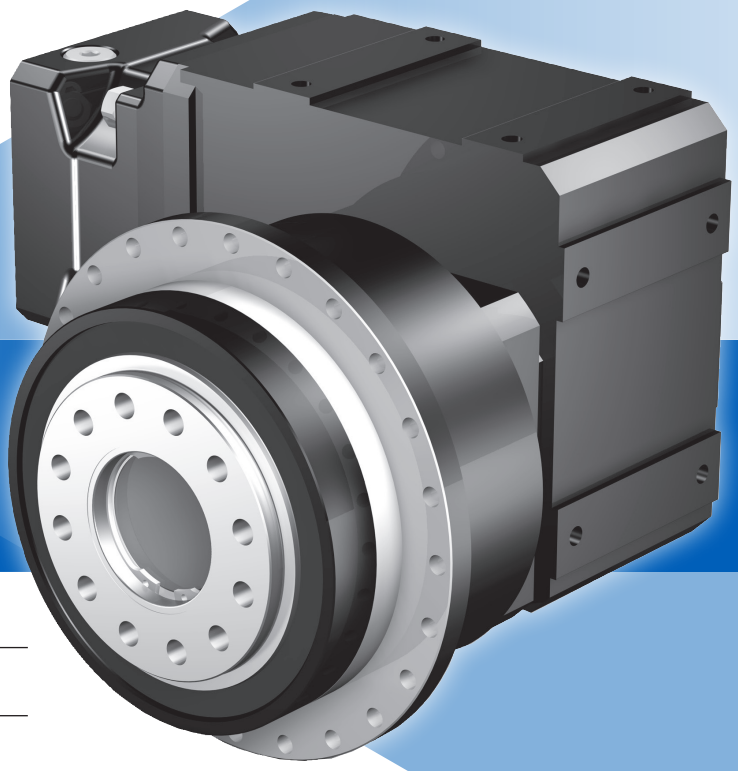
PHQK Series: RIGHT ANGLE – Flange Output

PHQK Features

- 22:1 to 591:1 ratios (higher ratios available. Contact STOBER.)
- Quiet running (<63dB(A))
- High load capacity and tilting rigidity through symmetrical bearing arrangement
- FKM seals for extended gearbox life
- Large motor input option to accept bigger diameter motor shafts so you don't use an oversized gearbox
- Error free motor mounting and quick changeover with toleranced pilot on motor plate
- Low no load running torque, giving you more torque for your application
- Magnetic oil filtration to remove contaminants to prevent breakdowns
- Build and ship in one day
- Assembled in the USA

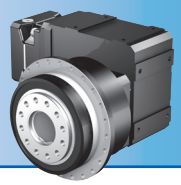
STOBER PHQK Series combines planetary and helical gearing. The PHQK provides a more compact, precise solution, and can handle higher input speeds. Every gearbox is made to order. STOBER will custom whatever you need to fit your application. Contact us today to learn more.



SHIPS in 1 DAY!
NO EXPEDITE FEE FOR 24 HOUR SERVICE

General Specifications

Ambient Temperature	0°C to +40°C (104°F) [Unit temperature <90°C Max]
Backlash	≤3.5 (see performance overview chart, page 238)
Coating	Standard Black (RAL-9005)
Degree of Protection	IP65
Direction of Rotation	See page 239
Efficiency	PHQK: 94%
Input RPM	Up to 6,000 RPM
Installation	Requires 12.9 fasteners. See page 288, for more information
Lubrication	Lubricated for life – standard Mobil SHC629; option food grade Mobil SHC CIBUS 150
Mounting Position	Must be specified, see page 257
Warranty	5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)



Overview

Selection Options *At-a-Glance*

Using the **Selection Data** table later in this section, select the PHKQ Series Gearhead with the appropriate performance and design options tailored to your motor choice and exact application requirements. Use the part number guide below as a reference to build a part number for the complete gearhead assembly.

Part Number Examples:

	1	2	3	4	5	6	7	8	9	0	!	@	
PHQK	PHQ	5	3	1	S	F	S	S	0030	K523VF	0040	ME10	EL1 *

	Design Option	Part Number Code	Description
1	**Series**	PHQ	Rotating flange output with Quattro power planetary
2	**Size**	5 7 8 9 10 11 12	7 sizes of gearhead
3	**Generation**	3 4	Sizes 5-8 Sizes 9-12
4	**# of Stages**	1	One stage
5	**Housing**	S	Standard mounting style
6	**Output Shaft**	F	Flange output
7	**Bearing**	S V	Standard Reinforced Bearing (Size 5 Only)
8	**Backlash**	S	Standard Backlash Reduced Backlash (Sizes 5-9 only)
9	**Ratio**	0030	Ratios range from 3:1 to 6:1 (0030=3:1)
0	**Secondary Unit**	K523VF	K Series helical/bevel unit: 6 sizes, 1, 2, 3, or 4 stages, with output shaft (V) and flange (F)
!	**Secondary Unit Ratio**	0040	Ratios from 4:1 to 99:1 (0040=4:1; 0020=2:1; 0030=3:1)
@	**Motor Adapter**	ME10 - ME50 MB	Motor Adapter with EasyAdapt coupling ServoStop with motor adapter with brake (Contact factory)
*	**Mounting Position**	EL1 EL2 EL3 EL4 EL5 EL6	Required special instruction for all units, see page 257

Options

ME Adapter Option

- MSS1 Seal – special input seal for longer life (For sizes PHQ5-8). Contact factory for this option.
- Peak Torque Booster – pinion securing element for shock loads, increasing peak torque up to 80%.

Integrated Safety Brake

- ServoStop – provides dynamic braking during power failures or emergency stops in hazardous situations. Contact factory for this option.

Coating Option

- Available with multi-layer, industrial 316 stainless steel epoxy coating. Contact factory for this option.

ATEX

- ATmosphere EXplosible – rated for explosive environments. Contact factory for this option and allow additional time for delivery.

PHQK Performance Overview

PHQK Series performance is dependent on several factors including duty cycle, bearing design, gearhead size and stage configuration, among others. Use the chart below for preliminary evaluation, then use the following performance chart and selection information on the following pages for specific performance sizing and selection.

Size/Generation/# of Stages		PHQ5	PHQ7	PHQ8	PHQ9	PHQ10	PHQ11	PHQ12
Secondary Unit		K102	K202	K402	K513	K713	K813	K913/K914
Acceleration Torque M_{2BMAX}	Nm	550	1050	2800	5760	10,000	22,000	43,000
Output Torque Nom. [1] M_{2N}	Nm	280	500	1400	3800	6500	13,000	21,772
Torsional Stiffness C_2	Nm/arcmin	70	136	400	771	1560	2623	4664
Torsional Backlash [2] $\Delta\phi$	arcmin	≤4	≤4	≤3.5	≤4	≤4	≤4	≤4
Input Speed Max. n_{1MAX}	Continuous Cyclic	4000 7000	4000 6500	3600 5500	3400 5000	2900 4200	2800 4000	2600 3800
Efficiency (@nom torque)	%	93	93	93	92	92	92	92
Weight	kg lbs	17.9 39.4	32.6 71.7	74.4 163.7	96.7 212.7	164.1 361	304.5 669.9	556.2 1223.6
Noise [3]	dB(A)	≤63	≤63	≤63	≤64	≤64	≤65	≤65
Performance by Bearing Design Option [4]								
Permitted Axial Force F_{2ax100}	N	4150	6150	10,050	33,000	50,000	60,000	70,000
Permitted Tilting Torque ≤100RPM M_{2K100}	Nm	440	1466	3500	7500	8800	11,000	18,000
Performance by Reinforced Bearing Design Option – Choose V Option [4]								
Permitted Axial Force F_{2ax100}	N	5000	–	–	–	–	–	–
Permitted Tilting Torque ≤100RPM M_{2K100}	Nm	572	–	–	–	–	–	–

[1] *Ratings based on input speed (n_1) of 1500 RPM. To calculate torque at higher input speeds, contact the factory.*

[2] *Tested at 1.5% of nominal torque and recorded on the output side of the gearhead. For lower backlash, contact STOBER technical support.*

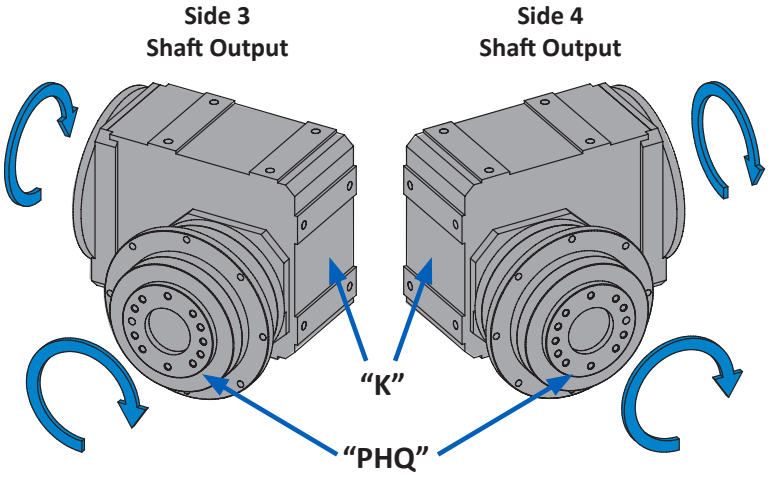
[3] *Measurement at one (1) meter distance with input speed (n_1) of 1500 RPM.*

[4] *Rating based on output speed (n_2) of 100 RPM. For values at other speeds see page 241.*

PHQK Series Direction of Rotation

For PHQK units, the "PHQ" Series planetary output unit can be mounted on either the right (Side 3) or the left (Side 4) of the "K" Series right angle secondary unit. Note CCW input direction of rotation and CW output shaft direction with both mounting configurations.

IMPORTANT: When ordering, Mounting Side 3 or Side 4 MUST BE SPECIFIED.

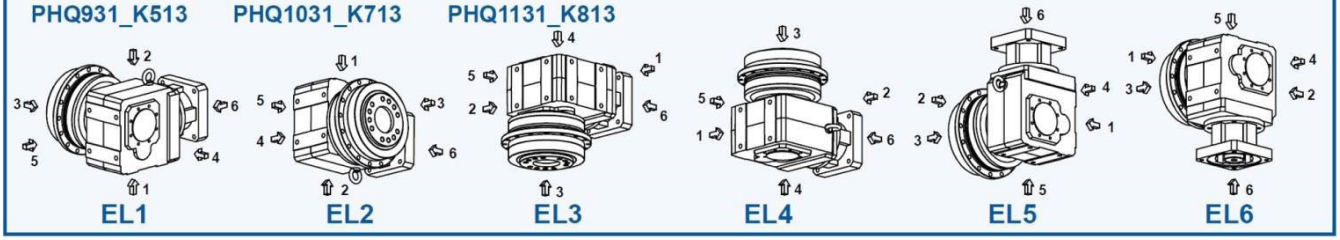


PHQK Mounting Position Options

When ordering, the mounting in position (EL1, EL2, EL3, EL4, EL5, EL6) MUST BE SPECIFIED

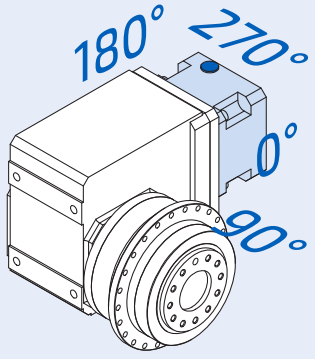
PHQ521_K102 PHQ721_K202 PHQ821_K402

PHQ931_K513 PHQ1031_K713 PHQ1131_K813



PHQK Series Motor Mounting Plate Access Hole

Access to the clamping screw for the motor coupling is located on the 270° side of the motor mounting plate at the location shown. If necessary, the motor mounting plate can be rotated in the field, if a 0°, 90° or 180° orientation for the access hole is desirable.



PHQK Series Motor Mounting Plate Option

STOBER Servo Gearheads fit the motor of your choice with the appropriate motor mounting plate assembled between the motor and the gearhead.

NOTE: When ordering a gearhead:

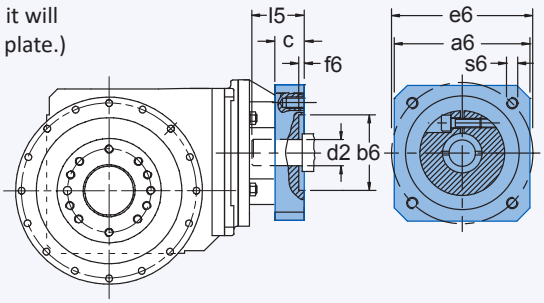
- Specify the motor manufacturer and part number
- Provide the motor drawing with dimensions, or specify the motor mounting dimensions (per the list shown at right)

For a precise dimension on a specific motor, or for general assistance, we recommend you contact STOBER Technical Support.

Customer Required Dimensions for Properly Sized Motor Mounting Plate

Motor information required with Motor Adapter

d2	Motor Shaft Diameter (If an adapter bushing is required it will be supplied with the motor plate.)
b6	Pilot Diameter
e6	Bolt Circle Diameter
s6	Bolt Diameter
l5	Motor Shaft Length
f6	Pilot Length
a6	Square Flange (Optional – motor plate will typically be made to match this dimension.)



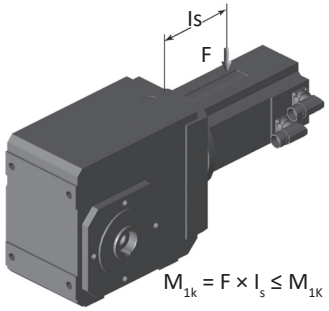
PHQK Motor Mounting Plate Dimensions — mm (Gearhead Part Number Specific)	ME10	ME20	ME30	ME40	ME50
Maximum Allowed Motor Shaft Dia.d2	19	32	38	48	60
Minimum Allowed Motor Plate Thickness c*	21	24	25	33	43

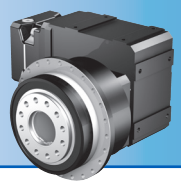
** Note that the c motor plate thickness is determined by the motor shaft length. The minimum motor plate thickness is the value listed.*

PHQX Series Permissible Motor Tilting Torque

The permissible tilting torque of the motor attached to the gear unit is a result of the static and dynamic load "F" from the motor weight, mass acceleration, and vibration multiplied by the distance from the center of gravity "l_s" of the motor.

M_{1K}	PHQK (ME Motor Adapters)				
	ME10	ME20	ME30	ME40	ME50
Nm	25	60	125	250	600





PHQK Series Permissible Output Shaft Load and Tilting Moments – Standard Bearings

Size	Z_2 Distance of Shaft Shoulder to Center of Output Bearing mm	F_{2ax100} Permitted Axial Force N	$F_{2rad100}$ Permitted Radial Force ≤100RPM N	$F_{2rad,acc}$ Radial Acceleration Force N	M_{2K100} Permitted Tilting Torque ≤100RPM Nm	$M_{2K,acc}$ Permitted Acceleration Tilting Torque Nm	C_{2K} Tilting Stiffness Nm/arcmin
5	97.0	4150	4536	4897	475	475	429
7	86.0	6150	17,045	17,045	1466	1466	500
8	125.5	10,050	27,778	27,778	3486	3486	1550
9	155.0	33,000	48,387	33,333	7500	4,183	7500
10	171.0	50,000	51,462	73,099	8800	12,500	9500
11	231	60,000	47,619	69,264	11,000	16,000	9500
12	281	70,000	64,057	106,761	18,000	30,000	11,500

PHQK Series Permissible Output Shaft Load and Tilting Moments – Reinforced Bearings

Size	Z_2 Distance of Shaft Shoulder to Center of Output Bearing mm	F_{2ax100} Permitted Axial Force N	$F_{2rad100}$ Permitted Radial Force ≤100RPM N	$F_{2rad,acc}$ Radial Acceleration Force N	M_{2K100} Permitted Tilting Torque ≤100RPM Nm	$M_{2K,acc}$ Permitted Acceleration Tilting Torque Nm	C_{2K} Tilting Stiffness Nm/arcmin
5	104.0	5000	5500	5500	572	572	478

PHQK Series Load/Life/Speed Calculations

The permissible load and tilting moment values are based on an output speed of 100 RPM. For higher speeds the following applies, where n_2 is the desired speed:

$$F_{2radN} = \frac{F_{2rad100}}{\sqrt[3]{\frac{n_{2m^*}}{100rpm}}} \qquad F_{2AX} = \frac{F_{2ax100}}{\sqrt[3]{\frac{n_2}{100}}} \qquad M_{2KX} = \frac{M_{2K100}}{\sqrt[3]{\frac{n_2}{100}}}$$

The application output tilting moment should be determined by the following formula:

$$M_{2k,acc^*} = \frac{2 \bullet F_{2ax100^*} \bullet y_2 + F_{2rad,acc^*} \bullet (x_2 + Z_2)}{1000} \leq M_{2k,acc}$$

$$M_{2k,eq^*} = \sqrt[3]{\frac{n_{2b1} \bullet t_{b1} \bullet M_{2kb1}{}^3 + \ldots + n_{2bn} \bullet t_{bn} \bullet M_{2kbn}{}^3}{n_{2b1} \bullet t_{b1} + \ldots + n_{2bn} \bullet t_{bn}}} \leq M_{2kN}$$

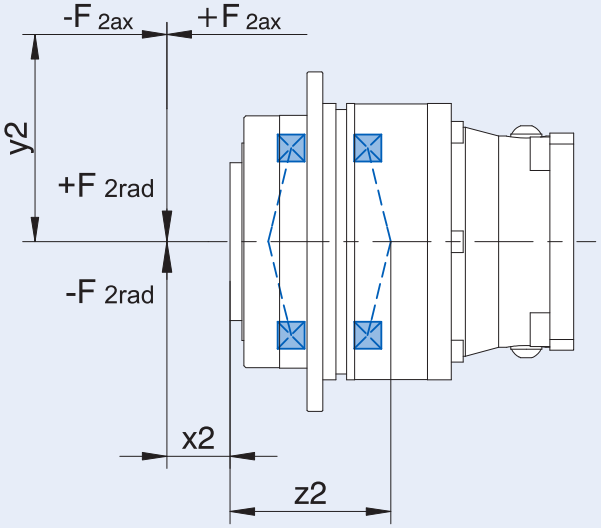
$$F_{2rad,eq^*} = \sqrt[3]{\frac{n_{2b1} \bullet t_{b1} \bullet F_{2rb1}{}^3 + \ldots + n_{2bn} \bullet t_{bn} \bullet F_{2rbn}{}^3}{n_{2b1} \bullet t_{b1} + \ldots + n_{2bn} \bullet t_{bn}}} \leq F_{2radN}$$

Where:

Z_2	Distance of Shaft Shoulder to Center of Output Bearing
n_2	Actual Average Output Speed
X_2	Distance of the Shaft Shoulder to the Force Application Point
Y_2	Distance of the Shaft Axis to the Axial Force Application Point
F_{2ax^*}	Actual Axial Force at Gear Unit Output
F_{2ax100}	Permitted Axial Force
$F_{2rad100}$	Permitted Radial Force ≤100RPM
$F_{2rad,acc}$	Radial Acceleration Force
F_{2rad,acc^*}	Radial Acceleration Force at Gear Unit Output
M_{2K100}	Permitted Tilting Torque ≤100RPM
$M_{2K,acc}$	Permitted Acceleration Tilting Torque
M_{2k,acc^*}	Permitted Acceleration Tilting Torque at Gear Unit Output
C_{2K}	Tilting Stiffness

All formulas shown are based on METRIC values

Upper case letters are permissible values. Lower case letters are for existing values.



The hours of life (L_h) of the unit can be determined by the following formula:

bearing life for duty cycle ≤ 40%

L_h > 10,000 hours if $M_{2K100}/M_{2A^*} < 1.25$ and > 1
L_h > 20,000 hours if $M_{2K100}/M_{2A^*} > 1.25$ and > 1.5
L_h > 30,000 hours if $M_{2K100}/M_{2A^*} < 1.5$

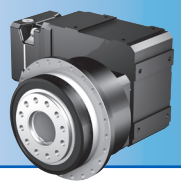
bearing life for duty cycle ≥ 40%

$$L_{hA} = L_h \left(\frac{40\%}{\text{Duty Cycle}} \right)$$

Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N}	M_{2acc}		M_{2NOT}	$\Delta\phi_2$		EL 1,2	EL 3,4,5,6	All	d_{MW}	J_1	C_2
		Nm	Nm	Nm	Nm	arcmin					mm	kgcm²	Nm/ arcmin
PHQ5K	**(continued next page)**												
22.00	22/1	280	492	492	667	4.0/2.0	PHQ531_0055K102_0040 ME10	3300	2800	5000	≤19	1.5	69
							PHQ531_0055K102_0040 ME20				≤24	3.4	70
30.62	8360/273	280	550	550	929	4.0/2.0	PHQ531_0055K102_0056 ME10	3300	2800	5000	≤19	1.3	70
							PHQ531_0055K102_0056 ME20				≤24	3.2	
33.00	33/1	280	550	550	948	4.0/2.0	PHQ531_0055K102_0060 ME10	3300	2800	5000	≤19	1.1	70
							PHQ531_0055K102_0060 ME20				≤24	3.0	
36.54	3289/90	280	550	550	948	4.0/2.0	PHQ531_0055K102_0066 ME10	3600	3300	5500	≤19	1.1	70
							PHQ531_0055K102_0066 ME20				≤24	2.9	
45.70	21,021/460	280	550	550	948	4.0/2.0	PHQ531_0055K102_0083 ME10	3600	3300	5500	≤19	0.93	70
							PHQ531_0055K102_0083 ME20				≤24	2.8	
50.87	9614/189	280	550	550	948	4.0/2.0	PHQ531_0055K102_0092 ME10	3600	3300	5500	≤19	0.97	70
							PHQ531_0055K102_0092 ME20				≤24	2.9	
55.77	5577/100	280	550	550	948	4.0/2.0	PHQ531_0055K102_0100 ME10	4000	3800	6000	≤19	0.85	70
							PHQ531_0055K102_0100 ME20	3700	3700		≤24	2.7	
63.61	1463/23	280	550	550	948	4.0/2.0	PHQ531_0055K102_0115 ME10	3600	3300	5500	≤19	0.88	70
							PHQ531_0055K102_0115 ME20				≤24	2.8	
69.40	4719/68	280	550	550	948	4.0/2.0	PHQ531_0055K102_0125 ME10	4000	3800	6000	≤19	0.79	70
							PHQ531_0055K102_0125 ME20	3700	3700		≤24	2.7	
77.63	2717/35	280	550	550	948	4.0/2.0	PHQ531_0055K102_0140 ME10	4000	3800	6000	≤19	0.82	70
							PHQ531_0055K102_0140 ME20	3700	3700		≤24	2.7	
91.93	1287/14	280	550	550	948	4.0/2.0	PHQ531_0055K102_0165 ME10	4000	4000	7000	≤19	0.73	70
							PHQ531_0055K102_0165 ME20	3700	3700	6000	≤24	2.6	
96.60	11,495/119	280	550	550	948	4.0/2.0	PHQ531_0055K102_0175 ME10	4000	3800	6000	≤19	0.77	70
							PHQ531_0055K102_0175 ME20	3700	3700		≤24	2.7	
110.8	4433/40	280	550	550	948	4.0/2.0	PHQ531_0055K102_0200 ME10	4000	4000	7000	≤19	0.71	70
							PHQ531_0055K102_0200 ME20	3700	3700	6000	≤24	2.6	

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Selection Data

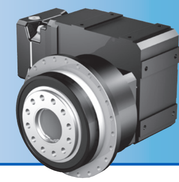


Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm²	Nm/ arcmin
PHQ5K	**(continued from previous page)**												
128.0	6270/49	280	550	550	948	4.0/2.0	PHQ531_0055K102_0230 ME10	4000	4000	7000	≤19	0.72	70
							PHQ531_0055K102_0230 ME20	3700	3700	6000	≤24	2.6	
138.7	13,871/100	280	550	550	948	4.0/2.0	PHQ531_0055K102_0250 ME10	4000	4000	7000	≤19	0.68	70
							PHQ531_0055K102_0250 ME20	3700	3700	6000	≤24	2.6	
154.3	6479/42	280	550	550	948	4.0/2.0	PHQ531_0055K102_0280 ME10	4000	4000	7000	≤19	0.70	70
							PHQ531_0055K102_0280 ME20	3700	3700	6000	≤24	2.6	
185.4	51,909/280	280	462	462	836	4.0/2.0	PHQ531_0055K102_0340 ME10	4000	4000	7000	≤19	0.63	70
193.1	20,273/105	280	550	550	948	4.0/2.0	PHQ531_0055K102_0350 ME10	4000	4000	7000	≤19	0.68	70
							PHQ531_0055K102_0350 ME20	3700	3700	6000	≤24	2.6	
221.7	4433/20	280	389	389	704	4.0/2.0	PHQ531_0055K102_0400 ME10	4000	4000	7000	≤19	0.62	70
258.0	25,289/98	280	550	550	948	4.0/2.0	PHQ531_0055K102_0470 ME10	4000	4000	7000	≤19	0.63	70
276.7	55,341/200	264	316	316	572	4.0/2.0	PHQ531_0055K102_0500 ME10	4000	4000	7000	≤19	0.62	70
308.5	6479/21	280	542	542	948	4.0/2.0	PHQ531_0055K102_0560 ME10	4000	4000	7000	≤19	0.62	70
385.2	26,961/70	280	440	440	797	4.0/2.0	PHQ531_0055K102_0700 ME10	4000	4000	7000	≤19	0.62	70

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Reducer Ratio (i)		Output Torque				Back-lash/ Red $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø d_{MW}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. [1] M_{2N}	Accel. M_{2acc}	M2 accHT	Peak [2] M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm²	Nm/ arcmin
PHQ7K (continued next page)													
22.00	22/1	500	921		1667	4.0/2.0	PHQ731_0055K202_0040 ME20	3000	2600	4500	≤32	6.6	134
							PHQ731_0055K202_0040 ME30				≤38	12	135
24.00	24/1	500	536		727	4.0/2.0	PHQ731_0055K202_0044 ME10	3000	2600	4500	≤19	2.8	131
			948		1819		PHQ731_0055K202_0044 ME20				≤32	6.2	135
							PHQ731_0055K202_0044 ME30				≤38	12	
28.47	2107/74	500	1004		2100	4.0/2.0	PHQ731_0055K202_0052 ME20	3000	2600	4500	≤32	5.7	135
							PHQ731_0055K202_0052 ME30				≤38	11	
33.00	33/1	500	737		1000	4.0/2.0	PHQ731_0055K202_0060 ME10	3000	2600	4500	≤19	2.4	133
			1050		2100		PHQ731_0055K202_0060 ME20				≤32	5.8	135
							PHQ731_0055K202_0060 ME30				≤38	11	
36.76	2279/62	500	822		1115	4.0/2.0	PHQ731_0055K202_0067 ME10	3500	3100	5000	≤19	1.8	134
			1050		2100		PHQ731_0055K202_0067 ME20				≤32	5.2	135
							PHQ731_0055K202_0067 ME30				≤38	10	136
39.15	23,177/592	500	1050		2100	4.0/2.0	PHQ731_0055K202_0071 ME20	3000	2600	4500	≤32	5.4	135
							PHQ731_0055K202_0071 ME30				≤38	11	136
46.18	1247/27	500	1032		1400	4.0/2.0	PHQ731_0055K202_0084 ME10	3500	3100	5000	≤19	1.4	134
			1050		2100		PHQ731_0055K202_0084 ME20				≤32	4.8	135
							PHQ731_0055K202_0084 ME30				≤38	10	136
50.55	25,069/496	500	1050		1533	4.0/2.0	PHQ731_0055K202_0092 ME10	3500	3100	5000	≤19	1.6	135
					2100		PHQ731_0055K202_0092 ME20				≤32	5.0	136
							PHQ731_0055K202_0092 ME30				≤38	10	
55.40	2881/52	500	1050		1680	4.0/2.0	PHQ731_0055K202_0100 ME10	3900	3500	5500	≤19	1.2	135
					2100		PHQ731_0055K202_0100 ME20	3700			≤32	4.6	136
							PHQ731_0055K202_0100 ME30	3500		5000	≤38	10	
63.50	13,717/216	500	1050		1925	4.0/2.0	PHQ731_0055K202_0115 ME10	3500	3100	5000	≤19	1.3	135
					2100		PHQ731_0055K202_0115 ME20				≤32	4.7	136
							PHQ731_0055K202_0115 ME30				≤38	10	
69.88	559/8	500	1050		2100	4.0/2.0	PHQ731_0055K202_0125 ME10	3900	3500	5500	≤19	1.1	135
							PHQ731_0055K202_0125 ME20	3700			≤32	4.5	136
							PHQ731_0055K202_0125 ME30	3500		5000	≤38	9.8	

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

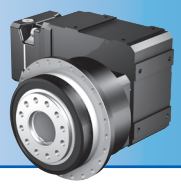


Reducer Ratio (i) Nom.	Reducer Ratio (i) Exact	Output Torque Nom. [1] M_{2N} Nm	Output Torque Accel. M_{2acc} Nm	Output Torque M2 accHT Nm	Output Torque Peak [2] M_{2NOT} Nm	Backlash/ Red $\Delta\phi_2$ arcmin	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1) Continuous EL 1,2	Max. Input Speed RPM (n1) Continuous EL 3,4,5,6	Max. Input Speed RPM (n1) Cyclic All	Motor Shaft [3] Max Ø d_{MW} mm	Input Inertia J_1 kgcm²	Tors. Stiffness C_2 Nm/ arcmin
PHQ7K	**(continued from previous page)**												
76.18	31,691/416	500	1050		2100	4.0/2.0	PHQ731_0055K202_0140 ME10	3900	3500	5500	≤19	1.1	135
							PHQ731_0055K202_0140 ME20	3700			≤32	4.5	136
							PHQ731_0055K202_0140 ME30	3500		5000	≤38	9.9	
92.72	2967/32	500	1050		2100	4.0/2.0	PHQ731_0055K202_0170 ME10	4000	3900	6500	≤19	0.90	135
							PHQ731_0055K202_0170 ME20	3700	3700	6000	≤32	4.3	136
							PHQ731_0055K202_0170 ME30	3500	3500	5000	≤38	9.6	
96.08	6149/64	500	1050		2100	4.0/2.0	PHQ731_0055K202_0175 ME10	3900	3500	5500	≤19	1.0	135
							PHQ731_0055K202_0175 ME20	3700			≤32	4.4	136
							PHQ731_0055K202_0175 ME30	3500		5000	≤38	9.7	
111.8	559/5	500	1050		2100	4.0/2.0	PHQ731_0055K202_0200 ME10	4000	3900	6500	≤19	0.83	136
							PHQ731_0055K202_0200 ME20	3700	3700	6000	≤24	2.7	
127.5	32,637/256	500	1050		2100	4.0/2.0	PHQ731_0055K202_0230 ME10	4000	3900	6500	≤19	0.87	136
							PHQ731_0055K202_0230 ME20	3700	3700	6000	≤32	4.3	
							PHQ731_0055K202_0230 ME30	3500	3500	5000	≤38	9.6	
138.2	1935/14	500	1050		2100	4.0/2.0	PHQ731_0055K202_0250 ME10	4000	3900	6500	≤19	0.77	136
							PHQ731_0055K202_0250 ME20	3700	3700	6000	≤24	2.7	
153.7	6149/40	500	1050		2100	4.0/2.0	PHQ731_0055K202_0280 ME10	4000	3900	6500	≤19	0.81	136
							PHQ731_0055K202_0280 ME20	3700	3700	6000	≤24	2.7	
184.9	1849/10	500	976		1765	4.0/2.0	PHQ731_0055K202_0340 ME10	4000	3900	6500	≤19	0.71	136
							PHQ731_0055K202_0340 ME20	3700	3700	6000	≤24	2.6	
190.0	21,285/112	500	1050		2100	4.0/2.0	PHQ731_0055K202_0350 ME10	4000	3900	6500	≤19	0.76	136
							PHQ731_0055K202_0350 ME20	3700	3700	6000	≤24	2.7	
222.2	1333/6	500	732		1126	4.0/2.0	PHQ731_0055K202_0400 ME10	4000	3900	6500	≤19	0.66	136
254.2	20,339/80	500	1050		2100	4.0/2.0	PHQ731_0055K202_0460 ME10	4000	3900	6500	≤19	0.71	136
							PHQ731_0055K202_0460 ME20	3700	3700	6000	≤24	2.6	
277.7	6665/24	500	610		1055	4.0/2.0	PHQ731_0055K202_0500 ME10	4000	3900	6500	≤19	0.64	136
305.5	14,663/48	500	1006		1548	4.0/2.0	PHQ731_0055K202_0560 ME10	4000	3900	6500	≤19	0.66	136
381.8	73,315/192	500	839		1451	4.0/2.0	PHQ731_0055K202_0690 ME10	4000	3900	6500	≤19	0.64	136

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Reducer Ratio (i)		Output Torque				Back-lash/ Red $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø d_{MW}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. [1] M_{2N}	Accel. M_{2acc}	M2 accHT	Peak [2] M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm²	Nm/ arcmin
PHQ8K (continued next page)													
22.00	22/1	1400	2421	4446		3.5/1.5	PHQ831_0055K402_0040 ME30	2600	2200	3800	≤38	20	395
							PHQ831_0055K402_0040 ME40				≤48	42	394
24.00	24/1	1400	2493	4850		3.5/1.5	PHQ831_0055K402_0044 ME30	2600	2200	3800	≤38	19	395
							PHQ831_0055K402_0044 ME40				≤48	40	
29.82	1849/62	1400	2680	4964		3.5/1.5	PHQ831_0055K402_0054 ME30	2600	2200	3800	≤38	16	397
							PHQ831_0055K402_0054 ME40				≤48	38	
33.00	33/1	1400	2772	4964		3.5/1.5	PHQ831_0055K402_0060 ME30	2600	2200	3800	≤38	17	397
							PHQ831_0055K402_0060 ME40				≤48	39	
36.95	2365/64	1400	2065	2801		3.5/1.5	PHQ831_0055K402_0067 ME20	3000	2600	4500	≤32	8.6	395
			2800	4964			PHQ831_0055K402_0067 ME30				≤38	14	398
							PHQ831_0055K402_0067 ME40				≤48	36	
41.01	20,339/496	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0075 ME30	2600	2200	3800	≤38	15	398
							PHQ831_0055K402_0075 ME40				≤48	37	
46.07	645/14	1400	2575	3492		3.5/1.5	PHQ831_0055K402_0084 ME20	3000	2600	4500	≤32	7.2	397
			2800	4964			PHQ831_0055K402_0084 ME30				≤38	13	398
							PHQ831_0055K402_0084 ME40				≤48	35	
50.81	26,015/512	1400	2800	3852		3.5/1.5	PHQ831_0055K402_0092 ME20	3000	2600	4500	≤32	7.7	397
				4964			PHQ831_0055K402_0092 ME30				≤38	13	399
							PHQ831_0055K402_0092 ME40				≤48	35	
55.54	1333/24	1400	2800	4209		3.5/1.5	PHQ831_0055K402_0100 ME20	3400	3000	5000	≤32	6.4	398
				4964			PHQ831_0055K402_0100 ME30				≤38	12	399
							PHQ831_0055K402_0100 ME40	3000		4500	≤48	34	
63.35	7095/112	1400	2800	4802		3.5/1.5	PHQ831_0055K402_0115 ME20	3000	2600	4500	≤32	6.7	398
				4964			PHQ831_0055K402_0115 ME30				≤38	12	399
							PHQ831_0055K402_0115 ME40				≤48	34	
69.62	1462/21	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0125 ME20	3400	3000	5000	≤32	5.7	398
							PHQ831_0055K402_0125 ME30				≤38	11	399
							PHQ831_0055K402_0125 ME40	3000		4500	≤48	33	

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*



Selection Data

Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N} Nm	M_{2acc} Nm	Nm	M_{2NOT} Nm	$\Delta\phi_2$ arcmin		EL 1,2	EL 3,4,5,6	All	d_{MW} mm	J_1 kgcm²	C_2 Nm/ arcmin

PHQ8K (continued from previous page)

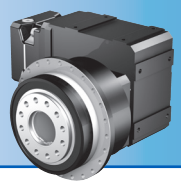
76.37	14,663/192	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0140 ME20	3400	3000	5000	≤32	6.1	399
							PHQ831_0055K402_0140 ME30				≤38	12	
							PHQ831_0055K402_0140 ME40	3000		4500	≤48	33	
93.16	559/6	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0170 ME20	3600	3300	5500	≤32	5.0	399
							PHQ831_0055K402_0170 ME30	3500		5000	≤38	11	
							PHQ831_0055K402_0170 ME40	3000	3000	4500	≤48	32	
95.73	8041/84	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0175 ME20	3400	3000	5000	≤32	5.5	399
							PHQ831_0055K402_0175 ME30				≤38	11	
							PHQ831_0055K402_0175 ME40	3000		4500	≤48	33	
111.1	1333/12	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0200 ME20	3600	3300	5500	≤32	4.8	399
							PHQ831_0055K402_0200 ME30	3500		5000	≤38	10	
128.1	6149/48	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0230 ME20	3600	3300	5500	≤32	4.9	399
							PHQ831_0055K402_0230 ME30	3500		5000	≤38	10	
							PHQ831_0055K402_0230 ME40	3000	3000	4500	≤48	32	
139.0	4171/30	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0250 ME20	3600	3300	5500	≤32	4.6	399
							PHQ831_0055K402_0250 ME30	3500		5000	≤38	9.9	
152.7	14,663/96	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0280 ME20	3600	3300	5500	≤32	4.7	399
							PHQ831_0055K402_0280 ME30	3500		5000	≤38	10	
185.2	2408/13	1400	2464	4069		3.5/1.5	PHQ831_0055K402_0340 ME20	3600	3300	5500	≤24	2.8	399
191.2	45,881/240	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0350 ME20	3600	3300	5500	≤32	4.5	399
							PHQ831_0055K402_0350 ME30	3500		5000	≤38	9.8	
222.8	2451/11	1400	1952	3529		3.5/1.5	PHQ831_0055K402_0410 ME20	3600	3300	5500	≤24	2.8	399
254.7	3311/13	1400	2800	4964		3.5/1.5	PHQ831_0055K402_0460 ME20	3600	3300	5500	≤24	2.8	399
277.3	5547/20	1400	1708	3088		3.5/1.5	PHQ831_0055K402_0500 ME20	3600	3300	5500	≤24	2.7	399
306.4	2451/8	1400	2684	4853		3.5/1.5	PHQ831_0055K402_0560 ME20	3600	3300	5500	≤24	2.7	399
381.4	61,017/160	1400	2348	4247		3.5/1.5	PHQ831_0055K402_0690 ME20	3600	3300	5500	≤24	2.7	400

[1] Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.
[2] Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)
** Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N}	M_{2acc}		M_{2NOT}	$\Delta\phi_2$		EL 1,2	EL 3,4,5,6	All	d_{MW}	J_1	C_2
		Nm	Nm	Nm	Nm	arcmin					mm	kgcm²	Nm/ arcmin
PHQ9K		**(continued next page)**											
44.08	1102/25	3800	5760	5760	8779	4.0/2.0	PHQ941_0060K513_0073 ME30	1900	1800	3200	≤38	26	767
							PHQ941_0060K513_0073 ME40				≤48	48	766
48.80	17081/350	3800	5760	5760	9720	4.0/2.0	PHQ941_0060K513_0081 ME30	1900	1800	3200	≤38	24	767
							PHQ941_0060K513_0081 ME40				≤48	46	
55.01	8526/155	3800	5760	5760	10954	4.0/2.0	PHQ941_0060K513_0092 ME30	1900	1800	3200	≤38	21	768
							PHQ941_0060K513_0092 ME40				≤48	43	
60.90	609/10	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0100 ME30	1900	1800	3200	≤38	20	769
							PHQ941_0060K513_0100 ME40				≤48	42	768
69.41	10759/155	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0115 ME30	2300	2200	3600	≤38	18	769
							PHQ941_0060K513_0115 ME40				≤48	40	
76.85	1537/20	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0130 ME30	2300	2200	3600	≤38	17	770
							PHQ941_0060K513_0130 ME40				≤48	39	769
87.22	11774/135	3800	4801	4801	6512	4.0/2.0	PHQ941_0060K513_0145 ME20	2300	2200	3600	≤32	9.9	768
			5760	5760	11250		PHQ941_0060K513_0145 ME30				≤38	15	770
							PHQ941_0060K513_0145 ME40				≤48	37	
96.56	26071/270	3800	5315	5315	7209	4.0/2.0	PHQ941_0060K513_0160 ME20	2300	2200	3600	≤32	9.4	769
			5760	5760	11250		PHQ941_0060K513_0160 ME30				≤38	15	770
							PHQ941_0060K513_0160 ME40				≤48	37	
104.9	6293/60	3800	5760	5760	7830	4.0/2.0	PHQ941_0060K513_0175 ME20	2800	2500	4200	≤32	8.5	769
					11250		PHQ941_0060K513_0175 ME30				≤38	14	770
							PHQ941_0060K513_0175 ME40				≤48	36	
116.1	27869/240	3800	5760	5760	8669	4.0/2.0	PHQ941_0060K513_0195 ME20	2800	2500	4200	≤32	8.2	769
					11250		PHQ941_0060K513_0195 ME30				≤38	14	770
							PHQ941_0060K513_0195 ME40				≤48	36	

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Selection Data



Reducer Ratio (i)		Output Torque				Back-lash/ Red $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø d_{MW}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. [1] M_{2N}	Accel. M_{2acc}	M2 accHT	Peak [2] M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm²	Nm/ arcmin

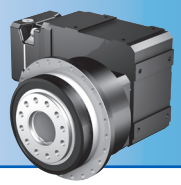
PHQ9K (continued from previous page)

132.0	2639/20	3800	5760	5760	9158	4.0/2.0	PHQ941_0060K513_0220 ME20	2800	2500	4200	≤32	7.2	770
					11250		PHQ941_0060K513_0220 ME30				≤38	13	771
							PHQ941_0060K513_0220 ME40				≤48	35	
146.1	11687/80	3800	5760	5760	10139	4.0/2.0	PHQ941_0060K513_0240 ME20	2800	2500	4200	≤32	7.0	770
					11250		PHQ941_0060K513_0240 ME30				≤38	12	771
							PHQ941_0060K513_0240 ME40				≤48	34	
175.1	14007/80	3800	5760	5760	10349	4.0/2.0	PHQ941_0060K513_0290 ME20	3400	3000	5000	≤32	6.1	770
					11250		PHQ941_0060K513_0290 ME30				≤38	12	771
							PHQ941_0060K513_0290 ME40	3000		4500	≤48	33	
193.8	62031/320	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0320 ME20	3400	3000	5000	≤32	6.0	771
							PHQ941_0060K513_0320 ME30				≤38	11	
							PHQ941_0060K513_0320 ME40	3000		4500	≤48	33	
208.8	1044/5	3800	5760	5760	11129	4.0/2.0	PHQ941_0060K513_0350 ME20	3400	3000	5000	≤32	5.6	771
							PHQ941_0060K513_0350 ME30				≤38	11	
231.2	8091/35	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0390 ME20	3400	3000	5000	≤32	5.5	771
							PHQ941_0060K513_0390 ME30				≤38	11	
261.0	261/1	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0440 ME20	3400	3000	5000	≤32	5.1	771
							PHQ941_0060K513_0440 ME30				≤38	10	
289.0	8091/28	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0480 ME20	3400	3000	5000	≤32	5.0	771
							PHQ941_0060K513_0480 ME30				≤38	10	
349.8	22736/65	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0580 ME20	3400	3000	5000	≤32	4.7	771
							PHQ941_0060K513_0580 ME30				≤38	10	
387.3	25172/65	3800	5760	5760	11250	4.0/2.0	PHQ941_0060K513_0650 ME20	3400	3000	5000	≤32	4.7	771
							PHQ941_0060K513_0650 ME30				≤38	10	
420.5	841/2	3800	5673	5673	7880	4.0/2.0	PHQ941_0060K513_0700 ME20	3400	3000	5000	≤24	3.0	771
465.6	26071/56	3800	5760	5760	8724	4.0/2.0	PHQ941_0060K513_0780 ME20	3400	3000	5000	≤24	3.0	771
523.7	26187/50	3800	4765	4765	7859	4.0/2.0	PHQ941_0060K513_0870 ME20	3400	3000	5000	≤24	2.8	771
579.9	115971/200	3800	5275	5275	8701	4.0/2.0	PHQ941_0060K513_0970 ME20	3400	3000	5000	≤24	2.8	771

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N}	M_{2acc}		M_{2NOT}	$\Delta\phi_2$		EL 1,2	EL 3,4,5,6	All	d_{MW}	J_1	C_2
		Nm	Nm	Nm	Nm	arcmin					mm	kgcm²	Nm/ arcmin
PHQ10K (continued next page)													
45.38	59535/1312	6500	10000	–	16947	4.0	PHQ1041_0060K713_0076 ME40	1700	1600	2700	≤48	93	1545
							PHQ1041_0060K713_0076 ME50				≤60	120	1551
50.24	263655/5248	6500	10000	–	18762	4.0	PHQ1041_0060K713_0084 ME40	1700	1600	2700	≤48	88	1548
							PHQ1041_0060K713_0084 ME50				≤60	116	1553
55.13	441/8	6500	10000	–	20000	4.0	PHQ1041_0060K713_0092 ME40	1700	1600	2700	≤48	77	1550
							PHQ1041_0060K713_0092 ME50				≤60	105	1554
61.03	1953/32	6500	10000	–	20000	4.0	PHQ1041_0060K713_0100 ME40	1700	1600	2700	≤48	74	1552
							PHQ1041_0060K713_0100 ME50				≤60	102	1555
70.69	70119/992	6500	10000	–	14077	4.0	PHQ1041_0060K713_0120 ME30	2000	1900	3200	≤38	41	1553
					20000		PHQ1041_0060K713_0120 ME40				≤48	63	1554
							PHQ1041_0060K713_0120 ME50				≤60	91	1557
78.26	10017/128	6500	10000	–	15584	4.0	PHQ1041_0060K713_0130 ME30	2000	1900	3200	≤38	39	1555
					20000		PHQ1041_0060K713_0130 ME40				≤48	62	
							PHQ1041_0060K713_0130 ME50				≤60	89	1557
88.81	1421/16	6500	10000	–	17637	4.0	PHQ1041_0060K713_0150 ME30	2000	1900	3200	≤38	32	1556
					20000		PHQ1041_0060K713_0150 ME40				≤48	55	1557
							PHQ1041_0060K713_0150 ME50				≤60	83	1558
98.33	6293/64	6500	10000	–	19525	4.0	PHQ1041_0060K713_0165 ME30	2000	1900	3200	≤38	31	1557
					20000		PHQ1041_0060K713_0165 ME40				≤48	54	
							PHQ1041_0060K713_0165 ME50				≤60	81	1559
109.7	80703/736	6500	10000	–	20000	4.0	PHQ1041_0060K713_0185 ME30	2400	2200	3600	≤38	26	1558
							PHQ1041_0060K713_0185 ME40				≤48	49	
							PHQ1041_0060K713_0185 ME50				≤60	77	1559
121.4	357399/2944	6500	10000	–	20000	4.0	PHQ1041_0060K713_0200 ME30	2400	2200	3600	≤38	26	1558
							PHQ1041_0060K713_0200 ME40				≤48	48	
							PHQ1041_0060K713_0200 ME50				≤60	76	1559
136.4	43659/320	6500	10000	–	20000	4.0	PHQ1041_0060K713_0230 ME30	2400	2200	3600	≤38	22	1559
							PHQ1041_0060K713_0230 ME40				≤48	44	
							PHQ1041_0060K713_0230 ME50				≤60	72	1560

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*



Selection Data

Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N} Nm	M_{2acc} Nm	Nm	M_{2NOT} Nm	$\Delta\phi_2$ arcmin		EL 1,2	EL 3,4,5,6	All	d_{MW} mm	J_1 kgcm²	C_2 Nm/ arcmin
PHQ10K	**(continued from previous page)**												
151.1	193347/1280	6500	10000	–	20000	4.0	PHQ1041_0060K713_0250 ME30	2400	2200	3600	≤38	21	1559
							PHQ1041_0060K713_0250 ME40				≤48	44	
							PHQ1041_0060K713_0250 ME50				≤60	72	1560
175.7	22491/128	6500	10000	–	20000	4.0	PHQ1041_0060K713_0290 ME30	2900	2600	4200	≤38	18	1559
							PHQ1041_0060K713_0290 ME40				≤48	40	1560
							PHQ1041_0060K713_0290 ME50	2500	2500	4000	≤60	68	
194.5	99603/512	6500	10000	–	20000	4.0	PHQ1041_0060K713_0320 ME30	2900	2600	4200	≤38	17	1560
							PHQ1041_0060K713_0320 ME40				≤48	40	
							PHQ1041_0060K713_0320 ME50			4000	≤60	68	
212.6	1701/8	6500	10000	–	20000	4.0	PHQ1041_0060K713_0350 ME30	2900	2600	4200	≤38	16	1560
							PHQ1041_0060K713_0350 ME40				≤48	37	
							PHQ1041_0060K713_0350 ME50	2500	2500	4000	≤60	66	
235.4	7533/32	6500	10000	–	20000	4.0	PHQ1041_0060K713_0390 ME30	2900	2600	4200	≤38	15	1560
							PHQ1041_0060K713_0390 ME40				≤48	37	
							PHQ1041_0060K713_0390 ME50	2500	2500	4000	≤60	66	
270.3	112455/416	6500	10000	–	20000	4.0	PHQ1041_0060K713_0450 ME30	2900	2600	4200	≤38	14	1560
							PHQ1041_0060K713_0450 ME40				≤48	35	
							PHQ1041_0060K713_0450 ME50	2500	2500	4000	≤60	65	
299.3	498015/1664	6500	10000	–	20000	4.0	PHQ1041_0060K713_0500 ME30	2900	2600	4200	≤38	13	1560
							PHQ1041_0060K713_0500 ME40				≤48	35	
							PHQ1041_0060K713_0500 ME50	2500	2500	4000	≤60	64	
351.4	22491/64	6500	10000	–	20000	4.0	PHQ1041_0060K713_0590 ME30	2900	2600	4200	≤38	12	1560
							PHQ1041_0060K713_0590 ME40				≤48	34	
							PHQ1041_0060K713_0590 ME50	2500	2500	4000	≤60	63	
389.1	99603/256	6500	10000	–	20000	4.0	PHQ1041_0060K713_0650 ME30	2900	2600	4200	≤38	12	1560
							PHQ1041_0060K713_0650 ME40				≤48	34	
							PHQ1041_0060K713_0650 ME50	2500	2500	4000	≤60	63	
427.2	13671/32	6500	10000	–	17839	4.0	PHQ1041_0060K713_0710 ME30	2900	2600	4200	≤38	11	1560
473.0	60543/128	6500	10000	–	19749	4.0	PHQ1041_0060K713_0790 ME30	2900	2600	4200	≤38	11	1560
534.0	68355/128	6500	10000	–	18207	4.0	PHQ1041_0060K713_0890 ME30	2900	2600	4200	≤38	11	1560
591.2	302715/512	6500	10000	–	20000	4.0	PHQ1041_0060K713_0990 ME30	2900	2600	4200	≤38	11	1560

[1] Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.
[2] Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)
** Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

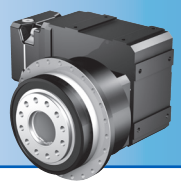
Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N} Nm	M_{2acc} Nm	Nm	M_{2NOT} Nm	$\Delta\phi_2$ arcmin		EL 1,2	EL 3,4,5,6	All	d_{MW} mm	J_1 kgcm²	C_2 Nm/ arcmin

PHQ11K (continued next page)

44.67	3127/70	12299	12299	–	16681	4.0	PHQ1141_0060K813_0074 ME40	1600	1500	2600	≤48	178	2578
							PHQ1141_0060K813_0074 ME50				≤60	206	2595
49.46	96937/1960	13000	13617	–	18470	4.0	PHQ1141_0060K813_0082 ME40	1600	1500	2600	≤48	164	2586
							PHQ1141_0060K813_0082 ME50				≤60	192	2600
55.70	11977/215	13000	15334	–	20797	4.0	PHQ1141_0060K813_0093 ME40	1600	1500	2600	≤48	136	2594
							PHQ1141_0060K813_0093 ME50				≤60	164	2605
61.67	53041/860	13000	16978	–	23027	4.0	PHQ1141_0060K813_0105 ME40	1600	1500	2600	≤48	127	2599
							PHQ1141_0060K813_0105 ME50				≤60	155	2608
89.05	28497/320	13000	22000	–	33239	4.0	PHQ1141_0060K813_0150 ME40	1900	1800	3000	≤48	83	2612
							PHQ1141_0060K813_0150 ME50				≤60	111	2616
98.59	126201/1280	13000	22000	–	36803	4.0	PHQ1141_0060K813_0165 ME40	1900	1800	3000	≤48	79	2614
							PHQ1141_0060K813_0165 ME50				≤60	107	2617
104.0	30149/290	11663	15259	–	20696	4.0	PHQ1141_0060K813_0175 ME30	2300	2100	3500	≤38	50	2614
							PHQ1141_0060K813_0175 ME40				≤48	73	2615
		13000	22000	–	38804		PHQ1141_0060K813_0175 ME50				≤60	101	2618
115.1	133517/1160	12912	16895	–	22915	4.0	PHQ1141_0060K813_0190 ME30	2300	2100	3500	≤38	48	2616
					42965		PHQ1141_0060K813_0190 ME40				≤48	70	
							PHQ1141_0060K813_0190 ME50				≤60	98	2619
138.3	31801/230	12400	18048	–	24479	4.0	PHQ1141_0060K813_0230 ME30	2300	2100	3500	≤38	36	2618
	31801/230	13000	22000		44000		PHQ1141_0060K813_0230 ME40				≤48	59	2619
							PHQ1141_0060K813_0230 ME50				≤60	87	2620
153.1	140833/920	13000	19983	–	27103	4.0	PHQ1141_0060K813_0260 ME30	2300	2100	3500	≤38	35	2619
			22000		44000		PHQ1141_0060K813_0260 ME40				≤48	57	
							PHQ1141_0060K813_0260 ME50				≤60	85	2621
175.5	7021/40	13000	21591	–	29284	4.0	PHQ1141_0060K813_0290 ME30	2800	2500	4000	≤38	28	2620
			22000		44000		PHQ1141_0060K813_0290 ME40				≤48	50	
							PHQ1141_0060K813_0290 ME50				≤60	78	2621

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Selection Data



Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N} Nm	M_{2acc} Nm	Nm	M_{2NOT} Nm	$\Delta\phi_2$ arcmin		EL 1,2	EL 3,4,5,6	All	d_{MW} mm	J_1 kgcm²	C_2 Nm/ arcmin

PHQ11K (continued from previous page)

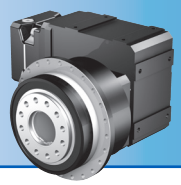
194.3	31093/160	13000	22000	–	32424	4.0	PHQ1141_0060K813_0320 ME30	2800	2500	4000	≤38	27	2621
					44000		PHQ1141_0060K813_0320 ME40				≤48	50	
							PHQ1141_0060K813_0320 ME50				≤60	77	2622
216.8	8673/40	13000	22000	–	30353	4.0	PHQ1141_0060K813_0360 ME30	2800	2500	4000	≤38	23	2621
					44000		PHQ1141_0060K813_0360 ME40				≤48	45	
							PHQ1141_0060K813_0360 ME50	2500			≤60	73	2622
240.1	38409/160	13000	22000	–	33607	4.0	PHQ1141_0060K813_0400 ME30	2800	2500	4000	≤38	22	2622
					44000		PHQ1141_0060K813_0400 ME40				≤48	45	
							PHQ1141_0060K813_0400 ME50	2500			≤60	72	
265.5	531/2	13000	22000	–	34112	4.0	PHQ1141_0060K813_0440 ME30	2800	2500	4000	≤38	19	2622
							PHQ1141_0060K813_0440 ME40				≤48	41	
							PHQ1141_0060K813_0440 ME50	2500			≤60	70	
293.9	16461/56	13000	22000	–	37770	4.0	PHQ1141_0060K813_0490 ME30	2800	2500	4000	≤38	18	2622
							PHQ1141_0060K813_0490 ME40				≤48	40	
							PHQ1141_0060K813_0490 ME50	2500			≤60	69	
354.5	42539/120	13000	22000	–	39925	4.0	PHQ1141_0060K813_0590 ME30	2800	2500	4000	≤38	15	2622
							PHQ1141_0060K813_0590 ME40				≤48	37	
							PHQ1141_0060K813_0590 ME50	2500			≤60	66	2623
392.5	188387/480	13000	22000	–	44000	4.0	PHQ1141_0060K813_0650 ME30	2800	2500	4000	≤38	15	2623
							PHQ1141_0060K813_0650 ME40				≤48	37	
							PHQ1141_0060K813_0650 ME50	2500			≤60	66	
430.2	10325/24	13000	22000	–	43909	4.0	PHQ1141_0060K813_0720 ME30	2800	2500	4000	≤38	14	2623
							PHQ1141_0060K813_0720 ME40				≤48	35	
							PHQ1141_0060K813_0720 ME50	2500			≤60	64	
476.3	45725/96	13000	22000	–	44000	4.0	PHQ1141_0060K813_0790 ME30	2800	2500	4000	≤38	13	2623
							PHQ1141_0060K813_0790 ME40				≤48	35	
							PHQ1141_0060K813_0790 ME50	2500			≤60	64	
526.6	21063/40	13000	15237	–	20667	4.0	PHQ1141_0060K813_0880 ME30	2800	2500	4000	≤38	12	2623
583.0	93279/160	13000	16871	–	22883	4.0	PHQ1141_0060K813_0970 ME30	2800	2500	4000	≤38	12	2623

[1] Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.
[2] Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)
** Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Reducer Ratio (i)		Output Torque				Back-lash/ Red	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	M2 accHT	Peak [2]			Continuous		Cyclic			
		M_{2N}	M_{2acc}		M_{2NOT}	$\Delta\phi_2$					d_{MW}	J_1	C_2
Nom.	Exact	Nm	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm²	Nm/ arcmin
PHQ12K	**(continued next page)**												
75.15	221247/2944	20689	20689	–	28062	4.0	PHQ1241_0060K913_0125 ME40	1800	1800	2800	≤48	195	4614
							PHQ1241_0060K913_0125 ME50				≤60	223	4633
114.4	915/8	25000	31485	–	42705	4.0	PHQ1241_0060K913_0190 ME40	2200	2100	3300	≤48	119	4643
							PHQ1241_0060K913_0190 ME50				≤60	147	4651
143.7	266631/1856	25000	39537	–	53625	4.0	PHQ1241_0060K913_0240 ME40	2200	2100	3300	≤48	94	4651
							PHQ1241_0060K913_0240 ME50				≤60	122	4656
192.7	141825/736	25000	43000	–	71941	4.0	PHQ1241_0060K913_0320 ME40	2600	2500	3800	≤48	72	4657
							PHQ1241_0060K913_0320 ME50	2500			≤60	100	4660
228.3	584319/2560	25000	43000	–	78148	4.0	PHQ1241_0060K913_0380 ME40	2600	2500	3800	≤48	63	4659
							PHQ1241_0060K913_0380 ME50	2500			≤60	91	4661
293.6	300669/1024	25000	43000	–	80000	4.0	PHQ1241_0060K913_0490 ME40	2600	2500	3800	≤48	52	4661
							PHQ1241_0060K913_0490 ME50	2500			≤60	80	4663
378.4	629703/1664	25000	43000	–	80000	4.0	PHQ1241_0060K913_0630 ME40	2600	2500	3800	≤48	45	4663
							PHQ1241_0060K913_0630 ME50	2500			≤60	73	
450.0	187209/416	25000	39283	–	53281	4.0	PHQ1241_0060K913_0750 ME40	2600	2500	3800	≤48	41	4663
							PHQ1241_0060K913_0750 ME50	2500			≤60	70	4664
554.1	7199037/12992	25000	39537	–	53625	4.0	PHQ1241_0060K914_0920 ME40	2600	2500	3800	≤48	37	4664
562.7	4177219/7424	16474	16676	–	22618	4.0	PHQ1241_0060K914_0940 ME30	2600	2500	3800	≤38	14	4663
572.5	293105/512	25000	37154	–	57728	4.0	PHQ1241_0060K913_0950 ME40	2600	2500	3800	≤48	38	4664
							PHQ1241_0060K913_0950 ME50	2500			≤60	67	
743.3	3829275/5152	25000	43000	–	71941	4.0	PHQ1241_0060K914_1240 ME40	2600	2500	3800	≤48	36	4664
754.7	2221925/2944	22100	22369	–	30340	4.0	PHQ1241_0060K914_1260 ME30	2600	2500	3800	≤38	12	4664
880.4	15776613/17920	25000	43000	–	78148	4.0	PHQ1241_0060K914_1470 ME40	2600	2500	3800	≤48	35	4664
894.0	9154331/10240	25000	26496	–	35937	4.0	PHQ1241_0060K914_1490 ME30	2600	2500	3800	≤38	12	4664

[1] Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.
[2] Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)
** Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*

Selection Data



Reducer Ratio (i)		Output Torque				Back-lash/ Red $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft [3] Max Ø d_{MW}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. [1] M_{2N}	Accel. M_{2acc}	M2 accHT	Peak [2] M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm²	Nm/ arcmin
PHQ12K (continued next page)													
1133	8118063/7168	25000	43000	–	80000	4.0	PHQ1241_0060K914_1890 ME40	2600	2500	3800	≤48	34	4664
1150	4710481/4096	25000	29221	–	39634	4.0	PHQ1241_0060K914_1920 ME30	2600	2500	3800	≤38	11	4664
1460	17001981/11648	25000	43000	–	80000	4.0	PHQ1241_0060K914_2430 ME40	2600	2500	3800	≤48	34	4665
1482	9865347/6656	25000	33011	–	44775	4.0	PHQ1241_0060K914_2470 ME30	2600	2500	3800	≤38	11	4665
1763	2932941/1664	25000	39283	–	53281	4.0	PHQ1241_0060K914_2940 ME30	2600	2500	3800	≤38	10	4665
2242	13775935/6144	25000	37154	–	57728	4.0	PHQ1241_0060K914_3740 ME30	2600	2500	3800	≤38	10	4665

[1] *Based on input speed of 2000 RPM. See page <?>.for details on torque calculations.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
* *Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)*