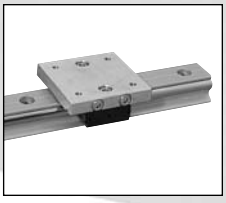
TUSK DIRECT, INC.

Econo-Rail Series



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Series ERL Double Rail Guide

Features

- Guide rails consist of two precision ground ∅12 mm steel shafts, with M5 threaded holes spaced 100 mm apart. Shaft is hardened to RC 62 ± 2.
- The two shafts are pulled together by the support block design, ensuring they are parallel to ≤ .02 mm / 1 m and easy assembly.
- The aluminum support blocks have two holes spaced 28 mm apart for easy mounting.
- The support blocks can be set at increments of 100 mm depending on the size of the load.
- Extremely low cost.
- Can use Roller Carriage, or Bearing Carriage.
- The steel shafts can be staggered and built up to provide virtually any length of travel.
- Note that the individual shafts and mounting blocks are sold separately.
- Maximum linear speeds of up to 10 m/sec.
- Example of Rail Assembly (as shown in picture below) requires: 2 - ERL500 and 5 - ERLB.

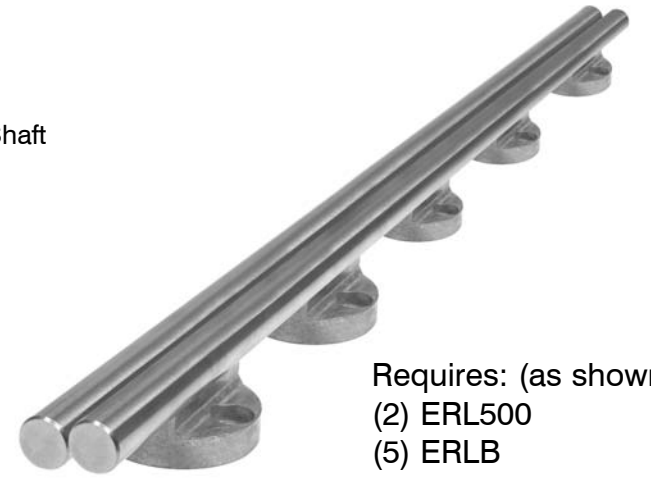
Tapped Shaft

Model (Length mm)	
ERL400	ERL1200
ERL500	ERL1300
ERL600	ERL1400
ERL700	ERL1500
ERL800	ERL1800
ERL900	ERL2000
ERL1000	ERL2500
ERL1100	ERL3000

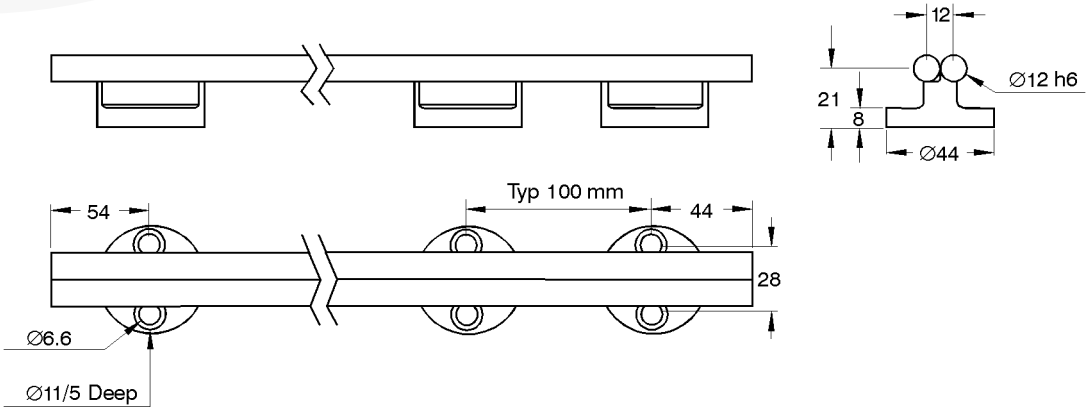
Mounting Block

ERLB

(Mounting screws for Steel Shaft are Included with Block)



Requires: (as shown)
(2) ERL500
(5) ERLB



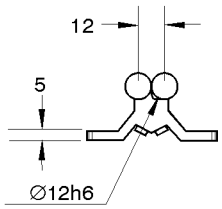
Series ERN Double Rail Guide

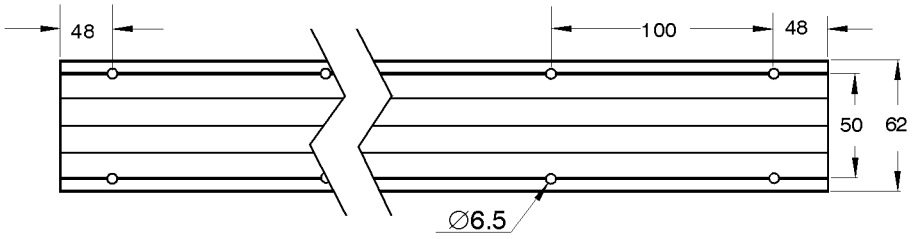
Features

- Guide Rails are fully supported uniformly throughout travel range on clear anodized aluminum support profile.
- Steel shafts are connected and tightened against each other by M5 screws. This produces a precise and rigid rail system ideal for most Linear Motion applications.
- Guide Rails and Support Profiles are sold as assembly in a variety of lengths.
- Guide Rails consist of two precision ground ∅12mm Cf53 steel shafts, hardened to RC 62 + 2, with M5 threads on 100 mm centers.
- Aluminum support profile has pairs of mounting holes at 100 mm intervals down the length of the rail system. Each pair of holes is 50 mm apart.

Model (Length mm)	
ERN400	ERN1200
ERN500	ERN1300
ERN600	ERN1400
ERN700	ERN1500
ERN800	ERN1800
ERN900	ERN2000
ERN1000	ERN2500
ERN1100	ERN3000

NOTE: Actual length is 2mm less than normal length)





Series ERN/ERL Compatible Carriages
Roller Carriage

Features

- For use with Series ERL and ERN Double Rail.
- Factory preloaded with two rollers that have eccentric mounting to allow for easy preload and clearance adjustment.
- Four precision rollers, ∅31 mm on each plate. Each roller has two sealed bearings, lubricated for life, for minimal maintenance.
- Consists of a ground and hardened steel plate 125 x 97 x 8 mm with four M6 threaded holes on a 50 mm grid for easy mounting.
- Rollers are available separately for OEM applications.
- Travel at up to 10 m/sec, with ultra quiet operation.
- Compatible with the ERL and ERN Systems.

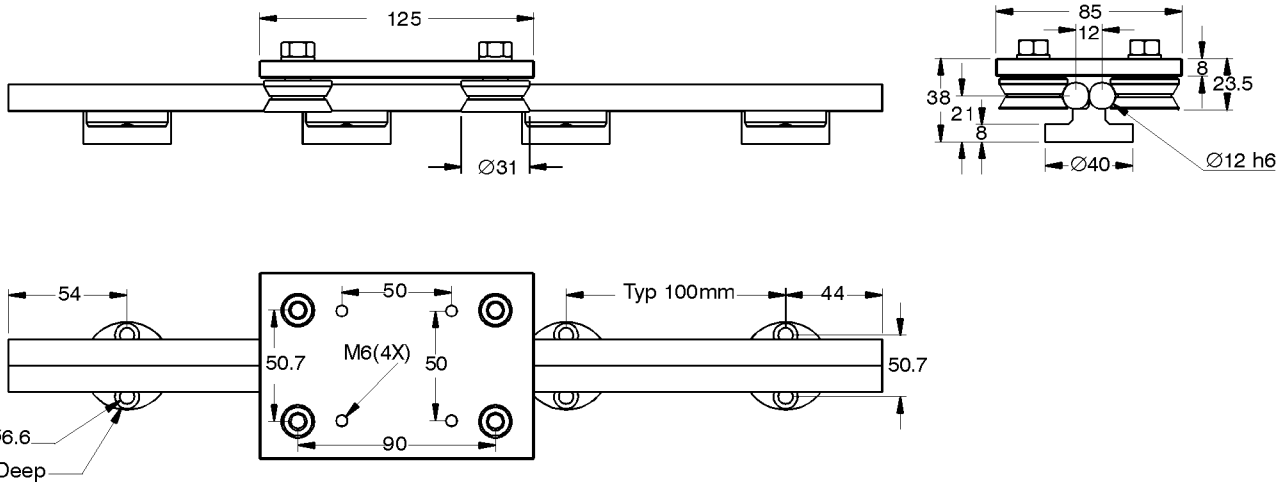
Maximum Load (N)

	Fz	Fy
Static	2800	2600
Dynamic	1400	1300

Maximum Moment (N=m)

	Mx	My	Mz
Static	73	125	65
Dynamic	38	60	32

Roller Carriage ERC 2011



Series ERN/ERL Compatible Carriages
Bearing Carriage

Features

- Carriage consists of milled aluminum block with steel core for a low cost yet durable bearing.
- ∅3.5 mm ball bearings incorporated into four recirculating raceways.
- Balls ride on steel core, this provides travel at up to 5 m/sec.
- 2 T-slots on top surface for mounting of M6 screws or nuts.
- Complete with wipers and lubrication ports.
- Compatible with the Series ERL and ERN Double Rail Systems.

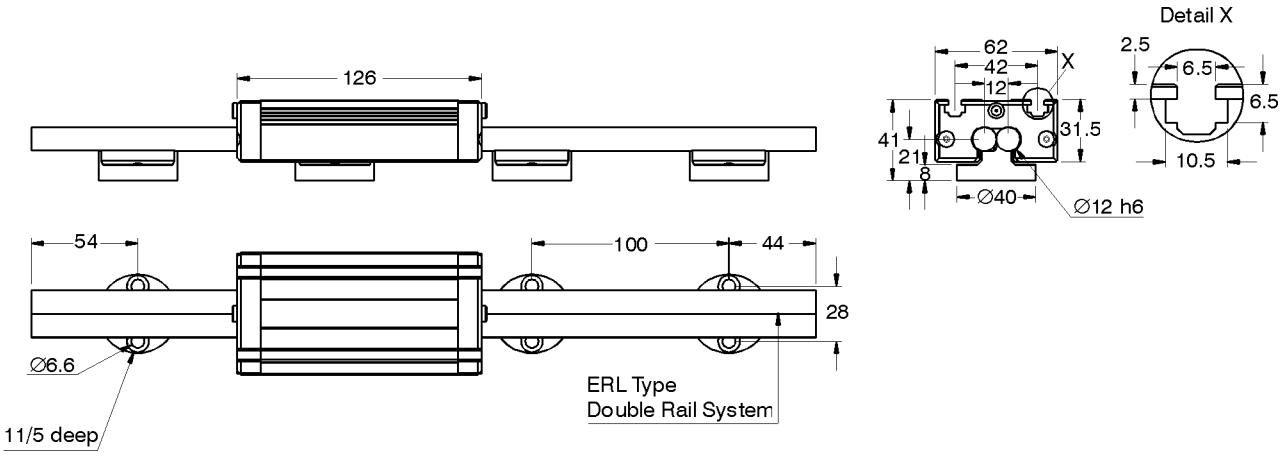
Bearing Carriages ERC 3003

Maximum Load (N)

	Fz	Fy
Static	2700	3200
Dynamic	1300	1600

Maximum Moment (N=m)

	Mx	My	Mz
Static	29	100	120
Dynamic	14	51	60



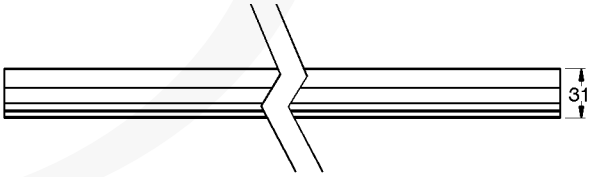
Series ERW Double Rail Guide

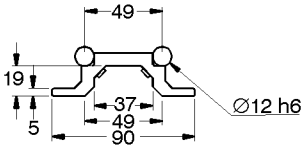
Features

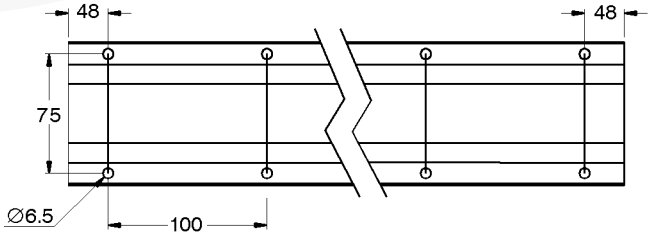
- Two guide rails supported uniformly through the length of travel by clear anodized, 90 mm wide aluminum support profile.
- Guide rails consist of two precision ground ∅12 mm h6 steel shafts with M5 threaded holes spaced 100 mm apart. The shafts are hardened to RC62 +2.
- The double rail and support profile is sold as a complete assembly in lengths from 400 mm to 3000 mm.
- The support profile has mounting holes 75 mm apart at 100 mm intervals along the system length.
- The two rails are each supported by and attached to the support profiles every 100 mm at 45° to profile, ensuring they are parallel.
- The extra wide rail spacing and base design provide high torsional stability and torque load capacity.

Model (Length mm)	
ERW400	ERW1200
ERW500	ERW1300
ERW600	ERW1400
ERW700	ERW1500
ERW800	ERW1800
ERW900	ERW2000
ERW1000	ERW2500
ERW1100	ERW3000

NOTE: (Actual length is 2 mm less than normal length)







Series ERCW Carriages
Roller Carriage

Features

- Consists of flat milled aluminum plate 150 x 125 x 20 mm with five longitudinal “T” slots for M6, DIN 508 T-nuts for easy mounting.
- Four precision ∅31 mm guide rollers are on each plate. Each roller has two rows of sealed bearings and are lubricated for life.
- Maximum linear speeds up to 10 m/sec.
- Two of the four guide rollers have eccentric pivots by which the desired preload of carriage can be adjusted.
- The preload capability allows for play-free operation.
- Rollers are available separately for OEM applications.

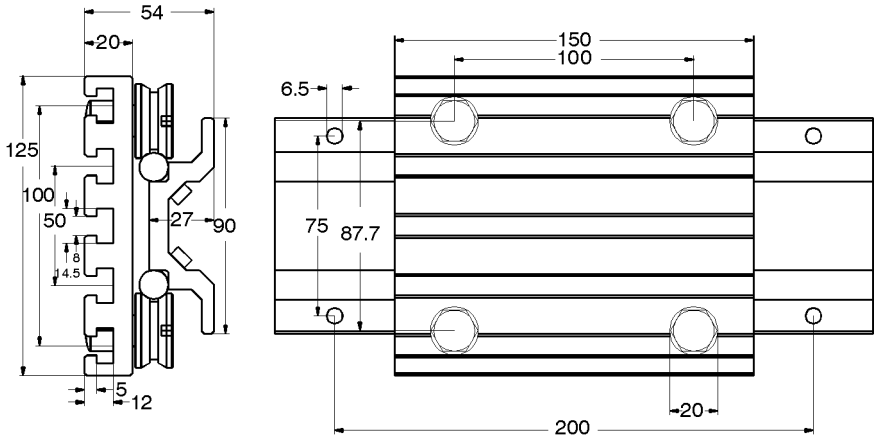
Maximum Load (N)

	Fz	Fy
Static	2800	2600
Dynamic	1400	1300

Maximum Moment (N=m)

	Mx	My	Mz
Static	125	165	82
Dynamic	62	80	40

Roller Carriage ERCW2010



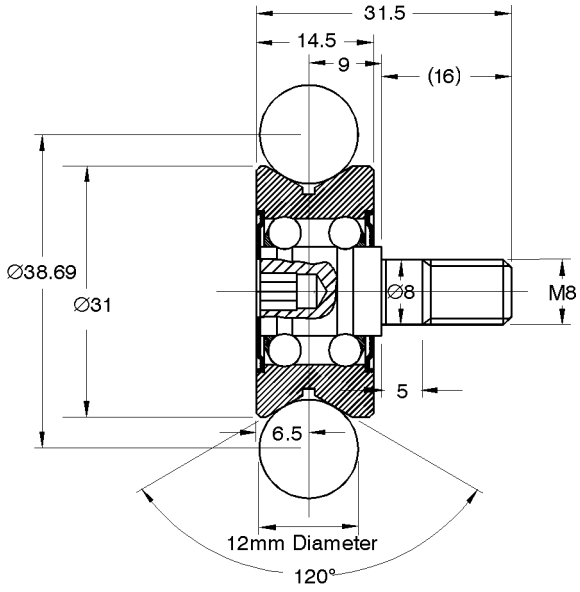
Individual Rollers

Features

- ∅31 mm diameter rollers.
- Concentric and eccentric types.
- Replacement bearings for roller carriage ERC2009, ERC2011 and ERCW2010.
- Comes with 2 bearings in a set.
- Each bearing has 2 independent rows of bearings sealed and lubricated for life.
- Ideal for OEM applications.

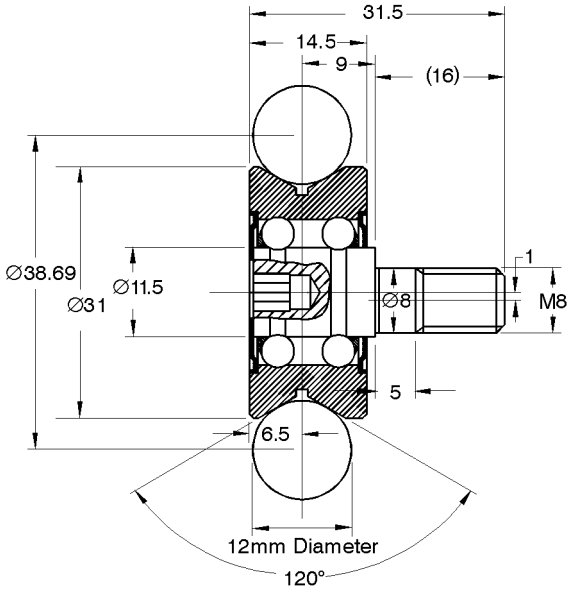
∅ 31 mm Set of 2 Rollers with Concentric Mount

Model RLC



∅ 31 mm Set of 2 Rollers with Eccentric Mount

Model RLE



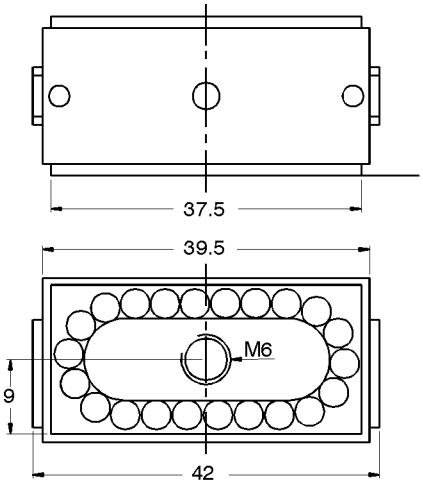
Series ER Compatible Carriages

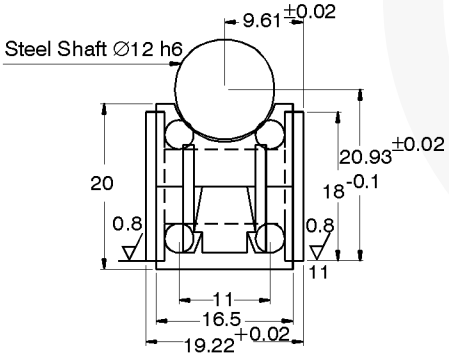
ER Linear Bearings

Features

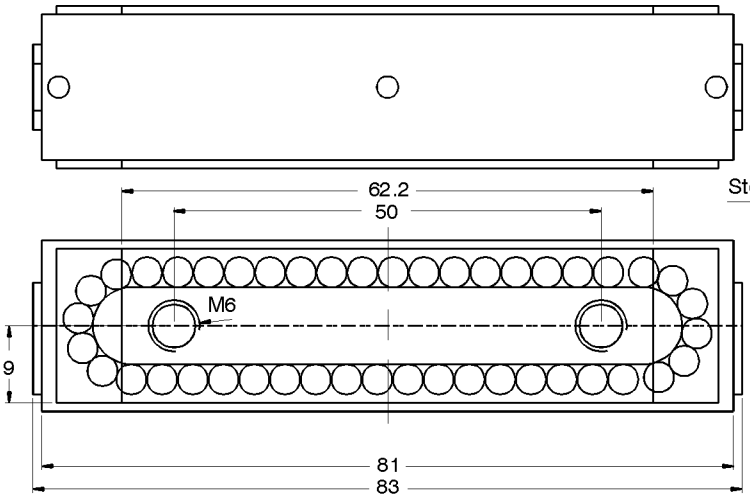
- Short bearing is replacement for short carriage; long bearing is replacement for long carriage.
- 3.5 mm diameter steel balls.
- Two independent recirculating ball bearing circuits per bearing.
- Ideal for OEM applications.
- Single-piece ground steel bearing core.

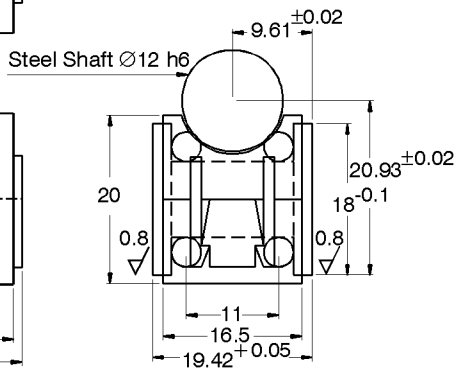
Short Bearing: ERC3001CB (sold in set of 2)





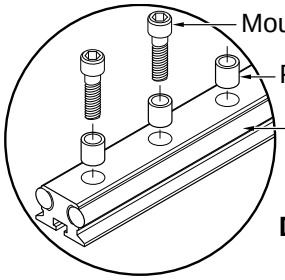
Long Bearing: ERC3002CB (sold in set of 2)





Series ER Extended Travel Linear Slides

Econo-Rail Slides

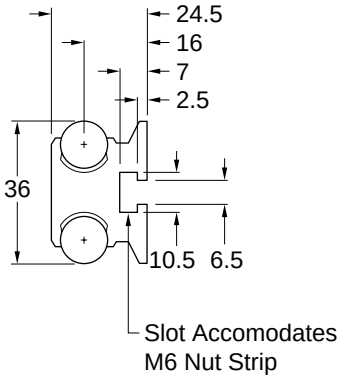


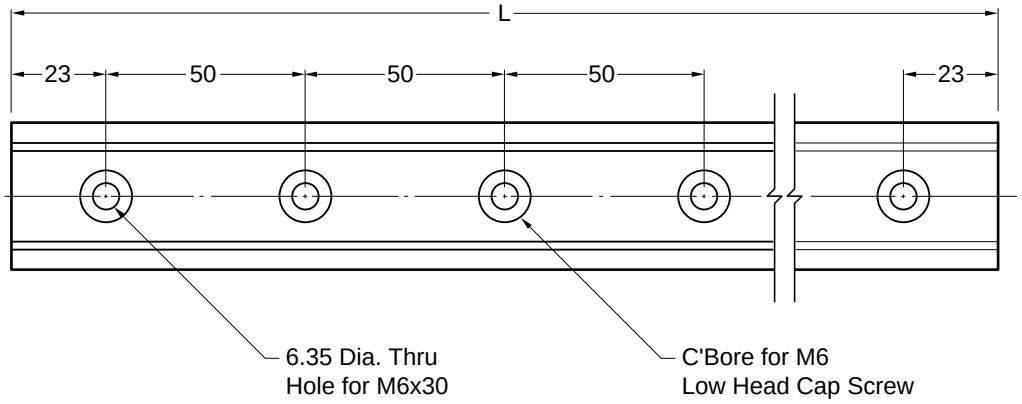
Double Rail Guide

Double Rail Guide

The double rail guide consists of two parallel, hardened and ground 12 mm diameter steel shafts, accuracy grade h6, hardness RC 62. These rails are secured in extruded aluminum channels 25 mm high. Parallelism and accurate center distances are achieved by the use of 12mm diameter h6 hardened and ground spacers inserted into the extrusion at 50 mm centers. The hardened spacers, hardness RC 62, are drilled to 6.5 mm diameter to accommodate mounting screws.

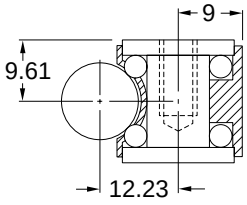
The intrinsic accuracy of this bearing system is provided by the precision steel shafts separated by precision spacers. The aluminum extrusion acts as a frame holding the components together. The entire system can be fabricated with no precision machining and, therefore, is very economical.





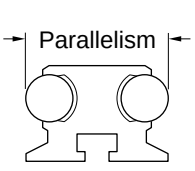
MODEL#	NOMINAL LENGTH MM (INCHES)
ER 300	300 (11.8)
ER 400	400 (15.7)
ER 500	500 (19.7)
ER 600	600 (23.6)
ER 850	850 (33.5)
ER 1000	1000 (39.4)
ER 1100	1100 (43.3)
ER 1250	1250 (49.2)
ER 1350	1350 (53.1)
ER 1500	1500 (59.1)
ER 1750	1750 (68.9)
ER 2000	2000 (78.7)
ER 2500	2500 (98.4)
ER 3000	3000 (118.1)

Principle Of Operation



1. Ground bearing block RC 60
2. Two parallel ball circuits 3.5mm
3. Steel shaft 12mm, h6, RC 60
4. Plastic cage for ball circulation

Technical Information



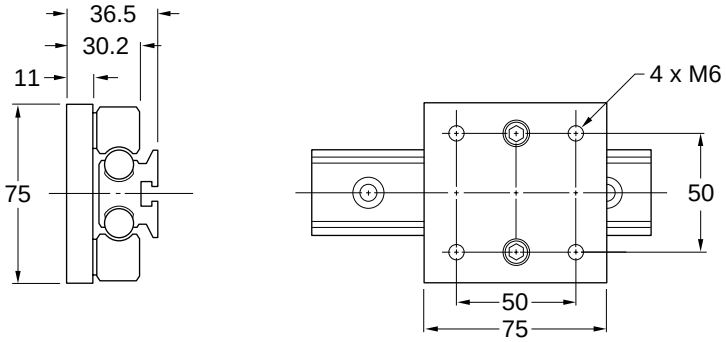
Parallelism	Weight
0.04 mm / m	3kg / m
0.0005”/ ft	2lb / ft

NOTE: STEEL SPACERS ARE NOT TO BE REMOVED

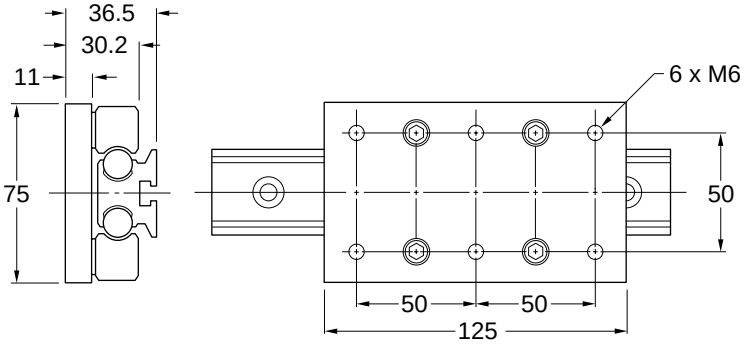
Series ERC Carriages

The Econo Rail Linear Bearing System has been designed to provide an economical guide system for a wide variety of applications, material handling equipment, pc board transfer lines, adhesive dispensing equipment, sign making machines, CNC wood routers, automation equipment, and robotics.

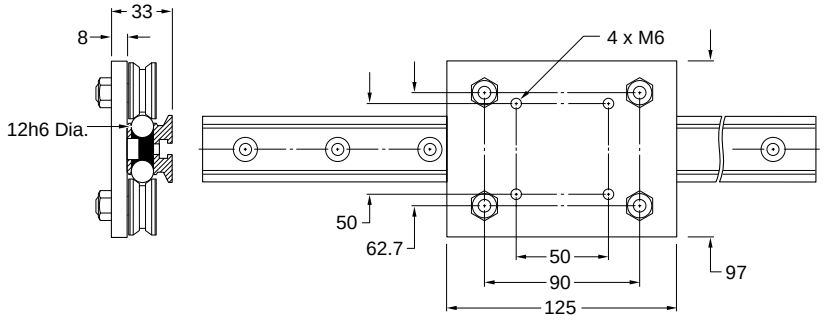
Precision and Economy
The patented design of the Econo Rail System provides precise motion and allows the guide system to be fabricated economically.



ERC 3001



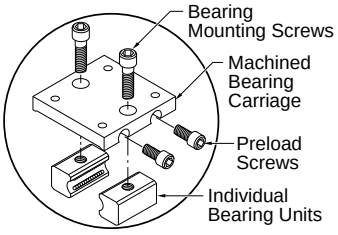
ERC 3002



ERC 2009

Linear Bearing
The heart of the linear bearing consists of a single piece bearing core which is ground all over and two recirculating ball bearing circuits with 3.5 mm diameter steel balls.

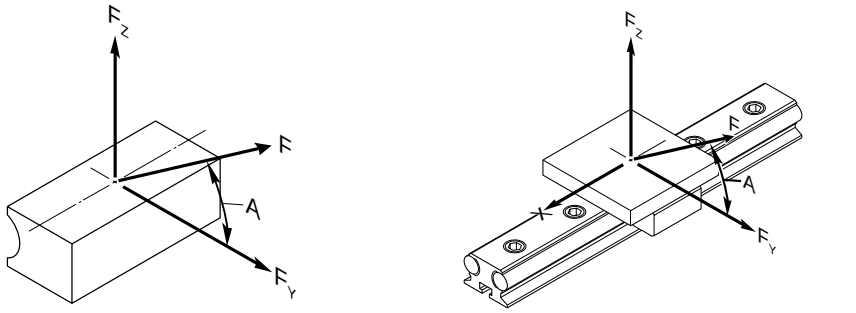
Two bearing elements are mounted on a specially machined plate to provide precise alignment. The bearing is preloaded to eliminate play and provide smooth and accurate motion along the track.



Linear Bearing

Load & Life

The load capacity of the bearing assembly is a function of the applied force and its angle of application. Only the components of the applied force F_y and F_z are to be used in the life and load calculations.



FORCE ON SINGLE BEARING FORCE ON DOUBLE BEARING

FIGURE 1.

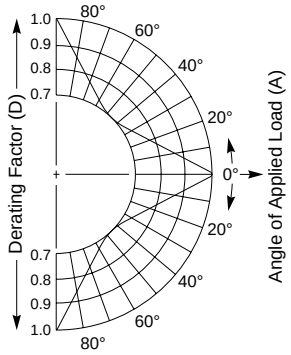


FIGURE 2.

TABLE 1:
Maximum static load and dynamic load capacity as a function of the angle A, of the applied force F

Carriage	Maximum Load Newtons (lbs.)	
	Static	Dynamic
ERC 3001 ERC 3002	D X 430N (96) D X 1270N (284)	D X 400N (89) D X 750N (168)
ERC 2009	FZ =470N (106) FY =1100N (246)	FZ = 1075N (240) FY = 2450N (548)

TABLE 2:
Maximum permissible moment for carriages

ERC	Moment Nm (lb. /in.)		
	Static		
	M_X	M_Y	M_Z
3001	7.3 (64.6)	3.7 (32.7)	3.7 (32.7)
3002	22 (194.7)	12.6 (111.5)	12.6 (111.5)
2009	20 (177)	36 (318.6)	42 (371.7)
	Dynamic		
	M_X	M_Y	M_Z
3001	7.3 (64.6)	3.7 (32.7)	3.7 (32.7)
3002	22 (194.7)	12.6 (111.5)	12.6 (111.5)
2009	50 (442.5)	90 (796.5)	100 (885)

NOTE:
ERC2009, ERC3001, ERC3002 compatible with ER Series Base/Rails only.
ERCW2010 compatible with ERW Series Base/Rails only.
ERC2011, ERC3003 compatible with ERN,ERL Series Base/Rails only.

Example:

ERC 3001 will be used with an applied load of 50N acting at an angle 45° from the horizontal.

1. To determine the maximum permitted static load that ERC 3001 can carry refer to table 1.

Maximum permitted static load = D x 430N, where D, the derating factor, is determined from Figure 2. At 45°, the derating factor is 0.7.

Maximum permitted static load = 0.7 x 430N = 301N

Static safety factor = $\frac{301N}{50N}$ =6.02

2. To determine the maximum permitted dynamic load that ERC 3001 can carry, refer to table 1.

Maximum permitted dynamic load = D x 400N, where D, the derating factor is determined from figure 2. At 45°, the derating factor is 0.7.

Maximum permitted dynamic load = 0.7 x 400N = 280N

3. The useful life is given by:

(Static Safety Factor) ^{3} x 10^5 meters
= $(6.02)^3$ x 10^5 meters
= 2.18 x 10^7 meters

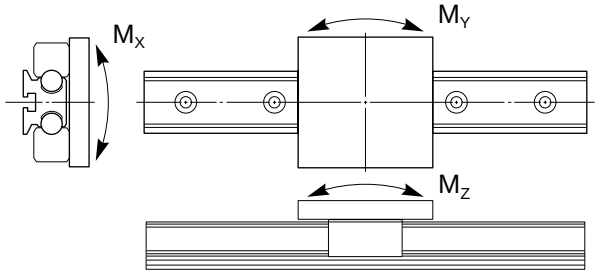


FIGURE 3.