

# PHQ Series: INLINE — Flange Output

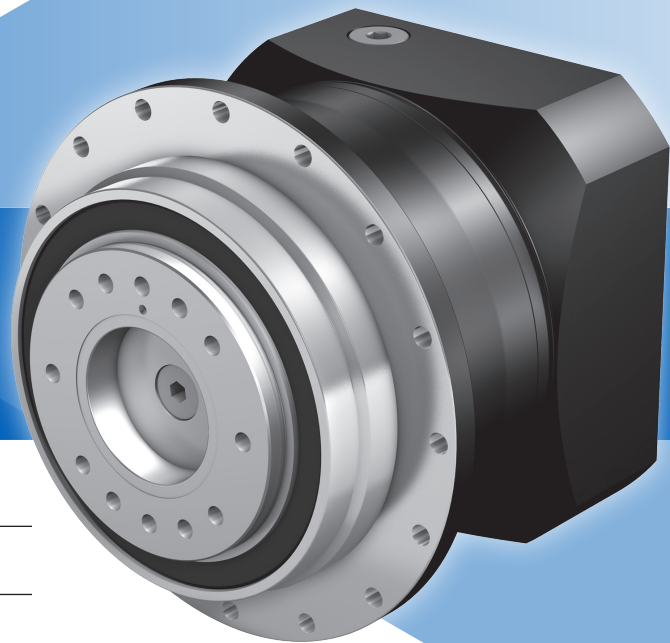
## PHQ Features

- 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<br>(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%;<br>2 stage 93%;<br>3 stage 90%   |
| <b>Input RPM</b>             | Up to 8,000 RPM   |
| <b>Installation</b>          | Requires 12.9 fasteners. See page 288 for more information                            |
| <b>Lubrication</b>           | Lubricated for life – standard Mobil SHC629;<br>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><br><b>9 10 11 12</b> | 8 sizes of gearhead  |
| <b>3</b> Generation    | <b>3</b><br><b>4</b>                | Sizes 3-8<br>Sizes 9-12  |
| <b>4</b> # of Stages   | <b>1</b><br><b>2</b><br><b>3</b>    | One stage<br>Two stage<br>Three stage  |
| <b>5</b> Housing       | <b>S</b>                            | Standard   |
| <b>6</b> Output        | <b>F</b>                            | Flange output  |
| <b>7</b> Bearing       | <b>S</b><br><b>V</b>                | Standard<br>Reinforced Bearing (PHQ4 and 5)  |
| <b>8</b> Backlash      | <b>S</b><br><b>R</b>                | Standard Backlash (PHQ4-8 only)<br>Reduced backlash (PHQ4-9 only)  |
| <b>9</b> Ratio         | <b>0055</b>                         | Ratios range from 5.5:1 to 600:1<br>(0055=5.5:1; 0160=16:1; 1000=100:1, etc.)  |
| <b>0</b> Motor Adapter | <b>ME</b><br><b>MF</b><br><b>MB</b> | Motor Adapter with EasyAdapt coupling<br>Motor Adapter with FlexiAdapt coupling (PHQ3-8) (Contact factory for this option)<br>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

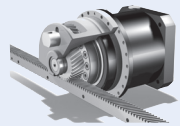
- Accommodates a larger diameter motor shaft without going to a larger size gearbox.

#### 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.



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## 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><br>$M_{2BMAX}$                       | Nm                   | 200                  |              | 550                  |              | 1050                 |              |              |
| <b>Output Torque Nom.</b> <sup>1</sup><br>$M_{2N}$              | Nm                   | 130                  |              | 320                  |              | 680                  |              |              |
| <b>Torsional Stiffness</b><br>$C_2$                             | Nm/arcmin            | 42                   |              | 102                  |              | 224                  |              |              |
| <b>Torsional Backlash</b> <sup>2)</sup><br>$\Delta\phi$ Reduced | arcmin               | $\leq 3$<br>$\leq 1$ |              | $\leq 3$<br>$\leq 1$ |              | $\leq 3$<br>$\leq 1$ |              |              |
| <b>Input Speed Max.</b><br>$n_{1MAX}$                           | Continuous<br>Cyclic | 3000<br>6000         | 4500<br>8000 | 2500<br>5000         | 4000<br>8000 | 2200<br>5000         | 3700<br>7000 | 4000<br>7000 |
| <b>Efficiency (@nom torque)</b>                                 | %                    | 96                   | 94           | 96                   | 94           | 96                   | 94           | 92           |
| <b>Weight</b>   | kg<br>lbs            | 4.8<br>10.6          | 5.3<br>11.7  | 7.6<br>16.7          | 8.9<br>19.6  | 15.9<br>35           | 16.1<br>35.4 | 17.4<br>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><br>$F_{2ax100}$   | N         | 2150 |  | 4150 |  | 6150 |  |  |
| <b>Permitted Tilting Torque</b><br>$M_{2K100}$ | Nm        | 257  |  | 440  |  | 1466 |  |  |
| <b>Tilting Stiffness</b><br>$C_{2K}$           | Nm/arcmin | 192  |  | 429  |  | 500  |  |  |

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

|  |           |      |  |      |  |   |  |  |
|--|-----------|------|--|------|--|---|--|--|
| <b>Permitted Axial Force</b><br>$F_{2ax100}$   | N         | 2900 |  | 5000 |  | — |  |  |
| <b>Permitted Tilting Torque</b><br>$M_{2K100}$ | Nm        | 354  |  | 572  |  | — |  |  |
| <b>Tilting Stiffness</b><br>$C_{2K}$           | 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 <?>.



# Overview

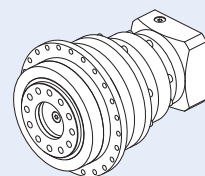
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| 8            |               |              | 9             |               | 10           |                | 11             |                | 12             |                |
|--------------|---------------|--------------|---------------|---------------|--------------|----------------|----------------|----------------|----------------|----------------|
| 1            | 2             | 3            | 2             | 3             | 2            | 3              | 2              | 3              | 2              | 3              |
| 2800         |               |              | 6000          |               | 10,000       |                | 22,000         |                | 43,000         |                |
| 1700         |               |              | 4500          |               | 6500         |                | 13,000         |                | 25,000         |                |
| 713          |               |              | 1223          |               | 2072         |                | 3529           |                | 6277           |                |
| ≤3<br>≤1     |               |              | ≤3<br>—       |               | ≤3<br>—      |                | ≤3<br>—        |                | ≤3<br>—        |                |
| 1500<br>4000 | 3000<br>6000  | 3700<br>6500 | 2800<br>4500  | 3300<br>6000  | 2500<br>4000 | 2800<br>4500   | 2300<br>3800   | 2800<br>4500   | 1700<br>3500   | 2500<br>4000   |
| 96           | 94            | 92           | 94            | 92            | 94           | 92             | 94             | 92             | 94             | 92             |
| 36.0<br>79.2 | 40.6<br>89.32 | 37.6<br>82.7 | 85.6<br>188.3 | 88.9<br>195.6 | 118.2<br>260 | 132.7<br>301.4 | 242.2<br>532.8 | 242.2<br>532.8 | 438.6<br>964.9 | 451.7<br>993.7 |
| ≤57          |               |              | ≤58           |               | ≤59          |                | ≤59            |                | ≤60            |                |
| 10,050       |               |              | 33,000        |               | 50,000       |                | 60,000         |                | 70,000         |                |
| 3486         |               |              | 7500          |               | 8800         |                | 11,000         |                | 18,000         |                |
| 1550         |               |              | 7500          |               | 9500         |                | 11,500         |                | 14,000         |                |
| —            |               |              | —             |               | —            |                | —              |                | —              |                |
| —            |               |              | —             |               | —            |                | —              |                | —              |                |
| —            |               |              | —             |               | —            |                | —              |                | —              |                |

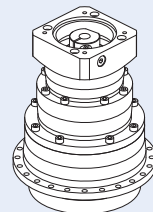
## PHQ Series Three-Stage Mounting Position

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

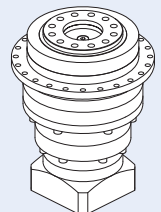
When ordering any of these three stage units, the mounting position (EL1, EL5 or EL6) **MUST BE SPECIFIED WITH THE ORDER!**



**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.

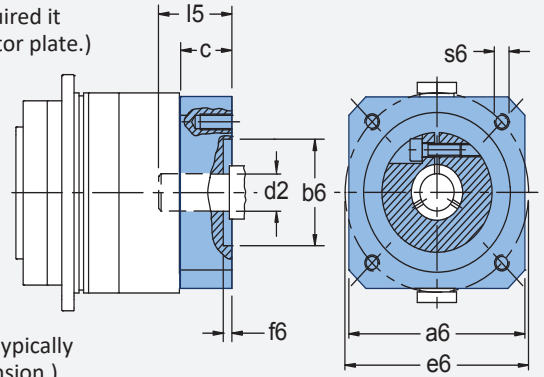
**NOTE: When ordering a gearhead:**

- 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)**

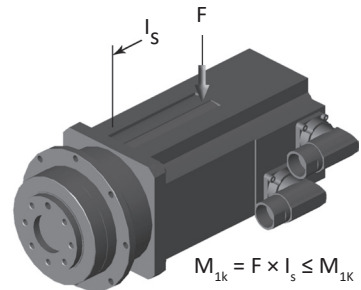
| d2<br>Max. Motor Shaft Ø | c<br>Min. Motor Plate Thickness* | Series / Size / # of Stages |         |         |         |         |         |         |         |     |         |         |         |      |          |      |          |      |      |
|--------------------------|----------------------------------|-----------------------------|---------|---------|---------|---------|---------|---------|---------|-----|---------|---------|---------|------|----------|------|----------|------|------|
|                          |                                  | 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                         |         | 432     |         |         |         |         |         |     |         |         |         |      |          |      |          |      |      |
| 24                       | 21                               | PHQ                         | 431     | 432...L |         | 532     |         |         |         | 733 |         |         |         |      |          |      |          |      |      |
| 32                       | 24                               | PHQ                         | 431...L |         | 531     | 532...L |         | 732     | 733...L |     |         | 833     |         |      |          |      |          |      |      |
| 38                       | 25                               | PHQ                         |         |         | 531...L |         | 731     | 732...L |         |     | 832     | 833...L | 943     |      |          |      |          |      |      |
| 48                       | 43                               | PHQ                         |         |         |         |         | 731...L |         |         |     | 832...L | 942     | 943...L | 1043 |          | 1143 |          |      |      |
| 60 <sup>1)</sup>         | 43                               | PHQ                         |         |         |         |         |         |         |         |     |         | 942...L |         | 1042 | 1043...L | 1142 | 1143...L | 1242 | 1243 |

\* 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  |            | PHQ942_ME  |  | PHQ1042_ME |  | PHQ1142_ME |  | PHQ1242_ME |  |
|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|--|------------|--|------------|--|------------|--|
|                 | PHQ432_ME | PHQ733_ME | PHQ532_ME | PHQ732_ME | PHQ832_ME | PHQ933_ME | PHQ1043_ME | PHQ1143_ME | PHQ1243_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><br>Distance of Shaft Shoulder to Center of Output Bearing<br>mm | F <sub>2ax100</sub><br>Permitted Axial Force<br>N | F <sub>2rad100</sub><br>Permitted Radial Force ≤100RPM<br>N | F <sub>2rad,acc</sub><br>Radial Acceleration Force<br>N | M <sub>2K100</sub><br>Permitted Tilting Torque ≤100RPM<br>Nm | M <sub>2K,acc</sub><br>Permitted Acceleration Tilting Torque<br>Nm | C <sub>2K</sub><br>Tilting Stiffness<br>Nm/arcmin |
|------|--|---|---|---|--|--|---|
| 4    | 83.0   | 2150  | 3095  | 3929  | 257  | 326  | 192   |
| 5    | 97.0   | 4150  | 4536  | 4897  | 440  | 475  | 429   |
| 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  | 69,264  | 11,000   | 16,000   | 11,500  |
| 12   | 281.0  | 70,000  | 64,057  | 106,761   | 18,000   | 30,000   | 14,000  |

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

| Size | Z <sub>2</sub><br>Distance of Shaft Shoulder to Center of Output Bearing<br>mm | F <sub>2ax100</sub><br>Permitted Axial Force<br>N | F <sub>2rad100</sub><br>Permitted Radial Force ≤100RPM<br>N | F <sub>2rad,acc</sub><br>Radial Acceleration Force<br>N | M <sub>2K100</sub><br>Permitted Tilting Torque ≤100RPM<br>Nm | M <sub>2K,acc</sub><br>Permitted Acceleration Tilting Torque<br>Nm | C <sub>2K</sub><br>Tilting Stiffness<br>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:

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

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

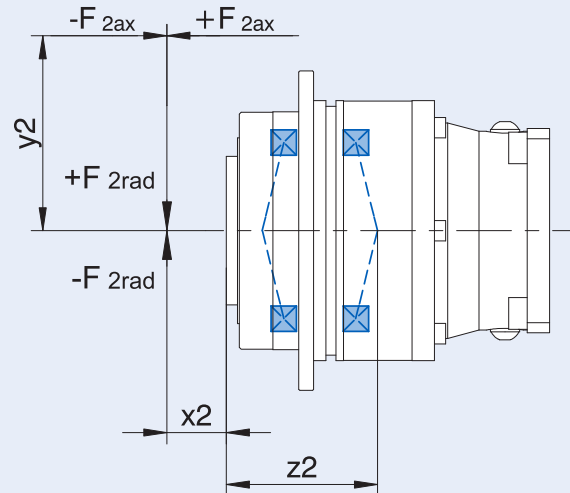
$$F_{2rad,eq*} = \sqrt[3]{\frac{n_{2b1} \cdot t_{b1} \cdot F_{2rb1}^3 + \dots + n_{2bn} \cdot t_{bn} \cdot F_{2rbn}^3}{n_{2b1} \cdot t_{b1} + \dots + n_{2bn} \cdot t_{bn}}} \leq F_{2radN}$$

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%**

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

# PHQ Series: INLINE — Flange Output

| 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> 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                                  |                                 |                           |        |  |  |  |                                   |

## PHQ5

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

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> | 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 |
|       |      |      |      | 4964 |   |   | PHQ831_0055 MEL |      |      | ≤60 |     |     |    |
| 22.00 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ832_0220 ME  | 2500 | 4500 | ≤38 | 11  | 709 | 63 |
|       |      |      |      |      |   |   | PHQ832_0220 MEL |      |      | ≤48 |     |     |    |
| 27.50 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ832_0280 ME  | 2700 | 5500 | ≤38 | 8.9 | 707 | 61 |
|       |      |      |      |      |   |   | PHQ832_0280 MEL |      |      | ≤48 |     |     |    |
| 38.50 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ832_0390 ME  | 3000 | 6000 | ≤38 | 7.7 | 697 | 60 |
|       |      |      |      |      |   |   | PHQ832_0390 MEL |      |      | ≤48 |     |     |    |
| 55.00 | 1700 | 2700 | 2990 | 4964 | 3 | 1 | PHQ832_0550 ME  | 3000 | 6000 | ≤38 | 7.0 | 669 | 58 |
|       |      |      |      |      |   |   | PHQ832_0550 MEL |      |      | ≤48 |     |     |    |
| 88.00 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_0880 ME  | 3000 | 5000 | ≤32 | 3.7 | 711 | 62 |
|       |      |      |      |      |   |   | PHQ833_0880 MEL |      |      | ≤38 |     |     |    |
| 110.0 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_1100 ME  | 3000 | 5000 | ≤32 | 3.6 | 711 | 62 |
|       |      |      |      |      |   |   | PHQ833_1100 MEL |      |      | ≤38 |     |     |    |
| 137.5 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_1380 ME  | 3500 | 6000 | ≤32 | 3.3 | 710 | 60 |
|       |      |      |      |      |   |   | PHQ833_1380 MEL |      |      | ≤38 |     |     |    |
| 154.0 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_1540 ME  | 3700 | 6500 | ≤32 | 3.0 | 709 | 59 |
|       |      |      |      |      |   |   | PHQ833_1540 MEL |      |      | ≤38 |     |     |    |
| 192.5 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_1930 ME  | 3700 | 6500 | ≤32 | 2.9 | 709 | 59 |
|       |      |      |      |      |   |   | PHQ833_1930 MEL |      |      | ≤38 |     |     |    |
| 220.0 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_2200 ME  | 3700 | 6500 | ≤32 | 2.7 | 705 | 57 |
|       |      |      |      |      |   |   | PHQ833_2200 MEL |      |      | ≤38 |     |     |    |
| 275.0 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_2750 ME  | 3700 | 6500 | ≤32 | 2.7 | 707 | 57 |
|       |      |      |      |      |   |   | PHQ833_2750 MEL |      |      | ≤38 |     |     |    |
| 385.0 | 1700 | 2800 | 3300 | 4964 | 3 | 1 | PHQ833_3850 ME  | 3700 | 6500 | ≤32 | 2.7 | 698 | 57 |
|       |      |      |      |      |   |   | PHQ833_3850 MEL |      |      | ≤38 |     |     |    |
| 550.0 | 1700 | 2700 | 2990 | 4964 | 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 | 6000 | 10496 | 3.0 | 1.0 | PHQ942_0180 ME  | 1800 | 3000 | ≤48 | 62  | 1212 | 66 |
|       |      |      |      | 12000 |     |     | PHQ942_0180 MEL |      |      | ≤60 |     | 90   |    |
| 24.00 | 3800 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ942_0240 ME  | 2000 | 3500 | ≤48 | 37  | 1211 | 64 |
|       |      |      |      |       |     |     | PHQ942_0240 MEL |      |      | ≤60 |     | 65   |    |
| 30.00 | 4200 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ942_0300 ME  | 2500 | 4000 | ≤48 | 29  | 1205 | 62 |
|       |      |      |      |       |     |     | PHQ942_0300 MEL |      |      | ≤60 |     | 57   |    |
| 42.00 | 4500 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ942_0420 ME  | 2800 | 4500 | ≤48 | 23  | 1190 | 61 |
|       |      |      |      |       |     |     | PHQ942_0420 MEL |      |      | ≤60 |     | 52   |    |
| 60.00 | 4500 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ942_0600 ME  | 2800 | 4500 | ≤48 | 20  | 1147 | 59 |
|       |      |      |      |       |     |     | PHQ942_0600 MEL |      |      | ≤60 |     | 49   |    |
| 72.00 | 3800 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_0720 ME  | 2200 | 4500 | ≤38 | 13  | 1202 | 63 |
|       |      |      |      |       |     |     | PHQ943_0720 MEL |      |      | ≤48 |     | 23   |    |
| 96.00 | 3800 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_0960 ME  | 2500 | 4500 | ≤38 | 11  | 1205 | 63 |
|       |      |      |      |       |     |     | PHQ943_0960 MEL |      |      | ≤48 |     | 21   |    |
| 120.0 | 4200 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_1200 ME  | 2500 | 4500 | ≤38 | 10  | 1201 | 63 |
|       |      |      |      |       |     |     | PHQ943_1200 MEL |      |      | ≤48 |     | 21   |    |
| 150.0 | 4200 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_1500 ME  | 2700 | 5500 | ≤38 | 8.8 | 1201 | 61 |
|       |      |      |      |       |     |     | PHQ943_1500 MEL |      |      | ≤48 |     | 19   |    |
| 168.0 | 3800 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_1680 ME  | 3000 | 6000 | ≤38 | 7.8 | 1203 | 60 |
|       |      |      |      |       |     |     | PHQ943_1680 MEL |      |      | ≤48 |     | 18   |    |
| 210.0 | 4200 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_2100 ME  | 3000 | 6000 | ≤38 | 7.6 | 1200 | 60 |
|       |      |      |      |       |     |     | PHQ943_2100 MEL |      |      | ≤48 |     | 18   |    |
| 240.0 | 3800 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_2400 ME  | 3000 | 6000 | ≤38 | 7.1 | 1197 | 58 |
|       |      |      |      |       |     |     | PHQ943_2400 MEL |      |      | ≤48 |     | 17   |    |
| 300.0 | 4200 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_3000 ME  | 3000 | 6000 | ≤38 | 7.0 | 1196 | 58 |
|       |      |      |      |       |     |     | PHQ943_3000 MEL |      |      | ≤48 |     | 17   |    |
| 420.0 | 4500 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_4200 ME  | 3000 | 6000 | ≤38 | 6.9 | 1184 | 58 |
|       |      |      |      |       |     |     | PHQ943_4200 MEL |      |      | ≤48 |     | 17   |    |
| 600.0 | 4500 | 6600 | 6600 | 13200 | 3.0 | 1.0 | PHQ943_6000 ME  | 3000 | 6000 | ≤38 | 6.9 | 1145 | 58 |
|       |      |      |      |       |     |     | PHQ943_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> 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                                  |                                 |                           |        |  |  |  |                                   |

## PHQ10

|       |      |       |   |       |     |   |                  |      |      |     |     |      |    |
|-------|------|-------|---|-------|-----|---|------------------|------|------|-----|-----|------|----|
| 24.00 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1042_0240 ME  | 1800 | 3000 | ≤60 | 100 | 2072 | 65 |
| 30.00 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1042_0300 ME  | 2000 | 3500 | ≤60 | 82  | 2064 | 63 |
| 42.00 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1042_0420 ME  | 2300 | 4000 | ≤60 | 69  | 2043 | 62 |
| 60.00 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1042_0600 ME  | 2500 | 4000 | ≤60 | 62  | 1972 | 60 |
| 96.00 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_0960 ME  | 2000 | 3500 | ≤48 | 36  | 2066 | 64 |
|       |      |       |   |       |     |   | PHQ1043_0960 MEL |      |      | ≤60 | 65  | 2067 |    |
| 120.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_1200 ME  | 2000 | 3500 | ≤48 | 35  | 2060 | 64 |
|       |      |       |   |       |     |   | PHQ1043_1200 MEL |      |      | ≤60 | 64  | 2061 |    |
| 150.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_1500 ME  | 2500 | 4000 | ≤48 | 28  | 2060 | 62 |
|       |      |       |   |       |     |   | PHQ1043_1500 MEL |      |      | ≤60 | 56  |      |    |
| 168.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_1680 ME  | 2800 | 4500 | ≤48 | 23  | 2063 | 61 |
|       |      |       |   |       |     |   | PHQ1043_1680 MEL |      |      | ≤60 | 51  |      |    |
| 210.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_2100 ME  | 2800 | 4500 | ≤48 | 23  | 2059 | 61 |
|       |      |       |   |       |     |   | PHQ1043_2100 MEL |      |      | ≤60 | 51  |      |    |
| 240.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_2400 ME  | 2800 | 4500 | ≤48 | 20  | 2055 | 59 |
|       |      |       |   |       |     |   | PHQ1043_2400 MEL |      |      | ≤60 | 48  |      |    |
| 300.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_3000 ME  | 2800 | 4500 | ≤48 | 20  | 2054 | 59 |
|       |      |       |   |       |     |   | PHQ1043_3000 MEL |      |      | ≤60 | 48  |      |    |
| 420.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_4200 ME  | 2800 | 4500 | ≤48 | 20  | 2036 | 62 |
|       |      |       |   |       |     |   | PHQ1043_4200 MEL |      |      | ≤60 | 48  |      |    |
| 600.0 | 6500 | 10000 | – | 20000 | 3.0 | – | PHQ1043_6000 ME  | 2800 | 4500 | ≤48 | 20  | 1969 | 59 |
|       |      |       |   |       |     |   | PHQ1043_6000 MEL |      |      | ≤60 | 48  |      |    |

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 | 22000  | – | 32208  | 3.0 | – | PHQ1142_0240 ME  | 1800 | 2800 | ≤60 | 171 | 3533 | 68 |
| 30.00 | 13000 | 22000  | – | 40000  | 3.0 | – | PHQ1142_0300 ME  | 2000 | 3300 | ≤60 | 126 | 3538 | 66 |
| 42.00 | 13000 | 22000  | – | 40000  | 3.0 | – | PHQ1142_0420 ME  | 2300 | 3800 | ≤60 | 92  | 3515 | 65 |
| 60.00 | 13000 | 22000  | – | 40000  | 3.0 | – | PHQ1142_0600 ME  | 2300 | 3800 | ≤60 | 73  | 3460 | 63 |
| 96.00 | 13000 | 22,000 | – | 40,000 | 3.0 | – | PHQ1143_0960 ME  | 2000 | 3500 | ≤48 | 43  | 3526 | 64 |
|       |       |        |   |        |     |   | PHQ1143_0960 MEL |      |      | ≤60 | 71  | 3529 |    |
| 120.0 | 13000 | 22,000 | – | 40,000 | 3.0 | – | PHQ1143_1200 ME  | 2000 | 3500 | ≤48 | 40  | 3509 | 62 |
|       |       |        |   |        |     |   | PHQ1143_1200 MEL |      |      | ≤60 | 68  | 3511 |    |
| 150.0 | 13000 | 22,000 | – | 40,000 | 3.0 | – | PHQ1143_1500 ME  | 2500 | 4000 | ≤48 | 31  | 3508 | 62 |
|       |       |        |   |        |     |   | PHQ1143_1500 MEL |      |      | ≤60 | 59  | 3509 |    |
| 168.0 | 13000 | 22,000 | – | 40,000 | 3.0 | – | PHQ1143_1680 ME  | 2800 | 4500 | ≤48 | 25  | 3518 | 61 |
|       |       |        |   |        |     |   | PHQ1143_1680 MEL |      |      | ≤60 | 53  | 3519 |    |
| 210.0 | 13000 | 22,000 | – | 40,000 | 3.0 | – | PHQ1143_2100 ME  | 2800 | 4500 | ≤48 | 24  | 3504 | 61 |
|       |       |        |   |        |     |   | PHQ1143_2100 MEL |      |      | ≤60 | 52  | 3505 |    |
| 240.0 | 13000 | 22,000 | – | 40,000 | 3.0 | – | PHQ1143_2400 ME  | 2800 | 4500 | ≤48 | 21  | 3494 | 59 |
|       |       |        |   |        |     |   | PHQ1143_2400 MEL |      |      | ≤60 | 49  | 3494 |    |
| 300.0 | 13000 | 22,000 | – | 40,000 | 3.0 | – | PHQ1143_3000 ME  | 2800 | 4500 | ≤48 | 21  | 3489 | 59 |
|       |       |        |   |        |     |   | PHQ1143_3000 MEL |      |      | ≤60 | 49  | 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> 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>Zred</sub> arcmin |                                 | Cont.                     | Cyclic |  |  |  |                                   |
|                 | Nm                                 | Nm                       | Nm   | Nm                                   | arcmin                          | arcmin                                  |                                 |                           |        |  |  |  |                                   |

## PHQ12

|       |       |       |   |       |     |   |                                 |      |      |     |     |      |    |
|-------|-------|-------|---|-------|-----|---|---------------------------------|------|------|-----|-----|------|----|
| 24.00 | 25000 | 43000 | – | 53836 | 3.0 | – | <a href="#">PHQ1242_0240 ME</a> | 1200 | 3000 | ≤60 | 584 | 6248 | 72 |
| 42.00 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1242_0420 ME</a> | 1700 | 3500 | ≤60 | 388 | 6236 | 69 |
| 96.00 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1243_0960 ME</a> | 1800 | 3000 | ≤60 | 113 | 6277 | 65 |
| 120.0 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1243_1200 ME</a> | 2000 | 3500 | ≤60 | 91  | 6272 | 63 |
| 168.0 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1243_1680 ME</a> | 2300 | 4000 | ≤60 | 74  | 6260 | 62 |
| 210.0 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1243_2100 ME</a> | 2000 | 3500 | ≤60 | 83  | 6154 | 63 |
| 240.0 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1243_2400 ME</a> | 2500 | 4000 | ≤60 | 64  | 6217 | 60 |
| 294.0 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1243_2940 ME</a> | 2300 | 4000 | ≤60 | 70  | 6150 | 62 |
| 420.0 | 25000 | 43000 | – | 80000 | 3.0 | – | <a href="#">PHQ1243_4200 ME</a> | 2500 | 4000 | ≤60 | 62  | 6136 | 60 |

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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)

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