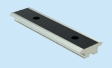




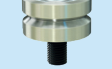
GV3

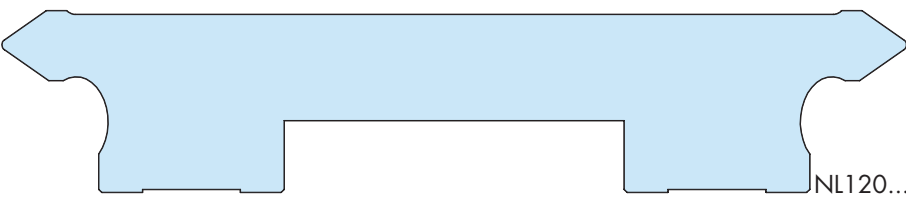
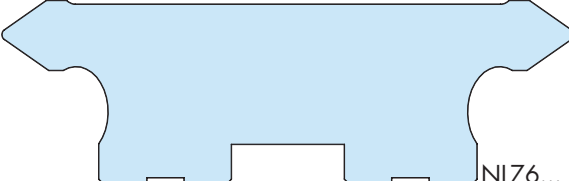
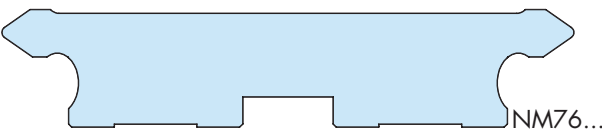
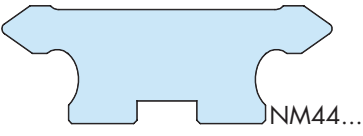
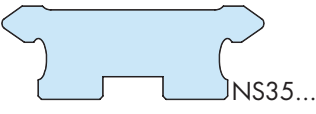
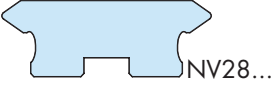
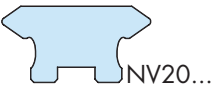
LINEAR GUIDANCE AND TRANSMISSION SYSTEM

 CAD

 Slides
26-31

 Carriages
22-25

 Bearings
34-37



SHOWN HERE ARE FULL SIZE ILLUSTRATIONS
OF ALL SLIDES AND ALL BEARINGS PLUS
SOME OF THE MORE POPULAR
ASSEMBLED CARRIAGES

L120...

L76...

M76...

M60...

S50...

M44...

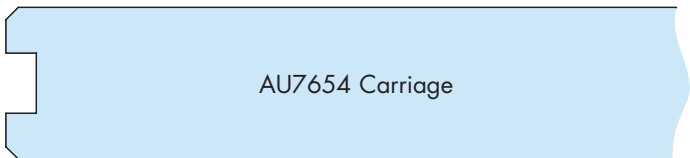
S35...

V28...

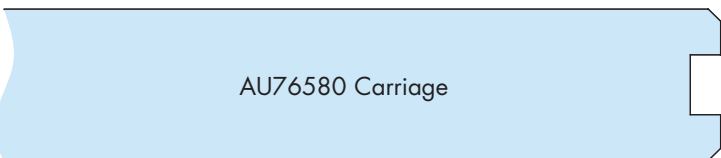
S25...

V20...

MS12...

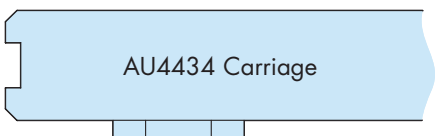


...J54...
(Ø54)

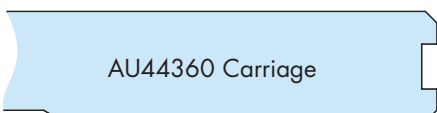


NL76...

...J580...
(Ø58)



...J34...
(Ø34)



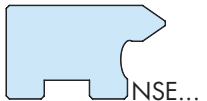
...J360...
(Ø36)



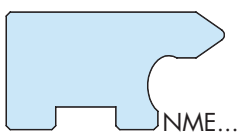
MSE...



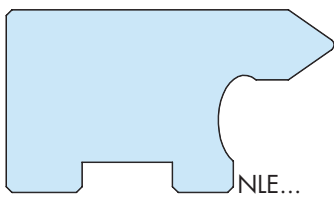
VE...



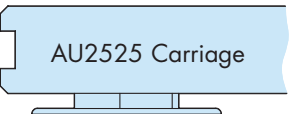
SE...



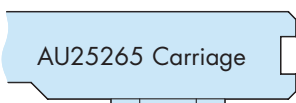
ME...



LE...



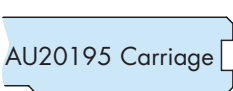
...J25...
(Ø25)



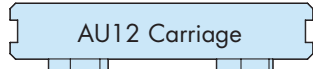
...J265...
(Ø26.5)



...J18...
(Ø18)



...J195...
(Ø19.5)

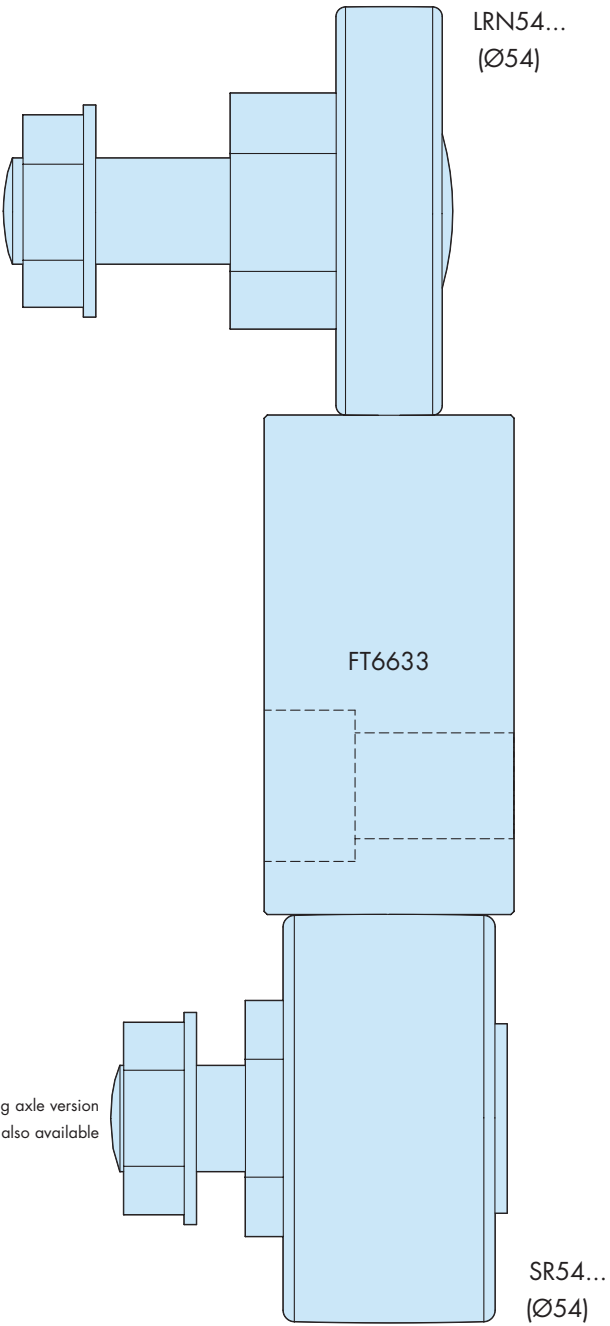
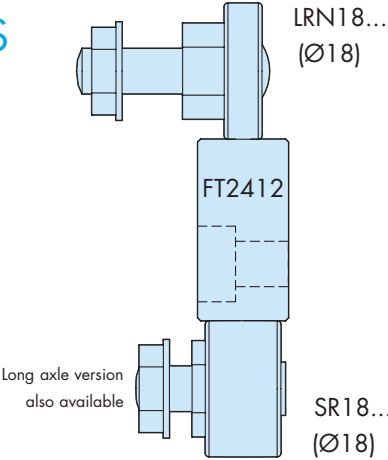
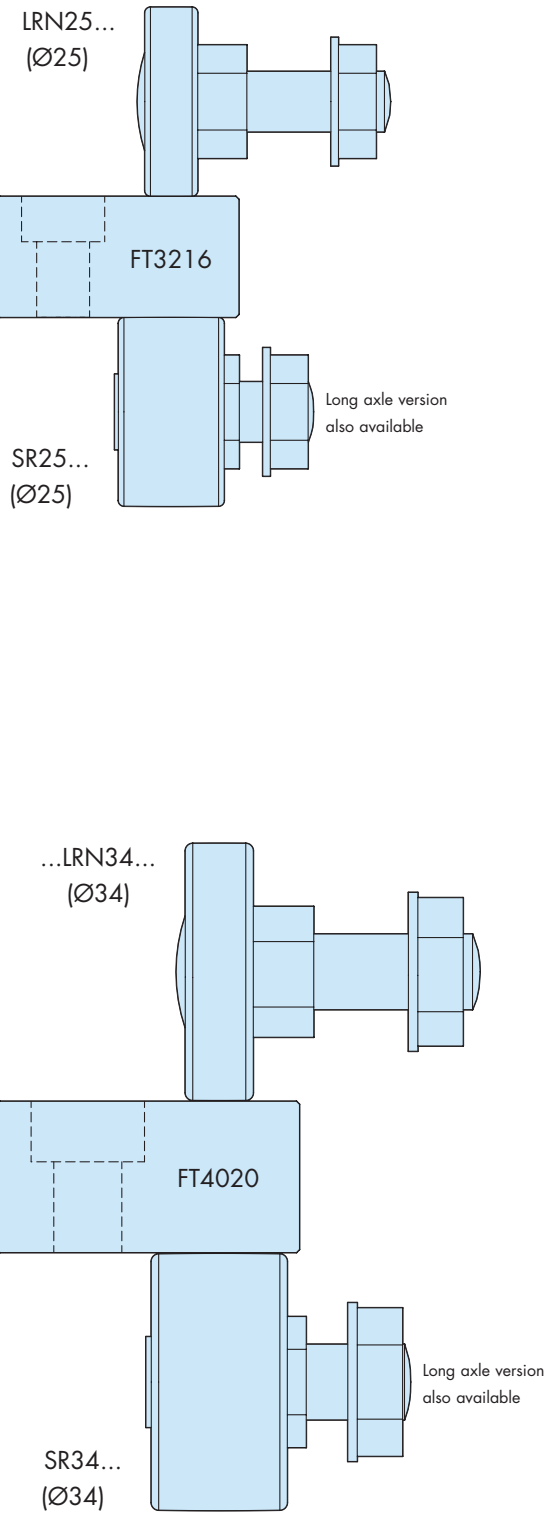


...J13...
(Ø12.7)

NMS12...



SHOWN HERE ARE FULL SIZE ILLUSTRATIONS OF ALL FLAT TRACKS AND TRACK ROLLERS, WITH ROLLERS RUNNING ON EITHER THE NARROW OR WIDE FACES OF THE TRACK.



The customer has a wide choice of HepcoMotion GV3 components in order to satisfy most linear motion requirements. To facilitate the selection process, the most commonly used components for a basic Slide System have been tabulated to show comparative benefits when used within a complete system. The benefits in the table are the important ones, which can be shown in comparative form and are by no means exhaustive. Please see the System Composition section 2-9 and pages relating to the individual components for other features, benefits and variants.

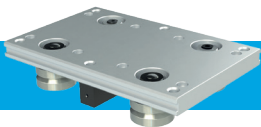
Bearing Type	Load		Speed	Smoothness	Tolerance of Misalignment	Rigidity	System Height	Tolerance of Debris	Price	
 Twin Bearing										
 Double Row Bearing										
 Slimline Bearing										
 Floating Bearing										

Slide Precision Grade	= ground surface	General Accuracy		Smoothness /Quietness		Friction		Price	
P1									
P2									
P3									

Lubrication Method	Load		Lubrication Interval	Debris Exclusion		Friction	Safety & Appearance		Price	
None				*	*					
 Lubricators				*	*					
 Cap Seals or Cap Wipers										
 Hepco Bleed Lubrication			Automatic lube frequency possible	*	*					

*The Hepco 'V' Bearing principle has a natural wiping action which tends to expel debris.
The above information is a general guide intended for preliminary selection purposes only.





HepcoMotion Standard Carriages are available to suit all sizes of [Double Edge Slides](#), in all grades of precision. Carriage Plates are precision machined from aluminium alloy and are supplied clear anodised.

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

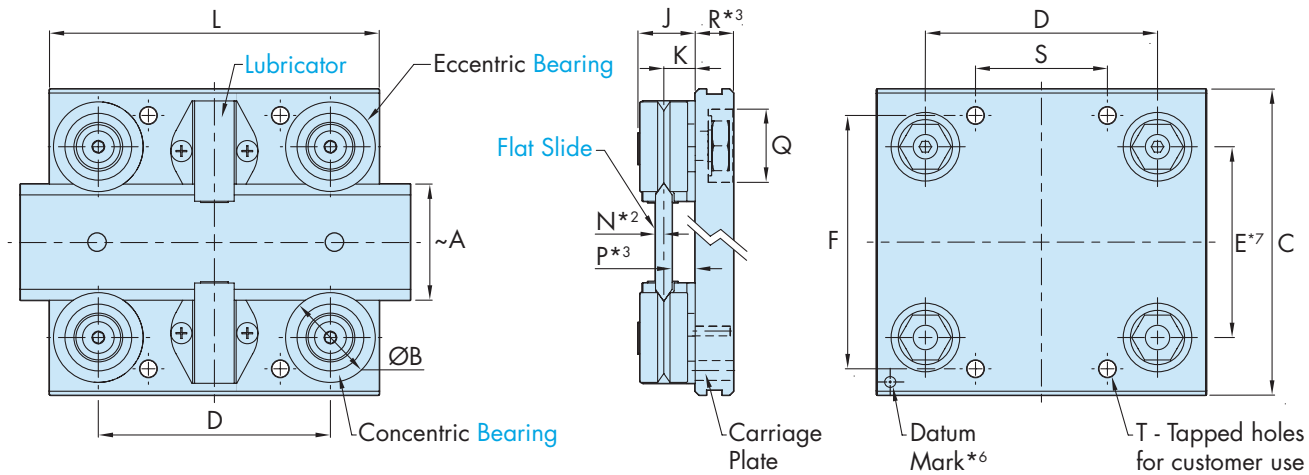
Removable Carriages incorporate Double Eccentric [Bearings](#), enabling the Carriage to be removed directly from the Slide. For full information and ordering information, please refer solely to the GV3 Technical Guide [↓](#).

The following types of Bearing and [Lubrication Device](#) may be specified (refer also to the availability table [📖 23](#)).

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

The Double Row Bearing 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.

Example: Short Carriage with [Lubricators](#) on a [Flat Slide](#)



Part Number	Use With		L2																																	
			~A	ØB	C	E*7	F	G*2		H	J	K	M	N*2		P*3			Q	R*3	Short Carriage*5				Medium Carriage				Long Carriage				Max Load Capacity (N)*1			
								P1	P2 & P3					P1	P2 & P3						Ø x depth	L	D	S	T	L	D	S	T	L	D	S	T	DR L1	DR L2	Twin L1
AU 12P1/P2 13 ...	NMS 12	MS 12	12	13	40	22.0	30	19	19.2	-	10.1	5.47	-	1.53	1.6	3.8			12.5 x 4.8	7.34	50	35	17	4 x M4	75	60	25	4 x M4	100	85	50	4 x M4	-		240	240
AU 12P3 13 ...					23.0																															
AU 20 18 ...	NV 20	V 20	20	18	64	34.7	50	24.75	24.95	14	12.4	6.75	57	2.14	2.2	4.5			16 x 7	10	65	43	20	4 x M5	100	55	44	6 x M5	140	95	62	6 x M5	760	1200	500	400
AU 28 18 ...	NV 28	V 28	28		72	42.7	58	25.75	25.95				65												5.5	16 x 8	11		75	52	25					
AU 25 25 ...	NS 25	S 25	25	25	80	46.6	65	30.5	30.7	18	16.6	9	78.5	2.39	2.5	6.5			22 x 8.4	11.5	80	51	24	4 x M6	135	74	60	6 x M6	180	120	82	6 x M6	1600	3000	1280	1200
AU 35 25 ...	NS 35	S 35	35		95	56.6	80	31.5	31.7				88.5												22 x 9.4	12.5	100		70	40	150					
AU 50 25 ...	NS 50	S 50	50		112	71.6	95	33	33.2				103.5						22 x 10.9	14	110	80	50		160	100	70		220	160	100					
AU 44 34 ...	NM 44	M 44	44	34	116	72.3	96	38.5	38.7	22.5	21.3	11.5	116	3.14	3.2	8.3			25 x 8.7	14.5	125	88	50	4 x M8	180	103	80	6 x M8	225	153	103	6 x M8	3600	6000	3200	2800
AU 60 34 ...	NM 60	M 60	60		135	88.3	115	41	41.2				132												25 x 11	17	150		110	60	200					
AU 76 34 ...	NM 76	M 76	76		150	104.3	130	42	42.2				148						25 x 12.5	18	170	130	80		240	165	110		340	265	160					
AU 76 54 ...	NL 76	L 76	76	54	185	119.1	160	58.5	58.7	36.5	34.7	19	182	4.56	4.7	14.3			32 x 13.5	20	200	140	90	4 x M10	300	198	135	6 x M10	400	298	185	6 x M10	10000	10000	7200	6400
AU 120 54 ...	NL 120	L 120	120		240	163.1	210	62.5	62.7				226												32 x 17.5	24	240		180	120	360					

- Notes:**
- Maximum loads quoted assume lubrication at the interface of [Bearings](#) and [Slide](#). This can best be achieved by using [Cap Seals](#), [Lubricators](#) or the [Bleed Lubrication](#) facility. It is strongly recommended that load and life are determined using the methods shown in the [Load/Life Calculations](#) section. 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 all grades of Slide with the exception of the smallest (size 12-13). Two sizes of 12-13 Carriages are therefore required: AU 12P1/P2 13, which is suitable for Slide grades P1 & P2, and AU 12P3 13, which is suitable for Slide grade P3.
 - Carriage size AU 28 18 incorporates a recess in the underside for fixing screw clearance when used with size V28 [Flat Slide](#). The P dimension in the table includes this recess.
 - Controlled Height (CHK) [Bearings](#) are usually selected from stock, quantities available may therefore be restricted. Please see the GV3 Technical Guide [↓](#).
 - [Cap Seals](#) are not available on Short Carriages. [Lubricators](#) may be used for lubrication purposes.
 - The datum mark identifies the reference edge used in manufacture. The concentric [Bearings](#) are always mounted on this side.
 - [Bearing](#), [Cap Seal](#) and [Lubricator](#) fixing hole sizes and positions are detailed in the GV3 Technical Guide [↓](#) according to the grade of [Slide](#) used. 'E' is the optimised drilling dimension and is suitable for general purposes. Actual Bearing positions will vary slightly when eccentrically adjusted.

The Nitrile Sealed Bearing option (NS) provides a higher degree of protection against ingress of water or debris in comparison to the default metal shielded type. A small increase in friction may result.

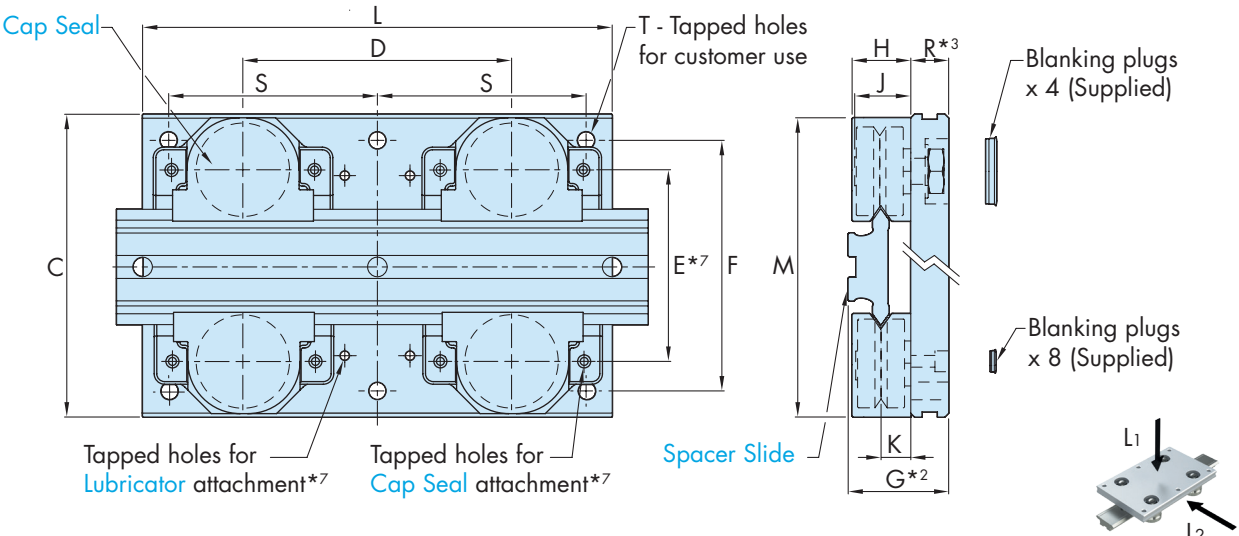
The Controlled Height Bearing option (CHK) minimises variation between Bearings in respect of the important 'K' dimension. This is desirable in high precision applications*4.

The Cap Seal option (CS) ensures efficient lubrication of the 'V' contact surfaces and protects against ingress of debris. Operational safety and system appearance are also improved. Once charged with grease, no further lubrication is necessary under most operating conditions. Lubrication vastly increases load capacity and life.

The Lubricator 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.

See Application Examples on [📖 10, 12, 14, 16 & 17](#)

Example: Medium Length Carriage with [Cap Seals](#) on a [Spacer Slide](#)



Ordering Details

2 x AU4434 L180 (CS) (DR) (NS) (CHK) + [Slide Part Number](#)

Number of Carriages set to specified [Slide](#)

AU... = Assembled Unit

CP... = Carriage Plate only

Carriage Length L = 180mm

Lubrication Options

CS for [Cap Seals](#)*5

or LB for [Lubricators](#)

Leave blank if not required

Leave blank if Slide is not required and Carriage will be supplied in a loose condition for self-adjustment

CHK = Controlled Height [Bearings](#)*4

Leave blank for standard tolerance

NS = Nitrile Sealed Bearings

Leave blank for metal shielded

DR = Double Row Bearings

Leave blank for Twin Bearings

Availability of Carriage Options

Part Number	-	DR	-	NS	CS	LB	CHK
AU 12...13...	✓	✓	✓	✓	✓	✓	✓
AU 20 18...	✓	✓	✓	✓	✓	✓	✓
AU 28 18...	✓	✓	✓	✓	✓	✓	✓
Larger sizes	✓	✓	✓	✓	✓	✓	✓

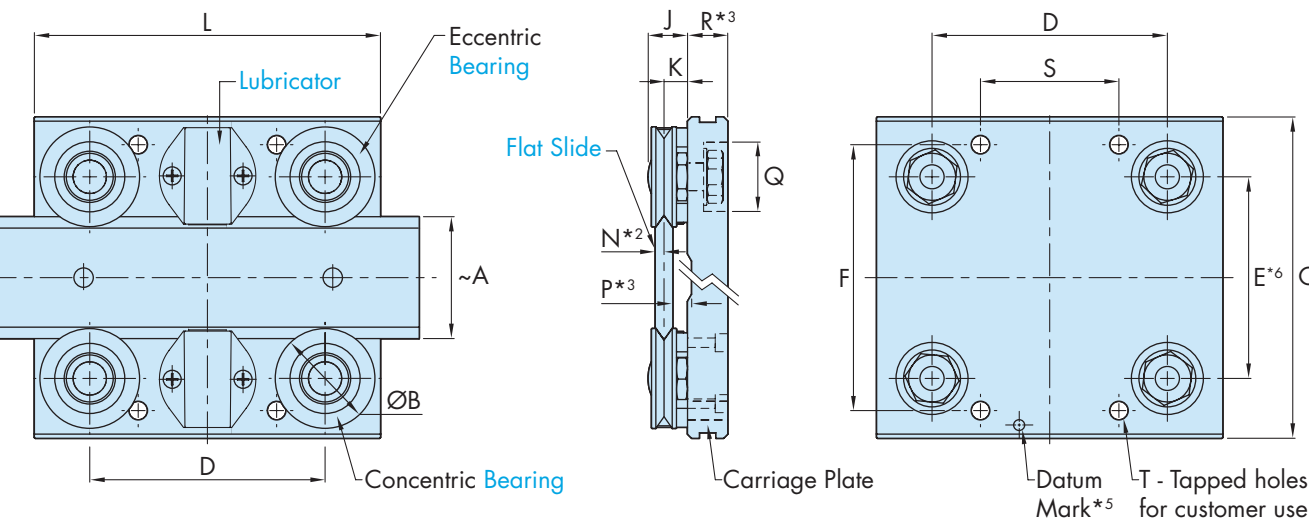


HepcoMotion Slimline Carriages incorporate compact [Slimline Bearings](#) to minimise system height. They are of lower load capacity compared with [Standard Bearings](#), but are lower in cost. Slimline Carriages are available to suit all sizes of [Double Edge Slides](#), in all grades of precision. Carriage Plates are precision machined from aluminium alloy and are supplied clear anodised.

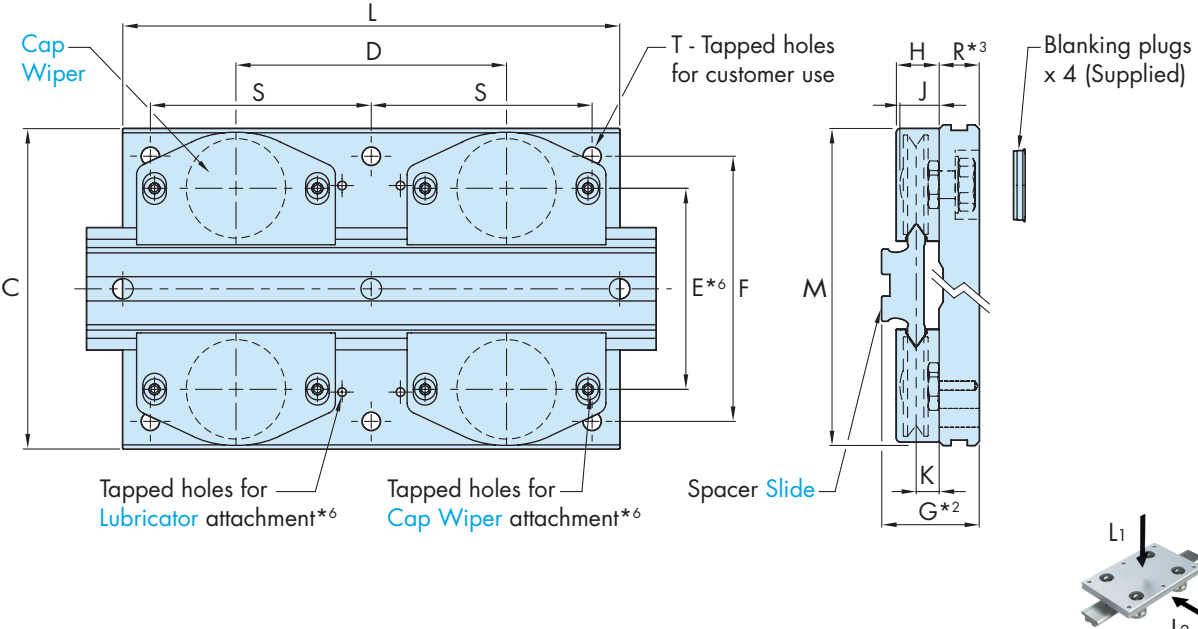
Carriages may be specified as **Assembled Units (AU Type)**, either factory set to the chosen [Slide](#), or without Slide for self-adjustment.

See Application Example on [12](#)

Example: Short Carriage with Lubricators on a Flat Slide



Example: Medium Length Carriage with Cap Wipers on a Spacer Slide



Part Number	Use With		~A	ØB	C	E*6	F	G*2		H	J	K	M	N*2		P*3			Q	R*3	Short Carriage*4				Medium Carriage				Long Carriage				Max Load Capacity (N)*1	
								P1	P2 & P3					P1	P2 & P3						L	D	S	T	L	D	S	T	L	D	S	T	L1	L2
AU 20 195 ...	NV 20	V 20	20	19.5	64	35.6	50	23.7	23.9	11.2	9.2	5.7	59	2.14	2.2	4.5			16 x 7	10	65	43	20	4 x M5	100	55	44	6 x M5	140	90	62	6 x M5	400	480
AU 28 195 ...	NV 28	V 28	28		72	43.6	58	24.7	24.9				67						22 x 8	11	75	52	25		125	75	55		175	125	80			
AU 25 265 ...	NS 25	S 25	25	26.5	80	46.2	65	28.3	28.5	13	11.3	6.8	76	2.39	2.5	6.5			22 x 8.4	11.5	85	55	25	4 x M6	135	74	60	6 x M6	180	120	82	6 x M6	940	1150
AU 35 265 ...	NS 35	S 35	35		95	56.2	80	29.3	29.5				86						22 x 9.4	12.5	100	70	40		150	90	65		200	140	90			
AU 50 265 ...	NS 50	S 50	50		112	71.2	95	30.8	31				101						22 x 10.9	14	110	80	50		160	100	70		220	160	100			
AU 44 360 ...	NM 44	M 44	44	36	116	72.8	96	35.3	35.5	15.5	14	8.3	113	3.14	3.2	6.6			25 x 8.7	14.5	125	85	50	4 x M8	180	98	80	6 x M8	225	145	103	6 x M8	2000	2400
AU 60 360 ...	NM 60	M 60	60		135	88.8	115	37.8	38				129						25 x 11	17	150	108	60		200	120	90		280	200	130			
AU 76 360 ...	NM 76	M 76	76		150	104.8	130	38.8	39				145						25 x 12.5	18	170	128	80		240	160	110		340	260	160			
AU 76 580 ...	NL 76	L 76	76	58	195	123.3	170	53.8	54	25	22.8	14.3	186	4.56	4.7	9.6			32 x 13.5	20	200	135	90	4 x M10	300	190	135	6 x M10	400	290	185	6 x M10	4240	5200
AU 120 580 ...	NL 120	L 120	120		240	167.3	210	57.8	58				230						32 x 17.5	24	240	185	120		360	240	165		480	360	225			

- Notes:**
- Maximum loads quoted assume lubrication at the interface of [Bearings](#) and [Slide](#). This can best be achieved by using [Cap Wipers](#), [Lubricators](#) or the [Bleed Lubrication](#) facility. It is strongly recommended that load and life are determined using the methods shown in the [Load/Life Calculations](#) section. 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 all grades of Slide.
 - All Carriages except sizes AU 76 580 & AU 120 580 incorporate a recess in the underside for fixing screw clearance when used with [Flat Slides](#). The P dimension in the table includes this recess.
 - [Cap Wipers](#) are not available on Short Slimline Carriages. [Lubricators](#) may be used for lubrication purposes. Metal shields are not available for Slimline Carriages AU 20 195 & AU 28 195.
 - The datum mark identifies the reference edge used in manufacture. The concentric [Bearings](#) are always mounted on this side.
 - [Bearing](#), [Cap Wiper](#) and [Lubricator](#) fixing hole sizes and positions are detailed in the GV3 Technical Guide [↓](#) according to the grade of [Slide](#) used. 'E' is the optimised drilling dimension and is suitable for general purposes. Actual Bearing positions will vary slightly when eccentrically adjusted.

The following types of [Bearing](#) and [Lubrication Device](#) may be specified (refer also to availability table below right).

The Nitrile Sealed Bearing option (NS) provides a higher degree of protection against ingress of water or debris than the default metal shielded type. A small increase in friction may result.

The Cap Wiper option (CW) ensures efficient lubrication of the 'V' contact surfaces and inhibits ingress of debris. Operational safety and system appearance are also improved. Once charged with grease, a very long interval until re-lubrication may be expected, subject to operating conditions. Lubrication vastly increases load capacity and life.

The Lubricator 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 Wiper](#).

Ordering Details

1 x AU44360 L180 (CW) (NS) + Slide Part Number

Number of Carriages set to specified Slide

Leave blank if Slide is not required and Carriage will be supplied in a loose condition for self-adjustment

NS = Nitrile Sealed Bearings*4

Leave blank for metal shielded

Lubrication Options

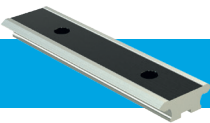
CW for Cap Wipers*4 or LB for Lubricators

Leave blank if not required

Availability of Carriage Options

Part Number	-	NS	CW	LB
	Metal Shields	Nitrile Seals	Cap Wipers*4	Lubricators
AU 20 195...	x	✓	✓	✓
AU 28 195...	x	✓	✓	✓
Larger sizes	✓	✓	✓	✓

Double Edge Spacer Slides

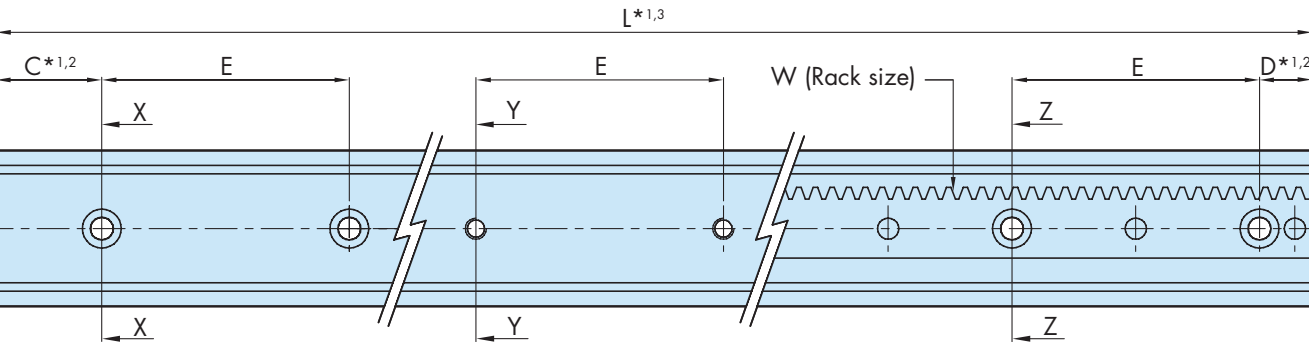


HepcoMotion.com

HepcoMotion Double Edge Spacer Slides are available in three precision grades and manufactured from high quality bearing steel, hardened on the 'V' running faces to provide an extremely hard wearing surface. Other areas remain soft for customising.

Grades P1 & P2 are ground on faces as illustrated. Grade P3 is precision drawn and sufficiently accurate for many applications. See System Selector 21. Slide fixing holes are accurately positioned, enabling customers to pre-drill their mounting holes. Slides without holes are also available.

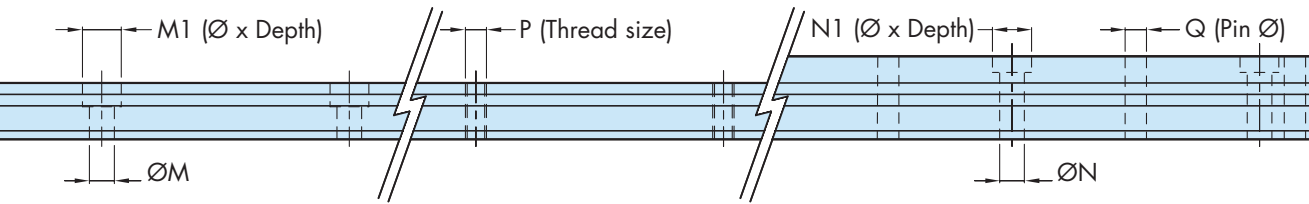
Spacer Slides bolt directly to the mounting surface of a machine, allowing running clearance for Bearings and Lubrication Devices. A central keyway is provided for simple location by means of Hepco Dowel Pins or customer's own key. Alternatively, where Lubrication Devices are not used, the datum edges may be located against a machined register*5.



Slide with Counterbored Holes

Slide with Tapped Holes

Slide with Fitted Rack



Part Number	Use With ^{*4}		Use one side only																																						
			A ~ Width	B		C & D ^{*1,2}		E	F		G		H	H1	J		K		L max ^{*1,3}		M	M1	N	N1	P	P1 ^{*6}		Q	R	S	T	U	V	W	Dowel Pin	X g7	Y m7	Z	Z1		
				P1 & P2	P3	Slide only	With Rack		P1	P2 & P3	P1	P2 & P3							P1 & P2	P3						P1 & P2	P3													Screw	Part No.
NMS 12 ...	... J 13 ...	-	12	12.37	13.25	20.5	-	45	3.0	3.2	6.2	6.4	4	1.8	8.5	8.9	1.7		1976	1976	3.5	6.2 x 3.1	-	-	M3	-	-	-	-	-	-	-	-	-	USD4	4	4	6.75	-		
NV 20 ...	... J 18 ...	... J 195 ...	20	20.37	21.01	43	15	90	4.21	4.42	8	8.2	5	2	12	12.4	1.75		4046	4046	4.5	8 x 4.1	4.5	7.5 x 2.9	M4	M4 x 20	FS420	4	6.35	6.35	6.2	4	5.65	0.7	USD5	4	5	6	1.75		
NV 28 ...			28	28.37	29.01								6	2.5	20	20.4					5.5	10 x 5.1			M5										USD6	4	6	6	2.25		
NS 25 ...			25	25.74	26.58	43	15	90	4.71	4.93	10	10.2	6	2.5	15	15.4	2.6		4046	4046	5.5	10 x 5.1	5.5	9.6 x 4	M5	M5 x 25	FS525	5	7.8	7.85	8.5	6	6.85	1	USD6	4	6	6	2.25		
NS 35 ...	... J 25 ...	... J265 ...	35	35.74	36.38								8	3	25	25.4					7	11 x 6.2			M6									USD8	6	8	8	2.75			
NS 50 ...			50	50.74	51.38								10	3.5	40	40.4					7	11 x 6.2			M6									USD10	8	10	12	3.25			
NM 44 ...			44	44.74	45.58	43	15	90	6.21	6.42	12.5	12.7	8	3	26	26.4	2.3		4046	4046	7	11 x 6.2	6.5	11 x 4.5	M6	M6 x 30	FS630	6	8.3	11.7	10.8	7.5	10.2	1.5	USD8	6	8	8	2.75		
NM 60 ...	... J 34 ...	... J 360 ...	60	60.74	61.38								10	3.5	42	42.4					9	15 x 8.2			M8									USD10	8	10	12	3.25			
NM 76 ...			76	76.74	77.38								12	4	58	58.4					9	15 x 8.2			M8									USD12	10	12	15	3.75			
NL 76 ...			76	76.74	77.58	88	30	180	9.21	9.43	19.5	19.7	15	5	50	50.4	4.8		4046	4046	14	20 x 12	14	20 x 8.0	M12	M12 x 50	FS1250	8	13.2	18.6	18	13.3	16.6	2	USD15	10	15	15	4.75		
NL 120 ...	... J 54 ...	... J 580 ...	120	120.74	121.38								45	9.5	94	94.4					11	18 x 10			-									-	-	-	-	-			

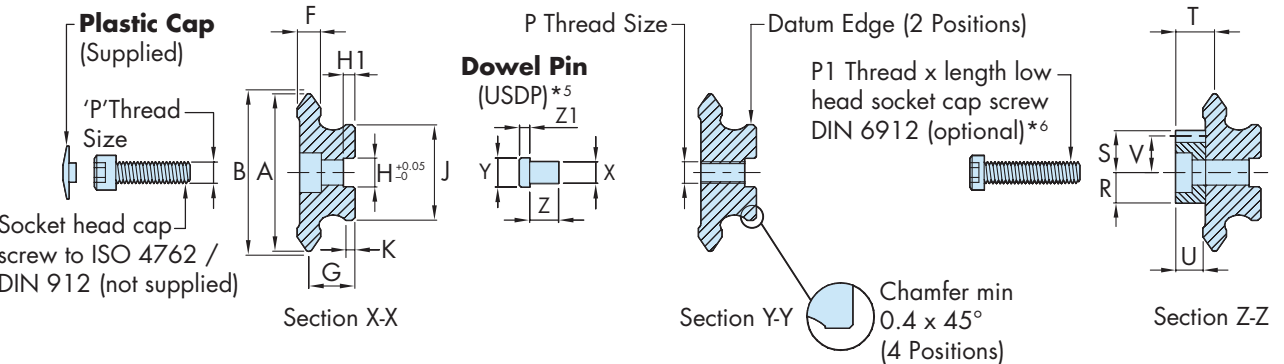
- Notes:
- Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified which maintain the C and D dimensions in the table above (n x hole pitch E + C + D, where n equals the number of hole pitches). In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal. The positions of the teeth on the Rack mounted versions relative to the mounting holes or Slide ends will vary. Rack mounted Slides with a regulated tooth position can be supplied on request.
 - The C and D dimensions for Rack mounted Slides are less than that for plain versions to provide support for the Rack close to its end. Slide lengths which require C and D dimensions which differ from this may require an extra hole at a non-standard pitch.
 - Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting.
 - In the table, the preferred choices of Bearings to use with each Slide are quoted. However, other combinations are possible (please see 'Mix & Match' Component Compatibility in the GV3 Technical Guide). Slides with the fitted Rack option are not compatible with Slimline Bearings.
 - Slides in their free unmounted state are not necessarily absolutely straight. If straightness is important, the Slide may be set by bolting down against a register or by utilising the central keyway. If Hepco Dowel Pins are used, these should be positioned one each end centrally between the Slide end and first hole and one located centrally between each pair of fixing holes, or as deemed necessary for the application.
 - Low head cap screws DIN 6912 are not universally stocked, so Hepco offers them as a convenience to customers in a single length for each thread size (see table). The NL120 Rack Slide Assembly (and all plain Double Edged Spacer Slides) is secured with cap screws to ISO 4762 / DIN 912, which are widely stocked.

The rigidity of the Spacer Slide enables it to be used as a self supporting element or construction member in a machine. See the GV3 Technical Guide for Slide deflection calculations.

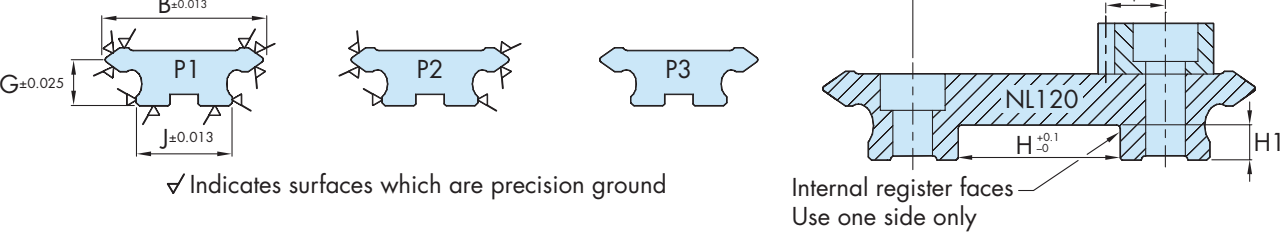
All Double Edge Spacer Slides, with the exception of the smallest, are available with a precision machined Rack for driving purposes in conjunction with HepcoMotion Pinions, Motors and Rack Driven Carriages*4.

Racks are dowelled to the Slide and become a fully serviceable element when bolted to the mounting surface. Racks may comprise of a number of lengths, precision mounted to a single Slide.

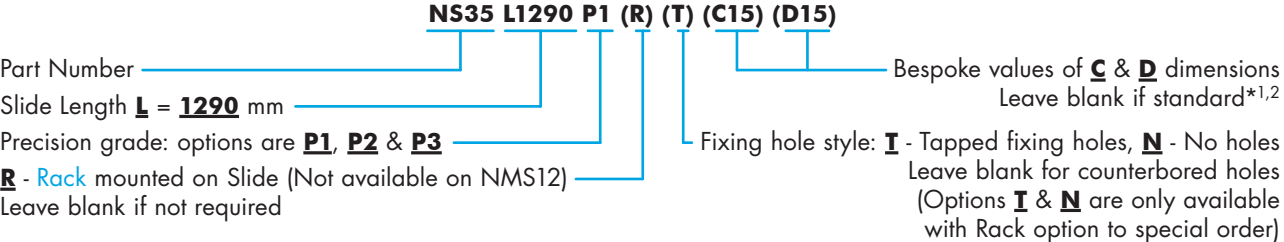
See Application Examples on 10 - 14, 16 & 17



Available Grades of Slide



Ordering Details



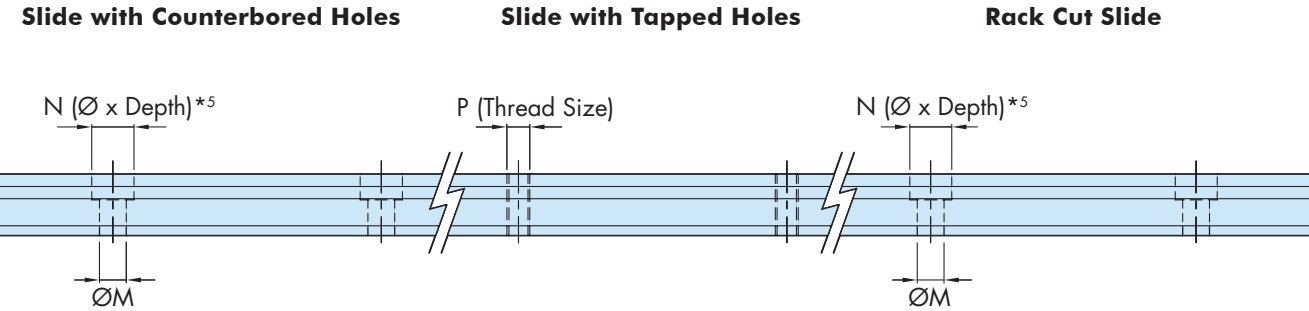
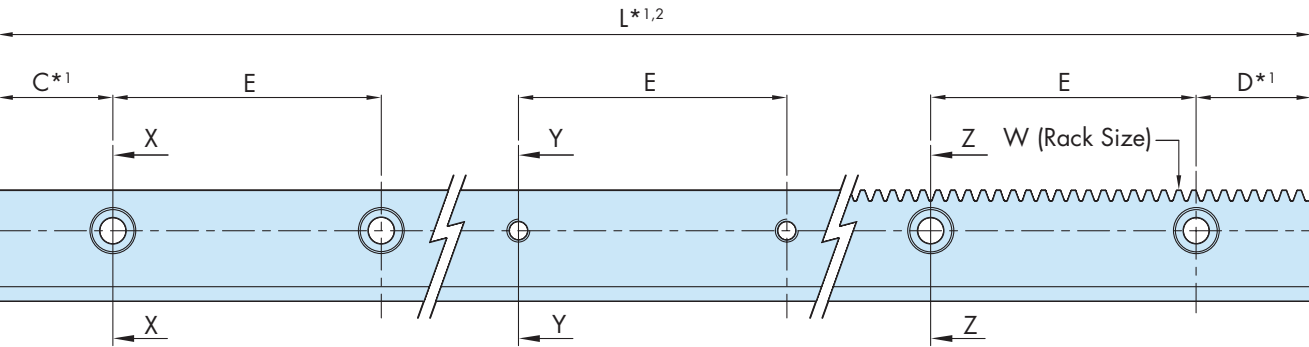
Ordering Example:
1 x NM60 L480 P2 R Double Edge Spacer Slide x 480 mm long in precision grade 2, fitted with Rack
7 x USD10 10 mm Ø dowel pins (optional)
6 x FS630 Low head socket cap screws M6 thread x 30 mm long (optional)

HepcoMotion Single Edge Spacer Slides are available in three precision grades and are manufactured from high quality bearing steel, hardened on the 'V' running faces to provide an extremely hard wearing surface. Other areas remain soft for customising.

Grades P1 & P2 are ground on faces as illustrated. Grade P3 is precision drawn and sufficiently accurate for many applications. See System Selector [21](#).

Slide fixing holes are accurately positioned, enabling customers to pre-drill their mounting holes. Slides without holes are also available.

Spacer Slides bolt directly to the mounting surface of a machine, allowing running clearance for [Bearings](#) and [Lubrication Devices](#). A central keyway is provided for simple location by means of Hepco Dowel Pins or a customer's own key. Alternatively, where Lubrication Devices are not used, the datum edges may be located against a machined register*⁴.



Part Number	Use With* ³																																	
			A ~ Slide Width	B		B1		C & D* ¹	E	F		G		H	H1			J		K	L max* ^{1,2}		M	N* ⁵	P	Q	R	W Mod	Dowel Pin	X g7	Y m7	Z	Z1	Max Rack Force lubricated (N)
				P1 & P2	P3	P1 & P2	P3			P1	P2 & P3	P1	P2 & P3					P1 & P2	P3		P1 & P2	P3												
NMS E ...	... J 13 ...	-	11	11.19	11.71	5	5.3	20.5	45	3.0	3.2	6.2	6.4	4	1.8			9.25	9.65	1.7	1976	4046	3.5	6.2 x 3.1	M3	3.80	4.5	0.5	USDP4	4	4	6.75	-	180
NV E ...	... J 18 ...	... J 195 ...	16	16.19	16.72	6.5	6.7	43	90	4.21	4.42	8	8.2	4	1.5			12	12.4	1.75	4046	4046	4.5	8 x 4.1	M4	4.82	5.8	0.7	USDP4	4	4	6.75	-	300
NS E ...	... J 25 ...	... J 265 ...	21	21.37	21.89	8.5	8.7	43	90	4.71	4.93	10	10.2	6	2.5			16	16.4	2.6	4046	4046	5.5	10 x 5.1	M5	6.15	7.4	1	USDP6	4	6	6	2.25	500
NM E ...	... J 34 ...	... J 360 ...	29	29.37	29.89	10.5	10.7	43	90	6.21	6.42	12.5	12.7	8	3			20	20.4	2.3	4046	4046	7	11 x 6.2	M6	7.69	9.25	1.25	USDP8	6	8	8	2.75	1000
NL E ...	... J 54 ...	... J 580 ...	43	43.37	43.89	16	16.2	88	180	9.21	9.43	19.5	19.7	12	4			30	30.4	4.8	4046	4046	11	18 x 10	M10	11.6	14.1	2	USDP12	10	12	15	3.75	1600

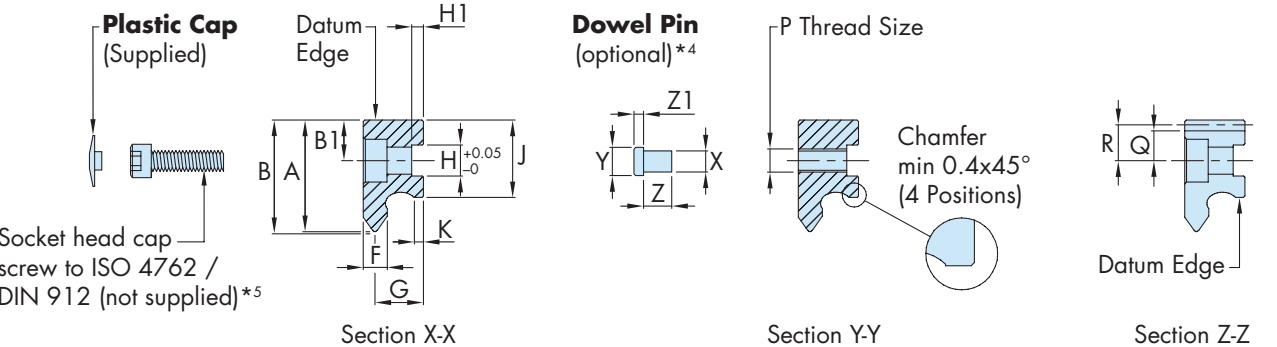
- Notes:**
- Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified which maintain the C and D dimensions in the table above (n x hole pitch E + C + D, where n equals the number of hole pitches). In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal. The position of the teeth on the rack cut versions relative to the mounting holes or Slide ends, will vary. Rack cut Slides with a regulated tooth position can be supplied on request.
 - Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting. Some sizes of Rack cut Slides are not always stocked in maximum lengths. In such cases the customer will be offered matched lengths for butting.
 - In the table, the preferred choices of [Bearings](#) to use with each Slide are quoted. However, other combinations are possible (please see 'Mix & Match' Component Compatibility in the GV3 Technical Guide [21](#)).
 - Slides in their free unmounted state are not necessarily absolutely straight. If straightness is important, the Slide may be set by bolting down against a register. If Hepco Dowel Pins are used, these should be positioned one each end centrally between the Slide end and first hole and one located centrally between each pair of fixing holes, or as deemed necessary for the application.
 - For the rack cut version of Slide size NVE, the counterbore diameter 'N' has been reduced slightly to suit cap head screws ISO 4762 / DIN 912 without knurled head. This is to maximise the strength in the critical area between the counterbore and root of the rack teeth. Due to accuracy requirements, pre-drilling of fixing holes is not recommended. Screws are available from Hepco: Part No. PFS415 (M4 x 15 long).

The Single Edge format allows two Slide 'V's to be mounted wide apart resulting in a considerable increase in moment load capacity, stiffness and stability. Spacing Slides apart also provides room for a centrally mounted drive.

Single Edge Spacer Slides are available with a precision rack machined into the back face, providing a convenient and strong means of driving. Corresponding [Pinions](#) are available, including Shaft type versions which are for use in conjunction with the Hepco [Drive Flange](#), [Motors](#) and [Gearboxes](#). Please see the GV3 Technical Guide [21](#).

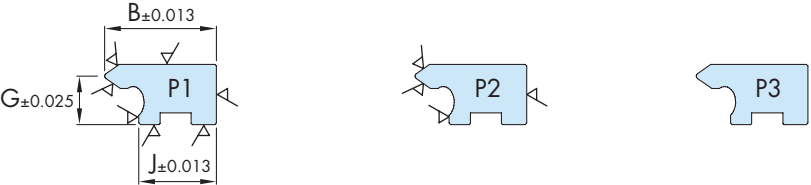
The large rear face of the Single Edge Spacer Slide, although unhardened, is sufficiently durable to act as a track on which to run Hepco [Track Rollers](#).

See Application Examples on [15](#), [16](#) & [17](#)



Available Grades of Slide

✓ Indicates surfaces which are precision ground



Ordering Details

Part Number **NME L930 P1 (R) (T) (C15) (D15)**

Slide Length **L = 930 mm**

Precision grade: options are **P1, P2 & P3**

R - Rack cut Slide (Leave blank if not required)

Bespoke values of **C** & **D** dimensions
Leave blank if standard*¹

Fixing hole style:
I - Tapped fixing holes, **N** - No holes
Leave blank for counterbored holes

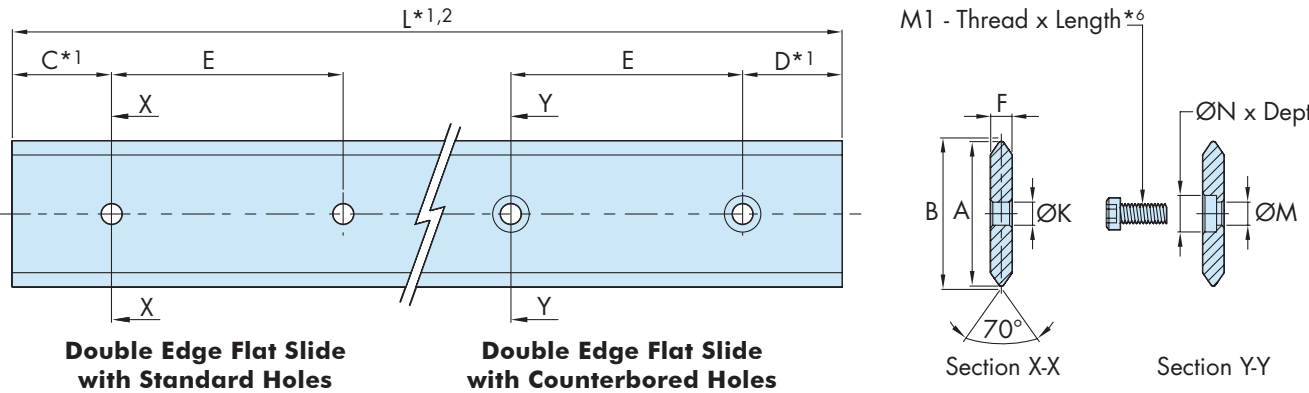
Ordering Example:

1 x NSE L2066 P3 N Single Edge Spacer Slide in precision grade 3, 2066 mm long with no holes
24 x USDP6 6 mm Ø head dowel pins (optional)

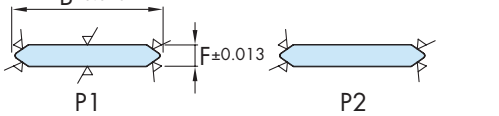
HepcoMotion Double Edge Flat Slides and Single Edge Flat Slides are available in three precision grades*4. They are manufactured from high quality bearing steel and hardened on the 'V' running faces to provide an extremely hard wearing surface. Other areas remain soft for customising.

Grades P1 & P2 are ground on faces as illustrated. Grade P3 is precision drawn and is sufficiently accurate for many applications. See System Selector [21](#).

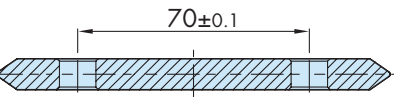
Slide fixing holes are accurately positioned enabling customers to pre-drill their mounting holes. Slides without holes are available in the unground P3 version. The counterbored hole version accommodates low head cap screws to achieve a flush top surface*5.



Available Grades of Slide



✓ Indicates surfaces which are precision ground



The L120 section has 2 rows of holes

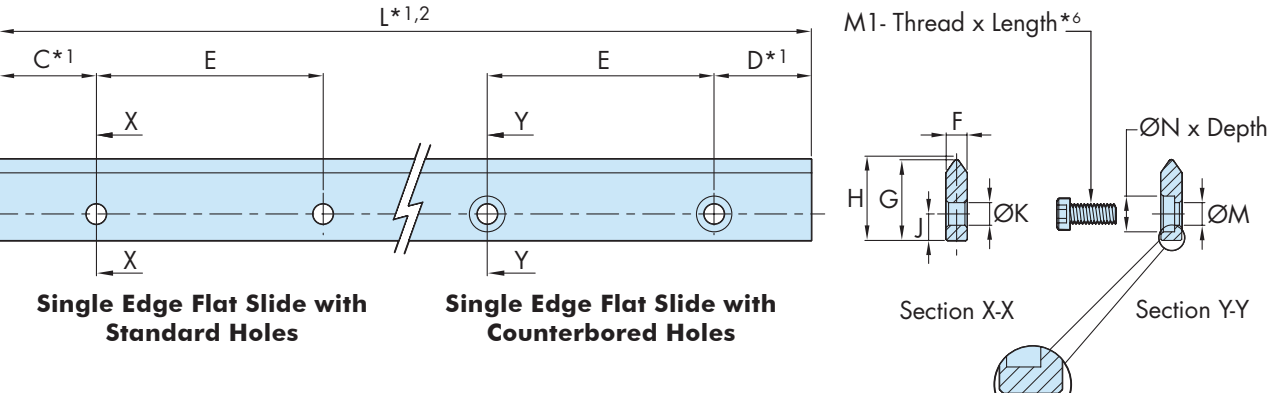
Part Number	Use With*3	A		B		C & D*1	E	F		G	H		J		K		L max*1,2		M	M1*6		N
		~Slide Width	P1 & P2	P3			±0.2	P1	P2 & P3		P1 & P2	P3	P1 & P2	P3	Ø	Screw Size	P1 & P2	P3		Screw Size	Part No.	Ø x Depth
MS 12 ...	MS E ...	... J 13 ...	-	12	12.55	13.13	13	30	3.05	3.2	-	-	-	-	3.5	M3	1000	1976	-	-	-	-
				-	-	-	20.5	45			11	11.37	11.8	4.5	4.7	3.5	M3					
V 20 ...	V E ...	... J18 ...	... J 195 ...	20	20.37	21.01	43	90	4.27	4.42	-	-	-	-	4.5	M4	4046	4046	4.5	M4 x 10	FS410	8 x 2.8
				28	28.37	29.01					16	16.37	16.8	6.0	6.2	4.5	M5					
S 25 ...	S E ...	... J25 ...	... J 265 ...	25	25.81	26.58	43	90	4.78	4.93	-	-	-	-	7	M6	4046	4046	5.5	M5 x 10	FS510	10 x 3.5
				35	35.81	36.58					19	19.46	20.0	6.5	6.7	5.5	M5					
M 44 ...	M E ...	... J34 ...	... J 360 ...	44	44.81	45.58	43	90	6.28	6.42	-	-	-	-	7	M6	4046	4046	7	M6 x 12	FS612	11 x 4
				60	60.81	61.58					25	25.46	26.0	8.0	8.2	7	M6					
L 76 ...	L E ...	... J54 ...	... J 580 ...	76	76.81	77.58	43	90	9.12	9.43	-	-	-	-	11.5	M10	4046	4046	11.5	M10 x 20	FS1020	18 x 6
				120	120.81	121.58					32	32.46	33.0	10.0	10.2	9	M8					

- Notes:**
- Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified which maintain the C and D dimensions in the table above (n x hole pitch E + C + D, where n equals the number of hole pitches). In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal.
 - Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting.
 - In the table, the preferred choices of Bearings to use with each Slide are quoted. However, other combinations are possible (please see 'Mix & Match' Component Compatibility in the GV3 Technical Guide [21](#)).
 - Slides in their free unmounted state are not necessarily absolutely straight. If important, the Slide should be bolted down to a flat surface and set straight.
 - A flush top surface is necessary where a belt is to be run on the top surface of the Slide, or in cases where there is restricted room between Slide and Carriage plate as may happen if mixing and matching between Slide and Bearing sizes. Also if using Slimline Bearings.
 - Low head socket cap screws DIN 6912 are not universally stocked but are available from Hepco in a single length for each thread size (see table).

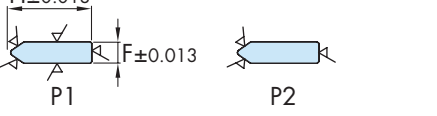
Flat Slides are useful if weight saving or minimum inertia is required, where the Slide is the moving component, and also where it is practical and cost advantageous to design a support profile integral with the machine, to provide running clearance for the Bearings and Lubrication Devices.

The Single Edge format allows two Slide 'V's to be mounted wide apart resulting in a considerable increase in moment load capacity, stiffness and stability. Spacing Slides apart can also allow room for a centrally mounted drive.

See Application Examples on [10](#), [11](#), [13](#), [14](#) & [15](#)



Available Grades of Slide



✓ Indicates surfaces which are precision ground

Chamfer min. 0.4 x 45°
2 positions

Ordering Details

Part Number **M60 L930 P1 (C) (C15) (D15)**

Slide Length **L = 930** mm

Precision grade: options are **P1, P2 & P3**

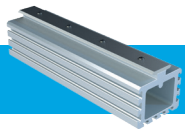
Bespoke values of **C** & **D** dimensions in mm. Leave blank if standard*1

Fixing hole style: **C** - Counterbored holes (Not available on MS12 & MSE) **N** - No holes (P3 grade only) Leave blank for plain holes

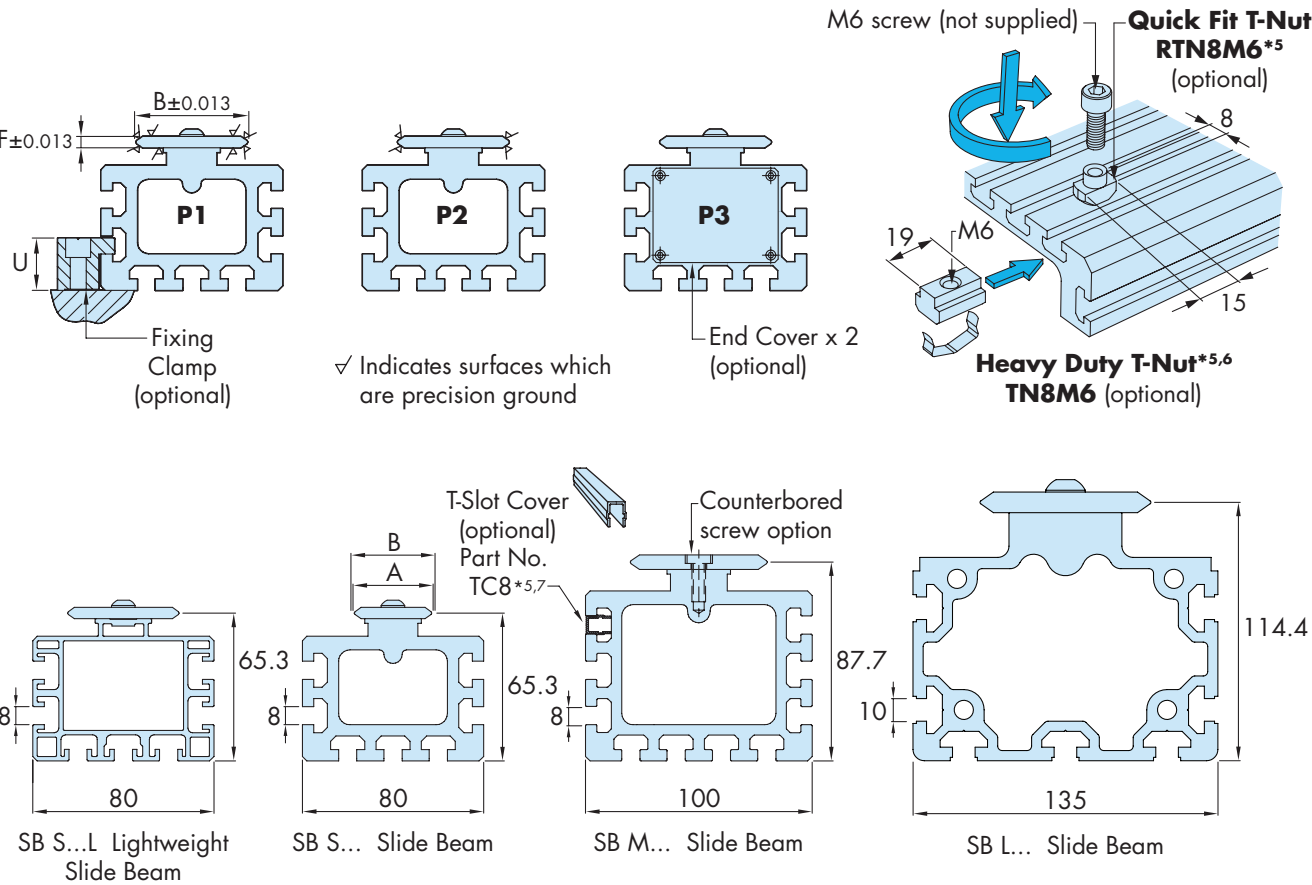
Ordering Example:

1 x LE L2156 P3 C Single Edge Flat Slide x 2156 mm long in unground grade 3 with counterbored holes

24 x FS820 Low head socket cap screws M8 thread x 20mm long (optional)



HepcoMotion Slide Beams consist of a [Flat Slide](#) mounted onto a precision, anodised aluminium extrusion to provide a rigid self supporting beam, which can form an integral part of a machine structure. See [GV3 Technical Guide](#) for Slide & Slide Beam deflection calculations. There are three basic sizes of beam, each available with a number of Slide widths. The smaller size beam is also available as a lightweight version. SB S... and SB M... Slide Beams can be supplied in lengths of up to 8 metres, while SB L... Slide Beams can be supplied in lengths of up to 6 metres*^{1,3}. Slides are available in a choice of three precision grades, as illustrated.

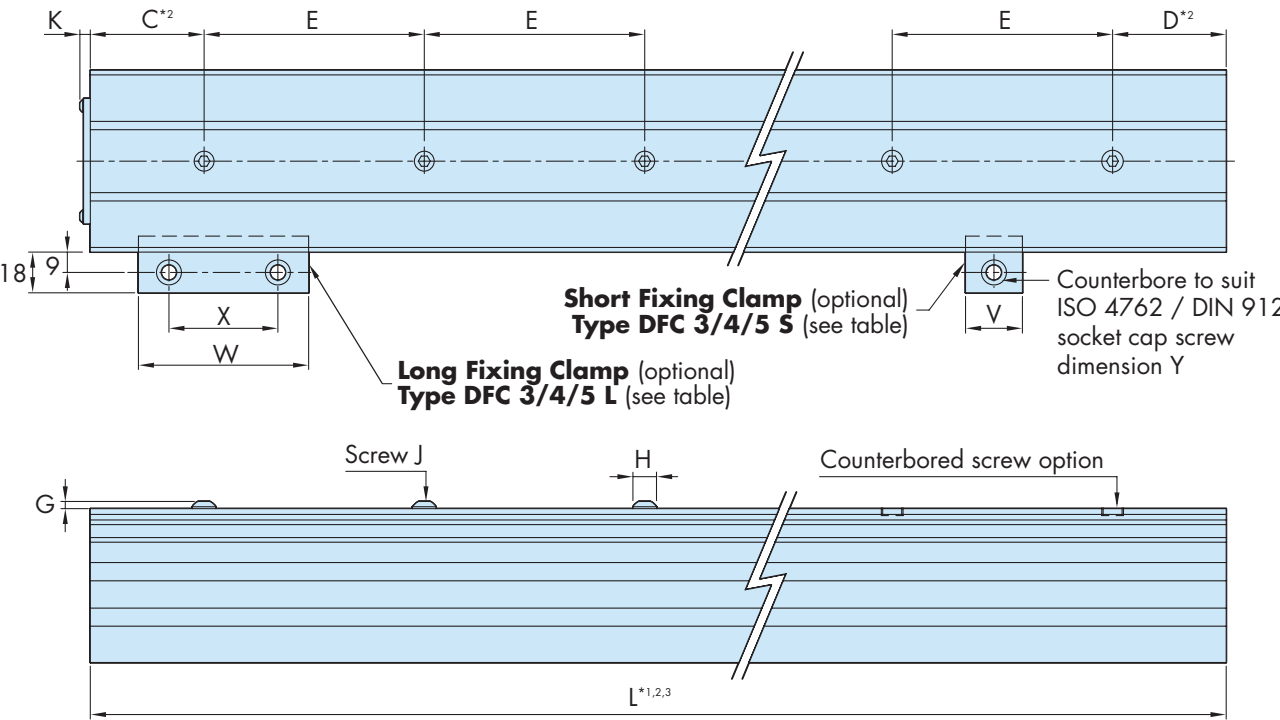


Part Number	Use With Carriages ^{*4}				A ~Slide Width	B		C & D ^{*2}	E			F		G	H	J		K	L max *1,2,3	Fixing Clamp		T-Nut		T-Slot Cover	U	V	W	X	Y
	Standard		Slimline			P1 & P2	P3					P1	P2 & P3			Standard	C/bored			Short	Long	Quick Fit	Heavy Duty						
SB S 35 ...	AU 35 25 ...	AU 35 265 ...	AU BD 35 25 ...	35	35.81	36.58	43	90			4.78	4.93	3.3	10.5	M6	M5	5.5	8000	DFC3S	DFC3L	RTN8M6	TN8M6	TC8	23	25	75	48	M6	
SB S 50 ...	AU 50 25 ...	AU 50 265 ...	AU BD 50 25 ...	50	50.82	51.58																							
SB M 44 ...	AU 44 34 ...	AU 44 360 ...	AU BD 44 34 ...	44	44.81	45.58	43	90			6.28	6.42	3.3	10.5	M6	M6	5.5	8000	DFC4S	DFC4L	RTN8M6	TN8M6	TC8	23	25	100	65	M8	
SB M 60 ...	AU 60 34 ...	AU 60 360 ...	AU BD 60 34 ...	60	60.81	61.58																							
SB M 76 ...	AU 76 34 ...	AU 76 360 ...	AU BD 76 34 ...	76	76.81	77.58					6.12																		
SB L 76 ...	AU 76 54 ...	AU 76 580 ...	Unavailable	76	76.81	77.58	43	90			9.12	9.43	5.5	17.5	M10	M10	10.5	6000	DFC5S	DFC5L	See Note 5 for details.		25.5	35	140	100	M10		

- Notes:**
- Beams longer than 4046mm are supplied with two or more lengths of matched [Slide](#), each mounted and dowelled to form a precision joint. Additional fixing screws are normally provided adjacent to each joint. Slide Beams with shorter Slides fixed in any position, can be supplied upon request.
 - For optimum price and delivery time, Slide Beam lengths should be specified which maintain the C and D dimensions in the table above. In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal.
 - For requirements in excess of L max, Slide Beams can be supplied matched ready for joining. Please contact Hepco for details.
 - In the table, the available choices of [Carriage](#) to use with each Slide Beam are quoted. However, it is possible to use a customer made carriage incorporating other sizes of [Bearing](#). Please see details of "Mix & Match" possibilities in the [GV3 Technical Guide](#).
 - Quick Fit T-Nut RTN8M6, Heavy Duty T-Nut TN8M6 and T-Slot Cover TC8 are compatible with SB S... and SB M... types only. Type SB L... Slide Beams are compatible with all [MCS Machine Construction System](#) Slot 10 T-Nuts, Slot Blocks and T-Slot Covers.
 - The Heavy Duty T-Nut TN8M6 is recommended for the lightweight beam and where greater security of fixing is required. T-Nut section is also available for Type SB S... and Type SB M... Slide Beams, in undrilled lengths up to 1000mm. Please specify part number **TN8S** followed by the required length in mm. For information on T-Nut section options for Type SB L... Slide Beams, please contact Hepco.
 - T-Slot Cover TC8 is made from black UPVC and is available in lengths up to 8000mm. Please specify part number **TC8** followed by the required length in mm.

The counterbored [Slide](#) option is necessary if Slide Beams are to be used in conjunction with Belt Driven Carriages. This is to provide an uninterrupted path for the belt. Please see the [GV3 Technical Guide](#). Customers requiring a complete ready-to-install belt driven unit with pulleys and optional motor may wish to consider the HepcoMotion [Driven Linear System](#) product range.

See Application Examples on [14](#)



Ordering Details

Part Number **SBS35 L1346 P1 (L) (C) (X) (C33) (D53)**

Beam Length **L = 1346** mm

Precision grade: options are **P1, P2 & P3**

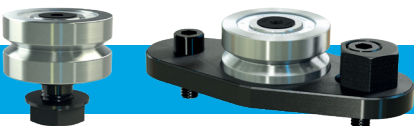
L - Lightweight beam option for SB S
Leave blank if not required

C - Counterbored screw fixing option
Leave blank if not required

X - End cover option
Leave blank if not required

Bespoke values of **C** & **D** dimensions in mm - Leave blank if standard*²

Ancillary Items:
See table for the part numbers relating to T-Nuts*⁶, T-Slot Cover *^{5,7} and Fixing Clamps.



HepcoMotion Standard Bearings are designed to be used with particular sizes of Slide but may be "Mix & Matched" in many instances*6.

The following Bearing formats and fixing methods are available:

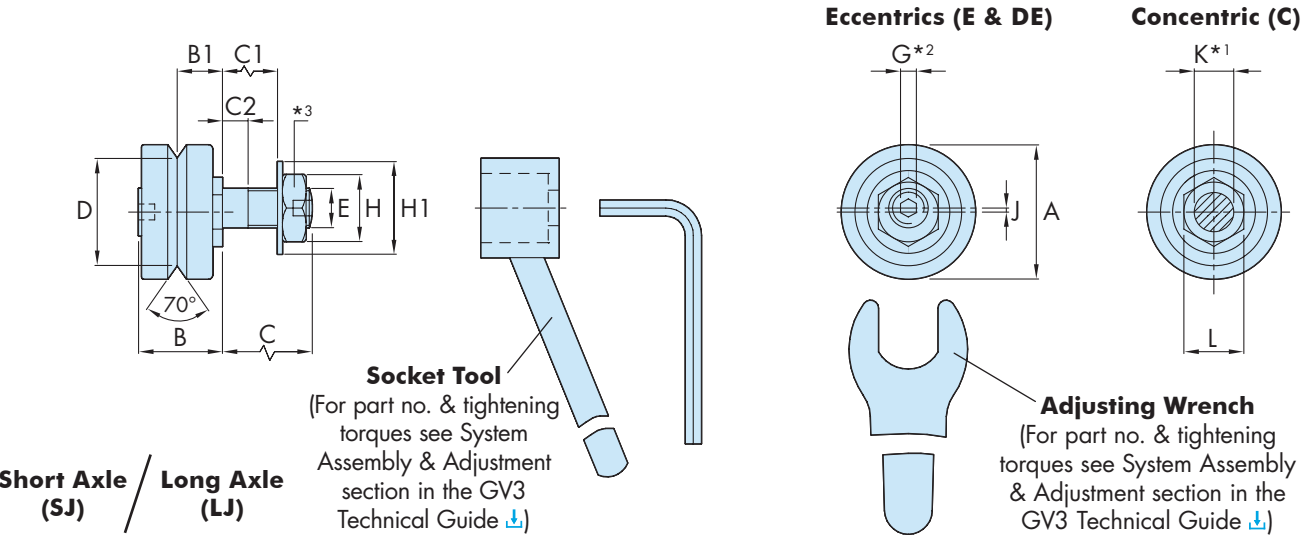
The Twin Bearing type, which is the default choice, comprises of two individual deep groove ball bearings on a single axle. This construction offers some compliance, allowing smoother running, easy adjustment and greater tolerance of misalignment.

The Double Row Bearing 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.

Both types of Bearing have been designed specially for Slide System applications and their performance confirmed by rigorous testing. External dimensions are identical.

The Nitrile Sealed option (NS) provides a higher degree of protection against ingress of water or debris in comparison to the default metal shielded type. A small increase in friction may result.

Through Fixing Type (SJ/LJ)



Part Number	Use With*6	A	B	B1	C		C1 max		C2		D ±0.025	E Metric Fine	F	G*2	H
					Short	Long	Short	Long	Short	Long					
					Axle	Axle	Axle	Axle	Axle	Axle					
... J 13 ...	NMS & MS	12.7	10.1	5.47	5.8	9.5	3	6.7	2.2	2.4	9.51	M4x0.5	8	-	7
... J 18 ...	NV & V	18	12.4	6.75	7.4	14	3.4	10	2.4	2.5	14.0	M6x0.75	10	2.5	10
... J 25 ...	NS & S	25	16.6	9	9.8	19	3.8	13	3.4	4.9	20.27	M8x1	14	3	13
... J 34 ...	NM & M	34	21.3	11.5	13.8	22	6.6	14.8	5.2	5.9	27.13	M10x1.25	18	4	17
... J 54 ...	NL & L	54	34.7	19	17.8	30	8.2	20.4	5.7	7.9	41.76	M14x1.5	28	6	22

Part Number	Max Working Load Capacity (N)				Bearing Static (Co) and Dynamic (C) Load Capacity (N)*5							
	Double Row Bearings		Twin Bearings		For Double Row Bearings				For each Twin Bearing race			
	Radial	Axial	Radial	Axial	Radial Loads		Axial Loads		Radial Loads		Axial Loads	
... J 13 ...	-	-	120	60	-	-	-	-	265	695	74	194
... J 18 ...	600	190	200	125	1168	2301	435	857	593	1438	173	419
... J 25 ...	1500	400	600	320	2646	5214	821	1618	1333	3237	326	791
... J 34 ...	3000	900	1400	800	5018	9293	1362	2523	2600	5291	557	1270
... J 54 ...	5000	2500	3200	1800	12899	21373	2777	4601	6657	13595	1136	2320

- Notes:**
- It is recommended that holes to suit Bearing mounting axles should be reamed to tolerance F6 for a sliding fit.
 - All eccentric Through Fixing type Bearing axles are supplied with sockets for adjustment as shown, with the exception of size 13.
 - Nuts for the Through Fixing type Bearings are chemically blacked on the concentric version and bright zinc plated on the eccentrics for identification purposes.
 - Controlled Height (CHK) Bearings are usually selected from stock, quantities available may therefore be restricted. Please see the GV3 Technical Guide.
 - The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and are only provided for comparison with other systems. Please use the Max Working Load figures and the Load/Life Calculations section to determine system performance.
 - The preferred choices of Slide to use with each Bearing are quoted. Other Slides may be used, as shown in the 'Mix & Match' Component Compatibility section of the GV3 Technical Guide.
 - The Blind Hole Eccentric Bearings cannot be fitted with Cap Seals, however Slide Lubricators may be specified instead.

The Through Hole Fixing type is available in two axle lengths, with the short axle version being compatible with Standard Carriage Plates. Both versions are available as fixed position **Concentric type (C)**, adjustable **Eccentric type (E)**, and **Double Eccentric type (DE)**, which allows a Removable Carriage to be disengaged from a Slide.

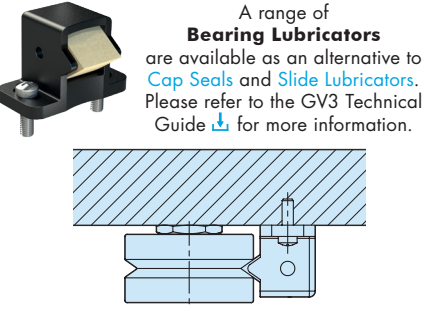
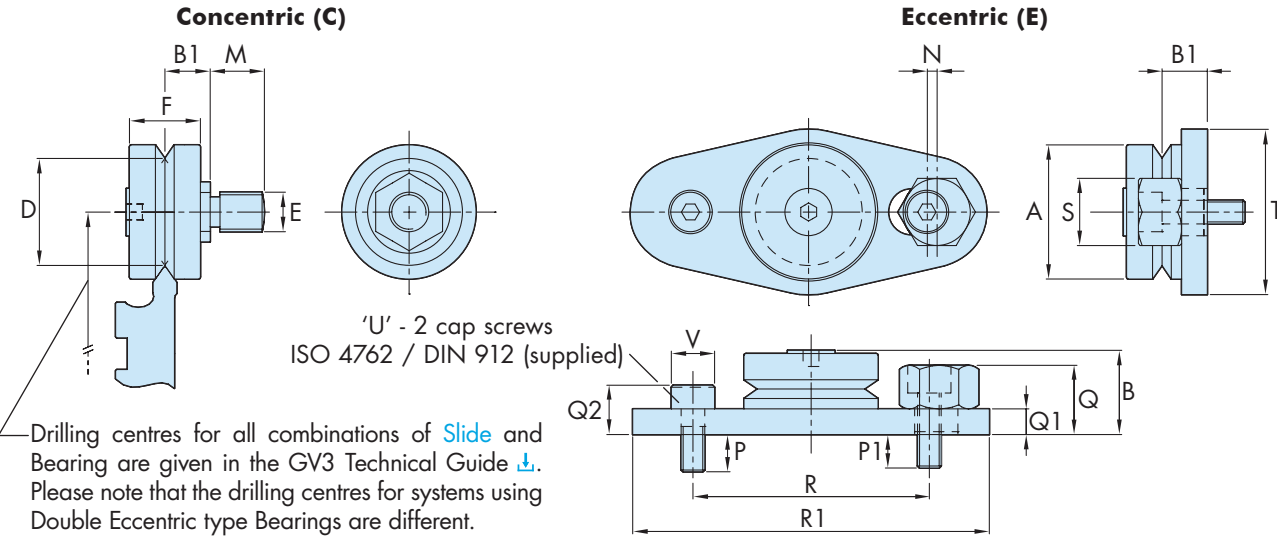
All Bearings are available in a **Controlled Height version (CHK)** which minimises variation in the B1 dimension*4. This is desirable in high precision applications.

The Blind Hole Fixing type (BH) allows mounting into a solid machine base where through mounting is not possible, or where adjustment from the front is preferred. They are available in **Concentric type (C)**, which are fixed, and **Eccentric type (E)**, which are adjustable.

All Bearings are greased for life internally. Customers are strongly recommended to provide lubrication to the interface between Bearings and Slide by specifying Hepco Cap Seals*7, which fit over the Bearings, or by using Hepco Lubricators. Lubrication greatly increases load capacity and life.

See Application Examples on 10 - 17

Blind Hole Fixing Type (BHJ)



Part Number	Options Available				
	- Metal Shields	NS Nitrile Seals	- Twin Bearings	DR Double Row Bearings	CHK Controlled Height Bearings
... J 13 ...	x	✓	✓	x	✓
... J 18 ...	x	✓	✓	✓	✓
... J 25 ...	✓	✓	✓	✓	✓
... J 34 ...	✓	✓	✓	✓	✓
... J 54 ...	✓	✓	✓	✓	✓

Ordering Details

Fixing type. Choose from: **LJ 25 C (DR) (NS) (CHK)**

SJ = Short Axle, **LJ** = Long Axle
& **BHJ** = Blind Hole Fixing

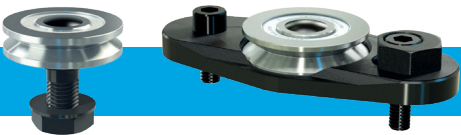
Part Number (~ Bearing Diameter in mm)

C = Concentric (fixed), **E** = Eccentric (adjustable)
or **DE** = Double Eccentric (for disengagement purposes)

Controlled Height*4
Leave blank if not required

Nitrile Sealed Bearing
Leave blank if metal shields are required

Double Row Bearing
Leave blank if Twin Bearing is required



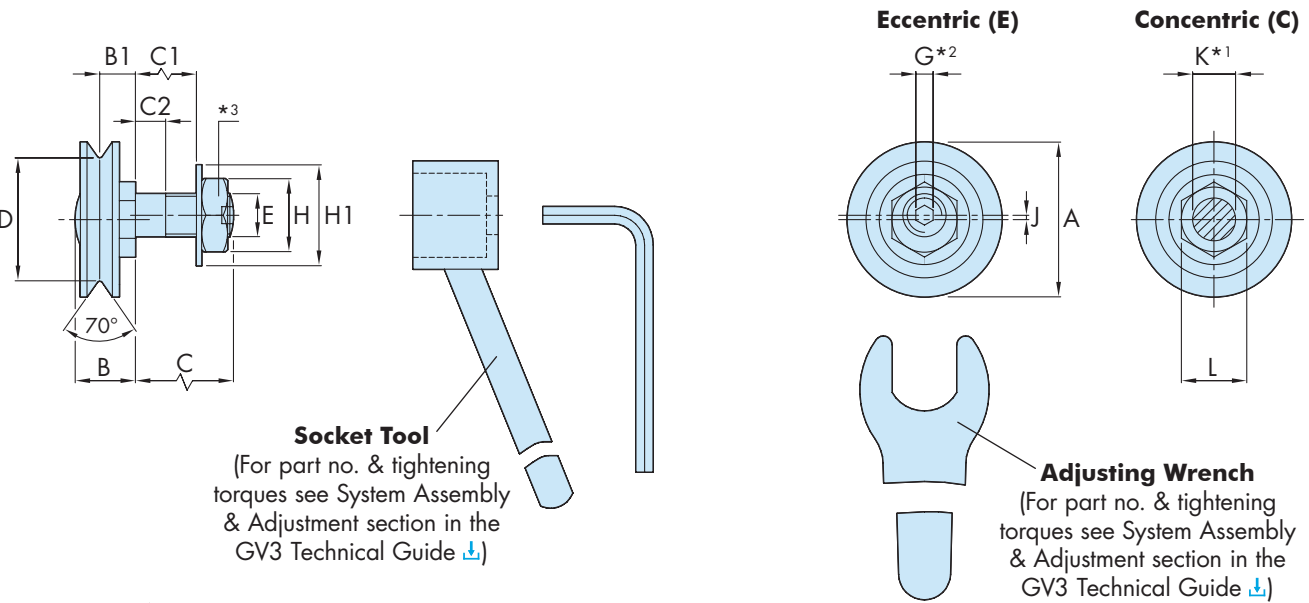
HepcoMotion Slimline Bearings are very compact due to the single ball track design. Good rigidity is maintained by a combination of ball to raceway conformity and low radial clearance, resulting in a low cost Bearing ideally suited to many Slide System applications. Performance of these Bearings has been confirmed by rigorous testing.

Slimline Bearings are designed to be used with particular sizes of Slide but may be "Mix & Matched" in many instances*5. The following Bearing formats and fixing methods are available:

The Nitrile Sealed option (NS) provides a higher degree of protection against ingress of water or debris in comparison to the default metal shielded type. A small increase in friction may result.

The Through Hole Fixing type is available in two axle lengths, with the short axle version being compatible with GV3 Slimline Carriage Plates. Both versions are available in the fixed position **Concentric type (C)** and adjustable **Eccentric type (E)**.

Through Fixing Type (GSJ/GLJ)



Short Axle (GSJ) / Long Axle (GLJ)

Part Number	Use With*5	A	B	B1	C		C1 max		C2		D	E	F	G*2	H			H1	J	K*1	L	M	N	P	P1	Q	Q1	Q2	R	R1	S	T	U	V
					Short Axle	Long Axle	Short Axle	Long Axle	Short Axle	Long Axle																								
... J 195 ...	NV & V	19.5	9.2	5.7	7.4	14	3.4	10	2.4	2.5	14.8	M6x0.75	5	2.5	10			13	0.7	6	11	7.4	1.2	8	10.5	8.6	4	8	38	54	11	24.5	M4	7
... J 265 ...	NS & S	26.5	11.3	6.8	9.8	19	3.8	13	3.4	4.9	19.98	M8x1	7	3	13			17	0.75	8	13	9.8	1.5	7	9	11	5	10	50	72	14	32	M5	8.5
... J 360 ...	NM & M	36	14	8.3	13.8	22	6.6	14.8	5.2	5.9	27.57	M10x1.25	9	4	17			21	1	10	15	13.8	2	9.5	11.3	13.3	6.5	12.5	60	90.5	17	42	M6	10
... J 580 ...	NL & L	58	22.8	14.3	17.8	30	8.2	20.4	5.7	7.9	46.08	M14x1.5	14	6	22			28	1.5	14	27	17.8	3	14.5	16.4	21.9	10.5	18.5	89.5	133	25	62	M8	13

Part Number	Max Working Load Capacity (N)		Bearing Static (Co) and Dynamic (C) Load Capacity (N)*4			
	Radial	Axial	Radial Loads		Axial Loads	
			Co	C	Co	C
... J 195 ...	240	100	563	1366	164	398
... J 265 ...	575	235	1267	3075	310	751
... J 360 ...	1200	500	2470	5625	530	1206
... J 580 ...	2600	1060	6324	12915	1079	2204

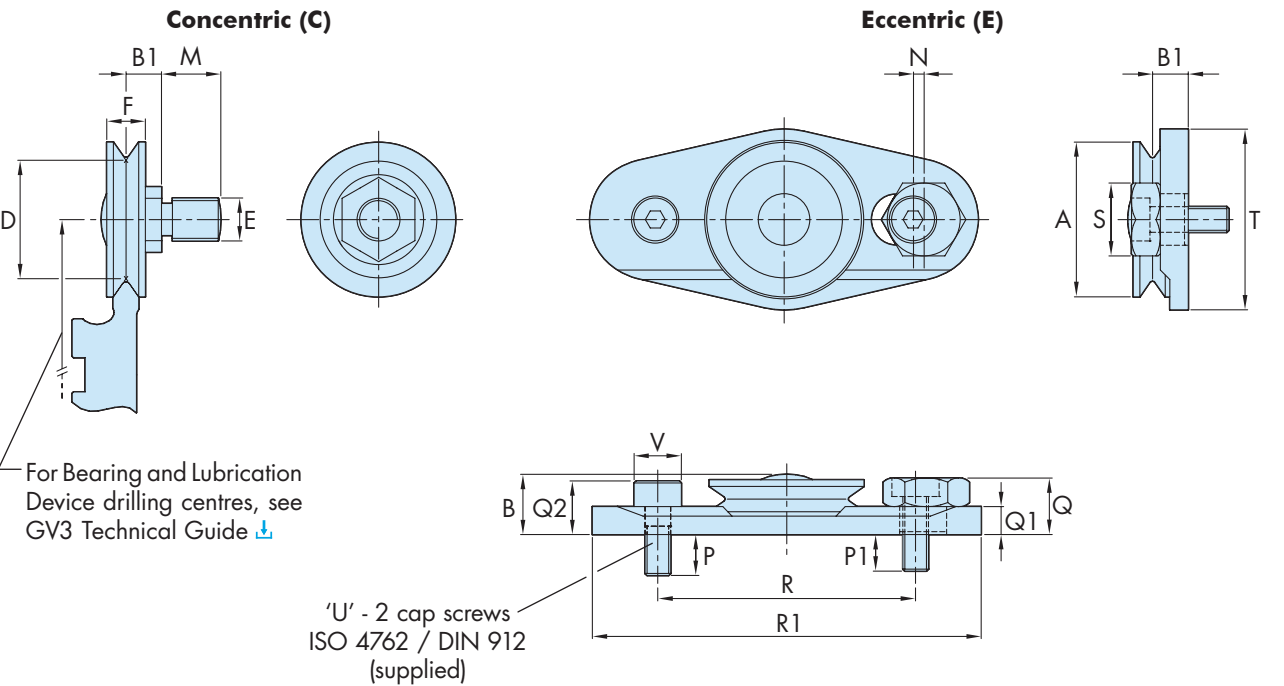
- Notes:**
- It is recommended that holes to suit Bearing mounting axles should be reamed to tolerance F6 for a sliding fit.
 - All eccentric Through Fixing type Bearing axles are supplied with sockets for adjustment as shown.
 - Nuts for the Through Fixing type Bearings are chemically blacked on the concentric version and bright zinc plated on the eccentrics for identification purposes.
 - The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and are only provided for comparison with other systems. Please use the Max Working Load figures and the Load/Life Calculations section to determine system performance.
 - The preferred choices of Slide to use with each Bearing are quoted. Other Slides may be used, as shown in the 'Mix & Match' Component Compatibility section of the GV3 Technical Guide.
 - The Blind Hole Eccentric Bearings cannot be fitted with Cap Wipers, however, Lubricators may be specified instead.

The Blind Hole Fixing type (BH) allows mounting into a solid machine base where through mounting is not possible, or where adjustment from the front is preferred. They are available in **Concentric type (C)**, which are fixed, and **Eccentric type (E)**, which are adjustable.

All Bearings are greased for life internally. Customers are strongly recommended to provide lubrication to the interface between Bearings and Slide by specifying Hepco Cap Wipers*, which fit over the Bearings, or by using Hepco Slimline Slide Lubricators. Lubrication greatly increases load capacity and life.

See Application Examples on 10 – 12 & 15

Blind Hole Fixing Type (GBHJ)

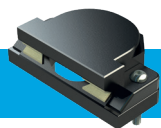


Part Number	Options Available	
	-	NS
	Metal Shields	Nitrile Seals
... J 195 ...	✗	✓
... J 265 ...	✓	✓
... J 360 ...	✓	✓
... J 580 ...	✓	✓

Ordering Details

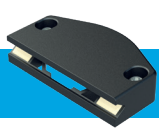
Fixing type. Choose from: **GLJ** = Short Axle, **GLJ** = Long Axle
& **GBHJ** = Blind Hole Fixing
Part Number (~10x Bearing Diameter in mm) **GLJ 265 C (NS)**
Nitrile Sealed Bearings
Leave blank if metal shields are required
C = Concentric (fixed), **E** = Eccentric (adjustable)

Cap Seals



HepcoMotion.com

Cap Wipers



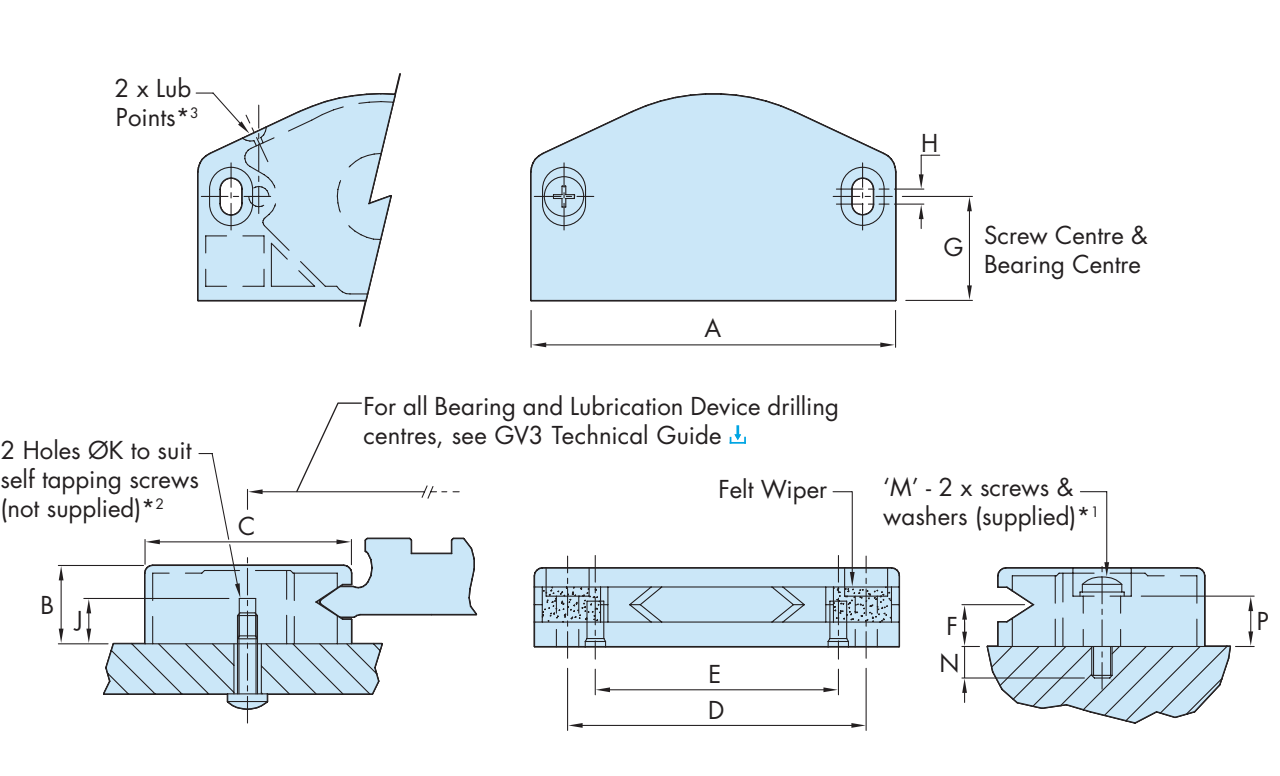
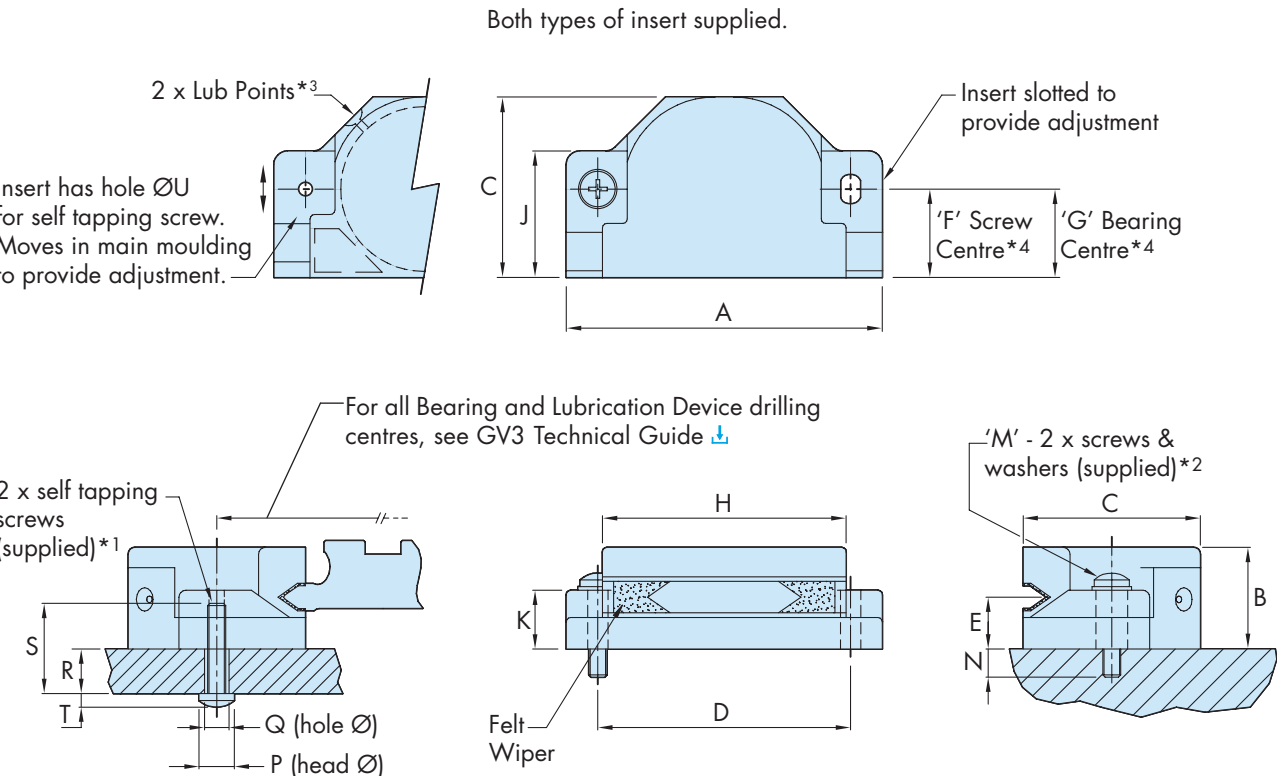
HepcoMotion.com

HepcoMotion flexible plastic Cap Seals fit over [Standard Bearings](#), providing effective sealing and protection, as well as wiping of debris from the [Slide](#) profile. Lubrication of the 'V' surface is provided by means of oil impregnated felt wipers. The internal cavity is filled with grease via the lubrication points, further improving lubrication and recharging the felt wipers as the grease releases oil under operation. Most systems require no further lubrication during the lifetime of the machine*³. The fitting of these seals increases life and load capacity, and linear speed capability, as well as improving operator safety. Cap Seals are not available for use with Blind Hole Eccentric type [Bearings](#) and J13 Bearings.

HepcoMotion rigid plastic Cap Wipers fit over [Slimline Bearings](#), providing effective protection, plus wiping of debris from the [Slide](#) profile. Lubrication of the 'V' surface is provided by means of oil impregnated felt wipers. The internal cavity is filled with grease via the lubrication points, further improving lubrication and recharging the felt wipers as the grease releases oil under operation. Most systems require no further lubrication during the lifetime of the machine*³. Fitting of Cap Wipers increases life and load capacity, and linear speed capability, as well as improving operator safety. Cap Wipers are not available for use with Blind Hole Eccentric type [Bearings](#).

See Application Examples on 11 – 14 & 16

See Application Example on 12



Part Number	Use With	Suitable for Slide Sections																		
		A	B	C	D	E	F	G	H	J	K	M*2		N	P	Q	R	S	T	U
						±0.1							Screw	Length				max		
CS 18 *4	... J 18 ...	42	13.8	21.2	32.5	6.75	12.3	10.4	32.3	18	6	M2.5	12	5.5	4.5	3	8.5	12	2	2
CS 25	... J 25 ...	55	18	30	44	9	14.8	14.8	43	22	8.6	M3	12	2.9	5.5	3.5	11	16	2	2.5
CS 34	... J 34 ...	70	22.5	40	56	11.5	19.6	19.6	54	28	13	M4	20	6.2	7	4.5	14	20	2.7	3.3
CS 54	... J 54 ...	98	36.5	60	80	19	29.7	29.7	78	40	20	M5	25	4	9	6	24	35	3.5	4

Part Number	Use With	Suitable for Slide Sections																	
		A	B	C	D	E	F	G	H	J	K	M*1		N	P				
					±0.1	±0.1						Screw	Length						
CW 195	... J 195 ...	43	11.2	22.8	35	27.5	5.7	11.3	2	7	2.4	M2.5	12	3	8.5				
CW 265	... J 265 ...	54	13	30.3	44	35	6.8	15.3	2.5	8.5	2.8	M3	16	5.5	10				
CW 360	... J 360 ...	72	15.5	40.8	59	48	8.3	20.5	3	9	3.8	M4	16	5.5	10				
CW 580	... J 580 ...	106	25	63.3	90	74	14.3	31.8	3.5	18	4.8	M5	25	4	20				

Part Number	Suitable for Slide Sections				
	MS	V	S	M	L
CS 18 *4	x	✓	✓	✓	✓
CS 25	x	x	✓	✓	✓
CS 34	x	x	x	✓	✓
CS 54	x	x	x	x	✓

Part Number	Suitable for Slide Sections				
	MS	V	S	M	L
CW 195	x	✓	x	x	x
CW 265	x	x	✓	x	x
CW 360	x	x	x	✓	x
CW 580	x	x	x	x	✓

Ordering Details

Ordering Details

- Notes:**
- Two self tapping screws for plastic are supplied with each Cap Seal. These have a cross-recessed pan head and use the PT thread form.
 - Two machine screws with cross-recessed pan heads (DIN7985A/ISO7045) and two flat washers (DIN125A) are supplied.
 - Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a No.2 consistency lithium soap based grease. A mole grease connector Part No. CSCHF4034 or a complete gun is available from Hepco if required.
 - The fixing screw positions for the CS18 do not lie on the centreline of the nominal [Bearing](#) position, unlike all other sizes.

- Notes:**
- Two cross-recessed pan head screws to DIN7985A/ISO7045 and washers (DIN433) are supplied with each Cap Wiper.
 - Cap Wipers may be secured using the blind holes 'K' in the underside. These may be tapped thread form 'M' to take a machine screw, or will accept a self tapping screw. The mounting holes will require slotting to provide adjustment.
 - Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a No.2 consistency lithium soap based grease. A mole grease connector Part No. HF4034 or complete gun is available from Hepco, if required.

Slide Lubricators



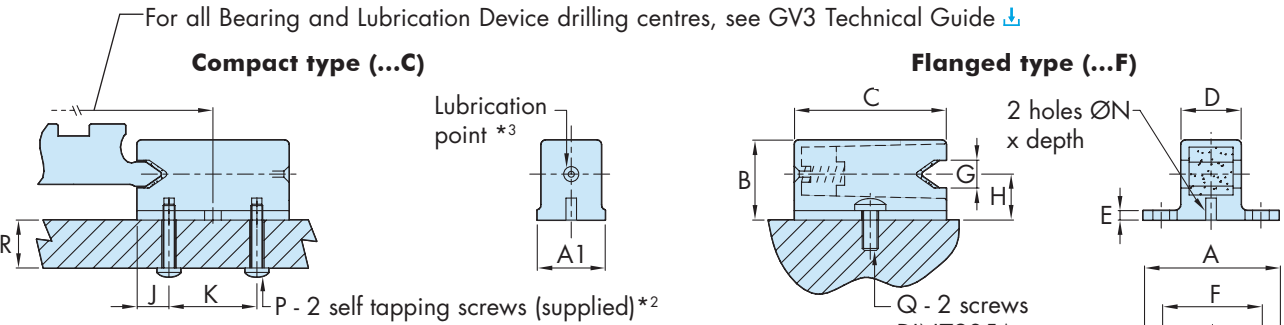
HepcoMotion plastic Slide Lubricators normally fit one each side of the Slide, between pairs of Bearings. However, any number may be fitted in any position according to requirements. Lubricators provide lubrication to the working surface of the Slide by means of spring loaded oil impregnated felt wipers.

System load capacity and life are greatly increased whilst retaining the low friction characteristics of dry running. Lubricators may be specified as part of any Hepco GV3 Carriage assembly or used within the customers' own design.

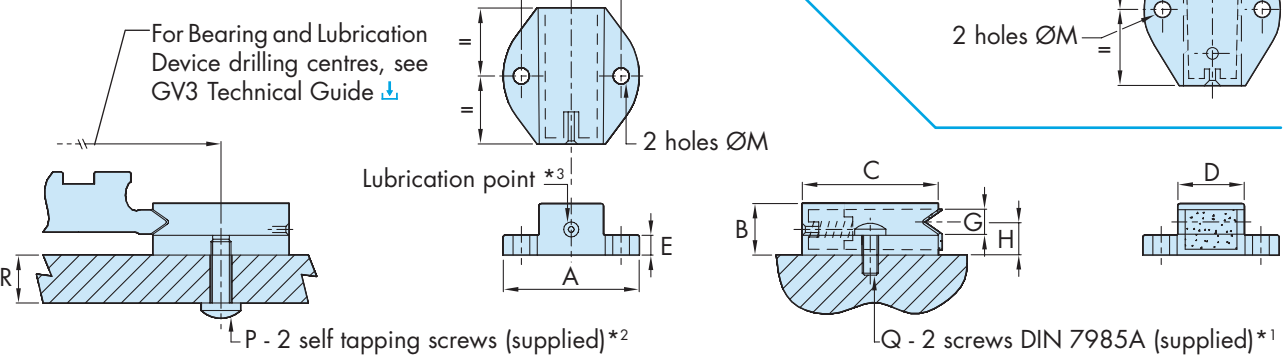
Lubricators are available to suit both Standard and Slimline Bearings. Both types are supplied with fasteners and can be attached with either a blind or through hole fixing.

See Application Examples on 10, 13, 15 & 16

Slide Lubricators for Standard Bearings



Slide Lubricators for Slimline Bearings



Part Number	A	A1	B	C	D	E	F	G	H	J	K	M	N	P*2	Q*1	R
LB 12 *4	17	7	10	13	5.2	2	12	3.1	5.46	3	6.5	2.7	1.7x2.5	Ø2.5x5	M2.5x6	3 2.5
LB 20 *4	19	8	12	22.5	6.5	2	13	7.2	6.75	4.75	13	2.7	1.7x2.5	Ø2.5x10	M2.5x6	8 7.5
LB 25	25	12	16.5	28	9.9	2	18	5.5	9	6	16	3.2	2.4x4.5	Ø3x10	M3x8	7.5 5.5
LB 44	34	17	20	38	15	2.4	25	7	11.5	8	22	4.2	2.4x5.5	Ø3x16	M4x10	13.5 11.5
LB 76	50	25	33.5	57	22.7	4.5	38	10	19	12	33	5.2	2.7x9	Ø3.5x22	M5x12	18.5 13
LB 195	19	-	8.7	19.8	6.85	5	13	4.1	5.7	-	-	2.7	-	Ø3x12	M2.5x10	9 -
LB 265	25	-	10.3	25	11.5	4	18	4.7	6.8	-	-	3.2	-	Ø3.5x12	M3x8	8.5 -
LB 360	34	-	12.9	34	16.6	5	25	6.2	8.3	-	-	4.2	-	Ø5x16	M4x10	11 -
LB 580	50	-	21.9	57	26.5	7.5	38	12.5	14.3	-	-	5.2	-	Ø6x25	M5x16	19 -

Part Number	Use With	Suitable for Slide Sections							Types Available	
		MS	V	S	M	L	Flanged (F)	Compact (C)	Flanged (F)	Compact (C)
LB 12 *4	...J 13...	✓	✓	✓	✓	✓	✓	✓	✓	✓
LB 20 *4	...J 18...	x	✓	✓	✓	✓	✓	✓	✓	✓
LB 25	...J 25...	x	✓	✓	x	x	✓	✓	✓	✓
LB 44	...J 34...	x	x	x	✓	x	✓	✓	✓	✓
LB 76	...J 54...	x	x	x	x	✓	✓	✓	✓	✓
LB 195	...J 195...	✓	✓	✓	✓	✓	✓	✓	✓	x
LB 265	...J 265...	x	✓	✓	✓	✓	✓	✓	✓	x
LB 360	...J 360...	x	x	✓	✓	✓	✓	✓	✓	x
LB 580	...J 580...	x	x	x	✓	✓	✓	✓	✓	x

- Notes:
- Two machine screws with cross-recessed pan heads size Q (DIN 7985A / ISO 7045) are supplied with each flanged type and slimline Lubricator.
 - 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.
 - Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a 68 viscosity EP mineral oil.
 - Sizes LB12 and LB20 have a true 'V' shape to enable them to engage with Slide thicknesses larger than their G dimensions.

Bleed Lubrication



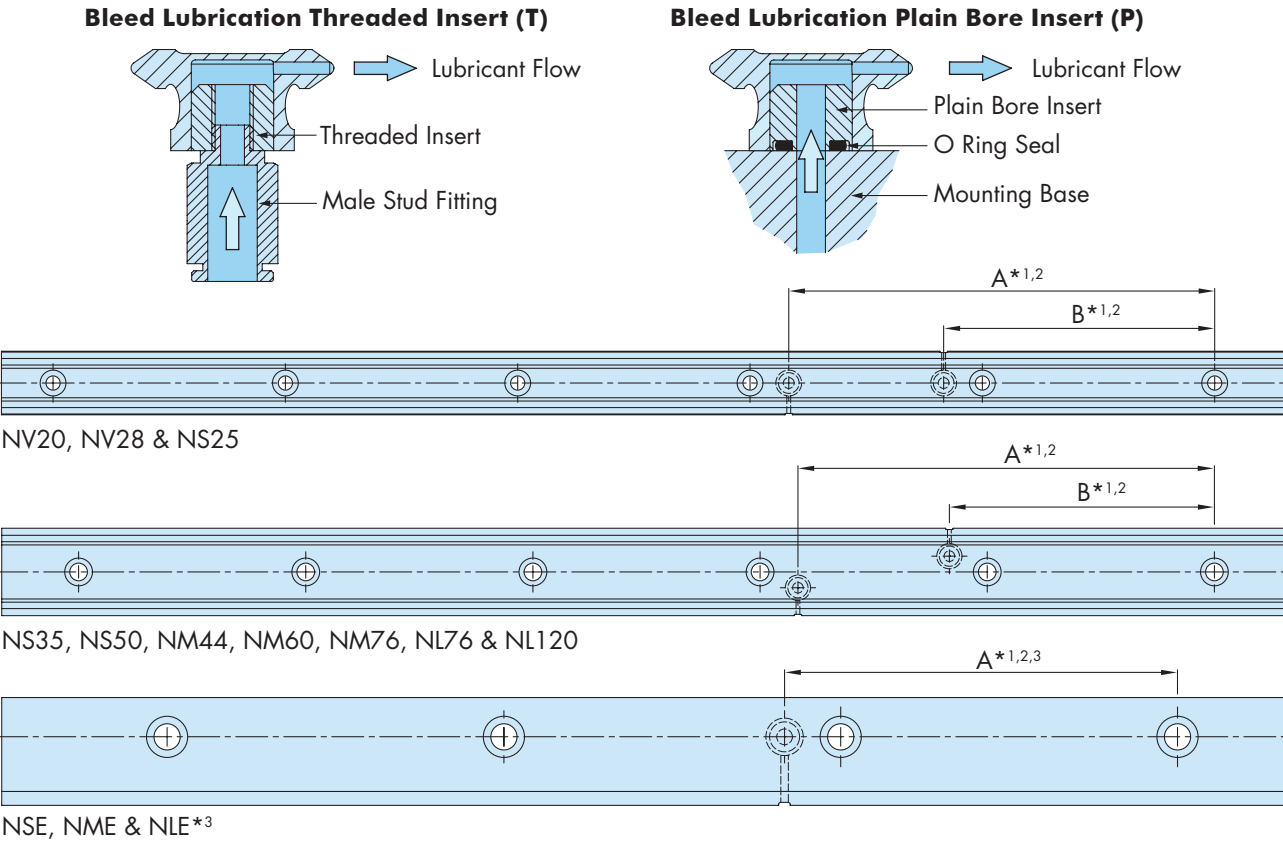
The HepcoMotion Bleed Lubrication facility enables a constant flow of lubricant to be channelled directly to the 'V' surfaces of the Slide. The lubricant is distributed along the length of the Slide by the Bearings as they run up and down. Most efficient distribution is achieved by also fitting Hepco Cap Seals / Wipers or Lubricators, which will be continuously charged with fresh lubricant and ensure an even spread over the working surfaces.

Bleed Lubrication is the best method of lubrication for continuous duty systems requiring long life.

The Bleed Lubrication facility is available with either an M5 screw fitting insert or an O-ring seal insert. 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.

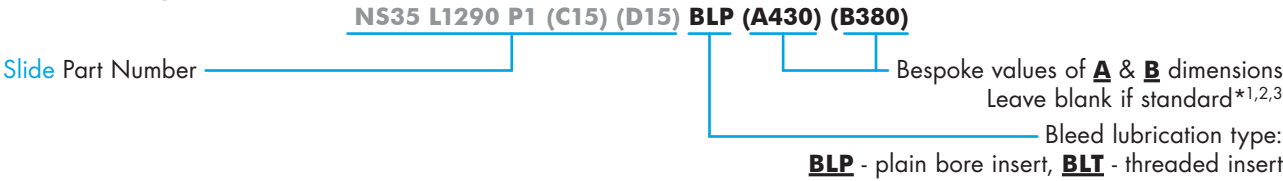
For full information, please see the GV3 Technical Guide.

See Application Example on 8



Slide Part Number	For Use With	A*1,2	B*1,2
NMS12		Bleed lubrication unavailable	
NV20, NV28, NS25, NS35, NS50, NM44, NM60 & NM76		435	375
NL76, NL120		330	210
NMSE & NVE		Bleed lubrication unavailable	
NSE & NME		375*3	-
NLE		390*3	-

Ordering Details



Ordering Example:
1 x NME L2336 P2 BLP A400 — Single Edge Spacer Slide, 2336mm long, P2 grade, with custom hole position A
1 x NME L2336 P2 BLP A1850 — Single Edge Spacer Slide, 2336mm long, P2 grade, with custom hole position A

- Notes:
- Dimensions A and B are distances from the centre of the mounting hole positioned nearest to the right-hand end of the Slide.
 - 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 adjusted bleed hole position dimension A to reflect this. This is shown in the ordering example above.

Flat Tracks



HepcoMotion.com

Narrow Track Rollers

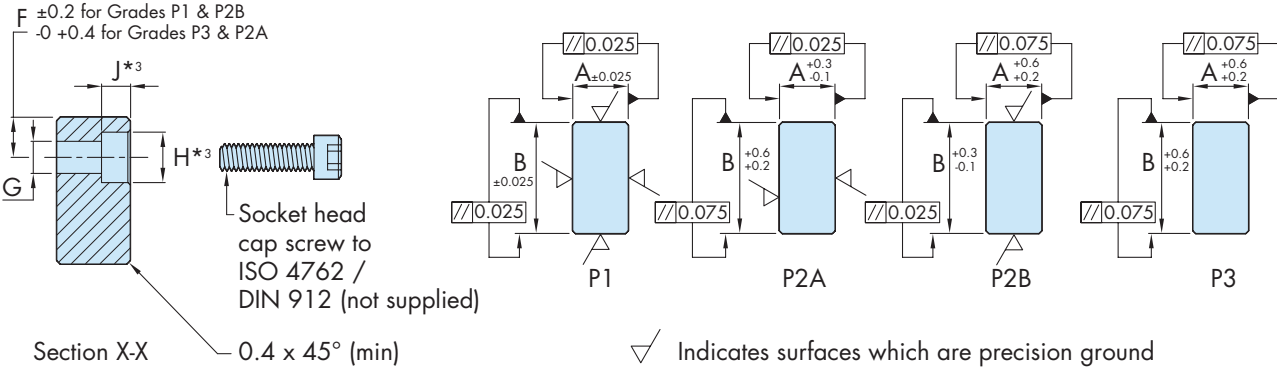
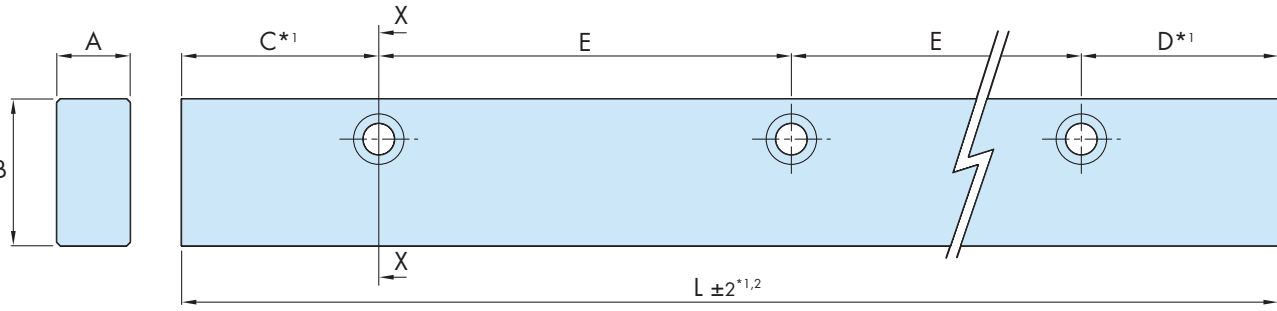


HepcoMotion.com

HepcoMotion GV3 Flat Tracks are made from high quality carbon steel and are hardened on all four faces to provide an extremely durable running surface. They have been designed to be used with the Hepco range of [Track Rollers](#). Flat Tracks are often used in conjunction with Hepco 'V' [Slides](#) in large systems where the design can eliminate the requirement to set Slides accurately parallel. They are available with various precision ground faces (as shown below), as well as unground P3 grade, which has a commercial finish suitable for many applications*4.

It is recommended that running surfaces should be kept lightly oiled. HepcoMotion GV3 Flat Track and Roller Lubricators are available for this purpose. Please see the GV3 Technical Guide [↓](#) for more information.

See Application Examples on [5](#)



Part Number	Use With		A		B		C*1	D*1	E	F	G	Screw Size	H*3	J*3	L*1,2 max
			P1 & P2A	P2B & P3	P1 & P2B	P2A & P3									
FT 24 12	...R 18...	LRN 18...	12	12.4	24	24.4	20.5	20.5	45	7.5	6	M5	10	5	2000
FT 32 16	...R 25...	LRN 25...	16	16.4	32	32.4	43	43	90	8.75	7	M6	11	6	4020
FT 40 20	...R 34...	LRN 34...	20	20.4	40	40.4	43	43	90	12	9	M8	15	8	4020
FT 66 33	...R 54...	LRN 54...	33	33.4	66	66.4	88	88	180	17	14	M12	20	12	4020

Ordering Details

Part Number FT4020 L1830 P2A C15 D15

Track Length **L** = 1830 mm

Precision grade: options are **P1, P2A, P2B & P3**

Bespoke values of **C** & **D** dimensions
Leave blank if standard (see table)

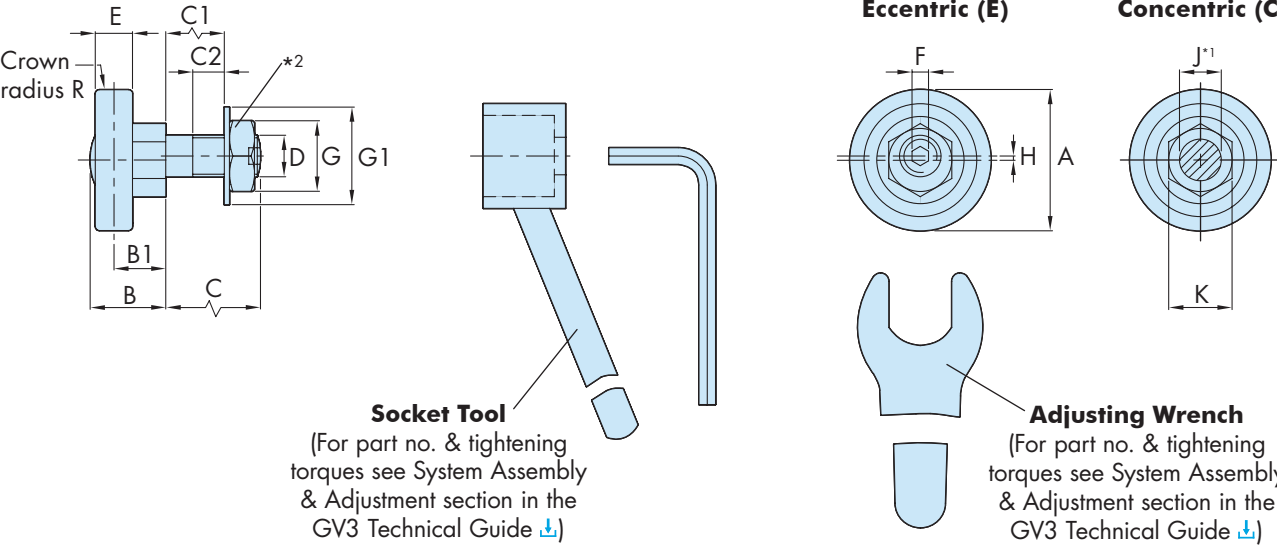
- Notes:**
- Any length of Flat Track within max length stated can be supplied, but for optimum price and delivery time, track lengths should be specified which maintain the C and D dimensions in the table above. In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal
 - Where Tracks longer than maximum length are required, two or more lengths in grades P1, P2A & P2B can be matched, suitable for butting, on request. In these cases the mating ends will be ground square.
 - The standard means of securing Flat Tracks to the mounting surface is via counterbored fixing holes in the positions shown. Other fixing hole possibilities are available on request. It is recommended that holes in the mounting surface are positioned by 'spotting through' from the Flat Track.
 - Important.** Tracks in their free unmounted state are not necessarily absolutely straight, however, they may be set to the required degree of straightness during installation.

HepcoMotion Narrow Track Rollers complement the other GV3 ranges of [Bearings](#). They are available in through hole fixing format, in a single axle length, in both fixed position **Concentric Type (C)** and adjustable **Eccentric Type (E)**.

Narrow Track Rollers consist of a high capacity single row deep groove ball bearing with a thick wall crowned outer ring. They are fitted with metal shields as standard, or with nitrile seals for better protection against liquids at the expense of a small increase in friction. They are suitable for running on any flat surface and as a retaining roller on the rear face of the [Single Edge Spacer Slide](#).

Rollers are greased for life internally, however, it is recommended to oil the running surface. HepcoMotion GV3 Flat Track Lubricators are available for this purpose. Please see the GV3 Technical Guide [↓](#) for more information.

See Application Example on [5](#)



Part Number	Use With*4	A	B	B1	C	C1	C2	D	E	F	G	G1	H	J*1	K	R
								Metric Fine						+0.00 -0.03		
LRN 18 ...	FT 24 12	18	11.5	8	14	10	2.5	M6x0.75	5	2.5	10	13	0.7	6	11	500
LRN 25 ...	FT 32 16	25	14.5	10	19	13	5	M8x1	7	3	13	17	0.75	8	13	500
LRN 34 ...	FT 40 20	34	18.2	12.5	22	14.8	6	M10x1.25	9	4	17	21	1	10	15	500
LRN 54 ...	FT 66 33	54	29.5	21	30	20.4	8	M14x1.5	14	6	22	28	1.5	14	27	500

Part Number	Max Working Load Capacity (N)	Roller Static (Co) and Dynamic (C) Load Capacity*3	
		Co (N)	C (N)
LRN 18 ...	400	593	1438
LRN 25 ...	1000	1333	3227
LRN 34 ...	2000	2600	5921
LRN 54 ...	5000	6657	13595

Part Number	Options Available	
	-	NS
LRN 18 ...	✗	✓
LRN 25 ...	✓	✓
LRN 34 ...	✓	✓
LRN 54 ...	✓	✓

Ordering Details

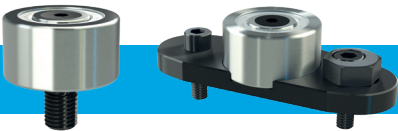
Part Number LRN25 C (NS)

25 denotes Roller diameter in mm

Nitrile Sealed Bearings
Leave blank if metal shields are required

C = Concentric (fixed) or **E** = Eccentric (adjustable)

- Notes:**
- It is recommended that holes to suit Track Roller mounting axles should be reamed to tolerance F6 for a sliding fit.
 - Nuts are chemically blacked on the concentric version and bright zinc plated on the eccentric version for identification purposes.
 - The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and are only provided for comparison with other systems. Please use the Max Working Load figures and the Load/Life Calculations on [50-52](#) to determine system performance.
 - Each size of Narrow Track Roller has been designated for use with a specific size of [Flat Track](#), as shown. However, any Track Roller may be used in conjunction with any size of Flat Track, [Single Edge Slide](#) or other running surface according to practicality of design.



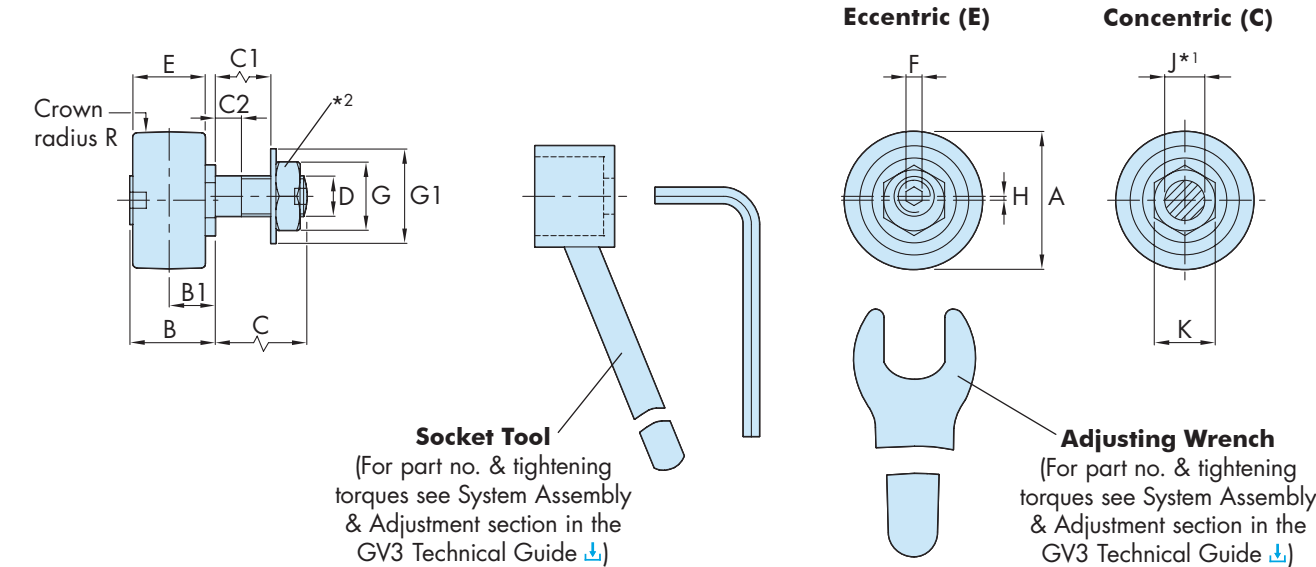
HepcoMotion Wide Track Rollers can be used with Hepco [Flat Tracks](#), the back face of [Single Edge Spacer Slides](#) and on any other type of running surface. Rollers comprise of a high capacity double row deep groove ball bearing, with a substantial section outer ring and crowned profile.

The **Through Hole Fixing type** is available in two axle lengths covering most thicknesses of mounting plate.

The **Blind Hole Fixing type** can be used where through holes are not possible, or where adjustment from the front is preferred.

Both versions are available in fixed position **Concentric type (C)** and adjustable **Eccentric type (E)**.

Through Fixing Type (SR/LR)



Short Axle (SR) / Long Axle (LR)

Part Number	Use With*4	A	B	B1	C		C1 max		C2		D Metric Fine	E	F	G	G1	H	J*1 +0.00 -0.03	K	L	M	N	N1	P	P1	P2	Q	Q1	R	S	S1	T	U	V
					Short Axle	Long Axle	Short Axle	Long Axle	Short Axle	Long Axle																							
... R 18 ...	FT 24 12 ...	18	12.4	6.75	7.4	14	3.4	10	2.4	2.5	M6 x 0.75	10	2.5	10	13	0.7	6	11	7.4	1.2	8	10.5	10	4	8	38	54	500	12.3	7.8	M4	7	11
... R 25 ...	FT 32 16 ...	25	16.6	9	9.8	19	3.8	13	3.4	4.9	M8 x 1	14	3	13	17	0.75	8	13	9.8	1.5	7	9	12	5	10	50	72	1000	16	11	M5	8.5	14
... R 34 ...	FT 40 20 ...	34	21.3	11.5	13.8	22	6.6	14.8	5.2	5.9	M10 x 1.25	18	4	17	21	1	10	15	13.8	2.0	9.5	8.5	17.5	6.5	12.5	60	90.5	1000	21	15.3	M6	10	17
... R 54 ...	FT 66 33 ...	54	34.7	19	17.8	30	8.2	20.4	5.7	7.9	M14 x 1.5	28	6	22	28	1.5	14	27	17.8	3.0	14.5	16.4	23.5	10.5	18.5	89.5	133	1500	31	25	M8	13	25

Part Number	Max Working Load Capacity	Roller Static (Co) and Dynamic (C) Load Capacity*3	
	(N)	Co (N)	C (N)
... R 18 ...	600	1168	2301
... R 25 ...	1600	2646	5214
... R 34 ...	3200	5162	9560
... R 54 ...	8000	13271	21989

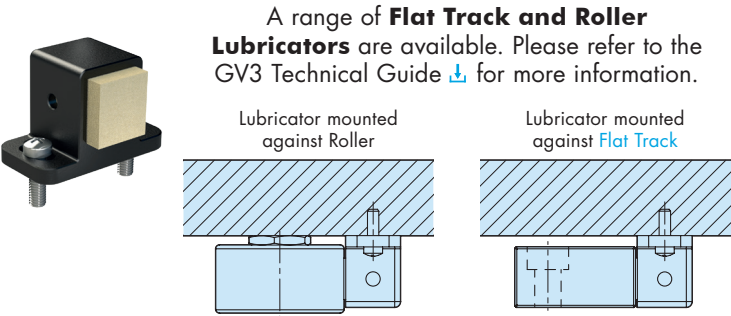
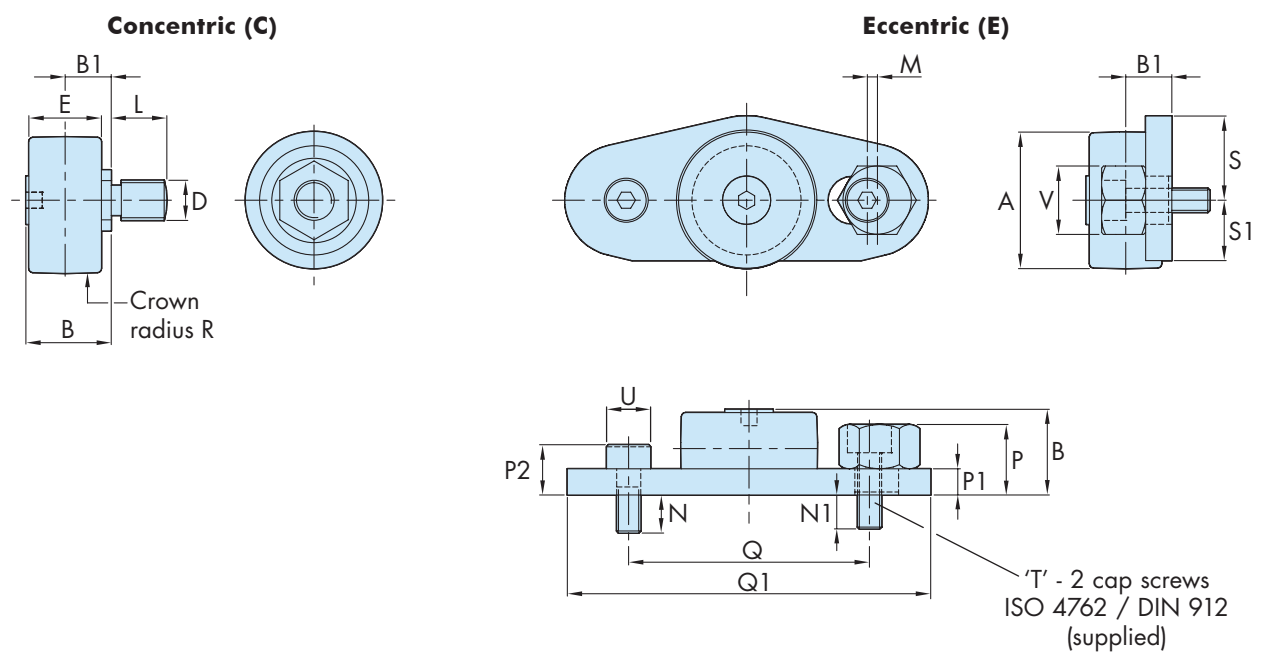
Rollers are available with either standard metal shields, or nitrile seals (NS), for a higher degree of protection against ingress of water or debris. A slight increase in friction may result.

Wide Track Rollers are available in the same basic sizes as Hepco 'V' [Bearings](#) and are well matched for functionality and performance in systems comprising both types of Bearing.

Rollers are greased for life internally, however, it is recommended to oil the running surface. HepcoMotion GV3 Flat Track and Roller Lubricators are available for this purpose. Please see the GV3 Technical Guide [5](#) for more information.

See Application Example on [5](#)

Blind Hole Fixing Type (BHR)



Part Number	Options Available	
	- Metal Shields	NS Nitrile Seals
... R 18 ...	✗	✓
... R 25 ...	✓	✓
... R 34 ...	✓	✓
... R 54 ...	✓	✓

- Notes:**
- It is recommended that holes to suit Track Roller mounting axles should be reamed to tolerance F6 for a sliding fit.
 - Nuts are chemically blocked on the concentric version and bright zinc plated on the eccentrics for identification purposes.
 - The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect system performance, and are only provided for comparison with other systems. Please use the Max Working Load figures and the Load/Life Calculations on [50-52](#) to determine system performance.
 - The preferred choice of [Flat Track](#) for each size of Roller is listed. However, any Track Roller may be used with any size of Flat Track or [Single Edge Spacer Slide](#) according to practicality of design.

Ordering Details

Fixing type. Choose from: **SR** = Short Axle, **LR** = Long Axle & **BHR** = Blind Hole Fixing
Part Number (Roller Diameter in mm) **LR 25 C (NS)**
Nitrile Sealed Roller
Leave blank if metal shields are required
C = Concentric (fixed) or E = Eccentric (adjustable)



HepcoMotion GV3 Racks provide a durable and powerful linear drive when used in conjunction with Hepco or other good quality, hardened [Pinions](#).

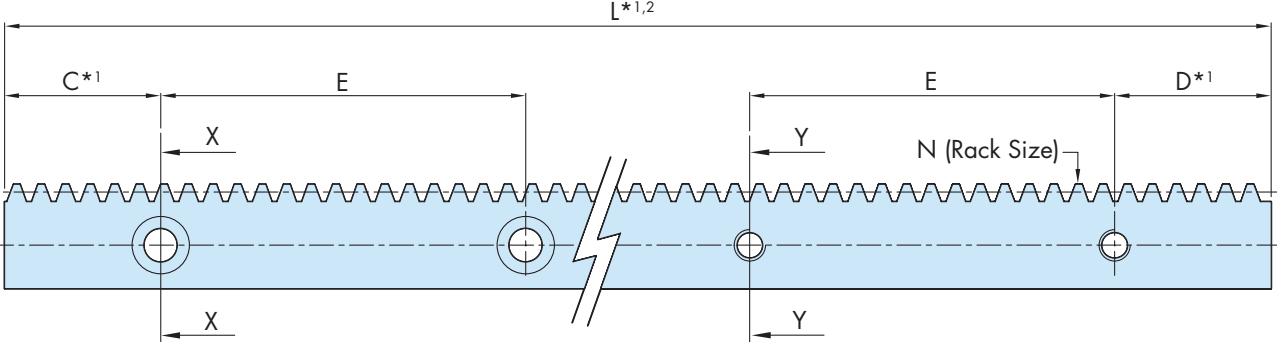
Racks are made from high quality carbon steel, ground on all faces prior to tooth cutting. Teeth are metric module with 20° pressure angle and are machined to a high degree of precision.

Racks are supplied with fixing hole types as shown or without holes if preferred. All holes are accurately positioned to enable customers to pre-drill their mounting holes.

The back face of the Rack is controlled parallel to the tooth pitch line, enabling it to be used as a register for setting*4.

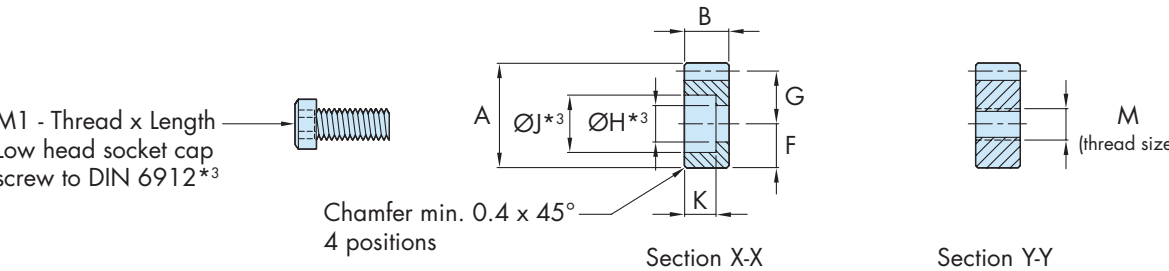
For best performance, the teeth should be lubricated with No.2 consistency lithium soap-based grease.

See Application Examples on [14 – 15](#)



Rack with Counterbored Holes

Rack with Tapped Holes



Part Number	Use With	A	B	C*1	D*1	E	F	G	H*3	J*3	K	L*1,2 max	M	M1*3		N mod	Max Rack Force (N)*5
														Screw	Part No.		
R 07 ...	P07 W5...	12.7	4.0	20.5	20.5	45	6.35	5.65	4.5	7.6	2.9	1796	M4	M4 x 10	FS410	0.7	110
R 10 ...	P10 W7...	15.65	6.75	43	43	90	7.8	6.85	5.5	9.6	4.0	1886	M5	M5 x 10	FS510	1.0	250
R 15 ...	P15 W8...	20.0	8.25	43	43	90	8.3	10.2	6.5	11	4.5	2966	M6	M6 x 12	FS612	1.5	400
R 20 ...	P20 W13...	31.75	14.0	43	43	90	13.2	16.55	11	18	10.5	3956	M10	M10	-	2.0	950

Ordering Details

Part Number **R15 L845 (T) (C15) (D20)**

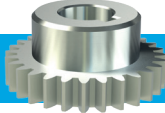
(Number relates to the tooth module)

Rack Length **L = 845** mm

Bespoke values of **C** & **D** dimensions
Leave blank if standard*1

Fixing hole style:
T - Tapped fixing holes, **N** - No holes
Leave blank for counterbored holes

- Notes:**
- Any length of Rack within L max dimension can be supplied, but for optimum price and delivery time, lengths should be specified which maintain the C and D dimensions in the table above. In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal.
 - Where longer Racks are required, standard lengths suitably matched for mounting end-to-end, will be supplied. In these cases, additional holes may be inserted to give support near the join positions. When mounting such compound Racks, care must be taken to match accurately the pitch line and tooth spacing across the join. A rack matching tool, which is a short length of Rack to engage in the two pieces to be mounted, will be supplied with such orders.
 - The standard counterbored holes on the three smallest sizes suit low head hex socket cap screws (to DIN 6912). These screws are not universally stocked so Hepco offers them as a convenience to customers in a single length for each thread size (see table). The largest size R20 Racks are thick enough to accommodate cap head screws to ISO 4762 / DIN 912, which are widely available.
 - Racks in their free unmounted state are not necessarily absolutely straight. If straightness is important, the Rack should be set by bolting down to a flat surface with the rear face located against a register. Care should be taken to align parallel with the relevant [Slide](#). Adjustment for the [Pinion](#) should be provided in order to achieve the desired mesh quality. For best performance, the teeth should be lubricated with No.2 consistency lithium soap-based grease.
 - The Max Rack Force is the continuous drive force that can be sustained by a well lubricated Rack used in conjunction with the appropriate Hepco [Pinion](#).

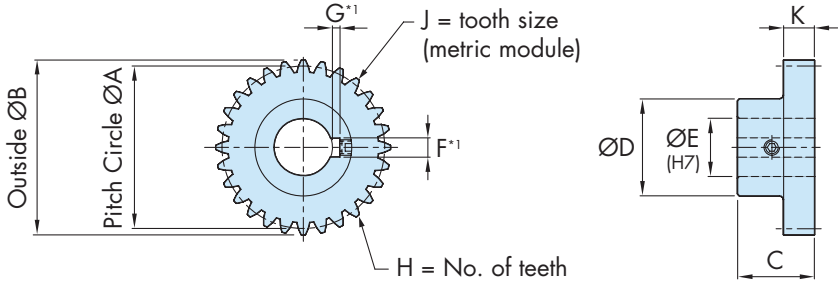


The HepcoMotion range of Pinions is compatible with all [Rack](#) cut GV3 components. **Boss Type** Pinions are for general use. **Shaft Type** Pinions, which are detailed in the Technical Guide, are compatible with Hepco [Rack Driven Carriages](#) and other designs benefiting from the Hepco [Drive Flange](#) and hollow shaft motor driven worm [Gearbox](#). Examples of these designs may be found in the Rack & Pinion Systems section of the GV3 Technical Guide [↓](#).

All Pinions have hardened teeth and are metric module with 20 pressure angle conforming to ISO 1328-1 grades. Pinions smaller than 1 module conform to ISO 1328-1 grade 10 and are supplied with a plain bore (B type), or with set screw (BK type*1). Pinions with modules of 1 and above have hardened and ground teeth, conform to ISO grade 6 and are available in steel as well as stainless steel in some sizes (see table). These Pinions are supplied with a plain bore (B type) or with keyway and set screw (BK type).

See Application Examples on [13 – 15 & 17](#)

Boss Type Pinion

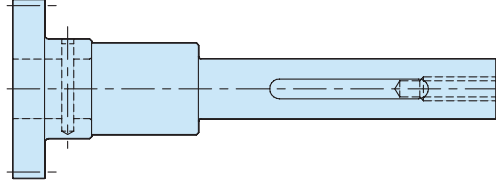


Part Number	Material*2	Condition*3	ISO 1328-1 grade	A	B	C	D	E	F*1	G*1	H	J mod	K
P05 W7 T28 ...	ST	✖	10	14	15	14	10	5	-	-	28	0.5	7
P07 W9 T28 ...	ST	✖	10	19.6	21	17	16	5	-	-	28	0.7	9
P07 W5 T28 ...	ST	✖	10	19.6	21	13	16	5	-	-	28	0.7	5
P10 W11 T42 ...	ST/SS	✓	6	42	44	23	30	15	5	2.3	42	1	11
P10 W7 T42 ...	ST	✓	6	42	44	18.5	30	15	5	2.3	42	1	7
P125 W14 T34 ...	ST/SS	✓	6	42.5	45	25.5	30	15	5	2.3	34	1.25	14
P15 W8 T28 ...	ST	✓	6	42	45	19.8	30	15	5	2.3	28	1.5	8
P20 W20 T27 ...	ST/SS	✓	6	54	58	35	40	20	6	2.8	27	2	20
P20 W13 T27 ...	ST	✓	6	54	58	25	40	20	6	2.8	27	2	13

Part Number	For Use With			
P05 W7 T28 ...	-	NMSE ... R	-	-
P07 W9 T28 ...	-	NVE ... R	-	-
P07 W5 T28 ...	R07 ...	-	NV ... R	-
P10 W11 T42 ...	-	NSE ... R	-	WG3 ...
P10 W7 T42 ...	R10 ...	-	NS ... R	-
P125 W14 T34 ...	-	NME ... R	-	WG4 ...
P15 W8 T28 ...	R15 ...	-	NM ... R	WG3 ...
P20 W20 T27 ...	-	NLE ... R	-	WG4 ...
P20 W13 T27 ...	R20 ...	-	NL ... R	WG4 ...

Shaft Type Pinion

For dimensions of the Shaft Type Pinion and ordering details, please see the GV3 Technical Guide [↓](#).



Shaft Type Pinions are supplied with a steel key, retaining washer and screw necessary to connect to the worm gearbox.

Ordering Details

(SS) P07 W9 T28 BK

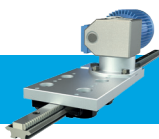
SS = Stainless Steel (see table for availability)
Leave blank for steel version

Boss Type Pinion Part Number

Pinion format:
B = Pinion with plain bore
BK = Pinion with keyway and set screw*1

- Notes:**
- Small "BK" type Pinions with bores below 8mm are supplied with set screw through to the bore but without keyway. It is usual practice to secure these Pinions by means of a set screw onto a flat on the shaft or by using a taper pin.
 - ST = steel, SS = stainless steel. Stainless steel Pinions are ground all over for corrosion resistance.
 - ✓ = Hardened all over. Teeth and bore ground. ✖ = Teeth hardened only. Teeth not ground.

Rack Driven Carriages



HepcoMotion.com



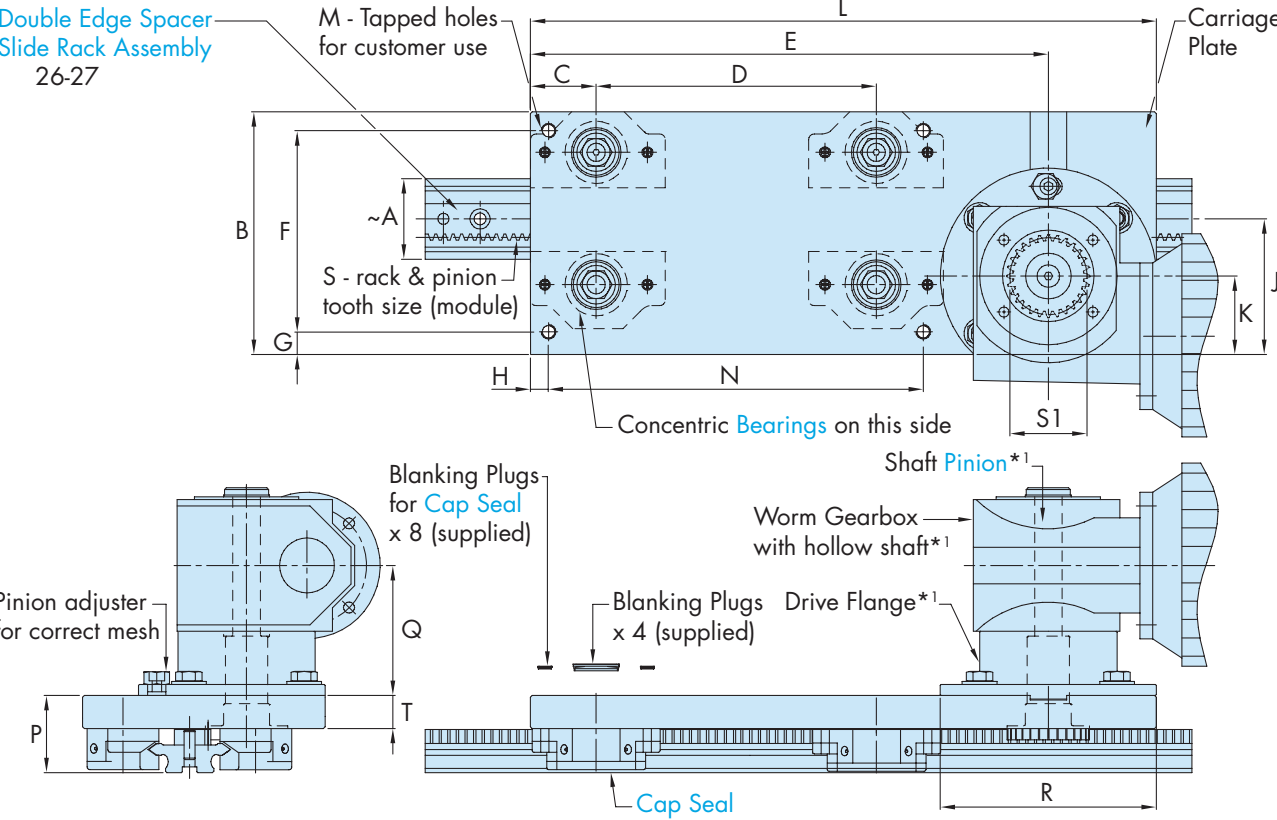
HepcoMotion Rack Driven Carriages are an economic means of achieving a powerful and controlled linear drive via the Hepco Worm Gearbox, Drive Flange and Shaft Pinion.

The Gearbox can be supplied with an integral AC Motor, which is the most economical means of achieving point to point linear motion and which may be controlled via the Hepco AC Speed Controller. The Gearbox can also be supplied with an adaptor flange and input shaft coupling to suit other makes or types of motor, including steppers and servos, which benefit from the low backlash of the Hepco Gearbox.

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

Please refer to the Rack & Pinion Systems section of the GV3 Technical Guide for illustrations of other compatible systems using the Hepco Worm Gearbox, Drive Flange and Shaft Pinion.

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



Part Number ^{*1}	A	B	C	D	E	F	G	H	J	K	L	M	N	P		Q	R	S	S1	T	Rack Drive Force (N) ^{*3}
														P1	P2 & P3						
AURD 44 34 L300 CS DR	44	133	36	112	240	113	10	10	74.1	43	300	M8	164	42	42.25	71	118	1.5	42	18	400
AURD 44 34 L420 CS DR				232	360						420		284								
AURD 60 34 L320 CS DR	60	144	36	132	260	124	10	10	74.1	43	320	M8	184	42	42.25	71	118	1.5	42	18	400
AURD 60 34 L440 CS DR				252	380						440		304								
AURD 76 34 L320 CS DR	76	154	36	132	260	134	10	10	74.1	43	320	M8	184	42	42.25	71	118	1.5	42	18	400
AURD 76 54 L360 CS DR	76	193	51	115	285	168	12.5	15	100.6	57	360	M10	187	58.5	58.75	72.5	147	2	54	20	700
AURD 76 54 L500 CS DR				255	425						500		327								
AURD 120 54 L380 CS DR	120	240	51	135	305	210	15	15	119.8	111.3	380	M10	207	58.5	58.75	72.5	147	2	54	20	700
AURD 120 54 L540 CS DR				295	465						540		367								

Ordering Details

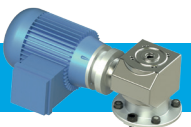
Part Number **AURD 60 34 L440 CS DR** + **Part Number for AC Geared Motor or Worm Gearbox see GV3 Technical Guide** + **Part Number for Double Edge Spacer Slide with fitted Rack**

CS for Cap Seals^{*2}

DR for Double Row Bearings^{*2}

- Notes:
- Gearbox ratios and all details of Shaft Pinions, Motors, Gearboxes and Drive Flanges can be found in the GV3 Technical Guide.
 - Standard Rack Driven Carriages are supplied with Double Row Bearings and Cap Seals. However, all variants, as available for Standard Carriages 22-25, can be supplied on request. Bespoke size Carriages can also be supplied. Please refer to the GV3 Technical Guide.
 - The quoted Rack Drive Force is determined by Rack and Pinion size, gearbox bearings and gears, and the duty. Please refer to the GV3 Technical Guide.

Gearboxes, Motors & Drive Flanges



HepcoMotion.com



HepcoMotion Gearboxes, AC Geared Motors and Drive Flanges can be used with Rack Driven Carriages 48, as well as with Rack Cut Single Edge Spacer Slides or separate Racks.

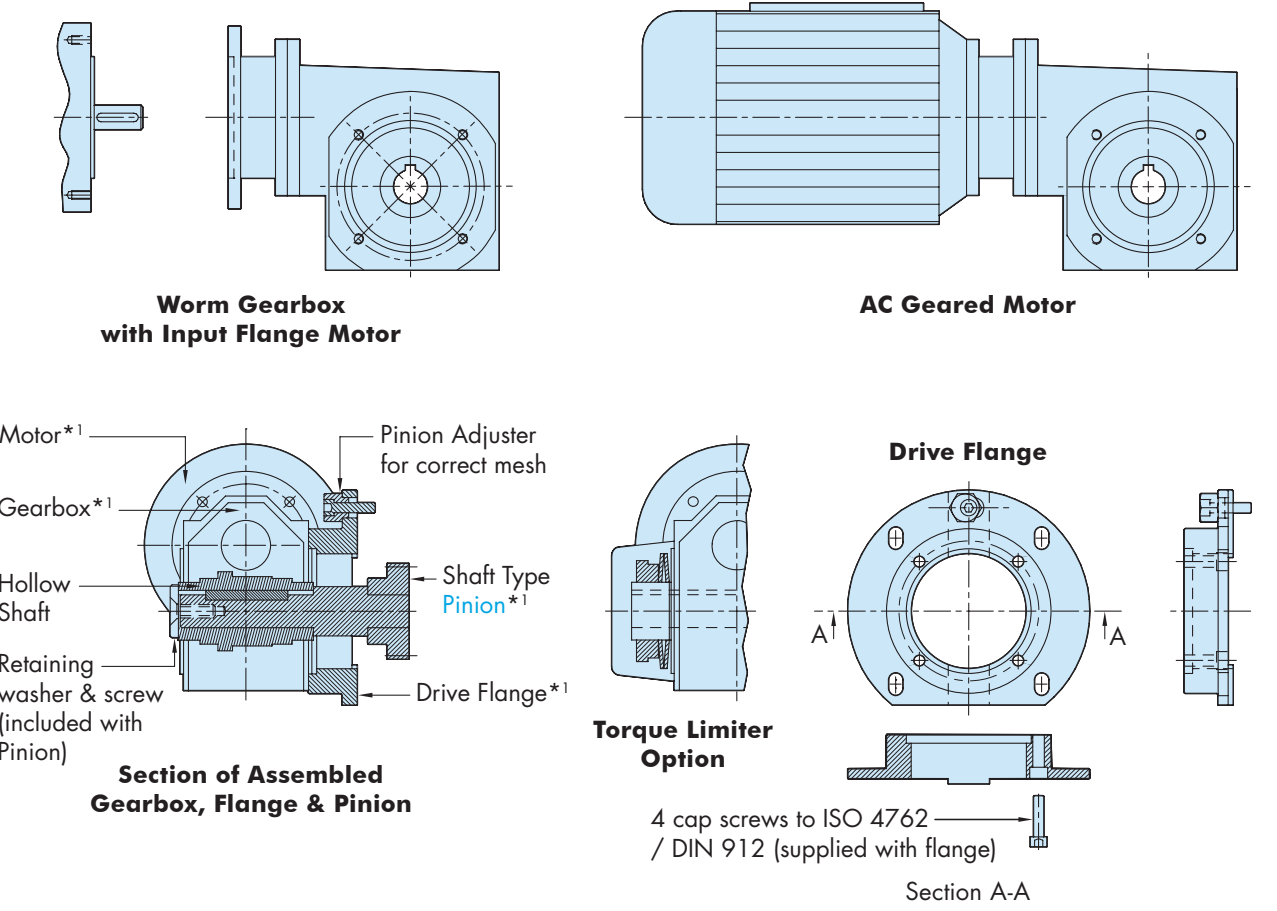
The high-duty yet lightweight Hepco Gearboxes with low backlash and low noise, make them particularly suitable for dynamic applications, whether driven by AC motor, stepper or servo. When sold separately, the input flange and shaft coupling of the Gearbox will be tailored to suit the customer's own motor. Gearboxes may be specified with an adjustable torque limiting clutch, if required.

The Drive Flange, which connects the Gearbox to the Carriage, incorporates a unique micro-adjustment facility for achieving correct engagement of Pinion with the Rack.

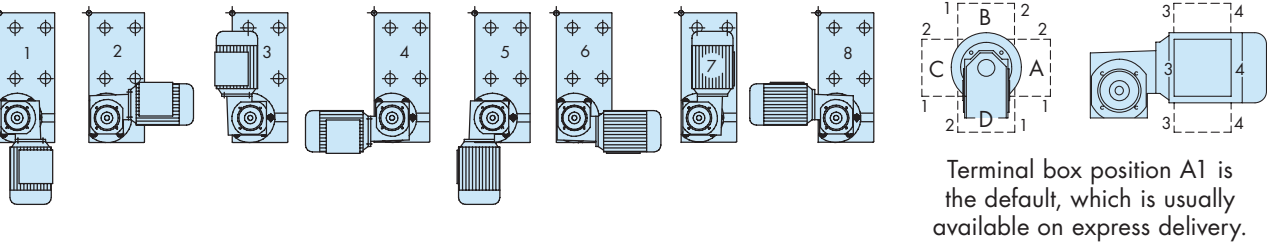
The AC Geared Motor can be combined with an AC Speed Controller to provide a complete drive control system. Motors are rated at 400/230V, protected to IP54, and finished in blue epoxy paint. Fitted disc brakes, alternative single and three phase windings, special finishes and enhanced IP protection are available on request.

Please see the GV3 Technical Guide for full details plus additional motor specifications available.

See Application Examples on 13 & 15



The AC Geared Motor and Worm Gearbox may be mounted onto a Rack Driven Carriage in any one of the eight configurations shown below. The terminal box may take one of four positions (A to D) and the cable exits also have four possible positions (1 to 4). Please use the diagram below as a guide to selection.



Ordering Details

Please refer to the GV3 Technical Guide and contact Hepco to discuss requirements.



The load capacity and life of HepcoMotion 'V' Slide Systems*1 will be determined by several factors. The key issues are the size and type of **Bearing** and **Slide**, the presence or absence of lubrication and the magnitude and direction of loads. Other factors including operational speed, length of stroke and environmental conditions may also have an effect*2.

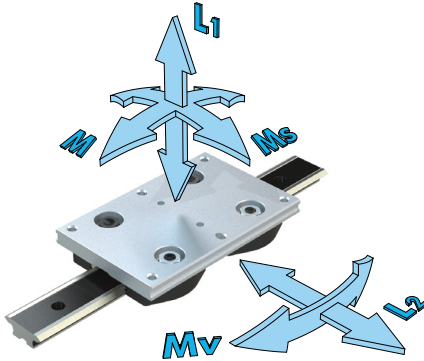
When calculating the system load and life, one of two approaches should be taken: if the system uses a conventional four-bearing **Carriage** (such as any of the Hepco Carriages), then this may be treated as a single item, and the load and life be determined as per the **Calculating Carriage Load Factor** section below; alternatively, each 'V' **Bearing** can be treated separately according to the method shown in the **Calculating 'V' Bearing Load Factor** section 51.

Calculating Carriage Load Factor*1,4

When calculating the life of a 'V' Slide System using a four-bearing Carriage, the loading on the system should be resolved into the direct load components, L1 and L2, and the moment load components M, Mv and Ms (see diagram on right).

To calculate the system life, the load factor Lf should first be calculated using the equation below:

Lf = (L1 / L1(max)) + (L2 / L2(max)) + (Ms / Ms(max)) + (Mv / Mv(max)) + (M / M(max))



Lf should not exceed 1 for any combination of loads.

The maximum direct and moment load capacities are given in the following tables for **Standard** and **Slimline Carriages**. Capacities are included for both dry and lubricated conditions. This refers to the 'V' contact, since all **Bearings** are greased internally for life. Values are based on shock-free duty. Once Lf has been determined for the application, the life is calculated as shown 51.

Mv(max) and M(max) are determined by multiplying the figure shown in the tables below by the spacing of the **Bearings**, D, in metres (shown right).



Maximum Working Load Capacity - Standard Carriages*4,6															
Carriage Part Number	Dry System, Twin & DR Type Bearing					Lubricated System, Twin Type Bearing					Lubricated System, DR Type Bearing				
	L1(max)	L2(max)	Ms(max)	Mv(max)	M(max)	L1(max)	L2(max)	Ms(max)	Mv(max)	M(max)	L1(max)	L2(max)	Ms(max)	Mv(max)	M(max)
	N	N	Nm	Nm	Nm	N	N	Nm	Nm	Nm	N	N	Nm	Nm*6	Nm
AU...12 13...	90	90	0.5	45xD	45xD	240	240	1.3	120xD	120xD	Not Available				
AU 20 18...	180	180	1.6	90xD	90xD	500	400	4.5	200xD	250xD	760	1200	7	600xD	380xD
AU 28 18...	180	180	2.3	90xD	90xD	500	400	6.5	200xD	250xD	760	1200	10	600xD	380xD
AU 25 25...	400	400	4.5	200xD	200xD	1280	1200	14	600xD	640xD	1600	3000	18	1500xD	800xD
AU 35 25...	400	400	6.5	200xD	200xD	1280	1200	21	600xD	640xD	1600	3000	26	1500xD	800xD
AU 50 25...	400	400	9.5	200xD	200xD	1280	1200	30	600xD	640xD	1600	3000	38	1500xD	800xD
AU 44 34...	800	800	16	400xD	400xD	3200	2800	65	1400xD	1600xD	3600	6000	73	3000xD	1800xD
AU 60 34...	800	800	22	400xD	400xD	3200	2800	90	1400xD	1600xD	3600	6000	100	3000xD	1800xD
AU 76 34...	800	800	29	400xD	400xD	3200	2800	115	1400xD	1600xD	3600	6000	130	3000xD	1800xD
AU 76 54...	1800	1800	64	900xD	900xD	7200	6400	250	3200xD	3600xD	10000	10000	360	5000xD	5000xD
AU 120 54...	1800	1800	100	900xD	900xD	7200	6400	410	3200xD	3600xD	10000	10000	580	5000xD	5000xD

Maximum Working Load Capacity - Slimline Carriages*4,6													
Carriage Part Number	Dry System, Slimline Type Bearing					Lubricated System, Slimline Type Bearing							
	L1(max)	L2(max)	Ms(max)	Mv(max)	M(max)	L1(max)	L2(max)	Ms(max)	Mv(max)	M(max)			
	N	N	Nm	Nm	Nm	N	N	Nm	Nm	Nm			
AU 20 195...	180	180	1.6	90xD	90xD	400	480	3.5	240xD	200xD			
AU 28 195...	180	180	2.3	90xD	90xD	400	480	5	240xD	200xD			
AU 25 265...	400	400	4.5	200xD	200xD	940	1150	10.5	575xD	470xD			
AU 35 265...	400	400	6.5	200xD	200xD	940	1150	15	575xD	470xD			
AU 50 265...	400	400	9.5	200xD	200xD	940	1150	22	575xD	470xD			
AU 44 360...	800	800	16	400xD	400xD	2000	2400	40	1200xD	1000xD			
AU 60 360...	800	800	22	400xD	400xD	2000	2400	55	1200xD	1000xD			
AU 76 360...	800	800	29	400xD	400xD	2000	2400	70	1200xD	1000xD			
AU 76 580...	1800	1800	64	900xD	900xD	4240	5200	150	2600xD	2120xD			
AU 120 580...	1800	1800	100	900xD	900xD	4240	5200	240	2600xD	2120xD			

Calculating 'V' Bearing Load Factor*1,3,4

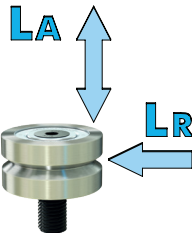
Many systems do not use a standard four-bearing **Carriage**. In such cases it is necessary to use conventional statics calculations to determine the loading on each **Bearing** in the system, by resolving loads into axial (LA) and radial (LR) components.

The maximum LA and LR load capacities for all types of Hepco 'V' **Bearing** are given in the table below. Capacities are included for both 'dry' and 'lubricated' conditions. This refers to the 'V' contact, since all **Bearings** are greased internally for life. Values are based on shock-free duty.

The load capacities stated in the table below assume that **Bearings** are used with **Slides** equal to or larger than the preferred Slide selection for that **Bearing** size. For details of the preferred sizes, see tables 34-37. For loading of **Bearings** with smaller **Slides**, please contact Hepco.

To calculate the system life, the load factor Lf should first be calculated using the equation below: Lf should not exceed 1 for any combination of loads.

Lf = (LA / LA(max)) + (LR / LR(max))



Maximum Working Load Capacity - Twin Type, Double Row and Slimline Bearings (N)*1,4														
Twin Type Bearing					Double Row (DR) Type Bearing					Slimline Type Bearing				
Part Number	Dry System		Lubricated		Part Number	Dry System		Lubricated		Part Number	Dry System		Lubricated	
	LA(max)	LR(max)	LA(max)	LR(max)		LA(max)	LR(max)	LA(max)	LR(max)		LA(max)	LR(max)	LA(max)	LR(max)
...J13...	22.5	45	60	120	-	-	-	-	-	-	-	-	-	-
...J18...	45	90	125	200	...J18 DR...	45	90	190	600	...J195...	45	90	100	240
...J25...	100	200	320	600	...J25 DR...	100	200	400	1500	...J265...	100	200	235	575
...J34...	200	400	800	1400	...J34 DR...	200	400	900	3000	...J360...	200	400	500	1200
...J54...	450	900	1800	3200	...J54 DR...	450	900	2500	5000	...J580...	450	900	1060	2600

Once Lf has been determined for each **Bearing**, the life can be calculated as follows:

Calculating Carriage or Individual 'V' Bearing Life*2,3,5,6

Life in km can be calculated using one of the two equations below. In these equations, the Basic Life is taken from the table below in respect of the **Bearing** type and the lubrication condition applicable.

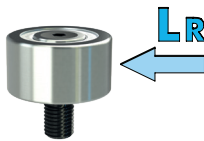
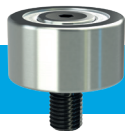
Dry System: Life (km) = Basic Life / (0.03 + 0.97Lf)^2

Lubricated System: Life (km) = Basic Life / (0.03 + 0.97Lf)^3

Basic Life*1,4								
Twin Type Bearing			Double Row (DR) Type Bearing			Slimline Type Bearing		
Part Number	Dry System	Lubricated	Part Number	Dry System	Lubricated	Part Number	Dry System	Lubricated
...J13...	40	50	-	-	-	-	-	-
...J18...	50	100	...J18 DR...	50	100	...J195...	50	100
...J25...	70	50	...J25 DR...	70	70	...J265...	70	50
...J34...	100	100	...J34 DR...	100	250	...J360...	100	250
...J54...	150	250	...J54 DR...	150	500	...J580...	150	200

Notes:

- The maximum values of LA and LR, and the magnitudes of the system Basic Life for each **Bearing** type relate to the performance of complete systems. Tests have shown these figures to be more reliable than working from the theoretical static and dynamic load capacities (C and Co) of the bearings. Values of C and Co have been included in tabulated data on the relevant **Bearing** pages as a means of comparison with other systems.
- The calculations within this section assume that the linear stroke involves a number of complete **Bearing** revolutions. If the stroke of any application is less than five times the **Bearing** outside diameter, calculate the distance travelled as if it moves five **Bearing** diameters per stroke. Systems operating at speeds in excess of 8 m/s may require additional calculation. Please contact Hepco for assistance.
- For the purposes of the Load/Life Calculations on this page, the axial load LA is the load in the axial direction that the **Bearing** can accept from a 'V' **Slide** engaged in its outer ring. Since the line of force is some distance removed from the axis of the **Bearing**, this value is much less than the theoretical axial load capacity, quoted on the relevant **Bearing** page.
- In the above calculations, the term 'lubricated' refers to the contact between the **Slide** and **Bearing** 'V's. This lubrication may best be achieved using Hepco **Cap Seals**, **Cap Wipers**, **Lubricators** or **Bleed Lubrication** facility. However, other methods that ensure the presence of suitable lubrication are acceptable.
- When a system consists of more than four **Bearings** per **Carriage** (see Application Examples 11 & 17), it cannot always be guaranteed that the load will share equally between all **Bearings**. In such cases, it is recommended that Controlled Height **Bearings** are specified (where available) and that the system is de-rated to allow for the life of the most heavily laden **Bearing**.
- For some sizes of DR **Bearing**, the actual life for applications with mainly L2/radial loads may be higher than the calculations indicate. This is because the calculations are simplified for easy use. Please contact Hepco for details in instances where a higher system life is required.



Systems incorporating [Track Rollers](#) running on [Flat Tracks](#) or the flat faces of [Single Edge Spacer Slides](#) will require a different calculation to determine the load and life. Track Rollers only have a radial load capacity stated, as they are not usually loaded axially. Their pure rolling contact with the Track means that they do not need to be de-rated for use in unlubricated applications (although it is recommended that the Tracks and Rollers be lightly oiled for best performance).

Calculating the System Load Factor*1

To calculate the Roller life, the load factor L_F should first be calculated using the equation below: L_F should not exceed 1.

$$L_F = \frac{L_R}{L_{R(max)}}$$

The maximum radial load capacity $L_{R(max)}$ for the Hepco range of [Track Rollers](#) is stated below:

Max Working Load Capacity*1			
Narrow Roller Type	$L_{R(max)}$	Wide Roller Type	$L_{R(max)}$
	N		N
LRN 18...	400	...R 18...	600
LRN 25...	1000	...R 25...	1600
LRN 34...	2000	...R 34...	3200
LRN 54...	5000	...R 54...	8000

Calculating Track Roller Life*2

With L_F determined for each Roller, the life in km can be calculated using the equation below. Please note that the 'Basic Life' for all Track Rollers is 1000 km, so a lookup table is not required.

$$\text{Life (km)} = \frac{1000}{L_F^3}$$

Load Capacity of the Track Roller Running Surface

In a system using a Track Roller running on a flat surface, it may be necessary to reduce the maximum loads applied if the track is not sufficiently hard. All Hepco [Flat Tracks](#) are hardened, and these can be used in conjunction with Hepco Track Rollers up to the maximum load capacities stated in the table above. Even higher loads up to the static load capacity, C_o , of the bearings (see Track Roller [43-45](#)) are possible without damage.

For softer running faces, such as the rear face of the Hepco [Single Edge Spacer Slides](#), the maximum [Track Roller](#) loads are reduced as stated in the table below:

Track Roller Maximum Load Capacities (N)				
Description of Track Roller Running Surface	Used with Track Roller type			
	LRN18...&...R18...	LRN25...&...R25...	LRN34...&...R34...	LRN54...&...R54...
Hepco Flat Tracks FT...	The load is limited by the $L_{R(max)}$ figure for the Track Roller			
Rear of Hepco Single Edge Slide	310	510	680	1600

It should be noted that while a softer running face will limit the maximum load that can be exerted by a [Track Roller](#), the life of the Track Roller at any given load is not affected.

Notes:

- 1. The values of L_R , and the system Basic Life for each [Track Roller](#) relate to the performance of complete systems. Tests have proven these figures to be more reliable than working from the theoretical static and dynamic load capacities (C and C_o) of the bearing. Values of C and C_o have been included in tabulated data on the relevant Track Roller pages as a means of comparison with other systems.
- 2. The calculations within this section assume that the linear stroke involves a number of complete [Track Roller](#) revolutions. If the stroke of any application is less than five times the Track Roller outside diameter, then please calculate the distance travelled as if it moves five Track Roller diameters per stroke. Systems operating at speeds in excess of 8 m/s may require additional calculation. Please contact Hepco for assistance.



'V' Slides

Material and finish: High carbon bearing steel AISI 52100, hardened on 'V' faces to typically 58-62 Rockwell 'C' scale. Those areas which are ground have N5 surface finish. Other areas have a chemical black finish.

Flat Tracks

Material and finish: Carbon or alloy steel, hardened on all faces to typically 58-62 Rockwell 'C' scale. Areas which are ground have N5 surface finish. Other areas have a chemical black finish.

Bearings & Track Rollers

Raceways & balls: Carbon-chromium bearing steel AISI 52100, hardened and tempered.
Shields: Steel with bright zinc plated finish.
Seals: Nitrile rubber
Cage: Plastic
Axles: High tensile steel with tensile strength = 695 N/mm². Chemical black finish.
BH...'E' base plate: Steel with chemical black finish.
Temperature range: -20°C to +120°C

Carriage Plates, Slide Beams, End Stops, Shock Absorber Fixing Blocks & Flange Clamps

Material: High strength aluminium alloy
Finish: Clear anodised to 15µm thickness.

Carriage Plate & Slide Counterbore Plugs

Material: Plastic

Cap Seals

Material: Body: Thermoplastic elastomer
Inserts: Impact resistant plastic
Wipers: Felt
Temperature range: -20°C to +60°C

Cap Wipers & Lubricators

Material: Impact resistant plastic with felt wiper.
Temperature range: -20°C to +60°C

Racks

Material and finish: Carbon steel with chemical black finish [↓](#).

Pinions

Material and finish (< Mod 1): EN40B steel. Unground. Teeth hardened. ISO 1328-1 accuracy grade 10.
Material and finish (≥ Mod 1): Standard version: Case hardened EN36 steel. Teeth and bore ground to N5 finish. ISO 1328-1 accuracy grade 6.
Stainless steel version: Hardened 420 series stainless steel. Ground on teeth and all main surfaces to N5 finish. ISO 1328-1 accuracy grade 6.

Frictional Resistance for 'V' Slide Systems

Coefficient of friction (without [Cap Seals](#), [Cap Wipers](#) or [Lubricators](#)) = 0.02
Cap Seals and Lubricators add friction as follows:
Four Cap Seals or Wipers per [Carriage](#) CS18 or CW195 = 4 N, CS25 or CW265 = 7 N, CS34 or CW360 = 15 N, CS54 or CW580 = 28 N
LB12 = 1 N, LB20 & LB195 = 1.5 N
LB25 & LB265 = 2.5 N LB44 & LB360 = 3 N
LB54 & LB580 = 4 N
Two Lubricators per Carriage

External Lubrication

[Cap Seals](#) and [Cap Wipers](#) should be lubricated with grease NLGI consistency No. 2.
[Lubricators](#) should be oiled using 68 cSt viscosity or similar oil. Food compatible lubricants can also be used.

Maximum Linear Speeds for 'V' Slides & Bearings and Flat Tracks & Rollers

Unlubricated 'V' Slides = 2 m/s
Lubricated 'V' Slides and all Flat Track applications = 8 m/s } Higher speeds are possible. Speed depends upon stroke, duty and environmental conditions.

Material specifications may change for reasons of technical advantage or availability.

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