

## Alpha Brushless Servo Motors



Applied Motion's Alpha Series Servo Motors provide approximately twice the torque per frame size as conventional servo motors. The rotor inertia has been optimally designed for typical loads, giving the Alpha Series optimum power ratings for their size.

### FEATURES

- Compact size.
- Speeds as high as 5,000 rpm.
- Built-in high resolution incremental encoder with differential outputs.
- 4 frame sizes: 28 mm, 40 mm, 60 mm, 80 mm.
- Power ratings range from 30 to 950 watts.

### OPTIONS

- Matching planetary gearheads, standard or metric output.
- Built-in fail-safe holding brake.
- Built-in absolute encoder or brushless resolver.

## Part Numbering System

# A0000-000-0-000

### Wattage Rating

A0030 = 30 watts  
 A0050 = 50 watts  
 A0100 = 100 watts  
 A0200 = 200 watts  
 A0400 = 400 watts  
 A0600 = 600 watts  
 A0800 = 800 watts  
 A0950 = 950 watts

### Encoder Type

1 = 2,000 C/T  
 2 = 2,048 C/T  
 3 = abs encoder  
 4 = resolver

### Shaft Type

0 = round  
 1 = one flat  
 2 = two flats  
 3 = keyway  
 4 = N/A  
 5 = brake option w/round shaft  
 6 = brake option w/one flat  
 7 = brake option w/two flats  
 8 = brake option w/keyway

### Voltage

1 = 100  
 2 = 200  
 3 = 24  
 4 = 48  
 5 = 60  
 6 = 80

### Custom Features/Optional Gearhead

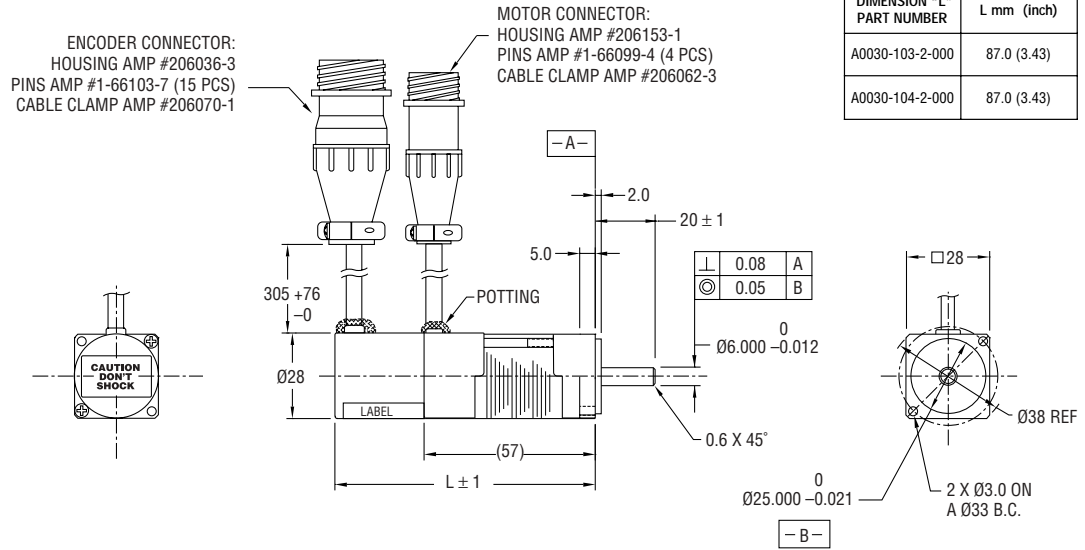
### Frame Size

1 = 22 mm  
 2 = 28 mm  
 3 = 40 mm  
 4 = 60 mm  
 5 = 80 mm

### EXAMPLE:

A0600-102-5-S10  
 600 watts  
 2,000 count encoder  
 round shaft  
 200 volts  
 80 mm frame  
 Standard 10:1 ratio gearhead

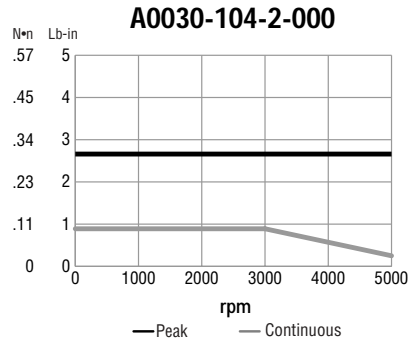
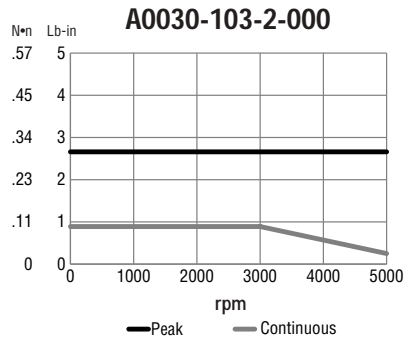
# 28 mm Alpha Motors



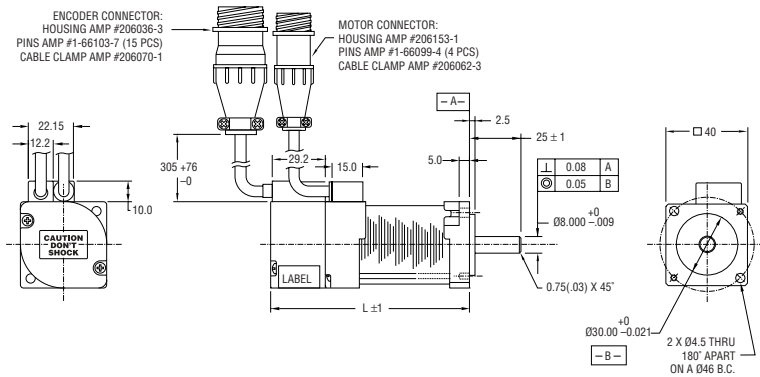
DIMENSION "L" PART NUMBER	L mm (inch)
A0030-103-2-000	87.0 (3.43)
A0030-104-2-000	87.0 (3.43)

Mounting Flange inches (mm)	■ 1.10 (28 mm)	
Part Number	A0030-103-2-000	A0030-104-2-000
Voltage V	24	48
Output Power W	30	30
Maximum Operating Speed rpm	5,000	5,000
Continuous Operating Speed rpm	3,000	
Continuous Stall Torque N.m. lb-in	0.095 0.84	0.095 0.84
Peak Torque (@ 3X rated current) N.m. lb-in	0.286 2.53	0.286 2.53
K <sub>T</sub> Torque Constant N.m./A lb-in/A	0.03 0.33	0.06 0.64
K <sub>E</sub> Voltage Constant V/krpm	3.40	6.60
Winding Resistance Ohm	0.78	2.80
Winding Inductance mH	0.48	1.8
Continuous Stall Current amps	2.9	1.5
Rotor Inertia g-cm <sup>2</sup> oz-in-sec <sup>2</sup>	10 1.42 x 10 <sup>-4</sup>	10 1.42 x 10 <sup>-4</sup>
Maximum Winding Temp	Class B (130° C)	
Friction Torque (max) N.m. lb-in	0.02 0.18	0.02 0.18
Weight (lbs)	.77	.77
Phases	3	
Poles	8	

## Torque Curves 28 mm Alpha Motors



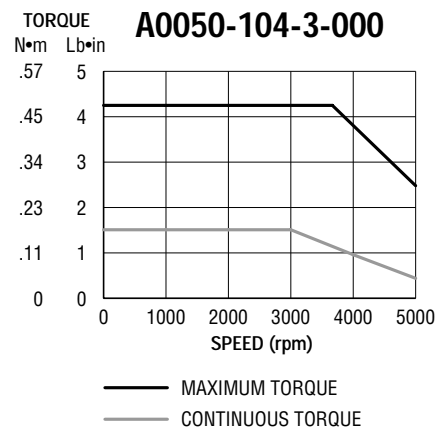
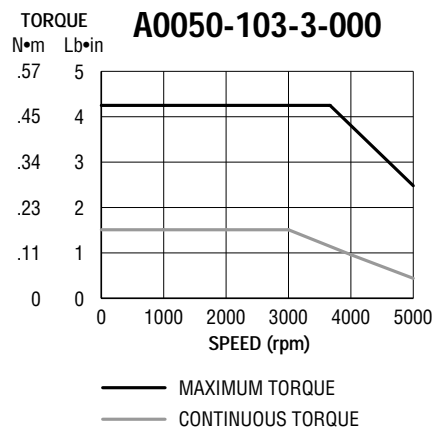
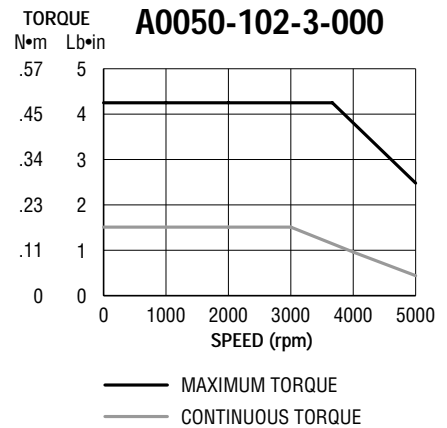
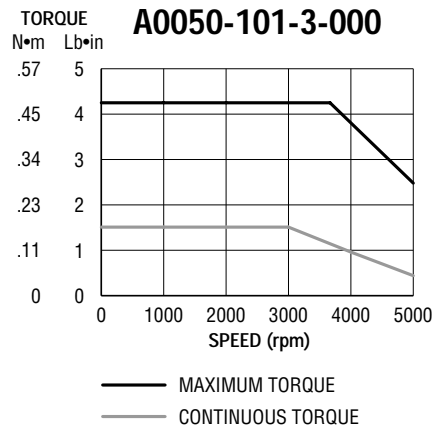
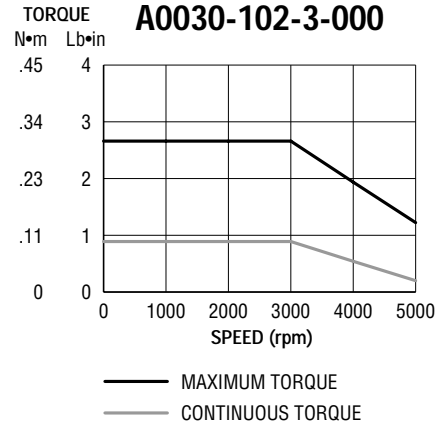
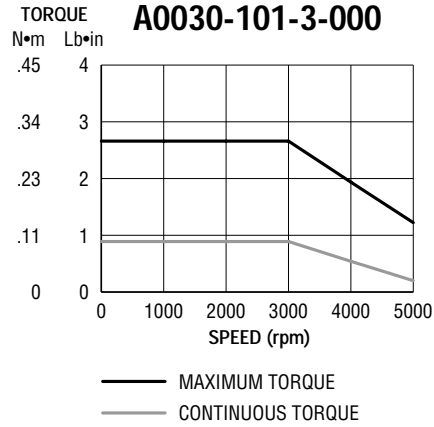


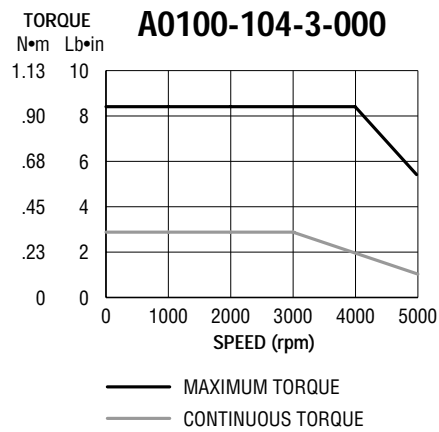
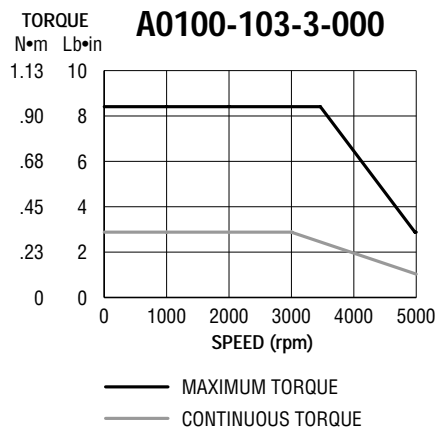
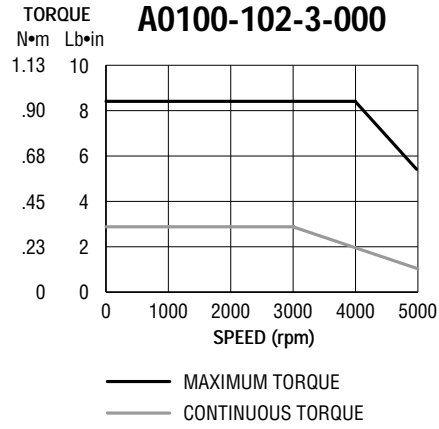
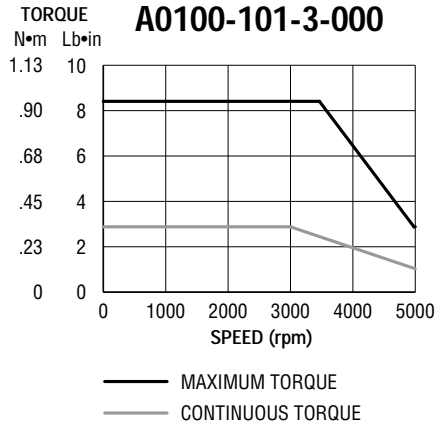


DIMENSION "L" PART NUMBER	L mm (inch)
A0030-101-3-000	61.5 (2.42)
A0030-102-3-000	61.5 (2.42)
A0050-101-3-000	70.6 (2.78)
A0050-102-3-000	70.6 (2.78)
A0050-103-3-000	70.6 (2.78)
A0050-104-3-000	70.6 (2.78)
A0100-101-3-000	88.4 (3.48)
A0100-102-3-000	88.4 (3.48)
A0100-103-3-000	88.4 (3.48)
A0100-104-3-000	88.4 (3.48)

Mounting Flange inches (mm)	■ 1.57 (40 mm)				
Part Number	A0050-104-3-000	A0100-101-3-000	A0100-102-3-000	A0100-103-3-000	A0100-104-3-000
Voltage V	48	100	200	24	48
Output Power W	50	100	100	100	100
Maximum Operating Speed rpm	5,000			4,000	5,000
Continuous Operating Speed rpm	3,000				
Continuous Stall Torque N.m. lb-in	0.159 1.41	0.318 2.81	0.318 2.81	0.318 2.81	0.318 2.81
Peak Torque (@ 3X rated current) N.m. lb-in	0.48 4.25	0.95 8.41	0.95 8.41	0.95 8.41	0.95 8.41
K <sub>T</sub> Torque Constant N.m./A lb-in/A	0.08 0.71	.22 1.95	.38 3.36	0.071 0.63	0.11 0.97
K <sub>E</sub> Voltage Constant V/krpm	8.40	23.0	39.8	7.40	11.7
Winding Resistance Ohm	2.60	7.4	22.8	0.79	2.00
Winding Inductance mH	3.10	10.0	34.0	1.17	2.60
Continuous Stall Current amps	2	1.5	0.9	4.5	3
Rotor Inertia g-cm <sup>2</sup> oz-in-sec <sup>2</sup>	23 3.26 x 10 <sup>-4</sup>	42 5.95 x 10 <sup>-4</sup>	42 5.95 x 10 <sup>-4</sup>	42 5.95 x 10 <sup>-4</sup>	42 5.95 x 10 <sup>-4</sup>
Maximum Winding Temp	Class B (130° C)				
Friction Torque (max) N.m. lb-in	0.03 0.27				
Weight (lbs)	0.88	1.10	1.10	1.10	1.10
Phases	3				
Poles	8				

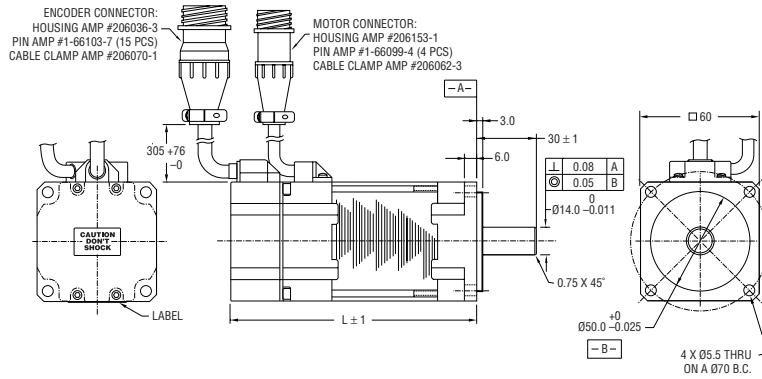
## Torque Curves 40 mm Alpha Motors







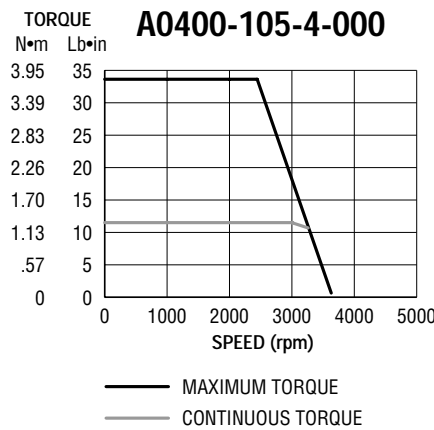
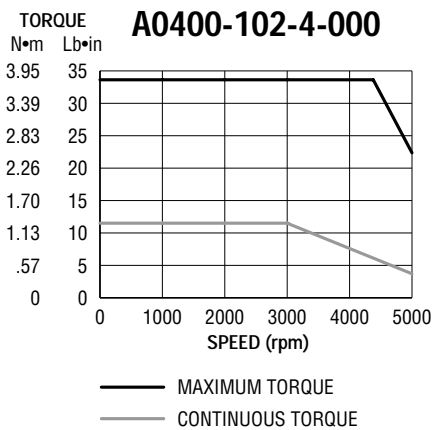
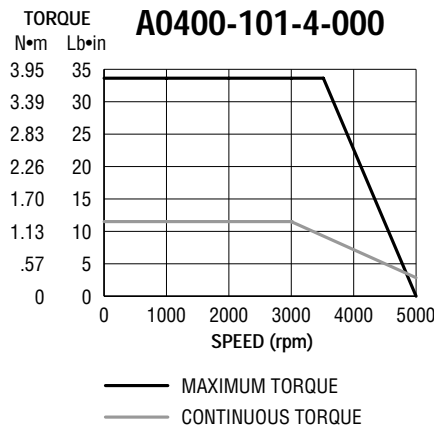
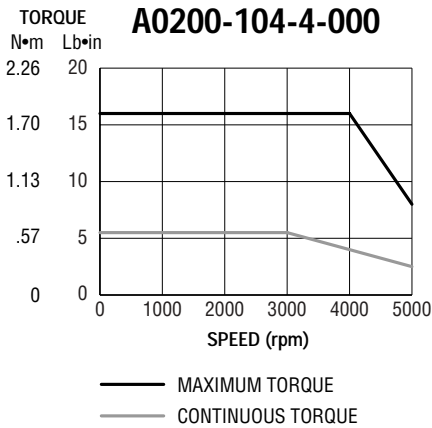
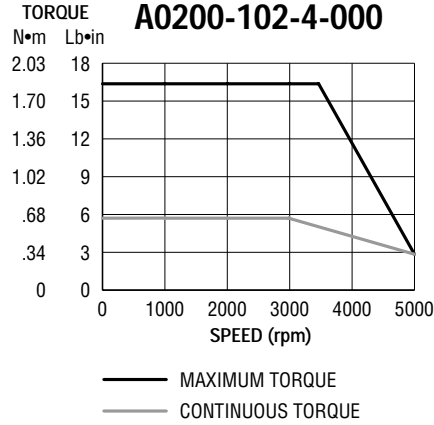
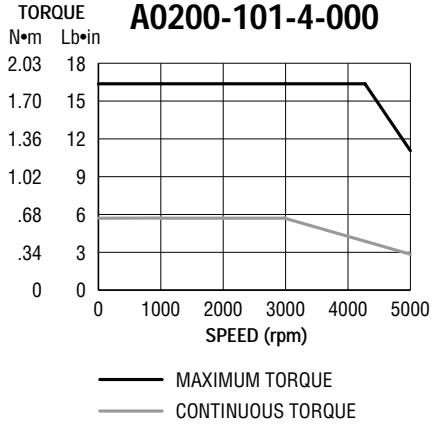
# 60 mm Alpha Motors



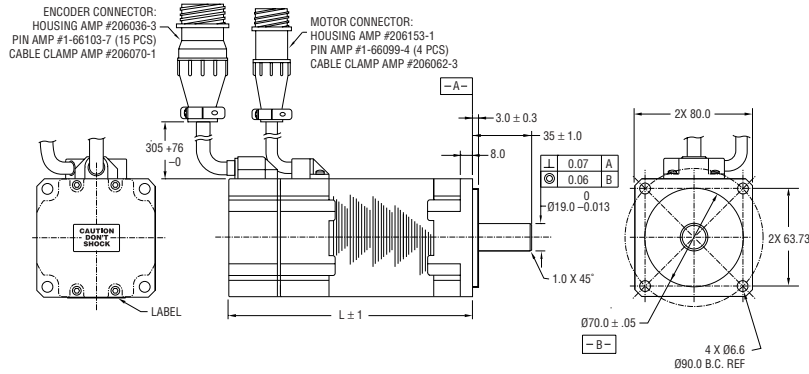
DIMENSION "L" PART NUMBER	L mm (Inch)
A0200-104-4-000	93 (3.66)
A0400-105-4-000	121 (4.76)

Mounting Flange inches (mm)		■ 2.36 (60 mm)					
Part Number		A0200-101-4-000	A200-102-4-000	A0200-104-4-000	A0400-101-4-000	A0400-102-4-000	A0400-105-4-000
Voltage	V	100	200	48	100	200	60
Output Power	W	200			400		
Maximum Operating Speed	rpm	5,000					3,600
Continuous Operating Speed	rpm	3,000					
Continuous Stall Torque	N.m. lb-in	0.64 5.66			1.27 11.24		
Peak Torque (@ 3X rated current)	N.m. lb-in	1.91 16.9			3.82 33.8		
K <sub>T</sub> Torque Constant	N.m./A lb-in/A	.20 1.77	.48 4.25	0.095 0.84	.26 2.30	.42 3.72	0.19 1.68
K <sub>e</sub> Voltage Constant	V/krpm	21.3	50.4	10.0	26.9	43.6	20.4
Winding Resistance	Ohm	1.4	7.4	.37	0.9	2.4	0.63
Winding Inductance	mH	4.8	27.0	1.10	3.4	9.0	2.00
Continuous Stall Current	amps	3.2	1.4	6.7	5.2	3.2	6.5
Rotor Inertia	g-cm <sup>2</sup> oz-in-sec <sup>2</sup>	200 2.83 x 10 <sup>-3</sup>	200 2.83 x 10 <sup>-3</sup>	200 2.83 x 10 <sup>-3</sup>	360 5.10 x 10 <sup>-3</sup>	360 5.10 x 10 <sup>-3</sup>	360 5.10 x 10 <sup>-3</sup>
Maximum Winding Temp		Class B (130° C)					
Friction Torque (max)	N.m. lb-in					0.04 0.35	
Weight (lbs)		2.42			3.52		
Phases		3					
Poles		8					

## Torque Curves 60 mm Alpha Motors



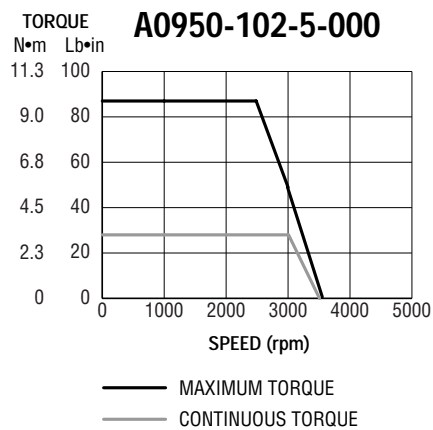
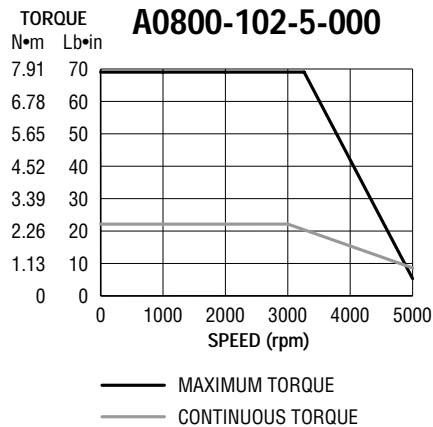
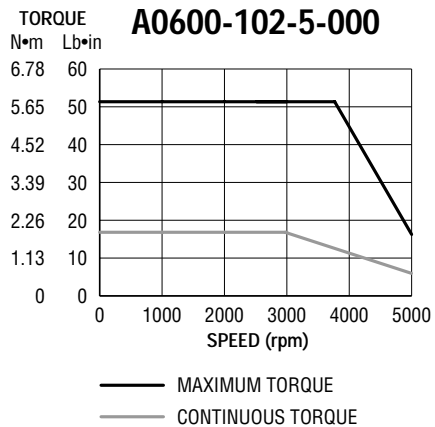
# 80 mm Alpha Motors



DIMENSION "L" PART NUMBER	L mm (inch)
A0600-102-5-000	128 (5.04)
A0800-102-5-000	145 (5.71)
A0950-102-5-000	160 (6.30)

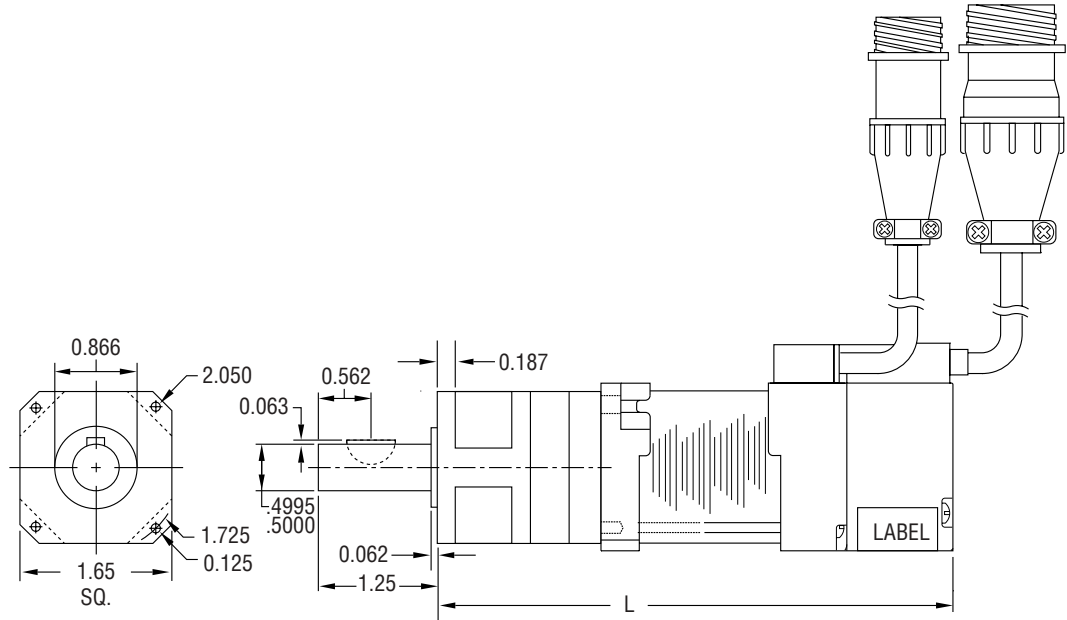
Mounting Flange inches (mm)		■ 3.15 (80)		
Part Number		A0600-102-5-000	A0800-102-5-000	A0950-102-5-000
Voltage	V	200	200	200
Output Power	W	600	800	950
Maximum Operating Speed	rpm	5,000		3,500
Continuous Operating Speed	rpm	3,000		
Continuous Stall Torque	N.m. lb-in	1.91 16.9	2.55 22.57	3.02 26.75
Peak Torque	N.m. lb-in	5.73 50.71	7.64 67.61	9.06 80.19
K <sub>T</sub> Torque Constant	N.m./A lb-in/A	.47 4.16	.57 5.05	0.71 6.28
K <sub>E</sub> Voltage Constant	V/krpm	49.0	59.4	74.3
Winding Resistance	Ohm	1.25	1.20	1.45
Winding Inductance	mH	8.0	8.7	10.9
Continuous Stall Current	amps	4.2	4.6	4.4
Rotor Inertia	g-cm <sup>2</sup> oz-in-sec <sup>2</sup>	1000 1.42 x 10 <sup>-2</sup>	1300 1.84 x 10 <sup>-2</sup>	1620 2.29 x 10 <sup>-2</sup>
Maximum Winding Temp	°C	130°C		
Friction Torque	N.m. lb-in	0.10 0.89		
Motor Weight	lbs.	5.73	7.04	8.36
Phases		3		
Poles		8		

## Torque Curves 80 mm Alpha Motors



# 40 mm Alpha Motors w/Optional Gearhead

## 40 mm Alpha Motor with Optional Gearhead Standard Dimension Gearhead



## 40 mm Alpha Motor with Optional Gearhead

### Standard Dimension Gearhead

P/N	Ratio*	Length Inches	Motor Winding		Motor Rated Torque		Gearhead Rated Torque	
			Watts	Volts	Cont lb-in	Peak lb-in	Cont lb-in	Peak lb-in
A0030-101-3-S05	5:1	5.05	30	100	0.84	2.57	143	223
A0030-101-3-S10	10:1	5.05	30	100	0.84	2.57	56	84
A0030-101-3-S25	25:1	5.68	30	100	0.84	2.57	171	267
A0030-102-3-S05	5:1	5.05	30	200	0.84	2.57	143	223
A0030-102-3-S10	10:1	5.05	30	200	0.84	2.57	56	84
A0030-102-3-S25	25:1	5.68	30	200	0.84	2.57	171	267
A0050-101-3-S05	5:1	5.41	50	100	1.41	4.25	143	223
A0050-101-3-S10	10:1	5.41	50	100	1.41	4.25	56	84
A0050-101-3-S25	25:1	6.04	50	100	1.41	4.25	171	267
A0050-102-3-S05	5:1	5.41	50	200	1.41	4.25	143	223
A0050-102-3-S10	10:1	5.41	50	200	1.41	4.25	56	84
A0050-102-3-S25	25:1	6.04	50	200	1.41	4.25	171	267
A0050-103-3-S05	5:1	5.41	50	24	1.41	4.25	143	223
A0050-103-3-S10	10:1	5.41	50	24	1.41	4.25	56	84
A0050-103-3-S25	25:1	6.04	50	24	1.41	4.25	171	267
A0050-104-3-S05	5:1	5.41	50	48	1.41	4.25	143	223
A0050-104-3-S10	10:1	5.41	50	48	1.41	4.25	56	84
A0050-104-3-S25	25:1	6.04	50	48	1.41	4.25	171	267
A0100-101-3-S05	5:1	6.11	100	100	2.81	8.41	143	223
A0100-101-3-S10	10:1	6.11	100	100	2.81	8.41	56	84
A0100-101-3-S25	25:1	6.74	100	100	2.81	8.41	171	267
A0100-102-3-S05	5:1	6.11	100	200	2.81	8.41	143	223
A0100-102-3-S10	10:1	6.11	100	200	2.81	8.41	56	84
A0100-102-3-S25	25:1	6.74	100	200	2.81	8.41	171	267
A0100-103-3-S05	5:1	6.11	100	24	2.81	8.41	143	223
A0100-103-3-S10	10:1	6.11	100	24	2.81	8.41	56	84
A0100-103-3-S25	25:1	6.74	100	24	2.81	8.41	171	267
A0100-104-3-S05	5:1	6.11	100	48	2.81	8.41	143	223
A0100-104-3-S10	10:1	6.11	100	48	2.81	8.41	56	84
A0100-104-3-S25	25:1	6.74	100	48	2.81	8.41	171	267

\*Other ratios available upon request

Radial Load (lbs.) 400  
Axial Load (lbs.) 400

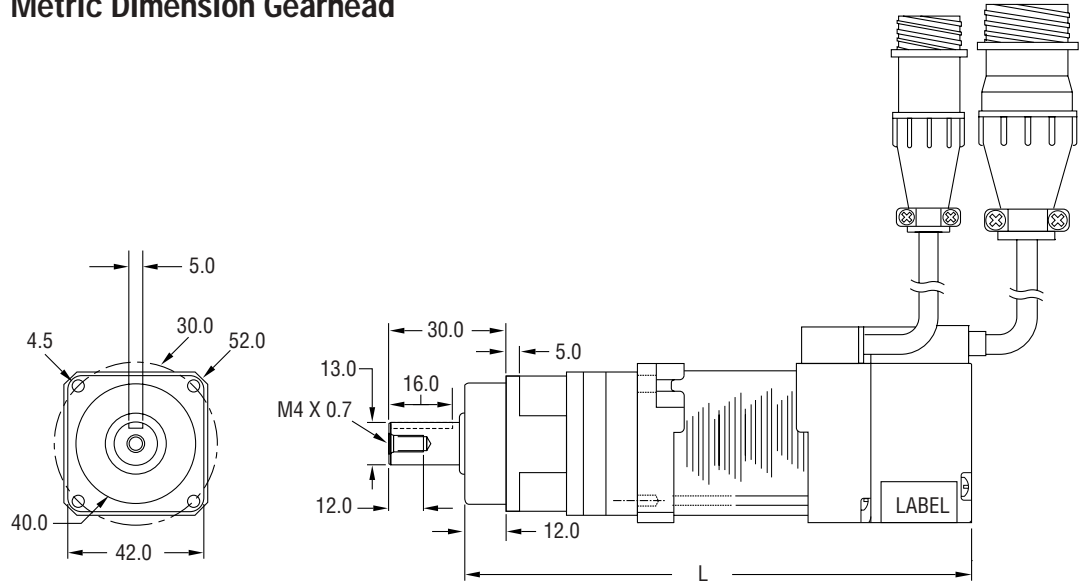
Backlash Ratings (arc minutes)	Standard	Low
Single Stage (3:1 – 10:1)	6	3
Double Stage (15:1 – 100:1)	10	5

**Note:**

Servo drive should be current limited if the continuous or peak torque of the motor exceeds the gearhead torque ratings.

# 40 mm Alpha Motors w/Optional Gearhead

## 40 mm Alpha Motor with Optional Gearhead Metric Dimension Gearhead



## 40 mm Alpha Motor with Optional Gearhead

### Metric Dimension Gearhead

P/N	Ratio*	Length mm	Motor Winding		Motor Rated Torque		Gearhead Rated Torque	
			Watts	Volts	Cont lb-in	Peak lb-in	Cont lb-in	Peak lb-in
A0030-101-3-M05	5:1	141	30	100	0.84	2.57	148	232
A0030-101-3-M10	10:1	141	30	100	0.84	2.57	56	84
A0030-101-3-M25	25:1	154	30	100	0.84	2.57	153	238
A0030-102-3-M05	5:1	141	30	200	0.84	2.57	148	232
A0030-102-3-M10	10:1	141	30	200	0.84	2.57	56	84
A0030-102-3-M25	25:1	154	30	200	0.84	2.57	153	238
A0050-101-3-M05	5:1	141	50	100	1.41	4.25	148	232
A0050-101-3-M10	10:1	141	50	100	1.41	4.25	56	84
A0050-101-3-M25	25:1	154	50	100	1.41	4.25	153	238
A0050-102-3-M05	5:1	141	50	200	1.41	4.25	148	232
A0050-102-3-M10	10:1	141	50	200	1.41	4.25	56	84
A0050-102-3-M25	25:1	154	50	200	1.41	4.25	153	238
A0050-103-3-M05	5:1	141	50	24	1.41	4.25	148	232
A0050-103-3-M10	10:1	141	50	24	1.41	4.25	56	84
A0050-103-3-M25	25:1	154	50	24	1.41	4.25	153	238
A0050-104-3-M05	5:1	141	50	48	1.41	4.25	148	232
A0050-104-3-M10	10:1	141	50	48	1.41	4.25	56	84
A0050-104-3-M25	25:1	154	50	48	1.41	4.25	153	238
A0100-101-3-M05	5:1	141	100	100	2.81	8.41	148	232
A0100-101-3-M10	10:1	141	100	100	2.81	8.41	56	84
A0100-101-3-M25	25:1	154	100	100	2.81	8.41	153	238
A0100-102-3-M05	5:1	141	100	200	2.81	8.41	148	232
A0100-102-3-M10	10:1	141	100	200	2.81	8.41	56	84
A0100-102-3-M25	25:1	154	100	200	2.81	8.41	153	238
A0100-103-3-M05	5:1	141	100	24	2.81	8.41	148	232
A0100-103-3-M10	10:1	141	100	24	2.81	8.41	56	84
A0100-103-3-M25	25:1	154	100	24	2.81	8.41	153	238
A0100-104-3-M05	5:1	141	100	48	2.81	8.41	148	232
A0100-104-3-M10	10:1	141	100	48	2.81	8.41	56	84
A0100-104-3-M25	25:1	154	100	48	2.81	8.41	153	238

\*Other ratios available upon request

Radial Load (lbs.) 205

Axial Load (lbs.) 205

Backlash Ratings (arc minutes) Standard Low

Single Stage (3:1 – 10:1) 6 3

Double Stage (15:1 – 100:1) 10 5

**Note:**

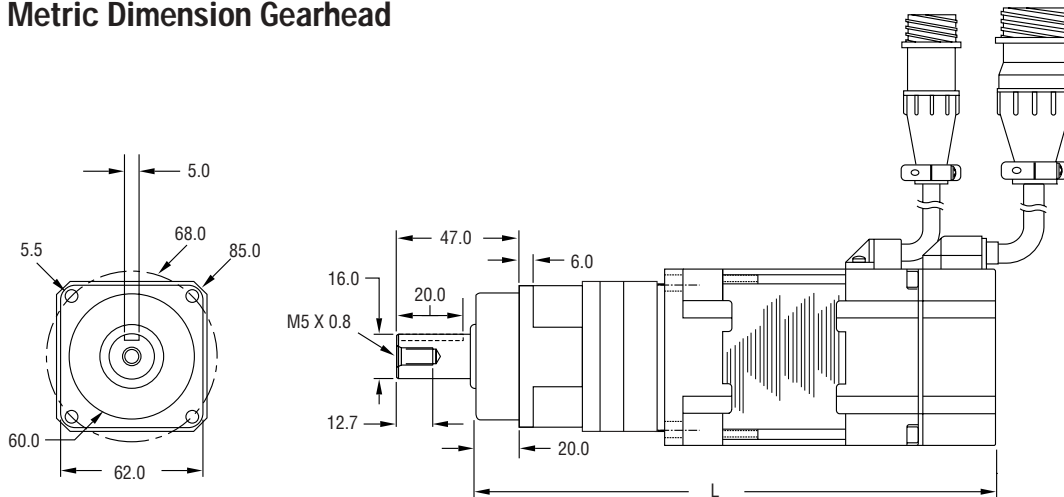
Servo drive should be current limited if the continuous or peak torque of the motor exceeds the gearhead torque ratings.





## 60 mm Alpha Motor with Optional Gearhead

### Metric Dimension Gearhead



P/N	Ratio*	Length mm	Motor Winding		Motor Rated Torque		Gearhead Rated Torque	
			Watts	Volts	Cont lb-in	Peak lb-in	Cont lb-in	Peak lb-in
A0200-101-4-M05	5:1	166	200	100	5.66	16.9	328	521
A0200-101-4-M10	10:1	166	200	100	5.66	16.9	119	179
A0200-101-4-M25	25:1	187	200	100	5.66	16.9	339	530
A0200-102-4-M05	5:1	166	200	200	5.66	16.9	328	521
A0200-102-4-M10	10:1	166	200	200	5.66	16.9	119	179
A0200-102-4-M25	25:1	187	200	200	5.66	16.9	339	530
A0200-104-4-M05	5:1	166	200	48	5.66	16.9	328	521
A0200-104-4-M10	10:1	166	200	48	5.66	16.9	119	179
A0200-104-4-M25	25:1	187	200	48	5.66	16.9	339	530
A0400-101-4-M05	5:1	166	400	100	11.24	33.8	328	521
A0400-101-4-M10	10:1	166	400	100	11.24	33.8	119	179
A0400-101-4-M25	25:1	187	400	100	11.24	33.8	339	530
A0400-102-4-M05	5:1	166	400	200	11.24	33.8	328	521
A0400-102-4-M10	10:1	166	400	200	11.24	33.8	119	179
A0400-102-4-M25	25:1	187	400	200	11.24	33.8	339	530
A0400-105-4-M05	5:1	166	400	60	11.24	33.8	328	521
A0400-105-4-M10	10:1	166	400	60	11.24	33.8	119	179
A0400-105-4-M25	25:1	187	400	60	11.24	33.8	339	530

\*Other ratios available upon request

Radial Load (lbs.) 320  
Axial Load (lbs.) 368

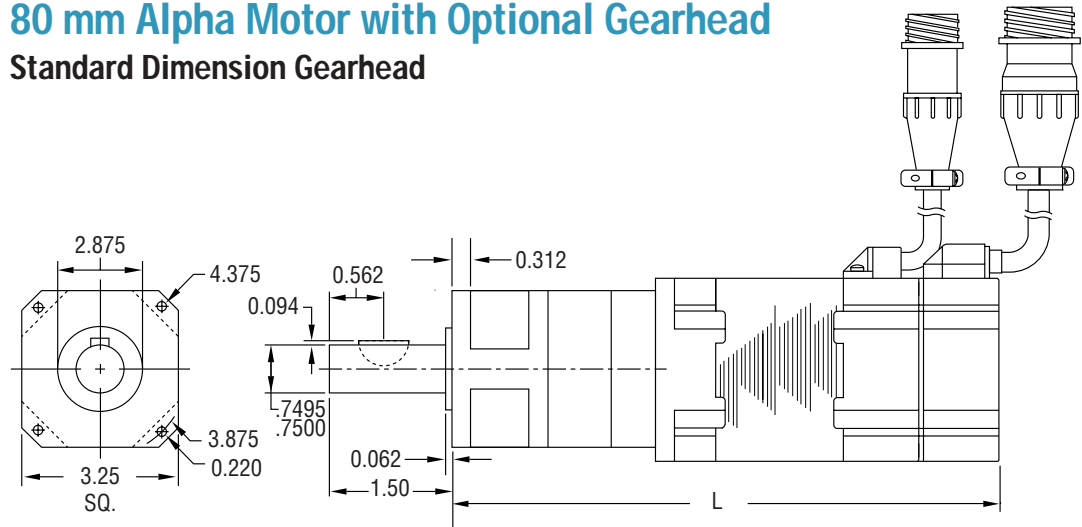
Backlash Ratings (arc minutes) Standard Low  
Single Stage (3:1 – 10:1) 6 3  
Double Stage (15:1 – 100:1) 10 5

**Note:**

Servo drive should be current limited if the continuous or peak torque of the motor exceeds the gearhead torque ratings.

# 80 mm Alpha Motors w/Optional Gearhead

## 80 mm Alpha Motor with Optional Gearhead Standard Dimension Gearhead



P/N	Ratio*	Length Inches	Motor Winding		Motor Rated Torque		Gearhead Rated Torque	
			Watts	Volts	Cont lb-in	Peak lb-in	Cont lb-in	Peak lb-in
A0600-102-5-S05	5:1	7.84	600	200	16.9	50.71	1113	1740
A0600-102-5-S10	10:1	7.84	600	200	16.9	50.71	552	828
A0600-102-5-S25	25:1	8.64	600	200	16.9	50.71	1333	2083
A0800-102-5-S05	5:1	8.51	800	200	22.57	67.61	1113	1740
A0800-102-5-S10	10:1	8.51	800	200	22.57	67.61	552	828
A0800-102-5-S25	25:1	9.31	800	200	22.57	67.61	1333	2083
A0950-102-5-S05	5:1	9.10	950	200	26.73	80.19	1113	1740
A0950-102-5-S10	10:1	9.10	950	200	26.73	80.19	552	828
A0950-102-5-S25	25:1	9.90	950	200	26.73	80.19	1333	2083

\*Other ratios available upon request

Radial Load (lbs.) 875  
Axial Load (lbs.) 875

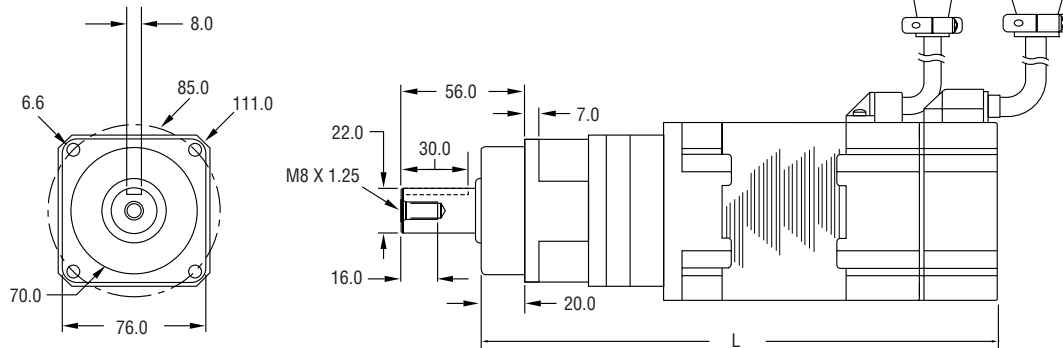
Backlash Ratings (arc minutes) Standard Low  
Single Stage (3:1 – 10:1) 6 3  
Double Stage (15:1 – 100:1) 10 5

**Note:**

Servo drive should be current limited if the continuous or peak torque of the motor exceeds the gearhead torque ratings.

## 80 mm Alpha Motor with Optional Gearhead

### Metric Dimension Gearhead



P/N	Ratio*	Length mm	Motor Winding Watts	Volts	Motor Rated Torque		Gearhead Rated Torque	
					Cont lb-in	Peak lb-in	Cont lb-in	Peak lb-in
A0600-102-5-M05	5:1	234	600	200	16.9	50.71	1145	1798
A0600-102-5-M10	10:1	234	600	200	16.9	50.71	552	828
A0600-102-5-M25	25:1	262	600	200	16.9	50.71	1205	1883
A0800-102-5-M05	5:1	234	800	200	22.57	67.61	1145	1798
A0800-102-5-M10	10:1	234	800	200	22.57	67.61	552	828
A0800-102-5-M25	25:1	262	800	200	22.57	67.61	1205	1883
A0950-102-5-M05	5:1	234	950	200	26.73	80.19	1145	1798
A0950-102-5-M10	10:1	234	950	200	26.73	80.19	552	828
A0950-102-5-M25	25:1	262	950	200	26.73	80.19	1205	1883

\*Other ratios available upon request

Radial Load (lbs.) 490  
Axial Load (lbs.) 515

Backlash Ratings (arc minutes) Standard Low  
Single Stage (3:1 – 10:1) 6 3  
Double Stage (15:1 – 100:1) 10 5

**Note:**

Servo drive should be current limited if the continuous or peak torque of the motor exceeds the gearhead torque ratings.