Megaflux Series

Thin Ring Torque Motors

Engineering Guide

Brushless Torque Motors
150mm to 760mm diameter
(6 inches to 30 inches)

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146 USA
Tel 918 627 1845
Tel 800 221 7572
Fax 918 660 0207
web www.emoteq.com

Megaflux Series
Thin Ring Torque Motors

Selection Guide

Megaflux Quick Selection Guide

Model Number	Continuous Stall Torque ft.lb.	Nm	Frameless Motor Diameter in	mm	Length in	mm
MF0150010	2	3	6.69	170	1.14	28.9
MF0150025	6	9	"	"	1.77	44.9
MF0150050	11	15	"	"	2.75	69.9
MF0150075	15	21	"	"	3.74	94.9
MF0150100	20	27	"	"	4.72	120
MF0210010	6	8	9.05	230	1.14	28.9
MF0210025	16	21	"	"	1.77	44.9
MF0210050	30	41	"	"	2.75	69.9
MF0210075	48	65	"	"	3.74	94.9
MF0210100	61	83	"	"	4.72	120
MF0255010	8	12	10.82	275	1.14	28.9
MF0255025	22	31	"	"	1.77	44.9
MF0255050	44	60	"	"	2.75	69.9
MF0255075	65	89	"	"	3.74	94.9
MF0255100	86	116	"	"	4.72	120
MF0310010	15	20	12.99	330	1.24	31.5
MF0310025	36	49	"	"	1.87	47.5
MF0310050	74	100	"	"	2.85	72.5
MF0310075	110	150	"	"	3.84	97.5
MF0310100	148	201	"	"	4.82	123
MF0410015	56	76	16.92	430	1.48	37.5
MF0410025	95	129	"	"	1.87	47.5
MF0410050	165	224	"	"	2.85	72.5
MF0410075	238	323	"	"	3.84	97.5
MF0410100	324	440	"	"	4.82	123
MF0510015	89	121	21.06	535	1.48	37.5
MF0510025	144	196	"	"	1.87	47.5
MF0510050	277	376	"	"	2.85	72.5
MF0510075	430	583	"	"	3.84	97.5
MF0510100	542	735	"	"	4.82	123
MF0610015	146	198	25.19	640	1.48	37.5
MF0610025	236	318	"	"	1.87	47.5
MF0610050	443	601	"	"	2.85	72.5
MF0610075	649	880	"	"	3.84	97.5
MF0610100	859	1164	"	"	4.82	123
MF0760015	244	331	31.18	792	1.48	37.5
MF0760025	393	533	"	"	1.87	47.5
MF0760050	755	1024	"	"	2.85	72.5
MF0760075	1121	1520	"	"	3.84	97.5
MF0760100	1490	2020	"	"	4.82	123

Note: Numbers are rounded for data presentation.

Megaflux Series Model Numbering

MF 210 010-B 00

- MF — Megaflux Series Brushless Motor
- 210 — Nominal Frame Size in mm
- 010 — Frame Stack Length Size in mm
- B — Winding Designation
- 00 — Design Modifications, 00 is standard

The model numbers refer to the magnetic OD of the motor in mm which is the OD before the provision for the ring of steel providing the mounting surface of the stator.

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series
Thin Ring Torque Motors

Product Description

Megaflux Brushless Torque Motors

Using over a decade's worth of brushless motor design experience, Emoteq has created the Megaflux Series of thin ring torque motors resulting in a high performance, attractively priced solution for driving large inertia or high torque load systems.

Megaflux motors have been engineered to provide very high output torques while moderating the parasitic condition of cogging torque. Cogging torque is created by the attraction of the permanent magnet rotor poles to the steel stator poles and creates a fluctuating drag torque that is undesirable in precision closed loop control systems.

The mechanical form factor of Megaflux motors, a thin annular ring with a large diameter to length ratio, allows the motor to be wrapped around a driven shaft. The direct connection of the motor to the load effectively eliminates problems of torsional resonances due to couplings and the backlash associated with gear driven systems. Direct integration also results in minimal mechanical size.

A series of through holes have been incorporated into the Megaflux stator design to provide a rugged, simple, and low cost method of mounting the stator. Using the load's bearing system, the need for separate end-caps has been removed. Similarly, the rotor features a series of holes to allow mounting directly to the load shaft.

Megaflux motors can be supplied with or without Hall effect sensors for commutation. Although the motors can be driven with six step commutation drives, for optimum performance, sinusoidal commutation is recommended.

This guide is intended to show the capabilities of the Megaflux Series. However, changes can be easily made to the mechanical and electrical characteristics to suit specific application requirements. We are also structured to engineer and build completely custom motor solutions.

An enthusiastic team focused on manufacturing high quality motors, produces the Megaflux motors in Emoteq's Tulsa, Oklahoma, USA facility.

Applications include:

Semiconductor manufacturing	Robot bases and joints
Laser scanning & printing	Machine tool axis drives
Coordinate measuring systems	Stabilized gun platforms

Rotary air-bearing table driven by an MF0210010 motor with integrated 150mm diameter, 0.5 micron resolution encoder.

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Size Constants

These parameters are dependent upon the size and shape of the motor but are largely independent of the winding used. However, special designs incorporating different lamination and magnet materials as well as design modifications such as increased magnetic air gaps can change these parameters. In such instances, a specific set of design data will be provided.

Maximum Continuous Stall Torque (T_C) is the amount of torque produced at low to zero speed which results in a 110°C rise in temperature. Based upon 20°C ambient temperatures, the resulting winding temperature is 130°C.

Maximum Rated Torque (T_R) is the amount of torque that the motor can produce without danger of demagnetizing the rotor. This torque is only available for short durations. Also, it may not be possible to produce the Maximum Rated Torque because of limitations of voltage and current (see Peak Torque).

Motor Constant (K_M) is the ratio of the peak torque to the square root of the input power at stall with 20°C ambient temperature. This ratio is useful during the initial selection of a motor because it indicates the ability of the motor to convert electrical power into torque.

$K_M = T_P$ (Peak Torque)/$\sqrt{P_P}$ (Peak Input Power)
or
$K_M = K_T$ (Torque Constant)/$\sqrt{R_M}$ (Terminal Resistance)

Electrical Time Constant (t_E) is the ratio of inductance L_M in Henries, to the resistance R_M in Ohms. This is the inductance and resistance as measured across any two phases in a delta or wye configuration.

$T_E = L_M/R_M$

Mechanical Time Constant (t_M) is the time required to reach 63.2% of the motors maximum speed after the application of constant DC voltage through the commutation electronics, ignoring friction, windage, and core losses.

$T_M = J_M * R_M / K_T * K_B$

Thermal Resistance (TPR) correlates winding temperature rise to the average power dissipated in the stator winding. The published TPR assumes that the motor is mounted to an aluminum heatsink of specific dimensions. Additional cooling from forced air, water jacketing, or increased heatsinking decreases the motor Thermal Resistance allowing higher power outputs than the published data.

Viscous Damping (F_0) gives an indication of the torque lost due to B.E.M.F. in the motor when the source impedance is zero. F_0 value can be represented as $F_0 = K_T * K_B / R_M$

Maximum Cogging Torque (T_F) is principally the static friction torque felt as the motor is rotated at low speed due to the attraction of the magnets to the steel stator teeth. The published value does not include the bearing friction of a housed motor.

Mechanical Data

Rotor inertia (J_M) is the moment of inertia of the rotor about its axis of rotation.

Motor Weight (W_M) is the weight of the standard motor.

Number of Poles (N_P) is the number of permanent magnet poles of the rotor. This is the actual number of magnets and not pole pairs.

Winding Constants

The winding constants are the parameters that vary with the number of wire turns per coil and the wire size. These parameters are collected under an alphabetical winding designation. A single frame size and length of motor will have several different windings. Special windings receive new designations in the sequence by which they are designed and released to production.

Design Voltage (V_P) is the nominal voltage required to produce the peak torque when the rotor speed is zero and the winding temperature is 20°C. As such, V_P is the product of I_P and R_M. At any temperature greater than 20°C, the required voltage to produce peak torque increases due to the increase in winding resistance. The design voltage is <u>not</u> a limit but a reference point for the data.

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Peak Torque (T_P) is the nominal value of developed torque with the rated current I_P applied to the windings. For each winding specified, the product of peak current (I_P) and nominal torque sensitivity (K_T) gives T_P unless the maximum rated torque (T_R) is reached.

Peak Current (I_P) is the rated current used to obtain the nominal peak torque from the motor with nominal torque sensitivity (K_T). I_P is generally the design voltage divided by the terminal resistance (R_M).

Torque Sensitivity (K_T) is the ratio of the developed torque to the applied current for a specific winding. K_T is related to the BEMF Constant K_B.

No Load Speed (S_{NL}) is the theoretical no load speed of the motor with the design voltage applied.

BEMF Constant (K_B) is the ratio of terminal to terminal voltage generated in the winding to the speed of the rotor. K_B is proportional to K_T.

Terminal Resistance (R_M) is the winding resistance measured between any two leads of the winding in either a delta or wye configuration at 25°C.

Terminal Inductance (L_M) is the winding inductance measured between any two leads of the winding in either delta or wye configuration at 25°C.

Configuration Drawings

The drawings reflect the standard configurations for the frameless motors. Options include integrated Hall effects, encoders and special mechanical modifications such as rotor ID's and extensions, and cabling requirements.

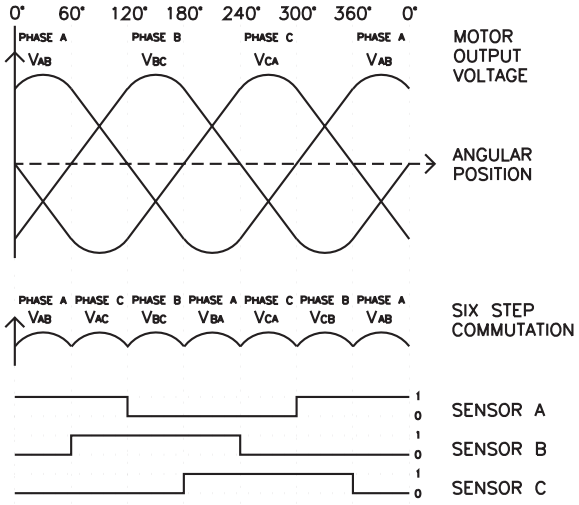
Standard Megaflux motors DO NOT include Hall effect sensors for commutation feedback. However, when installed, the rotor magnets are extended to provide a trigger for the Hall effects. The natural tendency is for the rotor to center axially which can create considerable axial loading and create difficulty when installing. Megaflux motors can be supplied with oversized rotors that naturally center while still providing an extension for Hall effect actuation.

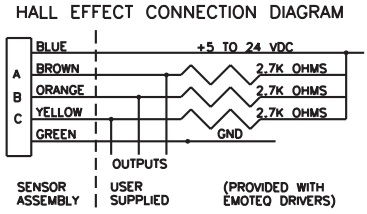
A separate handling and installation guide is available.

Motor Connections and Commutation Logic

MOTOR EXCITATION SEQUENCE AND SENSOR OUTPUT LOGIC FOR CW ROTATION VIEWING LEADWIRE END.

	EXCITATION STEP	1	2	3	4	5	6	1
MOTOR LEADS	(RED) A	+	+		−	−		+
	(WHT) B	−		+	+		−	−
	(BLK) C		−	−		+	+	
SENSOR OUTPUTS	(BRN) A	1	1	0	0	0	1	1
	(ORG) B	0	1	1	1	0	0	0
	(YEL) C	0	0	0	1	1	1	0

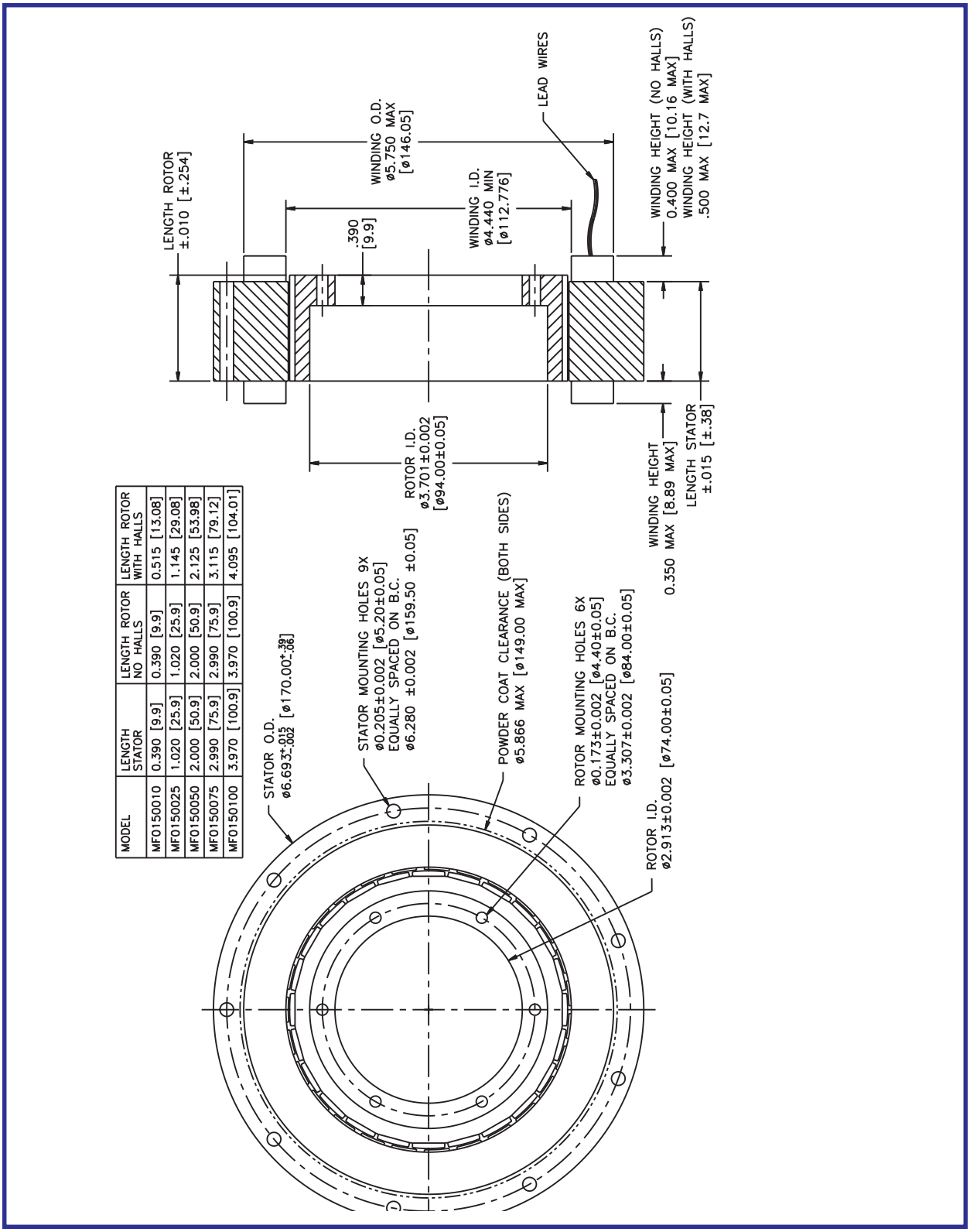




Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0150

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0150010	0.390 [9.9]	0.390 [9.9]	0.515 [13.08]
MF0150025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0150050	2.000 [50.9]	2.000 [50.9]	2.125 [53.98]
MF0150075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0150100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0150

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0150010			MF0150025			MF0150050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.	2.5			6.7			11.2		
		Nm	3.5			9.1			15.3		
Max Rated Torque, ±25%	T_R	lb.ft.	14.3			37.5			86.8		
		Nm	19.4			50.9			117.7		
Motor Constant,	K_M	lb.ft./√W	0.33			0.73			1.07		
		Nm/√W	0.44			0.99			1.46		
Electrical Time Constant	T_E	msec	2.13			3.50			3.56		
Mechanical Time Constant	T_M	msec	5.05			2.75			2.54		
Thermal Resistance	TPR	°C/Watt	1.25			0.85			0.70		
Viscous Damping	F_i	lb.ft./rpm	4.97E-5			1.4E-4			2.8E-4		
		Nm/rpm	6.73E-5			1.9E-4			3.8E-4		
Max Cogging Torque	T_F	lb.ft.	0.18			0.46			0.88		
		Nm	0.24			0.62			1.18		
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²	7.51E-4			2.0E-3			4.0E-3		
		Kg.m²	1.01E-3			2.7E-3			5.4E-3		
Frameless Motor Weight	Wt	lb.	2.47			6.02			11.77		
		Kg	1.12			2.73			5.34		
Number of Poles	N_P	-	24			24			24		
Winding Constants			**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	14.3	14.3	14.3	37.5	37.5	37.5	86.8	86.8	86.8
		Nm	19.4	19.4	19.4	50.9	50.9	50.9	117.7	117.2	117.7
Peak Current	I_P	Amperes	56.7	27.7	17.7	130.5	65.2	48.7	163.8	131.0	81.9
Torque Constant, ±10%	K_T	lb.ft./A	0.253	0.519	0.808	0.288	0.575	0.767	0.530	0.662	1.060
		Nm/A	0.343	0.703	1.096	0.390	0.780	1.040	0.718	0.898	1.437
No Load Speed	S_{NL}	RPM	1293	1973	2533	1136	1775	2663	617	1544	1930
		Rad/s	135.4	206.7	265.3	119.0	185.9	278.9	64.6	161.7	202.1
BEMF Constant, ±10%	K_B	V/KRPM	35.96	73.63	114.70	40.8	81.67	108.90	75.23	94.04	150.46
		V/rad/s	0.343	0.703	1.096	0.390	0.780	1.040	0.718	0.898	1.437
Terminal Resistance, ±12%	R_M	Ohms	0.584	2.52	5.93	0.154	0.615	1.084	0.242	0.360	0.988
Terminal Inductance, ±30%	L_M	mH	1.250	5.24	12.71	0.54	2.15	3.83	0.861	1.346	3.445

Parameter	Symbol	Unit	MF0150075			MF0150100			
Motor Constants									
Max Cont. Stall Torque	T_C	lb.ft.	15.7			20.3			
		Nm	21.3			27.6			
Max Rated Torque, ±25%	T_R	lb.ft.	129.9			172.6			
		Nm	176.2			234.1			
Motor Constant,	K_M	lb.ft./√W	1.38			1.64			
		Nm/√W	1.88			2.23			
Electrical Time Constant	T_E	msec	3.89			4.08			
Mechanical Time Constant	T_M	msec	2.29			2.17			
Thermal Resistance	TPR	°C/Watt	0.60			0.50			
Viscous Damping	F_i	lb.ft./rpm	4.3E-4			6.0E-4			
		Nm/rpm	5.9E-e			8.2E-4			
Max Cogging Torque	T_F	lb.ft.	1.20			1.79			
		Nm	1.62			2.41			
Mechanical Constants									
Frameless Motor Inertia	J_M	lb.ft.s²	6.0E-3			7.9E-3			
		Kg.m²	8.1E-3			0.011			
Frameless Motor Weight	Wt	lb.	17.49			23.15			
		Kg	7.93			10.50			
Number of Poles	N_P	-	24			24			
Winding Constants			**A**	**B**	**C**	**A**	**B**	**C**	
Design Voltage	V_P	Volts	48	150	300	48	150	300	
Peak Torque	T_P	lb.ft.	129.9	129.9	129.9	164.1	172.6	172.8	
		Nm	176.2	176.2	176.2	222.5	234.1	234.1	
Peak Current	I_P	Amperes	218.1	145.4	109.0	207.2	145.3	109	
Torque Constant, ±10%	K_T	lb.ft./A	0.596	0.894	1.191	0.792	1.188	1.584	
		Nm/A	0.808	1.212	1.615	1.074	1.611	2.148	
No Load Speed	S_{NL}	RPM	549	1144	1716	413	860	1291	
		Rad/s	57.53	119.8	179.8	43.27	90.14	135.22	
BEMF Constant, ±10%	K_B	V/KRPM	84.58	126.87	169.16	112.46	168.69	224.92	
		V/rad/s	0.808	1.212	1.615	1.074	1.611	2.148	
Terminal Resistance, ±12%	R_M	Ohms	0.184	0.414	0.736	0.232	0.521	0.926	
Terminal Inductance, ±30%	L_M	mH	0.716	1.612	2.865	0.946	2.128	3.783	

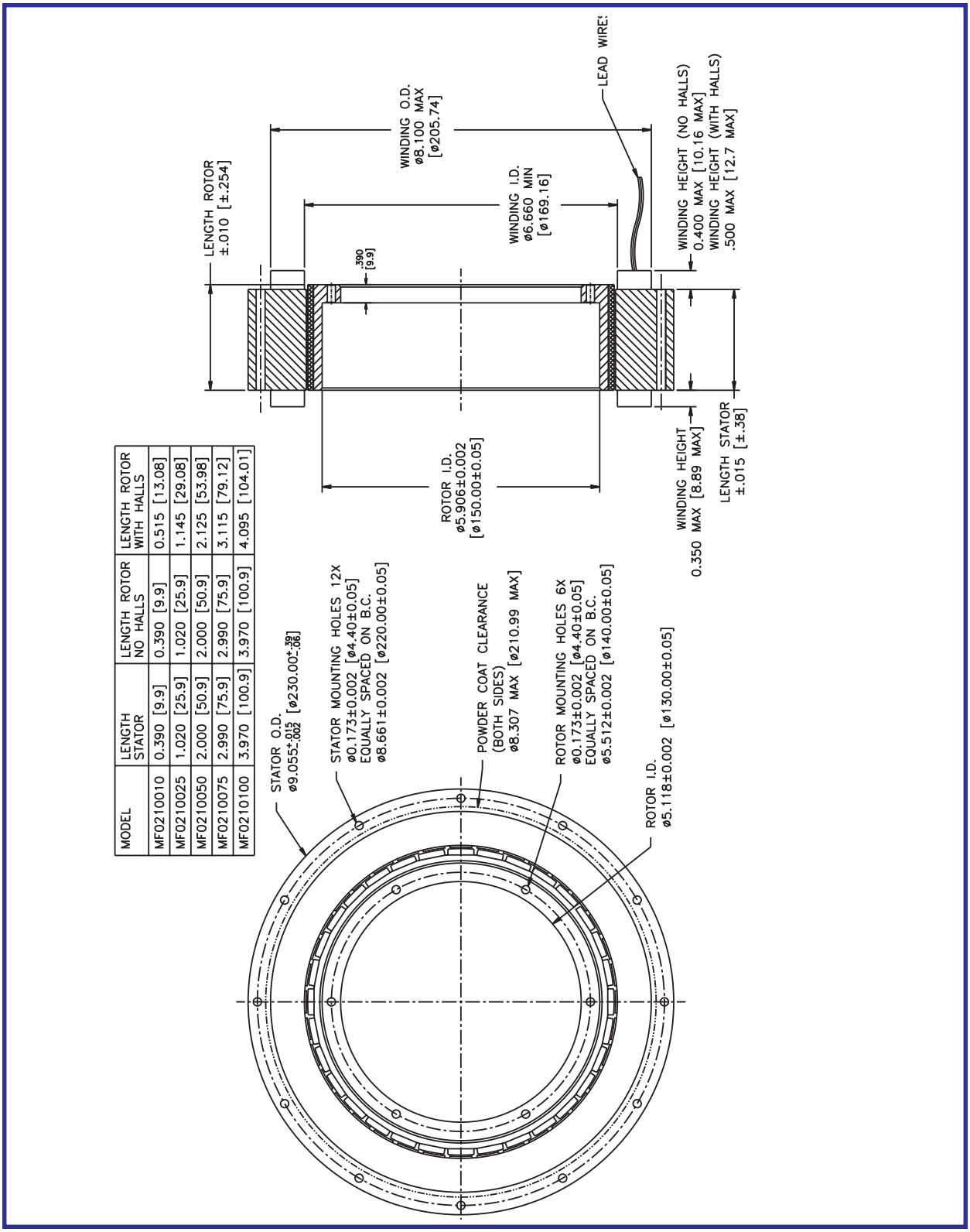
Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series

MF0210

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0210010	0.390 [9.9]	0.390 [9.9]	0.515 [13.08]
MF0210025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0210050	2.000 [50.9]	2.000 [50.9]	2.125 [53.98]
MF0210075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0210100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0210

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0210010			MF0210025			MF0210050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		6.4			16.0			30.3	
		Nm		8.7			21.7			41.1	
Max Rated Torque, ±25%	T_R	lb.ft.		43.7			114.6			225.5	
		Nm		59.3			155.4			305.7	
Motor Constant,	K_M	lb.ft./√W		0.71			1.51			2.45	
		Nm/√W		0.96			2.04			3.32	
Electrical Time Constant	T_E	msec		3.10			4.64			5.89	
Mechanical Time Constant	T_M	msec		5.64			3.36			2.53	
Thermal Resistance	TPR	°C/Watt		0.93			0.68			0.50	
Viscous Damping	F_I	lb.ft./rpm		1.7E-4			4.8E-4			7.7E-4	
		Nm/rpm		2.4E-4			6.5E-4			1.0E-3	
Max Cogging Torque	T_F	lb.ft.		0.27			0.72			1.36	
		Nm		0.36			0.97			1.83	
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		3.8E-3			0.010			0.021	
		Kg.m²		5.2E-4			0.014			0.028	
Frameless Motor Weight	Wt	lb.		3.70			8.76			16.79	
		Kg		1.68			3.97			7.61	
Number of Poles	N_P	-		32			32			32	
Winding Constants			A	B	C	A	B	C	A	B	C
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	43.7	43.7	43.7	114.6	225.5	225.5	225.5	225.5	225.5
		Nm	59.3	59.3	59.3	155.4	305.7	305.7	305.7	305.7	305.7
Peak Current	I_P	Amperes	124.2	54.8	40.5	261.8	165.6	140.1	455.4	165.6	140.1
Torque Constant, ±10%	K_T	lb.ft./A	0.352	0.798	1.080	0.438	1.362	1.609	0.495	1.362	1.609
		Nm/A	0.478	1.082	1.464	0.594	1.846	2.182	0.671	1.846	2.182
No Load Speed	S_{NL}	RPM	924	1275	1884	743	748	1266	658	748	1266
		Rad/s	96.8	133.5	197.3	77.8	78.3	132.6	68.9	78.3	132.61
BEMF Constant, ±10%	K_B	V/KRPM	50.0	113.35	153.36	62.18	193.34	228.49	70.30	193.34	228.49
		V/rad/s	0.478	1.082	1.464	0.594	1.846	2.182	0.671	1.846	2.182
Terminal Resistance, ±12%	R_M	Ohms	0.246	1.257	2.274	0.084	0.309	0.458	0.041	0.309	0.458
Terminal Inductance, ±30%	L_M	mH	0.765	3.931	7.195	0.390	1.820	2.543	0.241	1.820	2.543

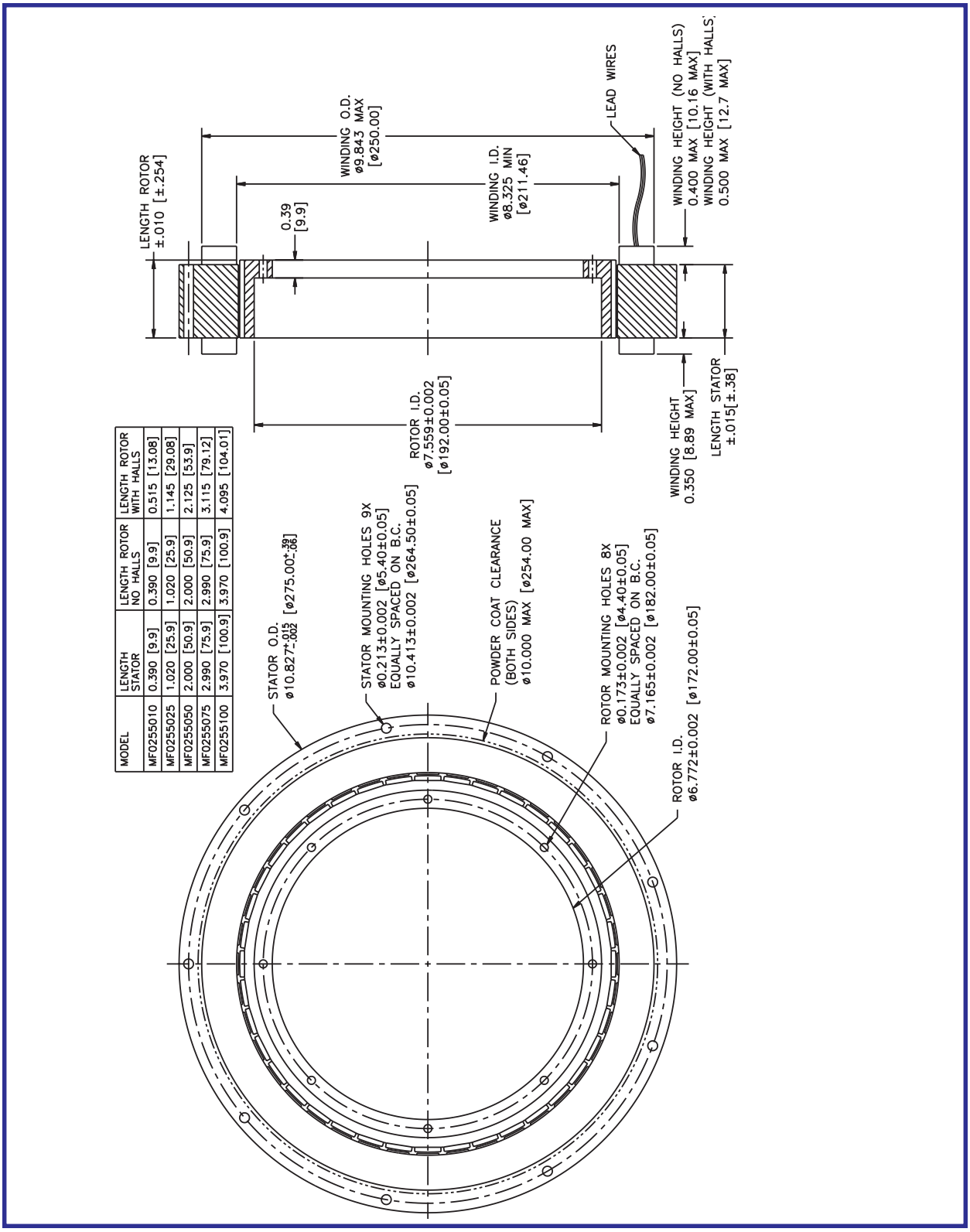
Parameter	Symbol	Unit	MF0210075			MF0210100					
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		48.4			61.7				
		Nm		65.6			83.6				
Max Rated Torque, ±25%	T_R	lb.ft.		337.2			447.7				
		Nm		457.2			607.1				
Motor Constant,	K_M	lb.ft./√W		3.14			3.72				
		Nm/√W		4.27			5.05				
Electrical Time Constant	T_E	msec		6.405			6.698				
Mechanical Time Constant	T_M	msec		2.306			2.190				
Thermal Resistance	TPR	°C/Watt		0.325			0.280				
Viscous Damping	F_I	lb.ft./rpm		1.5E-3			2.1E-3				
		Nm/rpm		2.0E-3			2.9E-3				
Max Cogging Torque	T_F	lb.ft.		1.99			2.76				
		Nm		2.68			3.72				
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		0.031			0.041				
		Kg.m²		0.042			0.056				
Frameless Motor Weight	Wt	lb.		24.81			32.76				
		Kg		11.25			14.86				
Number of Poles	N_P	-		32			32				
Winding Constants			A	B	C	A	B	C			
Design Voltage	V_P	Volts	48	150	300	48	150	300			
Peak Torque	T_P	lb.ft.	337.2	337.2	337.2	447.7	447.7	447.7			
		Nm	457.2	457.2	457.2	607.1	607.1	607.1			
Peak Current	I_P	Amperes	454.6	303.1	202.0	454.2	302.8	227.1			
Torque Constant, ±10%	K_T	lb.ft./A	0.742	1.113	1.669	0.986	1.479	1.972			
		Nm/A	1.006	1.508	2.263	1.337	2.005	2.673			
No Load Speed	S_{NL}	RPM	439	915	1221	330	689	1033			
		Rad/s	46.03	95.90	127.87	34.64	72.16	108.24			
BEMF Constant, ±10%	K_B	V/KRPM	105.31	157.96	236.95	139.95	209.93	279.91			
		V/rad/s	1.006	1.508	2.263	1.337	2.005	2.673			
Terminal Resistance, ±12%	R_M	Ohms	0.055	0.130	0.275	0.070	0.165	0.307			
Terminal Inductance, ±30%	L_M	mH	0.355	0.799	1.799	0.469	1.055	1.875			

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0255

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0255010	0.390 [9.9]	0.390 [9.9]	0.515 [13.08]
MF0255025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0255050	2.000 [50.9]	2.000 [50.9]	2.125 [53.9]
MF0255075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0255100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0255

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0255010			MF0255025			MF0255050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		8.9			22.8			44.2	
		Nm		12.0			31.0			60.0	
Max Rated Torque, ±25%	T_R	lb.ft.		51.1			133.5			261.3	
		Nm		69.3			181.0			354.5	
Motor Constant,	K_M	lb.ft./√W		0.96			2.05			3.17	
		Nm/√W		1.30			2.78			4.30	
Electrical Time Constant	T_E	msec		3.38			5.144			5.994	
Mechanical Time Constant	T_M	msec		7.64			4.539			3.770	
Thermal Resistance	TPR	°C/Watt		0.90			0.620			0.395	
Viscous Damping	F_I	lb.ft./rpm		3.3E-4			9.4E-4			1.9E-3	
		Nm/rpm		4.5E-4			1.2E-3			2.6E-3	
Max Cogging Torque	T_F	lb.ft.		0.33			0.70			1.40	
		Nm		0.44			0.95			1.89	
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s^2		9.6E-3			0.026			0.052	
		Kg.m^2		0.013			0.035			0.070	
Frameless Motor Weight	Wt	lb.		4.72			11.24			21.25	
		Kg		2.14			5.10			9.64	
Number of Poles	N_P	-		40			40			40	
Winding Constants			A	B	C	A	B	C	A	B	C
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	51.1	51.1	51.1	133.5	133.5	133.5	261.5	261.5	261.5
		Nm	69.3	69.3	69.3	181.0	181.0	181.0	354.5	354.5	354.5
Peak Current	I_P	Amperes	119.4	68.2	37.7	200.8	117.1	66.9	279.6	174.6	107.4
Torque Constant, ±10%	K_T	lb.ft./A	0.428	0.750	1.356	0.665	1.140	1.995	0.936	1.497	2.433
		Nm/A	0.581	1.016	1.839	0.902	1.545	2.705	1.269	2.030	3.299
No Load Speed	S_{NL}	RPM	762	1360	1503	490	894	1022	348	681	838
		Rad/s	79.7	142.4	157.4	51.4	93.6	107.0	36.5	71.3	87.7
BEMF Constant, ±10%	K_B	V/KRPM	60.81	106.42	192.56	94.40	161.84	283.22	132.87	212	345.46
		V/rad/s	0.581	1.016	1.839	0.902	1.545	2.705	1.269	2.030	3.299
Terminal Resistance, ±12%	R_M	Ohms	0.197	0.605	2.158	0.105	0.307	0.991	0.087	0.216	0.571
Terminal Inductance, ±30%	L_M	mH	0.669	2.048	6.708	0.538	1.581	4.842	0.521	1.333	3.521

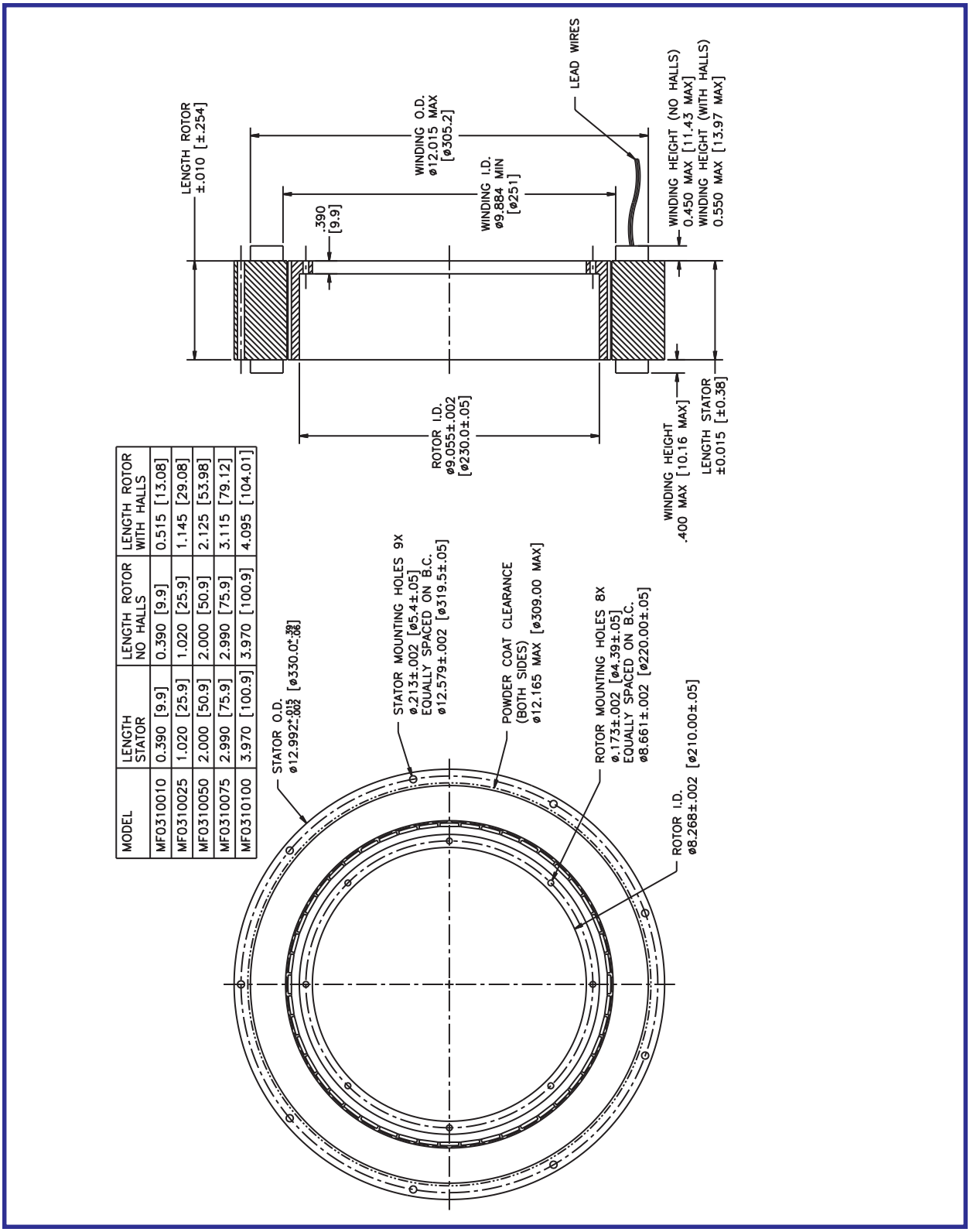
Parameter	Symbol	Unit	MF0255075			MF0255100					
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		65.9			86.0				
		Nm		89.4			116.6				
Max Rated Torque, ±25%	T_R	lb.ft.		390.8			518.9				
		Nm		529.9			703.5				
Motor Constant,	K_M	lb.ft./√W		4.07			4.75				
		Nm/√W		5.52			6.45				
Electrical Time Constant	T_E	msec		6.503			6.632				
Mechanical Time Constant	T_M	msec		3.434			3.347				
Thermal Resistance	TPR	°C/Watt		0.293			0.235				
Viscous Damping	F_I	lb.ft./rpm		3.0E-3			4.0E-3				
		Nm/rpm		4.1E-3			5.4E-3				
Max Cogging Torque	T_F	lb.ft.		2.00			2.87				
		Nm		2.70			3.88				
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s^2		0.077			0.103				
		Kg.m^2		0.105			0.139				
Frameless Motor Weight	Wt	lb.		31.46			41.45				
		Kg		14.27			18.80				
Number of Poles	N_P	-		40			40				
Winding Constants			A	B	C	A	B	C			
Design Voltage	V_P	Volts	48	150	300	48	150	300			
Peak Torque	T_P	lb.ft.	390.8	390.8	390.8	518.9	518.9	518.9			
		Nm	529.9	529.9	529.9	703.5	703.5	703.5			
Peak Current	I_P	Amperes	348.6	232.4	154.9	464.3	278.6	199.0			
Torque Constant, ±10%	K_T	lb.ft./A	1.121	1.682	2.523	1.118	1.863	2.608			
		Nm/A	1.520	2.280	3.421	1.515	2.525	3.535			
No Load Speed	S_{NL}	RPM	291	606	808	292	547	782			
		Rad/s	30.4	63.5	84.6	30.5	57.3	81.9			
BEMF Constant, ±10%	K_B	V/KRPM	159.19	238.79	358.19	158.67	264.45	370.23			
		V/rad/s	1.520	2.280	3.421	1.515	2.525	3.535			
Terminal Resistance, ±12%	R_M	Ohms	0.076	0.163	0.379	0.055	0.150	0.304			
Terminal Inductance, ±30%	L_M	mH	0.493	1.108	2.494	0.366	1.016	1.991			

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0310

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0310010	0.390 [9.9]	0.390 [9.9]	0.515 [13.08]
MF0310025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0310050	2.000 [50.9]	2.000 [50.9]	2.125 [53.98]
MF0310075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0310100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0310

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0310010			MF0310025			MF0310050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		15.1			36.2			74.0	
		Nm		20.5			49.1			100.4	
Max Rated Torque, ±25%	T_R	lb.ft.		74.4			194.6			381.4	
		Nm		100.9			263.8			517.1	
Motor Constant,	K_M	lb.ft./√W		1.49			3.12			5.10	
		Nm/√W		2.03			4.23			6.92	
Electrical Time Constant	T_E	msec		4.95			7.22			9.46	
Mechanical Time Constant	T_M	msec		6.33			3.95			2.92	
Thermal Resistance	TPR	°C/Watt		0.750			0.570			0.365	
Viscous Damping	F_I	lb.ft./rpm		6.8E-4			1.9E-3			4.2E-3	
		Nm/rpm		9.2E-4			2.6E-3			5.7E-3	
Max Cogging Torque	T_F	lb.ft.		0.30			0.80			1.43	
		Nm		0.41			1.08			1.93	
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s^2		0.019			0.052			0.103	
		Kg.m^2		0.026			0.071			0.140	
Frameless Motor Weight	Wt	lb.		6.942			15.92			30.46	
		Kg		3.149			7.22			13.81	
Number of Poles	N_P	-		48			48			48	
Winding Constants			A	B	C	A	B	C	A	B	C
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	74.4	74.4	74.47	194.6	194.6	194.6	381.4	381.4	381.4
		Nm	100.9	100.9	100.97	263.8	263.8	263.8	517.1	517.1	517.1
Peak Current	I_P	Amperes	144.2	84.8	46.51	202.0	117.8	74.4	234.2	175.7	117.1
Torque Constant, ±10%	K_T	lb.ft./A	0.516	0.878	1.601	0.964	1.652	2.615	1.628	2.171	3.256
		Nm/A	0.700	1.190	2.171	1.306	2.240	3.546	2.207	2.943	4.415
No Load Speed	S_{NL}	RPM	631	1161	1274	338	617	779	200	469	626
		Rad/s	66.1	121.6	133.4	35.4	64.6	81.7	20.9	49.2	65.6
BEMF Constant, ±10%	K_B	V/KRPM	73.32	124.65	227.30	136.80	234.52	371.32	231.16	308.21	462.32
		V/rad/s	0.700	1.190	2.171	1.306	2.240	3.546	2.207	2.943	4.415
Terminal Resistance, ±12%	R_M	Ohms	0.119	0.394	1.166	0.095	0.263	0.691	0.102	0.181	0.407
Terminal Inductance, ±30%	L_M	mH	0.589	1.702	5.658	0.688	2.022	5.070	0.962	1.711	3.849

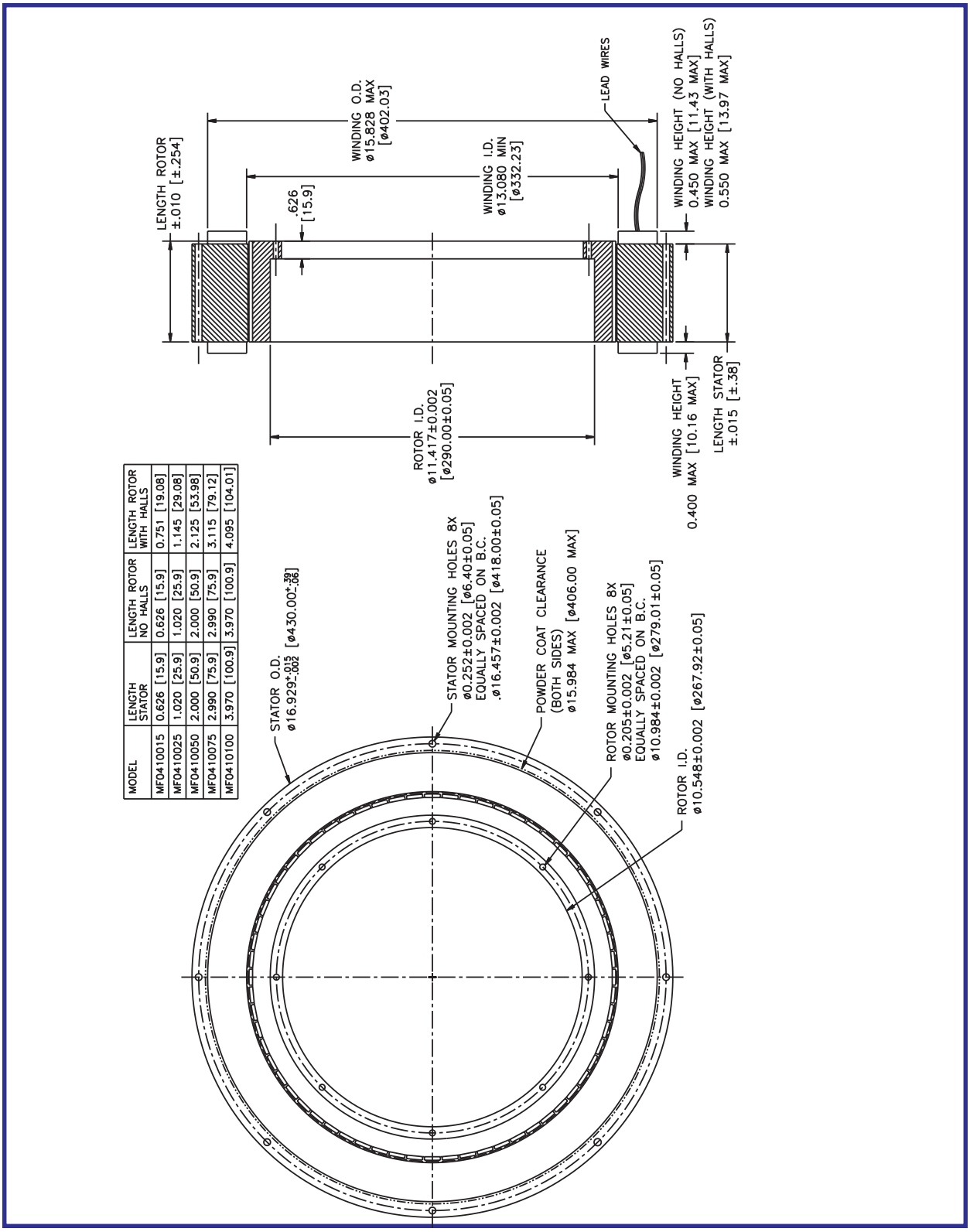
Parameter	Symbol	Unit	MF0310075			MF0310100					
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		110.6			148.9				
		Nm		150.0			201.9				
Max Rated Torque, ±25%	T_R	lb.ft.		569.9			760.1				
		Nm		772.6			1030.6				
Motor Constant,	K_M	lb.ft./√W		6.56			7.788				
		Nm/√W		8.89			10.560				
Electrical Time Constant	T_E	msec		10.318			10.822				
Mechanical Time Constant	T_M	msec		2.653			2.51				
Thermal Resistance	TPR	°C/Watt		0.270			0.210				
Viscous Damping	F_I	lb.ft./rpm		6.8E-3			0.010				
		Nm/rpm		9.3E-3			0.014				
Max Cogging Torque	T_F	lb.ft.		2.14			3.05				
		Nm		2.91			4.11				
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s^2		0.155			0.207				
		Kg.m^2		0.210			0.281				
Frameless Motor Weight	Wt	lb.		44.93			59.52				
		Kg		20.38			26.99				
Number of Poles	N_P	-		48			48				
Winding Constants			A	B	C	A	B	C			
Design Voltage	V_P	Volts	48	150	300	48	150	300			
Peak Torque	T_P	lb.ft.	569.9	59.9	569.9	760.1	760.1	760.1			
		Nm	772.6	772.6	772.6	1030.6	1030.6	1030.6			
Peak Current	I_P	Amperes	280.5	233.7	175.3	233.5	175.1	140.1			
Torque Constant, ±10%	K_T	lb.ft./A	2.031	2.438	3.250	3.254	4.339	5.424			
		Nm/A	2.754	3.305	4.407	4.412	5.883	7.354			
No Load Speed	S_{NL}	RPM	160.66	418	627	100	235	376			
		Rad/s	16.8	43.8	65.7	10.5	24.6	39.3			
BEMF Constant, ±10%	K_B	V/KRPM	288.42	346.10	461.74	462.04	616.06	770.07			
		V/rad/s	2.754	3.305	4.407	4.412	5.883	7.354			
Terminal Resistance, ±12%	R_M	Ohms	0.096	0.138	0.262	0.175	0.310	0.485			
Terminal Inductance, ±30%	L_M	mH	0.989	1.423	2.531	1.889	3.359	5.248			

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0410

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0410015	0.626 [15.9]	0.626 [15.9]	0.751 [19.08]
MF0410025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0410050	2.000 [50.9]	2.000 [50.9]	2.125 [53.98]
MF0410075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0410100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0410

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0410015			MF0410025			MF0410050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		56.6			95.4			165.2	
		Nm		76.7			129.3			224.0	
Max Rated Torque, ±25%	T_R	lb.ft.		239.9			390.6			765.2	
		Nm		325.3			529.6			1037.5	
Motor Constant,	K_M	lb.ft./√W		3.65			5.52			8.43	
		Nm/√W		4.95			7.48			11.43	
Electrical Time Constant	T_E	msec		7.55			10.07			11.52	
Mechanical Time Constant	T_M	msec		5.38			3.89			3.30	
Thermal Resistance	TPR	°C/Watt		0.320			0.257			0.200	
Viscous Damping	F_I	lb.ft./rpm		3.2E-3			5.3E-3			0.012	
		Nm/rpm		4.4E-3			7.2E-3			0.016	
Max Cogging Torque	T_F	lb.ft.		0.60			1.10			2.05	
		Nm		0.81			1.48			2.76	
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s^2		0.098			0.161			0.319	
		Kg.m^2		0.132			0.218			0.432	
Frameless Motor Weight	Wt	lb.		19.06			29.40			55.03	
		Kg		8.64			13.34			24.96	
Number of Poles	N_P	-		64			64			64	
Winding Constants			A	B	C	A	B	C	A	B	C
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	239.9	239.9	239.9	390.6	390.6	390.6	765.2	765.2	765.2
		Nm	325.3	325.3	325.3	529.6	529.6	529.6	1037.5	1037.5	1037.5
Peak Current	I_P	Amperes	270.6	162.4	108.2	402.6	230.0	146.4	319.9	266.6	199.9
Torque Constant, ±10%	K_T	lb.ft./A	0.887	1.478	2.216	0.970	1.698	2.668	2.392	2.870	3.826
		Nm/A	1.202	2.003	3.005	1.315	2.302	3.617	3.242	3.891	5.188
No Load Speed	S_{NL}	RPM	367	689	919	335	599	763	136	354	532
		Rad/s	38.4	72.1	96.2	35.1	62.8	79.9	14.2	37.1	55.7
BEMF Constant, ±10%	K_B	V/KRPM	125.87	209.78	314.67	137.75	241.06	378.81	339.55	407	543.28
		V/rad/s	1.202	2.003	3.005	1.315	2.302	3.617	3.242	3.891	5.188
Terminal Resistance, ±12%	R_M	Ohms	0.059	0.163	0.368	0.031	0.093	0.231	0.080	0.113	0.201
Terminal Inductance, ±30%	L_M	mH	0.445	1.235	2.779	0.311	0.953	2.353	0.927	1.335	2.373

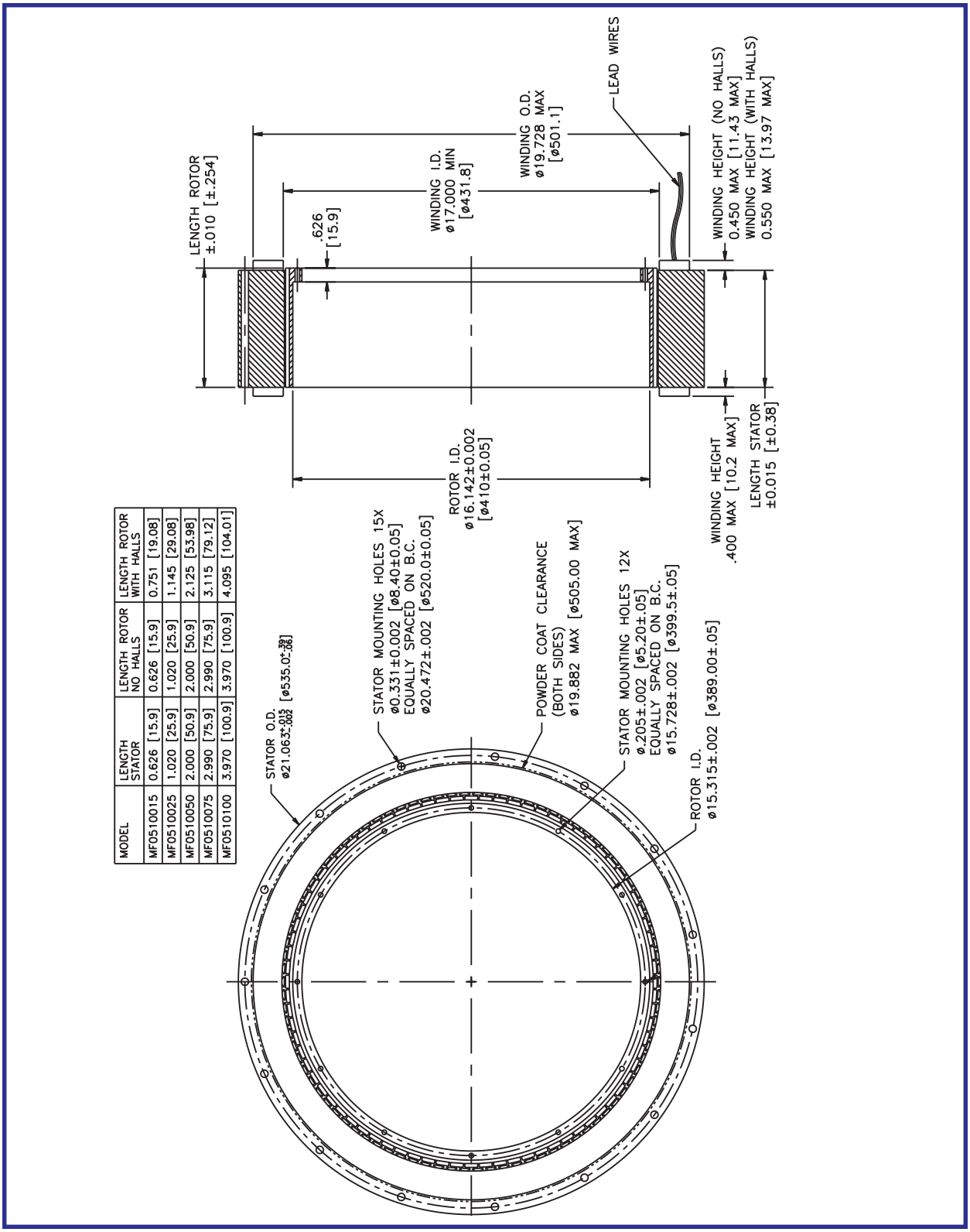
Parameter	Symbol	Unit	MF0410075			MF0410100					
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		238.4			324.9				
		Nm		323.2			440.5				
Max Rated Torque, ±25%	T_R	lb.ft.		1143.6			1518.2				
		Nm		1550.5			2058.4				
Motor Constant,	K_M	lb.ft./√W		10.98			13.31				
		Nm/√W		14.89			18.05				
Electrical Time Constant	T_E	msec		12.90			14.19				
Mechanical Time Constant	T_M	msec		2.92			2.64				
Thermal Resistance	TPR	°C/Watt		0.163			0.129				
Viscous Damping	F_I	lb.ft./rpm		0.023			0.031				
		Nm/rpm		0.031			0.041				
Max Cogging Torque	T_F	lb.ft.		3.04			4.14				
		Nm		4.10			5.58				
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s^2		0.478			0.636				
		Kg.m^2		0.648			0.862				
Frameless Motor Weight	Wt	lb.		81.66			108.46				
		Kg		37.04			49.19				
Number of Poles	N_P	-		64			64				
Winding Constants			A	B	C	A	B	C			
Design Voltage	V_P	Volts	48	150	300	48	150	300			
Peak Torque	T_P	lb.ft.	1143.6	1143.6	1143.6	1518.2	1518.2	1518.2			
		Nm	1550.5	1550.5	1550.5	2058.4	2058.4	2058.4			
Peak Current	I_P	Amperes	266.0	199.5	159.6	318.8	265.7	199.3			
Torque Constant, ±10%	K_T	lb.ft./A	4.299	5.732	7.164	4.761	5.713	7.618			
		Nm/A	5.828	7.771	9.714	6.455	7.746	10.328			
No Load Speed	S_{NL}	RPM	75	177	284	68	178	267			
		Rad/s	7.9	18.6	29.7	7.1	18.6	28.0			
BEMF Constant, ±10%	K_B	V/KRPM	610.32	813.76	1017.20	675.96	811.16	1081.55			
		V/rad/s	5.828	7.77	9.71	6.45	7.746	10.32			
Terminal Resistance, ±12%	R_M	Ohms	0.153	0.259	0.409	0.128	0.193	0.343			
Terminal Inductance, ±30%	L_M	mH	1.977	3.514	5.490	1.813	2.611	4.642			

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0510

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0510015	0.626 [15.9]	0.626 [15.9]	0.751 [19.08]
MF0510025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0510050	2.000 [50.9]	2.000 [50.9]	2.125 [53.98]
MF0510075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0510100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0510

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0510015			MF0510025			MF0510050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		89.3			144.6			277.9	
		Nm		121.0			196.0			376.8	
Max Rated Torque, ±25%	T_R	lb.ft.		598.6			974.8			1910.1	
		Nm		811.6			1321.7			2589.8	
Motor Constant,	K_M	lb.ft./√W		5.91			8.52			13.45	
		Nm/√W		8.02			11.56			18.24	
Electrical Time Constant	T_E	msec		8.31			10.14			12.42	
Mechanical Time Constant	T_M	msec		5.97			4.71			3.73	
Thermal Resistance	TPR	°C/Watt		0.337			0.267			0.180	
Viscous Damping	F_I	lb.ft./rpm		7.7E-3			0.013			0.033	
		Nm/rpm		0.011			0.018			0.045	
Max Cogging Torque	T_F	lb.ft.		0.67			1.21			2.32	
		Nm		0.91			1.63			3.13	
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		0.284			0.465			0.917	
		Kg.m²		0.384			0.630			1.243	
Frameless Motor Weight	Wt	lb.		21.48			33.18			62.28	
		Kg		9.74			15.05			28.25	
Number of Poles	N_P	-		80			80			80	
Winding Constants			A	B	C	A	B	C	A	B	C
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	598.6	598.6	598.6	974.8	974.8	974.8	1863.6	1910.1	1910.1
		Nm	811.6	811.6	811.6	1321.7	1321.7	1321.7	2526.8	2589.8	2589.8
Peak Current	I_P	Amperes	412.3	353.4	224.9	410.9	352.2	224.1	399.5	351.0	245.7
Torque Constant, ±10%	K_T	lb.ft./A	1.452	1.694	2.661	2.372	2.767	4.349	4.664	5.441	7.773
		Nm/A	1.968	2.296	3.608	3.216	3.752	5.896	6.323	7.377	10.539
No Load Speed	S_{NL}	RPM	223	599	762	136	366	466	69	186	261
		Rad/s	23.4	62.7	79.8	14.3	38.4	48.8	7.2	19.5	27.3
BEMF Constant, ±10%	K_B	V/KRPM	206.10	240.46	377.86	336.78	392.91	617.44	662.19	772.55	1103.65
		V/rad/s	1.968	2.296	3.608	3.216	3.752	5.896	6.323	7.377	10.53
Terminal Resistance, ±12%	R_M	Ohms	0.060	0.082	0.206	0.077	0.105	0.264	0.120	0.164	0.349
Terminal Inductance, ±30%	L_M	mH	0.501	0.681	1.683	0.785	1.068	2.638	1.492	2.031	4.144

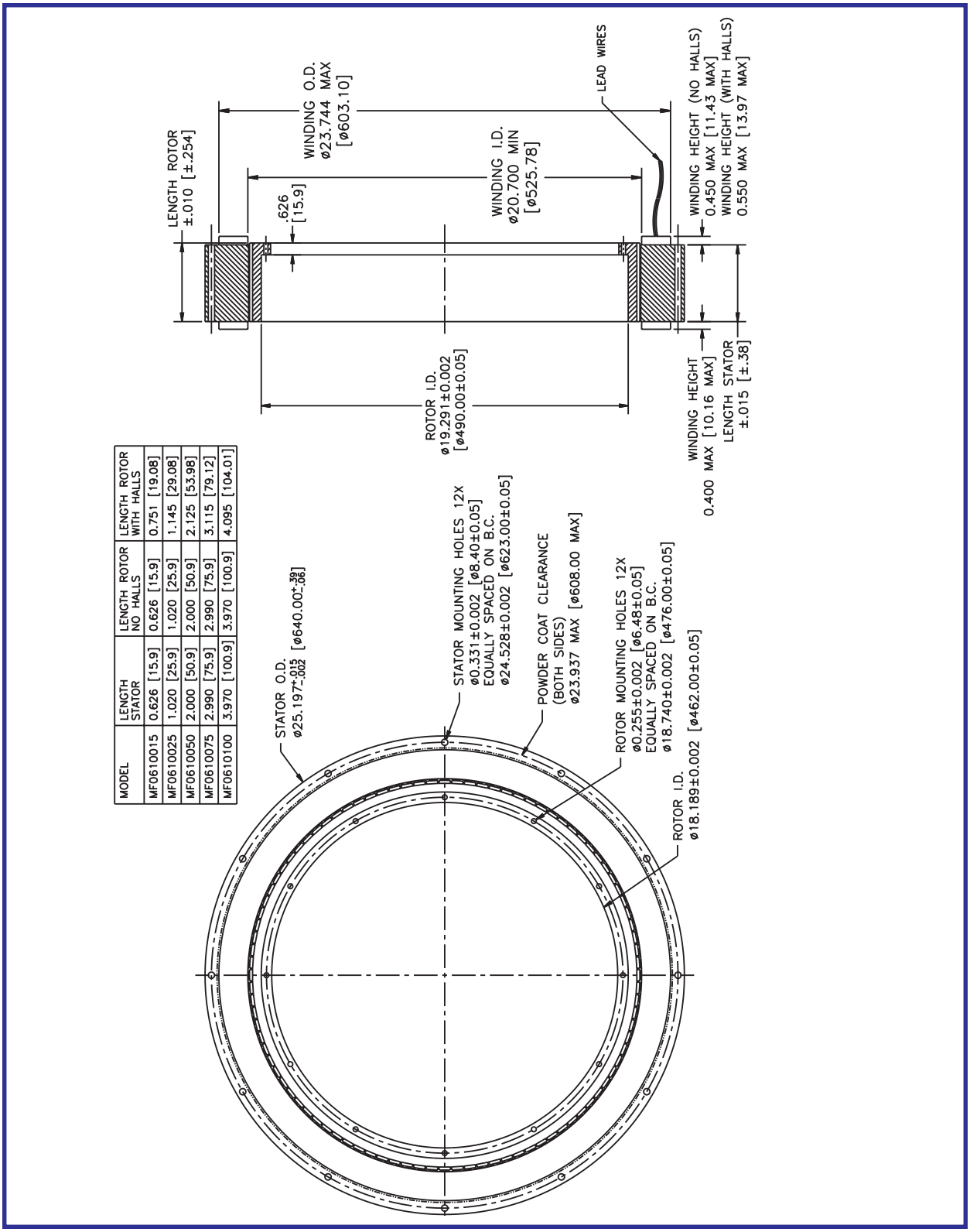
Parameter	Symbol	Unit	MF0510075			MF0510100					
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		430.5			542.7				
		Nm		583.6			735.91				
Max Rated Torque, ±25%	T_R	lb.ft.		2855.0			3790.2				
		Nm		3870.8			5138.9				
Motor Constant,	K_M	lb.ft./√W		17.36			20.54				
		Nm/√W		23.54			27.85				
Electrical Time Constant	T_E	msec		13.66			14.30				
Mechanical Time Constant	T_M	msec		3.35			3.19				
Thermal Resistance	TPR	°C/Watt		0.125			0.110				
Viscous Damping	F_I	lb.ft./rpm		0.055			0.084				
		Nm/rpm		0.075			0.114				
Max Cogging Torque	T_F	lb.ft.		3.10			4.53				
		Nm		4.18			6.11				
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		1.373			1.825				
		Kg.m²		1.862			2.474				
Frameless Motor Weight	Wt	lb.		91.87			121.02				
		Kg		41.67			54.89				
Number of Poles	N_P	-		80			80				
Winding Constants			A	B	C	A	B	C			
Design Voltage	V_P	Volts	48	150	300	48	150	300			
Peak Torque	T_P	lb.ft.	2489.6	2855.0	2855.1	2621.7	3790.2	3790.2			
		Nm	3375.5	3870.8	3870.8	3554.5	5138.9	5138.9			
Peak Current	I_P	Amperes	428.0	409.0	306.8	339.3	408.8	306.6			
Torque Constant, ±10%	K_T	lb.ft./A	5.816	6.979	9.306	7.726	9.271	12.361			
		Nm/A	7.885	9.462	12.617	10.475	12.570	16.760			
No Load Speed	S_{NL}	RPM	55	145	218	42	109	164			
		Rad/s	5.8	15.2	22.8	4.4	11.4	17.1			
BEMF Constant, ±10%	K_B	V/KRPM	825.75	990.90	1321.21	1096.91	1316.30	1755.06			
		V/rad/s	7.885	9.462	12.617	10.475	12.570	16.760			
Terminal Resistance, ±12%	R_M	Ohms	0.112	0.163	0.290	0.141	0.206	0.366			
Terminal Inductance, ±30%	L_M	mH	1.532	2.206	3.922	2.023	2.913	5.179			

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0610

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0610015	0.626 [15.9]	0.626 [15.9]	0.751 [19.08]
MF0610025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0610050	2.000 [50.9]	2.000 [50.9]	2.125 [53.98]
MF0610075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0610100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0610

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0610015			MF0610025			MF0610050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		146			236			443	
		Nm		198			318			601	
Max Rated Torque, ±25%	T_R	lb.ft.		744			1214			2376	
		Nm		1010			1646			3222	
Motor Constant,	K_M	lb.ft./√W		8.02			11.52			18.23	
		Nm/√W		10.87			15.62			24.72	
Electrical Time Constant	T_E	msec		9.44			11.56			14.20	
Mechanical Time Constant	T_M	msec		7.23			5.70			4.50	
Thermal Resistance	TPR	°C/Watt		0.230			0.185			0.130	
Viscous Damping	F_i	lb.ft./rpm		0.015			0.026			0.066	
		Nm/rpm		0.020			0.036			0.090	
Max Cogging Torque	T_F	lb.ft.		0.79			1.40			2.62	
		Nm		1.07			1.89			3.53	
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		0.631			1.027			2.033	
		Kg.m²		0.856			1.392			2.757	
Frameless Motor Weight	Wt	lb.		30.99			48.07			90.78	
		Kg		10.05			21.80			41.17	
Number of Poles	N_P	-		96			96			96	
Winding Constants			A	B	C	A	B	C	A	B	C
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	744	744	744	1214	1214	1214	2376	2376	2376
		Nm	1010	1010	1010	1646	1646	14646	3222	3222	3222
Peak Current	I_P	Amperes	356	305	212	356	305	214	354	304	212
Torque Constant, ±10%	K_T	lb.ft./A	2.090	2.438	3.483	3.402	3.969	5.669	6.700	7.817	11.167
		Nm/A	2.833	3.306	4.722	4.612	5.381	7.687	9.084	10.598	15.140
No Load Speed	S_{NL}	RPM	155	416	583	95	255	358	48	129	181
		Rad/s	16.29	43.63	61.09	10.00	26.80	37.53	5.08	13.61	19.05
BEMF Constant, ±10%	K_B	V/KRPM	296.701	346.152	494.50	482.97	563.47	804.95	951.29	1109.84	1585.49
		V/rad/s	2.833	3.306	4.722	4.612	5.381	7.687	9.084	10.598	15.140
Terminal Resistance, ±12%	R_M	Ohms	0.068	0.091	0.188	0.087	0.117	0.242	0.135	0.182	0.375
Terminal Inductance, ±30%	L_M	mH	0.641	0.872	1.780	1.007	1.371	2.797	1.917	2.610	5.326

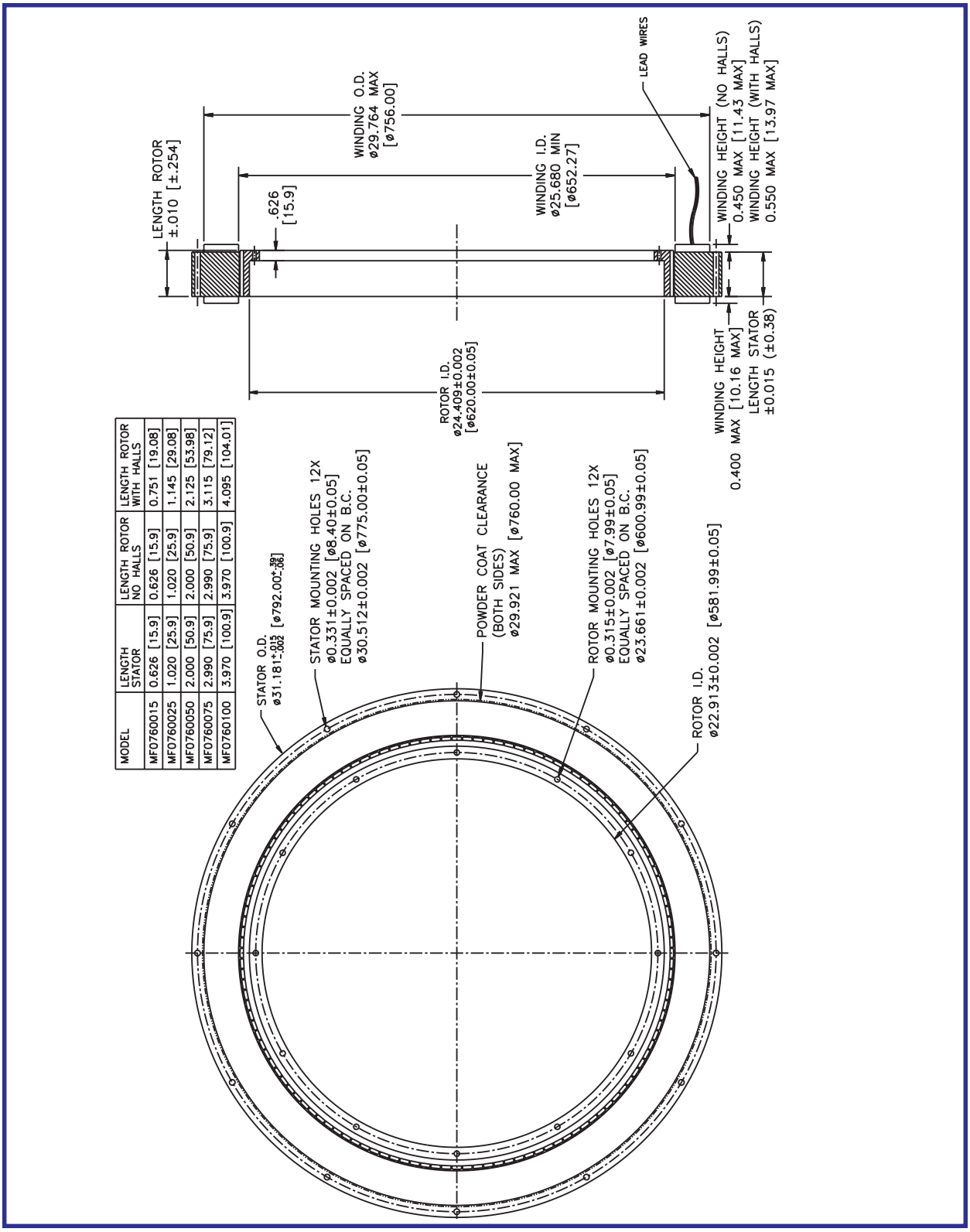
Parameter	Symbol	Unit	MF0610075			MF0610100					
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		649			859				
		Nm		880			1164				
Max Rated Torque, ±25%	T_R	lb.ft.		3550			4713				
		Nm		4814			6390				
Motor Constant,	K_M	lb.ft./√W		23.43			27.72				
		Nm/√W		31.77			37.59				
Electrical Time Constant	T_E	msec		15.47			16.21				
Mechanical Time Constant	T_M	msec		4.09			3.89				
Thermal Resistance	TPR	°C/Watt		0.100			0.080				
Viscous Damping	F_i	lb.ft./rpm		0.138			0.229				
		Nm/rpm		0.187			0.311				
Max Cogging Torque	T_F	lb.ft.		3.70			5.25				
		Nm		4.99			7.10				
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		3.050			4.056				
		Kg.m²		4.135			5.499				
Frameless Motor Weight	Wt	lb.		133.92			176.63				
		Kg		60.74			80.12				
Number of Poles	N_P	-		96			96				
Winding Constants			A	B	C	A	B	C			
Design Voltage	V_P	Volts	48	150	300	48	150	300			
Peak Torque	T_P	lb.ft.	2627	3550	3550	2768	4713	4713			
		Nm	3562	4814	4814	3753	6390	6390			
Peak Current	I_P	Amperes	261	303	212	207	303	212			
Torque Constant, ±10%	K_T	lb.ft./A	10.03	11.70	16.72	13.33	15.552	22.217			
		Nm/A	13.60	15.86	22.66	18.07	21.086	30.122			
No Load Speed	S_{NL}	RPM	32	86	121	24	65	91			
		Rad/s	3.39	9.09	12.72	2.55	6.84	9.577			
BEMF Constant, ±10%	K_B	V/KRPM	1424.36	1661.75	2373.93	1892.63	2208.07	3154.39			
		V/rad/s	13.602	15.869	22.669	18.073	21.086	30.122			
Terminal Resistance, ±12%	R_M	Ohms	0.183	0.247	0.509	0.231	0.311	0.642			
Terminal Inductance, ±30%	L_M	mH	2.837	3.862	7.881	3.748	5.101	10.410			

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0760

Thin Ring Torque Motors



MODEL	LENGTH STATOR	LENGTH ROTOR NO HALLS	LENGTH ROTOR WITH HALLS
MF0760015	0.626 [15.9]	0.626 [15.9]	0.751 [19.08]
MF0760025	1.020 [25.9]	1.020 [25.9]	1.145 [29.08]
MF0760050	2.000 [50.9]	2.000 [50.9]	2.125 [53.98]
MF0760075	2.990 [75.9]	2.990 [75.9]	3.115 [79.12]
MF0760100	3.970 [100.9]	3.970 [100.9]	4.095 [104.01]

Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series MF0760

Thin Ring Torque Motors

Parameter	Symbol	Unit	MF0760015			MF0760025			MF0760050		
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		244			393			755	
		Nm		331			533			1024	
Max Rated Torque, ±25%	T_R	lb.ft.		1861			3033			5945	
		Nm		2523			4112			8060	
Motor Constant,	K_M	lb.ft./√W		13.54			19.403			30.597	
		Nm/√W		18.63			26.306			41.484	
Electrical Time Constant	T_E	msec		13.45			16.50			20.27	
Mechanical Time Constant	T_M	msec		6.05			4.79			3.82	
Thermal Resistance	TPR	°C/Watt		0.235			0.187			0.126	
Viscous Damping	F_I	lb.ft./rpm		0.043			0.0777			0.201	
		Nm/rpm		0.058			0.105			0.273	
Max Cogging Torque	T_F	lb.ft.		0.90			1.71			3.05	
		Nm		1.22			2.30			4.11	
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		1.506			2.449			4.849	
		Kg.m²		2.042			3.320			6.574	
Frameless Motor Weight	Wt	lb.		43.45			67.04			125.95	
		Kg		19.71			30.41			57.13	
Number of Poles	N_P	-		128			128			126	
Winding Constants											
			A	B	C	A	B	C	A	B	C
Design Voltage	V_P	Volts	48	150	300	48	150	300	48	150	300
Peak Torque	T_P	lb.ft.	1861	1861	1861	3033	3033	3033	4622	5945	5945
		Nm	2523	2523	2523	4112	4112	4112	6267	8060	8060
Peak Current	I_P	Amperes	613	511	383	614	512	384	475	509	382
Torque Constant, ±10%	K_T	lb.ft./A	3.03	3.638	4.851	4.935	5.922	7.896	9.721	1.666	15.554
		Nm/A	4.111	4.933	6.577	6.691	8.029	10.706	13.180	15.817	21.089
No Load Speed	S_{NL}	RPM	107	279	418	65	171	257	33	87	130
		Rad/s	11.23	29.24	43.87	6.90	17.96	26.95	3.50	9.12	13.68
BEMF Constant, ±10%	K_B	V/KRPM	430.46	516.55	688.73	700.69	840.83	1121.11	1380.25	1656.30	2208.40
		V/rad/s	4.111	4.933	6.577	6.691	8.029	10.706	13.180	15.817	21.089
Terminal Resistance, ±12%	R_M	Ohms	0.050	0.073	0.126	0.065	0.095	0.163	0.101	0.148	0.254
Terminal Inductance, ±30%	L_M	mH	0.675	0.971	1.727	1.068	1.538	2.734	2.047	2.947	5.239

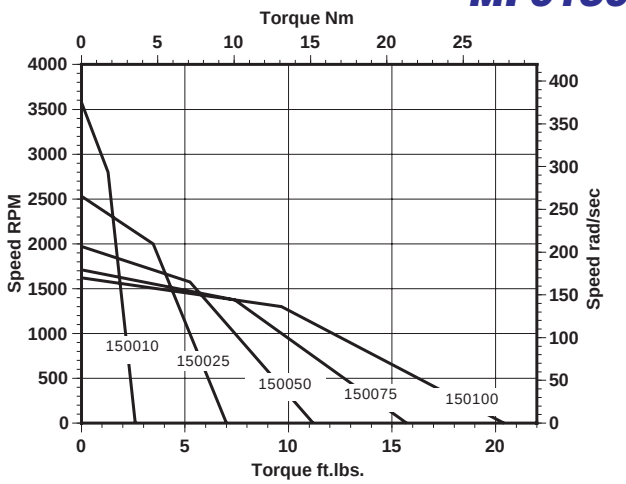
Parameter	Symbol	Unit	MF0760075			MF0760100					
Motor Constants											
Max Cont. Stall Torque	T_C	lb.ft.		1121			1490				
		Nm		1520			2020				
Max Rated Torque, ±25%	T_R	lb.ft.		8886			11738				
		Nm		12048			15914				
Motor Constant,	K_M	lb.ft./√W		39.245			46.25				
		Nm/√W		53.20			62.71				
Electrical Time Constant	T_E	msec		22.06			23.07				
Mechanical Time Constant	T_M	msec		3.483			3.31				
Thermal Resistance	TPR	°C/Watt		0.094			0.074				
Viscous Damping	F_I	lb.ft./rpm		0.390			0.587				
		Nm/rpm		0.529			0.796				
Max Cogging Torque	T_F	lb.ft.		4.37			6.08				
		Nm		5.89			8.21				
Mechanical Constants											
Frameless Motor Inertia	J_M	lb.ft.s²		7.27			9.62				
		Kg.m²		9.86			13.04				
Frameless Motor Weight	Wt	lb.		185.46			243.16				
		Kg		81.12			110.29				
Number of Poles	N_P	-		128			128				
Winding Constants											
			A	B	C	A	B	C			
Design Voltage	V_P	Volts	48	150	300	48	150	300			
Peak Torque	T_P	lb.ft.	5078	8886	8886	5336	11738	11738			
		Nm	6886	12048	12048	7235	15914	15914			
Peak Current	I_P	Amperes	348	508	381	277	508	381			
Torque Constant, ±10%	K_T	lb.ft./A	14.55	17.47	23.29	19.24	23.09	30.79			
		Nm/A	19.73	23.68	31.57	26.09	31.31	41.74			
No Load Speed	S_{NL}	RPM	22	58	87	16	44	66			
		Rad/s	2.33	6.09	9.13	1.76	4.60	6.91			
BEMF Constant, ±10%	K_B	V/KRPM	2066	2480	3306	2732	3278	4371			
		V/rad/s	19.73	23.68	31.57	26.09	31.31	41.74			
Terminal Resistance, ±12%	R_M	Ohms	0.138	0.202	0.346	0.173	0.254	0.435			
Terminal Inductance, ±30%	L_M	mH	3.035	4.371	7.770	3.994	5.751	10.22			

Allied Motion Technologies
Emoteq Corp

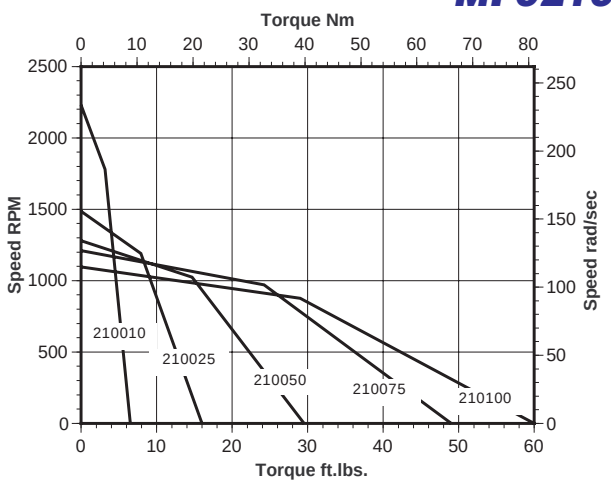
Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series
Thin Ring Torque Motors

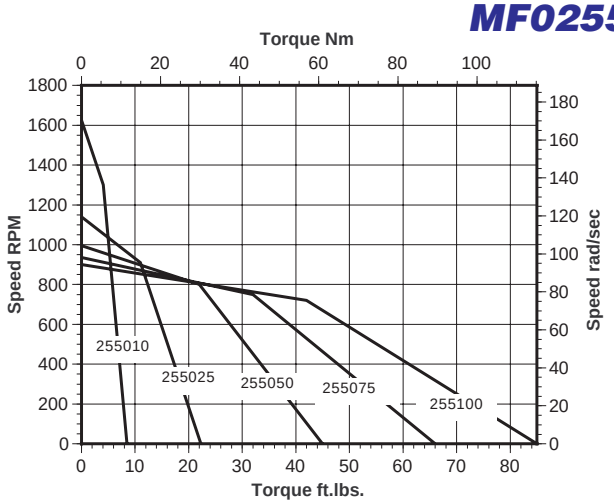
MF0150



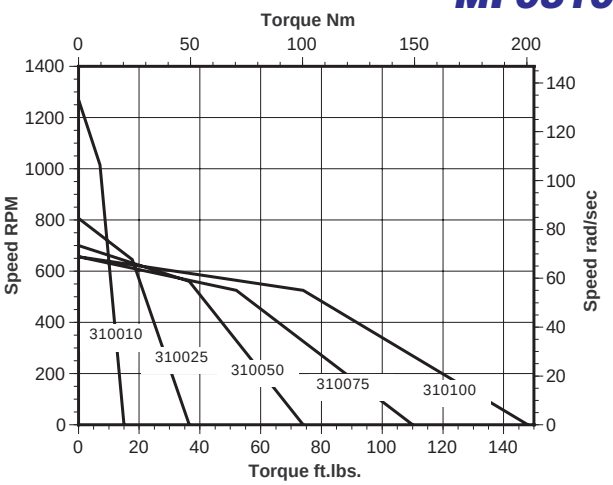
MF0210



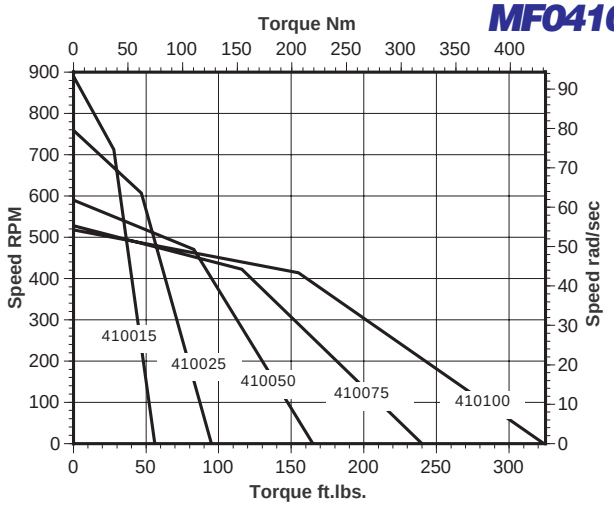
MF0255



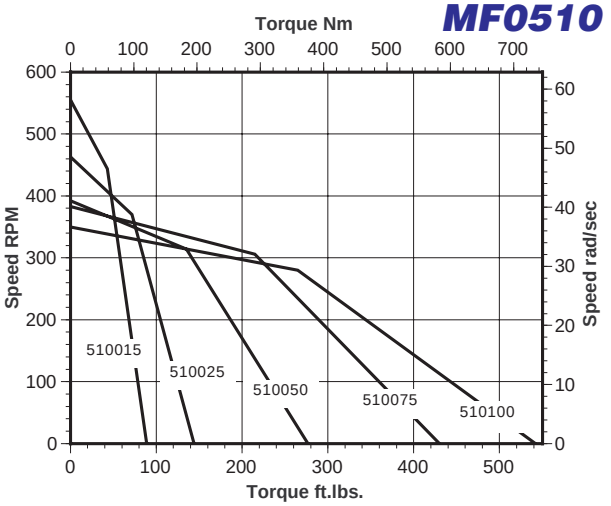
MF0310



MF0410



MF0510

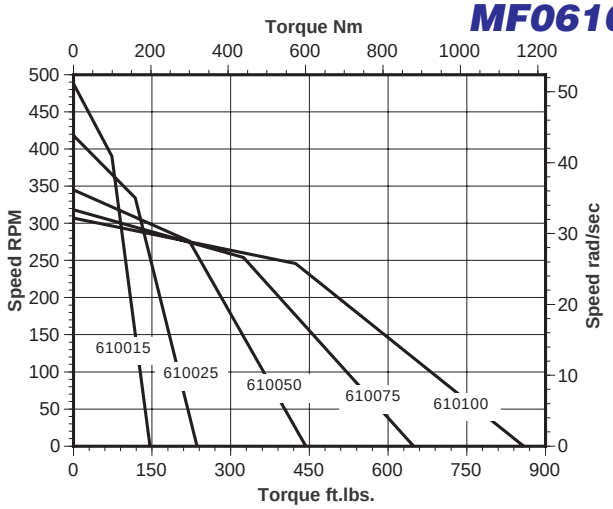


Allied Motion Technologies
Emoteq Corp

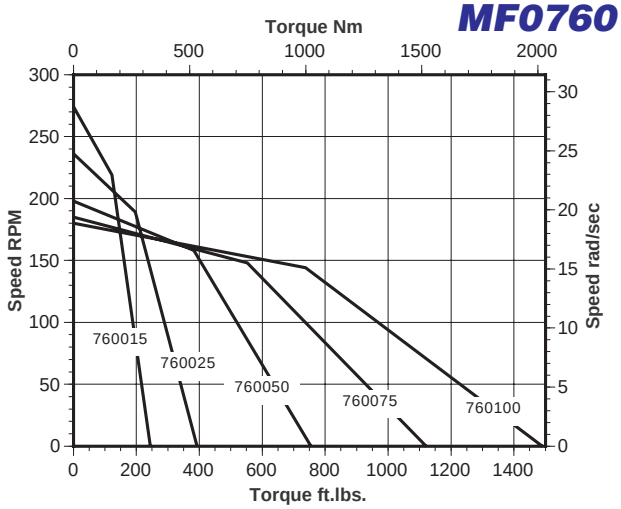
Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Megaflux Series
Thin Ring Torque Motors

MF0610



MF0760



Allied Motion Technologies
Emoteq Corp

Emoteq Corporation
10002 E. 43rd St. South
Tulsa, OK 74146
USA
Tel 918 627 1845
Fax 918 660 0207
www.emoteq.com

Sales Offices

Allied Motion Technologies
Emoteq Corp

Emoteq Corp
10002 E. 43rd St. So.
Tulsa, OK 74146
USA
Tel +1 918 627 1845
Tel +1 800 221 7572
Fax +1 918 660 0207

Emoteq UK Ltd
Innisfree, Mansfield Rd
Farnsfield, Newark
Nottinghamshire
NG22 8HG
England
Tel +44 01623 883206
Fax +44 01623 882103

Maccon GmbH
Kuhbachstr.9
D-81543 München
Germany
Tel +49 89 6512200
Fax +49 89 655217

Please contact our US office for assistance with applications engineering. Additionally, you may wish to visit our website www.emoteq.com for contact information.

Represented by: