

① Description

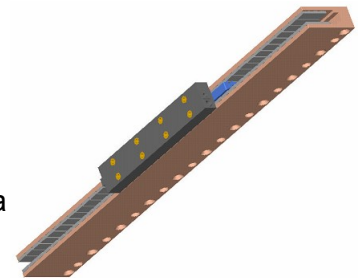
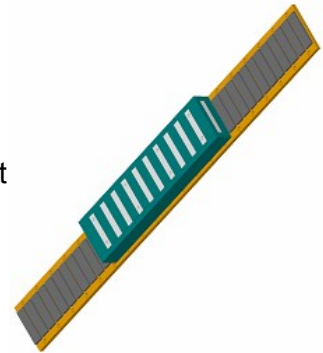
FORMOSA Linear Motors represent an innovative breakthrough in linear motor technology. Continuously developed and upgraded since 1998, these motors apply the knowledge and technology accumulated over the years by FORMOSA into everyday heavy duty industrial usage. FORMOSA's technological innovation is evidenced by its patent, NO 10-2002-0034160 which was given for its unique cooling system.

FORMOSA Linear Motors are three-phase brushless DC Motors that are powered by brushless amplifiers running in current mode or torque mode. The motors can be used in high speed, high acceleration applications that require constant repetitive action for millions and millions of cycles and are designed as a more efficient alternative to existing gears, belts, ball-screws, friction drives and rack and pinion drives.

FORMOSA Linear Motors are designed to be fully compatible with a variety of commercial linear encoders, drive amplifiers and motion controllers.

② Advantages of FORMOSA Linear Motors

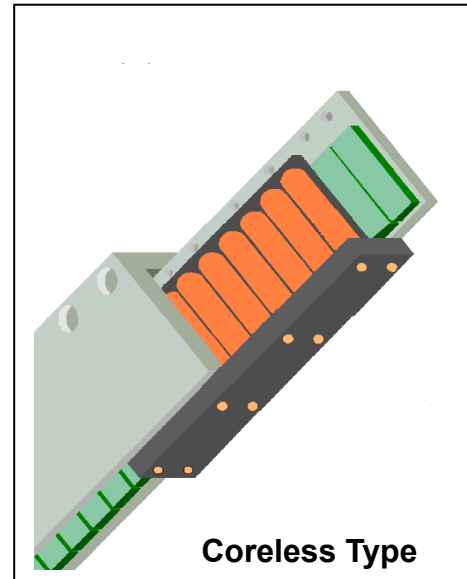
- ▶ High Velocity and Acceleration – High Velocity and Acceleration is attainable because there is no physical contact between the coil and the magnet. FORMOSA's Coreless Linear Motor are designed to achieve an acceleration of up to 15Gs and speeds of up to 10m/s.
- ▶ Unique Cooling system – The unique cooling tube inside the heat producing Coil assembly maximizes cooling performance, making it possible for FORMOSA's Linear Motor to sustain a higher level of current and force over contemporary Linear Motor designs.
- ▶ High Accuracy and Fidelity – FORMOSA's Linear motors can be equipped with a linear encoder which gives positional feedback to the motion controller, enabling the linear motor to maintain a positional accuracy of within +/-1 pulse of the Encoder.
- ▶ Smaller Positioning System – Because multiple coil assemblies can be mounted onto a single Magnet Track and controlled independently, the size of the positioning system can be drastically reduced.
- ▶ Simple Mechanical Design – Unlike other motors, FORMOSA's linear motor doesn't need a coupler to transfer force, this means that the produced force can be coupled directly to the load keeping the overall system efficient and simple.
- ▶ Longer Life Expectancy – Because there is no physical contact within the motor itself, resulting in a longer life expectancy of the motor, Linear Motors are ideal for use in applications where performance without any degradation is critical factor.



③ Coreless Type

Motor is composed of a mover(coil assembly) and a stator (magnet array).

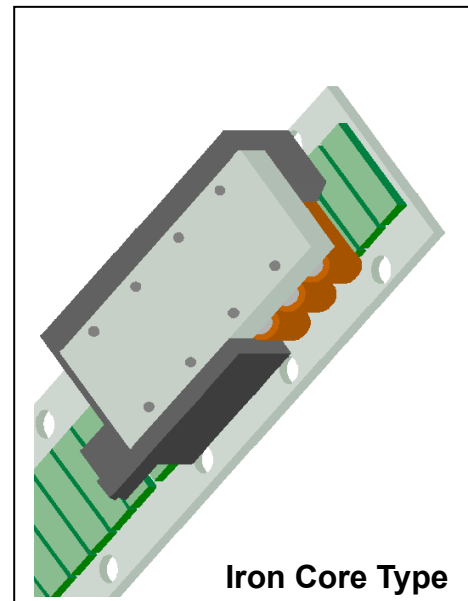
- ▶ Move
 - Without Core (No Magnetic Material)
 - Self Bonding Coil Assembly (High Fill Factor)
 - Rigid Molding Structure
 - Air Cooling in Mid- Coil Ejected to the Move Directly
- ▶ Stator
 - Iron Plate (Magnetic Flux Path)
 - Double Sided Magnet Array with exact equal space
- ▶ Characteristics
 - No Magnetic Attraction
 - Low Force Ripple/ Noise / Vibration
 - Cogging Free Smooth Motion (High Accuracy even at Extremely Low speed)
 - Excellent Heat Removal Mechanism



④ Iron Core Type

Motor is composed of a mover(coil assembly) and a stator (magnet array).

- ▶ Move
 - Coil inserted in Slot of Iron Core
 - Self Bonding Coil Assembly (High Fill Factor)
 - Rigid Molding Structure
- ▶ Stator
 - Iron Plate (Magnetic Flux Path)
 - Single Sided Magnet Array with exact equal space
- ▶ Characteristics
 - Balanced Back EMF Teeth Shape (Negligible Magnetic End Effect)
 - Low Force Ripple/ Good Controllability
 - Optimal Shape Design for Minimizing Cogging Force
 - High Power Rate



Coreless Type

Basic Specifications

- Rating Condition : Continuous
- Voltage Endurance : AC 1500V, 1 Min
- Operating Temperature : 0 ~ 40°C
- Coil Insulation Class : F Class (155°C)
- Hall Effect Device: Optional
- Air cooling available at no extra cost
- Power Supply Requirement: Trapezoidal or Sinusoidal
3-phase Brushless Amplifier.

FL-DMI Series

Performance Specifications

Model	Unit	DM120	DM130	DM140	DM150
Continuous Force	N	22.4	33.6	44.8	56.0
Continuous Current	Ams	1.0	1.0	1.0	1.0
Max. Force	N	67.2	100.8	134.4	168.1
Max. Current	Ams	3.1	3.1	3.1	3.1
Force Constant (K_f)	N/Ams	22.01	33.02	44.03	55.04
Back EMF Constant (K_e)	Vms/ (m/sec)	7.34	11.01	14.68	18.35
Electrical Time Constant	msec	0.2	0.2	0.2	0.2
Resistance (line-line)	Ohm	17.05	25.58	34.10	42.63
Inductance(line-line)	mH	3.39	5.09	6.78	8.48
Power Loss	W	26.5	39.8	53.0	66.3
Move Weight	kg	0.32	0.46	0.60	0.74

FL – DS Series

Performance Specifications

Model	Unit	DS20	DS30	DS40	DS50
Continuous Force	N	45.8	68.1	90.8	113.6
Continuous Current	Ams	2.8	2.8	2.8	2.8
Max. Force	N	136.3	204.4	272.5	340.7
Max. Current	Ams	8.5	8.5	8.5	8.5
Force Constant (K_f)	N/Ams	16.05	24.08	32.10	40.13
Back EMF Constant (K_e)	Vms/ (m/sec)	5.35	8.03	10.70	13.38
Electrical Time Constant	msec	0.4	0.4	0.4	0.4
Resistance (line-line)	Ohm	4.16	6.22	8.30	10.38
Inductance (line-line)	mH	1.86	2.78	3.70	4.64
Power Loss	W	50.0	74.7	99.7	124.7
Move Weight	kg	0.45	0.65	0.85	1.05

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FL – DM Series

Performance Specifications

Model	Unit	DM20	DM30	DM40	DM50
Continuous Force	N	87.8	131.7	175.6	219.5
Continuous Current	Ams	3.9	3.9	3.9	3.9
Max. Force	N	263.4	395.1	526.8	658.5
Max. Current	Ams	11.6	11.6	11.6	11.6
Force Constant (K_f)	N/Ams	22.80	34.21	45.61	57.01
Back EMF Constant (K_e)	Vms/ (m/sec)	7.62	11.42	15.23	19.04
Electrical Time Constant	msec	0.7	0.7	0.7	0.7
Resistance (line-line)	Ohm	3.34	5.02	6.69	8.36
Inductance (line-line)	mH	2.18	3.28	4.37	5.46
Power Loss	W	74.3	111.5	148.7	185.9
Move Weight	kg	0.67	0.97	1.27	1.57

FL – DL Series

Performance Specifications

Model	Unit	DL20	DL30	DL40	DL50
Continuous Force	N	22.56	338.4	451.2	564.0
Continuous Current	Ams	11.3	11.3	11.3	11.3
Max. Force	N	676.8	1015.2	1353.6	1692.0
Max. Current	Ams	33.9	33.9	33.9	33.9
Force Constant (K_f)	N/Ams	19.95	29.92	39.89	49.87
Back EMF Constant (K_e)	Vms/ (m/sec)	6.65	9.97	13.30	16.62
Electrical Time Constant	msec	1.2	1.2	1.2	1.2
Resistance (line-line)	Ohm	0.90	1.35	1.80	2.25
Inductance (line-line)	mH	1.11	1.67	2.22	2.78
Power Loss	W	172.3	258.5	344.6	430.8
Move Weight	kg	1.22	1.79	2.36	2.93

FL – DE Series

Performance Specifications

Model	Unit	DE02	DE03	DE04	DE05
Continuous Force	N	486.7	730.1	973.4	1216.8
Continuous Current	Ams	7.7	11.6	15.4	19.3
Max. Force	N	1460.2	2190.2	2920.3	3650.4
Max. Current	Ams	23.1	34.7	46.2	57.8
Force Constant (K_f)	N/Ams	63.21	63.21	63.21	63.21
Back EMF Constant (K_e)	Vms/ (m/sec)	21.25	21.25	21.25	21.25
Electrical Time Constant	msec	11.9	11.9	11.9	11.9
Resistance (line-line)	Ohm	3.45	2.30	1.73	1.38
Inductance (line-line)	mH	40.95	27.30	20.48	16.38
Power Loss	W	306.8	460.2	613.7	767.1
Move Weight	kg	2.26	3.32	4.38	5.44

Iron Core Type

Basic Specifications

- Rating Condition : Continuous
- Voltage Endurance : AC 1500V, 1 Min
- Operating Temperature : 0 ~ 40°C
- Coil Insulation Class : F Class (155°C)
- Hall Effect Device: Optional
- Power Supply Requirement: Trapezoidal or Sinusoidal
3-phase Brushless Amplifier.

FL – PMI Series

Performance Specifications

Model	Unit	PMI 10C	PMI 20C	PMI 30C	PMI 40C
Continuous Force	N	18.9	38.3	57.2	75.8
Continuous Current	Ams	1.3	1.3	1.3	1.3
Max. Force	N	56.8	114.8	171.7	227.3
Max. Current	Ams	3.8	3.8	3.8	3.8
Force Constant (K_f)	N/Ams	15.07	30.45	45.54	60.30
Back EMF Constant (K_e)	Vms/ (m/sec)	5.14	10.30	15.32	20.20
Electrical Time Constant	msec	2.0	2.1	2.1	2.1
Resistance (line-line)	Ohm	5.66	11.31	16.97	22.63
Inductance (line-line)	mH	11.59	23.57	35.40	47.09
Power Loss	W	13.4	26.8	40.2	53.6
Attraction Force	N	100	200	300	400

FL – PS Series

Performance Specifications

Model	Unit	PS10C	PS20C	PS30C	PS40C
Continuous Force	N	41.3	82.8	122.6	163.4
Continuous Current	Ams	2.0	2.0	2.0	2.0
Max. Force	N	123.8	248.4	367.8	490.1
Max. Current	Ams	5.9	5.9	5.9	5.9
Force Constant (K_f)	N/Ams	21.01	42.17	62.43	83.21
Back EMF Constant (K_e)	Vms/ (m/sec)	7.12	14.14	21.04	27.97
Electrical Time Constant	msec	3.6	3.7	3.7	3.7
Resistance (line-line)	Ohm	3.68	7.35	11.02	14.69
Inductance (line-line)	mH	13.15	26.89	40.36	53.80
Power Loss	W	21.3	42.5	63.7	85.0
Attraction Force	N	210	410	610	810

FL – PM Series

Performance Specifications

Model	Unit	PM10C	PM20C	PM30C	PM40C
Continuous Force	N	79.3	159.4	239.2	319.4
Continuous Current	Ams	3.8	3.8	3.8	3.8
Max. Force	N	237.9	478.2	717.5	958.1
Max. Current	Ams	11.5	11.5	11.5	11.5
Force Constant (K_f)	N/Ams	20.61	41.42	62.15	82.99
Back EMF Constant (K_e)	Vms/ (m/sec)	7.01	13.95	20.80	27.68
Electrical Time Constant	msec	4.9	4.9	5.0	5.0
Resistance (line-line)	Ohm	1.65	3.29	4.88	6.51
Inductance (line-line)	mH	8.12	16.26	24.38	32.52
Power Loss	W	36.5	73.1	108.5	144.6
Attraction Force	N	390	770	1160	1540

FL – PL Series

Performance Specifications

Model	Unit	PL10C	PL20C	PL30C	PL40C
Continuous Force	N	171.4	334.3	503.5	669.1
Continuous Current	Ams	4.4	4.4	4.4	8.8
Max. Force	N	514.2	1002.9	1510.5	2007.4
Max. Current	Ams	13.3	13.3	13.3	26.5
Force Constant (K_f)	N/Ams	38.80	75.67	113.97	75.73
Back EMF Constant (K_e)	Vms/ (m/sec)	12.71	25.13	37.65	25.06
Electrical Time Constant	msec	15.6	15.6	15.6	15.6
Resistance (line-line)	Ohm	2.60	5.20	7.80	2.60
Inductance (line-line)	mH	40.48	80.98	121.46	40.48
Power Loss	W	76.1	152.2	228.4	304.5
Attraction Force	N	690	1380	2070	2760

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FORMOSA®

TUBULAR MOTORS



- FULL RANGE OF TUBULAR MOTOR WITH CONTROLLER & ACCESSORIES.
- AC100V~230V 50/60Hz, WITH CE ,UL SAFETY APPROVAL

AC&DC ACTUATORS



- FULL RANGE OF ELECTRIC ACTUATOR GEARED MOTOR WITH CONTROLLER
- AC100V~230V 50/60Hz, WITH CE ,UL SAFETY APPROVAL

LINEAR GUIDWAY



- FULL RANGE OF LINEAR GUIDWAY , . IN ACCORD WITH JIS STANDARD.

BALLSCREWS



- FULL RANGE OF BALLSCREWS , . IN ACCORD WITH JIS STANDARD.

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