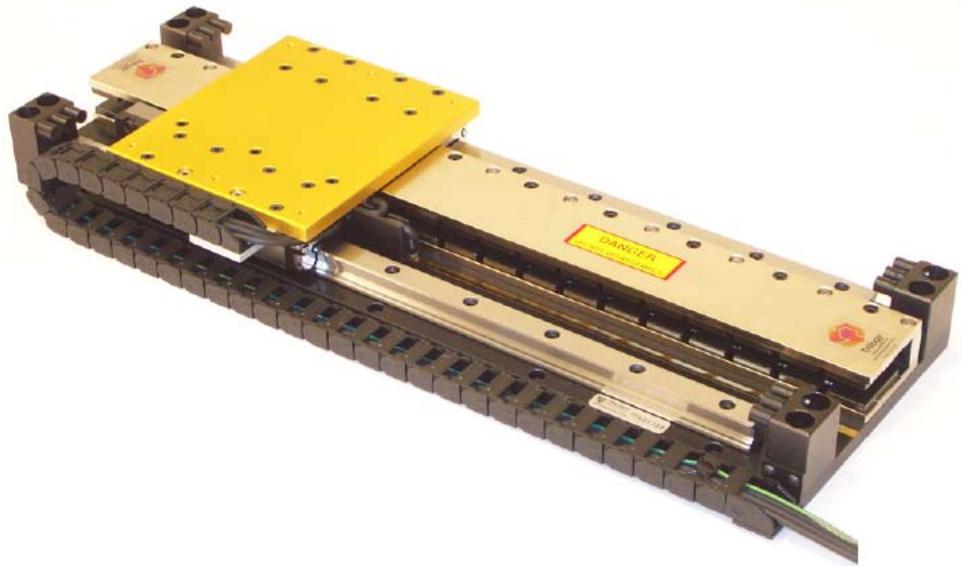
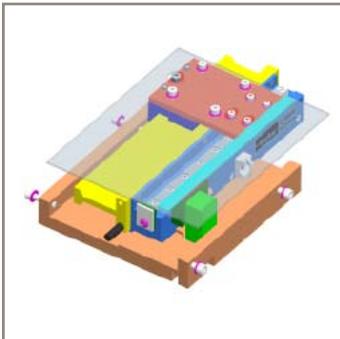
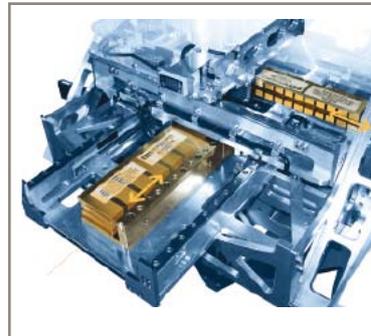


aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Trilogy

Linear Motors and Positioners



ENGINEERING YOUR SUCCESS.



WARNING – USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

I-FORCE Ironless linear motors



Parker Trilogy's I-Force ironless linear motors offer high forces and rapid accelerations in a compact package. With forces ranging from 5.5 lbf (24.5 N) - 197.5 lbf (878.6 N) continuous up to 5.5 lbf (24.5 N) - (883 lbf (3928 N) peak, the I-Force family offers a superior combination of performance and size.

The I-Force patented I-beam shape with its overlapping windings allows for a higher power density in a smaller motor, improved heat removal, and added structural stiffness. In addition, the ironless (or air core) linear motor design has no attractive force toward the magnets. This allows for easy installation and zero cogging during motion.

Ultra high-flex cables come standard with I-Force motors. In addition, we offer modular magnet tracks for unrestricted travel length. Incredibly smooth motion, high precision and high force density make the I-Force linear motors an ideal solution for your demanding positioning requirements.

Overlapping Windings:

- Increased force density
- Improved heat dissipation
- Lower temperature rise
- Smaller, less expensive motor

No attractive force toward the magnets:

- Easier/Safer assembly and handling, smoother travel (no cogging)

Uses thermally conductive epoxy together with the windings

(Patented RE34674):

- Better heat dissipation

Vacuum encapsulation process:

- Allows motors to be used in high-vacuum environments
(Rated at 10^{-6} torr, currently used in 10^{-7} torr applications)

Modular magnet track:

- Unrestricted travel length

Embedded overtemp thermostat or optional thermistor:

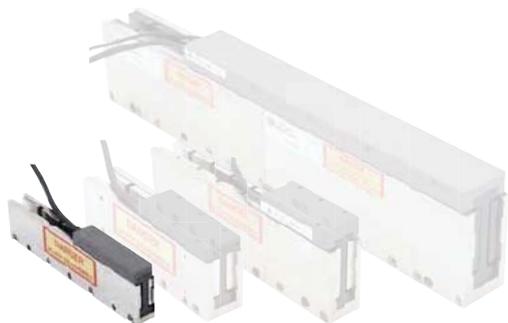
- Protects windings against overheating

Ultra high-flex cables:

- Longer cable life, good for millions of cycles

I-Force Ironless Linear Motors

110 Specifications



I-FORCE

- Ironless motor, patented, RE34674
- Cross-section: 2.05”H (50mm) x 0.82”W (21mm)
- Peak forces in two sizes to 45lbs (200N), continuous forces to 10lbs (44N)
- Precision ground 3-piece track (110 model)
- Two lengths of modular magnet tracks allow unlimited length of travel
- Single-piece magnet tracks to 36” length
- Prealigned imbedded digital Hall effect devices
- Internal thermal cutout switch protects coil

PERFORMANCE

MOTOR MODEL		110-1	110-2
Peak Force	N	108.5	202.5
	lb	24.4	45.5
Continuous Force	N	24.5	45.4
	lb	5.5	10.2
Peak Power	W	938	1641
Continuous Power	W	47	82

ELECTRICAL

MOTOR MODEL		110-1			110-2		
WIRING TYPE	UNITS	S-Series	P-Parallel	T-Triple	S-Series	P-Parallel	T-Triple
Peak Current	A _{pk sine}	15.9	31.8	47.7	14.8	29.6	44.4
	(RMS)	11.2	22.5	33.7	10.4	20.9	31.4
Continuous Current	A _{pk sine}	3.6	7.2	10.8	3.3	6.6	9.9
	(RMS)	2.5	5.1	7.6	2.3	4.7	7.0
Force Constant	N/A peak	6.8	3.4	2.3	13.7	6.8	4.6
	lb/A peak	1.5	0.8	0.5	3.1	1.5	1.0
Back EMF	V/m/s	7.9	3.9	2.6	15.7	7.9	5.2
	V/in/s	0.20	0.10	0.07	0.40	0.20	0.13
Resistance 25°C, phase to phase	ohms	3.8	1.0	0.4	7.6	1.9	1.0
Inductance, phase to phase	mH	1.0	0.3	0.1	2.0	0.5	0.2
Electrical Time Constant	ms	0.3	0.3	0.3	0.3	0.3	0.3
Motor Constant	N/W	3.56	3.56	3.56	5.02	5.02	5.02
	lb/W	0.80	0.80	0.80	1.13	1.13	1.13
Max Terminal Voltage	VDC	330	330	330	330	330	330

THERMAL

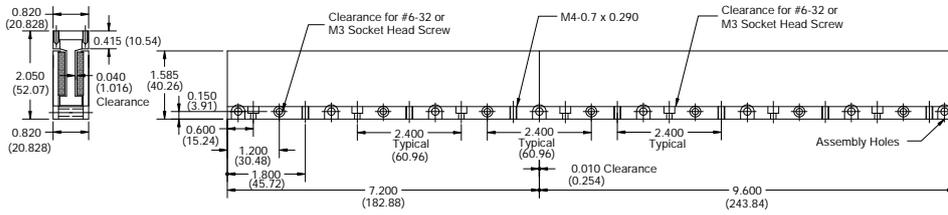
MOTOR MODEL		110-1	110-2
Thermal Resistance Wind-Amb	degC / W	1.59	0.92
Thermal Time Constant	min	3.2	3.2
Maximum Winding Temperature	°C	100	100

MECHANICAL

MOTOR MODEL		110-1	110-2
Coil Weight	kg	0.12	0.22
	lb	0.27	0.48
Coil Length	mm	81.3	142.2
	in	3.20	5.60
Attractive Force	N	0	0
	lbf	0	0
Electrical Cycle Length	mm	60.96	60.96
	in	2.40	2.40



MODULAR 11007M 11009M



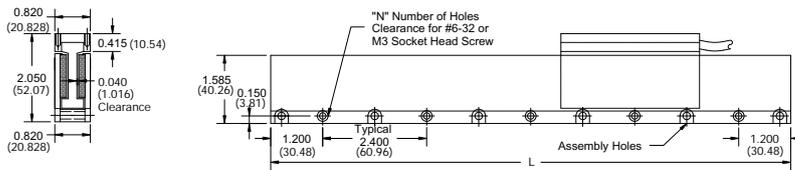
Incremental Length:
2.4in/60.96mm

Minimum Length:
2.4in/60.96mm

**Maximum Length:
(For Single Piece)**
36in/914.40mm

Weight/Foot:
2.66lbs/ft

SINGLE PIECE 110xxM1



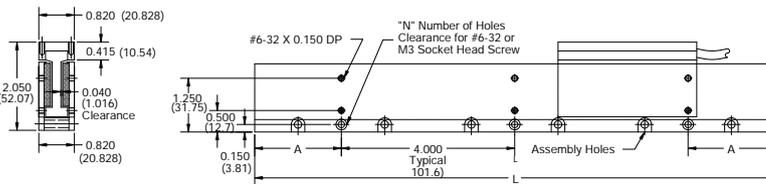
Incremental Length:
2.4in/60.96mm

Minimum Length:
2.4in/60.96mm

**Maximum Length:
(For Single Piece)**
36in/914.90mm

Weight/Foot:
2.66lbs/ft

SINGLE PIECE 110xxS



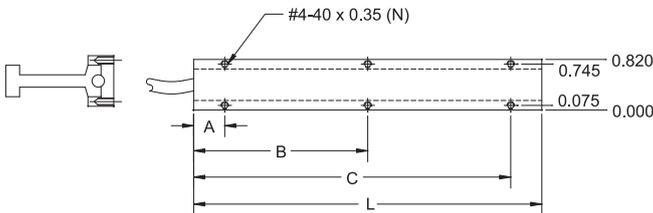
Incremental Length:
1.2in/30.48mm

Minimum Length:
8.4in/213.4mm

**Maximum Length:
(For Single Piece)**
36in/914.90mm

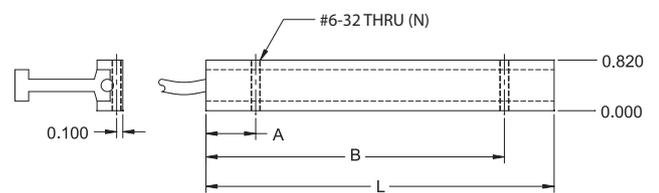
Weight/Foot:
2.66lbs/ft

(A) ENGLISH TOP MOUNTING



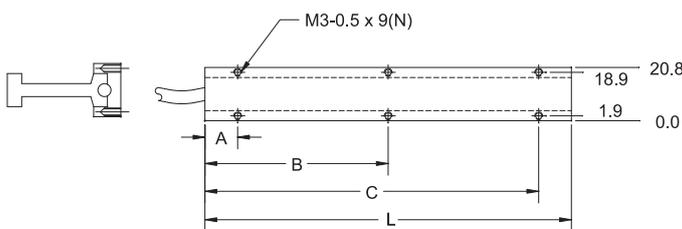
COIL SIZE (inches)	L	N	A	B	C
110-1A	3.20	4	0.50	2.70	---
110-2A	5.60	6	0.50	2.80	5.10

(B) ENGLISH SIDE MOUNTING



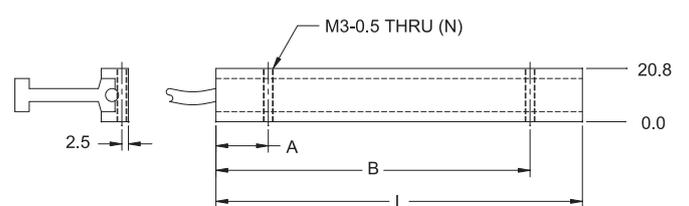
COIL SIZE (inches)	L	N	A	B
110-1B	3.20	2	0.80	2.40
110-2B	5.60	2	0.80	4.80

(M) METRIC TOP MOUNTING



COIL SIZE (mm)	L	N	A	B	C
110-1M	81.3	4	12.7	68.6	---
110-2M	142.2	6	12.7	71.1	129.5

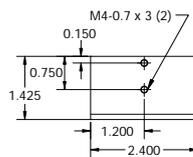
(N) METRIC SIDE MOUNTING



COIL SIZE (mm)	L	N	A	B
110-1N	81.3	2	20.3	60.9
110-2N	142.2	2	20.3	121.9

MODULAR TRACK			
LENGTH In Inches	LENGTH In mm	QUANTITY 11007M 11507M	QUANTITY 11009M 11509M
7.2	182.9	1	0
9.6	243.8	0	1
12.0	304.8	0	0
14.4	365.8	2	0
16.8	426.7	1	1
19.2	487.7	0	2
21.6	548.6	3	0
24.0	609.6	2	1
26.4	670.6	1	2
28.8	731.5	0	3
31.2	792.5	3	1
33.6	853.4	2	2
36.0	914.4	1	3
38.4	975.4	0	4
40.8	1036.3	3	2
43.2	1097.3	2	3
45.6	1158.2	1	4
48.0	1219.2	0	5
50.4	1280.2	3	3
52.8	1341.1	2	4
55.2	1402.1	1	5
57.6	1463.0	0	6
60.0	1524.0	3	4
62.4	1585.0	2	5
64.8	1645.9	1	6
67.2	1706.9	0	7
69.6	1767.8	3	5
72.0	1828.8	2	6

*Please note that 72.0 inches is NOT the maximum length for modular tracks.



P/N 11502M

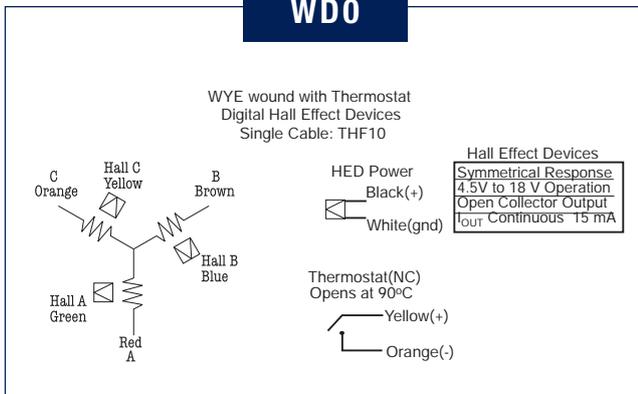


10xxS							
P/N	110xx	S	L (in)	L (mm)	A	mm	N
11008	S	8.4	205.8	0.20	5.08	3	
11009	S	9.6	235.2	0.80	20.32	3	
11010	S	10.8	264.6	1.40	35.56	3	
11012	S	12.0	294.0	2.00	50.80	3	
11013	S	13.2	323.4	2.60	66.04	3	
11014	S	14.4	352.8	3.20	81.28	3	
11015	S	15.6	382.2	3.80	96.52	3	
11016	S	16.8	411.6	0.40	10.16	5	
11018	S	18.0	441.0	1.00	25.40	5	
11019	S	19.2	470.4	1.60	40.64	5	
11020	S	20.4	499.8	2.20	55.88	5	
11021	S	21.6	529.2	2.80	71.12	5	
11022	S	22.8	558.6	3.40	86.36	5	
11024	S	24.0	588.0	4.00	101.60	5	
11025	S	25.2	617.4	0.60	15.24	7	
11026	S	26.4	646.8	1.20	30.48	7	
11027	S	27.6	676.2	1.80	45.72	7	
11028	S	28.8	705.6	2.40	60.96	7	
11030	S	30.0	735.0	3.00	76.20	7	
11031	S	31.2	764.4	3.60	91.44	7	
11032	S	32.4	793.8	0.20	5.08	9	
11033	S	33.6	823.2	0.80	20.32	9	
11034	S	34.8	852.6	1.40	35.56	9	
11036	S	36.0	882.0	2.00	50.80	9	

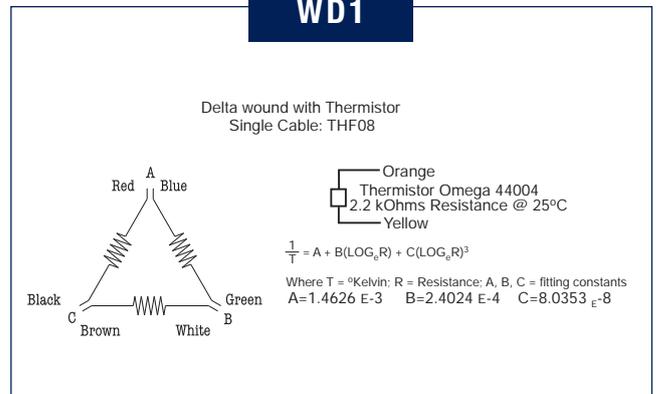
SINGLE PIECE 110xxM					
P/N	110xx	M	L (in)	L (mm)	N
11002	M	2.4	60.96	1	
11004	M	4.8	121.92	2	
11007	M	7.2	182.88	3	
11009	M	9.6	243.84	4	
11012	M	12.0	304.80	5	
11014	M	14.4	365.76	6	
11016	M	16.8	426.72	7	
11019	M	19.2	487.68	8	
11021	M	21.6	548.64	9	
11024	M	24.0	609.60	10	
11026	M	26.4	670.56	11	
11028	M	28.8	731.52	12	
11031	M	31.2	792.48	13	
11033	M	33.6	853.44	14	
11036	M	36.0	914.40	15	



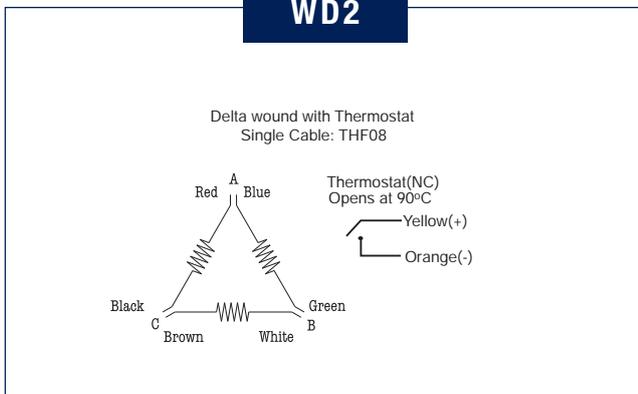
WDO



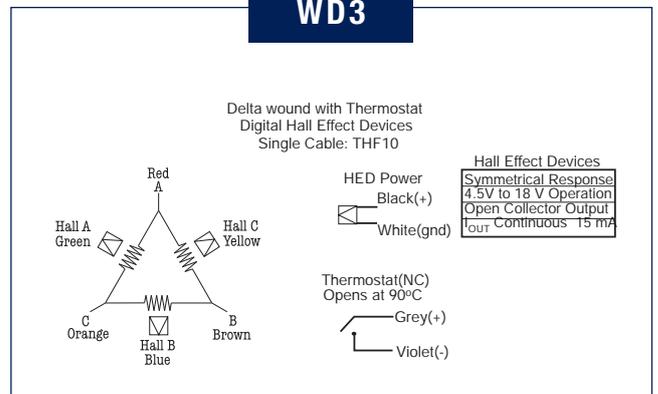
WD1



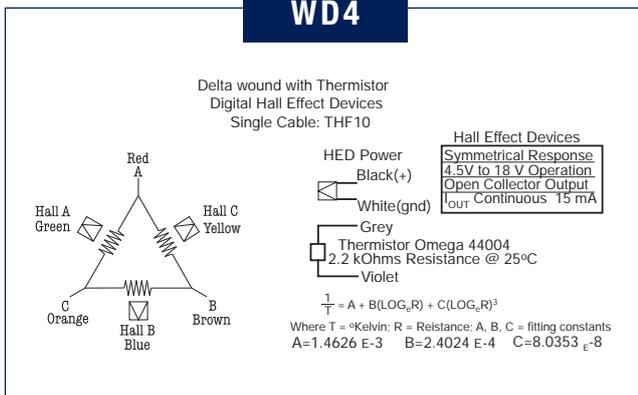
WD2



WD3



WD4



NOTES

1. Peak force and current based on 5% duty cycle and one second duration.
2. Continuous force and current based on coil winding temperature maintained at 100°C.
3. Force constant is peak of resistive force produced by 1.0 amp thru one motor lead and 0.5 amps thru other two leads. Also, Back EMF (V/in/sec) * 7.665 = Force constant (lb/amp).
4. Motor resistance measured between any two motor leads with motor connected in Delta winding at 25°C. For temperature at 100°C, multiply resistance by 1.295 (75°C rise * 0.393%/°C)
5. Back EMF measured between any two motor leads while moving at constant velocity. Value is amplitude or 0-Peak of sine wave produced.
6. Motor inductance measured using 1Kz with the motor in the magnetic field.
7. Electrical Time Constant is time it takes for motor value to reach 63% of its final current after a step change in voltage.

8. Thermal Time Constant is time it takes for motor temperature to reach 63% of its final value after a step change in power.
9. Thermal Resistance is the number of degrees (Celsius) of temperature rise in the winding per watt of power dissipated. Determined experimentally.
10. Motor Constant is a measure of efficiency. Calculated by dividing the force constant by the square root of the motor resistance at maximum operating temperature.
11. Electrical Cycle Length is distance coil must travel to complete 360° electrical cycle.
12. Use TIPS sizing software for the most accurate estimate of coil temperature for a particular motion profile.
13. Motors available with nickel plating or black epoxy coating on magnets. Track part number modified with -N or -B at end. Must be specified at time of order.

I-Force Ironless Linear Motors

210 Specifications



I-FORCE

- Ironless motor, patented, RE34674
- Cross-section: 2.25"H (57.1mm) x 1.25"W (31.7mm)
- Peak forces in four sizes to 110lbs (494), continuous forces to 24.8lb (104.5N)
- Precision ground 3-piece track (210 model)
- Two lengths of modular magnet tracks allow unlimited length of travel
- Prealigned imbedded digital HEDs, also available in separate cable from motor leads
- Internal air cooling manifold standard
- Internal thermal cutout switch protects coil

PERFORMANCE

MOTOR MODEL		210-1	210-2	210-3	210-4
Peak Force	N	137.0	255.8	375.0	494.2
	lb	30.8	57.5	84.3	111.1
Continuous Force	N	30.7	57.4	84.1	110.3
	lb	6.9	12.9	18.9	24.8
Peak Power	W	905	1583	2261	2940
Continuous Power	W	45	79	113	147

ELECTRICAL

MOTOR MODEL		210-1			210-2			210-3			210-4		
WIRING TYPE	UNITS	S-Series	P-Parallel	T-Triple									
Peak Current	A _{pk sine}	12.6	25.2	37.8	11.8	23.6	35.4	11.5	23	34.5	11.3	22.6	33.9
	(RMS)	8.9	17.8	26.7	8.3	16.7	25.0	8.1	16.3	24.4	8.0	16.0	23.9
Continuous Current	A _{pk sine}	2.8	5.6	8.4	2.6	5.2	7.8	2.6	5.2	7.8	2.5	5.0	7.5
	(RMS)	1.9	3.9	5.9	1.8	3.7	5.5	1.8	3.7	5.5	1.8	3.5	5.3
Force Constant	N/A peak	10.9	5.4	3.6	21.8	10.9	7.3	32.7	16.4	10.9	43.6	21.8	14.5
	lb/A peak	2.5	1.2	0.8	4.9	2.5	1.6	7.4	3.7	2.5	9.8	4.9	3.3
Back EMF	V/m/s	12.6	6.3	4.2	25.2	12.6	8.4	37.8	18.9	12.6	50.4	25.2	16.8
	V/in/s	0.32	0.16	0.11	0.64	0.32	0.21	0.96	0.48	0.32	1.28	0.64	0.43
Resistance 25°C, phase to phase	ohms	5.9	1.5	0.7	11.8	3.0	1.3	17.7	4.4	2.0	23.6	5.9	2.6
Inductance, phase to phase	mH	2.4	0.6	0.3	4.8	1.2	0.5	7.2	1.8	0.8	9.6	2.4	1.1
Electrical Time Constant	ms	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Motor Constant	N/W	4.54	4.54	4.54	6.45	6.45	6.45	7.87	7.87	7.87	9.12	9.12	9.12
	lb/W	1.02	1.02	1.02	1.45	1.45	1.45	1.77	1.77	1.77	2.05	2.05	2.05
Max Terminal Voltage	VDC	330	330	330	330	330	330	330	330	330	330	330	330

THERMAL

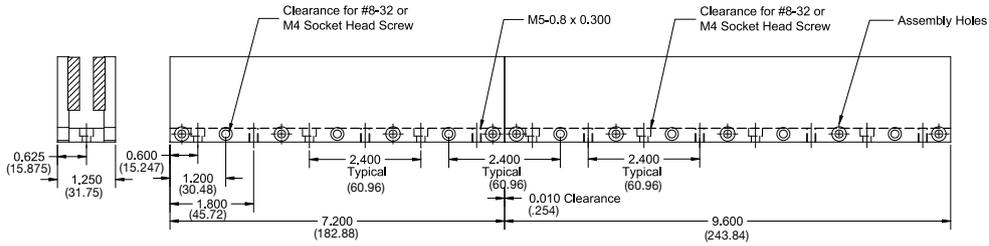
MOTOR MODEL		210-1	210-2	210-3	210-4
Thermal Resistance Wind-Amb	degC / W	1.67	0.94	0.66	0.51
Thermal Time Constant	min	4.3	4.3	4.3	4.3
Maximum Winding Temperature	°C	100	100	100	100

MECHANICAL

MOTOR MODEL		210-1	210-2	210-3	210-4
Coil Weight	kg	0.16	0.27	0.39	0.51
	lb	0.35	0.60	0.86	1.12
Coil Length	mm	81.3	142.2	203.2	264.2
	in	3.2	5.6	8.0	10.4
Attractive Force	N	0	0	0	0
	lbf	0	0	0	0
Electrical Cycle Length	mm	60.96	60.96	60.96	60.96
	in	2.4	2.4	2.4	2.4

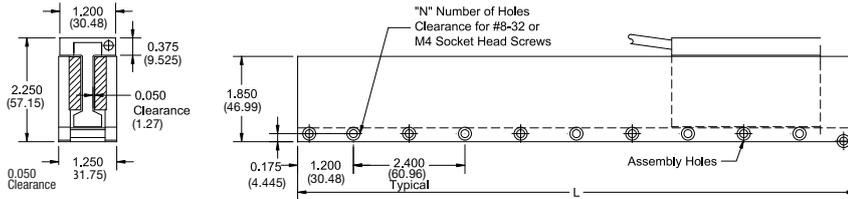


**MODULAR
21007M
21009M**



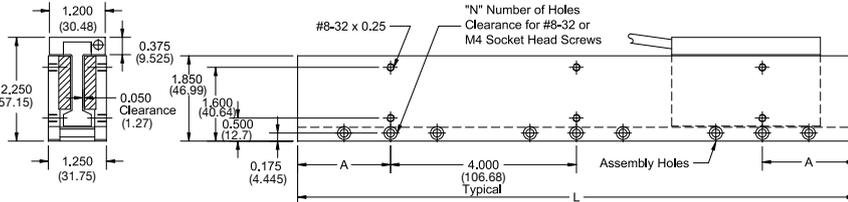
Incremental Length:
2.4in/60.96mm
Minimum Length:
2.4in/60.96mm
**Maximum Length:
(For Single Piece)**
48in/1219.2mm
Weight/Foot:
5.50lbs/ft

**SINGLE PIECE
210XXM1**



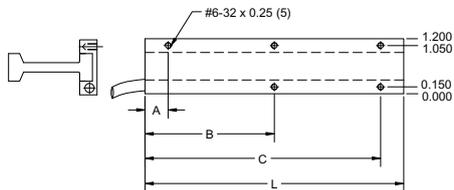
Incremental Length:
2.4in/60.96mm
Minimum Length:
2.4in/60.96mm
Maximum Length:
48in/1219.2mm
Weight/Foot:
5.50lbs/ft

**SINGLE PIECE
210XXS**

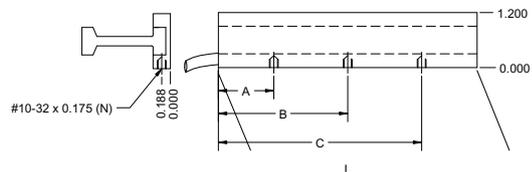


Incremental Length:
1.2in/30.48mm
Minimum Length:
8.4in/213.4mm
Maximum Length:
48in/1219.2mm
Weight/Foot:
5.50lbs/ft

(A) ENGLISH TOP MOUNTING



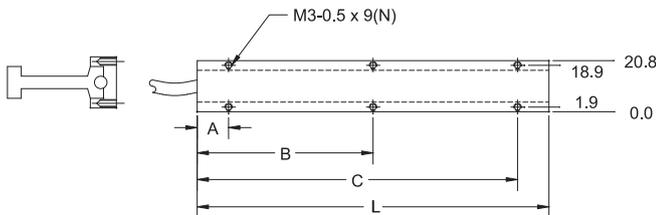
(B) ENGLISH SIDE MOUNTING



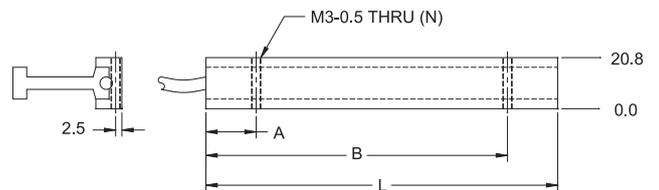
COIL SIZE (inches)	L	N	A	B	C
210-1A	3.20	5	0.50	1.60	2.70
210-2A	5.60	5	0.50	2.80	5.10
210-3A	8.00	5	0.50	4.00	7.50
210-4A	10.40	5	0.50	5.20	9.90

COIL SIZE (inches)	L	N	A	B	C
210-1B	3.20	2	1.950	2.950	---
210-2B	5.60	2	1.625	3.975	---
210-3B	8.00	3	2.438	4.000	5.562
210-4B	10.40	3	2.600	5.200	7.800

(M) METRIC TOP MOUNTING



(N) METRIC SIDE MOUNTING



COIL SIZE (mm)	L	N	A	B	C
210-1M	81.3	5	12.7	40.6	68.6
210-2M	142.2	5	12.7	71.1	129.5
210-3M	203.2	5	12.7	101.6	190.5
210-4M	264.2	5	12.7	132.1	251.5

COIL SIZE (mm)	L	N	A	B	C
210-1N	81.3	2	49.5	74.9	---
210-2N	142.2	2	41.3	101.0	---
210-3N	203.2	3	61.9	101.6	141.3
210-4N	264.2	3	66.0	132.1	198.1

MODULAR TRACK

LENGTH In Inches	LENGTH In mm	QUANTITY	
		21007M 21507M	21009M 21509M
7.2	182.9	1	0
9.6	243.8	0	1
12.0	304.8	0	0
14.4	365.8	2	0
16.8	426.7	1	1
19.2	487.7	0	2
21.6	548.6	3	0
24.0	609.6	2	1
26.4	670.6	1	2
28.8	731.5	0	3
31.2	792.5	3	1
33.6	853.4	2	2
36.0	914.4	1	3
38.4	975.4	0	4
40.8	1036.3	3	2
43.2	1097.3	2	3
45.6	1158.3	1	4
48.0	1219.2	0	5
50.4	1280.2	3	3
52.8	1341.1	2	4
55.2	1402.1	1	5
57.6	1463.0	0	6
60.0	1524.0	3	4
62.4	1585.0	2	5
64.8	1645.9	1	6
67.2	1706.9	0	7
69.6	1767.8	3	5
72.0	1828.8	2	6

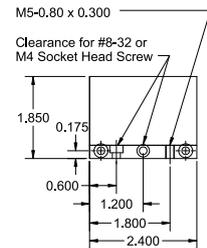
*Please note that 72.0 inches is NOT the maximum length for modular tracks.

210xxS

P/N	210xx	S	L (in)	L (mm)	A	mm	N
21008	S	8.4	205.8	0.20	5.08	3	
21009	S	9.6	235.2	0.80	20.32	3	
21010	S	10.8	264.6	1.40	35.56	3	
21012	S	12.0	294.0	2.00	50.80	3	
21013	S	13.2	323.4	2.60	66.04	3	
21014	S	14.4	352.8	3.20	81.28	3	
21015	S	15.6	382.2	3.80	96.52	3	
21016	S	16.8	411.6	0.40	10.16	5	
21018	S	18.0	441.0	1.00	25.40	5	
21019	S	19.2	470.4	1.60	40.64	5	
21020	S	20.4	499.8	2.20	55.88	5	
21021	S	21.6	529.2	2.80	71.12	5	
21022	S	22.8	558.6	3.40	86.36	5	
21024	S	24.0	588.0	4.00	101.60	5	
21025	S	25.2	617.4	0.60	15.24	7	
21026	S	26.4	646.8	1.20	30.48	7	
21027	S	27.6	676.2	1.80	45.72	7	
21028	S	28.8	705.6	2.40	60.96	7	
21030	S	30.0	735.0	3.00	76.20	7	
21031	S	31.2	764.4	3.60	91.44	7	
21032	S	32.4	793.8	0.20	5.08	9	
21033	S	33.6	823.2	0.80	20.32	9	
21034	S	34.8	842.6	1.40	35.56	9	
21036	S	36.0	882.0	2.00	50.80	9	
21037	S	37.2	911.4	2.60	66.04	9	
21038	S	38.4	940.8	3.20	81.28	9	
21039	S	39.6	970.2	3.80	96.52	9	
21040	S	40.8	999.6	0.40	10.16	11	
21042	S	42.0	1029.0	1.00	25.40	11	
21043	S	43.2	1058.4	1.60	40.64	11	
21044	S	44.4	1127.8	2.20	55.88	11	
21045	S	45.6	1158.2	2.80	71.12	11	
21046	S	46.8	1188.7	3.40	86.36	11	
21048	S	48.0	1219.2	4.00	101.6	11	

210xxM1

P/N	210xx	M1	L (in)	L (mm)	N
21002	M1	2.4	60.96	1	
21004	M1	4.8	121.62	2	
21007	M1	7.2	182.88	3	
21009	M1	9.6	243.84	4	
21012	M1	12.0	304.80	5	
21014	M1	14.4	365.76	6	
21016	M1	16.8	426.72	7	
21019	M1	19.2	487.68	8	
21021	M1	21.6	548.64	9	
21024	M1	24.0	609.60	10	
21026	M1	26.4	670.56	11	
21028	M1	28.8	731.52	12	
21031	M1	31.2	792.48	13	
21033	M1	33.6	853.44	14	
21036	M1	36.0	914.40	15	
21038	M1	38.4	975.36	16	
21040	M1	40.8	1036.32	17	
21043	M1	43.2	1097.28	18	
21045M1	M1	45.6	1158.24	19	
21048	M1	48.0	1219.20	20	



P/N 21002 M

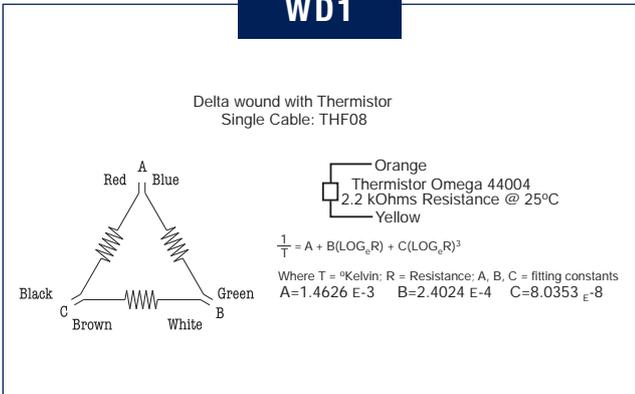


SINGLE PIECE 210xxM

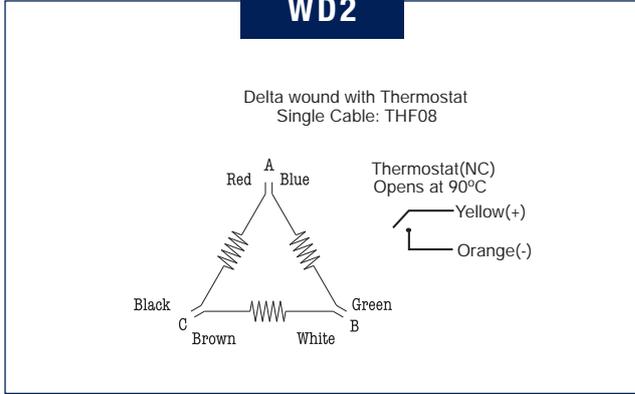
P/N	210xx	M	L (in)	L (mm)	N
21002	M	2.4	60.96	1	
21004	M	4.8	121.62	2	
21007	M	7.2	182.88	3	
21009	M	9.6	243.84	4	
21012	M	12.0	304.80	5	
21014	M	14.4	365.76	6	
21016	M	16.8	426.72	7	
21019	M	19.2	487.68	8	
21021	M	21.6	548.64	9	
21024	M	24.0	609.60	10	
21026	M	26.4	670.56	11	
21028	M	28.8	731.52	12	
21031	M	31.2	792.48	13	
21033	M	33.6	853.44	14	
21036	M	36.0	914.40	15	
21038	M	38.4	975.36	16	
21040	M	40.8	1036.32	17	
21043	M	43.2	1097.28	18	
21045	M	45.6	1158.24	19	
21048	M	48.0	1219.20	20	



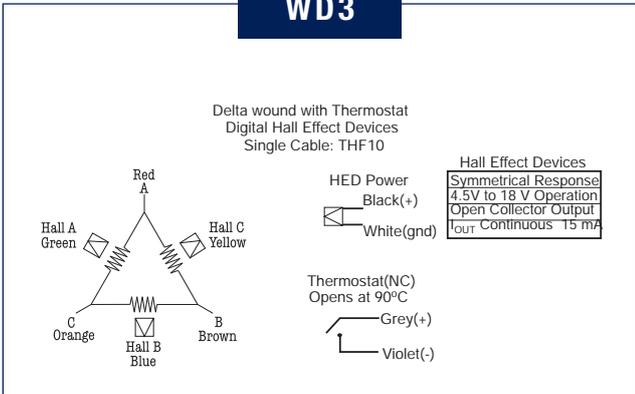
WD1



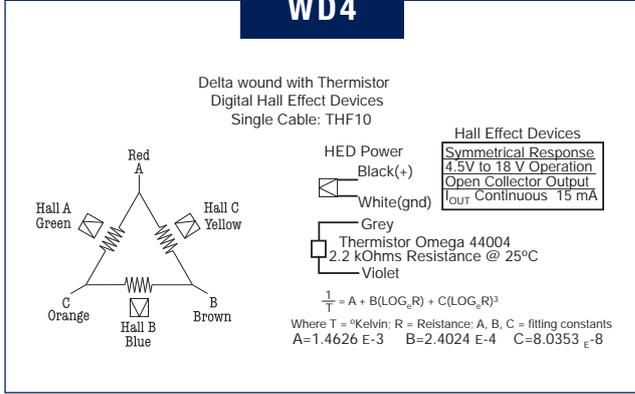
WD2



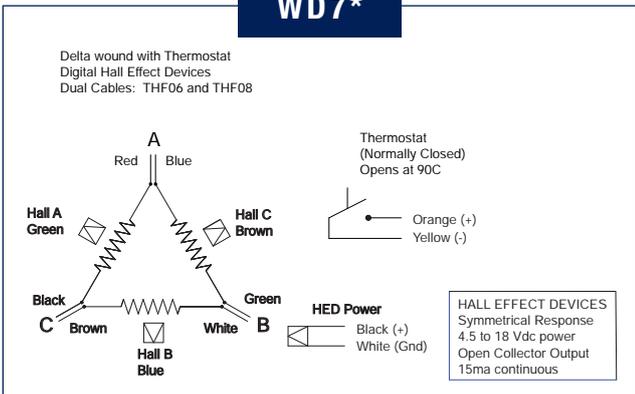
WD3



WD4



WD7*



*Preferred Configuration with Parker Drives

NOTES

1. Peak force and current based on 5% duty cycle and one second duration.
2. Continuous force and current based on coil winding temperature maintained at 100°C.
3. Force constant is peak of resistive force produced by 1.0 amp thru one motor lead and 0.5 amps thru other two leads. Also, Back EMF (V/in/sec) * 7.665 = Force constant (lb/amp).
4. Motor resistance measured between any two motor leads with motor connected in Delta winding at 25°C. For temperature at 100°C, multiply resistance by 1.295 (75°C rise * 0.393%/°C).
5. Back EMF measured between any two motor leads while moving at constant velocity. Value is amplitude or 0-Peak of sine wave produced.
6. Motor inductance measured using 1Kz with the motor in the magnetic field.
7. Electrical Time Constant is time it takes for motor value to reach 63% of its final current after a step change in voltage.

8. Thermal Time Constant is time it takes for motor temperature to reach 63% of its final value after a step change in power.
9. Thermal Resistance is the number of degrees (Celsius) of temperature rise in the winding per watt of power dissipated. Determined experimentally.
10. Motor Constant is a measure of efficiency. Calculated by dividing the force constant by the square root of the motor resistance at maximum operating temperature.
11. Electrical Cycle Length is distance coil must travel to complete 360° electrical cycle.
12. Use TIPS sizing software for the most accurate estimate of coil temperature for a particular motion profile.
13. Motors available with nickel plating or black epoxy coating on magnets. Track part number modified with -N or -B at end. Must be specified at time of order.

I-Force Ironless Linear Motors

310 Specifications



I-FORCE

- Ironless motor, patented, RE34674
- Cross-section: 3.40"H (86.4mm) x 1.35"W (34.3mm)
- Peak forces in two sizes to 263lbs (1170N), continuous forces to 58lbs (262N)
- Precision ground 3-piece track (310 model)
- Two lengths of modular magnet tracks allow unlimited length of travel
- Single-piece magnet tracks to 66" length
- Prealigned embedded digital HEDs, also available in separate cable from motor leads
- Internal air or liquid cooling available
- Internal thermal cutout switch protects coil

PERFORMANCE

MOTOR MODEL		310-1	310-2	310-3	310-4	310-5	310-6
Peak Force	N	218.9	409.3	600.0	790.0	980.0	1170.0
	lb	49.2	92.0	135.1	177.2	220.3	263.2
Continuous Force	N	49.0	91.6	133.9	176.2	219.3	262.0
	lb	11.0	20.6	30.1	39.6	49.3	58.9
Peak Power	W	1077	1885	2693	3500	4308	5116
Continuous Power	W	54	94	135	179	215	256

ELECTRICAL

MOTOR MODEL		310-1			310-2			310-3			310-4			310-5			310-6		
WIRING TYPE	UNITS	S	P	T	S	P	T	S	P	T	S	P	T	S	P	T	S	P	T
Peak Current	A pk sine	16.1	32.2	48.3	15.0	30.0	45.0	14.7	29.4	44.1	14.5	29.0	43.5	14.4	28.8	43.2	14.3	28.6	42.9
	(RMS)	11.4	22.8	34.2	10.6	21.2	31.8	10.4	20.8	31.2	10.3	20.5	30.8	10.2	20.4	30.5	10.1	20.2	30.3
Continuous Current	A pk sine	3.6	7.2	10.8	3.4	6.8	10.2	3.3	6.6	9.9	3.2	6.4	9.6	3.2	6.4	9.6	3.2	6.4	9.6
	(RMS)	2.5	5.1	7.6	2.4	4.8	7.2	2.5	4.7	7.0	2.3	4.5	6.8	2.3	4.5	6.8	2.3	4.5	6.8
Force Constant	N/A peak	13.7	6.8	4.6	27.3	13.6	9.1	40.9	20.5	13.6	54.7	27.4	18.2	68.1	34.0	22.7	81.8	40.9	27.3
	lb/A peak	3.1	1.5	1.0	6.1	3.1	2.0	9.2	4.6	3.1	12.3	6.2	4.1	15.3	7.7	5.1	18.4	9.2	6.1
Back EMF	V/m/s	15.7	7.8	5.2	31.5	15.7	10.5	47.2	23.6	15.7	63.0	31.5	21.0	78.7	39.4	26.2	94.5	47.2	31.5
	V/in/s	0.40	0.20	0.13	0.80	0.40	0.27	1.20	0.60	0.40	1.60	0.80	0.53	2.00	1.00	0.67	2.40	1.20	0.80
Resistance 25°C, phase to phase	ohms	4.3	1.1	0.5	8.6	2.2	1.0	12.9	3.2	1.4	17.2	4.3	1.9	21.5	5.4	2.4	25.8	6.5	2.9
Inductance, phase to phase	mH	3.0	0.8	0.3	6.0	1.5	0.7	9.0	2.3	1.0	12.0	3.0	1.3	15.0	3.8	1.7	18.0	4.5	2.0
Electrical Time Constant	ms	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Motor Constant	N/W	6.67	6.67	6.67	9.43	9.43	9.43	11.57	11.57	11.57	13.34	13.34	13.34	14.95	14.95	14.95	16.37	16.37	16.37
	lb/W	1.50	1.50	1.50	2.12	2.12	2.12	2.60	2.60	2.60	3.00	3.00	3.00	3.36	3.36	3.36	3.68	3.68	3.68
Max Terminal Voltage	VDC	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330

NOTE: S-Series P-Parallel T-Triple

THERMAL

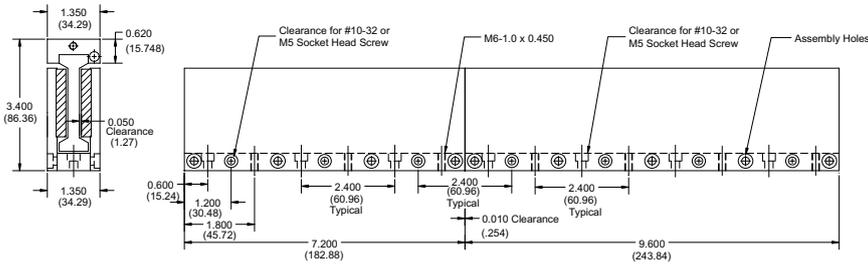
MOTOR MODEL		310-1	310-2	310-3	310-4	310-5	310-6
Thermal Resistance Wind-Amb	degC / W	1.39	0.79	0.56	0.43	0.35	0.29
Thermal Time Constant	min	7.5	7.5	7.5	7.5	7.5	7.5
Maximum Winding Temperature	°C	100	100	100	100	100	100

MECHANICAL

MOTOR MODEL		310-1	310-2	310-3	310-4	310-5	310-6
Coil Weight	kg	0.31	0.55	0.80	1.03	1.27	1.53
	lb	0.69	1.22	1.75	2.27	2.80	3.36
Coil Length	mm	81.3	142.2	203.2	264.2	325.1	386.1
	in	3.2	5.6	8.0	10.4	12.8	15.2
Attractive Force	N	0	0	0	0	0	0
	lbf	0	0	0	0	0	0
Electrical Cycle Length	mm	60.96	60.96	60.96	60.96	60.96	60.96
	in	2.4	2.4	2.4	2.4	2.4	2.4



MODULAR 31007M 31009M



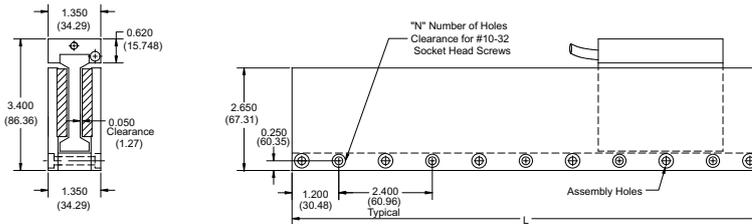
Incremental Length:
2.4in/60.96mm

Minimum Length:
2.4in/60.96mm

**Maximum Length:
(For Single Piece)**
64.8in/1645.9mm

Weight/Foot:
8.50lbs/ft

SINGLE PIECE 310xxM1



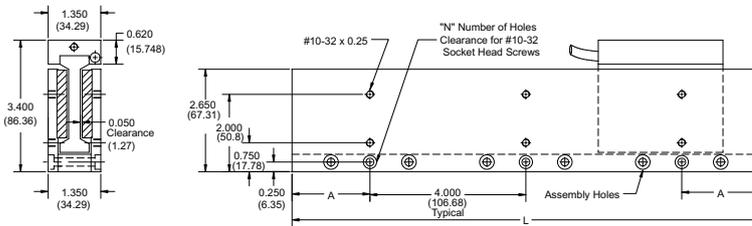
Incremental Length:
2.4in/60.96mm

Minimum Length:
2.4in/60.96mm

Maximum Length:
64.8in/1645.9mm

Weight/Foot:
8.50lbs/ft

SINGLE PIECE 310xxS



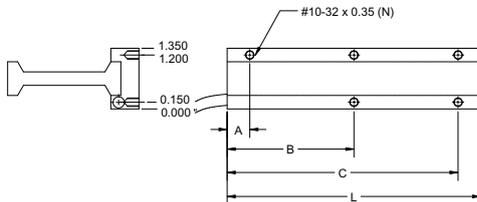
Incremental Length:
1.2in/30.48mm

Minimum Length:
8.4in/213.4mm

Maximum Length:
66in/1676.4mm

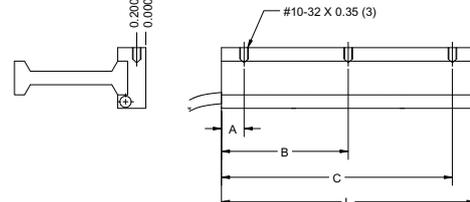
Weight/Foot:
8.50lbs/ft

(A) ENGLISH TOP MOUNTING



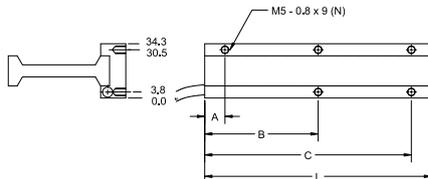
COIL SIZE (inches)	L	N	A	B	C
310-1A	3.20	5	0.50	1.60	2.70
310-2A	5.60	5	0.50	2.80	5.10
310-3A	8.00	5	0.50	4.00	7.50
310-4A	10.40	5	0.50	5.20	9.90
310-5A	12.80	5	0.50	6.40	12.30
310-6A	15.20	5	1.70	7.60	13.50

(B) ENGLISH SIDE MOUNTING



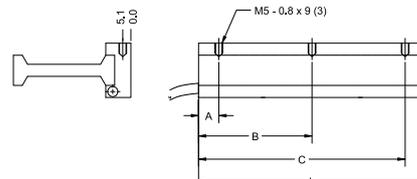
COIL SIZE (inches)	L	N	A	B	C
310-1B	3.20	3	0.50	1.60	2.70
310-2B	5.60	3	0.50	2.80	5.10
310-3B	8.00	3	0.50	4.00	7.50
310-4B	10.40	3	0.50	5.20	9.90
310-5B	12.80	3	0.50	6.40	12.30
310-6B	15.20	3	1.70	7.60	13.50

(M) METRIC TOP MOUNTING



COIL SIZE (mm)	L	N	A	B	C
310-1M	81.3	5	12.7	40.6	68.6
310-2M	141.2	5	12.7	71.1	129.5
310-3M	203.2	5	12.7	101.6	190.5
310-4M	264.2	5	12.7	132.1	251.5
310-5M	325.1	5	12.7	162.6	312.4
310-6M	386.1	5	43.2	193.0	342.9

(N) METRIC SIDE MOUNTING



COIL SIZE (mm)	L	N	A	B	C
310-1N	81.3	3	12.7	40.6	68.6
310-2N	141.2	3	12.7	71.1	129.5
310-3N	203.2	3	12.7	101.6	190.5
310-4N	264.2	3	12.7	132.1	251.5
310-5N	325.1	3	12.7	162.6	312.4
310-6N	386.1	3	43.2	193.0	342.9

MODULAR TRACK

LENGTH In Inches	LENGTH In mm	QUANTITY 31007M 31507M	QUANTITY 31009M 31509M
7.2	182.9	1	0
9.6	243.8	0	1
12.0	304.8	1	0
14.4	365.8	2	0
16.8	426.7	1	1
19.2	487.7	0	2
21.6	548.6	3	0
24.0	609.6	2	1
26.4	670.6	1	2
28.8	731.5	0	3
31.2	792.5	3	1
33.6	853.4	2	2
36.0	914.4	1	3
38.4	975.4	0	4
40.8	1036.3	3	2
43.2	1097.3	2	3
45.6	1158.3	1	4
48.0	1219.2	0	5
50.4	1280.2	3	3
52.8	1341.1	2	4
55.2	1402.1	1	5
57.6	1463.0	0	6
60.0	1524.0	3	4
62.4	1585.0	2	5
64.8	1645.9	1	6
67.2	1706.9	0	7
69.6	1767.8	3	5
72.0	1828.8	2	6

*Please note that 72.0 inches is NOT the maximum length for modular tracks.

310xxS

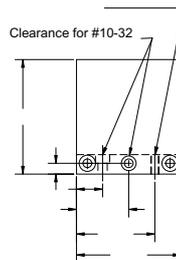
P/N	310xx	S	L (in)	L (mm)	A	A (mm)	N	P/N	310xx	S	L (in)	L (mm)	A	A (mm)	N
31008	S	8.4	205.8	0.20	5.08	3		31038	S	38.4	940.8	3.20	81.28	9	
31009	S	9.6	235.2	0.80	20.32	3		31039	S	39.6	970.2	3.80	96.52	9	
31010	S	10.8	264.6	1.40	1.40	3		31040	S	40.8	999.6	0.40	10.16	11	
31012	S	12.0	294.0	2.00	50.80	3		31042	S	42.0	1029.0	1.00	25.40	11	
31013	S	13.2	323.4	2.60	66.04	3		31043	S	43.2	1058.4	1.60	40.64	11	
31014	S	14.4	352.8	3.20	81.28	3		31044	S	44.4	1087.8	2.20	55.88	11	
31015	S	15.6	382.2	3.80	96.52	3		31045	S	45.6	1117.2	2.80	71.12	11	
31016	S	16.8	411.6	0.40	10.16	5		31046	S	46.8	1146.6	3.40	86.36	11	
31018	S	18.0	441.0	1.00	25.40	5		31048	S	48.0	1176.0	4.00	101.60	11	
31019	S	19.2	470.4	1.60	40.64	5		31049	S	49.2	1205.4	0.60	15.24	13	
31020	S	20.4	499.8	2.20	55.88	5		31050	S	50.4	1234.8	1.20	30.48	13	
31021	S	21.6	529.2	2.80	71.12	5		31051	S	51.6	1264.2	1.80	45.72	13	
31022	S	22.8	558.6	3.40	86.36	5		31052	S	52.8	1293.6	2.40	60.96	13	
31024	S	24.0	588.0	4.00	101.60	5		31054	S	54.0	1323.0	3.00	76.20	13	
31025	S	25.2	617.4	0.60	15.24	7		31055	S	55.2	1352.4	3.60	91.44	13	
31026	S	26.4	646.8	1.20	30.48	7		31056	S	56.4	1381.8	0.20	5.08	15	
31027	S	27.6	676.2	1.80	45.72	7		31057	S	57.6	1411.2	0.80	20.32	15	
31028	S	28.8	705.6	2.40	60.96	7		31058	S	58.8	1440.6	1.40	35.56	15	
31030	S	30.0	735.0	3.00	76.20	7		31060	S	60.0	1470.0	2.00	50.80	15	
31031	S	31.2	764.4	3.60	91.44	7		31061	S	61.2	1499.4	2.60	66.04	15	
31032	S	32.4	793.8	0.20	5.08	9		31062	S	62.4	1528.8	3.20	81.28	15	
31033	S	33.6	823.2	0.80	20.32	9		31063	S	63.6	1558.2	3.80	96.52	15	
31034	S	34.8	852.6	1.40	35.56	9		31064	S	64.8	1587.6	0.40	10.16	17	
31036	S	36.0	882.0	2.00	50.80	9		31066	S	66.0	1617.0	1.00	25.40	17	
31037	S	37.2	911.4	2.60	66.04	9									

310xxM1

P/N	310xx	M1	L (in)	L (mm)	N	P/N	310xx	M1	L (in)	L (mm)	N
31002	M1	2.4	60.96	1		31028	M1	28.8	731.52	12	
31004	M1	4.8	121.92	2		31031	M1	31.2	792.48	13	
31007	M1	7.2	182.88	3		31033	M1	33.6	853.44	14	
31009	M1	9.6	243.84	4		31036	M1	36.0	914.40	15	
31012	M1	12.0	304.80	5		31038	M1	38.1	975.36	16	
31014	M1	14.4	365.76	6		31040	M1	40.8	1036.32	17	
31016	M1	16.8	426.72	7		31043	M1	43.2	1097.28	18	
31019	M1	19.2	487.68	8		31045	M1	45.6	1158.20	19	
31021	M1	21.6	548.64	9		31048	M1	48.0	1219.20	20	
31024	M1	24.0	609.60	10		31050	M1	50.4	1280.16	21	
31026	M1	26.4	670.56	11		31052	M1	52.8	1341.12	22	
						31055	M1	55.2	1402.08	23	
						31057	M1	57.6	1463.04	24	
						31060	M1	60.0	1524.00	25	
						31062	M1	62.4	1584.96	26	
						31064	M1	64.8	1645.92	27	

SINGLE PIECE 310xxM

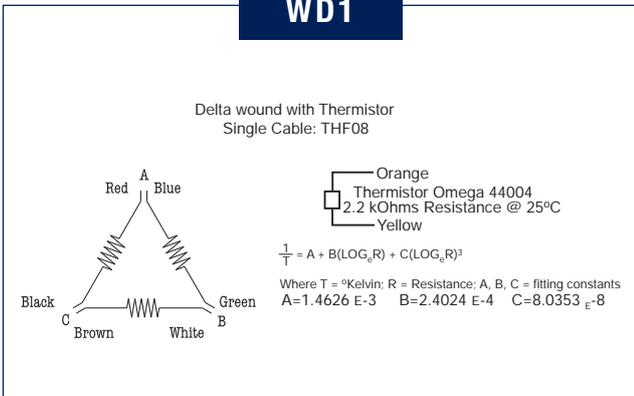
P/N	310xx	M	L (in)	L (mm)	N
31002	M	2.4	60.96	1	
31004	M	4.8	121.92	2	
31007	M	7.2	182.88	3	
31009	M	9.6	243.84	4	
31012	M	12.0	304.80	5	
31014	M	14.4	365.76	6	
31016	M	16.8	426.72	7	
31019	M	19.2	487.68	8	
31021	M	21.6	548.64	9	
31024	M	24.0	609.60	10	
31026	M	26.4	670.56	11	
31028	M	28.8	731.52	12	
31031	M	31.2	792.48	13	
31033	M	33.6	853.44	14	
31036	M	36.0	914.40	15	
31038	M	38.4	975.36	16	
31040	M	40.8	1036.32	17	
31043	M	43.2	1097.28	18	
31045	M	45.6	1158.24	19	
31048	M	48.0	1219.20	20	
31050	M	50.4	1280.16	21	
31052	M	52.8	1341.12	22	
31055	M	55.2	1402.08	23	
31057	M	57.6	1463.04	24	
31060	M	60.0	1524.00	25	
31062	M	62.4	1584.96	26	
31064	M	64.8	1645.92	27	



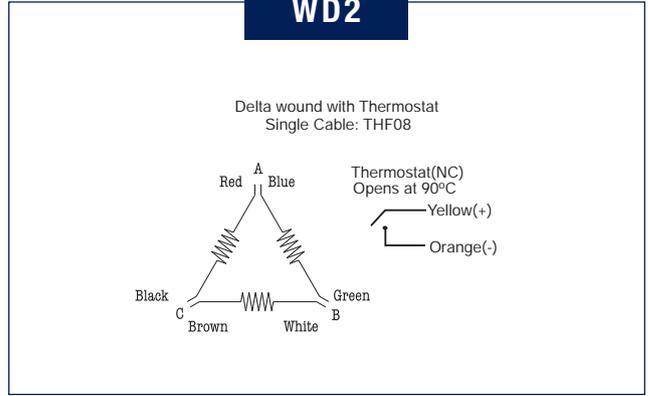
P/N 31002 M



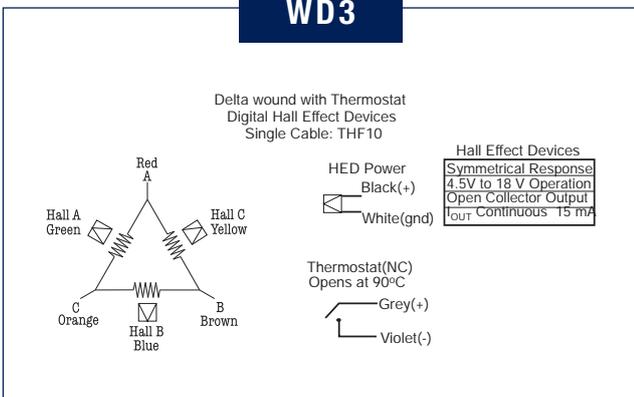
WD1



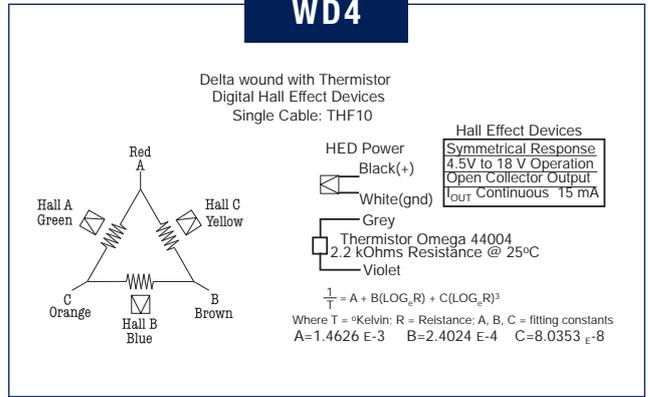
WD2



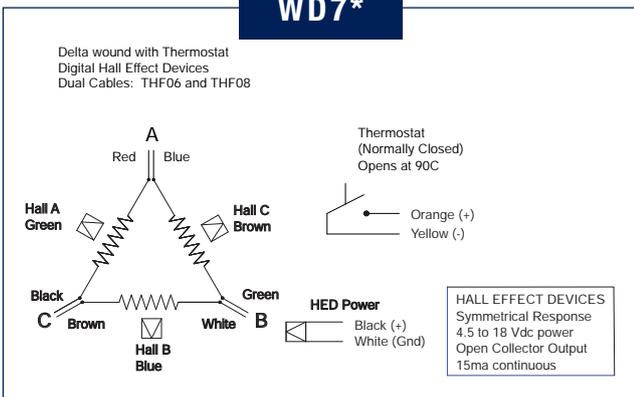
WD3



WD4



WD7*



*Preferred Configuration with Parker Drives

NOTES

1. Peak force and current based on 5% duty cycle and one second duration.
2. Continuous force and current based on coil winding temperature maintained at 100°C.
3. Force constant is peak of resistive force produced by 1.0 amp thru one motor lead and 0.5 amps thru other two leads. Also, Back EMF (V/in/sec) * 7.665 = Force constant (lb/amp).
4. Motor resistance measured between any two motor leads with motor connected in Delta winding at 25°C. For temperature at 100°C, multiply resistance by 1.295 (75°C rise * 0.393%/°C)
5. Back EMF measured between any two motor leads while moving at constant velocity. Value is amplitude or 0-Peak of sine wave produced.
6. Motor inductance measured using 1Kz with the motor in the magnetic field.
7. Electrical Time Constant is time it takes for motor value to reach 63% of its final current after a step change in voltage.

8. Thermal Time Constant is time it takes for motor temperature to reach 63% of its final value after a step change in power.
9. Thermal Resistance is the number of degrees (Celsius) of temperature rise in the winding per watt of power dissipated. Determined experimentally.
10. Motor Constant is a measure of efficiency. Calculated by dividing the force constant by the square root of the motor resistance at maximum operating temperature.
11. Electrical Cycle Length is distance coil must travel to complete 360° electrical cycle.
12. Use TIPS sizing software for the most accurate estimate of coil temperature for a particular motion profile.
13. Motors available with nickel plating or black epoxy coating on magnets. Track part number modified with -N or -B at end. Must be specified at time of order.

I-Force Ironless Linear Motors

410 Specifications



I-Force

- Ironless motor, patented, RE34674
- Cross-section: 4.50”H (114.3mm) x 2.00”W (50.8mm)
- Peak forces in two sizes to 883lbs (3928N), continuous forces to 197 lbs (878N)
- Precision ground 3-piece track (410 model)
- Two lengths of modular magnet tracks allow unlimited length of travel
- Single-piece magnet tracks to 72.24” length
- Prealigned embedded digital HEDs, also available in separate cable from motor leads
- Internal air cooling manifold or liquid cooling manifold
- Internal thermal cutout switch protects coil

PERFORMANCE

MOTOR MODEL		410-2	410-3	410-4	410-6	410-8
Peak Force	N	1041.4	1523.6	2006.3	2967.2	3928.1
	lb	234.1	342.5	451.0	667.0	883.0
Continuous Force	N	233.1	340.8	448.9	663.7	878.6
	lb	52.4	76.6	100.9	149.2	197.5
Peak Power	W	2835	4050	5265	7695	10125
Continuous Power	W	142	203	263	385	506

ELECTRICAL

MOTOR MODEL		410-2			410-3			410-4			410-6			410-8		
WIRING TYPE	UNITS	S	P	T	S	P	T	S	P	T	S	P	T	S	P	T
Peak Current	A _{pk sine}	19.1	38.2	57.3	18.6	37.2	55.8	18.4	36.8	55.2	18.1	36.2	54.3	18.0	36.0	54.0
	(RMS)	13.5	27.0	40.5	13.2	23.6	39.5	13.0	26.0	39.0	12.8	25.6	38.4	12.7	25.5	38.2
Continuous Current	A _{pk sine}	4.3	8.6	12.9	4.2	8.4	12.6	4.1	8.2	12.3	4.1	8.2	12.3	4.0	8.0	12.0
	(RMS)	3.0	6.1	9.1	3.0	5.9	8.9	2.9	5.8	8.7	2.9	5.8	8.7	2.8	5.7	8.5
Force Constant	N/A peak	54.5	27.3	18.2	81.8	40.9	27.3	109.0	54.5	36.3	163.7	81.8	54.6	218.4	109.2	72.8
	lb/A peak	12.3	6.1	4.1	18.4	9.2	6.1	24.5	12.3	8.2	36.8	18.4	12.3	49.1	24.6	16.4
Back EMF	V/m/s	63.0	31.5	21.0	94.5	47.2	31.5	126.0	63.0	42.0	189.0	94.5	63.0	252.0	126.0	84.0
	V/in/s	1.60	0.80	0.53	2.40	1.20	0.80	3.20	1.60	1.07	4.80	2.40	1.60	6.40	3.20	2.13
Resistance 25°C, phase to phase	ohms	8.0	2.0	0.9	12.0	3.0	1.3	16.0	4.0	1.8	24.0	6.0	2.7	32.0	8.0	3.6
Inductance, phase to phase	mH	10.0	2.5	1.1	15.0	3.8	1.7	20.0	5.0	2.2	30.0	7.5	3.3	40.0	10.0	4.4
Electrical Time Constant	ms	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Motor Constant	N/W	19.57	19.57	19.57	23.98	23.98	23.98	27.67	27.67	27.67	33.90	33.90	33.90	39.14	39.14	39.14
	lb/W	4.40	4.40	4.40	5.39	5.39	5.39	6.22	6.22	6.22	7.62	7.62	7.62	8.80	8.80	8.80
Max Terminal Voltage	VDC	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330

NOTE: S-Series P-Parallel T-Triple

THERMAL

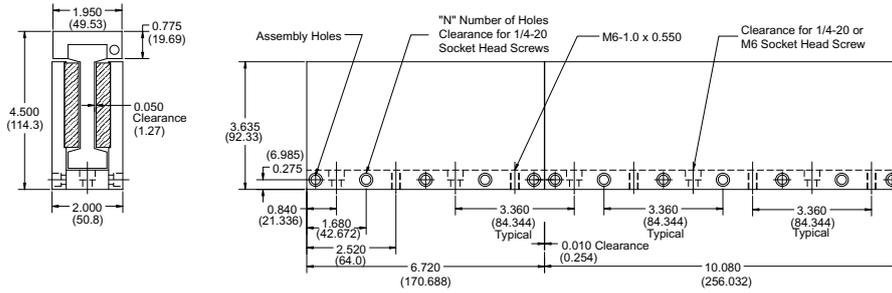
MOTOR MODEL		410-2	410-3	410-4	410-6	410-8
Thermal Resistance Wind-Amb	degC / W	0.53	0.37	0.26	0.19	0.15
Thermal Time Constant	min	15.1	15.1	15.1	15.1	15.1
Maximum Winding Temperature	°C	100	100	100	100	100

MECHANICAL

MOTOR MODEL		410-2	410-3	410-4	410-6	410-8
Coil Weight	kg	1.59	2.27	2.95	4.32	5.68
	lb	3.5	5.0	6.5	9.5	12.5
Coil Length	mm	199.1	284.5	369.8	540.5	711.2
	in	7.84	11.20	14.56	21.28	28.00
Attractive Force	N	0	0	0	0	0
	lbf	0	0	0	0	0
Electrical Cycle Length	mm	85.34	85.34	85.34	85.34	85.34
	in	3.36	3.36	3.36	3.36	3.36



MODULAR 41006M 41010M



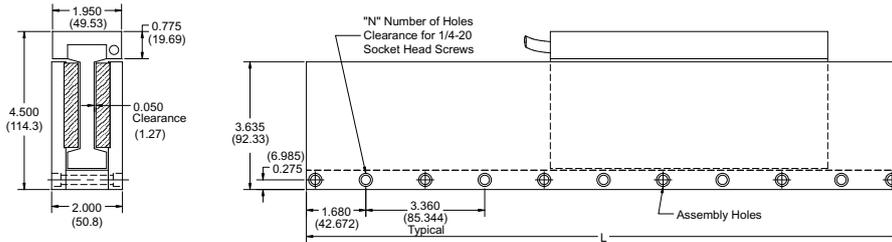
Incremental Length:
3.36in/85.34mm

Minimum Length:
6.72in/170.7mm

Maximum Length:
70.56in/1792.22mm

Weight/Foot:
20.0lbs/ft

SINGLE PIECE 410xxM1



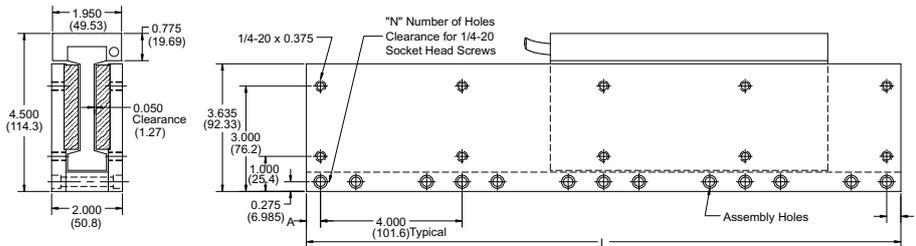
Incremental Length:
3.36in/85.34mm

Minimum Length:
6.72in/170.7mm

Maximum Length:
70.56in/1792.22mm

Weight/Foot:
20.0lbs/ft

SINGLE PIECE 410xxS



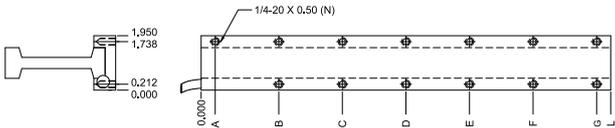
Incremental Length:
1.68in/42.67mm

Minimum Length:
16.80in/426.72mm

Maximum Length:
72.24in/1834.9mm

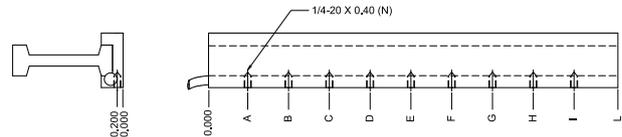
Weight/Foot:
20.0lbs/ft

(A) ENGLISH TOP MOUNTING



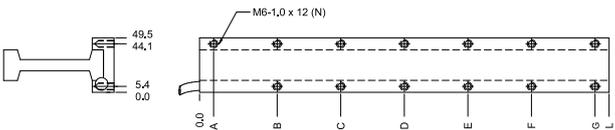
COIL SIZE (in)	L	N	A	B	C	D	E	F	G
410-2A	7.84	5	0.50	3.92	7.34	---	---	---	---
410-3A	11.20	8	0.50	1.60	5.60	9.60	10.70	---	---
410-4A	14.56	9	0.50	3.28	7.28	11.28	14.06	---	---
410-6A	21.28	13	0.50	2.64	6.64	10.64	14.64	18.64	20.78
410-8A	28.00	13	2.00	6.00	10.00	14.00	18.00	22.00	26.00

(B) ENGLISH SIDE MOUNTING



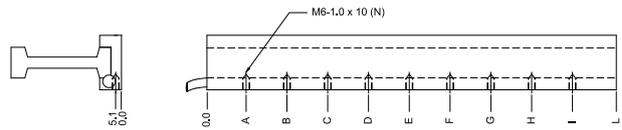
COIL SIZE (in)	L	N	A	B	C	D	E	F	G	H	I
410-2B	7.84	3	2.90	4.90	6.90	---	---	---	---	---	---
410-3B	11.20	3	4.10	7.10	10.10	---	---	---	---	---	---
410-4B	14.56	4	2.78	5.78	8.78	11.78	---	---	---	---	---
410-6B	21.28	6	3.14	6.14	9.14	12.14	15.14	18.14	---	---	---
410-8B	28.00	9	3.50	6.50	9.50	12.50	15.50	18.50	21.50	24.50	27.50

(M) METRIC TOP MOUNTING



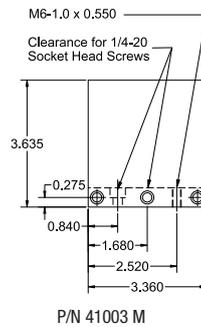
COIL SIZE (mm)	L	N	A	B	C	D	E	F	G
410-2M	199.1	5	12.7	99.6	186.4	---	---	---	---
410-3M	284.5	8	12.7	40.6	142.2	243.8	271.8	---	---
410-4M	369.8	9	12.7	83.3	184.9	286.5	357.1	---	---
410-6M	540.5	13	12.7	67.1	168.7	270.3	371.9	473.4	527.8
410-8M	711.2	13	50.8	152.4	254.0	355.6	457.2	558.8	660.4

(N) METRIC SIDE MOUNTING



COIL SIZE (mm)	L	N	A	B	C	D	E	F	G	H	I
410-2N	199.1	3	73.7	124.5	175.3	---	---	---	---	---	---
410-3N	284.5	3	104.1	180.3	256.5	---	---	---	---	---	---
410-4N	369.8	4	70.6	146.8	223.0	299.2	---	---	---	---	---
410-6N	540.5	6	79.7	156.0	232.2	308.4	384.6	460.8	---	---	---
410-8N	711.2	9	88.9	165.1	241.3	317.5	393.7	469.9	546.1	622.3	698.5

MODULAR TRACK			
LENGTH Inches	LENGTH In mm	QUANTITY 41006M	QUANTITY 41010M
6.72	170.69	1	0
10.08	256.03	0	1
13.44	341.38	0	0
16.80	426.72	1	1
20.16	512.06	0	2
23.52	597.41	2	1
26.88	682.75	1	2
30.24	768.10	0	3
33.60	853.44	2	2
36.96	938.78	1	3
40.32	1024.13	0	4
43.68	1109.47	2	3
47.04	1194.82	1	4
50.40	1280.16	0	5
53.76	1365.50	2	4
57.12	1450.85	1	5
60.48	1536.19	0	6
63.84	1621.54	2	5
67.20	1706.88	1	6
70.56	1792.22	0	7
73.92	1877.57	2	6
77.28	1962.91	1	7
80.64	2048.26	0	8
84.00	2133.60	2	7
87.36	2218.94	1	8
90.72	2304.29	0	9
94.08	2389.63	2	8
97.44	2474.98	1	9



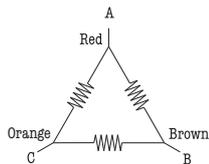
410 xx M1				
P/N	410xx M1	L (in)	L (mm)	N
41006 M1		6.72	170.69	2
41010 M1		10.08	256.03	3
41013 M1		13.44	341.38	4
41016 M1		16.80	426.72	5
41020 M1		20.16	512.06	6
41023 M1		23.52	597.41	7
41026 M1		26.88	682.75	8
41030 M1		30.24	768.10	9
41033 M1		33.60	853.44	10
41036 M1		36.96	938.78	11
41040 M1		40.32	1024.13	12
41043 M1		43.68	1109.47	13
41047 M1		47.04	1194.82	14
41050 M1		50.40	1280.16	15
41053 M1		53.76	1365.50	16
41057 M1		57.12	1450.85	17
41060 M1		60.48	1536.19	18
41063 M1		63.84	1621.54	19
41067 M1		67.20	1706.88	20
41070 M1		70.56	1792.22	21

SINGLE PIECE 410xxM				
P/N	410xx M	L (in)	L (mm)	N
41003 M		3.36	85.34	1
41006 M		6.72	170.69	2
41010 M		10.08	256.03	3
41013 M		13.44	341.38	4
41016 M		16.80	426.72	5
41020 M		20.16	512.06	6
41023 M		23.52	597.41	7
41026 M		26.88	682.75	8
41030 M		30.24	768.10	9
41033 M		33.60	853.44	10
41036 M		36.96	938.78	11
41040 M		40.32	1024.13	12
41043 M		43.68	1109.47	13
41047 M		47.04	1194.82	14
41050 M		50.40	1280.16	15
41053 M		53.76	1365.50	16
41057 M		57.12	1450.85	17
41060 M		60.48	1536.19	18
41063 M		63.84	1621.54	19
41067 M		67.20	1706.88	20
41070 M		70.56	1792.22	21



WD1

Delta wound with Thermistor
Single Cable: THF05



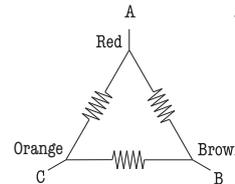
Orange
Thermistor Omega 44004
2.2 kOhms Resistance @ 25°C
Yellow

$$\frac{1}{T} = A + B(\text{LOG}_e R) + C(\text{LOG}_e R)^3$$

Where T = °Kelvin; R = Resistance; A, B, C = fitting constants
A=1.4626 E-3 B=2.4024 E-4 C=8.0353 E-8

WD2

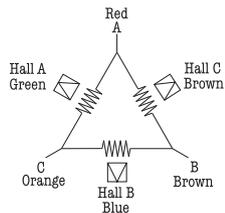
Delta wound with Thermostat
Single Cable: THF05



Thermostat(NC)
Opens at 90°C
Yellow(+)
Orange(-)

WD3

Delta wound with Thermostat
Digital Hall Effect Devices
Dual Cable: THF05 and THF06



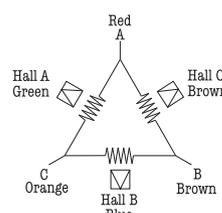
HED Power
Black(+)
White(gnd)

Thermostat(NC)
Opens at 90°C
Grey(+)
Violet(-)

Hall Effect Devices	
Symmetrical Response	4.5V to 18 V Operation
Open Collector Output	I _{OUT} Continuous 15 mA

WD4

Delta wound with Thermistor
Digital Hall Effect Devices
Dual Cable: THF05 and THF06



HED Power
Black(+)
White(gnd)

Thermistor Omega 44004
2.2 kOhms Resistance @ 25°C
Grey
Violet

$$\frac{1}{T} = A + B(\text{LOG}_e R) + C(\text{LOG}_e R)^3$$

Where T = °Kelvin; R = Resistance; A, B, C = fitting constants
A=1.4626 E-3 B=2.4024 E-4 C=8.0353 E-8

Hall Effect Devices	
Symmetrical Response	4.5V to 18 V Operation
Open Collector Output	I _{OUT} Continuous 15 mA

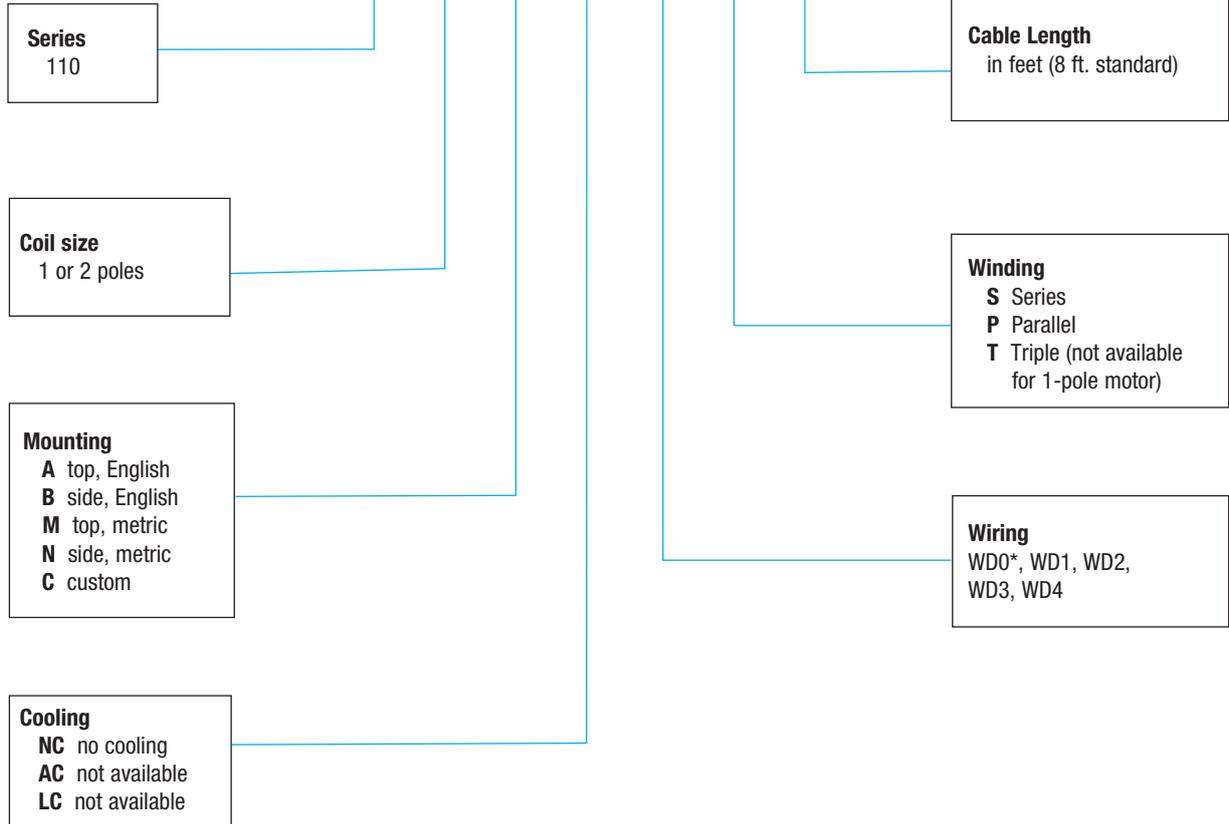
NOTES

1. Peak force and current based on 5% duty cycle and one second duration.
2. Continuous force and current based on coil winding temperature maintained at 100°C.
3. Force constant is peak of resistive force produced by 1.0 amp thru one motor lead and 0.5 amps thru other two leads. Also, Back EMF (V/in/sec) * 7.665 = Force constant (lb/amp).
4. Motor resistance measured between any two motor leads with motor connected in Delta winding at 25°C. For temperature at 100°C, multiply resistance by 1.295 (75°C rise * 0.393%/°C)
5. Back EMF measured between any two motor leads while moving at constant velocity. Value is amplitude or 0-Peak of sine wave produced.
6. Motor inductance measured using 1Kz with the motor in the magnetic field.
7. Electrical Time Constant is time it takes for motor value to reach 63% of its final current after a step change in voltage.
8. Thermal Time Constant is time it takes for motor temperature to reach 63% of its final value after a step change in power.
9. Thermal Resistance is the number of degrees (Celsius) of temperature rise in the winding per watt of power dissipated. Determined experimentally.
10. Motor Constant is a measure of efficiency. Calculated by dividing the force constant by the square root of the motor resistance at maximum operating temperature.
11. Electrical Cycle Length is distance coil must travel to complete 360° electrical cycle.
12. Use TIPS sizing software for the most accurate estimate of coil temperature for a particular motion profile.
13. Motors available with nickel plating or black epoxy coating on magnets. Track part number modified with -N or -B at end. Must be specified at time of order.

Motor Coil

Order Example:

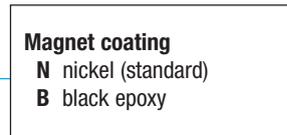
110 - 2 - B - NC - WD2 - P - 8



Magnet Track:

11024M1 - N

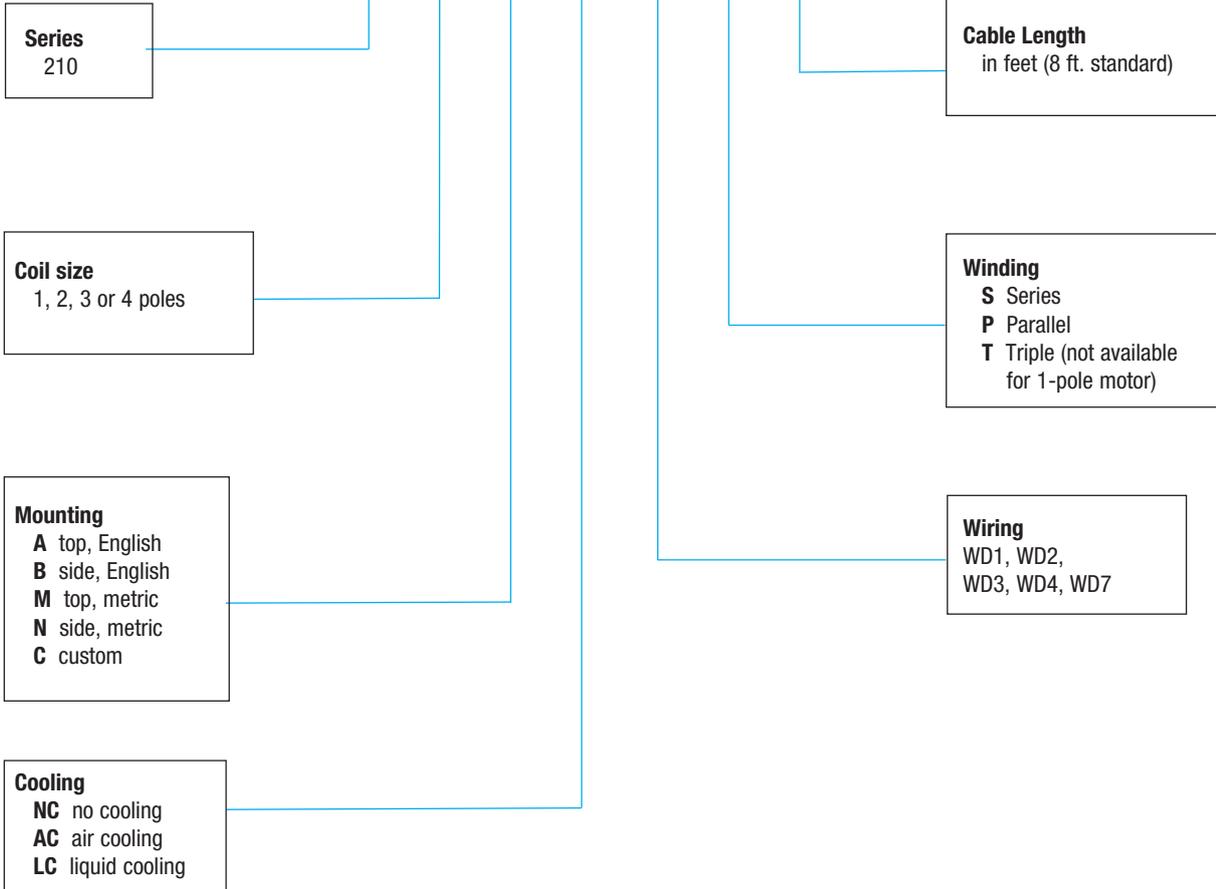
110xxM:	11007M, 11009M	7.20", 9.60	modular sections
11507M:	11507M, 11509M	7.20", 9.60	modular sections
110xxM1:	11036M1, max	36.00" max	single piece, 2.4" incr.
110xxM:	11036M, max	36.00" max	single piece, 2.4" incr.
115xxM:	11524M, max	24.00" max	single piece, 2.4" incr.
110xxS:	11036M, max	36.00" max	single piece, 1.2" incr.



Motor Coil

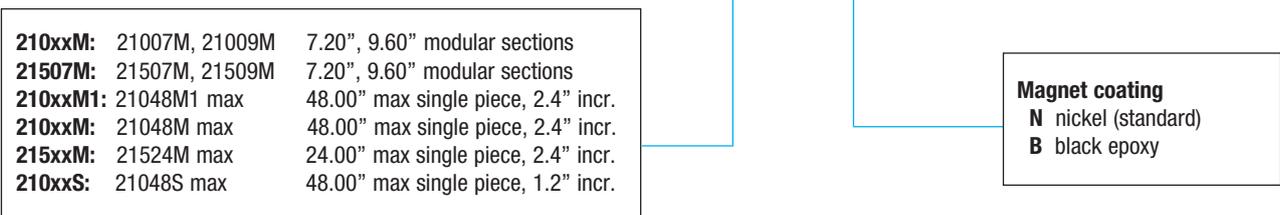
Order Example:

210 - 2 M - NC - WD2 P - 8



Magnet Track:

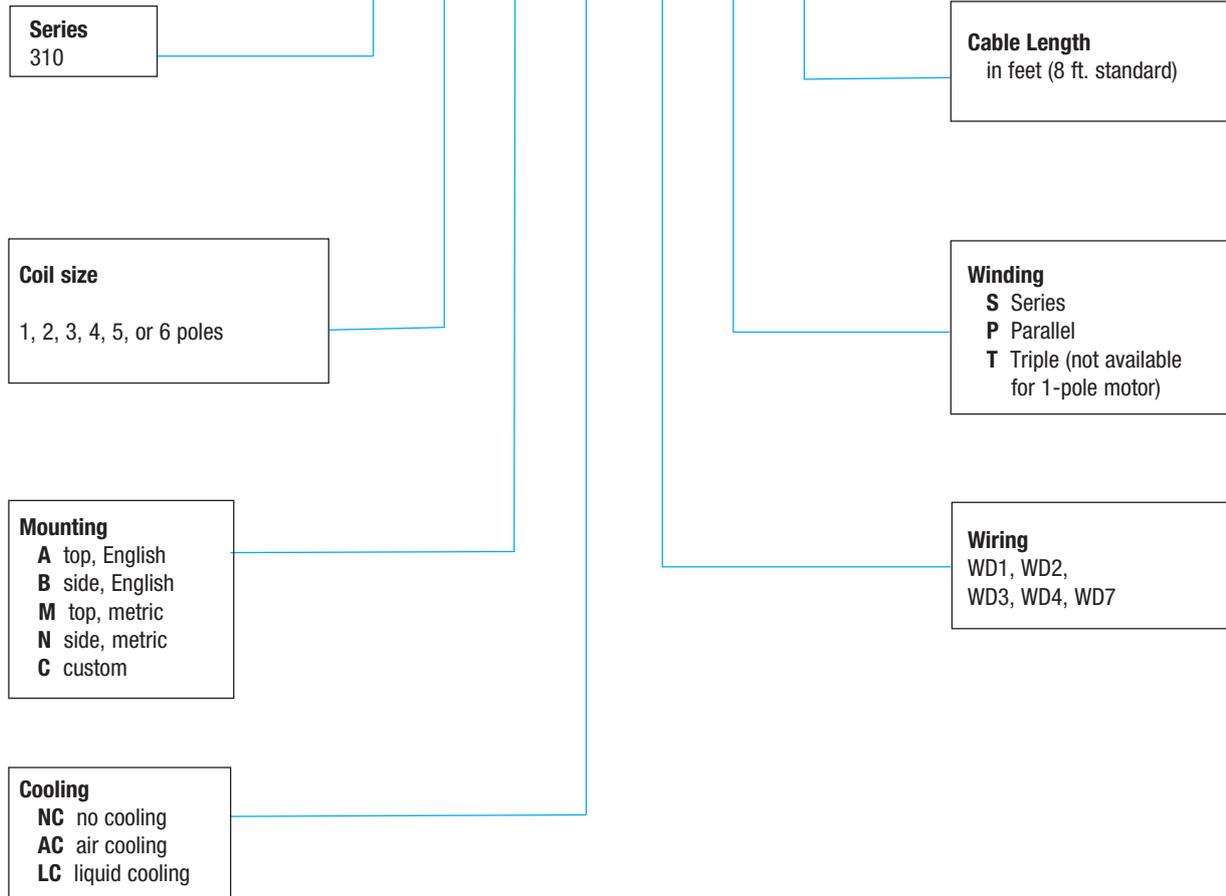
21024M1 - N



Motor Coil

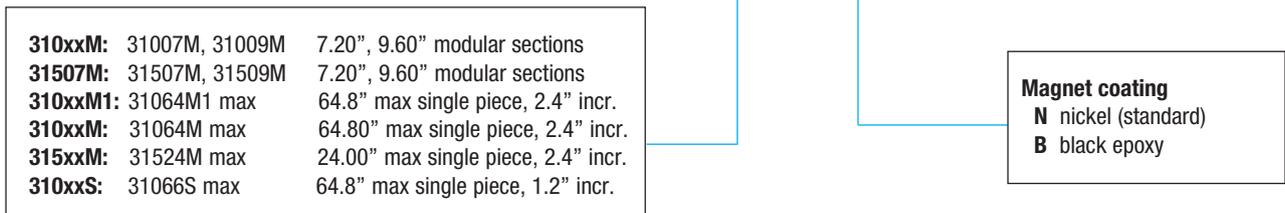
Order Example:

310 - 2 A - NC - WD2 P - 8



Magnet Track:

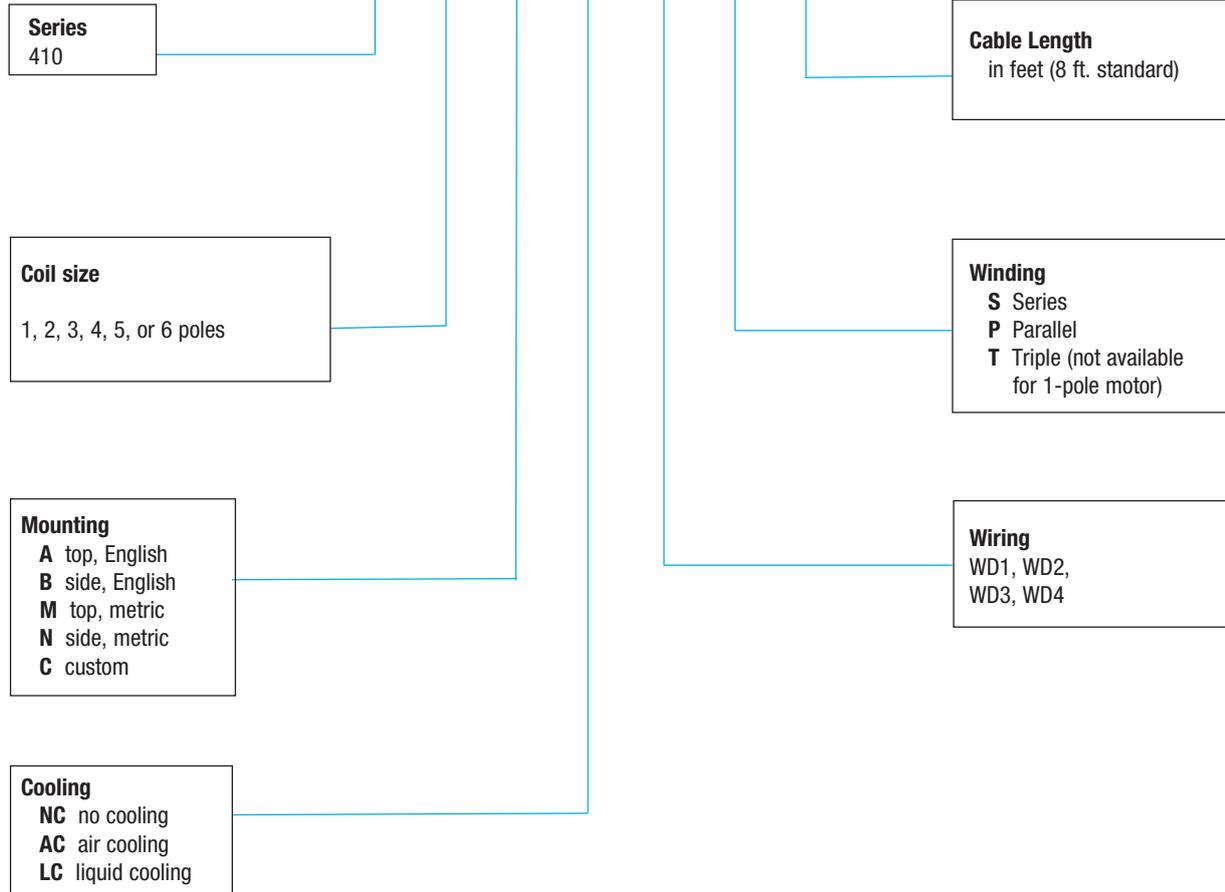
31024M1 - N



Motor Coil

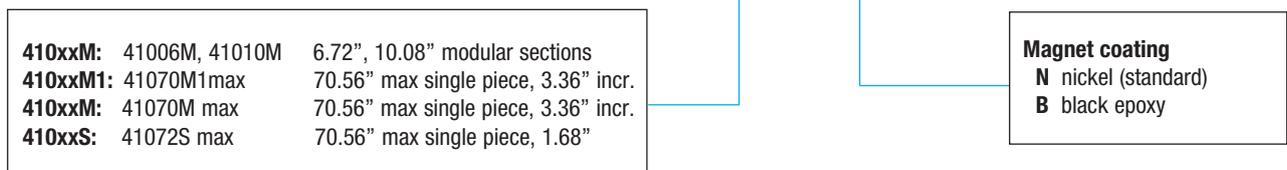
Order Example:

410 - 2 B - NC - WD2 P - 8



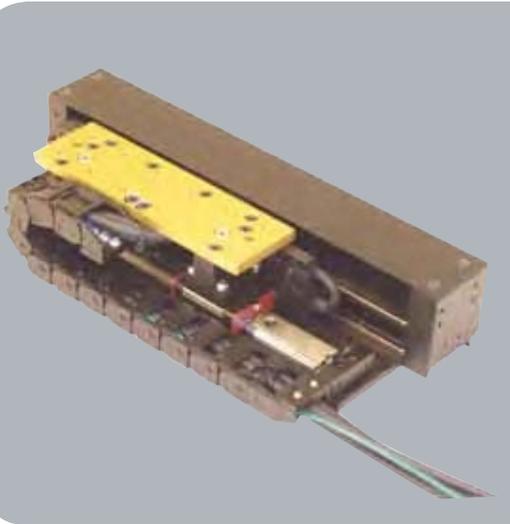
Magnet Track:

41024M1 - N



Additional information available on:
www.parker-eme.com/trilogy_motor

I-FORCE Ironless Linear Positioners



Parker TrilogY's I-Force linear positioners utilize our high-performance I-Force ironless linear motors in a pre-engineered, easily integrated, ready-to-run package. The principal design goal for these positioners is to achieve high performance at an economical cost while preserving the design flexibility to accommodate customization.

TrilogY's positioners have selectable single- or dual-bearing to match the performance and cost requirements for each application. In addition, they are designed to connect together using transition plates for XY or multi-axis configurations. Options include a variety of cable management systems in addition to bellows and hard covers.

Flexibility, multi-axis compatibility, and ease of customization make the I-Force linear positioners a superior choice for high performance and value.

- TrilogY positioners use ground steel or aluminum bases for flatness and parallelism because aluminum extrusions often do not meet the accuracy requirements for straightness and flatness.
- TrilogY has single- or dual-bearing rail positioners to better match the performance and cost requirements for each application.
- Every positioner includes a magnetic encoder for industrial environments or an optical encoder with resolutions down to 0.1 μ m (0.000 04").
- Dual-rail positioners have bellows as a standard option.
- Multiple carriage options are available on all positioner series.
- Different cable track widths available for added stiffness and rigidity
- Different cable track widths available as custom options for user payload tubes and cables

PERFORMANCE		LINEAR MAGNETIC ENCODER		RENISHAW ENCODER OPTIONS (Note 5)	
		5.0µm	1.0µm	0.5µm	0.1µm
Peak Velocity	in/s [m/s]	275 [7]	100 [2.5]	120 [3]	15 [0.4]
Resolution	in [µm]	0.0002 [5]	0.000 04 [1.0]	0.000 02 [0.5]	0.000 004 [0.1]
Repeatability	in [µm]	±0.0004 [±10]	±0.000 8 [2.0]	±0.000 06 [1.5]	±0.000 04 [1.0]
Accuracy – LME		±(30µm +50µm/m) ±(25µm +50µm/m)			
Accuracy – Renishaw		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		110-1	110-2
Peak Force	N	108.5	202.5
	lb	24.4	45.5
Continuous Force	N	24.5	45.4
	lb	5.5	10.2
Peak Power	W	938	1641
Continuous Power	W	47	82

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]	±0.000127 in/in [±127µm/m]	±.0000127 in/in
Flatness restrained on flat surface in [µm]	±0.013 [±330]	

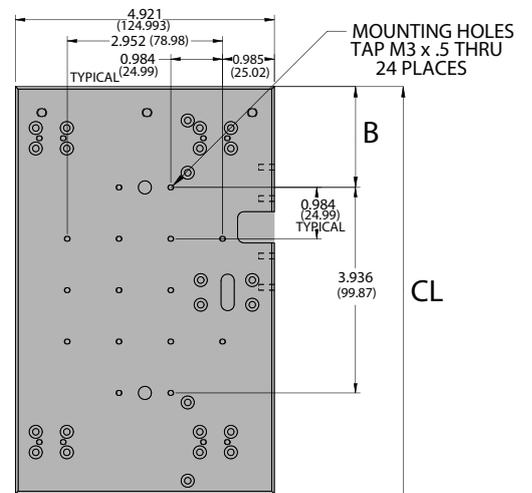
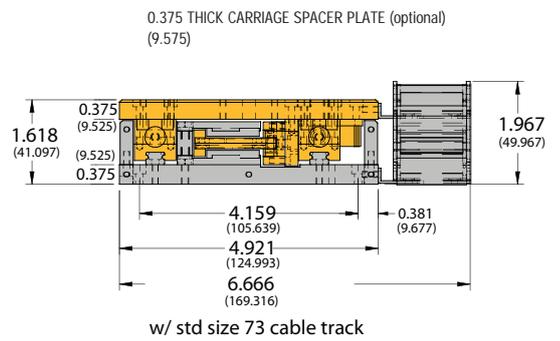
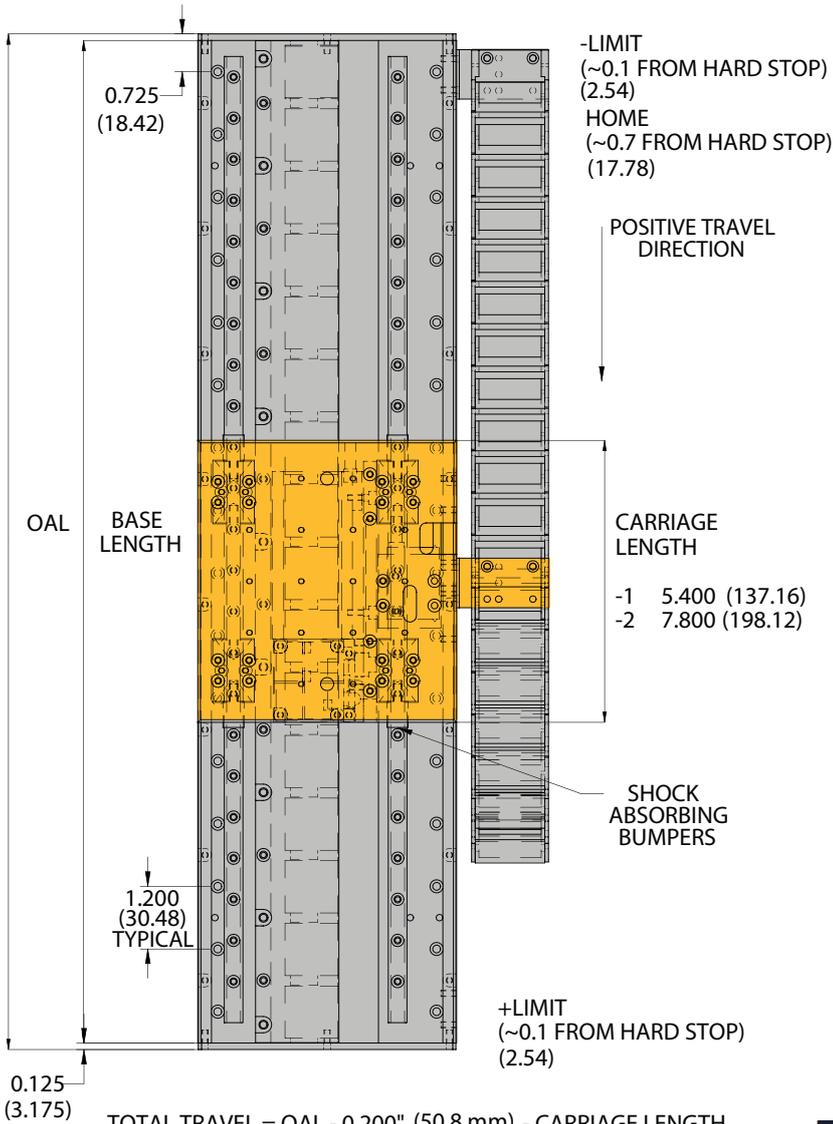
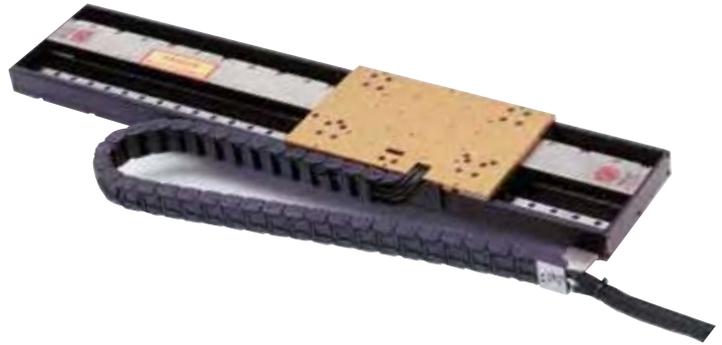
Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

LOAD		- 1	- 2
Vertical (Fv) see note 11	lbs [kg]	30 [13, 5]	30 [13, 5]
Side (Fs) see note 11	lbs [kg]	15 [6, 8]	15 [6, 8]
Moments–Roll (Mr) see note 11	lb-ft [N-m]	15 [20]	15 [20]
Moments–Pitch (Mp) see note 11	lb-ft [N-m]	52 [70]	52 [70]
Moments–Yaw (My) see note 11	lb-ft [N-m]	52 [70]	52 [70]



Dimensions shown in inches.

- Moving Carriage Assembly
- Stationary Base Assembly



TOTAL TRAVEL = OAL - 0.200" (50.8 mm) - CARRIAGE LENGTH
 OAL = BASE LENGTH + 0.250" (6.35 mm)
 BASE LENGTH = MULTIPLE OF 2.400" (60.96)

CARRIAGE SIZE				
	-1	mm	-2	mm
CL	5.400	137.16	7.800	198.12
B	0.732	18.59	1.932	49.07
Coil	110-1	110-1	110-2	110-2

PERFORMANCE		LINEAR MAGNETIC ENCODER		RENISHAW ENCODER OPTIONS (Note 5)	
		5.0µm	1.0µm	0.5µm	0.1µm
Peak Velocity	in/s [m/s]	275 [7]	100 [2.5]	120 [3]	15 [0.4]
Resolution	in [µm]	0.0002 [5]	0.000 04 [1.0]	0.000 02 [0.5]	0.000 004 [0.1]
Repeatability	in [µm]	±0.0004 [±10]	±0.000 8 [2.0]	±0.000 06 [1.5]	±0.000 04 [1.0]
Accuracy – LME		±(30µm +50µm/m)		±(25µm +50µm/m)	
Accuracy – Renishaw		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		110-1	110-2
Peak Force	N	108.5	202.5
	lb	24.4	45.5
Continuous Force	N	24.5	45.4
	lb	5.5	10.2
Peak Power	W	938	1641
Continuous Power	W	47	82

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]	±0.000127 in/in [±127µm/m]	±.000013 in/in [±13 µm/m]
Flatness restrained on flat surface in [µm]	±0.013 [±330]	

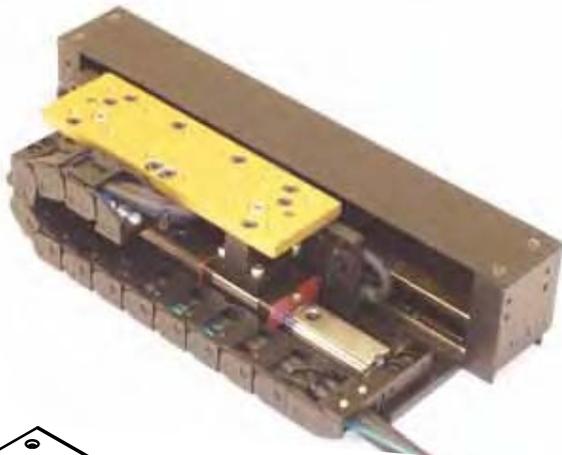
Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3
Carriage Assembly	lbs [kg]	1.10 [0,50]	1.50 [0,68]
Base Assembly			
T1SD Aluminum (0.250" thick)	lbs/ft [kg/m]	2.25 [3,35]▶
T1SA Aluminum (0.375" thick)	lbs/ft [kg/m]	2.78. [4,13]▶
Carriage Length	in [mm]	3.40 [86,4]	5.80 [147,3]
Coil Bar Length	in [mm]	3.20 [81,3]	5.60 [142,2]

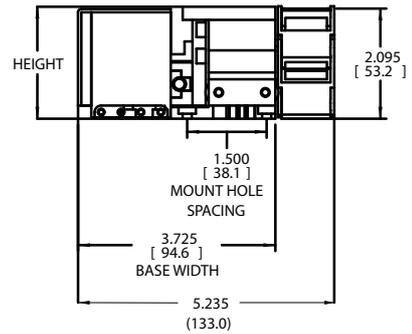
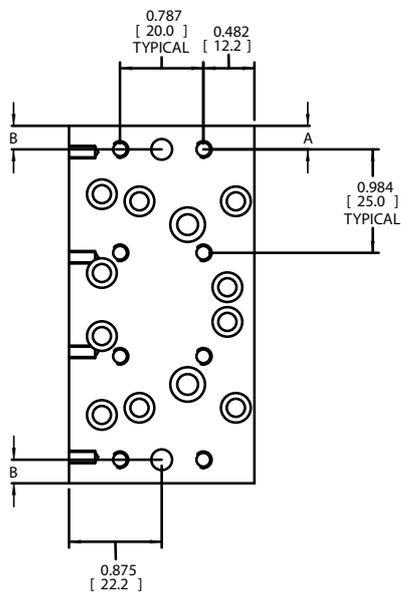
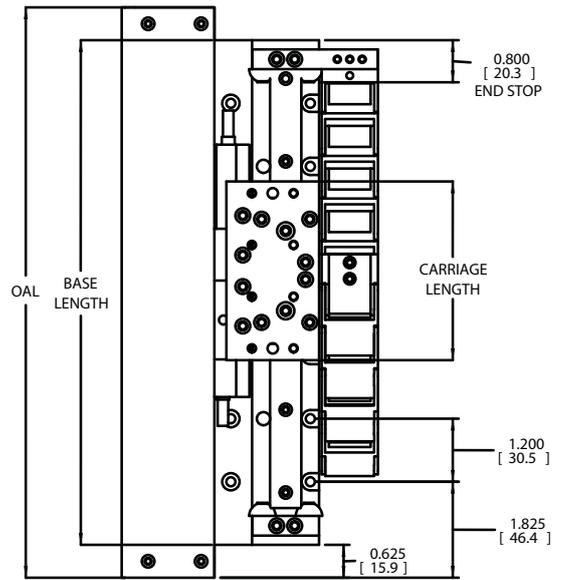
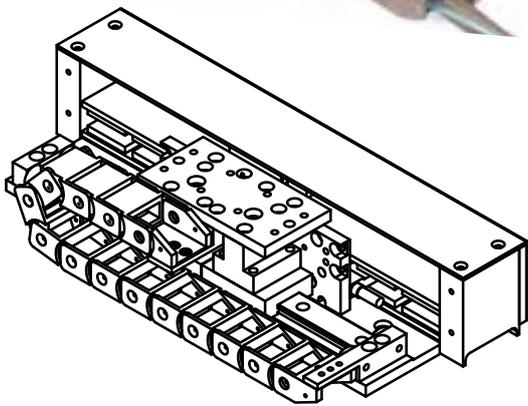
LOAD		- 1	- 2
Vertical (Fv) see note 11	lbs [kg]	25 [11, 3]	25 [11, 3]
Side (Fs) see note 11	lbs [kg]	13 [5, 7]	13 [5, 7]
Moments–Roll (Mr) see note 11	lb-ft [N-m]	11 [15]	11 [15]
Moments–Pitch (Mp) see note 11	lb-ft [N-m]	44 [60]	44 [60]
Moments–Yaw (My) see note 11	lb-ft [N-m]	44 [60]	44 [60]

NOTES

- Total travel (in) = BASE LENGTH - 1.6 (40.64 mm) - CARRIAGE LENGTH.
- Maximum base length is 40.8', 1m
- Aluminum base is black anodized.
- For complete motor specifications, refer to 110 series motor data sheet.
- Renishaw encoder, RGH24 series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Standard cable track provided is Iqus 07.20.018.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.



T1S



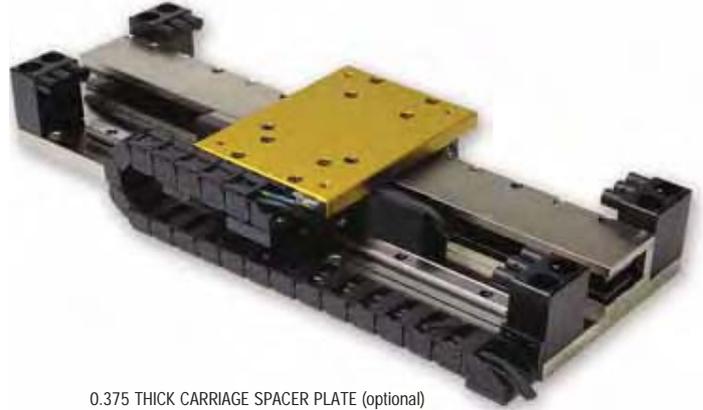
OAI = BASE LENGTH + 1.25 IN (31.75)
 TRAVEL = BASE LENGTH - 1.6 - CARRIAGE LENGTH
 TRAVEL (mm) = BASE LENGTH - 40.64 - CARRIAGE LENGTH

CARRIAGE TABLE		
COIL SIZE	-1	-2
CARRIAGE LENGTH	3.4 [86.4]	5.8 [147.3]
A (1ST MOUNTING HOLE)	0.224 [5.7]	0.440 [11.2]
B (DOWEL PIN HOLE)	0.224 [5.7]	0.440 [11.2]

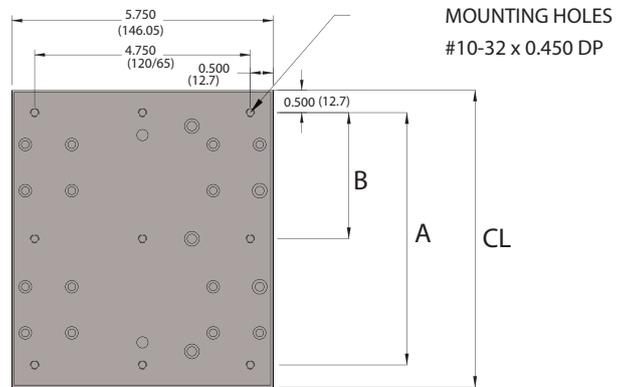
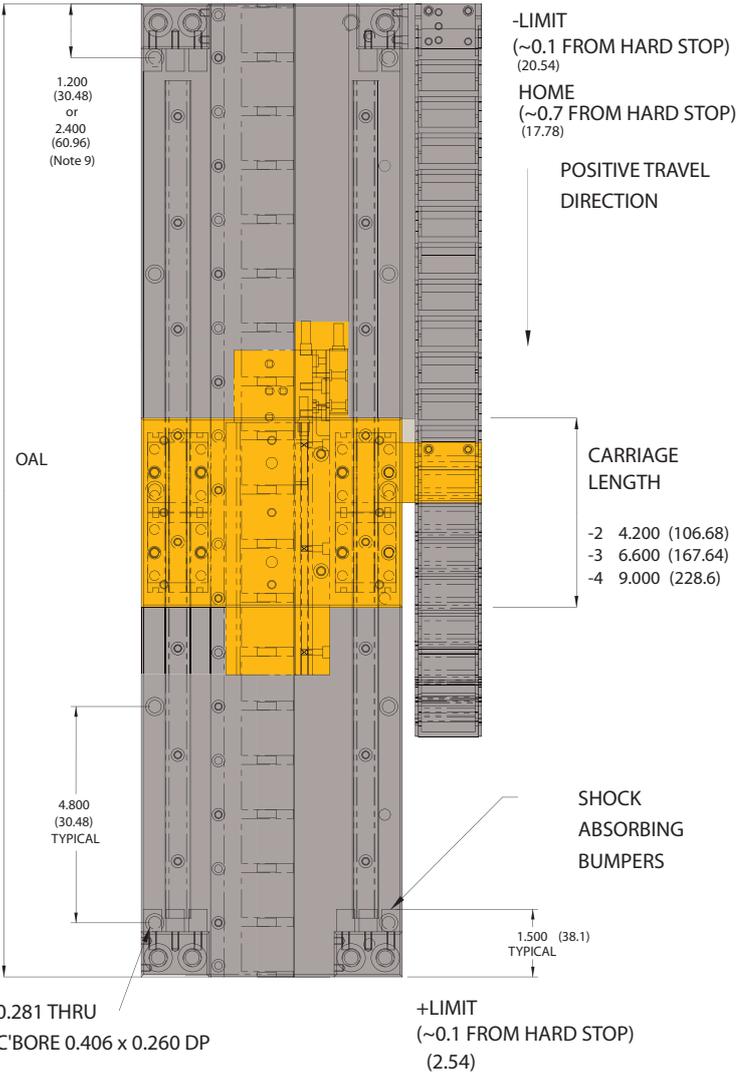
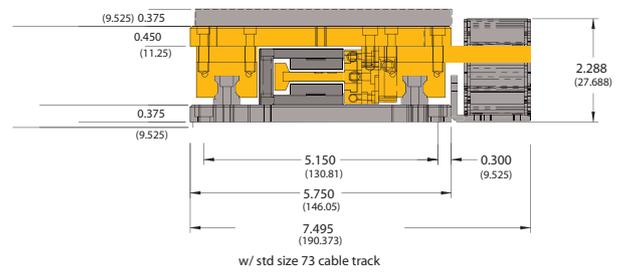


Dimensions shown in inches.

- Moving Carriage Assembly
- Stationary Base Assembly

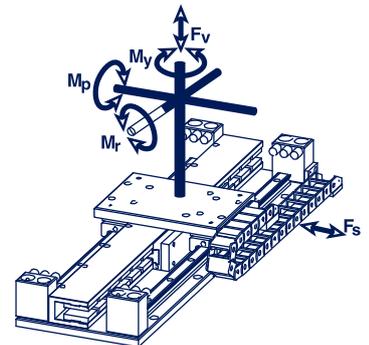


0.375 THICK CARRIAGE SPACER PLATE (optional)
(9.525)



TOTAL TRAVEL = OAL - 3.00" (76.2 mm) - CARRIAGE LENGTH
OAL = MULTIPLE OF 2.400" (60.96)

	CARRIAGE SIZE					
	- 2	mm	- 3	mm	- 4	mm
CL	4.200	106.68	6.600	167.64	9.000	228.6
A	3.200	81.28	5.600	142.24	8.000	203.80
B	—	—	2.800	71.12	4.000	101.60
COIL	210-2		210-3		210-4	



PERFORMANCE		LINEAR MAGNETIC ENCODER		RENISHAW ENCODER OPTIONS (Note 5)	
		5.0µm	1.0µm	0.5µm	0.1µm
Peak Velocity	in/s [m/s]	275 [7]	100 [2.5]	120 [3]	15 [0.4]
Resolution	in [µm]	0.0002 [5]	0.000 04 [1.0]	0.000 02 [0.5]	0.000 004 [0.1]
Repeatability	in [µm]	±0.0004 [±10]	±0.000 8 [2.0]	±0.000 06 [1.5]	±0.000 04 [1.0]
Accuracy – LME		±(30µm +50µm/m)		±(25µm +50µm/m)	
Accuracy – Renishaw		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		210-2	210-3	210-4
Peak Force	N	255.8	375.0	494.2
	lb	57.5	84.3	111.1
Continuous Force	N	57.4	84.1	110.3
	lb	12.9	18.9	24.8
Peak Power	W	1583	2261	2940
Continuous Power	W	79	113	147

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]	±0.000127 in/m [±127mm/m]	±0.0000127 in/in [±13mm/m]
Flatness restrained on flat surface in [µm]	±0.003 +.000254 in/in [±76 + 254µm/m]	

Note: For travels less than 1 meter, Flatness should be calculated at 1 meter

Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	
Carriage Assembly	lbs [kg]	2.10 [0,95]	3.10 [1,38]	3.80 [1,70]	
Base Assembly		>>	
	T2SA Aluminum (0.375" thick)	lbs/ft [kg/m]	9.10 [13,5]>>
	T2SB Aluminum (0.500" thick)	lbs/ft [kg/m]	9.90 [14,7]>>
T2SS Steel (0.500" thick)	lbs/ft [kg/m]	15.10 [22,5]>>	
Carriage Length	in [mm]	4.20 [106,7]	6.60 [167,6]	9.00 [228,6]	
Coil Bar Length	in [mm]	7.20 [182,9]	9.60 [243,8]	12.00 [304,8]	

LOAD		- 2	- 3	- 4
Vertical (Fv) see note 11	lbs [kg]	40 [18,1]	50 [22,7]	60 [27,2]
Side (Fs) see note 11	lbs [kg]	20 [9,1]	30 [13,6]	30 [13,6]
Moments–Roll (Mr) see note 11	lb-ft [N-m]	20 [27]	30 [40]	30 [40]
Moments–Pitch (Mp) see note 11	lb-ft [N-m]	50 [67]	100 [135]	100 [135]
Moments–Yaw (My) see note 11	lb-ft [N-m]	50 [67]	100 [135]	100 [135]

NOTES

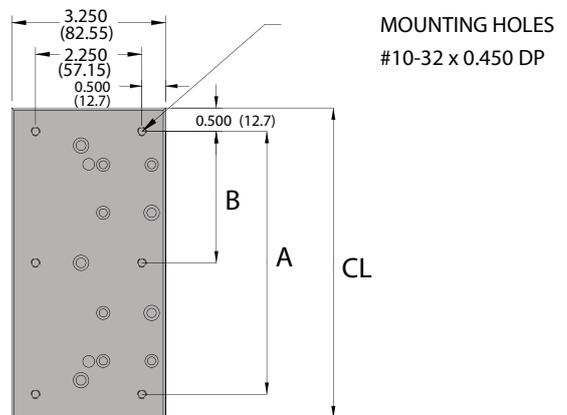
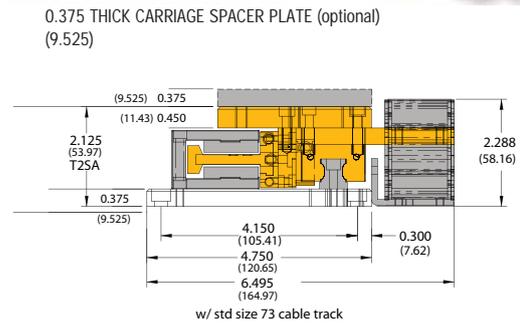
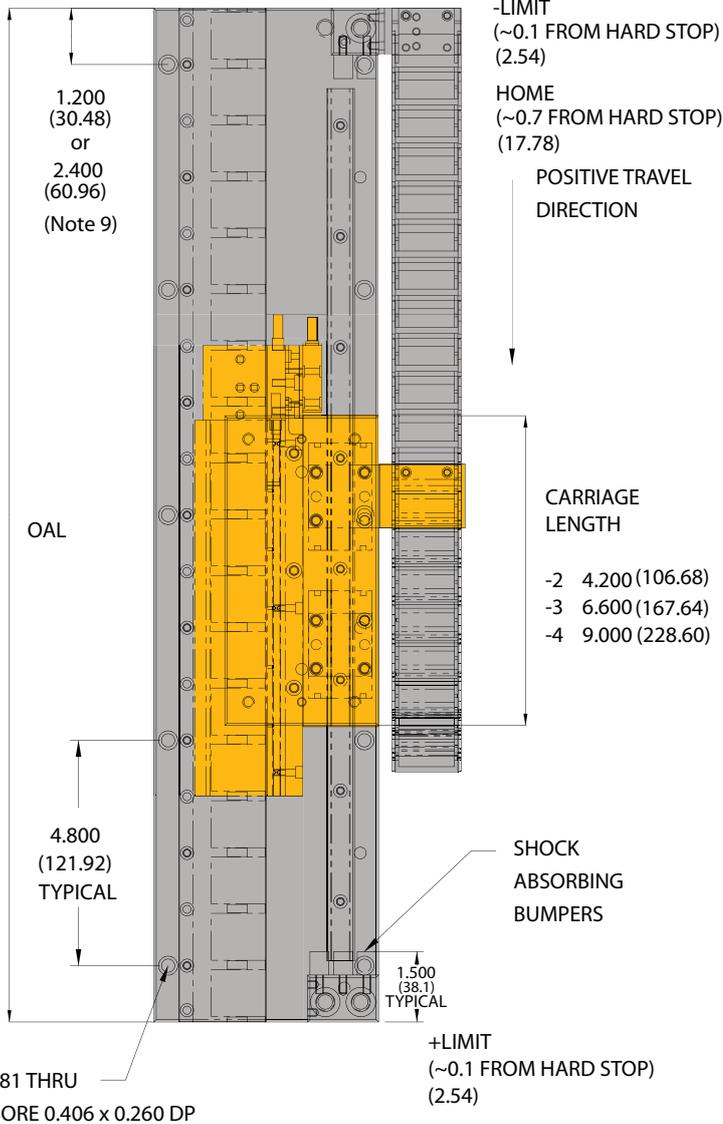
- Total travel = OAL – 3.00" (76.2 mm) – carriage length.
- Maximum base length is 120" (3048 mm).
- Aluminum base is black anodized. Steel base is nickel plated.
- For complete motor specifications, refer to 210 series motor data sheet.
- Renishaw encoder, RGH24 series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cable extends past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.175" higher than carriage mounting surface. It is recommended to use optional Spacer Plate for custom mounting holes.
- Standard cable track provided is Igus 07.30.018.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6....) or 2.400" (9.6, 14.4, 19.2, 24.0....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.



Dimensions shown in inches.

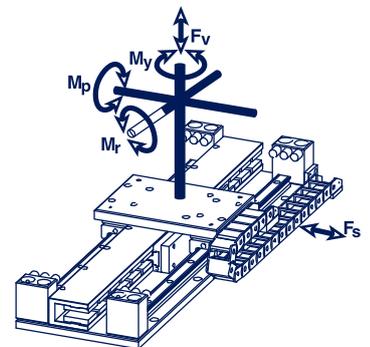
● Moving Carriage Assembly

● Stationary Base Assembly



TOTAL TRAVEL = OAL - 3.00" - CARRIAGE LENGTH
 = OAL - 76.2 mm - CARRIAGE LENGTH
 OAL = MULTIPLE OF 2.400" (60.96)

	CARRIAGE SIZE					
	- 2	mm	- 3	mm	- 4	mm
CL	4.200	106.68	6.600	167.64	9.000	228.60
A	3.200	81.28	5.600	142.24	8.000	203.20
B	—	71.12	2.800	101.60	4.000	101.64
COIL	210-2		210-3		210-4	



PERFORMANCE		LINEAR MAGNETIC ENCODER		RENISHAW ENCODER OPTIONS (Note 5)	
		5.0µm	1.0.1µm	0.5µm	0.1µm
Peak Velocity	in/s [m/s]	275 [7]	100 [2.5]	120 [3]	15 [0.4]
Resolution	in [µm]	0.0002 [5]	0.000 04 [1.0]	0.000 02 [0.5]	0.000 004 [0.1]
Repeatability	in [µm]	±0.0004 [±10]	±0.000 8 [2.0]	±0.000 06 [1.5]	±0.000 04 [1.0]
Accuracy – LME		±(30µm +50µm/m)		±(25µm +50µm/m)	
Accuracy – Renishaw		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		310-2	310-3	310-4	310-5	310-6
Peak Force	N	409.3	600.0	790.0	980.0	1170.0.1
	lb	92.0	135.1	177.2	220.3	263.2
Continuous Force	N	91.6	133.9	176.2	219.3	262.0
	lb	20.6	30.1	39.6	49.3	58.9
Peak Power	W	1885	2693	3500	4308	5116
Continuous Power	W	4	135	179	215	256

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]	±0.000127in/in [±127µm/m]	±.000013 in/in [13µm/m]
Flatness restrained on flat surface in [µm]	±0.003 + .000254 in/in [±76 + 254µm/m]	

Note: For travels less than 1 meter, Flatness should be calculated at 1 meter

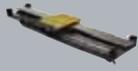
Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	- 5	- 6
Carriage Assembly	lbs [kg]	4.60 [2,1]	6.70 [3,0]	8.10 [3,7]	9.50 [4,3]	11.00 [5,0]
Base Assembly	T3DA Aluminum (3.375" thick)	lbs/ft [kg/m]	15.75 [23,4]▶▶▶
	T3DB Aluminum (0.500" thick)	lbs/ft [kg/m]	16.88 [25,1]▶▶▶
	T3DS Steel (0.500" thick)	lbs/ft [kg/m]	25.27 [37,6]▶▶▶
Carriage Length	in [mm]	4.20 [106,7]	6.60 [167,6]	9.00 [228,6]	11.40 [289,6]	13.80 [350,5]
Coil Bar Length	in [mm]	7.20 [182,9]	9.60 [243,8]	12.00 [304,8]	14.40 [365,8]	16.80 [426,7]

LOAD		- 2	- 3	- 4	- 5	- 6
Vertical (Fv) see note 11	lbs [kg]	120 [54]	150 [68]	180 [81]	210 [95]	240 [108]
Side (Fs) see note 11	lbs [kg]	80 [36]	100 [45]	100 [45]	100 [45]	100 [45]
Moments–Roll (Mr) see note 11	lb-ft [N-m]	80 [107]	100 [134]	100 [134]	100 [134]	100 [134]
Moments–Pitch (Mp) see note 11	lb-ft [N-m]	160 [214]	300 [402]	300 [402]	300 [402]	300 [402]
Moments–Yaw (My) see note 11	lb-ft [N-m]	160 [214]	300 [402]	300 [402]	300 [402]	300 [402]

NOTES

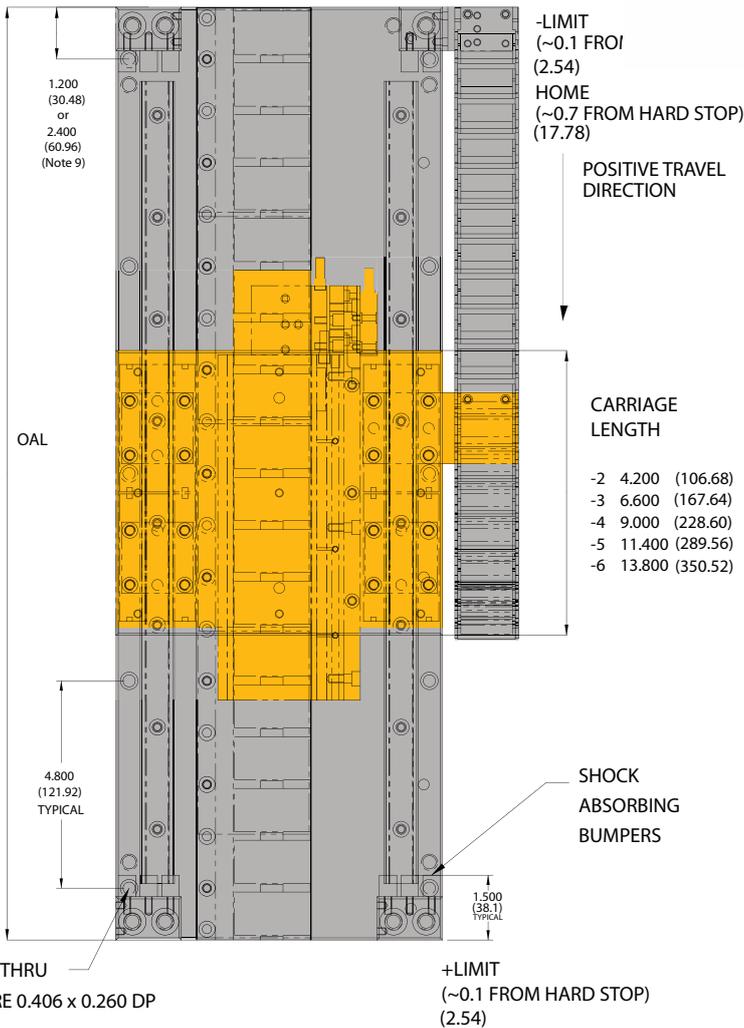
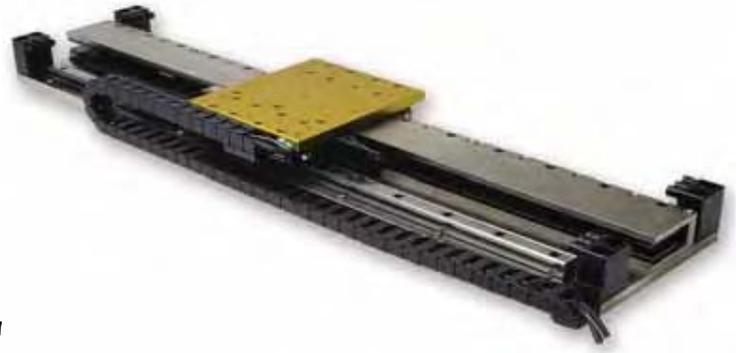
- Total travel = OAL – 3.00" (76.2 mm) – carriage length.
- Maximum base length is 120" (3048 mm).
- Aluminum base is black anodized. Steel base is nickel plated.
- For complete motor specifications, refer to 310 series motor data sheet.
- Renishaw encoder, RGH24 series, available in 0.05.0µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cable extends past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.175" higher than carriage mounting surface. It is recommended to use optional Spacer Plate for custom mounting holes.
- Standard cable track provided is Igus 07.30.018.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6...) or 2.400" (9.6, 14.4, 19.2, 24.0...) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements. Bearing manufacturer specifications exceed listed specifications.



Dimensions shown in inches.

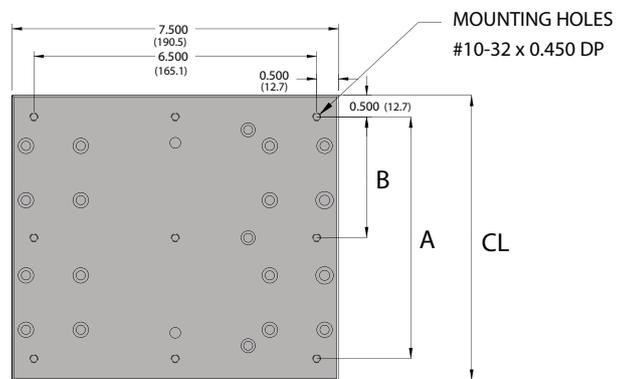
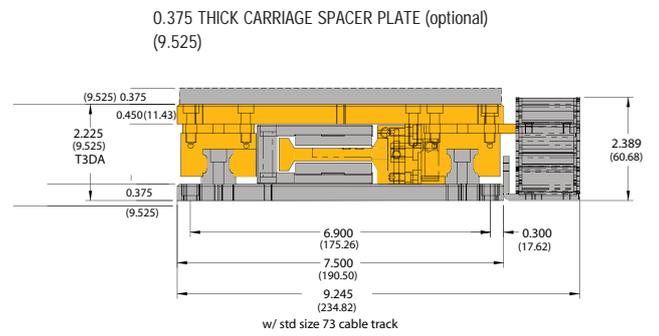
● Moving Carriage Assembly

● Stationary Base Assembly



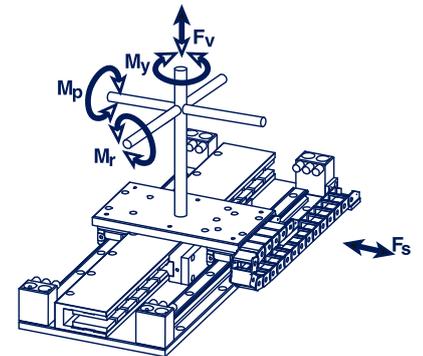
CARRIAGE LENGTH

-2	4.200	(106.68)
-3	6.600	(167.64)
-4	9.000	(228.60)
-5	11.400	(289.56)
-6	13.800	(350.52)



TOTAL TRAVEL = OAL - 3.00" (76.2) - CARRIAGE LENGTH
 OAL = MULTIPLE OF 2.400" (60.96)

	CARRIAGE SIZE									
	-2	mm	-3	mm	-4	mm	-5	mm	-6	mm
CL	4.200	106.68	6.600	167.64	9.000	228.60	11.400	289.56	13.800	350.52
A	3.200	81.28	5.650	142.24	8.000	203.20	10.400	264.16	12.800	325.12
B	—		2.800	71.12	4.000	101.60	5.200	132.08	6.400	162.56
COIL	310-2		310-3		310-4		310-5		310-6	



PERFORMANCE		LINEAR MAGNETIC ENCODER		RENISHAW ENCODER OPTIONS (Note 5)	
		5.0µm	1.0.1µm	0.5µm	0.1µm
Peak Velocity	in/s [m/s]	275 [7]	100 [2.5]	120 [3]	15 [0.4]
Resolution	in [µm]	0.0002 [5]	0.000 04 [1.0]	0.000 02 [0.5]	0.000 004 [0.1]
Repeatability	in [µm]	±0.0004 [±10]	±0.000 8 [2.0]	±0.000 06 [1.5]	±0.000 04 [1.0]
Accuracy – LME		±(30µm +50µm/m)		±(25µm +50µm/m)	
Accuracy – Renishaw		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		310-2	310-3	310-4	310-5	310-6
Peak Force	N	409.3	600.0	790.0	980.0	1170.0.1
	lb	92.0	135.1	177.2	220.3	263.2
Continuous Force	N	91.6	133.9	176.2	219.3	262.0
	lb	20.6	30.1	39.6	49.3	589
Peak Power	W	1885	2693	3500	4308	5116
Continuous Power	W	4	135	179	215	256

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]	±0.000127 [±127µm/m]	±.00013 in/in [±13µm/m]
Flatness restrained on flat surface in [µm]	±0.003 + .00254 in/in [±76 + 254µm/m]	

*Note: For travels less than 1 meter, Flatness should be calculated at 1 meter
Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft*

PHYSICAL		- 2	- 3	- 4	- 5	- 6
Carriage Assembly	lbs [kg]	3.00 [1,4]	4.40 [2,0]	5.50 [2,5]	6.40 [2,9]	7.40 [3,3]
Base Assembly						
T3SA Aluminum (3.375" thick)	lbs/ft [kg/m]	13.30 [19,8]▶▶▶▶
T3SB Aluminum (0.500" thick)	lbs/ft [kg/m]	14.25 [21,2]▶▶▶▶
T3SS Steel (0.500" thick)	lbs/ft [kg/m]	21.24 [31,6]▶▶▶▶
Carriage Length	in [mm]	4.20 [106,7]	6.60 [167,6]	9.00 [228,6]	11.40 [289,6]	13.80 [350,5]
Coil Bar Length	in [mm]	7.20 [182,9]	9.60 [243,8]	12.00 [304,8]	14.40 [365,8]	16.80 [426,7]

LOAD		- 2	- 3	- 4	- 5	- 6
Vertical (Fv) see note 11	lbs [kg]	80 [36]	100 [45]	120 [54]	140 [63]	160 [72]
Side (Fs) see note 11	lbs [kg]	30 [13]	50 [22]	50 [22]	50 [22]	50 [22]
Moments–Roll (Mr) see note 11	lb-ft [N-m]	35 [47]	50 [67]	50 [67]	50 [67]	50 [67]
Moments–Pitch (Mp) see note 11	lb-ft [N-m]	75 [100]	150 [201]	150 [201]	150 [201]	150 [201]
Moments–Yaw (My) see note 11	lb-ft [N-m]	75 [100]	150 [201]	150 [201]	150 [201]	150 [201]

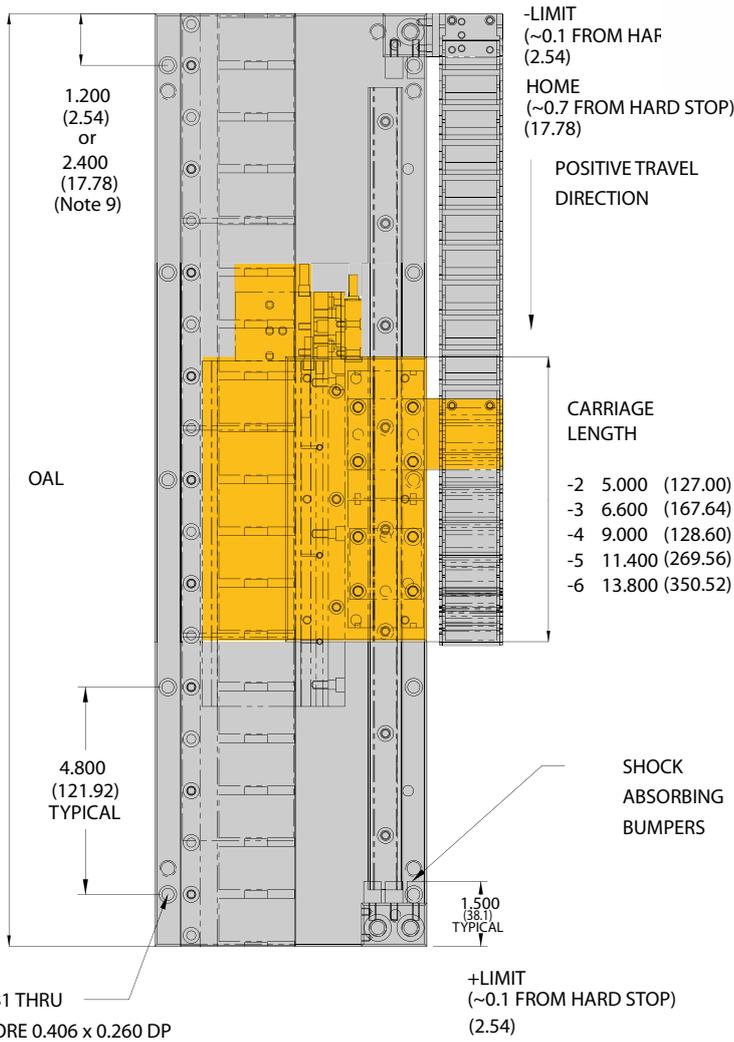
NOTES

- Total travel = OAL – 3.00" (76.2 mm) – carriage length.
- Maximum base length is 120" (3048 mm).
- Aluminum base is black anodized. Steel base is nickel plated.
- For complete motor specifications, refer to 310 series motor data sheet.
- Renishaw encoder, RGH24 series, available in 0.05.0µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cable extends past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.175" higher than carriage mounting surface. It is recommended to use optional Spacer Plate for custom mounting holes.
- Standard cable track provided is Igus 07.30.018.
- Base mounting holes are equidistant, 1.200" (12.0, 16.8, 21.6...) or 2.400" (9.6, 14.4, 19.2, 24.0...) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements Bearing manufacturer specifications exceed listed specifications.

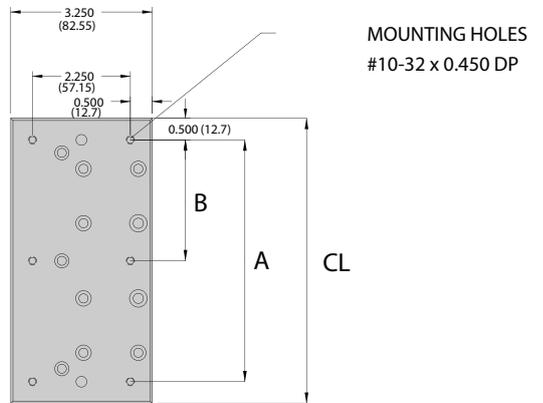
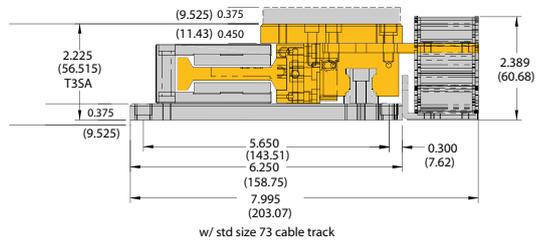


Dimensions shown in inches.

- Moving Carriage Assembly
- Stationary Base Assembly

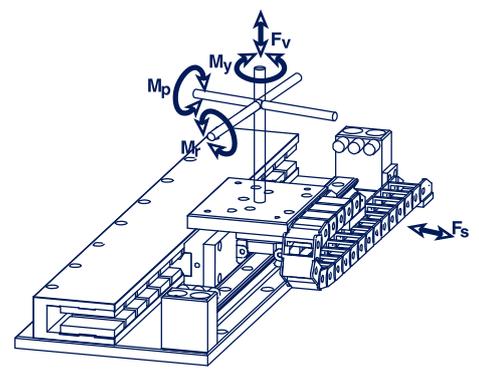


0.375 THICK CARRIAGE SPACER PLATE (optional)
(9.525)



TOTAL TRAVEL = OAL - 3.00" (76.2) - CARRIAGE LENGTH
OAL = MULTIPLE OF 2.400" (60.96)

	CARRIAGE SIZE									
	-2	mm	-3	mm	-4	mm	-5	mm	-6	mm
CL	5.000	127.00	6.600	167.64	9.000	228.60	11.400	289.56	13.800	350.52
A	4.000	101.60	5.650	142.24	8.000	203.20	10.400	264.16	12.800	325.12
B	2.000	50.8	2.800	71.12	4.000	101.60	5.200	132.08	6.400	162.56
COIL	310-2		310-3		310-4		310-5		310-6	



PERFORMANCE		LINEAR MAGNETIC ENCODER		RENISHAW ENCODER OPTIONS (Note 5)	
		5.0µm	1.0.1µm	0.5µm	0.1µm
Peak Velocity	in/s [m/s]	275 [7]	100 [2.5]	120 [3]	15 [0.4]
Resolution	in [µm]	0.0002 [5]	0.000 04 [1.0]	0.000 02 [0.5]	0.000 004 [0.1]
Repeatability	in [µm]	±0.0004 [±10]	±0.000 8 [2.0]	±0.000 06 [1.5]	±0.000 04 [1.0]
Accuracy – LME		±(30µm +50µm/m)		±(25µm +50µm/m)	
Accuracy – Renishaw		±(5µm +30µm/m)			

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		410-2	410-3	410-4	410-6	410-8
Peak Force	N	1041.4	1523.6	2006.3	2967.2	3928.1
	lb	234.1	342.5	451.0	667.0	883.0
Continuous Force	N	233.1	340.8	448.9	663.7	878.6
	lb	52.4	76.6	100.9	149.2	197.5
Peak Power	W	2835	4050	5265	7695	10125
Continuous Power	W	142	203	263	385	506

ACCURACY		STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]		±0.000127 in/in [±127µm/m]	±.000013 in/in [±13µm/m]
Flatness restrained on flat surface in [µm]		±.003 + .000254 in/in [±76 + 254µm/m]	

Note: For travels less than 1 meter, Flatness should be calculated at 1 meter
Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	- 6	- 8
Carriage Assembly						
T4DB Aluminum	lbs [kg]	9.0 [4,1]	14.9 [6,8]	18.1 [8,2]	24.1 [10,9]	30.2 [13,7]
T4DS Steel	lbs [kg]	13.29 [6,0]	22.20 [10,1]	28.46 [12,9]	40.51 [18,4]	52.59 [23,9]
Base Assembly						
T4DB Aluminum	lbs/ft [kg/m]	29.4 [43,8]▶▶▶▶
T4DS Steel	lbs/ft [kg/m]	39.3 [58,5]▶▶▶▶
Carriage Length	in [mm]	4.80 [121,9]	8.15 [207,0]	11.50 [292,1]	18.20 [462,3]	24.90 [632,5]
Coil Bar Length	in [mm]	10.00 [254]	13.36 [339]	16.72 [424]	23.44 [595]	30.16 [766]

LOAD		- 2	- 3	- 4	- 6	- 8
Vertical (Fv) see note 11	lbs [kg]	200 [90]	250 [113]	300[136]	400 [181]	400 [181]
Side (Fs) see note 11	lbs [kg]	150 [68]	150 [68]	150 [68]	150 [68]	150 [68]
Moments–Roll (Mr) see note 11	lb-ft [N-m]	100 [133]	150 [200]	150 [200]	150 [200]	150 [200]
Moments–Pitch (Mp) see note 11	lb-ft [N-m]	200 [266]	400 [532]	400 [532]	400 [532]	400 [532]
Moments–Yaw (My) see note 11	lb-ft [N-m]	200 [266]	400 [532]	400 [532]	400 [532]	400 [532]

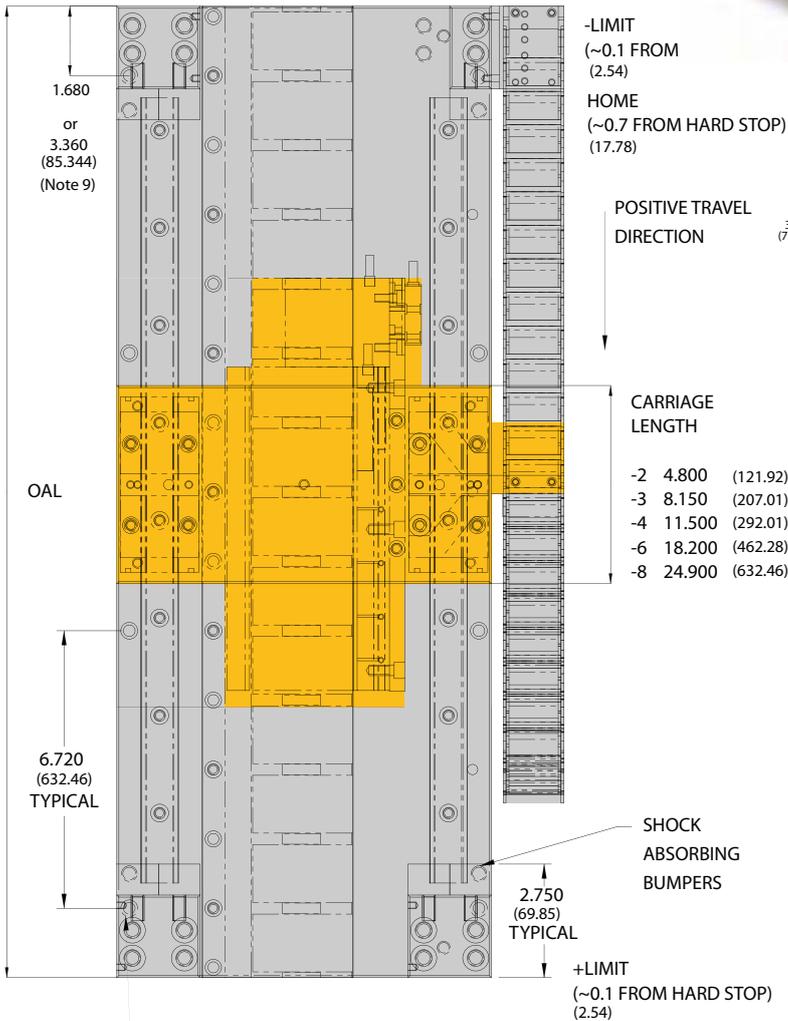
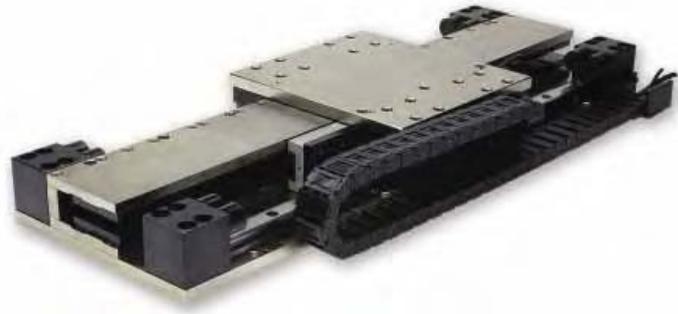
NOTES

- Total travel = OAL – 5.50" (139.7 mm) – carriage length.
- Maximum base length is 120" (3048)
- Aluminum base is black anodized. Steel base is nickel plated.
- For complete motor specifications, refer to 410 series motor data sheet.
- Renishaw encoder, RGH24 series, available in 0.05.0µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cable extends past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.175" higher than carriage mounting surface. It is recommended to use optional Spacer Plate for custom mounting holes.
- Standard cable track provided is Igus 07.30.028.
- Base mounting holes are equidistant, 1.680" (16.80, 23.52....) or 3.360" (20.16, 26.88....) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance requirements Bearing manufacturer specifications exceed listed specifications.

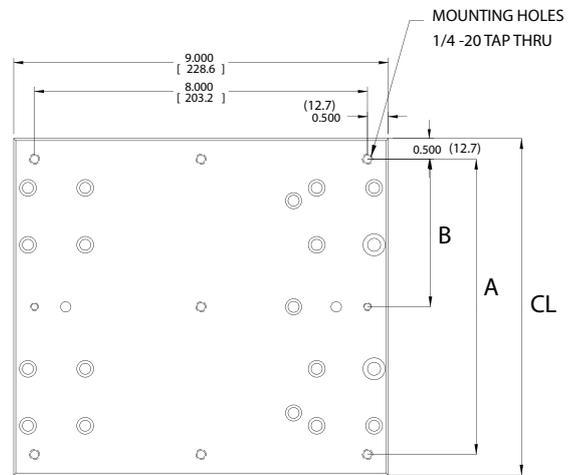
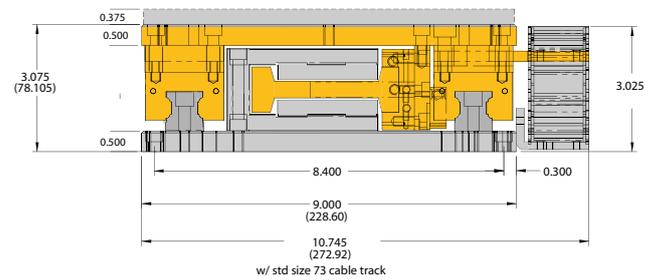


Dimensions shown in inches.

- Moving Carriage Assembly
- Stationary Base Assembly



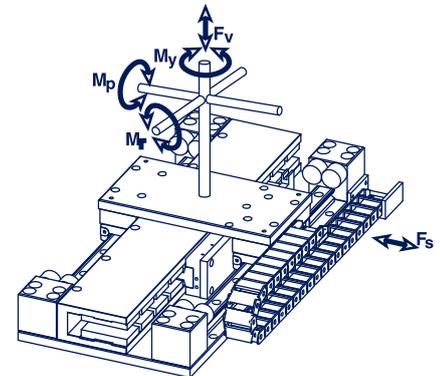
0.375 THICK CARRIAGE SPACER PLATE (optional)
(9.525)



0.281 THRU
C'BORE 0.406 x 0.260 DP

TOTAL TRAVEL = OAL - 5.50" (139.7) - CARRIAGE LENGTH
OAL = MULTIPLE OF 3.360" (85.34)

CARRIAGE SIZE										
	-2	mm	-3	mm	-4	mm	-6	mm	-8	mm
CL	4.800	121.92	8.150	207.01	11.500	292.10	18.200	462.28	24.900	632.46
A	3.800	96.52	7.150	181.61	10.500	266.70	17.200	436.88	23.900	607.66
B	—	—	3.575	90.805	5.250	133.35	8.600	218.44	11.950	303.53
COIL	410-2		410-3		410-4		410-6		410-8	



I-Force Ironless Motor Positioner

T4S Specifications

PERFORMANCE		LINEAR MAGNETIC ENCODER		RENISHAW ENCODER OPTIONS (Note 5)	
		5.0µm	1.0µm	0.5µm	0.1µm
Peak Velocity	in/s [m/s]	275 [7]	100 [2.5]	120 [3]	15 [0.4]
Resolution	in [µm]	0.0002 [5]	0.000 04 [1.0]	0.000 02 [0.5]	0.000 004 [0.1]
Repeatability	in [µm]	±0.0004 [±10]	±0.000 8 [2.0]	±0.000 06 [1.5]	±0.000 04 [1.0]
Accuracy – LME		±(30µm +50µm/m)		±(5µm +30µm/m)	
Accuracy – Renishaw					

Note: For travels less than 1 meter, accuracy should be calculated at 1 meter

MOTOR MODEL		410-2	410-3	410-4	410-6	410-8
Peak Force	N	1041.4	1523.6	2006.3	2967.2	3928.1
	lb	234.1	342.5	451.0	667.0	883.0
Continuous Force	N	233.1	340.8	448.9	663.7	878.6
	lb	52.4	76.6	100.9	149.2	197.5
Peak Power	W	2835	4050	5265	7695	10125
Continuous Power	W	142	203	263	385	506

ACCURACY	STANDARD	LASER ALIGNMENT OPTION
Straightness restrained on flat surface in [µm]	±0.000125in/in [±127µm/m]	±0.000013 in/in [±13µm/m]
Flatness restrained on flat surface in [µm]	±0.003 + .000254 in/in [±76 + 254µm/m]	

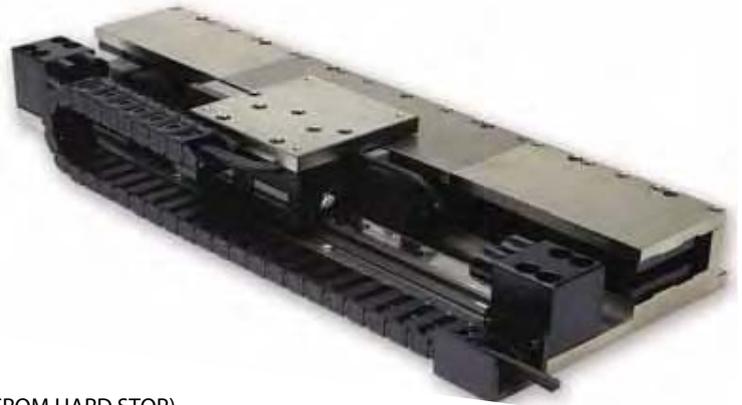
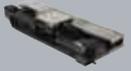
Note: For travels less than 1 meter, Flatness should be calculated at 1 meter
Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005in/ft

PHYSICAL		- 2	- 3	- 4	- 6	- 8
Carriage Assembly						
T4SB Aluminum	lbs [kg]	6.5 [3,0]	10.3 [4,7]	13.0 [5,9]	17.8 [8,1]	22.7 [10,3]
T4SS Steel	lbs [kg]	8.78 [4,0]	14.22 [6,5]	18.47 [8,4]	26.49 [12,0]	34.54 [15,7]
Base Assembly						
T4SB Aluminum	lbs/ft [kg/m]	26.7 [39,8]▶▶▶▶
T4SS Steel	lbs/ft [kg/m]	34.9 [52,0]▶▶▶▶
Carriage Length	in [mm]	4.80 [121,9]	8.15 [207,0]	11.50 [292,1]	18.20 [462,3]	24.90 [632,5]
Coil Bar Length	in [mm]	10.00 [254]	13.36 [339]	16.72 [424]	23.44 [595]	30.16 [766]

LOAD		- 2	- 3	- 4	- 6	- 8
Vertical (Fv) see note 11	lbs [kg]	150 [68]	175 [79]	175 [79]	200 [90]	200 [90]
Side (Fs) see note 11	lbs [kg]	75 [34]	75 [34]	75 [34]	75 [34]	75 [34]
Moments–Roll (Mr) see note 11	lb-ft [N-m]	50 [66]	100 [133]	100 [133]	100 [133]	100 [133]
Moments–Pitch (Mp) see note 11	lb-ft [N-m]	100 [133]	200 [266]	200 [266]	200 [266]	200 [266]
Moments–Yaw (My) see note 11	lb-ft [N-m]	100 [133]	200 [266]	200 [266]	200 [266]	200 [266]

NOTES

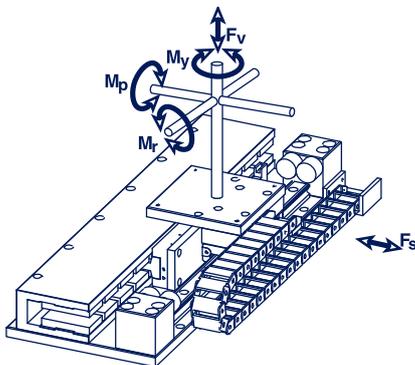
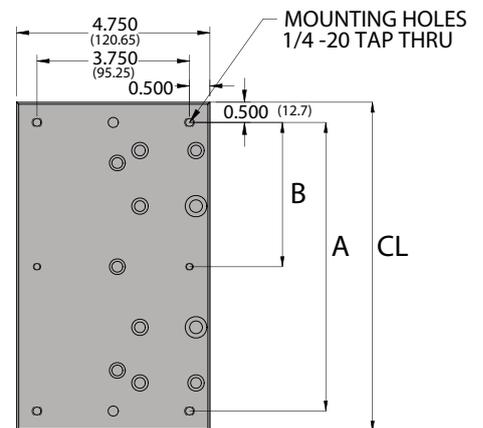
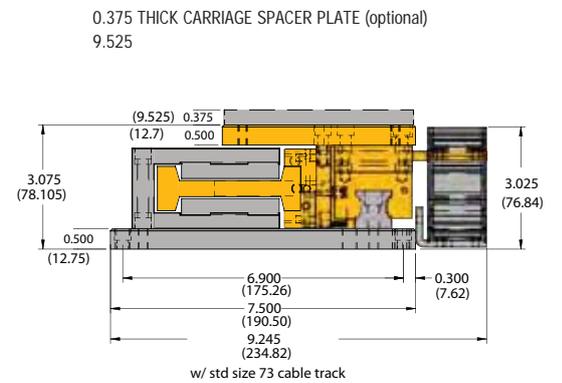
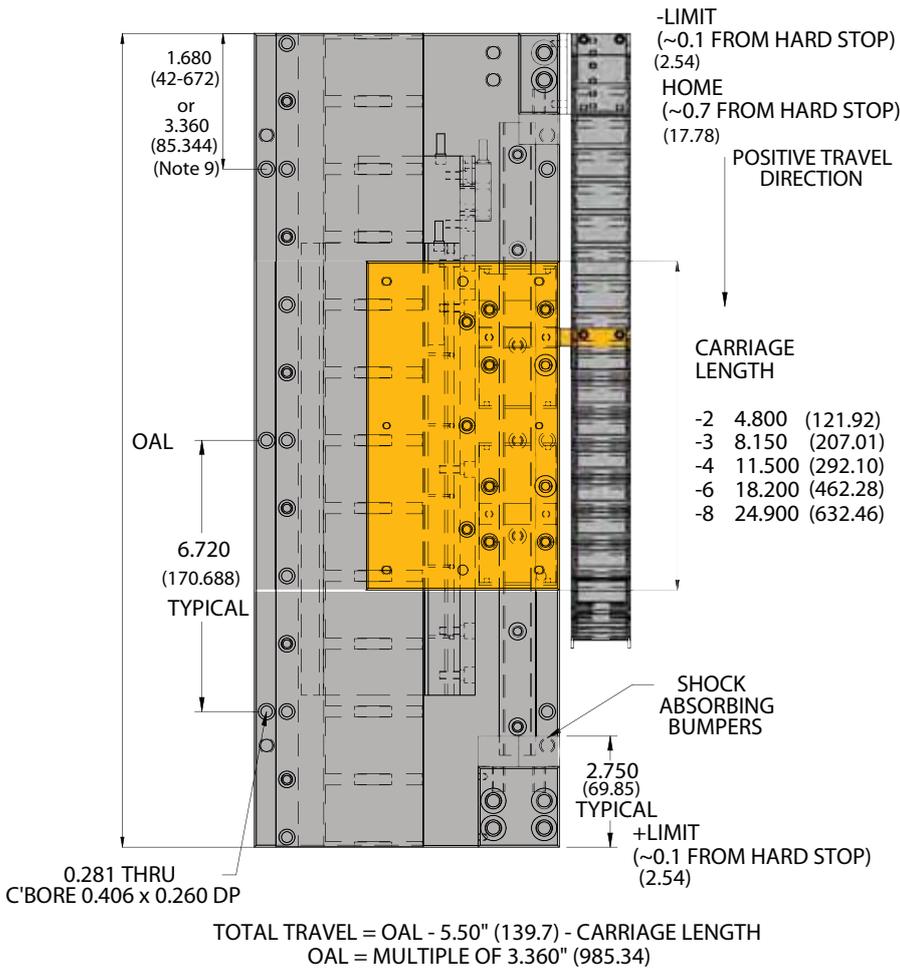
- Total travel = OAL – 5.50" (139.7 mm) – carriage length.
- Maximum base length is 168", 4.2 meters.
- Aluminum base is black anodized. Steel base is nickel plated.
- For complete motor specifications, refer to 410 series motor data sheet.
- Renishaw encoder, RGH24 series, available in 0.05µm, 0.1µm, 0.5µm, 1.0µm, 5.0µm.
- Cable extends past base by approximately 0.6" when carriage is at negative hard stop.
- Cable Track extends 0.175" higher than carriage mounting surface. It is recommended to use optional Spacer Plate for custom mounting holes.
- Standard cable track provided is Igus 07.30.028.
- Base mounting holes are equidistant, 1.680" (16.80, 23.52...) or 3.360" (20.16, 26.88...) from each end depending on base length.
- Specification subject to change without notice.
- Listed specifications based on motor size and typical performance require Bearing manufacturer specifications exceed listed specifications.



Dimensions shown in inches.

● Moving Carriage Assembly

● Stationary Base Assembly



CARRIAGE SIZE										
	-2	mm	-3	mm	-4	mm	-6	mm	-8	mm
CL	4.800	121.92	8.150	207.01	11.500	292.10	18.200	462.28	24.900	632.46
A	3.800	96.52	7.150	181.61	10.500	266.70	17.200	436.88	23.900	607.66
B	—	—	3.575	90.805	5.250	133.35	8.600	218.44	11.950	303.53
COIL	410-2		410-3		410-4		410-6		410-8	

I-Force Ironless Motor Positioner

T1S-T1D

Order Example:

T 1 D A 012 3 N S B A G 2

Series
T = Open Positioner

Motor Coil Series
1 = 110 Motor Coil

Bearing Rail Configuration
D = Dual Bearing Rails
S = Single Bearing Rails

Base Material
A = 3/8" Al

Length of Base
XXX = Length of base in inches
Max.: 33.6"
Min.: 9.6"
Increment: 2.4"

* Truncate base length in part number. Example: for a 16.8 inch base, "XXX" equal "016"

T1S Base Length = Travel (increments of 2.4" [60.96mm]) + 1.6" [40.64] + carriage length
T1D Base Length = Travel (increments of 2.4" [60.96 mm]) - 0.05" [1027 mm] + carriage length

Coil Size
1 = 1 pole, T1S 3.4" (86.4 mm)
2 = 2 pole T1S 5.8" (147.3 mm)
T1D 5.4" (137.6 mm)
T1D 7.8" (198.12 mm)
T1S 3.4" (86.4 mm)

Cooling
N no cooling

Winding Type
S Series
P Parallel

Cable track
0 = None
2 = Std.

Connector
Cable Connectorization
A = Aries
B = Flying Leads
C = Compax3
G = Gemini
V = ViX
Z = no cables

*Connectorized cables only available with Connector Box

Cable length
Cable Length
A = 1 Meter Flying Leads
B = 3 Meter Flying Leads
C = 7.5 Meter Flying Leads
L = 3 Extension Cables (with Connector Box)
M = 7.5 Extension Cables (with Connector Box)
Z = Connector Box ONLY (no extension cables)

*Flying leads – cable measured from last cable carrier link
*Extension Cables – cable measured from connection box at end of base

Encoder
A = LME, 1um
B = LME, 5um
Q = Renishaw, 5um
L = Renishaw, 1um
M = Renishaw, 0.5m
P = Renishaw, 0.1um
R = Renishaw, 1 V p-p sine/cosine
X = No encoder

Order Example:

T 2 D A 012 3 N S B A B 3

Series
 T = Open Positioner
 B = Bellows Positioner

Motor Coil Series
 2 = 210 motor coil

Bearing Rail Configuration
 D = Dual Bearing Rails
 S = Single Bearing Rails
 * Bellows positioners not available in single rail

Base material
 A = 0.375" Al

Length of Base
 XXX = Length of base In inches
 Max.: 120*
 Min.: 9.6"
 Increment: 2.4"
 *Truncate base length in part number. Example: for a 16.8 inch base, "XXX" equal "016"
 T1S Base Length = Travel (increments of 2.4" [60.96 mm]) + 3.0" [76.2] + carriage length
 T1D Base Length = Travel Travel (increments of 2.4" [60.96 mm])

Coil size
 2 = 2 pole, 4.2 in (106.68 mm)
 3 = 3 pole, 6.6 in (106.64 mm)
 4 = 4 pole, 9.0 in (228.60 mm)

Cooling
 N no cooling

Winding Type
 S Series
 P Parallel

Cable track
 0 = (no track)
 3 = (standard)

Connector
 Cable Connectorization
 A = Aries
 B = Flying Leads
 C = Compax3
 G = Gemini
 V = ViX
 Z = no cables
 *Connectorized cables only available with Connector Box

Cable length
 A = 1 Meter Flying Leads
 B = 3 Meter Flying Leads
 C = 7.5 Meter Flying Leads
 L = 3 Extension Cables (with Connector Box)
 M = 7.5 Extension Cables (with Connector Box)
 Z = Connector Box ONLY (no extension cables)
 *Flying leads – cable measured from last cable carrier link
 *Extension Cables – cable measured from connection box at end of base
 *7.5 Meter Flying Lead Cables available on:
 All bases with LME encoder
 All bases with Renishaw encoder under 86"
 For bases with Renishaw encoder over 86" the cable length (CL) will be CL = 10M - (base length in meters + 0.3M)

Encoder
 A = LME 1 um
 B = LME 5 um
 Q = Renishaw 5 um
 L = Renishaw 1 um
 M = Renishaw 0.5 um
 P = Renishaw 0.1 um
 R = Renishaw IV p-p sine/cosine
 X = No Encoder

*Consult factory for longer lengths.

I-Force Ironless Motor Positioner

T3S-T3D

Order Example:

T 3 D B 012 3 N S B A C 3

Series
T = Open Positioner
B = Bellows Positioner

Motor Coil Series
3 = 310 Motor Coil

Bearing Rail Configuration
D = Dual Bearing Rails
S = Single Bearing Rails
 * Bellows positioners not available in single rail

Base Material
B = 1/2" Al

Length of Base
XXX = Length of base in inches
 Max.: 118"
 Min.: 9.6"
 Increment: 2.4"

* Truncate base length in part number. Example: for a 16.8 inch base, "XXX" equal "016"
 Base Length = Travel (increments of 2.4" [60.96mm]) + 3.0" [76.2 mm] + carriage length

Coil Size
2 = 2 pole T3S 5.0" [127 mm], T3D 4.2" [106.68]
3 = 3 pole 6.6" [167.64 mm]
4 = 4 pole 9.0" [228.60 mm]
5 = 5 pole 11.4" [289.56 mm]
6 = 6 pole 13.3" [350.62 mm]

Cooling
N no cooling

Winding Type
S Series
P Parallel

Cable track
0 = None
3 = Std.

Connector
 Cable Connectorization
A = Aries
B = Flying Leads
C = Compax3
G = Gemini
V = ViX
Z = no cables
 *Connectorized cables only available with Connector Box

Cable length
 Cable Length
A = 1 Meter Flying Leads
B = 3 Meter Flying Leads
C = 7.5 Meter Flying Leads
L = 3 Extension Cables (with Connector Box)
M = 7.5 Extension Cables (with Connector Box)
Z = Connector Box ONLY (no extension cables)

*Flying leads – cable measured from last cable carrier link
 *Extension Cables – cable measured from connection box at end of base
 *7.5 Meter Flying Lead Cables available on:
 All bases with LME encoder
 All bases with Renishaw encoder under 86"
 For bases with Renishaw encoder over 86" the cable length (CL) will be CL = 10M - (base length in meters + 0.3M)

Encoder
A = LME, 1um
B = LME, 5um
Q = Renishaw, 5um
L = Renishaw, 1um
M = Renishaw, 0.5m
P = Renishaw, 0.1um
R = Renishaw, 1 V p-p sine/cosine
X = No encoder

Order Example:

T 4 D B XXX 3 N S B A B 4

Series
 T = Open Positioner
 B = Bellows Positioner

Motor Coil Series
 4 = 410 motor coil

Bearing Rail Configuration
 D = Dual Bearing Rails
 S = Single Bearing Rails
 * Bellows positioners not available in single rail

Base material
 B = 1/2" Al

Length of Base
 XXX = Length of base in inches
 Max.: 120" *
 Min.: 13.44"
 Increment: 3.36"
 * Truncate base length in part number.
 Example: for a 16.8 inch base, "XXX" equal "016"
 Base Length = Travel (increments of 2.4" [60.96mm])
 + 5.5" [39.7 mm] + carriage length

Coil size
 2 = 2 pole 4.8" [121.92 mm]
 3 = 3 pole 8.15" [207.01 mm]
 4 = 4 pole 11.5" [292.10 mm]
 6 = 6 pole 18.2" [462.28 mm]
 8 = 8 pole 24.9" [632.46 mm]

Cooling
 N no cooling

Winding Type
 S Series
 P Parallel

Cable track
 0 = (no track)
 4 = (standard)

Connector
 Cable Connectorization
 A = Aries
 B = Flying Leads
 C = Compax3
 G = Gemini
 V = ViX
 Z = no cables
 *Connectorize cables only available with Connector Box

Cable length
 A = 1 Meter Flying Leads
 B = 3 Meter Flying Leads
 C = 7.5 Meter Flying Leads
 L = 3 Extension Cables (with Connector Box)
 M = 7.5 Extension Cables (with Connector Box)
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 All bases with LME encoder
 All bases with Renishaw encoder under 86"
 For bases with Renishaw encoder over 86" the cable length (CL) will be CL = 10M - (base length in meters + 0.3M)

Encoder
 A = LME 1 um
 B = LME 5 um
 Q = Renishaw 5 um
 L = Renishaw 1 um
 M = Renishaw 0.5 um
 P = Renishaw 0.1 um
 R = Renishaw IV p-p sine/cosine
 X = No Encoder

*Consult factory for longer lengths.

Additional information available on:
www.parker-eme.com/trilogy_positioner

Parker Hannifin

The global leader in motion and control technologies and systems

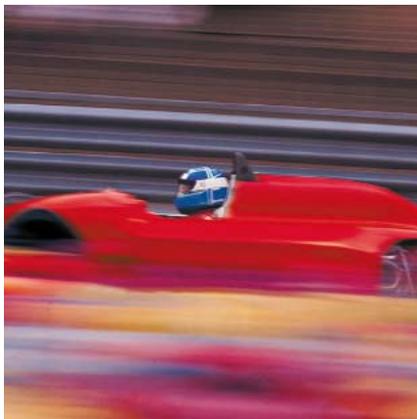
Global Partnerships Global Support

Parker is committed to helping make our customers more productive and more profitable through our global offering of motion and control products and systems. In an increasingly competitive global economy, we seek to develop customer relationships as technology partnerships. Working closely with our customers, we can ensure the best selection of technologies to suit the needs of our customers' applications.

Electromechanical Technologies for High Dynamic Performance and Precision Motion

Parker electromechanical technologies form an important part of Parker's global motion and control offering. Electromechanical systems combine high performance speed and position control with the flexibility to adapt the systems to the rapidly changing needs of the industries we serve.

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Parker Hannifin Corporation

With annual sales exceeding \$12 billion, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of commercial, mobile, industrial and aerospace markets. The company employs more than 62,000 people in 48 countries

around the world. Parker has increased its annual dividends paid to shareholders for 52 consecutive years, among the top five longest-running dividend-increase records in the S&P 500 index. For more information, visit the company's web site at www.parker.com, or its investor information site at www.phstock.com.

Electromechanical Automation

Global products with local manufacturing and support

Global Product Design

Parker Hannifin has more than 40 years' experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

Local Application Expertise

Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers' needs. Parker's engineering resources also extend to the development and manufacture of complete systems for continuous process and motion control applications.

Manufacturing to Meet Our Customers' Needs

Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker's manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers' expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia. This allows us to minimize transportation time and cost and to be able to respond more quickly to customer needs.

Worldwide Electromechanical Automation Manufacturing Locations

Europe

Littlehampton, United Kingdom
Dijon, France
Offenburg, Germany
Milan, Italy

Asia

Shanghai, China
Chennai, India

North America

Charlotte, North Carolina
Rohnert Park, California
Irwin, Pennsylvania
Wadsworth, Ohio
Port Washington, New York
New Ulm, Minnesota



Offenburg, Germany



Littlehampton, UK

Local Manufacturing and Support in Europe

Parker provides sales assistance and local technical support through a group of dedicated sales teams and a network of authorized technical

distributors throughout Europe. For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com.



● Manufacturing ○ Parker Sales Offices ● Distributors



Milan, Italy

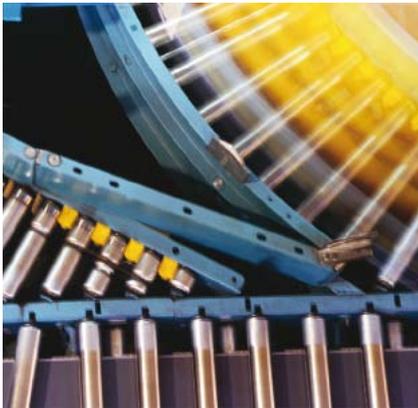


Dijon, France

Solutions to Improve Productivity, Increase Flexibility and Save Energy

Process Productivity and Reliability

Parker brings together the technology and experience required for continuous process applications across many industries. AC and DC variable speed drive products combined with application-specific function block-based configuration software ensure precise speed control and reliable performance. Parker combines more than 30 years of application experience with a global sales and support network that help you increase your machine availability.



	AC Drives	DC Drives	Direct Drive Motors	Servo Drives and Motors
Converting machinery				
Folding, gluing, stitching and collating	✓	✓		✓
Coating, laminating and foil stamping	✓	✓	✓	✓
Slitting, cutting and rewinding	✓	✓	✓	✓
Plastics processing machinery				
Plastic extrusion	✓		✓	
Injection moulding	✓		✓	✓
Thermal forming	✓		✓	✓
Wire and cable				
Wire and cable manufacturing	✓	✓		✓
Winding/unwinding	✓	✓	✓	
Extrusion for wire and cable	✓	✓	✓	
Printing Machinery				
Web/sheetfed offset	✓		✓	✓
Flexo printing	✓		✓	✓
Gravure printing	✓		✓	✓
Shaftless printing	✓		✓	✓
Other industries				
Paper machinery	✓		✓	
Sugar processing	✓	✓		
Steel production	✓	✓	✓	
Construction materials	✓	✓		
Automotive test rigs	✓	✓	✓	

Energy Efficiency and Clean Power

Parker has developed the technology to maximize the efficient use of energy in industrial, mobile and infrastructure environments.

Hybrid Vehicle Technology

Parker has adapted its electric drive technologies for use in hybrid electric vehicles, including utility vehicles and passenger vehicles. Examples include inverters and motor drives, as well as electric drive motors.

Energy Savings for Pumps, Fans and Compressors

Parker has the drive technology to help you make significant energy savings in the operation of pumps, fans and compressors in both industrial and infrastructure applications, including:

- Commercial refrigeration
- Water and wastewater treatment
- Building automation
- Industrial processes
- Hydraulic systems



Power Generation and Conversion

Using proven inverter technology, Parker has developed numerous solutions for the conversion of energy for commercial use from a variety of sources, including wind, wave and energy storage devices.

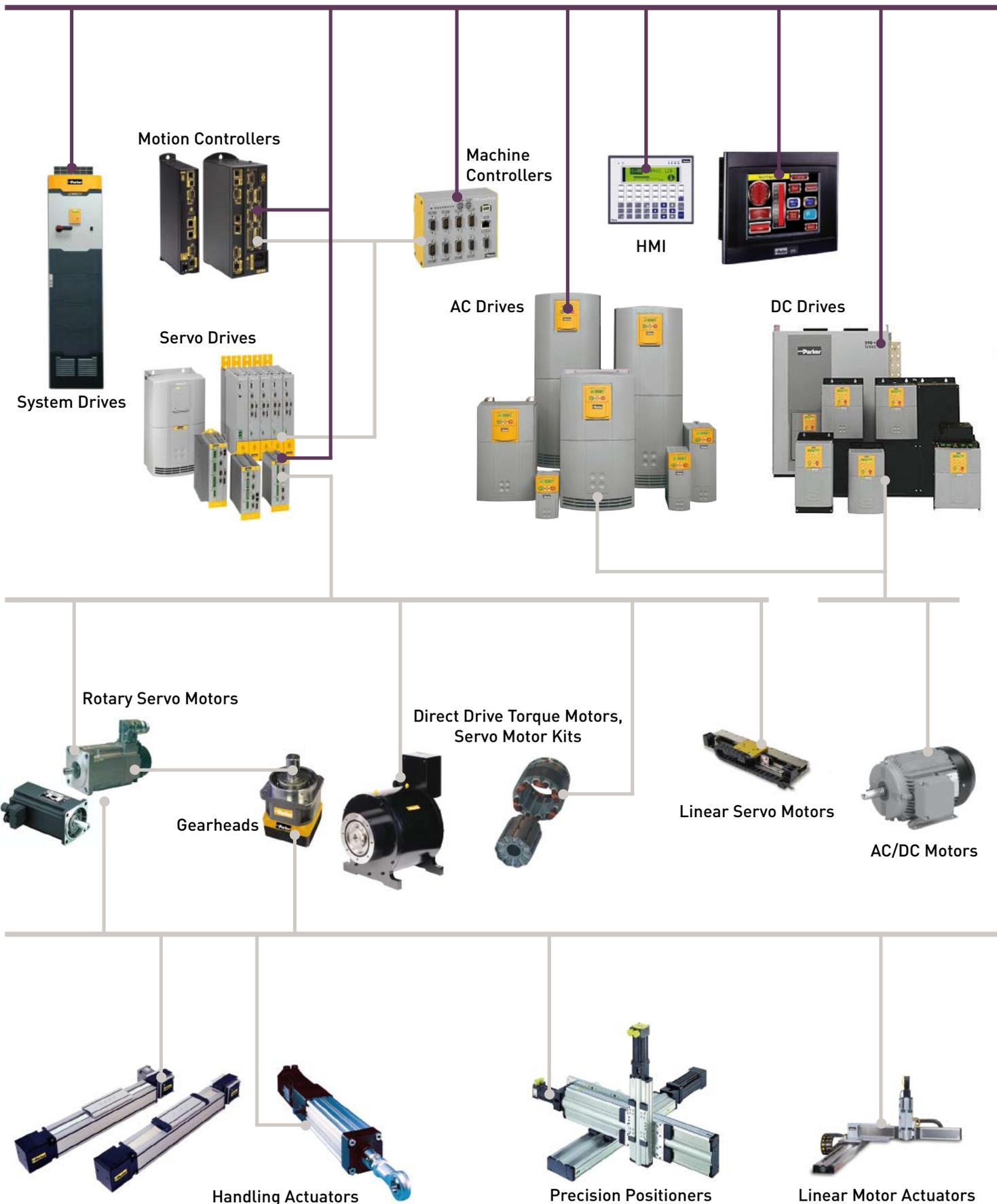
Motion Control Systems for Total Production Flexibility

Parker's electromechanical automation customers enjoy total production flexibility in their general and precision motion control applications. Complete packaged linear positioning systems, coupled to servo and stepper drives and controls, enable our customers to develop a complete motion solution with one partner. Parker provides the products for a wide range of motion needs- power, speed, travel, force- with easy to use controls designed to work on multiple control and communication platforms. Additionally, Parker's products can be easily customized to suit specific applications.

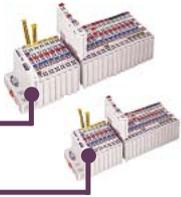


	Mechanical Actuators	Motors and Gearheads	Drives	Controls	HMI
Assembly machinery					
Pick and place	✓	✓	✓	✓	✓
Lifting	✓	✓	✓	✓	
Transfer machinery	✓	✓	✓	✓	✓
Automotive assembly					
Resistance welding	✓	✓	✓	✓	
Painting applications	✓	✓	✓	✓	✓
Transfer machinery	✓	✓	✓	✓	✓
Packaging machinery					
Primary, secondary, tertiary	✓	✓	✓	✓	✓
Handling machinery	✓	✓	✓	✓	✓
Food processing machinery					
Processing machinery	✓	✓	✓	✓	
Packaging machinery	✓	✓	✓	✓	
Handling machinery	✓	✓	✓	✓	✓
Material handling systems					
Transfer systems	✓	✓	✓	✓	✓
Pick and place systems	✓	✓	✓	✓	✓
Metal forming machinery					
Presses	✓	✓	✓	✓	✓
Tube bending	✓	✓	✓	✓	✓
Handling applications	✓	✓	✓	✓	✓
Machine tools					
Spindles		✓	✓		
Ancillary axes		✓	✓		
Semiconductor machinery					
Front end processes	✓	✓	✓	✓	✓
Inspection machinery	✓	✓	✓	✓	✓
Packaging machinery	✓	✓	✓	✓	✓
Lithography	✓	✓	✓	✓	
Medical devices					
Device manufacturing	✓	✓	✓	✓	✓
Product packaging and dispensing	✓	✓	✓	✓	✓
Scanning equipment	✓	✓	✓		
Pumps and analyzers		✓	✓		
Entertainment					
Theatre and studio automation	✓	✓	✓	✓	
Simulation and amusement rides	✓	✓	✓		

Complete Range of Solutions



Remote I/O



Stepper Drives



Stepper Motors



Gantry Systems



Value Added Services

In addition to providing products and systems, Parker also provides a number of value added services to our customers:

- Programming and commissioning services
- Power quality and energy surveys
- 24-hour support and service
- Product repairs
- Product training

Customization

Many automation applications cannot be solved with off the shelf products. Parker's products are designed to be versatile as well as easy to configure for the majority of industrial and process applications. Some customers require solutions that can't be found in a catalogue, and Parker has the resources and expertise available to provide customized solutions:

- Custom motor designs
- Customized mechanical positioning systems
- Customized control functionality
- Customized communication solutions



System Solutions

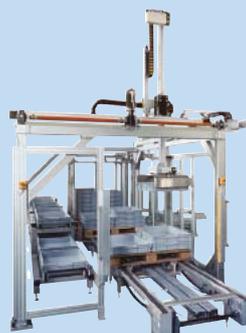
Parker offers system design and manufacturing in two main categories:

Drive Systems

Complete AC and DC drive systems across a wide power range, from less than 1 kW to more than 1 MW. Systems typically include electrical enclosure, ancillary electronic equipment and full documentation. Commissioning and support services are standard.

Mechanical Systems

Parker has more than 20 years of experience in providing a variety of multiple axis mechanical positioning systems, complete with motors, drives and controls. Typical applications include material transfer and pick and place gantry systems. Additionally, Parker designs and builds custom precision positioning systems, integrating precision bearing, feedback and drive systems, including Parker's range of linear servo motors. Each system ships complete with motors, drives and controls, and can include the programming and commissioning.



Parker Worldwide

AE – UAE, Dubai
Tel: +971 4 8127100
parker.me@parker.com

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe, Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

AZ – Azerbaijan, Baku
Tel: +994 50 2233 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BR – Brazil, Cachoeirinha RS
Tel: +55 51 3470 9144

BY – Belarus, Minsk
Tel: +375 17 209 9399
parker.belarus@parker.com

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

CH – Switzerland, Etoy
Tel: +41 (0) 21 821 02 30
parker.switzerland@parker.com

CL – Chile, Santiago
Tel: +56 2 623 1216

CN – China, Shanghai
Tel: +86 21 5031 2525

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 33 00 01
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HK – Hong Kong
Tel: +852 2428 8008

HU – Hungary, Budapest
Tel: +36 1 220 4155
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IN – India, Mumbai
Tel: +91 22 6513 7081-85

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

JP – Japan, Tokyo
Tel: +(81) 3 6408 3901

KR – South Korea, Seoul
Tel: +82 2 559 0400

KZ – Kazakhstan, Almaty
Tel: +7 7272 505 800
parker.easteurope@parker.com

LV – Latvia, Riga
Tel: +371 6 745 2601
parker.latvia@parker.com

MX – Mexico, Apodaca
Tel: +52 81 8156 6000

MY – Malaysia, Shah Alam
Tel: +60 3 7849 0800

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Ski
Tel: +47 64 91 10 00
parker.norway@parker.com

NZ – New Zealand, Mt Wellington
Tel: +64 9 574 1744

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SG – Singapore
Tel: +65 6887 6300

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TH – Thailand, Bangkok
Tel: +662 717 8140

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

TW – Taiwan, Taipei
Tel: +886 2 2298 8987

UA – Ukraine, Kiev
Tel: +380 44 494 2731
parker.ukraine@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

US – USA, Cleveland
Tel: +1 216 896 3000

VE – Venezuela, Caracas
Tel: +58 212 238 5422

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

European Product Information Centre
Free phone: 00 800 27 27 5374
(from AT, BE, CH, CZ, DE, DK, ES, FI, FR, IE, IT, NL, NO, PL, PT, RU, SE, UK, ZA)

Ed. 2009-03-11

