

Torque Motors

Megaflux Frameless Brushless Torque Motors—MF0760

Brushless thin-ring component (rotor and stator) torque motor

Allied Motion’s Megaflux family of brushless torque motors includes 12 series of high performance frameless component torque motors, ranging in outside diameter from 60 mm up to 792 mm (2.36 in. up to 31.2 in.). Each motor consists of a matched rotor and stator pair. The stator is wound WYE with the three phase terminals made available.

This datasheet provides a specification overview of the MF family and specific data for the MF0760 series motors.

Megaflux frameless brushless torque motors are computer-designed and -optimized to provide the highest torque density brushless torque motors available. Special attention has been given to cogging torque minimization to enhance their performance in precision applications.

Frameless Megaflux motors are thin annular ring motors with large diameter-to-length ratios, and are intended to be integrated directly into mechanisms, effectively eliminating problems of torsional resonances due to couplings and backlash associated with gear trains. They are typically mounted directly to the driven axis, and their large open bore enables passing system electrical cabling, fluid piping or light beams through the motor center.

Features & Benefits

- 12 standard frame sizes from 60 mm up to 792 mm outside diameter
- Continuous stall torque as high as 1875 Nm (1383 lb-ft) covers a very wide range of applications
- Computer-optimized design maximizes torque density and performance
- Large, clear through bore—allows passage of air, water, or vacuum lines, optical beams, and/or electrical/signal wiring
- Three winding voltage designs for each size of 48, 150, and 300 VDC
- Hall sensor assembly standard on MF0060 through MF0127 series

Options & Accessories

- Custom winding designs to accommodate special voltage requirements
- Thin lamination MFS version for improved efficiency in applications requiring high speeds
- Hall-effect sensor array for commutation signals on larger series
- Special-engineered mechanical configurations to meet specific application needs
- Application-matched brushless servo drives



- High torque density, thin-ring frameless brushless torque motors
- 12 stator diameters, each with five stack heights, mean a wide selection of performances from which to choose
- High rated continuous stall torque of up to 1875 Nm (1383 lb-ft)
- Three winding designs: 48, 150, and 300 VDC

SPECIFICATION SUMMARY

Model	Units	MF0060	MF0076	MF0095	MF0127	MF0150	MF0210
Continuous Stall Torque	lb-ft	0.22 - 0.76	0.38 - 1.62	0.68 - 3.24	1.2 - 6.2	2.3 - 18.2	5.9 - 55.3
	Nm	0.29 - 1.04	0.51 - 2.20	0.92 - 4.39	1.6 - 8.4	3.1 - 24.7	8.0 - 75.0
No Load Speed	RPM	2076 - 7098	1640 - 6447	1300 - 5436	939 - 5097	416 - 2500	338 - 1894
Diameter (Outer)	in	2.38	2.99	3.73	5.00	6.69	9.06
	mm	60.4	76.0	94.7	127.0	170.0	230.0
Model	Units	MF0255	MF0310	MF0410	MF0510	MF0610	MF0760
Continuous Stall Torque	lb-ft	7.2 - 75.9	12.8 - 133.7	50.6 - 280	81 - 504	127 - 762	225 - 1383
	Nm	9.7 - 102.9	17.3 - 181.3	68.6 - 380	110 - 684	172 - 1034	304 - 1875
No Load Speed	RPM	280 - 1591	100 - 1260	71 - 926	42 - 771	25 - 595	17.1 - 422
Diameter (Outer)	in	10.83	13.0	16.9	21.1	25.2	31.18
	mm	275.0	330	430	535	640	792

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SPECIFICATIONS (all data measured at 20 °C ambient)

Model No.		MF0760015			MF0760025			MF076050		
Winding Voltage	V	48	150	300	48	150	300	48	150	300
Stall Torque (continuous) ⁽¹⁾	lb-ft	226	225	228	354	353	361	694	688	700
	Nm	307	304	309	480	478	490	941	933	949
Peak Torque (±25%)	lb-ft	1861	1861	1861	3033	3033	3033	4543	5946	5945
	Nm	2524	2524	2523	4112	4112	4112	6160	8061	8061
Peak Current	A	621	517	388	628	524	393	475	518	389
No Load Speed	RPM	108	281	422	67	175	263	34	89	133
	rad/s	11.3	29.4	44.2	7.06	18.3	27.5	3.55	9.28	13.9
Cogging Torque (max.)	lb-ft	0.45			0.86			1.53		
	Nm	0.61			1.17			2.07		
Torque Constant (±10%)	lb-ft/A	3.00	3.60	4.80	4.83	5.79	7.72	9.56	11.47	15.30
	Nm/A	4.07	4.88	6.51	6.54	7.85	10.47	12.96	15.55	20.74
Voltage Constant (±10%)	V/kRPM	426	511	681	685	822	1096	1357	1629	2172
	V/rad/s	4.07	4.88	6.51	6.54	7.85	10.47	12.96	15.55	20.74
Motor Constant	lb-ft/√W	13.40	13.29	13.52	18.75	18.67	19.13	30.08	29.82	30.35
	Nm/√W	18.16	18.02	18.33	25.42	25.31	25.93	40.78	40.43	41.15
Elect. Time Constant	ms	13.47	13.24	13.71	16.11	15.98	16.77	20.27	19.91	20.63
Mech. Time Constant	ms	0.96	0.97	0.94	0.78	0.79	0.75	0.61	0.62	0.60
Terminal Resistance (±12%)	Ohm	0.050	0.073	0.126	0.066	0.096	0.163	0.101	0.148	0.254
Terminal Inductance (±30%)	mH	0.675	0.971	1.727	1.068	1.538	2.734	2.047	2.947	5.239
Thermal Resistance ⁽¹⁾	°C/W	0.235			0.187			0.126		
Motor Inertia	lb-ft-s ²	2.4E-1			3.9E-1			7.8E-1		
	kg-m ²	3.3E-1			5.3E-1			1.05		
Motor Weight	lb	47.8	47.6	48.1	74.0	73.6	74.0	138.8	138.3	139.3
	kg	21.69	21.58	21.80	33.59	33.39	33.56	62.96	62.75	63.17
Ambient Storage Temperature	°C	-55 to 150								
Poles	-	128								

(1) Housed version of motor mounted to 762 mm sq. x 12.7 mm (30 in. sq x 1.0 in.) aluminum plate in still air; maximum operating temperature (ambient + rise) is 130 °C

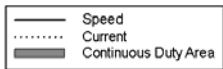
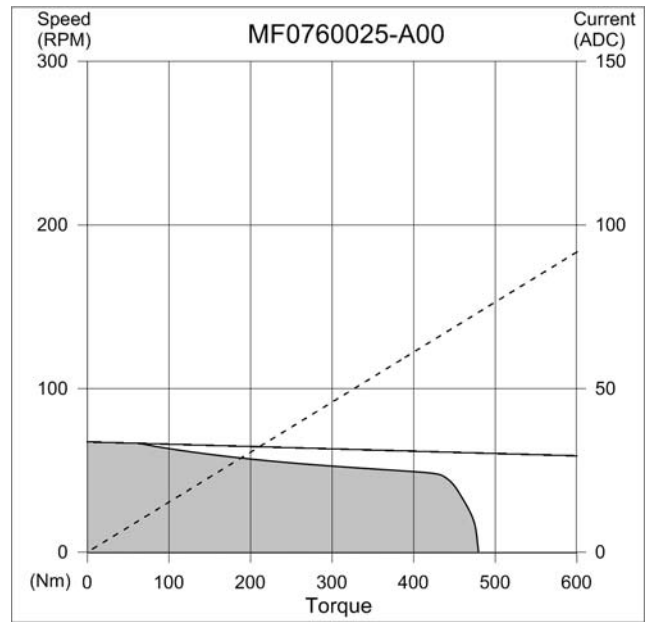
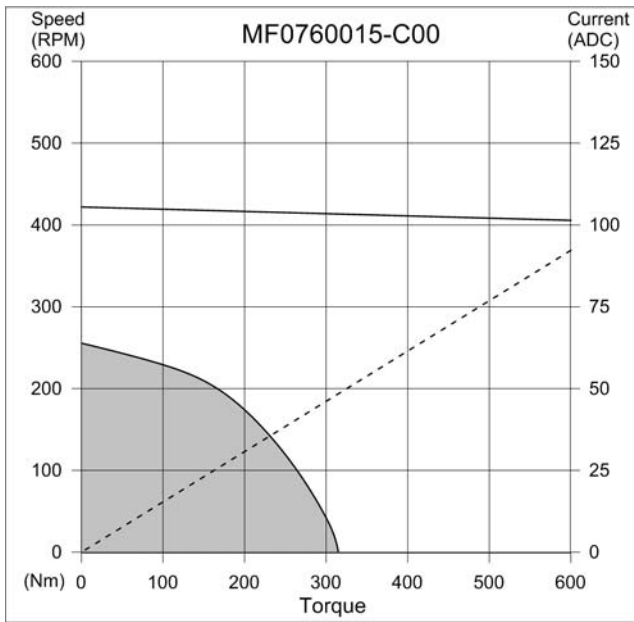
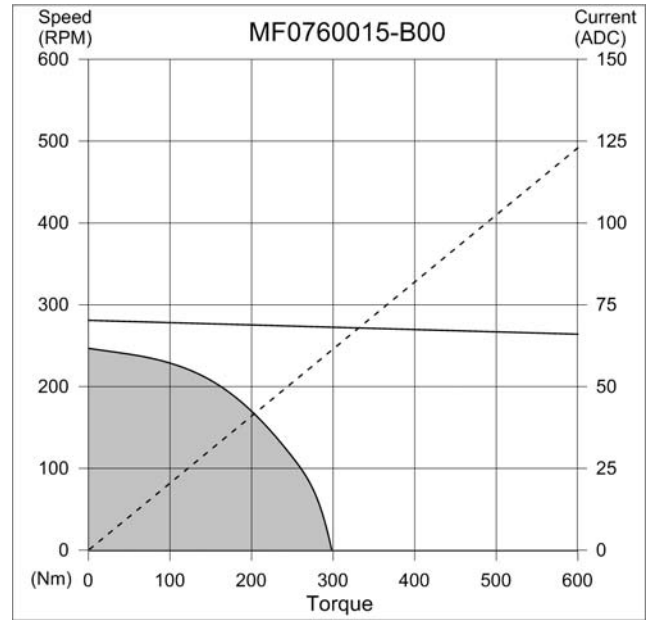
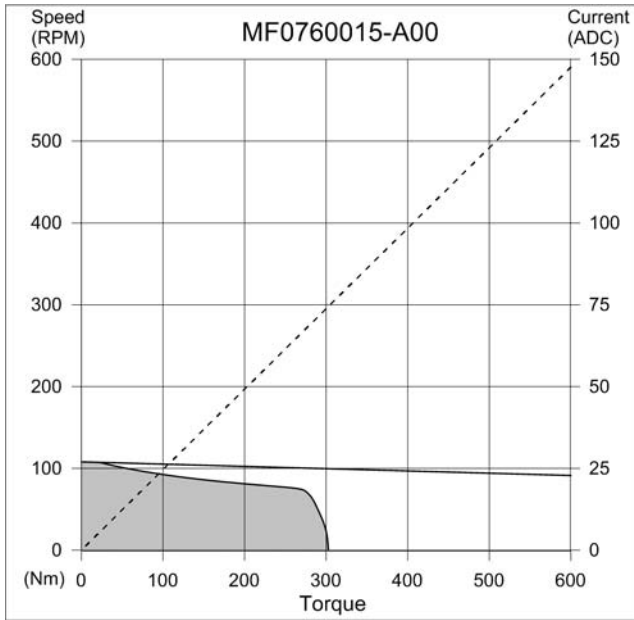
Model No.		MF0760075			MF0760100		
Winding Voltage	V	48	150	300	48	150	300
Stall Torque (continuous) ⁽¹⁾	lb-ft	1031	1022	1040	1371	1359	1383
	Nm	1398	1386	1410	1858	1842	1875
Peak Torque (±25%)	lb-ft	4980	8886	8886	5238	11738	11738
	Nm	6751	12048	12048	7102	15914	15915
Peak Current	A	348	517	388	276	515	386
No Load Speed	RPM	22.7	59.2	88.7	17.1	44.6	66.9
	rad/s	2.38	6.20	9.29	1.79	4.67	7.01
Cogging Torque (max.)	lb-ft	2.19			3.04		
	Nm	2.97			4.12		
Torque Constant (±10%)	lb-ft/A	14.32	17.18	22.91	18.99	22.79	30.38
	Nm/A	19.41	23.29	31.06	25.75	30.89	41.19
Voltage Constant (±10%)	V/kRPM	2033	2439	3252	2696	3235	4314
	V/rad/s	19.41	23.29	31.06	25.75	30.89	41.19
Motor Constant	lb-ft/√W	38.54	38.22	38.94	45.52	45.12	45.96
	Nm/√W	52.25	51.82	52.80	61.72	61.18	62.31
Elect. Time Constant	ms	21.99	21.64	22.46	23.07	22.67	23.51
Mech. Time Constant	ms	0.56	0.56	0.55	0.53	0.54	0.52
Terminal Resistance (±12%)	Ohm	0.138	0.202	0.346	0.174	0.255	0.437
Terminal Inductance (±30%)	mH	3.035	4.371	7.770	4.014	5.780	10.275
Thermal Resistance ⁽¹⁾	°C/W	0.094			0.074		
Motor Inertia	lb-ft-s ²	1.17			1.55		
	kg-m ²	1.58			2.11		
Motor Weight	lb	204.5	203.9	205.1	270	269	270
	kg	92.75	92.47	93.03	122.3	121.9	122.6
Ambient Storage Temperature	°C	-55 to 150					
Poles	-	128					

(1) Housed version of motor mounted to 762 mm sq. x 12.7 mm (30 in. sq x 1.0 in.) aluminum plate in still air; maximum operating temperature (ambient + rise) is 130 °C

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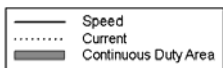
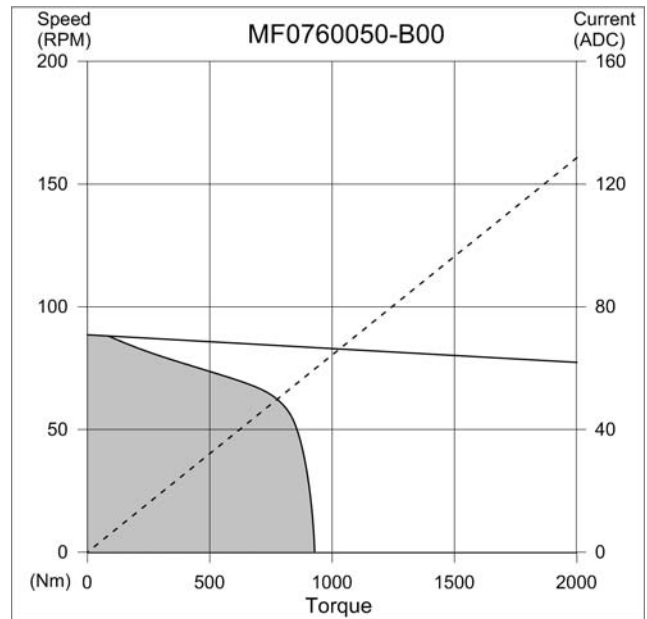
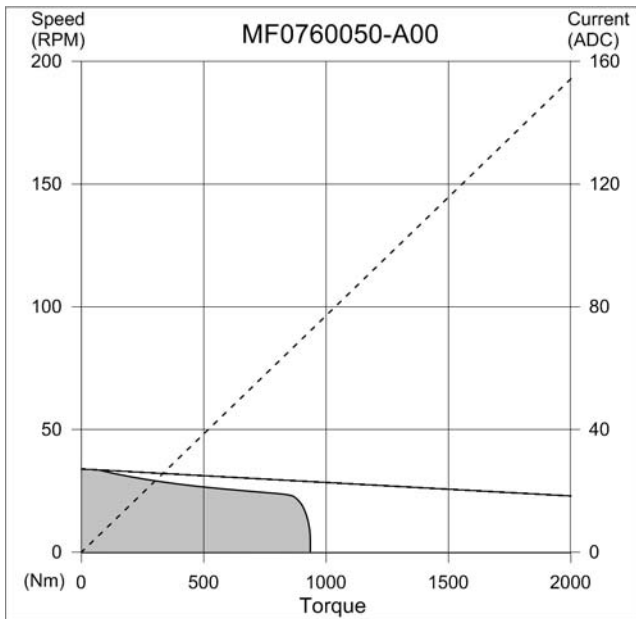
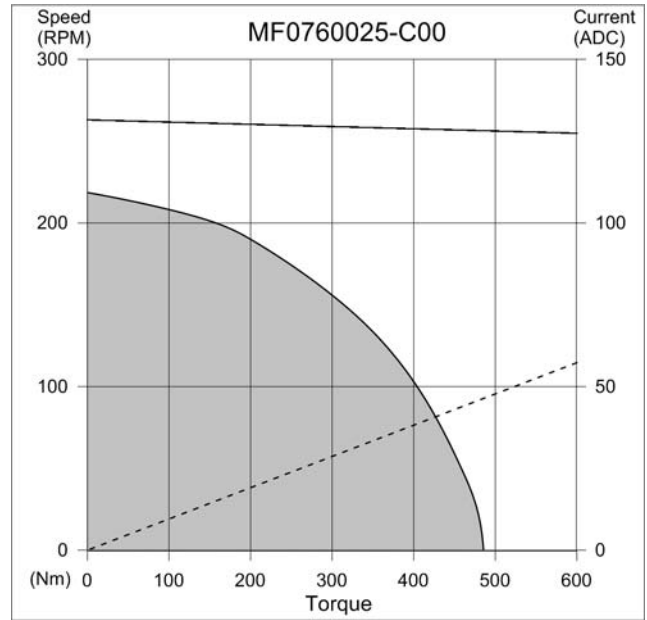
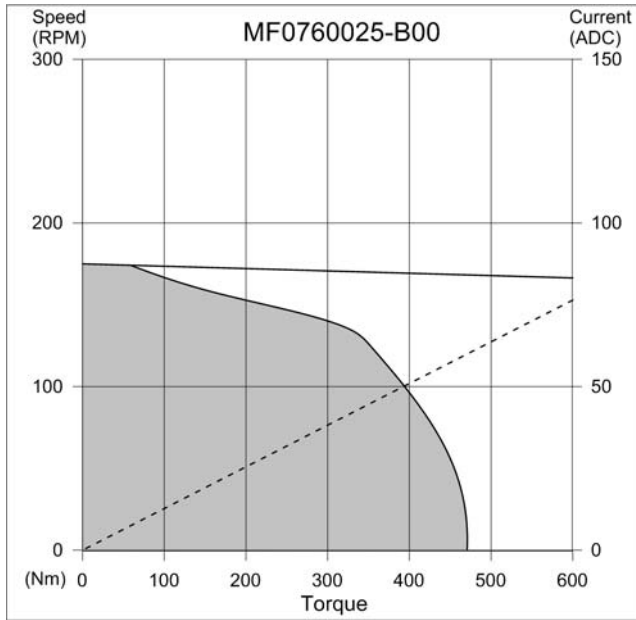
PERFORMANCE



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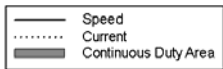
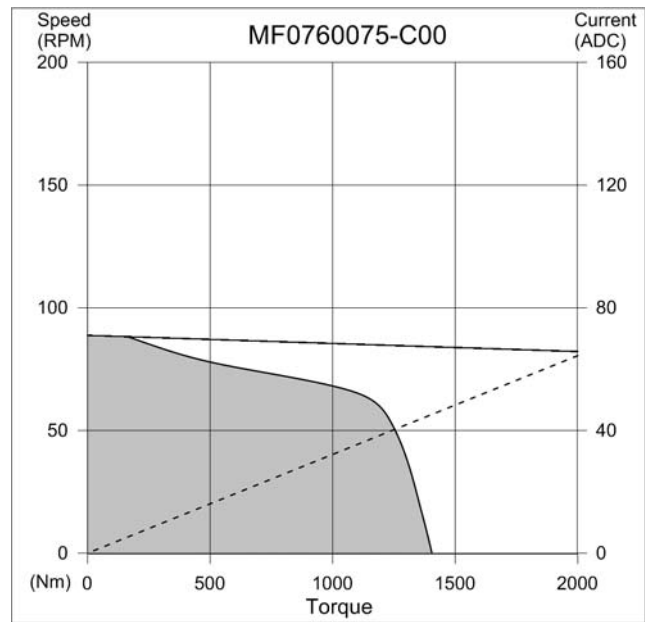
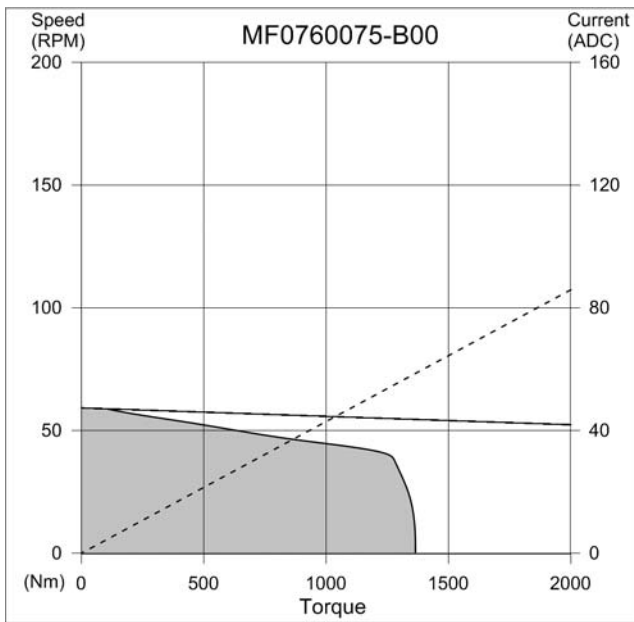
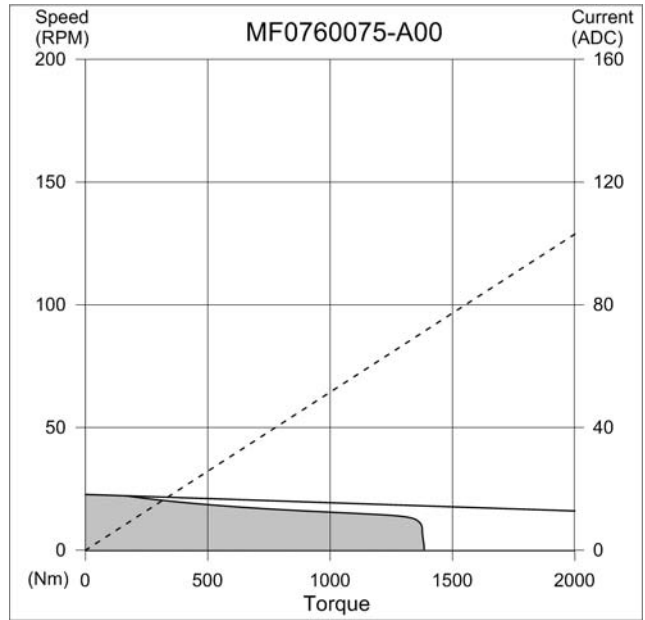
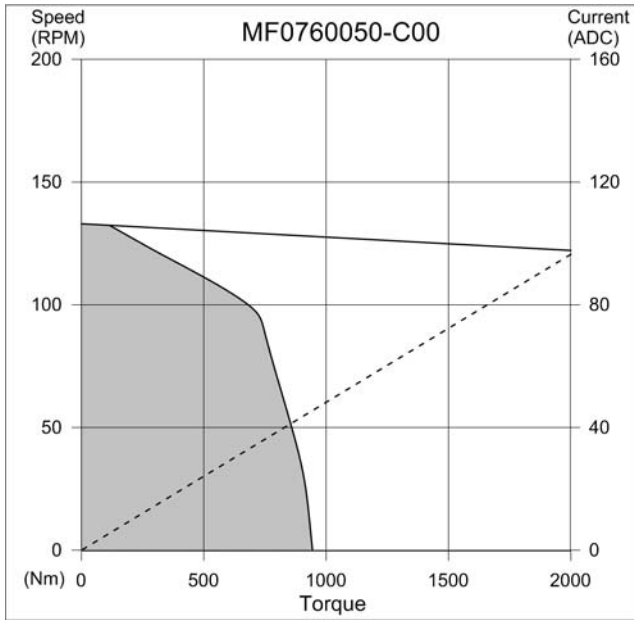
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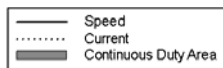
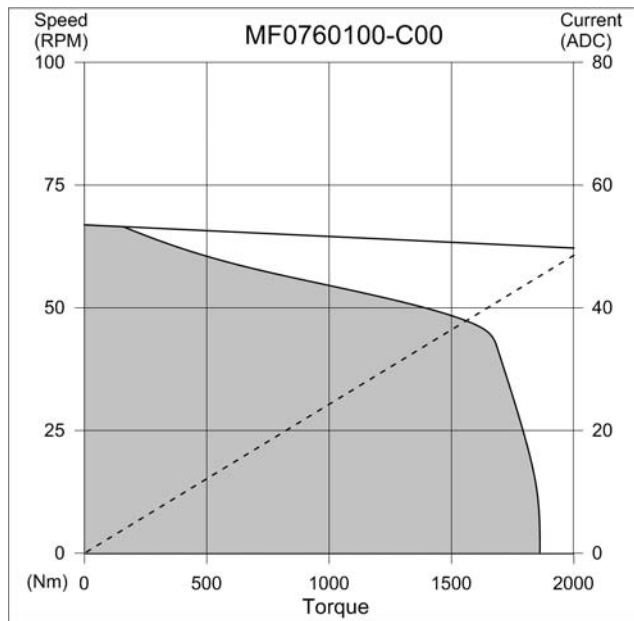
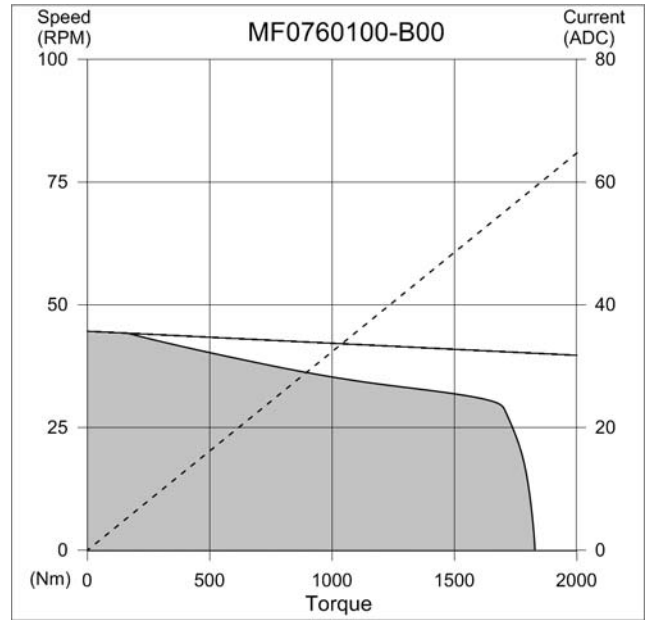
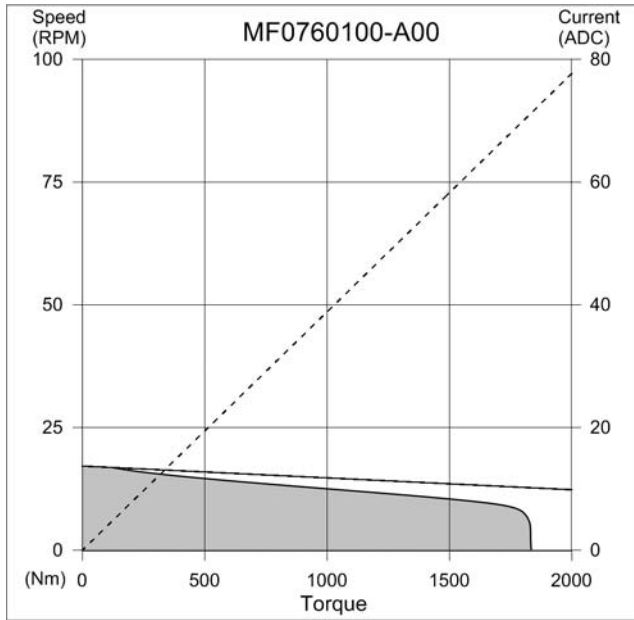
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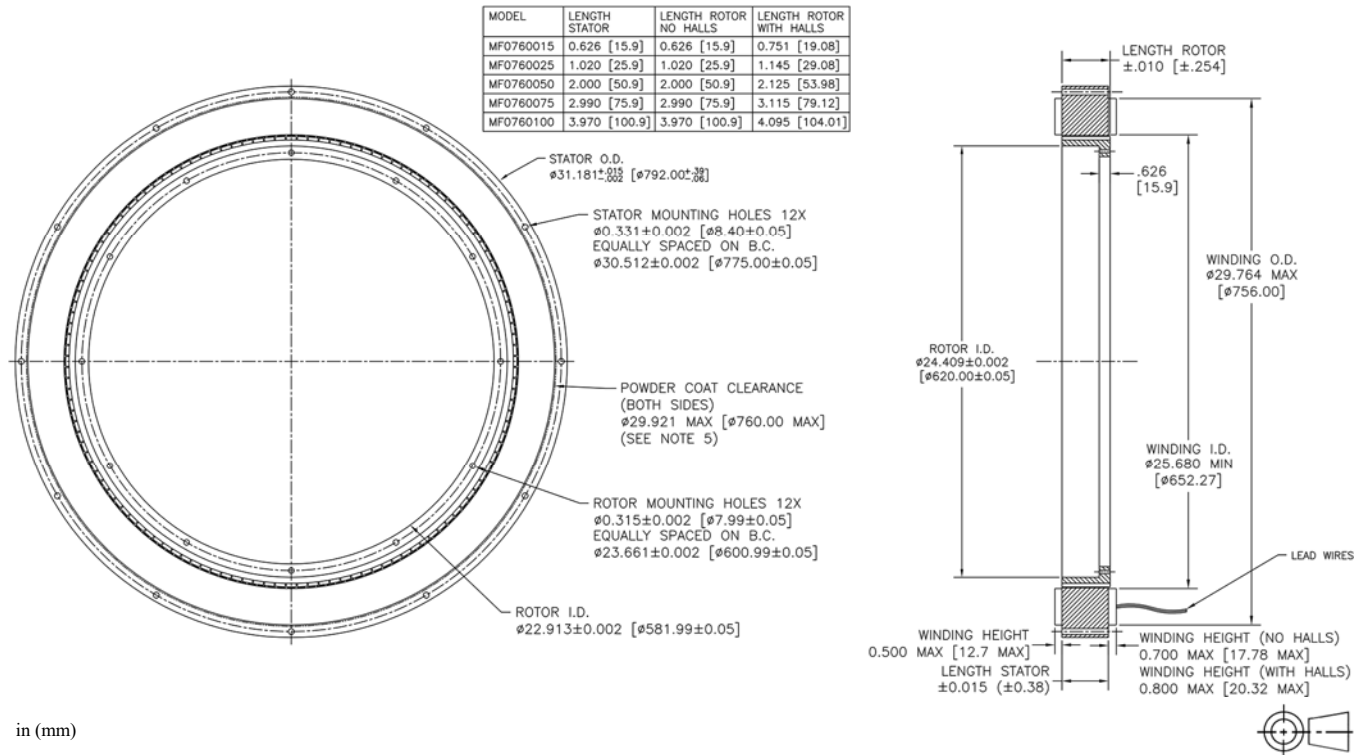
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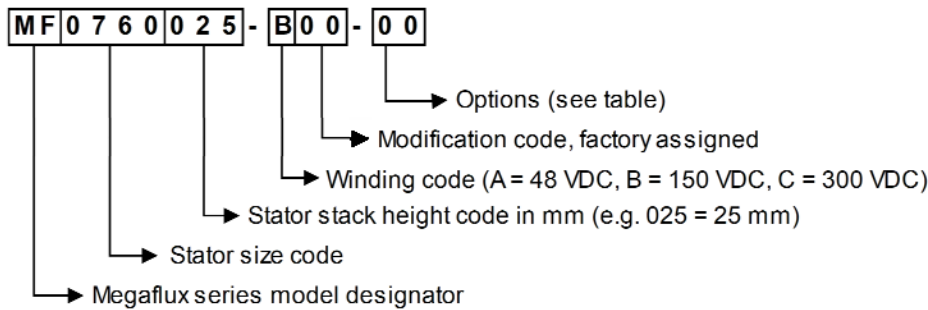
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DIMENSIONS



MODEL NUMBERING



Options
C = Customer-specified connector
Z = RoHS compliant