
109	189	212	3.3	1.5	PHQ522_0280 EZ701U	430	800	27.50	55/2	3700	6500	8.7	3	94	15
109	248	284	4.3	1.1	PHQ522_0280 EZ503U	430	800	27.50	55/2	3700	6500	7.8	3	94	15
136	57	61	1.4	4.9	PHQ522_0220 EZ401U	170	800	22.00	22/1	3300	6000	1.2	3	95	11
136	88	96	2.1	3.2	PHQ522_0220 EZ501U	330	800	22.00	22/1	3300	6000	3.2	3	95	12
136	96	106	2.3	2.9	PHQ522_0220 EZ402U	330	800	22.00	22/1	3300	6000	1.9	3	95	12
136	141	176	3.4	2.0	PHQ522_0220 EZ404U	430	800	22.00	22/1	3300	6000	3.3	3	95	14
136	151	164	3.7	1.8	PHQ522_0220 EZ502U	430	800	22.00	22/1	3300	6000	5.5	3	95	13
136	151	170	3.7	1.8	PHQ522_0220 EZ701U	410	800	22.00	22/1	3300	6000	8.8	3	95	15
136	198	227	4.8	1.4	PHQ522_0220 EZ503U	430	800	22.00	22/1	3300	6000	7.9	3	95	15
136	246	295	6.0	1.1	PHQ522_0220 EZ702U	430	800	22.00	22/1	3300	6000	14	3	95	18
136	276	327	6.7	1.0	PHQ522_0220 EZ505U	430	800	22.00	22/1	3300	6000	12	3	95	18
545	63	76	6.4	3.5	PHQ521_0055 EZ702U	220	800	5.500	11/2	2500	5500	15	3	107	15
545	71	84	7.2	3.1	PHQ521_0055 EZ505U	350	800	5.500	11/2	2500	5500	13	3	107	15
545	87	110	8.8	2.6	PHQ521_0055 EZ703U	340	800	5.500	11/2	2500	5500	22	3	107	17
545	112	159	11	2.0	PHQ521_0055 EZ705U	430	800	5.500	11/2	2500	5500	35	3	107	23
PHQ5 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 430$ Nm)															
205	194	313	4.7	1.4	PHQ522_0220 EZ505U	430	800	22.00	22/1	3300	6000	12	3	95	18
818	50	81	5.8	3.9	PHQ521_0055 EZ505U	350	800	5.500	11/2	2500	5500	13	3	107	15
818	64	106	7.3	3.0	PHQ521_0055 EZ703U	340	800	5.500	11/2	2500	5500	22	3	107	17
818	87	158	10	2.2	PHQ521_0055 EZ705U	430	800	5.500	11/2	2500	5500	35	3	107	23
PHQ5 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 430$ Nm)															
109	118	143	0.9	1.9	PHQ522_0550 EZ401U	430	800	55.00	55/1	4000	7000	0.97	3	87	11
109	174	225	1.4	1.3	PHQ522_0550 EZ501U	430	800	55.00	55/1	4000	7000	2.9	3	87	12
109	179	251	1.4	1.2	PHQ522_0550 EZ402U	430	800	55.00	55/1	4000	7000	1.7	3	87	12
156	82	100	0.9	3.4	PHQ522_0390 EZ401U	300	800	38.50	77/2	4000	7000	1.0	3	92	11
156	122	158	1.3	2.3	PHQ522_0390 EZ501U	430	800	38.50	77/2	4000	7000	3.0	3	92	12
156	125	175	1.3	2.2	PHQ522_0390 EZ402U	430	800	38.50	77/2	4000	7000	1.7	3	92	12
156	186	279	1.9	1.5	PHQ522_0390 EZ502U	430	800	38.50	77/2	4000	7000	5.3	3	92	13
156	208	301	2.2	1.3	PHQ522_0390 EZ404U	430	800	38.50	77/2	4000	7000	3.1	3	92	14
218	59	72	1.0	4.8	PHQ522_0280 EZ401U	220	800	27.50	55/2	3700	6500	1.1	3	94	11
218	87	113	1.5	3.2	PHQ522_0280 EZ501U	410	800	27.50	55/2	3700	6500	3.1	3	94	12
218	90	125	1.6	3.1	PHQ522_0280 EZ402U	410	800	27.50	55/2	3700	6500	1.8	3	94	12
218	133	199	2.3	2.1	PHQ522_0280 EZ502U	430	800	27.50	55/2	3700	6500	5.4	3	94	13
218	133	202	2.3	2.1	PHQ522_0280 EZ701U	430	800	27.50	55/2	3700	6500	8.7	3	94	15
218	148	215	2.6	1.9	PHQ522_0280 EZ404U	430	800	27.50	55/2	3700	6500	3.2	3	94	14
218	159	271	2.7	1.8	PHQ522_0280 EZ503U	430	800	27.50	55/2	3700	6500	7.8	3	94	15
273	70	90	1.7	4.0	PHQ522_0220 EZ501U	330	800	22.00	22/1	3300	6000	3.2	3	95	12
273	72	100	1.7	3.9	PHQ522_0220 EZ402U	330	800	22.00	22/1	3300	6000	1.9	3	95	12
273	106	160	2.6	2.6	PHQ522_0220 EZ502U	430	800	22.00	22/1	3300	6000	5.5	3	95	13
273	106	162	2.6	2.6	PHQ522_0220 EZ701U	410	800	22.00	22/1	3300	6000	8.8	3	95	15
273	119	172	2.9	2.4	PHQ522_0220 EZ404U	430	800	22.00	22/1	3300	6000	3.3	3	95	14
273	127	217	3.1	2.2	PHQ522_0220 EZ503U	430	800	22.00	22/1	3300	6000	7.9	3	95	15
273	147	293	3.6	1.9	PHQ522_0220 EZ702U	430	800	22.00	22/1	3300	6000	14	3	95	18
PHQ7 ($n_{1N} = 2000$ rpm, $M_{2acc,max} = 950$ Nm)															
364	231	349	9.5	2.8	PHQ721_0055 EZ805U	950	1700	5.500	11/2	2200	5000	135	3	235	55
PHQ7 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 950$ Nm)															
14	554	594	0.2	1.2	PHQ723_2200 EZ401U	950	1700	220.0	220/1	4000	7000	0.99	3	202	19
16	485	520	0.2	1.3	PHQ723_1930 EZ401U	950	1700	192.5	385/2	4000	7000	1.0	3	203	19
19	388	416	0.3	1.7	PHQ723_1540 EZ401U	950	1700	154.0	154/1	4000	7000	1.0	3	203	19
19	596	651	0.4	1.1	PHQ723_1540 EZ501U	950	1700	154.0	154/1	4000	7000	3.0	3	203	20
22	347	371	0.3	1.9	PHQ723_1380 EZ401U	950	1700	137.5	275/2	3700	6500	1.2	3	204	19
22	532	582	0.4	1.2	PHQ723_1380 EZ501U	950	1700	137.5	275/2	3700	6500	3.1	3	204	20
22	582	644	0.5	1.1	PHQ723_1380 EZ402U	950	1700	137.5	275/2	3700	6500	1.9	3	204	20
27	277	297	0.3	2.3	PHQ723_1100 EZ401U	840	1700	110.0	110/1	3300	6000	1.3	3	204	19
27	426	465	0.5	1.5	PHQ723_1100 EZ501U	950	1700	110.0	110/1	3300	6000	3.3	3	204	20
27	465	515	0.5	1.4	PHQ723_1100 EZ402U	950	1700	110.0	110/1	3300	6000	2.0	3	204	20
34	222	238	0.3	2.9	PHQ723_0880 EZ401U	670	1700	88.00	88/1	3300	6000	1.3	3	204	19
34	341	372	0.5	1.9	PHQ723_0880 EZ501U	950	1700	88.00	88/1	3300	6000	3.3	3	204	20

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]
PHQ11 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 22000$ Nm)															
10	6021	10017	0.1	2.2	PHQ1133_3000 EZ802U	22000	40000	300.0	300/1	2800	4500	61	3	3491	257
10	7182	13014	0.1	1.8	PHQ1133_3000 EZ803U	22000	40000	300.0	300/1	2800	4500	87	3	3491	263
13	4817	8014	0.1	2.7	PHQ1133_2400 EZ802U	21600	40000	240.0	240/1	2800	4500	62	3	3497	257
13	5746	10411	0.1	2.3	PHQ1133_2400 EZ803U	22000	40000	240.0	240/1	2800	4500	87	3	3497	263
14	4215	7012	0.1	3.1	PHQ1133_2100 EZ802U	18900	40000	210.0	210/1	2800	4500	64	3	3506	257
14	5027	9110	0.1	2.6	PHQ1133_2100 EZ803U	22000	40000	210.0	210/1	2800	4500	90	3	3506	263
18	3372	5610	0.1	3.9	PHQ1133_1680 EZ802U	15120	40000	168.0	168/1	2800	4500	65	3	3520	257
18	4022	7288	0.2	3.2	PHQ1133_1680 EZ803U	21920	40000	168.0	168/1	2800	4500	91	3	3520	263
20	3011	5009	0.1	4.3	PHQ1133_1500 EZ802U	13500	40000	150.0	150/1	2500	4000	71	3	3510	257
20	3591	6507	0.2	3.6	PHQ1133_1500 EZ803U	19580	40000	150.0	150/1	2500	4000	96	3	3510	263
25	2873	5206	0.2	4.5	PHQ1133_1200 EZ803U	15660	40000	120.0	120/1	2200	3500	104	3	3514	263
PHQ11 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 22000$ Nm)															
15	2835	9315	–	4.6	PHQ1133_3000 EZ802U	22000	40000	300.0	300/1	2800	4500	61	3	3491	257



7

Planetary geared motors

PHQA

7.1 Overview

Quattro-Power for maximum power density

Features

Power density	★★★★★
Backlash	★★★★★
Price category	€€€€€
Shaft load	★★★★★
Smooth operation	★★★★★
Torsional stiffness	★★★★★
Mass moment of inertia	★★★★★
Helical gearing	✓
Maintenance-free	✓
Any installation position (single/two stage)	✓
High power density	✓
(four-stage planetary system)	
Continuous operation without cooling	✓
(FKM seal ring at the input and output)	
Pretensioned angular contact ball bearings at the output in an O-arrangement, ideally suited for helical-gear rack and pinion drives	✓
Compact and highly dynamic due to direct motor attachment	✓

Key: ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

Technical data

i	5.5 – 600
M_{2acc}	84 – 10000 Nm
$\Delta\phi_2$	0.7 – 1.5 arcmin
η_{get}	$\leq 96 \%$

7.2 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>.

An explanation of the formula symbols can be found in Chapter [▶ 29.1](#).

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]
PHQA4 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 170$ Nm)															
55	48	49	0.6	2.5	PHQA422_0550 EZ301U	140	300	55.00	55/1	4500	8000	0.21	1	35	5.3
55	81	86	1.0	1.5	PHQA422_0550 EZ302U	170	300	55.00	55/1	4500	8000	0.31	1	35	5.9
55	106	112	1.4	1.1	PHQA422_0550 EZ303U	170	300	55.00	55/1	4500	8000	0.42	1	35	6.4
78	33	34	0.7	3.6	PHQA422_0390 EZ301U	100	300	38.50	77/2	4500	8000	0.24	1	37	5.3
78	57	60	1.3	2.1	PHQA422_0390 EZ302U	170	300	38.50	77/2	4500	8000	0.34	1	37	5.9
78	74	78	1.6	1.6	PHQA422_0390 EZ303U	170	300	38.50	77/2	4500	8000	0.45	1	37	6.4
78	100	107	2.2	1.2	PHQA422_0390 EZ401U	170	300	38.50	77/2	4500	8000	0.98	1	37	7.8
109	41	43	1.5	3.0	PHQA422_0280 EZ302U	130	300	27.50	55/2	4000	7000	0.38	1	37	5.9
109	53	56	1.9	2.3	PHQA422_0280 EZ303U	170	300	27.50	55/2	4000	7000	0.49	1	37	6.4
109	72	77	2.6	1.7	PHQA422_0280 EZ401U	170	300	27.50	55/2	4000	7000	1.0	1	37	7.8
109	110	120	4.0	1.1	PHQA422_0280 EZ501U	170	300	27.50	55/2	4000	7000	3.0	1	37	8.8
136	33	34	1.7	3.7	PHQA422_0220 EZ302U	100	300	22.00	22/1	3700	6500	0.44	1	37	5.9
136	42	45	2.2	2.8	PHQA422_0220 EZ303U	140	300	22.00	22/1	3700	6500	0.55	1	37	6.4
136	57	61	2.9	2.1	PHQA422_0220 EZ401U	170	300	22.00	22/1	3700	6500	1.1	1	37	7.8
136	88	96	4.5	1.4	PHQA422_0220 EZ501U	170	300	22.00	22/1	3700	6500	3.1	1	37	8.8
136	96	106	4.9	1.2	PHQA422_0220 EZ402U	170	300	22.00	22/1	3700	6500	1.8	1	37	8.9
545	23	25	4.8	4.2	PHQA421_0055 EZ501U	84	300	5.500	11/2	2000	6000	3.2	1	42	7.5
545	36	45	7.7	2.6	PHQA421_0055 EZ404U	150	300	5.500	11/2	2000	6000	3.2	1	42	9.7
545	39	42	8.2	2.4	PHQA421_0055 EZ502U	160	300	5.500	11/2	2000	6000	5.5	1	42	9.0
545	51	59	11	1.9	PHQA421_0055 EZ503U	170	300	5.500	11/2	2000	6000	7.8	1	42	11
545	71	84	15	1.3	PHQA421_0055 EZ505U	170	300	5.500	11/2	2000	6000	12	1	42	13
PHQA4 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 170$ Nm)															
109	46	49	0.6	2.4	PHQA422_0550 EZ301U	140	300	55.00	55/1	4500	8000	0.21	1	35	5.3
109	77	86	1.1	1.4	PHQA422_0550 EZ302U	170	300	55.00	55/1	4500	8000	0.31	1	35	5.9
109	100	115	1.4	1.1	PHQA422_0550 EZ303U	170	300	55.00	55/1	4500	8000	0.42	1	35	6.4
156	32	34	0.7	3.8	PHQA422_0390 EZ301U	100	300	38.50	77/2	4500	8000	0.24	1	37	5.3
156	54	60	1.2	2.2	PHQA422_0390 EZ302U	170	300	38.50	77/2	4500	8000	0.34	1	37	5.9
156	70	81	1.5	1.7	PHQA422_0390 EZ303U	170	300	38.50	77/2	4500	8000	0.45	1	37	6.4
156	82	100	1.8	1.5	PHQA422_0390 EZ401U	170	300	38.50	77/2	4500	8000	0.98	1	37	7.8
218	38	43	1.4	3.1	PHQA422_0280 EZ302U	130	300	27.50	55/2	4000	7000	0.38	1	37	5.9
218	50	58	1.8	2.4	PHQA422_0280 EZ303U	170	300	27.50	55/2	4000	7000	0.49	1	37	6.4
218	59	72	2.1	2.0	PHQA422_0280 EZ401U	170	300	27.50	55/2	4000	7000	1.0	1	37	7.8
218	87	113	3.2	1.4	PHQA422_0280 EZ501U	170	300	27.50	55/2	4000	7000	3.0	1	37	8.8
218	90	125	3.3	1.3	PHQA422_0280 EZ402U	170	300	27.50	55/2	4000	7000	1.7	1	37	8.9
273	31	34	1.6	3.9	PHQA422_0220 EZ302U	100	300	22.00	22/1	3700	6500	0.44	1	37	5.9
273	40	46	2.0	3.0	PHQA422_0220 EZ303U	140	300	22.00	22/1	3700	6500	0.55	1	37	6.4
273	47	57	2.4	2.6	PHQA422_0220 EZ401U	170	300	22.00	22/1	3700	6500	1.1	1	37	7.8
273	70	90	3.5	1.7	PHQA422_0220 EZ501U	170	300	22.00	22/1	3700	6500	3.1	1	37	8.8
273	72	100	3.6	1.7	PHQA422_0220 EZ402U	170	300	22.00	22/1	3700	6500	1.8	1	37	8.9
1091	18	23	4.8	4.2	PHQA421_0055 EZ501U	84	300	5.500	11/2	2000	6000	3.2	1	42	7.5
1091	27	41	7.3	2.8	PHQA421_0055 EZ502U	160	300	5.500	11/2	2000	6000	5.5	1	42	9.0
1091	31	44	8.1	2.5	PHQA421_0055 EZ404U	150	300	5.500	11/2	2000	6000	3.2	1	42	9.7
1091	33	56	8.7	2.3	PHQA421_0055 EZ503U	170	300	5.500	11/2	2000	6000	7.8	1	42	11
PHQA5 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 430$ Nm)															
55	143	153	0.9	1.9	PHQA522_0550 EZ401U	430	800	55.00	55/1	4000	7000	0.97	1	87	11
55	220	240	1.4	1.3	PHQA522_0550 EZ501U	430	800	55.00	55/1	4000	7000	2.9	1	87	12
55	240	266	1.5	1.2	PHQA522_0550 EZ402U	430	800	55.00	55/1	4000	7000	1.7	1	87	12
78	100	107	1.0	2.8	PHQA522_0390 EZ401U	300	800	38.50	77/2	4000	7000	1.0	1	92	11
78	154	168	1.6	1.8	PHQA522_0390 EZ501U	430	800	38.50	77/2	4000	7000	3.0	1	92	12
78	168	186	1.8	1.7	PHQA522_0390 EZ402U	430	800	38.50	77/2	4000	7000	1.7	1	92	12
78	247	308	2.6	1.1	PHQA522_0390 EZ404U	430	800	38.50	77/2	4000	7000	3.1	1	92	14
78	265	286	2.8	1.1	PHQA522_0390 EZ502U	430	800	38.50	77/2	4000	7000	5.3	1	92	13

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	[arcmin]	[Nm/	[kg]
										[rpm]	[rpm]	kgm ²]		arcmin]	
PHQA5 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 430$ Nm)															
109	72	77	1.2	3.9	PHQA522_0280 EZ401U	220	800	27.50	55/2	3700	6500	1.1	1	94	11
109	110	120	1.9	2.5	PHQA522_0280 EZ501U	410	800	27.50	55/2	3700	6500	3.1	1	94	12
109	120	133	2.1	2.3	PHQA522_0280 EZ402U	410	800	27.50	55/2	3700	6500	1.8	1	94	12
109	176	220	3.1	1.6	PHQA522_0280 EZ404U	430	800	27.50	55/2	3700	6500	3.2	1	94	14
109	189	205	3.3	1.5	PHQA522_0280 EZ502U	430	800	27.50	55/2	3700	6500	5.4	1	94	13
109	189	212	3.3	1.5	PHQA522_0280 EZ701U	430	800	27.50	55/2	3700	6500	8.7	1	94	15
109	248	284	4.3	1.1	PHQA522_0280 EZ503U	430	800	27.50	55/2	3700	6500	7.8	1	94	15
136	57	61	1.4	4.9	PHQA522_0220 EZ401U	170	800	22.00	22/1	3300	6000	1.2	1	95	11
136	88	96	2.1	3.2	PHQA522_0220 EZ501U	330	800	22.00	22/1	3300	6000	3.2	1	95	12
136	96	106	2.3	2.9	PHQA522_0220 EZ402U	330	800	22.00	22/1	3300	6000	1.9	1	95	12
136	141	176	3.4	2.0	PHQA522_0220 EZ404U	430	800	22.00	22/1	3300	6000	3.3	1	95	14
136	151	164	3.7	1.8	PHQA522_0220 EZ502U	430	800	22.00	22/1	3300	6000	5.5	1	95	13
136	151	170	3.7	1.8	PHQA522_0220 EZ701U	410	800	22.00	22/1	3300	6000	8.8	1	95	15
136	198	227	4.8	1.4	PHQA522_0220 EZ503U	430	800	22.00	22/1	3300	6000	7.9	1	95	15
136	246	295	6.0	1.1	PHQA522_0220 EZ702U	430	800	22.00	22/1	3300	6000	14	1	95	18
136	276	327	6.7	1.0	PHQA522_0220 EZ505U	430	800	22.00	22/1	3300	6000	12	1	95	18
545	63	76	6.4	3.5	PHQA521_0055 EZ702U	220	800	5.500	11/2	2500	5500	15	1	107	15
545	71	84	7.2	3.1	PHQA521_0055 EZ505U	350	800	5.500	11/2	2500	5500	13	1	107	15
545	87	110	8.8	2.6	PHQA521_0055 EZ703U	340	800	5.500	11/2	2500	5500	22	1	107	17
545	112	159	11	2.0	PHQA521_0055 EZ705U	430	800	5.500	11/2	2500	5500	35	1	107	23
PHQA5 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 430$ Nm)															
205	194	313	4.7	1.4	PHQA522_0220 EZ505U	430	800	22.00	22/1	3300	6000	12	1	95	18
818	50	81	5.8	3.9	PHQA521_0055 EZ505U	350	800	5.500	11/2	2500	5500	13	1	107	15
818	64	106	7.3	3.0	PHQA521_0055 EZ703U	340	800	5.500	11/2	2500	5500	22	1	107	17
818	87	158	10	2.2	PHQA521_0055 EZ705U	430	800	5.500	11/2	2500	5500	35	1	107	23
PHQA5 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 430$ Nm)															
109	118	143	0.9	1.9	PHQA522_0550 EZ401U	430	800	55.00	55/1	4000	7000	0.97	1	87	11
109	174	225	1.4	1.3	PHQA522_0550 EZ501U	430	800	55.00	55/1	4000	7000	2.9	1	87	12
109	179	251	1.4	1.2	PHQA522_0550 EZ402U	430	800	55.00	55/1	4000	7000	1.7	1	87	12
156	82	100	0.9	3.4	PHQA522_0390 EZ401U	300	800	38.50	77/2	4000	7000	1.0	1	92	11
156	122	158	1.3	2.3	PHQA522_0390 EZ501U	430	800	38.50	77/2	4000	7000	3.0	1	92	12
156	125	175	1.3	2.2	PHQA522_0390 EZ402U	430	800	38.50	77/2	4000	7000	1.7	1	92	12
156	186	279	1.9	1.5	PHQA522_0390 EZ502U	430	800	38.50	77/2	4000	7000	5.3	1	92	13
156	208	301	2.2	1.3	PHQA522_0390 EZ404U	430	800	38.50	77/2	4000	7000	3.1	1	92	14
218	59	72	1.0	4.8	PHQA522_0280 EZ401U	220	800	27.50	55/2	3700	6500	1.1	1	94	11
218	87	113	1.5	3.2	PHQA522_0280 EZ501U	410	800	27.50	55/2	3700	6500	3.1	1	94	12
218	90	125	1.6	3.1	PHQA522_0280 EZ402U	410	800	27.50	55/2	3700	6500	1.8	1	94	12
218	133	199	2.3	2.1	PHQA522_0280 EZ502U	430	800	27.50	55/2	3700	6500	5.4	1	94	13
218	133	202	2.3	2.1	PHQA522_0280 EZ701U	430	800	27.50	55/2	3700	6500	8.7	1	94	15
218	148	215	2.6	1.9	PHQA522_0280 EZ404U	430	800	27.50	55/2	3700	6500	3.2	1	94	14
218	159	271	2.7	1.8	PHQA522_0280 EZ503U	430	800	27.50	55/2	3700	6500	7.8	1	94	15
273	70	90	1.7	4.0	PHQA522_0220 EZ501U	330	800	22.00	22/1	3300	6000	3.2	1	95	12
273	72	100	1.7	3.9	PHQA522_0220 EZ402U	330	800	22.00	22/1	3300	6000	1.9	1	95	12
273	106	160	2.6	2.6	PHQA522_0220 EZ502U	430	800	22.00	22/1	3300	6000	5.5	1	95	13
273	106	162	2.6	2.6	PHQA522_0220 EZ701U	410	800	22.00	22/1	3300	6000	8.8	1	95	15
273	119	172	2.9	2.4	PHQA522_0220 EZ404U	430	800	22.00	22/1	3300	6000	3.3	1	95	14
273	127	217	3.1	2.2	PHQA522_0220 EZ503U	430	800	22.00	22/1	3300	6000	7.9	1	95	15
273	147	293	3.6	1.9	PHQA522_0220 EZ702U	430	800	22.00	22/1	3300	6000	14	1	95	18
PHQA7 ($n_{1N} = 2000$ rpm, $M_{2acc,max} = 950$ Nm)															
364	231	349	9.5	2.8	PHQA721_0055 EZ805U	950	1900	5.500	11/2	2200	5000	135	1	235	55
PHQA7 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 950$ Nm)															
14	554	594	0.2	1.2	PHQA723_2200 EZ401U	950	1900	220.0	220/1	4000	7000	0.99	1	202	19
16	485	520	0.2	1.3	PHQA723_1930 EZ401U	950	1900	192.5	385/2	4000	7000	1.0	1	203	19
19	388	416	0.3	1.7	PHQA723_1540 EZ401U	950	1900	154.0	154/1	4000	7000	1.0	1	203	19
19	596	651	0.4	1.1	PHQA723_1540 EZ501U	950	1900	154.0	154/1	4000	7000	3.0	1	203	20
22	347	371	0.3	1.9	PHQA723_1380 EZ401U	950	1900	137.5	275/2	3700	6500	1.2	1	204	19
22	532	582	0.4	1.2	PHQA723_1380 EZ501U	950	1900	137.5	275/2	3700	6500	3.1	1	204	20
22	582	644	0.5	1.1	PHQA723_1380 EZ402U	950	1900	137.5	275/2	3700	6500	1.9	1	204	20
27	277	297	0.3	2.3	PHQA723_1100 EZ401U	840	1900	110.0	110/1	3300	6000	1.3	1	204	19
27	426	465	0.5	1.5	PHQA723_1100 EZ501U	950	1900	110.0	110/1	3300	6000	3.3	1	204	20
27	465	515	0.5	1.4	PHQA723_1100 EZ402U	950	1900	110.0	110/1	3300	6000	2.0	1	204	20
34	222	238	0.3	2.9	PHQA723_0880 EZ401U	670	1900	88.00	88/1	3300	6000	1.3	1	204	19
34	341	372	0.5	1.9	PHQA723_0880 EZ501U	950	1900	88.00	88/1	3300	6000	3.3	1	204	20

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	[arcmin]	[Nm/	[kg]
										[rpm]	[rpm]	kgm ²]		arcmin]	
PHQA9 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 6000$ Nm)															
25	1782	2246	0.4	2.1	PHQA933_1200 EZ703U	6000	12000	120.0	120/1	2500	4500	26	1	1203	94
25	2300	3262	0.5	1.7	PHQA933_1200 EZ705U	6000	12000	120.0	120/1	2500	4500	38	1	1203	100
25	2408	4007	0.5	1.6	PHQA933_1200 EZ802U	6000	12000	120.0	120/1	2500	4500	62	1	1203	108
31	1037	1244	0.3	3.7	PHQA933_0960 EZ702U	3540	12000	96.00	96/1	2500	4500	18	1	1207	92
31	1426	1797	0.4	2.7	PHQA933_0960 EZ703U	5620	12000	96.00	96/1	2500	4500	26	1	1207	94
31	1840	2609	0.5	2.1	PHQA933_0960 EZ705U	6000	12000	96.00	96/1	2500	4500	39	1	1207	100
31	1927	3205	0.5	2.0	PHQA933_0960 EZ802U	6000	12000	96.00	96/1	2500	4500	63	1	1207	108
31	2298	4164	0.6	1.7	PHQA933_0960 EZ803U	6000	12000	96.00	96/1	2500	4500	88	1	1207	114
42	778	933	0.3	4.9	PHQA933_0720 EZ702U	2660	12000	72.00	72/1	2200	4500	20	1	1205	92
42	1069	1348	0.5	3.6	PHQA933_0720 EZ703U	4210	12000	72.00	72/1	2200	4500	28	1	1205	94
42	1380	1957	0.6	2.8	PHQA933_0720 EZ705U	6000	12000	72.00	72/1	2200	4500	41	1	1205	100
42	1445	2404	0.6	2.6	PHQA933_0720 EZ802U	6000	12000	72.00	72/1	2200	4500	65	1	1205	108
42	1724	3123	0.7	2.2	PHQA933_0720 EZ803U	6000	12000	72.00	72/1	2200	4500	90	1	1205	114
50	1244	2070	0.7	2.8	PHQA932_0600 EZ802U	5580	12000	60.00	60/1	2800	4500	61	1	1149	100
50	1484	2690	0.9	2.4	PHQA932_0600 EZ803U	6000	12000	60.00	60/1	2800	4500	86	1	1149	106
71	871	1449	0.8	4.4	PHQA932_0420 EZ802U	3910	12000	42.00	42/1	2800	4500	63	1	1195	100
71	1039	1883	1.0	3.7	PHQA932_0420 EZ803U	5660	12000	42.00	42/1	2800	4500	89	1	1195	106
PHQA9 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 6000$ Nm)															
19	2614	4320	0.2	1.5	PHQA933_2400 EZ703U	6000	12000	240.0	240/1	3300	6000	22	1	1198	94
21	2287	3780	0.2	1.7	PHQA933_2100 EZ703U	6000	12000	210.0	210/1	3300	6000	23	1	1200	94
27	1830	3024	0.2	2.1	PHQA933_1680 EZ703U	6000	12000	168.0	168/1	3300	6000	23	1	1204	94
27	2480	4536	0.3	1.5	PHQA933_1680 EZ705U	6000	12000	168.0	168/1	3300	6000	35	1	1204	100
30	1634	2700	0.2	2.3	PHQA933_1500 EZ703U	6000	12000	150.0	150/1	3000	5500	24	1	1202	94
30	2214	4050	0.3	1.7	PHQA933_1500 EZ705U	6000	12000	150.0	150/1	3000	5500	37	1	1202	100
38	1134	3726	0.2	3.4	PHQA933_1200 EZ802U	6000	12000	120.0	120/1	2500	4500	62	1	1203	108
38	1307	2160	0.3	2.9	PHQA933_1200 EZ703U	6000	12000	120.0	120/1	2500	4500	26	1	1203	94
38	1771	3240	0.3	2.1	PHQA933_1200 EZ705U	6000	12000	120.0	120/1	2500	4500	38	1	1203	100
47	907	2981	0.2	4.2	PHQA933_0960 EZ802U	6000	12000	96.00	96/1	2500	4500	63	1	1207	108
47	1045	1728	0.3	3.6	PHQA933_0960 EZ703U	5620	12000	96.00	96/1	2500	4500	26	1	1207	94
47	1417	2592	0.4	2.7	PHQA933_0960 EZ705U	6000	12000	96.00	96/1	2500	4500	39	1	1207	100
63	784	1296	0.3	4.8	PHQA933_0720 EZ703U	4210	12000	72.00	72/1	2200	4500	28	1	1205	94
63	1063	1944	0.4	3.6	PHQA933_0720 EZ705U	6000	12000	72.00	72/1	2200	4500	41	1	1205	100
PHQA9 ($n_{1N} = 6000$ rpm, $M_{2acc,max} = 6000$ Nm)															
10	2808	4266	0.1	1.4	PHQA933_6000 EZ701U	6000	12000	600.0	600/1	3300	6000	9.1	1	1145	90
14	1966	2986	0.1	1.9	PHQA933_4200 EZ701U	6000	12000	420.0	420/1	3300	6000	9.1	1	1184	90
20	1404	2133	0.1	2.7	PHQA933_3000 EZ701U	5400	12000	300.0	300/1	3300	6000	9.1	1	1196	90
20	1944	3861	0.1	2.0	PHQA933_3000 EZ702U	6000	12000	300.0	300/1	3300	6000	14	1	1196	92
25	1123	1706	0.1	3.4	PHQA933_2400 EZ701U	4320	12000	240.0	240/1	3300	6000	9.2	1	1198	90
25	1555	3089	0.1	2.4	PHQA933_2400 EZ702U	6000	12000	240.0	240/1	3300	6000	14	1	1198	92
29	983	1493	0.1	3.9	PHQA933_2100 EZ701U	3780	12000	210.0	210/1	3300	6000	9.8	1	1200	90
29	1361	2703	0.1	2.8	PHQA933_2100 EZ702U	6000	12000	210.0	210/1	3300	6000	15	1	1200	92
36	786	1194	0.1	4.8	PHQA933_1680 EZ701U	3020	12000	168.0	168/1	3300	6000	9.9	1	1204	90
36	1089	2162	0.1	3.5	PHQA933_1680 EZ702U	6000	12000	168.0	168/1	3300	6000	15	1	1204	92
PHQA10 ($n_{1N} = 2000$ rpm, $M_{2acc,max} = 10000$ Nm)															
17	4720	7139	0.6	1.4	PHQA1033_1200 EZ805U	10000	20000	120.0	120/1	2200	3500	150	1.5	2062	166
21	3776	5711	0.6	1.7	PHQA1033_0960 EZ805U	10000	20000	96.00	96/1	2200	3500	152	1.5	2068	166
PHQA10 ($n_{1N} = 3000$ rpm, $M_{2acc,max} = 10000$ Nm)															
14	4215	7012	0.2	1.5	PHQA1033_2100 EZ802U	10000	20000	210.0	210/1	2800	4500	63	1.5	2059	147
18	3372	5610	0.3	1.9	PHQA1033_1680 EZ802U	10000	20000	168.0	168/1	2800	4500	64	1.5	2064	147
18	4022	7288	0.3	1.6	PHQA1033_1680 EZ803U	10000	20000	168.0	168/1	2800	4500	89	1.5	2064	153
20	3011	5009	0.3	2.2	PHQA1033_1500 EZ802U	10000	20000	150.0	150/1	2500	4000	69	1.5	2061	147
20	3591	6507	0.3	1.8	PHQA1033_1500 EZ803U	10000	20000	150.0	150/1	2500	4000	94	1.5	2061	153
25	2408	4007	0.3	2.7	PHQA1033_1200 EZ802U	10000	20000	120.0	120/1	2200	3500	76	1.5	2062	147
25	2873	5206	0.4	2.3	PHQA1033_1200 EZ803U	10000	20000	120.0	120/1	2200	3500	101	1.5	2062	153
31	1927	3205	0.3	3.4	PHQA1033_0960 EZ802U	8640	20000	96.00	96/1	2200	3500	77	1.5	2068	147
31	2298	4164	0.4	2.8	PHQA1033_0960 EZ803U	10000	20000	96.00	96/1	2200	3500	102	1.5	2068	153
PHQA10 ($n_{1N} = 4500$ rpm, $M_{2acc,max} = 10000$ Nm)															
19	2268	7452	0.1	2.9	PHQA1033_2400 EZ802U	10000	20000	240.0	240/1	2800	4500	61	1.5	2056	147
21	1985	6521	0.1	3.3	PHQA1033_2100 EZ802U	10000	20000	210.0	210/1	2800	4500	63	1.5	2059	147
27	1588	5216	0.1	4.1	PHQA1033_1680 EZ802U	10000	20000	168.0	168/1	2800	4500	64	1.5	2064	147