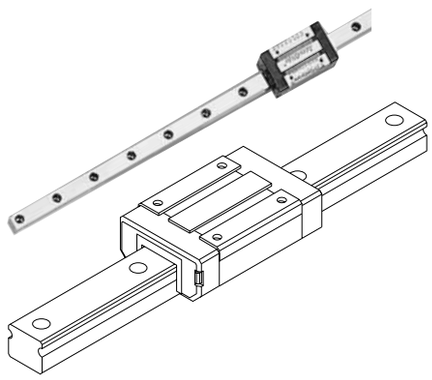
AccuMini Linear Ball Guides

Ultra compact, high roll moment capacity



Thomson AccuMini Linear Ball Guides offer:

- Advanced Ball Control - reduces friction to provide smooth, quiet operation at high speeds.
- Full Length Integral Wiper - protects critical components from contamination to maximize system life.
- Gothic Arch Profile - provides high roll moment capacity, critical for single rail designs.
- Engineered Polymer Retainer - reduces system inertia and noise.
- Stainless Steel Ball Bearings - resist corrosion from harsh environments.

Part Number Description and Specification

AccuMini Assembly

1 AD 10 AA A H LXXXX Y= (See Note 1 Below) -XXX

- **# of Carriages Per Rail**
- **AccuMini Assembly**
- **Size:** 10, 15, 20
- **Style** / **Description**: AA Standard
- **Preload Designation** / **Description**: A Clearance; B Approx. 0.03 C
- **Accuracy Class**: H = High; P = Precision
- **Length**
- **Options**: **-A** Armoloy Plating; **-LDS** Low Drag Seal; **-Mxx** Special Option

AccuMini Carriage Only

CD 10 AA A H -XXX

- **AccuMini Carriage**
- **Size:** 10, 15, 20
- **Style** / **Description**: AA Standard
- **Preload Designation** / **Description**: A Clearance; B Approx. 0.03 C
- **Accuracy Class**: H = High; P = Precision
- **Options**: **-A** Armoloy Plating; **-LDS** Low Drag Seal; **-Mxx** Special Option

AccuMini Rail Only

RD 10 H LXXXX Y= (See Note 1 Below)

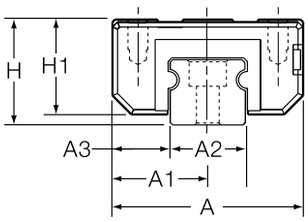
- **AccuMini Rail**
- **Size:** 10, 15, 20
- **Accuracy Class**: H = High; P = Precision
- **Length**

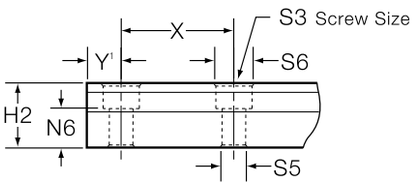
1. Y= Distance from end of rail to center of 1st mounting hole

THOMSON Linear Motion. Optimized.™

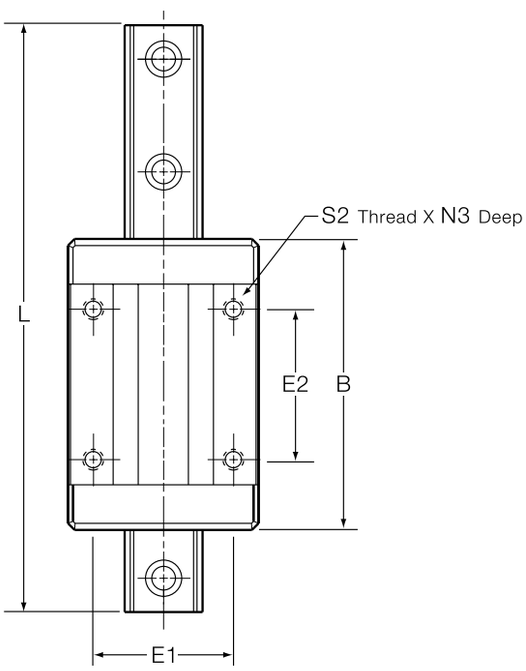
AccuMini

(Miniature Series)
Low Profile, Compact Design





1. "Y" dimension will be equal on both ends unless specified by customer.

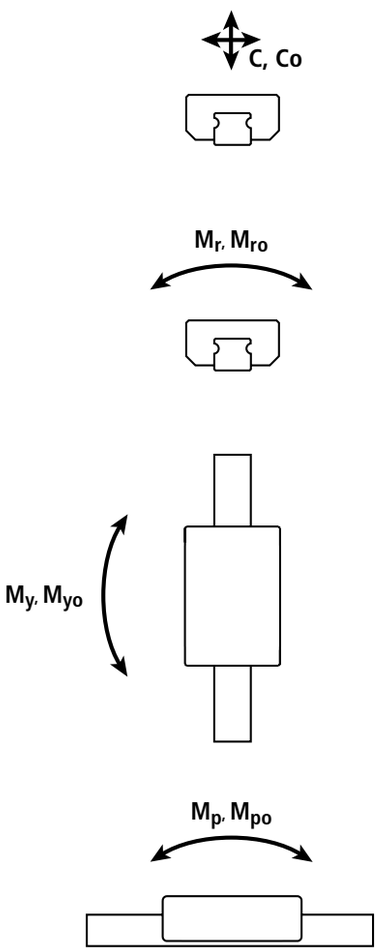


NOTE:
The AccuMini linear guide series carriages do not have retained balls. Removing the carriage from the rail without an arbor will result in the balls falling out.

AccuMini Linear Guide Series

(mm)														
Size	**A**	**A1**	**A2**	**A3**	**H**	**H1**	**H2**	**B**	**E1**	**E2**	**S2**	**S3**	**S5**	**S6**
10	26	13	10	8	15	13	9	40	17	20	M2.5	M2.5	3	5.5
15	38	19	15	11.5	21	19	13	58	28	30	M4	M4	4.5	8
20	50	25	20	15	28	25.6	18	76	37	40	M5	M5	5.5	9.5

AccuMini



Dynamic Load and Moment Ratings

C = Dynamic load rating
M_p = Dynamic pitch moment rating
M_r = Dynamic roll moment rating
M_y = Dynamic yaw moment rating
The dynamic load and moment ratings are based upon a 100 km travel life. In order to compare with bearings rated for 50 km, divide the dynamic capacity of the bearing rated for 50 km by 1.26.

Static Load and Moment Capacities

Co = Static load capacity
M_{po} = Static pitch moment capacity
M_{ro} = Static roll moment capacity
M_{yo} = Static yaw moment capacity
The static load and moment capacities are the maximum radial load and moment load that should be applied to the bearing while there is no relative motion between the carriage and rail.

Bearing Travel Life Comparison

$L = (C/F)^3 \times 100$ km
where:
L = travel life, km
C = dynamic load rating, N
F = applied dynamic load, N

$C_{min} = F \left(\frac{L}{100}\right)^{1/3}$
where:
C_{min} = minimum required dynamic load rating, N
F = applied dynamic load, N
L = required travel life, km

Operating Parameters

Maximum Velocity = 3 m/s
Maximum Acceleration = 50 m/s²
Maximum Temperature = 80° C

AccuMini Series

(mm)					Load Rating	N (lbf)	Moment Rating		Nm (lbf-ft)		MASS Carriage	Rail
Size	N3	N6	X	L_{max}‡	C(@100 km)	C_o	M_p, M_y	M_{po}, M_{yo}	M_r	M_{ro}	kg	kg/m
10	4.5	5.5	25	3000	2820 (635)	5300 1,190	10 (7)	20 (15)	15 (11)	28 (21)	0.045	0.65
15	6	7.5	40	3000	6375 (1,430)	15200 (3,420)	35 (26)	66 (49)	51 (38)	96 (71)	0.141	1.42
20	8	9.5	60	3000	11870 (2,670)	23000 (5,170)	75 (55)	140 (105)	125 (92)	235 (175)	0.345	2.55

‡ Maximum rail length in one section. Multiple sections can be butt jointed together for longer lengths.

AccuMini

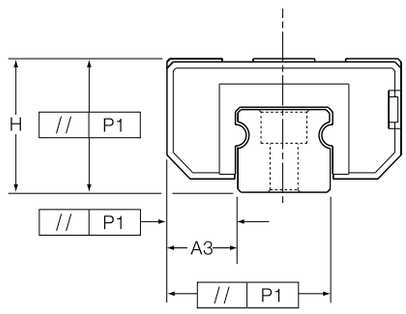
Three tolerances describe the accuracy of a Profile Rail bearing: Running Parallelism, Pair Variation, and Assembly Accuracy. These are measured from the rail base to the center of the carriage top (H), and from the rail reference edge to the center of the carriage reference edge (A3).

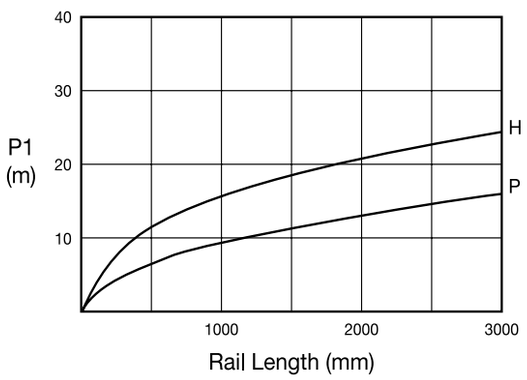
Running Parallelism describes the tolerance on H and A3 as a function of axial travel, measured from one carriage down the length of the rail. This is analogous to straightness of travel. As such, parallelism describes attributes of the rail only.

Assembly Accuracy describes the tolerance on H and A3 as a function of a carriage – rail assembly, measured from the nominal dimensions.

Pair Variation describes tolerance on H and A3 as a function of carriages at the same position on a common rail. Pair variation describes carriage precision only.

The accuracy class selected will partially determine the accuracy of the system. Other factors such as mounting surface flatness and straightness also significantly affect system accuracy.





Tolerances

	Accuracy Class	
	H - High	P - Precision
Assembly Accuracy Tolerance on dimension H and A3 (measured at middle of carriage at any point along rail)	±40	±20
Pair Variation Max variation in dimensions H and A3 measured on multiple carriages mounted on the same rail (measured at the middle of carriage at same position on rail)	15	7
Running Parallelism	See figures above.	

All values in µm

Preload Accuracy Combinations

Accuracy Class	Preload	
	Clearance up to 10 µm	Light approximately 0,03C[1]
P	–	B
H	A	B

1. C = Dynamic load capacity of the bearing.

Calculations

To determine proper carriage size:

$$C_{min} = F \bullet \left(\frac{L}{100}\right)^{1/3}$$

C_{min} = minimum required dynamic load capacity of carriage (N)

F = equivalent load on carriage (N)

L = required travel life (km)

To determine travel life:

$$L = \left(\frac{C}{F}\right)^{3} \bullet 100$$

L = normal travel life (km)

C = rated dynamic load capacity of carriage (N)

F = equivalent load on carriage (N)

Conversions

1 lb_f = 4,448 N
1 kg_f = 9.8 N
1 km = 39,370 inches
1 Nm = 0.7376 lb_f - ft

Operating Parameters

Maximum Velocity = 3 m/s
Maximum Acceleration = 50 m/s^2
Maximum Temperature = 80° C