



HepcoMotion® GV3

LINEAR GUIDANCE AND TRANSMISSION SYSTEM







BWC.COM

Additional information can be viewed within the online GV3 Technical Guide when you click this icon:



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

HDS2 Heavy Duty Linear Guide

The full contents of the GV3 Technical Guide can be viewed or downloaded by clicking this icon:



GV3 linear guidance and transmission system

Smooth – Fast – Accurate – Quiet Durable

Simple – Versatile – Economic

An unrivaled linear motion system, designed to serve a diverse range of automation and linear applications.



Contents BWC.com

System Co	mposition	4 - 11		Standard & Slimline Carriages	24 - 27
	Belt Driven Carriages	8		Slides	28 - 33
	Floating Bearings	9		Slide Beams	34 - 35
	Axial Stiffness Bearing	9		Standard & Slimline Bearings	36 - 39
(5) (5) (5) (5) (5) (5) (5) (5) (5) (5)	Vacuum & Extreme Temperature	9		Lubrication Devices	40 - 42
	GV3-MCS Connectivity	9		Bleed Lubrication	43
00	Flange Clamps	10		Flat Tracks	44
	Removable Carriages	10		Track Rollers	45 - 47
The state of the s	Side Access Adjustment	10	THE THE PARTY OF T	Racks	48
	Carriage Locking Device	- 11	THE PARTY OF THE P	Pinions	49
	End Stops & Shock Absorbers	- 11		Rack Driven Carriages	50
Applicatio	n Examples	12 - 19	Gearboxes AC Geared	, Drive Flanges & I Motors	51
Full Size III	ustrations	20 - 22	+ Load/	Life Calculations	52 - 54
System Se	lector	23	Technical S	pecifications	55
System Ass	embly & Adjustment	Ţ	Drive Syste	m Recommendations	Ţ
Drive Calcu Rack Driver	ulations for Carriages	<u></u>	Load/Life C	Calculation Examples	Ţ
Deflection of Self-Suppor		Ŧ		& Match' ponent Compatibility	Ţ
Data & Dim Assembled	nensions for Systems	Ţ	kg Comp	ponent Mass	Ţ

Linear Motion System with Standard Bearings

INDIVIDUAL COMPONENTS, OR FULLY-ASSEMBLED AND ADJUSTED SYSTEMS, **READY TO INSTALL**

ALL SLIDES (COMMON FEATURES) (L. 28-33)

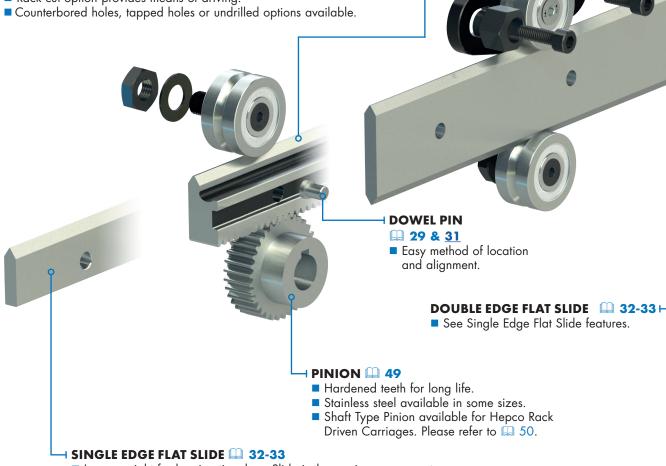
- One piece construction for assured parallelism and rigidity.
- Manufactured from high quality bearing steel.
- Deep hardened V faces for maximum wear resistance.
- Soft center section allows customizing.
- Any length supplied up to 4 meters.
- Unlimited length achieved by butting.
- Attractive, corrosion inhibiting black finish on unground faces.
- Common 70° 'V' allows many Bearing/Slide combinations.

BLIND HOLE BEARING 36-37

- For mounting into thick plates or where access to opposite side is restricted.
- Eccentric version adjusted from operating side for ease of access.
- Concentric version (shown on opposite side of the Slide) has threaded axle and locates into tapped hole in the mounting surface.



- Mounts directly to a flat surface. No spacer required.
- Can be spaced apart for high moment load capacity.
- Back face provides mounting register, or running surface for Track Roller.
- Keyway and datum edges provide means of location and alignment.
- Rack cut option provides means of driving.



- Lower weight for less inertia where Slide is the moving component.
- Lower cost in cases where spacer is part of customer's construction.
- Plain hole, or counterbored fixing option for flush top surface.
- Single Edge Flat Slides can be spaced apart for high moment load capacity.

STANDARD CARRIAGE . 24-25

- Factory adjusted to chosen Slide, if required.
- Carriage Plate available as an individual item, for self assembly.
- Useful size platform with flush surface and tapped holes for mounting purposes.
- Available with Bearings only, or with the addition of Cap Seals or Lubricators.
- Controlled height option for special accuracy requirements.
- Removable option for direct disengagement from Slide.

SEE APPLICATION EXAMPLES SECTION FOR DESIGN IDEAS

LUBRICATOR 🛄 42

- Lubricates contact surfaces, increasing load capacity and life.
- Long lubrication interval.
- Lightly sprung felt wiper ensures low friction.
- Can be attached from either side of a Carriage.
- Flanged and Compact versions available.



- Mounts directly to a flat surface. No spacer required.
- Keyway and datum edges provide means of location and alignment.
- Can be supplied with Rack mounted on top surface.
- Counterbored hole fixing, tapped hole fixing or undrilled options available.



- Lubricates contact surfaces, increasing load capacity and life.
- Lubricated for life in most applications.
- Seals against ingress of debris.
- Improves operational safety.
- Incorporates both through hole and tapped hole fixing facility.

STANDARD BEARING FIXING TYPES 4 36-37

- Concentric axle type provides datum for the system.
- Eccentric axle type provides adjustment for the system.
- Two axle lengths available, long & short.
- Controlled Height option improves system height accuracy.
- Blind Hole Fixing types (see 🚨 4).
- Double eccentric axle version available to enable direct removal of Carriage from a Slide. Useable only with Removable Type Carriage, due to hole positions. Please refer to the GV3 Technical Guide ...



TWIN BEARING (shown left)

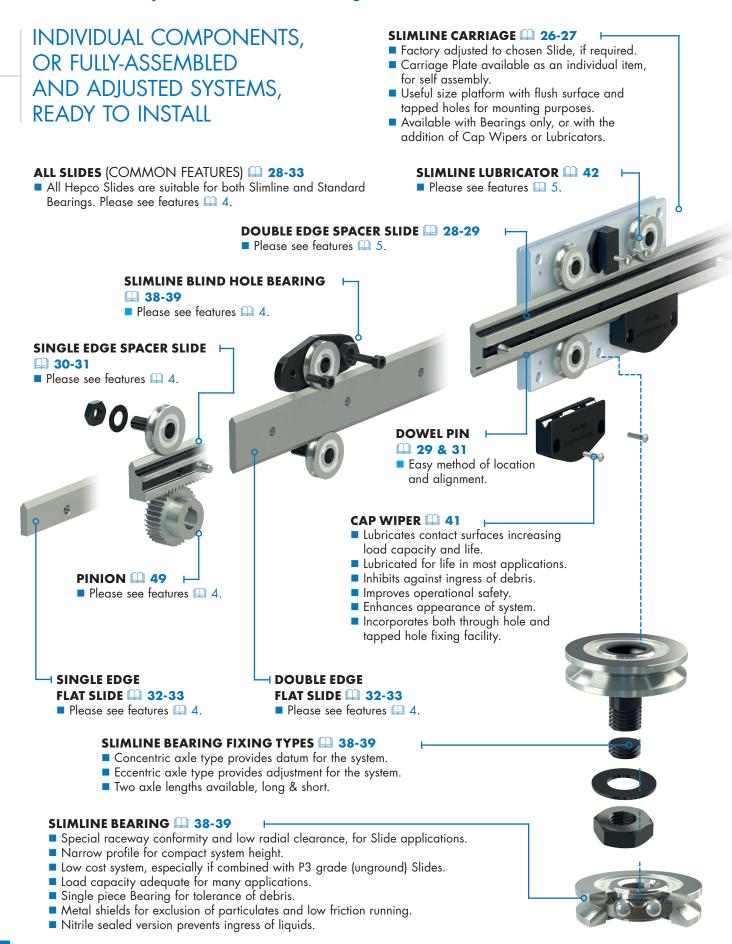
DOUBLE ROW BEARING (shown right) 4 36-37

- Twin Bearing for tolerance of misalignment and smooth running.
- Double Row Bearing for debris tolerance and higher load capacity.
- Special raceway conformity and low radial clearance.
- Metal shields for exclusion of particulates and low friction running.
- Nitrile sealed version prevents ingress of liquids.
- Lubricated for life internally.





Linear Motion System with Slimline Bearings



Linear Motion System with Flat Track & Rollers

TRACK ROLLERS (COMMON FEATURES) 45-47

- Size and load capacity equivalent to Hepco 'V' Bearings.
- Special raceway conformity with low radial clearance.
- Crowned running face for tolerance of misalignment.
- Metal shields for exclusion of particulates and low friction running.
- Nitrile sealed version prevents ingress of liquids.
- Designed to run on Flat Track or back face of Single Edge Spacer Slides.

WIDE TRACK ROLLER 46-47

- Concentric axle type (shown above Flat Track) provides datum for the system.
- Eccentric axle type (shown below Flat Track) provides adjustment for the system.
- Two axle lengths available, long & short.

BLIND HOLE WIDE TRACK ROLLER 46-47

- For mounting into thick plates or where access to opposite side is restricted.
- Adjustable from operating side, for ease of access.

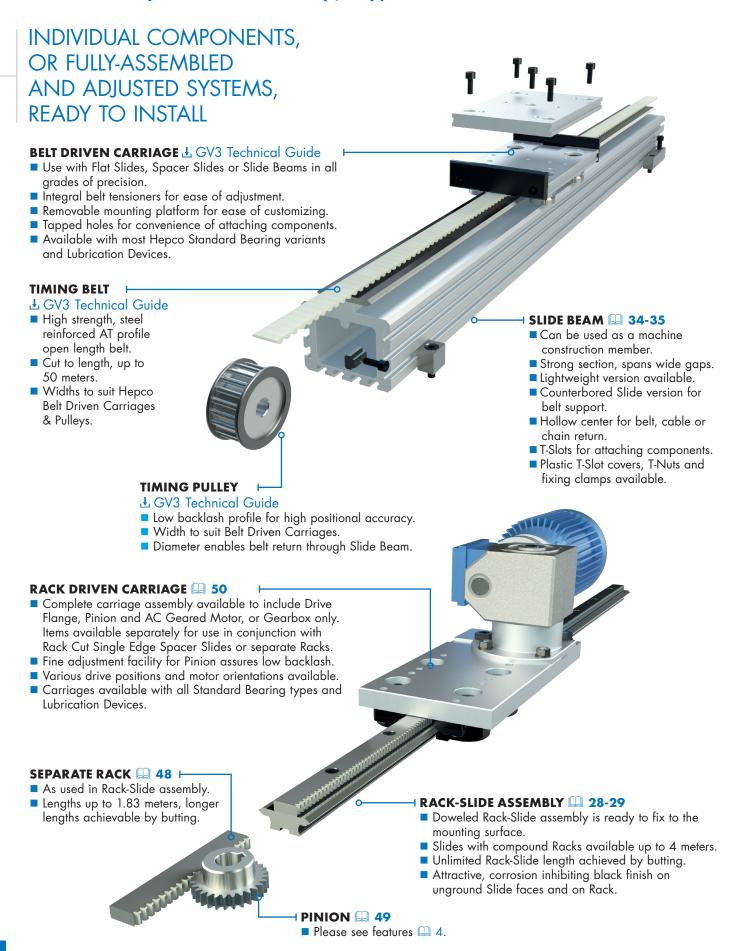


FLAT TRACK 🛄 44

- Choose from ground all over, ground on opposing faces, or unground.
- Deep hardened faces for maximum wear resistance.
- Manufactured from high quality carbon steel.
- Offset fixing holes for versatility of mounting.
- Four useful sizes compatible with Hepco 'V' Slides.
- Any length supplied up to 4 meters in most sizes.
- Unlimited length achieved by butting.

SINGLE EDGE SPACER SLIDE & CONCENTRIC V BEARING Please see 6 6 for features and page references. NARROW TRACK ROLLER 45 Concentric axle type provides datum for the system. Eccentric axle type provides adjustment for the system.

Linear Motion System with Drive Facility / Support Structure



Ancillary Components

FLOATING BEARING

- Provides axial movement (float) of the 'V' position to compensate for parallelism error when two Slides are mounted in parallel.
- Caged needle roller bearing for high speed operation.
- Nitrile seals to prevent ingress of debris.
- Lubricated for life internally.

See Application Examples 🕮 14 & 17

SEE **APPLICATION EXAMPLES SECTION** FOR DESIGN IDEAS







VACUUM AND EXTREME TEMPERATURE BEARING

- All stainless steel construction.
- Grease types for either extreme high temperature or extreme low temperature applications.
- Available in most GV3 sizes including Blind Hole Fixing versions.
- Also available in Track Roller format.

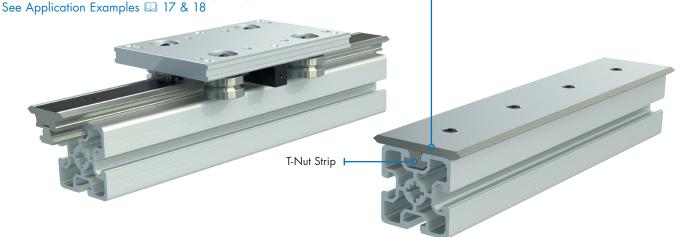
See Application Examples 19

AXIAL STIFFNESS BEARING

- Developed for applications where system height needs to be stable under deflection and vibration.
- Suited to light and moderately-loaded busy systems, requiring maximum stiffness and precision under axial loading of the Bearing.
- Interchangeable with Standard Bearing sizes 25 and 34.
- Supplied with nitrile seals as standard.

MCS-GV3 CONNECTIVITY

- GV3 Spacer Slides and Flat Slides can be mounted to
- Hepco MCS (Machine Construction System) profiles.
- Can be supplied factory-assembled, ready for installation.
- Hepco T-Nut Strip provides a location for Spacer Slides and retains fastener positions in the event of disassembly.
- Comprehensive range of aluminum profiles and Slide mounting combinations available, including Single Edge Slides.



Ancillary Components

INDIVIDUAL COMPONENTS, OR FULLY-ASSEMBLED AND ADJUSTED SYSTEMS, **READY TO INSTALL**

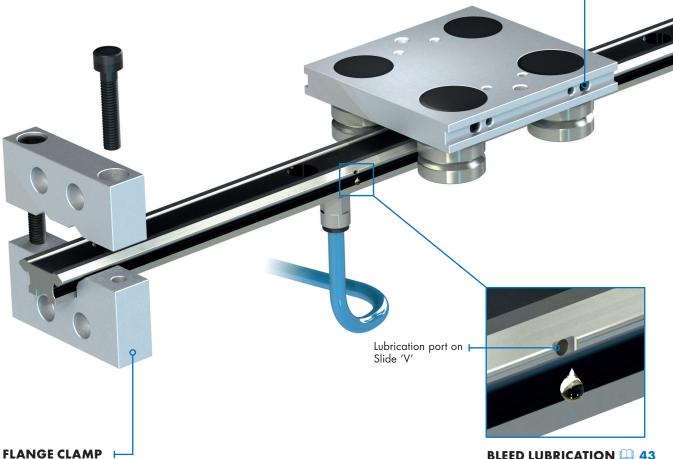
REMOVABLE CARRIAGE & GV3 Technical Guide

Incorporates Double Eccentric Bearings to enable complete removal of the Carriage. Please see Side Access Adjustment below and in the GV3 Technical Guide L for an alternative method of removal without having to first disassemble mounted components.



CARRIAGE WITH SIDE-ACCESS ADJUSTMENT & GV3 Technical Guide

- Alternative method of Bearing adjustment, allowing fine and controlled setting.
- Available with sizes Ø25, Ø34 and Ø54 Standard Bearings.
- No necessity to remove customer components from the Carriage Plate when adjusting.
- Adjustment is sufficient to remove Carriage directly from the Slide.
- Secure setting. Will not alter under abnormal service conditions.
- Advantageous in applications where access required to adjust Standard Eccentric or Double Eccentric Bearings is limited.



- Enables Slide to become a self supporting beam.
- Two mounting possibilities, face fixing or base fixing.
- Easy removal of Slide and positive relocation.
- Available in long or short type, to support a Slide at one or both ends.

BLEED LUBRICATION 43

- Channels lubricant directly to the 'V' surface of Slides.
- For connection to any centralized lubrication system, dispensing pump and controller or pressure feed canister.

END STOP & GV3 Technical Guide

- Provides a physical stop to the linear movement and impact protection should a system overrun.
- Conical buffer provides a controlled deceleration to the Carriage to protect the system and payload.
- May be positioned anywhere along the length of a Slide for maximum flexibility.

SEE APPLICATION **EXAMPLES SECTION** FOR DESIGN IDEAS



■ Provides a safe and simple method of manually locking a Standard Carriage in position to facilitate processes where a secure, stationary platform is required.

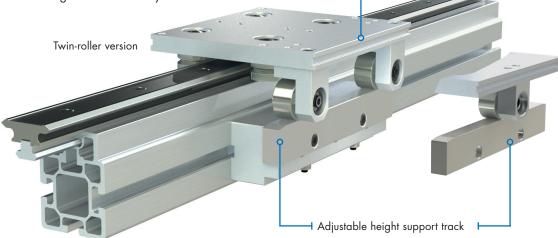
MOMENT LOAD CARRIAGE

- Provides extra support and rigidity in applications where high downwards or offset loads are anticipated, typically at work stations.
- Two sizes of Carriage/Slide combinations available.
- Available with two types of work station support static roller type and dynamic roller type (shown) - both designed to connect to a track system support beam.
- Single-roller or twin-roller configurations.
- Carriage locking system available for precise positioning of Carriage when stationary.

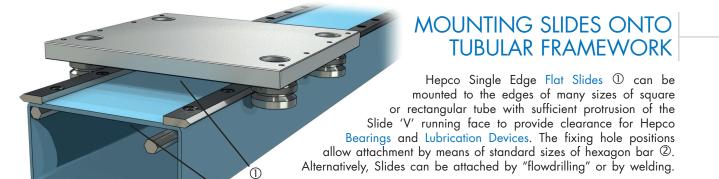
SHOCK ABSORBER

♣ GV3 Technical Guide

- Increases life of the Slide System by reducing stress on internal elements and reducing wear on the Slide in crucial deceleration zones.
- Permits higher operating speeds and reduces maintenance costs and noise levels.
- Enhances safety in the event of control system failure.
- Compatible with Standard and Slimline Carriages.
- Top mounting, end mounting or clamp mounting types available, according to Slide size and type.

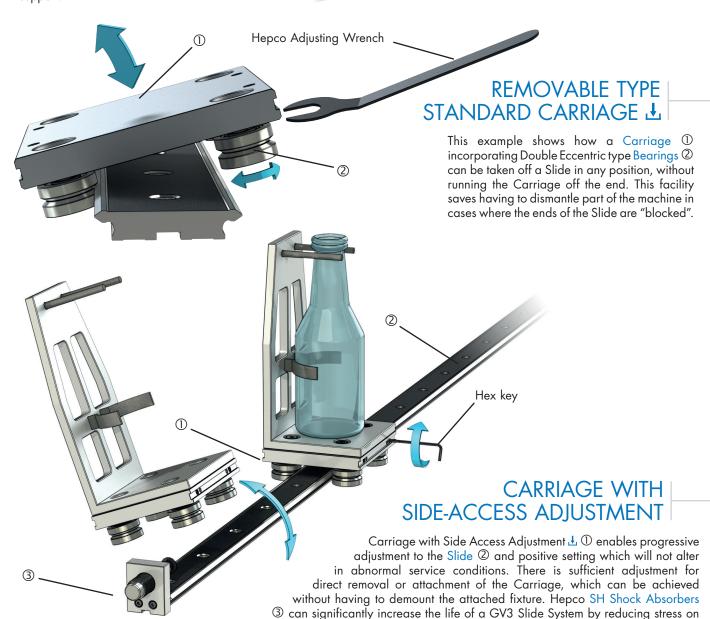


Single-roller version

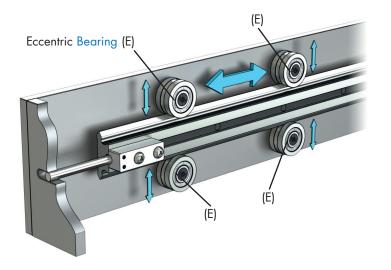


LOW HEIGHT SYSTEM

A very compact Slide System can be achieved by using Hepco Flat Slides ① in conjunction with Slimline Bearings ② and by choosing thin section material for the Carriage and Slide support.



components and minimizing wear on the Slide in the crucial deceleration zone.

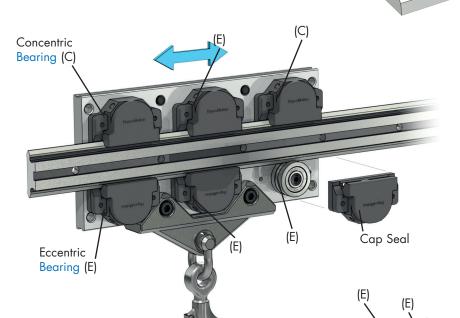


EASE OF ALIGNMENT USING ALL ECCENTRIC BEARINGS

This example shows the possibility to adjust the Hepco GV3 Slide System in one plane, thus avoiding the necessity for precision drilling and fitting.

LIGHT LOADS

Where very light loads are anticipated, three Bearings may be used instead of the usual configuration of four. This saves on component cost and assembly time.



HEAVY LOAD REQUIREMENTS

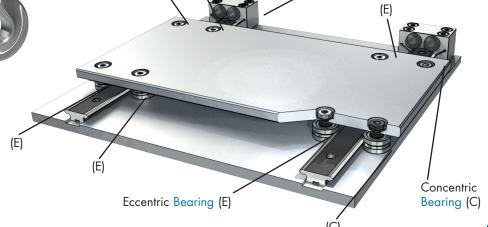
For increased load capacity, additional Eccentric Bearings 'E' may be installed in between the outermost ones. Multiple Bearing installations benefit from the use of Controlled Height Bearings & which ensure better load distribution. Cap Seals will provide lubrication and maximize load capacity.

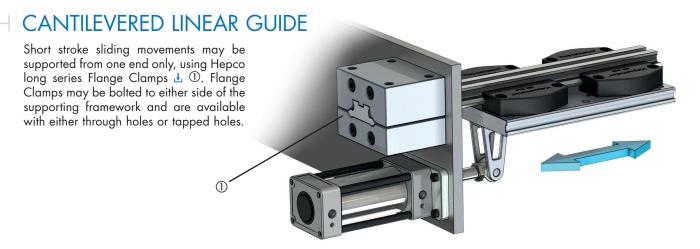
Alternatively, Hepco HDS2 Heavy Duty Linear Guide and MHD Track Roller Linear Motion systems may be used for very high load.

End Stop 🕹

WIDE PLATFORM

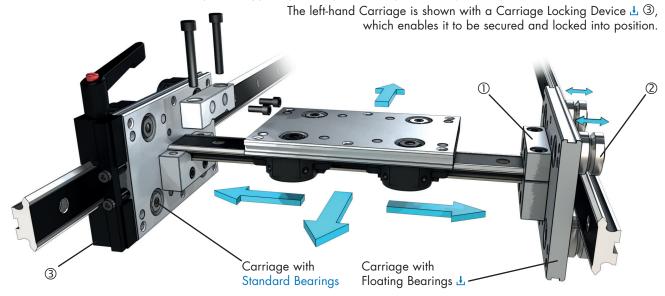
Rigidity of a wide platform is achieved by mounting Slides in parallel. Single Edge Slides should be considered for long platforms.



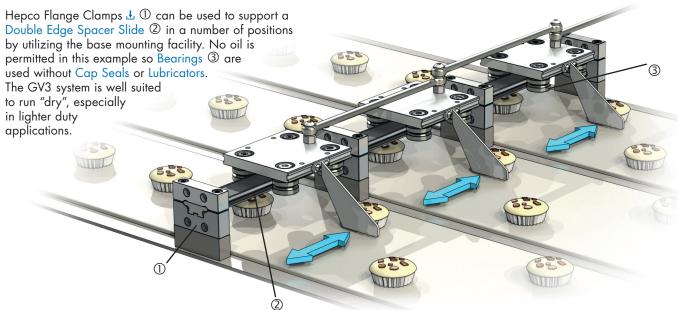


SIMPLE TWO AXIS CONNECTION

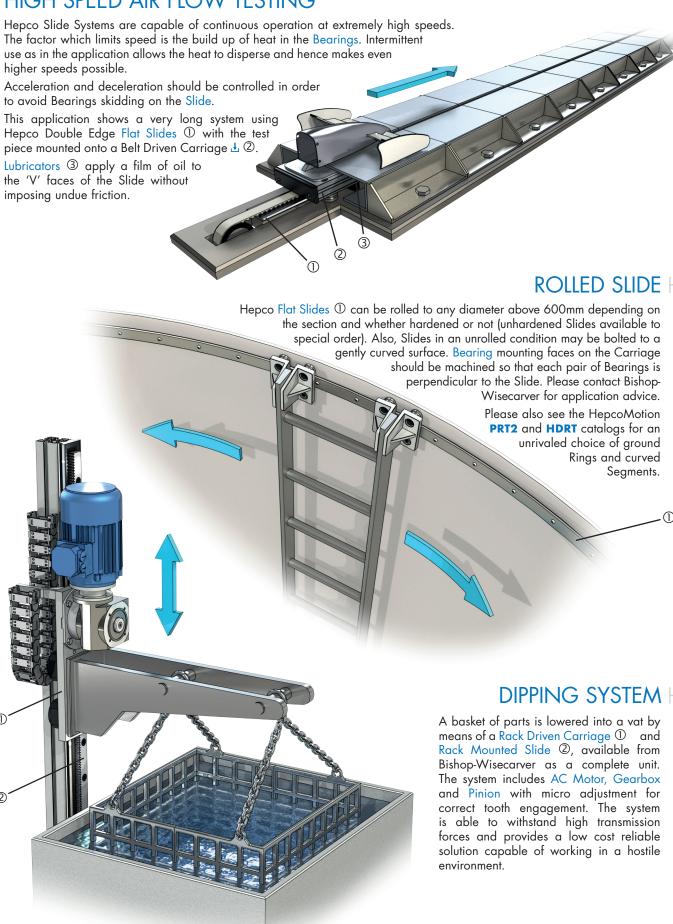
Hepco short series Flange Clamps & ① are an ideal method of connecting opposing Carriages and creating a second axis which can be easily installed or removed. To overcome the necessity to set opposing Slides parallel, Hepco Floating Bearings & ② are used on one side.



MULTI-LANE ROW DIVIDER



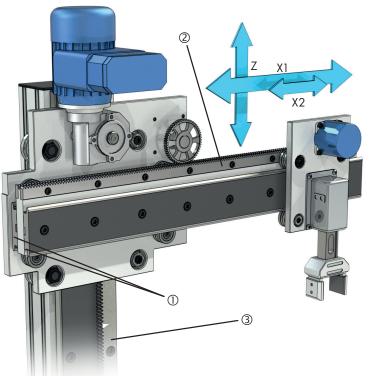
HIGH SPEED AIR FLOW TESTING



REMOTE CONTROLLED CAMERA

Hepco Slides are used extensively in the theatre and film industry for positioning cameras or lighting.

This example shows a Hepco Slide Beam ① with flush Slide surface for engagement with a friction drive roller. The Slide Beam which is attached to the ceiling members, provides a rigid foundation and absorbs vibration.





TELESCOPIC PICK AND PLACE GANTRY

The telescopic beam can travel alternately either side of the support column, between production lines, enabling components to be moved from one line to the other.

The beam retracts out of the paths of adjacent production lines, enabling components to be moved from one line to another without interrupting flow.

Primary X axis: Double Edge Spacer Slides

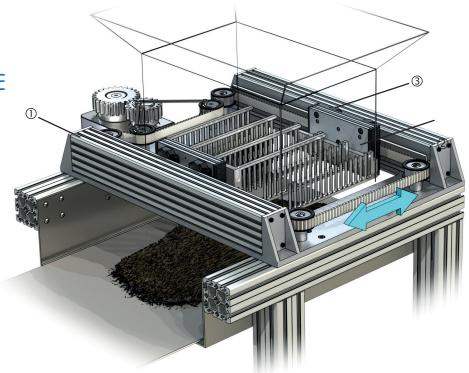
① are mounted back to back, sandwiching the support plate for the Hepco Racks ②, providing a compact design and a rigid beam.

Secondary X axis: The gripper mechanism is driven end-to-end along the beam by motor and Pinion engaged in the secondary Rack.

Z axis: A Hepco 120mm wide Spacer Slide with Rack ③ is chosen for the vertical axis to withstand the high moment forces involved.

PULVERIZING MACHINE

Hepco Slide Beams ① complete with Belt Driven Carriages 上 ② enable a simple contra-reciprocating motion to be achieved. The high stiffness of the Slide Beams contribute to the rigidity of the structure and absorb vibration. The unique belt tensioning device within the Carriage enables easy adjustment and positioning of the pulverizing combs. Hepco Cap Seals ③ ensure long life without further re-lubrication in this application and prevent debris entering the Bearings.

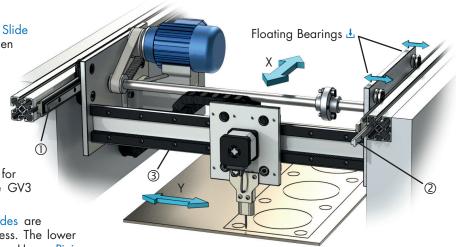


HIGH SPEED MARKING MACHINE

X axis: The Hepco Double Edge Spacer Slide with Rack ① assures parallelism between teeth and 'V' faces of the Slide, providing smooth motion with low backlash. Hepco Floating Bearings ₺ mounted on one side allow for imperfection of parallelism between the opposing X axis Slides to be accommodated. Hepco MCS Machine Construction

System profiles with T-Nut fixing facility ② provide a useful method for attaching the X axis Slides. Please see GV3 Technical Guide ☑.

Y axis: Hepco Single Edge Spacer Slides are mounted wide apart for increased stiffness. The lower Rack Cut Slide 3 enables direct drive via a Hepco Pinion.



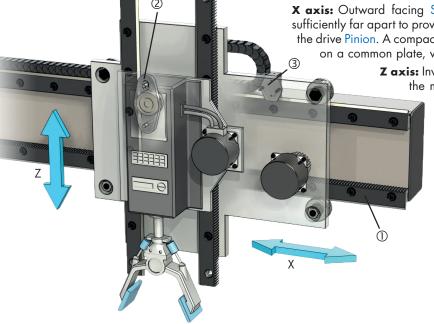
COMPACT RACK DRIVEN X-Z MOVEMENT

X axis: Outward facing Single Edge Spacer Slides ① are mounted sufficiently far apart to provide the required rigidity and to accommodate the drive Pinion. A compact design is achieved by mounting the Bearings on a common plate, which also supports the Slides for the Z axis.

Z axis: Inward facing Single Edge Spacer Slides allow the motor and drive Pinion to be accommodated adjacent to the gripper housing. Blind

Hole Fixing Bearings ② are used as through hole fixing is not possible.

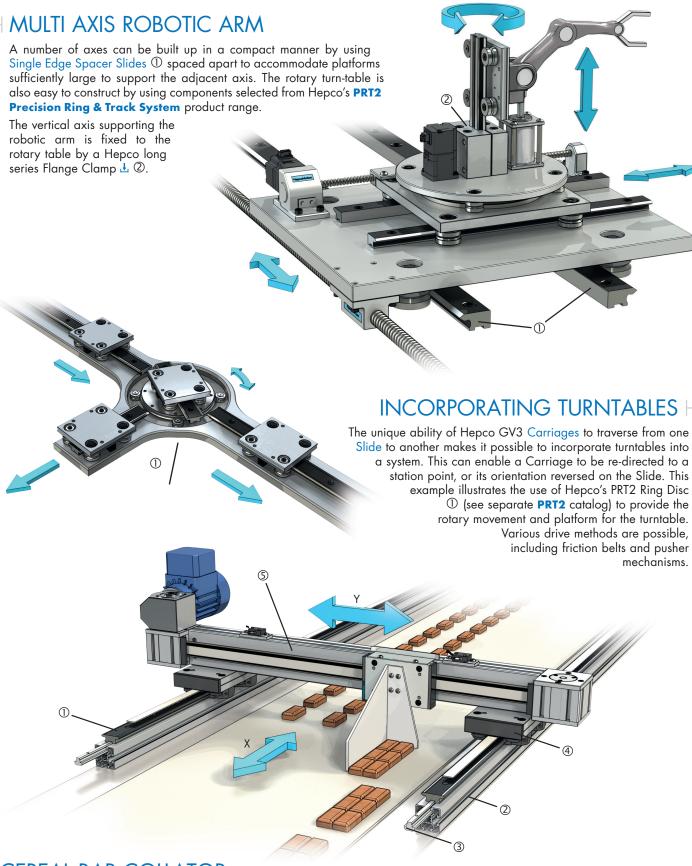
Lubricators 3 are used throughout for friction free application of oil to minimize risk of stalling the stepper motors.



TELESCOPIC LOADER

suitable ratio.

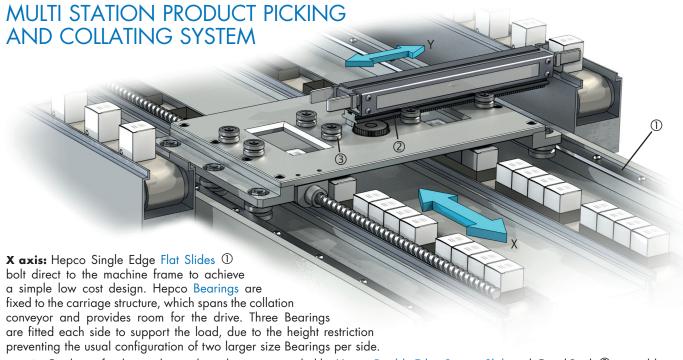
Hepco Flat Slides ① combined with Slimline
Bearings ② produce a low profile Slide System
enabling a compact telescopic system to be
designed. Hepco Racks ③ are
easily incorporated to
provide an efficient
means of driving
via Pinions of a



CEREAL BAR COLLATOR

X axis: Hepco Spacer Slides ① attach to Hepco MCS Machine Construction System aluminum profiles ② by means of Hepco T-section location strip ③. Hepco Belt Driven Carriages 🕹 ④ incorporate an easy means of tensioning as well as providing support for the Y-axis.

Y axis: Comprises a Hepco DLS Driven Linear System unit ⑤, which is a complete linear motion element with pulleys, switch components and motor gearbox, if required. Please see separate DLS catalog.

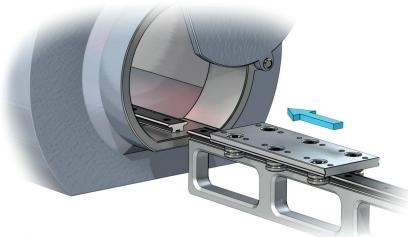


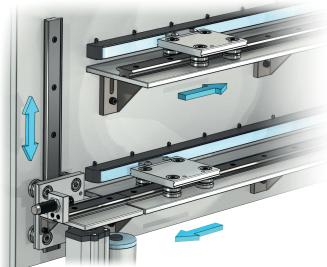
Y axis: Guidance for the product picking device is provided by Hepco Double Edge Spacer Slide with Fitted Rack ② to enable drive via a Hepco Pinion. The Slide runs in a "railway" of Controlled Height Twin Type Bearings & ③, which ensure alignment and compliance as the Slide engages. All Eccentric type Bearings are used except the two outermost on one side, which are the Concentric type in order to provide a datum for the system.

TRAVERSING A GAP

In this example, a special Six Bearing Carriage moves in and out of a chamber, traversing a gap between two Slides to provide room for a sealing door to close. The Slides have a special tapered lead-in profile for smooth transition.

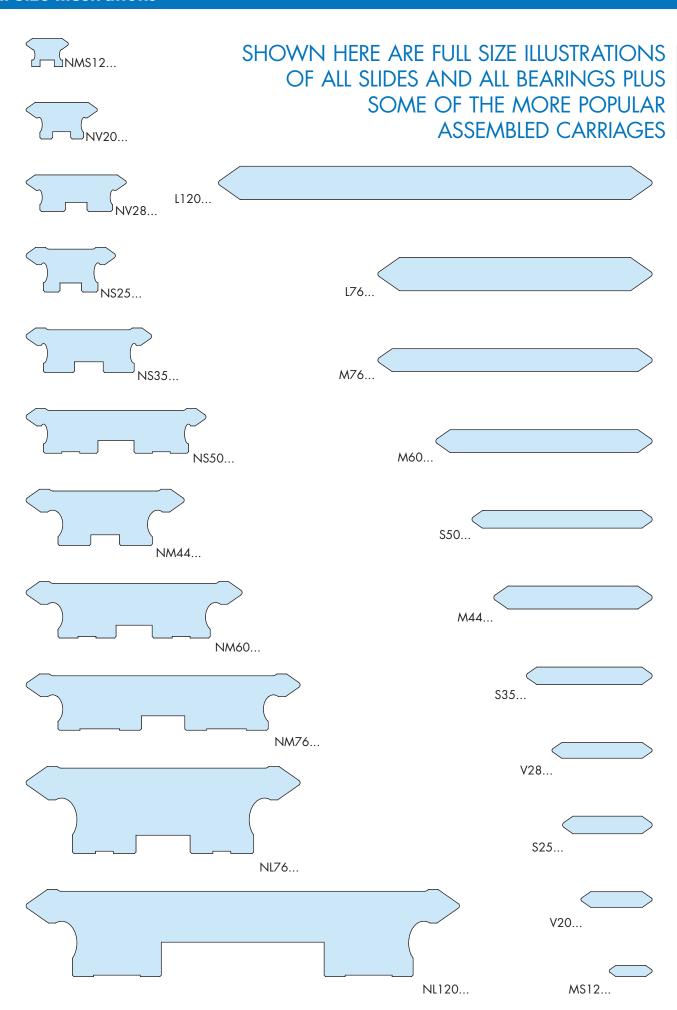
For vacuum applications, Hepco Extreme
Temperature & Vacuum Bearings &
are available, in addition to Hepco's **SL2 Stainless Steel Linear Guide** product range.

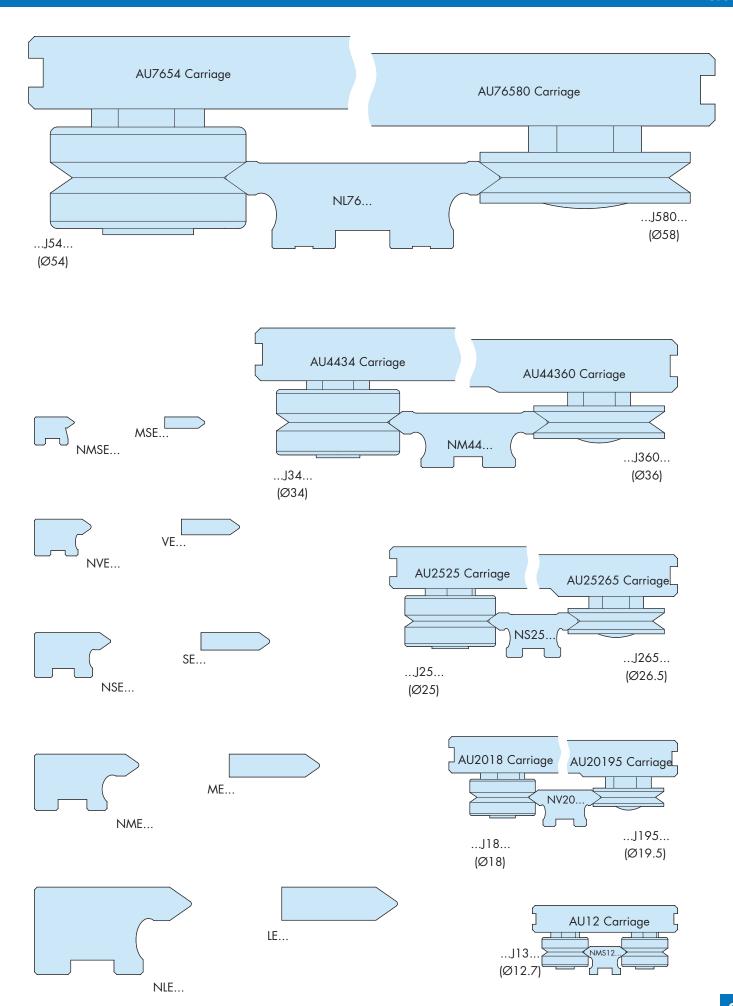


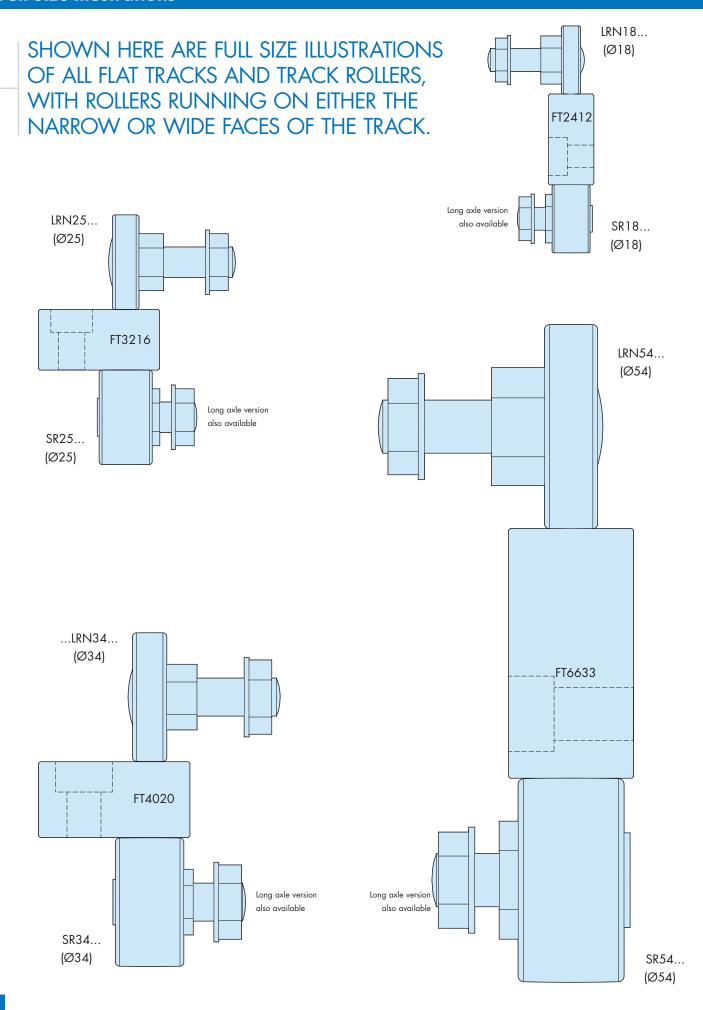


TRANSPORT SYSTEM

A unique feature of the Hepco GV3 system is the ability of a Slide to be moved into near perfect alignment with another Slide for smooth transfer of Carriages. It is therefore possible to switch lanes and change direction. This example shows Carriages being driven by friction belt onto a Slide, which is then elevated to another level. Carriages are cycled around the system, maintaining the same orientation. Customers requiring high speed operation with orientation in the direction of travel, should consider Hepco's PRT2 Precision Ring and Track System product range.







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 4–11 and pages relating to the individual components for other features, benefits and variants.

Bearing Type	-(i) -	oad	Speed	Smoothness	Tolerance of Misalignment	Rigidity	System Height	Tolerance of Debris	Price
-71-5	<u></u> • •	<u></u>	<u>•</u>	<u> </u>	<u></u>	<u>•</u>	<u> </u>	<u> </u>	<u></u>
Twin Bearing	attl	attl	aull	attl	attl	attl	attl	attl	and I
Double Row Bearing	attl	attl	attl	attl	attl	attl	attl	attl	attl
Slimline Bearing	all	attl	attl	att	attl	attl	attl	adl	.ull
Floating Bearing	aill	attl	aull	attl	attl	aul	attl	aull	attl

Slide Precision	on $\sqrt{}$ = ground	General Accuracy	Smoothness / Quietness	Friction	Price
Grade	surface	⊕ ⊚	<u></u>		◎ ○
P1		attl	attl	attl	attl
P2		attl	attl	attl	aill
Р3	- =	attl	attl	attl	adl

Lubrication Method	Load	Lubrication Interval	Exclusion	Friction	Safety & Appearance	Price
Memod	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
None	attl	attl	*	attl	attl	adl
Lubricators	adl	atil	*	attl	attl	adl.
Cap Seals or Cap Wipers	adl	all	attl	atil	adl	
Hepco Bleed Lubrication	adl	Automatic lube frequency possible	*	will	attl	adl

^{*}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.

Standard Carriages

HepcoMotion Standard Carriages are available to suit all sizes of Double Edge Slides, in all grades of precision. Carriage Plates are precision machined from aluminum alloy and are supplied clear anodized.

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

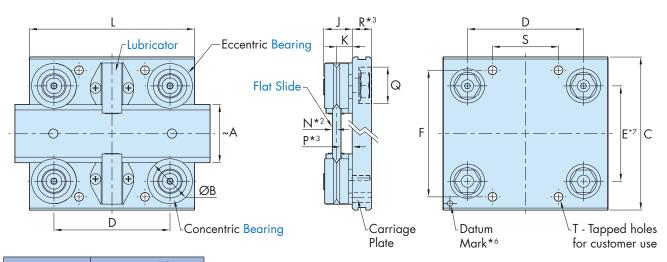
Removable Carriages incorporate Double Eccentric Bearings, enabling the Carriage to be removed directly from the Slide. For full information and ordering information, please refer solely to the GV3 Technical Guide 4.

The following types of Bearing and Lubrication Device may be specified (refer also to the availability table 🚨 25).

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



	D	L		Use \	With																
	Pari			-//		-7/	~A	ØB	С	E*7	F	G	*2	Н	J	K	M	N	*2	P*3	
	Numb	er	Too									P1	P2 & P3					P1	P2 & P3		
AU	12P1/P	2 13	NMS	10	MS	12	12	13	40	22.0	30	19	19.2	_	10.1	5.47		1.53	1.6	3.8	
AU	12P3	13	14/4/2	12	1713	12	12	13	40	23.0	30	17	17.2	-	10.1	3.47	,	1.55	1.0	3.0	
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	
AU	28	18	NV	28	V	28	28	10	72	42.7	58	25.75	25.95	14	12.4	0.73	65	2.14	2.2	5.5	
AU	25	25	NS	25	S	25	25		80	46.6	65	30.5	30.7				78.5				
AU	35	25	NS	35	S	35	35	25	95	56.6	80	31.5	31.7	18	16.6	9	88.5	2.39	2.5	6.5	
AU	50	25	NS	50	S	50	50		112	71.6	95	33	33.2				103.5				
AU	44	34	NM	44	М	44	44		116	72.3	96	38.5	38.7				116				
AU	60	34	NM	60	М	60	60	34	135	88.3	115	41	41.2	22.5	21.3	11.5	132	3.14	3.2	8.3	
AU	76	34	NM	76	M	76	<i>7</i> 6		150	104.3	130	42	42.2				148				
AU	<i>7</i> 6	54	NL	<i>7</i> 6	L	76	<i>7</i> 6	54	185	119.1	160	58.5	58.7	36.5	34.7	19	182	4.56	4.7	14.3	
AU	120	54	NL	120	L	120	120	54	240	163.1	210	62.5	62.7	30.5	34./	19	226	4.30	4./	14.3	

- 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.
- 2. 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.
- 3. 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.
- 4. Controlled Height (CHK) Bearings are usually selected from stock, quantities available may therefore be restricted. Please see the GV3 Technical Guide 🕹 .
- 5. Cap Seals are not available on Short Carriages. Lubricators may be used for lubrication purposes.
- 6. The datum mark identifies the reference edge used in manufacture. The concentric Bearings are always mounted on this side.
- 7. Bearing, Cap Seal and Lubricator fixing hole sizes and positions are detailed in the GV3 Technical Guide discording to the grade of Slide used. 'E' is the optimized 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.

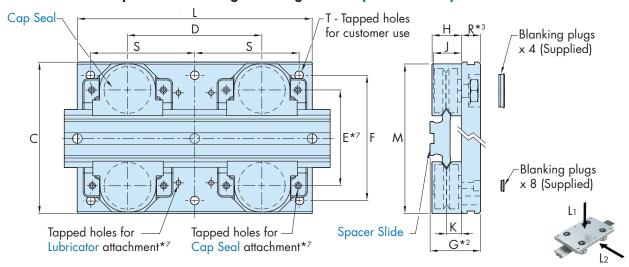
The Controlled Height Bearing option (CHK) minimizes variation between Bearings in respect of the important 'K' dimension. This is desirable in high precision applications*4.

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.

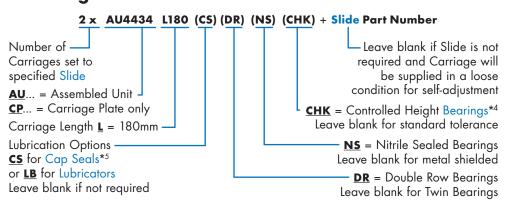
See Application Examples on 2 12, 14, 16, 18 & 19

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



Q	R* 3	Sł	ort (Carri	age*5	Me	ediun	n Cai	rriage	L	ong	Carri	iage	Max	c Load C	apacity ((N)*1
Ø x depth		L	D	S	T	L	D	S	T	L	D	S	T	DR L ₁	DR L2	Twin L ₁	Twin L2
12.5 x 4.8	7.34	50	35	17	4 x M4	<i>7</i> 5	60	25	4 x M4	100	85	50	4 x M4	-		240	240
16x7	10	65	43	20	4 x M5	100	55	44	6 x M5	140	95	62	6 x M5	<i>7</i> 60	1200	500	400
16×8	11	<i>7</i> 5	52	25	125	80	55	0 X M3	1 <i>7</i> 5	130	80	0 X M3	760	1200	300	400	
22×8.4	11.5	80	51	24		135	74	60		180	120	82					
22 x 9.4	12.5	100	70	40	4 x M6	150	90	65	6 x M6	200	140	90	6 x M6	1600	3000	1280	1200
22 x 10.9	14	110	80	50		160	1	70		220	160	100					
25×8.7	14.5	125	88	50		180	103	80		225	153	103					
25 x 11	17	150	110	60	4 x M8	200	125	90	6 x M8	280	205	130	6 x M8	3600	6000	3200	2800
25 x 12.5	18	170	130	80		240		110		340	265	160					
32 x 13.5	20	200	140	90	4 x M10	300	198	135	4 4410	400	298	185	4 4410	10000	10000	7200	4.400
32 x 17.5	24	240	180	120	4 x MIO	360	258	165	6 x M10	480	378	225	6 x M10	10000	10000	/200	6400

Ordering Details



Availability of Carriage Options

Part Number	-	DR	-	NS	cs	LB	снк
	Twin Bearings	Double Row	Metal Shields	Nitrile Seals	Cap Seals*5	Lubricators	Controlled Height
AU 1213	√	×	×	\checkmark	×	\checkmark	\checkmark
AU 20 18	√	√	x	√	√	√	\checkmark
AU 28 18	√	√	×	\checkmark	√	√	√
Larger sizes	√	√	√	√	√	√	√

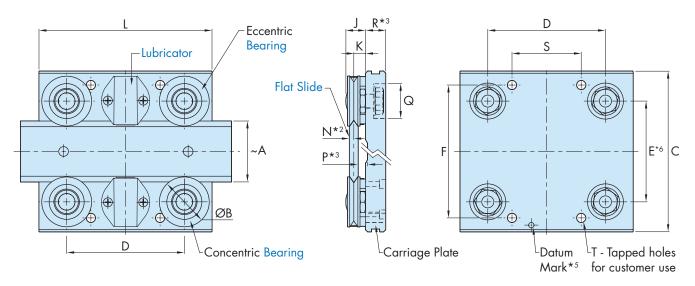
Slimline Carriages

HepcoMotion Slimline Carriages incorporate compact Slimline Bearings to minimize 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 aluminum alloy and are supplied clear anodized

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 🛄 14

Example: Short Carriage with Lubricators on a Flat Slide



D	Use V	With															
Part Number	1-//	1-11	~A	ØB	С	E*6	F	G	*2	Н	J	K	M	N	*2	P*3	
Number	2							P1	P2 & P3					P1	P2 & P3		
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	
AU 28 195	NV 28	V 28	28	19.5	72	43.6	58	24.7	24.9	11.2	9.2	3.7	67	2.14	2.2	4.5	
AU 25 265	NS 25	S 25	25		80	46.2	65	28.3	28.5				76				
AU 35 265	NS 35	S 35	35	26.5	95	56.2	80	29.3	29.5	13	11.3	6.8	86	2.39	2.5	6.5	
AU 50 265	NS 50	S 50	50		112	71.2	95	30.8	31				101				
AU 44 360	NM 44	M 44	44		116	72.8	96	35.3	35.5				113			6.6	
AU 60 360	NM 60	M 60	60	36	135	88.8	115	37.8	38	15.5	14	8.3	129	3.14	3.2	7.9	
AU 76 360	NM 76	M 76	76		150	104.8	130	38.8	39				145			7.9	
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	
AU 120 580	NL 120	L 120	120	36	240	167.3	210	57.8	58	23	22.0	14.5	230	4.50	4.7	9.0	

- 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.
- 2. 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.
- 3. 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.
- 5. The datum mark identifies the reference edge used in manufacture. The concentric Bearings are always mounted on this side.
- 6. Bearing, Cap Wiper and Lubricator fixing hole sizes and positions are detailed in the GV3 Technical Guide data according to the grade of Slide used. 'E' is the optimized drilling dimension and is suitable for general purposes. Actual Bearing positions will vary slightly when eccentrically adjusted.

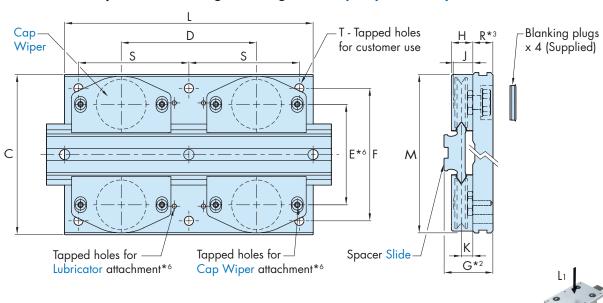
The following types of Bearing and Lubrication Device may be specified (refer also to availability table below right).

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.

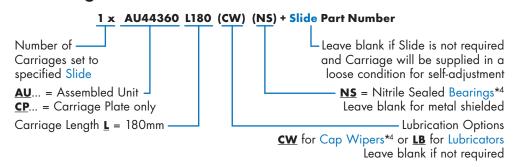
The Lubricator option (LB) applies oil to the 'V' contact surfaces by means of lightly sprung felt pads, which are charged with oil to give long intervals between re-lubrication. The Lubricator option is useful where the advantages of increased load and life are required, but with lower friction compared to the Cap Wiper.

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



Q	R* 3	Sł	nort (Carrio	age*4	M	ediun	n Car	riage	I	Long	Carri	age	Max Load Co	apacity (N)*1
Ø x depth		L	D	S	T	L	D	S	T	L	D	S	T	Li	L2
16×7	10	65	43	20	4 x M5	100	55	44	6 x M5	140	90	62	6 x M5	400	480
16×8	11	75	52	25	4 X M3	125	<i>7</i> 5	55	0 X M3	175	125	80	0 X M3	400	400
22×8.4	11.5	85	55	25		135	74	60		180	120	82			
22 x 9.4	12.5	100	70	40	4 x M6	150	90	65	6 x M6	200	140	90	6 x M6	940	1150
22 x 10.9	14	110	80	50	4 x M6	160	100	70		220	160	100			
25 x 8.7	14.5	125	85	50		180	98	80		225	145	103			
25 x 11	17	150	108	60	4 x M8	200	120	90	6 x M8	280	200	130	6 x M8	2000	2400
25 x 12.5	18	170	128	80		240	160	110		340	260	160			
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
32 x 17.5	24	240	185	120	4 X M(10	360	240	165	O X MIO	480	360	225	0 X M 10	4240	3200

Ordering Details



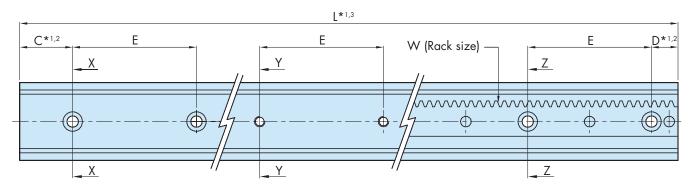
Availability of Carriage Options

Part Number		NS	cw	LB
	Metal Shields	Nitrile Seals	Cap Wipers*4	Lubricators
AU 20 195	x	\checkmark	\checkmark	\checkmark
AU 28 195	x	\checkmark	\checkmark	\checkmark
Larger sizes	\checkmark	\checkmark	√	√

Double Edge Spacer Slides

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 customizing. Grades P1 & P2 are ground on faces as illustrated. Grade P3 is precision drawn and sufficiently accurate for many applications. See System Selector 23. Slide fixing holes are accurately positioned, enabling customers to predrill their mounting holes. Slides without holes are also available.

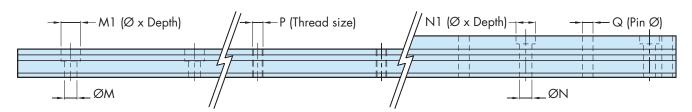
Spacer Slides bolt directly to the mounting surface of a machine, allowing running clearance for Bearings and Lubrication Devices. A central keyway is provided for simple location by means of Hepco Dowel Pins or customer's own key. Alternatively, where Lubrication Devices are not used, the datum edges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



Slide with Counterbored Holes

Slide with Tapped Holes

Slide with Fitted Rack



Donat	Use \	With*4																
Part Number			A		В	C &	D *1,2	E		F		G	н	H1	J		K	
Number	P		~ Width	P1 & P2	P3	Slide only	With Rack		P1	P2 & P3	P1	P2 & P3			P1 & P2	Р3		
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	
NV 20	110	J 195	20	20.37	21.01	43	15	00	4.21	4.42	8	8.2	5	2	12	12.4	1.75	
NV 28	J 10	J 193	28	28.37	29.01	43	13	90	4.21	4.42	0	0.2	6	2.5	20	20.4	1./3	
NS 25			25	25.74	26.58								6	2.5	15	15.4		
NS 35	J 25	J265	35	35.74	36.38	43	15	90	4.71	4.93	10	10.2	8	3	25	25.4	2.6	
NS 50			50	50.74	51.38								10	3.5	40	40.4		
NM 44			44	44.74	45.58								8	3	26	26.4		
NM 60	J 34	J 360	60	60.74	61.38	43	15	90	6.21	6.42	12.5	12.7	10	3.5	42	42.4	2.3	
NM 76			76	76.74	77.38								12	4	58	58.4		
NL 76	1.5.4	J 580	76	76.74	77.58	- 88	30	100	9.21	9.43	10.5	10.7	15	5	50	50.4	4.8	
NL 120	J 34	3 360	120	120.74	121.38	00	30	100	7.21	7.43	19.3	17./	45	9.5	94	94.4	4.0	

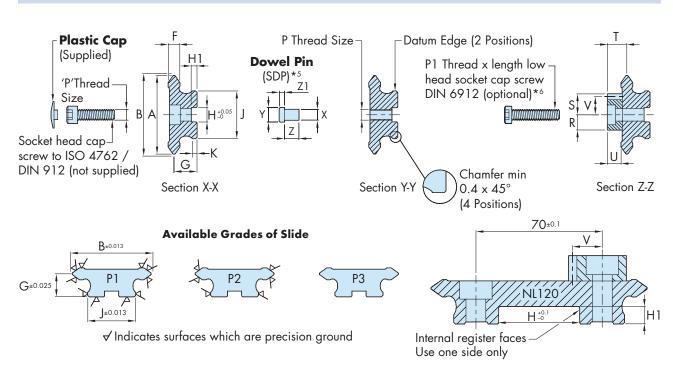
- 1. Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified which maintain the C and D dimensions in the table above (n x hole pitch E + C + D, where n equals the number of hole pitches). In all cases, unless otherwise specified 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.
- 2. 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.
- 3. Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting.
- 4. 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 1.). Slides with the fitted Rack option are not compatible with Slimline Bearings.
- 5. 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 utilizing 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 Bishop-Wisecarver 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.

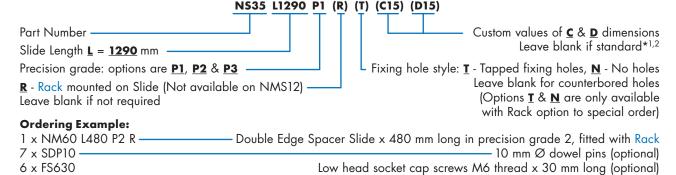
Racks are doweled to the Slide and become a fully serviceable element when bolted to the mounting surface. Racks may comprise of a number of lengths, precision mounted to a single Slide.

See Application Examples on 🚨 12 - 16, 18 & 19



L ma	x *1,3	M	M1	N	N1	Р	PI	*6	Q	R	S	Т	U	٧	W	Dowel	Х	Y	Z	Z1
P1 & P2	Р3						Screw	Part No.							Mod	Pin	K6	m6		
1976	1976	3.5	6.2 x 3.1	-	-	МЗ	-	-	-	-	-	-	-	-	-	SDP4	4	4	6.75	-
4046	4046	4.5	8 x 4.1	15	7.5 x 2.9	M4	M4 x 20	FS420	4	6.35	4 25	6.2	4	5.65	0.7	SDP5	4	5	6	1.75
4040	4040	5.5	10 x 5.1	4.5	7.3 x 2.9	M5	1V14 X 2U	13420	4	0.33	0.33	0.2	4	3.03	0.7	SDP6	4	6	6	2.25
		5.5	10 x 5.1			M5										SDP6	4	6	6	2.25
4046	4046	7	11 x 6.2	5.5	9.6 x 4	M6	M5 x 25	FS525	5	7.8	7.85	8.5	6	6.85	1	SDP8	6	8	8	2.75
		7	11 x 6.2			M6										SDP10	8	10	12	3.25
		7	11 x 6.2			M6										SDP8	6	8	8	2.75
4046	4046	9	15 x 8.2	6.5	11 x 4.5	M8	M6 x 30	FS630	6	8.3	11.7	10.8	7.5	10.2	1.5	SDP10	8	10	12	3.25
		9	15 x 8.2			M8										SDP12	10	12	15	3.75
4046	10.14	14	20 x 12	14	20 x 8.0	M12	M12 x 50	FS1250	0	12.2	18.6	18	12.2	144	2	SDP15	10	15	15	4.75
4046	4046	11	18 x 10	11	18 x 10.5	M10	-	-	ð	13.2	10.0	18	13.3	10.0		-	-	-	-	-

Ordering Details



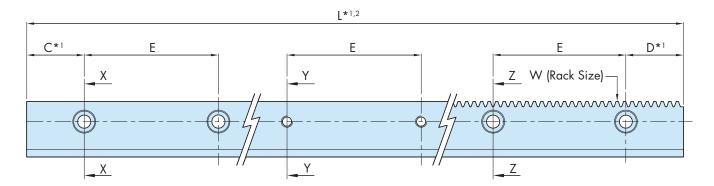
Single Edge Spacer Slides

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 customizing.

Grades P1 & P2 are ground on faces as illustrated. Grade P3 is precision drawn and sufficiently accurate for many applications. See System Selector 23.

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

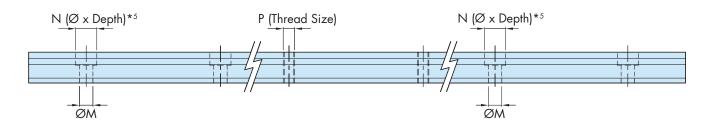
Spacer Slides bolt directly to the mounting surface of a machine, allowing running clearance for Bearings and Lubrication Devices. A central keyway is provided for simple location by means of Hepco Dowel Pins or a customer's own key. Alternatively, where Lubrication Devices are not used, the datum edges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



Slide with Counterbored Holes

Slide with Tapped Holes

Rack Cut Slide



Part Use With*3			With*3															
	Num				Α		3	В	1	C & D*1	E		F		G	Н	H1	
	NUM	iber	9		~ Slide Width	P1 & P2	P3	P1 & P2	Р3			P1	P2 & P3	P1	P2 & P3			
1	NMS	Ε	J 13	-	11	11.19	11.71	5	5.3	20.5	45	3.0	3.2	6.2	6.4	4	1.8	
	NV	Ε	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	
	NS	Ε	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	
	NM	Ε	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	
	NL	Ε	J 54	J 580	43	43.37	43.89	16	16.2	88	180	9.21	9.43	19.5	19.7	12	4	

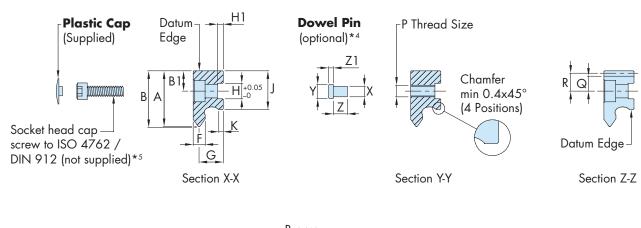
- 1. Any length of Slide within L max dimension can be supplied, but for optimum price and delivery time, Slide lengths should be specified which maintain the C and D dimensions in the table above (n x hole pitch E + C + D, where n equals the number of hole pitches). In all cases, unless otherwise specified 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.
- 2. 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.
- 3. 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 1.).
- 4. 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.
- 5. 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 maximize the strength in the critical area between the counterbore and root of the rack teeth. Due to accuracy requirements, predrilling of fixing holes is not recommended. Screws are available from Bishop-Wisecarver: 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 Ł.

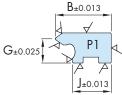
The large rear face of the Single Edge Spacer Slide, although unhardened, is sufficiently durable to act as a track on which to run Hepco Track Rollers.

See Application Examples on 🚨 17, 18 & 19



Available Grades of Slide

√ Indicates surfaces which are precision ground

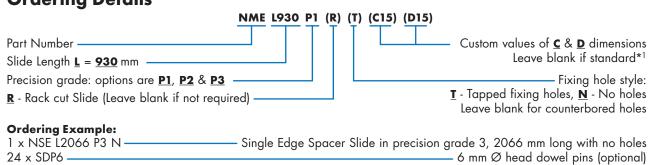






	J	l	K	L mo	x*1,2	M	N *5	P	Q	R	W	Dowel	X	Y	Z	Z1	Max Rack Force
	P1 & P2 P3			P1 & P2 P3							Mod	Pin	K6	m6			Lubricated (N)
	9.25	9.65	1.7	1976	4046	3.5	6.2 x 3.1	M3	3.80	4.5	0.5	SDP4	4	4	6.75	-	180
	12	12.4	1.75	4046	4046	4.5	8 x 4.1	M4	4.82	5.8	0.7	SDP4	4	4	6.75	-	300
	16	16.4	2.6	4046	4046	5.5	10 x 5.1	M5	6.15	7.4	1	SDP6	4	6	6	2.25	500
	20	20.4	2.3	4046	4046	7	11 x 6.2	M6	7.69	9.25	1.25	SDP8	6	8	8	2.75	1000
	30	30.4	4.8	4046	4046	11	18 x 10	M10	11.6	14.1	2	SDP12	10	12	15	3.75	1600

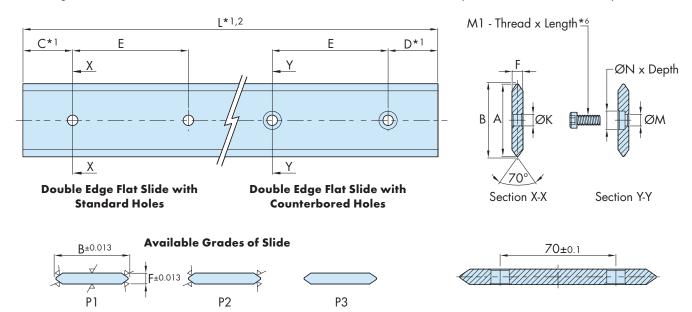
Ordering Details



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 customizing.

Grades P1 & P2 are ground on faces as illustrated. Grade P3 is precision drawn and is sufficiently accurate for many applications. See System Selector 23.

Slide fixing holes are accurately positioned enabling customers to predrill 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.



✓ Indicates surfaces which are precision ground

The L120 section has 2 rows of holes

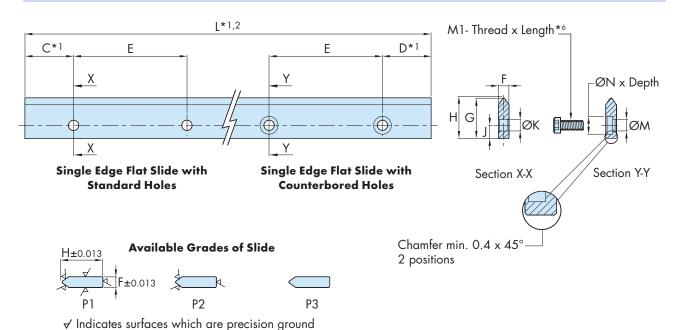
Part N	umber	Use With*3									
/-/I	<i>[-]</i>			Α		В	C & D*1	E		F	
				~Slide Width	P1 & P2	P3		±0.2	P1	P2 & P3	
MS 12		J 13		12	12.55	13.13	13	30	2.05	3.2	
	MS E]JIS	-	-	-	-	20.5	45	3.05	3.2	
V 20				20	20.37	21.01					
V 28		J18	J 195	28	28.37	29.01	43	90	4.27	4.42	
	V E			-	-	-					
S 25				25	25.81	26.58					
S 35		J25	J 265	35	35.81	36.58	43	90	4.78	4.93	
S 50		JZJ		50	50.82	51.58	45	90			
	S E			-	-	-					
M 44				44	44.81	45.58			6.28		
M 60		J34	J 360	60	60.81	61.58	43	90	0.20	4 40	
M 76		JS4	J 300	76	76.81	77.58	43	90	6.12	6.42	
	M E			-	-	-			6.28		
L 76				76	76.81	77.58	43	90			
L 120		J54	J 580	120	120.81	121.58	88	180	9.12	9.43	
	L E			-	-	-	43	90			

- 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.
- 2. Where Slides longer than the maximum length are required, lengths can be matched, suitable for butting.
- 3. 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 4).
- 4. 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.
- 5. 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.
- 6. Low head socket cap screws DIN 6912 are not universally stocked but are available from Bishop-Wisecarver in a single length for each thread size (see table).

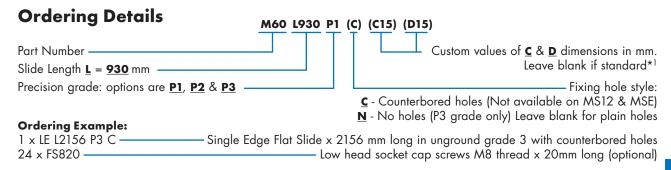
Flat Slides are useful if weight saving or minimum inertia is required, where the Slide is the moving component, and also where it is practical and cost advantageous to design a support profile integral with the machine, to provide running clearance for the Bearings and Lubrication Devices.

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.

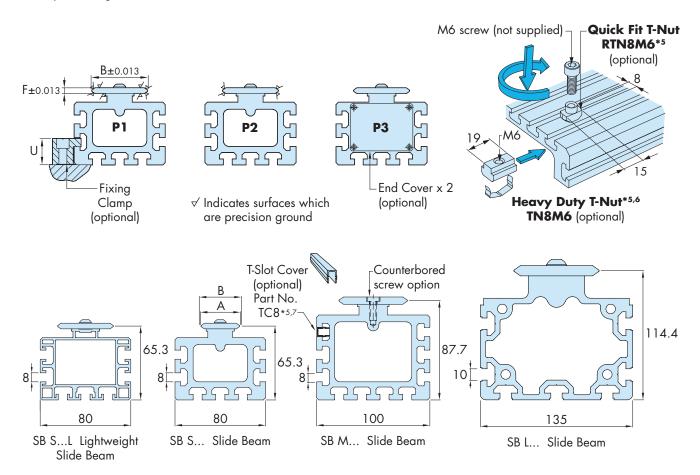
See Application Examples on 🚨 12, 13, 15, 16 & 17



G	F	1	J			K	L mo	x *1,2	M	M	*6	N
~ Slide Width	P1 & P2	Р3	P1 & P2	P3	Ø	Screw Size	P1 & P2	Р3		Screw Size	Part No.	Ø x Depth
-	-	-	-	-	3.5	M3	1000	1976				
11	11.3 <i>7</i>	11.8	4.5	4.7	3.5	M3	1000	19/0	-	-	-	-
					4.5	M4						
-	-	-	-	-	5.5	M5	4046	4046	4.5	M4 x 10	FS410	8 x 2.8
16	16.37	16.8	6.0	6.2	4.5	M4						
-	-	-	-	-	7	M6	4046	4046	5.5	M5 x 10	FS510	10 x 3.5
19	19.46	20.0	6.5	6.7	5.5	M5						
					7	M6						
-	-	-	-	-	9	M8	4046	4046	7	M6 x 12	FS612	11 x 4
25	25.46	26.0	8.0	8.2	7	M6						
-	-	-	-	-	11.5	M10	4046	4046	11.5	M10 × 20	FS1020	18 x 6
32	32.46	33.0	10.0	10.2	9	M8			9	M8 x 20	FS820	15 x 6



HepcoMotion Slide Beams consist of a Flat Slide mounted onto a precision, anodized aluminum 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 meters, while SB L... Slide Beams can be supplied in lengths of up to 6 meters*1,3. Slides are available in a choice of three precision grades, as illustrated.



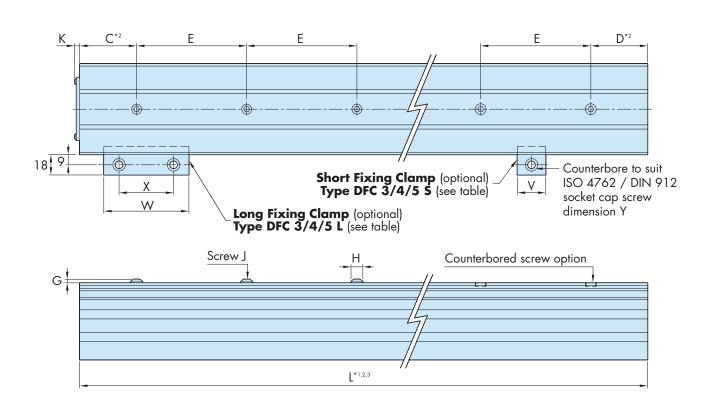
Doorst		Use With Carriages*4							
Part Number	Standard	Slimline	Belt	Α	E	3	C & D*2	Е	
Number			Driven	~Slide Width	P1 & P2	Р3			
SB S 35	AU 35 25	AU 35 265	AU BD 35 25	35	35.81	36.58	43	90	
SB S 50	AU 50 25	AU 50 265	AU BD 50 25	50	50.82	51.58	43	90	
SB M 44	AU 44 34	AU 44 360	AU BD 44 34	44	44.81	45.58			
SB M 60	AU 60 34	AU 60 360	AU BD 60 34	60	60.81	61.58	43	90	
SB M 76	AU 76 34	AU 76 360	AU BD 76 34	76	<i>7</i> 6.81	<i>7</i> 7.58			
SB L 76	AU 76 54	AU 76 580	Unavailable	76	<i>7</i> 6.81	77.58	43	90	

- Beams longer than 4046mm are supplied with two or more lengths of matched Slide, each mounted and doweled to form a precision joint. Additional fixing screws are normally provided adjacent to each join. Slide Beams with shorter Slides fixed in any position, can be supplied upon request.
- 2. 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.
- 3. For requirements in excess of L max, Slide Beams can be supplied matched ready for joining. Please contact Bishop-Wisecarver for details.
- 4. 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 1.
- 5. 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 MC5 Machine Construction System Slot 10 T-Nuts, Slot Blocks and T-Slot Covers.
- 6. 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 TN85 followed by the required length in mm. For information on T-Nut section options for Type SB L... Slide Beams, please contact Bishop-Wisecarver.
- 7. 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 4.

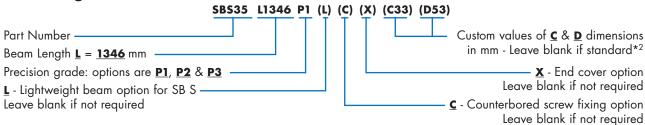
Customers requiring a complete ready-to-install belt driven unit with pulleys and optional motor may wish to consider the HepcoMotion **Driven Linear System** product range.

See Application Examples on 🛄 16



F		G	Н	J		K	Lmax	Fixing Clamp		T-Nut		T-Slot	U	V	W	Х	Y
P1	P2 & P3			Standard	C/bored		* 1,2,3	Short	Long	Quick Fit	Heavy Duty	Cover					
4.78	4.93	3.3	10.5	M6	M5	5.5	8000	DFC3S	DFC3L	RTN8M6	TN8M6	TC8	23	25	75	48	M6
6.28		3.3	10.5	M6													
0.20	6.42	4.4	14	M8	M6	5.5	8000	DFC4S	DFC4L	RTN8M6	TN8M6	TC8	23	25	100	65	M8
6.12		4.4	14	7710													
9.12	9.43	5.5	17.5	M10	M10	10.5	6000	DFC5S	DFC5L	See No	ote 5 for de	tails.	25.5	35	140	100	M10

Ordering Details



Ancillary Items:

See table for the part numbers relating to T-Nuts*6, T-Slot Cover *5,7 and Fixing Clamps.

Standard Bearings

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:

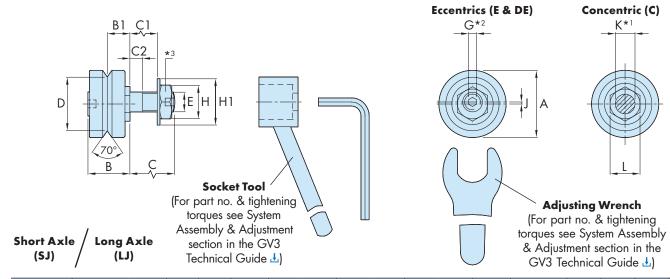
The Twin Bearing type, which is the default choice, comprises of two individual deep groove ball bearings on a single axle. This construction offers some compliance, allowing smoother running, easy adjustment and greater tolerance of misalignment.

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)



	Dt	Use With*6		В	B1		C	C1 r	nax	C	2	D	Е	F	G*2	Н									
	Part		1/6/	(-/)				Short	Long	Short	Long	Short	Long	±0.025	Metric										
	Number	To						Axle	Axle	Axle	Axle	Axle	Axle		Fine										
ſ	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	&	٧	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	&	М	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							

	Max \	Working Lo	oad Capac	ity (N)	Bearing Static (Co) and Dynamic (C) Load Capacity (N)*5									
Part	Double Ro	w Bearings	Twin B	earings	Fo	or Double R	ow Bearin	gs	For each Twin Bearing race					
Number	Radial	Axial	Radial	Axial	Radial	Loads	Axial	Loads	Radial	Loads	Axial	Loads		
	Kaalai	Axidi	Kaalal	Axidi	Со	С	Со	С	Со	С	Со	С		
J 13	-	-	120	60	-	-	-	-	265	695	74	194		
J 18	600	190	200	125	1168	2301	435	857	593	1438	1 <i>7</i> 3	419		
J 25	1500	400	600	320	2646	5214	821	1618	1333	3237	326	<i>7</i> 91		
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		

- 1. It is recommended that holes to suit Bearing mounting axles should be reamed to tolerance F6 for a sliding fit.
- 2. All eccentric Through Fixing type Bearing axles are supplied with sockets for adjustment as shown, with the exception of size 13.
- 3. Nuts for the Through Fixing type Bearings are chemically blacked on the concentric version and bright zinc plated on the eccentrics for identification purposes.
- 4. Controlled Height (CHK) Bearings are usually selected from stock, quantities available may therefore be restricted. Please see the GV3 Technical Guide 🕹.
- 5. 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.
- 6. 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 ...
- 7. 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.

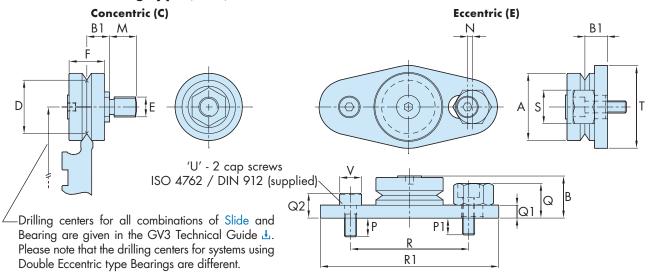
All Bearings are available in a **Controlled Height version (CHK)** which minimizes variation in the B1 dimension*4. This is desirable in high precision applications.

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)

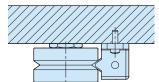


H1	•	J	K*1	L	M	N	P	P1	Q	Q1	Q2	R	R1	S	T	U	V
	E	DE	+0.00									±0.1					
			-0.03														
9	0.5	1.9	4	7	5.8	1.0	6.25	6.6	8.5	3.75	6.75	30	47.5	8	20	М3	5.5
13	0.7	2.6	6	11	7.4	1.2	8	10.5	10	4	8	38	54	11	24.5	M4	7
17	0.75	2.75	8	13	9.8	1.5	7	9	12	5	10	50	72	14	32	M5	8.5
21	1	3.6	10	15	13.8	2.0	9.5	8.5	17.5	6.5	12.5	60	90.5	1 <i>7</i>	42	M6	10
28	1.5	5.5	14	27	17.8	3.0	14.5	16.4	23.5	10.5	18.5	89.5	133	25	62	M8	13



A range of Bearing Lubricators

are available as an alternative to Cap Seals and Slide Lubricators. Please refer to the GV3 Technical Guide 🕹 for more information.



_		Or	otions Availal	ble	
Part	-	NS	-	DR	СНК
Number	Metal Shields	Nitrile Seals	Twin Bearings	Double Row Bearings	Controlled Height Bearings
J 13	×	✓	✓	×	✓
J 18	×	✓	✓	✓	✓
J 25	✓	✓	✓	✓	✓
J 34	✓	✓	✓	✓	✓
J 54	✓	✓	✓	✓	✓

Ordering Details

Fixing type. Choose from:

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)

Leave blank if Twin Bearing is required

Slimline Bearings

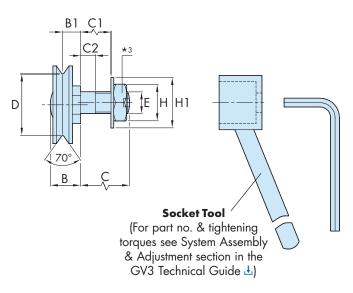
HepcoMotion Slimline Bearings are very compact due to the single ball track design. Good rigidity is maintained by a combination of ball to raceway conformity and low radial clearance, resulting in a low cost Bearing ideally suited to many Slide System applications. Performance of these Bearings has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

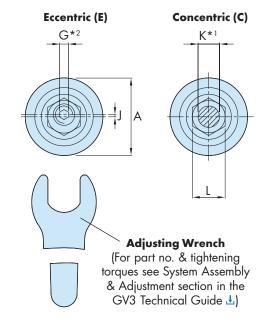
Slimline Bearings are designed to be used with particular sizes of Slide but may be "Mix & Matched" in many instances*5. The following Bearing formats and fixing methods are available:

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)







Donat	Use	Wit	h* ⁵	A	В	B1	(С	C1 i	nax	С	2	D	E	F	G* ²	Н	
Part Number		1/6/	-				Short	Long	Short	Long	Short	Long	±0.025	Metric				
Number	Too						Axle	Axle	Axle	Axle	Axle	Axle		Fine				
J 195	NV	&	٧	19.5	9.2	5.7	7.4	14	3.4	10	2.4	2.5	14.8	M6x0.75	5	2.5	10	
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	
J 360	NM	&	М	36	14	8.3	13.8	22	6.6	14.8	5.2	5.9	27.57	M10x1.25	9	4	17	
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	

Dt	Max Working Lo	oad Capacity (N)	Bearing Sta	tic (Co) and Dyne	amic (C) Load Ca _l	pacity (N)*4
Part Number	p.,	A:-I	Radial	Loads	Axial	Loads
Number	Radial	Axial	Co	С	Co	С
J 195	240	100	563	1366	164	398
J 265	575	235	1267	3075	310	<i>7</i> 51
J 360	1200	500	2470	5625	530	1206
J 580	2600	1060	6324	12915	1079	2204

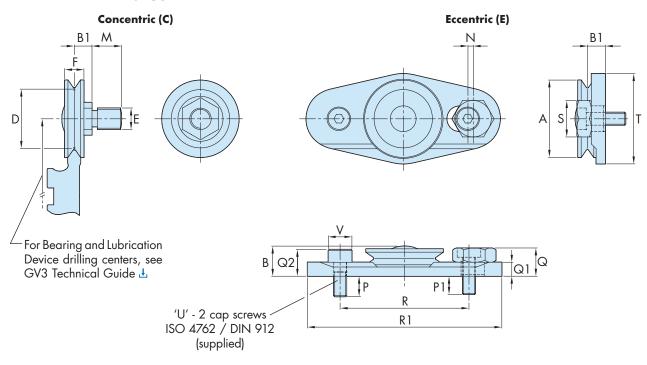
- 1. It is recommended that holes to suit Bearing mounting axles should be reamed to tolerance F6 for a sliding fit.
- 2. All eccentric Through Fixing type Bearing axles are supplied with sockets for adjustment as shown.
- 3. Nuts for the Through Fixing type Bearings are chemically blacked on the concentric version and bright zinc plated on the eccentrics for identification purposes.
- 4. 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.
- 5. 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 ...
- 6. 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*6, which fit over the Bearings, or by using Hepco Slimline Slide Lubricators. Lubrication greatly increases load capacity and life.

See Application Examples on 🚨 12 - 14 & 17

Blind Hole Fixing Type (GBHJ)



H1	J	K *1	L	M	N	P	P1	Q	Q1	Q2	R	R1	S	T	U	V
		+0									±0.1					
		-0.03														
13	0.7	6	11	7.4	1.2	8	10.5	8.6	4	8	38	54	11	24.5	M4	7
1 <i>7</i>	0.75	8	13	9.8	1.5	7	9	11	5	10	50	72	14	32	M5	8.5
21	1	10	15	13.8	2	9.5	11.3	13.3	6.5	12.5	60	90.5	17	42	M6	10
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

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

Ordering Details

Fixing type. Choose from:

GSJ = Short Axle, GLJ = Long Axle

& GBHJ = Blind Hole Fixing

Part Number (~10x Bearing Diameter in mm)

GLJ 265 C (NS)

Leave blank if metal shields are required

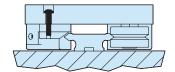
C = Concentric (fixed), E = Eccentric (adjustable)

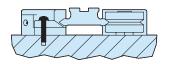
HepcoMotion flexible plastic Cap Seals fit over Standard Bearings, providing effective sealing and protection, as well as wiping of debris from the Slide profile. Lubrication of the 'V' surface is provided by means of oil impregnated felt wipers.

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.

See Application Examples on 🚨 11 - 14 & 16

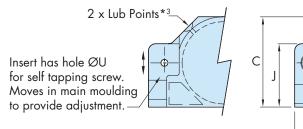
Through Hole Fixing

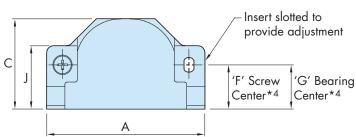


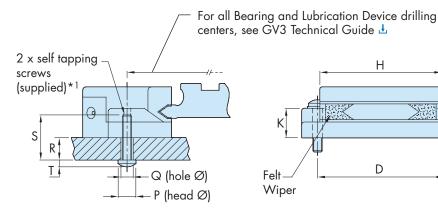


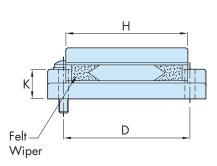
Tapped Hole Fixing

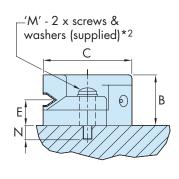
Both types of insert supplied.











Donat	Use With																			
Part Number		A	В	С	D	Е	F	G	Н	J	K	M	* 2	N	Р	Q	R	S	Т	U
Number	F				±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	S	uitable	for Slide	Section	S
Number	MS	V	S	M	L
CS 18 *4	×	✓	✓	✓	✓
CS 25	×	×	✓	✓	✓
CS 34	×	×	×	✓	✓
CS 54	×	×	×	×	✓

Ordering Details

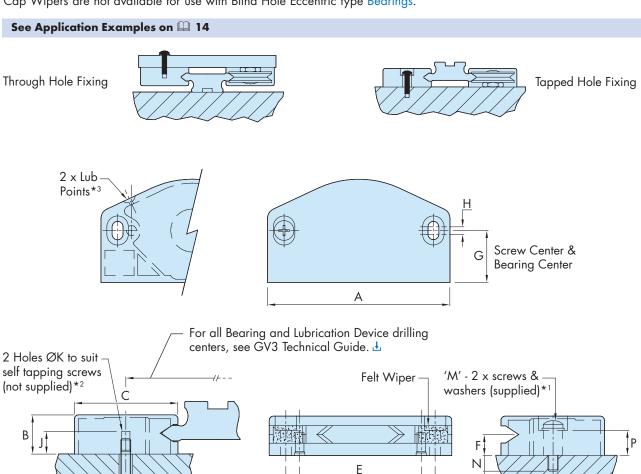
 $4 \times CS 34$ State quantity and part number

- 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 (DIN 7985A / ISO 7045) and two flat washers (DIN 125A) are supplied.
- 3. 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 male grease connector Part No. CSCHF4034 or a complete gun is available from Bishop-Wisecarver if required
- The fixing screw positions for the CS18 do not lie on the centerline of the nominal Bearing position, unlike all other sizes.

Cap Wipers BWC.com

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.



	Use With														
Part Number		A	В	С	D	E	F	G	Н	J	K	М	*1	N	P
Itomber					±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

D

Part	9	ouitable	for Slide	Section	S
Number	MS	V	S	M	L
CW 195	×	✓	×	×	×
CW 265	×	×	✓	×	×
CW 360	×	×	×	✓	×
CW 580	×	×	×	×	✓

Ordering Details

4 x CW 360
State quantity and part number

- 1. Two cross-recessed pan head screws to DIN 7985A / ISO 7045 and washers (DIN 433) are supplied with each Cap Wiper.
- 2. 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.
- 3. 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 male grease connector Part No. CSCHF4034 or complete gun is available from Bishop-Wisecarver, if required.

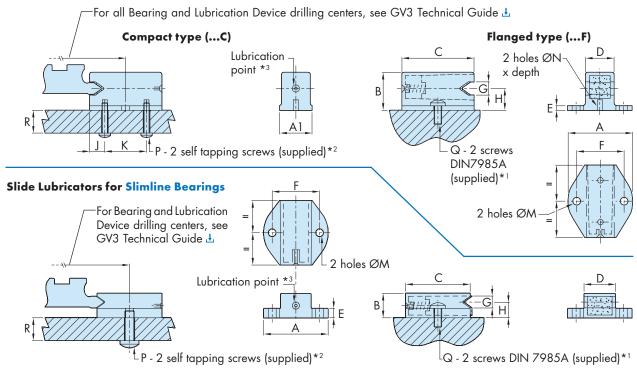
HepcoMotion plastic Slide Lubricators normally fit one each side of the Slide, between pairs of Bearings. However, any number may be fitted in any position according to requirements. Lubricators provide lubrication to the working surface of the Slide by means of spring loaded oil impregnated felt wipers.

System load capacity and life are greatly increased while 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 🚨 12, 15, 17 & 18

Slide Lubricators for Standard Bearings



Part	Α	A1	В	С	D	Е	F	G	Н	J	K	M	N	P*2	Q*1	F	2
Number							±0.1				±0.1			Thread x Length	Thread x Length	max	min
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	-

	Use With	✓	= Preferr	ed choice	e, √ = C	ompatible	e, 🗴= Not Co	mpatible
Part		Suit	table f	or Slid	e Secti	ons	Types A	vailable
Number		MS	V	S	M	L	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	✓	✓
LB 76	J 54	×	X	×	×	✓	✓	✓
LB 195	J 195	✓	✓	✓	✓	✓	✓	×
LB 265	J 265	x	✓	✓	✓	✓	✓	×
LB 360	J 360	×	×	✓	√	✓	✓	×
LB 580	J 580	×	×	×	√	√	√	×

Ordering Details

Part number — Lubricator type:

F = Flanged, C = Compact

- 1. Two machine screws with cross-recessed pan heads size Q (DIN 7985A / ISO 7045) are supplied with each flanged type and slimline Lubricator.
- 2. 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.
- 3. Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a 68 viscosity EP mineral oil.
- 4. Sizes LB12 and LB20 have a true 'V' shape to enable them to engage with Slide thicknesses larger than their G dimensions.

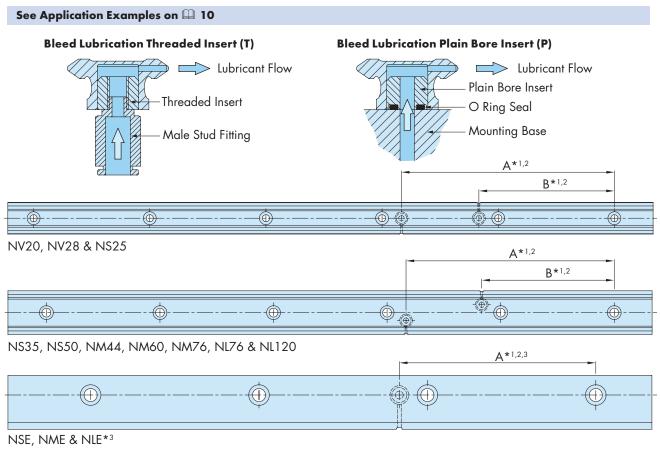
Bleed Lubrication BWC.com

The HepcoMotion Bleed Lubrication facility enables a constant flow of lubricant to be channeled 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.

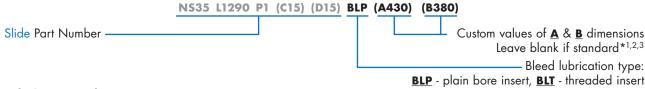
The Bleed Lubrication facility is available with either an M5 screw fitting insert or an O-ring seal insert. Connection can be made to a centralized lubrication system, pressure feed canister or an oil dispensing pump and controller, which can be programmed to meter a set dose of lubricant, according to the distance traveled by the Carriage.

For full information, please see the GV3 Technical Guide 4.



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

Ordering Details



Ordering Example:

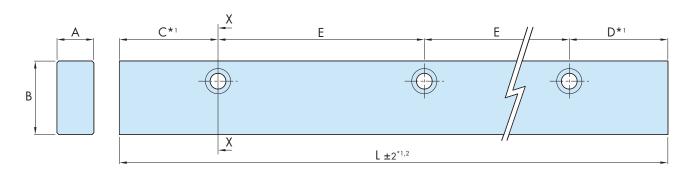
1 x NME L2336 P2 BLP A400 ———— Single Edge Spacer Slide, 2336mm long, P2 grade, with custom hole position A 1 x NME L2336 P2 BLP A1850 ——— Single Edge Spacer Slide, 2336mm long, P2 grade, with custom hole position A

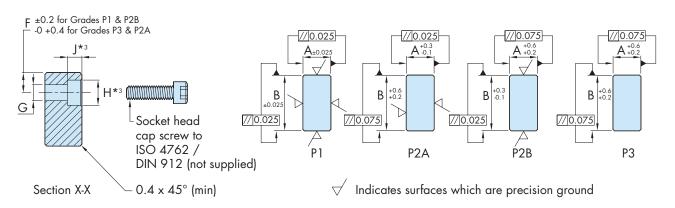
- 1. Dimensions A and B are distances from the center of the mounting hole positioned nearest to the right-hand end of the Slide.
- 2. Custom position bleed holes can be specified, but cannot be located more than 600mm from the end of the Slide. Mounting holes should be avoided.
- To order a symmetrical 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.

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 🛄 7





Doort	Use	With													
Part Number			. A	A	E	3	C*1	D *1	Е	F	G	Screw	H* 3	J* 3	L*1,2
Number			P1 & P2A	P2B & P3	P1 & P2B	P2A & P3					Ø	Size	Ø	~	max
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



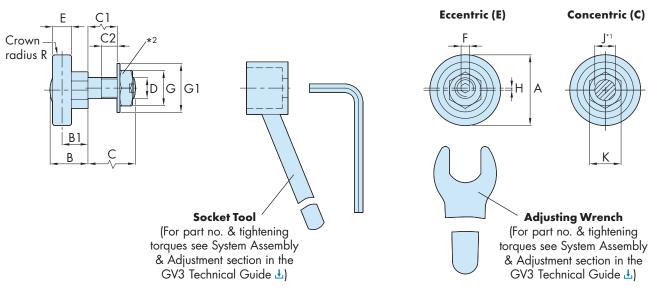
- 1. Any length of Flat Track within max length stated can be supplied, but for optimum price and delivery time, track lengths should be specified which maintain the C and D dimensions in the table above. In all cases, unless otherwise specified by the customer, C and D dimensions will be supplied equal
- 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.
- 3. 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.
- 4. 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 Examples on 🛄 10



Part Number	Use With*4	A	В	B1	С	C1	C2	D Metric Fine	E	F	G	G1	Н	J* 1 +0.00 -0.03	K	R
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	Max Working Load Capacity	Roller Stat Dynamic (C) Lo	ic (Co) and oad Capacity*3
Number	(N)	Co (N)	C (N)
LRN 18	400	593	1438
LRN 25	1000	1333	3227
LRN 34	2000	2600	5921
LRN 54	5000	6657	13595

Dt	Options Available										
Part Number	•	NS									
Number	Metal Shields	Nitrile Seals									
LRN 18	×	✓									
LRN 25	✓	✓									
LRN 34	✓	✓									
LRN 54	✓	✓									

Ordering Details

- 1. It is recommended that holes to suit Track Roller mounting axles should be reamed to tolerance F6 for a sliding fit.
- 2. Nuts are chemically blacked on the concentric version and bright zinc plated on the eccentric version for identification purposes.
- 3. 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 452-54 to determine system performance.
- 4. Éach 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.

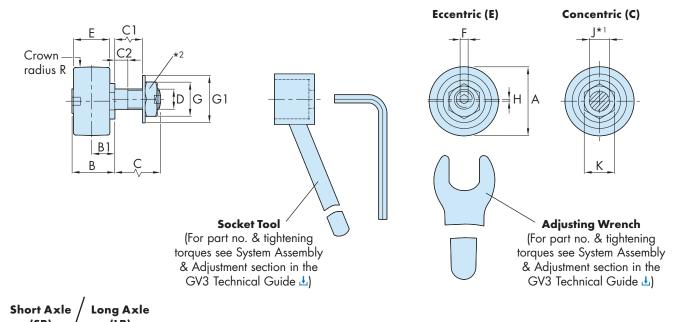
Wide Track Rollers

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)



Part	Use With*4	A	В	B1	(C	C1 r	max	C	2	D	E	F	G	G1	
Number	6				Short	Long	Short	Long	Short	Long	Metric					
Number					Axle	Axle	Axle	Axle	Axle	Axle	Fine					
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	
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	
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	
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	

Part	Max Working Load Capacity	Roller Stat Dynamic (C) Lo	ic (Co) and oad Capacity*3
Number	(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

- 1. It is recommended that holes to suit Track Roller mounting axles should be reamed to tolerance F6 for a sliding fit.
- 2. Nuts are chemically blacked on the concentric version and bright zinc plated on the eccentrics for identification purposes.
- 3. 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 \$\omega\$ 52-54 to determine system performance.
- 4. 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.

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.

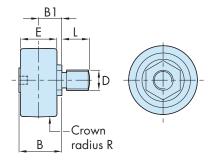
Wide Track Rollers are available in the same basic sizes as Hepco 'V' Bearings and are well matched for functionality and performance in systems comprising both types of Bearing.

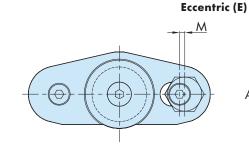
Rollers are greased for life internally, however, it is recommended to oil the running surface. HepcoMotion GV3 Flat Track and Roller Lubricators are available for this purpose. Please see the GV3 Technical Guide 🕹 for more information.

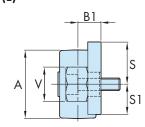
See Application Examples on 🛄 7

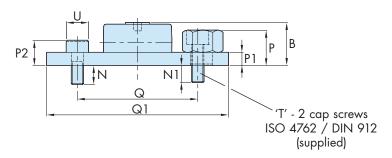
Blind Hole Fixing Type (BHR)

Concentric (C)







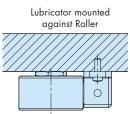


Н	J *1	K	L	M	N	NI	Р	P1	P2	Q	Q1	R	S	S1	T	U	V
	+0.00																
	-0.03																
0.7	6	11	7.4	1.2	8	10.5	10	4	8	38	54	500	12.3	7.8	M4	7	11
0.75	8	13	9.8	1.5	7	9	12	5	10	50	72	1000	16	11	M5	8.5	14
1	10	15	13.8	2.0	9.5	8.5	17.5	6.5	12.5	60	90.5	1000	21	15.3	M6	10	17
1.5	14	27	17.8	3.0	14.5	16.4	23.5	10.5	18.5	89.5	133	1500	31	25	M8	13	25



A range of Flat Track and Roller Lubricators are available. Please refer to the GV3

Technical Guide & for more information.





LR 25 C (NS)

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

Ordering Details

Fixing type. Choose from: **SR** = Short Axle, **LR** = Long Axle & **BHR** = Blind Hole Fixing Part Number (Roller Diameter in mm)

Nitrile Sealed Roller Leave blank if metal shields are required \mathbf{C} = Concentric (fixed) or \mathbf{E} = Eccentric (adjustable)

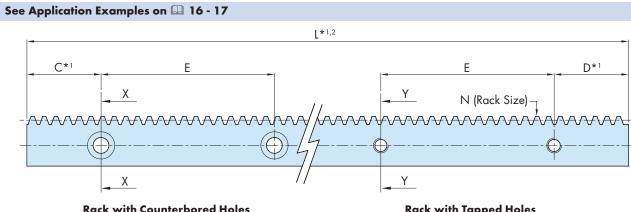
HepcoMotion GV3 Racks provide a durable and powerful linear drive when used in conjunction with Hepco or other good quality, hardened Pinions.

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 predrill their mounting holes.

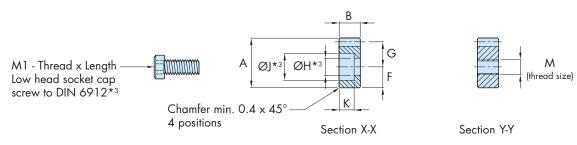
The back face of the Rack is controlled parallel to the tooth pitch line, enabling it to be used as a register for setting*4.

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



Rack with Counterbored Holes

Rack with Tapped Holes



Part	Use With																
Number		A	В	C *1	D *1	E	F	G	H* 3	J* 3	K	L*1,2	M	M1	*3	N	Max Rack
Number						±0.25						max		Screw	Part No.	mod	Force (N)*5
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 R15 L845 (T) (C15) (D20) Part Number Custom values of **C** & **D** dimensions (Number relates to the tooth module) Leave blank if standard*1 Rack Length L = 845 mm Fixing hole style: I - Tapped fixing holes, N - No holes Leave blank for counterbored holes

- 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 Bishop-Wisecarver 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.

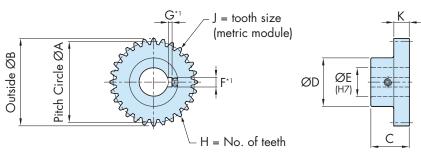
Pinions BWC.com

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 🚨 15 - 17 & 19

Boss Type Pinion

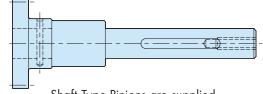


Part	Material*2	Condition*3	ISO 1328-1	A	В	С	D	E	F*1	G*1	Н	J	K
Number			grade									mod	
P05 W7 T28	ST	*	10	14	15	14	10	5	-	-	28	0.5	7
P07 W9 T28	ST	*	10	19.6	21	17	16	5	-	-	28	0.7	9
P07 W5 T28	ST	*	10	19.6	21	13	16	5	-	-	28	0.7	5
P10 W11 T42	ST/SS	✓	6	42	44	23	30	15	5	2.3	42	1	11
P10 W7 T42	ST	✓	6	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		For Us	e With	
Number				
P05 W7 T28	-	NMSE R	-	-
P07 W9 T28	-	NVE R	-	-
P07 W5 T28	RO7	-	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 4.



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

Ordering Details

<u>\$5</u> = Stainless Steel (see table for availability)

Leave blank for steel version

Boss Type Pinion Part Number

Pinion format: <u>B</u> = Pinion with plain bore

BK = Pinion with keyway and set screw*1

Notes:

1. 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.

(SS) P07 W9 T28

BK

- ST = steel, SS = stainless steel. Stainless steel Pinions are ground all over for corrosion resistance.
- ✓ = Hardened all over. Teeth and bore ground.
 X = Teeth hardened only. Teeth not ground.

Rack Driven Carriages

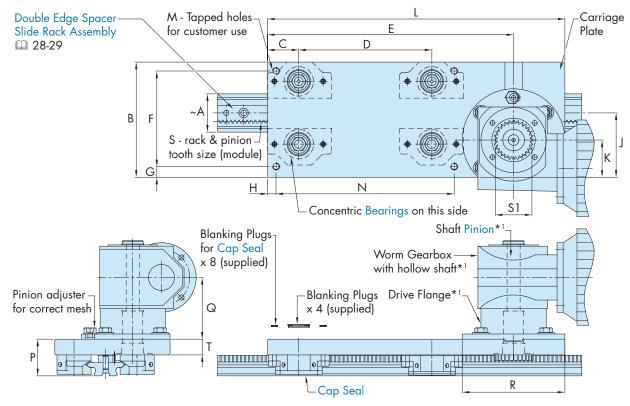
HepcoMotion Rack Driven Carriages are an economic means of achieving a powerful and controlled linear drive via the Hepco Worm Gearbox, Drive Flange and Shaft Pinion.

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 adapter 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 aluminum alloy and are supplied anodized.

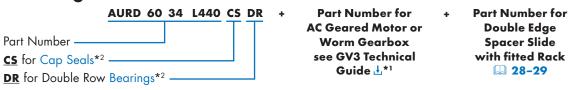
Please refer to the Rack & Pinion Systems section of the GV3 Technical Guide & for illustrations of other compatible systems using the Hepco Worm Gearbox, Drive Flange and Shaft Pinion.

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



Part	A	В	С	D	E	F	G	н	J	K	L	M	N		P	Q	R	S	S1	T	Rack Drive		
Number*1	~													P1	P2 & P3						Force (N)*3		
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	44	133	30	232	360	113	10	10	74.1	43	420	////0	284	42	42.23	/ 1	110	1.5	42	10	400		
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	00	144	144	144 3	+ 30	252	380		10	10	74.1	45	440	////0	304	42	42.23		110	1.5	42	10	400
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	102	<i>E</i> 1	115	285	140	10.5	1.5	100 4	57	360	M10	187	E0 E	E0 7E	72.5	1 47	2	54	20	700		
AURD 76 54 L500 CS DR	/0	193	51 -	255	425	100	12.5	15	100.6		500	MIO	327	36.3	58.75	/2.5	14/	2	34	20	700		
AURD 120 54 L380 CS DR	120	240	<i>E</i> 1	135	305	210	15	15	110.0	111.3	380	M10	207	E0 E	58.75	72.5	1.47	2	54	20	700		
AURD 120 54 L540 CS DR	120	240)	295	465	210	13	13	117.0	111.3	540	/////	367	56.5	36./3	72.3	14/	2	54	20	700		

Ordering Details



- 1. Gearbox ratios and all details of Shaft Pinions, Motors, Gearboxes and Drive Flanges can be found in the GV3 Technical Guide 🕹 .
- 2. Standard Rack Driven Carriages are supplied with Double Row Bearings and Cap Seals. However, all variants, as available for Standard Carriages
 24–27, can be supplied on request. Custom size Carriages can also be supplied. Please refer to the GV3 Technical Guide 4.
- 3. 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 🛂

HepcoMotion Gearboxes, AC Geared Motors and Drive Flanges can be used with Rack Driven Carriages 50, as well as with Rack Cut Single Edge Spacer Slides or separate Racks.

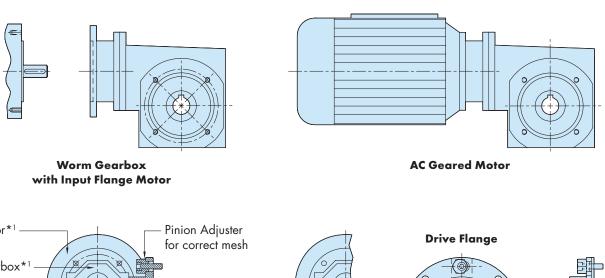
The high-duty yet lightweight Hepco Gearboxes with low backlash and low noise, make them particularly suitable for dynamic applications, whether driven by AC motor, stepper or servo. When sold separately, the input flange and shaft coupling of the Gearbox will be tailored to suit the customer's own motor.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

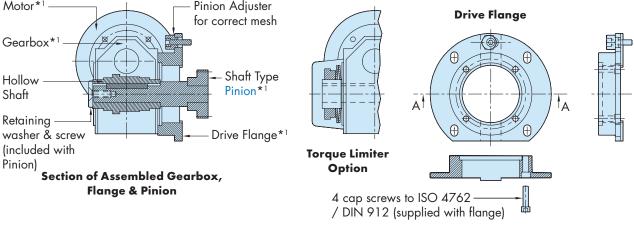
The Drive Flange, which connects the Gearbox to the Carriage, incorporates a unique micro-adjustment facility for achieving correct engagement of Pinion with the Rack.

The AC Geared Motor can be combined with an AC Speed Controller 1 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.

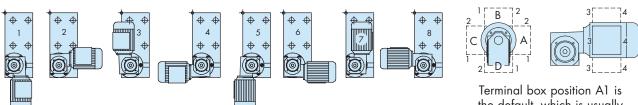
See Application Examples on 🚨 15 & 17





Section A-A

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.



lerminal box position AI is the default, which is usually available on express delivery.

Ordering Details

Please refer to the GV3 Technical Guide 🕹 and contact Bishop-Wisecarver to discuss requirements.

Load/Life Calculations - Carriages and Individual 'V' Bearings

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 \square 53.

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:

$$L_F = \frac{L_1}{L_{1_{(max)}}} + \frac{L_2}{L_{2_{(max)}}} + \frac{Ms}{Ms_{(max)}} + \frac{Mv}{Mv_{(max)}} + \frac{M}{M_{(max)}}$$

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 \$\omega\$ 53.

 $Mv_{[max]}$ and $M_{[max]}$ are determined by multiplying the figure shown in the tables below by the spacing of the Bearings, D, in meters (shown right).

	Maximum Working Load Capacity - Standard Carriages*4,6																
Carriage Dry System, Twin & DR Typ				DR Type B	earing	earing Lubricated System, Twin Type Bearing							Lubricated System, DR Type Bearing				
Part	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)		
Number	N	N	Nm	Nm	Nm	N	N	Nm	Nm	Nm	N	N	Nm	Nm*6	Nm		
AU12 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		

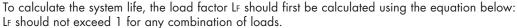
	Maximum Working Load Capacity - Slimline Carriages*4,6												
Carriage		Dry System	, Slimline Ty	pe Bearing		Lubricated System, Slimline Type Bearing							
Part	L1(max)	L2(max)	Ms(max)	Mv(max)	M(max)	L1 (max)	L2(max)	Ms(max)	Mv(max)	M(max)			
Number	N	N	Nm	Nm	Nm	N	N	Nm	Nm	Nm			
AU 20 195	180	180	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 36–39. For loading of Bearings with smaller Slides, please contact Bishop-Wisecarver.



$$LF = \frac{LA}{LA_{\{max\}}} + \frac{LR}{LR_{\{max\}}}$$



Maximum Working Load Capacity - Twin Type, Double Row and Slimline Bearings (N) * 1,4														
Twin Type Bearing					Double	Slimline Type Bearing								
Part	Dry S	ystem	em Lubricated		Part	Dry System		Lubricated		Part	Dry System		Lubricated	
Number	LA(max)	LR(max)	LA(max)	LR(max)	Number	LA(max)	LR(max)	LA(max)	LR(max)	Number	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) =
$$\frac{\text{Basic Life}}{(0.03 + 0.97 \text{LF})^2}$$
Life (km) = $\frac{\text{Basic Life}}{(0.03 + 0.97 \text{LF})^3}$

Basic Life * 1,4											
Twi	n Type Bearin	g	Double Ro	ow (DR) Type I	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			

- 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.
- 2. 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 traveled 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 Bishop-Wisecurver for assistance.
- 3. 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.
- 4. 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.
- 5. When a system consists of more than four Bearings per Carriage (see Application Examples (13 & 19), 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.
- 6. 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 Bishop-Wisecarver for details in instances where a higher system life is required.

Load/Life Calculations - Track Rollers

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 LR_(max) for the Hepco range of Track Rollers is stated below:

N	Max Working Load Capacity * 1										
Narrow Roller	LR(max)	Wide Belley Tyre	LR(max)								
Туре	N	Wide Roller Type	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 LF 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.

Life (km) =
$$\frac{1000}{1 \, \text{F}^3}$$

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, Co, of the bearings (see Track Roller 45-47) 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	Used with Track Roller type									
Roller Running Surface	LRN18&R18	LRN25&R25	LRN34&R34	LRN54&R54						
Hepco Flat Tracks FT	The load is limited by the LR(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.

- The values of LR, 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 Co) of the bearing. Values of C and Co 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 traveled 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 Bishop-Wisecurver 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

High tensile steel with tensile strength = 695 N/mm². Chemical black finish. Axles:

BH...'E' base plate: Steel with chemical black finish.

-20°C to +120°C Temperature range:

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

Material: High strength aluminum alloy Finish: Clear anodized to 15µm thickness.

Carriage Plate & Slide Counterbore Plugs

Material: Plastic

Cap Seals

Body: Thermoplastic elastomer Material:

Inserts: Impact resistant plastic

Wipers: Felt

Temperature range: -20°C to +60°C

Cap Wipers & Lubricators

Material: Impact resistant plastic with felt wiper.

-20°C to +60°C Temperature range:

Racks

Material and finish: Carbon steel with chemical black finish 4.

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:

CS18 or CW195 = $4 N_{1}$ CS25 or CW265 = 7 N, Four Cap Seals or Wipers per Carriage

CS34 or CW360 = 15 N,CS54 or CW580 = 28 NTwo Lubricators per Carriage $LB12 = 1 N_{r}$ LB20 & LB195 = 1.5 N

LB25 & LB265 = 2.5 NLB44 & LB360 = 3 N,

LB54 & LB580 = 4 N

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

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

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



Bishop-Wisecarver® is proud to be the exclusive North American distributor of HepcoMotion® products since 1984.

Components & Accessories

DualVee® MadeWell®

GV3 SL2 PRT2

HDS2 HDRT MCS

Motor Mounts Gantry Brackets Wrenches

Manual Linear Guide Systems

DualVee[®]
UtiliTrak[®]
MinVee[®]
GV3

Simple Select®

SL2 HDS2 MHD HTS

BWC.COM

Actuated Linear Guide Systems

LoPro®
XLA™
ECO60™
SlickStick™
SteadyRail™
HDLS
HDCS
PDU2
DAPDU2
SBD

PSD SDM

DLS

Robot Transfer Units

LoPro® RTU DualVee® RTU

Custom Solutions

Extruded Profile Guides Custom Bearings Custom Subassemblies Engineering Services

Large Diameter Ring Guides and Track

Rotary Guide Systems

PRT2 DTS2 DTS ALR HDRT 1-Trak GFX

Women's Business Enterprise



Certified WOSB

Contact

Web: **BWC.com** Phone: **(925) 439-8272** Email: **Sales@bwc.com**

Corporate Office

Bishop-Wisecarver 2104 Martin Way Pittsburg, CA 94565

Quality Certifications



- Certified Bay Area Green Business
- Certified Evergreen

Certifications & Compliance

- EN 9100:2018
- JISQ 9100:2016
- ISO 13485 & GMP Compliance
- Responsible Minerals Initiative
- RoHS
- International Traffic in Arms Regulations Compliant