IREX

POWERED BY INNOVATION

I70 Iron Core Linear Motor Series Connection Specification									
General Motor Specifications	**UNITS**	**Dash #**	**1**	**2**	**3**	**4**	**8**	**10**	**12**
Attractive Preload Force using 0.5mm[.02"] clearance gap	N		274	547	821	1095	2189	2737	3284
	Lbf		61.5	123	185	246	492	615	738
Attractive Preload Force using 1.0mm[.04"] clearance gap	N		233	465	698	931	1861	2326	2792
	Lbf		52.3	105	157	209	418	523	628
Max Operating Temperature	°C		125	125	125	125	125	125	125
Maximum Temp. Rise	°C		105	105	105	105	105	105	105
Coil Resistance (6 lead @ 25°C)	Ω		2.5	5.0	7.6	10.1	20.1	25.2	30.2
Coil Resistance (6 lead @ Max. °C)	Ω		3.6	7.1	10.7	14.2	28.5	35.6	42.7
Inductance @ 1kHz	mH		3.5	7.1	10.6	14.1	28.3	35.3	42.4
Thermal Resistance (Bracket Top Mount)	°C/W		0.42	0.23	0.1395	0.1046	0.05	0.04	0.03
Continuous Power Top Mount (Max. °C)	W		251	466	753	1004	2007	2509	3011
Continuous Power, top mount to plate**(Max. °C)	W		172	264	355	423	655	760	864
Motor Constant	lb_f/sqrt(W)		0.8	1.1	1.3	1.6	2.2	2.5	2.7
	N/sqrt(W)		3.45	5.07	5.98	6.91	9.77	10.92	11.96
Peak Power (Max. °C, 10% Duty)	W		2509	4656	7528	10037	20075	25093	30112
Electrical Time Constant (@ 25°C)	ms		1.4	1.4	1.4	1.4	1.4	1.4	1.4
Maximum Line to Line Voltage	Vrms		670	670	670	670	670	670	670
Coil Weight	Pounds		0.70	1.40	2.10	2.90	5.80	7.20	8.70
	Kilograms		0.32	0.64	0.95	1.32	2.64	3.27	3.95
Coil length (inside magnet track without HED)	inch		2.41	4.81	7.21	9.61	19.21	24.01	28.81
HED increases coil length by 1.48 inch (37.6mm)	mm		61.2	122.2	183.1	244.1	487.9	609.9	731.8
Delta Connected Specifications	**UNITS**	**Dash #**	**1**	**2**	**3**	**4**	**8**	**10**	**12**
Force Constant using 0.5mm[.02"] clearance gap	N/A		6.8	13.7	20.5	27.4	54.7	68.4	82.1
	lb_f/A		1.5	3.1	4.6	6.1	12.3	15.4	18.4
Force Constant using 1mm[.04"] clearance gap	N/A		6.2	12.3	18.5	24.6	49.2	61.5	73.9
	lb_f/A		1.4	2.8	4.2	5.5	11.1	13.8	16.6
Phase Resistance (Δ @ 25°C)	Ω		1.68	3.4	5.0	6.7	13.4	16.8	20.1
Phase Resistance (Δ @ Max. °C)	Ω		2.37	4.7	7.1	9.5	19.0	23.7	28.5
Inductance @ 1kHz	mH		2.4	4.7	7.1	9.4	18.8	23.5	28.2
Continuous Force using 0.5mm[.02"] clearance gap	N		54.7	109.4	164.1	218.8	437.6	547.1	656.5
	lb_f		12.3	24.6	36.9	49.2	98.4	123.0	147.6
Continuous Force using 1.0mm[.04"] clearance gap	N		49.2	98.5	147.7	196.9	393.9	492.4	590.8
	lb_f		11.1	22.1	33.2	44.3	88.6	110.7	132.8
Continuous Current	A		8.00	8.00	8.00	8.00	8.00	8.00	8.00
Peak Force* using 0.5mm[.02"] clearance gap	N		101	201	302	402	804	1005	1206
	lb_f		23	45	68	90	181	226	271
Peak Force* using 1.0mm[.04"] clearance gap	N		90	181	271	362	724	905	1086
	lb_f		20	41	61	81	163	203	244
Peak Current*	A		14.70	14.70	14.70	14.70	14.70	14.70	14.70
Continuous Force, aluminum plate heat sink** (see below)	N		58.3	102.1	144.9	182.6	321.3	387.1	451.9
	lbf		13.1	22.9	32.6	41.1	72.2	87.0	101.6
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		6.8	13.7	20.5	27.4	54.7	68.4	82.1
	V/in/s		0.2	0.3	0.5	0.7	1.4	1.7	2.1
WYE connected Specifications	**UNITS**	**Dash #**	**1**	**2**	**3**	**4**	**8**	**10**	**12**
Force Constant using 0.5mm[.02"] clearance gap	N/A		11.8	23.7	35.5	47.4	94.8	118.4	142.1
	lb_f/A		2.7	5.3	8.0	10.7	21.3	26.6	32.0
	N/A		10.7	21.3	32.0	42.6	85.3	106.6	127.9
Force Constant using 1.0mm[.04"] clearance gap	lb_f/A		2.4	4.8	7.2	9.6	19.2	24.0	28.8
Phase Resistance (Ψ @ 25°C)	Ω		5.03	10.07	15.10	20.14	40.28	50.35	60.42
Phase Resistance (Ψ @ Max. °C)	Ω		7.12	14.24	21.35	28.47	56.94	71.18	85.41
Inductance @ 1kHz	mH		7.1	14.1	21.2	28.3	56.5	70.7	84.8
Continuous Force using 0.5mm[.02"] clearance gap	N		54.7	109.4	164.1	218.8	437.6	547.1	656.5
	lb_f		12.3	24.6	36.9	49.2	98.4	123.0	147.6
Continuous Force using 0.5mm[.02"] clearance gap	N		49.2	98.5	147.7	196.9	393.9	492.4	590.8
	lb_f		11.1	22.1	33.2	44.3	88.6	110.7	132.8
Continuous Current	A		4.62	4.62	4.62	4.62	4.62	4.62	4.62
Peak Force* using 0.5mm[.02"] clearance gap	N		174	348	522	696	1393	1741	2089
	lb_f		39	78	117	157	313	391	470
Peak Force* using 1.0mm[.04"] clearance gap	N		157	313	470	627	1254	1567	1880
	lb_f		35	70	106	141	282	352	423
Peak Current*	A		14.70	14.70	14.70	14.70	14.70	14.70	14.70
Continuous Force, aluminum plate heat sink** (see below)	N		58.3	102.1	144.9	182.6	321.3	387.1	451.9
	lbf		13.1	22.9	32.6	41.1	72.2	87.0	101.6
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		11.8	23.7	35.5	47.4	94.8	118.4	142.1
	V/inch/s		0.3	0.6	0.9	1.2	2.4	3.0	3.6

* 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 1.0 seconds.
Back EMF plus IR drop must not exceed "Maximum Terminal Voltage" listed.
Electrical cycle length is 30.5mm. Watts with (0.5m wide and .25m longer than coil *15mm thick)
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 for any connection. Do not exceed 13 Ampere peak current (4-second maximum) for Series Connection
Magnet track maximum environment temperature is 50 Deg. C.
Cable adds TBDΩ/m
Shaded column represents "Special" model
** 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 25 Deg. C free air using 0.5mm (.02") clearance gap.
Magnet Track weight is 3.9kg/m (2.6 pounds/foot).