# Servo Gear Units

***Geared to a higher standard™***

# Servo Gear Units

## Welcome to STOBER!

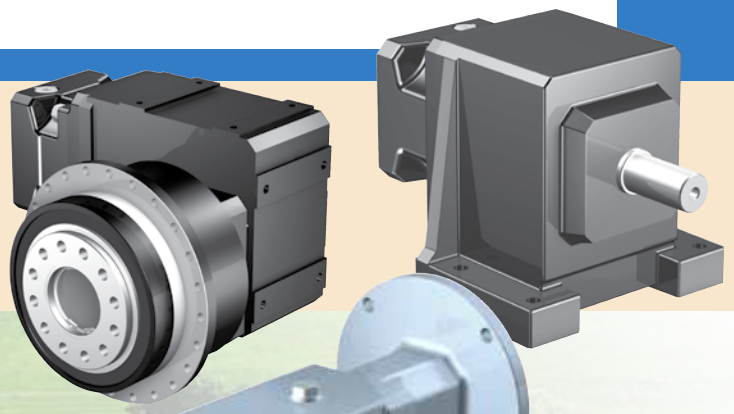
***Thank you for your interest in the servo gear reducers offered by STOBER Drives, Inc.!***

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

This 80 year heritage has given us expertise in servo gearing for which STOBER is recognized worldwide as the "gold standard." STOBER 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. STOBER 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.

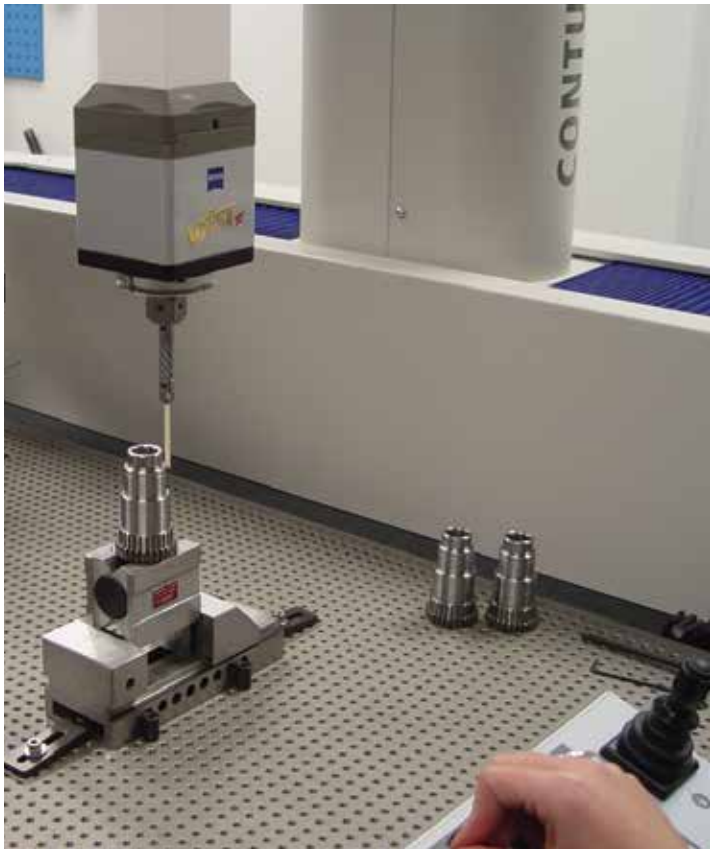
*Peter Feil, General Manager, STOBER Drives, Inc.*



*STOBER 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 STOBER products for 1 day shipment nationwide.*

## Contents





*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 STOBER, 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 STOBER considered the industry Gold Standard? Our products are backed with superior service, outstanding quality, and the STOBER guarantee.

- STOBER 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

## The Servo Gear Difference

A STOBER 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!

STOBER 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 STOBER planetary gearheads with HeliCamber™ gearing

## Striving Harder to Deliver the Best Gear Solutions

STOBER 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.

**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

*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).*

**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

## 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
- 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

***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 STOBER 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**

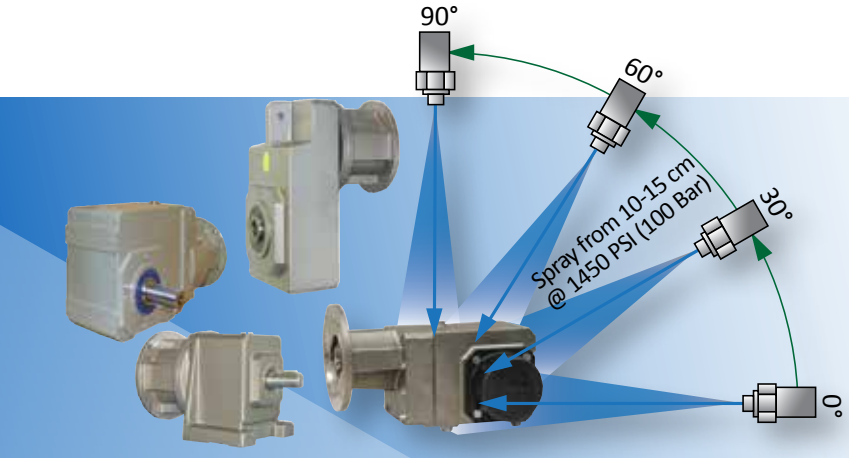
Servo gearheads with the air cooled ServoCool® option reduces the operating temperature 22°C (increases the ambient temperature limit 22°C), increases the output speed 54% and improves the servo motor rating 25%.

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.





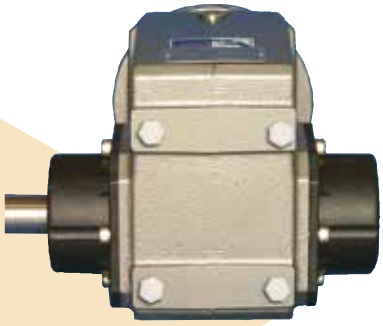
*Above: KSS Servo Gearheads are IP69K certified to withstand frequent pressure cleaning operations typical in the food industry and elsewhere. Other STOBER products, including C, F and K Series, are optionally available with IP69K compliant protection.*

## Wobble Free Bushing

**F K KL KSS**

The STOBER "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.

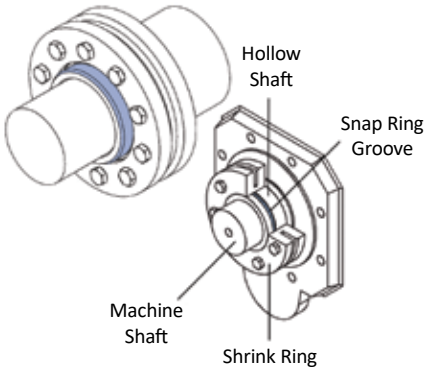
The double sided bushing is not installed into the unit at assembly, but with easy-to-follow installation instructions, the unit and bushing can be mounted on the machinery quickly – without any special tools.

### 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.

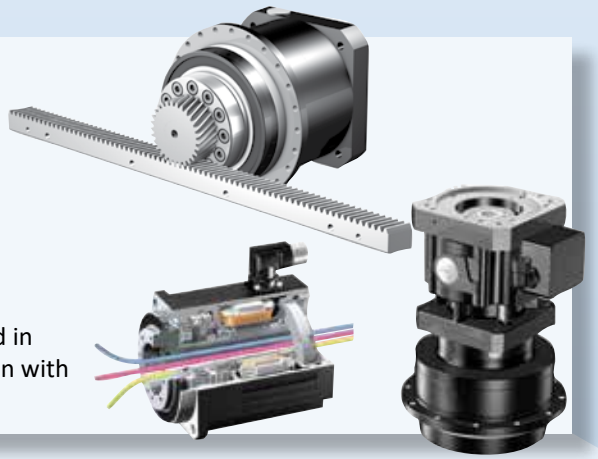
Gear units supplied with a shrink ring, are shipped with the ring installed on the hollow shaft end, ready for assembly.

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

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

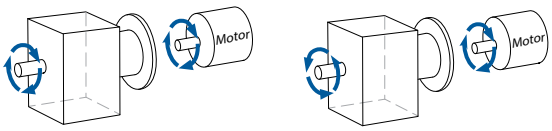
**Rack and Pinion** Servo gearhead systems are a ready to install engineered solution for precision automation applications requiring forces up to 122 kN (27,400 lbs.) with linear backlash as low as 7 µm

**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

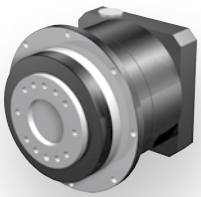
## Inline & Offset Inline Gearheads




### P/PA — Shaft Output *

STOBER 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.

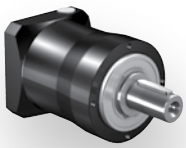
- 3:1 to 100:1
- Up to 2,000 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: P: <3 arc min; PA: <1 arc min



### PH/PHA/PHQ/PHQA — Flange Output*

STOBER PH family geaheads 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.

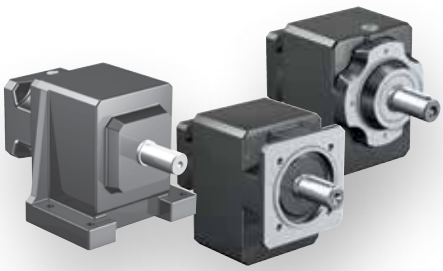
- 4:1 to 600:1
- Up to 13,000 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: PH/PHQ: <3 arc min; PHA/PHQA: <1 arc min



### PE — Shaft Output*

STOBER 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 STOBER 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*

STOBER 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

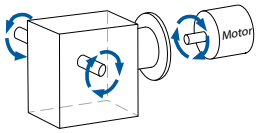
### F — Versatile Outputs*

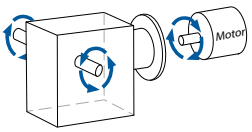
STOBER F Series gear drives are a popular choice for applications that require high performance, efficiency, durability, and flexibility. F Series are available with a wide selection of configurations to match almost any mounting requirement.

- 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



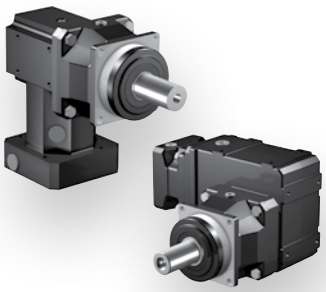




*Many right angle gearheads offer output on either or both sides*

## K — Versatile Outputs*

STOBER 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.

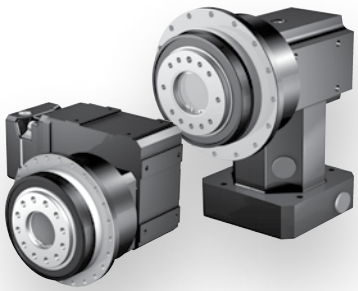
- 4:1 to 381:1
- Up to 12,000 Nm torque (nom)
- Up to 7,000 RPM input speed
- Backlash <10 arc min



## PKX/PK — Shaft Output*

STOBER 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*

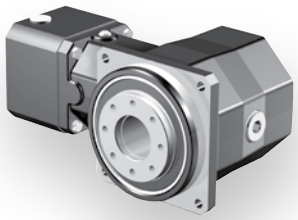
STOBER PH right angle geahead configurations offer a rotating flange output combining the P Series gearhead with the low ratio "KX" or reduced backlash K Series. The PHQK features the "Quattro" power planetary gearing for extreme torque and ratio capabilities.

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

## KL — Verstile Outputs*

The STOBER 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 — Verstile Outputs*

STOBER 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

SS304

## KSS — Versatile Outputs*

STOBER 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) | **Solid Shaft** | • | • | | | | | • | • | • |
| | **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 |
| | **304SS Housing** | | | | | | | | | |
| **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** | | | | | • | • | • | • | • |
| | **10,000-23,000** | | | | | • | • | | | |

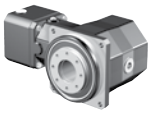
** See page 331 for more information*

## RIGHT ANGLE GEARHEADS











| | K | KL | PKX | PK | PHKX | PHK | PHQK | KS | KSS |
|---|---|---|---|---|---|---|---|---|---|
| | page 162 | | page 214 | | page 248 | | | page 298 | page 312 |
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# Servo Gear Units Application-Tailored Solutions

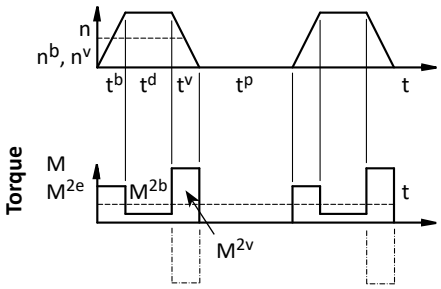
| Industry | Ideal Gearhead Applications | | Recommended STOBER Gearhead |
|---|---|---|---|
| **Aerospace** | • Automated Guided Vehicles (AGV)<br>• Drilling and Riveting<br>• Machine Tool<br>• Testing and Inspection | • Carbon Fiber Placement<br>• Fuselage<br>• Space Tracking Systems<br>• Wing assembly | Inline: P, PA, PH, PHA<br>Right Angle: KS<br>Also: STOBER rack and pinion systems and hollow bore servo motors |
| **Automation** | • Assembly turn tables<br>• Linear presses<br>• Robotics auxiliary axis<br>• Palletizing | • Custom assembly machines<br>• Radar<br>• Pipe and wire bending | Inline: P, PA, PE, PH, PHA<br>Right Angle: K/KL, PKX, KS<br>Also: STOBER rack and pinion systems, hollow bore servo motors, and servo brakes |
| **Automotive Manufacturing** | • Transfer lines<br>• Robotic auxiliary<br>• Machining<br>• Tire manufacturing<br>• Carbon fiber production | • Metal cutting and bending<br>• Pick and place<br>• Index tables<br>• Electronics assembly | Inline: P, PA, PE, PH, PHA<br>Right Angle: K/KL, PKX, KS<br>Also: STOBER rack and pinion systems, hollow bore servo motors, and servo brakes |
| **Converting** | • Cutting<br>• Tension Control<br>• Web Lines | • Winding<br>• Paper Converting | Inline: P, PA, C, PH, PHA<br>Right Angle: K/KL<br>Also: STOBER hollow bore servo motor, servo brakes and fans |
| **Machine Tool** | • Horizontal and vertical mills<br>• Large gantry cranes<br>• Carbon fiber placement<br>• Flame, laser, water jet, and plasma cutting<br>• Back gauging | • Grinding<br>• X-Y tables<br>• Indexing tables<br>• Chip conveyors<br>• Bending and forming<br>• Tool changers | Inline: P, PA, PH, PHA, PHQ, PHQA<br>Right Angle: PKX, PHKX, PHK, PHQK, KS<br>Also: STOBER rack and pinion systems, hollow bore servo motors, and servo brakes |
| **Material Handling** | • Pick and place<br>• Line diverter<br>• Sorting/diverting | • Linear transfer<br>• Palletizing | Inline: PE, C<br>Right Angle: K/KL, F<br>Also: STOBER hollow bore servo motors |
| **Medical** | • Imaging<br>• Radiation<br>• Centrifuge | | Inline: P, PA, C, PH, PHA<br>Right Angle: K/KL, F, KS<br>Also: STOBER hollow bore servo motors |
| **Packaging** | • Continuous or intermittent filling applications | | Inline: P, PA, PE, C, PH, PHA<br>Right Angle: K/KL, F, PKX, KS<br>Also: STOBER hollow bore servo motors |
| **Plastics/ Composites** | • Often used to replace hydraulic actuators in injection molding<br>• Injection molding<br>• Carbon fiber placement | • Extrusion lines<br>• Blow molding<br>• Thermoforming<br>• Rubber molding | Inline: P, PA, PH, PHA, PHQ, PHQA<br>Also: STOBER rack and pinion systems and hollow bore servo motors |
| **Printing** | • Labels<br>• Flexographic printing | • Circuit Boards<br>• Sheet | Inline: P, PA, PH, PHA<br>Also: STOBER hollow bore servo motors and servo brakes |
| **Robotics** | • Delta<br>• Pick and place<br>• Telescoping arms | • Auxiliary axis to rotate and move robot<br>• Positioning axis | Inline: PH, PHA, PHQ, PHQA<br>Also: STOBER rack and pinion systems and hollow bore servo motors |
| **Semiconductor** | • Wafer polishing<br>• Wafer handling | • Circuit web printing | Inline: P, PA, PH, PHA<br>Also: STOBER hollow bore servo motors |
| **Valve Control** | • Ideal for handling rapid dithering positioning<br>• Ball, gate, and globe valves | • Throttle/governor valves<br>• Chokes<br>• Process valves<br>• ATEX explosion proof available | Inline: P, PA, PH, PHA<br>Right Angle: K/KL, F, PKX, PHKX<br>Also: STOBER hollow bore servo motors |

## 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




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

## Service Factor

### Apply to Nominal Rating ONLY

| Load Factor $f_B$ | P, PA, PE PH, PHA PHV, PHVA, PHQ, PHQA, KS | PKX, PK, PHKX, PHK, PHQK, C, F, K, KSS |
|---|---|---|
| **Operating Mode** | | |
| Continuous | 1.0 | 1.0 |
| Cyclic | 1.0 | 1.25 |
| Cyclic–Reversing | 1.0 | 1.4 |

| 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.

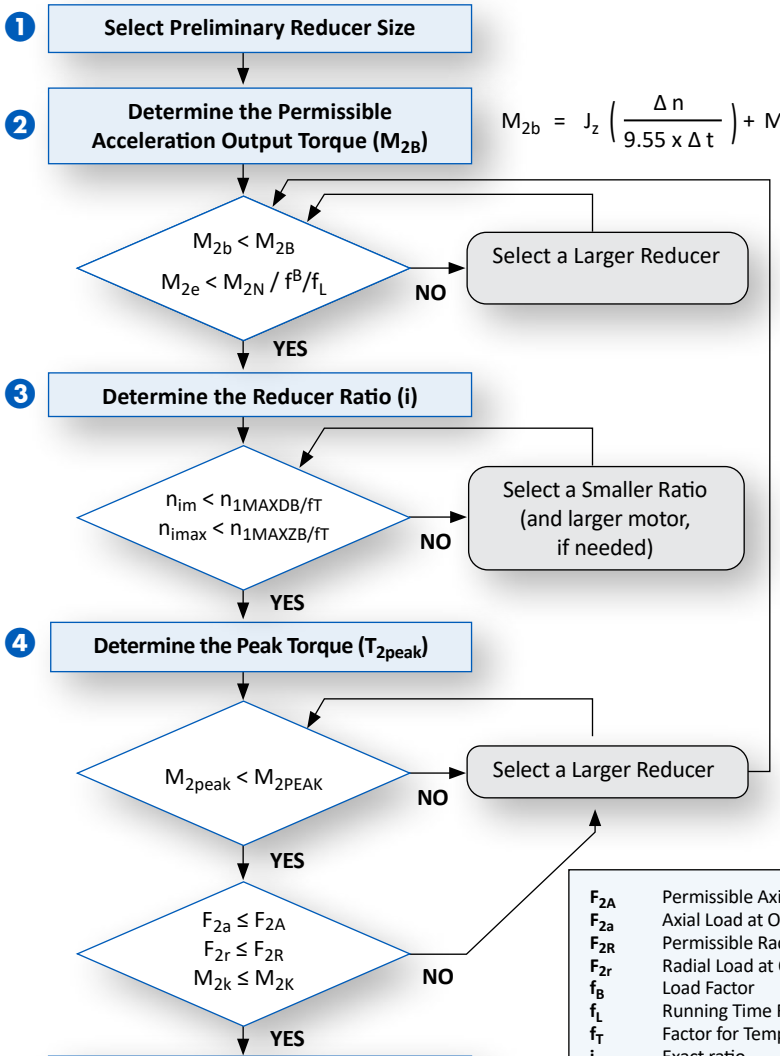
**Cyclic Duty:** Drive will cycle on and off.

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

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

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

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




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

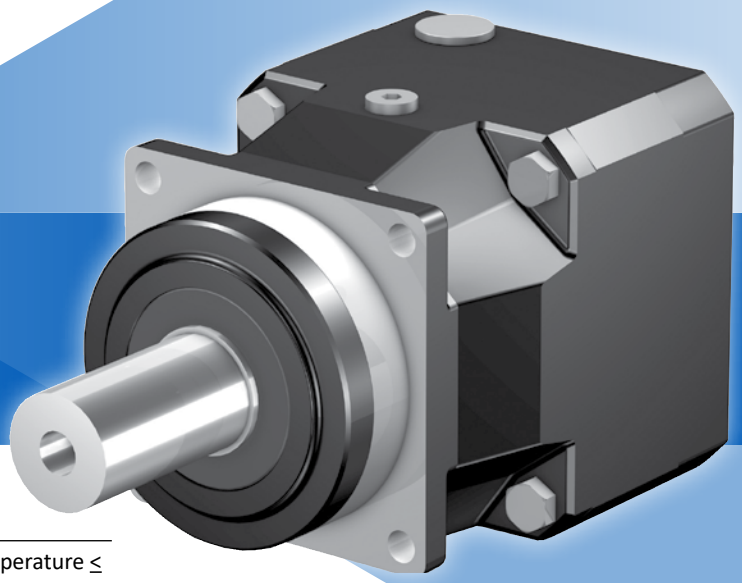
# P/PA Series: INLINE — Shaft Output

## Features

- 3:1 to 100:1 ratios (higher ratios available. Contact STOBER.)
- Quiet running (as low as 60dB(A))
- Bearing options to suit your application needs.
- 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 (see page 19), 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

*STOBER P & PA Series Servo Precision Planetary Gearheads feature HeliCamber® gearing and other components which make them the most accurate and efficient planetary gearheads available. Our gear technology provides minimum wear, low backlash and low noise. Keyed, keyless, bearing options, and more are all available in one day. Every gearbox is made to order. STOBER will custom whatever you need to fit your application. Contact us today to learn more.*

**All P Series and select PA Series SHIP in 1 DAY!**
NO EXPEDITE FEE FOR 24 HOUR SERVICE



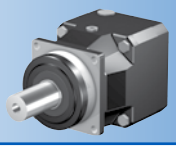
## General Specifications

| | |
|---|---|
| **Ambient Temperature** | 0° C to +40°C (104° F) [Unit temperature ≤ 90° C Max.] |
| **Backlash** | ≤1 arcmins, see performance overview chart, page 16 |
| **Coating** | Standard Black (RAL 790-4); food duty optional (P3 thru P5 only) |
| **Degree of Protection** | IP65 |
| **Direction of Rotation** | Input and output rotate the SAME direction |
| **Efficiency** | 1 stage 97%; 2 stage 95% |
| **Input RPM** | Up to 8,000 rpm |
| **Installation** | Requires grade 10.9 fasteners. See page 328, for more information |
| **Lubrication** | Lubricated for life – standard Mobil SHC629; option food grade Mobil SHC CIBUS 150 |
| **Mounting Position** | Unrestricted |
| **Warranty** | 5 Year Limited (2 years on normal wear items: bearings, seals, etc.) |

## Comparative Advantages

| | P | PA |
|---|---|---|
| Precision | Better | Best |
| Smoothness (low velocity ripple) | Better | Best |
| Uniformity of motion through full temperature range | Better | Best |

# Overview



## Selection Options *At-a-Glance*

Using the **Selection Data** table later in this section, select the P/PA Series Gearhead with the appropriate performance and design options tailored to your motor choice and exact application requirements. Use the part number guide below as a reference to build a part number for the complete gearhead assembly.

**Part Number Examples:**

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ |
|---|---|---|---|---|---|---|---|---|---|
| P | 4 | 2 | 1 | S | P | R | 0030 | MT | L |
| PA | 4 | 2 | 1 | S | P | D | 0030 | MF | LC |

| | Design Option | Part Number Code | Description |
|---|---|---|---|
| ① | **Series** | P | Solid shaft inline style planetary |
| | | PA | Solid shaft inline style advanced planetary |
| ② | **Size** | 2 3 4 5 7 8 9 | 7 sizes of gearhead (size 2 & 9 available for P Series only) |
| ③ | **Generation** | 2 | Version of gearhead |
| ④ | **# of Stages** | 1 | One stage for ratios of ≤ 10:1 |
| | | 2 | Two stage for ratios >10:1 |
| ⑤ | **Housing** | S | Standard mounting style |
| ⑥ | **Output** | P | Shaft with key |
| | | G | Plain shaft (no key) |
| ⑦ | **Bearings** See output bearing options page 18 |  R | Ball bearing (P Series only) |
| | |  D | Double row angular contact bearing (except P2) |
| | |  Z | Cylindrical roller bearing (P Series only, except P2) |
| ⑧ | **Ratio** | 0030 | Ratios range from 3:1 to 100:1 (0030=3:1; 0160=16:1; 1000=100:1, etc.) |
| ⑨ | **Motor Adapter** | MT | For P Series only – See motor mounting plate option page 17 |
| | | MF | For PA Series only – See motor mounting plate option page 17 |
| ⑩ | **Options** | L | Large Input |
| | | C | ServoCool |
| | | F | Food Duty (size P3 thru P5 only) |

## Options

### ServoCool

- Used when a higher input speed is required or when improved performance and longer life is needed
- Reduces operating temperatures; helpful for applications with high ambient temperature
- Ideal for large planetary or units with small ratios

### Coatings

- **Standard:** For dry areas and normal conditions. All units standard coating, unless ordered with Food Duty
- **Food Duty**: Able to withstand severe wet areas and washdown application (size P3 thru P5 only)

### 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

## P/PA Series Performance Overview

P 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.

| Series-Size | | | | P2 | | P/PA3 | | P/PA4 | | P/PA5 | | P/PA7 | | P/PA8 | | P9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # of Stages | | | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| **Acceleration Torque** $M_{2BMAX}$ | | | N | 22 | | 65 | | 120 | | 300 | | 700 | | 1600 | | 3000 | |
| **Output Torque Nom.** [1] $M_{2N}$ | | | N | 16 | | 45 | | 85 | | 210 | | 440 | | 1000 | | 2000 | |
| **Torsional Stiffness** $C_2$ | | | Nm/arcmin | 1.9 | | 5 | | 11 | | 33 | | 55 | | 176 | | 350 | 340 |
| **Torsional Backlash** [2] $\Delta\phi$ | | | arcmin | | | | | | | | | | | | | | |
| | | P Series | | ≤6 | ≤8 | ≤4 | ≤5 | ≤4 | ≤5 | ≤3 | ≤4 | ≤3 | ≤4 | ≤3 | ≤4 | ≤3 | ≤4 |
| | | PA Series | | — | — | ≤2 | ≤3 | ≤2 | ≤3 | ≤1 | ≤2 | ≤1 | ≤2 | ≤1 | ≤2 | — | — |
| **Input Speed Max.** $n_{1MAX}$ | | | Continuous | 4500 | 4500 | 4500 | 4500 | 4000 | 4500 | 3700 | 4000 | 3300 | 3700 | 2800 | 3300 | 2500 | 2800 |
| | | | Cyclic | 8000 | 8000 | 8000 | 8000 | 7000 | 8000 | 6500 | 7000 | 6000 | 6500 | 4500 | 6000 | 4000 | 4500 |
| **With ServoCool Option** | Continuous | P Series | | — | — | — | — | 4500 | — | 5500 | 4500 | 5000 | 5000 | 4500 | 4500 | 4000 | 4000 |
| | | PA Series | | | | | | 6000 | | 6000 | 5500 | 5500 | 5500 | 5500 | 5500 | — | — |
| | Cyclic | | | — | — | — | — | 7000 | — | 6500 | 7000 | 6000 | 6500 | 6000 | 6000 | 5000 | 6000 |
| **Efficiency (@ nom torque)** | | | % | 97 | 95 | 97 | 95 | 97 | 95 | 97 | 95 | 97 | 95 | 97 | 95 | 97 | 95 |
| **Weight** | | | kg | 1.2 | 1.8 | 2.6 | 3.5 | 4.0 | 5.3 | 6.5 | 8.5 | 12 | 15 | 26 | 32 | 50 | 61 |
| | | | lbs | 3 | 4 | 6 | 8 | 9 | 12 | 14 | 19 | 27 | 33 | 57 | 71 | 110 | 135 |
| **Noise** [3] | | | dB(A) | ≤61 | ≤61 | ≤61 | ≤61 | ≤62 | ≤60 | ≤63 | ≤61 | ≤64 | ≤62 | ≤65 | ≤63 | ≤65 | ≤64 |

### Performance by Bearing Design Option [4]

**R = Ball bearing (P Series Only) D = Double row angular contact bearing Z = Cylindrical roller bearing (P Series Only)**

| Series-Size | | | | P2 | P/PA3 | P/PA4 | P/PA5 | P/PA7 | P/PA8 | P9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Axial Load Max.** $F_{2AMAX}$ | R | P Series | N | 500 | 1000 | 1500 | 2300 | 2900 | 4700 | 6000 |
| | D | P Series<br>PA Series | N | — | 1400 | 2250 | 3500 | 4500 | 7500 | 10,000 |
| | Z | P Series | N | — | 600 | 1000 | 1600 | 2000 | 3600 | 5000 |
| **Radial Load Max.** $F_{2RMAX}$ | R | P Series | N | 1200 | 2500 | 4000 | 6500 | 8000 | 13,000 | 18,000 |
| | D | P Series<br>PA Series | N | — | 2750 | 4500 | 7000 | 9000 | 15,000 | 20,000 |
| | Z | P Series | N | — | 3000 | 5000 | 8000 | 10,000 | 18,000 | 27,000 |
| **Tilting Moment Max.** $M_{2KMAX}$ | R | P Series | Nm | 34 | 88 | 160 | 338 | 536 | 897 | 1665 |
| | D | P Series<br>PA Series | N | —<br>— | 105<br>231 | 194<br>439 | 406<br>847 | 648<br>1314 | 1140<br>2655 | 2070<br>— |
| | Z | P Series | Nm | — | 105 | 200 | 416 | 670 | 1242 | 2500 |

[1] *Ratings based on input speed ($n_1$) of 2000 RPM.*

*For torque at higher input speeds ($M_{2NX}$) solve the formula:*

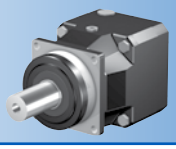
$$M_{2NX} = \frac{M_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$$

*where $n_1$ = Actual Input Speed.*

[2] *Tested at 1.5% of nominal torque and recorded on the output side of the gearhead. For reduced value see the PA Series.*

[3] *Measurement at one (1) meter distance with input speed ($n_1$) of 2000 RPM.*

[4] *Options R and Z are available with P Series only. See page 18 for output bearing options. Rating based on output speed ($n_2$) of 100 RPM. For values at other speeds see page 19.*





## P/PA Series Motor Mounting Plate Option (Motor information required with ME or MF Motor Adapter 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.

Maximum 10 working days for custom motor mounting plates.

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

d2 Motor Shaft Diameter (If an adapter bushing is required it will be supplied with the motor plate.)

b6 Pilot Diameter

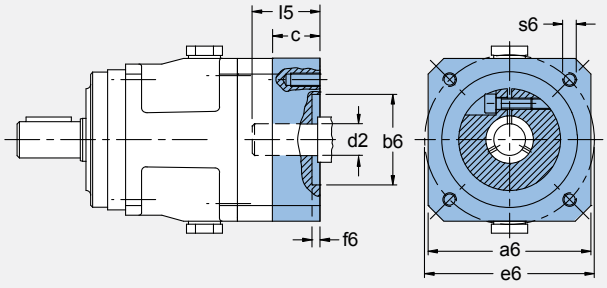
e6 Bolt Circle Diameter

s6 Bolt Diameter

l5 Motor Shaft Length

f6 Pilot Length

a6 Square Flange
(Optional – motor plate will typically be made to match this dimension.)

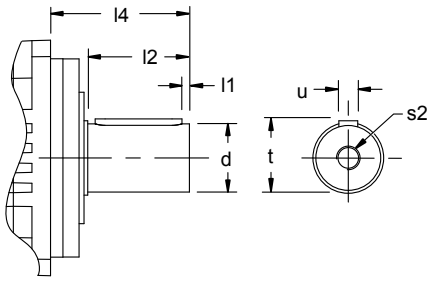



| Motor Mounting Plate Dimensions — mm(Gearhead Part Number Specific) | P221<br>P222<br>P/PA322 | P221...L<br>P222...L<br>P/PA321<br>P322...L<br>P/PA422 | P/PA321...L<br>P/PA421<br>P/PA422...L<br>P/PA522 | P/PA421...L<br>P/PA521<br>P/PA522...L<br>P/PA722 | P/PA521...L<br>P/PA721<br>P/PA722...L<br>P/PA822 | P/PA721...L<br>P/PA821<br>P/PA822...L<br>P922 | P821...L P921<br>P922...L |
|---|---|---|---|---|---|---|---|
| Maximum Allowed Motor Shaft Dia. d2 | 14 | 19 | 24 | 32 | 38 | 48 | 60 |
| Minimum Allowed Motor Plate Thickness c* | 15 | 18 | 21 | 24 | 25 | 33 | 43 |

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

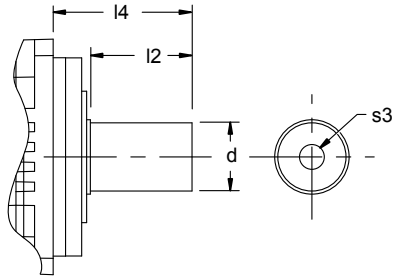
## P/PA Series Output Shaft Options ("P" or "G" designated in part number, for example: P421S P 0160 MEL)

### P Shaft with Key




| Unit | d k6 | | l1 | l2 | l4 | s2 (1) | t | u (2) |
|---|---|---|---|---|---|---|---|---|
| | mm | | mm | mm | mm | | mm | W x H x L |
| P2 | 12 | +0.012/+0.001 | 2 | 22 | 36 | M4 | 13.5 | A4x4x18 |
| P/PA3 | 16 | +0.012/+0.001 | 2 | 28 | 48 | M5 | 18.0 | A5x5x22 |
| P/PA4 | 22 | +0.015/+0.002 | 3 | 36 | 56 | M8 | 24.5 | A6x6x28 |
| P/PA5 | 32 | +0.018/+0.002 | 3 | 58 | 88 | M12 | 35.0 | A10x8x50 |
| P/PA7 | 40 | +0.018/+0.002 | 4 | 82 | 112 | M16 | 43.0 | A12x8x70 |
| P/PA8 | 55 | +0.021/+0.002 | 6 | 82 | 112 | M20 | 59.0 | A16x10x70 |
| P9 | 75 | +0.021/+0.002 | 7 | 105 | 143 | M20 | 79.5 | A20x12x90 |

### G Shaft without Key

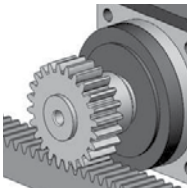
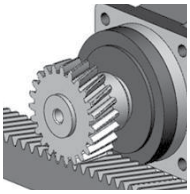
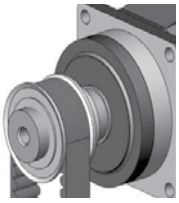



| Unit | d k6 | | l2 | l4 | s3 (1) |
|---|---|---|---|---|---|
| | mm | | mm | mm | |
| P2 | 12 | +0.012/+0.001 | 22 | 36 | M4 |
| P/PA3 | 16 | +0.012/+0.001 | 28 | 48 | M5 |
| P/PA4 | 22 | +0.015/+0.002 | 36 | 56 | M8 |
| P/PA5 | 32 | +0.018/+0.002 | 58 | 88 | M12 |
| P/PA7 | 40 | +0.018/+0.002 | 82 | 112 | M16 |
| P/PA8 | 55 | +0.021/+0.002 | 82 | 112 | M20 |
| P9 | 75 | +0.021/+0.002 | 105 | 143 | M20 |

(1) *The center hole in shafts with keys (Option "P") are machined to DIN 332 T2 shape DR.*

(2) *Feather keys are toleranced according to standard DIN 6885.*

## P/PA Series Output Bearing Options

| | R Ball Bearing (P Series only) | D Double Row Angular Contact Bearing | Z Cylindrical Roller Bearing (P Series only) |
|---|---|---|---|
| |  |  |  |
| **Characteristics:** | • Minimal frictional torque<br>• Good radial load capacity<br>• Axial load approx. 35% of radial load | • Low frictional torque<br>• Good radial bearing capacity<br>• Axial load approx. 50% of radial load | • Very good radial load capacity<br>• Axial load approx. 20% of radial load |
| **Applications:** | • Spur geared rack/pinion<br>• Couplings<br>• Belt with or without light tension | • Helical geared rack/pinion<br>• Couplings with high axial load<br>• Belt with or without light tension | • Prestressed belt drive<br>• Prestressed spur rack drive<br>• Applications with high radial loads and/or high service requirements |

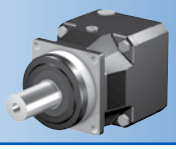
## Permissible Output Shaft Load and Tilting Moments*

| Unit | $z_2$ mm | $F_{2A}$ N | $F_{2R}$ N | $F_{2RB}$ N | $M_{2K}$ Nm | $M_{2KB}$ Nm |
|---|---|---|---|---|---|---|
| **R Ball Bearing (P Series only)** | | | | | | |
| P2 | 17 | 500 | 1200 | 1300 | 34 | 36 |
| P3 | 21 | 1000 | 2500 | 2500 | 88 | 88 |
| P4 | 22 | 1500 | 4000 | 4500 | 160 | 180 |
| P5 | 23 | 2300 | 6500 | 7000 | 338 | 364 |
| P7 | 26 | 2900 | 8000 | 9000 | 536 | 603 |
| P8 | 28 | 4700 | 13,000 | 18,000 | 897 | 1242 |
| P9 | 40 | 6000 | 18,000 | 27,000 | 1665 | 2498 |
| **D Double Row Angular Contact Bearing** | | | | | | |
| P/PA3 | 24 | 1400 | 2750 | 2750 | 105 | 105 |
| P/PA4 | 25 | 2250 | 4500 | 5000 | 194 | 215 |
| P/PA5 | 29 | 3500 | 7000 | 8000 | 406 | 464 |
| P/PA7 | 31 | 4500 | 9000 | 10,000 | 648 | 720 |
| P/PA8 | 35 | 7500 | 15,000 | 18,000 | 1140 | 1368 |
| P9 | 51 | 10,000 | 20,000 | 30,000 | 2070 | 3105 |
| **Z Cylindrical Roller Bearing (P Series only)** | | | | | | |
| P3 | 21 | 600 | 3000 | 3000 | 105 | 105 |
| P4 | 22 | 1000 | 5000 | 5000 | 200 | 200 |
| P5 | 23 | 1600 | 8000 | 8000 | 416 | 416 |
| P7 | 26 | 2000 | 10,000 | 10,000 | 670 | 670 |
| P8 | 28 | 3600 | 18,000 | 18,000 | 1242 | 1242 |
| P9 | 40 | 5000 | 27,000 | 35,000 | 2500 | 3238 |

** Refer to illustration and load/life/speed definitions on page 19*

*During EMERGENCY OFF operation (maximum stops per gearhead = 1000) the permissible values in the table for $F_{2A}$, $F2_R$, and $M_{2K}$ can be multiplied by a factor of 2.*

*The permissible load values given are valid with the load applied to the center of the output shaft ($x_2$).*



# Overview

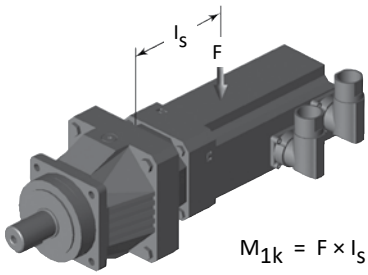
## P/PA No Load Running Torque*

| | | Input Ratio $T_R$ | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | One Stage | | | | | | Two Stage | | | | | | | | | | |
| Unit | | 3 | 4 | 5 | 7 | 8 | 10 | 15 | 16 | 20 | 25 | 28 | 32 | 35 | 40 | 50 | 70 | 100 |
| P2 | Nm | — | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | — | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| P/PA3 | Nm | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| P/PA4 | Nm | 0.4 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| P/PA5 | Nm | 0.8 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| P/PA7 | Nm | 0.9 | 0.7 | 0.6 | 0.5 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| P/PA8 | Nm | 1.6 | 1.3 | 1.1 | 0.9 | 0.7 | 0.7 | 0.3 | 0.6 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| P9 | Nm | — | 2 | 2 | 2 | — | 1.25 | — | 1.25 | 1.25 | 1.25 | 1.25 | — | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 |

** Torque is measured with the input at 2000 RPM and an ambient temperature of 20° C.*

## 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.




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

| $M_{1K}$ | P221 P222 P/PA322 | P/PA321 P/PA422 | P/PA421 P/PA522 | P/PA521 P/PA722 | P/PA721 P/PA822 | P/PA821 P922 | P921 |
|---|---|---|---|---|---|---|---|
| Nm | 10 | 20 | 40 | 80 | 200 | 400 | 800 |

## P/PA Series Load/Life/Speed Calculations

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

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

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

$$M_{2A} = \frac{2 \bullet F_{2a} \bullet y_2 + F_{2rb} \bullet (x_2 + z_2)}{1000} \leq M_{2KB}$$

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

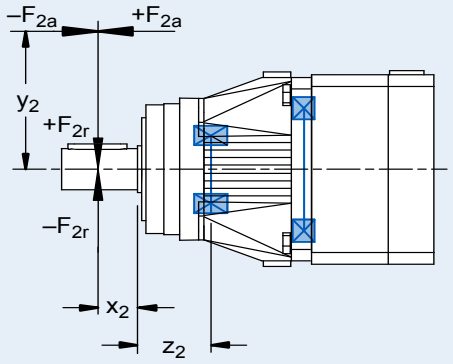
$$F_{2r} = \sqrt[3]{\frac{n_{2b1} \bullet t_{b1} \bullet F_{2rb1}{}^3 + \ldots + n_{2bn} \bullet t_{bn} \bullet F_{2rbn}{}^3}{n_{2b1} \bullet t_{b1} + \ldots + n_{2bn} \bullet t_{bn}}} \leq F_{2R}$$

Where:

| | | | |
|---|---|---|---|
| $F_{2a}$ | Axial Load at Output Shaft | $M_{2K}$ | Rated Tilting Torque |
| $F_{2A}$ | Permissible Axial Load | $M_{2k}$ | Equivalent Tilting Load |
| $F_{2r}$ | Radial Load at Output Shaft | $M_{2KB}$ | Acceleration Tilting Torque |
| $F_{2R}$ | Permissible Radial Load | $z_2$ | Distance Factor |
| $F_{2RB}$ | Acceleration Permissible Radial Load | | |

**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 hours if $M_{2K}/M_{2A}$ < 1.25 and > 1
$L_h$ > 20,000 hours if $M_{2K}/M_{2A}$ > 1.25 and > 1.5
$L_h$ > 30,000 hours if $M_{2K}/M_{2A}$ < 1.5

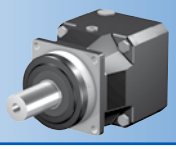
**bearing life for duty cycle ≥ 40%**

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

| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$) | | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P2** | **(continued next page)** | | | | | | | | | |
| 4.000 | 16 | 22 | 44 | ≤6 | P221_0040MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P221_0040MTL | | | 19 | 0.6 | 1.9 |
| 5.000 | 16 | 22 | 44 | ≤6 | P221_0050MT | 4500 | 8000 | 14 | 0.1 | 1.9 |
| | | | | | P221_0050MTL | | | 19 | 0.6 | |
| 7.000 | 16 | 22 | 44 | ≤6 | P221_0070MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P221_0070MTL | | | 19 | 0.6 | |
| 8.000 | 14 | 18 | 36 | ≤6 | P221_0080MT | 4500 | 8000 | 14 | 0.1 | 1.7 |
| | | | | | P221_0080MTL | | | 19 | 0.6 | |
| 10.00 | 12 | 18 | 36 | ≤6 | P221_0100MT | 4500 | 8000 | 14 | 0.1 | 1.6 |
| | | | | | P221_0100MTL | | | 19 | 0.6 | |
| 16.00 | 16 | 22 | 44 | ≤8 | P222_0160MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0160MTL | | | 19 | 0.6 | |
| 20.00 | 16 | 22 | 44 | ≤8 | P222_0200MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0200MTL | | | 19 | 0.6 | |
| 25.00 | 16 | 22 | 44 | ≤8 | P222_0250MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0250MTL | | | 19 | 0.6 | |
| 28.00 | 16 | 22 | 44 | ≤8 | P222_0280MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0280MTL | | | 19 | 0.6 | |
| 32.00 | 14 | 18 | 36 | ≤8 | P222_0320MT | 4500 | 8000 | 14 | 0.1 | 1.7 |
| | | | | | P222_0320MTL | | | 19 | 0.6 | |
| 35.00 | 16 | 22 | 44 | ≤8 | P222_0350MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0350MTL | | | 19 | 0.6 | |
| 40.00 | 16 | 22 | 44 | ≤8 | P222_0400MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0400MTL | | | 19 | 0.6 | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

# Selection Data



| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day<br>Part Number*<br>(Gearhead + Input) | Maximum Input Speed RMP ($n_1$) | | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P2** | **(continued from previous page)** | | | | | | | | | |
| 50.00 | 16 | 22 | 44 | ≤8 | P222_0500MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0500MTL | | | 19 | 0.6 | |
| 56.00 | 14 | 18 | 36 | ≤8 | P222_0560MT | 4500 | 8000 | 14 | 0.1 | 1.7 |
| | | | | | P222_0560MTL | | | 19 | 0.6 | |
| 70.00 | 16 | 22 | 44 | ≤8 | P222_0700MT | 4500 | 8000 | 14 | 0.1 | 1.8 |
| | | | | | P222_0700MTL | | | 19 | 0.6 | |
| 80.00 | 14 | 18 | 36 | ≤8 | P222_0800MT | 4500 | 8000 | 14 | 0.1 | 1.7 |
| | | | | | P222_0800MTL | | | 19 | 0.6 | |
| 100.0 | 12 | 18 | 36 | ≤8 | P222_1000MT | 4500 | 8000 | 14 | 0.1 | 1.6 |
| | | | | | P222_1000MTL | | | 19 | 0.6 | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
** MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
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| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day<br>Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$) | | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P/PA3** | **(continued next page)** | | | | | | | | | |
| 3.000 | 30 | 50 | 64 | ≤4 | P321_0030MT | 3500 | 6000 | 19 | 0.8 | 5.7 |
| | | | 122 | | P321_0030MTL | | | 24 | 1.5 | |
| | | | | | P321_0030MTLC | 4500 | | | 1.1 | 5.4 |
| | | | | ≤2 | PA321_0030MF | 3500 | | 19 | 0.7 | 5.0 |
| | | | | | PA321_0030MFL | | | 24 | 1.7 | 5.5 |
| | | | | | PA321_0030MFLC | 4500 | | | | 5.4 |
| 4.000 | 45 | 65 | 85 | ≤4 | P321_0040MT | 3700 | 6500 | 19 | 0.7 | 5.3 |
| | | | 130 | | P321_0040MTL | | | 24 | 1.4 | |
| | | | | | P321_0040MTLC | 5000 | | | 1.0 | 5.1 |
| | | | | ≤2 | PA321_0040MF | 3700 | | 19 | 0.6 | 4.9 |
| | | | | | PA321_0040MFL | | | 24 | 1.7 | 5.2 |
| | | | | | PA321_0040MFLC | 5000 | | | | 5.1 |
| 5.000 | 45 | 65 | 130 | ≤4 | P321_0050MT | 4000 | 7000 | 14 | 0.6 | 5.1 |
| | | | | | P321_0050MTL | | | 19 | 1.3 | |
| | | | | | P321_0050MTLC | 5000 | | | 0.9 | 5.0 |
| | | | | ≤2 | PA321_0050MF | 4000 | | | 0.6 | 4.9 |
| | | | | | PA321_0050MFL | | | 24 | 1.6 | 5.0 |
| | | | | | PA321_0050MFLC | 5000 | | | | |
| 7.000 | 45 | 60 | 130 | ≤4 | P321_0070MT | 4500 | 8000 | 14 | 0.6 | 4.4 |
| | | | | | P321_0070MTL | | | 19 | 1.3 | |
| | | | | | P321_0070MTLC | 5500 | | | 0.9 | |
| | | | | ≤2 | PA321_0070MF** | 4500 | | | 0.5 | 4.3 |
| | | | | | PA321_0070MFL** | | | 24 | 1.6 | 4.4 |
| | | | | | PA321_0070MFLC | 5500 | | | | |
| 8.000 | 40 | 50 | 100 | ≤4 | P321_0080MT | 4500 | 8000 | 14 | 0.6 | 4.2 |
| | | | | | P321_0080MTL | | | 19 | 1.3 | |
| | | | | | P321_0080MTLC | 5500 | | | 0.9 | |
| | | | | ≤2 | PA321_0080MF | 4500 | | | 0.5 | 4.1 |
| | | | | | PA321_0080MFL | | | 24 | 1.6 | 4.2 |
| | | | | | PA321_0080MFLC | 5500 | | | | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
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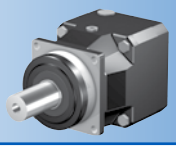
*** Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

# Selection Data



| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA3** (continued next page) | | | | | | | | | | |
| 10.00 | 30 | 50 | 100 | ≤4 | P321_0100MT | 4500 | 8000 | 14 | 0.6 | 4.0 |
| | | | | | P321_0100MTL | | | 19 | 1.2 | |
| | | | | | P321_0100MTLC | 6000 | | | 0.9 | |
| | | | | ≤2 | PA321_0100MF** | 4500 | | | 0.5 | |
| | | | | | PA321_0100MFL** | | | 24 | 1.6 | |
| | | | | | PA321_0100MFLC | 6000 | | | | |
| 12.00 | 30 | 50 | 122 | ≤5 | P322_0120MT | 4000 | 8000 | 14 | 0.1 | 4.2 |
| | | | | | P322_0120MTL | | | 19 | 0.6 | 4.3 |
| | | | | ≤3 | PA322_0120MF | 4500 | | 14 | 0.1 | 4.2 |
| 16.00 | 45 | 65 | 130 | ≤5 | P322_0160MT | 4500 | 8000 | 14 | 0.1 | 4.5 |
| | | | | | P322_0160MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0160MF | | | 14 | 0.1 | |
| 20.00 | 45 | 65 | 130 | ≤5 | P322_0200MT | 4500 | 8000 | 14 | 0.1 | 4.6 |
| | | | | | P322_0200MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0200MF | | | 14 | 0.1 | |
| 25.00 | 45 | 65 | 130 | ≤5 | P322_0250MT | 4500 | 8000 | 14 | 0.1 | 4.6 |
| | | | | | P322_0250MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0250MF | | | 14 | 0.1 | |
| 28.00 | 45 | 65 | 130 | ≤5 | P322_0280MT | 4500 | 8000 | 14 | 0.1 | 4.5 |
| | | | | | P322_0280MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0280MF | | | 14 | 0.1 | |
| 32.00 | 40 | 50 | 100 | ≤5 | P322_0320MT | 4500 | 8000 | 14 | 0.1 | 4.1 |
| | | | | | P322_0320MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0320MF | | | 14 | 0.1 | |
| 35.00 | 45 | 65 | 130 | ≤5 | P322_0350MT | 4500 | 8000 | 14 | 0.1 | 4.6 |
| | | | | | P322_0350MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0350MF | | | 14 | 0.1 | |
| 40.00 | 45 | 65 | 130 | ≤5 | P322_0400MT | 4500 | 8000 | 14 | 0.1 | 4.4 |
| | | | | | P322_0400MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0400MF | | | 14 | 0.1 | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | $kgcm^2$ | Nm |

## P/PA3 (continued from previous page)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 50.00 | 45 | 65 | 130 | ≤5 | P322_0500MT | 4500 | 8000 | 14 | 0.1 | 4.5 |
| | | | | | P322_0500MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0500MF | | | 14 | 0.1 | |
| 56.00 | 40 | 50 | 100 | ≤5 | P322_0560MT | 4500 | 8000 | 14 | 0.1 | 4.1 |
| | | | | | P322_0560MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0560MF | | | 14 | 0.1 | |
| 70.00 | 45 | 60 | 130 | ≤5 | P322_0700MT | 4500 | 8000 | 14 | 0.1 | 4.2 |
| | | | | | P322_0700MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0700MF | | | 14 | 0.1 | |
| 80.00 | 40 | 50 | 100 | ≤5 | P322_0800MT | 4500 | 8000 | 14 | 0.1 | 4.1 |
| | | | | | P322_0800MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_0800MF | | | 14 | 0.1 | |
| 100.0 | 30 | 50 | 100 | ≤5 | P322_1000MT | 4500 | 8000 | 14 | 0.1 | 3.9 |
| | | | | | P322_1000MTL | | | 19 | 0.6 | |
| | | | | ≤3 | PA322_1000MF | | | 14 | 0.1 | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
** MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
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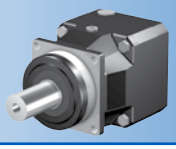
# Selection Data





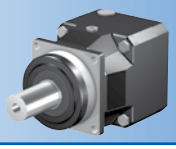
| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day — Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA4** | **(continued next page)** | | | | | | | | | |
| 3.000 | 50 | 100 | 240 | ≤4 | P421_0030MT | 3000 | 5500 | 24 | 1.9 | 12.5 |
| | | | | | P421_0030MTC | 4500 | 6000 | | 2.3 | 11.4 |
| | | | | | P421_0030MTL | 3000 | 5500 | 32 | 4.2 | 12.5 |
| | | | | | P421_0030MTLC | 4500 | 6000 | | 3.2 | 11.8 |
| | | | 212 | ≤2 | PA421_0030MF | 3000 | 5500 | 24 | 2.3 | 11.4 |
| | | | | | PA421_0030MFC | 4500 | 6000 | | | |
| | | | 240 | | PA421_0030MFL | 3000 | 5500 | 32 | 5.4 | 11.8 |
| | | | | | PA421_0030MFLC | 4500 | 6000 | | | |
| 4.000 | 85 | 120 | 240 | ≤4 | P421_0040MT | 3300 | 6000 | 24 | 1.5 | 12.0 |
| | | | | | P421_0040MTC | 5000 | | | 1.9 | 11.4 |
| | | | | | P421_0040MTL | 3300 | | 32 | 3.8 | 12.0 |
| | | | | | P421_0040MTLC | 5000 | | | 2.8 | 11.6 |
| | | | | ≤2 | PA421_0040MF** | 3300 | | 24 | 1.9 | 11.4 |
| | | | | | PA421_0040MFC** | 5000 | | | | |
| | | | | | PA421_0040MFL** | 3300 | | 32 | 5.0 | 11.6 |
| | | | | | PA421_0040MFLC** | 5000 | | | | |
| 5.000 | 85 | 120 | 240 | ≤4 | P421_0050MT | 3700 | 6500 | 24 | 1.4 | 11.7 |
| | | | | | P421_0050MTC | 5000 | | | 1.8 | 11.3 |
| | | | | | P421_0050MTL | 3700 | | 32 | 3.7 | 11.7 |
| | | | | | P421_0050MTLC | 5000 | | | 2.7 | 11.5 |
| | | | | ≤2 | PA421_0050MF** | 3700 | | 24 | 1.8 | 11.3 |
| | | | | | PA421_0050MFC** | 5000 | | | | |
| | | | | | PA421_0050MFL** | 3700 | | 32 | 4.9 | 11.5 |
| | | | | | PA421_0050MFLC** | 5000 | | | | |
| 7.000 | 85 | 110 | 240 | ≤4 | P421_0070MT | 4000 | 7000 | 24 | 1.3 | 10.1 |
| | | | | | P421_0070MTC | 5500 | | | 1.6 | 10.0 |
| | | | | | P421_0070MTL | 4000 | | 32 | 3.6 | 10.1 |
| | | | | | P421_0070MTLC | 5500 | | | 2.6 | 10.0 |
| | | | | ≤2 | PA421_0070MF** | 4000 | | 24 | 1.6 | 9.9 |
| | | | | | PA421_0070MFC** | 5500 | | | | |
| | | | | | PA421_0070MFL** | 4000 | | 32 | 4.8 | 10.0 |
| | | | | | PA421_0070MFLC** | 5500 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | $kgcm^2$ | Nm |
| **P/PA4** | **(continued next page)** | | | | | | | | | |
| 8.000 | 80 | 100 | 200 | ≤4 | P421_0080MT | 4000 | 7000 | 24 | 1.3 | 9.5 |
| | | | | | P421_0080MTC | 5500 | | | 1.6 | 9.4 |
| | | | | | P421_0080MTL | 4000 | | 32 | 3.6 | 9.5 |
| | | | | | P421_0080MTLC | 5500 | | | 2.5 | 9.4 |
| | | | | ≤2 | PA421_0080MF | 4000 | | 24 | 1.6 | 9.4 |
| | | | | | PA421_0080MFC | 5500 | | | | |
| | | | | | PA421_0080MFL | 4000 | | 32 | 4.8 | |
| | | | | | PA421_0080MFLC | 5500 | | | | |
| 10.00 | 60 | 100 | 200 | ≤4 | P421_0100MT | 4000 | 7000 | 24 | 1.3 | 9.0 |
| | | | | | P421_0100MTC | 6000 | | | 1.6 | 8.9 |
| | | | | | P421_0100MTL | 4000 | | 32 | 3.5 | 9.0 |
| | | | | | P421_0100MTLC | 6000 | | | 2.5 | |
| | | | | ≤2 | PA421_0100MF** | 4000 | | 24 | 1.6 | 8.9 |
| | | | | | PA421_0100MFC** | 6000 | | | | |
| | | | | | PA421_0100MFL** | 4000 | | 32 | 4.7 | 9.0 |
| | | | | | PA421_0100MFLC** | 6000 | | | | |
| 12.00 | 50 | 100 | 240 | ≤5 | P422_0120MT | 3500 | 6500 | 19 | 0.7 | 9.9 |
| | | | | | P422_0120MTL | | | 24 | 1.4 | |
| | | | | | P422_0120MTLC | 4500 | | | 1.0 | 9.8 |
| | | | | ≤3 | PA422_0120MF | 3700 | | 19 | 0.7 | |
| | | | | | PA422_0120MFL | | | 24 | 1.7 | 9.9 |
| | | | | | PA422_0120MFLC | 4500 | | | | 9.8 |
| 16.00 | 85 | 120 | 240 | ≤5 | P422_0160MT | 3700 | 6500 | 19 | 0.7 | 10.5 |
| | | | | | P422_0160MTL | | | 24 | 1.4 | |
| | | | | | P422_0160MTLC | 5000 | | | 1.0 | |
| | | | | ≤3 | PA422_0160MF | 3700 | | 19 | 0.6 | 10.4 |
| | | | | | PA422_0160MFL | | | 24 | 1.7 | 10.5 |
| | | | | | PA422_0160MFLC | 5000 | | | | |
| 20.00 | 85 | 120 | 240 | ≤5 | P422_0200MT | 3700 | 6500 | 19 | 0.7 | 10.8 |
| | | | | | P422_0200MTL | | | 24 | 1.4 | |
| | | | | | P422_0200MTLC | 5000 | | | 1.0 | 10.7 |
| | | | | ≤3 | PA422_0200MF | 3700 | | 19 | 0.6 | |
| | | | | | PA422_0200MFL | | | 24 | 1.7 | |
| | | | | | PA422_0200MFLC | 5000 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

# Selection Data



| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day — Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA4** (continued next page) | | | | | | | | | | |
| 25.00 | 85 | 120 | 240 | ≤5 | P422_0250MT | 4000 | 7000 | 19 | 0.6 | 10.7 |
| | | | | | P422_0250MTL | | | 24 | 1.3 | |
| | | | | | P422_0250MTLC | 5000 | | | 0.9 | |
| | | | | ≤3 | PA422_0250MF | 4000 | | 19 | 0.6 | |
| | | | | | PA422_0250MFL | | | 24 | 1.6 | |
| | | | | | PA422_0250MFLC | 5000 | | | | |
| 28.00 | 85 | 120 | 240 | ≤5 | P422_0280MT | 4500 | 8000 | 19 | 0.6 | 10.3 |
| | | | | | P422_0280MTL | | | 24 | 1.3 | |
| | | | | | P422_0280MTLC | 5500 | | | 0.9 | 10.2 |
| | | | | ≤3 | PA422_0280MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_0280MFL | | | 24 | 1.6 | |
| | | | | | PA422_0280MFLC | 5500 | | | | |
| 32.00 | 80 | 100 | 200 | ≤5 | P422_0320MT | 3700 | 6500 | 19 | 0.7 | 9.2 |
| | | | | | P422_0320MTL | | | 24 | 1.4 | |
| | | | | | P422_0320MTLC | 5000 | | | 1.0 | |
| | | | | ≤3 | PA422_0320MF | 3700 | | 19 | 0.6 | |
| | | | | | PA422_0320MFL | | | 24 | 1.7 | |
| | | | | | PA422_0320MFLC | 5000 | | | | |
| 35.00 | 85 | 120 | 240 | ≤5 | P422_0350MT | 4500 | 8000 | 19 | 0.6 | 10.6 |
| | | | | | P422_0350MTL | | | 24 | 1.3 | |
| | | | | | P422_0350MTLC | 5500 | | | 0.9 | |
| | | | | ≤3 | PA422_0350MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_0350MFL | | | 24 | 1.6 | |
| | | | | | PA422_0350MFLC | 5500 | | | | |
| 40.00 | 85 | 120 | 240 | ≤5 | P422_0400MT | 4500 | 8000 | 19 | 0.6 | 10.1 |
| | | | | | P422_0400MTL | | | 24 | 1.2 | |
| | | | | | P422_0400MTLC | 5500 | | | 0.9 | |
| | | | | ≤3 | PA422_0400MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_0400MFL | | | 24 | 1.6 | |
| | | | | | PA422_0400MFLC | 5500 | | | | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
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|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | $kgcm^2$ | Nm |

## P/PA4 (continued from previous page)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 50.00 | 85 | 120 | 240 | ≤5 | P422_0500MT | 4500 | 8000 | 19 | 0.6 | 10.5 |
| | | | | | P422_0500MTL | | | 24 | 1.2 | |
| | | | | | P422_0500MTLC | 5500 | | | 0.9 | |
| | | | | ≤3 | PA422_0500MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_0500MFL | | | 24 | 1.6 | |
| | | | | | PA422_0500MFLC | 5500 | | | | |
| 56.00 | 80 | 100 | 200 | ≤5 | P422_0560MT | 4500 | 8000 | 19 | 0.6 | 9.2 |
| | | | | | P422_0560MTL | | | 24 | 1.3 | |
| | | | | | P422_0560MTLC | 5500 | | | 0.9 | |
| | | | | ≤3 | PA422_0560MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_0560MFL | | | 24 | 1.6 | |
| | | | | | PA422_0560MFLC | 5500 | | | | |
| 70.00 | 85 | 110 | 240 | ≤5 | P422_0700MT | 4500 | 8000 | 19 | 0.6 | 9.6 |
| | | | | | P422_0700MTL | | | 24 | 1.2 | |
| | | | | | P422_0700MTLC | 5500 | | | 0.9 | |
| | | | | ≤3 | PA422_0700MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_0700MFL | | | 24 | 1.6 | |
| | | | | | PA422_0700MFLC | 5500 | | | | |
| 80.00 | 80 | 100 | 200 | ≤5 | P422_0800MT | 4500 | 8000 | 19 | 0.6 | 9.2 |
| | | | | | P422_0800MTL | | | 24 | 1.2 | |
| | | | | | P422_0800MTLC | 5500 | | | 0.9 | |
| | | | | ≤3 | PA422_0800MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_0800MFL | | | 24 | 1.6 | |
| | | | | | PA422_0800MFLC | 5500 | | | | |
| 100.0 | 60 | 100 | 200 | ≤5 | P422_1000MT | 4500 | 8000 | 19 | 0.6 | 8.8 |
| | | | | | P422_1000MTL | | | 24 | 1.2 | |
| | | | | | P422_1000MTLC | 5500 | | | 0.9 | |
| | | | | ≤3 | PA422_1000MF | 4500 | | 19 | 0.5 | |
| | | | | | PA422_1000MFL | | | 24 | 1.6 | |
| | | | | | PA422_1000MFLC | 5500 | | | | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
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** MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
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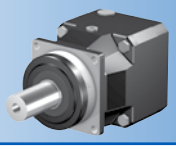
# Selection Data





| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA5** | **(continued next page)** | | | | | | | | | |
| 3.000 | 120 | 200 | 259 | ≤3 | P521_0030MT | 2500 | 4500 | 32 | 6.3 | 36.3 |
| | | | 457 | | P521_0030MTC | 4000 | 6000 | | 7.6 | 30.7 |
| | | | | | P521_0030MTL | 2500 | 4500 | 38 | 9.3 | 36.3 |
| | | | | | P521_0030MTLC | 4000 | 6000 | | 7.5 | 33.0 |
| | | | | ≤1 | PA521_0030MF | 2500 | 4500 | 32 | 7.6 | 30.7 |
| | | | | | PA521_0030MFC | 4000 | 6000 | | | |
| | | | | | PA521_0030MFL | 2500 | 4500 | 38 | 14.4 | 33.0 |
| | | | | | PA521_0030MFLC | 4000 | 6000 | | | |
| 4.000 | 210 | 300 | 600 | ≤3 | P521_0040MT | 3000 | 5000 | 32 | 4.5 | 32.1 |
| | | | | | P521_0040MTC | 4500 | 6000 | | 5.8 | 29.4 |
| | | | | | P521_0040MTL | 3000 | 5000 | 38 | 7.6 | 32.1 |
| | | | | | P521_0040MTLC | 4500 | 6000 | | 5.8 | 30.6 |
| | | | | ≤1 | PA521_0040MF** | 3000 | 5000 | 32 | | 29.4 |
| | | | | | PA521_0040MFC** | 4500 | 6000 | | | |
| | | | | | PA521_0040MFL** | 3000 | 5000 | 38 | 12.7 | 30.6 |
| | | | | | PA521_0040MFLC** | 4500 | 6000 | | | |
| 5.000 | 210 | 300 | 432 | ≤3 | P521_0050MT | 3500 | 6000 | 32 | 4.1 | 31.1 |
| | | | 600 | | P521_0050MTC | 5000 | | | 5.4 | 29.4 |
| | | | | | P521_0050MTL | 3500 | | 38 | 7.2 | 31.1 |
| | | | | | P521_0050MTLC | 5000 | | | 5.4 | 30.2 |
| | | | | ≤1 | PA521_0050MF** | 3500 | | 32 | | 29.4 |
| | | | | | PA521_0050MFC** | 5000 | | | | |
| | | | | | PA521_0050MFL** | 3500 | | 38 | 12.3 | 30.2 |
| | | | | | PA521_0050MFLC** | 5000 | | | | |
| 7.000 | 210 | 270 | 600 | ≤3 | P521_0070MT | 3700 | 6500 | 32 | 3.7 | 28.0 |
| | | | | | P521_0070MTC | 5000 | | | 5.0 | 27.1 |
| | | | | | P521_0070MTL | 3700 | | 38 | 6.8 | 28.0 |
| | | | | | P521_0070MTLC | 5000 | | | 6.7 | 27.5 |
| | | | | ≤1 | PA521_0070MF** | 3700 | | 32 | 5.0 | 27.1 |
| | | | | | PA521_0070MFC** | 5000 | | | | |
| | | | | | PA521_0070MFL** | 3700 | | 38 | 11.9 | 27.5 |
| | | | | | PA521_0070MFLC** | 5000 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
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* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
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| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$) | | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P/PA5** | **(continued next page)** | | | | | | | | | |
| 8.000 | 200 | 250 | 500 | ≤3 | P521_0080MT | 3700 | 6500 | 32 | 3.7 | 26.0 |
| | | | | | P521_0080MTC | 5500 | | | 4.9 | 25.4 |
| | | | | | P521_0080MTL | 3700 | | 38 | 6.7 | 26.0 |
| | | | | | P521_0080MTLC | 5500 | | | 6.6 | 25.7 |
| | | | | ≤1 | PA521_0080MF | 3700 | | 32 | 4.9 | 25.4 |
| | | | | | PA521_0080MFC | 5500 | | | | |
| | | | | | PA521_0080MFL | 3700 | | 38 | 11.8 | 25.7 |
| | | | | | PA521_0080MFLC | 5500 | | | | |
| 10.00 | 140 | 250 | 500 | ≤3 | P521_0100MT | 3700 | 6500 | 32 | 3.6 | 25.0 |
| | | | | | P521_0100MTC | 6000 | | | 4.8 | 24.7 |
| | | | | | P521_0100MTL | 3700 | | 38 | 6.7 | 25.0 |
| | | | | | P521_0100MTLC | 6000 | | | 6.6 | 24.8 |
| | | | | ≤1 | PA521_0100MF** | 3700 | | 32 | 4.8 | 24.7 |
| | | | | | PA521_0100MFC** | 6000 | | | | |
| | | | | | PA521_0100MFL** | 3700 | | 38 | 11.8 | 24.8 |
| | | | | | PA521_0100MFLC** | 6000 | | | | |
| 12.00 | 120 | 200 | 457 | ≤4 | P522_0120MT | 3000 | 6000 | 24 | 1.6 | 27.2 |
| | | | | | P522_0120MTC | 4500 | | | 1.9 | 26.8 |
| | | | | | P522_0120MTL | 3000 | | 32 | 3.8 | 27.2 |
| | | | | | P522_0120MTLC | 4500 | | | 2.8 | 26.9 |
| | | | | ≤2 | PA522_0120MF | 3300 | | 24 | 1.9 | 26.8 |
| | | | | | PA522_0120MFC | 4500 | | | | |
| | | | | | PA522_0120MFL | 3300 | | 32 | 5.1 | 26.9 |
| | | | | | PA522_0120MFLC | 4500 | | | | |
| 16.00 | 210 | 300 | 600 | ≤4 | P522_0160MT | 3300 | 6000 | 24 | 1.6 | 27.5 |
| | | | | | P522_0160MTC | 5000 | | | 1.9 | 27.3 |
| | | | | | P522_0160MTL | 3300 | | 32 | 3.8 | 27.5 |
| | | | | | P522_0160MTLC | 5000 | | | 2.8 | 27.4 |
| | | | | ≤2 | PA522_0160MF | 3300 | | 24 | 1.9 | 27.3 |
| | | | | | PA522_0160MFC | 5000 | | | | |
| | | | | | PA522_0160MFL | 3300 | | 32 | 5.0 | 27.4 |
| | | | | | PA522_0160MFLC | 5000 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
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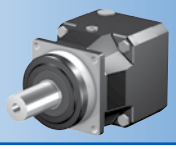
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

# Selection Data



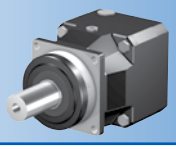
| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day — Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA5** | **(continued next page)** | | | | | | | | | |
| 20.00 | 210 | 300 | 600 | ≤4 | P522_0200MT | 3300 | 6000 | 24 | 1.6 | 28.2 |
| | | | | | P522_0200MTC | 5000 | | | 1.9 | 28.0 |
| | | | | | P522_0200MTL | 3300 | | 32 | 3.8 | 28.2 |
| | | | | | P522_0200MTLC | 5000 | | | 2.8 | 28.1 |
| | | | | ≤2 | PA522_0200MF | 3300 | | 24 | 1.9 | 28.0 |
| | | | | | PA522_0200MFC | 5000 | | | | |
| | | | | | PA522_0200MFL | 3300 | | 32 | 5.0 | 28.1 |
| | | | | | PA522_0200MFLC | 5000 | | | | |
| 25.00 | 210 | 300 | 600 | ≤4 | P522_0250MT | 3700 | 6500 | 24 | 1.5 | 28.1 |
| | | | | | P522_0250MTC | 5000 | | | 1.8 | 28.0 |
| | | | | | P522_0250MTL | 3700 | | 32 | 3.7 | 28.1 |
| | | | | | P522_0250MTLC | 5000 | | | 2.7 | |
| | | | | ≤2 | PA522_0250MF | 3700 | | 24 | 1.8 | 28.0 |
| | | | | | PA522_0250MFC | 5000 | | | | |
| | | | | | PA522_0250MFL | 3700 | | 32 | 4.9 | 28.1 |
| | | | | | PA522_0250MFLC | 5000 | | | | |
| 28.00 | 210 | 300 | 600 | ≤4 | P522_0280MT | 4000 | 7000 | 24 | 1.3 | 26.8 |
| | | | | | P522_0280MTC | 5500 | | | 1.7 | 26.7 |
| | | | | | P522_0280MTL | 4000 | | 32 | 3.6 | 26.8 |
| | | | | | P522_0280MTLC | 5500 | | | 2.6 | 26.7 |
| | | | | ≤2 | PA522_0280MF | 4000 | | 24 | 1.6 | |
| | | | | | PA522_0280MFC | 5500 | | | | |
| | | | | | PA522_0280MFL | 4000 | | 32 | 4.8 | |
| | | | | | PA522_0280MFLC | 5500 | | | | |
| 32.00 | 200 | 250 | 500 | ≤4 | P522_0320MT | 3300 | 6000 | 24 | 1.5 | 25.1 |
| | | | | | P522_0320MTC | 5000 | | | 1.9 | |
| | | | | | P522_0320MTL | 3300 | | 32 | 3.8 | |
| | | | | | P522_0320MTLC | 5000 | | | 2.8 | |
| | | | | ≤2 | PA522_0320MF | 3300 | | 24 | 1.9 | |
| | | | | | PA522_0320MFC | 5000 | | | | |
| | | | | | PA522_0320MFL | 3300 | | 32 | 5.0 | |
| | | | | | PA522_0320MFLC | 5000 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$) | | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P/PA5** | **(continued next page)** | | | | | | | | | |
| 35.00 | 210 | 300 | 600 | ≤4 | P522_0350MT | 4000 | 7000 | 24 | 1.3 | 27.7 |
| | | | | | P522_0350MTC | 5500 | | | 1.7 | 27.6 |
| | | | | | P522_0350MTL | 4000 | | 32 | 3.6 | 27.7 |
| | | | | | P522_0350MTLC | 5500 | | | 2.6 | |
| | | | | ≤2 | PA522_0350MF | 4000 | | 24 | 1.6 | 27.6 |
| | | | | | PA522_0350MFC | 5500 | | | | |
| | | | | | PA522_0350MFL | 4000 | | 32 | 4.8 | 27.7 |
| | | | | | PA522_0350MFLC | 5500 | | | | |
| 40.00 | 210 | 300 | 600 | ≤4 | P522_0400MT | 4000 | 7000 | 24 | 1.3 | 26.2 |
| | | | | | P522_0400MTC | 5500 | | | 1.6 | |
| | | | | | P522_0400MTL | 4000 | | 32 | 3.5 | |
| | | | | | P522_0400MTLC | 5500 | | | 2.5 | |
| | | | | ≤2 | PA522_0400MF | 4000 | | 24 | 1.6 | |
| | | | | | PA522_0400MFC | 5500 | | | | |
| | | | | | PA522_0400MFL | 4000 | | 32 | 4.8 | |
| | | | | | PA522_0400MFLC | 5500 | | | | |
| 50.00 | 210 | 300 | 600 | ≤4 | P522_0500MT | 4000 | 7000 | 24 | 1.3 | 27.3 |
| | | | | | P522_0500MTC | 5500 | | | 1.6 | |
| | | | | | P522_0500MTL | 4000 | | 32 | 3.5 | |
| | | | | | P522_0500MTLC | 5500 | | | 2.5 | |
| | | | | ≤2 | PA522_0500MF | 4000 | | 24 | 1.6 | |
| | | | | | PA522_0500MFC | 5500 | | | | |
| | | | | | PA522_0500MFL | 4000 | | 32 | 4.8 | |
| | | | | | PA522_0500MFLC | 5500 | | | | |
| 56.00 | 200 | 250 | 500 | ≤4 | P522_0560MT | 4000 | 7000 | 24 | 1.3 | 25.1 |
| | | | | | P522_0560MTC | 5500 | | | 1.7 | |
| | | | | | P522_0560MTL | 4000 | | 32 | 3.6 | |
| | | | | | P522_0560MTLC | 5500 | | | 2.6 | |
| | | | | ≤2 | PA522_0560MF | 4000 | | 24 | 1.6 | |
| | | | | | PA522_0560MFC | 5500 | | | | |
| | | | | | PA522_0560MFL | 4000 | | 32 | 4.8 | |
| | | | | | PA522_0560MFLC | 5500 | | | | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
** MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
*** Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

# Selection Data



| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day — Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |

## P/PA5 (continued from previous page)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 70.00 | 210 | 270 | 600 | ≤4 | P522_0700MT | 4000 | 7000 | 24 | 1.3 | 26.3 |
| | | | | | P522_0700MTC | 5500 | | | 1.6 | |
| | | | | | P522_0700MTL | 4000 | | 32 | 3.5 | |
| | | | | | P522_0700MTLC | 5500 | | | 2.5 | |
| | | | | ≤2 | PA522_0700MF | 4000 | | 24 | 1.6 | |
| | | | | | PA522_0700MFC | 5500 | | | | |
| | | | | | PA522_0700MFL | 4000 | | 32 | 4.7 | |
| | | | | | PA522_0700MFLC | 5500 | | | | |
| 80.00 | 200 | 250 | 500 | ≤4 | P522_0800MT | 4000 | 7000 | 24 | 1.3 | 25.1 |
| | | | | | P522_0800MTC | 5500 | | | 1.6 | |
| | | | | | P522_0800MTL | 4000 | | 32 | 3.5 | |
| | | | | | P522_0800MTLC | 5500 | | | 2.5 | |
| | | | | ≤2 | PA522_0800MF | 4000 | | 24 | 1.6 | |
| | | | | | PA522_0800MFC | 5500 | | | | |
| | | | | | PA522_0800MFL | 4000 | | 32 | 4.7 | |
| | | | | | PA522_0800MFLC | 5500 | | | | |
| 100.0 | 140 | 250 | 500 | ≤4 | P522_1000MT | 4000 | 7000 | 24 | 1.3 | 24.3 |
| | | | | | P522_1000MTC | 5500 | | | 1.6 | |
| | | | | | P522_1000MTL | 4000 | | 32 | 3.5 | |
| | | | | | P522_1000MTLC | 5500 | | | 2.5 | |
| | | | | ≤2 | PA522_1000MF | 4000 | | 24 | 1.6 | |
| | | | | | PA522_1000MFC | 5500 | | | | |
| | | | | | PA522_1000MFL | 4000 | | 32 | 4.7 | |
| | | | | | PA522_1000MFLC | 5500 | | | | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
** MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
*** Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | $kgcm^2$ | Nm |
| **P/PA7** | **(continued next page)** | | | | | | | | | |
| 3.000 | 280 | 431 | 538 | ≤3 | P721_0030MT | 2200 | 3700 | 38 | 14.8 | 64.5 |
| | | 500 | 1036 | | P721_0030MTC | 3400 | 6000 | | 23.2 | 54.7 |
| | | | | | P721_0030MTL | 2200 | 3700 | 48 | 32.7 | 64.5 |
| | | | | | P721_0030MTLC | 3400 | 6000 | | 25.4 | 58.8 |
| | | | 1001 | ≤1 | PA721_0030MF** | 2200 | 3700 | 38 | 20.2 | 54.7 |
| | | | | | PA721_0030MFC** | 3400 | 6000 | | | |
| | | | 1036 | | PA721_0030MFL** | 2200 | 3700 | 48 | 39.1 | 58.8 |
| | | | | | PA721_0030MFLC** | 3400 | 6000 | | | |
| 4.000 | 440 | 700 | 1381 | ≤3 | P721_0040MT | 2500 | 4500 | 38 | 10.1 | 60.0 |
| | | | | | P721_0040MTC | 3600 | 6000 | | 18.5 | 54.9 |
| | | | | | P721_0040MTL | 2500 | 4500 | 48 | 27.9 | 60.0 |
| | | | | | P721_0040MTLC | 3600 | 6000 | | 20.7 | 57.1 |
| | | | 1335 | ≤1 | PA721_0040MF** | 2500 | 4500 | 38 | 15.5 | 54.9 |
| | | | | | PA721_0040MFC** | 3600 | 6000 | | | |
| | | | 1381 | | PA721_0040MFL** | 2500 | 4500 | 48 | 34.4 | 57.1 |
| | | | | | PA721_0040MFLC** | 3600 | 6000 | | | |
| 5.000 | 440 | 700 | 1400 | ≤3 | P721_0050MT | 3000 | 5500 | 38 | 8.6 | 57.5 |
| | | | | | P721_0050MTC | 4200 | 6000 | | 17.0 | 54.4 |
| | | | | | P721_0050MTL | 3000 | 5500 | 48 | 26.4 | 57.5 |
| | | | | | P721_0050MTLC | 4200 | 6000 | | 19.1 | 55.8 |
| | | | | ≤1 | PA721_0050MF | 3000 | 5500 | 38 | 14.0 | 54.4 |
| | | | | | PA721_0050MFC | 4200 | 6000 | | | |
| | | | | | PA721_0050MFL | 3000 | 5500 | 48 | 32.8 | 55.8 |
| | | | | | PA721_0050MFLC | 4200 | 6000 | | | |
| 7.000 | 440 | 650 | 1254 | ≤3 | P721_0070MT | 3300 | 6000 | 38 | 7.6 | 55.0 |
| | | | | | P721_0070MTC | 4700 | | | 15.7 | 53.1 |
| | | | | | P721_0070MTL | 3300 | | 48 | 25.9 | 55.0 |
| | | | | | P721_0070MTLC | 4700 | | | 16.0 | 54.0 |
| | | | | ≤1 | PA721_0070MF** | 3300 | | 38 | 12.7 | 53.1 |
| | | | | | PA721_0070MFC** | 4700 | | | | |
| | | | | | PA721_0070MFL** | 3300 | | 48 | 31.8 | 54.0 |
| | | | | | PA721_0070MFLC** | 4700 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
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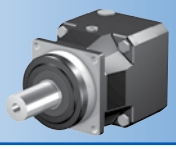
# Selection Data



| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day<br>Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA7** | **(continued next page)** | | | | | | | | | |
| 8.000 | 400 | 500 | 1000 | ≤3 | P721_0080MT | 3300 | 6000 | 38 | 7.3 | 53.0 |
| | | | | | P721_0080MTC | 5000 | | | 15.4 | 51.7 |
| | | | | | P721_0080MTL | 3300 | | 48 | 25.6 | 53.0 |
| | | | | | P721_0080MTLC | 5000 | | | 15.8 | 52.3 |
| | | | | ≤1 | PA721_0080MF | 3300 | | 38 | 12.4 | 51.7 |
| | | | | | PA721_0080MFC | 5000 | | | | |
| | | | | | PA721_0080MFL | 3300 | | 48 | 31.6 | 52.3 |
| | | | | | PA721_0080MFLC | 5000 | | | | |
| 10.00 | 300 | 500 | 1000 | ≤3 | P721_0100MT | 3300 | 6000 | 38 | 7.0 | 49.5 |
| | | | | | P721_0100MTC | 5500 | | | 15.2 | 48.7 |
| | | | | | P721_0100MTL | 3300 | | 48 | 25.3 | 49.5 |
| | | | | | P721_0100MTLC | 5500 | | | 15.5 | 49.1 |
| | | | | ≤1 | PA721_0100MF** | 3300 | | 38 | 12.2 | 48.7 |
| | | | | | PA721_0100MFC** | 5500 | | | | |
| | | | | | PA721_0100MFL** | 3300 | | 48 | 31.3 | 49.1 |
| | | | | | PA721_0100MFLC** | 5500 | | | | |
| 12.00 | 280 | 500 | 1005 | ≤4 | P722_0120MT | 2500 | 5000 | 32 | 4.9 | 52.7 |
| | | | 1036 | | P722_0120MTC | 4000 | 6000 | | 6.2 | 51.9 |
| | | | | | P722_0120MTL | 2500 | 5000 | 38 | 8.0 | 52.7 |
| | | | | | P722_0120MTLC | 4000 | 6000 | | 6.2 | 52.3 |
| | | | | ≤2 | PA722_0120MF | 3000 | 5000 | 32 | | 51.9 |
| | | | | | PA722_0120MFC | 4000 | 6000 | | | |
| | | | | | PA722_0120MFL | 3000 | 5000 | 38 | 13.1 | 52.3 |
| | | | | | PA722_0120MFLC | 4000 | 6000 | | | |
| 16.00 | 440 | 700 | 1340 | ≤4 | P722_0160MT | 3000 | 5000 | 32 | 4.6 | 53.7 |
| | | | 1381 | | P722_0160MTC | 4500 | 6000 | | 5.9 | 53.2 |
| | | | | | P722_0160MTL | 3000 | 5000 | 38 | 7.7 | 53.7 |
| | | | | | P722_0160MTLC | 4500 | 6000 | | 5.9 | 53.4 |
| | | | | ≤2 | PA722_0160MF | 3000 | 5000 | 32 | | 53.2 |
| | | | | | PA722_0160MFC | 4500 | 6000 | | | |
| | | | | | PA722_0160MFL | 3000 | 5000 | 38 | 12.8 | 53.4 |
| | | | | | PA722_0160MFLC | 4500 | 6000 | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
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| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | $kgcm^2$ | Nm |
| **P/PA7** | **(continued next page)** | | | | | | | | | |
| 20.00 | 440 | 700 | 1400 | ≤4 | P722_0200MT | 3000 | 5000 | 32 | 4.5 | 53.7 |
| | | | | | P722_0200MTC | 4500 | 6000 | | 5.8 | 53.3 |
| | | | | | P722_0200MTL | 3000 | 5000 | 38 | 7.6 | 53.7 |
| | | | | | P722_0200MTLC | 4500 | 6000 | | 5.8 | 53.5 |
| | | | | ≤2 | PA722_0200MF | 3000 | 5000 | 32 | | 53.3 |
| | | | | | PA722_0200MFC | 4500 | 6000 | | | |
| | | | | | PA722_0200MFL | 3000 | 5000 | 38 | 12.7 | 53.5 |
| | | | | | PA722_0200MFLC | 4500 | 6000 | | | |
| 25.00 | 440 | 700 | 1400 | ≤4 | P722_0250MT | 3500 | 6000 | 32 | 4.1 | 53.5 |
| | | | | | P722_0250MTC | 5000 | | | 5.4 | 53.3 |
| | | | | | P722_0250MTL | 3500 | | 38 | 7.2 | 53.5 |
| | | | | | P722_0250MTLC | 5000 | | | 5.4 | 53.4 |
| | | | | ≤2 | PA722_0250MF | 3500 | | 32 | | 53.3 |
| | | | | | PA722_0250MFC | 5000 | | | | |
| | | | | | PA722_0250MFL | 3500 | | 38 | 12.3 | 53.4 |
| | | | | | PA722_0250MFLC | 5000 | | | | |
| 28.00 | 440 | 700 | 1381 | ≤4 | P722_0280MT | 3700 | 6500 | 32 | 3.8 | 52.9 |
| | | | | | P722_0280MTC | 5000 | | | 5.1 | 52.7 |
| | | | | | P722_0280MTL | 3700 | | 38 | 6.9 | 52.9 |
| | | | | | P722_0280MTLC | 5000 | | | 6.8 | 52.8 |
| | | | | ≤2 | PA722_0280MF | 3700 | | 32 | 5.1 | 52.7 |
| | | | | | PA722_0280MFC | 5000 | | | | |
| | | | | | PA722_0280MFL | 3700 | | 38 | 12.0 | 52.8 |
| | | | | | PA722_0280MFLC | 5000 | | | | |
| 32.00 | 400 | 500 | 1000 | ≤4 | P722_0320MT | 3000 | 5000 | 32 | 4.5 | 51.7 |
| | | | | | P722_0320MTC | 4500 | | | 5.7 | 51.5 |
| | | | | | P722_0320MTL | 3000 | | 38 | 7.5 | 51.7 |
| | | | | | P722_0320MTLC | 4500 | | | 5.7 | 51.6 |
| | | | | ≤2 | PA722_0320MF | 3000 | | 32 | | 51.5 |
| | | | | | PA722_0320MFC | 4500 | | | | |
| | | | | | PA722_0320MFL | 3000 | | 38 | 12.6 | 51.6 |
| | | | | | PA722_0320MFLC | 4500 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
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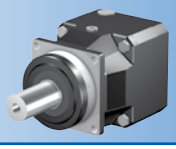
# Selection Data





| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA7** | **(continued next page)** | | | | | | | | | |
| 35.00 | 440 | 700 | 1400 | ≤4 | P722_0350MT | 3700 | 6500 | 32 | 3.8 | 53.1 |
| | | | | | P722_0350MTC | 5000 | | | 5.0 | 53.0 |
| | | | | | P722_0350MTL | 3700 | | 38 | 6.9 | 53.1 |
| | | | | | P722_0350MTLC | 5000 | | | 6.7 | |
| | | | | ≤2 | PA722_0350MF | 3700 | | 32 | 5.0 | 53.0 |
| | | | | | PA722_0350MFC | 5000 | | | | |
| | | | | | PA722_0350MFL | 3700 | | 38 | 12.0 | 53.1 |
| | | | | | PA722_0350MFLC | 5000 | | | | |
| 40.00 | 440 | 700 | 1381 | ≤4 | P722_0400MT | 3700 | 6500 | 32 | 3.7 | 52.2 |
| | | | | | P722_0400MTC | 5500 | | | 4.9 | 52.1 |
| | | | | | P722_0400MTL | 3700 | | 38 | 6.7 | 52.2 |
| | | | | | P722_0400MTLC | 5500 | | | 6.6 | 52.1 |
| | | | | ≤2 | PA722_0400MF | 3700 | | 32 | 4.9 | |
| | | | | | PA722_0400MFC | 5500 | | | | |
| | | | | | PA722_0400MFL | 3700 | | 38 | 11.8 | |
| | | | | | PA722_0400MFLC | 5500 | | | | |
| 50.00 | 440 | 700 | 1400 | ≤4 | P722_0500MT | 3700 | 6500 | 32 | 3.6 | 52.7 |
| | | | | | P722_0500MTC | 5500 | | | 4.9 | 52.6 |
| | | | | | P722_0500MTL | 3700 | | 38 | 6.7 | 52.7 |
| | | | | | P722_0500MTLC | 5500 | | | 6.6 | 52.6 |
| | | | | ≤2 | PA722_0500MF** | 3700 | | 32 | 4.9 | |
| | | | | | PA722_0500MFC** | 5500 | | | | |
| | | | | | PA722_0500MFL** | 3700 | | 38 | 11.8 | |
| | | | | | PA722_0500MFLC** | 5500 | | | | |
| 56.00 | 400 | 500 | 1000 | ≤4 | P722_0560MT | 3700 | 6500 | 32 | 3.8 | 51.7 |
| | | | | | P722_0560MTC | | | | 5.0 | 51.6 |
| | | | | | P722_0560MTL | | | 38 | 6.8 | 51.7 |
| | | | | | P722_0560MTLC | | | | 6.7 | 51.6 |
| | | | | ≤2 | PA722_0560MF | | | 32 | 5.0 | |
| | | | | | PA722_0560MFC | 5000 | | | | |
| | | | | | PA722_0560MFL | 3700 | | 38 | 11.9 | |
| | | | | | PA722_0560MFLC | 5000 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$) | | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P/PA7** | **(continued from previous page)** | | | | | | | | | |
| 70.00 | 440 | 650 | 1254 | ≤4 | P722_0700MT | 3700 | 6500 | 32 | 3.6 | 52.6 |
| | | | | | P722_0700MTC | 5500 | | | 4.9 | |
| | | | | | P722_0700MTL | 3700 | | 38 | 6.7 | |
| | | | | | P722_0700MTLC | 5500 | | | 6.6 | |
| | | | | ≤2 | PA722_0700MF | 3700 | | 32 | 4.9 | |
| | | | | | PA722_0700MFC | 5500 | | | | |
| | | | | | PA722_0700MFL | 3700 | | 38 | 11.8 | |
| | | | | | PA722_0700MFLC | 5500 | | | | |
| 80.00 | 400 | 500 | 1000 | ≤4 | P722_0800MT | 3700 | 6500 | 32 | 3.6 | 51.7 |
| | | | | | P722_0800MTC | 5500 | | | 4.9 | 51.6 |
| | | | | | P722_0800MTL | 3700 | | 38 | 6.7 | 51.7 |
| | | | | | P722_0800MTLC | 5500 | | | 6.6 | |
| | | | | ≤2 | PA722_0800MF | 3700 | | 32 | 4.9 | 51.6 |
| | | | | | PA722_0800MFC | 5500 | | | | |
| | | | | | PA722_0800MFL | 3700 | | 38 | 11.8 | 51.7 |
| | | | | | PA722_0800MFLC | 5500 | | | | |
| 100.0 | 300 | 500 | 1000 | ≤4 | P722_1000MT | 3700 | 6500 | 32 | 3.6 | 48.5 |
| | | | | | P722_1000MTC | 5500 | | | 4.9 | |
| | | | | | P722_1000MTL | 3700 | | 38 | 6.7 | |
| | | | | | P722_1000MTLC | 5500 | | | 6.6 | |
| | | | | ≤2 | PA722_1000MF | 3700 | | 32 | 4.9 | |
| | | | | | PA722_1000MFC | 5500 | | | | |
| | | | | | PA722_1000MFL | 3700 | | 38 | 11.8 | |
| | | | | | PA722_1000MFLC | 5500 | | | | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
** MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
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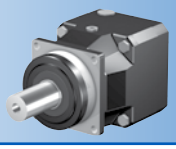
# Selection Data



| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day — Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA8** | **(continued next page)** | | | | | | | | | |
| 3.000 | 800 | 1200 | 1756 | ≤3 | P821_0030MT | 1800 | 3000 | 48 | 64.6 | 220.0 |
| | | | | | P821_0030MTC | 3000 | 4500 | | 70.2 | 165.4 |
| | | | | | P821_0030MTL | 1800 | 3000 | 60 | 92.6 | 220.0 |
| | | | | | P821_0030MTLC | 3000 | 4500 | | | 201.7 |
| | | | | ≤1 | PA821_0030MF | 1800 | 3000 | 48 | 71.0 | 165.4 |
| | | | | | PA821_0030MFC | 3000 | 4500 | | | |
| 4.000 | 800 | 1600 | 2332 | ≤3 | P821_0040MT | 2200 | 3500 | 48 | 41.2 | 205.0 |
| | | | | | P821_0040MTC | 3200 | 5000 | | 46.3 | 174.7 |
| | | | | | P821_0040MTL | 2200 | 3500 | 60 | 68.7 | 205.0 |
| | | | | | P821_0040MTLC | 3200 | 5000 | | | 195.7 |
| | | | | ≤1 | PA821_0040MF | 2200 | 3500 | 48 | 47.1 | 174.7 |
| | | | | | PA821_0040MFC | 3200 | 5000 | | | |
| 5.000 | 1000 | 1600 | 2899 | ≤3 | P821_0050MT | 2500 | 4000 | 48 | 33.9 | 194.0 |
| | | | | | P821_0050MTC | 3750 | 6000 | | 39.5 | 175.6 |
| | | | | | P821_0050MTL | 2500 | 4000 | 60 | 61.9 | 194.0 |
| | | | | | P821_0050MTLC | 3750 | 6000 | | | 188.6 |
| | | | | ≤1 | PA821_0050MF | 2500 | 4000 | 48 | 40.3 | 175.6 |
| | | | | | PA821_0050MFC | 3750 | 6000 | | | |
| 7.000 | 1000 | 1400 | 2801 | ≤3 | P821_0070MT | 2800 | 4500 | 48 | 29.2 | 176.5 |
| | | | | | P821_0070MTC | 4500 | 6000 | | 34.9 | 167.0 |
| | | | | | P821_0070MTL | 2800 | 4500 | 60 | 57.2 | 176.5 |
| | | | | ≤1 | PA821_0070MF | | | 48 | 35.6 | 167.0 |
| | | | | | PA821_0070MFC | 4500 | 6000 | | | |
| 8.000 | 800 | 1200 | 2400 | ≤3 | P821_0080MT | 2800 | 4500 | 48 | 28.0 | 166.2 |
| | | | | | P821_0080MTC | 5000 | 6000 | | 33.6 | 159.6 |
| | | | | | P821_0080MTL | 2800 | 4500 | 60 | 56.0 | 166.2 |
| | | | | ≤1 | PA821_0080MF | | | 48 | 34.4 | 159.6 |
| | | | | | PA821_0080MFC | 5000 | 6000 | | | |
| 10.00 | 700 | 1200 | 2400 | ≤3 | P821_0100MT | 2800 | 4500 | 48 | 26.8 | 153.0 |
| | | | | | P821_0100MTC | 5500 | 6000 | | 32.4 | 149.4 |
| | | | | | P821_0100MTL | 2800 | 4500 | 60 | 54.8 | 153.0 |
| | | | | ≤1 | PA821_0100MF | | | 48 | 33.2 | 149.4 |
| | | | | | PA821_0100MFC | 5500 | 6000 | | | |

*[1] Based on input speed of 2000 RPM. See page 16 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] For additional motor shaft sizes, please visit configurator.stober.com*
*[4] Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
** MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
*** Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$) | | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P/PA8** | **(continued next page)** | | | | | | | | | |
| 12.00 | 800 | 1200 | 2089 | ≤4 | P822_0120MT | 2200 | 4500 | 38 | 12.1 | 156.3 |
| | | | 2396 | | P822_0120MTC | 3300 | 5000 | | 20.6 | 152.2 |
| | | | | | P822_0120MTL | 2200 | 4500 | 48 | 30.0 | 156.3 |
| | | | | | P822_0120MTLC | 3300 | 5000 | | 22.7 | 154.1 |
| | | | | ≤2 | PA822_0120MF | 2500 | 4500 | 38 | 17.6 | 152.2 |
| | | | | | PA822_0120MFC | 3300 | 5000 | | | |
| | | | | | PA822_0120MFL | 2500 | 4500 | 48 | 36.4 | 154.1 |
| | | | | | PA822_0120MFLC | 3300 | 5000 | | | |
| 16.00 | 800 | 1600 | 3178 | ≤4 | P822_0160MT | 2500 | 4500 | 38 | 10.6 | 168.9 |
| | | | | | P822_0160MTC | 3400 | 6000 | | 19.1 | 166.2 |
| | | | | | P822_0160MTL | 2500 | 4500 | 48 | 28.5 | 168.9 |
| | | | | | P822_0160MTLC | 3400 | 6000 | | 21.2 | 167.4 |
| | | | | ≤2 | PA822_0160MF | 2500 | 4500 | 38 | 16.1 | 166.2 |
| | | | | | PA822_0160MFC | 3400 | 6000 | | | |
| | | | | | PA822_0160MFL | 2500 | 4500 | 48 | 34.9 | 167.4 |
| | | | | | PA822_0160MFLC | 3400 | 6000 | | | |
| 20.00 | 1000 | 1600 | 3200 | ≤4 | P822_0200MT | 2500 | 4500 | 38 | 10.2 | 171.8 |
| | | | | | P822_0200MTC | 3600 | 6000 | | 18.7 | 170.0 |
| | | | | | P822_0200MTL | 2500 | 4500 | 48 | 28.1 | 171.8 |
| | | | | | P822_0200MTLC | 3600 | 6000 | | 20.8 | 170.8 |
| | | | | ≤2 | PA822_0200MF | 2500 | 4500 | 38 | 15.7 | 170.0 |
| | | | | | PA822_0200MFC | 3600 | 6000 | | | |
| | | | | | PA822_0200MFL | 2500 | 4500 | 48 | 34.5 | 170.8 |
| | | | | | PA822_0200MFLC | 3600 | 6000 | | | |
| 25.00 | 1000 | 1600 | 3200 | ≤4 | P822_0250MT | 3000 | 5500 | 38 | 8.8 | 170.9 |
| | | | | | P822_0250MTC | 4000 | 6000 | | 17.3 | 169.8 |
| | | | | | P822_0250MTL | 3000 | 5500 | 48 | 26.7 | 170.9 |
| | | | | | P822_0250MTLC | 4000 | 6000 | | 19.4 | 170.3 |
| | | | | ≤2 | PA822_0250MF | 3000 | 5500 | 38 | 14.3 | 169.8 |
| | | | | | PA822_0250MFC | 4000 | 6000 | | | |
| | | | | | PA822_0250MFL | 3000 | 5500 | 48 | 33.1 | 170.3 |
| | | | | | PA822_0250MFLC | 4000 | 6000 | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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.)*
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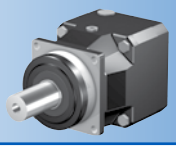
# Selection Data



| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | kgcm² | Nm |
| **P/PA8** | **(continued next page)** | | | | | | | | | |
| 28.00 | 800 | 1600 | 3178 | ≤4 | P822_0280MT | 3300 | 6000 | 38 | 7.8 | 166.3 |
| | | | | | P822_0280MTC | 4500 | | | 15.9 | 165.2 |
| | | | | | P822_0280MTL | 3300 | | 48 | 26.1 | 166.3 |
| | | | | | P822_0280MTLC | 4500 | | | 16.3 | 165.7 |
| | | | | ≤2 | PA822_0280MF | 3300 | | 38 | 12.9 | 165.2 |
| | | | | | PA822_0280MFC | 4500 | | | | |
| | | | | | PA822_0280MFL | 3300 | | 48 | 32.1 | 165.7 |
| | | | | | PA822_0280MFLC | 4500 | | | | |
| 32.00 | 800 | 1200 | 2400 | ≤4 | P822_0320MT | 2500 | 4500 | 38 | 9.9 | 159.3 |
| | | | | | P822_0320MTC | 3600 | 6000 | | 18.3 | 158.7 |
| | | | | | P822_0320MTL | 2500 | 4500 | 48 | 27.7 | 159.3 |
| | | | | | P822_0320MTLC | 3600 | 6000 | | 20.4 | 159.0 |
| | | | | ≤2 | PA822_0320MF | 2500 | 4500 | 38 | 15.3 | 158.7 |
| | | | | | PA822_0320MFC | 3600 | 6000 | | | |
| | | | | | PA822_0320MFL | 2500 | 4500 | 48 | 34.1 | 159.0 |
| | | | | | PA822_0320MFLC | 3600 | 6000 | | | |
| 35.00 | 1000 | 1600 | 3200 | ≤4 | P822_0350MT | 3300 | 6000 | 38 | 7.7 | 170.0 |
| | | | | | P822_0350MTC | 4500 | | | 15.8 | 169.3 |
| | | | | | P822_0350MTL | 3300 | | 48 | 26.0 | 170.0 |
| | | | | | P822_0350MTLC | 4500 | | | 16.1 | 169.6 |
| | | | | ≤2 | PA822_0350MF | 3300 | | 38 | 12.8 | 169.3 |
| | | | | | PA822_0350MFC | 4500 | | | | |
| | | | | | PA822_0350MFL | 3300 | | 48 | 31.9 | 169.6 |
| | | | | | PA822_0350MFLC | 4500 | | | | |
| 40.00 | 800 | 1600 | 3178 | ≤4 | P822_0400MT | 3300 | 6000 | 38 | 7.2 | 162.8 |
| | | | | | P822_0400MTC | 5000 | | | 15.3 | 162.3 |
| | | | | | P822_0400MTL | 3300 | | 48 | 25.5 | 162.8 |
| | | | | | P822_0400MTLC | 5000 | | | 15.6 | 162.6 |
| | | | | ≤2 | PA822_0400MF | 3300 | | 38 | 12.3 | 162.3 |
| | | | | | PA822_0400MFC | 5000 | | | | |
| | | | | | PA822_0400MFL | 3300 | | 48 | 31.4 | 162.6 |
| | | | | | PA822_0400MFLC | 5000 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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.)*
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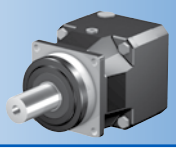
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | Cont. | Cyclic | mm | $kgcm^2$ | Nm |
| **P/PA8** | **(continued next page)** | | | | | | | | | |
| 50.00 | 1000 | 1600 | 3200 | ≤4 | P822_0500MT | 3300 | 6000 | 38 | 7.1 | 167.7 |
| | | | | | P822_0500MTC | 5000 | | | 15.2 | 167.4 |
| | | | | | P822_0500MTL | 3300 | | 48 | 25.4 | 167.7 |
| | | | | | P822_0500MTLC | 5000 | | | 15.6 | 167.5 |
| | | | | ≤2 | PA822_0500MF | 3300 | | 38 | 12.2 | 167.4 |
| | | | | | PA822_0500MFC | 5000 | | | | |
| | | | | | PA822_0500MFL | 3300 | | 48 | 31.4 | 167.5 |
| | | | | | PA822_0500MFLC | 5000 | | | | |
| 56.00 | 800 | 1200 | 2400 | ≤4 | P822_0560MT | 3300 | 6000 | 38 | 7.7 | 159.3 |
| | | | | | P822_0560MTC | 4700 | | | 15.8 | 159.1 |
| | | | | | P822_0560MTL | 3300 | | 48 | 26.0 | 159.3 |
| | | | | | P822_0560MTLC | 4700 | | | 16.1 | 159.2 |
| | | | | ≤2 | PA822_0560MF | 3300 | | 38 | 12.8 | 159.1 |
| | | | | | PA822_0560MFC | 4500 | | | | |
| | | | | | PA822_0560MFL | 3300 | | 48 | 31.9 | 159.2 |
| | | | | | PA822_0560MFLC | 4500 | | | | |
| 70.00 | 1000 | 1400 | 2801 | ≤4 | P822_0700MT | 3300 | 6000 | 38 | 7.1 | 164.5 |
| | | | | | P822_0700MTC | 5000 | | | 15.2 | 164.4 |
| | | | | | P822_0700MTL | 3300 | | 48 | 25.4 | 164.5 |
| | | | | | P822_0700MTLC | 5000 | | | 15.5 | 164.4 |
| | | | | ≤2 | PA822_0700MF | 3300 | | 38 | 12.2 | |
| | | | | | PA822_0700MFC | 5000 | | | | |
| | | | | | PA822_0700MFL | 3300 | | 48 | 31.3 | |
| | | | | | PA822_0700MFLC | 5000 | | | | |
| 80.00 | 800 | 1200 | 2400 | ≤4 | P822_0800MT | 3300 | 6000 | 38 | 7.0 | 159.3 |
| | | | | | P822_0800MTC | 5000 | | | 15.2 | 159.2 |
| | | | | | P822_0800MTL | 3300 | | 48 | 25.3 | 159.3 |
| | | | | | P822_0800MTLC | 5000 | | | 15.5 | 159.2 |
| | | | | ≤2 | PA822_0800MF | 3300 | | 38 | 12.2 | |
| | | | | | PA822_0800MFC | 5000 | | | | |
| | | | | | PA822_0800MFL | 3300 | | 48 | 31.3 | |
| | | | | | PA822_0800MFLC | 5000 | | | | |
| 100.0 | 700 | 1200 | 2400 | ≤4 | P822_1000MT | 3300 | 6000 | 38 | 7.0 | 148.4 |
| | | | | | P822_1000MTC | 5000 | | | 15.1 | 148.3 |
| | | | | | P822_1000MTL | 3300 | | 48 | 25.3 | 148.4 |
| | | | | | P822_1000MTLC | 5000 | | | 15.5 | |
| | | | | ≤2 | PA822_1000MF | 3300 | | 38 | 12.1 | 148.3 |
| | | | | | PA822_1000MFC | 5000 | | | | |
| | | | | | PA822_1000MFL | 3300 | | 48 | 31.3 | 148.4 |
| | | | | | PA822_1000MFLC | 5000 | | | | |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

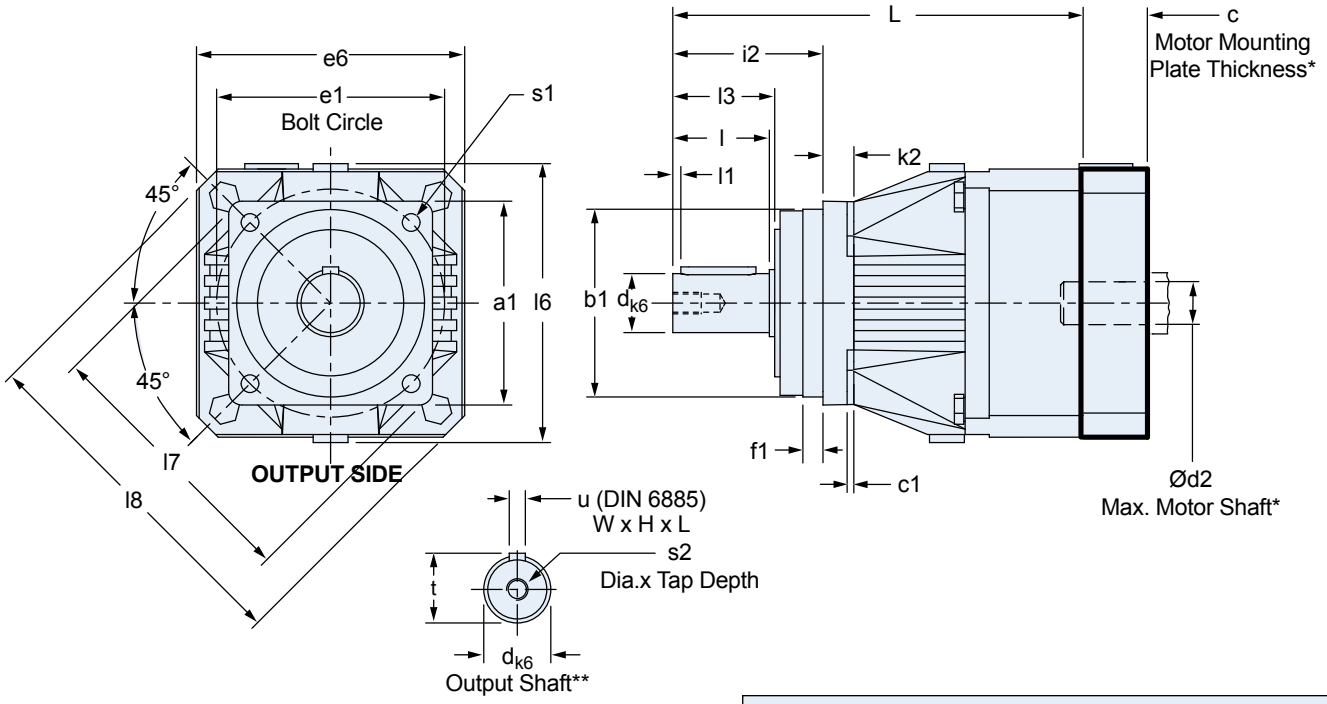




| Exact Ratio (i) | Output Torque: Nominal [1] $M_{2N}$ | Output Torque: Acceleration $M_{2B}$ | Output Torque: Peak [2] $M_{2PEAK}$ | Backlash | All P Series and PA** Units In-stock — Ship in 1 Day: Part Number* (Gearhead + Input) | Maximum Input Speed RMP ($n_1$): Cont. | Maximum Input Speed RMP ($n_1$): Cyclic | Motor Shaft [3] Max Ø $D^6$ | Input Inertia [4] $J_1$ | Torsional Stiffness C2 (per arcmin) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nm | Nm | Nm | arcmin | | | | mm | $kgcm^2$ | Nm |
| **P9** | **(continued next page)** | | | | | | | | | |
| 4.000 | 2000 | 3000 | 5526 | ≤3 | P921_0040MT | 2000 | 3000 | 60 | 98.2 | 380.0 |
| | | | | | P921_0040MTC | 3000 | 4500 | | 93.6 | 349.3 |
| 5.000 | 2000 | 3000 | 6000 | ≤3 | P921_0050MT | 2200 | 3500 | 60 | 80.4 | 360.0 |
| | | | | | P921_0050MTC | 3500 | 5000 | | 75.8 | 341.8 |
| 7.000 | 2000 | 2700 | 5399 | ≤3 | P921_0070MT | 2500 | 4000 | 60 | 67.1 | 330.0 |
| | | | | | P921_0070MTC | 4000 | 5000 | | 62.5 | 322.0 |
| 10.00 | 1400 | 2000 | 4000 | ≤3 | P921_0100MT | 2500 | 4000 | 60 | 59.5 | 260.0 |
| | | | | | P921_0100MTC | 4000 | 5000 | | 54.8 | 257.5 |
| 16.00 | 2000 | 3000 | 5526 | ≤4 | P922_0160MT | 2200 | 3500 | 48 | 41.7 | 340.5 |
| | | | | | P922_0160MTC | 3200 | 5000 | | 47.3 | 334.5 |
| | | | | | P922_0160MTL | 2200 | 3500 | 60 | 69.7 | 340.5 |
| | | | | | P922_0160MTLC | 3200 | 5000 | | | 338.9 |
| 20.00 | 2000 | 3000 | 6000 | ≤4 | P922_0200MT | 2200 | 3500 | 48 | 41.0 | 336.4 |
| | | | | | P922_0200MTC | 3200 | 5000 | | 46.2 | 332.6 |
| | | | | | P922_0200MTL | 2200 | 3500 | 60 | 68.6 | 336.4 |
| | | | | | P922_0200MTLC | 3200 | 5000 | | | 335.3 |
| 25.00 | 2000 | 3000 | 6000 | ≤4 | P922_0250MT | 2500 | 4000 | 48 | 34.3 | 335.1 |
| | | | | | P922_0250MTC | 3750 | 6000 | | 39.9 | 332.7 |
| | | | | | P922_0250MTL | 2500 | 4000 | 60 | 62.3 | 335.1 |
| | | | | | P922_0250MTLC | 3750 | 6000 | | | 334.5 |
| 28.00 | 2000 | 3000 | 5526 | ≤4 | P922_0280MT | 2800 | 4500 | 48 | 29.8 | 334.9 |
| | | | | | P922_0280MTC | 4000 | 5000 | | 35.4 | 332.7 |
| | | | | | P922_0280MTL | 2800 | 4500 | 60 | 57.8 | 334.9 |
| 35.00 | 2000 | 3000 | 6000 | ≤4 | P922_0350MT | 2800 | 4500 | 48 | 29.4 | 332.8 |
| | | | | | P922_0350MTC | 4000 | 6000 | | 35.1 | 331.4 |
| | | | | | P922_0350MTL | 2800 | 4500 | 60 | 57.5 | 332.8 |
| 40.00 | 2000 | 3000 | 5526 | ≤4 | P922_0400MT | 2800 | 4500 | 48 | 26.8 | 328.9 |
| | | | | | P922_0400MTC | 4500 | 6000 | | 32.4 | 327.9 |
| | | | | | P922_0400MTL | 2800 | 4500 | 60 | 54.8 | 328.9 |
| 50.00 | 2000 | 3000 | 6000 | ≤4 | P922_0500MT | 2800 | 4500 | 48 | 26.6 | 329.0 |
| | | | | | P922_0500MTC | 4500 | 6000 | | 32.2 | 328.3 |
| | | | | | P922_0500MTL | 2800 | 4500 | 60 | 54.6 | 329.0 |
| 70.00 | 2000 | 2700 | 5399 | ≤4 | P922_0700MT | 2800 | 4500 | 48 | 26.5 | 316.1 |
| | | | | | P922_0700MTC | 4500 | 6000 | | 32.1 | 315.8 |
| | | | | | P922_0700MTL | 2800 | 4500 | 60 | 54.5 | 316.1 |
| 100.0 | 1400 | 2000 | 4000 | ≤4 | P922_1000MT | 2800 | 4500 | 48 | 26.4 | 255.7 |
| | | | | | P922_1000MTC | 4500 | 6000 | | 32.0 | 255.6 |
| | | | | | P922_1000MTL | 2800 | 4500 | 60 | 54.4 | 255.7 |

[1] *Based on input speed of 2000 RPM. See page 16 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] *For additional motor shaft sizes, please visit configurator.stober.com*
[4] *Inertia based on maximum input. For lower inertia, using smaller diameter input, contact STOBER.*
* *MF = Motor Adapter with FlexiAdapt® coupling MT = Motor Adapter L = Large Input C = ServoCool*
** *Designates select PA units avialable in stock for next day shipping (all P units are in stock for next day shipping)*

## Standard Input
## ServoCool Input Option




** See Motor Mounting Plate Option, page 17 for details.*
*** See Output Shaft Options, page 17 for details.*

**Table 1 Dimensions (mm)**

| Unit | a1 | b1 | h6 | c1 | d | k6 | e1 | e6 | f1 | i2 |
|---|---|---|---|---|---|---|---|---|---|---|
| P2 | 55 | 50 | +0.000/-0.019 | 6 | 12 | +0.012/+0.001 | 63 | 55 | 7 | 36 |
| P/PA3 | 72 | 60 | +0.000/-0.019 | 7 | 16 | +0.012/+0.001 | 75 | 72 | 7.5 | 48 |
| P/PA4 | 76 | 70 | +0.000/-0.019 | 9 | 22 | +0.015/+0.002 | 85 | 98 | 7.5 | 56 |
| P/PA5 | 101 | 90 | +0.000/-0.022 | 10 | 32 | +0.018/+0.002 | 120 | 115 | 15 | 88 |
| P/PA7 | 145 | 130 | +0.000/-0.025 | 15 | 40 | +0.018/+0.002 | 165 | 145 | 3.5 | 112 |
| P/PA8 | 190 | 160 | +0.000/-0.025 | 15 | 55 | +0.021/+0.002 | 215 | 190 | 10 | 112 |
| P9 | 212 | 180 | +0.000/-0.025 | 17 | 75 | +0.021/+0.002 | 250 | 225 | 10 | 143 |

**Table 2 Dimensions (mm)**

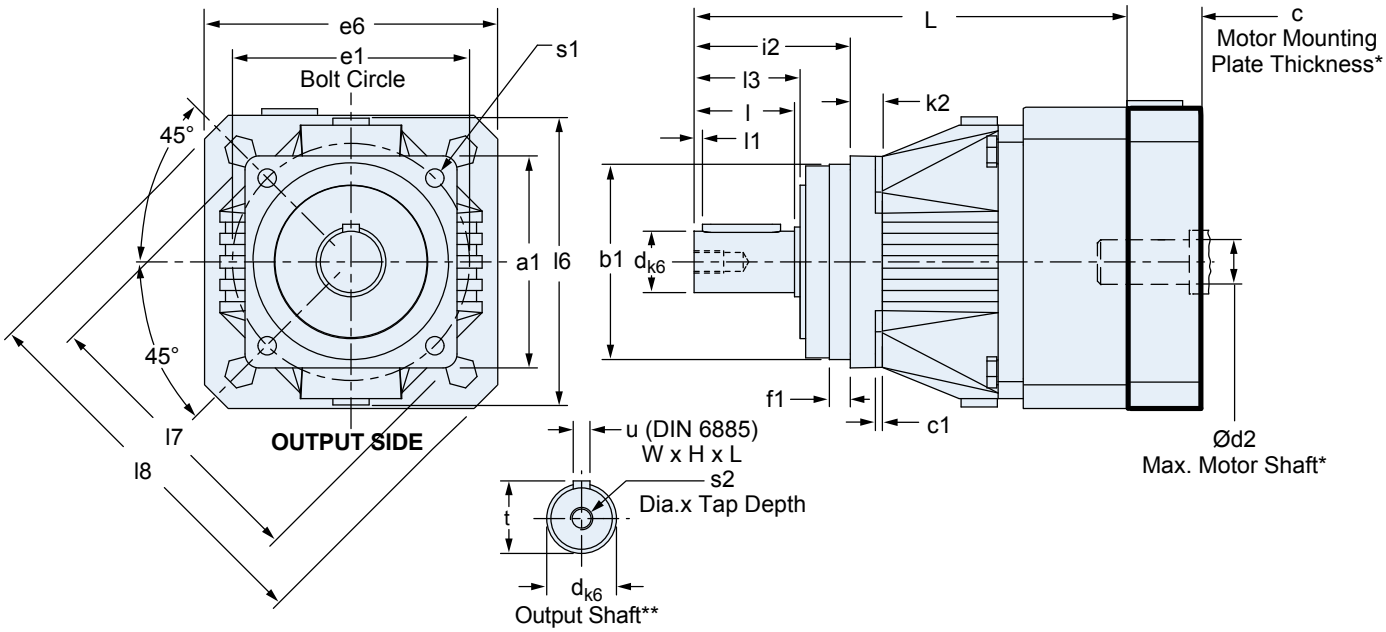
| Unit | k2 | l | l1 | l3 | l6 | l7 | l8 | s1 | s2 | t | u |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P2 | — | 22 | 2 | 24 | 62 | 74 | 80 | 5.5 | M4x10 | 13.5 | A4x4x18 |
| P/PA3 | — | 28 | 2 | 30 | 79 | 92 | 92 | 5.5 | M5x12.5 | 18 | A5x5x22 |
| P/PA4 | 12 | 36 | 3 | 38 | 98 | 103.3 | 130 | 6.6 | M8x19 | 24.5 | A6x6x28 |
| P/PA5 | 14 | 58 | 3 | 60 | 121 | 139 | 149 | 9 | M12x28 | 35 | A10x8x50 |
| P/PA7 | — | 82 | 4 | 85 | 145 | — | 190 | 11 | M16x36 | 43 | A12x8x70 |
| P/PA8 | — | 82 | 6 | 85 | 190 | — | 250 | 13.5 | M20x42 | 59 | A16x10x70 |
| P9 | 22 | 105 | 7 | 109 | 225 | 285 | 300 | 17.5 | M20x42 | 79.5 | A20x12x90 |

**Table 3 Dimensions (mm)**

| L | | | |
|---|---|---|---|
| **Standard** | | **ServoCool** | |
| P221 | 94.5 | — | |
| P222 | 126.5 | — | |
| P/PA321 | 135 | — | |
| P/PA322 | 158.5 | — | |
| P/PA421 | 153 | P/PA421_C | 176.5 |
| P/PA422 | 200.5 | — | |
| P/PA521 | 193 | P/PA521_C | 221 |
| P/PA522 | 242.5 | P/PA522_C | 266 |
| P/PA721 | 242 | P/PA721_C | 272 |
| P/PA722 | 294 | P/PA722_C | 322 |
| P/PA821 | 283 | P/PA821_C | 331 |
| P/PA822 | 350.5 | P/PA822_C | 380.5 |
| P921 | 353 | P921_C | 418 |
| P922 | 441 | P922_C | 489 |

# Dimensional Data

## Large Input Option




** See Motor Mounting Plate Option, page 17 for details.*
*** See Output Shaft Options, page 17 for details.*

**Table 1 Dimensions (mm)**

| Unit | a1 | b1 | h6 | c1 | d | k6 | e1 | f1 | i2 |
|---|---|---|---|---|---|---|---|---|---|
| P2_L | 55 | 50 | +0.000/-0.019 | 6 | 12 | +0.012/+0.001 | 63 | 7 | 36 |
| P/PA3_L | 72 | 60 | +0.000/-0.019 | 7 | 16 | +0.012/+0.001 | 75 | 7.5 | 48 |
| P/PA4_L | 76 | 70 | +0.000/-0.019 | 9 | 22 | +0.015/+0.002 | 85 | 7.5 | 56 |
| P/PA5_L | 101 | 90 | +0.000/-0.022 | 10 | 32 | +0.018/+0.002 | 120 | 15 | 88 |
| P/PA7_L | 145 | 130 | +0.000/-0.025 | 15 | 40 | +0.018/+0.002 | 165 | 3.5 | 112 |
| P/PA8_L | 190 | 160 | +0.000/-0.025 | 15 | 55 | +0.021/+0.002 | 215 | 10 | 112 |
| P9_L | 212 | 180 | +0.000/-0.025 | 17 | 75 | +0.021/+0.002 | 250 | 10 | 143 |

**Table 2 Dimensions (mm)**

| Unit | k2 | l | l1 | l3 | l6 | l7 | s1 | s2 | t | u |
|---|---|---|---|---|---|---|---|---|---|---|
| P2_L | — | 22 | 2 | 24 | 92 | 74 | 5.5 | M4x10 | 13.5 | A4x4x18 |
| P/PA3_L | — | 28 | 2 | 30 | 130 | 92 | 5.5 | M5x12.5 | 18 | A5x5x22 |
| P/PA4_L | 12 | 36 | 3 | 38 | 149 | 103.3 | 6.6 | M8x19 | 24.5 | A6x6x28 |
| P/PA5_L | 14 | 58 | 3 | 60 | 190 | 139 | 9 | M12x28 | 35 | A10x8x50 |
| P/PA7_L | — | 82 | 4 | 85 | 250 | — | 11 | M16x36 | 43 | A12x8x70 |
| P/PA8_L | — | 82 | 6 | 85 | 190 | — | 13.5 | M20x42 | 59 | A16x10x70 |
| P9_L | 22 | 105 | 7 | 109 | 225 | 285 | 17.5 | M20x42 | 79.5 | A20x12x90 |

**Table 3 Dimensions (mm)**

| Size | e6 | L | l8 |
|---|---|---|---|
| P221_L | 75 | 111 | 100 |
| P222_L | 75 | 143 | 100 |
| P/PA321_L | 100 | 138.3 | 130 |
| P322_L | 75 | 175 | 100 |
| P/PA421_L | 115 | 161.5 | 149 |
| P/PA422_L | 100 | 203.8 | 130 |
| P/PA521_L | 145 | 207 | 188 |
| P/PA522_L | 115 | 251 | 149 |
| P/PA721_L | 190 | 259 | 250 |
| P/PA722_L | 145 | 308 | 188 |
| P821_L | 225 | 291 | 300 |
| P/PA822_L | 190 | 367.5 | 250 |
| P922_L | 225 | 449 | 300 |