



Slotless Linear Servo Motor

Compumotor's SL Series brushless linear servo motors feature the same slotless winding design made popular by our SM and SE Series rotary servo motors. Along with reduced manufacturing costs, the slotless design creates several performance advantages when compared to traditional ironcore and ironless linear servo motors.

The Linear Motor Concept

The idea is simple enough. Take a conventional rotary servo motor and unwrap it. What was the stator is now a

forcer and the rotor becomes a magnet bar. With this design, the motor is connected directly to the load. Direct linear motion is achieved without any rotary to linear transmission devices. The direct coupling of the forcer to the load provides these performance benefits:

- High Speeds
- High Precision
- High Stiffness
- Zero Backlash
- Low Maintenance
- Fast Response

Part Numbering System: Forcer

Series	Forcer Width	# Poles	Winding	Commutation	-	Cable Length	Options
SL	043	04	A	H		FL	N
	063	06		N		10	W*
	102	08		25			
	140	10					
		12					

* W option (water cooling is not available on the SL043 size forcers).
Air cooling standard on all forcers except SL043.

Example: SL06308AH-10W (63mm wide forcer, 8 pole, A winding, Hall-effect commutation, 10 foot cabling, W water cooled).

Summary Chart: Below is a summary of linear motor attributes and how each technology compares to the others.

ATTRIBUTE	IronCore	AirCore	Slotless
Cost	Low	High	Lowest
Attractive Force	Highest	None	Moderate
Cogging	Highest	None	Moderate
Force / Size	Best	Moderate	Good
Thermal Characteristics	Best	Lowest	Good
Forcer Weight	Heaviest	Lightest	Moderate
Forcer Strength	Best	Worst	Good

Product Specifications:

Convection cooled

Model	Force Cont. N (lbs)	Force Peak N (lbs)	Force Attr. N (lbs)	Length mm (in)	Width mm (in)	Height mm (in)	Height w/ rail mm (in)
SL04304	20 (4.5)	60 (13.5)	112 (25)	132.1 (5.2)	43 (1.69)	14.73 (.58)	26.8 (1.05)
SL04306	27 (6)	81 (18)	168 (38)	174.2 (6.86)	43 (1.69)	14.73 (.58)	26.8 (1.05)
SL04308	34 (7.5)	102 (23)	224 (50)	216.2 (8.51)	43 (1.69)	14.73 (.58)	26.8 (1.05)
SL04310	43 (9.7)	129 (29)	280 (67)	258.3 (10.17)	43 (1.69)	14.73 (.58)	26.8 (1.05)
SL04312	56 (12.5)	168 (37.5)	336 (76)	300.2 (11.82)	43 (1.69)	14.73 (.58)	26.8 (1.05)
SL06304	41 (9)	122 (27)	223 (50)	135.4 (5.33)	63 (2.48)	14.73 (.58)	26.8 (1.05)
SL06306	61 (14)	183 (41)	336 (76)	177.5 (6.99)	63 (2.48)	14.73 (.58)	26.8 (1.05)
SL06308	80 (18)	240 (54)	448 (100)	219.5 (8.64)	63 (2.48)	14.73 (.58)	26.8 (1.05)
SL06310	94 (21)	283 (64)	672 (151)	261.5 (10.3)	63 (2.48)	14.73 (.58)	26.8 (1.05)
SL06312	114 (26)	342 (77)	896 (201)	303.5 (11.95)	63 (2.48)	14.73 (.58)	26.8 (1.05)
SL10204	75 (17)	225 (51)	448 (101)	133.7 (5.26)	102 (4.02)	20.3 (0.8)	33.7 (1.33)
SL10206	112 (25)	336 (75)	672 (151)	175.7 (6.92)	102 (4.02)	20.3 (0.8)	33.7 (1.33)
SL10208	150 (34)	450 (102)	896 (201)	217.7 (8.57)	102 (4.02)	20.3 (0.8)	33.7 (1.33)
SL10210	187 (42)	561 (126)	1120 (252)	259.7 (10.22)	102 (4.02)	20.3 (0.8)	33.7 (1.33)
SL10212	225 (50)	675 (150)	1344 (302)	301.7 (11.88)	102 (4.02)	20.3 (0.8)	33.7 (1.33)
SL14004	92 (21)	276 (63)	667 (152)	133.7 (5.26)	140 (5.51)	20.3 (0.8)	33.7 (1.33)
SL14006	134 (30)	402 (91)	1001 (228)	175.7 (6.92)	140 (5.51)	20.3 (0.8)	33.7 (1.33)
SL14008	164 (37)	490 (111)	1334 (303)	217.7 (8.57)	140 (5.51)	20.3 (0.8)	33.7 (1.33)
SL14010	202 (46)	606 (138)	1668 (379)	259.7 (10.22)	140 (5.51)	20.3 (0.8)	33.7 (1.33)
SL14012	246 (56)	739 (168)	2002 (455)	301.7 (11.88)	140 (5.51)	20.3 (0.8)	33.7 (1.33)

Active cooling

Model	Force, Cont. Air @ 60 psi N (lbs)	Force, Cont. Water @ 10 psi N (lbs)	
SL06304	46 (10)	53 (12)	
SL06306	64 (14)	79 (18)	
SL06308	86 (19)	119 (27)	
SL06310	105 (24)	148 (33)	
SL06312	125 (28)	182 (41)	
SL10204	75 (17)	86 (19)	
SL10206	112 (25)	128 (29)	
SL10208	150 (34)	173 (39)	
SL10210	188 (42)	215 (48)	
SL10212	226 (50)	259 (58)	
SL14004	154 (35)	198 (45)	
SL14006	235 (53)	291 (65)	
SL14008	300 (68)	356 (80)	
SL14010	361 (81)	426 (96)	
SL14012	403 (91)	475 (107)	

Notes:

- Specifications at 25° C ambient, 125° C coil temperature.
- At 40° C ambient temperature, reduce force by 12%.
- Force production assumes aluminum heatsink of 1 inch by 10 inches by length of forcer body. Without heatsink, reduce force by 30%.
- SL043 and SL102 include preliminary specifications.