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Safety Instructions

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

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

The shafts of STOBER geared motors rotate at very high speeds and can cut off or severely injure hands, fingers, and arms.

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 Geared Motor, 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.

If you have questions about the installation, operation, maintenance or lubrication of the geared motor, information can be found in this catalog, on our website, or by calling STOBER Technical Support.

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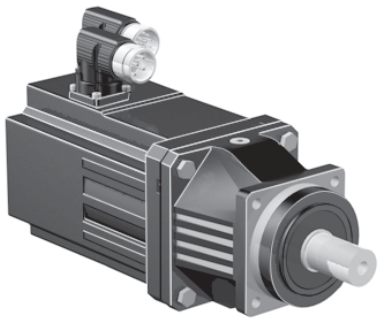
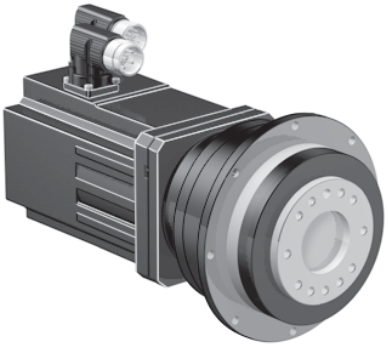
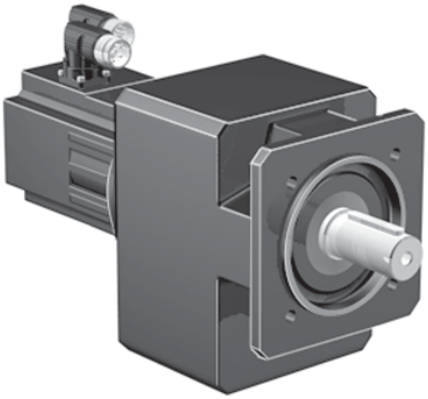
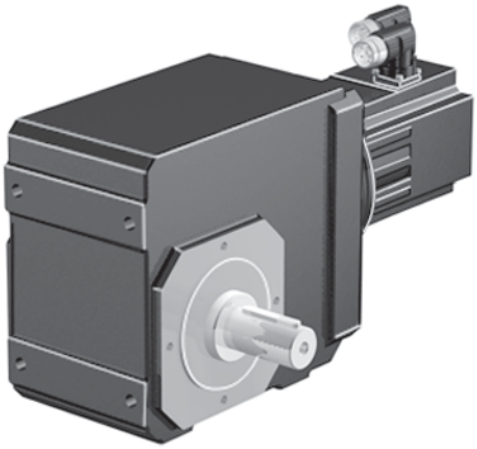
See web site for drawings.

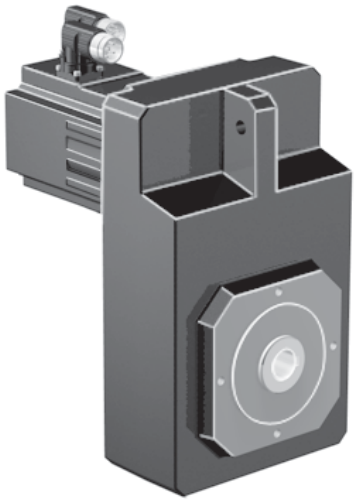
ServoFit Geared Motors











See web site for drawings.

Geared Motor Features

STOBER ED geared servo motors are set-up for connection to a variety of popular servo inverters. They are a compact, highly-dynamic, electronically commutated, permanent magnet brushless motor of modular construction. The stator and rotor components have been designed in an energy-optimized shape to provide very low torque ripple and high power density. The feedback is by resolver or multiturn or singleturn absolute encoder.

Basic components of the motors are: housing, flange, feedback, thermal winding protection (PTC thermistor), backlash free holding brake, and plug connectors.

ED servo geared motors are designed for industrial machinery and comply with the following standards and regulations:

- EN60034/VED0530
- IEC34, IEC72, IEC85
- VDE0100, VDE0110
- EEC Machinery Directive 2006/42/EG
- EEC Low Voltage Directive 2006/95/EC

- CE mark - standard
- UL and CSA approved.
- Mounting position – ANY
- Enclosure – IP65
- Thermal Classification – F 155° C, overtemperature ΔT = 105K
- Maximum DC Link Voltage - 650V (Exceding this value will damage winding insulation.)
- Environment/Altitude – The motor design data is valid for continuous operation (DIN EN60034) with temperature range from -15 to +40°C.
- Neodymium iron boron magnets
- Rotating connectors – 290°
- Cooling – IC 0041 surface cooling
- Surface – Black
- Oversized bearings – designed for gearing loads

See web site for drawings.

Geared Motor

Table No. 1 **ED Servo Motor – 3000 RPM, 650V**

Motor	K_E	I_N	K_{MN}	P_N	I_O	K_M	I_{MAX}	J [1]	m
Part No.		A	Nm/A	kW	A	Nm/A	A	kgcm²	kg
ED302U	60	1.52	0.645	0.31	1.63	0.702	6.08	0.317	2.27
ED303U	60	2.04	1.227	0.42	2.12	1.287	4.32	0.415	2.77
ED401U	70	2.88	1.533	0.74	3.02	1.637	8	1.47	3.9
ED402U	70	5.85	1.594	1.43	6.10	1.637	15	2.65	5.52
ED403U	70	7.76	1.421	1.87	8.22	1.637	20	3.81	7.08
ED503U	70	9.05	1.473	2.39	11.90	1.637	22	8.65	9.66
ED505U	140	8.52	1.409	3.77	9.83	1.637	45	13.9	14.1
ED704U	140	11.00	1.500	5.18	12.48	1.637	48	30	19.3

1) Other options are available. Contact STOBER Drives.

Table No. 2 **ED Permanent Magnet Brake Motor**

Motor	M_{BS}	M_{BD}	I_B	W_{ZMAX}	NS	J_{NS}	W_{NR}	t_2	t_1	J_B	m_B
Part No.	Nm	Nm	A	kJ/Br		10^{-4}kgm²	kJ	ms	ms	10^{-4}kgm²	kg
ED302	4.0	3.8	0.50	6.0	36,800	0.99	180	35	12	0.180	0.55
ED303	4.0	3.8	0.50	6.0	30,600	1.19	180	35	12	0.180	0.55
ED401	8.0	7.5	0.75	8.5	14,700	4.11	300	40	22	0.585	1.40
ED402	8.0	7.5	0.75	8.5	9,350	6.47	300	40	22	0.585	1.40
ED403	8.0	7.5	0.75	8.5	6,900	8.79	300	40	22	0.585	1.40
ED503	15.0	15.0	1.00	11.0	5,300	20.80	550	50	31	1.748	2.25
ED505	15.0	15.0	1.00	11.0	3,550	31.30	550	50	31	1.748	2.25
ED704	32.0	28.0	1.10	25.0	4,100	68.50	1400	90	36	4.233	4.60

In currentless status, the braking rotor is pulled by the force of the permanent magnet with the friction disk to the poles of the coil, thus securing the rotor shaft. Release of the brake is performed elecromagnetically: coil voltage 24V DC ±5% (smoothed direct current) generates a magnetic field which counteracts the permanent magnetic field and neutralizes its effect. For protection against switching overvoltages, STOBER recommends using a type S14 K35 (or comparable) varistor in addition to the braking coil.

K_E – (V/1000RPM) The peak value of the induced delta voltage at an operating temperature of 105K and 1000 RPM at no load. The values in the catalog and on the rating plate. Tolerance: ±10%.

I_N – (A) The permissible permanent current at the rated working point depending on the winding variant (K_E)Tolerance: ±5%.

K_{MN} – (Nm/A) A torque constant at rated speed and rated torque.

P_N – (kW) Shaft capacity the motor is able to supply continuously for the particular rated point. Tolerance: ±5%.

I_O – (A) Flowing current at stall torque depending on the winding variant (K_E). Tolerance: ±5%.

K_M – (Nm/A) A constant over the entive operating range of the motor depending the variant (KE). it is defined by the quotient of the inner torque at the rotor and current specifice to the winding variant (K_E). Tolerance: ±5%.

I_{MAX} – (A) Maximum current which the motor can be briefly supplied depending on the winding variant (K_E). Tolerance: ±5%
CAUTION: Exceeding these values may cause irreversible damage.

J – (10^4kgm²) Mass moment of inertia

m – (kg) Weight of the motor without a brake.

M_{BS} – (Nm) Static braking torque (100°C)

M_{BD} – (Nm) Dynamic braking torque (100°C)

I_B – (A) Braking current (20°C)

W_{ZMAX} – (kJ/Br) Maximum permissible frictional work per single brake per hour

NS – Permissible number of emergency stops from 3000 RPM and mass moment of inertia values.

J_{NS} – (10^{-4}kgm²) Mass moment of inertia values for emergency stops

W_{NR} – (kJ) Frictional work before wear limit

t_2 – (ms) Operating time (release time) at (100°C)

t_1 – (ms) Engaging time (achieve braking time)

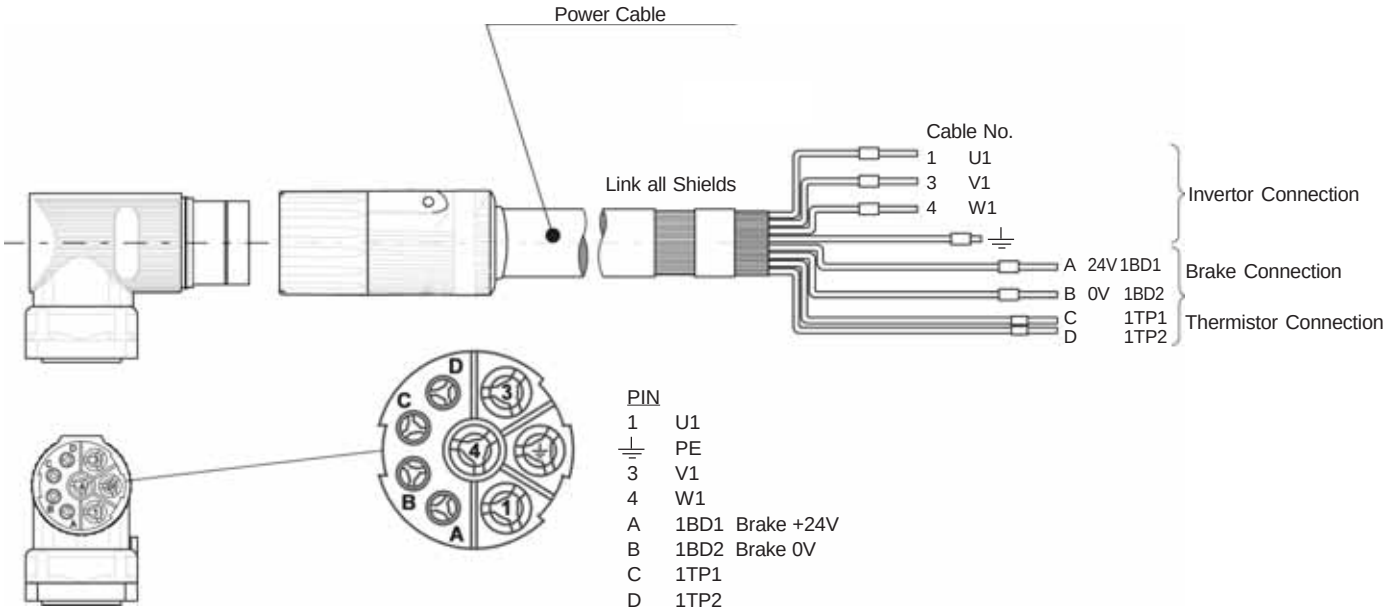
J_B – (10^{-4}kgm²) Brake mass moment of inertia

m_B – (kg) weight of the brake

UZK – DC link voltage

Geared Motor Connectors

Standard Power Connector



Some features of STOBER cables are:

- Metal connectors for grounding
- Double shielding
- Noise resistant
- Torsional stress ±30°/M
- Flexible– 5 million bending cycles 120m/min.
- Colors conform to DESINA
- Flame retardent
- Torsionally resistant
- Small permissible bending radius – 10×Diameter
- UL and CSA certified

Standard Resolver Feedback Connector

Table No. 3
Resolver Feedback Connector

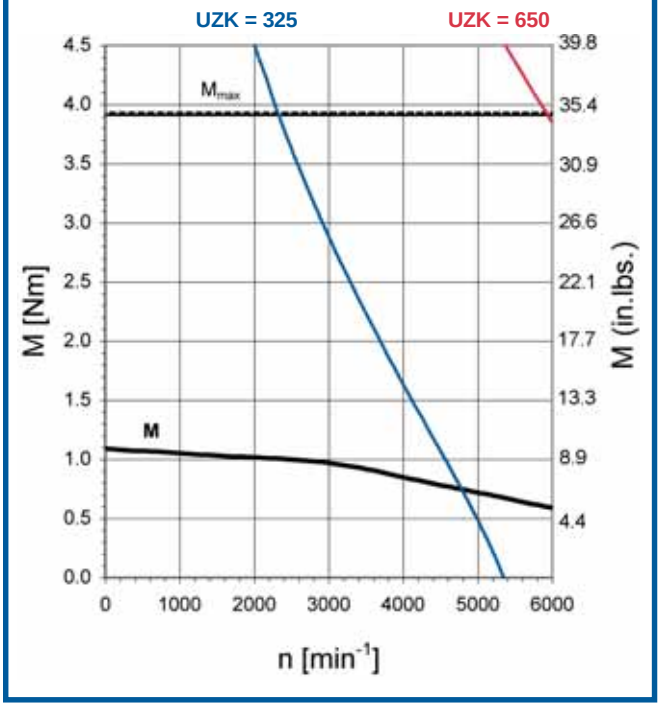
Pin	Signal	Color
1	S3 Cos+	Black
2	S1 Cos 0V	Red
3	S4 Sin+	Blue
4	S2 Sin 0V	Yellow
5	free	–
6	free	–
7	R2 Excitation +	Yellow White
8	R1 Excitation 0V	Red White
9	free	–
10	free	–
11	free	–
12	free	–

See web site for drawings.

Geared Motor
ED302 – ED402
Characteristic Graphs

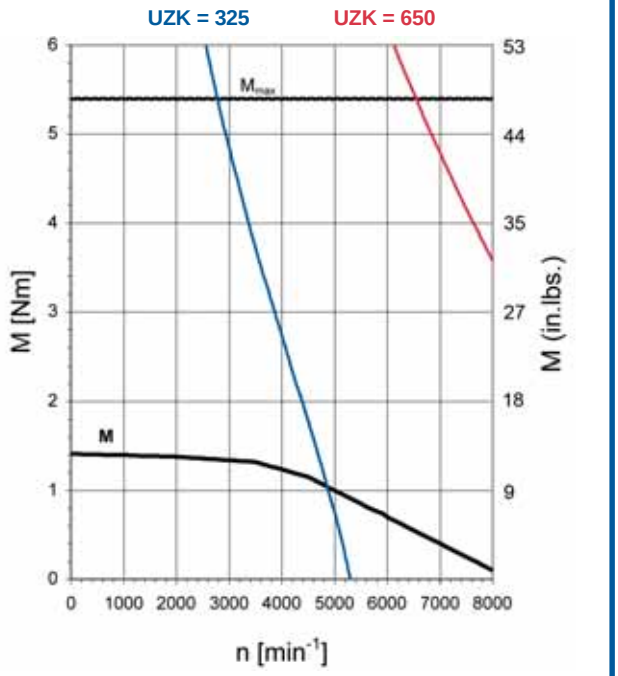
ED302U

KE = 60



ED303U

KE = 60

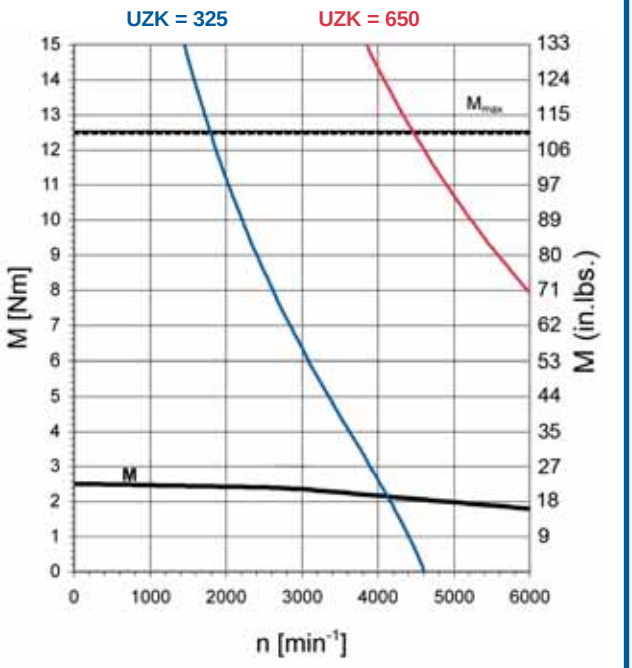


UZK = DC Link Voltage

For 480V AC use 650 DC Link.
For 240V AC use 325 DC Link.

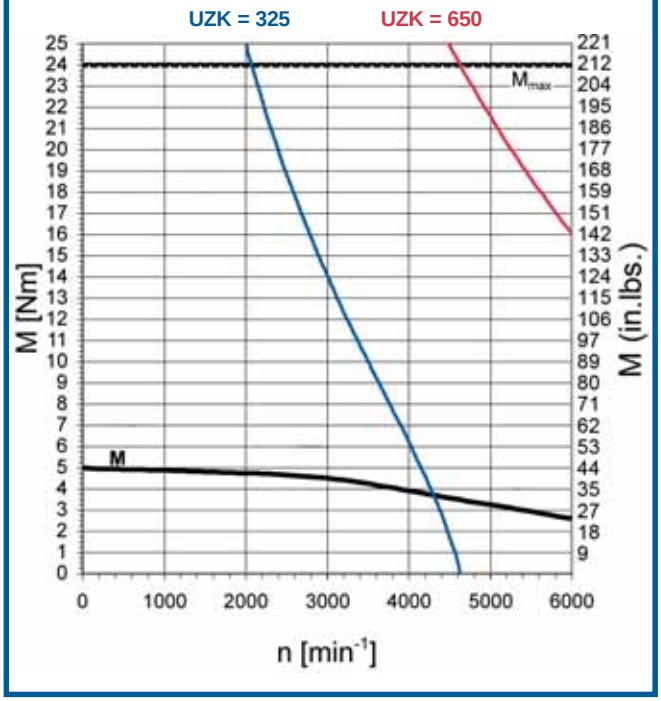
ED401U

KE = 70



ED402U

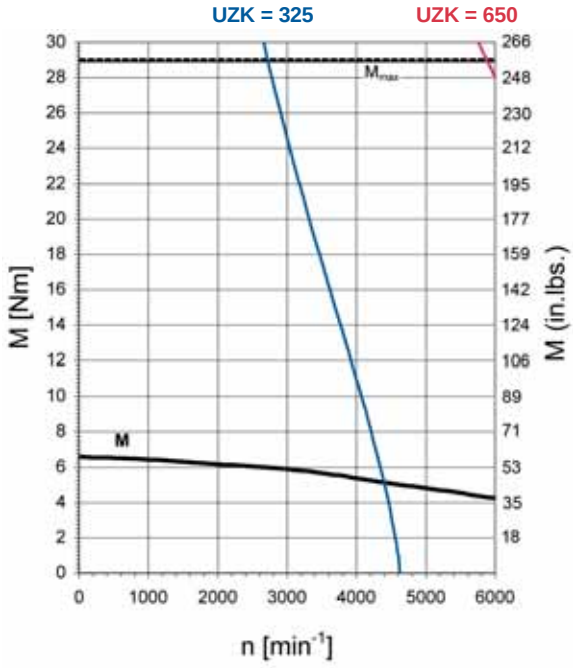
KE = 70



Geared Motor
ED403 – ED704
Characteristic Graphs

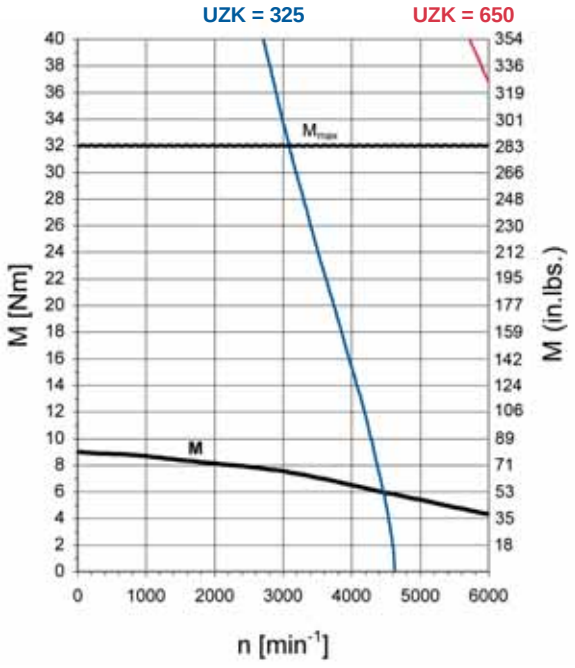
ED403U

KE = 70



ED503U

KE = 70

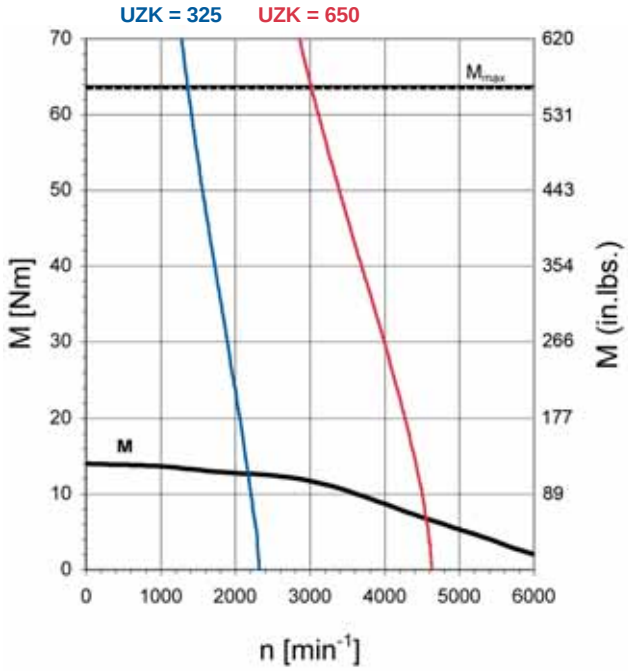


UZK = DC Link Voltage

For 480V AC use 650 DC Link.
For 240V AC use 325 DC Link.

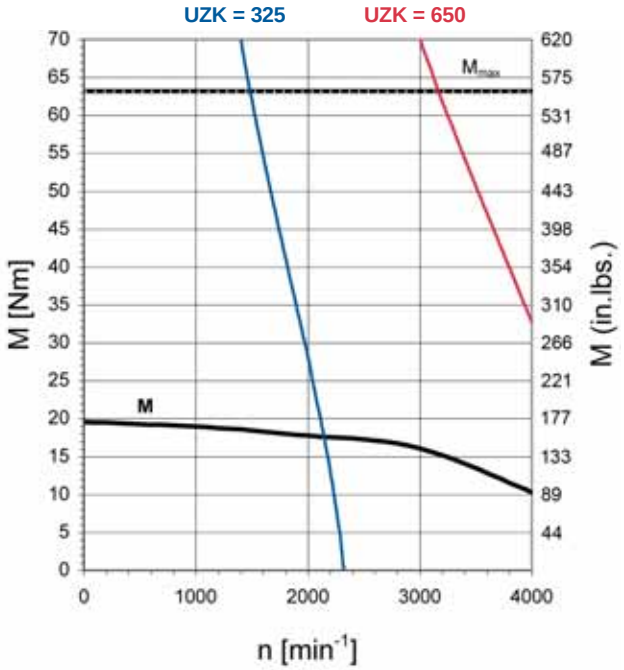
ED505U

KE = 140



ED704U

KE = 140



See web site for drawings.

"P" Series
ServoFit® Geared Motor
Features

The "P" Series ServoFit® Geared Motors feature HeliCamber® gearing 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:

- Compact
- Low Inertia
- Dynamic Response
- Lowest Standard Backlash
- High Torsional Stiffness
- Quiet Running
- Assembled in the U.S.A.
- Single Complete Package
- High Reliability

- Rotatable Connectors (IP66 rating)
- Insulation Class F
- 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
- FKM seals – smallest possible diameter– reducing friction and heat buildup, increasing efficiency, and allowing continuous duty without additional cooling.
- Bearing options for application specific radial load, axial load, and tilting moments
- 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.
- Ring gear machined integral to the housing – not welded or pressed in – provides greater concentricity and eliminates speed fluctuation
- Magnetic oil filtration
- Planet carrier straddle mounted for robust output capacity

See web site for drawings.

"P" Series
ServoFit® Geared Motor
Overview

			P221_ED P222_ED	P321_ED P322_ED	P421_ED P422_ED	P521_ED P522_ED	P721_ED P722_ED	P822_ED
Acceleration Torque		in.lbs.	195	575	1052	2,655	6,195	14,160
$T_{2B\ MAX}$		Nm	22	65	120	300	700	1,600
Output Torque Nom.		in.lbs.	132	265	628	1,743	3,469	6,938
T_{2N}		Nm	15	30	71	197	392	784
Torsional Backlash [1]								
$\Delta\varphi$		arcmin	≤6 ≤8	≤4 ≤5	≤4 ≤5	≤3 ≤4	≤3 ≤4	≤4
Torsional Stiffness								
C_2		in.lbs./arcmin	17	47	106	275	486	1,513
		Nm/arcmin	1.9	5.3	12	31	55	170
Axial Load Maximum [2]	R	lbs.	112	225	337	518	653	1,058
		N	500	1,000	1,500	2,300	2,900	4,700
F_{2AMAX}	D	lbs.	–	315	506	788	1,013	1,68
		N		1,400	2,250	3,500	4,500	7,500
	Z	lbs.	–	135	225	360	450	810
		N		600	1,000	1,600	2,000	3,600
Radial Load Maximum [3]	R	lbs.	270	563	900	1,463	1,800	2,925
		N	1,200	2,500	4,000	6,500	8,000	13,000
F_{2RMAX} [2]	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 Maximum [3]	R	in.lbs.	300	779	1,416	2,991	4,774	5,938
		Nm	34	88	160	338	536	897
T_{2Kmax} [2]	D	in.lbs.	–	929	1,717	3,593	5,735	10,089
		Nm		105	194	406	648	1,140
	Z	in.lbs.	–	929	1,770	3,682	5,929	10,992
		Nm		105	200	416	670	1,242
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					
Insulation Class			F (155°C)					
Finish			Black (Standard)					
Warranty			2 Year Limited					

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

2) See Page 109 for output bearing options.

3) Rating based on output speed (n_2) of 100 RPM. For values at other speeds see Page 108.

"P" Series
ServoFit® Geared Motor
Part No. Explanation

OPTIONS and REQUIRED INFORMATION

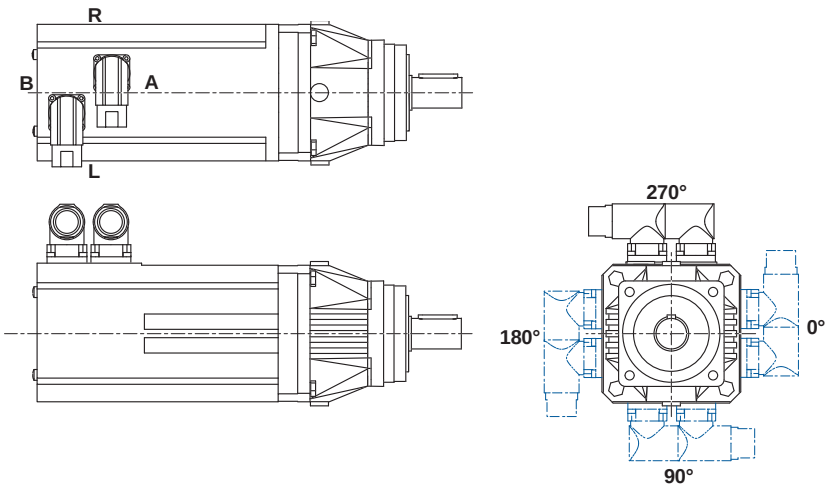
P 4 2 1 S P R 0050 ED 4 0 2 U R O

- **P** Series ServoFit® Geared Motor
- Unit No.
- Generation Number
- No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- **S**tandard Housing
- Output Shaft Options (See Page 13 or 108.)
  "**G**" Shaft – no Key
  "**P**" Output Shaft with Key
- Output Bearing Options (See Page 12 or 108.)
  "**R**" Normal Bearing
  "**D**" Reinforced Bearings-Axial
  "**Z**" Reinforced Bearings-Radial
- Exact Ratio: **0050** = 5:1
- Dynamic Series
- Motor Frame Size
- Generation Number
- Number of Magnet Stacks
- Self Ventilating
- Feedback
  Resolver
  Multiturn Absolute Encoder Inductive
  Singleturn Absolute Encoder Inductive
- Brake
  "**O**" Without Brake
  "**P**" Permanent Magnet Brake

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Specify – Cable Entry Side.
Specify – Connector Location.

Cable Entry



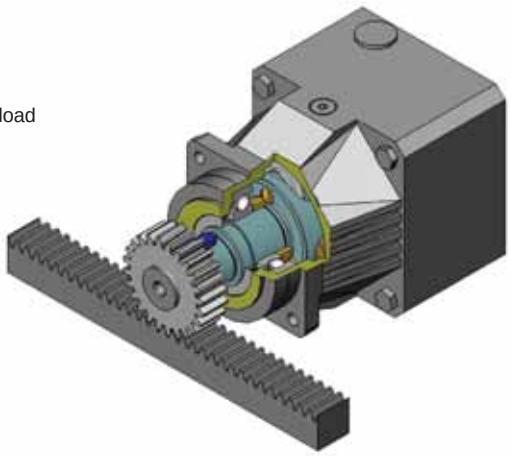
Standard cable entry is side "L".
Power and control connecters are both rotatable in any position.

See web site for drawings.

"P" Series
ServoFit® Geared Motor
Output Bearing Options

"R" – Deep Groove Ball Bearing
Characteristics:

Minimal frictional torque
Good Radial load capacity
Axial load approx. 35% of radial load

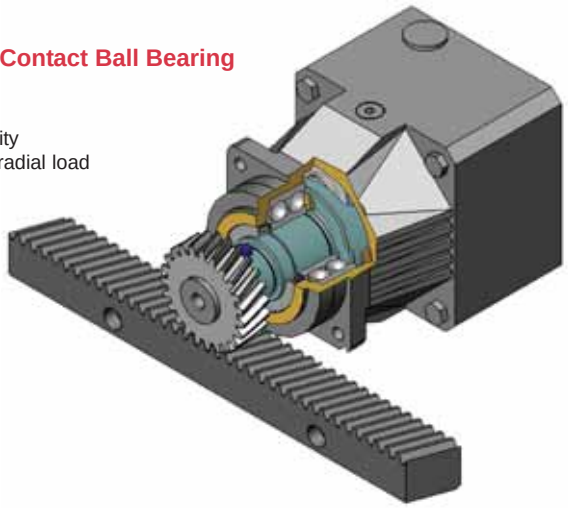


Applications:

Spur geared rack/pinion
Couplings
Belt with or without light tension

"D" – Double Row Angular Contact Ball Bearing
Characteristics:

Low frictional torque
Good radial bearing capacity
Axial load approx. 50% of radial load

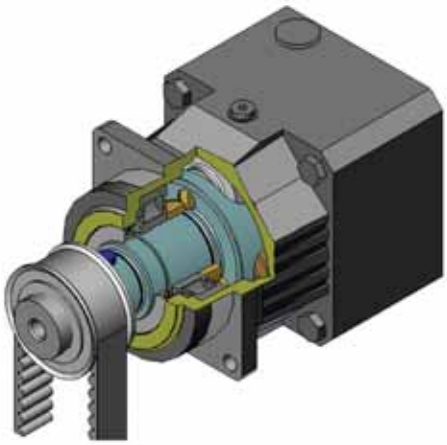


Applications:

Helical geared rack/pinion
Couplings with high axial load
Belt with or without light tension

"Z" – Cylindrical Roller Bearing
Characteristics:

Very good radial load capacity
Axial load approx. 20% of radial load

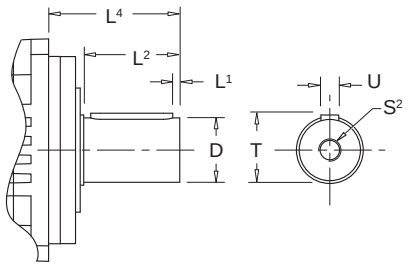


Applications:

Prestressed belt drive
Prestressed spur rack drive
Applications with high radial loads
and/or high service requirements

"P" Series
ServoFit® Geared Motor
Output Shaft Options

"P" – Shaft with Key



"G" – Shaft without Key

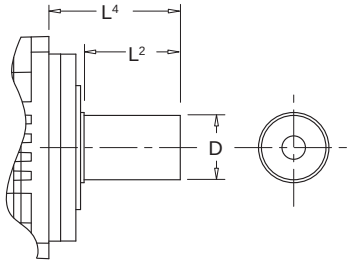


Table No. 1 **Output Shaft Options**

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
P2	12 +.012/+.001	2	.08	22	.87	36	1.42	M4	13.5	.53	A4x4x18
P3	16 +.012/+.001	2	.08	28	1.10	48	1.89	M5	18	.71	A5x5x22
P4	22 +.015/+.002	3	.11	36	1.42	56	2.20	M8	24.5	.96	A6x6x28
P5	32 +.018/+.002	3	.11	58	2.28	88	3.46	M12	35	1.38	A10x8x50
P7	40 +.018/+.002	4	.16	82	3.23	112	4.41	M16	43	1.69	A12x8x70
P8	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
P2	12 +.012/+.001	22	.87	36	1.42
P3	16 +.012/+.001	28	1.10	48	1.89
P4	22 +.015/+.002	36	1.42	56	2.20
P5	32 +.018/+.002	58	2.28	88	3.46
P7	40 +.018/+.002	82	3.23	112	4.41
P8	55 +.021/+.002	82	3.23	112	4.41

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

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

See web site for drawings.

"P" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Input RPM n1 Max. Continuous	Input RPM n1 Max. Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
P221_ED – 3000 RPM 480V														
P221_0040ED302U	750	4.0	34	3.8	135	15.2	389	44.0	4,500	8,000	0.49	6	17	1.9
P221_0040ED303U	750	4.0	46	5.2	185	21.0	389	44.0	4,500	8,000	0.65	6	17	1.9
P221_0050ED302U	600	5.0	42	4.8	168	19.0	389	44.0	4,500	8,000	0.47	6	17	1.9
P221_0050ED303U	600	5.0	58	6.5	195	22.0	389	44.0	4,500	8,000	0.63	6	17	1.9
P222_ED – 3000 RPM 480V														
P222_0160ED302U	188	16.0	132	14.9	195	22.0	389	44.0	4,500	8,000	0.49	8	16	1.8
P321_ED – 3000 RPM 480V														
P321_0030ED302U	1,000	3.0	25	2.9	101	11.4	567	64.0	3,500	6,000	0.65	4	50	5.7
P321_0030ED303U	1,000	3.0	35	3.9	139	15.7	567	64.0	3,500	6,000	0.81	4	50	5.7
P321_0030ED401U	1,000	3.0	61	6.9	322	36.4	1,082	122.2	3,500	6,000	1.61	4	50	5.7
P321_0030ED402U	1,000	3.0	117	13.3	443	50.0	1,082	122.2	3,500	6,000	2.71	4	50	5.7
P321_0030ED403U	1,000	3.0	153	17.3	443	50.0	1,082	122.2	3,500	6,000	3.81	4	50	5.7
P321_0040ED401U	750	4.0	81	9.2	429	48.5	1,151	130.0	3,700	6,500	1.53	4	47	5.3
P321_0040ED402U	750	4.0	157	17.7	575	65.0	1,151	130.0	3,700	6,500	2.63	4	47	5.3
P321_0040ED403U	750	4.0	204	23.0	575	65.0	1,151	130.0	3,700	6,500	3.73	4	47	5.3
P321_0050ED401U	600	5.0	101	11.4	537	60.6	1,151	130.0	4,000	7,000	1.48	4	45	5.1
P321_0050ED402U	600	5.0	196	22.1	575	65.0	1,151	130.0	4,000	7,000	2.59	4	45	5.1
P321_0050ED403U	600	5.0	255	28.8	575	65.0	1,151	130.0	4,000	7,000	3.68	4	45	5.1
P321_0070ED302U	429	7.0	59	6.7	236	26.6	1,151	130.0	4,500	8,000	0.48	4	39	4.4
P321_0070ED303U	429	7.0	81	9.2	324	36.7	1,151	130.0	4,500	8,000	0.64	4	39	4.4
P321_0080ED302U	375	8.0	67	7.6	269	30.4	885	100.0	4,500	8,000	0.47	4	37	4.2
P321_0080ED303U	375	8.0	93	10.5	371	41.9	885	100.0	4,500	8,000	0.63	4	37	4.2
P321_0100ED302U	300	10.0	84	9.5	337	38.0	885	100.0	4,500	8,000	0.46	4	35	4.0
P321_0100ED303U	300	10.0	116	13.1	443	50.0	885	100.0	4,500	8,000	0.62	4	35	4.0
P322_ED – 3000 RPM 480V														
P322_0120ED302U	250	12.0	99	11.2	395	44.7	1,082	122.2	4,000	8,000	0.50	5	38	4.3
P322_0120ED303U	250	12.0	136	15.4	443	50.0	1,082	122.2	4,000	8,000	0.66	5	38	4.3
P322_0160ED302U	188	16.0	132	14.9	527	59.6	1,151	130.0	4,500	8,000	0.49	5	40	4.5
P322_0160ED303U	188	16.0	182	20.5	575	65.0	1,151	130.0	4,500	8,000	0.65	5	40	4.5
P322_0200ED302U	150	20.0	165	18.6	575	65.0	1,151	130.0	4,500	8,000	0.49	5	41	4.6
P322_0200ED303U	150	20.0	227	25.7	575	65.0	1,151	130.0	4,500	8,000	0.65	5	41	4.6
P322_0250ED302U	120	25.0	206	23.3	575	65.0	1,151	130.0	4,500	8,000	0.47	5	41	4.6
P322_0250ED303U	120	25.0	284	32.1	575	65.0	1,151	130.0	4,500	8,000	0.63	5	41	4.6
P322_0320ED302U	94	32.0	264	29.8	443	50.0	885	100.0	4,500	8,000	0.49	5	36	4.1

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2X} = Application Torque and n_{1X} = Operating RPM

$$M_{2X} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1X}}{n_1}\right)}}$$

"P" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Input RPM n1 Max. Continuous	Input RPM n1 Max. Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
P421_ED – 3000 RPM 480V														
P421_0030ED402U	1,000	3.0	117	13.3	618	69.8	1,339	151.3	3,000	5,500	3.20	4	111	12.5
P421_0030ED403U	1,000	3.0	153	17.3	747	84.4	1,339	151.3	3,000	5,500	4.29	4	111	12.5
P421_0030ED503U	1,000	3.0	196	22.1	824	93.1	2,124	240.0	3,000	5,500	8.94	4	111	12.5
P421_0030ED505U	1,000	3.0	309	34.9	885	100.0	2,124	240.0	3,000	5,500	13.92	4	111	12.5
P421_0040ED403U	750	4.0	204	23.0	996	112.5	1,786	201.8	3,300	6,000	3.90	4	106	12.0
P421_0040ED503U	750	4.0	261	29.5	1,062	120.0	2,124	240.0	3,300	6,000	8.54	4	106	12.0
P421_0040ED505U	750	4.0	412	46.6	1,062	120.0	2,124	240.0	3,300	6,000	13.53	4	106	12.0
P421_0050ED402U	600	5.0	196	22.1	1,030	116.4	2,124	240.0	3,700	6,500	2.70	4	104	11.7
P421_0050ED403U	600	5.0	255	28.8	1,062	120.0	2,124	240.0	3,700	6,500	3.79	4	104	11.7
P421_0050ED503U	600	5.0	326	36.9	1,062	120.0	2,124	240.0	3,700	6,500	8.44	4	104	11.7
P421_0050ED505U	600	5.0	515	58.2	1,062	120.0	2,124	240.0	3,700	6,500	13.42	4	104	11.7
P421_0070ED401U	429	7.0	142	16.0	751	84.9	2,124	240.0	4,000	7,000	1.49	4	89	10.1
P421_0070ED402U	429	7.0	274	31.0	974	110.0	2,124	240.0	4,000	7,000	2.59	4	89	10.1
P421_0070ED403U	429	7.0	357	40.3	974	110.0	2,124	240.0	4,000	7,000	3.68	4	89	10.1
P421_0080ED401U	375	8.0	162	18.3	858	97.0	1,770	200.0	4,000	7,000	1.47	4	84	9.5
P421_0080ED402U	375	8.0	313	35.4	885	100.0	1,770	200.0	4,000	7,000	2.57	4	84	9.5
P421_0080ED403U	375	8.0	408	46.1	885	100.0	1,770	200.0	4,000	7,000	3.66	4	84	9.5
P421_0100ED401U	300	10.0	203	22.9	885	100.0	1,770	200.0	4,000	7,000	1.45	4	80	9.0
P421_0100ED402U	300	10.0	391	44.2	885	100.0	1,770	200.0	4,000	7,000	2.55	4	80	**9.0**
P422_ED – 3000 RPM 480V														
P422_0120ED303U	250	12.0	136	15.4	545	61.6	2,124	240.0	3,500	6,500	0.77	5	88	9.9
P422_0120ED401U	250	12.0	238	26.9	885	100.0	2,124	240.0	3,500	6,500	1.57	5	88	9.9
P422_0160ED401U	188	16.0	317	35.9	1,062	120.0	2,124	240.0	3,700	6,500	1.55	5	93	10.5
P422_0160ED402U	188	16.0	613	69.3	1,062	120.0	2,124	240.0	3,700	6,500	2.65	5	93	10.5
P422_0200ED303U	150	20.0	227	25.7	908	102.6	2,124	240.0	3,700	6,500	0.74	5	95	10.8
P422_0200ED401U	150	20.0	397	44.8	1,062	120.0	2,124	240.0	3,700	6,500	1.54	5	95	10.8
P422_0250ED302U	120	25.0	206	23.3	824	93.1	2,124	240.0	4,000	7,000	0.53	5	95	10.7
P422_0250ED303U	120	25.0	284	32.1	1,062	120.0	2,124	240.0	4,000	7,000	0.69	5	95	10.7
P422_0250ED401U	120	25.0	496	56.1	1,062	120.0	2,124	240.0	4,000	7,000	1.49	5	95	10.7
P422_0280ED302U	107	28.0	231	26.1	923	104.3	2,124	240.0	4,500	8,000	0.49	5	91	10.3
P422_0280ED303U	107	28.0	318	35.9	1,062	120.0	2,124	240.0	4,500	8,000	0.65	5	91	10.3
P422_0320ED302U	94	32.0	264	29.8	885	100.0	1,770	200.0	3,700	6,500	0.57	5	82	9.2
P422_0320ED303U	94	32.0	363	41.0	885	100.0	1,770	200.0	3,700	6,500	0.73	5	82	9.2
P422_0320ED401U	94	32.0	635	71.7	885	100.0	1,770	200.0	3,700	6,500	1.54	5	82	9.2
P422_0350ED302U	86	35.0	288	32.6	1,062	120.0	2,124	240.0	4,500	8,000	0.48	5	94	10.6
P422_0350ED303U	86	35.0	397	44.9	1,062	120.0	2,124	240.0	4,500	8,000	0.65	5	94	10.6
P422_0400ED302U	75	40.0	330	37.2	1,062	120.0	2,124	240.0	4,500	8,000	0.47	5	89	10.1
P422_0400ED303U	75	40.0	454	51.3	1,062	120.0	2,124	240.0	4,500	8,000	0.63	5	89	10.1
P422_0500ED302U	60	50.0	412	46.6	1,062	120.0	2,124	240.0	4,500	8,000	0.46	5	93	10.5
P422_0500ED303U	60	50.0	568	64.1	1,062	120.0	2,124	240.0	4,500	8,000	0.63	5	93	10.5
P422_0700ED302U	43	70.0	577	65.2	974	110.0	2,124	240.0	4,500	8,000	0.46	5	85	9.6

Index of Symbols

M_2 ..... Output Torque	i ..... Ratio
M_{2B} ..... Acceleration Torque	J_1 ..... Mass moment of inertia (input)
M_{2NOT} ..... Peak Torque - Emergency Stops	Δφ ..... Backlash in Arc Minutes
n_2 ..... Output RPM	C_2 ..... Torsional Stiffness

See web site for drawings.

"P" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Input RPM n1 Max. Continuous	Input RPM n1 Max. Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
P521_ED – 3000 RPM 480V														
P521_0030ED503U	1,000	3.0	196	22.1	824	93.1	2,292	259.0	2,500	4,500	9.52	3	321	36.3
P521_0030ED505U	1,000	3.0	309	34.9	1,638	185.1	2,292	259.0	2,500	4,500	14.50	3	321	36.3
P521_0030ED704U	1,000	3.0	425	48.0	1,628	183.9	3,683	416.1	2,500	4,500	29.69	3	321	36.3
P521_0040ED505U	750	4.0	412	46.6	2,184	246.8	3,056	345.3	3,000	5,000	14.29	3	284	32.1
P521_0040ED704U	750	4.0	567	64.0	2,170	245.2	4,910	554.8	3,000	5,000	29.48	3	284	32.1
P521_0050ED505U	600	5.0	515	58.2	2,655	300.0	3,820	431.7	3,500	6,000	13.88	3	275	31.1
P521_0050ED704U	600	5.0	708	80.0	2,655	300.0	5,310	600.0	3,500	6,000	29.07	3	275	31.1
P521_0070ED503U	429	7.0	457	51.6	1,923	217.3	5,310	600.0	3,700	6,500	8.52	3	248	28.0
P521_0070ED505U	429	7.0	721	81.5	2,390	270.0	5,310	600.0	3,700	6,500	13.50	3	248	28.0
P521_0080ED503U	375	8.0	522	59.0	2,198	248.3	4,425	500.0	3,700	6,500	8.45	3	230	26.0
P521_0080ED505U	375	8.0	824	93.1	2,213	250.0	4,425	500.0	3,700	6,500	13.44	3	230	26.0
P521_0100ED503U	300	10.0	652	73.7	2,213	250.0	4,425	500.0	3,700	6,500	8.39	3	221	25.0
P521_0100ED505U	300	10.0	1,030	116.4	2,213	250.0	4,425	500.0	3,700	6,500	13.37	3	221	25.0
P522_ED – 3000 RPM 480V														
P522_0120ED401U	250	12.0	238	26.9	1,261	142.5	3,683	416.1	3,000	6,000	1.77	4	240	27.2
P522_0120ED402U	250	12.0	460	52.0	1,770	200.0	3,683	416.1	3,000	6,000	2.87	4	240	27.2
P522_0120ED403U	250	12.0	599	67.7	1,770	200.0	3,683	416.1	3,000	6,000	3.96	4	240	27.2
P522_0120ED503U	250	12.0	767	86.6	1,770	200.0	3,683	416.1	3,000	6,000	8.61	4	240	27.2
P522_0160ED402U	188	16.0	613	69.3	2,655	300.0	4,910	554.8	3,300	6,000	2.85	4	243	27.5
P522_0160ED403U	188	16.0	799	90.3	2,655	300.0	4,910	554.8	3,300	6,000	3.95	4	243	27.5
P522_0160ED503U	188	16.0	1,022	115.5	2,655	300.0	4,910	554.8	3,300	6,000	8.59	4	243	27.5
P522_0160ED505U	188	16.0	1,614	182.4	2,655	300.0	4,910	554.8	3,300	6,000	13.58	4	243	27.5
P522_0200ED401U	150	20.0	397	44.8	2,102	237.5	5,310	600.0	3,300	6,000	1.73	4	249	28.2
P522_0200ED402U	150	20.0	767	86.6	2,655	300.0	5,310	600.0	3,300	6,000	2.83	4	249	28.2
P522_0200ED403U	150	20.0	999	112.9	2,655	300.0	5,310	600.0	3,300	6,000	3.92	4	249	28.2
P522_0200ED503U	150	20.0	1,278	144.4	2,655	300.0	5,310	600.0	3,300	6,000	8.57	4	249	28.2
P522_0250ED401U	120	25.0	496	56.1	2,627	296.9	5,310	600.0	3,700	6,500	1.62	4	249	28.1
P522_0250ED402U	120	25.0	958	108.3	2,655	300.0	5,310	600.0	3,700	6,500	2.72	4	249	28.1
P522_0250ED403U	120	25.0	1,249	141.1	2,655	300.0	5,310	600.0	3,700	6,500	3.81	4	249	28.1
P522_0250ED503U	120	25.0	1,597	180.5	2,655	300.0	5,310	600.0	3,700	6,500	8.46	4	249	28.1
P522_0280ED401U	107	28.0	556	62.8	2,655	300.0	4,910	554.8	4,000	7,000	1.52	4	237	26.8
P522_0280ED402U	107	28.0	1,073	121.3	2,655	300.0	4,910	554.8	4,000	7,000	2.62	4	237	26.8
P522_0280ED403U	107	28.0	1,398	158.0	2,655	300.0	4,910	554.8	4,000	7,000	3.71	4	237	26.8
P522_0320ED401U	94	32.0	635	71.7	2,213	250.0	4,425	500.0	3,300	6,000	1.70	4	223	25.1
P522_0320ED402U	94	32.0	1,227	138.6	2,213	250.0	4,425	500.0	3,300	6,000	2.80	4	223	25.1
P522_0350ED401U	86	35.0	694	78.5	2,655	300.0	5,310	600.0	4,000	7,000	1.51	4	245	27.7
P522_0350ED402U	86	35.0	1,342	151.6	2,655	300.0	5,310	600.0	4,000	7,000	2.61	4	245	27.7
P522_0350ED403U	86	35.0	1,748	197.5	2,655	300.0	5,310	600.0	4,000	7,000	3.70	4	245	27.7
P522_0400ED401U	75	40.0	794	89.7	2,655	300.0	4,910	554.8	4,000	7,000	1.46	4	232	26.2
P522_0400ED402U	75	40.0	1,534	173.3	2,655	300.0	4,910	554.8	4,000	7,000	2.56	4	232	26.2
P522_0500ED401U	60	50.0	992	112.1	2,655	300.0	5,310	600.0	4,000	7,000	1.46	4	242	27.3
P522_0700ED401U	43	70.0	1,389	156.9	2,390	270.0	5,310	600.0	4,000	7,000	1.46	4	233	26.3

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2X} = Application Torque and n_{1X} = Operating RPM

$$M_{2X} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1X}}{n_1}\right)}}$$

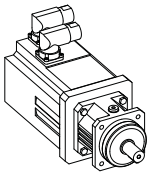
"P" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Input RPM n1 Max. Continuous	Input RPM n1 Max. Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
P721_ED – 3000 RPM 480V														
P721_0070ED704U	429	7.0	992	112.0	3,798	429.1	11,117	1,256.2	3,300	6,000	29.46	3	487	55.0
P721_0080ED704U	375	8.0	1,133	128.0	4,340	490.4	8,850	1,000.0	3,300	6,000	29.20	3	469	53.0
P721_0100ED704U	300	10.0	1,416	160.1	4,425	500.0	8,850	1,000.0	3,300	6,000	28.95	3	438	49.5
P722_ED – 3000 RPM 480V														
P722_0120ED503U	250	12.0	767	86.6	3,228	364.8	8,893	1,004.9	2,500	5,000	9.69	4	467	52.7
P722_0120ED505U	250	12.0	1,211	136.8	4,425	500.0	8,893	1,004.9	2,500	5,000	14.67	4	467	52.7
P722_0120ED704U	250	12.0	1,665	188.1	4,425	500.0	9,168	1,036.0	2,500	5,000	29.86	4	467	52.7
P722_0160ED503U	188	16.0	1,022	115.5	4,305	486.4	11,858	1,339.8	3,000	5,000	9.39	4	475	53.7
P722_0160ED505U	188	16.0	1,614	182.4	6,195	700.0	11,858	1,339.8	3,000	5,000	14.38	4	475	53.7
P722_0160ED704U	188	16.0	2,220	250.8	6,195	700.0	12,224	1,381.3	3,000	5,000	29.57	4	475	53.7
P722_0200ED503U	150	20.0	1,278	144.4	5,381	608.0	12,390	1,400.0	3,000	5,000	9.30	4	475	53.7
P722_0200ED505U	150	20.0	2,018	228.0	6,195	700.0	12,390	1,400.0	3,000	5,000	14.28	4	475	53.7
P722_0200ED704U	150	20.0	2,774	313.5	6,195	700.0	12,390	1,400.0	3,000	5,000	29.47	4	475	53.7
P722_0250ED503U	120	25.0	1,597	180.5	6,195	700.0	12,390	1,400.0	3,500	6,000	8.90	4	474	53.5
P722_0250ED505U	120	25.0	2,522	285.0	6,195	700.0	12,390	1,400.0	3,500	6,000	13.89	4	474	53.5
P722_0250ED704U	120	25.0	3,468	391.9	6,195	700.0	12,390	1,400.0	3,500	6,000	29.08	4	474	53.5
P722_0280ED503U	107	28.0	1,789	202.2	6,195	700.0	12,224	1,381.3	3,700	6,500	8.61	4	468	52.9
P722_0280ED505U	107	28.0	2,825	319.2	6,195	700.0	12,224	1,381.3	3,700	6,500	13.60	4	468	52.9
P722_0320ED503U	94	32.0	2,045	231.0	4,425	500.0	8,850	1,000.0	3,000	5,000	9.22	4	457	51.7
P722_0350ED503U	86	35.0	2,236	252.7	6,195	700.0	12,390	1,400.0	3,700	6,500	8.58	4	470	53.1
P722_0350ED505U	86	35.0	3,531	399.0	6,195	700.0	12,390	1,400.0	3,700	6,500	13.56	4	470	53.1
P722_0400ED503U	75	40.0	2,556	288.8	6,195	700.0	12,224	1,381.3	3,700	6,500	8.43	4	462	52.2
P722_0500ED503U	60	50.0	3,195	361.0	6,195	700.0	12,390	1,400.0	3,700	6,500	8.42	4	466	52.7
P822_ED – 3000 RPM 480V														
P822_0120ED704U	250	12.0	1,665	188.1	6,376	720.5	18,486	2,088.8	2,200	4,500	34.04	4	1,383	156.3
P822_0160ED704U	188	16.0	2,220	250.8	8,502	960.6	24,648	2,785.1	2,500	4,500	32.55	4	1,495	168.9
P822_0200ED704U	150	20.0	2,774	313.5	10,627	1,200.8	28,320	3,200.0	2,500	4,500	32.12	4	1,520	171.8
P822_0250ED704U	120	25.0	3,468	391.9	13,284	1,501.0	28,320	3,200.0	3,000	5,500	30.74	4	1,513	170.9
P822_0280ED704U	107	28.0	3,884	438.9	14,160	1,600.0	28,320	3,200.0	3,300	6,000	29.71	4	1,471	166.3
P822_0320ED704U	94	32.0	4,439	501.6	10,620	1,200.0	21,240	2,400.0	2,500	4,500	31.75	4	1,410	159.3
P822_0350ED704U	86	35.0	4,855	548.6	14,160	1,600.0	28,320	3,200.0	3,300	6,000	29.58	4	1,505	170.0
P822_0400ED704U	75	40.0	5,549	627.0	14,160	1,600.0	28,320	3,200.0	3,300	6,000	29.08	4	1,441	162.8
P822_0500ED704U	60	50.0	6,936	783.8	14,160	1,600.0	28,320	3,200.0	3,300	6,000	29.01	4	1,484	167.7

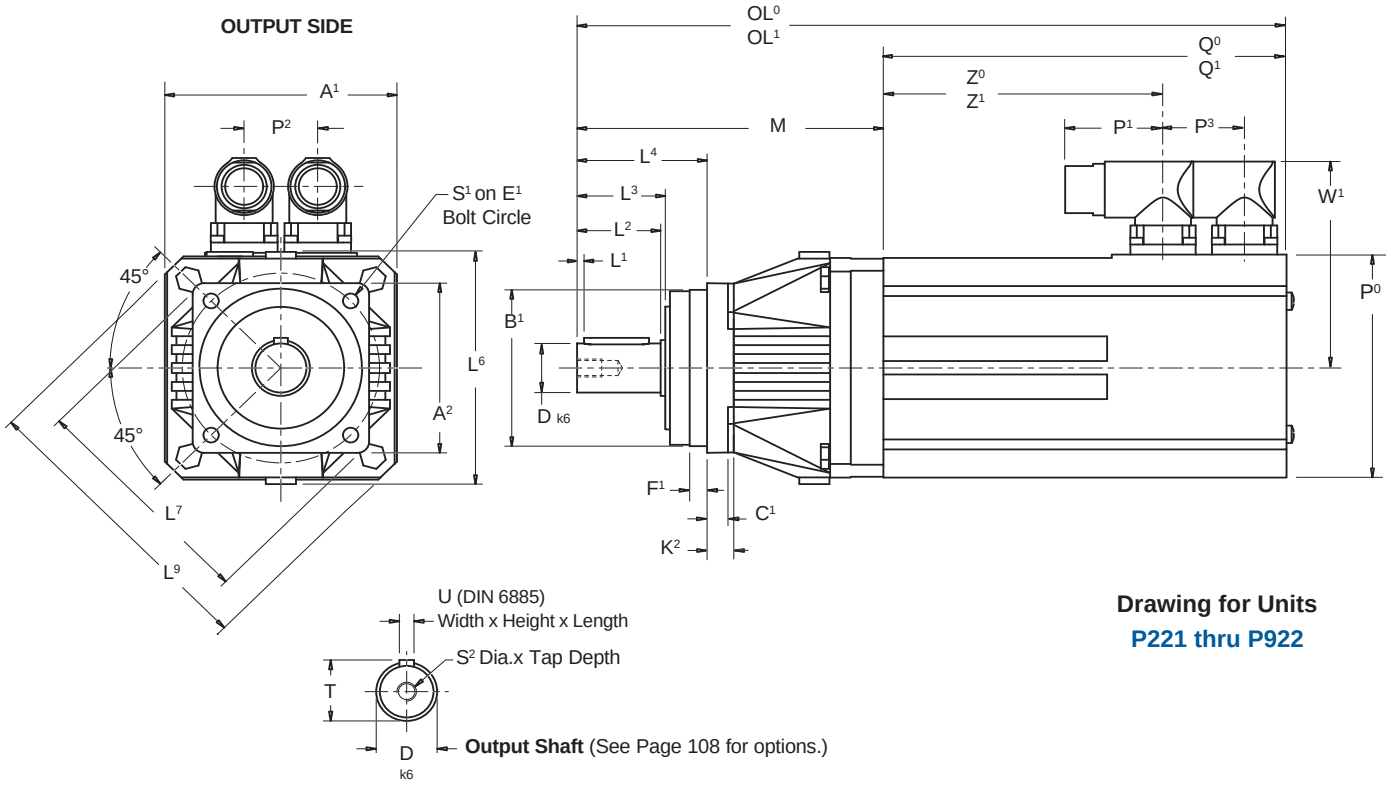
Index of Symbols

M_2 ..... Output Torque	i ..... Ratio
M_{2B} ..... Acceleration Torque	J_1 ..... Mass moment of inertia (input)
M_{2NOT} ..... Peak Torque - Emergency Stops	Δφ ..... Backlash in Arc Minutes
n_2 ..... Output RPM	C_2 ..... Torsional Stiffness

See web site for drawings.



"P" Series
ServoFit® Geared Motor
Dimensional Data



Drawing for Units
P221 thru P922

Table No. 1 **"P" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

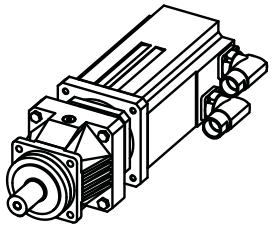
Unit	A1	A2	B1 h6	C1	D k6	E1	F1	K2	L1	L2	L3	L4	L6	L7	L8	S1	S2	T	U
P221/P222	55 2.17	55 2.17	50 +.000/-.019 1.969 +.0000/-.0007	6 .24	12 +.012/+.001	63 2.48	7 .28	– –	2 .08	22 .87	24 .94	36 1.42	62 2.44	74 2.91	80 3.15	5.5 .22	M4x10	13.5 .53	A4x4x18
P321/P322	72 2.83	72 2.83	60 +.000/-.019 2.362 +.0000/-.0007	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	92 3.62	5.5 .22	M5x12.5	18 .71	A5x5x22
P421/P422	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	103.3 4.07	130 5.12	6.6 .26	M8x19	24.5 .96	A6x6x28
P521/P522	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 2.28	60 2.36	88 3.46	121 4.76	139 5.47	149 5.87	9 .35	M12x28	35 1.38	A10x8x50
P721/P722	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
P821/P822	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. Example:

P421SPR0050ED402URO

ServoFit® Geared Motor, Output Shaft with Key, Normal Bearing, Dynamic Series, Self Ventilated, Resolver, Without Brake

See Page 11 for details of Part Number.



Typical 2 Stage Configuration

"P" Series
ServoFit® Geared Motor
Dimensional Data

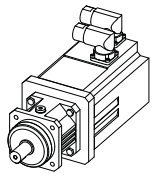


Table No. 2 **"P" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1
P221	101.5 4.00	235.5 9.27	273 10.75	101.5 4.00	253.5 9.98	291 11.46	—	—	—	—	—	—	—	—	—
P222	133.5 5.26	267.5 10.53	305 12.01	—	—	—	—	—	—	—	—	—	—	—	—
P321	121.5 4.76	255.5 10.06	293 11.54	121.5 4.76	273.5 10.77	311 12.24	115.5 4.55	253.5 9.98	299.5 11.79	115.5 4.55	288.5 11.36	334.5 13.17	115.5 4.55	323.5 12.74	369.5 14.55
P322	165.5 6.52	299.5 11.79	337 13.27	165.5 6.52	317.5 12.50	355 13.98	—	—	—	—	—	—	—	—	—
P421	—	—	—	—	—	—	132 5.20	270 10.63	316 12.44	132 5.20	305 12.01	351 13.82	132 5.20	340 13.39	386 15.20
P422	187 7.36	321 12.64	358.5 14.11	187 7.36	339 13.35	376.5 14.82	181 7.16	319 12.56	365 14.37	181 7.16	354 13.94	400 15.75	—	—	—
P522	—	—	—	—	—	—	221.5 8.72	359.5 14.15	405.5 15.96	221.5 8.72	394.5 15.53	440.5 17.34	221.5 8.72	429.5 16.91	475.5 18.72

Unit	ED503			ED505			ED704		
	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1
P421	143 5.63	346 13.62	397 15.63	143 5.63	416 16.38	467 18.39	—	—	—
P521	174 6.85	377 14.84	428 16.85	174 6.85	447 17.60	498 19.61	175.5 6.91	437.5 17.22	501 19.72
P522	232.5 9.15	435.5 17.15	486.5 19.15	232.5 9.15	505.5 19.90	556.5 21.91	—	—	—
P721	—	—	—	—	—	—	210.5 8.29	472.5 18.60	536 21.10
P722	275 10.83	478 18.82	529 20.83	275 10.83	548 21.57	599 23.58	276.5 10.89	538.5 21.20	602 23.70
P822	—	—	—	—	—	—	319 15.56	581 22.87	644.5 25.37

Q^0, Z^0, OL^0 are dimensions without a brake.
Q^1, Z^1, OL^1 are dimensions with a brake.

Table No. 3 **Dimensions (mm/inches)**

Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	134 5.28	171.5 6.75	78 3.07	74 2.91	74 2.91
ED303	72 2.83	42 1.65	14 .55	44 1.73	152 5.98	189.5 7.46	78 3.07	92 3.62	92 3.62
ED401	98 3.86	42 1.65	31 1.22	35 1.38	138 5.43	184 7.24	91 3.58	85 3.35	131 5.16
ED402	98 3.86	42 1.65	31 1.22	35 1.38	173 6.81	219 8.62	91 3.58	120 4.72	166 6.54
ED403	98 3.86	42 1.65	31 1.22	35 1.38	208 8.19	254 10.00	91 3.58	155 6.10	201 7.91
ED503	115 4.53	42 1.65	32 1.26	35 1.38	203 7.99	254 10.00	100 3.94	146 5.87	197 7.76
ED505	115 4.53	42 1.65	32 1.26	35 1.38	273 10.75	324 12.76	100 3.94	216 8.50	267 10.51
ED704	145 5.71	42 1.65	40 1.57	35 1.38	262 10.31	325.5 12.81	115 4.53	205 8.07	269 10.59

Table No. 4 **"P" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)**

Unit	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
P221	3.1	6.8	3.6	7.9	—	—	—	—	—	—	—	—	—	—	—	—
P222	3.6	7.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
P321	3.7	8.2	4.2	9.3	5.4	11.8	7.0	15.4	8.5	18.8	—	—	—	—	—	—
P322	4.4	9.6	4.9	10.7	—	—	—	—	—	—	—	—	—	—	—	—
P421	—	—	—	—	6.5	14.3	8.1	17.9	9.7	21.3	12.3	27.0	16.7	36.8		
P422	6.8	14.9	7.3	16.0	8.4	18.5	10.0	22.1	—	—	—	—	—	—	—	—
P521	—	—	—	—	—	—	—	—	—	—	14.1	31.0	18.5	40.8	23.7	52.3
P522	—	—	—	—	11.0	24.3	12.6	27.8	14.2	31.3	16.8	37.0	21.2	46.7	—	—
P721	—	—	—	—	—	—	—	—	—	—	—	—	—	—	27.5	60.7
P722	—	—	—	—	—	—	—	—	—	—	22.6	49.7	27.0	59.5	32.2	71.0
P822	—	—	—	—	—	—	—	—	—	—	—	—	—	—	47.5	104.8

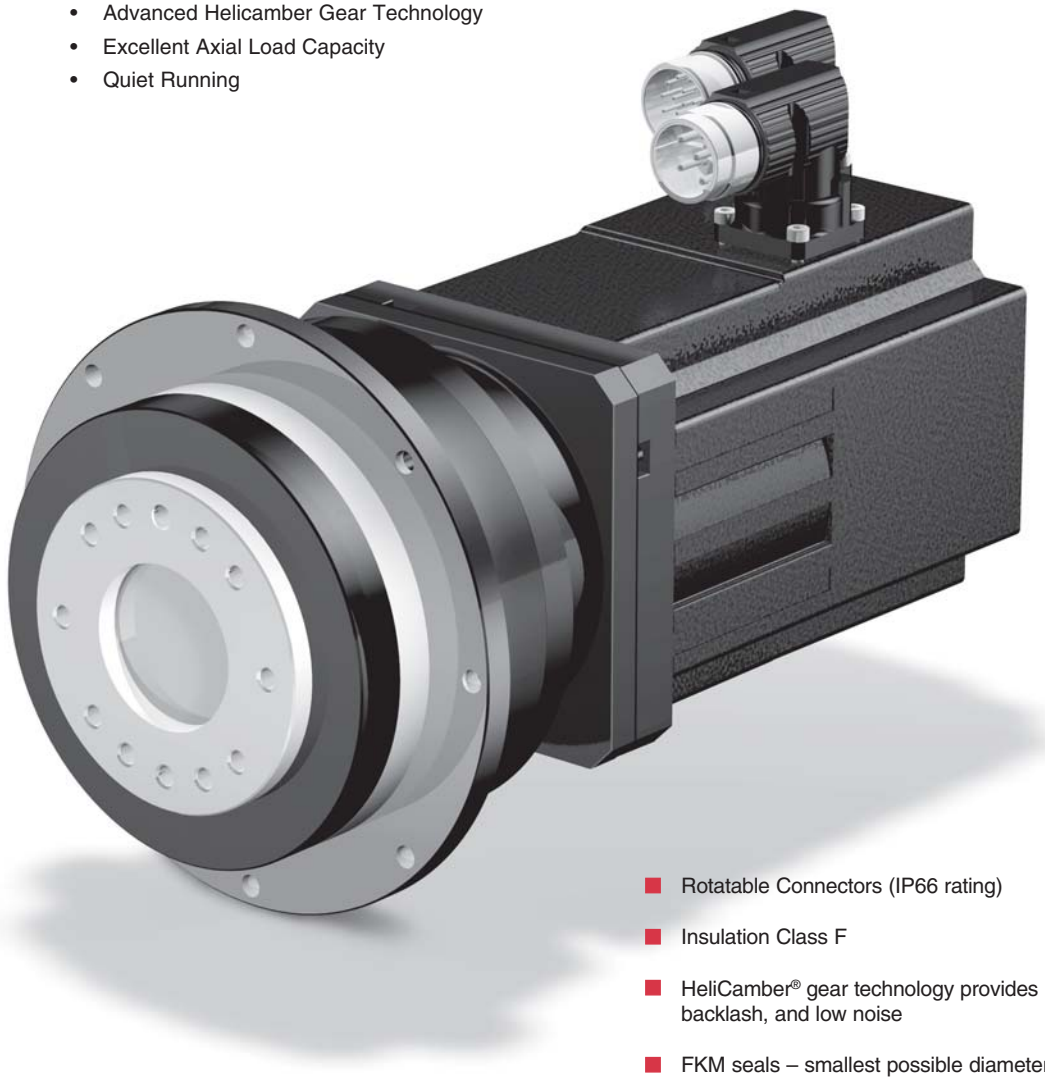
See web site for drawings.

"PH" Series
ServoFit® Geared Motor
Features

The "PH" Series ServoFit® Geared Motors are designed for high demands of torsional stiffness 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:

- Compact
- Low Inertia
- Dynamic Response
- ISO Output Flange for Coupling Free Mounting
- Advanced Helicamber Gear Technology
- Excellent Axial Load Capacity
- Quiet Running



- Rotatable Connectors (IP66 rating)
- Insulation Class F
- HeliCamber® gear technology provides minimum wear, low backlash, and low noise
- FKM seals – smallest possible diameter–reducing friction and heat buildup, increasing efficiency, and allowing continuous duty without additional cooling.
- Single piece steel housing provides greater concentricity and more precise alignment
- Oversized tapered roller bearings and shafts for high radial load capacity and superior torsional stiffness
- Ring gear machined integral to the housing – not welded or pressed in
- Gears are case hardened to 61 Rockwell “C” and ground for maximum efficiency
- 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.

See web site for drawings.

"PH" Series
ServoFit® Geared Motor
Overview

			PH321_ED PH322_ED	PH421_ED PH422_ED	PH521_ED PH522_ED	PH721_ED PH722_ED	PH822_ED	PH923_ED
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
Output Torque Nominal	T_{2N}	in.lbs. Nm	310 35	779 88	1,176 212	3,460 391	6,796 768	15,912 1,798
Torsional Backlash [1]	$\Delta\varphi$	arcmin	≤3	≤3	≤3	≤3	≤3	≤3
Torsional Stiffness	C_2	in.lbs./arcmin Nm/arcmin	≤115 ≤13	≤345 ≤39	≤867 ≤98	≤1,416 ≤160	≤3,557 ≤402	≤3,540 ≤400
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
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
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
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	88 39.8	139 63
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.					
Insulation Class			F (155°C)					
Finish			Black					
Warranty			2 Year Limited					

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

"PH" Series
ServoFit® Geared Motor
Part No. Explanation

OPTIONS and REQUIRED INFORMATION

PH 4 2 1 F 0050 ED 4 0 2 U R O

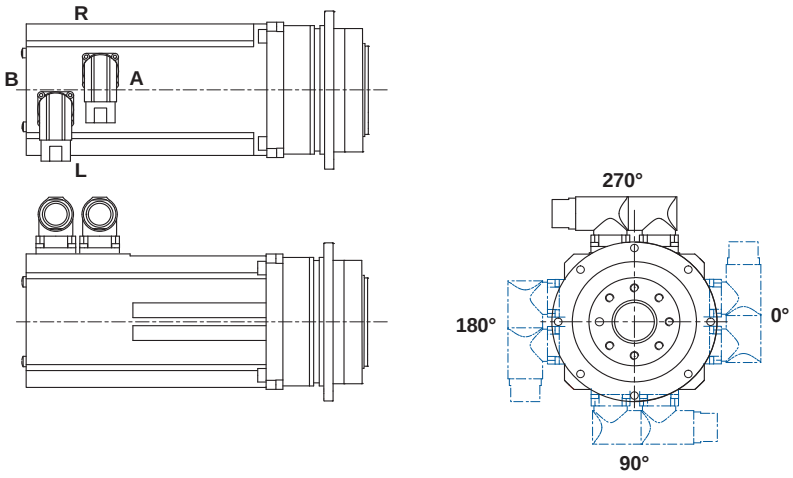
- **PH** ServoFit® Geared Motor
- Unit No.
- Generation Number
- No. of Gear Stages (**1** = 1 Stage, **2** = 2 Stages)
- Standard **F**langed Housing
- Exact Ratio: **0050** = 5:1
- Dynamic Series
- Motor Frame Size
- Generation Number
- Number of Magnet Stacks
- Self Ventilating
- Feedback
  - **R**esolver
  - **M**ultiturn Absolute Encoder Inductive
  - **S**ingleturn Absolute Encoder Inductive
- Brake
  - "**O**" Without Brake
  - "**P**" Permanent Magnet Brake

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Specify – Cable Entry Side.

Specify – Connector Location.

Cable Entry



Standard cable entry is side "L".

Power and control connecters are both rotatable in any position.

"PH" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Input RPM n1 Max. Continuous	Input RPM n1 Max. Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
PH321_ED – 3000 RPM 480V														
PH321F0050ED302U	600	5.0	42	4.7	167	18.8	944	106.7	3,000	6,000	0.52	4	115	13
PH321F0050ED303U	600	5.0	57	6.5	229	25.9	944	106.7	3,000	6,000	0.68	4	115	13
PH321F0050ED401U	600	5.0	100	11.3	531	60.0	1,151	130.0	3,000	6,000	1.48	4	115	13
PH321F0050ED402U	600	5.0	194	21.9	575	65.0	1,151	130.0	3,000	6,000	2.58	4	115	13
PH321F0050ED403U	600	5.0	252	28.5	575	65.0	1,151	130.0	3,000	6,000	3.68	4	115	13
PH321F0070ED302U	429	7.0	58	6.6	233	26.3	1,151	130.0	3,500	6,000	0.48	4	102	12
PH321F0070ED303U	429	7.0	80	9.1	321	36.3	1,151	130.0	3,500	6,000	0.64	4	102	12
PH321F0100ED302U	300	10.0	83	9.4	333	37.6	885	100.0	3,800	6,000	0.46	4	80	9
PH321F0100ED303U	300	10.0	115	13.0	443	50.0	885	100.0	3,800	6,000	0.62	4	80	9
PH322_ED – 3000 RPM 480V														
PH322F0200ED302U	150	20.0	161	18.2	575	65.0	1,151	130.0	4,500	8,000	0.49	4	90	10
PH322F0200ED303U	150	20.0	222	25.1	575	65.0	1,151	130.0	4,500	8,000	0.65	4	90	10
PH322F0250ED302U	120	25.0	202	22.8	575	65.0	1,151	130.0	4,500	8,000	0.47	4	90	10
PH322F0250ED303U	120	25.0	278	31.4	575	65.0	1,151	130.0	4,500	8,000	0.63	4	90	10
PH322F0280ED302U	107	28.0	226	25.5	531	60.0	1,151	130.0	4,500	8,000	0.49	4	91	10
PH322F0280ED303U	107	28.0	311	35.2	531	60.0	1,151	130.0	4,500	8,000	0.65	4	91	10

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2X} = Application Torque and n_{1X} = Operating RPM

$$M_{2X} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1X}}{n_1}\right)}}$$

"PH" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque Nominal M_2 in.lbs.	Nm	Acceleration [2] M_{2B} in.lbs.	Nm	Peak [3] M_{2NOT} in.lbs.	Nm	Input RPM n1 Max. Continuous	Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Nm
PH421_ED – 3000 RPM 480V														
PH421F0040ED401U	750	4.0	80	9.1	425	48.0	1,786	201.8	2,300	5,000	1.89	3	345	39
PH421F0040ED402U	750	4.0	155	17.5	816	92.2	1,786	201.8	2,300	5,000	3.00	3	345	39
PH421F0040ED403U	750	4.0	202	22.8	986	111.4	1,786	201.8	2,300	5,000	4.09	3	345	39
PH421F0040ED503U	750	4.0	258	29.2	1,087	122.9	2,124	240.0	2,300	5,000	8.74	3	345	39
PH421F0040ED505U	750	4.0	408	46.1	1,151	130.0	2,124	240.0	2,300	5,000	13.72	3	345	39
PH421F0050ED402U	600	5.0	194	21.9	1,020	115.2	2,124	240.0	2,700	6,000	2.82	3	327	37
PH421F0050ED403U	600	5.0	252	28.5	1,151	130.0	2,124	240.0	2,700	6,000	3.91	3	327	37
PH421F0050ED503U	600	5.0	323	36.5	1,151	130.0	2,124	240.0	2,700	6,000	8.56	3	327	37
PH421F0050ED505U	600	5.0	510	57.6	1,151	130.0	2,124	240.0	2,700	6,000	13.54	3	327	37
PH421F0070ED401U	429	7.0	140	15.9	743	84.0	2,124	240.0	3,200	6,000	1.56	3	274	31
PH421F0070ED402U	429	7.0	271	30.6	974	110.0	2,124	240.0	3,200	6,000	2.66	3	274	31
PH421F0070ED403U	429	7.0	353	39.9	974	110.0	2,124	240.0	3,200	6,000	3.76	3	274	31
PH421F0100ED401U	300	10.0	201	22.7	885	100.0	1,770	200.0	3,500	6,000	1.49	3	186	21
PH421F0100ED402U	300	10.0	387	43.8	885	100.0	1,770	200.0	3,500	6,000	2.59	3	186	21
PH422_ED – 3000 RPM 480V														
PH422F0160ED302U	188	16.0	129	14.6	516	58.3	2,124	240.0	3,700	6,500	0.60	3	236	27
PH422F0160ED303U	188	16.0	178	20.1	711	80.4	2,124	240.0	3,700	6,500	0.76	3	236	27
PH422F0160ED401U	188	16.0	311	35.1	1,151	130.0	2,124	240.0	3,700	6,500	1.56	3	236	27
PH422F0160ED402U	188	16.0	600	67.9	1,151	130.0	2,124	240.0	3,700	6,500	2.66	3	236	27
PH422F0160ED403U	188	16.0	782	88.4	1,151	130.0	2,124	240.0	3,700	6,500	3.76	3	236	27
PH422F0200ED303U	150	20.0	222	25.1	889	100.4	2,124	240.0	3,700	6,500	0.75	3	256	29
PH422F0200ED401U	150	20.0	388	43.9	1,151	130.0	2,124	240.0	3,700	6,500	1.55	3	256	29
PH422F0200ED402U	150	20.0	751	84.8	1,151	130.0	2,124	240.0	3,700	6,500	2.65	3	256	29
PH422F0250ED302U	120	25.0	202	22.8	807	91.1	2,124	240.0	4,000	7,000	0.53	3	254	29
PH422F0250ED303U	120	25.0	278	31.4	1,111	125.6	2,124	240.0	4,000	7,000	0.69	3	254	29
PH422F0250ED401U	120	25.0	486	54.9	1,151	130.0	2,124	240.0	4,000	7,000	1.50	3	254	29
PH422F0280ED302U	107	28.0	226	25.5	903	102.1	2,124	240.0	4,500	8,000	0.49	3	222	25
PH422F0280ED303U	107	28.0	311	35.2	1,151	130.0	2,124	240.0	4,500	8,000	0.65	3	222	25
PH422F0350ED302U	86	35.0	282	31.9	1,129	127.6	2,124	240.0	4,500	8,000	0.49	3	245	28
PH422F0350ED303U	86	35.0	389	43.9	1,151	130.0	2,124	240.0	4,500	8,000	0.65	3	245	28
PH422F0400ED302U	75	40.0	323	36.5	1,151	130.0	2,124	240.0	4,500	8,000	0.47	3	214	24
PH422F0400ED303U	75	40.0	444	50.2	1,151	130.0	2,124	240.0	4,500	8,000	0.63	3	214	24
PH422F0500ED302U	60	50.0	403	45.6	1,151	130.0	2,124	240.0	4,500	8,000	0.47	3	239	27
PH422F0500ED303U	60	50.0	556	62.8	1,151	130.0	2,124	240.0	4,500	8,000	0.63	3	239	27
PH422F0700ED302U	43	70.0	565	63.8	974	110.0	2,124	240.0	4,500	8,000	0.46	3	237	27

Index of Symbols

M_2 ..... Output Torque	i ..... Ratio
M_{2B} ..... Acceleration Torque	J_1 ..... Mass moment of inertia (input)
M_{2NOT} ..... Peak Torque - Emergency Stops	Δφ ..... Backlash in Arc Minutes
n_2 ..... Output RPM	C_2 ..... Torsional Stiffness

See web site for drawings.

"PH" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Input RPM n1 Max. Continuous	Input RPM n1 Max. Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
PH521_ED – 3000 RPM 480V														
PH521F0040ED505U	750	4.0	408	46.1	2,161	244.2	3,056	345.3	2,200	5,000	13.39	3	867	98
PH521F0040ED704U	750	4.0	561	63.4	2,148	242.7	4,910	554.8	2,200	5,000	28.58	3	867	98
PH521F0050ED505U	600	5.0	510	57.6	2,702	305.3	3,820	431.7	2,500	5,500	14.21	3	823	93
PH521F0050ED704U	600	5.0	701	79.2	2,685	303.4	5,310	600.0	2,500	5,500	29.40	3	823	93
PH521F0070ED503U	429	7.0	452	51.1	1,903	215.0	5,310	600.0	3,000	6,000	8.75	3	681	77
PH521F0070ED505U	429	7.0	714	80.6	2,390	270.0	5,310	600.0	3,000	6,000	13.73	3	681	77
PH521F0100ED503U	300	10.0	646	73.0	2,213	250.0	4,425	500.0	3,300	6,000	8.50	3	487	55
PH521F0100ED505U	300	10.0	1,020	115.2	2,213	250.0	4,425	500.0	3,300	6,000	13.48	3	487	55
PH522_ED – 3000 RPM 480V														
PH522F0160ED402U	188	16.0	600	67.9	2,832	320.0	4,910	554.8	3,300	6,000	2.80	3	574	65
PH522F0160ED403U	188	16.0	782	88.4	2,832	320.0	4,910	554.8	3,300	6,000	3.89	3	574	65
PH522F0160ED503U	188	16.0	1,001	113.1	2,832	320.0	4,910	554.8	3,300	6,000	8.54	3	574	65
PH522F0160ED505U	188	16.0	1,580	178.6	2,832	320.0	4,910	554.8	3,300	6,000	13.52	3	574	65
PH522F0200ED402U	150	20.0	751	84.8	2,832	320.0	5,310	600.0	3,300	6,000	2.85	3	628	71
PH522F0200ED403U	150	20.0	978	110.5	2,832	320.0	5,310	600.0	3,300	6,000	3.94	3	628	71
PH522F0200ED503U	150	20.0	1,251	141.4	2,832	320.0	5,310	600.0	3,300	6,000	8.59	3	628	71
PH522F0250ED401U	120	25.0	486	54.9	2,572	290.6	5,310	600.0	3,700	6,500	1.63	3	624	71
PH522F0250ED402U	120	25.0	938	106.0	2,832	320.0	5,310	600.0	3,700	6,500	2.73	3	624	71
PH522F0250ED403U	120	25.0	1,222	138.1	2,832	320.0	5,310	600.0	3,700	6,500	3.83	3	624	71
PH522F0250ED503U	120	25.0	1,564	176.7	2,832	320.0	5,310	600.0	3,700	6,500	8.47	3	624	71
PH522F0280ED401U	107	28.0	544	61.5	2,832	320.0	4,910	554.8	4,000	7,000	1.50	3	540	61
PH522F0280ED402U	107	28.0	1,051	118.7	2,832	320.0	4,910	554.8	4,000	7,000	2.60	3	540	61
PH522F0280ED403U	107	28.0	1,369	154.7	2,832	320.0	4,910	554.8	4,000	7,000	3.69	3	540	61
PH522F0350ED401U	86	35.0	680	76.8	2,832	320.0	5,310	600.0	4,000	7,000	1.52	3	602	68
PH522F0350ED402U	86	35.0	1,314	148.4	2,832	320.0	5,310	600.0	4,000	7,000	2.62	3	602	68
PH522F0350ED403U	86	35.0	1,711	193.3	2,832	320.0	5,310	600.0	4,000	7,000	3.71	3	602	68
PH522F0400ED401U	75	40.0	777	87.8	2,832	320.0	4,910	554.8	4,000	7,000	1.45	3	516	58
PH522F0400ED402U	75	40.0	1,501	169.6	2,832	320.0	4,910	554.8	4,000	7,000	2.56	3	516	58
PH522F0500ED401U	60	50.0	971	109.7	2,832	320.0	5,310	600.0	4,000	7,000	1.46	3	582	66
PH522F0500ED402U	60	50.0	1,877	212.0	2,832	320.0	5,310	600.0	4,000	7,000	2.56	3	582	66
PH522F0700ED401U	43	70.0	1,360	153.6	2,390	270.0	5,310	600.0	4,000	7,000	1.46	3	580	66

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2X} = Application Torque and n_{1X} = Operating RPM

$$M_{2X} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1X}}{n_1}\right)}}$$

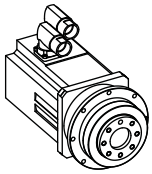
"PH" Series
ServoFit® Geared Motor
Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio Exact i	Output Torque Nominal M_2 in.lbs.	Nm	Acceleration [2] M_{2B} in.lbs.	Nm	Peak [3] M_{2NOT} in.lbs.	Nm	Input RPM n1 Max. Continuous	Cyclic	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Nm
PH721_ED – 3000 RPM 480V														
PH721F0070ED704U	429	7.0	981	110.9	3,759	424.7	11,117	1,256.2	2,500	5,000	29.82	3	1,416	160
PH721F0100ED704U	300	10.0	1,402	158.4	4,425	500.0	8,850	1,000.0	3,000	5,000	29.13	3	1,035	117
PH722_ED – 3000 RPM 480V														
PH722F0160ED503U	188	16.0	1,001	113.1	4,214	476.2	11,735	1,326.0	3,000	5,000	9.46	3	1,204	136
PH722F0160ED505U	188	16.0	1,580	178.6	6,195	700.0	11,735	1,326.0	3,000	5,000	14.44	3	1,204	136
PH722F0160ED704U	188	16.0	2,173	245.5	6,195	700.0	12,224	1,381.3	3,000	5,000	29.63	3	1,204	136
PH722F0200ED503U	150	20.0	1,251	141.4	5,268	595.2	12,390	1,400.0	3,000	5,000	9.34	3	1,325	150
PH722F0200ED505U	150	20.0	1,975	223.2	6,195	700.0	12,390	1,400.0	3,000	5,000	14.33	3	1,325	150
PH722F0200ED704U	150	20.0	2,716	306.9	6,195	700.0	12,390	1,400.0	3,000	5,000	29.52	3	1,325	150
PH722F0250ED503U	120	25.0	1,564	176.7	6,195	700.0	12,390	1,400.0	3,500	6,000	8.93	3	1,317	149
PH722F0250ED505U	120	25.0	2,469	279.0	6,195	700.0	12,390	1,400.0	3,500	6,000	13.92	3	1,317	149
PH722F0250ED704U	120	25.0	3,395	383.6	6,195	700.0	12,390	1,400.0	3,500	6,000	29.11	3	1,317	149
PH722F0280ED503U	107	28.0	1,751	197.9	6,195	700.0	12,224	1,381.3	3,700	6,500	8.63	3	1,159	131
PH722F0280ED505U	107	28.0	2,765	312.5	6,195	700.0	12,224	1,381.3	3,700	6,500	13.62	3	1,159	131
PH722F0350ED503U	86	35.0	2,189	247.4	6,195	700.0	12,390	1,400.0	3,700	6,500	8.60	3	1,289	146
PH722F0350ED505U	86	35.0	3,457	390.6	6,195	700.0	12,390	1,400.0	3,700	6,500	13.58	3	1,289	146
PH722F0400ED503U	75	40.0	2,502	282.7	6,195	700.0	12,224	1,381.3	3,700	6,500	8.44	3	1,119	126
PH722F0500ED503U	60	50.0	3,128	353.4	6,195	700.0	12,390	1,400.0	3,700	6,500	8.43	3	1,258	142
PH822_ED – 3000 RPM 480V														
PH822F0160ED704U	188	16.0	2,173	245.5	8,323	940.4	24,394	2,756.4	2,500	4,500	33.03	3	3,268	369
PH822F0200ED704U	150	20.0	2,716	306.9	10,403	1,175.5	28,320	3,200.0	2,500	4,500	32.47	3	3,562	402
PH822F0250ED704U	120	25.0	3,395	383.6	13,004	1,469.4	28,320	3,200.0	3,000	5,500	30.96	3	3,521	398
PH822F0280ED704U	107	28.0	3,802	429.7	14,565	1,645.7	28,320	3,200.0	3,300	6,000	29.87	3	3,157	357
PH822F0350ED704U	86	35.0	4,753	537.1	17,700	2,000.0	28,320	3,200.0	3,300	6,000	29.69	3	3,477	393
PH822F0400ED704U	75	40.0	5,432	613.8	16,992	1,920.0	28,320	3,200.0	3,300	6,000	29.15	3	3,021	341
PH822F0500ED704U	60	50.0	6,790	767.3	17,700	2,000.0	28,320	3,200.0	3,300	6,000	29.06	3	3,370	381
PH923_ED – 3000 RPM 480V														
PH923F0910ED704U	33	91.0	11,959	1,351.4	37,613	4,250.0	75,225	8,500.0	2,500	4,500	67.41	3	3,540	400
PH923F1210ED704U	25	121.0	15,902	1,796.9	37,613	4,250.0	75,225	8,500.0	2,500	4,500	66.02	3	3,540	400

Index of Symbols

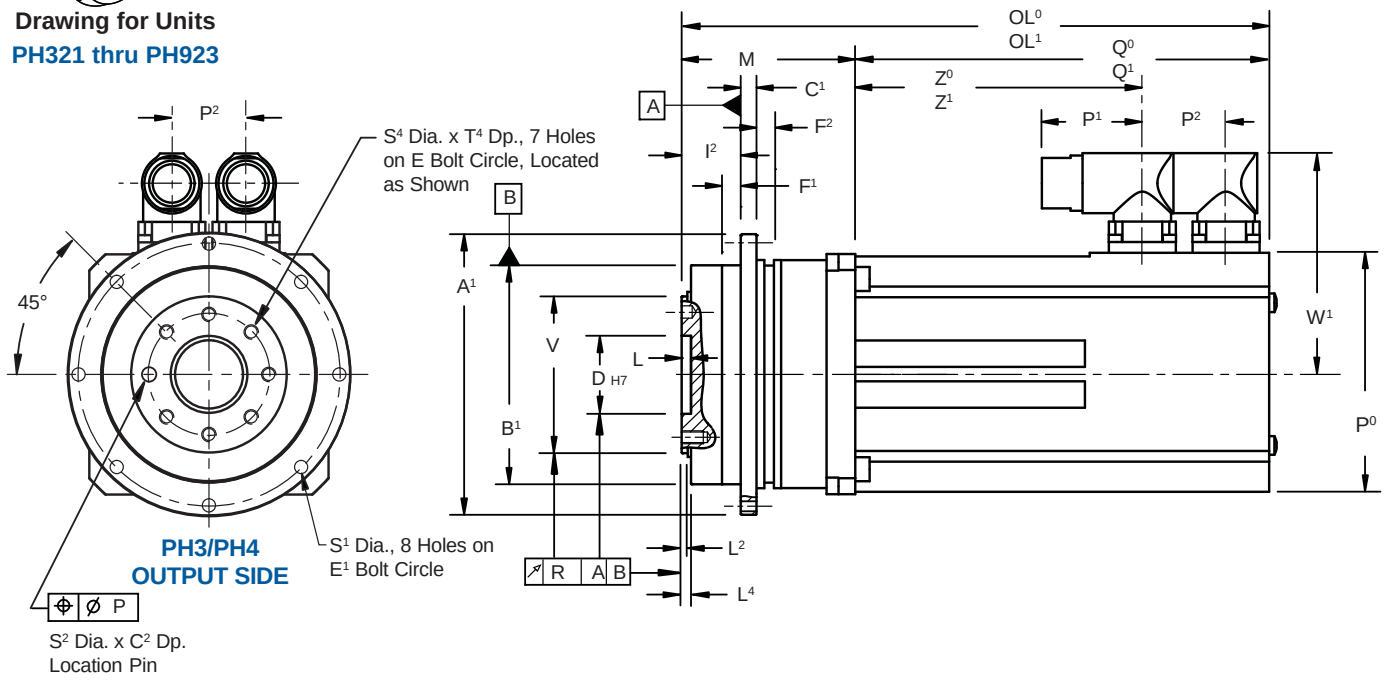
M_2 ..... Output Torque	i ..... Ratio
M_{2B} ..... Acceleration Torque	J_1 ..... Mass moment of inertia (input)
M_{2NOT} ..... Peak Torque - Emergency Stops	Δφ ..... Backlash in Arc Minutes
n_2 ..... Output RPM	C_2 ..... Torsional Stiffness

See web site for drawings.

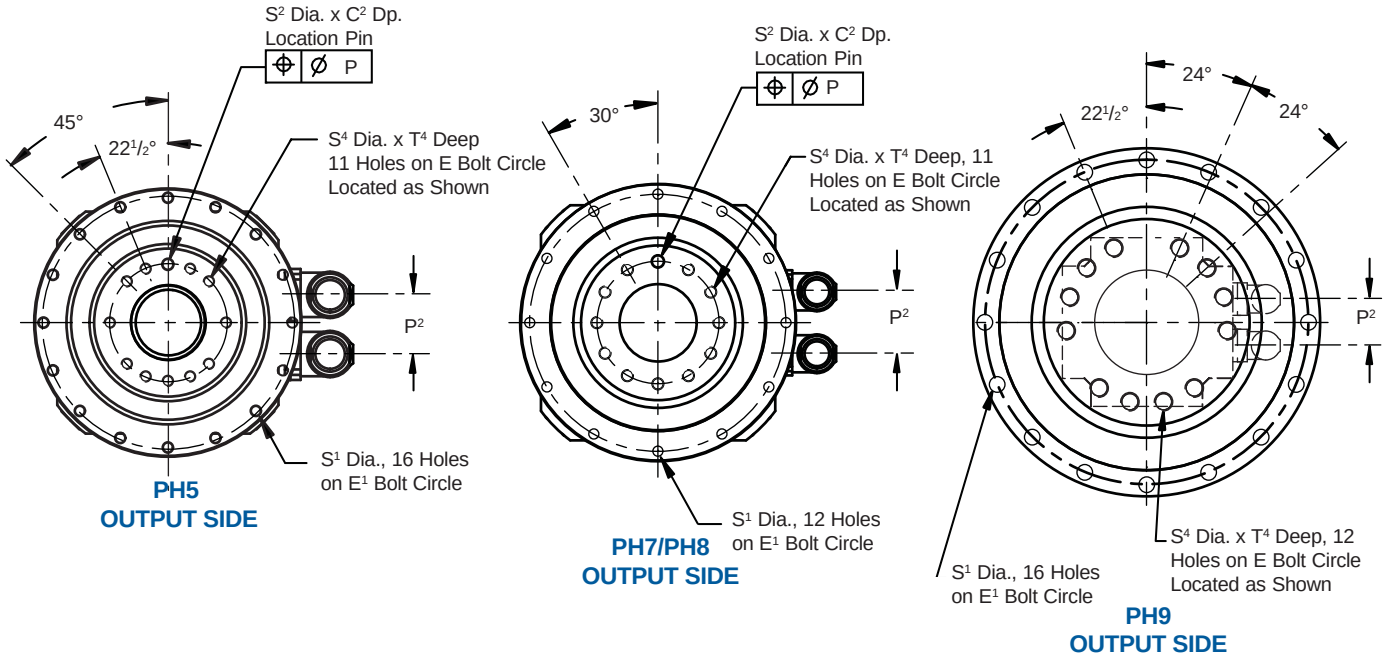


"PH" Series
ServoFit® Geared Motor
Dimensional Data

Drawing for Units
PH321 thru PH923



PH3/PH4
OUTPUT SIDE



PH5
OUTPUT SIDE

PH7/PH8
OUTPUT SIDE

PH9
OUTPUT SIDE

Table No. 1 **"PH" Series – PowerLine ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	A¹	B¹ h7	C¹	C²	D H7	E	E¹	F¹	F²	I²	L	L²	L⁴	P	R
PH321/PH322	86 3.39	64 +.000/-.030 2.520 +.0000/-.0012	4 .16	3 .12	20 +.021/-.0 .787 +.0008/-.0000	31.5 1.24	79 3.11	7 .28	8 .31	19.5 .77	4 .16	3 .12	3.5 .14	.02 .0008	.020 .0008
PH421/PH422	118 4.65	90 +.000/-.035 3.543 +.0000/-.0014	7 .28	7 .28	31.5 +.025/-.0 1.240 +.0010/-.0000	50 1.97	109 4.29	10 .39	10 .39	30 1.18	6 .24	6 .24	6 .24	.02 .0008	.020 .0008
PH521/PH522	145 5.71	110 +.000/-.035 4.331 +.0000/-.0014	8 .32	7 .28	40 +.025/-.0 1.575 +.0010/-.0000	63 2.48	135 5.31	10 .39	12 .47	29 1.14	6 .24	6 .24	6 .24	.02 .0008	.020 .0008
PH721/PH722	179 7.05	140 +.000/-.040 5.513 +.0000/-.0016	10 .39	7 .28	50 +.025/-.0 1.969 +.0010/-.0000	80 3.15	168 6.61	12 .47	12 .47	38 1.50	6 .24	6 .24	6 .24	.02 .0008	.025 .0010
PH822	247 9.72	200 +.000/-.046 7.874 +.0000/-.0018	12 .47	10 .39	80 +.030/-.0 3.150 +.0012/-.0000	125 4.92	233 9.17	15 .59	15 .59	50 1.97	8 .31	8 .31	8 .31	–	.030 .0012
PH923	300 11.81	255 +.000/-.052 10.039 +.000/-.0020	18 .71	–	90 +.035/-.0 3.543 +.0014/-.0000	140 5.51	280 11.02	20 .79	20 .79	66 2.60	12 .47	11 .43	12 .47	–	.030 .0012

"PH" Series
ServoFit® Geared Motor
Dimensional Data

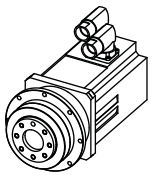


Table No. 2 Dimensions (mm/inches)

Unit	S^1	S^2 H7	S^4	T^4	V h7
PH321/PH322	4.5 .18	5 +.012/-.000 .20 +.0005/-.0000	M5	7 .28	40 +.000/-.025 1.575 +.000/-.0010
PH421/PH422	5.5 .22	6 +.012/-.000 .236 +.0005/-.0000	M6	10 .39	63 +.000/-.030 2.480 +.000/-.0012
PH521/PH522	5.5 .22	6 +.012/-.000 .236 +.0005/-.0000	M6	11 .43	80 +.000/-.030 3.150 +.000/-.0012
PH721/PH722	6.6 .26	8 +.015/-.000 .315 +.0006/-.0000	M8	14 .55	100 +.000/-.035 3.937 +.000/-.0014
PH822	9 .35	10 +.015/-.000 .393 +.0006/-.0000	M10	18 .71	160 +.000/-.040 6.299 +.000/-.0016
PH923	13.5 .53	–	M16	24 .94	180 +.000/-.040 7.087 +.000/-.0016

Q^0, Z^0, OL^0 are dimensions without a brake.
Q^1, Z^1, OL^1 are dimensions with a brake.

Table No. 3 Dimensions (mm/inches)

Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	134 5.28	171.5 6.75	78 3.07	74 2.91	74 2.91
ED303	72 2.83	42 1.65	14 .55	44 1.73	152 5.98	189.5 7.46	78 3.07	92 3.62	92 3.62
ED401	98 3.86	42 1.65	31 1.22	35 1.38	138 5.43	184 7.24	91 3.58	85 3.35	131 5.16
ED402	98 3.86	42 1.65	31 1.22	35 1.38	173 6.81	219 8.62	91 3.58	120 4.72	166 6.54
ED403	98 3.86	42 1.65	31 1.22	35 1.38	208 8.19	254 10.00	91 3.58	155 6.10	201 7.91
ED503	115 4.53	42 1.65	32 1.26	35 1.38	203 7.99	254 10.00	100 3.94	146 5.87	197 7.76
ED505	115 4.53	42 1.65	32 1.26	35 1.38	273 10.75	324 12.76	100 3.94	216 8.50	267 10.51
ED704	145 5.71	42 1.65	40 1.57	35 1.38	262 10.31	325.5 12.81	115 4.53	205 8.07	269 10.59

Table No. 4 "PH" Series – ServoFit® Geared Motor – Dimensions (mm/inches)

Unit	ED302			ED303			ED401			ED402			ED403		
	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1
PH321	70.5 2.78	204.5 8.05	242 9.53	70.5 2.78	222.5 8.76	260 10.24	64 2.52	202 7.95	248 9.76	64 2.52	237 9.33	283 11.14	64 2.52	272 10.71	318 12.52
PH322	111 4.37	245 9.65	282.5 11.12	111 4.37	263 10.35	300.5 11.83	—	—	—	—	—	—	—	—	—
PH421	—	—	—	—	—	—	78 3.07	216 8.50	262 10.31	78 3.07	251 9.88	297 11.69	78 3.07	286 11.26	332 13.07
PH422	133 5.24	267 10.51	304.5 11.99	133 5.24	205 8.07	322.5 12.70	127 5.00	265 10.43	311 12.24	127 5.00	300 11.81	346 13.62	127 5.00	335 13.19	381 15.00
PH522	—	—	—	—	—	—	138.5 5.45	276.5 10.89	322.5 12.70	138.5 5.45	311.5 12.26	357.5 14.07	138.5 5.45	346.5 13.64	392.5 15.45

Unit	ED503			ED505			ED704		
	M	OL^0	OL^1	M	OL^0	OL^1	M	OL^0	OL^1
PH421	88.5 3.48	291.5 11.48	342.5 13.48	88.5 3.48	388.5 15.30	412.5 16.24	—	—	—
PH521	91.5 3.60	294.5 11.59	345.5 13.60	91.5 3.60	364.5 14.35	415.5 16.36	92.5 3.64	354.5 13.96	418 16.46
PH522	149.5 5.89	352.5 13.88	403.5 15.89	149.5 5.89	422.5 16.63	473.5 18.64	—	—	—
PH721	—	—	—	—	—	—	106.5 4.19	398.5 15.69	432 17.01
PH722	171 6.73	374 14.72	425 16.73	171 6.73	444 17.48	495 19.49	172.5 6.79	434.5 17.11	498 19.61
PH822	—	—	—	—	—	—	219.5 8.64	481.5 18.96	545 21.46
PH923	—	—	—	—	—	—	225 8.86	487 19.17	550.5 21.67

Part No. Example:

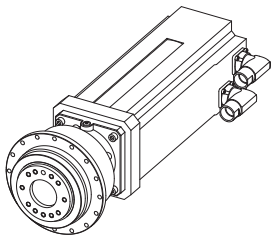
PH521F0050ED505URO

ServoFit® Geared Motor
Dynamic Series, Self Ventilated, Resolver, Without Brake

See Page 23 for details of Part Number.

Table No. 5 "PH" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

Unit	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
PH321	3.2	7.0	3.7	8.1	4.8	10.6	6.4	14.2	8.0	17.6	—	—	—	—	—	—
PH322	3.7	8.1	4.2	9.2	—	—	—	—	—	—	—	—	—	—	—	—
PH421	—	—	—	—	6.4	14.1	8.0	17.7	9.6	21.1	12.2	26.8	16.6	36.6	—	—
PH422	6.1	13.4	6.6	14.5	7.7	17.0	9.3	20.6	10.9	24.0	—	—	—	—	—	—
PH521	—	—	—	—	—	—	—	—	—	—	14.2	31.2	18.6	41.0	23.8	52.5
PH522	—	—	—	—	10.6	23.4	12.2	27.0	13.8	30.4	16.4	36.1	20.8	45.9	—	—
PH721	—	—	—	—	—	—	—	—	—	—	—	—	—	—	27.8	61.3
PH722	—	—	—	—	—	—	—	—	—	—	22.2	58.9	26.6	48.7	31.8	70.2
PH822	—	—	—	—	—	—	—	—	—	—	—	—	—	—	55.3	122.0
PH923	—	—	—	—	—	—	—	—	—	—	—	—	—	—	78.3	172.7



Typical 2 Stage Configuration

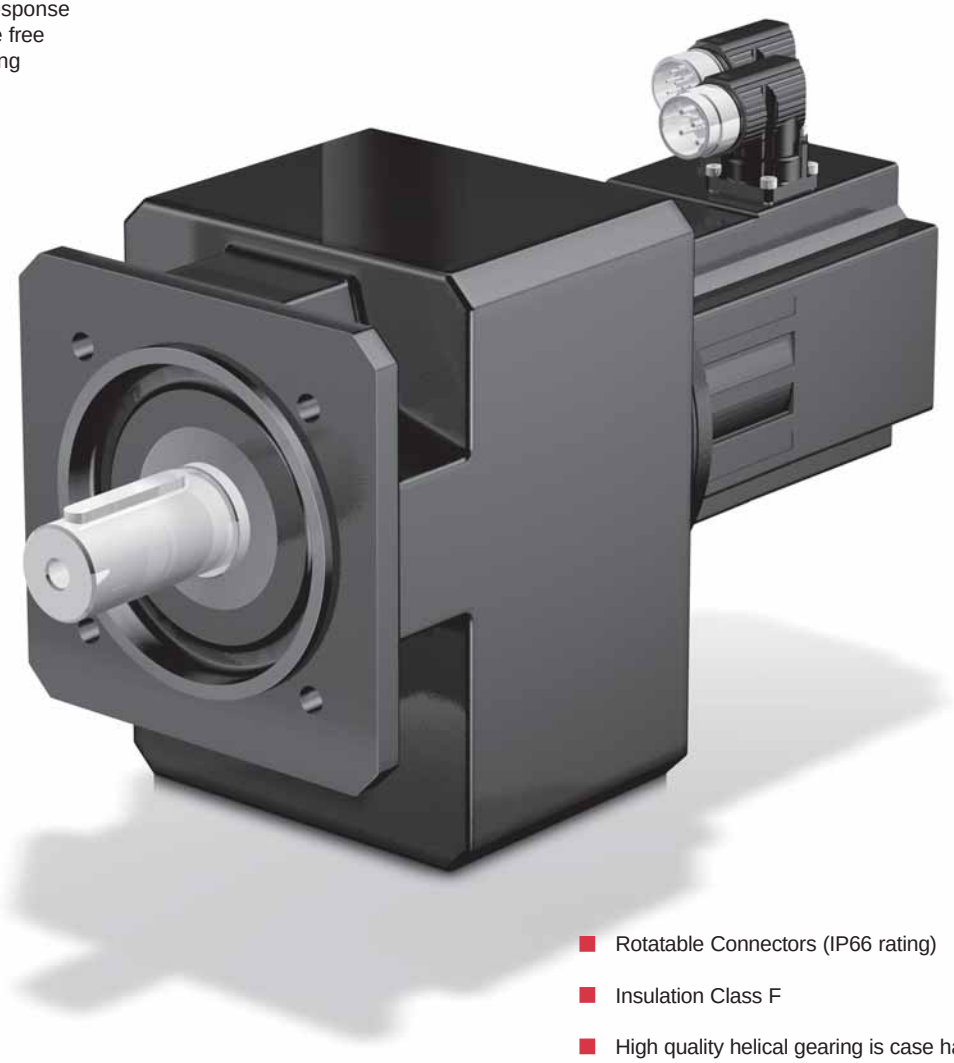
See web site for drawings.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Geared Motor Features

Performance Specifications:

- Nominal output torque – up to 19,300 in.lbs. (2,180 Nm)
- Reducer ratios from 2:1 to 183:1
- Compact
- Low Inertia
- Dynamic Response
- Maintenance free
- Quiet Running

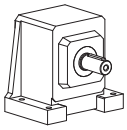


- Rotatable Connectors (IP66 rating)
- Insulation Class F
- High quality helical gearing is case hardened to 58-62 Rockwell C. Precision finished for low noise and long service life. Backlash is ≤20 arc minutes
- High tensile strength shafts with captured keys available inches, metric, or stainless.
- 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.
- 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

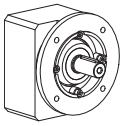
See web site for drawings.

"C" Series–Concentric Helical ServoFit® Geared Motor Overview

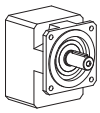
Housing Styles + Servo Motor = Geared Motor Configurations



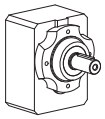
Style N
Foot Mount



Style F
Round Flange

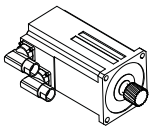


Style Q,
Square Flange



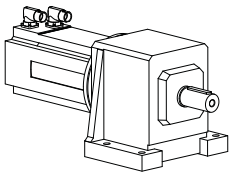
Style G
Tapped Holes

+

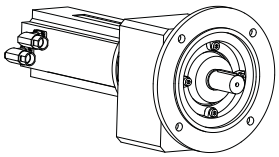


Servo Motor

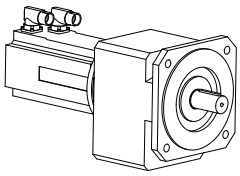
Geared Motor Configurations



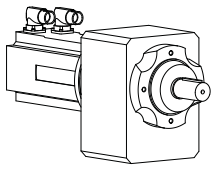
Style N, Foot Mount



Style F, Round Flange

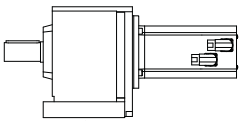


Style Q, Square Flange

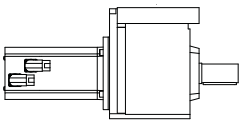


Style G, Tapped Holes

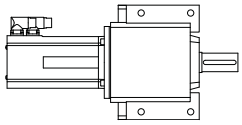
Mounting Positions



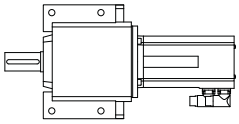
EL1



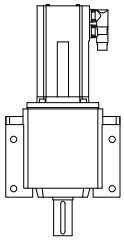
EL2



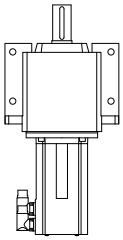
EL3



EL4

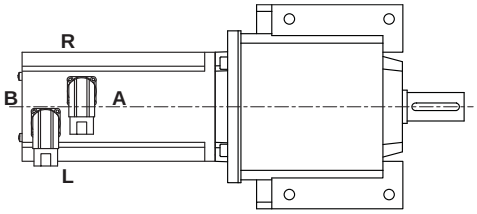


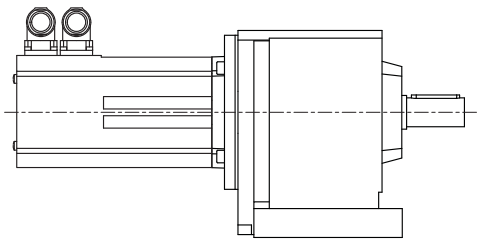
EL5

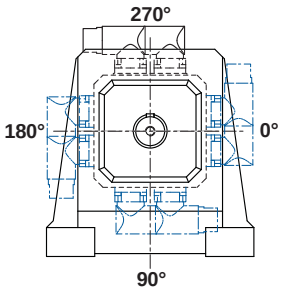


EL6

Cable Entry







Standard cable entry is terminal box side “L”.
This foot mounted unit, Housing Style “N”, is shown: EL1, Cable Entry L, 270°.
Power and control connecters are both rotatable in any position.

"C" Series–Concentric Helical ServoFit® Geared Motor Part No. Explanation

OPTIONS and REQUIRED INFORMATION

C 4 0 2 N 0135 ED 5 0 3 U R O

- **C** – Concentric Helical
- **4** – Unit Size No.
- **0** – Design Generation
- **2** – No. of Stages (**2** = 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
- **ED** – Dynamic Series
- **5** – Motor Frame Size
- **0** – Generation Number
- **3** – Number of Magnet Stacks
- **U** – Self Ventilating
- **R** – Feedback
  - **R**esolver
  - **M**ultiturn Absolute Encoder Inductive
  - **S**ingleturn Absolute Encoder Inductive
- **O** – "**O**" Without Brake
  "**P**" Permanent Magnet Brake

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Mounting Position – EL1 EL2 EL3 EL4 EL5 EL6 (See Page 112.)
Option – Imperial or Metric Shaft (Metric not available in all sizes.)
Specify – Cable Entry Side.
Specify – Connector Location.

See web site for drawings.

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

C002_ED – 3000 RPM 480V Continued Next Page

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C002_0020ED302U	1,502	2.0	1480/741	17	1.9	34	7.6	121	13.6	3,500	3,000	6,000	1.18	20	11	1.3
C002_0020ED303U	1,502	2.0	1480/741	23	2.6	93	10.5	121	13.6	3,500	3,000	6,000	1.34	20	11	1.3
C002_0020ED401U	1,502	2.0	1480/741	40	4.6	184	20.7	230	25.9	3,500	3,000	6,000	2.15	20	11	1.3
C002_0020ED402U	1,502	2.0	1480/741	78	8.8	184	20.7	230	25.9	3,500	3,000	6,000	3.25	20	11	1.3
C002_0020ED403U	1,502	2.0	1480/741	102	11.5	184	20.7	230	25.9	3,500	3,000	6,000	4.34	20	11	1.3
C002_0020ED503U	1,502	2.0	1480/741	130	14.7	346	39.1	432	48.8	3,500	3,000	6,000	8.99	20	11	1.3
C002_0020ED505U	1,502	2.0	1480/741	206	23.2	346	39.1	432	48.8	3,500	3,000	6,000	13.97	20	11	1.3
C002_0028ED302U	1,083	2.8	36/13	23	2.6	93	10.5	158	17.9	3,500	3,000	6,000	0.87	20	11	1.3
C002_0028ED303U	1,083	2.8	36/13	32	3.6	127	14.3	158	17.9	3,500	3,000	6,000	1.04	20	11	1.3
C002_0028ED401U	1,083	2.8	36/13	56	6.3	241	27.3	301	34.1	3,500	3,000	6,000	1.84	20	11	1.3
C002_0028ED402U	1,083	2.8	36/13	108	12.2	241	27.3	301	34.1	3,500	3,000	6,000	2.94	20	11	1.3
C002_0028ED403U	1,083	2.8	36/13	141	16.0	241	27.3	301	34.1	3,500	3,000	6,000	4.04	20	11	1.3
C002_0028ED503U	1,083	2.8	36/13	181	20.4	454	51.3	568	64.1	3,500	3,000	6,000	8.68	20	11	1.3
C002_0031ED302U	978	3.1	46/15	26	2.9	103	11.7	173	19.5	3,700	3,600	6,000	0.81	20	11	1.3
C002_0031ED303U	978	3.1	46/15	36	4.0	138	15.6	173	19.5	3,700	3,600	6,000	0.97	20	11	1.3
C002_0031ED401U	978	3.1	46/15	62	7.0	263	29.7	328	37.1	3,700	3,600	6,000	1.78	20	11	1.3
C002_0031ED402U	978	3.1	46/15	120	13.6	263	29.7	328	37.1	3,700	3,600	6,000	2.88	20	11	1.3
C002_0031ED403U	978	3.1	46/15	156	17.7	263	29.7	328	37.1	3,700	3,600	6,000	3.97	20	11	1.3
C002_0031ED503U	978	3.1	46/15	200	22.6	495	55.9	618	69.9	3,700	3,600	6,000	8.62	20	11	1.3
C002_0033ED302U	904	3.3	1702/513	28	3.2	112	12.6	187	21.1	3,700	3,600	6,000	0.80	20	11	1.3
C002_0033ED303U	904	3.3	1702/513	38	4.3	149	16.9	187	21.1	3,700	3,600	6,000	0.96	20	11	1.3
C002_0033ED401U	904	3.3	1702/513	67	7.6	284	32.1	355	40.1	3,700	3,600	6,000	1.76	20	11	1.3
C002_0033ED402U	904	3.3	1702/513	130	14.7	284	32.1	355	40.1	3,700	3,600	6,000	2.87	20	11	1.3
C002_0033ED403U	904	3.3	1702/513	169	19.1	284	32.1	355	40.1	3,700	3,600	6,000	3.96	20	11	1.3
C002_0033ED503U	904	3.3	1702/513	216	24.5	535	60.5	669	75.6	3,700	3,600	6,000	8.61	20	11	1.3
C002_0038ED302U	782	3.8	441/115	32	3.6	129	14.6	207	23.4	3,700	3,600	6,000	0.71	20	11	1.3
C002_0038ED303U	782	3.8	441/115	44	5.0	166	18.7	207	23.4	3,700	3,600	6,000	0.87	20	11	1.3
C002_0038ED401U	782	3.8	441/115	78	8.8	316	35.7	394	44.6	3,700	3,600	6,000	1.67	20	11	1.3
C002_0038ED402U	782	3.8	441/115	150	17.0	316	35.7	394	44.6	3,700	3,600	6,000	2.77	20	11	1.3
C002_0038ED403U	782	3.8	441/115	196	22.1	316	35.7	394	44.6	3,700	3,600	6,000	3.87	20	11	1.3
C002_0038ED503U	782	3.8	441/115	250	28.3	571	64.6	743	83.9	3,700	3,600	6,000	8.51	20	11	1.3
C002_0041ED302U	723	4.1	1813/437	35	3.9	140	15.8	224	25.3	3,700	3,600	6,000	0.70	20	11	1.3
C002_0041ED303U	723	4.1	1813/437	48	5.4	179	20.3	224	25.3	3,700	3,600	6,000	0.86	20	11	1.3
C002_0041ED401U	723	4.1	1813/437	84	9.5	341	38.6	427	48.2	3,700	3,600	6,000	1.67	20	11	1.3
C002_0041ED402U	723	4.1	1813/437	162	18.4	341	38.6	427	48.2	3,700	3,600	6,000	2.77	20	11	1.3
C002_0041ED403U	723	4.1	1813/437	212	23.9	341	38.6	427	48.2	3,700	3,600	6,000	3.86	20	11	1.3
C002_0041ED503U	723	4.1	1813/437	271	30.6	575	65.0	803	90.8	3,700	3,600	6,000	8.51	20	11	1.3
C002_0047ED302U	641	4.7	117/25	39	4.4	157	17.8	244	27.6	4,000	4,000	6,000	0.64	20	11	1.3
C002_0047ED303U	641	4.7	117/25	54	6.1	195	22.1	244	27.6	4,000	4,000	6,000	0.80	20	11	1.3
C002_0047ED401U	641	4.7	117/25	95	10.7	372	42.0	465	52.5	4,000	4,000	6,000	1.61	20	11	1.3
C002_0047ED402U	641	4.7	117/25	183	20.7	372	42.0	465	52.5	4,000	4,000	6,000	2.71	20	11	1.3
C002_0047ED403U	641	4.7	117/25	239	27.0	372	42.0	465	52.5	4,000	4,000	6,000	3.80	20	11	1.3
C002_0047ED503U	641	4.7	117/25	305	34.5	575	65.0	875	98.9	4,000	4,000	6,000	8.45	20	11	1.3

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

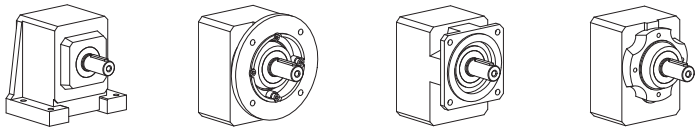
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C002_ED – 3000 RPM 480V Continued Next Page																
C002_0051ED302U	593	5.1	481/95	43	4.8	170	19.3	264	29.9	4,000	4,000	6,000	0.64	20	11	1.3
C002_0051ED303U	593	5.1	481/95	59	6.6	211	23.9	264	29.9	4,000	4,000	6,000	0.80	20	11	1.3
C002_0051ED401U	593	5.1	481/95	103	11.6	402	45.5	503	56.8	4,000	4,000	6,000	1.60	20	11	1.3
C002_0051ED402U	593	5.1	481/95	198	22.4	402	45.5	503	56.8	4,000	4,000	6,000	2.70	20	11	1.3
C002_0051ED403U	593	5.1	481/95	258	29.2	402	45.5	503	56.8	4,000	4,000	6,000	3.80	20	11	1.3
C002_0058ED302U	515	5.8	99/17	49	5.5	196	22.1	292	33.0	4,000	4,000	6,000	0.59	20	11	1.3
C002_0058ED303U	515	5.8	99/17	67	7.6	234	26.4	292	33.0	4,000	4,000	6,000	0.75	20	11	1.3
C002_0058ED401U	515	5.8	99/17	118	13.3	444	50.2	555	62.8	4,000	4,000	6,000	1.55	20	11	1.3
C002_0058ED402U	515	5.8	99/17	228	25.8	444	50.2	555	62.8	4,000	4,000	6,000	2.65	20	11	1.3
C002_0058ED403U	515	5.8	99/17	297	33.6	444	50.2	555	62.8	4,000	4,000	6,000	3.75	20	11	1.3
C002_0063ED302U	476	6.3	2035/323	53	6.0	212	24.0	316	35.7	4,000	4,000	6,000	0.58	20	11	1.3
C002_0063ED303U	476	6.3	2035/323	73	8.3	253	28.6	316	35.7	4,000	4,000	6,000	0.74	20	11	1.3
C002_0063ED401U	476	6.3	2035/323	128	14.4	481	54.3	601	67.9	4,000	4,000	6,000	1.55	20	11	1.3
C002_0063ED402U	476	6.3	2035/323	247	27.9	481	54.3	601	67.9	4,000	4,000	6,000	2.65	20	11	1.3
C002_0063ED403U	476	6.3	2035/323	321	36.3	481	54.3	601	67.9	4,000	4,000	6,000	3.74	20	11	1.3
C002_0077ED302U	389	7.7	54/7	65	7.3	260	29.3	368	41.6	4,000	4,000	6,000	0.54	20	11	1.3
C002_0077ED303U	389	7.7	54/7	89	10.1	295	33.3	368	41.6	4,000	4,000	6,000	0.70	20	11	1.3
C002_0077ED401U	389	7.7	54/7	156	17.7	561	63.3	701	79.2	4,000	4,000	6,000	1.50	20	11	1.3
C002_0077ED402U	389	7.7	54/7	302	34.1	561	63.3	701	79.2	4,000	4,000	6,000	2.60	20	11	1.3
C002_0082ED302U	364	8.2	667/81	69	7.8	277	31.3	463	52.4	3,700	3,600	6,000	0.72	16	14	1.6
C002_0082ED303U	364	8.2	667/81	95	10.8	371	41.9	463	52.4	3,700	3,600	6,000	0.88	16	14	1.6
C002_0082ED401U	364	8.2	667/81	167	18.9	637	72.0	882	99.6	3,700	3,600	6,000	1.68	16	14	1.6
C002_0082ED402U	364	8.2	667/81	322	36.4	637	72.0	882	99.6	3,700	3,600	6,000	2.78	16	14	1.6
C002_0082ED403U	364	8.2	667/81	420	47.4	637	72.0	882	99.6	3,700	3,600	6,000	3.88	16	14	1.6
C002_0092ED302U	325	9.2	1495/162	78	8.8	311	35.1	519	58.7	3,700	3,600	6,000	0.71	16	14	1.6
C002_0092ED303U	325	9.2	1495/162	107	12.1	415	46.9	519	58.7	3,700	3,600	6,000	0.87	16	14	1.6
C002_0092ED401U	325	9.2	1495/162	187	21.1	575	65.0	988	112	3,700	3,600	6,000	1.68	16	14	1.6
C002_0092ED402U	325	9.2	1495/162	361	40.8	575	65.0	988	112	3,700	3,600	6,000	2.78	16	14	1.6
C002_0105ED302U	291	10.3	1421/138	87	9.8	347	39.2	557	62.9	3,700	3,600	6,000	0.65	16	14	1.6
C002_0105ED303U	291	10.3	1421/138	119	13.5	445	50.3	557	62.9	3,700	3,600	6,000	0.81	16	14	1.6
C002_0105ED401U	291	10.3	1421/138	209	23.6	637	72.0	1,059	120	3,700	3,600	6,000	1.61	16	14	1.6
C002_0105ED402U	291	10.3	1421/138	403	45.5	637	72.0	1,059	120	3,700	3,600	6,000	2.71	16	14	1.6
C002_0115ED302U	260	11.5	3185/276	97	11.0	388	43.9	624	70.5	3,700	3,600	6,000	0.64	16	14	1.6
C002_0115ED303U	260	11.5	3185/276	134	15.1	499	56.4	624	70.5	3,700	3,600	6,000	0.81	16	14	1.6
C002_0115ED401U	260	11.5	3185/276	234	26.4	575	65.0	1,062	120	3,700	3,600	6,000	1.61	16	14	1.6
C002_0125ED302U	239	12.6	377/30	106	11.9	423	47.8	656	74.1	4,000	4,000	6,000	0.60	16	14	1.6
C002_0125ED303U	239	12.6	377/30	146	16.5	525	59.3	656	74.1	4,000	4,000	6,000	0.76	16	14	1.6
C002_0125ED401U	239	12.6	377/30	255	28.8	637	72.0	1,062	120	4,000	4,000	6,000	1.57	16	14	1.6
C002_0140ED302U	213	14.1	169/12	118	13.4	474	53.5	735	83.1	4,000	4,000	6,000	0.60	16	14	1.6
C002_0140ED303U	213	14.1	169/12	163	18.4	575	65.0	735	83.1	4,000	4,000	6,000	0.76	16	14	1.6
C002_0140ED401U	213	14.1	169/12	285	32.2	575	65.0	1,062	120	4,000	4,000	6,000	1.56	16	14	1.6

Housing Styles

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



Contact STOBER for availability of "Q" housing style.

See Page 33 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

C002_ED – 3000 RPM 480V Continued

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C002_0155ED302U	192	15.6	1595/102	132	14.9	526	59.5	784	88.6	4,000	4,000	6,000	0.56	16	14	1.6
C002_0155ED303U	192	15.6	1595/102	181	20.5	627	70.9	784	88.6	4,000	4,000	6,000	0.72	16	14	1.6
C002_0155ED401U	192	15.6	1595/102	317	35.8	637	72.0	1,062	120	4,000	4,000	6,000	1.53	16	14	1.6
C002_0175ED302U	171	17.5	3575/204	147	16.7	575	65.0	879	99.3	4,000	4,000	6,000	0.56	16	14	1.6
C002_0175ED303U	171	17.5	3575/204	203	22.9	575	65.0	879	99.3	4,000	4,000	6,000	0.72	16	14	1.6
C002_0175ED401U	171	17.5	3575/204	355	40.1	575	65.0	1,062	120	4,000	4,000	6,000	1.52	16	14	1.6
C002_0210ED302U	145	20.7	145/7	174	19.7	637	72.0	989	112	4,000	4,000	6,000	0.52	16	14	1.6
C002_0210ED303U	145	20.7	145/7	240	27.1	637	72.0	989	112	4,000	4,000	6,000	0.68	16	14	1.6
C002_0210ED401U	145	20.7	145/7	420	47.4	637	72.0	1,062	120	4,000	4,000	6,000	1.49	16	14	1.6
C002_0230ED302U	129	23.2	325/14	195	22.1	575	65.0	1,062	120	4,000	4,000	6,000	0.52	16	14	1.6
C002_0230ED303U	129	23.2	325/14	269	30.4	575	65.0	1,062	120	4,000	4,000	6,000	0.68	16	14	1.6
C002_0250ED302U	120	25.0	899/36	210	23.7	637	72.0	1,062	120	4,000	4,000	6,000	0.50	16	14	1.6
C002_0250ED303U	120	25.0	899/36	289	32.7	637	72.0	1,062	120	4,000	4,000	6,000	0.66	16	14	1.6
C002_0280ED302U	107	28.0	2015/72	235	26.6	575	65.0	1,062	120	4,000	4,000	6,000	0.50	16	14	1.6
C002_0280ED303U	107	28.0	2015/72	324	36.6	575	65.0	1,062	120	4,000	4,000	6,000	0.66	16	14	1.6
C002_0310ED302U	96	31.3	2813/90	263	29.7	637	72.0	1,062	120	4,000	4,000	6,000	0.48	16	14	1.6
C002_0310ED303U	96	31.3	2813/90	362	40.9	637	72.0	1,062	120	4,000	4,000	6,000	0.64	16	14	1.6
C002_0350ED302U	86	35.0	1261/36	295	33.3	575	65.0	1,062	120	4,000	4,000	6,000	0.48	16	14	1.6
C002_0350ED303U	86	35.0	1261/36	406	45.9	575	65.0	1,062	120	4,000	4,000	6,000	0.64	16	14	1.6
C002_0420ED302U	72	41.8	3509/84	351	39.7	637	72.0	1,062	120	4,000	4,000	6,000	0.47	16	14	1.6
C002_0470ED302U	64	46.8	7865/168	394	44.5	575	65.0	1,062	120	4,000	4,000	6,000	0.47	16	14	1.6

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

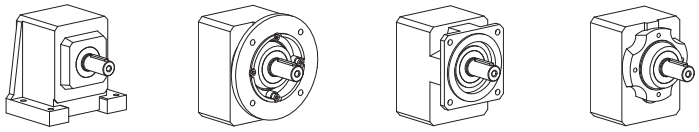
- M_2 ... Output Torque
- M_{2B} ... Acceleration Torque
- M_{2NOT} ... Peak Torque – Emergency Stops
- n_2 ... Output RPM
- i ... Exact Ratio = Exact Tooth Count
- J_1 ... Mass moment of inertia (input)
- Δφ ... Backlash in Arc Minutes
- C_2 ... Torsional Stiffness

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C102_ED – 3000 RPM 480V Continued Next Page																
C102_0020ED403U	1,487	2.0	1128/559	103	11.6	195	22.0	243	27.5	3,100	2,600	5,000	5.49	18	28	3.1
C102_0020ED503U	1,487	2.0	1128/559	132	14.9	366	41.4	458	51.7	3,100	2,600	5,000	10.14	18	28	3.1
C102_0020ED505U	1,487	2.0	1128/559	208	23.5	366	41.4	458	51.7	3,100	2,600	5,000	15.12	18	28	3.1
C102_0020ED704U	1,487	2.0	1128/559	286	32.3	860	97.2	1,075	121	3,100	2,600	5,000	30.31	18	28	3.1
C102_0022ED401U	1,378	2.2	468/215	44	5.0	210	23.7	262	29.6	3,100	2,600	5,000	3.25	18	28	3.1
C102_0022ED402U	1,378	2.2	468/215	85	9.6	210	23.7	262	29.6	3,100	2,600	5,000	4.35	18	28	3.1
C102_0022ED403U	1,378	2.2	468/215	111	12.5	210	23.7	262	29.6	3,100	2,600	5,000	5.44	18	28	3.1
C102_0022ED503U	1,378	2.2	468/215	142	16.0	395	44.7	494	55.8	3,100	2,600	5,000	10.09	18	28	3.1
C102_0022ED505U	1,378	2.2	468/215	224	25.3	395	44.7	494	55.8	3,100	2,600	5,000	15.07	18	28	3.1
C102_0022ED704U	1,378	2.2	468/215	308	34.8	928	105	1,160	131	3,100	2,600	5,000	30.26	18	28	3.1
C102_0024ED503U	1,253	2.4	2303/962	156	17.6	429	48.5	536	60.6	3,100	2,600	5,000	9.74	18	28	3.1
C102_0024ED505U	1,253	2.4	2303/962	247	27.9	429	48.5	536	60.6	3,100	2,600	5,000	14.72	18	28	3.1
C102_0024ED704U	1,253	2.4	2303/962	339	38.3	977	110	1,259	142	3,100	2,600	5,000	29.91	18	28	3.1
C102_0026ED503U	1,162	2.6	1911/740	168	19.0	463	52.3	578	65.3	3,100	2,600	5,000	9.70	18	28	3.1
C102_0026ED505U	1,162	2.6	1911/740	266	30.1	463	52.3	578	65.3	3,100	2,600	5,000	14.69	18	28	3.1
C102_0026ED704U	1,162	2.6	1911/740	366	41.3	1,002	113	1,357	153	3,100	2,600	5,000	29.88	18	28	3.1
C102_0031ED403U	971	3.1	2491/806	158	17.8	281	31.8	352	39.7	3,600	3,100	6,000	4.61	18	28	3.1
C102_0031ED503U	971	3.1	2491/806	202	22.8	530	59.9	662	74.8	3,600	3,100	6,000	9.26	18	28	3.1
C102_0031ED505U	971	3.1	2491/806	318	36.0	530	59.9	662	74.8	3,600	3,100	6,000	14.24	18	28	3.1
C102_0031ED704U	971	3.1	2491/806	438	49.5	1,064	120	1,555	176	3,600	3,100	6,000	29.43	18	28	3.1
C102_0033ED403U	900	3.3	2067/620	170	19.2	303	34.3	379	42.9	3,600	3,100	6,000	4.59	18	28	3.1
C102_0033ED503U	900	3.3	2067/620	218	24.6	571	64.6	714	80.7	3,600	3,100	6,000	9.24	18	28	3.1
C102_0033ED505U	900	3.3	2067/620	343	38.8	571	64.6	714	80.7	3,600	3,100	6,000	14.22	18	28	3.1
C102_0033ED704U	900	3.3	2067/620	472	53.4	1,091	123	1,677	189	3,600	3,100	6,000	29.41	18	28	3.1
C102_0039ED303U	773	3.9	1363/351	45	5.1	179	20.3	224	25.4	3,600	3,100	6,000	1.32	18	28	3.1
C102_0039ED401U	773	3.9	1363/351	79	8.9	341	38.6	427	48.2	3,600	3,100	6,000	2.12	18	28	3.1
C102_0039ED402U	773	3.9	1363/351	152	17.2	341	38.6	427	48.2	3,600	3,100	6,000	3.23	18	28	3.1
C102_0039ED403U	773	3.9	1363/351	198	22.4	341	38.6	427	48.2	3,600	3,100	6,000	4.32	18	28	3.1
C102_0039ED503U	773	3.9	1363/351	253	28.6	643	72.6	804	90.8	3,600	3,100	6,000	8.97	18	28	3.1
C102_0039ED505U	773	3.9	1363/351	400	45.2	643	72.6	804	90.8	3,600	3,100	6,000	13.95	18	28	3.1
C102_0039ED704U	773	3.9	1363/351	550	62.1	1,148	130	1,887	213	3,600	3,100	6,000	29.14	18	28	3.1
C102_0042ED303U	716	4.2	377/90	49	5.5	194	21.9	242	27.4	3,600	3,100	6,000	1.31	18	28	3.1
C102_0042ED401U	716	4.2	377/90	85	9.6	368	41.6	460	52.0	3,600	3,100	6,000	2.11	18	28	3.1
C102_0042ED402U	716	4.2	377/90	164	18.5	368	41.6	460	52.0	3,600	3,100	6,000	3.21	18	28	3.1
C102_0042ED403U	716	4.2	377/90	214	24.1	368	41.6	460	52.0	3,600	3,100	6,000	4.31	18	28	3.1
C102_0042ED503U	716	4.2	377/90	273	30.9	694	78.4	867	98.0	3,600	3,100	6,000	8.95	18	28	3.1
C102_0042ED505U	716	4.2	377/90	432	48.8	694	78.4	867	98.0	3,600	3,100	6,000	13.94	18	28	3.1
C102_0042ED704U	716	4.2	377/90	593	67.0	1,151	130	1,947	220	3,600	3,100	6,000	29.13	18	28	3.1
C102_0047ED402U	644	4.7	3149/676	182	20.6	395	44.7	494	55.8	3,800	3,500	6,000	3.05	18	28	3.1
C102_0047ED403U	644	4.7	3149/676	238	26.8	395	44.7	494	55.8	3,800	3,500	6,000	4.14	18	28	3.1
C102_0047ED503U	644	4.7	3149/676	304	34.3	744	84.1	930	105	3,800	3,500	6,000	8.79	18	28	3.1
C102_0047ED505U	644	4.7	3149/676	480	54.2	744	84.1	930	105	3,800	3,500	6,000	13.77	18	28	3.1

Housing Styles

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



Contact STOBER for availability of "Q" housing style.

See Page 33 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

C102_ED – 3000 RPM 480V Continued Next Page

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C102_0050ED303U	597	5.0	201/40	58	6.6	224	25.3	280	31.7	3,800	3,500	6,000	1.14	18	28	3.1
C102_0050ED401U	597	5.0	201/40	102	11.5	426	48.2	533	60.2	3,800	3,500	6,000	1.94	18	28	3.1
C102_0050ED402U	597	5.0	201/40	197	22.2	426	48.2	533	60.2	3,800	3,500	6,000	3.04	18	28	3.1
C102_0050ED403U	597	5.0	201/40	256	29.0	426	48.2	533	60.2	3,800	3,500	6,000	4.14	18	28	3.1
C102_0050ED503U	597	5.0	201/40	328	37.0	803	90.7	1,003	113	3,800	3,500	6,000	8.78	18	28	3.1
C102_0050ED505U	597	5.0	201/40	518	58.5	803	90.7	1,003	113	3,800	3,500	6,000	13.76	18	28	3.1
C102_0059ED303U	511	5.9	47/8	68	7.7	252	28.5	315	35.6	3,800	3,500	6,000	0.99	18	28	3.1
C102_0059ED401U	511	5.9	47/8	119	13.4	479	54.2	599	67.7	3,800	3,500	6,000	1.79	18	28	3.1
C102_0059ED402U	511	5.9	47/8	230	26.0	479	54.2	599	67.7	3,800	3,500	6,000	2.89	18	28	3.1
C102_0059ED403U	511	5.9	47/8	300	33.9	479	54.2	599	67.7	3,800	3,500	6,000	3.99	18	28	3.1
C102_0059ED503U	511	5.9	47/8	383	43.3	902	102	1,128	127	3,800	3,500	6,000	8.63	18	28	3.1
C102_0063ED402U	473	6.3	507/80	248	28.0	517	58.4	646	73.0	3,800	3,500	6,000	2.89	18	28	3.1
C102_0063ED403U	473	6.3	507/80	323	36.5	517	58.4	646	73.0	3,800	3,500	6,000	3.98	18	28	3.1
C102_0063ED503U	473	6.3	507/80	414	46.7	973	110	1,217	137	3,800	3,500	6,000	8.63	18	28	3.1
C102_0078ED302U	385	7.8	3243/416	66	7.4	262	29.6	395	44.7	4,000	3,900	6,000	0.69	18	28	3.1
C102_0078ED303U	385	7.8	3243/416	90	10.2	316	35.7	395	44.7	4,000	3,900	6,000	0.85	18	28	3.1
C102_0078ED401U	385	7.8	3243/416	158	17.8	601	68.0	752	84.9	4,000	3,900	6,000	1.66	18	28	3.1
C102_0078ED402U	385	7.8	3243/416	305	34.5	601	68.0	752	84.9	4,000	3,900	6,000	2.76	18	28	3.1
C102_0078ED403U	385	7.8	3243/416	398	44.9	601	68.0	752	84.9	4,000	3,900	6,000	3.85	18	28	3.1
C102_0078ED503U	385	7.8	3243/416	509	57.5	1,132	128	1,416	160	4,000	3,900	6,000	8.50	18	28	3.1
C102_0083ED302U	363	8.3	1537/186	70	7.9	278	31.4	494	55.8	3,600	3,100	6,000	1.17	15	35	3.9
C102_0083ED303U	363	8.3	1537/186	96	10.8	383	43.3	494	55.8	3,600	3,100	6,000	1.33	15	35	3.9
C102_0083ED401U	363	8.3	1537/186	167	18.9	752	85.0	940	106	3,600	3,100	6,000	2.14	15	35	3.9
C102_0083ED402U	363	8.3	1537/186	323	36.5	752	85.0	940	106	3,600	3,100	6,000	3.24	15	35	3.9
C102_0083ED403U	363	8.3	1537/186	421	47.6	752	85.0	940	106	3,600	3,100	6,000	4.33	15	35	3.9
C102_0083ED503U	363	8.3	1537/186	539	60.9	1,221	138	1,770	200	3,600	3,100	6,000	8.98	15	35	3.9
C102_0093ED302U	322	9.3	3180/341	78	8.9	314	35.5	558	63.0	3,600	3,100	6,000	1.15	15	35	3.9
C102_0093ED303U	322	9.3	3180/341	108	12.2	432	48.9	558	63.0	3,600	3,100	6,000	1.32	15	35	3.9
C102_0093ED401U	322	9.3	3180/341	189	21.3	849	95.9	1,061	120	3,600	3,100	6,000	2.12	15	35	3.9
C102_0093ED402U	322	9.3	3180/341	365	41.3	849	95.9	1,061	120	3,600	3,100	6,000	3.22	15	35	3.9
C102_0093ED403U	322	9.3	3180/341	476	53.7	849	95.9	1,061	120	3,600	3,100	6,000	4.32	15	35	3.9
C102_0093ED503U	322	9.3	3180/341	608	68.8	1,221	138	1,998	226	3,600	3,100	6,000	8.96	15	35	3.9
C102_0105ED402U	289	10.4	841/81	406	45.9	913	103	1,141	129	3,600	3,100	6,000	3.05	15	35	3.9
C102_0105ED403U	289	10.4	841/81	529	59.8	913	103	1,141	129	3,600	3,100	6,000	4.14	15	35	3.9
C102_0105ED503U	289	10.4	841/81	677	76.5	1,221	138	2,124	240	3,600	3,100	6,000	8.79	15	35	3.9
C102_0115ED402U	256	11.7	1160/99	459	51.8	1,030	116	1,288	146	3,600	3,100	6,000	3.04	15	35	3.9
C102_0115ED403U	256	11.7	1160/99	597	67.5	1,030	116	1,288	146	3,600	3,100	6,000	4.13	15	35	3.9
C102_0115ED503U	256	11.7	1160/99	764	86.4	1,221	138	2,124	240	3,600	3,100	6,000	8.78	15	35	3.9
C102_0125ED402U	241	12.5	1943/156	488	55.1	1,057	119	1,321	149	3,800	3,500	6,000	2.93	15	35	3.9
C102_0125ED403U	241	12.5	1943/156	635	71.8	1,057	119	1,321	149	3,800	3,500	6,000	4.02	15	35	3.9
C102_0140ED401U	213	14.1	2010/143	285	32.2	1,192	135	1,491	168	3,800	3,500	6,000	1.82	15	35	3.9
C102_0140ED402U	213	14.1	2010/143	550	62.2	1,192	135	1,491	168	3,800	3,500	6,000	2.92	15	35	3.9
C102_0140ED403U	213	14.1	2010/143	717	81.0	1,192	135	1,491	168	3,800	3,500	6,000	4.01	15	35	3.9

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

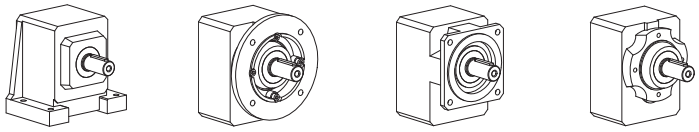
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C102_ED – 3000 RPM 480V Continued																
C102_0155ED401U	191	15.7	377/24	318	36.0	1,221	138	1,602	181	3,800	3,500	6,000	1.72	15	35	3.9
C102_0155ED402U	191	15.7	377/24	615	69.5	1,221	138	1,602	181	3,800	3,500	6,000	2.82	15	35	3.9
C102_0155ED403U	191	15.7	377/24	801	90.5	1,221	138	1,602	181	3,800	3,500	6,000	3.91	15	35	3.9
C102_0175ED401U	169	17.7	195/11	359	40.6	1,221	138	1,808	204	3,800	3,500	6,000	1.71	15	35	3.9
C102_0175ED402U	169	17.7	195/11	694	78.4	1,221	138	1,808	204	3,800	3,500	6,000	2.81	15	35	3.9
C102_0210ED401U	144	20.8	667/32	422	47.7	1,221	138	2,010	227	4,000	3,900	6,000	1.61	15	35	3.9
C102_0210ED402U	144	20.8	667/32	816	92.2	1,221	138	2,010	227	4,000	3,900	6,000	2.71	15	35	3.9
C102_0240ED302U	128	23.5	1035/44	198	22.4	792	89.4	1,193	135	4,000	3,900	6,000	0.64	15	35	3.9
C102_0240ED303U	128	23.5	1035/44	273	30.8	954	108	1,193	135	4,000	3,900	6,000	0.81	15	35	3.9
C102_0240ED401U	128	23.5	1035/44	477	53.8	1,221	138	2,124	240	4,000	3,900	6,000	1.61	15	35	3.9
C102_0250ED303U	119	25.1	377/15	291	32.9	977	110	1,221	138	4,000	3,900	6,000	0.76	15	35	3.9
C102_0250ED401U	119	25.1	377/15	509	57.5	1,221	138	2,124	240	4,000	3,900	6,000	1.56	15	35	3.9
C102_0280ED303U	106	28.4	312/11	329	37.1	1,103	125	1,378	156	4,000	3,900	6,000	0.76	15	35	3.9
C102_0280ED401U	106	28.4	312/11	575	64.9	1,221	138	2,124	240	4,000	3,900	6,000	1.56	15	35	3.9
C102_0310ED303U	97	31.1	435/14	360	40.7	1,153	130	1,441	163	4,000	3,900	6,000	0.71	15	35	3.9
C102_0310ED401U	97	31.1	435/14	629	71.1	1,221	138	2,124	240	4,000	3,900	6,000	1.52	15	35	3.9
C102_0350ED302U	86	35.1	2700/77	295	33.3	1,180	133	1,626	184	4,000	3,900	6,000	0.55	15	35	3.9
C102_0350ED303U	86	35.1	2700/77	406	45.9	1,221	138	1,626	184	4,000	3,900	6,000	0.71	15	35	3.9
C102_0350ED401U	86	35.1	2700/77	710	80.3	1,221	138	2,124	240	4,000	3,900	6,000	1.52	15	35	3.9
C102_0420ED302U	72	41.6	1247/30	350	39.5	1,221	138	1,812	205	4,000	3,900	6,000	0.51	15	35	3.9
C102_0420ED303U	72	41.6	1247/30	482	54.4	1,221	138	1,812	205	4,000	3,900	6,000	0.67	15	35	3.9
C102_0420ED401U	72	41.6	1247/30	842	95.2	1,221	138	2,124	240	4,000	3,900	6,000	1.48	15	35	3.9
C102_0470ED302U	64	46.9	516/11	395	44.6	1,221	138	2,045	231	4,000	3,900	6,000	0.51	15	35	3.9
C102_0470ED303U	64	46.9	516/11	544	61.4	1,221	138	2,045	231	4,000	3,900	6,000	0.67	15	35	3.9
C102_0500ED302U	60	49.9	899/18	420	47.5	1,221	138	2,087	236	4,000	3,900	6,000	0.49	15	35	3.9
C102_0500ED303U	60	49.9	899/18	579	65.4	1,221	138	2,087	236	4,000	3,900	6,000	0.65	15	35	3.9
C102_0560ED302U	53	56.4	620/11	474	53.6	1,221	138	2,124	240	4,000	3,900	6,000	0.49	15	35	3.9
C102_0560ED303U	53	56.4	620/11	653	73.8	1,221	138	2,124	240	4,000	3,900	6,000	0.65	15	35	3.9
C102_0620ED302U	48	62.4	4495/72	525	59.3	1,221	138	2,107	238	4,000	3,900	6,000	0.48	15	35	3.9
C102_0620ED303U	48	62.4	4495/72	724	81.8	1,221	138	2,107	238	4,000	3,900	6,000	0.64	15	35	3.9
C102_0700ED302U	43	70.5	775/11	593	67.0	1,221	138	2,124	240	4,000	3,900	6,000	0.48	15	35	3.9
C102_0700ED303U	43	70.5	775/11	817	92.3	1,221	138	2,124	240	4,000	3,900	6,000	0.64	15	35	3.9
C103_ED – 3000 RPM 480V																
C103_0820ED302U	37	81.6	31349/384	677	76.5	1,221	138	2,124	240	4,000	3,900	6,000	0.50	15	35	3.9
C103_0920ED302U	33	92.1	16215/176	764	86.3	1,221	138	2,124	240	4,000	3,900	6,000	0.50	15	35	3.9

Housing Styles

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



Contact STOBER for availability of "Q" housing style.

See Page 33 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

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Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C202_0020ED505U	1,493	2.0	432/215	207	23.4	379	42.9	474	53.6	3,000	2,600	4,500	17.15	17	53	6.0
C202_0020ED704U	1,493	2.0	432/215	285	32.2	891	101	1,113	126	3,000	2,600	4,500	32.34	17	53	6.0
C202_0022ED505U	1,374	2.2	2160/989	225	25.4	412	47	516	58.3	3,000	2,600	4,500	16.96	17	53	6.0
C202_0022ED704U	1,374	2.2	2160/989	309	35.0	968	109	1,210	137	3,000	2,600	4,500	32.15	17	53	6.0
C202_0025ED704U	1,212	2.5	99/40	351	39.6	1,061	120	1,327	150	3,000	2,600	4,500	31.34	17	53	6.0
C202_0027ED704U	1,115	2.7	495/184	381	43.1	1,154	130	1,442	163	3,000	2,600	4,500	31.21	17	53	6.0
C202_0031ED505U	967	3.1	90/29	320	36.1	551	62.3	689	77.8	3,500	3,100	5,000	15.32	17	53	6.0
C202_0031ED704U	967	3.1	90/29	440	49.7	1,294	146	1,617	183	3,500	3,100	5,000	30.51	17	53	6.0
C202_0034ED503U	889	3.4	2250/667	220	24.9	599	67.7	749	84.6	3,500	3,100	5,000	10.25	17	53	6.0
C202_0034ED505U	889	3.4	2250/667	347	39.3	599	67.7	749	84.6	3,500	3,100	5,000	15.24	17	53	6.0
C202_0034ED704U	889	3.4	2250/667	478	54.0	1,406	159	1,758	199	3,500	3,100	5,000	30.43	17	53	6.0
C202_0039ED505U	772	3.9	486/125	401	45.3	665	75.2	831	94.0	3,500	3,100	5,000	14.72	17	53	6.0
C202_0039ED704U	772	3.9	486/125	551	62.2	1,562	176	1,952	221	3,500	3,100	5,000	29.91	17	53	6.0
C202_0042ED505U	710	4.2	486/115	435	49.2	723	81.7	904	102	3,500	3,100	5,000	14.68	17	53	6.0
C202_0042ED704U	710	4.2	486/115	599	67.6	1,697	191.8	2,122	240	3,500	3,100	5,000	29.87	17	53	6.0
C202_0047ED505U	643	4.7	14/3	481	54.3	770	87.0	962	109	3,700	3,500	5,500	14.34	17	53	6.0
C202_0047ED704U	643	4.7	14/3	661	74.7	1,770	200	2,259	255	3,700	3,500	5,500	29.53	17	53	6.0
C202_0051ED503U	591	5.1	350/69	331	37.4	837	94.5	1,046	118	3,700	3,500	5,500	9.32	17	53	6.0
C202_0051ED505U	591	5.1	350/69	522	59.0	837	94.5	1,046	118	3,700	3,500	5,500	14.31	17	53	6.0
C202_0051ED704U	591	5.1	350/69	718	81.2	1,770	200	2,455	277	3,700	3,500	5,500	29.50	17	53	6.0
C202_0058ED402U	518	5.8	666/115	227	25.6	487	55.1	609	68.8	3,700	3,500	5,500	3.31	17	53	6.0
C202_0058ED403U	518	5.8	666/115	295	33.4	487	55.1	609	68.8	3,700	3,500	5,500	4.41	17	53	6.0
C202_0058ED503U	518	5.8	666/115	378	42.7	918	104	1,147	130	3,700	3,500	5,500	9.05	17	53	6.0
C202_0058ED505U	518	5.8	666/115	597	67.4	918	104	1,147	130	3,700	3,500	5,500	14.04	17	53	6.0
C202_0058ED704U	518	5.8	666/115	820	92.7	1,770	200	2,693	304	3,700	3,500	5,500	29.23	17	53	6.0
C202_0063ED403U	477	6.3	3330/529	321	36.3	530	59.9	662	74.8	3,700	3,500	5,500	4.38	17	53	6.0
C202_0063ED503U	477	6.3	3330/529	411	46.4	998	113	1,247	141	3,700	3,500	5,500	9.03	17	53	6.0
C202_0063ED505U	477	6.3	3330/529	648	73.3	998	113	1,247	141	3,700	3,500	5,500	14.01	17	53	6.0
C202_0063ED704U	477	6.3	3330/529	892	101	1,770	200	2,928	331	3,700	3,500	5,500	29.20	17	53	6.0
C202_0078ED402U	385	7.8	39/5	305	34.5	617	69.8	772	87.2	4,000	3,900	6,000	3.02	17	53	6.0
C202_0078ED403U	385	7.8	39/5	398	44.9	617	69.8	772	87.2	4,000	3,900	6,000	4.11	17	53	6.0
C202_0078ED503U	385	7.8	39/5	509	57.5	1,163	131	1,453	164	4,000	3,900	6,000	8.76	17	53	6.0
C202_0078ED704U	385	7.8	39/5	1,105	125	1,770	200	3,098	350	4,000	3,900	6,000	28.93	17	53	6.0
C202_0082ED503U	366	8.2	475/58	534	60.4	1,454	164	1,818	205	3,500	3,100	5,000	9.78	14	73	8.3
C202_0082ED505U	366	8.2	475/58	844	95.3	1,454	164	1,818	205	3,500	3,100	5,000	14.76	14	73	8.3
C202_0082ED704U	366	8.2	475/58	1,160	131	2,036	230	3,540	400	3,500	3,100	5,000	29.95	14	73	8.3
C202_0094ED503U	320	9.4	2450/261	612	69.2	1,667	188	2,083	235	3,500	3,100	5,000	9.74	14	73	8.3
C202_0094ED505U	320	9.4	2450/261	967	109	1,667	188	2,083	235	3,500	3,100	5,000	14.73	14	73	8.3
C202_0105ED503U	292	10.3	513/50	669	75.6	1,755	198	2,194	248	3,500	3,100	5,000	9.39	14	73	8.3
C202_0105ED505U	292	10.3	513/50	1,057	119	1,755	198	2,194	248	3,500	3,100	5,000	14.37	14	73	8.3

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

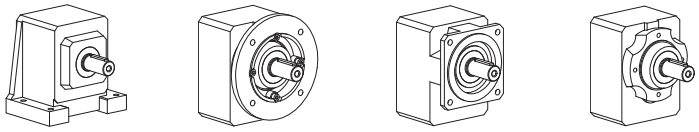
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C202_ED – 3000 RPM 480V Continued																
C202_0120ED503U	255	11.8	294/25	767	86.7	2,012	227	2,515	284	3,500	3,100	5,000	9.37	14	73	8.3
C202_0120ED505U	255	11.8	294/25	1,211	137	2,012	227	2,515	284	3,500	3,100	5,000	14.35	14	73	8.3
C202_0125ED503U	244	12.3	665/54	803	90.8	2,031	230	2,539	287	3,700	3,500	5,500	9.11	14	73	8.3
C202_0125ED505U	244	12.3	665/54	1,269	143	2,031	230	2,539	287	3,700	3,500	5,500	14.10	14	73	8.3
C202_0140ED503U	213	14.1	3430/243	921	104	2,036	230	2,910	329	3,700	3,500	5,500	9.10	14	73	8.3
C202_0155ED402U	196	15.3	703/46	598	67.6	1,286	145	1,608	182	3,700	3,500	5,500	3.15	14	73	8.3
C202_0155ED403U	196	15.3	703/46	779	88.1	1,286	145	1,608	182	3,700	3,500	5,500	4.25	14	73	8.3
C202_0155ED503U	196	15.3	703/46	997	113	2,036	230	3,027	342	3,700	3,500	5,500	8.89	14	73	8.3
C202_0175ED402U	171	17.5	3626/207	686	77.5	1,474	167	1,843	208	3,700	3,500	5,500	3.14	14	73	8.3
C202_0175ED403U	171	17.5	3626/207	893	101	1,474	167	1,843	208	3,700	3,500	5,500	4.24	14	73	8.3
C202_0175ED503U	171	17.5	3626/207	1,143	129	2,036	230	3,470	392	3,700	3,500	5,500	8.88	14	73	8.3
C202_0210ED402U	146	20.6	247/12	806	91.0	1,629	184	2,037	230	4,000	3,900	6,000	2.93	14	73	8.3
C202_0210ED403U	146	20.6	247/12	1,050	119	1,629	184	2,037	230	4,000	3,900	6,000	4.03	14	73	8.3
C202_0240ED402U	127	23.6	637/27	924	104	1,868	211	2,334	264	4,000	3,900	6,000	2.93	14	73	8.3
C202_0240ED403U	127	23.6	637/27	1,203	136	1,868	211	2,334	264	4,000	3,900	6,000	4.02	14	73	8.3
C202_0250ED402U	122	24.6	1577/64	965	109	1,888	213	2,359	267	4,000	3,900	6,000	2.83	14	73	8.3
C202_0250ED403U	122	24.6	1577/64	1,256	142	1,888	213	2,359	267	4,000	3,900	6,000	3.93	14	73	8.3
C202_0280ED401U	106	28.2	4067/144	572	64.7	2,036	230	2,704	306	4,000	3,900	6,000	1.73	14	73	8.3
C202_0280ED402U	106	28.2	4067/144	1,106	125	2,036	230	2,704	306	4,000	3,900	6,000	2.83	14	73	8.3
C202_0310ED401U	98	30.7	399/13	622	70.3	2,036	230	2,790	315	4,000	3,900	6,000	1.64	14	73	8.3
C202_0310ED402U	98	30.7	399/13	1,201	136	2,036	230	2,790	315	4,000	3,900	6,000	2.74	14	73	8.3
C202_0350ED401U	85	35.2	1372/39	713	80.5	2,036	230	3,198	361	4,000	3,900	6,000	1.63	14	73	8.3
C202_0350ED402U	85	35.2	1372/39	1,377	156	2,036	230	3,198	361	4,000	3,900	6,000	2.74	14	73	8.3
C202_0410ED303U	73	40.9	817/20	473	53.5	1,468	166	1,835	207	4,000	3,900	6,000	0.75	14	73	8.3
C202_0410ED401U	73	40.9	817/20	828	93.5	2,036	230	3,490	394	4,000	3,900	6,000	1.55	14	73	8.3
C202_0470ED303U	64	46.8	2107/45	543	61.3	1,682	190	2,103	238	4,000	3,900	6,000	0.75	14	73	8.3
C202_0470ED401U	64	46.8	2107/45	949	107	2,036	230	3,540	400	4,000	3,900	6,000	1.55	14	73	8.3
C202_0490ED303U	61	49.2	1083/22	570	64.5	1,702	192	2,128	240	4,000	3,900	6,000	0.71	14	73	8.3
C202_0490ED401U	61	49.2	1083/22	997	113	2,036	230	3,540	400	4,000	3,900	6,000	1.51	14	73	8.3
C202_0560ED303U	53	56.4	1862/33	654	73.9	1,951	220	2,439	276	4,000	3,900	6,000	0.71	14	73	8.3
C202_0560ED401U	53	56.4	1862/33	1,143	129	2,036	230	3,540	400	4,000	3,900	6,000	1.51	14	73	8.3
C202_0610ED303U	49	61.4	2945/48	711	80.3	1,988	225	2,515	284	4,000	3,900	6,000	0.68	14	73	8.3
C202_0700ED303U	43	70.3	7595/108	815	92.1	2,036	230	2,883	326	4,000	3,900	6,000	0.67	14	73	8.3
C203_ED – 3000 RPM 480V																
C203_0810ED303U	37	80.6	11609/144	921	104	2,036	230	3,540	400	4,000	3,900	6,000	0.68	14	73	8.3
C203_0920ED303U	32	92.4	29939/324	1,055	119	2,036	230	3,540	400	4,000	3,900	6,000	0.68	14	73	8.3
C203_1110ED303U	27	110.6	191149/1728	1,263	143	2,036	230	3,540	400	4,000	3,900	6,000	0.67	14	73	8.3

Housing Styles

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



Contact STOBER for availability of "Q" housing style.

See Page 33 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C302_ED – 3000 RPM 480V																
C302_0020ED505U	1,485	2.0	608/301	208	23.5	394	44.6	493	55.7	2,700	2,300	4,000	20.19	16	63	7.1
C302_0022ED505U	1,378	2.2	468/215	224	25.3	425	48.0	531	60.0	2,700	2,300	4,000	19.88	16	63	7.1
C302_0031ED704U	965	3.1	1045/336	441	49.8	1,334	151	1,667	188	3,200	2,800	4,500	32.05	16	63	7.1
C302_0034ED704U	895	3.4	429/128	475	53.6	1,437	162	1,797	203	3,200	2,800	4,500	31.92	16	63	7.1
C302_0039ED704U	774	3.9	190/49	549	62.1	1,608	182	2,011	227	3,200	2,800	4,500	31.03	16	63	7.1
C302_0042ED704U	718	4.2	117/28	592	66.9	1,733	196	2,167	245	3,200	2,800	4,500	30.95	16	63	7.1
C302_0047ED704U	642	4.7	589/126	662	74.8	1,866	211	2,332	264	3,500	3,100	5,000	30.40	16	63	7.1
C302_0050ED704U	595	5.0	403/80	714	80.6	2,011	227	2,513	284	3,500	3,100	5,000	30.35	16	63	7.1
C302_0059ED503U	512	5.9	2584/441	382	43.2	963	109	1,204	136	3,500	3,100	5,000	9.65	16	63	7.1
C302_0059ED505U	512	5.9	2584/441	604	68.2	963	109	1,204	136	3,500	3,100	5,000	14.64	16	63	7.1
C302_0059ED704U	512	5.9	2584/441	830	93.8	2,261	256	2,827	319	3,500	3,100	5,000	29.83	16	63	7.1
C302_0063ED505U	475	6.3	221/35	650	73.5	1,038	117	1,298	147	3,500	3,100	5,000	14.60	16	63	7.1
C302_0063ED704U	475	6.3	221/35	894	101	2,437	275	3,046	344	3,500	3,100	5,000	29.79	16	63	7.1
C302_0078ED704U	383	7.8	494/63	1,111	125	2,842	321	3,553	401	3,800	3,500	5,500	29.30	16	63	7.1
C302_0083ED704U	364	8.3	33/4	1,169	132	3,538	400	4,422	500	3,200	2,800	4,500	31.02	13	77	8.7
C302_0093ED704U	322	9.3	3575/384	1,319	149	3,098	350	4,991	564	3,200	2,800	4,500	30.94	13	77	8.7
C302_0105ED704U	292	10.3	72/7	1,457	165	3,540	400	5,333	603	3,200	2,800	4,500	30.37	13	77	8.7
C302_0115ED704U	258	11.6	325/28	1,644	186	3,098	350	6,018	680	3,200	2,800	4,500	30.32	13	77	8.7
C302_0125ED704U	242	12.4	62/5	1,756	198	3,540	400	6,186	699	3,500	3,100	5,000	29.95	13	77	8.7
C302_0140ED704U	214	14.0	2015/144	1,982	224	3,098	350	6,195	700	3,500	3,100	5,000	29.91	13	77	8.7
C302_0155ED503U	193	15.5	544/35	1,014	115	2,555	289	3,194	361	3,500	3,100	5,000	9.36	13	77	8.7
C302_0155ED505U	193	15.5	544/35	1,601	181	2,555	289	3,194	361	3,500	3,100	5,000	14.34	13	77	8.7
C302_0155ED704U	193	15.5	544/35	2,202	249	3,540	400	6,195	700	3,500	3,100	5,000	29.53	13	77	8.7
C302_0175ED503U	171	17.5	1105/63	1,144	129	2,884	326	3,604	407	3,500	3,100	5,000	9.34	13	77	8.7
C302_0175ED505U	171	17.5	1105/63	1,807	204	2,884	326	3,604	407	3,500	3,100	5,000	14.32	13	77	8.7
C302_0210ED503U	144	20.8	104/5	1,357	153	3,211	363	4,014	454	3,800	3,500	5,500	8.96	13	77	8.7
C302_0230ED503U	128	23.5	845/36	1,531	173	3,098	350	4,530	512	3,800	3,500	5,500	8.95	13	77	8.7
C302_0250ED503U	121	24.8	124/5	1,618	183	3,540	400	4,621	522	3,800	3,500	5,500	8.79	13	77	8.7
C302_0280ED503U	107	28.0	2015/72	1,826	206	3,098	350	5,214	589	3,800	3,500	5,500	8.79	13	77	8.7
C302_0310ED503U	97	31.0	776/25	2,025	229	3,540	400	5,507	622	3,800	3,500	5,500	8.64	13	77	8.7
C303_ED – 3000 RPM 480V																
C303_0810ED303U	37	81.5	1222/15	930	105	2,952	334	3,689	417	3,800	3,500	5,500	0.70	13	77	8.7
C303_0920ED303U	33	91.9	39715/432	1,050	119	3,098	350	4,163	470	3,800	3,500	5,500	0.70	13	77	8.7
C303_1100ED303U	27	109.6	94705/864	1,252	141	3,098	350	4,964	561	3,800	3,500	5,500	0.69	13	77	8.7
C303_1370ED303U	22	137.2	59267/432	1,567	177	3,098	350	6,195	700	3,800	3,500	5,500	0.68	13	77	8.7
C303_1830ED303U	16	182.8	1645/9	2,088	236	3,098	350	6,195	700	3,800	3,500	5,500	0.67	13	77	8.7

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

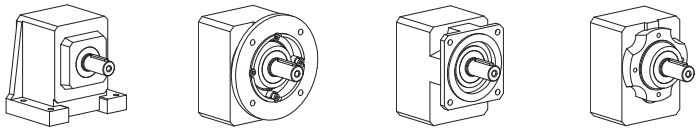
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C402_ED – 3000 RPM 480V																
C402_0044ED704U	683	4.4	145/33	622	70.3	1,883	213	2,354	266	2,900	2,500	4,000	33.95	15	151	17.0
C402_0053ED704U	568	5.3	465/88	748	84.6	2,199	248	2,749	311	3,300	2,800	4,500	32.65	15	151	17.0
C402_0066ED704U	451	6.6	585/88	942	106	2,643	299	3,304	373	3,300	2,800	4,500	31.44	15	151	17.0
C402_0078ED704U	384	7.8	2001/256	1,107	125	2,939	332	3,674	415	3,500	3,200	5,000	30.51	15	151	17.0
C402_0105ED704U	288	10.4	406/39	1,475	167	4,461	504	5,577	630	2,900	2,500	4,000	32.81	12	193	21.8
C402_0115ED704U	258	11.6	1885/162	1,648	186	4,868	550	6,234	704	2,900	2,500	4,000	32.73	12	193	21.8
C402_0125ED704U	240	12.5	651/52	1,773	200	5,210	589	6,512	736	3,300	2,800	4,500	31.86	12	193	21.8
C402_0140ED704U	214	14.0	2015/144	1,982	224	4,868	550	7,279	822	3,300	2,800	4,500	31.81	12	193	21.8
C402_0160ED704U	190	15.8	63/4	2,231	252	5,310	600	7,828	884	3,300	2,800	4,500	30.95	12	193	21.8
C402_0175ED704U	170	17.6	845/48	2,494	282	4,868	550	8,749	989	3,300	2,800	4,500	30.91	12	193	21.8
C402_0210ED704U	144	20.9	4347/208	2,960	334	5,310	600	9,735	1,100	3,500	3,200	5,000	30.11	12	193	21.8
C402_0250ED503U	120	24.9	324/13	1,626	184	3,861	436	4,826	545	3,500	3,200	5,000	9.54	12	193	21.8
C402_0280ED503U	108	27.9	195/7	1,817	205	4,315	488	5,394	609	3,500	3,200	5,000	9.53	12	193	21.8
C402_0310ED503U	96	31.2	405/13	2,033	230	4,595	519	5,744	649	3,500	3,200	5,000	9.15	12	193	21.8
C402_0350ED503U	86	34.8	975/28	2,272	257	4,868	550	6,420	725	3,500	3,200	5,000	9.14	12	193	21.8
C402_0420ED503U	72	41.8	7056/169	2,724	308	5,310	600	7,197	813	3,500	3,200	5,000	8.80	12	193	21.8
C402_0470ED503U	64	46.7	140/3	3,045	344	4,868	550	8,045	909	3,500	3,200	5,000	8.80	12	193	21.8
C402_0500ED503U	60	50.2	1305/26	3,275	370	5,310	600	8,305	938	3,500	3,200	5,000	8.65	12	193	21.8

Housing Styles

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



Contact STOBER for availability of "Q" housing style.

See Page 33 for required ordering information and part number example.

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C502_ED – 3000 RPM 480V																
C502_0046ED704U	648	4.6	162/35	656	74.1	1,995	225	2,494	282	3,100	2,700	4,000	36.62	14	188	21.2
C502_0067ED704U	451	6.7	559/84	943	107	2,760	312	3,450	390	3,100	2,700	4,000	34.04	14	188	21.2
C502_0155ED704U	191	15.7	377/24	2,225	251	6,515	736	8,144	920	3,100	2,700	4,000	33.06	12	201	22.7
C502_0175ED704U	170	17.6	845/48	2,494	282	7,301	825	9,127	1,031	3,100	2,700	4,000	32.98	12	201	22.7
C502_0210ED704U	144	20.8	667/32	2,952	334	8,142	920	10,220	1,155	3,400	3,000	4,500	31.50	12	201	22.7
C502_0230ED704U	128	23.4	1495/64	3,309	374	7,523	850	11,453	1,294	3,400	3,000	4,500	31.46	12	201	22.7
C502_0250ED704U	120	25.1	2407/96	3,551	401	8,142	920	11,785	1,332	3,400	3,000	4,500	30.71	12	201	22.7
C502_0280ED704U	107	28.1	5395/192	3,980	450	7,523	850	13,207	1,492	3,400	3,000	4,500	30.68	12	201	22.7
C502_0310ED704U	96	31.2	406/13	4,424	500	8,142	920	13,989	1,581	3,400	3,000	4,500	30.06	12	201	22.7
C502_0420ED503U	72	41.7	667/16	2,720	307	5,979	676	7,474	845	3,400	3,000	4,500	9.25	12	201	22.7
C502_0470ED503U	64	46.7	1495/32	3,048	344	6,701	757	8,376	946	3,400	3,000	4,500	9.24	12	201	22.7
C502_0500ED503U	60	49.8	1943/39	3,250	367	6,871	776	8,589	970	3,400	3,000	4,500	8.99	12	201	22.7
C502_0560ED503U	54	55.8	335/6	3,643	412	7,523	850	9,625	1,088	3,400	3,000	4,500	8.98	12	201	22.7
C502_0620ED503U	48	62.4	4495/72	4,073	460	7,583	857	10,203	1,153	3,400	3,000	4,500	8.75	12	201	22.7
C502_0700ED503U	43	70.0	10075/144	4,565	516	7,523	850	11,434	1,292	3,400	3,000	4,500	8.74	12	201	22.7
C503_ED – 3000 RPM 480V																
C503_0810ED503U	37	80.6	19343/240	5,182	586	8,142	920	10,219	1,155	3,400	3,000	4,500	8.62	12	201	22.7
C612_ED – 3000 RPM 480V																
C612_0195ED704U	153	19.6	549/28	2,777	314	7,637	863	9,546	1,079	3,200	2,900	4,000	33.83	10	656	74.2
C612_0250ED704U	120	24.9	5185/208	3,531	399	9,218	1,042	11,523	1,302	3,200	2,900	4,000	32.11	10	656	74.2
C612_0270ED704U	109	27.4	192/7	3,885	439	10,683	1,207	13,354	1,509	3,200	2,900	4,000	33.58	10	656	74.2
C612_0320ED704U	93	32.4	1037/32	4,590	519	11,340	1,281	14,175	1,602	3,200	2,900	4,000	30.78	10	656	74.2
C612_0350ED704U	86	34.9	1360/39	4,939	558	12,213	1,380	16,119	1,821	3,200	2,900	4,000	31.95	10	656	74.2
C612_0390ED704U	76	39.4	1891/48	5,580	631	12,963	1,465	16,465	1,860	3,200	2,900	4,000	30.10	10	656	74.2
C612_0450ED704U	66	45.3	136/3	6,421	726	12,213	1,380	19,829	2,241	3,200	2,900	4,000	30.69	10	656	74.2
C612_0550ED704U	54	55.1	496/9	7,806	882	12,213	1,380	23,010	2,600	3,200	2,900	4,000	30.04	10	656	74.2
C613_ED – 3000 RPM 480V																
C613_0490ED704U	61	49.3	31537/640	6,879	777	13,817	1,561	17,271	1,952	3,200	2,900	4,000	29.57	10	656	74.2
C613_0630ED704U	47	63.5	48739/768	8,859	1,001	14,603	1,650	21,185	2,394	3,200	2,900	4,000	29.35	10	656	74.2
C613_0760ED503U	40	75.8	5307/70	4,875	551	7,636	863	9,545	1,079	3,200	2,900	4,000	8.78	10	656	74.2
C613_0880ED503U	34	87.6	3944/45	5,636	637	9,192	1,039	11,490	1,298	3,200	2,900	4,000	8.88	10	656	74.2
C613_1060ED503U	28	106.1	3712/35	6,820	771	10,682	1,207	13,353	1,509	3,200	2,900	4,000	8.76	10	656	74.2

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

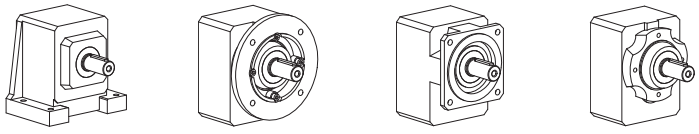
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"C" Series–Concentric Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom. Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
C712_ED – 3000 RPM 480V																
C712_0340ED704U	89	33.8	2163/64	4,787	541	12,337	1,394	15,421	1,742	3,100	2,900	3,600	33.31	10	1,081	122.2
C712_0410ED704U	73	41.0	2625/64	5,810	656	14,353	1,622	17,941	2,027	3,100	2,900	3,600	31.89	10	1,081	122.2
C712_0470ED704U	64	46.8	515/11	6,631	749	17,090	1,931	21,362	2,414	3,100	2,900	3,600	33.16	10	1,081	122.2
C712_0570ED704U	53	56.8	625/11	8,048	909	19,883	2,247	24,853	2,808	3,100	2,900	3,600	31.78	10	1,081	122.2
C712_0700ED704U	43	69.5	765/11	9,851	1,113	20,355	2,300	29,065	3,284	3,100	2,900	3,600	30.77	10	1,081	122.2
C713_ED – 3000 RPM 480V																
C713_0810ED704U	37	81.0	20727/256	11,303	1,277	21,622	2,443	27,027	3,054	3,100	2,900	3,600	29.63	10	1,081	122.2
C713_0990ED704U	30	99.1	6345/64	13,840	1,564	24,426	2,760	31,783	3,591	3,100	2,900	3,600	29.43	10	1,081	122.2
C813_ED – 3000 RPM 480V																
C813_0790ED704U	38	79.3	285619/3600	11,076	1,251	22,403	2,531	28,004	3,164	2,900	2,700	3,400	30.69	10	1,802	203.6
C813_0910ED704U	33	90.8	18800/207	12,679	1,433	26,557	3,001	33,197	3,751	2,900	2,700	3,400	31.11	10	1,802	203.6
C813_1080ED704U	28	107.6	4841/45	15,018	1,697	30,377	3,432	37,972	4,291	2,900	2,700	3,400	30.61	10	1,802	203.6
C813_1380ED704U	22	138.4	2491/18	19,319	2,183	36,639	4,140	46,197	5,220	2,900	2,700	3,400	30.07	10	1,802	203.6

Housing Styles

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

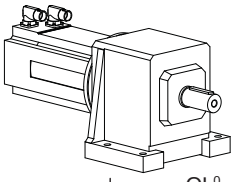


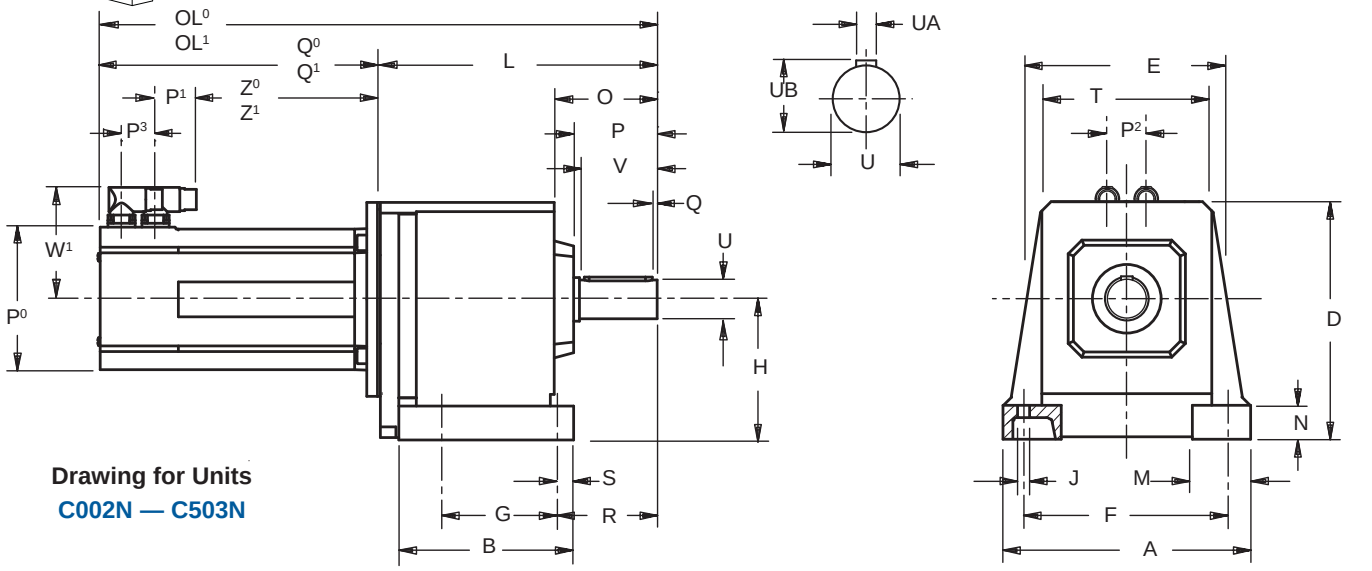
Contact STOBER for availability of "Q" housing style.

See Page 33 for required ordering information and part number example.

See web site for drawings.

ServoFit® Geared Motor – "C" Series Foot Mount – "N" Housing 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	S	T	V	Z²
C002	5.20	3.74	5.67	4.33	2.44	3.23	.28	1.38	.79	2.24	1.73	.16	2.17	.43	3.62	1.57	—
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	.51	4.88	1.97	—
C202/C203	7.87	5.31	7.68	6.69	3.35	4.53	.43	1.97	1.18	3.39	2.56	.16	3.11	.55	5.43	2.36	—
C302/C303	8.46	6.06	8.46	7.28	4.13	5.12	.43	1.97	1.18	3.35	2.56	.16	3.11	.55	5.91	2.36	—
C402	10.04	7.09	9.65	8.66	4.33	5.71	.55	2.36	1.38	4.17	3.39	.16	4.13	.75	6.89	3.15	—
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	.87	7.56	3.15	—
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	.98	6.97	3.94	6.57
C712	14.37	11.22	14.76	11.81	9.25	9.25	.71	3.54	1.97	7.28	5.00	.20	6.42	.98	7.56	4.72	7.91
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	1.14	8.78	5.51	8.70

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

	Standard Shaft - inches			Optional Shaft - mm		
Base Module	U	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	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
C612/C613	2.125	$^{1}/_{2} \times ^{1}/_{2} \times 3^{5}/_{32}$	2.35	50_{k6}	A14x9x90	53.5
C712/C713	2.375	$^{5}/_{8} \times ^{5}/_{8} \times 3^{15}/_{16}$	2.65	60_{m6}	A18x11x100	64
C813	2.875	$^{3}/_{4} \times ^{3}/_{4} \times 4^{5}/_{16}$	3.21	70_{m6}	A20x12x125	74.5

Part No. Example

C402N0470ED503URO

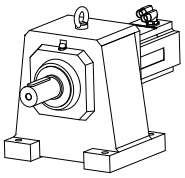
Foot Mounting, Concentric Helical
ServoFit® Geared Motor
Dynamic Series, Self Ventilated,
Resolver, Without Brake

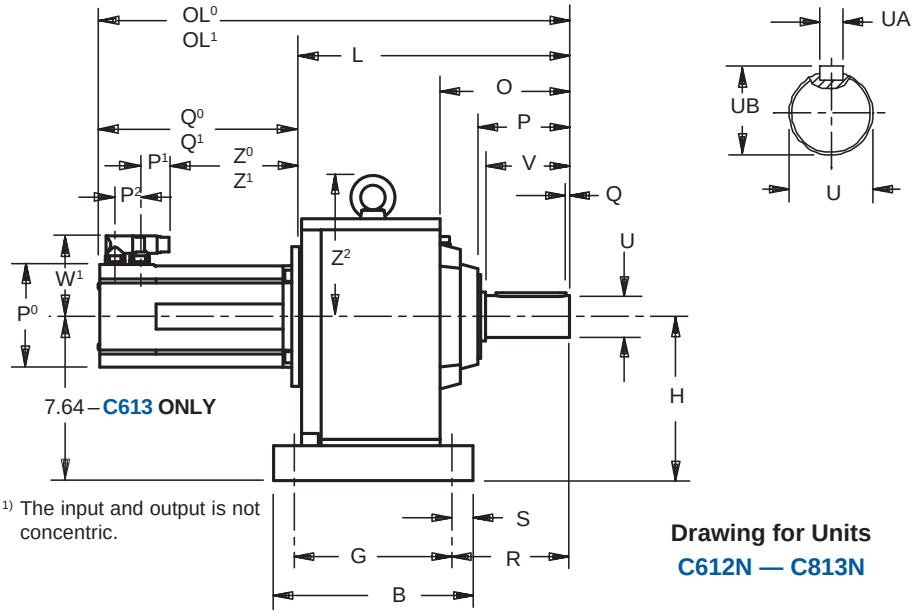
See Page 33 for details of Part Number.

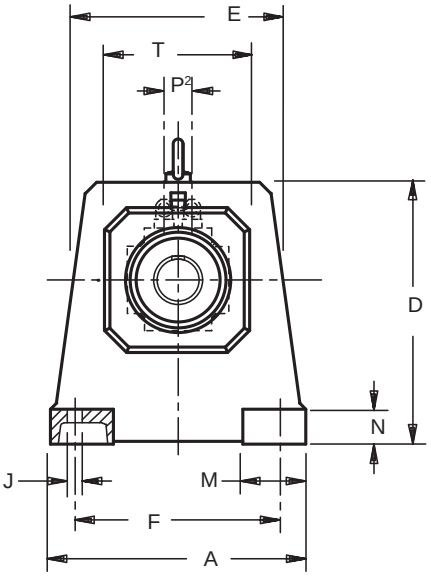
Table No. 3 **"C" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)**

	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
C002	8.3	18.2	8.8	19.3	9.9	21.8	11.5	25.4	13.1	28.8	15.7	34.5	20.1	44.3	—	—
C102	13.2	29.0	13.7	30.1	14.8	32.6	16.4	36.2	18.0	39.6	20.6	45.3	25.0	55.1	30.2	66.6
C103	16.1	35.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	17.7	39.0	18.8	41.5	20.4	45.0	22.0	48.5	24.6	54.2	29.0	63.9	34.2	75.5
C203	—	—	22.6	49.8	—	—	—	—	—	—	—	—	—	—	—	—
C302	—	—	—	—	—	—	—	—	—	—	29.7	65.4	34.1	75.2	39.3	86.7
C303	—	—	27.0	59.5	—	—	—	—	—	—	—	—	—	—	—	—
C402	—	—	—	—	—	—	—	—	—	—	—	—	39.9	87.9	49.5	109.2
C502	—	—	—	—	—	—	—	—	—	—	—	—	51.5	113.5	61.1	134.8
C503	—	—	—	—	—	—	—	—	—	—	—	—	55.4	122.2	—	—
C612	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76.4	168.5
C613	—	—	—	—	—	—	—	—	—	—	—	—	75.2	165.7	84.8	187.0
C712	—	—	—	—	—	—	—	—	—	—	—	—	—	—	111.7	246.3
C713	—	—	—	—	—	—	—	—	—	—	—	—	—	—	124.8	275.2
C813	—	—	—	—	—	—	—	—	—	—	—	—	—	—	183.8	405.3

ServoFit® Geared Motor – "C" Series
Foot Mount – "N" Housing
Dimensional Data







Drawing for Units
C612N — C813N

1) The input and output is not concentric.

Table No. 4 **"C" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

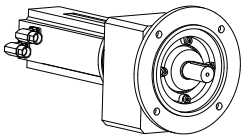
Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹
C002	154 6.06	312 12.28	324 12.76	154 6.06	330 12.99	342 13.52	154 6.06	309 12.17	355 13.98	154 6.06	344 13.54	390 15.35	154 6.06	379 14.92	425 16.73
C102	187 7.36	345 13.58	357 14.06	187 7.36	363 14.29	375 14.76	187 7.36	342 13.46	388 15.28	187 7.36	377 14.84	423 16.65	187 7.36	412 16.22	458 18.03
C103	224 8.82	382 15.04	394 15.51	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	—	215 8.46	391 15.39	403 15.87	215 8.46	370 14.57	416 16.38	215 8.46	405 15.94	451 17.76	215 8.46	440 17.32	486 19.13
C203	—	—	—	252 9.92	428 16.85	440 17.32	—	—	—	—	—	—	—	—	—
C303	—	—	—	271 10.67	447 17.60	459 18.07	—	—	—	—	—	—	—	—	—

Unit	ED503			ED505			ED704		
	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹
C002	158 6.22	385 15.16	436 17.17	158 6.22	455 17.91	506 19.92	—	—	—
C102	191 7.52	418 16.46	469 18.46	191 7.52	488 19.21	539 21.22	193 7.60	478.5 18.84	542 21.34
C202	219 8.62	446 17.56	497 19.57	219 8.62	516 20.31	567 22.32	221 8.70	506.5 19.94	570 22.44
C302	238 9.37	465 18.31	516 20.31	238 9.37	535 21.06	586 23.07	240 9.45	525.5 20.69	589 23.19
C402	—	—	—	285.5 11.24	582.5 22.93	633.5 24.94	287.5 11.32	573 22.56	636.5 25.06
C502	—	—	—	307 12.09	604 23.78	631 25.79	309 12.17	594.5 23.41	658 25.91
C503	—	—	—	350 13.78	647 25.47	698 27.48	—	—	—
C612	—	—	—	—	—	—	333 13.11	618.5 24.35	682 26.85
C613	—	—	—	375 14.76	672 26.46	723 28.46	395 15.55	680.5 26.79	744 29.29
C712	—	—	—	—	—	—	386 15.20	671.5 26.44	735 28.94
C713	—	—	—	—	—	—	447 17.60	732.5 28.84	796 31.34
C813	—	—	—	—	—	—	514 20.24	799.5 31.48	863 33.98

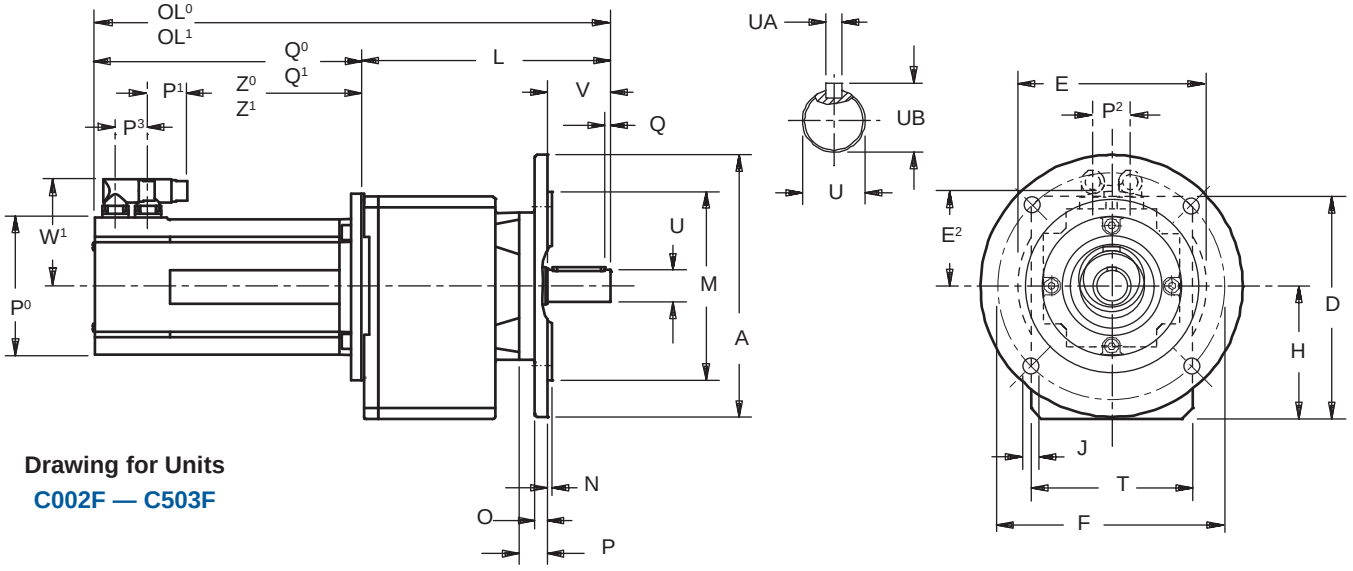
Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake..

Table No. 5 **Dimensions (mm/inches)**

Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52



ServoFit® Geared Motor – "C" Series
Round Flange – "F" Housing
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	V	Z1
C002	6.30	5.55	5.12	3.11	.35	4.331 +.001/-.0004	.12	.39	.71	.16	3.82	1.57	—
C102/C103	7.87	6.89	6.50	3.94	.43	5.118 +.001/-.0004	.14	.47	.83	.16	5.12	1.97	—
C202/C203	7.87	7.56	6.50	4.41	.43	5.118 +.001/-.0004	.14	.47	1.06	.16	5.59	2.36	—
C302/C303	9.84	8.35	8.46	5.00	.55	7.087 +.001/-.0004	.16	.47	1.06	.16	6.06	2.36	—
C402	9.84	9.55	8.46	5.61	.55	7.087 +.001/-.0004	.16	.55	1.10	.16	7.01	3.15	—
C502/C503	11.81	11.26	10.43	6.54	.55	9.055 +.001/-.001	.16	.63	1.14	.16	7.68	3.15	—
C612/C613	11.81	11.97	10.43	7.44 1)	.55	9.055 +.001/-.001	.16	.67	1.42	.20	8.86	3.94	6.57
C712	13.78	14.61	11.81	9.09	.71	9.842 +.000/-.001	.20	.71	1.73	.20	10.43	4.72	7.91
C813	15.75	17.52	13.78	11.22	.71	11.811 +.000/-.001	.20	.79	1.77	.39	12.20	5.51	8.70

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

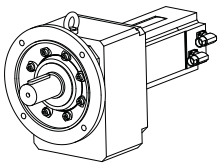
	Standard Shaft - inches			Optional Shaft - mm		
Base Module	U	UA	UB	U	UA	UB
C002	.750	3/16 × 3/16 × 1 7/32	.83	20k6	A6x6x32	22.5
C102/C103	1.000	1/4 × 1/4 × 1 9/16	1.11	25k6	A8x7x40	28
C202/C203	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33
C302/C303	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33
C402	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43
C502/C503	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43
C612/C613	2.125	1/2 × 1/2 × 3 5/32	2.35	50k6	A14x9x90	53.5
C712/C713	2.375	5/8 × 5/8 × 3 15/16	2.65	60m6	A18x11x100	64
C813	2.875	3/4 × 3/4 × 4 5/16	3.21	70m6	A20x12x125	74.5

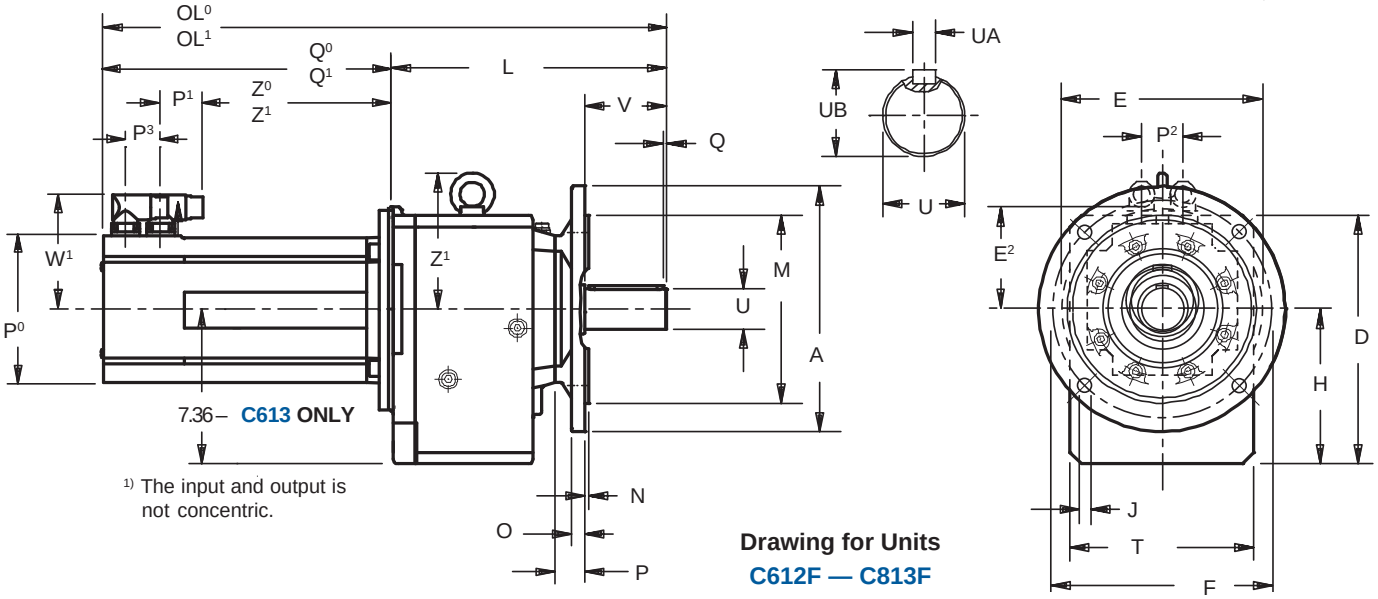
Part No. Example
C402F0470ED503URO
Flange Mounting, Concentric Helical
ServoFit® Geared Motor
Dynamic Series, Self Ventilated,
Resolver, Without Brake
See Page 33 for details of Part Number.

Table No. 3 **"C" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)**

	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
C002	8.3	18.2	8.8	19.3	9.9	21.8	11.5	25.4	13.1	28.8	15.7	34.5	20.1	44.3	—	—
C102	13.2	29.0	13.7	30.1	14.8	32.6	16.4	36.2	18.0	39.6	20.6	45.3	25.0	55.1	30.2	66.6
C103	16.1	35.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	17.7	39.0	18.8	41.5	20.4	45.0	22.0	48.5	24.6	54.2	29.0	63.9	34.2	75.5
C203	—	—	22.6	49.8	—	—	—	—	—	—	—	—	—	—	—	—
C302	—	—	—	—	—	—	—	—	—	—	29.7	65.4	34.1	75.2	39.3	86.7
C303	—	—	27.0	59.5	—	—	—	—	—	—	—	—	—	—	—	—
C402	—	—	—	—	—	—	—	—	—	—	—	—	39.9	87.9	49.5	109.2
C502	—	—	—	—	—	—	—	—	—	—	—	—	51.5	113.5	61.1	134.8
C503	—	—	—	—	—	—	—	—	—	—	—	—	55.4	122.2	—	—
C612	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76.4	168.5
C613	—	—	—	—	—	—	—	—	—	—	—	—	75.2	165.7	84.8	187.0
C712	—	—	—	—	—	—	—	—	—	—	—	—	—	—	111.7	246.3
C713	—	—	—	—	—	—	—	—	—	—	—	—	—	—	124.8	275.2
C813	—	—	—	—	—	—	—	—	—	—	—	—	—	—	183.8	405.3

ServoFit® Geared Motor – "C" Series
Round Flange – "F" Housing
Dimensional Data





[1] The input and output is not concentric.

Drawing for Units
C612F — C813F

Table No. 4 **"C" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹
C002	154 6.06	312 12.28	324 12.76	154 6.06	330 12.99	342 13.52	154 6.06	309 12.17	355 13.98	154 6.06	344 13.54	390 15.35	154 6.06	379 14.92	425 16.73
C102	187 7.36	345 13.58	357 14.06	187 7.36	363 14.29	375 14.76	187 7.36	342 13.46	388 15.28	187 7.36	377 14.84	423 16.65	187 7.36	412 16.22	458 18.03
C103	224 8.82	382 15.04	394 15.51	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	—	215 8.46	391 15.39	403 15.87	215 8.46	370 14.57	416 16.38	215 8.46	405 15.94	451 17.76	215 8.46	440 17.32	486 19.13
C203	—	—	—	252 9.92	428 16.85	440 17.32	—	—	—	—	—	—	—	—	—
C303	—	—	—	271 10.67	447 17.60	459 18.07	—	—	—	—	—	—	—	—	—

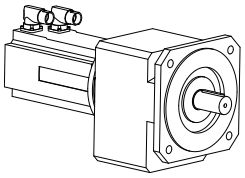
Unit	ED503			ED505			ED704		
	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹
C002	158 6.22	385 15.16	436 17.17	158 6.22	455 17.91	506 19.92	—	—	—
C102	191 7.52	418 16.46	469 18.46	191 7.52	488 19.21	539 21.22	193 7.60	478.5 18.84	542 21.34
C202	219 8.62	446 17.56	497 19.57	219 8.62	516 20.31	567 22.32	221 8.70	506.5 19.94	570 22.44
C302	238 9.37	465 18.31	516 20.31	238 9.37	535 21.06	586 23.07	240 9.45	525.5 20.69	589 23.19
C402	—	—	—	285.5 11.24	582.5 22.93	633.5 24.94	287.5 11.32	573 22.56	636.5 25.06
C502	—	—	—	307 12.09	604 23.78	631 25.79	309 12.17	594.5 23.41	658 25.91
C503	—	—	—	350 13.78	647 25.47	698 27.48	—	—	—
C612	—	—	—	—	—	—	333 13.11	618.5 24.35	682 26.85
C613	—	—	—	375 14.76	672 26.46	723 28.46	395 15.55	680.5 26.79	744 29.29
C712	—	—	—	—	—	—	386 15.20	671.5 26.44	735 28.94
C713	—	—	—	—	—	—	447 17.60	732.5 28.84	796 31.34
C813	—	—	—	—	—	—	514 20.24	799.5 31.48	863 33.98

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

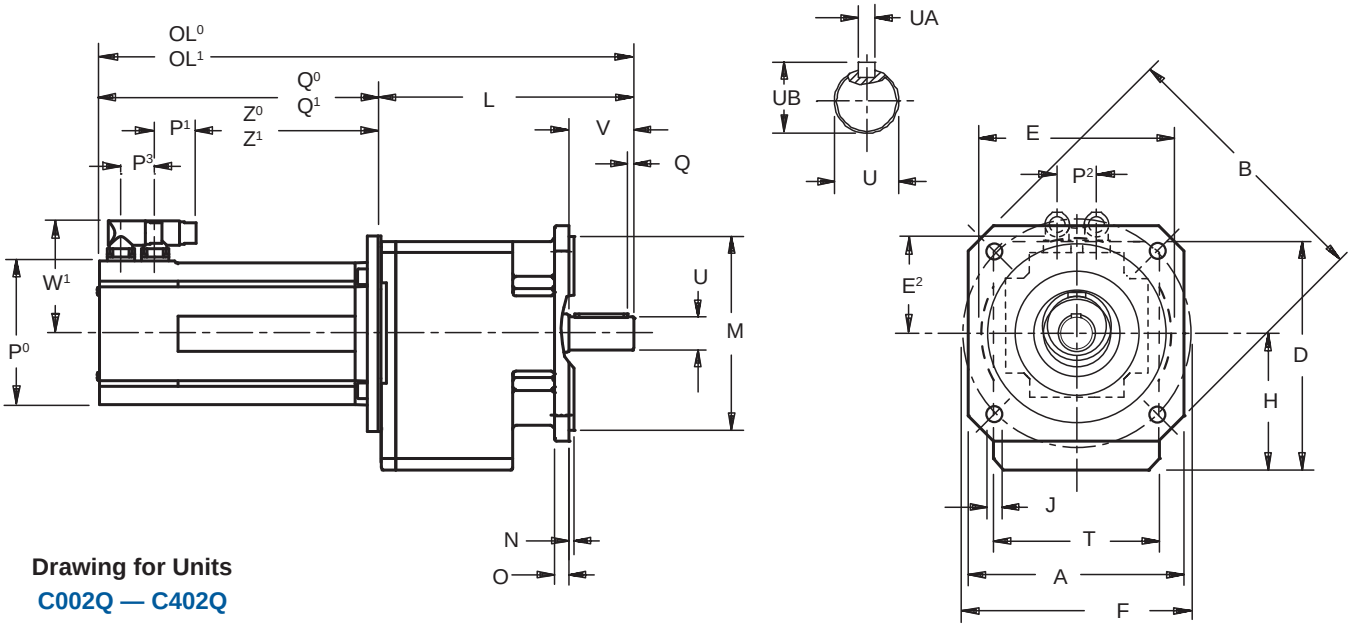
Table No. 5 **Dimensions (mm/inches)**

Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

See web site for drawings.



ServoFit® Geared Motor – "C" Series
Square Flange – "Q" Housing
Dimensional Data



Drawing for Units
C002Q — C402Q

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	7.87	9.84	9.55	8.46	5.61	.55	7.087 +.001/-.0004	.16	.55	.16	7.01

[1)]See Table No. 5

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

Base Module	Standard Shaft - inches			Optional Shaft - mm		
	U	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	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.

Table No. 3 **"C" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)**

	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
C002	8.3	18.2	8.8	19.3	9.9	21.8	11.5	25.4	13.1	28.8	15.7	34.5	20.1	44.3	—	—
C102	13.2	29.0	13.7	30.1	14.8	32.6	16.4	36.2	18.0	39.6	20.6	45.3	25.0	55.1	30.2	66.6
C103	16.1	35.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	17.7	39.0	18.8	41.5	20.4	45.0	22.0	48.5	24.6	54.2	29.0	63.9	34.2	75.5
C203	—	—	22.6	49.8	—	—	—	—	—	—	—	—	—	—	—	—
C302	—	—	—	—	—	—	—	—	—	—	29.7	65.4	34.1	75.2	39.3	86.7
C303	—	—	27.0	59.5	—	—	—	—	—	—	—	—	—	—	—	—
C402	—	—	—	—	—	—	—	—	—	—	—	—	39.9	87.9	49.5	109.2

ServoFit® Geared Motor – "C" Series
Square Flange – "Q" Housing
Dimensional Data

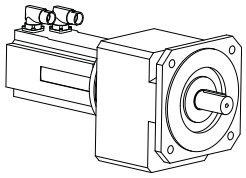


Table No. 4 **"C" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
C002	154 6.06	312 12.28	324 12.76	154 6.06	330 12.99	342 13.52	154 6.06	309 12.17	355 13.98	154 6.06	344 13.54	390 15.35	154 6.06	379 14.92	425 16.73
C102	187 7.36	345 13.58	357 14.06	187 7.36	363 14.29	375 14.76	187 7.36	342 13.46	388 15.28	187 7.36	377 14.84	423 16.65	187 7.36	412 16.22	458 18.03
C103	224 8.82	382 15.04	394 15.51	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	—	215 8.46	391 15.39	403 15.87	215 8.46	370 14.57	416 16.38	215 8.46	405 15.94	451 17.76	215 8.46	440 17.32	486 19.13
C203	—	—	—	252 9.92	428 16.85	440 17.32	—	—	—	—	—	—	—	—	—
C303	—	—	—	271 10.67	447 17.60	459 18.07	—	—	—	—	—	—	—	—	—

Unit	ED503			ED505			ED704		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
C002	158 6.22	385 15.16	436 17.17	158 6.22	455 17.91	506 19.92	—	—	—
C102	191 7.52	418 16.46	469 18.46	191 7.52	488 19.21	539 21.22	193 7.60	478.5 18.84	542 21.34
C202	219 8.62	446 17.56	497 19.57	219 8.62	516 20.31	567 22.32	221 8.70	506.5 19.94	570 22.44
C302	238 9.37	465 18.31	516 20.31	238 9.37	535 21.06	586 23.07	240 9.45	525.5 20.69	589 23.19
C402	—	—	—	285.5 11.24	582.5 22.93	633.5 24.94	287.5 11.32	573 22.56	636.5 25.06

Q^0, Z^0, and OL^0 are dimensions without a brake.
Q^1, Z^1, and OL^1 are dimensions with a brake.

Table No. 5 **Dimensions (mm/inches)**

Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

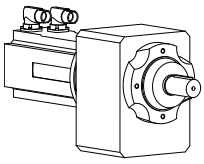
Part No. Example

C402Q0470ED503URO

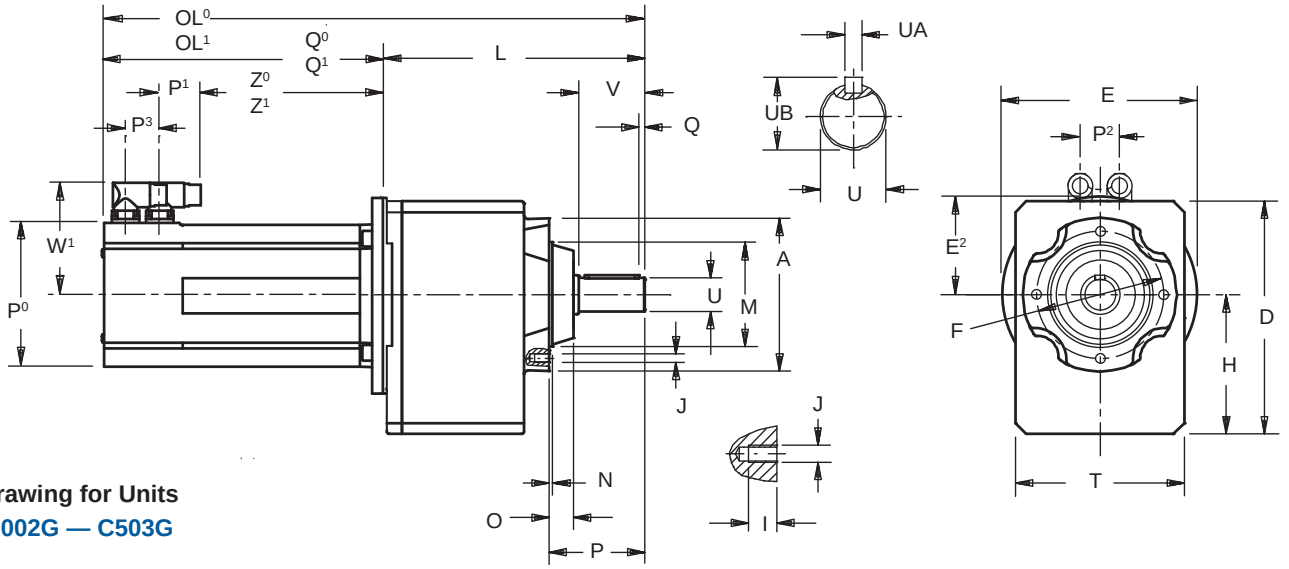
Square Flange Mounting, Concentric Helical
ServoFit® Geared Motor
Dynamic Series, Self Ventilated, Resolver,
Without Brake

See Page 33 for details of Part Number.

See web site for drawings.



ServoFit® Geared Motor – "C" Series
Tapped Hole – "G" Housing
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	V	Z1
C002	3.43	5.55	2.95	3.11	.39	4-M6	2.165 +.001/-.0003	.12	.55	2.28	.16	3.82	1.57	—
C102/C103	4.72	6.89	3.94	3.94	.51	4-M6	3.150 +.001/-.0003	.12	.67	2.80	.16	5.12	1.97	—
C202/C203	5.51	7.56	4.53	4.41	.51	4-M8	3.740 +.001/-.0004	.12	.87	3.43	.16	5.59	2.36	—
C302/C303	5.51	8.35	4.53	5.00	.51	4-M8	3.740 +.001/-.0004	.12	.87	3.43	.16	6.06	2.36	—
C402	6.30	9.55	5.12	5.61	.63	4-M10	4.331 +.001/-.0004	.14	.87	4.25	.16	7.01	3.15	—
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	3.15	—
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	3.94	6.57
C712	7.68	14.61	7.28	9.09	.75	8-M12	6.102 +.001/-.0004	.31	1.46	6.46	.20	10.43	4.72	7.91
C813	8.90	17.52	8.46	11.22	.75	8-M12	7.283 +.001/-.001	.20	1.46	7.28	.39	12.20	5.51	8.70[1]

[2] C502/C503 has 8 holes located as shown on drawing for C612G– C813G.

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

	Standard Shaft - inches			Optional Shaft - mm		
Base Module	U	UA	UB	U	UA	UB
C002	.750	3/16 × 3/16 × 1 7/32	.83	20k6	A6x6x32	22.5
C102/C103	1.000	1/4 × 1/4 × 1 9/16	1.11	25k6	A8x7x40	28
C202/C203	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33
C302/C303	1.250	1/4 × 1/4 × 1 15/16	1.36	30k6	A8x7X50	33
C402	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43
C502/C503	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43
C612/C613	2.125	1/2 × 1/2 × 3 5/32	2.35	50k6	A14x9x90	53.5
C712/C713	2.375	5/8 × 5/8 × 3 15/16	2.65	60m6	A18x11x100	64
C813	2.875	3/4 × 3/4 × 4 5/16	3.21	70m6	A20x12x125	74.5

Part No. Example
C402G0470ED503URO

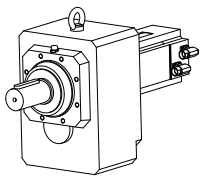
Tapped Hole Housing, Concentric Helical
ServoFit® Geared Motor
Dynamic Series, Self Ventilated,
Resolver, Without Brake

See Page 33 for details of Part Number.

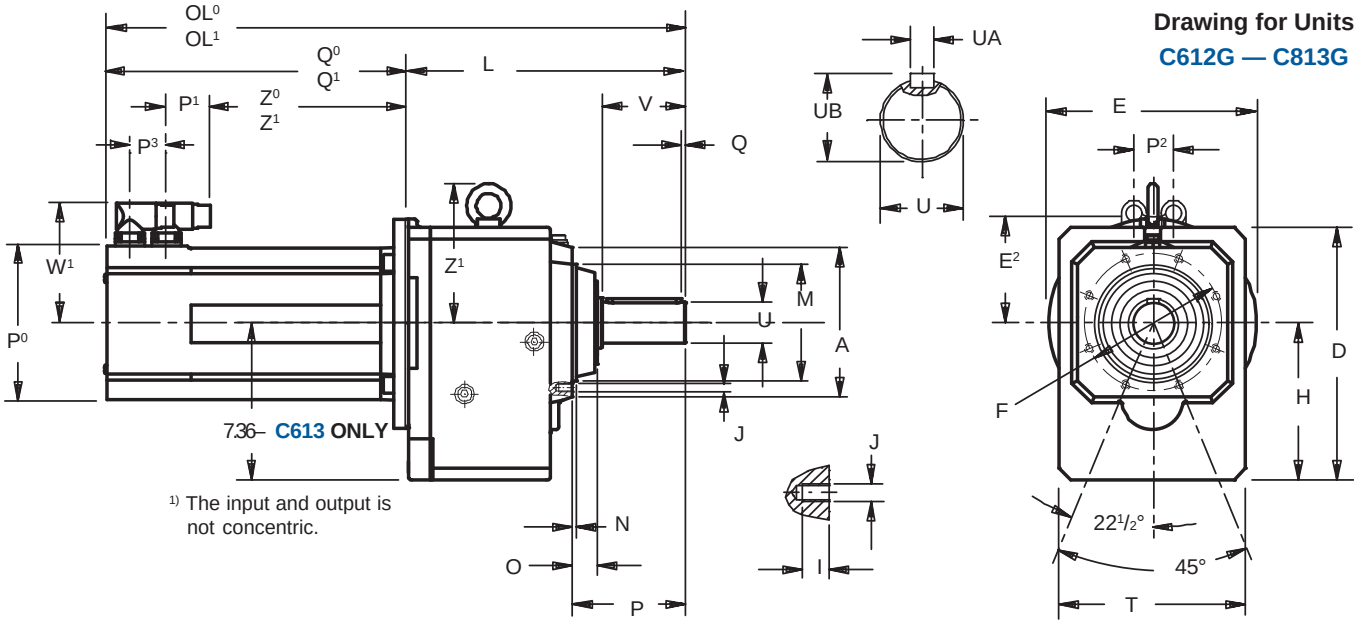
Table No. 3 **"C" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)**

	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
C002	8.3	18.2	8.8	19.3	9.9	21.8	11.5	25.4	13.1	28.8	15.7	34.5	20.1	44.3	—	—
C102	13.2	29.0	13.7	30.1	14.8	32.6	16.4	36.2	18.0	39.6	20.6	45.3	25.0	55.1	30.2	66.6
C103	16.1	35.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	17.7	39.0	18.8	41.5	20.4	45.0	22.0	48.5	24.6	54.2	29.0	63.9	34.2	75.5
C203	—	—	22.6	49.8	—	—	—	—	—	—	—	—	—	—	—	—
C302	—	—	—	—	—	—	—	—	—	—	29.7	65.4	34.1	75.2	39.3	86.7
C303	—	—	27.0	59.5	—	—	—	—	—	—	—	—	—	—	—	—
C402	—	—	—	—	—	—	—	—	—	—	—	—	39.9	87.9	49.5	109.2
C502	—	—	—	—	—	—	—	—	—	—	—	—	51.5	113.5	61.1	134.8
C503	—	—	—	—	—	—	—	—	—	—	—	—	55.4	122.2	—	—
C612	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76.4	168.5
C613	—	—	—	—	—	—	—	—	—	—	—	—	75.2	165.7	84.8	187.0
C712	—	—	—	—	—	—	—	—	—	—	—	—	—	—	111.7	246.3
C713	—	—	—	—	—	—	—	—	—	—	—	—	—	—	124.8	275.2
C813	—	—	—	—	—	—	—	—	—	—	—	—	—	—	183.8	405.3

ServoFit® Geared Motor – "C" Series
Tapped Hole – "G" Housing
Dimensional Data



Drawing for Units
C612G — C813G



[1] The input and output is not concentric.

Table No. 4 **"C" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹
C002	154 6.06	312 12.28	324 12.76	154 6.06	330 12.99	342 13.52	154 6.06	309 12.17	355 13.98	154 6.06	344 13.54	390 15.35	154 6.06	379 14.92	425 16.73
C102	187 7.36	345 13.58	357 14.06	187 7.36	363 14.29	375 14.76	187 7.36	342 13.46	388 15.28	187 7.36	377 14.84	423 16.65	187 7.36	412 16.22	458 18.03
C103	224 8.82	382 15.04	394 15.51	—	—	—	—	—	—	—	—	—	—	—	—
C202	—	—	—	215 8.46	391 15.39	403 15.87	215 8.46	370 14.57	416 16.38	215 8.46	405 15.94	451 17.76	215 8.46	440 17.32	486 19.13
C203	—	—	—	252 9.92	428 16.85	440 17.32	—	—	—	—	—	—	—	—	—
C303	—	—	—	271 10.67	447 17.60	459 18.07	—	—	—	—	—	—	—	—	—

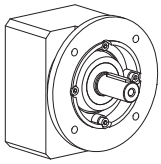
Unit	ED503			ED505			ED704		
	L	OL⁰	OL¹	L	OL⁰	OL¹	L	OL⁰	OL¹
C002	158 6.22	385 15.16	436 17.17	158 6.22	455 17.91	506 19.92	—	—	—
C102	191 7.52	418 16.46	469 18.46	191 7.52	488 19.21	539 21.22	193 7.60	478.5 18.84	542 21.34
C202	219 8.62	446 17.56	497 19.57	219 8.62	516 20.31	567 22.32	221 8.70	506.5 19.94	570 22.44
C302	238 9.37	465 18.31	516 20.31	238 9.37	535 21.06	586 23.07	240 9.45	525.5 20.69	589 23.19
C402	—	—	—	285.5 11.24	582.5 22.93	633.5 24.94	287.5 11.32	573 22.56	636.5 25.06
C502	—	—	—	307 12.09	604 23.78	631 25.79	309 12.17	594.5 23.41	658 25.91
C503	—	—	—	350 13.78	647 25.47	698 27.48	—	—	—
C612	—	—	—	—	—	—	333 13.11	618.5 24.35	682 26.85
C613	—	—	—	375 14.76	672 26.46	723 28.46	395 15.55	680.5 26.79	744 29.29
C712	—	—	—	—	—	—	386 15.20	671.5 26.44	735 28.94
C713	—	—	—	—	—	—	447 17.60	732.5 28.84	796 31.34
C813	—	—	—	—	—	—	514 20.24	799.5 31.48	863 33.98

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

Table No. 5 **Dimensions (mm/inches)**

Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

See web site for drawings.



ServoFit® Geared Motor – "C" Series
Optional Flanges – "F" Housing
Dimensional Data

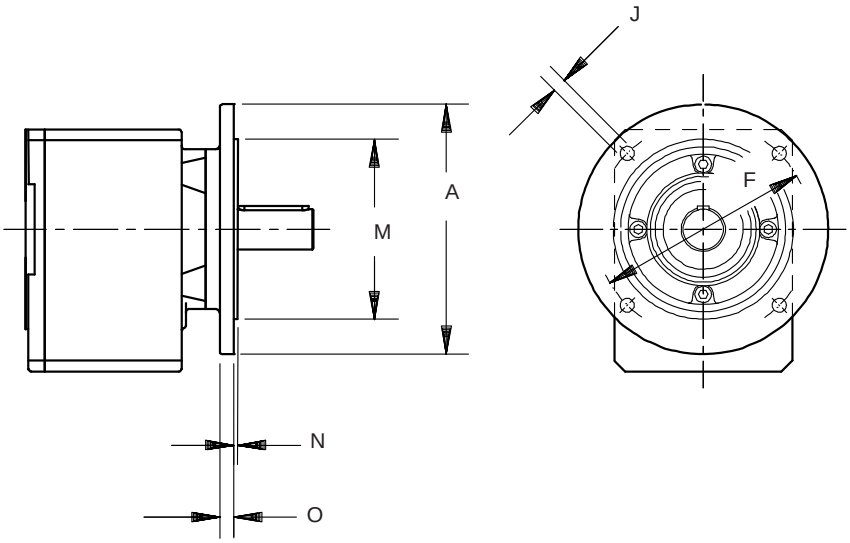


Table No. 1
"C" Series — Optional Flange Dimensions (Inches)

Base Module	Flange Designation	A	F	J	M	N	O
C0	**120**	4.724	3.93	.28	3.150	.12	.39
	140	5.512	4.53	.35	3.740	.12	.39
	160 *	6.300	5.12	.35	4.331	.12	.39
C1	**140**	5.512	4.53	.35	3.740	.14	.32
	160	6.300	5.12	.35	4.331	.14	.39
	200 *	7.874	6.50	.43	5.118	.14	.47
C2	**160**	6.300	5.12	.35	4.331	.14	.39
	200 *	7.874	6.50	.43	5.118	.14	.47
	250	9.843	8.46	.55	7.087	.16	.47
C3	**160**	6.300	5.12	.35	4.331	.14	.39
	200	7.874	6.50	.43	5.118	.14	.47
	250 *	9.843	8.46	.55	7.087	.16	.47
C4	**200**	7.874	6.50	.43	5.118	.16	.55
	250 *	9.843	8.46	.55	7.087	.16	.55
	300	11.811	10.43	.55	9.055	.16	.55
C5	**250**	9.843	8.46	.55	7.087	.16	.55
	300 *	11.811	10.43	.55	9.055	.16	.63
C6	**300** *	11.811	10.43	.55	9.055	.16	.67
C7	**350** *	13.780	11.81	.71	9.842	.20	.71
C8	**350**	13.780	11.81	.71	9.842	.20	.71
	400 *	15.748	13.78	.71	11.811	.20	.79
	450	17.717	15.75	.71	13.780	.20	.79

* This is the standard flange diameter. This flange is shipped unless otherwise specified.

"F" Series—Offset Helical ServoFit® Geared Motor Features

Performance Specifications:

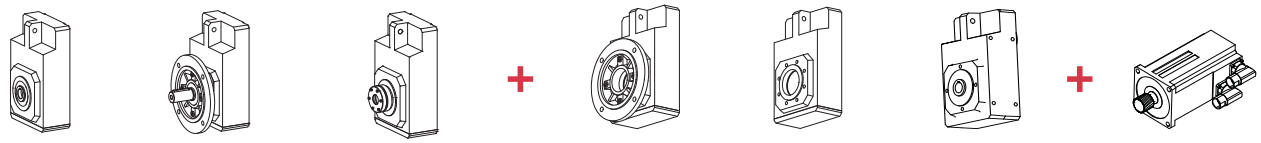
- Nominal output torque – up to 6,089 in. lbs. (688 Nm)
- Reducer ratios from 4.3:1 to 221:1
- Compact
- Low Inertia
- Dynamic Response
- Maintenance free
- Quiet Running

- Rotatable Connectors (IP66 rating)
- Insulation Class F
- 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
- 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 with 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.
- Output Options: Solid shaft
  Hollow
  Backlash free, wobble free bushings
  Metric or stainless shaft or quill

See web site for drawings.

"F" Series–Offset Helical ServoFit® Geared Motor Overview

Output Style + Housing Style + Servo Motor = Geared Motor Configurations



Style A
Hollow Output

Style V
Solid Output

Style W
Bushing Output

+

Style F
Round Flange

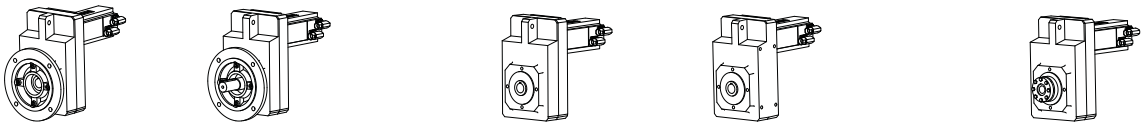
Style G
Tapped Holes

Style GN
Foot Mount

+

Servo Motor

Geared Motor Configurations



Style AF

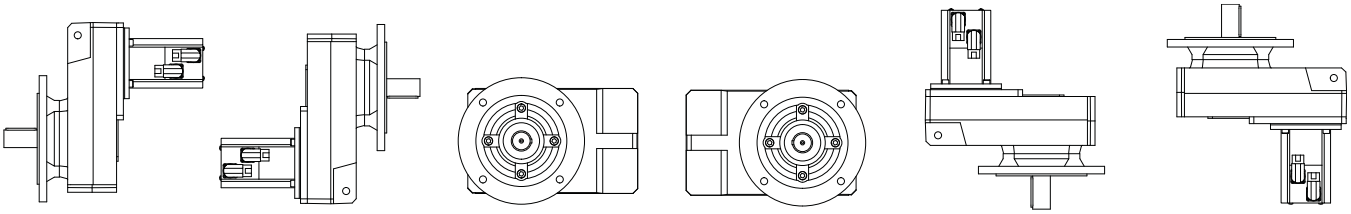
Style VF

Style AG

Style AGN

Style WG

Mounting Positions



EL1

EL2

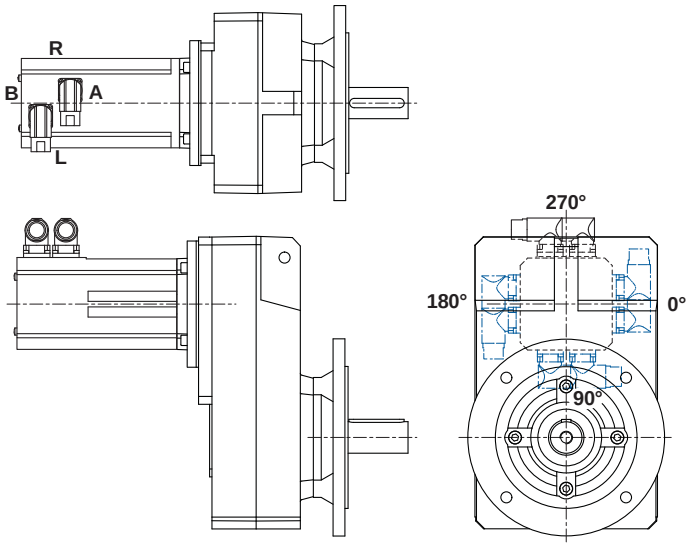
EL3

EL4

EL5

EL6

Cable Entry



Standard cable entry is terminal box side “L”.
This unit is shown: EL1, Cable Entry L, 270°.
Power and control connecters are both rotatable in any position.

"F" Series–Offset Helical ServoFit® Geared Motor Part No. Explanation

OPTIONS and REQUIRED INFORMATION

F 4 0 2 V F 0135 ED 5 0 3 U R O

- **OF**fset Helical
- Unit Size No.
- Design Generation
- No. of Stages (**2** = 2 Stage, determined by ratio)
- 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)
- HOUSING STYLE
  - "**F**" Housing Style – Flange Mounting
  - "**G**" Housing Style – Tapped Holes
  - "**GN**" Housing Style – Foot Mount
- Nominal Ratio: (**0135** = 13.5:1)
- Dynamic Series
- Motor Frame Size
- Generation Number
- Number of Magnet Stacks
- Self Ventilating
- Feedback
  - **R**esolver
  - **M**ultiturn Absolute Encoder Inductive
  - **S**ingleturn Absolute Encoder Inductive
- "**O**" Without Brake
  "**P**" Permanent Magnet Brake

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Mounting Position – EL1 EL2 EL3 EL4 EL5 EL6 (See Page 112.)

Specify – Cable Entry Side

Specify – Connector Location

[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: F**2**02/F**2**03)
- **W**obble **F**ree Single Side Bushing

W F N 2 – 103

- Output Bore in inches – **103** = $1^{3}/_{16}$
- Base Module Size example: F**2**02)
- **W**obble **F**ree – **N**o Covers – Double Side Bushing

"F" Series–Offset Helical ServoFit® Geared Motor Selection Data

F102_ED – 3000 RPM 480V Continued Next Page

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
F102_0043ED303U	696	4.3	56/13	50	5.6	200	22.6	260	29.4	3,500	3,000	6,000	2.11	11/8	58	6.5
F102_0043ED401U	696	4.3	56/13	87	9.9	396	44.8	495	55.9	3,500	3,000	6,000	2.92	11/8	58	6.5
F102_0043ED402U	696	4.3	56/13	169	19.1	396	44.8	495	55.9	3,500	3,000	6,000	4.02	11/8	58	6.5
F102_0043ED403U	696	4.3	56/13	220	24.8	396	44.8	495	55.9	3,500	3,000	6,000	5.11	11/8	58	6.5
F102_0043ED503U	696	4.3	56/13	281	31.8	746	84.3	932	105	3,500	3,000	6,000	9.76	11/8	58	6.5
F102_0043ED505U	696	4.3	56/13	444	50.1	746	84.3	932	105	3,500	3,000	6,000	14.74	11/8	58	6.5
F102_0065ED302U	464	6.5	84/13	54	6.1	217	24.6	370	41.8	3,500	3,000	6,000	1.20	11/8	58	6.5
F102_0065ED303U	464	6.5	84/13	75	8.5	296	33.4	370	41.8	3,500	3,000	6,000	1.36	11/8	58	6.5
F102_0065ED401U	464	6.5	84/13	131	14.8	563	63.6	704	79.5	3,500	3,000	6,000	2.17	11/8	58	6.5
F102_0065ED402U	464	6.5	84/13	253	28.6	563	63.6	704	79.5	3,500	3,000	6,000	3.27	11/8	58	6.5
F102_0065ED403U	464	6.5	84/13	330	37.2	563	63.6	704	79.5	3,500	3,000	6,000	4.36	11/8	58	6.5
F102_0065ED503U	464	6.5	84/13	422	47.6	929	105	1,325	150	3,500	3,000	6,000	9.01	11/8	58	6.5
F102_0072ED302U	419	7.2	322/45	60	6.8	241	27.2	403	45.5	3,700	3,600	6,000	1.08	11/8	58	6.5
F102_0072ED303U	419	7.2	322/45	83	9.4	322	36.4	403	45.5	3,700	3,600	6,000	1.24	11/8	58	6.5
F102_0072ED401U	419	7.2	322/45	145	16.4	613	69.2	766	86.6	3,700	3,600	6,000	2.04	11/8	58	6.5
F102_0072ED402U	419	7.2	322/45	280	31.7	613	69.2	766	86.6	3,700	3,600	6,000	3.14	11/8	58	6.5
F102_0072ED403U	419	7.2	322/45	365	41.2	613	69.2	766	86.6	3,700	3,600	6,000	4.24	11/8	58	6.5
F102_0072ED503U	419	7.2	322/45	467	52.8	929	105	1,442	163	3,700	3,600	6,000	8.88	11/8	58	6.5
F102_0089ED302U	335	8.9	1029/115	75	8.5	301	34.0	484	54.7	3,700	3,600	6,000	0.88	11/8	58	6.5
F102_0089ED303U	335	8.9	1029/115	104	11.7	387	43.7	484	54.7	3,700	3,600	6,000	1.04	11/8	58	6.5
F102_0089ED401U	335	8.9	1029/115	181	20.5	736	83.2	920	104	3,700	3,600	6,000	1.84	11/8	58	6.5
F102_0089ED402U	335	8.9	1029/115	350	39.6	736	83.2	920	104	3,700	3,600	6,000	2.95	11/8	58	6.5
F102_0089ED403U	335	8.9	1029/115	456	51.6	736	83.2	920	104	3,700	3,600	6,000	4.04	11/8	58	6.5
F102_0089ED503U	335	8.9	1029/115	584	66.0	929	105	1,733	196	3,700	3,600	6,000	8.69	11/8	58	6.5
F102_0110ED302U	275	10.9	273/25	92	10.4	367	41.5	570	64.4	4,000	4,000	6,000	0.75	11/8	58	6.5
F102_0110ED303U	275	10.9	273/25	127	14.3	456	51.5	570	64.4	4,000	4,000	6,000	0.92	11/8	58	6.5
F102_0110ED401U	275	10.9	273/25	221	25.0	868	98.0	1,084	123	4,000	4,000	6,000	1.72	11/8	58	6.5
F102_0110ED402U	275	10.9	273/25	427	48.3	868	98.0	1,084	123	4,000	4,000	6,000	2.82	11/8	58	6.5
F102_0110ED403U	275	10.9	273/25	557	62.9	868	98.0	1,084	123	4,000	4,000	6,000	3.92	11/8	58	6.5
F102_0135ED302U	221	13.6	231/17	114	12.9	457	51.7	681	77.0	4,000	4,000	6,000	0.66	11/8	58	6.5
F102_0135ED303U	221	13.6	231/17	157	17.8	545	61.6	681	77.0	4,000	4,000	6,000	0.82	11/8	58	6.5
F102_0135ED401U	221	13.6	231/17	275	31.1	929	105	1,296	146	4,000	4,000	6,000	1.63	11/8	58	6.5
F102_0135ED402U	221	13.6	231/17	532	60.1	929	105	1,296	146	4,000	4,000	6,000	2.73	11/8	58	6.5
F102_0185ED302U	163	18.5	1495/81	155	17.5	621	70.2	1,039	117	3,700	3,600	6,000	0.77	11/6	68	7.7
F102_0185ED303U	163	18.5	1495/81	214	24.2	831	93.9	1,039	117	3,700	3,600	6,000	0.94	11/6	68	7.7
F102_0185ED401U	163	18.5	1495/81	374	42.3	1,062	120	1,976	223	3,700	3,600	6,000	1.74	11/6	68	7.7
F102_0185ED402U	163	18.5	1495/81	723	81.6	1,062	120	1,976	223	3,700	3,600	6,000	2.84	11/6	68	7.7
F102_0230ED302U	130	23.1	3185/138	194	21.9	777	87.8	1,248	141	3,700	3,600	6,000	0.68	11/6	68	7.7
F102_0230ED303U	130	23.1	3185/138	267	30.2	998	113	1,248	141	3,700	3,600	6,000	0.85	11/6	68	7.7
F102_0230ED401U	130	23.1	3185/138	468	52.8	1,062	120	2,124	240	3,700	3,600	6,000	1.65	11/6	68	7.7

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

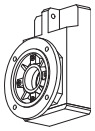
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"F" Series–Offset Helical ServoFit® Geared Motor Selection Data

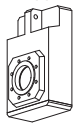
Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
F102_ED – 3000 RPM 480V Continued																
F102_0280ED302U	107	28.2	169/6	237	26.8	948	107	1,471	166	4,000	4,000	6,000	0.63	11/6	68	7.7
F102_0280ED303U	107	28.2	169/6	326	36.9	1,062	120	1,471	166	4,000	4,000	6,000	0.79	11/6	68	7.7
F102_0280ED401U	107	28.2	169/6	571	64.5	1,062	120	2,124	240	4,000	4,000	6,000	1.59	11/6	68	7.7
F102_0350ED302U	86	35.0	3575/102	295	33.3	1,062	120	1,757	199	4,000	4,000	6,000	0.58	11/6	68	7.7
F102_0350ED303U	86	35.0	3575/102	406	45.9	1,062	120	1,757	199	4,000	4,000	6,000	0.74	11/6	68	7.7
F102_0350ED401U	86	35.0	3575/102	710	80.2	1,062	120	2,124	240	4,000	4,000	6,000	1.54	11/6	68	7.7
F102_0460ED302U	65	46.4	325/7	391	44.1	1,062	120	2,124	240	4,000	4,000	6,000	0.53	11/6	68	7.7
F102_0460ED303U	65	46.4	325/7	538	60.8	1,062	120	2,124	240	4,000	4,000	6,000	0.69	11/6	68	7.7
F102_0560ED302U	54	56.0	2015/36	471	53.2	1,062	120	2,124	240	4,000	4,000	6,000	0.51	11/6	68	7.7
F102_0560ED303U	54	56.0	2015/36	649	73.3	1,062	120	2,124	240	4,000	4,000	6,000	0.67	11/6	68	7.7
F102_0700ED302U	43	70.1	1261/18	589	66.6	1,062	120	2,124	240	4,000	4,000	6,000	0.49	11/6	68	7.7

Housing Styles

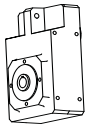
F – Round Flange



G – Tapped Holes



GN – Foot Mount



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

See Page 57 for required ordering information and part number example.

"F" Series–Offset Helical ServoFit® Geared Motor Selection Data

F202_ED – 3000 RPM 480V Continued Next Page

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
F202_0047ED401U	641	4.7	2616/559	95	10.7	451	51.0	564	63.7	3,100	2,600	5,000	5.47	11/8	138	15.6
F202_0047ED402U	641	4.7	2616/559	183	20.7	451	51.0	564	63.7	3,100	2,600	5,000	6.57	11/8	138	15.6
F202_0047ED403U	641	4.7	2616/559	239	27.0	451	51.0	564	63.7	3,100	2,600	5,000	7.66	11/8	138	15.6
F202_0047ED503U	641	4.7	2616/559	305	34.5	849	96.0	1,062	120	3,100	2,600	5,000	12.31	11/8	138	15.6
F202_0047ED505U	641	4.7	2616/559	482	54.5	849	96.0	1,062	120	3,100	2,600	5,000	17.29	11/8	138	15.6
F202_0047ED704U	641	4.7	2616/559	663	74.9	1,859	210	2,493	282	3,100	2,600	5,000	32.48	11/8	138	15.6
F202_0056ED503U	540	5.6	5341/962	362	40.9	995	112	1,243	140	3,100	2,600	5,000	11.28	11/8	138	15.6
F202_0056ED505U	540	5.6	5341/962	572	64.6	995	112	1,243	140	3,100	2,600	5,000	16.26	11/8	138	15.6
F202_0056ED704U	540	5.6	5341/962	786	88.9	1,859	210	2,919	330	3,100	2,600	5,000	31.45	11/8	138	15.6
F202_0072ED402U	419	7.2	5777/806	281	31.7	652	73.7	815	92.1	3,600	3,100	6,000	4.44	11/8	138	15.6
F202_0072ED403U	419	7.2	5777/806	365	41.3	652	73.7	815	92.1	3,600	3,100	6,000	5.54	11/8	138	15.6
F202_0072ED503U	419	7.2	5777/806	468	52.8	1,228	139	1,535	173	3,600	3,100	6,000	10.18	11/8	138	15.6
F202_0072ED505U	419	7.2	5777/806	738	83.4	1,228	139	1,535	173	3,600	3,100	6,000	15.17	11/8	138	15.6
F202_0072ED704U	419	7.2	5777/806	1,015	115	1,859	210	3,540	400	3,600	3,100	6,000	30.36	11/8	138	15.6
F202_0090ED303U	333	9.0	3161/351	104	11.8	416	47.0	520	58.8	3,600	3,100	6,000	1.91	11/8	138	15.6
F202_0090ED401U	333	9.0	3161/351	182	20.6	792	89.5	990	112	3,600	3,100	6,000	2.71	11/8	138	15.6
F202_0090ED402U	333	9.0	3161/351	353	39.8	792	89.5	990	112	3,600	3,100	6,000	3.81	11/8	138	15.6
F202_0090ED403U	333	9.0	3161/351	459	51.9	792	89.5	990	112	3,600	3,100	6,000	4.91	11/8	138	15.6
F202_0090ED503U	333	9.0	3161/351	588	66.4	1,491	168	1,864	211	3,600	3,100	6,000	9.55	11/8	138	15.6
F202_0090ED505U	333	9.0	3161/351	928	105	1,491	168	1,864	211	3,600	3,100	6,000	14.54	11/8	138	15.6
F202_0110ED402U	278	10.8	7303/676	423	47.8	916	104	1,146	129	3,800	3,500	6,000	3.46	11/8	138	15.6
F202_0110ED403U	278	10.8	7303/676	551	62.2	916	104	1,146	129	3,800	3,500	6,000	4.55	11/8	138	15.6
F202_0110ED503U	278	10.8	7303/676	705	79.6	1,726	195	2,157	244	3,800	3,500	6,000	9.20	11/8	138	15.6
F202_0110ED505U	278	10.8	7303/676	1,113	126	1,726	195	2,157	244	3,800	3,500	6,000	14.18	11/8	138	15.6
F202_0135ED402U	220	13.6	109/8	533	60.3	1,111	126	1,389	157	3,800	3,500	6,000	3.15	11/8	138	15.6
F202_0135ED403U	220	13.6	109/8	695	78.5	1,111	126	1,389	157	3,800	3,500	6,000	4.25	11/8	138	15.6
F202_0135ED503U	220	13.6	109/8	889	100	1,859	210	2,616	296	3,800	3,500	6,000	8.89	11/8	138	15.6
F202_0185ED402U	161	18.7	6360/341	730	82.5	1,698	192	2,122	240	3,600	3,100	6,000	3.43	11/6	159	17.9
F202_0185ED403U	161	18.7	6360/341	951	107	1,698	192	2,122	240	3,600	3,100	6,000	4.53	11/6	159	17.9
F202_0185ED503U	161	18.7	6360/341	1,217	137	2,390	270	3,996	451	3,600	3,100	6,000	9.17	11/6	159	17.9
F202_0230ED401U	128	23.4	2320/99	475	53.6	2,060	233	2,576	291	3,600	3,100	6,000	2.07	11/6	159	17.9
F202_0230ED402U	128	23.4	2320/99	917	104	2,060	233	2,576	291	3,600	3,100	6,000	3.17	11/6	159	17.9
F202_0230ED403U	128	23.4	2320/99	1,195	135	2,060	233	2,576	291	3,600	3,100	6,000	4.27	11/6	159	17.9
F202_0230ED503U	128	23.4	2320/99	1,529	173	2,390	270	4,248	480	3,600	3,100	6,000	8.91	11/6	159	17.9
F202_0280ED401U	107	28.1	4020/143	570	64.4	2,385	269	2,981	337	3,800	3,500	6,000	1.91	11/6	159	17.9
F202_0280ED402U	107	28.1	4020/143	1,100	124	2,385	269	2,981	337	3,800	3,500	6,000	3.01	11/6	159	17.9
F202_0280ED403U	107	28.1	4020/143	1,433	162	2,385	269	2,981	337	3,800	3,500	6,000	4.11	11/6	159	17.9
F202_0350ED401U	85	35.5	390/11	718	81.2	2,390	270	3,615	408	3,800	3,500	6,000	1.77	11/6	159	17.9
F202_0350ED402U	85	35.5	390/11	1,388	157	2,390	270	3,615	408	3,800	3,500	6,000	2.87	11/6	159	17.9
F202_0470ED302U	64	47.0	1035/22	396	44.7	1,583	179	2,385	269	4,000	3,900	6,000	0.68	11/6	159	17.9
F202_0470ED303U	64	47.0	1035/22	545	61.6	1,908	216	2,385	269	4,000	3,900	6,000	0.84	11/6	159	17.9
F202_0470ED401U	64	47.0	1035/22	953	108	2,390	270	4,248	480	4,000	3,900	6,000	1.64	11/6	159	17.9

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

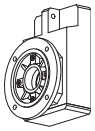
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"F" Series–Offset Helical ServoFit® Geared Motor Selection Data

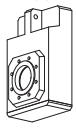
Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
F202_ED – 3000 RPM 480V Continued																
F202_0570ED302U	53	56.7	624/11	477	53.9	1,909	216	2,756	311	4,000	3,900	6,000	0.62	11/6	159	17.9
F202_0570ED303U	53	56.7	624/11	657	74.3	2,205	249	2,756	311	4,000	3,900	6,000	0.78	11/6	159	17.9
F202_0570ED401U	53	56.7	624/11	1,149	130	2,390	270	4,248	480	4,000	3,900	6,000	1.58	11/6	159	17.9
F202_0700ED302U	43	70.1	5400/77	590	66.7	2,360	267	3,252	367	4,000	3,900	6,000	0.56	11/6	159	17.9
F202_0700ED303U	43	70.1	5400/77	813	91.8	2,390	270	3,252	367	4,000	3,900	6,000	0.73	11/6	159	17.9
F202_0700ED401U	43	70.1	5400/77	1,421	161	2,390	270	4,248	480	4,000	3,900	6,000	1.53	11/6	159	17.9
F202_0940ED302U	32	93.8	1032/11	789	89.2	2,390	270	4,090	462	4,000	3,900	6,000	0.52	11/6	159	17.9
F202_0940ED303U	32	93.8	1032/11	1,087	123	2,390	270	4,090	462	4,000	3,900	6,000	0.68	11/6	159	17.9
F202_1130ED302U	27	112.7	1240/11	948	107	2,390	270	4,248	480	4,000	3,900	6,000	0.50	11/6	159	17.9
F202_1130ED303U	27	112.7	1240/11	1,306	148	2,390	270	4,248	480	4,000	3,900	6,000	0.66	11/6	159	17.9
F202_1410ED302U	21	140.9	1550/11	1,185	134	2,390	270	4,248	480	4,000	3,900	6,000	0.48	11/6	159	17.9
F203_ED – 3000 RPM 480V																
F203_1840ED302U	16	184.3	16215/88	1,528	173	2,390	270	4,248	480	4,000	3,900	6,000	0.50	11/7	159	17.9

Housing Styles

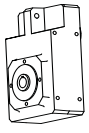
F – Round Flange



G – Tapped Holes



GN – Foot Mount



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

See Page 57 for required ordering information and part number example.

See web site for drawings.

"F" Series–Offset Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
F302_ED – 3000 RPM 480V																
F302_0046ED503U	646	4.6	4992/1075	303	34.2	877	99.1	1,096	124	3,000	2,600	4,500	16.41	11/8	180	20.4
F302_0046ED505U	646	4.6	4992/1075	478	54.1	877	99.1	1,096	124	3,000	2,600	4,500	21.40	11/8	180	20.4
F302_0046ED704U	646	4.6	4992/1075	658	74.3	2,059	233	2,574	291	3,000	2,600	4,500	36.59	11/8	180	20.4
F302_0057ED704U	524	5.7	143/25	810	91.5	2,453	277	3,066	346	3,000	2,600	4,500	34.14	11/8	180	20.4
F302_0072ED505U	418	7.2	208/29	739	83.5	1,273	144	1,592	180	3,500	3,100	5,000	17.10	11/8	180	20.4
F302_0072ED704U	418	7.2	208/29	1,016	115	2,990	338	3,737	422	3,500	3,100	5,000	32.29	11/8	180	20.4
F302_0090ED505U	334	9.0	5616/625	926	105	1,537	174	1,922	217	3,500	3,100	5,000	15.86	11/8	180	20.4
F302_0090ED704U	334	9.0	5616/625	1,273	144	3,098	350	4,512	510	3,500	3,100	5,000	31.05	11/8	180	20.4
F302_0110ED503U	278	10.8	1456/135	704	79.5	1,779	201	2,224	251	3,700	3,500	5,500	10.14	11/8	180	20.4
F302_0110ED505U	278	10.8	1456/135	1,111	126	1,779	201	2,224	251	3,700	3,500	5,500	15.13	11/8	180	20.4
F302_0110ED704U	278	10.8	1456/135	1,528	173	3,098	350	5,221	590	3,700	3,500	5,500	30.32	11/8	180	20.4
F302_0135ED403U	224	13.4	7696/575	682	77.1	1,126	127	1,408	159	3,700	3,500	5,500	4.92	11/8	180	20.4
F302_0135ED503U	224	13.4	7696/575	873	98.7	2,121	240	2,651	300	3,700	3,500	5,500	9.56	11/8	180	20.4
F302_0135ED505U	224	13.4	7696/575	1,379	156	2,121	240	2,651	300	3,700	3,500	5,500	14.55	11/8	180	20.4
F302_0135ED704U	224	13.4	7696/575	1,896	214	3,098	350	5,753	650	3,700	3,500	5,500	29.74	11/8	180	20.4
F302_0190ED503U	160	18.8	4900/261	1,225	138	3,333	377	4,167	471	3,500	3,100	5,000	10.15	11/6	193	21.8
F302_0190ED505U	160	18.8	4900/261	1,934	219	3,333	377	4,167	471	3,500	3,100	5,000	15.13	11/6	193	21.8
F302_0240ED503U	128	23.5	588/25	1,534	173	3,983	450	5,030	568	3,500	3,100	5,000	9.62	11/6	193	21.8
F302_0240ED505U	128	23.5	588/25	2,423	274	3,983	450	5,030	568	3,500	3,100	5,000	14.61	11/6	193	21.8
F302_0280ED503U	106	28.2	6860/243	1,842	208	3,983	450	5,821	658	3,700	3,500	5,500	9.28	11/6	193	21.8
F302_0350ED402U	86	35.0	7252/207	1,371	155	2,948	333	3,685	416	3,700	3,500	5,500	3.26	11/6	193	21.8
F302_0350ED403U	86	35.0	7252/207	1,786	202	2,948	333	3,685	416	3,700	3,500	5,500	4.35	11/6	193	21.8
F302_0350ED503U	86	35.0	7252/207	2,286	258	3,983	450	6,940	784	3,700	3,500	5,500	9.00	11/6	193	21.8
F302_0470ED402U	64	47.2	1274/27	1,847	209	3,735	422	4,669	528	4,000	3,900	6,000	2.99	11/6	193	21.8
F302_0470ED403U	64	47.2	1274/27	2,406	272	3,735	422	4,669	528	4,000	3,900	6,000	4.08	11/6	193	21.8
F302_0560ED303U	53	56.5	4067/72	655	74.0	2,275	257	2,843	321	4,000	3,900	6,000	0.97	11/6	193	21.8
F302_0560ED401U	53	56.5	4067/72	1,144	129	3,983	450	5,409	611	4,000	3,900	6,000	1.77	11/6	193	21.8
F302_0560ED402U	53	56.5	4067/72	2,211	250	3,983	450	5,409	611	4,000	3,900	6,000	2.87	11/6	193	21.8
F302_0700ED401U	43	70.4	2744/39	1,425	161	3,983	450	6,396	723	4,000	3,900	6,000	1.66	11/6	193	21.8
F302_0700ED402U	43	70.4	2744/39	2,754	311	3,983	450	6,396	723	4,000	3,900	6,000	2.76	11/6	193	21.8
F302_0940ED303U	32	93.6	4214/45	1,085	123	3,364	380	4,205	475	4,000	3,900	6,000	0.76	11/6	193	21.8
F302_0940ED401U	32	93.6	4214/45	1,897	214	3,983	450	7,080	800	4,000	3,900	6,000	1.57	11/6	193	21.8
F302_1130ED303U	27	112.8	3724/33	1,308	148	3,902	441	4,877	551	4,000	3,900	6,000	0.72	11/6	193	21.8
F302_1130ED401U	27	112.8	3724/33	2,286	258	3,983	450	7,080	800	4,000	3,900	6,000	1.52	11/6	193	21.8
F302_1410ED303U	21	140.6	7595/54	1,630	184	3,983	450	5,766	652	4,000	3,900	6,000	0.68	11/6	193	21.821.8
F303_ED – 3000 RPM 480V																
F303_1850ED303U	16	184.8	29939/162	2,111	239	3,983	450	7,080	800	4,000	3,900	6,000	0.68	11/7	193	21.8
F303_2210ED303U	14	221.2	191149/864	2,527	286	3,983	450	7,080	800	4,000	3,900	6,000	0.67	11/7	193	21.8

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

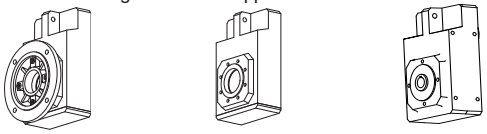
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"F" Series–Offset Helical ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
F402_ED – 3000 RPM 480V																
F402_0047ED505U	641	4.7	1408/301	482	54.5	914	103	1,142	129	2,700	2,300	4,000	28.06	10/7	342	38.7
F402_0047ED704U	641	4.7	1408/301	663	74.9	2,145	242	2,681	303	2,700	2,300	4,000	43.25	10/7	342	38.7
F402_0058ED704U	516	5.8	3784/651	823	93.0	2,588	292	3,236	366	2,700	2,300	4,000	38.62	10/7	342	38.7
F402_0072ED704U	417	7.2	605/84	1,020	115	3,088	349	3,861	436	3,200	2,800	4,500	35.37	10/7	342	38.7
F402_0090ED704U	334	9.0	440/49	1,272	144	3,724	421	4,656	526	3,200	2,800	4,500	33.17	10/7	342	38.7
F402_0110ED704U	277	10.8	682/63	1,533	173	4,320	488	5,400	610	3,500	3,100	5,000	31.87	10/7	342	38.7
F402_0135ED505U	221	13.6	5984/441	1,398	158	2,231	252	2,788	315	3,500	3,100	5,000	15.57	10/7	342	38.7
F402_0135ED704U	221	13.6	5984/441	1,922	217	4,868	550	6,547	740	3,500	3,100	5,000	30.76	10/7	342	38.7
F402_0185ED704U	161	18.6	3575/192	2,637	298	6,195	700	9,981	1,128	3,200	2,800	4,500	31.70	10/5	342	38.7
F402_0230ED704U	129	23.2	325/14	3,288	372	6,195	700	12,035	1,360	3,200	2,800	4,500	30.81	10/5	342	38.7
F402_0280ED704U	107	28.0	2015/72	3,964	448	6,195	700	12,390	1,400	3,500	3,100	5,000	30.25	10/5	342	38.7
F402_0350ED503U	86	35.1	2210/63	2,289	259	5,767	652	7,209	815	3,500	3,100	5,000	9.55	10/5	342	38.7
F402_0350ED505U	86	35.1	2210/63	3,614	408	5,767	652	7,209	815	3,500	3,100	5,000	14.54	10/5	342	38.7
F402_0470ED503U	64	46.9	845/18	3,063	346	6,195	700	9,059	1,024	3,800	3,500	5,500	9.07	10/5	342	38.7
F402_0560ED503U	54	56.0	2015/36	3,652	413	6,195	700	10,428	1,178	3,800	3,500	5,500	8.87	10/5	342	38.7
F602_ED – 3000 RPM 480V																
F602_0135ED704U	220	13.6	871/64	1,928	218	5,411	611	6,764	764	3,300	2,800	4,500	33.79	10/7	644	72.7
F602_0230ED704U	129	23.3	1885/81	3,296	372	9,735	1,100	12,467	1,409	2,900	2,500	4,000	33.86	10/5	685	77.4
F602_0280ED704U	107	28.0	2015/72	3,964	448	9,735	1,100	14,558	1,645	3,300	2,800	4,500	32.59	10/5	685	77.4
F602_0350ED704U	85	35.2	845/24	4,987	564	9,735	1,100	17,498	1,977	3,300	2,800	4,500	31.40	10/5	685	77.4
F602_0560ED503U	54	55.7	390/7	3,635	411	8,630	975	10,788	1,219	3,500	3,200	5,000	9.72	10/5	685	77.4
F602_0700ED503U	43	69.6	975/14	4,544	513	9,735	1,100	12,841	1,451	3,500	3,200	5,000	9.27	10/5	685	77.4
F602_0930ED503U	32	93.3	280/3	6,089	688	9,735	1,100	16,090	1,818	3,500	3,200	5,000	8.87	10/5	685	77.4

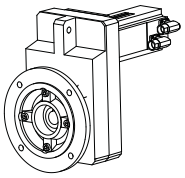
Housing Styles

F – Round Flange **G** – Tapped Holes **GN** – Foot Mount



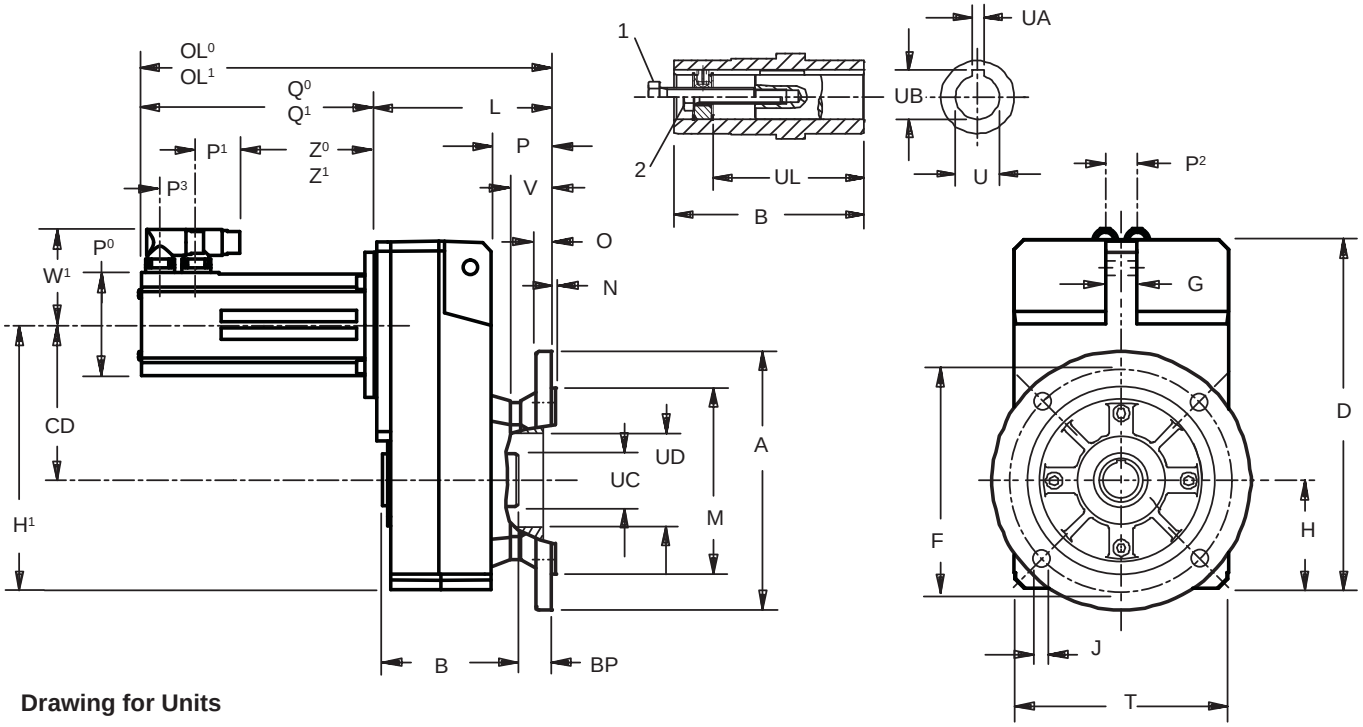
The "F" Housing Style is available as Hollow (A) or Solid (V) Output.
"G" style is Hollow (A) or Bushing (W).

See Page 57 for required ordering information and part number example.



ServoFit® Geared Motor – "F" Series
Round Flange – "F" Housing
Hollow Output – Dimensional Data

See Page 104 for installation of hollow ouput.



Drawing for Units
F102AF — F602AF

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	6.65	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	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. 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	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	1.500	.375	1.67	40H7	12JS9	43.3
F602	2.000	.500	2.23	40H7	14JS9	53.8

Part No. Example

F402AF0350ED503URO

Offset Helical ServoFit® Geared Motor
Hollow Output, Flange Mounting,
Dynamic Series, Self Ventilated,
Resolver, Without Brake

See Page 57 for details of Part Number.

ServoFit® Geared Motor – "F" Series
Round Flange – “F” Housing
Hollow Output – Dimensional Data

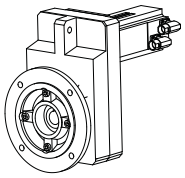


Table No. 3 "F" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

Unit	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
F102	13.5	29.7	14.0	30.8	15.1	33.3	16.7	36.9	18.3	40.3	20.9	46.0	25.3	55.8	—	—
F202	21.7	47.8	22.2	48.9	23.3	51.4	24.9	54.9	26.5	58.4	29.1	64.1	33.5	73.9	38.7	85.4
F203	24.6	54.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F302	—	—	29.8	65.6	30.9	68.1	32.5	71.7	34.1	75.1	36.7	80.8	41.1	90.6	46.3	102.1
F303	—	—	34.7	76.4	—	—	—	—	—	—	—	—	—	—	—	—
F402	—	—	—	—	—	—	—	—	—	—	45.0	99.1	49.4	108.9	54.6	120.4
F602	—	—	—	—	—	—	—	—	—	—	72.0	158.7	—	—	81.6	180.0

Table No. 4 "F" Series – ServoFit® Geared Motor – Dimensions (mm/inches)

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	129.5 5.10	287.5 11.32	299.5 11.79	129.5 5.10	305.5 12.03	317.5 12.50	129.5 5.10	284.5 11.20	330.5 13.01	129.5 5.10	319.5 12.58	365.5 14.39	129.5 5.10	354.5 13.96	400.5 15.77
F202	153 6.02	311 12.24	323 12.72	153 6.02	329 12.95	341 13.43	153 6.02	308 12.13	354 13.94	153 6.02	343 13.50	389 15.31	153 6.02	378 14.88	424 16.69
F203	190.0 7.48	348 13.70	360 14.17	—	—	—	—	—	—	—	—	—	—	—	—
F302	169.5 6.67	327.5 12.89	339.5 13.37	169.5 6.67	345.5 13.60	357.5 14.07	169.5 6.67	324.5 12.78	370.5 14.59	169.5 6.67	359.5 14.15	405.5 15.96	169.5 6.67	394.5 15.53	440.5 17.34
F303	—	—	—	206.5 8.13	382.5 15.06	394.5 15.53	—	—	—	—	—	—	—	—	—

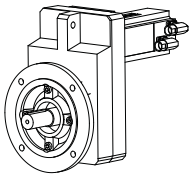
Unit	ED503			ED505			ED704		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	133.5 5.26	360.5 14.19	411.5 16.20	133.5 5.26	430.5 16.95	481.5 18.96	—	—	—
F202	157 6.18	384 15.12	435 17.13	157 6.18	454 17.87	505 19.88	159 6.26	444.5 17.50	508 20.00
F302	173.5 6.83	376.5 14.82	451.5 17.78	173.5 6.83	470.5 18.52	521.5 20.53	175.5 6.91	461 18.15	524.5 20.65
F402	188.5 7.42	400.5 15.77	466.5 18.37	188.5 7.42	485.5 19.11	536.5 21.12	190.5 7.50	476 18.74	539.5 21.24
F602	219.5 8.64	446.5 17.58	497.5 19.59	—	—	—	221.5 8.72	507 19.96	570.50 22.46

Table No. 5 Dimensions (mm/inches)

Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

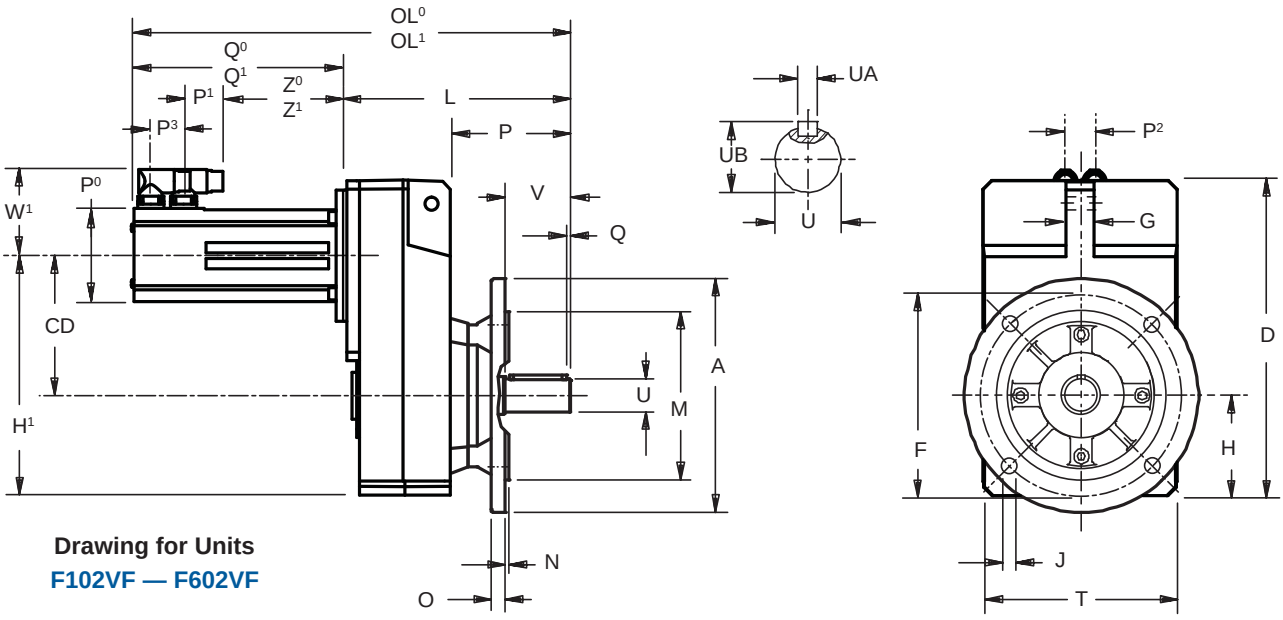
Q^0, Z^0, and OL^0 are dimensions without a brake.
Q^1, Z^1, and OL^1 are dimensions with a brake.

See web site for drawings.



ServoFit® Geared Motor – "F" Series
Round Flange – "F" Housing
Shaft Output – Dimensional Data

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



Drawing for Units
F102VF — F602VF

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	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	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

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

Base Module	Standard Shaft - inches			Optional Shaft - mm		
	U	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	1.625	3/8 × 3/8 × 2 7/8	1.79	40k6	A12x8X70	43
F602	2.125	1/2 × 1/2 × 3 5/32	2.35	50k6	A14x9X90	53.5

Part No. Example

F402AF0350ED503URO

Offset Helical ServoFit® Geared Motor
Hollow Output, Flange Mounting,
Dynamic Series, Self Ventilated,
Resolver, Without Brake

See Page 57 for details of Part Number.

ServoFit® Geared Motor – "F" Series
Round Flange – "F" Housing
Shaft Output – Dimensional Data

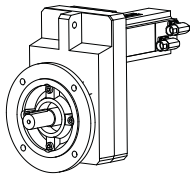


Table No. 3 "F" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

Unit	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
F102	13.5	29.7	14.0	30.8	15.1	33.3	16.7	36.9	18.3	40.3	20.9	46.0	25.3	55.8	—	—
F202	21.7	47.8	22.2	48.9	23.3	51.4	24.9	54.9	26.5	58.4	29.1	64.1	33.5	73.9	38.7	85.4
F203	24.6	54.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F302	—	—	29.8	65.6	30.9	68.1	32.5	71.7	34.1	75.1	36.7	80.8	41.1	90.6	46.3	102.1
F303	—	—	34.7	76.4	—	—	—	—	—	—	—	—	—	—	—	—
F402	—	—	—	—	—	—	—	—	—	—	45.0	99.1	49.4	108.9	54.6	120.4
F602	—	—	—	—	—	—	—	—	—	—	72.0	158.7	—	—	81.6	180.0

Table No. 4 "F" Series – ServoFit® Geared Motor – Dimensions (mm/inches)

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	179.5 7.07	337.5 13.29	349.5 13.76	179.5 7.07	355.5 14.00	367.5 14.47	179.5 7.07	334.5 13.17	380.5 14.98	179.5 7.07	369.5 14.55	415.5 16.36	179.5 7.07	404.5 15.93	450.5 17.74
F202	213 8.39	371 14.61	383 15.08	213 8.39	389 15.31	401 15.79	213 8.39	368 14.49	414 16.30	213 8.39	403 15.87	449 17.68	213 8.39	438 17.24	484 19.06
F203	190.0 7.48	348 13.70	360 14.17	—	—	—	—	—	—	—	—	—	—	—	—
F302	239.5 9.43	397.5 15.65	409.5 16.12	239.5 9.43	415.5 16.36	427.5 16.83	239.5 9.43	394.5 15.53	440.5 17.34	239.5 9.43	429.5 16.91	475.5 18.72	239.5 9.43	464.5 18.29	510.5 20.10
F303	—	—	—	276.5 10.89	452.5 17.81	464.5 18.29	—	—	—	—	—	—	—	—	—

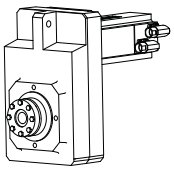
Unit	ED503			ED505			ED704		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	183.5 7.22	410.5 16.16	461.5 18.17	183.5 7.22	480.5 18.92	531.5 20.93	—	—	—
F202	217 8.54	420 16.54	495 19.49	217 8.54	514 20.24	565 22.24	219 8.62	504.5 19.86	568 22.36
F302	243.5 9.59	444 17.48	521.5 20.53	243.5 9.59	540.5 21.28	591.5 23.29	245.5 9.67	531 20.91	594.5 23.41
F402	268.5 10.57	495.5 19.51	546.5 21.52	268.5 10.57	565.5 22.26	616.5 24.27	270.5 10.65	556 21.89	619.5 24.39
F602	319.5 12.58	546.5 21.52	597.5 23.52	—	—	—	321.5 12.66	607 23.90	670.5 26.40

Table No. 5 Dimensions (mm/inches)

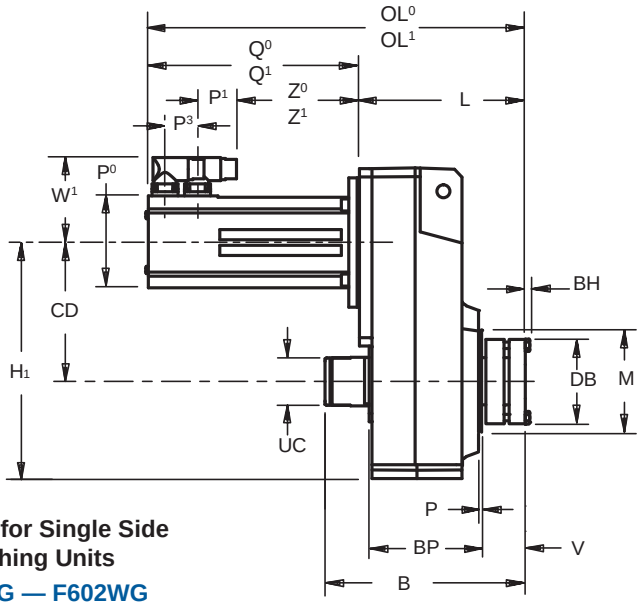
Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

Q^0, Z^0, and OL^0 are dimensions without a brake.
Q^1, Z^1, and OL^1 are dimensions with a brake.

See web site for drawings.

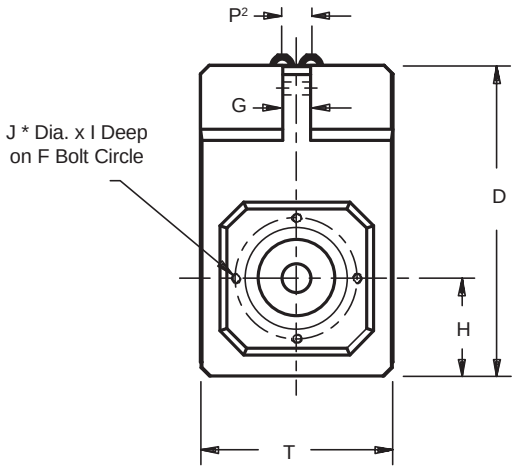


ServoFit® Geared Motor – "F" Series
Tapped Hole – "G" Housing
Single Bushing – Dimensional Data



Drawing for Single Side Bushing Units

F102WG — F602WG



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	H1	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	3.54	.79	2.91	6.93	.51	M8	2.953	.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	6.65	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	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 has 8 tapped holes instead of 4 as shown on drawing.

Table No. 2 "WF" Single Side Bushings – Inches

Base Module	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	WF1-075	—	—	—	—	—	—	—	—	—	—	—	—
F202/F203	—	WF2-100	WF2-103	—	—	—	—	—	—	—	—	—	—
F302/F303	—	WF3-100	WF3-103	WF3-104	WF3-106	WF3-107	WF3-108	—	—	—	—	—	—
F402	—	WF4-100	WF4-103	WF4-104	WF4-106	WF4-107	WF4-108	—	—	—	—	—	—
F602	—	—	—	—	—	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.

Table No. 3 "WF" Bushing Single Side without Covers – Metric

Unit	Stock Bores Sizes 20	30	35
F102	WF1-20	—	—
F202	—	WF2-30	—
F302	—	WF3-30	WF3-35

Part No. Example

F402WG0350ED503URO WF4-107

Offset Helical ServoFit® Geared Motor
Single Side Bushing (Bore must be specified)
Dynamic Series, Self Ventilated, Resolver,
Without Brake

See Page 57 for details of Part Number.

ServoFit® Geared Motor – "F" Series
Tapped Hole – "G" Housing
Single Bushing – Dimensional Data

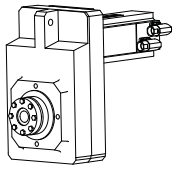


Table No. 4 "F" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

Unit	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
F102	13.5	29.7	14.0	30.8	15.1	33.3	16.7	36.9	18.3	40.3	20.9	46.0	25.3	55.8	—	—
F202	21.7	47.8	22.2	48.9	23.3	51.4	24.9	54.9	26.5	58.4	29.1	64.1	33.5	73.9	38.7	85.4
F203	24.6	54.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F302	—	—	29.8	65.6	30.9	68.1	32.5	71.7	34.1	75.1	36.7	80.8	41.1	90.6	46.3	102.1
F303	—	—	34.7	76.4	—	—	—	—	—	—	—	—	—	—	—	—
F402	—	—	—	—	—	—	—	—	—	—	45.0	99.1	49.4	108.9	54.6	120.4
F602	—	—	—	—	—	—	—	—	—	—	72.0	158.7	—	—	81.6	180.0

Table No. 5 "F" Series – ServoFit® Geared Motor – Dimensions (mm/inches)

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	180 7.09	338 13.31	350 13.78	180 7.09	356 14.02	368 14.49	180 7.09	335 13.19	381 15.00	180 7.09	370 14.57	416 16.38	180 7.09	405 15.94	451 17.76
F202	213 8.39	371 14.61	383 15.08	213 8.39	389 15.31	401 15.79	213 8.39	368 14.49	414 16.30	213 8.39	403 15.87	449 17.68	213 8.39	438 17.24	484 19.06
F203	250 9.84	408 16.06	420 16.54	—	—	—	—	—	—	—	—	—	—	—	—
F302	240 9.45	398 15.67	410 16.14	240 9.45	416 16.38	428 16.85	240 9.45	395 15.55	441 17.36	240 9.45	430 16.93	476 18.74	240 9.45	465 18.31	511 20.12
F303	—	—	—	277 10.91	453 17.83	465 18.31	—	—	—	—	—	—	—	—	—

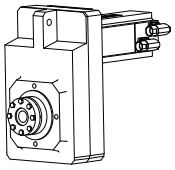
Unit	ED503			ED505			ED704		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	184 7.24	411 16.18	462 18.19	184 7.24	481 18.94	532 20.94	—	—	—
F202	217 8.54	444 17.48	495 19.49	217 8.54	514 20.24	565 22.24	219 8.62	504.5 19.86	568 22.36
F302	244 9.61	471 18.54	522 20.55	244 9.61	541 21.30	592 23.31	246 9.69	531.5 20.93	595 23.43
F402	269 10.59	496 19.53	547 21.54	269 10.59	566 22.28	617 24.29	271 10.67	556.5 21.91	620 24.41
F602	320 12.60	547 21.54	598 23.54	—	—	—	322 12.68	607.5 23.92	671 26.42

Table No. 6 Dimensions (mm/inches)

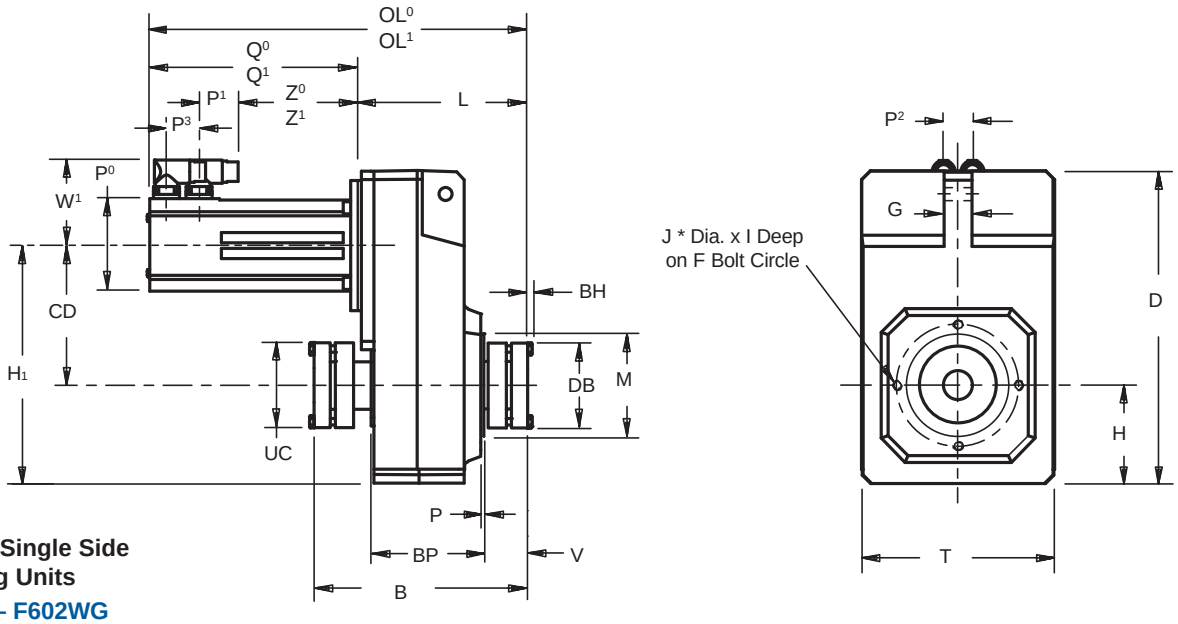
Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

Q^0, Z^0, and OL^0 are dimensions without a brake.
Q^1, Z^1, and OL^1 are dimensions with a brake.

See web site for drawings.



ServoFit® Geared Motor – "F" Series
Tapped Hole – "G" Housing
Double Bushing – Dimensional Data



Drawing for Single 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 or F303.

Table No. 1 "F" Series – Double 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	Bushing Capscrews No.– Size Metric	Tight. Torque in.lbs	Tight. Torque Nm
F102	4.02	6.73	9.37	3.54	.79	2.91	6.93	.51	M8	2.953	.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. 4 "WFN" Double Side Bushings without Covers – Inches

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.

Table No. 5 "WFN" Bushing Double Side without Covers – Metric

Unit	Stock Bores Sizes 20	30	35	40
F102	WFN1-20	—	—	—
F202	—	WFN2-30	—	—
F302	—	WFN3-30	WFN3-35	—
F402	—	—	—	WFN4-40
F602	—	—	—	WFN5-40

NOTE: F6 units use a WFN5 Bushing Kit.

Part No. Example

F402WG0350ED503URO WFN4-107

Offset Helical ServoFit® Geared Motor
Double Side Bushing (Bore must be specified.)
Dynamic Series, Self Ventilated, Resolver,
Without Brake

See Page 57 for details of Part Number.

ServoFit® Geared Motor – "F" Series
Tapped Hole – "G" Housing
Double Bushing – Dimensional Data

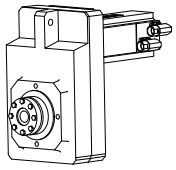


Table No. 4 "F" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

Unit	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
F102	13.5	29.7	14.0	30.8	15.1	33.3	16.7	36.9	18.3	40.3	20.9	46.0	25.3	55.8	—	—
F202	21.7	47.8	22.2	48.9	23.3	51.4	24.9	54.9	26.5	58.4	29.1	64.1	33.5	73.9	38.7	85.4
F203	24.6	54.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F302	—	—	29.8	65.6	30.9	68.1	32.5	71.7	34.1	75.1	36.7	80.8	41.1	90.6	46.3	102.1
F303	—	—	34.7	76.4	—	—	—	—	—	—	—	—	—	—	—	—
F402	—	—	—	—	—	—	—	—	—	—	45.0	99.1	49.4	108.9	54.6	120.4
F602	—	—	—	—	—	—	—	—	—	—	72.0	158.7	—	—	81.6	180.0

Table No. 5 "F" Series – ServoFit® Geared Motor – Dimensions (mm/inches)

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	180 7.09	338 13.31	350 13.78	180 7.09	346 13.62	368 14.49	180 7.09	335 13.19	381 15.00	180 7.09	370 14.57	416 16.38	180 7.09	405 15.94	451 17.76
F202	213 8.39	371 14.61	383 15.08	213 8.39	389 15.31	401 15.79	213 8.39	368 14.49	414 16.30	213 8.39	403 15.87	449 17.68	213 8.39	438 17.24	484 19.06
F203	250 9.84	408 16.06	420 16.54	—	—	—	—	—	—	—	—	—	—	—	—
F302	240 9.45	398 15.67	410 16.14	240 9.45	416 16.38	428 16.85	240 9.45	395 15.55	441 17.36	240 9.45	430 16.93	476 18.74	240 9.45	448 18.31	511 20.12
F303	—	—	—	277 10.91	453 17.83	465 18.31	—	—	—	—	—	—	—	—	—

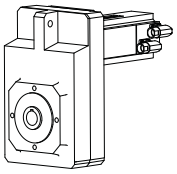
Unit	ED503			ED505			ED704		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	184 7.24	411 16.18	462 18.19	184 7.24	481 18.94	532 20.94	—	—	—
F202	217 8.54	444 17.48	495 19.49	217 8.54	514 20.24	565 22.24	219 8.62	504.5 19.86	568 22.36
F302	244 9.61	471 18.54	522 20.55	244 9.61	541 21.30	592 23.31	246 9.69	531.5 20.93	595 23.43
F402	269 10.59	469 19.53	547 21.54	269 10.59	566 22.28	617 24.29	271 10.67	556.5 21.91	620 24.41
F602	320 12.60	547 21.54	598 23.54	—	—	—	322 12.68	607.5 23.92	671 26.42

Table No. 6 Dimensions (mm/inches)

Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

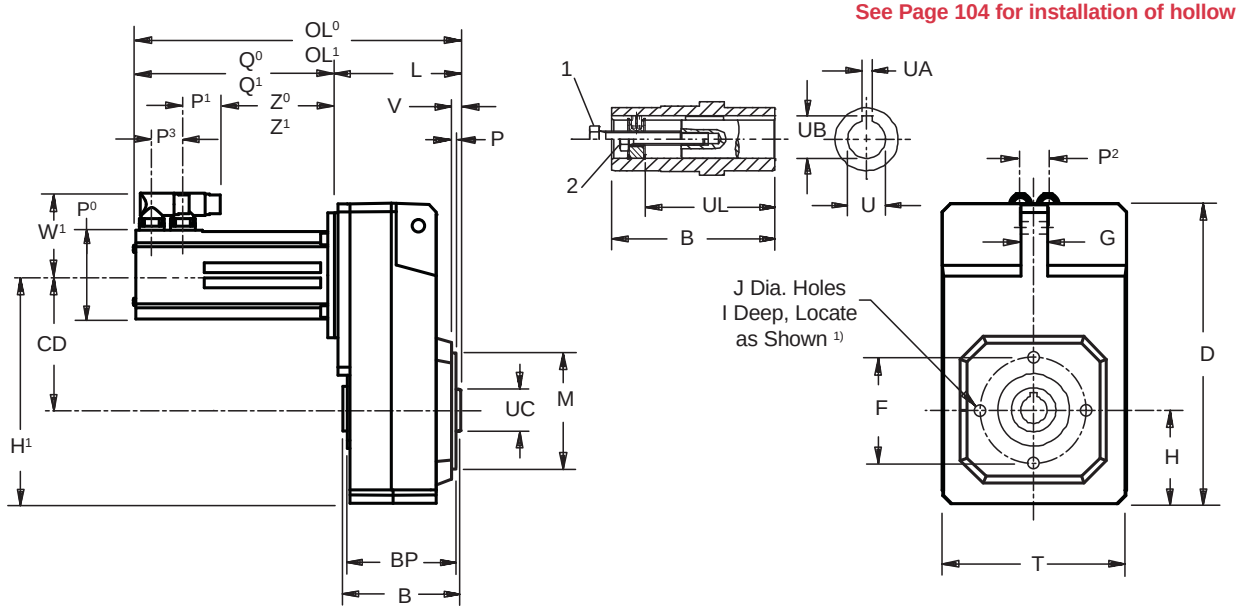
Q^0, Z^0, and OL^0 are dimensions without a brake.
Q^1, Z^1, and OL^1 are dimensions with a brake.

See web site for drawings.



ServoFit® Geared Motor – "F" Series
Tapped Hole – "G" Housing
Hollow Output – Dimensional Data

See Page 104 for installation of hollow ouput.



Drawing for Units
F102AG — F602AG

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	6.65	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	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 has 8 tapped holes located 22.5° from horizontal instead of 4 as shown on drawing.
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	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	1.500	.375	1.67	40H7	12JS9	43.3
F602	2.000	.500	2.23	40H7	14JS9	53.8

Part No. Example

F402AG0350ED503URO

Offset Helical ServoFit® Geared Motor
Hollow Output, Tapped Hole Housing
Dynamic Series, Self Ventilated, Resolver,
Without Brake

See Page 57 for details of Part Number.

ServoFit® Geared Motor – "F" Series
Tapped Hole – "G" Housing
Hollow Output – Dimensional Data

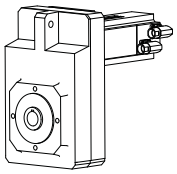


Table No. 4 "F" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

Unit	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
F102	13.5	29.7	14.0	30.8	15.1	33.3	16.7	36.9	18.3	40.3	20.9	46.0	25.3	55.8	—	—
F202	21.7	47.8	22.2	48.9	23.3	51.4	24.9	54.9	26.5	58.4	29.1	64.1	33.5	73.9	38.7	85.4
F203	24.6	54.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F302	—	—	29.8	65.6	30.9	68.1	32.5	71.7	34.1	75.1	36.7	80.8	41.1	90.6	46.3	102.1
F303	—	—	34.7	76.4	—	—	—	—	—	—	—	—	—	—	—	—
F402	—	—	—	—	—	—	—	—	—	—	45.0	99.1	49.4	108.9	54.6	120.4
F602	—	—	—	—	—	—	—	—	—	—	72.0	158.7	—	—	81.6	180.0

Table No. 5 "F" Series – ServoFit® Geared Motor – Dimensions (mm/inches)

Unit	ED302			ED303			ED401			ED402			ED403		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	104 4.09	262 10.31	274 10.79	104 4.09	280 11.02	292 11.50	104 4.09	259 10.20	305 12.01	104 4.09	294 11.57	340 13.39	104 4.09	329 12.95	375 14.76
F202	123 4.84	281 11.06	293 11.54	123 4.84	299 11.77	311 12.24	123 4.84	278 10.94	324 12.76	123 4.84	313 12.32	359 14.13	123 4.84	348 13.70	394 15.51
F203	160 6.30	318 12.52	330 12.99	—	—	—	—	—	—	—	—	—	—	—	—
F302	138 5.43	296 11.65	308 12.13	138 5.43	314 12.36	326 12.83	138 5.43	293 11.54	339 13.35	138 5.43	328 12.91	374 14.72	138 5.43	363 14.29	409 16.10
F303	—	—	—	175 6.89	351 13.82	363 14.29	—	—	—	—	—	—	—	—	—

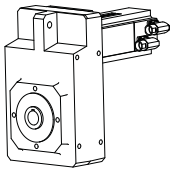
Unit	ED503			ED505			ED704		
	L	OL^0	OL^1	L	OL^0	OL^1	L	OL^0	OL^1
F102	108 4.25	335 13.19	386 15.20	108 4.25	405 15.94	456 17.95	—	—	—
F202	127 5.00	354 13.94	405 15.94	127 5.00	424 16.69	475 18.70	129 5.08	414.5 16.32	478 18.82
F302	142 5.59	369 14.53	420 16.54	142 5.59	439 17.28	490 19.29	144 5.67	429.5 16.91	493 19.41
F402	157 6.18	384 15.12	435 17.13	157 6.18	454 17.87	505 19.88	159 6.26	444.5 17.50	508 20.00
F602	190 7.48	417 16.42	468 18.43	—	—	—	192 7.56	477.5 18.80	541 21.30

Table No. 6 Dimensions (mm/inches)

Unit	P^0	P^1	P^2	P^3	Q^0	Q^1	W^1	Z^0	Z^1
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

Q^0, Z^0, and OL^0 are dimensions without a brake.
Q^1, Z^1, and OL^1 are dimensions with a brake.

See web site for drawings.



ServoFit® Geared Motor – "F" Series
Tapped Hole – “GN” Housing
Hollow Output – Dimensional Data

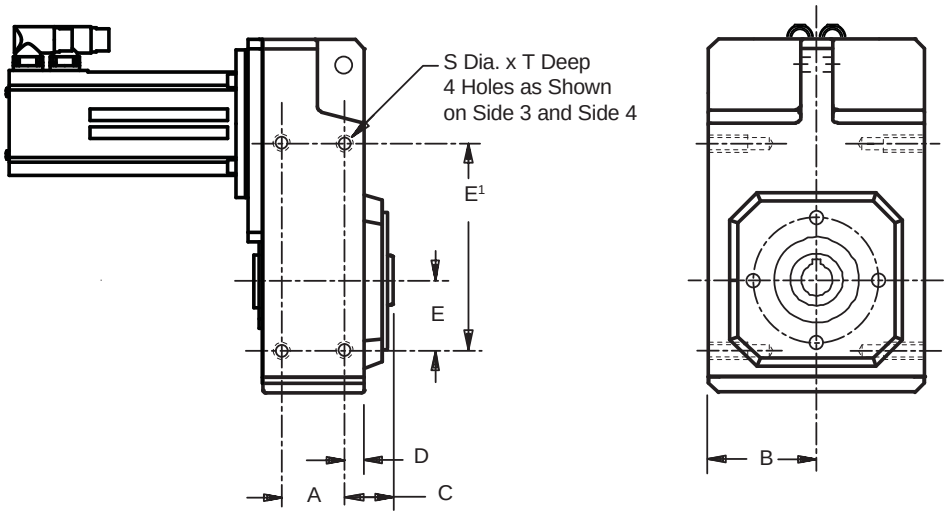


Table No. 1

"F" Series — Foot Mount “GN” Housing Dimensions (Inches)

Base Module	A	B	C	D	E	E1	S	T
F102	1.97	2.79	1.14	.39	1.57	5.51	M6	.43
F202/F203	2.52	3.46	1.32	.41	2.17	6.89	M8	.51
F302/F303	2.83	4.02	1.48	.49	2.36	7.87	M10	.63
F402	3.43	4.49	1.48	49	2.76	8.66	M10	.63
F602	4.25	5.16	1.83	.61	3.35	10.63	M12	.75

ServoFit® Geared Motor – "F" Series
Rubber Buffer
Dimensional Data

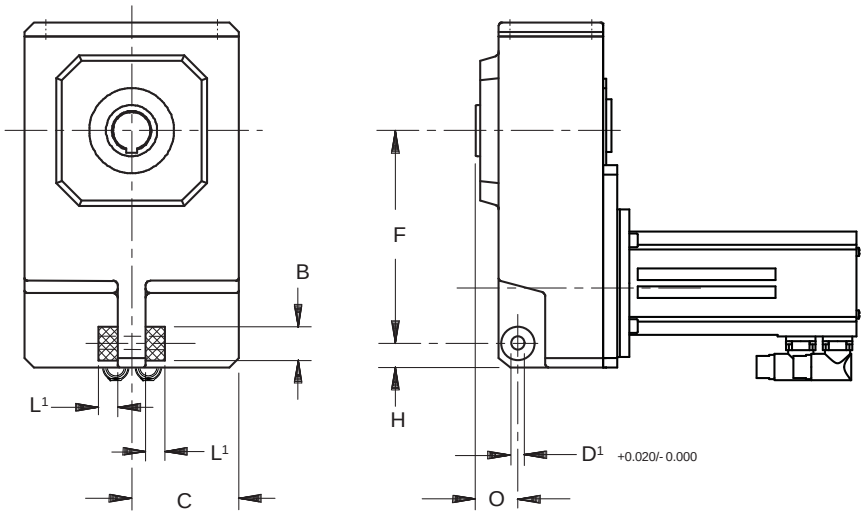


Table No. 2

"F" Series — Rubber Buffer Dimensions (Inches)

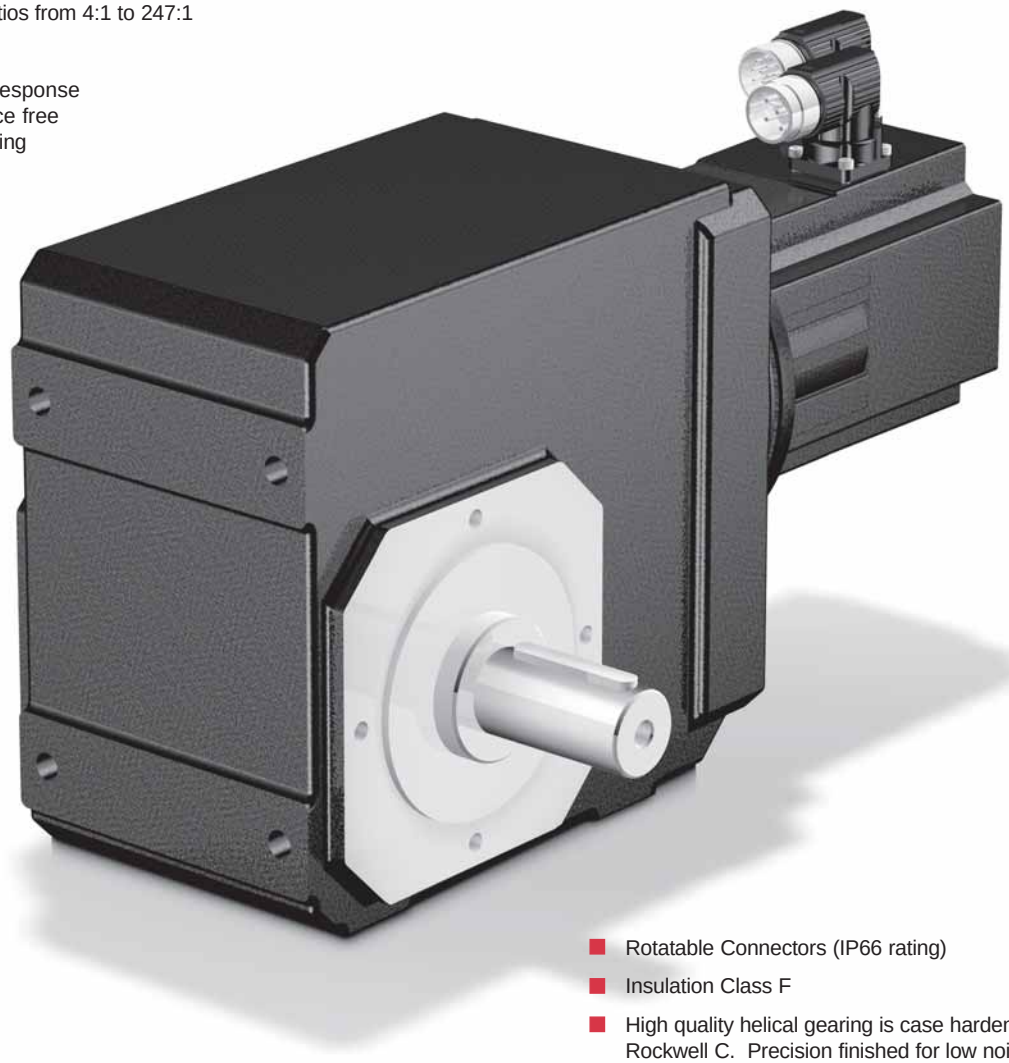
Base Module	Part No.	B	C	F	H	D1	L1	O
F102	**25192**	1.18	2.86	5.91	.55	.43	.59	1.38
F202/F203	**25192**	1.18	3.55	7.12	.98	.43	.59	1.57
F302/F303	**25193**	1.57	4.06	8.07	.96	.55	.79	1.77
F402	**25193**	1.57	4.53	8.98	1.02	.55	.79	1.77
F602	**25194**	2.36	5.22	10.63	1.02	.57	1.18	2.77

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

"K" Series—Right Angle Helical/Bevel ServoFit® Geared Motor Features

Performance Specifications:

- Nominal output torque – up to 34,000 in. lbs. (3,835 Nm)
- Reducer ratios from 4:1 to 247:1
- Compact
- Low Inertia
- Dynamic Response
- Maintenance free
- Quiet Running



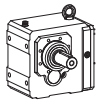
- Rotatable Connectors (IP66 rating)
- Insulation Class F
- High quality helical gearing is case hardened to 58-62 Rockwell C. Precision finished for low noise and long service life. When the backlash is set by our manufacturing and assemble methods it remains consistent throughout the life of the reducer without further need for adjustment.
  Standard backlash is ≤12 arc minutes
  Reduced backlash is ≤6 arc minutes
- High efficiency spiral bevel gearing provides quiet operation and excellent torque carrying capacity
- 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.
- 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.
- Output Options: Solid shaft
  Hollow
  Backlash free, wobble free bushings
  Metric and stainless shaft or quill

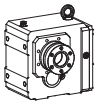
See web site for drawings.

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Overview

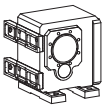
Output Style + Housing Style + Servo Motor = Geared Motor Configurations

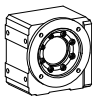

Style A
Hollow Output

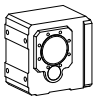

Style V
Solid Output

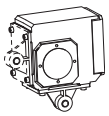

Style W
Bushing Output

+

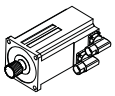

Style N
Foot Mount


Style F
Round Flange

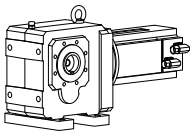

Style G
Tapped Holes

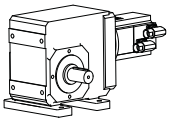

Style GD
Torque Arm Bracket

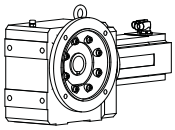
+

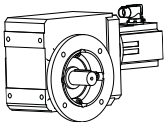

Servo Motor

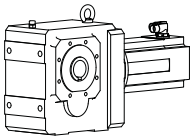
Geared Motor Configurations

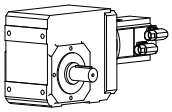

Style AN
Hollow Output

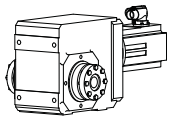

Style VN
Solid Output


Style AF
Hollow Output

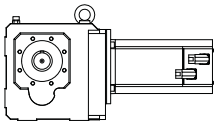

Style VF
Solid Output

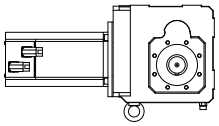

Style AG
Hollow Output

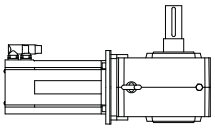

Style VG
Solid Output

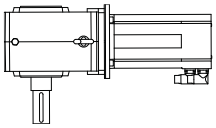

Style WG
Bushing Output

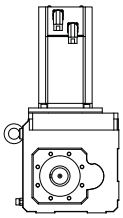
Mounting Positions *(Units shown with shaft on Side 4.)*

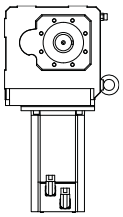

EL1


EL2

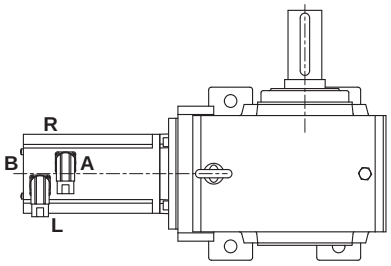

EL3

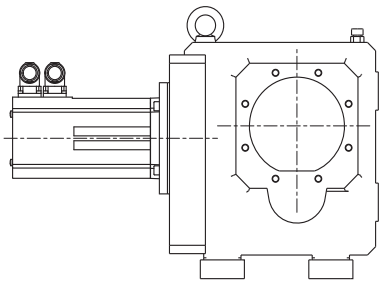

EL4

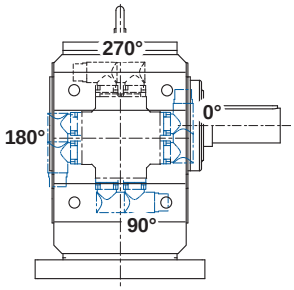

EL5


EL6

Cable Entry







Standard cable entry is terminal box side “L”.
This unit is shown: EL1, Shaft Side 4, Feet Side 1, Cable Entry L, 270°.
Power and control connecters are both rotatable in any position.

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Part No. Explanation

OPTIONS and REQUIRED INFORMATION

K 6 1 3 V N 0640 ED 5 0 3 U R O

- **K** – Right Angle Helical/Bevel
- **6** – Unit Size No.
- **1** – Design Generation
- **3** – No. of Stages (**3** = 3 Stage, determined by ratio)
- **V** – 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 3 or Side 4
- **N** – 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
- **0640** – Nominal Ratio: (**0640** = 63.71:1)
- **ED** – Dynamic Series
- **5** – Motor Frame Size
- **0** – Generation Number
- **3** – Number of Magnet Stacks
- **U** – Self Ventilating
- **R** – Feedback
  - **R**esolver
  - **M**ultiturn Absolute Encoder Inductive
  - **S**ingleturn Absolute Encoder Inductive
- **O** – "**O**" Without Brake
  "**P**" Permanent Magnet Brake

THE FOLLOWING INFORMATION IS REQUIRED FOR ANY UNIT:

Mounting Position – EL1 EL2 EL3 EL4 EL5 EL6 (See Page 112.)

Backlash Option – Standard or Reduced Backlash

Specify – Cable Entry Side

Specify – Connector Location

[1)] Not available in all sizes.

Bushing Part No. Explanation

W F 6 – 107

- **W F** – **W**obble **F**ree Single Side Bushing
- **6** – Base Module Size example: K**6**13/K**6**14)
- **107** – Output Bore in inches – **107** = $1\frac{7}{16}$

W F B 6 – 107

- **W F B** – **W**obble **F**ree Double Side
- **6** – Base Module Size example: K**6**13/K**6**14)
- **107** – Output Bore in inches – **107** = $1\frac{7}{16}$

See web site for drawings.

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1]	Ratio i	Output Torque: Nominal M_2		Acceleration [2] M_{2B}		Peak [3] M_{2NOT}		Max. Input RPM: Continuous Mounting Position		Cyclic	Mass Moment of Inertia	Back-lash Nom.[4]	Torsional Stiffness per arcmin	
									EL	EL					
	n2	Nom. Exact	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm	1,2,3,4	5,6	ALL	J_1 kgcm²	Δφ arcmin	C_2 in.lbs.	Nm
K102_ED – 3000 RPM 480V Continued Next Page															
K102_0040ED401U	750	4.0 4/1	81	9.2	368	41.6	460	51.9	3,300	2,800	4,500	2.24	12/6	60	6.8
K102_0040ED402U	750	4.0 4/1	157	17.7	368	41.6	460	51.9	3,300	2,800	4,500	3.34	12/6	60	6.8
K102_0040ED403U	750	4.0 4/1	204	23.0	368	41.6	460	51.9	3,300	2,800	4,500	4.43	12/6	60	6.8
K102_0040ED503U	750	4.0 4/1	261	29.5	692	78.2	866	97.8	3,300	2,800	4,500	9.08	12/6	60	6.8
K102_0040ED505U	750	4.0 4/1	412	46.6	692	78.2	866	97.8	3,300	2,800	4,500	14.06	12/6	60	6.8
K102_0056ED303U	539	5.6 1520/273	65	7.3	258	29.2	336	38.0	3,300	2,800	4,500	1.29	12/6	60	6.8
K102_0056ED401U	539	5.6 1520/273	113	12.7	512	57.8	640	72.3	3,300	2,800	4,500	2.09	12/6	60	6.8
K102_0056ED402U	539	5.6 1520/273	218	24.6	512	57.8	640	72.3	3,300	2,800	4,500	3.20	12/6	60	6.8
K102_0056ED403U	539	5.6 1520/273	284	32.1	512	57.8	640	72.3	3,300	2,800	4,500	4.29	12/6	60	6.8
K102_0056ED503U	539	5.6 1520/273	363	41.0	964	109	1,205	136	3,300	2,800	4,500	8.94	12/6	60	6.8
K102_0060ED303U	500	6.0 6/1	70	7.9	275	31.0	343	38.8	3,300	2,800	4,500	1.06	12/6	60	6.8
K102_0060ED401U	500	6.0 6/1	122	13.7	523	59.1	653	73.8	3,300	2,800	4,500	1.86	12/6	60	6.8
K102_0060ED402U	500	6.0 6/1	235	26.5	523	59.1	653	73.8	3,300	2,800	4,500	2.97	12/6	60	6.8
K102_0060ED403U	500	6.0 6/1	306	34.6	523	59.1	653	73.8	3,300	2,800	4,500	4.06	12/6	60	6.8
K102_0060ED503U	500	6.0 6/1	391	44.2	984	111	1,230	139	3,300	2,800	4,500	8.71	12/6	60	6.8
K102_0066ED303U	452	6.6 299/45	77	8.7	299	33.8	374	42.3	3,600	3,300	5,000	0.99	12/6	60	6.8
K102_0066ED401U	452	6.6 299/45	135	15.2	569	64.3	711	80.4	3,600	3,300	5,000	1.80	12/6	60	6.8
K102_0066ED402U	452	6.6 299/45	260	29.4	569	64.3	711	80.4	3,600	3,300	5,000	2.90	12/6	60	6.8
K102_0066ED403U	452	6.6 299/45	339	38.3	569	64.3	711	80.4	3,600	3,300	5,000	3.99	12/6	60	6.8
K102_0066ED503U	452	6.6 299/45	433	49.0	1,024	116	1,339	151	3,600	3,300	5,000	8.64	12/6	60	6.8
K102_0083ED303U	361	8.3 1911/230	96	10.9	359	40.6	449	50.8	3,600	3,300	5,000	0.88	12/6	60	6.8
K102_0083ED401U	361	8.3 1911/230	168	19.0	684	77.2	855	96.6	3,600	3,300	5,000	1.69	12/6	60	6.8
K102_0083ED402U	361	8.3 1911/230	325	36.8	684	77.2	855	96.6	3,600	3,300	5,000	2.79	12/6	60	6.8
K102_0083ED403U	361	8.3 1911/230	424	47.9	684	77.2	855	96.6	3,600	3,300	5,000	3.88	12/6	60	6.8
K102_0083ED503U	361	8.3 1911/230	542	61.3	1,103	125	1,609	182	3,600	3,300	5,000	8.53	12/6	60	6.8
K102_0092ED303U	324	9.2 1748/189	107	12.1	416	47.1	521	58.8	3,600	3,300	5,000	0.94	12/6	60	6.8
K102_0092ED401U	324	9.2 1748/189	187	21.2	792	89.5	990	112	3,600	3,300	5,000	1.74	12/6	60	6.8
K102_0092ED402U	324	9.2 1748/189	362	40.9	792	89.5	990	112	3,600	3,300	5,000	2.85	12/6	60	6.8
K102_0092ED403U	324	9.2 1748/189	472	53.3	792	89.5	990	112	3,600	3,300	5,000	3.94	12/6	60	6.8
K102_0100ED302U	296	10.1 507/50	85	9.6	341	38.6	529	59.8	4,000	3,800	5,500	0.65	12/6	60	6.8
K102_0100ED303U	296	10.1 507/50	118	13.3	424	47.9	529	59.8	4,000	3,800	5,500	0.81	12/6	60	6.8
K102_0100ED401U	296	10.1 507/50	205	23.2	806	91.0	1,007	114	4,000	3,800	5,500	1.62	12/6	60	6.8
K102_0100ED402U	296	10.1 507/50	397	44.9	806	91.0	1,007	114	4,000	3,800	5,500	2.72	12/6	60	6.8
K102_0100ED403U	296	10.1 507/50	517	58.4	806	91.0	1,007	114	4,000	3,800	5,500	3.81	12/6	60	6.8
K102_0115ED302U	259	11.6 266/23	97	11.0	389	44.0	625	70.7	3,600	3,300	5,000	0.69	12/6	60	6.8
K102_0115ED303U	259	11.6 266/23	134	15.1	500	56.5	625	70.7	3,600	3,300	5,000	0.85	12/6	60	6.8
K102_0115ED401U	259	11.6 266/23	234	26.5	952	108	1,189	134	3,600	3,300	5,000	1.65	12/6	60	6.8
K102_0115ED402U	259	11.6 266/23	453	51.2	952	108	1,189	134	3,600	3,300	5,000	2.75	12/6	60	6.8
K102_0115ED403U	259	11.6 266/23	590	66.6	952	108	1,189	134	3,600	3,300	5,000	3.85	12/6	60	6.8

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2X} = Application Torque and n_{1X} = Operating RPM

$$M_{2X} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1X}}{n_1}\right)}}$$

Index of Symbols

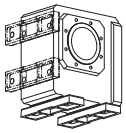
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

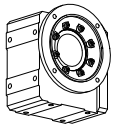
Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K102_ED – 3000 RPM 480V Continued																
K102_0125ED302U	238	12.6	429/34	106	12.0	425	48.0	633	71.5	4,000	3,800	5,500	0.59	12/6	60	6.8
K102_0125ED303U	238	12.6	429/34	146	16.5	506	57.2	633	71.5	4,000	3,800	5,500	0.75	12/6	60	6.8
K102_0125ED401U	238	12.6	429/34	256	28.9	963	109	1,203	136	4,000	3,800	5,500	1.56	12/6	60	6.8
K102_0125ED402U	238	12.6	429/34	494	55.8	963	109	1,203	136	4,000	3,800	5,500	2.66	12/6	60	6.8
K102_0125ED403U	238	12.6	429/34	643	72.7	963	109	1,203	136	4,000	3,800	5,500	3.75	12/6	60	6.8
K102_0140ED302U	213	14.1	494/35	119	13.4	475	53.7	737	83.3	4,000	3,800	5,500	0.63	12/6	60	6.8
K102_0140ED303U	213	14.1	494/35	164	18.5	590	66.6	737	83.3	4,000	3,800	5,500	0.79	12/6	60	6.8
K102_0140ED401U	213	14.1	494/35	286	32.3	1,121	127	1,402	158	4,000	3,800	5,500	1.59	12/6	60	6.8
K102_0140ED402U	213	14.1	494/35	552	62.4	1,121	127	1,402	158	4,000	3,800	5,500	2.69	12/6	60	6.8
K102_0165ED302U	179	16.7	117/7	141	15.9	562	63.6	798	90.2	4,000	4,000	6,000	0.54	12/6	60	6.8
K102_0165ED303U	179	16.7	117/7	194	21.9	639	72.2	798	90.2	4,000	4,000	6,000	0.70	12/6	60	6.8
K102_0165ED401U	179	16.7	117/7	339	38.3	1,106	125	1,518	172	4,000	4,000	6,000	1.50	12/6	60	6.8
K102_0165ED402U	179	16.7	117/7	654	73.9	1,106	125	1,518	172	4,000	4,000	6,000	2.61	12/6	60	6.8
K102_0175ED302U	171	17.6	2090/119	148	16.7	591	66.8	880	99.5	4,000	3,800	5,500	0.58	12/6	60	6.8
K102_0175ED303U	171	17.6	2090/119	204	23.0	704	79.6	880	99.5	4,000	3,800	5,500	0.74	12/6	60	6.8
K102_0175ED401U	171	17.6	2090/119	356	40.2	1,195	135	1,675	189	4,000	3,800	5,500	1.54	12/6	60	6.8
K102_0175ED402U	171	17.6	2090/119	688	77.7	1,195	135	1,675	189	4,000	3,800	5,500	2.64	12/6	60	6.8
K102_0200ED302U	149	20.2	403/20	170	19.2	678	76.6	926	105	4,000	4,000	6,000	0.51	12/6	60	6.8
K102_0200ED303U	149	20.2	403/20	234	26.4	741	83.7	926	105	4,000	4,000	6,000	0.68	12/6	60	6.8
K102_0200ED401U	149	20.2	403/20	408	46.1	1,106	125	1,761	199	4,000	4,000	6,000	1.48	12/6	60	6.8
K102_0230ED302U	129	23.3	1140/49	196	22.1	783	88.5	1,111	126	4,000	4,000	6,000	0.53	12/6	60	6.8
K102_0230ED303U	129	23.3	1140/49	270	30.5	889	100	1,111	126	4,000	4,000	6,000	0.69	12/6	60	6.8
K102_0230ED401U	129	23.3	1140/49	471	53.3	1,195	135	2,113	239	4,000	4,000	6,000	1.50	12/6	60	6.8
K102_0250ED302U	119	25.2	1261/50	212	24.0	849	95.9	1,099	124	4,000	4,000	6,000	0.49	12/6	60	6.8
K102_0250ED303U	119	25.2	1261/50	292	33.0	880	99.4	1,099	124	4,000	4,000	6,000	0.65	12/6	60	6.8
K102_0250ED401U	119	25.2	1261/50	511	57.7	1,020	115	1,700	192	4,000	4,000	6,000	1.46	12/6	60	6.8
K102_0280ED302U	107	28.0	589/21	236	26.7	944	107	1,289	146	4,000	4,000	6,000	0.51	12/6	60	6.8
K102_0280ED303U	107	28.0	589/21	325	36.7	1,031	117	1,289	146	4,000	4,000	6,000	0.67	12/6	60	6.8
K102_0280ED401U	107	28.0	589/21	568	64.2	1,195	135	2,124	240	4,000	4,000	6,000	1.47	12/6	60	6.8
K102_0340ED302U	89	33.7	4719/140	284	32.0	775	87.6	1,292	146	4,000	4,000	6,000	0.47	12/6	60	6.8
K102_0340ED303U	89	33.7	4719/140	391	44.1	775	87.6	1,292	146	4,000	4,000	6,000	0.63	12/6	60	6.8
K102_0350ED302U	85	35.1	3686/105	295	33.4	1,181	133	1,530	173	4,000	4,000	6,000	0.49	12/6	60	6.8
K102_0350ED303U	85	35.1	3686/105	407	46.0	1,195	135	1,530	173	4,000	4,000	6,000	0.65	12/6	60	6.8
K102_0350ED401U	85	35.1	3686/105	711	80.4	1,195	135	2,124	240	4,000	4,000	6,000	1.45	12/6	60	6.8
K102_0470ED302U	64	46.9	2299/49	395	44.6	1,079	122	1,798	203	4,000	4,000	6,000	0.47	12/6	60	6.8
K102_0470ED303U	64	46.9	2299/49	544	61.4	1,079	122	1,798	203	4,000	4,000	6,000	0.63	12/6	60	6.8

Housing Styles

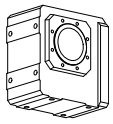
N Foot Mounted



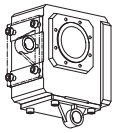
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



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

See Page 79 for required ordering information and part number example.

See web site for drawings.

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

K202_ED – 3000 RPM 480V Continued Next Page

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Backlash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K202_0040ED403U	750	4.0	4/1	204	23.0	392	44.3	490	55.4	3,000	2,600	4,000	6.07	10/5	94	10.6
K202_0040ED503U	750	4.0	4/1	261	29.5	739	83.5	923	104	3,000	2,600	4,000	10.72	10/5	94	10.6
K202_0040ED505U	750	4.0	4/1	412	46.6	739	83.5	923	104	3,000	2,600	4,000	15.70	10/5	94	10.6
K202_0040ED704U	750	4.0	4/1	567	64.0	1,544	174	2,168	245	3,000	2,600	4,000	30.89	10/5	94	10.6
K202_0044ED402U	687	4.4	48/11	171	19.3	421	47.5	526	59.4	3,000	2,600	4,000	4.64	10/5	94	10.6
K202_0044ED403U	687	4.4	48/11	223	25.1	421	47.5	526	59.4	3,000	2,600	4,000	5.74	10/5	94	10.6
K202_0044ED503U	687	4.4	48/11	285	32.2	792	89.5	990	112	3,000	2,600	4,000	10.38	10/5	94	10.6
K202_0044ED505U	687	4.4	48/11	450	50.8	792	89.5	990	112	3,000	2,600	4,000	15.37	10/5	94	10.6
K202_0044ED704U	687	4.4	48/11	618	69.8	1,590	180	2,325	263	3,000	2,600	4,000	30.56	10/5	94	10.6
K202_0052ED503U	579	5.2	2107/407	338	38.2	927	105	1,159	131	3,000	2,600	4,000	9.91	10/5	94	10.6
K202_0052ED505U	579	5.2	2107/407	533	60.3	927	105	1,159	131	3,000	2,600	4,000	14.90	10/5	94	10.6
K202_0052ED704U	579	5.2	2107/407	733	82.9	1,683	190	2,722	308	3,000	2,600	4,000	30.09	10/5	94	10.6
K202_0060ED403U	500	6.0	6/1	306	34.6	578	65.4	723	81.7	3,000	2,600	4,000	5.33	10/5	94	10.6
K202_0060ED503U	500	6.0	6/1	391	44.2	1,089	123	1,361	154	3,000	2,600	4,000	9.97	10/5	94	10.6
K202_0060ED505U	500	6.0	6/1	618	69.8	1,089	123	1,361	154	3,000	2,600	4,000	14.95	10/5	94	10.6
K202_0060ED704U	500	6.0	6/1	850	96.0	1,768	200	3,196	361	3,000	2,600	4,000	30.14	10/5	94	10.6
K202_0067ED401U	449	6.7	2279/341	135	15.3	608	68.7	760	85.9	3,500	3,100	4,500	2.52	10/5	94	10.6
K202_0067ED402U	449	6.7	2279/341	262	29.6	608	68.7	760	85.9	3,500	3,100	4,500	3.62	10/5	94	10.6
K202_0067ED403U	449	6.7	2279/341	341	38.5	608	68.7	760	85.9	3,500	3,100	4,500	4.72	10/5	94	10.6
K202_0067ED503U	449	6.7	2279/341	436	49.3	1,145	129	1,432	162	3,500	3,100	4,500	9.36	10/5	94	10.6
K202_0067ED505U	449	6.7	2279/341	688	77.8	1,145	129	1,432	162	3,500	3,100	4,500	14.35	10/5	94	10.6
K202_0067ED704U	449	6.7	2279/341	947	107	1,832	207	3,361	380	3,500	3,100	4,500	29.54	10/5	94	10.6
K202_0071ED503U	421	7.1	2107/296	464	52.5	1,275	144	1,594	180	3,000	2,600	4,000	9.62	10/5	94	10.6
K202_0071ED505U	421	7.1	2107/296	733	82.9	1,275	144	1,594	180	3,000	2,600	4,000	14.60	10/5	94	10.6
K202_0084ED401U	357	8.4	2494/297	170	19.2	738	83.4	923	104	3,500	3,100	4,500	2.19	10/5	94	10.6
K202_0084ED402U	357	8.4	2494/297	329	37.1	738	83.4	923	104	3,500	3,100	4,500	3.29	10/5	94	10.6
K202_0084ED403U	357	8.4	2494/297	428	48.4	738	83.4	923	104	3,500	3,100	4,500	4.39	10/5	94	10.6
K202_0084ED503U	357	8.4	2494/297	548	61.9	1,390	157	1,738	196	3,500	3,100	4,500	9.03	10/5	94	10.6
K202_0084ED505U	357	8.4	2494/297	865	97.7	1,390	157	1,738	196	3,500	3,100	4,500	14.02	10/5	94	10.6
K202_0092ED402U	326	9.2	2279/248	360	40.6	836	94.5	1,046	118	3,500	3,100	4,500	3.45	10/5	94	10.6
K202_0092ED403U	326	9.2	2279/248	469	53.0	836	94.5	1,046	118	3,500	3,100	4,500	4.54	10/5	94	10.6
K202_0092ED503U	326	9.2	2279/248	600	67.7	1,575	178	1,969	222	3,500	3,100	4,500	9.19	10/5	94	10.6
K202_0092ED505U	326	9.2	2279/248	947	107	1,575	178	1,969	222	3,500	3,100	4,500	14.17	10/5	94	10.6
K202_0100ED402U	298	10.1	2881/286	394	44.6	855	96.6	1,068	121	3,900	3,500	5,000	3.10	10/5	94	10.6
K202_0100ED403U	298	10.1	2881/286	514	58.0	855	96.6	1,068	121	3,900	3,500	5,000	4.19	10/5	94	10.6
K202_0100ED503U	298	10.1	2881/286	657	74.3	1,609	182	2,011	227	3,900	3,500	5,000	8.84	10/5	94	10.6
K202_0100ED505U	298	10.1	2881/286	1,038	117	1,609	182	2,011	227	3,900	3,500	5,000	13.82	10/5	94	10.6
K202_0115ED402U	260	11.5	1247/108	452	51.1	1,015	115	1,269	143	3,500	3,100	4,500	3.18	10/5	94	10.6
K202_0115ED403U	260	11.5	1247/108	589	66.5	1,015	115	1,269	143	3,500	3,100	4,500	4.28	10/5	94	10.6
K202_0115ED503U	260	11.5	1247/108	753	85.1	1,912	216	2,389	270	3,500	3,100	4,500	8.92	10/5	94	10.6

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

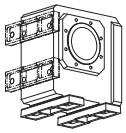
"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

K202_ED – 3000 RPM 480V Continued

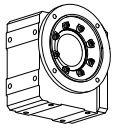
Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K202_0125ED402U	236	12.7	559/44	497	56.2	1,036	117	1,295	146	3,900	3,500	5,000	2.92	10/5	94	10.6
K202_0125ED403U	236	12.7	559/44	648	73.2	1,036	117	1,295	146	3,900	3,500	5,000	4.02	10/5	94	10.6
K202_0125ED503U	236	12.7	559/44	829	93.7	1,947	220	2,439	276	3,900	3,500	5,000	8.66	10/5	94	10.6
K202_0140ED402U	217	13.9	2881/208	542	61.3	1,175	133	1,469	166	3,900	3,500	5,000	3.02	10/5	94	10.6
K202_0140ED403U	217	13.9	2881/208	706	79.8	1,175	133	1,469	166	3,900	3,500	5,000	4.11	10/5	94	10.6
K202_0140ED503U	217	13.9	2881/208	904	102	1,947	220	2,766	313	3,900	3,500	5,000	8.76	10/5	94	10.6
K202_0170ED303U	178	16.9	2967/176	195	22.1	684	77.3	855	96.6	4,000	3,900	5,500	0.87	10/5	94	10.6
K202_0170ED401U	178	16.9	2967/176	342	38.6	1,300	147	1,626	184	4,000	3,900	5,500	1.67	10/5	94	10.6
K202_0170ED402U	178	16.9	2967/176	660	74.6	1,300	147	1,626	184	4,000	3,900	5,500	2.77	10/5	94	10.6
K202_0170ED403U	178	16.9	2967/176	860	97.1	1,300	147	1,626	184	4,000	3,900	5,500	3.87	10/5	94	10.6
K202_0170ED503U	178	16.9	2967/176	1,100	124	1,947	220	3,061	346	4,000	3,900	5,500	8.51	10/5	94	10.6
K202_0175ED402U	172	17.5	559/32	684	77.3	1,425	161	1,781	201	3,900	3,500	5,000	2.87	10/5	94	10.6
K202_0175ED403U	172	17.5	559/32	891	101	1,425	161	1,781	201	3,900	3,500	5,000	3.97	10/5	94	10.6
K202_0175ED503U	172	17.5	559/32	1,140	129	1,947	220	3,354	379	3,900	3,500	5,000	8.61	10/5	94	10.6
K202_0200ED401U	148	20.3	1118/55	412	46.5	1,503	170	1,879	212	4,000	3,900	5,500	1.60	10/5	94	10.6
K202_0200ED402U	148	20.3	1118/55	796	89.9	1,503	170	1,879	212	4,000	3,900	5,500	2.70	10/5	94	10.6
K202_0200ED403U	148	20.3	1118/55	1,037	117	1,503	170	1,879	212	4,000	3,900	5,500	3.80	10/5	94	10.6
K202_0230ED401U	129	23.2	2967/128	470	53	1,788	202	2,235	253	4,000	3,900	5,500	1.65	10/5	94	10.6
K202_0230ED402U	129	23.2	2967/128	907	103	1,788	202	2,235	253	4,000	3,900	5,500	2.75	10/5	94	10.6
K202_0230ED403U	129	23.2	2967/128	1,182	134	1,788	202	2,235	253	4,000	3,900	5,500	3.84	10/5	94	10.6
K202_0250ED401U	119	25.1	1935/77	509	57.5	1,773	200	2,217	250	4,000	3,900	5,500	1.54	10/5	94	10.6
K202_0250ED402U	119	25.1	1935/77	984	111	1,773	200	2,217	250	4,000	3,900	5,500	2.65	10/5	94	10.6
K202_0280ED401U	107	28.0	559/20	566	64.0	1,947	220	2,583	292	4,000	3,900	5,500	1.58	10/5	94	10.6
K202_0280ED402U	107	28.0	559/20	1,094	124	1,947	220	2,583	292	4,000	3,900	5,500	2.68	10/5	94	10.6
K202_0340ED303U	89	33.6	1849/55	390	44.0	1,172	132	1,466	166	4,000	3,900	5,500	0.69	10/5	94	10.6
K202_0340ED401U	89	33.6	1849/55	681	77.0	1,636	185	2,726	308	4,000	3,900	5,500	1.49	10/5	94	10.6
K202_0350ED401U	87	34.6	1935/56	700	79.1	1,947	220	3,048	344	4,000	3,900	5,500	1.53	10/5	94	10.6
K202_0350ED402U	87	34.6	1935/56	1,353	153	1,947	220	3,048	344	4,000	3,900	5,500	2.63	10/5	94	10.6
K202_0400ED303U	74	40.4	1333/33	468	52.9	1,227	139	1,688	191	4,000	3,900	5,500	0.66	10/5	94	10.6
K202_0460ED303U	65	46.2	1849/40	536	60.5	1,612	182	2,015	228	4,000	3,900	5,500	0.68	10/5	94	10.6
K202_0460ED401U	65	46.2	1849/40	936	106	1,947	220	3,540	400	4,000	3,900	5,500	1.48	10/5	94	10.6
K202_0500ED303U	59	50.5	6665/132	585	66.1	1,022	116	1,704	193	4,000	3,900	5,500	0.64	10/5	94	10.6
K202_0560ED302U	54	55.5	1333/24	467	52.8	1,687	191	2,321	262	4,000	3,900	5,500	0.50	10/5	94	10.6
K202_0560ED303U	54	55.5	1333/24	644	72.7	1,687	191	2,321	262	4,000	3,900	5,500	0.66	10/5	94	10.6
K202_0690ED302U	43	69.4	6665/96	584	66.0	1,406	159	2,343	265	4,000	3,900	5,500	0.48	10/5	94	10.6
K202_0690ED303U	43	69.4	6665/96	805	90.9	1,406	159	2,343	265	4,000	3,900	5,500	0.64	10/5	94	10.6

Housing Styles

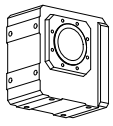
N Foot Mounted



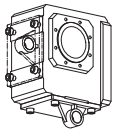
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



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

See Page 79 for required ordering information and part number example.

See web site for drawings.

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

K203_ED – 3000 RPM 480V

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K203_0390ED303U	76	39.5	135407/3432	451	50.9	1,429	162	1,787	202	4,000	3,900	5,500	0.69	10/6	94	10.6
K203_0450ED303U	66	45.2	58609/1296	517	58.4	1,638	185	2,048	231	4,000	3,900	5,500	0.69	10/6	94	10.6
K203_0500ED303U	60	49.8	26273/528	568	64.2	1,803	204	2,253	255	4,000	3,900	5,500	0.68	10/6	94	10.6
K203_0540ED303U	55	54.3	135407/2496	620	70.0	1,947	220	2,457	278	4,000	3,900	5,500	0.68	10/6	94	10.6
K203_0660ED302U	45	66.0	46483/704	547	61.9	1,947	220	2,990	338	4,000	3,900	5,500	0.51	10/6	94	10.6
K203_0660ED303U	45	66.0	46483/704	754	85.2	1,947	220	2,990	338	4,000	3,900	5,500	0.67	10/6	94	10.6
K203_0680ED302U	44	68.4	26273/384	567	64.1	1,947	220	3,099	350	4,000	3,900	5,500	0.51	10/6	94	10.6
K203_0680ED303U	44	68.4	26273/384	781	88.3	1,947	220	3,099	350	4,000	3,900	5,500	0.67	10/6	94	10.6
K203_0800ED302U	38	79.6	26273/330	660	74.6	1,947	220	3,537	400	4,000	3,900	5,500	0.50	10/6	94	10.6
K203_0800ED303U	38	79.6	26273/330	909	103	1,947	220	3,537	400	4,000	3,900	5,500	0.66	10/6	94	10.6
K203_0910ED302U	33	90.8	46483/512	753	85.1	1,947	220	3,540	400	4,000	3,900	5,500	0.50	10/6	94	10.6
K203_0910ED303U	33	90.8	46483/512	1,037	117	1,947	220	3,540	400	4,000	3,900	5,500	0.67	10/6	94	10.6
K203_1090ED302U	27	109.5	26273/240	908	103	1,947	220	3,540	400	4,000	3,900	5,500	0.50	10/6	94	10.6
K203_1090ED303U	27	109.5	26273/240	1,250	141	1,947	220	3,540	400	4,000	3,900	5,500	0.66	10/6	94	10.6
K203_1350ED302U	22	135.3	30315/224	1,122	127	1,947	220	3,540	400	4,000	3,900	5,500	0.50	10/6	94	10.6

K302_ED – 3000 RPM 480V Continued Next Page

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K302_0040ED505U	750	4.0	4/1	412	46.6	762	86.1	952	108	2,700	2,300	3,800	18.40	10/4	146	16.5
K302_0040ED704U	750	4.0	4/1	567	64.0	1,789	202	2,236	253	2,700	2,300	3,800	33.59	10/4	146	16.5
K302_0044ED505U	687	4.4	48/11	450	50.8	824	93.1	1,030	116	2,700	2,300	3,800	17.73	10/4	146	16.5
K302_0044ED704U	687	4.4	48/11	618	69.8	1,935	219	2,419	273	2,700	2,300	3,800	32.92	10/4	146	16.5
K302_0054ED704U	558	5.4	43/8	761	86.0	2,305	260	2,881	326	2,700	2,300	3,800	31.72	10/4	146	16.5
K302_0060ED505U	500	6.0	6/1	618	69.8	1,133	128	1,416	160	2,700	2,300	3,800	16.86	10/4	146	16.5
K302_0060ED704U	500	6.0	6/1	850	96.0	2,660	301	3,325	376	2,700	2,300	3,800	32.05	10/4	146	16.5
K302_0067ED505U	445	6.7	2150/319	694	78.5	1,197	135	1,496	169	3,200	2,800	4,200	15.56	10/4	146	16.5
K302_0067ED704U	445	6.7	2150/319	955	108	2,810	317	3,512	397	3,200	2,800	4,200	30.75	10/4	146	16.5
K302_0074ED704U	406	7.4	473/64	1,047	118	3,170	358	3,962	448	2,700	2,300	3,800	31.15	10/4	146	16.5
K302_0084ED503U	355	8.4	2322/275	551	62.2	1,445	163	1,806	204	3,200	2,800	4,200	9.90	10/4	146	16.5
K302_0084ED505U	355	8.4	2322/275	870	98.3	1,445	163	1,806	204	3,200	2,800	4,200	14.88	10/4	146	16.5
K302_0084ED704U	355	8.4	2322/275	1,196	135	3,392	383	4,240	479	3,200	2,800	4,200	30.07	10/4	146	16.5
K302_0093ED503U	324	9.3	1075/116	605	68.3	1,645	186	2,057	232	3,200	2,800	4,200	10.21	10/4	146	16.5
K302_0093ED505U	324	9.3	1075/116	955	108	1,645	186	2,057	232	3,200	2,800	4,200	15.19	10/4	146	16.5
K302_0093ED704U	324	9.3	1075/116	1,313	148	3,407	385	4,829	546	3,200	2,800	4,200	30.38	10/4	146	16.5
K302_0100ED503U	296	10.1	3010/297	661	74.7	1,672	189	2,090	236	3,500	3,100	5,000	9.46	10/4	146	16.5
K302_0100ED505U	296	10.1	3010/297	1,044	118	1,672	189	2,090	236	3,500	3,100	5,000	14.45	10/4	146	16.5
K302_0100ED704U	296	10.1	3010/297	1,436	162	3,407	385	4,906	554	3,500	3,100	5,000	29.64	10/4	146	16.5
K302_0115ED503U	258	11.6	1161/100	757	85.6	1,986	224	2,483	281	3,200	2,800	4,200	9.66	10/4	146	16.5
K302_0115ED505U	258	11.6	1161/100	1,196	135	1,986	224	2,483	281	3,200	2,800	4,200	14.65	10/4	146	16.5
K302_0115ED704U	258	11.6	1161/100	1,644	186	3,407	385	5,829	659	3,200	2,800	4,200	29.84	10/4	146	16.5

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

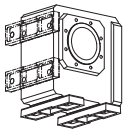
"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

K302_ED – 3000 RPM 480V Continued

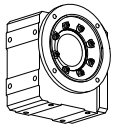
Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K302_0125ED403U	239	12.6	3182/253	641	72.5	1,058	120	1,323	150	3,500	3,100	5,000	4.48	10/4	146	16.5
K302_0125ED503U	239	12.6	3182/253	821	92.7	1,993	225	2,491	282	3,500	3,100	5,000	9.12	10/4	146	16.5
K302_0125ED505U	239	12.6	3182/253	1,296	146	1,993	225	2,491	282	3,500	3,100	5,000	14.11	10/4	146	16.5
K302_0125ED704U	239	12.6	3182/253	1,781	201	3,407	385	5,849	661	3,500	3,100	5,000	29.30	10/4	146	16.5
K302_0140ED503U	215	13.9	1505/108	909	103	2,299	260	2,873	325	3,500	3,100	5,000	9.30	10/4	146	16.5
K302_0140ED505U	215	13.9	1505/108	1,435	162	2,299	260	2,873	325	3,500	3,100	5,000	14.29	10/4	146	16.5
K302_0140ED704U	215	13.9	1505/108	1,974	223	3,407	385	6,195	700	3,500	3,100	5,000	29.48	10/4	146	16.5
K302_0170ED402U	177	16.9	559/33	663	74.9	1,341	152	1,676	189	3,800	3,500	5,000	3.06	10/4	146	16.5
K302_0170ED403U	177	16.9	559/33	864	97.6	1,341	152	1,676	189	3,800	3,500	5,000	4.15	10/4	146	16.5
K302_0170ED503U	177	16.9	559/33	1,105	125	2,525	285	3,156	357	3,800	3,500	5,000	8.80	10/4	146	16.5
K302_0175ED402U	173	17.3	1591/92	677	76.5	1,455	164	1,819	206	3,500	3,100	5,000	3.28	10/4	146	16.5
K302_0175ED403U	173	17.3	1591/92	882	99.6	1,455	164	1,819	206	3,500	3,100	5,000	4.37	10/4	146	16.5
K302_0175ED503U	173	17.3	1591/92	1,128	127	2,740	310	3,425	387	3,500	3,100	5,000	9.02	10/4	146	16.5
K302_0175ED505U	173	17.3	1591/92	1,781	201	2,740	310	3,425	387	3,500	3,100	5,000	14.00	10/4	146	16.5
K302_0200ED402U	148	20.3	3569/176	794	89.7	1,553	176	1,942	219	3,800	3,500	5,000	2.92	10/4	146	16.5
K302_0200ED403U	148	20.3	3569/176	1,034	117	1,553	176	1,942	219	3,800	3,500	5,000	4.01	10/4	146	16.5
K302_0200ED503U	148	20.3	3569/176	1,323	149	2,925	330	3,656	413	3,800	3,500	5,000	8.66	10/4	146	16.5
K302_0230ED402U	129	23.3	559/24	912	103	1,844	208	2,305	260	3,800	3,500	5,000	3.00	10/4	146	16.5
K302_0230ED403U	129	23.3	559/24	1,188	134	1,844	208	2,305	260	3,800	3,500	5,000	4.09	10/4	146	16.5
K302_0230ED503U	129	23.3	559/24	1,520	172	3,407	385	4,340	490	3,800	3,500	5,000	8.74	10/4	146	16.5
K302_0250ED402U	119	25.3	3612/143	989	112	1,837	208	2,296	259	3,800	3,500	5,000	2.79	10/4	146	16.5
K302_0250ED503U	119	25.3	3612/143	1,648	186	3,407	385	4,324	489	3,800	3,500	5,000	8.53	10/4	146	16.5
K302_0280ED402U	108	27.9	3569/128	1,091	123	2,136	241	2,670	302	3,800	3,500	5,000	2.88	10/4	146	16.5
K302_0280ED403U	108	27.9	3569/128	1,422	161	2,136	241	2,670	302	3,800	3,500	5,000	3.97	10/4	146	16.5
K302_0280ED503U	108	27.9	3569/128	1,819	206	3,407	385	5,027	568	3,800	3,500	5,000	8.62	10/4	146	16.5
K302_0340ED402U	89	33.6	1849/55	1,316	149	2,297	260	2,872	324	3,800	3,500	5,000	2.68	10/4	146	16.5
K302_0350ED402U	86	34.7	903/26	1,360	154	2,526	285	3,157	357	3,800	3,500	5,000	2.77	10/4	146	16.5
K302_0410ED303U	74	40.5	4902/121	469	53.1	1,401	158	1,751	198	3,800	3,500	5,000	0.73	10/4	146	16.5
K302_0410ED401U	74	40.5	4902/121	821	92.7	2,045	231	3,331	376	3,800	3,500	5,000	1.53	10/4	146	16.5
K302_0460ED401U	65	46.2	1849/40	936	106	3,159	357	3,949	446	3,800	3,500	5,000	1.57	10/4	146	16.5
K302_0460ED402U	65	46.2	1849/40	1,809	204	3,159	357	3,949	446	3,800	3,500	5,000	2.67	10/4	146	16.5
K302_0560ED401U	54	55.7	2451/44	1,129	128	2,811	318	4,580	517	3,800	3,500	5,000	1.52	10/4	146	16.5
K302_0690ED303U	43	69.4	6665/96	805	90.9	2,249	254	2,846	322	3,800	3,500	5,000	0.68	10/4	146	16.5

Housing Styles

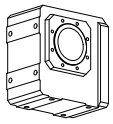
N Foot Mounted



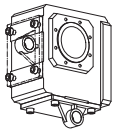
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



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

See Page 79 for required ordering information and part number example.

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1]	Ratio i	Output Torque: Nominal M_2		Acceleration [2] M_{2B}		Peak [3] M_{2NOT}		Max. Input RPM: Continuous / Mounting Position EL	Continuous / Mounting Position EL	Cyclic ALL	Mass Moment of Inertia J_1	Backlash Nom.[4] $\Delta\varphi$	Torsional Stiffness per arcmin C_2	
	n2	Nom. Exact	in.lbs.	Nm	in.lbs.	Nm	in.lbs.	Nm	1,2,3,4	5,6	ALL	kgcm²	arcmin	in.lbs.	Nm
K303_ED – 3000 RPM 480V															
K303_0330ED503U	92	32.6 44892/1375	2,099	237	3,391	383	4,239	479	3,800	3,500	5,000	8.50	10/5	146	16.5
K303_0490ED303U	61	49.3 74777/1518	563	63.6	1,785	202	2,231	252	3,800	3,500	5,000	0.71	10/5	146	16.5
K303_0550ED303U	55	54.6 70735/1296	623	70.4	1,977	223	2,472	279	3,800	3,500	5,000	0.72	10/5	146	16.5
K303_0790ED303U	38	79.4 167743/2112	907	103	2,878	325	3,597	406	3,800	3,500	5,000	0.68	10/5	146	16.5
K303_0910ED303U	33	91.2 26273/288	1,042	118	3,305	373	4,131	467	3,800	3,500	5,000	0.68	10/5	146	16.5
K303_1090ED303U	27	109.2 167743/1536	1,247	141	3,407	385	4,946	559	3,800	3,500	5,000	0.67	10/5	146	16.5
K303_1360ED303U	22	136.0 14147/104	1,554	176	3,407	385	5,945	672	3,800	3,500	5,000	0.67	10/5	146	16.5
K303_1810ED303U	17	181.0 86903/480	2,068	234	3,407	385	6,091	688	3,800	3,500	5,000	0.66	10/5	146	16.5
K402_ED – 3000 RPM 480V															
K402_0044ED505U	687	4.4 48/11	450	50.8	852	96.3	1,065	120	2,600	2,200	3,500	22.09	10/4	273	30.8
K402_0060ED505U	500	6.0 6/1	618	69.8	1,172	132	1,465	165	2,600	2,200	3,500	20.41	10/4	273	30.8
K402_0060ED704U	500	6.0 6/1	850	96.0	2,751	311	3,438	389	2,600	2,200	3,500	35.60	10/4	273	30.8
K402_0067ED704U	446	6.7 215/32	952	108	2,881	326	3,602	407	3,000	2,600	4,000	32.85	10/4	273	30.8
K402_0075ED704U	402	7.5 1849/248	1,056	119	3,320	375	4,150	469	2,600	2,200	3,500	33.67	10/4	273	30.8
K402_0084ED704U	358	8.4 645/77	1,187	134	3,474	393	4,343	491	3,000	2,600	4,000	31.55	10/4	273	30.8
K402_0092ED704U	325	9.2 2365/256	1,309	148	3,962	448	4,952	560	3,000	2,600	4,000	32.14	10/4	273	30.8
K402_0100ED704U	297	10.1 1333/132	1,430	162	4,030	455	5,037	569	3,400	3,000	4,500	30.76	10/4	273	30.8
K402_0115ED704U	260	11.5 645/56	1,631	184	4,777	540	5,971	675	3,000	2,600	4,000	31.09	10/4	273	30.8
K402_0125ED505U	237	12.7 2924/231	1,304	147	2,081	235	2,601	294	3,400	3,000	4,500	14.86	10/4	273	30.8
K402_0125ED704U	237	12.7 2924/231	1,793	203	4,886	552	6,107	690	3,400	3,000	4,500	30.05	10/4	273	30.8
K402_0140ED704U	216	13.9 1333/96	1,967	222	5,310	600	6,926	783	3,400	3,000	4,500	30.44	10/4	273	30.8
K402_0170ED704U	177	16.9 559/33	2,399	271	5,310	600	7,675	867	3,600	3,300	5,000	29.42	10/4	273	30.8
K402_0175ED505U	172	17.4 731/42	1,793	203	2,861	323	3,577	404	3,400	3,000	4,500	14.66	10/4	273	30.8
K402_0175ED704U	172	17.4 731/42	2,465	279	5,310	600	8,397	949	3,400	3,000	4,500	29.85	10/4	273	30.8
K402_0200ED503U	149	20.2 1333/66	1,318	149	3,010	340	3,763	425	3,600	3,300	5,000	9.00	10/4	273	30.8
K402_0200ED704U	149	20.2 1333/66	2,861	323	5,310	600	8,835	998	3,600	3,300	5,000	29.17	10/4	273	30.8
K402_0230ED503U	129	23.3 559/24	1,520	172	3,596	406	4,495	508	3,600	3,300	5,000	9.14	10/4	273	30.8
K402_0230ED704U	129	23.3 559/24	3,299	373	5,310	600	9,735	1,100	3,600	3,300	5,000	29.31	10/4	273	30.8
K402_0250ED503U	119	25.3 4171/165	1,649	186	3,588	405	4,485	507	3,600	3,300	5,000	8.76	10/4	273	30.8
K402_0280ED503U	108	27.8 1333/48	1,812	205	4,139	468	5,174	585	3,600	3,300	5,000	8.92	10/4	273	30.8
K402_0340ED503U	89	33.7 4816/143	2,197	248	4,130	467	5,615	634	3,600	3,300	5,000	8.56	10/4	273	30.8
K402_0350ED503U	86	34.8 4171/120	2,268	256	4,933	557	6,167	697	3,600	3,300	5,000	8.71	10/4	273	30.8
K402_0460ED503U	65	46.3 602/13	3,021	341	5,310	600	7,721	872	3,600	3,300	5,000	8.54	10/4	273	30.8

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2X} = Application Torque and n_{1X} = Operating RPM

$$M_{2X} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1X}}{n_1}\right)}}$$

Index of Symbols

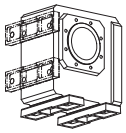
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
$\Delta\varphi$ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

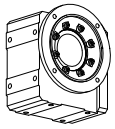
Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque: Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K513_ED – 3000 RPM 480V																
K513_0145ED704U	206	14.5	5887/405	2,029	229	6,140	694	7,675	867	2,300	2,200	3,600	34.44	10/5	438	49.5
K513_0160ED704U	186	16.1	26071/1620	2,247	254	6,798	768	8,497	960	2,300	2,200	3,600	33.94	10/5	438	49.5
K513_0175ED704U	172	17.5	6293/360	2,440	276	7,170	810	8,962	1,013	2,800	2,500	4,000	33.00	10/5	438	49.5
K513_0195ED704U	155	19.4	27869/1440	2,702	305	7,937	897	9,922	1,121	2,800	2,500	4,000	32.65	10/5	438	49.5
K513_0220ED704U	136	22.0	2639/120	3,070	347	8,618	974	10,772	1,217	2,800	2,500	4,000	31.66	10/5	438	49.5
K513_0240ED704U	123	24.3	11687/480	3,399	384	8,850	1,000	11,926	1,348	2,800	2,500	4,000	31.44	10/5	438	49.5
K513_0290ED704U	103	29.2	4669/160	4,074	460	8,850	1,000	13,518	1,527	3,400	3,000	4,500	30.51	10/5	438	49.5
K513_0320ED704U	93	32.3	20677/640	4,510	510	8,850	1,000	14,967	1,691	3,400	3,000	4,500	30.39	10/5	438	49.5
K513_0350ED503U	86	34.8	174/5	2,238	253	5,313	600	6,641	750	3,400	3,000	4,500	9.82	10/5	438	49.5
K513_0350ED704U	86	34.8	174/5	4,858	549	8,850	1,000	15,592	1,762	3,400	3,000	4,500	30.00	10/5	438	49.5
K513_0390ED503U	78	38.5	2697/70	2,477	280	5,882	665	7,353	831	3,400	3,000	4,500	9.74	10/5	438	49.5
K513_0390ED704U	78	38.5	2697/70	5,379	608	8,850	1,000	15,930	1,800	3,400	3,000	4,500	29.91	10/5	438	49.5
K513_0440ED503U	69	43.5	87/2	2,797	316	6,324	715	7,905	893	3,400	3,000	4,500	9.33	10/5	438	49.5
K513_0480ED503U	62	48.2	2697/56	3,097	350	7,002	791	8,752	989	3,400	3,000	4,500	9.28	10/5	438	49.5
K513_0580ED503U	51	58.3	11368/195	3,749	424	7,924	895	9,905	1,119	3,400	3,000	4,500	8.91	10/5	438	49.5
K513_0650ED503U	46	64.5	12586/195	4,150	469	8,773	991	10,966	1,239	3,400	3,000	4,500	8.87	10/5	438	49.5
K513_0700ED503U	43	70.1	841/12	4,506	509	8,714	985	11,430	1,291	3,400	3,000	4,500	8.72	10/5	438	49.5
K513_0780ED503U	39	77.6	26071/336	4,989	564	8,850	1,000	12,654	1,430	3,400	3,000	4,500	8.70	10/5	438	49.5
K514_ED – 3000 RPM 480V																
K514_0850ED503U	35	85.0	76531/900	5,382	608	8,617	974	10,771	1,217	3,400	3,000	4,500	8.63	10/6	438	49.5

Housing Styles

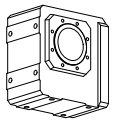
N Foot Mounted



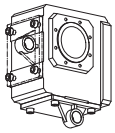
F Round Flange



G Tapped Holes



GD Torque Arm Bracket



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

See Page 79 for required ordering information and part number example.

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Output Torque Nominal M_2 Nm	Output Torque Acceleration [2] M_{2B} in.lbs.	Output Torque Acceleration [2] M_{2B} Nm	Output Torque Peak [3] M_{2NOT} in.lbs.	Output Torque Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Continuous Mounting Position EL 5,6	Max. Input RPM Cyclic ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K613_ED – 3000 RPM 480V																
K613_0170ED704U	175	17.2	549/32	2,395	271	7,288	824	9,110	1,029	2,600	2,300	3,600	36.96	10/5	730	82.5
K613_0190ED704U	158	19.0	17019/896	2,652	300	8,069	912	10,086	1,140	2,600	2,300	3,600	36.41	10/5	730	82.5
K613_0290ED704U	104	28.8	29463/1024	4,017	454	11,123	1,257	13,904	1,571	3,100	2,800	4,000	32.32	10/5	730	82.5
K613_0320ED704U	94	31.9	130479/4096	4,447	502	12,315	1,392	15,394	1,739	3,100	2,800	4,000	32.13	10/5	730	82.5
K613_0350ED704U	87	34.6	35441/1024	4,832	546	12,826	1,449	16,033	1,812	3,100	2,800	4,000	31.28	10/5	730	82.5
K613_0380ED704U	78	38.3	156953/4096	5,349	604	14,160	1,600	17,751	2,006	3,100	2,800	4,000	31.15	10/5	730	82.5
K613_0430ED704U	70	43.1	8967/208	6,018	680	14,160	1,600	19,031	2,150	3,100	2,800	4,000	30.42	10/5	730	82.5
K613_0480ED704U	63	47.7	39711/832	6,663	753	14,160	1,600	21,070	2,381	3,100	2,800	4,000	30.33	10/5	730	82.5
K613_0580ED704U	52	57.5	29463/512	8,033	908	14,160	1,600	23,872	2,697	3,100	2,800	4,000	29.63	10/5	730	82.5
K613_0640ED503U	47	63.7	130479/2048	4,097	463	9,006	1,018	11,257	1,272	3,100	2,800	4,000	9.41	10/5	730	82.5
K613_0640ED704U	47	63.7	130479/2048	8,894	1,005	14,160	1,600	25,665	2,900	3,100	2,800	4,000	29.58	10/5	730	82.5
K613_0690ED503U	44	68.8	28609/416	4,422	500	9,348	1,056	11,685	1,320	3,100	2,800	4,000	9.13	10/5	730	82.5
K613_0760ED503U	39	76.1	126697/1664	4,896	553	10,349	1,169	12,936	1,462	3,100	2,800	4,000	9.10	10/5	730	82.5
K613_0860ED503U	35	86.2	66185/768	5,541	626	10,311	1,165	13,880	1,568	3,100	2,800	4,000	8.84	10/5	730	82.5
K613_0950ED503U	31	95.4	293105/3072	6,135	693	11,418	1,290	15,368	1,736	3,100	2,800	4,000	8.82	10/5	730	82.5
K614_ED – 3000 RPM 480V																
K614_0840ED503U	36	83.8	160979/1920	5,307	600	8,863	1,001	11,078	1,252	3,100	2,800	4,000	8.82	10/6	730	82.5
K614_0930ED503U	32	92.8	712907/7680	5,875	664	9,812	1,109	12,265	1,386	3,100	2,800	4,000	8.80	10/6	730	82.5
K614_1110ED503U	27	111.3	284809/2560	7,041	796	11,122	1,257	13,903	1,571	3,100	2,800	4,000	8.68	10/6	730	82.5
K614_1230ED503U	24	123.2	1261297/10240	7,796	881	12,314	1,391	15,392	1,739	3,100	2,800	4,000	8.66	10/6	730	82.5
K713_ED – 3000 RPM 480V																
K713_0390ED704U	76	39.2	2511/64	5,477	619	15,061	1,702	18,826	2,127	2,900	2,600	3,800	34.44	10/5	1,112	125.6
K713_0450ED704U	67	45.1	37485/832	6,290	711	16,420	1,855	20,525	2,319	2,900	2,600	3,800	32.62	10/5	1,112	125.6
K713_0500ED704U	60	49.9	166005/3328	6,963	787	18,179	2,054	22,724	2,568	2,900	2,600	3,800	32.49	10/5	1,112	125.6
K713_0590ED704U	51	58.6	7497/128	8,176	924	20,200	2,282	25,250	2,853	2,900	2,600	3,800	31.09	10/5	1,112	125.6
K713_0650ED704U	46	64.8	33201/512	9,052	1,023	22,364	2,527	27,955	3,159	2,900	2,600	3,800	31.01	10/5	1,112	125.6
K713_0710ED704U	42	71.2	4557/64	9,940	1,123	23,010	2,600	29,328	3,314	2,900	2,600	3,800	30.31	10/5	1,112	125.6
K713_0790ED704U	38	78.8	20181/256	11,005	1,243	23,010	2,600	32,470	3,669	2,900	2,600	3,800	30.25	10/5	1,112	125.6

[1] For 240V, see charts on Pages 6 and 7.
[2] Maximum acceleration torque of assembly (motor plus gearhead).
[3] Maximum momentary torque for emergency stops or heavy shock load.
Admissible stops per life of assembly (rating based on gearhead ONLY) = 1,000 stops maximum.
[4] Backlash shown "STANDARD/REDUCED".

If Duty Cyle is ≤60%, use the above values.

If Duty Cyle is 100%, the following formula applies.
Where M_{2x} = Application Torque and n_{1x} = Operating RPM

$$M_{2x} = \frac{M_2}{\sqrt{2 \times \left(\frac{n_{1x}}{n_1}\right)}}$$

Index of Symbols

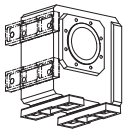
M_2 ... Output Torque
M_{2B} ... Acceleration Torque
M_{2NOT} ... Peak Torque – Emergency Stops
n_2 ... Output RPM
i ... Exact Ratio = Exact Tooth Count
J_1 ... Mass moment of inertia (input)
Δφ ... Backlash in Arc Minutes
C_2 ... Torsional Stiffness

"K" Series–Right Angle Helical/Bevel ServoFit® Geared Motor Selection Data

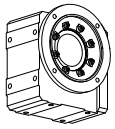
Geared Motor Part Number	Nom. Output RPM [1] n2	Ratio i Nom.	Ratio i Exact	Output Torque Nominal M_2 in.lbs.	Nominal M_2 Nm	Acceleration [2] M_{2B} in.lbs.	Acceleration [2] M_{2B} Nm	Peak [3] M_{2NOT} in.lbs.	Peak [3] M_{2NOT} Nm	Max. Input RPM Continuous Mounting Position EL 1,2,3,4	Max. Input RPM Cyclic Mounting Position EL 5,6	Max. Input RPM Cyclic Mounting Position ALL	Mass Moment of Inertia J_1 kgcm²	Back-lash Nom.[4] Δφ arcmin	Torsional Stiffness per arcmin C_2 in.lbs.	Torsional Stiffness per arcmin C_2 Nm
K714_ED – 3000 RPM 480V																
K714_0890ED704U	34	89.1	227997/2560	12,238	1,383	23,010	2,600	30,764	3,476	2,900	2,600	3,800	29.71	10/6	1,112	125.6
K714_0990ED704U	30	98.6	1009701/10240	13,549	1,531	23,010	2,600	34,061	3,849	2,900	2,600	3,800	29.67	10/6	1,112	125.6
K714_1130ED503U	26	113.2	72471/640	7,167	810	11,705	1,323	14,631	1,653	2,900	2,600	3,800	8.98	10/6	1,112	125.6
K714_1250ED503U	24	125.4	320943/2560	7,935	897	12,959	1,464	16,198	1,830	2,900	2,600	3,800	8.96	10/6	1,112	125.6
K714_1370ED503U	22	137.0	5481/40	8,673	980	13,602	1,537	17,003	1,921	2,900	2,600	3,800	8.83	10/6	1,112	125.6
K714_1520ED503U	20	151.7	24273/160	9,602	1,085	15,060	1,702	18,825	2,127	2,900	2,600	3,800	8.82	10/6	1,112	125.6
K813_ED – 3000 RPM 480V																
K813_0440ED704U	68	44.3	177/4	6,177	698	16,986	1,919	21,233	2,399	2,800	2,500	3,600	37.94	10/5	1,737	196.3
K813_0490ED704U	61	49.0	5487/112	6,839	773	18,806	2,125	23,508	2,656	2,800	2,500	3,600	37.43	10/5	1,737	196.3
K813_0720ED704U	42	71.7	10325/144	10,009	1,131	24,728	2,794	30,911	3,493	2,800	2,500	3,600	32.53	10/5	1,737	196.3
K813_0790ED704U	38	79.4	45725/576	11,082	1,252	27,378	3,094	34,223	3,867	2,800	2,500	3,600	32.33	10/5	1,737	196.3
K813_0880ED704U	34	87.8	7021/80	12,252	1,384	28,919	3,268	36,149	4,085	2,800	2,500	3,600	31.27	10/5	1,737	196.3
K813_0970ED704U	31	97.2	31093/320	13,564	1,533	32,018	3,618	40,022	4,522	2,800	2,500	3,600	31.14	10/5	1,737	196.3
K814_ED – 3000 RPM 480V																
K814_1150ED704U	26	114.6	329987/2880	15,744	1,779	31,663	3,578	39,579	4,472	2,800	2,500	3,600	30.15	10/6	1,737	196.3
K814_1270ED704U	24	126.9	1461371/11520	17,431	1,970	35,056	3,961	43,819	4,951	2,800	2,500	3,600	30.08	10/6	1,737	196.3
K814_1420ED704U	21	141.5	135877/960	19,449	2,198	37,253	4,209	46,566	5,262	2,800	2,500	3,600	29.80	10/6	1,737	196.3
K814_1570ED704U	19	156.7	601741/3840	21,532	2,433	41,153	4,650	51,555	5,825	2,800	2,500	3,600	29.74	10/6	1,737	196.3
K814_1730ED704U	17	173.3	2773/16	23,815	2,691	41,153	4,650	54,760	6,188	2,800	2,500	3,600	29.54	10/6	1,737	196.3
K814_1920ED704U	16	191.9	85963/448	26,366	2,979	41,153	4,650	60,627	6,851	2,800	2,500	3,600	29.51	10/6	1,737	196.3
K914_ED – 3000 RPM 480V																
K914_0940ED704U	32	93.8	4177219/44544	12,886	1,456	28,639	3,236	35,798	4,045	2,600	2,500	3,400	33.03	10/5	3,354	379.0
K914_1260ED704U	24	125.8	2221925/17664	17,284	1,953	36,252	4,096	45,314	5,120	2,600	2,500	3,400	31.56	10/5	3,354	379.0
K914_1490ED704U	20	149.0	9154331/61440	20,473	2,313	41,465	4,685	51,832	5,857	2,600	2,500	3,400	30.93	10/5	3,354	379.0
K914_1920ED704U	16	191.7	4710481/24576	26,337	2,976	50,447	5,700	63,059	7,125	2,600	2,500	3,400	30.26	10/5	3,354	379.0
K914_2470ED704U	12	247.0	3288449/13312	33,944	3,835	61,501	6,949	76,876	8,687	2,600	2,500	3,400	29.80	10/5	3,354	379.0

Housing Styles

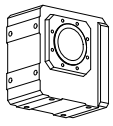
N Foot Mounted



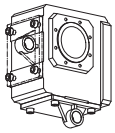
F Round Flange



G Tapped Holes



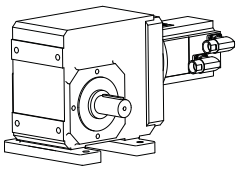
GD Torque Arm Bracket



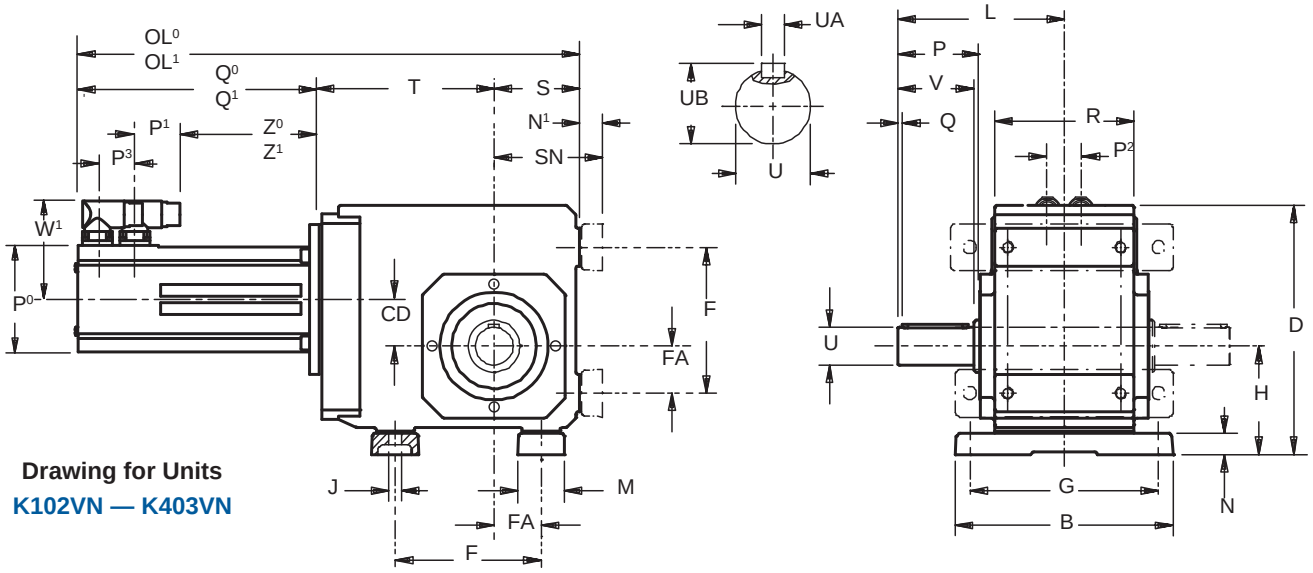
These Housing Styles are available as Hollow (A), Bushing (W), or Solid (V) Output.

See Page 79 for required ordering information and part number example.

See web site for drawings.



ServoFit® Geared Motor – "K" Series
Foot Mount – "N" Housing
Shaft Output – 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	Z²	BO	FA	N¹	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	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
K914	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

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

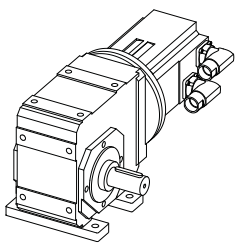
Table No. 2 **Metric output available on request.**

	Standard Shaft – inches			Optional Shaft – mm		
Base Module	U	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	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
K914	3.625	7/8 × 7/8 × 5 1/2	4.01	90m6	M25 ×14×140	95

Part No. Example
K402VN0460ED503URO
Right Angle Helical Bevel
Solid Shaft, Foot Mounting,
ServoFit® Geared Motor
Dynamic Series, Self Ventilated,
Resolver, Without Brake
See Page 79 for details of Part Number.

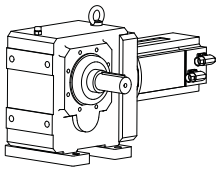
Table No. 3 **"K" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)**

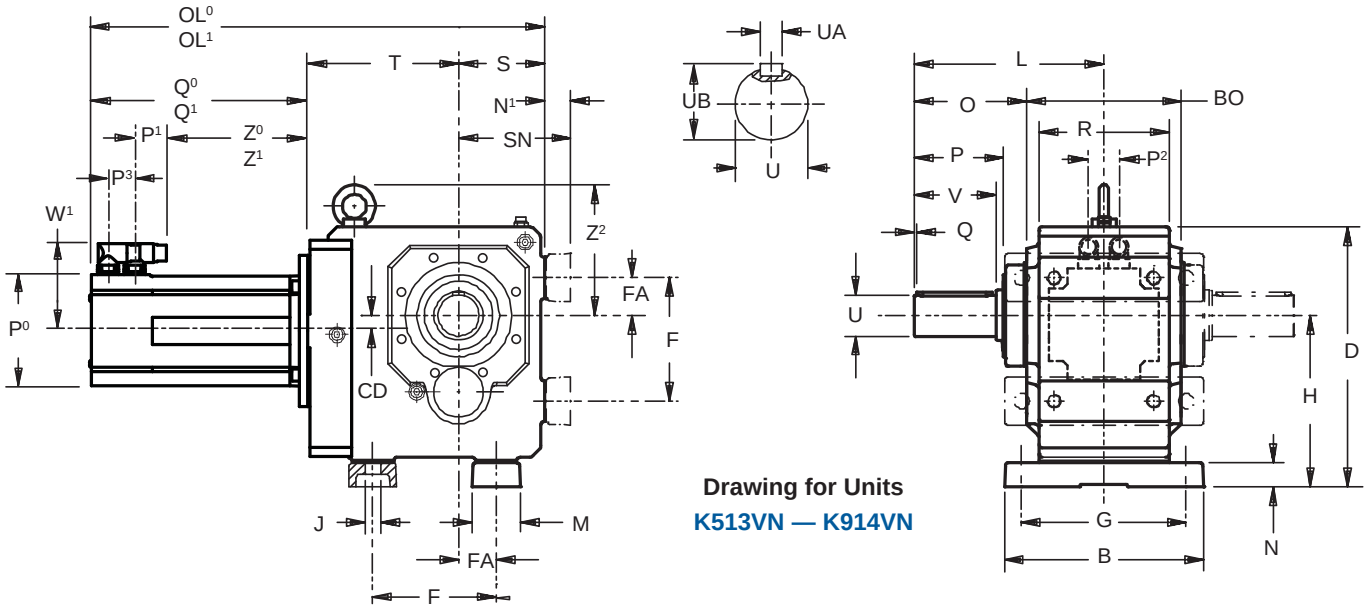
	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
K102	12.0	26.4	12.5	27.5	13.6	30.0	15.2	33.6	16.8	37.0	19.4	42.7	23.8	52.5	—	—
K202	19.5	42.9	20.0	44.0	21.1	46.5	22.7	50.1	24.3	53.5	26.9	59.2	31.3	69.0	36.5	80.5
K203	22.4	49.3	22.9	50.4	—	—	—	—	—	—	—	—	—	—	—	—
K302	—	—	25.0	55.1	26.1	57.6	27.7	61.1	29.3	64.6	31.9	70.3	36.3	80.0	41.5	91.6
K303	—	—	29.9	65.9	—	—	—	—	—	—	36.8	81.1	—	—	—	—
K402	—	—	—	—	—	—	—	—	—	—	45.4	100	49.8	110	55.0	121
K513	—	—	—	—	—	—	—	—	—	—	51.2	113	—	—	60.8	134
K514	—	—	—	—	—	—	—	—	—	—	55.7	123	—	—	—	—
K613	—	—	—	—	—	—	—	—	—	—	72.7	160.2	—	—	82.3	182
K614	—	—	—	—	—	—	—	—	—	—	76.6	169	—	—	—	—
K713	—	—	—	—	—	—	—	—	—	—	—	—	—	—	111	244
K714	—	—	—	—	—	—	—	—	—	—	110	241	—	—	119	262
K813	—	—	—	—	—	—	—	—	—	—	—	—	—	—	164	362
K814	—	—	—	—	—	—	—	—	—	—	—	—	—	—	177	391
K914	—	—	—	—	—	—	—	—	—	—	—	—	—	—	291	642



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

ServoFit® Geared Motor – "K" Series
Foot Mount – "N" Housing
Shaft Output – Dimensional Data





Drawing for Units
K513VN — K914VN

Table No. 4 **"K" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	124 4.88	342 13.46	354 13.94	124 4.88	360 14.17	372 14.65	124 4.88	339 13.35	385 15.16	124 4.88	374 14.72	420 16.54	124 4.88	409 16.10	455 17.91
K202	143 5.63	366 14.41	378 14.88	143 5.63	384 15.12	396 15.59	143 5.63	363 14.29	409 16.10	143 5.63	398 15.67	444 17.48	143 5.63	433 17.05	479 18.86
K203	180 7.09	403 15.87	415 16.34	180 7.09	421 16.57	433 17.05	—	—	—	—	—	—	—	—	—
K302	—	—	—	163 6.42	414 16.30	426 16.77	163 6.42	393 15.47	439 17.28	163 6.42	428 16.85	474 18.66	163 6.42	463 18.23	509 20.04
K303	—	—	—	200 7.87	451 17.76	463 18.23	—	—	—	—	—	—	—	—	—

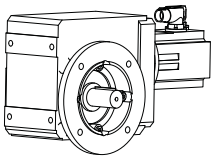
Unit	ED503			ED505			ED704		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	128 5.04	415 16.34	466 18.35	128 5.04	485 19.09	536 21.10	—	—	—
K202	147 5.79	439 17.28	490 19.29	147 5.79	509 20.04	560 22.05	149 5.87	499.5 19.67	563 22.17
K302	167 6.57	469 18.46	520 20.47	167 6.57	539 21.22	590 23.23	169 6.65	529.5 20.85	593 23.35
K303	210 8.27	512 20.16	563 22.17	—	—	—	—	—	—
K402	187 7.36	504 19.84	555 21.85	187 7.36	574 22.60	625 24.61	189 7.44	564.5 22.22	628 24.72
K513	172 6.77	499 19.65	550 21.65	—	—	—	174 6.85	559.5 22.03	623 24.53
K514	215 8.46	542 21.34	593 23.35	—	—	—	—	—	—
K613	191 7.52	538 21.18	589 23.19	—	—	—	193 7.60	598.5 23.56	662 26.06
K614	234 9.21	581 22.87	632 24.88	—	—	—	—	—	—
K713	—	—	—	—	—	—	221 8.70	631.5 24.86	695 27.36
K714	263 10.35	615 24.21	666 26.22	—	—	—	283 11.14	693.5 27.30	757 29.80
K813	—	—	—	—	—	—	247 9.72	677.5 26.67	741 29.17
K814	—	—	—	—	—	—	308 12.13	738.5 29.07	802 31.57
K914	—	—	—	—	—	—	353 13.90	818.5 32.22	882 34.72

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

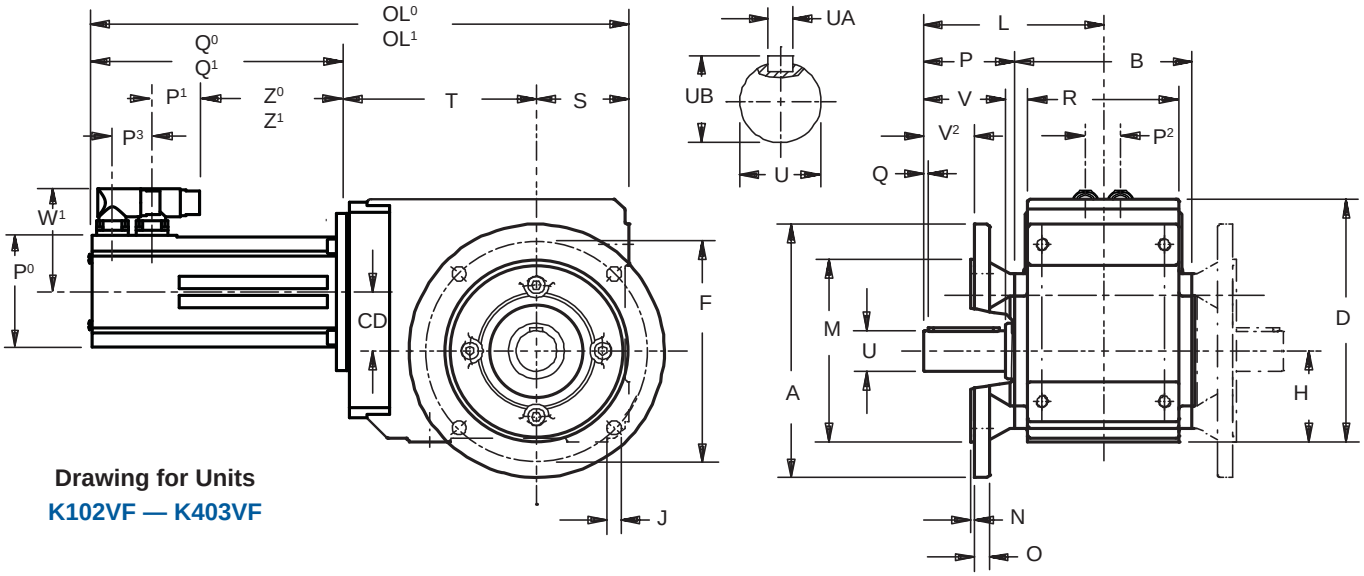
Table No. 5 **Dimensions (mm/inches)**

Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

See web site for drawings.



ServoFit® Geared Motor – "K" Series
Round Flange – "F" Housing
Shaft Output – 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	Z²
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	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
K914	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

* K914 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	UA – Key	UB	U	UA – Key	UB
K102	1.000	$^1/_4 \times ^1/_4 \times 1^9/_{16}$	1.11	25_{k6}	M8 ×7×40	28
K202/203	1.250	$^1/_4 \times ^1/_4 \times 1^{15}/_{16}$	1.36	30_{k6}	M8 ×7×50	33
K302/303	1.250	$^1/_4 \times ^1/_4 \times 1^{15}/_{16}$	1.36	30_{k6}	M8 ×7×50	33
K402	1.375	$^5/_{16} \times ^5/_{16} \times 2^5/_{16}$	1.51	40_{k6}	M12 ×8×70	43
K513/514	1.750	$^3/_8 \times ^3/_8 \times 3^5/_{32}$	1.92	45_{k6}	M14 ×9×80	48.5
K613/614	1.750	$^3/_8 \times ^3/_8 \times 3^5/_{32}$	1.92	50_{k6}	M14 ×9×90	53.5
K713/714	2.375	$^5/_8 \times ^5/_8 \times 3^{15}/_{16}$	2.65	60_{k6}	M18 ×11×110	64
K813/814	2.875	$^3/_4 \times ^3/_4 \times 4^5/_{16}$	3.21	70_{m6}	M20 ×12×125	74.5
K914	3.625	$^7/_8 \times ^7/_8 \times 5^1/_2$	4.01	90_{m6}	M25 ×14×140	95

Part No. Example

K402VF0460ED503URO

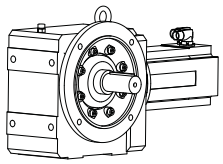
Right Angle Helical Bevel
Solid Shaft, Flange Mounting,
ServoFit® Geared Motor
Dynamic Series, Self Ventilated,
Resolver, Without Brake

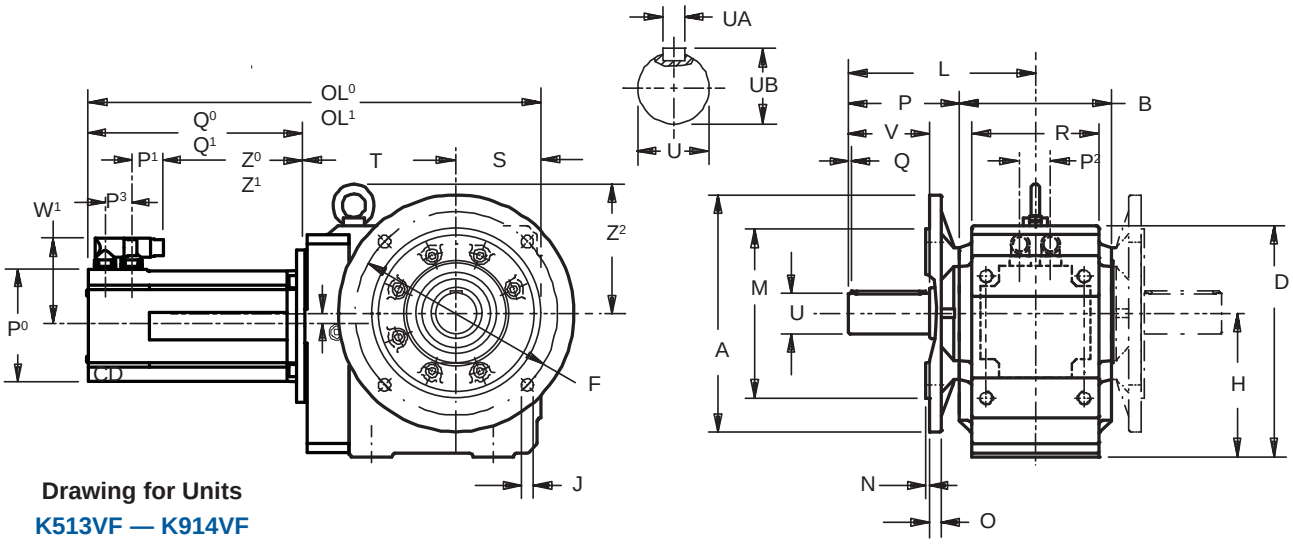
See Page 79 for details of Part Number.

Table No. 3 **"K" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)**

	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
K102	12.0	26.4	12.5	27.5	13.6	30.0	15.2	33.6	16.8	37.0	19.4	42.7	23.8	52.5	—	—
K202	19.5	42.9	20.0	44.0	21.1	46.5	22.7	50.1	24.3	53.5	26.9	59.2	31.3	69.0	36.5	80.5
K203	22.4	49.3	22.9	50.4	—	—	—	—	—	—	—	—	—	—	—	—
K302	—	—	25.0	55.1	26.1	57.6	27.7	61.1	29.3	64.6	31.9	70.3	36.3	80.0	41.5	91.6
K303	—	—	29.9	65.9	—	—	—	—	—	—	36.8	81.1	—	—	—	—
K402	—	—	—	—	—	—	—	—	—	—	45.4	100	49.8	110	55.0	121
K513	—	—	—	—	—	—	—	—	—	—	51.2	113	—	—	60.8	134
K514	—	—	—	—	—	—	—	—	—	—	55.7	123	—	—	—	—
K613	—	—	—	—	—	—	—	—	—	—	72.7	160.2	—	—	82.3	182
K614	—	—	—	—	—	—	—	—	—	—	76.6	169	—	—	—	—
K713	—	—	—	—	—	—	—	—	—	—	—	—	—	—	111	244
K714	—	—	—	—	—	—	—	—	—	—	110	241	—	—	119	262
K813	—	—	—	—	—	—	—	—	—	—	—	—	—	—	164	362
K814	—	—	—	—	—	—	—	—	—	—	—	—	—	—	177	391
K914	—	—	—	—	—	—	—	—	—	—	—	—	—	—	291	642

ServoFit® Geared Motor – "K" Series
Round Flange – "F" Housing
Shaft Output – Dimensional Data





Drawing for Units
K513VF — K914VF

Table No. 4 **"K" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

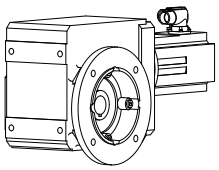
Unit	ED302			ED303			ED401			ED402			ED403		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	124 4.88	342 13.46	354 13.94	124 4.88	360 14.17	372 14.65	124 4.88	339 13.35	385 15.16	124 4.88	374 14.72	420 16.54	124 4.88	409 16.10	455 17.91
K202	143 5.63	366 14.41	378 14.88	143 5.63	384 15.12	396 15.59	143 5.63	363 14.29	409 16.10	143 5.63	398 15.67	444 17.48	143 5.63	433 17.05	479 18.86
K203	180 7.09	403 15.87	415 16.34	180 7.09	421 16.57	433 17.05	—	—	—	—	—	—	—	—	—
K302	—	—	—	163 6.42	414 16.30	426 16.77	163 6.42	393 15.47	439 17.28	163 6.42	428 16.85	474 18.66	163 6.42	463 18.23	509 20.04
K303	—	—	—	200 7.87	451 17.76	463 18.23	—	—	—	—	—	—	—	—	—

Unit	ED503			ED505			ED704		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	128 5.04	415 16.34	466 18.35	128 5.04	485 19.09	536 21.10	—	—	—
K202	147 5.79	439 17.28	490 19.29	147 5.79	509 20.04	560 22.05	149 5.87	499.5 19.67	563 22.17
K302	167 6.57	469 18.46	520 20.47	167 6.57	539 21.22	590 23.23	169 6.65	529.5 20.85	593 23.35
K303	210 8.27	512 20.16	563 22.17	—	—	—	—	—	—
K402	187 7.36	504 19.84	555 21.85	187 7.36	574 22.60	625 24.61	189 7.44	564.5 22.22	628 24.72
K513	172 6.77	499 19.65	550 21.65	—	—	—	174 6.85	559.5 22.03	623 24.53
K514	215 8.46	542 21.34	593 23.35	—	—	—	—	—	—
K613	191 7.52	538 21.18	589 23.19	—	—	—	193 7.60	598.5 23.56	662 26.06
K614	234 9.21	581 22.87	632 24.88	—	—	—	—	—	—
K713	—	—	—	—	—	—	221 8.70	631.5 24.86	695 27.36
K714	263 10.35	615 24.21	666 26.22	—	—	—	283 11.14	693.5 27.30	757 29.80
K813	—	—	—	—	—	—	247 9.72	677.5 26.67	741 29.17
K814	—	—	—	—	—	—	308 12.13	738.5 29.07	802 31.57
K914	—	—	—	—	—	—	353 13.90	818.5 32.22	882 34.72

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

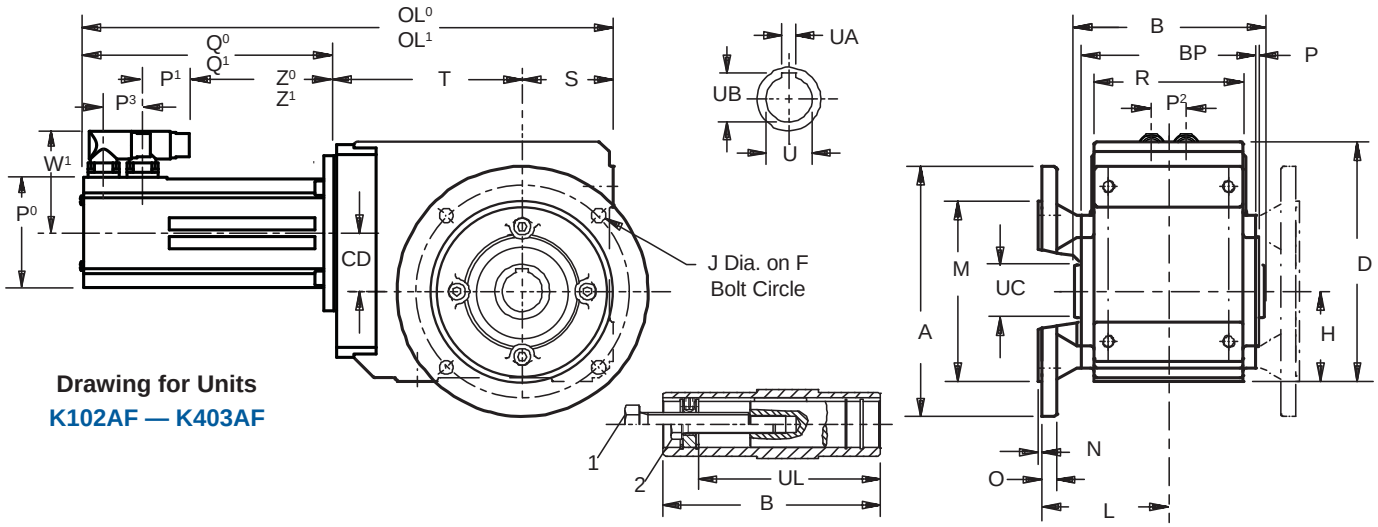
Table No. 5 **Dimensions (mm/inches)**

Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52



ServoFit® Geared Motor – "K" Series
Round Flange – "F" Housing
Hollow Output – Dimensional Data

See Page 104 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	Z²	BP	UC	UL	1
K102	6.30	4.72	6.30	5.12	2.36	.35	3.35	4.331 +.001/-.0004	.14	.39	.12	3.54	2.36	—	3.54	1.57	3.86	1/2-13
K202/203	7.87	5.83	7.48	6.50	2.56	.43	3.90	5.118 +.001/-.0004	.14	.47	.12	4.53	2.56	—	3.94	1.77	4.78	1/2-13
K302/303	7.87	6.30	8.39	6.50	2.95	.43	4.37	5.118 +.001/-.0004	.14	.55	.12	5.12	2.95	—	4.53	1.97	4.92	5/8-11
K402	9.84	7.40	9.45	8.46	3.54	.55	4.98	7.087 +.001/-.0004	.16	.59	.14	5.83	3.54	—	5.12	2.17	6.18	3/4-10
K513/514	9.84	7.87	10.24	8.46	6.30	.55	5.20	7.087 +.001/-.0004	.16	.59	.14	6.30	3.94	5.98	5.12	2.56	6.46	3/4-10
K613/614	11.81	8.46	12.20	10.43	7.48	.55	5.35	9.055 +.001/-.001	.16	.67	.14	6.61	4.72	6.77	6.50	2.76	7.05	3/4-10
K713/714	13.78	9.53	13.46	11.81	8.35	.71	6.18	9.842 +.000/-.001	.20	.71	.14	7.48	4.92	7.52	7.28	3.35	8.43	1-8
K813/814	15.75	11.81	16.14	13.78	10.43	.71	7.32	11.811 +.000/-.001	.20	.79	.16	9.25	5.71	8.11	8.46	3.94	10.35	1-8
K914	17.72	13.78	19.49	15.75	12.40	.71	8.46	13.780 +.000/-.001	.20	.91	.20	11.22	7.09	9.84	10.43	4.33	12.32	1-8

Table No. 2 Metric output available on request.

Base Module	Standard Bore - inches			Optional Bore - mm		
	U	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	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
K914	3.250	.750	3.59	90H7	25JS9	95.4

Part No. Example

K402AF0460ED503URO

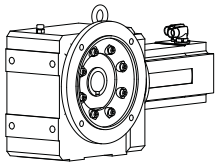
Right Angle Helical Bevel
Hollow Output, Flange Mounting,
ServoFit® Geared Motor
Dynamic Series, Self Ventilated,
Resolver, Without Brake

See Page 79 for details of Part Number.

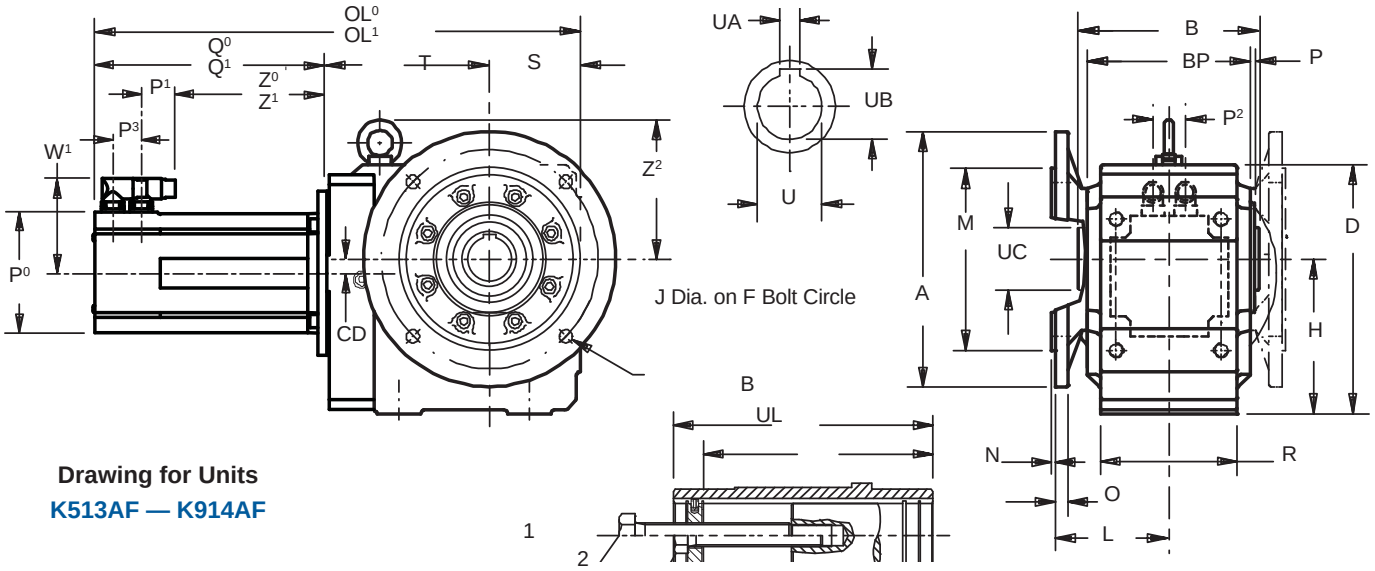
Table No. 3 "K" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
K102	12.0	26.4	12.5	27.5	13.6	30.0	15.2	33.6	16.8	37.0	19.4	42.7	23.8	52.5	—	—
K202	19.5	42.9	20.0	44.0	21.1	46.5	22.7	50.1	24.3	53.5	26.9	59.2	31.3	69.0	36.5	80.5
K203	22.4	49.3	22.9	50.4	—	—	—	—	—	—	—	—	—	—	—	—
K302	—	—	25.0	55.1	26.1	57.6	27.7	61.1	29.3	64.6	31.9	70.3	36.3	80.0	41.5	91.6
K303	—	—	29.9	65.9	—	—	—	—	—	—	36.8	81.1	—	—	—	—
K402	—	—	—	—	—	—	—	—	—	—	45.4	100	49.8	110	55.0	121
K513	—	—	—	—	—	—	—	—	—	—	51.2	113	—	—	60.8	134
K514	—	—	—	—	—	—	—	—	—	—	55.7	123	—	—	—	—
K613	—	—	—	—	—	—	—	—	—	—	72.7	160.2	—	—	82.3	182
K614	—	—	—	—	—	—	—	—	—	—	76.6	169	—	—	—	—
K713	—	—	—	—	—	—	—	—	—	—	—	—	—	—	111	244
K714	—	—	—	—	—	—	—	—	—	—	110	241	—	—	119	262
K813	—	—	—	—	—	—	—	—	—	—	—	—	—	—	164	362
K814	—	—	—	—	—	—	—	—	—	—	—	—	—	—	177	391
K914	—	—	—	—	—	—	—	—	—	—	—	—	—	—	291	642

ServoFit® Geared Motor – "K" Series
Round Flange – "F" Housing
Hollow Output – Dimensional Data



See Page 104 for installation of hollow ouput.



Drawing for Units
K513AF — K914AF

Table No. 4 **"K" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	124 4.88	342 13.46	354 13.94	124 4.88	360 14.17	372 14.65	124 4.88	339 13.35	385 15.16	124 4.88	374 14.72	420 16.54	124 4.88	409 16.10	455 17.91
K202	143 5.63	366 14.41	378 14.88	143 5.63	384 15.12	396 15.59	143 5.63	363 14.29	409 16.10	143 5.63	398 15.67	444 17.48	143 5.63	433 17.05	479 18.86
K203	180 7.09	403 15.87	415 16.34	180 7.09	421 16.57	433 17.05	—	—	—	—	—	—	—	—	—
K302	—	—	—	163 6.42	414 16.30	426 16.77	163 6.42	393 15.47	439 17.28	163 6.42	428 16.85	474 18.66	163 6.42	463 18.23	509 20.04
K303	—	—	—	200 7.87	451 17.76	463 18.23	—	—	—	—	—	—	—	—	—

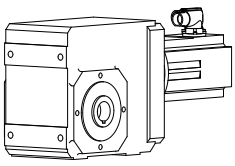
Unit	ED503			ED505			ED704		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	128 5.04	415 16.34	466 18.35	128 5.04	485 19.09	536 21.10	—	—	—
K202	147 5.79	439 17.28	490 19.29	147 5.79	509 20.04	560 22.05	149 5.87	499.5 19.67	563 22.17
K302	167 6.57	469 18.46	520 20.47	167 6.57	539 21.22	590 23.23	169 6.65	529.5 20.85	593 23.35
K303	210 8.27	512 20.16	563 22.17	—	—	—	—	—	—
K402	187 7.36	504 19.84	555 21.85	187 7.36	574 22.60	625 24.61	189 7.44	564.5 22.22	628 24.72
K513	172 6.77	499 19.65	550 21.65	—	—	—	174 6.85	559.5 22.03	623 24.53
K514	215 8.46	542 21.34	593 23.35	—	—	—	—	—	—
K613	191 7.52	538 21.18	589 23.19	—	—	—	193 7.60	598.5 23.56	662 26.06
K614	234 9.21	581 22.87	632 24.88	—	—	—	—	—	—
K713	—	—	—	—	—	—	221 8.70	631.5 24.86	695 27.36
K714	263 10.35	615 24.21	666 26.22	—	—	—	283 11.14	693.5 27.30	757 29.80
K813	—	—	—	—	—	—	247 9.72	677.5 26.67	741 29.17
K814	—	—	—	—	—	—	308 12.13	738.5 29.07	802 31.57
K914	—	—	—	—	—	—	353 13.90	818.5 32.22	882 34.72

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

Table No. 5 **Dimensions (mm/inches)**

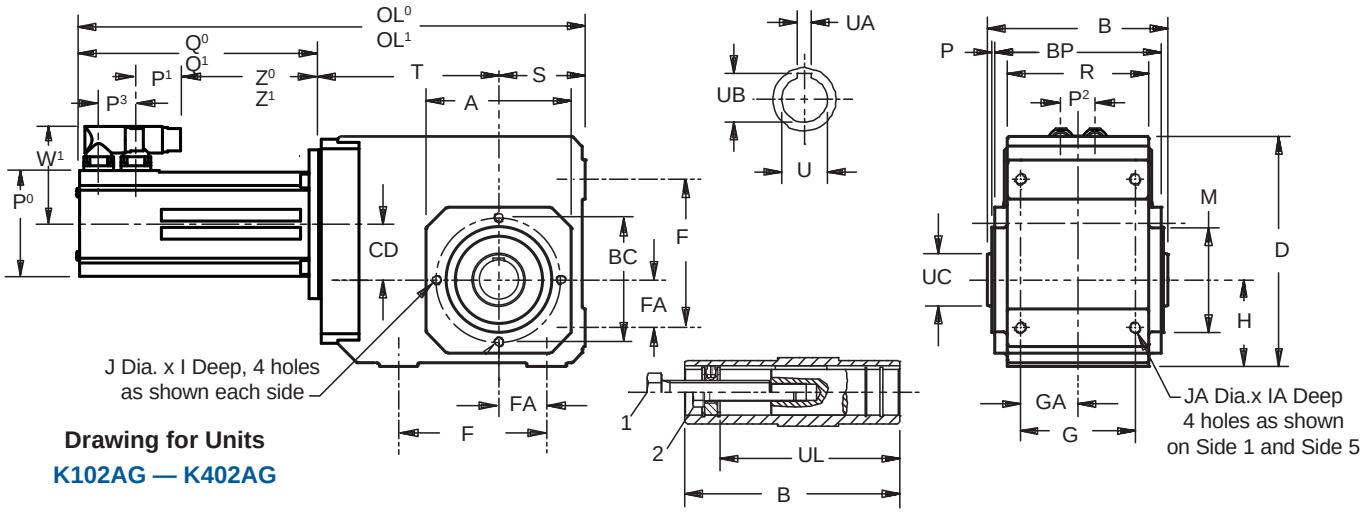
Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

See web site for drawings.



ServoFit® Geared Motor – "K" Series
Tapped Hole – "G" Housing
Hollow Output – Dimensional Data

See Page 104 for installation of hollow ouput.



Drawing for Units
K102AG — K402AG

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	Z²	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	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
K914	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

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	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
K914	4.33	12.32	1-8

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

Part No. Example

K402AG0460ED503URO

Right Angle Helical Bevel
Hollow Output, Tapped Hole Housing,
ServoFit® Geared Motor
Dynamic Series, Self Ventilated,
Resolver, Without Brake

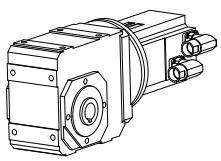
See Page 79 for details of Part Number.

Table No. 3 Metric output available on request.

Base Module	Standard Bore - inches			Optional Bore - mm		
	U	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	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
K914	3.250	.750	3.59	90H7	25JS9	95.4

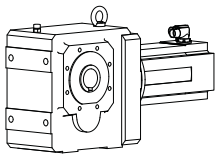
Table No. 4 "K" Series – ServoFit® Geared Motor – Approximate Weight – (kg/lbs)

	ED302		ED303		ED401		ED402		ED403		ED503		ED505		ED704	
Unit	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
K102	12.0	26.4	12.5	27.5	13.6	30.0	15.2	33.6	16.8	37.0	19.4	42.7	23.8	52.5	—	—
K202	19.5	42.9	20.0	44.0	21.1	46.5	22.7	50.1	24.3	53.5	26.9	59.2	31.3	69.0	36.5	80.5
K203	22.4	49.3	22.9	50.4	—	—	—	—	—	—	—	—	—	—	—	—
K302	—	—	25.0	55.1	26.1	57.6	27.7	61.1	29.3	64.6	31.9	70.3	36.3	80.0	41.5	91.6
K303	—	—	29.9	65.9	—	—	—	—	—	—	36.8	81.1	—	—	—	—
K402	—	—	—	—	—	—	—	—	—	—	45.4	100	49.8	110	55.0	121
K513	—	—	—	—	—	—	—	—	—	—	51.2	113	—	—	60.8	134
K514	—	—	—	—	—	—	—	—	—	—	55.7	123	—	—	—	—
K613	—	—	—	—	—	—	—	—	—	—	72.7	160.2	—	—	82.3	182
K614	—	—	—	—	—	—	—	—	—	—	76.6	169	—	—	—	—
K713	—	—	—	—	—	—	—	—	—	—	—	—	—	—	111	244
K714	—	—	—	—	—	—	—	—	—	—	110	241	—	—	119	262
K813	—	—	—	—	—	—	—	—	—	—	—	—	—	—	164	362
K814	—	—	—	—	—	—	—	—	—	—	—	—	—	—	177	391
K914	—	—	—	—	—	—	—	—	—	—	—	—	—	—	291	642

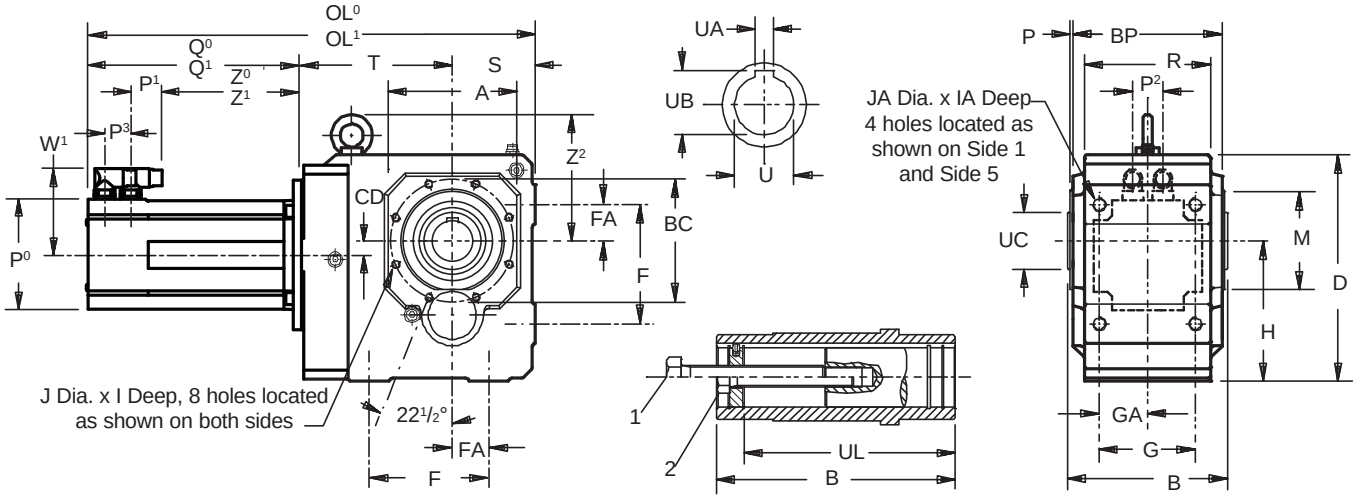


K1 Housing with tapped holes on Side 1, Side 2, and Side 5.

ServoFit® Geared Motor – "K" Series
Tapped Hole – "G" Housing
Hollow Output – Dimensional Data



See Page 104 for installation of hollow ouput.



Drawing for Units
K513AG — K914AG

Table No. 5 **"K" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	124 4.88	342 13.46	354 13.94	124 4.88	360 14.17	372 14.65	124 4.88	339 13.35	385 15.16	124 4.88	374 14.72	420 16.54	124 4.88	409 16.10	455 17.91
K202	143 5.63	366 14.41	378 14.88	143 5.63	384 15.12	396 15.59	143 5.63	363 14.29	409 16.10	143 5.63	398 15.67	444 17.48	143 5.63	433 17.05	479 18.86
K203	180 7.09	403 15.87	415 16.34	180 7.09	421 16.57	433 17.05	—	—	—	—	—	—	—	—	—
K302	—	—	—	163 6.42	414 16.30	426 16.77	163 6.42	393 15.47	439 17.28	163 6.42	428 16.85	474 18.66	163 6.42	463 18.23	509 20.04
K303	—	—	—	200 7.87	451 17.76	463 18.23	—	—	—	—	—	—	—	—	—

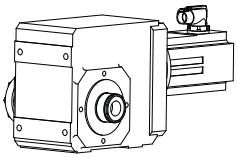
Unit	ED503			ED505			ED704		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	128 5.04	415 16.34	466 18.35	128 5.04	485 19.09	536 21.10	—	—	—
K202	147 5.79	439 17.28	490 19.29	147 5.79	509 20.04	560 22.05	149 5.87	499.5 19.67	563 22.17
K302	167 6.57	469 18.46	520 20.47	167 6.57	539 21.22	590 23.23	169 6.65	529.5 20.85	593 23.35
K303	210 8.27	512 20.16	563 22.17	—	—	—	—	—	—
K402	187 7.36	504 19.84	555 21.85	187 7.36	574 22.60	625 24.61	189 7.44	564.5 22.22	628 24.72
K513	172 6.77	499 19.65	550 21.65	—	—	—	174 6.85	559.5 22.03	623 24.53
K514	215 8.46	542 21.34	593 23.35	—	—	—	—	—	—
K613	191 7.52	538 21.18	589 23.19	—	—	—	193 7.60	598.5 23.56	662 26.06
K614	234 9.21	581 22.87	632 24.88	—	—	—	—	—	—
K713	—	—	—	—	—	—	221 8.70	631.5 24.86	695 27.36
K714	263 10.35	615 24.21	666 26.22	—	—	—	283 11.14	693.5 27.30	757 29.80
K813	—	—	—	—	—	—	247 9.72	677.5 26.67	741 29.17
K814	—	—	—	—	—	—	308 12.13	738.5 29.07	802 31.57
K914	—	—	—	—	—	—	353 13.90	818.5 32.22	882 34.72

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

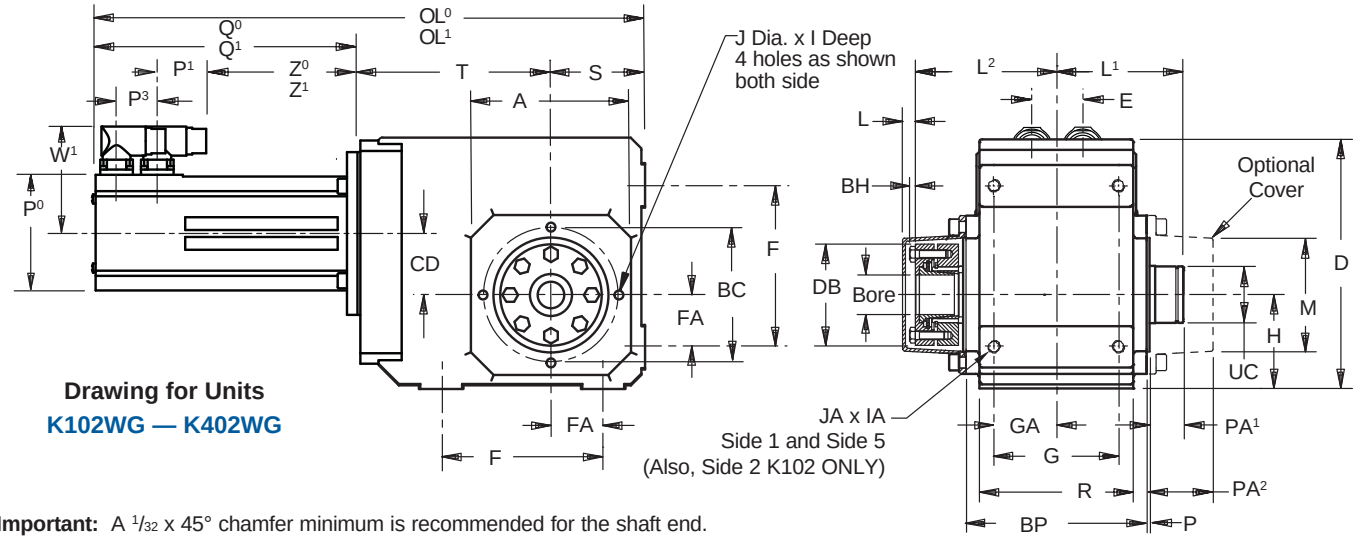
Table No. 6 **Dimensions (mm/inches)**

Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

See web site for drawings.



ServoFit® Geared Motor – "K" Series
Tapped Hole – "G" Housing
Single Bushing – Dimensional Data



Drawing for Units
K102WG — K402WG

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	L1	L2	M	P	PA1	PA2	R	S	Z2	BC	BH
K102	1.000	4.13	6.30	3.54	2.76	2.36	.51	4-M8	.24	3.15	3.66	3.07	.12	.95	1.62	3.54	2.36	—	3.54	.16
K202/203	1.1875	4.57	7.48	4.53	3.54	2.56	.51	4-M8	.39	3.78	4.27	3.46	.12	1.02	1.54	4.53	2.56	—	3.94	.16
K302/303	1.500	5.20	8.39	5.12	4.13	2.95	.51	4-M8	.43	4.02	4.54	3.78	.12	1.02	1.55	5.12	2.95	—	4.53	.16
K402	1.500	5.98	9.45	6.10	4.72	3.54	.63	4-M10	.47	4.69	5.32	4.33	.14	1.14	1.83	5.83	3.54	—	5.12	.20
K513/514	2.000	5.71	10.24	5.51	4.92	6.30	.63	8-M10	.43	4.96	5.61	4.54	.14	1.18	1.87	6.30	3.94	5.98	5.12	.20
K613/614	2.1875	7.09	12.20	6.30	5.12	7.48	.63	8-M10	.51	5.12	6.10	5.00	.14	1.38	2.11	6.61	4.72	5.98	6.50	.24
K713/714	2.375	7.68	13.46	7.09	5.71	8.35	.75	8-M12	–	6.20	7.29	–	.14	1.61	2.70	7.48	4.92	7.52	7.28	.24
K813/814	2.750	8.90	16.14	9.45	7.28	10.43	.75	8-M12	–	7.58	8.70	–	.16	2.03	2.99	9.25	5.71	8.11	8.46	.31

Table No. 2

Base Module	BP	DB	FA	GA	IA	JA	UC
K102	4.17	2.76	1.18	1.38	.51	M8	1.54
K202/203	5.28	3.07	1.38	1.77	.63	M10	1.73
K302/303	5.75	3.31	1.57	2.07	.63	M10	1.93
K402	6.81	3.82	1.97	2.36	.75	M12	2.13
K513/514	7.28	4.13	1.57	2.46	1.02	M16	2.56
K613/614	7.87	4.65	1.97	2.56	1.02	M16	2.91
K713/714	8.90	5.43	2.17	2.85	1.22	M20	3.35
K813/814	11.10	6.22	2.95	3.64	1.50	M24	3.94

Part No. Example

K402WG0460ED503URO WF4–106

Right Angle Helical Bevel
Single Side Bushing, Tapped Hole Housing,
ServoFit® Geared Motor
Dynamic Series, Self Ventilated, Resolver, Without Brake

See Page 79 for details of Part Number.

SPECIFY BUSHING SIDE (3 or 4) WHEN ORDERING

Table No. 3 **"WF" Single Side Bushing – Inches**

Unit	Stock Bores Sizes					
	1	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2
K1	WF1-100	—	—	—	—	—
K2	WF2-100	WF2-103	—	—	—	—
K3	WF3-100	WF3-103	WF3-104	WF3-106	WF3-107	WF3-108
K4	WF4-100	WF4-103	WF4-104	WF4-106	WF4-107	WF4-108

Table No. 4
"WF" Single Side Bushing – Metric

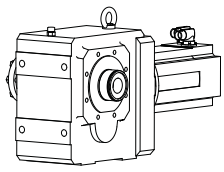
Unit	Stock Bores Sizes – mm		
	25	30	35
K1	WF1-25	—	—
K2	—	WF2-30	—
K3	—	WF3-30	WF3-35

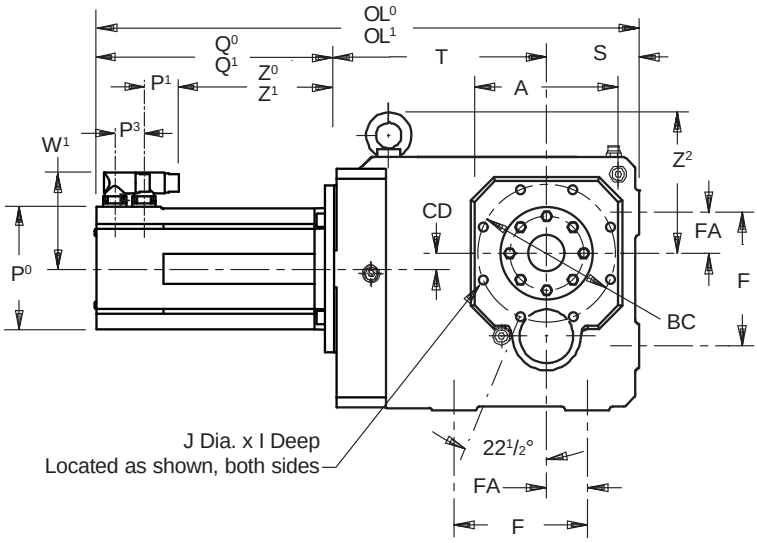
Table No. 5 **"WF" Single Side Bushings – Inches**

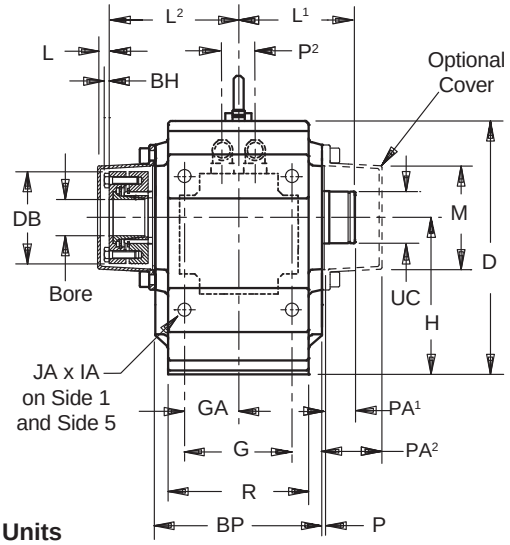
Unit	Stock Bores Sizes – Inches											
	1 7/16	1 1/2	1 5/8	1 11/16	1 3/4	1 7/8	1 15/16	2	2 3/16	2 3/8	2 7/16	2 3/4
K5	WF5-107	WF5-108	WF5-110	WF5-107	WF5-112	WF5-114	WF5-115	WF5-200	—	—	—	—
K6	WF6-107	WF6-108	WF6-110	WF6-111	WF6-112	—	WF6-115	WF6-200	WF6-203	—	—	—
K7	—	—	—	—	—	—	WF7-115	WF7-200	WF7-203	WF7-206	—	—
K8	—	—	—	—	—	—	—	—	WF8-203	WF8-206	WB7-207	WF8-212

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.

ServoFit® Geared Motor – "K" Series
Tapped Hole – "G" Housing
Single Bushing – Dimensional Data







Drawing for Units
K513WG — K814WG

Table No. 6 **"K" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	124 4.88	342 13.46	354 13.94	124 4.88	360 14.17	372 14.65	124 4.88	339 13.35	385 15.16	124 4.88	374 14.72	420 16.54	124 4.88	409 16.10	455 17.91
K202	143 5.63	366 14.41	378 14.88	143 5.63	384 15.12	396 15.59	143 5.63	363 14.29	409 16.10	143 5.63	398 15.67	444 17.48	143 5.63	433 17.05	479 18.86
K203	180 7.09	403 15.87	415 16.34	180 7.09	421 16.57	433 17.05	—	—	—	—	—	—	—	—	—
K302	—	—	—	163 6.42	414 16.30	426 16.77	163 6.42	393 15.47	439 17.28	163 6.42	428 16.85	474 18.66	163 6.42	463 18.23	509 20.04
K303	—	—	—	200 7.87	451 17.76	463 18.23	—	—	—	—	—	—	—	—	—

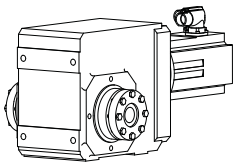
Unit	ED503			ED505			ED704		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	128 5.04	415 16.34	466 18.35	128 5.04	485 19.09	536 21.10	—	—	—
K202	147 5.79	439 17.28	490 19.29	147 5.79	509 20.04	560 22.05	149 5.87	499.5 19.67	563 22.17
K302	167 6.57	469 18.46	520 20.47	167 6.57	539 21.22	590 23.23	169 6.65	529.5 20.85	593 23.35
K303	210 8.27	512 20.16	563 22.17	—	—	—	—	—	—
K402	187 7.36	504 19.84	555 21.85	187 7.36	574 22.60	625 24.61	189 7.44	564.5 22.22	628 24.72
K513	172 6.77	499 19.65	550 21.65	—	—	—	174 6.85	559.5 22.03	623 24.53
K514	215 8.46	542 21.34	593 23.35	—	—	—	—	—	—
K613	191 7.52	538 21.18	589 23.19	—	—	—	193 7.60	598.5 23.56	662 26.06
K614	234 9.21	581 22.87	632 24.88	—	—	—	—	—	—
K713	—	—	—	—	—	—	221 8.70	631.5 24.86	695 27.36
K714	263 10.35	615 24.21	666 26.22	—	—	—	283 11.14	693.5 27.30	757 29.80
K813	—	—	—	—	—	—	247 9.72	677.5 26.67	741 29.17
K814	—	—	—	—	—	—	308 12.13	738.5 29.07	802 31.57

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

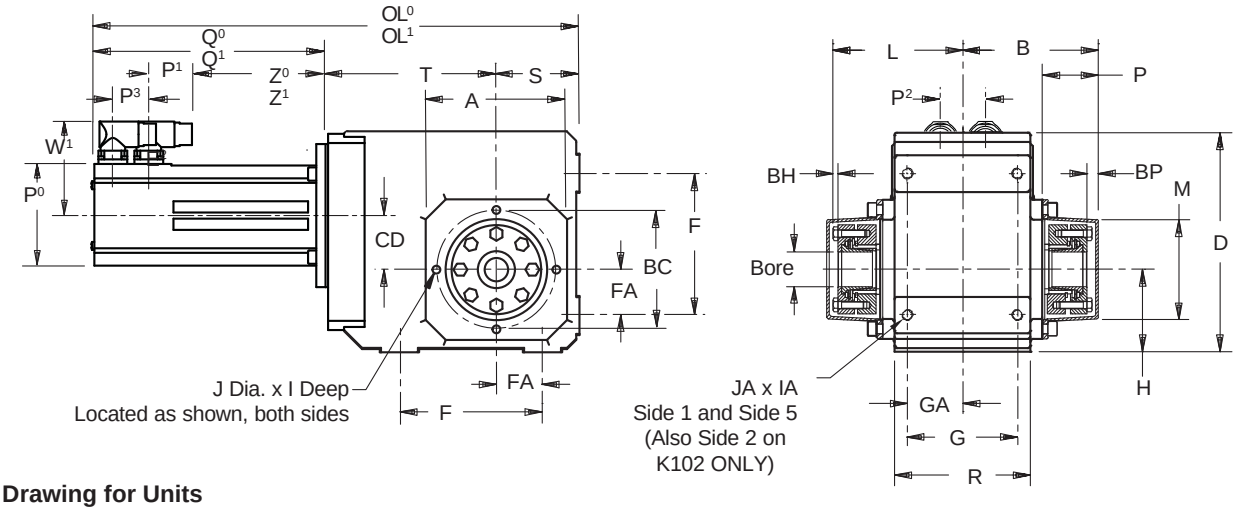
Table No. 7 **Dimensions (mm/inches)**

Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

See web site for drawings.



ServoFit® Geared Motor – "K" Series
Tapped Hole – "G" Housing
Double Bushing – Dimensional Data



Drawing for Units
K102WG — K402WG

Table No. 1 **"K" Series – Double Side Bushing – Unit Dimensions (Inches)**

Base Module	A	B	D	F	G	H	I	J	L	M	P	R	S	Z²	BC	BP	BH	FA	GA	IA	JA
K102	4.13	3.90	6.30	3.54	2.76	2.36	.51	4-M8	3.82	3.07	1.97	3.54	2.36	—	3.54	.24	.16	1.18	1.38	.51	M8
K202/203	4.57	4.68	7.48	4.53	3.54	2.56	.51	4-M8	4.45	3.46	2.05	4.53	2.56	—	3.94	.39	.16	1.38	1.77	.63	M10
K302/303	5.20	4.98	8.39	5.12	4.13	2.95	.51	4-M8	4.70	3.78	2.09	5.12	2.95	—	4.53	.43	.16	1.57	2.07	.63	M10
K402	5.98	5.80	9.45	6.10	4.72	3.54	.63	4-M10	5.53	4.33	2.40	5.83	3.54	—	5.12	.47	.20	1.97	2.36	.75	M12
K513/514	5.71	6.05	10.24	5.51	4.92	6.30	.63	8-M10	5.81	4.54	2.40	6.30	3.94	5.98	5.12	.43	.20	1.57	2.46	1.02	M16
K613/614	7.09	6.61	12.20	6.30	5.12	7.48	.63	8-M10	6.34	5.00	2.68	6.61	4.72	6.77	6.50	.51	.24	1.97	2.56	1.02	M16
K713/714	7.68	7.68	13.46	7.09	5.71	8.35	.75	8-M12	7.53	5.75	2.91	7.48	4.92	7.52	7.28	.39	.24	2.17	2.85	1.22	M20
K813/814	8.90	9.34	16.14	9.45	7.28	10.43	.75	8-M12	9.01	6.95	3.43	9.25	5.71	8.11	8.46	.64	.31	2.95	3.64	1.50	M24

Part No. Example

K402WG0460ED503URO WFB4–106

Right Angle Helical Bevel
Double Side Bushing, Tapped Hole Housing,
ServoFit® Geared Motor
Dynamic Series, Self Ventilated, Resolver, Without Brake

See Page 79 for details of Part Number.

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. 2 **"WFB" Double Side Bushings – Inches**

Unit	Stock Bores Sizes 1	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2
K1	WFB1-100	—	—	—	—	—
K2	WFB2-100	WFB2-103	—	—	—	—
K3	WFB3-100	WFB3-103	WFB3-104	WFB3-106	WFB3-107	WFB3-108
K4	WFB4-100	WFB4-103	WFB4-104	WFB4-106	WFB4-107	WFB4-108

Table No. 3

"WFB" – Double Side Bushings – Metric

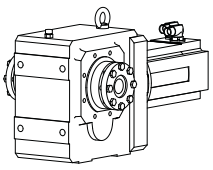
Unit	Stock Bores Sizes – mm 25	30	35	40
K1	WFB1-25	—	—	—
K2	—	WFB2-30	—	—
K3	—	WFB3-30	WFB3-35	—
K4	—	—	—	WFB4-40
K5	—	—	—	WFB5-40
K6	—	—	—	WFB6-40

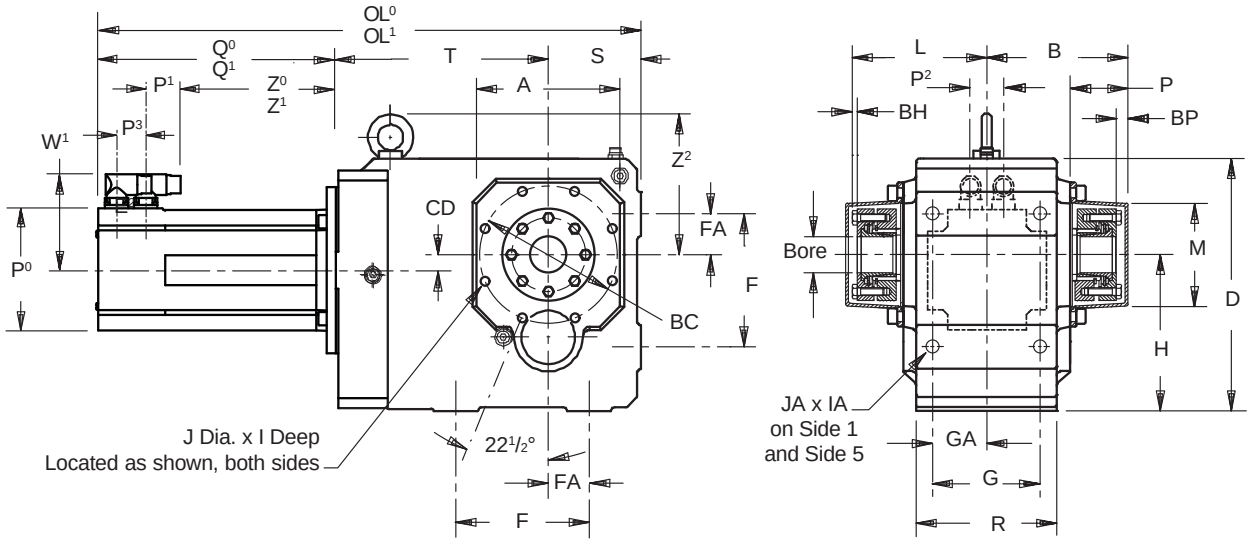
Table No. 4 **"WFB" Double Side Bushings – Inches**

Unit	Stock Bores Sizes – Inches 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
K5	WFB5-107	WFB5-108	WFB5-110	WFB5-107	WFB5-112	WFB5-114	WFB5-115	WFB5-200	—	—	—	—
K6	WFB6-107	WFB6-108	WFB6-110	WFB6-111	WFB6-112	—	WFB6-115	WFB6-200	WFB6-203	—	—	—
K7	—	—	—	—	—	—	WFB7-115	WFB7-200	WFB7-203	WFB7-206	—	—
K8	—	—	—	—	—	—	—	—	WFB8-203	WFB8-206	WFB7-207	WFB8-212

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.

ServoFit® Geared Motor – "K" Series
Tapped Hole – "G" Housing
Double Bushing – Dimensional Data





Drawing for Units
K513WG — K814WG

Table No. 5 **"K" Series – ServoFit® Geared Motor – Dimensions (mm/inches)**

Unit	ED302			ED303			ED401			ED402			ED403		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	124 4.88	342 13.46	354 13.94	124 4.88	360 14.17	372 14.65	124 4.88	339 13.35	385 15.16	124 4.88	374 14.72	420 16.54	124 4.88	409 16.10	455 17.91
K202	143 5.63	366 14.41	378 14.88	143 5.63	384 15.12	396 15.59	143 5.63	363 14.29	409 16.10	143 5.63	398 15.67	444 17.48	143 5.63	433 17.05	479 18.86
K203	180 7.09	403 15.87	415 16.34	180 7.09	421 16.57	433 17.05	—	—	—	—	—	—	—	—	—
K302	—	—	—	163 6.42	414 16.30	426 16.77	163 6.42	393 15.47	439 17.28	163 6.42	428 16.85	474 18.66	163 6.42	463 18.23	509 20.04
K303	—	—	—	200 7.87	451 17.76	463 18.23	—	—	—	—	—	—	—	—	—

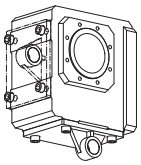
Unit	ED503			ED505			ED704		
	T	OL⁰	OL¹	T	OL⁰	OL¹	T	OL⁰	OL¹
K102	128 5.04	415 16.34	466 18.35	128 5.04	485 19.09	536 21.10	—	—	—
K202	147 5.79	439 17.28	490 19.29	147 5.79	509 20.04	560 22.05	149 5.87	499.5 19.67	563 22.17
K302	167 6.57	469 18.46	520 20.47	167 6.57	539 21.22	590 23.23	169 6.65	529.5 20.85	593 23.35
K303	210 8.27	512 20.16	563 22.17	—	—	—	—	—	—
K402	187 7.36	504 19.84	555 21.85	187 7.36	574 22.60	625 24.61	189 7.44	564.5 22.22	628 24.72
K513	172 6.77	499 19.65	550 21.65	—	—	—	174 6.85	559.5 22.03	623 24.53
K514	215 8.46	542 21.34	593 23.35	—	—	—	—	—	—
K613	191 7.52	538 21.18	589 23.19	—	—	—	193 7.60	598.5 23.56	662 26.06
K614	234 9.21	581 22.87	632 24.88	—	—	—	—	—	—
K713	—	—	—	—	—	—	221 8.70	631.5 24.86	695 27.36
K714	263 10.35	615 24.21	666 26.22	—	—	—	283 11.14	693.5 27.30	757 29.80
K813	—	—	—	—	—	—	247 9.72	677.5 26.67	741 29.17
K814	—	—	—	—	—	—	308 12.13	738.5 29.07	802 31.57

Q⁰, Z⁰, and OL⁰ are dimensions without a brake.
Q¹, Z¹, and OL¹ are dimensions with a brake.

Table No. 6 **Dimensions (mm/inches)**

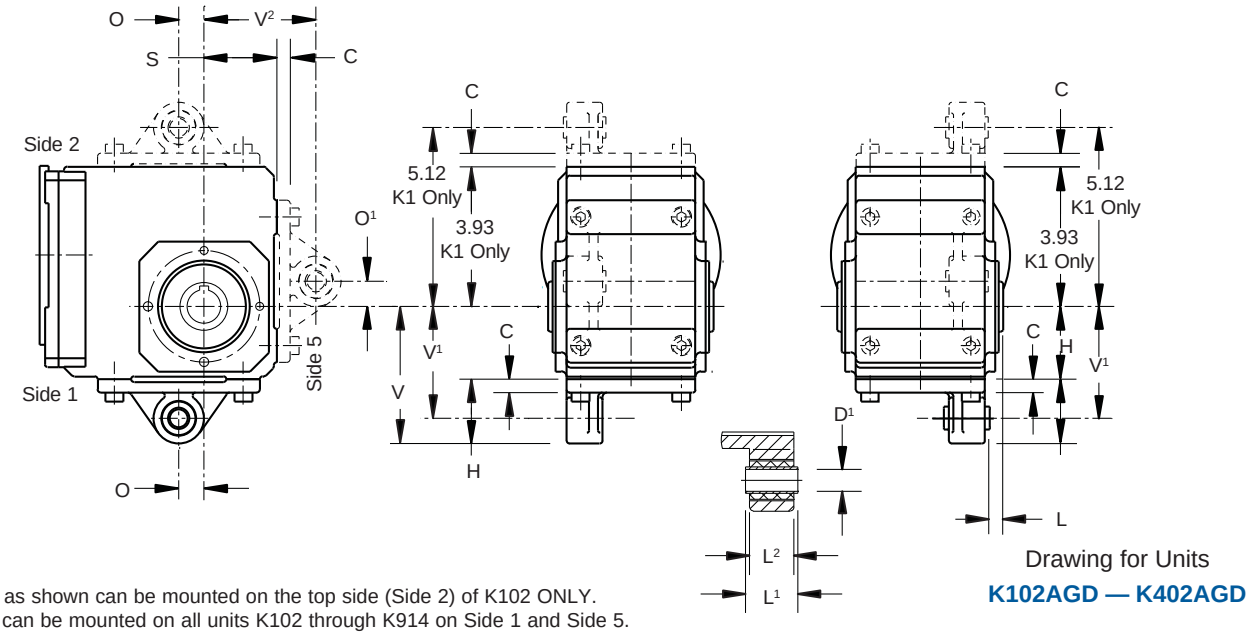
Unit	P⁰	P¹	P²	P³	Q⁰	Q¹	W¹	Z⁰	Z¹
ED302	72 2.83	42 1.65	14 .55	44 1.73	158 6.22	170 6.69	78 3.07	98 3.86	98 3.86
ED303	72 2.83	42 1.65	14 .55	44 1.73	176 6.93	188 7.40	78 3.07	116 4.57	116 4.57
ED401	98 3.86	42 1.65	31 1.22	35 1.38	155 6.10	201 7.91	91 3.58	102 4.02	148 5.83
ED402	98 3.86	42 1.65	31 1.22	35 1.38	190 7.48	236 9.29	91 3.58	137 5.39	183 7.20
ED403	98 3.86	42 1.65	31 1.22	35 1.38	225 8.86	271 10.67	91 3.58	172 6.77	218 8.58
ED503	115 4.53	42 1.65	32 1.26	35 1.38	227 8.94	278 10.94	100 3.94	170 6.69	221 8.70
ED505	115 4.53	42 1.65	32 1.26	35 1.38	297 11.69	348 13.70	100 3.94	240 9.45	291 11.46
ED704	145 5.71	42 1.65	40 1.57	35 1.38	285.5 11.24	349 13.74	115 4.53	228.5 9.00	292.5 11.52

See web site for drawings.



ServoFit® Geared Motor – "K" Series
Torque Arm Bracket
Dimensional Data

(Torque arm supplied by others.)

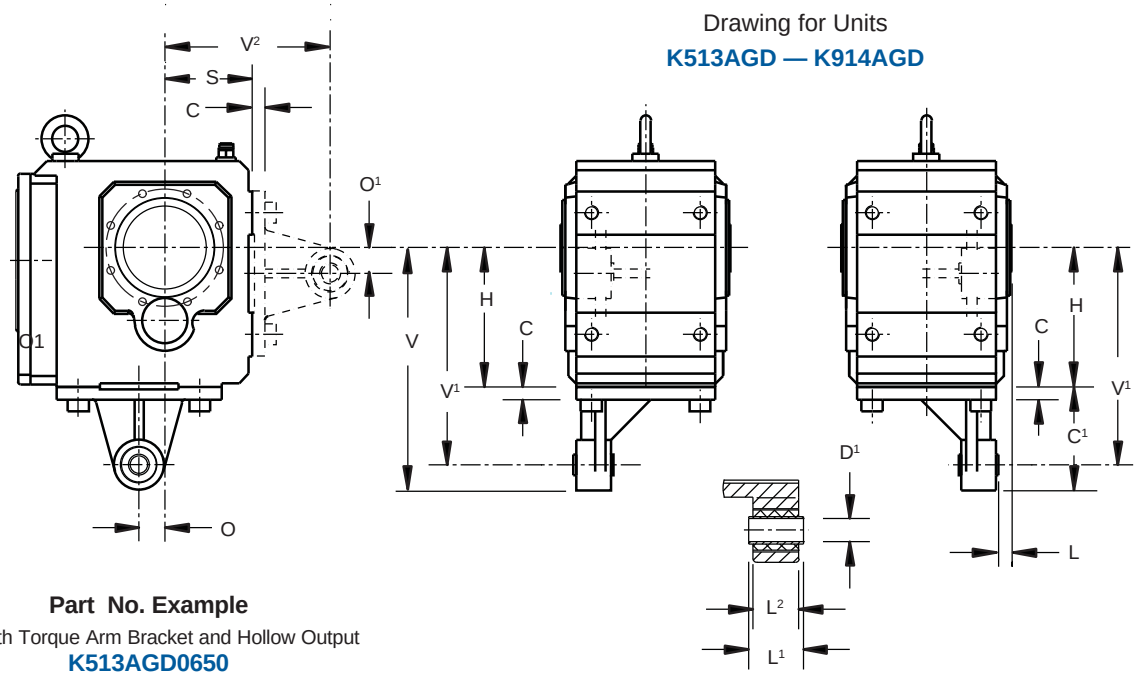


Drawing for Units
K102AGD — K402AGD

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 K914 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	.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

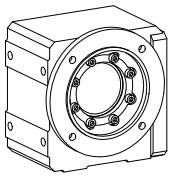


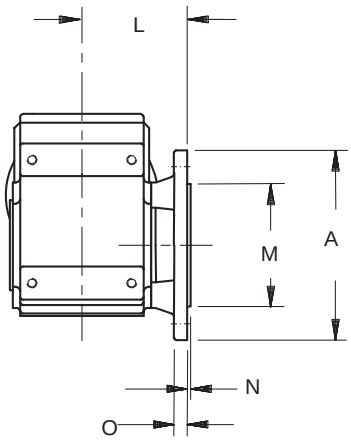
Drawing for Units
K513AGD — K914AGD

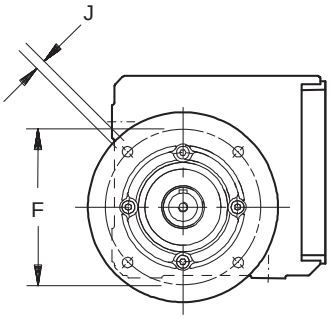
Part No. Example

Unit with Torque Arm Bracket and Hollow Output
K513AGD0650

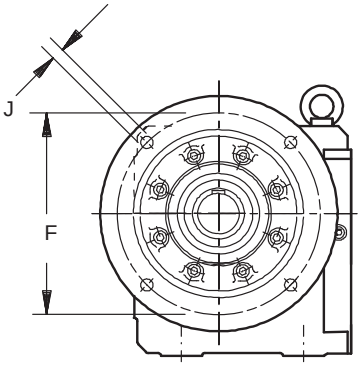
ServoFit® Geared Motor – "K" Series
Optional Round Flange Sizes
Dimensional Data



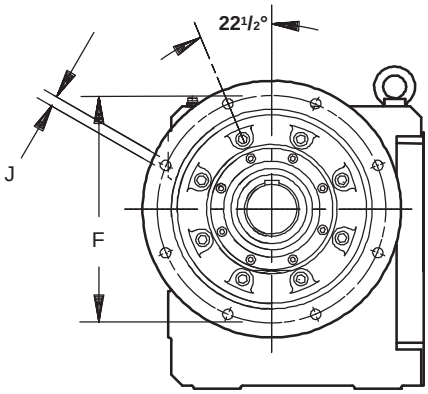




Drawing for Units
K102F—K402F



Drawing for Units
K513F—K814F



Drawing for Units
K914F

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	**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
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

* This is the standard flange diameter. For other diameters, specify at the time of ordering.

ServoFit® Geared Motor
Installation of Hollow Output

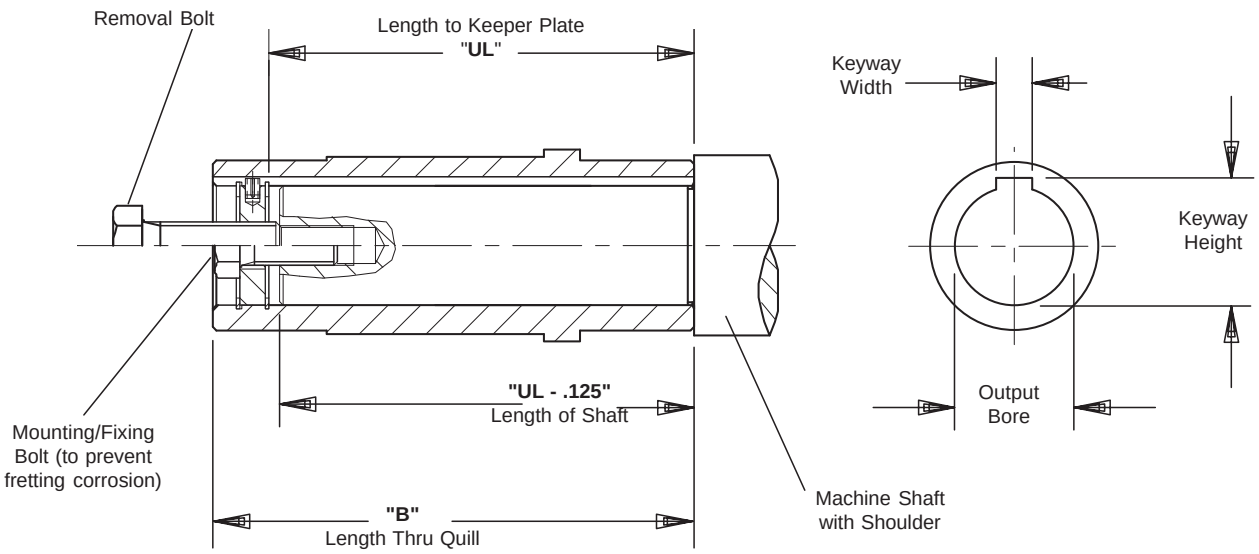


Table No. 1
Hollow Shaft — "U" Dimension

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

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. 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

ServoFit® Geared Motor
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:

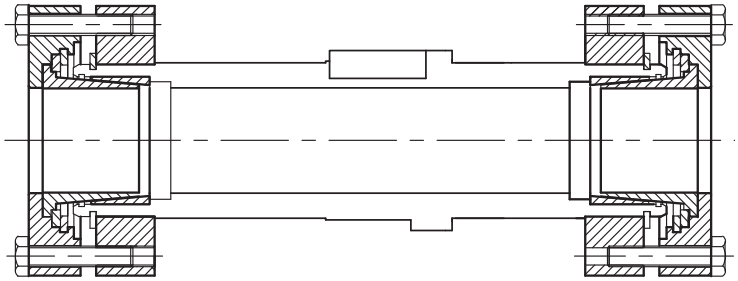
- All quills and bushing parts are high tensile stainless steel – providing the additional benefit of corrosion resistance.
- Featuring a distinct support side and a clamp side, the dual tapered cones will overcome a wide range of tolerances normally found with standard shaft materials. There is no shaft key necessary.
- All hardware is stainless steel or nickel plated.
- Units sizes K102 through K814 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 inches.

Detailed instructions for mounting the bushing are included with each bushing kit.

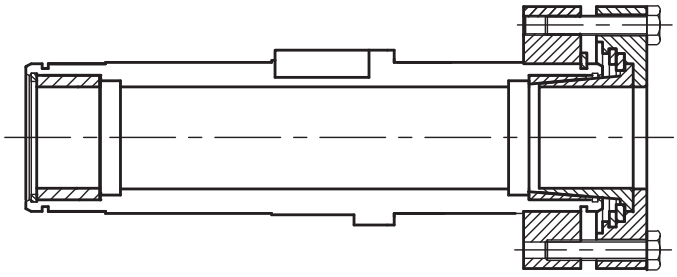
Double Sided Bushing



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

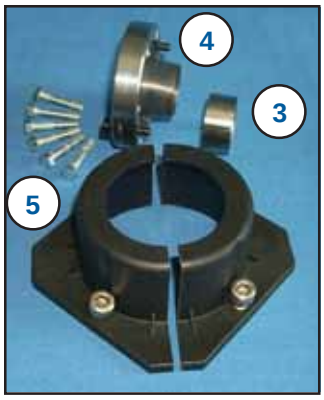


Support Side **Clamp Side**

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.

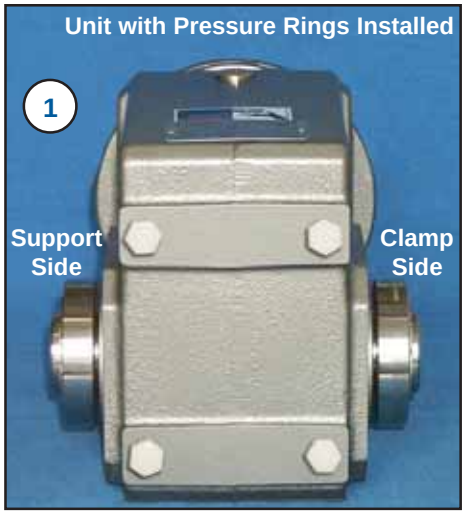
[1] U.S. Patent Number 5,496,127

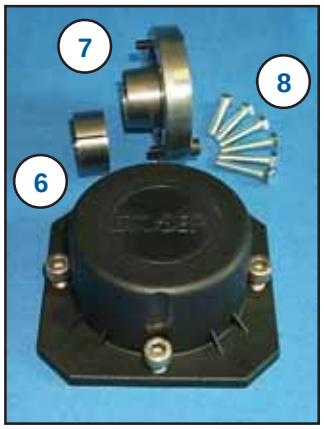
ServoFit® Geared Motor – "K" Series
"WFB" Bushing Installation



Support Side Bushing Components

The Support Side is the bushing with the dark coating on the cone. Do NOT use cleaner on the coated cone.



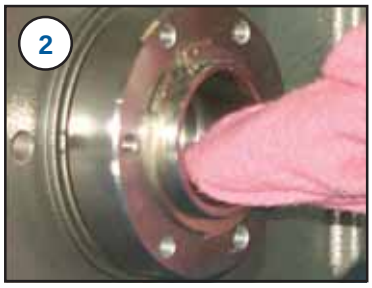


Clamp Side Bushing Components

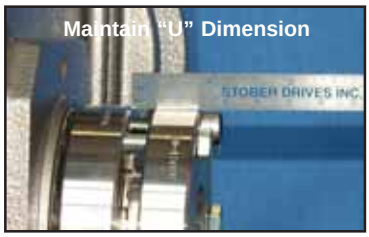
Support Side Installation

K1 units do not have a tapered cone.

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.



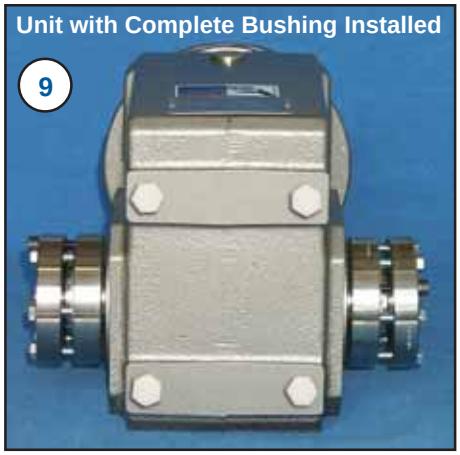
The "U" distance (between the rings) determined by the spacer bolts (see Table 1) must be maintained throughout assembly of the bushing and mounting onto the shaft. Therefore DO NOT tighten the capscrews or remove the spacer bolts until the unit is mounted on the shaft.

Clamp Side Installation

K1 units do not have a tapered cone.

Install the Flanged Cone Assembly (7) with it's slot opposite the slot in the tapered cone (6).

ServoFit® Geared Motor – "K" Series
"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.

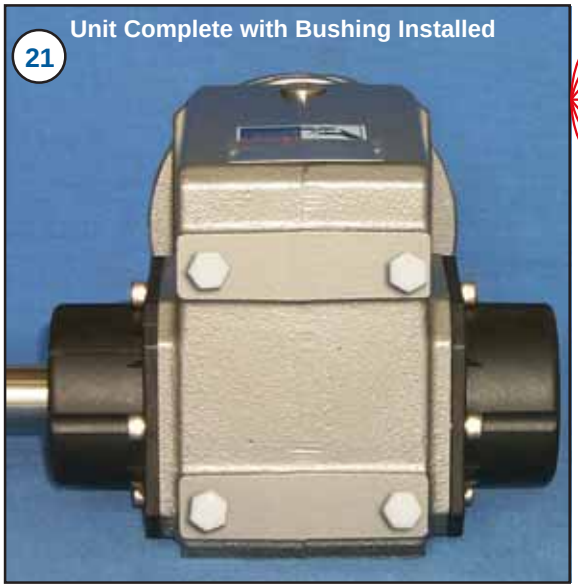


Table No. 1

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.

"P" Series
ServoFit® Geared Motor
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: $F_{2RX} = \frac{F_{2R}}{\sqrt[3]{\frac{n_2}{100}}}$ $T_{2KX} = \frac{T_{2K}}{\sqrt[3]{\frac{n_2}{100}}}$

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

All formulas shown are based on metric values.

Table No. 1 Permissible Load and Tilting Moments

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	270	34	300
P3	21	.827	1,000	225	2,500	563	88	779
P4	22	.866	1,500	337	4,000	900	160	1,416
P5	23	.906	2,300	518	6,500	1,463	338	2,708
P7	26	1.023	2,900	653	8,000	1,800	536	4,744
P8	28	1.102	4,700	1,058	13,000	2,925	897	7,938

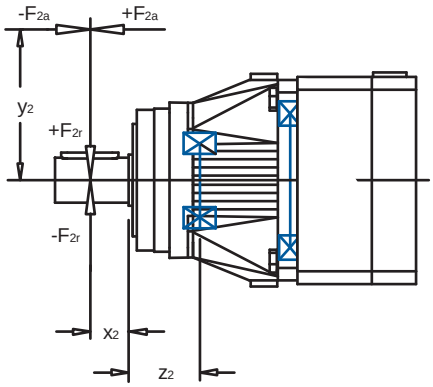
D – Output Bearing Option, Axially Reinforced

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	24	.945	1,400	315	2,750	619	105	929
P4	25	.984	2,250	506	4,500	1,013	194	1,717
P5	29	1.142	3,500	788	7,000	1,575	406	3,593
P7	31	1.220	4,500	1,013	9,000	2,025	648	5,735
P8	35	1.378	7,500	1,688	15,000	3,375	1,140	10,089

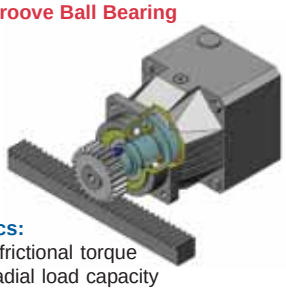
Z – Output Bearing Option, Radially Reinforced

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	416	3,682
P7	26	1.02	2,000	450	10,000	2,250	670	5,929
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).



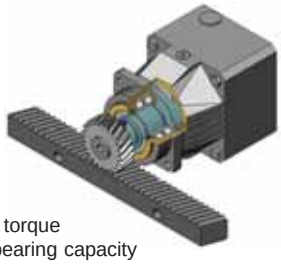
"R" – Deep Groove Ball Bearing



Characteristics:
- Minimal frictional torque
- Good Radial load capacity
- Axial load approx. 35% of radial load

Applications:
- Spur geared rack/pinion
- Couplings
- Belt with or without light tension

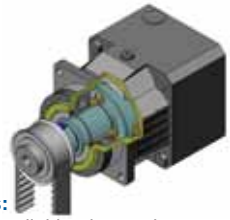
"D" – Double Row Angular Contact Ball Bearing



Characteristics:
- Low frictional torque
- Good radial bearing capacity
- Axial load approx. 50% of radial load

Applications:
- Helical geared rack/pinion
- Couplings with high axial load
- Belt with or without light tension

"Z" – Cylindrical Roller Bearing



Characteristics:
- Very good radial load capacity
- Axial load approx. 20% of radial load

Applications:
- Prestressed belt drive
- Prestressed spur rack drive
- Applications with high radial loads and/or high service requirements

"PH" Series
ServoFit® Geared Motor
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:

$$T_{2A} = \frac{F_{2a} \cdot y_2 + F_{2r} \cdot (x_2 + z_2)}{1000} \leq T_{2K}$$

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.

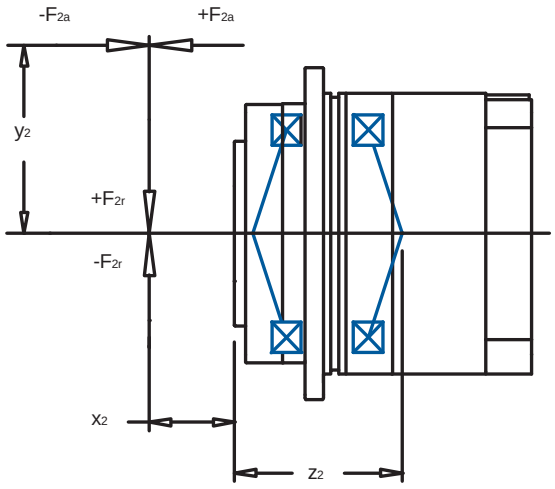


Table No. 1 "PH" Series – Permissible Output Load and Tilting Moments

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	62	2.44	1,650	371	100	885	–	–
PH4	84	3.07	2,150	484	260	2,124	160	1,416
PH5	97	3.62	4,150	934	440	3,717	300	2,655
PH7	88	3.31	6,150	1,384	1,500	13,275	500	4,425
PH8	126	4.65	10,050	2,261	3,500	30,975	1,550	13,718
PH9	140	5.51	33,000	7,425	6,500	57,525	5,500	48,675

ServoFit® Geared Motor 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.

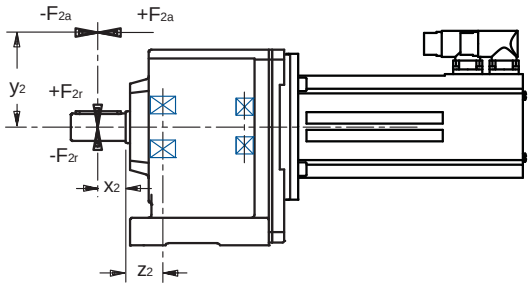


Table No. 1 Permissible Load and Tilting Moments

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

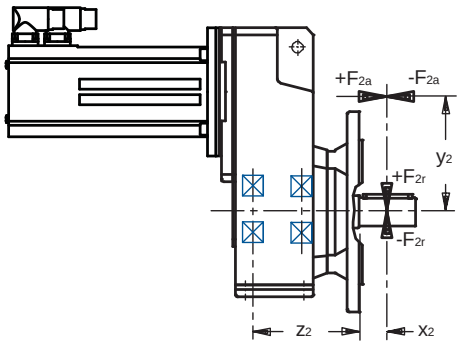


Table No. 2 Permissible Load and Tilting Moments

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

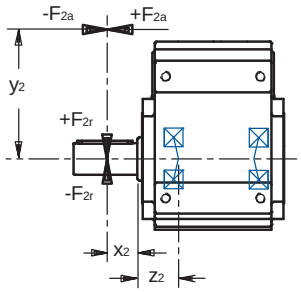


Table No. 3 Single Solid Output Permissible Load and Tilting Moments

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

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.

$$OHL = \frac{126{,}000 \text{ x } HP \text{ x } K}{D \text{ x } RPM}$$

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® Geared Motor 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 Mobilgear 600XP220 lubrication. In order to provide the proper lubrication quantity **the mounting position must be specified at the time the unit is ordered**.

Maintenance

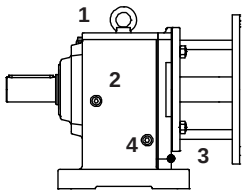
With STOBER reducers very little maintenance is required under normal operating conditions.
Unless otherwise noted breathers are provided on the following units:

C612 through C813
K513 through K914

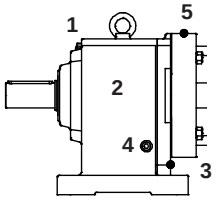
We recommend that the lubrication be changed in units supplied with breathers according to the following schedule:

Normal Operating Conditions – after 5000 Hours
Wet Operating Conditions – after 2000 Hours.

Units supplied without breathers (beverage and food packages) are lubricated for life.



C612-C712

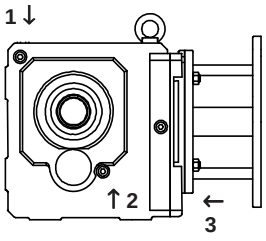


C613-C813

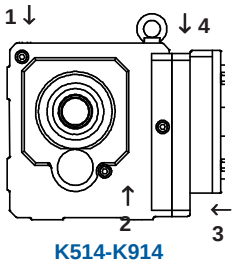
Table No. 1 Drain Plug and Vent Location

Mounting Position	1	2	2a	3	5
EL1	Vent			Drain	
EL2	Drain			Vent	
EL3		Vent	Drain		
EL4		Drain	Vent		
EL5 (C612-C712)	Drain			Vent	
EL5 (C613-C813)	Drain				Vent
EL6	Vent			Drain	

Position 2a is on the opposite side of 2.



K513-K813



K514-K914

Table No. 2 Drain Plug and Vent Location

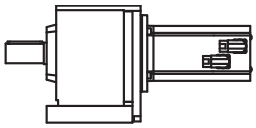
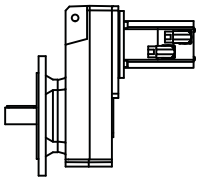
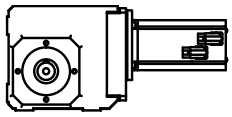
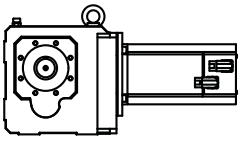
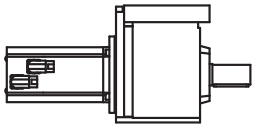
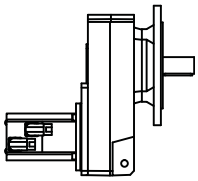
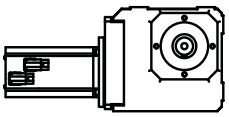
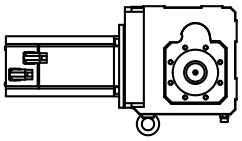
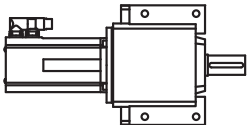
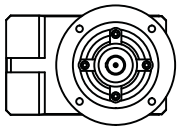
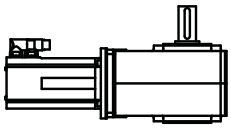
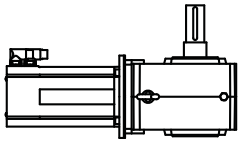
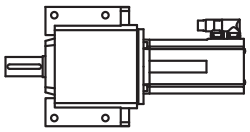
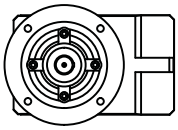
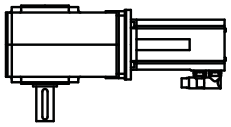
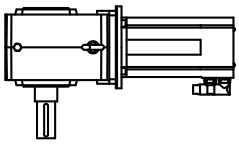
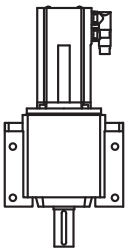
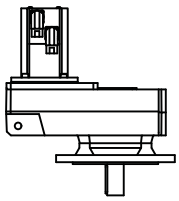
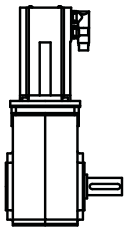
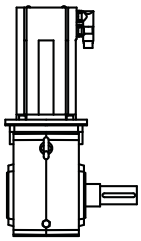
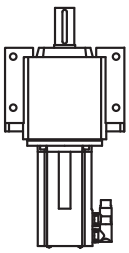
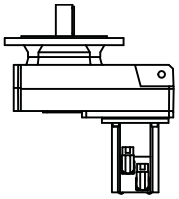
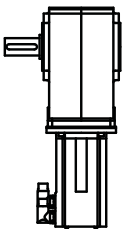
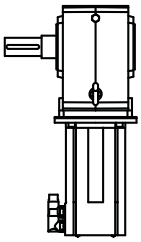
Mounting Position	1	2	2a	3	4
EL1	Vent			Drain	
EL2	Drain			Vent	
EL3		Vent	Drain		
EL4		Drain	Vent		
EL5 (K513/K813)	Drain			Vent	
EL5 (K514/K914)	Drain				Vent
EL6 (K513/K813)	Vent			Drain	
EL6 (K513/K914)	Vent				Drain

Position 2a is on the opposite side of 2.

ServoFit® Geared Motor Mounting Position Specification

("K" Series shown with shaft on Side 4.)

All STOBER units are filled with the correct amount of lubrication before shipping. In order to provide the proper lubrication quantity **the mounting position must be specified at the time the unit is ordered**.

Mounting Position	"C" Series	"F" Series	"K" Series K1-K4	"K" Series K5-K9
EL1 Side 1 is the bottom side when the unit is set in a normal position. Side 1 is the down side for EL1.				
EL2 Side 2 is the top of the unit. Side 2 is the down side for EL2 . (The unit is up-side-down.)				
EL3 Side 3 is the right side when facing the input with the unit in a normal position (EL1). Side 3 is the down side for EL3. Right angle units have the output on Side 3 or 4.				
EL4 Side 4 is the left side when facing the input with the unit in a normal position (EL1). Side 4 is the down side for EL4. Right angle units have the output on Side 3 or 4.				
EL5 Side 5 is the side opposite the motor. Side 5 is the down side for EL5.				
EL6 Side 6 is always the input or motor side. Side 6 is the down side for EL6.				

ServoFit® Geared Motor
Direction of Rotation

All units shown EL1.

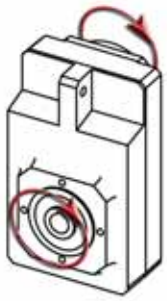
P221 – P822

PH321 – PH923

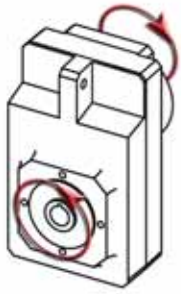
C002 – C712

C103 – C813

F102 – F602

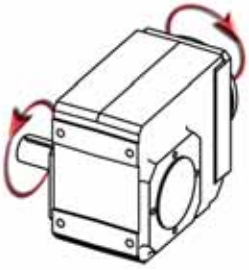


F203 – F603

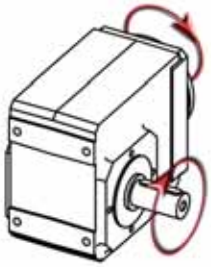


K102 – K402

Shaft Side 3

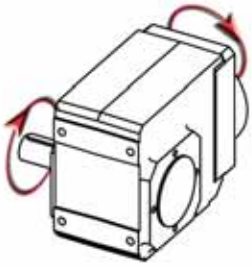


Shaft Side 4

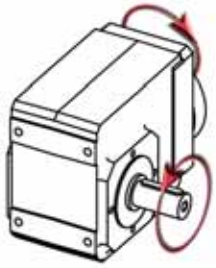


K203 – K403

Shaft Side 3

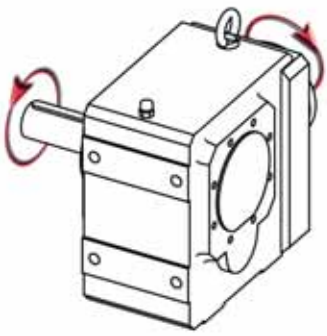


Shaft Side 4

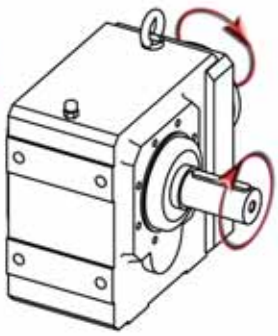


K513 – K813

Shaft Side 3

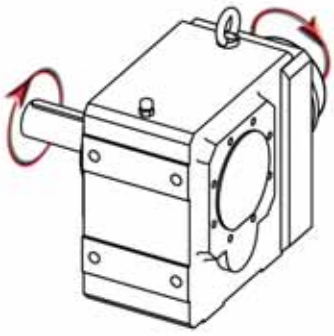


Shaft Side 4

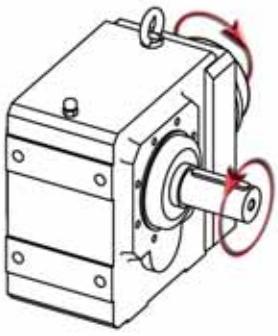


K514 – K914

Shaft Side 3



Shaft Side 4



See web site for drawings.

ServoFit® Geared Motor Compatibility

STOBER ServoFit® Geared Motors are compatible with many servo inverters. All Geared Motors are tested at the factory with your specified inverter to assure compatibility before shipping. Instructions are available for different parameter settings for the specified inverter. **Contact STOBER Drives Inc. for other manufacturers not shown in the following compatibility table.**

Table No. 1 Servo Inverter Compatibility

Manufacturer	Series/Type	Resolver (2 pole)	Absolute Encoder EnDat®
B&R	Acopos	x	x [1]
Control Techiques	Unidrive SP	x	–
Eurotherm	Samson S3-3	x	–
Eurotherm	Samson S3-7	x	–
Danaher/Kollmorgen	Servostar 300/600	x	–
Siemens	Masterdrive Simodrive 611	–	x [2]
Yaskawa	Sigma FSP	x	–
Yet	Xtra Drive	x	–

Drive manufacturers not listed, should contact STOBER to provide compatibility information.

[1] Heidenhain EQI1329
[2] Heidenhain EQN1125-512 for ED2 and ED3
Heidenhain EQN1325-2048 for ED4 to ED/EK7

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Fax: +49 (0) 7231 582-1000
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E-mail: mail@stoeber.de

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South Korea

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E-mail: dkstoeber@stoeber.co.kr

Switzerland

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Bahnhofstr. 9
6341 Baar
Phone: +41 (0) 41 760 59 05
Fax: +41 (0) 41 760 62 62
E-mail: info@stoeber.ch

United States of America

STOBER Drives Inc.
1781 Downing Drive
Maysville KY 41056
Phone: 606 759-5090
Fax: 606 759-5045
E-mail: sales@stober.com

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 (ServoFit Modular System, ServoFit Precision Planetary Gearheads, and ServoFit Geared Motors) and MGS Long Life products; 3-years (single shift operation or 18 months multiple shift operation) for other MGS products; 2-years (single shift operation or 12 months multiple shift operation) for ComTrac products, from the date of shipment to the Customer. For ServoFit products, the motor on ServoFit Geared Motors, as well as 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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