



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/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		58.73	102.1	144.9	182.6	321.3	387.1	451.9
	lb _f		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
	lb _f		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. 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 3.9ka/m (2.6 pounds/foot).	Watts with (0.5m wide and .25m longer than coil *15mm thick)
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170 Iron Core Linear Motor Parallel Connection Specification

General Motor Specifications	UNITS	Dash #	2	4	6	8	10	12
Attractive Preload Force using 0.5mm[.02"] clearance gap	N		547	1095	1642	2189	2737	3284
	Lbf		123	246	369	492	615	738
Attractive Preload Force using 1.0mm[.04"] clearance gap	N		465	931	1396	1861	2326	2792
	Lbf		105	209	314	418	523	628
Max Operating Temperature	°C		125	125	125	125	125	125
Maximum Temp. Rise	°C		105	105	105	105	105	105
Coil Resistance (6 lead @ 25°C)	Ω		1.3	2.5	3.8	5.0	6.3	7.6
Coil Resistance (6 lead @ Max. °C)	Ω		1.8	3.6	5.3	7.1	8.9	10.7
Inductance @ 1kHz	mH		2	4	5	7	9	11
Thermal Resistance (Bracket Top Mount)	°C/W		0.23	0.10	0.07	0.05	0.04	0.03
Continuous Power Top Mount (Max. °C)	W		466	931	1506	1862	2328	2793
Continuous Power, top mount to plate** (Max. °C)	W		264	529	544	1057	1322	1586
Motor Constant	lb _f /sqrt(W)		1.1	1.6	1.9	2.2	2.5	2.7
	N/sqrt(W)		5.1	6.9	8.5	9.8	10.9	12.0
Peak Power (Max. °C, 10% Duty)	W		4656	9311	15056	18622	23278	27933
Electrical Time Constant (@ 25°C)	ms		1.4	1.4	1.4	1.4	1.4	1.4
Maximum Line to Line Voltage	V _{rms}		670	670	670	670	670	670
Coil Weight	Pounds		1.4	2.9	4.3	5.8	7.2	8.7
	Kilograms		0.6	1.3	2.0	2.6	3.3	4.0
Coil length (inside magnet track without HED)	inch		4.81	9.61	14.41	19.21	24.01	28.81
HED increases coil length by 1.48 inch (37.6mm)	mm		122	244	366	488	610	732
Delta Connected Specifications	UNITS	Dash #	2	4	6	8	10	12
Force Constant using 0.5mm[.02"] clearance gap	N/A		6.8	13.7	20.5	27.4	34.2	41.0
	lb _f /A		1.5	3.1	4.6	6.1	7.7	9.2
Force Constant using 1mm[.04"] clearance gap	N/A		6.2	12.3	18.5	24.6	30.8	36.9
	lb _f /A		1.4	2.8	4.2	5.5	6.9	8.3
Phase Resistance (Δ @ 25°C)	Ω		0.8	1.7	2.5	3.4	4.2	5.0
Phase Resistance (Δ @ Max. °C)	Ω		1.2	2.4	3.6	4.7	5.9	7.1
Inductance @ 1kHz	mH		1.2	2.4	3.5	4.7	5.9	7.1
Continuous Force using 0.5mm[.02"] clearance gap	N		109.4	218.8	328.2	437.6	547.1	656.5
	lb _f		24.6	49.2	73.8	98.4	123.0	147.6
Continuous Force using 1.0mm[.04"] clearance gap	N		98.5	196.9	295.4	393.9	492.4	590.8
	lb _f		22.1	44.3	66.4	88.6	110.7	132.8
Continuous Current	A		16.00	16.00	16.00	16.00	16.00	16.00
Peak Force* using 0.5mm[.02"] clearance gap	N		201	402	603	804	1005	1206
	lb _f		45	90	136	181	226	271
Peak Force* using 1.0mm[.04"] clearance gap	N		181	362	543	724	905	1086
	lb _f		41	81	122	163	203	244
Peak Current*	A		29.4	29.4	29.4	29.4	29.4	29.4
Continuous Force, aluminum plate heat sink** (see below)	N		102.1	204.2	253.6	408.3	510.4	612.5
	lb _f		22.9	45.9	57.0	91.8	114.7	137.7
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		6.8	13.7	20.5	27.4	34.2	41.0
	V/in/s		0.2	0.3	0.5	0.7	0.9	1.0
WYE connected Specifications	UNITS	Dash #	2	4	6	8	10	12
Force Constant using 0.5mm[.02"] clearance gap	N/A		11.8	23.7	35.5	47.4	59.2	71.1
	lb _f /A		2.7	5.3	8.0	10.7	13.3	16.0
	N/A		10.7	21.3	32.0	42.6	53.3	64.0
Force Constant using 1.0mm[.04"] clearance gap	lb _f /A		2.4	4.8	7.2	9.6	12.0	14.4
Phase Resistance (Ψ @ 25°C)	Ω		2.5	5.0	7.6	10.1	12.6	15.1
Phase Resistance (Ψ @ Max. °C)	Ω		3.6	7.1	10.7	14.2	17.8	21.4
Inductance @ 1kHz	mH		3.5	7.1	10.6	14.1	17.7	21.2
Continuous Force using 0.5mm[.02"] clearance gap	N		109.4	218.8	328.2	437.6	547.1	656.5
	lb _f		24.6	49.2	73.8	98.4	123.0	147.6
Continuous Force using 0.5mm[.02"] clearance gap	N		98.5	196.9	295.4	393.9	492.4	590.8
	lb _f		22.1	44.3	66.4	88.6	110.7	132.8
Continuous Current	A		9.24	9.24	9.24	9.24	9.24	9.24
Peak Force* using 0.5mm[.02"] clearance gap	N		348	696	1045	1393	1741	2089
	lb _f		78	157	235	313	391	470
Peak Force* using 1.0mm[.04"] clearance gap	N		313	627	940	1254	1567	1880
	lb _f		70	141	211	282	352	423
Peak Current*	A		29.4	29.4	29.4	29.4	29.4	29.4
Continuous Force, aluminum plate heat sink** (see below)	N		102.1	204.2	253.6	408.3	510.4	612.5
	lb _f		22.9	45.9	57.0	91.8	114.7	137.7
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		11.8	23.7	35.5	47.4	59.2	71.1
	V/inch/s		0.3	0.6	0.9	1.2	1.5	1.8

* 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.

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 26 Ampere peak current (4-second maximum) for Parallel 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).



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Preliminary I70 Iron Core Linear Motor (Double Parallel & Higher Order Parallel Connection Specification)

General Motor Specifications	UNITS	Dash #	4	8	10	12
Attractive Preload Force using 0.5mm[.02"] clearance gap	N		1095	2189	2737	3284
	Lbf		246	492	615	738
Attractive Preload Force using 1.0mm[.04"] clearance gap	N		931	1861	2326	2792
	Lbf		209	418	523	628
Max Operating Temperature	°C		125	125	125	125
Maximum Temp. Rise	°C		105	105	105	105
Coil Resistance (6 lead @ 25°C)	Ω		0.63	1.26	1.01	1.89
Coil Resistance (6 lead @ Max. °C)	Ω		0.89	1.78	1.42	2.67
Inductance @ 1kHz	mH		1	2	1	3
Thermal Resistance (Bracket Top Mount)	°C/W		0.10	0.05	0.04	0.03
Continuous Power Top Mount (Max. °C)	W		931	1862	2328	2793
Continuous Power, top mount to plate** (Max. °C)	W		931	1862	2328	2793
Motor Constant	lb _f /sqrt(W)		1.6	2.2	2.5	2.7
	N/sqrt(W)		6.9	9.8	10.9	12.0
Peak Power (Max. °C, 10% Duty)	W		9311	18622	23278	27933
Electrical Time Constant (@ 25°C)	ms		1.4	1.4	1.4	1.4
Maximum Line to Line Voltage	Vrms		670	670	670	670
Coil Weight	Pounds		2.9	5.8	7.2	8.7
	Kilograms		1.3	2.6	3.3	4.0
Coil length (inside magnet track without HED)	inch		9.61	19.21	24.01	28.81
HED increases coil length by 1.48 inch (37.6mm)	mm		244	488	610	732
Delta Connected Specifications	UNITS	Dash #	4	8	10	12
Force Constant using 0.5mm[.02"] clearance gap	N/A		6.8	13.7	13.7	20.5
	lb _f /A		1.5	3.1	3.1	4.6
Force Constant using 1mm[.04"] clearance gap	N/A		6.2	12.3	12.6	18.5
	lb _f /A		1.4	2.8	2.8	4.2
Phase Resistance (Δ @ 25°C)	Ω		0.4	0.8	0.7	1.3
Phase Resistance (Δ @ Max. °C)	Ω		0.6	1.2	0.9	1.8
Inductance @ 1kHz	mH		0.6	1.2	0.9	1.8
Continuous Force using 0.5mm[.02"] clearance gap	N		218.8	437.6	437.6	656.5
	lb _f		49.2	98.4	98.4	147.6
Continuous Force using 1.0mm[.04"] clearance gap	N		196.9	393.9	402.6	590.8
	lb _f		44.3	88.6	90.5	132.8
Continuous Current	A		32.0	32.0	32.0	32.0
Peak Force* using 0.5mm[.02"] clearance gap	N		342	684	684	1026
	lb _f		77	154	154	231
Peak Force* using 1.0mm[.04"] clearance gap	N		308	615	629	923
	lb _f		69	138	141	208
Peak Current*	A		50.0	50.0	50.0	50.0
Continuous Force, aluminum plate heat sink** (see below)	N		270.9	541.9	677.3	812.8
	lb _f		60.9	121.8	152.3	182.7
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		6.8	13.7	13.7	20.5
	V/in/s		0.2	0.3	0.3	0.5
WYE connected Specifications	UNITS	Dash #	4	8	10	12
Force Constant using 0.5mm[.02"] clearance gap	N/A		11.8	23.7	23.7	35.5
	lb _f /A		2.7	5.3	5.3	8.0
	N/A		10.7	21.3	21.8	32.0
Force Constant using 1.0mm[.04"] clearance gap	lb _f /A		2.4	4.8	4.9	7.2
Phase Resistance (Ψ @ 25°C)	Ω		1.3	2.5	2.0	3.8
Phase Resistance (Ψ @ Max. °C)	Ω		1.8	3.6	2.8	5.3
Inductance @ 1kHz	mH		1.8	3.5	2.8	5.3
Continuous Force using 0.5mm[.02"] clearance gap	N		218.8	437.6	437.6	656.5
	lb _f		49.2	98.4	98.4	147.6
Continuous Force using 0.5mm[.02"] clearance gap	N		196.9	393.9	402.6	590.8
	lb _f		44.3	88.6	90.5	132.8
Continuous Current	A		18.48	18.48	18.48	18.48
Peak Force* using 0.5mm[.02"] clearance gap	N		592	1184	1184	1777
	lb _f		133	266	266	399
Peak Force* using 1.0mm[.04"] clearance gap	N		533	1066	1090	1599
	lb _f		120	240	245	359
Peak Current*	A		50.0	50.0	50.0	50.0
Continuous Force, aluminum plate heat sink** (see below)	N		270.9	541.9	677.3	812.8
	lb _f		60.9	121.8	152.3	182.7
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		11.8	23.7	23.7	35.5
	V/inch/s		0.3	0.6	0.6	0.9

* 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 mm. 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 for any connection. Do not exceed 44 Ampere peak current (4-second maximum) for Double Parallel Connection

Magnet track maximum environment temperature is 50 Deg. C.

Cable adds 0.055in/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°C free air using 0.5mm (.02") clearance gap.

Magnet Track weight is 3.9kg/m (2.6 pounds/foot).

Highlighted columns are special electrical connection - not double parallel