

K / N Series Stepper Motors

General Specifications

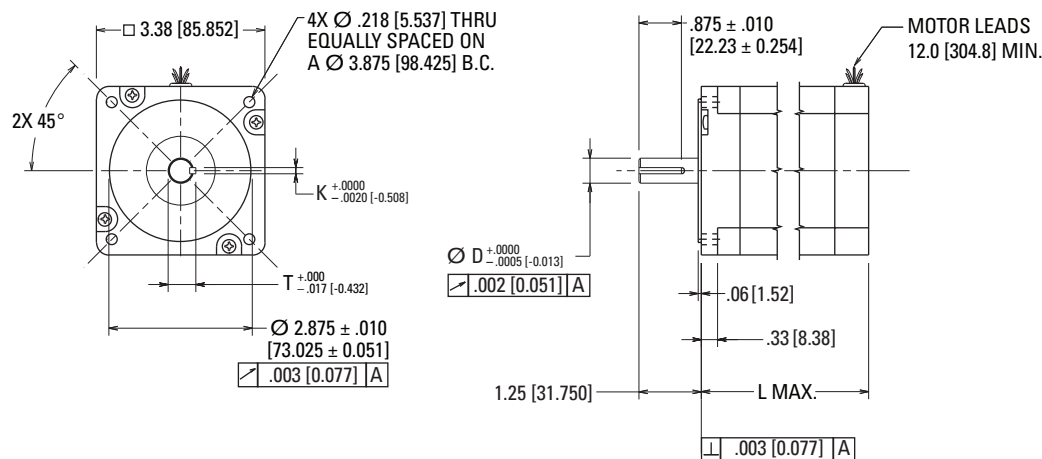


- NEMA Sizes 34, 42
- Standard (N) and enhanced (K) using SIGMAX technology
- Standard NEMA mounting
- CE and cUR compliant
- Unipolar or Bipolar windings
- Features: leadwire connection, straight keyway
- Options: splash-proof terminal board, MS connector, rear shaft extension, provision for encoder, shaft seal
- Custom Motors

Phases	2 and 4
Full Steps per Revolution	200
Step Angle	1.8°
Step Accuracy (of one full step, no load)	± 1.5 % K3, K4 ± 3 % N3, N4
Operating Temperature	-20°C to +40°C
Insulation Class	Class B, 130°C
Insulation Voltage Rating	340 Vdc
Insulation Resistance	100 Megohms

K3 / N3 Outline Drawings

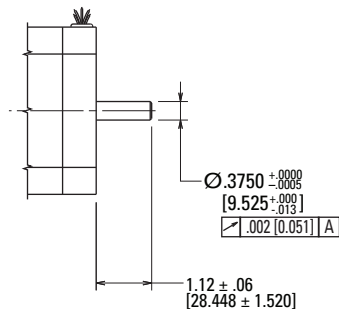
Leadwire Hookup



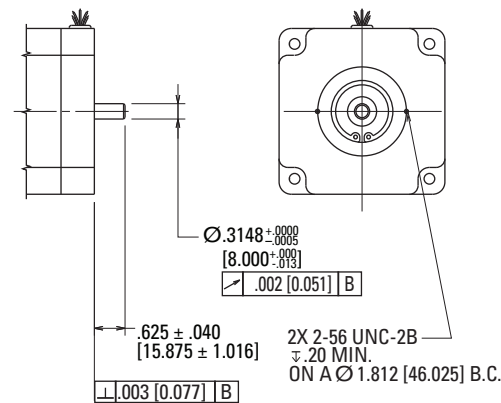
Model	"D"	"K"	"T"	"L" MAX
31HR	0.5000 (12.700)	0.1250 (3.175)	0.555 (14.097)	3.13 (79.502)
32HR				4.65 (118.11)
33HR	0.6250 (15.875)	0.1875 (4.763)	0.705 (17.907)	6.13 (155.70)
34HR				7.68 (195.07)

Dimensions in inches [mm]

Double Shaft Configuration



Encoder Mounting Provision

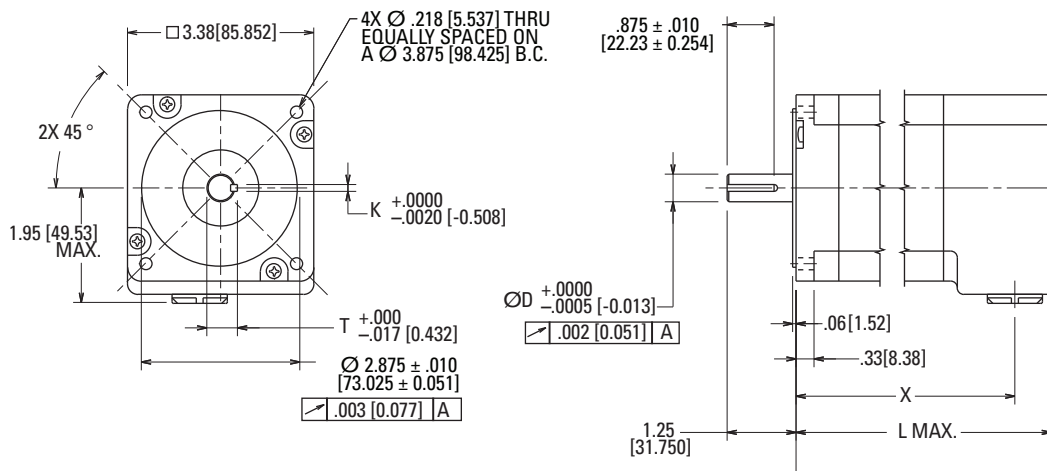


Dimensions in inches [mm]

K / N Series Stepper Motors

K3 / N3 Outline Drawings

Splashproof Construction / Terminal Board Connections

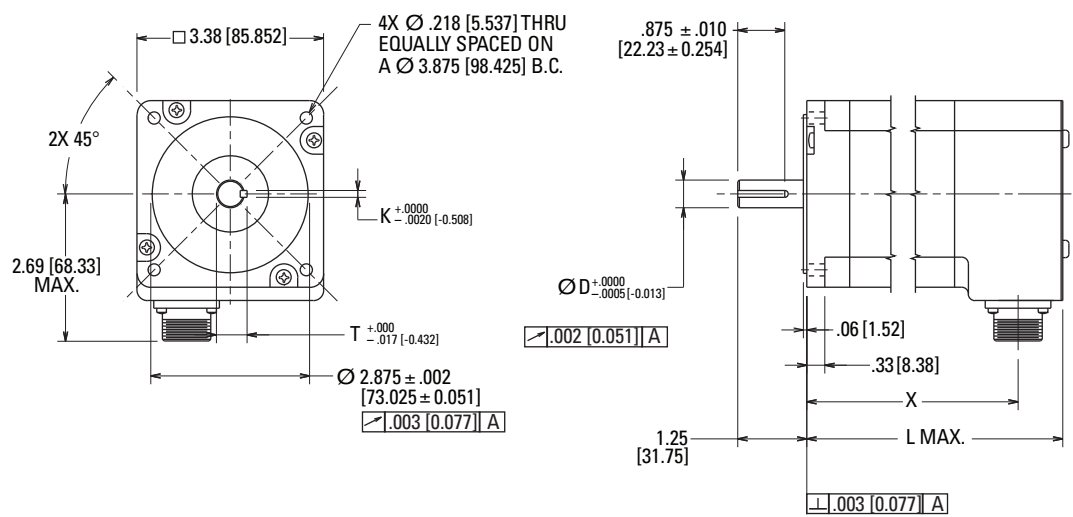


Dimensions in inches [mm]

Model	"D"	"K"	"T"	"X"	"L" MAX
31HL	0.5000 (12.700)	0.1250 (3.175)	0.555 (14.097)	3.70 (93.98)	4.44 (112.78)
32HL				5.22 (132.59)	5.96 (151.38)
33HL	0.6250 (15.875)	0.1875 (4.763)	0.705 (17.907)	6.74 (171.20)	7.48 (189.99)
34HL				8.25 (209.55)	8.99 (228.35)

K3 / N3 Outline Drawings

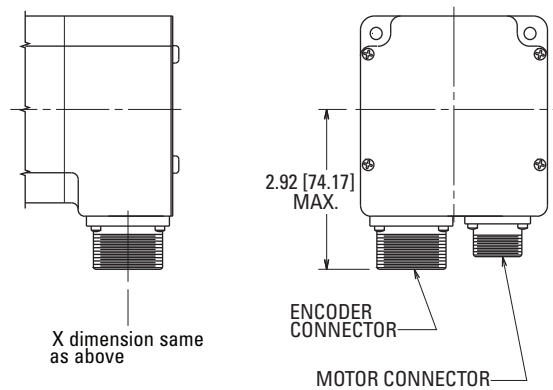
Splashproof Construction / MS Connector(s)



Model	"D"	"K"	"T"	"X"	"L" MAX
31HC	0.5000 (12.700)	0.1250 (3.175)	0.555 (14.097)	3.56 (90.42)	4.44 (112.78)
32HC				5.07 (128.78)	5.96 (151.38)
33HC	0.6250 (15.875)	0.1875 (4.763)	0.705 (17.907)	6.59 (165.10)	7.48 (189.99)
34HC				8.11 (205.99)	8.99 (228.35)

Dimensions in inches [mm]

Encoder Mounting Option

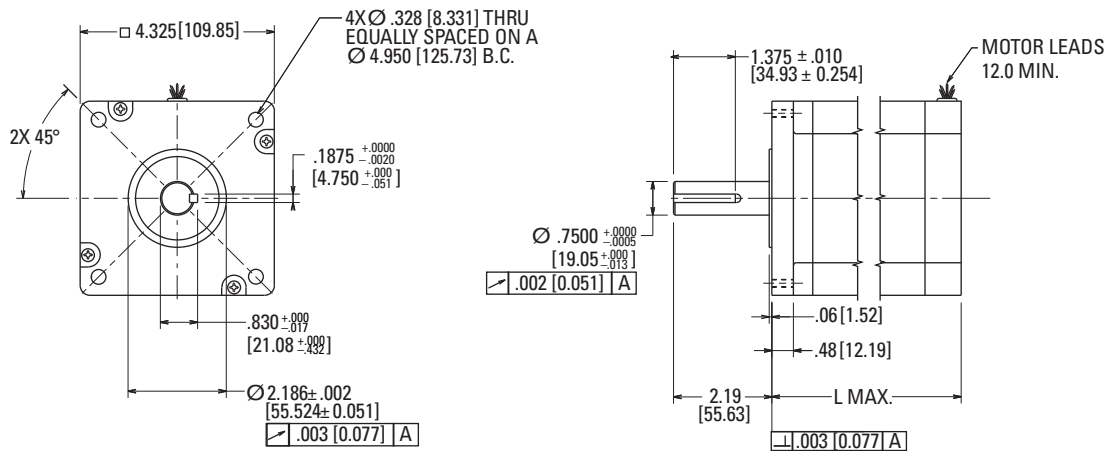


Dimensions in inches [mm]

K / N Series Stepper Motors

K4 / N4 Outline Drawings

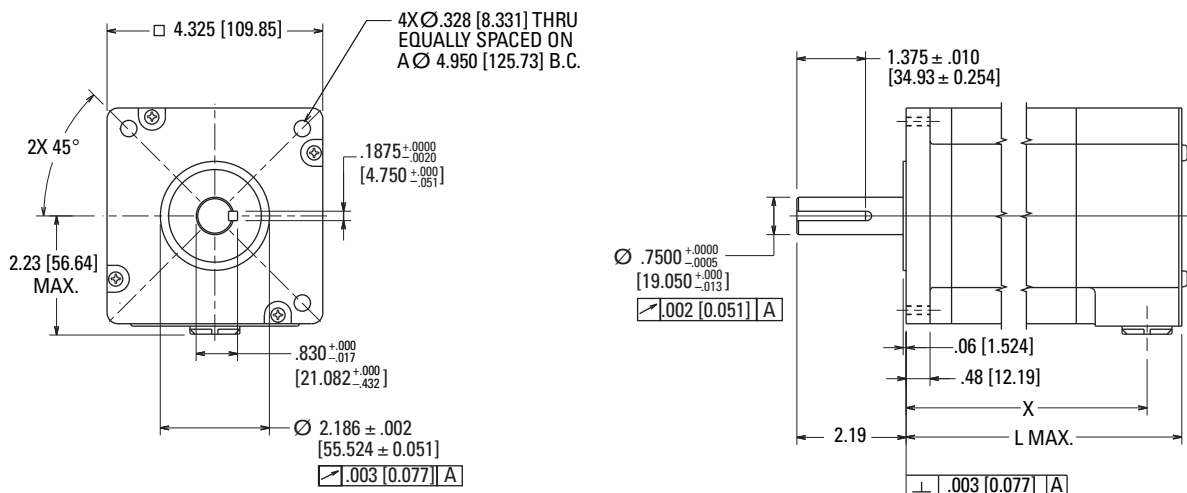
Regular Leadwire Hookup



Model	"L" MAX
41HR	3.89 (98.81)
42HR	5.91 (150.11)
43HR	7.92 (201.17)

Dimensions in inches [mm]

Splashproof Construction / Terminal Board Connections

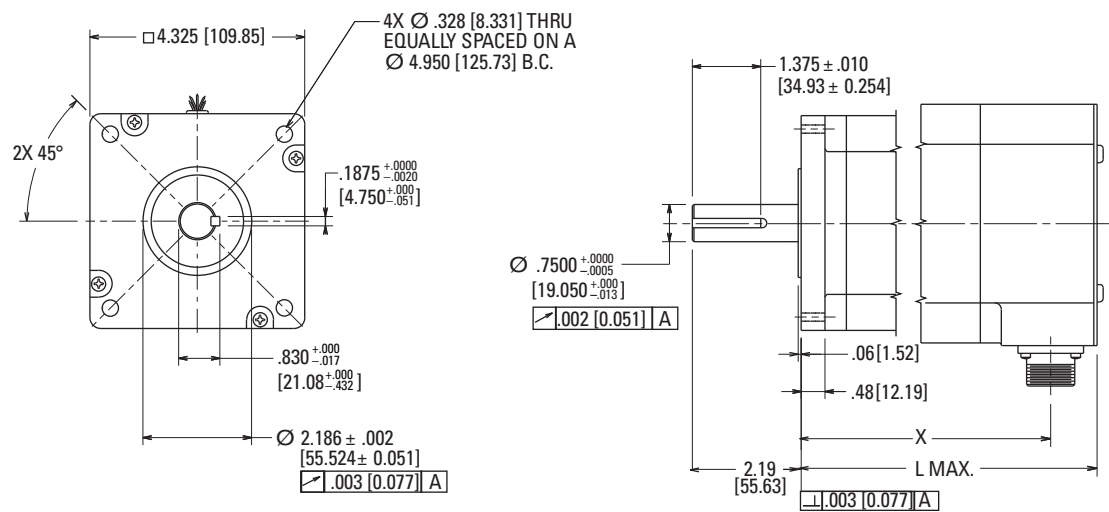


Model	"X"	"L" MAX
41HL	4.46 (113.28)	5.20 (132.08)
42HL	6.48 (164.59)	7.22 (183.39)
43HL	8.49 (215.65)	9.23 (234.44)

Dimensions in inches [mm]

K4 / N4 Outline Drawings

Splashproof Construction / MS Connector(s)



Model	"X"	"L" MAX
41HC	4.32 (109.73)	5.20 (132.08)
42HC	6.33 (160.78)	7.22 (183.39)
43HC	8.35 (212.09)	9.23 (234.44)

Dimensions in inches [mm]

K / N Series Stepper Motors

K3 / N3 Performance Data

	Motor Model Number	Config.			Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Detent Torque	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
		Parallel	Series	Unipolar	oz-in (Nm) +/-10%	Amps DC	Ohms +/-10%	mH Typical	oz-in (Nm)	Mounted °C/Watt	oz-in-s ² (kg-m ² x 10 ⁻³)	lb (kg)	Radial Force lb (N)	Axial Force lb (N)
1 Stack	N31xxHL-L	•			650 (4.59)	8.6	0.18	1.4	18 (0.13)	2.7	0.0202 (0.14)	5.0 (2.3)	65 (289)	305 (1360)
	N31xxLL-L		•			4.3	0.72	5.8						
	N31xxHK-L	•			665 (4.69)	6.6	0.29	2.6						
	N31xxLK-L		•			3.3	1.16	10.3						
	N31xxHJ-L	•			645 (4.55)	5.5	0.42	3.5						
	N31xxLJ-L		•			2.7	1.69	14						
	N31xxHH-L	•			635 (4.48)	2.8	1.55	12.5						
	N31xxLH-L		•			1.4	6.21	50.1						
	N31xxLG-L	•			641 (4.52)	1.73	4.06	34.5						
	N31xxHG-L		•			0.86	16.2	138						
	N31xxEL-L			•	460 (3.25)	6.1	0.36	1.4						
	N31xxEK-L			•	470 (3.32)	4.7	0.58	2.6						
	N31xxEJ-L			•	455 (3.21)	3.9	0.84	3.5						
	N31xxEH-L			•	450 (3.18)	2.0	3.10	12.5						
	N31xxEG-L			•	453 (3.20)	1.22	8.12	34.5						
Enhanced 1 Stack	K31xxHL-L	•			830 (5.86)	8.6	0.18	1.2	25 (0.18)	2.7	0.0202 (0.14)	5.0 (2.3)	65 (289)	305 (1360)
	K31xxLL-L		•			4.3	0.72	4.7						
	K31xxHK-L	•			845 (5.96)	6.6	0.29	2.1						
	K31xxLK-L		•			3.3	1.16	8.3						
	K31xxHJ-L	•			820 (5.79)	5.5	0.42	2.8						
	K31xxLJ-L		•			2.7	1.69	11.4						
	K31xxHH-L	•			805 (5.68)	2.8	1.55	10.2						
	K31xxLH-L		•			1.4	6.21	40.7						
	K31xxLG-L	•			816 (5.76)	1.73	4.06	28.1						
	K31xxLG-L		•			0.86	16.2	112						
	K31xxEL-L			•	590 (4.16)	6.1	0.36	1.2						
	K31xxEK-L			•	600 (4.23)	4.7	0.58	2.1						
	K31xxEJ-L			•	580 (4.09)	3.9	0.84	2.8						
	K31xxEH-L			•	570 (4.03)	2.0	3.10	10.2						
	K31xxEG-L			•	577 (4.08)	1.22	8.12	28.1						
2 Stack	N32xxHD-L	•			1195 (8.45)	3.2	1.57	16.5	36 (0.25)	2.0	0.038 (0.27)	8.4 (3.8)	65 (289)	305 (1360)
	N32xxLD-L		•			1.6	6.30	66.1						
	N32xxHM-L	•			1215 (8.58)	10	0.18	1.8						
	N32xxLM-L		•			5.0	0.70	7.0						
	N32xxHL-L	•			1200 (8.47)	8.1	0.26	2.6						
	N32xxLL-L		•			4.1	1.03	10.3						
	N32xxHK-L	•			1245 (8.79)	6.1	0.45	5.1						
	N32xxLK-L		•			3.0	1.80	20.6						
	N32xxHJ-L	•			1195 (8.43)	5.1	0.63	6.5						
	N32xxLJ-L		•			2.5	2.53	26						
	N32xxLG-L	•			1240 (8.76)	1.91	4.41	51.6						
	N32xxHG-L		•			0.95	17.6	206						
	N32xxED-L			•	845 (5.97)	2.3	3.15	16.5						
	N32xxEM-L			•	860 (6.07)	7.1	0.35	1.8						
	N32xxEL-L			•	850 (6.00)	5.8	0.52	2.6						
	N32xxEK-L			•	885 (6.25)	4.3	0.90	5.1						
	N32xxEJ-L			•	845 (5.96)	3.5	1.27	6.5						
	N32xxEG-L			•	887 (6.19)	1.35	8.82	51.6						

Note: See page 88 for K&N series connection diagrams and switching sequence.

Continued on page 57.

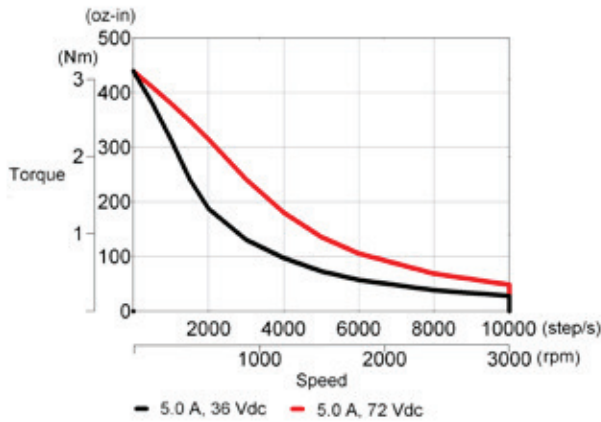
K3 / N3 Performance Data (continued)

	Motor Model Number	Config.			Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Detent Torque	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading*	
		Parallel	Series	Unipolar									Radial Force	Axial Force
					oz-in (Nm) +/-10%	Amps DC	Ohms +/-10%	mH Typical		oz-in (Nm)	Mounted °C/Watt	oz-in-s ² (kg-m ² x 10 ⁻³)	lb (kg)	lb (N)
Enhanced 2 Stack	K32xxHD-L	•			1510 (10.7)	3.2	1.57	13.0	50 (0.35)	2.0	0.038 (0.27)	8.4 (3.8)	65 (289)	305 (1360)
	K32xxLD-L		•			1.6	6.30	51.9						
	K32xxHM-L	•			1535 (10.8)	10	0.18	1.4						
	K32xxHMI-L		•			5.0	0.70	5.5						
	K32xxHL-L	•			1515 (10.7)	8.1	0.26	2.0						
	K32xxLL-L		•			4.1	1.03	8.1						
	K32xxHK-L	•			1580 (11.2)	6.1	0.45	4.0						
	K32xxLK-L		•			3.0	1.8	16.2						
	K32xxHJ-L	•			1510 (10.7)	5.1	0.63	5.1						
	K32xxLJ-L		•			2.5	2.53	20.5						
	K32xxLG-L	•			1570 (11.1)	1.91	4.41	51.6						
	K32xxHG-L		•			0.95	17.6	162						
	K32xxED-L			•	1065 (7.53)	2.3	3.15	13.0						
	K32xxEM-L			•	1085 (7.66)	7.1	0.35	1.4						
	K32xxEL-L			•	1070 (7.55)	5.8	0.52	2.0						
K32xxEK-L			•	1120 (7.90)	4.3	0.90	4.0							
K32xxEJ-L			•	1065 (7.52)	3.5	1.27	5.1							
K32xxEG-L			•	1110 (7.85)	1.35	8.82	40.5							
3 Stack	N33xxHE-L	•			1700 (12.0)	4.0	1.27	13.6	54 (0.38)	1.6	0.0567 (0.40)	11.9 (5.39)	65 (289)	305 (1360)
	N33xxLE-L		•			2.0	5.06	54.5						
	N33xxHM-L	•			1715 (12.1)	9.9	0.22	2.3						
	N33xxLM-L		•			5.0	0.87	9.0						
	N33xxHL-L	•			1845 (13.0)	9.0	0.26	3.4						
	N33xxLL-L		•			4.5	1.06	13.6						
	N33xxHK-L	•			1755 (12.4)	6.1	0.56	6.4						
	N33xxLK-L		•			3.0	2.23	25.8						
	N33xxHJ-L	•			1710 (12.1)	5.0	0.83	9.0						
	N33xxLJ-L		•			2.5	3.31	36						
	N33xxGL-L	•			1710 (12.1)	2.50	3.25	36						
	N33xxHG-L		•			1.24	13.1	144						
	N33xxEE-L			•	1200 (8.47)	2.8	2.53	13.6						
	N33xxEM-L			•	1215 (8.58)	7.0	0.44	2.3						
	N33xxEL-L			•	1305 (9.21)	6.3	0.53	3.4						
	N33xxEK-L			•	1240 (8.75)	4.3	1.12	6.4						
	N33xxEJ-L			•	1210 (8.54)	3.5	1.65	9.0						
	N33xxEG-L			•	1210 (8.55)	1.75	6.51	36						
Enhanced 3 Stack	K33xxHE-L	•			2125 (15.0)	4.0	1.27	10.6	75 (0.53)	1.6	0.0567 (0.40)	11.9 (5.39)	65 (289)	305 (1360)
	K33xxLE-L		•			2.0	5.06	42.2						
	K33xxHM-L	•			2150 (15.2)	9.9	0.22	1.7						
	K33xxLM-L		•			5.0	0.87	7.0						
	K33xxHL-L	•			2340 (16.5)	9.0	0.26	2.6						
	K33xxLL-L		•			4.5	1.06	10.6						
	K33xxHK-L	•			2205 (15.6)	6.1	0.56	5.0						
	K33xxLK-L		•			3.0	2.23	19.9						
	K33xxHJ-L	•			2145 (15.1)	5.0	0.83	7.0						
	K33xxLJ-L		•			2.5	3.31	27.9						
	K33xxLG-L	•			2145 (15.1)	2.5	3.25	27.9						
	K33xxHG-L		•			1.24	13.1	111						
	K33xxEE-L			•	1505 (10.6)	2.8	2.53	10.6						
	K33xxEM-L			•	1520 (10.7)	7.0	0.44	1.7						
	K33xxEL-L			•	1655 (11.7)	6.3	0.53	2.6						
K33xxEK-L			•	1560 (11.0)	4.3	1.12	5.0							
K33xxEJ-L			•	1515 (10.7)	3.5	1.65	7.0							
K33xxEG-L			•	1515 (10.7)	1.75	6.51	27.9							

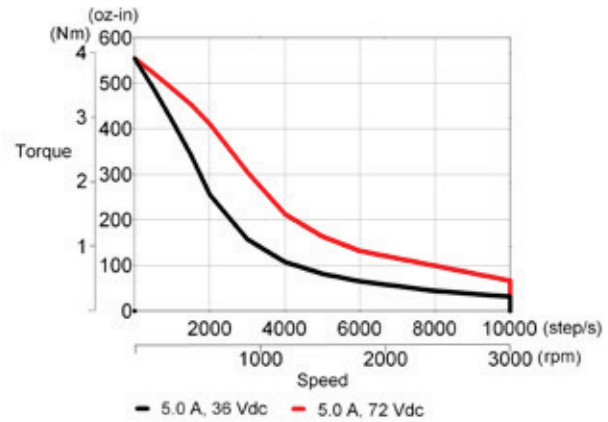
K / N Series Stepper Motors

K3/N3 Performance Curves

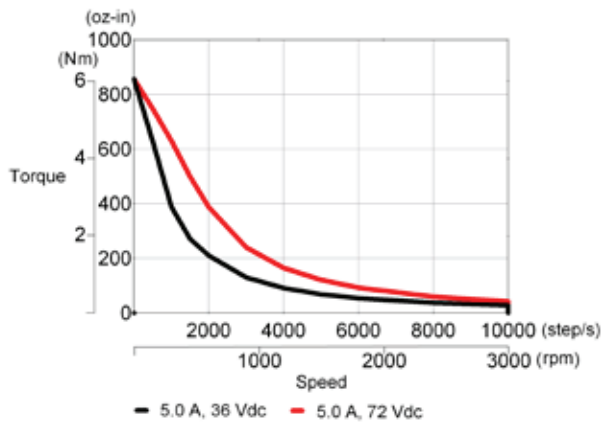
N31xxHJ-L w/ P70530



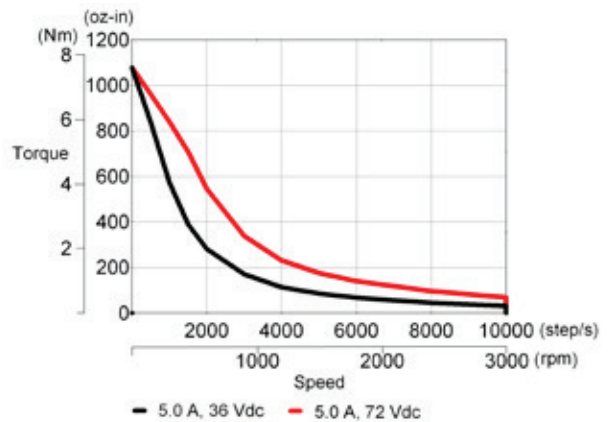
K31xxHJ-L w/ P70530



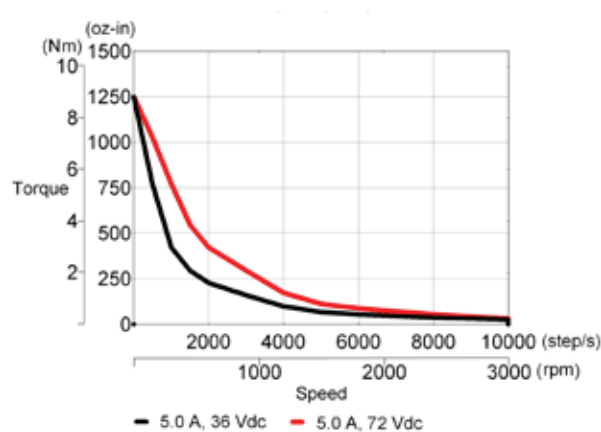
N32xxHJ-L w/ P70530



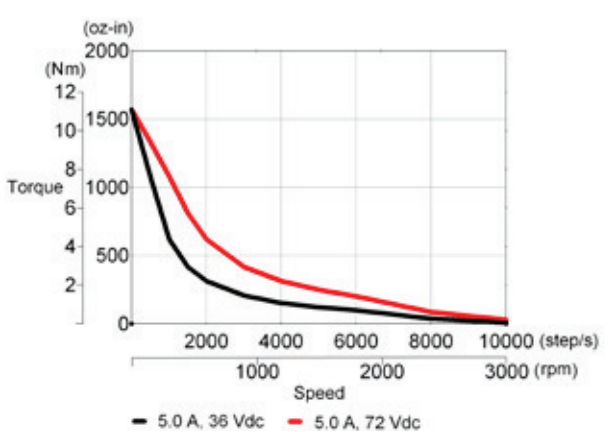
K31xxHJ-L w/ P70530



N33xxHJ-L w/ P70530

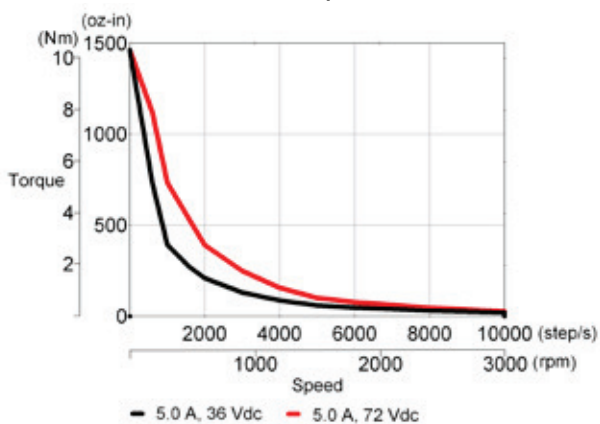


K33xxHJ-L w/ P70530

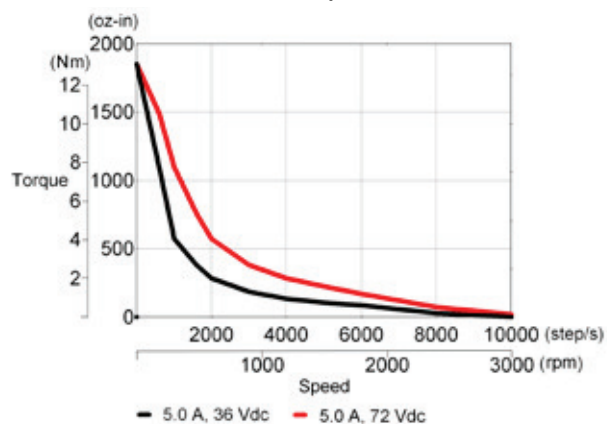


K3/N3 Performance Curves

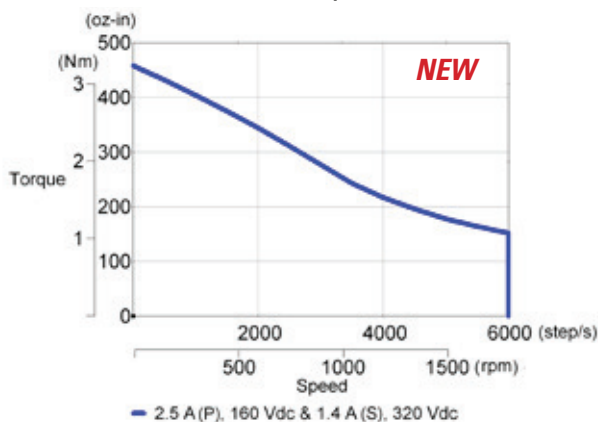
N34xxHJ-L w/ P70530



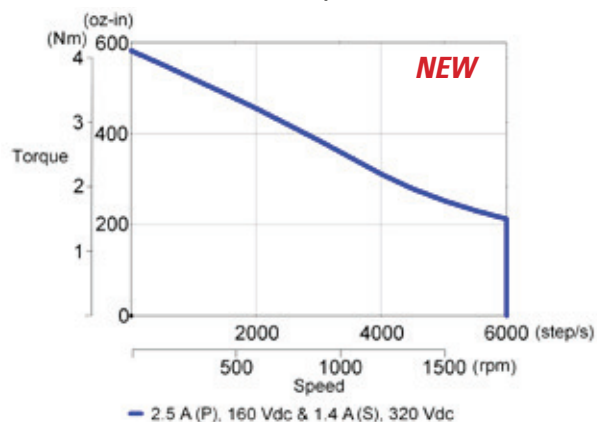
K34xxHJ-L w/ P70530



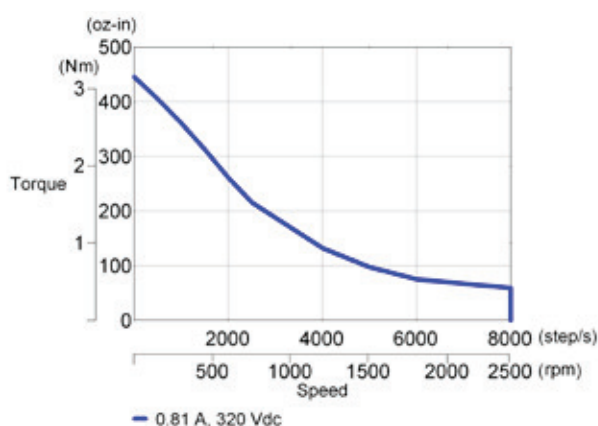
N31xxxH-L w/ P6000



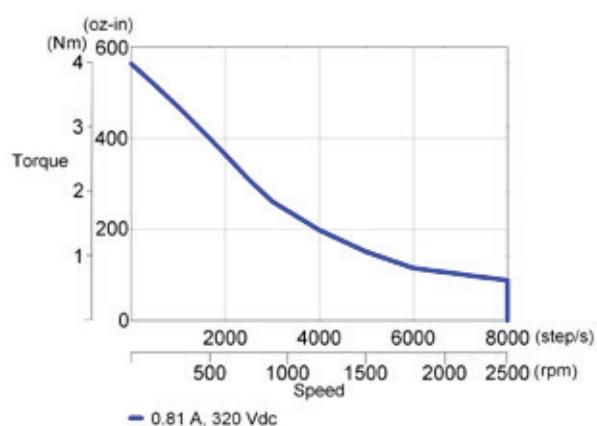
K31xxxH-L w/ P6000



N31xxLG-L w/ P70360



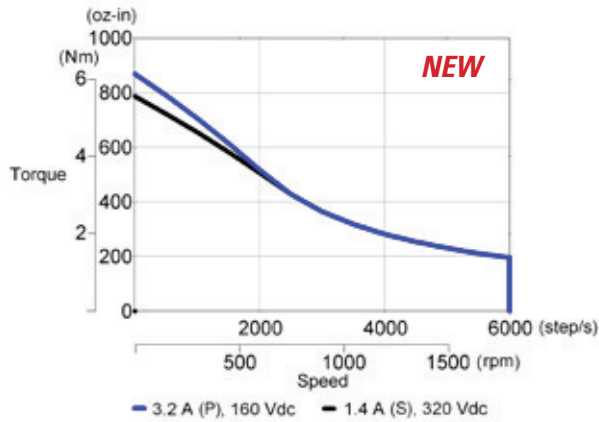
K31xxLG-L (P) w/ P70360



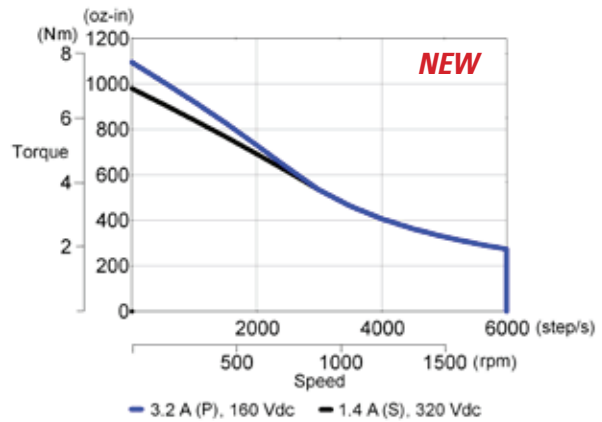
K / N Series Stepper Motors

K3/N3 Performance Curves

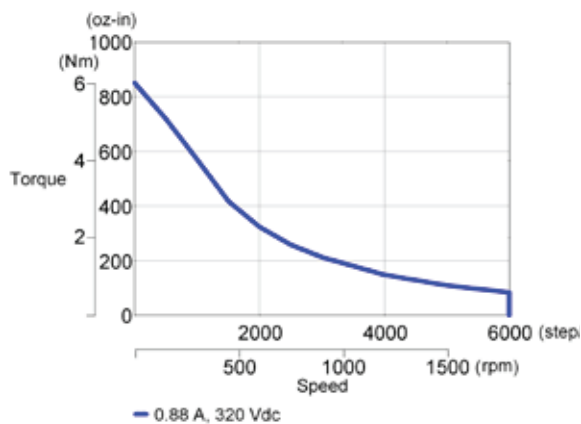
N32xxxD-L w/ P6000



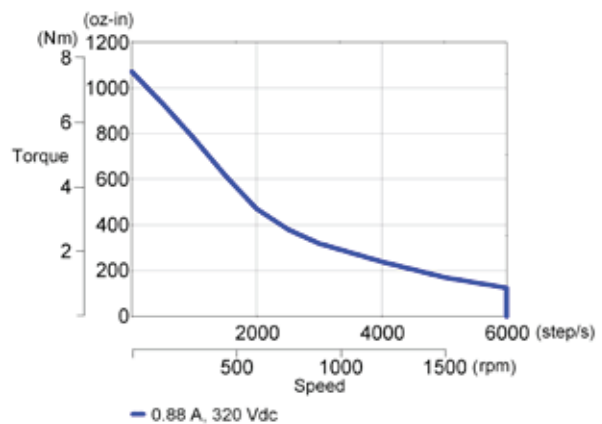
K32xxxD-L w/ P6000



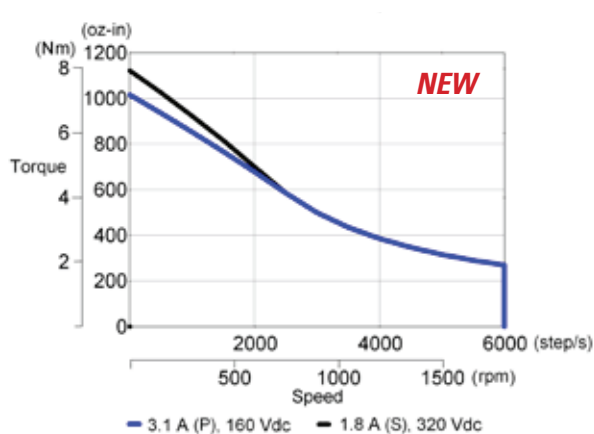
N32xxLG-L w/ P70360



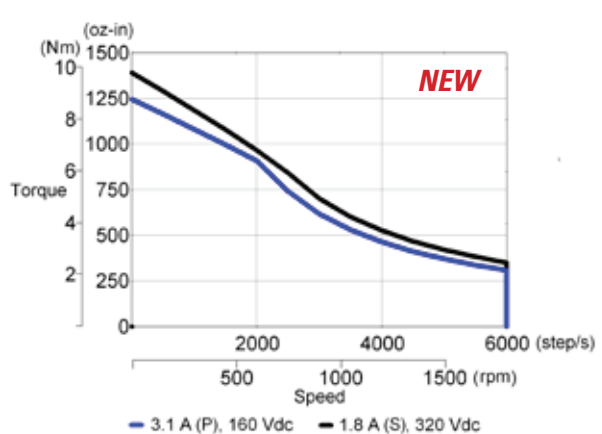
K32xxLG-L w/ P70360



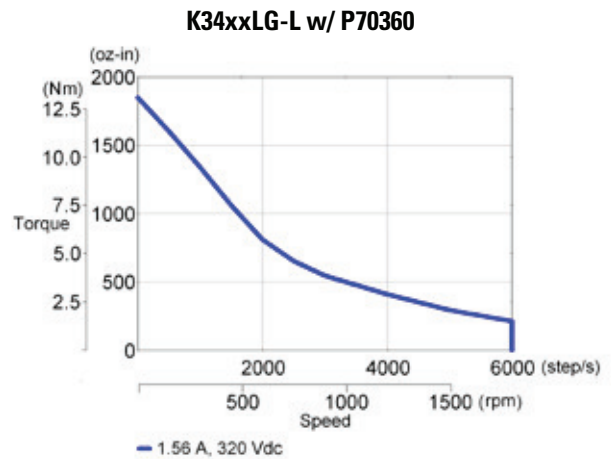
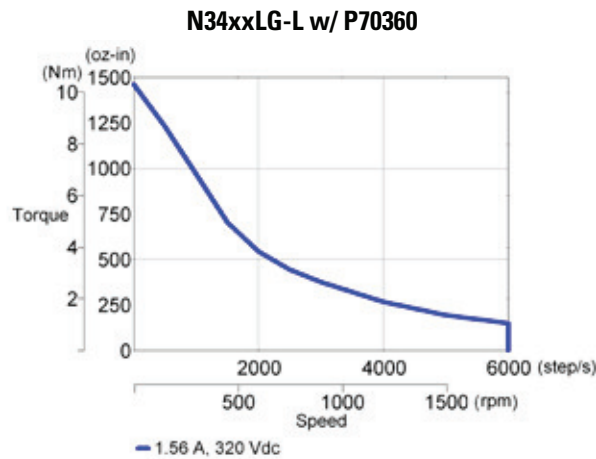
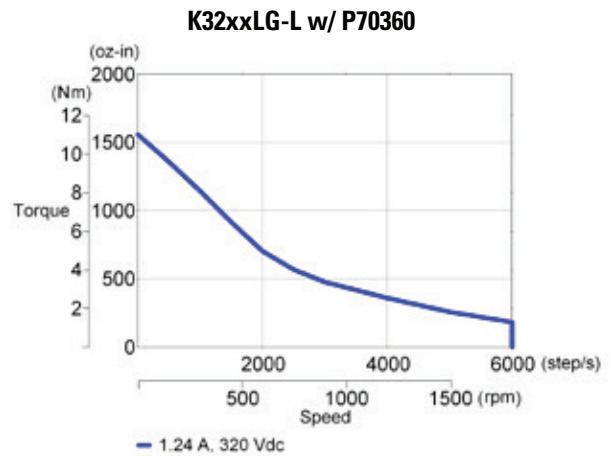
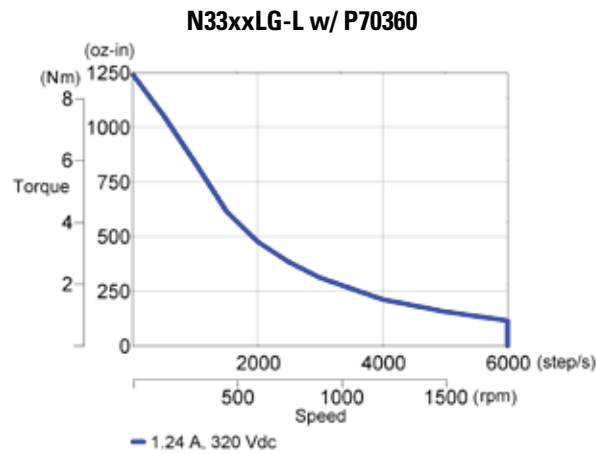
N33xxxE-L w/ P6000



K33xxxE-L w/ P6000



K3/N3 Performance Curves



K / N Series Stepper Motors

K4 / N4 Performance Data

	Motor Model Number	Config.			Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Detent Torque	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
		Parallel	Series	Unipolar									Radial Force	Axial Force
					oz-in (Nm) +/-10%	Amps DC	Ohms +/-10%	mH Typical		oz-in (Nm)	Mounted °C/Watt	oz-in-s ² (kg-m ² x 10 ⁻³)	lb (kg)	lb (N)
1 Stack	N41xxHF-L	•			1675 (11.8)	5.2	0.64	12.2	42 (0.30)	1.9	0.0783 (0.55)	11 (4.98)	125 (556)	11 (4.98)
	N41xxLF-L		•			2.6	2.56	48.9						
	N41xxHM-L	•			1655 (11.7)	10.7	0.16	2.8						
	N41xxLM-L		•			5.3	0.63	11.1						
	N41xxHL-L	•			1625 (11.5)	8.7	0.93	3.9						
	N41xxLL-L		•			4.4	0.58	15.8						
	N41xxHJ-L	•			1630 (11.5)	5.5	0.31	10.1						
	N41xxLJ-L		•			2.7	0.47	40.4						
	N41xxLG-L	•			1630 (11.5)	3.5	1.45	25.1						
	N41xxHG-L		•			1.73	5.76	100						
	N41xxEF-L			•	1185 (8.37)	3.7	1.28	12.2						
	N41xxEM-L			•	1170 (8.26)	7.5	0.23	2.8						
	N41xxEL-L			•	1150 (8.12)	6.2	2.33	3.9						
	N41xxEJ-L			•	1150 (8.12)	3.9	1.16	10.1						
	N41xxEG-L			•	1150 (8.12)	2.4	2.89	25.1						
Enhanced 1 Stack	K41xxHF-L	•			2170 (15.3)	5.2	0.64	9.5	65 (0.46)	1.9	0.0783 (0.55)	11 (4.98)	125 (556)	11 (4.98)
	K41xxLF-L		•			2.6	2.56	38						
	K41xxHM-L	•			2135 (15.1)	10.7	0.16	2.2						
	K41xxLM-L		•			5.3	0.63	8.7						
	K41xxHL-L	•			2090 (14.8)	8.7	0.23	3.1						
	K41xxLL-L		•			4.4	0.93	12.3						
	K41xxHJ-L	•			2095 (14.8)	5.5	0.58	7.8						
	K41xxLJ-L		•			2.7	2.33	31.4						
	K41xxLG-L	•			2095 (14.8)	3.5	1.45	19.5						
	K41xxHG-L		•			1.73	5.80	77.9						
	N41xxEF-L			•	1535 (10.8)	3.7	1.28	9.5						
	N41xxEM-L			•	1510 (10.7)	7.5	0.31	2.2						
	N41xxEL-L			•	1480 (10.5)	6.2	0.47	3.1						
	N41xxEJ-L			•	1480 (10.5)	3.9	1.16	7.8						
	N41xxEG-L			•	1480 (10.5)	2.4	2.89	25.1						
2 Stack	N42xxHF-L	•			2925 (20.6)	5.5	0.81	14.4	84 (0.59)	1.3	0.155 (1.09)	18.4 (8.34)	125 (556)	11 (4.98)
	N42xxLF-L		•		2923 (20.6)	2.7	3.2	57.7						
	N42xxHN-L	•			3130 (22.1)	15.8	0.10	2.1						
	N42xxLN-L		•			7.9	0.41	8.4						
	N42xxHM-L	•			3145 (22.2)	9.9	0.25	5.5						
	N42xxLM-L		•			4.9	1.02	22						
	N42xxHL-L	•			3085 (21.8)	8.1	0.38	7.8						
	N42xxLL-L		•			4.0	1.51	31.2						
	N42xxHK-L	•			3105 (21.9)	6.4	0.60	12.8						
	N42xxLK-L		•			3.2	2.41	51.1						
	N42xxLG-L	•			2315 (22.7)	4.8	1.07	25.3						
	N42xxHG-L		•			2.4	4.27	101						
	N42xxEF-L			•	2065 (14.6)	3.9	1.62	14.4						
	N42xxEN-L			•	2215 (15.6)	11.2	0.21	2.1						
	N42xxEM-L			•	2225 (15.7)	7.0	0.51	5.5						
	N42xxEL-L			•	2185 (15.4)	5.7	0.75	7.8						
	N42xxEK-L			•	2200 (15.5)	4.5	1.2	12.8						
	N42xxEG-L			•	2920 (20.6)	3.4	2.14	19.4						

Note: See page 88 for K&N series connection diagrams and switching sequence.

Continued on page 63.

K4 / N4 Performance Data (continued)

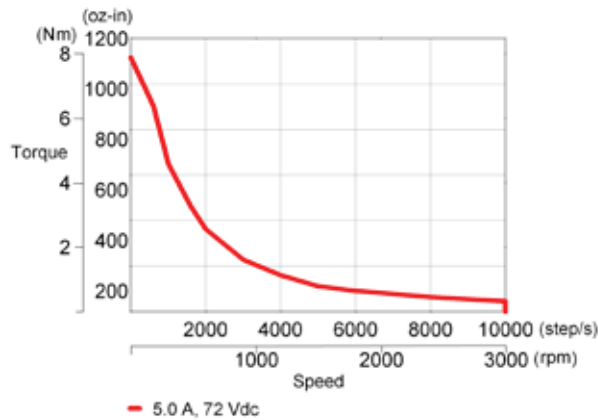
	Motor Model Number	Config.			Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Detent Torque	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
		Parallel	Series	Unipolar									Radial Force	Axial Force
					oz-in (Nm) +/-10%	Amps DC	Ohms +/-10%	mH Typical	oz-in (Nm)	Mounted °C/Watt	oz-in-s ² (kg-m ² x 10 ⁻³)	lb (kg)	lb (N)	lb (N)
Enhanced 2 Stack	K42xxHF-L	•			3700 (26.11)	5.5	0.81	11.1	126 (0.89)	1.2	0.155 (1.09)	18.4 (8.34)	125 (556)	11 (4.98)
	K42xxLF-L		•			2.7	3.23	44.2						
	K42xxHN-L	•			4000 (28.2)	15.8	0.10	1.6						
	K42xxLN-L		•			7.9	0.41	6.5						
	K42xxHM-L	•			4025 (28.4)	9.9	0.25	4.2						
	K42xxLM-L		•			4.9	1.02	16.9						
	K42xxHL-L	•			3935 (27.8)	8.1	0.38	6.0						
	K42xxLL-L		•			4.0	1.51	23.9						
	K42xxHK-L	•			3965 (28.0)	6.4	0.60	9.8						
	K42xxLK-L		•			3.2	2.41	39.2						
	K42xxLG-L	•			4130 (29.1)	4.8	1.07	19.4						
	K42xxHG-L		•			2.4	4.27	77.5						
	K42xxEF-L			•	2615 (18.5)	3.9	1.62	11.1						
	K42xxEN-L			•	2830 (20.0)	11.2	0.21	1.6						
	K42xxEM-L			•	2845 (20.1)	7.0	0.51	4.2						
	K42xxEL-L			•	2785 (19.7)	5.7	0.75	6.0						
3 Stack	K42xxEK-L			•	2805 (19.8)	4.5	1.2	9.8						
	K42xxEG-L			•	2920 (20.6)	3.4	2.14	19.4						
	N43xxHN-L	•			4365 (30.8)	15.4	0.14	3.2	106 (0.75)	1.0	0.229 (1.62)	25.7 (11.6)	125 (556)	11 (4.98)
	N43xxLN-L		•			7.7	0.55	13						
	N43xxHM-L	•			4320 (30.5)	9.9	0.33	7.7						
	N43xxLM-L		•			4.9	1.32	30.7						
	N43xxHL-L	•			4250 (30.0)	8.0	0.50	11						
	N43xxLL-L		•			4.0	1.98	44.2						
	N43xxHK-L	•			4340 (30.6)	6.2	0.82	19.6						
	N43xxLK-L		•			3.1	3.29	78.5						
	N43xxEN-L			•	3090 (21.8)	10.9	0.28	3.2						
	N43xxEM-L			•	3055 (21.6)	7.0	0.66	7.7						
	N43xxEL-L			•	3010 (21.2)	5.7	0.99	11						
	N43xxEK-L			•	3070 (21.7)	4.4	1.65	19.6						
Enhanced 3 Stack	K43xxHN-L	•			5700 (40.2)	15.4	0.14	2.5	118 (0.83)	1.0	0.229 (1.62)	25.7 (11.6)	125 (556)	11 (4.98)
	K43xxLN-L		•			7.7	0.55	10						
	K43xxHM-L	•			5630 (39.7)	9.9	0.33	5.9						
	K43xxLM-L		•			4.9	1.32	23.7						
	K43xxHL-L	•			5530 (39.0)	8.0	0.50	8.5						
	K43xxLL-L		•			4.0	1.98	34.1						
	K43xxHK-L	•			5655 (39.9)	6.2	0.82	15.2						
	K43xxLK-L		•			3.1	3.29	60.7						
	K43xxEN-L			•	4030 (28.4)	10.9	0.28	2.5						
	K43xxEM-L			•	3985 (28.1)	7.0	0.66	5.9						
	K43xxEL-L			•	3910 (27.6)	5.7	0.99	8.5						
	K43xxEK-L			•	4000 (28.2)	4.4	1.65	15.2						

Note: See page 88 for K&N series connection diagrams and switching sequence.

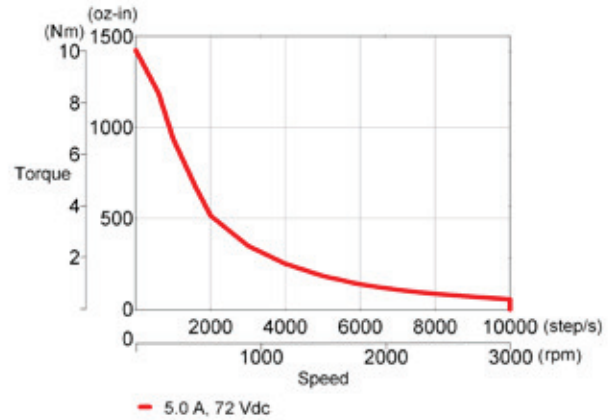
K / N Series Stepper Motors

K4/N4 Performance Curves

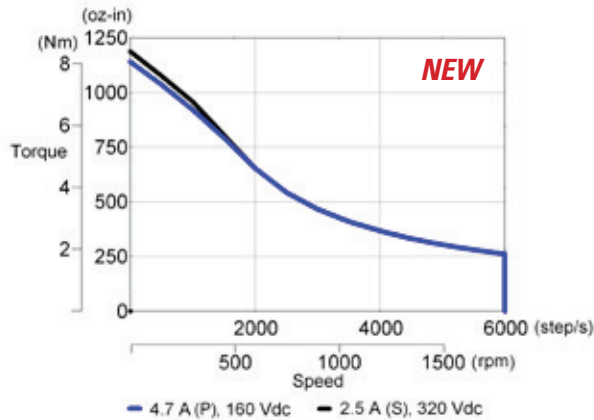
N41xxHJ-L w/ P70530



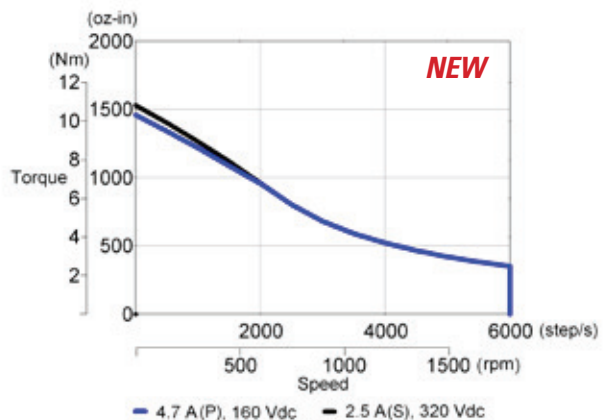
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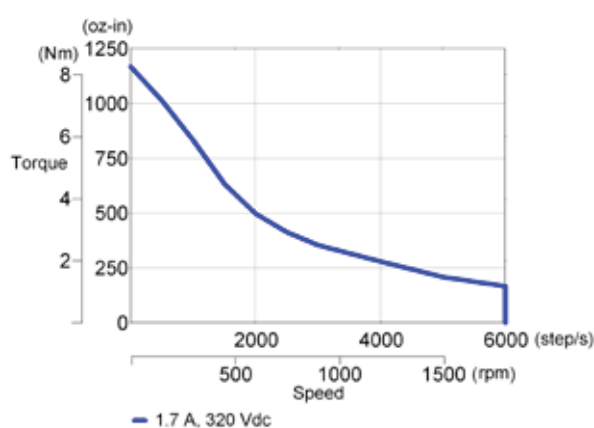
N41xxxF-L w/ P6000



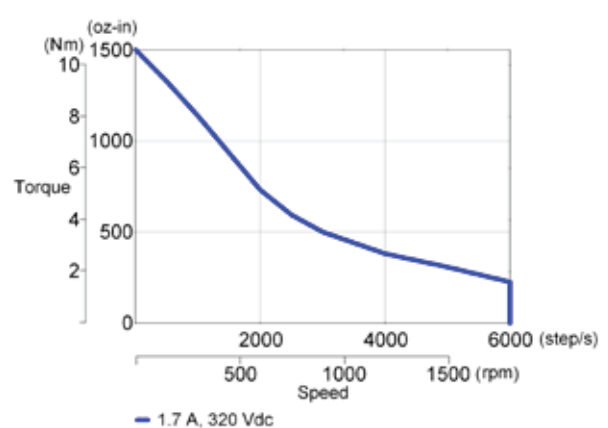
K41xxxF-L w/ P6000



N41xxLG-L w/ P70360



K41xxLG-L w/ P70360



K4/N4 Performance Curves

