IREX

POWERED BY INNOVATION

I38 Iron Core Linear Motor Parallel Connection Specification

General Motor Specifications	UNITS	Dash #	2	4	8	10	12
Attractive Preload Force using 0.5mm[.02"] clearance gap	N		299	598	1196	1495	1794
	Lbf		67	134	269	336	403
Attractive Preload Force using 1.0mm[.04"] clearance gap	N		254	508	1016	1270	1524
	Lbf		57	114	228	286	343
Max Operating Temperature	°C		125	125	125	125	125
Maximum Temp. Rise	°C		105	105	105	105	105
Coil Resistance (6 lead @ 25°C)	Ω		2	4	8	10	12
Coil Resistance (6 lead @ Max. °C)	Ω		3	6	12	15	18
Inductance @ 1kHz	mH		2	4	7	9	11
Thermal Resistance (Bracket Top Mount)	°C/W		0.29	0.14	0.07	0.06	0.05
Continuous Power Top Mount (Max. °C)	W		368	737	1474	1842	2211
Continuous Power, top mount to plate**(Max. °C)	W		230	367	585	685	782
Motor Constant	lb_f/sqrt(W)		0.6	0.9	1.3	1.4	1.5
	N/sqrt(W)		2.8	3.9	5.6	6.2	6.8
Peak Power (Max. °C, 10% Duty)	W		3684	7368	14737	18421	22105
Electrical Time Constant (@ 25°C)	ms		0.9	0.9	0.9	0.9	0.9
Maximum Line to Line Voltage	Vrms		670	670	670	670	670
Coil Weight	Pounds		0.9	1.8	3.7	4.7	5.6
	Kilograms		0.4	0.8	1.7	2.1	2.5
Coil length (inside magnet track without HED)	inch		4.81	9.61	19.21	24.01	28.81
HED increases coil length by 1.48 inch (37.6mm)	mm		122	244	488	610	732
Delta Connected Specifications	**UNITS**	**Dash #**	**2**	**4**	**8**	**10**	**12**
Force Constant using 0.5mm[.02"] clearance gap	N/A		5.7	11.5	23.0	28.7	34.5
	lb_f/A		1.3	2.6	5.2	6.5	7.7
Force Constant using 1mm[.04"] clearance gap	N/A		5.3	10.6	21.1	26.4	31.7
	lb_f/A		1.2	2.4	4.8	5.9	7.1
Phase Resistance (Δ @ 25°C)	Ω		1.4	2.8	5.5	6.9	8.3
Phase Resistance (Δ @ Max. °C)	Ω		2.0	3.9	7.8	9.8	11.8
Inductance @ 1kHz	mH		1.2	2.4	4.8	6.0	7.2
Continuous Force using 0.5mm[.02"] clearance gap	N		53.4	106.8	213.6	267.0	320.4
	lb_f		12.0	24.0	48.0	60.0	72.0
Continuous Force using 1.0mm[.04"] clearance gap	N		49.1	98.3	196.5	245.7	294.8
	lb_f		11.0	22.1	44.2	55.2	66.3
Continuous Current	A		9.30	9.30	9.30	9.30	9.30
Peak Force* using 0.5mm[.02"] clearance gap	N		249	498	996	1245	1494
	lb_f		56	112	224	280	336
Peak Force* using 1.0mm[.04"] clearance gap	N		229	458	916	1145	1374
	lb_f		51	103	206	257	309
Peak Current*	A		43.3	43.3	43.3	43.3	43.3
Continuous Force, aluminum plate heat sink** (see below)	N		62.2	111.1	198.4	240.0	281.0
	lbf		14.0	25.0	44.6	54.0	63.2
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		5.7	11.5	23.0	28.7	34.5
	V/in/s		0.1	0.3	0.6	0.7	0.9
WYE connected Specifications	**UNITS**	**Dash #**	**2**	**4**	**8**	**10**	**12**
Force Constant using 0.5mm[.02"] clearance gap	N/A		9.9	19.9	39.8	49.7	59.7
	lb_f/A		2.2	4.5	8.9	11.2	13.4
	N/A		9.2	18.3	36.6	45.8	54.9
Force Constant using 1.0mm[.04"] clearance gap	lb_f/A		2.1	4.1	8.2	10.3	12.3
Phase Resistance (Ψ @ 25°C)	Ω		4.2	8.3	16.6	20.8	25.0
Phase Resistance (Ψ @ Max. °C)	Ω		5.9	11.8	23.5	29.4	35.3
Inductance @ 1kHz	mH		3.6	7.2	14.3	17.9	21.5
Continuous Force using 0.5mm[.02"] clearance gap	N		53.4	106.8	213.6	267.0	320.4
	lb_f		12.0	24.0	48.0	60.0	72.0
Continuous Force using 0.5mm[.02"] clearance gap	N		49.1	98.3	196.5	245.7	294.8
	lb_f		11.0	22.1	44.2	55.2	66.3
Continuous Current	A		5.37	5.37	5.37	5.37	5.37
Peak Force* using 0.5mm[.02"] clearance gap	N		249	498	996	1245	1494
	lb_f		56	112	224	280	336
Peak Force* using 1.0mm[.04"] clearance gap	N		229	458	916	1145	1374
	lb_f		51	103	206	257	309
Peak Current*	A		25.0	25.0	25.0	25.0	25.0
Continuous Force, aluminum plate heat sink** (see below)	N		62.2	111.1	198.4	240.0	281.0
	lbf		14.0	25.0	44.6	54.0	63.2
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		9.9	19.9	39.8	49.7	59.7
	V/inch/s		0.3	0.5	1.0	1.3	1.5

* Notes:

Specifications based on heat sink maintained within 10°C of ambient temperature at motor bracket interface.
On time of "Peak Power" (duration) less than 1 second for peak current listed.
Back EMF plus IR drop must not exceed "Maximum Terminal Voltage" listed.
Electrical cycle length is 30.5mm. Skewed Track Cogging force estimated at 45N.
Resistance Specifications do not include the cable resistance.
Cogging force due to magnet saliency is about 45N
Custom cable required for peak current exceeding 50 ampere.
Magnet track maximum environment temperature is 50 Deg. C.
Cable adds 0.01Ω/m
Shaded columns represent "Special" models.
** Heat Sink is a 0.5 meter wide, 15mm thick aluminum plate, extending 0.25 meter beyond each end of the coil bracket, suspended in 25ºC free air using 0.5mm (.02") clearance gap.
Magnet track weight 2KG/m (1.35lb/ft)