

This guide interacts with the HepcoMotion website and SL2 catalogue



Where you see this clickable icon, save time on the design process by using our website's Product Configurator. Enter your application parameters and the configurator will recommend a custom solution to meet your needs:

Additional information can be viewed within the online SL2 catalogue when you click this icon:

To assist browsing this guide online, clicking wherever you see blue hypertext, page number, or a product icon in the page margins, will take you directly to the section required:

Where other HepcoMotion product ranges are referred to, clicking on the title will take you to the catalogue in question:

The full contents of the SL2 catalogue can be viewed or downloaded by clicking this icon: HDS2 Heavy Duty Linear Guide

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SL2 Stainless steel linear guide

Smooth – Quiet – Corrosion resistant Accurate – Fast – Suitable in harsh environments

A corrosion resistant, stainless steel linear guide system for use in food and medical industries or corrosive environments.





For an introduction to the SL2 product range, and examples of how the various products detailed in this Technical Guide can be used, please refer to the System Composition \square and Application Examples \square sections within the main **SL2 catalogue**.





System Assembly & Adjustment*1

Please refer to the Video section of the HepcoMotion website for a selection of How-To videos that complement the information provided in this section of the SL2 Technical Guide.

Through Fixing Type Bearings & Track Rollers

Having loosely assembled the components (minus load), the Concentric type Bearings 🗹 should be fully tightened and the Eccentric type Bearings tightened just sufficiently to permit adjustment.

The Hepco Adjusting Wrench should then be engaged with hexagon flanges of the Eccentric type Bearings and gradually turned until the Slide $\[emcircle]$ (or Track $\[emcircle]$) is captivated between each pair of Bearings such that there is no apparent play, but with minimal pre-load.

Each pair of Bearings should then be checked for correct pre-load by rotating one of them between forefinger and thumb with the Slide (or Track) stationary so that the Bearing skids against it. A degree of resistance should be felt, but the Bearing should turn without difficulty.

When all Eccentric type Bearings have been adjusted and tested in this manner, the fixing nuts should be fully tightened to the recommended torque settings as in the table on (1) 3, then checked again for pre-load as before.

Please note that too much pre-load will shorten the life of the system.

Alternative means of adjustment

Eccentric type Bearings I may also be adjusted using a standard hex key and Hepco Socket Tool. This method permits re-adjustment without first having to remove Cap Seals I ; however, extreme care should be taken not to induce excessive pre-load, which can only be judged in this case, from the resulting friction of the system. Due to the reduced control associated with this method, it is only recommended when the Adjusting Wrench method is not possible.





Blind Hole Fixing Type Bearings & Track Rollers

Concentric type Blind Hole Fixing Bearings \square (or Concentric type Blind Hole Track Rollers \square) are simply screwed into tapped holes in the mounting surface and tightened down using the Hepco Adjusting Wrench.

Each Eccentric type Bearing (or Track Roller) should be located by means of the two screws provided and tightened just sufficiently to still enable adjustment via the eccentric hexagon bush. The same basic procedures, as outlined for the Through Fixing type, should be used to ensure that the correct level of pre-load is applied before finally tightening down the fixing screws.



Cap Seals

Fitting of Cap Seals \square should be carried out after Bearing \square adjustment has been completed.

To fit the Cap Seals over the Bearings, the Standard Carriage should be removed from the Slide, then the Cap Seals loosely assembled to the Carriage Plate utilising either the Through Hole Fixing facility, which is the default method for Hepco Carriages, or the Tapped Hole Fixing facility, which requires tapped holes to be provided in the Carriage Plate. Two sets of plastic inserts are included with each Cap Seal to cater for both methods.

The Slide \square should be re-engaged with the Carriage and each Cap Seal adjusted in, until the felt wipers just make contact with the Slide 'V' surface until smearing of the lubricant is observed when the system is operated. When adjusting the Cap Seal using the Through Hole Fixing method, care should be taken to hold the plastic inserts to prevent them from moving whilst the screws are tightened.

Greater sealing effect, at the expense of increased friction, may be achieved by adjusting each Cap Seal body in further until its 'V' profile makes contact with the 'V' profile of the Slide.

The fixing screws should be fully tightened and each Cap Seal charged with a No. 2 Lithium soap-based grease until grease is seen to overflow.

Male grease connector, part No. HF 4034 or complete gun is available from Hepco, if required.

Bearing/Track Roller Adjusting Tools and Tightening Torques

When ordering individual components for the first time, an Adjusting Wrench or Socket Tool should also be ordered - these are only available from Hepco.

Bearing/Roller Type	13	18	25	34.w	54
Adjusting Wrench	AT13	AT18	AT25	AT34	AT54
Socket Tool	-	RT6	RT8	RT10	RT14
Fixing Nut Torque	2Nm	7Nm	18Nm	33Nm	90Nm

HepcoMotion.com



Calculations - Load/Life Calculation Examples

The formula and values in the following examples are detailed in the Load/Life Calculations 🗹 section of the SL2 catalogue.

Example Calculation 1

A machine control unit is mounted onto a Hepco AUSSM76240CSDRNS Carriage (Standard Carriage 🗹 with fitted Cap Seals 🗹 and Double Row Bearings 🖄, mounted onto an SSNM76 Double Edge Spacer Slide Z. The weight of the control unit and Carriage is 45 kg, and the centre of mass is central along the length of the Carriage, and 0.085m from the Slide 'V', as shown in the diagram.

The system is lubricated.

Calculating the Carriage life:

(Refer to 📖 34-35 of the Load/Life Calculations 🗹 section within the SL2 catalogue.)

$$L_{1} = M = Mv = 0$$

$$L_{2} = 45 \text{ kg x } 9.81(\text{gravity}) = 441.5 \text{ N} \qquad Ms = 441.5 \text{ x } 0.085 = 37.5 \text{ Nm}$$

$$L_{F} = \frac{L_{1}}{L_{1}(\text{max})} + \frac{L_{2}}{L_{2}(\text{max})} + \frac{M_{s}}{Ms_{(\text{max})}} + \frac{M_{v}}{Mv_{(\text{max})}} + \frac{M}{M_{(\text{max})}}$$

$$L_{F} = \frac{0}{3600} + \frac{441.5}{6000} + \frac{37.5 \text{ Nm}}{129 \text{ Nm}} + \frac{0}{3000 \text{ x D}} + \frac{0}{1800 \text{ x D}} = 0.364$$

$$Life = \frac{\text{Basic Life}}{(0.03 + 0.97\text{LF})^{3}} = \frac{150}{(0.03 + 0.97 \text{ x } 0.364)^{3}} = 2.668 \text{ km}$$



Example Calculation 2

An overhead transfer system uses a combination of an SSNME Single Edge Spacer Slide 🗹 and an SSFT4020 Flat Track d on either side of a machine bay. 2 off LJ34CDR Bearings with CS34 Cap Seals run on the 'V' Slide. 2 off LR54C Track Rollers run on the Flat Track. A single SSLRN34E Narrow Track Roller 🗹 is on the non-loaded side of both the 'V' Slide and Flat Track to retain the moving structure on the Slides.

A weight of 220 kg is located centrally on the structure, such that the load is equally distributed between the SSLJ34's and SSLR34's, each therefore experiencing a radial load of $9.81 \times 55 = 540 \text{ N}$.

The system is lubricated.

Calculating the life of each LJ34CDR Bearing:

(Refer to \square 34-35 of the SL2 catalogue \square .) Lr = 540 N $L_A = 0$ $L_F = \frac{L_A}{L_{A_{(max)}}} + \frac{L_R}{L_{R_{(max)}}} = \frac{0}{900} + \frac{540}{3000} = 0.180$ Life = $\frac{\text{Basic Life}}{(0.03 + 0.97 \text{LF})^3} = \frac{150}{(0.03 + 0.97 \times 0.180)^3} = \frac{17,514 \text{ km}}{17,514 \text{ km}}$ Calculating the life of each LR54C Track Roller: (Refer to page ♀ 36 of the SL2 catalogue ♂.) Weight = 220 kg $I_{A} = 0$ Lr = 540 N $L_F = \frac{L_R}{L_{R(max)}} = \frac{540}{3200} = 0.169$ Life = $\frac{750}{1s^3}$ = $\frac{750}{0.169^3}$ = **155,382 km**

From this it can be seen that the 'V' bearings are the life determining factor for the system as a whole.

Example Calculation 3

A machine vertical movement uses a Hepco AUSSS25180 Carriage 🗹 without Cap Seals d'or Lubricators d'mounted onto an SSNS25 Double Edge Spacer Slide Z. The Slide system is run in a dry condition and is raised and lowered by a ball screw, as shown. The total mass being raised and lowered is 4 kg. The load F1 due to the weight of 4 kg x 9.81 = 39.2 N is balanced out by the force F2 of the ball screw, so no direct load is put onto the Slide system. There is a moment load in the M direction which is calculated by taking moments about the Slide 'V'.

Calculating the Carriage life:

(Refer to \square 34-35 of the SL2 catalogue \square .)

 $M = (39.2 \text{ N} \times 0.14 \text{ m}) - (39.2 \text{ N} \times 0.05 \text{ m}) = 3.53 \text{ Nm}.$ $L_1 = L_2 = Ms = Mv = 0$

$$L_{F} = \frac{0}{320} + \frac{0}{320} + \frac{0}{3.6} + \frac{0}{160 \times 0.12} + \frac{3.53}{160 \times 0.12}$$

Life = $\frac{Basic Life}{(0.03 + 0.97LF)^{2}} = \frac{70}{(0.03 + 0.97 \times 0.184)^{2}}$

Example Calculation 4

A testing machine has a horizontal table movement that uses 2 off SSNVE Single Edge Spacer Slides I with 2 off SSBHJ18CNS and 2 off SSBHJ18ENS Blind Hole Standard Bearings 2. Lubrication is provided by 2 off SSLB20F Lubricators 2.

The table includes a casting, and the weight is 8 kg, which is centrally located with respect to the four Bearings.

When the table is moving, there is an external load of 30 N, which is exerted as shown in the diagram.

The weight of the table exerts a force 8 kg x 9.81 = 78.5 N.

This is equally shared between all four Bearings, so each sees an axial load of 19.6 N.

The external force of 30 N is shared by the two concentric Bearings. Each sees a radial load of 15 N.

The external force also exerts a turning moment which will be balanced by additional axial reaction forces on the Bearings. Taking moments about the 'V' of the concentric side (ignoring the weight reactions which will cancel out) we get: 30 N x 0.04m = 1.2 Nm. Counter- clockwise moment: Clockwise moment: 2 x (reaction force on each eccentric Bearing) x 0.1 m Since clockwise moment = counter-clockwise moment, then reaction force on each eccentric Bearing = $\frac{1.2 \text{ Nm}}{2 \times 0.1 \text{ m}} = 6 \text{ N}.$

Since there is no unbalanced vertical force, the axial reaction on each concentric Bearing will be equal and opposite, i.e. -6 N. The load on each concentric and eccentric Bearing is therefore as follows:

Each Concentric Bearing:	LA = 19.6 - 6 = 13.6 N
Each Eccentric Bearing:	L _A = 19.6 + 6 = 25.6 N

Calculating the Bearing life:

(Refer to D 34-35 of the SL2 catalogue Z.)

$$L_{F} = \frac{LA}{LA_{(max)}} + \frac{LR}{LR_{(max)}}$$

$$L_{F} \text{ (for concentrics)} = \frac{13.6 \text{ N}}{125 \text{ N}} + \frac{15 \text{ N}}{200 \text{ N}} = 0.184$$

The Bearing life for the more heavily loaded eccentric Bearings is calculated as shown below:

Life =
$$\frac{\text{Basic Life}}{(0.03 + 0.97 \text{LF})^3} = \frac{75}{(0.03 + 0.97 \times 0.205)^3} = 6,258 \text{ km}$$







$$L_{R} = 15 N$$
$$L_{R} = 0$$

LF (for eccentrics) =
$$\frac{25.6 \text{ N}}{125 \text{ N}} + \frac{0}{200 \text{ N}} = 0.205$$

Calculations - Deflection of Self-Supporting Slides HepcoMotion.com

When SL2 Spacer Slides 🗹 are used as self-supporting beams (as shown in Application Examples section of the SL2

catalogue), the Slides will deflect under load and their own weight. Care should be taken when designing an installation

to take account of this deflection, by choosing a Slide that will give both adequate life and satisfactory stiffness for the duty.

CAD

SL2 Catalogue

SL2 Catalogue ÷, Applicatio Examples

Slides

(1)*^{2,3}

00 Flange Clamps

maximum at the centre of the span when the load passes over this point. This maximum deflection is given by equation (1): 5L⁴Qg FL³ d =

The deflection of a Slide across a span (as shown, right) will be a

48E

Deflection due to

the applied load

384EI Deflection due to the Slide or Slide Beam's weight



The deflection of a Slide acting as a cantilever will be a maximum at the free end when the load is at the outermost extremity of its stroke. This maximum deflection is given by equation (2)*1:



In the equations (1) and (2) above, L, k and d are the dimensions shown in the relevant diagrams (in mm) and F is the load applied (in Newtons). The term EI is the product of the Slide material's Young's modulus and the section moment of inertia, which is a constant, relating to the stiffness of the Slide section in a specific direction (see illustrations below). The term Q is the mass of the Slide in kg/mm and g is the acceleration due to gravity (=9.81m/s²). The values of EI and Q for the various sections are given in the table below:

Slide	El (Section Stif	Q = Section Mass	
Part Number	Horizontal*3	Vertical*3	kg/mm
SS NS 25	4.2 x 10 ⁸	1.2 x 10 ⁹	0.0015
SS NM 44	1.3 x 10 ⁹	9.0 x 10°	0.0035
SS NL 76	1.1 x 10 ¹⁰	7.0 x 10 ¹⁰	0.010

Horizontal Bending



Vertical Bending

Notes:

- The calculation for the deflection of a cantilevered Slide assumes that the Slide 🗹 is held absolutely rigidly at one end. This is often difficult to achieve 1 in practice, and it is usual to allow for additional deflection due to the compliance of the support. Hepco will supply such data on Flange Clamps, on request.
- 2. The deflections calculated are for static loads. In some situations, dynamic loading may increase the amount of bend.
- 3. For maximum stiffness, the Slide section should be arranged such that the bending mode with the higher value for El resists bending. Care should be taken in such applications to ensure that offset loads do not cause excessive bending in the weaker perpendicular plane.

'Mix & Match' Component Compatibility

Customers can design a system to meet their exact requirements by combining components as indicated in the 'Mix & Match' compatibility table below:

			ΥM	ix &	Ma	tch′	Com	pon	ent (Com	patil	oility	, Chc	ırt	
		✓	= Pref	errec	l choi	се	√=	Con	npatil	ole	× -	= Not	t Con	npatik	ole
			ŧ		}										
	Part			9					*						
	Number	SSJ13	SSJ18	SSJ25	SSJ34	SSJ54	SSCS18	SSCS25	SSCS34	SSCS54	SSLB12	SSLB20	SSLB25	SSLB44	SSLB76
	SS NMS 12	\checkmark	×	×	×	×	×	×	×	×	\checkmark	×	×	×	×
	SS NV 20	\checkmark	\checkmark	\checkmark	\checkmark	×	\checkmark	×	×	×	\checkmark	\checkmark	\checkmark	×	×
	SS NS 25	\checkmark	\checkmark	\checkmark	\checkmark	×	\checkmark	\checkmark	×	×	\checkmark	\checkmark	\checkmark	×	×
22	SS NM 44	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	✓	✓	\checkmark	×	\checkmark	\checkmark	×	\checkmark	×
	SS NL 76	\checkmark	✓	×	×	\checkmark									
	SS NV E	✓	\checkmark	✓	✓	×	\checkmark	×	×	×	✓	\checkmark	×	×	×
/0/	SS NS E	\checkmark	\checkmark	\checkmark	\checkmark	×	\checkmark	\checkmark	×	×	\checkmark	\checkmark	\checkmark	×	×
	SS NM E	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	✓	✓	\checkmark	×	✓	\checkmark	×	\checkmark	\checkmark
7	SS NL E	\checkmark	✓	✓	✓	\checkmark	\checkmark	\checkmark	✓	\checkmark	✓	✓	×	×	\checkmark
	SS MS 12	\checkmark	✓	×	×	×	×	×	×	×	\checkmark	×	×	×	×
	SS V 20	\checkmark	\checkmark	\checkmark	\checkmark	×	\checkmark	×	×	×	✓	\checkmark	\checkmark	×	×
	SS S 25	\checkmark	×	×	\checkmark	\checkmark	\checkmark	\checkmark	×						
- - - -	\checkmark	×	×	\checkmark	✓	\checkmark	✓	×							
	\checkmark	×	×	\checkmark	\checkmark	\checkmark	\checkmark	×							
	✓	\checkmark	\checkmark	~	\checkmark	✓	✓	\checkmark	×	\checkmark	\checkmark	×	\checkmark	\checkmark	
	SS M 60	\checkmark	×	\checkmark	\checkmark	×	\checkmark	\checkmark							
	SS M 76	\checkmark	×	\checkmark	\checkmark	×	\checkmark	\checkmark							
	SS L 76	✓	✓	~	✓	\checkmark	✓	✓	✓	\checkmark	✓	~	×	×	\checkmark

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Data & Dimensions for Assembled Systems

SL2 can be ordered either as individual components or as factory assembled systems. For details on the extensive range of factory assembled Standard Carriages I^a and Removable Carriages, please refer to the SL2 catalogue and this guide. This section includes summary data on Slides I^a, Bearings I^a and Lubrication Devices I^a. They allow customers to calculate the overall dimensions of a system (less the Carriage plate) and provide important reference dimensions including drilling details. The information can be determined for any combination of components as indicated in the Mix and Match table on IIa 7, enabling customers to design a system to meet their exact requirements.

'V' Slide Systems with Standard 'V' Bearing

Please refer to the diagrams below and the tables 🔛 9 when designing a system utilising the Standard Bearing 🗹 programme. For systems which incorporate Track Rollers 🗹 and/or Pinions 🗹, see 🛄 10. CAD models are also available online.



	Part Number	A	В	С	D	E	F	G	н
	SS NMS 12	12.37	6.2	-	-	4	8.5	45	M3
1017	SS NV 20	20.37	8	-	-	5	12	90	M4
	SS NS 25	25.74	10	-	-	6	15	90	M5
Low	SS NM 44	44.74	12.5	-	-	8	26	90	M6
	SS NL 76	76.74	19.5	-	-	15	50	180	M12
	SS NV E	9.69	8	-	6.5	4	12	90	M4
	SS NS E	12.87	10	-	8.5	6	16	90	M5
$ \langle $	SS NM E	18.87	12.5	-	10.5	8	20	90	M6
	SS NL E	27.37	19.5	-	16	12	30	180	M10
	SS MS 12	12.55	-	1.52	-	-	-	30	M3
	SS V 20	20.37	-	2.14	-	-	-	90	M4
	SS S 25	25.81	-	2.39	-	-	-	90	M6
	SS S 35	35.81	-	2.39	-	-	-	90	M6
/ ° //	SS S 50	50.82	-	2.39	-	-	-	90	M6
	SS M 44	44.81	-	3.14	-	-	-	90	M6
	SS M 60	60.81	-	3.14	-	-	-	90	M8
	SS M 76	76.81	-	3.14	-	-	-	90	M8
	SS L 76	76.81	-	4.56	-	-	-	90	M10

	Part	J	K *1	м	Ν	Р	(short) t axle)	(long) 1 axle)	R	S	T	U	V	W
	Number						Min	Max	Min	Max					Metric Fine	
	SSJ13	12.7	9.51	5.47	4.5	4	2.2	3	2.4	6.7	47.5	30	10	M3	M4x0.5	1.34
	SSJ18	18	14.0	6.75	5.6	6	2.4	3.4	2.5	10	54	38	12.3	M4	M6x0.75	1.84
	SSJ25	25	20.27	9.0	7.5	8	2.2	3.8	4.9	13	72	50	16	M5	M8x1	1.95
	SSJ34	34	27.13	11.5	9.7	10	5.2	6.6	5.9	14.8	90.5	60	21	M6	M10x1.25	2.55
\sim	SSJ54	54	41.8	19.0	15.6	14	5.7	8.2	7.9	20.4	133	89.5	31	M8	M14x1.5	3.89

	Part Number	x	XI	Y	z	Al	B1	Cl	Use with Bearings
~	SS CS 18	32.5	-	42	13.8	11	M2.5	3	SSJ18
	SS CS 25	44	-	55	18	16	M3	3.5	SSJ25
	SS CS 34	56	-	70	22.5	21	M4	4.5	SSJ34
	SS CS 54	80	-	98	36.5	31	M5	6	SSJ54

	Part Number	DI	E1	F1	G1	H1	IJ	К1	MI	N1	P 1	Use with Bearings
	SS LB 12	17	12	7	4.8	11.5	10	1.6	6.5	M2.5	2.5	SSJ13
	SS LB 20	19	13	8	7.3	19	12	0.8	13	M2.5	2.5	SSJ18
No.	SS LB 25	25	18	12	9	23	16.5	1	16	M3	3	SSJ25
	SS LB 44	34	25	17	11.8	31	20	0.8	22	M4	3	SSJ34
	SS LB 76	50	38	25	17.8	47	33.5	1.3	33	M5	3.5	SSJ54

Notes:

- 1. The fixing screw positions for the size SSCS18 Cap Seal 🗹 are not on the same centreline as the Bearing. When using the SSCS18, please add 3.8mm to A+K.
- Drilling centres A+K apply to all Bearings I² with the exception of double eccentric (DE) type. If double eccentric Bearings are used with the intention of disengaging the Slide, then drilling centres A+K+W should be used. Double eccentric Bearings are designed to adjust in with the eccentric making a 45° angle to the Slide as shown above.













Data & Dimensions for Assembled Systems

Systems with Track Rollers, Racks & Pinions

The section includes data on Single Edge Spacer Slides 🗹, Bearings 🖒, Track Rollers 🖒, Flat Tracks 🖒, Racks 🖒 and Pinions To allow customers to calculate overall dimensions of a system and look up important dimensions, including drilling details. It is possible to run a Wide Track Roller on the rear face of the Single Edge Spacer Slide, but this option is not shown, as the Narrow Track Roller usually fits better. The extra load capacity of the Wide Track Roller will not usually be a benefit when used with the Single Edge Spacer Slide, as the soft back face can be damaged if used beyond the load capacity of the Narrow Track Roller.



	Part	A	В	с	D	D1 *1	E	F	G	н
	Number									
	SS NV E	9.69	8	10.0	6.5	5.8	4	12	90	M4
/=/	SS NS E	12.87	10	12.25	8.5	7.4	6	16	90	M5
\Box	SS NM E	18.87	12.5	15.5	10.5	9.25	8	20	90	M6
	SS NL E	27.37	19.5	24.0	16	14.1	12	30	180	M10

		Part Number	A1	B1	Cl	D1	G	н	S *1 Rack Module	
	7	SS R 07	6.35	12.7	4	5.65	45	M4	0.7	
I		SS R 10	7.8	15.65	6.75	6.85	90	M5	1	
		SS R 15	8.3	20	8.25	10.2	90	M6	1.5	
l		SS R 20	13.2	31.75	14	16.55	90	M10	2	

	Part Number	Q No of Teeth	R mod	S	Т	U	×	X	w
	SS P07 W9 T28	28	0.7	19.6	5	17	16	21	9
	SS P07 W5 T28	28	0.7	19.6	5	13	16	21	5
	SS P10 W11 T42	42	1	42	15	23	30	44	11
ullille	SS P10 W7 T42	42	1	42	15	18.5	30	44	7
	SS P125 W14 T34	34	1.25	42.5	15	25.5	30	45	14
	SS P15 W8 T28	28	1.5	42	15	19.8	30	45	8
	SS P20 W20 T27	27	2	54	20	35	40	58	20
	SS P20 W13 T27	27	2	54	20	25	40	58	13

All sizes of Track Roller ^[7] (in both narrow and wide formats) have a crown radius to avoid the problems that can occur if imperfect alignment concentrates the load on the edge of the Roller. Any Track Roller can be used with any size of Flat Track ^[7] or Single Edge Spacer Slide ^[7], subject to physical size constraints. Any Rack ^[7] and Pinion ^[7] combination can be used, subject to the tooth size matching, and other obvious size constraints.



	Part	JB	KB	MB	NB	PB	Z (sho	rt axle
	Number						Min	Max
	SSJ13	12.7	9.51	5.47	4.5	4	2.2	3
	SSJ18	18	14.00	6.75	5.6	6	2.4	3.4
	SSJ25	25	20.27	9.0	7.5	8	2.2	3.8
	SSJ34	34	27.13	11.5	9.7	10	5.2	6.6
	SSJ54	54	41.76	19.0	15.6	14	5.7	8.2

Part	JR	MR	NR	PR	Z (sho	ort axle)	Z (lon	g axle)	MI	К1	QI	P1	NI
 Number					Min	Max	Min	Max					Metric Fine
SSR18	18	6.75	5.6	6	2.4	3.4	2.5	10	54	38	12.25	M4	M6x0.75
SSR25	25	9.0	7.5	8	2.2	3.8	4.9	13	72	50	16	M5	M8x1
SSR34	34	11.5	9.7	10	5.2	6.6	5.9	14.8	90.5	60	21	M6	M10x1.25

	SS LRN18	18	8	3.5	6	-	-
T	SS LRN25	25	10	4.5	8	-	-
9	SS LRN34	34	12.5	5.7	10	-	-

Note:

FI G GI H

Part

Number

E1

 SS FT 24
 12
 7.5
 16.5
 45
 12
 M5

 SS FT 32
 16
 8.75
 23.25
 90
 16
 M6

 SS FT 40
 20
 12
 28
 90
 20
 M8

The calculated position of the Pinion 🗹 relative to the Rack 🗹 gives an approximate location only. Customers should make provision for the Pinion to be adjusted relative to the Rack to ensure that the best running condition is achieved.



2.5	10
4.9	13
5.9	14.8













Component Mass

	Part Number	Mass (kg)
Standard	AUSS MS 12 50 NS	0.07
Carriages	AUSS MS 12 75 NS	0.09
•	AUSS MS 12 100 NS	0.11
	AUSS V 20 65 NS	0.21
	AUSS V 20 100 NS	0.27
	AUSS V 20 140 NS	0.34
&	AUSS S 25 80 NS	0.41
Removable	AUSS S 25 130 NS	0.54
Carriages	AUSS S 25 180 NS	0.66
(see equivalent	AUSS \$ 35 100 NS	0.53
Standard Carriages for Removable Carriage	AUSS \$ 35 150 NS	0.7
mass.)	AUSS S 35 200 NS	0.86
	AUSS S 50 110 NS	0.67
	AUSS S 50 160 NS	0.89
	AUSS S 50 220 NS	1.2
	AUSS M 44 125 NS	1.1
	AUSS M 44 175 NS	1.4
	AUSS M 44 225 NS	1.6
	AUSS M 60 150 NS	1.5
	AUSS M 60 200 NS	1.8
	AUSS M 60 280 NS	2.3
	AUSS M 76 170 NS	1.8
	AUSS M 76 240 NS	2.3
	AUSS M 76 340 NS	3.1
	AUSS L 76 200 NS	3.8
	AUSS L 76 300 NS	4.8
	AUSS L 76 400 NS	5.8

	Part Number	Mass (kg)
Carriage	SS BK 2525	0.2
Locking Device	SS BK 3525	0.3
·	SS BK 4434	0.4
	SS BK 5025	0.6
	SS BK 6034	0.8
	SS BK 7634	1.5
	SS BK 7654	1.5

	Part Number	Mass (ka/m)
Single Edge	SS NV E	1.0
Spacer Slides	SS NS E	1.6
	SS NM E	2.6
\leq	SS NL E	6.0

	Part Number	Mass (kg/m)
Double Edge	SS NMS 12	0.5
Spacer Slides	SS NV 20	1.0
(Slide Only)	SS NS 25	1.5
11 TR	SS NM 44	3.5
	SS NL 76	10

	Part Number	Mass (kg/m)
Double Edge	SS NV 20R	1.4
Spacer Slides	SS NS 25R	2.3
(With Rack)	SS NM 44R	4.7
	SS NL 76R	13

	Part Number	Mass (kg/m)
Double Edge	SS MS 12	0.23
Flat Slides	SS V 20	0.6
	SS S 25	0.8
	SS S 35	1.3
	SS S 50	1.7
	SS M 44	1.9
	SS M 60	2.7
	SS M 76	3.4
	SS L 76	5.0

	Part Number	Mass (kg/m)
Racks	SS R 07	0.37
~	SS R 10	0.77
A	SS R 15	1.2
S and a second s	SS R 20	3.3

	Part Number	Mass (kg/m)
Flat Tracks	SS FT 24 12	2.3
6	SS FT 32 16	4.0
	SS FT 40 20	6.3

	Part Number	Mass (kg)
Standard	SS SJ 13NS	0.008
Bearings	SS SJ 18NS	0.019
	SS SJ 25NS	0.048
	SS SJ 34NS	0.115
Ð	SS SJ 54NS	0.415
2	SS LJ 13NS	0.008
æ	SS LJ 18NS	0.020
Vacuum	SS LJ 25NS	0.051
Bearings	SS LJ 34NS	0.120
(See equivalent	SS LJ 54NS	0.425
Standard Bearing	SS BHJ 13 CNS	0.007
tor Vacuum Bearing	SS BHJ 18 CNS	0.018
mass.)	SS BHJ 25 CNS	0.043
	SS BHJ 34 CNS	0.105
	SS BHJ 54 CNS	0.390
	SS BHJ 13 ENS	0.027
	SS BHJ 18 ENS	0.045
	SS BHJ 25 ENS	0.105
	SS BHJ 34 ENS	0.235
	SS BHJ 54 ENS	0.800

	Part Number	Mass (kg)
Floatina	SS SFJ 25NS	0.058
Bearings	SS SFJ 34NS	0.130
	SS SFJ 54NS	0.492
	SS LFJ 25NS	0.060
	SS LFJ 34NS	0.135
	SS LFJ 54NS	0.505

	Part Number	Mass (kg)
Lubrication	SS CS 18	0.006
Device	SS CS 25	0.013
	SS CS 34	0.028
	SS CS 54	0.078
	SS LB 12	0.002
\sim	SS LB 20	0.003
	SS LB 25	0.006
	SS LB 44	0.016
<u></u>	SS LB 76	0.044

	Part Number	Mass (kg)				
Pinions	SS P07 W9 T28	0.031				
(Boss Type)	SS P07 W5 T28	0.022				
	SS P10 W11 T42	0.160				
	SS P10 W7 T42	0.120				
	SS P125 W14 T34	0.20				
	SS P15 W8 T28	0.125				
	SS P20 W20 T27	0.430				
	SS P20 W13 T27	0.300				

	Part Number	Mass (kg)
Wide Track	SS SR 18NS	0.020
Rollers	SS SR 25NS	0.050
	SS SR 34NS	0.120
	SS LR 18S	0.021
	SS LR 25NS	0.055
	SS LR 34NS	0.125
	SS BHR 18 CNS	0.019
	SS BHR 25 CNS	0.045
	SS BHR 34 CNS	0.110
	SS BHR 18 ENS	0.045
	SS BHR 25 ENS	0.105
	SS BHR 34 ENS	0.235

	Part Number	Mass (kg)
Narrow	SS LRN 18NS	0.016
Track Rollers	SS LRN 25NS	0.040
	SS LRN 34NS	0.085
ė		

	Part Number	Mass (kg)
Vacuum	VAC SS LRN 25	0.04
Track Rollers	VAC SS LRN 34	0.085
J J	VAC SS LRN 54	0.310

	Part Number	Mass (kg)						
	SS SFC 25	0.120						
Flange Clamps	SS SFC 44	0.220						
	SS SFC 76	0.500						
007	SS LFC 25	0.405						
Contraction of the second	SS LFC 44	0.630						
\checkmark	SS LFC 76	1.430						

	Part Number	Mass (kg)
	SS SUJ 20	0.018
Axial Stiffness Bogrings	SS SUJ 25	0.042
	SS SUJ 34	0.097
bearings	SS SUJ 40	0.172
	SS LUJ 20	0.019
	SS LUJ 25	0.046
	SS LUJ 34	0.102
	SS LUJ 40	0.181























Removable Carriages

Hepco Removable Carriages are available to suit all sizes of Double Edge Slides 2.

Carriage Plates are precision machined from aluminium alloy and are supplied clear anodised.

Carriages may be specified as Assembled Units (AU SS Type), either factory set to the chosen Slide, or without Slide for self-adjustment.

The key feature of Removable Carriages is the incorporation of Double Eccentric Bearings 2. By slackening the Bearing axle fixing nuts and rotating the eccentric using the adjusting spanner, the Carriage can be disengaged from the Slide (see □ 2). This can be a considerable advantage over Standard Carriages ☑, which must either be run off the end of the Slide, or be disassembled to allow removal.

The following types of Bearing and lubrication device may be specified (refer also to availability table below right).

The Twin Bearing type which is the default choice, comprises two individual Bearings on a common axle. This offers some compliance, with smoother running, easy adjustment and greater tolerance of misalignment.

Example: Short Removable Carriage with Lubricators on a Flat Slide



The Double Row Bearing d type (DR) incorporates a one piece Bearing with two ball tracks. This offers higher load capacity, especially in the radial direction and is less susceptible to entrapment of debris. The Nitrile Seal (NS) provides a higher degree of sealing against ingress of water or debris. A small increase in friction may result.

The Controlled Height Bearing option (CH) minimises variation between Bearings in respect of the important 'K' dimension. This is desirable in high precision applications*³.

The Lubricator I option (LB) applies oil to the 'V' contact surfaces by means of lightly sprung felt pads which are charged with oil to give long intervals between re-lubrication. The Lubricator option is useful where the advantages of increased load and life are required but with lower friction compared to the Cap Seal Z. Lubricators are fixed with screws through the Carriage, so that they can be detached easily in the event of Carriage removal from the Slide

See 🛄 6 of the SL2 catalogue 🗹

Example: Medium Removable Carriage on a Spacer Slide



Lubricator	attachmer	ľ

Dart	0361																							
Number	LTh	-	Α	ØB	С	E	F	G *2	J	K	N *2	P*2,3	Q	R		Sho	rt Carr	iage	Medi	um Car	riage	Lon	g Carr	i
Number			~										Ø x depth			L	D	S	L	D	S	L	D	Ι
AU SS MS 12 R	SS NMS 12	SS MS 12	12	13	40	23.3	30	19	10.1	5.46	1.49	3.8	12.5 x 4.8	7.34		50	35	17	75	60	25	100	85	
AU SS V 20 R	SS NV 20	SS V 20	20	18	64	35.9	50	24.75	12.4	6.75	2.1	4.5	16 x 7	10		65	43	20	100	55	88	140	95	
AU SS S 25 R	SS NS 25	SS S 25	25		80	48.3	65	30.5			2.24		22 x 8.4	11.5		80	51	24	135	74	120	180	120	
AU SS S 35 R	-	SS S 35	35	25	95	58.3	80	31.5	16.6	9	2.30	6.5	22 x 9.4	12.5		100	70	40	150	90	130	200	140	Ι
AU SS S 50 R	-	SS S 50	50		112	73.3	95	33			2.34		22 x 10.9	14		110	80	50	160	100	140	220	160	I
AU SS M 44 R	SS NM 44	SS M 44	44		116	74.8	96	38.5			3.08		25 x 8.7	14.5		125	88	50	180	103	160	225	153	
AU SS M 60 R	-	SS M 60	60	34	135	90.8	115	41	21.3	11.5	2.05	8.3	25 x 11	17		150	110	60	200	125	180	280	205	
AU SS M 76 R	-	SS M 76	76		150	106.8	130	42			3.05		25 x 12.5	18		170	130	80	240	165	220	340	265	I
AU SS L 76 R	SS NL 76	SS L 76	76	54	185	123.0	160	58.5	34.7	19	4.56	14.3	32 x 13.5	20		200	140	90	300	198	270	400	298	

Notes:

- Maximum loads quoted assume lubrication at the interface of Bearings 🗹 and Slide 🗹. This can best be achieved by using Cap Seals 🗹 or Lubricators 1 2. It is strongly recommended that load and life are determined using the methods shown in the Load/Life Calculations 2 section of the SL2 catalogue. The Bearing static and dynamic load capacities (C & Co) often quoted by manufacturers are not the best basis for practical life calculations. C & Co figures are included on the Bearing pages for comparison.
- Some dimensions will vary by the amount of the grinding allowance according to which grade of Slide is selected. All Carriages are compatible with 2. all arades of Slide.
- olled Height (CHK) Bearings are available in five bands, grouped in steps of 0.020mm from B1-0.050mm to B1+0.050mm, in respect of the B1 3. Co dimension given in the Standard Bearings section of the main SL2 catalogue. They are supplied in sets of up to 50 parts as standard, with larger sets on request. Customers requiring CHK Bearings within the same tolerance band, in respect of a number of Carriages, should state this on their order.
- 4. The datum mark identifies the reference edge used in manufacture. The concentric Bearings are always mounted on this side

Ordering Details



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R -T Tapped holes for Blanking customer use Plugs x 4 (Supplied) Blanking Spacer Slide Plugs x 4 (Supplied) Т Max Load Capacity (N)*1 ge S DR L1 DR L2 Twin L1 Twin L2 50 240 240 4×M4 124 320 4×M5 760 1200 380 164 180 960 960 4×M6 1600 3000 200 206 260 4×M8 3600 6000 3000 3000 320 370 6000 6000 4×M10 8000 10000

Leave blank if Slide not required and Carriage will be supplied in a loose condition for self-adjustment **CH** = Controlled Height Bearings*4 Leave blank for standard tolerance **NS** = Nitrile Sealed Bearings ^{*∎*} (Standard)

> **DR** = Double Row Bearings Leave blank for Twin Bearings

Availability of **Carriage Options**

-	DR	LB	снк
Twin Bearings	Double Row	Lubricators	Controlled Height
✓	×	✓	\checkmark
✓	✓	\checkmark	✓
✓	✓	✓	<
\checkmark	✓	✓	\checkmark
	<	 < < < < < Twin Bearings < < < × < < × < < × < ×<td><</td> <	<











Rack & Pinion Systems

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HepcoMotion Racks Z, Pinions Z, Drive Flanges and Gearboxes or AC Geared Motors can be used to construct a range of different custom Rack Driven system configurations. Two examples of other configurations are shown below:

SL2 Catalogue Racks

System with opposing Single Edge Spacer Slides 🗹

One Single Edge Spacer Slide has a rack cut into the back face, engaged with a Pinion.



ď



System with driven Rack [7] A Hepco Drive Flange and hollow shaft motor driven worm gearbox are mounted to a fixed plate.



Our Technical Department will be pleased to assist with all aspects of specification and ordering.

Compact Slide Lubricators

HepcoMotion plastic Compact Slide Lubricators are for use with Hepco SL2 Removable Carriages. They normally fit one each side of the Slide Z, between pairs of Bearings Z. However, any number may be fitted in any position according to requirements. Lubricators provide lubrication to the working surface of the Slide by means of spring loaded oil impregnated felt wipers.

System load capacity and life are greatly increased whilst retaining the low friction characteristics of dry running. Compact Lubricators may be specified as part of any Hepco SL2 Removable Carriage assembly or used within the customers' own design.

Lubricators are supplied with fasteners.

See 📖 6 of the SL2 catalogue 🗹

Slide Lubricators for Standard Bearings 17 for use on Removable Carriages

For all Bearing and Lubrication Device drilling centres, see page 9.

Compact type (...C)



Lubricatio point *2

P - 2 self tapping screws (supplied)*1

Part	Α	В	С	D			G	н	J	К	N	P *1
Number					max	min				±0.1		Thread x Length
SS LB 12 *3	7	10	13	5.2	3	2.5	3.1	5.46	3	6.5	1.7x2.5	M2.5x5
SS LB 20 *3	8	12	22.5	6.5	8	7.5	7.2	6.75	4.75	13	1.7x2.5	M2.5x10
SS LB 25	12	16.5	28	9.9	7.5	5.5	5.5	9	6	16	2.4x4.5	M3x10
SS LB 44	17	20	38	15	13.5	11.5	7	11.5	8	22	2.4x5.5	M3x16
SS LB 76	25	33.5	57	22.7	18.5	13	10	19	12	33	2.7x9	M3.5x22

	Use With	🗸 = Preferre	ed choice, v	🗸 = Compa	ible, x = N	ot Compat
Part Number		S	uitable	for Slic	le Sectio	ons
Number	Y	MS	V	S	M	L
SS LB 12 *3	J 13	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
SS LB 20 *3	J 18	x	✓	\checkmark	\checkmark	✓
SS LB 25	J 25	x	\checkmark	 Image: A second s	x	x
SS LB 44	J 34	x	x	x	 Image: A set of the set of the	x
SS LB 76	J 54	x	x	x	x	✓

Notes:

- Two self tapping screws for plastic (size P) are supplied with each compact type Lubricator. These have a cross-recessed pan head and PT thread form.
- 2.
- 3. Sizes SSLB12 and SSLB20 have a true 'V' shape to enable them to engage with Slide 🗹 thicknesses larger than their G dimensions.

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2 holes ØN x depth



Ordering Details		
	SSLE	<u>844</u> C
Part number		
Lubricator type:		

<u>C</u> = Compact

Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a 68 viscosity EP mineral oil.



CAD







17

Carriage Locking Device



CAD

The HepcoMotion Carriage Locking Device has been designed to provide a safe and simple method of manually locking a Standard Carriage 🗹 in position to facilitate processes where a secure, stationary platform is required. It is available factory assembled in Standard Carriage format only for sizes AUSS2525 and above.









	Use With									
Part Number		A	В	С	D	E	F	G	н	J
								lever disengaged		
SS BK 25 25	AUSS 25 25	78					33.5	37.0	28.0	
SS BK 35 25	AUSS 35 25	88	16	21.5	26.5	57	31.0	34.5	29.0	18.4
SS BK 50 25	AUSS 50 25	103					30.0	33.5	30.5	
SS BK 44 34	AUSS 44 34	116					51.5	55.0	35.0	
SS BK 60 34	AUSS 60 34	132	16	23.5	29.5	83	50.0	53.5	37.5	22.4
SS BK 76 34	AUSS 76 34	148					50.5	54.0	38.5	
SS BK 76 54	AUSS 76 54	164	20	33.5	41.5	105	53.0	57.0	54.0	34.9

Ordering Details

AUSSS25 180 (CS) (DR) NS (CH) BK + Slide Part Number*1



BK = Carriage Locking Device option

Ordering

2 x (3 x AUSSM60 200 LB DR NS BK + SSM60 L3056) (2 systems each with 3 Carriages per Slide) Example:

Notes:

1. Due to the limited clearance between Locking Device components and the Slide Id, all Slides with Locking Devices must have counterbored holes.

Flange Clamps

Flange Clamps enable the slide system to act as a self-supporting constructional element of the machine. Manufactured from aluminium alloy, the clamps are then treated with a corrosion resistant coating certified by the U.S. Department of Agriculture. They are available for use with SSNS25, SSNM44, and SSNL76 section Spacer Slides only.

Short Flange Clamps (type SFC) enable the Slide to be supported between two opposing faces. The Long Flange Clamp (type LFC) enables short lengths of Slide to be supported from one end only. The machined base mounting facility may be utilised by customers wishing to space the slide system away from the mounting surface. Please refer to the Deflection of Self Supporting Slides calculations section on 🛄 6.

Assembly

Flange Clamps should be positioned proud of the ends of the Slide*1. Flange fixing screws should be located and slightly tightened, before clamping screws 'M' are fully tightened. Progressive tightening of each screw 'M' is recommended. Flange fixing screws may then be fully tightened.

See Application Examples on 📖 8, 9 & 11 of the SL2 catalogue 🗹



_	Use With																					
Part Number]=[]j	A	В	Cl	C2	D	E	F	G	Н	J	К	L	M	Ν	Ρ	Q	R	S	T	Weig	ght/g
Nomber	To and the second secon									±0.2	±0.2										S FC	L FC
SS S/LFC 25	SS NS 25	60	54.6	15	55	29.8	9.8	1.8	20	34.6	20	45	35	M6x30	9.5	5	M8	6	35	17	120	405
SS S/LFC 44	SS NM 44	80	59.6	20	60	34.8	12.3	2.5	25	39.6	30	60	40	M8x30	11	6	M10	7	40	20	220	630
SS S/LFC 76	SS NL 76	120	74.6	25	75	44.8	19.3	4	30	49.6	55	95	50	M10x40	14	8	M12	9	45	23	500	1430

Ordering Details





Clamp Length.

- **S** = Short Type (use one at each end of Slide)
- \mathbf{L} = Long type (use for cantilever Slide mounting)

Notes:

- For mounting Slides ₫ between opposing faces, Slides should be ordered 2mm shorter than the required span.
- 2. Standard drilled Flange Clamps will be reworked for customers requiring tapped hole option 'Q'.



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Short Flange Clamp (SFC)

Long Flange Clamp (LFC)

Q = tapped hole option is required^{*2} Leave blank for through hole fixing Part Number (44 = nominal Slide width in mm)





Vacuum & High Temperature Bearings

Concentric (C)*3

CAD

kg

Mass 12-13

SL2 Catalogu ď

available in sizes from 18mm to 54mm in diameter, with a broad range of fixing styles, and with load capacities from 180N to 4.200N. Hepco VACSS Vacuum & High Temperature Bearings are made entirely from stainless steel parts and are lubricated internally for

HepcoMotion Vacuum & Extreme Temperature Bearings and Track Rollers are designed for extreme environments. They are

life using Krytox LVP grease. They are suitable for use in high vacuums, at temperatures from -15°C to +210°C, and in the presence of oxygen. They are widely used in applications including semiconductor wafer manufacture, aerospace components, vapour deposition processes, LCD panel and plasma display manufacture and in vacuum evaporation equipment.

The Bearings have the same dimensions as SL2 Standard Bearings.

The J18 VACSS Bearings have a different construction to the larger sizes, using a one piece outer wheel into which two smaller Bearings are fitted. This size is not available in the low temperature LTSS version.

These Bearings can be supplied with alternative grease, without grease or without shields, on request.

Carriage plates to suit Vacuum & High Temperature Bearings are available on special request, please contact Hepco's Technical department to discuss your requirements.

Through Fixing Type (SJ/LJ)









Eccentrics (E&DE)*3

Low Temperature Bearings

Hepco LTSS Low Temperature Bearings are lubricated internally for life using AeroShell Grease 22, which is suitable for use at temperatures from -50°C to +150°C. This lubricant enables use in much colder conditions than the VACSS Bearings, for applications such as cold stores and specialised freeze dry equipment.

Through Hole Fixing type is available in two axle lengths covering most thicknesses of mounting plate. Both are available in Concentric type (C) which are fixed, Eccentric type (E), adjustable, and Double Eccentric type (DE), which have sufficient adjustment to enable a Carriage Z to be disengaged from the Slide Z.

Blind Hole Fixing type (BHJ) allows mounting into a solid machine base where through mounting holes are not possible, or where the thickness of the mounting plate is too great. The Blind Hole Fixing type is also useful where adjustment from the front is preferred or where access to the opposite side of the mounting hole is restricted. They are available in the fixed position Concentric type (C) and adjustable Eccentric type (E).

See Application Example on \Box 8 of the SL2 catalogue \Box

Blind Hole Fixing Type (BHJ)



Part	A	В	B1		C	C	1	C	2	D	E	F	G	н	I	J	К	L	M	MI	N	*4	O *1	Р
Number				SJ	IJ	SJ	IJ	SJ	IJ	±0.025		Metric Fine									E	DE	+0.0 -0.03	
J 18	18	12.4	6.75	7.4	14	3.4	10	2.4	2.5	14.00	7	M6 x 0.75	10	0.6	7.4	0.8	3.2	2.5	10	13	0.7	2.6	6	11
J 25	25	16.6	9	9.8	19	3.8	13	2.2	4.9	20.27	10	M8 x 1	14	0.5	9.8	1	5	3	13	17	0.75	2.75	8	13
J 34	34	21.3	11.5	13.8	22	6.6	14.8	5.2	5.9	27.13	12	M10 x 1.25	18	0.7	13.8	1.25	6	4	17	21	1	3.6	10	15
J 54	54	34.7	19	17.8	30	8.2	20.4	5.7	7.9	41.76	25	M14 x 1.5	28	1.6	17.8	1.6	8	6	22	28	1.5	5.5	14	27

Dart	Q	R *4	S	S 1	T	TI	T2	U	Ul	V	W	X	Y	Y	Z	Adjusting	Socket	Max V	Norking Loa	d Capacitie	s (N)*6	Basic L	.ife* ⁶
Number								0.1								Wrench**	Tool*3	Lubri	cated	D	r y		
Nomber								±0.1										Axial	Radial	Axial	Radial	Lubricated	Dry
J 18	2	1.2	8	10.5	10	4	8	38	54	11	24.5	M4	7	7	7	AT18	RT6	60	180	36	72	80	50
J 25	3	1.5	7	9	12	5	10	50	72	14	32	M5	8.	8.5	10	AT25	RT8	240	450	80	160	50	70
J 34	4	2.0	9.5	8.5	17.5	6.5	12.5	60	90.5	17	42	M6	10	10	14	AT34	RT10	520	900	160	320	100	100
J 54	8	3.0	14.5	16.4	23.5	10.5	18.5	89.5	133	25	62	M8	1	13	20	AT54	RT14	1350	2400	360	720	250	150

Ordering Details

or **LT** = Low Temperature

SS = Stainless steel

Bearing Type

VAC SS SJ 25 C

Notes:

It is recommended that holes to suit Bearing mounting axles should be reamed to tolerance F6 for a sliding fit.

Eccentric Bearing fixing axles are supplied with hexagon sockets for adjustment as shown 2.

Nuts and washers are supplied with both concentric and eccentric SJ/LJ type Bearings. 3.

'N' is the eccentric offset due to the eccentric design (2 x N = total stroke). R dimension is both the eccentric offset of the adjusting nut and total stroke 4. at the Bearing centreline.

5 For adjusting tool part numbers see table. For adjustment procedure and fixing nut tightening torques 🛄 3.

To calculate the load capacity and life of systems using these Bearings, please use the methods shown in the main SL2 catalogue 🗹.

Fixing type Choose from: SJ = Short Axle, LJ = Long Axle

Choose from: **VAC** = Vacuum & High Temperature

& **BHJ** = Blind Hole Fixing

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Eccentric (E)





Journal type: **C** = Concentric (fixed) **E** = Eccentric (adjustable) or **DE** = Double Eccentric (adjustable SJ/LJ only) **25** = Bearing Diameter in mm (Size 18 not available as LT grade)











Vacuum & Extreme Temperature Track Rollers

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Vacuum & High Temperature and Low Temperature Track Rollers 🗹 are available as fixed position Concentric type (C) and adjustable Eccentric type (E) on through hole fixing axles. They are available with 25mm, 34mm or 54mm diameters, and load capacities up to 4,200N. Track Rollers can be run with any suitable Flat Track I, or can be used as cam followers. Materials and greases are the same as are used on the VACSS Vacuum & High Temperature and LTSS Low Temperature 'V' Bearings shown on the previous pages.

kg Mass

CAD









Part Number	A	В	B1	с	СІ	C2	D	E	F Metric Fine	G	н	J	к
LRN 25	25	14.5	10	19	13	5	500	10	M8x1	7	1	1	5
LRN 34	34	18.2	12.5	22	14.8	6	500	12	M10x1.25	9	1.2	1.25	6
LRN 54	54	29.5	21	30	20.4	8	500	23.5	M14x1.5	14	1.4	1.6	8

Part Number	L*2	м	MI	N	O *1	Р	Adjusting Wrench	Socket Tool	Max Working Load	Roller Static Radial Load C	and Dynamic Capacities (N)* ³
NUMBER					+0 -0.03			e	Capacity*4	Co	с
LRN 25	3	13	17	0.75	8	13	AT25	RT8	800	1092	2632
LRN 34	4	17	21	1	10	15	AT34	RT10	1400	1905	4078
LRN 54	6	22	28	1.5	14	27	AT54	RT14	4200	5319	10965

Ordering Details

Bearing Type Choose from: **VAC** = Vacuum & High Temperature or **LT** = Low Temperature

SS = Stainless steel

VAC SS LRN25 C

 \mathbf{C} = Concentric (fixed) or \mathbf{E} = Eccentric (Adjustable) LRN = Indicates a Track Roller, 25 denotes the diameter in mm

Notes:

- It is recommended that holes to suit Track Roller 🗹 mounting axles should be reamed to tolerance F6 for a sliding fit.
- Eccentric Track Roller fixing axles are supplied with hexagon sockets for adjustment as shown. 2.
- The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and 3 are only provided for comparison with other systems.
- 4. To calculate the load capacity and life of systems using these Rollers, please use the methods provided in the Load/Life Calculations section of the SL2 catalogue 🗹.

Floating Bearings

HepcoMotion Floating Bearings are designed to provide axial movement (float) of the 'V' position; this is especially useful where 'V' Slides I' are mounted in parallel. The axial movement compensates for parallelism tolerances between the opposing V's, reducing the potential of additional loading and helping to maintain a consistent running quality. Floating Bearings are available in three basic sizes to work easily with the SL2 range. They are available in two axle lengths covering most thicknesses of Carriage I or mounting plate, the short axle version being compatible with Hepco Carriage Plates. Both versions are available in Concentric type (C), which are fixed providing a datum (in radial direction) for the system, Eccentric (E) and Double Eccentric type (DE) to enable system adjustment, with the DE version having sufficient stroke to permit disengagement from the Slide.

For more information, or to suit a specific application, please contact Hepco's Technical Department.



Ordering Details

28 1.3 8 1.6 8 6 22 28 1.5

SS SFJ 25 C NS

5.5 14 27 11.5 12.6 19

SS = Stainless Steel Fixing type

(Choose from: SFJ = Short Axle, LFJ = Long Axle)

Ordering Examples for Floating Bearing Lubricator:

SS LB 25 C FB SS LB 44 F FB

Notes:

- It is recommended that holes to suit Bearing 🗹 mounting axles should be reamed to tolerance F6 for a sliding fit. 2. The quoted static and dynamic load capacities use industry standard calculations and are only provided for comparison with other systems. Please use the Load/Life Calculation methods from the main SL2 catalogue 🗹. In all cases, Hepco Floating Bearings will have a life equal to or greater than the corresponding size of Double Row Standard Bearings. Floating Bearings are not designed to be axially loaded.
- 3. The 'N' dimension is the eccentric offset.
- Δ Fastenings are stainless steel.
- The variation in the 'B1' dimension is the min/max axial movement of the 'V' centre also referred to as 'V float'. 5
- 6. two self-tapping screws for plastic with PT thread form and cross-recessed pan heads are supplied for compact type Lubricators 🗹.
- 7
- 8. Dimension S accomodates the 'V' float of the Floating Bearings.

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Concentric (C)

Flange Type

	C	Cl		C	2	D	E	E1	F
SFJ	LFJ	SFJ	LFJ	SFJ	LFJ	±0.025			Metric Fine
9.8	19	3.8	13	3.4	4.9	20.27	11.5	10	M8 x 1
3.8	22	6	14	5.2	5.9	27.13	16	12	M10 x 1.25
7.8	30	8	20	5.7	7.9	41.76	28	25	M14 x 1.5

Adjusting Wrench	Socket Tool	Max Working	Bearing Load Capa	Radial cities (N)*2
	@	Load Capacity (N)*2	Static (Co)	Dynamic (C)
AT25	RT8	1500	6100	4900
AT34	RT10	3000	12500	11500
AT54	RT14	5000	28900	21500

NS = Nitrile Sealed Bearings $\underline{\mathbf{C}}$ = Concentric (fixed), $\underline{\mathbf{E}}$ = Eccentric (adjustable) or **DE** = Double Eccentric (for disengagement purposes) **25** = Bearing diameter (Choose from 25, 34 and 54)

Compact type (C) Lubricator for 25mm diameter Floating Bearing Flanged type (F) Lubricator for 34mm diameter Floating Bearing

Two machine screws with cross-recessed pan heads to DIN7985A are supplied for fixing the flanged type Floating Bearing Lubricator. Additionally,

Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a 68 viscosity EP mineral oil.











SL2 Catalogue
+ - X ÷
Load/Life Calculations



Bleed Lubrication

The HepcoMotion Bleed Lubrication facility enables a constant flow of lubricant to be channelled directly to the 'V' surfaces of the Slide 🗹. The lubricant is picked up and distributed by the Bearings 🗹 whilst traversing the Slide. Lubricant distribution can be facilitated further by also fitting Hepco Cap Seals 🗹 or Lubricators 🗹, which will be continuously charged with fresh lubricant and ensure an even spread over the working surfaces.

As the lubricant is provided via the Slide rather than the Lubricators or Cap Seals, the number of lubrication devices fitted to each Carriage 🗹 can be reduced within a system. It is recommended that one in four Carriages is fitted with Lubricators or Cap Seals in any system using bleed lubrication. This will reduce friction and running costs.

Inserts are available with either an M5 thread or 4mm diameter bore with O-ring seal.

Connection can be made to a centralised lubrication system, pressure feed canister or an oil dispensing pump and controller, which can be programmed to meter a set dose of lubricant according to the distance travelled by the Carriage.



Below is an example of how the bleed lubrication facility can be incorporated into a typical application:



Please specify at the time of ordering.



œ.⊕



Single Edge Slides

Single Edge Slides 🗹 are also available with the bleed lubrication facility. Details of their positions are shown below.







R

L₂

Bleed Lubrication Inserts

The plain bore insert has an O-ring seal between the mounting base and the Slide 🗹 to stop lubricant escaping. The threaded version has an M5 male stud fitting through which the lubricant is pumped. Please refer to the diagrams below. For more information please contact Hepco's technical department.

Threaded Insert (BLT)	8 Lubricant Flow Threaded Insert
Plain Bore Insert (BLP)	Plain Bore Insert Ø3.5 O Ring Seal Ø10

Male Stud Connectors

Straight Connector 90° Connector



The tube used with the standard male stud fitting is 4mm diameter nylon or polyurethane tube. Alternative sizes of male stud fittings and tube are available on request. Please contact Hepco's technical department for more information.

Slide Part Number	For Use With	A* ^{1,2}	B *1,2	C	D *3	ØE	К		
SSNMS12		Bleed lubrication unavailable							
SSNV20	1017	435	375	8	M5 / Ø3.5	1.5	-		
SSNS25		435	375	10	M5 / Ø3.5	1.5	-		
SSNM44		435	375	12.5	M5 / Ø3.5	1.5	6.25		
SSNL76		330	210	19.5	M5 / Ø3.5	2.0	18		
SSNVE			l	Bleed lubricc	ition unavailable	е			
SSNSE	6	375*4	-	10	M5 / Ø3.5	1.5	-		
SSNME		375*4	-	12.5	M5 / Ø3.5	2.0	-		
SSNLE		390*4	-	19.5	M5 / Ø3.5	2.0	22.25		

Auto Lubrication Canister

This can be set to dispense the lubricant to the Slide *I* at regular intervals and can be adjusted, depending on the application. Please specify at the time of ordering, if required.



Notes:

- Dimensions A and B are distances from the centre of the mounting hole positioned nearest to the right-hand end of the Slide 🗹.
- 2.
- 3. Depends on whether a plain or threaded insert is used.
- 4. adjusted bleed hole position dimension A to reflect this. This is shown in the ordering example above.



Single Edge Spacer Slide, 2336mm long, with custom hole position A

Custom position bleed holes can be specified, but cannot be located more than 600mm from the end of the Slide. Mounting holes should be avoided.

To order a symmetrical pair of Single Edge Spacer Slides with Bleed Lubrication, one of the Slides should be an opposite handed version, with an

Bearing Lubricators & Flat Track / Roller Lubricators



Lubrication Point

Lubrication Point

HepcoMotion Bearing Lubricators & Flat Track / Roller Lubricators*1 provide a simple and versatile means of applying lubricant to a system, and consist of a plastic housing incorporating a sprung loaded oil impregnated felt wiper. Bearing Lubricators are an alternative to Slide Lubricators 🗹 for lubricating 'V' Slide Systems with Standard Bearings 🗹.

Z **Bearing Lubricator**





CAD







Dout	For Use with													
Number	000)))		A	A B		D	E	F	G	H	J	К	L
SS BLB 25	SS J 25	-	-		14					9.46	5.90			
SS RLB 25		SS R 25	SS FT 32 16	28	10	10.5	13.5	3	20.5	705	11	9	5.25	M3
SS NRLB 25		SS LRN 25	SS FT 32 16		14.5					7.25				
SS BLB 34	SS J 34	-	-		10					12.46	7.30			
SS RLB 34		SS R 34	SS FT 40 20	28	19	14.5	14	3	20.5	0.25	11	11.5	7.25	M3
SS NRLB 34		SS LRN 34	SS FT 40 20		18					9.25	11			
SS BLB 54	SS J 54	-	-		22					18	12.6			
SS RLB 54		SS R54	-	42	32	18	21.5	5	32	11	01	19	9	M4
SS NRLB 54		SS LRN 54	-		29					11	21			

Ordering Details

Part Number

Notes:

Wide Track Roller Lubricators can be used with both Wide Track Rollers 🗹 and Flat Tracks 🗹. Narrow Track Roller Lubricators can be used with both Narrow Track Rollers and Flat Tracks.

SS BLB 34

For drilling centres, see Data & Dimensions for Assembled Systems section 🛄 10-11. 2.

Κ

Controlled Height Bearings - CHK

HepcoMotion Controlled Height Bearings (CHK) are designed to minimise the variation in the 'V' height of Standard Bearings 2. This is desirable in high precision applications, and in Carriages 2 using Double Row type Bearings. Controlled Height (CHK) Bearings are available in five incremental ±0.010mm bands, spanning a total of ±0.050mm in respect of the B1 dimension. They are supplied in sets of up 50 parts as standard, with larger sets on request. CHK Bearings of differing bands should not be mixed in any Carriage assembly. In applications with multiple Carriages, it is recommended that Bearings with adjacent tolerance bands are used in Carriages that will be assembled next to each other.

To aid identification, Bearings are supplied with a colour coded mark located in the hexagon recess on the underside of the Bearing, as shown below.





Red

Identification Colours:

Orange

B1

В Identification Colour В Red Orange Yellow Green Blue

Ordering Details^{*1}



Bearing Part Number

Notes:



1. A set of Bearings will be supplied within a single band. Bearings within a specific band are available on request.





C. C.







Yellow

Green



Blue

l Tolerance							
and	B1						
٨	-0.05						
A	-0.03						
D	-0.03						
D	-0.01						
<u> </u>	-0.01						
C	+0.01						
D	+0.01						
υ	+0.03						
E	+0.03						
C	+0.05						





Axial Stiffness Bearings

HepcoMotion Axial Stiffness Bearings have been developed for applications where system height needs to be more resistant to deflections and vibrations. They are stiffer under axial (L1) loading and are also more resistant to any relaxation in system preload than a similar system using standard Hepcomotion DR bearings. This makes them well suited to precise applications, particularly busy ones.

Load and life performance meets the published specification for the similar size of **DR** bearings, but the **DR** type should remain the first choice for heavily loaded systems.

Axial stiffness bearings are interchangeable with standard SL2 bearings. They are available in sizes 25 and 34 only and are supplied with nitrile seals as standard.

Through Fixing Type



		Α	В	B1		2	C	1	C	2	D	E	F	G	Н	H1		J	K *1	L
	Part Number				Short	Long	Short	Long	Short	Long							E	DE	+ 0.00	
	Nomber				Axle	Axle	Axle	Axle	Axle	Axle	±0.025	Metric Fine					c	DE	- 0.03	
	SSUJ 25	25	15.5	9	9.8	19	3.8	13	3.4	4.9	20.27	M8x1	11	3	13	17	0.75	2.75	8	13
ĺ	SSUJ 34	34	19.2	11.5	13.8	22	6.6	14.8	5.2	5.9	27.13	M10x1.25	14	4	17	21	1	3.6	10	15

To help facilitate bearing type selection, key attributes of Hepco Twin, Double Row and Axial Stiffness bearings are compared in the chart below:

Bearing Type	Max Wor Axial	king Load Radial	Speed	Smoothness	Tolerance to Misalignment	Mass	System Height	Tolerance to Debris	Stiffness Under Axial Load
Twin	att.		.ull	att.	Il	all	all	att	all
Double Row	.all	.ull	.ull		.all	all		II	.all
Axial Stiffness	. di		.ull		all	all		.ull	.atl

Visual Comparison



Load / Life Calculations

The maximum axial (LA) and radial (LR) working load capacities, in Newtons, for all sizes of Hepco AS type bearings, are given in the table below. Values are based on shock-free duty.

All bearings are greased internally for life. Customers should provide lubrication to the interface between bearings and slide. This can be achieved using Hepco Slide Lubricators or Cap Seals. Lubrication maximises load capacity and life. To calculate system life, the load factor LF should first be calculated by using the equation below and capacities in the table provided.

LF should not exceed 0.5 for any combination of loads on Axial Stiffness bearings. Life, in kilometres, can then be calculated using the second equation. The value for Basic Life is also taken from the table.

Part	Maximum Wo	Basic	
Number	LA(max)	LR(max)	Life (km)
SS UJ 25	290	1080	70
SS UJ 34	570	1600	425





Notes:

- It is recommended that holes to suit Bearing mounting axles should be reamed to tolerance F6 for a sliding fit.
- 2. All eccentric Through Fixing type Bearing axles are supplied with sockets for adjustment
- 3. Please see the 'Mix & Match' Component Compatibility section for preferred choices of Slide to use with each Bearing.

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Slides

CAD

kg

Mass

SL2 ue 🗹



$$LF = \frac{L_A}{L_{A_{(max)}}} + \frac{L_R}{L_{R_{(max)}}} \le 0.5$$



$$Life (km) = \frac{Basic Life}{(0.03 + 0.97 Lr)^3}$$

31

MCS-SL2 Connectivity - Slides



Mass

60

90

60

60

60

90

45

60

SS NL 76*2

T-Nut Strip provides location of Spacer Slide 🗹 and retention of fixing screw position in the event of disassembly.

SS NVE

SS NVE

SS NSE

SS NME

SS NSE

SS NME SS NLE*2

SS NSE

SS NME

SS NLE*2

SS NL 76 R*2

Compatibility Table - SL2 Spacer and Flat Slides 🗹 with MCS Profiles

	R	5		Slic	le Part	Nu	mbe	er
Vidth Hei		Height				ALL	>	<
Slide	20	20	SS NV	20				
Lubricators	20	40	00111	20	SS NV	20	R	
	40	20			00111	20	ĸ	
SL2 Catalogue								
	30	30	SS NS	25				
	30	60			SS NS	25	R	
D	30	90						
bearings	60	30	SS NM	44				
	90	30			SS NM	44	R	
SL2 Catalogue								
	10	40	SS NS	25				
1	40	80			SS NS	25	R	
	80	40						
Slides	80	80	SS NM	44				
	80	160			SS NM	44	R	
SL2 Catalogue	160	80						
All and a state of the state of	160	80	SS NL	76* ^{1,2}				
					SS NL	76	R*1,2	
Racks	45	45	SS NS	25				
	45	60			55 NS	25	R	
0	45	90						
ka	60	45	55 NM	44	66 N II 4	1.1		_
	10	10			55 NM	44	R	

R	ĘŽ	Slide Part No			
Nidth	Height		Ð		
20 20	20 40	SS S 35	~	\checkmark	~
30 30	30 60	SS M 44	 Image: A start of the start of	\checkmark	
30	90	SS S 50	\checkmark	\checkmark	✓
60	30	SS M 76	 Image: A set of the set of the	\checkmark	 ✓
40	20	SS S 50	 Image: A start of the start of	\checkmark	
		SS S 50	 Image: A set of the set of the	\checkmark	
40	40	SS M 60	 Image: A start of the start of	\checkmark	 ✓
40	80	SS M 76	 Image: A start of the start of	\checkmark	✓
		SS L 76*2	 Image: A start of the start of	\checkmark	✓
45	45	SS M 60	\checkmark	~	\checkmark
45	60	SS M 76	 Image: A start of the start of	\checkmark	 ✓
45	90	SS L 76*2	 Image: A set of the set of the	\checkmark	 Image: A set of the set of the
60	45	SS M 76	\checkmark	\checkmark	\checkmark
60	60	SS L 76			

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= Fits with all grades of Slide



Using profile part no. e.g. 0-132-<u>8081</u> Profile Length **H** Slide position **J** Leave blank for self assembly Slide mounting position number

C for clockwise or **A** for anti-clockwise facing of Single Edge Slide Leave blank if not required

Slide Length L Slide part number

Please specify from SL2 catalogue

on SL2 Flat Slides

C=Counterbored option for flush surface

R=Rack mounted to SL2 Spacer Slide

SL2 Flat Slide mounting to special order

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1. SSNL76 Spacer Slides can only be attached to the two centre most positions of the 160mm wide face of the 80 x 160 profile.

Slide hole centres and fixing screw sizes and types will vary from those specified in the SL2 catalogue. 2.

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HepcoMotion[®]

ADVANCED LINEAR SOLUTIONS



GV3 - (Simple Select)



SBD



MHD Heavy Duty Track Roller Guidance System



HDS2 Heavy Duty Slide System



PRT2 Ring Slides and Track System



HDRT Heavy Duty Ring Slides and Track System



SL2

Stainless Steel Based Slide System



HLG



MCS



DTS



DLS



Powerslide-2 Guided Rodless Cylinder



PDU2





Shaft Precision Steel and Aluminium Shaft



Ball Bushings Linear Bearing System





LoPro Aluminium Based Slide System



UtiliTrak® Lightweight U Channel Guideway

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Certification Number 14479 ISO 9001



Нерсо

Ball Screws

GFX

Guidance for Beckhoff XTS

Telescopic Ball Bearing Slides

HPS