ServoFit® Gearheads
The Precision Decision

Safety Instructions

In order to obtain long life and trouble-free operation from your STOBER gearhead, it is essential that the proper installation and operating procedures be followed. Failure to follow these instructions will void the drive's warranty.

The torque required by the application must not exceed the gearhead torque capacity shown on the nameplate. For safety purposes, a safety coupling should be installed between the gearhead and the driven load. Otherwise, overload may cause damage to the interior parts of the gearhead which may result in breaking the gearhead housing. As a result, persons could be injured by flying parts or splashing hot gear oil.

If you have questions about the installation, operation or maintenance of your gearhead, please contact your local STOBER distributor or STOBER Technical Support for assistance.

WARNING: Safety is the most important consideration when operating any type of drive. Through proper application, safe handling methods, and wearing appropriate clothing, you can prevent accidents and injury to yourself and fellow workers.

The shafts of STOBER gearheads rotate at very high speeds and can cut off or severely injure hands, fingers, and arms. Use appropriate guards for shafts and other rotating parts at all times. Follow all directions in the service instruction manual. Obey all federal, state and local safety regulations when operating the drive.

- Always be sure electrical power is off while making electrical connections and during installation and maintenance of the unit.
- Keep clothing, hands, and tools away from ventilation openings on motors and from all rotating parts during operation.
- Lift the drive with a double rope sling or other proper lifting equipment of adequate strength. Make sure load is secured and balanced to prevent shifting when unit is being moved. Lifting drives by hand may be dangerous and should be avoided.
- The intended use of lifting lugs is to handle the weight of the unit only. Never use a lifting lug to lift attached assemblies.
- Never operate drive at speeds higher than those shown on the nameplate, or personal injury may result. Contact STOBER Drives Inc., if there is any change of operating conditions from those for which the unit was originally sold (as stamped on the nameplate). Failure to comply could result in personal injury and or machinery damage.
- Always follow good safety practices at all times.

Each drive is tested before delivery. Before installation, however, it is advisable to examine the unit for possible damage which might have occurred during transit. If damage is discovered, it should be immediately reported to the transport agent.

If installation is delayed after receipt of the gearhead, the drive should be stored in a clean, dry place until put into service. Long term storage requires special procedures. If not kept in a heated, dry area, consult STOBER Drives, Inc. for storage instructions.

NOTE: If it is necessary to clean drive shafts, take care to protect the oil seals.

IMPORTANT: Do not use any device to hammer the unit onto the output shaft during installation since the bearing races could be damaged.

Other maintenance and lubrication information can be found in this catalog, on our website, or by calling STOBER Technical Support.

Table of Contents

See web site for drawings.

ServoFit® Gearheads
The Precision Decision

PA Series

- Backlash – ≤ 1 arc/mins
- Ratios – 3:1 to100:1
- Input RPM – up to 6000
- Noise Level – as low as 58 dB(A)**
- Output Torque from 398 to 8,850 in.lbs
- Available:
  - – Washdown Food Duty

P Series

- Backlash – ≤ 3 arc/mins
- Ratios – 3:1 to100:1
- Input RPM – up to 6000
- Noise Level – as low as 58 dB(A)**
- Output Torque from 142 to 8,850 in.lbs.
- Available:
  - – Washdown Food Duty

PHA Series

- Backlash – ≤ 1 arc/mins
- Ratios – 4:1 to 910:1
- Input RPM – up to 6,000
- Noise Level – as low as 58 dB(A)**
- Output Torque from 398 to 35,400 in.lbs.

PH Series

- Backlash – ≤ 3 arc/mins
- Ratios – 4:1 to 910:1
- Input RPM – up to 6,000
- Noise Level – as low as 58 dB(A)**
- Output Torque from 398 to 35,400 in.lbs.

PKX Series

- Backlash – ≤ 6.5 arc/mins
- Ratios – 3:1 to 300:1
- Input RPM – up to 6,000
- Noise Level – as low as 69 dB(A)**
- Output Torque from 354 to 7,080 in.lbs.

Available:
  - – Washdown Food Duty

PHKX Series

- Backlash – ≤ 5 arc/mins
- Ratios – 5:1 to 1,200:1
- Input RPM – up to 6,000
- Noise Level – as low as 69 dB(A)**
- Output Torque from 885 to 22,125 in.lbs.

F Series

- Backlash:
  - Standard ≤ 11 arc/mins
  - Reduced ≤ 7 arc/mins
- Ratios – 4:1 to 540:1*
- Input RPM – up to 4,500
- Noise Level – as low as 53 dB(A)**
- Output Torque from 200 to 9,700 in.lbs.
- Available:
  - – Inch or Metric Output
  - – Solid, Hollow, Single and Double Bushing
  - – Beverage and Food Duty

K Series

- Backlash:
  - Standard ≤ 12 arc/mins
  - Reduced ≤ 6 arc/mins
- Ratios – 4:1 to 381:1*
- Input RPM – up to 4,500
- Noise Level – as low as 53 dB(A)**
- Output Torque from 190 to 106,000 in.lbs.
- Available:
  - – Inch or Metric Output
  - – Solid, Hollow, Single and Double Bushing
  - – Beverage and Food Duty

PE Series

- Backlash – ≤ 15 arc/mins
- Ratios – 5:1 to 100:1
- Input RPM – up to 8,000
- Noise Level – as low as 60 dB(A)**
- Output Torque from 106 to 1,858 in.lbs.

C Series

- Backlash – ≤ 20 arc/mins
- Ratios – 2:1 to 276:1*
- Input RPM – up to 4,500
- Noise Level – as low as 53 dB(A)**
- Output Torque from 97 to 62,000 in.lbs.
- Available:
  - – Inch or Metric Output
  - – Beverage and Food Duty

* Ratios standard in one housing. Higher ratios available in compound units.
** dB(A) rating measured at 1 meter distance with 3000 RPM input.

See web site for drawings.

ServoFit® Gearheads
The Precision Decision

The STOBER offering of ServoFit™ gearheads will enable you to fit all your servo needs. The ServoFit™ Precision Planetary Gearheads (SPG) are for compact, highly dynamic applications. The ServoFit™ Modular System was designed for those applications where the compact size of a planetary gearhead is not needed. With these two lines, STOBER Drives offers the world's largest variety of servo gearheads.

The STOBER difference = VALUE for you!

5 YEAR LIMITED WARRANTY

Full warranty on all reducer components: gears, covers, material and workmanship, etc. Normal wear items (oil seals, bearings, etc.) are covered for 2 years.

Fits Any Servo Motor

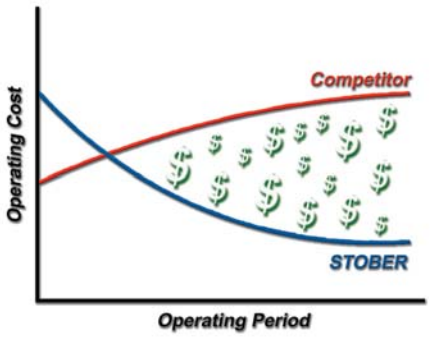
Motor plates for the TriAdapt™ mounting system will fit a wide selection of NEMA, IEC, or custom servo motors.

STANDARD 3-DAY DELIVERY

Most sizes are available with STANDARD 3 DAY DELIVERY. (Does not apply to PA and PHA.) Custom motor plates – 10 days maximum.

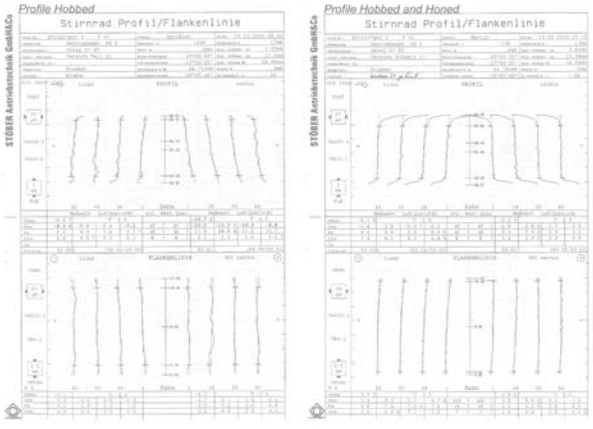
SAME DAY EMERGENCY SHIPPING

24 Hours – No expedite fee.



Helical Gears

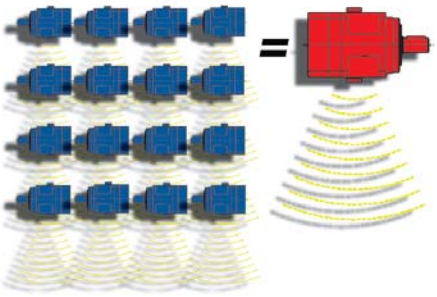
- Highest torque capacity
- Maximum efficiency
- Maintains low noise level



Exceptional Performance

- Low noise level
- Cool running
- High speed capacity
- High torque capacity
- Low backlash

1 conventional planetary gearhead produces the same noise level as 16 STOBER planetary gearheads with HeliCamber™ gearing technology.



See web site for drawings.

ServoFit® Gearheads
ServoCool

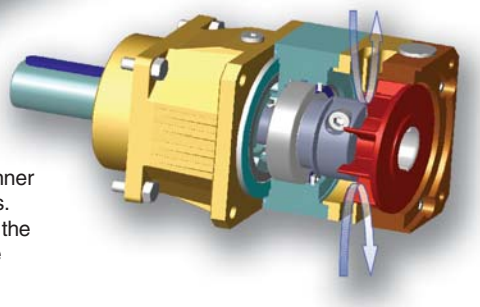
The compact design of planetary gearhead allows very little area for heat dissipation. While the STOBER Precision Planantary Gearhead has the lowest operating temperature available, even it's rating in continuous applications is limited by heat, especially with large planetaries or units with small ratios. The ServoCool planetary gearhead is made possible by adding a ventilator module to the existing ServoFit Precision Planetary Gearhead. These units are currently available in P and PH Series, Size 7 and 8. For other sizes in the Precision Planetary series and also for the ServoFit Modular Series, contact STOBER Technical Support.

Connection flange Cool Plate with intake and outlet slots

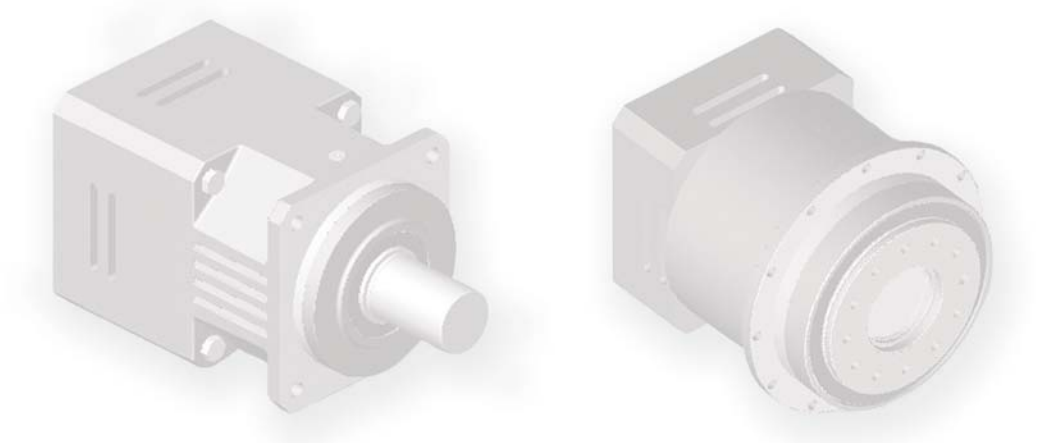
Radial ventilator

Standard coupling

Modular design – the ventilator module can be purchased as a kit and to retrofit existing P and PH Series gearheads, sizes 7 and 8.

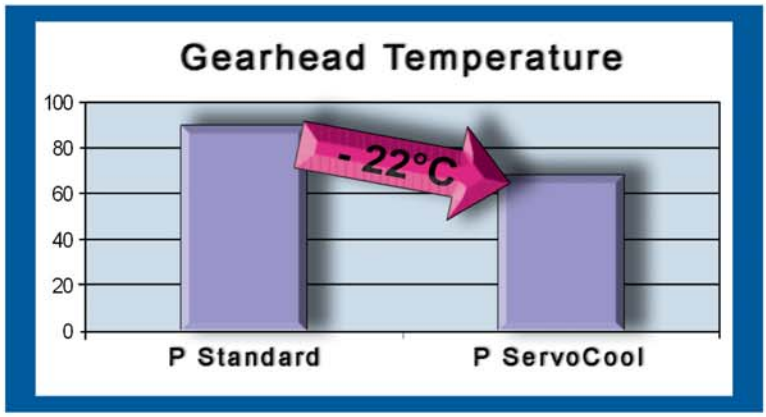


Air is accelerated outward in a radial manner and then escapes through the outlet slots. Due to the resulting negative pressure in the motor adapter, air is pulled in through the inlet slots.



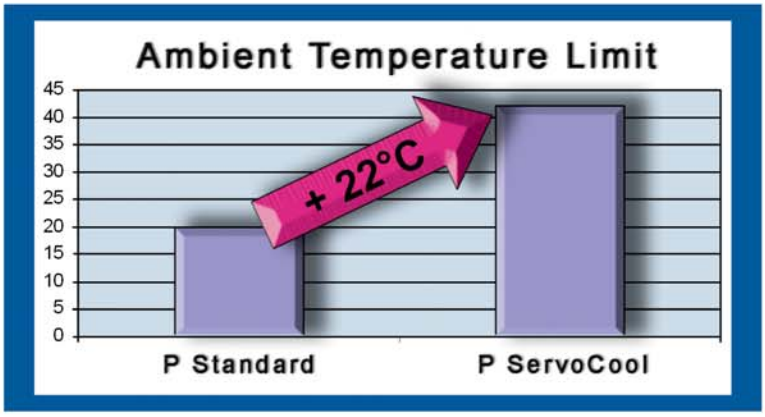
See web site for drawings.

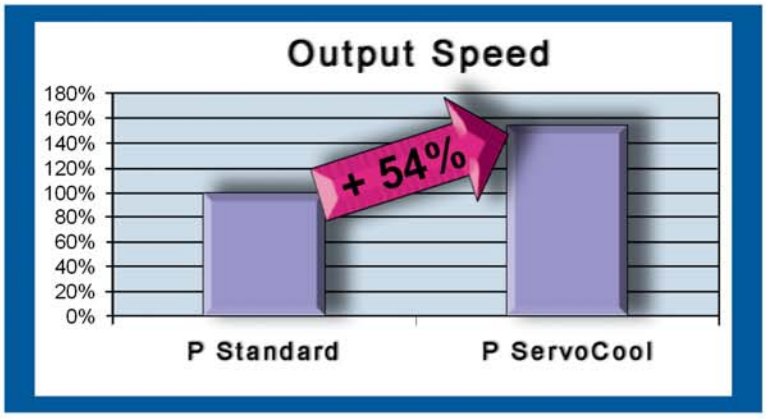
ServoFit® Gearheads
ServoCool



According to data from lubricant suppliers, the lifespan of oil doubles, at certain temperatures, if operating temperature is reduced by 10°C. Adding the ServoCool ventilator reduces gearhead temperature 22°C – quadrupling the expected lubricant life.

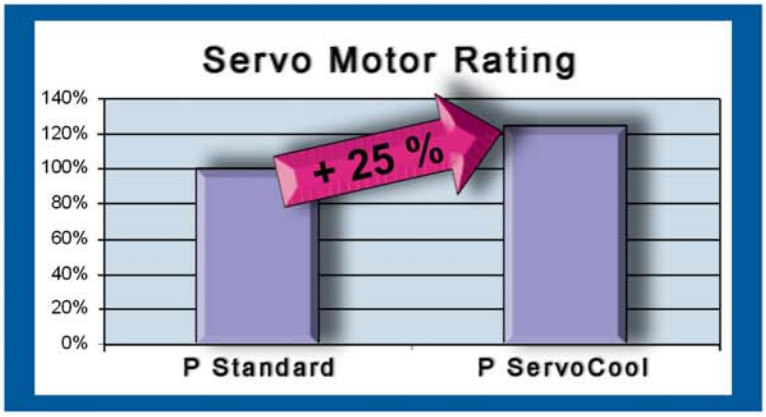
- Synthetic oil
- Lower temperature means longer life
- Lubricated for life – maintenance free solutions
- More compact than external motor ventilator





- Ventilator fan mounts to motor shaft
- Forced air ventilation improves performance
- Modular design “fits” existing units
- Optional for P and PH Series

- Increased motor performance
- No added motor
- No additional wiring
- More compact than external motor ventilator



See web site for drawings.

ServoFit® Gearheads
Beverage, Food, and Poultry

Beverage, Food, and Poultry Duty

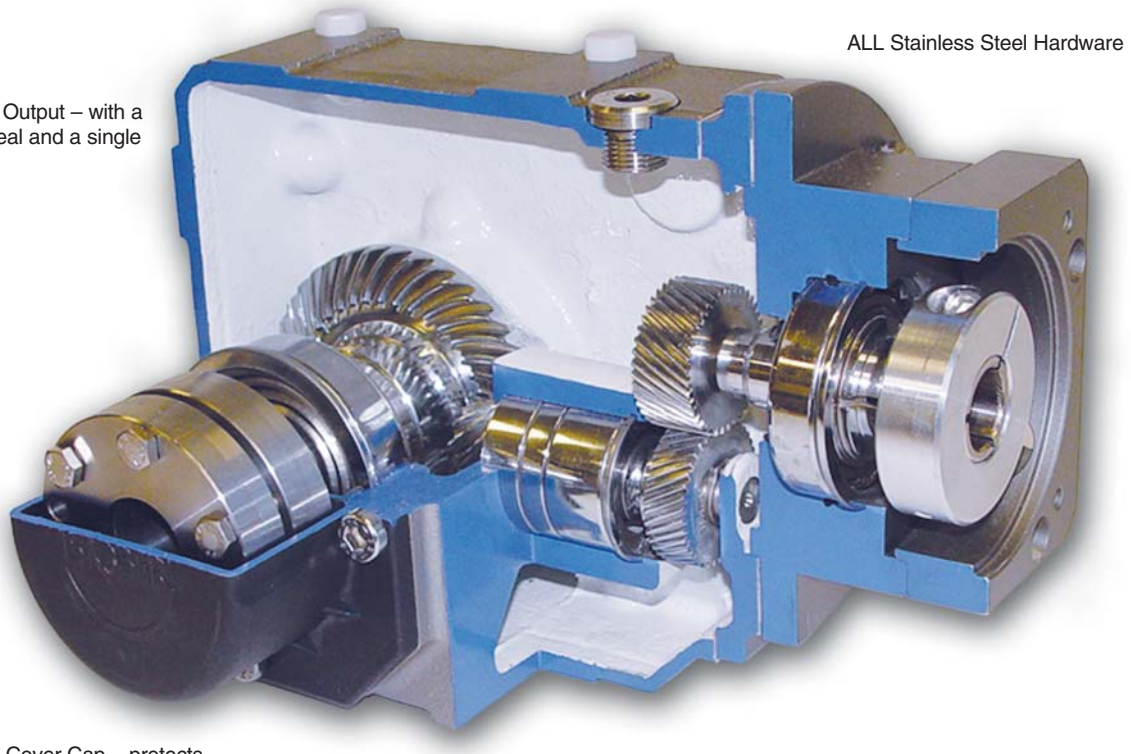
- Lubricated for Life – Double Output Seals
- Maintenance Free – No Breather
- Stainless Output Bushing, Shaft, or Bore – Includes Output Covers for Bushings and Quills
- Multilayer Industrial 316 Stainless Steel Epoxy Coating
- 5 Year Warranty

Standard Coating:

• BEVERAGE	1-Primer 2-Industrial 316 Stainless Steel Epoxy
• FOOD	1-Primer 2-Industrial 316 Stainless Steel Epoxy 1-Silver Bullet Anti-Microbial™ Epoxy
• Options	Layer of Ultra Clear Industrial Epoxy White Epoxy

ALL Stainless Steel Hardware

Double Sealed Output – with a dual lip outer seal and a single lip inner seal



Outside Closed Cover Cap – protects seals from high pressure washing

Inside Split Cover Cap – enables easy assembly onto the shaft

OUTPUT OPTIONS:

- Patented (U.S. Patent Number 5,496,127) Stainless Steel Double Sided Bushing Mounted into Stainless Steel Output Quill – easily mounts onto standard cold finished, ground, or stainless shafting.
- Single side output shaft
- Hollow output

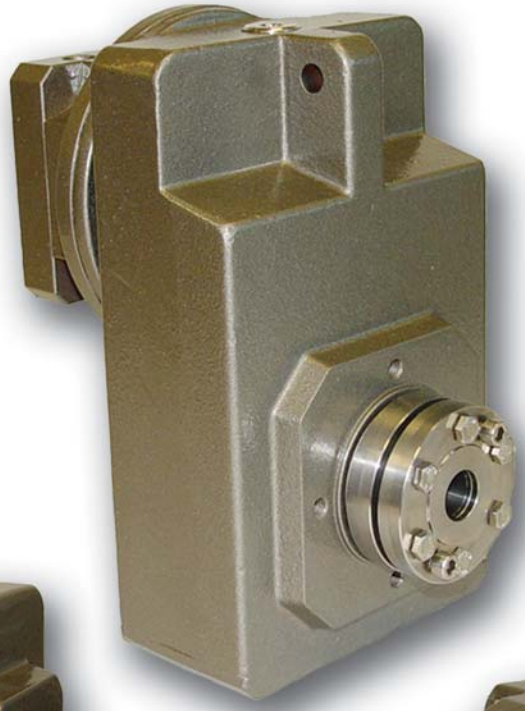
Silver Bullet AM™ is a registered trademark of Burke Industrial Coatings.

Mounting Position must be specified when ordering.

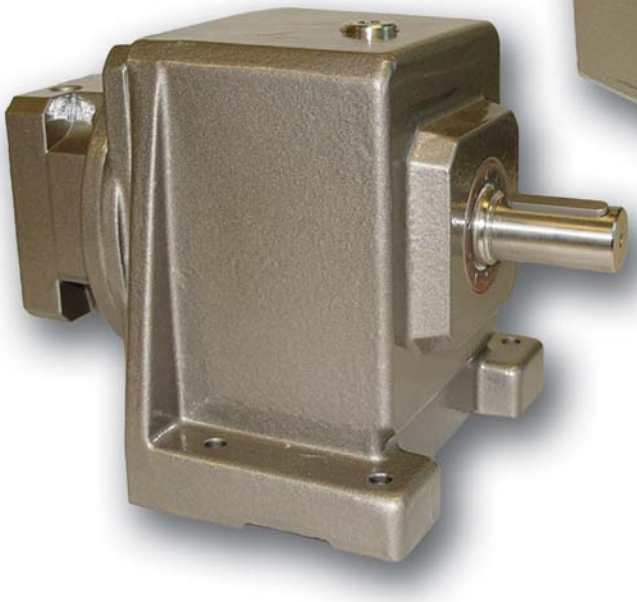
See web site for drawings.

ServoFit® Gearheads
Beverage, Food, and Poultry

"F" Series Hollow Output.
(Stainless steel output is not available in all sizes.)



"C" Series Solid Shaft
(Stainless steel output is not available in all sizes.)



“P” Series Precision Planetary – Sizes 3 thru 5
(Stainless steel output is not available in all sizes.)

Mounting Position must be specified when ordering.

See web site for drawings.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Performance Specification Overview

				P221	P222	P321	P322	P421	P422	P521	P522	P721	P722	P821	P822
Acceleration Torque Maximum	T_{2B}		in.lbs.	195		575		1052		2,655		6,195		14,160	
			Nm	22		65		120		300		700		1,600	
Output Torque [1] Nominal	T_{2N}		in.lbs.	142		398		752		1,858		3,894		8,850	
			Nm	16		45		85		210		440		1,000	
Input Speed Maximum	n_{1MAX}		Continuous	4,500	4,500	4,500	4,500	4,000	4,500	3,700	4,000	3,300	3,700	2,800	3,300
			Cyclic	8,000	8,000	8,000	8,000	7,000	8,000	6,500	7,000	6,000	6,500	4,500	6,000
ServoCool Input RPM Maximum	n_{1MAX}		Continuous	–		–		–		–		5,500	–	4,000	4,500
			Cyclic	–		–		–		–		6,000	–	4,500	6,000
Torsional Backlash [2]	$\Delta\varphi$		arcmin	≤6	≤8	≤4	≤5	≤4	≤5	≤3	≤4	≤3	≤4	≤3	≤4
Torsional Stiffness	C_2		in.lbs./arcmin	17		44		100		266		486		1,557	
			Nm/arcmin	1.9		5		11		33		55		176	
Axial Load Maximum	F_{2AMAX}	R	lbs.	112		225		337		518		653		1,058	
			N	500		1,000		1,500		2,300		2,900		4,700	
See Page 136 for OUTPUT BEARING OPTIONS		D	lbs.	–		315		506		788		1,013		1,688	
			N			1,400		2,250		3,500		4,500		7,500	
		Z	lbs.	–		135		225		360		450		675	
			N			600		1,000		1,600		2,000		3,000	
Radial Load [3] Maximum	F_{2RMAX}	R	lbs.	270		563		900		1,463		1,800		2,925	
			N	1,200		2,500		4,000		6,500		8,000		13,000	
See Page 136 for OUTPUT BEARING OPTIONS		D	lbs.	–		619		1,013		1,575		2,025		3,375	
			N			2,750		4,500		7,000		9,000		15,000	
		Z	lbs.	–		675		1,125		1,800		2,250		4,050	
			N			3,000		5,000		8,000		10,000		18,000	
Tilting Moment [3] Maximum	T_{2Kmax}	R	in.lbs.	300		1,859		3,451		6,956		10,337		20,364	
			Nm	34		210		390		786		1,168		2,301	
See Page 136 for OUTPUT BEARING OPTIONS		D	in.lbs.	–		2,044		3,885		7,496		11,629		23,497	
			Nm			231		439		847		1,314		2,655	
		Z	in.lbs.	–		2,230		4,319		8,567		12,921		28,196	
			Nm			252		488		968		1,460		3,186	
Efficiency (at Nominal Torque)	h		%	97%	95%	97%	95%	97%	95%	97%	95%	97%	95%	97%	95%
Weight	m		pounds	3	4.0	6	8	9	12	14	19	27	33	57	71
			kg	1.2	1.8	2.6	3.5	4.0	5.3	6.5	8.5	12	15	26	32
Noise Level	L_{PA}		dB(A) [4]	≤61	≤61	≤61	≤61	≤62	≤60	≤63	≤61	≤64	≤62	≤65	≤63
Balance Quality				Q 2.5 (Quality Class-2.5 millimeters per second)											
Lubrication				Synthetic Oil – Lubricated for Life											
Degree of Protection				IP65 - FKM Shaft Seals											
Mounting Position				Unrestricted											
Direction of Rotation				Input and Output Rotate the SAME Direction.											
Ambient Temperature				0°C to +40°C (104° F) Other temperatures, contact STOBER Drives.											
Finish				Black (Standard), Washdown, Food and Beverage Options Available											
Lifetime.[5]	L_h		hours	L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 and > 1.00 L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25 and < 1.50 L_h > 30,000 hours if T_{2K}/T_{2A} > 1.5												
Warranty				5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)											

1) Ratings based on input speed (n_1) of 2000 RPM.
For torque at higher input speeds (T_{2NX}) solve the formula, where n_1 = Actual Input Speed. $T_{2NX} = \dfrac{T_{2N}}{\sqrt[3]{\dfrac{n_1}{2000}}}$

2) Tested at 1.5% of nominal torque and recorded on the input side of the gearhead.

3) Rating based on output speed (n_2) of 100 RPM. For values at other speeds see Page 136.

4) Measurement at one (1) meter distance with input speed (n_1) of 2000 RPM.

5) T_{2A} equals actual tilting moment of the application. See Page 136 for calculation details.

Refer to Page 148 for ServoFit Precision Planetary Gearhead Selection Procedure.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Features

The "P" Series–ClassicLine of ServoFit Precision Planetary Gearheads feature HeliCamber® gearing, TriAdapt® motor adapter system and many other components which make them the most accurate and efficient planetary gearheads available. HeliCamber® gear technology provides minimum wear, low backlash and low noise. All units are lubricated for life with synthetic oil and sealed to IP65 standards to prevent lubricant contamination for long life.

Some of these features are:

- Readily Attaches to Any Servo Motor (IEC, NEMA, or Customized Motor Plates*)
- 5 Year Limited Warranty (2 years on bearings, seals, etc.)
- Lowest Standard Backlash
- High Torsional Stiffness
- Advanced Gear Technology
- 95 to 97% Efficiency
- Quiet Running
- Assembled in the U.S.A.

* Maximum 10 working days for custom motor plates.

NO EXPEDITE FEE FOR 24 HOUR SERVICE

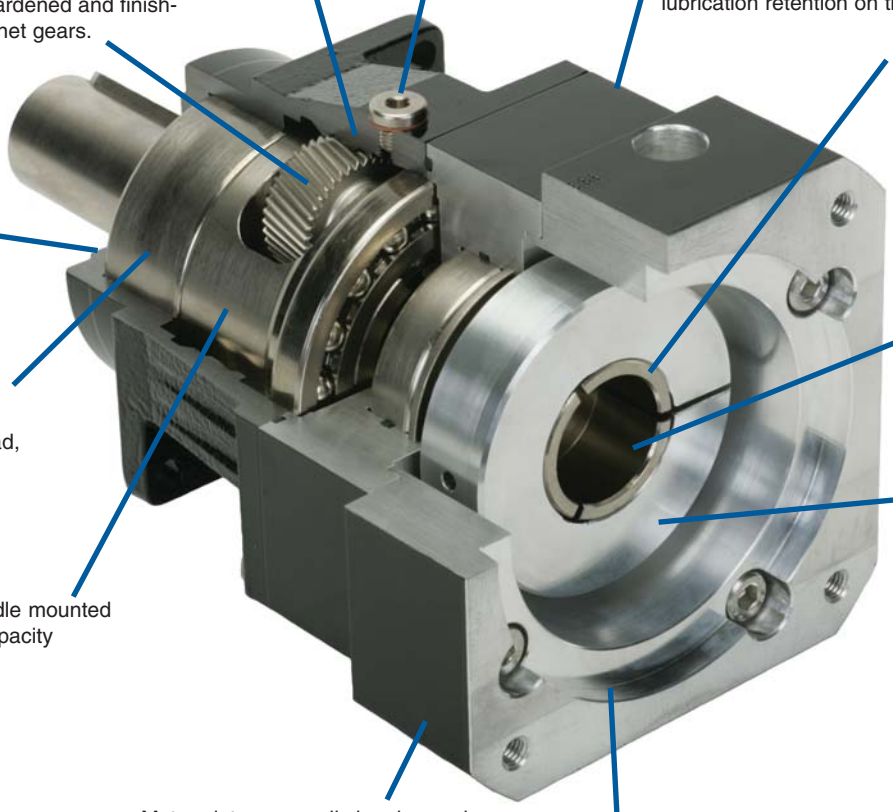
Ring gear machined integral to the housing – not welded or pressed in – provides greater concentricity and eliminates speed fluctuation

Magnetic oil filtration

Highest running accuracy and precision ensured by single piece housing made from high-tensile tempered ductile iron with the additional characteristics of dissipating heat, noise dampening, and greater lubrication retention on the ring gear

Highest running smoothness achieved by proven helical gearing and gear tooth microgeometry. Gear quality provided by case-hardened and finish-ground sun and planet gears.

Triple-split collet – for greater concentricity and low inertia – is rated in excess of 200 percent of the gearheads input torque capacity



FKM seals

Adapter bushings to fit all motor shafts – no key required

Bearing options for application specific radial load, axial load, and tilting moments

The patented TriAdapt® motor coupling is designed to allow thermal expansion of the motor shaft – ensuring long motor life by preventing thrust load on the motor bearings.

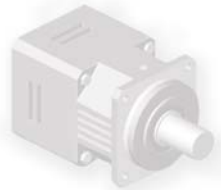
The TriAdapt® motor shaft adapter system allows installation of motor in minutes – no special tools required

Planet carrier straddle mounted for robust output capacity

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

Motor plate pilot toleranced to fit your motor for precise concentricity

Also available with input shaft (AW).



Available as ServoCool in Sizes P7 and P8.

See web site for drawings.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	$øD^6$ mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
P221 with Motor Mounting Plate													
P221S_ _0040MT	4.000	4,500	8,000	14	.141	16.2	1.83	142	16	195	22	389	44
P221S_ _0040MTL	4.000	4,500	8,000	19	.502	16.2	1.83	142	16	195	22	389	44
P221S_ _0050MT	5.000	4,500	8,000	14	.122	16.4	1.85	142	16	195	22	389	44
P221S_ _0050MTL	5.000	4,500	8,000	19	.455	16.4	1.85	142	16	195	22	389	44
P221S_ _0070MT	7.000	4,500	8,000	14	.106	15.6	1.77	142	16	195	22	389	44
P221S_ _0070MTL	7.000	4,500	8,000	19	.412	15.6	1.77	142	16	195	22	389	44
P221S_ _0080MT	8.000	4,500	8,000	14	.101	14.9	1.68	124	14	159	18	319	36
P221S_ _0080MTL	8.000	4,500	8,000	19	.404	14.9	1.68	124	14	159	18	319	36
P221S_ _0100MT	10.00	4,500	8,000	14	.098	14.0	1.59	106	12	159	18	319	36
P221S_ _0100MTL	10.00	4,500	8,000	19	.396	14.0	1.59	106	12	159	18	319	36
P222 with Motor Mounting Plate													
P222S_ _0160MT	16.00	4,500	8,000	14	.138	15.8	1.78	142	16	195	22	389	44
P222S_ _0160MTL	16.00	4,500	8,000	19	.502	15.8	1.78	142	16	195	22	389	44
P222S_ _0200MT	20.00	4,500	8,000	14	.120	15.8	1.78	142	16	195	22	389	44
P222S_ _0200MTL	20.00	4,500	8,000	19	.502	15.8	1.78	142	16	195	22	389	44
P222S_ _0250MT	25.00	4,500	8,000	14	.119	16.2	1.83	142	16	195	22	389	44
P222S_ _0250MTL	25.00	4,500	8,000	19	.455	16.2	1.83	142	16	195	22	389	44
P222S_ _0280MT	28.00	4,500	8,000	14	.106	15.8	1.78	142	16	195	22	389	44
P222S_ _0280MTL	28.00	4,500	8,000	19	.412	15.8	1.78	142	16	195	22	389	44
P222S_ _0320MT	32.00	4,500	8,000	14	.134	14.8	1.68	124	14	159	18	319	36
P222S_ _0320MTL	32.00	4,500	8,000	19	.502	14.8	1.68	124	14	159	18	319	36
P222S_ _0350MT	35.00	4,500	8,000	14	.106	16.1	1.82	142	16	195	22	389	44
P222S_ _0350MTL	35.00	4,500	8,000	19	.412	16.1	1.82	142	16	195	22	389	44
P222S_ _0400MT	40.00	4,500	8,000	14	.098	15.6	1.77	142	16	195	22	389	44
P222S_ _0400MTL	40.00	4,500	8,000	19	.396	15.6	1.77	142	16	195	22	389	44
P222S_ _0500MT	50.00	4,500	8,000	14	.098	16.0	1.81	142	16	195	22	389	44
P222S_ _0500MTL	50.00	4,500	8,000	19	.396	16.0	1.81	142	16	195	22	389	44
P222S_ _0700MT	70.00	4,500	8,000	14	.098	15.6	1.76	142	16	195	22	389	44
P222S_ _0700MT	70.00	4,500	8,000	19	.396	15.6	1.76	142	16	195	22	389	44
P222S_ _1000MT	100.0	4,500	8,000	14	.098	14.0	1.58	106	12	159	18	319	36
P222S_ _1000MT	100.0	4,500	8,000	19	.396	14.0	1.58	106	12	159	18	319	36

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD^6 mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
P321 with Motor Mounting Plate													
P321S_ _0030MT	3.000	3,500	6,000	19	.584	44.2	5.0	266	30	443	50	1,082	122
P321S_ _0030MTL	3.000	3,500	6,000	24	1.56	44.2	5.0	266	30	443	50	1,082	122
P321S_ _0040MT	4.000	3,700	6,500	19	.502	43.7	4.9	398	45	575	65	1,151	130
P321S_ _0040MTL	4.000	3,700	6,500	24	1.17	43.7	4.9	398	45	575	65	1,151	130
P321S_ _0050MT	5.000	4,000	7,000	19	.455	43.2	4.9	398	45	575	65	1,151	130
P321S_ _0050MTL	5.000	4,000	7,000	24	1.07	43.2	4.9	398	45	575	65	1,151	130
P321S_ _0070MT	7.000	4,500	8,000	19	.412	38.0	4.3	398	45	531	60	1,151	130
P321S_ _0070MTL	7.000	4,500	8,000	24	.933	38.0	4.3	398	45	531	60	1,151	130
P321S_ _0080MT	8.000	4,500	8,000	19	.404	36.5	4.1	354	40	443	50	885	100
P321S_ _0080MTL	8.000	4,500	8,000	24	.914	36.5	4.1	354	40	443	50	885	100
P321S_ _0100MT	10.00	4,500	8,000	19	.396	35.0	4.0	266	30	443	50	885	100
P321S_ _0100MTL	10.00	4,500	8,000	24	.895	35.0	4.0	266	30	443	50	885	100
P322 with Motor Mounting Plate													
P322S_ _0150MT	15.00	4,500	8,000	14	.143	39.7	4.5	266	30	443	50	1,082	122
P322S_ _0150MTL	15.00	4,500	8,000	19	.455	39.7	4.5	266	30	443	50	1,082	122
P322S_ _0160MT	16.00	4,500	8,000	14	.143	39.7	4.5	398	45	575	65	1,151	130
P322S_ _0160MTL	16.00	4,500	8,000	19	.502	39.7	4.5	398	45	575	65	1,151	130
P322S_ _0200MT	20.00	4,500	8,000	14	.123	39.8	4.5	398	45	575	65	1,151	130
P322S_ _0200MTL	20.00	4,500	8,000	19	.502	39.8	4.5	398	45	575	65	1,151	130
P322S_ _0250MT	25.00	4,500	8,000	14	.121	40.7	4.6	398	45	575	65	1,151	130
P322S_ _0250MTL	25.00	4,500	8,000	19	.455	40.7	4.6	398	45	575	65	1,151	130
P322S_ _0280MT	28.00	4,500	8,000	14	.108	39.5	4.5	398	45	575	65	1,151	130
P322S_ _0280MTL	28.00	4,500	8,000	19	.412	39.5	4.5	398	45	575	65	1,151	130
P322S_ _0320MT	32.00	4,500	8,000	14	.137	35.9	4.1	354	40	443	50	885	100
P322S_ _0320MTL	32.00	4,500	8,000	19	.502	35.9	4.1	354	40	443	50	885	100
P322S_ _0350MT	35.00	4,500	8,000	14	.107	40.5	4.6	398	45	575	65	1,151	130
P322S_ _0350MTL	35.00	4,500	8,000	19	.412	40.5	4.6	398	45	575	65	1,151	130
P322S_ _0400MT	40.00	4,500	8,000	14	.099	38.8	4.4	398	45	575	65	1,151	130
P322S_ _0400MTL	40.00	4,500	8,000	19	.396	38.8	4.4	398	45	575	65	1,151	130
P322S_ _0500MT	50.00	4,500	8,000	14	.099	40.0	4.5	398	45	575	65	1,151	130
P322S_ _0500MTL	50.00	4,500	8,000	19	.396	40.0	4.5	398	45	575	65	1,151	130
P322S_ _0700MT	70.00	4,500	8,000	14	.098	36.9	4.2	398	45	531	60	1,151	130
P322S_ _0700MTL	70.00	4,500	8,000	19	.396	36.9	4.2	398	45	531	60	1,151	130
P322S_ _1000MT	100.0	4,500	8,000	14	.098	34.5	3.9	266	30	443	50	885	100
P322S_ _1000MTL	100.0	4,500	8,000	19	.396	34.5	3.9	266	30	443	50	885	100

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness C_2		Output Torque					
								Nominal [1] T_{2N}		Acceleration T_{2B}		Peak [2] T_{2PEAK}	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD⁶ mm	J_1 10^{-4} kgcm²	in.lbs. per arcmin	Nm	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
P421 with Motor Mounting Plate													
P421S_ _0030MT	3.000	3,000	5,500	24	1.56	100.6	11.4	443	50	885	100	2,124	240
P421S_ _0030MTL	3.000	3,000	5,500	32	3.76	100.6	11.4	443	50	885	100	2,124	240
P421S_ _0040MT	4.000	3,300	6,000	24	1.17	100.8	11.4	752	85	1,062	120	2,124	240
P421S_ _0040MTL	4.000	3,300	6,000	32	3.54	100.8	11.4	752	85	1,062	120	2,124	240
P421S_ _0050MT	5.000	3,700	6,500	24	1.07	100.2	11.3	752	85	1,062	120	2,124	240
P421S_ _0050MTL	5.000	3,700	6,500	32	3.13	100.2	11.3	752	85	1,062	120	2,124	240
P421S_ _0070MT	7.000	4,000	7,000	24	.933	87.7	9.9	752	85	974	110	2,124	240
P421S_ _0070MTL	7.000	4,000	7,000	32	2.83	87.7	9.9	752	85	974	110	2,124	240
P421S_ _0080MT	8.000	4,000	7,000	24	.914	83.0	9.4	708	80	885	100	1,770	200
P421S_ _0080MTL	8.000	4,000	7,000	32	2.76	83.0	9.4	708	80	885	100	1,770	200
P421S_ _0100MT	10.00	4,000	7,000	24	.895	79.0	8.9	531	60	885	100	1,770	200
P421S_ _0100MTL	10.00	4,000	7,000	32	2.69	79.0	8.9	531	60	885	100	1,770	200
P422 with Motor Mounting Plate													
P422S_ _0150MT	15.00	3,700	6,500	19	.519	92.2	10.4	443	50	885	100	2,124	240
P422S_ _0150MTL	15.00	3,700	6,500	24	1.07	92.2	10.4	443	50	885	100	2,124	240
P422S_ _0160MT	16.00	3,700	6,500	19	.519	92.2	10.4	752	85	1,062	120	2,124	240
P422S_ _0160MTL	16.00	3,700	6,500	24	1.17	92.2	10.4	752	85	1,062	120	2,124	240
P422S_ _0200MT	20.00	4,000	7,000	19	.467	92.1	10.4	752	85	1,062	120	2,124	240
P422S_ _0200MTL	20.00	4,000	7,000	24	1.17	92.1	10.4	752	85	1,062	120	2,124	240
P422S_ _0250MT	25.00	4,000	7,000	19	.463	94.5	10.7	752	85	1,062	120	2,124	240
P422S_ _0250MTL	25.00	4,000	7,000	24	1.07	94.5	10.7	752	85	1,062	120	2,124	240
P422S_ _0280MT	28.00	4,500	8,000	19	.422	90.4	10.2	752	85	1,062	120	2,124	240
P422S_ _0280MTL	28.00	4,500	8,000	24	.933	90.4	10.2	752	85	1,062	120	2,124	240
P422S_ _0320MT	32.00	3,700	6,500	19	.505	81.6	9.2	708	80	885	100	1,770	200
P422S_ _0320MTL	32.00	3,700	6,500	24	1.07	81.6	9.2	708	80	885	100	1,770	200
P422S_ _0350MT	35.00	4,500	8,000	19	.420	93.4	10.6	752	85	1,062	120	2,124	240
P422S_ _0350MTL	35.00	4,500	8,000	24	.933	93.4	10.6	752	85	1,062	120	2,124	240
P422S_ _0400MT	40.00	4,500	8,000	19	.401	89.3	10.1	752	85	1,062	120	2,124	240
P422S_ _0400MTL	40.00	4,500	8,000	24	.895	89.3	10.1	752	85	1,062	120	2,124	240
P422S_ _0500MT	50.00	4,500	8,000	19	.400	92.6	10.5	752	85	1,062	120	2,124	240
P422S_ _0500MTL	50.00	4,500	8,000	24	.895	92.6	10.5	752	85	1,062	120	2,124	240
P422S_ _0700MT	70.00	4,500	8,000	19	.398	85.0	9.6	752	85	974	110	2,124	240
P422S_ _0700MTL	70.00	4,500	8,000	24	.895	85.0	9.6	752	85	974	110	2,124	240
P422S_ _1000MT	100.0	4,500	8,000	19	.398	77.9	8.8	531	60	885	100	1,770	200
P422S_ _1000MTL	100.0	4,500	8,000	24	.895	77.9	8.8	531	60	885	100	1,770	200

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead		Continuous	Cyclic			C_2		T_{2N}		T_{2B}		T_{2PEAK}	
	i	RPM (n_1)		øD[6] mm	J_1 10^{-4} kgcm²	in.lbs. per arcmin	Nm	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
P521 with Motor Mounting Plate													
P521S_ _0030MT	3.000	2,500	4,500	32	3.76	271.5	30.7	1,062	120	1,770	200	3,683	416
P521S_ _0030MTL	3.000	2,500	4,500	38	13.01	271.5	30.7	1,062	120	1,770	200	3,683	416
P521S_ _0040MT	4.000	3,000	5,000	32	3.54	260.3	29.4	1,859	210	2,655	300	4,910	555
P521S_ _0040MTL	4.000	3,000	5,000	38	8.29	260.3	29.4	1,859	210	2,655	300	4,910	555
P521S_ _0050MT	5.000	3,500	6,000	32	3.13	260.5	29.4	1,859	210	2,655	300	5,310	600
P521S_ _0050MTL	5.000	3,500	6,000	38	6.76	260.5	29.4	1,859	210	2,655	300	5,310	600
P521S_ _0070MT	7.000	3,700	6,500	32	2.83	240.2	27.1	1,859	210	2,390	270	5,310	600
P521S_ _0070MTL	7.000	3,700	6,500	38	7.45	240.2	27.1	1,859	210	2,390	270	5,310	600
P521S_ _0080MT	8.000	3,700	6,500	32	2.76	225.0	25.4	1,770	200	2,213	250	4,425	500
P521S_ _0080MTL	8.000	3,700	6,500	38	7.19	225.0	25.4	1,770	200	2,213	250	4,425	500
P521S_ _0100MT	10.00	3,700	6,500	32	2.69	218.2	24.7	1,239	140	2,213	250	4,425	500
P521S_ _0100MTL	10.00	3,700	6,500	38	6.94	218.2	24.7	1,239	140	2,213	250	4,425	500
P522 with Motor Mounting Plate													
P522S_ _0150MT	15.00	3,300	6,000	24	1.22	241.5	27.3	1,062	120	1,770	200	3,683	416
P522S_ _0150MTL	15.00	3,300	6,000	32	3.13	241.5	27.3	1,062	120	1,770	200	3,683	416
P522S_ _0160MT	16.00	3,300	6,000	24	1.22	241.5	27.3	1,859	210	2,655	300	4,910	555
P522S_ _0160MTL	16.00	3,300	6,000	32	3.54	241.5	27.3	1,859	210	2,655	300	4,910	555
P522S_ _0200MT	20.00	3,700	6,500	24	1.10	241.3	27.3	1,859	210	2,655	300	4,910	555
P522S_ _0200MTL	20.00	3,700	6,500	32	3.54	241.3	27.3	1,859	210	2,655	300	4,910	555
P522S_ _0250MT	25.00	3,700	6,500	24	1.08	248.0	28.0	1,859	210	2,655	300	5,310	600
P522S_ _0250MTL	25.00	3,700	6,500	32	3.13	248.0	28.0	1,859	210	2,655	300	5,310	600
P522S_ _0280MT	28.00	4,000	7,000	24	.963	236.3	26.7	1,859	210	2,655	300	4,910	555
P522S_ _0280MTL	28.00	4,000	7,000	32	2.83	236.3	26.7	1,859	210	2,655	300	4,910	555
P522S_ _0320MT	32.00	3,300	6,000	24	1.17	222.2	25.1	1,770	200	2,213	250	4,425	500
P522S_ _0320MTL	32.00	3,300	6,000	32	3.54	222.2	25.1	1,770	200	2,213	250	4,425	500
P522S_ _0350MT	35.00	4,000	7,000	24	.954	244.6	27.6	1,859	210	2,655	300	5,310	600
P522S_ _0350MTL	35.00	4,000	7,000	32	2.83	244.6	27.6	1,859	210	2,655	300	5,310	600
P522S_ _0400MT	40.00	4,000	7,000	24	.909	232.0	26.2	1,859	210	2,655	300	4,910	555
P522S_ _0400MTL	40.00	4,000	7,000	32	2.69	232.0	26.2	1,859	210	2,655	300	4,910	555
P522S_ _0500MT	50.00	4,000	7,000	24	.905	241.6	27.3	1,859	210	2,655	300	5,310	600
P522S_ _0500MTL	50.00	4,000	7,000	32	2.69	241.6	27.3	1,859	210	2,655	300	5,310	600
P522S_ _0700MT	70.00	4,000	7,000	24	.902	232.9	26.3	1,859	210	2,390	270	5,310	600
P522S_ _0700MTL	70.00	4,000	7,000	32	2.69	232.9	26.3	1,859	210	2,390	270	5,310	600
P522S_ _1000MT	100.0	4,000	7,000	24	.900	215.2	24.3	1,239	140	2,213	250	4,425	500
P522S_ _1000MTL	100.0	4,000	7,000	32	2.69	215.2	24.3	1,239	140	2,213	250	4,425	500

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead		Continuous RPM (n_1)	Cyclic	øD⁶	J_1	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
	i			mm	10^{-4} kgcm²								
P721 with Motor Mounting Plate													
P721S_ _0030MT	3.000	2,200	3,700	38	13.01	484.1	54.7	2,478	280	4,425	500	9,168	1,036
P721S_ _0030MTC	3.000	3,400	3,700	38	16.01	484.1	54.7	2,478	280	4,425	500	9,168	1,036
P721S_ _0030MTL	3.000	2,200	3,700	48	57.29	484.1	54.7	2,478	280	4,425	500	9,168	1,036
P721S_ _0040MT	4.000	2,500	4,500	38	8.29	485.5	54.9	3,894	440	6,195	700	12,224	1,381
P721S_ _0040MTC	4.000	3,600	4,500	38	11.29	485.5	54.9	3,894	440	6,195	700	12,224	1,381
P721S_ _0040MTL	4.000	2,500	4,500	48	33.45	485.5	54.9	3,894	440	6,195	700	12,224	1,381
P721S_ _0050MT	5.000	3,000	5,500	38	6.76	481.2	54.4	3,894	440	6,195	700	12,390	1,400
P721S_ _0050MTC	5.000	4,200	5,500	38	9.76	481.2	54.4	3,894	440	6,195	700	12,390	1,400
P721S_ _0050MTL	5.000	3,000	5,500	48	26.63	481.2	54.4	3,894	440	6,195	700	12,390	1,400
P721S_ _0070MT	7.000	3,300	6,000	38	7.45	470.3	53.1	3,894	440	5,753	650	11,117	1,256
P721S_ _0070MTC	7.000	4,700	6,000	38	10.45	470.3	53.1	3,894	440	5,753	650	11,117	1,256
P721S_ _0070MTL	7.000	3,300	6,000	48	19.84	470.3	53.1	3,894	440	5,753	650	11,117	1,256
P721S_ _0080MT	8.000	3,300	6,000	38	7.19	457.2	51.7	3,540	400	4,425	500	8,850	1,000
P721S_ _0080MTC	8.000	5,000	6,000	38	10.19	457.2	51.7	3,540	400	4,425	500	8,850	1,000
P721S_ _0080MTL	8.000	3,300	6,000	48	18.60	457.2	51.7	3,540	400	4,425	500	8,850	1,000
P721S_ _0100MT	10.00	3,300	6,000	38	6.94	431.4	48.7	2,655	300	4,425	500	8,850	1,000
P721S_ _0100MTC	10.00	5,500	6,000	38	9.94	431.4	48.7	2,655	300	4,425	500	8,850	1,000
P721S_ _0100MTL	10.00	3,300	6,000	48	17.43	431.4	48.7	2,655	300	4,425	500	8,850	1,000
P722 with Motor Mounting Plate													
P722S_ _0150MT	15.00	3,000	5,000	32	3.04	470.0	53.1	2,478	280	4,425	500	9,168	1,036
P722S_ _0150MTL	15.00	3,000	5,000	38	6.76	470.0	53.1	2,478	280	4,425	500	9,168	1,036
P722S_ _0160MT	16.00	3,000	5,000	32	3.63	471.0	53.2	3,894	440	6,195	700	12,224	1,381
P722S_ _0160MTL	16.00	3,000	5,000	38	8.29	471.0	53.2	3,894	440	6,195	700	12,224	1,381
P722S_ _0200MT	20.00	3,500	6,000	32	3.20	471.0	53.2	3,894	440	6,195	700	12,224	1,381
P722S_ _0200MTL	20.00	3,500	6,000	38	8.29	471.0	53.2	3,894	440	6,195	700	12,224	1,381
P722S_ _0250MT	25.00	3,500	6,000	32	3.14	472.0	53.3	3,894	440	6,195	700	12,390	1,400
P722S_ _0250MTL	25.00	3,500	6,000	38	6.76	472.0	53.3	3,894	440	6,195	700	12,390	1,400
P722S_ _0280MT	28.00	3,700	6,500	32	2.92	466.5	52.7	3,894	440	6,195	700	12,224	1,381
P722S_ _0280MTL	28.00	3,700	6,500	38	7.45	466.5	52.7	3,894	440	6,195	700	12,224	1,381
P722S_ _0320MT	32.00	3,000	5,000	32	3.46	456.2	51.5	3,540	400	4,425	500	8,850	1,000
P722S_ _0320MTL	32.00	3,000	5,000	38	8.29	456.2	51.5	3,540	400	4,425	500	8,850	1,000
P722S_ _0350MT	35.00	3,700	6,500	32	2.89	469.1	53.0	3,894	440	6,195	700	12,390	1,400
P722S_ _0350MTL	35.00	3,700	6,500	38	7.45	469.1	53.0	3,894	440	6,195	700	12,390	1,400
P722S_ _0400MT	40.00	3,700	6,500	32	2.74	460.9	52.1	3,894	440	6,195	700	12,224	1,381
P722S_ _0400MTL	40.00	3,700	6,500	38	6.94	460.9	52.1	3,894	440	6,195	700	12,224	1,381
P722S_ _0500MT	50.00	3,700	6,500	32	2.72	465.5	52.6	3,894	440	6,195	700	12,390	1,400
P722S_ _0500MTL	50.00	3,700	6,500	38	6.94	465.5	52.6	3,894	440	6,195	700	12,390	1,400
P722S_ _0700MT	70.00	3,700	6,500	32	2.71	465.6	52.6	3,894	440	5,753	650	11,117	1,256
P722S_ _0700MTL	70.00	3,700	6,500	38	6.94	465.6	52.6	3,894	440	5,753	650	11,117	1,256
P722S_ _1000MT	100.0	3,700	6,500	32	2.71	429.5	48.5	2,655	300	4,425	500	8,850	1,000
P722S_ _1000MTL	100.0	3,700	6,500	38	6.94	429.5	48.5	2,655	300	4,425	500	8,850	1,000

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Selection Data

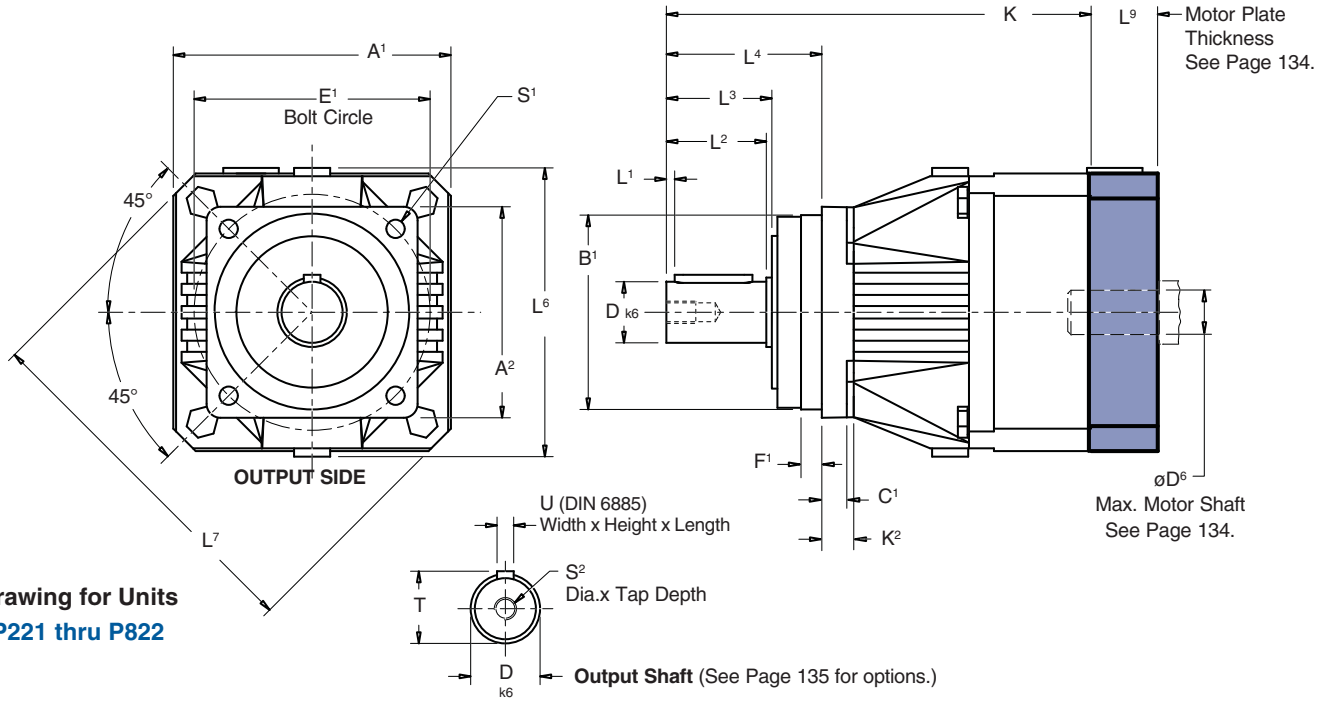
Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead		Continuous	Cyclic			C_2		T_{2N}		T_{2B}		T_{2PEAK}	
	i	RPM (n_1)		øD[6] mm	J_1 10^{-4} kgcm²	in.lbs. per arcmin	Nm	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
P821 with Motor Mounting Plate													
P821S_ _0030MT	3.000	1,800	3,000	48	57.29	1,463.5	165.4	7,080	800	10,620	1,200	17,049	1,926
P821S_ _0030MTC	3.000	3,000	3,000	48	73.29	1,463.5	165.4	7,080	800	10,620	1,200	17,049	1,926
P821S_ _0040MT	4.000	2,200	3,500	48	33.45	1,546.5	174.7	7,080	800	14,160	1,600	22,732	2,569
P821S_ _0040MTC	4.000	3,200	3,500	48	49.45	1,546.5	174.7	7,080	800	14,160	1,600	22,732	2,569
P821S_ _0050MT	5.000	2,500	4,000	48	26.63	1,553.9	175.6	8,850	1,000	14,160	1,600	28,320	3,200
P821S_ _0050MTC	5.000	3,750	4,000	48	42.63	1,553.9	175.6	8,850	1,000	14,160	1,600	28,320	3,200
P821S_ _0070MT	7.000	2,800	4,500	48	19.84	1,477.5	167.0	8,850	1,000	12,390	1,400	24,878	2,811
P821S_ _0070MTC	7.000	4,500	4,500	48	35.84	1,477.5	167.0	8,850	1,000	12,390	1,400	24,878	2,811
P821S_ _0080MT	8.000	2,800	4,500	48	18.60	1,412.6	159.6	7,080	800	10,620	1,200	21,240	2,400
P821S_ _0080MTC	8.000	5,000	4,500	48	34.60	1,412.6	159.6	7,080	800	10,620	1,200	21,240	2,400
P821S_ _0100MT	10.00	2,800	4,500	48	17.43	1,321.9	149.4	6,195	700	10,620	1,200	21,240	2,400
P821S_ _0100MTC	10.00	5,500	4,500	48	33.43	1,321.9	149.4	6,195	700	10,620	1,200	21,240	2,400
P822 with Motor Mounting Plate													
P822S_ _0150MT	15.00	2,500	4,500	38	8.85	1,470.7	166.2	7,080	800	10,620	1,200	17,049	1,926
P822S_ _0150MTC	15.00	3,300	4,500	38	11.85	1,470.7	166.2	7,080	800	10,620	1,200	17,049	1,926
P822S_ _0150MTL	15.00	2,500	4,500	48	26.63	1,470.7	166.2	7,080	800	10,620	1,200	17,049	1,926
P822S_ _0160MT	16.00	2,500	4,500	38	8.85	1,470.7	166.2	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0160MTC	16.00	3,300	4,500	38	11.85	1,470.7	166.2	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0160MTL	16.00	2,500	4,500	48	33.45	1,470.7	166.2	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0200MT	20.00	3,000	5,500	38	7.31	1,468.3	165.9	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0200MTC	20.00	3,600	5,500	38	10.31	1,468.3	165.9	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0200MTL	20.00	3,000	5,500	48	33.45	1,468.3	165.9	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0250MT	25.00	3,000	5,500	38	7.04	1,502.5	169.8	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0250MTC	25.00	4,000	5,500	38	10.04	1,502.5	169.8	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0250MTL	25.00	3,000	5,500	48	26.63	1,502.5	169.8	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0280MT	28.00	3,300	6,000	38	7.70	1,461.8	165.2	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0280MTC	28.00	4,250	6,000	38	10.70	1,461.8	165.2	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0280MTL	28.00	3,300	6,000	48	19.84	1,461.8	165.2	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0320MT	32.00	2,500	4,500	38	8.06	1,404.4	158.7	7,080	800	10,620	1,200	21,240	2,400
P822S_ _0320MTC	32.00	3,300	4,500	38	11.06	1,404.4	158.7	7,080	800	10,620	1,200	21,240	2,400
P822S_ _0320MTL	32.00	2,500	4,500	48	33.45	1,404.4	158.7	7,080	800	10,620	1,200	21,240	2,400
P822S_ _0350MT	35.00	3,300	6,000	38	7.56	1,498.1	169.3	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0350MTC	35.00	4,100	6,000	38	10.56	1,498.1	169.3	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0350MTL	35.00	3,300	6,000	48	19.84	1,498.1	169.3	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0400MT	40.00	3,300	6,000	38	7.06	1,436.6	162.3	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0400MTC	40.00	5,000	6,000	38	10.06	1,436.6	162.3	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0400MTL	40.00	3,300	6,000	48	17.43	1,436.6	162.3	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0500MT	50.00	3,300	6,000	38	7.00	1,481.1	167.4	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0500MTC	50.00	5,000	6,000	38	10.00	1,481.1	167.4	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0500MTL	50.00	3,300	6,000	48	17.43	1,481.1	167.4	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0700MT	70.00	3,300	6,000	38	6.95	1,454.6	164.4	8,850	1,000	12,390	1,400	24,878	2,811
P822S_ _0700MTC	70.00	5,000	6,000	38	9.95	1,454.6	164.4	8,850	1,000	12,390	1,400	24,878	2,811
P822S_ _0700MTL	70.00	3,300	6,000	48	17.43	1,454.6	164.4	8,850	1,000	12,390	1,400	24,878	2,811
P822S_ _1000MT	100.0	3,300	6,000	38	6.93	1,312.8	148.3	6,195	700	10,620	1,200	21,240	2,400
P822S_ _1000MTC	100.0	5,000	6,000	38	9.93	1,312.8	148.3	6,195	700	10,620	1,200	21,240	2,400
P822S_ _1000MTL	100.0	3,300	6,000	48	17.43	1,312.8	148.3	6,195	700	10,620	1,200	21,240	2,400

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Dimensional Data



Drawing for Units
P221 thru P822

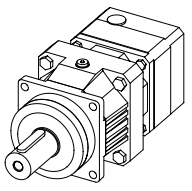
Table No. 1 **"P" Series – Precision Planetary Gearhead Dimensions (mm/inches)**

Unit	A^1	A^2	B^1 h6	C^1	D k6	E^1	F^1	K^2	L^1	L^2	L^3	L^4	L^6	L^7	S^1	S^2	T	U
P221/P222	55	55	50 +.000/-.019	6	12 +.012/+.001	63	7	–	2	22	24	36	62	74	5.5	M4x10	13.5	A4x4x18
	2.17	2.17	1.969 +.0000/-.0007	.24		2.48	.28	–	.08	.87	.94	1.42	2.44	2.91	.22		.53	
P321/P322	72	72	60 +.000/-.019	7	16 +.012/+.001	75	7.5	–	2	28	30	48	79	92	5.5	M5x12.5	18	A5x5x22
	2.83	2.83	2.362 +.0000/-.0007	.28		2.95	.30	–	.08	1.10	1.18	1.89	3.11	3.62	.22		.71	
P421/P422	98	76	70 +.000/-.019	9	22 +.015/+.002	85	7.5	12	3	36	38	56	98	130	6.6	M8x19	24.5	A6x6x28
	3.86	2.99	2.756 +.0000/-.0007	.35		3.35	.30	.47	.12	1.42	1.50	2.20	3.86	5.12	.26		.96	
P521/P522	115	101	90 +.000/-.022	10	32 +.018/+.002	120	15	14	3	58	60	88	121	149	9	M12x28	35	A10x8x50
	4.53	3.98	3.543 +.0000/-.0009	.39		4.72	.59	.55	.12	14.09	2.36	3.46	4.76	5.87	.35		1.38	
P721/P722	145	145	130 +.000/-.025	15	40 +.018/+.002	165	3.5	–	4	82	85	112	145	190	11	M16x36	43	A12x8x70
	5.71	5.71	5.118 +.000/-.001	.59		6.50	.14	–	.16	3.23	3.35	4.41	5.71	7.48	.43		1.69	
P821/P822	190	190	160 +.000/-.025	15	55 +.021/+.002	215	10	–	6	82	85	112	190	250	13.5	M20x42	59	A16x10x70
	7.48	7.48	6.299 +.000/-.001	.59		8.46	.39	–	.24	3.23	3.35	4.41	7.48	9.84	.53		2.32	

Part No. Explanation

P 7 2 1 S P R 0030 MT C

- **C** – Option for ServoCool
- **MT** – Motor Plate with TriAdapt Coupling
- **0030** – Ratio (**0030** = 3.0:1)
- **R** – Normal Bearing
- **D** – Reinforced Bearings-Axial
- **Z** – Reinforced Bearings-Radial
- **G** – Shaft – no Key
- **P** – Output Shaft with Key
- **V** – Splined Shaft
- **S** – Standard Housing
- **2** – No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- **1** – Generation Number
- **21** – Unit No.
- **P 721** – ClassicLine ServoFit Precision Planetary Gearhead


Typical 2 Stage Configuration

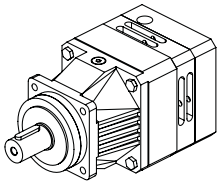
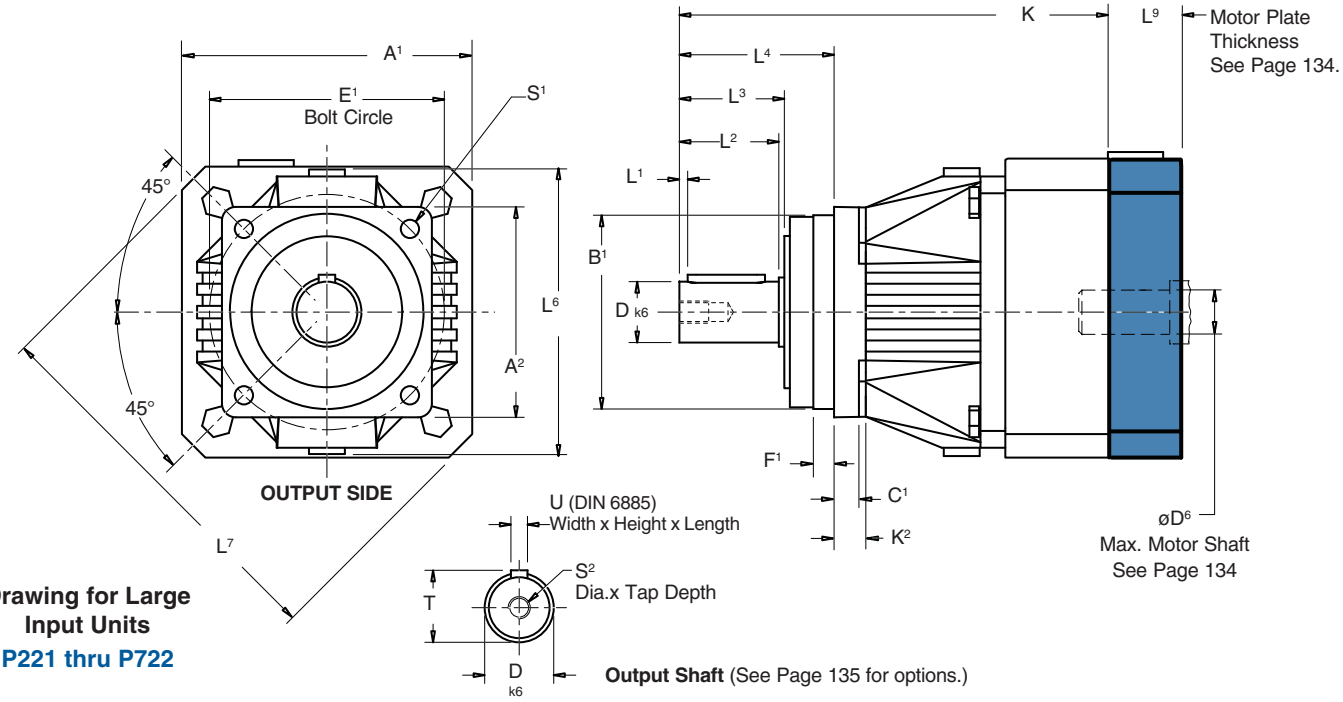

Typical ServoCool Configuration

Table No. 2

K Dimension					
Standard			ServoCool		
Unit	mm	inches	Unit	mm	inches
P221	105.5	4.15	–		
P222	146.5	5.77	–		
P321	135	5.31	–		
P322	177	6.97	–		
P421	153	6.02	–		
P422	200.5	7.89	–		
P521	193	7.60	–		
P522	242.5	9.55	–		
P721	242	9.53	**P721_C**	272	10.71
P722	294	11.57	–		
P821	283	11.14	**P821_C**	331	13.03
P822	350.5	13.80	**P822_C**	380.5	14.98

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. (See Page 134.)

"P" Series–ClassicLine–Large Input ServoFit® Precision Planetary Gearhead Dimensional Data



Drawing for Large Input Units
P221 thru P722

Output Shaft (See Page 135 for options.)

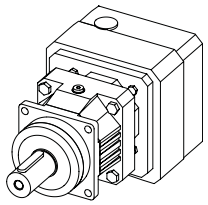
Table No. 1 **"P" Series – Large Input – Precision Planetary Gearhead Dimensions (mm/inches)**

Unit	A^1	A^2	B^1 h6	C^1	D k6	E^1	F^1	K^2	L^1	L^2	L^3	L^4	L^6	L^7	S^1	S^2	T	U
P221/P222_L	72	55	50 +.000/-.019	6	12 +.012/+.001	63	7	–	2	22	24	36	62	92	5.5	M4x10	13.5	A4x4x18
	2.83	2.17	1.969 +.0000/-.0007	.24		2.48	.28	–	.08	.87	.94	1.42	2.44	3.62	.22		.53	
P321/P322_L	98	72	60 +.000/-.019	7	16 +.012/+.001	75	7.5	–	2	28	30	48	79	130	5.5	M5x12.5	18	A5x5x22
	3.86	2.83	2.362 +.0000/-.0007	.28		2.95	.30	–	.08	1.10	1.18	1.89	3.11	5.12	.22		.71	
P421/P422_L	115	76	70 +.000/-.019	9	22 +.015/+.002	85	7.5	12	3	36	38	56	98	149	6.6	M8x19	24.5	A6x6x28
	4.53	2.99	2.756 +.0000/-.0007	.35		3.35	.30	.47	.12	1.42	1.50	2.20	3.86	5.87	.26		.96	
P521/P522_L	145	101	90 +.000/-.022	10	32 +.018/+.002	120	15	14	3	58	60	88	121	190	9	M12x28	35	A10x8x50
	5.71	3.98	3.543 +.0000/-.0009	.39		4.72	.59	.55	.12	14.09	2.36	3.46	4.76	7.48	.35		1.38	
P721/P722_L	190	145	130 +.000/-.025	15	40 +.018/+.002	165	3.5	–	4	82	85	112	145	250	11	M16x36	43	A12x8x70
	7.48	5.71	5.118 +.000/-.001	.59		6.50	.14	–	.16	3.23	3.35	4.41	5.71	9.84	.43		1.69	

Part No. Explanation

P 4 2 1 S P R 0030 MT L

- **L** – Large Input
- **MT** – Motor Plate with TriAdapt Coupling
- **0030** – Ratio (**0030** = 3.0:1)
- **R** – Normal Bearing
- **D** – Reinforced Bearings-Axial
- **Z** – Reinforced Bearings-Radial
- **G** – Shaft – no Key
- **P** – Output Shaft with Key
- **V** – Splined Shaft
- **S** – Standard Housing
- **1** – No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- **2** – Generation Number
- **4** – Unit No.
- **P** – ClassicLine ServoFit Precision Planetary Gearhead



Typical 2 Stage Configuration
Large Input

Table No. 2

Unit	K	
	mm	inches
P221_L	122	4.80
P222_L	163	6.42
P321_L	139	5.47
P322_L	181	7.13
P421_L	164.5	6.48
P422_L	209	8.23
P521_L	207	8.15
P522_L	256.5	10.10
P721_L	259	10.20
P722_L	311	12.24

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. (See Page 134.)

"PA" Series–Advanced ClassicLine ServoFit® Precision Planetary Gearhead Performance Specification Overview

			PA321 PA322	PA421 PA422	PA521 PA522	PA721 PA722	P821 P822
Acceleration Torque	T_{2B}	in.lbs.	575	1052	2,655	6,195	14,160
Maximum		Nm	65	120	300	700	1,600
Nominal Output Torque [1]	T_{2N}	in.lbs.	398	752	1,858	3,894	8,850
		Nm	45	85	210	440	1,000
Input Speed Maximum	n_{1MAX}	Continuous	4,500	4,000 4,500	3,700 4,000	3,300 3,700	2,800 3,300
		Cyclic	8,000	7,000 8,000	6,500 7,000	6,000 6,500	4,500 6,000
ServoCool	n_{1MAX}	Continuous	–	–	–	5,500 –	5,500 5,000
Input RPM Maximum		Cyclic	–	–	–	6,000 –	4,500 6,000
Torsional Backlash [2]	$\Delta\varphi$	arcmin	≤2 ≤3	≤2 ≤3	≤1 ≤2	≤1 ≤2	≤1 ≤2
Torsional Stiffness	C_2	in.lbs./arcmin	44	100	266	486	1,557
		Nm/arcmin	5	11	33	55	176
Axial Load Max.	F_{2AMAX}	lbs.	315	506	788	1,013	1,688
		N	1,400	2,250	3,500	4,500	7,500
Radial Load Max. [3]	F_{2RMAX}	lbs.	619	1,012	1,575	2,025	3,375
		N	2,750	4,500	7,000	9,000	15,000
Tilting Moment Max. [3]	T_{2KMAX}	in.lbs.	2,044	3,885	7,496	11,629	23,497
		Nm	231	439	847	1,314	2,655
Efficiency (at Nominal Torque)	h	%	97% 95%	97% 95%	97% 95%	97% 95%	97% 95%
Weight	m	pounds	6 8	9 12	14 19	27 33	57 71
		kg	2.6 3.5	4.0 5.3	6.5 8.5	12 15	26 32
Noise Level	L_{PA}	dB(A) [4]	≤61 ≤61	≤62 ≤60	≤63 ≤61	≤64 ≤62	≤65 ≤63
Balance Quality			Q 2.5 (Quality Class-2.5 millimeters per second)				
Lubrication			Synthetic Oil – Lubricated for Life				
Degree of Protection			IP65 - FKM Shaft Seals				
Mounting Position			Unrestricted				
Direction of Rotation			Input and Output Rotate the SAME Direction.				
Ambient Temperature			0°C to +40°C (104° F) Other temperatures, contact STOBER Drives.				
Finish			Black (Standard), Washdown, Food and Beverage Options Available				
Lifetime.[5]	L_h	hours	L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 and > 1.00 L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25 and < 1.50 L_h > 30,000 hours if T_{2K}/T_{2A} > 1.5				
Warranty			5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)				

1) Ratings based on input speed (n_1) of 2000 RPM.
For torque at higher input speeds (T_{2NX}) solve the formula, where n_1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

2) Tested at 1.5% of nominal torque and recorded on the input side of the gearhead.

3) Rating based on output speed (n_2) of 100 RPM. For values at other speeds see Page 136.

4) Measurement at one (1) meter distance with input speed (n_1) of 2000 RPM.

5) T_{2A} equals actual tilting moment of the application. See Page 136 for calculation details.

Refer to Page 148 for ServoFit Precision Planetary Gearhead Selection Procedure.

"PA" Series–Advanced ClassicLine ServoFit® Precision Planetary Gearhead Features

The "PA" Series–ClassicLine of ServoFit Precision Planetary Gearheads feature HeliCamber® gearing, FlexiAdapt® motor adapter system and other features which make them the most accurate, efficient, and lowest backlash planetary gearheads available. HeliCamber® gear technology provides minimum wear, low backlash and low noise. All units are lubricated for life with synthetic oil and sealed to IP65 standards to prevent lubricant contamination.

Some of these features are:

- Lowest Backlash on the Market
- Advanced Gear Technology
- Quiet Running
- 5 Year Limited Warranty (2 years on bearings, seals, etc.)
- Readily Attaches to Any Servo Motor (IEC, NEMA, or customized motor plates*)
- High Torsional Stiffness
- 95 to 97% Efficiency
- Ground and honed gearing

* Maximum 10 working days for custom motor plates.

The FlexiAdapt® motor coupling is designed for accurate and precise motor installation. The integrated thermal expansion feature in the shape of a bellows compensates for linear expansion of the motor shaft.

The FlexiAdapt® motor shaft adapter system allows installation of motor in minutes without special tools.

Motor plate pilot toleranced to fit your motor for precise concentricity

Backlash ≤ 1 arcminute – Precision selection of parts ensure optimal performance without binding gear teeth – resulting in a more accurate and smooth direct drive

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

Magnetic oil filtration

Adapter bushings to fit all motor shafts – no key required

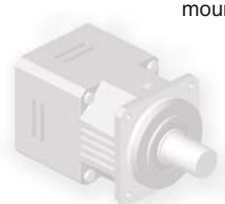
Double row ball bearings on the output for high radial and axial capacity while maintaining efficiency.

Ring gear machined integral to the housing – not welded or pressed in – provides greater concentricity and eliminates speed fluctuation

High quality gearing provided by case-hardened and ground sun and planet gears and honed ring gear.

Oversized single-piece planet carrier made of high-tensile material assure the highest torsional stiffness while straddle mounted bearings minimize misalignment.

FKM seals for the smallest possible diameter–reducing friction and heat buildup, increasing efficiency, and allowing continuous duty without additional cooling.



Highest running accuracy and precision ensured by single piece housing made from high-tensile tempered ductile iron with the additional characteristics of dissipating heat, noise dampening, and greater lubrication retention on the ring gear

Available as ServoCool in Sizes P7 and P8.

See web site for drawings.

"PA" Series–Advanced ClassicLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead		Continuous	Cyclic			C_2		T_{2N}		T_{2B}		T_{2PEAK}	
	i	RPM (n_1)		mm	10^{-4} kgcm²	in.lbs. per arcmin	Nm	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
PA321 with Motor Mounting Plate													
PA321S_ D0030MF	3.000	3,500	6,000	19	.694	44.2	5.0	266	30	443	50	1,082	122
PA321S_ D0040MF	4.000	3,700	6,500	19	.613	43.7	4.9	398	45	575	65	1,151	130
PA321S_ D0050MF	5.000	4,000	7,000	19	.565	43.2	4.9	398	45	575	65	1,151	130
PA321S_ D0070MF	7.000	4,500	8,000	19	.511	38.0	4.3	398	45	531	60	1,151	130
PA321S_ D0080MF	8.000	4,500	8,000	19	.503	36.5	4.1	354	40	443	50	885	100
PA321S_ D0100MF	10.00	4,500	8,000	19	.495	35.0	4.0	266	30	443	50	885	100
PA322 with Motor Mounting Plate													
PA322S_ D0160MF	16.00	4,500	8,000	14	.207	39.7	4.5	398	45	575	65	1,151	130
PA322S_ D0200MF	20.00	4,500	8,000	14	.187	39.8	4.5	398	45	575	65	1,151	130
PA322S_ D0250MF	25.00	4,500	8,000	14	.185	40.7	4.6	398	45	575	65	1,151	130
PA322S_ D0280MF	28.00	4,500	8,000	14	.172	39.5	4.5	398	45	575	65	1,151	130
PA322S_ D0320MF	32.00	4,500	8,000	14	.201	35.9	4.1	354	40	443	50	885	100
PA322S_ D0350MF	35.00	4,500	8,000	14	.171	40.5	4.6	398	45	575	65	1,151	130
PA322S_ D0400MF	40.00	4,500	8,000	14	.163	38.8	4.4	398	45	575	65	1,151	130
PA322S_ D0500MF	50.00	4,500	8,000	14	.163	40.0	4.5	398	45	575	65	1,151	130
PA322S_ D0700MF	70.00	4,500	8,000	14	.162	36.9	4.2	398	45	531	60	1,151	130
PA322S_ D1000MF	100.0	4,500	8,000	14	.162	34.5	3.9	266	30	443	50	885	100
PA421 with Motor Mounting Plate													
PA421S_ D0030MF	3.000	3,000	5,500	24	2.25	100.6	11.4	443	50	885	100	2,124	240
PA421S_ D0040MF	4.000	3,300	6,000	24	1.86	100.8	11.4	752	85	1,062	120	2,124	240
PA421S_ D0050MF	5.000	3,700	6,500	24	1.75	100.2	11.3	752	85	1,062	120	2,124	240
PA421S_ D0070MF	7.000	4,000	7,000	24	1.62	87.7	9.9	752	85	974	110	2,124	240
PA421S_ D0080MF	8.000	4,000	7,000	24	1.60	83.0	9.4	708	80	885	100	1,770	200
PA421S_ D0100MF	10.00	4,000	7,000	24	1.58	79.0	8.9	531	60	885	100	1,770	200
PA422 with Motor Mounting Plate													
PA422S_ D0150MF	15.00	3,700	6,500	19	.630	92.2	10.4	443	50	885	100	2,124	240
PA422S_ D0160MF	16.00	3,700	6,500	19	.630	92.2	10.4	752	85	1,062	120	2,124	240
PA422S_ D0200MF	20.00	4,000	7,000	19	.578	92.1	10.4	752	85	1,062	120	2,124	240
PA422S_ D0250MF	25.00	4,000	7,000	19	.574	94.5	10.7	752	85	1,062	120	2,124	240
PA422S_ D0280MF	28.00	4,500	8,000	19	.521	90.4	10.2	752	85	1,062	120	2,124	240
PA422S_ D0320MF	32.00	3,700	6,500	19	.616	81.6	9.2	708	80	885	100	1,770	200
PA422S_ D0350MF	35.00	4,500	8,000	19	.519	93.4	10.6	752	85	1,062	120	2,124	240
PA422S_ D0400MF	40.00	4,500	8,000	19	.500	89.3	10.1	752	85	1,062	120	2,124	240
PA422S_ D0500MF	50.00	4,500	8,000	19	.499	92.6	10.5	752	85	1,062	120	2,124	240
PA422S_ D0700MF	70.00	4,500	8,000	19	.497	85.0	9.6	752	85	974	110	2,124	240
PA422S_ D1000MF	100.0	4,500	8,000	19	.497	77.9	8.8	531	60	885	100	1,770	200

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PA" Series–Advanced ClassicLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
						C_2		Nominal [1] T_{2N}		Acceleration T_{2B}		Peak [2] T_{2PEAK}	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD[6] mm	J_1 10^{-4} kgcm²	in.lbs. per arcmin	Nm	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
PA521 with Motor Mounting Plate													
PA521S_ D0030MF	3.000	2,500	4,500	32	6.04	271.5	30.7	1,062	120	1,770	200	3,683	416
PA521S_ D0040MF	4.000	3,000	5,000	32	5.83	260.3	29.4	1,859	210	2,655	300	4,910	555
PA521S_ D0050MF	5.000	3,500	6,000	32	5.42	260.5	29.4	1,859	210	2,655	300	5,310	600
PA521S_ D0070MF	7.000	3,700	6,500	32	4.97	240.2	27.1	1,859	210	2,390	270	5,310	600
PA521S_ D0080MF	8.000	3,700	6,500	32	4.90	225.0	25.4	1,770	200	2,213	250	4,425	500
PA521S_ D0100MF	10.00	3,700	6,500	32	4.84	218.2	24.7	1,239	140	2,213	250	4,425	500
PA522 with Motor Mounting Plate													
PA522S_ D0150MF	15.00	3,300	6,000	24	1.91	241.5	27.3	1,062	120	1,770	200	3,683	416
PA522S_ D0160MF	16.00	3,300	6,000	24	1.91	241.5	27.3	1,859	210	2,655	300	4,910	555
PA522S_ D0200MF	20.00	3,700	6,500	24	1.79	241.3	27.3	1,859	210	2,655	300	4,910	555
PA522S_ D0250MF	25.00	3,700	6,500	24	1.77	248.0	28.0	1,859	210	2,655	300	5,310	600
PA522S_ D0280MF	28.00	4,000	7,000	24	1.65	236.3	26.7	1,859	210	2,655	300	4,910	555
PA522S_ D0320MF	32.00	3,300	6,000	24	1.86	222.2	25.1	1,770	200	2,213	250	4,425	500
PA522S_ D0350MF	35.00	4,000	7,000	24	1.64	244.6	27.6	1,859	210	2,655	300	5,310	600
PA522S_ D0400MF	40.00	4,000	7,000	24	1.59	232.0	26.2	1,859	210	2,655	300	4,910	555
PA522S_ D0500MF	50.00	4,000	7,000	24	1.59	241.6	27.3	1,859	210	2,655	300	5,310	600
PA522S_ D0700MF	70.00	4,000	7,000	24	1.59	232.9	26.3	1,859	210	2,390	270	5,310	600
PA522S_ D1000MF	100.0	4,000	7,000	24	1.59	215.2	24.3	1,239	140	2,213	250	4,425	500
PA721 with Motor Mounting Plate													
PA721S_ D0030MF	3.000	2,200	3,700	38	20.25	484.1	54.7	2,478	280	4,425	500	9,168	1,036
PA721S_ D0030MFC	3.000	2,200	3,700	38	23.25	484.1	54.7	2,478	280	4,425	500	9,168	1,036
PA721S_ D0040MF	4.000	2,500	4,500	38	15.53	485.5	54.9	3,894	440	6,195	700	12,224	1,381
PA721S_ D0040MFC	4.000	2,500	4,500	38	18.53	485.5	54.9	3,894	440	6,195	700	12,224	1,381
PA721S_ D0050MF	5.000	3,000	5,500	38	14.00	481.2	54.4	3,894	440	6,195	700	12,390	1,400
PA721S_ D0050MFC	5.000	3,000	5,500	38	17.00	481.2	54.4	3,894	440	6,195	700	12,390	1,400
PA721S_ D0070MF	7.000	3,300	6,000	38	12.66	470.3	53.1	3,894	440	5,753	650	11,117	1,256
PA721S_ D0070MFC	7.000	3,300	6,000	38	15.66	470.3	53.1	3,894	440	5,753	650	11,117	1,256
PA721S_ D0080MF	8.000	3,300	6,000	38	12.40	457.2	51.7	3,540	400	4,425	500	8,850	1,000
PA721S_ D0080MFC	8.000	3,300	6,000	38	15.40	457.2	51.7	3,540	400	4,425	500	8,850	1,000
PA721S_ D0100MF	10.00	3,300	6,000	38	12.15	431.4	48.7	2,655	300	4,425	500	8,850	1,000
PA721S_ D0100MFC	10.00	3,300	6,000	38	15.15	431.4	48.7	2,655	300	4,425	500	8,850	1,000
PA722 with Motor Mounting Plate													
PA722S_ D0150MF	15.00	3,000	5,000	32	5.91	471.0	53.2	2,478	280	4,425	500	9,168	1,036
PA722S_ D0160MF	16.00	3,000	5,000	32	5.91	471.0	53.2	3,894	440	6,195	700	12,224	1,381
PA722S_ D0200MF	20.00	3,500	6,000	32	5.49	471.0	53.2	3,894	440	6,195	700	12,224	1,381
PA722S_ D0250MF	25.00	3,500	6,000	32	5.42	472.0	53.3	3,894	440	6,195	700	12,390	1,400
PA722S_ D0280MF	28.00	3,700	6,500	32	5.06	466.5	52.7	3,894	440	6,195	700	12,224	1,381
PA722S_ D0320MF	32.00	3,000	5,000	32	5.74	456.2	51.5	3,540	400	4,425	500	8,850	1,000
PA722S_ D0350MF	35.00	3,700	6,500	32	5.03	469.1	53.0	3,894	440	6,195	700	12,390	1,400
PA722S_ D0400MF	40.00	3,700	6,500	32	4.88	460.9	52.1	3,894	440	6,195	700	12,224	1,381
PA722S_ D0500MF	50.00	3,700	6,500	32	4.87	465.5	52.6	3,894	440	6,195	700	12,390	1,400
PA722S_ D0700MF	70.00	3,700	6,500	32	4.86	465.6	52.6	3,894	440	5,753	650	11,117	1,256
PA722S_ D1000MF	100.0	3,700	6,500	32	4.85	429.5	48.5	2,655	300	4,425	500	8,850	1,000

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

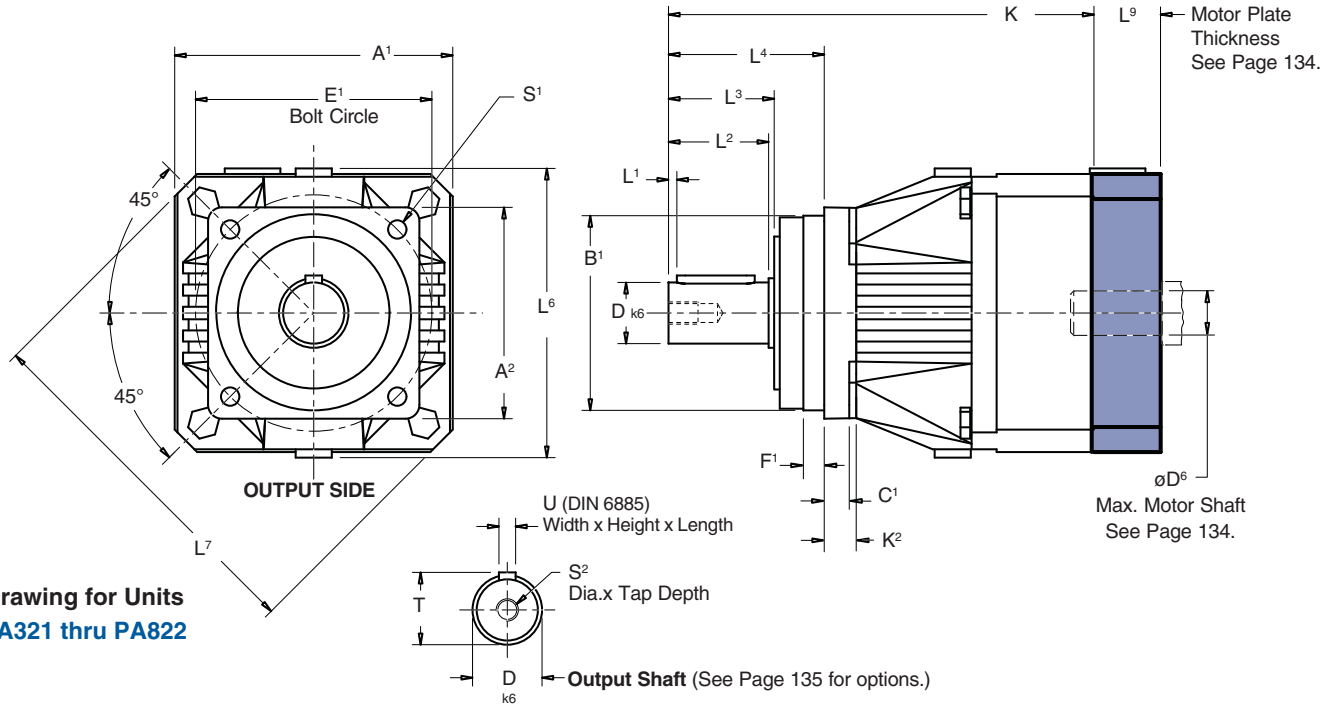
"PA" Series–Advanced ClassicLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input) Gearhead	Exact Ratio i	Maximum Input Speed Continuous RPM (n_1)	Cyclic RPM (n_1)	Maximum Motor Shaft øD⁶ mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs. per arcmin	Nm per arcmin	Output Torque Nominal [1] T_{2N} in.lbs.	Nm	Acceleration T_{2B} in.lbs.	Nm	Peak [2] T_{2PEAK} in.lbs.	Nm
PA821 with Motor Mounting Plate													
PA821S_ D0030MF	3.000	1,800	3,000	48	54.18	1,463.5	165.4	7,080	800	10,620	1,200	17,049	1,926
PA821S_ D0030MFC	3.000	1,800	3,000	48	70.18	1,463.5	165.4	7,080	800	10,620	1,200	17,049	1,926
PA821S_ D0040MF	4.000	2,200	3,500	48	30.34	1,546.5	174.7	7,080	800	14,160	1,600	22,732	2,569
PA821S_ D0040MFC	4.000	2,200	3,500	48	46.34	1,546.5	174.7	7,080	800	14,160	1,600	22,732	2,569
PA821S_ D0050MF	5.000	2,500	4,000	48	23.52	1,553.9	175.6	8,850	1,000	14,160	1,600	28,320	3,200
PA821S_ D0050MFC	5.000	2,500	4,000	48	49.52	1,553.9	175.6	8,850	1,000	14,160	1,600	28,320	3,200
PA821S_ D0070MF	7.000	2,800	4,500	48	18.86	1,477.5	167.0	8,850	1,000	12,390	1,400	24,878	2,811
PA821S_ D0070MFC	7.000	2,800	4,500	48	34.86	1,477.5	167.0	8,850	1,000	12,390	1,400	24,878	2,811
PA821S_ D0080MF	8.000	2,800	4,500	48	17.62	1,412.6	159.6	7,080	800	10,620	1,200	21,240	2,400
PA821S_ D0080MFC	8.000	2,800	4,500	48	33.62	1,412.6	159.6	7,080	800	10,620	1,200	21,240	2,400
PA821S_ D0100MF	10.00	2,800	4,500	48	16.45	1,321.9	149.4	6,195	700	10,620	1,200	21,240	2,400
PA821S_ D0100MFC	10.00	2,800	4,500	48	32.45	1,321.9	149.4	6,195	700	10,620	1,200	21,240	2,400
PA822 with Motor Mounting Plate													
PA822S_ D0150MF	15.00	2,500	4,500	38	16.09	1,470.7	166.2	7,080	800	10,620	1,200	17,049	1,926
PA822S_ D0150MFC	15.00	2,500	4,500	38	19.09	1,470.7	166.2	7,080	800	10,620	1,200	17,049	1,926
PA822S_ D0160MF	16.00	2,500	4,500	38	16.09	1,470.7	166.2	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0160MFC	16.00	2,500	4,500	38	19.09	1,470.7	166.2	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0200MF	20.00	3,000	5,500	38	14.55	1,468.3	165.9	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0200MFC	20.00	3,000	5,500	38	17.55	1,468.3	165.9	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0250MF	25.00	3,000	5,500	38	14.28	1,502.5	169.8	8,850	1,000	14,160	1,600	28,320	3,200
PA822S_ D0250MFC	25.00	3,000	5,500	38	17.28	1,502.5	169.8	8,850	1,000	14,160	1,600	28,320	3,200
PA822S_ D0280MF	28.00	3,300	6,000	38	12.92	1,461.8	165.2	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0280MFC	28.00	3,300	6,000	38	15.92	1,461.8	165.2	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0320MF	32.00	2,500	4,500	38	15.29	1,404.4	158.7	7,080	800	10,620	1,200	21,240	2,400
PA822S_ D0320MFC	32.00	2,500	4,500	38	18.29	1,404.4	158.7	7,080	800	10,620	1,200	21,240	2,400
PA822S_ D0350MF	35.00	3,300	6,000	38	12.78	1,498.1	169.3	8,850	1,000	14,160	1,600	28,320	3,200
PA822S_ D0350MFC	35.00	3,300	6,000	38	15.78	1,498.1	169.3	8,850	1,000	14,160	1,600	28,320	3,200
PA822S_ D0400MF	40.00	3,300	6,000	38	12.28	1,436.6	162.3	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0400MFC	40.00	3,300	6,000	38	15.28	1,436.6	162.3	7,080	800	14,160	1,600	28,320	3,200
PA822S_ D0500MF	50.00	3,300	6,000	38	12.21	1,481.1	167.4	8,850	1,000	14,160	1,600	28,320	3,200
PA822S_ D0500MFC	50.00	3,300	6,000	38	15.21	1,481.1	167.4	8,850	1,000	14,160	1,600	28,320	3,200
PA822S_ D0700MF	70.00	3,300	6,000	38	12.17	1,454.6	164.4	8,850	1,000	12,390	1,400	24,878	2,811
PA822S_ D0700MFC	70.00	3,300	6,000	38	15.17	1,454.6	164.4	8,850	1,000	12,390	1,400	24,878	2,811
PA822S_ D1000MF	100.0	3,300	6,000	38	12.14	1,312.8	148.3	6,195	700	10,620	1,200	21,240	2,400
PA822S_ D1000MFC	100.0	3,300	6,000	38	15.14	1,312.8	148.3	6,195	700	10,620	1,200	21,240	2,400

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PA" Series–Advanced ClassicLine ServoFit® Precision Planetary Gearhead Dimensional Data



Drawing for Units
PA321 thru PA822

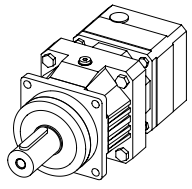
Table No. 1 **"PA" Series – Advanced Precision Planetary Gearhead Dimensions (mm/inches)**

Unit	A1	A2	B1 h6	C1	D k6	E1	F1	K2	L1	L2	L3	L4	L6	L7	S1	S2	T	U
PA321/PA322	72 2.83	72 2.83	60 +.000/-.019 2.362 +.0000/-.0007	7 .28	16 +.012/+.001	75 2.95	7.5 .30	– –	2 .08	28 1.10	30 1.18	48 1.89	79 3.11	92 3.62	5.5 .22	M5x12.5	18 .71	A5x5x22
PA421/PA422	98 3.86	76 2.99	70 +.000/-.019 2.756 +.0000/-.0007	9 .35	22 +.015/+.002	85 3.35	7.5 .30	12 .47	3 .12	36 1.42	38 1.50	56 2.20	98 3.86	130 5.12	6.6 .26	M8x19	24.5 .96	A6x6x28
PA521/PA522	115 4.53	101 3.98	90 +.000/-.022 3.543 +.0000/-.0009	10 .39	32 +.018/+.002	120 4.72	15 .59	14 .55	3 .12	58 14.09	60 2.36	88 3.46	121 4.76	149 5.87	9 .35	M12x28	35 1.38	A10x8x50
PA721/PA722	145 5.71	145 5.71	130 +.000/-.025 5.118 +.000/-.001	15 .59	40 +.018/+.002	165 6.50	3.5 .14	– –	4 .16	82 3.23	85 3.35	112 4.41	145 5.71	190 7.48	11 .43	M16x36	43 1.69	A12x8x70
PA821/PA822	190 7.48	190 7.48	160 +.000/-.025 6.299 +.000/-.001	15 .59	55 +.021/+.002	215 8.46	10 .39	– –	6 .24	82 3.23	85 3.35	112 4.41	190 7.48	250 9.84	13.5 .53	M20x42	59 2.32	A16x10x70

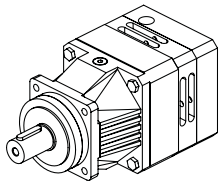
Part No. Explanation

PA 4 2 1 S P D 0030 MF C

- **C** – Option for ServoCool
- **MF** – Motor Plate with FlexiAdapt® Coupling
- **0030** – Ratio (**0030** = 3.0:1)
- **D** – Reinforced Bearings-Axial
- **G** – Shaft – no Key
- **P** – Output Shaft with Key
- **V** – Splined Shaft
- **S** – Standard Housing
- **1** – No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- **2** – Generation Number
- **4** – Unit No.
- **PA** – Advanced ClassicLine ServoFit Precision Planetary Gearhead



Typical 2 Stage Configuration



Typical ServoCool Configuration

Table No. 2

K Dimension					
Standard			ServoCool		
Unit	mm	inches	Unit	mm	inches
P321	135	5.31	–		
P322	177	6.97	–		
P421	153	6.02	–		
P422	200.5	7.89	–		
P521	193	7.60	–		
P522	242.5	9.55	–		
P721	242	9.53	**P721_C**	272	10.71
P722	294	11.57	–		
P821	283	11.14	**P821_C**	331	13.03
P822	350.5	13.80	**P822_C**	380.5	14.98

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. (See Page 134.)

"PKX" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Performance Specification Overview

				P321 KX3	P421 KX4	P422 KX3	P521 KX5	P522 KX4	P721 KX7	P722 KX5	P821 KX8	P822 KX7
Acceleration Torque Maximum	T_{2B}		in.lbs. Nm	575 65	1052 120		2,655 300		6,195 700		14,160 1,600	
Nominal Output Torque [1]	T_{2N}		in.lbs. Nm	398 45	752 85		1,858 210		3,894 440		8,850 1,000	
Input Speed Maximum	n_{1MAX}		Continuous Cyclic	3,000 6,000	3,000 6,000		3,000 4,500		2,500 4,500		1,800 4,000	2,500 4,500
Torsional Backlash [2]	$\Delta\varphi$		arcmin	5 - 7.5	5-7.5	5-5.5	4-6.5	4-5.5	4-5.5		4-5.5	
Torsional Stiffness	C_2		in.lbs./arcmin Nm/arcmin	44 5	100 11		266 33		486 55		1,557 176	
Axial Load Max.	F_{2AMAX}	R	lbs. N	225 1,000	337 1,500		518 2,300		653 2,900		1,058 4,700	
See Page 136 for BEARING OPTIONS		D	lbs. N	315 1,400	506 2,250		788 3,500		1,013 4,500		1,688 7,500	
		Z	lbs. N	135 600	225 1,000		360 1,600		450 2,000		675 3,000	
Radial Load Max. [3]	F_{2RMAX}	R	lbs. N	563 2,500	900 4,000		1,463 6,500		1,800 8,000		2,925 13,000	
See Page 136 for BEARING OPTIONS		D	lbs. N	619 2,750	1,013 4,500		1,575 7,000		2,025 9,000		3,375 15,000	
		Z	lbs. N	675 3,000	1,125 5,000		1,800 8,000		2,250 10,000		4,050 18,000	
Tilting Moment Max.[3]	T_{2Kmax}	R	in.lbs. Nm	1,859 210	3,451 390		6,956 786		10,337 1,168		20,364 2,301	
See Page 136 for BEARING OPTIONS		D	in.lbs. Nm	2,044 231	3,885 439		7,496 847		11,629 1,314		23,497 2,655	
		Z	in.lbs. Nm	2,230 252	4,319 488		8,567 968		12,921 1,460		28,196 3,186	
Weight	m		pounds kg	9.5 4.3	15 6.8	16 7.0	28.5 12.8	25 11.3	51 23.2	47 21.3	105 47.4	95 43.2
Noise Level	L_{PA}		dB(A) [4]	≤69	≤70	≤69	≤71	≤70	≤73	≤71	≤75	≤73
Efficiency (at Nom. Torque)	h		%	93-95								
Balance Quality				Q 2.5 (Quality Class-2.5 millimeters per second)								
Lubrication				Synthetic Oil – Lubricated for Life								
Degree of Protection				IP65 - FKM Shaft Seals								
Mounting Position				EL1  EL2  EL3  EL4  EL5  EL6  Must be Specified.							
Direction of Rotation				(See Page 140.)								
Ambient Temperature				0°C to +40°C (104° F) Other temperatures, contact STOBER Drives.								
Finish				Black								
Lifetime.[5]	L_h		hours	L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 and > 1.00 L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25 and < 1.50 L_h > 30,000 hours if T_{2K}/T_{2A} > 1.5								
Warranty				5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)								

1) Ratings based on input speed (n_1) of 2000 RPM.
For torque at higher input speeds (T_{2NX}) solve the formula, where n_1 = Actual Input Speed.

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

2) Lower than standard backlash is available upon request. Contact STOBER Technical Support.
(Tested at 1.5% of nominal torque and recorded on the input side of the gearhead.)

3) Rating based on output speed (n_2) of 100 RPM. For values at other speeds see Page 136.

4) Measurement at one (1) meter distance with input speed (n_1) of 3000 RPM.

5) T_{2A} equals actual tilting moment of the application. See Page 136 for calculation details.

"PKX" Series–ClassicLine ServoFit® Precision Planetary Gearhead Features

The "PKX" Series–ClassicLine of ServoFit Precision Planetary Gearheads combines the "P" Series gearhead and a low ratio right angle which uses the FlexiAdapt® motor coupling. HeliCamber® gear technology provides minimum wear, low backlash, and low noise. "PKX" Series units are lubricated for life with synthetic oil and sealed to IP65 standards to prevent lubricant contamination for long life. They have all the great features of the "P" Series unit with the configuration of a right angle.

Some of these features are:

- Readily Attaches to Any Servo Motor (IEC, NEMA, or Customized Motor Plates*)
- 5 Year Limited Warranty (2 years on bearings, seals, etc.)
- Lowest Standard Backlash
- High Torsional Stiffness
- Advanced Gear Technology
- 93 to 95% Efficiency
- Quiet Running
- Assembled in the U.S.A.

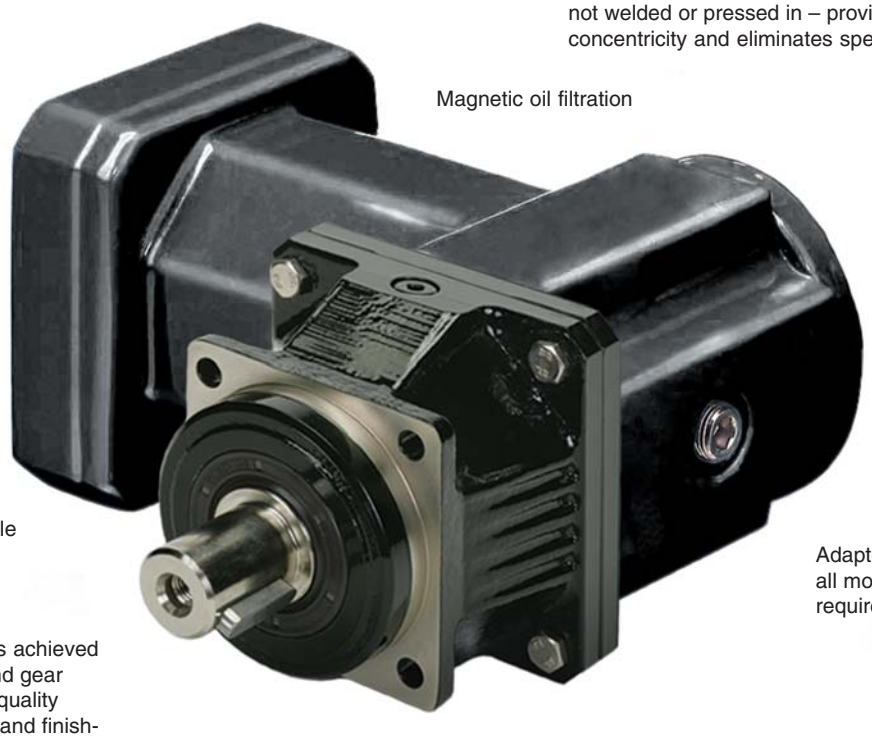
* Maximum 10 working days for custom motor plates.

NO EXPEDITE FEE FOR 24 HOUR SERVICE

Highest running accuracy and precision ensured by single piece housing made from high-tensile tempered ductile iron with the additional characteristics of dissipating heat, noise dampening, and greater lubrication retention on the ring gear

Ring gear machined integral to the housing – not welded or pressed in – provides greater concentricity and eliminates speed fluctuation

Magnetic oil filtration



Bearing options for application specific radial load, axial load, and tilting moments

FKM seals

Planet carrier straddle mounted for robust output capacity

Adapter bushings to fit all motor shafts – no key required

Highest running smoothness achieved by proven helical gearing and gear tooth microgeometry. Gear quality provided by case-hardened and finish-ground sun and planet gears.

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

Motor plate pilot toleranced to fit your motor for precise concentricity

The FlexiAdapt® motor coupling is designed for accurate and precise motor installation. The integrated thermal expansion feature in the shape of a bellows compensates for linear expansion of the motor shaft.

The FlexiAdapt® motor shaft adapter system allows installation of motor in minutes without special tools.

See web site for drawings.

"PKX" Series–ClassicLine Right Angle ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio i	Max. Input RPM (n_1) Continuous EL 1,2,5,6	Max. Input RPM (n_1) Continuous EL 3,4	Max. Input RPM (n_1) Cyclic All	Max. Motor Shaft øD6 mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs. per arcmin	Torsional Stiffness C_2 Nm per arcmin	Output Torque Nominal 1) T_{2N} in.lbs.	Output Torque Nominal 1) T_{2N} Nm	Output Torque Acceleration T_{2B} in.lbs.	Output Torque Acceleration T_{2B} Nm	Output Torque Peak 2) T_{2PEAK} in.lbs.	Output Torque Peak 2) T_{2PEAK} Nm
P321S_ _KX3 with Motor Mounting Plate														
P321S_ _0030KX301VF0010MF	3.000	3,000	2,500	4,000	19	1.210	22.3	2.5	258	29	335	38	567	64
P321S_ _0040KX301VF0010MF	4.000	3,000	2,500	4,000	19	1.128	28.2	3.2	343	39	446	50	755	85
P321S_ _0050KX301VF0010MF	5.000	3,000	2,500	4,000	19	1.081	32.1	3.6	398	45	558	63	944	107
P321S_ _0030KX301VF0020MF	6.000	3,500	3,000	5,000	19	.853	22.3	2.5	258	29	335	38	644	73
P321S_ _0070KX301VF0010MF	7.000	3,000	2,500	4,000	19	1.038	33.0	3.7	398	45	531	60	1,151	130
P321S_ _0040KX301VF0020MF	8.000	3,500	3,000	5,000	19	.833	28.2	3.2	343	39	446	50	858	97
P321S_ _0050KX301VF0020MF	10.00	3,500	3,000	5,000	19	.821	32.1	3.6	398	45	558	63	1,073	121
P321S_ _0040KX301VF0030MF	12.00	3,500	3,000	6,000	19	.759	28.2	3.2	343	39	446	50	858	97
P321S_ _0050KX301VF0030MF	15.00	3,500	3,000	6,000	19	.753	32.1	3.6	398	45	558	63	1,073	121
P321S_ _0100KX301VF0020MF	20.00	3,500	3,000	5,000	19	.806	32.8	3.7	266	30	443	50	885	100
P321S_ _0100KX301VF0030MF	30.00	3,500	3,000	6,000	19	.747	32.8	3.7	266	30	443	50	885	100
P421S_ _KX4 with Motor Mounting Plate														
P421S_ _0030KX401VF0010MF	3.000	2,500	2,000	3,500	24	3.045	46.3	5.2	443	50	644	73	1,288	146
P421S_ _0040KX401VF0010MF	4.000	2,500	2,000	3,500	24	2.651	60.7	6.9	687	78	858	97	1,717	194
P421S_ _0050KX401VF0010MF	5.000	2,500	2,000	3,500	24	2.545	70.5	8.0	752	85	1,062	120	2,124	240
P421S_ _0030KX401VF0020MF	6.000	2,500	2,500	4,000	24	1.794	46.3	5.2	443	50	644	73	1,288	146
P421S_ _0070KX401VF0010MF	7.000	2,500	2,000	3,500	24	2.435	74.1	8.4	752	85	974	110	2,124	240
P421S_ _0040KX401VF0020MF	8.000	2,500	2,500	4,000	24	1.696	60.7	6.9	687	78	858	97	1,717	194
P421S_ _0050KX401VF0020MF	10.00	2,500	2,500	4,000	24	1.669	70.5	8.0	752	85	1,062	120	2,124	240
P421S_ _0040KX401VF0030MF	12.00	3,000	3,000	4,500	24	1.465	60.7	6.9	687	78	858	97	1,717	194
P421S_ _0050KX401VF0030MF	15.00	3,000	3,000	4,500	24	1.453	70.5	8.0	752	85	1,062	120	2,124	240
P421S_ _0100KX401VF0020MF	20.00	2,500	2,500	4,000	24	1.632	73.1	8.3	531	60	885	100	1,770	200
P421S_ _0100KX401VF0030MF	30.00	3,000	3,000	4,500	24	1.436	73.1	8.3	531	60	885	100	1,770	200
P422S_ _KX3 with Motor Mounting Plate														
P422S_ _0350KX301VF0010MF	35.00	3,500	2,500	4,000	19	1.046	92.0	10.4	752	85	1,062	120	2,124	240
P422S_ _0200KX301VF0020MF	40.00	3,000	3,000	5,000	19	.824	88.0	9.9	752	85	1,062	120	2,124	240
P422S_ _0250KX301VF0020MF	50.00	3,500	3,000	5,000	19	.823	91.7	10.4	752	85	1,062	120	2,124	240
P422S_ _0200KX301VF0030MF	60.00	3,500	3,000	6,000	19	.755	88.0	9.9	752	85	1,062	120	2,124	240
P422S_ _0700KX301VF0010MF	70.00	3,500	2,500	4,000	19	1.024	84.7	9.6	752	85	974	110	2,124	240
P422S_ _0250KX301VF0030MF	75.00	3,500	3,000	6,000	19	.754	91.7	10.4	752	85	1,062	120	2,124	240
P422S_ _0500KX301VF0020MF	100.0	3,500	3,000	5,000	19	.807	91.9	10.4	752	85	1,062	120	2,124	240
P422S_ _0500KX301VF0030MF	150.0	3,500	3,000	6,000	19	.747	91.9	10.4	752	85	1,062	120	2,124	240
P422S_ _1000KX301VF0020MF	200.0	3,500	3,000	5,000	19	.807	77.8	8.8	531	60	885	100	1,770	200
P422S_ _1000KX301VF0030MF	300.0	3,500	3,000	6,000	19	.747	77.8	8.8	531	60	885	100	1,770	200
P521S_ _KX5 with Motor Mounting Plate														
P521S_ _0030KX501VF0010MF	3.000	2,500	2,000	3,000	32	8.734	119.8	13.5	1,062	120	1,622	183	3,219	364
P521S_ _0040KX501VF0010MF	4.000	2,500	2,000	3,000	32	8.522	154.7	17.5	1,717	194	2,163	244	4,292	485
P521S_ _0050KX501VF0010MF	5.000	2,500	2,000	3,000	32	8.112	181.3	20.5	1,859	210	2,655	300	5,310	600
P521S_ _0030KX501VF0020MF	6.000	2,500	2,500	3,500	32	5.588	119.8	13.5	1,062	120	1,622	183	3,219	364
P521S_ _0070KX501VF0010MF	7.000	2,500	2,000	3,000	32	7.736	200.1	22.6	1,859	210	2,390	270	5,310	600
P521S_ _0040KX501VF0020MF	8.000	2,500	2,500	3,500	32	5.535	154.7	17.5	1,717	194	2,163	244	4,292	485
P521S_ _0050KX501VF0020MF	10.00	2,500	2,500	3,500	32	5.432	181.3	20.5	1,859	210	2,655	300	5,310	600
P521S_ _0040KX501VF0030MF	12.00	3,000	3,000	4,000	32	4.892	154.7	17.5	1,717	194	2,163	244	4,292	485
P521S_ _0050KX501VF0030MF	15.00	3,000	3,000	4,000	32	4.847	181.3	20.5	1,859	210	2,655	300	5,310	600
P521S_ _0100KX501VF0020MF	20.00	2,500	2,500	3,500	32	5.305	200.4	22.6	1,239	140	2,213	250	4,425	500
P521S_ _0100KX501VF0030MF	30.00	3,000	3,000	4,000	32	4.790	200.4	22.6	1,239	140	2,213	250	4,425	500
P522S_ _KX4 with Motor Mounting Plate Continued Next Page														
P522S_ _0350KX401VF0010MF	35.00	2,500	2,000	3,500	24	2.456	239.6	27.1	1,859	210	2,655	300	5,310	600
P522S_ _0200KX401VF0020MF	40.00	2,500	2,500	4,000	24	1.678	226.9	25.6	1,859	210	2,655	300	4,910	555
P522S_ _0250KX401VF0020MF	50.00	2,500	2,500	4,000	24	1.674	238.1	26.9	1,859	210	2,655	300	5,310	600

1) Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

2) Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PKX" Series–ClassicLine Right Angle ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio i	Max. Input RPM (n_1) Continuous Mounting Position EL 1,2,5,6	Max. Input RPM (n_1) Continuous Mounting Position EL 3,4	Max. Input RPM (n_1) Cyclic All	Max. Motor Shaft øD6 mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs. per arcmin	Torsional Stiffness C_2 Nm per arcmin	Output Torque Nominal 1) T_{2N} in.lbs.	Output Torque Nominal 1) T_{2N} Nm	Output Torque Acceleration T_{2B} in.lbs.	Output Torque Acceleration T_{2B} Nm	Output Torque Peak 2) T_{2PEAK} in.lbs.	Output Torque Peak 2) T_{2PEAK} Nm
P522S_ _KX4 with Motor Mounting Plate														
P522S_ _0200KX401VF0030MF	60.00	3,000	3,000	4,500	24	1.457	226.9	25.6	1,859	210	2,655	300	4,910	555
P522S_ _0700KX401VF0010MF	70.00	2,500	2,000	3,500	24	2.404	231.8	26.2	1,859	210	2,390	270	5,310	600
P522S_ _0250KX401VF0030MF	75.00	3,000	3,000	4,500	24	1.455	238.1	26.9	1,859	210	2,655	300	5,310	600
P522S_ _0500KX401VF0020MF	100.0	2,500	2,500	4,000	24	1.635	239.2	27.0	1,859	210	2,655	300	5,310	600
P522S_ _0500KX401VF0030MF	150.0	2,500	3,000	4,500	24	1.438	239.2	27.0	1,859	210	2,655	300	5,310	600
P522S_ _1000KX401VF0020MF	200.0	2,500	2,500	4,000	24	1.633	214.7	24.3	1,239	140	2,213	250	4,425	500
P522S_ _1000KX401VF0030MF	300.0	3,000	3,000	4,500	24	1.437	214.7	24.3	1,239	140	2,213	250	4,425	500
P721S_ _KX7 with Motor Mounting Plate														
P721S_ _0030KX701VF0010MF	3.000	1,800	1,600	2,250	38	33.167	325.4	36.8	2,478	280	3,219	364	5,666	640
P721S_ _0040KX701VF0010MF	4.000	1,800	1,600	2,250	38	28.449	380.7	43.0	3,434	388	4,292	485	7,554	854
P721S_ _0050KX701VF0010MF	5.000	1,800	1,600	2,250	38	26.915	409.7	46.3	3,894	440	5,365	606	9,443	1,067
P721S_ _0030KX701VF0020MF	6.000	1,800	1,800	3,000	38	16.788	325.4	36.8	2,478	280	3,219	364	6,438	728
P721S_ _0070KX701VF0010MF	7.000	1,800	1,600	2,250	38	25.916	435.3	49.2	3,894	440	5,753	650	11,117	1,256
P721S_ _0040KX701VF0020MF	8.000	1,800	1,800	3,000	38	15.609	380.7	43.0	3,434	388	4,292	485	8,585	970
P721S_ _0050KX701VF0020MF	10.00	1,800	1,800	3,000	38	15.225	409.7	46.3	3,894	440	5,365	606	10,731	1,213
P721S_ _0040KX701VF0030MF	12.00	2,100	2,100	3,500	38	12.818	380.7	43.0	3,434	388	4,292	485	8,585	970
P721S_ _0050KX701VF0030MF	15.00	2,100	2,100	3,500	38	12.648	409.7	46.3	3,894	440	5,365	606	10,731	1,213
P721S_ _0100KX701VF0020MF	20.00	1,800	1,800	3,000	38	14.848	416.4	47.0	2,655	300	4,425	500	8,850	1,000
P721S_ _0100KX701VF0030MF	30.00	2,100	2,100	3,500	38	12.480	416.4	47.0	2,655	300	4,425	500	8,850	1,000
P722S_ _KX5 with Motor Mounting Plate														
P722S_ _0350KX501VF0010MF	35.00	2,500	2,000	3,000	32	7.798	461.9	52.2	3,894	440	6,195	700	12,390	1,400
P722S_ _0200KX501VF0020MF	40.00	2,500	2,500	3,500	32	5.450	448.8	50.7	3,894	440	6,195	700	12,224	1,381
P722S_ _0250KX501VF0020MF	50.00	2,500	2,500	3,500	32	5.434	457.5	51.7	3,894	440	6,195	700	12,390	1,400
P722S_ _0200KX501VF0030MF	60.00	3,000	3,000	4,000	32	4.854	448.8	50.7	3,894	440	6,195	700	12,224	1,381
P722S_ _0700KX501VF0010MF	70.00	2,500	2,000	3,000	32	7.625	463.8	52.4	3,894	440	5,753	650	11,117	1,256
P722S_ _0250KX501VF0030MF	75.00	3,000	3,000	4,000	32	4.847	457.5	51.7	3,894	440	6,195	700	12,390	1,400
P722S_ _0500KX501VF0020MF	100.0	2,500	2,500	3,500	32	5.313	462.0	52.2	3,894	440	6,195	700	12,390	1,400
P722S_ _0500KX501VF0030MF	150.0	3,000	3,000	4,000	32	4.794	462.0	52.2	3,894	440	6,195	700	12,390	1,400
P722S_ _1000KX501VF0020MF	200.0	2,500	2,500	3,500	32	5.309	428.7	48.4	2,655	300	4,425	500	8,850	1,000
P722S_ _1000KX501VF0030MF	300.0	3,000	3,000	4,000	32	4.792	428.7	48.4	2,655	300	4,425	500	8,850	1,000
P821S_ _KX8 with Motor Mounting Plate														
P821S_ _0030KX801VF0020MF	6.000	1,100	1,100	2,500	48	58.975	740.4	83.7	5,151	582	7,082	800	12,877	1,455
P821S_ _0040KX801VF0020MF	8.000	1,100	1,100	2,500	48	53.015	978.5	110.6	6,868	776	9,443	1,067	17,169	1,940
P821S_ _0050KX801VF0020MF	10.00	1,100	1,100	2,500	48	51.309	1,131.5	127.9	8,585	970	11,804	1,334	21,461	2,425
P821S_ _0040KX801VF0030MF	12.00	1,300	1,300	3,000	48	45.063	978.5	110.6	6,868	776	9,443	1,067	17,169	1,940
P821S_ _0050KX801VF0030MF	15.00	1,300	1,300	3,000	48	44.305	1,131.5	127.9	8,585	970	11,804	1,334	21,461	2,425
P821S_ _0100KX801VF0020MF	20.00	1,100	1,100	2,500	48	49.537	1,228.7	138.8	6,195	700	10,620	1,200	21,240	2,400
P821S_ _0100KX801VF0030MF	30.00	1,300	1,300	3,000	48	43.517	1,228.7	138.8	6,195	700	10,620	1,200	21,240	2,400
P822S_ _KX7 with Motor Mounting Plate														
P822S_ _0350KX701VF0010MF	35.00	1,800	1,600	2,250	38	26.033	1,483.0	167.6	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0200KX701VF0020MF	40.00	1,800	1,800	3,000	38	15.363	1,421.0	160.6	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0250KX701VF0020MF	50.00	1,800	1,800	3,000	38	15.295	1,470.4	166.1	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0200KX701VF0030MF	60.00	2,100	2,100	3,500	38	12.709	1,421.0	160.6	7,080	800	14,160	1,600	28,320	3,200
P822S_ _0700KX701VF0010MF	70.00	1,800	1,600	2,250	38	25.418	1,450.9	163.9	8,850	1,000	12,390	1,400	24,878	2,811
P822S_ _0250KX701VF0030MF	75.00	2,100	2,100	3,500	38	12.679	1,470.4	166.1	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0500KX701VF0020MF	100.0	1,800	1,800	3,000	38	14.863	1,473.8	166.5	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _0500KX701VF0030MF	150.0	2,100	2,100	3,500	38	12.487	1,473.8	166.5	8,850	1,000	14,160	1,600	28,320	3,200
P822S_ _1000KX701VF0020MF	200.0	1,800	1,800	3,000	38	14.845	1,311.4	148.2	6,195	700	10,620	1,200	21,240	2,400
P822S_ _1000KX701VF0030MF	300.0	2,100	2,100	3,500	38	12.479	1,311.4	148.2	6,195	700	10,620	1,200	21,240	2,400

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

"PKX" Series–ClassicLine Right Angle ServoFit® Precision Planetary Gearhead Dimensional Data

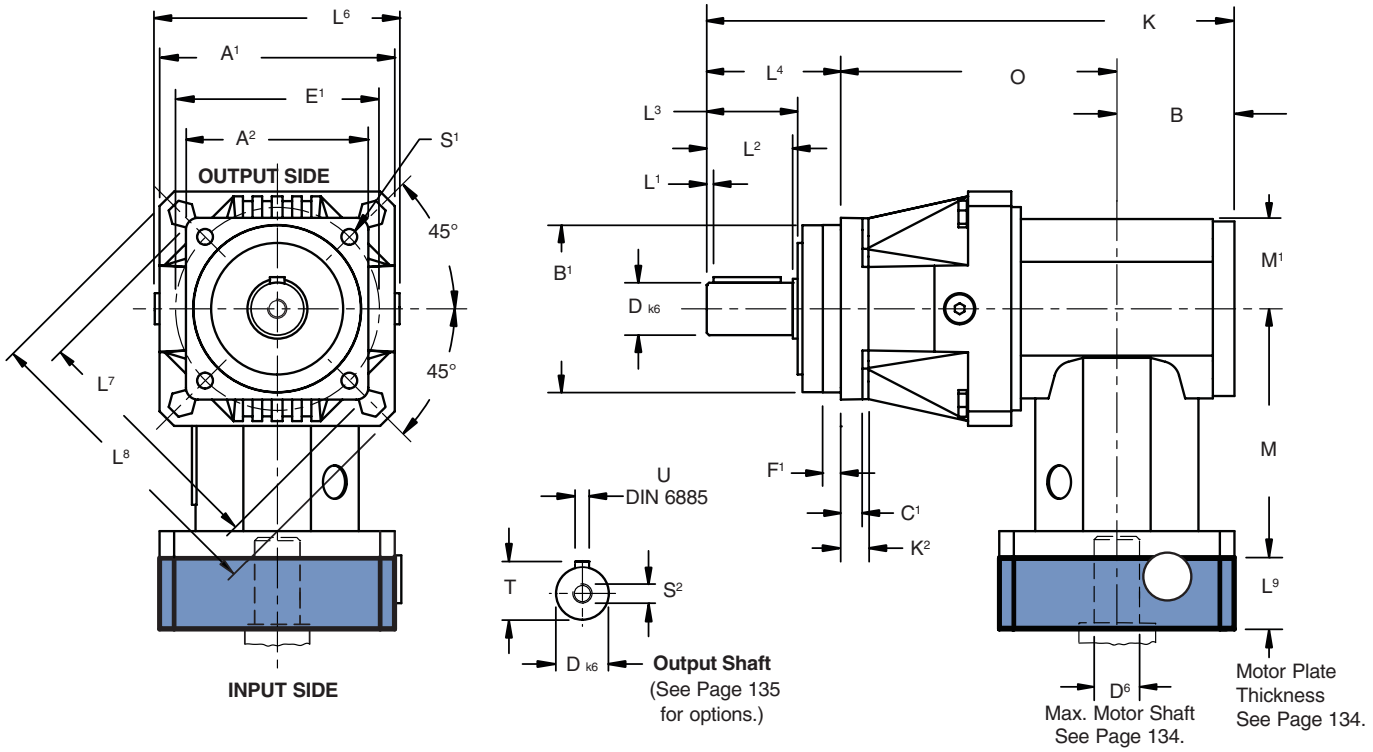


Table No. 1 **"PKX" Series – ServoFit Precision Planetary Gearhead Dimensions (mm/inches)**

Unit	A1	A2	B1 h6	C1	D k6	E1	F1	K2	L1	L2	L3	L4	L6	L7	L8	S1	S2	T	U
P321S_KX3	72	72	60 +.000/-.019	7	16 +.012/+.001	75	7.5	–	2	28	30	48	79	–	92	5.5	M5x12.5	18	A5x5x22
	2.83	2.83	2.362 +.0000/-.0007	.28		2.95	.30	–	.08	1.10	1.18	1.89	3.11	–	3.62	.22		.71	
P421S_KX4	98	76	70 +.000/-.019	9	22 +.015/+.002	85	7.5	12	3	36	38	56	98	107	130	6.6	M8x19	24.5	A6x6x28
	3.86	2.99	2.756 +.0000/-.0007	.35		3.35	.30	.47	.12	1.42	1.50	2.20	3.86	4.09	5.12	.26		.96	
P521S_KX5	115	101	90 +.000/-.022	10	32 +.018/+.002	120	15	14	3	58	60	88	121	139	149	9	M12x28	35	A10x8x50
	4.53	3.98	3.543 +.0000/-.0009	.39		4.72	.59	.55	.12	2.28	2.36	3.46	4.76	5.47	5.87	.35		1.38	
P721S_KX7	145	145	130 +.000/-.025	15	40 +.018/+.002	165	3.5	–	4	82	85	112	145	–	190	11	M16x36	43	A12x8x70
	5.71	5.71	5.118 +.000/-.001	.59		6.50	.14	–	.16	3.23	3.35	4.41	5.71	–	7.48	.43		1.69	
P821S_KX8	190	190	160 +.000/-.025	15	55 +.021/+.002	215	10	–	6	82	85	112	190	–	250	13.5	M20x42	59	A12x8x70
	7.48	7.48	6.299 +.000/-.001	.59		8.46	.39	–	.24	3.23	3.35	4.41	7.48	–	9.84	.53		2.32	

Table No. 2 Dimensions (mm/inches)

Unit	B	K	M	M1	O
P321S_KX3	40	184	95.5	31	96
	1.57	7.24	3.76	1.22	3.78
P421S_KX4	49	220	104	37.5	115
	1.93	8.66	4.09	1.48	4.53
P521S_KX5	60	277	132	45	129
	2.36	10.91	5.20	1.77	5.08
P721S_KX7	74	343	172.5	60	157
	2.91	13.50	6.79	2.36	6.18
P821S_KX8	92	417	210	75	213
	3.62	16.42	8.27	2.95	8.39

Part No. Explanation

P 4 2 1 S P R 0100 KX401VF 0030 MF

- **MF** – Motor Plate with FlexiAdapt® Coupling
- **0030** – Ratio (0030 = 3.0:1)
- **KX401VF** – Right Angle Unit, Size **4**, **1** Stage
- **0100** – Ratio (**0100** = 10.0:1)
- **R** – Normal Bearing
- **D** – Reinforced Bearings-Axial
- **Z** – Reinforced Bearings-Radial
- **G** – Shaft – no Key
- **P** – Output Shaft with Key
- **V** – Splined Shaft
- **S** – Standard Housing
- **1** – No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- **2** – Generation Number
- **4** – Unit No.
- **P** – ClassicLine ServoFit Precision Planetary Gearhead

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. (See Page 134)

"PKX" Series–ClassicLine Right Angle ServoFit® Precision Planetary Gearhead Dimensional Data

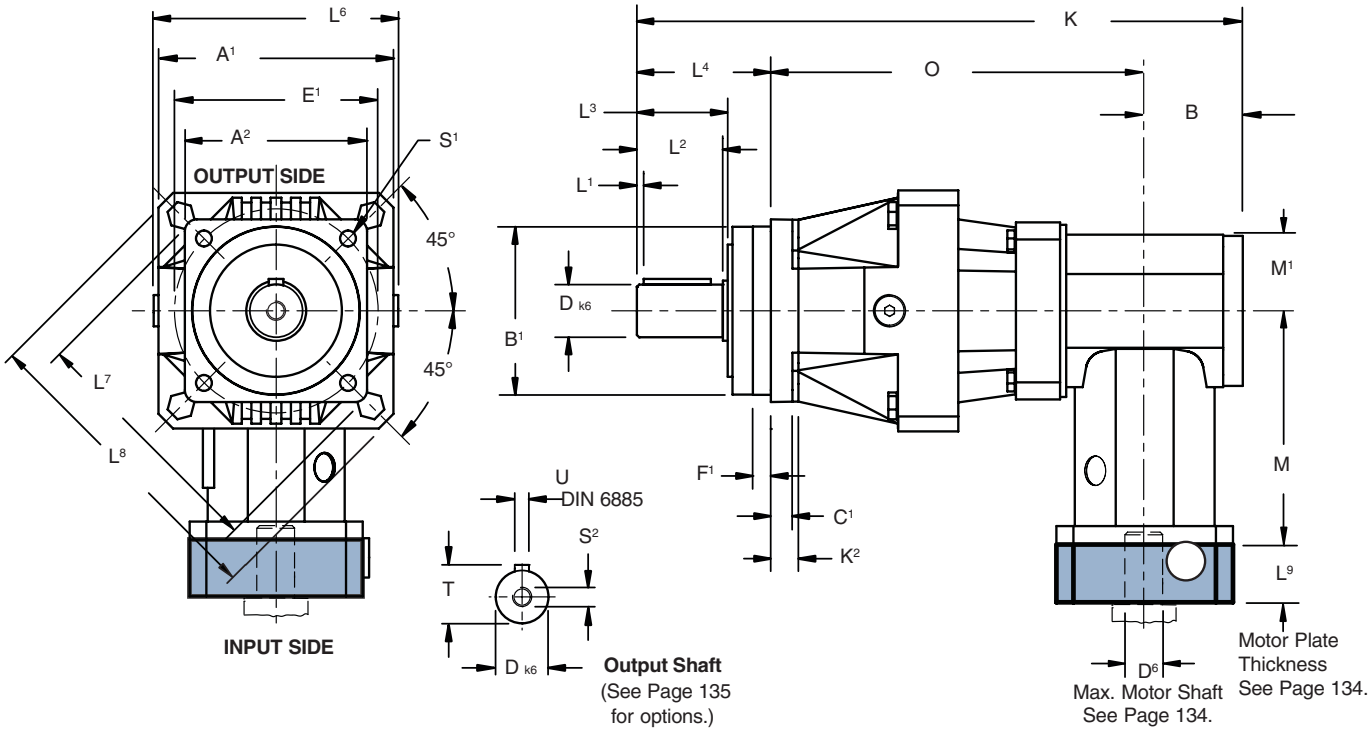


Table No. 3 **"PKX" Series – ServoFit Precision Planetary Gearhead Dimensions (mm/inches)**

Unit	A1	A2	B1 h6	C1	D k6	E1	F1	K2	L1	L2	L3	L4	L6	L7	L8	S1	S2	T	U
P422S_KX3	98	76	70 +.000/-.019	9	22 +.015/+.002	85	7.5	12	3	36	38	56	98	104	130	6.6	M8x19	24.5	A6x6x28
	3.86	2.99	2.756 +.0000/-.0007	.35		3.35	.30	.47	.12	1.42	1.50	2.20	3.86	4.09	5.12	.26		.96	
P522S_KX4	115	101	90 +.000/-.022	10	32 +.018/+.002	120	15	14	3	58	60	88	121	139	149	9	M12x28	35	A10x8x50
	4.53	3.98	3.543 +.0000/-.0009	.39		4.72	.59	.55	.12	2.28	2.36	3.46	4.76	5.47	5.87	.35		1.38	
P722S_KX5	145	145	130 +.000/-.025	15	40 +.018/+.002	165	3.5	–	4	82	85	112	145	–	190	11	M16x36	43	A12x8x70
	5.71	5.71	5.118 +.000/-.001	.59		6.50	.14	–	.16	3.23	3.35	4.41	5.71	–	7.48	.43		1.69	
P822S_KX7	190	190	160 +.000/-.025	15	55 +.021/+.002	215	10	–	6	82	85	112	190	–	250	13.5	M20x42	59	A12x8x70
	7.48	7.48	6.299 +.000/-.001	.59		8.46	.39	–	.24	3.23	3.35	4.41	7.48	–	9.84	.53		2.32	

Part No. Explanation

P 4 2 2 S P R 0250 KX301VF 0030 MF

- Motor Plate with FlexiAdapt® Coupling
- Ratio(**0030** = 3.0:1)
- Right Angle Unit, Size **3, 1** Stage
- Ratio (**0250** = 25.0:1)
- **R –** Normal Bearing
- **D –** Reinforced Bearings-Axial
- **Z –** Reinforced Bearings-Radial
- **G –** Shaft – no Key
- **P –** Output Shaft with Key
- **V –** Splined Shaft
- Standard Housing
- No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- Generation Number
- Unit No.
- ClassicLine ServoFit Precision Planetary Gearhead

Table No. 4 Dimensions (mm/inches)

Unit	B	K	M	M1	O
P422S_KX3	40	249.5	95.5	31	153.5
	1.57	9.83	3.76	1.22	6.04
P522S_KX4	49	309.5	104	37.5	172.5
	1.93	12.19	4.09	1.48	6.79
P722S_KX5	60	378	132	45	206
	2.36	14.88	5.20	1.77	8.11
P822S_KX7	74	451.5	172.5	60	265.5
	2.91	17.76	6.79	2.36	10.45

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. (See Page 134.)

"PH" Series–PowerLine
ServoFit® Precision Planetary Gearhead
Performance Specifications

	Size	PH321 PH322	PH421 PH422	PH521 PH522	PH721 PH722	PH821 PH822	PH923 PH912 PH924	PH1023 PH1012 PH1024
Acceleration Torque Max. T_{2B}	in.lbs. Nm	575 65	1,150 130	2,832 320	6,195 700	17,700 2,000	37,612 4,250	66,375 7,500
Output Torque Nominal [1] T_{2N}	in.lbs. Nm	398 45	796 90	1,947 220	3,894 440	11,062 1,250	22,125 2,500	35,400 4,000
Input Speed Maximum n_{1MAX}	Continuous Cyclic	3500 4500 6000 8000	3000 8000 6000 8000	6000 7000 6000 7000	5000 6500 5000 6500	4000 6000 4000 6000	4500 4500 6500 4500 4500 6500	4500 4500 6000 4500 4500 6000
ServoCool Input RPM Maximum n_{1MAX}	Continuous	– –	– –	– –	4000 – 5000 –	4500 4500 4000 6000	– –	– –
Torsional Backlash [2] $\Delta\varphi$	arcmin	≤3	≤3	≤3	≤3	≤3	≤3	≤3
Torsional Stiffness C_2	in.lbs./arcmin Nm/arcmin	≤106 ≤12	≤292 ≤33	≤708 ≤80	≤1,371 ≤155	≤3,752 ≤424	≤5,858 ≤662	≤9,673 ≤1,093
Axial Load Maximum F_{2AMAX}	lbs. N	371 1,650	484 2,150	934 4,150	1,384 6,150	2,260 10,050	7,425 33,000	11,250 50,000
Tilting Moment Maximum T_{2K}	in.lbs. Nm	885 100	2,301 260	3,894 440	13,275 1,500	30,975 3,500	57,525 6,500	77,880 8,800
Tilting Stiffness C_{2K}	in.lbs./arcmin Nm/arcmin	– –	1,416 160	2,655 300	4,425 500	13,718 1,550	48,675 5,500	84,075 9,500
Efficiency (at Nominal Torque) h	%	96% 94%	96% 94%	96% 94%	96% 94%	96% 94%	96% 94% 92%	94% 92% 90%
Weight m	pounds kg	4 1.8	9 10 3.9 4.6	15 18 6.6 8.1	27 32 12.3 14.6	76 88 34.6 39.8	157 139 141 71 63 64.1	190 216 218 86 98 99
Noise Level [4] L_{PA}	dB(A)	≤61	≤62	≤63	≤64	≤65	≤65	≤65
Balance Quality		Q 2.5 (Quality Class-2.5 millimeters per second)						
Lubrication		Synthetic Oil (ISO VG 150)						
Degree of Protection		IP65						
Mounting Position		Unrestricted.						
Ambient Temperature		0°C to +40°C (104° F) Other temperatures, contact STOBER Drives.						
Finish		Black (RAL 9005)						
Lifetime [5] L_h	hours	L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25						
Warranty		5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)						

[1] Ratings based on input speed (n_1) of 2000 RPM.
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed.

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

[2] Tested at 1.5% of nominal torque and recorded on the input side of the gearhead.

[3] Rating based on output speed (n2) of 100 RPM. For values at other speeds see Page 137.

[4] Measurement at one (1) meter distance with input speed (n1) of 3000 RPM.

[5] T_{2A} equals actual tilting moment of the application. See Page 137 for calculation details.

"PH" Series–PowerLine
ServoFit® Precision Planetary Gearhead
Features

The "PH" Series–PowerLine of ServoFit Precision Planetary Gearheads are designed for the exacting demands on torsional and tilting rigidity. The "PH" series is well suited where a smooth, precise, reliable drive is needed. All units are lubricated for life with synthetic oil and sealed to IP65 standards to prevent lubricant contamination for long life.

Some features are:

- Readily Attaches to Any Servo Motor
- Superior Torsional Stiffness
- 90-96% Efficiency
- Excellent Axial Load Capacity
- ISO Output Flange for Coupling Free Mounting
- Advanced Helicamber Gear Technology
- 5 Year Limited Warranty (2 Year on bearings, seals, etc.)
- Wide Selection of IEC, NEMA, or Customized Motor Plates

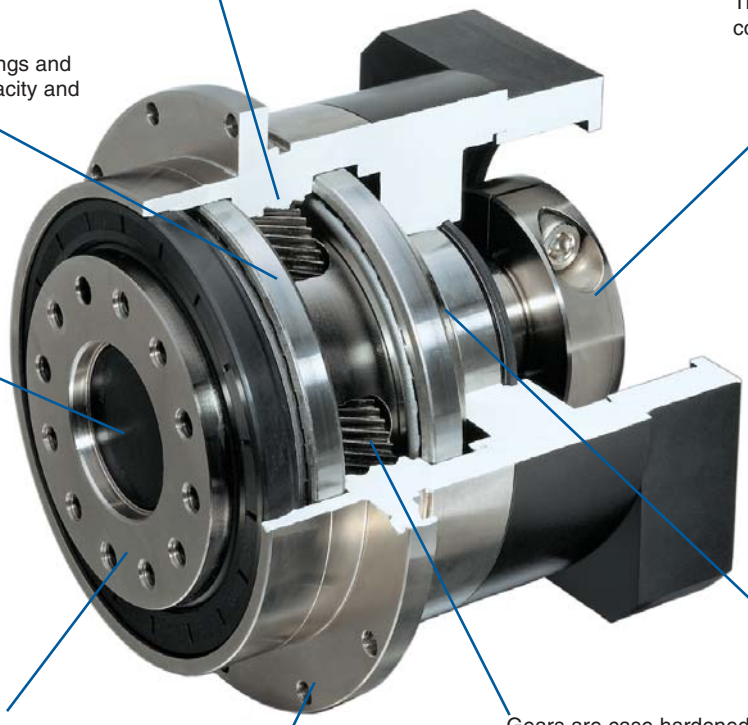
HeliCamber® gear technology provides minimum wear, low backlash, and low noise

The patented TriAdapt® motor coupling is designed to allow thermal expansion of the motor shaft–ensuring long motor life by preventing thrust load on the motor bearings.

Ring gear machined integral to the housing – not welded or pressed in

Triple-split steel collet for greater concentricity and low inertia

Oversized tapered roller bearings and shafts for high radial load capacity and superior torsional stiffness



TriAdapt® motor shaft adapter system allows installation of motor in minutes — no special tools required

Blind pilot hole

Adapter bushings fit all motor shafts – no key required

The output flange dimensions are ISO 9409 and allow easy mounting to rotary or indexing tables, pinions, timing belt pulleys, transmission shafting, etc., without using a coupling.

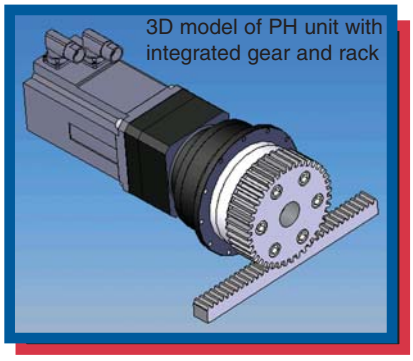
FKM seal

Gears are case hardened to 61 Rockwell "C" and ground for maximum efficiency

Single piece steel housing provides greater concentricity and more precise alignment

Also available with input shaft (AW).

Available as ServoCool in Sizes PH7 and PH8.



3D model of PH unit with integrated gear and rack

See web site for drawings.

"PH" Series–PowerLine
ServoFit® Precision Planetary Gearhead
Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD⁶ mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
PH321 with Motor Mounting Plate													
PH321_0050MT	5.000	3,000	6,000	19	.638	115.2	13	399	45	576	65	1,152	130
PH321_0050MTL	5.000	3,000	6,000	24	1.6	115.2	13	399	45	576	65	1,152	130
PH321_0070MT	7.000	3,500	6,000	19	.593	101.9	12	399	45	531	60	1,152	130
PH321_0070MTL	7.000	3,500	6,000	24	1.4	101.9	12	399	45	531	60	1,152	130
PH321_0100MT	10.00	3,800	6,000	19	.575	79.7	9.0	266	30	443	50	886	100
PH321_0100MTL	10.00	3,800	6,000	24	1.3	79.7	9.0	266	30	443	50	886	100
PH322 with Motor Mounting Plate													
PH322_0200MT	20.00	4,500	8,000	14	.14	90.4	10	399	45	576	65	1,152	130
PH322_0200MTL	20.00	4,500	8,000	19	.50	90.4	10	399	45	576	65	1,152	130
PH322_0250MT	25.00	4,500	8,000	14	.12	90.4	10	399	45	576	65	1,152	130
PH322_0250MTL	25.00	4,500	8,000	19	.50	90.4	10	399	45	576	65	1,152	130
PH322_0280MT	28.00	4,500	8,000	14	.14	90.7	10	399	45	531	60	1,152	130
PH322_0280MTL	28.00	4,500	8,000	19	.64	90.7	10	399	45	531	60	1,152	130
PH322_0350MT	35.00	4,500	8,000	14	.11	89.3	10	399	45	576	65	1,152	130
PH322_0350MTL	35.00	4,500	8,000	19	.59	89.3	10	399	45	576	65	1,152	130
PH322_0400MT	40.00	4,500	8,000	14	.14	76.1	8.6	266	30	443	50	886	100
PH322_0400MTL	40.00	4,500	8,000	19	.50	76.1	8.6	266	30	443	50	886	100
PH322_0500MT	50.00	4,500	8,000	14	.10	86.9	9.8	399	45	576	65	1,152	130
PH322_0500MTL	50.00	4,500	8,000	19	.58	86.9	9.8	399	45	576	65	1,152	130
PH322_0700MT	70.00	4,500	8,000	14	.10	88.8	10	399	45	531	60	1,152	130
PH322_0700MTL	70.00	4,500	8,000	19	.58	88.8	10	399	45	531	60	1,152	130
PH322_1000MT	100.0	4,500	8,000	14	.10	75.5	8.5	266	30	443	50	886	100
PH322_1000MTL	100.0	4,500	8,000	19	.58	75.5	8.5	266	30	443	50	886	100
PH421 with Motor Mounting Plate													
PH421_0040MT	4.000	2,300	5,000	24	1.7	345.5	39	753	85	1,152	130	2,126	240
PH421_0040MTL	4.000	2,300	5,000	32	3.6	345.5	39	753	85	1,152	130	2,126	240
PH421_0050MT	5.000	2,700	6,000	24	1.6	327.7	37	753	85	1,152	130	2,126	240
PH421_0050MTL	5.000	2,700	6,000	32	4.5	327.7	37	753	85	1,152	130	2,126	240
PH421_0070MT	7.000	3,200	6,000	24	1.4	274.6	31	753	85	974	110	2,126	240
PH421_0070MTL	7.000	3,200	6,000	32	4.0	274.6	31	753	85	974	110	2,126	240
PH421_0100MT	10.00	3,500	6,000	24	1.3	186.0	21	531	60	886	100	1,772	200
PH421_0100MTL	10.00	3,500	6,000	32	3.7	186.0	21	531	60	886	100	1,772	200
PH422 with Motor Mounting Plate													
PH422_0160MT	16.00	3,700	6,500	19	.72	236.6	27	797	90	1,152	130	2,126	240
PH422_0160MTL	16.00	3,700	6,500	24	1.7	236.6	27	797	90	1,152	130	2,126	240
PH422_0200MT	20.00	3,700	6,500	19	.71	256.2	29	797	90	1,152	130	2,126	240
PH422_0200MTL	20.00	3,700	6,500	24	1.7	256.2	29	797	90	1,152	130	2,126	240
PH422_0250MT	25.00	4,000	7,000	19	.65	254.0	29	797	90	1,152	130	2,126	240
PH422_0250MTL	25.00	4,000	7,000	24	1.6	254.0	29	797	90	1,152	130	2,126	240
PH422_0280MT	28.00	4,500	8,000	19	.60	222.3	25	797	90	1,152	130	2,126	240
PH422_0280MTL	28.00	4,500	8,000	24	1.4	222.3	25	797	90	1,152	130	2,126	240
PH422_0350MT	35.00	4,500	8,000	19	.60	245.3	28	797	90	1,152	130	2,126	240
PH422_0350MTL	35.00	4,500	8,000	24	1.4	245.3	28	797	90	1,152	130	2,126	240
PH422_0400MT	40.00	4,500	8,000	19	.58	214.7	24	797	90	1,152	130	2,126	240
PH422_0400MTL	40.00	4,500	8,000	24	1.3	214.7	24	797	90	1,152	130	2,126	240
PH422_0500MT	50.00	4,500	8,000	19	.58	239.2	27	797	90	1,152	130	2,126	240
PH422_0500MTL	50.00	4,500	8,000	24	1.3	239.2	27	797	90	1,152	130	2,126	240
PH422_0700MT	70.00	4,500	8,000	19	.58	237.1	27	797	90	974	110	2,126	240
PH422_0700MTL	70.00	4,500	8,000	24	1.3	237.1	27	797	90	974	110	2,126	240
PH422_1000MT	100.0	4,500	8,000	19	.58	176.7	20	531	60	886	100	1,772	200
PH422_1000MTL	100.0	4,500	8,000	24	1.3	176.7	20	531	60	886	100	1,772	200

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PH" Series–PowerLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead		Continuous	Cyclic			C_2		T_{2N}		T_{2B}		T_{2PEAK}	
	i	RPM (n_1)		øD[6] mm	J_1 10^{-4} kgcm²	in.lbs. per arcmin	Nm	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
PH521 with Motor Mounting Plate													
PH521_0040MT	4.000	2,200	5,000	32	3.6	868.1	98	1,860	210	2,835	320	4,915	555
PH521_0040MTL	4.000	2,200	5,000	28	11	868.1	98	1,860	210	2,835	320	4,915	555
PH521_0050MT	5.000	2,500	5,500	32	4.5	823.8	93	1,860	210	2,835	320	5,315	600
PH521_0050MTL	5.000	2,500	5,500	38	9.3	823.8	93	1,860	210	2,835	320	5,315	600
PH521_0070MT	7.000	3,000	6,000	32	4.0	682.1	77	1,860	210	2,392	270	5,315	600
PH521_0070MTL	7.000	3,000	6,000	38	7.9	682.1	77	1,860	210	2,392	270	5,315	600
PH521_0100MT	10.00	3,300	6,000	32	3.7	487.2	55	1,240	140	2,215	250	4,429	500
PH521_0100MTL	10.00	3,300	6,000	38	7.2	487.2	55	1,240	140	2,215	250	4,429	500
PH522 with Motor Mounting Plate													
PH522_0160MT	16.00	3,300	6,000	24	1.5	574.7	65	1,860	210	2,835	320	4,915	555
PH522_0160MTL	16.00	3,300	6,000	32	3.6	574.7	65	1,860	210	2,835	320	4,915	555
PH522_0200MT	20.00	3,300	6,000	24	1.6	628.8	71	1,949	220	2,835	320	5,315	600
PH522_0200MTL	20.00	3,300	6,000	32	3.6	628.8	71	1,949	220	2,835	320	5,315	600
PH522_0250MT	25.00	3,700	6,500	24	1.5	625.1	71	1,949	220	2,835	320	5,315	600
PH522_0250MTL	25.00	3,700	6,500	32	4.5	625.1	71	1,949	220	2,835	320	5,315	600
PH522_0280MT	28.00	4,000	7,000	24	1.3	540.4	61	1,860	210	2,835	320	4,915	555
PH522_0280MTL	28.00	4,000	7,000	32	4.0	540.4	61	1,860	210	2,835	320	4,915	555
PH522_0350MT	35.00	4,000	7,000	24	1.3	602.1	68	1,949	220	2,835	320	5,315	600
PH522_0350MTL	35.00	4,000	7,000	32	4.0	602.1	68	1,949	220	2,835	320	5,315	600
PH522_0400MT	40.00	4,000	7,000	24	1.3	516.5	58	1,860	210	2,835	320	4,915	555
PH522_0400MTL	40.00	4,000	7,000	32	3.7	516.5	58	1,860	210	2,835	320	4,915	555
PH522_0500MT	50.00	4,000	7,000	24	1.3	582.9	66	1,949	220	2,835	320	5,315	600
PH522_0500MTL	50.00	4,000	7,000	32	3.7	582.9	66	1,949	220	2,835	320	5,315	600
PH522_0700MT	70.00	4,000	7,000	24	1.3	580.7	66	1,860	210	2,392	270	5,315	600
PH522_0700MTL	70.00	4,000	7,000	32	3.7	580.7	66	1,860	210	2,392	270	5,315	600
PH522_1000MT	100.0	4,000	7,000	24	1.3	459.1	52	1,240	140	2,215	250	4,429	500
PH522_1000MTL	100.0	4,000	7,000	32	3.7	459.1	52	1,240	140	2,215	250	4,429	500
PH721 with Motor Mounting Plate													
PH721_0040MT	4.000	1,900	4,000	38	11	1638.7	185	3,898	440	6,201	700	12,235	1,381
PH721_0040MTC	4.000	2,600	4,000	38	14	1638.7	185	3,898	440	6,201	700	12,235	1,381
PH721_0040MTL	4.000	1,900	4,000	48	49	1638.7	185	3,898	440	6,201	700	12,235	1,381
PH721_0050MT	5.000	2,200	5,000	38	9.3	1629.9	184	3,898	440	6,201	700	12,401	1,400
PH721_0050MTC	5.000	2,800	5,000	38	12.3	1629.9	184	3,898	440	6,201	700	12,401	1,400
PH721_0050MTL	5.000	2,200	5,000	48	40	1629.9	184	3,898	440	6,201	700	12,401	1,400
PH721_0070MT	7.000	2,500	5,000	38	7.9	1417.3	160	3,898	440	5,758	650	11,127	1,256
PH721_0070MTC	7.000	3,000	5,000	38	10.9	1417.3	160	3,898	440	5,758	650	11,127	1,256
PH721_0070MTL	7.000	2,500	5,000	48	32	1417.3	160	3,898	440	5,758	650	11,127	1,256
PH721_0100MT	10.00	3,000	5,000	38	7.2	1036.4	117	2,657	300	4,429	500	8,858	1,000
PH721_0100MTC	10.00	4,000	5,000	38	10.2	1036.4	117	2,657	300	4,429	500	8,858	1,000
PH721_0100MTL	10.00	3,000	5,000	48	28	1036.4	117	2,657	300	4,429	500	8,858	1,000
PH722 with Motor Mounting Plate Continued Next Page													
PH722_0160MT	16.00	3,000	5,000	32	4.7	1204.8	136	3,898	440	6,201	700	12,235	1,381
PH722_0160MTL	16.00	3,000	5,000	38	11	1204.8	136	3,898	440	6,201	700	12,235	1,381
PH722_0200MT	20.00	3,000	5,000	32	4.6	1325.9	150	3,898	440	6,201	700	12,401	1,400
PH722_0200MTL	20.00	3,000	5,000	38	11	1325.9	150	3,898	440	6,201	700	12,401	1,400
PH722_0250MT	25.00	3,500	6,000	32	4.2	1318.0	149	3,898	440	6,201	700	12,401	1,400
PH722_0250MTL	25.00	3,500	6,000	38	9.3	1318.0	149	3,898	440	6,201	700	12,401	1,400
PH722_0280MT	28.00	3,700	6,500	32	3.9	1159.8	131	3,898	440	6,201	700	12,235	1,381
PH722_0280MTL	28.00	3,700	6,500	38	7.9	1159.8	131	3,898	440	6,201	700	12,235	1,381
PH722_0350MT	35.00	3,700	6,500	32	3.8	1290.6	146	3,898	440	6,201	700	12,401	1,400
PH722_0350MTL	35.00	3,700	6,500	38	7.9	1290.6	146	3,898	440	6,201	700	12,401	1,400

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

"PH" Series–PowerLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input) Gearhead	Exact Ratio i	Maximum Input Speed Continuous RPM (n_1)	Cyclic RPM (n_1)	Maximum Motor Shaft øD6 mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs per arcmin	Nm per arcmin	Output Torque Nominal 1) T_{2N} in.lbs	Nm	Acceleration T_{2B} in.lbs	Nm	Peak 2) T_{2PEAK} in.lbs	Nm
PH722 with Motor Mounting Plate Continued													
PH722_0400MT	40.00	3,700	6,500	32	3.7	1120.5	126	3,898	440	6,201	700	12,235	1,381
PH722_0400MTL	40.00	3,700	6,500	38	7.2	1120.5	126	3,898	440	6,201	700	12,235	1,381
PH722_0500MT	50.00	3,700	6,500	32	3.6	1259.2	142	3,898	440	6,201	700	12,401	1,400
PH722_0500MTL	50.00	3,700	6,500	38	7.2	1259.2	142	3,898	440	6,201	700	12,401	1,400
PH722_0700MT	70.00	3,700	6,500	32	3.6	1253.5	142	3,898	440	5,758	650	11,127	1,256
PH722_0700MTL	70.00	3,700	6,500	38	7.2	1253.5	142	3,898	440	5,758	650	11,127	1,256
PH722_1000MT	100.0	3,700	6,500	32	3.6	990.1	112	2,657	300	4,429	500	8,858	1,000
PH722_1000MTL	100.0	3,700	6,500	38	7.2	990.1	112	2,657	300	4,429	500	8,858	1,000
PH821 with Motor Mounting Plate													
PH821_0040MT	4.000	1,500	3,500	48	49	5314.8	600	7,086	800	14,173	1,600	22,752	2,569
PH821_0040MTC	4.000	2,200	3,500	48	65	5314.8	600	7,086	800	14,173	1,600	22,752	2,569
PH821_0050MT	5.000	1,700	4,000	48	40	4871.9	550	8,858	1,000	15,059	1,700	28,346	3,200
PH821_0050MTC	5.000	2,500	4,000	48	56	4871.9	550	8,858	1,000	15,059	1,700	28,346	3,200
PH821_0070MT	7.000	2,000	4,000	48	32	4074.7	460	8,858	1,000	14,173	1,600	24,900	2,811
PH821_0070MTC	7.000	3,200	4,000	48	38	4074.7	460	8,858	1,000	14,173	1,600	24,900	2,811
PH821_0100MT	10.00	2,500	4,000	48	28	2790.3	315	7,086	800	10,630	1,200	21,259	2,400
PH821_0100MTC	10.00	4,500	4,000	48	44	2790.3	315	7,086	800	10,630	1,200	21,259	2,400
PH822 with Motor Mounting Plate													
PH822_0160MT	16.00	2,500	4,500	38	11	3270.6	369	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0160MTC	16.00	3,250	4,500	38	14	3270.6	369	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0160MTL	16.00	2,500	4,500	48	49	3270.6	369	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0200MT	20.00	2,500	4,500	38	11	3564.8	402	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0200MTC	20.00	3,300	4,500	38	14	3564.8	402	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0200MTL	20.00	2,500	4,500	48	49	3564.8	402	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0250MT	25.00	3,000	5,500	38	9.1	3523.7	398	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0250MTC	25.00	3,800	5,500	38	12.1	3523.7	398	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0250MTL	25.00	3,000	5,500	48	40	3523.7	398	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0280MT	28.00	3,300	6,000	38	8.0	3160.2	357	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0280MTC	28.00	3,800	6,000	38	11.0	3160.2	357	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0280MTL	28.00	3,300	6,000	48	32	3160.2	357	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0350MT	35.00	3,300	6,000	38	7.8	3479.9	393	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0350MTC	35.00	3,800	6,000	38	10.8	3479.9	393	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0350MTL	35.00	3,300	6,000	48	32	3479.9	393	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0400MT	40.00	3,300	6,000	38	7.2	3023.9	341	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0400MTC	40.00	4,500	6,000	38	10.2	3023.9	341	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0400MTL	40.00	3,300	6,000	48	28	3023.9	341	9,744	1,100	17,716	2,000	28,346	3,200
PH822_0500MT	50.00	3,300	6,000	38	7.2	3372.9	381	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0500MTC	50.00	4,500	6,000	38	10.2	3372.9	381	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0500MTL	50.00	3,300	6,000	48	28	3372.9	381	11,073	1,250	17,716	2,000	28,346	3,200
PH822_0700MT	70.00	3,300	6,000	38	7.1	3425.1	387	8,858	1,000	14,173	1,600	24,900	2,811
PH822_0700MTC	70.00	4,500	6,000	38	10.1	3425.1	387	8,858	1,000	14,173	1,600	24,900	2,811
PH822_0700MTL	70.00	3,300	6,000	48	28	3425.1	387	8,858	1,000	14,173	1,600	24,900	2,811
PH822_1000MT	100.0	3,300	6,000	38	7.0	2623.3	296	7,086	800	10,630	1,200	21,259	2,400
PH822_1000MTC	100.0	4,500	6,000	38	10.0	2623.3	296	7,086	800	10,630	1,200	21,259	2,400
PH822_1000MTL	100.0	3,300	6,000	48	28	2623.3	296	7,086	800	10,630	1,200	21,259	2,400
PH912 with Motor Mounting Plate Continued Next Page													
PH912_0120MT	12.00	1,800	3,000	48	75	5410.2	611	22,145	2,500	37,647	4,250	66,209	7,475
PH912_0160MT	16.00	2,200	3,500	48	47	5342.4	603	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0180MT	18.00	1,800	3,000	48	69	5987.4	676	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0200MT	20.00	2,500	4,000	48	38	5287.3	597	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0240MT	24.00	2,200	3,500	48	43	5950.2	672	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0280MT	28.00	2,800	4,500	48	31	5188.3	586	22,145	2,500	37,647	4,250	75,293	8,500

1) Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

2) Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PH" Series–PowerLine
ServoFit® Precision Planetary Gearhead
Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD[6] mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
PH912 with Motor Mounting Plate Continued													
PH912_0300MT	30.00	2,500	4,000	48	36	5919.7	668	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0320MT	32.00	2,800	4,500	48	29	5122.5	578	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0400MT	40.00	2,800	4,500	48	28	5028.2	568	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0420MT	42.00	2,800	4,500	48	30	5864.0	662	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0480MT	48.00	2,800	4,500	48	29	5826.4	658	22,145	2,500	37,647	4,250	75,293	8,500
PH912_0600MT	60.00	2,800	4,500	48	27	5771.7	652	22,145	2,500	37,647	4,250	75,293	8,500
PH923 with Motor Mounting Plate													
PH923_0610MT	61.00	2,500	4,500	38	49	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH923_0610MTL	61.00	2,500	4,500	48	49	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH923_0910MT	91.00	2,500	4,500	38	46	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH923_0910MTL	91.00	2,500	4,500	48	46	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH923_1210MT	121.0	2,500	4,500	38	44	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH923_1210MTL	121.0	2,500	4,500	48	49	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924 with Motor Mounting Plate													
PH924_1830MT	183.0	2,500	4,500	32	9.5	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_1830MTL	183.0	2,500	4,500	48	57	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_3050MT	305.0	3,500	6,000	32	5.8	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_3050MTL	305.0	3,500	6,000	48	42	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_4550MT	455.0	3,500	6,000	32	5.7	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_4550MTL	455.0	3,500	6,000	48	42	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_6370MT	637.0	3,700	6,500	32	4.5	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_6370MTL	637.0	3,700	6,500	48	35	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_9100MT	910.0	3,700	6,500	32	4.0	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH924_9100MTL	910.0	3,700	6,500	48	33	3543.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PH1012 with Motor Mounting Plate													
PH1012_0180MT	18.00	1,800	3,000	48	72	10028.7	1132	35,432	4,000	66,435	7,500	99,314	11,212
PH1012_0240MT	24.00	2,200	3,500	48	45	9924.9	1120	35,432	4,000	66,435	7,500	132,418	14,949
PH1012_0300MT	30.00	2,500	4,000	48	37	9840.2	1111	35,432	4,000	66,435	7,500	132,870	15,000
PH1012_0420MT	42.00	2,800	4,500	48	31	9687.4	1094	35,432	4,000	66,435	7,500	132,870	15,000
PH1012_0480MT	48.00	2,800	4,500	48	29	9585.2	1082	35,432	4,000	66,435	7,500	132,870	15,000
PH1012_0600MT	60.00	2,800	4,500	48	27	9437.9	1065	35,432	4,000	66,435	7,500	132,870	15,000
PH1023 with Motor Mounting Plate													
PH1023_0610MT	61.00	2,500	4,500	48	146	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1023_0910MT	91.00	2,500	4,500	48	120	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024 with Motor Mounting Plate													
PH1024_1830MT	183.0	2,200	3,700	38	28	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_1830MTL	183.0	2,200	3,700	48	57	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_3050MT	305.0	3,000	5,500	38	13	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_3050MTL	305.0	3,000	5,500	48	42	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_4550MT	455.0	3,000	5,500	38	12	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_4550MTL	455.0	3,000	5,500	48	42	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_6370MT	637.0	3,300	6,000	38	9.5	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_6370MTL	637.0	3,300	6,000	48	35	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_9100MT	910.0	3,300	6,000	38	8.0	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PH1024_9100MTL	910.0	3,300	6,000	48	33	4871.9	550	35,432	4,000	66,435	7,500	132,870	15,000

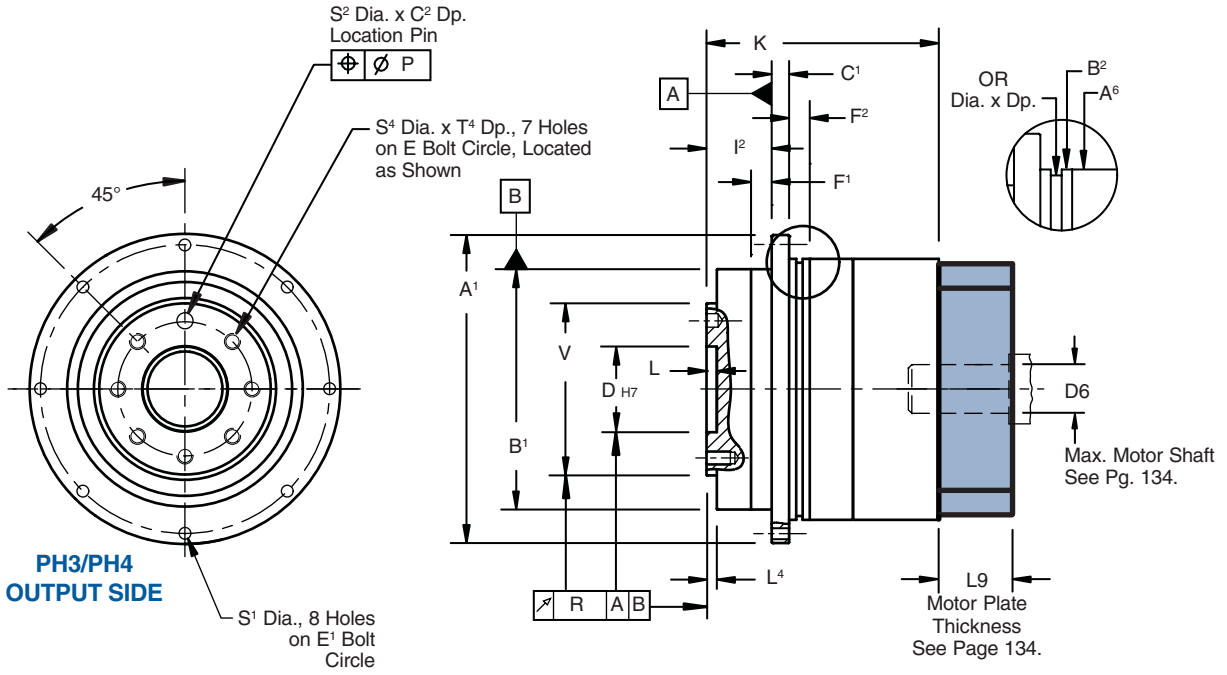
Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

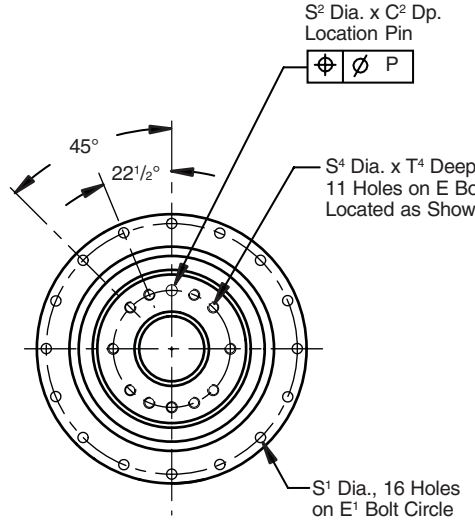
See web site for drawings.

"PH" Series–PowerLine ServoFit® Precision Planetary Gearhead Dimensional Data

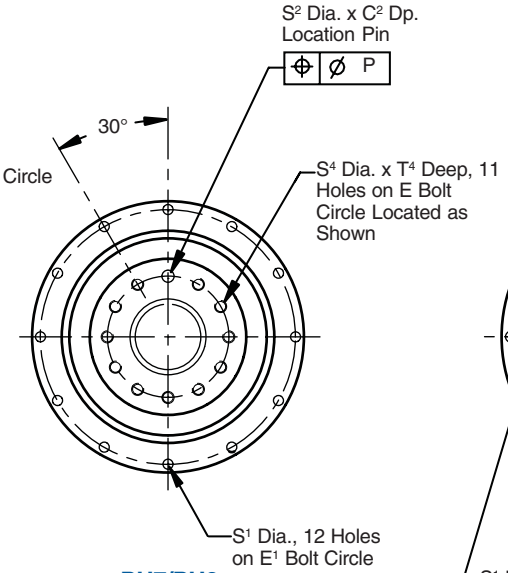
Drawing for Units
PH321 thru PH1024



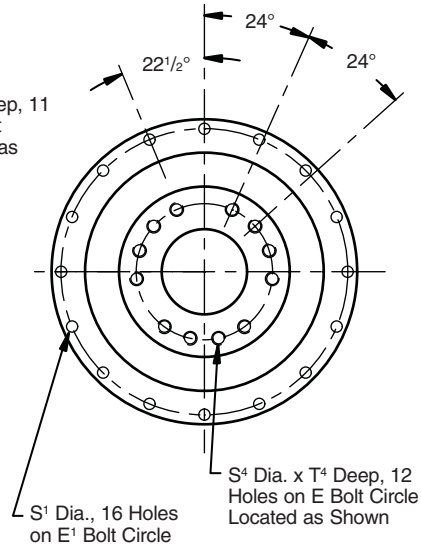
PH3/PH4 OUTPUT SIDE



PH5 OUTPUT SIDE



PH7/PH8 OUTPUT SIDE



PH9/PH10 OUTPUT SIDE

See web site for drawings.

"PH" Series–PowerLine ServoFit® Precision Planetary Gearhead Dimensional Data

Table No. 1 **"PH" Series – PowerLine Gearhead with Motor Plate – Dimensions (mm/inches)**

Unit	A[1]	B[1] h7	B[2] h7	C[1]	C[2]	D H7	E	E[1]	F[1]	F[2]	I[2]	L	L[2]	L[4]	OR
PH321/PH322	86	64 +.000/-.030	70 * +.000/-.030	4	3	20 +.021/-.0	31.5	79	7	8	19.5	4	3	3.5	65x2
	3.39	2.520 +.0000/-.0012	2.756 +.0000/-.0012	.16	.12	.787 +.0008/-.0000	1.24	3.11	.28	.31	.77	.16	.12	.14	2.55x.08
PH421/PH422	118	90 +.000/-.035	95 +.000/-.035	7	7	31.5 +.025/-.0	50	109	10	10	30	6	6	6	90x3
	4.65	3.543 +.0000/-.0014	3.740 +.0000/-.0014	.28	.28	1.240 +.0010/-.0000	1.97	4.29	.39	.39	1.18	.24	.24	.24	3.54x.12
PH521/PH522	145	110 +.000/-.035	120 * +.000/-.035	8	7	40 +.025/-.0	63	135	10	12	29	6	6	6	110x3
	5.71	4.331 +.0000/-.0014	4.724 +.0000/-.0014	.32	.28	1.575 +.0010/-.0000	2.48	5.31	.39	.47	1.14	.24	.24	.24	4.33x.12
PH721/PH722	179	140 +.000/-.040	152 +.000/-.040	10	7	50 +.025/-.0	80	168	12	12	38	6	6	6	145x3
	7.05	5.513 +.0000/-.0016	5.984 +.0000/-.0016	.39	.28	1.969 +.0010/-.0000	3.15	6.61	.47	.47	1.50	.24	.24	.24	5.71x.12
PH821/PH822	247	200 +.000/-.046	212 +.000/-.046	12	10	80 +.030/-.0	125	233	15	15	50	8	8	8	200x5
	9.72	7.874 +.0000/-.0018	8.346 +.0000/-.0018	.47	.39	3.150 +.0012/-.0000	4.92	9.17	.59	.59	1.97	.31	.31	.31	7.87x.20
PH912	300	255 +.000/-.052	255 +.000/-.052	18	–	90 +.035/-.0	140	280	20	20	66	12	11	12	238x5
PH923/PH924	11.81	10.039 +.000/-.0020	10.039 +.0000/-.0020	.71		3.543 +.0014/-.0000	5.51	11.02	.79	.79	2.60	.47	.43	.47	9.37x.20
PH1012	330	285 +.000/-.057	285 +.000/-.052	20	–	95 +.035/-.0	160	310	20	20	75	10	15	15	270x6
PH1023/PH1024	12.99	11.220 +.000/-.0022	11.221 +.0000/-.0020	.79		3.740 +.0014/-.0000	6.30	12.20	.79	.79	2.95	.39	.59	.59	10.63x.24

* Not applicable for PH322 and PH522.

Table No. 2 **"PH" Series – PowerLine Dimensions (mm/inches)**

Unit	P	R	S[1]	S[2] H7	S[4]	T[4]	V h7
PH321/PH322	.02	.020	4.5	5 +.012/-.000	M5	7	40 +.000/-.025
	.0008	.0008	.18	.20 +.0005/-.0000		.28	1.575 +.000/-.0010
PH421/PH422	.02	.020	5.5	6 +.012/-.000	M6	10	63 +.000/-.030
	.0008	.0008	.22	.236 +.0005/-.0000		.39	2.480 +.000/-.0012
PH521/PH522	.02	.020	5.5	6 +.012/-.000	M6	11	80 +.000/-.030
	.0008	.0008	.22	.236 +.0005/-.0000		.43	3.150 +.000/-.0012
PH721/PH722	.02	.025	6.6	8 +.015/-.000	M8	14	100 +.000/-.035
	.0008	.0010	.26	.315 +.0006/-.0000		.55	3.937 +.000/-.0014
PH821/PH822	–	.030	9	10 +.015/-.000	M10	18	160 +.000/-.040
		.0012	.35	.393 +.0006/-.0000		.71	6.299 +.000/-.0016
PH912	–	.030	13.5	–	M16	24	180 +.000/-.040
PH923/PH924		.0012	.53			94	7.087 +.000/-.0016
PH1012	–	.040	13.5	–	M20	30	200 +.000/-.046
PH1023/PH1024		.0016	.53			1.18	7.874 +.000/-.0018

Table No. 3

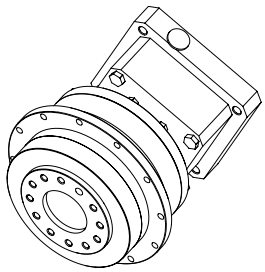
K Dimension					
Standard			ServoCool		
Unit	mm	inches	Unit	mm	inches
PH321	80.5	3.17	–		
PH322	104	4.09	–		
PH421	106	4.17	–		
PH422	146.5	5.77	–		
PH521	110	4.33	–		
PH522	159.5	6.28	–		
PH721	138	5.43	**PH721_C**	168	6.61
PH722	190	7.48	–		
PH821	183	7.20	**PH821_C**	231	9.09
PH822	251	9.88	**PH822_C**	281	11.06
PH912	336.5	13.24	–		
PH923	257	10.12	–		
PH924	309	12.17	–		
PH1012	366	14.41	–		
PH1023	307	12.09	–		
PH1024	375	14.76	–		

Part No. Explanation

PH 8 2 1 F 0050 MT C

- C – Option for ServoCool
- MT – Motor Plate with TriAdapt Coupling
- 0050 – Ratio (**0050** = 5.0:1)
- F – Output Flange
- 1 – No. of Stages (**1** = 1 Stage, **2** = 2 Stage)
- 2 – Generation No.
- 8 – Unit No.
- PH – PowerLine ServoFit Precision Planetary Gearhead

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions.

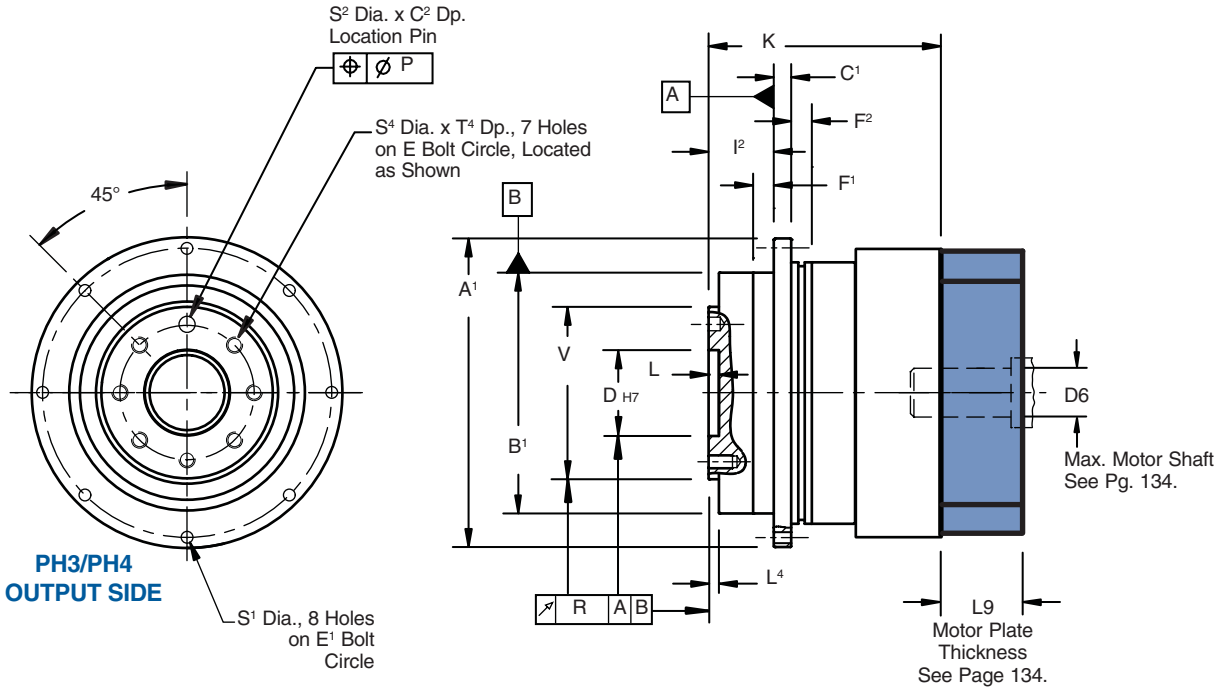


Typical 2 Stage Configuration

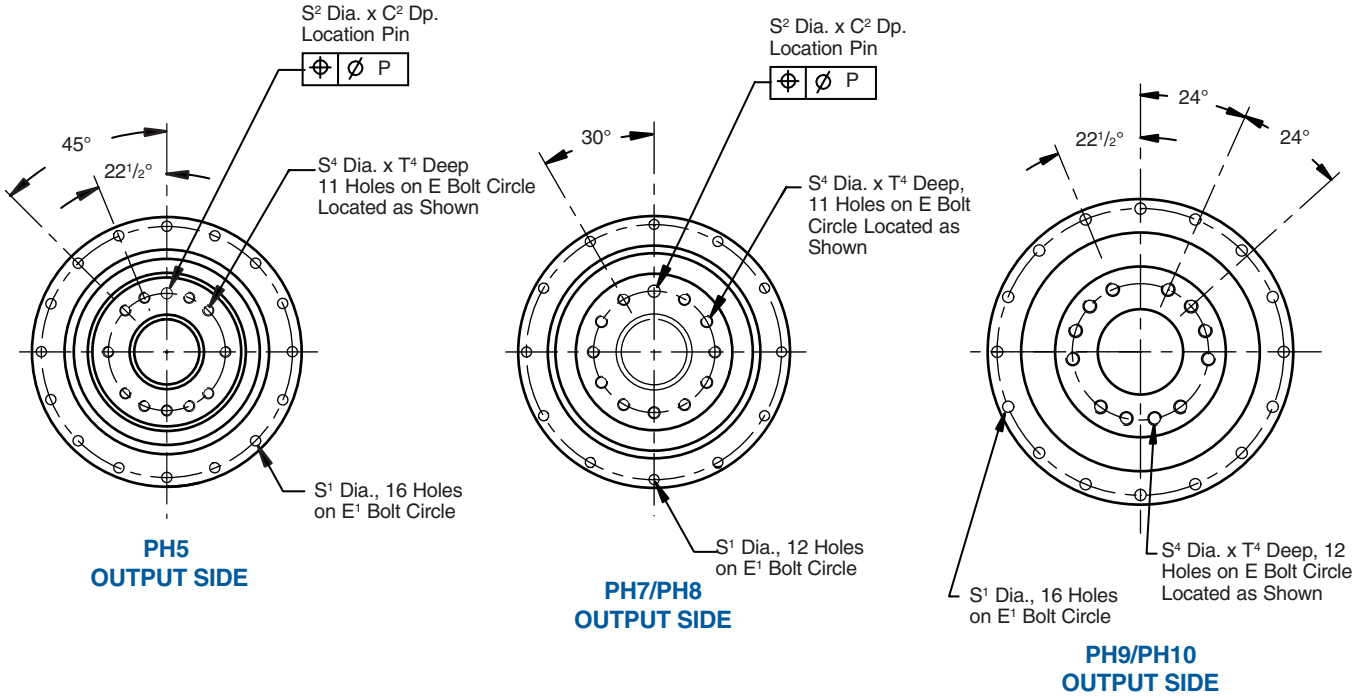
See web site for drawings.

"PH" Series–PowerLine – Large Input ServoFit® Precision Planetary Gearhead Dimensional Data

Drawing for Units
PH321_L thru PH1024_L



PH3/PH4 OUTPUT SIDE



PH5 OUTPUT SIDE

PH7/PH8 OUTPUT SIDE

PH9/PH10 OUTPUT SIDE

"PH" Series–PowerLine – Large Input ServoFit® Precision Planetary Gearhead Dimensional Data

Table No. 1 **"PH" Series – Large Input – PowerLine Gearhead – Dimensions (mm/inches)**

Unit	A[1]	B[1] h7	C[1]	C[2]	D H7	E	E[1]	F[1]	F[2]	I[2]	L	L[2]	L[4]
PH321/PH322_L	86	64 +.000/-.030	4	3	20 +.021/-.0	31.5	79	7	8	19.5	4	3	3.5
	3.39	2.520 +.0000/-.0012	6.16	.12	.787 +.0008/-.0000	1.24	3.11	.28	.31	.77	.16	.12	.14
PH421/PH422_L	118	90 +.000/-.035	7	7	31.5 +.025/-.0	50	109	10	10	30	6	6	6
	4.65	3.543 +.0000/-.0014	.28	.28	1.240 +.0010/-.0000	1.97	4.29	.39	.39	1.18	.24	.24	.24
PH521/PH522_L	145	110 +.000/-.035	8	7	40 +.025/-.0	63	135	10	12	29	6	6	6
	5.71	4.331 +.0000/-.0014	.32	.28	1.575 +.0010/-.0000	2.48	5.31	.39	.47	1.14	.24	.24	.24
PH721/PH722_L	179	140 +.000/-.040	10	7	50 +.025/-.0	80	168	12	12	38	6	6	6
	7.05	5.513 +.0000/-.0016	.39	.28	1.969 +.0010/-.0000	3.15	6.61	.47	.47	1.50	.24	.24	.24
PH822_L	247	200 +.000/-.046	12	10	80 +.030/-.0	125	233	15	15	50	8	8	8
	9.72	7.874 +.0000/-.0018	.47	.39	3.150 +.0012/-.0000	4.92	9.17	.59	.59	1.97	.31	.31	.31
PH923/PH924_L	300	255 +.000/-.052	18	–	90 +.035/-.0	140	280	20	20	66	12	11	12
	11.81	10.039 +.000/-.0020	.71		3.543 +.0014/-.0000	5.51	11.02	.79	.79	2.60	.47	.43	.47
PH1024_L	330	285 +.000/-.057	20	–	95 +.035/-.0	160	310	20	20	75	10	15	15
	12.99	11.220 +.000/-.0022	.79		3.740 +.0014/-.0000	6.30	12.20	.79	.79	2.95	.39	.59	.59

Table No. 2 **"PH" Series – Large Input – Dimensions (mm/inches)**

Unit	P	R	S[1]	S[2] H7	S[4]	T[4]	V h7
PH321/PH322_L	.02	.020	4.5	5 +.012/-.000	M5	7	40 +.000/-.025
	.0008	.0008	.18	.20 +.0005/-.0000		.28	1.575 +.000/-.0010
PH421/PH422_L	.02	.020	5.5	6 +.012/-.000	M6	10	63 +.000/-.030
	.0008	.0008	.22	.236 +.0005/-.0000		.39	2.480 +.000/-.0012
PH521/PH522_L	.02	.020	5.5	6 +.012/-.000	M6	11	80 +.000/-.030
	.0008	.0008	.22	.236 +.0005/-.0000		.43	3.150 +.000/-.0012
PH721/PH722_L	.02	.025	6.6	8 +.015/-.000	M8	14	100 +.000/-.035
	.0008	.0010	.26	.315 +.0006/-.0000		.55	3.937 +.000/-.0014
PH822_L	–	.030	9	10 +.015/-.000	M10	18	160 +.000/-.040
		.0012	.35	.393 +.0006/-.0000		.71	6.299 +.000/-.0016
PH923/PH924_L	–	.030	13.5	–	M16	24	180 +.000/-.040
		.0012	.53			94	7.087 +.000/-.0016
PH1024_L	–	.040	13.5	–	M20	30	200 +.000/-.046
		.0016	.53			1.18	7.874 +.000/-.0018

Table No. 3

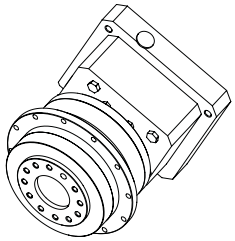
Unit	K Dimension mm	K Dimension inches
PH321_L	84.5	3.33
PH322_L	121	4.76
PH421_L	117.5	4.63
PH422_L	150.5	5.93
PH521_L	124	4.88
PH522_L	171	6.73
PH721_L	155	6.10
PH722_L	204	8.03
PH822_L	268	10.55
PH923_L	274	10.79
PH924_L	323	12.72
PH1024_L	389	15.31

Part No. Explanation

PH 4 2 1 F 0050 MT L

- L – Large Input
- MT – Motor Plate with TriAdapt Coupling
- 0050 – Ratio (**0050** = 5.0:1)
- F – Output Flange
- 1 – No. of Stages (**1** = 1 Stage, **2** = 2 Stage)
- 2 – Generation No.
- 4 – Unit No.
- PH – PowerLine ServoFit Precision Planetary Gearhead

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions.



Typical 2 Stage Configuration

See web site for drawings.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Performance Specifications

		Size	PHA321 PHA322	PHA421 PHA422	PHA521 PHA522	PHA721 PHA722	PHA821 PHA822	PHA923 PHA912 PHA924	PHA1023 PHA1012 PHA1024
Acceleration Torque Max.	T_{2B}	in.lbs. Nm	575 65	1,150 130	2,832 320	6,195 700	17,700 2,000	37,612 4,250	66,375 7,500
Output Torque Nominal [1]	T_{2N}	in.lbs. Nm	398 45	796 90	1,947 220	3,894 440	11,062 1,250	22,125 2,500	35,400 4,000
Input Speed Maximum	n_{1MAX}	Continuous Cyclic	3500 4500 6000 8000	3000 4500 6000 8000	3000 4000 6000 7000	2500 3700 5000 6500	2500 3300 4000 6000	2800 2500 3700 4500 4500 6500	2800 2500 3300 4500 4500 6000
ServoCool Input RPM Maximum	n_{1MAX}	Continuous Cyclic	– –	– –	– –	4,000 – 5,000 –	4,500 4,500 4,000 6,000	– –	– –
Torsional Backlash [2]	$\Delta\varphi$	arcmin	≤2	≤1	≤1	≤1	≤1	≤1	≤1
Torsional Stiffness	C_2	in.lbs./arcmin Nm/arcmin	≤106 ≤12	≤292 ≤33	≤708 ≤80	≤1,371 ≤155	≤3,752 ≤424	≤5,858 ≤662	≤9,673 ≤1,093
Axial Load Maximum	F_{2AMAX}	lbs. N	371 1,650	484 2,150	934 4,150	1,384 6,150	2,260 10,050	7,425 33,000	11,250 50,000
Tilting Moment Maximum	T_{2K}	in.lbs. Nm	885 100	2,301 260	3,894 440	13,275 1,500	30,975 3,500	57,525 6,500	77,880 8,800
Tilting Stiffness	C_{2K}	in.lbs./arcmin Nm/arcmin	– –	1,416 160	2,655 300	4,425 500	13,718 1,550	48,675 5,500	84,075 9,500
Efficiency (at Nominal Torque)	h	%	96% 94%	96% 94%	96% 94%	96% 94%	96% 94%	96% 94% 92%	94% 92% 90%
Weight	m	pounds kg	4 1.8	9 10 3.9 4.6	15 18 6.6 8.1	27 32 12.3 14.6	76 88 34.6 39.8	157 139 141 71 63 64.1	190 216 218 86 98 99
Noise Level [4]	L_{PA}	dB(A)	≤61	≤62	≤63	≤64	≤65	≤65	≤65
Balance Quality			Q 2.5 (Quality Class-2.5 millimeters per second)						
Lubrication			Synthetic Oil (ISO VG 150)						
Degree of Protection			IP65						
Mounting Position			Unrestricted						
Ambient Temperature			0°C to +40°C (104° F) Other temperatures, contact STOBER Drives.						
Finish			Black (RAL 9005)						
Lifetime [5]	L_h	hours	L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25						
Warranty			5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)						

[1] Ratings based on input speed (n_1) of 2000 RPM.
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Tested at 1.5% of nominal torque and recorded on the input side of the gearhead.

[3] Rating based on output speed (n2) of 100 RPM. For values at other speeds see Page 137.

[4] Measurement at one (1) meter distance with input speed (n1) of 3000 RPM.

[5] T_{2A} equals actual tilting moment of the application. See Page 137 for calculation details.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Features

The "PHA" Series–PowerLine of ServoFit Precision Planetary Gearheads are designed for the exacting demands on torsional and tilting rigidity. The "PHA" series is well suited where a smooth, precise, reliable drive is needed. All units are lubricated for life with synthetic oil and sealed on the smallest diameters possible with FKM radial oil seals to IP65 standards – reduces friction and prevents heat build up, increases efficiency, and prevents lubricant contamination for long life.

Some features are:

- Readily Attaches to Any Servo Motor
- Superior Torsional Stiffness
- 90-96% Efficiency
- Excellent Axial Load Capacity
- ≤ 1 arc minute backlash
- ISO Output Flange for Coupling Free Mounting
- Advanced Helicamber Gear Technology
- 5 Year Limited Warranty (2 Year on bearings, seals, etc.)
- Wide Selection of IEC, NEMA, or Customized* Motor Plates
- Groung and honed gearing

Helical gears made with the proven experience of HeliCamber® gear technology provides the highest running smoothness – ensuring backlash stability and extremely quiet operation.

The FlexiAdapt® motor coupling is designed for large motor shaft diameters and features a bellows coupling to compensate for thermal expansion of the motor shaft–ensuring long motor life by preventing thrust load on the motor bearings.

Balanced clamp coupling for smooth operation at high speeds.

Ring gear machined integral to the housing – not welded or pressed in

The FlexiAdapt® motor shaft adapter system allows easy and accurate installation of motor in minutes — no special tools required.

Adapter bushings fit all motor shafts – no key required

FKM double-lip radial oil seals for continuous duty applications and very good chemical resistance.

Blind pilot hole

Gears are case hardened to 61 Rockwell "C" and ground and honed for maximum accuracy.

Backlash ≤ 1 arcminute – Precision selection of parts ensure optimal performance without binding gear teeth – resulting in a more accurate and smooth direct drive

The output flange dimensions are ISO 9409 and allow easy mounting to rotary or indexing tables, pinions, timing belt pulleys, transmission shafting, etc., without using a coupling.

Single piece high tensile steel housing provides greater concentricity and more precise alignment – ensuring high running accuracy and precision.

Oversized tapered roller bearings and shafts for high radial load capacity and superior torsional stiffness

Precision selection of gears and parts ensures backlash of less than 1 arcminute.

Available as ServoCool in Sizes PH7 and PH8.

See web site for drawings.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD^6 mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
PHA321 with Motor Mounting Plate													
PHA321_0050MF	5.000	3,000	6,000	19	.563	103.2	12	399	45	576	65	1,152	130
PHA321_0070MF	7.000	3,500	6,000	19	.515	95.8	11	399	45	531	60	1,152	130
PHA321_0100MF	10.00	3,800	6,000	19	.497	77.8	8.8	266	30	443	50	886	100
PHA322 with Motor Mounting Plate													
PHA322_0200MF	20.00	4,500	8,000	14	.204	89.7	10	399	45	576	65	1,152	130
PHA322_0250MF	25.00	4,500	8,000	14	.185	89.9	10	399	45	576	65	1,152	130
PHA322_0280MF	28.00	4,500	8,000	14	.201	90.3	10	399	45	531	60	1,152	130
PHA322_0350MF	35.00	4,500	8,000	14	.170	89.0	10	399	45	576	65	1,152	130
PHA322_0400MF	40.00	4,500	8,000	14	.200	76.0	8.6	266	30	443	50	886	100
PHA322_0500MF	50.00	4,500	8,000	14	.163	86.7	10	399	45	576	65	1,152	130
PHA322_0700MF	70.00	4,500	8,000	14	.162	88.7	10	399	45	531	60	1,152	130
PHA322_1000MF	100.0	4,500	8,000	14	.162	75.4	8.5	266	30	443	50	886	100
PHA421 with Motor Mounting Plate													
PHA421_0040MF	4.000	2,300	5,000	24	2.05	294.2	33	753	85	1,152	130	2,126	240
PHA421_0050MF	5.000	2,700	6,000	24	1.87	296.4	33	753	85	1,152	130	2,126	240
PHA421_0070MF	7.000	3,200	6,000	24	1.69	259.7	29	753	85	974	110	2,126	240
PHA421_0100MF	10.00	3,500	6,000	24	1.62	182.5	21	531	60	886	100	1,772	200
PHA422 with Motor Mounting Plate													
PHA422_0160MF	16.00	3,700	6,500	19	.642	231.3	26	797	90	1,152	130	2,126	240
PHA422_0200MF	20.00	3,700	6,500	19	.631	252.2	28	797	90	1,152	130	2,126	240
PHA422_0250MF	25.00	4,000	7,000	19	.579	251.5	28	797	90	1,152	130	2,126	240
PHA422_0280MF	28.00	4,500	8,000	19	.525	220.4	25	797	90	1,152	130	2,126	240
PHA422_0350MF	35.00	4,500	8,000	19	.521	243.8	28	797	90	1,152	130	2,126	240
PHA422_0400MF	40.00	4,500	8,000	19	.502	213.8	24	797	90	1,152	130	2,126	240
PHA422_0500MF	50.00	4,500	8,000	19	.500	238.5	27	797	90	1,152	130	2,126	240
PHA422_0700MF	70.00	4,500	8,000	19	.498	236.8	27	797	90	974	110	2,126	240
PHA422_1000MF	100.0	4,500	8,000	19	.497	176.6	20	531	60	886	100	1,772	200

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD^6 mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
PHA521 with Motor Mounting Plate													
PHA521_0040MF	4.000	2,200	5,000	32	4.93	679.0	77	1,860	210	2,835	320	4,915	555
PHA521_0050MF	5.000	2,500	5,500	32	5.75	704.6	80	1,860	210	2,835	320	5,315	600
PHA521_0070MF	7.000	3,000	6,000	32	5.20	627.3	71	1,860	210	2,392	270	5,315	600
PHA521_0100MF	10.00	3,300	6,000	32	4.95	472.7	53	1,240	140	2,215	250	4,429	500
PHA522 with Motor Mounting Plate													
PHA522_0160MF	16.00	3,300	6,000	24	1.85	564.5	64	1,860	210	2,835	320	4,915	555
PHA522_0200MF	20.00	3,300	6,000	24	1.90	621.0	70	1,949	220	2,835	320	5,315	600
PHA522_0250MF	25.00	3,700	6,500	24	1.78	620.1	70	1,949	220	2,835	320	5,315	600
PHA522_0280MF	28.00	4,000	7,000	24	1.63	536.6	61	1,860	210	2,835	320	4,915	555
PHA522_0350MF	35.00	4,000	7,000	24	1.65	599.0	68	1,949	220	2,835	320	5,315	600
PHA522_0400MF	40.00	4,000	7,000	24	1.59	514.8	58	1,860	210	2,835	320	4,915	555
PHA522_0500MF	50.00	4,000	7,000	24	1.59	581.5	66	1,949	220	2,835	320	5,315	600
PHA522_0700MF	70.00	4,000	7,000	24	1.59	580.0	66	1,860	210	2,392	270	5,315	600
PHA522_1000MF	100.0	4,000	7,000	24	1.59	458.9	52	1,240	140	2,215	250	4,429	500
PHA721 with Motor Mounting Plate													
PHA721_0040MF	4.000	1,900	4,000	38	16.63	1271.3	144	3,898	440	6,201	700	12,235	1,381
PHA721_0040MFC	4.000	2,600	4,000	38	19.63	1271.3	144	3,898	440	6,201	700	12,235	1,381
PHA721_0050MF	5.000	2,200	5,000	38	14.78	1376.6	156	3,898	440	6,201	700	12,401	1,400
PHA721_0050MFC	5.000	2,800	5,000	38	17.78	1376.6	156	3,898	440	6,201	700	12,401	1,400
PHA721_0070MF	7.000	2,500	5,000	38	13.03	1286.0	145	3,898	440	5,758	650	11,127	1,256
PHA721_0070MFC	7.000	3,000	5,000	38	16.03	1286.0	145	3,898	440	5,758	650	11,127	1,256
PHA721_0100MF	10.00	3,000	5,000	38	12.33	999.8	113	2,657	300	4,429	500	8,858	1,000
PHA721_0100MFC	10.00	4,000	5,000	38	15.33	999.8	113	2,657	300	4,429	500	8,858	1,000
PHA722 with Motor Mounting Plate													
PHA722_0160MF	16.00	3,000	5,000	32	5.98	1176.4	133	3,898	440	6,201	700	12,235	1,381
PHA722_0200MF	20.00	3,000	5,000	32	5.87	1303.7	147	3,898	440	6,201	700	12,401	1,400
PHA722_0250MF	25.00	3,500	6,000	32	5.46	1303.9	147	3,898	440	6,201	700	12,401	1,400
PHA722_0280MF	28.00	3,700	6,500	32	5.08	1149.1	130	3,898	440	6,201	700	12,235	1,381
PHA722_0350MF	35.00	3,700	6,500	32	5.05	1282.2	145	3,898	440	6,201	700	12,401	1,400
PHA722_0400MF	40.00	3,700	6,500	32	4.89	1115.6	126	3,898	440	6,201	700	12,235	1,381
PHA722_0500MF	50.00	3,700	6,500	32	4.88	1255.2	142	3,898	440	6,201	700	12,401	1,400
PHA722_0700MF	70.00	3,700	6,500	32	4.86	1251.5	141	3,898	440	5,758	650	11,127	1,256
PHA722_1000MF	100.0	3,700	6,500	32	4.85	989.4	112	2,657	300	4,429	500	8,858	1,000

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	$øD^6$ mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
PHA821 with Motor Mounting Plate													
PHA821_0040MF	4.000	1,500	3,500	48	54.82	3527.3	399	7,086	800	14,173	1,600	22,752	2,569
PHA821_0040MFC	4.000	2,200	3,500	48	70.82	3527.3	399	7,086	800	14,173	1,600	22,752	2,569
PHA821_0050MF	5.000	1,700	4,000	48	45.84	3755.4	424	8,858	1,000	15,059	1,700	28,346	3,200
PHA821_0050MFC	5.000	2,500	4,000	48	61.84	3755.4	424	8,858	1,000	15,059	1,700	28,346	3,200
PHA821_0070MF	7.000	2,000	4,000	48	38.42	3546.2	401	8,858	1,000	14,173	1,600	24,900	2,811
PHA821_0070MFC	7.000	3,200	4,000	48	54.42	3546.2	401	8,858	1,000	14,173	1,600	24,900	2,811
PHA821_0100MF	10.00	2,500	4,000	48	34.60	2657.4	300	7,086	800	10,630	1,200	21,259	2,400
PHA821_0100MFC	10.00	4,500	4,000	48	50.60	2657.4	300	7,086	800	10,630	1,200	21,259	2,400
PHA822 with Motor Mounting Plate													
PHA822_0160MF	16.00	2,500	4,500	38	16.57	3156.8	357	9,744	1,100	17,716	2,000	28,346	3,200
PHA822_0160MFC	16.00	3,250	4,500	38	19.57	3156.8	357	9,744	1,100	17,716	2,000	28,346	3,200
PHA822_0200MF	20.00	2,500	4,500	38	16.01	3477.3	393	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0200MFC	20.00	3,300	4,500	38	19.01	3477.3	393	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0250MF	25.00	3,000	5,500	38	14.50	3468.5	392	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0250MFC	25.00	3,800	5,500	38	17.50	3468.5	392	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0280MF	28.00	3,300	6,000	38	13.08	3115.8	352	9,744	1,100	17,716	2,000	28,346	3,200
PHA822_0280MFC	28.00	3,800	6,000	38	16.08	3115.8	352	9,744	1,100	17,716	2,000	28,346	3,200
PHA822_0350MF	35.00	3,300	6,000	38	12.89	3445.4	389	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0350MFC	35.00	3,800	6,000	38	15.89	3445.4	389	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0400MF	40.00	3,300	6,000	38	12.36	3003.9	339	9,744	1,100	17,716	2,000	28,346	3,200
PHA822_0400MFC	40.00	4,500	6,000	38	15.36	3003.9	339	9,744	1,100	17,716	2,000	28,346	3,200
PHA822_0500MF	50.00	3,300	6,000	38	12.27	3356.9	379	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0500MFC	50.00	4,500	6,000	38	15.27	3356.9	379	11,073	1,250	17,716	2,000	28,346	3,200
PHA822_0700MF	70.00	3,300	6,000	38	12.19	3416.7	386	8,858	1,000	14,173	1,600	24,900	2,811
PHA822_0700MFC	70.00	4,500	6,000	38	15.19	3416.7	386	8,858	1,000	14,173	1,600	24,900	2,811
PHA822_1000MF	100.0	3,300	6,000	38	12.15	2620.9	296	7,086	800	10,630	1,200	21,259	2,400
PHA822_1000MFC	100.0	4,500	6,000	38	15.15	2620.9	296	7,086	800	10,630	1,200	21,259	2,400

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness C_2		Output Torque					
								Nominal [1] T_{2N}		Acceleration T_{2B}		Peak [2] T_{2PEAK}	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD⁶ mm	J_1 10^{-4} kgcm²	in.lbs. per arcmin	Nm	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
PHA912 with Motor Mounting Plate													
PHA912_0120MF	12.00	1,800	3,000	48	80.88	5116.9	578	22,145	2,500	37,647	4,250	66,209	7,475
PHA912_0160MF	16.00	2,200	3,500	48	52.70	5177.6	585	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0180MF	18.00	1,800	3,000	48	74.83	5823.2	658	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0200MF	20.00	2,500	4,000	48	43.87	5182.8	586	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0240MF	24.00	2,200	3,500	48	49.30	5857.9	662	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0280MF	28.00	2,800	4,500	48	37.46	5127.5	579	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0300MF	30.00	2,500	4,000	48	41.69	5860.9	662	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0320MF	32.00	2,800	4,500	48	35.80	5077.0	574	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0400MF	40.00	2,800	4,500	48	34.13	5000.0	565	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0420MF	42.00	2,800	4,500	48	36.35	5829.3	659	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0480MF	48.00	2,800	4,500	48	34.95	5800.1	655	22,145	2,500	37,647	4,250	75,293	8,500
PHA912_0600MF	60.00	2,800	4,500	48	33.58	5755.1	650	22,145	2,500	37,647	4,250	75,293	8,500
PHA923 with Motor Mounting Plate													
PHA923_0610MF	61.00	2,500	4,500	38	54.76	3533.7	399	22,145	2,500	37,647	4,250	75,293	8,500
PHA923_0910MF	91.00	2,500	4,500	38	50.61	3537.9	400	22,145	2,500	37,647	4,250	75,293	8,500
PHA923_1210MF	121.0	2,500	4,500	38	49.23	3540.2	400	22,145	2,500	37,647	4,250	75,293	8,500
PHA924 with Motor Mounting Plate													
PHA924_1830MF	183.0	2,500	4,500	32	10.79	3541.3	400	22,145	2,500	37,647	4,250	75,293	8,500
PHA924_3050MF	305.0	3,500	6,000	32	7.13	3542.5	400	22,145	2,500	37,647	4,250	75,293	8,500
PHA924_4550MF	455.0	3,500	6,000	32	6.97	3542.9	400	22,145	2,500	37,647	4,250	75,293	8,500
PHA924_6370MF	637.0	3,700	6,500	32	5.76	3543.0	400	22,145	2,500	37,647	4,250	75,293	8,500
PHA924_9100MF	910.0	3,700	6,500	32	5.23	3543.1	400	22,145	2,500	37,647	4,250	75,293	8,500
PHA1012 with Motor Mounting Plate													
PHA1012_0180MF	18.00	1,800	3,000	48	77.98	9576.5	1082	35,432	4,000	66,435	7,500	99,314	11,212
PHA1012_0240MF	24.00	2,200	3,500	48	51.07	9670.7	1093	35,432	4,000	66,435	7,500	132,418	14,949
PHA1012_0300MF	30.00	2,500	4,000	48	42.83	9678.7	1094	35,432	4,000	66,435	7,500	132,870	15,000
PHA1012_0420MF	42.00	2,800	4,500	48	36.93	9593.0	1084	35,432	4,000	66,435	7,500	132,870	15,000
PHA1012_0480MF	48.00	2,800	4,500	48	35.39	9514.2	1075	35,432	4,000	66,435	7,500	132,870	15,000
PHA1012_0600MF	60.00	2,800	4,500	48	33.87	9393.8	1061	35,432	4,000	66,435	7,500	132,870	15,000
PHA1023 with Motor Mounting Plate													
PHA1023_0610MF	61.00	2,500	4,500	48	152.02	4862.2	549	35,432	4,000	66,435	7,500	132,870	15,000
PHA1023_0910MF	91.00	2,500	4,500	48	126.62	4866.8	550	35,432	4,000	66,435	7,500	132,870	15,000
PHA1024 with Motor Mounting Plate													
PHA1024_1830MF	183.0	2,200	3,700	38	33.72	4869.9	550	35,432	4,000	66,435	7,500	132,870	15,000
PHA1024_3050MF	305.0	3,000	5,500	38	18.85	4871.2	550	35,432	4,000	66,435	7,500	132,870	15,000
PHA1024_4550MF	455.0	3,000	5,500	38	17.83	4871.6	550	35,432	4,000	66,435	7,500	132,870	15,000
PHA1024_6370MF	637.0	3,300	6,000	38	14.62	4871.7	550	35,432	4,000	66,435	7,500	132,870	15,000
PHA1024_9100MF	910.0	3,300	6,000	38	13.11	4871.8	550	35,432	4,000	66,435	7,500	132,870	15,000

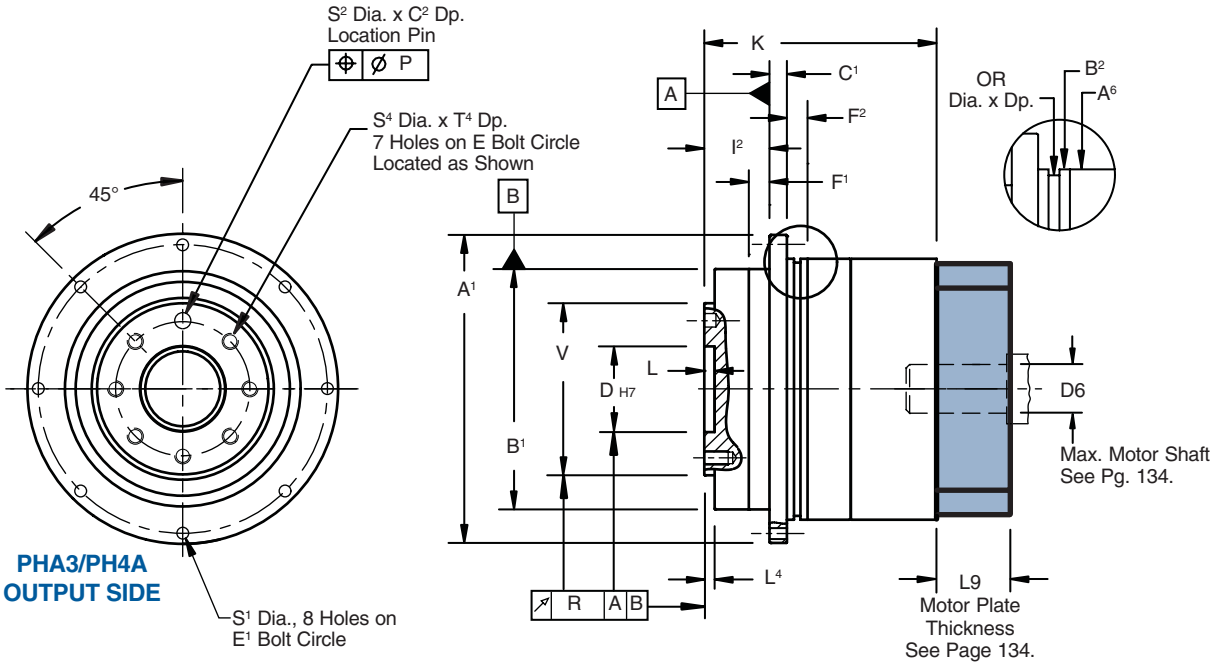
Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

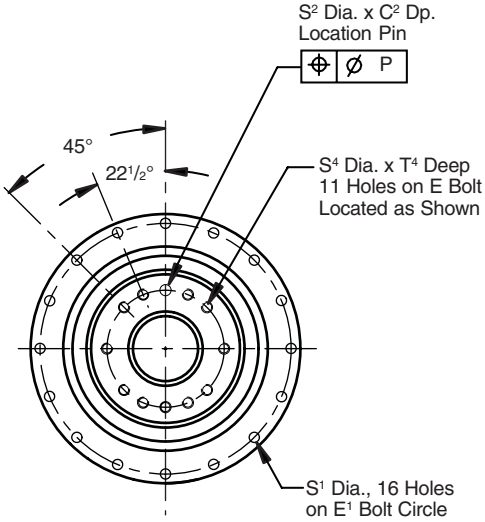
See web site for drawings.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Dimensional Data

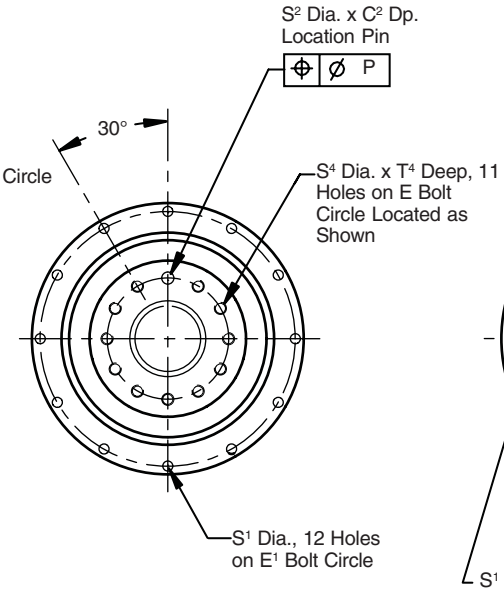
Drawing for Units
PHA321 thru PHA1024



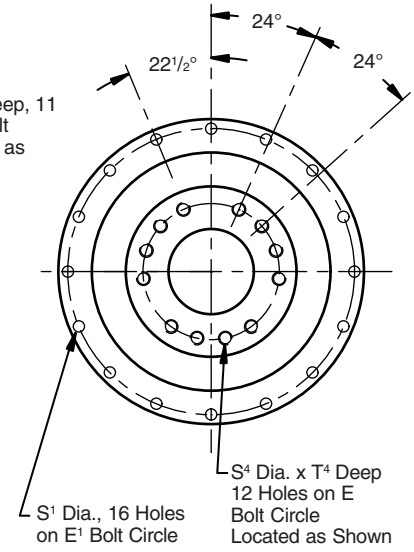
PHA3/PH4A
OUTPUT SIDE



PHA5
OUTPUT SIDE



PHA7/PHA8
OUTPUT SIDE



PHA9/PHA10
OUTPUT SIDE

See web site for drawings.

"PHA" Series–Advanced PowerLine ServoFit® Precision Planetary Gearhead Dimensional Data

Table No. 1 **"PHA" Series – Advanced PowerLine Gearhead with Motor Plate – Dimensions (mm/inches)**

Unit	A[1]	B[1] h7	B[2] h7	C[1]	C[2]	D H7	E	E[1]	F[1]	F[2]	I[2]	L	L[2]	L[4]	OR
PHA321/PHA322	86	64 +.000/-.030	70 * +.000/-.030	4	3	20 +.021/-.0	31.5	79	7	8	19.5	4	3	3.5	65x2
	3.39	2.520 +.0000/-.0012	2.756 +.0000/-.0012	.16	.12	.787 +.0008/-.0000	1.24	3.11	.28	.31	.77	.16	.12	.14	2.55x.08
PHA421/PHA422	118	90 +.000/-.035	95 +.000/-.035	7	7	31.5 +.025/-.0	50	109	10	10	30	6	6	6	90x3
	4.65	3.543 +.0000/-.0014	3.740 +.0000/-.0014	.28	.28	1.240 +.0010/-.0000	1.97	4.29	.39	.39	1.18	.24	.24	.24	3.54x.12
PHA521/PHA522	145	110 +.000/-.035	120 * +.000/-.035	8	7	40 +.025/-.0	63	135	10	12	29	6	6	6	110x3
	5.71	4.331 +.0000/-.0014	4.724 +.0000/-.0014	.32	.28	1.575 +.0010/-.0000	2.48	5.31	.39	.47	1.14	.24	.24	.24	4.33x.12
PHA721/PHA722	179	140 +.000/-.040	152 +.000/-.040	10	7	50 +.025/-.0	80	168	12	12	38	6	6	6	145x3
	7.05	5.513 +.0000/-.0016	5.984 +.0000/-.0016	.39	.28	1.969 +.0010/-.0000	3.15	6.61	.47	.47	1.50	.24	.24	.24	5.71x.12
PHA821/PHA822	247	200 +.000/-.046	212 +.000/-.046	12	10	80 +.030/-.0	125	233	15	15	50	8	8	8	200x5
	9.72	7.874 +.0000/-.0018	8.346 +.0000/-.0018	.47	.39	3.150 +.0012/-.0000	4.92	9.17	.59	.59	1.97	.31	.31	.31	7.87x.20
PHA912	300	255 +.000/-.052	255 +.000/-.052	18	–	90 +.035/-.0	140	280	20	20	66	12	11	12	238x5
PHA923/PHA924	11.81	10.039 +.000/-.0020	10.039 +.0000/-.0020	.71		3.543 +.0014/-.0000	5.51	11.02	.79	.79	2.60	.47	.43	.47	9.37x.20
PHA1012	330	285 +.000/-.057	285 +.000/-.052	20	–	95 +.035/-.0	160	310	20	20	75	10	15	15	270x6
PHA1023/PHA1024	12.99	11.220 +.000/-.0022	11.221 +.0000/-.0020	.79		3.740 +.0014/-.0000	6.30	12.20	.79	.79	2.95	.39	.59	.59	10.63x.24

* Not applicable on a PH322 and PH522.

Table No. 2 **"PHA" Series – Dimensions (mm/inches)**

Unit	P	R	S[1]	S[2] H7	S[4]	T[4]	V h7
PHA321/PHA322	.02	.020	4.5	5 +.012/-.000	M5	7	40 +.000/-.025
	.0008	.0008	.18	.20 +.0005/-.0000		.28	1.575 +.000/-.0010
PHA421/PHA422	.02	.020	5.5	6 +.012/-.000	M6	10	63 +.000/-.030
	.0008	.0008	.22	.236 +.0005/-.0000		.39	2.480 +.000/-.0012
PHA521/PHA522	.02	.020	5.5	6 +.012/-.000	M6	11	80 +.000/-.030
	.0008	.0008	.22	.236 +.0005/-.0000		.43	3.150 +.000/-.0012
PHA721/PHA722	.02	.025	6.6	8 +.015/-.000	M8	14	100 +.000/-.035
	.0008	.0010	.26	.315 +.0006/-.0000		.55	3.937 +.000/-.0014
PHA821/PHA822	–	.030	9	10 +.015/-.000	M10	18	160 +.000/-.040
		.0012	.35	.393 +.0006/-.0000		.71	6.299 +.000/-.0016
PHA912	–	.030	13.5	–	M16	24	180 +.000/-.040
PHA923/PHA924		.0012	.53			94	7.087 +.000/-.0016
PHA1012	–	.040	13.5	–	M20	30	200 +.000/-.046
PHA1023/PHA1024		.0016	.53			1.18	7.874 +.000/-.0018

Table No. 3

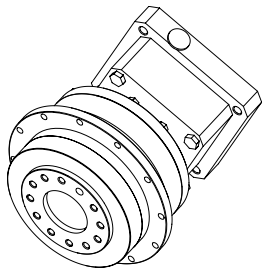
K Dimension					
Standard			ServoCool		
Unit	mm	inches	Unit	mm	inches
PHA321	80.5	3.17	–		
PHA322	104	4.09	–		
PHA421	106	4.17	–		
PHA422	146.5	5.77	–		
PHA521	110	4.33	–		
PHA522	159.5	6.28	–		
PHA721	138	5.43	**PHA721_C**	168	6.61
PHA722	190	7.48	–		
PHA821	183	7.20	**PHA821_C**	231	9.09
PHA822	251	9.88	**PHA822_C**	281	11.06
PHA912	336.5	13.24	–		
PHA923	257	10.12	–		
PHA924	309	12.17	–		
PHA1012	366	14.41	–		
PHA1023	307	12.09	–		
PHA1024	375	14.76	–		

Part No. Explanation

PHA 7 2 1 F 0050 MF C

- **C** – Option for ServoCool
- **MF** – Motor Plate with FlexiAdapt Coupling
- **0050** – Ratio (**0050** = 5.0:1)
- **F** – Output Flange
- **1** – No. of Stages (**1** = 1 Stage, **2** = 2 Stage)
- **2** – Generation No.
- **7** – Unit No.
- **PHA** – Advanced PowerLine ServoFit Precision Planetary Gearhead

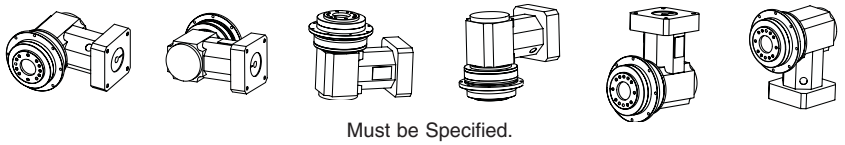
When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions.



Typical 2 Stage Configuration

See web site for drawings.

"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Performance Specifications

		Size	PH321 KX3	PH421 KX4	PH422 KX3	PH521 KX5	PH522 KX4	PH721 KX7	PH722 KX5	PH821 KX8	PH822 KX7	PH922 KX8
Acceleration Torque Maximum	T_{2B}	in.lbs. Nm	558 63	1,071 121	1,105 130	2,708 306	2,832 320	5,753 650	6,195 700	14,160 1,600	17,700 2,000	37,612 4250
Output Torque [1] **Nominal**	T_{2N}	in.lbs. Nm	398 45	797 90		1,947 220		3,894 440		8,850 1,000	11,063 1,250	22,125 2,500
Input Speed Maximum	n_{1MAX}	Continuous Cyclic	3,500 6,000	3,000 4,500	3,500 6,000	3,000 4,500		2,100 3,500	3,000 4,000	1,300 3,000	2,100 3,500	1,300 3,000
Torsional Backlash [2]	$\Delta\varphi$	arcmin	≤6	≤5.5	≤3.5	≤5.5	≤3.5	≤5	≤3.5	≤5	≤3.5	≤3.5
Torsional Stiffness Maximum	C_2	in.lbs./arcmin Nm/arcmin	69 7.8	168 19	230 26	416 47	575 65	1,053 119	1,239 140	2,505 283	3,407 385	5,717 646
Axial Load Maximum	F_{2AMAX}	lbs. N	371 1,650	484 2,150		934 4,150		1,384 6,150		2,261 10,050		7,425 33,000
Tilting Moment [3] **Maximum**	T_{2K}	in.lbs. Nm	885 100	2,301 260		3,894 440		2,593 1,500		30,975 3,500		57,525 6,500
Weight	m	pounds kg	8 3.5	12 5.5	14 6.3	28 12.9	24 10.9	52 23.5	46 20.9	124 56	112 51	203 92.0
Noise Level [4]	L_{PA}	dB(A)	≤70	≤70	≤70	≤72	≤70	≤72		≤74	≤72	≤74
Efficiency at Nominal Torque	η	%	≥93 - 96									
Balance Quality			Q 2.5 (Quality Class - 2.5 millimeters per second)									
Lubrication			Synthetic Oil (ISO VG 150)									
Mounting Position			EL1 EL2 EL3 EL4 EL5 EL6  Must be Specified.									
Direction of Rotation			See Page 140 for direction of rotation.									
Ambient Temperature			0°C to +40°C (104° F) Other temperatures, contact STOBER Drives.									
Finish			Black (RAL 9005)									
Lifetime [5]	L_h	hours	L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25									
Warranty			5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)									

[1] Ratings based on input speed (n_1) of 2000 RPM.
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed.

[2] Tested at 1.5% of nominal torque and recorded on the input side of the gearhead.

[3] Rating based on output speed (n2) of 100 RPM. For values at other speeds see Page 137. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[4] Measurement at one (1) meter distance with input speed (n1) of 3000 RPM.

[5] T_{2A} equals actual tilting moment of the application. See Page 137 for overhung loads.

"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Features

The "PHKX" Series combines the "PH" Series–PowerLine of ServoFit Precision Planetary Gearheads with a right angle to provide a configuration that is a smooth, precise, and reliable drive with the benefit of direct mounting to many types of equipment without a coupling. All units are lubricated for life with synthetic oil and sealed to IP65 standards to prevent lubricant contamination for long life.

Some features are:

- High Axial Load Capacity
- Superior Torsional Stiffness
- 5-300:1 Ratio Range
- Wide Selection of IEC, NEMA, or Customized Motor Wide Plates
- Lowest Backlash
- Advanced Helical Gear Technology
- 5 Year Limited Warranty (2 Year on bearings, seals, etc.)

Motor plate pilot toleranced to fit your motor for precise concentricity

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

Highly efficient spiral bevel gearsets provide quiet operation and excellent torque carrying capacity.

Adapter bushings to fit all motor shafts – no key required

HeliCamber® gear technology provides minimum wear, low backlash, and low noise

The integrated motor coupling is designed to allow thermal expansion of the motor shaft– ensuring long motor life by preventing thrust load on the motor bearings.

Ring gear machined integral to the housing – not welded or pressed in – provides greater concentricity and more precise alignment

FKM seals

Blind pilot hole

Oversized tapered roller bearings and shafts for high radial load capacity and superior torsional stiffness

The output flange dimensions are ISO 9409 and allow easy mounting to rotary or indexing tables, pinions, timing belt pulleys, transmission shafting, etc., without using a coupling.

Gears are case hardened to 61 Rockwell "C" and ground for maximum efficiency

Single piece steel housing

See web site for drawings.

"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio i	Max. Input RPM (n_1) Continuous Mounting Position EL 1,2,5,6	Max. Input RPM (n_1) Continuous Mounting Position EL 3,4	Max. Input RPM (n_1) Cyclic Mounting Position All	Max. Motor Shaft øD6 mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs. per arcmin	Torsional Stiffness C_2 Nm per arcmin	Output Torque Nominal 1) T_{2N} in.lbs.	Output Torque Nominal 1) T_{2N} Nm	Output Torque Acceleration T_{2B} in.lbs.	Output Torque Acceleration T_{2B} Nm	Output Torque Peak 2) T_{2PEAK} in.lbs.	Output Torque Peak 2) T_{2PEAK} Nm
PH321_KX3 with Motor Mounting Plate														
PH321F0050KX301VF0010MF	5.000	3,000	2,500	4,000	19	1.08	56.5	6.4	399	45	558	63	945	107
PH321F0070KX301VF0010MF	7.000	3,000	2,500	4,000	19	1.04	69.3	7.8	399	45	531	60	1,152	130
PH321F0050KX301VF0020MF	10.00	3,500	3,000	5,000	19	0.82	56.5	6.4	399	45	558	63	1,074	121
PH321F0070KX301VF0020MF	14.00	3,500	3,000	5,000	19	0.81	69.3	7.8	399	45	531	60	1,152	130
PH321F0050KX301VF0030MF	15.00	3,500	3,500	6,000	19	0.75	56.5	6.4	399	45	558	63	1,074	121
PH321F0100KX301VF0020MF	20.00	3,500	3,000	5,000	19	0.81	67.6	7.6	266	30	443	50	886	100
PH321F0070KX301VF0030MF	21.00	3,500	3,500	6,000	19	0.75	69.3	7.8	399	45	531	60	1,152	130
PH321F0100KX301VF0030MF	30.00	3,500	3,500	6,000	19	0.75	67.6	7.6	266	30	443	50	886	100
PH421_KX4 with Motor Mounting Plate														
PH421F0040KX401VF0010MF	4.000	2,500	2,000	3,500	25	2.84	100.5	11.3	687	78	859	97	1,718	194
PH421F0050KX401VF0010MF	5.000	2,500	2,000	3,500	25	2.66	132.2	14.9	753	85	1,074	121	2,126	240
PH421F0070KX401VF0010MF	7.000	2,500	2,000	3,500	25	2.51	168.2	19.0	753	85	974	110	2,126	240
PH421F0040KX401VF0020MF	8.000	2,500	2,500	4,000	25	1.74	100.5	11.3	687	78	859	97	1,718	194
PH421F0050KX401VF0020MF	10.00	2,500	2,500	4,000	25	1.70	132.2	14.9	797	90	1,074	121	2,126	240
PH421F0040KX401VF0030MF	12.00	3,000	3,000	4,500	25	1.49	100.5	11.3	687	78	859	97	1,718	194
PH421F0070KX401VF0020MF	14.00	2,500	2,500	4,000	25	1.66	168.2	19.0	797	90	974	110	2,126	240
PH421F0050KX401VF0030MF	15.00	3,000	3,000	4,500	25	1.47	132.2	14.9	797	90	1,074	121	2,126	240
PH421F0100KX401VF0020MF	20.00	2,500	2,500	4,000	25	1.64	153.7	17.4	531	60	886	100	1,772	200
PH421F0070KX401VF0030MF	21.00	3,000	3,000	4,500	25	1.45	168.2	19.0	797	90	974	110	2,126	240
PH421F0100KX401VF0030MF	30.00	3,000	3,000	4,500	25	1.44	153.7	17.4	531	60	886	100	1,772	200
PH422_KX3 with Motor Mounting Plate														
PH422F0350KX301VF0010MF	35.00	3,000	2,500	4,000	19	1.05	234.6	26.5	797	90	1,152	130	2,126	240
PH422F0200KX301VF0020MF	40.00	3,500	3,000	5,000	19	.84	223.8	25.3	797	90	1,152	130	2,126	240
PH422F0160KX301VF0030MF	48.00	3,500	3,500	6,000	19	.76	195.8	22.1	797	90	1,152	130	2,126	240
PH422F0250KX301VF0020MF	50.00	3,500	3,000	5,000	19	.82	232.7	26.3	797	90	1,152	130	2,126	240
PH422F0280KX301VF0020MF	56.00	3,500	3,000	5,000	19	.81	208.9	23.6	797	90	1,152	130	2,126	240
PH422F0200KX301VF0030MF	60.00	3,500	3,500	6,000	19	.76	223.8	25.3	797	90	1,152	130	2,126	240
PH422F0350KX301VF0020MF	70.00	3,500	3,000	5,000	19	.81	234.6	26.5	797	90	1,152	130	2,126	240
PH422F0250KX301VF0030MF	75.00	3,500	3,500	6,000	19	.76	232.7	26.3	797	90	1,152	130	2,126	240
PH422F0400KX301VF0020MF	80.00	3,500	3,000	5,000	19	.81	208.3	23.5	797	90	1,152	130	2,126	240
PH422F0280KX301VF0030MF	84.00	3,500	3,500	6,000	19	.75	208.9	23.6	797	90	1,152	130	2,126	240
PH422F0500KX301VF0020MF	100.0	3,500	3,000	5,000	19	.81	234.2	26.4	797	90	1,152	130	2,126	240
PH422F0350KX301VF0030MF	105.0	3,500	3,500	6,000	19	.75	234.6	26.5	797	90	1,152	130	2,126	240
PH422F0400KX301VF0030MF	120.0	3,500	3,500	6,000	19	.75	208.3	23.5	797	90	1,152	130	2,126	240
PH422F0700KX301VF0020MF	140.0	3,500	3,000	5,000	19	.81	234.5	26.5	797	90	974	110	2,126	240
PH422F0500KX301VF0030MF	150.0	3,500	3,500	6,000	19	.75	234.2	26.4	797	90	1,152	130	2,126	240
PH422F1000KX301VF0020MF	200.0	3,500	3,000	5,000	19	.81	176.0	19.9	531	60	886	100	1,772	200
PH422F0700KX301VF0030MF	210.0	3,500	3,500	6,000	19	.75	234.5	26.5	797	90	974	110	2,126	240
PH422F1000KX301VF0030MF	300.0	3,500	3,500	6,000	19	.75	176.0	19.9	531	60	886	100	1,772	200

1) Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \dfrac{T_{2N}}{\sqrt[3]{\dfrac{n_1}{2000}}}$

2) Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio i	Max. Input RPM (n_1) Continuous Mounting Position EL 1,2,5,6	Max. Input RPM (n_1) Continuous Mounting Position EL 3,4	Max. Input RPM (n_1) Cyclic Mounting Position All	Max. Motor Shaft øD6 mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs. per arcmin	Torsional Stiffness C_2 Nm per arcmin	Output Torque Nominal 1) T_{2N} in.lbs.	Output Torque Nominal 1) T_{2N} Nm	Output Torque Acceleration T_{2B} in.lbs.	Output Torque Acceleration T_{2B} Nm	Output Torque Peak 2) T_{2PEAK} in.lbs.	Output Torque Peak 2) T_{2PEAK} Nm
PH521_KX5 with Motor Mounting Plate														
PH521F0040KX501VF0010MF	4.000	2,500	2,000	3,000	36	7.62	244.4	27.6	1,718	194	2,165	244	4,296	485
PH521F0050KX501VF0010MF	5.000	2,500	2,000	3,000	36	8.44	323.1	36.5	1,860	210	2,707	306	5,315	600
PH521F0070KX501VF0010MF	7.000	2,500	2,000	3,000	36	7.97	412.2	46.5	1,860	210	2,392	270	5,315	600
PH521F0040KX501VF0020MF	8.000	2,500	2,500	3,500	36	5.31	244.4	27.6	1,718	194	2,165	244	4,296	485
PH521F0050KX501VF0020MF	10.00	2,500	2,500	3,500	36	5.52	323.1	36.5	1,949	220	2,707	306	5,315	600
PH521F0040KX501VF0030MF	12.00	3,000	3,000	4,000	36	4.79	244.4	27.6	1,718	194	2,165	244	4,296	485
PH521F0070KX501VF0020MF	14.00	2,500	2,500	3,500	36	5.40	412.2	46.5	1,860	210	2,392	270	5,315	600
PH521F0050KX501VF0030MF	15.00	3,000	3,000	4,000	36	4.88	323.1	36.5	1,949	220	2,707	306	5,315	600
PH521F0100KX501VF0020MF	20.00	2,500	2,500	3,500	36	5.33	396.4	44.7	1,240	140	2,215	250	4,429	500
PH521F0070KX501VF0030MF	21.00	3,000	3,000	4,000	36	4.83	412.2	46.5	1,860	210	2,392	270	5,315	600
PH521F0100KX501VF0030MF	30.00	3,000	3,000	4,000	36	4.80	396.4	44.7	1,240	140	2,215	250	4,429	500
PH522_KX4 with Motor Mounting Plate														
PH522F0350KX401VF0010MF	35.00	2,500	2,000	3,500	25	2.46	570.4	64.4	1,949	220	2,835	320	5,315	600
PH522F0200KX401VF0020MF	40.00	2,500	2,500	4,000	25	1.71	534.1	60.3	1,949	220	2,835	320	5,315	600
PH522F0160KX401VF0030MF	48.00	3,000	3,000	4,500	25	1.46	458.5	51.8	1,860	210	2,835	320	4,915	555
PH522F0250KX401VF0020MF	50.00	2,500	2,500	4,000	25	1.68	561.6	63.4	1,949	220	2,835	320	5,315	600
PH522F0280KX401VF0020MF	56.00	2,500	2,500	4,000	25	1.64	501.4	56.6	1,860	210	2,835	320	4,915	555
PH522F0200KX401VF0030MF	60.00	3,000	3,000	4,500	25	1.47	534.1	60.3	1,949	220	2,835	320	5,315	600
PH522F0350KX401VF0020MF	70.00	2,500	2,500	4,000	25	1.65	570.4	64.4	1,949	220	2,835	320	5,315	600
PH522F0250KX401VF0030MF	75.00	3,000	3,000	4,500	25	1.46	561.6	63.4	1,949	220	2,835	320	5,315	600
PH522F0400KX401VF0020MF	80.00	2,500	2,500	4,000	25	1.63	498.4	56.3	1,860	210	2,835	320	4,915	555
PH522F0280KX401VF0030MF	84.00	3,000	3,000	4,500	25	1.44	501.4	56.6	1,860	210	2,835	320	4,915	555
PH522F0500KX401VF0020MF	100.0	2,500	2,500	4,000	25	1.64	567.9	64.1	1,949	220	2,835	320	5,315	600
PH522F0350KX401VF0030MF	105.0	3,000	3,000	4,500	25	1.44	570.4	64.4	1,949	220	2,835	320	5,315	600
PH522F0400KX401VF0030MF	120.0	3,000	3,000	4,500	25	1.44	498.4	56.3	1,860	210	2,835	320	4,915	555
PH522_KX4 with Motor Mounting Plate														
PH522F0700KX401VF0020MF	140.0	2,500	2,500	4,000	25	1.63	573.0	64.7	1,860	210	2,392	270	5,315	600
PH522F0500KX401VF0030MF	150.0	3,000	3,000	4,500	25	1.44	567.9	64.1	1,949	220	2,835	320	5,315	600
PH522F1000KX401VF0020MF	200.0	2,500	2,500	4,000	25	1.63	456.8	51.6	1,240	140	2,215	250	4,429	500
PH522F0700KX401VF0030MF	210.0	3,000	3,000	4,500	25	1.44	573.0	64.7	1,860	210	2,392	270	5,315	600
PH522F1000KX401VF0030MF	300.0	3,000	3,000	4,500	25	1.44	456.8	51.6	1,240	140	2,215	250	4,429	500
PH721_KX7 with Motor Mounting Plate														
PH721F0040KX701VF0010MF	4.000	1,800	1,600	2,250	43	29.54	739.1	83.4	3,437	388	4,296	485	7,561	854
PH721F0050KX701VF0010MF	5.000	1,800	1,600	2,250	43	27.70	918.4	103.7	3,898	440	5,370	606	9,451	1,067
PH721F0070KX701VF0010MF	7.000	1,800	1,600	2,250	43	26.28	1054.7	119.1	3,898	440	5,758	650	11,127	1,256
PH721F0040KX701VF0020MF	8.000	1,800	1,800	3,000	43	15.88	739.1	83.4	3,437	388	4,296	485	8,592	970
PH721F0050KX701VF0020MF	10.00	1,800	1,800	3,000	43	15.42	918.4	103.7	3,898	440	5,370	606	10,740	1,213
PH721F0040KX701VF0030MF	12.00	2,100	2,100	3,500	43	12.94	739.1	83.4	3,437	388	4,296	485	8,592	970
PH721F0070KX701VF0020MF	14.00	1,800	1,800	3,000	43	15.07	1054.7	119.1	3,898	440	5,758	650	11,127	1,256
PH721F0050KX701VF0030MF	15.00	2,100	2,100	3,500	43	12.74	918.4	103.7	3,898	440	5,370	606	10,740	1,213
PH721F0100KX701VF0020MF	20.00	1,800	1,800	3,000	43	14.89	922.7	104.2	2,657	300	4,429	500	8,858	1,000
PH721F0070KX701VF0030MF	21.00	2,100	2,100	3,500	43	12.58	1054.7	119.1	3,898	440	5,758	650	11,127	1,256
PH721F0100KX701VF0030MF	30.00	2,100	2,100	3,500	43	12.50	922.7	104.2	2,657	300	4,429	500	8,858	1,000

Index of Symbols

MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

See web site for drawings.

"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio i	Max. Input RPM (n_1) Continuous EL 1,2,5,6	Max. Input RPM (n_1) Continuous EL 3,4	Max. Input RPM (n_1) Cyclic All	Max. Motor Shaft øD⁶ mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs. per arcmin	Torsional Stiffness C_2 Nm per arcmin	Output Torque Nominal [1] T_{2N} in.lbs.	Output Torque Nominal [1] T_{2N} Nm	Output Torque Acceleration T_{2B} in.lbs.	Output Torque Acceleration T_{2B} Nm	Output Torque Peak [2] T_{2PEAK} in.lbs.	Output Torque Peak [2] T_{2PEAK} Nm
PH722_KX5 with Motor Mounting Plate														
PH722F0350KX501VF0010MF	35.00	2,500	2,000	3,000	36	7.82	1229.7	138.8	3,898	440	6,201	700	12,401	1,400
PH722F0200KX501VF0020MF	40.00	2,500	2,500	3,500	36	5.55	1147.0	129.5	3,898	440	6,201	700	12,401	1,400
PH722F0160KX501VF0030MF	48.00	3,000	3,000	4,000	36	4.91	986.4	111.4	3,898	440	6,201	700	12,235	1,381
PH722F0250KX501VF0020MF	50.00	2,500	2,500	3,500	36	5.44	1199.0	135.4	3,898	440	6,201	700	12,401	1,400
PH722F0280KX501VF0020MF	56.00	2,500	2,500	3,500	36	5.37	1084.3	122.4	3,898	440	6,201	700	12,235	1,381
PH722F0200KX501VF0030MF	60.00	3,000	3,000	4,000	36	4.90	1147.0	129.5	3,898	440	6,201	700	12,401	1,400
PH722F0350KX501VF0020MF	70.00	2,500	2,500	3,500	36	5.36	1229.7	138.8	3,898	440	6,201	700	12,401	1,400
PH722F0250KX501VF0030MF	75.00	3,000	3,000	4,000	36	4.85	1199.0	135.4	3,898	440	6,201	700	12,401	1,400
PH722F0400KX501VF0020MF	80.00	2,500	2,500	3,500	36	5.32	1084.8	122.5	3,898	440	6,201	700	12,235	1,381
PH722F0280KX501VF0030MF	84.00	3,000	3,000	4,000	36	4.82	1084.3	122.4	3,898	440	6,201	700	12,235	1,381
PH722F0500KX501VF0020MF	100.0	2,500	2,500	3,500	36	5.32	1230.0	138.9	3,898	440	6,201	700	12,401	1,400
PH722F0350KX501VF0030MF	105.0	3,000	3,000	4,000	36	4.81	1229.7	138.8	3,898	440	6,201	700	12,401	1,400
PH722F0400KX501VF0030MF	120.0	3,000	3,000	4,000	36	4.80	1084.8	122.5	3,898	440	6,201	700	12,235	1,381
PH722F0700KX501VF0020MF	140.0	2,500	2,500	3,500	36	5.31	1238.6	139.8	3,898	440	5,758	650	11,127	1,256
PH722F0500KX501VF0030MF	150.0	3,000	3,000	4,000	36	4.79	1230.0	138.9	3,898	440	6,201	700	12,401	1,400
PH722F1000KX501VF0020MF	200.0	2,500	2,500	3,500	36	5.31	985.5	111.3	2,657	300	4,429	500	8,858	1,000
PH722F0700KX501VF0030MF	210.0	3,000	3,000	4,000	36	4.79	1238.6	139.8	3,898	440	5,758	650	11,127	1,256
PH722F1000KX501VF0030MF	300.0	3,000	3,000	4,000	36	4.79	985.5	111.3	2,657	300	4,429	500	8,858	1,000
PH821_KX8 with Motor Mounting Plate														
PH821F0040KX801VF0010MF	4.000	1,000	750	1,750	54	101.43	1518.5	171.4	6,874	776	9,451	1,067	14,435	1,630
PH821F0050KX801VF0010MF	5.000	1,000	750	1,750	54	92.44	1975.1	223.0	8,592	970	11,814	1,334	18,044	2,037
PH821F0070KX801VF0010MF	7.000	1,000	750	1,750	54	85.00	2506.2	282.9	8,858	1,000	14,173	1,600	24,900	2,811
PH821F0040KX801VF0020MF	8.000	1,100	1,100	2,500	54	54.94	1518.5	171.4	6,874	776	9,451	1,067	17,185	1,940
PH821F0050KX801VF0020MF	10.00	1,100	1,100	2,500	54	52.69	1975.1	223.0	8,592	970	11,814	1,334	21,481	2,425
PH821F0040KX801VF0030MF	12.00	1,300	1,300	3,000	54	45.92	1518.5	171.4	6,874	776	9,451	1,067	17,185	1,940
PH821F0070KX801VF0020MF	14.00	1,100	1,100	2,500	54	50.83	2506.2	282.9	8,858	1,000	14,173	1,600	24,900	2,811
PH821F0050KX801VF0030MF	15.00	1,300	1,300	3,000	54	44.92	1975.1	223.0	8,592	970	11,814	1,334	21,481	2,425
PH821F0100KX801VF0020MF	20.00	1,100	1,100	2,500	54	49.88	2306.0	260.3	7,086	800	10,630	1,200	21,259	2,400
PH821F0070KX801VF0030MF	21.00	1,300	1,300	3,000	54	44.09	2506.2	282.9	8,858	1,000	14,173	1,600	24,900	2,811
PH821F0100KX801VF0030MF	30.00	1,300	1,300	3,000	54	43.67	2306.0	260.3	7,086	800	10,630	1,200	21,259	2,400
PH822_KX7 with Motor Mounting Plate Continued Next Page														
PH822F0350KX701VF0010MF	35.00	1,800	1,600	2,250	43	26.15	3366.3	380.0	11,073	1,250	17,716	2,000	28,346	3,200
PH822F0200KX701VF0020MF	40.00	1,800	1,800	3,000	43	15.73	3223.4	363.9	11,073	1,250	17,716	2,000	28,346	3,200
PH822F0160KX701VF0030MF	48.00	2,100	2,100	3,500	43	12.93	2839.5	320.6	9,744	1,100	16,830	1,900	28,346	3,200
PH822F0250KX701VF0020MF	50.00	1,800	1,800	3,000	43	15.35	3302.4	372.8	11,073	1,250	17,716	2,000	28,346	3,200
PH822F0280KX701VF0020MF	56.00	1,800	1,800	3,000	43	15.08	3015.7	340.5	9,744	1,100	17,716	2,000	28,346	3,200
PH822F0200KX701VF0030MF	60.00	2,100	2,100	3,500	43	12.87	3223.4	363.9	11,073	1,250	17,716	2,000	28,346	3,200
PH822F0350KX701VF0020MF	70.00	1,800	1,800	3,000	43	15.03	3366.3	380.0	11,073	1,250	17,716	2,000	28,346	3,200
PH822F0250KX701VF0030MF	75.00	2,100	2,100	3,500	43	12.70	3302.4	372.8	11,073	1,250	17,716	2,000	28,346	3,200
PH822F0400KX701VF0020MF	80.00	1,800	1,800	3,000	43	14.90	2957.5	333.9	9,744	1,100	17,716	2,000	28,346	3,200
PH822F0280KX701VF0030MF	84.00	2,100	2,100	3,500	43	12.58	3015.7	340.5	9,744	1,100	17,716	2,000	28,346	3,200
PH822F0500KX701VF0020MF	100.0	1,800	1,800	3,000	43	14.88	3319.6	374.8	11,073	1,250	17,716	2,000	28,346	3,200
PH822F0350KX701VF0030MF	105.0	2,100	2,100	3,500	43	12.56	3366.3	380.0	11,073	1,250	17,716	2,000	28,346	3,200

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Selection Data

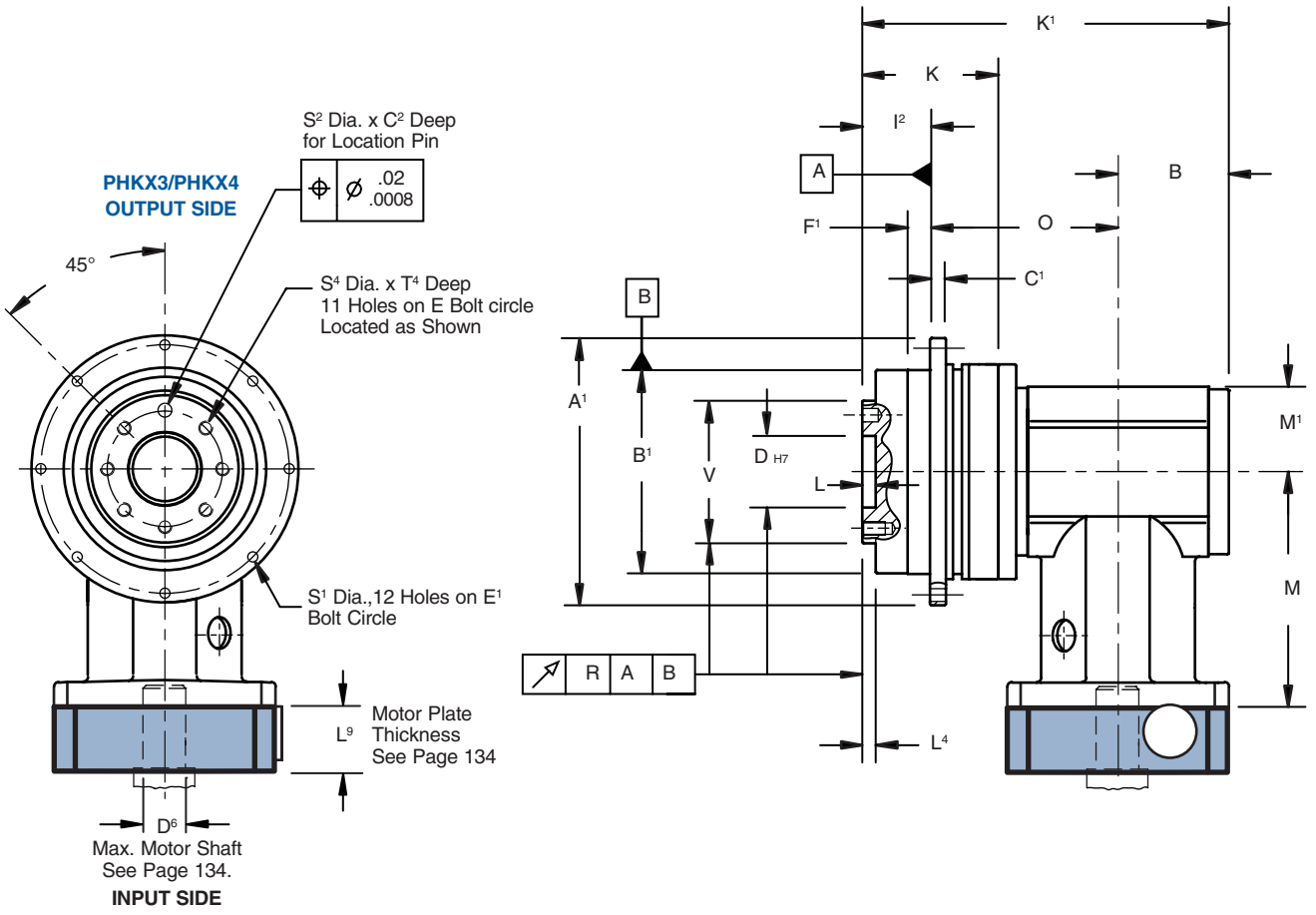
Part Number (Gearhead + Input)	Exact Ratio i	Max. Input RPM (n_1) Continuous Mounting Position EL 1,2,5,6	Max. Input RPM (n_1) Continuous Mounting Position EL 3,4	Max. Input RPM (n_1) Cyclic All	Max. Motor Shaft øD6 mm	Mass Moment of Inertia J_1 10^{-4} kgcm²	Torsional Stiffness C_2 in.lbs. per arcmin	Torsional Stiffness C_2 Nm per arcmin	Output Torque Nominal 1) T_{2N} in.lbs.	Output Torque Nominal 1) T_{2N} Nm	Output Torque Acceleration T_{2B} in.lbs.	Output Torque Acceleration T_{2B} Nm	Output Torque Peak 2) T_{2PEAK} in.lbs.	Output Torque Peak 2) T_{2PEAK} Nm
PH822_KX7 with Motor Mounting Plate Continued														
PH822F0400KX701VF0030MF	120.0	2,100	2,100	3,500	43	12.50	2957.5	333.9	9,744	1,100	17,716	2,000	28,346	3,200
PH822F0700KX701VF0020MF	140.0	1,800	1,800	3,000	43	14.86	3396.9	383.5	8,858	1,000	14,173	1,600	24,900	2,811
PH822F0500KX701VF0030MF	150.0	2,100	2,100	3,500	43	12.49	3319.6	374.8	11,073	1,250	17,716	2,000	28,346	3,200
PH822F1000KX701VF0020MF	200.0	1,800	1,800	3,000	43	14.85	2615.2	295.2	7,086	800	10,630	1,200	21,259	2,400
PH822F0700KX701VF0030MF	210.0	2,100	2,100	3,500	43	12.49	3396.9	383.5	8,858	1,000	14,173	1,600	24,900	2,811
PH822F1000KX701VF0030MF	300.0	2,100	2,100	3,500	43	12.48	2615.2	295.2	7,086	800	10,630	1,200	21,259	2,400
PH912_KX8 with Motor Mounting Plate														
PH912F0120KX801VF0010MF	12.00	1,000	750	1,750	54	127.49	4217.6	476.1	20,196	2,280	27,770	3,135	42,412	4,788
PH912F0160KX801VF0010MF	16.00	1,000	750	1,750	54	99.31	4617.2	521.2	22,145	2,500	37,026	4,180	56,549	6,384
PH912F0180KX801VF0010MF	18.00	1,000	750	1,750	54	121.44	5256.3	593.4	22,145	2,500	37,647	4,250	63,618	7,182
PH912F0200KX801VF0010MF	20.00	1,000	750	1,750	54	90.48	4808.9	542.9	22,145	2,500	37,647	4,250	70,687	7,980
PH912F0120KX801VF0020MF	24.00	1,100	1,100	2,500	54	61.45	4217.6	476.1	20,196	2,280	27,770	3,135	50,491	5,700
PH912F0300KX801VF0010MF	30.00	1,000	750	1,750	54	88.30	5640.5	636.8	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0160KX801VF0020MF	32.00	1,100	1,100	2,500	54	54.41	4617.2	521.2	22,145	2,500	37,026	4,180	67,321	7,600
PH912F0180KX801VF0020MF	36.00	1,100	1,100	2,500	54	59.94	5256.3	593.4	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0200KX801VF0020MF	40.00	1,100	1,100	2,500	54	52.20	4808.9	542.9	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0420KX801VF0010MF	42.00	1,000	750	1,750	54	82.94	5720.9	645.8	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0240KX801VF0020MF	48.00	1,100	1,100	2,500	54	53.56	5521.0	623.3	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0180KX801VF0030MF	54.00	1,300	1,300	3,000	54	48.14	5256.3	593.4	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0300KX801VF0020MF	60.00	1,100	1,100	2,500	54	51.66	5640.5	636.8	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0240KX801VF0030MF	72.00	1,300	1,300	3,000	54	45.30	5521.0	623.3	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0400KX801VF0020MF	80.00	1,100	1,100	2,500	54	49.76	4912.0	554.5	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0420KX801VF0020MF	84.00	1,100	1,100	2,500	54	50.32	5720.9	645.8	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0300KX801VF0030MF	90.00	1,300	1,300	3,000	54	44.46	5640.5	636.8	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0480KX801VF0020MF	96.00	1,100	1,100	2,500	54	49.97	5717.6	645.5	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0600KX801VF0020MF	120.0	1,100	1,100	2,500	54	49.62	5702.9	643.8	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0420KX801VF0030MF	126.0	1,300	1,300	3,000	54	43.86	5720.9	645.8	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0480KX801VF0030MF	144.0	1,300	1,300	3,000	54	43.71	5717.6	645.5	22,145	2,500	37,647	4,250	75,293	8,500
PH912F0600KX801VF0030MF	180.0	1,300	1,300	3,000	54	43.56	5702.9	643.8	22,145	2,500	37,647	4,250	75,293	8,500

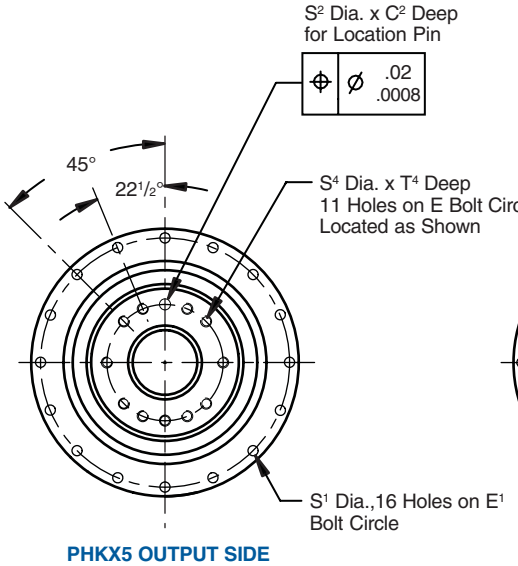
Index of Symbols

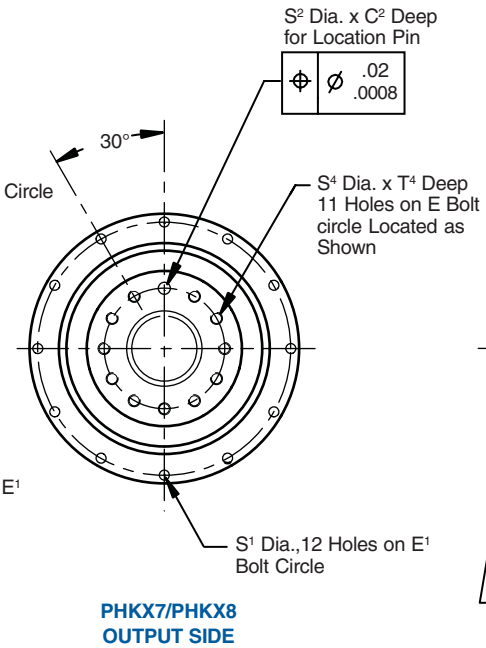
MT ..... Motor adapter with TriAdapt® coupling	i ..... Ratio - Exact	T_{2N} ..... Nominal Torque
MF ..... Motor adapter with FlexiAdapt® coupling	n_1 ..... Maximum input speed RPM	T_{2B} ..... Acceleration Torque Maximum
L ..... Large Input	J_1 ..... Mass moment of inertia (input)	T_{2PEAK} ..... Peak Torque
C ..... ServoCool	C_2 ..... Torsional Stiffness	

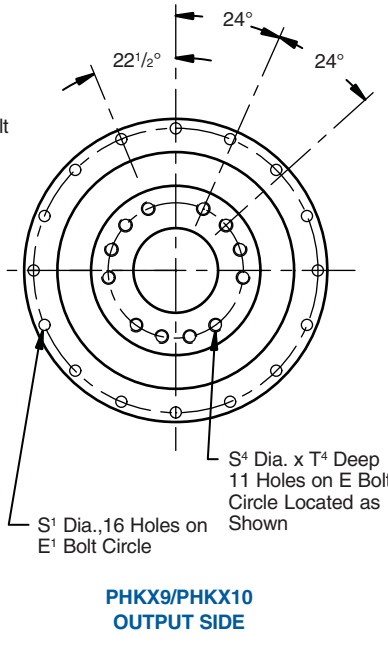
See web site for drawings.

"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Dimensional Data









"PHKX" Series–PowerLine Right Angle ServoFit® Precision Planetary Gearhead Dimensional Data

Table No. 1 **"PHKX" Series – PowerLine Gearhead with Motor Plate – Dimensions (mm/inches)**

Unit	A[1]	B[1] h7	C[1]	C[2]	D H7	E	E[1]	F[1]	I[2]	L	L[2]	L[4]	R	S[1]	S[2] H7	S[4]	T[4]	V h7
PH3_KX	86	64 +.000/-.030	4	3	20 +.021/-.0	31.5	79	7	19.5	4	3	3.5	.020	4.5	5 +.012/-.000	M5	7	40 +.000/-.025
	3.39	2.520 +.0000/-.0012	.16	.12	.787 +.0008/-.0000	1.24	3.11	.28	.77	.16	.12	.14	.0008	.18	.20 +.0005/-.0000		.28	1.575 +.000/-.0010
PH4_KX	118	90 +.000/-.035	7	7	31.5 +.025/-.0	50	109	10	30	6	6	6	.020	5.5	6 +.012/-.000	M6	10	63 +.000/-.030
	4.65	3.543 +.0000/-.0014	.28	.28	1.240 +.0010/-.0000	1.97	4.29	.39	1.18	.24	.24	.24	.0008	.22	.236 +.0005/-.0000		.39	2.480 +.000/-.0012
PH5_KX	145	110 +.000/-.035	8	7	40 +.025/-.0	63	135	10	29	6	6	6	.020	5.5	6 +.012/-.000	M6	11	80 +.000/-.030
	5.71	4.331 +.0000/-.0014	.32	.28	1.575 +.0010/-.0000	2.48	5.31	.39	1.14	.24	.24	.24	.0008	.22	.236 +.0005/-.0000		.43	3.150 +.000/-.0012
PH7_KX	179	140 +.000/-.040	10	7	50 +.025/-.0	80	168	12	38	6	6	6	.025	6.6	8 +.015/-.000	M8	14	100 +.000/-.035
	7.05	5.513 +.0000/-.0016	.39	.28	1.969 +.0010/-.0000	3.15	6.61	.47	1.50	.24	.24	.24	.0010	.26	.315 +.0006/-.0000		.55	3.937 +.000/-.0014
PH8_KX	247	200 +.000/-.046	12	10	80 +.030/-.0	125	233	15	50	8	8	8	.030	9	10 +.015/-.000	M10	18	160 +.000/-.040
	9.72	7.874 +.0000/-.0018	.47	.39	3.150 +.0012/-.0000	4.92	9.17	.59	1.97	.31	.31	.31	.0012	.35	.393 +.0006/-.0000		.71	6.299 +.000/-.0016
PH9_KX	300	255 +.000/-.052	18	–	90 +.035/-.0	140	280	20	66	12	11	12	.030	13.5	–	M16	24	180 +.000/-.040
	11.81	10.039 +.000/-.0020	.71		3.543 +.0014/-.0000	5.51	11.02	.79	2.60	.47	.43	.47	.0012	.53			.94	7.087 +.000/-.0016

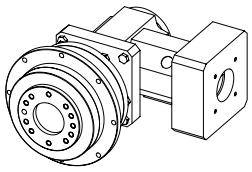
Table No. 2 **"PHKX" Series – PowerLine Dimensions (mm/inches)**

Unit	B	K	K[1]	M	M[1]	O
PH321_KX3	40	50	133.5	95.5	31	74
	1.57	1.97	5.26	3.76	1.22	2.91
PH421_KX4	50	66	167	104	37.5	87
	1.97	2.60	6.57	4.09	1.48	3.43
PH422_KX3	40	113	195.5	95.5	31	125.5
	1.57	4.45	7.70	3.76	1.22	4.94
PH521_KX5	59	70	193	132	45	105
	2.32	2.76	7.60	5.20	1.77	4.13
PH522_KX4	50	124.5	227.5	104	37.5	148.5
	1.97	4.90	8.96	4.09	1.48	5.85
PH721_KX7	74	88	239	172.5	60	127
	2.91	3.46	9.41	6.79	2.39	5.00
PH722_KX5	59	150	273	132	45	176
	2.32	5.91	10.75	5.20	1.77	6.93
PH821_KX8	92	126	317.5	210	75	175.5
	3.62	4.96	12.50	8.27	2.95	6.91
PH822_KX7	74	201	352	172.5	60	228
	2.91	7.91	13.86	6.79	2.39	8.98
PH912_KX8	92	277.5	470.5	210	75	312.5
	3.62	10.93	18.52	8.27	2.95	12.30

Part No. Explanation

PH 4 2 1 F 0050 KX401VF 0020 MF

- PH — PowerLine Right Angle ServoFit Precision Planetary Gearhead
- 4 — Unit No.
- 2 — Generation No.
- 1 — No. of Stages (**1** = 1 Stage, **2** = 2 Stage)
- F — Output Flange
- 0050 — Ratio (**0050** = 5:1, Total Ratio 5 x 2 = 10:1)
- KX401VF — Right Angle Unit, Size 4 with Shaft and Flange
- 0020 — Ratio (0020 = 2:1)
- MF — Motor Plate with FlexiAdapt Coupling



Typical 2 Stage Configuration

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions.

See web site for drawings.

"PE" Series–EconoLine
ServoFit® Precision Planetary Gearhead
Performance Specifications

		Size	Ratio	PE201 PE202	PE301 PE302	PE401 PE402	PE501 PE502
Permissible Acceleration Torque	T_{2B}	in.lbs. Nm	5, 25, 50	132 15	292 33	725 82	1,858 210
		in.lbs. Nm	10, 100	106 12	265 30	637 72	1,593 180
Nominal Output Torque [1]	T_{2N}	in.lbs. Nm		58 6.5	159 18	398 45	1,062 120
Input Speed Maximum	n_{1MAX}	Continuous Cyclic		4,000 8,000	3,700 6,000	3,400 6,000	2,600 5,000
Torsional Stiffness	C_2	in.lbs./arcmin Nm/arcmin		9 1	31 3.5	89 10	221 25
Axial Load Max.	F_{2AMAX}	lbs. N		56 250	93 412	146 650	270 1,200
Radial Load Max. [2]	F_{2RMAX}	lbs. N		190 850	370 1,650	585 2,600	1,080 4,800
Tilting Moment Max. [2]	T_{2K}	in.lbs. Nm		221 25	451 51	991 112	2,973 336
Weight	m	pounds kg		1.8 2.2 0.8 1.0	4.4 5.5 2.0 2.5	9.4 11.6 4.3 5.3	20.2 25.1 9.2 11.4
Noise Level [3]	L_{PA}	dB(A)		≤60	≤62	≤62	≤64
Torsional Backlash	Δφ	arcmin		1 Stage (5, 10:1) = ≤12; 2 Stage (25, 50, 100:1) = ≤15			
Efficiency (at Nominal Torque)	η	%		1 Stage (5, 10:1) = ≥96; 2 Stage (25, 50, 100:1) = ≥94			
Lubrication				Synthetic Grease (NLGI 2) Lubricated for Life			
Mounting Position				Unrestricted			
Ambient Temperature				0°C to +40°C (104° F) Other temperatures, contact STOBER Drives.			
Finish				Black (RAL 9005)			
Lifetime [4]	L_h	hours		L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25			
Warranty				5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)			

1) Ratings based on input speed (n_1) of 2000 RPM.
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed.

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

2) Rating based on output speed (n2) of 100 RPM. For values at other speeds see Page 138.

3) Measurement at one (1) meter distance with input speed (n1) of 3000 RPM.

4) T_{2A} equals actual tilting moment of the application. See Page 138 for overhung loads.

See web site for drawings.

"PE" Series–EconoLine ServoFit® Precision Planetary Gearhead Features

The "PE" Series–EconoLine of ServoFit Precision Planetary Gearheads are available for applications where very low backlash is not a criteria. They are an economical straight tooth planetary, comparable in quality to other STOBER units. "PE" Series units are shipped with a motor adapter to fit your specific motor, can be supplied with NEMA output adapters, and have a five year warranty. All units are lubricated for life with synthetic grease and enclosed to IP65 standards to prevent lubricant contamination for long life.

Some features of these units are:

- Readily Attaches to Any Servo Motor
- Quiet Running ≤64 dB(A)
- Readily Available
- Wide Selection of IEC, NEMA, or Customized* Motor Plates
- 94 to 96% Efficiency
- NEMA Output Available
- 5 Year Limited Warranty (2 Years bearings, seals, etc.)

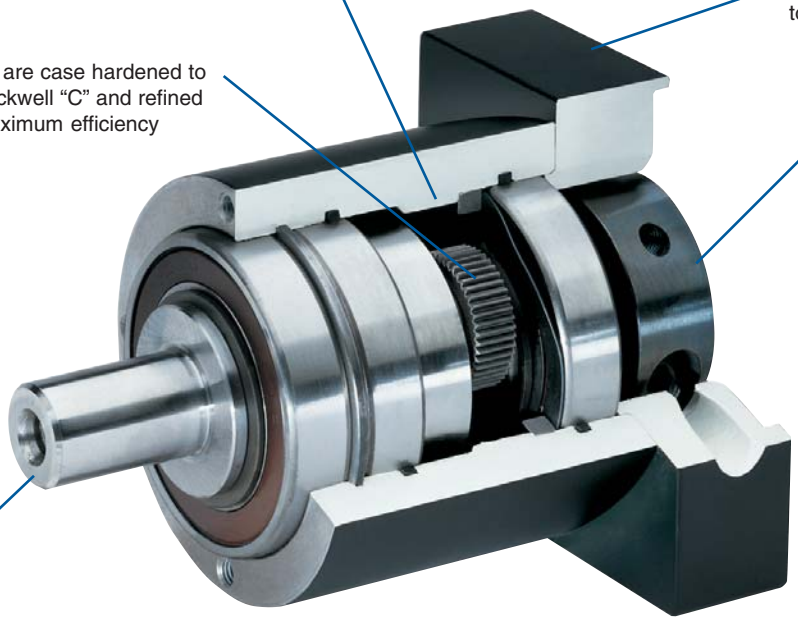
* Maximum 10 working days for custom motor plates.

Motor plate pilot toleranced to fit your motor for precise concentricity

Ring gear machined integral to the housing – not welded or pressed in

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

Gears are case hardened to 61 Rockwell "C" and refined for maximum efficiency



The integrated motor coupling is designed to allow thermal expansion of the motor shaft–ensuring long motor life by preventing thrust load on the motor bearings.

Adapter bushings fit all motor shafts – no key required

Single piece planet carrier and shaft for greater concentricity and more precise alignment

Available with NEMA Output Adapters (shaft remains metric). See Page 59.

"PE" Series–EconoLine ServoFit® Precision Planetary Gearhead Selection Data

Part Number (Gearhead + Input)	Exact Ratio	Maximum Input Speed		Maximum Motor Shaft	Mass Moment of Inertia	Torsional Stiffness		Output Torque					
								Nominal [1]		Acceleration		Peak [2]	
Gearhead	i	Continuous RPM (n_1)	Cyclic	øD⁶ mm	J_1 10^{-4} kgcm²	C_2 in.lbs. per arcmin	Nm	T_{2N} in.lbs.	Nm	T_{2B} in.lbs.	Nm	T_{2PEAK} in.lbs.	Nm
PE201 with Motor Mounting Plate													
PE201SP0050M	5.000	4,000	8,000	11	.063	8.9	1.0	58	6.5	133	15	248	28
PE201SP0100M	10.00	4,000	8,000	11	.063	8.9	1.0	49	5.5	106	12	248	28
PE202 with Motor Mounting Plate													
PE202SP0250M	25.00	4,000	8,000	11	.052	8.9	1.0	58	6.5	133	15	248	28
PE202SP0500M	50.00	4,000	8,000	11	.052	8.9	1.0	58	6.5	133	15	248	28
PE202SP1000M	100.0	4,000	8,000	11	.052	8.9	1.0	49	5.5	106	12	248	28
PE301 with Motor Mounting Plate													
PE301SP0050M	5.000	3,700	6,000	14	.31	31	3.5	159	18	292	33	664	75
PE301SP0100M	10.00	3,700	6,000	14	.31	31	3.5	150	17	266	30	664	75
PE302 with Motor Mounting Plate													
PE302SP0250M	25.00	3,700	6,000	14	.25	31	3.5	159	18	292	33	664	75
PE302SP0500M	50.00	3,700	6,000	14	.25	31	3.5	159	18	292	33	664	75
PE302SP1000M	100.0	3,700	6,000	14	.25	31	3.5	150	17	266	30	664	75
PE401 with Motor Mounting Plate													
PE401SP0050M	5.000	3,400	6,000	19	1.72	88.5	10	398	45	726	82	1,770	200
PE401SP0100M	10.00	3,400	6,000	19	1.72	88.5	10	354	40	637	72	1,770	200
PE402 with Motor Mounting Plate													
PE402SP0250M	25.00	3,400	6,000	19	1.47	88.5	10	398	45	726	82	1,770	200
PE402SP0500M	50.00	3,400	6,000	19	1.47	88.5	10	398	45	726	82	1,770	200
PE402SP1000M	100.0	3,400	6,000	19	1.47	88.5	10	354	40	637	72	1,770	200
PE501 with Motor Mounting Plate													
PE501SP0050M	5.000	2,600	5,000	24	5.50	221.3	25	1,062	120	1,859	210	4,248	480
PE501SP0100M	10.00	2,600	5,000	24	5.50	221.3	25	885	100	1,593	180	4,248	480
PE502 with Motor Mounting Plate													
PE502SP0250M	25.00	2,600	5,000	24	4.45	221.3	25	1,062	120	1,859	210	4,248	480
PE502SP0500M	50.00	2,600	5,000	24	4.45	221.3	25	1,062	120	1,859	210	4,248	480
PE502SP1000M	100.0	2,600	5,000	24	4.45	221.3	25	885	100	1,593	180	4,248	480

Part No. Explanation

PE 4 0 1 SP 0050 M

- **M** – Motor Plate
- **0050** – Ratio (**0050** = 5.0:1)
- **SP** – Output shaft with key
- **1** – No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- Generation Number
- Unit No.
- EconLine ServoFit Planetary Gearhead

When ordering a planetary gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. (See Page 134.)

[1] Based on input speed: n1 = 2000 RPM
For torque at higher input speeds (T_{2NX}) solve the formula, where n1 = Actual Input Speed. $T_{2NX} = \frac{T_{2N}}{\sqrt[3]{\frac{n_1}{2000}}}$

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of gearhead = 1,000 stops maximum.

"PE" Series–EconoLine ServoFit® Precision Planetary Gearhead Dimensional Data

Dimension shown in millimeters (inches).

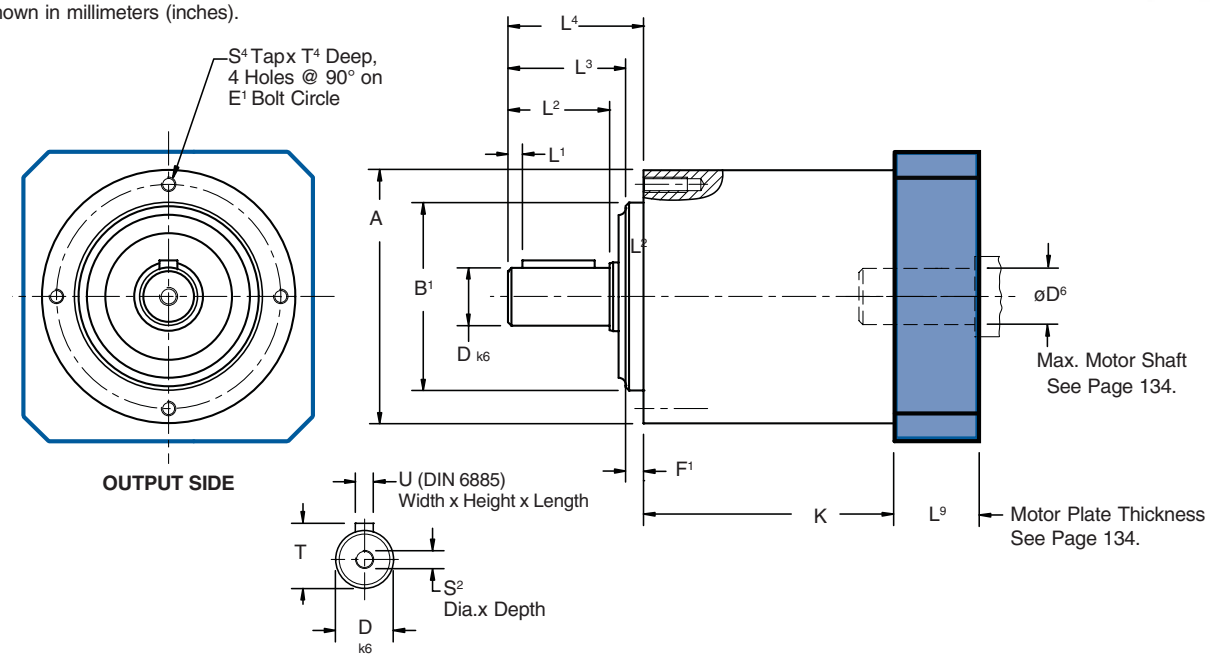


Table No. 1 **"PE" Series – Precision Planetary Gearhead Dimensions (mm/inches)**

Unit	A	B^1 h6	D k6	E^1	F^1	L^1	L^2	L^3	L^4	S^2	S^4	T	T^4	U
PE201/P202	50 1.97	35 +.000/-.016 1.378 +.0000/-.0006	12 +.012/+.001	44 1.73	4 .16	2 .08	18 .71	20.5 .81	24.5 .96	M4	M4	13.5 .53	10 .39	A4x4x14
PE301/PE302	70 2.76	52 +.000/-.019 2.047 +.0000/-.0007	16 +.012/+.001	62 2.44	5 .20	2 .08	28 1.10	31 1.22	36 1.42	M5	M5	18 .71	12 .47	A5x5x25
PE401/PE402	90 3.54	68 +.000/-.019 2.677 +.0000/-.0007	22 +.015/+.002	80 3.15	5 .20	3 .12	36 1.42	41 1.61	46 1.81	M8	M6	24.5 .96	15 .59	A6x6x32
PE501/PE502	120 4.72	90 +.000/-.022 3.543 +.0000/-.0009	32 +.018/+.002	108 4.25	6 .24	3 .12	58 2.28	64 2.52	70 2.76	M12	M8	35 1.38	20 .79	A10x8x50

Table No. 2

Unit	K	
	mm	inches
PE201	53	2.09
PE202	74.5	2.93
PE301	69	2.72
PE302	91.5	3.60
PE401	80	3.15
PE402	109	4.29
PE501	160.5	6.32
PE502	142	5.59

Table No. 3 **NEMA Output FINnge (mm/inches)**

NEMA	N^1	N^2	N^3	N^5	N^6	N^7	N^8
23	58 2.28	66.67 2.625	38.10 +.000/-.025 1.500 +.000/-.001	7 .28	1.6 .063	5.0 .20	76 2.99
34	83 3.27	98.43 3.875	73.03 +.000/-.030 2.875 +.000/-.001	8 .31	1.6 .063	5.5 .22	111 4.37
42	107 4.21	125.73 4.950	55.52 +.000/-.030 2.186 +.000/-.001	7.6 .30	2.4 .094	7.1 .28	143 5.63
56	146 5.75	149.23 5.875	114.30 +.000/-.035 4.500 +.000/-.001	15 .59	3.2 .125	10 .39	200 7.87

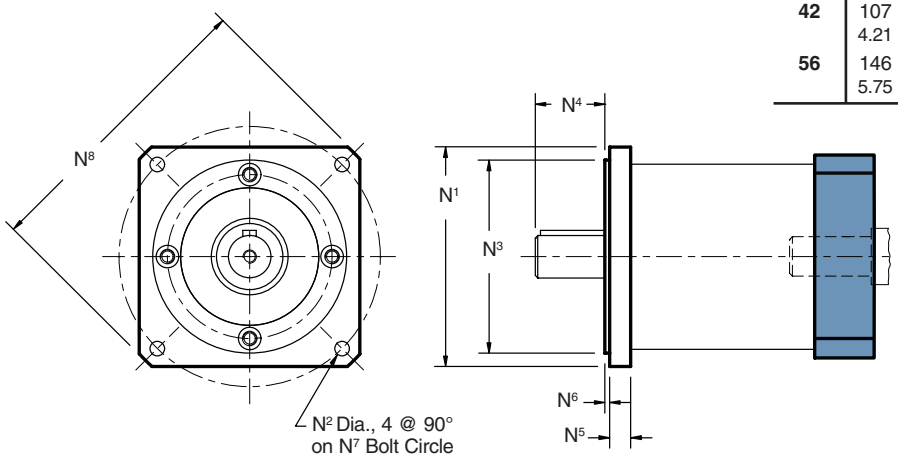


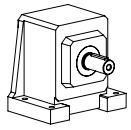
Table No. 4 **N^4 Dimension**

NEMA	PE2	PE3	PE4	PE5
23	15.9 .63	–	–	–
34	–	26.6 1.05	36.8 1.45	–
42	–	25.6 1.01	36 1.42	–
56	–	–	–	51.8 2.04

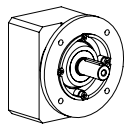
See web site for drawings.

"C" Series–Concentric Helical ServoFit® SMS Gearhead Overview

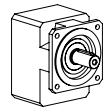
Housing Styles + TriAdapt® Motor Adapter Input = Gearhead Configurations



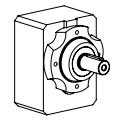
Style N
Foot Mount



Style F
Round Flange



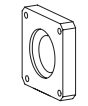
Style Q,
Square Flange



Style G
Tapped Holes

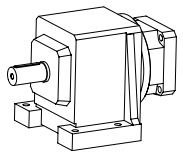
+

MT
Motor Adapter

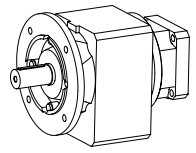


Motor Plate
to fit any servo motor

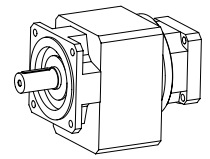
Gearhead Configurations



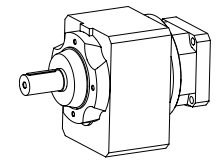
Style N, Foot Mount



Style F, Round Flange



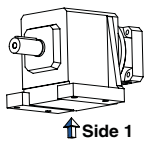
Style Q, Square Flange



Style G, Tapped Holes

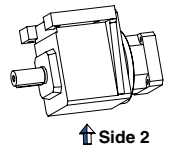
Mounting Positions

EL1



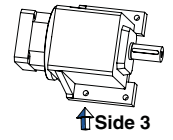
Side 1

EL2



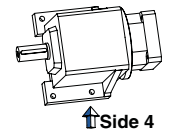
Side 2

EL3



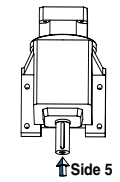
Side 3

EL4



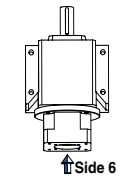
Side 4

EL5



Side 5

EL6



Side 6

Part No. Explanation with OPTIONS and REQUIRED INFORMATION

C 4 0 2 N 0135 MT20 B

- **C** – Concentric Helical
- **4** – Unit Size No.
- **0** – Design Generation
- **2** – No. of Stages (**02** = 2 Stage, determined by ratio)
- **N** – HOUSING STYLE
  "**N**" Housing Style – Foot Mounting
  "**F**" Housing Style – Flange Mounting
  "**Q**" Housing Style – Square Output Flange
  "**G**" Housing Style – Tapped Holes
- **0135** – Nominal Ratio: **0135** = 13.5:1
- **MT20** – TriAdapt® Motor Adapter Size: **MT10**, **MT20**, **MT30**, **MT40**
- **B** – This designation is only required when ordering a:
  B – Beverage Duty
  F – Food Duty
  P – Poultry Duty

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Mounting Position	–	EL1 EL2 EL3 EL4 EL5 EL6
Motor	–	Motor Manufacturer and Model Number
Paint	–	Black (Standard) ..... White ..... Stainless
Option	–	Imperial or Metric Shaft[1)]
Package Options	–	Beverge Duty ..... Food Duty ..... Poultry Duty

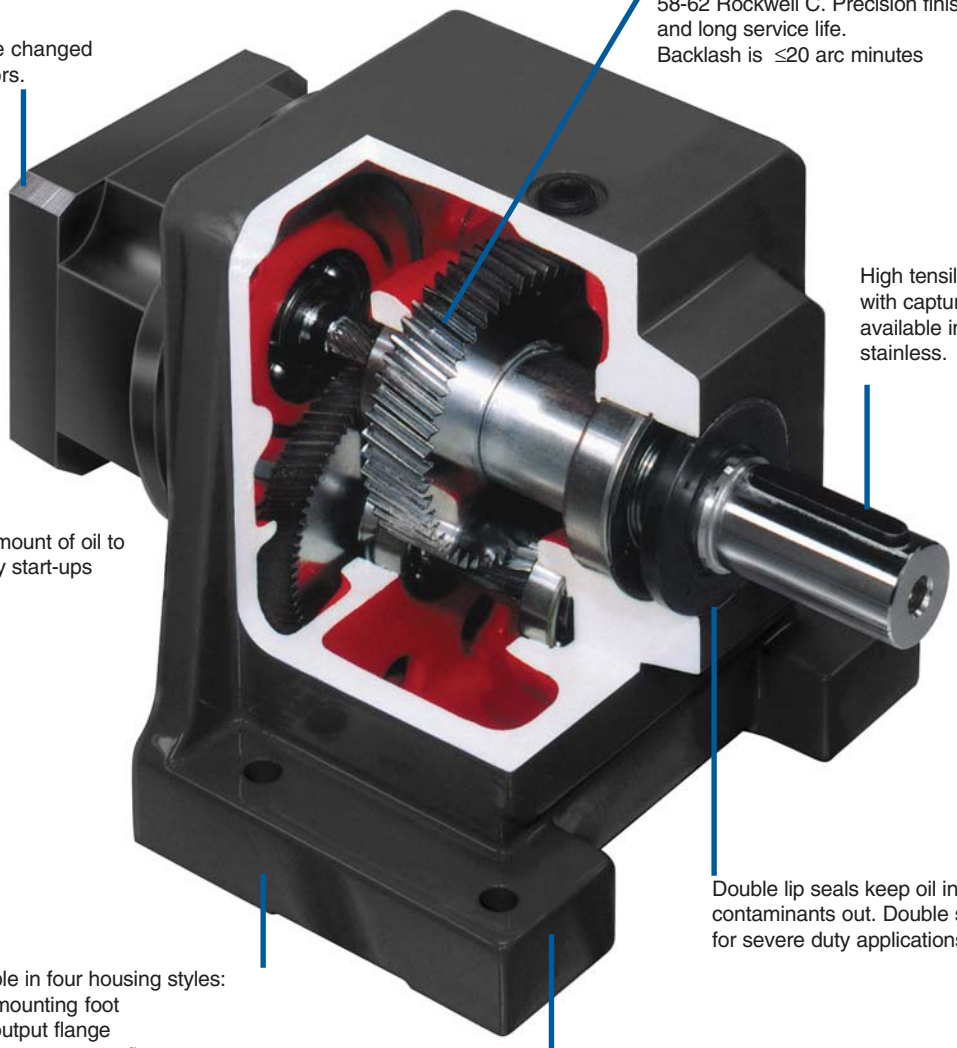
[1)] Not available in all sizes. Contact STOBER.

"C" Series–Concentric Helical ServoFit® Modular System

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

Performance Specifications:

- Input RPM up to 4,500 RPM
- Nominal output torque – 97 to 62,000 in.lbs. (21-7,000 Nm)
- Reducer ratios from 2:1 to 276:1
- 5 year limited warranty (2 years on bearings, seals, etc.)
- Ambient temperature – 0°C to +40°C (104°F)
- Noise level – as low as 53 dB(A)
- ≥ 95.5% Efficiency
- Maintenance free
- Can be back driven



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

High quality helical gearing is case hardened to 58-62 Rockwell C. Precision finished for low noise and long service life.
Backlash is ≤20 arc minutes

High tensile strength shafts with captured keys available inches, metric, or stainless.

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

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

Available in four housing styles:
N-mounting foot
F-output flange
Q-square output flange
G-tapped holes

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

Also available in washdown, food duty, and beverage duty.
* Maximum 10 working days for custom motor plates.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	arcmins $\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C002 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 55 dB(A) [3]**	
C002_0020 MT10	2.0	1480/741	1.3	20	7	0.8	3,500	3,000	4,000	184	21	184	21	230	26
C002_0020 MT20	2.0	1480/741	1.9	20	7	0.8	3,500	3,000	4,000	226	26	346	39	433	49
C002_0028 MT10	2.8	36/13	1.0	20	9	1.0	3,500	3,000	4,000	241	27	241	27	302	34
C002_0028 MT20	2.8	36/13	1.6	20	9	1.0	3,500	3,000	4,000	252	28	455	51	568	64
C002_0031 MT10	3.1	46/15	1.0	20	9	1.0	3,700	3,600	4,200	256	29	263	30	329	37
C002_0031 MT20	3.1	46/15	1.6	20	9	1.0	3,500	3,500	4,200	256	29	495	56	619	70
C002_0033 MT10	3.3	1702/513	1.0	20	9	1.0	3,700	3,600	4,200	263	30	284	32	356	40
C002_0033 MT20	3.3	1702/513	1.6	20	9	1.1	3,500	3,500	4,200	263	30	536	60	669	76
C002_0038 MT10	3.8	441/115	0.9	20	10	1.1	3,700	3,600	4,200	276	31	316	36	395	45
C002_0038 MT20	3.8	441/115	1.5	20	10	1.1	3,500	3,500	4,200	276	31	572	65	743	84
C002_0041 MT10	4.1	1813/437	0.9	20	10	1.1	3,700	3,600	4,200	283	32	342	39	427	48
C002_0041 MT20	4.1	1813/437	1.5	20	10	1.1	3,500	3,500	4,200	283	32	576	65	804	91
C002_0047 MT10	4.7	117/25	0.8	20	10	1.1	4,000	4,000	4,500	287	32	372	42	465	53
C002_0047 MT20	4.7	117/25	1.4	20	10	1.1	3,500	3,500	4,500	287	32	576	65	876	99
C002_0051 MT10	5.1	481/95	0.8	20	10	1.1	4,000	4,000	4,500	295	33	403	45	503	57
C002_0051 MT20	5.1	481/95	1.4	20	10	1.2	3,500	3,500	4,500	295	33	576	65	948	107
C002_0058 MT10	5.8	99/17	0.7	20	10	1.2	4,000	4,000	4,500	309	35	445	50	556	63
C002_0058 MT20	5.8	99/17	1.3	20	10	1.2	3,500	3,500	4,500	309	35	576	65	974	110
C002_0063 MT10	6.3	2035/323	0.7	20	10	1.2	4,000	4,000	4,500	317	36	481	54	601	68
C002_0063 MT20	6.3	2035/323	1.3	20	11	1.2	3,500	3,500	4,500	317	36	576	65	974	110
C002_0077 MT10	7.7	54/7	0.7	20	11	1.2	4,000	4,000	4,500	339	38	561	63	701	79
C002_0077 MT20	7.7	54/7	1.3	20	11	1.2	3,500	3,500	4,500	339	38	561	63	701	79
C002_0082 MT10	8.2	667/81	0.9	16	14	1.5	3,700	3,600	4,200	420	47	638	72	882	100
C002_0082 MT20	8.2	667/81	1.5	16	14	1.5	3,500	3,500	4,200	420	47	638	72	1,063	120
C002_0092 MT10	9.2	1495/162	0.9	16	14	1.5	3,700	3,600	4,200	437	49	576	65	989	112
C002_0092 MT20	9.2	1495/162	1.5	16	14	1.6	3,500	3,500	4,200	437	49	576	65	1,063	120
C002_0105 MT10	10.3	1421/138	0.8	16	14	1.6	3,700	3,600	4,200	453	51	638	72	1,060	120
C002_0105 MT20	10.3	1421/138	1.4	16	14	1.6	3,500	3,500	4,200	453	51	638	72	1,063	120
C002_0115 MT10	11.5	3185/276	0.8	16	14	1.6	3,700	3,600	4,200	470	53	576	65	1,063	120
C002_0115 MT20	11.5	3185/276	1.4	16	14	1.6	3,500	3,500	4,200	470	53	576	65	1,063	120
C002_0125 MT10	12.6	377/30	0.8	16	14	1.6	4,000	4,000	4,500	472	53	638	72	1,063	120
C002_0125 MT20	12.6	377/30	1.4	16	14	1.6	3,500	3,500	4,500	472	53	638	72	1,063	120
C002_0140 MT10	14.1	169/12	0.8	16	14	1.6	4,000	4,000	4,500	490	55	576	65	1,063	120
C002_0140 MT20	14.1	169/12	1.4	16	14	1.6	3,500	3,500	4,500	490	55	576	65	1,063	120
C002_0155 MT10	15.6	1595/102	0.7	16	14	1.6	4,000	4,000	4,500	507	57	638	72	1,063	120
C002_0155 MT20	15.6	1595/102	1.3	16	14	1.6	3,500	3,500	4,500	507	57	638	72	1,063	120
C002_0175 MT10	17.5	3575/204	0.7	16	14	1.6	4,000	4,000	4,500	527	59	576	65	1,063	120
C002_0175 MT20	17.5	3575/204	1.3	16	14	1.6	3,500	3,500	4,500	527	59	576	65	1,063	120
C002_0210 MT10	20.7	145/7	0.7	16	14	1.6	4,000	4,000	4,500	531	60	638	72	1,063	120
C002_0210 MT20	20.7	145/7	1.3	16	14	1.6	3,500	3,500	4,500	531	60	638	72	1,063	120
C002_0230 MT10	23.2	325/14	0.7	16	14	1.6	4,000	4,000	4,500	531	60	576	65	1,063	120
C002_0230 MT20	23.2	325/14	1.3	16	14	1.6	3,500	3,500	4,500	531	60	576	65	1,063	120

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

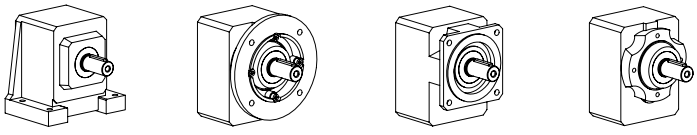
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
					C_2		Continuous		Cyclic	$T_{2N \leq 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C002 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 55 dB(A)** [3]	
C002_0250 MT10	25.0	899/36	0.7	16	14	1.6	4,000	4,000	4,500	531	60	638	72	1,063	120
C002_0250 MT20	25.0	899/36	1.3	16	14	1.6	3,500	3,500	4,500	531	60	638	72	1,063	120
C002_0280 MT10	28.0	2015/72	0.7	16	14	1.6	4,000	4,000	4,500	531	60	576	65	1,063	120
C002_0280 MT20	28.0	2015/72	1.3	16	14	1.6	3,500	3,500	4,500	531	60	576	65	1,063	120
C002_0310 MT10	31.3	2813/90	0.6	16	14	1.6	4,000	4,000	4,500	531	60	638	72	1,063	120
C002_0310 MT20	31.3	2813/90	1.2	16	14	1.6	3,500	3,500	4,500	531	60	638	72	1,063	120
C002_0350 MT10	35.0	1261/36	0.6	16	14	1.6	4,000	4,000	4,500	531	60	576	65	1,063	120
C002_0350 MT20	35.0	1261/36	1.2	16	14	1.6	3,500	3,500	4,500	531	60	576	65	1,063	120
C002_0420 MT10	41.8	3509/84	0.6	16	14	1.6	4,000	4,000	4,500	531	60	638	72	1,063	120
C002_0470 MT10	46.8	7865/168	0.6	16	14	1.6	4,000	4,000	4,500	531	60	576	65	1,063	120
C002_0500 MT10	49.9	899/18	0.6	16	14	1.6	4,000	4,000	4,500	531	60	638	72	1,048	118
C002_0560 MT10	56.0	2015/36	0.6	16	14	1.6	4,000	4,000	4,500	531	60	576	65	1,063	120
C002_0620 MT10	62.4	1247/20	0.6	16	14	1.6	4,000	4,000	4,500	531	60	638	72	1,063	120
C002_0700 MT10	69.9	559/8	0.6	16	14	1.6	4,000	4,000	4,500	531	60	576	65	1,063	120
C102 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 55 dB(A)** [3]	
C102_0020 MT10	2.0	1128/559	2.5	18	12	1.3	3,100	2,700	3,600	195	22	195	22	243	27
C102_0020 MT20	2.0	1128/559	3.1	18	12	1.4	3,100	2,700	3,600	472	53	763	86	1,076	121
C102_0020 MT30	2.0	1128/559	7.9	18	16	1.8	3,100	2,700	3,600	472	53	861	97	1,076	121
C102_0022 MT10	2.2	468/215	2.4	18	13	1.4	3,100	2,700	3,600	210	24	210	24	263	30
C102_0022 MT20	2.2	468/215	3.0	18	13	1.5	3,100	2,700	3,600	484	55	823	93	1,161	131
C102_0022 MT30	2.2	468/215	7.8	18	17	1.9	3,100	2,700	3,600	484	55	929	105	1,161	131
C102_0024 MT20	2.4	2303/962	2.7	18	15	1.7	3,100	2,700	3,600	500	56	905	102	1,260	142
C102_0024 MT30	2.4	2303/962	7.5	18	18	2.0	3,100	2,700	3,600	500	56	978	110	1,260	142
C102_0026 MT20	2.6	1911/740	2.7	18	16	1.8	3,100	2,700	3,600	513	58	976	110	1,359	153
C102_0026 MT30	2.6	1911/740	7.5	18	19	2.1	3,100	2,700	3,600	513	58	1,003	113	1,359	153
C102_0031 MT10	3.1	2491/806	1.6	18	17	2.0	3,600	3,200	4,100	282	32	282	32	352	40
C102_0031 MT20	3.1	2491/806	2.2	18	18	2.0	3,500	3,200	4,100	518	58	1,065	120	1,556	176
C102_0031 MT30	3.1	2491/806	7.0	18	21	2.4	3,500	3,200	4,000	518	58	1,065	120	1,556	176
C102_0033 MT10	3.3	2067/620	1.6	18	18	2.1	3,600	3,200	4,100	304	34	304	34	380	43
C102_0033 MT20	3.3	2067/620	2.2	18	19	2.1	3,500	3,200	4,100	531	60	1,092	123	1,678	189
C102_0033 MT30	3.3	2067/620	7.0	18	22	2.4	3,500	3,200	4,000	531	60	1,092	123	1,678	189
C102_0039 MT10	3.9	1363/351	1.3	18	20	2.3	3,600	3,200	4,100	342	39	342	39	427	48
C102_0039 MT20	3.9	1363/351	1.9	18	21	2.3	3,500	3,200	4,100	559	63	1,149	130	1,888	213
C102_0039 MT30	3.9	1363/351	6.7	18	23	2.6	3,500	3,200	4,000	559	63	1,149	130	1,888	213
C102_0042 MT10	4.2	377/90	1.3	18	21	2.4	3,600	3,200	4,100	369	42	369	42	461	52
C102_0042 MT20	4.2	377/90	1.9	18	22	2.4	3,500	3,200	4,100	573	65	1,152	130	1,949	220
C102_0042 MT30	4.2	377/90	6.7	18	24	2.7	3,500	3,200	4,000	573	65	1,152	130	1,949	220
C102_0047 MT10	4.7	3149/676	1.1	18	22	2.5	3,800	3,600	4,300	396	45	396	45	494	56
C102_0047 MT20	4.7	3149/676	1.7	18	22	2.5	3,500	3,500	4,300	583	66	1,152	130	1,949	220
C102_0047 MT30	4.7	3149/676	6.5	18	24	2.7	3,500	3,500	4,000	583	66	1,152	130	1,949	220

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	10^{-4}kgcm² J_1	arcmins Δφ	in.lbs. C_2	Nm C_2	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C102 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 55 dB(A) [3]**	
C102_0050 MT10	5.0	201/40	1.1	18	23	2.6	3,800	3,600	4,300	427	48	427	48	533	60
C102_0050 MT20	5.0	201/40	1.7	18	23	2.6	3,500	3,500	4,300	598	68	1,152	130	1,949	220
C102_0050 MT30	5.0	201/40	6.5	18	25	2.8	3,500	3,500	4,000	598	68	1,152	130	1,949	220
C102_0059 MT10	5.9	47/8	1.0	18	24	2.7	3,800	3,600	4,300	480	54	480	54	600	68
C102_0059 MT20	5.9	47/8	1.6	18	24	2.7	3,500	3,500	4,300	630	71	1,152	130	1,949	220
C102_0059 MT30	5.9	47/8	6.4	18	25	2.9	3,500	3,500	4,000	630	71	1,152	130	1,949	220
C102_0063 MT10	6.3	507/80	1.0	18	24	2.7	3,800	3,600	4,300	517	58	517	58	647	73
C102_0063 MT20	6.3	507/80	1.6	18	25	2.8	3,500	3,500	4,300	646	73	1,152	130	1,949	220
C102_0063 MT30	6.3	507/80	6.4	18	26	2.9	3,500	3,500	4,000	646	73	1,152	130	1,949	220
C102_0078 MT10	7.8	3243/416	0.8	18	25	2.9	4,000	4,000	4,500	602	68	602	68	752	85
C102_0078 MT20	7.8	3243/416	1.4	18	26	2.9	3,500	3,500	4,500	681	77	1,152	130	1,949	220
C102_0078 MT30	7.8	3243/416	6.2	18	26	3.0	3,500	3,500	4,000	681	77	1,152	130	1,949	220
C102_0083 MT10	8.3	1537/186	1.3	15	32	3.6	3,600	3,200	4,100	753	85	753	85	941	106
C102_0083 MT20	8.3	1537/186	1.9	15	32	3.6	3,500	3,200	4,100	849	96	1,222	138	2,126	240
C102_0083 MT30	8.3	1537/186	6.7	15	33	3.7	3,500	3,200	4,000	849	96	1,222	138	2,126	240
C102_0093 MT10	9.3	3180/341	1.3	15	32	3.6	3,600	3,200	4,100	850	96	850	96	1,062	120
C102_0093 MT20	9.3	3180/341	1.9	15	32	3.7	3,500	3,200	4,100	884	100	1,222	138	2,126	240
C102_0093 MT30	9.3	3180/341	6.7	15	33	3.8	3,500	3,200	4,000	884	100	1,222	138	2,126	240
C102_0105 MT10	10.4	841/81	1.1	15	33	3.7	3,600	3,200	4,100	914	103	914	103	1,142	129
C102_0105 MT20	10.4	841/81	1.7	15	33	3.7	3,500	3,200	4,100	917	103	1,222	138	2,126	240
C102_0105 MT30	10.4	841/81	6.5	15	34	3.8	3,500	3,200	4,000	917	103	1,222	138	2,126	240
C102_0115 MT10	11.7	1160/99	1.1	15	33	3.7	3,600	3,200	4,100	954	108	1,031	116	1,289	146
C102_0115 MT20	11.7	1160/99	1.7	15	33	3.8	3,500	3,200	4,100	954	108	1,222	138	2,126	240
C102_0115 MT30	11.7	1160/99	6.5	15	34	3.8	3,500	3,200	4,000	954	108	1,222	138	2,126	240
C102_0125 MT10	12.5	1943/156	1.0	15	33	3.8	3,800	3,600	4,300	957	108	1,058	119	1,322	149
C102_0125 MT20	12.5	1943/156	1.6	15	33	3.8	3,500	3,500	4,300	957	108	1,222	138	2,126	240
C102_0125 MT30	12.5	1943/156	6.4	15	34	3.8	3,500	3,500	4,000	957	108	1,222	138	2,126	240
C102_0140 MT10	14.1	2010/143	1.0	15	34	3.8	3,800	3,600	4,300	996	112	1,194	135	1,492	168
C102_0140 MT20	14.1	2010/143	1.6	15	34	3.8	3,500	3,500	4,300	996	112	1,222	138	2,126	240
C102_0140 MT30	14.1	2010/143	6.4	15	34	3.9	3,500	3,500	4,000	996	112	1,222	138	2,126	240
C102_0155 MT10	15.7	377/24	0.9	15	34	3.8	3,800	3,600	4,300	1,033	117	1,222	138	1,603	181
C102_0155 MT20	15.7	377/24	1.5	15	34	3.8	3,500	3,500	4,300	1,033	117	1,222	138	2,126	240
C102_0155 MT30	15.7	377/24	6.3	15	34	3.9	3,500	3,500	4,000	1,033	117	1,222	138	2,126	240
C102_0175 MT10	17.7	195/11	0.9	15	34	3.8	3,800	3,600	4,300	1,063	120	1,222	138	1,809	204
C102_0175 MT20	17.7	195/11	1.5	15	34	3.9	3,500	3,500	4,300	1,063	120	1,222	138	2,126	240
C102_0175 MT30	17.7	195/11	6.3	15	34	3.9	3,500	3,500	4,000	1,063	120	1,222	138	2,126	240
C102_0210 MT10	20.8	667/32	0.8	15	34	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,012	227
C102_0210 MT20	20.8	667/32	1.4	15	34	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0210 MT30	**20.8**	**667/32**	**6.2**	**15**	**34**	**3.9**	**3,500**	**3,500**	**4,000**	**1,063**	**120**	**1,222**	**138**	2,126	240
C102_0240 MT10	23.5	1035/44	0.8	15	34	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0240 MT20	23.5	1035/44	1.4	15	34	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0240 MT30	23.5	1035/44	6.2	15	35	3.9	3,500	3,500	4,000	1,063	120	1,222	138	2,126	240

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

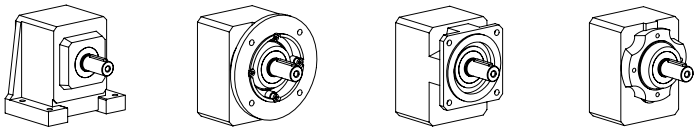
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C102 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 55 dB(A)** [3]	
C102_0250 MT10	25.1	377/15	0.8	15	34	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0250 MT20	25.1	377/15	1.4	15	34	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0250 MT30	25.1	377/15	6.2	15	35	3.9	3,500	3,500	4,000	1,063	120	1,222	138	2,126	240
C102_0280 MT10	28.4	312/11	0.8	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0280 MT20	28.4	312/11	1.4	15	35	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0280 MT30	28.4	312/11	6.2	15	35	3.9	3,500	3,500	4,000	1,063	120	1,222	138	2,126	240
C102_0310 MT10	31.1	435/14	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0310 MT20	31.1	435/14	1.3	15	35	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0310 MT30	31.1	435/14	6.1	15	35	3.9	3,500	3,500	4,000	1,063	120	1,222	138	2,126	240
C102_0350 MT10	35.1	2700/77	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0350 MT20	35.1	2700/77	1.3	15	35	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0350 MT30	35.1	2700/77	6.1	15	35	3.9	3,500	3,500	4,000	1,063	120	1,222	138	2,126	240
C102_0420 MT10	41.6	1247/30	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0420 MT20	41.6	1247/30	1.3	15	35	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0470 MT10	46.9	516/11	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0470 MT20	46.9	516/11	1.3	15	35	3.9	3,500	3,500	4,500	1,063	120	1,222	138	2,126	240
C102_0500 MT10	49.9	899/18	0.6	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,089	236
C102_0560 MT10	56.4	620/11	0.6	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C102_0620 MT10	62.4	4495/72	0.6	15	35	3.9	4,000	4,000	4,500	1,054	119	1,222	138	2,108	238
C102_0700 MT10	70.5	775/11	0.6	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C103 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 55 dB(A)** [3]	
C103_0820 MT10	81.6	31349/384	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C103_0920 MT10	92.1	16215/176	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C103_1110 MT10	111.1	1222/11	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C103_1370 MT10	137.3	10575/77	0.7	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C103_1840 MT10	183.7	2021/11	0.6	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C103_2210 MT10	220.8	7285/33	0.6	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C103_2760 MT10	275.9	36425/132	0.6	15	35	3.9	4,000	4,000	4,500	1,063	120	1,222	138	2,126	240
C202 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 53 dB(A)** [3]	
C202_0020 MT20	2.0	432/215	5.1	17	15	1.7	3,000	2,600	3,500	690	78	760	86	1,114	126
C202_0020 MT30	2.0	432/215	9.9	17	21	2.4	3,000	2,600	3,500	728	82	1,408	159	2,874	324
C202_0022 MT20	2.2	2160/989	4.9	17	17	2.0	3,000	2,600	3,500	749	85	826	93	1,211	137
C202_0022 MT30	2.2	2160/989	9.7	17	23	2.6	3,000	2,600	3,500	749	85	1,448	163	3,100	350
C202_0025 MT20	2.5	99/40	4.1	17	20	2.3	3,000	2,600	3,500	781	88	936	106	1,328	150
C202_0025 MT30	2.5	99/40	8.9	17	27	3.0	3,000	2,600	3,500	781	88	1,062	120	1,328	150
C202_0027 MT20	2.7	495/184	4.0	17	23	2.5	3,000	2,600	3,500	803	91	1,017	115	1,443	163
C202_0027 MT30	2.7	495/184	8.8	17	29	3.3	3,000	2,600	3,500	803	91	1,155	130	1,443	163
C202_0031 MT20	3.1	90/29	3.3	17	26	3.0	3,500	3,100	4,000	800	90	1,173	132	1,618	183
C202_0031 MT30	3.1	90/29	8.1	17	33	3.7	3,500	3,100	4,000	800	90	1,295	146	1,618	183

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	arcmins $\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C202 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 53 dB(A) [3]**	
C202_0034 MT20	3.4	2250/667	3.2	17	29	3.2	3,500	3,100	4,000	822	93	1,275	144	1,759	199
C202_0034 MT30	3.4	2250/667	8.0	17	35	3.9	3,500	3,100	4,000	822	93	1,407	159	1,759	199
C202_0039 MT20	3.9	486/125	2.7	17	32	3.6	3,500	3,100	4,000	862	97	1,470	166	1,954	221
C202_0039 MT30	3.9	486/125	7.5	17	38	4.3	3,500	3,100	4,000	862	97	1,563	176	1,954	221
C202_0042 MT20	4.2	486/115	2.6	17	34	3.9	3,500	3,100	4,000	886	100	1,598	180	2,124	240
C202_0042 MT30	4.2	486/115	7.4	17	40	4.5	3,500	3,100	4,000	886	100	1,699	192	2,124	240
C202_0047 MT20	4.7	14/3	2.3	17	37	4.1	3,500	3,500	4,200	899	102	1,764	199	2,261	255
C202_0047 MT30	4.7	14/3	7.1	17	42	4.7	3,500	3,500	4,000	899	102	1,772	200	2,261	255
C202_0051 MT20	5.1	350/69	2.3	17	39	4.4	3,500	3,500	4,200	925	104	1,772	200	2,457	277
C202_0051 MT30	5.1	350/69	7.1	17	43	4.9	3,500	3,500	4,000	925	104	1,772	200	2,457	277
C202_0058 MT10	5.8	666/115	1.4	17	40	4.5	3,700	3,500	4,200	488	55	488	55	610	69
C202_0058 MT20	5.8	666/115	2.0	17	41	4.7	3,500	3,500	4,200	966	109	1,772	200	2,696	304
C202_0058 MT30	5.8	666/115	6.8	17	45	5.1	3,500	3,500	4,000	966	109	1,772	200	2,696	304
C202_0063 MT10	6.3	3330/529	1.4	17	42	4.7	3,700	3,500	4,200	530	60	530	60	663	75
C202_0063 MT20	6.3	3330/529	2.0	17	43	4.8	3,500	3,500	4,200	994	112	1,772	200	2,930	331
C202_0063 MT30	6.3	3330/529	6.8	17	46	5.2	3,500	3,500	4,000	994	112	1,772	200	2,930	331
C202_0078 MT10	7.8	39/5	1.1	17	45	5.1	4,000	3,900	4,500	618	70	618	70	772	87
C202_0078 MT20	7.8	39/5	1.7	17	46	5.2	3,500	3,500	4,500	1,040	117	1,772	200	3,100	350
C202_0078 MT30	7.8	39/5	6.5	17	48	5.5	3,500	3,500	4,000	1,040	117	1,772	200	3,100	350
C202_0082 MT20	8.2	475/58	2.7	14	61	6.9	3,500	3,100	4,000	1,404	159	2,037	230	3,543	400
C202_0082 MT30	8.2	475/58	7.5	14	65	7.4	3,500	3,100	4,000	1,404	159	2,037	230	3,543	400
C202_0094 MT20	9.4	2450/261	2.7	14	64	7.2	3,500	3,100	4,000	1,470	166	2,037	230	3,543	400
C202_0094 MT30	9.4	2450/261	7.5	14	67	7.6	3,500	3,100	4,000	1,470	166	2,037	230	3,543	400
C202_0105 MT20	10.3	513/50	2.3	14	65	7.3	3,500	3,100	4,000	1,514	171	2,037	230	3,543	400
C202_0105 MT30	10.3	513/50	7.1	14	68	7.7	3,500	3,100	4,000	1,514	171	2,037	230	3,543	400
C202_0120 MT20	11.8	294/25	2.3	14	67	7.5	3,500	3,100	4,000	1,584	179	2,037	230	3,543	400
C202_0120 MT30	11.8	294/25	7.1	14	69	7.8	3,500	3,100	4,000	1,584	179	2,037	230	3,543	400
C202_0125 MT20	12.3	665/54	2.1	14	67	7.6	3,500	3,500	4,200	1,579	178	2,037	230	3,543	400
C202_0125 MT30	12.3	665/54	6.9	14	70	7.9	3,500	3,500	4,000	1,579	178	2,037	230	3,543	400
C202_0140 MT20	14.1	3430/243	2.0	14	69	7.8	3,500	3,500	4,200	1,653	187	2,037	230	3,543	400
C202_0140 MT30	14.1	3430/243	6.8	14	70	8.0	3,500	3,500	4,000	1,653	187	2,037	230	3,543	400
C202_0155 MT10	15.3	703/46	1.2	14	69	7.8	3,700	3,500	4,200	1,287	145	1,287	145	1,609	182
C202_0155 MT20	15.3	703/46	1.8	14	69	7.8	3,500	3,500	4,200	1,697	192	2,037	230	3,543	400
C202_0155 MT30	15.3	703/46	6.6	14	71	8.0	3,500	3,500	4,000	1,697	192	2,037	230	3,543	400
C202_0175 MT10	17.5	3626/207	1.2	14	70	7.9	3,700	3,500	4,200	1,476	167	1,476	167	1,844	208
C202_0175 MT20	17.5	3626/207	1.8	14	70	7.9	3,500	3,500	4,200	1,772	200	2,037	230	3,543	400
C202_0175 MT30	17.5	3626/207	6.6	14	71	8.1	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0210 MT10	20.6	247/12	1.0	14	71	8.0	4,000	3,900	4,500	1,631	184	1,631	184	2,038	230
C202_0210 MT20	20.6	247/12	1.6	14	71	8.0	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0210 MT30	20.6	247/12	6.4	14	72	8.1	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0240 MT10	23.6	637/27	1.0	14	71	8.1	4,000	3,900	4,500	1,772	200	1,869	211	2,337	264
C202_0240 MT20	23.6	637/27	1.6	14	72	8.1	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0240 MT30	23.6	637/27	6.4	14	72	8.2	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

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- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

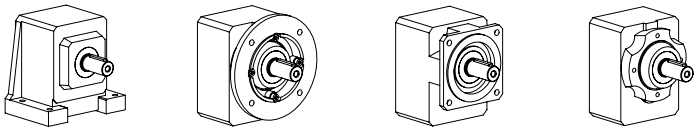
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C202 with MT TriAdapt® Motor Adapter Continued															**Noise Level ≤ 53 dB(A) [3]**
C202_0250 MT10	24.6	1577/64	0.9	14	72	8.1	4,000	3,900	4,500	1,772	200	1,889	213	2,362	267
C202_0250 MT20	24.6	1577/64	1.5	14	72	8.1	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0250 MT30	24.6	1577/64	6.3	14	72	8.2	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0280 MT10	28.2	4067/144	0.9	14	72	8.1	4,000	3,900	4,500	1,772	200	2,037	230	2,707	306
C202_0280 MT20	28.2	4067/144	1.5	14	72	8.2	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0280 MT30	28.2	4067/144	6.3	14	73	8.2	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0310 MT10	30.7	399/13	0.8	14	72	8.2	4,000	3,900	4,500	1,772	200	2,037	230	2,793	315
C202_0310 MT20	30.7	399/13	1.4	14	72	8.2	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0310 MT30	30.7	399/13	6.2	14	73	8.2	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0350 MT10	35.2	1372/39	0.8	14	73	8.2	4,000	3,900	4,500	1,772	200	2,037	230	3,201	361
C202_0350 MT20	35.2	1372/39	1.4	14	73	8.2	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0350 MT30	35.2	1372/39	6.2	14	73	8.2	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0410 MT10	40.9	817/20	0.7	14	73	8.2	4,000	3,900	4,500	1,772	200	2,037	230	3,493	394
C202_0410 MT20	40.9	817/20	1.3	14	73	8.2	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0410 MT30	40.9	817/20	6.1	14	73	8.2	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0470 MT10	46.8	2107/45	0.7	14	73	8.2	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C202_0470 MT20	46.8	2107/45	1.3	14	73	8.2	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0470 MT30	46.8	2107/45	6.1	14	73	8.3	3,500	3,500	4,000	1,772	200	2,037	230	3,543	400
C202_0490 MT10	49.2	1083/22	0.7	14	73	8.2	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C202_0490 MT20	49.2	1083/22	1.3	14	73	8.2	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0560 MT10	56.4	1862/33	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C202_0560 MT20	56.4	1862/33	1.3	14	73	8.3	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C202_0610 MT10	61.4	2945/48	0.7	14	73	8.3	4,000	3,900	4,500	1,658	187	1,989	225	2,518	284
C202_0700 MT10	70.3	7595/108	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	2,886	326
C203 with MT TriAdapt® Motor Adapter															**Noise Level ≤ 53 dB(A) [3]**
C203_0800 MT20	79.6	7163/90	1.4	14	73	8.3	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C203_0810 MT10	80.6	11609/144	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C203_0910 MT20	91.2	36946/405	1.4	14	73	8.3	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C203_0920 MT10	92.4	29939/324	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C203_1090 MT20	109.2	117943/1080	1.4	14	73	8.3	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C203_1110 MT10	110.6	191149/1728	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C203_1360 MT20	136.0	79576/585	1.4	14	73	8.3	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C203_1380 MT10	137.8	16121/117	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C203_1810 MT20	181.0	122206/675	1.4	14	73	8.3	3,500	3,500	4,500	1,772	200	2,037	230	3,543	400
C203_1830 MT10	183.4	99029/540	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C203_2210 MT10	221.0	43757/198	0.7	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	3,543	400
C203_2750 MT10	275.4	356965/1296	0.6	14	73	8.3	4,000	3,900	4,500	1,772	200	2,037	230	2,885	326

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	arcmins $\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C302 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 53 dB(A) [3]**	
C302_0020 MT20	2.0	608/301	8.2	16	16	1.8	2,700	2,300	3,200	694	78	764	86	1,159	131
C302_0020 MT30	2.0	608/301	13.0	16	23	2.6	2,700	2,300	3,200	1,237	140	1,814	205	2,988	337
C302_0020 MT40	2.0	608/301	17.0	16	34	3.9	2,700	2,300	3,200	1,237	140	2,309	261	2,988	337
C302_0022 MT20	2.2	468/215	7.8	16	18	2.1	2,700	2,300	3,200	748	84	823	93	1,249	141
C302_0022 MT30	2.2	468/215	12.6	16	25	2.8	2,700	2,300	3,200	1,268	143	1,955	221	3,221	364
C302_0022 MT40	2.2	468/215	16.6	16	37	4.1	2,700	2,300	3,200	1,268	143	2,368	267	3,221	364
C302_0025 MT20	2.5	1634/651	6.3	16	22	2.5	2,700	2,300	3,200	863	97	949	107	1,398	158
C302_0025 MT30	2.5	1634/651	11.1	16	29	3.3	2,700	2,300	3,200	1,330	150	2,254	254	3,607	407
C302_0025 MT40	2.5	1634/651	15.1	16	41	4.6	2,700	2,300	3,200	1,330	150	2,483	280	3,607	407
C302_0027 MT20	2.7	1677/620	6.1	16	24	2.7	2,700	2,300	3,200	930	105	1,023	115	1,507	170
C302_0027 MT30	2.7	1677/620	10.9	16	32	3.6	2,700	2,300	3,200	1,363	154	2,429	274	3,887	439
C302_0027 MT40	2.7	1677/620	14.9	16	43	4.8	2,700	2,300	3,200	1,363	154	2,546	287	3,887	439
C302_0031 MT20	3.1	1045/336	4.8	16	28	3.2	3,200	2,800	3,700	1,069	121	1,176	133	1,669	188
C302_0031 MT30	3.1	1045/336	9.6	16	36	4.1	3,200	2,800	3,700	1,350	152	2,667	301	4,304	486
C302_0031 MT40	3.1	1045/336	13.6	16	46	5.2	3,000	2,800	3,500	1,350	152	2,667	301	4,304	486
C302_0034 MT20	3.4	429/128	4.7	16	31	3.5	3,200	2,800	3,700	1,152	130	1,267	143	1,798	203
C302_0034 MT30	3.4	429/128	9.5	16	38	4.3	3,200	2,800	3,700	1,384	156	2,734	309	4,639	524
C302_0034 MT40	3.4	429/128	13.5	16	48	5.4	3,000	2,800	3,500	1,384	156	2,734	309	4,639	524
C302_0039 MT20	3.9	190/49	3.8	16	35	4.0	3,200	2,800	3,700	1,284	145	1,466	166	2,012	227
C302_0039 MT30	3.9	190/49	8.6	16	42	4.8	3,200	2,800	3,700	1,453	164	2,870	324	4,872	550
C302_0039 MT40	3.9	190/49	12.6	16	51	5.8	3,000	2,800	3,500	1,453	164	2,870	324	4,872	550
C302_0042 MT20	4.2	117/28	3.7	16	38	4.3	3,200	2,800	3,700	1,384	156	1,580	178	2,169	245
C302_0042 MT30	4.2	117/28	8.5	16	44	5.0	3,200	2,800	3,700	1,489	168	2,923	330	4,872	550
C302_0042 MT40	4.2	117/28	12.5	16	52	5.9	3,000	2,800	3,500	1,489	168	2,923	330	4,872	550
C302_0047 MT20	4.7	589/126	3.2	16	41	4.6	3,500	3,100	4,000	1,288	145	1,767	200	2,334	264
C302_0047 MT30	4.7	589/126	8.0	16	47	5.3	3,500	3,100	4,000	1,501	169	2,923	330	4,872	550
C302_0047 MT40	4.7	589/126	12.0	16	54	6.1	3,000	3,000	3,500	1,501	169	2,923	330	4,872	550
C302_0050 MT20	5.0	403/80	3.1	16	43	4.9	3,500	3,100	4,000	1,388	157	1,905	215	2,515	284
C302_0050 MT30	5.0	403/80	7.9	16	49	5.5	3,500	3,100	4,000	1,538	174	2,923	330	4,872	550
C302_0050 MT40	5.0	403/80	11.9	16	55	6.2	3,000	3,000	3,500	1,538	174	2,923	330	4,872	550
C302_0059 MT20	5.9	2584/441	2.6	16	47	5.3	3,500	3,100	4,000	1,412	159	2,215	250	2,829	319
C302_0059 MT30	5.9	2584/441	7.4	16	52	5.9	3,500	3,100	4,000	1,618	183	2,923	330	4,872	550
C302_0059 MT40	5.9	2584/441	11.4	16	57	6.4	3,000	3,000	3,500	1,618	183	2,923	330	4,872	550
C302_0063 MT20	6.3	221/35	2.6	16	49	5.5	3,500	3,100	4,000	1,522	172	2,387	269	3,049	344
C302_0063 MT30	6.3	221/35	7.4	16	53	6.0	3,500	3,100	4,000	1,659	187	2,923	330	4,872	550
C302_0063 MT40	6.3	221/35	11.4	16	58	6.5	3,000	3,000	3,500	1,659	187	2,923	330	4,872	550
C302_0078 MT20	7.8	494/63	2.1	16	53	5.9	3,500	3,500	4,300	1,430	161	2,845	321	3,556	401
C302_0078 MT30	7.8	494/63	6.9	16	56	6.3	3,500	3,500	4,000	1,735	196	2,923	330	4,872	550
C302_0078 MT40	7.8	494/63	10.9	16	59	6.7	3,000	3,000	3,500	1,735	196	2,923	330	4,872	550
C302_0083 MT20	8.3	33/4	3.8	13	64	7.2	3,200	2,800	3,700	2,255	255	3,119	352	4,426	500
C302_0083 MT30	8.3	33/4	8.6	13	68	7.7	3,200	2,800	3,700	2,255	255	3,543	400	6,201	700
C302_0083 MT40	8.3	33/4	12.6	13	73	8.2	3,000	2,800	3,500	2,255	255	3,543	400	6,201	700

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

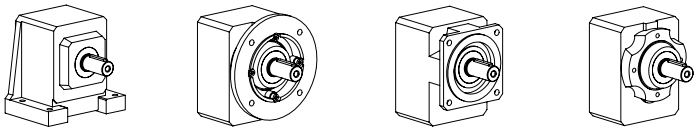
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C302 with MT TriAdapt® Motor Adapter Continued															**Noise Level ≤ 53 dB(A) [3]**
C302_0093 MT20	9.3	3575/384	3.7	13	66	7.5	3,200	2,800	3,700	2,348	265	3,100	350	4,995	564
C302_0093 MT30	9.3	3575/384	8.5	13	70	7.9	3,200	2,800	3,700	2,348	265	3,100	350	6,201	700
C302_0093 MT40	9.3	3575/384	12.5	13	74	8.3	3,000	2,800	3,500	2,348	265	3,100	350	6,201	700
C302_0105 MT20	10.3	72/7	3.1	13	68	7.7	3,200	2,800	3,700	2,427	274	3,543	400	5,338	603
C302_0105 MT30	10.3	72/7	7.9	13	71	8.1	3,200	2,800	3,700	2,427	274	3,543	400	6,201	700
C302_0105 MT40	10.3	72/7	11.9	13	74	8.4	3,000	2,800	3,500	2,427	274	3,543	400	6,201	700
C302_0115 MT20	11.6	325/28	3.1	13	70	7.9	3,200	2,800	3,700	2,527	285	3,100	350	6,023	680
C302_0115 MT30	11.6	325/28	7.9	13	73	8.2	3,200	2,800	3,700	2,527	285	3,100	350	6,201	700
C302_0115 MT40	11.6	325/28	11.9	13	75	8.5	3,000	2,800	3,500	2,527	285	3,100	350	6,201	700
C302_0125 MT20	12.4	62/5	2.7	13	71	8.0	3,500	3,100	4,000	2,507	283	3,543	400	6,191	699
C302_0125 MT30	12.4	62/5	7.5	13	73	8.3	3,500	3,100	4,000	2,507	283	3,543	400	6,201	700
C302_0125 MT40	12.4	62/5	11.5	13	75	8.5	3,000	3,000	3,500	2,507	283	3,543	400	6,201	700
C302_0140 MT20	14.0	2015/144	2.7	13	72	8.1	3,500	3,100	4,000	2,610	295	3,100	350	6,201	700
C302_0140 MT30	14.0	2015/144	7.5	13	74	8.4	3,500	3,100	4,000	2,610	295	3,100	350	6,201	700
C302_0140 MT40	14.0	2015/144	11.5	13	76	8.5	3,000	3,000	3,500	2,610	295	3,100	350	6,201	700
C302_0155 MT20	15.5	544/35	2.3	13	73	8.2	3,500	3,100	4,000	2,703	305	3,543	400	6,201	700
C302_0155 MT30	15.5	544/35	7.1	13	75	8.4	3,500	3,100	4,000	2,703	305	3,543	400	6,201	700
C302_0155 MT40	15.5	544/35	11.1	13	76	8.6	3,000	3,000	3,500	2,703	305	3,543	400	6,201	700
C302_0175 MT20	17.5	1105/63	2.3	13	74	8.3	3,500	3,100	4,000	2,815	318	3,100	350	6,201	700
C302_0175 MT30	17.5	1105/63	7.1	13	75	8.5	3,500	3,100	4,000	2,815	318	3,100	350	6,201	700
C302_0175 MT40	17.5	1105/63	11.1	13	76	8.6	3,000	3,000	3,500	2,815	318	3,100	350	6,201	700
C302_0210 MT20	20.8	104/5	1.9	13	75	8.5	3,500	3,500	4,300	2,899	327	3,543	400	6,201	700
C302_0210 MT30	20.8	104/5	6.7	13	76	8.6	3,500	3,500	4,000	2,899	327	3,543	400	6,201	700
C302_0210 MT40	20.8	104/5	10.7	13	77	8.6	3,000	3,000	3,500	2,899	327	3,543	400	6,201	700
C302_0230 MT20	23.5	845/36	1.9	13	75	8.5	3,500	3,500	4,300	3,018	341	3,100	350	6,201	700
C302_0230 MT30	23.5	845/36	6.7	13	76	8.6	3,500	3,500	4,000	3,018	341	3,100	350	6,201	700
C302_0230 MT40	23.5	845/36	10.7	13	77	8.7	3,000	3,000	3,500	3,018	341	3,100	350	6,201	700
C302_0250 MT20	24.8	124/5	1.7	13	76	8.5	3,500	3,500	4,300	3,074	347	3,543	400	6,201	700
C302_0250 MT30	24.8	124/5	6.5	13	76	8.6	3,500	3,500	4,000	3,074	347	3,543	400	6,201	700
C302_0250 MT40	24.8	124/5	10.5	13	77	8.7	3,000	3,000	3,500	3,074	347	3,543	400	6,201	700
C302_0280 MT20	28.0	2015/72	1.7	13	76	8.6	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C302_0280 MT30	28.0	2015/72	6.5	13	76	8.6	3,500	3,500	4,000	3,100	350	3,100	350	6,201	700
C302_0280 MT40	28.0	2015/72	10.5	13	77	8.7	3,000	3,000	3,500	3,100	350	3,100	350	6,201	700
C302_0310 MT20	31.0	776/25	1.6	13	76	8.6	3,500	3,500	4,300	350	3,543	400	6,201	700	
C302_0310 MT30	31.0	776/25	6.4	13	77	8.7	3,500	3,500	4,000	350	3,543	400	6,201	700	
C302_0310 MT40	31.0	776/25	10.4	13	77	8.7	3,000	3,000	3,500	350	3,543	400	6,201	700	
C302_0350 MT20	35.0	1261/36	1.6	13	76	8.6	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C302_0350 MT30	35.0	1261/36	6.4	13	77	8.7	3,500	3,500	4,000	3,100	350	3,100	350	6,201	700
C302_0350 MT40	35.0	1261/36	10.4	13	77	8.7	3,000	3,000	3,500	3,100	350	3,100	350	6,201	700
C302_0410 MT20	41.4	2688/65	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,543	400	6,201	700
C302_0410 MT30	41.4	2688/65	6.2	13	77	8.7	3,500	3,500	4,000	3,100	350	3,543	400	6,201	700
C302_0470 MT20	46.7	140/3	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C302_0470 MT30	46.7	140/3	6.2	13	77	8.7	3,500	3,500	4,000	3,100	350	3,100	350	6,201	700

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	10^{-4}kgcm² J_1	arcmins Δφ	in.lbs. C_2	Nm C_2	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C302 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 53 dB(A)** [3]	
C302_0500 MT20	49.7	2736/55	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,543	400	6,201	700
C302_0500 MT30	49.7	2736/55	6.2	13	77	8.7	3,500	3,500	4,000	3,100	350	3,543	400	6,201	700
C302_0560 MT20	56.1	1235/22	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C302_0560 MT30	56.1	1235/22	6.2	13	77	8.7	3,500	3,500	4,000	3,100	350	3,100	350	6,201	700
C302_0620 MT20	61.9	1548/25	1.3	13	77	8.7	3,500	3,500	4,300	2,932	331	3,518	397	4,990	563
C302_0700 MT20	69.9	559/8	1.3	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	5,631	636
C303 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 53 dB(A)** [3]	
C303_0800 MT20	80.4	6032/75	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,543	400	6,201	700
C303_0810 MT10	81.5	1222/15	0.7	13	77	8.7	3,800	3,500	4,300	2,954	334	2,954	334	3,693	417
C303_0910 MT20	90.8	4901/54	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_0920 MT10	91.9	39715/432	0.7	13	77	8.7	3,800	3,500	4,300	3,100	350	3,100	350	4,167	470
C303_1080 MT20	108.2	11687/108	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_1100 MT10	109.6	94705/864	0.7	13	77	8.7	3,800	3,500	4,300	3,100	350	3,100	350	4,969	561
C303_1350 MT20	135.4	36569/270	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_1370 MT10	137.2	59267/432	0.7	13	77	8.7	3,800	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_1800 MT20	180.4	1624/9	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_1830 MT10	182.8	1645/9	0.7	13	77	8.7	3,800	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_2170 MT20	217.1	7163/33	1.4	13	77	8.7	3,500	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_2200 MT10	219.9	58045/264	0.7	13	77	8.7	3,800	3,500	4,300	3,100	350	3,100	350	6,201	700
C303_2740 MT10	273.7	26273/96	0.7	13	77	8.7	3,800	3,500	4,300	3,100	350	3,100	350	5,631	636
C402 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [3]	
C402_0020 MT30	2.0	551/280	23.1	15	28	3.1	2,500	2,100	3,000	1,606	181	1,767	199	3,029	342
C402_0020 MT40	2.0	551/280	27.1	15	49	5.5	2,500	2,100	3,000	1,830	207	2,424	274	3,029	342
C402_0022 MT30	2.2	171/77	21.2	15	34	3.8	2,500	2,100	3,000	1,813	205	1,994	225	3,419	386
C402_0022 MT40	2.2	171/77	25.2	15	57	6.4	2,500	2,100	3,000	1,905	215	2,735	309	3,419	386
C402_0025 MT30	2.5	609/248	18.2	15	39	4.4	2,500	2,100	3,000	1,970	222	2,205	249	3,668	414
C402_0025 MT40	2.5	609/248	22.2	15	64	7.2	2,500	2,100	3,000	1,970	222	2,934	331	3,668	414
C402_0028 MT30	2.8	945/341	17.0	15	47	5.3	2,500	2,100	3,000	2,051	232	2,488	281	4,138	467
C402_0028 MT40	2.8	945/341	21.0	15	73	8.3	2,500	2,100	3,000	2,051	232	3,311	374	4,138	467
C402_0031 MT30	3.1	1537/496	14.5	15	54	6.1	2,900	2,500	3,400	2,026	229	2,783	314	4,453	503
C402_0031 MT40	3.1	1537/496	18.5	15	82	9.2	2,900	2,500	3,400	2,026	229	3,562	402	4,453	503
C402_0035 MT30	3.5	2385/682	13.7	15	63	7.1	2,900	2,500	3,400	2,109	238	3,140	354	5,025	567
C402_0035 MT40	3.5	2385/682	17.7	15	91	10.2	2,900	2,500	3,400	2,109	238	4,020	454	5,025	567
C402_0039 MT20	3.9	841/216	7.2	15	53	6.0	2,900	2,500	3,400	1,338	151	1,472	166	2,088	236
C402_0039 MT30	3.9	841/216	12.0	15	71	8.0	2,900	2,500	3,400	2,186	247	3,496	395	5,385	608
C402_0039 MT40	3.9	841/216	16.0	15	98	11.1	2,900	2,500	3,400	2,186	247	4,181	472	5,385	608
C402_0044 MT20	4.4	145/33	6.7	15	62	7.0	2,900	2,500	3,400	1,510	170	1,661	188	2,356	266
C402_0044 MT30	4.4	145/33	11.5	15	80	9.0	2,900	2,500	3,400	2,276	257	3,945	445	6,077	686
C402_0044 MT40	4.4	145/33	15.5	15	106	12.0	2,900	2,500	3,400	2,276	257	4,353	491	6,077	686

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

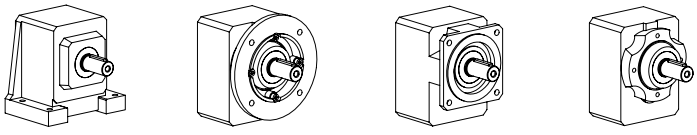
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C402 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [3]	
C402_0047 MT20	4.7	899/192	5.8	15	66	7.5	3,300	2,800	3,800	1,555	176	1,770	200	2,438	275
C402_0047 MT30	4.7	899/192	10.6	15	84	9.5	3,300	2,800	3,800	2,227	251	4,204	475	6,287	710
C402_0047 MT40	4.7	899/192	14.6	15	110	12.4	3,000	2,800	3,500	2,227	251	4,446	502	6,287	710
C402_0053 MT20	5.3	465/88	5.4	15	75	8.5	3,300	2,800	3,800	1,755	198	1,998	226	2,751	311
C402_0053 MT30	5.3	465/88	10.2	15	93	10.5	3,300	2,800	3,800	2,319	262	4,629	523	7,096	801
C402_0053 MT40	5.3	465/88	14.2	15	117	13.2	3,000	2,800	3,500	2,319	262	4,629	523	7,096	801
C402_0059 MT20	5.9	377/64	4.4	15	84	9.4	3,300	2,800	3,800	1,631	184	2,227	251	2,930	331
C402_0059 MT30	5.9	377/64	9.2	15	101	11.4	3,300	2,800	3,800	2,404	271	4,799	542	7,529	850
C402_0059 MT40	5.9	377/64	13.2	15	122	13.8	3,000	2,800	3,500	2,404	271	4,799	542	7,529	850
C402_0066 MT20	6.6	585/88	4.2	15	92	10.4	3,300	2,800	3,800	1,840	208	2,513	284	3,307	373
C402_0066 MT30	6.6	585/88	9.0	15	109	12.3	3,300	2,800	3,800	2,503	283	4,872	550	7,529	850
C402_0066 MT40	6.6	585/88	13.0	15	127	14.4	3,000	2,800	3,500	2,503	283	4,872	550	7,529	850
C402_0078 MT20	7.8	2001/256	3.3	15	103	11.7	3,500	3,200	4,000	1,697	192	2,942	332	3,677	415
C402_0078 MT30	7.8	2001/256	8.1	15	118	13.3	3,500	3,200	4,000	2,590	292	4,872	550	7,529	850
C402_0078 MT40	7.8	2001/256	12.1	15	133	15.0	3,000	3,000	3,500	2,590	292	4,872	550	7,529	850
C402_0083 MT30	8.3	3339/403	11.9	12	146	16.5	2,900	2,500	3,400	3,916	442	5,315	600	9,744	1,100
C402_0083 MT40	8.3	3339/403	15.9	12	168	18.9	2,900	2,500	3,400	3,916	442	5,315	600	9,744	1,100
C402_0093 MT30	9.3	3445/372	11.8	12	154	17.4	2,900	2,500	3,400	4,064	459	4,872	550	9,744	1,100
C402_0093 MT40	9.3	3445/372	15.8	12	172	19.5	2,900	2,500	3,400	4,064	459	4,872	550	9,744	1,100
C402_0105 MT20	10.4	406/39	5.6	12	145	16.4	2,900	2,500	3,400	3,578	404	3,936	444	5,582	630
C402_0105 MT30	10.4	406/39	10.4	12	161	18.1	2,900	2,500	3,400	4,226	477	5,315	600	9,744	1,100
C402_0105 MT40	10.4	406/39	14.4	12	176	19.9	2,900	2,500	3,400	4,226	477	5,315	600	9,744	1,100
C402_0115 MT20	11.6	1885/162	5.5	12	153	17.3	2,900	2,500	3,400	3,999	451	4,399	497	6,239	704
C402_0115 MT30	11.6	1885/162	10.3	12	166	18.8	2,900	2,500	3,400	4,385	495	4,872	550	9,744	1,100
C402_0115 MT40	11.6	1885/162	14.3	12	179	20.3	2,900	2,500	3,400	4,385	495	4,872	550	9,744	1,100
C402_0125 MT20	12.5	651/52	4.6	12	157	17.8	3,300	2,800	3,800	4,158	469	4,733	534	6,518	736
C402_0125 MT30	12.5	651/52	9.4	12	169	19.1	3,300	2,800	3,800	4,304	486	5,315	600	9,744	1,100
C402_0125 MT40	12.5	651/52	13.4	12	181	20.5	3,000	2,800	3,500	4,304	486	5,315	600	9,744	1,100
C402_0140 MT20	14.0	2015/144	4.6	12	163	18.5	3,300	2,800	3,800	4,467	504	4,872	550	7,285	822
C402_0140 MT30	14.0	2015/144	9.4	12	174	19.6	3,300	2,800	3,800	4,467	504	4,872	550	9,744	1,100
C402_0140 MT40	14.0	2015/144	13.4	12	183	20.7	3,000	2,800	3,500	4,467	504	4,872	550	9,744	1,100
C402_0160 MT20	15.8	63/4	3.7	12	169	19.1	3,300	2,800	3,800	4,359	492	5,315	600	7,835	884
C402_0160 MT30	15.8	63/4	8.5	12	178	20.0	3,300	2,800	3,800	4,646	525	5,315	600	9,744	1,100
C402_0160 MT40	15.8	63/4	12.5	12	185	20.9	3,000	2,800	3,500	4,646	525	5,315	600	9,744	1,100
C402_0175 MT20	17.6	845/48	3.7	12	173	19.6	3,300	2,800	3,800	4,822	544	4,872	550	8,757	989
C402_0175 MT30	17.6	845/48	8.5	12	180	20.4	3,300	2,800	3,800	4,822	544	4,872	550	9,744	1,100
C402_0175 MT40	17.6	845/48	12.5	12	187	21.1	3,000	2,800	3,500	4,822	544	4,872	550	9,744	1,100
C402_0210 MT20	20.9	4347/208	2.9	12	179	20.2	3,500	3,200	4,000	4,538	512	5,315	600	9,744	1,100
C402_0210 MT30	20.9	4347/208	7.7	12	184	20.8	3,500	3,200	4,000	4,872	550	5,315	600	9,744	1,100
C402_0210 MT40	20.9	4347/208	11.7	12	189	21.3	3,000	3,000	3,500	4,872	550	5,315	600	9,744	1,100
C402_0230 MT20	23.4	1495/64	2.9	12	181	20.5	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0230 MT30	23.4	1495/64	7.7	12	186	21.0	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0230 MT40	23.4	1495/64	11.7	12	190	21.4	3,000	3,000	3,500	4,872	550	4,872	550	9,744	1,100

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C402 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [3]	
C402_0250 MT20	24.9	324/13	2.5	12	183	20.6	3,500	3,200	4,000	4,735	535	5,315	600	9,744	1,100
C402_0250 MT30	24.9	324/13	7.3	12	187	21.1	3,500	3,200	4,000	4,872	550	5,315	600	9,744	1,100
C402_0250 MT40	24.9	324/13	11.3	12	190	21.5	3,000	3,000	3,500	4,872	550	5,315	600	9,744	1,100
C402_0280 MT20	27.9	195/7	2.5	12	185	20.9	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0280 MT30	27.9	195/7	7.3	12	188	21.2	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0280 MT40	27.9	195/7	11.3	12	191	21.5	3,000	3,000	3,500	4,872	550	4,872	550	9,744	1,100
C402_0310 MT20	31.2	405/13	2.1	12	186	21.0	3,500	3,200	4,000	4,867	549	5,315	600	9,744	1,100
C402_0310 MT30	31.2	405/13	6.9	12	189	21.3	3,500	3,200	4,000	4,872	550	5,315	600	9,744	1,100
C402_0310 MT40	31.2	405/13	10.9	12	191	21.6	3,000	3,000	3,500	4,872	550	5,315	600	9,744	1,100
C402_0350 MT20	34.8	975/28	2.1	12	188	21.2	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0350 MT30	34.8	975/28	6.9	12	190	21.4	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0350 MT40	34.8	975/28	10.9	12	192	21.6	3,000	3,000	3,500	4,872	550	4,872	550	9,744	1,100
C402_0420 MT20	41.8	7056/169	1.8	12	189	21.4	3,500	3,200	4,000	4,872	550	5,315	600	9,744	1,100
C402_0420 MT30	41.8	7056/169	6.6	12	191	21.5	3,500	3,200	4,000	4,872	550	5,315	600	9,744	1,100
C402_0420 MT40	41.8	7056/169	10.6	12	192	21.7	3,000	3,000	3,500	4,872	550	5,315	600	9,744	1,100
C402_0470 MT20	46.7	140/3	1.7	12	190	21.5	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0470 MT30	46.7	140/3	6.5	12	191	21.6	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0470 MT40	46.7	140/3	10.5	12	192	21.7	3,000	3,000	3,500	4,872	550	4,872	550	9,744	1,100
C402_0500 MT20	50.2	1305/26	1.6	12	191	21.5	3,500	3,200	4,000	4,872	550	5,315	600	8,313	938
C402_0500 MT30	50.2	1305/26	6.4	12	192	21.6	3,500	3,200	4,000	4,872	550	5,315	600	8,313	938
C402_0560 MT20	56.1	9425/168	1.6	12	191	21.6	3,500	3,200	4,000	4,872	550	4,872	550	9,292	1,049
C402_0560 MT30	56.1	9425/168	6.4	12	192	21.7	3,500	3,200	4,000	4,872	550	4,872	550	9,292	1,049
C402_0630 MT20	62.5	8127/130	1.5	12	192	21.6	3,500	3,200	4,000	4,440	501	5,315	600	8,879	1,002
C402_0630 MT30	62.5	8127/130	6.3	12	192	21.7	3,500	3,200	4,000	4,440	501	5,315	600	8,879	1,002
C402_0700 MT20	69.9	559/8	1.5	12	192	21.7	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C402_0700 MT30	69.9	559/8	6.3	12	192	21.7	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C403 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 61 dB(A)** [3]	
C403_0810 MT20	80.8	42021/520	1.5	12	192	21.7	3,500	3,200	4,000	4,872	550	5,315	600	9,744	1,100
C403_0900 MT20	90.3	8671/96	1.5	12	192	21.7	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C403_1080 MT20	107.7	754/7	1.5	12	193	21.8	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C403_1350 MT20	134.6	1885/14	1.4	12	193	21.8	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C403_1800 MT20	180.4	1624/9	1.4	12	193	21.8	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C403_2170 MT20	216.9	54665/252	1.4	12	193	21.8	3,500	3,200	4,000	4,872	550	4,872	550	9,291	1,049
C403_2700 MT20	270.2	16211/60	1.4	12	193	21.8	3,500	3,200	4,000	4,872	550	4,872	550	9,744	1,100
C502 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [3]	
C502_0020 MT30	2.0	81/41	36.0	14	29	3.3	2,400	2,000	2,900	1,613	182	1,774	200	3,142	355
C502_0020 MT40	2.0	81/41	40.0	14	52	5.9	2,400	2,000	2,900	2,514	284	2,514	284	3,142	355
C502_0022 MT30	2.2	645/287	33.8	14	36	4.0	2,400	2,000	2,900	1,834	207	2,018	228	3,573	403
C502_0022 MT40	2.2	645/287	37.8	14	62	7.0	2,400	2,000	2,900	2,859	323	2,859	323	3,573	403
C502_0025 MT30	2.5	49/20	27.6	14	41	4.6	2,400	2,000	2,900	2,000	226	2,200	248	3,784	427
C502_0025 MT40	2.5	49/20	31.6	14	70	7.9	2,400	2,000	2,900	3,027	342	3,027	342	3,784	427

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

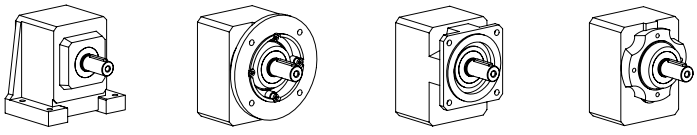
Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	arcmins $\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C502 with MT TriAdapt® Motor Adapter Continued															**Noise Level ≤ 61 dB(A) [3]**
C502_0028 MT30	2.8	301/108	26.1	14	50	5.6	2,400	2,000	2,900	2,275	257	2,502	283	4,305	486
C502_0028 MT40	2.8	301/108	30.1	14	81	9.2	2,400	2,000	2,900	3,229	365	3,444	389	4,305	486
C502_0031 MT30	3.1	477/155	21.3	14	58	6.5	2,800	2,400	3,300	2,512	284	2,763	312	4,595	519
C502_0031 MT40	3.1	477/155	25.3	14	91	10.2	2,800	2,400	3,300	3,170	358	3,676	415	4,595	519
C502_0035 MT30	3.5	2279/651	20.4	14	68	7.7	2,800	2,400	3,300	2,858	323	3,144	355	5,228	590
C502_0035 MT40	3.5	2279/651	24.4	14	103	11.6	2,800	2,400	3,300	3,309	374	4,183	472	5,228	590
C502_0039 MT30	3.9	58/15	17.0	14	77	8.7	2,800	2,400	3,300	3,035	343	3,472	392	5,579	630
C502_0039 MT40	3.9	58/15	21.0	14	112	12.6	2,800	2,400	3,300	3,421	386	4,463	504	5,579	630
C502_0044 MT30	4.4	2494/567	16.4	14	89	10.1	2,800	2,400	3,300	3,452	390	3,950	446	6,346	716
C502_0044 MT40	4.4	2494/567	20.4	14	123	13.9	2,800	2,400	3,300	3,571	403	5,077	573	6,346	716
C502_0046 MT20	4.6	162/35	9.4	14	72	8.1	3,100	2,700	3,600	1,591	180	1,750	198	2,496	282
C502_0046 MT30	4.6	162/35	14.2	14	94	10.6	3,100	2,700	3,600	3,035	343	4,156	469	6,439	727
C502_0046 MT40	4.6	162/35	18.2	14	128	14.4	3,000	2,700	3,500	3,511	396	5,151	582	6,439	727
C502_0053 MT20	5.3	258/49	9.0	14	83	9.4	3,100	2,700	3,600	1,810	204	1,990	225	2,839	321
C502_0053 MT30	5.3	258/49	13.8	14	106	12.0	3,100	2,700	3,600	3,452	390	4,727	534	7,323	827
C502_0053 MT40	5.3	258/49	17.8	14	138	15.5	3,000	2,700	3,500	3,665	414	5,859	661	7,323	827
C502_0059 MT20	5.9	117/20	7.1	14	93	10.5	3,100	2,700	3,600	1,958	221	2,212	250	3,036	343
C502_0059 MT30	5.9	117/20	11.9	14	116	13.1	3,100	2,700	3,600	3,287	371	5,253	593	7,830	884
C502_0059 MT40	5.9	117/20	15.9	14	145	16.4	3,000	2,700	3,500	3,796	429	6,264	707	7,830	884
C502_0067 MT20	6.7	559/84	6.8	14	105	11.9	3,100	2,700	3,600	2,227	251	2,516	284	3,453	390
C502_0067 MT30	6.7	559/84	11.6	14	127	14.3	3,100	2,700	3,600	3,740	422	5,975	675	8,907	1,006
C502_0067 MT40	6.7	559/84	15.6	14	153	17.3	3,000	2,700	3,500	3,963	447	7,086	800	8,907	1,006
C502_0078 MT20	7.8	621/80	5.0	14	119	13.5	3,400	3,000	3,900	2,015	228	2,935	331	3,810	430
C502_0078 MT30	7.8	621/80	9.8	14	139	15.7	3,400	3,000	3,900	3,384	382	6,970	787	9,826	1,109
C502_0078 MT40	7.8	621/80	13.8	14	161	18.2	3,000	3,000	3,500	4,045	457	7,086	800	9,826	1,109
C502_0083 MT30	8.3	1537/186	16.9	12	150	17.0	2,800	2,400	3,300	5,938	670	7,419	838	12,340	1,393
C502_0083 MT40	8.3	1537/186	20.9	12	173	19.6	2,800	2,400	3,300	5,938	670	8,149	920	12,340	1,393
C502_0093 MT30	9.3	3445/372	16.6	12	159	17.9	2,800	2,400	3,300	6,168	696	7,529	850	13,830	1,561
C502_0093 MT40	9.3	3445/372	20.6	12	178	20.1	2,800	2,400	3,300	6,168	696	7,529	850	13,830	1,561
C502_0105 MT30	10.4	841/81	14.1	12	166	18.7	2,800	2,400	3,300	6,407	723	8,149	920	14,173	1,600
C502_0105 MT40	10.4	841/81	18.1	12	183	20.6	2,800	2,400	3,300	6,407	723	8,149	920	14,173	1,600
C502_0115 MT30	11.6	1885/162	13.9	12	172	19.4	2,800	2,400	3,300	6,655	751	7,529	850	14,173	1,600
C502_0115 MT40	11.6	1885/162	17.9	12	186	21.0	2,800	2,400	3,300	6,655	751	7,529	850	14,173	1,600
C502_0125 MT20	12.4	87/7	7.4	12	162	18.3	3,100	2,700	3,600	4,272	482	4,699	530	6,703	757
C502_0125 MT30	12.4	87/7	12.2	12	175	19.8	3,100	2,700	3,600	6,576	742	8,149	920	14,173	1,600
C502_0125 MT40	12.4	87/7	16.2	12	188	21.2	3,000	2,700	3,500	6,576	742	8,149	920	14,173	1,600
C502_0140 MT20	13.9	195/14	7.3	12	169	19.0	3,100	2,700	3,600	4,787	540	5,266	594	7,512	848
C502_0140 MT30	13.9	195/14	12.1	12	180	20.3	3,100	2,700	3,600	6,831	771	7,529	850	14,173	1,600
C502_0140 MT40	13.9	195/14	16.1	12	190	21.5	3,000	2,700	3,500	6,831	771	7,529	850	14,173	1,600
C502_0155 MT20	15.7	377/24	5.8	12	175	19.7	3,100	2,700	3,600	5,257	593	5,939	670	8,151	920
C502_0155 MT30	15.7	377/24	10.6	12	184	20.8	3,100	2,700	3,600	7,086	800	8,149	920	14,173	1,600
C502_0155 MT40	15.7	377/24	14.6	12	193	21.7	3,000	2,700	3,500	7,086	800	8,149	920	14,173	1,600

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C502 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 61 dB(A)** [3]	
C502_0175 MT20	17.6	845/48	5.8	12	179	20.3	3,100	2,700	3,600	5,891	665	6,655	751	9,135	1,031
C502_0175 MT30	17.6	845/48	10.6	12	187	21.1	3,100	2,700	3,600	7,086	800	7,529	850	14,173	1,600
C502_0175 MT40	17.6	845/48	14.6	12	194	21.9	3,000	2,700	3,500	7,086	800	7,529	850	14,173	1,600
C502_0210 MT20	20.8	667/32	4.3	12	185	20.9	3,400	3,000	3,900	5,411	611	7,880	890	10,229	1,155
C502_0210 MT30	20.8	667/32	9.1	12	191	21.6	3,400	3,000	3,900	7,086	800	8,149	920	14,173	1,600
C502_0210 MT40	20.8	667/32	13.1	12	196	22.1	3,000	3,000	3,500	7,086	800	8,149	920	14,173	1,600
C502_0230 MT20	23.4	1495/64	4.2	12	188	21.2	3,400	3,000	3,900	6,064	685	7,529	850	11,464	1,294
C502_0230 MT30	23.4	1495/64	9.0	12	193	21.8	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600
C502_0230 MT40	23.4	1495/64	13.0	12	197	22.2	3,000	3,000	3,500	7,086	800	7,529	850	14,173	1,600
C502_0250 MT20	25.1	2407/96	3.5	12	190	21.4	3,400	3,000	3,900	5,497	621	8,149	920	11,796	1,332
C502_0250 MT30	25.1	2407/96	8.3	12	194	21.9	3,400	3,000	3,900	7,086	800	8,149	920	14,173	1,600
C502_0250 MT40	25.1	2407/96	12.3	12	198	22.3	3,000	3,000	3,500	7,086	800	8,149	920	14,173	1,600
C502_0280 MT20	28.1	5395/192	3.5	12	192	21.7	3,400	3,000	3,900	6,160	695	7,529	850	13,219	1,492
C502_0280 MT30	28.1	5395/192	8.3	12	195	22.1	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600
C502_0280 MT40	28.1	5395/192	12.3	12	198	22.4	3,000	3,000	3,500	7,086	800	7,529	850	14,173	1,600
C502_0310 MT20	31.2	406/13	2.8	12	194	21.9	3,400	3,000	3,900	5,646	637	8,149	920	14,001	1,581
C502_0310 MT30	31.2	406/13	7.6	12	196	22.2	3,400	3,000	3,900	7,086	800	8,149	920	14,001	1,581
C502_0310 MT40	31.2	406/13	11.6	12	199	22.4	3,000	3,000	3,500	7,086	800	8,149	920	14,001	1,581
C502_0350 MT20	35.0	35/1	2.8	12	195	22.0	3,400	3,000	3,900	6,328	714	7,529	850	14,173	1,600
C502_0350 MT30	35.0	35/1	7.6	12	197	22.3	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600
C502_0350 MT40	35.0	35/1	11.6	12	199	22.5	3,000	3,000	3,500	7,086	800	7,529	850	14,173	1,600
C502_0420 MT20	41.7	667/16	2.2	12	197	22.2	3,400	3,000	3,900	5,877	663	8,149	920	14,173	1,600
C502_0420 MT30	41.7	667/16	7.0	12	198	22.4	3,400	3,000	3,900	7,086	800	8,149	920	14,173	1,600
C502_0420 MT40	41.7	667/16	11.0	12	200	22.5	3,000	3,000	3,500	7,086	800	8,149	920	14,173	1,600
C502_0470 MT20	46.7	1495/32	2.2	12	198	22.3	3,400	3,000	3,900	6,587	744	7,529	850	14,173	1,600
C502_0470 MT30	46.7	1495/32	7.0	12	199	22.5	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600
C502_0470 MT40	46.7	1495/32	11.0	12	200	22.6	3,000	3,000	3,500	7,086	800	7,529	850	14,173	1,600
C502_0500 MT20	49.8	1943/39	1.9	12	198	22.4	3,400	3,000	3,900	6,005	678	8,149	920	14,173	1,600
C502_0500 MT30	49.8	1943/39	6.7	12	199	22.5	3,400	3,000	3,900	7,086	800	8,149	920	14,173	1,600
C502_0500 MT40	49.8	1943/39	10.7	12	200	22.6	3,000	3,000	3,500	7,086	800	8,149	920	14,173	1,600
C502_0560 MT20	55.8	335/6	1.9	12	199	22.4	3,400	3,000	3,900	6,729	760	7,529	850	14,173	1,600
C502_0560 MT30	55.8	335/6	6.7	12	200	22.5	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600
C502_0560 MT40	55.8	335/6	10.7	12	200	22.6	3,000	3,000	3,500	7,086	800	7,529	850	14,173	1,600
C502_0620 MT20	62.4	4495/72	1.7	12	199	22.5	3,400	3,000	3,900	6,077	686	7,590	857	10,212	1,153
C502_0620 MT30	62.4	4495/72	6.5	12	200	22.6	3,400	3,000	3,900	6,325	714	7,590	857	10,212	1,153
C502_0700 MT20	70.0	10075/144	1.7	12	199	22.5	3,400	3,000	3,900	6,811	769	7,529	850	11,444	1,292
C502_0700 MT30	70.0	10075/144	6.5	12	200	22.6	3,400	3,000	3,900	7,086	800	7,529	850	11,444	1,292
C503 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [3]	
C503_0810 MT20	80.6	19343/240	1.6	12	200	22.6	3,400	3,000	3,900	7,086	800	8,149	920	10,228	1,155
C503_0900 MT20	90.3	8671/96	1.6	12	200	22.6	3,400	3,000	3,900	7,086	800	7,529	850	11,463	1,294
C503_1090 MT20	108.6	31291/288	1.5	12	200	22.6	3,400	3,000	3,900	7,086	800	7,529	850	13,218	1,492
C503_1350 MT20	135.3	406/3	1.5	12	201	22.6	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

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- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

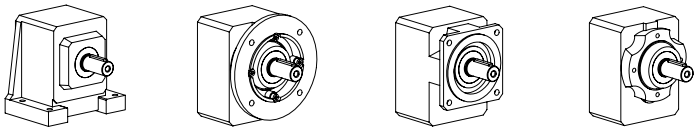
Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	arcmins $\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C503 with MT TriAdapt® Motor Adapter Continued															**Noise Level ≤ 61 dB(A)** [3]
C503_1810 MT20	180.6	8671/48	1.4	12	201	22.7	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600
C503_2160 MT20	215.9	1943/9	1.4	12	201	22.7	3,400	3,000	3,900	7,086	800	7,529	850	14,173	1,600
C503_2710 MT20	270.5	58435/216	1.4	12	201	22.7	3,400	3,000	3,900	7,086	800	7,529	850	11,443	1,292
C612 with MT TriAdapt® Motor Adapter Continued Next Page															**Noise Level ≤ 61 dB(A)** [3]
C612_0042 MT30	4.2	2745/656	52.9	10	124	14.0	2,300	1,900	2,800	3,415	386	3,757	424	6,831	771
C612_0042 MT40	4.2	2745/656	56.9	10	217	24.5	2,300	1,900	2,800	5,522	623	5,522	623	6,902	779
C612_0051 MT30	5.1	61/12	42.1	10	168	19.0	2,300	1,900	2,800	4,149	468	4,564	515	8,147	920
C612_0051 MT40	5.1	61/12	46.1	10	277	31.3	2,300	1,900	2,800	6,518	736	6,518	736	8,147	920
C612_0065 MT30	6.5	3233/496	31.7	10	238	26.8	2,700	2,300	3,200	5,320	601	5,852	661	10,064	1,136
C612_0065 MT40	6.5	3233/496	35.7	10	358	40.4	2,700	2,300	3,200	7,649	864	8,051	909	10,064	1,136
C612_0071 MT30	7.1	64/9	38.4	10	265	29.9	2,300	1,900	2,800	5,804	655	6,385	721	11,398	1,287
C612_0071 MT40	7.1	64/9	42.4	10	386	43.6	2,300	1,900	2,800	8,307	938	9,118	1,029	11,398	1,287
C612_0082 MT30	8.2	1769/216	25.0	10	310	35.0	2,700	2,300	3,200	6,685	755	7,354	830	12,217	1,379
C612_0082 MT40	8.2	1769/216	29.0	10	430	48.5	2,700	2,300	3,200	8,254	932	9,773	1,103	12,217	1,379
C612_0091 MT30	9.1	848/93	29.4	10	346	39.0	2,700	2,300	3,200	7,443	840	8,187	924	14,079	1,589
C612_0091 MT40	9.1	848/93	33.4	10	460	52.0	2,700	2,300	3,200	8,555	966	11,263	1,272	14,079	1,589
C612_0100 MT30	10.1	3721/368	20.7	10	379	42.8	3,000	2,600	3,500	7,550	852	9,079	1,025	14,489	1,636
C612_0100 MT40	10.1	3721/368	24.7	10	488	55.1	3,000	2,600	3,500	8,549	965	11,592	1,309	14,489	1,636
C612_0115 MT30	11.5	928/81	23.6	10	418	47.2	2,700	2,300	3,200	9,232	1,042	10,287	1,161	17,090	1,929
C612_0115 MT40	11.5	928/81	27.6	10	517	58.4	2,700	2,300	3,200	9,232	1,042	12,224	1,380	17,090	1,929
C612_0125 MT30	12.6	2013/160	16.7	10	446	50.3	3,000	2,600	3,500	7,941	897	11,296	1,275	17,288	1,952
C612_0125 MT40	12.6	2013/160	20.7	10	537	60.6	3,000	2,600	3,500	9,195	1,038	13,830	1,561	17,288	1,952
C612_0140 MT30	14.1	976/69	19.7	10	478	54.0	3,000	2,600	3,500	9,562	1,079	12,224	1,380	20,270	2,288
C612_0140 MT40	14.1	976/69	23.7	10	558	63.0	3,000	2,600	3,500	9,562	1,079	12,224	1,380	20,270	2,288
C612_0160 MT30	16.2	1037/64	13.3	10	511	57.7	3,200	2,900	3,700	8,237	930	14,549	1,642	21,206	2,394
C612_0160 MT40	16.2	1037/64	17.3	10	579	65.3	3,000	2,900	3,500	9,792	1,105	14,616	1,650	21,206	2,394
C612_0175 MT30	17.6	88/5	16.1	10	529	59.7	3,000	2,600	3,500	10,284	1,161	12,224	1,380	23,031	2,600
C612_0175 MT40	17.6	88/5	20.1	10	590	66.6	3,000	2,600	3,500	10,284	1,161	12,224	1,380	23,031	2,600
C612_0195 MT30	19.6	549/28	11.4	10	550	62.1	3,200	2,900	3,700	8,479	957	14,616	1,650	24,644	2,782
C612_0195 MT40	19.6	549/28	15.4	10	602	67.9	3,000	2,900	3,500	10,434	1,178	14,616	1,650	24,644	2,782
C612_0230 MT30	22.7	68/3	12.9	10	573	64.7	3,200	2,900	3,700	10,951	1,236	12,224	1,380	23,031	2,600
C612_0230 MT40	22.7	68/3	16.9	10	615	69.4	3,000	2,900	3,500	10,951	1,236	12,224	1,380	23,031	2,600
C612_0250 MT30	24.9	5185/208	9.7	10	586	66.2	3,200	2,900	3,700	8,759	989	14,616	1,650	25,688	2,900
C612_0250 MT40	**24.9**	**5185/208**	**13.7**	**10**	**622**	**70.2**	**3,000**	**2,900**	**3,500**	**11,304**	**1,276**	**14,616**	**1,650**	25,688	2,900
C612_0270 MT30	27.4	192/7	11.2	10	598	67.5	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C612_0270 MT40	27.4	192/7	15.2	10	627	70.8	3,000	2,900	3,500	11,515	1,300	12,224	1,380	23,031	2,600
C612_0320 MT30	32.4	1037/32	8.4	10	613	69.2	3,200	2,900	3,700	9,131	1,031	14,616	1,650	25,688	2,900
C612_0320 MT40	32.4	1037/32	12.4	10	636	71.8	3,000	2,900	3,500	12,337	1,393	14,616	1,650	25,688	2,900
C612_0350 MT30	34.9	1360/39	9.5	10	619	69.9	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C612_0350 MT40	34.9	1360/39	13.5	10	638	72.1	3,000	2,900	3,500	11,515	1,300	12,224	1,380	23,031	2,600

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	arcmins $\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C612 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 61 dB(A)** [3]	
C612_0390 MT30	39.4	1891/48	7.7	10	627	70.8	3,200	2,900	3,700	9,250	1,044	12,975	1,465	16,479	1,860
C612_0390 MT40	39.4	1891/48	11.7	10	642	72.5	3,000	2,900	3,500	10,812	1,221	12,975	1,465	16,479	1,860
C612_0450 MT30	45.3	136/3	8.3	10	634	71.6	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C612_0450 MT40	45.3	136/3	12.3	10	646	72.9	3,000	2,900	3,500	11,515	1,300	12,224	1,380	23,031	2,600
C612_0550 MT30	55.1	496/9	7.6	10	641	72.4	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C612_0550 MT40	55.1	496/9	11.6	10	649	73.3	3,000	2,900	3,500	11,515	1,300	12,224	1,380	23,031	2,600
C612_0690 MT30	68.9	620/9	7.1	10	647	73.0	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C612_0690 MT40	68.9	620/9	11.1	10	652	73.6	3,000	2,900	3,500	11,515	1,300	12,224	1,380	23,031	2,600
C613 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 61 dB(A)** [3]	
C613_0490 MT30	49.3	31537/640	7.2	10	637	72.0	3,200	2,900	3,700	10,848	1,225	13,829	1,561	17,287	1,952
C613_0630 MT30	63.5	48739/768	6.9	10	645	72.8	3,200	2,900	3,700	11,723	1,323	14,616	1,650	21,204	2,394
C613_0760 MT20	75.8	5307/70	1.7	10	643	72.6	3,200	2,900	3,700	7,600	858	7,643	863	9,554	1,079
C613_0770 MT30	76.8	8601/112	6.8	10	649	73.2	3,200	2,900	3,700	12,264	1,384	14,616	1,650	24,642	2,782
C613_0880 MT20	87.6	3944/45	1.8	10	647	73.0	3,200	2,900	3,700	9,200	1,039	9,200	1,039	11,500	1,298
C613_0890 MT30	88.8	799/9	6.9	10	651	73.5	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C613_0980 MT30	97.6	243695/2496	6.7	10	652	73.6	3,200	2,900	3,700	12,844	1,450	14,616	1,650	25,688	2,900
C613_1060 MT20	106.1	3712/35	1.7	10	650	73.4	3,200	2,900	3,700	10,632	1,200	10,692	1,207	13,365	1,509
C613_1070 MT30	107.4	752/7	6.8	10	653	73.7	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C613_1270 MT30	126.9	48739/384	6.6	10	654	73.8	3,200	2,900	3,700	12,844	1,450	14,616	1,650	25,688	2,900
C613_1350 MT20	134.8	15776/117	1.6	10	653	73.7	3,200	2,900	3,700	11,213	1,266	12,224	1,380	16,132	1,821
C613_1370 MT30	136.6	15980/117	6.7	10	654	73.9	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C613_1750 MT20	175.3	7888/45	1.5	10	655	73.9	3,200	2,900	3,700	11,515	1,300	12,224	1,380	19,846	2,240
C613_1780 MT30	177.6	1598/9	6.6	10	656	74.0	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C613_2130 MT20	213.1	28768/135	1.5	10	655	74.0	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C613_2660 MT20	266.4	7192/27	1.4	10	656	74.1	3,200	2,900	3,700	11,515	1,300	12,224	1,380	23,031	2,600
C712 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 67 dB(A)** [3]	
C712_0043 MT30	4.3	477/112	101.8	10	139	15.7	2,200	1,900	2,700	3,476	392	3,824	432	6,953	785
C712_0043 MT40	4.3	477/112	105.8	10	256	28.9	2,200	1,900	2,700	5,899	666	5,899	666	7,374	832
C712_0053 MT30	5.3	1827/344	77.3	10	201	22.7	2,200	1,900	2,700	4,335	489	4,769	538	8,670	979
C712_0053 MT40	5.3	1827/344	81.3	10	352	39.8	2,200	1,900	2,700	7,120	804	7,120	804	8,900	1,005
C712_0068 MT30	6.8	252/37	57.4	10	296	33.4	2,600	2,300	3,100	5,560	628	6,116	690	10,992	1,241
C712_0068 MT40	6.8	252/37	61.4	10	479	54.1	2,600	2,300	3,100	8,794	993	8,794	993	10,992	1,241
C712_0074 MT30	7.4	3480/473	70.9	10	330	37.2	2,200	1,900	2,700	6,005	678	6,606	746	12,011	1,356
C712_0074 MT40	7.4	3480/473	74.9	10	520	58.7	2,200	1,900	2,700	9,862	1,113	9,862	1,113	12,328	1,392
C712_0085 MT30	8.5	4347/512	44.2	10	399	45.0	2,600	2,300	3,100	6,930	782	7,623	861	13,214	1,492
C712_0085 MT40	8.5	4347/512	48.2	10	598	67.5	2,600	2,300	3,100	10,571	1,193	10,571	1,193	13,214	1,492
C712_0094 MT30	9.4	3840/407	53.4	10	454	51.2	2,600	2,300	3,100	7,701	869	8,472	956	15,227	1,719
C712_0094 MT40	9.4	3840/407	57.4	10	653	73.7	2,600	2,300	3,100	12,182	1,375	12,182	1,375	15,227	1,719

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 ... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

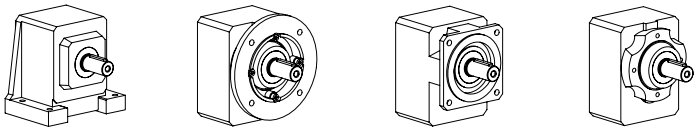
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
					C_2		Continuous		Cyclic	$T_{2N \leq 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C712 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 67 dB(A)** [3]	
C712_0099 MT30	9.9	4599/464	37.5	10	480	54.2	2,900	2,600	3,400	8,091	913	8,900	1,005	15,052	1,699
C712_0099 MT40	9.9	4599/464	41.5	10	678	76.6	2,900	2,600	3,400	12,041	1,359	12,041	1,359	15,052	1,699
C712_0120 MT30	11.8	1035/88	41.7	10	572	64.6	2,600	2,300	3,100	9,600	1,084	10,560	1,192	18,304	2,066
C712_0120 MT40	11.8	1035/88	45.7	10	761	85.9	2,600	2,300	3,100	14,644	1,653	14,644	1,653	18,304	2,066
C712_0130 MT30	13.2	4851/368	27.6	10	633	71.4	2,900	2,600	3,400	9,954	1,124	11,836	1,336	18,890	2,133
C712_0130 MT40	13.2	4851/368	31.6	10	810	91.4	2,900	2,600	3,400	15,112	1,706	15,112	1,706	18,890	2,133
C712_0135 MT30	13.7	4380/319	35.6	10	654	73.8	2,900	2,600	3,400	11,207	1,265	12,328	1,392	20,850	2,354
C712_0135 MT40	13.7	4380/319	39.6	10	826	93.3	2,900	2,600	3,400	15,848	1,789	16,680	1,883	20,850	2,354
C712_0165 MT30	16.7	1071/64	21.1	10	751	84.8	3,100	2,900	3,600	10,448	1,179	15,025	1,696	22,994	2,596
C712_0165 MT40	16.7	1071/64	25.1	10	895	101.1	3,000	2,900	3,500	16,556	1,869	18,395	2,077	22,994	2,596
C712_0185 MT30	18.3	420/23	26.5	10	790	89.2	2,900	2,600	3,400	13,790	1,557	16,396	1,851	26,169	2,954
C712_0185 MT40	18.3	420/23	30.5	10	921	103.9	2,900	2,600	3,400	17,428	1,968	20,373	2,300	26,169	2,954
C712_0210 MT30	20.7	1323/64	16.9	10	840	94.8	3,100	2,900	3,600	10,621	1,199	18,561	2,095	27,054	3,054
C712_0210 MT40	20.7	1323/64	20.9	10	952	107.5	3,000	2,900	3,500	17,765	2,005	21,643	2,443	27,054	3,054
C712_0230 MT30	23.2	255/11	20.4	10	880	99.4	3,100	2,900	3,600	14,474	1,634	20,373	2,300	31,854	3,596
C712_0230 MT40	23.2	255/11	24.4	10	976	110.2	3,000	2,900	3,500	17,716	2,000	20,373	2,300	31,854	3,596
C712_0250 MT30	25.3	405/16	13.8	10	907	102.4	3,100	2,900	3,600	11,063	1,249	22,728	2,566	31,815	3,592
C712_0250 MT40	25.3	405/16	17.8	10	992	112.0	3,000	2,900	3,500	19,005	2,146	24,448	2,760	31,815	3,592
C712_0290 MT30	28.6	315/11	16.5	10	941	106.2	3,100	2,900	3,600	14,712	1,661	20,373	2,300	35,432	4,000
C712_0290 MT40	28.6	315/11	20.5	10	1,010	114.0	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C712_0340 MT30	33.8	2163/64	10.9	10	977	110.3	3,100	2,900	3,600	11,395	1,286	24,448	2,760	39,811	4,494
C712_0340 MT40	33.8	2163/64	14.9	10	1,029	116.2	3,000	2,900	3,500	19,973	2,255	24,448	2,760	39,811	4,494
C712_0350 MT30	35.1	2700/77	13.6	10	983	111.0	3,100	2,900	3,600	15,325	1,730	20,373	2,300	35,432	4,000
C712_0350 MT40	35.1	2700/77	17.6	10	1,033	116.6	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C712_0410 MT30	41.0	2625/64	9.5	10	1,008	113.8	3,100	2,900	3,600	11,680	1,319	22,265	2,514	37,108	4,189
C712_0410 MT40	41.0	2625/64	13.5	10	1,046	118.1	3,000	2,900	3,500	18,554	2,095	22,265	2,514	37,108	4,189
C712_0470 MT30	46.8	515/11	10.7	10	1,024	115.7	3,100	2,900	3,600	15,785	1,782	20,373	2,300	35,432	4,000
C712_0470 MT40	46.8	515/11	14.7	10	1,054	119.0	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C712_0570 MT30	56.8	625/11	9.4	10	1,042	117.7	3,100	2,900	3,600	16,179	1,827	20,373	2,300	35,432	4,000
C712_0570 MT40	56.8	625/11	13.4	10	1,063	120.0	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C712_0700 MT30	69.5	765/11	8.3	10	1,055	119.1	3,100	2,900	3,600	16,503	1,863	20,373	2,300	29,091	3,284
C712_0700 MT40	69.5	765/11	12.3	10	1,069	120.7	3,000	2,900	3,500	17,716	2,000	20,373	2,300	29,091	3,284
C713 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 67 dB(A)** [3]	
C713_0510 MT40	50.8	18711/368	13.1	10	1,058	119.5	3,000	2,900	3,500	21,259	2,400	24,448	2,760	36,099	4,075
C713_0650 MT40	64.5	4131/64	12.6	10	1,067	120.5	3,000	2,900	3,500	21,259	2,400	24,448	2,760	42,518	4,800
C713_0800 MT40	79.7	5103/64	12.4	10	1,072	121.1	3,000	2,900	3,500	21,259	2,400	24,448	2,760	42,518	4,800
C713_0810 MT30	81.0	20727/256	7.2	10	1,062	119.9	3,100	2,900	3,600	15,115	1,706	21,642	2,443	27,052	3,054
C713_0890 MT40	89.4	6885/77	12.6	10	1,074	121.3	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C713_0980 MT40	97.6	10935/112	12.2	10	1,076	121.4	3,000	2,900	3,500	21,259	2,400	24,448	2,760	31,816	3,592
C713_0990 MT30	99.1	6345/64	7.0	10	1,069	120.7	3,100	2,900	3,600	16,001	1,806	24,448	2,760	31,812	3,591

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes



Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	10^{-4}kgcm² J_1	arcmins Δφ	in.lbs. C_2	Nm C_2	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C713 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 67 dB(A)** [3]	
C713_1100 MT40	110.5	1215/11	12.3	10	1,077	121.6	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C713_1300 MT40	130.4	8343/64	12.0	10	1,078	121.8	3,000	2,900	3,500	21,259	2,400	24,448	2,760	39,812	4,494
C713_1320 MT30	132.4	33887/256	6.8	10	1,075	121.3	3,100	2,900	3,600	16,914	1,910	24,448	2,760	39,807	4,494
C713_1350 MT40	135.3	72900/539	12.1	10	1,079	121.8	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C713_1370 MT30	137.3	10575/77	7.0	10	1,075	121.4	3,100	2,900	3,600	17,716	2,000	20,373	2,300	35,432	4,000
C713_1810 MT40	180.6	13905/77	11.9	10	1,080	122.0	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C713_1830 MT30	183.4	24205/132	6.8	10	1,078	121.7	3,100	2,900	3,600	17,716	2,000	20,373	2,300	35,432	4,000
C713_2190 MT40	219.2	16875/77	11.9	10	1,081	122.0	3,000	2,900	3,500	17,716	2,000	20,373	2,300	35,432	4,000
C713_2230 MT30	222.5	29375/132	6.7	10	1,079	121.9	3,100	2,900	3,600	17,716	2,000	20,373	2,300	35,432	4,000
C812 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 67 dB(A)** [3]	
C812_0125 MT40	12.7	5546/435	63.5	10	902	101.8	2,700	2,400	3,200	15,488	1,748	15,488	1,748	19,360	2,186
C812_0170 MT40	17.1	1180/69	45.2	10	1,041	117.5	2,900	2,700	3,400	19,605	2,213	19,605	2,213	24,506	2,767
C812_0175 MT40	17.3	1504/87	60.6	10	1,360	153.6	2,700	2,400	3,200	21,001	2,371	21,001	2,371	26,251	2,964
C812_0200 MT40	20.3	6077/300	37.1	10	1,102	124.4	2,900	2,700	3,400	22,426	2,532	22,426	2,532	28,032	3,165
C812_0230 MT40	23.2	1600/69	43.6	10	1,527	172.4	2,900	2,700	3,400	26,583	3,001	26,583	3,001	33,229	3,751
C812_0260 MT40	26.1	3127/120	28.3	10	1,169	131.9	2,900	2,700	3,400	23,994	2,709	27,283	3,080	34,103	3,850
C812_0270 MT40	27.5	412/15	35.9	10	1,597	180.3	2,900	2,700	3,400	30,408	3,433	30,408	3,433	38,010	4,291
C812_0340 MT40	33.6	2183/65	22.1	10	1,213	137.0	2,900	2,700	3,400	24,757	2,795	33,261	3,755	41,577	4,694
C812_0350 MT40	35.3	106/3	27.6	10	1,673	188.9	2,900	2,700	3,400	31,889	3,600	36,672	4,140	46,242	5,220
C812_0400 MT40	39.9	2596/65	18.9	10	1,234	139.4	2,900	2,700	3,400	25,417	2,869	38,126	4,304	47,658	5,380
C812_0460 MT40	45.5	592/13	21.7	10	1,723	194.5	2,900	2,700	3,400	31,889	3,600	36,672	4,140	56,374	6,364
C812_0540 MT40	54.2	704/13	18.6	10	1,746	197.1	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,778	7,200
C812_0690 MT40	68.9	620/9	15.6	10	1,767	199.5	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,778	7,200
C813 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 67 dB(A)** [3]	
C813_0490 MT40	49.2	49914/1015	15.2	10	1,734	195.7	2,900	2,700	3,400	26,726	3,017	29,597	3,341	36,997	4,177
C813_0660 MT40	66.0	10620/161	14.0	10	1,764	199.2	2,900	2,700	3,400	29,099	3,285	37,466	4,230	46,832	5,287
C813_0780 MT40	78.1	54693/700	13.4	10	1,775	200.4	2,900	2,700	3,400	30,394	3,431	42,518	4,800	53,567	6,047
C813_0790 MT30	79.3	285619/3600	8.3	10	1,747	197.2	2,900	2,700	3,400	18,513	2,090	22,424	2,531	28,029	3,164
C813_0890 MT40	89.4	14400/161	13.9	10	1,782	201.2	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,501	7,169
C813_0910 MT30	90.8	18800/207	8.7	10	1,760	198.7	2,900	2,700	3,400	24,032	2,713	26,582	3,001	33,227	3,751
C813_1010 MT40	100.5	28143/280	12.9	10	1,786	201.7	2,900	2,700	3,400	31,985	3,611	42,518	4,800	65,171	7,357
C813_1060 MT40	105.9	3708/35	13.4	10	1,788	201.9	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,778	7,200
C813_1080 MT30	107.6	4841/45	8.2	10	1,772	200.1	2,900	2,700	3,400	25,102	2,834	30,405	3,432	38,006	4,291
C813_1300 MT40	129.5	58941/455	12.4	10	1,793	202.4	2,900	2,700	3,400	33,744	3,809	42,518	4,800	74,407	8,400
C813_1360 MT40	136.3	954/7	12.8	10	1,794	202.6	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,778	7,200
C813_1380 MT30	138.4	2491/18	7.6	10	1,784	201.5	2,900	2,700	3,400	26,416	2,982	36,672	4,140	46,238	5,220

[1] Maximum torque for continuous input RPM - horizontal output position.

[2] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[3] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

"C" Series–Concentric Helical ServoFit® Modular System Selection Data

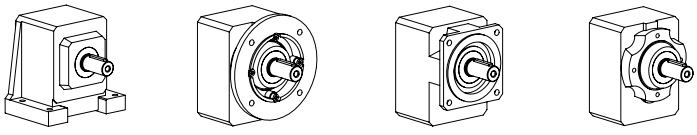
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [1]		Acceleration		Peak [2]	
					C_2		Continuous		Cyclic	$T_{2N \leq 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
C813 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 67 dB(A)** [3]	
C813_1760 MT40	175.6	15984/91	12.4	10	1,798	203.0	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,778	7,200
C813_1780 MT30	178.4	6956/39	7.3	10	1,792	202.3	2,900	2,700	3,400	27,868	3,146	36,672	4,140	56,370	6,364
C813_2090 MT40	208.9	19008/91	12.2	10	1,800	203.2	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,778	7,200
C813_2120 MT30	212.1	8272/39	7.1	10	1,795	202.7	2,900	2,700	3,400	29,035	3,278	36,672	4,140	63,778	7,200
C813_2660 MT40	265.7	1860/7	12.0	10	1,801	203.3	2,900	2,700	3,400	31,889	3,600	36,672	4,140	63,778	7,200
C813_2700 MT30	269.8	7285/27	6.9	10	1,799	203.0	2,900	2,700	3,400	30,280	3,418	36,672	4,140	63,778	7,200
C913 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 73 dB(A)** [3]	
C913_0780 MT40	77.7	60939/784	15.8	10	3,374	380.9	2,800	2,600	3,300	35,070	3,959	44,280	4,999	55,351	6,249
C913_0900 MT40	90.2	55575/616	17.0	10	3,400	383.8	2,800	2,600	3,300	47,294	5,339	53,584	6,049	66,979	7,561
C913_1100 MT40	110.4	21645/196	15.6	10	3,426	386.7	2,800	2,600	3,300	49,826	5,625	57,577	6,500	78,641	8,878
C913_1390 MT40	138.9	66105/476	14.5	10	3,445	388.9	2,800	2,600	3,300	52,502	5,927	57,577	6,500	94,154	10,629
C913_1760 MT40	176.1	34515/196	13.6	10	3,458	390.3	2,800	2,600	3,300	53,148	6,000	57,577	6,500	106,296	12,000
C913_2150 MT40	215.4	3015/14	13.1	10	3,464	391.1	2,800	2,600	3,300	53,148	6,000	57,577	6,500	106,296	12,000

Motor Shaft

Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

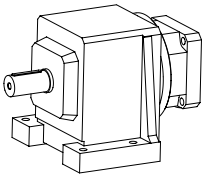
Housing Styles

N – Foot Mounted **F** – Round Flange **Q** – Square Flange **G** – Tapped Holes

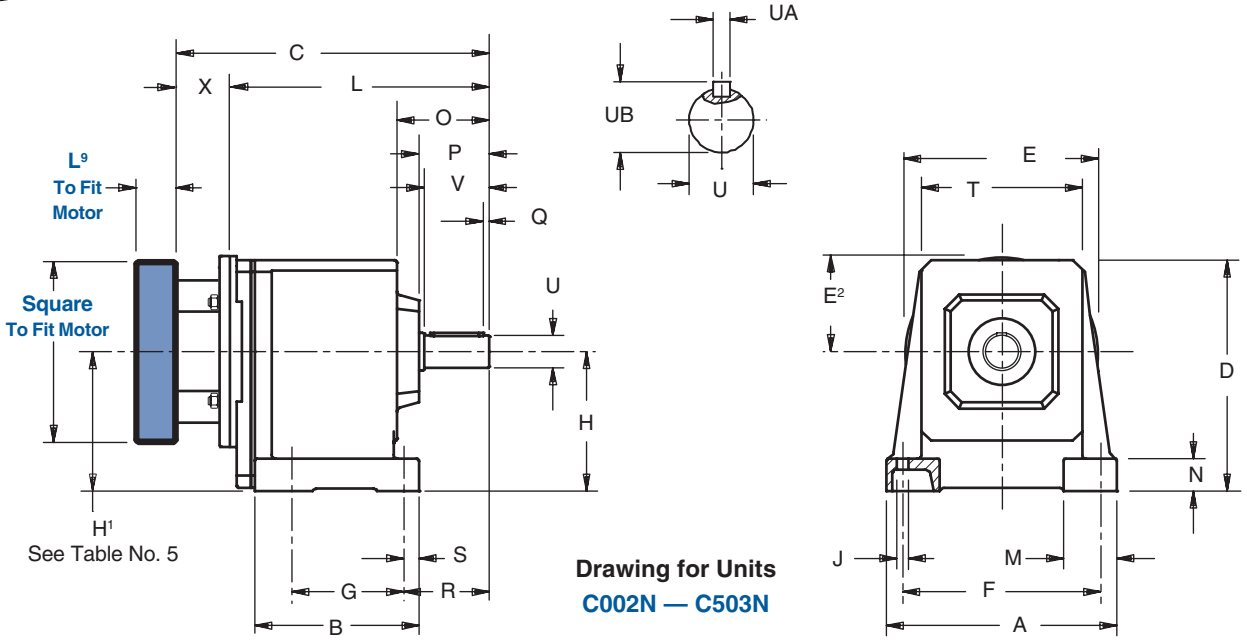


Contact STOBER for availability of "Q" housing style.

See Page 60 for required ordering information and part number example.



"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data



Drawing for Units
C002N — C503N

Table No. 1 **"C" Series – Foot Mounting Unit Dimensions (Inches) – "N" Housing Style**

Base Module	A	B	D	F	G	H	J	M	N	O	P	Q	R
C002	5.20	3.74	5.67	4.33	2.44	3.23	.28	1.38	.79	2.24	1.73	.16	2.17
C102/C103	6.93	4.65	6.97	5.91	2.76	4.02	.35	1.65	.98	2.72	2.13	.16	2.64
C202/C203	7.87	5.31	7.68	6.69	3.35	4.53[1]	.43	1.97	1.18	3.39	2.56	.16	3.11
C302/C303	8.46	6.06	8.46	7.28	4.13	5.12[1]	.43	1.97	1.18	3.35	2.56	.16	3.11
C402/C403	10.04	7.09	9.65	8.66	4.33	5.71	.55	2.36	1.38	4.17	3.39	.16	4.13
C502/C503	11.42	7.76	11.42	9.65	5.12	6.69	.71	2.76	1.57	4.21	3.39	.16	4.25
C612/C613	11.81	10.43	12.40	9.65	8.46	7.87[1]	.71	2.95	1.57	6.02	4.17	.20	5.12
C712/C713	14.37	11.22	14.76	11.81	9.25	9.25[1]	.71	3.54	1.97	7.28	5.00	.20	6.42
C812/C813	17.13	14.17	17.72	13.39	11.81	11.42	.87	3.74	2.17	8.58	5.83	.39	7.48
C913	20.08	16.14	20.87	15.75	13.39	13.39	1.02	4.33	2.36	10.08	7.01	.39	8.74

[1] See Table No. 5

Table No. 2 **Metric output available on request**

Base Module	S	T	Standard Shaft - inches			Optional Shaft - mm			V	Z[1]
			U +.000/-.001	UA	UB	U	UA	UB		
C002	.43	3.62	.750	3/16 × 3/16 × 1 7/32	.83	20k6	A6x6x32	22.5	1.57	—
C102/C103	.51	4.88	1.000	1/4 × 1/4 × 1 9/16	1.11	25k6	A8x7x40	28	1.97	—
C202/C203	.55	5.43	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33	2.36	—
C302/C303	.55	5.91	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33	2.36	—
C402/C403	.75	6.89	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43	3.15	—
C502/C503	.87	7.56	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43	3.15	—
C612/C613	.98	6.97	2.125	1/2 × 1/2 × 3 5/32	2.35	50k6	A14x9x90	53.5	3.94	6.57
C712/C713	.98	7.56	2.375	5/8 × 5/8 × 3 15/16	2.65	60m6	A18x11x100	64	4.72	7.91
C812/C813	1.14	8.78	2.875	3/4 × 3/4 × 4 5/16	3.21	70m6	A20x12x125	74.5	5.51	8.70
C913	1.34	10.91	3.625	7/8 × 7/8 × 5 1/2	4.01	90m6	A25x14x140	95	6.69	10.24

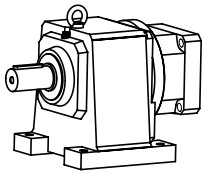
Table No. 3 **"MT" Motor Plate Dimensions**

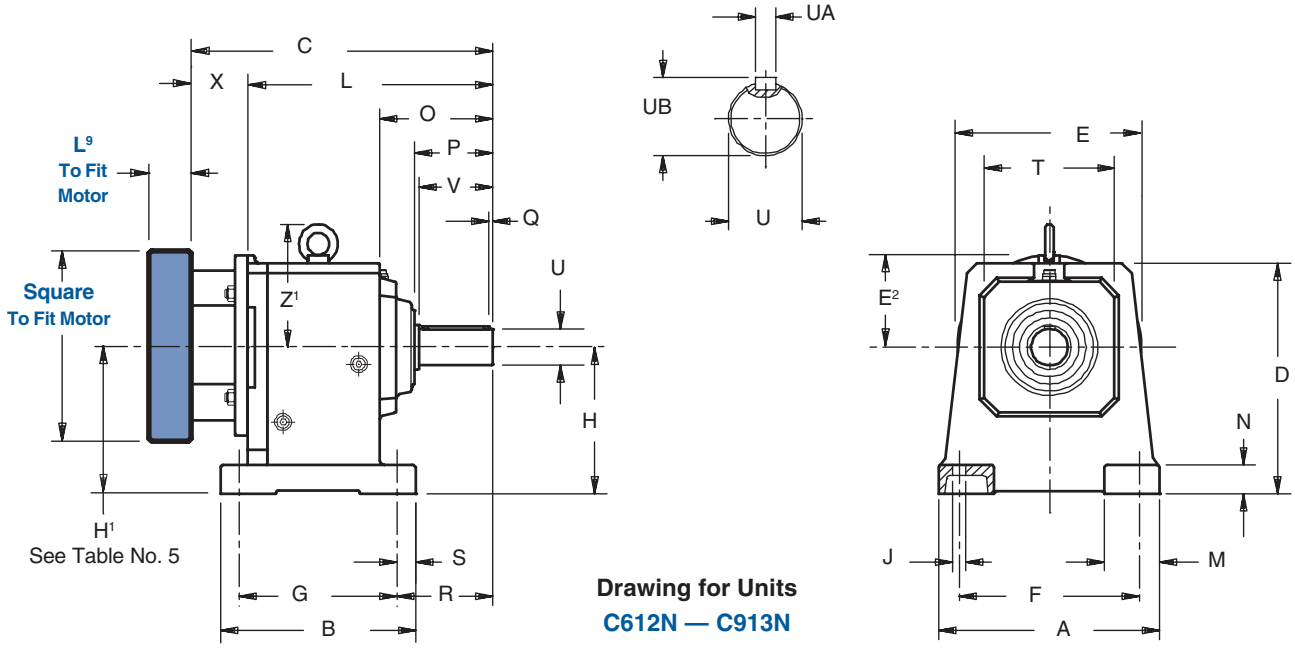
Motor Adapter	Motor Shaft D6 Max. [1]		Motor Plate [2] Thickness L9 Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

[1] If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
[2] Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data





Drawing for Units
C612N — C913N

Table No. 4

"C" Series – Foot Mounting Unit Dimensions (Inches) – "N" Housing Style

Base	MT10		MT20		MT30		MT40		Approx.
Module	C	L	C	L	C	L	C	L	Wt.(lbs.)
C002	7.63	6.06	8.19	6.22	—	—	—	—	18
C102	8.93	7.36	9.49	7.52	9.96	7.60	—	—	29
C103	10.39	8.82	—	—	—	—	—	—	34
C202	10.03	8.46	10.59	8.62	11.06	8.70	—	—	38
C203 [1]	11.49	9.92	12.28	10.31	—	—	—	—	45
C302	—	—	11.34	9.37	11.81	9.45	13.07	9.57	49
C303 [1]	12.24	10.67	13.03	11.06	—	—	—	—	56
C402	—	—	13.23	11.26	13.70	11.34	14.96	11.46	71
C403	—	—	14.92	12.95	—	—	—	—	78
C502	—	—	14.06	12.09	14.53	12.17	15.78	12.28	95
C503	—	—	15.75	13.78	—	—	—	—	111
C612 [1]	—	—	—	—	15.47	13.11	16.73	13.23	115
C613 [1]	—	—	16.73	14.76	17.91	15.55	—	—	159
C712	—	—	—	—	17.56	15.20	18.78	15.28	199
C713 [1]	—	—	—	—	19.96	17.60	—	—	221
C812	—	—	—	—	—	—	21.41	17.91	322
C813	—	—	—	—	22.60	20.24	24.21	20.71	342
C913	—	—	—	—	—	—	26.06	22.56	678

[1] See Table No. 5

Table No. 5

"C" Series – Input Dimension

Base	MT20	MT30	MT40
Module	H1	H1	H1
C203	3.09	–	–
C303	3.66	–	–
C612	–	7.63	7.63
C613	–	–	7.63
C713	–	–	10.00

Units shown in Table 5 do not have a concentric input and output.

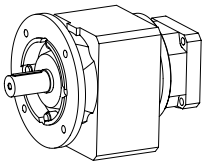
Part No. Example

Foot Mounting with TriAdapt® Motor Adapter

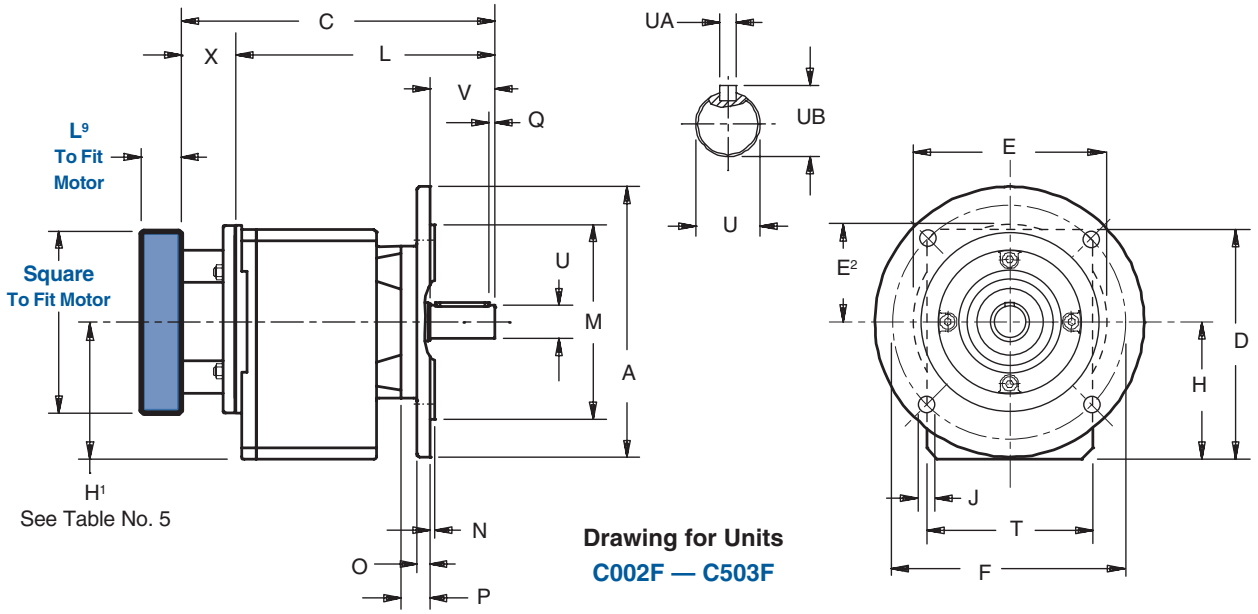
C302N0620 MT10

For approximate weight, add adapter weight from Table 3 and base module weight from Table 4.

See web site for drawings.



"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data



Drawing for Units
C002F — C503F

Table No. 1 **"C" Series – Round Flange Unit Dimensions (Inches) – "F" Housing Style**

Base Module	A	D	F	H	J	M	N	O	P	Q	T
C002	6.30	5.55	5.12	3.11	.35	4.331 +.001/-.0004	.12	.39	.71	.16	3.82
C102/C103	7.87	6.89	6.50	3.94	.43	5.118 +.001/-.0004	.14	.47	.83	.16	5.12
C202/C203	7.87	7.56	6.50	4.41 1)	.43	5.118 +.001/-.0004	.14	.47	1.06	.16	5.59
C302/C303	9.84	8.35	8.46	5.00 1)	.55	7.087 +.001/-.0004	.16	.47	1.06	.16	6.06
C402/C403	9.84	9.55	8.46	5.61	.55	7.087 +.001/-.0004	.16	.55	1.10	.16	7.01
C502/C503	11.81	11.26	10.43	6.54	.55	9.055 +.001/-.001	.16	.63	1.14	.16	7.68
C612/C613	11.81	11.97	10.43	7.44 1)	.55	9.055 +.001/-.001	.16	.67	1.42	.20	8.86
C712/C713	13.78	14.61	11.81	9.09 1)	.71	9.842 +.000/-.001	.20	.71	1.73	.20	10.43
C812/C813	15.75	17.52	13.78	11.22	.71	11.811 +.000/-.001	.20	.79	1.77	.39	12.20
C913	17.72	20.63	15.75 *	13.15	.71	13.780 +.000/-.001	.20	.91	1.97	.39	14.37

1) See Table No. 6
* C913 has 8 mounting holes (located 22.5° from horizontal) in the output flange instead of 4 as shown in the drawing.

Table No. 2 **Metric output available on request**

Base Module	Standard Shaft - inches			Optional Shaft - mm			V	Z1
	U +.000/-.001	UA	UB	U	UA	UB		
C002	.750	3/16 × 3/16 × 1 7/32	.83	20k6	A6x6x32	22.5	1.57	—
C102/C103	1.000	1/4 × 1/4 × 1 9/16	1.11	25k6	A8x7x40	28	1.97	—
C202/C203	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33	2.36	—
C302/C303	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33	2.36	—
C402/C403	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43	3.15	—
C502/C503	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43	3.15	—
C612/C613	2.125	1/2 × 1/2 × 3 5/32	2.35	50k6	A14x9x90	53.5	3.94	6.57
C712/C713	2.375	5/8 × 5/8 × 3 15/16	2.65	60m6	A18x11x100	64	4.72	7.91
C812/C813	2.875	3/4 × 3/4 × 4 5/16	3.21	70m6	A20x12x125	74.5	5.51	8.70
C913	3.625	7/8 × 7/8 × 5 1/2	4.01	90m6	A25x14x140	95	6.69	10.24

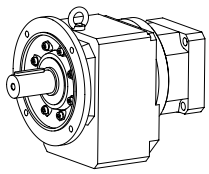
Table No. 3 **"MT" Motor Plate Dimensions**

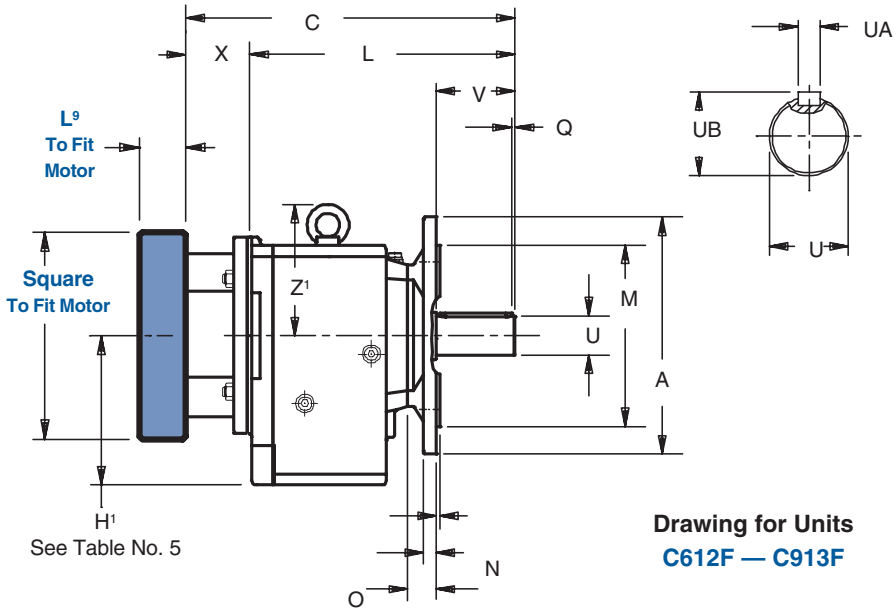
Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness L9 Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data





Drawing for Units
C612F — C913F

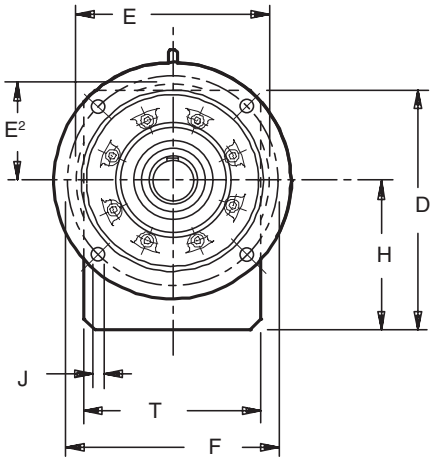


Table No. 4
"C" Series – Round Flange Unit Dimensions (Inches) – "F" Housing Style

Base	MT10		MT20		MT30		MT40		Approx.
Module	C	L	C	L	C	L	C	L	Wt.(lbs.)
C002	7.63	6.06	8.19	6.22	—	—	—	—	18
C102	8.93	7.36	9.49	7.52	9.96	7.60	—	—	29
C103	10.39	8.82	—	—	—	—	—	—	34
C202	10.03	8.46	10.59	8.62	11.06	8.70	—	—	38
C203 [1]	11.49	9.92	12.28	10.31	—	—	—	—	45
C302	—	—	11.34	9.37	11.81	9.45	13.07	9.57	49
C303 [1]	12.24	10.67	13.03	11.06	—	—	—	—	56
C402	—	—	13.23	11.26	13.70	11.34	14.96	11.46	71
C403	—	—	14.92	12.95	—	—	—	—	78
C502	—	—	14.06	12.09	14.53	12.17	15.78	12.28	95
C503	—	—	15.75	13.78	—	—	—	—	111
C612 [1]	—	—	—	—	15.47	13.11	16.73	13.23	115
C613 [1]	—	—	16.73	14.76	17.91	15.55	—	—	159
C712	—	—	—	—	17.56	15.20	18.78	15.28	199
C713 [1]	—	—	—	—	19.96	17.60	—	—	221
C812	—	—	—	—	—	—	21.41	17.91	322
C813	—	—	—	—	22.60	20.24	24.21	20.71	342
C913	—		—	—	—	—	26.06	22.56	678

[1] See Table No. 6

Table No. 5
"C" Series – Input Dimension

Base	MT20	MT30	MT40
Module	H1	H1	H1
C203	2.97	–	–
C303	3.54	–	–
C612	–	7.44	7.44
C613	–	–	7.44
C713	–	–	9.84

Units shown in Table 5 do not have a concentric input and output.

Part No. Example

Round Flange with TriAdapt® Motor Adapter

C302F0620 MT10

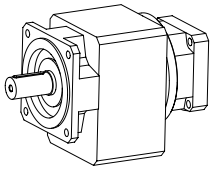
Table No. 6 Optional Flange Dimensions (Inches)

Base Module	Flange Size	A	F	J	M	N	O
C0	120	4.724	3.93	.28	3.150 +.001/-.0004	.12	.39
	140	5.512	4.53	.35	3.740 +.001/-.0004	.12	.39
C1	140	5.512	4.53	.35	3.740 +.001/-.0004	.14	.32
	160	6.300	5.12	.35	4.331 +.001/-.0004	.14	.39
C2	160	6.300	5.12	.35	4.331 +.001/-.0004	.14	.39
	250	9.843	8.46	.55	7.087 +.001/-.0004	.16	.47
C3	160	6.300	5.12	.35	4.331 +.001/-.0004	.14	.39
	200	7.874	6.50	.43	5.118 +.001/-.0004	.14	.47
C4	200	7.874	6.50	.43	5.118 +.001/-.0004	.16	.55
	300	11.811	10.43	.55	9.055 +.001/-.001	.16	.55
C5	250	9.843	8.46	.55	7.087 +.001/-.0004	.16	.55
C8	350	13.780	11.81	.71	9.842 +.000/-.001	.20	.71
	450	17.717	15.75	.71	13.780 +.000/-.001	.20	.79

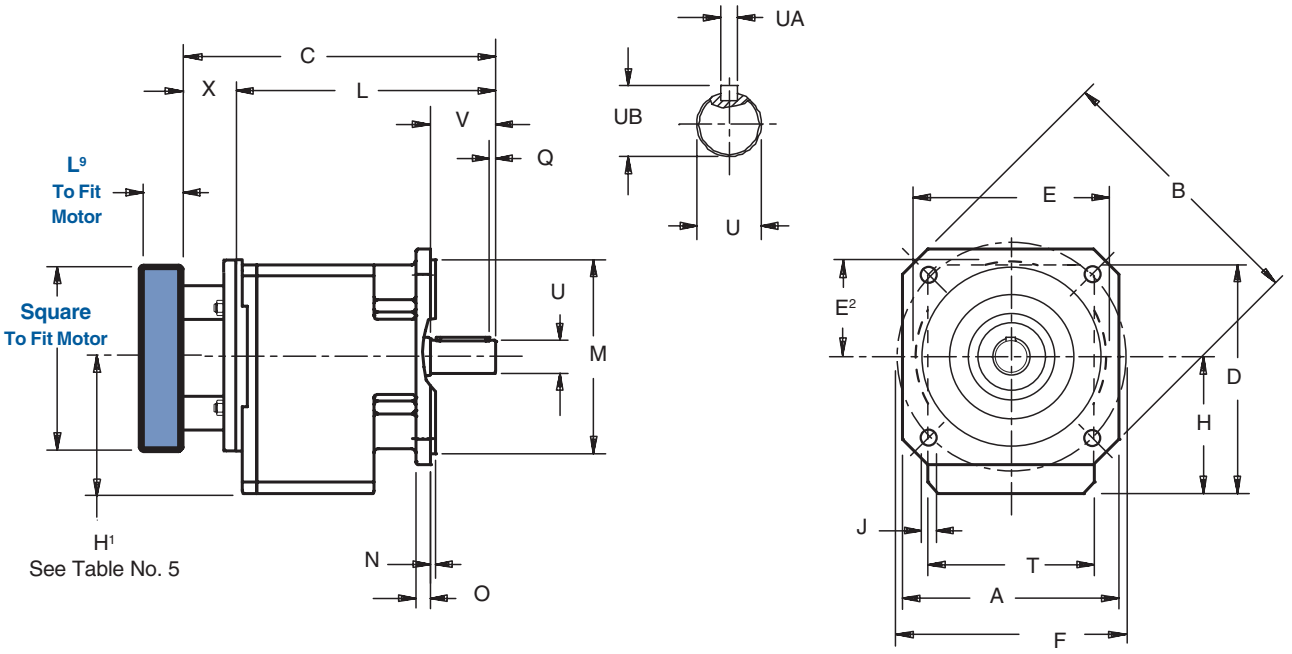
Optional flange are not available for all sizes.

For approximate weight, add adapter weight from Table 4 and base module weight from Table 5.

See web site for drawings.



"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data



Drawing for Units
C002Q — C503Q

Table No. 1 **"C" Series – Square Flange Unit Dimensions (Inches) – "Q" Housing Style**

Base Module	A	B	D	F	H	J	M	N	O	Q	T
C002	4.88	6.30	5.55	5.12	3.11	.35	4.331 +.001/-.0004	.14	.35	.16	3.82
C102/C103	5.71	7.56	6.89	6.50	3.94	.43	5.118 +.001/-.0004	.14	.43	.16	5.12
C202/C203	5.71	7.56	7.56	6.50	4.41 [1)]	.43	5.118 +.001/-.0004	.14	.43	.16	5.59
C302/C303	7.87	9.84	8.35	8.46	5.00 [1)]	.55	7.087 +.001/-.0004	.16	.55	.16	6.06
C402/C403	7.87	9.84	9.55	8.46	5.61	.55	7.087 +.001/-.0004	.16	.55	.16	7.01
C502/C503	9.84	11.81	11.26	10.43	6.54	.55	9.055 +.001/-.001	.16	.63	.16	7.68

[1)]See Table No. 5

Table No. 2 **Metric output available on request**

Base	Standard Shaft - inches			Optional Shaft - mm		
Module	U +.000/-.001	UA	UB	U	UA	UB
C002	.750	$^{3}/_{16} \times {}^{3}/_{16} \times 1{}^{7}/_{32}$	.83	20_{k6}	A6x6x32	22.5
C102/C103	1.000	$^{1}/_{4} \times {}^{1}/_{4} \times 1{}^{9}/_{16}$	1.11	25_{k6}	A8x7x40	28
C202/C203	1.250	$^{1}/_{4} \times {}^{1}/_{4} \times 1{}^{15}/_{16}$	1.36	30_{k6}	A8x7X50	33
C302/C303	1.250	$^{1}/_{4} \times {}^{1}/_{4} \times 1{}^{15}/_{16}$	1.36	30_{k6}	A8x7X50	33
C402/C403	1.625	$^{3}/_{8} \times {}^{3}/_{8} \times 2{}^{7}/_{8}$	1.79	40_{k6}	A12x8X70	43
C502/C503	1.625	$^{3}/_{8} \times {}^{3}/_{8} \times 2{}^{7}/_{8}$	1.79	40_{k6}	A12x8X70	43

Contact STOBER Drives for availability of "Q" housing style.

"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data

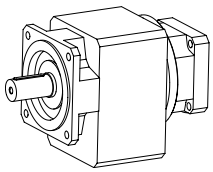


Table No. 3 "MT" Motor Plate Dimensions

Motor Adapter	Motor Shaft D⁶ Max. [1]		Motor Plate [2] Thickness L⁹ Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E_2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

[1] If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
[2] Motor plate maximum thickness (L⁹) will vary with motor shaft length but will not be less than shown.

Table No. 4

"C" Series – Square Flange Unit Dimensions (Inches) – "Q" Housing Style

Base Module	MT10		MT20		MT30		MT40		Approx. Wt.(lbs.)
	C	L	C	L	C	L	C	L	
C002	7.63	6.06	8.19	6.22	—	—	—	—	18
C102	8.93	7.36	9.49	7.52	9.96	7.60	—	—	29
C103	10.39	8.82	—	—	—	—	—	—	34
C202	10.03	8.46	10.59	8.62	11.06	8.70	—	—	38
C203 [1]	11.49	9.92	12.28	10.31	—	—	—	—	45
C302	—	—	11.34	9.37	11.81	9.45	13.07	9.57	49
C303 [1]	12.24	10.67	13.03	11.06	—	—	—	—	56
C402	—	—	13.23	11.26	13.70	11.34	14.96	11.46	71
C403	—	—	14.92	12.95	—	—	—	—	78
C502	—	—	14.06	12.09	14.53	12.17	15.78	12.28	95
C503	—	—	15.75	13.78	—	—	—	—	111

[1] See Table No. 5

Table No. 5

Input Dimension (Inches)

Base Module	MT20
	H[1]
C203	2.97
C303	3.54

Units shown in Table 5 do not have a concentric input and output.

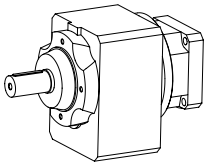
Part No. Example

Square Flange with TriAdapt® Motor Adapter

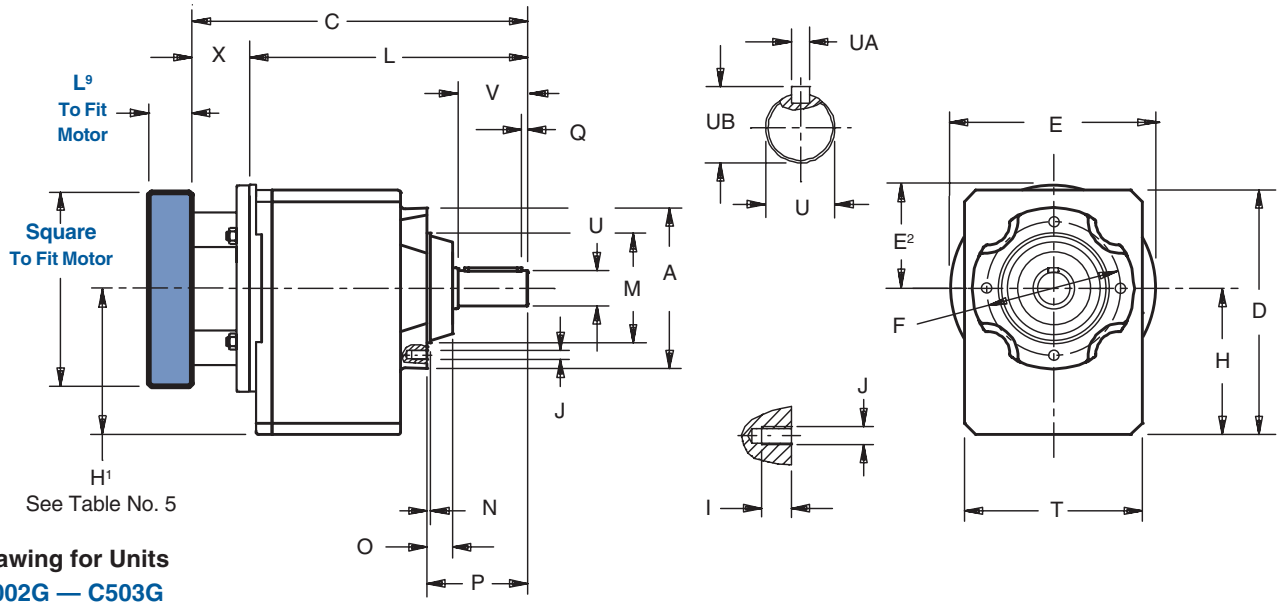
C302Q0620 MT20

See pages 8-25 for SServoFit Modular System configuration, mounting, and selection data
For approximate weight, add adapter weight from Table 3 and base module weight from Table 4.

See web site for drawings.



"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data



Drawing for Units
C002G — C503G

Table No. 1 **"C" Series – Tapped Holes Unit Dimensions (Inches) – "G" Housing Style**

Base Module	A	D	F	H	I	J	M	N	O	P	Q	T
C002	3.43	5.55	2.95	3.11	.39	4-M6	2.165 +.001/-.0003	.12	.55	2.28	.16	3.82
C102/C103	4.72	6.89	3.94	3.94	.51	4-M6	3.150 +.001/-.0003	.12	.67	2.80	.16	5.12
C202/C203	5.51	7.56	4.53	4.41 [1]	.51	4-M8	3.740 +.001/-.0004	.12	.87	3.43	.16	5.59
C302/C303	5.51	8.35	4.53	5.00 [1]	.51	4-M8	3.740 +.001/-.0004	.12	.87	3.43	.16	6.06
C402/C403	6.30	9.55	5.12	5.61	.63	4-M10	4.331 +.001/-.0004	.14	.87	4.25	.16	7.01
C502/C503	7.56	11.26	6.50	6.54	.63	8-M10[2]	5.118 +.001/-.0004	.14	.91	4.29	.16	7.68
C612/C613	7.09	11.97	6.50	7.44 [1]	.63	8-M10	5.512 +.001/-.0004	.20	1.18	5.35	.20	8.86
C712/C713	7.68	14.61	7.28	9.09 [1]	.75	8-M12	6.102 +.001/-.0004	.31	1.46	6.46	.20	10.43
C812/C813	8.90	17.52	8.46	11.22	.75	8-M12	7.283 +.001/-.001	.20	1.46	7.28	.39	12.20
C913	11.02	20.63	10.43	13.15	1.02	8-M16	9.055 +.001/-.001	.20	1.65	8.66	.39	14.37

[1] See Table No. 5
[2] C502/C503 has 8 holes located as shown on drawing for C612G–C913G.

Table No. 2 **Metric output available on request**

Base Module	Standard Shaft - inches			Optional Shaft - mm			V	Z[1]
	U +.000/-.001	UA	UB	U	UA	UB		
C002	.750	3/16 × 3/16 × 17/32	.83	20k6	A6x6x32	22.5	1.57	—
C102/C103	1.000	1/4 × 1/4 × 19/16	1.11	25k6	A8x7x40	28	1.97	—
C202/C203	1.250	1/4 × 1/4 × 115/16	1.36	30k6	A8x7X50	33	2.36	—
C302/C303	1.250	1/4 × 1/4 × 115/16	1.36	30k6	A8x7X50	33	2.36	—
C402/C403	1.625	3/8 × 3/8 × 27/8	1.79	40k6	A12x8X70	43	3.15	—
C502/C503	1.625	3/8 × 3/8 × 27/8	1.79	40k6	A12x8X70	43	3.15	—
C612/C613	2.125	1/2 × 1/2 × 35/32	2.35	50k6	A14x9x90	53.5	3.94	6.57
C712/C713	2.375	5/8 × 5/8 × 315/16	2.65	60m6	A18x11x100	64	4.72	7.91
C812/C813	2.875	3/4 × 3/4 × 45/16	3.21	70m6	A20x12x125	74.5	5.51	8.70
C913	3.625	7/8 × 7/8 × 51/2	4.01	90m6	A25x14x140	95	6.69	10.24

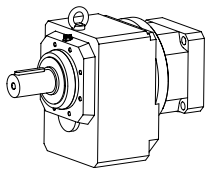
Table No. 3 **"MT" Motor Plate Dimensions**

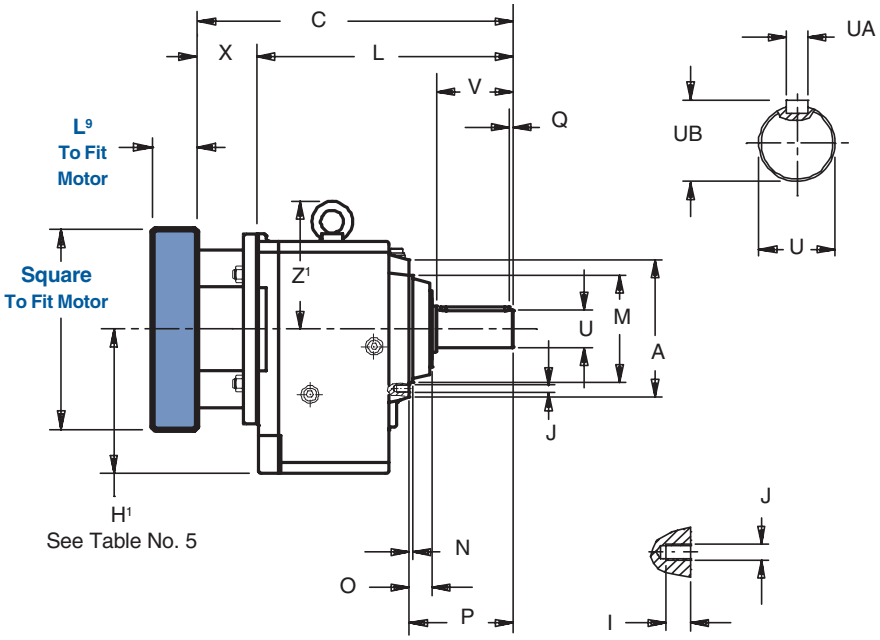
Motor Adapter	Motor Shaft D6 Max. [1]		Motor Plate [2] Thickness L9 Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

[1] If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
[2] Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Modular System Dimensional Data





Drawing for Units
C612G — C913G

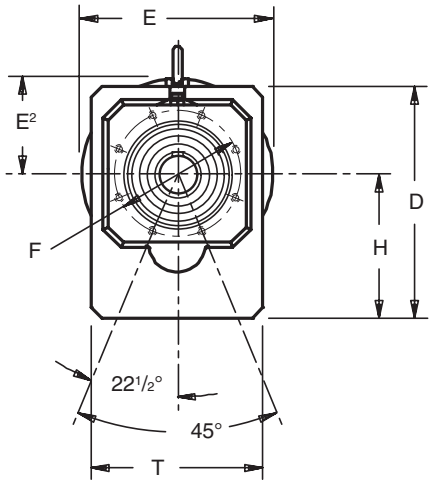


Table No. 4

"C" Series – Tapped Holes Unit Dimensions (Inches) – "G" Housing Style

Base	MT10		MT20		MT30		MT40		Approx.
Module	C	L	C	L	C	L	C	L	Wt.(lbs.)
C002	7.63	6.06	8.19	6.22	—	—	—	—	18
C102	8.93	7.36	9.49	7.52	9.96	7.60	—	—	29
C103	10.39	8.82	—	—	—	—	—	—	34
C202	10.03	8.46	10.59	8.62	11.06	8.70	—	—	38
C203 [1]	11.49	9.92	12.28	10.31	—	—	—	—	45
C302	—	—	11.34	9.37	11.81	9.45	13.07	9.57	49
C303 [1]	12.24	10.67	13.03	11.06	—	—	—	—	56
C402	—	—	13.23	11.26	13.70	11.34	14.96	11.46	71
C403	—	—	14.92	12.95	—	—	—	—	78
C502	—	—	14.06	12.09	14.53	12.17	15.78	12.28	95
C503	—	—	15.75	13.78	—	—	—	—	111
C612 [1]	—	—	—	—	15.47	13.11	16.73	13.23	115
C613 [1]	—	—	16.73	14.76	17.91	15.55	—	—	159
C712	—	—	—	—	17.56	15.20	18.78	15.28	199
C713 [1]	—	—	—	—	19.96	17.60	—	—	221
C812	—	—	—	—	—	—	21.41	17.91	322
C813	—	—	—	—	22.60	20.24	24.21	20.71	342
C913	—		—	—	—	—	26.06	22.56	678

[1] See Table No. 5

Table No. 5

"C" Series – Input Dimension

Base	MT20	MT30	MT40
Module	H1	H1	H1
C203	2.97	–	–
C303	3.54	–	–
C612	–	7.44	7.44
C613	–	–	7.44
C713	–	–	9.84

Units shown in Table 5 do not have a concentric input and output.

Part No. Example

Tapped Holes Housing with TriAdapt® Motor Adapter

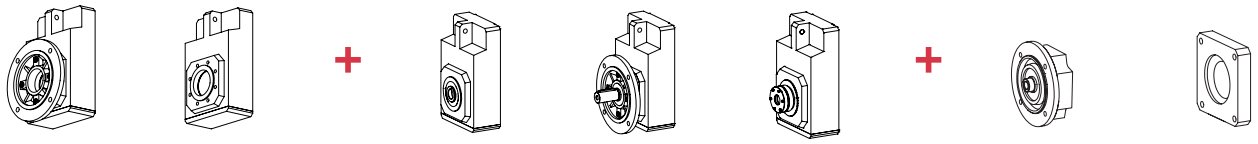
C302G0620 MT20

See pages 8-25 for ServoFit Modular System configuration, mounting, and selection data
For approximate weight, add adapter weight from Table 3 and base module weight from Table 4.

See web site for drawings.

"F" Series–Offset Helical ServoFit® SMS Gearhead Overview

Housing Style + Output Style + TriAdapt® Input = Gearhead Configurations

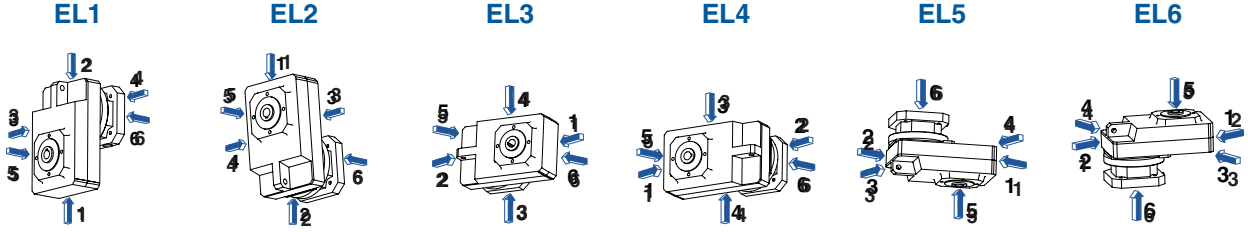


Style F	Style G		Style A	Style V	Style W		MT	Motor Plate
Round Flange	Tapped Holes		Hollow Output	Solid Output	Bushing Output		Motor Adapter	to fit any servo motor

Gearhead Configurations

Style AF	Style VF	Style AG	Style WG

Mounting Positions



EL1	EL2	EL3	EL4	EL5	EL6

Part No. Explanation with OPTIONS and REQUIRED INFORMATION

F 4 0 2 V F 0135 MT20 B

- **B** – This designation is only required when ordering a:
  B – Beverage Duty
  F – Food Duty
  P – Poultry Duty
- TriAdapt® Motor Adapter Size: **MT10**, **MT20**, **MT30**, **MT40**
- Nominal Ratio: (**0135** = 13.5:1)
- HOUSING STYLE
  "**F**" Housing Style – Flange Mounting
  "**G**" Housing Style – Tapped Holes
- OUTPUT STYLE
  "**V**" Solid Output – ONLY AVAILABLE with "F" Housing Style
  SPECIFY IN A NOTE: Standard or Stainless Steel[1)]
  Imperial or Metric [1)]
  "**A**" Hollow Output
  SPECIFY IN A NOTE: Standard or Stainless Steel [1)]
  Imperial or Metric [1)]
  "**W**" Wobble Free Bushing
  SPECIFY IN A NOTE: Bushing Part Number
  Single or Double Bushing (Double not possible on F203, F303, F403, F603)
  Single Side 5 or Side 6 (Side 6 not possible on F203, F303, F403, F603)
- No. of Stages (**02** = 2 Stage, determined by ratio)
- Design Generation
- Unit Size No.
- OFfset Helical

[1)]Not available in all sizes.

Bushing Part No. Explanation

W F 2 – 103

- Output Bore in inches – **103** = 1 3/16
- Base Module Size example: F202/F203)
- **W**obble **F**ree Single Side Bushing

W F N 2 – 103

- Output Bore in inches – **103** = 1 3/16
- Base Module Size example: F202)
- **W**obble **F**ree – **N**o Covers – Double Side Bushing

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Mounting Position	–	EL1 EL2 EL3 EL4 EL5 EL6
Motor	–	Motor Manufacturer and Model Number
Paint	–	Black (Standard)..... White ..... Stainless
Package Option	–	Beverage Duty ..... Food Duty ..... Poultry Duty
Backlash Option	–	Standard or Reduced Backlash

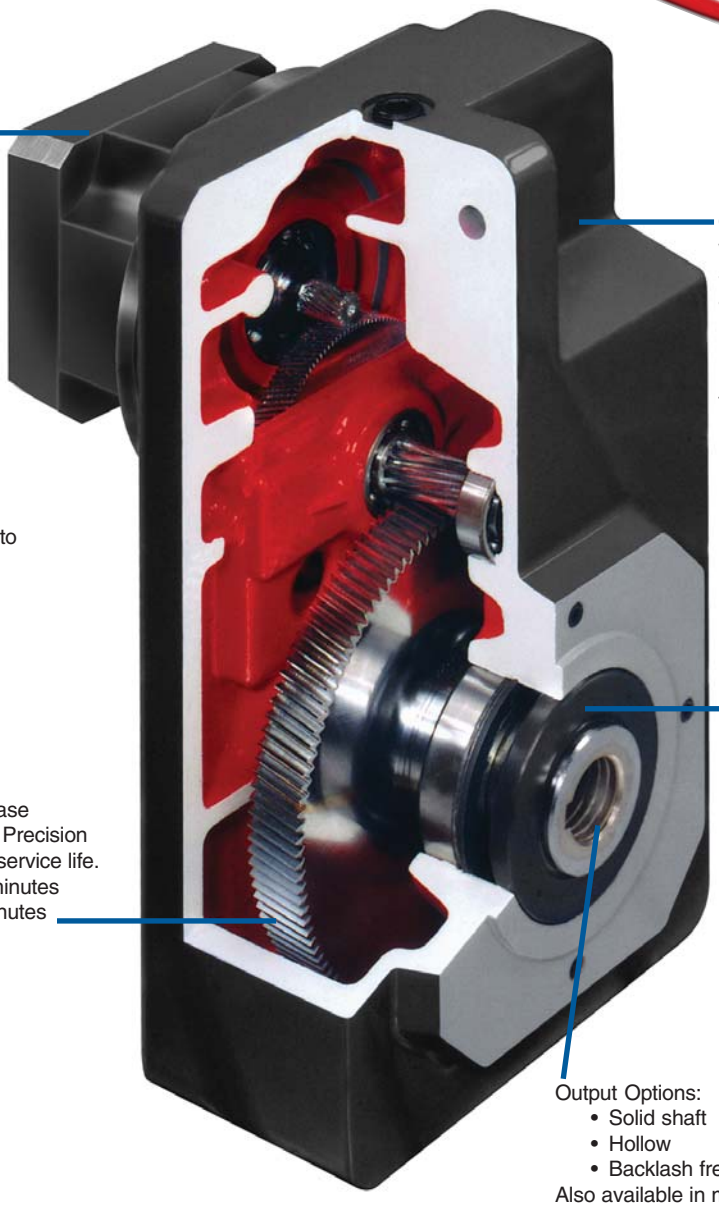
See web site for drawings.

"F" Series—Offset Helical ServoFit® Modular System

Compact size and flexibility make these gear drives a popular choice for applications that require high performance, efficiency, and durability. Series "F" gear drives, like all SMS units, are available with a wide selection of configurations to match almost any mounting requirement.

Performance Specifications:

- Input RPM up to 4,500 RPM
- Nominal output torque – 200 to 9,700 in. lbs. (22-1,100 Nm)
- Reducer ratios from 4.1:1 to 540:1
- 5 year limited warranty (2 years on bearings, seals, etc.)
- Ambient temperature – 0°C to +40°C (104°F)
- Noise level – as low as 53 dB(A)
- ≥ 95.5% Efficiency
- Maintenance free
- Can be back driven



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

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

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

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

High quality helical gearing is case hardened to 58-62 Rockwell C. Precision finished for low noise and long service life.
Standard backlash is ≤11 arc minutes
Reduced backlash is ≤7 arc minutes

Output Options:
- Solid shaft
- Hollow
- Backlash free, wobble free bushings

Also available in metric or stainless shaft or quill.

Also available in washdown and poultry duty.
* Maximum 10 working days for custom motor plates.

See web site for drawings.

"F" Series–Offset Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
F102 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 55 dB(A) [4]**	
F102_0043 MT10	4.3	56/13	2.1	11/8	35	4.0	3,500	3,000	4,000	396	45	396	45	496	56
F102_0043 MT20	4.3	56/13	2.7	11/8	37	4.1	3,500	3,000	4,000	448	51	746	84	933	105
F102_0065 MT10	6.5	84/13	1.4	11/8	45	5.1	3,500	3,000	4,000	512	58	563	64	704	79
F102_0065 MT20	6.5	84/13	2.0	11/8	46	5.2	3,500	3,000	4,000	512	58	930	105	1,326	150
F102_0072 MT10	7.2	322/45	1.2	11/8	47	5.3	4,000	3,600	4,500	507	57	613	69	767	87
F102_0072 MT20	7.2	322/45	1.8	11/8	48	5.4	3,500	3,500	4,500	507	57	930	105	1,444	163
F102_0089 MT10	8.9	1029/115	1.0	11/8	50	5.7	4,000	3,600	4,500	546	62	737	83	921	104
F102_0089 MT20	8.9	1029/115	1.6	11/8	51	5.8	3,500	3,500	4,500	546	62	930	105	1,734	196
F102_0110 MT10	10.9	273/25	0.9	11/8	53	5.9	4,000	4,000	4,500	584	66	868	98	1,085	123
F102_0110 MT20	10.9	273/25	1.5	11/8	53	6.0	3,500	3,500	4,500	584	66	930	105	1,772	200
F102_0135 MT10	13.6	231/17	0.8	11/8	54	6.1	4,000	4,000	4,500	628	71	930	105	1,297	146
F102_0135 MT20	13.6	231/17	1.4	11/8	55	6.2	3,500	3,500	4,500	628	71	930	105	1,772	200
F102_0185 MT10	18.5	1495/81	0.9	11/6	66	7.4	4,000	3,600	4,500	695	78	1,063	120	1,978	223
F102_0185 MT20	18.5	1495/81	1.5	11/6	66	7.5	3,500	3,500	4,500	695	78	1,063	120	2,126	240
F102_0230 MT10	23.1	3185/138	0.8	11/6	67	7.5	4,000	3,600	4,500	749	85	1,063	120	2,126	240
F102_0230 MT20	23.1	3185/138	1.4	11/6	67	7.6	3,500	3,500	4,500	749	85	1,063	120	2,126	240
F102_0280 MT10	28.2	169/6	0.8	11/6	67	7.6	4,000	4,000	4,500	801	90	1,063	120	2,126	240
F102_0280 MT20	28.2	169/6	1.4	11/6	67	7.6	3,500	3,500	4,500	801	90	1,063	120	2,126	240
F102_0350 MT10	35.0	3575/102	0.7	11/6	68	7.7	4,000	4,000	4,500	861	97	1,063	120	2,126	240
F102_0350 MT20	35.0	3575/102	1.3	11/6	68	7.7	3,500	3,500	4,500	861	97	1,063	120	2,126	240
F102_0460 MT10	46.4	325/7	0.7	11/6	68	7.7	4,000	4,000	4,500	946	107	1,063	120	2,126	240
F102_0460 MT20	46.4	325/7	1.3	11/6	68	7.7	3,500	3,500	4,500	946	107	1,063	120	2,126	240
F102_0560 MT10	56.0	2015/36	0.7	11/6	68	7.7	4,000	4,000	4,500	1,006	114	1,063	120	2,126	240
F102_0560 MT20	56.0	2015/36	1.3	11/6	68	7.7	3,500	3,500	4,500	1,006	114	1,063	120	2,126	240
F102_0700 MT10	70.1	1261/18	0.6	11/6	68	7.7	4,000	4,000	4,500	1,063	120	1,063	120	2,126	240
F102_0700 MT20	70.1	1261/18	1.2	11/6	68	7.7	3,500	3,500	4,500	1,063	120	1,063	120	2,126	240
F102_0940 MT10	93.6	7865/84	0.6	11/6	68	7.7	4,000	4,000	4,500	1,063	120	1,063	120	2,126	240
F102_1120 MT10	111.9	2015/18	0.6	11/6	68	7.7	4,000	4,000	4,500	1,063	120	1,063	120	2,126	240
F102_1400 MT10	139.8	559/4	0.6	11/6	69	7.7	4,000	4,000	4,500	1,063	120	1,063	120	2,126	240
F202 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 53 dB(A) [4]**	
F202_0047 MT10	4.7	2616/559	4.7	11/8	60	6.8	3,100	2,700	3,600	452	51	452	51	564	64
F202_0047 MT20	4.7	2616/559	5.3	11/8	64	7.2	3,100	2,700	3,600	953	108	1,769	200	2,495	282
F202_0047 MT30	4.7	2616/559	10.1	11/8	80	9.1	3,100	2,700	3,600	953	108	1,860	210	2,495	282
F202_0056 MT20	5.6	5341/962	4.2	11/8	75	8.5	3,100	2,700	3,600	1,009	114	1,860	210	2,921	330
F202_0056 MT30	5.6	5341/962	9.0	11/8	91	10.3	3,100	2,700	3,600	1,009	114	1,860	210	2,921	330
F202_0072 MT10	7.2	5777/806	2.5	11/8	89	10.0	3,600	3,200	4,100	653	74	653	74	816	92
F202_0072 MT20	7.2	5777/806	3.1	11/8	92	10.4	3,500	3,200	4,100	1,046	118	1,860	210	3,543	400
F202_0072 MT30	7.2	5777/806	7.9	11/8	106	11.9	3,500	3,200	4,000	1,046	118	1,860	210	3,543	400
F202_0090 MT10	9.0	3161/351	1.9	11/8	102	11.5	3,600	3,200	4,100	793	89	793	89	991	112
F202_0090 MT20	9.0	3161/351	2.5	11/8	105	11.8	3,500	3,200	4,100	1,128	127	1,860	210	3,543	400
F202_0090 MT30	9.0	3161/351	7.3	11/8	115	13.0	3,500	3,200	4,000	1,128	127	1,860	210	3,543	400

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"F" Series–Offset Helical ServoFit® Modular System Selection Data

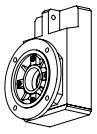
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
F202 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 53 dB(A) [4]**	
F202_0110 MT10	10.8	7303/676	1.5	11/8	111	12.5	3,800	3,600	4,300	917	104	917	104	1,147	129
F202_0110 MT20	10.8	7303/676	2.1	11/8	113	12.8	3,500	3,500	4,300	1,177	133	1,860	210	3,543	400
F202_0110 MT30	10.8	7303/676	6.9	11/8	121	13.7	3,500	3,500	4,000	1,177	133	1,860	210	3,543	400
F202_0135 MT10	13.6	109/8	1.2	11/8	120	13.5	3,800	3,600	4,300	1,112	126	1,112	126	1,391	157
F202_0135 MT20	13.6	109/8	1.8	11/8	121	13.7	3,500	3,500	4,300	1,272	144	1,860	210	3,543	400
F202_0135 MT30	13.6	109/8	6.6	11/8	127	14.3	3,500	3,500	4,000	1,272	144	1,860	210	3,543	400
F202_0185 MT10	18.7	6360/341	1.5	11/6	145	16.4	3,600	3,200	4,100	1,438	162	1,699	192	2,124	240
F202_0185 MT20	18.7	6360/341	2.1	11/6	146	16.5	3,500	3,200	4,100	1,438	162	2,392	270	4,252	480
F202_0185 MT30	18.7	6360/341	6.9	11/6	151	17.0	3,500	3,200	4,000	1,438	162	2,392	270	4,252	480
F202_0230 MT10	23.4	2320/99	1.3	11/6	150	16.9	3,600	3,200	4,100	1,552	175	2,062	233	2,578	291
F202_0230 MT20	23.4	2320/99	1.9	11/6	151	17.0	3,500	3,200	4,100	1,552	175	2,392	270	4,252	480
F202_0230 MT30	23.4	2320/99	6.7	11/6	154	17.3	3,500	3,200	4,000	1,552	175	2,392	270	4,252	480
F202_0280 MT10	28.1	4020/143	1.1	11/6	152	17.2	3,800	3,600	4,300	1,619	183	2,387	269	2,984	337
F202_0280 MT20	28.1	4020/143	1.7	11/6	153	17.3	3,500	3,500	4,300	1,619	183	2,392	270	4,252	480
F202_0280 MT30	28.1	4020/143	6.5	11/6	155	17.5	3,500	3,500	4,000	1,619	183	2,392	270	4,252	480
F202_0350 MT10	35.5	390/11	1.0	11/6	155	17.5	3,800	3,600	4,300	1,750	198	2,392	270	3,618	408
F202_0350 MT20	35.5	390/11	1.6	11/6	155	17.5	3,500	3,500	4,300	1,750	198	2,392	270	4,252	480
F202_0350 MT30	35.5	390/11	6.4	11/6	156	17.7	3,500	3,500	4,000	1,750	198	2,392	270	4,252	480
F202_0470 MT10	47.0	1035/22	0.8	11/6	156	17.7	4,000	4,000	4,500	1,890	213	2,392	270	4,252	480
F202_0470 MT20	47.0	1035/22	1.4	11/6	157	17.7	3,500	3,500	4,500	1,890	213	2,392	270	4,252	480
F202_0470 MT30	47.0	1035/22	6.2	11/6	157	17.8	3,500	3,500	4,000	1,890	213	2,392	270	4,252	480
F202_0570 MT10	56.7	624/11	0.8	11/6	157	17.7	4,000	4,000	4,500	2,012	227	2,392	270	4,252	480
F202_0570 MT20	56.7	624/11	1.4	11/6	157	17.8	3,500	3,500	4,500	2,012	227	2,392	270	4,252	480
F202_0570 MT30	56.7	624/11	6.2	11/6	158	17.8	3,500	3,500	4,000	2,012	227	2,392	270	4,252	480
F202_0700 MT10	70.1	5400/77	0.7	11/6	158	17.8	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F202_0700 MT20	70.1	5400/77	1.3	11/6	158	17.8	3,500	3,500	4,500	2,126	240	2,392	270	4,252	480
F202_0700 MT30	70.1	5400/77	6.1	11/6	158	17.9	3,500	3,500	4,000	2,126	240	2,392	270	4,252	480
F202_0940 MT10	93.8	1032/11	0.7	11/6	158	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F202_0940 MT20	93.8	1032/11	1.3	11/6	158	17.9	3,500	3,500	4,500	2,126	240	2,392	270	4,252	480
F202_1130 MT10	112.7	1240/11	0.7	11/6	158	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F202_1410 MT10	140.9	1550/11	0.6	11/6	158	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F203 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 53 dB(A) [4]**	
F203_1840 MT10	184.3	16215/88	0.7	11/7	159	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F203_2220 MT10	222.2	2444/11	0.7	11/7	159	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F203_2750 MT10	274.7	21150/77	0.7	11/7	159	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F203_3670 MT10	367.5	4042/11	0.7	11/7	159	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F203_4420 MT10	441.5	14570/33	0.6	11/7	159	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480
F203_5520 MT10	551.9	36425/66	0.6	11/7	159	17.9	4,000	4,000	4,500	2,126	240	2,392	270	4,252	480

Motor Shaft

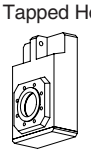
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

F – Round Flange



G – Tapped Holes



The "F" Housing Style is available as Hollow (A) or Solid (V) Output.
"G" style is Hollow (A) or Bushing (W).

See Page 88 for required ordering information and part number example.

"F" Series–Offset Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
F302 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 53 dB(A)** [4]	
F302_0046 MT20	4.6	4992/1075	9.4	11/8	71	8.0	3,000	2,600	3,500	1,596	180	1,756	198	2,576	291
F302_0046 MT30	4.6	4992/1075	14.2	11/8	92	10.4	3,000	2,600	3,500	1,600	181	3,094	349	5,758	650
F302_0057 MT20	5.7	143/25	6.9	11/8	89	10.1	3,000	2,600	3,500	1,715	194	2,163	244	3,069	346
F302_0057 MT30	5.7	143/25	11.7	11/8	111	12.5	3,000	2,600	3,500	1,715	194	2,455	277	3,069	346
F302_0072 MT20	7.2	208/29	5.1	11/8	109	12.3	3,500	3,100	4,000	1,757	198	2,711	306	3,741	422
F302_0072 MT30	7.2	208/29	9.9	11/8	129	14.5	3,500	3,100	4,000	1,757	198	2,992	338	3,741	422
F302_0090 MT20	9.0	5616/625	3.8	11/8	128	14.4	3,500	3,100	4,000	1,894	214	3,100	350	4,516	510
F302_0090 MT30	9.0	5616/625	8.6	11/8	144	16.2	3,500	3,100	4,000	1,894	214	3,100	350	4,516	510
F302_0110 MT20	10.8	1456/135	3.1	11/8	140	15.8	3,500	3,500	4,200	1,976	223	3,100	350	5,225	590
F302_0110 MT30	10.8	1456/135	7.9	11/8	153	17.3	3,500	3,500	4,000	1,976	223	3,100	350	5,225	590
F302_0135 MT10	13.4	7696/575	1.9	11/8	149	16.9	3,700	3,500	4,200	1,127	127	1,127	127	1,409	159
F302_0135 MT20	13.4	7696/575	2.5	11/8	152	17.2	3,500	3,500	4,200	2,123	240	3,100	350	5,758	650
F302_0135 MT30	13.4	7696/575	7.3	11/8	162	18.3	3,500	3,500	4,000	2,123	240	3,100	350	5,758	650
F302_0190 MT20	18.8	4900/261	3.1	11/6	175	19.8	3,500	3,100	4,000	2,421	273	3,986	450	7,086	800
F302_0190 MT30	18.8	4900/261	7.9	11/6	182	20.5	3,500	3,100	4,000	2,421	273	3,986	450	7,086	800
F302_0240 MT20	23.5	588/25	2.6	11/6	182	20.5	3,500	3,100	4,000	2,610	295	3,986	450	7,086	800
F302_0240 MT30	23.5	588/25	7.4	11/6	186	21.0	3,500	3,100	4,000	2,610	295	3,986	450	7,086	800
F302_0280 MT20	28.2	6860/243	2.2	11/6	185	20.9	3,500	3,500	4,200	2,723	307	3,986	450	7,086	800
F302_0280 MT30	28.2	6860/243	7.0	11/6	188	21.2	3,500	3,500	4,000	2,723	307	3,986	450	7,086	800
F302_0350 MT10	35.0	7252/207	1.3	11/6	187	21.1	3,700	3,500	4,200	2,926	330	2,951	333	3,689	416
F302_0350 MT20	35.0	7252/207	1.9	11/6	188	21.2	3,500	3,500	4,200	2,926	330	3,986	450	7,086	800
F302_0350 MT30	35.0	7252/207	6.7	11/6	190	21.4	3,500	3,500	4,000	2,926	330	3,986	450	7,086	800
F302_0470 MT10	47.2	1274/27	1.1	11/6	190	21.4	4,000	3,900	4,500	3,149	355	3,738	422	4,673	528
F302_0470 MT20	47.2	1274/27	1.7	11/6	190	21.5	3,500	3,500	4,500	3,149	355	3,986	450	7,086	800
F302_0470 MT30	47.2	1274/27	6.5	11/6	191	21.6	3,500	3,500	4,000	3,149	355	3,986	450	7,086	800
F302_0560 MT10	56.5	4067/72	1.0	11/6	191	21.6	4,000	3,900	4,500	3,343	377	3,986	450	5,414	611
F302_0560 MT20	56.5	4067/72	1.6	11/6	191	21.6	3,500	3,500	4,500	3,343	377	3,986	450	7,086	800
F302_0560 MT30	56.5	4067/72	6.4	11/6	192	21.7	3,500	3,500	4,000	3,343	377	3,986	450	7,086	800
F302_0700 MT10	70.4	2744/39	0.9	11/6	192	21.6	4,000	3,900	4,500	3,543	400	3,986	450	6,402	723
F302_0700 MT20	70.4	2744/39	1.5	11/6	192	21.7	3,500	3,500	4,500	3,543	400	3,986	450	7,086	800
F302_0700 MT30	70.4	2744/39	6.3	11/6	192	21.7	3,500	3,500	4,000	3,543	400	3,986	450	7,086	800
F302_0940 MT10	93.6	4214/45	0.8	11/6	192	21.7	4,000	3,900	4,500	3,543	400	3,986	450	7,086	800
F302_0940 MT20	93.6	4214/45	1.4	11/6	192	21.7	3,500	3,500	4,500	3,543	400	3,986	450	7,086	800
F302_0940 MT30	93.6	4214/45	6.2	11/6	193	21.8	3,500	3,500	4,000	3,543	400	3,986	450	7,086	800
F302_1130 MT10	112.8	3724/33	0.7	11/6	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	7,086	800
F302_1130 MT20	112.8	3724/33	1.3	11/6	193	21.8	3,500	3,500	4,500	3,543	400	3,986	450	7,086	800
F302_1410 MT10	140.6	7595/54	0.7	11/6	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	5,771	652
F303 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 53 dB(A)** [4]	
F303_1820 MT20	182.4	73892/405	1.4	11/7	193	21.8	3,500	3,500	4,500	3,543	400	3,986	450	7,086	800
F303_1850 MT10	184.8	29939/162	0.7	11/7	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	7,086	800
F303_2180 MT20	218.4	117943/540	1.4	11/7	193	21.8	3,500	3,500	4,500	3,543	400	3,986	450	7,086	800

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A) Measured at 1 meter distance with 3000 RPM input.

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"F" Series–Offset Helical ServoFit® Modular System Selection Data

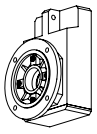
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
F303 with MT TriAdapt® Motor Adapter Continued															**Noise Level ≤ 53 dB(A)** [4]
F303_2210 MT10	221.2	191149/864	0.7	11/7	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	7,086	800
F303_2720 MT20	272.1	159152/585	1.4	11/7	193	21.8	3,500	3,500	4,500	3,543	400	3,986	450	7,086	800
F303_2760 MT10	275.6	32242/117	0.7	11/7	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	7,086	800
F303_3620 MT20	362.1	244412/675	1.4	11/7	193	21.8	3,500	3,500	4,500	3,543	400	3,986	450	7,086	800
F303_3670 MT10	366.8	99029/270	0.7	11/7	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	7,086	800
F303_4420 MT10	442.0	43757/99	0.7	11/7	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	7,086	800
F303_5510 MT10	550.9	356965/648	0.7	11/7	193	21.8	4,000	3,900	4,500	3,543	400	3,986	450	5,771	651
F402 with MT TriAdapt® Motor Adapter Continued Next Page															**Noise Level ≤ 53 dB(A)** [4]
F402_0047 MT20	4.7	1408/301	16.0	10/7	88	9.9	2,700	2,300	3,200	1,608	182	1,769	200	2,683	303
F402_0047 MT30	4.7	1408/301	20.8	10/7	123	13.9	2,700	2,300	3,200	2,744	310	4,200	474	6,921	781
F402_0047 MT40	4.7	1408/301	24.8	10/7	186	21.0	2,700	2,300	3,200	2,744	310	4,872	550	6,921	781
F402_0058 MT20	5.8	3784/651	11.4	10/7	119	13.4	2,700	2,300	3,200	1,998	226	2,198	248	3,238	366
F402_0058 MT30	5.8	3784/651	16.2	10/7	159	17.9	2,700	2,300	3,200	2,950	333	4,872	550	8,353	943
F402_0058 MT40	5.8	3784/651	20.2	10/7	221	25.0	2,700	2,300	3,200	2,950	333	4,872	550	8,353	943
F402_0072 MT20	7.2	605/84	8.1	10/7	154	17.4	3,200	2,800	3,700	2,475	279	2,723	307	3,864	436
F402_0072 MT30	7.2	605/84	12.9	10/7	195	22.1	3,200	2,800	3,700	2,994	338	4,872	550	9,744	1,100
F402_0072 MT40	7.2	605/84	16.9	10/7	253	28.5	3,000	2,800	3,500	2,994	338	4,872	550	9,744	1,100
F402_0090 MT20	9.0	440/49	5.9	10/7	192	21.7	3,200	2,800	3,700	2,973	336	3,395	383	4,660	526
F402_0090 MT30	9.0	440/49	10.7	10/7	231	26.1	3,200	2,800	3,700	3,222	364	4,872	550	9,744	1,100
F402_0090 MT40	9.0	440/49	14.7	10/7	279	31.5	3,000	2,800	3,500	3,222	364	4,872	550	9,744	1,100
F402_0110 MT20	10.8	682/63	4.6	10/7	222	25.1	3,500	3,100	4,000	2,982	337	4,092	462	5,405	610
F402_0110 MT30	10.8	682/63	9.4	10/7	257	29.0	3,500	3,100	4,000	3,329	376	4,872	550	9,744	1,100
F402_0110 MT40	10.8	682/63	13.4	10/7	296	33.4	3,000	3,000	3,500	3,329	376	4,872	550	9,744	1,100
F402_0135 MT20	13.6	5984/441	3.5	10/7	255	28.8	3,500	3,100	4,000	3,271	369	4,872	550	6,552	740
F402_0135 MT30	13.6	5984/441	8.3	10/7	283	31.9	3,500	3,100	4,000	3,589	405	4,872	550	9,744	1,100
F402_0135 MT40	13.6	5984/441	12.3	10/7	311	35.2	3,000	3,000	3,500	3,589	405	4,872	550	9,744	1,100
F402_0185 MT20	18.6	3575/192	4.5	10/5	290	32.7	3,200	2,800	3,700	4,109	464	6,201	700	9,990	1,128
F402_0185 MT30	18.6	3575/192	9.3	10/5	308	34.8	3,200	2,800	3,700	4,109	464	6,201	700	12,401	1,400
F402_0185 MT40	18.6	3575/192	13.3	10/5	325	36.7	3,000	2,800	3,500	4,109	464	6,201	700	12,401	1,400
F402_0230 MT20	23.2	325/14	3.6	10/5	307	34.6	3,200	2,800	3,700	4,423	499	6,201	700	12,046	1,360
F402_0230 MT30	23.2	325/14	8.4	10/5	320	36.1	3,200	2,800	3,700	4,423	499	6,201	700	12,401	1,400
F402_0230 MT40	23.2	325/14	12.4	10/5	331	37.4	3,000	2,800	3,500	4,423	499	6,201	700	12,401	1,400
F402_0280 MT20	28.0	2015/72	3.0	10/5	317	35.8	3,500	3,100	4,000	4,568	516	6,201	700	12,401	1,400
F402_0280 MT30	28.0	2015/72	7.8	10/5	326	36.9	3,500	3,100	4,000	4,568	516	6,201	700	12,401	1,400
F402_0280 MT40	28.0	2015/72	11.8	10/5	335	37.8	3,000	3,000	3,500	4,568	516	6,201	700	12,401	1,400
F402_0350 MT20	35.1	2210/63	2.5	10/5	326	36.8	3,500	3,100	4,000	4,926	556	6,201	700	12,401	1,400
F402_0350 MT30	35.1	2210/63	7.3	10/5	332	37.5	3,500	3,100	4,000	4,926	556	6,201	700	12,401	1,400
F402_0350 MT40	35.1	2210/63	11.3	10/5	338	38.1	3,000	3,000	3,500	4,926	556	6,201	700	12,401	1,400
F402_0470 MT20	46.9	845/18	2.0	10/5	333	37.6	3,500	3,500	4,300	5,281	596	6,201	700	12,401	1,400
F402_0470 MT30	46.9	845/18	6.8	10/5	337	38.0	3,500	3,500	4,000	5,281	596	6,201	700	12,401	1,400
F402_0470 MT40	46.9	845/18	10.8	10/5	340	38.4	3,000	3,000	3,500	5,281	596	6,201	700	12,401	1,400

Motor Shaft

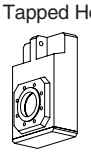
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

F – Round Flange



G – Tapped Holes



The "F" Housing Style is available as Hollow (A) or Solid (V) Output.
"G" style is Hollow (A) or Bushing (W).

See Page 88 for required ordering information and part number example.

"F" Series–Offset Helical ServoFit® Modular System Selection Data

Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
F402 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 53 dB(A)** [4]	
F402_0560 MT20	56.0	2015/36	1.8	10/5	336	37.9	3,500	3,500	4,300	5,600	632	6,201	700	12,401	1,400
F402_0560 MT30	56.0	2015/36	6.6	10/5	338	38.2	3,500	3,500	4,000	5,600	632	6,201	700	12,401	1,400
F402_0560 MT40	56.0	2015/36	10.6	10/5	341	38.5	3,000	3,000	3,500	5,600	632	6,201	700	12,401	1,400
F402_0700 MT20	70.1	1261/18	1.6	10/5	338	38.2	3,500	3,500	4,300	6,035	681	6,201	700	12,401	1,400
F402_0700 MT30	70.1	1261/18	6.4	10/5	340	38.4	3,500	3,500	4,000	6,035	681	6,201	700	12,401	1,400
F402_0700 MT40	70.1	1261/18	10.4	10/5	341	38.5	3,000	3,000	3,500	6,035	681	6,201	700	12,401	1,400
F402_0930 MT20	93.3	280/3	1.5	10/5	340	38.4	3,500	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F402_0930 MT30	93.3	280/3	6.3	10/5	341	38.5	3,500	3,500	4,000	6,201	700	6,201	700	12,401	1,400
F402_1120 MT20	112.3	1235/11	1.4	10/5	341	38.5	3,500	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F402_1120 MT30	112.3	1235/11	6.2	10/5	342	38.6	3,500	3,500	4,000	6,201	700	6,201	700	12,401	1,400
F402_1400 MT20	139.8	559/4	1.3	10/5	342	38.6	3,500	3,500	4,300	6,201	700	6,201	700	11,262	1,271
F403 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 53 dB(A)** [4]	
F403_1820 MT20	181.5	4901/27	1.4	10/6	342	38.6	3,500	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_1840 MT10	183.9	39715/216	0.7	10/6	342	38.6	3,800	3,500	4,300	6,201	700	6,201	700	8,334	941
F403_2160 MT20	216.4	11687/54	1.4	10/6	342	38.6	3,500	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_2190 MT10	219.2	94705/432	0.7	10/6	342	38.6	3,800	3,500	4,300	6,201	700	6,201	700	9,937	1,122
F403_2710 MT20	270.9	36569/135	1.4	10/6	342	38.7	3,500	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_2740 MT10	274.4	59267/216	0.7	10/6	342	38.7	3,800	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_3610 MT20	360.9	3248/9	1.4	10/6	343	38.7	3,500	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_3660 MT10	365.6	3290/9	0.7	10/6	343	38.7	3,800	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_4340 MT20	434.1	14326/33	1.4	10/6	343	38.7	3,500	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_4400 MT10	439.7	58045/132	0.7	10/6	343	38.7	3,800	3,500	4,300	6,201	700	6,201	700	12,401	1,400
F403_5470 MT10	547.4	26273/48	0.7	10/6	343	38.7	3,800	3,500	4,300	6,201	700	6,201	700	11,261	1,271
F602 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [4]	
F602_0045 MT30	4.5	1273/280	42.2	10/7	141	16.0	2,500	2,100	3,000	3,711	419	4,082	461	6,998	790
F602_0045 MT40	4.5	1273/280	46.2	10/7	240	27.1	2,500	2,100	3,000	4,660	526	5,598	632	6,998	790
F602_0057 MT30	5.7	1407/248	30.5	10/7	196	22.2	2,500	2,100	3,000	4,631	523	5,094	575	8,472	956
F602_0057 MT40	5.7	1407/248	34.5	10/7	310	34.9	2,500	2,100	3,000	5,017	566	6,778	765	8,472	956
F602_0072 MT30	7.2	3551/496	22.2	10/7	265	29.9	2,900	2,500	3,400	5,160	583	6,428	726	10,287	1,161
F602_0072 MT40	7.2	3551/496	26.2	10/7	384	43.3	2,900	2,500	3,400	5,160	583	8,230	929	10,287	1,161
F602_0090 MT20	9.0	1943/216	12.1	10/7	260	29.4	2,900	2,500	3,400	3,091	349	3,401	384	4,823	545
F602_0090 MT30	9.0	1943/216	16.9	10/7	338	38.1	2,900	2,500	3,400	5,568	629	8,077	912	12,440	1,404
F602_0090 MT40	9.0	1943/216	20.9	10/7	450	50.9	2,900	2,500	3,400	5,568	629	8,858	1,000	12,440	1,404
F602_0110 MT20	10.8	2077/192	9.1	10/7	319	36.0	3,300	2,800	3,800	3,593	406	4,090	462	5,632	636
F602_0110 MT30	10.8	2077/192	13.9	10/7	396	44.7	3,300	2,800	3,800	5,672	640	8,858	1,000	14,173	1,600
F602_0110 MT40	10.8	2077/192	17.9	10/7	497	56.1	3,000	2,800	3,500	5,672	640	8,858	1,000	14,173	1,600
F602_0135 MT20	13.6	871/64	6.6	10/7	392	44.2	3,300	2,800	3,800	3,767	425	5,145	581	6,770	764
F602_0135 MT30	13.6	871/64	11.4	10/7	461	52.1	3,300	2,800	3,800	6,123	691	8,858	1,000	14,173	1,600
F602_0135 MT40	13.6	871/64	15.4	10/7	542	61.2	3,000	2,800	3,500	6,123	691	8,858	1,000	14,173	1,600

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A) Measured at 1 meter distance with 3000 RPM input.

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- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 3, 4
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL5 and EL6
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL3, EL4
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

"F" Series–Offset Helical ServoFit® Modular System Selection Data

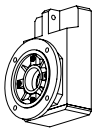
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
F602 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 61 dB(A) [4]**	
F602_0185 MT30	18.5	3445/186	13.6	10/5	558	63.0	2,900	2,500	3,400	7,084	800	9,744	1,100	17,716	2,000
F602_0185 MT40	18.5	3445/186	17.6	10/5	619	69.8	2,900	2,500	3,400	7,084	800	9,744	1,100	17,716	2,000
F602_0230 MT20	23.3	1885/81	6.6	10/5	555	62.7	2,900	2,500	3,400	7,644	863	8,798	993	12,479	1,409
F602_0230 MT30	23.3	1885/81	11.4	10/5	599	67.6	2,900	2,500	3,400	7,644	863	9,744	1,100	17,716	2,000
F602_0230 MT40	23.3	1885/81	15.4	10/5	642	72.4	2,900	2,500	3,400	7,644	863	9,744	1,100	17,716	2,000
F602_0280 MT20	28.0	2015/72	5.4	10/5	590	66.6	3,300	2,800	3,800	7,786	879	9,744	1,100	14,571	1,645
F602_0280 MT30	28.0	2015/72	10.2	10/5	623	70.4	3,300	2,800	3,800	7,786	879	9,744	1,100	17,716	2,000
F602_0280 MT40	28.0	2015/72	14.2	10/5	654	73.9	3,000	2,800	3,500	7,786	879	9,744	1,100	17,716	2,000
F602_0350 MT20	35.2	845/24	4.2	10/5	622	70.2	3,300	2,800	3,800	8,405	949	9,744	1,100	17,514	1,977
F602_0350 MT30	35.2	845/24	9.0	10/5	645	72.8	3,300	2,800	3,800	8,405	949	9,744	1,100	17,716	2,000
F602_0350 MT40	35.2	845/24	13.0	10/5	666	75.1	3,000	2,800	3,500	8,405	949	9,744	1,100	17,716	2,000
F602_0470 MT20	46.7	1495/32	3.1	10/5	648	73.1	3,500	3,200	4,000	9,057	1,022	9,744	1,100	17,716	2,000
F602_0470 MT30	46.7	1495/32	7.9	10/5	662	74.7	3,500	3,200	4,000	9,057	1,022	9,744	1,100	17,716	2,000
F602_0470 MT40	46.7	1495/32	11.9	10/5	674	76.1	3,000	3,000	3,500	9,057	1,022	9,744	1,100	17,716	2,000
F602_0560 MT20	55.7	390/7	2.7	10/5	659	74.3	3,500	3,200	4,000	9,604	1,084	9,744	1,100	17,716	2,000
F602_0560 MT30	55.7	390/7	7.5	10/5	669	75.5	3,500	3,200	4,000	9,604	1,084	9,744	1,100	17,716	2,000
F602_0560 MT40	55.7	390/7	11.5	10/5	677	76.5	3,000	3,000	3,500	9,604	1,084	9,744	1,100	17,716	2,000
F602_0700 MT20	69.6	975/14	2.2	10/5	668	75.4	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F602_0700 MT30	69.6	975/14	7.0	10/5	675	76.2	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F602_0700 MT40	69.6	975/14	11.0	10/5	680	76.8	3,000	3,000	3,500	9,744	1,100	9,744	1,100	17,716	2,000
F602_0930 MT20	93.3	280/3	1.8	10/5	676	76.3	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F602_0930 MT30	93.3	280/3	6.6	10/5	679	76.7	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F602_0930 MT40	93.3	280/3	10.6	10/5	683	77.1	3,000	3,000	3,500	9,744	1,100	9,744	1,100	17,716	2,000
F602_1120 MT20	112.2	9425/84	1.6	10/5	679	76.6	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F602_1120 MT30	112.2	9425/84	6.4	10/5	681	76.9	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F602_1400 MT20	139.8	559/4	1.5	10/5	681	76.9	3,500	3,200	4,000	3,500	1,100	9,744	1,100	17,716	2,000
F602_1400 MT30	139.8	559/4	6.3	10/5	683	77.1	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F603 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 61 dB(A) [4]**	
F603_1810 MT20	180.6	8671/48	1.5	10/6	683	77.1	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F603_2150 MT20	215.4	1508/7	1.5	10/6	684	77.2	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F603_2690 MT20	269.3	1885/7	1.4	10/6	684	77.2	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F603_3610 MT20	360.9	3248/9	1.4	10/6	685	77.3	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000
F603_4340 MT20	433.8	54665/126	1.4	10/6	685	77.3	3,500	3,200	3,200	9,744	1,100	9,744	1,100	17,716	2,000
F603_5400 MT20	540.4	16211/30	1.4	10/6	685	77.3	3,500	3,200	4,000	9,744	1,100	9,744	1,100	17,716	2,000

Motor Shaft

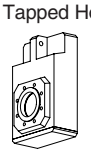
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

F – Round Flange

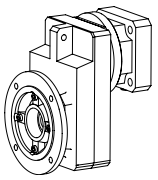


G – Tapped Holes



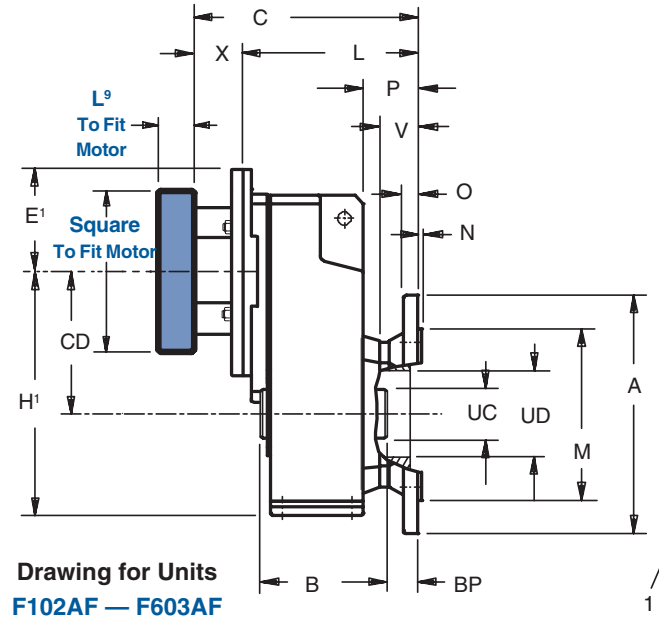
The "F" Housing Style is available as Hollow (A) or Solid (V) Output.
"G" style is Hollow (A) or Bushing (W).

See Page 88 for required ordering information and part number example.

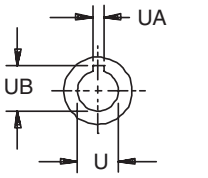


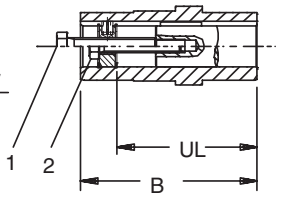
"F" Series–Offset Helical ServoFit® Modular System Dimensional Data

See Page 143 for installation of hollow ouput.



Drawing for Units
F102AF — F603AF





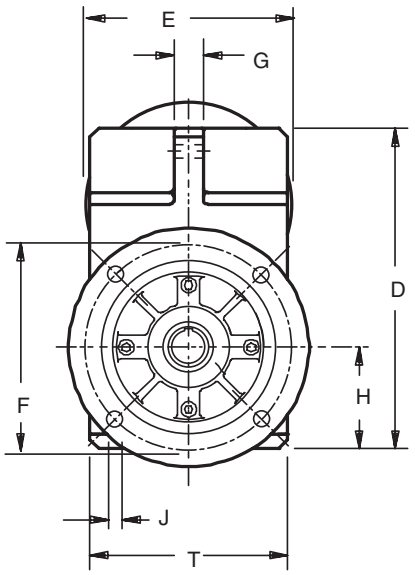


Table No. 1 "F" Series –Round Flange Unit Dimensions (Inches) – "F" Housing Style

Base Module	CD	A	B	D	F	G	H	H1	J	M	N	O	P	T	BP	UC	UD	UL	1
F102	4.02	6.30	3.74	9.37	5.12	.79	2.91	6.93	.43	4.331 +.001/-.0004	.14	.39	1.75	5.71	1.00	1.38	2.05	2.87	3/8-16
F202/F203	5.16	7.87	4.53	11.77	6.50	.87	3.66	8.82	.43	5.118 +.001/-.0004	.14	.55	2.09	7.09	1.18	1.77	2.56	3.62	1/2-13
F302/F303	5.89	9.84	5.12	13.23	8.46	1.18	4.17	10.06	.55	7.087 +.001/-.0004	.16	.59	2.22	8.11	1.24	1.97	2.83	4.06	1/2-13
F402/F403	6.65 [1]	9.84	5.71	14.57	8.46	1.18	4.57	11.22	.55	7.087 +.001/-.0004	.16	.59	2.22	9.06	1.24	2.17	2.83	4.49	3/4-10
F602/F603	7.72	11.81	7.09	17.64	10.43	1.38	5.39	13.11	.87	9.055 +.001/-.001	.16	.67	2.38	10.43	1.16	2.76	3.15	5.63	3/4-10

[1] C.D. is 5.19 for F403 with MT20.

1. Removal Bolt — not supplied.
2. Mounting Bolt — must be smaller than removal bolt.

Table No. 2 Metric output available on request

Base Module	Standard Bore - inches			Optional Bore - mm		
	U +.000/-.001	UA	UB	U	UA	UB
F102	.750	.187	.84	20H7	6JS9	22.8
F202/F203	1.000	.250	1.12	25H7	8JS9	28.3
F302/F303	1.250	.250	1.37	30H7	8JS9	33.3
F402/F403	1.500	.375	1.67	40H7	12JS9	43.3
F602/F603	2.000	.500	2.23	40H7	14JS9	53.8

Table No. 3 "F" Series – Unit Dimensions (Inches) – "F" Housing Style

Base Module	MT10		MT20		MT30		MT40		Approx. Wt. lbs.
	C	L	C	L	C	L	C	L	
F102	6.67	5.10	7.23	5.26	—	—	—	—	38
F202	7.59	6.02	8.15	6.18	9.62	6.26	—	—	51
F203	9.05	7.48	—	—	—	—	—	—	64
F302	8.24	6.67	8.80	6.83	9.27	6.91	—	—	67
F303	9.70	8.13	10.49	8.52	—	—	—	—	73
F402	—	—	14.62	7.42	9.86	7.50	11.12	7.62	84
F403	10.29	8.72	11.08	9.11	—	—	—	—	91
F602	—	—	10.61	8.64	11.08	8.72	12.34	8.84	165
F603	—	—	12.30	10.33	—	—	—	—	177

Table No. 4 "MT" Motor Plate Dimensions

Motor Adapter	Motor Shaft D6 Max. [1]		Motor Plate [2] Thickness L9 Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

[1] If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
[2] Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

For approximate weight, add base module weight form Table 3 and adapter weight from Table 4.

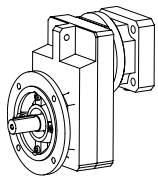
Part No. Example

Round Flange Unit with TriAdapt® Motor Adapter

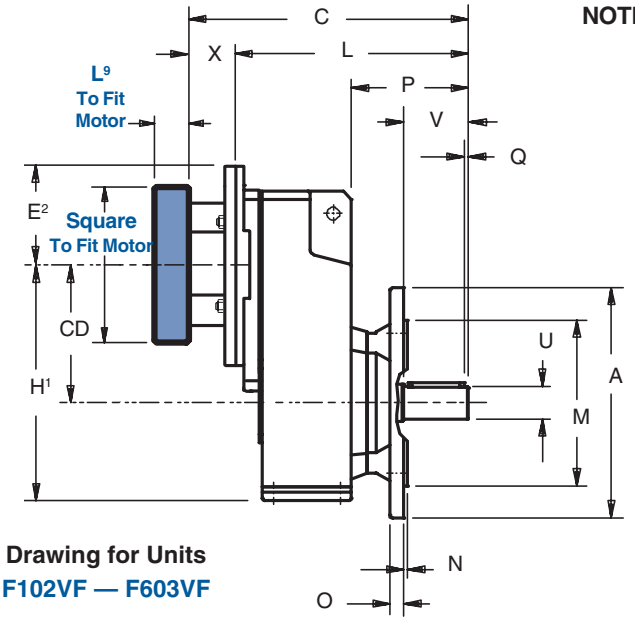
F302AF0620 MT20

See web site for drawings.

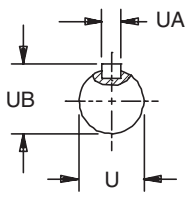
"F" Series–Offset Helical ServoFit® Modular System Dimensional Data



NOTE: Solid output shaft is ONLY available with an output flange.



Drawing for Units
F102VF — F603VF



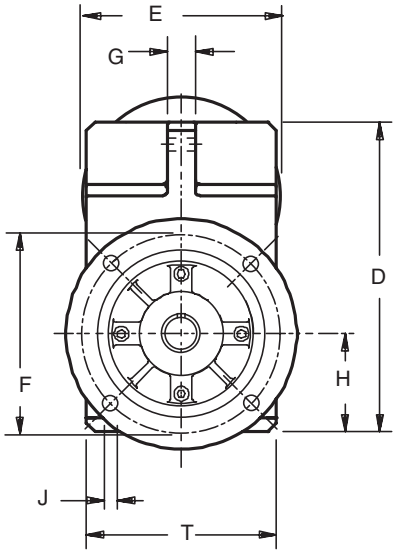


Table No. 1 "F" Series – Round Flange Dimensions (Inches) – "F" Housing Style

Base Module	CD	A	D	F	G	H	H1	J	M	N	O	P	Q	T	V
F102	4.02	6.30	9.37	5.12	.79	2.91	6.93	.35	4.331 +.001/-.0004	.14	.39	3.80	.16	5.71	1.97
F202/F203	5.16	7.87	11.77	6.50	.87	3.66	8.82	.43	5.118 +.001/-.0004	.14	.55	4.53	.16	7.09	2.36
F302/F303	5.89	9.84	13.23	8.46	1.18	4.17	10.06	.55	7.087 +.001/-.0004	.16	.59	5.10	.16	8.11	2.76
F402/F403	6.65 1)	9.84	14.57	8.46	1.18	4.57	11.22	.55	7.087 +.001/-.0004	.16	.59	5.49	.16	9.06	3.15
F602/F603	7.72	11.81	17.64	10.43	1.38	5.39	13.11	.55	9.055 +.001/-.001	.16	.67	6.44	.20	10.43	3.94

1) C.D. is 5.19 for F403 with MT20.

Table No. 2 Metric output available on request

Base Module	Standard Shaft - inches			Optional Shaft - mm		
	U +.000/-.001	UA	UB	U	UA	UB
F102	1.000	1/4 × 1/4 × 1 9/16	1.11	25k6	A8x7x40	28
F202/F203	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7x50	33
F302/F303	1.375	5/16 × 5/16 × 2 5/16	1.51	35k6	A10x8X60	38
F402/F403	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43
F602/F603	2.125	1/2 × 1/2 × 3 5/32	2.35	50k6	A14x9X90	53.5

Table No. 3 "F" Series–"F" Housing Style

Base Module	MT10		MT20		MT30		MT40		Approx.
	C	L	C	L	C	L	C	L	Wt. lbs.
F102	8.66	7.09	9.21	7.24	—	—	—	—	38
F202	9.96	8.39	10.51	8.54	10.98	8.62	—	—	51
F203	11.41	9.84	—	—	—	—	—	—	64
F302	11.02	9.45	11.58	9.61	12.05	9.69	—	—	67
F303	12.48	10.91	13.25	11.28	—	—	—	—	73
F402	—	—	12.56	10.59	13.03	10.67	14.29	10.79	84
F403	13.46	11.89	14.25	12.28	—	—	—	—	91
F602	—	—	14.57	12.60	15.04	12.68	16.30	12.80	165
F603	—	—	16.26	14.29	—	—	—	—	177

Table No. 4 "MT" Motor Plate Dimensions

Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness L9 Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

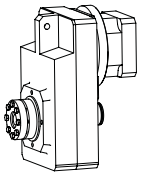
Part No. Example

Round Flange with TriAdapt® Motor Adapter

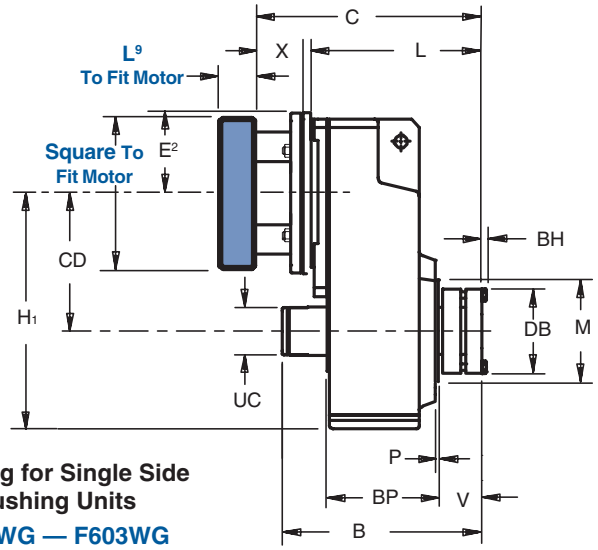
F302VF0620 MT20

For approximate weight, add base module weight form Table 3 and adapter weight from Table 4.

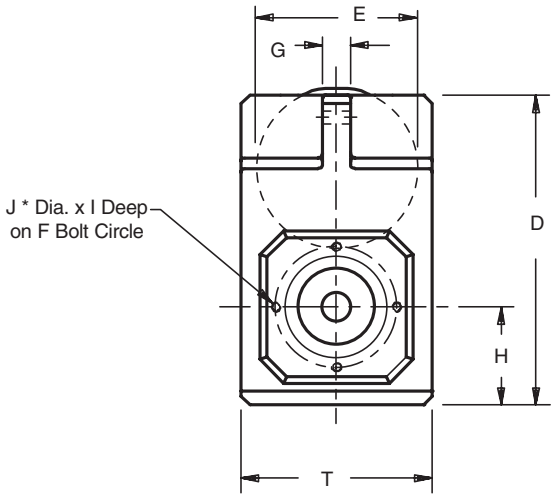
See web site for drawings.



"F" Series–Offset Helical ServoFit® Modular System Dimensional Data



Drawing for Single Side Bushing Units
F102WG — F603WG



Important: For ease of installation, a 1/32 x 45° chamfer (minimum) is recommended for the output shaft end.

Table No. 1 "F" Series – Single Side Wobble Free Bushing Unit Dimensions (Inches)

Base Module	CD	B	D	F	G	H	H_1	I	J *	M	P	T	V	BH	BP	DB	UC	Bushing Capscrews No.– Size Metric	Tight Torque in.lbs	Tight Torque Nm
F102	4.02	6.40	9.37	3.35	.79	2.91	6.93	.51	M8	2.756	.10	5.71	1.18	.16	3.43	2.68	1.35	6 – M6x25	89	10
F202/F203	5.16	7.26	11.77	4.53	.87	3.66	8.82	.51	M8	3.740	.12	7.09	1.54	.16	4.13	3.07	1.74	8 – M6x30	89	10
F302/F303	5.89	7.95	13.23	5.12	1.18	4.17	10.06	.63	M10	4.331	.14	8.11	1.54	.16	4.72	3.31	1.90	8 – M6x30	89	10
F402/F403	6.65 [1]	8.93	14.57	5.12	1.18	4.57	11.22	.63	M10	4.331	.14	9.06	1.78	.20	5.31	3.82	2.14	8 – M8x30	221	25
F602/F603	7.72	10.24	17.64	6.50	1.38	5.39	13.11	.63	M10	5.118	.14	10.43	1.77	.24	6.54	4.13	2.53	8 – M10x35	434	49

*F602 and F603 has 8 tapped holes instead of 4 as shown on drawing.
[1] C.D. is 5.19 for F403 with MT20.

Table No. 2 "MT" Motor Plate Dimensions

Motor Adapter	Motor Shaft D⁶ Max. [1] mm	Motor Shaft D⁶ Max. [1] ins.	Motor Plate [2] Thickness L⁹ Minimum mm	Motor Plate [2] Thickness L⁹ Minimum inches	Inches E	Inches E^2	Inches X	Wt. lbs.
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

[1] If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
[2] Motor plate maximum thickness (L⁹) will vary with motor shaft length but will not be less than shown.

Table No. 3 "F" Series–"F" Housing Style

Base Module	MT10 C	MT10 L	MT20 C	MT20 L	MT30 C	MT30 L	MT40 C	MT40 L	Approx. Wt. lbs.
F102	8.66	7.09	9.21	7.24	—	—	—	—	38
F202	9.96	8.39	10.51	8.54	10.98	8.62	—	—	51
F203	11.41	9.84	—	—	—	—	—	—	64
F302	11.02	9.45	11.58	9.61	12.05	9.69	—	—	67
F303	12.48	10.91	13.25	11.28	—	—	—	—	73
F402	—	—	12.56	10.59	13.03	10.67	14.29	10.79	84
F403	13.46	11.89	14.25	12.28	—	—	—	—	91
F602	—	—	14.57	12.60	15.04	12.68	16.30	12.80	165
F603	—	—	16.26	14.29	—	—	—	—	177

Table No. 4 "WF" Single Side Bushings

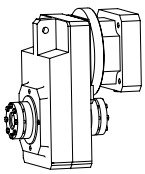
Base Module	Stock Bores Sizes ¾	1	1 3/16	1 ¼	1 3/8	1 7/16	1 ½	1 5/8	1 11/16	1 ¾	1 7/8	1 15/16	2
F102	WF1-075	—	—	—	—	—	—	—	—	—	—	—	—
F202/F203	—	WF2-100	WF2-103	—	—	—	—	—	—	—	—	—	—
F302/F303	—	WF3-100	WF3-103	WF3-104	WF3-106	WF3-107	WF3-108	—	—	—	—	—	—
F402/F403	—	WF4-100	WF4-103	WF4-104	WF4-106	WF4-107	WF4-108	—	—	—	—	—	—
F602/F603	—	—	—	—	—	WF5-107	WF5-108	WF5-110	WF5-111	WF5-112	WF5-114	WF5-115	WF5-200

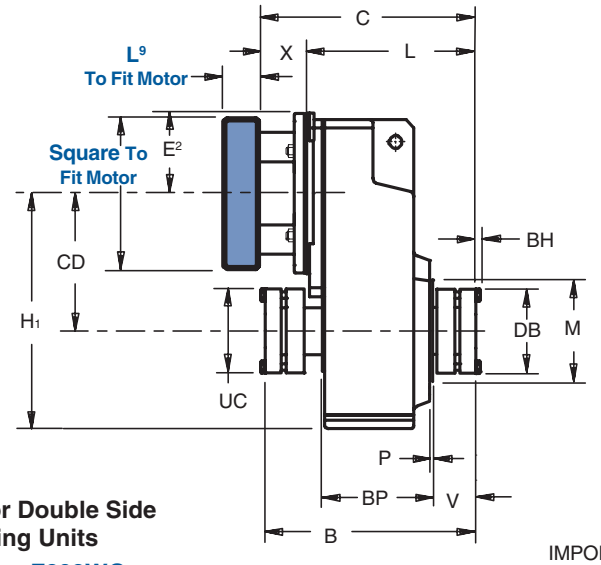
A complete bushing kit includes the locking ring assembly, tapered cone, support ring, and all hardware to mount the kit into the reducer.
The bushing will accept a shaft with a tolerance of +.000/-.005.
NOTE: F6 units use a WF5 Bushing Kit.

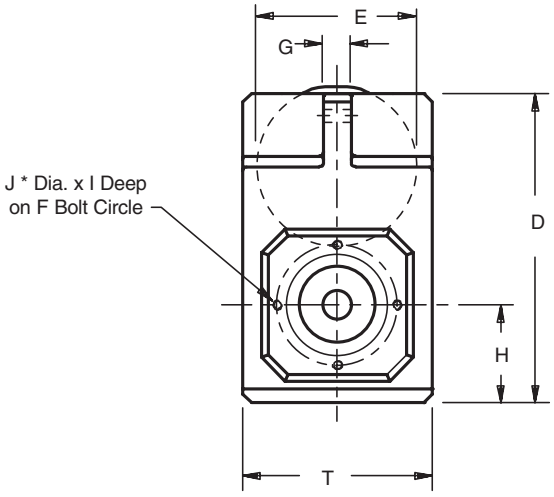
For an approximate unit weight, add the weights in Table 2 and Table 3.

Part No. Example
Unit with TriAdapt® Motor Adapter, 1 3/8" Bore, Single Bushing
F402WG0560 MT20 WF4–106

"F" Series–Offset Helical ServoFit® Modular System Dimensional Data







Drawing for Double Side Bushing Units

F102WG – F602WG

IMPORTANT: A 1/32 x 45° chamfer minimum is recommended for the shaft end.
The bushing will accept a shaft with a tolerance of +.000/-.005.
The double bushing cannot be mounted on sizes F203, F303, F403, or F603.

Table No. 1 "F" Series – Double Side Wobble Free Bushing Unit Dimensions (Inches)

Base Module	CD	B	D	F	G	H	H₁	I	J *	M	P	T	V	BH	BP	DB	Bushing Capscrews No.– Size Metric	Tight Torque in.lbs	Tight Torque Nm
F102	4.02	6.73	9.37	3.35	.79	2.91	6.93	.51	M8	2.756	.10	5.71	1.18	.16	3.43	2.68	6 – M6x25	89	10
F202	5.16	7.77	11.77	4.53	.87	3.66	8.82	.51	M8	3.740	.12	7.09	1.54	.16	4.13	3.07	8 – M6x30	89	10
F302	5.89	8.46	13.23	5.12	1.18	4.17	10.06	.63	M10	4.331	.14	8.11	1.54	.16	4.72	3.31	8 – M6x30	89	10
F402	6.65	9.57	14.57	5.12	1.18	4.57	11.22	.63	M10	4.331	.14	9.06	1.78	.20	5.31	3.82	8 – M8x30	221	25
F602	7.72	10.84	17.64	6.50	1.38	5.39	13.11	.63	M10	5.118	.14	10.43	1.77	.24	6.54	4.13	8 – M10x35	434	49

*F602 has 8 tapped holes instead of 4 as shown on drawing.

Table No. 2 "MT" Motor Plate Dimensions

Motor Adapter	Motor Shaft D⁶ Max. [1] mm	Motor Shaft D⁶ Max. [1] ins.	Motor Plate [2] Thickness L⁹ Minimum mm	Motor Plate [2] Thickness L⁹ Minimum inches	Inches E	Inches E²	Inches X	Wt. lbs.
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

Table No. 3 "F" Series–"F" Housing Style

Base Module	MT10 C	MT10 L	MT20 C	MT20 L	MT30 C	MT30 L	MT40 C	MT40 L	Approx. Wt. lbs.
F102	8.66	7.09	9.21	7.24	—	—	—	—	38
F202	9.96	8.39	10.51	8.54	10.98	8.62	—	—	51
F302	11.02	9.45	11.58	9.61	12.05	9.69	—	—	67
F402	—	—	12.56	10.59	13.03	10.67	14.29	10.79	84
F602	—	—	14.57	12.60	15.04	12.68	16.30	12.80	165

[1] If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
[2] Motor plate maximum thickness (L⁹) will vary with motor shaft length but will not be less than shown.

Table No. 4 "WFN" Double Side Bushings without Covers

Unit	Stock Bores Sizes 3/4	1	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2	1 5/8	1 11/16	1 3/4	1 7/8	1 15/16	2
F102	WFN1-075	—	—	—	—	—	—	—	—	—	—	—	—
F202	—	WFN2-100	WFN2-103	—	—	—	—	—	—	—	—	—	—
F302	—	WFN3-100	WFN3-103	WFN3-104	WFN3-106	WFN3-107	WFN3-108	—	—	—	—	—	—
F402	—	WFN4-100	WFN4-103	WFN4-104	WFN4-106	WFN4-107	WFN4-108	—	—	—	—	—	—
F602	—	—	—	—	—	WFN5-107	WFN5-108	WFN5-110	WFN5-111	WFN5-112	WFN5-114	WFN5-115	WFN5-200

A complete bushing kit includes the locking ring assembly, tapered cone, support ring, and all hardware to mount the kit into the reducer.
The bushing will accept a shaft with a tolerance of +.000/-.005.

NOTE: F6 units use a WFN5 Bushing Kit.

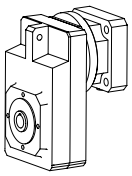
For an approximate unit weight, add the weights in Table 2 and Table 3.

Part No. Explanation

Unit with TriAdapt® Motor Adapter 1 3/8" Bore Double Bushing – No Covers

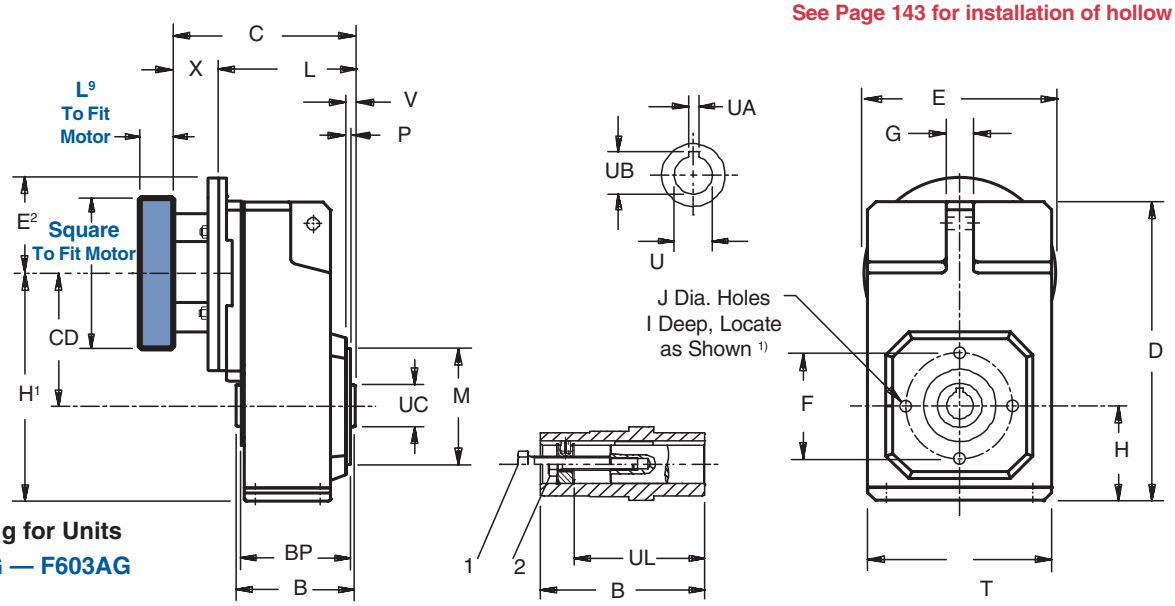
F402WG0560 MT20 WFN4–106

See web site for drawings.



"F" Series–Offset Helical ServoFit® Modular System Dimensional Data

See Page 143 for installation of hollow ouput.



Drawing for Units
F102AG — F603AG

Table No. 1 "F" Series – Tapped Holes Unit Dimensions (Inches) – "G" Housing Style

Base Module	CD	B	D	F	G	H	H1	I	J 1)	M	P	T	V	BP	UC	UL	1
F102	4.02	3.74	9.37	3.35	.79	2.91	6.93	.51	4-M8	2.756 +.001/-.0003	.10	5.71	.26	3.43	1.38	2.87	3/8-16
F202/F203	5.16	4.53	11.77	4.53	.87	3.66	8.82	.51	4-M8	3.740 +.001/-.0004	.12	7.09	.31	4.13	1.77	3.62	1/2-13
F302/F303	5.89	5.12	13.23	5.12	1.18	4.17	10.06	.63	4-M10	4.331 +.001/-.0004	.14	8.11	.33	4.72	1.97	4.06	1/2-13
F402/F403	6.65 2)	5.71	14.57	5.12	1.18	4.57	11.22	.63	4-M10	4.331 +.001/-.0004	.14	9.06	.33	5.31	2.17	4.49	3/4-10
F602/F603	7.72	7.09	17.64	6.50	1.38	5.39	13.11	.63	8-M10	5.118 +.001/-.0004	.14	10.43	.41	6.54	2.76	5.63	3/4-10

1) F602 and F603 has 8 tapped holes located 22.5° from horizontal instead of 4 as shown on drawing.
2) C.D. is 5.19 for F403 with MT20.
1. Removal Bolt — not supplied.
2. Mounting Bolt — must be smaller than removal bolt.

Table No. 2 Metric output available on request

Base Module	Standard Bore - inches			Optional Bore - mm		
	U +.000/-.001	UA	UB	U	UA	UB
F102	.750	.187	.84	20H7	6JS9	22.8
F202/F203	1.000	.250	1.12	25H7	8JS9	28.3
F302/F303	1.250	.250	1.37	30H7	8JS9	33.3
F402/F403	1.500	.375	1.67	40H7	12JS9	43.3
F602/F603	2.000	.500	2.23	40H7	14JS9	53.8

Table No. 3 "F" Series – "G" Housing Style

Base Module	MT10		MT20		MT30		MT40		Approx. Wt. lbs.
	C	L	C	L	C	L	C	L	
F102	5.66	4.09	6.22	4.25	—	—	—	—	38
F202	6.41	4.84	6.97	5.00	7.44	5.08	—	—	51
F203	7.87	6.30	—	—	—	—	—	—	64
F302	7.00	5.43	7.56	5.59	8.03	5.67	—	—	67
F303	8.46	6.89	9.25	7.28	—	—	—	—	73
F402	—	—	8.15	6.18	8.62	6.26	9.88	6.38	84
F403	9.05	7.48	9.84	7.87	—	—	—	—	91
F602	—	—	9.45	7.48	9.92	7.56	11.18	7.68	165
F603	—	—	11.14	9.17	—	—	—	—	177

Table No. 4 "MT" Motor Plate Dimensions

Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness L9 Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

Part No. Example
Tapped Holes Housing with TriAdapt® Motor Adapter
F302AG0620 MT20

For approximate weight, add base module weight form Table 3 and adapter weight from Table 4.

"F" Series–Offset Helical ServoFit® Modular System Dimensional Data

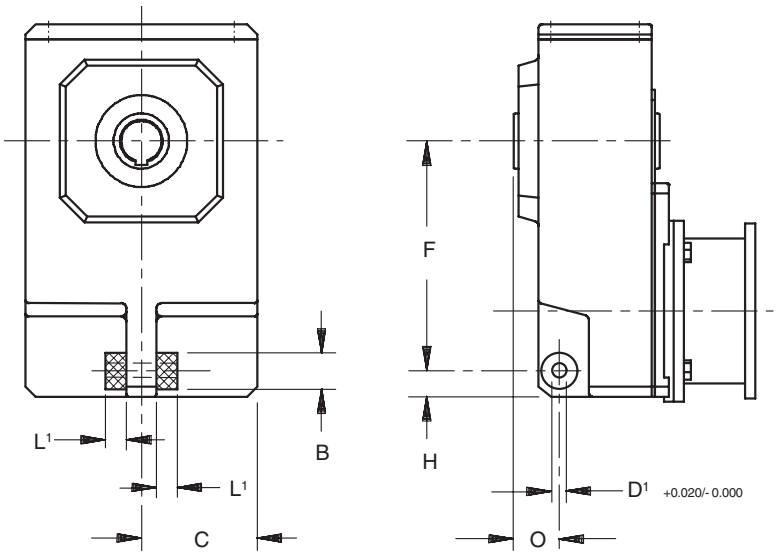


Table No. 4

"F" Series — Rubber Buffer Dimensions (Inches)

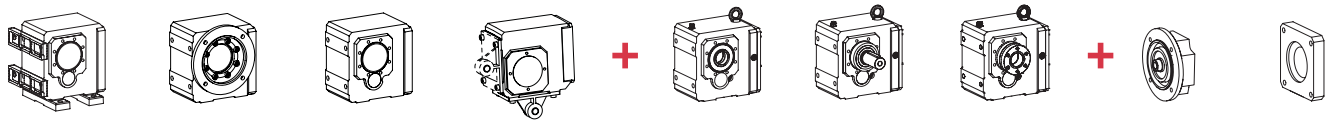
Base Module	Part No.	B	C	F	H	D1	L1	O
F102/F103	25192	1.18	2.86	5.91	.55	.43	.59	1.38
F202/F203	25192	1.18	3.55	7.12	.98	.43	.59	1.57
F302/F303	25193	1.57	4.06	8.07	.96	.55	.79	1.77
F402/F403	25193	1.57	4.53	8.98	1.02	.55	.79	1.77
F602/F603	25194	2.36	5.22	10.63	1.02	.57	1.18	2.77

Order two (2) rubber buffers for each unit.
Torque arms are not supplied by STOBER.

See web site for drawings.

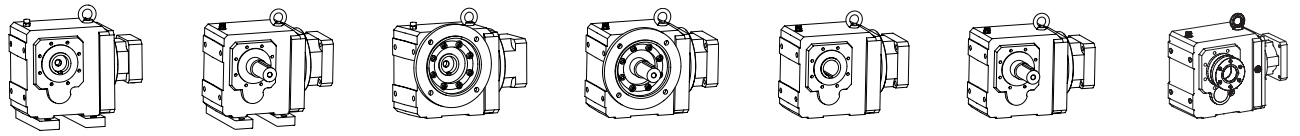
"K" Series–Right Angle Helical/Bevel ServoFit® Modular System Overview

Housing Style + Output Style + TriAdapt® Input = Gearhead Configurations



Style N Foot Mount | Style F Round Flange | Style G Tapped Holes | Style GD Torque Arm Bracket | + | Style A Hollow Output | Style V Solid Output | Style W Bushing Output | + | MT Motor Adapter | Motor Plate Fit ANY Servo Motor

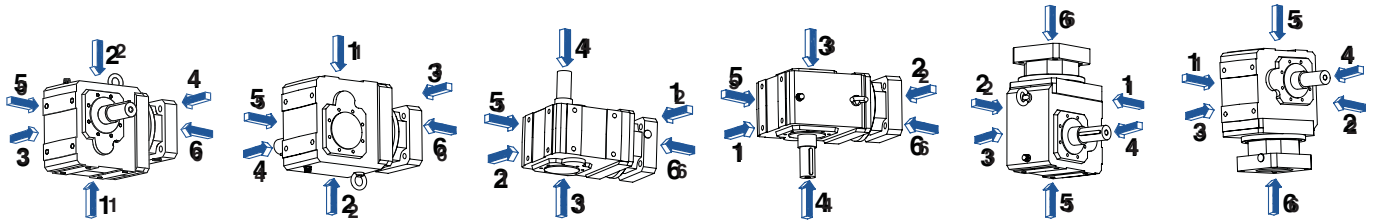
Gearhead Configurations



Style AN Hollow Output | Style VN Solid Output | Style AF Hollow Output | Style VF Solid Output | Style AG Hollow Output | Style VG Solid Output | Style WG Bushing Output

Mounting Positions *(Units shown with shaft on Side 4.)*

EL1 EL2 EL3 EL4 EL5 EL6



Part No. Explanation with OPTIONS and REQUIRED INFORMATION

K 6 1 3 A GD 0580 MT40 B

This designation is only required when ordering a: **B** – Beverage Duty, **F** – Food Duty, **P** – Poultry Duty

TriAdapt® Motor Adapter Size: **MT10**, **MT20**, **MT30**, **MT40**

Nominal Ratio: (**0580** = 57.5:1)

HOUSING STYLE
"**F**" Housing Style – Flange Mounting ..... **SPECIFY IN A NOTE**: Flange on Side 3 or Side 4
"**G**" Housing Style – Tapped Holes
"**GD**" G Housing Style with Torque Arm Bracket .... **SPECIFY IN A NOTE**: Torque Arm Bracket on Side 1 or Side 5
"**N**" Housing Style – Foot Mount ..... **SPECIFY IN A NOTE**: Feet on Side 1 or Side 5

OUTPUT STYLE
"**V**" Solid Output ..... **SPECIFY IN A NOTE**: Standard or Stainless Steel[1)]
..... Imperial or Metric[1)]
..... Single or Double
..... IF Single: Shaft on Side 3 or Side 4
"**A**" Hollow Output ..... **SPECIFY IN A NOTE**: Standard or Stainless Steel[1)]
..... Imperial or Metric[1)]
"**W**" Wobble Free Bushing ..... **SPECIFY IN A NOTE**: Bushing Part Number
..... Single or Double Bushing
..... IF Single: Side 5 or Side 6

[1)] Not available in all sizes.

No. of Stages (**3** = 3 Stage, determined by ratio)

Design Generation

Unit Size No.

Right Angle Helical/Bevel

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Mounting Position – EL1 EL2 EL3 EL4 EL5 EL6
Motor – Motor Manufacturer and Model Number
Paint – Black (Standard)..... White ..... Stainless
Package Option – Beverge Duty ..... Food Duty ..... Poultry Duty
Backlash Option – Standard or Reduced Backlash

Bushing Part No. Explanation

W F 5 – 107

Output Bore in inches – **107** = $1^{7}/_{16}$
Base Module Size example: K**5**13/K**5**14)
Wobble **F**ree Single Side Bushing

W F B 5 – 107

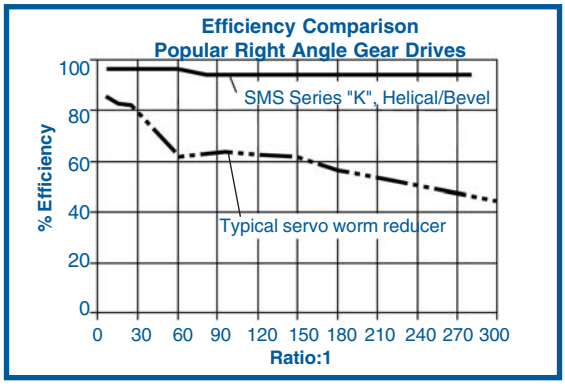
Output Bore in inches – **107** = $1^{7}/_{16}$
Base Module Size example: K**5**13/K**5**14)
Wobble **F**ree Double Side

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

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

Performance Specifications:

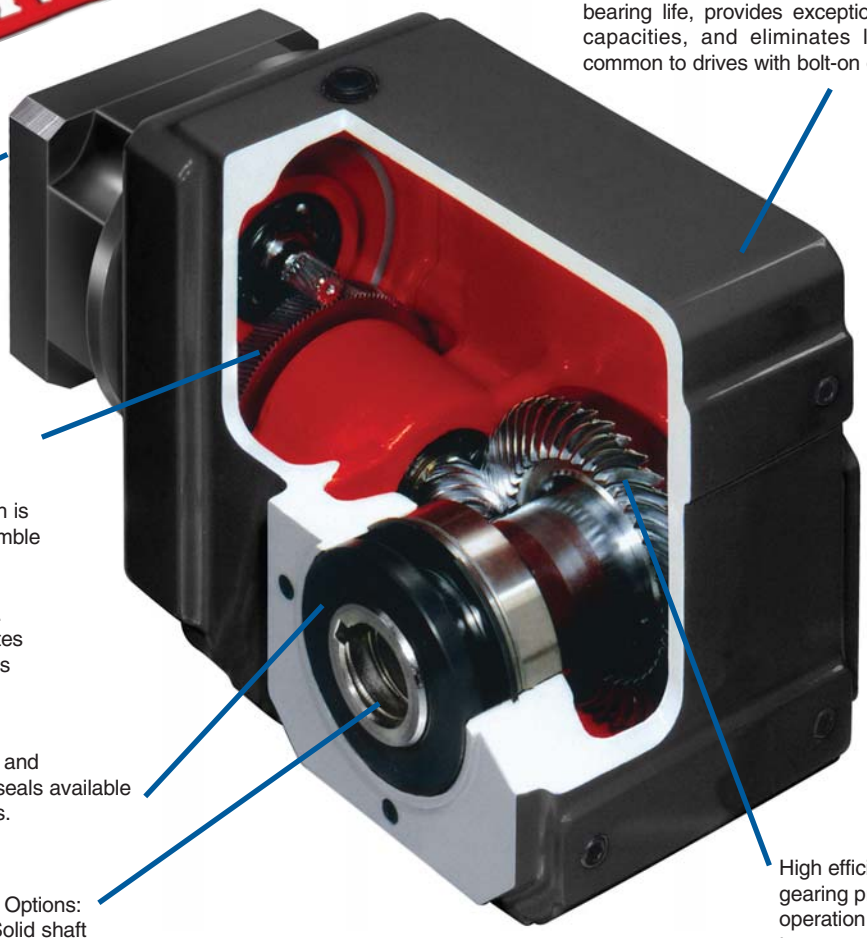
- Input RPM up to 4,500 RPM
- Nominal output torque–109 to 106,000 in. lbs. (12-11,900Nm)
- Reducer ratios from 4:1 to 381:1
- 5 year limited warranty (2 years on bearings, seals, etc.)
- Ambient temperature – 0°C to +40°C (104°F)
- Noise level – as low as 53 dB(A)
- Maintenance free
- Can be back driven



STANDARD 3-DAY DELIVERY

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

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



High quality helical gearing is case hardened to 58-62 Rockwell C. Precision finished for low noise and long service life. When the backlash is set by our manufacturing and assemble methods it remains consistent throughout the life of the reducer without further need for adjustment.
Standard backlash is ≤12 arc minutes
Reduced backlash is ≤6 arc minutes

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

Output Options:
- Solid shaft
- Hollow
- Backlash free, wobble free bushings

Also available in metric or stainless shaft or quill

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

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

Also available in washdown, poultry duty, food duty, and beverage duty.
* Maximum 10 working days for custom motor plates.

See web site for drawings.

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

Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K102 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 53 dB(A) [4]**	
K102_0040 MT10	4.0	4/1	1.4	12/6	25	2.8	3,300	2,800	3,800	368	42	368	42	460	52
K102_0040 MT20	4.0	4/1	2.0	12/6	25	2.9	3,300	2,800	3,800	434	49	693	78	866	98
K102_0056 MT10	5.6	1520/273	1.3	12/6	38	4.3	3,300	2,800	3,800	484	55	512	58	640	72
K102_0056 MT20	5.6	1520/273	1.9	12/6	39	4.5	3,300	2,800	3,800	484	55	965	109	1,206	136
K102_0060 MT10	6.0	6/1	1.1	12/6	30	3.4	3,300	2,800	3,800	496	56	523	59	654	74
K102_0060 MT20	6.0	6/1	1.7	12/6	30	3.4	3,300	2,800	3,800	496	56	985	111	1,231	139
K102_0066 MT10	6.6	299/45	1.0	12/6	31	3.5	3,900	3,400	4,400	486	55	570	64	712	80
K102_0066 MT20	6.6	299/45	1.6	12/6	31	3.5	3,500	3,400	4,400	486	55	1,025	116	1,340	151
K102_0083 MT10	8.3	1911/230	0.9	12/6	33	3.7	3,900	3,400	4,400	523	59	684	77	855	97
K102_0083 MT20	8.3	1911/230	1.5	12/6	33	3.7	3,500	3,400	4,400	523	59	1,104	125	1,611	182
K102_0092 MT10	9.2	1748/189	0.9	12/6	46	5.2	3,900	3,400	4,400	542	61	793	90	991	112
K102_0092 MT20	9.2	1748/189	1.5	12/6	46	5.2	3,500	3,400	4,400	542	61	1,145	129	1,866	211
K102_0100 MT10	10.1	507/50	0.8	12/6	34	3.8	4,000	3,800	4,500	555	63	806	91	1,008	114
K102_0100 MT20	10.1	507/50	1.4	12/6	34	3.8	3,500	3,500	4,500	555	63	1,107	125	1,898	214
K102_0115 MT10	11.6	266/23	0.8	12/6	48	5.4	3,900	3,400	4,400	584	66	952	108	1,190	134
K102_0115 MT20	11.6	266/23	1.4	12/6	48	5.4	3,500	3,400	4,400	584	66	1,196	135	2,126	240
K102_0125 MT10	12.6	429/34	0.7	12/6	34	3.9	4,000	3,800	4,500	596	67	963	109	1,204	136
K102_0125 MT20	12.6	429/34	1.3	12/6	35	3.9	3,500	3,500	4,500	596	67	1,107	125	1,949	220
K102_0140 MT10	14.1	494/35	0.8	12/6	49	5.5	4,000	3,800	4,500	619	70	1,122	127	1,403	158
K102_0140 MT20	14.1	494/35	1.4	12/6	49	5.6	3,500	3,500	4,500	619	70	1,196	135	2,126	240
K102_0165 MT10	16.7	117/7	0.7	12/6	35	4.0	4,000	4,000	4,500	655	74	1,107	125	1,520	172
K102_0165 MT20	16.7	117/7	1.3	12/6	35	4.0	3,500	3,500	4,500	655	74	1,107	125	1,520	172
K102_0175 MT10	17.6	2090/119	0.7	12/6	50	5.6	4,000	3,800	4,500	666	75	1,196	135	1,676	189
K102_0175 MT20	17.6	2090/119	1.3	12/6	50	5.6	3,500	3,500	4,500	666	75	1,196	135	2,126	240
K102_0200 MT10	20.2	403/20	0.7	12/6	35	4.0	4,000	4,000	4,500	697	79	1,107	125	1,763	199
K102_0200 MT20	20.2	403/20	1.3	12/6	35	4.0	3,500	3,500	4,500	697	79	1,107	125	1,763	199
K102_0230 MT10	23.3	1140/49	0.7	12/6	51	5.7	4,000	4,000	4,500	731	83	1,196	135	2,115	239
K102_0230 MT20	23.3	1140/49	1.3	12/6	51	5.7	3,500	3,500	4,500	731	83	1,196	135	2,115	239
K102_0250 MT10	25.2	1261/50	0.6	12/6	36	4.0	4,000	4,000	4,500	751	85	1,021	115	1,701	192
K102_0250 MT20	25.2	1261/50	1.2	12/6	36	4.0	3,500	3,500	4,500	751	85	1,021	115	1,701	192
K102_0280 MT10	28.0	589/21	0.7	12/6	51	5.7	4,000	4,000	4,500	778	88	1,196	135	2,126	240
K102_0280 MT20	28.0	589/21	1.3	12/6	51	5.8	3,500	3,500	4,500	778	88	1,196	135	2,126	240
K102_0340 MT10	33.7	4719/140	0.6	12/6	36	4.0	4,000	4,000	4,500	647	73	776	88	1,293	146
K102_0350 MT10	35.1	3686/105	0.6	12/6	51	5.8	4,000	4,000	4,500	839	95	1,196	135	2,126	240
K102_0350 MT20	35.1	3686/105	1.2	12/6	51	5.8	3,500	3,500	4,500	839	95	1,196	135	2,126	240
K102_0400 MT10	40.3	403/10	0.6	12/6	36	4.1	4,000	4,000	4,500	544	61	653	74	846	96
K102_0470 MT10	46.9	2299/49	0.6	12/6	51	5.8	4,000	4,000	4,500	900	102	1,080	122	1,800	203
K102_0500 MT10	50.3	5031/100	0.6	12/6	36	4.1	4,000	4,000	4,500	442	50	531	60	885	100
K102_0560 MT10	56.1	1178/21	0.6	12/6	51	5.8	4,000	4,000	4,500	758	86	909	103	1,178	133
K102_0700 MT10	70.0	2451/35	0.6	12/6	51	5.8	4,000	4,000	4,500	616	70	739	83	1,232	139

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

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

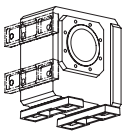
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$		C_2										
			J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K202 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 53 dB(A)** [4]	
K202_0040 MT10	4.0	4/1	3.1	10/5	33	3.8	3,000	2,600	3,500	393	44	393	44	491	55
K202_0040 MT20	4.0	4/1	3.7	10/5	35	3.9	3,000	2,600	3,500	799	90	1,512	171	2,170	245
K202_0040 MT30	4.0	4/1	8.5	10/5	41	4.7	3,000	2,600	3,500	799	90	1,546	174	2,170	245
K202_0044 MT10	4.4	48/11	2.7	10/5	36	4.1	3,000	2,600	3,500	421	48	421	48	526	59
K202_0044 MT20	4.4	48/11	3.3	10/5	37	4.2	3,000	2,600	3,500	823	93	1,591	180	2,327	263
K202_0044 MT30	4.4	48/11	8.1	10/5	43	4.9	3,000	2,600	3,500	823	93	1,591	180	2,327	263
K202_0052 MT20	5.2	2107/407	2.9	10/5	42	4.7	3,000	2,600	3,500	871	98	1,684	190	2,724	308
K202_0052 MT30	5.2	2107/407	7.7	10/5	47	5.3	3,000	2,600	3,500	871	98	1,684	190	2,724	308
K202_0060 MT10	6.0	6/1	2.3	10/5	51	5.8	3,000	2,600	3,500	579	65	579	65	724	82
K202_0060 MT20	6.0	6/1	2.9	10/5	53	5.9	3,000	2,600	3,500	915	103	1,769	200	3,199	361
K202_0060 MT30	6.0	6/1	7.7	10/5	59	6.6	3,000	2,600	3,500	915	103	1,769	200	3,199	361
K202_0067 MT10	6.7	2279/341	1.7	10/5	46	5.2	3,500	3,100	4,000	609	69	609	69	761	86
K202_0067 MT20	6.7	2279/341	2.3	10/5	47	5.3	3,500	3,100	4,000	901	102	1,834	207	3,364	380
K202_0067 MT30	6.7	2279/341	7.1	10/5	51	5.8	3,500	3,100	4,000	901	102	1,834	207	3,364	380
K202_0071 MT20	7.1	2107/296	2.6	10/5	57	6.4	3,000	2,600	3,500	969	109	1,873	211	3,543	400
K202_0071 MT30	7.1	2107/296	7.4	10/5	62	7.0	3,000	2,600	3,500	969	109	1,873	211	3,543	400
K202_0084 MT10	8.4	2494/297	1.4	10/5	50	5.7	3,500	3,100	4,000	739	83	739	83	924	104
K202_0084 MT20	8.4	2494/297	2.0	10/5	51	5.7	3,500	3,100	4,000	972	110	1,949	220	3,543	400
K202_0084 MT30	8.4	2494/297	6.8	10/5	54	6.1	3,500	3,100	4,000	972	110	1,949	220	3,543	400
K202_0092 MT10	9.2	2279/248	1.5	10/5	61	6.9	3,500	3,100	4,000	837	95	837	95	1,046	118
K202_0092 MT20	9.2	2279/248	2.1	10/5	62	7.0	3,500	3,100	4,000	1,002	113	1,949	220	3,543	400
K202_0092 MT30	9.2	2279/248	6.9	10/5	66	7.4	3,500	3,100	4,000	1,002	113	1,949	220	3,543	400
K202_0100 MT10	10.1	2881/286	1.2	10/5	52	5.9	3,900	3,500	4,400	855	97	855	97	1,069	121
K202_0100 MT20	10.1	2881/286	1.8	10/5	53	6.0	3,500	3,500	4,400	996	112	1,949	220	3,543	400
K202_0100 MT30	10.1	2881/286	6.6	10/5	55	6.2	3,500	3,500	4,000	996	112	1,949	220	3,543	400
K202_0115 MT10	11.5	1247/108	1.3	10/5	65	7.3	3,500	3,100	4,000	1,016	115	1,016	115	1,270	143
K202_0115 MT20	11.5	1247/108	1.9	10/5	66	7.4	3,500	3,100	4,000	1,081	122	1,949	220	3,543	400
K202_0115 MT30	11.5	1247/108	6.7	10/5	68	7.7	3,500	3,100	4,000	1,081	122	1,949	220	3,543	400
K202_0125 MT10	12.7	559/44	1.0	10/5	55	6.2	3,900	3,500	4,400	1,037	117	1,037	117	1,297	146
K202_0125 MT20	12.7	559/44	1.6	10/5	55	6.2	3,500	3,500	4,400	1,076	122	1,949	220	3,543	400
K202_0125 MT30	12.7	559/44	6.4	10/5	56	6.4	3,500	3,500	4,000	1,076	122	1,949	220	3,543	400
K202_0140 MT10	13.9	2881/208	1.1	10/5	67	7.6	3,900	3,500	4,400	1,108	125	1,176	133	1,470	166
K202_0140 MT20	13.9	2881/208	1.7	10/5	67	7.6	3,500	3,500	4,400	1,108	125	1,949	220	3,543	400
K202_0140 MT30	13.9	2881/208	6.5	10/5	69	7.8	3,500	3,500	4,000	1,108	125	1,949	220	3,543	400
K202_0170 MT10	16.9	2967/176	0.9	10/5	56	6.4	4,000	3,900	4,500	1,173	132	1,302	147	1,627	184
K202_0170 MT20	16.9	2967/176	1.5	10/5	57	6.4	3,500	3,500	4,500	1,173	132	1,949	220	3,543	400
K202_0170 MT30	16.9	2967/176	6.3	10/5	57	6.5	3,500	3,500	4,000	1,173	132	1,949	220	3,543	400
K202_0175 MT10	17.5	559/32	1.0	10/5	69	7.8	3,900	3,500	4,400	1,197	135	1,426	161	1,783	201
K202_0175 MT20	17.5	559/32	1.6	10/5	69	7.8	3,500	3,500	4,400	1,197	135	1,949	220	3,543	400
K202_0175 MT30	17.5	559/32	6.4	10/5	70	7.9	3,500	3,500	4,000	1,197	135	1,949	220	3,543	400
K202_0200 MT10	20.3	1118/55	0.8	10/5	57	6.4	4,000	3,900	4,500	1,248	141	1,504	170	1,880	212
K202_0200 MT20	20.3	1118/55	1.4	10/5	57	6.5	3,500	3,500	4,500	1,248	141	1,949	220	3,541	400
K202_0200 MT30	20.3	1118/55	6.2	10/5	58	6.5	3,500	3,500	4,000	1,248	141	1,949	220	3,541	400

Motor Shaft

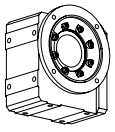
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

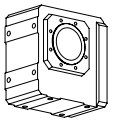
N Foot Mounted



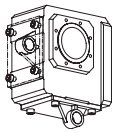
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.

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

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K202 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 53 dB(A) [4]**	
K202_0230 MT10	23.2	2967/128	0.8	10/5	70	7.9	4,000	3,900	4,500	1,304	147	1,790	202	2,237	253
K202_0230 MT20	23.2	2967/128	1.4	10/5	70	7.9	3,500	3,500	4,500	1,304	147	1,949	220	3,543	400
K202_0230 MT30	23.2	2967/128	6.2	10/5	71	8.0	3,500	3,500	4,000	1,304	147	1,949	220	3,543	400
K202_0250 MT10	25.1	1935/77	0.7	10/5	58	6.5	4,000	3,900	4,500	1,340	151	1,775	200	2,219	250
K202_0250 MT20	25.1	1935/77	1.3	10/5	58	6.5	3,500	3,500	4,500	1,340	151	1,949	220	3,543	400
K202_0250 MT30	25.1	1935/77	6.1	10/5	58	6.6	3,500	3,500	4,000	1,340	151	1,949	220	3,543	400
K202_0280 MT10	28.0	559/20	0.8	10/5	71	8.0	4,000	3,900	4,500	1,388	157	1,949	220	2,586	292
K202_0280 MT20	28.0	559/20	1.4	10/5	71	8.0	3,500	3,500	4,500	1,388	157	1,949	220	3,543	400
K202_0280 MT30	28.0	559/20	6.2	10/5	71	8.1	3,500	3,500	4,000	1,388	157	1,949	220	3,543	400
K202_0340 MT10	33.6	1849/55	0.7	10/5	58	6.6	4,000	3,900	4,500	1,364	154	1,637	185	2,729	308
K202_0340 MT20	33.6	1849/55	1.3	10/5	58	6.6	3,500	3,500	4,500	1,364	154	1,637	185	2,729	308
K202_0350 MT10	34.6	1935/56	0.7	10/5	71	8.0	4,000	3,900	4,500	1,490	168	1,949	220	3,051	344
K202_0350 MT20	34.6	1935/56	1.3	10/5	71	8.1	3,500	3,500	4,500	1,490	168	1,949	220	3,543	400
K202_0350 MT30	34.6	1935/56	6.1	10/5	72	8.1	3,500	3,500	4,000	1,490	168	1,949	220	3,543	400
K202_0400 MT10	40.4	1333/33	0.7	10/5	58	6.6	4,000	3,900	4,500	1,023	116	1,228	139	1,690	191
K202_0460 MT10	46.2	1849/40	0.7	10/5	72	8.1	4,000	3,900	4,500	1,642	185	1,949	220	3,543	400
K202_0460 MT20	46.2	1849/40	1.3	10/5	72	8.1	3,500	3,500	4,500	1,642	185	1,949	220	3,543	400
K202_0500 MT10	50.5	6665/132	0.6	10/5	58	6.6	4,000	3,900	4,500	853	96	1,023	116	1,705	193
K202_0560 MT10	55.5	1333/24	0.7	10/5	72	8.1	4,000	3,900	4,500	1,407	159	1,688	191	2,323	262
K202_0690 MT10	69.4	6665/96	0.6	10/5	72	8.1	4,000	3,900	4,500	1,172	132	1,407	159	2,345	265
K203 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 53 dB(A) [4]**	
K203_0390 MT10	39.5	135407/3432	0.7	10/6	58	6.6	4,000	3,900	4,500	1,431	162	1,431	162	1,788	202
K203_0450 MT10	45.2	58609/1296	0.7	10/6	72	8.1	4,000	3,900	4,500	1,630	184	1,640	185	2,050	231
K203_0500 MT10	49.8	26273/528	0.7	10/6	58	6.6	4,000	3,900	4,500	1,683	190	1,804	204	2,256	255
K203_0540 MT10	54.3	135407/2496	0.7	10/6	72	8.1	4,000	3,900	4,500	1,732	195	1,949	220	2,459	278
K203_0660 MT10	66.0	46483/704	0.7	10/6	59	6.6	4,000	3,900	4,500	1,772	200	1,949	220	2,993	338
K203_0680 MT10	68.4	26273/384	0.7	10/6	72	8.1	4,000	3,900	4,500	1,772	200	1,949	220	3,101	350
K203_0800 MT10	79.6	26273/330	0.7	10/6	59	6.6	4,000	3,900	4,500	1,772	200	1,949	220	3,540	400
K203_0910 MT10	90.8	46483/512	0.7	10/6	72	8.1	4,000	3,900	4,500	1,772	200	1,949	220	3,543	400
K203_1090 MT10	109.5	26273/240	0.7	10/6	72	8.1	4,000	3,900	4,500	1,772	200	1,949	220	3,543	400
K203_1350 MT10	135.3	30315/224	0.7	10/6	72	8.1	4,000	3,900	4,500	1,772	200	1,949	220	3,543	400
K203_1810 MT10	181.0	86903/480	0.7	10/6	72	8.1	4,000	3,900	4,500	1,772	200	1,949	220	3,543	400
K203_2180 MT10	217.5	62651/288	0.6	10/6	72	8.1	4,000	3,900	4,500	1,407	159	1,688	191	2,323	262
K203_2720 MT10	271.9	313255/1152	0.6	10/6	72	8.1	4,000	3,900	4,500	1,172	132	1,407	159	2,345	265

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

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

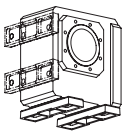
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$		C_2										
			J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K302 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 53 dB(A)** [4]	
K302_0040 MT20	4.0	4/1	6.4	10/4	40	4.5	2,700	2,300	3,200	1,375	155	1,512	171	2,238	253
K302_0040 MT30	4.0	4/1	11.2	10/4	49	5.5	2,700	2,300	3,200	1,450	164	2,707	306	5,772	652
K302_0044 MT20	4.4	48/11	5.7	10/4	43	4.9	2,700	2,300	3,200	1,493	168	1,650	186	2,421	273
K302_0044 MT30	4.4	48/11	10.5	10/4	52	5.8	2,700	2,300	3,200	1,493	168	2,787	315	6,201	700
K302_0054 MT20	5.4	43/8	4.5	10/4	51	5.7	2,700	2,300	3,200	1,600	181	2,032	229	2,884	326
K302_0054 MT30	5.4	43/8	9.3	10/4	58	6.5	2,700	2,300	3,200	1,600	181	2,307	260	2,884	326
K302_0060 MT20	6.0	6/1	4.8	10/4	59	6.7	2,700	2,300	3,200	1,660	187	2,268	256	3,328	376
K302_0060 MT30	6.0	6/1	9.6	10/4	67	7.6	2,700	2,300	3,200	1,660	187	3,099	350	6,201	700
K302_0067 MT20	6.7	2150/319	3.5	10/4	57	6.5	3,200	2,800	3,700	1,630	184	2,548	288	3,515	397
K302_0067 MT30	6.7	2150/319	8.3	10/4	63	7.1	3,200	2,800	3,700	1,630	184	2,812	317	3,515	397
K302_0074 MT20	7.4	473/64	3.9	10/4	66	7.5	2,700	2,300	3,200	1,779	201	2,794	315	3,965	448
K302_0074 MT30	7.4	473/64	8.7	10/4	73	8.2	2,700	2,300	3,200	1,779	201	3,172	358	3,965	448
K302_0084 MT20	8.4	2322/275	2.8	10/4	63	7.1	3,200	2,800	3,700	1,757	198	3,192	360	4,244	479
K302_0084 MT30	8.4	2322/275	7.6	10/4	67	7.5	3,200	2,800	3,700	1,757	198	3,395	383	4,244	479
K302_0093 MT20	9.3	1075/116	3.2	10/4	72	8.2	3,200	2,800	3,700	1,813	205	3,410	385	4,833	546
K302_0093 MT30	9.3	1075/116	8.0	10/4	77	8.7	3,200	2,800	3,700	1,813	205	3,410	385	4,833	546
K302_0100 MT20	10.1	3010/297	2.4	10/4	66	7.4	3,500	3,100	4,000	1,813	205	3,410	385	4,911	554
K302_0100 MT30	10.1	3010/297	7.2	10/4	69	7.8	3,500	3,100	4,000	1,813	205	3,410	385	4,911	554
K302_0115 MT20	11.6	1161/100	2.6	10/4	77	8.6	3,200	2,800	3,700	1,954	221	3,410	385	5,835	659
K302_0115 MT30	11.6	1161/100	7.4	10/4	80	9.0	3,200	2,800	3,700	1,954	221	3,410	385	5,835	659
K302_0125 MT10	12.6	3182/253	1.5	10/4	68	7.7	3,500	3,100	4,000	1,059	120	1,059	120	1,324	150
K302_0125 MT20	12.6	3182/253	2.1	10/4	69	7.8	3,500	3,100	4,000	1,948	220	3,410	385	5,854	661
K302_0125 MT30	12.6	3182/253	6.9	10/4	71	8.0	3,500	3,100	4,000	1,948	220	3,410	385	5,854	661
K302_0140 MT20	13.9	1505/108	2.3	10/4	79	8.9	3,500	3,100	4,000	2,016	228	3,410	385	6,201	700
K302_0140 MT30	13.9	1505/108	7.1	10/4	81	9.2	3,500	3,100	4,000	2,016	228	3,410	385	6,201	700
K302_0170 MT10	16.9	559/33	1.1	10/4	71	8.0	3,800	3,500	4,300	1,342	152	1,342	152	1,678	189
K302_0170 MT20	16.9	559/33	1.7	10/4	71	8.1	3,500	3,500	4,300	2,093	236	3,410	385	6,201	700
K302_0170 MT30	16.9	559/33	6.5	10/4	73	8.2	3,500	3,500	4,000	2,093	236	3,410	385	6,201	700
K302_0175 MT10	17.3	1591/92	1.4	10/4	81	9.1	3,500	3,100	4,000	1,457	164	1,457	164	1,821	206
K302_0175 MT20	17.3	1591/92	2.0	10/4	81	9.2	3,500	3,100	4,000	2,166	245	3,410	385	6,201	700
K302_0175 MT30	17.3	1591/92	6.8	10/4	83	9.4	3,500	3,100	4,000	2,166	245	3,410	385	6,201	700
K302_0200 MT10	20.3	3569/176	1.0	10/4	72	8.1	3,800	3,500	4,3000	1,555	176	1,555	176	1,943	219
K302_0200 MT20	20.3	3569/176	1.6	10/4	72	8.2	3,500	3,500	4,300	2,222	251	3,410	385	6,201	700
K302_0200 MT30	20.3	3569/176	6.4	10/4	73	8.3	3,500	3,500	4,000	2,222	251	3,410	385	6,201	700
K302_0230 MT10	23.3	559/24	1.1	10/4	83	9.4	3,800	3,500	4,300	1,845	208	1,845	208	2,307	260
K302_0230 MT20	23.3	559/24	1.7	10/4	83	9.4	3,500	3,500	4,300	2,328	263	3,410	385	6,201	700
K302_0230 MT30	23.3	559/24	6.5	10/4	84	9.5	3,500	3,500	4,000	2,328	263	3,410	385	6,201	700
K302_0250 MT10	25.3	3612/143	0.9	10/4	73	8.2	3,800	3,500	4,300	1,839	208	1,839	208	2,298	259
K302_0250 MT20	25.3	3612/143	1.5	10/4	73	8.3	3,500	3,500	4,300	2,391	270	3,410	385	4,328	489
K302_0250 MT30	25.3	3612/143	6.3	10/4	74	8.3	3,500	3,500	4,000	2,391	270	3,410	385	4,328	489
K302_0280 MT10	27.9	3569/128	1.0	10/4	84	9.4	3,800	3,500	4,300	2,138	241	2,138	241	2,672	302
K302_0280 MT20	27.9	3569/128	1.6	10/4	84	9.5	3,500	3,500	4,300	2,471	279	3,410	385	6,201	700
K302_0280 MT30	27.9	3569/128	6.4	10/4	85	9.5	3,500	3,500	4,000	2,471	279	3,410	385	6,201	700

Motor Shaft

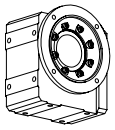
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

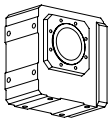
N Foot Mounted



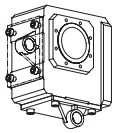
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.

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

Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K302 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 53 dB(A) [4]**	
K302_0340 MT10	33.6	1849/55	0.8	10/4	74	8.3	3,800	3,500	4,300	2,066	233	2,299	260	2,874	324
K302_0340 MT20	33.6	1849/55	1.4	10/4	74	8.3	3,500	3,500	4,300	2,217	250	2,660	300	4,434	501
K302_0340 MT30	33.6	1849/55	6.2	10/4	74	8.4	3,500	3,500	4,000	2,217	250	2,660	300	4,434	501
K302_0350 MT10	34.7	903/26	0.9	10/4	84	9.5	3,800	3,500	4,300	2,528	285	2,528	285	3,160	357
K302_0350 MT20	34.7	903/26	1.5	10/4	84	9.5	3,500	3,500	4,300	2,659	300	3,410	385	5,951	672
K302_0350 MT30	34.7	903/26	6.3	10/4	85	9.6	3,500	3,500	4,000	2,659	300	3,410	385	5,951	672
K302_0410 MT10	40.5	4902/121	0.7	10/4	74	8.4	3,800	3,500	4,300	1,705	193	2,046	231	3,334	376
K302_0410 MT20	40.5	4902/121	1.3	10/4	74	8.4	3,500	3,500	4,300	1,705	193	2,046	231	3,334	376
K302_0460 MT10	46.2	1849/40	0.8	10/4	85	9.6	3,800	3,500	4,300	2,841	321	3,162	357	3,952	446
K302_0460 MT20	46.2	1849/40	1.4	10/4	85	9.6	3,500	3,500	4,300	2,925	330	3,410	385	6,097	688
K302_0460 MT30	46.2	1849/40	6.2	10/4	85	9.6	3,500	3,500	4,000	2,925	330	3,410	385	6,097	688
K302_0500 MT10	50.5	6665/132	0.7	10/4	74	8.4	3,800	3,500	4,300	1,364	154	1,637	185	2,072	234
K302_0560 MT10	55.7	2451/44	0.7	10/4	85	9.6	3,800	3,500	4,300	2,345	265	2,814	318	4,584	517
K302_0560 MT20	55.7	2451/44	1.3	10/4	85	9.6	3,500	3,500	4,300	2,345	265	2,814	318	4,584	517
K302_0690 MT10	69.4	6665/96	0.7	10/4	85	9.6	3,800	3,500	4,300	1,876	212	2,251	254	2,849	322
K303 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 53 dB(A) [4]**	
K303_0330 MT20	32.6	44892/1375	1.5	10/5	74	8.3	3,500	3,500	4,300	2,605	294	3,394	383	4,243	479
K303_0360 MT20	35.8	215/6	1.5	10/5	85	9.5	3,500	3,500	4,300	2,687	303	3,410	385	4,833	546
K303_0390 MT20	39.2	34916/891	1.4	10/5	74	8.4	3,500	3,500	4,300	2,768	313	3,410	385	4,910	554
K303_0450 MT20	44.9	11223/250	1.4	10/5	85	9.6	3,500	3,500	4,300	2,897	327	3,410	385	5,834	659
K303_0490 MT10	49.3	74777/1518	0.7	10/5	74	8.4	3,800	3,500	4,300	1,786	202	1,786	202	2,233	252
K303_0490 MT20	48.6	184556/3795	1.4	10/5	74	8.4	3,500	3,500	4,300	2,975	336	3,410	385	5,854	661
K303_0540 MT20	53.9	8729/162	1.4	10/5	85	9.6	3,500	3,500	4,300	3,078	348	3,410	385	6,201	700
K303_0550 MT10	54.6	70735/1296	0.7	10/5	85	9.6	3,800	3,500	4,300	1,979	223	1,979	223	2,474	279
K303_0650 MT20	65.5	32422/495	1.4	10/5	75	8.4	3,500	3,500	4,300	3,100	350	3,410	385	6,201	700
K303_0660 MT10	66.3	26273/396	0.7	10/5	75	8.4	3,800	3,500	4,300	2,150	243	2,406	272	3,007	340
K303_0670 MT20	66.9	46139/690	1.4	10/5	85	9.6	3,500	3,500	4,300	3,100	350	3,410	385	6,201	700
K303_0680 MT10	67.7	74777/1104	0.7	10/5	85	9.6	3,800	3,500	4,300	2,456	277	2,456	277	3,070	347
K303_0780 MT20	78.4	103501/1320	1.4	10/5	75	8.4	3,500	3,500	4,300	3,100	350	3,410	385	6,201	700
K303_0790 MT10	79.4	167743/2112	0.7	10/5	75	8.4	3,800	3,500	4,300	2,287	258	2,880	325	3,600	406
K303_0900 MT20	90.1	16211/180	1.4	10/5	85	9.6	3,500	3,500	4,300	3,100	350	3,410	385	6,201	700
K303_0910 MT10	91.2	26273/288	0.7	10/5	85	9.6	3,800	3,500	4,300	2,956	334	3,308	373	4,135	467
K303_1080 MT20	107.8	103501/960	1.4	10/5	85	9.6	3,500	3,500	4,300	3,100	350	3,410	385	6,201	700
K303_1090 MT10	109.2	167743/1536	0.7	10/5	85	9.6	3,800	3,500	4,300	3,100	350	3,410	385	4,950	559
K303_1340 MT20	134.3	8729/65	1.4	10/5	85	9.7	3,500	3,500	4,300	3,100	350	3,410	385	5,950	672
K303_1360 MT10	136.0	14147/104	0.7	10/5	85	9.7	3,800	3,500	4,300	3,100	350	3,410	385	5,950	672
K303_1790 MT20	178.7	53621/300	1.4	10/5	86	9.7	3,500	3,500	4,300	3,048	344	3,410	385	6,097	688
K303_1810 MT10	181.0	86903/480	0.7	10/5	86	9.7	3,800	3,500	4,300	3,048	344	3,410	385	6,097	688
K303_2180 MT10	218.2	38399/176	0.7	10/5	86	9.7	3,800	3,500	4,300	2,345	265	2,814	318	4,583	517
K303_2720 MT10	271.9	313255/1152	0.7	10/5	86	9.7	3,800	3,500	4,300	1,876	212	2,251	254	2,849	322

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

See web site for drawings.

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

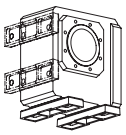
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$		C_2										
			J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K402 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 51 dB(A)** [4]	
K402_0040 MT20	4.0	4/1	11.4	10/4	55	6.2	2,600	2,200	3,100	1,375	155	1,512	171	2,311	261
K402_0040 MT30	4.0	4/1	16.2	10/4	72	8.2	2,600	2,200	3,100	2,203	249	3,592	405	5,960	673
K402_0040 MT40	4.0	4/1	20.2	10/4	99	11.2	2,600	2,200	3,100	2,203	249	4,062	459	5,960	673
K402_0044 MT20	4.4	48/11	10.1	10/4	61	6.9	2,600	2,200	3,100	1,500	169	1,650	186	2,503	283
K402_0044 MT30	4.4	48/11	14.9	10/4	79	8.9	2,600	2,200	3,100	2,268	256	3,918	442	6,456	729
K402_0044 MT40	4.4	48/11	18.9	10/4	105	11.8	2,600	2,200	3,100	2,268	256	4,182	472	6,456	729
K402_0054 MT20	5.4	1849/341	7.5	10/4	77	8.7	2,600	2,200	3,100	1,863	210	2,050	231	3,021	341
K402_0054 MT30	5.4	1849/341	12.3	10/4	95	10.7	2,600	2,200	3,100	2,438	275	4,496	508	7,791	880
K402_0054 MT40	5.4	1849/341	16.3	10/4	117	13.2	2,600	2,200	3,100	2,438	275	4,496	508	7,791	880
K402_0060 MT20	6.0	6/1	8.4	10/4	92	10.4	2,600	2,200	3,100	2,062	233	2,268	256	3,442	389
K402_0060 MT30	6.0	6/1	13.2	10/4	113	12.8	2,600	2,200	3,100	2,522	285	4,650	525	8,877	1,002
K402_0060 MT40	6.0	6/1	17.2	10/4	139	15.7	2,600	2,200	3,100	2,522	285	4,650	525	8,877	1,002
K402_0067 MT20	6.7	215/32	5.6	10/4	93	10.5	3,000	2,600	3,500	2,309	261	2,540	287	3,605	407
K402_0067 MT30	6.7	215/32	10.4	10/4	108	12.2	3,000	2,600	3,500	2,497	282	4,829	545	9,298	1,050
K402_0067 MT40	6.7	215/32	14.4	10/4	127	14.3	3,000	2,600	3,500	2,497	282	4,829	545	9,298	1,050
K402_0075 MT20	7.5	1849/248	6.4	10/4	111	12.5	2,600	2,200	3,100	2,563	289	2,819	318	4,154	469
K402_0075 MT30	7.5	1849/248	11.2	10/4	129	14.6	2,600	2,200	3,100	2,711	306	4,999	564	9,744	1,100
K402_0075 MT40	7.5	1849/248	15.2	10/4	150	17.0	2,600	2,200	3,100	2,711	306	4,999	564	9,744	1,100
K402_0084 MT20	8.4	645/77	4.3	10/4	107	12.1	3,000	2,600	3,500	2,687	303	3,167	358	4,347	491
K402_0084 MT30	8.4	645/77	9.1	10/4	120	13.6	3,000	2,600	3,500	2,687	303	5,197	587	9,744	1,100
K402_0084 MT40	8.4	645/77	13.1	10/4	134	15.1	3,000	2,600	3,500	2,687	303	5,197	587	9,744	1,100
K402_0092 MT20	9.2	2365/256	4.9	10/4	128	14.4	3,000	2,600	3,500	2,777	313	3,493	394	4,956	560
K402_0092 MT30	9.2	2365/256	9.7	10/4	143	16.1	3,000	2,600	3,500	2,777	313	5,315	600	9,744	1,100
K402_0092 MT40	9.2	2365/256	13.7	10/4	159	17.9	3,000	2,600	3,500	2,777	313	5,315	600	9,744	1,100
K402_0100 MT20	10.1	1333/132	3.5	10/4	118	13.3	3,400	3,000	3,900	2,743	310	3,818	431	5,042	569
K402_0100 MT30	10.1	1333/132	8.3	10/4	128	14.5	3,400	3,000	3,900	2,743	310	5,315	600	9,744	1,100
K402_0100 MT40	10.1	1333/132	12.3	10/4	138	15.6	3,000	3,000	3,500	2,743	310	5,315	600	9,744	1,100
K402_0115 MT20	11.5	645/56	3.9	10/4	141	16.0	3,000	2,600	3,500	2,988	337	4,354	492	5,977	675
K402_0115 MT30	11.5	645/56	8.7	10/4	153	17.3	3,000	2,600	3,500	2,988	337	5,315	600	9,744	1,100
K402_0115 MT40	11.5	645/56	12.7	10/4	164	18.6	3,000	2,600	3,500	2,988	337	5,315	600	9,744	1,100
K402_0125 MT20	12.7	2924/231	2.8	10/4	127	14.4	3,400	3,000	3,900	2,958	334	4,785	540	6,113	690
K402_0125 MT30	12.7	2924/231	7.6	10/4	135	15.2	3,400	3,000	3,900	2,958	334	5,315	600	9,744	1,100
K402_0125 MT40	12.7	2924/231	11.6	10/4	142	16.1	3,000	3,000	3,500	2,958	334	5,315	600	9,744	1,100
K402_0140 MT20	13.9	1333/96	3.2	10/4	151	17.0	3,400	3,000	3,900	3,051	344	5,249	593	6,933	783
K402_0140 MT30	13.9	1333/96	8.0	10/4	160	18.0	3,400	3,000	3,900	3,051	344	5,315	600	9,744	1,100
K402_0140 MT40	13.9	1333/96	12.0	10/4	168	19.0	3,000	3,000	3,500	3,051	344	5,315	600	9,744	1,100
K402_0170 MT20	16.9	559/33	2.2	10/4	136	15.4	3,500	3,300	4,100	3,146	355	5,315	600	7,682	867
K402_0170 MT30	16.9	559/33	7.0	10/4	141	15.9	3,500	3,300	4,000	3,198	361	5,315	600	9,744	1,100
K402_0170 MT40	16.9	559/33	11.0	10/4	145	16.4	3,000	3,000	3,500	3,198	361	5,315	600	9,744	1,100
K402_0175 MT20	17.4	731/42	2.6	10/4	159	18.0	3,400	3,000	3,900	3,289	371	5,315	600	8,405	949
K402_0175 MT30	17.4	731/42	7.4	10/4	165	18.7	3,400	3,000	3,900	3,289	371	5,315	600	9,744	1,100
K402_0175 MT40	17.4	731/42	11.4	10/4	171	19.3	3,000	3,000	3,500	3,289	371	5,315	600	9,744	1,100

Motor Shaft

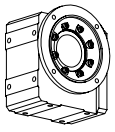
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

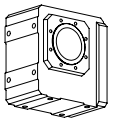
N Foot Mounted



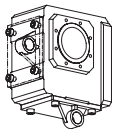
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.

See web site for drawings.

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

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K402 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 51 dB(A)** [4]	
K402_0200 MT20	20.2	1333/66	1.9	10/4	140	15.8	3,500	3,300	4,100	3,258	368	5,315	600	8,842	998
K402_0200 MT30	20.2	1333/66	6.7	10/4	143	16.2	3,500	3,300	4,000	3,391	383	5,315	600	8,842	998
K402_0200 MT40	20.2	1333/66	10.7	10/4	147	16.5	3,000	3,000	3,500	3,391	383	5,315	600	8,842	998
K402_0230 MT20	23.3	559/24	2.1	10/4	166	18.8	3,500	3,300	4,100	3,556	401	5,315	600	9,744	1,100
K402_0230 MT30	23.3	559/24	6.9	10/4	170	19.2	3,500	3,300	4,000	3,556	401	5,315	600	9,744	1,100
K402_0230 MT40	23.3	559/24	10.9	10/4	173	19.6	3,000	3,000	3,500	3,556	401	5,315	600	9,744	1,100
K402_0250 MT20	25.3	4171/165	1.7	10/4	143	16.2	3,500	3,300	4,100	3,353	379	5,315	600	8,868	1,001
K402_0250 MT30	25.3	4171/165	6.5	10/4	146	16.4	3,500	3,300	4,000	3,655	413	5,315	600	8,868	1,001
K402_0250 MT40	25.3	4171/165	10.5	10/4	148	16.7	3,000	3,000	3,500	3,655	413	5,315	600	8,868	1,001
K402_0280 MT20	27.8	1333/48	1.9	10/4	169	19.1	3,500	3,300	4,100	3,771	426	5,315	600	9,744	1,100
K402_0280 MT30	27.8	1333/48	6.7	10/4	172	19.4	3,500	3,300	4,000	3,771	426	5,315	600	9,744	1,100
K402_0280 MT40	27.8	1333/48	10.7	10/4	174	19.7	3,000	3,000	3,500	3,771	426	5,315	600	9,744	1,100
K402_0340 MT20	33.7	4816/143	1.5	10/4	146	16.5	3,500	3,300	4,100	3,445	389	4,134	467	5,620	634
K402_0340 MT30	33.7	4816/143	6.3	10/4	147	16.6	3,500	3,300	4,000	3,445	389	4,134	467	5,620	634
K402_0350 MT20	34.8	4171/120	1.7	10/4	172	19.4	3,500	3,300	4,100	4,064	459	5,315	600	9,744	1,100
K402_0350 MT30	34.8	4171/120	6.5	10/4	173	19.6	3,500	3,300	4,000	4,064	459	5,315	600	9,744	1,100
K402_0350 MT40	34.8	4171/120	10.5	10/4	175	19.7	3,000	3,000	3,500	4,064	459	5,315	600	9,744	1,100
K402_0410 MT20	40.5	4902/121	1.4	10/4	147	16.6	3,500	3,300	4,100	2,729	308	3,274	370	5,457	616
K402_0410 MT30	40.5	4902/121	6.2	10/4	148	16.7	3,500	3,300	4,000	2,729	308	3,274	370	5,457	616
K402_0460 MT20	46.3	602/13	1.5	10/4	174	19.6	3,500	3,300	4,100	4,472	505	5,315	600	7,728	872
K402_0460 MT30	46.3	602/13	6.3	10/4	175	19.7	3,500	3,300	4,000	4,472	505	5,315	600	7,728	872
K402_0500 MT20	50.4	5547/110	1.4	10/4	148	16.7	3,500	3,300	4,100	2,387	270	2,865	323	4,064	459
K402_0560 MT20	55.7	2451/44	1.4	10/4	174	19.7	3,500	3,300	4,100	3,752	424	4,502	508	7,504	847
K402_0560 MT30	55.7	2451/44	6.2	10/4	175	19.8	3,500	3,300	4,000	3,752	424	4,502	508	7,504	847
K402_0690 MT20	69.3	5547/80	1.3	10/4	175	19.8	3,500	3,300	4,100	3,283	371	3,939	445	5,588	631
K403 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 51 dB(A)** [4]	
K403_0320 MT20	32.4	2494/77	1.6	10/5	146	16.4	3,500	3,300	4,100	3,477	393	3,477	393	4,346	491
K403_0360 MT20	35.7	13717/384	1.6	10/5	172	19.4	3,500	3,300	4,100	3,965	448	3,965	448	4,956	560
K403_0390 MT20	39.0	38657/990	1.5	10/5	147	16.6	3,500	3,300	4,100	4,033	455	4,033	455	5,042	569
K403_0450 MT20	44.5	1247/28	1.5	10/5	173	19.6	3,500	3,300	4,100	4,414	498	4,781	540	5,976	675
K403_0490 MT20	48.9	169592/3465	1.5	10/5	148	16.7	3,500	3,300	4,100	4,555	514	4,890	552	6,112	690
K403_0540 MT20	53.7	38657/720	1.5	10/5	174	19.7	3,500	3,300	4,100	4,698	530	5,315	600	6,932	783
K403_0650 MT20	65.5	32422/495	1.4	10/5	148	16.8	3,500	3,300	4,100	4,872	550	5,315	600	7,681	867
K403_0660 MT10	66.3	26273/396	0.7	10/5	148	16.8	3,600	3,300	4,100	2,406	272	2,406	272	3,007	340
K403_0670 MT20	67.3	21199/315	1.4	10/5	175	19.8	3,500	3,300	4,100	4,872	550	5,315	600	8,404	949
K403_0680 MT10	68.2	34357/504	0.7	10/5	175	19.7	3,600	3,300	4,100	2,472	279	2,472	279	3,090	349
K403_0780 MT20	78.1	38657/495	1.4	10/5	149	16.8	3,500	3,300	4,100	4,872	550	5,315	600	8,842	998
K403_0790 MT10	79.1	62651/792	0.7	10/5	149	16.8	3,600	3,300	4,100	2,610	295	2,869	324	3,586	405
K403_0900 MT20	90.1	16211/180	1.4	10/5	176	19.8	3,500	3,300	4,100	4,872	550	5,315	600	9,744	1,100
K403_0910 MT10	91.2	26273/288	0.7	10/5	176	19.8	3,600	3,300	4,100	3,308	373	3,308	373	4,135	467

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

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

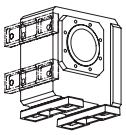
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K403 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 51 dB(A)** [4]	
K403_1070 MT20	107.4	38657/360	1.4	10/5	176	19.8	3,500	3,300	4,100	4,872	550	5,315	600	9,744	1,100
K403_1090 MT10	108.8	62651/576	0.7	10/5	176	19.8	3,600	3,300	4,100	3,588	405	3,944	445	4,930	557
K403_1340 MT20	134.4	120959/900	1.4	10/5	176	19.9	3,500	3,300	4,100	4,872	550	5,315	600	9,744	1,100
K403_1360 MT10	136.1	196037/1440	0.7	10/5	176	19.9	3,600	3,300	4,100	3,766	425	4,937	557	6,171	697
K403_1790 MT20	179.1	34916/195	1.4	10/5	176	19.9	3,500	3,300	4,100	4,737	535	5,315	600	7,727	872
K403_1810 MT10	181.4	14147/78	0.7	10/5	176	19.9	3,600	3,300	4,100	4,012	453	5,315	600	7,727	872
K403_2150 MT20	215.4	23693/110	1.4	10/5	176	19.9	3,500	3,300	4,100	3,752	424	4,502	508	7,504	847
K403_2180 MT10	218.2	38399/176	0.7	10/5	176	19.9	3,600	3,300	4,100	3,752	424	4,502	508	7,504	847
K403_2720 MT10	271.6	86903/320	0.7	10/5	176	19.9	3,600	3,300	4,100	3,283	371	3,939	445	5,587	631
K513 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [4]	
K513_0073 MT30	7.3	551/75	23.1	10/5	172	19.4	1,900	1,800	2,900	5,555	627	6,502	734	11,147	1,258
K513_0073 MT40	7.3	551/75	27.1	10/5	213	24.0	1,900	1,800	2,900	5,555	627	8,858	1,000	11,147	1,258
K513_0081 MT30	8.1	17081/2100	21.2	10/5	185	20.8	1,900	1,800	2,900	5,747	649	7,198	813	12,341	1,393
K513_0081 MT40	8.1	17081/2100	25.2	10/5	222	25.0	1,900	1,800	2,900	5,747	649	8,858	1,000	12,341	1,393
K513_0092 MT30	9.2	1421/155	18.2	10/5	198	22.3	1,900	1,800	2,900	5,981	675	8,113	916	13,494	1,523
K513_0092 MT40	9.2	1421/155	22.2	10/5	230	26.0	1,900	1,800	2,900	5,981	675	8,858	1,000	13,494	1,523
K513_0100 MT30	10.2	203/20	17.0	10/5	208	23.5	1,900	1,800	2,900	6,187	698	8,858	1,000	14,939	1,686
K513_0100 MT40	10.2	203/20	21.0	10/5	237	26.7	1,900	1,800	2,900	6,187	698	8,858	1,000	14,939	1,686
K513_0115 MT30	11.6	10759/930	14.5	10/5	220	24.8	2,300	2,200	3,300	6,064	685	8,858	1,000	15,944	1,800
K513_0115 MT40	11.6	10759/930	18.5	10/5	244	27.5	2,300	2,200	3,300	6,064	685	8,858	1,000	15,944	1,800
K513_0130 MT30	12.8	1537/120	13.7	10/5	228	25.7	2,300	2,200	3,300	6,273	708	8,858	1,000	15,944	1,800
K513_0130 MT40	12.8	1537/120	17.7	10/5	248	28.0	2,300	2,200	3,300	6,273	708	8,858	1,000	15,944	1,800
K513_0145 MT20	14.5	5887/405	7.2	10/5	219	24.7	2,300	2,200	3,300	4,924	556	5,416	611	7,682	867
K513_0145 MT30	14.5	5887/405	12.0	10/5	236	26.6	2,300	2,200	3,300	6,544	739	8,858	1,000	15,944	1,800
K513_0145 MT40	14.5	5887/405	16.0	10/5	253	28.6	2,300	2,200	3,300	6,544	739	8,858	1,000	15,944	1,800
K513_0160 MT20	16.1	26071/1620	6.7	10/5	227	25.6	2,300	2,200	3,300	5,451	615	5,996	677	8,505	960
K513_0160 MT30	16.1	26071/1620	11.5	10/5	242	27.3	2,300	2,200	3,300	6,769	764	8,858	1,000	15,944	1,800
K513_0160 MT40	16.1	26071/1620	15.5	10/5	256	28.9	2,300	2,200	3,300	6,769	764	8,858	1,000	15,944	1,800
K513_0175 MT20	17.5	6293/360	5.8	10/5	232	26.2	2,800	2,500	3,700	5,921	668	6,513	735	8,970	1,013
K513_0175 MT30	17.5	6293/360	10.6	10/5	246	27.7	2,800	2,500	3,700	6,517	736	8,858	1,000	15,944	1,800
K513_0175 MT40	17.5	6293/360	14.6	10/5	258	29.1	2,800	2,500	3,500	6,517	736	8,858	1,000	15,944	1,800
K513_0195 MT20	19.4	27869/1440	5.4	10/5	239	26.9	2,800	2,500	3,700	6,555	740	7,211	814	9,931	1,121
K513_0195 MT30	19.4	27869/1440	10.2	10/5	250	28.2	2,800	2,500	3,700	6,742	761	8,858	1,000	15,944	1,800
K513_0195 MT40	19.4	27869/1440	14.2	10/5	260	29.4	2,800	2,500	3,500	6,742	761	8,858	1,000	15,944	1,800
K513_0220 MT20	22.0	2639/120	4.4	10/5	245	27.7	2,800	2,500	3,700	6,337	715	8,194	925	10,782	1,217
K513_0220 MT30	22.0	2639/120	9.2	10/5	254	28.7	2,800	2,500	3,700	7,035	794	8,858	1,000	15,944	1,800
K513_0220 MT40	22.0	2639/120	13.2	10/5	263	29.6	2,800	2,500	3,500	7,035	794	8,858	1,000	15,944	1,800
K513_0240 MT20	24.3	11687/480	4.2	10/5	249	28.2	2,800	2,500	3,700	7,016	792	8,858	1,000	11,937	1,348
K513_0240 MT30	24.3	11687/480	9.0	10/5	257	29.0	2,800	2,500	3,700	7,278	822	8,858	1,000	15,944	1,800
K513_0240 MT40	24.3	11687/480	13.0	10/5	264	29.8	2,800	2,500	3,500	7,278	822	8,858	1,000	15,944	1,800

Motor Shaft

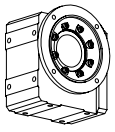
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

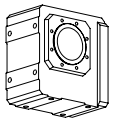
N Foot Mounted



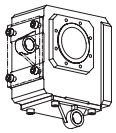
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.

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

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K513 with MT TriAdapt® Motor Adapter Continued															**Noise Level ≤ 61 dB(A)** [4]
K513_0290 MT20	29.2	4669/160	3.3	10/5	256	28.8	3,400	3,000	3,900	6,305	712	8,858	1,000	13,530	1,527
K513_0290 MT30	29.2	4669/160	8.1	10/5	261	29.5	3,400	3,000	3,900	7,246	818	8,858	1,000	15,944	1,800
K513_0290 MT40	29.2	4669/160	12.1	10/5	266	30.0	3,000	3,000	3,500	7,246	818	8,858	1,000	15,944	1,800
K513_0320 MT20	32.3	20677/640	3.2	10/5	258	29.1	3,400	3,000	3,900	6,981	788	8,858	1,000	14,980	1,691
K513_0320 MT30	32.3	20677/640	8.0	10/5	263	29.7	3,400	3,000	3,900	7,496	846	8,858	1,000	15,944	1,800
K513_0320 MT40	32.3	20677/640	12.0	10/5	267	30.1	3,000	3,000	3,500	7,496	846	8,858	1,000	15,944	1,800
K513_0350 MT20	34.8	174/5	2.8	10/5	260	29.3	3,400	3,000	3,900	6,579	743	8,858	1,000	15,606	1,762
K513_0350 MT30	34.8	174/5	7.6	10/5	264	29.8	3,400	3,000	3,900	7,684	868	8,858	1,000	15,606	1,762
K513_0350 MT40	34.8	174/5	11.6	10/5	267	30.2	3,000	3,000	3,500	7,684	868	8,858	1,000	15,606	1,762
K513_0390 MT20	38.5	2697/70	2.7	10/5	262	29.5	3,400	3,000	3,900	7,284	822	8,858	1,000	15,944	1,800
K513_0390 MT30	38.5	2697/70	7.5	10/5	265	29.9	3,400	3,000	3,900	7,950	897	8,858	1,000	15,944	1,800
K513_0390 MT40	38.5	2697/70	11.5	10/5	268	30.2	3,000	3,000	3,500	7,950	897	8,858	1,000	15,944	1,800
K513_0440 MT20	43.5	87/2	2.3	10/5	264	29.8	3,400	3,000	3,900	6,763	763	8,858	1,000	15,944	1,800
K513_0440 MT30	43.5	87/2	7.1	10/5	266	30.1	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K513_0440 MT40	43.5	87/2	11.1	10/5	268	30.3	3,000	3,000	3,500	7,972	900	8,858	1,000	15,944	1,800
K513_0480 MT20	**48.2**	**2697/56**	**2.2**	**10/5**	**265**	**29.9**	**3,400**	**3,000**	**3,900**	**7,487**	**845**	**8,858**	**1,000**	15,944	1,800
K513_0480 MT30	48.2	2697/56	7.0	10/5	267	30.1	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K513_0480 MT40	48.2	2697/56	11.0	10/5	269	30.3	3,000	3,000	3,500	7,972	900	8,858	1,000	15,944	1,800
K513_0580 MT20	58.3	11368/195	1.9	10/5	267	30.1	3,400	3,000	3,900	6,925	782	8,858	1,000	15,944	1,800
K513_0580 MT30	58.3	11368/195	6.7	10/5	268	30.3	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K513_0580 MT40	58.3	11368/195	10.7	10/5	269	30.4	3,000	3,000	3,500	7,972	900	8,858	1,000	15,944	1,800
K513_0650 MT20	64.5	12586/195	1.8	10/5	267	30.2	3,400	3,000	3,900	7,667	866	8,858	1,000	15,944	1,800
K513_0650 MT30	64.5	12586/195	6.6	10/5	269	30.3	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K513_0650 MT40	64.5	12586/195	10.6	10/5	270	30.4	3,000	3,000	3,500	7,972	900	8,858	1,000	15,944	1,800
K513_0700 MT20	70.1	841/12	1.7	10/5	268	30.2	3,400	3,000	3,900	3,400	798	8,722	985	11,440	1,291
K513_0700 MT30	70.1	841/12	6.5	10/5	269	30.3	3,400	3,000	3,900	7,268	821	8,722	985	11,440	1,291
K513_0780 MT20	77.6	26071/336	1.7	10/5	268	30.3	3,400	3,000	3,000	7,824	883	8,858	1,000	12,666	1,430
K513_0780 MT30	77.6	26071/336	6.5	10/5	269	30.4	3,400	3,000	3,900	7,972	900	8,858	1,000	12,666	1,430
K513_0870 MT20	87.3	8729/100	1.5	10/5	269	30.3	3,400	3,000	3,900	6,105	689	7,326	827	12,211	1,378
K513_0870 MT30	87.3	8729/100	6.3	10/5	269	30.4	3,400	3,000	3,900	6,105	689	7,326	827	12,211	1,378
K513_0970 MT20	96.6	38657/400	1.5	10/5	269	30.4	3,400	3,000	3,900	6,761	763	8,113	916	13,522	1,527
K513_0970 MT30	96.6	38657/400	6.3	10/5	270	30.4	3,400	3,000	3,900	6,761	763	8,113	916	13,522	1,527
K514 with MT TriAdapt® Motor Adapter Continued Next Page															**Noise Level ≤ 61 dB(A)** [4]
K514_0850 MT20	85.0	76531/900	1.6	10/6	269	30.3	3,400	3,000	3,900	7,972	900	8,625	974	10,781	1,217
K514_0940 MT20	94.1	338923/3600	1.6	10/6	269	30.4	3,400	3,000	3,900	7,972	900	8,858	1,000	11,936	1,347
K514_1130 MT20	112.8	135401/1200	1.5	10/6	269	30.4	3,400	3,000	3,900	7,972	900	8,858	1,000	13,529	1,527
K514_1250 MT20	124.9	599633/4800	1.5	10/6	270	30.4	3,400	3,000	3,900	7,972	900	8,858	1,000	14,979	1,691
K514_1350 MT20	134.6	3364/25	1.5	10/6	270	30.5	3,400	3,000	3,900	7,972	900	8,858	1,000	15,604	1,762
K514_1490 MT20	149.0	26071/175	1.5	10/6	270	30.5	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K514_1680 MT20	168.2	841/5	1.4	10/6	270	30.5	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K514_1860 MT20	186.2	26071/140	1.4	10/6	270	30.5	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 ... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

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

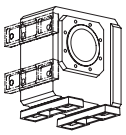
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$		C_2										
			J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K514 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 61 dB(A)** [4]	
K514_2250 MT20	225.4	659344/2925	1.4	10/6	270	30.5	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K514_2500 MT20	249.6	729988/2925	1.4	10/6	270	30.5	3,400	3,000	3,900	7,972	900	8,858	1,000	15,944	1,800
K514_2710 MT20	271.0	24389/90	1.4	10/6	270	30.5	3,400	3,000	3,900	7,268	821	8,722	985	11,439	1,291
K514_3000 MT20	300.0	756059/2520	1.4	10/6	270	30.5	3,400	3,000	3,900	7,972	900	8,858	1,000	12,665	1,430
K514_3380 MT20	337.5	253141/750	1.4	10/6	270	30.5	3,400	3,000	3,900	6,105	689	7,326	827	12,211	1,378
K514_3740 MT20	373.7	1121053/3000	1.4	10/6	270	30.5	3,400	3,000	3,900	6,761	763	8,113	916	13,522	1,527
K613 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [4]	
K613_0073 MT30	7.3	19215/2624	37.9	10/5	216	24.4	1,800	1,700	2,800	5,891	665	6,480	732	11,477	1,296
K613_0073 MT40	7.3	19215/2624	41.9	10/5	285	32.2	1,800	1,700	2,800	7,466	843	9,182	1,037	11,477	1,296
K613_0081 MT30	8.1	85095/10496	34.8	10/5	236	26.6	1,800	1,700	2,800	6,522	736	7,174	810	12,706	1,434
K613_0081 MT40	8.1	85095/10496	38.8	10/5	301	33.9	1,800	1,700	2,800	7,723	872	10,165	1,148	12,706	1,434
K613_0091 MT30	9.1	20923/2304	28.8	10/5	257	29.0	1,800	1,700	2,800	7,306	825	8,036	907	13,823	1,561
K613_0091 MT40	9.1	20923/2304	32.8	10/5	317	35.7	1,800	1,700	2,800	8,021	906	11,059	1,248	13,823	1,561
K613_0100 MT30	10.1	92659/9216	26.8	10/5	275	31.1	1,800	1,700	2,800	8,088	913	8,897	1,004	15,305	1,728
K613_0100 MT40	10.1	92659/9216	30.8	10/5	329	37.2	1,800	1,700	2,800	8,298	937	12,244	1,382	15,305	1,728
K613_0115 MT30	11.4	22631/1984	22.1	10/5	296	33.4	2,200	2,000	3,200	8,095	914	10,094	1,140	16,789	1,895
K613_0115 MT40	11.4	22631/1984	26.1	10/5	343	38.7	2,200	2,000	3,200	8,095	914	13,431	1,516	16,789	1,895
K613_0125 MT30	12.6	3233/256	20.9	10/5	311	35.1	2,200	2,000	3,200	8,374	945	11,176	1,262	18,588	2,098
K613_0125 MT40	12.6	3233/256	24.9	10/5	352	39.7	2,200	2,000	3,200	8,374	945	14,173	1,600	18,588	2,098
K613_0145 MT30	14.3	12383/864	17.4	10/5	327	36.9	2,200	2,000	3,200	8,735	986	12,683	1,432	20,378	2,301
K613_0145 MT40	14.3	12383/864	21.4	10/5	361	40.8	2,200	2,000	3,200	8,735	986	14,173	1,600	20,378	2,301
K613_0160 MT30	15.9	54839/3456	16.6	10/5	338	38.2	2,200	2,000	3,200	9,036	1,020	14,042	1,585	22,562	2,547
K613_0160 MT40	15.9	54839/3456	20.6	10/5	368	41.5	2,200	2,000	3,200	9,036	1,020	14,173	1,600	22,562	2,547
K613_0170 MT20	17.2	549/32	9.7	10/5	319	36.0	2,600	2,300	3,500	5,811	656	6,392	722	9,119	1,029
K613_0170 MT30	17.2	549/32	14.5	10/5	346	39.0	2,600	2,300	3,500	8,772	990	14,173	1,600	23,519	2,655
K613_0170 MT40	17.2	549/32	18.5	10/5	372	42.0	2,600	2,300	3,500	8,772	990	14,173	1,600	23,519	2,655
K613_0190 MT20	19.0	17019/896	9.2	10/5	331	37.4	2,600	2,300	3,500	6,434	726	7,077	799	10,095	1,140
K613_0190 MT30	19.0	17019/896	14.0	10/5	355	40.0	2,600	2,300	3,500	9,075	1,024	14,173	1,600	25,688	2,900
K613_0190 MT40	19.0	17019/896	18.0	10/5	377	42.5	2,600	2,300	3,500	9,075	1,024	14,173	1,600	25,688	2,900
K613_0220 MT20	21.7	5551/256	7.3	10/5	345	39.0	2,600	2,300	3,500	7,345	829	8,080	912	11,090	1,252
K613_0220 MT30	21.7	5551/256	12.1	10/5	364	41.1	2,600	2,300	3,500	9,484	1,071	14,173	1,600	25,688	2,900
K613_0220 MT40	21.7	5551/256	16.1	10/5	382	43.1	2,600	2,300	3,500	9,484	1,071	14,173	1,600	25,688	2,900
K613_0240 MT20	24.0	24583/1024	6.9	10/5	354	40.0	2,600	2,300	3,500	8,132	918	8,945	1,010	12,278	1,386
K613_0240 MT30	24.0	24583/1024	11.7	10/5	370	41.8	2,600	2,300	3,500	9,812	1,108	14,173	1,600	25,688	2,900
K613_0240 MT40	24.0	24583/1024	15.7	10/5	385	43.5	2,600	2,300	3,500	9,812	1,108	14,173	1,600	25,688	2,900
K613_0290 MT20	28.8	29463/1024	5.1	10/5	367	41.4	3,100	2,800	3,700	7,592	857	10,721	1,210	13,916	1,571
K613_0290 MT30	28.8	29463/1024	9.9	10/5	379	42.7	3,100	2,800	3,700	9,828	1,110	14,173	1,600	25,688	2,900
K613_0290 MT40	28.8	29463/1024	13.9	10/5	389	43.9	3,000	2,800	3,500	9,828	1,110	14,173	1,600	25,688	2,900
K613_0320 MT20	31.9	130479/4096	4.9	10/5	372	42.0	3,100	2,800	3,700	8,405	949	11,869	1,340	15,407	1,739
K613_0320 MT30	31.9	130479/4096	9.7	10/5	382	43.2	3,100	2,800	3,700	10,168	1,148	14,173	1,600	25,688	2,900
K613_0320 MT40	31.9	130479/4096	13.7	10/5	391	44.2	3,000	2,800	3,500	10,168	1,148	14,173	1,600	25,688	2,900

Motor Shaft

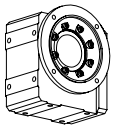
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

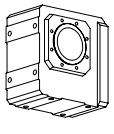
N Foot Mounted



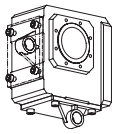
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.

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

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K613 with MT TriAdapt® Motor Adapter Continued															**Noise Level ≤ 61 dB(A)** [4]
K613_0350 MT20	34.6	35441/1024	4.1	10/5	376	42.5	3,100	2,800	3,700	7,712	871	12,838	1,449	16,048	1,812
K613_0350 MT30	34.6	35441/1024	8.9	10/5	385	43.4	3,100	2,800	3,700	10,453	1,180	14,173	1,600	25,688	2,900
K613_0350 MT40	34.6	35441/1024	12.9	10/5	392	44.3	3,000	2,800	3,500	10,453	1,180	14,173	1,600	25,688	2,900
K613_0380 MT20	38.3	156953/4096	3.9	10/5	380	42.9	3,100	2,800	3,700	8,539	964	14,173	1,600	17,767	2,006
K613_0380 MT30	38.3	156953/4096	8.7	10/5	387	43.7	3,100	2,800	3,700	10,813	1,221	14,173	1,600	25,688	2,900
K613_0380 MT40	38.3	156953/4096	12.7	10/5	394	44.4	3,000	2,800	3,500	10,813	1,221	14,173	1,600	25,688	2,900
K613_0430 MT20	43.1	8967/208	3.2	10/5	384	43.4	3,100	2,800	3,700	7,922	894	14,173	1,600	19,048	2,150
K613_0430 MT30	43.1	8967/208	8.0	10/5	390	44.0	3,100	2,800	3,700	11,247	1,270	14,173	1,600	19,048	2,150
K613_0430 MT40	43.1	8967/208	12.0	10/5	395	44.6	3,000	2,800	3,500	11,247	1,270	14,173	1,600	19,048	2,150
K613_0480 MT20	47.7	39711/832	3.1	10/5	387	43.7	3,100	2,800	3,700	8,771	990	14,173	1,600	21,089	2,381
K613_0480 MT30	47.7	39711/832	7.9	10/5	392	44.2	3,100	2,800	3,700	11,635	1,313	14,173	1,600	21,089	2,381
K613_0480 MT40	47.7	39711/832	11.9	10/5	396	44.7	3,000	2,800	3,500	11,635	1,313	14,173	1,600	21,089	2,381
K613_0580 MT20	57.5	29463/512	2.4	10/5	391	44.1	3,100	2,800	3,700	8,246	931	14,173	1,600	23,893	2,697
K613_0580 MT30	57.5	29463/512	7.2	10/5	394	44.5	3,100	2,800	3,700	12,383	1,398	14,173	1,600	23,893	2,697
K613_0580 MT40	57.5	29463/512	11.2	10/5	397	44.8	3,000	2,800	3,500	12,383	1,398	14,173	1,600	23,893	2,697
K613_0640 MT20	63.7	130479/2048	2.4	10/5	392	44.3	3,100	2,800	3,700	9,129	1,031	14,173	1,600	25,688	2,900
K613_0640 MT30	63.7	130479/2048	7.2	10/5	395	44.6	3,100	2,800	3,700	12,810	1,446	14,173	1,600	25,688	2,900
K613_0640 MT40	63.7	130479/2048	11.2	10/5	397	44.9	3,000	2,800	3,500	12,810	1,446	14,173	1,600	25,688	2,900
K613_0690 MT20	68.8	28609/416	2.1	10/5	393	44.4	3,100	2,800	3,700	8,425	951	13,967	1,577	23,278	2,628
K613_0690 MT30	68.8	28609/416	6.9	10/5	396	44.7	3,100	2,800	3,700	11,639	1,314	13,967	1,577	23,278	2,628
K613_0690 MT40	68.8	28609/416	10.9	10/5	398	44.9	3,000	2,800	3,500	11,639	1,314	13,967	1,577	23,278	2,628
K613_0760 MT20	76.1	126697/1664	2.0	10/5	394	44.5	3,100	2,800	3,700	9,327	1,053	14,173	1,600	25,688	2,900
K613_0760 MT30	76.1	126697/1664	6.8	10/5	396	44.7	3,100	2,800	3,700	12,844	1,450	14,173	1,600	25,688	2,900
K613_0760 MT40	76.1	126697/1664	10.8	10/5	398	44.9	3,000	2,800	3,500	12,844	1,450	14,173	1,600	25,688	2,900
K613_0860 MT20	86.2	66185/768	1.8	10/5	395	44.6	3,100	2,800	3,700	8,526	963	10,320	1,165	13,893	1,568
K613_0860 MT30	86.2	66185/768	6.6	10/5	397	44.8	3,100	2,800	3,700	8,600	971	10,320	1,165	13,893	1,568
K613_0950 MT20	95.4	293105/3072	1.8	10/5	396	44.7	3,100	2,800	3,700	9,440	1,066	11,429	1,290	15,382	1,736
K613_0950 MT30	95.4	293105/3072	6.6	10/5	397	44.9	3,100	2,800	3,700	9,524	1,075	11,429	1,290	15,382	1,736
K614 with MT TriAdapt® Motor Adapter Continued Next Page															**Noise Level ≤ 61 dB(A)** [4]
K614_0840 MT20	83.8	160979/1920	1.8	10/6	395	44.6	3,100	2,800	3,700	8,871	1,001	8,871	1,001	11,088	1,252
K614_0930 MT20	92.8	712907/7680	1.7	10/6	396	44.7	3,100	2,800	3,700	9,821	1,109	9,821	1,109	12,277	1,386
K614_1110 MT20	111.3	284809/2560	1.6	10/6	397	44.8	3,100	2,800	3,700	11,132	1,257	11,132	1,257	13,915	1,571
K614_1230 MT20	123.2	1261297/10240	1.6	10/6	397	44.9	3,100	2,800	3,700	12,325	1,391	12,325	1,391	15,406	1,739
K614_1340 MT20	133.8	1027789/7680	1.6	10/6	398	44.9	3,100	2,800	3,700	11,773	1,329	12,837	1,449	16,046	1,812
K614_1480 MT20	148.2	4551637/30720	1.5	10/6	398	44.9	3,100	2,800	3,700	12,844	1,450	14,173	1,600	17,766	2,006
K614_1670 MT20	166.7	86681/520	1.5	10/6	398	45.0	3,100	2,800	3,700	12,328	1,392	14,173	1,600	19,047	2,150
K614_1850 MT20	184.6	383873/2080	1.5	10/6	399	45.0	3,100	2,800	3,700	12,844	1,450	14,173	1,600	21,087	2,381
K614_2230 MT20	222.5	284809/1280	1.4	10/6	399	45.0	3,100	2,800	3,700	12,844	1,450	14,173	1,600	23,891	2,697
K614_2460 MT20	246.3	1261297/5120	1.4	10/6	399	45.0	3,100	2,800	3,700	12,844	1,450	14,173	1,600	25,688	2,900
K614_2660 MT20	265.9	829661/3120	1.4	10/6	399	45.0	3,100	2,800	3,700	11,639	1,314	13,967	1,577	23,278	2,628
K614_2940 MT20	294.4	3674213/12480	1.4	10/6	399	45.1	3,100	2,800	3,700	12,844	1,450	14,173	1,600	25,688	2,900

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

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

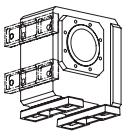
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$		C_2										
			J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K614 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 61 dB(A)** [4]	
K614_3330 MT20	333.2	383873/1152	1.4	10/6	399	45.1	3,100	2,800	3,700	8,600	971	10,320	1,165	13,892	1,568
K614_3690 MT20	368.9	1700009/4608	1.4	10/6	399	45.1	3,100	2,800	3,700	9,524	1,075	11,429	1,290	15,380	1,736
K713 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 59 dB(A)** [4]	
K713_0076 MT30	7.6	19845/2624	71.2	10/5	295	33.4	1,700	1,600	2,700	6,084	687	6,693	756	12,169	1,374
K713_0076 MT40	7.6	19845/2624	75.2	10/5	428	48.3	1,700	1,600	2,700	9,837	1,111	9,837	1,111	12,297	1,388
K713_0084 MT30	8.4	87885/10496	66.3	10/5	331	37.4	1,700	1,600	2,700	6,736	760	7,410	836	13,472	1,521
K713_0084 MT40	8.4	87885/10496	70.3	10/5	463	52.2	1,700	1,600	2,700	10,891	1,230	10,891	1,230	13,614	1,537
K713_0092 MT30	9.2	147/16	54.4	10/5	365	41.2	1,700	1,600	2,700	7,392	834	8,131	918	14,515	1,639
K713_0092 MT40	9.2	147/16	58.4	10/5	492	55.6	1,700	1,600	2,700	11,612	1,311	11,612	1,311	14,515	1,639
K713_0100 MT30	10.2	651/64	51.2	10/5	401	45.3	1,700	1,600	2,700	8,183	924	9,002	1,016	16,069	1,814
K713_0100 MT40	10.2	651/64	55.2	10/5	523	59.0	1,700	1,600	2,700	12,855	1,451	12,855	1,451	16,069	1,814
K713_0120 MT30	11.8	23373/1984	39.2	10/5	452	51.0	2,000	1,900	3,000	9,478	1,070	10,425	1,177	17,928	2,024
K713_0120 MT40	11.8	23373/1984	43.2	10/5	562	63.4	2,000	1,900	3,000	13,823	1,561	14,342	1,619	17,928	2,024
K713_0130 MT30	13.0	3339/256	37.2	10/5	485	54.8	2,000	1,900	3,000	10,493	1,185	11,542	1,303	19,849	2,241
K713_0130 MT40	13.0	3339/256	41.2	10/5	585	66.1	2,000	1,900	3,000	14,300	1,614	15,879	1,793	19,849	2,241
K713_0150 MT30	14.8	1421/96	29.8	10/5	523	59.1	2,000	1,900	3,000	11,908	1,344	13,099	1,479	21,761	2,457
K713_0150 MT40	14.8	1421/96	33.8	10/5	611	68.9	2,000	1,900	3,000	14,916	1,684	17,409	1,965	21,761	2,457
K713_0165 MT30	16.4	6293/384	28.5	10/5	551	62.2	2,000	1,900	3,000	13,184	1,488	14,502	1,637	24,092	2,720
K713_0165 MT40	16.4	6293/384	32.5	10/5	628	70.9	2,000	1,900	3,000	15,431	1,742	19,274	2,176	24,092	2,720
K713_0185 MT30	18.3	26901/1472	23.8	10/5	577	65.2	2,400	2,200	3,300	14,487	1,635	16,172	1,826	25,811	2,914
K713_0185 MT40	18.3	26901/1472	27.8	10/5	644	72.7	2,400	2,200	3,300	15,058	1,700	20,649	2,331	25,811	2,914
K713_0200 MT30	20.2	119133/5888	23.0	10/5	599	67.6	2,400	2,200	3,300	15,578	1,759	17,905	2,021	28,576	3,226
K713_0200 MT40	20.2	119133/5888	27.0	10/5	657	74.1	2,400	2,200	3,300	15,578	1,759	22,861	2,581	28,576	3,226
K713_0230 MT30	22.7	14553/640	18.8	10/5	621	70.1	2,400	2,200	3,300	15,238	1,720	20,122	2,272	30,795	3,476
K713_0230 MT40	22.7	14553/640	22.8	10/5	669	75.5	2,400	2,200	3,300	16,196	1,828	23,031	2,600	30,795	3,476
K713_0250 MT30	25.2	64449/2560	18.2	10/5	637	71.9	2,400	2,200	3,300	16,755	1,891	22,278	2,515	34,094	3,849
K713_0250 MT40	25.2	64449/2560	22.2	10/5	677	76.5	2,400	2,200	3,300	16,755	1,891	23,031	2,600	34,094	3,849
K713_0290 MT30	29.3	7497/256	14.5	10/5	656	74.1	2,900	2,600	3,600	15,162	1,712	23,031	2,600	37,773	4,264
K713_0290 MT40	29.3	7497/256	18.5	10/5	688	77.6	2,900	2,600	3,500	16,544	1,868	23,031	2,600	37,773	4,264
K713_0320 MT30	32.4	33201/1024	14.2	10/5	667	75.3	2,900	2,600	3,600	16,787	1,895	23,031	2,600	41,821	4,721
K713_0320 MT40	32.4	33201/1024	18.2	10/5	693	78.3	2,900	2,600	3,500	17,115	1,932	23,031	2,600	41,821	4,721
K713_0350 MT30	35.4	567/16	12.2	10/5	675	76.2	2,900	2,600	3,600	15,608	1,762	23,031	2,600	42,518	4,800
K713_0350 MT40	35.4	567/16	16.2	10/5	697	78.7	2,900	2,600	3,500	17,629	1,990	23,031	2,600	42,518	4,800
K713_0390 MT30	39.2	2511/64	12.0	10/5	683	77.1	2,900	2,600	3,600	17,280	1,951	23,031	2,600	42,518	4,800
K713_0390 MT40	39.2	2511/64	16.0	10/5	701	79.2	2,900	2,600	3,500	18,238	2,059	23,031	2,600	42,518	4,800
K713_0450 MT30	45.1	37485/832	10.2	10/5	691	78.0	2,900	2,600	3,600	16,122	1,820	23,031	2,600	42,518	4,800
K713_0450 MT40	45.1	37485/832	14.2	10/5	705	79.6	2,900	2,600	3,500	19,098	2,156	23,031	2,600	42,518	4,800
K713_0500 MT30	49.9	166005/3328	10.1	10/5	696	78.6	2,900	2,600	3,600	17,850	2,015	23,031	2,600	42,518	4,800
K713_0500 MT40	49.9	166005/3328	14.1	10/5	708	79.9	2,900	2,600	3,500	19,757	2,230	23,031	2,600	42,518	4,800
K713_0590 MT30	58.6	7497/128	8.7	10/5	702	79.3	2,900	2,600	3,600	16,807	1,897	23,031	2,600	42,518	4,800
K713_0590 MT40	58.6	7497/128	12.7	10/5	711	80.3	2,900	2,600	3,500	20,844	2,353	23,031	2,600	42,518	4,800

Motor Shaft

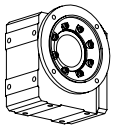
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

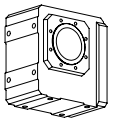
N Foot Mounted



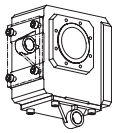
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.

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

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K713 with MT TriAdapt® Motor Adapter Continued														**Noise Level ≤ 59 dB(A) [4]**	
K713_0650 MT30	64.8	33201/512	8.6	10/5	705	79.6	2,900	2,600	3,600	18,608	2,101	23,031	2,600	42,518	4,800
K713_0650 MT40	64.8	33201/512	12.6	10/5	712	80.4	2,900	2,600	3,500	21,259	2,400	23,031	2,600	42,518	4,800
K713_0710 MT30	71.2	4557/64	7.9	10/5	707	79.9	2,900	2,600	3,600	17,027	1,922	23,031	2,600	29,355	3,314
K713_0710 MT40	71.2	4557/64	11.9	10/5	713	80.5	2,900	2,600	3,500	19,244	2,173	23,031	2,600	29,355	3,314
K713_0790 MT30	78.8	20181/256	7.8	10/5	710	80.1	2,900	2,600	3,600	18,851	2,128	23,031	2,600	32,500	3,669
K713_0790 MT40	78.8	20181/256	11.8	10/5	714	80.7	2,900	2,600	3,500	21,259	2,400	23,031	2,600	32,500	3,669
K713_0890 MT30	89.0	22785/256	7.3	10/5	712	80.3	2,900	2,600	3,600	14,803	1,671	17,764	2,005	29,607	3,342
K713_0890 MT40	89.0	22785/256	11.3	10/5	715	80.8	2,900	2,600	3,500	14,803	1,671	17,764	2,005	29,607	3,342
K713_0990 MT30	98.5	100905/1024	7.2	10/5	713	80.5	2,900	2,600	3,600	16,394	1,851	19,672	2,221	32,787	3,701
K713_0990 MT40	98.5	100905/1024	11.2	10/5	716	80.8	2,900	2,600	3,500	16,394	1,851	19,672	2,221	32,787	3,701
K714 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 59 dB(A) [4]**	
K714_0890 MT30	89.1	227997/2560	7.3	10/6	712	80.3	2,900	2,600	3,600	19,968	2,254	23,031	2,600	30,792	3,476
K714_0990 MT30	98.6	1009701/10240	7.2	10/6	713	80.5	2,900	2,600	3,600	21,259	2,400	23,031	2,600	34,091	3,849
K714_1130 MT20	113.2	72471/640	1.9	10/6	712	80.3	2,900	2,600	3,600	11,715	1,323	11,715	1,323	14,644	1,653
K714_1150 MT30	114.7	117453/1024	7.0	10/6	714	80.7	2,900	2,600	3,600	21,259	2,400	23,031	2,600	37,770	4,264
K714_1250 MT20	125.4	320943/2560	1.9	10/6	713	80.5	2,900	2,600	3,600	12,970	1,464	12,970	1,464	16,213	1,830
K714_1270 MT30	127.0	520149/4096	7.0	10/6	715	80.8	2,900	2,600	3,600	21,259	2,400	23,031	2,600	41,817	4,721
K714_1370 MT20	137.0	5481/40	1.8	10/6	714	80.6	2,900	2,600	3,600	13,615	1,537	13,615	1,537	17,018	1,921
K714_1390 MT30	138.8	8883/64	6.9	10/6	716	80.8	2,900	2,600	3,600	21,259	2,400	23,031	2,600	42,518	4,800
K714_1520 MT20	151.7	24273/160	1.8	10/6	715	80.7	2,900	2,600	3,600	15,073	1,702	15,073	1,702	18,842	2,127
K714_1540 MT30	153.7	39339/256	6.8	10/6	716	80.9	2,900	2,600	3,600	21,259	2,400	23,031	2,600	42,518	4,800
K714_1740 MT20	174.2	72471/416	1.6	10/6	716	80.8	2,900	2,600	3,600	14,755	1,666	16,434	1,855	20,542	2,319
K714_1760 MT30	176.5	587265/3328	6.7	10/6	717	80.9	2,900	2,600	3,600	21,259	2,400	23,031	2,600	42,518	4,800
K714_1930 MT20	192.9	320943/1664	1.6	10/6	716	80.9	2,900	2,600	3,600	16,336	1,844	18,194	2,054	22,743	2,567
K714_1950 MT30	195.4	2600745/13312	6.7	10/6	717	81.0	2,900	2,600	3,600	21,259	2,400	23,031	2,600	42,518	4,800
K714_2260 MT20	226.5	72471/320	1.5	10/6	717	81.0	2,900	2,600	3,600	15,725	1,775	20,216	2,282	25,271	2,853
K714_2290 MT30	229.4	117453/512	6.6	10/6	718	81.0	2,900	2,600	3,600	21,259	2,400	23,031	2,600	42,518	4,800
K714_2510 MT20	250.7	320943/1280	1.5	10/6	717	81.0	2,900	2,600	3,600	17,410	1,965	22,382	2,527	27,978	3,159
K714_2540 MT30	254.0	520149/2048	6.6	10/6	718	81.1	2,900	2,600	3,600	21,259	2,400	23,031	2,600	42,518	4,800
K714_2750 MT20	275.3	44051/160	1.5	10/6	718	81.0	2,900	2,600	3,600	16,223	1,831	23,031	2,600	29,352	3,314
K714_3050 MT20	304.8	195083/640	1.5	10/6	718	81.0	2,900	2,600	3,600	17,961	2,028	23,031	2,600	32,497	3,669
K714_3440 MT20	344.1	44051/128	1.4	10/6	718	81.1	2,900	2,600	3,600	14,803	1,671	17,764	2,005	29,607	3,342
K714_3810 MT20	381.0	195083/512	1.4	10/6	718	81.1	2,900	2,600	3,600	16,394	1,851	19,672	2,221	32,787	3,701

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 .... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

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

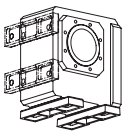
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$		C_2										
			J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K813 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 65 dB(A)** [4]	
K813_0074 MT30	7.4	3127/420	161.2	10/5	350	39.5	1,600	1,500	2,600	5,989	676	6,588	744	11,979	1,352
K813_0074 MT40	7.4	3127/420	165.2	10/5	564	63.7	1,600	1,500	2,600	10,163	1,147	10,163	1,147	12,704	1,434
K813_0082 MT30	8.2	96937/11760	142.9	10/5	404	45.6	1,600	1,500	2,600	6,631	749	7,294	823	13,263	1,497
K813_0082 MT40	8.2	96937/11760	146.9	10/5	628	70.8	1,600	1,500	2,600	11,252	1,270	11,252	1,270	14,065	1,588
K813_0093 MT30	9.3	11977/1290	115.5	10/5	471	53.2	1,600	1,500	2,600	7,469	843	8,216	927	14,938	1,686
K813_0093 MT40	9.3	11977/1290	119.5	10/5	702	79.2	1,600	1,500	2,600	12,266	1,385	12,266	1,385	15,333	1,731
K813_0105 MT30	10.3	53041/5160	103.7	10/5	533	60.1	1,600	1,500	2,600	8,269	934	9,096	1,027	16,539	1,867
K813_0105 MT40	10.3	53041/5160	107.7	10/5	763	86.2	1,600	1,500	2,600	13,581	1,533	13,581	1,533	16,976	1,916
K813_0120 MT30	11.9	6608/555	80.6	10/5	624	70.4	1,900	1,800	2,900	9,578	1,081	10,536	1,189	18,938	2,138
K813_0120 MT40	11.9	6608/555	84.6	10/5	848	95.7	1,900	1,800	2,900	15,150	1,710	15,150	1,710	18,938	2,138
K813_0130 MT30	13.2	7316/555	73.4	10/5	687	77.6	1,900	1,800	2,900	10,605	1,197	11,665	1,317	20,967	2,367
K813_0130 MT40	13.2	7316/555	77.4	10/5	901	101.8	1,900	1,800	2,900	16,774	1,894	16,774	1,894	20,967	2,367
K813_0150 MT30	14.8	9499/640	59.2	10/5	760	85.8	1,900	1,800	2,900	11,940	1,348	13,134	1,483	22,766	2,570
K813_0150 MT40	14.8	9499/640	63.2	10/5	958	108.2	1,900	1,800	2,900	18,213	2,056	18,213	2,056	22,766	2,570
K813_0165 MT30	16.4	42067/2560	54.5	10/5	819	92.5	1,900	1,800	2,900	13,219	1,492	14,541	1,642	25,205	2,845
K813_0165 MT40	16.4	42067/2560	58.5	10/5	1,001	113.1	1,900	1,800	2,900	20,164	2,276	20,164	2,276	25,205	2,845
K813_0175 MT30	17.3	30149/1740	48.4	10/5	849	95.8	2,300	2,100	3,200	13,939	1,574	15,333	1,731	25,932	2,928
K813_0175 MT40	17.3	30149/1740	52.4	10/5	1,022	115.4	2,300	2,100	3,200	20,746	2,342	20,746	2,342	25,932	2,928
K813_0190 MT30	19.2	133517/6960	45.1	10/5	902	101.8	2,300	2,100	3,200	15,432	1,742	16,976	1,916	28,710	3,241
K813_0190 MT40	19.2	133517/6960	49.1	10/5	1,058	119.4	2,300	2,100	3,200	22,968	2,593	22,968	2,593	28,710	3,241
K813_0230 MT30	23.0	31801/1380	33.8	10/5	987	111.4	2,300	2,100	3,200	18,529	2,092	20,392	2,302	32,546	3,674
K813_0230 MT40	23.0	31801/1380	37.8	10/5	1,111	125.4	2,300	2,100	3,200	26,037	2,939	26,037	2,939	32,546	3,674
K813_0260 MT30	25.5	140833/5520	31.9	10/5	1,027	115.9	2,300	2,100	3,200	20,514	2,316	22,577	2,549	36,033	4,068
K813_0260 MT40	25.5	140833/5520	35.9	10/5	1,134	128.1	2,300	2,100	3,200	28,827	3,254	28,827	3,254	36,033	4,068
K813_0290 MT30	29.3	7021/240	24.9	10/5	1,073	121.2	2,800	2,500	3,500	18,623	2,102	25,888	2,923	39,618	4,473
K813_0290 MT40	29.3	7021/240	28.9	10/5	1,161	131.0	2,800	2,500	3,500	28,963	3,270	31,694	3,578	39,618	4,473
K813_0320 MT30	32.4	31093/960	23.7	10/5	1,102	124.4	2,800	2,500	3,500	20,618	2,328	28,662	3,236	43,863	4,952
K813_0320 MT40	32.4	31093/960	27.7	10/5	1,176	132.8	2,800	2,500	3,500	29,963	3,383	35,091	3,961	43,863	4,952
K813_0360 MT30	36.1	2891/80	19.4	10/5	1,129	127.4	2,800	2,500	3,500	18,930	2,137	31,980	3,610	46,613	5,262
K813_0360 MT40	36.1	2891/80	23.4	10/5	1,191	134.4	2,800	2,500	3,500	31,077	3,508	37,290	4,210	46,613	5,262
K813_0400 MT30	40.0	12803/320	18.6	10/5	1,150	129.8	2,800	2,500	3,500	20,958	2,366	35,405	3,997	51,606	5,826
K813_0400 MT40	40.0	12803/320	22.6	10/5	1,201	135.6	2,800	2,500	3,500	32,149	3,629	41,190	4,650	51,606	5,826
K813_0440 MT30	44.3	177/4	15.5	10/5	1,167	131.8	2,800	2,500	3,500	19,718	2,226	39,158	4,421	54,814	6,188
K813_0440 MT40	44.3	177/4	19.5	10/5	1,210	136.6	2,800	2,500	3,500	33,247	3,753	41,190	4,650	54,814	6,188
K813_0490 MT30	49.0	5487/112	15.0	10/5	1,182	133.4	2,800	2,500	3,500	21,831	2,465	41,190	4,650	60,687	6,851
K813_0490 MT40	49.0	5487/112	19.0	10/5	1,218	137.5	2,800	2,500	3,500	34,395	3,883	41,190	4,650	60,687	6,851
K813_0590 MT30	59.1	42539/720	11.8	10/5	1,203	135.8	2,800	2,500	3,500	20,311	2,293	41,190	4,650	68,590	7,743
K813_0590 MT40	59.1	42539/720	15.8	10/5	1,228	138.7	2,800	2,500	3,500	35,600	4,019	41,190	4,650	68,590	7,743
K813_0650 MT30	65.4	188387/2880	11.5	10/5	1,212	136.8	2,800	2,500	3,500	22,487	2,539	41,190	4,650	74,407	8,400
K813_0650 MT40	65.4	188387/2880	15.5	10/5	1,233	139.2	2,800	2,500	3,500	37,204	4,200	41,190	4,650	74,407	8,400
K813_0720 MT30	71.7	10325/144	10.1	10/5	1,218	137.5	2,800	2,500	3,500	20,817	2,350	38,322	4,326	63,869	7,210
K813_0720 MT40	71.7	10325/144	14.1	10/5	1,236	139.5	2,800	2,500	3,500	31,935	3,605	38,322	4,326	63,869	7,210

Motor Shaft

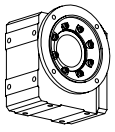
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

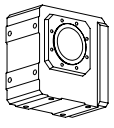
N Foot Mounted



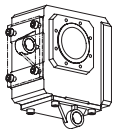
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.

See web site for drawings.

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

Part Number	Reducer Ratio i		Input Inertia 10^{-4}kgcm²	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K813 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 65 dB(A)** [4]	
K813_0790 MT30	79.4	45725/576	9.9	10/5	1,225	138.2	2,800	2,500	3,500	23,048	2,602	41,190	4,650	70,731	7,985
K813_0790 MT40	79.4	45725/576	13.9	10/5	1,239	139.9	2,800	2,500	3,500	35,365	3,992	41,190	4,650	70,731	7,985
K813_0880 MT30	87.8	7021/80	8.8	10/5	1,229	138.8	2,800	2,500	3,500	21,233	2,397	28,945	3,268	36,182	4,085
K813_0880 MT40	87.8	7021/80	12.8	10/5	1,241	140.1	2,800	2,500	3,500	24,838	2,804	28,945	3,268	36,182	4,085
K813_0970 MT30	97.2	31093/320	8.7	10/5	1,234	139.3	2,800	2,500	3,500	23,508	2,654	32,047	3,618	40,058	4,522
K813_0970 MT40	97.2	31093/320	12.7	10/5	1,243	140.4	2,800	2,500	3,500	27,506	3,105	32,047	3,618	40,058	4,522
K814 with MT TriAdapt® Motor Adapter Continued Next Page														**Noise Level ≤ 65 dB(A)** [4]	
K814_0670 MT40	66.8	38763/580	14.5	10/6	1,234	139.3	2,800	2,500	3,500	36,220	4,089	39,644	4,476	49,555	5,594
K814_0740 MT40	74.0	1201653/16240	14.3	10/6	1,237	139.6	2,800	2,500	3,500	37,204	4,200	41,190	4,650	54,864	6,194
K814_0890 MT40	88.9	40887/460	13.5	10/6	1,242	140.2	2,800	2,500	3,500	37,204	4,200	41,190	4,650	62,195	7,021
K814_0980 MT40	98.4	181071/1840	13.4	10/6	1,244	140.4	2,800	2,500	3,500	37,204	4,200	41,190	4,650	68,859	7,774
K814_1130 MT40	112.8	9027/80	12.9	10/6	1,246	140.6	2,800	2,500	3,500	37,204	4,200	41,190	4,650	74,407	8,400
K814_1150 MT30	114.6	329987/2880	7.7	10/6	1,239	139.8	2,800	2,500	3,500	25,991	2,934	31,692	3,578	39,615	4,472
K814_1250 MT40	124.9	279837/2240	12.8	10/6	1,247	140.8	2,800	2,500	3,500	37,204	4,200	41,190	4,650	74,407	8,400
K814_1270 MT30	126.9	1461371/11520	7.7	10/6	1,241	140.1	2,800	2,500	3,500	28,776	3,249	35,087	3,961	43,859	4,951
K814_1390 MT40	139.4	11151/80	12.5	10/6	1,248	140.9	2,800	2,500	3,500	37,204	4,200	41,190	4,650	74,407	8,400
K814_1420 MT30	141.5	135877/960	7.4	10/6	1,243	140.4	2,800	2,500	3,500	26,940	3,041	37,287	4,209	46,608	5,262
K814_1540 MT40	154.3	49383/320	12.5	10/6	1,249	141.0	2,800	2,500	3,500	37,204	4,200	41,190	4,650	74,407	8,400
K814_1570 MT30	156.7	601741/3840	7.3	10/6	1,245	140.6	2,800	2,500	3,500	29,827	3,367	41,190	4,650	51,602	5,825
K814_1710 MT40	170.7	4779/28	12.3	10/6	1,249	141.0	2,800	2,500	3,500	37,204	4,200	41,190	4,650	54,816	6,188
K814_1730 MT30	173.3	2773/16	7.1	10/6	1,246	140.7	2,800	2,500	3,500	28,519	3,220	41,190	4,650	54,810	6,188
K814_1890 MT40	189.0	148149/784	12.2	10/6	1,250	141.1	2,800	2,500	3,500	37,204	4,200	41,190	4,650	60,690	6,851
K814_1920 MT30	191.9	85963/448	7.1	10/6	1,247	140.8	2,800	2,500	3,500	31,575	3,565	41,190	4,650	60,682	6,851
K814_2280 MT40	227.9	18231/80	12.0	10/6	1,251	141.2	2,800	2,500	3,500	37,204	4,200	41,190	4,650	68,593	7,744
K814_2310 MT30	231.4	1999333/8640	6.9	10/6	1,249	141.0	2,800	2,500	3,500	30,148	3,403	41,190	4,650	68,584	7,743
K814_2520 MT40	252.3	565161/2240	12.0	10/6	1,251	141.2	2,800	2,500	3,500	37,204	4,200	41,190	4,650	74,407	8,400
K814_2560 MT30	256.2	8854189/34560	6.9	10/6	1,250	141.1	2,800	2,500	3,500	33,378	3,768	41,190	4,650	74,407	8,400
K814_2770 MT40	276.6	4425/16	11.9	10/6	1,251	141.2	2,800	2,500	3,500	31,935	3,605	38,322	4,326	63,869	7,210
K814_2810 MT30	280.8	485275/1728	6.8	10/6	1,250	141.1	2,800	2,500	3,500	31,427	3,548	38,322	4,326	63,869	7,210
K814_3060 MT40	306.2	137175/448	11.9	10/6	1,251	141.3	2,800	2,500	3,500	35,365	3,992	41,190	4,650	70,731	7,985
K814_3110 MT30	310.9	2149075/6912	6.8	10/6	1,250	141.2	2,800	2,500	3,500	34,794	3,928	41,190	4,650	70,731	7,985

[1] Backlash shown "STANDARD/REDUCED".

[2] Maximum torque for continuous input RPM - horizontal output position.

[3] Maximum momentary torque for emergency stops or heavy shock load. Admissible stops per life of reducer = 1,000 stops maximum.

[4] dB(A)Measured at 1 meter distance with 3000 RPM input

Index of Symbols

- i ... Exact Ratio = Exact Tooth Count
- J_1 ... Reducer Inertia
- C ... ServoCool
- C_2 ... Torsional Stiffness
- n_{1DBH} ... Maximum Continuous Input RPM Horizontal Mounting - EL1, 2, 5, 6
- n_{1DBV} ... Maximum Continuous Input RPM Vertical Position - EL3 and EL4
- n_{1ZB} ... Maximum Cyclic Input RPM
- T_{2N} ... Nominal Torque @ 2000 RPM Input
- $T_{2N(n1DBH)}$ ... Rated Torque @ Maximum Continuous Input RPM Horizontal Mounting - EL1, EL2, EL5, EL6
- T_{2B} ... Acceleration Torque Maximum
- T_{2PEAK} ... Peak Torque

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

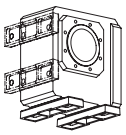
Part Number	Reducer Ratio i		Input Inertia	Backlash arcmins	Torsional Stiffness per arcmin		Input RPM			Output Torque					
							Maximum			Nominal [2]		Acceleration		Peak [3]	
							Continuous		Cyclic	$T_{2N \le 2000\ RPM}$		T_{2B}		T_{2PEAK}	
	Nom.	Exact	$10^{-4}kgcm^2$ J_1	$\Delta\varphi$ [1]	in.lbs.	Nm	n_{1DBH}	n_{1DBV}	n_{1ZB}	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm
K913 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 65 dB(A)** [4]	
K913_0240 MT40	23.9	88877/3712	73.0	10/5	1,585	178.9	2,200	2,100	3,100	28,667	3,236	28,667	3,236	35,834	4,045
K913_0320 MT40	32.1	47275/1472	50.5	10/5	1,697	191.6	2,600	2,500	3,300	36,287	4,097	36,287	4,097	45,359	5,121
K913_0380 MT40	38.0	194773/5120	40.9	10/5	1,742	196.6	2,600	2,500	3,300	41,507	4,686	41,507	4,686	51,884	5,857
K913_0490 MT40	48.9	100223/2048	30.6	10/5	1,788	201.8	2,600	2,500	3,300	46,057	5,200	50,497	5,701	63,122	7,126
K913_0630 MT40	63.1	209901/3328	23.5	10/5	1,817	205.1	2,600	2,500	3,300	47,521	5,365	61,561	6,950	76,952	8,687
K913_0750 MT40	75.0	62403/832	19.9	10/5	1,830	206.6	2,600	2,500	3,300	48,789	5,508	68,207	7,700	88,210	9,958
K913_0950 MT40	95.4	293105/3072	16.4	10/5	1,843	208.0	2,600	2,500	3,300	47,620	5,376	57,144	6,451	95,240	10,752
K914 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 65 dB(A)** [4]	
K914_0920 MT40	92.4	2399679/25984	15.9	10/5	1,841	207.9	2,600	2,500	3,300	51,301	5,792	54,781	6,184	68,477	7,730
K914_0940 MT30	93.8	4177219/44544	10.6	10/5	1,819	205.3	2,600	2,500	3,300	25,351	2,862	28,664	3,236	35,831	4,045
K914_1240 MT40	123.9	1276425/10304	14.3	10/5	1,851	208.9	2,600	2,500	3,300	55,856	6,306	68,207	7,700	86,680	9,785
K914_1260 MT30	125.8	2221925/17664	9.1	10/5	1,838	207.5	2,600	2,500	3,300	34,011	3,840	36,284	4,096	45,355	5,120
K914_1470 MT40	146.7	5258871/35840	13.7	10/5	1,854	209.3	2,600	2,500	3,300	58,341	6,586	68,207	7,700	99,147	11,193
K914_1490 MT30	149.0	9154331/61440	8.5	10/5	1,845	208.3	2,600	2,500	3,300	35,534	4,012	41,503	4,685	51,879	5,857
K914_1890 MT40	188.8	2706021/14336	13.0	10/5	1,858	209.7	2,600	2,500	3,300	61,395	6,931	68,207	7,700	120,623	13,617
K914_1920 MT30	191.7	4710481/24576	7.8	10/5	1,852	209.1	2,600	2,500	3,300	37,395	4,222	50,493	5,700	63,116	7,125
K914_2430 MT40	243.3	5667327/23296	12.5	10/5	1,860	210.0	2,600	2,500	3,300	62,006	7,000	68,207	7,700	124,012	14,000
K914_2470 MT30	247.0	3288449/13312	7.4	10/5	1,856	209.6	2,600	2,500	3,300	39,451	4,454	61,556	6,949	76,945	8,687
K914_2940 MT30	293.8	977647/3328	7.1	10/5	1,858	209.8	2,600	2,500	3,300	41,103	4,640	68,207	7,700	88,202	9,957
K914_3740 MT30	373.7	13775935/36864	6.9	10/5	1,860	210.0	2,600	2,500	2,500	42,865	4,839	57,144	6,451	95,240	10,752
K1014 with MT TriAdapt® Motor Adapter														**Noise Level ≤ 65 dB(A)** [4]	
K1014_1220MT40	121.6	556605/4576	18.4	10/5	4,062	458.5	2,500	2,300	3,200	65,262	7,368	71,200	8,038	89,000	10,047
K1014_1490MT40	148.9	30969/208	16.5	10/5	4,082	460.8	2,500	2,300	3,200	68,756	7,762	83,596	9,437	104,495	11,797
K1014_1870MT40	187.2	662067/3536	15.1	10/5	4,097	462.5	2,500	2,300	3,200	72,449	8,179	100,087	11,299	125,108	14,124
K1014_2370MT40	237.4	49383/208	14.0	10/5	4,106	463.6	2,500	2,300	3,200	76,116	8,593	116,926	13,200	150,564	16,998
K1014_2900MT40	290.4	392553/1352	13.3	10/5	4,112	464.2	2,500	2,300	3,200	78,321	8,842	116,926	13,200	175,508	19,813

Motor Shaft

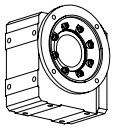
Motor Adapter	Max. Shaft Diameter
MT10	19
MT20	24
MT30	38
MT40	48

Housing Styles

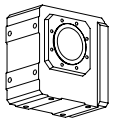
N Foot Mounted



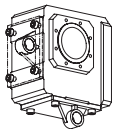
F Round Flange



G Tapped Holes

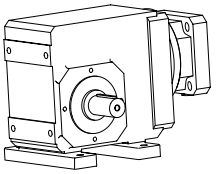


GD Torque Arm Bracket

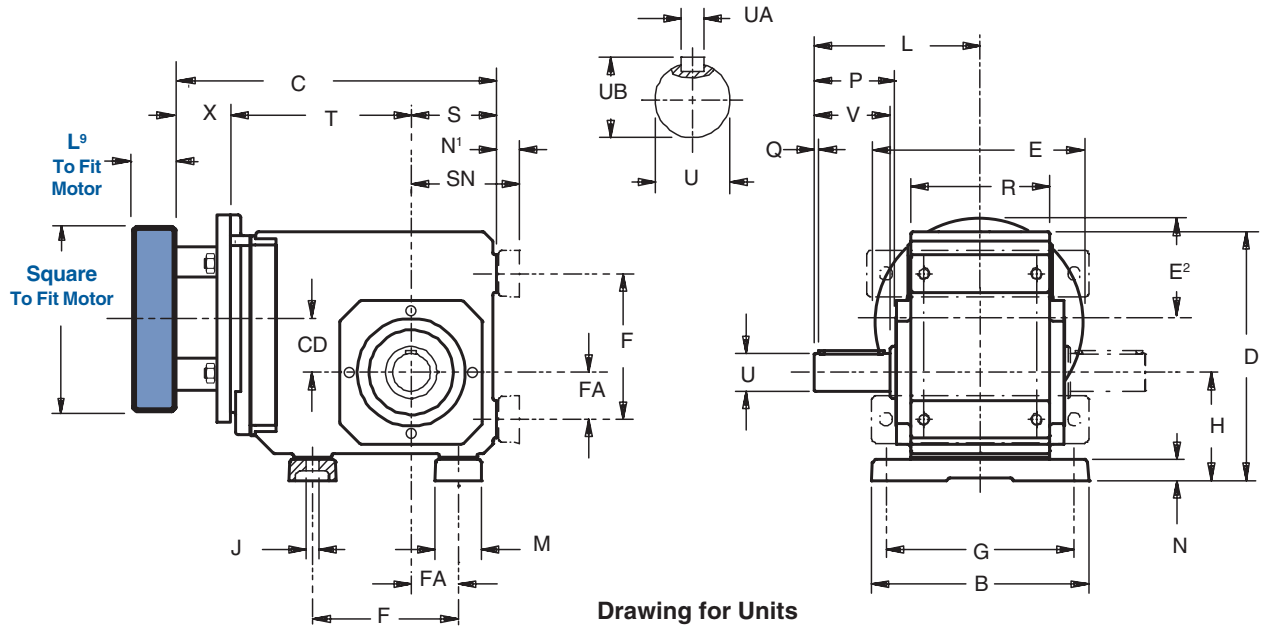


These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 102 for required ordering information and part number example.



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



Drawing for Units
K102VN — K403VN

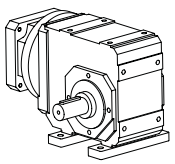
Table No. 1 **"K" Series – Foot Mounting Unit Dimensions (Inches) – "N" Housing Style**

Base Module	B	D	F	G	H	J	L	M	N	O	P	Q	R	S	V	Z[1]	BO	FA	N[1]	SN
K102	5.51	6.81	3.54[1)]	4.53	2.95	.35	4.53	1.18	.51	—	2.32	.16	3.54	2.36	1.97	—	—	1.18	.59	2.95
K202/203	7.28	8.39	4.53	6.10	3.46	.43	5.31	1.57	.79	—	2.56	.16	4.53	2.56	2.36	—	—	1.38	.91	3.46
K302/303	7.87	9.29	5.12	6.69	3.86	.43	5.59	1.77	.79	—	2.60	.16	5.12	2.95	2.36	—	—	1.57	.91	3.86
K402/403	9.06	10.43	6.10	7.87	4.53	.55	6.54	1.97	.87	—	3.39	.16	5.83	3.54	2.76	—	—	1.97	.98	4.53
K513/514	9.45	11.42	5.51	7.87	7.48	.71	8.74	2.36	1.06	5.10	3.90	.16	6.30	3.94	3.54	5.98	7.28	1.57	1.18	5.12
K613/614	9.84	13.39	6.30	8.27	8.66	.71	9.29	2.56	1.06	5.35	4.31	.16	6.61	4.72	3.94	6.77	7.87	1.97	1.18	5.91
K713/714	11.42	14.96	7.09	9.45	9.84	.87	10.91	2.76	1.38	6.46	5.14	.16	7.48	4.92	4.72	7.52	8.90	2.17	1.50	6.42
K813/814	14.17	17.91	9.45	11.81	12.20	1.02	12.83	3.35	1.61	7.28	5.94	.20	9.25	5.71	5.51	8.11	11.10	2.95	1.77	7.48
K913/914	16.93	21.46	11.02	14.17	14.37	1.30	15.16	3.74	1.81	8.66	7.13	.31	11.22	7.09	6.69	9.84	12.99	3.74	1.97	9.06
K1014	15.75	23.27	13.78	12.99	14.76	1.54	16.46	4.72	1.77	9.45	8.66	.59	15.75	—	8.27	12.01	14.02	4.53	1.77	8.86

[1)] Mounting holes are also located on Side 1 of the K1 unit ONLY.

Table No. 2 **Metric output available on request.**

Base Module	Standard Shaft – inches			Optional Shaft – mm		
	U +.000/.001	UA – Key	UB	U	UA – Key	UB
K102	1.000	1/4 × 1/4 × 1 9/16	1.11	25k6	M8 ×7×40	28
K202/203	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	M8 ×7×50	33
K302/303	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	M8 ×7×50	33
K402/403	1.375	5/16 × 5/16 × 2 5/16	1.51	40k6	M12 ×8×70	43
K513/514	1.750	3/8 × 3/8 × 3 5/32	1.92	45k6	M14 ×9×80	48.5
K613/614	1.750	3/8 × 3/8 × 3 5/32	1.92	50k6	M14 ×9×90	53.5
K713/714	2.375	5/8 × 5/8 × 3 15/16	2.65	60k6	M18 ×11×110	64
K813/814	2.875	3/4 × 3/4 × 4 5/16	3.21	70m6	M20 ×12×125	74.5
K913/914	3.625	7/8 × 7/8 × 5 1/2	4.01	90m6	M25 ×14×140	95
K1014	4.375	1 × 1 × 7 1/8	4.82	110m6	M28 ×16×180	116

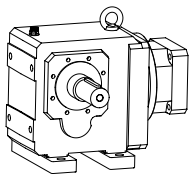


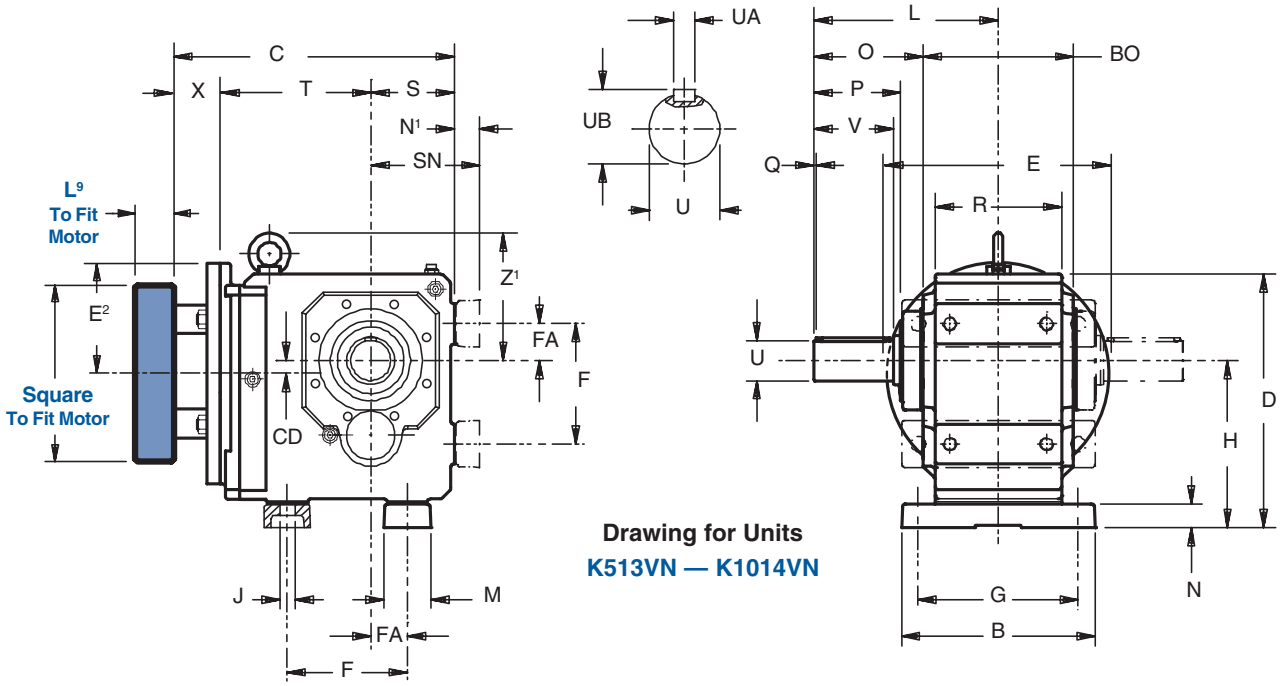
K1 Housing with tapped holes on Side 1, Side 2, and Side 5. Shown EL1 with mounting feet on Side 1.

Part No. Example
Foot Mounting with TriAdapt® Motor Adapter
K303VN0650 MT20

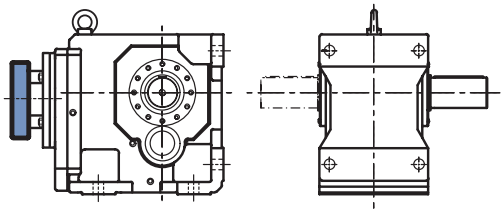
For approximate weight, add adapter weight from Table 3 and base module weight from Table 4.

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





Drawing for Units
K513VN — K1014VN



Mounting feet are integral on the K10 housing.

Table No. 3 "MT" Motor Plate Dimensions

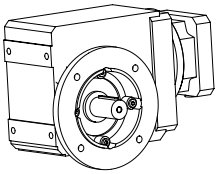
Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness		Inches			Wt. lbs.
			L9 Minimum					
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

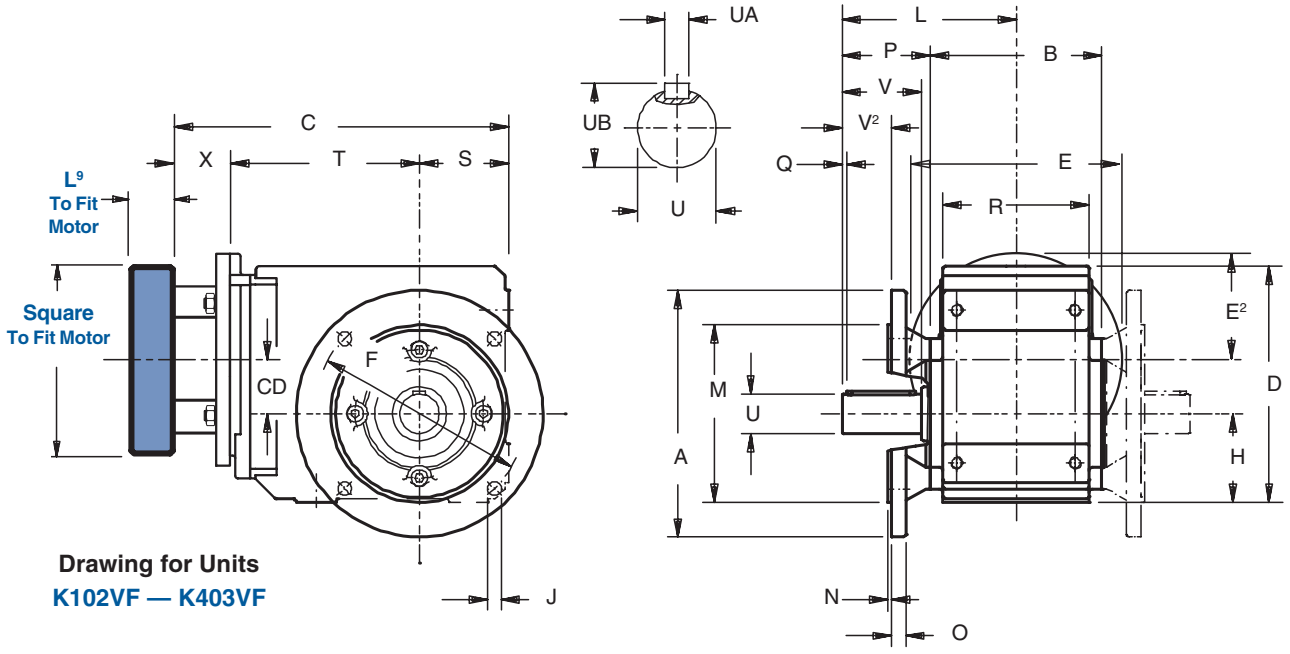
Table No. 4
"K" Series – Foot Mounting Unit Dimensions (Inches) – "N" Housing Style

Base Module	MT10			MT20			MT30			MT40			Wt. lbs.
	CD	C	T	CD	C	T	CD	C	T	CD	C	T	
K102	1.42	9.40	4.88	1.42	9.96	5.04	—	—	—	—	—	—	31
K202	1.81	9.76	5.63	1.81	10.32	5.79	1.81	10.79	5.87	—	—	—	40
K203	1.81	11.22	7.09	—	—	—	—	—	—	—	—	—	53
K302	2.07	10.94	6.42	2.07	11.49	6.57	2.07	11.96	6.65	—	—	—	67
K303	2.07	12.39	7.87	.63	13.19	8.27	—	—	—	—	—	—	73
K402	—	—	—	2.36	12.87	7.36	2.36	13.34	7.44	2.36	14.60	7.56	93
K403	2.36	13.77	8.66	.91	14.57	9.06	—	—	—	—	—	—	100
K513	—	—	—	.59	12.68	6.77	.59	13.15	6.85	.59	14.41	6.97	106
K514	—	—	—	.59	14.37	8.46	—	—	—	—	—	—	109
K613	—	—	—	.71	14.21	7.52	.71	14.68	7.60	.71	15.94	7.72	170
K614	—	—	—	.71	15.90	9.21	—	—	—	—	—	—	177
K713	—	—	—	—	—	—	.79	15.98	8.70	.79	17.24	8.82	221
K714	—	—	—	.79	17.24	10.35	.79	18.42	11.14	—	—	—	234
K813	—	—	—	—	—	—	.94	17.79	9.72	.94	19.01	9.80	309
K814	—	—	—	—	—	—	.94	20.20	12.13	—	—	—	331
K913	—	—	—	—	—	—	—	—	—	.98	22.16	11.57	508
K914	—	—	—	—	—	—	.98	23.35	13.90	.98	24.96	14.37	530
K1014	—	—	—	—	—	—	—	—	—	1.10	30.08	17.72	1,011

See web site for drawings.



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



Drawing for Units
K102VF — K403VF

Table No. 1 **"K" Series – Round Flange Unit Dimensions (Inches) – "F" Housing Style**

Base Module	A	B	D	F	H	J	L	M	N	O	P	Q	R	S	V	V²	Z¹
K102	6.30	4.17	6.30	5.12	2.36	.35	4.53	4.331 +.001/-.0004	.14	.39	2.44	.16	3.54	2.36	1.97	1.18	—
K202/203	7.87	5.28	7.48	6.50	2.56	.43	5.31	5.118 +.001/-.0004	.14	.47	2.68	.16	4.53	2.56	2.36	1.42	—
K302/303	7.87	5.75	8.39	6.50	2.95	.43	5.59	5.118 +.001/-.0004	.14	.55	2.72	.16	5.12	2.95	2.36	1.22	—
K402/403	9.84	6.81	9.45	8.46	3.54	.55	6.54	7.087 +.001/-.0004	.16	.59	3.52	.16	5.83	3.54	2.76	1.95	—
K513/514	9.84	7.28	10.24	8.46	6.30	.55	8.74	7.087 +.001/-.0004	.16	.59	5.10	.16	6.30	3.94	3.54	—	5.98
K613/614	11.81	7.87	12.20	10.43	7.48	.55	9.29	9.055 +.001/-.001	.16	.67	5.35	.16	6.61	4.72	3.94	—	6.77
K713/714	13.78	8.90	13.46	11.81	8.35	.71	10.91	9.842 +.000/-.001	.20	.71	6.46	.16	7.48	4.92	4.72	—	7.52
K813/814	15.75	11.10	16.14	13.78	10.43	.71	12.83	11.811 +.000/-.001	.20	.79	7.28	.20	9.25	5.71	5.51	—	8.11
K913/914	17.72	12.99	19.49	15.75 *	12.40	.71	15.16	13.780 +.000/-.001	.20	.91	8.66	.31	11.22	7.09	6.69	—	9.84
K1014	21.65	14.02	23.27	19.69 *	14.76	.71	18.35	17.716 +.000/-.002	.20	.98	11.34	.59	15.75	8.86	8.27	—	12.01

* K913 thru K1014 has 8 mounting holes in the output flange instead of 4 as shown in drawing.

Table No. 2 **Metric output available on request.**

	Standard Shaft – inches			Optional Shaft – mm		
Base Module	U +.000/.001	UA – Key	UB	U	UA – Key	UB
K102	1.000	1/4 × 1/4 × 1 9/16	1.11	25k6	M8 ×7×40	28
K202/203	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	M8 ×7×50	33
K302/303	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	M8 ×7×50	33
K402/403	1.375	5/16 × 5/16 × 2 5/16	1.51	40k6	M12 ×8×70	43
K513/514	1.750	3/8 × 3/8 × 3 5/32	1.92	45k6	M14 ×9×80	48.5
K613/614	1.750	3/8 × 3/8 × 3 5/32	1.92	50k6	M14 ×9×90	53.5
K713/714	2.375	5/8 × 5/8 × 3 15/16	2.65	60k6	M18 ×11×110	64
K813/814	2.875	3/4 × 3/4 × 4 5/16	3.21	70m6	M20 ×12×125	74.5
K913/914	3.625	7/8 × 7/8 × 5 1/2	4.01	90m6	M25 ×14×140	95
K1014	4.375	1 × 1 × 7 1/8	4.82	110m6	M28 ×16×180	116

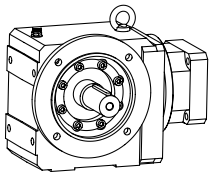
Part No. Example

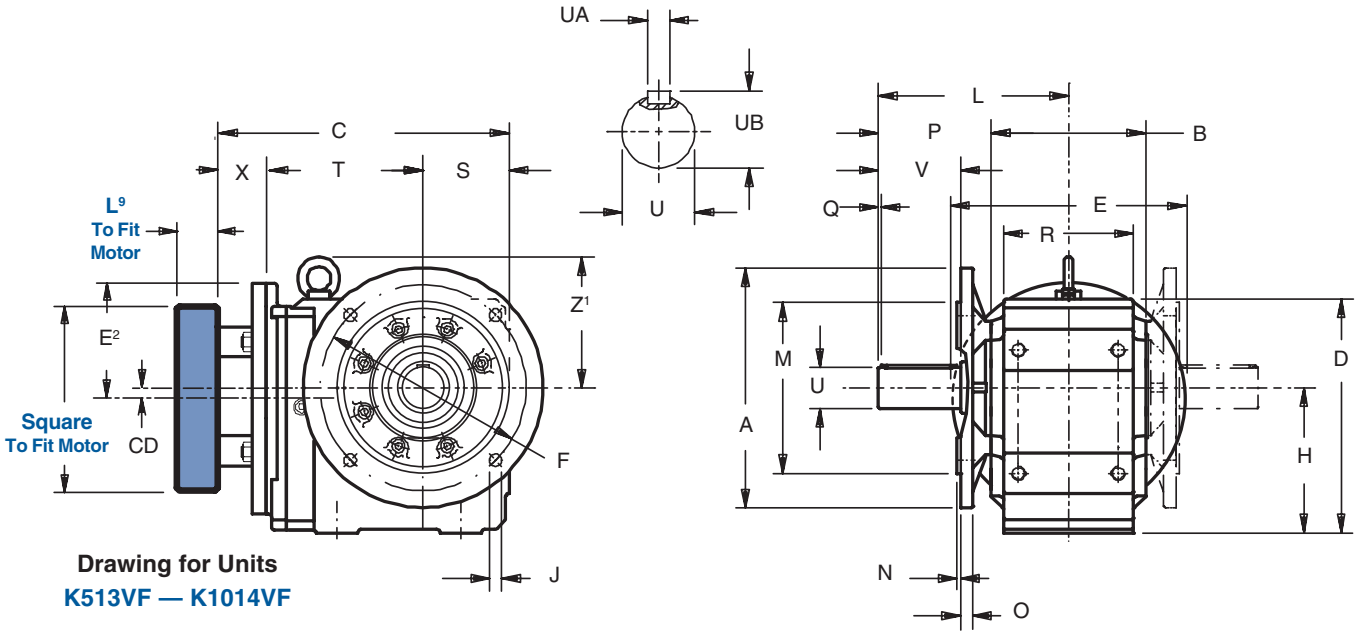
Round Flange with TriAdapt® Motor Adapter

K303VF0650 MT20

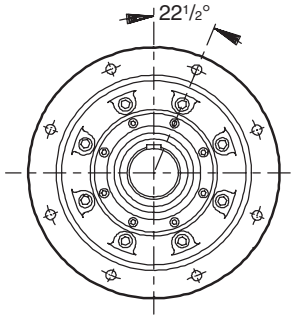
For approximate weight, add adapter weight from Table 3 and base module weight from Table 4.

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





Drawing for Units
K513VF — K1014VF



K913 thru K1014 has 8 mounting holes in the output flange located as shown.

Table No. 3 "MT" Motor Plate Dimensions

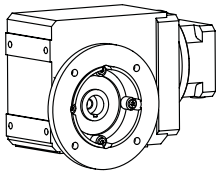
Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness L9 Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

Table No. 4
"K" Series – Flange Mounting Unit Dimensions (Inches) – "F" Housing Style

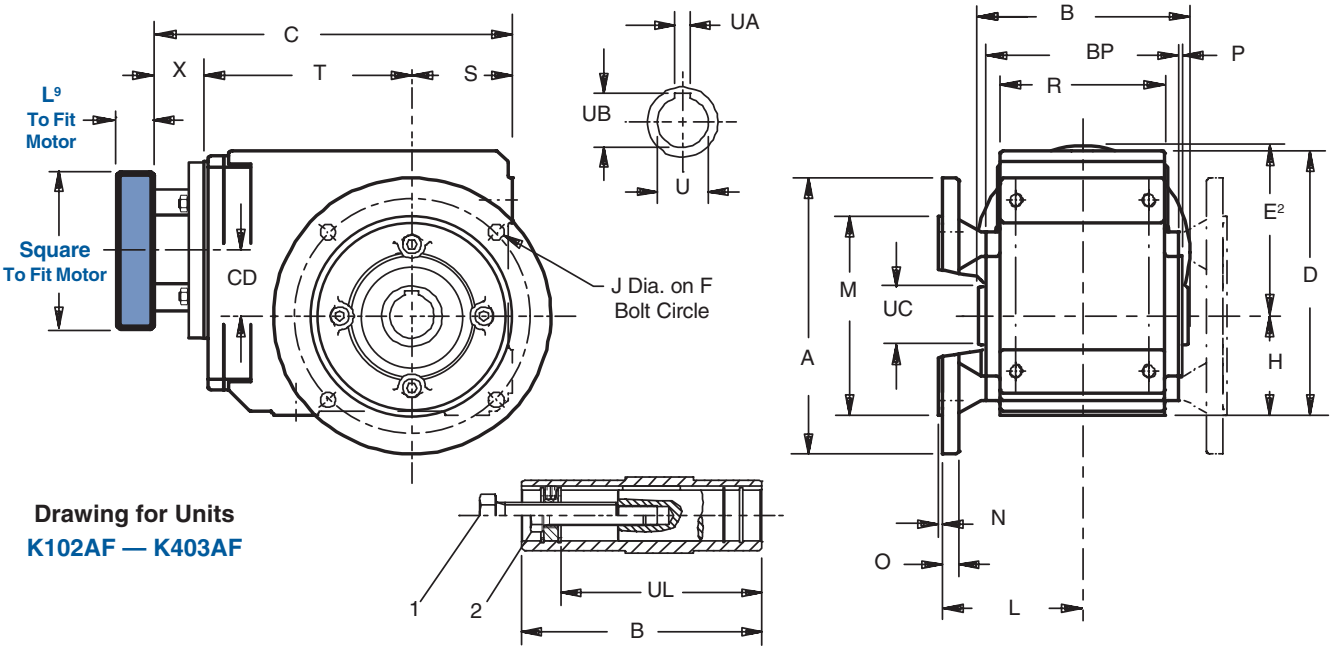
Base Module	MT10			MT20			MT30			MT40			Wt. lbs.
	CD	C	T	CD	C	T	CD	C	T	CD	C	T	
K102	1.42	9.40	4.88	1.42	9.96	5.04	—	—	—	—	—	—	31
K202	1.81	9.76	5.63	1.81	10.32	5.79	1.81	10.79	5.87	—	—	—	40
K203	1.81	11.22	7.09	—	—	—	—	—	—	—	—	—	53
K302	2.07	10.94	6.42	2.07	11.49	6.57	2.07	11.96	6.65	—	—	—	67
K303	2.07	12.39	7.87	.63	13.19	8.27	—	—	—	—	—	—	73
K402	—	—	—	2.36	12.87	7.36	2.36	13.34	7.44	2.36	14.60	7.56	93
K403	2.36	13.77	8.66	.91	14.57	9.06	—	—	—	—	—	—	100
K513	—	—	—	.59	12.68	6.77	.59	13.15	6.85	.59	14.41	6.97	106
K514	—	—	—	.59	14.37	8.46	—	—	—	—	—	—	109
K613	—	—	—	.71	14.21	7.52	.71	14.68	7.60	.71	15.94	7.72	170
K614	—	—	—	.71	15.90	9.21	—	—	—	—	—	—	177
K713	—	—	—	—	—	—	.79	15.98	8.70	.79	17.24	8.82	221
K714	—	—	—	.79	17.24	10.35	.79	18.42	11.14	—	—	—	234
K813	—	—	—	—	—	—	.94	17.79	9.72	.94	19.01	9.80	309
K814	—	—	—	—	—	—	.94	20.20	12.13	—	—	—	331
K913	—	—	—	—	—	—	—	—	—	.98	22.16	11.57	508
K914	—	—	—	—	—	—	.98	23.35	13.90	.98	24.96	14.37	530
K1014	—	—	—	—	—	—	—	—	—	1.10	30.08	17.72	1,011

See web site for drawings.



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

See Page 143 for installation of hollow ouput.



Drawing for Units
K102AF — K403AF

Table No. 1 "K" Series – Hollow Output, Round Flange Unit Dimensions (Inches) – "F" Housing Style

Base Module	A	B	D	F	H	J	L	M	N	O	P	R	S	Z_1	BP	UC	UL	1
K102	6.30	4.17	6.30	5.12	2.36	.35	4.53	4.331 +.001/-.0004	.14	.39	2.44	3.54	2.36	—	4.17	1.57	3.86	1/2-13
K202/203	7.87	5.28	7.48	6.50	2.56	.43	5.31	5.118 +.001/-.0004	.14	.47	2.68	4.53	2.56	—	5.28	1.77	4.78	1/2-13
K302/303	7.87	5.75	8.39	6.50	2.95	.43	5.59	5.118 +.001/-.0004	.14	.55	2.72	5.12	2.95	—	5.75	1.97	4.92	5/8-11
K402/403	9.84	6.81	9.45	8.46	3.54	.55	6.54	7.087 +.001/-.0004	.16	.59	3.52	5.83	3.54	—	6.81	2.17	6.18	3/4-10
K513/514	9.84	7.28	10.24	8.46	6.30	.55	8.74	7.087 +.001/-.0004	.16	.59	5.10	6.30	3.94	5.98	7.28	2.56	6.46	3/4-10
K613/614	11.81	7.87	12.20	10.43	7.48	.55	9.29	9.055 +.001/-.001	.16	.67	5.35	6.61	4.72	6.77	7.87	2.76	7.05	3/4-10
K713/714	13.78	8.90	13.46	11.81	8.35	.71	10.91	9.842 +.000/-.001	.20	.71	6.46	7.48	4.92	7.52	8.90	3.35	8.43	1-8
K813/814	15.75	11.10	16.14	13.78	10.43	.71	12.83	11.811 +.000/-.001	.20	.79	7.28	9.25	5.71	8.11	11.10	3.94	10.35	1-8
K913/914	17.72	12.99	19.49	15.75	12.40	.71	15.16	13.780 +.000/-.001	.20	.91	8.66	11.22	7.09	9.84	12.99	4.33	12.32	1-8
K1014	21.65	14.02	23.27	19.69	14.76	.71	18.35	17.716 +.000/-.002	.20	.98	11.34	15.75	8.86	12.01	15.60	5.12	14.25	1 1/4-7

Table No. 2 **Metric output available on request.**

	Standard Bore - inches			Optional Bore - mm		
Base Module	U +.000/.001	UA	UB	U	UA	UB
K102	1.000	.250	1.11	25H7	8JS9	28.3
K202/203	1.1875	.250	1.31	30H7	8JS9	33.3
K302/303	1.375	.312	1.52	35H7	10JS9	38.3
K402/403	1.500	.375	1.67	40H7	12JS9	43.3
K513/514	2.000	.500	2.13	50H7	14JS9	53.8
K613/614	2.000	.500	2.23	50H7	14JS9	53.8
K713/714	2.375	.625	2.66	60H7	18JS9	64.4
K813/814	2.750	.625	3.03	70H7	20JS9	74.9
K913/914	3.250	.750	3.59	90H7	25JS9	95.4
K1014	4.000	1.000	4.31	100H7	28JS9	116

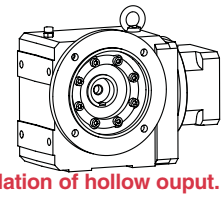
Part No. Example

Round Flange with TriAdapt® Motor Adapter

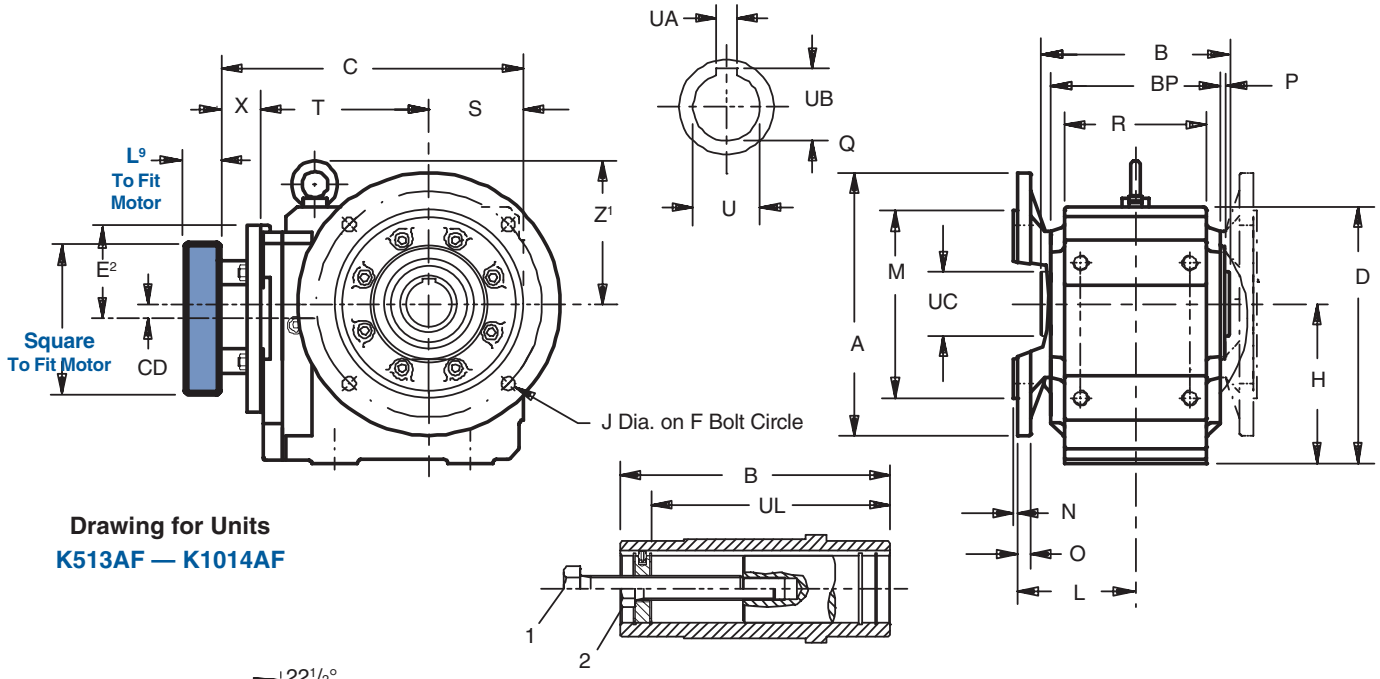
K303AF0650 MT20

For approximate weight, add adapter weight from Table 3 and base module weight from Table 4.

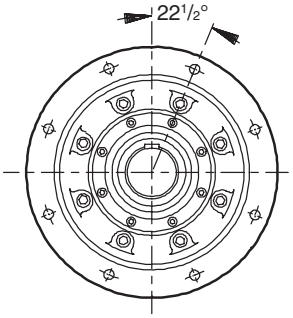
"K" Series–Right Angle Helical/Bevel ServoFit® Modular System Dimensional Data



See Page 143 for installation of hollow ouput.



Drawing for Units
K513AF — K1014AF



K913 thru K1014 has 8 mounting holes in the output flange located as shown.

Table No. 3 "MT" Motor Plate Dimensions

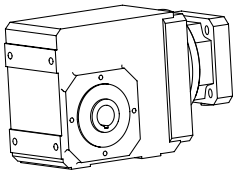
Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness		Inches			Wt. lbs.
			L9 Minimum					
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

Table No. 4
"K" Series – Flange Mounting Unit Dimensions (Inches) – "F" Housing Style

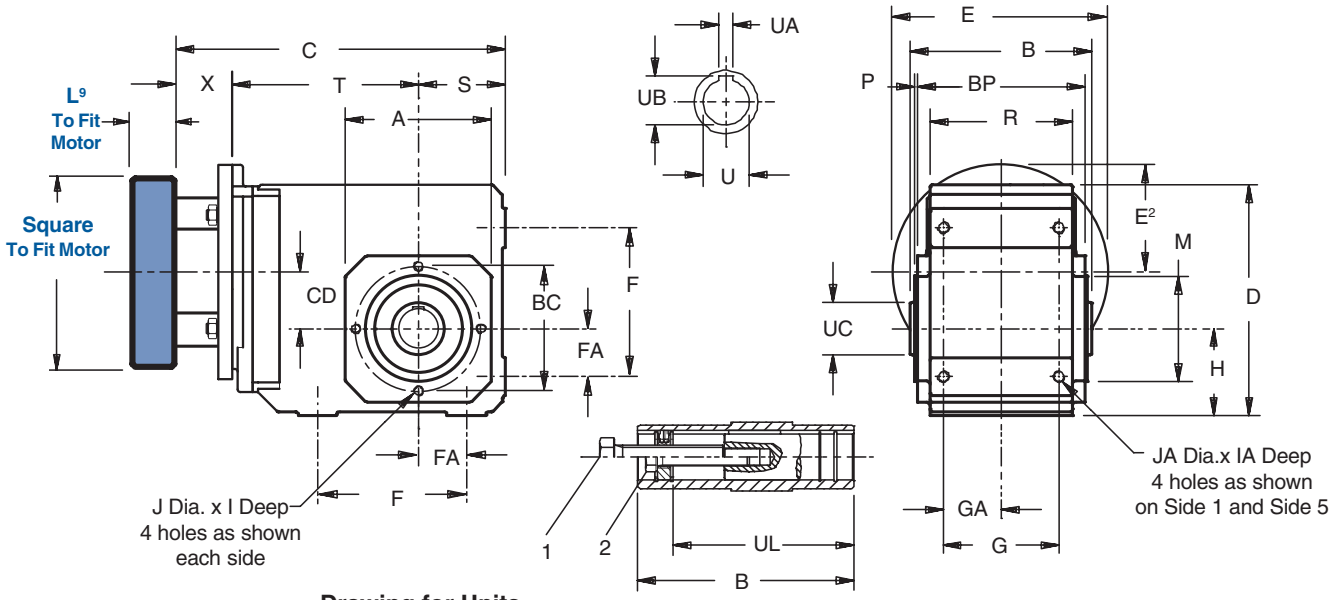
Base Module	MT10			MT20			MT30			MT40			Wt. lbs.
	CD	C	T	CD	C	T	CD	C	T	CD	C	T	
K102	1.42	9.40	4.88	1.42	9.96	5.04	—	—	—	—	—	—	31
K202	1.81	9.76	5.63	1.81	10.32	5.79	1.81	10.79	5.87	—	—	—	40
K203	1.81	11.22	7.09	—	—	—	—	—	—	—	—	—	53
K302	2.07	10.94	6.42	2.07	11.49	6.57	2.07	11.96	6.65	—	—	—	67
K303	2.07	12.39	7.87	.63	13.19	8.27	—	—	—	—	—	—	73
K402	—	—	—	2.36	12.87	7.36	2.36	13.34	7.44	2.36	14.60	7.56	93
K403	2.36	13.77	8.66	.91	14.57	9.06	—	—	—	—	—	—	100
K513	—	—	—	.59	12.68	6.77	.59	13.15	6.85	.59	14.41	6.97	106
K514	—	—	—	.59	14.37	8.46	—	—	—	—	—	—	109
K613	—	—	—	.71	14.21	7.52	.71	14.68	7.60	.71	15.94	7.72	170
K614	—	—	—	.71	15.90	9.21	—	—	—	—	—	—	177
K713	—	—	—	—	—	—	.79	15.98	8.70	.79	17.24	8.82	221
K714	—	—	—	.79	17.24	10.35	.79	18.42	11.14	—	—	—	234
K813	—	—	—	—	—	—	.94	17.79	9.72	.94	19.01	9.80	309
K814	—	—	—	—	—	—	.94	20.20	12.13	—	—	—	331
K913	—	—	—	—	—	—	—	—	—	.98	22.16	11.57	508
K914	—	—	—	—	—	—	.98	23.35	13.90	.98	24.96	14.37	530
K1014	—	—	—	—	—	—	—	—	—	1.10	30.08	17.72	1,011

See web site for drawings.



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

See Page 143 for installation of hollow ouput.



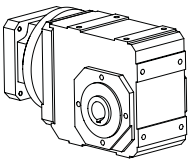
Drawing for Units
K102AG — K403AG

Table No. 1 **"K" Series – Tapped Hole Unit Dimensions (Inches) – "G" Housing Style**

Base Module	A	B	D	F	G	H	I	J	M	P	R	S	Z[1]	BC	BP	FA	GA	IA	JA
K102	4.13	4.72	6.30	3.54	2.76	2.36	.51	4-M8	2.953 +.001/-.0003	.12	3.54	2.36	—	3.54	4.17	1.18	1.38	.51	M8
K202/203	4.57	5.83	7.48	4.53	3.54	2.56	.51	4-M8	3.228 +.001/-.0004	.12	4.53	2.56	—	3.94	5.28	1.38	1.77	.63	M10
K302/303	5.20	6.30	8.39	5.12	4.13	2.95	.51	4-M8	3.740 +.001/-.0004	.12	5.12	2.95	—	4.53	5.75	1.57	2.07	.63	M10
K402/403	5.98	7.40	9.45	6.10	4.72	3.54	.63	4-M10	4.331 +.001/-.0004	.14	5.83	3.54	—	5.12	6.81	1.97	2.36	.75	M12
K513/514	5.71	7.87	10.24	5.51	4.92	6.30	.63	8-M10	4.331 +.001/-.0004	.14	6.30	3.94	5.98	5.12	7.28	1.57	2.46	1.02	M16
K613/614	7.09	8.46	12.20	6.30	5.12	7.48	.63	8-M10	5.512 +.001/-.0004	.14	6.61	4.72	6.77	6.50	7.87	1.97	2.56	1.02	M16
K713/714	7.68	9.53	13.46	7.09	5.71	8.35	.75	8-M12	6.102 +.001/-.0004	.14	7.48	4.92	7.52	7.28	8.90	2.17	2.85	1.22	M20
K813/814	8.90	11.81	16.14	9.45	7.28	10.43	.75	8-M12	7.283 +.001/-.001	.16	9.25	5.71	8.11	8.46	11.10	2.95	3.64	1.50	M24
K913/914	11.02	13.78	19.49	11.02	8.86	12.40	1.02	8-M16	9.055 +.001/-.001	.20	11.22	7.09	9.84	10.43	12.99	3.74	4.43	1.89	M30
K1014	13.38	16.14	23.27	11.81	12.99	14.76	1.30	8-M20	9.843 +.001/-.001	.28	15.59	8.86	12.01	11.81	15.60	4.53	6.50	1.77	1.54

Table No. 2

Base Module	UC	UL	1
K102	1.57	3.86	1/2-13
K202/203	1.77	4.78	1/2-13
K302/303	1.97	4.92	5/8-11
K402/403	2.17	6.18	3/4-10
K513/514	2.56	6.46	3/4-10
K613/614	2.76	7.05	3/4-10
K713/714	3.35	8.43	1-8
K813/814	3.94	10.35	1-8
K913/914	4.33	12.32	1-8
K1014	5.12	14.25	1 1/4-7



K1 Housing with tapped holes on Side 1, Side 2, and Side 5.

Table No. 3 **Metric output available on request.**

	Standard Bore - inches			Optional Bore - mm		
Base Module	U +.000/.001	UA	UB	U	UA	UB
K102	1.000	.250	1.11	25H7	8JS9	28.3
K202/203	1.1875	.250	1.31	30H7	8JS9	33.3
K302/303	1.375	.312	1.52	35H7	10JS9	38.3
K402/403	1.500	.375	1.67	40H7	12JS9	43.3
K513/514	2.000	.500	2.13	50H7	14JS9	53.8
K613/614	2.000	.500	2.23	50H7	14JS9	53.8
K713/714	2.375	.625	2.66	60H7	18JS9	64.4
K813/814	2.750	.625	3.03	70H7	20JS9	74.9
K913/914	3.250	.750	3.59	90H7	25JS9	95.4
K1014	4.000	1.000	4.31	100H7	28JS9	116

1. Removal Bolt — not supplied.
2. Mounting Bolt — must be smaller than removal bolt.

For approximate weight, add adapter weight from Table 4 and base module weight from Table 5.

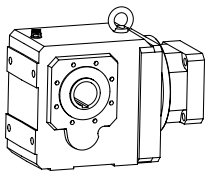
Part No. Example

Tapped Holes Housing with TriAdapt® Motor Adapter

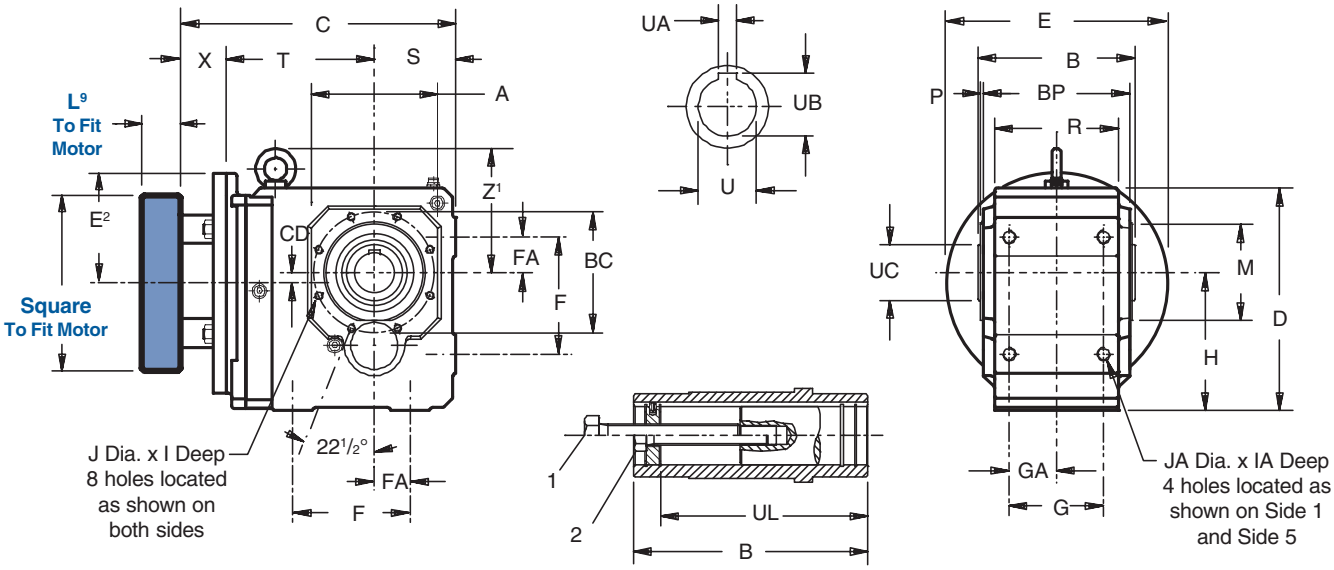
K303AG0650 MT20

See web site for drawings.

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



See Page 143 for installation of hollow ouput.



Drawing for Units
K513AG — K1014AG

Table No. 4

"K" Series – Tapped Hole Unit Dimensions (Inches) – "G" Housing Style

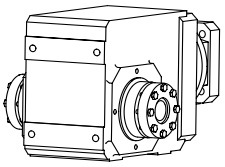
Base	MT10			MT20			MT30			MT40			Wt.
Module	CD	C	T	CD	C	T	CD	C	T	CD	C	T	lbs.
K102	1.42	9.40	4.88	1.42	9.96	5.04	—	—	—	—	—	—	31
K202	1.81	9.76	5.63	1.81	10.32	5.79	1.81	10.79	5.87	—	—	—	40
K203	1.81	11.22	7.09	—	—	—	—	—	—	—	—	—	53
K302	2.07	10.94	6.42	2.07	11.49	6.57	2.07	11.96	6.65	—	—	—	67
K303	2.07	12.39	7.87	.63	13.19	8.27	—	—	—	—	—	—	73
K402	—	—	—	2.36	12.87	7.36	2.36	13.34	7.44	2.36	14.60	7.56	93
K403	2.36	13.77	8.66	.91	14.57	9.06	—	—	—	—	—	—	100
K513	—	—	—	.59	12.68	6.77	.59	13.15	6.85	.59	14.41	6.97	106
K514	—	—	—	.59	14.37	8.46	—	—	—	—	—	—	109
K613	—	—	—	.71	14.21	7.52	.71	14.68	7.60	.71	15.94	7.72	170
K614	—	—	—	.71	15.90	9.21	—	—	—	—	—	—	177
K713	—	—	—	—	—	—	.79	15.98	8.70	.79	17.24	8.82	221
K714	—	—	—	.79	17.24	10.35	.79	18.42	11.14	—	—	—	234
K813	—	—	—	—	—	—	.94	17.79	9.72	.94	19.01	9.80	309
K814	—	—	—	—	—	—	.94	20.20	12.13	—	—	—	331
K913	—	—	—	—	—	—	—	—	—	.98	22.16	11.57	508
K914	—	—	—	—	—	—	.98	23.35	13.90	.98	24.96	14.37	530
K1014	—	—	—	—	—	—	—	—	—	1.10	30.08	17.72	1,011

Table No. 4 **"MT" Motor Plate Dimensions**

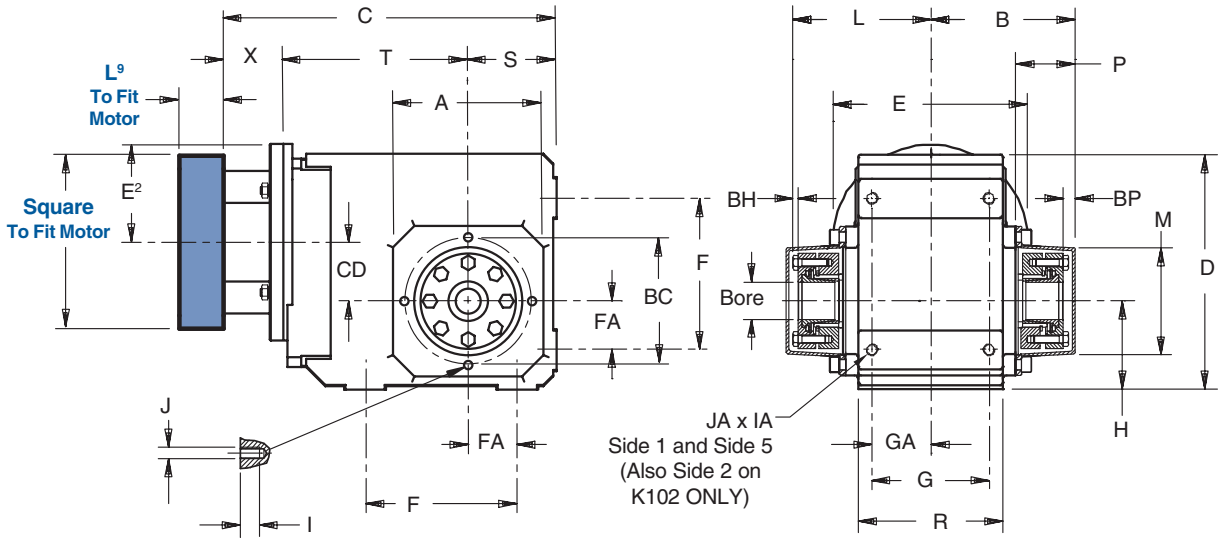
Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness		Inches			Wt.
			L9 Minimum					
	mm	ins.	mm	inches	E	E2	X	lbs.
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L9) will vary with motor shaft length but will not be less than shown.

See web site for drawings.



"K" Series–Right Angle Helical/Bevel ServoFit® Modular System Double Side Wobble Free Bushing



Drawing for Units
K102WG — K403WG

Important: A 1/32 x 45° chamfer minimum is recommended for the shaft end. The bushing will accept a shaft with a tolerance of +.000/-.005.

Table No. 1 "K" Series – Double Wobble Free – Unit Dimensions (Inches)

Base Module	Max. Bore	A	B	D	F	G	H	I	J	L
K102	1.000	4.13	3.90	6.30	3.54	2.76	2.36	.51	4-M8	3.82
K202/203	1.1875	4.57	4.68	7.48	4.53	3.54	2.56	.51	4-M8	4.45
K302/303	1.500	5.20	4.98	8.39	5.12	4.13	2.95	.51	4-M8	4.70
K402/403	1.500	5.98	5.80	9.45	6.10	4.72	3.54	.63	4-M10	5.53
K513/514	2.000	5.71	6.05	10.24	5.51	4.92	6.30	.63	8-M10	5.81
K613/614	2.1875	7.09	6.61	12.20	6.30	5.12	7.48	.63	8-M10	6.34
K713/714	2.375	7.68	7.68	13.46	7.09	5.71	8.35	.75	8-M12	7.53
K813/814	2.750	8.90	9.34	16.14	9.45	7.28	10.43	.75	8-M12	9.01

Table No. 2

Base Module	M	P	R	S	Z[1]	BC	BP	BH	FA	GA	IA	JA
K102	3.07	1.97	3.54	2.36	—	3.54	.24	.16	1.18	1.38	.51	M8
K202/203	3.46	2.05	4.53	2.56	—	3.94	.39	.16	1.38	1.77	.63	M10
K302/303	3.78	2.09	5.12	2.95	—	4.53	.43	.16	1.57	2.07	.63	M10
K402/403	4.33	2.40	5.83	3.54	—	5.12	.47	.20	1.97	2.36	.75	M12
K513/514	4.54	2.40	6.30	3.94	5.98	5.12	.43	.20	1.57	2.46	1.02	M16
K613/614	5.00	2.68	6.61	4.72	6.77	6.50	.51	.24	1.97	2.56	1.02	M16
K713/714	5.75	2.91	7.48	4.92	7.52	7.28	.39	.24	2.17	2.85	1.22	M20
K813/814	6.95	3.43	9.25	5.71	8.11	8.46	.64	.31	2.95	3.64	1.50	M24

Table No. 3 "MT" Motor Plate Dimensions

Motor Adapter	Motor Shaft D[6] Max. [1]		Motor Plate [2] Thickness L[9] Minimum		Inches			Wt. lbs.
	mm	ins.	mm	inches	E	E[2]	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

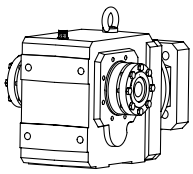
[1] If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
[2] Motor plate maximum thickness (L[9]) will vary with motor shaft length but will not be less than shown.

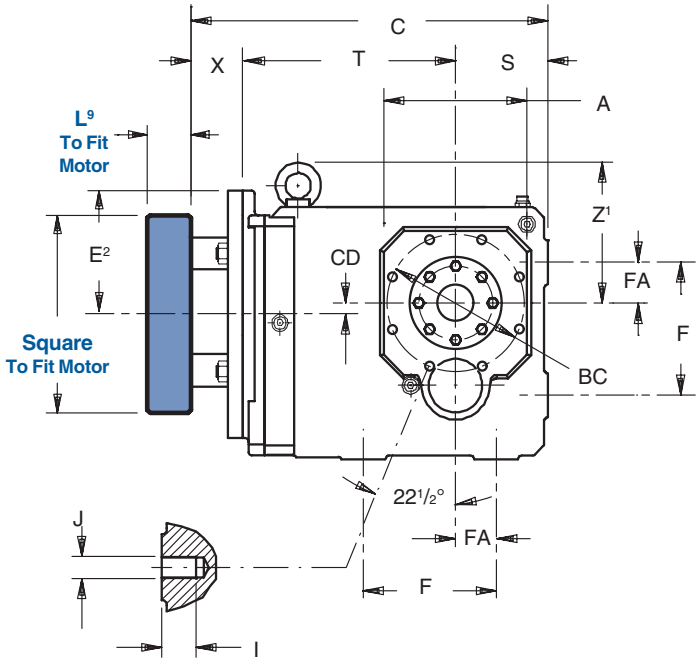
Table No. 4 "WFB" Bushing Kits

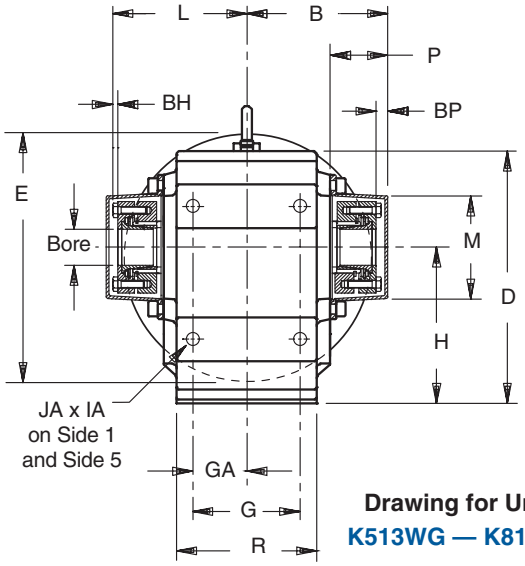
Bushing Kit No.	Bore-inches
WFB1-100	1
WFB2-100	1
WFB2-103	1 3/16
WFB3-100	1
WFB3-103	1 3/16
WFB3-104	1 1/4
WFB3-106	1 3/8
WFB3-107	1 7/16
WFB3-108	1 1/2
WFB4-100	1
WFB4-103	1 3/16
WFB4-104	1 1/4
WFB4-106	1 3/8
WFB4-107	1 7/16
WFB4-108	1 1/2
WFB5-107	1 7/16
WFB5-108	1 1/2
WFB5-110	1 5/8
WFB5-111	1 11/16
WFB5-112	1 3/4
WFB5-114	1 7/8
WFB5-115	1 15/16
WFB5-200	2
WFB6-107	1 7/16
WFB6-108	1 1/2
WFB6-110	1 5/8
WFB6-111	1 11/16
WFB6-112	1 3/4
WFB6-115	1 15/16
WFB6-200	2
WFB6-203	2 3/16
WFB7-115	1 15/16
WFB7-200	2
WFB7-203	2 3/16
WFB7-206	2 3/8
WFB8-203	2 3/16
WFB8-206	2 3/8
WFB8-207	2 7/16
WFB8-212	2 3/4

Bushing Kit No.	Bore-Metric
WFB4-40	40mm
WFB5-40	40mm
WFB6-40	40mm

"K" Series–Right Angle Helical/Bevel ServoFit® Modular System Double Side Wobble Free Bushing







Drawing for Units
K513WG — K814WG

Table No. 5 "K" Series – Double Wobble Free – Unit Dimensions (Inches)

Base	MT10			MT20			MT30			MT40			Wt.
Module	CD	C	T	CD	C	T	CD	C	T	CD	C	T	lbs.
K102	1.42	9.40	4.88	1.42	9.96	5.04	—	—	—	—	—	—	31
K202	1.81	9.76	5.63	1.81	10.32	5.79	1.81	10.79	5.87	—	—	—	40
K203	1.81	11.22	7.09	—	—	—	—	—	—	—	—	—	53
K302	2.07	10.94	6.42	2.07	11.49	6.57	2.07	11.96	6.65	—	—	—	67
K303	2.07	12.39	7.87	.63	13.19	8.27	—	—	—	—	—	—	73
K402	—	—	—	2.36	12.87	7.36	2.36	13.34	7.44	2.36	14.60	7.56	93
K403	2.36	13.77	8.66	.91	14.57	9.06	—	—	—	—	—	—	100
K513	—	—	—	.59	12.68	6.77	.59	13.15	6.85	.59	14.41	6.97	106
K514	—	—	—	.59	14.37	8.46	—	—	—	—	—	—	109
K613	—	—	—	.71	14.21	7.52	.71	14.68	7.60	.71	15.94	7.72	170
K614	—	—	—	.71	15.90	9.21	—	—	—	—	—	—	177
K713	—	—	—	—	—	—	.79	15.98	8.70	.79	17.24	8.82	221
K714	—	—	—	.79	17.24	10.35	.79	18.42	11.14	—	—	—	234
K813	—	—	—	—	—	—	.94	17.79	9.72	.94	19.01	9.80	309
K814	—	—	—	—	—	—	.94	20.20	12.13	—	—	—	331

Table No. 6 "WFB" Bushing – Stock Bores

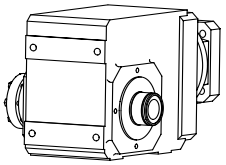
Base	INCHES																METRIC
Module	1	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2	1 5/8	1 11/16	1 3/4	1 7/8	1 15/16	2	2 3/16	2 3/8	2 7/16	2 3/4	40mm
K102	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
K202/K203	x	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
K302/K303	x	x	x	x	x	x	—	—	—	—	—	—	—	—	—	—	—
K402/K403	x	x	x	x	x	x	—	—	—	—	—	—	—	—	—	—	x
K513/K514	—	—	—	—	x	x	x	x	x	x	x	x	—	—	—	—	x
K613/K614	—	—	—	—	x	x	x	x	x	—	x	x	x	—	—	—	x
K713/K714	—	—	—	—	—	—	—	—	—	—	x	x	x	x	—	—	—
K813/K814	—	—	—	—	—	—	—	—	—	—	—	—	x	x	x	x	—

Part No. Example

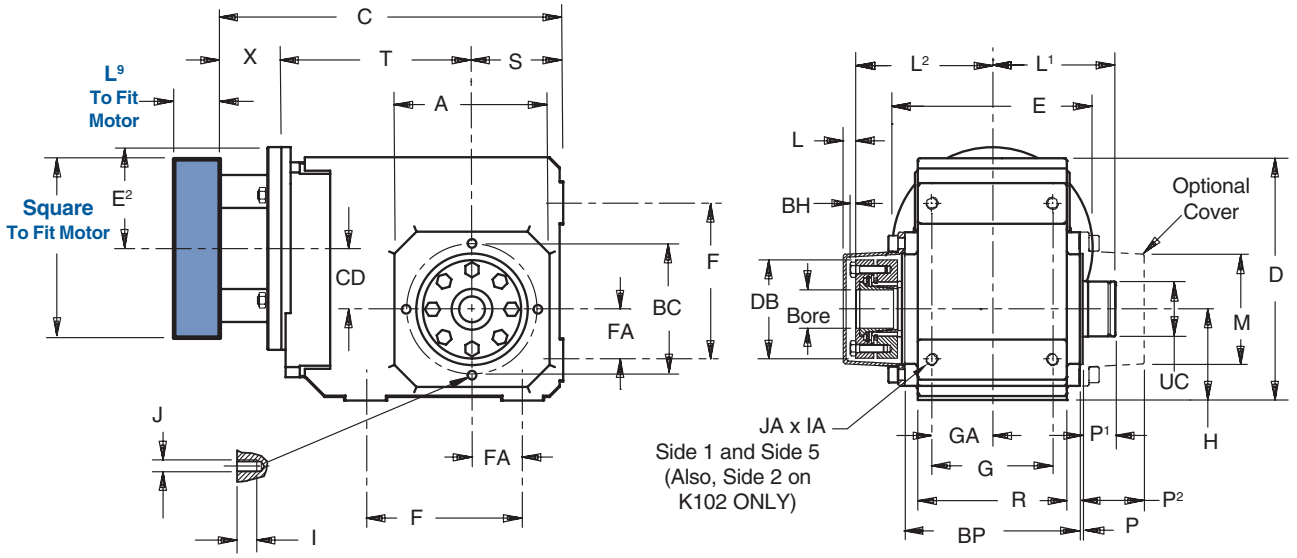
Unit with TriAdapt® Motor Adapter
1 3/8" Bore Double Bushing
K402WG0560 MT20
WFB4–106

NOTES: A complete bushing kit includes the locking ring assembly, tapered cone, support ring, and all hardware to mount the kit into the reducer. The WFB1-100 bushing does not have a tapered cone.

See web site for drawings.



"K" Series–Right Angle Helical/Bevel ServoFit® Modular System Single Side Wobble Free Bushing



Drawing for Units
K102WG — K403WG

Important: A 1/32 x 45° chamfer minimum is recommended for the shaft end. The bushing will accept a shaft with a tolerance of +.000/-.005.

Table No. 1 "K" Series – Single Side Wobble Free – Unit Dimensions (Inches)

Base Module	Max. Bore	A	D	F	G	H	I	J	L	L_1	L_2	M
K102	1.000	4.13	6.30	3.54	2.76	2.36	.51	4-M8	.24	3.15	3.66	3.07
K202/203	1.1875	4.57	7.48	4.53	3.54	2.56	.51	4-M8	.39	3.78	4.27	3.46
K302/303	1.500	5.20	8.39	5.12	4.13	2.95	.51	4-M8	.43	4.02	4.54	3.78
K402/403	1.500	5.98	9.45	6.10	4.72	3.54	.63	4-M10	.47	4.69	5.32	4.33
K513/514	2.000	5.71	10.24	5.51	4.92	6.30	.63	8-M10	.43	4.96	5.61	4.54
K613/614	2.1875	7.09	12.20	6.30	5.12	7.48	.63	8-M10	.51	5.12	6.10	5.00
K713/714	2.375	7.68	13.46	7.09	5.71	8.35	.75	8-M12	–	6.20	7.29	–
K813/814	2.750	8.90	16.14	9.45	7.28	10.43	.75	8-M12	–	7.58	8.70	–

Table No. 2

Base Module	P	P_1	P_2	R	S	Z_1	BC	BH	BP	DB	FA	GA	IA	JA	UC
K102	.12	.95	1.62	3.54	2.36	—	3.54	.16	4.17	2.76	1.18	1.38	.51	M8	1.54
K202/203	.12	1.02	1.54	4.53	2.56	—	3.94	.16	5.28	3.07	1.38	1.77	.63	M10	1.73
K302/303	.12	1.02	1.55	5.12	2.95	—	4.53	.16	5.75	3.31	1.57	2.07	.63	M10	1.93
K402/403	.14	1.14	1.83	5.83	3.54	—	5.12	.20	6.81	3.82	1.97	2.36	.75	M12	2.13
K513/514	.14	1.18	1.87	6.30	3.94	5.98	5.12	.20	7.28	4.13	1.57	2.46	1.02	M16	2.56
K613/614	.14	1.38	2.11	6.61	4.72	6.77	6.50	.24	7.87	4.65	1.97	2.56	1.02	M16	2.91
K713/714	.14	1.61	2.70	7.48	4.92	7.52	7.28	.24	8.90	5.43	2.17	2.85	1.22	M20	3.35
K813/814	.16	2.03	2.99	9.25	5.71	8.11	8.46	.31	11.10	6.22	2.95	3.64	1.50	M24	3.94

Table No. 3 "MT" Motor Plate Dimensions

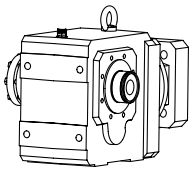
Motor Adapter	Motor Shaft D6 Max. 1)		Motor Plate 2) Thickness		Inches			Wt. lbs.
			L9 Minimum					
	mm	ins.	mm	inches	E	E2	X	
MT10	19	.748	22	.866	5.51	2.75	1.57	5
MT20	24	.945	26	1.024	6.30	3.15	1.97	8
MT30	38	1.260	35	1.378	7.87	3.94	2.36	12
MT40	48	1.890	44	1.732	9.84	4.92	3.50	18

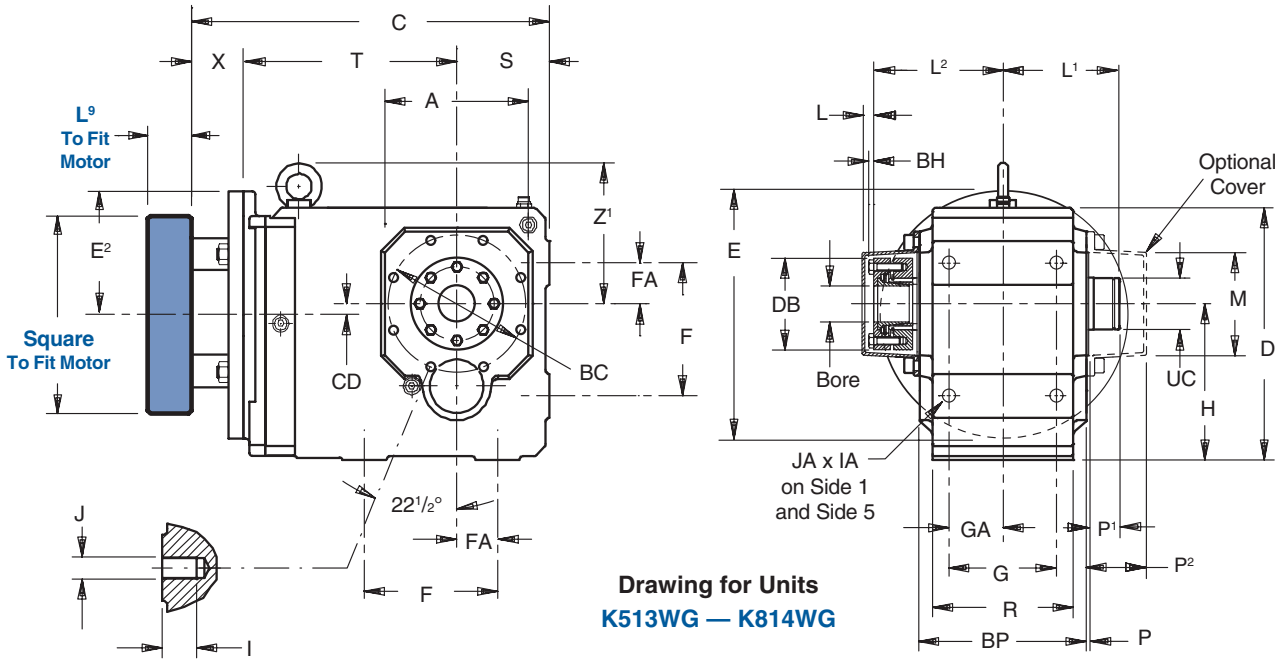
Table No. 4 "WF" Bushing Kits

Bushing Kit No.	Bore inches
WF1-100	1
WF2-100	1
WF2-103	1 3/16
WF3-100	1
WF3-103	1 3/16
WF3-104	1 1/4
WF3-106	1 3/8
WF3-107	1 7/16
WF3-108	1 1/2
WF4-100	1
WF4-103	1 3/16
WF4-104	1 1/4
WF4-106	1 3/8
WF4-107	1 7/16
WF4-108	1 1/2
WF5-107	1 7/16
WF5-108	1 1/2
WF5-110	1 5/8
WF5-111	1 11/16
WF5-112	1 3/4
WF5-114	1 7/8
WF5-115	1 15/16
WF5-200	2
WF6-107	1 7/16
WF6-108	1 1/2
WF6-110	1 5/8
WF6-111	1 11/16
WF6-112	1 3/4
WF6-115	1 15/16
WF6-200	2
WF6-203	2 3/16
WF7-115	1 15/16
WF7-200	2
WF7-203	2 3/16
WF7-206	2 3/8
WF8-203	2 3/16
WF8-206	2 3/8
WF8-207	2 7/16
WF8-212	2 3/4

1) If an adapter bushing is required it will be supplied as a component of the motor mounting plate.
2) Motor plate maximum thickness (L^9) will vary with motor shaft length but will not be less than shown.

"K" Series–Right Angle Helical/Bevel ServoFit® Modular System Single Side Wobble Free Bushing





Drawing for Units
K513WG — K814WG

Table No. 5 "K" Series – Single Wobble Free – Unit Dimensions (Inches)

Base	MT10			MT20			MT30			MT40			Wt.
Module	CD	C	T	CD	C	T	CD	C	T	CD	C	T	lbs.
K102	1.42	9.40	4.88	1.42	9.96	5.04	—	—	—	—	—	—	31
K202	1.81	9.76	5.63	1.81	10.32	5.79	1.81	10.79	5.87	—	—	—	40
K203	1.81	11.22	7.09	—	—	—	—	—	—	—	—	—	53
K302	2.07	10.94	6.42	2.07	11.49	6.57	2.07	11.96	6.65	—	—	—	67
K303	2.07	12.39	7.87	.63	13.19	8.27	—	—	—	—	—	—	73
K402	—	—	—	2.36	12.87	7.36	2.36	13.34	7.44	2.36	14.60	7.56	93
K403	2.36	13.77	8.66	.91	14.57	9.06	—	—	—	—	—	—	100
K513	—	—	—	.59	12.68	6.77	.59	13.15	6.85	.59	14.41	6.97	106
K514	—	—	—	.59	14.37	8.46	—	—	—	—	—	—	109
K613	—	—	—	.71	14.21	7.52	.71	14.68	7.60	.71	15.94	7.72	170
K614	—	—	—	.71	15.90	9.21	—	—	—	—	—	—	177
K713	—	—	—	—	—	—	.79	15.98	8.70	.79	17.24	8.82	221
K714	—	—	—	.79	17.24	10.35	.79	18.42	11.14	—	—	—	234
K813	—	—	—	—	—	—	.94	17.79	9.72	.94	19.01	9.80	309
K814	—	—	—	—	—	—	.94	20.20	12.13	—	—	—	331

Table No. 6 "WF" Bushing – Stock Bores

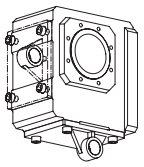
Base	INCHES															
Module	1	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2	1 5/8	1 11/16	1 3/4	1 7/8	1 15/16	2	2 3/16	2 3/8	2 7/16	2 3/4
K102	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
K202/K203	x	x	—	—	—	—	—	—	—	—	—	—	—	—	—	—
K302/K303	x	x	x	x	x	x	—	—	—	—	—	—	—	—	—	—
K402/K403	x	x	x	x	x	x	—	—	—	—	—	—	—	—	—	—
K513/K514	—	—	—	—	x	x	x	x	x	x	x	x	—	—	—	—
K613/K614	—	—	—	—	x	x	x	x	x	—	x	x	x	—	—	—
K713/K714	—	—	—	—	—	—	—	—	—	—	x	x	x	x	—	—
K813/K814	—	—	—	—	—	—	—	—	—	—	—	—	x	x	x	x

Part No. Example

Unit with TriAdapt® Motor Adapter
1 3/8" Bore Single Bushing
K402WG0560 MT20
WF4–106

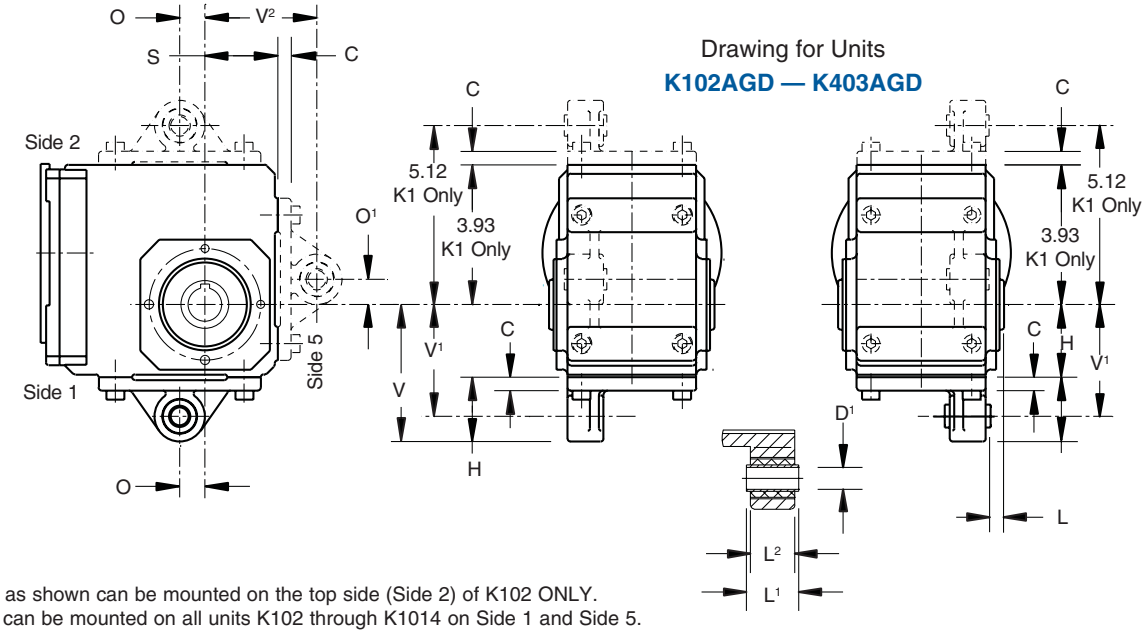
SPECIFY BUSHING SIDE WHEN ORDERING

NOTES: A complete bushing kit includes the locking ring assembly, tapered cone, support ring, and all hardware to mount the kit into the reducer. The WF1-100 bushing does not have a tapered cone.
The optional cover caps can be ordered separately.



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

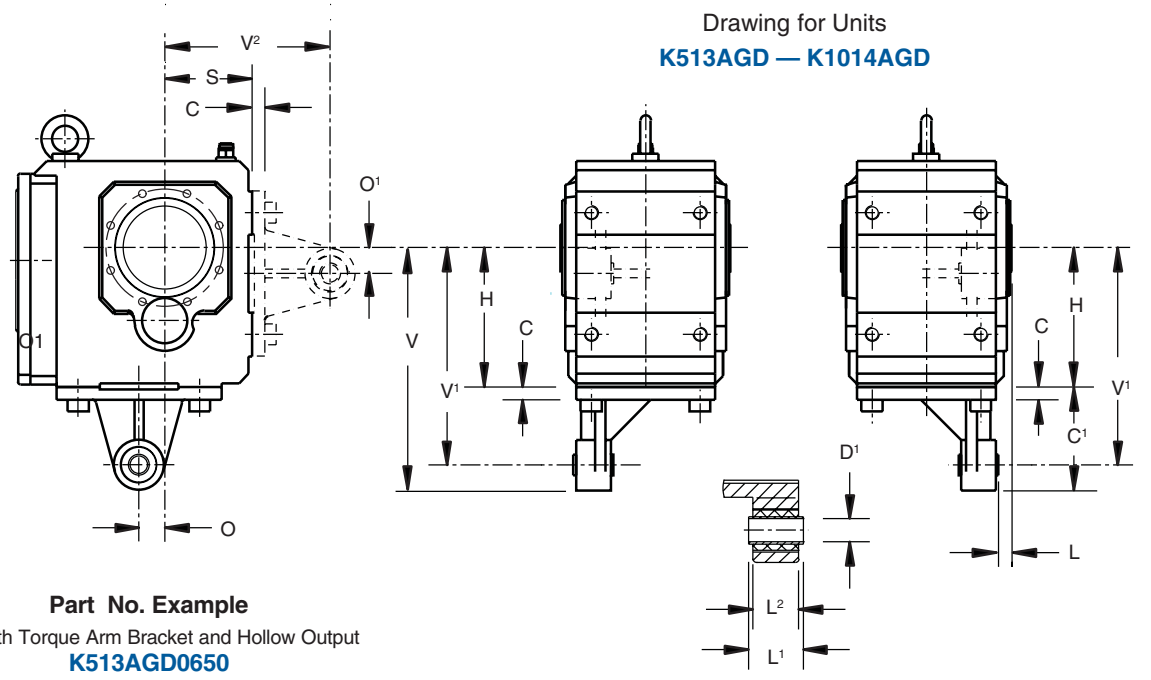
(Torque arm supplied by others.)



The bracket as shown can be mounted on the top side (Side 2) of K102 ONLY.
All brackets can be mounted on all units K102 through K1014 on Side 1 and Side 5.

Table No. 1 **"K" Series — Torque Arm Bracket Dimensions (Inches)**

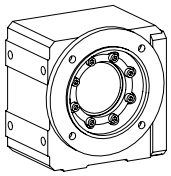
Base Module	C	C¹	D¹ H9		H	L	L¹	L²	O	O¹	S	V	V¹	V²
K102	.39	2.03	.47	+0.017/-0.000	2.36	.51	1.10	.94	.59	.59	2.36	4.39	3.54	3.54
K202/K203	.47	2.26	.63	+0.017/-0.000	2.56	.53	1.50	1.26	.89	.89	2.56	4.82	3.93	3.93
K302/K303	.47	2.66	.63	+0.017/-0.000	2.95	.47	1.50	1.26	.98	.98	2.95	5.61	4.72	4.72
K402/K403	.55	3.46	.79	+0.020/-0.000	3.54	.67	1.81	1.57	1.08	1.08	3.54	7.00	5.91	5.91
K513/K514	.59	4.68	.79	+0.020/-0.000	6.30	.67	1.81	1.57	1.18	1.18	3.93	10.98	9.84	7.48
K613/K614	.59	3.50	.79	+0.020/-0.000	7.48	.81	1.81	1.57	1.18	1.18	4.72	10.98	9.84	7.09
K713/K714	.67	4.80	.79	+0.020/-0.000	8.35	.91	2.76	2.52	1.38	1.38	4.92	13.15	11.81	8.39
K813/K814	.67	4.77	.94	+0.020/-0.000	10.43	1.02	4.53	4.02	1.77	1.77	5.71	15.20	13.78	9.06
K913/K914	.79	6.80	.94	+0.020/-0.000	12.40	1.02	4.53	4.02	1.77	1.77	7.09	19.20	17.72	12.40
K1014	1.65	9.25	1.57	+0.024/-0.000	14.76	.24	4.88	4.65	2.36	2.17	8.86	24.01	21.65	15.75

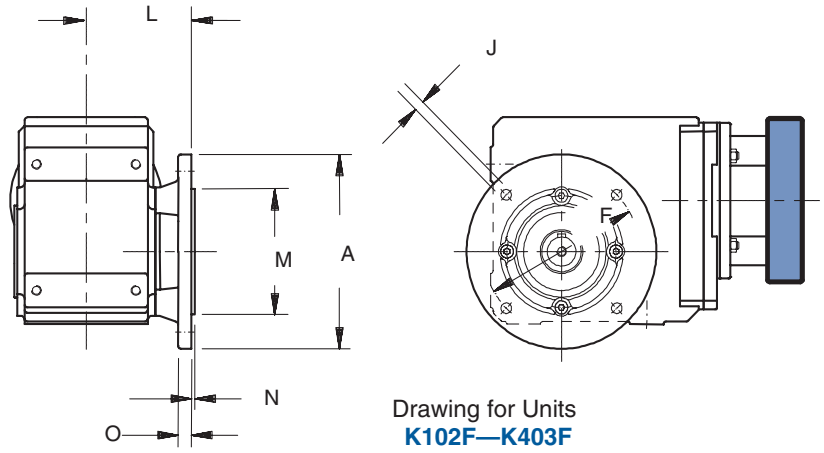


Part No. Example

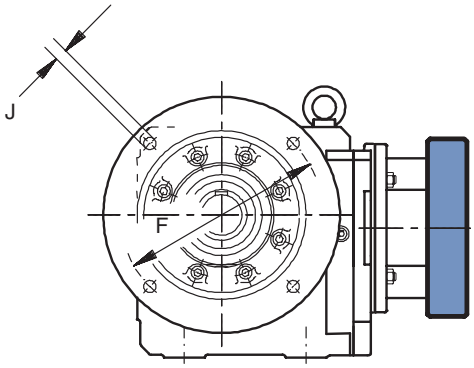
Unit with Torque Arm Bracket and Hollow Output
K513AGD0650

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

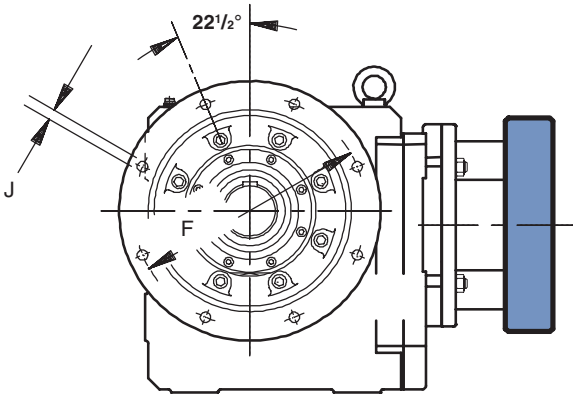




Drawing for Units
K102F—K403F



Drawing for Units
K513F—K814F



Drawing for Units
K913-K1014F

Table No. 1 "K" Series — Optional Flange Dimensions (Inches)

Base Module	Flange Designation	A	F	J	L	M	N	O
K102	140	5.51	4.53	.35	3.35	3.740 +0.001/-0.0004	.12	.39
	160 *	6.30	5.12	.35	3.35	4.331 +0.001/-0.0004	.14	.39
K202/K203	160	6.30	5.12	.35	3.90	4.331 +0.001/-0.0004	.14	.47
	200 *	7.87	6.50	.43	3.90	5.118 +0.001/-0.0004	.14	.47
K302/K303	160	6.30	5.12	.35	4.37	4.331 +0.001/-0.0004	.14	.55
	200 *	7.87	6.50	.43	4.37	5.118 +0.001/-0.0004	.14	.55
	250	9.84	8.46	.55	4.37	7.087 +0.001/-0.0004	.14	.55
K402/K403	**250** *	9.84	8.46	.55	4.98	7.087 +0.001/-0.0004	.16	.59
K513/K514	**250** *	9.84	8.46	.55	5.20	7.087 +0.001/-0.0004	.16	.59
K613/K614	**300** *	11.81	10.43	.55	5.35	9.055 +0.001/-0.0005	.16	.67
K713/K714	**350** *	13.78	11.81	.71	6.18	9.843 +0.000/-0.001	.20	.71
K813/K814	350	13.78	11.81	.71	7.32	9.843 +0.000/-0.001	.20	.79
	400 *	15.75	13.78	.71	7.32	11.811 +0.000/-0.001	.20	.79
	450	17.72	15.75	.71	7.32	13.781 +0.000/-0.002	.20	.79
K913/K914	**450** *	17.72	15.75	.71	8.46	13.780 +0.000/-0.002	.20	.91
	550	21.65	19.69	.71	8.46	17.717 +0.000/-0.002	.20	.91
K1014	**550**	21.65	19.69	.71	10.08	17.717 +0.000/-0.002	.20	.98

* This is the standard flange diameter. For other diameters, specify at the time of ordering.

See web site for drawings.

ServoFit® Gearhead
Motor Plate Specifications

STOBER ServoFit Gearheads will fit the motor of your choice by assembling the correct motor mounting plate between the motor and the gearhead. When ordering a gearhead, specify the motor manufacturer and part number, provide the motor drawing with dimensions, or specify the motor mounting dimensions. The motor plate thickness (L^9) dimension will be determined by the motor shaft length. The minimum motor plate thickness is shown below. For a precise dimension on a specific motor, contact STOBER Technical Support.

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

1. D^6 Motor Shaft Diameter (If an adapter bushing is required it will be supplied with the motor plate.)
2. D^7 Pilot Diameter
3. D^8 Bolt Circle Diameter
4. D^9 Bolt Diameter
5. L^{11} Motor Shaft Length
6. L^{12} Pilot Length
7. L^{14} Square Flange (Optional–Motor plate will typically be made to match.)

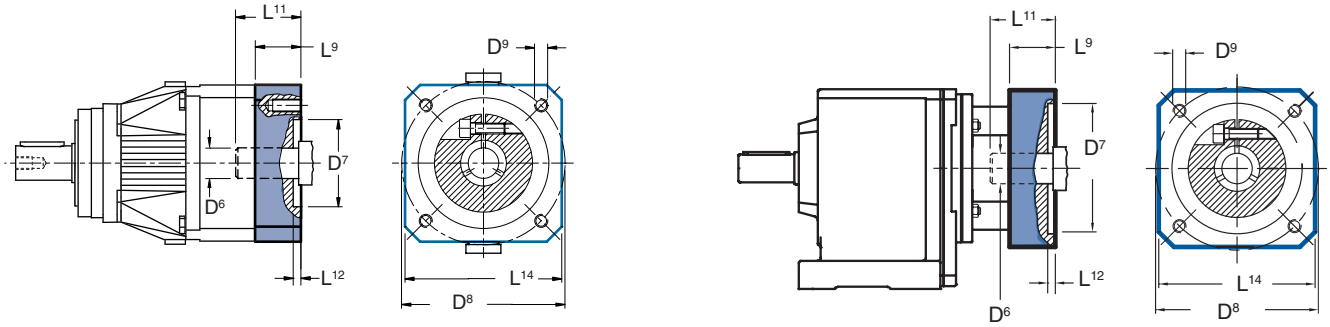


Table No. 1 **Motor Plate Thickness - Minimum**

Unit								Motor Shaft D^6 Max.	Motor Plate L^9 Min.	
P	PA	PKX	PH	PHA	PHKX	PE	C, F, K	mm	mm	ins.
P221 P222 P322	PA322		PH322	PHA322				14	15	.59
P221L P222L P321 P322L P422	PA321 PA422	P321KX3 P422KX3	PH321 PH322L PH422	PHA321 PHA422	PH321KX3 PH322KX3 PH422KX3			19	18	.71
P321L P421 P422L P522	PA421 PA522	P421KX4 P522KX4	PH321L PH421 PH422L PH522	PHA421 PHA522	PH421KX4 PH522KX4			24	21	.83
P421L P521 P522L P722	PA521 PA722	P521KX5 P722KX5	PH421L PH521 PH522L PH722 PH924	PHA521 PHA722 PHA924	PH521KX5 PH722KX5			32	24	.95
P521L P721 P722L P822	PA721 PA822	P721KX7 P822KX7	PH521L PH721 PH722L PH822 PH923 PH1024	PHA721 PHA822 PHA923 PHA1024	PH721KX7 PH822KX7			38	25	.98
P721L P821 P822L	PA821	P821KX8	PH821 PH912 PH1012	PHA821 PHA912 PHA1012 PHA1023	PH821KX8 PH912KX8			48	33	1.3
						PE201/PE202 PE301/PE302 PE401/PE402 PE501/PE502		11 14 19 24	18 20 30 33	.71 .79 1.2 1.3
							MT10	19	21	.83
							MT20	24	24	.95
							MT30	38	25	.98
							MT40	48	33	1.3

See web site for drawings.

"P and PA" Series–ClassicLine ServoFit® Precision Planetary Gearhead Output Shaft Options

Table No. 1 **Output Shaft Options**

P – Shaft with Key

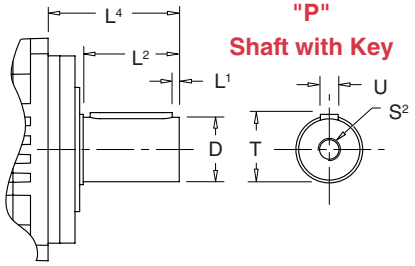
Unit No.	D k6 mm		L1 mm	L1 inches	L2 mm	L2 inches	L4 mm	L4 inches	S2 (1)	T mm	T inches	U (2) WDxHTxLG
P3/PA3	16	+.012/+.001	2	.08	28	1.10	48	1.89	M5	18	.71	A5x5x22
P4/PA4	22	+.015/+.002	3	.11	36	1.42	56	2.20	M8	24.5	.96	A6x6x28
P5/PA5	32	+.018/+.002	3	.11	58	2.28	88	3.46	M12	35	1.38	A10x8x50
P7/PA7	40	+.018/+.002	4	.16	82	3.23	112	4.41	M16	43	1.69	A12x8x70
P8/PA8	55	+.021/+.002	6	.24	82	3.23	112	4.41	M20	59	2.32	A16x10x70

G – Shaft without Key

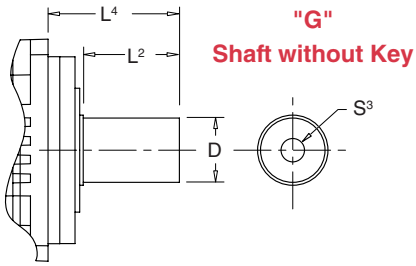
Unit No.	D k6 mm		L2 mm	L2 inches	L4 mm	L4 inches	S3 (1)
P3/PA3	16	+.012/+.001	28	1.10	48	1.89	R4x8.5
P4/PA4	22	+.015/+.002	36	1.42	56	2.20	R4x8.5
P5/PA5	32	+.018/+.002	58	2.28	88	3.46	R4x8.5
P7/PA7	40	+.018/+.002	82	3.23	112	4.41	R4x8.5
P8/PA8	55	+.021/+.002	82	3.23	112	4.41	R5x10.6

V – Splined Shaft

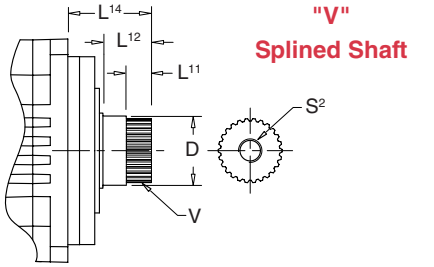
Unit No.	D k6 mm		L11 mm	L11 inches	L12 mm	L12 inches	L14 mm	L14 inches	S2 (1)	V (3)
P3/PA3	16	+.012/+.001	15	.59	26	1.02	46	1.81	M5	W16x.80x30x18x6m
P4/PA4	22	+.015/+.002	15	.59	26	1.02	46	1.81	M8	W22x1.25x30x16x6m
P5/PA5	32	+.018/+.002	15	.59	26	1.02	56	2.20	M12	W32x1.25x30x24x6m
P7/PA7	40	+.018/+.002	20	.79	40	1.57	70	2.76	M16	W40x2.00x30x18x6m
P8/PA8	55	+.021/+.002	21.5	.85	41.5	1.63	71.5	2.81	M20	W55x2.00x30x26x6m



"P" Shaft with Key



"G" Shaft without Key



"V" Splined Shaft

(1) The center hole in shafts with keys (Option "P") are machined to DIN 332 T2 shape DR. The center hole in shafts without keys (Option "G") are machined to DIN 332 T1.

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

(3) The recommended hub tolerance is H7. Because of pitch errors due to teeth cutting, this tolerance will provide backlash free operation. The hub should be heated to 100° C for assembly onto the splined shaft.

Table No. 2 **"P" Series Input – No Load Running Torque – T_R**

Unit No.		Ratio 3	4	5	7	8	10	15	16	20	25	28	32	35	40	50	70	100
P3	in.lbs.	2.7	1.8	1.8	1.8	1.8	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
	Nm.	.3	.2	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
P4	in.lbs.	3.5	2.7	2.7	1.8	1.8	1.8	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
	Nm	.4	.3	.3	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
P5	in.lbs.	7.0	5.3	4.4	3.5	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	Nm	.8	.6	.5	.4	.3	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2
P7	in.lbs.	8.0	6.2	5.3	4.4	3.5	3.5	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	Nm	.9	.7	.6	.5	.4	.4	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2
P8	in.lbs.	14.2	11.5	9.7	8.0	6.2	6.2	5.3	5.3	4.4	4.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	Nm	1.6	1.3	1.1	.9	.7	.7	.3	.6	.5	.5	.4	.4	.4	.4	.4	.4	.4

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

Table No. 3 **"PA" Series Input – No Load Running Torque – T_R**

Unit No.		Ratio 3	4	5	7	8	10	15	16	20	25	28	32	35	40	50	70	100
PA3	in.lbs.	2.7	1.8	1.8	1.8	1.8	1.8	–	1.3	1.3	.9	.9	.9	.9	.9	.9	.9	.9
	Nm.	.3	.2	.2	.2	.2	.2	–	.15	.15	.1	.1	.1	.1	.1	.1	.1	.1
PA4	in.lbs.	4.4	3.5	3.5	2.7	2.7	2.7	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	Nm	.5	.4	.4	.3	.3	.3	.3	.3	.2	.15	.15	.15	.15	.15	.15	.15	.15
PA5	in.lbs.	7.0	5.3	4.4	3.5	3.5	3.5	3.5	3.5	2.7	2.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	Nm	.8	.6	.5	.4	.4	.5	.4	.4	.3	.3	.2	.2	.2	.2	.2	.2	.2
PA7	in.lbs.	8.0	6.2	5.3	4.4	4.4	4.4	6.2	4.4	3.5	1.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	Nm	.9	.7	.6	.5	.5	.5	.7	.5	.4	.2	.4	.4	.4	.4	.4	.4	.4
PA8	in.lbs.	19.5	17.7	15.9	15.0	15.0	15.0	8.0	5.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	Nm	2.2	2.0	1.8	1.7	1.7	1.7	.9	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5

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

See web site for drawings.

"P" Series–ClassicLine
ServoFit® Precision Planetary Gearhead
Output Shaft Loads

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:

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

The application input tilting moment should be determined by the following formula: $T_{2A} = \frac{F_{2a} \cdot y_2 + F_{2r} \cdot (x_2 + z_2)}{1000} \leq T_{2K}$

The hours of life (L_h) of the unit can be determined by the following formula:
L_h > 10,000 hours if T_{2K}/T_{2A} < 1.25 and > 1.00
L_h > 20,000 hours if T_{2K}/T_{2A} > 1.25 and < 1.50
L_h > 30,000 hours if T_{2K}/T_{2A} > 1.5

Table No. 1 Permissible Load and Tilting Moments

All formulas shown are based on metric values.

R – Output Bearing Option, Normal

Unit No.	z_2 mm	z_2 inches	F_{2A} N	F_{2A} lbs.	F_{2R} N	F_{2R} lbs.	T_{2K} Nm	T_{2K} in.lbs.
P2	17	.669	500	112	1,200	1,062	34	300
P3	21	.827	1,000	225	2,500	563	88	779
P4	22	.866	1,500	338	4,000	900	160	1,416
P5	23	.906	2,300	518	6,500	1,463	306	2,708
P7	26	1.023	2,900	652	8,000	1,800	550	4,868
P8	28	1.102	4,700	1,057	13,000	2,925	897	7,938

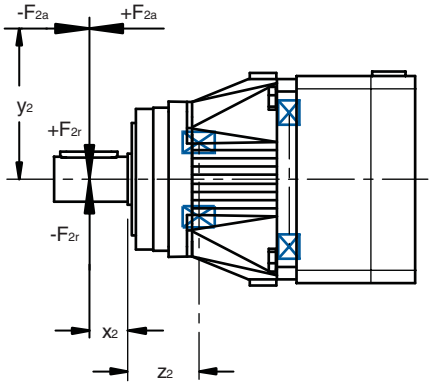
D – Output Bearing Option, Axially Reinforced

Unit No.	z_2 mm	z_2 inches	F_{2A} N	F_{2A} lbs.	F_{2R} N	F_{2R} lbs.	T_{2K} Nm	T_{2K} in.lbs.
P3, PA3	24	.945	1,400	315	2,750	619	105	929
P4, PA4	25	.984	2,250	506	4,500	1,013	194	1,717
P5, PA5	29	1.142	3,500	788	7,000	1,575	371	3,283
P7, PA7	31	1.220	4,500	1,013	9,000	2,025	648	5,735
P8, PA8	35	1.378	7,500	1,688	15,000	3,375	1,140	10,089

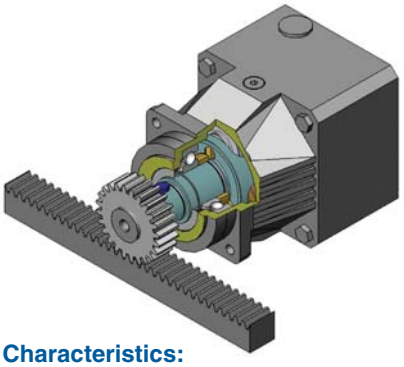
Z – Output Bearing Option, Radially Reinforced

Unit No.	z_2 mm	z_2 inches	F_{2A} N	F_{2A} lbs.	F_{2R} N	F_{2R} lbs.	T_{2K} Nm	T_{2K} in.lbs.
P3	21	.83	600	135	3,000	675	105	929
P4	22	.87	1,000	225	5,000	1,125	200	1,770
P5	23	.91	1,600	360	8,000	1,800	376	3,328
P7	26	1.02	2,000	450	10,000	2,250	690	6,107
P8	28	1.10	3,600	810	18,000	4,050	1,242	10,992

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



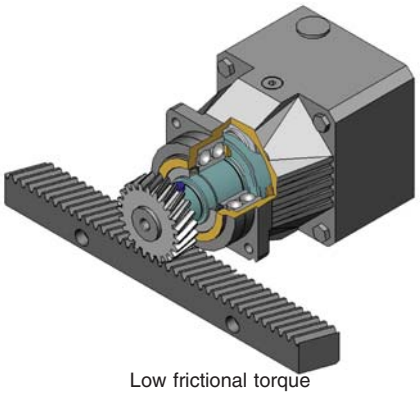
"R"
Deep Groove Ball Bearing



Characteristics:
Minimal frictional torque
Good Radial load capacity
Axial load approx. 35% of radial load

Applications:
Spur geared rack/pinion
Couplings
Belt without / or with light tension

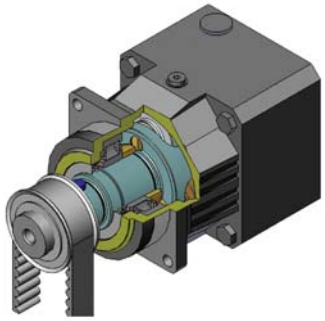
"D"
Double Row Angular Contact Ball Bearing



Low frictional torque
Good radial bearing capacity
Axial load approx. 50% of radial load

Helical geared rack/pinion
Couplings with high axial load
Belt without / or with light tension

"Z"
Cylindrical Roller Bearing



Very good radial load capacity
Axial load approx. 20% of radial load

Prestressed belt drive
Prestressed spur rack drive
Applications with high radial loads
and/or high service requirements

See web site for drawings.

"PH and PHA" Series–PowerLine ServoFit® Precision Planetary Gearhead Permissable Shaft Load

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:

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

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

$$T_{2A} = \frac{F_{2a} \bullet y_2 + F_{2r} \bullet (x_2 + z_2)}{1000} \leq T_{2K}$$

The application input tilting angle can be determined by the following formula:

$$\Delta\varphi = \frac{T_{2A}}{C_{2K}}$$

Value is in arcminutes. C_{2K} is found on Page 30.

The hours of life (L_h) of the unit can be detemined by the following formula:

L_h > 10,000 hours if $T_{2K}/T_{2A} < 1.25$
L_h > 20,000 hours if $T_{2K}/T_{2A} > 1.25$

All formulas shown are based on metric values.

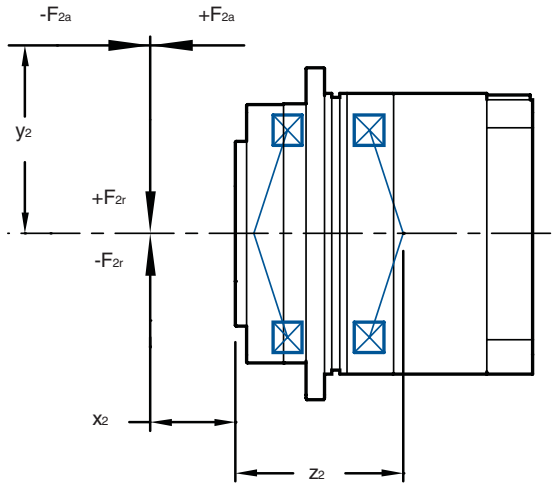


Table No. 1 "PH" and "PHA" Series – Permissible Output Load and Tilting Moments

Unit No.	z_2 mm	z_2 inches	F_{2AMAX} N	F_{2AMAX} lbs.	T_{2KMAX} Nm	T_{2KMAX} in.lbs.	C_{2K} Nm/arcmin	C_{2K} In.lbs/arcmin
PH3, PHA3	62	2.44	1,650	371	100	885	–	–
PH4, PHA4	84	3.07	2,150	484	260	2,124	160	1,416
PH5, PHA5	97	3.62	4,150	934	440	3,717	300	2,655
PH7, PHA7	88	3.31	6,150	1,384	1,500	13,275	500	4,425
PH8, PHA8	126	4.65	10,050	2,261	3,500	30,975	1,550	13,718
PH9, PHA9	140	5.51	33,000	7,425	6,500	57,525	5,500	48,675
PH10, PHA10	171	5.51	50,000	11,250	8,800	77,880	9,500	84,075

"PE" Series–EconoLine ServoFit® Planetary Gearhead Permissable Shaft Load

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:

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

The application input tilting moment should be determined by the following formula: $T_{2A} = \frac{F_{2a} \bullet y_2 + F_{2r} \bullet (x_2 + z_2)}{1000} \leq T_{2K}$

The hours of life (L_h) of the unit can be detemined by the following formula: L_h > 10,000 hours if $T_{2K}/T_{2A} < 1.25$
L_h > 20,000 hours if $T_{2K}/T_{2A} > 1.25$

All formulas shown are based on metric values.

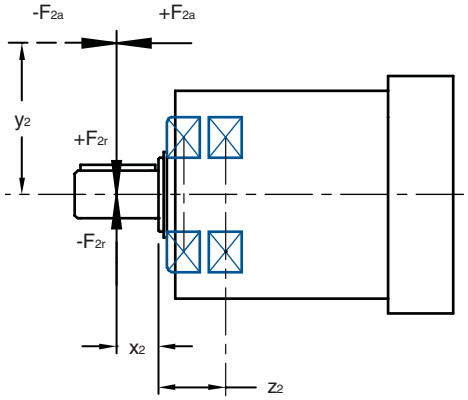


Table No. 1 "PE" Series – Permissible Load and Tilting Moments

Unit No.	z_2 mm	z_2 inches	F_{2A} N	F_{2A} lbs.	F_{2R} N	F_{2R} lbs.	T_{2K} Nm	T_{2K} in.lbs.
PE201, PE202	20	0.79	250	56	850	191	25	221
PE301, PE302	28	1.10	412	93	1,650	371	69	610
PE401, PE402	31	1.22	650	146	2,600	585	127	1,124
PE501, PE502	41	1.61	1,200	270	4,800	1,080	336	2,974

ServoFit® Modular System
Permissible Loads
Tilting Moment

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

The permissible load and tilting moment values are based on an output speed of 20 RPM. For higher speeds the following applies, where n_2 is the desired speed:

$$F_{2RX} = \frac{F_{2R}}{\sqrt[3]{\frac{n_2}{20}}} \qquad T_{2KX} = \frac{T_{2K}}{\sqrt[3]{\frac{n_2}{20}}}$$

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

$$T_{2A} = \frac{F_{2a} \bullet y_2 + F_{2r} \bullet (x_2 + z_2)}{1000} \leq T_{2K}$$

All formulas shown are based on METRIC values.

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

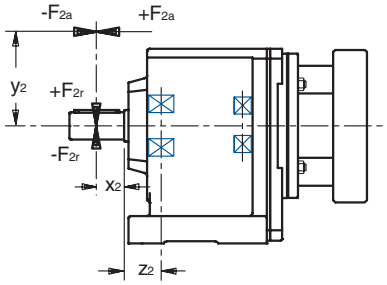


Table No. 1 Permissible Load and Tilting Moments

Unit No.	z_2 mm	z_2 inches	F_{2A} N	F_{2A} lbs.	F_{2R} N	F_{2R} lbs.	T_{2K} Nm	T_{2K} in.lbs.
C0	20	0.79	500	112	1,900	427	80	708
C1	30	1.18	850	191	3,400	765	190	1,682
C2	30	1.18	1,050	236	4,200	945	260	2,301
C3	30	1.18	1,400	315	5,650	1,271	350	3,098
C4	35	1.38	2,400	540	9,700	2,182	750	6,638
C5	42	1.65	3,000	675	11,000	2,475	900	7,965
C6	40	1.57	4,000	900	16,000	3,600	1,500	13,275
C7	45	1.77	5,500	1,237	22,000	4,950	2,400	21,240
C8	50	1.97	7,500	1,687	30,000	6,750	3,700	32,745
C9	55	2.17	9,500	2,137	37,000	8,325	5,200	46,020

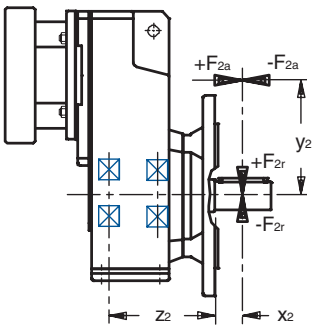


Table No. 2 Permissible Load and Tilting Moments

Unit No.	z_2 mm	z_2 inches	F_{2A} N	F_{2A} lbs.	F_{2R} N	F_{2R} lbs.	T_{2K} Nm	T_{2K} in.lbs.
F1	93	3.66	1,100	247	4,200	945	500	4,425
F2	116	4.57	1,400	351	5,400	1,215	790	6,991
F3	131	5.16	1,900	427	7,500	1,687	1250	11,062
F4	144	5.67	2,350	528	9,250	2,081	1700	15,045
F6	170	6.69	3,100	697	12,500	2,812	2750	24,337

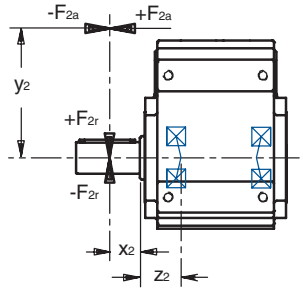


Table No. 3 Single Solid Output Permissible Load and Tilting Moments

Unit No.	z_2 mm	z_2 inches	F_{2A} N	F_{2A} lbs.	F_{2R} N	F_{2R} lbs.	T_{2K} Nm	T_{2K} in.lbs.
K1	40	1.57	1,900	427	5,000	1,125	360	3,186
K2	42	1.65	2,100	472	6,000	1,350	430	3,805
K3	45	1.77	2,400	540	7,000	1,575	525	4,646
K4	52	2.05	3,500	787	11,200	2,520	1,050	9,292
K5	72	2.83	3,500	787	13,450	3,026	1,580	13,983
K6	72	2.83	4,000	900	16,000	3,600	1,960	17,346
K7	85	3.35	5,500	1,237	22,000	4,950	3,200	28,320
K8	60	2.36	7,250	1,631	29,000	6,525	3,800	33,630
K9	70	2.76	16,500	3,712	65,000	14,625	10,100	89,385
K10	84	3.31	25,000	5,625	80,000	18,000	15,200	134,520

For DOUBLE output shaft: F_{2R} x 0.7

Overhung Loads

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

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

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

where

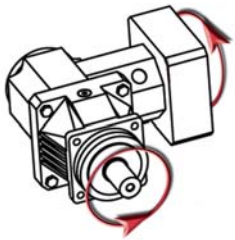
OHL = Overhung Load (lbs.)
HP = Horsepower
D = Pitch Dia. (in.) of Sprocket, Gear, Sheave, Pulley, etc.
RPM = Maximum Speed
K = 1.00 Chain Drives
1.25 Gear Drives
1.25 Gearbelt Drives
1.50 V-Belt Drives
2.50 Flat Belt Drives

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

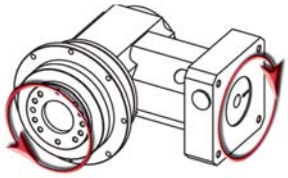
ServoFit® Precision Planetary Gearhead Direction of Rotation

Input and Output Rotate in OPPOSITE Directions

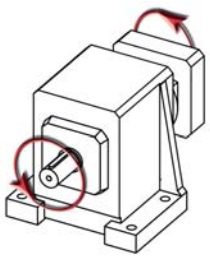
P321KX3 – P521KX5
P422KX3 – P522KX4



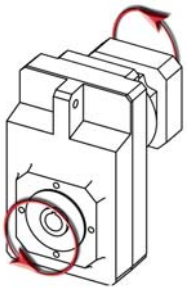
PH421KX4 – PH521KX5
PH422KX3 – PH522KX4



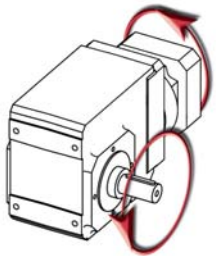
"C" Series – 3 Stage
C103 through C913



"F" Series – 3 Stage
F203 through F603

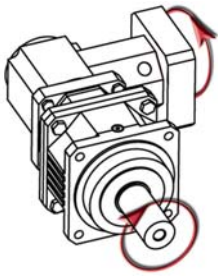


"K" Series – 3 Stage
K203 through K913

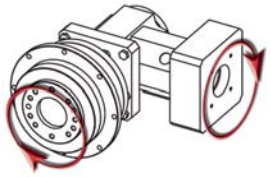


Input and Output Rotate in the SAME Direction

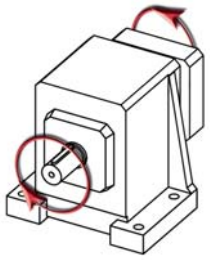
P721KX701 – P821KX801
P722KX501 – P822KX701



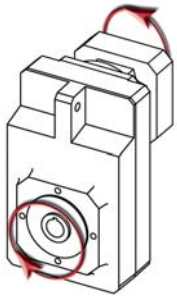
PH721KX7 – PH821KX8
PH722KX5 – PH912KX8



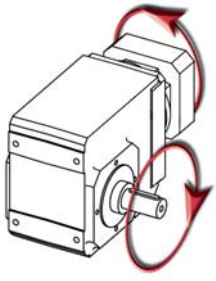
"C" Series – 2 Stage
C002 through C812



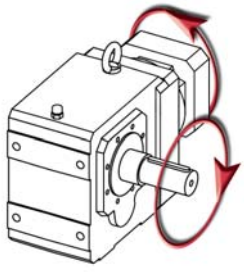
"F" Series – 2 Stage
F102 through F602



"K" Series – 2 Stage
K102 through K402



"K" Series – 4 Stage
K514 through K1014



See web site for drawings.

ServoFit®
Lubrication Data

All ServoFit Precision Planetary units are filled with synthetic oil and lubricated for life. The units should never be opened or the oil changed.

All ServoFit Modular System units are shipped filled with the required amount of lubrication. In order to provide the proper lubrication quantity **the mounting position must be specified at the time the unit is ordered**.

Maintenance

With STOBER reducers very little maintenance is required under normal operating conditions. Unless otherwise noted breathers are provided on the following units:

C612 through C913
F602 through F603
K513 through K1014

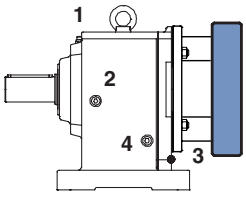
We recommend that the lubrication be changed in units supplied with breathers according to the following schedule:

Normal Operating Conditions ..... after 5000 Hours
Wet Operating Conditions ..... after 2000 Hours.

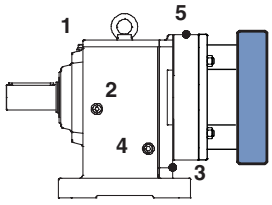
Units supplied without breathers (beverage and food packages) are lubricated for life.

Table No. 1

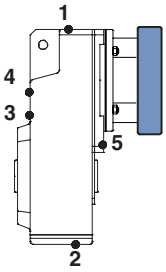
Lubricant Manufacturer	Ambient Temperature +15°F to +125°F AGMA Lubricant No. 5EP
BP	Transgear 80W90
Chevron	AW Mach. Oil 150
Exxon	Spartan EP-220
Mobil	Mobilgear 630
Shell	Permogear 220
Texaco	Meropa 220
Union	Gearlub 5EP



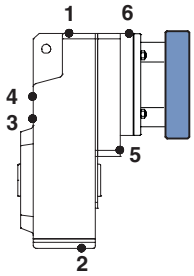
C612-C1012



C613-C1013



F602



F603

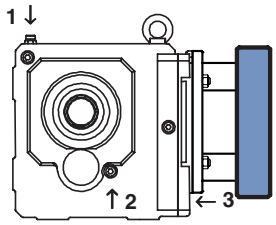
Table No. 2 Drain Plug and Vent Location

Mounting Position	1	2	2a	3	5
EL1	Vent			Drain	
EL2	Drain			Vent	
EL3		Vent	Drain		
EL4		Drain	Vent		
EL5 (C612-C1012)	Drain			Vent	
EL5 (C613-C1013)	Drain				Vent
EL6	Vent			Drain	

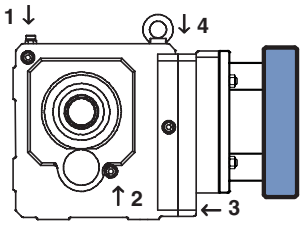
Position 2a is on the opposite side of 2.

Table No. 3 Drain Plug and Vent Location

Mounting Position	1	2	3	4	5	6
EL1	Vent	Drain				
EL2	Drain	Vent				
EL3		Drain		Vent		
EL4		Drain	Vent			
EL5 (F602)			Drain		Vent	
EL5 (F603)			Drain			Vent
EL6 (F602)			Vent		Drain	
EL6 (F603)			Vent			Drain



K513-K1013



K514-K1014

Table No. 4 Drain Plug and Vent Location

Mounting Position	1	2	2a	3	4
EL1	Vent			Drain	
EL2	Drain			Vent	
EL3		Vent	Drain		
EL4		Drain	Vent		
EL5 (K513/K1013)	Drain			Vent	
EL5 (K514/K1014)	Drain				Vent
EL6 (K513/K1013)	Vent			Drain	
EL6 (K513/K1014)	Vent				Drain

Position 2a is on the opposite side of 2.

See web site for drawings.

ServoFit® Modular System
Wobble Free Bushing Features

"No Key and Wobble Free"

The STOBER "Wobble Free" bushing is a unique patented(1) stainless steel system which can be supplied on a single side or double sides. These bushings can be mounted in the "F" Series and "K" Series ServoFit reducers. Each case size can be provided with a variety of bushing bore sizes. The unit is selected based on horsepower or torque rating, output speed or ratio, and the shaft size of the driven equipment.

Some special features of the bushing system are:

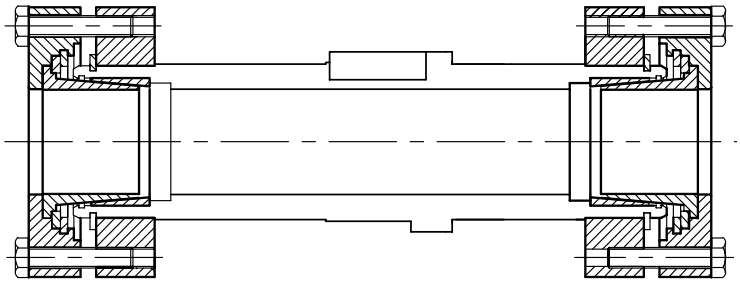
- All quills and bushing parts are high tensile stainless steel – providing the additional benefit of corrosion resistance.
- Featuring a distinct support side and a clamp side, the dual tapered cones will overcome a wide range of tolerances normally found with standard shaft materials. There is no shaft key necessary.
- All hardware is stainless steel or nickel plated.
- Units sizes K102 through K614 can be supplied with output covers on one or both sides which protect the seals and also cover the rotating bushing. F102 through F603 can only have a cover mounted on Side 5. The closed cover has an O-ring for added protection.
- Wobble Free – tapered cones in conjunction with a support ring or support side bushing prevent the "rocking" of the reducer on the shaft, common with many bushing designs.
- The reducer output bore can be changed any time by changing the bushing kit.

Important: A 1/32 x 45° chamfer minimum is recommended for the shaft end.

The bushing will accept a shaft with a tolerance of +.000/-.005.

Detailed instructions for mounting the bushing are included with each bushing kit.

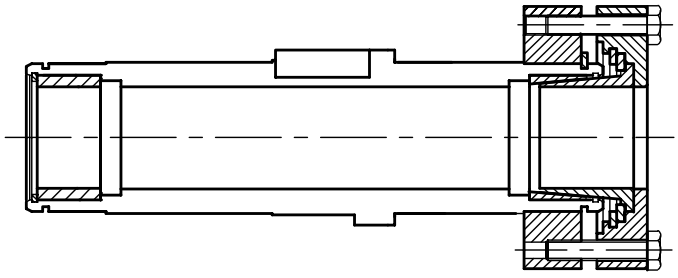
Double Sided Bushing



Support Side **Clamp Side**

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

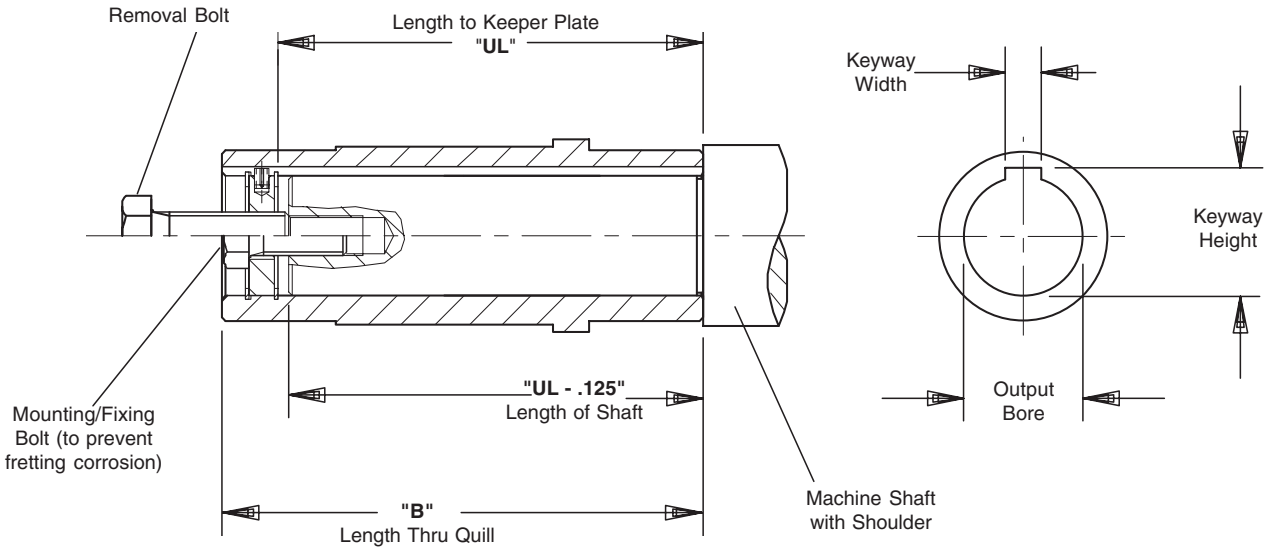


Support Side **Clamp Side**

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.

(1) U.S. Patent Number 5,496,127

ServoFit® Modular System
Installation of Hollow Output



Mounting Hollow Output Reducers

A STOBER hollow output reducer can be mounted from either side. The tolerance for the hollow bore is shown in the table below and the shaft should be toleranced to fit this bore accordingly.

A keeper plate inside the quill is provided with each unit to prevent axial movement. This keeper plate is held in place with snap rings and can be easily removed for location on either end. A spring pin in the keeper plate mounts into the keyway of the quill and prevents rotation. The keeper plate center hole is tapped to fit the removal bolt.

Before installation, brush the inside of the quill with rust inhibiting grease. When mounting the unit onto the shaft, avoid hammering as this may damage the bearings. Do not mount the reducer dry as removal may be impossible.

The drawing above shows a mounting or fixing bolt and a removal bolt. The mounting/fixing bolt should be smaller in size than the removal bolt. See Table No. 2.

To use the keeper plate with a mounting/fixing bolt, drill and tap the end of the shaft that will be mounted into the reducer. Insert the mounting/fixing bolt through the keeper plate and thread into the shaft end. The machine shaft length should not be longer than the “UL” dimension. A shaft length of "UL minus .125" will allow the shaft shoulder to pull against the face of the quill of the reducer.

Removal of Hollow Output Reducers

To dismantle the unit from the shaft, remove the mounting bolt. Thread the removal bolt into the keeper plate to press against the shaft and loosen the shaft from the unit. Removal of the reducer will be easier if the quill is greased before installation.

Table No. 1
Hollow Shaft — "U" Dimension

Bore Range	Tolerance
.39 – .71	+.0007 / -.0000
.71 – 1.18	+.0008 / -.0000
1.18 – 1.97	+.0010 / -.0000
1.97 – 3.15	+.0012 / -.0000
3.15 Up	+.0014 / -.0000

Table No. 2 "UL" Dimension and Removal Bolt Size

Unit	Bore	UL	Bolt	Unit	Bore	UL	Bolt
F1	.750	2.67	3/8-16 NC	K1	1.000	3.86	1/2-13 NC
F2	1.000	3.62	1/2-13 NC	K2	1.187	4.78	1/2-13 NC
F3	1.250	4.06	1/2-13 NC	K3	1.375	4.92	5/8-11 NC
F4	1.500	4.49	3/4-10 NC	K4	1.500	6.18	3/4-10 NC
F6	2.000	5.63	3/4-10 NC	K5	2.000	6.46	3/4-10 NC
				K6	2.000	7.05	3/4-10 NC
				K7	2.375	8.43	1-8 NC
				K8	2.750	10.35	1-8 NC
				K9	3.250	12.32	1-8 NC
				K10	4.000	14.25	1 1/4-7 NC

See web site for drawings.

ServoFit® Gearhead Motor Mounting Instructions

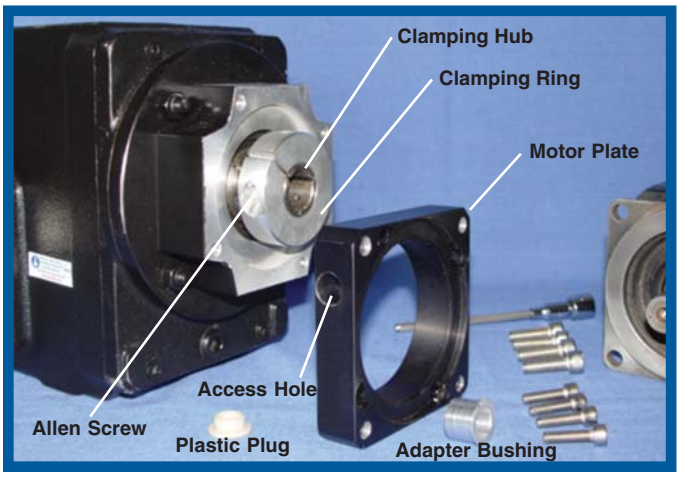
General Information

Servo motors are mounted to ServoFit® gearheads by using a TriAdapt® motor adapter with a clamp coupling or the FlexiAdapt® motor adapter with a bellows shaped thermal expansion feature. These patented adapters require no key but uses a friction locking triple split collet to clamp the shaft. A split bushing is included when the motor shaft is smaller than the input bore in the gearhead. The coupling operates free of backlash and, if installed correctly, requires no maintenance.

Tolerances for the motor must be ISO j6 on the pilot diameter and ISO k6 on the motor shaft, see Table No. 1. The motor shaft does not require a key but shaft runout, pilot concentricity and perpendicularity should meet DIN standard 42955-N when possible.

Important: Clean the motor shaft with degreaser to remove any film of oil or grease.

Parts for ServoFit Modular System



Parts for ServoFit Precision Planetary Gearheads

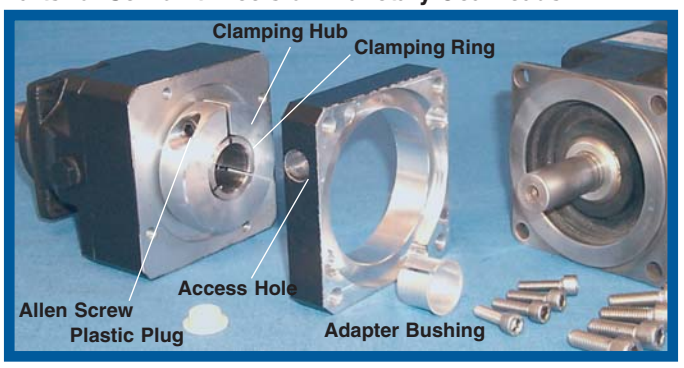


Table No. 1 Tolerances for Motors

k6 - Shaft Diameter	Metric (µm)	Imperial (ins.)
over 6 - 10	+10 / +1	+.00039 / +.00004
over 10 - 18	+12 / +1	+.00047 / +.00004
over 18 - 30	+15 / +2	+.00059 / +.00008
over 30 - 50	+18 / +2	+.0007 / +.00008
j6 - Pilot Diameter	Metric (µm)	Imperial (ins.)
over 10 - 18	+8 / -3	+.0003 / -.00012
over 18 - 30	+9 / -4	+.00035 / -.00016
over 30 - 50	+11 / -5	+.0004 / -.0002
over 50 - 80	+12 / -7	+.00047 / -.00027
over 80 - 120	+13 / -9	+.0005 / -.00035
over 120 - 180	+14 / -11	+.00055 / -.0004
over 180 - 250	+16 / -13	+.0006 / -.0005
over 250 - 315	+16 / -16	+.0006 / -.0006
over 315 - 400	+18 / -18	+.0007 / -.0007

Table No. 2 Capscrew Tightening Torque

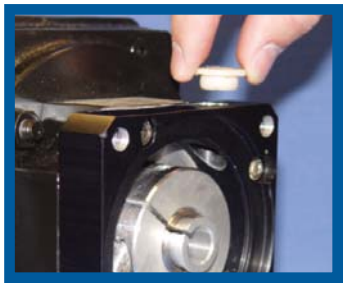
Unit	Allen Wrench Size	Tightening Torque Nm.	Tightening Torque in. lbs.
ServoFit Precision Planetary Gearheads			
P221, P222, P221L, P222L	5	10	88.5
P321, PA321	5	10	88.5
P322, PA322, P322L	5	10	88.5
P321L, P421, PA421, P422L, P522	6	25	221.25
P422, PA422	5	10	88.5
P421L, P521, PA521, P522L	6	25	221.25
P522, PA522, P522L	6	25	221.25
P521L, P721, PA721. P722L	8	45	398.25
P722, PA722	6	25	221.25
P721L, P821, PA821, P822L	10	60	531
P822, PA822	8	45	398.25
P321KX3	4	10	88.5
P421KX4	5	14	123.9
P422KX3	4	10	88.5
P521KX5	5	14	123.9
P522KX4	5	14	123.9
P721KX7	8	45	398.25
P722KX5	5	14	123.9
P821KX8	10	60	531
P822KX7	8	45	398.25
PH321, PHA321, PH322L	5	10	123.9
PH322, PHA322	5	10	123.9
PH321L, PH421, PHA421, PH422L	6	25	221.25
PH422, PHA422	5	10	88.5
PH421L, PH521, PHA521, PH522L	6	25	221.25
PH522, PHA522	6	25	221.25
PH521L, PH721, PHA721, PH722L	8	45	398.25
PH722, PHA722	6	25	221.25
PH821, PHA821	10	60	531
PH822, PHA822	8	45	398.25
PH912, PHA912	10	60	531
PH923, PHA923	8	45	398.25
PH924, PHA924	10	60	531
PH1012, PHA1012	10	60	531
PH1023, PHA1023	10	60	531
PH1024, PHA1024	8	45	398.25
PH321KX3	4	10	88.5
PH421KX4	5	14	123.9
PH422KX3	4	10	88.5
PH521KX5	5	14	123.9
PH522KX4	5	14	123.9
PH721KX7	8	45	398.25
PH722KX5	5	14	123.9
PH821KX8	10	60	531
PH822KX7	8	45	398.25
PH912KX8	10	60	531
PE2	4	10	88.5
PE3	5	17	150.45
PE4	6	42	371.7
PE5	8	83	734.55
ServoFit Gearheads – "C", "F", or "K"			
MT10	5	10	88.5
MT20	6	25	221.25
MT30	8	45	398.25
MT40	10	60	531

See web site for drawings.

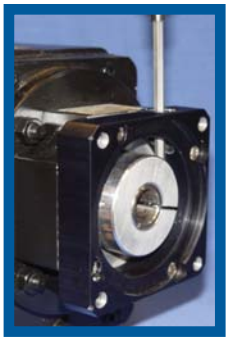
ServoFit® Gearhead
Motor Mounting Instructions

STEP 1. Remove the access hole plug.

Carefully remove the plastic plug from the access hole in the motor plate.



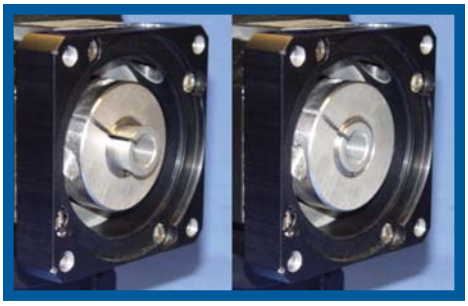
STEP 2. Align screw with access hole.



Visually align the access hole with the Allen screw in the clamping ring by turning the gearhead output shaft or the input coupling. (Shown with wrench for illustration purposes.)

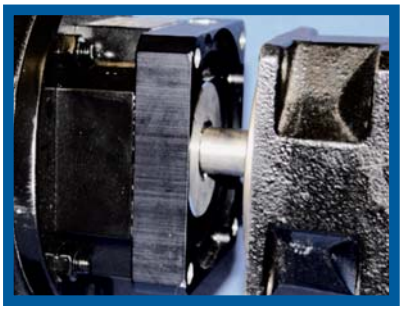
STEP 3. Install bushing (when applicable).

If an adapter bushing is needed, degrease the bushing inside and outside. Align the slot in the adapter bushing with the slot in the coupling hub. Slide the bushing into the input bore until the collar of the bushing touches the shaft end.



STEP 4. Carefully mount the motor.

Place the gearhead (with the bushing installed where necessary) onto the motor shaft. (If there is a keyway in the motor shaft, align the slot in the clamping hub at 180° to the keyway.) Support the gearhead while sliding it onto the motor shaft.

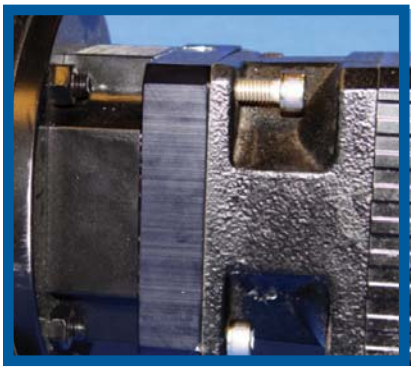


IT IS VERY IMPORTANT THAT THE GEARHEAD IS NOT FORCED ONTO THE SHAFT AND THE MOTOR IS CONCENTRIC WITH THE GEARHEAD COUPLING.

STEP 5. Bolt the motor to the motor plate.

Bolt the motor flange to the gearhead motor plate.

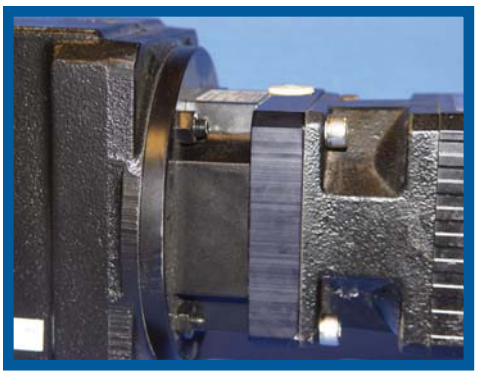
Tighten the motor bolts to the recommended tightening torque shown in Table No. 2.



STEP 6. Tighten the TriAdapt coupling screw.

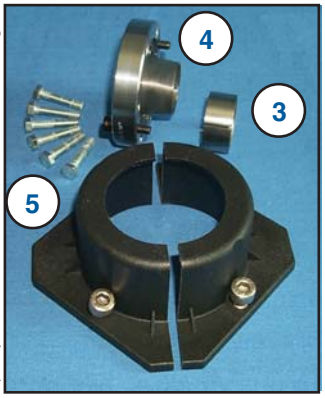
With a torque wrench, tighten the Allen screw on the coupling to the recommended torque shown in Table No. 2. A torque wrench extension is provided with each gearhead. If there are two (2) screws, be sure to tighten them equally.

STEP 7. Re-insert the plastic plug.



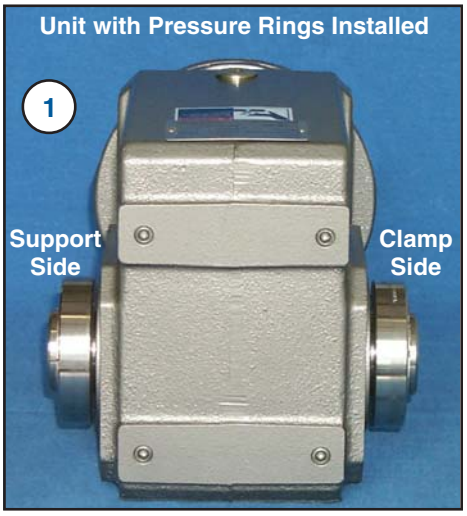
See web site for drawings.

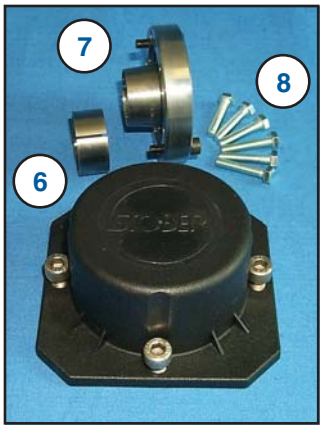
"K" Series – ServoFit® Modular System
"WFB" Bushing Installation



Support Side Bushing Components

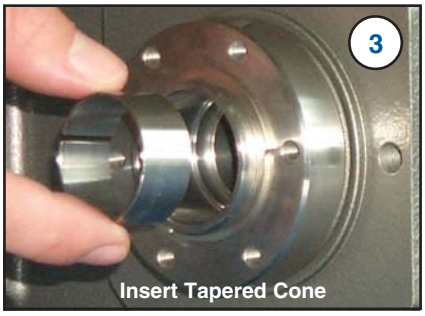
The Support Side is the bushing with the coating on the cone. Do NOT use cleaner on the coated cone.

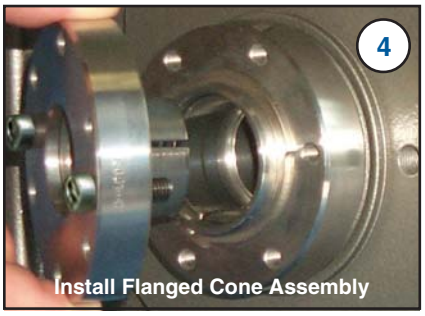




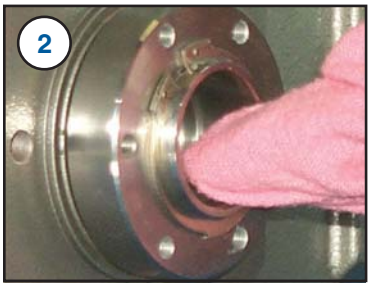
Clamp Side Bushing Components

Support Side Installation

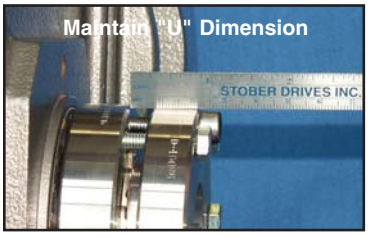




Install the Flanged Cone Assembly (4) with it's slot opposite the slot in the tapered cone (3).

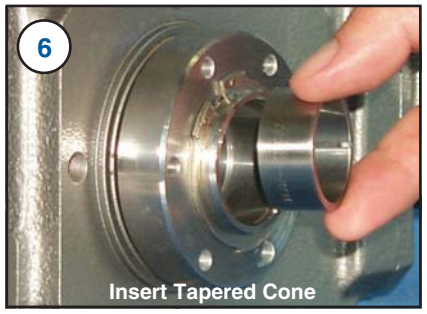


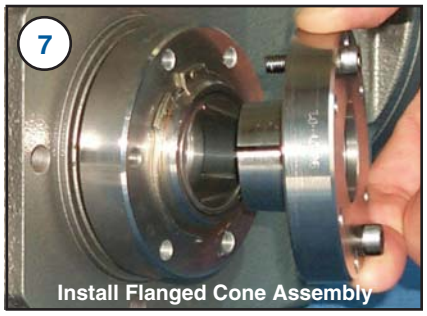
Be sure the inside of the quill is free of grease and oil before installing the tapered cones.



The "U" distance (between the rings) determined by the spacer bolts (see Table 1) must be maintained throughout assembly of the bushing and mounting onto the shaft. Therefore DO NOT tighten the capscrews or remove the spacer bolts until the unit is mounted on the shaft.

Clamp Side Installation

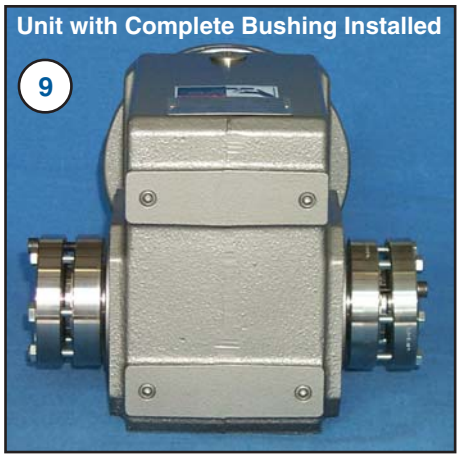


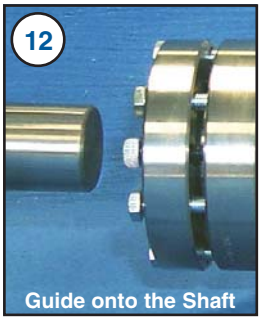


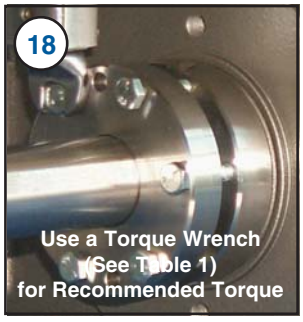
Install the Flanged Cone Assembly (7) with it's slot opposite the slot in the tapered cone (6).

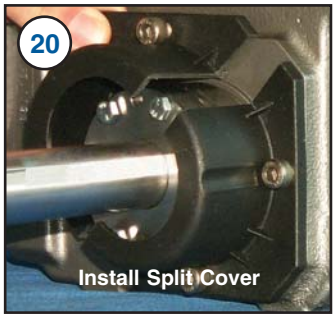
See web site for drawings.

"K" Series – ServoFit® Modular System
"WFB" Bushing Installation









Tighten all capscrews to the torque shown in Table 1. Use a torque wrench. The tightening should be done gradually in a rotating sequence and will require more than one rotation.

After two hours (minimum) running time, check capscrews and retighten, if necessary.

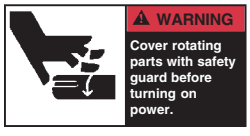
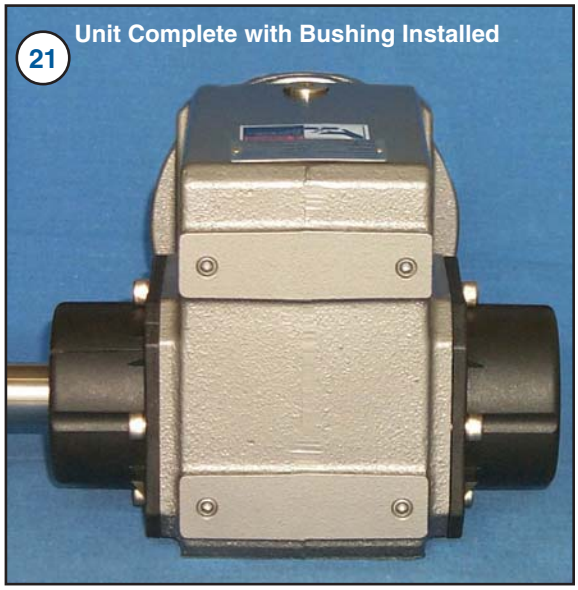


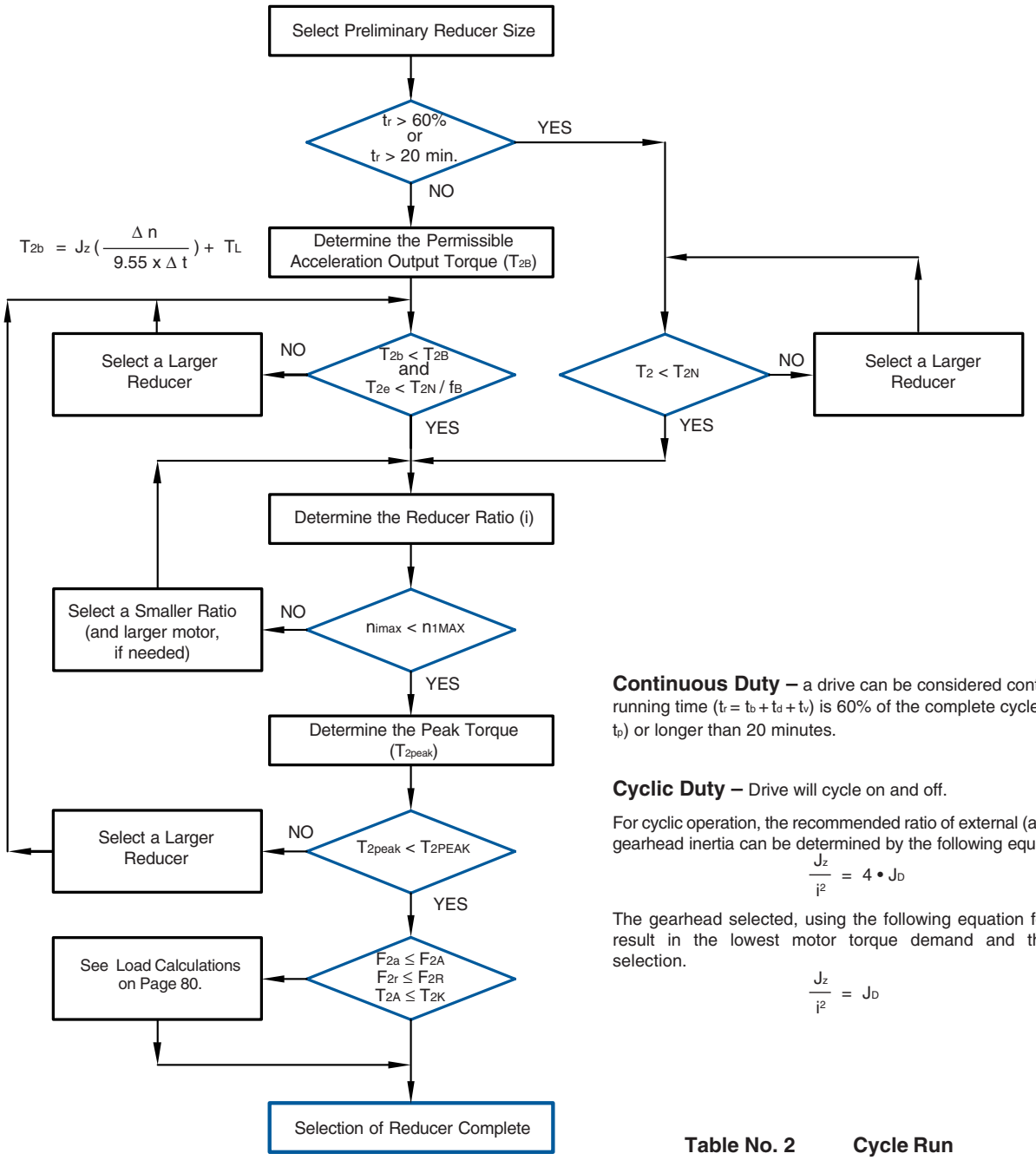
Table No. 1

Base Module	Capscrews		Tightening Torque		U		Spacer Bolts
	Qty.	Size x Length	Nm.	in. lbs.	mm	ins.	
K102	6	M6x25 mm	10	89	5	.20	M6x20mm
K202/K203	6	M6x30 mm	10	89	5	.20	M6x20mm
K302/K303	8	M6x30 mm	10	89	5	.20	M6x20mm
K402/K403	8	M8x30 mm	25	221	6	.24	M8x20mm
K513/K514	8	M8x30 mm	25	221	7	.28	M8x25mm
K613/K614	8	M10x35 mm	49	434	8.5	.33	M10x25mm
K713/K714	8	M10x40 mm	49	434	5.5	.22	M10x25mm
K813/K814	8	M12x40 mm	85	752	7	.28	M12x45mm



See web site for drawings.

ServoFit® Gearhead
Selection Procedures Flow Chart



Continuous Duty – a drive can be 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.

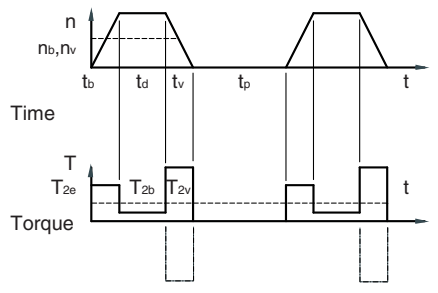
For cyclic operation, the recommended ratio of external (application) inertia to gearhead inertia can be determined by the following equation:

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

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

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

Table No. 2 Cycle Run



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

Table No. 1
"C", "F", and "K" ONLY
ServoFit Service Factor

Operating Mode	f_B
Continuous	1.0
Cylic	1.25
Cylic-Reversing	1.4

See web site for drawings.

ServoFit® Gearhead
Selection Procedures Formula Explanation

Table No. 3 Index of Values and Symbols

Symbol	Value Imperial	Value *Multiplier*	Value Metric	Description
F_{2a}	lbs.	4.45	N	Axial Force @ Output Shaft
F_{2A}	lbs.	4.45	N	Permissible Axial Force
F_{2r}	lbs.	4.45	N	Radial Force @ Output Shaft
F_{2R}	lbs.	4.45	N	Permissible Radial Load
f_B	—	—	—	Load Factor – SMS Only
i	—	—	—	Reducer Ratio
J_D	lb-in-s^2	1.13×10^3	kgcm^2	Motor + Reducer Inertia @ Motor RPM
J_Z	lb-in-s^2	1.13×10^3	kgcm^2	Total Inertia @ Reducer RPM
n	RPM	—	min^{-1}	Speed
n_b	RPM	—	min^{-1}	Acceleration Speed
n_v	RPM	—	min^{-1}	Deceleration Speed
n_1	RPM	—	min^{-1}	Input Speed
n_2	RPM	—	min^{-1}	Reducer Output Speed
T	in.lbs.	.113	Nm	Torque
T_2	in.lbs.	.113	Nm	Application Torque
T_{2e}	in.lbs.	.113	Nm	Equivalent Torque (Average RMS Torque)
T_{2K}	in.lbs.	.113	Nm	Reducer Tilting Moment
T_L	in.lbs.	.113	Nm	Friction Torque (Losses)
T_{2b}	in.lbs.	.113	Nm	Application Acceleration Torque
T_{2B}	in.lbs.	.113	Nm	Reducer Acceleration Torque
T_{2N}	in.lbs.	.113	Nm	Reducer Nominal Output Torque
T_{2peak}	in.lbs.	.113	Nm	Application Peak Torque
T_{2PEAK}	in.lbs.	.113	Nm	Reducer Peak Torque
T_{2V}	in.lbs.	.113	Nm	Application Deceleration Torque
t	seconds	—	seconds	Time
t_b	seconds	—	seconds	Acceleration Time
t_d	seconds	—	seconds	Duration Time
t_v	seconds	—	seconds	Deceleration Time
t_p	seconds	—	seconds	Pause Time
t_r	seconds	—	seconds	Running Time

Table No. 4 Conversions Factors

Imperial				
1 inch	x	25.4	=	mm
1 in^2	x	645.16	=	mm^2
1 lb	x	.453	=	kg
1 US gal	x	3.785	=	L
1 HP	x	.746	=	kW
1 lb	x	4.45	=	N
1 lb in	x	.113	=	Nm
1 lb ft	x	1.36	=	Nm
1 lb ft	x	.1383	=	kgm
1 lb in	x	.0115	=	kgm
1 lb in^2	x	.00029	=	kgm^2
1 PSI	x	.0689	=	bar
1 PSI	x	.00686	=	N/mm^2
°F	=	32 + $^9/_5$ x °C		
Metric				
mm	x	.03937	=	inch
1 mm^2	x	.0015	=	in^2
1 kg	x	2.205	=	lb
1 L	x	.264	=	US gal
1 kW	x	1.341	=	HP
1 N	x	.225	=	lb
1 Nm	x	8.85	=	lb in
1 Nm	x	.737	=	lb ft
1 kgm	x	7.233	=	lb ft
1 kgm	x	86.798	=	lb ft
1 kgm^2 (J)	x	3418.0	=	lb in^2 (WR^2)
1 bar	x	14.5	=	PSI
1 N/mm^2	x	145.04	=	PSI
°C	=	$^5/_9$ (°F-32)		

Table No. 5 Backlash Comparison – Arcminute vs Linear Distance

Arcminute	Degrees	Linear Distance in Inches at 3" R	at 12" R	at 24" R	at 48" R
1	.017	.0009	.0035	.0070	.0140
2	.033	.0017	.0070	.0140	.0279
3	.050	.0026	.0105	.0209	.0419
4	.067	.0035	.0140	.0279	.0558
5	.083	.0044	.0175	.0349	.0698
6	.100	.0052	.0209	.0419	.0838
7	.117	.0061	.0244	.0489	.0977
8	.133	.0070	.0279	.0558	.1117
9	.150	.0079	.0314	.0628	.1257
10	.167	.0087	.0349	.0698	.1396
11	.183	.0096	.0384	.0768	.1536
12	.200	.0105	.0419	.0838	.1675
13	.217	.0113	.0454	.0908	.1815
14	.233	.0122	.0489	.0977	.1955
15	.250	.0131	.0524	.1047	.2094
16	.267	.0140	.0558	.1117	.2234
17	.283	.0148	.0593	.1187	.2373
18	.300	.0157	.0628	.1257	.2513
19	.317	.0166	.0663	.1326	.2653
20	.333	.0175	.0698	.1396	.2792

These values can be interpolated for backlash or distances not shown in the table.

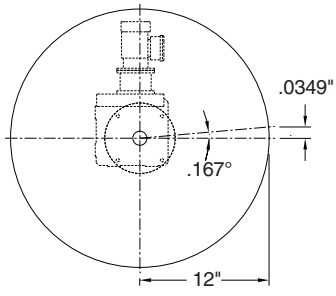
$$\text{Backlash in Arcminutes} = \left(\frac{\text{Linear Backlash in Inches x 57.296}}{\text{Radius}}\right) 60$$

Table No. 5 can be used to determine the amount of linear movement that will be realized with a given backlash value.

Example:
A "K" Series gearhead is mounted, with the output shaft vertical, under a 24" diameter turntable. The gearhead backlash is 10 arcminutes.

Reading across the table, the angular value of 10 arcminutes is .167 degrees.

Further determination indicates 10 arcminutes backlash will allow a linear movement of .0349 inches when measured at a 12 inch radius.



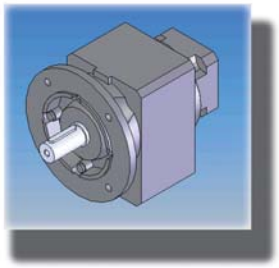
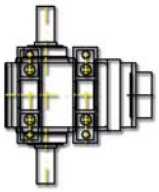
See web site for drawings.

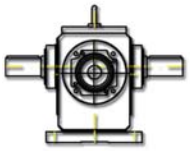
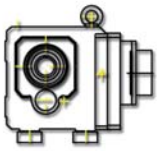
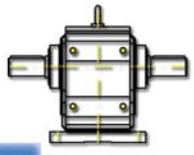
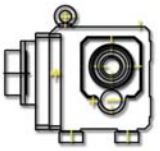
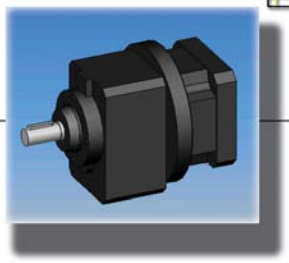
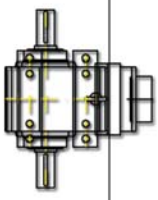
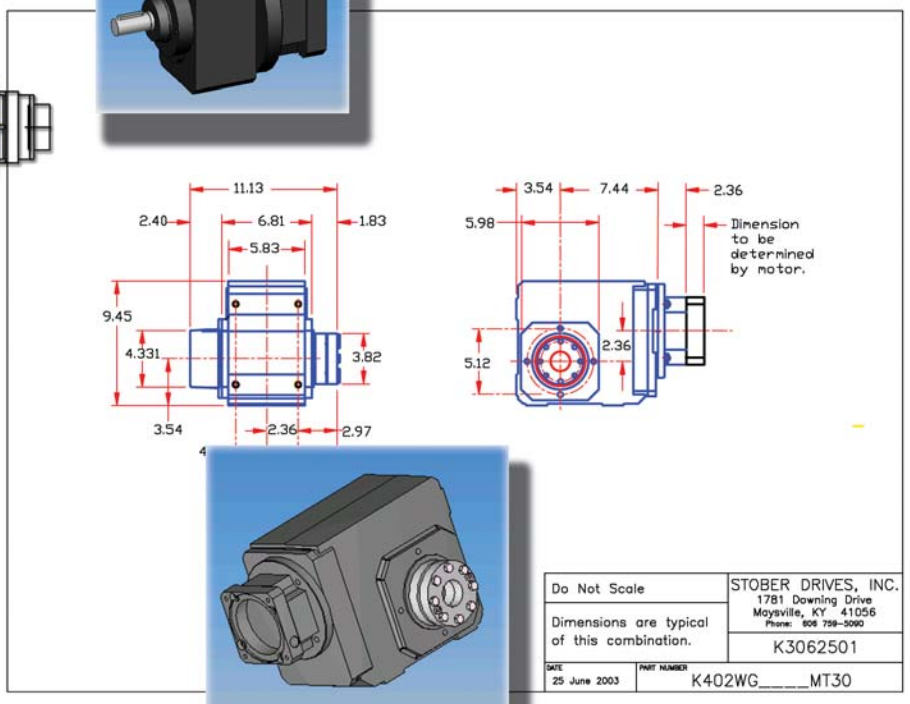
ServoFit® Gearhead
2D and 3D Drawing Support

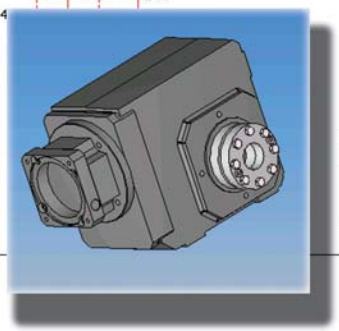
Drawings are available in a format to suit your application. We can provide eDrawings, 2D, 3D, CAD drawings with six views, or certified faxable prints.

The eDrawing application gives you the power to view 3D models and 2D drawings with no special software. The viewer and drawing are contained in one simple download. eDrawings eliminate the communication barriers that designers and engineers deal with daily. They are small enough to email, are self-viewing, and significantly easier to understand, plus, there is no more uncertainty about whether the recipient will be able to open and view the drawing file you send.

Check our web site (www.stober.com) for product drawings in the configuation you need. Call Technical Support for information that is not shown or e-mail *sales@stober.com* or *drawings@stober.com* with your request.

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Phone: 606 759-5090
Fax: 606 759-5045
E-mail: sales@stober.com

See web site for drawings.

Terms and Conditions of Sale

1. **GENERAL.** All orders for products supplied by STOBER DRIVES INC. ("STOBER") shall be subject to these terms and conditions of sales. All transactions shall be governed by the laws of the Commonwealth of Kentucky. No modifications hereto will be binding unless agreed to in writing by STOBER.

2. **CUSTOMER.** The term "Customer," as used herein, means the distributor, resale dealer, original equipment manufacturer or first end-user customer that purchases the STOBER products.

3. **WARRANTY.** STOBER products shall be free from defects in material and workmanship for a maximum of 5-years (single shift operation or 30 months multiple shift operation) for ServoFit products; 3-years (single shift operation or 18 months multiple shift operation) for MGS products; 2-years (single shift operation or 12 months multiple shift operation) for TD products, from the date of shipment to the Customer. For ServoFit products, all normal wear items, including oil seals and bearings, shall be covered for a period of 2-years (single shift operation or 12 months multiple shift operation). In the event that a product proves to be defective, STOBER's sole obligation shall be, at its option, to repair or replace the product. The repaired or replacement product will be shipped F.O.B. STOBER's facilities, freight prepaid by STOBER.

No employee, agent or representative of STOBER has the authority to waive, alter, vary or add to the terms hereof without the prior written approval of an officer of STOBER. It is expressly agreed that (a) this section constitutes the final expression of the parties' understanding with respect to the warranty and (b) this section is a complete and exclusive statement of the terms of the warranty.

STOBER shall have no obligation under the warranty set forth above in the event that:

(a) The Customer fails, within the warranty period to notify STOBER in writing and provide STOBER with evidence satisfactory to STOBER of the alleged defect within five (5) days after it becomes known to the customer;

(b) After inspection of a product, STOBER determines, in its sole discretion, that it is not defective in material or workmanship;

(c) Repair or replacement of a product is required through normal wear and tear;

(d) Any part in a product or any ingredient contained in a product requires replacement or repair through routine usage or normal wear and tear;

(e) A product is not maintained or used in accordance with STOBER's applicable operating and/or maintenance manuals, whether by the Customer or any third party;

(f) A product has been subject to misuse, misapplication, negligence, neglect (including, but not limited to, improper maintenance or storage), accident, catastrophe, improper installation, modification, adjustment, repair or lubrication, whether by the Customer or any third party, without the prior written consent of STOBER. Misuse shall include, but not be limited to, deterioration in a product due to chemical action and wear caused by the presence of abrasive materials;

(g) The system of connected rotating parts into which the product becomes incorporated is not compatible with the product, or it is not free from critical speed or torsional or other type of vibration within the specified operating range, no matter how induced; or

(h) The transmitted load and imposed torsional thrust and overhung loads are not within the published capacity limits for the unit sold.

Items manufactured by other parties but installed in or affixed to STOBER's products are not warranted by STOBER and bear only those warranties, express or implied, which are given by the manufacturer of such items, if any.

THE WARRANTY SET FORTH ABOVE IS INTENDED SOLELY FOR THE BENEFIT OF THE Customer AND DOES NOT APPLY TO ANY THIRD PARTY. ALL CLAIMS MUST BE MADE BY THE Customer AND MAY NOT BE MADE BY ANY THIRD PARTY. THIS WARRANTY MAY NOT BE TRANSFERRED OR ASSIGNED, IN WHOLE OR IN PART, BY THE Customer FOR ANY REASON WHATSOEVER. ANY SUCH ATTEMPTED TRANSFER OR ASSIGNMENT SHALL BE NULL AND VOID.

THIS WARRANTY TAKES THE PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH ARE HEREBY DISCLAIMED AND EXCLUDED BY STOBER, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF USE AND ALL OBLIGATIONS OR LIABILITIES ON THE PART OF STOBER FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE, REPAIR OR PERFORMANCE OF THE PRODUCTS.

4. **MODIFICATIONS.** STOBER reserves the right, without notice to the Customer, to (a) change the specifications of any product, (b) improve a product in any manner that STOBER deems necessary or appropriate and (c) discontinue the manufacture of any product.

5. **PURCHASE ORDERS.** The Customer will submit purchase orders for the products to STOBER in writing, whether by mail or telefax, which shall set forth, at a minimum: (a) an identification of the products ordered, (b) prices for such products, (c) quantities, (d) requested delivery dates and (e) shipping instructions and shipping addresses.

6. **ACCEPTANCE OF ORDERS.** All purchase orders received from the Customer are subject to acceptance by STOBER in writing.

7. **MODIFICATION OF ORDERS.** No accepted purchase order shall be modified or canceled except upon the written agreement of STOBER and the Customer. Mutually agreed cancellations shall be subject to reasonable charges based upon expenses already incurred by STOBER and commitments made by STOBER. Mutually agreed change orders shall be subject to all provisions of these Terms and Conditions of Sale.

8. **PRICE INCREASES.** STOBER may increase its prices for the products by providing the original purchaser of the products with at least thirty (30) days' prior written notice. Increased prices for products shall not apply to purchase orders accepted prior to the effective date of the price increase unless such orders provide for delivery more than thirty (30) days after the date of acceptance of the order.

9. **PRICING AND DELIVERY TERMS.** In accordance with KRS 355.2-319(1)(b), all products are delivered F.O.B. STOBER's warehouse facility in Maysville, Kentucky, or such other facility as STOBER may designate. Orders are then shipped per Customer's shipping instructions as set forth in Customer's purchase order. **CATALOG PRICING DOES NOT INCLUDE SHIPPING, HANDLING AND TAXES.** Once delivered to a common carrier of the Customer's choosing [or of STOBER's choosing if Customer has failed to specify a common carrier on or before five (5) days prior to the requested delivery date] STOBER shall have no further responsibility for the products and all risk of damage, loss or delay shall pass to the Customer. A handling fee is added to freight costs by STOBER to cover the cost of having to pay the carrier within seven (7) days when the terms with the Customer are net 30. The Customer has the option of shipping collect with our carrier or the carrier of choice.

10. **PAYMENT TERMS.** Net 30 days. All orders will be shipped either prepaid by the Customer or C.O.D., at STOBER's option, unless the Customer has established a previously approved credit line. If STOBER approves a credit line for the Customer, all payments shall be due within thirty (30) days of the date of the invoice. If any invoice is not paid in full within such thirty (30) day period, then finance charges shall be assessed at the rate of one and one-half percent (1½%) per month (eighteen percent (18%) per year). If such rate is deemed to be usurious at any time, it shall be reduced to the maximum rate permitted by applicable law. STOBER may stop or withhold shipment of products if the Customer does not fulfill its payment obligations. If STOBER is insecure about payment for any reason, STOBER may require full or partial payment in advance and as a condition to the continuation of its delivery of products.

11. **SECURITY INTEREST.** Unless and until the products are paid for in full, STOBER reserves a security interest in them to secure the unpaid balance of the purchase price. The Customer hereby grants to STOBER a power of attorney, coupled with an interest, to execute and file on behalf of the Customer all necessary financing statements and other documents required or appropriate to protect the security interest granted herein.

12. **ACCEPTANCE OF PRODUCTS.** The Customer will conduct any incoming inspection tests as soon as possible upon arrival of the products, but in no event later than ten (10) days after the date of receipt. Any products not rejected by written notice to STOBER within such period shall be deemed accepted by the Customer. STOBER shall not be liable for any additional costs, expenses or damages incurred by the Customer, directly or indirectly, as a result of any shortage, damage or discrepancy in a shipment.

13. **LIMITATION OF REMEDIES.**

(a) STOBER SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED BY DELAY IN FURNISHING THE CUSTOMER WITH PRODUCTS.

(b) IN NO EVENT SHALL STOBER'S LIABILITY INCLUDE ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL LOSSES OR DAMAGES, EVEN IF STOBER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSS OR DAMAGE.

14. **MADE-TO-ORDER PRODUCTS.** STOBER reserves the right to revoke and amend any price quotations offered to the Customer for made-to-order products, provided that such price quotations have not been accepted by the Customer prior to the date of revocation or amendment.

15. **DIES, TOOLS AND EQUIPMENT.** Charges incurred by the Customer for dies, tools and other equipment shall not confer ownership or the right to possession therein by the Customer. All such dies, tools and equipment shall remain the property of STOBER, and STOBER shall have the exclusive right to possession thereof. STOBER shall maintain such tools and equipment in good working order.

16. **REGULATORY LAWS AND STANDARDS.** STOBER makes no representation that its products conform to state or local laws, ordinances, regulations, codes or standards except as may be otherwise agreed to in writing by STOBER.

17. **SIZES AND WEIGHTS.** STOBER's products are made only in the sizes and to the specifications set forth in its catalogs and other literature. If any alteration is requested, such altered product will be treated as a made-to-order item. STOBER assumes no responsibility for typographical errors which may appear in its catalogs or literature, and cannot accept alteration charges caused by such errors. Since weights shown in STOBER's catalogs are approximate, they cannot be used in determining freight allowances set forth in its catalogs and other literature. Freight allowances will be determined at the time of shipment and shall be based on actual shipping weight.

18. **SYSTEM DESIGN.** Responsibility for system design to ensure proper use and application of STOBER's products within their published specifications and ratings rests solely with the Customer. This includes, but is not limited to, an analysis of loads created by torsional vibrations within the entire system, regardless of how induced.

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