Quantum Series Brushless Servo Motors

NEMA 17, 23, 34, High Power Density, Sinusoidal BEMF

- NEMA 17, 23, and 34 frame high performance brushless servo motors
- Power from 68 up to 846 W cont., and stall torque rated from 0.08 up to 2.32 Nm cont.
- Standard winding voltages of 24, 40, and 130 VDC

Allied Motion's Quantum (QB) housed brushless servo motors are designed for use in precision servo applications that require a standard NEMA 17, 23, or 34 frame size motor.

The QB series are electromechanically optimized for high output power, high torque density, and low cogging torque. Their high power density ratio allows a smaller size motor to be used in many applications, saving space and weight.

Quantum motors are also available as frameless versions for direct machine integration.

Features & Benefits

- Three standard NEMA frame sizes with three stack lengths each cover a wide range of servo applications
- Rated stall torque from 11.5 oz-in (0.08 Nm) up to 328 oz-in (2.3 Nm)
- Standard winding voltage ratings of 24, 40, and 130 VDC
- High strength NdFeB magnets maximize torque production
- Integrated Hall sensors for commutation
- Computer optimized design for maximum power and torque density ensures the most compact and efficient design possible

Options

- Encoder and resolver feedback options for compatibility with virtually all servo drives and motion controllers
- Sealed versions up to IP65 for operation in harsh environments
- Custom winding options to provide higher operating ranges of speed and voltage (up to 300 VDC)

SPECIFICATIONS SUMMARY

Model	Units	QB017xx	QB023xx	QB034xx
Cont. Stall Torque	oz-in	11.5 - 33.5	51 - 138	115 - 328
	Nm	0.08 - 0.23	0.36 - 0.98	0.81 - 2.32
Max. Cont. Power Output	Watt	68 - 167	202 - 411	410 - 846
Design Voltage	VDC	24, 40, 130		
No Load Speed	RPM	6318 - 29095	3014 - 10254	1413 - 8037

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Brushless Servo Motors

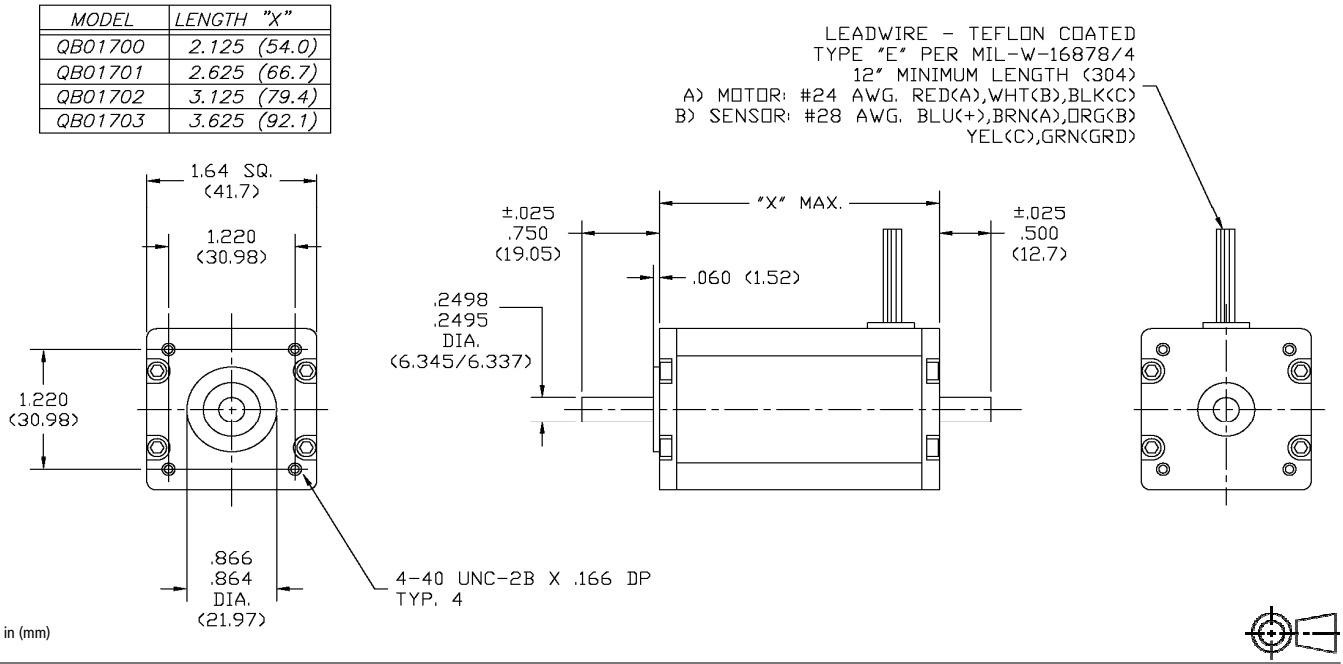
Quantum NEMA 17 Series Brushless Servo Motors

SPECIFICATIONS

Model No.		QB01700			QB01701			QB01702		
Max. Cont. Stall Torque	oz-in	11.5			21.6			33.5		
	Nm	0.08			0.15			0.23		
Max Rated Torque	oz-in	92			169			264		
	Nm	0.65			1.19			1.87		
Max. Cogging Torque	oz-in	1.0			1.5			1.8		
	N m	7.0 E-3			1.1 E-2			1.3 E-2		
Motor Constant	oz-in/√W	3.20			4.99			6.85		
	Nm/√W	0.023			0.035			0.048		
Electrical Time Constant	ms	0.380			0.520			0.590		
Mechanical Time Constant	ms	2.030			1.670			1.330		
Thermal Resistance	°C/Watt	4.7			3.29			2.58		
Viscous Damping	oz-in/RPM	7.5 E-5			1.5 E-4			2.3 E-4		
	Nm/RPM	5.3 E-7			1.1E-6			1.6E-6		
Motor Inertia	oz-in-s²	1.5 E-4			3.0 E-4			4.4 E-4		
	kg-m²	1.1 E-6			2.1E-6			3.1E-6		
Motor Weight	oz	7.8			12.1			16.4		
	kg	0.22			0.34			0.47		
Poles	-	6								
Winding Constants		**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
Nominal Supply Voltage	VDC	24	40	130	24	40	130	24	40	130
Peak Current	A	36	24	15	44	35	14	42	41	16
Torque Constant	oz-in/A	2.54	3.84	6.04	3.65	4.79	11.35	5.13	6.32	16.20
	Nm/A	0.018	0.027	0.043	0.026	0.034	0.080	0.036	0.045	0.114
No-Load Speed	RPM	12775	14068	29095	8874	11287	15488	6318	8555	10851
	rad/s	1337	1473	3046	829	1182	1621	661	895	1136
Back EMF Constant	V/kRPM	1.88	2.84	4.46	2.70	3.54	8.39	3.79	4.67	11.98
	V/rad/s	0.018	0.027	0.043	0.026	0.034	0.080	0.036	0.045	0.114
Resistance (ph-ph, ±12%)	Ohms	0.63	1.51	3.76	0.530	1.080	6.440	0.56	0.86	5.62
Inductance (ph-ph, ±30%)	mH	0.24	0.55	1.36	0.28	0.48	2.68	0.330	0.5	3.29

DIMENSIONS

MODEL	LENGTH "X"
QB01700	2.125 (54.0)
QB01701	2.625 (66.7)
QB01702	3.125 (79.4)
QB01703	3.625 (92.1)



in (mm)

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Quantum NEMA 17 Series Brushless Servo Motors

PERFORMANCE

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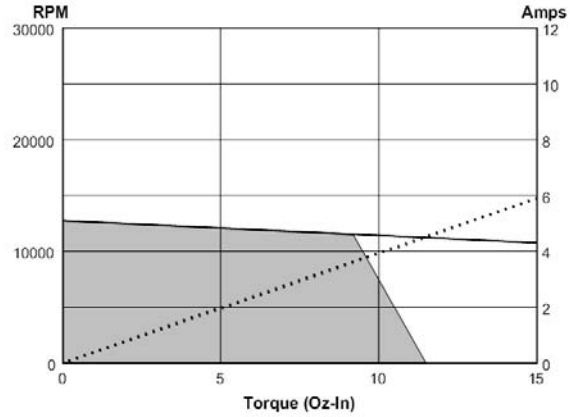

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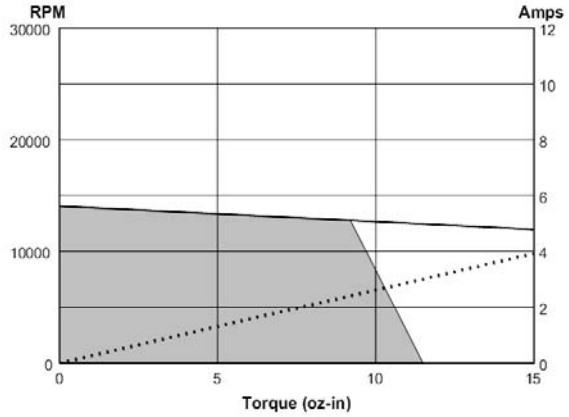

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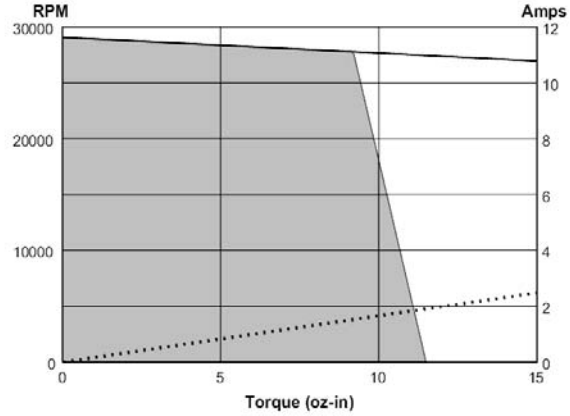

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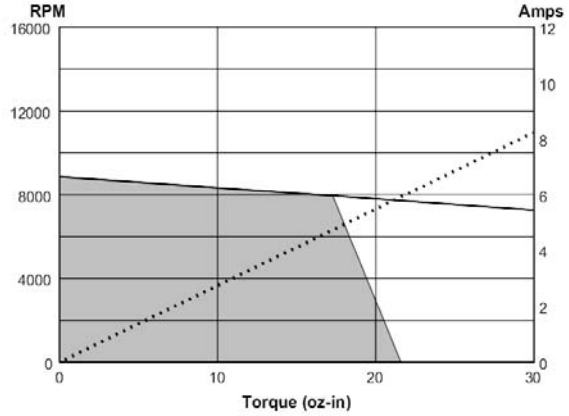

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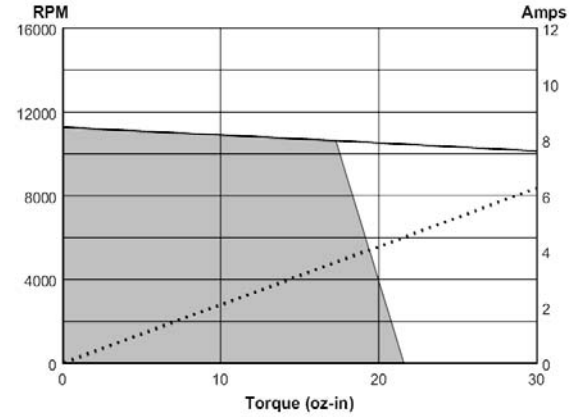

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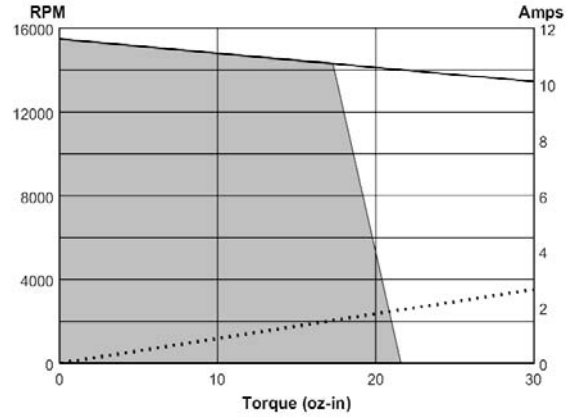

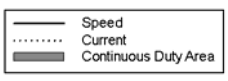

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Brushless Servo Motors

Quantum NEMA 17 Series Brushless Servo Motors

PERFORMANCE

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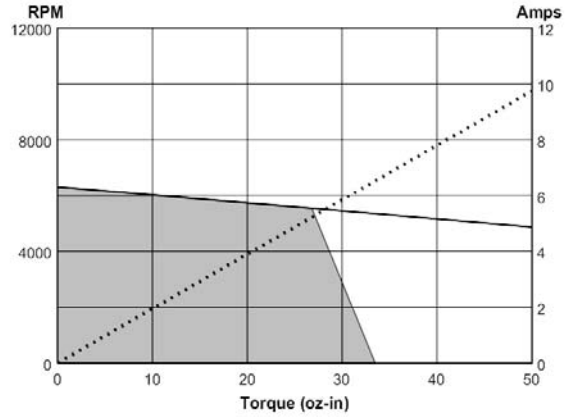

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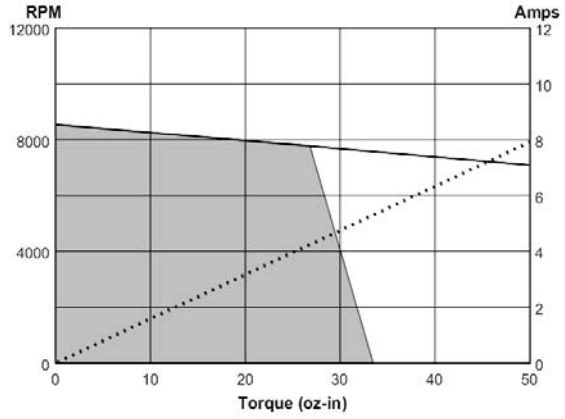

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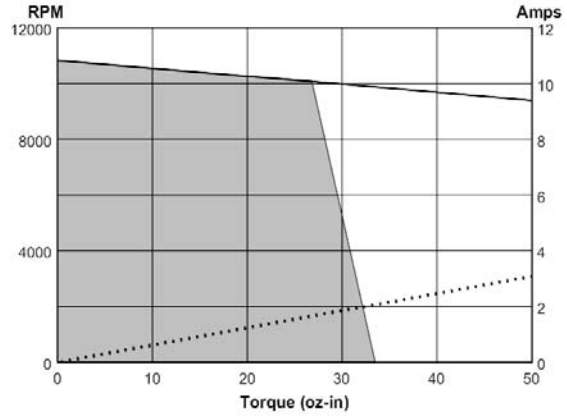

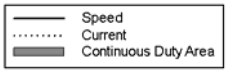

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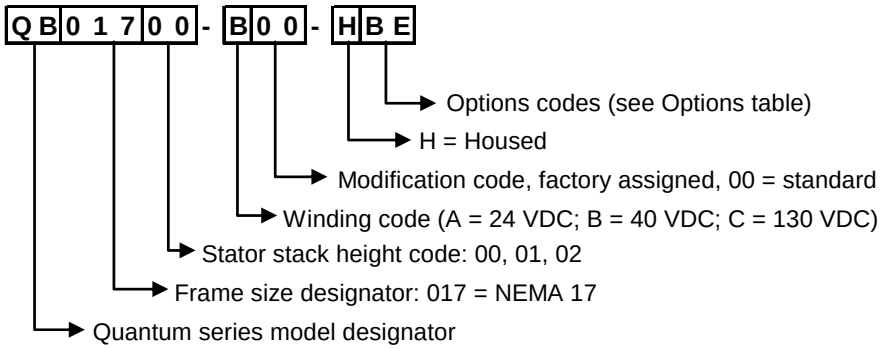

Options	
E =	Encoder
B =	Holding brake
C =	Motor connector
G =	Gearbox
I =	IP65 rating (IP44 std.)
P =	Ruggedized housing
R =	Resolver

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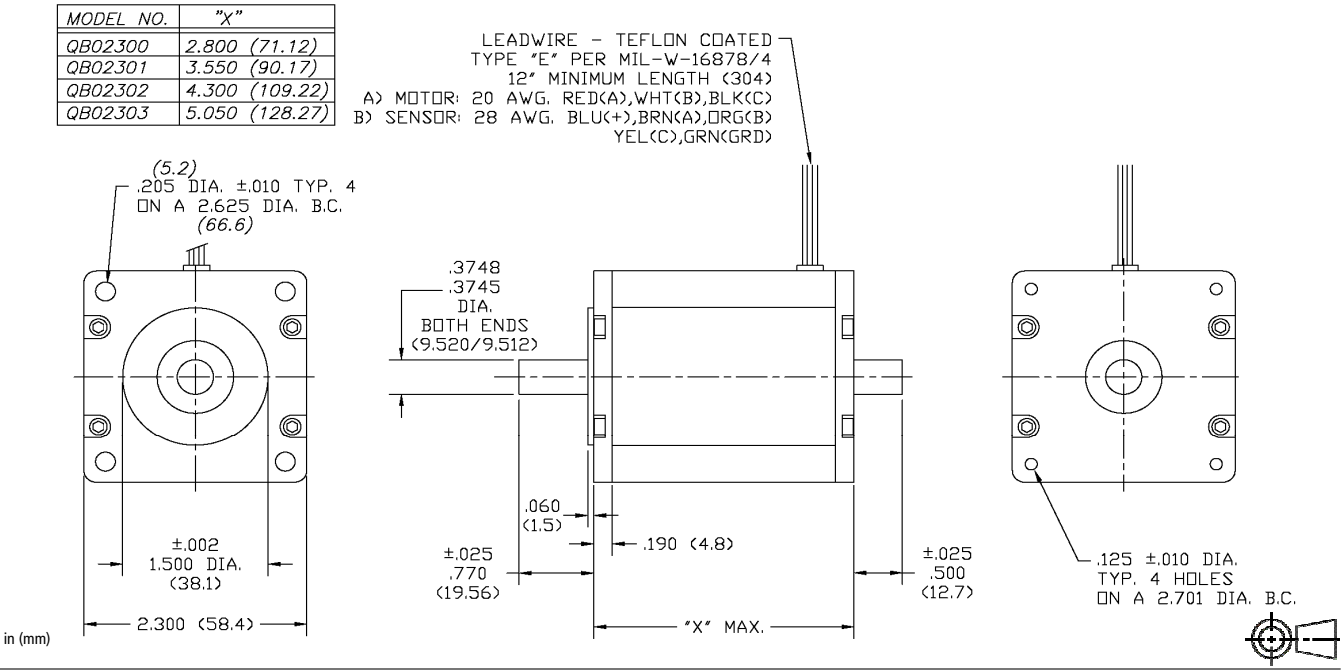
Quantum NEMA 23 Series Brushless Servo Motors

SPECIFICATIONS

Model No.		QB02300			QB02301			QB02302		
Max. Cont. Stall Torque	oz-in	51			96			138		
	Nm	0.36			0.68			0.98		
Max Rated Torque	oz-in	558			1117			1676		
	Nm	3.94			7.9			11.8		
Max. Cogging Torque	oz-in	2.6			4.1			5.1		
	N m	0.018			0.029			0.036		
Motor Constant	oz-in/√W	10.8			17.2			22.0		
	Nm/√W	0.076			0.121			0.155		
Electrical Time Constant	ms	0.94			1.14			1.22		
Mechanical Time Constant	ms	1.30			1.03			0.94		
Thermal Resistance	°C/Watt	2.79			2.00			1.59		
Viscous Damping	oz-in/RPM	3.5E-4			7.5E-4			1.1E-3		
	Nm/RPM	2.5E-6			5.3E-6			7.9E-6		
Motor Inertia	oz-in-s²	1.1E-3			2.2E-3			3.3E-3		
	kg-m²	7.9E-6			1.5E-5			2.3E-5		
Motor Weight	oz	24.1			32.6			41.2		
	kg	0.68			0.92			1.17		
Poles	-	6								
Winding Constants		**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
Nominal Supply Voltage	VDC	24	40	130	24	40	130	24	40	130
Peak Current	A	95	81	32	61	62	40	100	104	56
Torque Constant	oz-in/A	5.4	6.8	17.1	10.7	13.5	27.1	10.7	13.4	29.4
	Nm/A	0.038	0.048	0.121	0.076	0.096	0.192	0.076	0.095	0.208
No-Load Speed	RPM	5994	7888	10254	3014	3981	6470	3014	4035	5860
	rad/s	627	826	1073	315	416	677	315	422	624
Back EMF Constant	V/kRPM	4.0	5.0	12.6	7.9	10.0	20.0	7.9	9.9	21.8
	V/rad/s	0.038	0.048	0.121	0.076	0.096	0.192	0.076	0.095	0.208
Resistance (ph-ph, ±12%)	Ohms	0.25	0.40	2.53	0.39	0.63	2.55	0.24	0.38	2.00
Inductance (ph-ph, ±30%)	mH	0.23	0.38	2.37	0.45	0.72	2.88	0.29	0.46	2.22

DIMENSIONS

MODEL NO.	"X"
QB02300	2.800 (71.12)
QB02301	3.550 (90.17)
QB02302	4.300 (109.22)
QB02303	5.050 (128.27)



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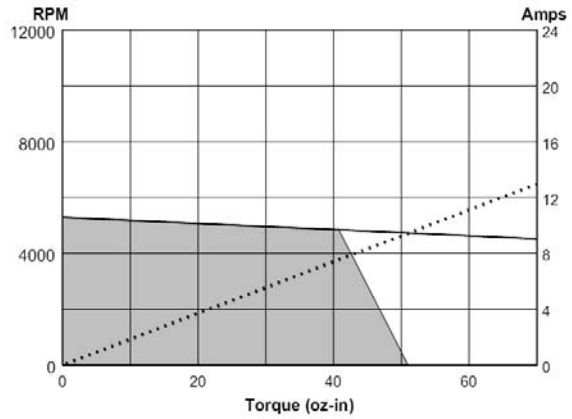

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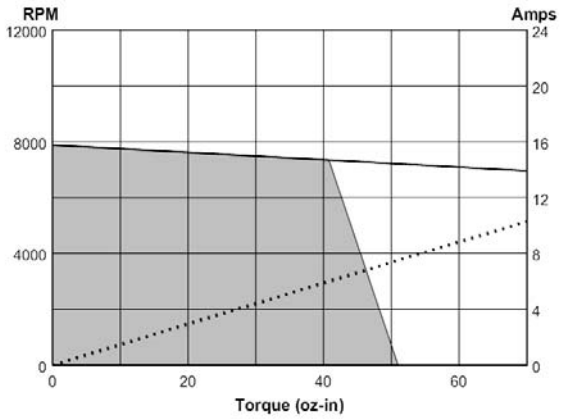

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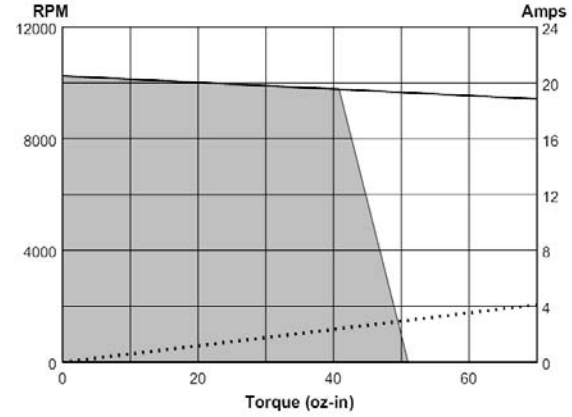

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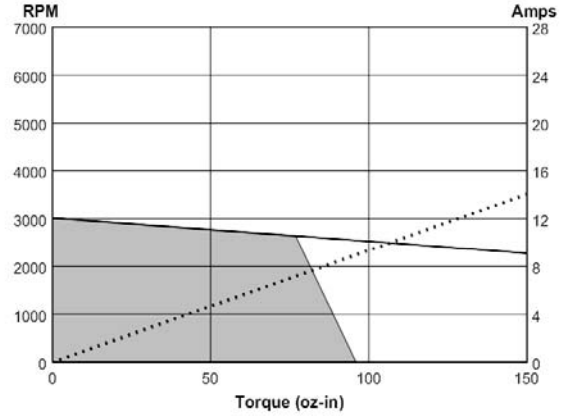

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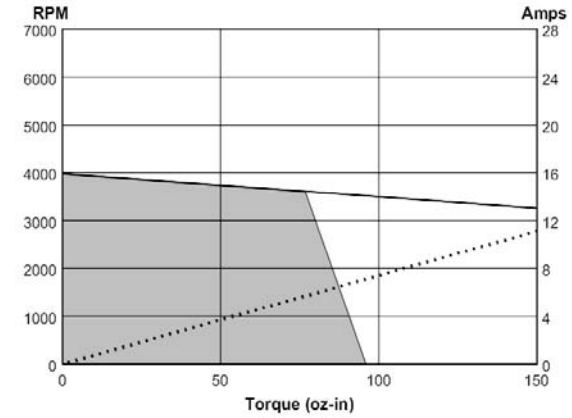

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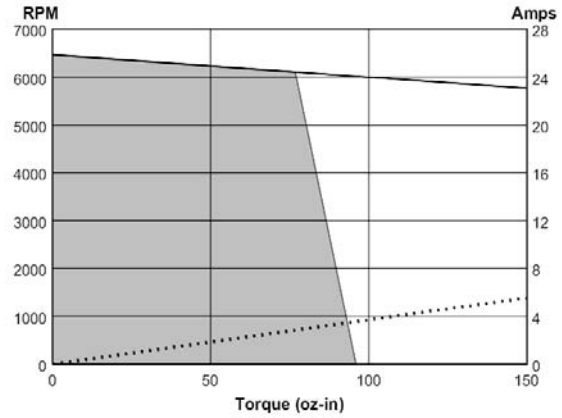

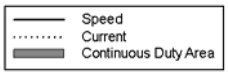

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PERFORMANCE

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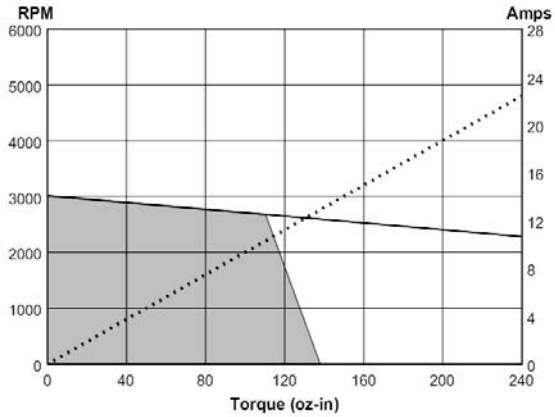

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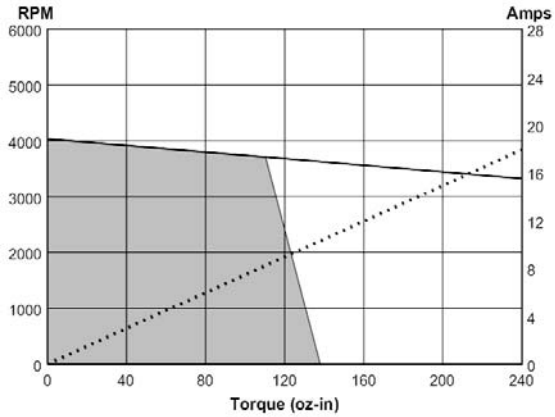

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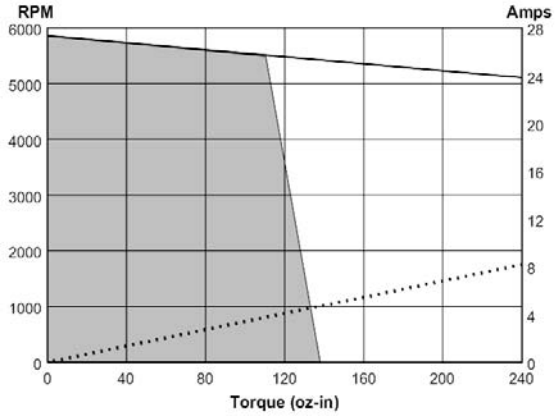

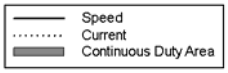

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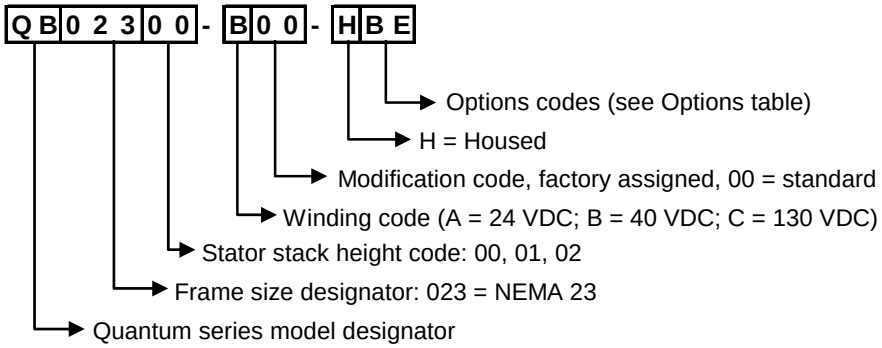

Options	
E =	Encoder
B =	Holding brake
C =	Motor connector
G =	Gearbox
I =	IP65 rating (IP44 std.)
P =	Ruggedized housing
R =	Resolver

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Brushless Servo Motors

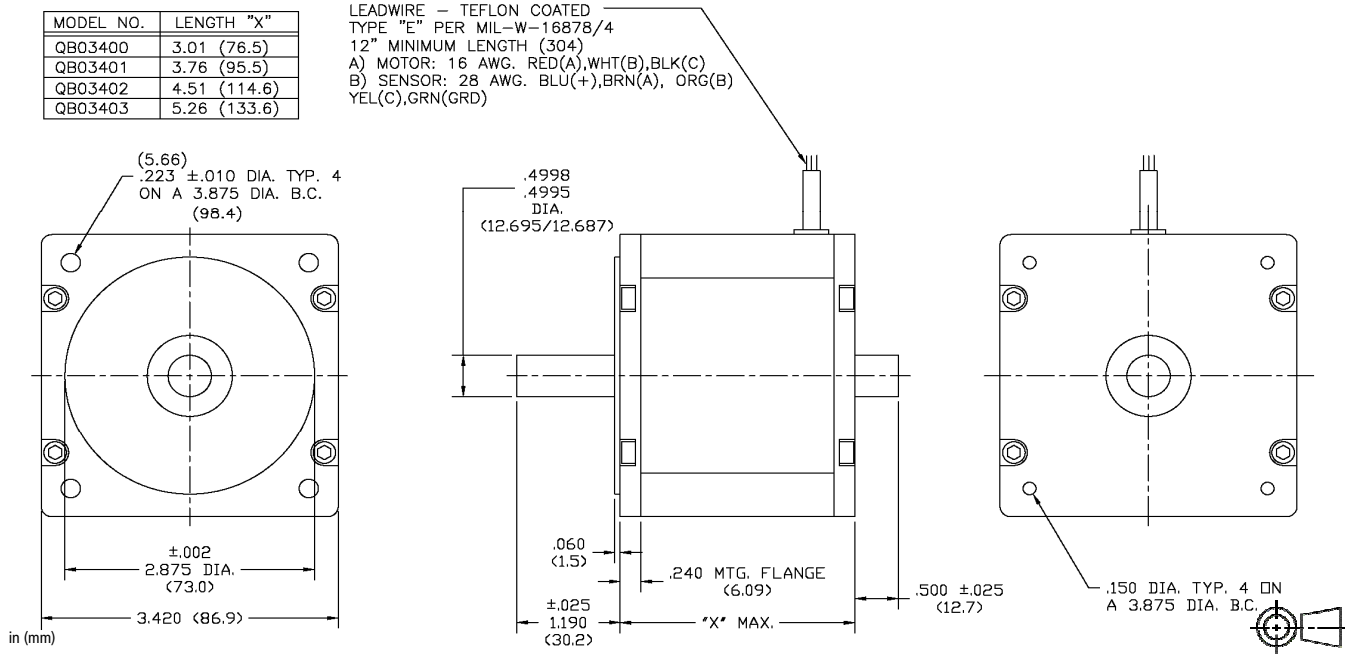
Quantum NEMA 34 Series Brushless Servo Motors

SPECIFICATIONS

Model No.		QB03400			QB03401			QB03402		
Max. Cont. Stall Torque	oz-in	115			222			328		
	Nm	0.81			1.57			2.32		
Max Rated Torque	oz-in	761			1538			2307		
	Nm	5.38			10.8			16.2		
Max. Cogging Torque	oz-in	3.5			5.0			6.5		
	N m	0.025			0.035			0.046		
Motor Constant	oz-in/√W	20.1			34.7			44.7		
	Nm/√W	0.142			0.245			0.316		
Electrical Time Constant	ms	1.89			2.57			2.78		
Mechanical Time Constant	ms	2.59			1.74			1.57		
Thermal Resistance	°C/Watt	1.87			1.51			1.15		
Viscous Damping	oz-in/RPM	7.3E-4			1.5E-3			2.3E-3		
	Nm/RPM	5.1E-6			1.0E-5			1.6E-5		
Motor Inertia	oz-in-s²	7.5E-3			1.5E-2			2.2E-2		
	kg-m²	5.3E-5			1.0E-4			1.5E-4		
Motor Weight	oz	54.6			78.1			103.3		
	kg	1.55			2.24			2.92		
Poles	-	6								
Winding Constants		**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
Nominal Supply Voltage	VDC	24	40	130	24	40	130	24	40	130
Peak Current	A	51	49	34	81	65	40	91	81	51
Torque Constant	oz-in/A	13.7	15.4	21.8	18.8	23.5	37.6	22.9	28.2	45.0
	Nm/A	0.098	0.109	0.154	0.133	0.166	0.266	0.162	0.200	0.318
No-Load Speed	RPM	2367	3499	8037	1722	2286	4665	1413	1913	3802
	rad/s	247	366	841	180	240	488	148	200	408
Back EMF Constant	V/kRPM	10.1	11.4	16.1	13.9	17.4	27.8	16.9	20.9	33.3
	V/rad/s	0.097	0.109	0.154	0.133	0.166	0.266	0.162	0.200	0.318
Resistance (ph-ph, ±12%)	Ohms	0.46	0.58	1.17	0.29	0.46	1.24	0.26	0.40	1.03
Inductance (ph-ph, ±30%)	mH	0.88	1.11	2.24	0.75	1.18	3.03	0.73	1.11	2.82

DIMENSIONS

MODEL NO.	LENGTH "X"
QB03400	3.01 (76.5)
QB03401	3.76 (95.5)
QB03402	4.51 (114.6)
QB03403	5.26 (133.6)



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Quantum NEMA 34 Series Brushless Servo Motors

PERFORMANCE

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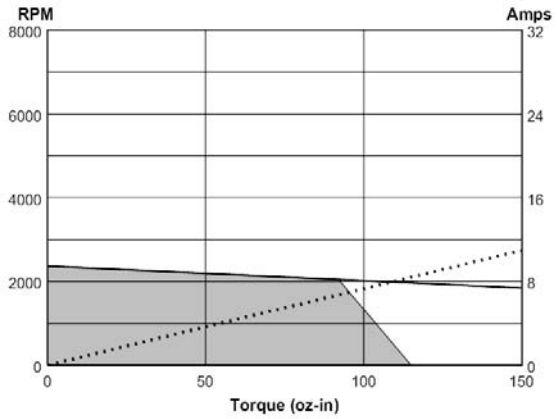

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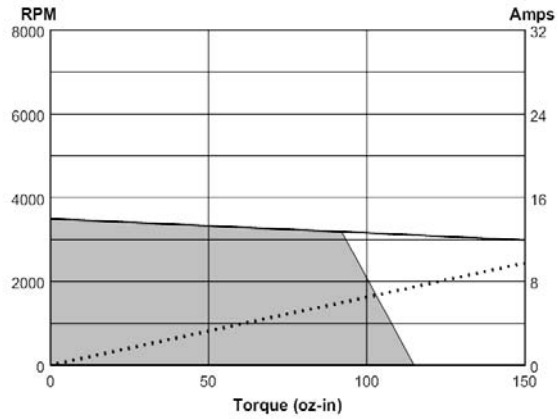

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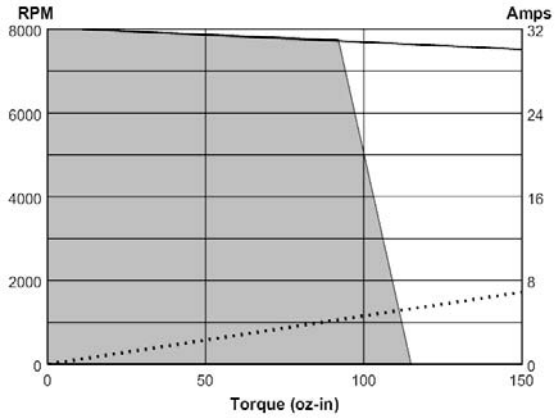

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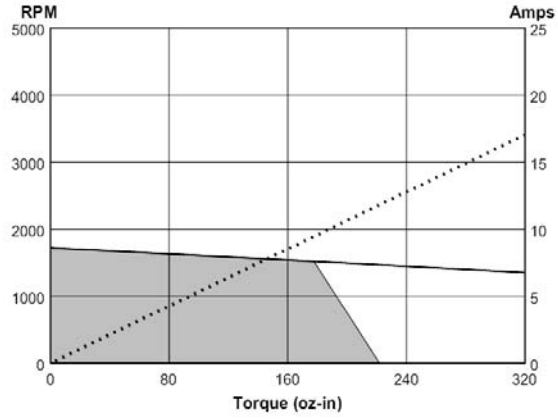

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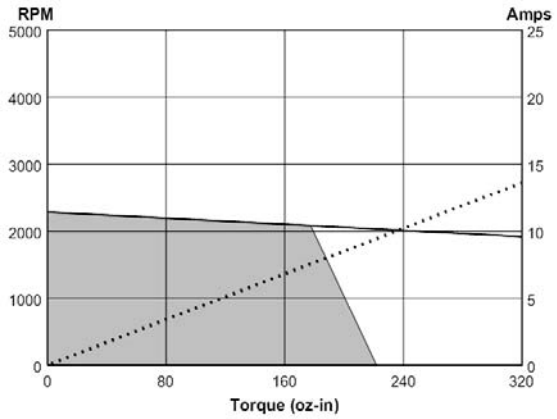

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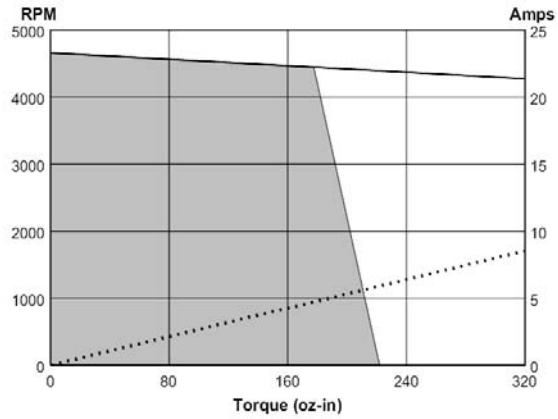

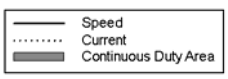

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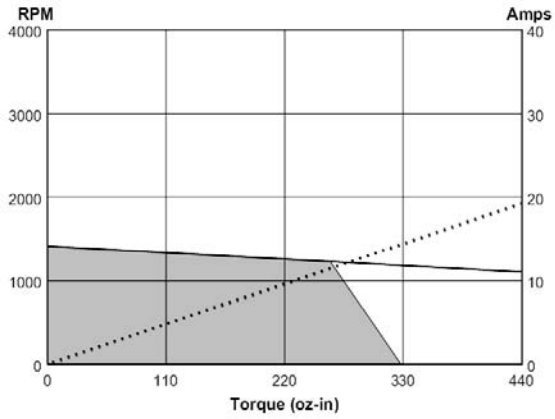
Brushless Servo Motors

Quantum NEMA 34 Series Brushless Servo Motors

PERFORMANCE

QB03402-A00



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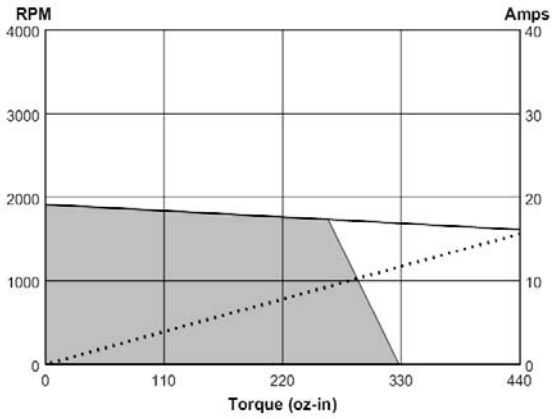

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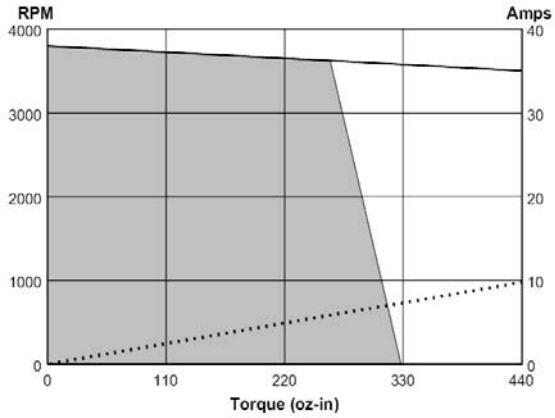
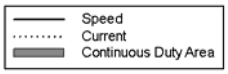
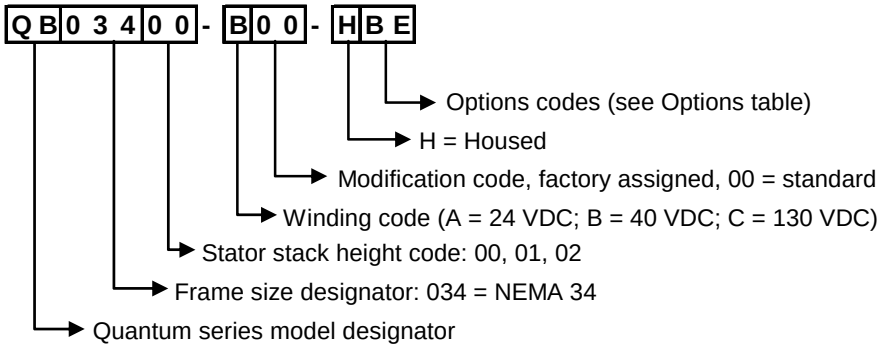




MODEL NUMBERING



Options	
E =	Encoder
B =	Holding brake
C =	Motor connector
G =	Gearbox
I =	IP65 rating (IP44 std.)
P =	Ruggedized housing
R =	Resolver

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NOTES

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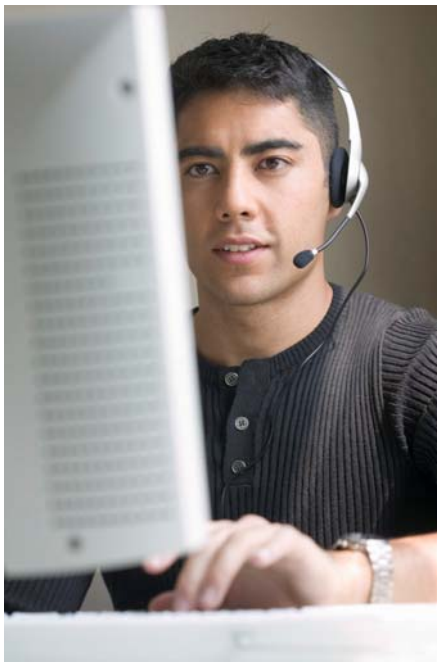

Allied Motion's application engineering and customer service teams are available to assist you with all aspects of the selection and purchase of our products, including:

- Detailed product information and documentation
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