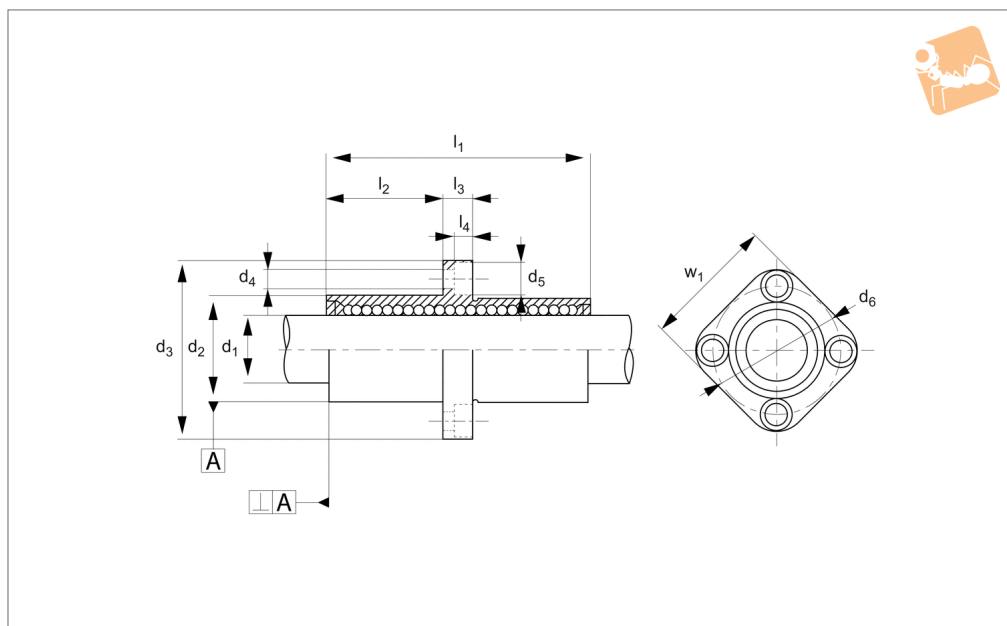




Linear Ball Bushings double length

Linear Bearings



L1731

LINEAR BEARINGS

Material

Hardened and ground body from bearing steel.

Single body resin retainer (POM).

Supplied with nitrile rubber (NBR) end-seals -UU as standard.

Technical Notes

For use with hardened shafts only (see part

nos. L1770 - L1772) - tolerance h6.

Temperature range: -20°C to +80°C.

For applications requiring higher temperatures we can make the bushings suitable for use up to +120°C by changing the ball retainers, end plates, and seals. Please advise at time of ordering if this is required.

Tips

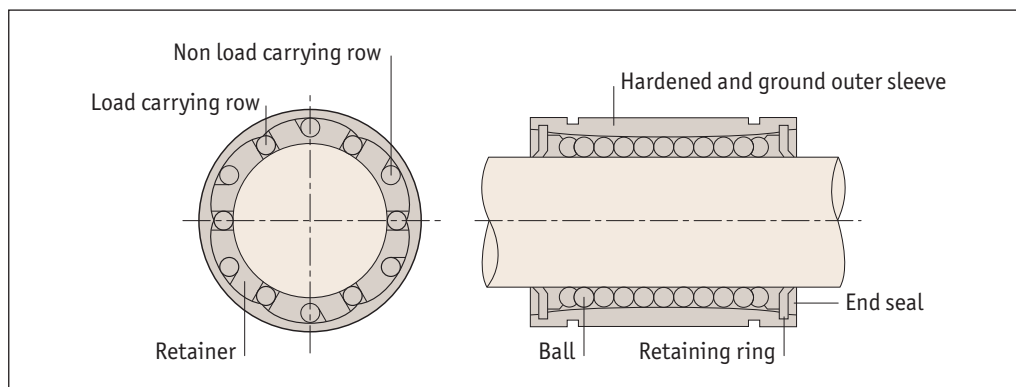
Nickel plated version with stainless steel balls (for corrosion resistance) on request - or stainless steel version no. L1733.

Order No.	d ₁ tol. h6	d ₂ tol. h6	l ₁	d ₃	d ₄	d ₅	d ₆	l ₂	l ₃	l ₄	No. of ball circuits	w ₁	Squareness A µm	Dyn. load C N max.	Static load C ₀ N max.	Weight g
L1731.008	8	16	45	32	3,4	6,5	24	20,0	5	3,3	4	25	15	430	780	53
L1731.012	12	22	57	42	4,5	8,0	32	25,5	6	4,4	4	32	15	650	1200	100
L1731.016	16	26	70	46	4,5	8,0	36	32,0	6	4,4	5	35	15	1230	2350	187
L1731.020	20	32	80	54	5,5	9,5	43	36,0	8	5,4	5	42	17	1400	2750	260
L1731.025	25	40	112	62	5,5	9,5	51	52,0	8	5,4	6	50	17	1560	3140	515
L1731.030	30	47	123	76	6,6	11,0	62	56,5	10	6,5	6	60	17	2940	5490	655
L1731.040	40	62	154	98	9	14,0	80	70,5	13	8,6	6	75	20	3430	8040	1560
L1731.050	50	75	192	112	9	14,0	94	89,5	13	8,6	6	88	20	6080	15900	3500
L1731.060	60	90	211	134	11	17,5	112	96,5	18	10,8	6	106	30	7650	20000	4500

Order No.	l ₃	l ₄	No. of ball circuits	w ₁	Squareness A µm	Dyn. load C N	Static load C ₀ N
L1731.008	5	3.3	4	25	15	430	780
L1731.012	6	4.4	4	32	15	650	1200
L1731.016	6	4.4	5	35	15	1230	2350
L1731.020	8	5.4	5	42	17	1400	2750
L1731.025	8	5.4	6	50	17	1560	3140
L1731.030	10	6.5	6	60	17	2940	5490
L1731.040	13	8.6	6	75	20	3430	8040
L1731.050	13	8.6	6	88	20	6080	15900
L1731.060	18	10.8	6	106	30	7650	20000



Linear ball bushings



Applications

- Computers and peripheral equipment.
- Recording equipment.
- Linear motion systems.
- Multi-axis drilling machine.
- Printing machines.
- Food packaging machines.
- Punching presses.
- Tool grinders.
- Assembly systems.
- Card selectors.

Interchangeability

Our linear bushing systems are designed to have full interchangeability, with other manufacturers' parts. **For shafting see part numbers L1770 to L1785.**

High precision retainer

The single body retainer guides 4-6 ball circuits. It precisely guides the balls with a smooth motion.

Tolerance of housing bore

Normal fit is standard, pressed fit is for without clearance.

Type	Case	
Part no.	Normal fit	Pressed fit
L1706 to L1733	H7	K6, J6
L1706... ⁻¹ to L1733... ⁻¹	H7	J7

Rigid outer sleeve

The hardened and precisely ground outer sleeve is made of bearing steel.

L1750 bushing carriages

Consists of light aluminium case and L1706 type linear bushing, so the installation can be finished simply by bolting. Longer life can be obtained by adjusting the orientation of the ball circuits in the linear carriage element against the direction of load.

Tolerance of shaft

Type	Shaft	
Part no.	Normal fit	Tight fit
L1706 to L1733	h6	k6
L1706... ⁻¹ to L1733... ⁻¹	f6, g6	h6



Technical Information

Load rating important information



Basic dynamic load rating C

The basic dynamic load rating is defined as the constant load both in direction and magnitude under which a group of identical linear bushings are individually operated. 90% of the units can travel 50Km without failing due to rolling contact fatigue.

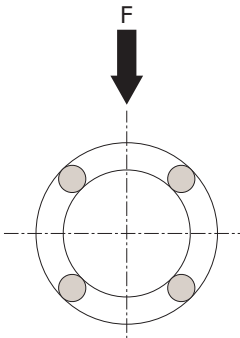
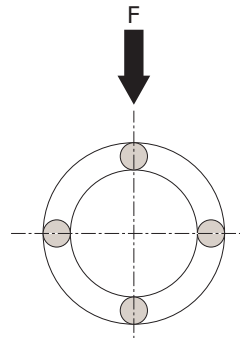
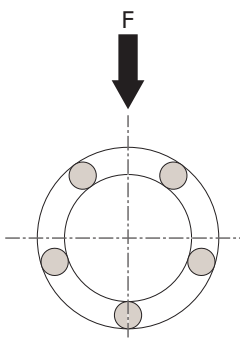
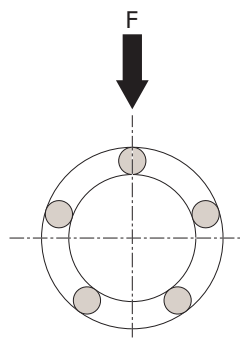
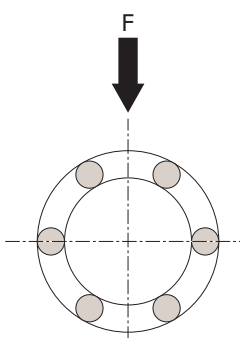
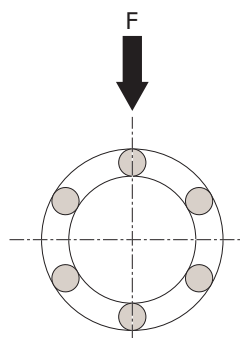
Basic static load rating C₀

If a linear bushing is subject to an excessive load or impact, a permanent deformation occurs between the raceway and the rolling element. The basic static load rating is defined as the static load that gives a prescribed constant contact stress at the centre of the contact area between the rolling element and raceway receiving the maximum load.

Relationships between load ratings and the position of ball circuits

Load ratings of linear bushing are affected by the position of the ball circuits as shown below.

Load ratings and orientation of balls.

No of ball rows	Orientation of balls	
	Maximum load rating	Minimum load rating
4		
	$F = 1.41 \times C$	$F = C$
5		
	$F = 1.46 \times C$	$F = C$
6		
	$F = 1.26 \times C$	$F = C$



When designing a linear motion system it is necessary to consider how the application will affect performance. The following examples demonstrate how the position of the load and the centre of gravity can influence product selection. When evaluating your application, review each of the forces acting on your system and determine the product that best suits your needs.

Horizontal application

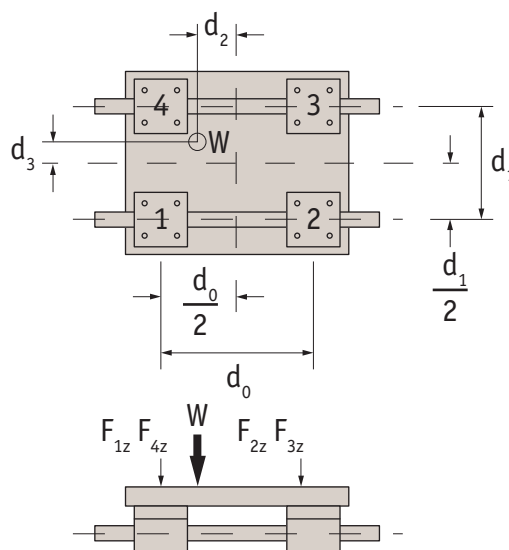
For uniform speed or when stopped.

$$F_{1z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{2z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{3z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{4z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$



Horizontal application

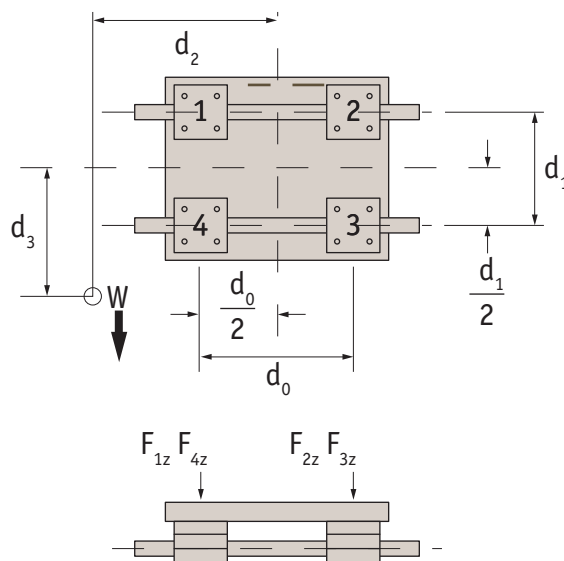
For uniform speed or when stopped.

$$F_{1z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{2z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) - \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{3z} = \frac{W}{4} - \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$

$$F_{4z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right) + \left(\frac{W}{2} \cdot \frac{d_3}{d_1} \right)$$





Technical Information

Load rating important information

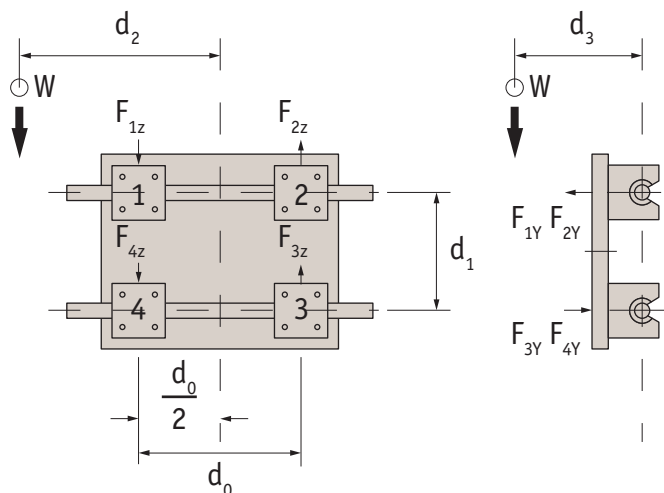
Linear Ball Bushings

LINEAR BEARINGS

$$F_{1Y} \sim F_{4Y} = \left(\frac{W}{2} \cdot \frac{d_3}{d_0} \right)$$

$$F_{1Z} = F_{4Z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right)$$

$$F_{2Z} = F_{3Z} = \frac{W}{4} + \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right)$$



Side mounted application

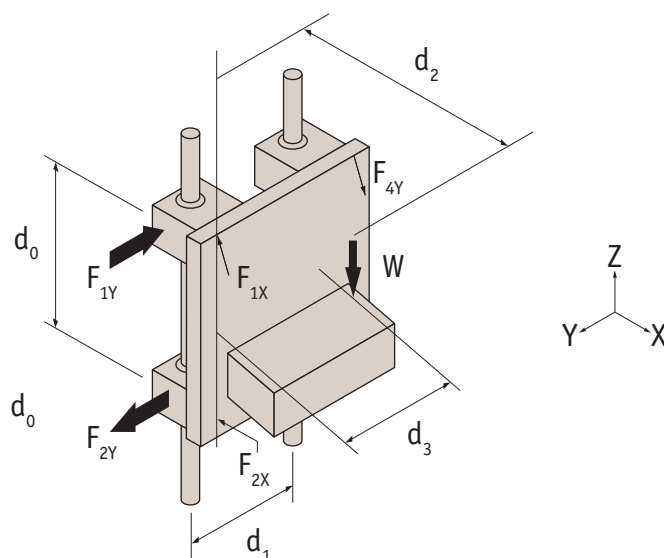
For uniform speed or when stopped.

$$F_{1X} \sim F_{4X} = \left(\frac{W}{2} \cdot \frac{d_2}{d_0} \right)$$

$$F_{1Y} \sim F_{4Y} = \left(\frac{W}{2} \cdot \frac{d_3}{d_0} \right)$$

$$F_{1X} + F_{4X} \sim F_{2X} + F_{3X}$$

$$F_{1Y} + F_{4Y} \sim F_{2Y} + F_{3Y}$$



Vertical application

For uniform speed or when stopped. On start up/stop the load varies due to inertia in the system.