Phone: 877-478-3241
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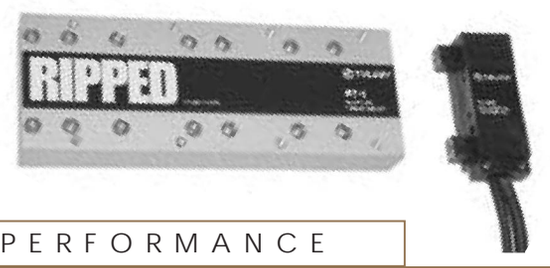
specifications R7

IRONCORE LINEAR MOTOR



- **RIPPED** Ironcore motor, Patent Pending
  Cross-section: 70mm(2.756") x 37.5mm(1.476")
- Peak forces in three sizes to 2135N(480lbs), Continuous forces to 476N(107lbs)
- Two lengths of modular magnet tracks allow unlimited length of travel
- Connector modules allow quick and easy installation
- Internal thermal cutout switch protects coil

PERFORMANCE

MOTOR MODEL		R7-1	R7-2	R7-3
Peak Force	N	712	1423	2135
	lb	160	320	480
Continuous Force	N	156	316	476
	lb	35	71	107
Peak Power	W	8618	18140	27190
Continuous Power	W	235	470	701

ELECTRICAL

MOTOR MODEL		R7-1	R7-2		R7-3	
WIRING TYPE	UNITS	S-Series	S-Series	P-Parallel	S-Series	T-Triple
Peak Current	A	40.9	40.9	81.8	40.9	122.7
Continuous Current	A	6.6	6.6	13.2	6.6	19.8
Force Constant	N/A peak	23.2	46.4	23.2	69.6	23.2
	lb/A peak	5.2	10.4	5.2	15.6	5.2
Back EMF	V/m/s	26.8	53.5	26.8	80.3	26.8
	V/in/s	0.68	1.36	0.68	2.04	0.68
Resistance 25°C, phase to phase	ohms	4.2	8.4	2.1	12.6	1.4
Inductance, phase to phase	mH	6.1	12.2	3.1	18.3	2.0
Electrical Time Constant	ms	1.5	1.5	1.5	1.5	1.5
Motor Constant	$N/\sqrt{W}$	9.9	14.1	14.1	17.2	17.2
	$lb/\sqrt{W}$	2.24	3.16	3.16	3.87	3.87
Max Terminal Voltage	VDC	330	330		330	

THERMAL

MOTOR MODEL		R7-1	R7-2	R7-3
Thermal Dissipation Constant	W/°C	3.13	6.27	9.40
Thermal Time Constant	min	12.7	12.7	12.7
Maximum Winding Temperature	°C	100	100	100

MECHANICAL

MOTOR MODEL		R7-1	R7-2	R7-3
Coil Weight	kg	1.5	3.0	4.5
	lb	3.3	6.7	10.0
Coil Length	mm	218.2	378.2	538.2
(includes connector module)	in	8.590	14.890	21.189
Attractive Force	N	1557	3114	4671
	lbf	350	700	1050
Electrical Cycle Length	mm	40	40	40
	in	1.575	1.575	1.575

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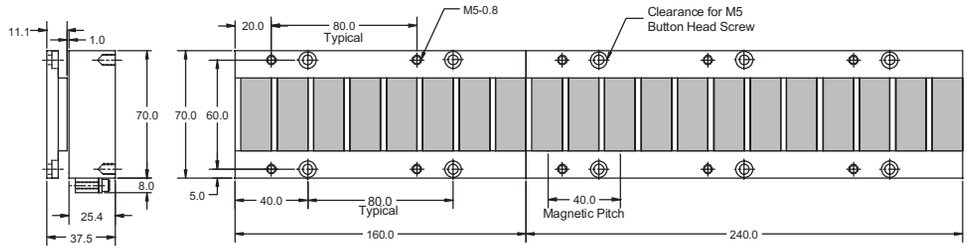
R7 dimensions

MODULAR TRACKS R7-160-M-x R7-240-M-x



Incremental Length:
80.0mm/3.1496"

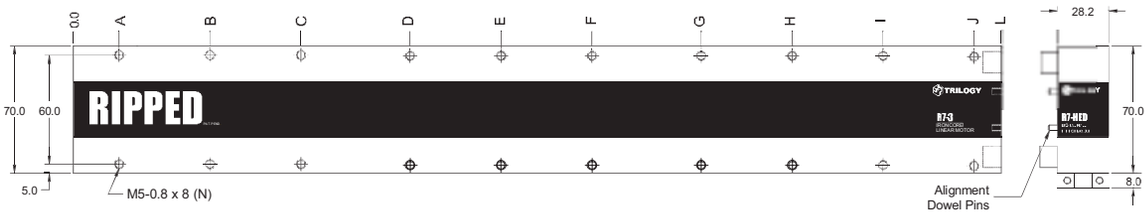
Minimum Length:
40.0mm/1.5748"

Weight:
4.57Kg/m (3.08lbs/ft)

R7-160-M-N (Nickel Plated Magnets)
R7-240-M-N "

R7-160-M-B (Black Epoxy Coated Magnets)
R7-240-M-B "

COIL ASSEMBLY R7-xA-NC-Mx

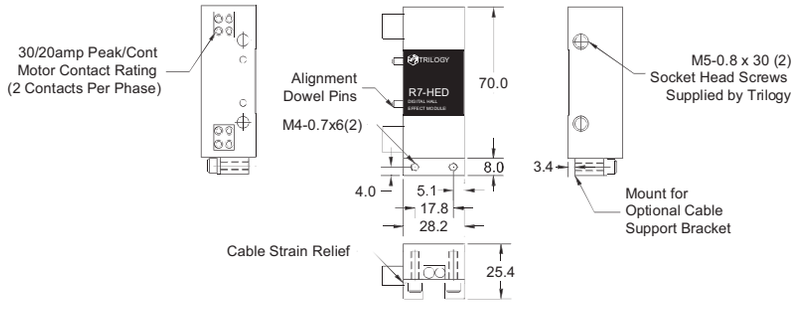


R7 COIL ASSEMBLY

R7-xA-NC-Mx	N	A	B	C	D	E	F	G	H	I	J	L
R7-1A-NC-Mx	8	25.0	75.0	125.0	175.0	-	-	-	-	-	-	190.0
R7-2A-NC-Mx	14	25.0	75.0	125.0	185.0	235.0	285.0	335.0	-	-	-	350.0
R7-3A-NC-Mx	20	25.0	75.0	125.0	185.0	235.0	285.0	345.0	395.0	445.0	495.0	510.0

R7-1A-NC-MS Series Winding
R7-2A-NC-MS or -MP Series or Parallel Winding
R7-3A-NC-MS or -MT Series or Triple Winding

CONNECTOR MODULE R7-xxx-Rx-x



R7 CONNECTOR MODULE

R7-xxx-Rx-x	Motor Connector	Digital HED's	Limit Sensors
R7-CM-Rx-x	✓		
R7-HED-Rx-x	✓	✓	✓

R7-xxx-RS-1 or -RP-1 or -RT-1: 1m cable standard.
Module and Coil Assembly winding (S,P or T) must match.

NOTES

1. Peak force and current based on 5% duty cycle results in the maximum temperature rise.
2. The force constant gradually decreases at high current levels. At the peak current the force constant is reduced by 24%. Refer to Trilogy's website for motor performance curves at different current levels. TIPS sizing software accommodates the changing force constant with current in its algorithms
3. Specifications are based on the maintaining the air gap between the coil and track shown in the drawings. Refer to Trilogy's website for motor performance curves at different air gaps.
4. Continuous force and current based on coil winding temperature maintained at 100°C.
5. Motor resistance measured between any two motor leads with motor connected in Wye winding at 25°C. For temperature at 100°C, multiply resistance by 1.295 (75°C rise * 0.393%/°C)
6. Thermal Dissipation Constant is amount of power in watts required to raise the winding temperature by 1°C. Determined experimentally using a TR7 Positioner.
7. 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.
8. Use TIPS sizing software for the most accurate estimate of coil temperature for a particular motion profile.

SAFETY

1. USE EXTREME CAUTION IN HANDLING TRACKS. Ironcore Linear Motors contain exposed magnets and have an open magnetic field. Any ferrous metal, steel or iron, will be attracted to the magnet track. The amount of attractive force increases significantly as the distance from the magnet decreases. Severe injury may occur to fingers or hands if caught between the track and coil or other metal object.
2. USE EXTREME CAUTION WHEN INSTALLING THE COIL. The data sheet lists the attractive force between the coil and track. Refer to the "Motor Installation Guide" for proper installation instructions.
3. ANY PERSON WITH MEDICAL ELECTRONIC IMPLANTS SHOULD USE EXTREME CAUTION WHEN NEAR AN OPEN MAGNETIC FIELD. The magnetic field could interfere with the medical device's operation.
4. ANY PERSON WORKING OR HANDLING THE TRACKS SHOULD REMOVE PERSONAL EFFECTS. Items such as jewelry, watches, keys and credit cards may be damaged or adversely affected by the magnetic field.

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specifications R10

IRONCORE LINEAR MOTOR

- **RIPPED** Ironcore motor, Patent Pending
- Cross-section: 100mm(3.94") x 58mm(2.28")
- Peak forces in three sizes to 4671N(1050lbs), Continuous forces to 1174N(264lbs)
- Two lengths of modular magnet tracks allow unlimited length of travel
- Connector modules allow quick and easy installation
- Internal thermal cutout switch protects coil

PERFORMANCE

MOTOR MODEL		R10-1	R10-2	R10-3
Peak Force	N	1557	3114	4671
	lb	350	700	1050
Continuous Force	N	391	783	1174
	lb	88	176	264
Peak Power	W	13,300	26,600	39,900
Continuous Power	W	397	794	1191

ELECTRICAL

MOTOR MODEL		R10-1	R10-2		R10-3	
WIRING TYPE	UNITS	S-Series	S-Series	P-Parallel	S-Series	T-Triple
Peak Current	A	45.0	45.0	90.0	45.0	135.0
Continuous Current	A	7.8	7.8	15.6	7.8	23.4
Force Constant	N/A peak	47.7	95.5	47.7	143.2	47.7
	lb/A peak	10.7	10.7	32.2	32.2	10.7
Back EMF	V/m/s	55.1	110.2	55.1	165.4	55.1
	V/in/s	1.40	2.80	1.40	4.20	1.40
Resistance 25°C, phase to phase	ohms	5.1	10.2	2.6	15.3	1.7
Inductance, phase to phase	mH	15.4	30.8	7.7	46.2	5.1
Electrical Time Constant	ms	3	3	3	3	3
Motor Constant	$N/\sqrt{W}$	18.6	26.3	26.3	32.2	32.2
	$lb/\sqrt{W}$	4.18	5.91	5.91	7.23	7.23
Max Terminal Voltage	VDC	330	330		330	

THERMAL

MOTOR MODEL		R10-1	R10-2	R10-3
Thermal Dissipation Constant	W/°C	5.3	10.6	15.9
Thermal Time Constant	min	14.6	14.6	14.6
Maximum Winding Temperature	°C	100	100	100

MECHANICAL

MOTOR MODEL		R10-1	R10-2	R10-3
Coil Weight	kg	4.5	9.1	13.6
	lb	10.0	20.0	30.0
Coil Length	mm	295.0	535.0	775.0
(includes connector module)	in	11.614	21.063	30.512
Attractive Force	N	3,559	7,117	10,675
	lbf	800	1600	2400
Electrical Cycle Length	mm	60	60	60
	in	2.362	2.362	2.362

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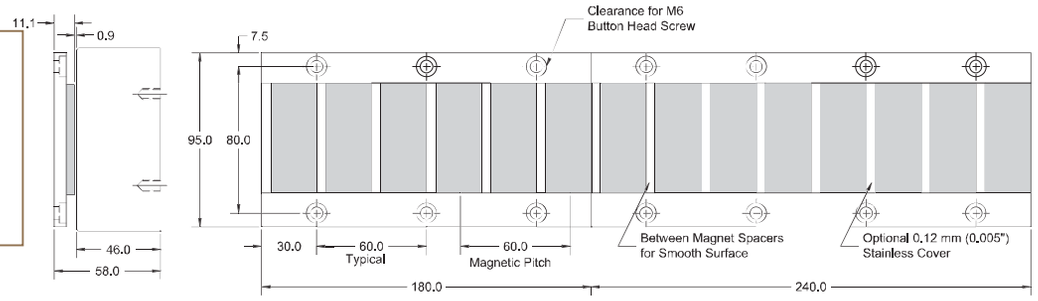
R10 dimensions

MODULAR TRACKS R10-180-M-x R10-240-M-x



Incremental Length:
60.0mm/2.3622"

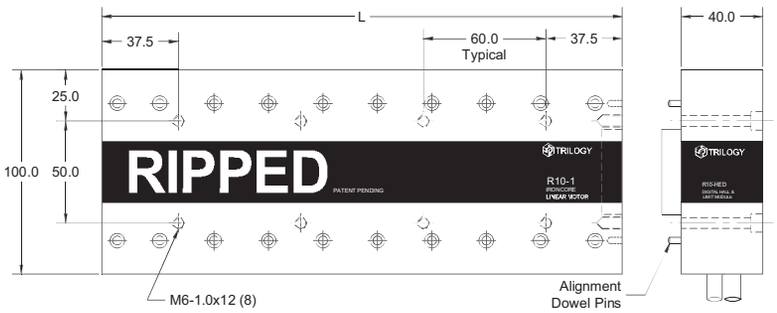
Minimum Length:
60.0mm/2.3622"

Weight:
6.51Kg/m (4.38lbs/ft)

R10-180-M-N (Nickel Plated Magnets)
R10-240-M-N "

R10-180-M-B (Black Epoxy Coated Magnets)
R10-240-M-B "

COIL ASSEMBLY R10-xA-NC-Mx

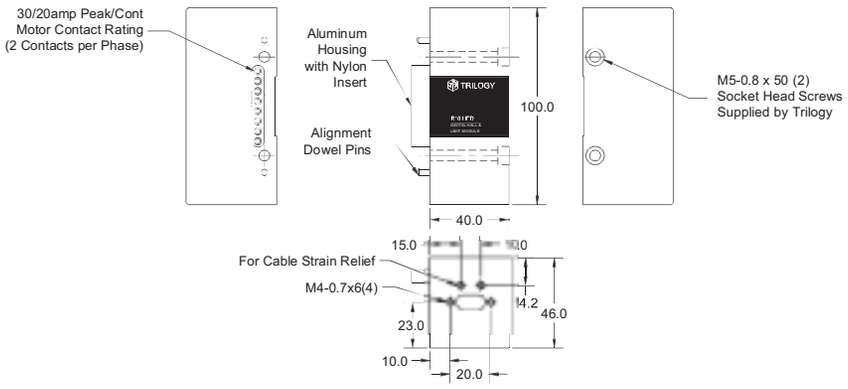


R10 COIL ASSEMBLY

R10-xA-NC-Mx	L	N	OAL
R10-1A-NC-Mx	255.0	8	295.0
R10-2A-NC-Mx	495.0	16	535.0
R10-3A-NC-Mx	735.0	24	775.0

R10-1A-NC-MS Series Winding
R10-2A-NC-MS or -MP Series or Parallel Winding
R10-3A-NC-MS or -MT Series or Triple Winding

CONNECTOR MODULE R10-xxx-Rx-x



R10 CONNECTOR MODULE

R10-xxx-Rx-x	Motor Connector	Digital HED's	Limit Sensors
R10-CM-Rx-x	✓		
R10-HED-Rx-x	✓	✓	✓

R10-xxx-RS-1 or -RP-1 or -RT-1: 1m cable standard.
Module and Coil Assembly winding (S,P or T) must match.

NOTES

1. Peak force for the R10 is not limited by the temperature rise. Using the peak current at a 6.4% duty cycle results in the maximum temperature rise.
2. The force constant gradually decreases at high current levels. At the peak current the force constant is reduced by 27%. Refer to Trilogy's website for motor performance curves at different current levels. TIPS sizing software accommodates the changing force constant with current in its algorithm's
3. Specifications are based on the maintaining the air gap between the coil and track shown in the drawings. Refer to Trilogy's website for motor performance curves at different air gaps.
4. Continuous force and current based on coil winding temperature maintained at 100°C.
5. Motor resistance measured between any two motor leads with motor connected in Wye winding at 25°C. For temperature at 100°C, multiply resistance by 1.295 (75°C rise * 0.393%/°C)
6. Thermal Dissipation Constant is amount of power in watts required to raise the winding temperature by 1°C. Determined experimentally using a TR10 Positioner.
7. 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.
8. Use TIPS sizing software for the most accurate estimate of coil temperature for a particular motion profile.

SAFETY

1. USE EXTREME CAUTION IN HANDLING TRACKS. Ironcore Linear Motors contain exposed magnets and have an open magnetic field. Any ferrous metal, steel or iron, will be attracted to the magnet track. The amount of attractive force increases significantly as the distance from the magnet decreases. Severe injury may occur to fingers or hands if caught between the track and coil or other metal object.
2. USE EXTREME CAUTION WHEN INSTALLING THE COIL. The data sheet lists the attractive force between the coil and track. Refer to the "Motor Installation Guide" for proper installation instructions.
3. ANY PERSON WITH MEDICAL ELECTRONIC IMPLANTS SHOULD USE EXTREME CAUTION WHEN NEAR AN OPEN MAGNETIC FIELD. The magnetic field could interfere with the medical device's operation.
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specifications R16

IRONCORE LINEAR MOTOR

- **RIPPED** Ironcore motor, Patent Pending
- Cross-section: 100mm(3.94") x 58mm(2.28")
- Peak forces in three sizes to 4671N(1050lbs), Continuous forces to 1174N(264lbs)
- Two lengths of modular magnet tracks allow unlimited length of travel
- Connector modules allow quick and easy installation
- Internal thermal cutout switch protects coil

PERFORMANCE

MOTOR MODEL		R16-1	R16-2	R16-3
Peak Force	N	2478	4955	7433
	lb	557	1114	1671
Continuous Force	N	743	1487	2230
	lb	167	334	501
Peak Power	W	7065	14130	21195
Continuous Power	W	353	707	1060

ELECTRICAL

MOTOR MODEL		R16-1	R16-2		R16-3	
WIRING TYPE	UNITS	S-Series	S-Series	P-Parallel	S-Series	T-Triple
Peak Current	A	34.8	34.8	69.8	34.8	104.5
Continuous Current	A	7.8	7.8	15.6	7.8	23.4
Force Constant	N/A peak	95.5	190.9	95.5	286.4	95.5
	lb/A peak	21.5	42.9	21.5	64.4	21.5
Back EMF	V/m/s	110.2	220.5	110.2	330.7	110.2
	V/in/s	2.80	5.60	2.80	8.40	2.80
Resistance 25°C, phase to phase	ohms	6.0	12.0	3.0	18.0	2.0
Inductance, phase to phase	mH	29.0	58.0	14.5	87.0	9.7
Electrical Time Constant	ms	4.8	4.8	4.8	4.8	4.8
Motor Constant	$N/\sqrt{W}$	39.6	55.9	55.9	68.5	68.5
	$lb/\sqrt{W}$	8.89	12.57	12.57	15.40	15.40
Max Terminal Voltage	VDC	330	330		330	

THERMAL

MOTOR MODEL		R16-1	R16-2	R16-3
Thermal Dissipation Constant	W/°C	4.71	9.42	14.13
Thermal Time Constant	min	37.1	37.1	37.1
Maximum Winding Temperature	°C	100	100	100

MECHANICAL

MOTOR MODEL		R16-1	R16-2	R16-3
Coil Weight	kg	9.10	18.20	27.30
	lb	20.0	40.0	60.0
Coil Length	mm	305.5	545.5	785.5
(includes connector module)	in	12.027	21.476	30.925
Attractive Force	N	7117	14234	21351
	lbf	1600	3200	4800
Electrical Cycle Length	mm	60	60	60
	in	2.3622	2.3622	2.3622

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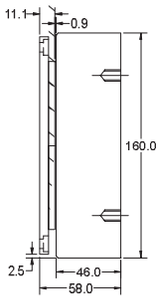
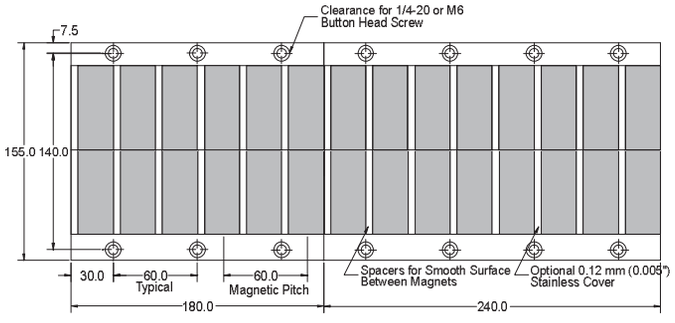
R16 dimensions

MODULAR TRACKS R16-180-M-X R16-240-M-X





Incremental Length:
60.0mm (2.3622")

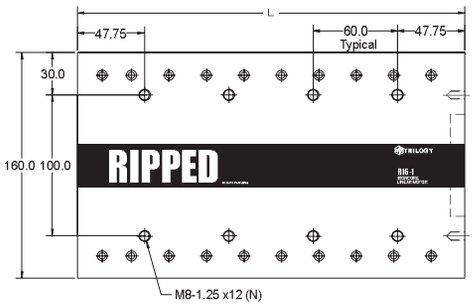
Minimum Length:
180.0mm (7.0866")

Weight:
11.34Kg/m (7.60lbs/ft)

R16-180-M-N (Nickel Plated Magnets)
R16-240-M-N "

R16-180-COVER (Optional)
R16-240-COVER "

COIL ASSEMBLY R16-xA-NC-Mx

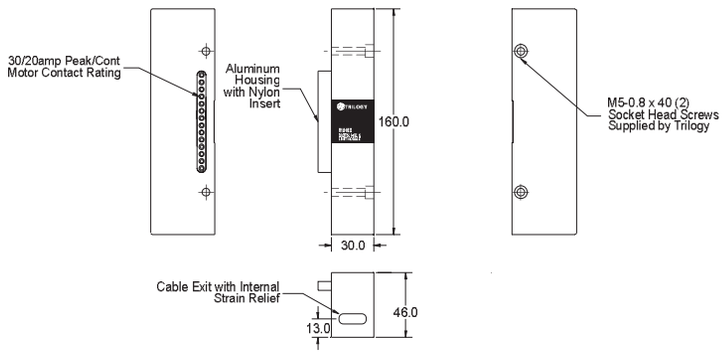


R16 COIL ASSEMBLY

R16-xA-NC-Mx	L	N	OAL
R16-1A-NC-Mx	275.5	8	305.5
R16-2A-NC-Mx	515.5	16	545.5
R16-3A-NC-Mx	755.5	24	785.5

R16-1A-NC-MS Series Winding
R16-2A-NC-MS or -MP Series or Parallel Winding
R16-3A-NC-MS or -MT Series or Triple Winding

CONNECTOR MODULE R16-xxx-Rx-x



R16 CONNECTOR MODULE

R16-xxx-Rx-x	Motor Connector	Digital HED's	Limit Sensors
R16-CM-Rx-x	✔		
R16-HED-Rx-x	✔	✔	✔

R16-xxx-RS-1 or -RP-1 or -RT-1: 1m cable standard.
Module and Coil Assembly winding (S,P or T) must match.

NOTES

1. Peak force for the R16 is not limited by the temperature rise. Using the peak current at a 6.4% duty cycle results in the maximum temperature rise.
2. The force constant gradually decreases at high current levels. At the peak current the force constant is reduced by 27%. Refer to Trilogy's website for motor performance curves at different current levels. TIPS sizing software accommodates the changing force constant with current in its algorithm's
3. Specifications are based on the maintaining the air gap between the coil and track shown in the drawings. Refer to Trilogy's website for motor performance curves at different air gaps.
4. Continuous force and current based on coil winding temperature maintained at 100°C.
5. Motor resistance measured between any two motor leads with motor connected in Wye winding at 25°C. For temperature at 100°C, multiply resistance by 1.295 (75°C rise * 0.393%/°C)
6. Thermal Dissipation Constant is amount of power in watts required to raise the winding temperature by 1°C. Determined experimentally using a TR16 Positioner.
7. 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.
8. Use TIPS sizing software for the most accurate estimate of coil temperature for a particular motion profile.

SAFETY

1. USE EXTREME CAUTION IN HANDLING TRACKS. Ironcore Linear Motors contain exposed magnets and have an open magnetic field. Any ferrous metal, steel or iron, will be attracted to the magnet track. The amount of attractive force increases significantly as the distance from the magnet decreases. Severe injury may occur to fingers or hands if caught between the track and coil or other metal object.
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