

Torque Motors

Megaflux Frameless Brushless Torque Motors—MF0610

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 MF0610 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

Torque Motors

MF0610 Series Frameless Brushless Torque Motors

SPECIFICATIONS (all data measured at 20 °C ambient)

Model No.		MF0610015			MF0610025			MF061050		
Winding Voltage	V	48	150	300	48	150	300	48	150	300
Stall Torque (continuous) ⁽¹⁾	lb-ft	127	131	131	216	217	216	411	412	411
	Nm	172	178	177	293	294	293	557	559	557
Peak Torque (±25%)	lb-ft	743	743	743	1214	1214	1214	2363	2374	2374
	Nm	1008	1008	1008	1646	1646	1646	3204	3218	3218
Peak Current	A	368	315	221	362	310	217	56	307	214
No Load Speed	RPM	159	425	595	96	259	363	49	130	183
	rad/s	16.7	44.5	62.3	10.1	27.1	38.0	5.1	13.6	19.2
Cogging Torque (max.)	lb-ft	0.40			0.70			1.31		
	Nm	0.54			0.95			1.78		
Torque Constant (±10%)	lb-ft/A	2.02	2.36	3.37	3.36	3.92	5.60	6.65	7.74	11.08
	Nm/A	2.74	3.20	4.57	4.55	5.31	7.59	9.01	10.50	15.02
Voltage Constant (±10%)	V/kRPM	287	335	478	477	556	795	944	1100	1573
	V/rad/s	2.74	3.20	4.57	4.55	5.31	7.59	9.01	10.50	15.02
Motor Constant	lb-ft/√W	7.76	7.80	7.77	11.37	11.45	11.38	18.09	18.15	18.09
	Nm/√W	10.52	10.57	10.53	15.42	15.53	15.42	24.53	24.61	24.53
Elect. Time Constant	ms	9.45	9.53	9.47	11.56	11.72	11.56	14.20	14.34	14.20
Mech. Time Constant	ms	1.62	1.60	1.62	1.21	1.21	1.22	0.96	0.94	0.97
Terminal Resistance (±12%)	Ohm	0.068	0.091	0.188	0.087	0.117	0.242	0.135	0.182	0.375
Terminal Inductance (±30%)	mH	0.641	0.872	1.780	1.007	1.371	2.797	1.917	2.610	5.326
Thermal Resistance ⁽¹⁾	°C/W	0.230			0.185			0.130		
Motor Inertia	lb-ft-s ²	1.4E-1			2.2E-1			4.5E-1		
	kg-m ²	1.9E-1			3.0E-1			6.0E-1		
Motor Weight	lb	34.0	34.1	34.0	52.6	52.8	52.6	99.7	98.9	99.7
	kg	15.4	15.48	15.43	23.88	23.93	23.88	45.23	44.85	45.23
Ambient Storage Temperature	°C	-55 to 150								
Poles	-	96								

(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

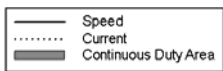
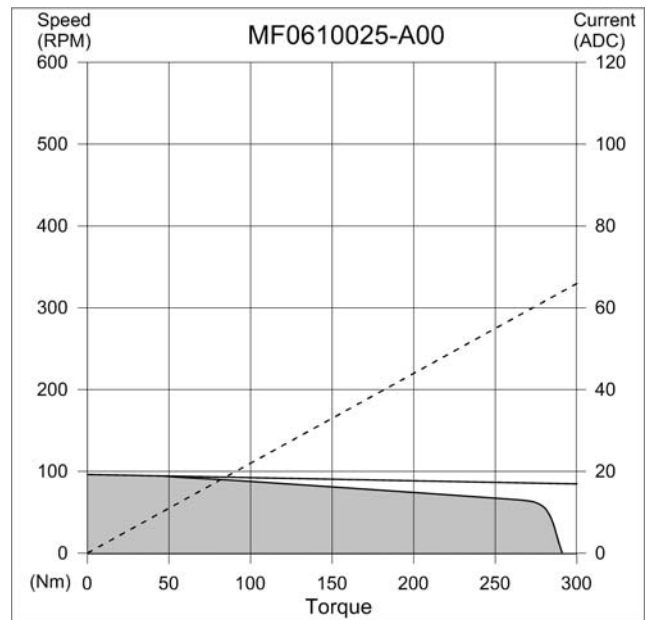
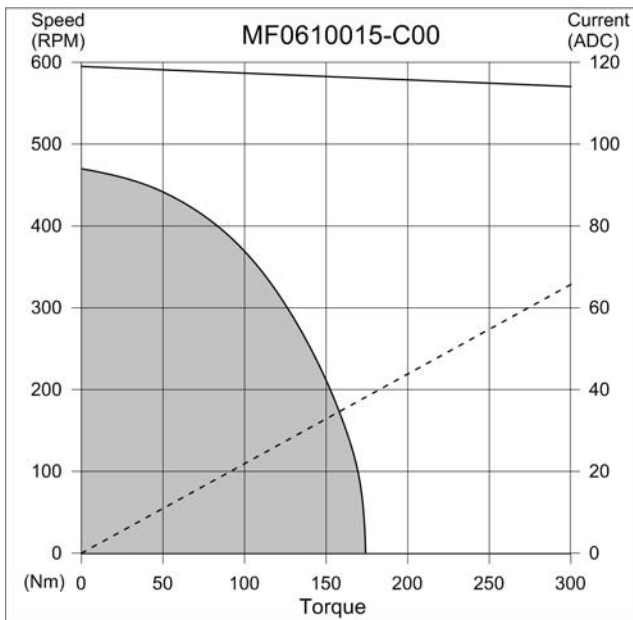
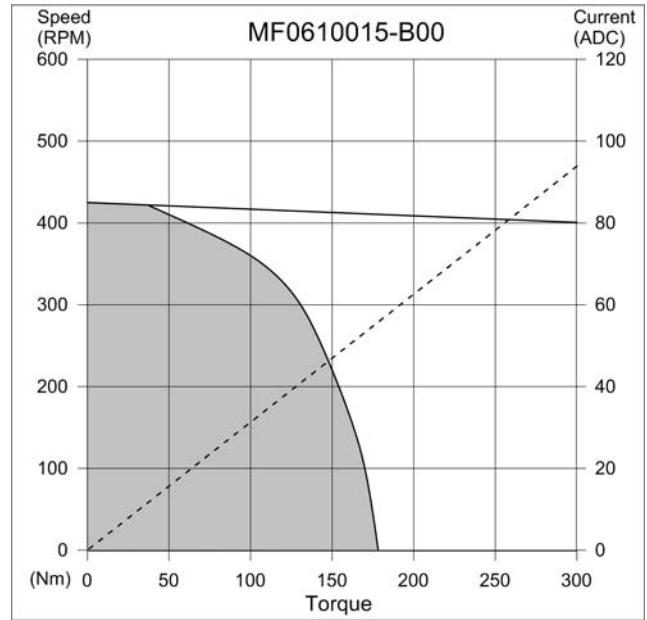
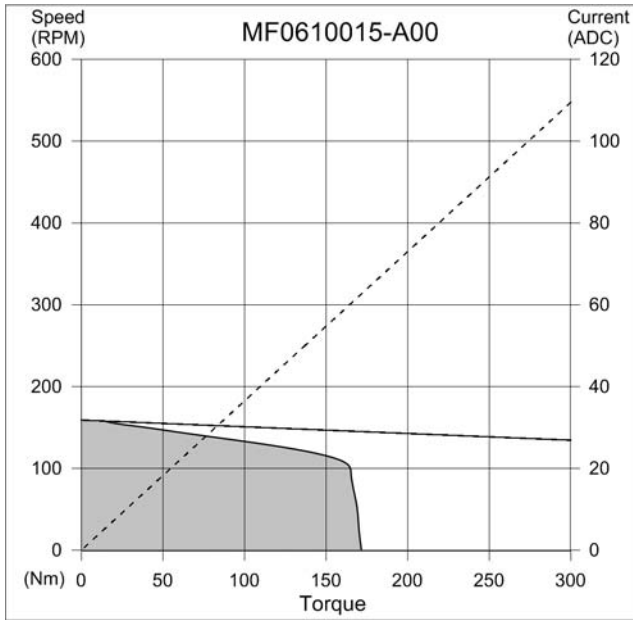
Model No.		MF0610075			MF0610100		
Winding Voltage	V	48	150	300	48	150	300
Stall Torque (continuous) ⁽¹⁾	lb-ft	591	594	591	758	762	758
	Nm	802	805	802	1028	1034	1028
Peak Torque (±25%)	lb-ft	2573	3548	3548	2661	4712	4712
	Nm	3488	4810	4810	3608	6389	6389
Peak Current	A	262	311	217	208	315	221
No Load Speed	RPM	33	88	123	25	67	93
	rad/s	3.5	9.3	12.9	2.6	7.0	9.8
Cogging Torque (max.)	lb-ft	1.85			2.63		
	Nm	2.51			3.56		
Torque Constant (±10%)	lb-ft/A	9.81	11.42	16.35	12.81	14.94	21.34
	Nm/A	13.30	15.49	22.16	17.36	20.25	28.93
Voltage Constant (±10%)	V/kRPM	13.93	1622	2321	1818	2121	3030
	V/rad/s	13.30	15.49	22.16	17.36	20.25	28.93
Motor Constant	lb-ft/√W	22.93	22.98	22.91	26.64	26.79	26.63
	Nm/√W	31.09	31.16	31.06	36.12	36.32	36.11
Elect. Time Constant	ms	15.50	15.64	15.48	16.23	16.40	16.21
Mech. Time Constant	ms	0.90	0.88	0.90	0.87	0.87	0.87
Terminal Resistance (±12%)	Ohm	0.183	0.247	0.509	0.231	0.311	0.642
Terminal Inductance (±30%)	mH	2.837	3.862	7.881	3.748	5.101	10.410
Thermal Resistance ⁽¹⁾	°C/W	0.100			0.080		
Motor Inertia	lb-ft-s ²	6.7E-1			8.9E-1		
	kg-m ²	9.1E-1			1.21		
Motor Weight	lb	147	146	147	194	195	194
	kg	66.76	66.16	66.76	88.11	88.24	88.11
Ambient Storage Temperature	°C	-55 to 150					
Poles	-	96					

(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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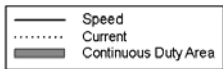
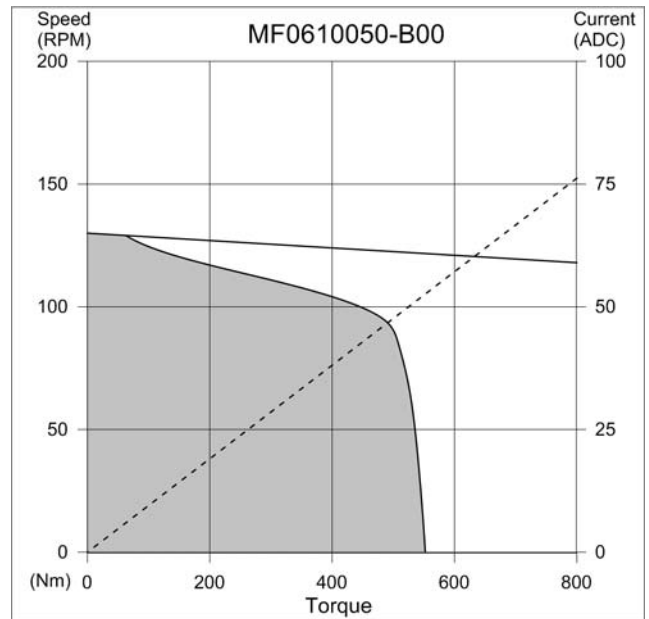
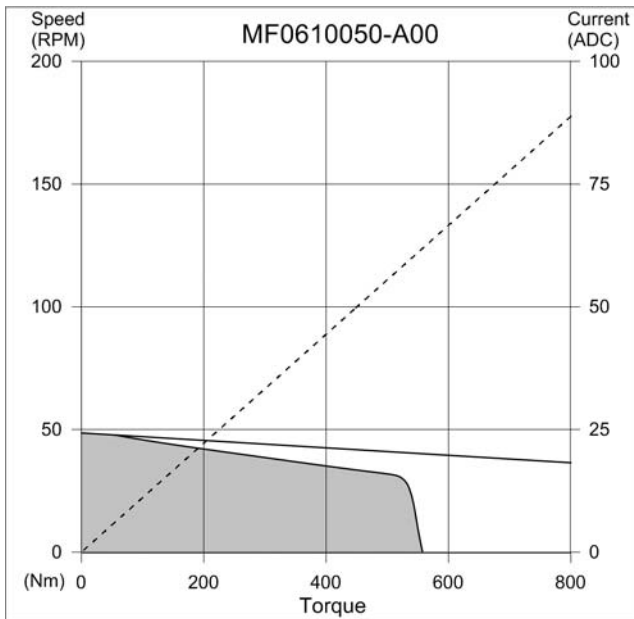
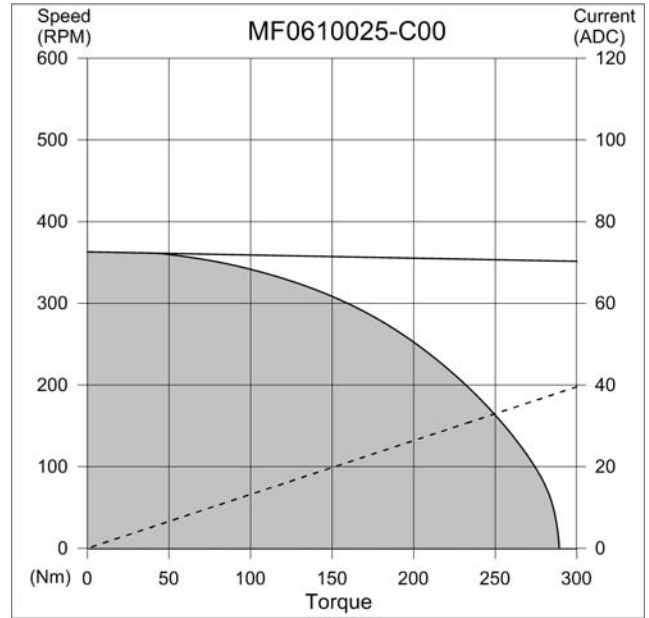
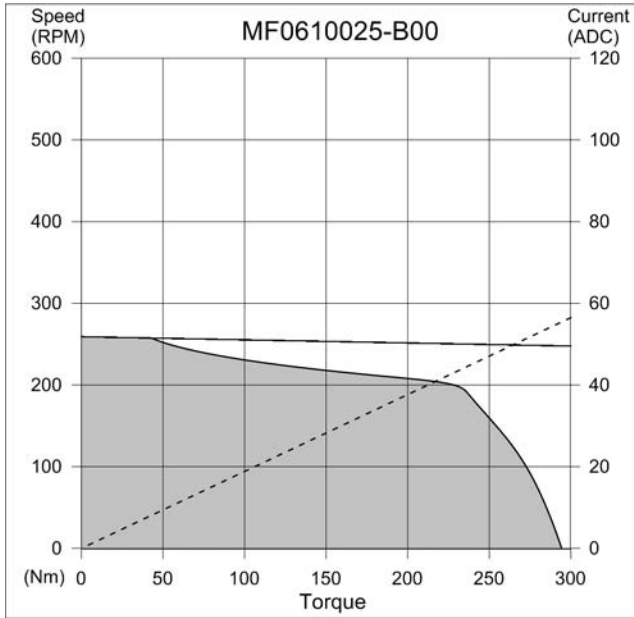
PERFORMANCE



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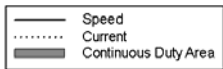
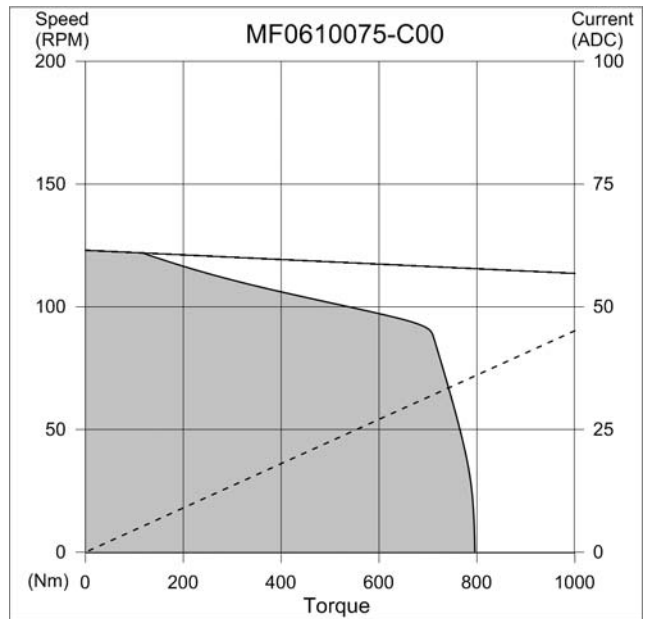
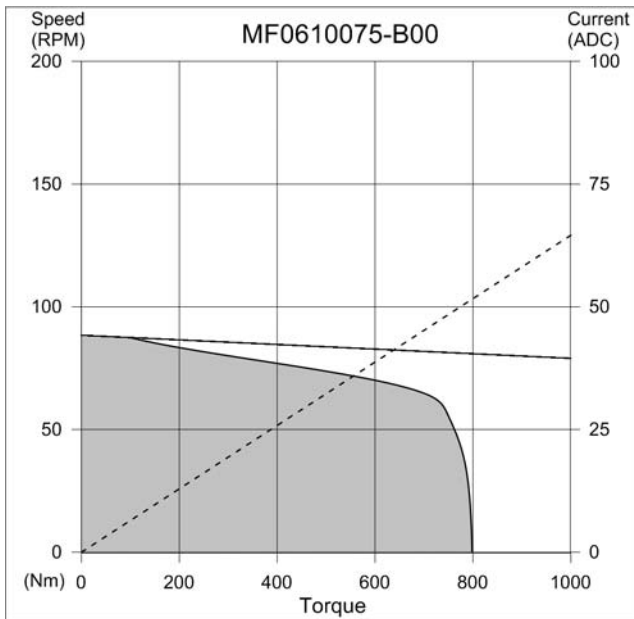
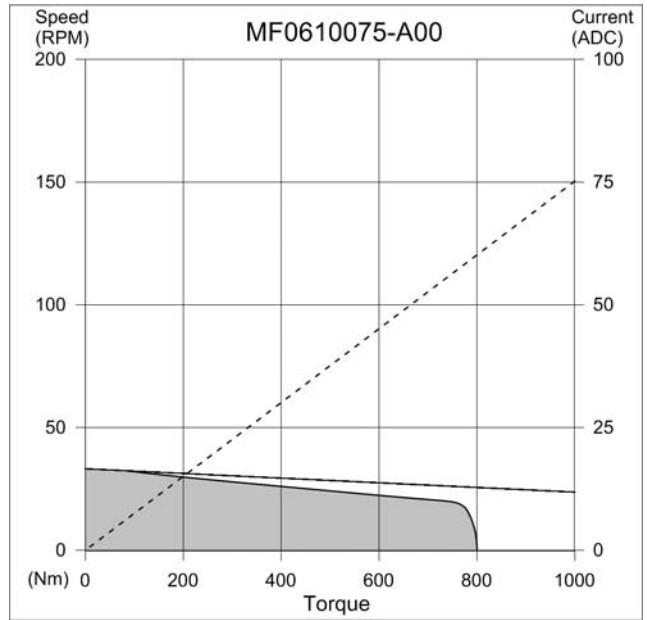
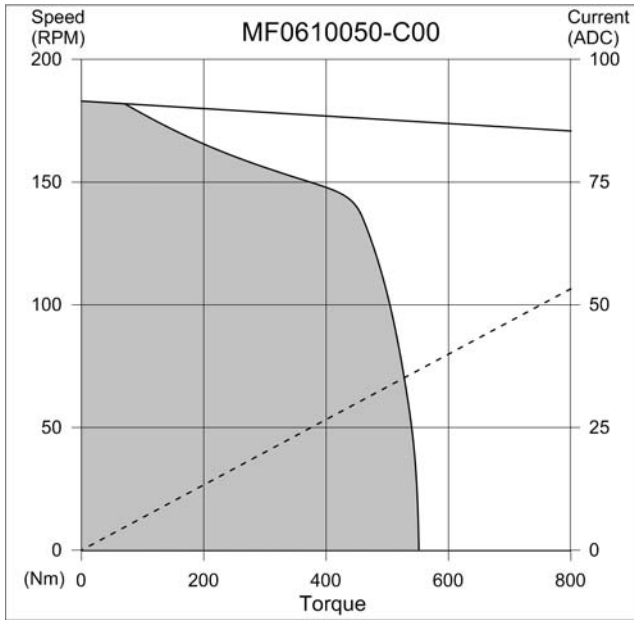
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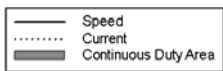
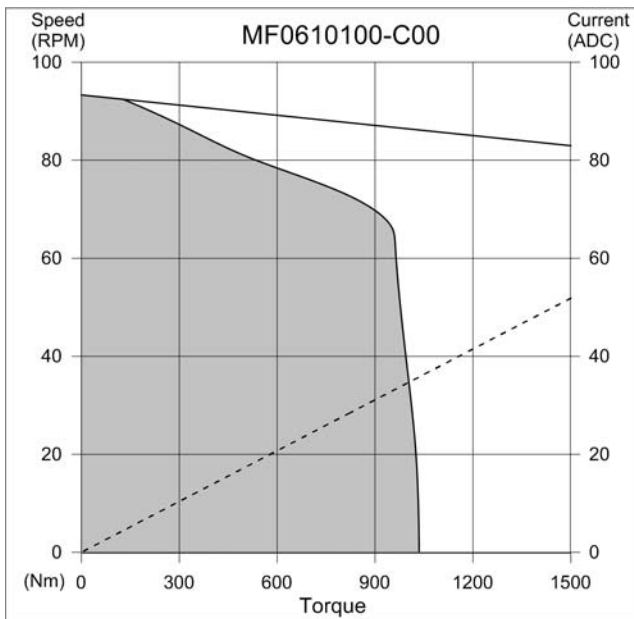
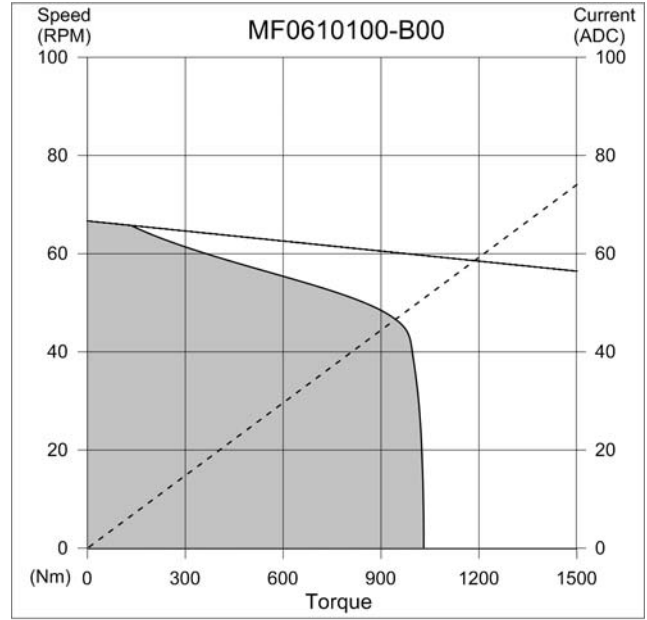
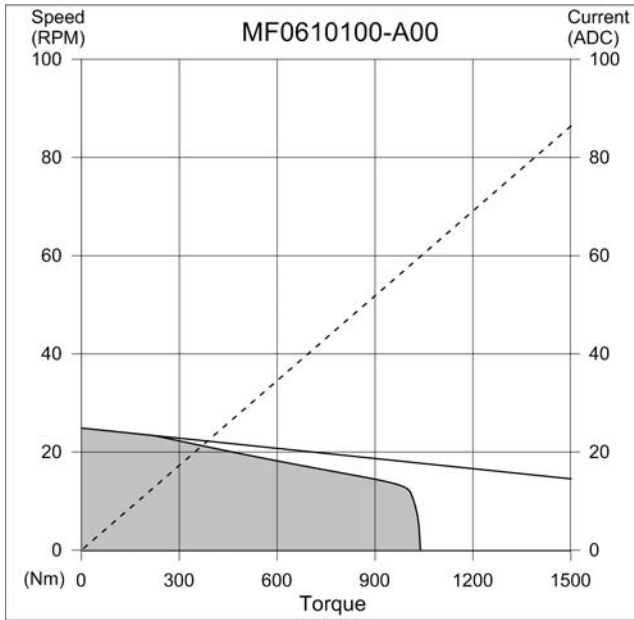
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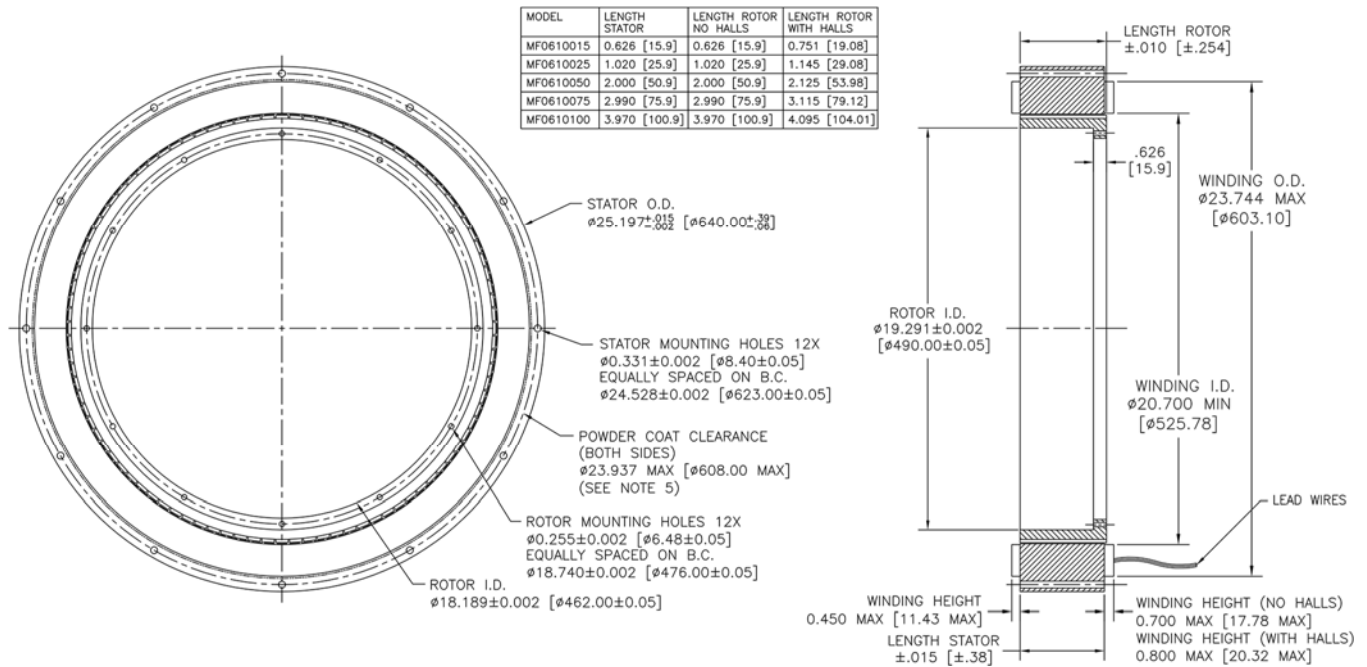
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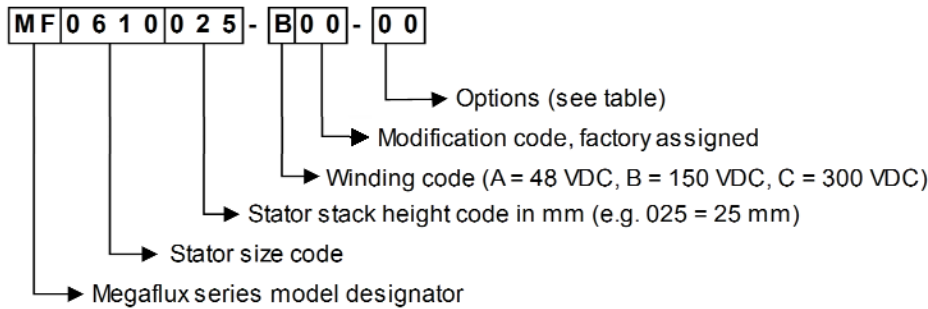
DIMENSIONS



in (mm)



MODEL NUMBERING



Options	
C	Customer-specified connector
Z	RoHS compliant