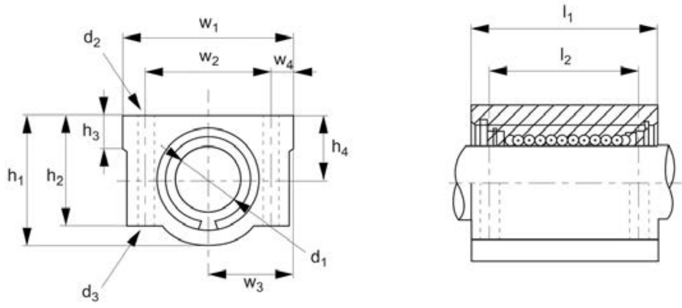


L1751

Material
Aluminium carriage housing with L1709, stainless steel (440C) linear bushing installed.
Bushing has a resin -RS (POM) or stainless steel -SS (316) retainer and nitrile rubber (NBR) end seals -UU.
Stainless steel balls 440C.
Long versions have L1713 linear bearing installed.

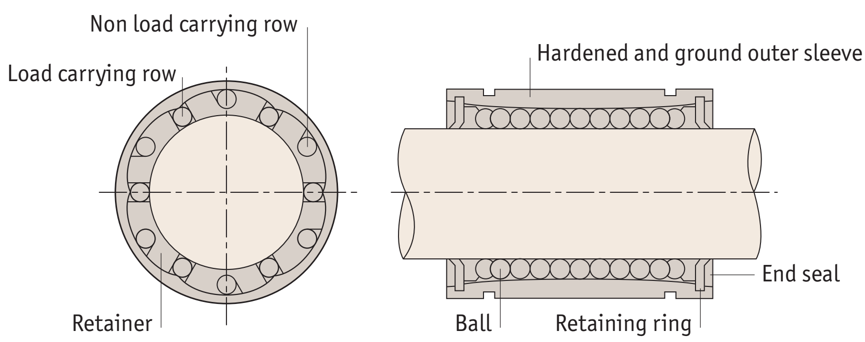
Technical Notes
For use with corrosion resistant hardened shafts (see part no. L1772).
Temperature range: -20°C to +120°C.

Order No.	Type	Ball cage	d_1 tol. h6	l_1	d_2	d_3	h_1	h_2	Weight g
L1751.008-RS	Normal	Resin	8	30.0	M4x 8	3.4	22.0	18.0	60
L1751.012-RS	Normal	Resin	12	39.0	M5x10	4.3	30.0	24.5	118
L1751.016-RS	Normal	Resin	16	44.0	M5x12	4.3	38.5	32.5	180
L1751.020-RS	Normal	Resin	20	53.0	M6x12	5.2	41.0	35.0	245
L1751.025-RS	Normal	Resin	25	67.0	M8x18	6.8	51.5	41.0	550
L1751.008-SS	Normal	Stainless	8	30.0	M4x 8	3.4	22.0	18.0	60
L1751.012-SS	Normal	Stainless	12	39.0	M5x10	4.3	30.0	24.5	118
L1751.016-SS	Normal	Stainless	16	44.0	M5x12	4.3	38.5	32.5	180
L1751.020-SS	Normal	Stainless	20	53.0	M6x12	5.2	41.0	35.0	245
L1751.025-SS	Normal	Stainless	25	67.0	M8x18	6.8	51.5	41.0	550
L1751.008-L-RS	Long	Resin	8	58.0	M4x 8	3.4	22.0	18.0	98
L1751.012-L-RS	Long	Resin	12	77.0	M5x10	4.3	30.0	24.5	232
L1751.016-L-RS	Long	Resin	16	89.0	M5x12	4.3	38.5	32.5	360
L1751.020-L-RS	Long	Resin	20	106.0	M6x12	5.2	41.0	35.0	490
L1751.025-L-RS	Long	Resin	25	136.0	M8x18	6.8	51.5	41.0	1100
L1751.008-L-SS	Long	Stainless	8	58.0	M4x 8	3.4	22.0	18.0	98
L1751.012-L-SS	Long	Stainless	12	77.0	M5x10	4.3	30.0	24.5	232
L1751.016-L-SS	Long	Stainless	16	89.0	M5x12	4.3	38.5	32.5	360
L1751.020-L-SS	Long	Stainless	20	106.0	M6x12	5.2	41.0	35.0	490
L1751.025-L-SS	Long	Stainless	25	136.0	M8x18	6.8	51.5	41.0	1100
L1751.008-S-RS	Short	Resin	8	14.4	M4x 8	3.4	22.0	18.0	40
L1751.012-S-RS	Short	Resin	12	20.3	M5x10	4.3	30.0	24.5	82
L1751.016-S-RS	Short	Resin	16	22.3	M5x12	4.3	38.5	32.5	122
L1751.020-S-RS	Short	Resin	20	28.3	M6x12	5.2	41.0	35.0	176
L1751.025-S-RS	Short	Resin	25	40.4	M8x18	6.8	51.5	41.0	400
L1751.008-S-SS	Short	Stainless	8	14.4	M4x 8	3.4	22.0	18.0	40
L1751.012-S-SS	Short	Stainless	12	20.3	M5x10	4.3	30.0	24.5	82
L1751.016-S-SS	Short	Stainless	16	22.3	M5x12	4.3	38.5	32.5	122
L1751.020-S-SS	Short	Stainless	20	28.3	M6x12	5.2	41.0	35.0	176
L1751.025-S-SS	Short	Stainless	25	40.3	M8x18	6.8	51.5	41.0	400

Stainless Linear Carriages
closed

Order No.	h_3	h_4 ±0.02	l_2 ±0.2	w_1	w_2 ±0.2	w_3 ±0.02	w_4	Dyn. load C N max.	Static load C_0 N max.	Linear ball bushing used
L1751.008-RS	6	11	18	34	24	17	5.0	260	400	L1709.008
L1751.012-RS	8	15	26	44	33	22	5.5	410	590	L1709.012
L1751.016-RS	9	19	34	50	36	25	7.0	770	1170	L1709.016
L1751.020-RS	11	21	40	54	40	27	7.0	860	1370	L1709.020
L1751.025-RS	12	26	50	76	54	38	11.0	980	1560	L1709.025
L1751.008-SS	6	11	18	34	24	17	5.0	260	400	L1709.508
L1751.012-SS	8	15	26	44	33	22	5.5	410	590	L1709.512
L1751.016-SS	9	19	34	50	36	25	7.0	770	1170	L1709.516
L1751.020-SS	11	21	40	54	40	27	7.0	860	1370	L1709.520
L1751.025-SS	12	26	50	76	54	38	11.0	980	1560	L1709.525
L1751.008-L-RS	6	11	42	34	24	17	5.0	410	800	2 x L1709.008
L1751.012-L-RS	8	15	64	44	33	22	5.5	650	1180	2 x L1709.012
L1751.016-L-RS	9	19	79	50	36	25	7.0	1230	2340	2 x L1709.016
L1751.020-L-RS	11	21	90	54	40	27	7.0	1370	2740	2 x L1709.020
L1751.025-L-RS	12	26	119	76	54	38	11.0	1560	3120	2 x L1709.025
L1751.008-L-SS	6	11	42	34	24	17	5.0	410	800	2 x L1709.508
L1751.012-L-SS	8	15	64	44	33	22	5.5	650	1180	2 x L1709.512
L1751.016-L-SS	9	19	79	50	36	25	7.0	1230	2340	2 x L1709.516
L1751.020-L-SS	11	21	90	54	40	27	7.0	1370	2740	2 x L1709.520
L1751.025-L-SS	12	26	119	76	54	38	11.0	1560	3120	2 x L1709.525
L1751.008-S-RS	6	11	-	34	24	17	5.0	260	400	L1709.008
L1751.012-S-RS	8	15	-	44	33	22	5.5	410	590	L1709.012
L1751.016-S-RS	9	19	-	50	36	25	7.0	770	1170	L1709.016
L1751.020-S-RS	11	21	-	54	40	27	7.0	860	1370	L1709.020
L1751.025-S-RS	12	26	-	76	54	38	11.0	980	1560	L1709.025
L1751.008-S-SS	6	11	-	34	24	17	5.0	260	400	L1709.508
L1751.012-S-SS	8	15	-	44	33	22	5.5	410	590	L1709.512
L1751.016-S-SS	9	19	-	50	36	25	7.0	770	1170	L1709.516
L1751.020-S-SS	11	21	-	54	40	27	7.0	860	1370	L1709.520
L1751.025-S-SS	12	26	-	76	54	38	11.0	980	1560	L1709.525

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

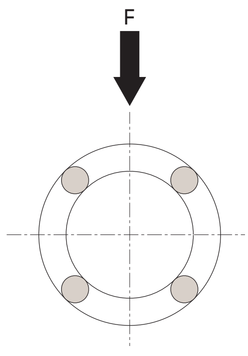
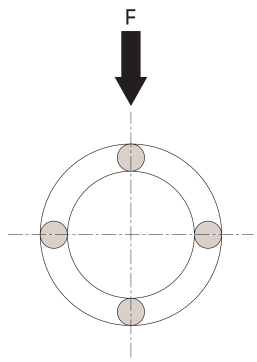
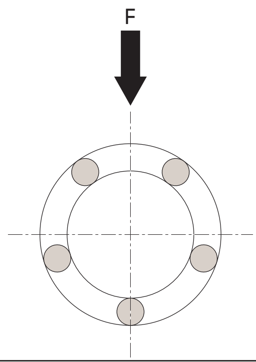
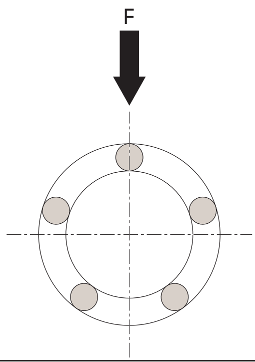
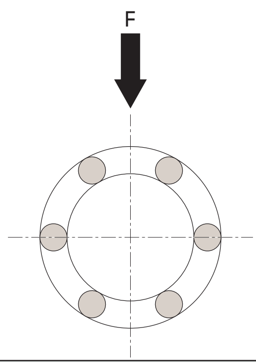
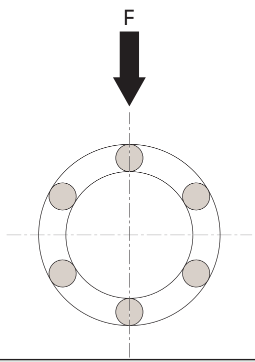
Load rating important information

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 C_0
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 x C	 F = C
5	 F = 1.46 x C	 F = C
6	 F = 1.26 x C	 F = C

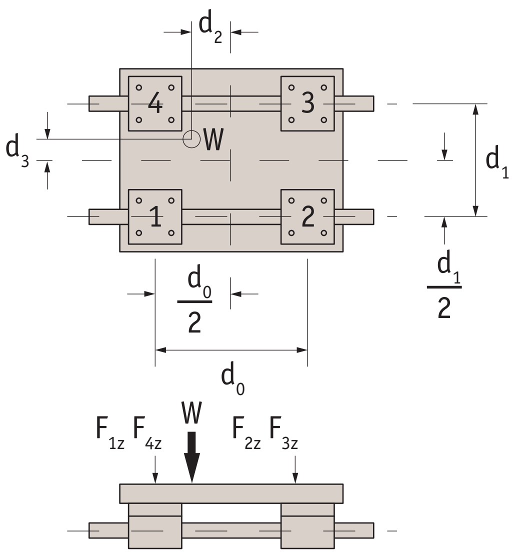
When designing a linear motion system it is necessary to consider how the application will affect performance. The following examples demonstrate how the position of the load and the centre of gravity can influence product selection. When evaluating your application, review each of the forces acting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

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

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

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

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



Horizontal application

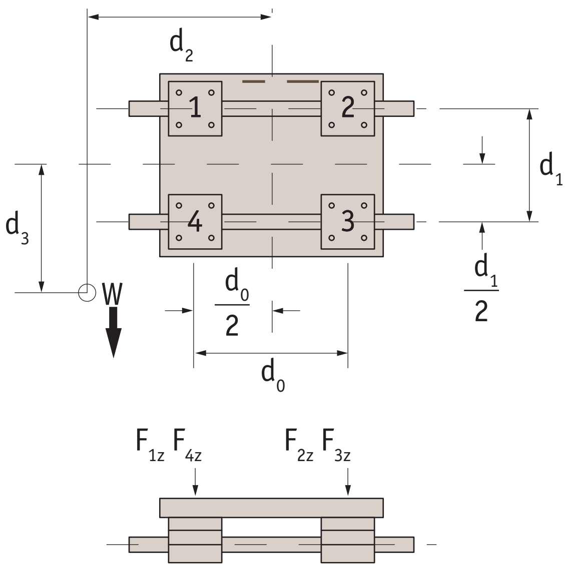
For uniform speed or when stopped.

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

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

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

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



Horizontal application

For uniform speed or when stopped.

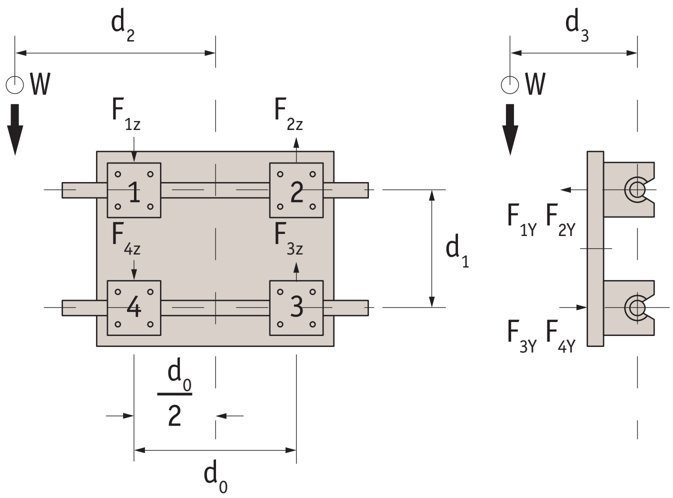
Side mounted application

For uniform speed or when stopped.

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

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

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



Vertical application

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

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

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

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

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