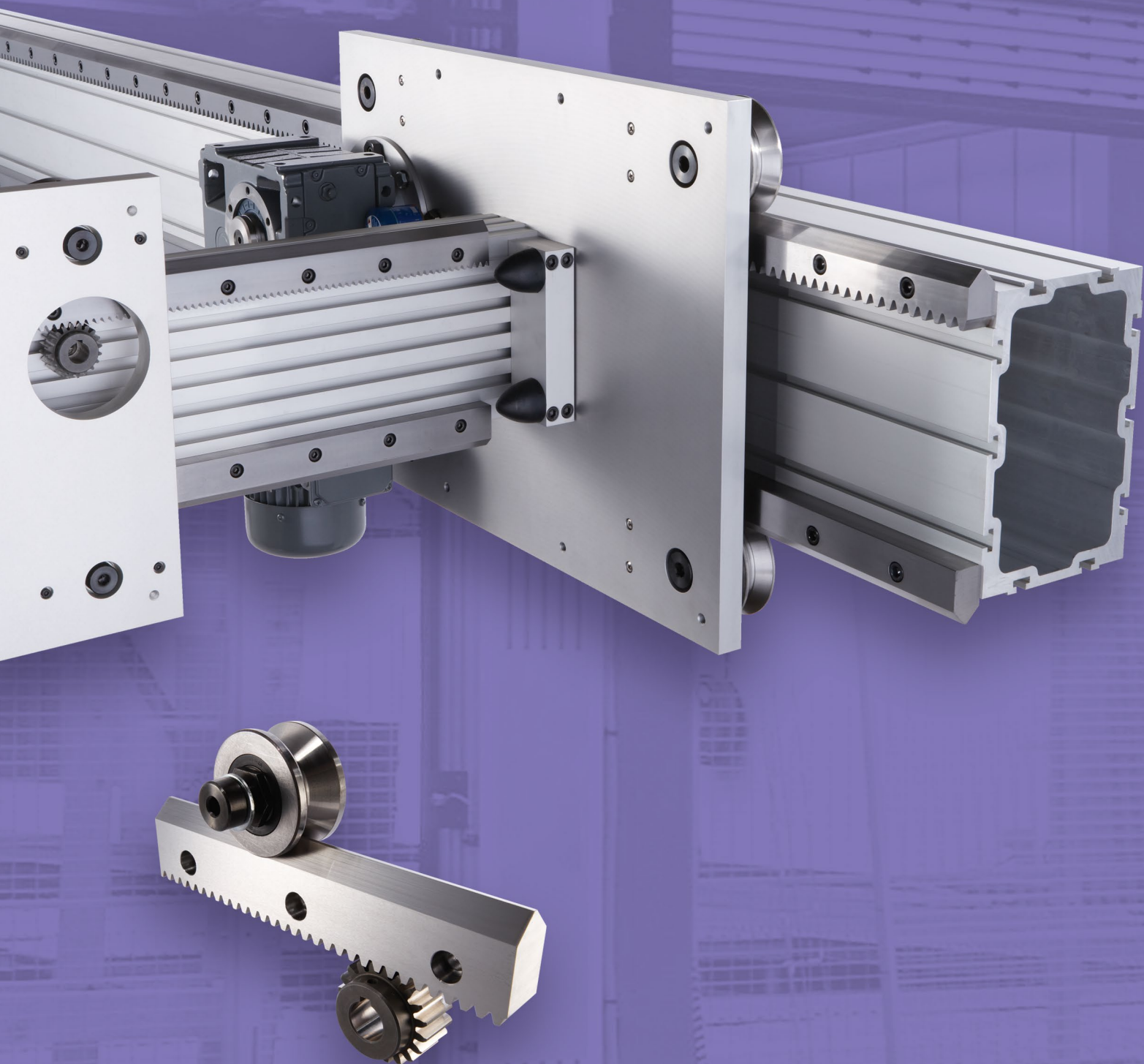


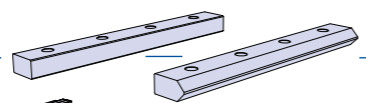
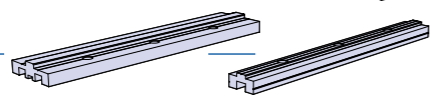
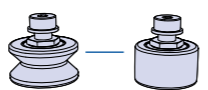
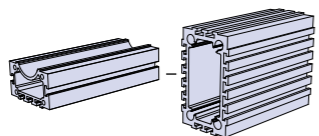
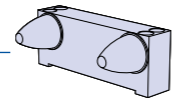
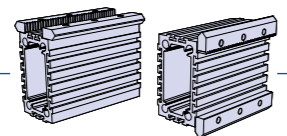
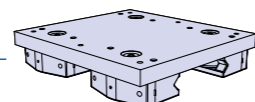
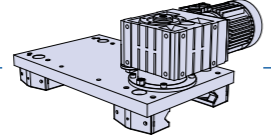
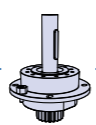
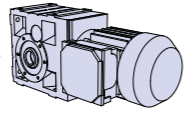
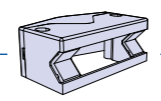
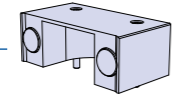
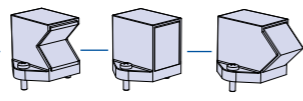
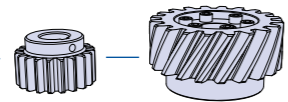
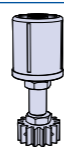
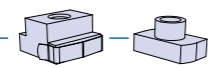
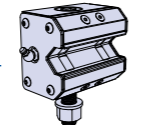
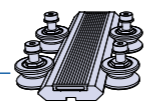
HepcoMotion®

HDS2

heavy duty
slide system



Contents

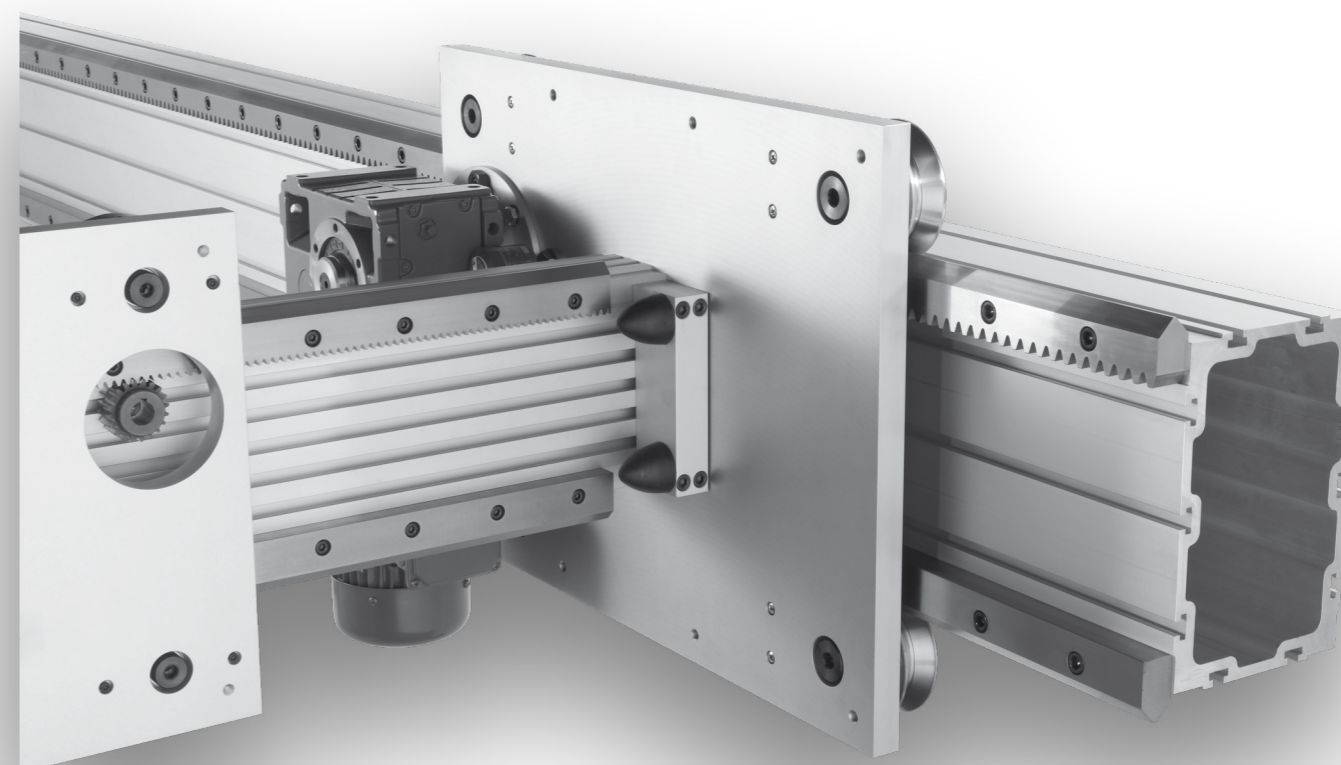
Introduction	_____	1
System Composition	_____	2-7
Application Examples	_____	8-9
Full Size Illustrations for Initial Selection	_____	10-13
Data and Dimensions for Individual Components		
V Slides & Flat Tracks		14-15
Back Plates		16-17
Bearings		18-21
Construction Beams		22-23
Buffer Units		23
Assembled Beams		24-25
Carriages		26-27
Rack Driven Carriages		28-29
Drive Flange Assembly		30
AC Geared Motors		31
Bearing Cap Wipers		32
Roller Cap Wipers		33
Lubricators		34
Pinions		35
Automatic Rack Lubrication		36
Lubrication Accessories	_____	37
T-Nuts		38
Bearing Blocks		39
Technical Data	_____	_____
Data and Dimensions for Assembled Systems		40-41
Load Life Calculations	_____	42-44
Matched Systems	_____	45
Mix & Match Component Compatibility	_____	46-47
Installation	_____	48
Technical Specifications	_____	49

Introduction

HepcoMotion® has updated the highly successful Heavy Duty Slide System, retaining the best features from the previous system, and incorporating them in a greatly expanded range under the name of HDS2. Many new components have been added including larger bearings, with increased load capacity, two sizes of construction beam, single edge V slides and flat track, as well as a range of drive options. All this, with an option for stainless steel or corrosion resistant components as standard, enables the HDS2 range to offer a solution for most customer's applications.

Customers can choose from low cost commercial slides for general use or high precision ground slides to suit applications where accuracy and smoothness are key requirements.

Customers can save design and manufacturing time by specifying ready mounted systems complete with rack driven carriages, safe in the knowledge that everything has been designed and tested by one of the world's leading specialists in linear technology.



2D & 3D CAD files available

Please visit Hepco for a CAD CD or visit www.HepcoMotion.com and select CAD.

Features and Benefits

- Low cost **commercial, precision** ground and **stainless steel systems** available.
- **Spur** or **helical rack** & pinion options for ease of driving.
- **Unique wiping action** expels dirt and debris, in harsh environments
- Available as assembled units or in component form, providing **maximum flexibility** of design.
- Versatile construction beams for multiple design options
- System capacities up to **68 kN**.
- Can operate without lubrication, ideal for food machinery and clean applications.
- Slides and tracks available in one piece up to **4 metres long**, saves on assembly time.
- Long lengths comprising replaceable segments, reduces downtime in the event of damage.
- Flat tracks overcome necessity for parallel installation.
- **Simple** alignment facility to achieve parallelism of V slides
- Works in any plane and orientation for unrestricted use in machine construction.

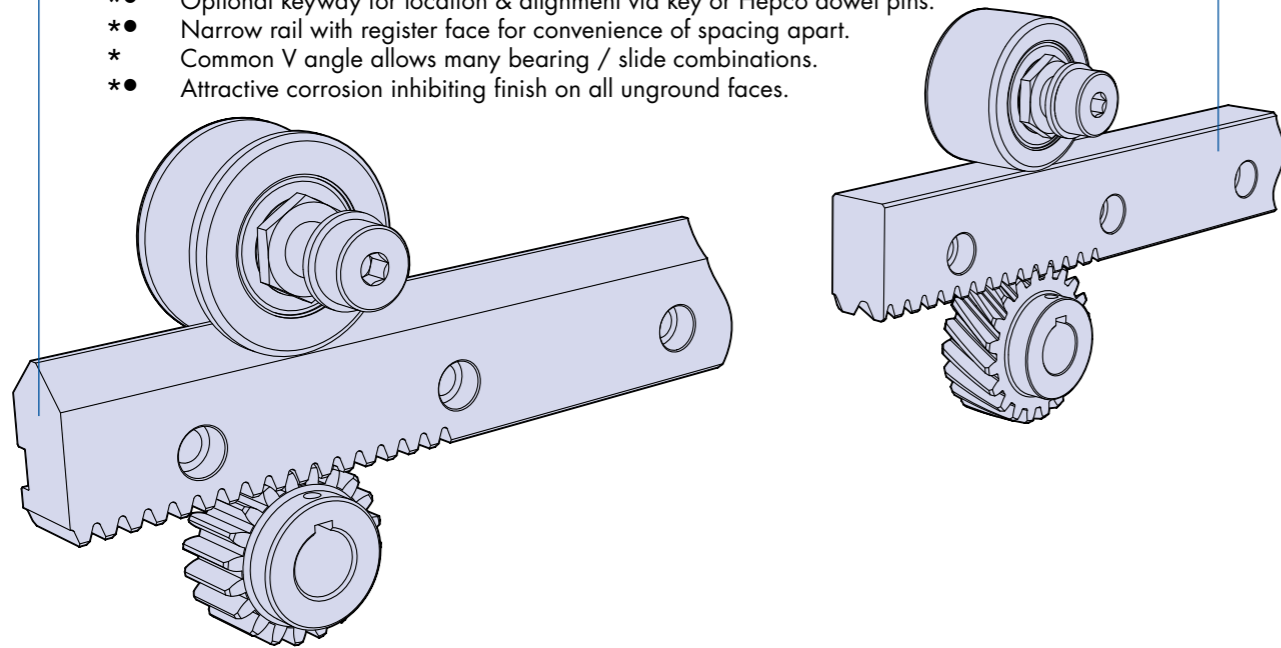
System Composition

The HDS2 system comprises of a versatile family of slides, flat tracks, construction beams and other components, which will meet the requirements of the most demanding applications.

2 to 7 provide an overview of the comprehensive HDS2 system. The slides and flat tracks may be attached to a suitable section, or they may be used in conjunction with Hepco back plates to give a ready made support profile. Slides and flat tracks can also be fitted to Hepco construction beams in many positions to provide a versatile all-in-one guide, drive and construction element.

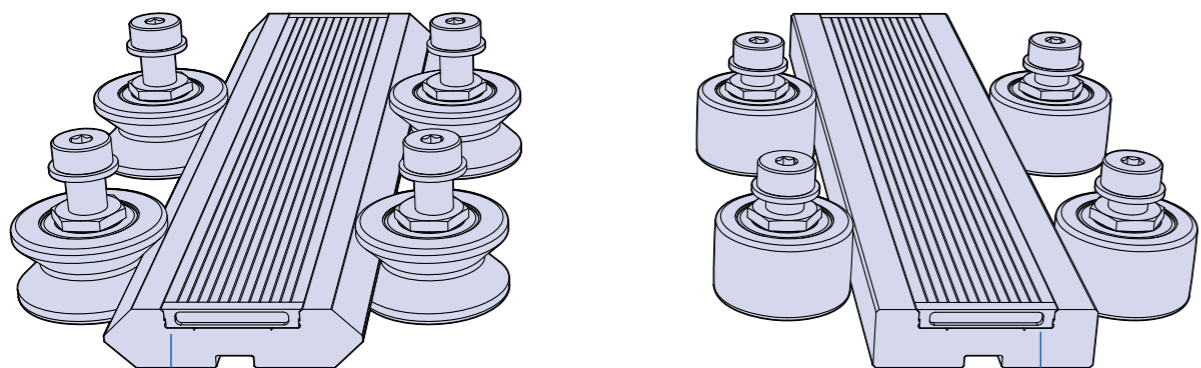
* Single Edge V Slide / Single Edge Flat Track 14 & 45 ●

- *● Precision ground, low cost commercial, and stainless steel versions available.
- *● Available up to 4 metres long, unlimited lengths achieved by butting.
- *● Optional long lengths comprising replaceable short segments.
- *● Deep hardened running faces for maximum wear resistance.
- *● Unhardened centre allows customising.
- *● Spur & helical rack cut options provide means of driving.
- *● Optional keyway for location & alignment via key or Hepco dowel pins.
- *● Narrow rail with register face for convenience of spacing apart.
- *● Common V angle allows many bearing / slide combinations.
- *● Attractive corrosion inhibiting finish on all unground faces.



* Double Edge V Slide / Double Edge Flat Track 15 & 45 ●

- *● One piece construction with built in parallelism.
- *● Precision ground, low cost commercial, and stainless steel versions available.
- *● Available up to 4 metres long, unlimited lengths achieved by butting.
- *● Optional long lengths comprising replaceable short segments.
- *● Deep hardened running faces for maximum wear resistance.
- *● Unhardened centre allows customising.
- *● Lightened centre with attractive debris cover.
- *● Keyway for location & alignment via key or Hepco dowel pins.
- *● Common V angle allows many bearing / slide combinations.
- *● Attractive corrosion inhibiting finish on all unground faces.

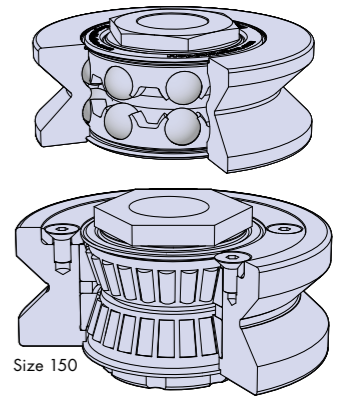


System Composition

* V Bearings / Track Rollers 18-21 ●

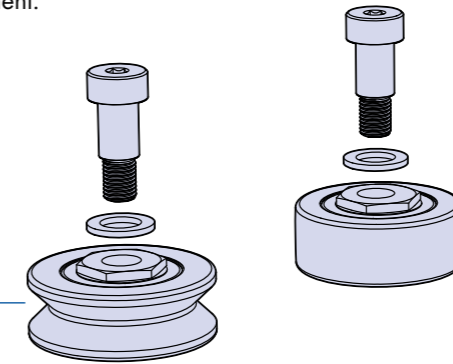
Bearing & Roller common features 18-21

- *● Special raceway conformity and low radial clearance, for slide applications.
- *● Double row bearings for tolerance of debris & high load capacity.
- *● Load capacity up to **50kN** each.
- *● Can be installed and removed without disengaging the carriage.
- *● Nitrile sealed for lifetime lubrication & to inhibit ingress of liquids & contaminants.
- *● All options available in stainless steel.
- Permits out of parallel installation.
- Crowned contact face to overcome misalignment.



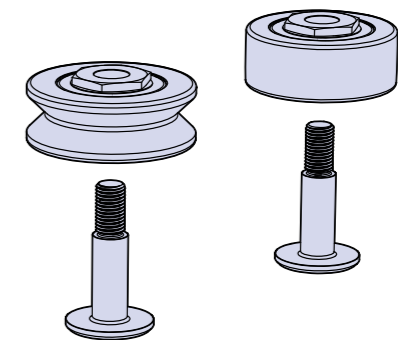
Through hole fixing

- Bolt lengths to suit plate thickness from 7 to 40mm.
- Concentric (fixed) or eccentric (adjustable) studs.
- Can be installed & removed without carriage disengagement.



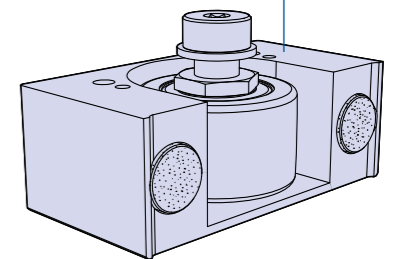
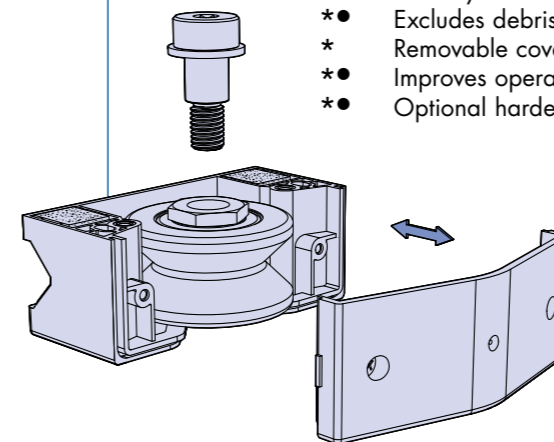
Blind hole fixing

- For mounting into thick plates or where access to opposite side is restricted.
- Concentric (fixed) or eccentric (adjustable) studs.
- Can be installed & removed without removing slide.



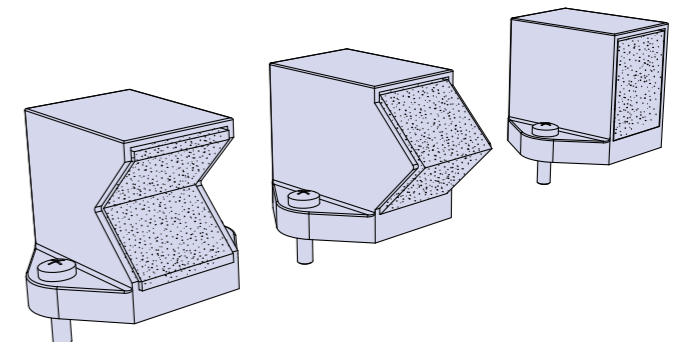
* V Bearing Cap Wiper / Roller Cap Wiper 32-33 ●

- *● Lubricates contact faces reducing wear.
- *● In many cases re-lubrication is unnecessary.
- *● Excludes debris from bearing contact faces.
- *● Removable cover allows adjustment of system without disassembly.
- *● Improves operational safety.
- *● Optional hardened stainless steel scraper.



Lubricators 34

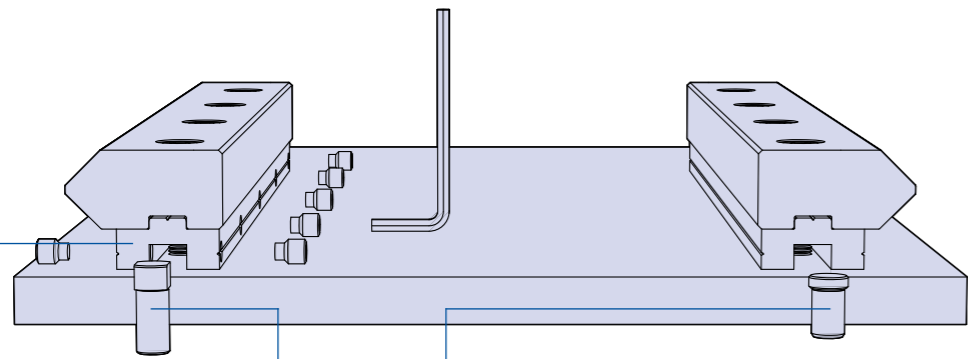
- Lubricates systems - increasing load & life.
- Lightly sprung felt wiper ensures low friction.
- Versions to fit slide, track, V bearing & track rollers.
- Blind and through hole fixing.



System Composition

* Low Narrow / Low Wide Back plates 16 ●

- Strong construction in light weight aluminium.
- Profiles to suit single and double edge slides.
- * Adjustable alignment option to obtain parallelism of the system.
- Easily incorporated into customers design.
- Will attach to T-slot positions of construction beams.
- Key locations for attachment of slide and for mounting.
- Supplied clear anodised.
- Manufactured to precision extrusion tolerances.

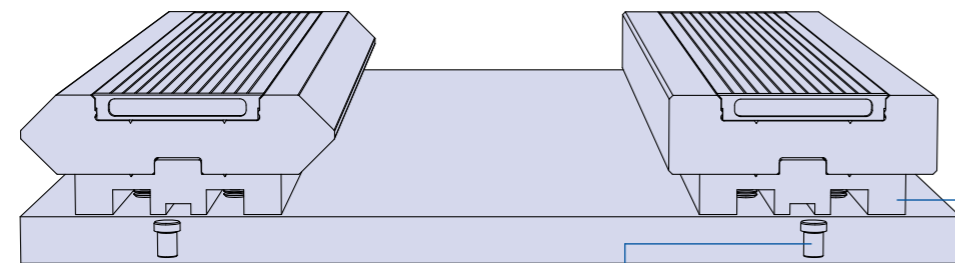


Back plate alignment dowel

Adjustable alignment in conjunction with jacking screw, ensures parallelism between slides or tracks.

Back plate location dowel

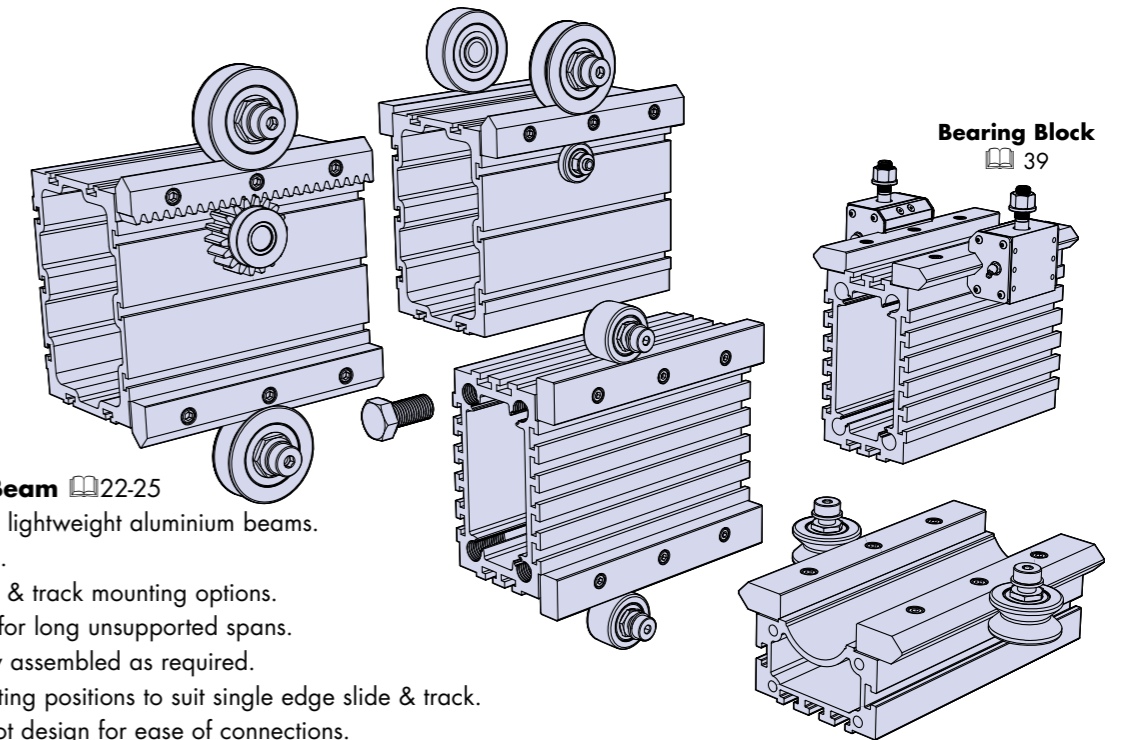
Simple means of location and alignment, provides datum location.



Back plate location dowel

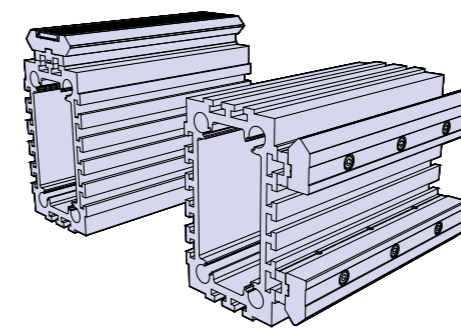
- Spaces V slide and flat track away from mounting surface to allow the use of bearings, rollers and cap wipers.
- Male key for location on V slide and flat tracks.
- Female keyway for location using customer own key section, or Hepco dowel pins.
- High wide & high narrow back plates available 16-17 to suit slides with bearing blocks 39

System Composition

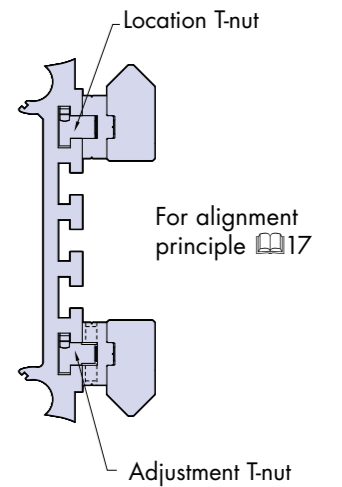


Construction Beam 22-25

- High strength lightweight aluminium beams.
- 3 useful sizes.
- Multiple slide & track mounting options.
- Stiff sections for long unsupported spans.
- Supplied fully assembled as required.
- Corner mounting positions to suit single edge slide & track.
- Common T-slot design for ease of connections.
- Plastic T-slot cover and metal end covers available.



Flush T-nut Location T-nut

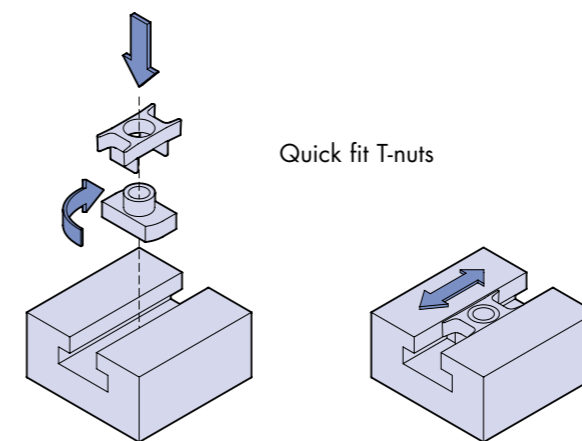


Location T-nut For alignment principle 17

Adjustment T-nut

T-Slot Fixing 16,17 & 25

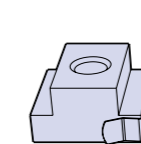
- Multiple T-slot positions for attaching slides and tracks via back plates.
- Use of location and adjustment T-nuts for ease of assembly and alignment.
- Enables the use of double edge slide and flat track to be fitted to construction beams.



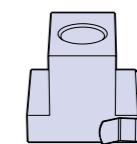
Quick fit T-nuts

T-Nuts 38

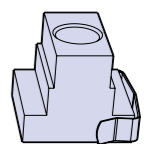
- Simple means of attaching components.
- Plastic or spring retainer prevents loss of position.
- Location type fits into the back plate keyway.
- Adjustment type for ease of alignment.
- Multiple thread sizes are available.



Flush T-nut



Location T-nut




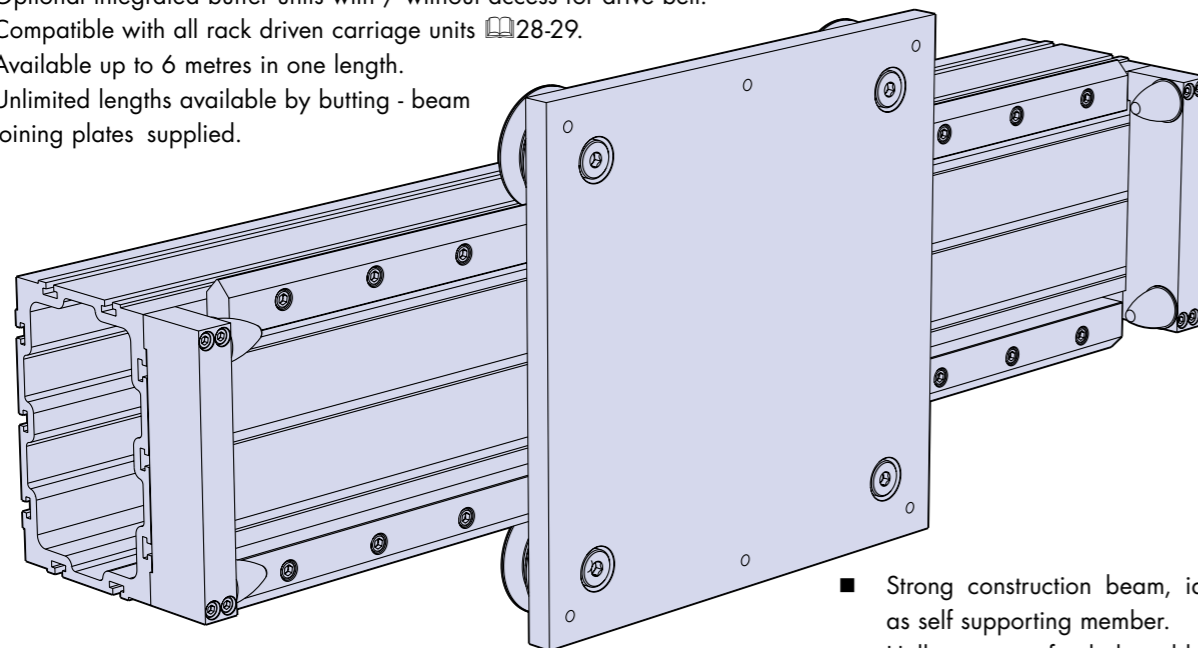
Adjustment T-nut

System Composition

The HDS2 range has been greatly extended to include assembled carriages, 3 sizes of construction beam, larger capacity bearings and a host of improved features. This also provides flexibility for many sizes and types of heavy duty components to be interchanged in order to achieve a comprehensive combination of space and performance possibilities.

Assembled Beams with Carriages 26-27

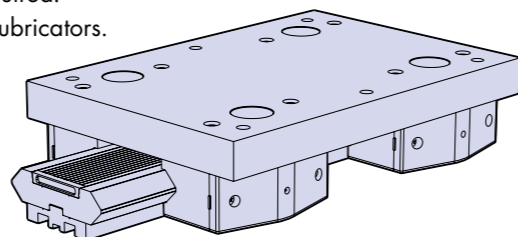
- Fully assembled factory built beam with ready adjusted carriage.
- Available for all opposing corner mounted V slide options for all sizes of beam.
- Optional integrated buffer units with / without access for drive belt.
- Compatible with all rack driven carriage units  28-29.
- Available up to 6 metres in one length.
- Unlimited lengths available by butting - beam joining plates supplied.



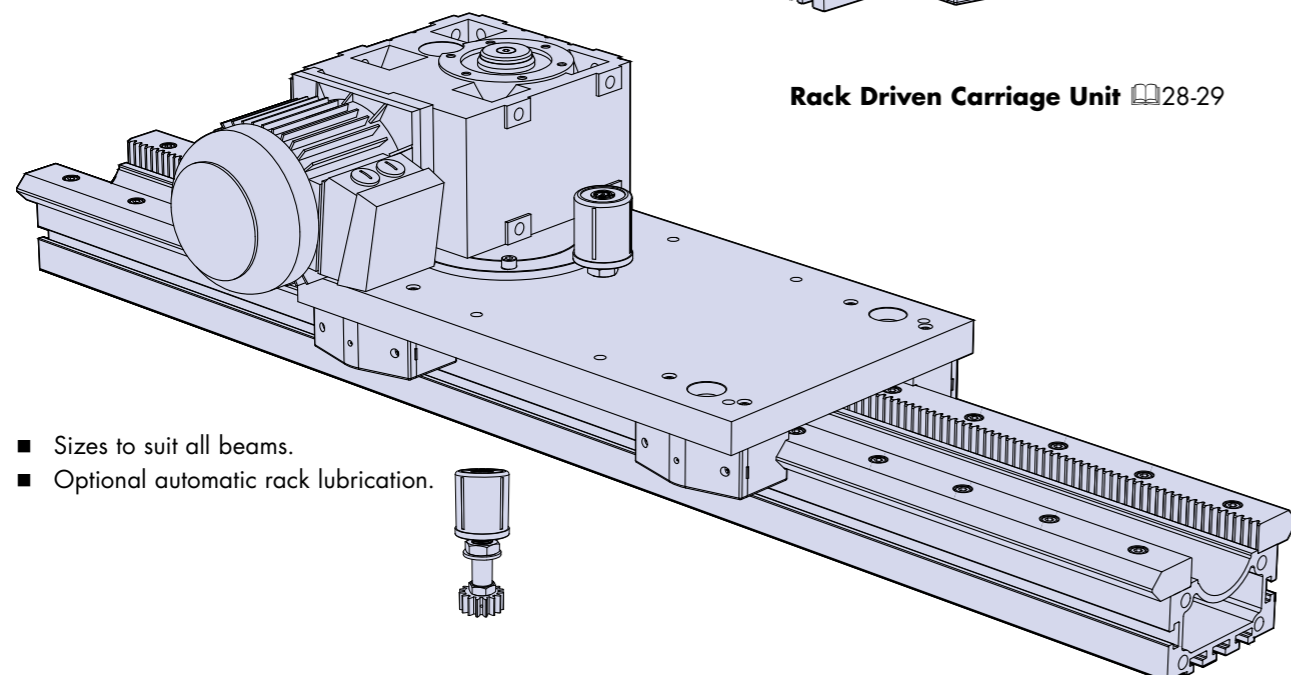
- Strong construction beam, ideal as self supporting member.
- Hollow centre for belt, cable or chain return.

Carriages 26-27

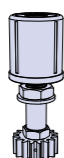
- Factory adjusted to double edge slide, or beam assembly as required.
- Available with bearings only, or with addition of cap wipers or lubricators.
- Hardened stainless steel scrapers available for cap wipers.
- Tapped holes in convenient positions for attachment purposes.
- Compatible with both precision ground and commercial slides.
- Corrosion resistant options available on all sizes.



Rack Driven Carriage Unit  28-29



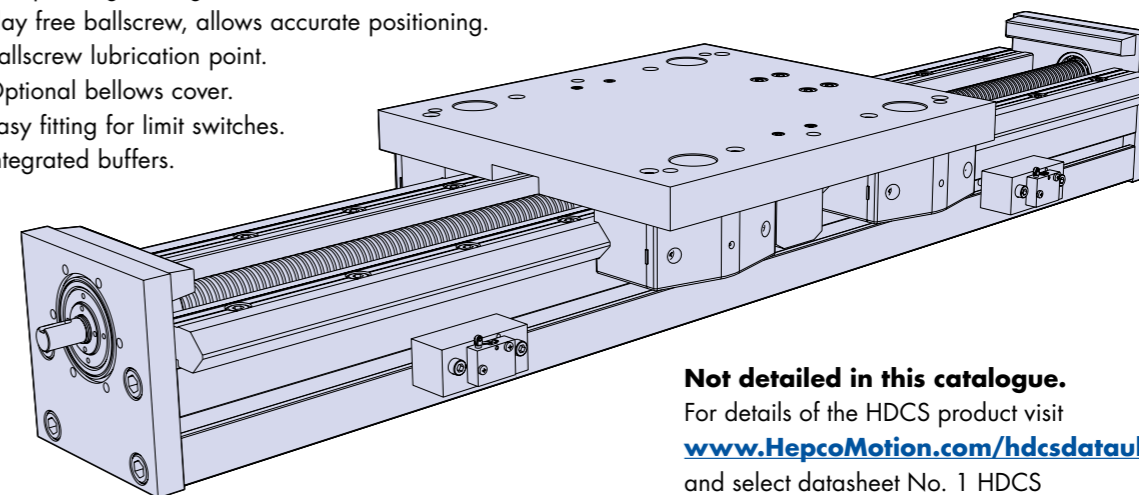
- Sizes to suit all beams.
- Optional automatic rack lubrication.



System Composition

HDCS - Heavy Duty Compact Screw Driven Unit

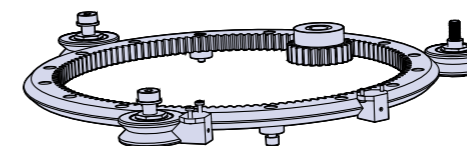
- High performance linear transmission.
- High capacity, high precision.
- Compact high strength aluminium beam.
- Play free ballscrew, allows accurate positioning.
- Ballscrew lubrication point.
- Optional bellows cover.
- Easy fitting for limit switches.
- Integrated buffers.



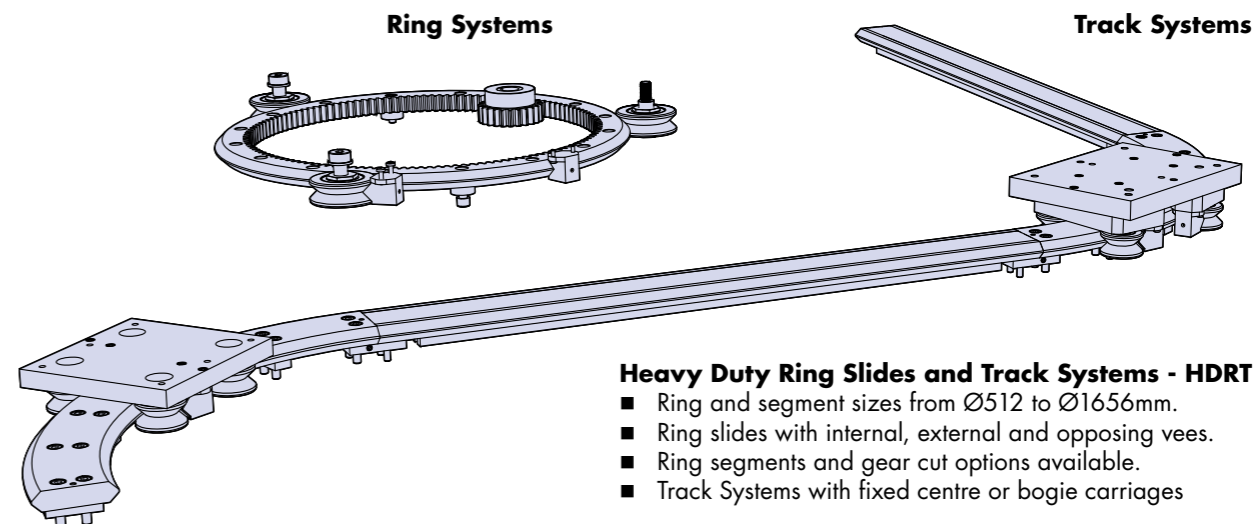
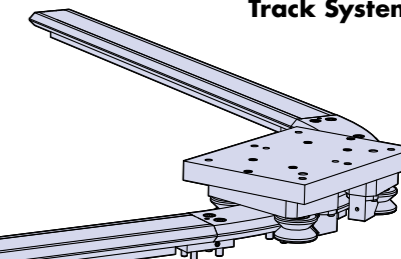
Not detailed in this catalogue.

For details of the HDCS product visit www.HepcoMotion.com/hdcsdatauk and select datasheet No. 1 HDCS

Ring Systems



Track Systems



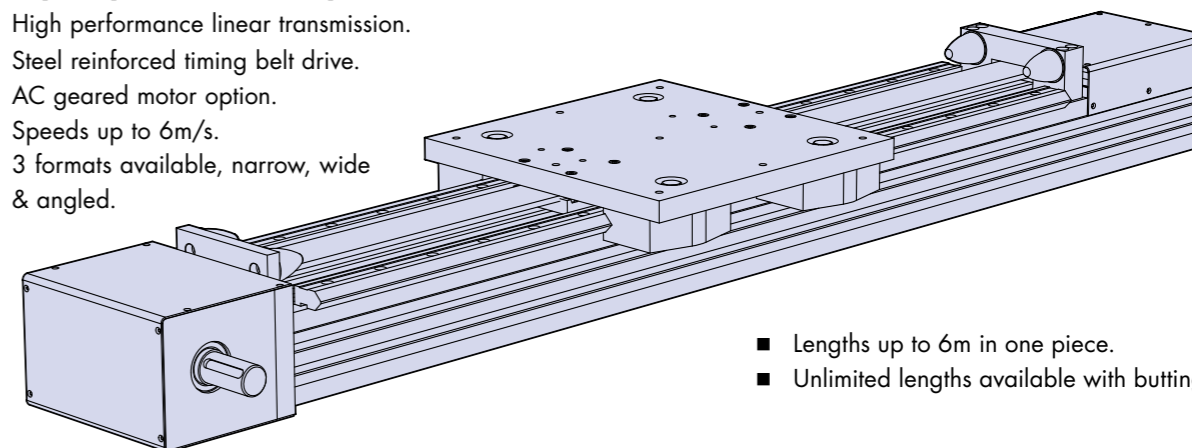
Heavy Duty Ring Slides and Track Systems - HDRT

- Ring and segment sizes from Ø512 to Ø1656mm.
- Ring slides with internal, external and opposing vees.
- Ring segments and gear cut options available.
- Track Systems with fixed centre or bogie carriages

Not detailed in this catalogue. For details of the HDRT product visit www.HepcoMotion.com or request separate catalogue

Heavy Duty Driven Linear System - HDLS

- High performance linear transmission.
- Steel reinforced timing belt drive.
- AC geared motor option.
- Speeds up to 6m/s.
- 3 formats available, narrow, wide & angled.



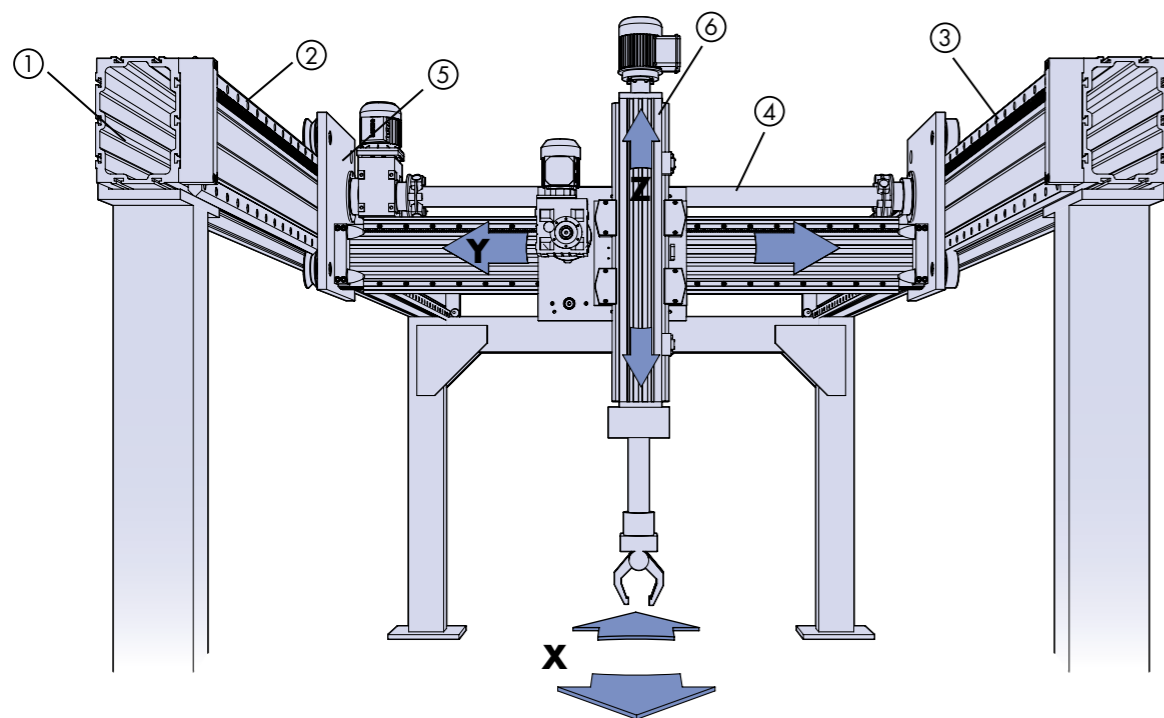
- Lengths up to 6m in one piece.
- Unlimited lengths available with butting.

Not detailed in this catalogue. For details of the HDLS product visit www.HepcoMotion.com or request separate catalogue

Application Examples

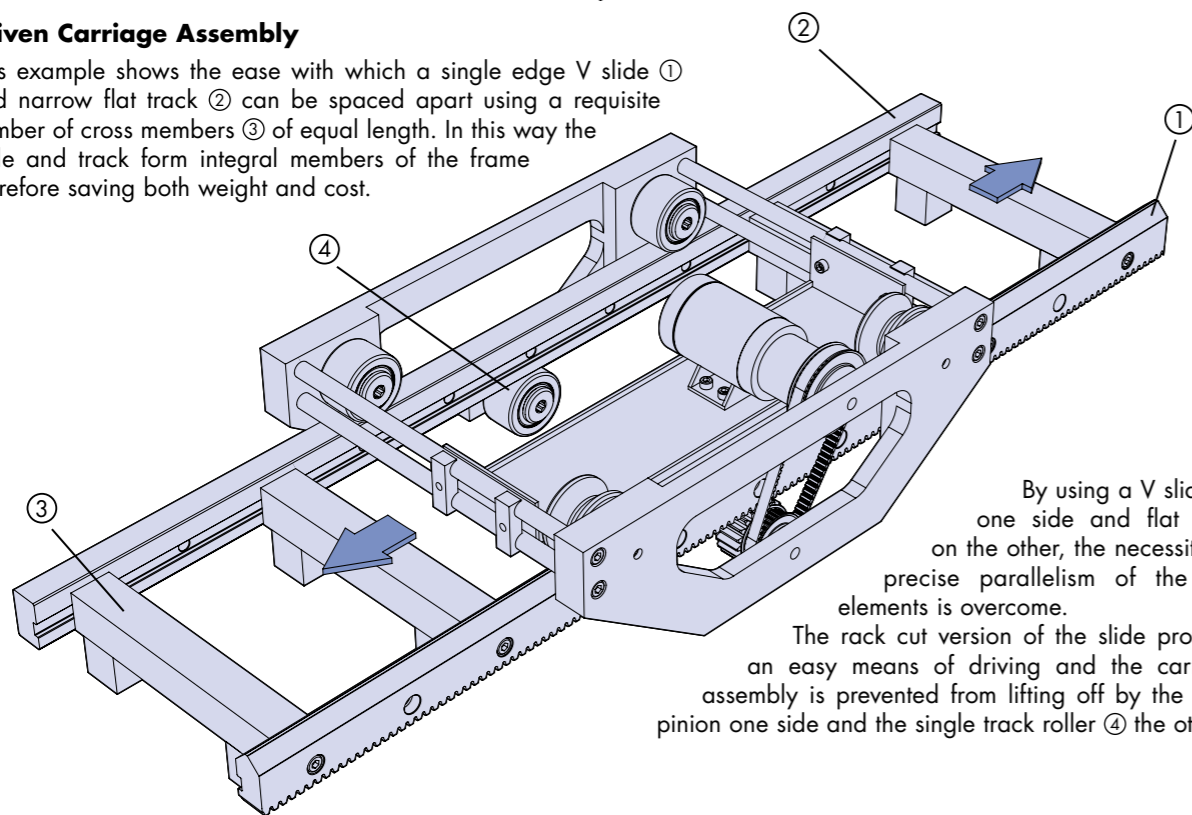
Gantry Robot

The HDS2 system contains all the major components to produce high capacity gantry systems such as that shown below. The extreme rigidity of the construction beams ① allow for long unsupported spans up to 6m depending on load. The use of V slides ② on one side of the X axis and flat tracks ③ on the other makes allowances for the variation in parallelism between the two beams. The common drive shaft ④ allows for the Y axis to be driven from both X axis beams, via the integrated racks on both the V slide and flat tracks. The ends of the Y axis beam have been tapped to allow direct connection into the driven carriages ⑤ on the X axis. Both X & Y axis beams have been fitted with buffer units for end of stroke protection. The Z axis incorporates a Hepco HDCS unit ⑥, which is driven via a ballscrew, this provides both the precision and capacity required for this type of application.



Driven Carriage Assembly

This example shows the ease with which a single edge V slide ① and narrow flat track ② can be spaced apart using a requisite number of cross members ③ of equal length. In this way the slide and track form integral members of the frame therefore saving both weight and cost.



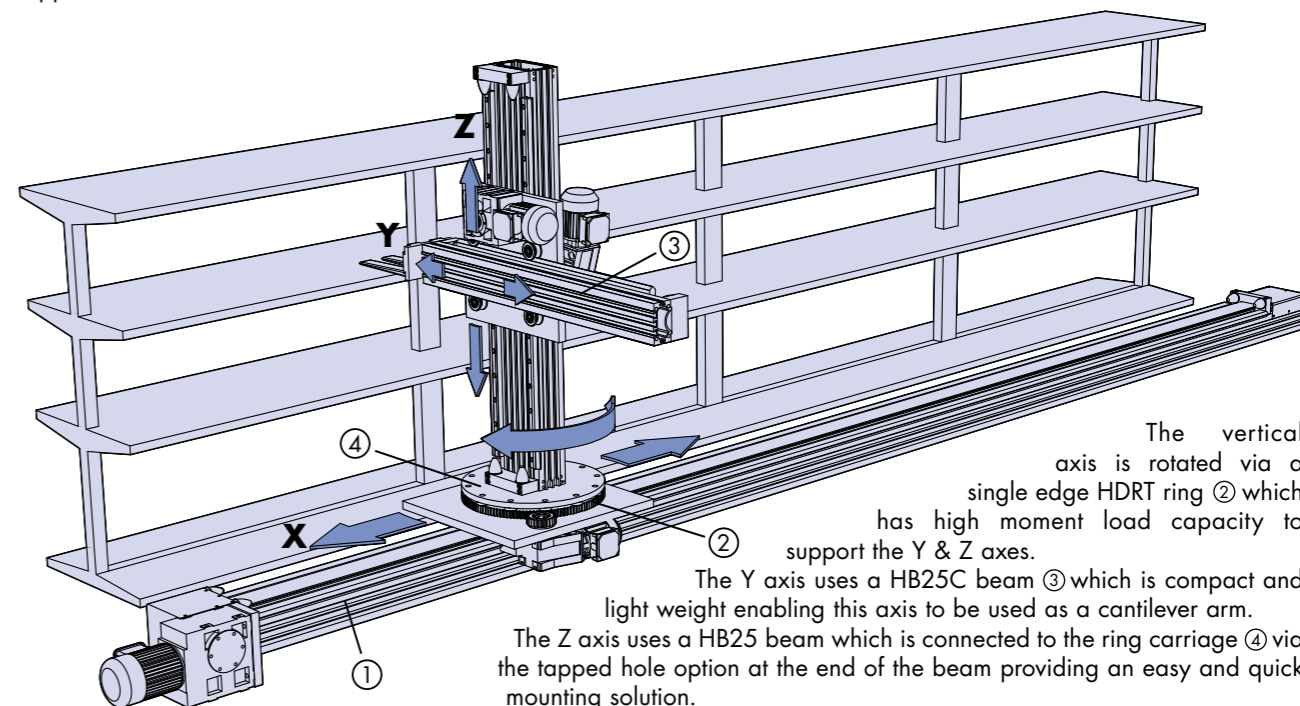
By using a V slide on one side and flat track on the other, the necessity for precise parallelism of the two elements is overcome. The rack cut version of the slide provides an easy means of driving and the carriage assembly is prevented from lifting off by the drive pinion one side and the single track roller ④ the other.

HepcoMotion systems division specialises in the design and manufacture of special machines incorporating its products. Some typical examples are shown above.

Application Examples

Pick and Place Application

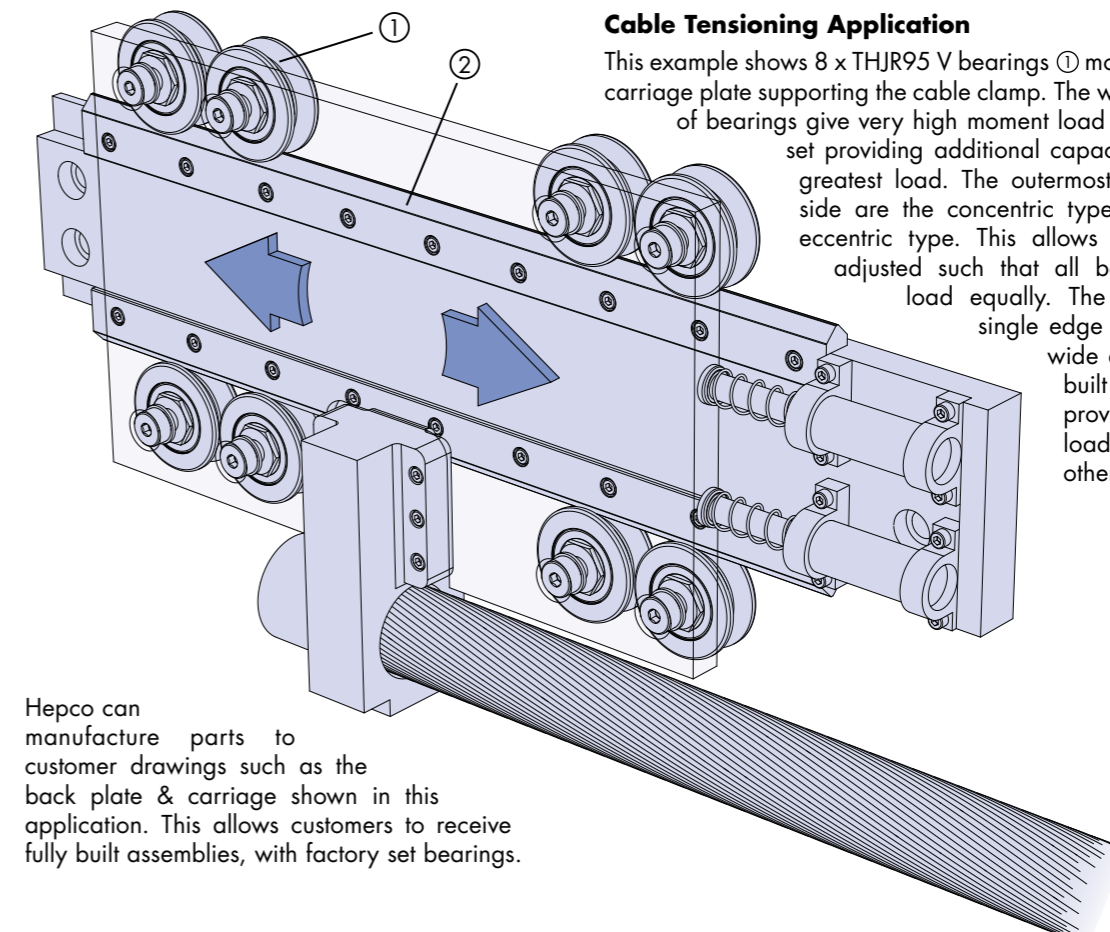
This example shows a 4 axis pick and place system using a combination of Hepco HDS2, HDLS and HDRT parts. HDLS & HDRT are related products featured on 7 and detailed in separate Hepco catalogues. The X axis comprises of the HDLS unit ① which is driven via a steel reinforced timing belt and incorporates an HB25 beam. It is ideally suited to high speed applications of this nature.



The vertical axis is rotated via a single edge HDRT ring ② which has high moment load capacity to support the Y & Z axes. The Y axis uses a HB25C beam ③ which is compact and light weight enabling this axis to be used as a cantilever arm. The Z axis uses a HB25 beam which is connected to the ring carriage ④ via the tapped hole option at the end of the beam providing an easy and quick mounting solution.

Cable Tensioning Application

This example shows 8 x THJR95 V bearings ① mounted on a special carriage plate supporting the cable clamp. The widely spaced pairs of bearings give very high moment load capacity the inner set providing additional capacity at the point of greatest load. The outermost bearings on one side are the concentric type, the rest are the eccentric type. This allows the system to be adjusted such that all bearings share the load equally. The bearings run on single edge V slides ② spaced wide apart on a custom built back plate which provides high moment load capacity in the other direction.



Hepco can manufacture parts to customer drawings such as the back plate & carriage shown in this application. This allows customers to receive fully built assemblies, with factory set bearings.

HepcoMotion systems division specialises in the design and manufacture of special machines incorporating its products. Some typical examples are shown above.

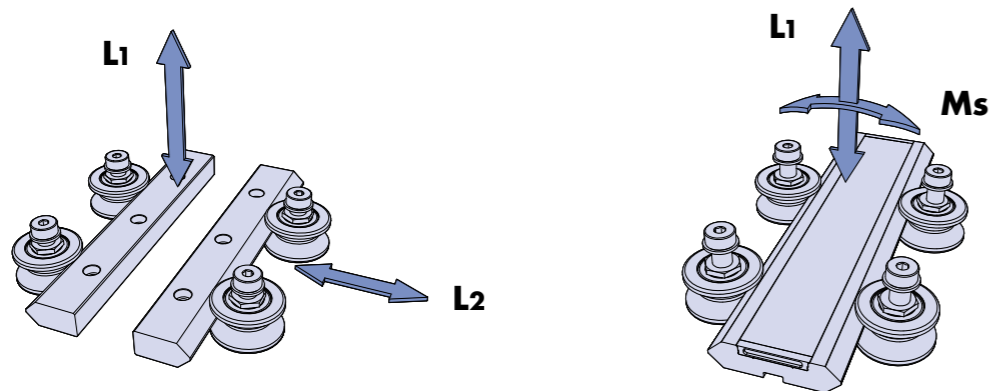
Full Size Illustrations For Initial Selection

Full size illustrations of the basic V slide systems and flat track systems together with load capacity are shown on this and the following 3 pages as a guide to facilitate initial selection. Once a choice has been made, customers should refer to individual component pages for dimensions and to 42-44 for comprehensive details on load and life. Combinations other than shown in this section are possible, please refer to the Mix & Match tables on 46-47. There is a wide range of other components complementary to the V slide systems and flat track systems. These are illustrated on the system composition 2.7 cross referenced to the relevant component pages.

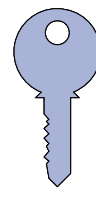
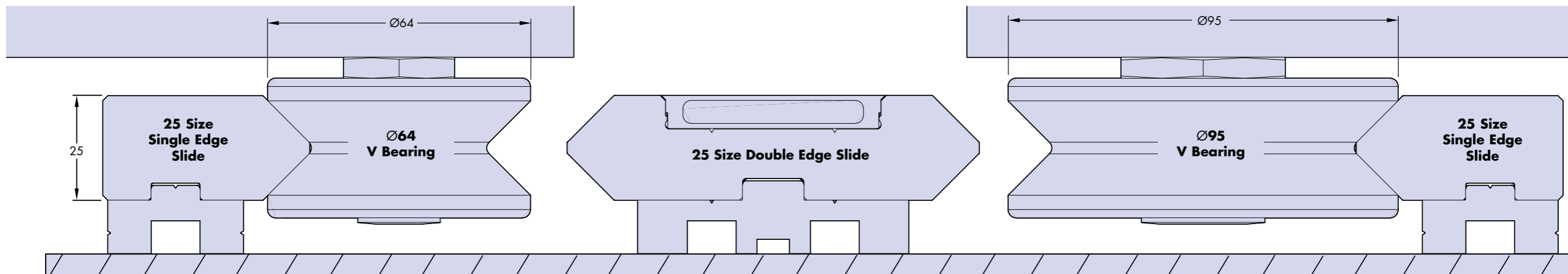
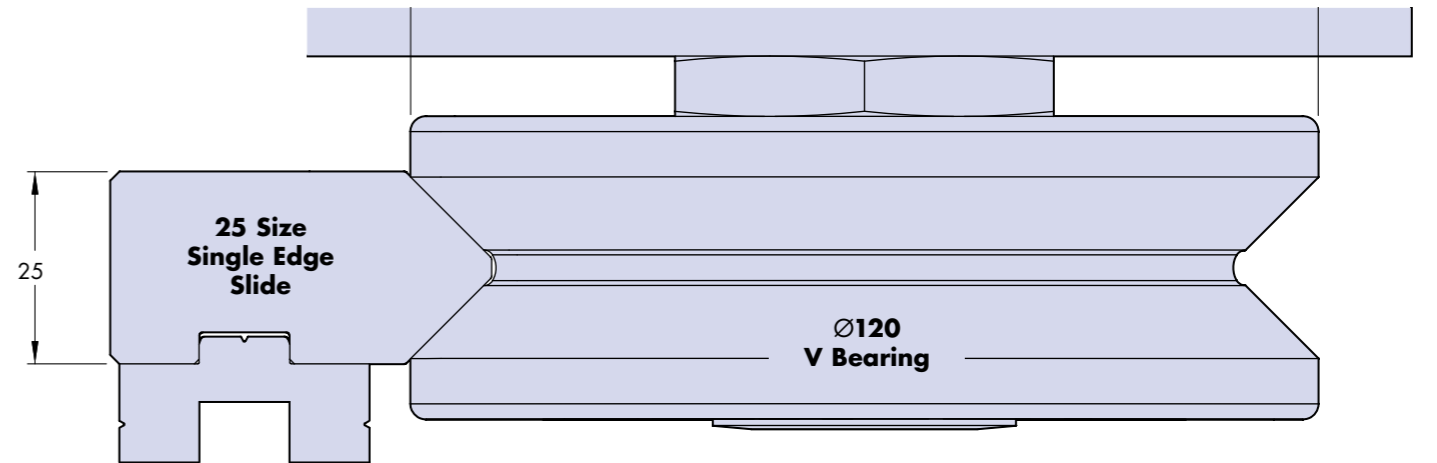
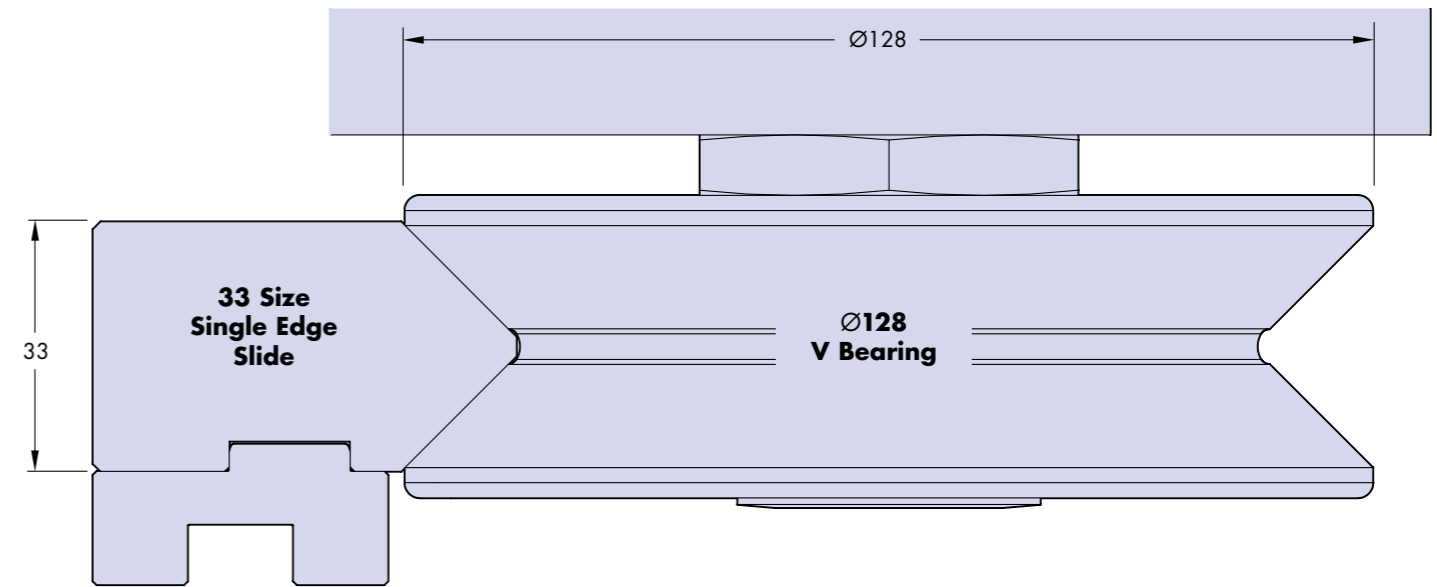
Please note that bearing cap wipers and roller cap wipers are not shown on the illustrations. These will increase the space required very slightly 32.

Slide		Bearing		System Load (Lubricated)		
Size & Type	Part No.	Ø	Part No.	L1	L2	Ms
25 Single Edge	C/P/SS HSS25	64	B/THJR64	10 000N	16 000N	Variable
25 Single Edge	C/P/SS HSS25	95	B/THJR95	28 000N	40 000N	Variable
25 Single Edge	C/P/SS HSS25	120	B/THJR120	40 000N	60 000N	Variable
25 Double Edge	C/P/SS HSD25	64	B/THJR64	10 000N	16 000N	450Nm
25 Double Edge	C/P/SS HSD25	95	B/THJR95	28 000N	40 000N	1280Nm
25 Double Edge	C/P/SS HSD25	120	B/THJR120	40 000N	60 000N	1820Nm
33 Single Edge	C/P/SS HSS33	128	B/THJR128	40 000N	60 000N	Variable
33 Single Edge	C/P/SS HSS33	150	B/THJR150	68 000N	100 000N	Variable

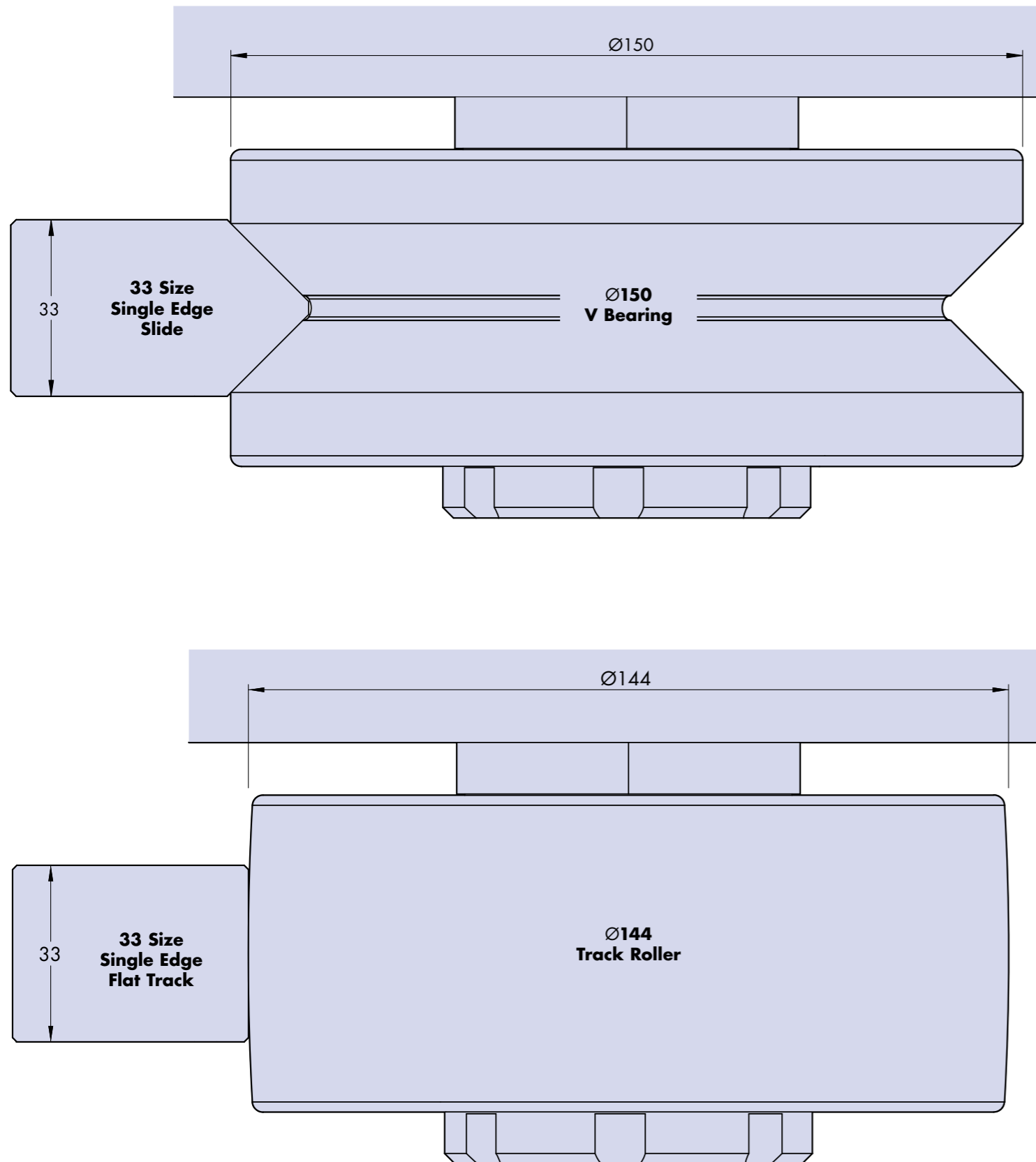
Load capacities apply to steel systems, for stainless steel systems load capacities are 25% lower



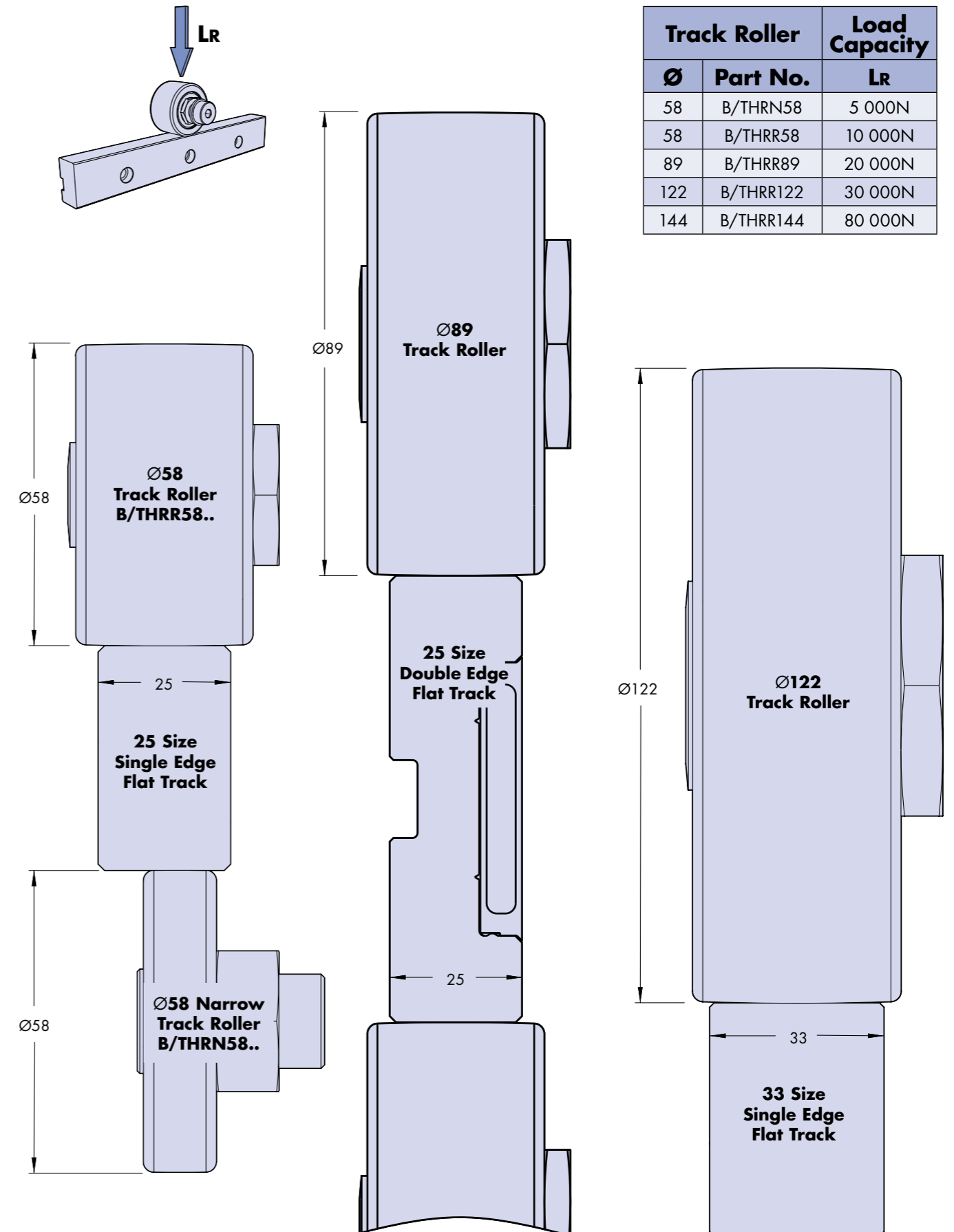
Full Size Illustrations For Initial Selection



Full Size Illustrations For Initial Selection



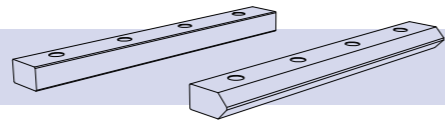
Full Size Illustrations For Initial Selection



Track Roller		Load Capacity
Ø	Part No.	LR
58	B/THRN58	5 000N
58	B/THRR58	10 000N
89	B/THRR89	20 000N
122	B/THRR122	30 000N
144	B/THRR144	80 000N

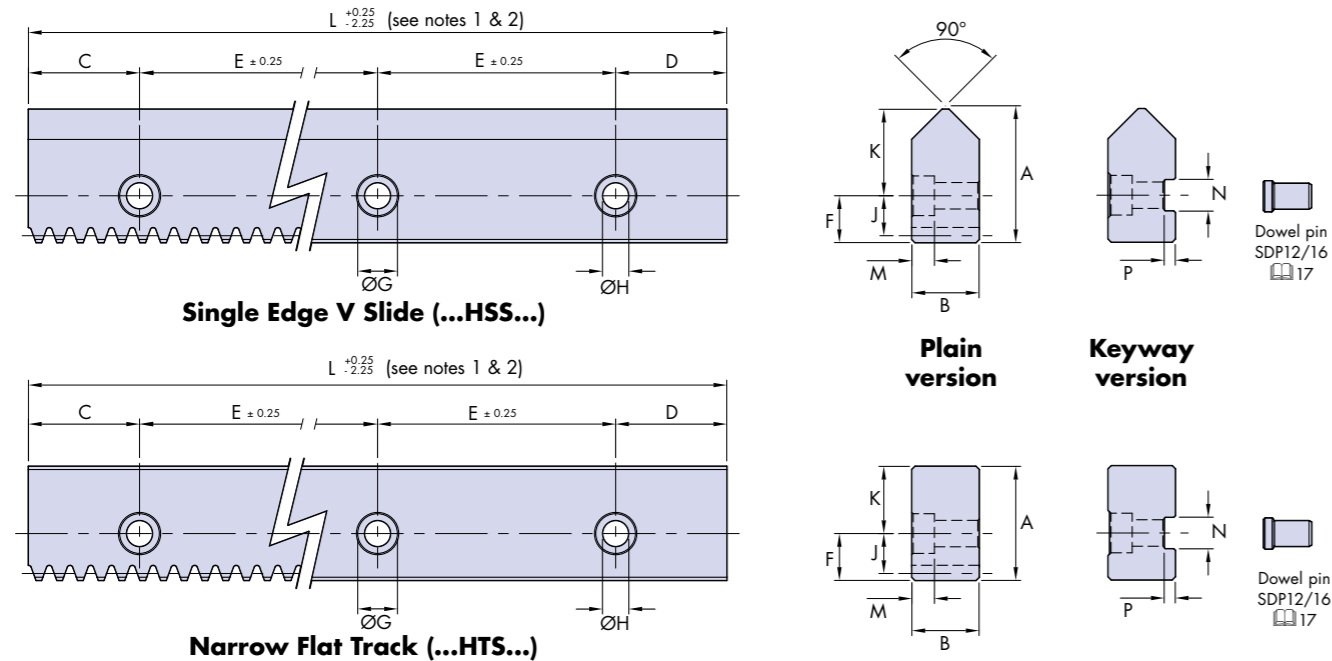


V Slides & Flat Tracks



Hepco HDS2 V slides and flat tracks are manufactured from high quality bearing steel, hardened on the wearing surfaces. Other areas are left soft for customising. All sizes are available in precision ground, commercial and stainless steel grades. The precision and stainless steel grades are ground on the wearing surfaces and mounting face to provide accuracy and smooth operation. The commercial grade is etched on the wearing surfaces to aid lubrication retention and is suitable for many applications. Single edge slides and tracks are available with a spur or helical rack cut into the rear face. These are also available with a keyway for use with Hepco back plates or dowel pins.

Popular options available on request: Non standard lengths and holes - Butt jointed profiles of unlimited length*2
 45 - Matched and replaceable short butted sets 45 - Hardened racks*5



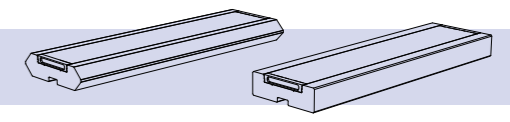
Part Number	A	B	C	D	E	F	G	H	J Rack Module				K	L	M	N	P	kg/m ~
									2.5	3	4	5						
CHSS 25	51.7	25.4	43	43	90	17.7	15	10	15.1	14.6	-	-	32.7	4046	8.5	12	4.2	8
SS/PHSS 25	51.2	25	43	43	90	17.5	15	10	15.1	14.6	-	-	32.5	4046	8.5	12	4	8
CHSS 33	57.7	33.4	58	58	120	26.2	20	14	-	-	22.1	21.1	30.2	3956	12.7	16	4.2	12.3
SS/PHSS 33	57.2	33	58	58	120	26	20	14	-	-	22.1	21.1	30	3956	12.5	16	4	12.3
CHTS 25	43.1	25.4	43	43	90	17.7	15	10	15.1	14.6	-	-	25.4	4046	8.5	12	4.2	7.7
SS/PHTS 25	42.7	25	43	43	90	17.5	15	10	15.1	14.6	-	-	25.2	4046	8.5	12	4	7.7
CHTS 33	44.7	33.4	58	58	120	26.2	20	14	-	-	22.1	21.1	18.5	3956	12.7	16	4.2	11.7
SS/PHTS 33	44.2	33	58	58	120	26	20	14	-	-	22.1	21.1	18.3	3956	12.5	16	4	11.7

Rack Type & Module Availability					Type	Precision / Commercial	Type	Precision / Commercial	Commercial Grade		
Module	Rack Type*4	HSS25	HTS25	HSS33	HTS33	°6	Stainless steel	Grade	°6	Stainless steel	Grade
2.5	Spur	✓	✓	✗	✗	..HSS...			..HSD...		
2.5	Helical	✓	✓	✗	✗	..HTS...			..HTD...		
3	Spur	✓	✓	✗	✗						
4	Helical	✗	✗	✓	✓						
5	Spur	✗	✗	✓	✓						

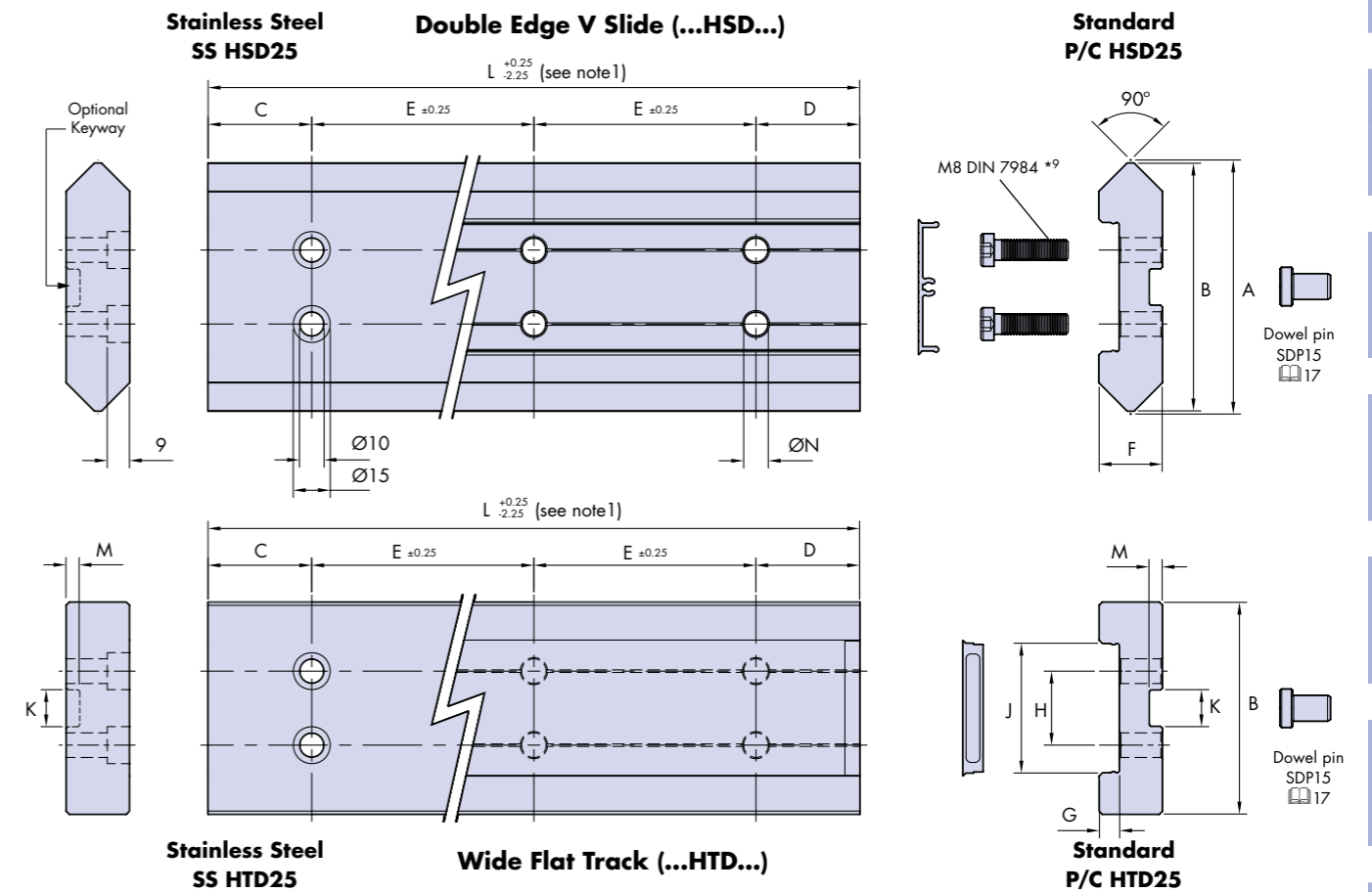
✓ = Standard option ✗ = Not available
 Helical racks are not available for SS versions
 ✓ Indicates surfaces which are precision ground

- Notes:**
- Any length of slide up to 4046mm long can be supplied in one piece, but for optimum price and delivery, slide lengths should be specified with C & D dimensions as shown in the above table.
 - Butt jointed slides of unlimited length are available. The hole pitch will be maintained across the joint. See installation details 45
 - Tooth pitch positions relative to the hole pitch may vary between components. Customers using rack cut profiles in parallel should ensure that one drive pinion can be adjusted relative to the other in order to compensate. Rack cut profiles to a regulated or matched tooth position are available on request.
 - Helical racks have a left handed helix angle of 30 degrees.
 - Hardened racks are available on request, ..HSS/HTS25 with mod 3 racks are supplied with hardened rack as standard.
 - Commercial V slides and flat tracks are manufactured to ± 0.3 tolerance on width and ± 0.1 tolerance on thickness, precision and stainless steel versions are manufactured to ± 0.025 on both width and thickness. Finish is generally to N5.

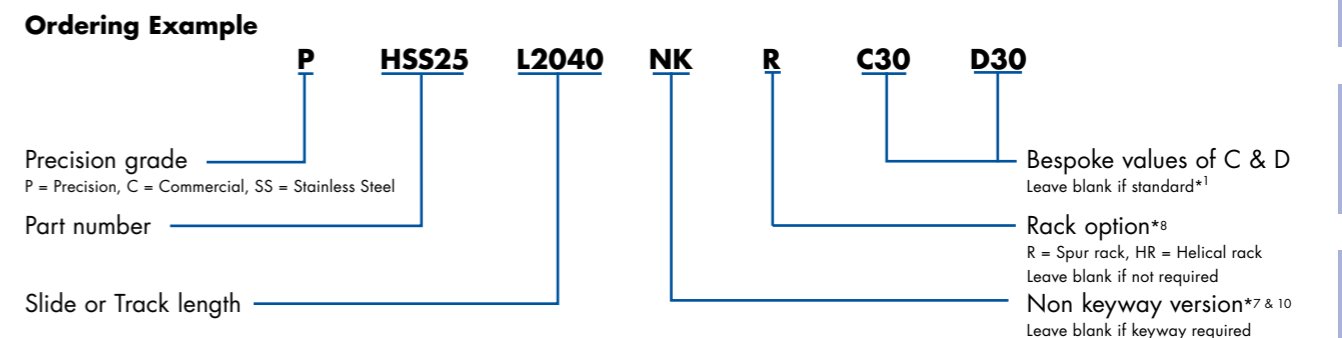
V Slides & Flat Tracks



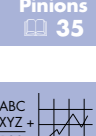
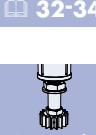
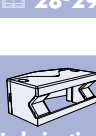
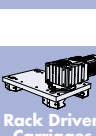
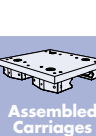
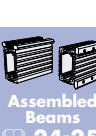
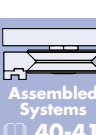
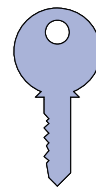
Hepco double edge slides and wide flat tracks have built in parallelism for ease of setting. Both are supplied with flush fitting plastic covers and end caps to prevent entrapment of debris. Double edge slides and wide flat tracks are supplied with a keyway for locating to a key register, Hepco dowel pins or back plates. Stainless steel versions are available and have a slightly different design, without the central recess or plastic cover and with mounting holes and counterbores to suit M8 cap head screws to DIN912.



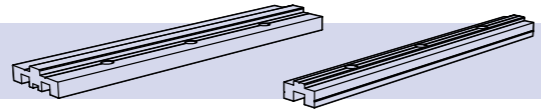
Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N	kg/m ~
CHSD 25	103	100.4	43	43	90	25.4	8.2	30	52.6	15	4046	5.35	10	13.5
SS/PHSD 25	102.4	100	43	43	90	25	8	30	52.6	15	4046	5.15	10	13.5
CHTD 25	-	85.8	43	43	90	25.4	8.2	30	52.6	15	4046	5.35	10	12.5
SS/PHTD 25	-	85.4	43	43	90	25	8	30	52.6	15	4046	5.15	10	12.5



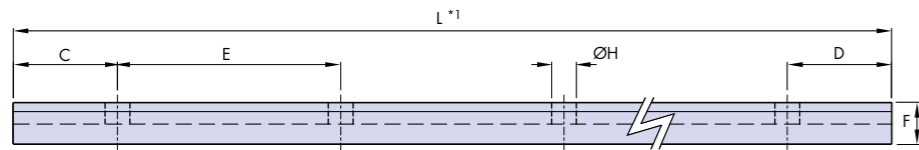
- Notes:**
- Single edge slides & flat tracks for corner mounting to Hepco beams should be ordered without keyway 'NK' 24. The keyway version is useful for customers own location requirements and is necessary when using Hepco back plates 16 & 25.
 - HSS & HTS 25 slide and flat tracks have an option of 2.5 or 3 module spur rack. 2.5 module rack is supplied as standard when 'R' is added to the part number. If 3 module rack is required add 3 after 'R' to confirm size required. Helical racks are not available for stainless steel slides or flat tracks.
 - M8 low head cap screws are available from Hepco in the following lengths: 30mm (part no. FS8-30) for use without back plate, 40mm (part no. FS8-40) for use with low back plates & 60mm (part no. FS8-60) for use with high back plates. HSS and HTS slides and tracks can use widely available standard M8 & M12 capscrews DIN 912.
 - Standard double edge V slides and flat tracks are not available in 'NK' version.



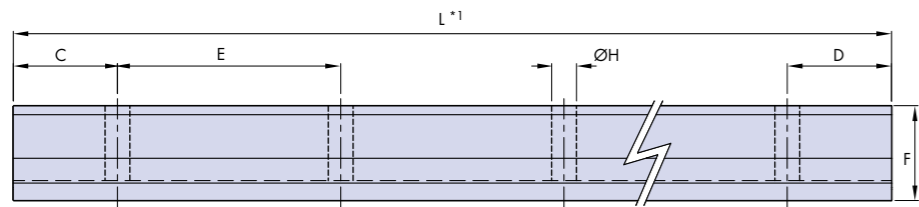
Back Plates



HDS2 back plates are designed to space the V slides and flat tracks off the mounting surface, providing clearance to accommodate the V bearings and track rollers plus their respective lubrication devices [47]. They may be used either within the customer's own machine design or in conjunction with the construction beams [25]. The male key section is designed to locate in the optional keyway of the slide and flat tracks whilst the female keyway section(s) are designed to locate either with the customer's own key section or with Hepco dowel pins. The HHN25 and HLN narrow type back plates may be ordered with a jacking screw alignment facility to enable one slide or track to be set exactly parallel to another within a system (see opposite).

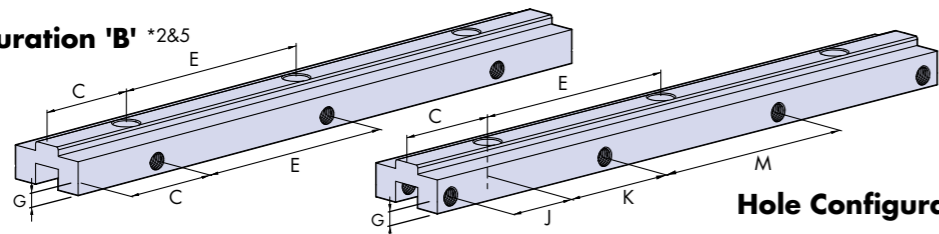


Low Narrow Back Plate



High Narrow Back Plate

Hole Configuration 'B' *2&5



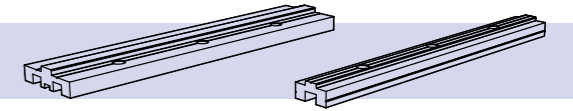
Hole Configuration 'A' *2&5

Part Number	For Use With			A	B	C	D	E	F	G ⁴	H	J ⁴	K ⁴	L	M ⁴	N	P	R	S	kg/m		
	HSS	HTS	HTD																			
HLN 25	HSS 25	HTS 25		33	13	*1	*1	90	16.6	5	10	35	45	6026	90	12	+0 -0.2	12	+0.2 -0	16.5	3.6	1.0
HLN 33	HSS 33	HTS 33		39	15	*1	*1	120	18.6	5	14	50	60	5996	120	16	+0 -0.3	14	+0.3 -0	19.5	3.6	1.6
HLW 25	HSD 25	HTD 25		66	13	*1	*1	90	17.7	-	10	-	-	6026	-	15	+0 -0.2	12	+0.2 -0	33	4.7	2.25
HHN 25	HSS 25	HTS 25		27	34.5	*1	*1	90	38.1	5	10	35	45	6026	90	12	+0 -0.3	12	+0.2 -0	20	3.6	3.8
HHN 33	HSS 33	HTS 33		27	30.8	*1	*1	120	34.4	5	14	50	60	5996	120	16	+0 -0.2	14	+0.3 -0	21	3.6	3.7
HHW 25	HSD 25	HTD 25		54	34.5	*1	*1	90	39.2	-	10	-	-	6026	-	15	+0 -0.2	12	+0.2 -0	35	4.7	5.3

Notes:

- Overall lengths ('L' dimension) should be ordered to correspond with the length of slide or track ensuring that 'C' & 'D' dimensions also correspond. Back plate lengths up to 6026mm are available in one piece to suit butted matched sets [45].
- HLN back plates will be supplied with tapped holes and M8 dog point socket set screws to ISO 4028 for customers requiring the jacking screw alignment facility. Hole configuration 'B' denotes jacking screw positions corresponding with fixing hole positions, necessary when used in conjunction with the construction beams (see figure 1). Hole configuration 'A' denotes jacking screw positions mid way between fixing hole positions and is for general use where customers provide their own centre key section or use Hepco alignment dowel pins USDPA as shown in figure 2.
- Holes for Hepco dowel pins should be reamed to a tolerance K6. Dowel pin head Ø tolerance for engagement with keyway is m7.
- Dimensions G, J, K & M only apply for back plates supplied with either type 'A' or type 'B' hole configurations.
- Type 'B' hole configuration is only available for the HLN25 & HHN25 back plates. Type 'A' hole configurations are available for all narrow type back plates.

Back Plates



Mounting surfaces and location faces are manufactured to precision extrusion tolerances and are adequate for most applications. Back plates are manufactured from high strength aluminium and are supplied clear anodised. Compatibility of back plates with the various sizes and types of slide, tracks, bearings and lubricators can be found on [46 & 47].

Alignment procedure

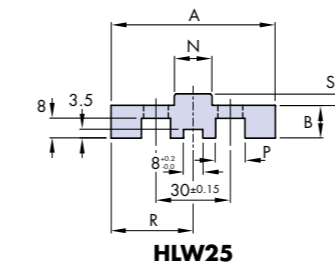
It is normal to use one adjustable slide/track and back plate element in conjunction with one non-adjustable element. The non-adjustable element should be located onto a key, Hepco dowel pins, or otherwise set adequately straight for the application and bolted down tight.

Where the Hepco construction beams are used, the non-adjustable element should be located by means of Hepco location T-nuts types 'L' and the adjustable element by means of the alignment T-nuts type 'A'. (for T-nut details [38]).

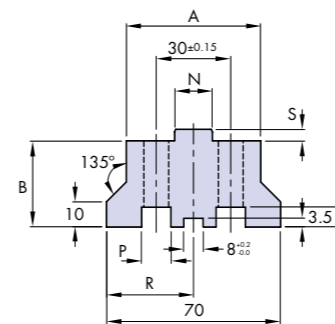
For applications not requiring a construction beam, the adjustable element should be located onto a reduced width key section or Hepco dowel pins type SDPA midway between centres. The hole in the mounting surface for fixing, should be spotted and drilled from the back plate to ensure even clearance around the screws.

The adjustable element should be set parallel to the non-adjustable element at the end hole positions with the jacking screws set for even clearance around the fixing screws and the end screws tightened down. Working outwards from the centre of the element and with all but the end screws fully retracted, each jacking screw should be progressively jacked in to influence the elements parallel with the corresponding position on the opposing element then both jacking screws locked and the corresponding fixing screw tightened down. Depending upon available hole clearances, it is possible to bend an element up to 1mm pro-rata per metre.

Low Wide Back Plate



HLW25



HHW25

High Wide Back Plate

Alignment principle for use with Hepco beam. Hole configuration 'B' *2

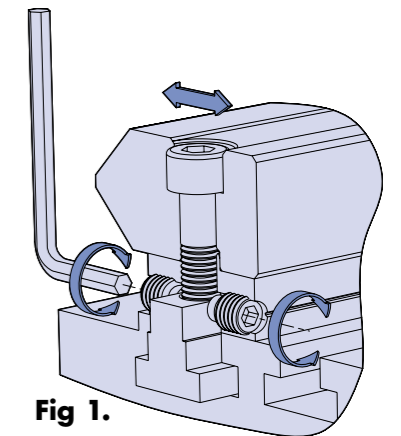


Fig 1.

General alignment principle Hole configuration 'A' *2

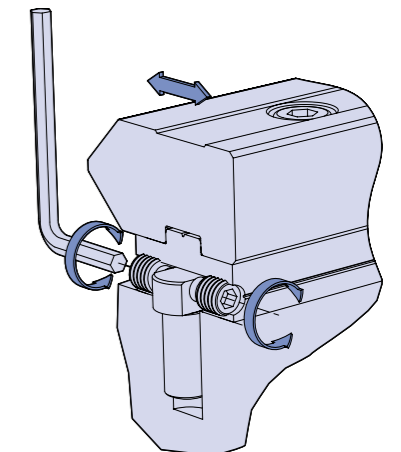
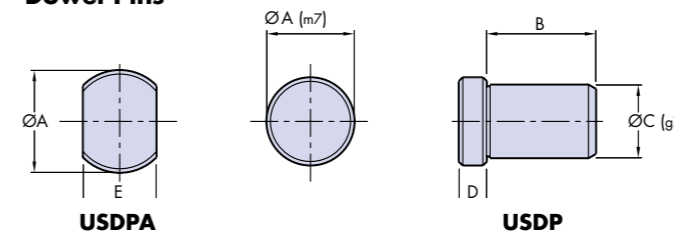


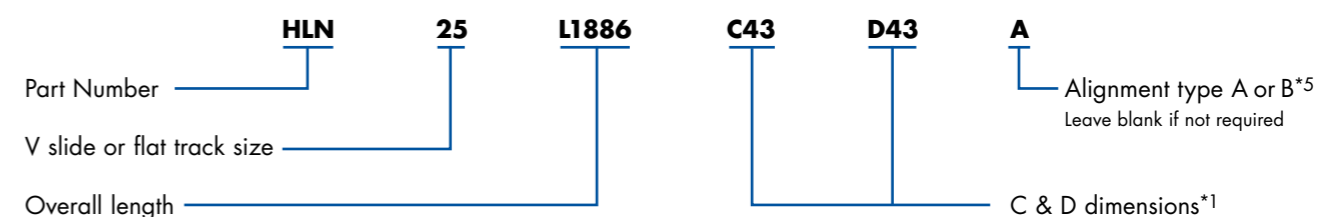
Fig 2.

Dowel Pins

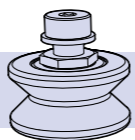


Part Number	ØA ^{*3}	B	ØC ^{*3}	D	E
USDP8	8	8	6	2.75	-
USDP12	12	15	10	3.75	-
USDP14	14	15	12	3.75	-
USDP15	15	15	10	4.75	-
USDP16	16	15	12	3.75	-
USDPA14	14	20	10	7.5	10
USDPA16	16	20	12	7.5	12

Ordering Example for Back Plates

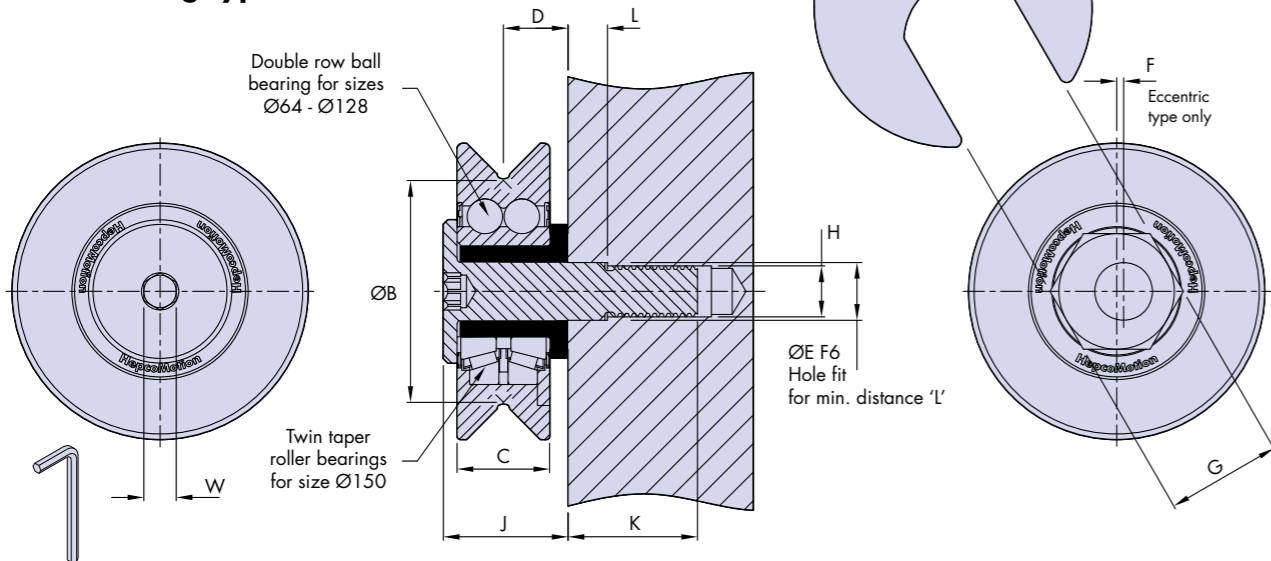


V Bearings

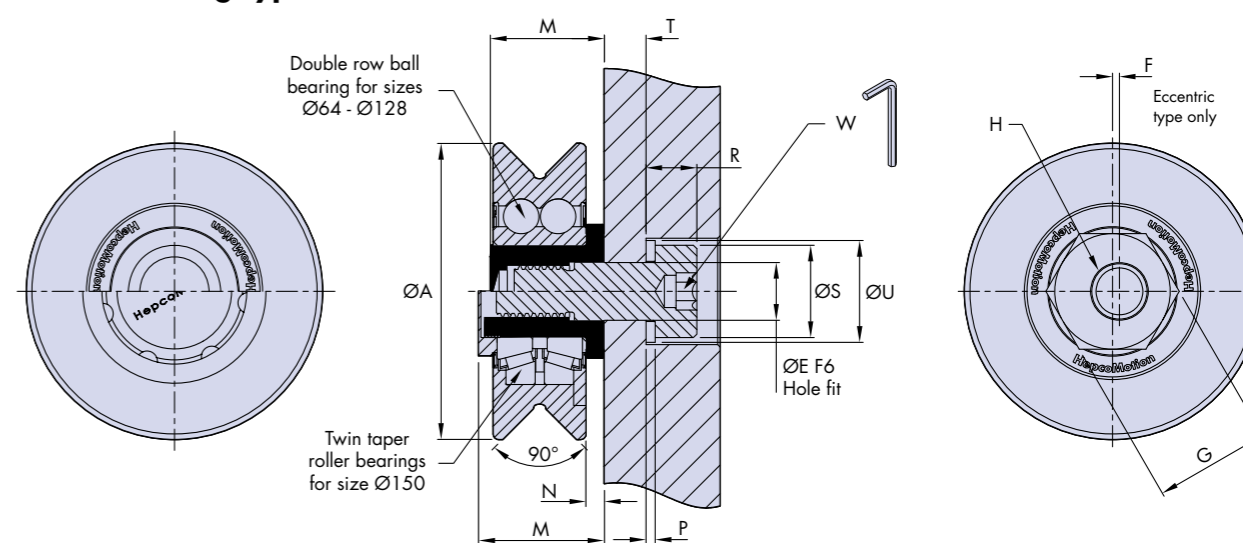


Hepco HJR bearings use double row ball bearings on sizes 64 to 128 and twin taper roller bearings on size 150. These provide high axial and radial load capacity. The design allows for easy assembly, and bearings can be removed from a system with a single screw. Each bearing has a chemically blacked, high tensile steel journal and bush and is available in concentric and eccentric (adjustable) forms. Each bearing is available with either a blind or through-hole fixing. Stainless steel versions are available as standard.

Blind Hole Fixing Type - BH



Through Hole Fixing Type - TH



Part Number	For Use With V Slide		ØB ±0.015	C	D	ØE F6	F	G	H	J	K	L	M	N	P	R	ØS	ØU	W	kg~	Max Working Load Capacity ³		Bearing Static (Co) & Dynamic (C) Radial Load Capacities ⁴		
	ØA																				Axial (N)	Radial (N)	Co (N)	C (N)	
BHJR..	64	HSS 25	HSD 25	41	34	22	16	1.25	27	M10	43	26	10	-	5	-	-	-	-	10	0.65	2500	8000	12 899	21 373
THJR..	64	HSS 25	HSD 25	41	34	22	16	1.25	27	M12	-	-	-	40	5	2.5	13.5	24	28	8	0.65	2500	8000	12 899	21 373
BHJR..	95	HSS 25	HSD 25	72	34	22	20	2	40	M16	44	41	11.5	-	5	-	-	-	-	12	1.45	7000	20 000	29 340	41 823
THJR..	95	HSS 25	HSD 25	72	34	22	20	2	40	M16	-	-	-	40	5	3	17	30	34	10	1.45	7000	20 000	29 340	41 823
BHJR..	120	HSS 25	HSD 25	96	40	28	25	3	50	M24	54	56	17	-	8	-	-	-	-	14	3.0	10 000	30 000	43 200	63 830
THJR..	120	HSS 25	HSD 25	96	40	28	25	3	50	M24	-	-	-	50	8	4	22	40	44	14	3.0	10 000	30 000	43 200	63 830
BHJR..	128	HSS 33	-	96	40	28	25	3	50	M24	54	56	17	-	8	-	-	-	-	14	3.0	10 000	30 000	43 200	63 830
THJR..	128	HSS 33	-	96	40	28	25	3	50	M24	-	-	-	50	8	4	22	40	44	14	3.0	10 000	30 000	43 200	63 830
BHJR..	150	HSS 33	-	118	60	40	38	2	65	M36	80	70	21	-	10	-	-	-	-	19	7.5	17 000	50 000	218 000	150 018
THJR..	150	HSS 33	-	118	60	40	38	2	65	M36	-	-	-	80	10	5	33	60	66	22	7.5	17 000	50 000	218 000	150 018

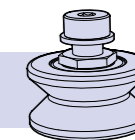
Mounting Plate Screw Lengths

Part Number	T ¹	
	min	max
THJR 64 ... 12	6.5	12.5
THJR 64 ... 17	11.5	17.5
THJR 64 ... 22	16.5	22.5
THJR 64 ... 27	21.5	27.5
THJR 95 ... 16	9	16
THJR 95 ... 22	16	22
THJR 95 ... 27	21	27
THJR 95 ... 32	26	32

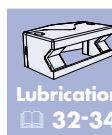
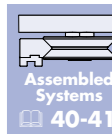
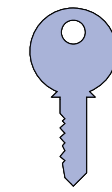
Part Number	T ¹	
	min	max
THJR 120 ... 17	6.5	17
THJR 120 ... 27	16.5	27
THJR 120 ... 37	26.5	37
THJR 128 ... 17	6.5	17
THJR 128 ... 27	16.5	27
THJR 128 ... 37	26.5	37
THJR 150 ... 25	6.5	25
THJR 150 ... 40	21.5	40

- Notes:**
- When using THJR bearings, the part number must be selected to suit the required plate thickness, T. Choose from the tables above.
 - Adjustment tools for V bearing and track rollers are available. Please order part number AT54 for HJR64, AT95 for HJR95. AT128 for HJR120/HJR128, and AT150 for HJR150.

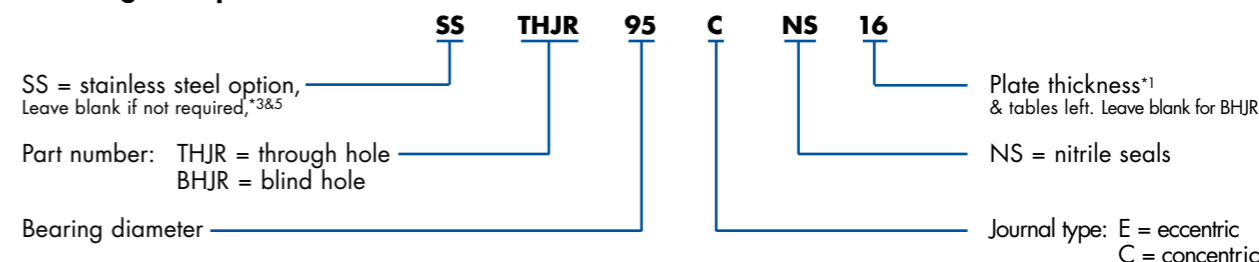
V Bearings



All bearings are greased for life and incorporate nitrile seals to inhibit ingress of liquids and contaminants. Customers are strongly recommended to provide lubrication to the interface between the bearings and the slide by specifying Hepco cap wipers or lubricators which contact the vee of the slide or the bearing. This lubrication greatly increases the load capacity and life.

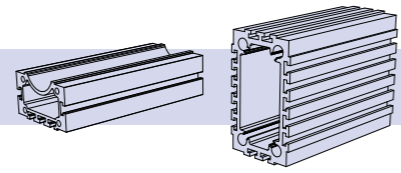


Ordering Example



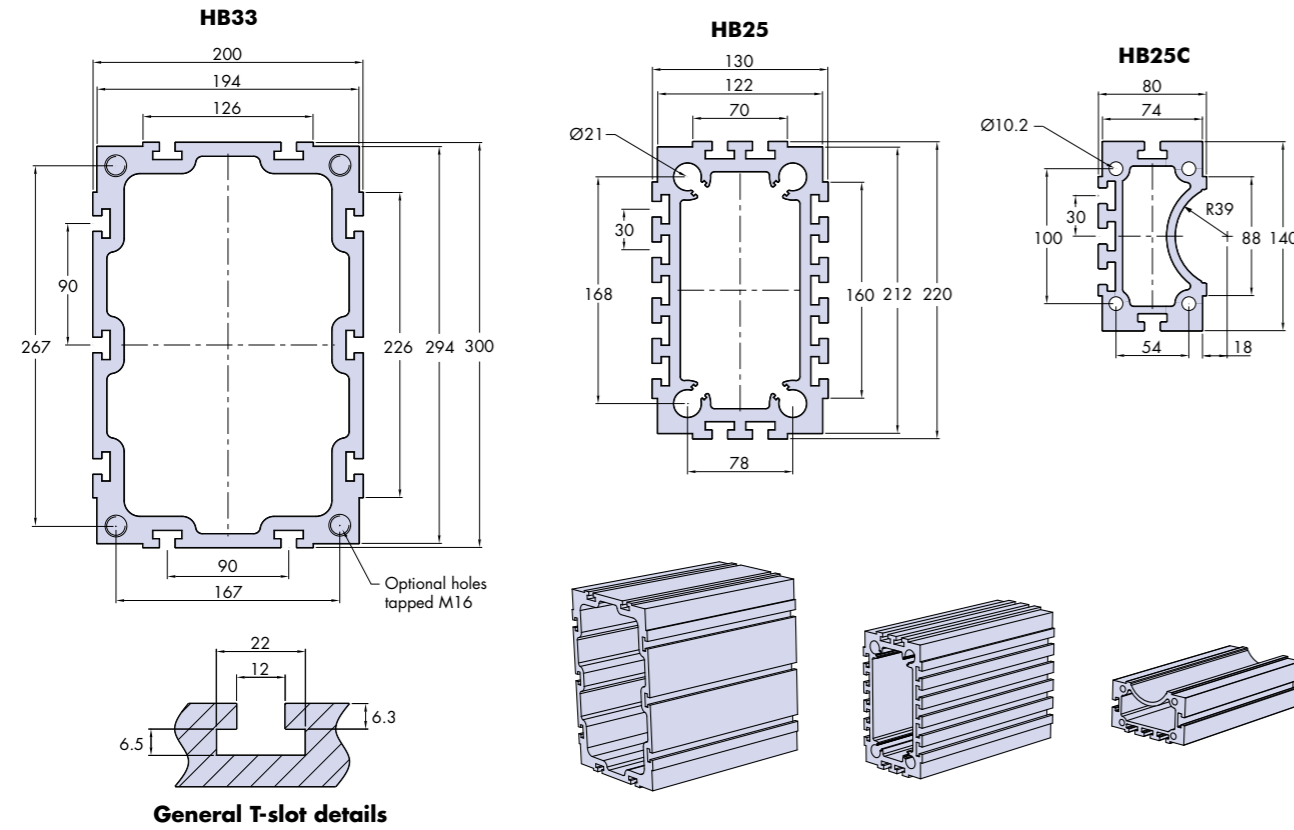
- Notes:**
- Load capacities stated, assume lubrication at the bearing/slide interface. Stainless steel versions have a 25% lower capacity.
 - The quoted static and dynamic load capacities are based on industry standard calculations. These do not accurately reflect performance, and are only provided for comparison with other systems. Please use Max Working Load figures and the load/life calculations on 42-44 to determine system performance.
 - SS versions of the size 150 bearing contains a steel twin taper roller bearing, protected by nitrile seals.

Construction Beams



The design of Hepco construction beams enables slides and flat tracks to be factory assembled directly to the corner faces of the beam or, to be mounted at the many T-slot positions in conjunction with back plates and T-nuts 24&25. Very high stiffness allows the beams to be used as self supporting construction elements.

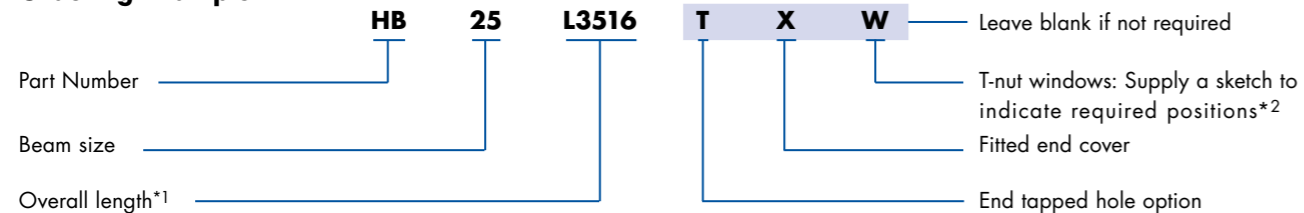
The recess in the HB25C beam has been designed to accommodate a screw drive. Beams are manufactured from high strength aluminium alloy to precision extrusion tolerances and are supplied clear anodised. Beam deflection can be calculated using simple beam theory requiring second moment of inertia figures which are given in the table below. For further details of calculations please visit www.HepcoMotion.com/hdsdatauk and select datasheet No. 2 Beam Deflection Calculations.



Beam	Second Moment Of Inertia		kg/m
	Vertical X-X	Horizontal Y-Y	
HB 25C	2.8x10 ⁶	10.2x10 ⁶	11.3kg/m
HB 25	4.7x10 ⁷	1.8x10 ⁷	24kg/m
HB 33	16.9x10 ⁷	8.4x10 ⁷	37.5kg/m

Beam second moment of inertia figures, are stated in mm⁴.

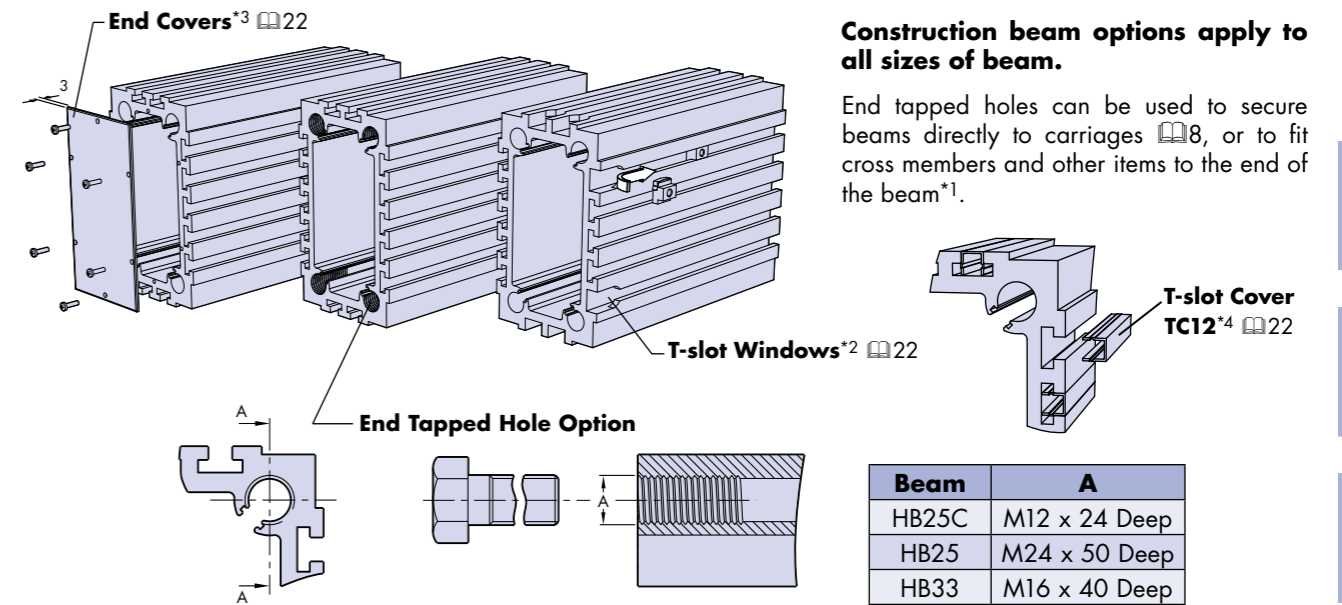
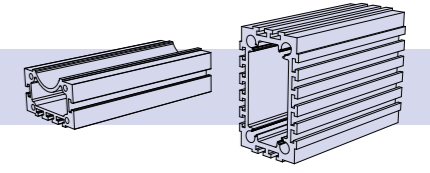
Ordering Example



Notes:

- Beams are cut to customer's length requirements with machine finished ends. They may be requested matched in length and should be ordered minimum 5mm longer than the corresponding slides or tracks. Beams are available in one piece up to 6m long. Special high strength joining systems can be readily supplied to achieve beams of unlimited length. Customers attaching carriage plates or other components directly to the ends of the beam which require a higher than normal squareness are requested to specify this requirement when ordering.
- Where access to beam end will be blocked, customers using high strength T-nuts 38 can specify T-nut windows at either end of any T-slot to enable nuts to be inserted. Supply a sketch to indicate required positions.
- Fitted aluminium end covers are supplied clear anodised and are secured via pan head screw DIN7985. Covers are not compatible with end tapped hole option.
- Plastic T-slot cover compatible with all construction beams is available, please specify the number required and length. Example; 14 x TC12 L3000.

Construction Beam Options

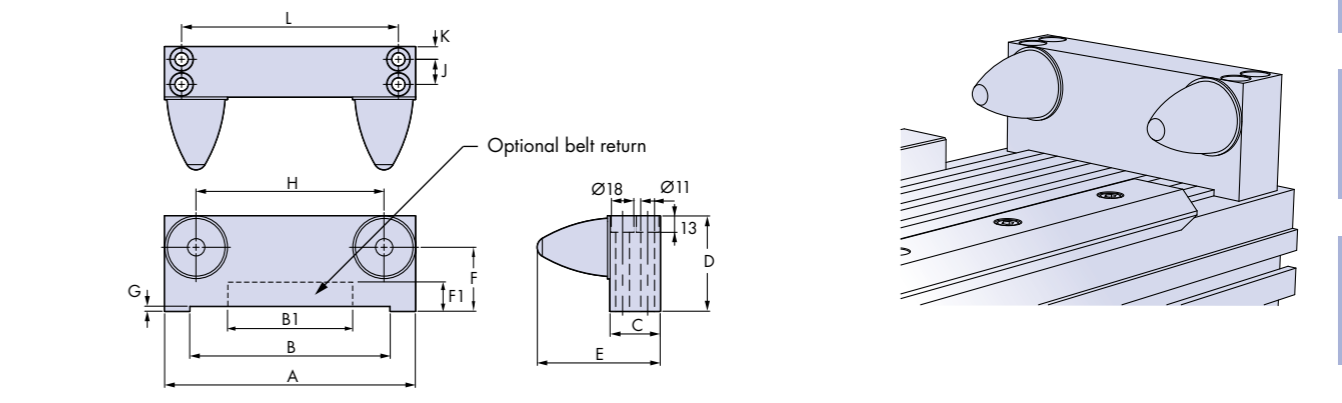


Construction beam options apply to all sizes of beam.

End tapped holes can be used to secure beams directly to carriages 8, or to fit cross members and other items to the end of the beam*1.

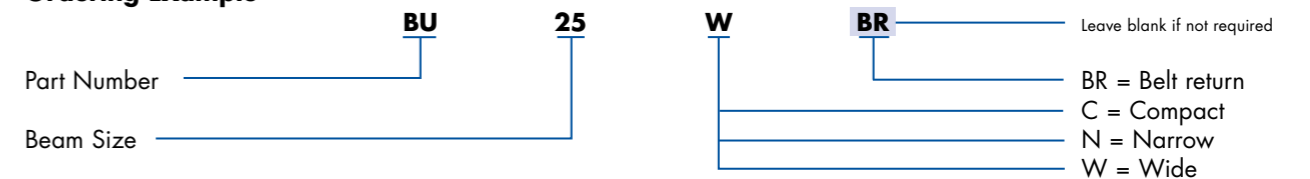
Buffer Units

Buffer units are available for the three sizes of Hepco construction beam. Made from high strength aluminium and clear anodised, the buffer unit is fitted with rubber end stops in line with the assembled carriage 26-29. Alternative design buffer units can be supplied with access for a belt return as supplied on HDLS driven system 7.



Part Number	For Use With	A	B	B1	C	D	E	F	F1	G	H	J	K	L	kg~
BU 25C	HB 25C	140	88	55	40	76	98	51	32	4	90	20	10	115	0.52
BU 25N	HB 25N	156	70	55	40	76	98	51	40	4	106	20	10	83	0.57
BU 25W	HB 25W	200	160	80	40	76	98	51	40	4	150	20	10	173	0.69
BU 33N	HB 33N	195	126	80	40	82	98	57	40	4	146	20	10	170	0.73
BU 33W	HB 33W	294	226	110	40	82	98	57	40	4	244	20	10	270	1.03

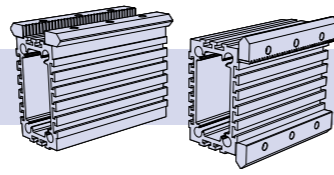
Ordering Example



Notes:

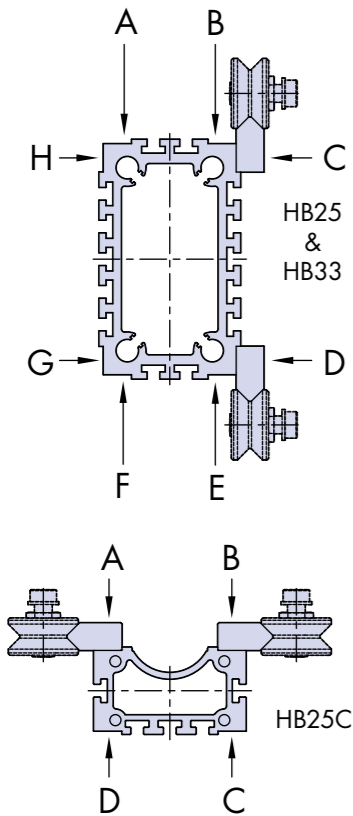
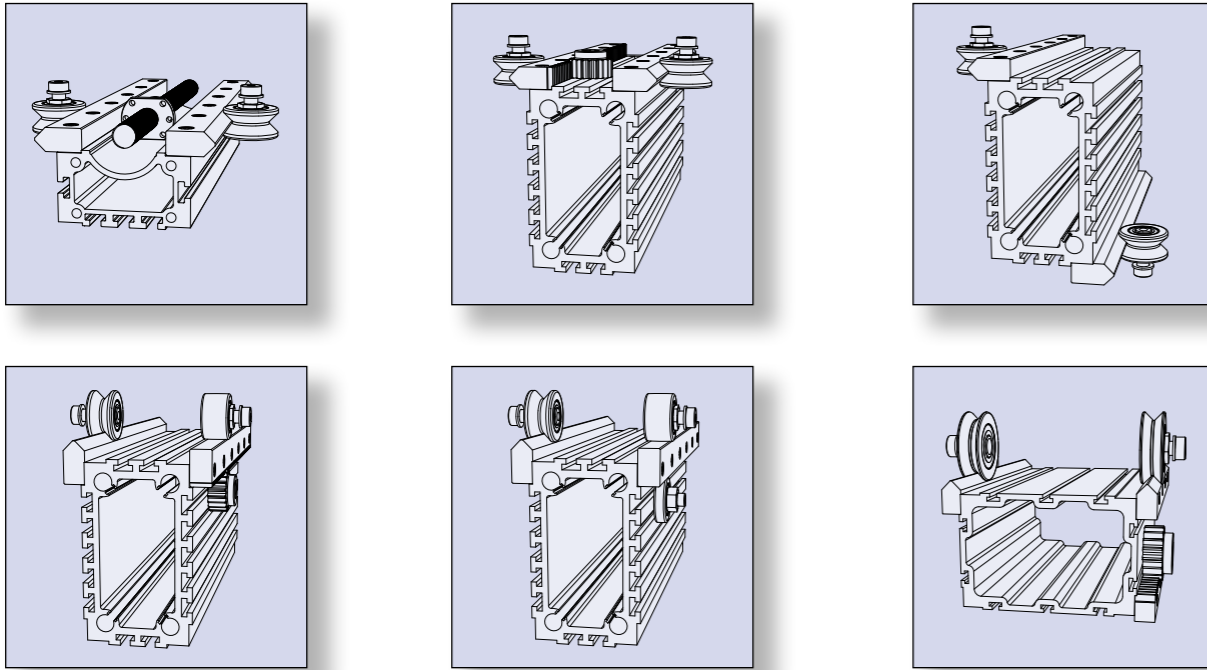
- Buffer units are design to fit directly to Hepco construction beams, holes should be drilled and tapped into the beam. Positions are given by dimension L & J, holes should be drilled and tapped M10.
- Dimensions B1 & F1 refer to access for a belt return, available with optional BU...BR

Assembled Beams



Corner Mounted Slides & Tracks

Below are shown a selection of varied ways Hepco single edge V slides and narrow flat tracks can be used when mounted to the corner faces of the construction beams. Slides and tracks should be specified without a keyway. Corner face mounting has the advantage of being lower in cost compared to T-slot mounting due to the back plate and T-nuts not being required. A range of Hepco assembled carriages 26-29 are available to suit all corner mounted slide options. These will be factory adjusted to the beam unit if specified in the ordering details below. Buffer units for end of stroke protection are available 23.



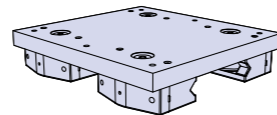
Ordering Example*1&3

Simply list the components required and bracket those to be factory assembled, specifying the mounting positions on the construction beam as relevant. See drawing for construction beam mounting positions. Where slides or tracks are ordered shorter than the length of the beam, it will be assumed that the required position is equidistant from both ends of the beam unless otherwise stated.

Example

- 1 x HB25 L4051
- 1 x CHSS25NK L4046 - Assembled position C
- 1 x CHSS25NK L4046 - Assembled position D

Mounted Carriage (Optional)
1 x AU6425WCW 26-27

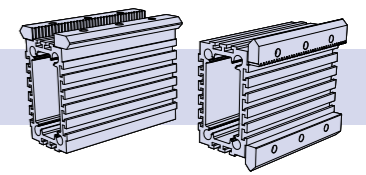


The table below identifies the available options for corner mounted slides & tracks when fitted to Hepco construction beams, also 46.

Beam	Single edge slide & flat track			
	HSS25	HTS25	HSS33	HTS33
HB 25C	✓	✓	✗	✗
HB 25	✓	✓	✗	✗
HB 33	✓*4	✓	✓	✓

✓ = Standard option ✗ = Not compatible

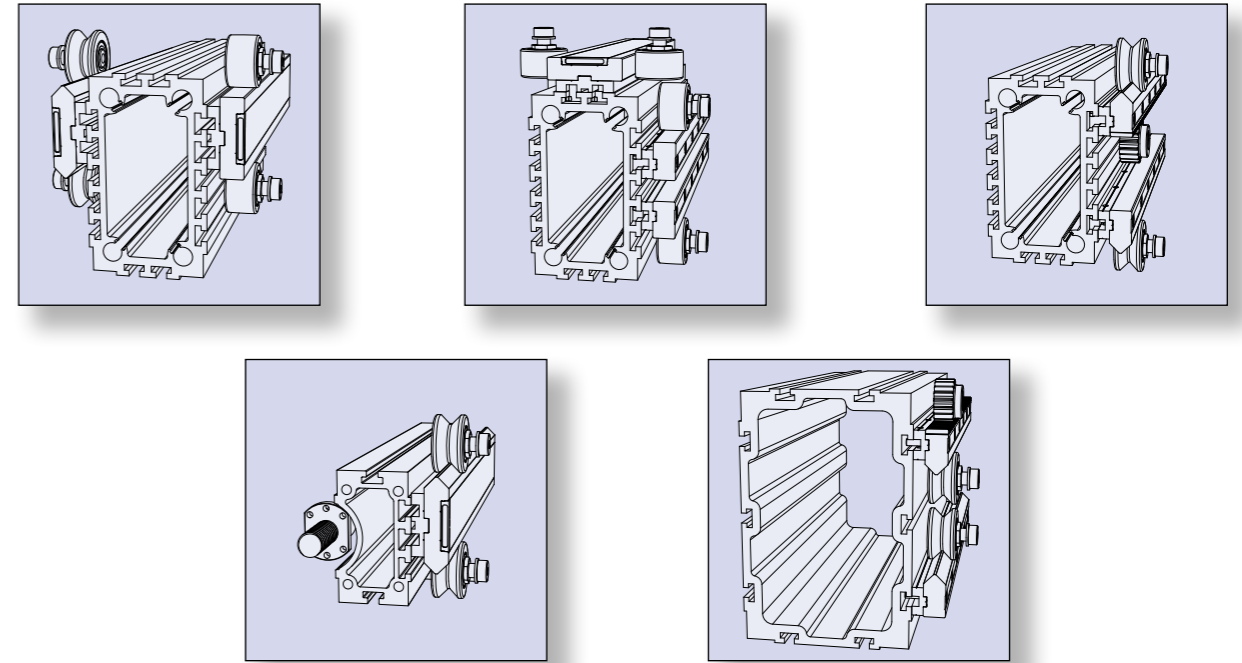
Assembled Beams



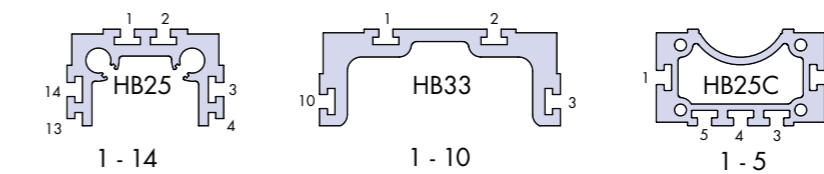
T-Slot Mounted Slides & Tracks

Below is shown a selection of the varied ways Hepco slides and flat tracks can be used when mounted to the T-slot positions of the construction beams. Single edge slides and narrow flat tracks should be specified with a keyway. T-slot mounting has the advantage that one element can be set parallel to another by means of the alignment facility whether they are mounted on the same beam or, on separate beams in parallel 17.

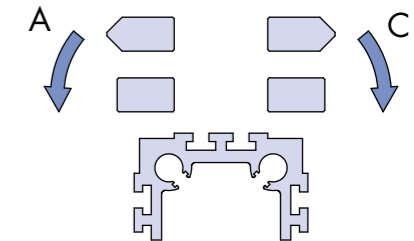
The T-slot mounting method can also accommodate the double edge slides and wide flat tracks (except on HB33 beam). For compatibility of slides and tracks with particular back plates 47.



T-slot Designation



Orientation Designation*2



Ordering Example

- 1 x HB25 L3961
 - 1 x CHSD25 L3956
 - 1 x HLW25 L3956
 - 44 x HTNM8L
 - 44 x HTNM8
 - 88 x FS840*5
- Assembled position 4/5

Optional mounted carriage (T-slot mounted double edge slide only) 26 & 27
1 x AU9525DCW

Notes (See also notes 22):

- Beams with corner mounted slides and tracks should be ordered factory assembled which ensures best parallelism between linear elements.
- Where single edge slides and narrow flat tracks are to be T-slot mounted, please state orientation required ('C' clockwise or 'A' anticlockwise see drawing above) after T-slot position. Example: 1 x CHSS25 L4051 position 4 A.
- Butt jointed slides and tracks will be fitted for requirements in excess of 4046mm long (hole pitches at the joint may vary 45). Unless specified by the customer, Hepco will determine the individual lengths to make up a matched butted set with the minimum number of joints. Joints will be offset to one another where slides or tracks are mounted in parallel on the same beam. This will ensure best running condition across the joints.
- Cap wipers are not compatible with this option.
- M8 low head cap screws are required when fitting standard double edge slides and flat tracks. Different lengths are available from Hepco for the various configurations 15 for details.



Slides
14-15

Backplates
16-17

Bearings
18-21

Beams
22-23

Assembled Systems
40-41

Assembled Carriages
26-27

Rack Driven Carriages
28-29

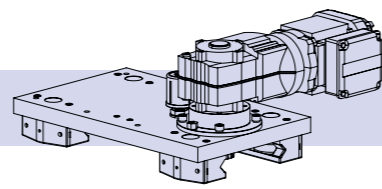
Lubrication
32-34

T-Nuts
38

Technical
42-45

Mix & Match
46

Rack Driven Carriages



Hepco HDS2 rack driven carriages are available to suit the corner mounted options for construction beam assemblies or for other mounting arrangements with slides spaced the same distance apart 27. They are designed to engage with single edge V slides with integrated racks in precision, stainless steel and commercial grade options. They have all the benefits of the assembled carriages 26-27 with the addition of a high performance rack and pinion drive facility.

Rack driven carriages can be supplied with an automatic lubrication device which will apply a controlled amount of grease direct to the teeth 36.

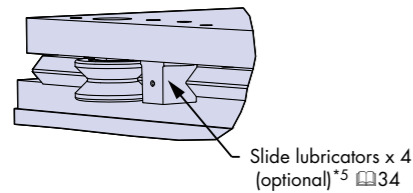
Part Number	For Use With					Rack Options*1																		kg*2									
	Beam	Slide	Bearing	2.5,3,4,5=mod, S=Spur, H=Helical					A	B	C	D	E	F	G	H		J		K	L	M			R	S		T		U	V	W	
				2.5S	2.5H	3.0S	4.0H	5.0S								Spur	Helical	Spur	Helical			Spur	Helical			Spur	Helical	Spur	Helical				Spur
AURD 64 25 C..	HB 25C		HSS 25	Ø64	✓	✓	✗	✗	✗	310	250	231.9	385	62.5	145	190	80	133.5	137.4	180	510	128.5	131.6	68	185	190.5	30	46	M10x20	18.0			
AURD 64 25 C..3	HB 25C		HSS 25	Ø64	✗	✗	✓	✗	✗	310	250	231.9	385	62.5	145	190	90	138	-	200	510	132	-	69.5	224.5	230	30	46	M10x20	18.3			
AURD 64 25 N..	HB 25		HSS 25	Ø64	✓	✓	✗	✗	✗	300	240	213.9	365	62.5	135	190	80	137.5	141.4	180	490	132.5	135.6	68	185	190.5	30	46	M10x20	17.2			
AURD 64 25 W..	HB 25		HSS 25	Ø64	✓	✓	✗	✗	✗	390	330	303.9	425	62.5	165	190	80	137.5	141.4	180	550	132.5	135.6	68	185	190.5	30	46	M10x20	22.6			
AURD 95 25 C..	HB 25C		HSS 25	Ø95	✗	✓	✓	✗	✗	375	315	262.9	430	80	185	200	90	170.5	169.9	200	590	164.5	164.1	69.5	68	224.5	185	230	190.5	30	46	M10x20	26.9
AURD 95 25 N..	HB 25		HSS 25	Ø95	✗	✓	✓	✗	✗	360	300	244.9	390	80	165	200	90	172	171.4	200	550	166	165.6	69.5	68	224.5	185	230	190.5	30	46	M10x20	25.0
AURD 95 25 W..	HB 25		HSS 25	Ø95	✗	✓	✓	✗	✗	450	390	334.9	450	80	195	200	90	172	171.4	200	610	166	165.6	69.5	68	224.5	185	230	190.5	30	46	M10x20	31.2
AURD 120 25 C..	HB 25C		HSS 25	Ø120	✗	✓	✓	✗	✗	430	370	286.9	465	117.5	220	230	90	198	197.4	220	700	192	191.6	69.5	68	224.5	185	230	190.5	30	58	M10x20	42.6
AURD 120 25 N..	HB 25		HSS 25	Ø120	✗	✓	✓	✗	✗	410	350	268.9	415	117.5	195	230	90	197	196.4	220	650	191	190.6	69.5	68	224.5	185	230	190.5	30	58	M10x20	39.8
AURD 120 25 W..	HB 25		HSS 25	Ø120	✗	✓	✓	✗	✗	500	440	358.9	415	117.5	195	230	90	197	196.4	220	650	191	190.6	69.5	68	224.5	185	230	190.5	30	58	M10x20	44.6
AURD 128 33 N..	HB 33		HSS 33	Ø128	✗	✗	✗	✓	✓	480	420	335.9	525	122.5	245	250	110	232.5	228.9	240	770	212.5	210.5	68	243.5	248.5	30	58	M12x20	52.3			
AURD 128 33 W..	HB 33		HSS 33	Ø128	✗	✗	✗	✓	✓	580	520	435.9	555	122.5	260	250	110	232.5	228.9	240	800	212.5	210.5	68	243.5	248.5	30	58	M12x20	60.0			
AURD 150 33 N..	HB 33		HSS 33	Ø150	✗	✗	✗	✓	✓	530	470	357.9	575	137.5	295	240	110	257.5	253.9	240	850	237.5	235.5	88	263.5	268.5	50	85	M16x30	101.2			
AURD 150 33 W..	HB 33		HSS 33	Ø150	✗	✗	✗	✓	✓	630	570	457.9	675	137.5	345	240	110	257.5	253.9	240	950	237.5	235.5	88	263.5	268.5	50	85	M16x30	124.7			

For installation and adjustment procedure visit www.HepcoMotion.com/hdsdatauk and select datasheet No. 8 HDS2 Rack Driven Carriages.

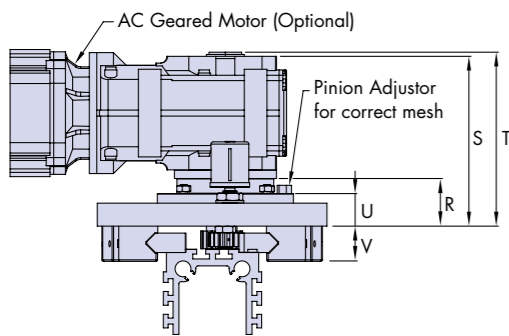
For Rack Driven Carriage Load Capacities 42

Special shape and size carriages, and carriages to suit different slide spacing, can be readily supplied.

For dimensions and specification of the drive flange assembly and AC geared motor 30-31

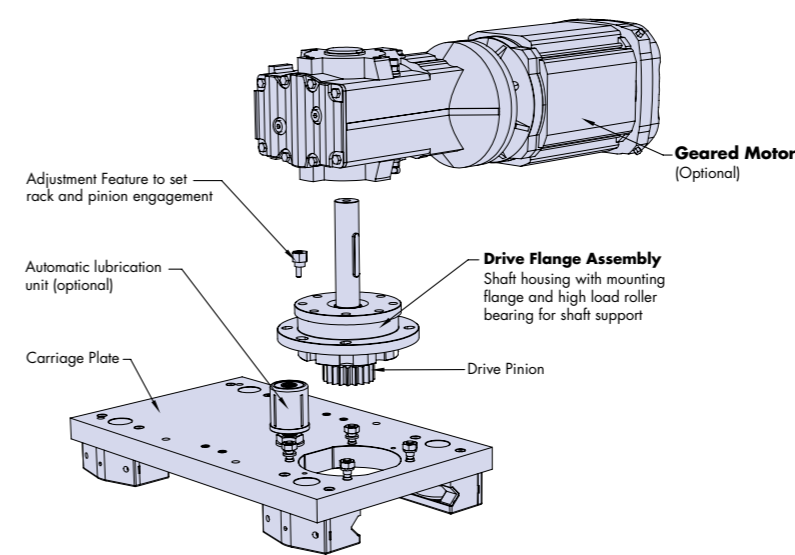
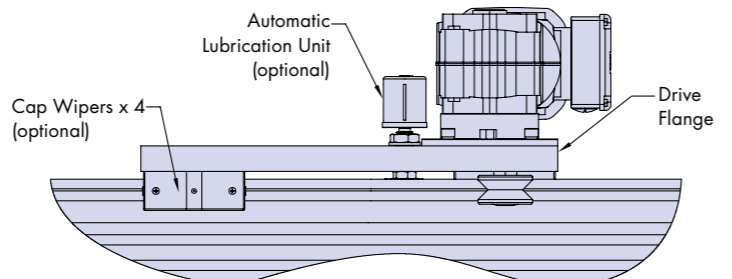
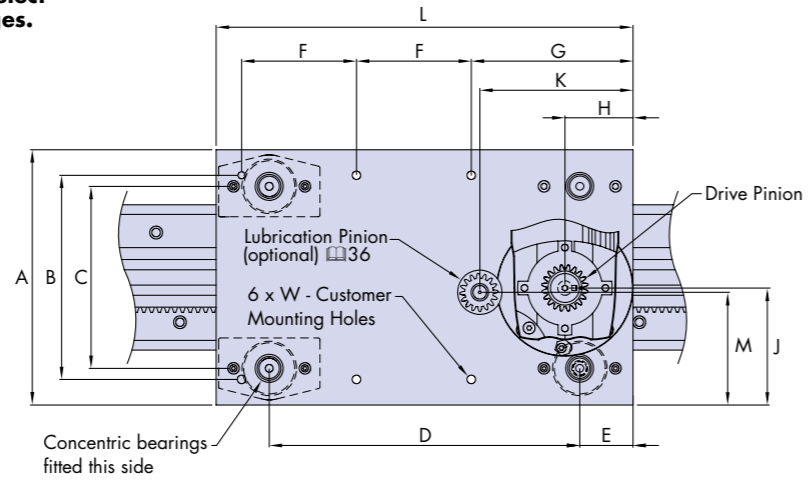


Slide lubricators x 4 (optional)*5 34

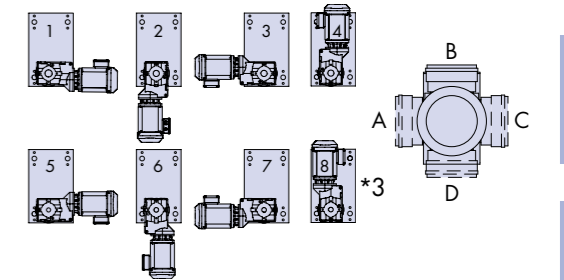


Notes:

- Module 2.5 and 4 helical racks have a left handed helix angle of 30°, available as a standard option on HSS25HR and HSS33HR slides respectively.
- Assembled carriage weights do not include motor & gearbox, 31 for details.
- Motor mounting position 3,4,5 & 8 are not compatible with the standard mounting position of the automatic lubrication unit, alternative positions of the lubrication unit are available.
- SS versions have all stainless steel components except carriage and drive flange body which are aluminium clear anodised (enhanced anti-corrosion finish available on application). Cap wipers are plastic, geared motor is standard.
- For cap wiper mounting hole positions 32. For lubricator mounting hole positions 26 & 34.



Customers ordering rack driven carriages fitted with geared motors should specify the orientation required (1-8)*3, and the terminal box position (A-D) by indicating these requirements in the ordering details for the geared motor 31.



Ordering Example

SS AURD 64 25C 3S LB CW L — Leave blank if not required

Stainless version*4
Leave blank if not required

Part number

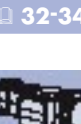
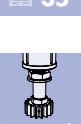
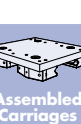
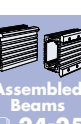
Bearing size

Carriage type
26 & 27 for range available

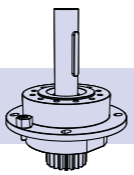
Rack Type
2.5S = Module 2.5 Spur, 2.5H = Module 2.5 Helical
3S = Module 3 Spur, 4H = Module 4 Helical, 5S = Module 5 Spur

— CW = Cap wipers
— CW4S = Cap wipers + Outboard scrapers
— LB = Slide lubricators

Geared motor should be ordered as a separate item 31.



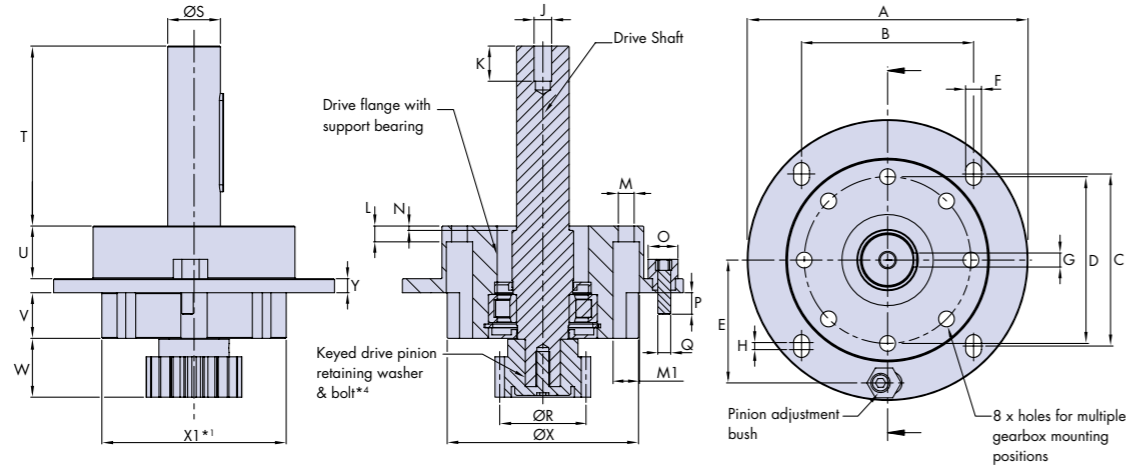
Drive Flange Assembly



Hepco drive flange assemblies are available to suit all five rack sizes*6. They are designed to mount on the top face of the rack driven carriage and connect the drive from the geared motor, to the pinion. A high capacity roller bearing is fitted to provide rigid support to both geared motor and carriage, and to withstand high radial loads*3. Axial forces which are generated when helical rack and pinion are used, are supported by the gearbox bearings. The drive flange assembly features a unique micro adjustment facility for achieving correct mesh between pinion and rack.

The drive flange body for both stainless (SS) and standard versions is in aluminium clear anodised. An enhanced anti-corrosion finish is available on application. The stainless version is supplied with stainless steel shaft, pinion and fixings, and steel roller bearing protected by nitrile seals. Pinions mod. 2.5 and 3 are keyed to the shaft and retained by screw and washer. The larger pinions mod. 4 and 5 incorporate a keyless locking bush for secure fixing under higher loading conditions 35. Stainless pinions are supplied keyed to the shaft and retained by screw and washer. Other sizes of pinion can be readily supplied to special order*5.

The standard drive flange assembly as shown, is designed to be coupled with Hepco geared motors but modified or special drive flanges can be readily supplied to suit customers own motor gearbox, including servo and stepper types.



Part Number	For Use With					Rack Module	No. of teeth	A	B	C	D	E	F	G	H	J
	Slide	Track	Bearing	Track Roller	Geared Motor											
HDF 25S					HB 29	2.5S	20	160	98	98	95	70	9	8	4	M10
HDF 25H	.HSS25.	.HTS25.	.HJR64	.HRR58	HB 29	2.5H										
HDF 30S			.HJR95	.HRR89	HB 39	3.0S	20	180	110	110	115	78	11	8	4	M10
HDF 25HX	.HSS25.	.HTS25.	.HJR120	.HRR122	HB 29	2.5H										
HDF 30SX					HB 39	3.0S	24	220	130	130	130	92	13	12	8	M16
HDF 40H	.HSS33.	.HTS33.	.HJR128	.HRR122	HB 49	4.0H										
HDF 50S					HB 49	5.0S	24	220	130	130	130	92	13	12	8	M16
HDF 40HX	.HSS33.	.HTS33.	.HJR150	.HRR144	HB 49	4.0H										
HDF 50SX					HB 49	5.0S										

Part Number	K	L	M	M1	N	O	P	Q	R	S	T	U	V	W	X	X1	Y	kg~
HDF 25S	20	9	9	15	2.5	17	12	M6	50	30	102.5	30	26	33.5	110	105	8	2.5
HDF 25H									57.74									
HDF 30S	20	10.5	11	17	2.5	17	12	M6	60	30	132.5	31.5	26	33.5	128	120	8	3.0
HDF 25HX									57.74									
HDF 30SX	20	10.5	11	17	2.5	17	12	M6	60	30	132.5	31.5	26	39.5	128	120	8	3.0
HDF 40H									110.85									
HDF 50S	32	9.5	13	19	2	25	19	M8	120	40	150	31.5	10	60	150	142	8	8.6
HDF 40HX									110.85									
HDF 50SX	32	30	13	19	2	25	19	M8	120	40	150	32	42	60	150	142	8	9.4

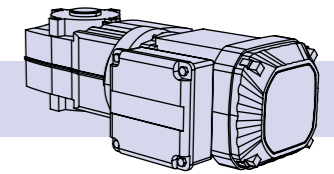
Ordering Example

Stainless version*6 **SS** **HDF** **30S** **20** Number of teeth of pinion
 Leave blank if not required
 Part Number _____ Rack and pinion Module/type

Notes:

- X1 denotes the dimension between the parallel faces of the flange body which engages with the slot on the carriage for adjustment purposes.
- Rack and pinion module: S = spur, H = helical.
- Drive flange assemblies have a dynamic radial bearing capacity (C_r) of 38000N for HDF25&30, and 60500N for HDF40&50.
- Drive flange assembly shown in the drawing is for module 2.5, 3 & SS versions, module 4 & 5 use a keyless locking bush 35.
- Customers requiring alternative pinion sizes should note that the mounting position of the drive flange assembly on the rack driven carriage 28-29 will need to be altered to compensate. Please discuss this requirement with Hepco.
- Stainless version (SS): drive flange assemblies are available to suit spur racks only.

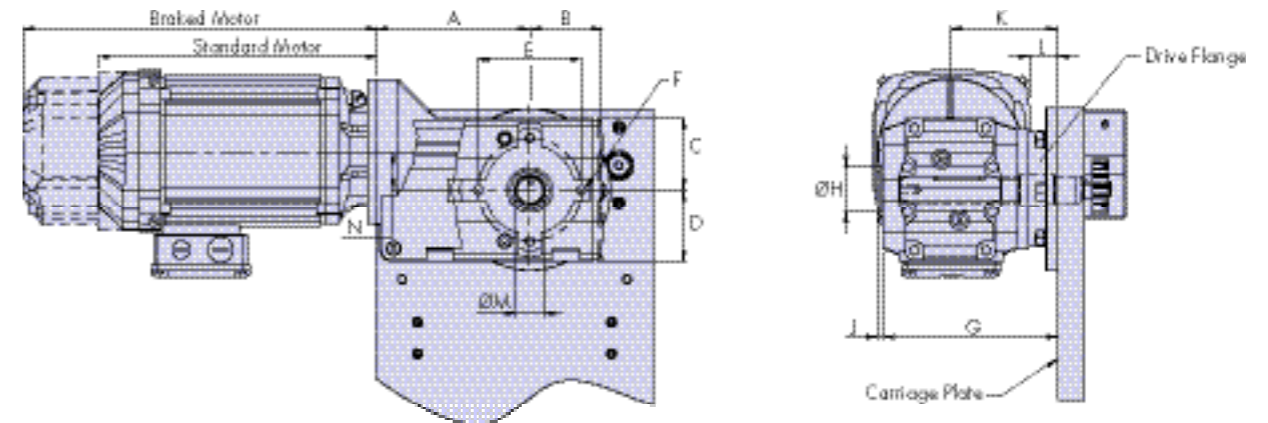
AC geared motors



Hepco rack driven carriages can be supplied with an AC geared motor which provides a simple and low cost means of achieving point to point linear motion. Helical bevel gearboxes with hollow output shafts are supplied as standard. The compact design complements the Hepco rack driven carriage and the hollow shaft allows direct connection of the drive flange assembly with maximum rigidity.

3 phase motors comply with IEC34-VDE530, DIN57530 and 42677. Motors are protected to IP55, and are finished in silver grey paint. Motors with alternative single and three phase windings, special finishes and enhanced IP protection rating are available on request. The large range of motor sizes and gearbox ratios available, enable ideal solutions to be specified for most applications. For requirements outside AC motor capabilities, servo motors can be directly fitted to the helical gearbox via a standard or tailored input flange.

In all cases customers are requested to discuss their requirements with Hepco who use special selection software to quickly specify the correct choice of motor and gearbox. Dimensions stated below could vary depending on the choice of motor and gearbox, and are shown for initial selection only.



Part Number	A	B	C	D	E	F	G	ØH	J	K	L	M ¹	N	kg~ Gearbox only
HB 29	134	61	63.5	63.5	95	M8x18	155	40	5.5	96.5	38	30	23.5	6.8
HB 39	170	81	80	80	115	M10x16	189.5	50	5.5	114.5	39.5	30	42.5	18
HB 49	207	99	100	100	130	M12x20	212	55	5	125	38	40	50	30

AC geared motors are available in 6 frame sizes, 63, 71, 80, 90, 100 and 112 to suit many different types of application. Various power ratings are also available.

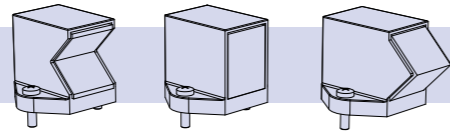
Customers are requested to contact Hepco's technical department before ordering so that the correct geared motor can be specified for your application.

Notes:

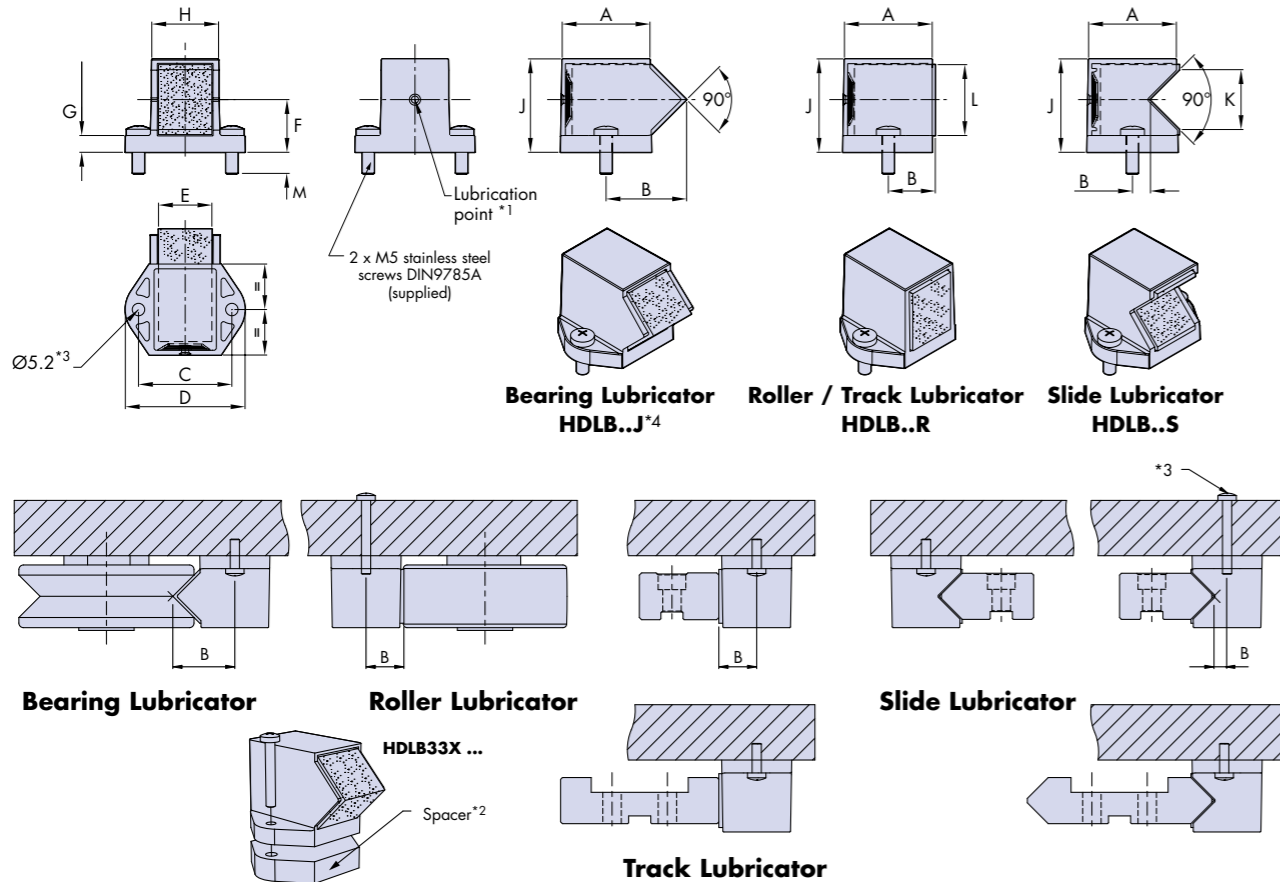
- 'M' dimension refers to hollow shaft diameter for the gearbox, this can be cross referenced to 'S' dimension on 30 to aid selection of the drive flange assembly.



Lubricators



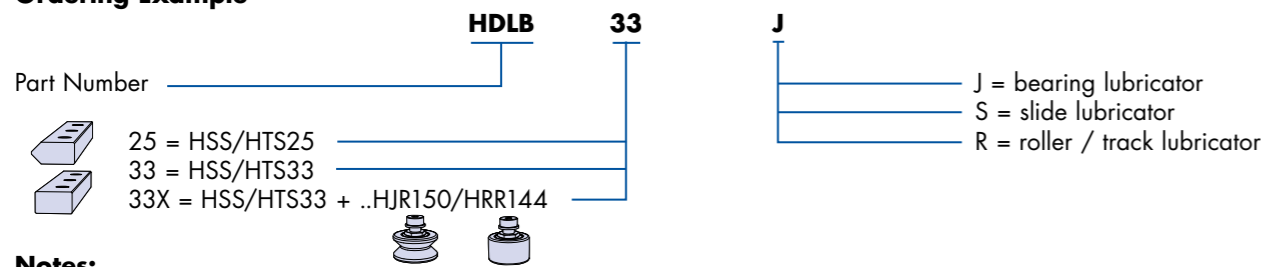
Lubricators provide a simple and versatile means of applying lubricant to a system thereby increasing load capacity and extending life. Lubricators consist of an impact resistant plastic housing incorporating a sprung loaded oil impregnated felt wiper. There are three types available for applying lubricant directly to either slide, flat track and track roller or V bearing. They can be sited in any convenient position to give best access for re-lubrication and can be mounted from above or below as shown.



Part Number	A	B	C	D	E	F	G	H	J	K	L	M	kg~
HDLB 25 J	38	34	39	50	23	22	7	27	39	-	30	5	0.10
HDLB 25 S	38	8.5	39	50	23	22	7	27	39	24	30	5	0.08
HDLB 25 R	38	21	39	50	23	22	7	27	39	-	30	5	0.09
HDLB 33 J	50	44	50	65	30	28	9	35	50	-	38	11	0.20
HDLB 33 S	50	9.9	50	65	30	28	9	35	50	33	38	11	0.15
HDLB 33 R	50	25	50	65	30	28	9	35	50	-	38	11	0.18
HDLB 33X J	50	44	50	65	30	40	21	35	62	-	38	14	0.28
HDLB 33X S	50	9.9	50	65	30	40	21	35	62	33	38	14	0.23
HDLB 33X R	50	25	50	65	30	40	21	35	62	-	38	14	0.26

For compatibility with mating components 46-47

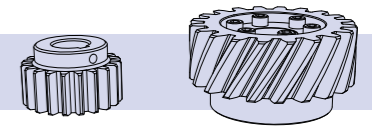
Ordering Example



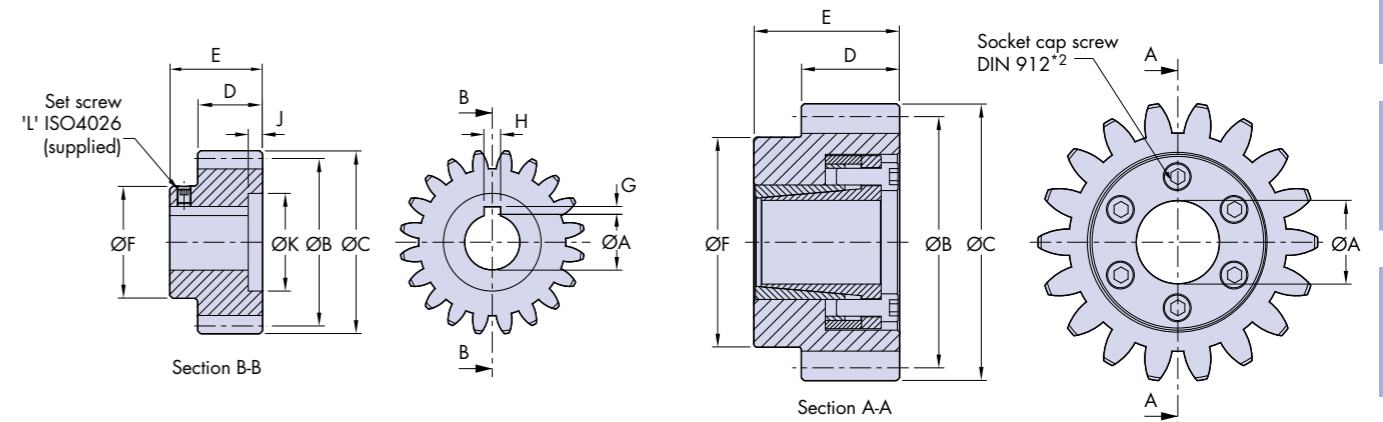
Notes:

- The lubrication interval depends on stroke, duty and environment 49 for lubricants. Threaded insert can be incorporated at the lubrication position to enable lubricators to be linked to a central point or lubrication canister 37.
- HDLB33X lubricators will be supplied with a spacer to match the height of the Ø150 bearing and Ø144 track roller.
- For through hole fixing, the Ø5.2 holes in the lubricator should be tapped M6.
- The use of bearing lubricators allows easy carriage disengagement with the slide, as only the bearing will need to be removed.

Pinions



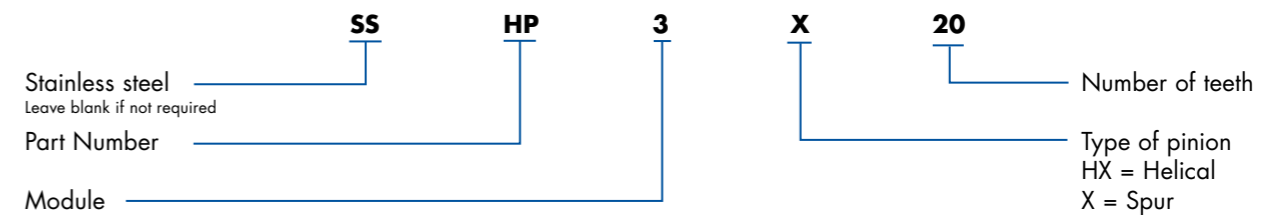
Pinions are made from high grade case hardened steel, the teeth are precision ground to ISO 1328 grade 6 for maximum wear resistance. Two types of pinions are available to suit the spur and helical rack cut into the back face of the single edge V slide and flat track. The smaller module pinions are supplied with a keyway location to mate with the drive shaft. The large module 4 and 5 pinions incorporate a locking bush which, when tightened, locks onto the shaft and makes a rigid connection. Stainless steel spur pinions are available as standard and are supplied with a keyway location only.



Part Number (Steel pinion*1&3)	Pinion Type	Helix Angle	Mod	No of Teeth	A	B	C	D	E	F	G	H	J	K	L	kg
HP 25 X 20	Spur	-	2.5	20	20	50	55	23	33	40	2.8	6	6	36	M5	0.35
HP 25 HX 20	Helical	30	2.5	20	20	57.74	62.74	23	33	40	2.8	6	6	36	M5	0.46
HP 3 X 20	Spur	-	3	20	20	60	66	23	33	40	2.8	6	6	36	M5	0.5
HP 4 HX 20	Helical	30	4	20	30	92.38	100.38	35	52	75	-	-	-	-	-	1.9
HP 4 HX 24	Helical	30	4	24	40	110.85	118.85	35	59	90	-	-	-	-	-	2.9
HP 5 X 18	Spur	-	5	18	30	90	100	35	52	75	-	-	-	-	-	1.8
HP 5 X 24	Spur	-	5	24	40	120	130	35	59	100	-	-	-	-	-	3.6

Part Number (Stainless steel pinion*1&3)	Pinion Type	Mod	No of Teeth	A	B	C	D	E	F	G	H	J	K	L	kg
SS HP 25 X 20	Spur	2.5	20	20	50	55	23	33	40	2.8	6	5	35	M5	0.35
SS HP 3 X 20	Spur	3	20	20	60	66	23	33	40	2.8	6	5	35	M5	0.5
SS HP 5 X 18	Spur	5	18	30	90	100	35	52	75	3.3	10	8.5	60	M8	1.8
SS HP 5 X 24	Spur	5	24	40	120	130	35	59	100	3.3	12	8.5	60	M8	3.6

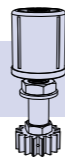
Ordering Example



Notes:

- Module 2.5 & 3, and all stainless steel pinions are supplied with location keyway and both retaining washer and a countersunk screw. All other steel versions are supplied complete with a locking bush.
- Locking bush retaining bolts should be tightened to a torque of 17Nm.
- All steel pinions are supplied case hardened with ground teeth as standard, stainless steel versions are manufactured from 420 stainless steel and are hardened and ground.

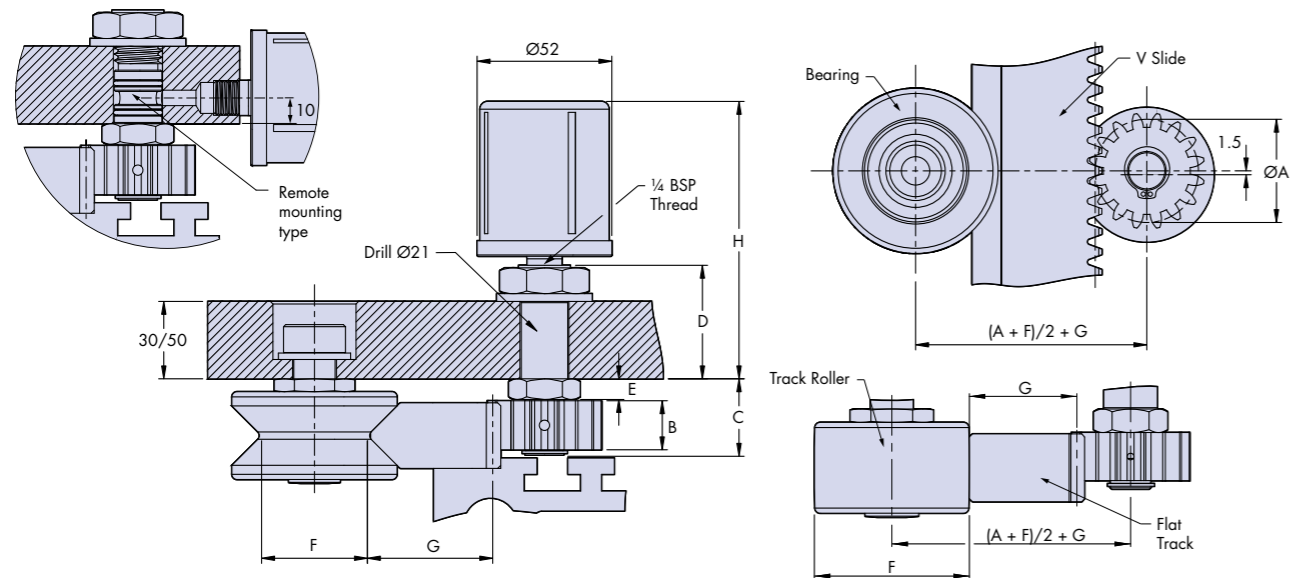
Automatic Rack Lubrication



Hepco automatic rack lubrication systems provide constant lubrication to the rack and pinion interface. Two types are available, integral canister mounting, and remote canister mounting which require lubricant passageways in the carriage plate to be drilled as required. The lubrication systems are available to suit all sizes of rack driven carriage 28-29 and are generally suitable for customers own manufactured carriages of the required thickness.

They are compatible with most combinations of Hepco rack elements and bearings, either V slides with V bearings or flat tracks with rollers. These combinations are given in the table below. Lubrication is carried out by means of grease filled pressure canister which delivers lubricant at a controlled rate via cross drilled plastic pinion direct to the teeth of the rack.

Rack lubrication units to suit other thickness of carriage plate can be readily supplied to special order.

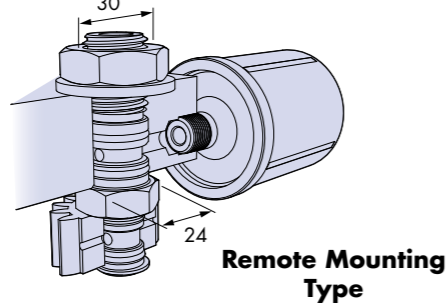
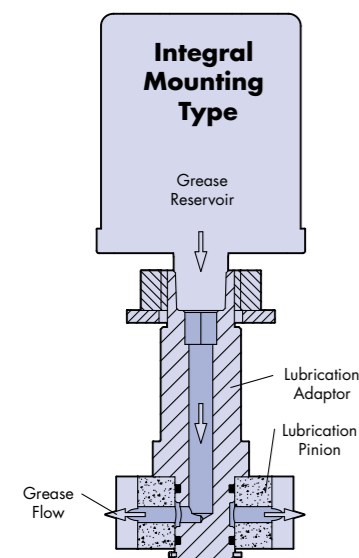


Part Number	Mod	Pinion Type	For Use With		No of Teeth	A	B	C	D	E	H
HLPA 25 S	2.5	Spur	..HJR64.	..HRR58.	16	40	18	30	47	9	150
HLPA 25 H	2.5	Helical	..HJR95.	..HRR89.	16	46.2	18	30	47	9	150
HLPA 30 S	3	Spur			16	48	18	30	47	9	150
HLPA 25 SX	2.5	Spur			16	40	18	36	47	15	150
HLPA 25 HX	2.5	Helical	..HJR120.	..HRR122.	16	46.2	18	36	47	15	150
HLPA 30 SX	3	Spur			16	48	18	36	47	15	150
HLPA 40 H	4	Helical	..HJR128.	..HRR122.	16	73.9	24	40	47	13.5	150
HLPA 50 S	5	Spur	..HJR128.	..HRR122.	16	80	24	40	47	13.5	150
HLPA 40 HX	4	Helical	..HJR150.	..HJR144.	16	73.9	24	52	67	25.5	170
HLPA 50 SX	5	Spur	..HJR150.	..HJR144.	16	80	24	52	67	25.5	170

Mod	G			
2.5	49.1	48.8	40.5	40.3
3	48.6	48.3	40.0	39.8

Mod	G			
4	53.6	53.3	40.6	40.3
5	52.6	52.3	39.6	39.3

	F		F
..HJR64	41	..HRR58	58
..HJR95	72	..HRR89	89
..HJR120	96	..HRR122	122
..HJR128	96	..HRR144	144
..HJR150	118		



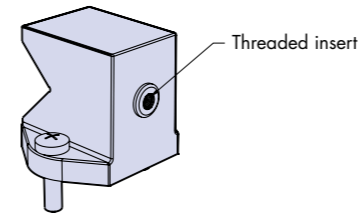
Ordering Example

Automatic Rack Lubrication unit **HLPA** **255** **I**
 Rack module / Type **I**
 Rack lubrication canisters should be ordered separately Part Number **LAGD125**

Lubrication Accessories

Hepco can provide modifications to the standard cap wipers and lubricators so that they can be easily connected to a centralised lubrication system. By adding threaded inserts to locations on the lubricator and cap wiper body it allows threaded connectors to be fitted so that oil lubrication can be fed directly to the felt wipers. Inserts with M4, M5 and M6 threads are available as standard options, other sizes are available on request.

Lubricator Options



All types and sizes of lubricator as detailed on 34 can be fitted with threaded insert at the lubrication point, please refer to that page for positions. Standard fitted inserts may be ordered by adding a suffix as shown below, to the lubricator part number 34.

Ordering Example

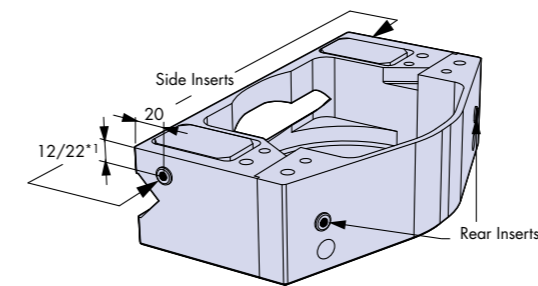
State Lubricator part number 34 followed by:
C4 for M4 insert. **C5** for M5 insert. **C6** for M6 insert.

Cap Wiper Options

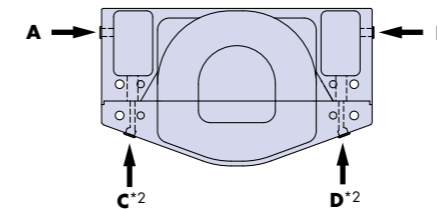
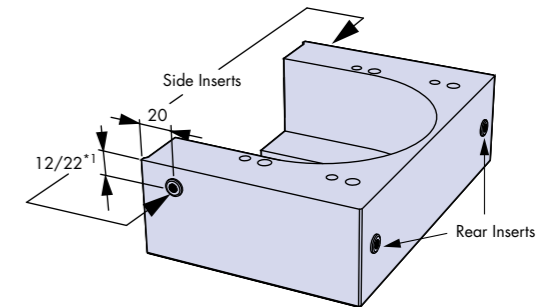
All types and sizes of bearing cap wipers and roller cap wipers as detailed on 32 & 33 can be fitted with threaded inserts. Inserts may be fitted either one or both ends of the wiper body or, at one or both oil lubrication positions in the back face 32 & 33. The small series cap wipers are available only with inserts fitted at the ends*2.

Oil lubrication into the felt wiper one end of the wiper body is generally sufficient to ensure carry over of lubricant to the felt insert in the other side of the body (see automatic lubrication example at the bottom of the page). This allows an outboard scraper to be fitted at the opposite end to the insert if required.

Bearing Cap Wiper Insert Positions

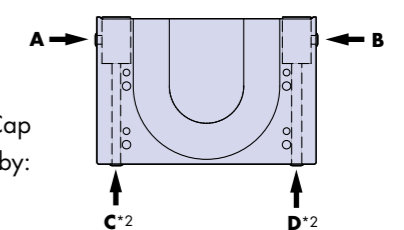


Roller Cap Wiper Insert Positions



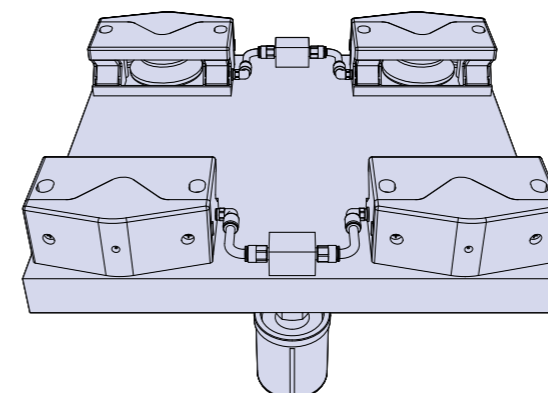
Ordering Example

State Bearing Cap Wiper / Roller Cap Wiper part number 32 & 33 followed by:
C4 A — Choose insert position A - D
C4 for M4 insert. **C5** for M5 insert.
C6 for M6 insert



Notes:

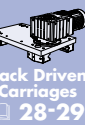
- Roller cap wipers CW144 and bearing cap wiper CW150 have insert dimension 22mm from the wiper mounting base. All others have a dimension of 12mm.
- Insert positions C & D are not available for small series bearing cap wipers CW64 & CW95.



For further information visit www.HepcoMotion.com/hdsdatauk and select datasheet No. 9 HDS2 Cap Wiper Options.

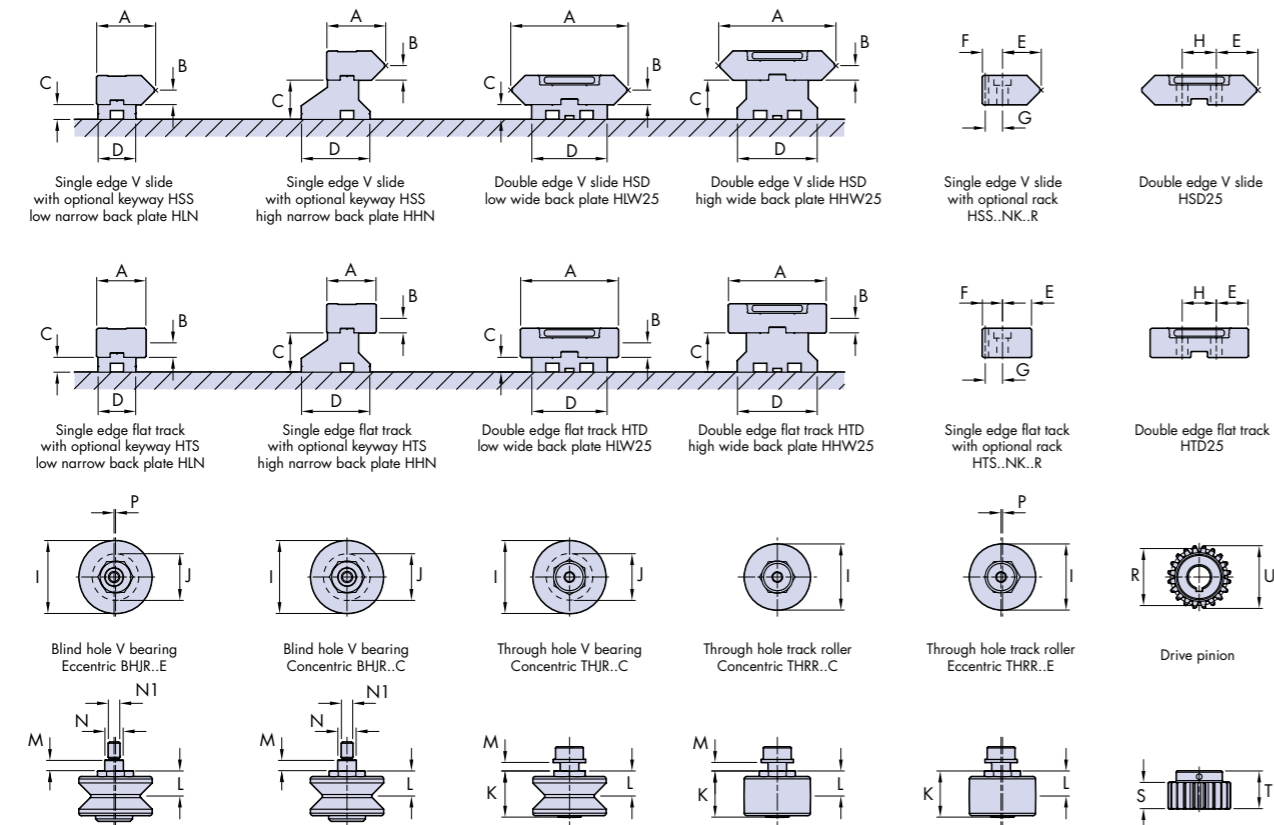
Automatic Lubrication For Cap Wipers

Threaded inserts for cap wipers and lubricators enable them to be linked to a central lubrication point or pressure feed canister. Hepco are able to supply carriages with linked lubrication devices according to customers preferred layout. The illustration shows one of the many possibilities.



Data and Dimensions for Assembled Systems

Use this section to calculate the overall dimensions of a system without having to refer to dimensions on individual component pages. Use it also for calculating drilling positions and for important reference dimensions of mating components. These tables include all basic dimensions for most standard components. For more detailed dimensional information refer to the catalogue pages for the individual components.

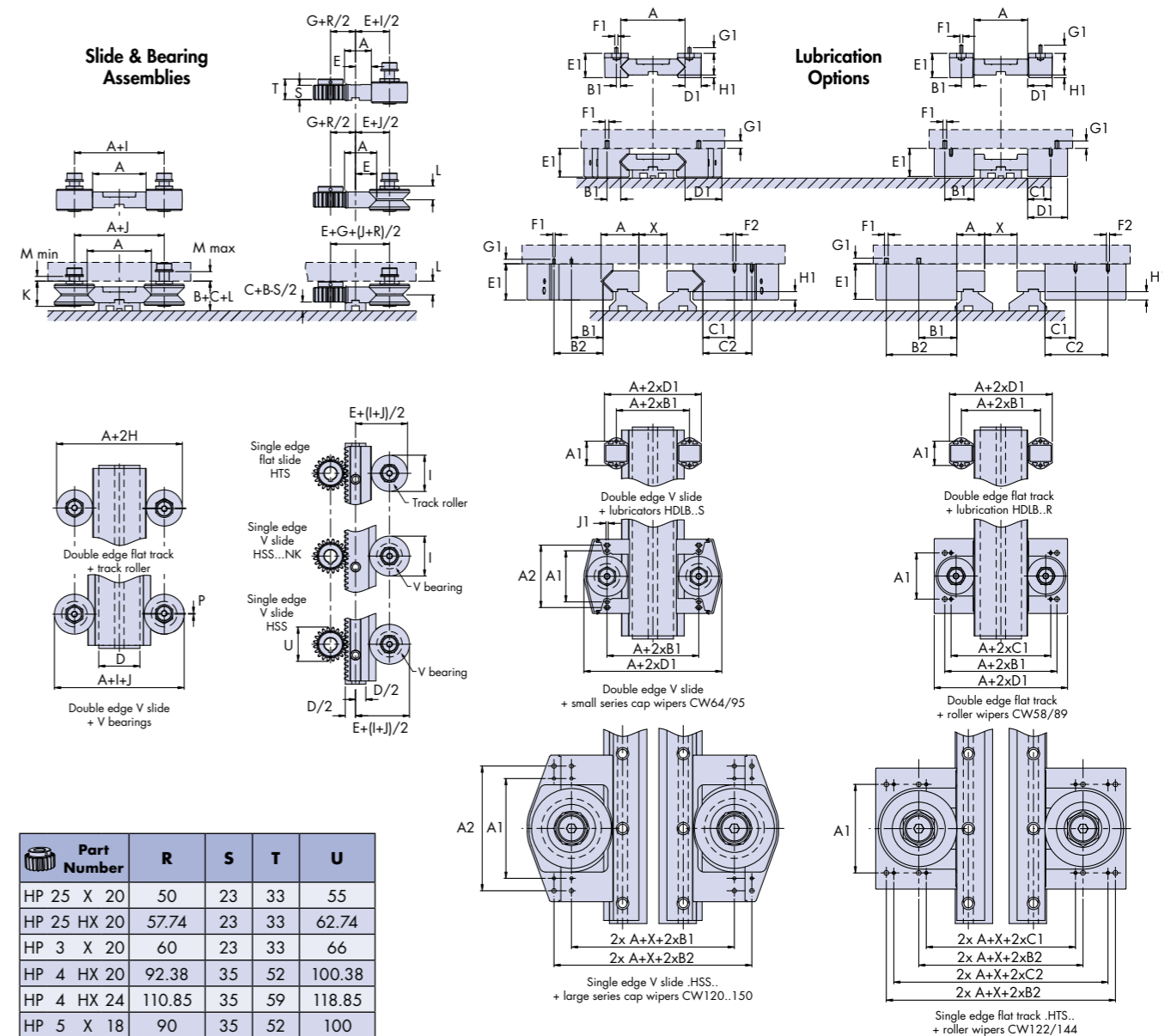


Part Number	Rack module	A		B		C	D	E		F		G	H
		P Grade	C Grade	P Grade	C Grade			P Grade	C Grade	P Grade	C Grade		
HSS 25	2.5	51.2	51.7	12.5	12.7	13	33	33.7	34	17.5	17.7	15.1	-
HSS 25	3	51.2	51.7	12.5	12.7	13	33	33.7	34	17.5	17.7	14.6	-
HSS 33	4	57.2	57.7	16.5	16.7	15	39	31.2	31.5	26	26.2	22.1	-
HSS 33	5	57.2	57.7	16.5	16.7	15	39	31.2	31.5	26	26.2	21.1	-
HSD 25	-	102.4	103	12.5	12.7	13	66	36.2	36.5	-	-	-	30
HTD 25	-	85.42	85.8	12.5	12.7	13	66	27.7	27.9	-	-	-	30
HTS 25	2.5	42.7	43.1	12.5	12.7	13	33	25.2	25.4	17.5	17.7	15.1	-
HTS 25	3	42.7	43.1	12.5	12.7	13	33	25.2	25.4	17.5	17.7	14.6	-
HTS 33	4	44.2	44.7	16.5	16.7	15	39	18.3	18.5	26	26.2	22.1	-
HTS 33	5	44.2	44.7	16.5	16.7	15	39	18.3	18.5	26	26.2	21.1	-

Part Number	Part Number																	
	THJR 64	THJR 95	THJR 120	THJR 128	THJR 150	BHJR 64	BHJR 95	BHJR 120	BHJR 128	BHJR 150	THRR 58	THRR 89	THRR 122	THRR 144	BHRR 58	BHRR 89	BHRR 122	BHRR 144
I	64	95	120	128	150	64	95	120	128	150	58	89	122	144	58	89	122	144
J	41	72	96	96	118	41	72	96	96	118	-	-	-	-	-	-	-	-
K	40	40	50	50	80	44	44	54	54	80	40	40	50	80	44	44	54	80
L	22	22	28	28	40	22	22	28	28	40	22	22	28	40	22	22	28	40
M min	6.5	9	6.5	6.5	6.5	10	11.5	17	17	20	6.5	9	6.5	6.5	10	11.5	17	20
M max	27.5	32	37	37	40	-	-	-	-	-	27.5	32	37	40	-	-	-	-
N ⁺²	16	20	25	25	38	16	20	25	25	38	16	20	25	38	16	20	25	38
N1	-	-	-	-	-	M10	M16	M24	M24	M36	-	-	-	-	M10	M16	M24	M36
P ⁺³	1.25	2	3	3	-	1.25	2	3	3	-	1.25	2	3	-	1.25	2	3	-

Data and Dimensions for Assembled Systems

For systems using Hepco carriages, please refer to 26 and for systems incorporating Hepco beams, please refer to 27. Dimensions not stated can be found on the relevant component pages.



Part Number	R	S	T	U
HP 25 X 20	50	23	33	55
HP 25 HX 20	57.74	23	33	62.74
HP 3 X 20	60	23	33	66
HP 4 HX 20	92.38	35	52	100.38
HP 4 HX 24	110.85	35	59	118.85
HP 5 X 18	90	35	52	100
HP 5 X 24	120	35	59	130

X is the variable spacing between slides / tracks see end view above.

Part Number	A1	B1	D1	E1	F1	G1	H1	Part Number	A1	A2	B1	B2	C1	C2	D1	E1	F1	F2	G1	H1
HDLB 25 J	39	34	53	39	M5	5	4.5	CW 64	84	100	19	-	19	-	56	46	M5	-	8	1.7
HDLB 25 S	39	8.5	10.5	39	M5	5	4.5	CW 95	114	132	35	-	35	-	89	46	M5	-	8	1.7
HDLB 25 R	39	21	38	39	M5	5	4.5	CW 120	160	195	47.5	73.5	47.5	73.5	115.5	58	M6	M6	9	17.3
HDLB 33 J	50	42	67	50	M5	7	5.5	CW 128	165	200	47.5	75.5	47.5	75.5	118.5	58	M6	M6	9	13.3
HDLB 33 S	50	9.9	34.9	50	M5	7	5.5	CW 150	190	235	58	89.5	58	89.5	142	85	M6	M6	12	28.3
HDLB 33 R	50	25	50	50	M5	7	5.5	CW 58	74	-	47	-	37	-	64	45	M5	-	15	2.7
HDLB 33 JX	50	42	67	62	M5	9	5.5	CW 89	105	-	62.5	-	50.5	-	95	45	M5	-	15	2.7
HDLB 33 SX	50	9.9	34.9	62	M5	9	5.5	CW 122	142	-	61	113	49	101	130	58	M5	M5	9	13.3
HDLB 33 RX	50	25	50	62	M5	9	5.5	CW 144	165	-	72	124	60	112	152	84	M5	M5	13	27.3

Notes:

- The calculated position of the pinion relative to the rack gives an approximate location only. Customers should make provision for the pinion to be adjusted relative to the rack to ensure the best running condition. The Hepco drive flange assembly 30 includes a facility for this type of adjustment.
- Mounting hole for bearing (ref. N dimension) should be drilled and reamed tolerance F6.
- P dimension refers to eccentric V bearings and track rollers only.

Load Life Calculations

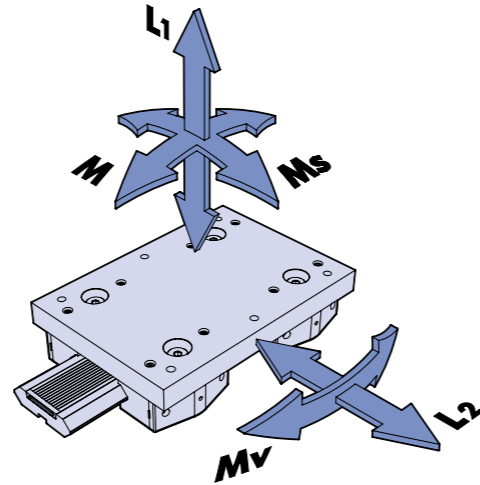
The load capacity and life expectancy of Hepco HDS2 will be determined by several factors. The key factors are the size and type of bearings and slide, the presence or absence of lubrication and the magnitude and direction of loads. Other factors including operational speed, length of stroke and environmental conditions may also have an effect.

When calculating the system load and life, one of two approaches should be taken: if the system uses a conventional 4 bearing carriage (such as any of the Hepco HDS2 carriages), then this may be treated as a single item, and the load and life be determined as in the **Systems with carriages** section below; alternatively, each bearing can be treated separately according to the method shown in the **Individual bearing calculations** section.

Systems with Carriages

When calculating the loading and life of a V slide system using a 4 bearing carriage, the loading on the system should be resolved into the direct load components, L_1 and L_2 , and the moment loading components M , M_v and M_s (see diagram on the right).

The maximum direct and moment load capacities for HDS2 carriages are given in the tables 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.



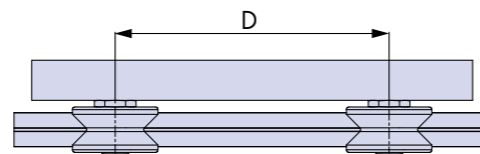
Carriage Part Number	Dry System					Lubricated System				
	L1(max) N	L2(max) N	Ms(max) Nm	Mv(max) Nm	M(max) Nm	L1(max) N	L2(max) N	Ms(max) Nm	Mv(max) Nm	M(max) Nm
AU6425D..	10 000	16 000	450	8 x D	5 x D	10 000	16 000	450	8 x D	5 x D
AU..6425C..	10 000	16 000	900	8 x D	5 x D	10 000	16 000	900	8 x D	5 x D
AU..6425N..	10 000	16 000	810	8 x D	5 x D	10 000	16 000	810	8 x D	5 x D
AU..6425W..	10 000	16 000	1260	8 x D	5 x D	10 000	16 000	1260	8 x D	5 x D
AU9525D..	28 000	40 000	1280	20 x D	14 x D	28 000	40 000	1280	20 x D	14 x D
AU..9525C..	28 000	40 000	2510	20 x D	14 x D	28 000	40 000	2510	20 x D	14 x D
AU..9525N..	28 000	40 000	2260	20 x D	14 x D	28 000	40 000	2260	20 x D	14 x D
AU..9525W..	28 000	40 000	3520	20 x D	14 x D	28 000	40 000	3520	20 x D	14 x D
AU12025D..	-	-	-	-	-	40 000	60 000	1830	30 x D	20 x D
AU..12025C..	-	-	-	-	-	40 000	60 000	3590	30 x D	20 x D
AU..12025N..	-	-	-	-	-	40 000	60 000	3230	30 x D	20 x D
AU..12025W..	-	-	-	-	-	40 000	60 000	5030	30 x D	20 x D
AU..12833N..	40 000	60 000	4530	30 x D	20 x D	40 000	60 000	4530	30 x D	20 x D
AU..12833W..	40 000	60 000	6530	30 x D	20 x D	40 000	60 000	6530	30 x D	20 x D
AU..15033N..	-	-	-	-	-	68 000	100 000	7710	50 x D	34 x D
AU..15033W..	-	-	-	-	-	68 000	100 000	11 110	50 x D	34 x D

Load capacities apply to steel systems, for stainless steel systems load capacities are 25% lower

Calculating the System Load Factor

To calculate the system life, the load factor L_f should first be calculated using the equation below. Where M_v and M loads are concerned, the $M_{v(max)}$ and $M_{(max)}$ for the relevant carriage will need to be determined. This is established by multiplying the figure shown in the table by the spacing of the bearing, D , in millimetres. L_f should not exceed 1 for any combination of loads. Once L_f has been determined for the application, the life is calculated as shown on 43.

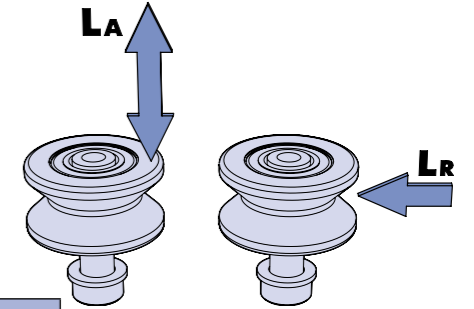
$$\text{Load Factor } L_f = \frac{L_1}{L_{1(max)}} + \frac{L_2}{L_{2(max)}} + \frac{M_s}{M_{s(max)}} + \frac{M_v}{M_{v(max)}} + \frac{M}{M_{(max)}}$$



Load Life Calculations

Individual 'V' Bearing Calculations

Many systems do not use standard carriages. In such cases it is necessary to use conventional statics calculations to determine the loading on each bearing in the system, by resolving into axial L_A and radial L_R components. Maximum capacities for all types of Hepco HDS2 'V' bearings are given in the table below, and 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.



Bearing Part Number	Dry			Lubricated		
	LA (max) N	LR (max) N	Basic Life (km)	LA (max) N	LR (max) N	Basic Life (km)
..HJR64	2500	8000	300	2500	8000	500
..HJR95	7000	20 000	400	7000	20 000	400
..HJR120	-	-	-	10 000	30 000	700
..HJR128	10 000	30 000	500	10 000	30 000	700
..HJR150	-	-	-	17 000	50 000	2000

The above figures assume that bearings are used with slides equal or larger than the preferred slide selection for that bearing size. For details of the preferred sizes, 18-19. For loading of bearings with smaller slides, please contact Hepco.

Calculating the System Load Factor

To calculate the system life, the load factor L_f should first be calculated using the equation below.

$$\text{Load Factor } L_f = \frac{L_A}{L_{A(max)}} + \frac{L_R}{L_{R(max)}}$$

L_f should not exceed 1 for any combination of loads.

Once L_f has been determined for each bearing, the life can be calculated as follows:

Calculating System Life

With the L_f determined for either a 4 bearing carriage or for an individual bearing, the life in km can be calculated using one of the three equations below. In these equations, the Basic Life is taken from the table (above) in respect of the bearing and lubrication condition applicable.

Dry System	Lubricated System	Lubricated System
Life (km) = $\frac{\text{Basic Life}}{(0.04 + 0.96L_f)^2}$	Life (km) = $\frac{\text{Basic Life}}{(0.04 + 0.96L_f)^3}$	Life (km) = $\frac{\text{Basic Life}}{(0.04 + 0.96L_f)^{3.3}}$
	(Use this calculation for all bearings other than ..HJR150.)	(Use this calculation for ..HJR150 bearings only.)

For further information regarding calculations using the methods above visit www.HepcoMotion.com/hdsdatauk and select datasheet No. 5 HDS2 Load Life Calculations.

Notes:

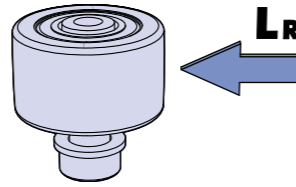
- The maximum values of L_1 , L_2 , M_s , M , M_v , L_A and L_R , and the magnitude of the system basic life for each bearing type, relate to the performance of complete systems. Tests have shown these figures to be more reliable than working from theoretical static and dynamic load capacities (C and C_o) of the bearings.
- 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, then please calculate the distance travelled as if it moves five bearing diameters per stroke. Systems operating at speed in excess of 8m/s may require additional calculations. Please contact Hepco for assistance.
- For the purpose of the Load/Life calculations on this page, the axial load L_A is the load in the axial direction which 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 of the bearing.
- 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 lubricators, cap wipers, however other methods which ensure the presence of a suitable grease or oil in the critical area are acceptable.
- When a system consists of more than 4 bearings per carriage (e.g. see application example on 9) it cannot always be guaranteed that the load will share equally between all bearings. In such cases it is recommended that the system be derated to allow for the life of the most heavily laden bearing. Please contact Hepco for assistance.

Load Life Calculations

Track Roller Calculations

Systems incorporating track rollers running on flat tracks or flat faces of the single edge 'V' 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 derated for use in unlubricated applications (although it is recommended that the tracks and rollers be lightly oiled for best performance).

The maximum radial load capacity L_R for the Hepco HDS2 track Roller is stated in the table below.



Load Capacities for Track Rollers		Basic Life (km)
Roller Part Number	L_R (max) N	
..HRN58	5 000	500
..HRR58	10 000	300
..HRR89	20 000	400
..HRR122	30 000	700
..HRR144	80 000	500

Calculating the System Load Factor

To calculate the roller life, the load factor L_f should first be calculated using the equation below.

$$\text{Load Factor } L_f = \frac{L_R}{L_{R(\max)}} \quad L_f \text{ should not exceed 1.}$$

Calculating Track Roller Life

With L_f determined for each roller, the life in km can be calculated using the equation below. The basic life is taken from the table (above) for the respective track roller.

$$\text{Life (km)} = \frac{\text{Basic Life}}{L_f^3}$$

(Use this calculation for all track rollers other than ..HRR144.)

$$\text{Life (km)} = \frac{\text{Basic Life}}{L_f^{3.3}}$$

(Use this calculation for ..HRR144 track roller only.)

Rack and Pinion Force Calculations

The driving force which can be transmitted through a rack and pinion will depend on the choice of rack (e.g. Mod 2.5 spur or Mod 4 x 30° helical), the size of pinion selected, the length of stroke and the desired life (total travel in km). The table below details the driving force in N for all combinations of parts and for a useful range of stroke lengths and design lives. All figures assume ideal lubrication and pinion contact conditions, and that all movement is for the full stroke indicated. It is recommended that a safety factor be applied when selecting rack and pinion components. This table is suitable for initial selection of parts, but please contact Hepco if you require a specific calculation tailored for your application.

Rack and Pinion combination	Stroke length = 1m			Stroke length = 4m			Stroke length = 16m		
	Expected life of rack & pinion			Expected life of rack & pinion			Expected life of rack & pinion		
	1000km	5000km	25000km	1000km	5000km	25000km	1000km	5000km	25000km
Mod 2.5 & 20 tooth pinion	2200	1700	1200	3700	2500	1800	3700	3600	2500
Mod 2.5 helical & 20 tooth pinion	3300	3000	2500	4300	3500	3100	4300	4100	3500
Mod 3 & 20 tooth pinion	3400	3100	2500	4400	3600	3200	4400	4300	3600
Mod 4 helical & 20 tooth pinion	6700	5200	3700	11800	8000	5800	11900	11000	8200
Mod 4 helical & 24 tooth pinion	7500	5800	5300	12600	9200	6600	12700	12700	8300
Mod 5 & 18 tooth pinion	4700	3900	2700	8500	5700	4100	8500	8500	5800
Mod 5 & 24 tooth pinion	5800	4700	3300	10900	7400	5300	11000	11000	7500

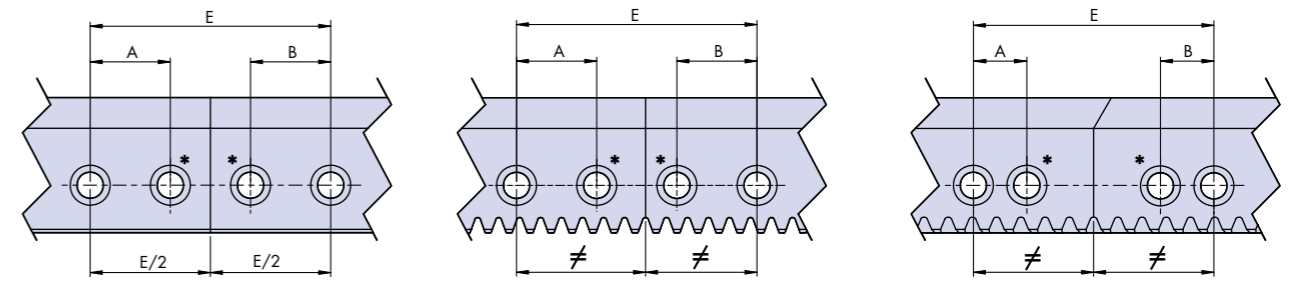
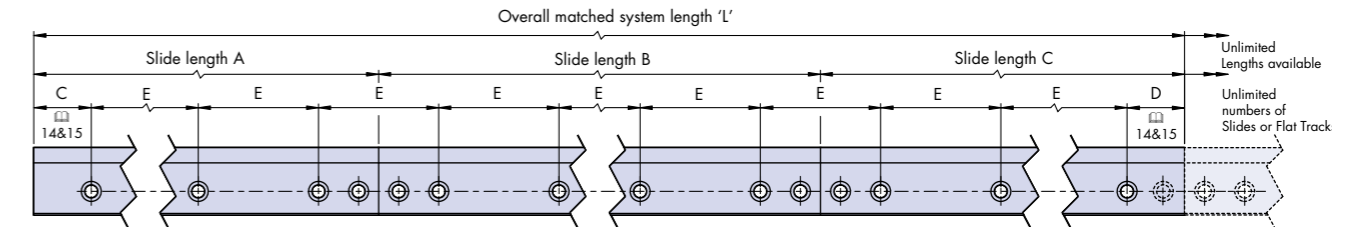
Matched Systems

Slides or flat tracks can be ordered as matched sets to achieve any length. This is useful not only for achieving very long lengths but also for multiple short lengths to enable replacement of a damaged section.

For standard matched system requirements, Hepco will supply a number of slides or flat track lengths to achieve the overall length required with the minimum number of joints. A continuous hole pitch will be maintained along the entire length of the matched system and an additional hole will be provided either side of the joint for security and alignment. For plain, non rack cut matched systems, the joints will be central between mounting holes (see example A). For rack cut systems, the joint position between teeth may not coincide with the centre position between holes and therefore could be up to one tooth pitch offset either side (see examples B & C).

Where specific rack cut lengths or multiple identical rack cut lengths are required, these must be ordered to a factor of the tooth pitch. Special hole positions may be required.

In all matched systems the details are recorded to enable the replacement of any individual slide or track.



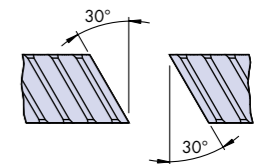
EXAMPLE A
Non rack cut
matched system

* = Additional hole

EXAMPLE B
Spur rack cut
matched system

EXAMPLE C
Helical rack cut
matched system

	V Slides			Flat Tracks							
	.HSS25.	.HSS33.	.HSD25.	.HTS25.	.HTS33.	.HTD25.					
	Non Rack	Spur Rack	Helical Rack	Non Rack	Spur Rack	Helical Rack	Non Rack	Spur Rack	Helical Rack	Non Rack	
A	30	20	40	30	30	30	30	20	40	30	30
B	30	20	40	30	30	30	30	20	40	30	30
E	90		120	90	90		120		90		



For best running quality when using single edge slides or flat tracks in parallel, it is advisable to offset the joints so they do not coincide. It is also important to ensure that slides and tracks overlap any joints in the back plates or beams where these have been supplied in joined condition for long length requirements. Such applications should be discussed with Hepco.

For further information on matched systems and installation details, please refer to www.HepcoMotion.com/hdsdatauk and select datasheet No. 6 HDS2 Matched Systems. **IMPORTANT:** All matched system requirements should be referred to Hepco's Technical Department.

Ordering Details

Standard matched systems (longer than 4046mm):

Simply state 'L' to the required overall length according to the slide and flat track ordering details 15.

Specific or identical length matched systems:

State the overall length of the matched slide or track required and the individual quantity and lengths of which it is comprised, according to ordering details 15.

Example 1: 1 x **matched** P HSS25 L7826 NK R C43 D43 comprising 4 x P HSS25 L1956.5 NK R

Note: For rack cut slides and tracks, Hepco will determine the C & D dimensions to suit the rack pitch across the joints.

Example 2: 1 x **matched** P HSS25 L5576 C43 D43 comprising;
1 x P HSS25 L3688 C43 D45 + 1 x P HSS25 L1888 C45 D43

Mix & Match Component Compatibility

		✓ = Preferred Choice				✓ = Compatible				✗ = Not Compatible		
		Part Number	..HSS25NK...	..HSS33NK...	..HSS25...	..HSS33...	..HTS25NK...	..HTS33NK...	..HTS25...	..HTS33...	..HSD25...	..HTD25...
V Bearings		.HJR64...	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗
		.HJR95...	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗
		.HJR120...	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗
		.HJR128...	✗	✓	✓	✓	✗	✗	✗	✗	✗	✗
		.HJR150...	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗
Track Rollers		.HRN58...	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓	✓	✓	✓	✗	✓
		.HRR58...	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓	✓	✓	✓	✗	✓
		.HRR89...	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓	✓	✓	✓	✗	✓
		.HRR122...	✗	✓ ⁺¹	✗	✓ ⁺¹	✓	✓	✓	✓	✗	✓
		.HRR144...	✗	✓ ⁺¹	✗	✓ ⁺¹	✓	✓	✓	✓	✗	✓
Back Plate		.HLN25..	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗
		.HLN33..	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗
		.HHN25..	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗
		.HHN33..	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗
		.HLW25..	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓
Construction Beam		.HB25C..	✓	✗	✓	✗	✓	✗	✓	✗	✓ ⁺²	✓ ⁺²
		.HB25..	✓	✗	✓	✗	✓	✗	✓	✗	✓ ⁺²	✓ ⁺²
		.HB33..		✓	✓	✓	✓	✓	✓	✓	✓ ⁺²	✓ ⁺²
Lubricator		.HDLB25R	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓	✓	✓	✓	✗	✓
		.HDLB33R	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓ ⁺¹	✓	✓	✓	✓	✗	✓
		.HDLB33RX	✗	✓ ⁺¹	✗	✓ ⁺¹	✗	✓	✗	✓	✗	✗
		.HDLB25S	✓	✗	✓	✗	✗	✗	✗	✗	✓	✗
		.HDLB33S	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗
	.HDLB33SX	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	

		V Bearings					Track Rollers				
		Part Number	.HJR64...	.HJR95...	.HJR120...	.HJR128...	.HJR150...	.HRR58...	.HRR89...	.HRR122...	.HRR144...
Lubricator		.HDLB25J	✓	✓	✓ ⁺³	✓ ⁺³	✓ ⁺³	✗	✗	✗	✗
		.HDLB33J	✓ ⁺³	✓ ⁺³	✓	✓	✓ ⁺³	✗	✗	✗	✗
		.HDLB33JX	✗	✗	✗	✗	✓	✗	✗	✗	✗
		.HDLB25R	✗	✗	✗	✗	✗	✓	✓	✓ ⁺³	✓ ⁺³
		.HDLB33R	✗	✗	✗	✗	✗	✓ ⁺³	✓ ⁺³	✓	✓ ⁺³
		.HDLB33RX	✗	✗	✗	✗	✗	✗	✗	✗	✓
		.HDLB25S	✓	✓	✓ ⁺³	✓ ⁺³	✓ ⁺³	✗	✗	✗	✗
		.HDLB33S	✓ ⁺³	✓ ⁺³	✓	✓	✓ ⁺³	✗	✗	✗	✗
		.HDLB33SX	✗	✗	✗	✗	✓	✗	✗	✗	✗

Notes:

- Track rollers, roller cap wipers and roller lubricators are compatible with single edge V slides, when used on the back face of the slide.
- Double edge V slides & flat tracks can only be fitted to the Hepco construction beams by using the HLW25 or HHW25 back plate and T-nuts 25.
- Allowances for differences in mounting heights will be required, please refer to the relevant component pages for details.

Mix & Match Component Compatibility



		Lubrication Devices Mix & Match											
		V Bearings					Track Rollers						
		Part Number	.HJR64...	.HJR95...	.HJR120...	.HJR128...	.HJR150...	.HRR58..	.HRR89..	.HRR122..	.HRR144..		
V Slides & Back Plates		.HSS25.. + .HLN25..	HDLB25S or CW64	HDLB25S or CW95	HDLB33S	✗	✗	HDLB25R or CW58	HDLB25R or CW89	HDLB33R	✗		
		.HSS33.. + .HLN33..	HDLB25S	HDLB25S	HDLB33S	HDLB33S	✗	HDLB25R or CW58	HDLB25R or CW89	HDLB33R	✗		
		.HSS25.. + .HHN25..	HDLB25S or CW64	HDLB25S or CW95	HDLB33S or CW120	✗	✗	HDLB25R	HDLB25R	✗	✗		
		.HSS33.. + .HHN33..	HDLB25S	HDLB25S	HDLB33S	HDLB33S or CW128	HDLB33S or CW150	HDLB25R or CW58	HDLB25R or CW89	HDLB33R	HDLB33RX		
		.HSD25.. + .HLW25..	HDLB25S or CW64	HDLB25S or CW95	HDLB33S	✗	✗	✗	✗	✗	✗		
Flat Tracks & Back Plates		.HSD25.. + .HHW25..	HDLB25S or CW64	HDLB25S or CW95	HDLB33S or CW120	✗	✗	✗	✗	✗	✗		
		.HTS25.. + .HLN25..								HDLB25R or CW58	HDLB25R or CW89	HDLB33R	✗
		.HTS33.. + .HLN33..								HDLB25R or CW58	HDLB25R or CW89	HDLB33R	✗
		.HTS25.. + .HHN25..								HDLB25R or CW58	HDLB25R or CW89	HDLB33R or CW122 ^{1,2}	✗
		.HTS33.. + .HHN33..								HDLB25R or CW58	HDLB25R or CW89	HDLB33R or CW122 ^{1,2}	HDLB33RX or CW144 ^{1,3}
	.HTD25.. + .HLW25..									HDLB25R or CW58	HDLB25R or CW89	HDLB33R	✗
	.HTD25.. + .HHW25..									HDLB25R or CW58	HDLB25R or CW89	HDLB33R or CW122	✗

Notes:

- Track rollers, roller cap wipers and roller lubricators are only compatible with single edge V slides, when used on the back face of the slide.
- Roller cap wiper CW122 is only compatible with HTS25 + HHN25 and HTS33 + HHN33 when running on the front face of the flat track.
- Roller cap wiper CW144 is only compatible with HTS33 + HHN33 when running on the front face of the flat track.

		Indicates back face of HSS25/33 slide			Indicates front face of HTS25 flat track			Indicates front face of HTS33 flat track
--	--	---------------------------------------	--	--	--	--	--	--

Installation

This page covers general installation of V bearings  and track roller systems . Further installation details can be found on our website www.HepcoMotion.com/hdsdatauk by selecting datasheet No. 7 HDS2 Fixing of Slides and Bearing Elements. For installation details of bearing block systems (insert image) please select datasheet No. 4 HDS2 Bearing Blocks.

V Slides and Flat Tracks (Without Hepco Back Plates)

For optimum performance and accuracy, slides and tracks should be mounted on a flat surface. Single edge V slides and single edge flat tracks should be set parallel in a system either by clamping the back faces against parallel registers, or by locating the keyways onto Hepco dowel pins or purpose made key sections. Double edge V slides and wide flat tracks may be located in a similar manner utilising the keyway if precise straightness or positional location is required.

V Slides and Flat Tracks (With Hepco Back Plates)

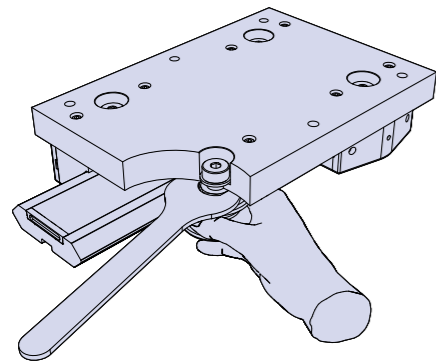
Installation of slides or tracks mounted on back plates is similar to the above procedure. Either the edge of the back plate itself or the keyway can be utilised to provide a datum reference. If the edge of the back plate is used, it is important to ensure that the depth of register affords running clearance for the V bearings, cap wipers and bearing blocks. It is advisable to set the assembled elements against the loaded side of the keys/dowels in order to overcome any slight clearances.

Customers mounting single edge V slides or single edge flat tracks in parallel are recommended to specify the jacking screw alignment facility available for use both with and without the Hepco construction beam (17 for installation details). Customers may also specify the location T-nut HTNM8L for locating assembled elements to construction beams. N.B. Location T-nuts should be used in only one or other of the two large keyways in the wide plate HLW25.

Drilling (V slides and Flat Tracks)

It is recommended that holes in the mounting surface should be drilled using the slide or track as a template, unless an accurate means of pre-drilling is available.

V Bearings/Cap Wipers and Track Rollers (See figure below left)



The mounting surfaces for the V bearings should be flat and in the same plane. The bearing elements should be assembled to the mounting surface or carriage with the concentric bearings on the side taking the greatest load. In the case of more than two bearing assemblies engaged on the datum (concentric) side of the slide or track, all bearing assemblies in between the two outermost concentric assemblies should be eccentric type to allow precise engagement and sharing of the load. All bearings on the opposite side should be the eccentric type.

The concentric bearings should be fully tightened and the eccentrics semi-tightened then adjusted to their outermost position. The complete carriage assembly minus any additional components should be counterbalanced through its centre of gravity by means of a length of rope. N.B. It is recommended that a lifting eye in the appropriate position be provided for this purpose.

With the carriage in its counterbalanced condition the eccentric bearings opposite the concentrics should be rotated using the Hepco adjusting wrench until engaged with the slide or track such that there is no detectable play and minimal preload. The bearings should be checked for preload by rotating between forefinger and thumb such that the bearing skids against the slide or track without application of undue force. The adjusted bearings should then be fully tightened and checked again for preload. The process as described should be repeated for any pairs of eccentric bearings fitted in between the outermost ones. The carriage assembly may then be checked for free running by pushing back and forth along the slide.

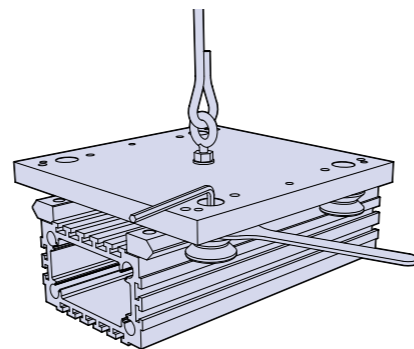
The carriage should be withdrawn from the slide to enable bearing cap wipers to be fitted if required. (Roller cap wipers can be fitted without the necessity to withdraw the carriage.) The carriage should be returned to the slide with cap wipers adjusted to achieve maximum compression of the felt wipers without the slide contacting the plastic body. The carriage assembly should then be checked for running quality in the non-counterbalanced condition. On completion of adjustment, the chamber of the small series bearing cap wipers only, should be charged with grease 49.

Important: Additional preload imposed on the system by incorrect adjustment or misalignment will reduce the load capacity and life of the system. Customers are advised to make allowances for this.

Bearing Adjustment and Carriage Removal

Bearing adjustment can take place with cap wipers in place and without the need to remove the carriage from the slide or track. First remove the front cover from the cap wiper body to expose the eccentric bearings, this will allow access for the adjustment wrench. Adjustment for the bearings themselves is as described above, again adjustment should take place with the carriage in its counterbalanced state.

Carriage removal can take place without the need to slide the carriage to the end of the slide or track. Remove the front covers from the cap wipers covering the concentric bearings, this will allow access for the adjustment wrench. With the wrench in place, unscrew the bearing stud from the bearing, once removed the bearing can be removed from the carriage. Remove the cap wiper body and the carriage can now be lifted clear from the slide. Replacement is the reversal of this procedure, the advantage of this method is that the eccentric bearings are not affected therefore adjustment should not be required.



Technical Specifications

'V' Slides & Flat Tracks

Material and finish: High carbon bearing steel, hardened on running faces. Those areas which are ground have N5 surface finish. Other areas have a chemical black finish.

Stainless steel version

Material and finish: Special martensitic stainless steel conforming generally to AISI 420 series, ground on all main surfaces to N5. Hardened on running faces.

Bearings & Track Rollers

Bearings rings, balls & rollers: Carbon-chromium bearing steel AISI 52100, hardened and tempered.
Seals: Nitrile rubber.
Cage: Plastic, Metal for ...HJR150... & ...HRR144...
Studs: High tensile steel. Chemical black finish.
Temperature range: -20°C to +120°C

Stainless steel version

Bearings rings, balls & rollers: Stainless steel AISI 440C, hardened and tempered. SS...HJR150... & SS...HRR144... contain a steel twin taper roller bearing.
Seals: Nitrile rubber.
Cage: Plastic.
Studs: Fixing bolts and SSTH... bushes stainless steel AISI 431 or DIN EN 1.4057. SSBH... bushes AISI 303.
Temperature range: -20°C to +120°C

Carriage Plates & Back Plates

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

Cap Wipers & Lubricators

Material: Body: Impact resistant plastic.
Wipers: Felt.
Fixings: Stainless steel grades AISI 304 or 316.
Temperature range: -20°C to +60°C.

Lubricants: Small series bearing cap wipers. Grease NLGI consistency No. 2.
Large series bearing cap wipers, all roller cap wipers and all lubricators. } Oil 68 cSt or similar. Food compatible lubricants may also be used.

Frictional Resistance for 'V' Slide Systems

Coefficient of friction (without cap wiper or lubricators) = 0.02.
Cap seals and lubricators add friction as follows.

4 cap wipers per carriage CW64 or CW95 = 5N
CW120, CW128 or CW150 = 10N

4 Lubricators per carriage HDLB25 = 2.5N
HDLB33 = 5 N

Maximum Linear Speeds

HDS2 V slide and flat track system can operate at very high speeds, up to 10m/s in some instances. Speeds are dependent on stroke, duty and environmental conditions. Please contact Hepco to discuss application requirements. Stated speeds do not apply to rack driven systems.

Tightening Torques

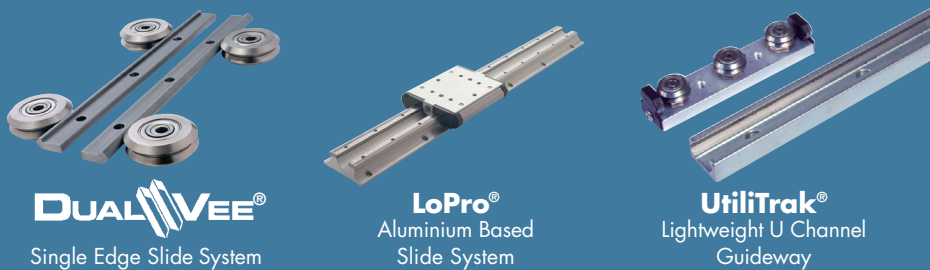
Please visit our website www.HepcoMotion.com/hdsdatauk and select datasheet No. 7 HDS2 Fixing of Slides and Bearing Elements.

HepcoMotion® Product Range



Bishop Wisecarver Product Range

HepcoMotion® – Exclusive European partners and distributors for Bishop-Wisecarver since 1984.



For further information on HepcoMotion® products – please request our leaflet 'FPL'

HepcoMotion®

www.HepcoMotion.com

Lower Moor Business Park, Tiverton Way, Tiverton, Devon, England EX16 6TG

Tel: +44 (0)1884 257000

E-mail: sales@hepcotion.com

CATALOGUE No. HDS2 04.6 UK © 2013 Hepco Slide Systems Ltd.

Reproduction in whole or part without prior authorisation from Hepco is prohibited. Although every effort has been made to ensure the accuracy of the information in this catalogue, Hepco cannot accept liability for any omissions or errors. Hepco reserves the right to make alterations to the product resulting from technical developments.

Many Hepco products are protected by: Patents, Copyright, Design Right or Registered Design. Infringement is strictly prohibited and may be challenged in law. The Customer's attention is drawn to the following clause in Hepco's conditions of sale:

'It shall be the Customer's sole responsibility to ensure that goods supplied by Hepco will be suitable or fit for any particular application or purpose of the Customer, whether or not such application or purpose is known to Hepco. The Customer will be solely responsible for any errors in, or omissions from, any specifications or information the Customer provides. Hepco will not be obliged to verify whether any such specifications or information are correct or sufficient for any application or purpose.'

Hepco's full conditions of sale are available on request and will apply to all quotations and contracts for the supply of items detailed in this catalogue.

HepcoMotion is the trading name of Hepco Slide Systems Ltd.