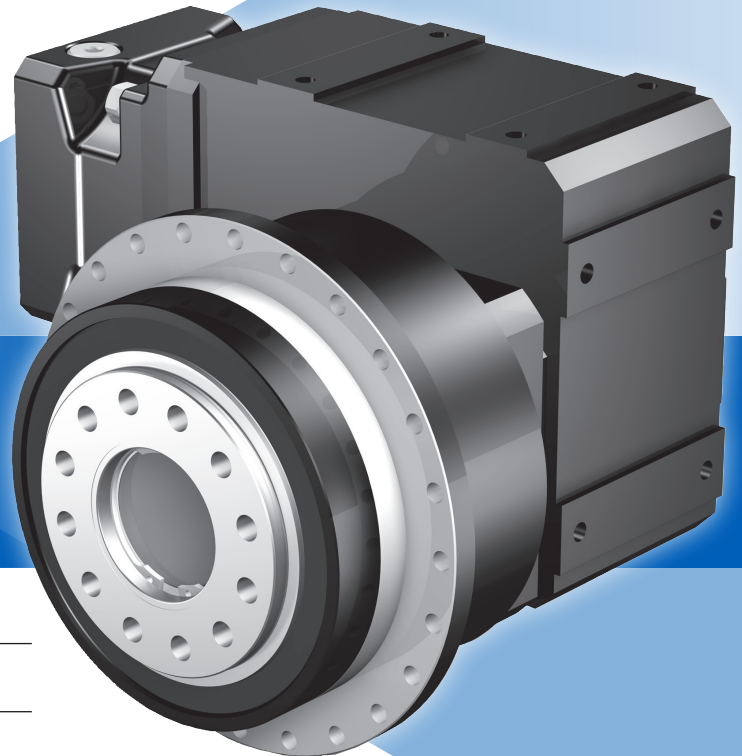


PHQK Series: RIGHT ANGLE – Flange Output

PHQK Features

- 22:1 to 591:1 ratios (higher ratios available. Contact STÖBER.)
- 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

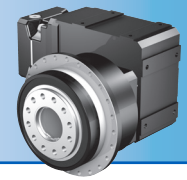
STÖBER PHQK Series combines planetary and helical gearing. The PHQK provides a more compact, precise solution, and can handle higher input speeds. Every gearbox is made to order. STÖBER will custom whatever you need to fit your application. Contact us today to learn more.



**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 256)
Coating	Standard Black (RAL-9005)
Degree of Protection	IP65
Direction of Rotation	See page 257
Efficiency	PHQK: 94%
Input RPM	Up to 6,000 RPM
Installation	Requires 12.9 fasteners. See page 306, 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 PHQK 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:

PHQK **1** **2** **3** **4** **5** **6** **7** **8** **9** **0** **!** **@** **EL1** *

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	Version of gearhead
4 # of Stages	1	One stage
5 Housing	S	Standard mounting style
6 Output Shaft	F	Flange output
7 Bearing	S V	Standard (Size 5-8 only) Reinforced Bearing (Size 5)
8 Backlash	S	Standard Backlash (Size 5-8 only)
9 Ratio	0030	Ratios range from 5.5:1 to 6:1 (0055=5.5:1)
0 Secondary Unit	K523VF	K Series helical/bevel unit: 6 sizes, 1, 2 or 3 stages, with output shaft (V) and flange (F)
! Secondary Unit Ratio	0010	Ratios from 4:1 to 99:1 (0010=1:1; 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

PHQK Series: RIGHT ANGLE – Flange Output

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 Series: RIGHT ANGLE – Flange Output

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	4000	4000	3600	3400	2900	2800	2600
	Cyclic	7000	6500	5500	5000	4200	4000	3800
Efficiency (@nom torque)	%	93	93	93	92	92	92	92
Weight	kg	17.9	32.6	74.4	96.7	164.1	304.5	556.2
	lbs	39.4	71.7	163.7	212.7	361	669.9	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	1500	3500	7500	8800	11,000	15,000

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	–	–	–	–	–	–

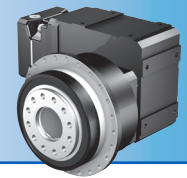
¹⁾ Ratings based on input speed (n_1) of 1500 RPM.

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 STÖBER 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 259.

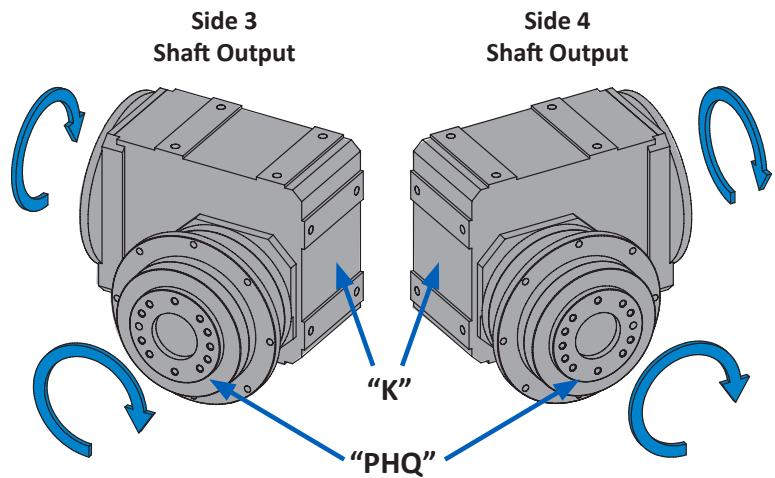


Overview

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.**

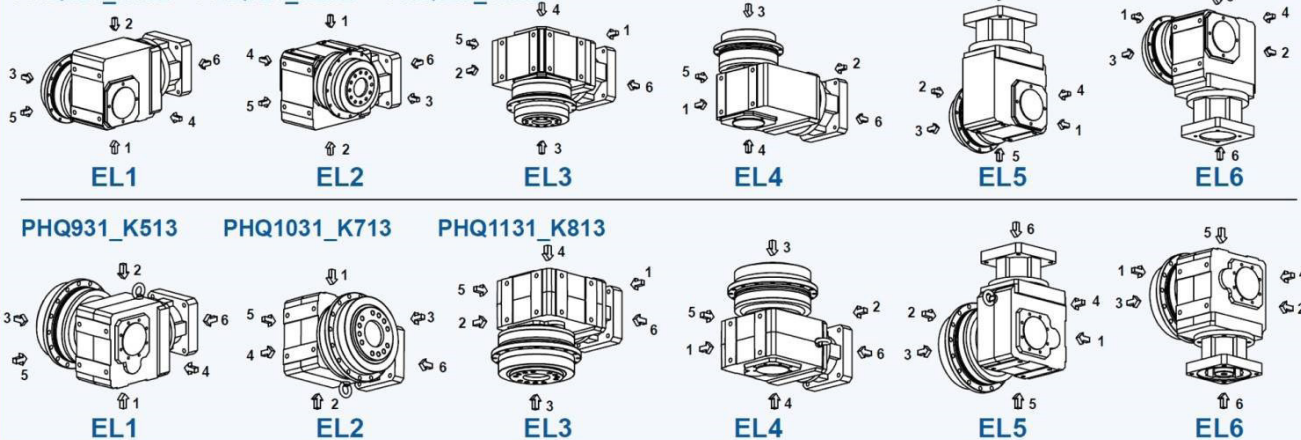


PHQK Series: RIGHT ANGLE – Flange Output

PHQK Mounting Position Options

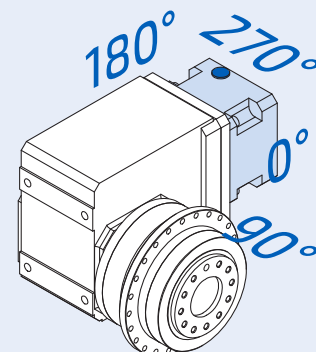
When ordering, the mounting in position (EL1, EL2, EL3, EL4, EL5, EL6) **MUST BE SPECIFIED**

PHQ521_K102 PHQ721_K202 PHQ821_K402



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: RIGHT ANGLE – Flange Output

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:

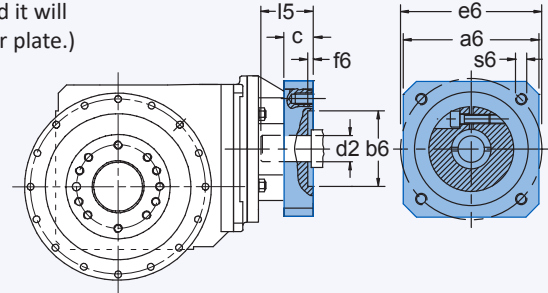
- Specify the motor manufacturer and part number
- Provide the motor drawing with dimensions, or specify the motor mounting dimensions (per the list shown at right)

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)

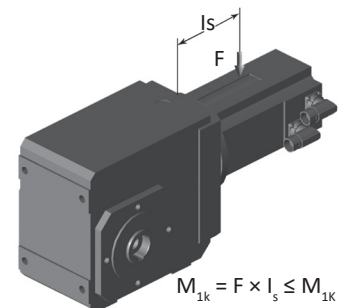
	ME10	ME20	ME30	ME40	ME50
Maximum Allowed Motor Shaft Dia. d2	19	32	38	48	60
Minimum Allowed Motor Plate Thickness c*	21	24	25	33	43

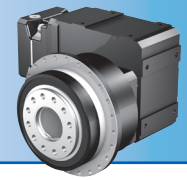
* Note that the c motor plate thickness is determined by the motor shaft length. The minimum motor plate thickness is the value listed.

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





Overview

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	70,968	7500	11,000	7500
10	171.0	50,000	51,462	73,099	8800	12,500	9500
11	231	60,000	47,619	60,606	11,000	14,000	9500
12	281	70,000	53,380	71,040	15,000	20,000	14,000

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: RIGHT ANGLE – Flange Output

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 n₂ is the desired speed:

$$F_{2radN} = \frac{F_{2rad100}}{\sqrt[3]{\frac{n_{2m} \cdot n_2}{100}}} \quad F_{2ax} = \frac{F_{2ax100}}{\sqrt[3]{\frac{n_2}{100}}} \quad M_{2KX} = \frac{M_{2K100}}{\sqrt[3]{\frac{n_2}{100}}}$$

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

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

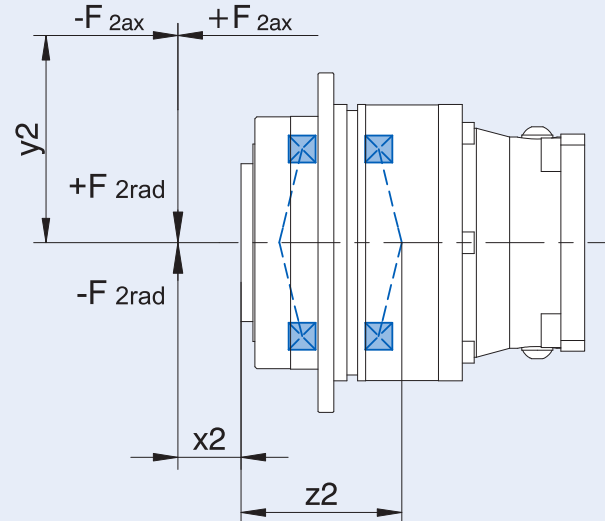
$$M_{2K,eq*} = \sqrt[3]{\frac{n_{2b1} \cdot t_{b1} \cdot M_{2Kb1}^3 + \dots + n_{2bn} \cdot t_{bn} \cdot M_{2Kbn}^3}{n_{2b1} \cdot t_{b1} + \dots + n_{2bn} \cdot t_{bn}}} \leq M_{2K}$$

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

Where:

- Z₂ Distance of Shaft Shoulder to Center of Output Bearing
- n₂ Actual Average Output Speed
- X₂ Distance of the Shaft Shoulder to the Force Application Point
- Y₂ 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%

$$L_h > 10,000 \text{ hours if } M_{2K100}/M_{2A*} < 1.25 \text{ and } > 1$$

$$L_h > 20,000 \text{ hours if } M_{2K100}/M_{2A*} > 1.25 \text{ and } > 1.5$$

$$L_h > 30,000 \text{ hours if } M_{2K100}/M_{2A*} < 1.5$$

bearing life for duty cycle ≥ 40%

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

PHQK Series: RIGHT ANGLE – Flange Output

Reducer Ratio (i)		Output Torque			Back-lash $\Delta\phi_2$ arcmin	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d _{MW} mm	Input Inertia J ₁ kgcm ²	Tors. Stiffness C ₂ Nm/arcmin
		Nom. ¹⁾ M _{2N} Nm	Accel. M _{2acc} Nm	Peak ²⁾ M _{2NOT} Nm			Continuous		Cyclic			
							EL 1,2	EL 3,4,5,6	All			

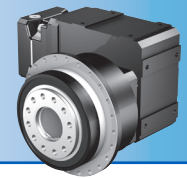
PHQ5K (continued next page)

22.00	22/1	280	492	667	4.0	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	928	4.0	PHQ531_0055K102_0056 ME10	3300	2800	5000	≤19	1.3	70
						PHQ531_0055K102_0056 ME20				≤24	3.2	
33.00	33/1	280	550	948	4.0	PHQ531_0055K102_0060 ME10	3300	2800	5000	≤19	1.1	70
						PHQ531_0055K102_0060 ME20				≤24	3.0	
36.54	3289/90	280	550	948	4.0	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	948	4.0	PHQ531_0055K102_0083 ME10	3600	3300	5500	≤19	0.93	70
						PHQ531_0055K102_0083 ME20				≤24	2.8	
50.87	9614/189	280	550	948	4.0	PHQ531_0055K102_0092 ME10	3600	3300	5500	≤19	0.97	70
						PHQ531_0055K102_0092 ME20				≤24	2.9	
55.77	5577/100	280	550	948	4.0	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	948	4.0	PHQ531_0055K102_0115 ME10	3600	3300	5500	≤19	0.88	70
						PHQ531_0055K102_0115 ME20				≤24	2.8	
69.40	4719/68	280	550	948	4.0	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	948	4.0	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	948	4.0	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	948	4.0	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	948	4.0	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 258 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 $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d_{mw}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. ¹⁾ M_{2N}	Accel. M_{2acc}	Peak ²⁾ M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm ²	Nm/ arcmin

PHQ5K (continued from previous page)

128.0	6270/49	280	550	948	4.0	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	948	4.0	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	948	4.0	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	836	4.0	PHQ531_0055K102_0340 ME10	4000	4000	7000	≤ 19	0.63	70
193.1	20,273/105	280	550	948	4.0	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	704	4.0	PHQ531_0055K102_0400 ME10	4000	4000	7000	≤ 19	0.62	70
258.0	25,289/98	280	550	948	4.0	PHQ531_0055K102_0470 ME10	4000	4000	7000	≤ 19	0.63	70
276.7	55,341/200	264	316	572	4.0	PHQ531_0055K102_0500 ME10	4000	4000	7000	≤ 19	0.62	70
308.5	6479/21	280	542	948	4.0	PHQ531_0055K102_0560 ME10	4000	4000	7000	≤ 19	0.62	70
385.2	26,961/70	280	440	797	4.0	PHQ531_0055K102_0700 ME10	4000	4000	7000	≤ 19	0.62	70

PHQK Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 2000 RPM. See page 258 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)

PHQK Series: RIGHT ANGLE – Flange Output

Reducer Ratio (i)		Output Torque			Back-lash $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂
		Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Peak ²⁾ M _{2NOT}			Continuous		Cyclic			
		Nm	Nm	Nm			EL 1,2	EL 3,4,5,6	All			

PHQ7K (continued next page)

22.00	22/1	500	921	1667	4.0	PHQ731_0055K202_0040 ME20	3000	2600	4500	≤32	6.6	134	
						PHQ731_0055K202_0040 ME30				≤38		12	135
24.00	24/1	500	536	728	4.0	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	PHQ731_0055K202_0052 ME20	3000	2600	4500	≤32	5.7	135	
						PHQ731_0055K202_0052 ME30				≤38			11
33.00	33/1	500	738	1000	4.0	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	821	1114	4.0	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	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	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	1532	4.0	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	1679	4.0	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	
63.50	13,717/216	500	1050	1925	4.0	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	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	

¹⁾ Based on input speed of 2000 RPM. See page 258 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			Backlash $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d_{mw}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. ¹⁾ M_{2N}	Accel. M_{2acc}	Peak ²⁾ M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm ²	Nm/ arcmin

PHQ7K (continued from previous page)

76.18	31,691/416	500	1050	2100	4.0	PHQ731_0055K202_0140 ME10	3900	3500	5500	≤ 19	1.1	135
						PHQ731_0055K202_0140 ME20	3700			≤ 32	4.5	
						PHQ731_0055K202_0140 ME30	3500			5000	≤ 38	
92.72	2967/32	500	1050	2100	4.0	PHQ731_0055K202_0170 ME10	4000	3900	6500	≤ 19	0.90	135
						PHQ731_0055K202_0170 ME20	3700	3700	6000	≤ 32	4.3	
						PHQ731_0055K202_0170 ME30	3500	3500	5000	≤ 38	9.6	
96.08	6149/64	500	1050	2100	4.0	PHQ731_0055K202_0175 ME10	3900	3500	5500	≤ 19	1.0	135
						PHQ731_0055K202_0175 ME20	3700			≤ 32	4.4	
						PHQ731_0055K202_0175 ME30	3500			5000	≤ 38	
111.8	559/5	500	1050	2100	4.0	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	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	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	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	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	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	1146	4.0	PHQ731_0055K202_0400 ME10	4000	3900	6500	≤ 19	0.66	136
254.2	20,339/80	500	1050	2100	4.0	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	1103	4.0	PHQ731_0055K202_0500 ME10	4000	3900	6500	≤ 19	0.64	136
305.5	14,663/48	500	1006	1576	4.0	PHQ731_0055K202_0560 ME10	4000	3900	6500	≤ 19	0.66	136
381.8	73,315/192	500	839	1517	4.0	PHQ731_0055K202_0690 ME10	4000	3900	6500	≤ 19	0.64	136

PHQK Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 2000 RPM. See page 258 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)

PHQK Series: RIGHT ANGLE – Flange Output

Reducer Ratio (i)		Output Torque			Back-lash $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂
		Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Peak ²⁾ M _{2NOT}			Continuous		Cyclic			
		Nm	Nm	Nm			EL 1,2	EL 3,4,5,6	All			

PHQ8K (continued next page)

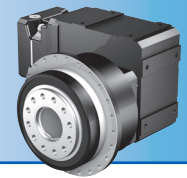
22.00	22/1	1400	2421	4446	3.5	PHQ831_0055K402_0040 ME30	2600	2200	3800	≤38	20	395
						PHQ831_0055K402_0040 ME40				≤48	42	394
24.00	24/1	1400	2493	4850	3.5	PHQ831_0055K402_0044 ME30	2600	2200	3800	≤38	19	395
						PHQ831_0055K402_0044 ME40				≤48	40	
29.82	1849/62	1400	2680	5087	3.5	PHQ831_0055K402_0054 ME30	2600	2200	3800	≤38	16	397
						PHQ831_0055K402_0054 ME40				≤48	38	
33.00	33/1	1400	2772	5087	3.5	PHQ831_0055K402_0060 ME30	2600	2200	3800	≤38	17	397
						PHQ831_0055K402_0060 ME40				≤48	39	
36.95	2365/64	1400	2065	2800	3.5	PHQ831_0055K402_0067 ME20	3000	2600	4500	≤32	8.6	395
			2800	5087		PHQ831_0055K402_0067 ME30				≤38	14	398
						PHQ831_0055K402_0067 ME40				≤48	36	
41.01	20,339/496	1400	2800	5087	3.5	PHQ831_0055K402_0075 ME30	2600	2200	3800	≤38	15	398
						PHQ831_0055K402_0075 ME40				≤48	37	
46.07	645/14	1400	2574	3492	3.5	PHQ831_0055K402_0084 ME20	3000	2600	4500	≤32	7.2	397
			2800	5087		PHQ831_0055K402_0084 ME30				≤38	13	398
						PHQ831_0055K402_0084 ME40				≤48	35	
50.81	26,015/512	1400	2800	3850	3.5	PHQ831_0055K402_0092 ME20	3000	2600	4500	≤32	7.7	397
				5087		PHQ831_0055K402_0092 ME30				≤38	13	399
						PHQ831_0055K402_0092 ME40				≤48	35	
55.54	1333/24	1400	2800	4209	3.5	PHQ831_0055K402_0100 ME20	3400	3000	5000	≤32	6.4	398
				5087		PHQ831_0055K402_0100 ME30				≤38	12	399
						PHQ831_0055K402_0100 ME40	3000	4500	≤48	34		
63.35	7095/112	1400	2800	4801	3.5	PHQ831_0055K402_0115 ME20	3000	2600	4500	≤32	6.7	398
				5087		PHQ831_0055K402_0115 ME30				≤38	12	399
						PHQ831_0055K402_0115 ME40				≤48	34	
69.62	1462/21	1400	2800	4980	3.5	PHQ831_0055K402_0125 ME20	3400	3000	5000	≤32	5.7	398
				5087		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 258 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			Backlash $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d_{mw}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. ¹⁾ M_{2N}	Accel. M_{2acc}	Peak ²⁾ M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm ²	Nm/ arcmin

PHQ8K (continued from previous page)

76.37	14,663/192	1400	2800	5087	3.5	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	5087	3.5	PHQ831_0055K402_0170 ME20	3600	3300	5500	≤32	5.0	399
						PHQ831_0055K402_0170 ME30				3500	5000	
						PHQ831_0055K402_0170 ME40	3000	3000	4500	≤48	32	
95.73	8041/84	1400	2800	5087	3.5	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	5087	3.5	PHQ831_0055K402_0200 ME20	3600	3300	5500	≤32	4.8	399
						PHQ831_0055K402_0200 ME30				3500	5000	
128.1	6149/48	1400	2800	5087	3.5	PHQ831_0055K402_0230 ME20	3600	3300	5500	≤32	4.9	399
						PHQ831_0055K402_0230 ME30				3500	5000	
						PHQ831_0055K402_0230 ME40	3000	3000	4500	≤48	32	
139.0	4171/30	1400	2800	5087	3.5	PHQ831_0055K402_0250 ME20	3600	3300	5500	≤32	4.6	399
						PHQ831_0055K402_0250 ME30				3500	5000	
152.7	14,663/96	1400	2800	5087	3.5	PHQ831_0055K402_0280 ME20	3600	3300	5500	≤32	4.7	399
						PHQ831_0055K402_0280 ME30				3500	5000	
185.2	2408/13	1400	2464	4095	3.5	PHQ831_0055K402_0340 ME20	3600	3300	5500	≤24	2.8	399
191.2	45,881/240	1400	2800	5087	3.5	PHQ831_0055K402_0350 ME20	3600	3300	5500	≤32	4.5	399
						PHQ831_0055K402_0350 ME30				3500	5000	
222.8	2451/11	1400	1952	3529	3.5	PHQ831_0055K402_0410 ME20	3600	3300	5500	≤24	2.8	399
254.7	3311/13	1400	2800	5087	3.5	PHQ831_0055K402_0460 ME20	3600	3300	5500	≤24	2.8	399
277.3	5547/20	1400	1708	3088	3.5	PHQ831_0055K402_0500 ME20	3600	3300	5500	≤24	2.7	399
306.4	2451/8	1400	2684	4853	3.5	PHQ831_0055K402_0560 ME20	3600	3300	5500	≤24	2.7	399
381.4	61,017/160	1400	2348	4247	3.5	PHQ831_0055K402_0690 ME20	3600	3300	5500	≤24	2.7	400

PHQK Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 2000 RPM. See page 258 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)

PHQK Series: RIGHT ANGLE – Flange Output

Reducer Ratio (i)		Output Torque			Back-lash $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂
		Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Peak ²⁾ M _{2NOT}			Continuous		Cyclic			
		Nm	Nm	Nm			EL 1,2	EL 3,4,5,6	All			

PHQ9K (continued next page)

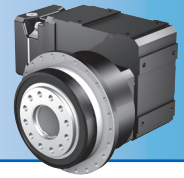
44.08	1102/25	3800	5760	8780	4.0	PHQ931_0060K513_0073 ME30	1900	1800	3200	≤38	26	767
						PHQ931_0060K513_0073 ME40				≤48	48	766
48.80	17,081/350	3800	5760	9720	4.0	PHQ931_0060K513_0081 ME30	1900	1800	3200	≤38	24	767
						PHQ931_0060K513_0081 ME40				≤48	46	
55.01	8526/155	3800	5760	10,956	4.0	PHQ931_0060K513_0092 ME30	1900	1800	3200	≤38	21	768
						PHQ931_0060K513_0092 ME40				≤48	43	
60.90	609/10	3800	5760	11,250	4.0	PHQ931_0060K513_0100 ME30	1900	1800	3200	≤38	20	769
						PHQ931_0060K513_0100 ME40				≤48	42	768
69.41	10,759/155	3800	5760	11,250	4.0	PHQ931_0060K513_0115 ME30	2300	2200	3600	≤38	18	769
						PHQ931_0060K513_0115 ME40				≤48	40	
76.85	1537/20	3800	5760	11,250	4.0	PHQ931_0060K513_0130 ME30	2300	2200	3600	≤38	17	770
						PHQ931_0060K513_0130 ME40				≤48	39	769
87.22	11,774/135	3800	4803	6514	4.0	PHQ931_0060K513_0145 ME20	2300	2200	3600	≤32	9.9	768
			5760	11,250		PHQ931_0060K513_0145 ME30				≤38	15	770
						PHQ931_0060K513_0145 ME40				≤48	37	
96.56	26,071/270	3800	5317	7212	4.0	PHQ931_0060K513_0160 ME20	2300	2200	3600	≤32	9.5	769
			5760	11,250		PHQ931_0060K513_0160 ME30				≤38	15	770
						PHQ931_0060K513_0160 ME40				≤48	37	
104.9	6293/60	3800	5760	7834	4.0	PHQ931_0060K513_0175 ME20	2800	2500	4200	≤32	8.5	769
				11,250		PHQ931_0060K513_0175 ME30				≤38	14	770
						PHQ931_0060K513_0175 ME40				≤48	36	
116.1	27,869/240	3800	5760	8673	4.0	PHQ931_0060K513_0195 ME20	2800	2500	4200	≤32	8.2	769
				11,250		PHQ931_0060K513_0195 ME30				≤38	14	770
						PHQ931_0060K513_0195 ME40				≤48	36	
132.0	2639/20	3800	5760	9160	4.0	PHQ931_0060K513_0220 ME20	2800	2500	4200	≤32	7.2	770
				11,250		PHQ931_0060K513_0220 ME30				≤38	13	771
						PHQ931_0060K513_0220 ME40				≤48	35	

¹⁾ Based on input speed of 2000 RPM. See page 258 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 $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d_{mw}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. ¹⁾ M_{2N}	Accel. M_{2acc}	Peak ²⁾ M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm ²	Nm/ arcmin

PHQ9K (continued from previous page)

146.1	11,687/80	3800	5760	10,142	4.0	PHQ931_0060K513_0240 ME20	2800	2500	4200	≤ 32	7.0	770
				11,250		PHQ931_0060K513_0240 ME30				≤ 38	12	771
						PHQ931_0060K513_0240 ME40				≤ 48	34	
175.1	14,007/80	3800	5760	10,351	4.0	PHQ931_0060K513_0290 ME20	3400	3000	5000	≤ 32	6.1	770
				11,250		PHQ931_0060K513_0290 ME30				≤ 38	12	771
						PHQ931_0060K513_0290 ME40			3000	4500	≤ 48	
193.8	62,031/320	3800	5760	11,250	4.0	PHQ931_0060K513_0320 ME20	3400	3000	5000	≤ 32	6.0	771
						PHQ931_0060K513_0320 ME30				≤ 38	11	
						PHQ931_0060K513_0320 ME40	3000		4500	≤ 48	33	
208.8	1044/5	3800	5760	11,132	4.0	PHQ931_0060K513_0350 ME20	3400	3000	5000	≤ 32	5.6	771
						PHQ931_0060K513_0350 ME30				≤ 38	11	
231.2	8091/35	3800	5760	11,250	4.0	PHQ931_0060K513_0390 ME20	3400	3000	5000	≤ 32	5.5	771
						PHQ931_0060K513_0390 ME30				≤ 38	11	
261.0	261/1	3800	5760	11,250	4.0	PHQ931_0060K513_0440 ME20	3400	3000	5000	≤ 32	5.1	771
						PHQ931_0060K513_0440 ME30				≤ 38	10	
289.0	8091/28	3800	5760	11,250	4.0	PHQ931_0060K513_0480 ME20	3400	3000	5000	≤ 32	5.1	771
						PHQ931_0060K513_0480 ME30				≤ 38	10	
349.8	22,736/65	3800	5760	11,250	4.0	PHQ931_0060K513_0580 ME20	3400	3000	5000	≤ 32	4.7	771
						PHQ931_0060K513_0580 ME30				≤ 38	10	
387.3	25,172/65	3800	5760	11,250	4.0	PHQ931_0060K513_0650 ME20	3400	3000	5000	≤ 32	4.7	771
						PHQ931_0060K513_0650 ME30				≤ 38	10	
420.5	841/2	3800	5671	7980	4.0	PHQ931_0060K513_0700 ME20	3400	3000	5000	≤ 24	3.0	771
465.6	26,071/56	3800	5760	8835	4.0	PHQ931_0060K513_0780 ME20	3400	3000	5000	≤ 24	3.0	771
523.7	26,187/50	3800	4764	8233	4.0	PHQ931_0060K513_0870 ME20	3400	3000	5000	≤ 24	2.8	771
579.9	115,971/200	3800	5276	9115	4.0	PHQ931_0060K513_0970 ME20	3400	3000	5000	≤ 24	2.8	771

PHQK Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 2000 RPM. See page 258 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)

PHQK Series: RIGHT ANGLE – Flange Output

Reducer Ratio (i)		Output Torque			Back-lash $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂
		Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Peak ²⁾ M _{2NOT}			Continuous		Cyclic			
		Nm	Nm	Nm			EL 1,2	EL 3,4,5,6	All			

PHQ10K (continued next page)

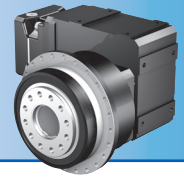
45.38	59,535/1312	6500	10,000	16,946	4.0	PHQ1031_0060K713_0076 ME40	1700	1600	2700	≤48	92	1545
						PHQ1031_0060K713_0076 ME50				≤60	120	1551
50.24	263,655/5248	6500	10,000	18,761	4.0	PHQ1031_0060K713_0084 ME40	1700	1600	2700	≤48	88	1548
						PHQ1031_0060K713_0084 ME50				≤60	116	1553
55.13	441/8	6500	10,000	20,000	4.0	PHQ1031_0060K713_0092 ME40	1700	1600	2700	≤48	77	1550
						PHQ1031_0060K713_0092 ME50				≤60	105	1554
61.03	1953/32	6500	10,000	20,000	4.0	PHQ1031_0060K713_0100 ME40	1700	1600	2700	≤48	74	1552
						PHQ1031_0060K713_0100 ME50				≤60	102	1555
70.69	70,119/992	6500	10,000	14,078	4.0	PHQ1031_0060K713_0120 ME30	2000	1900	3200	≤38	41	1553
				20,000		PHQ1031_0060K713_0120 ME40				≤48	63	1554
						PHQ1031_0060K713_0120 ME50				≤60	91	1557
78.26	10,017/128	6500	10,000	15,586	4.0	PHQ1031_0060K713_0130 ME30	2000	1900	3200	≤38	39	1555
				20,000		PHQ1031_0060K713_0130 ME40				≤48	62	
						PHQ1031_0060K713_0130 ME50				≤60	89	1557
88.81	1421/16	6500	10,000	17,643	4.0	PHQ1031_0060K713_0150 ME30	2000	1900	3200	≤38	32	1556
				20,000		PHQ1031_0060K713_0150 ME40				≤48	55	1557
						PHQ1031_0060K713_0150 ME50				≤60	83	1558
98.33	6293/64	6500	10,000	19,533	4.0	PHQ1031_0060K713_0165 ME30	2000	1900	3200	≤38	31	1557
				20,000		PHQ1031_0060K713_0165 ME40				≤48	53	
						PHQ1031_0060K713_0165 ME50				≤60	81	1559
109.7	80,703/736	6500	10,000	20,000	4.0	PHQ1031_0060K713_0185 ME30	2400	2200	3600	≤38	26	1558
						PHQ1031_0060K713_0185 ME40				≤48	49	
						PHQ1031_0060K713_0185 ME50				≤60	77	1559
121.4	357,399/2944	6500	10,000	20,000	4.0	PHQ1031_0060K713_0200 ME30	2400	2200	3600	≤38	26	1558
						PHQ1031_0060K713_0200 ME40				≤48	48	1558
						PHQ1031_0060K713_0200 ME50				≤60	76	1559
136.4	43,659/320	6500	10,000	20,000	4.0	PHQ1031_0060K713_0230 ME30	2400	2200	3600	≤38	22	1559
						PHQ1031_0060K713_0230 ME40				≤48	44	
						PHQ1031_0060K713_0230 ME50				≤60	72	1560

¹⁾ Based on input speed of 2000 RPM. See page 258 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 $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d_{mw}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. ¹⁾ M_{2N}	Accel. M_{2acc}	Peak ²⁾ M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm ²	Nm/ arcmin

PHQ10K (continued from previous page)

151.1	193,347/1280	6500	10,000	20,000	4.0	PHQ1031_0060K713_0250 ME30	2400	2200	3600	≤ 38	21	1559
						PHQ1031_0060K713_0250 ME40				≤ 48	44	
						PHQ1031_0060K713_0250 ME50				≤ 60	72	
175.7	22,491/128	6500	10,000	20,000	4.0	PHQ1031_0060K713_0290 ME30	2900	2600	4200	≤ 38	18	1559
						PHQ1031_0060K713_0290 ME40				≤ 48	40	
						PHQ1031_0060K713_0290 ME50				2500	2500	
194.5	99,603/512	6500	10,000	20,000	4.0	PHQ1031_0060K713_0320 ME30	2900	2600	4200	≤ 38	17	1560
						PHQ1031_0060K713_0320 ME40				≤ 48	40	
						PHQ1031_0060K713_0320 ME50				2500	2500	
212.6	1701/8	6500	10,000	20,000	4.0	PHQ1031_0060K713_0350 ME30	2900	2600	4200	≤ 38	16	1560
						PHQ1031_0060K713_0350 ME40				≤ 48	37	
						PHQ1031_0060K713_0350 ME50				2500	2500	
235.4	7533/32	6500	10,000	20,000	4.0	PHQ1031_0060K713_0390 ME30	2900	2600	4200	≤ 38	15	1560
						PHQ1031_0060K713_0390 ME40				≤ 48	37	
						PHQ1031_0060K713_0390 ME50				2500	2500	
270.3	112,455/416	6500	10,000	20,000	4.0	PHQ1031_0060K713_0450 ME30	2900	2600	4200	≤ 38	14	1560
						PHQ1031_0060K713_0450 ME40				≤ 48	35	
						PHQ1031_0060K713_0450 ME50				2500	2500	
299.3	498,015/1664	6500	10,000	20,000	4.0	PHQ1031_0060K713_0500 ME30	2900	2600	4200	≤ 38	13	1560
						PHQ1031_0060K713_0500 ME40				≤ 48	35	
						PHQ1031_0060K713_0500 ME50				2500	2500	
351.4	22,491/64	6500	10,000	20,000	4.0	PHQ1031_0060K713_0590 ME30	2900	2600	4200	≤ 38	12	1560
						PHQ1031_0060K713_0590 ME40				≤ 48	34	
						PHQ1031_0060K713_0590 ME50				2500	2500	
389.1	99,603/256	6500	10,000	20,000	4.0	PHQ1031_0060K713_0650 ME30	2900	2600	4200	≤ 38	12	1560
						PHQ1031_0060K713_0650 ME40				≤ 48	34	
						PHQ1031_0060K713_0650 ME50				2500	2500	
427.2	13,671/32	6500	10,000	17,790	4.0	PHQ1031_0060K713_0710 ME30	2900	2600	4200	≤ 38	11	1560
473.0	60,543/128	6500	10,000	19,696	4.0	PHQ1031_0060K713_0790 ME30	2900	2600	4200	≤ 38	11	1560
534.0	68,355/128	6500	10,000	18,789	4.0	PHQ1031_0060K713_0890 ME30	2900	2600	4200	≤ 38	11	1560
591.2	302,715/512	6500	10,000	20,000	4.0	PHQ1031_0060K713_0990 ME30	2900	2600	4200	≤ 38	11	1560

PHQK Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 2000 RPM. See page 258 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)

PHQK Series: RIGHT ANGLE – Flange Output

Reducer Ratio (i)		Output Torque			Back-lash $\Delta\phi_2$ arcmin	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d _{MW} mm	Input Inertia J ₁ kgcm ²	Tors. Stiffness C ₂ Nm/arcmin
		Nom. ¹⁾ M _{2N} Nm	Accel. M _{2acc} Nm	Peak ²⁾ M _{2NOT} Nm			Continuous		Cyclic			
							EL 1,2	EL 3,4,5,6	All			

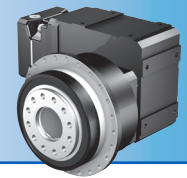
PHQ11K (continued next page)

44.67	3127/70	12,299	12,299	16,681	4.0	PHQ1131_0060K813_0074 ME40	1600	1500	2600	≤48	178	2578	
						PHQ1131_0060K813_0074 ME50				≤60		2595	
49.46	96,937/1960	13,000	13,617	18,469	4.0	PHQ1131_0060K813_0082 ME40	1600	1500	2600	≤48	164	2586	
						PHQ1131_0060K813_0082 ME50				≤60		2600	
55.70	11,977/215	13,000	15,337	20,802	4.0	PHQ1131_0060K813_0093 ME40	1600	1500	2600	≤48	136	2594	
						PHQ1131_0060K813_0093 ME50				≤60		2605	
61.67	53,041/860	13,000	16,981	23,031	4.0	PHQ1131_0060K813_0105 ME40	1600	1500	2600	≤48	127	2599	
						PHQ1131_0060K813_0105 ME50				≤60		2608	
89.05	28,497/320	13,000	22,000	33,255	4.0	PHQ1131_0060K813_0150 ME40	1900	1800	3000	≤48	83	2612	
						PHQ1131_0060K813_0150 ME50				≤60		2616	
98.59	126,201/1280	13,000	22,000	36,818	4.0	PHQ1131_0060K813_0165 ME40	1900	1800	3000	≤48	79	2614	
						PHQ1131_0060K813_0165 ME50				≤60		2617	
104.0	30,149/290	13,000	15,266	20,706	4.0	PHQ1131_0060K813_0175 ME30	2300	2100	3500	≤38	50	2614	
			22,000	38,823		PHQ1131_0060K813_0175 ME40				≤48		73	2615
						PHQ1131_0060K813_0175 ME50				≤60		101	2618
115.1	133,517/1160	13,000	16,901	22,924	4.0	PHQ1131_0060K813_0190 ME30	2300	2100	3500	≤38	48	2616	
			22,000	42,982		PHQ1131_0060K813_0190 ME40				≤48			70
						PHQ1131_0060K813_0190 ME50				≤60		98	2619
138.3	31,801/230	13,000	18,054	24,487	4.0	PHQ1131_0060K813_0230 ME30	2300	2100	3500	≤38	36	2618	
			22,000	44,000		PHQ1131_0060K813_0230 ME40				≤48		59	2619
						PHQ1131_0060K813_0230 ME50				≤60		87	2620
153.1	140,833/920	13,000	19,988	27,110	4.0	PHQ1131_0060K813_0260 ME30	2300	2100	3500	≤38	35	2619	
			22,000	44,000		PHQ1131_0060K813_0260 ME40				≤48			57
						PHQ1131_0060K813_0260 ME50				≤60		85	2621
175.5	7021/40	13,000	21,599	29,295	4.0	PHQ1131_0060K813_0290 ME30	2800	2500	4000	≤38	28	2620	
			22,000	44,000		PHQ1131_0060K813_0290 ME40				≤48			50
						PHQ1131_0060K813_0290 ME50	2500			≤60		78	2621

¹⁾ Based on input speed of 2000 RPM. See page 258 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 $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d_{mw}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. ¹⁾ M_{2N}	Accel. M_{2acc}	Peak ²⁾ M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm ²	Nm/ arcmin

PHQ11K (continued from previous page)

194.3	31,093/160	13,000	22,000	32,435	4.0	PHQ1131_0060K813_0320 ME30	2800	2500	4000	≤ 38	27	2621
				44,000		PHQ1131_0060K813_0320 ME40				≤ 48	50	
						PHQ1131_0060K813_0320 ME50				≤ 60	77	
216.8	8673/40	13,000	22,000	30,365	4.0	PHQ1131_0060K813_0360 ME30	2800	2500	4000	≤ 38	23	2621
				44,000		PHQ1131_0060K813_0360 ME40				≤ 48	45	
						PHQ1131_0060K813_0360 ME50				≤ 60	73	
240.1	38,409/160	13,000	22,000	33,618	4.0	PHQ1131_0060K813_0400 ME30	2800	2500	4000	≤ 38	22	2622
				44,000		PHQ1131_0060K813_0400 ME40				≤ 48	45	
						PHQ1131_0060K813_0400 ME50				≤ 60	72	
265.5	531/2	13,000	22,000	34,123	4.0	PHQ1131_0060K813_0440 ME30	2800	2500	4000	≤ 38	19	2622
						PHQ1131_0060K813_0440 ME40				≤ 48	41	
						PHQ1131_0060K813_0440 ME50				≤ 60	70	
293.9	16,461/56	13,000	22,000	37,779	4.0	PHQ1131_0060K813_0490 ME30	2800	2500	4000	≤ 38	18	2622
						PHQ1131_0060K813_0490 ME40				≤ 48	40	
						PHQ1131_0060K813_0490 ME50				≤ 60	69	
354.5	42,539/120	13,000	22,000	39,942	4.0	PHQ1131_0060K813_0590 ME30	2800	2500	4000	≤ 38	15	2622
						PHQ1131_0060K813_0590 ME40				≤ 48	37	
						PHQ1131_0060K813_0590 ME50				≤ 60	66	
392.5	188,387/480	13,000	22,000	44,000	4.0	PHQ1131_0060K813_0650 ME30	2800	2500	4000	≤ 38	15	2623
						PHQ1131_0060K813_0650 ME40				≤ 48	37	
						PHQ1131_0060K813_0650 ME50				≤ 60	66	
430.2	10,325/24	13,000	22,000	43,809	4.0	PHQ1131_0060K813_0720 ME30	2800	2500	4000	≤ 38	14	2623
						PHQ1131_0060K813_0720 ME40				≤ 48	35	
						PHQ1131_0060K813_0720 ME50				≤ 60	64	
476.3	45,725/96	13,000	22,000	44,000	4.0	PHQ1131_0060K813_0790 ME30	2800	2500	4000	≤ 38	13	2623
						PHQ1131_0060K813_0790 ME40				≤ 48	35	
						PHQ1131_0060K813_0790 ME50				≤ 60	64	
526.6	21,063/40	13,000	15,197	20,612	4.0	PHQ1131_0060K813_0880 ME30	2800	2500	4000	≤ 38	12	2623
583.0	93,279/160	13,000	16,825	22,820	4.0	PHQ1131_0060K813_0970 ME30	2800	2500	4000	≤ 38	12	2623

PHQK Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 2000 RPM. See page 258 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)

PHQ Series: RIGHT ANGLE – Flange Output

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

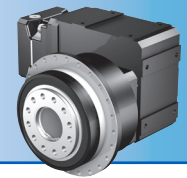
PHQ12K (continued next page)

75.15	221,247/2944	20,691	20,691	28,064	4.0	PHQ1231_0060K913_0125 ME40	1800	1800	2800	≤48	196	4614
						PHQ1231_0060K913_0125 ME50				≤60	224	4633
114.4	915/8	25,000	31,491	42,713	4.0	PHQ1231_0060K913_0190 ME40	2200	2100	3300	≤48	120	4643
						PHQ1231_0060K913_0190 ME50				≤60	148	4651
143.7	266,631/1856	25,000	39,553	53,647	4.0	PHQ1231_0060K913_0240 ME40	2200	2100	3300	≤48	94	4651
						PHQ1231_0060K913_0240 ME50				≤60	122	4656
192.7	141,825/736	25,000	43,000	71,960	4.0	PHQ1231_0060K913_0320 ME40	2600	2500	3800	≤48	72	4657
						PHQ1231_0060K913_0320 ME50	2500			≤60	100	4660
228.3	584,319/2560	25,000	43,000	78,173	4.0	PHQ1231_0060K913_0380 ME40	2600	2500	3800	≤48	63	4659
						PHQ1231_0060K913_0380 ME50	2500			≤60	91	4661
293.6	300,669/1024	25,000	4,3000	80,000	4.0	PHQ1231_0060K913_0490 ME40	2600	2500	3800	≤48	52	4661
						PHQ1231_0060K913_0490 ME50	2500			≤60	80	4663
378.4	629,703/1664	25,000	43,000	80,000	4.0	PHQ1231_0060K913_0630 ME40	2600	2500	3800	≤48	45	4663
						PHQ1231_0060K913_0630 ME50	2500			≤60	73	
450.0	187,209/416	25,000	39,294	53,297	4.0	PHQ1231_0060K913_0750 ME40	2600	2500	3800	≤48	41	4663
						PHQ1231_0060K913_0750 ME50	2500			≤60	70	4664
572.5	293,105/512	25,000	37,158	57,592	4.0	PHQ1231_0060K913_0950 ME40	2600	2500	3800	≤48	38	4664
						PHQ1231_0060K913_0950 ME50	2500			≤60	67	
554.1	7,199,037/12,992	25,000	39,555	53,650	4.0	PHQ1231_0060K914_0920 ME40	2600	2500	3800	≤48	37	4664
562.7	4,177,219/7424	16,485	16,742	22,708	4.0	PHQ1231_0060K914_0940 ME30	2600	2500	3800	≤38	14	4663
743.3	3,829,275/5152	25,000	43,000	71,963	4.0	PHQ1231_0060K914_1240 ME40	2600	2500	3800	≤48	36	4664
754.7	2,221,925/2944	22,116	22,457	30,459	4.0	PHQ1231_0060K914_1260 ME30	2600	2500	3800	≤38	12	4664
880.4	15,776,613/17,920	25,000	43,000	78,175	4.0	PHQ1231_0060K914_1470 ME40	2600	2500	3800	≤48	35	4664

¹⁾ Based on input speed of 2000 RPM. See page 258 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 $\Delta\phi_2$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max ϕ d_{mw}	Input Inertia J_1	Tors. Stiffness C_2
		Nom. ¹⁾ M_{2N}	Accel. M_{2acc}	Peak ²⁾ M_{2NOT}			Continuous		Cyclic			
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2	EL 3,4,5,6	All	mm	kgcm ²	Nm/ arcmin

PHQ12K (continued from previous page)

894.0	9,154,331/10,240	25,000	26,501	35,944	4.0	PHQ1231_0060K914_1490 ME30	2600	2500	3800	≤38	12	4664
1133	8,118,063/7168	25,000	43,000	80,000	4.0	PHQ1231_0060K914_1890 ME40	2600	2500	3800	≤48	34	4664
1150	4,710,481/4096	25,000	29,227	39,642	4.0	PHQ1231_0060K914_1920 ME30	2600	2500	3800	≤38	11	4664
1460	17001981/11,648	25,000	43,000	80,000	4.0	PHQ1231_0060K914_2430 ME40	2600	2500	3800	≤48	34	4665
1482	9,865,347/6656	25,000	33,023	44,790	4.0	PHQ1231_0060K914_2470 ME30	2600	2500	3800	≤38	11	4665
1763	2,932,941/1664	25,000	39,291	53,292	4.0	PHQ1231_0060K914_2940 ME30	2600	2500	3800	≤38	10	4665
2242	13,775,935/6144	25,000	37,158	57,587	4.0	PHQ1231_0060K914_3740 ME30	2600	2500	3800	≤38	10	4665

PHQK Series: RIGHT ANGLE – Flange Output

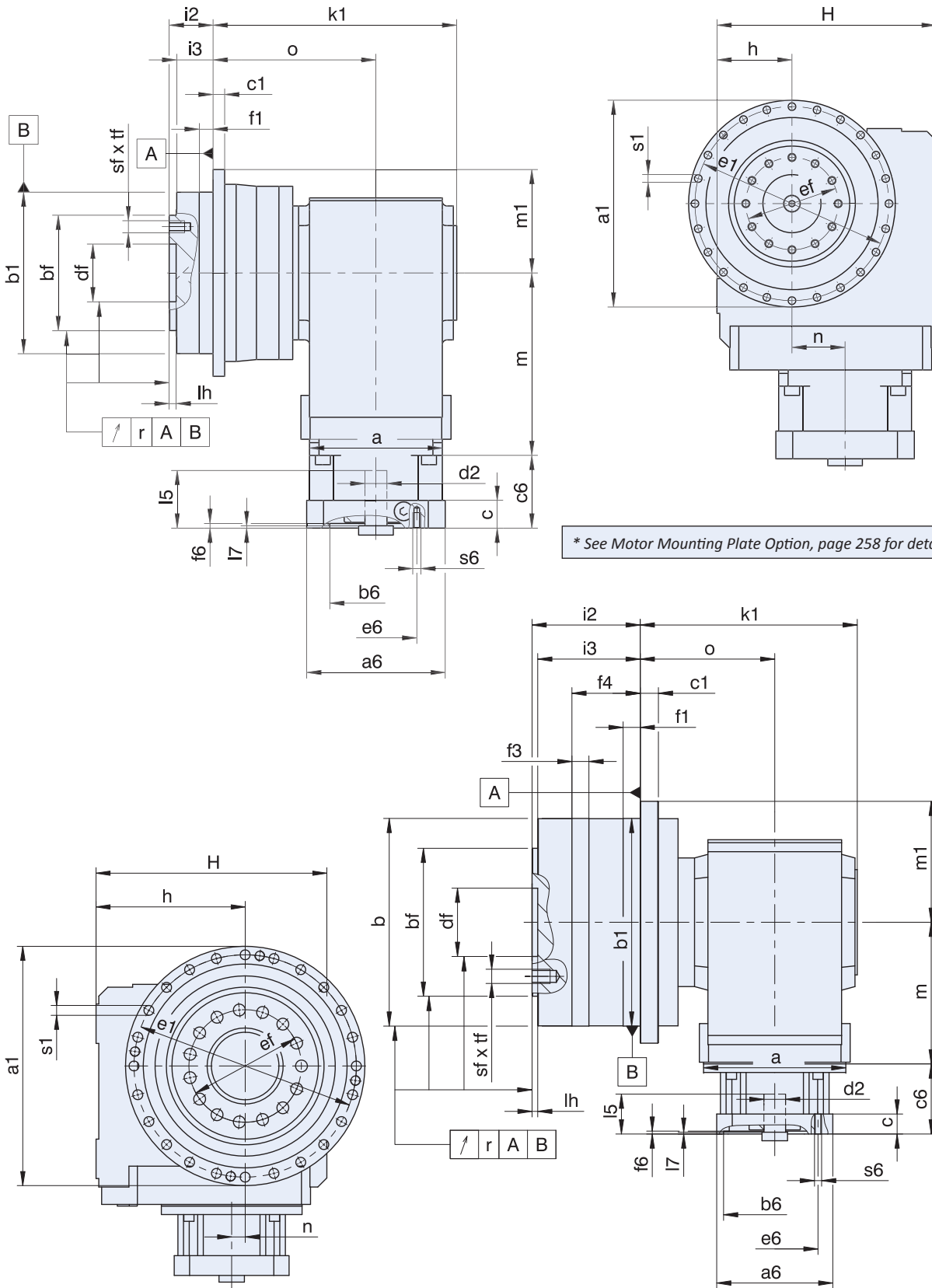
¹⁾ Based on input speed of 2000 RPM. See page 258 for details on torque calculations.

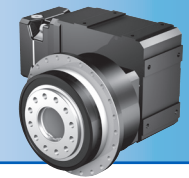
²⁾ Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)

* Motor shaft adapter code (shaft diameter max - mm): ME10 (19), ME20 (32), ME30 (38), ME40 (48), ME50 (60)

PHQK Series: RIGHT ANGLE – Flange Output

PHQK Series Dimensions – All Units





Dimensional Data

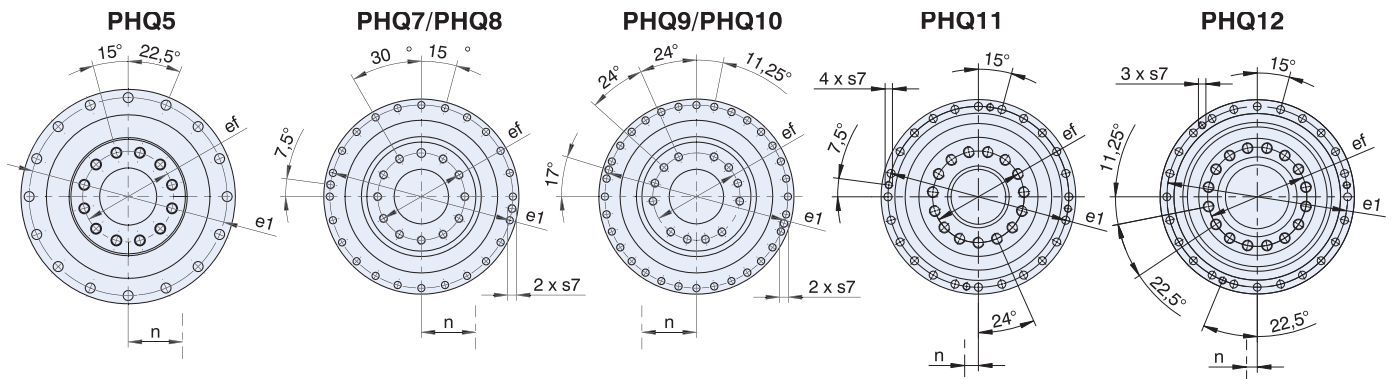


Table 1 Dimensions (mm)

Unit	Øa1	Øb	Øb1	Øbf	c1	Ødf	Øe1	Øef	f1	f3	f4	h	H	i2	i3	k1	lh	m1	o	r	Øs1	s7	sf	tf
PHQ531_K102	145 ^{h7}	-	110 ^{h7}	80 ^{h7}	8	40 ^{H6}	135	63	10	-	-	60	160	29	23	180.0	6	72.5	124.0	0.020	5.5	-	M8	11
PHQ731_K202	179 ^{h7}	-	140 ^{h7}	100 ^{h7}	10	50 ^{H6}	168	80	12	-	-	65	190	38	32	216.0	6	89.5	146.0	0.025	6.6	-	M10	16
PHQ831_K402	247 ^{h7}	-	200 ^{h7}	160 ^{h7}	12	80 ^{H6}	233	125	15	-	-	90	240	50	42	289.0	8	123.5	199.0	0.030	9.0	M10	M12	17
PHQ931_K513	300 ^{h7}	-	255 ^{h7}	180 ^{h7}	18	90 ^{H6}	280	145	20	-	-	160	260	66	55	292.5	12	150.0	196.5	0.030	13.5	M8	M20	28
PHQ1031_K713	330 ^{h7}	-	285 ^{h7}	200 ^{h7}	20	95 ^{H6}	310	166	20	-	-	212	342	75	60	344.5	10	165.0	228.0	0.040	13.5	M10	M24	35
PHQ1131_K813	425 ^{h7}	365 ^{H6}	365 ^{H6}	260 ^{h7}	32	120 ^{H6}	395	200	30	30	120	265	410	190	180	381.5	10	212.5	236.5	0.040	17.5	M16	M24	35.5
PHQ1231_K913	550 ^{h7}	470 ^{H6}	470 ^{H6}	330 ^{h7}	45	180 ^{H7}	510	280	30	30	145	315	495	206.5	195.5	452.0	10	275.0	282.0	0.040	22.0	M16	M30	48

Motor Mounting Plate

Table 2 Dimensions (mm)

Base Module	Motor Adapter Code															Wt. lbs.
	ME10			ME20			ME30			ME40			ME50			
	a	m	n	a	m	n	a	m	n	a	m	n	a	m	n	
PH531_K102	98	124	36	115	128	36	-	-	-	-	-	-	-	-	-	43
PH731_K102	98	143	46	115	147	46	145	149	46	-	-	-	-	-	-	53
PH731_K202	-	-	-	160	187	60	145	189	60	190	192	60	-	-	-	69
PH831_K202	-	-	-	160	172	15	145	174	15	190	177	15	-	-	-	116
PH831_K302	-	-	-	-	-	-	200	221	20	190	224	20	300	237	20	134
PH931_K513	-	-	-	-	-	-	200	247	24	250	249	24	300	262	24	213
PH1031_K613	-	-	-	-	-	-	-	-	-	250	294	25	300	307	25	310

PHQK Series: RIGHT ANGLE – Flange Output