

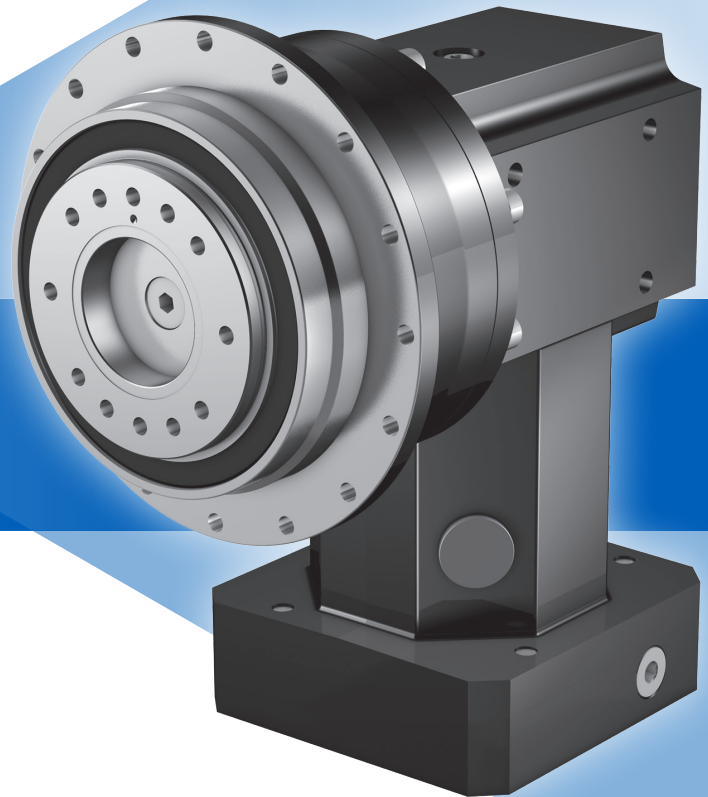
PHKX Series: RIGHT ANGLE – Flange Output

PHKX Features

- 4:1 to 300:1 ratios (higher ratios available. Contact STÖBER.)
- Quiet running (<64dB(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 PHKX provides a right angle option with planetary gearing. 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 on page 206)
Coating	Standard Black (RAL-9005)
Degree of Protection	IP65
Direction of Rotation	See page 207
Efficiency	PHKX: 1 stage 96%, 2 stage 94%
Input RPM	Up to 6,000 RPM
Installation	Requires 12.9 fasteners. See page 288, for more information
Lubrication	Lubricated for life – standard Mobil SHC629; option food grade Mobil SHC CIBUS 150
Mounting Position	Must be specified, see page 207
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 PHKX 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:

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

PH 3 3 1 S F S S 0040 KX301VF 0010 MF

Design Option	Part Number Code	Description
1 Series	PH	Rotating flange output planetary
2 Size	3 4 5 7 8 9 10	7 sizes of gearhead
3 Generation	3 4	sizes 3-8 sizes 9 and 10
4 # of Stages	1 2	One stage for ratios of ≤ 10:1 Two stage for ratios >30:1
5 Housing	S	Standard mounting style
6 Output Shaft	F	Flange output
7 Bearing	S V	Standard Reinforced Bearing (Sizes 3-5)
8 Backlash	S R	Standard Backlash Reduced Backlash (PH3-9)
9 Ratio	0040	Ratios range from 4:1 to 100:1 (0040=4:1; 0055=5.5:1; 1000=100:1, ect.)
0 Secondary Unit	KX301VF	KX Series right angle unit: 5 sizes, 1 stage, without output shaft (V) and with flange (F)
! Secondary Unit Ratio	0010	Ratios from 1:1 to 3:1 (0010=1:1; 0020=2:1; 0030=3:1)
@ Motor Adapter	MF	Motor Adapter with FlexiAdapt coupling
* Mounting Position	EL1 EL2 EL3 EL4 EL5 EL6	Required special instruction for all units, see page 207

PHKX Series: RIGHT ANGLE – Flange Output

Options

Coating Options

- 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.

PHKX Series: RIGHT ANGLE – Flange Output

PHKX 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/Generation/# of Stages		PH331	PH332	PH431	PH432	PH531	PH532	PH731	PH732	PH831	PH832	PH942	PH1042
Secondary Unit		KX3	KX3	KX4	KX3	KX5	KX4	KX7	KX5	KX7	KX7	KX7	KX7
Acceleration Torque M_{2BMAX}	Nm	75	80	160		370	385	840	866	1200	2100	4883	4883
Output Torque Nom. ¹ M_{2N}	Nm	53		110		296		600		1557		3500	
Torsional Stiffness C_2	Nm/arcmin	8.4	13	19	30	46	78	122	176	253	489	1035	1545
Torsional Backlash ²⁾ $\Delta\phi$ Reduced	arcmin	≤ 5 ≤ 3	≤ 4 ≤ 2	≤ 4 ≤ 2	≤ 3 ≤ 1	≤ 4 ≤ 2	≤ 3 ≤ 1	≤ 4 ≤ 2	≤ 3 ≤ 1	≤ 4 ≤ 2	≤ 3 ≤ 1	≤ 3 ≤ 1	≤ 3 -
Input Speed Max. n_{1MAX}	Continuous Cyclic	3500 6000		3000 5500	3500 6000	3000 5000		2100 4000	3000 5000	2100 4000	2100 4500	2100 4000	2100 4000
Efficiency (@nom torque)	%	95	92	95	92	95	92	95	92	95	92	92	92
Weight	kg lbs	3.5 7.7	4.0 8.8	7.9 17.4	6.5 14.3	13.5 29.7	11.8 26	25.5 56.1	21.8 48	43.9 96.6	49.4 108.7	77 170	93 250
Noise ³⁾	dB(A)	≤ 64		≤ 66	≤ 64	≤ 68	≤ 66	≤ 70	≤ 68	≤ 70		≤ 70	≤ 70
Performance by Bearing Design Option ⁴⁾													
Permitted Axial Force F_{2ax100}	N	1650		2150		4150		6150		10,050		33,000	50,000
Permitted Tilting Torque M_{2K100}	Nm	101		257		440		1466		3486		7500	8800
Performance by Reinforced Bearing Design Option													
Permitted Axial Force F_{2ax100}	N	2200		2900		5000		—		—		—	—
Permitted Tilting Torque $\leq 100RPM$ M_{2K100}	Nm	150		354		572		—		—		—	—

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

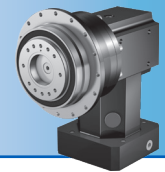
For torque at higher input speeds (M_{2NX}) solve the formula:
where n_1 = Actual Input Speed.

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

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

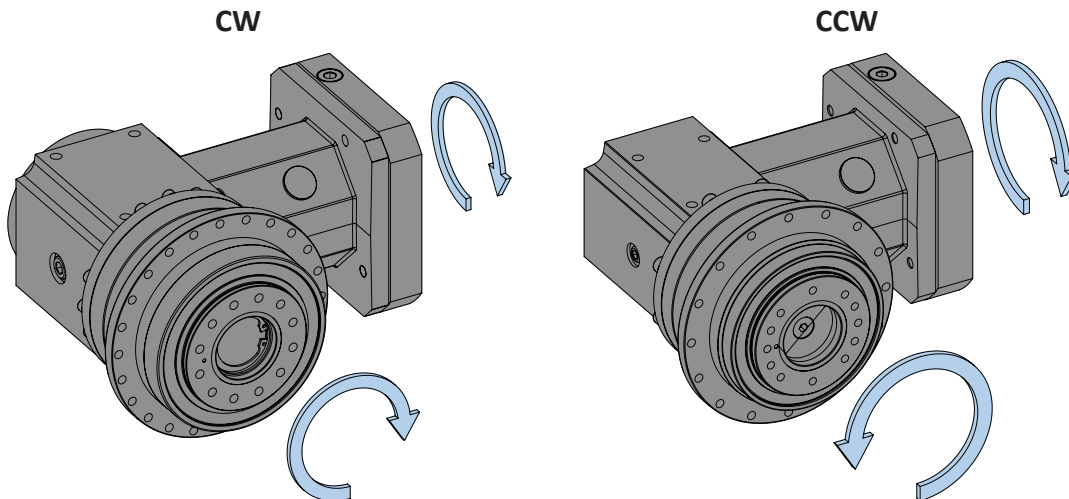
³⁾ Measurement at one (1) meter distance with input speed (n_1) of 1500 RPM.

⁴⁾ Rating based on output speed (n_2) of 100 RPM. For values at other speeds see page 209.



Overview

PHKX Series Direction of Rotation



CW
 1 Stage Units (PH7 thru PH10)
 2 Stage Units (PH7 thru PH10)

CCW
 1 Stage Units (PH3 thru PH5)
 2 Stage Units (PH3 thru PH5)

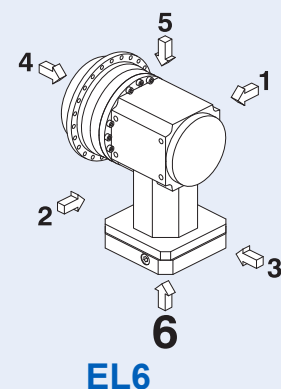
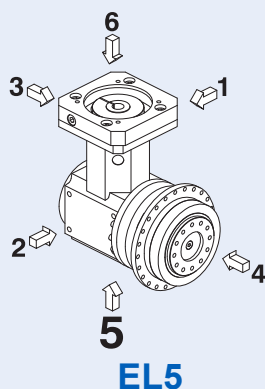
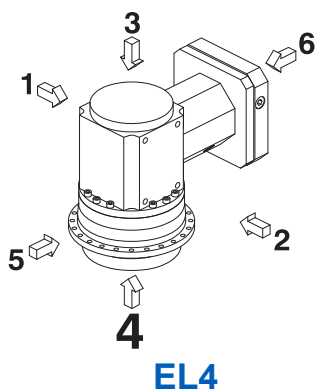
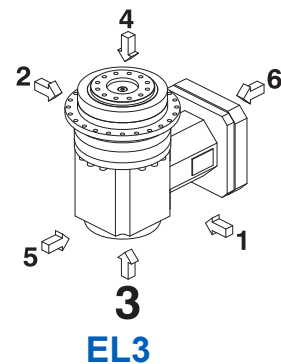
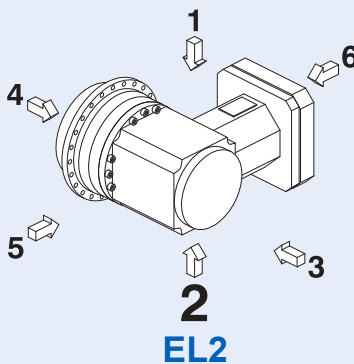
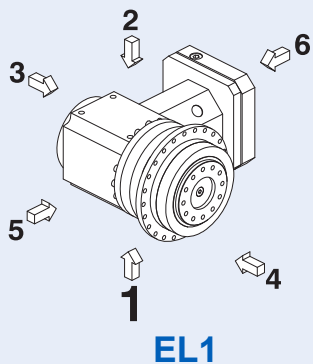
PHKX Series: RIGHT ANGLE – Flange Output

PHKX Mounting Position Options

Horizontal Positions (EL1, EL2, EL5, EL6) are interchangeable;

Vertical Positions (EL3 and EL4) **MUST BE SPECIFIED**

IMPORTANT: Mounting PHKX in either vertical mounting position (EL3 or EL4) must be specified when ordering.



IMPORTANT: Mounting PHKX in either vertical mounting position (EL3 or EL4) must be specified when ordering.

PHKX Series: RIGHT ANGLE – Flange Output

PHKX 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:

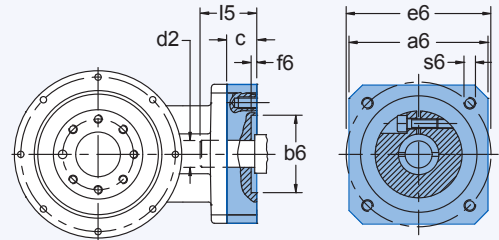
- Specify the motor manufacturer and part number
- Provide the motor drawing with dimensions, or specify the motor mounting dimensions (per the list shown at right)

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 (MF option for PHKX)

- 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.)



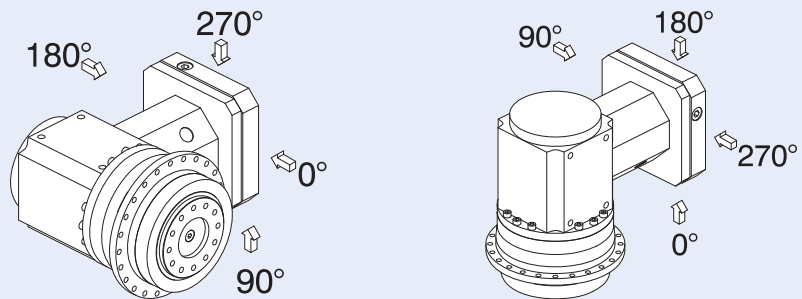
PHKX Motor Mounting Plate Dimensions — mm (Gearhead Part Number Specific)

	PH331KX3 PH332KX3 PH432KX3	PH431KX4 PH532KX4	PH531KX5 PH732KX5	PH731KX7 PH831KX7 PH832KX7 PH942KX7 PH1042KX7
Maximum Allowed Motor Shaft Dia. d2	19	24	32	38
Minimum Allowed Motor Plate Thickness c*	18	21	24	25

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

PHKX Series Motor Mounting Plate Access Hole

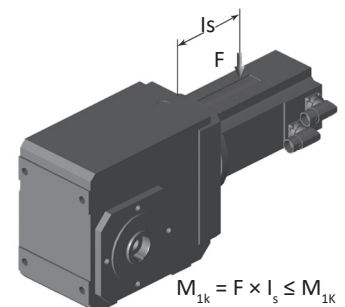
Access to the clamping screw for the motor coupling is located on the 270° side of the motor mounting plate at the location shown. If necessary, the motor mounting plate can be rotated in the field, if a 0°, 90° or 180° orientation for the access hole is desirable.



PHKX 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}	PHKX (MF Motor Adapters)			
	PHKX3	PHKX4	PHKX5	PHKX7
Nm	12	24	50	100





Overview

PHKX 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
3	62.5	1650	1613	1613	101	101	75
4	83.0	2150	3095	3571	257	296	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	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

PHKX 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
3	66.5	2200	2250	2250	150	150	80
4	88.5	2900	4000	4000	354	354	217
5	104.0	5000	5500	5500	572	572	478

PHKX Series: RIGHT ANGLE – Flange Output

PHKX Series Load/Life/Speed Calculations

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

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

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

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

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

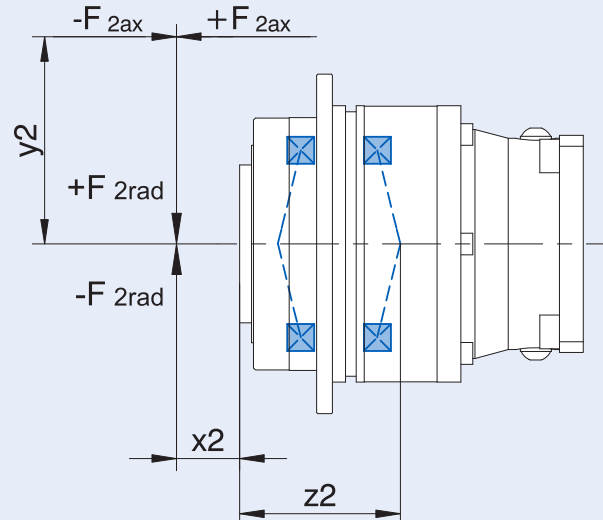
$$F_{2rad,eq*} = \sqrt[3]{\frac{n_{2b1} \cdot t_{b1} \cdot F_{2rb1}^3 + \dots + n_{2bn} \cdot t_{bn} \cdot F_{2rbn}^3}{n_{2b1} \cdot t_{b1} + \dots + n_{2bn} \cdot t_{bn}}} \leq F_{2radN}$$

Where:

- 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%

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

PHKX Series: RIGHT ANGLE – Flange Output

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max Ø d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂	Oper. Noise L _{pA}
	Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Accel. Torque for Reduced Backlash M _{2accHT}	Peak ²⁾ M _{2NOT}	Backlash Δφ ₂	Red. Backlash Δφ _{2red}		Continuous		Cyclic				
								EL 1,2,5,6	EL 3,4	All				
	Nm	Nm	Nm	Nm	arcmin	arcmin								

PH3KX

5.000	45	62	62	115	6.0	4.0	PH331_0050KX301_0010 MF	3000	2500	4500	≤19	1.1	6.9	70
7.000	45	75	77	150	5.5	3.5	PH331_0070KX301_0010 MF	3000	2500	4500	≤19	1.0	8.4	70
10.00	45	62	62	130	6.0	4.0	PH331_0050KX301_0020 MF	3500	3000	5500	≤19	0.82	6.9	66
14.00	45	75	77	150	5.5	3.5	PH331_0070KX301_0020 MF	3500	3000	5500	≤19	0.81	8.4	66
15.00	45	62	62	130	6.0	4.0	PH331_0050KX301_0030 MF	3500	3500	6000	≤19	0.75	6.9	64
20.00	36	60	60	120	5.0	3.0	PH331_0100KX301_0020 MF	3500	3000	5500	≤19	0.81	7.8	66
21.00	45	75	77	150	5.5	3.5	PH331_0070KX301_0030 MF	3500	3500	6000	≤19	0.75	8.4	64
30.00	36	60	60	120	5.0	3.0	PH331_0100KX301_0030 MF	3500	3500	6000	≤19	0.75	7.8	64
35.00	50	80	85	160	4.5	2.5	PH332_0350KX301_0010 MF	3000	2500	4500	≤19	1.0	13	70
40.00	45	80	85	160	4.5	2.5	PH332_0200KX301_0020 MF	3500	3000	5500	≤19	0.81	13	66
50.00	50	80	85	160	4.5	2.5	PH332_0250KX301_0020 MF	3500	3000	5500	≤19	0.81	13	66
56.00	50	75	75	150	4.5	2.5	PH332_0280KX301_0020 MF	3500	3000	5500	≤19	0.81	12	66
60.00	45	80	85	160	4.5	2.5	PH332_0200KX301_0030 MF	3500	3500	6000	≤19	0.75	13	64
70.00	50	80	85	160	4.5	2.5	PH332_0350KX301_0020 MF	3500	3000	5500	≤19	0.81	13	66
75.00	50	80	85	160	4.5	2.5	PH332_0250KX301_0030 MF	3500	3500	6000	≤19	0.75	13	64
80.00	50	67	67	134	4.5	2.5	PH332_0400KX301_0020 MF	3500	3000	5500	≤19	0.81	8.9	66
84.00	50	75	75	150	4.5	2.5	PH332_0280KX301_0030 MF	3500	3500	6000	≤19	0.75	12	64
100.0	50	75	75	150	4.0	2.0	PH332_0500KX301_0020 MF	3500	3000	5500	≤19	0.81	12	66
105.0	50	80	85	160	4.5	2.5	PH332_0350KX301_0030 MF	3500	3500	6000	≤19	0.75	13	64
120.0	50	67	67	134	4.5	2.5	PH332_0400KX301_0030 MF	3500	3500	6000	≤19	0.75	8.9	64
140.0	53	69	69	138	4.0	2.0	PH332_0700KX301_0020 MF	3500	3000	5500	≤19	0.80	11	66
150.0	50	75	75	150	4.0	2.0	PH332_0500KX301_0030 MF	3500	3500	6000	≤19	0.75	12	64
200.0	46	60	60	120	4.0	2.0	PH332_1000KX301_0020 MF	3500	3000	5500	≤19	0.80	8.8	66
210.0	53	69	69	138	4.0	2.0	PH332_0700KX301_0030 MF	3500	3500	6000	≤19	0.75	11	64
300.0	46	60	60	120	4.0	2.0	PH332_1000KX301_0030 MF	3500	3500	6000	≤19	0.75	8.8	64

¹⁾ Based on input speed of 1500 RPM. See page 206 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.)

³⁾ Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

* MF = Motor Adapter with FlexiAdapt® coupling



Selection Data

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max Ø d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂	Oper. Noise L _{PA}
	Nom. ¹⁾ M _{ZN}	Accel. M _{Zacc}	Accel. Torque for Reduced Backlash M _{ZaccHT}	Peak ²⁾ M _{2NOT}	Backlash Δφ ₂	Red. Backlash Δφ _{zred}		Continuous		Cyclic				
								EL 1,2,5,6	EL 3,4					
	Nm	Nm	Nm	Nm	arcmin	arcmin								

PH4KX

4.000	77	96	96	208	5.5	3.5	PH431_0040KX401_0010 MF	2500	2000	4000	≤24	2.9	11	72
5.000	85	120	120	260	5.0	3.0	PH431_0050KX401_0010 MF	2500	2000	4000	≤24	2.7	15	72
7.000	85	160	168	320	4.5	2.5	PH431_0070KX401_0010 MF	2500	2000	4000	≤24	2.5	19	72
8.000	77	96	96	208	5.5	3.5	PH431_0040KX401_0020 MF	2500	2500	5000	≤24	1.7	11	68
10.000	90	120	120	260	5.0	3.0	PH431_0050KX401_0020 MF	2500	2500	5000	≤24	1.7	15	68
12.000	77	96	96	208	5.5	3.5	PH431_0040KX401_0030 MF	3000	3000	5500	≤24	1.5	11	66
14.000	90	160	168	320	4.5	2.5	PH431_0070KX401_0020 MF	2500	2500	5000	≤24	1.7	19	68
15.000	90	120	120	260	5.0	3.0	PH431_0050KX401_0030 MF	3000	3000	5500	≤24	1.5	15	66
20.000	75	115	115	230	4.0	2.0	PH431_0100KX401_0020 MF	2500	2500	5000	≤24	1.6	18	68
21.000	90	160	168	320	4.5	2.5	PH431_0070KX401_0030 MF	3000	3000	5500	≤24	1.5	19	66
30.000	75	115	115	230	4.0	2.0	PH431_0100KX401_0030 MF	3000	3000	5500	≤24	1.4	18	66
32.000	90	160	173	312	3.5	1.5	PH432_0160KX301_0020 MF	3500	3000	5500	≤19	0.83	25	66
35.000	110	160	174	320	3.5	1.5	PH432_0350KX301_0010 MF	3000	2500	4500	≤19	1.1	30	70
40.000	95	150	150	299	3.5	1.5	PH432_0200KX301_0020 MF	3500	3000	5500	≤19	0.82	27	66
48.000	90	160	173	312	3.5	1.5	PH432_0160KX301_0030 MF	3500	3500	6000	≤19	0.76	25	64
50.000	100	161	174	322	3.5	1.5	PH432_0250KX301_0020 MF	3500	3000	5500	≤19	0.82	29	66
56.000	95	160	173	312	3.5	1.5	PH432_0280KX301_0020 MF	3500	3000	5500	≤19	0.83	29	66
60.000	95	150	150	299	3.5	1.5	PH432_0200KX301_0030 MF	3500	3500	6000	≤19	0.75	27	64
70.000	110	160	174	320	3.5	1.5	PH432_0350KX301_0020 MF	3500	3000	5500	≤19	0.82	30	66
75.000	100	161	174	322	3.5	1.5	PH432_0250KX301_0030 MF	3500	3500	6000	≤19	0.75	29	64
80.000	110	155	169	310	3.5	1.5	PH432_0400KX301_0020 MF	3500	3000	5500	≤19	0.83	29	66
84.000	95	160	173	312	3.5	1.5	PH432_0280KX301_0030 MF	3500	3500	6000	≤19	0.76	29	64
100.0	120	159	174	318	3.0	1.0	PH432_0500KX301_0020 MF	3500	3000	5500	≤19	0.82	30	66
105.0	110	160	174	320	3.5	1.5	PH432_0350KX301_0030 MF	3500	3500	6000	≤19	0.75	30	64
120.0	110	155	169	310	3.5	1.5	PH432_0400KX301_0030 MF	3500	3500	6000	≤19	0.76	29	64
140.0	120	158	164	316	3.0	1.0	PH432_0700KX301_0020 MF	3500	3000	5500	≤19	0.81	27	66
150.0	120	159	174	318	3.0	1.0	PH432_0500KX301_0030 MF	3500	3500	6000	≤19	0.75	30	64
200.0	85	110	110	220	3.0	1.0	PH432_1000KX301_0020 MF	3500	3000	5500	≤19	0.81	20	66
210.0	120	158	164	316	3.0	1.0	PH432_0700KX301_0030 MF	3500	3500	6000	≤19	0.75	27	64
300.0	85	110	110	220	3.0	1.0	PH432_1000KX301_0030 MF	3500	3500	6000	≤19	0.75	20	64

PHKX Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 1500 RPM. See page 206 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.)

³⁾ Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

* MF = Motor Adapter with FlexiAdapt® coupling

PHKX Series: RIGHT ANGLE – Flange Output

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft Max Ø d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂	Oper. Noise L _{PA}
	Nom. M _{2N} ¹⁾	Accel. M _{2acc}	Accel. Torque for Reduced Backlash M _{2accHT}	Peak M _{2NOT} ²⁾	Backlash Δφ ₂	Red. Backlash Δφ _{2red}		Continuous		Cyclic				
								EL 1,2,5,6	EL 3,4					
	Nm	Nm	Nm	Nm	arcmin	arcmin								

PH5KX

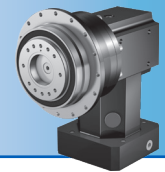
4.000	192	242	242	521	5.5	3.5	PH531_0040KX501_0010 MF	2500	2000	3500	≤32	9.1	28	74
5.000	210	302	302	651	5.0	3.0	PH531_0050KX501_0010 MF	2500	2000	3500	≤32	8.5	37	74
7.000	210	370	387	705	4.5	2.5	PH531_0070KX501_0010 MF	2500	2000	3500	≤32	8.0	46	74
8.000	192	242	242	521	5.5	3.5	PH531_0040KX501_0020 MF	2500	2500	4500	≤32	5.7	28	70
10.00	220	302	302	651	5.0	3.0	PH531_0050KX501_0020 MF	2500	2500	4500	≤32	5.5	37	70
12.00	192	242	242	521	5.5	3.5	PH531_0040KX501_0030 MF	3000	3000	5000	≤32	5.0	28	68
14.00	210	370	387	705	4.5	2.5	PH531_0070KX501_0020 MF	2500	2500	4500	≤32	5.4	46	70
15.00	220	302	302	651	5.0	3.0	PH531_0050KX501_0030 MF	3000	3000	5000	≤32	4.9	37	68
20.00	180	288	288	575	4.0	2.0	PH531_0100KX501_0020 MF	2500	2500	4500	≤32	5.3	44	70
21.00	210	370	387	705	4.5	2.5	PH531_0070KX501_0030 MF	3000	3000	5000	≤32	4.8	46	68
30.00	180	288	288	575	4.0	2.0	PH531_0100KX501_0030 MF	3000	3000	5000	≤32	4.8	44	68
32.00	230	355	355	696	3.5	1.5	PH532_0160KX401_0020 MF	2500	2500	5000	≤24	1.7	63	68
35.00	290	385	400	705	3.5	1.5	PH532_0350KX401_0010 MF	2500	2000	4000	≤24	2.5	78	72
40.00	250	370	387	705	3.5	1.5	PH532_0200KX401_0020 MF	2500	2500	5000	≤24	1.7	71	68
48.00	230	355	355	696	3.5	1.5	PH532_0160KX401_0030 MF	3000	3000	5500	≤24	1.5	63	66
50.00	260	385	400	705	3.5	1.5	PH532_0250KX401_0020 MF	2500	2500	5000	≤24	1.7	75	68
56.00	240	355	387	696	3.5	1.5	PH532_0280KX401_0020 MF	2500	2500	5000	≤24	1.7	72	68
60.00	250	370	387	705	3.5	1.5	PH532_0200KX401_0030 MF	3000	3000	5500	≤24	1.5	71	66
70.00	290	385	400	705	3.5	1.5	PH532_0350KX401_0020 MF	2500	2500	5000	≤24	1.7	78	68
75.00	260	385	400	705	3.5	1.5	PH532_0250KX401_0030 MF	3000	3000	5500	≤24	1.4	75	66
80.00	260	355	356	696	3.5	1.5	PH532_0400KX401_0020 MF	2500	2500	5000	≤24	1.7	71	68
84.00	240	355	387	696	3.5	1.5	PH532_0280KX401_0030 MF	3000	3000	5500	≤24	1.5	72	66
100.0	296	385	400	705	3.0	1.0	PH532_0500KX401_0020 MF	2500	2500	5000	≤24	1.7	77	68
105.0	290	385	400	705	3.5	1.5	PH532_0350KX401_0030 MF	3000	3000	5500	≤24	1.5	78	66
120.0	260	355	356	696	3.5	1.5	PH532_0400KX401_0030 MF	3000	3000	5500	≤24	1.5	71	66
140.0	284	370	387	705	3.0	1.0	PH532_0700KX401_0020 MF	2500	2500	5000	≤24	1.6	69	68
150.0	296	385	400	705	3.0	1.0	PH532_0500KX401_0030 MF	3000	3000	5500	≤24	1.4	77	66
200.0	221	288	288	575	3.0	1.0	PH532_1000KX401_0020 MF	2500	2500	5000	≤24	1.6	52	68
210.0	284	370	387	705	3.0	1.0	PH532_0700KX401_0030 MF	3000	3000	5500	≤24	1.4	69	66
300.0	221	288	288	575	3.0	1.0	PH532_1000KX401_0030 MF	3000	3000	5500	≤24	1.4	52	66

¹⁾ Based on input speed of 1500 RPM. See page 206 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.)

³⁾ Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

* MF = Motor Adapter with FlexiAdapt® coupling



Selection Data

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max Ø d _{MW}	Input Inertia J ₁	Tors. Stiffness C ₂	Oper. Noise L _{PA}
	Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Accel. Torque for Reduced Backlash M _{2accHT}	Peak ²⁾ M _{2NOT}	Backlash Δφ ₂	Red. Backlash Δφ _{2red}		Continuous		Cyclic				
								EL 1,2,5,6	EL 3,4					
	Nm	Nm	Nm	Nm	arcmin	arcmin				mm				

PH7KX

4.000	384	480	480	917	5.5	3.5	PH731_0040KX701_0010 MF	1800	1600	3000	≤38	30	94	76
5.000	440	600	600	1146	5.0	3.0	PH731_0050KX701_0010 MF	1800	1600	3000	≤38	28	111	76
7.000	440	840	840	1604	4.5	2.5	PH731_0070KX701_0010 MF	1800	1600	3000	≤38	26	122	76
8.000	384	480	480	1042	5.5	3.5	PH731_0040KX701_0020 MF	1800	1800	3500	≤38	16	94	72
10.00	440	600	600	1302	5.0	3.0	PH731_0050KX701_0020 MF	1800	1800	3500	≤38	15	111	72
12.00	384	480	480	1042	5.5	3.5	PH731_0040KX701_0030 MF	2100	2100	4000	≤38	13	94	70
14.00	440	840	840	1720	4.5	2.5	PH731_0070KX701_0020 MF	1800	1800	3500	≤38	15	122	72
15.00	440	600	600	1302	5.0	3.0	PH731_0050KX701_0030 MF	2100	2100	4000	≤38	13	111	70
20.00	350	575	575	1150	4.0	2.0	PH731_0100KX701_0020 MF	1800	1800	3500	≤38	15	110	72
21.00	440	840	840	1720	4.5	2.5	PH731_0070KX701_0030 MF	2100	2100	4000	≤38	13	122	70
30.00	350	575	575	1150	4.0	2.0	PH731_0100KX701_0030 MF	2100	2100	4000	≤38	13	110	70
32.00	450	740	740	1480	3.5	1.5	PH732_0160KX501_0020 MF	2500	2500	4500	≤32	5.6	152	70
35.00	540	866	908	1720	3.5	1.5	PH732_0350KX501_0010 MF	2500	2000	3500	≤32	8.0	172	74
40.00	460	805	845	1610	3.5	1.5	PH732_0200KX501_0020 MF	2500	2500	4500	≤32	4.9	157	70
48.00	450	740	740	1480	3.5	1.5	PH732_0160KX501_0030 MF	3000	3000	5000	≤32	4.9	152	68
50.00	500	866	908	1720	3.5	1.5	PH732_0250KX501_0020 MF	2500	2500	4500	≤32	5.4	166	70
56.00	540	770	880	1540	3.5	1.5	PH732_0280KX501_0020 MF	2500	2500	4500	≤32	5.5	176	70
60.00	460	805	845	1610	3.5	1.5	PH732_0200KX501_0030 MF	3000	3000	5000	≤32	4.9	157	68
70.00	540	866	908	1720	3.5	1.5	PH732_0350KX501_0020 MF	2500	2500	4500	≤32	5.4	172	70
75.00	500	866	908	1720	3.5	1.5	PH732_0250KX501_0030 MF	3000	3000	5000	≤32	4.8	166	68
80.00	540	770	770	1540	3.5	1.5	PH732_0400KX501_0020 MF	2500	2500	4500	≤32	5.5	174	70
84.00	540	770	880	1540	3.5	1.5	PH732_0280KX501_0030 MF	3000	3000	5000	≤32	4.9	176	68
100.0	600	830	834	1660	3.0	1.0	PH732_0500KX501_0020 MF	2500	2500	4500	≤32	5.4	171	70
105.0	540	866	908	1720	3.5	1.5	PH732_0350KX501_0030 MF	3000	3000	5000	≤32	4.8	172	68
120.0	540	770	770	1540	3.5	1.5	PH732_0400KX501_0030 MF	3000	3000	5000	≤32	4.9	174	68
140.0	600	809	847	1617	3.0	1.0	PH732_0700KX501_0020 MF	2500	2500	4500	≤32	5.3	152	70
150.0	600	830	834	1660	3.0	1.0	PH732_0500KX501_0030 MF	3000	3000	5000	≤32	4.8	171	68
200.0	423	550	550	1100	3.0	1.0	PH732_1000KX501_0020 MF	2500	2500	4500	≤32	5.3	121	70
210.0	600	809	847	1617	3.0	1.0	PH732_0700KX501_0030 MF	3000	3000	5000	≤32	4.8	152	68
300.0	423	550	550	1100	3.0	1.0	PH732_1000KX501_0030 MF	3000	3000	5000	≤32	4.8	121	68

PHKX Series: RIGHT ANGLE – Flange Output

¹⁾ Based on input speed of 1500 RPM. See page 206 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.)

³⁾ Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

* MF = Motor Adapter with FlexiAdapt® coupling

PHKX Series: RIGHT ANGLE – Flange Output

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

PH8KX

4.000	384	480	480	917	5.5	3.5	PH831_0040KX701_0010 MF	1800	1600	3000	≤38	52	122	76
5.000	480	600	600	1146	5.0	3.0	PH831_0050KX701_0010 MF	1800	1600	3000	≤38	41	170	76
7.000	672	840	840	1604	4.5	2.5	PH831_0070KX701_0010 MF	1800	1600	3000	≤38	34	232	76
8.000	384	480	480	1042	5.5	3.5	PH831_0040KX701_0020 MF	1800	1800	3500	≤38	21	122	72
10.00	772	1200	1200	2292	4.0	2.0	PH831_0050KX701_0020 MF	1800	1600	3500	≤38	29	253	76
12.00	384	480	480	1042	5.5	3.5	PH831_0040KX701_0030 MF	2100	2100	4000	≤38	15	122	70
14.00	672	840	840	1823	4.5	2.5	PH831_0070KX701_0020 MF	1800	1800	3500	≤38	17	232	72
15.00	480	600	600	1302	5.0	3.0	PH831_0050KX701_0030 MF	2100	2100	4000	≤38	14	170	70
20.00	850	1200	1200	2604	4.0	2.0	PH831_0100KX701_0020 MF	1800	1800	3500	≤38	16	253	72
21.00	672	840	840	1823	4.5	2.5	PH831_0070KX701_0030 MF	2100	2100	4000	≤38	13	232	70
30.00	850	1200	1200	2604	4.0	2.0	PH831_0100KX701_0030 MF	2100	2100	4000	≤38	13	253	70
32.00	1100	1860	1860	3929	3.5	1.5	PH832_0160KX701_0020 MF	1800	1800	3500	≤38	16	415	72
40.00	1250	2100	2300	4200	3.5	1.5	PH832_0200KX701_0020 MF	1800	1800	3500	≤38	15	462	72
48.00	1100	1860	1860	3929	3.5	1.5	PH832_0160KX701_0030 MF	2100	2100	4000	≤38	13	415	70
50.00	1300	2100	2300	4200	3.5	1.5	PH832_0250KX701_0020 MF	1800	1800	3500	≤38	15	479	72
56.00	1100	2000	2000	3929	3.5	1.5	PH832_0280KX701_0020 MF	1800	1800	3500	≤38	16	451	72
60.00	1250	2100	2300	4200	3.5	1.5	PH832_0200KX701_0030 MF	2100	2100	4000	≤38	13	462	70
70.00	1450	2100	2300	4200	3.5	1.5	PH832_0350KX701_0020 MF	1800	1800	3500	≤38	15	489	72
75.00	1300	2100	2300	4200	3.5	1.5	PH832_0250KX701_0030 MF	2100	2100	4000	≤38	13	479	70
80.00	1100	1920	1936	3840	3.5	1.5	PH832_0400KX701_0020 MF	1800	1800	3500	≤38	16	440	72
84.00	1100	2000	2000	3929	3.5	1.5	PH832_0280KX701_0030 MF	2100	2100	4000	≤38	13	451	70
100.0	1557	2100	2300	4200	3.0	1.0	PH832_0500KX701_0020 MF	1800	1800	3500	≤38	15	481	72
105.0	1450	2100	2300	4200	3.5	1.5	PH832_0350KX701_0030 MF	2100	2100	4000	≤38	13	489	70
120.0	1100	1920	1936	3840	3.5	1.5	PH832_0400KX701_0030 MF	2100	2100	4000	≤38	13	440	70
140.0	1422	1848	1936	3696	3.0	1.0	PH832_0700KX701_0020 MF	1800	1800	3500	≤38	15	421	72
150.0	1557	2100	2300	4200	3.0	1.0	PH832_0500KX701_0030 MF	2100	2100	4000	≤38	13	481	70
200.0	1062	1380	1380	2760	3.0	1.0	PH832_1000KX701_0020 MF	1800	1800	3500	≤38	15	332	72
210.0	1422	1848	1936	3696	3.0	1.0	PH832_0700KX701_0030 MF	2100	2100	4000	≤38	13	421	70
300.0	1062	1380	1380	2760	3.0	1.0	PH832_1000KX701_0030 MF	2100	2100	4000	≤38	12	332	70

¹⁾ Based on input speed of 1500 RPM. See page 206 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.)

³⁾ Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

* MF = Motor Adapter with FlexiAdapt® coupling



Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max Ø d _{MW} mm	Input Inertia J ₁ kgcm ²	Tors. Stiffness C ₂ Nm/ arcmin	Oper. Noise L _{pA} dB(A)
	Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Accel. Torque for Reduced Backlash M _{2accHT}	Peak ²⁾ M _{2NOT}	Back- lash Δφ ₂	Red. Back- lash Δφ _{2red}		Continuous		Cyclic				
	Nm	Nm	Nm	Nm	arcmin	arcmin		EL 1,2,5,6	EL 3,4	All				

PH9KX

12.00	1116	1395	1395	2839	4.0	2.0	PH942_0120KX701_0010 MF	1800	1600	3000	≤38	76	655	76
16.00	1488	1860	1860	3785	3.5	1.5	PH942_0160KX701_0010 MF	1800	1600	3000	≤38	48	808	76
18.00	1674	2093	2093	4258	3.5	1.5	PH942_0180KX701_0010 MF	1800	1600	3000	≤38	70	832	76
20.00	1860	2325	2325	4731	3.5	1.5	PH942_0200KX701_0010 MF	1800	1600	3000	≤38	39	908	76
24.00	1116	1395	1395	3226	4.0	2.0	PH942_0120KX701_0020 MF	1800	1800	3500	≤38	27	655	72
30.00	2790	3488	3488	7097	3.5	1.5	PH942_0300KX701_0010 MF	1800	1600	3000	≤38	37	988	76
32.00	1488	1860	1860	4301	3.5	1.5	PH942_0160KX701_0020 MF	1800	1800	3500	≤38	20	808	72
36.00	1674	2093	2093	4839	3.5	1.5	PH942_0180KX701_0020 MF	1800	1800	3500	≤38	26	832	72
40.00	1860	2325	2325	5376	3.5	1.5	PH942_0200KX701_0020 MF	1800	1800	3500	≤38	18	908	72
42.00	3500	4883	4883	9935	3.0	1.0	PH942_0420KX701_0010 MF	1800	1600	3000	≤38	31	1035	76
48.00	2232	2790	2790	6452	3.5	1.5	PH942_0240KX701_0020 MF	1800	1800	3500	≤38	20	932	72
54.00	1674	2093	2093	4839	3.5	1.5	PH942_0180KX701_0030 MF	2100	2100	4000	≤38	17	832	70
60.00	2790	3488	3488	8065	3.5	1.5	PH942_0300KX701_0020 MF	1800	1800	3500	≤38	18	988	72
72.00	2232	2790	2790	6452	3.5	1.5	PH942_0240KX701_0030 MF	2100	2100	4000	≤38	15	932	70
80.00	3200	4600	4600	9200	3.5	1.5	PH942_0400KX701_0020 MF	1800	1800	3500	≤38	16	998	72
84.00	3500	4883	4883	10000	3.0	1.0	PH942_0420KX701_0020 MF	1800	1800	3500	≤38	16	1035	72
90.00	2790	3488	3488	8065	3.5	1.5	PH942_0300KX701_0030 MF	2100	2100	4000	≤38	14	988	70
96.00	3500	5000	5000	10000	3.0	1.0	PH942_0480KX701_0020 MF	1800	1800	3500	≤38	16	1033	72
120.0	3500	5000	5000	10000	3.0	1.0	PH942_0600KX701_0020 MF	1800	1800	3500	≤38	16	1033	72
126.0	3500	4883	4883	10000	3.0	1.0	PH942_0420KX701_0030 MF	2100	2100	4000	≤38	13	1035	70
144.0	3500	5000	5000	10000	3.0	1.0	PH942_0480KX701_0030 MF	2100	2100	4000	≤38	13	1033	70
180.0	3500	5000	5000	10000	3.0	1.0	PH942_0600KX701_0030 MF	2100	2100	4000	≤38	13	1033	70

PHKX Series: RIGHT ANGLE – Flange Output

PHKX Series: RIGHT ANGLE – Flange Output

Exact Ratio (i)	Output Torque						Part Number* (Gearhead + Input)	Max. Input Speed RPM (n1)			Motor Shaft ³⁾ Max Ø d _{MW} mm	Input Inertia J ₁ kgcm ²	Tors. Stiffness C ₂ Nm/ arcmin	Oper. Noise L _{pA} dB(A)
	Nom. ¹⁾ M _{2N}	Accel. M _{2acc}	Accel. Torque for Reduced Backlash M _{2accHT}	Peak ²⁾ M _{2NOT}	Backlash Δφ ₂ arcmin	Red. Backlash Δφ _{2red} arcmin		Continuous		Cyclic				
	Nm	Nm	Nm	Nm	arcmin	arcmin		EL 1,2,5,6	EL 3,4	All				

PH10KX

18.00	1674	2093	–	4258	3.5	–	PH1042_0180KX701_0010 MF	1800	1600	3000	≤38	72	1127	76
24.00	2232	2790	–	5677	3.5	–	PH1042_0240KX701_0010 MF	1800	1600	3000	≤38	45	1328	76
30.00	2790	3488	–	7097	3.5	–	PH1042_0300KX701_0010 MF	1800	1600	3000	≤38	38	1444	76
36.00	1674	2093	–	4839	3.5	–	PH1042_0180KX701_0020 MF	1800	1800	3500	≤38	26	1127	72
42.00	3906	4883	–	9935	3.0	–	PH1042_0420KX701_0010 MF	1800	1600	3000	≤38	31	1545	76
48.00	2232	2790	–	6452	3.5	–	PH1042_0240KX701_0020 MF	1800	1800	2500	≤38	20	1328	72
54.00	1674	2093	–	4839	3.5	–	PH1042_0180KX701_0030 MF	2100	2100	4000	≤38	18	1127	70
60.00	2790	3488	–	8065	3.5	–	PH1042_0300KX701_0020 MF	1800	1800	3500	≤38	18	1444	72
72.00	2232	2790	–	6452	3.5	–	PH1042_0240KX701_0030 MF	2100	2100	4000	≤38	15	1328	70
84.00	3906	4883	–	11290	3.0	–	PH1042_0420KX701_0020 MF	1800	1800	3500	≤38	16	1545	72
90.00	2790	3488	–	8065	3.5	–	PH1042_0300KX701_0030 MF	2100	2100	4000	≤38	14	1444	70
120.0	4900	6975	–	14000	3.0	–	PH1042_0600KX701_0020 MF	1800	1800	3500	≤38	16	1542	72
126.0	3906	4883	–	11290	3.0	–	PH1042_0420KX701_0030 MF	2100	2100	4000	≤38	13	1545	70
180.0	4900	6975	–	14000	3.0	–	PH1042_0600KX701_0030 MF	2100	2100	4000	≤38	13	1542	70