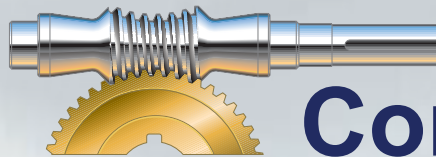
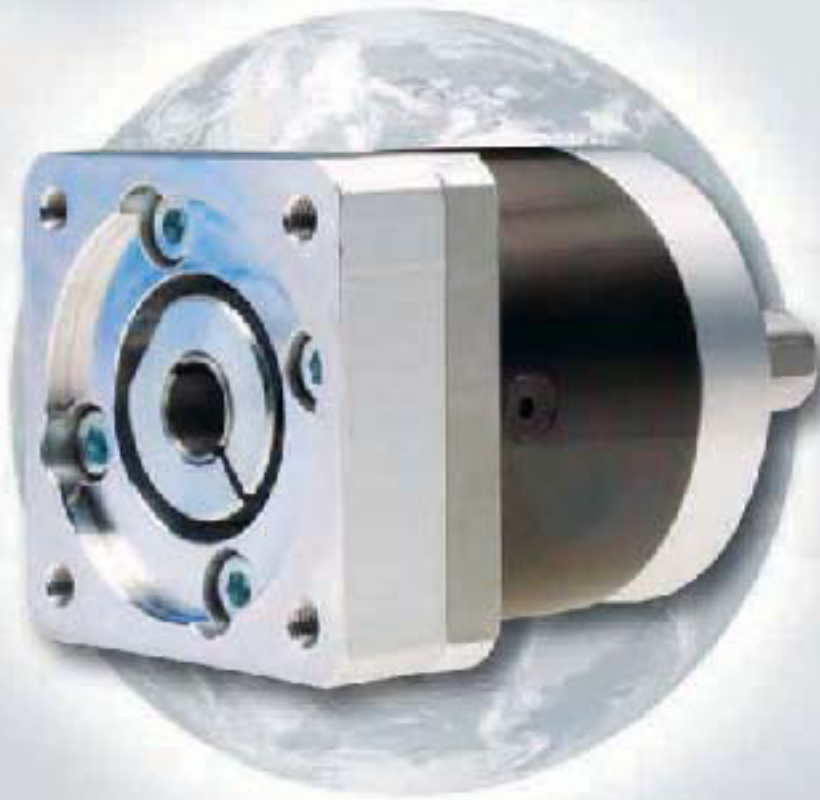


Series E

AccuDrive

CAT.E-03/09.NA



**Cone Drive™**

0206

***Now you can get design flexibility and lasting performance from our complete family of AccuDrive Precision Products.***

**Series W Precision Servo Gearhead.**

**Output torque** up to 8,500 lb.in.  
**Motor** adapters to fit servo motors.  
**Center distance** from 38 to 89 mm.  
**Speed Range** up to 6,000 RPM input.  
**Sizes** available 38, 51, 64, 76 and 89.  
**Universal Mounting** with shaft mount and flange mount standard.  
**Gear ratios** from 5:1 to 60:1, special ratios available.  
 Standard backlash, low backlash, and ZERO backlash available.



**Series P In-line Planetary Servo Gearhead.**

**Output torque** capacity up to 15,930 lb.in.  
**Motor** adapters to fit servo motors.  
**Output Flange Square** from 70 to 190 mm.  
**Speed Range** up to 10,000 RPM input.  
**Sizes** available 70, 90, 115, 142, 190.  
**Gear ratios** from 3:1 to 100:1  
 Universal Mounting with shaft mount and flange mount standard.  
 Three arcminutes backlash or better.



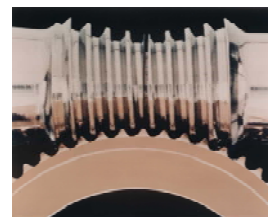
**Model RG Right Angle Gearhead.**

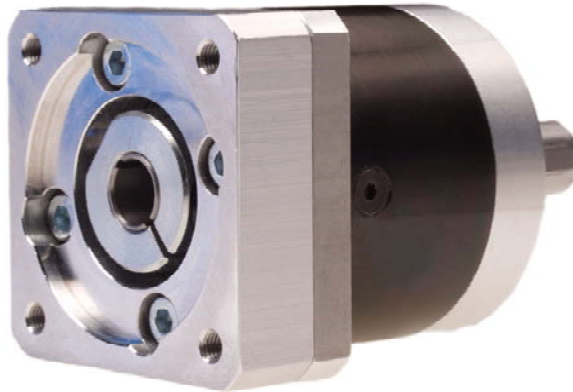
**Output torque** capacity up to 8,500 lb.in.  
**Motor** sizes (standard), adapters to fit servo motors.  
**Center distance** from 1.5 to 3.5 inches.  
**Input Power** ratings up to 27 H.P., speed range up to 4,000 RPM.  
**Sizes** available 15, 20, 25, 30, and 35.  
 Universal Mounting with shaft mount and flange mount standard, in single reduction type.  
**Gear ratios** from 5:1 to 60:1.



**ABSOLUTE ZERO backlash AccuDrive gearing.**

Unique design captures both sides of the gear tooth to completely eliminate backlash. Automatically compensates for wear-guaranteed zero backlash for the life of the gearset. Available for single, double and triple reduction types, loose gearing, special designs, and the Series W.





### **PRECISION HONED PLANETARY GEARING**

- ◆ High torque capacity
- ◆ High efficiency
- ◆ Backlash as low as 8 arc minutes
- ◆ Low noise, as low as 55dB(A)
- ◆ Exact ratios

### **UNIVERSAL HOUSING AND FLEXIBLE OUTPUT FLANGES**

- ◆ Mount in any position
- ◆ 200% shock load capacity
- ◆ Accepts input speeds to 10,000 rpm
- ◆ Available with C-face, NEMA, and D-flange output flanges

### **ONE-MINUTE MOTOR MOUNTING**

- ◆ Integrated input flange mounts directly to your servomotor
- ◆ Hollow input shaft easily accepts your motor shaft and clamps to provide zero backlash connection

### **MAINTENANCE FREE**

- ◆ Factory filled with synthetic grease
- ◆ No lubrication service throughout unit life
- ◆ Seals provide leak-free operation and protection against harsh environments

### **READILY AVAILABLE**

- ◆ Standard ratios in stock
- ◆ Stocked motor plates and bushings to fit your servomotor

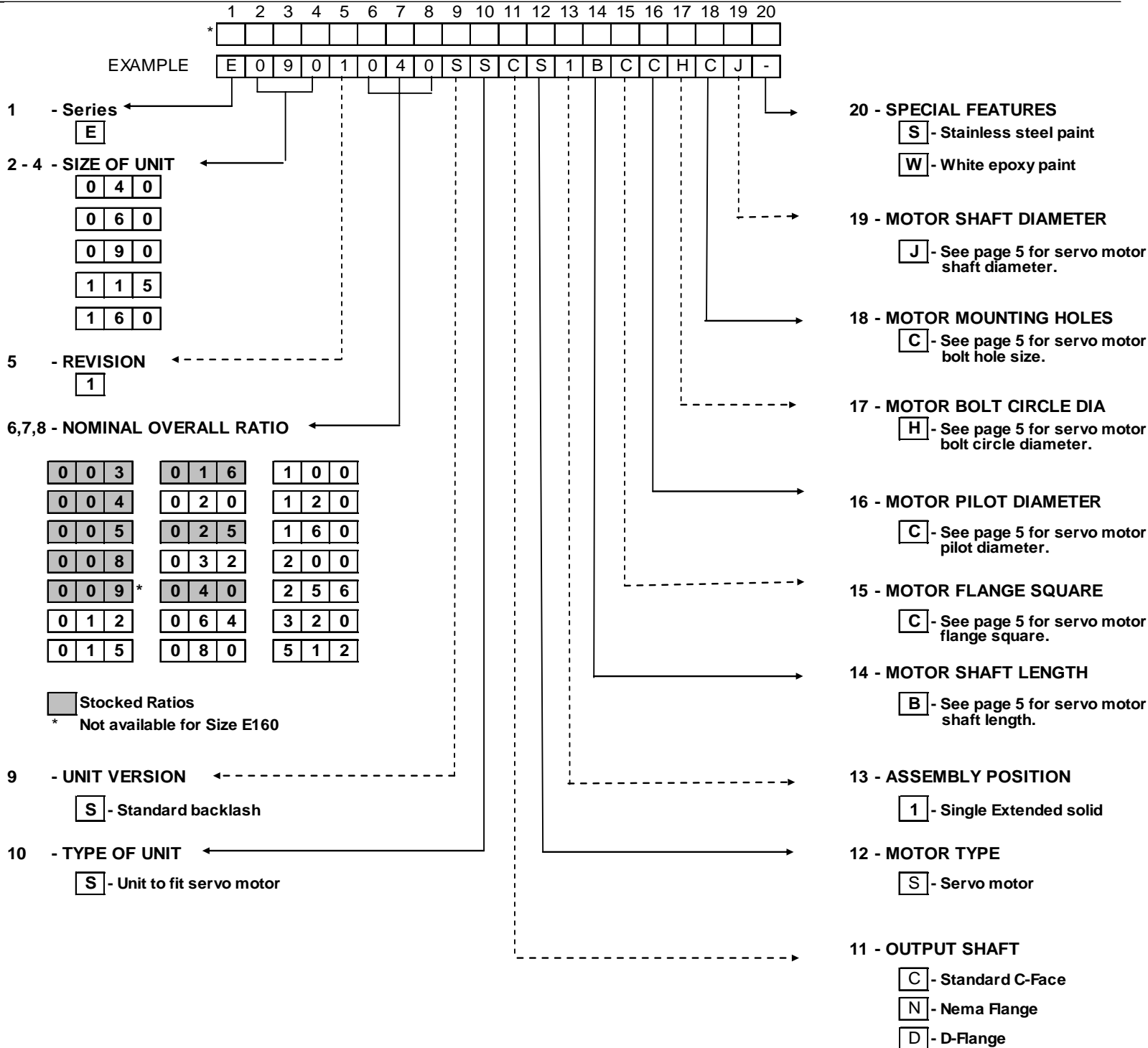
### **FREE SERIES E APPLICATION ASSISTANCE**

To ensure optimum performance, our Application Engineers can help you design the ideal servo mechanical drive system for your particular application.

We're available to further discuss the Series E design characteristics and help with specifying backlash, gear ratios, and speeds.

Call and tell us about your application.

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\* THIS PAGE MAY BE PHOTOCOPIED ALLOWING THE CUSTOMER TO ENTER THEIR ORDER.

MOTOR MOUNTING CODES  
SERVO MOTOR FLANGE SELECTION

0206

E040 SELECTIONS	COLUMN	SHAFT LENGTH									
	14	25									
	ENTRY	M									
	COLUMN	FLANGE SQUARE									
	15	40									
	ENTRY	M									
	COLUMN	PILOT DIAMETER									
	16	20.02	30								
	ENTRY	S	T								
	COLUMN	BOLT CIRCLE									
17	46	46.7									
ENTRY	V	W									
COLUMN	BOLT HOLE DIAMETER IN MOTOR FLANGE										
18	3.2-3.6	4.3-4.8									
ENTRY	J	K									
COLUMN	MOTOR SHAFT DIAMETER										
19	4	5	6	6.35	8						
ENTRY	X	Y	Z	A	B						

E060 SELECTIONS	COLUMN	SHAFT LENGTH									
	14	23	30	32							
	ENTRY	A	B	C							
	COLUMN	FLANGE SQUARE									
	15	60	70	80	90						
	ENTRY	P	A	B	C						
	COLUMN	PILOT DIAMETER									
	16	38.1	40	50	60	70	73.07				
	ENTRY	A	B	C	D	E	F				
	COLUMN	BOLT CIRCLE									
17	63	65	66.68	70	75	80	90	95	98.43		
ENTRY	A	B	C	D	E	F	G	H	J		
COLUMN	BOLT HOLE DIAMETER IN MOTOR FLANGE										
18	4.5-5.2	5.3-6.3	6.4-8.3								
ENTRY	A	B	C								
COLUMN	MOTOR SHAFT DIAMETER										
19	6	6.35	8	9	9.525	10	11	12	12.7	14	
ENTRY	Z	A	B	C	D	E	F	G	H	J	

E090 SELECTIONS	COLUMN	SHAFT LENGTH									
	14	30	32	40	50	58					
	ENTRY	B	C	D	F	G					
	COLUMN	FLANGE SQUARE									
	15	80	90	100	115	120					
	ENTRY	B	C	D	E	F					
	COLUMN	PILOT DIAMETER									
	16	38.1	40	50	60	70	73.07	80	95	110	
	ENTRY	A	B	C	D	E	F	G	H	J	
	COLUMN	BOLT CIRCLE									
17	66.68	70	75	80	90	95	98.43	100	115	130	
ENTRY	C	D	E	F	G	H	J	K	L	M	
COLUMN	BOLT HOLE DIAMETER IN MOTOR FLANGE										
18	4.5-5.2	5.3-6.3	6.4-8.3	8.4-10.3							
ENTRY	A	B	C	D							
COLUMN	MOTOR SHAFT DIAMETER										
19	9.525	10	11	12	12.7	14	16	19			
ENTRY	D	E	F	G	H	J	K	L			

E115 SELECTIONS	COLUMN	SHAFT LENGTH									
	14	40	50	58							
	ENTRY	D	F	G							
	COLUMN	FLANGE SQUARE									
	15	115	120	140							
	ENTRY	E	F	G							
	COLUMN	PILOT DIAMETER									
	16	95	110	130							
	ENTRY	H	J	L							
	COLUMN	BOLT CIRCLE									
17	115	130	145	165							
ENTRY	L	M	N	P							
COLUMN	BOLT HOLE DIAMETER IN MOTOR FLANGE										
18	6.4-8.3	8.4-10.3	10.4-12.4								
ENTRY	C	D	E								
COLUMN	MOTOR SHAFT DIAMETER										
19	11	12.7	14	16	19	22	24				
ENTRY	F	H	J	K	L	M	N				

E160 SELECTIONS	COLUMN	SHAFT LENGTH									
	14	50	58	60	80						
	ENTRY	F	G	H	J						
	COLUMN	FLANGE SQUARE									
	15	140	180	190							
	ENTRY	G	H	J							
	COLUMN	PILOT DIAMETER									
	16	110	114.3	130	180						
	ENTRY	J	K	L	M						
	COLUMN	BOLT CIRCLE									
17	130	145	165	200	215						
ENTRY	M	N	P	Q	R						
COLUMN	BOLT HOLE DIAMETER IN MOTOR FLANGE										
18	8.4-10.3	10.4-12.4	12.5-15								
ENTRY	D	E	F								
COLUMN	MOTOR SHAFT DIAMETER										
19	19	24	28	32	35						
ENTRY	L	N	P	Q	R						

1. Use the tables on this page to determine Columns 14-19 of your 20 digit order code (page 4).
2. First, choose the appropriate table for the Series E unit size you have selected: E040, E060, E090, E115, or E160. Detailed specifications for each unit are given on pages 6-9 of this catalog.
3. Then select the appropriate codes for Columns 14-19 by matching the dimensions on your servo motor flange to the codes listed in the respective table.
4. If you need assistance, please contact Cone Drive customer service.

**PLANETARY SERVO GEARHEAD  
TECHNICAL DATA**

0607

Ratios	Gear Stages		Output Torque by Gearhead Size									
			E040		E060		E090		E115		E160	
			T <sub>2N</sub>	T <sub>MAX</sub>	T <sub>2N</sub>	T <sub>MAX</sub>	T <sub>2N</sub>	T <sub>MAX</sub>	T <sub>2N</sub>	T <sub>MAX</sub>	T <sub>2N</sub>	T <sub>MAX</sub>
3	1	lb.in.	97	150	245	398	752	1203	1018	1628	3540	5664
		Nm	11	17	28	45	85	136	115	184	400	640
4	1	lb.in.	133	212	336	540	1018	1628	1372	2531	3982	6372
		Nm	15	24	38	61	115	184	155	248	450	720
5	1	lb.in.	124	194	354	566	973	1558	1726	2761	3982	6372
		Nm	14	22	40	64	110	176	195	312	450	720
8	1	lb.in.	53	88	160	256	442	708	1062	1699	3982	6372
		Nm	6	10	18	29	50	80	120	192	450	720
9	2	lb.in.	142	230	389	619	1150	1840	1858	2973	-	-
		Nm	16	26	44	70	130	208	210	336	-	-
12	2	lb.in.	177	283	389	619	1062	1699	2301	3681	7080	11328
		Nm	20	32	44	70	120	192	260	416	800	1280
15	2	lb.in.	159	256	389	619	973	1558	2035	3257	6195	9912
		Nm	18	29	44	70	110	176	230	368	700	1120
16	2	lb.in.	177	283	389	619	1062	1699	2301	3681	7080	11328
		Nm	20	32	44	70	120	192	260	416	800	1280
20	2	lb.in.	177	283	389	619	1062	1699	2301	3681	7080	11328
		Nm	20	32	44	70	120	192	260	416	800	1280
25	2	lb.in.	159	256	354	566	973	1558	2035	3257	6195	9912
		Nm	18	29	40	64	110	176	230	368	700	1120
32	2	lb.in.	177	283	389	619	1062	1699	2301	3681	7080	11328
		Nm	20	32	44	70	120	192	260	416	800	1280
40	2	lb.in.	159	256	354	566	973	1558	2035	3257	6195	9912
		Nm	18	29	40	64	110	176	230	368	700	1120
64	2	lb.in.	66	106	159	256	442	708	1062	1699	3982	6372
		Nm	7.5	12	18	29	50	80	120	192	450	720
60	3	lb.in.	177	283	389	619	973	1558	2301	3681	-	-
		Nm	20	32	44	70	110	176	260	416	-	-
80	3	lb.in.	177	283	389	619	1062	1699	2301	3681	-	-
		Nm	20	32	44	70	120	192	260	416	-	-
100	3	lb.in.	177	283	389	619	1062	1699	2301	3681	-	-
		Nm	20	32	44	70	120	192	260	416	-	-
120	3	lb.in.	159	256	389	619	973	1558	2035	3257	-	-
		Nm	18	29	44	70	110	176	230	368	-	-
160	3	lb.in.	177	283	389	619	1062	1699	2301	3681	-	-
		Nm	20	32	44	70	120	192	260	416	-	-
200	3	lb.in.	159	256	354	566	973	1558	2035	3257	-	-
		Nm	18	29	40	64	110	176	230	368	-	-
256	3	lb.in.	177	283	389	619	1062	1699	2301	3681	-	-
		Nm	20	32	44	70	120	192	260	416	-	-
320	3	lb.in.	159	256	354	566	973	1558	1035	3257	-	-
		Nm	18	29	40	64	110	176	230	368	-	-
512	3	lb.in.	66	106	159	256	442	708	1062	1699	-	-
		Nm	7.5	12	18	29	50	80	120	192	-	-

Stock Ratios

T2N = Continuous duty rated torque, at uniform load, 30000 hours L10 design life, at 100 rpm output shaft speed

TMAX = Maximum torque allowable for 30000 output shaft rotations

	Gear Stages		Size				
			E040	E060	E090	E115	E160
Emergency Stop			$2 \times T_{2N}$				
Maximum Radial Load		lbs.	36.0	76.4	146.1	337.2	944.2
		N	160	340	650	1500	4200
Maximum Axial Load		lbs.	36.0	101.2	202.3	472.1	1348.8
		N	160	450	900	2100	6000
Efficiency	1	%	96				
	2	%	94				
	3	%	90				
Average Lifetime		Hours	30,000				
Weight	1	lbs.	0.77	1.9	4.6	13.2	39.6
		kg.	0.35	0.9	2.1	6.0	18.0
	2	lbs.	0.99	2.4	5.7	17.6	48.5
		kg.	0.45	1.1	2.6	8.0	22.0
	3	lbs.	1.20	2.8	6.8	22.0	-
		kg.	0.55	1.3	3.1	10.0	-
Maximum motor weight	1, 2, 3	lbs.	4.40	7.7	19.8	35.2	110.0
		kg.	2.00	3.5	9.0	16.0	50.0

**PLANETARY SERVO GEARHEAD  
TECHNICAL DATA**

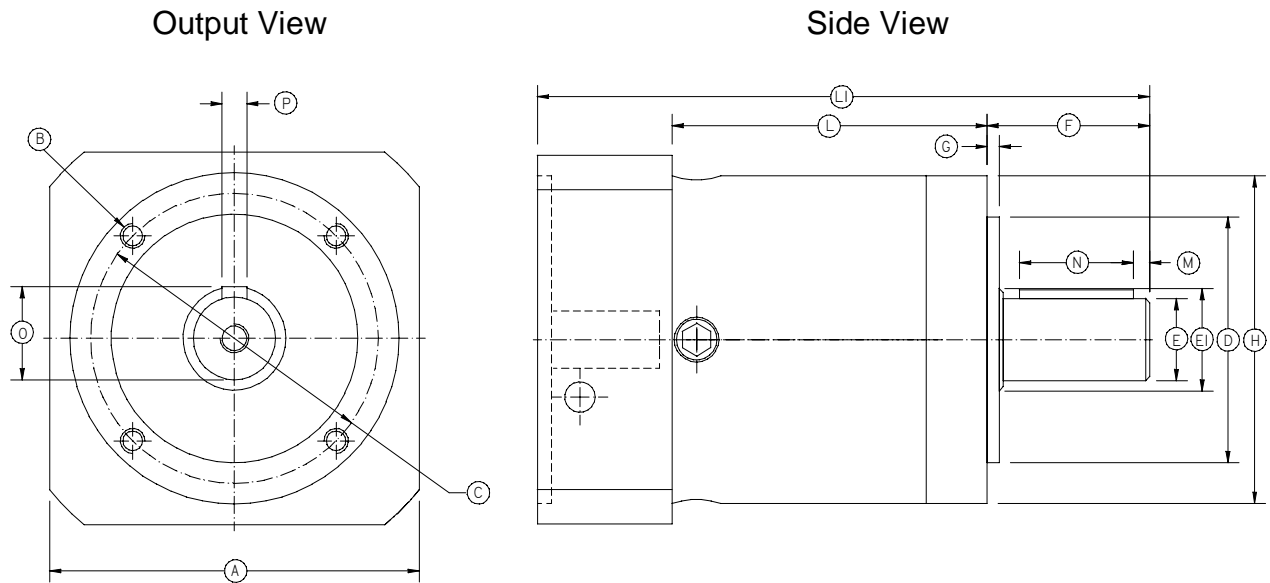
0206

	Ratios	Gear Stages		Size				
				E040	E060	E090	E115	E160
Moment of Inertia	3	1	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.270	1.190	6.80	23.2	107.4
			kgcm <sup>2</sup>	0.031	0.135	0.77	2.63	12.14
	4		lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.190	0.820	4.60	15.8	68.8
			kgcm <sup>2</sup>	0.022	0.093	0.52	1.79	7.78
	5		lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.160	0.690	3.90	13.5	53.7
			kgcm <sup>2</sup>	0.019	0.078	0.45	1.53	6.07
	8	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.150	0.570	3.40	11.6	40.9	
		kgcm <sup>2</sup>	0.017	0.065	0.39	1.32	4.63	
	9	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.260	1.150	6.54	23.1	-	
		kgcm <sup>2</sup>	0.030	0.131	0.74	2.62	-	
	12	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.250	1.120	6.30	22.6	109.0	
		kgcm <sup>2</sup>	0.029	0.127	0.72	2.56	12.37	
	15	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.200	0.680	6.28	22.3	109.0	
		kgcm <sup>2</sup>	0.023	0.077	0.71	2.53	12.35	
	16	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.190	0.770	4.40	15.4	66.0	
		kgcm <sup>2</sup>	0.022	0.088	0.50	1.75	7.47	
	20	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.160	0.660	3.80	13.2	58.8	
		kgcm <sup>2</sup>	0.019	0.075	0.44	1.5	6.65	
	25	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.160	0.660	3.80	13.1	51.4	
		kgcm <sup>2</sup>	0.019	0.075	0.44	1.49	5.81	
	32	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.150	0.560	3.40	11.5	56.2	
		kgcm <sup>2</sup>	0.017	0.064	0.39	1.30	6.36	
	40	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.140	0.560	3.40	11.5	46.7	
		kgcm <sup>2</sup>	0.016	0.064	0.39	1.30	5.28	
	64	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.140	0.560	3.40	11.5	39.8	
		kgcm <sup>2</sup>	0.016	0.064	0.39	1.30	4.50	
	80	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.160	0.660	4.40	13.2	-	
		kgcm <sup>2</sup>	0.019	0.075	0.50	1.50	-	
	100	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.160	0.660	3.80	13.1	-	
		kgcm <sup>2</sup>	0.019	0.075	0.44	1.49	-	
	120	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.250	0.560	6.10	22.1	-	
		kgcm <sup>2</sup>	0.029	0.064	0.70	2.50	-	
160	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.140	0.560	3.45	11.5	-		
	kgcm <sup>2</sup>	0.016	0.064	0.39	1.30	-		
200	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.140	0.560	3.45	11.5	-		
	kgcm <sup>2</sup>	0.016	0.064	0.39	1.30	-		
256	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.140	0.560	3.45	11.5	-		
	kgcm <sup>2</sup>	0.016	0.064	0.39	1.30	-		
320	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.140	0.560	3.45	11.5	-		
	kgcm <sup>2</sup>	0.016	0.064	0.39	1.30	-		
512	lb.in.s <sup>2</sup> x 10 <sup>-4</sup>	0.140	0.560	3.45	11.5	-		
	kgcm <sup>2</sup>	0.016	0.064	0.39	1.30	-		

**PLANETARY SERVO GEARHEAD  
TECHNICAL DATA**

0206

	Gear Stages		Size				
			E040	E060	E090	E115	E160
Backlash	1	arcmin.	<24	<16	<9	<8	<6
	2	arcmin.	<28	<20	<14	<12	<10
	3	arcmin.	<30	<22	<16	<14	-
Torsional Stiffness (per arcminute)	1	lb.in./arcmin	8.9	20.4	53.1	106.2	336.3
		Nm/arcmin	1.0	2.3	6.0	12.0	38.0
	2	lb.in./arcmin	9.7	22.1	57.5	115.1	362.9
		Nm/arcmin	1.1	2.5	6.5	13.0	41.0
	3	lb.in./arcmin	8.9	22.1	55.8	106.2	-
		Nm/arcmin	1.0	2.5	6.3	12.0	-
Running Noise		dB(A)	55	58	60	65	70
Max. input speed		RPM	18000	13000	7000	6500	6500
Cont. input speed		RPM	4500	4000	4000	3500	3000



**Standard Unit with C-FACE Output**

Unit Size	A		B	C		D		E		E1		F		G		H	
	Input Flange Square			Mounting Hole Thread	Bolt Circle Diameter		Pilot Diameter		Shaft Diameter		Shaft Shoulder Diameter		Output Shaft Length from Flange		Pilot Depth		Housing Diameter
	Inch	mm	Inch		mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
E040	1.574	40	M4 X 6	1.338	34	1.023	26	0.393	10	0.482	12	1.023	26	0.078	2	1.574	40
E060	2.362	60	M5 X 8	2.047	52	1.574	40	0.551	14	0.669	17	1.377	35	0.118	3	2.362	60
E090	3.150	80	M6 X 10	2.755	70	2.362	60	0.787	20	0.984	25	1.574	40	0.118	3	3.15	80
E115	4.527	115	M10 X 16	3.937	100	3.149	80	0.984	25	1.377	35	2.165	55	0.157	4	4.527	115
E160	6.299	160	M12 X 20	5.708	145	5.118	130	1.574	40	2.165	55	3.425	87	0.196	5	6.299	160

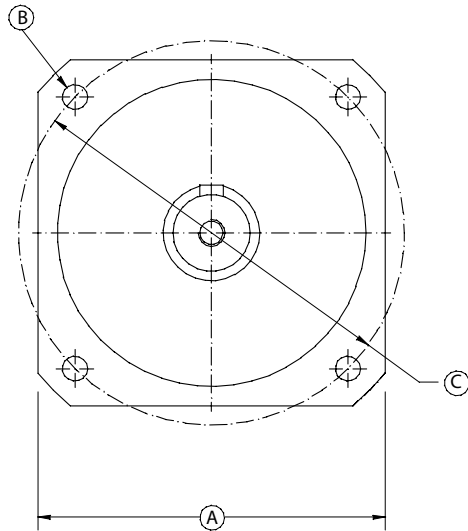
Unit Size	L						L1						M		N		O		P	
	Body Length						Body Length						Distance from End of Shaft	Keyway Length		Key & Shaft Height		Keyway Width		
	1 stage		2 stage		3 stage		1 stage		2 stage		3 stage			Inch	mm	Inch	mm	Inch	mm	Inch
E040	1.535	39	2.040	52	2.519	64	Gearhead length from motor plate to the end of the output shaft will vary depending on the motor selection. Please contact Cone Drive Engineering if length is critical to application to get exact gearhead length.						0.098	2.5	0.708	18	0.440	11.2	0.118	3
E060	1.850	47	2.322	59	2.834	72							0.098	2.5	0.984	25	0.629	16	0.196	5
E090	2.381	60.5	3.051	77.5	3.740	95							0.157	4	1.102	28	0.885	22.5	0.236	6
E115	2.913	74	3.976	101	5.039	128							0.196	5	1.574	40	1.102	28	0.314	8
E160	4.094	104	6.043	153.5	-	-							0.314	8	2.559	65	1.692	43	0.472	12

\* "L" and "L1" dimensions may vary for longer than standard motor shaft dimensions.

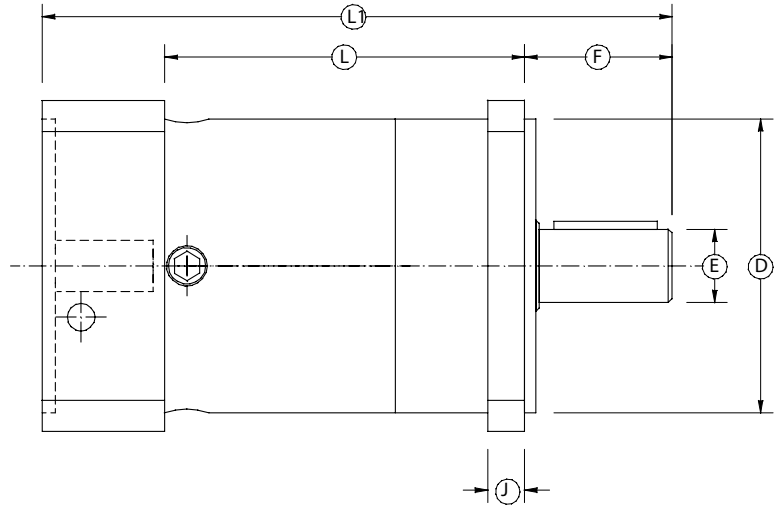
## PLANETARY SERVO GEARBOX NEMA AND D-FLANGE DIMENSION

0206

Output View



Side View



### Optional NEMA Flange Output

Unit Size	A		B		C		D		E		F		J		L					
	Output Flange Square		Bolt Hole		Bolt Circle Diameter		Pilot Diameter		Shaft Diameter		Output Shaft Length From Flange		Flange Thickness		Body Length					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	stage 1		stage 2		stage 3	
E060 <sup>1</sup>	2.362	60	0.177	4.5	2.625	66.	1.500	38.1	0.551	14	0.944	24	0.433	11	2.283	58.0	2.755	70.0	3.267	83
E090 <sup>2</sup>	3.267	83	0.217	5.5	3.874	98.4	2.874	73.0	0.787	20	1.102	28	0.472	12	2.854	72.5	3.523	89.5	4.212	107
E115 <sup>3</sup>	5.000	127	3/8-16		5.875	149.2	4.500	114.3	0.984	25	1.496	39	0.630	16	3.543	90	4.606	117	5.669	144

1. Output flange is Nema23
2. Output flange is Nema34
3. Output flange is Nema56C

### Optional Metric D Flange Output

Unit Size	A		B		C		D		E		F		J		L					
	Output Flange Square		Bolt Hole		Bolt Circle Diameter		Pilot Diameter		Shaft Diameter		Output Shaft Length From Flange		Flange Thickness		Body Length					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	stage 1		stage 2		stage 3	
E090	3.543	90	0.256	6.5	3.937	100	3.149	80	0.787	20k6	1.574	40	0.393	10	2.814	71.5	3.484	88.5	4.173	106
E115	4.527	115	0.334	8.5	5.118	130	4.33	10	0.984	25k6	2.165	55	0.59	15	3.897	99	4.96	126	6.023	153

**PLANETARY SERVO GEARHEAD  
SIZING AND SELECTION**

0206

**Required Application Data**

Motor Continuous Torque	<b>T<sub>cont</sub></b>
Motor Peak Torque	<b>T<sub>peak</sub></b>
Motor Rotor Inertia*	<b>J<sub>mot</sub></b>
Load Inertia*	<b>J<sub>load</sub></b>
Load Torque (non-dynamic Frictional and/or Gravity Load)	<b>T<sub>load</sub></b>
Reduction Ratio	<b>Ratio</b>

\*Any unit can be used for inertia as long as it is used consistently.

**Calculated Data**

Load torque reflected to input:  
 $T_{input} = T_{load} / (\text{Ratio} \times \text{eff.})$   
 Load inertia referred to input shaft:  
 $J_{ref} = J_{load} / \text{Ratio}^2$

Eff: Ratios ≤ 8:1 = .96  
 Ratios ≥ 9.1 = .94

**data example:**

$T_{cont} = 10.9 \text{ Nm}$        $T_{peak} = 45.7 \text{ Nm}$        $J_{mot} = 1.0$   
 $J_{load} = 10$                $T_{load} = 15 \text{ Nm}$               Ratio = 3

**for Cyclical Applications Using Motor Peak Torque**

formula & applied calculation example:

Step One

Calculate the inertia parameter: **J<sub>par</sub>**

$$J_{par} = J_{mot} / (J_{ref} + J_{mot})$$

$$J_{ref} = 10 / 3^2 = 1.11$$

$$J_{par} = 1 / (1.11 + 1) = .474$$

Step Two

Calculate the total gearhead required output torque: **T<sub>output</sub>**

$$T_{output} = ((T_{peak} - T_{input}) \times (1 - J_{par}) + T_{input}) \times \text{Ratio} \times \text{Eff.}$$

Step Three

Calculate service factor: **Sf**

$$Sf = T_{2N} / T_{output}$$

Select reducer size and related output torque **T<sub>2N</sub>** from table on page #. For most applications the calculated service factor should be greater than 1.0.

**E115 T<sub>2N</sub> = 80 Nm**  
**Sf = 80 / 76.2 = 1.05**

**for Continuous Applications Using Motor Continuous Torque**

formula & applied calculation example:

Calculate service factor: **Sf**

$$Sf = T_{2N} / (T_{cont} \times \text{Ratio} \times \text{Eff.})$$

Select reducer size and related output torque **T<sub>2N</sub>** from table on page #. For most applications the calculated service factor should be greater than 1.0.

**E90 T<sub>2N</sub> = 40 Nm**  
**Sf = 40 / (10.9 x 3 x .96) = 1.27**



## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

0206

### Lubrication

Series E Planetary Servo Gearheads are lubricated with the synthetic grease type Kluberplex BEM 34/132. Under normal conditions the gearheads will require no lubrication service throughout the life of the unit. Series E gearheads are built for universal mounting, ready to mount in any position.

### Installation

#### Motor on Gearhead:

1. Slide the motor shaft into the hollow bore input shaft until the gearhead and motor flanges are seated together.
2. Use the bolts provided to clamp the gearhead and motor flanges together. Tighten the bolts crosswise.
3. Tighten the clamping screw through the access slot in the gearhead flange to the following torque settings:

Torque Tightening					
Unit Size	E040	E060	E090	E115	E160
Lb.In.	18	40	80	150	350
Nm	2.0	4.5	9.5	16.5	40.0
Hex Key Size	-	3	4	5	6

4. Push the urethane plug provided into the access slot on the gearhead motor plate.
5. Maximum Motor Weights

Motor Weight Maximum					
Unit Size	E040	E060	E090	E115	E160
Lbs.	4.5	7.75	20.0	35.0	110.0
Kg	2.0	3.5	9.0	16.0	50.0

#### Ancillary Components:

1. Couplings, sheaves and sprockets should be mounted on the shaft carefully. Do not pound or hammer them onto the shaft as this will damage bearings and seals.
2. Sprockets and sheaves should be mounted as close to the gearhead as possible and "V" belts and chains adjusted to the proper tension to keep bearing loading and shaft deflection to a minimum. Too much tension in belts and improper location of sheaves and sprockets will lead to excessive overhung load, bearing wear and shaft deflection. For specific information on overhung load capacity, shaft stress and bearing life, please contact us.

#### Start-Up

1. After the gear head has been properly mounted and aligned, it is ready for start-up.
2. Make sure driven machine is clear of all obstructions and all safety guards and covers are in place. If possible, turn motor shaft by hand to confirm drive system is operating freely and in correct direction of rotation.
3. Jog motor to confirm proper rotation.
4. Operate gearhead with minimum load for approximately 15 minutes (in both directions if applicable) to seat gears, bearings, and oil seals.

#### Maintenance

1. If a gearhead has to be repaired, contact us for detailed instruction, blueprints, parts list, etc. If necessary, field service is available.
2. If a gearhead is to be returned, contact us for instructions and a returned material authorization (RMA) number.
3. Please have model number information and serial number from the unit name plate recorded.

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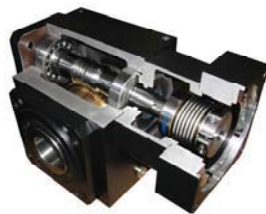


## Cone Drive Family of Products

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Model HP



AccuDrive



Gearsets



Specials

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