

# PHQ Series: INLINE — Flange Output

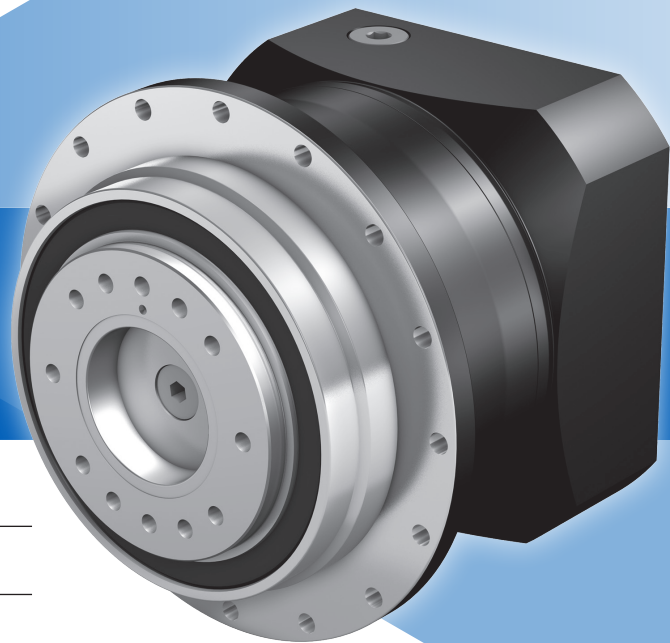
## PHQ Features

- 4:1 to 600:1 ratios (higher ratios available. Contact STÖBER.)
- Quiet running (As low as 55dB(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 PHQ Series Servo Precision Planetary Gearheads are designed for applications that demand torsional stiffness and tilting rigidity. The advanced lines can handle high accuracy machines. Every gearbox is made to order. STÖBER will custom whatever you need to fit your application. Contact us today to learn more.*

**All PHQ Series  
SHIP in 1 Day!**

**NO EXPEDITE FEE FOR 24  
HOUR SERVICE**



## General Specifications

<b>Ambient Temperature</b>	0°C to +40°C (104°F) [Unit temperature <90°C Max]
<b>Backlash</b>	≤1 arcmins (see performance overview page 46)
<b>Coating</b>	Black (RAL-9005)
<b>Degree of Protection</b>	IP65
<b>Direction of Rotation</b>	Input and output rotate the SAME direction
<b>Efficiency</b>	1 stage 96%; 2 stage 93%; 3 stage 90%
<b>Input RPM</b>	Up to 8,000 RPM
<b>Installation</b>	Requires 12.9 fasteners. See page 306 for more information
<b>Lubrication</b>	Lubricated for life – standard Mobil SHC629; option food grade Mobil SHC CIBUS 150
<b>Mounting Position</b>	Unrestricted except PHQ three stage units, see page 47
<b>Warranty</b>	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 PH 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 !  
**PHQ** 4 3 1 S F S S 0055 ME L

Design Option	Part Number Code	Description
<b>1</b> Series	<b>PHQ</b>	Rotating flange output planetary
<b>2</b> Size	<b>4 5 7 8</b> <b>9 10 11 12</b>	8 sizes of gearhead
<b>3</b> Generation	<b>3</b>	Version of gearhead
<b>4</b> # of Stages	<b>1</b> <b>2</b> <b>3</b>	One stage Two stage Three stage
<b>5</b> Housing	<b>S</b>	Standard (PHQ4-8 only)
<b>6</b> Output	<b>F</b>	Flange output
<b>7</b> Bearing	<b>S</b> <b>V</b>	Standard (PHQ4-8 only) Reinforced Bearing (PHQ4 and 5)
<b>8</b> Backlash	<b>S</b> <b>R</b>	Standard Backlash (PHQ4-8 only) Reduced backlash (PHQ4-8 only)
<b>9</b> Ratio	<b>0040</b>	Ratios range from 4:1 to 600:1 (0055=5.5:1; 0160=16:1; 1000=100:1, etc.)
<b>0</b> Motor Adapter	<b>ME</b> <b>MF</b> <b>MB</b>	Motor Adapter with EasyAdapt coupling Motor Adapter with FlexiAdapt coupling (PHQ3-8) (Contact factory for this option) ServoStop motor adapter with brake (Contact factory for this option)
<b>!</b> Options	<b>L</b>	Large Input

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## Options

### ME Adapter Option

- MSS1 Seal – special input seal for longer life (For sizes PHQ5-8). Contact factory for this option.

### 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.

### Large Input

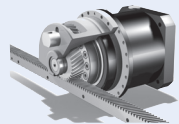
- Accommodates a larger diameter motor shaft without going to a larger size gearbox.

### ATEX

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

### Rack and Pinion Systems

- PHQ available with rack and pinion. Contact factory for this option.



# PHQ Series: INLINE — Flange Output

## PHQ Performance Overview

PH 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	4		5		7		
		# of Stages	1	2	1	2	1	2
<b>Acceleration Torque</b> $M_{2BMAX}$	Nm	200		550		1050		
<b>Output Torque Nom.</b> <sup>1</sup> $M_{2N}$	Nm	130		320		680		
<b>Torsional Stiffness</b> $C_2$	Nm/arcmin	42		102		224		
<b>Torsional Backlash</b> <sup>2)</sup> $\Delta\phi$ Reduced	arcmin	$\leq 3$ $\leq 1$		$\leq 3$ $\leq 1$		$\leq 3$ $\leq 1$		
<b>Input Speed Max.</b> $n_{1MAX}$	Continuous Cyclic	3000 6000	4500 8000	2500 5000	4000 8000	2200 5000	3700 7000	4000 7000
<b>Efficiency (@nom torque)</b>	%	96	94	96	94	96	94	92
<b>Weight</b>	kg lbs	4.8 10.6	5.3 11.7	7.6 16.7	8.9 19.6	15.9 35	16.1 35.4	17.4 38.3
<b>Noise</b> <sup>3)</sup>	dB(A)	$\leq 55$		$\leq 56$		$\leq 57$		

### Performance by Bearing Design Option <sup>4)</sup>

<b>Permitted Axial Force</b> $F_{2ax100}$	N	2150		4150		6150		
<b>Permitted Tilting Torque</b> $M_{2K100}$	Nm	257		440		1466		
<b>Tilting Stiffness</b> $C_{2K}$	Nm/arcmin	192		429		500		

### Performance by Reinforced Bearing Design Option – Choose V Option <sup>4)</sup>

<b>Permitted Axial Force</b> $F_{2ax100}$	N	2900		5000		—		
<b>Permitted Tilting Torque</b> $M_{2K100}$	Nm	354		572		—		
<b>Tilting Stiffness</b> $C_{2K}$	Nm/arcmin	217		478		—		

\* PHQ cyclic speed is 5000

<sup>1)</sup> Ratings based on input speed ( $n_1$ ) of 1500 RPM.

For torque at higher input speeds ( $M_{2NX}$ ) solve the formula:  
where  $n_1$  = Actual Input Speed.

$$M_{2NX} = \frac{M_{2N}}{\sqrt[3]{\frac{n_1}{1500}}}$$

<sup>2)</sup> Tested at 1.5% of nominal torque and recorded on the output side of the gearhead. For lower backlash, contact STÖBER technical support.

<sup>3)</sup> Measurement at one (1) meter distance with input speed ( $n_1$ ) of 1500 RPM.

<sup>4)</sup> Rating based on output speed ( $n_2$ ) of 100 RPM. For values at other speeds see page 48.

### Backlash Options In Stock

All standard backlash options are in stock and ship in one day. These reduced backlash options are in stock and ship in one day.

	PHQ532	PHQ833
<b>Ratio</b>	0550	1100 1380



# Overview

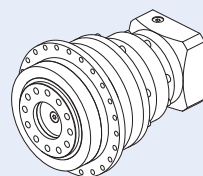
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8			9		10		11		12	
1	2	3	2	3	2	3	2	3	2	3
2800			6000		10,000		22,000		43,000	
1700			3800		6500		13,000		25,000	
≤713			≤1220		≤2062		≤3538		≤6269	
≤3 ≤1			≤3 —		≤3 —		≤3 —		≤3 —	
1500 4000	3000 6000	3700 6500	2800 4500	3300 6000	2500 4000	2800 4500	2300 3800	2800 4500	1700 3500	2500 4000
96	94	92	94	92	94	92	94	92	94	92
36.0 79.2	40.6 89.32	37.6 82.7	85.6 188.3	88.9 195.6	118.2 260	132.7 301.4	242.2 532.8	242.2 532.8	438.6 964.9	451.7 993.7
≤57			≤58		≤59		≤59		≤60	
10,050			33,000		50,000		60,000		70,000	
3486			7500		8800		11,000		15,000	
1550			7500		9500		11,500		14,000	
—			—		—		—		—	
—			—		—		—		—	
—			—		—		—		—	

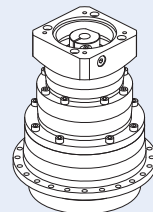
## PHQ Series Three-Stage Mounting Position

For all three stage units (PHQ: Size 7-12), the amount of lubrication depends on the mounting position.

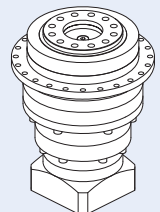
When ordering any of these three stage units, the mounting position (EL1, EL5 or EL6) **MUST BE SPECIFIED WITH THE ORDER!**



EL1



EL5



EL6

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## PHQ Series Motor Mounting Plate Option

(Motor information required with Motor Adapter ME option)

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

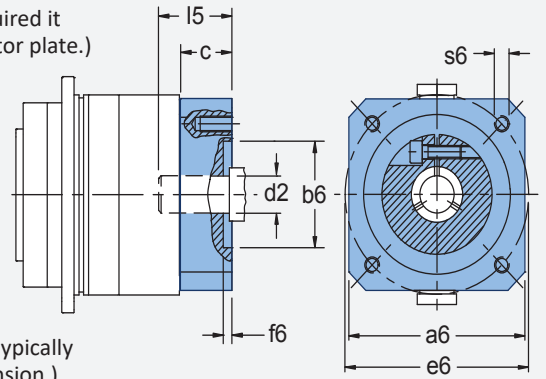
**NOTE: When ordering a gearhead:**

- 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**

- 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.)



**Motor Mounting Plate Dimensions — mm (Part Number Specific)**

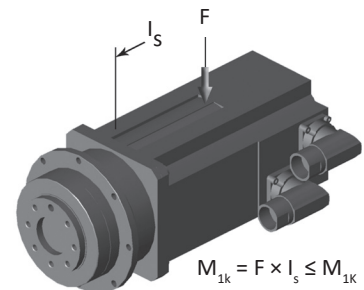
d2 Max. Motor Shaft Ø	c Min. Motor Plate Thickness*	Series / Size / # of Stages																		
		4		5		7			8			9		10		11		12		
		1	2	1	2	1	2	3	1	2	3	2	3	2	3	2	3	2	3	
19	18	PHQ		422																
24	21	PHQ	421	422...L		522				723										
32	24	PHQ	421...L		521	522...L		722	723...L				823							
38	25	PHQ			521...L		721	722...L			822	823...L		933						
48	43	PHQ					721...L				822...L		932	933...L		1033		1133		
60 <sup>1)</sup>	43	PHQ											932...L		1032	1033...L	1132	1133...L	1232	1233

\* Note that the c motor plate thickness is determined by the motor shaft length. The minimum motor plate thickness is the value listed.  
<sup>1)</sup> Maximum motor shaft diameter is 55 mm for PHQ932...L with ratios above 30:1 and for PHQ1033...L and PHQ1133...L with ratios above 150:1.

## PHQ 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<sub>s</sub>” of the motor.

M <sub>1K</sub>	PHQ431_ME		PHQ531_ME		PHQ731_ME		PHQ831_ME		PHQ931_ME		PHQ1032_ME		PHQ1132_ME		PHQ1232_ME	
	PHQ432_ME	PHQ733_ME	PHQ532_ME	PHQ833_ME	PHQ732_ME	PHQ933_ME	PHQ832_ME	PHQ1133_ME	PHQ932_ME	PHQ1233_ME	PHQ1033_ME	PHQ1132_ME	PHQ1233_ME	PHQ1132_ME	PHQ1232_ME	
Nm	20	40	80	200	400	800	1200	1800								





# Overview

## PHQ Series Permissible Output Shaft Load and Tilting Moments – Standard Bearings

Size	Z <sub>2</sub> Distance of Shaft Shoulder to Center of Output Bearing mm	F <sub>2ax100</sub> Permitted Axial Force N	F <sub>2rad100</sub> Permitted Radial Force ≤100RPM N	F <sub>2rad,acc</sub> Radial Acceleration Force N	M <sub>2K100</sub> Permitted Tilting Torque ≤100RPM Nm	M <sub>2K,acc</sub> Permitted Acceleration Tilting Torque Nm	C <sub>2K</sub> Tilting Stiffness Nm/arcmin
4	83.0	2150	3095	3929	257	326	160
5	97.0	4150	4536	4897	440	475	380
7	86.0	6150	17,045	17,045	1466	1466	500
8	125.5	10,050	27,778	33,333	3486	4183	1550
9	155.0	33,000	48,387	70,968	7,500	11,000	7500
10	171.0	50,000	51,462	73,099	8,800	12,500	9500
11	231.0	60,000	47,619	60,606	11,000	14,000	11,500
12	281.0	70,000	53,380	71,040	15,000	20,000	14,000

## PHQ Series Permissible Output Shaft Load and Tilting Moments – Reinforced Bearings

Size	Z <sub>2</sub> Distance of Shaft Shoulder to Center of Output Bearing mm	F <sub>2ax100</sub> Permitted Axial Force N	F <sub>2rad100</sub> Permitted Radial Force ≤100RPM N	F <sub>2rad,acc</sub> Radial Acceleration Force N	M <sub>2K100</sub> Permitted Tilting Torque ≤100RPM Nm	M <sub>2K,acc</sub> Permitted Acceleration Tilting Torque Nm	C <sub>2K</sub> Tilting Stiffness Nm/arcmin
4	88.5	2900	4000	4000	354	354	217
5	104.0	5000	5500	5500	572	572	478

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## PHQ 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:

$$F_{2AX} = \frac{F_{2ax100}}{\sqrt[3]{\frac{n_2}{100}}} \quad F_{2radN} = \frac{F_{2rad100}}{\sqrt[3]{\frac{n_2}{100rpm}}} \quad M_{2KX} = \frac{M_{2K100}}{\sqrt[3]{\frac{n_2}{100}}}$$

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

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

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

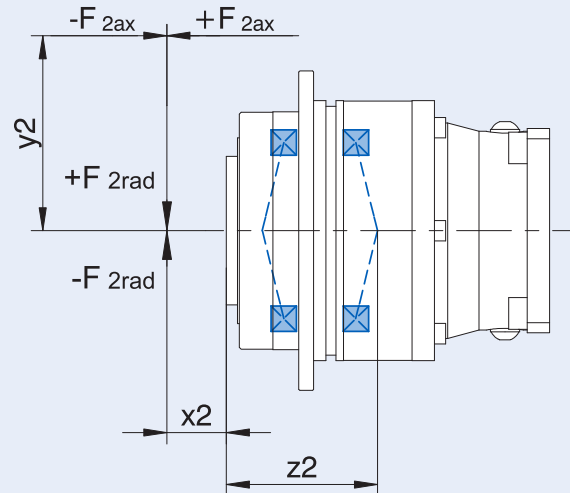
$$F_{2rad,eq*} = \sqrt[3]{\frac{n_{2b1} \cdot t_{b1} \cdot F_{2rb1}^3 + \dots + n_{2bn} \cdot t_{bn} \cdot F_{2rnb}^3}{n_{2b1} \cdot t_{b1} + \dots + n_{2bn} \cdot t_{bn}}} \leq F_{2radN}$$

Where:

- Z<sub>2</sub> Distance of Shaft Shoulder to Center of Output Bearing
- n<sub>2</sub> Actual Average Output Speed
- x<sub>2</sub> Distance of the Shaft Shoulder to the Force Application Point
- y<sub>2</sub> Distance of the Shaft Axis to the Axial Force Application Point
- F<sub>2ax\*</sub> Actual Axial Force at Gear Unit Output
- F<sub>2ax100</sub> Permitted Axial Force
- F<sub>2rad100</sub> Permitted Radial Force ≤100RPM
- F<sub>2rad,acc</sub> Radial Acceleration Force
- F<sub>2rad,acc\*</sub> Radial Acceleration Force at Gear Unit Output
- M<sub>2K100</sub> Permitted Tilting Torque ≤100RPM
- M<sub>2K,acc</sub> Permitted Acceleration Tilting Torque
- M<sub>2k,acc\*</sub> Permitted Acceleration Tilting Torque at Gear Unit Output
- C<sub>2K</sub> 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%

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

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Exact Ratio (i)	Output Torque				Backlash $\Delta\phi_2$	Red. Backlash $\Delta\phi_{2red}$	Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max $\phi$ $d_{MW}$	Input Inertia $J_1$	Tors. Stiffness $C_2$	Oper. Noise $L_{pA}$
	Nom. <sup>1)</sup> $M_{2N}$	Accel. $M_{2acc}$	Accel. Torque for Reduced Backlash $M_{2accHT}$	Peak <sup>2)</sup> $M_{2NOT}$				Cont.	Cyclic				
	Nm	Nm	Nm	Nm				arcmin	arcmin				

## PHQ4

5.500	100	200	220	385	3	1	PHQ431_0055 ME	3000	6000	$\leq 24$	1.1	42	59
				400			PHQ431_0055 MEL			$\leq 32$	2.7		
22.00	120	200	238	400	3	1	PHQ432_0220 ME	4000	8000	$\leq 19$	0.51	40	60
							PHQ432_0220 MEL			$\leq 24$	0.94		
27.50	120	200	246	400	3	1	PHQ432_0280 ME	4500	8000	$\leq 19$	0.46	40	58
							PHQ432_0280 MEL			$\leq 24$	0.89		
38.50	130	200	246	400	3	1	PHQ432_0390 ME	4500	8000	$\leq 19$	0.43	40	57
							PHQ432_0390 MEL			$\leq 24$	0.86		
55.00	130	200	247	400	3	1	PHQ432_0550 ME	4500	8000	$\leq 19$	0.41	38	55
							PHQ432_0550 MEL			$\leq 24$	0.84		

<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option



# Selection Data

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max Ø d <sub>MW</sub>	Input Inertia J <sub>1</sub>	Tors. Stiffness C <sub>2</sub>	Oper. Noise L <sub>PA</sub>
	Nom. <sup>1)</sup> M <sub>ZN</sub>	Accel. M <sub>Zacc</sub>	Accel. Torque for Reduced Backlash M <sub>ZaccHT</sub>	Peak <sup>2)</sup> M <sub>ZNOT</sub>	Backlash Δφ <sub>2</sub>	Red. Backlash Δφ <sub>Zred</sub>							
	Nm	Nm	Nm	Nm	arcmin	arcmin		Cont.	Cyclic	mm	kgcm <sup>2</sup>	Nm/arcmin	dB(A)

## PHQ5

5.500	280	550	550	948	3	1	PHQ531_0055 ME	2500	5000	≤32	3.3	101	60
							PHQ531_0055 MEL			≤38		102	
22.00	290	480	530	948	3	1	PHQ532_0220 ME	3500	7000	≤24	1.1	102	61
							PHQ532_0220 MEL			≤32		2.7	
27.50	300	540	562	948	3	1	PHQ532_0280 ME	3700	7500	≤24	1.0	102	59
							PHQ532_0280 MEL			≤32		2.6	
38.50	320	530	552	948	3	1	PHQ532_0390 ME	4000	8000	≤24	0.94	100	58
							PHQ532_0390 MEL			≤32		2.5	
55.00	320	500	500	948	3	1	PHQ532_0550 ME	4000	8000	≤24	0.89	95	56
							PHQ532_0550 MEL			≤32		2.5	

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<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option



# PHQ Series: INLINE — Flange Output

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max Ø d <sub>MW</sub>	Input Inertia J <sub>1</sub>	Tors. Stiffness C <sub>2</sub>	Oper. Noise L <sub>PA</sub>
	Nom. <sup>1)</sup> M <sub>2N</sub>	Accel. M <sub>2acc</sub>	Accel. Torque for Reduced Backlash M <sub>2accHT</sub>	Peak <sup>2)</sup> M <sub>2NOT</sub>	Backlash Δφ <sub>2</sub>	Red. Backlash Δφ <sub>2red</sub>							
	Nm	Nm	Nm	Nm	arcmin	arcmin		Cont.	Cyclic	mm	kgcm <sup>2</sup>	Nm/arcmin	dB(A)

## PHQ7

5.500	500	1050	1050	1816	3	1	PHQ731_0055 ME	2200	5000	≤38	8.9	216	61
				2100			PHQ731_0055 MEL			≤48		19	
22.00	650	900	1000	1800	3	1	PHQ732_0220 ME	3000	6000	≤32	3.6	224	62
							PHQ732_0220 MEL			≤38			
27.50	650	1050	1050	2100	3	1	PHQ732_0280 ME	3500	7000	≤32	3.3	223	60
							PHQ732_0280 MEL			≤38			
38.50	680	1050	1050	2100	3	1	PHQ732_0390 ME	3700	7000	≤32	2.9	220	59
							PHQ732_0390 MEL			≤38			
55.00	680	1050	1050	2100	3	1	PHQ732_0550 ME	3700	7000	≤32	2.7	213	57
							PHQ732_0550 MEL			≤38			
88.00	680	1050	1050	2100	3	1	PHQ733_0880 ME	3300	6000	≤24	1.2	224	61
							PHQ733_0880 MEL			≤32			
110.0	680	1050	1050	2100	3	1	PHQ733_1100 ME	3300	6000	≤24	1.1	224	61
							PHQ733_1100 MEL			≤32			
137.5	680	1050	1050	2100	3	1	PHQ733_1380 ME	3700	6500	≤24	1.0	224	59
							PHQ733_1380 MEL			≤32			
154.0	680	1050	1050	2100	3	1	PHQ733_1540 ME	4000	7000	≤24	0.95	223	58
							PHQ733_1540 MEL			≤32			
192.5	680	1050	1050	2100	3	1	PHQ733_1930 ME	4000	7000	≤24	0.94	223	58
							PHQ733_1930 MEL			≤32			
220.0	680	1050	1050	2100	3	1	PHQ733_2200 ME	4000	7000	≤24	0.89	222	56
							PHQ733_2200 MEL			≤32			
275.0	680	1050	1050	2100	3	1	PHQ733_2750 ME	4000	7000	≤24	0.89	222	56
							PHQ733_2750 MEL			≤32			
385.0	680	1050	1050	2100	3	1	PHQ733_3850 ME	4000	7000	≤24	0.88	221	56
							PHQ733_3850 MEL			≤32			
550.0	680	1050	1050	2100	3	1	PHQ733_5500 ME	4000	7000	≤24	0.88	214	56
							PHQ733_5500 MEL			≤32			

<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option



Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max Ø d <sub>MW</sub> mm	Input Inertia J <sub>1</sub> kgcm <sup>2</sup>	Tors. Stiffness C <sub>2</sub> Nm/arcmin	Oper. Noise L <sub>PA</sub> dB(A)
	Nom. <sup>1)</sup> M <sub>ZN</sub>	Accel. M <sub>Zacc</sub>	Accel. Torque for Reduced Backlash M <sub>ZaccHT</sub>	Peak <sup>2)</sup> M <sub>ZNOT</sub>	Backlash Δφ <sub>2</sub> arcmin	Red. Backlash Δφ <sub>2red</sub> arcmin		Cont.	Cyclic				
	Nm	Nm	Nm	Nm	arcmin	arcmin							

## PHQ8

5.500	1400	2800	3300	3311	3	1	PHQ831_0055 ME	1500	4000	≤48	31	621	62
				5087			PHQ831_0055 MEL			≤60			
22.00	1700	2800	3300	5087	3	1	PHQ832_0220 ME	2500	4500	≤38	11	709	63
							PHQ832_0220 MEL			≤48			
27.50	1700	2800	3300	5087	3	1	PHQ832_0280 ME	2700	5500	≤38	8.9	707	61
							PHQ832_0280 MEL			≤48			
38.50	1700	2800	3300	5087	3	1	PHQ832_0390 ME	3000	6000	≤38	7.7	697	60
							PHQ832_0390 MEL			≤48			
55.00	1700	2700	2990	5087	3	1	PHQ832_0550 ME	3000	6000	≤38	7.0	669	58
							PHQ832_0550 MEL			≤48			
88.00	1700	2800	3300	5087	3	1	PHQ833_0880 ME	3000	5000	≤32	3.7	711	62
							PHQ833_0880 MEL			≤38			
110.0	1700	2800	3300	5087	3	1	PHQ833_1100 ME	3000	5000	≤32	3.6	711	62
							PHQ833_1100 MEL			≤38			
137.5	1700	2800	3300	5087	3	1	PHQ833_1380 ME	3500	6000	≤32	3.3	710	60
							PHQ833_1380 MEL			≤38			
154.0	1700	2800	3300	5087	3	1	PHQ833_1540 ME	3700	6500	≤32	3.0	709	59
							PHQ833_1540 MEL			≤38			
192.5	1700	2800	3300	5087	3	1	PHQ833_1930 ME	3700	6500	≤32	2.9	709	59
							PHQ833_1930 MEL			≤38			
220.0	1700	2800	3300	5087	3	1	PHQ833_2200 ME	3700	6500	≤32	2.7	705	57
							PHQ833_2200 MEL			≤38			
275.0	1700	2800	3300	5087	3	1	PHQ833_2750 ME	3700	6500	≤32	2.7	707	57
							PHQ833_2750 MEL			≤38			
385.0	1700	2800	3300	5087	3	1	PHQ833_3850 ME	3700	6500	≤32	2.7	698	57
							PHQ833_3850 MEL			≤38			
550.0	1700	2700	2990	5087	3	1	PHQ833_5500 ME	3700	6500	≤32	2.7	672	57
							PHQ833_5500 MEL			≤38			

<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option

# PHQ Series: INLINE — Flange Output

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max Ø d <sub>MW</sub>	Input Inertia J <sub>1</sub>	Tors. Stiffness C <sub>2</sub>	Oper. Noise L <sub>PA</sub>
	Nom. <sup>1)</sup> M <sub>2N</sub>	Accel. M <sub>2acc</sub>	Accel. Torque for Reduced Backlash M <sub>2accHT</sub>	Peak <sup>2)</sup> M <sub>2NOT</sub>	Backlash ΔΦ <sub>2</sub>	Red. Backlash ΔΦ <sub>2red</sub>							
	Nm	Nm	Nm	Nm	arcmin	arcmin		Cont.	Cyclic	mm	kgcm <sup>2</sup>	Nm/arcmin	dB(A)

## PHQ9

18.00	3800	6000	-	10,115	3	-	PHQ932_0180 ME	1800	3000	≤48	64	1177	66
							PHQ932_0180 MEL			≤60		1220	
24.00	3800	6000	-	12,000	3	-	PHQ932_0240 ME	2200	3500	≤48	35	1191	64
							PHQ932_0240 MEL			≤60		1215	
30.00	3800	6000	-	12,000	3	-	PHQ932_0300 ME	2500	4000	≤48	28	1192	62
							PHQ932_0300 MEL			≤60		1208	
42.00	3800	6000	-	12,000	3	-	PHQ932_0420 ME	2800	4500	≤48	20	1182	61
							PHQ932_0420 MEL			≤55		1192	
60.00	3800	6000	-	12,000	3	-	PHQ932_0600 ME	2800	4500	≤48	18	1144	59
							PHQ932_0600 MEL			≤55		1148	
72.00	3800	6000	-	12,000	3	-	PHQ933_0720 ME	2200	4500	≤38	13	1198	63
							PHQ933_0720 MEL			≤48		1202	
96.00	3800	6000	-	12,000	3	-	PHQ933_0960 ME	2500	4500	≤38	11	1203	63
							PHQ933_0960 MEL			≤48		1205	
120.0	3800	6000	-	12,000	3	-	PHQ933_1200 ME	2500	4500	≤38	11	1200	63
							PHQ933_1200 MEL			≤48		1201	
150.0	3800	6000	-	12,000	3	-	PHQ933_1500 ME	3000	5500	≤38	9.0	1200	61
							PHQ933_1500 MEL			≤48		1201	
168.0	3800	6000	-	12,000	3	-	PHQ933_1680 ME	3300	6000	≤38	6.2	1202	60
							PHQ933_1680 MEL			≤48		1203	
210.0	3800	6000	-	12,000	3	-	PHQ933_2100 ME	3300	6000	≤38	6.0	1199	60
							PHQ933_2100 MEL			≤48		1200	
240.0	3800	6000	-	12,000	3	-	PHQ933_2400 ME	3300	6000	≤38	5.4	1197	58
							PHQ933_2400 MEL			≤48		17	
300.0	3800	6000	-	12,000	3	-	PHQ933_3000 ME	3300	6000	≤38	5.4	1196	58
							PHQ933_3000 MEL			≤48		17	
420.0	3800	6000	-	12,000	3	-	PHQ933_4200 ME	3300	6000	≤38	5.3	1184	58
							PHQ933_4200 MEL			≤48		17	
600.0	3800	6000	-	12,000	3	-	PHQ933_6000 ME	3300	6000	≤38	5.3	1144	58
							PHQ933_6000 MEL			≤48		17	

<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option



Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max Ø d <sub>MW</sub>	Input Inertia J <sub>1</sub>	Tors. Stiffness C <sub>2</sub>	Oper. Noise L <sub>PA</sub>
	Nom. <sup>1)</sup> M <sub>2N</sub>	Accel. M <sub>2acc</sub>	Accel. Torque for Reduced Backlash M <sub>2accHT</sub>	Peak <sup>2)</sup> M <sub>2NOT</sub>	Backlash Δφ <sub>2</sub>	Red. Backlash Δφ <sub>2red</sub>							
	Nm	Nm	Nm	Nm	arcmin	arcmin		Cont.	Cyclic	mm	kgcm <sup>2</sup>	Nm/arcmin	dB(A)

## PHQ10

24.00	6500	10,000	–	20,000	3	–	PHQ1032_0240 ME	2000	3000	≤60	100	2062	65
30.00	6500	10,000	–	20,000	3	–	PHQ1032_0300 ME	2200	3500	≤60	82	2058	63
42.00	6500	10,000	–	20,000	3	–	PHQ1032_0420 ME	2500	4000	≤60	67	2040	62
60.00	6500	10,000	–	20,000	3	–	PHQ1032_0600 ME	2500	4000	≤60	60	1970	60
96.00	6500	10,000	–	20,000	3	–	PHQ1033_0960 ME	2200	3500	≤48	36	2062	64
							PHQ1033_0960 MEL			≤60	72	2067	
120.0	6500	10,000	–	20,000	3	–	PHQ1033_1200 ME	2200	3500	≤48	35	2058	64
							PHQ1033_1200 MEL			≤60	71	2061	
150.0	6500	10,000	–	20,000	3	–	PHQ1033_1500 ME	2500	4000	≤48	28	2058	62
							PHQ1033_1500 MEL			≤60	64	2060	
168.0	6500	10,000	–	20,000	3	–	PHQ1033_1680 ME	2800	4500	≤48	21	2062	61
							PHQ1033_1680 MEL			≤55	53	2063	
210.0	6500	10,000	–	20,000	3	–	PHQ1033_2100 ME	2800	4500	≤48	20	2058	61
							PHQ1033_2100 MEL			≤55	53	2059	
240.0	6500	10,000	–	20,000	3	–	PHQ1033_2400 ME	2800	4500	≤48	18	2054	59
							PHQ1033_2400 MEL			≤55	50	2055	
300.0	6500	10,000	–	20,000	3	–	PHQ1033_3000 ME	2800	4500	≤48	18	2053	59
							PHQ1033_3000 MEL			≤55	50	2054	
420.0	6500	10,000	–	20,000	3	–	PHQ1033_4200 ME	2800	4500	≤48	18	2036	62
							PHQ1033_4200 MEL			≤55	50		
600.0	6500	10,000	–	20,000	3	–	PHQ1033_6000 ME	2800	4500	≤48	17	1969	59
							PHQ1033_6000 MEL			≤55	50		

PHQ Series: INLINE — Flange Output

<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option

# PHQ Series: INLINE — Flange Output

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max Ø d <sub>MW</sub> mm	Input Inertia J <sub>1</sub> kgcm <sup>2</sup>	Tors. Stiffness C <sub>2</sub> Nm/arcmin	Oper. Noise L <sub>PA</sub> dB(A)
	Nom. <sup>1)</sup> M <sub>2N</sub>	Accel. M <sub>2acc</sub>	Accel. Torque for Reduced Backlash M <sub>2accHT</sub>	Peak <sup>2)</sup> M <sub>2NOT</sub>	Backlash Δφ <sub>2</sub> arcmin	Red. Backlash Δφ <sub>2red</sub> arcmin		Cont.	Cyclic				
	Nm	Nm	Nm	Nm	arcmin	arcmin							

## PHQ11

24.00	13000	22,000	–	32,208	3	–	PHQ1132_0240 ME	1800	3800	≤60	175	3533	68
30.00	13000	22,000	–	40,000	3	–	PHQ1132_0300 ME	2000	3300	≤60	128	3538	66
42.00	13000	22,000	–	32,708	3	–	PHQ1132_0420 ME	2300	3800	≤60	89	3515	65
60.00	13000	22,000	–	40,000	3	–	PHQ1132_0600 ME	2300	2800	≤60	71	3460	63
96.00	13000	22,000	–	40,000	3	–	PHQ1133_0960 ME	2200	3500	≤48	41	3515	64
							PHQ1133_0960 MEL			≤60	77	3528	
120.0	13000	22,000	–	40,000	3	–	PHQ1133_1200 ME	2200	3500	≤48	37	3502	62
							PHQ1133_1200 MEL			≤60	74	3511	
150.0	13000	22,000	–	40,000	3	–	PHQ1133_1500 ME	2500	4000	≤48	30	3503	62
							PHQ1133_1500 MEL			≤60	66	3508	
168.0	13000	22,000	–	40,000	3	–	PHQ1133_1680 ME	2800	4500	≤48	22	3513	61
							PHQ1133_1680 MEL			≤55	55	3518	
210.0	13000	22,000	–	40,000	3	–	PHQ1133_2100 ME	2800	4500	≤48	21	3502	61
							PHQ1133_2100 MEL			≤55	54	3505	
240.0	13000	22,000	–	40,000	3	–	PHQ1133_2400 ME	2800	4500	≤48	19	3494	59
							PHQ1133_2400 MEL			≤55	51	3496	
300.0	13000	22,000	–	40,000	3	–	PHQ1133_3000 ME	2800	4500	≤48	18	3489	59
							PHQ1133_3000 MEL			≤55	51	3490	

<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option



Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)		Motor Shaft <sup>3)</sup> Max Ø d <sub>MW</sub>	Input Inertia J <sub>1</sub>	Tors. Stiffness C <sub>2</sub>	Oper. Noise L <sub>PA</sub>
	Nom. <sup>1)</sup> M <sub>ZN</sub>	Accel. M <sub>Zacc</sub>	Accel. Torque for Reduced Backlash M <sub>ZaccHT</sub>	Peak <sup>2)</sup> M <sub>ZNOT</sub>	Backlash Δφ <sub>2</sub>	Red. Backlash Δφ <sub>Zred</sub>							
	Nm	Nm	Nm	Nm	arcmin	arcmin		Cont.	Cyclic	mm	kgcm <sup>2</sup>	Nm/arcmin	dB(A)

## PHQ12

24.00	25,000	43,000	–	53,836	3	–	<a href="#">PHQ1232_0240 ME</a>	1200	3000	≤60	537	6248	72
42.00	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1232_0420 ME</a>	1700	3500	≤60	371	6236	69
96.00	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1233_0960 ME</a>	2000	3000	≤60	116	6271	65
120.0	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1233_1200 ME</a>	2200	3500	≤60	92	6269	63
168.0	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1233_1680 ME</a>	2500	4000	≤60	72	6258	62
210.0	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1233_2100 ME</a>	2200	3500	≤60	83	6153	63
240.0	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1233_2400 ME</a>	2500	4000	≤60	62	6216	60
294.0	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1233_2940 ME</a>	2500	4000	≤60	68	6149	62
420.0	25,000	43,000	–	80,000	3	–	<a href="#">PHQ1233_4200 ME</a>	2500	4000	≤60	60	6136	60

PHQ Series: INLINE — Flange Output

<sup>1)</sup> Based on input speed of 1500 RPM. See page 46 for details on torque calculations.

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

<sup>3)</sup> For additional motor shaft sizes or smaller inertia value, please visit [configurator.stober.com](http://configurator.stober.com)

\* ME= Motor Adapter L=Large Input Option