



## Servo Gear Units

***Geared to a higher  
standard™***

**In-Position  
Technologies**

[www.iptech1.com](http://www.iptech1.com) | (877) 478-3241 | [help@iptech1.com](mailto:help@iptech1.com)



**STÖBER**

# Servo Gear Units



## Welcome to STOBBER!

***Thank you for your interest in the servo gear reducers offered by STOBBER Drives, Inc.!***

In 1934, the Stöber brothers founded a small shop in Pforzheim, Germany that made machines and repaired engines. Today, STOBBER is an international organization with offices in ten countries.

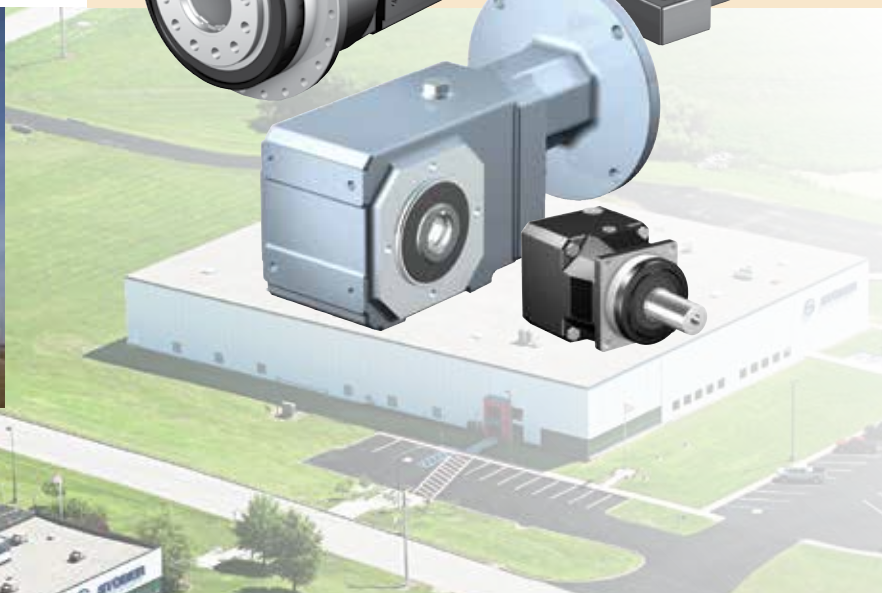
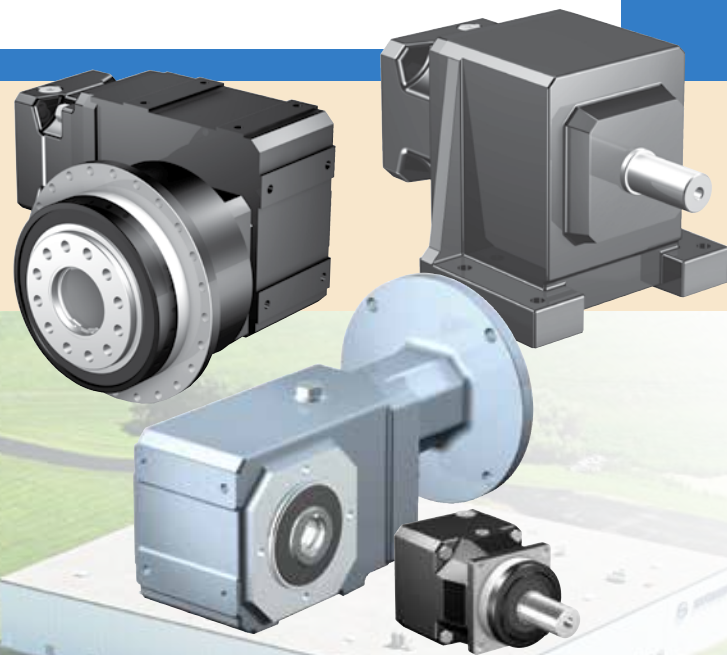
This 80 year heritage has given us expertise in servo gearing for which STOBBER is recognized worldwide as the “gold standard.” STOBBER products are of the highest quality and use only the best components.

This catalog covers our comprehensive servo gearbox products — Servo Precision Planetary and Modular Gearheads. STOBBER is recognized across the United States for its solution design, product durability, and service support. We look forward to the opportunity to work with you, and to help with your servo gearing needs.

*Peter Feil, General Manager, STOBBER Drives, Inc.*



*STOBBER Drives Inc. was founded in 1991. Our Maysville, Kentucky campus includes 85,000 square feet of sales and service offices, assembly, manufacturing, and warehousing space for German-engineered STOBBER products for 1 day shipment nationwide.*



## Contents

About STOBER Drives		4-5
Servo Gear Units Features		6-7
Servo Gear Units Overview At-a-Glance		8-9
Servo Gear Units Sizing/Selection		10-11
<b>Inline &amp; Offset Gearhead Series</b>	<b>P/PA</b>	14
	<b>PH (A, Q, QA)</b>	46
	<b>PE</b>	92
	<b>C</b>	102
	<b>F</b>	140
<b>Right Angle Gearhead Series</b>	<b>K/KL</b>	162
	<b>PKX/PK</b>	214
	<b>PHKX/PHK/PHQK</b>	248
	<b>KS</b>	298
	<b>KSS</b>	312
Technical Reference		326
Terms & Conditions of Sale		330
Other STOBER Drive Products		331



All manufactured components are inspected before being released to assembly. Our quality inspection team ensures every part meets tolerances and is in spec.

### Unsurpassed:

STOBER products are designed and built to perform for the toughest applications. Reliability, adaptability and maintainability are our focus, and durability is truly our trademark.

**Solution Designs** that build quality around every requirement.

**Product Durability** that enhances the reliability and life of every application.

**Service Support** that is empowered to meet and exceed client expectations.



#### STOBER Serviced Industries:

- Beverage
- Food Processing
- Packaging
- Machine Tool
- Robotics
- Material Handling
- Semiconductor
- Printing
- Converting and many others...

# Servo Gear Units

## The Best you Can Buy...

At STÖBER, offering the best is not a buzz word — it is our passion and way of life. We offer the best product, provided by the best people and processes, and backed by the best service.

Why is STÖBER considered the industry Gold Standard? Our products are backed with superior service, outstanding quality, and the STÖBER guarantee.

- STÖBER gearheads survive in the toughest environments, providing long life under extreme conditions. Their high reliability and durability saves non-productive downtime and cost
- Our product reliability is backed by one of the best warranties in the industry
- We build and ship in 1 day saving you inventory hassle and cost
- Adapts to any servo motor

**Vision:** To be recognized as the gold standard

**Mission:** To provide the most reliable drive solutions for demanding applications in the shortest lead-time

**Values:** Seeking the best; operating with integrity; serving others, growth through learning

## The Servo Gear Difference

A STÖBER Servo Gearhead helps optimize your total operational performance with:

- High torsional stiffness, superior accuracy
- Smoother running, better efficiency
- Leakage free, maintenance free
- Runs cool – a difference you can feel
- Runs measurably quieter – 16 times more quiet\*
- Lower backlash
- The versatility and interchangeability of our components allow most products to be assembled and shipped in 1 day

### \* Noise Level

If a planetary is loud — something is WRONG!

STÖBER Servo planetary =  
60 dB(A)

Convention spur gear planetary =  
70-72 dB(A)

Bottom line: 1 conventional gearhead produces the same noise level as 16 STÖBER planetary gearheads with HeliCamber™ gearing

## Striving Harder to Deliver the Best Gear Solutions

STÖBER Drives has been assembling products at our Maysville, Kentucky facility for over twenty years. Our expertise in the production and assembly of low-backlash gear units produces products that comply with the highest quality standards.

But, we don't remain satisfied with the status quo. We are continuously improving our modern machining production center including numerous recent acquisitions to improve our manufacture time and to ensure maximum quality levels.

All reducer components (gears, covers, material, etc.) are backed by a five year warranty. Normal wear items (oil seals, bearings, etc.) are covered for two years.





Assembly stages of “F” Series gearheads: Paint curing oven allows for one day assembly and higher paint durability (left); units awaiting final inspection prior to shipment (right).

## Service Support for a Lifetime

We stand behind every drive we sell, which is why our service support is also the gold standard in the industry:

STOBER takes pride in offering knowledgeable, factory-trained USA-based service support for our customers. When you call, you won't get a call center on the other side of the globe. Your call is answered in 3 rings or less, letting you know you've found a support system that values your time.

Our easy order method insures you maintain a single contact throughout the process. And, your service representatives are directly responsible for your account. After the sale, our products are easy to install, but if you do have a question or a problem, we provide application and installation support anywhere in the US. With over 80 years gearing & 30 years motor and electronics experience, we have the expertise to solve your most difficult problems.

### Application Support Programs

- For support during normal business hours: call 800-711-3588 or email [sales@stober.com](mailto:sales@stober.com)
- 24/7 emergency customer service hotline: 606.563.6035
- Consultative product support team available via phone or live chat on our website
- Application Sizing Software
- Online web tools: CAD and configurator
- On-site training available
- Emergency shipments available 24/7



### Key STOBER Numbers

- 1 day shipping
- 1 hour quoting
- 3 rings or less when you call in — we answer the phone, not an automated switchboard!
- 100% inspected and tested during assembly for seal pressure test and ratio verification. STOBER also observes the reducer for any abnormal noise or vibrations during testing
- 5 year warranty
- 24/7 customer service



### STOBER Staff Team Members

Facing page: Earl Bennington, Warehouse Team Leader, 1992, and Anita Truesdell, Picker, 2007;  
From top, left to right: Stephanie Berry, LMS Administrator, 2006; Brian Sharp, Product Management Team Leader, 2003; Rick McCall, Machinist, 2007; Lee Thomas, Industrial Engineer, 2003

# The Servo Gear Unit Difference

The following outlines some of our quality standards and unique STÖBER features that set Servo gearheads apart from all others...

## Food and Corrosion Resistant Duty

P PKX PK C F K/KL KSS

Lifetime lubrication; double output seals (where possible); maintenance free design; stainless output bushing, shaft, or bore — finish is USDA approved for food processing and handling; heat cured.

### KSS for extreme high pressure food washdown!

- IP69K certified for extreme high pressure food washdown (sprayed at close distance at 100 bars or 1,450 PSI)
- Certified against dust and water ingress
- 304 stainless steel cast housing

## Explosion Proof

P PA PH PHA PHQ PHQA  
PKX PHKX C F K

ATEX is often used in process control and converting where unstable gases and dust can be found

ATEX is a directive consisting of two European directives describing equipment or work environment allowed in an environment with an explosive atmosphere. ATEX derives its name from the ATmospheres EXplosible.

Please consult our product support team for assistance selecting an ATEX gearbox.

## Large Input Planetary

P PA PE PH PHA PHQ PHQA KS

Equipping a Servo gearhead with the large input option allows a larger shaft diameter motor to be used, keeping gearhead size and cost down! This input is ideal for inertia matching.

## ServoCool®

P PA PH PHA



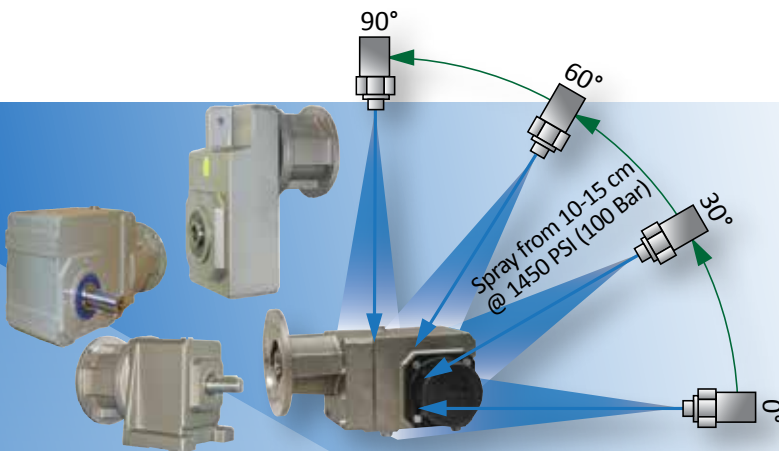
Servo gearheads with the air cooled ServoCool® option reduces the operating temperature 22°C (increases the ambient temperature limit 22°C), increases the output speed 54% and improves the servo motor rating 25%.

Servo motors are connected to Servo gearheads by using a motor adapter.

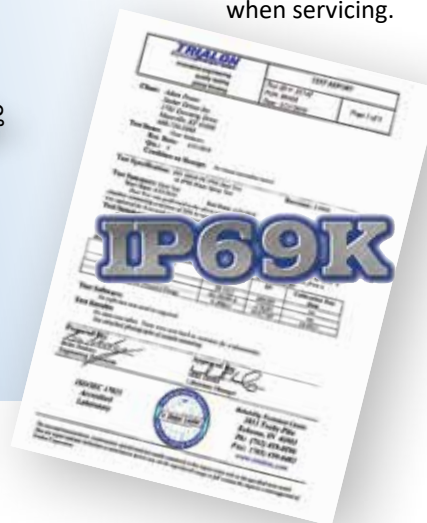
## Spiral Groove Hollow Bore

F K KL KS KSS

The inside diameter on our hollow bore units feature a spiral (rifle) bore design providing an anti-seize lubricating groove. This enables the Servo gearhead to slide off freely when servicing without damage to the output shaft. With conventional smooth-surface hollow bore designs, any anti-seize lubricant applied during installation of the output shaft has no where to go except out the other end. Invariably, these designs will seize, making it necessary to cut off the output shaft when servicing.



Above: KSS Servo Gearheads are IP69K certified to withstand frequent pressure cleaning operations typical in the food industry and elsewhere. Other STÖBER products, including C, F and K Series, are optionally available with IP69K compliant protection.

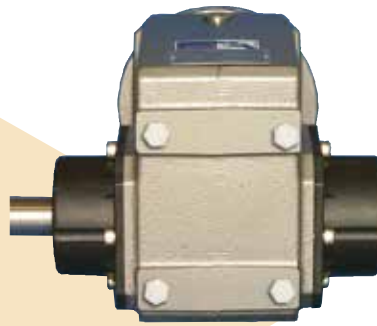


## Wobble Free Bushing

F K KL KSS

The STÖBER “Wobble Free” bushing is a unique (U.S. Patent Number 5,496,127), bushing system which can be supplied on a single side or double sides. Each case size can be provided with a variety of bushing bores. The unit is selected based on torque rating, output speed or ratio, and the shaft size of the driven equipment.

- A distinct support side and a clamp side, the dual tapered cones will overcome a wide range of tolerances normally found with standard shaft materials. No shaft key necessary.
- Many unit sizes can be supplied with output covers on one or both sides which protect the seals and also cover the rotating bushing
- The reducer output bore can be changed any time by changing the bushing kit
- The quill, all bushing parts, and hardware can be supplied stainless steel to provide corrosion resistance for washdown applications



### Double Sided Bushing:

This unique design allows the unit to be mounted on the shaft from either side of the reducer by reversing the clamp side and support side bushings. The clamp side is determined by the customer but is usually the easily accessible outside bushing.

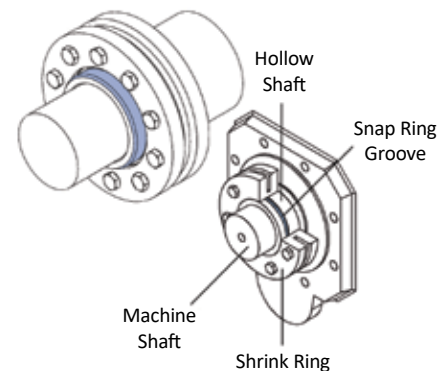
The double sided bushing is not installed into the unit at assembly, but with easy-to-follow installation instructions, the unit and bushing can be mounted on the machinery quickly – without any special tools.

### Single Sided Bushing :

The single sided bushing is assembled at the time of the order. The bushing side extension must be specified by the customer before assembly. The bushing is installed into the unit for shipping and is not interchangeable once the unit is assembled.

## Shrink Ring Connection

F K KL KS



F, K, KL and KS Series gearheads with a hollow bore can be connected to a finished machine drive shaft by frictional engagement through compression of a shrink ring on the hollow shaft.

This shaft-hub connection is totally free of backlash. Because of its self-centering property, it can transmit high torques and axial thrusts with great accuracy.

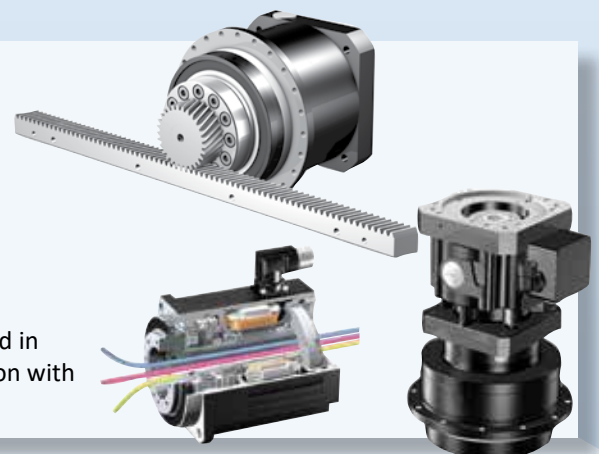
Gear units supplied with a shrink ring, are shipped with the ring installed on the hollow shaft end, ready for assembly.

## See page 331 for More Servo Gearhead Compatible Products...

**EZ Series Servo Motors** available to fit all Servo gearheads

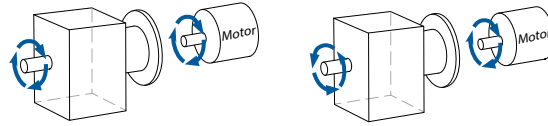
**Rack and Pinion** Servo gearhead systems are a ready to install engineered solution for precision automation applications requiring forces up to 122 kN (27,400 lbs.) with linear backlash as low as 7 µm

**ServoStop** automatic, electrically-actuated integrated holding brake used in place of a servo motor brake for dynamic safety braking, or in conjunction with the servo motor brake for redundancy in safety applications



# Servo Gear Units

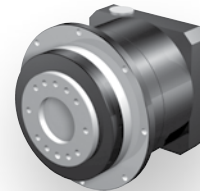
## Inline & Offset Inline Gearheads



### P/PA — Shaft Output \*

STOBBER P Series is the cornerstone of most of our inline family of precision planetary gearheads. They are the most accurate and efficient planetary gearheads available. HeliCamber® gear technology provides minimum wear, low backlash and low noise. The PA Advanced Series takes backlash to the absolute minimum, and performance to the max.

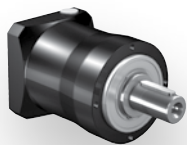
- 3:1 to 100:1
- Up to 2,000 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: P: <3 arc min; PA: <1 arc min



### PH/PHA/PHQ/PHQA — Flange Output\*

STOBBER PH family gearheads offer a rotating flange output version of the P Series. The PHA Advanced Series takes backlash to the absolute minimum, and the PHQ and PHQA feature “Quattro” power planetary gearing for extreme torque and ratio capabilities.

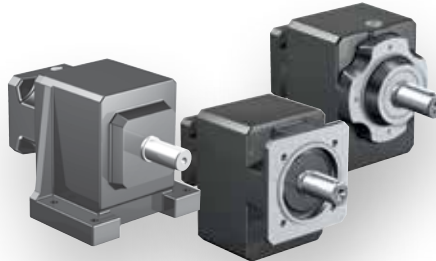
- 4:1 to 600:1
- Up to 13,000 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: PH/PHQ: <3 arc min; PHA/PHQA: <1 arc min



### PE — Shaft Output\*

STOBBER PE Series Servo Precision Planetary Gearheads are available for applications where very low backlash is not a criteria. They are an economical helical tooth planetary, comparable in quality to other STOBBER units.

- 3:1 to 100:1
- Up to 160 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: < 8 arc min



### C — Shaft Output\*

STOBBER C Series gear drives offer performance, durability, and economy for a wide range of applications. High efficiency helical gearing keeps motor size to a minimum while running almost silently.

- 2:1 to 276:1
- Up to 7,000 Nm torque (nom)
- Up to 6,500 RPM input speed
- Backlash: < 14 arc min

### F — Versatile Outputs\*

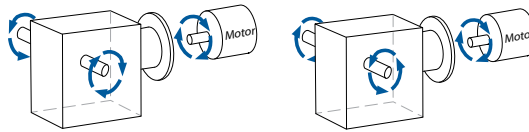
STOBBER F Series gear drives are a popular choice for applications that require high performance, efficiency, durability, and flexibility. F Series are available with a wide selection of configurations to match almost any mounting requirement.

- 4:1 to 551:1
- Up to 1,100 Nm torque (nom)
- Up to 7,000 RPM input speed
- Backlash: < 10 arc min

\* See page 326 for comparison of all output options and sizes available



## Right Angle Gearheads



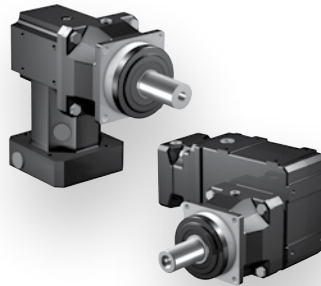
Many right angle gearheads offer output on either or both sides



### K – Versatile Outputs\*

STOBBER K Series helical/bevel gear drives are the most popular and versatile Servo right angle gearheads. They are the optimal drive for truly demanding continuous-duty applications, offering higher efficiencies than conventional worm gear drives or planetary gearheads.

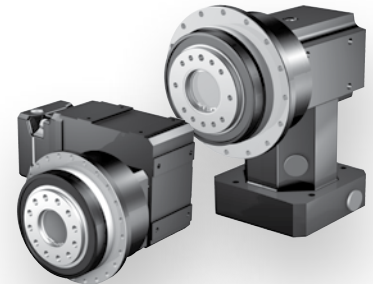
- 4:1 to 381:1
- Up to 12,000 Nm torque (nom)
- Up to 7,000 RPM input speed
- Backlash <10 arc min



### PKX/PK – Shaft Output\*

STOBBER PKX and PK Series precision planetary gearheads combine the P Series gearhead with the low ratio “KX” right angle platform or the reduced backlash K Series platform.

- Ratios: 3:1 to 300:1;
- Up to 2,000 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: PKX: ≤4 arc min;  
PK: ≤3.5 arc min



### PHKX/PHK/PHQK – Flange Output\*

STOBBER PH right angle gearhead configurations offer a rotating flange output combining the P Series gearhead with the low ratio “KX” or reduced backlash K Series. The PHQK features the “Quattro” power planetary gearing for extreme torque and ratio capabilities.

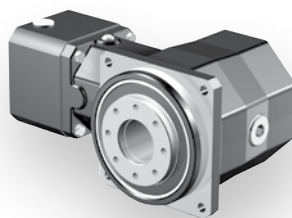
- 4:1 to 591:1
- Torque: 13,000 Nm (nom)
- Up to 7,000 RPM input speed
- Backlash <3.5 arc min



### KL – Versatile Outputs\*

The STOBBER KL Series offers the same output and housing versatility as the K series, but is much more compact and ideal for smaller gearhead size applications.

- 4:1 to 32:1
- Up to 50 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: ≤20 arc min



### KS – Versatile Outputs\*

STOBBER KS Series precision planetary gearheads use time-tested helical gearing and finish ground spiral bevel gears to provide a low backlash unit, that is smooth running, with high efficiency, high power density, and high input speed capacity..

- 6:1 to 200:1
- Up to 250 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: < 4 arc min



### KSS – Versatile Outputs\*

STOBBER is proud to offer our quality-proven, high-efficiency KSS Series Helical/Bevel speed reducer in a stainless steel housing necessary for the toughest washdown applications.

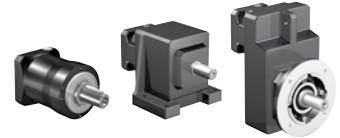
- 4:1 to 70:1
- Up to 346 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: < 10 arc min

# Servo Gear Units

## Versatility

STOBER Drives offers the world's largest variety of gearheads to fit virtually all servo needs.

## INLINE & OFFSET INLINE GEARHEADS



## Performance, Configurations and Options

		P	PA	PH	PHA	PHQ	PHQA	PE	C	F
		page 14		page 46				page 92	page 102	page 140
Input	Large Input	•	•	•	•	•	•	•		
	ServoCool	•	•	•	•					
		•	•					•	•	•
Output (see page 326 for details)	Hollow Bore									•
	Rotating Flange			•	•	•	•		•	•
	Shrink Ring									•
	Single Bushing									•
	Double Bushing									•
Housing	Flange								•	•
	Foot Mount								•	•
	Tapped Holes								•	•
Protection	IP65	•	•	•	•	•	•	IP64	•	•
	IP69K Washdown								Opt	Opt
	ATEX Certified	Opt	Opt	Opt	Opt	Opt	Opt		Opt	Opt
Paint/Coatings	Standard Black	•	•	•	•	•	•	•	•	•
	Food Duty	•							•	•
	Corrosion Resistant Duty								•	•
Added Functionality	ServoStop*	•	•	•	•				•	•
	Rack and Pinion*	•	•	•				•		
Performance + Good +++ Better +++++ Best	Continuous RPM	+++	+++	++	++	++	++	+++	+++	++
	Stiffness	+++	+++	++	++++	+++++	+++++	+	+	++++
	Torque Density	+++	+++	++	++++	+++++	+++++	+	+	++++
Precision ArcMin Backlash	1	•		Opt		Opt				
	1-3			•		•			•	
	3-5				•					
	5-10						Opt			Opt
	10-15		•				•			•
	15-20							•		
Nominal Output Torque Ranges Nm	0-50	•	•	•	•			•	•	•
	50-200	•	•	•	•			•	•	•
	200-1,000	•	•			•	•	•	•	•
	1,000-5,000	•	•			•	•	•	•	•
	5,000-10,000					•	•	•	•	•
						•	•			

\* See page 331 for more information

**RIGHT ANGLE GEARHEADS**



	<b>K</b>	<b>KL</b>	<b>PKX</b>	<b>PK</b>	<b>PHKX</b>	<b>PHK</b>	<b>PHQK</b>	<b>KS</b>	<b>KSS</b>
	page 162		page 214		page 248			page 298	page 312
								•	
	•	•	•	•				•	•
	•	•						•	•
	•	•			•	•	•	•	
	•	•						•	•
	•	•							•
	•	•							•
	•	•	•	•	•	•	•	•	•
	Opt	Opt							•
	Opt		Opt		Opt	Opt	Opt	Opt	•
									•
	•	•	•	•	•	•	•	•	
	•	•	•	•				•	
	•	•	•	•	•	•	•	•	
	•	•	•	•	•	•	•	•	
	++++	++	+	++	+	++	++	+++	+++
	+	+	+++	++	++++	+++	+++++	++	+
	+	+	+++	++	+++	++	++++	++	+
				•					
	Opt		•		•	•	•	•	
	•								•
		•							
	•	•	•		•		•	•	•
	•		•	•	•	•	•	•	•
	•		•	•	•	•	•	•	•
	•		•	•	•	•	•	•	•
	•				•		•		

# Servo Gear Units Application-Tailored Solutions

Industry	Ideal Gearhead Applications	Recommended STÖBER Gearhead
<b>Aerospace</b>	<ul style="list-style-type: none"> <li>Automated Guided Vehicles (AGV)</li> <li>Drilling and Riveting</li> <li>Machine Tool</li> <li>Testing and Inspection</li> </ul>	<ul style="list-style-type: none"> <li>Carbon Fiber Placement</li> <li>Fuselage</li> <li>Space Tracking Systems</li> <li>Wing assembly</li> </ul>
<b>Automation</b>	<ul style="list-style-type: none"> <li>Assembly turn tables</li> <li>Linear presses</li> <li>Robotics auxiliary axis</li> <li>Palletizing</li> </ul>	<ul style="list-style-type: none"> <li>Custom assembly machines</li> <li>Radar</li> <li>Pipe and wire bending</li> </ul>
<b>Automotive Manufacturing</b>	<ul style="list-style-type: none"> <li>Transfer lines</li> <li>Robotic auxiliary</li> <li>Machining</li> <li>Tire manufacturing</li> <li>Carbon fiber production</li> </ul>	<ul style="list-style-type: none"> <li>Metal cutting and bending</li> <li>Pick and place</li> <li>Index tables</li> <li>Electronics assembly</li> </ul>
<b>Converting</b>	<ul style="list-style-type: none"> <li>Cutting</li> <li>Tension Control</li> <li>Web Lines</li> </ul>	<ul style="list-style-type: none"> <li>Winding</li> <li>Paper Converting</li> </ul>
<b>Machine Tool</b>	<ul style="list-style-type: none"> <li>Horizontal and vertical mills</li> <li>Large gantry cranes</li> <li>Carbon fiber placement</li> <li>Flame, laser, water jet, and plasma cutting</li> <li>Back gauging</li> </ul>	<ul style="list-style-type: none"> <li>Grinding</li> <li>X-Y tables</li> <li>Indexing tables</li> <li>Chip conveyors</li> <li>Bending and forming</li> <li>Tool changers</li> </ul>
<b>Material Handling</b>	<ul style="list-style-type: none"> <li>Pick and place</li> <li>Line diverter</li> <li>Sorting/diverting</li> </ul>	<ul style="list-style-type: none"> <li>Linear transfer</li> <li>Palletizing</li> </ul>
<b>Medical</b>	<ul style="list-style-type: none"> <li>Imaging</li> <li>Radiation</li> <li>Centrifuge</li> </ul>	
<b>Packaging</b>	<ul style="list-style-type: none"> <li>Continuous or intermittent filling applications</li> </ul>	
<b>Plastics/Composites</b>	<ul style="list-style-type: none"> <li>Often used to replace hydraulic actuators in injection molding</li> <li>Injection molding</li> <li>Carbon fiber placement</li> </ul>	<ul style="list-style-type: none"> <li>Extrusion lines</li> <li>Blow molding</li> <li>Thermoforming</li> <li>Rubber molding</li> </ul>
<b>Printing</b>	<ul style="list-style-type: none"> <li>Labels</li> <li>Flexographic printing</li> </ul>	<ul style="list-style-type: none"> <li>Circuit Boards</li> <li>Sheet</li> </ul>
<b>Robotics</b>	<ul style="list-style-type: none"> <li>Delta</li> <li>Pick and place</li> <li>Telescoping arms</li> </ul>	<ul style="list-style-type: none"> <li>Auxiliary axis to rotate and move robot</li> <li>Positioning axis</li> </ul>
<b>Semiconductor</b>	<ul style="list-style-type: none"> <li>Wafer polishing</li> <li>Wafer handling</li> </ul>	<ul style="list-style-type: none"> <li>Circuit web printing</li> </ul>
<b>Valve Control</b>	<ul style="list-style-type: none"> <li>Ideal for handling rapid dithering positioning</li> <li>Ball, gate, and globe valves</li> </ul>	<ul style="list-style-type: none"> <li>Throttle/governor valves</li> <li>Chokes</li> <li>Process valves</li> <li>ATEX explosion proof available</li> </ul>

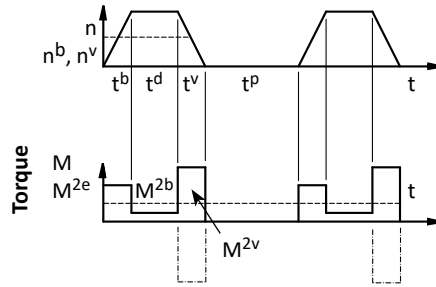
# Gearhead Sizing to your Specific Application Requirements

## Sizing/Selection

Use the chart on the facing page and below to determine the best series and the right size gearhead to meet your specific application requirements. In each product section of this catalog, the necessary data and a "Load/Life/Speed Calculation" section are provided to help you work through these equations..

*By all means, please feel free to call or email (sales@stober.com), if you have any questions or need assistance determining the best solution for your application.*

## Cycle Run



$$M_{2e} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot M_{2b}^3 + \dots + n_{2n} \cdot t_n \cdot M_{2n}^3}{n_{2b} \cdot t_b + \dots + n_{2n} \cdot t_n}}$$

## Service Factor

Apply to Nominal Rating ONLY

P, PA, PE PH, PHA PHV, PHVA, PHQ, PHQA, KS	PKX, PK, PHKX, PHK, PHQK, C, F, K, KSS
--	---

Load Factor  $f_B$

Operating Mode

Continuous	1.0	1.0
Cyclic	1.0	1.25
Cyclic-	1.0	1.4
Reversing		

Running Time Factor  $f_L$

≤8 hours	1.0
≤16 hours	1.15
≤24 hours	1.2

Apply to Input RPM

Temperature Factor  $f_T$

	Without Ventilation	Fan Cooled
<20°C	1.00	0.90
<30°C	1.10	1.00
<40°C	1.25	1.15

**Continuous Duty:** Drive is considered continuous duty if the running time ( $t^r = t^b + t^d + t^v$ ) is 60% of the complete cycle time ( $t^b + t^d + t^v + t^p$ ) or longer than 20 minutes.

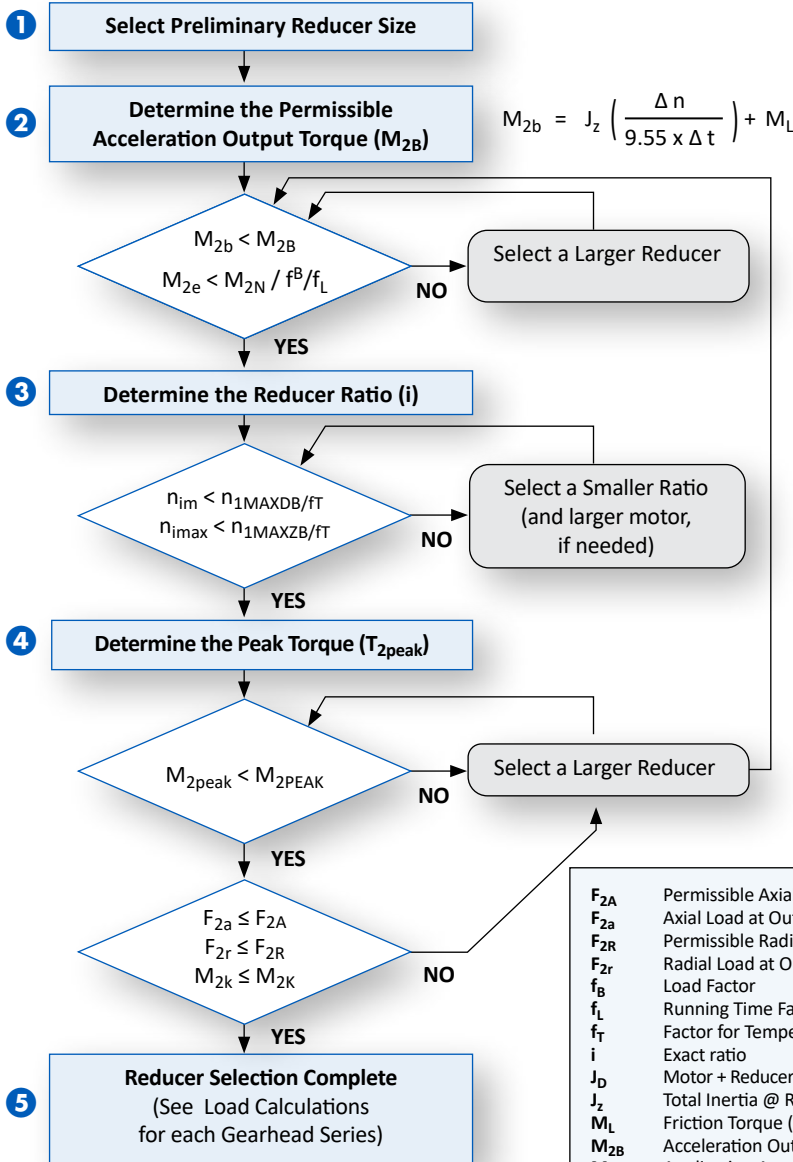
**Cyclic Duty:** Drive will cycle on and off.

For cyclic operation, the recommended ratio of external (application) inertia to gearhead inertia can be determined by the following equation:

$$\frac{J_z}{i^2} = 4 \cdot J_D$$

The gearhead selected, using the following equation for inertia ratio, will result in the lowest motor torque demand and the optimum drive selection:

$$\frac{J_z}{i^2} = J_D$$



$$M_{2b} = J_z \left( \frac{\Delta n}{9.55 \times \Delta t} \right) + M_L$$

$F_{2A}$	Permissible Axial Load	$M_{2K}$	Rated Tilting Torque
$F_{2a}$	Axial Load at Output Shaft	$M_{2k}$	Equivalent Tilting Load
$F_{2R}$	Permissible Radial load	$M_{2N}$	Nominal Output Torque
$F_{2r}$	Radial Load at Output Shaft	$M_{2peak}$	Peak Output Torque
$f_B$	Load Factor	$n_{1db}$	Maximum Continuous Input
$f_L$	Running Time Factor	$n_{1zb}$	Maximum Cyclic Input
$f_T$	Factor for Temperature	$n_{im}$	Maximum Continuous Speed
$i$	Exact ratio	$n_{imax}$	Maximum Cyclic Speed
$J_D$	Motor + Reducer Inertia @ Motor RPM	$T_{2PEAK}$	Peak Torque
$J_z$	Total Inertia @ Reducer RPM	$t_r$	Running Time
$M_L$	Friction Torque (Losses)	$t_b$	Acceleration Time
$M_{2B}$	Acceleration Output Torque	$t_d$	Duration Time
$M_{2b}$	Application Acceleration Torque	$t_v$	Deceleration Time
$M_{2e}$	Equivalent Torque (Avg RMS Torque)		

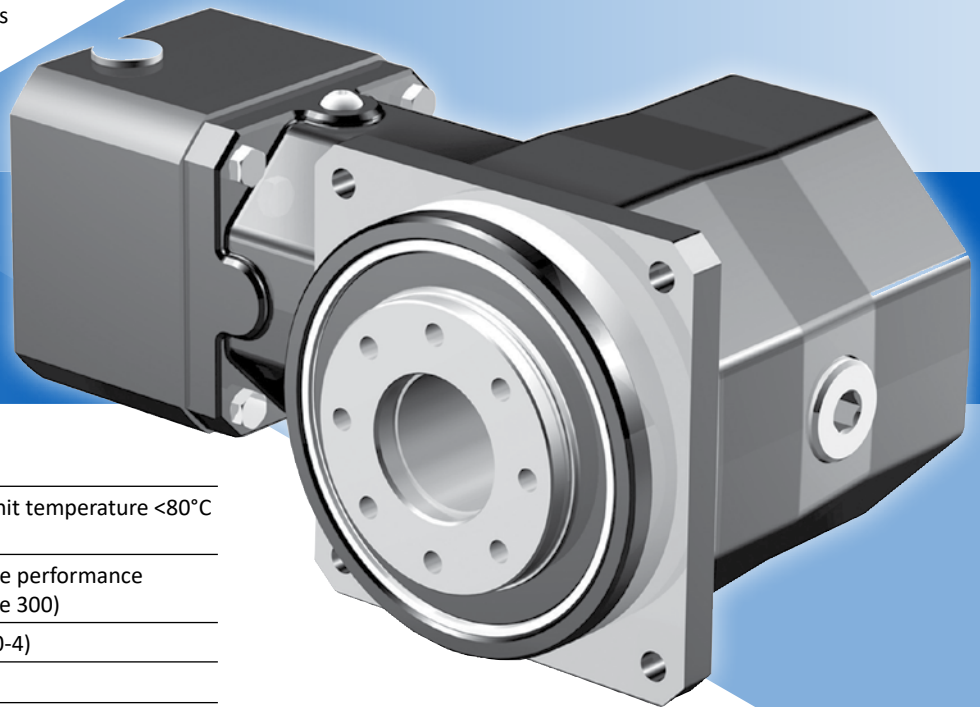
## KS Series: RIGHT ANGLE – Versatile Outputs

### Features

- 6:1 to 200:1 ratios (higher ratios available. Contact STÖBER.)
- Quiet running (<62dB(A))
- Flexibility for mounting
- Adaptability: shafts available in metric and imperial to meet your requirements
- 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

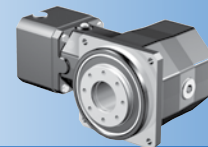
*STÖBER KS Series uses helical and bevel gearing to provide a low backlash unit, that is smooth running, with high efficiency, high power density, and high input speed capacity. The KS also offers flexibly with three output options: shaft, flange, and hollow. Every gearbox is made to order. STÖBER will 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

<b>Ambient Temperature</b>	0°C to +40°C (104°F) [Unit temperature <80°C Max]
<b>Backlash</b>	≤4 standard arcmins (see performance overview chart, see page 300)
<b>Coating</b>	Standard Black (RAL 790-4)
<b>Degree of Protection</b>	IP65
<b>Direction of Rotation</b>	Input and output rotate the SAME direction (see page 300)
<b>Efficiency</b>	2 stage 95%; 3 stage 93%;
<b>Input RPM</b>	Up to 6,000 RPM
<b>Installation</b>	Requires 10.9 fasteners for tapped holes housing. See page 328, for more information
<b>Lubrication</b>	Lubricated for life – standard Mobil SHC629; option food grade Mobil SHC CIBUS 150
<b>Mounting Position</b>	Must be specified, see page 301
<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 KS 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 KS ② 4 ③ 0 ④ 2 ⑤ P ⑥ F ⑦ 0060 ⑧ MT ⑨ L EL1 \*

Design Option	Part Number Code	Description
① <b>Series</b>	KS	Concentric helical
② <b>Size</b>	4 5 7	3 sizes of gearhead
③ <b>Generation</b>	0	Version of gearhead
④ <b># of Stages</b>	2 3	Two stage for ratios ≤20:1 Three stage for ratios >20:1
⑤ <b>Output</b>	P G F S	Shaft with key Plain shaft (no key) Flanged hollow Shrink ring
⑥ <b>Housing</b>	F	Standard
⑦ <b>Ratio</b>	0060	Ratios range from 6:1 to 200:1 (0060=6:1; 0200=20:1; 2000=200:1)
⑧ <b>Motor Adapter</b>	MT	MT Motor adapter (See also motor mounting plate option, page 301)
⑩ <b>Options</b>	L	Large Input
* <b>Mounting Position</b>	EL1 EL2 EL3 EL4 EL5 EL6	Required special instruction for all units, see page 301

### Options

#### Coating Options

- KS Series are also available with a multi-layer, industrial 316 stainless steel epoxy coating (contact factory)

#### Large Input

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

#### ATEX

- ATmosphere EXplosible — Please contact factory for this option and allow additional time for delivery

#### Oil Reservoir

- Use with 3 stage units (for vertical EL5 orientation, see page 300)

KS Series: RIGHT ANGLE – Versatile Outputs

# KS Series: RIGHT ANGLE – Versatile Outputs

## KS Performance Overview

KS 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		KS40		KS50		KS70	
# of Stages		2	3	2	3	2	3
Acceleration Torque $M_{2BMAX}$	Nm	90		200		400	
Output Torque Nom. <sup>1)</sup> $M_{2N}$	Nm	65		125		250	
Torsional Stiffness $C_2$	Nm/arcmin	≤8.5		≤17		≤42	
Torsional Backlash <sup>2)</sup> $\Delta\phi$	arcmin	≤6		≤5		≤4	
Input Speed Max. $n_{1MAX}$	Continuous	4000	4500	3500	4200	3200	4000
	Cyclic	6000	6000	6000	6000	6000	6000
Efficiency (@nom torque)	%	95	93	95	93	95	93
Weight	kg	8.4	8.2	13.6	14.4	26.8	28.1
	lbs	18.5	18.1	30	31.8	59.1	62
Noise <sup>3)</sup>	dB(A)	≤65		≤62		≤63	

Performance by Output Option (P = Shaft with Key; G = Shaft without Key; F = Flanged Hollow Output; S = Shrink Ring) <sup>4)</sup>

Size/Generation		KS40		KS50		KS70	
Axial Load Max. $F_{2AMAX}$	P/G	N	3400	6000	10,000		
	F	N	4000	6000	10,000		
	S	N	4000	6000	10,000		
Radial Load Max. $F_{2RMAX}$	P/G	N	5000	8000	10,000		
Tilting Moment Max. $M_{2KMAX}$	F/S	Nm	210	460	780		

<sup>1)</sup> Ratings based on input speed ( $n_1$ ) of 2000 RPM.

$$M_{2NX} = \frac{M_{2N}}{\left(\frac{n_1}{2000}\right)^3}$$

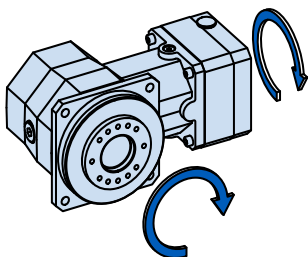
For torque at higher input speeds ( $M_{2NX}$ ) solve the formula:  
where  $n_1$  = Actual Input Speed.

<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 2000 RPM.

<sup>4)</sup> Rating based on output speed ( $n_2$ ) of 100 RPM. For values at other speeds see page 302.

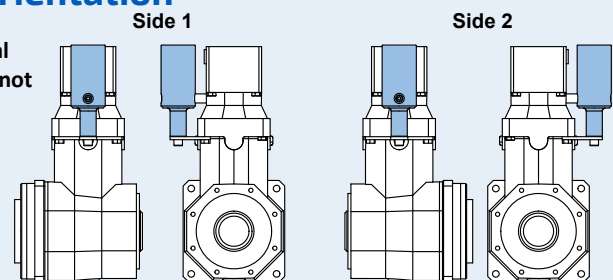
## KS Direction of Rotation



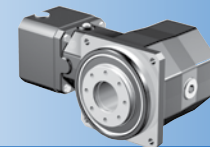
## Oil Reservoir Orientation

For 3 stage units in vertical EL5 mounting position — not available with large input option

When ordering, Side 1 or Side 2 MUST BE SPECIFIED.







# Overview

## KS Series Motor Mounting Plate Option (Motor information required with Motor Adapter ME option)

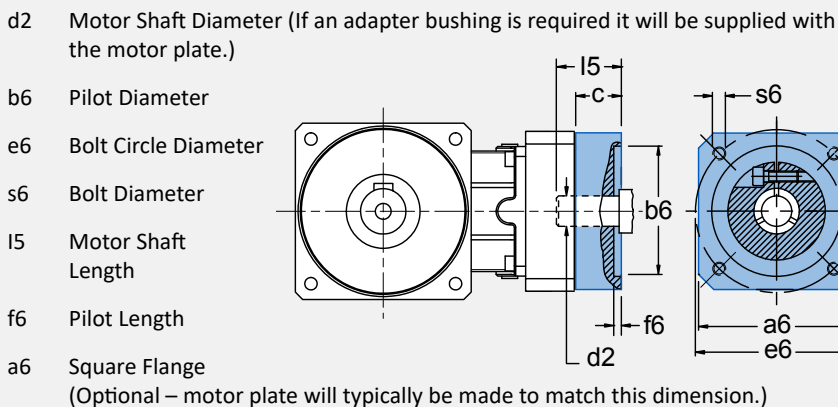
STÖBER Servo Gearheads fit the motor of your choice with the appropriate motor mounting plate assembled between the motor and the gearhead.

**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 STÖBER Technical Support.

### Customer Required Dimensions for Properly Sized Motor Mounting Plate



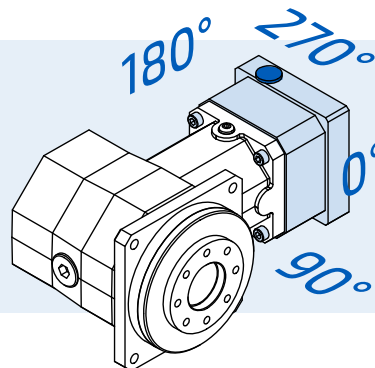
### Motor Mounting Plate Dimensions — mm (Gearhead Part Number Specific)

	KS403	KS402 KS403...L KS503	KS402...L KS502 KS503...L KS703	KS502...L KS702 KS703...L	KS702...L
Maximum Allowed Motor Shaft Dia. d2	14	19	24	32	38
Minimum Allowed Motor Plate Thickness c	15	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.

## KS Series Motor Mounting Plate Access Hole

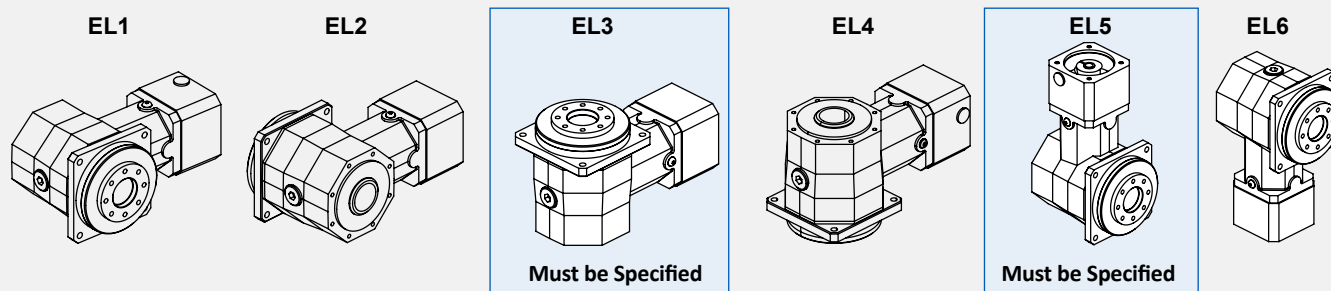
Access to the clamping screw for the motor coupling is located on the 270° side of the motor mounting plate at the location shown. If necessary, the motor mounting plate can be rotated in the field, if a 0°, 90° or 180° orientation for the access hole is desirable.



## KS Mounting Position Options

KS Units can be mounted in any of the positions illustrated below.

When ordering KS units mounted in a vertical position (EL3) or in a horizontal position (EL5), the mounting position **MUST BE SPECIFIED**. NOTE: EL5 3 stage units are only available with the oil reservoir option.

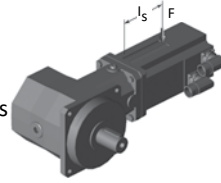


KS Series: RIGHT ANGLE – Versatile Outputs

# KS Series: RIGHT ANGLE – Versatile Outputs

## 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.



$$M_{1k} = F \times l_s \leq M_{1K}$$

M <sub>1K</sub>	KS403	KS402 KS503	KS502 KS703	KS702
Nm	10	20	40	80

## Permissible Output Shaft Load and Tilting Moments\*

Unit	Z <sub>2</sub> mm	F <sub>2A</sub> N	F <sub>2R</sub> N	F <sub>2RB</sub> N	M <sub>2K</sub> Nm	M <sub>2KB</sub> Nm
<b>P/G Solid Shaft (with/without key)</b>						
KS4	34	3400	5000	5000	260	260
KS5	40	6000	8000	8000	550	550
KS7	51	10,000	10,000	10,000	920	920
<b>F Flange Hollow Output</b>						
KS4	38	4000	6842	10,263	260	390
KS5	45	6000	12,222	18,333	550	825
KS7	55	10,000	16,727	25,091	920	1380
<b>S Hollow Output with Shrink Ring</b>						
KS4	36	4000	5000	5000	260	260
KS5	42	6000	8000	8000	550	550
KS7	52	10,000	10,000	10,000	920	920

\* Refer to illustration and definitions below.

During EMERGENCY OFF operation (maximum stops per gearhead = 1000) the permissible values in the table for F<sub>2A</sub>, F<sub>2R</sub> and M<sub>2K</sub> can be multiplied by a factor of 2.

## KS 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<sub>2</sub> is the desired speed:

$$F_{2AX} = \frac{F_{2A}}{\sqrt[3]{\frac{n_2}{100}}}, \quad F_{2RX} = \frac{F_{2R}}{\sqrt[3]{\frac{n_2}{100}}}, \quad M_{2KX} = \frac{M_{2K}}{\sqrt[3]{\frac{n_2}{100}}}$$

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

**Output P & G** 
$$M_{2A} = \frac{2 \cdot F_{2a} \cdot y_2 + F_{2rb} \cdot (x_2 + z_2)}{1000} \leq M_{2KB}$$

**Output F & S** 
$$M_{2A} = \frac{F_{2a} \cdot y_2 + F_{2rb} \cdot (x_2 + z_2)}{1000} \leq M_{2KB}$$

$$M_{2ka} = \sqrt[3]{\frac{n_{2b1} \cdot t_{b1} \cdot M_{2kb1}^3 + \dots + n_{2bn} \cdot t_{bn} \cdot M_{2kbn}^3}{n_{2b1} \cdot t_{b1} + \dots + n_{2bn} \cdot t_{bn}}} \leq M_{2K}$$

$$F_{2r} = \sqrt[3]{\frac{n_{2b1} \cdot t_{b1} \cdot F_{2rb1}^3 + \dots + n_{2bn} \cdot t_{bn} \cdot F_{2rbn}^3}{n_{2b1} \cdot t_{b1} + \dots + n_{2bn} \cdot t_{bn}}} \leq F_{2R}$$

Where:

- |   |  |
|---|--|
| F <sub>2a</sub> Axial Load at Output Shaft            | M <sub>2K</sub> Rated Tilting Torque         |
| F <sub>2A</sub> Permissible Axial Load                | M <sub>2k</sub> Equivalent Tilting Load      |
| F <sub>2r</sub> Radial Load at Output Shaft           | M <sub>2KB</sub> Acceleration Tilting Torque |
| F <sub>2R</sub> Permissible Radial Load               | Z <sub>2</sub> Distance Factor               |
| F <sub>2RB</sub> Acceleration Permissible Radial Load |  |

The hours of life (L<sub>n</sub>) of the unit can be determined by the following formula:

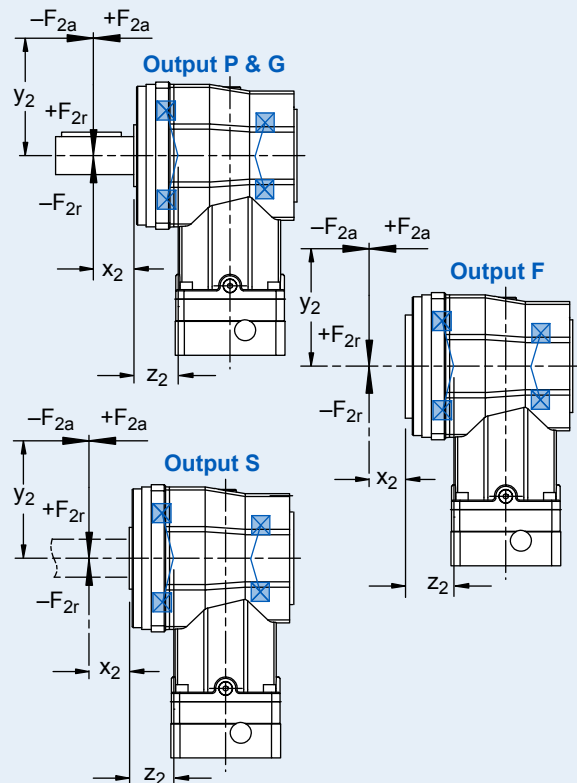
**bearing life for duty cycle ≤ 40%**

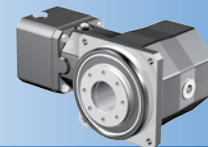
- L<sub>n</sub> > 10,000 hours if M<sub>2k</sub>/M<sub>2A</sub> < 1.25 and > 1
- L<sub>n</sub> > 20,000 hours if M<sub>2k</sub>/M<sub>2A</sub> > 1.25 and > 1.5
- L<sub>n</sub> > 30,000 hours if M<sub>2k</sub>/M<sub>2A</sub> < 1.5

**bearing life for duty cycle ≥ 40%**

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

All formulas shown are based on METRIC values  
Upper case letters are permissible values. Lower case letters are for existing values.





# Selection Data

Exact Ratio (i)	Output Torque			Part Number* (Gearhead + Input)	Maximum Input Speed RMP (n1)		Motor Shaft Max Ø D <sup>6</sup>	Input Inertia <sup>3)</sup> j <sub>1</sub>	Torsional Stiffness C2 (per arcmin)
	Nominal <sup>1)</sup> M <sub>2N</sub>	Acceleration M <sub>2B</sub>	Peak <sup>2)</sup> M <sub>2PEAK</sub>		Cont.	Cyclic			
	Nm	Nm	Nm				mm	kgcm <sup>2</sup>	Nm

## KS4

6.000	60	90	140	KS402_0060MT	3000	6000	19	1.2	8.5
				KS402_0060MTL			24	1.9	
8.000	65	90	140	KS402_0080MT	3500	6000	19	0.9	8.5
				KS402_0080MTL			24	1.6	
10.00	65	90	140	KS402_0100MT	3800	6000	19	0.8	8.5
				KS402_0100MTL			24	1.4	
14.00	65	90	140	KS402_0140MT	4000	6000	19	0.6	8.5
				KS402_0140MTL			24	1.3	
20.00	60	90	140	KS402_0200MT	4000	6000	19	0.6	8.5
				KS402_0200MTL			24	1.3	
24.00	60	90	140	KS403_0240MT	3500	6000	14	0.2	8.5
				KS403_0240MTL			19	0.7	
32.00	65	90	140	KS403_0320MT	3500	6000	14	0.2	8.5
				KS403_0320MTL			19	0.6	
40.00	65	90	140	KS403_0400MT	3500	6000	14	0.2	8.5
				KS403_0400MTL			19	0.6	
50.00	65	90	140	KS403_0500MT	4000	6000	14	0.1	8.5
				KS403_0500MTL			19	0.6	
70.00	65	90	140	KS403_0700MT	4500	6000	14	0.1	8.5
				KS403_0700MTL			19	0.6	
80.00	65	90	140	KS403_0800MT	4500	6000	14	0.1	8.5
				KS403_0800MTL			19	0.6	
100.0	65	90	140	KS403_1000MT	4500	6000	14	0.1	8.5
				KS403_1000MTL			19	0.6	
140.0	65	90	140	KS403_1400MT	4500	6000	14	0.1	8.5
				KS403_1400MTL			19	0.6	
200.0	60	90	140	KS403_2000MT	4500	6000	14	0.1	8.5
				KS403_2000MTL			19	0.6	

**KS Series: RIGHT ANGLE – Versatile Outputs**

<sup>1)</sup> Based on input speed of 2000 RPM. See page 300 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> Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

\* MT = Motor Adapter      L = Large Input Option

# KS Series: RIGHT ANGLE – Versatile Outputs

Exact Ratio (i)	Output Torque			Part Number* (Gearhead + Input)	Maximum Input Speed RMP (n1)		Motor Shaft Max Ø D <sup>6</sup>	Input Inertia <sup>3)</sup> j <sub>1</sub>	Torsional Stiffness C2 (per arcmin)
	Nominal <sup>1)</sup> M <sub>2N</sub>	Acceleration M <sub>2B</sub>	Peak <sup>2)</sup> M <sub>2PEAK</sub>		Cont.	Cyclic			
	Nm	Nm	Nm						

## KS5

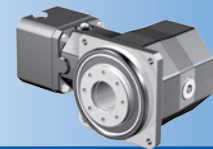
6.000	100	200	300	KS502_0060MT	2500	5500	24	2.9	17.0
				KS502_0060MTL			32	5.1	
8.000	125	200	300	KS502_0080MT	2800	6000	24	2.3	17.0
				KS502_0080MTL			32	4.5	
10.00	125	200	300	KS502_0100MT	3000	6000	24	1.9	17.0
				KS502_0100MTL			32	4.1	
14.00	125	200	300	KS502_0140MT	3200	6000	24	1.5	17.0
				KS502_0140MTL			32	3.8	
20.00	120	200	300	KS502_0200MT	3500	6000	24	1.3	17.0
				KS502_0200MTL			32	3.6	
24.00	100	200	300	KS503_0240MT	3100	6000	19	0.8	17.0
				KS503_0240MTL			24	1.5	
32.00	125	200	300	KS503_0320MT	3100	6000	19	0.8	17.0
				KS503_0320MTL			24	1.5	
40.00	125	200	300	KS503_0400MT	3100	6000	19	0.8	17.0
				KS503_0400MTL			24	1.4	
50.00	125	200	300	KS503_0500MT	3500	6000	19	0.7	17.0
				KS503_0500MTL			24	1.4	
70.00	125	200	300	KS503_0700MT	4200	6000	19	0.6	17.0
				KS503_0700MTL			24	1.3	
80.00	125	200	300	KS503_0800MT	4200	6000	19	0.6	17.0
				KS503_0800MTL			24	1.3	
100.0	125	200	300	KS503_1000MT	4200	6000	19	0.6	17.0
				KS503_1000MTL			24	1.3	
140.0	125	200	300	KS503_1400MT	4200	6000	19	0.6	17.0
				KS503_1400MTL			24	1.2	
200.0	120	200	300	KS503_2000MT	4200	6000	19	0.6	17.0
				KS503_2000MTL			24	1.2	

<sup>1)</sup> Based on input speed of 2000 RPM. See page 300 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> Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

\* MT = Motor Adapter L = Large Input Option



# Selection Data

Exact Ratio (i)	Output Torque			Part Number* (Gearhead + Input)	Maximum Input Speed RMP (n <sub>1</sub> )		Motor Shaft Max Ø D <sup>6</sup>	Input Inertia <sup>3)</sup> j <sub>1</sub>	Torsional Stiffness C <sub>2</sub> (per arcmin)
	Nominal <sup>1)</sup> M <sub>2N</sub>	Acceleration M <sub>2B</sub>	Peak <sup>2)</sup> M <sub>2PEAK</sub>		Cont.	Cyclic			
	Nm	Nm	Nm				mm	kgcm <sup>2</sup>	Nm

## KS7

6.000	240	400	600	KS702_0060MT	2100	4500	32	9.3	42.0
				KS702_0060MTL			38	12.3	
8.000	250	400	600	KS702_0080MT	2500	5000	32	6.4	42.0
				KS702_0080MTL			38	9.4	
10.00	250	400	600	KS702_0100MT	2800	6000	32	5.3	42.0
				KS702_0100MTL			38	8.3	
14.00	250	400	600	KS702_0140MT	3000	6000	32	4.3	42.0
				KS702_0140MTL			38	7.4	
20.00	250	400	600	KS702_0200MT	3200	6000	32	3.9	42.0
				KS702_0200MTL			38	6.9	
24.00	240	400	600	KS703_0240MT	3000	6000	24	2.0	42.0
				KS703_0240MTL			32	4.2	
32.00	250	400	600	KS703_0320MT	3000	6000	24	1.8	42.0
				KS703_0320MTL			32	4.0	
40.00	250	400	600	KS703_0400MT	3000	6000	24	1.8	42.0
				KS703_0400MTL			32	4.0	
50.00	250	400	600	KS703_0500MT	3200	6000	24	1.6	42.0
				KS703_0500MTL			32	3.8	
70.00	250	400	600	KS703_0700MT	3500	6000	24	1.4	42.0
				KS703_0700MTL			32	3.6	
80.00	250	400	600	KS703_0800MT	4000	6000	24	1.3	42.0
				KS703_0800MTL			32	3.6	
100.0	250	400	600	KS703_1000MT	4000	6000	24	1.3	42.0
				KS703_1000MTL			32	3.6	
140.0	250	400	600	KS703_1400MT	4000	6000	24	1.3	42.0
				KS703_1400MTL			32	3.5	
200.0	250	400	600	KS703_2000MT	4000	6000	24	1.3	42.0
				KS703_2000MTL			32	3.5	

**KS Series: RIGHT ANGLE – Versatile Outputs**

<sup>1)</sup> Based on input speed of 2000 RPM. See page 300 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.)

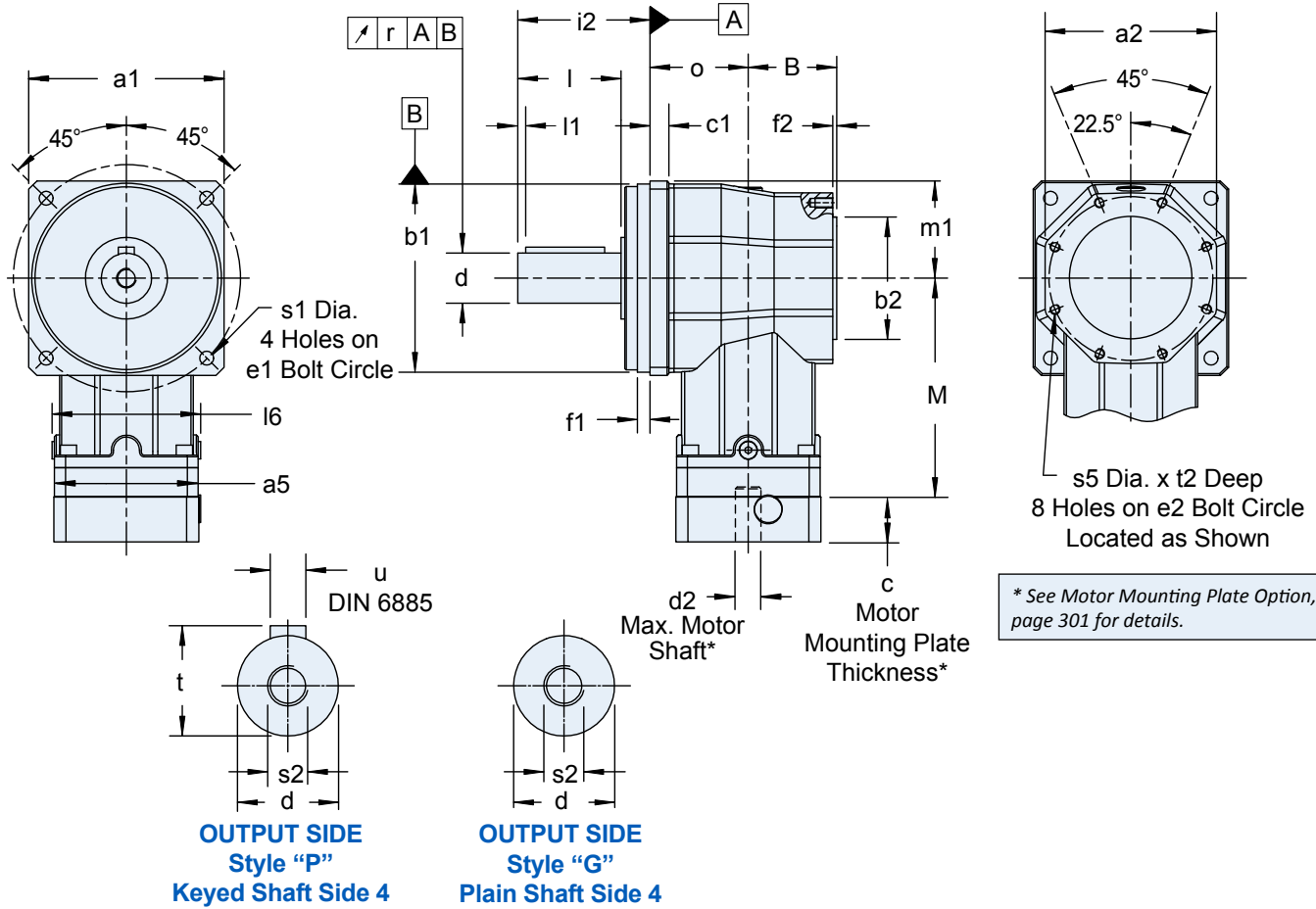
<sup>3)</sup> Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STÖBER.

\* MT = Motor Adapter      L = Large Input Option

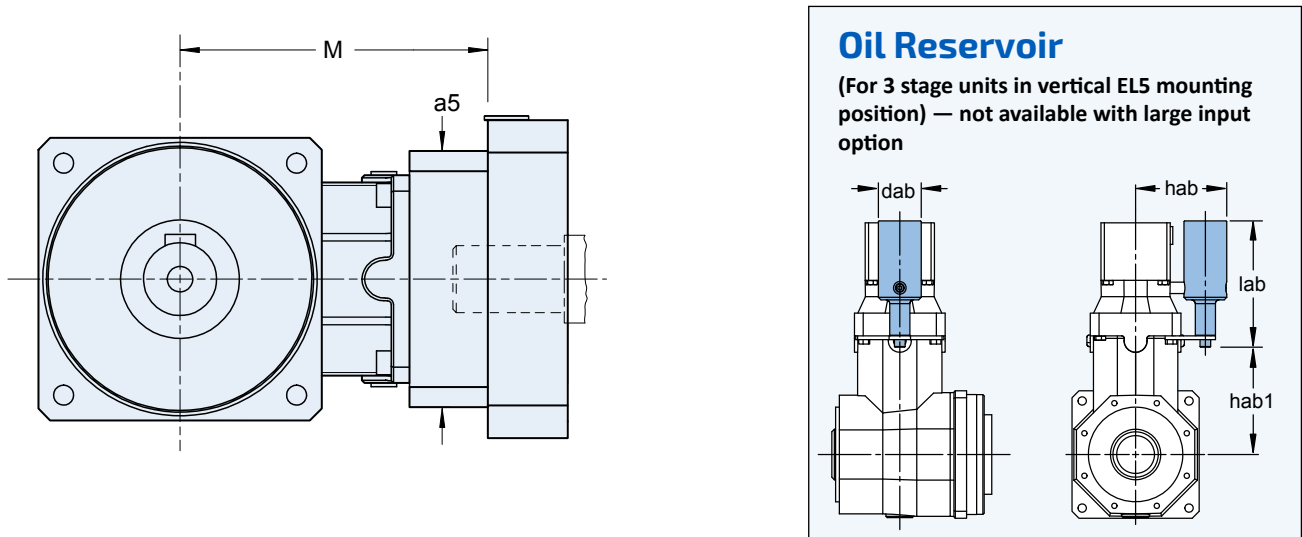
# KS Series: RIGHT ANGLE – Versatile Outputs

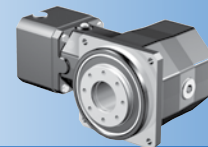
## Shaft Output – “P” (with key) & “G” (without key)

### With Standard Input



### With Large Input Option





# Dimensional Data

**Table 1 Dimensions (mm)**

Unit	a1	a2	B	b1	h6	b2	h6	c1	d	k6	e1	e2
KS4	101	93	51	95	+0.000/-0.022	75	+0.000/-0.019	10	22	+0.015/+0.002	120	88
KS5	125	109	58	120	+0.000/-0.022	90	+0.000/-0.022	10	32	+0.018/+0.002	145	105
KS7	155	135	70	150	+0.000/-0.025	110	+0.000/-0.022	15	40	+0.018/+0.002	180	130

**Table 2 Dimensions (mm)**

Unit	f1	f2	i2	l	l1	l6	m1	o	r	s1	s2	s5	t	t2	u
KS4	8	3	52	36	3	77.5	50.5	53	0.020	6.6	M8	M5x0.80	24.5	9	A6x6x28
KS5	9	3	75.5	58	3	98	62.5	62	0.020	9	M12	M6x1.00	35	11	A10x8x50
KS7	10	3	105	82	4	120	77.5	78	0.025	11	M16	M8x1.25	43	14	A12x8x70

**Table 3 Dimensions (mm)**

Standard Input			Large Input		
Unit	a5	M	Unit	a5	M
KS402	72	137.5	KS402_L	100	141.5
KS403	55	161.0	KS403_L	75	177.5
KS502	98	158.0	KS502_L	115	166.5
KS503	72	205.5	KS503_L	100	209.5
KS702	115	191.0	KS702_L	145	205.0
KS703	98	240.5	KS703_L	115	249.0

**Table 4 Oil Reservoir Dimensions (mm)**

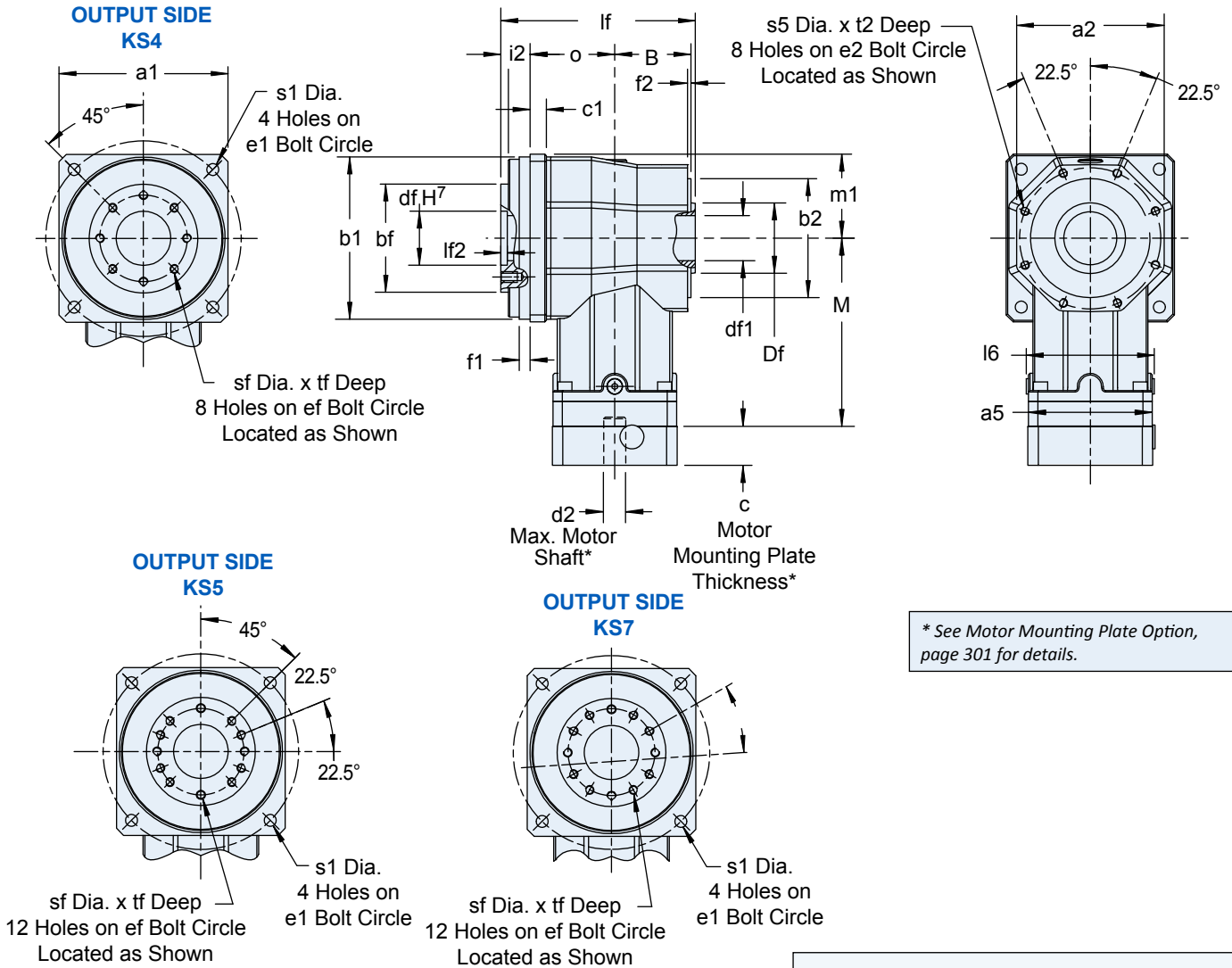
Unit Type	dab	hab	hab1	lab
KS403	34	74.5	85	100
KS503	39	92	105	122
KS703	49	109.5	132	134

**KS Series: RIGHT ANGLE – Versatile Outputs**

# KS Series: RIGHT ANGLE – Versatile Outputs

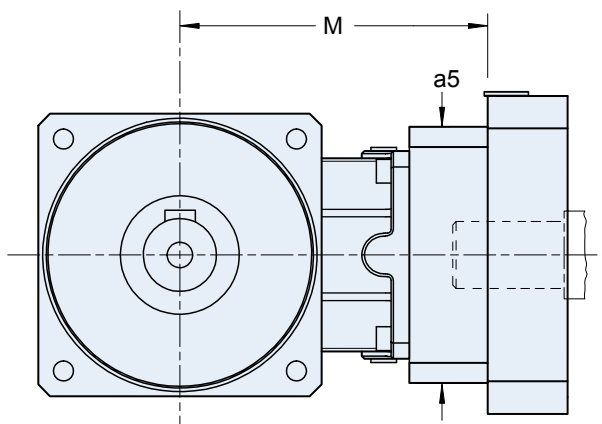
## Flanged Hollow Output – “F”

### With Standard Input



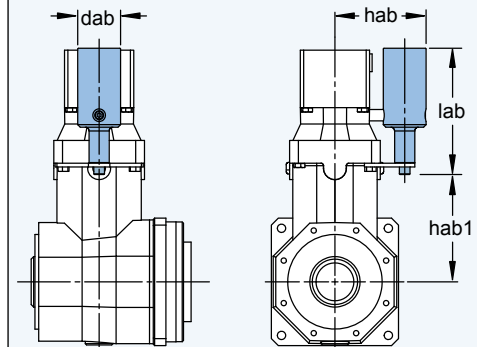
\* See Motor Mounting Plate Option, page 301 for details.

### With Large Input Option

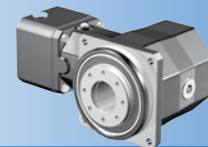


### Oil Reservoir

(For 3 stage units in vertical EL5 mounting position) — not available with large input option







## Dimensional Data

**Table 1 Dimensions (mm)**

Unit	a1	a2	B	b1	h6	b2	h6	bf	h7	c1	Df	d <sup>9</sup>	df	H <sup>7</sup>	df1
KS4	101	93	51	95	+0.000/-0.022	75	+0.000/-0.019	63	+0.000/-0.030	10	40	-0.080/-0.180	31.5	+0.025/-0.0	30
KS5	125	109	58	120	+0.000/-0.022	90	+0.000/-0.022	80	+0.000/-0.030	10	48	-0.080/-0.180	40	+0.025/-0.0	38
KS7	155	135	70	150	+0.000/-0.025	110	+0.000/-0.022	100	+0.000/-0.035	15	60	-0.100/-0.174	50	+0.025/-0.0	49

**Table 2 Dimensions (mm)**

Unit	e1	e2	ef	f1	f2	i2	l6	lf	lf2	m1	o	s1	s5	sf	t2	tf
KS4	120	88	50	8	3	20	77.5	127	6	50.5	53	6.6	M5x0.80	M6x1.00	9	11
KS5	145	105	63	9	3	22	98	145	7	62.5	62	9	M6x1.00	M6x1.00	11	12
KS7	180	130	80	10	3	27	120	178	7	77.5	78	11	M8x1.25	M8x1.25	14	15

**Table 3 Dimensions (mm)**

Standard Input			Large Input		
Unit	a5	M	Unit	a5	M
KS402	72	137.5	KS402_L	100	141.5
KS403	55	161.0	KS403_L	75	177.5
KS502	98	158.0	KS502_L	115	166.5
KS503	72	205.5	KS503_L	100	209.5
KS702	115	191.0	KS702_L	145	205.0
KS703	98	240.5	KS703_L	115	249.0

**Table 4 Oil Reservoir Dimensions (mm)**

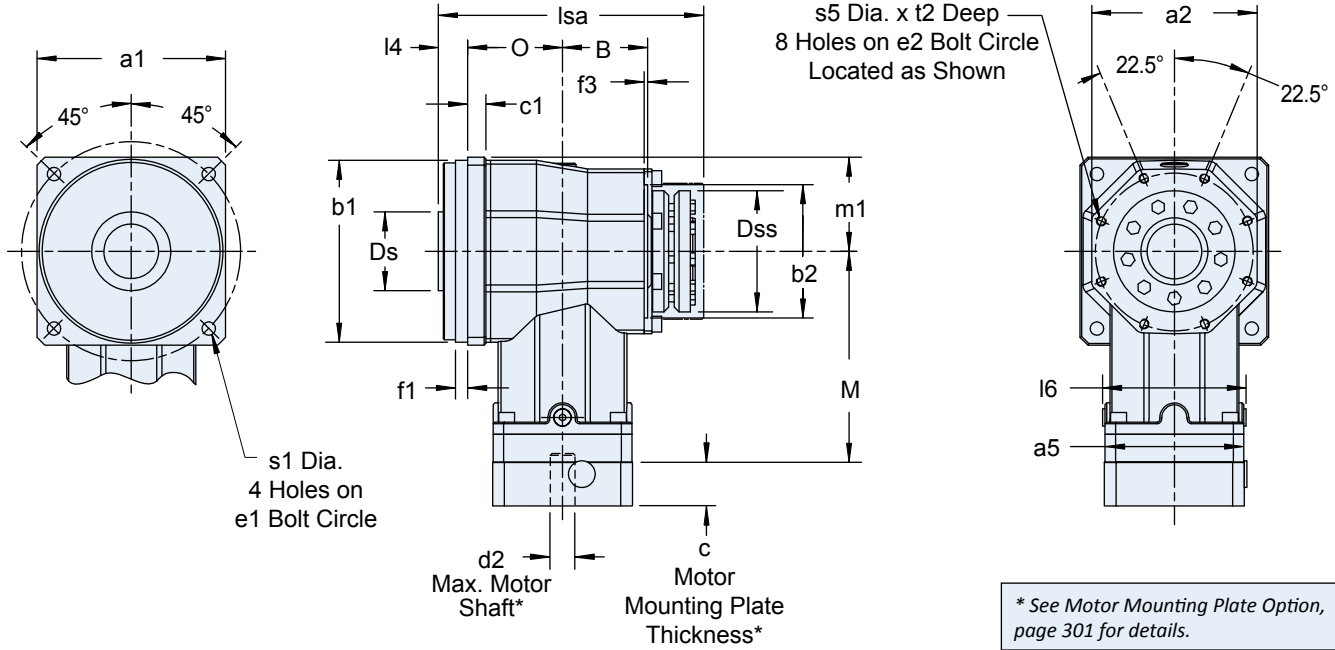
Unit Type	dab	hab	hab1	lab
KS403	34	74.5	85	100
KS503	39	92	105	122
KS703	49	109.5	132	134

**KS Series: RIGHT ANGLE – Versatile Outputs**

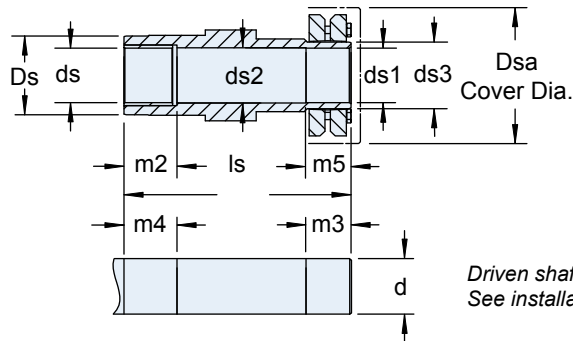
# KS Series: RIGHT ANGLE – Versatile Outputs

## Shrink Ring Output – “S”

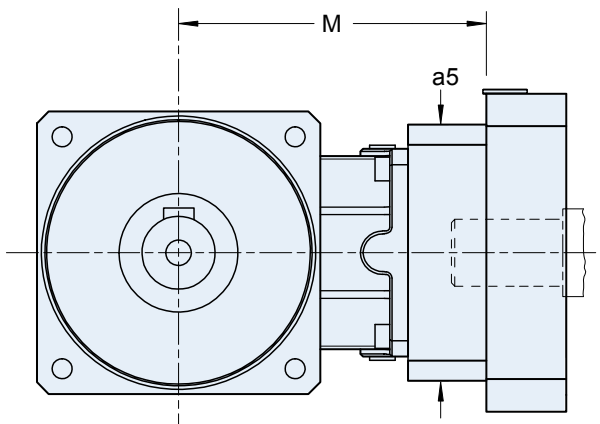
### With Standard Input



\* See Motor Mounting Plate Option, page 301 for details.

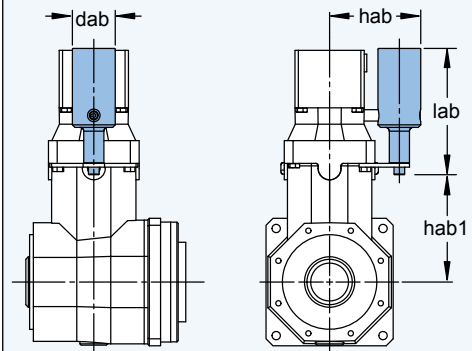


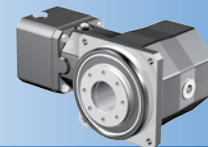
### With Large Input Option



### Oil Reservoir

(For 3 stage units in vertical EL5 mounting position) — not available with large input option





## Dimensional Data

**Table 1 Dimensions (mm)**

Unit	a1	a2	B	b1	h6	b2	h6	c1	Ds	Dsa	Dss	ds	h9	ds1		ds2	ds3
														Bore <sup>H9</sup>	Shaft <sup>H9</sup>		
KS4	101	93	51	95	+0.000/-0.022	75	+0.000/-0.019	10	40	72	60	25	+0.000/-0.052	25	25	25.5	30
KS5	125	109	58	120	+0.000/-0.022	90	+0.000/-0.022	10	50	92	80	35	+0.000/-0.062	35	35	35.5	44
KS7	155	135	70	150	+0.000/-0.025	110	+0.000/-0.022	15	65	112	100	45	+0.000/-0.062	45	45	45.5	55

**Table 2 Dimensions (mm)**

Unit	e1	e2	f1	f2	l4	l6	ls	lsa	m1	m2	m3	m4	m5	o	s1	s5	t2
KS4	120	88	8	3	18	77.5	151	158	50.5	20	34	25	29	53	6.6	M5x0.80	9
KS5	145	105	9	3	19.5	98	171.5	179.5	62.5	30	39	35	34	62	9	M6x1.00	11
KS7	180	130	10	3	24	120	211	218	77.5	40	42	45	37	78	11	M8x1.25	14

**Table 3 Dimensions (mm)**

Standard Input			Large Input		
Unit	a5	M	Unit	a5	M
KS402	72	137.5	KS402_L	100	141.5
KS403	55	161.0	KS403_L	75	177.5
KS502	98	158.0	KS502_L	115	166.5
KS503	72	205.5	KS503_L	100	209.5
KS702	115	191.0	KS702_L	145	205.0
KS703	98	240.5	KS703_L	115	249.0

**Table 4 Oil Reservoir Dimensions (mm)**

Unit Type	dab	hab	hab1	lab
KS403	34	74.5	85	100
KS503	39	92	105	122
KS703	49	109.5	132	134

KS Series: RIGHT ANGLE – Versatile Outputs

# In-Position Technologies

www.iptech1.com | (877) 478-3241 | help@iptech1.com