"K" Series – Right Angle Helical/Bevel ServoFit® Modular System

Right angle helical/bevel gear drives offer higher input-to-output efficiencies than conventional worm gear drives or right angle planetary gearheads — making them the optimal drive for truly demanding continuous applications.

Performance Specifications:
- Input RPM up to 4,500 RPM
- Nominal output torque — 109 to 106,000 in. lbs. (12-11,900Nm)
- Reducer ratios from 4:1 to 381:1
- 5 year limited warranty (2 years on bearings, seals, etc.)
- Ambient temperature — 0° C to +40°C (104° F) [Unit temperature ≤ 80° C Max.]
- Noise level — as low as 53 dB(A)
- Maintenance free
- Can be back driven

High quality helical gearing is case hardened to 58-62 Rockwell C. Precision finished for low noise and long service life. When the backlash is set by our manufacturing and assemble methods it remains consistent throughout the life of the reducer without further need for adjustment.

Standard backlash is ≤12 arc minutes. Reduced backlash is ≤6 arc minutes

One-piece cast iron housing with precision machined bearing supports assure gearset alignment, prolongs bearing life, provides exceptional overhung load capacities, and eliminates leakage problems common to drives with bolt-on output covers.

Double lip seals keep oil in and contaminants out. Double seals available for severe duty applications.

High efficiency spiral bevel gearing provides quiet operation and excellent torque carrying capacity

Efficiency Comparison
Popular Right Angle Gear Drives

Introducing "KL" Series

- Compact
- Symmetrical
- Nominal output torque — 130 to 443 in. lbs. (15-50Nm)
- Reducer ratios from 4:1 to 32:1
- Maintenance free

Motor plate can easily be changed to fit your choice of motors.

Custom motor plates supplied in 10 working days maximum.

High quality helical gearing is case hardened to 58-62 Rockwell C. Precision finished for low noise and long service life. When the backlash is set by our manufacturing and assemble methods it remains consistent throughout the life of the reducer without further need for adjustment.

Standard backlash is ≤12 arc minutes. Reduced backlash is ≤6 arc minutes

Shipped with the proper amount of oil to prevent gear damaging dry start-ups.

Size comparison of KL102 and K102

See web site for drawings.
### Part No. Explanation

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>K 6 1 3 A GD 0580 MT40 B</td>
<td>Right Angle Helical/Bevel (output is at a right angle to input; gears are helical and spiral bevel)</td>
</tr>
</tbody>
</table>

- **Series** K
- **Size** 6
- **Generation** 1
- **No. of Gear Stages** 3

#### Series Size
- Sizes available: KL1, KL2, K1, K2, K3, K4, K5, K6, K7, K8, K9, K10

#### Generation
- Design generation: first generation 0, second generation 1, etc.

#### No. of Gear Stages
- Number of gear stages: 2, 3, 4 (determined by the ratio)

#### Output Style
- **A** Hollow output
  - Available: imperial, metric, and stainless steel in most sizes.
- **S** — Shrink Ring output
  - SPECIFY: Side 3 or Side 4.
- **V** — Shaft output
  - SPECIFY: Shaft Side 3 or Side 4 (shown).
  - Available: imperial, metric, and stainless steel in most sizes.
  - KL ONLY: **P** — Shaft output with a key
  - **G** — Shaft output without a key
  - **W** — Single or double wobble free bushing output
    - IF Single Bushing — SPECIFY: Side 3 or Side 4 (shown).

#### Housing Style
- **GD** Torque arm backet mounting
  - SPECIFY: Side 1 or Side 5 (also Side 2 on K1).
- **F** — Output flange
  - SPECIFY: Side 3 or Side 4 (shown).
- **G** — Tapped holes on the both sides of the output
- **N** — Foot mounting
  - SPECIFY: Side 1 (shown) or Side 5 (also Side 2 on K1).

#### Ratio
- **0580** Approximate ratio: 0580 = 58.297:1 (4:1 up to 381:1)

#### Motor Adapter
- **MT40** Motor adapter size from Selection Data: MT10, MT20, MT30, MT40, MT50
  - (Motor information must be specified.)

#### Option
- **B** Add when ordering the Beverage Duty option.
- **F** — Add when ordering the Food Duty option.

#### Specify these options ONLY when deviating from STANDARD:
- Output — Inches (standard) or Metric (not available in all sizes)
- Output Material — Stainless (not available in all sizes)
- Backlash — Reduced
- Paint — Black (standard), White, or Stainless
- Oil — Mobilgear 600XP220 (standard), Food grade (Mobil SHC CIBUS 220) or Synthetic (Mobil SHC630)
“K” Series – Right Angle Helical/Bevel
ServoFit® Modular System

Mounting Positions – Must be Specified

K1 – K4

K5 – K10

Table No.1

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KL1_MQ</td>
<td>16</td>
<td>15</td>
<td>MT30</td>
<td>38</td>
<td>25</td>
</tr>
<tr>
<td>KL2_MQ/MT10</td>
<td>19</td>
<td>21</td>
<td>MT40</td>
<td>48</td>
<td>33</td>
</tr>
<tr>
<td>MT20</td>
<td>24</td>
<td>24</td>
<td>MT50</td>
<td>60</td>
<td>43</td>
</tr>
</tbody>
</table>

“K” units have the shaft on Side 3 and/or Side 4 (shown). Shaft side must be specified.

EL1 Side 1 is the bottom side when the unit is set in a normal position. Side 1 is the down side for EL1.
EL2 Side 2 is the top of the unit. Side 2 is the down side for EL2. (The unit is up-side-down.)
EL3 Side 3 is the right side when facing the input with the unit in a normal position (EL1). Side 3 is the down side for EL3.
EL4 Side 4 is the left side when facing the input with the unit in a normal position (EL1). Side 4 is the down side for EL4.
EL5 Side 5 is the side opposite the motor. Side 5 is the down side for EL5.
EL6 Side 6 is the input or motor side. Side 6 is the down side for EL6.

**DO NOT MOUNT** any STOBER reducer in a position other than specified on the order.

All STOBER units are filled with the correct amount of lubrication before shipping. In order to provide the proper lubrication quantity the mounting position must be specified at the time the unit is ordered. Our web site: [http://www.stober.com/pages/lubrication-quantity](http://www.stober.com/pages/lubrication-quantity) list the oil quantity for each size and mounting position.

Motor Mounting Specifications

STOBER ServoFit Gearheads will fit the motor of your choice by assembling the correct motor mounting plate between the motor and the gearhead. When ordering a gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. The motor plate thickness (L9) dimension will be determined by the motor shaft length. The minimum motor plate thickness is shown below. For a precise dimension on a specific motor, contact STOBER Technical Support.

The following dimensions are required to provide the correct motor mounting plate:

1. D6 Motor Shaft Diameter (If an adapter bushing is required it will be supplied with the motor plate.)
2. D7 Pilot Diameter
3. D8 Bolt Circle Diameter
4. D9 Bolt Diameter
5. L11 Motor Shaft Length
6. L12 Pilot Length
7. L14 Square Flange (Optional — Motor plate will typically be made to match.)

Refer to Page 302 for ServoFit Gearhead Selection Procedure.
Overhung Load

Pulling forces or overhung load of pulleys, sheaves, sprockets, etc. on the reducer output shaft must not exceed the allowable limits shown in the above calculations. The overhung load shown is measured at the center of the shaft extension.

The following formula can be used to determine actual overhung load for a given drive.

**METRIC**

\[
OHL = \frac{19,100 \times kW \times K}{D \times n}
\]

where

- \( OHL \) = Newtons (N)
- \( kW \) = Transmitted Kilowatt
- \( D \) = Pitch Diameter (meters) of Sprocket, Gear, Sheave, Pulley, etc.
- \( n \) = Maximum Shaft RPM
- \( K \) = 1.00 Single Chain Drive
- 1.25 Timing Belt Drive
- 1.25 Spur, Helical Gear Drive
- 1.50 V-Belt Drive
- 2.50 Flat Belt Drive

**IMPERIAL**

\[
OHL = \frac{126,000 \times HP \times K}{D \times RPM}
\]

where

- \( OHL \) = Pounds (lbs.)
- \( HP \) = Horsepower
- \( D \) = Pitch Diameter (inches) of Sprocket, Gear, Sheave, Pulley, etc.
- \( n \) = Maximum Shaft RPM
- \( K \) = 1.00 Single Chain Drive
- 1.25 Timing Belt Drive
- 1.25 Spur, Helical Gear Drive
- 1.50 V-Belt Drive
- 2.50 Flat Belt Drive

No overhung load is encountered when an reducer is flange mounted and/or coupling connected to another unit. However, the shafts of all components must be accurately aligned and secured to prevent pre-loading of the bearings and premature bearing failure.
Permissible Shaft Load and Tilting Moment

All formulas shown are based on METRIC values.

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

The permissible load values given are valid with the load applied to the center of the output shaft (x₂).

The permissible load and tilting moment values are based on an output speed of 20 RPM. For higher speeds the following applies, where n₂ is the desired speed:

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

\[ M_{2A} = \frac{2 \cdot F_{2A} \cdot y_2 + F_{2R} \cdot (x_2 + z_2)}{1000} \leq M_{2K} \]

<table>
<thead>
<tr>
<th>Table No. 2</th>
<th>“K” Series – Permissible Load and Tilting Moments</th>
</tr>
</thead>
<tbody>
<tr>
<td>z₂</td>
<td>mm</td>
</tr>
<tr>
<td>KL1_V</td>
<td>18.5</td>
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<tr>
<td>KL2_V</td>
<td>22</td>
</tr>
<tr>
<td>K1_V</td>
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<td>K2_V</td>
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</tr>
<tr>
<td>K3_V</td>
<td>45</td>
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<tr>
<td>K4_V</td>
<td>52</td>
</tr>
<tr>
<td>K5_V</td>
<td>72</td>
</tr>
<tr>
<td>K6_V</td>
<td>72</td>
</tr>
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<td>K8_V</td>
<td>80</td>
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<tr>
<td>K9_V</td>
<td>87</td>
</tr>
<tr>
<td>K10_V</td>
<td>25</td>
</tr>
</tbody>
</table>

¹) Values shown for “W” Style are for double bushings. For single bushings use value M₂K x 0.5 and F₂A x 0.5.
²) For DOUBLE output shaft: F₂R x 0.7
³) Solid Shaft unit with a Flange — z₂ value is 132mm/5.20”; F₂r value is 64,000N/14,400 lbs.

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 “I_s” of the motor.

\[ M_{1K} = F \times I_s \leq M_{2K} \]

<table>
<thead>
<tr>
<th>Table No. 1</th>
<th>Permissible Motor Tilting Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>“K” Series Unit with MT</td>
<td>Nm</td>
</tr>
<tr>
<td>MT10</td>
<td>25</td>
</tr>
<tr>
<td>MT20</td>
<td>60</td>
</tr>
<tr>
<td>MT30</td>
<td>125</td>
</tr>
<tr>
<td>MT40</td>
<td>250</td>
</tr>
<tr>
<td>MT50</td>
<td>500</td>
</tr>
</tbody>
</table>
"K" Series—Right Angle Helical/Bevel ServoFit® Modular System
Selection Data

Part Number | Reducer Ratio | Nom. | Exact | Input RPM | Maximum Torque | Backlash arcmin | Input Inertia | Torsional Stiffness per arcmin | Output Torque |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KL102 with MQ Motor Adapter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KL102_0040 MQ</td>
<td>4/1</td>
<td>3,500</td>
<td>3,000</td>
<td>4,500</td>
<td>5,000</td>
<td>16</td>
<td>0.89</td>
<td>16</td>
<td>1.8</td>
</tr>
<tr>
<td>KL102_0080 MQ</td>
<td>8/1</td>
<td>4,000</td>
<td>5,000</td>
<td>4,000</td>
<td>6,000</td>
<td>16</td>
<td>0.89</td>
<td>16</td>
<td>1.8</td>
</tr>
<tr>
<td>KL102_0160 MQ</td>
<td>16/1</td>
<td>4,000</td>
<td>6,000</td>
<td>4,000</td>
<td>6,000</td>
<td>16</td>
<td>0.89</td>
<td>16</td>
<td>1.8</td>
</tr>
<tr>
<td>KL102_0320 MQ</td>
<td>32/1</td>
<td>4,000</td>
<td>6,000</td>
<td>4,000</td>
<td>6,000</td>
<td>16</td>
<td>0.89</td>
<td>16</td>
<td>1.8</td>
</tr>
</tbody>
</table>

KL202 with MQ Motor Adapter | | | | | | | | | |
| KL202_0040 MQ | 4/1 | 3,500 | 3,000 | 4,500 | 5,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |
| KL202_0080 MQ | 8/1 | 4,000 | 5,000 | 4,000 | 6,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |
| KL202_0160 MQ | 16/1 | 4,000 | 6,000 | 4,000 | 6,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |
| KL202_0320 MQ | 32/1 | 4,000 | 6,000 | 4,000 | 6,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |

K102 with MT TriAdapt® Motor Adapter | | | | | | | | | |
| K102_0040 MT10 | 4/1 | 3,000 | 4,000 | 4,000 | 6,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |
| K102_0080 MT20 | 8/1 | 4,000 | 5,000 | 4,000 | 6,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |
| K102_0160 MT10 | 16/1 | 4,000 | 6,000 | 4,000 | 6,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |
| K102_0320 MT20 | 32/1 | 4,000 | 6,000 | 4,000 | 6,000 | 16 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 | 20 | 0.89 | 16 | 1.8 |

1) Backlash shown “STANDARD/REDUCED”.
2) Maximum torque for continuous input RPM - horizontal output position.
3) Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of reducer = 1,000 stops maximum.
4) dB(A) Measured at 1 meter distance with 3000 RPM input

Maximum Motor Shaft

<table>
<thead>
<tr>
<th>Adapter Diameter</th>
<th>Adapter Diameter</th>
<th>Adapter Diameter</th>
<th>Adapter Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>KL1_MQ</td>
<td>16</td>
<td>MT10</td>
<td>19</td>
</tr>
<tr>
<td>KL2_MQ</td>
<td>19</td>
<td>MT20</td>
<td>24</td>
</tr>
<tr>
<td>KL3_MQ</td>
<td>24</td>
<td>MT30</td>
<td>38</td>
</tr>
<tr>
<td>KL4_MQ</td>
<td>38</td>
<td>MT40</td>
<td>48</td>
</tr>
<tr>
<td>KL5_MQ</td>
<td>48</td>
<td>MT50</td>
<td>60</td>
</tr>
</tbody>
</table>

See web site for drawings.