
Stainless Steel Options Available
Please contact our Sales Department for a Datasheet
HepcoMotion®
HDS
heavy duty
slide system
HEPCO®
www.HepcoMotion.com

Contents

* See additional components section for further options (pages 37~43)

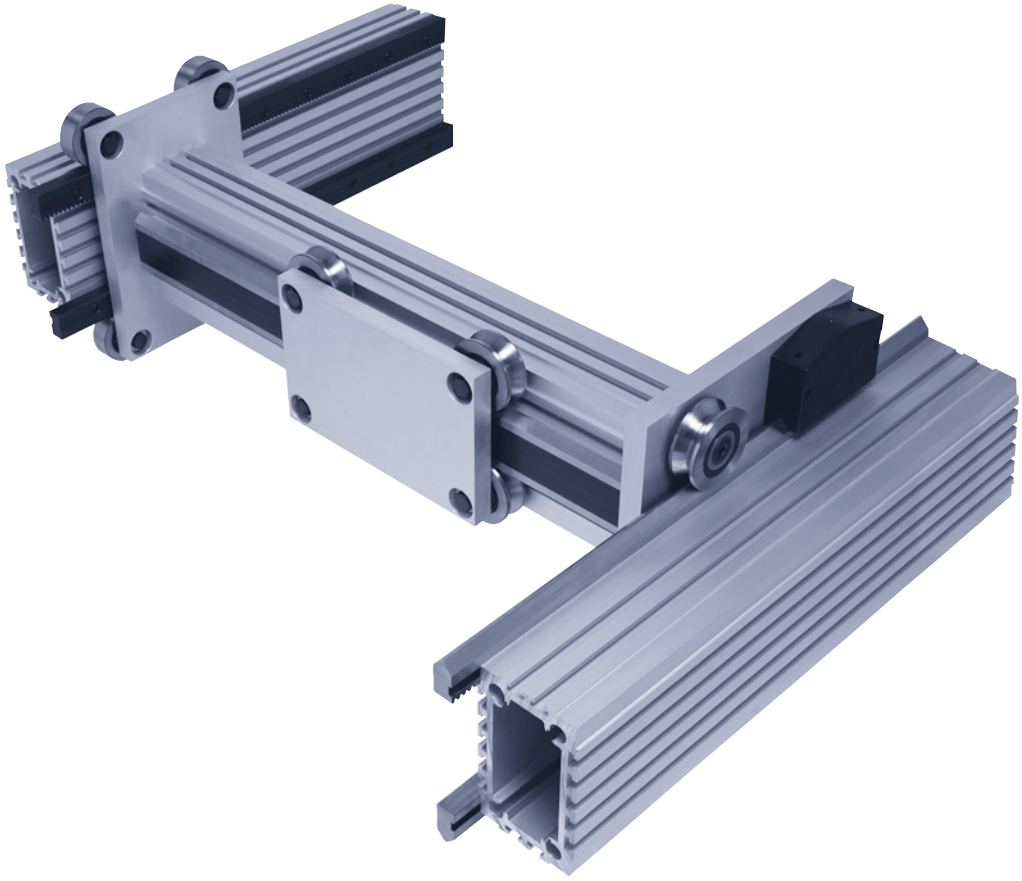
Introducing the HepcoMotion® HDS
Heavy Duty Slide System

Recognising the need for a versatile, easy to install, low maintenance yet affordable high load slide system, the Hepco design team have upgraded their highly regarded Heavy Duty slide system to include long length slides and flat tracks together with an unprecedented range of complementary and interchangeable components to satisfy both the simplest and most sophisticated needs of the design engineer.

The customer now has the choice of either low cost commercial precision for less important guidance applications or high precision ground tolerances to suit machine tool type applications.

Two types of bearing element are available to satisfy either high load, or super high load sustained accuracy requirements and great care has been taken to provide efficient sealing and lubrication.

Customers can save design and manufacturing time by specifying ready mounted systems complete with drive transmission facility, safe in the knowledge that everything has been designed and tested by one of the worlds leading specialists in linear technology.



HepcoMotion® HDS – Features and Benefits

- Slides and tracks in one piece up to 4 metres long.
- Low cost commercial, or precision systems available.
- Two types of bearing element according to load requirements.
- Positive lubrication and effective sealing.
- Double edge slides for built in parallelism.
- Single edge slides for spacing apart.
- Rack cut versions and pinions for ease of driving.
- Flat tracks overcome necessity for parallel installation.
- Simple alignment facility to achieve parallelism of V slides.
- Versatile construction beam for unlimited design options.
- Eccentric facility for easy installation and adjustment.
- High load carrying capacity.
- High degree of rigidity and stability.
- Tolerant of debris.
- Works in harsh environments.
- Silent operation.
- Low friction.
- Works in any plane.

System Composition

The new Heavy Duty slide system comprises a versatile family of slides, flat tracks and other components which may be used with either double row ball bearing assemblies for high load applications or with blocks containing four needle roller bearings for super high load applications.

Slides and flat track are available up to 4 metres in length in both high precision ground and low cost, commercial versions and a rack cut option is available with pinions to provide a simple and effective means of driving.

✻ BORED TYPE PINIONS

● SHAFT TYPE PINIONS

- ● ✻ Hardened teeth for long life.
- ● Shaft diameter and tolerance to suit standard bearing.
- ● Two useful lengths available.
- ● Centred both ends for easy reworking.
- ✻ Bore diameter and tolerance to suit compatible shaft size.
- ✻ Keyway provided.

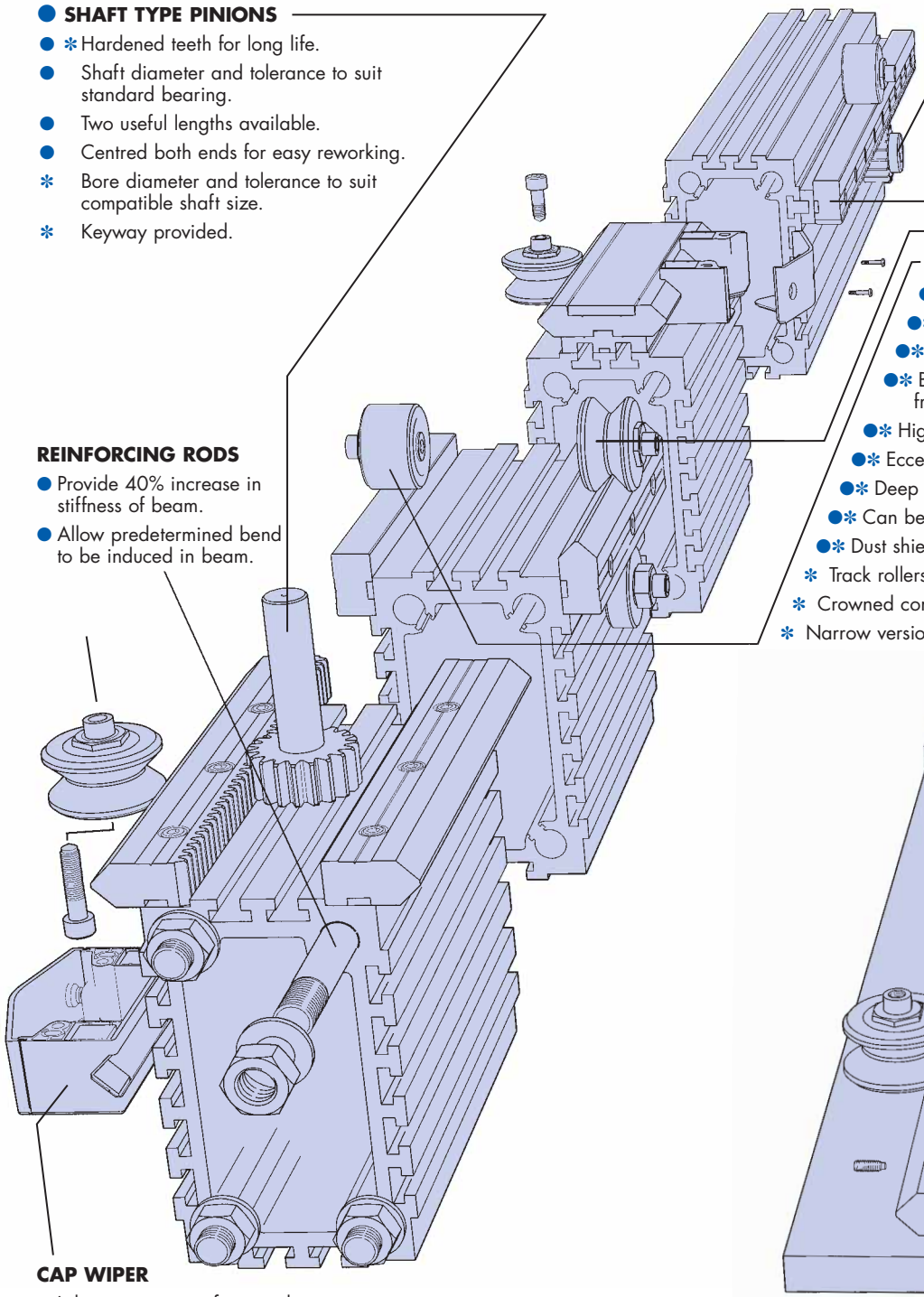
REINFORCING RODS

- ● Provide 40% increase in stiffness of beam.
- ● Allow predetermined bend to be induced in beam.

● V BEARINGS

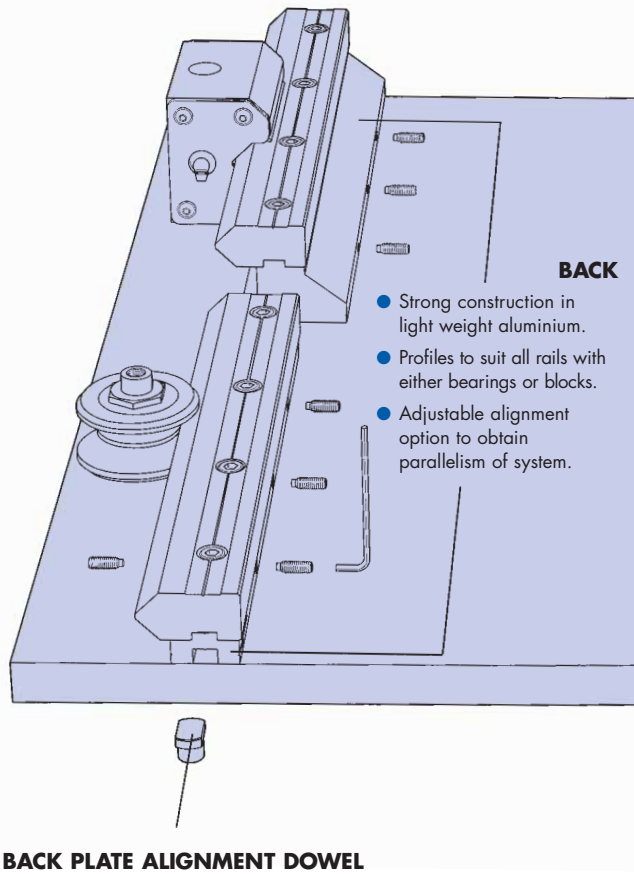
✻ TRACK ROLLERS

- ● Precision deep ground V form.
- ●✻ Rigid mounting register.
- ●✻ Compact design.
- ●✻ Blind hole version bolted and adjusted from front face.
- ●✻ High load capacity.
- ●✻ Eccentric version easily adjusted.
- ●✻ Deep groove double row precision bearing.
- ●✻ Can be mounted in virtually any thickness plate.
- ●✻ Dust shielded or neoprene sealed versions available.
- ✻ Track rollers permit out of parallel installation.
- ✻ Crowned contact face to overcome misalignment.
- ✻ Narrow version for restricted space applications.



CAP WIPER

- ● Lubricates contact faces reducing wear.
- ● Long interval before relubrication is necessary.
- ● Excludes debris from bearing contact faces.
- ● Incorporates both through hole and tapped hole fixing facility.
- ● Removable cover allows adjustment of system without disassembly.



BACK

- ● Strong construction in light weight aluminium.
- ● Profiles to suit all rails with either bearings or blocks.
- ● Adjustable alignment option to obtain parallelism of system.

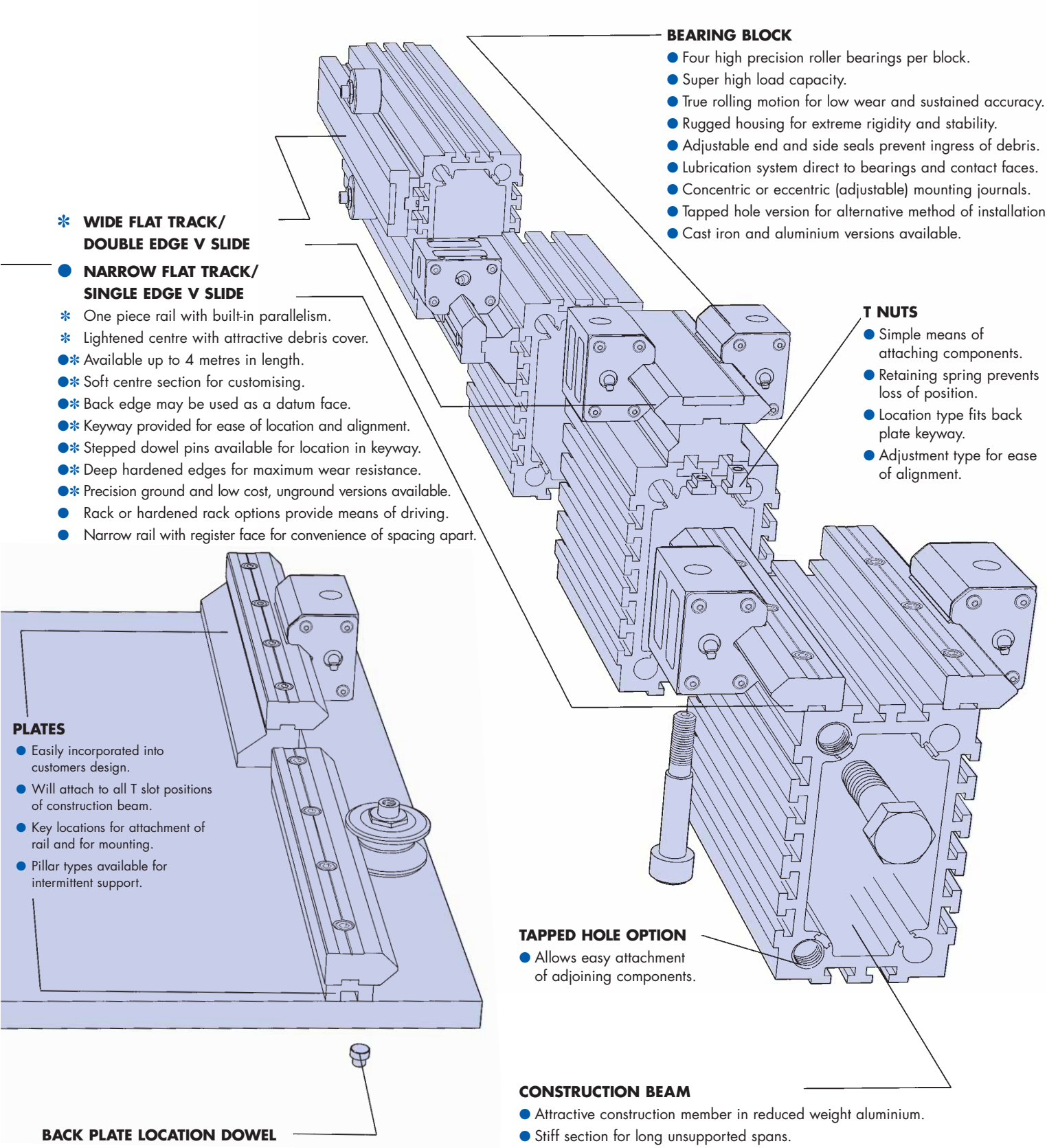
BACK PLATE ALIGNMENT DOWEL

- ● Adjustable alignment in conjunction with jacking screw.

System Composition

The slides and tracks may be attached direct to a suitable section, or they may be used in conjunction with Hepco back plates to give a ready made support profile. The considerable problems to set systems in parallel have been overcome with the unique jacking screw alignment option.

A rigid aluminium beam section is available to which all Hepco Heavy Duty systems may be attached in 22 different positions and in dozens of different combinations providing a versatile all in one guide, drive and construction element.



BEARING BLOCK
- Four high precision roller bearings per block.
- Super high load capacity.
- True rolling motion for low wear and sustained accuracy.
- Rugged housing for extreme rigidity and stability.
- Adjustable end and side seals prevent ingress of debris.
- Lubrication system direct to bearings and contact faces.
- Concentric or eccentric (adjustable) mounting journals.
- Tapped hole version for alternative method of installation.
- Cast iron and aluminium versions available.

✻ WIDE FLAT TRACK/ DOUBLE EDGE V SLIDE

● NARROW FLAT TRACK/ SINGLE EDGE V SLIDE
- ✻ One piece rail with built-in parallelism.
- ✻ Lightened centre with attractive debris cover.
- ●✻ Available up to 4 metres in length.
- ●✻ Soft centre section for customising.
- ●✻ Back edge may be used as a datum face.
- ●✻ Keyway provided for ease of location and alignment.
- ●✻ Stepped dowel pins available for location in keyway.
- ●✻ Deep hardened edges for maximum wear resistance.
- ●✻ Precision ground and low cost, unground versions available.
- ● Rack or hardened rack options provide means of driving.
- ● Narrow rail with register face for convenience of spacing apart.

T NUTS
- Simple means of attaching components.
- Retaining spring prevents loss of position.
- Location type fits back plate keyway.
- Adjustment type for ease of alignment.

PLATES
- Easily incorporated into customers design.
- Will attach to all T slot positions of construction beam.
- Key locations for attachment of rail and for mounting.
- Pillar types available for intermittent support.

TAPPED HOLE OPTION
- Allows easy attachment of adjoining components.

CONSTRUCTION BEAM
- Attractive construction member in reduced weight aluminium.
- Stiff section for long unsupported spans.
- Eight corner mounting positions to suit narrow slide and track profiles.
- Fourteen T slot mounting positions to locate with any back plate.

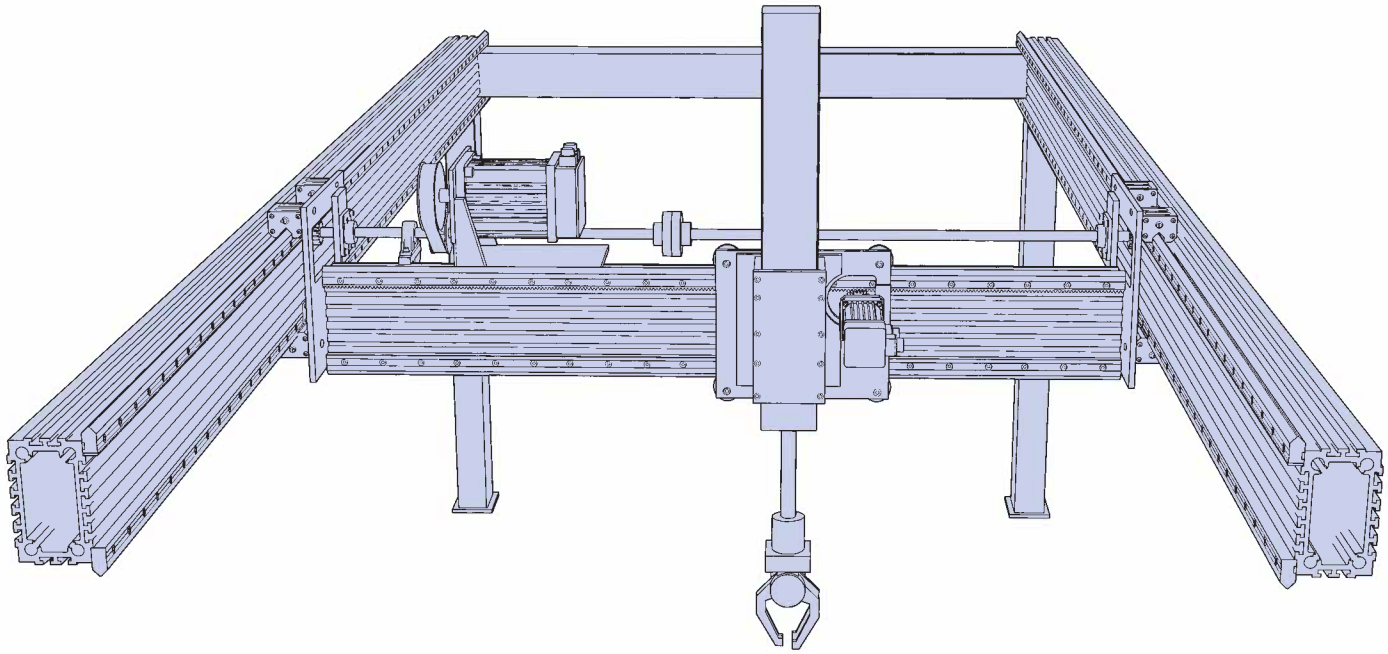
BACK PLATE LOCATION DOWEL
- Simple means of location and alignment.

Gantry Robot

The Hepco Heavy Duty system with its rigid construction beam, and drive facility is the ideal choice for XY gantry robot design. The example shows single edge V slides mounted direct to the corner faces of the beam with high load carrying capacity bearing block supporting the greater mass of the X axis and V bearing assemblies with cap wipers (not shown) supporting the Y axis.

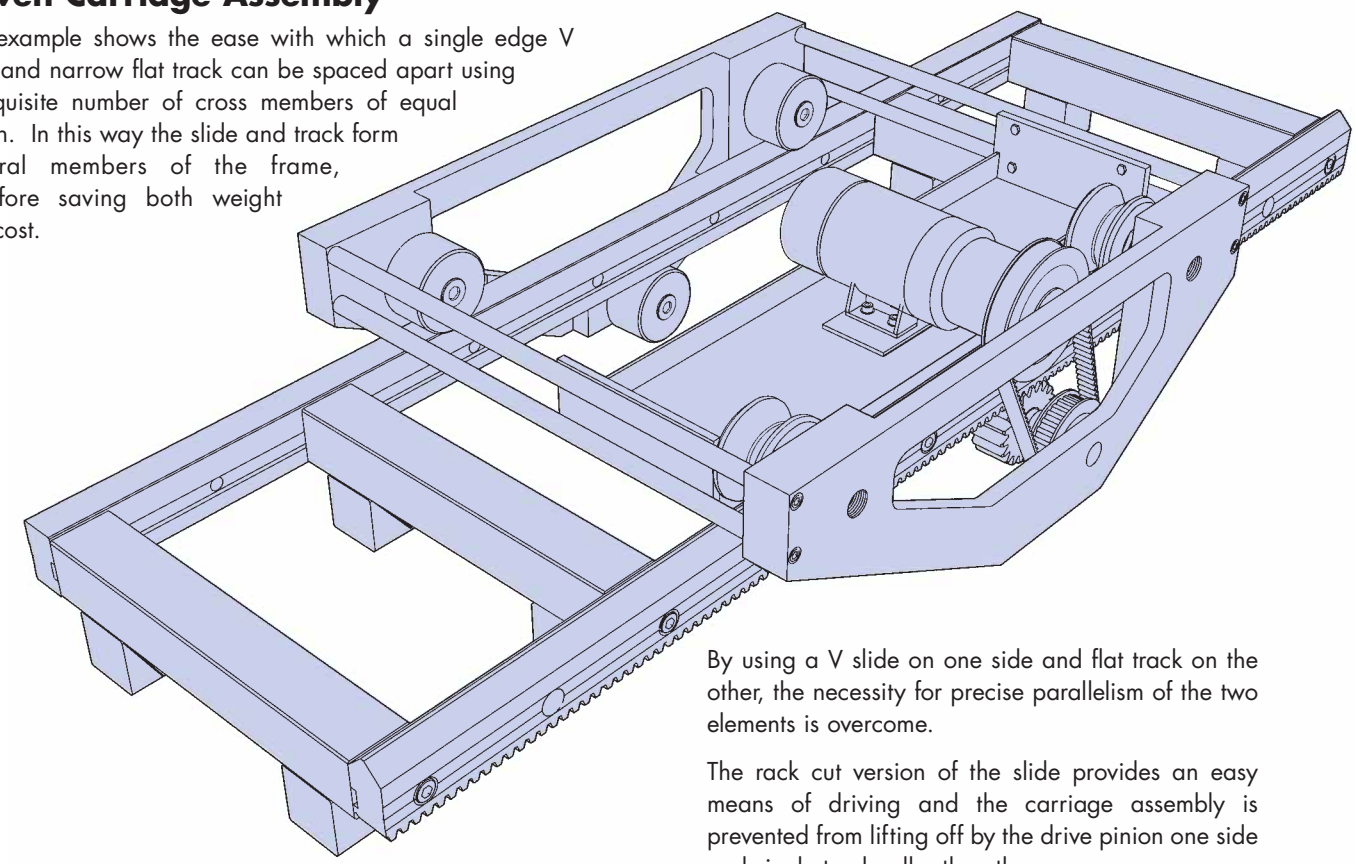
The continuous 4 metre long slides, rack cut on the back face together with pinions, provide smooth transmission of the drive and overcomes the problems of multiple butt jointing.

Many gantry robot applications do not require the precision of ground slides. By choosing the commercial unground system customers are provided with an economic solution with adequate accuracy for their requirements.



Driven Carriage Assembly

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

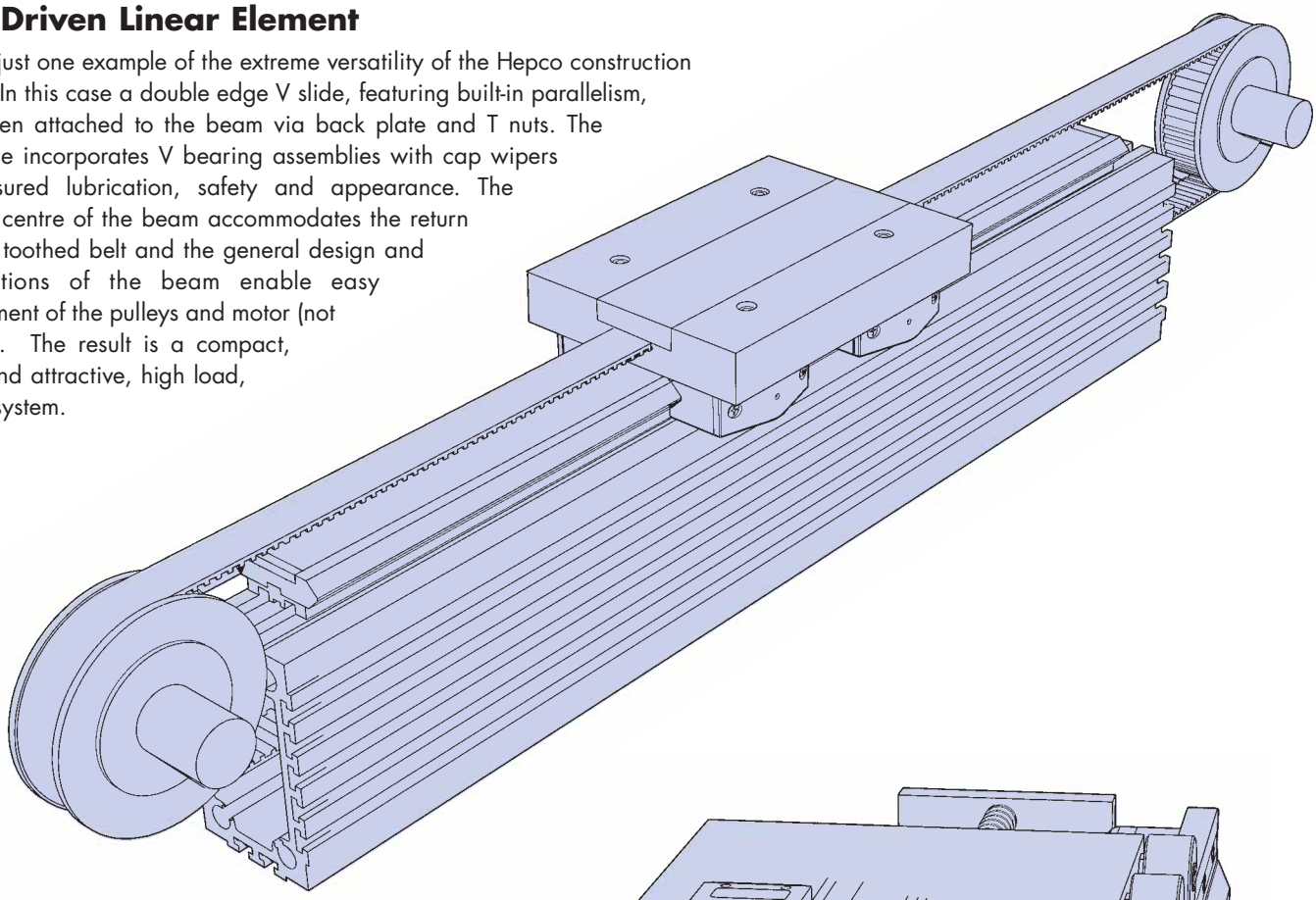


By using a V slide on one side and flat track on the other, the necessity for precise parallelism of the two elements is overcome.

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 single track roller the other.

Belt Driven Linear Element

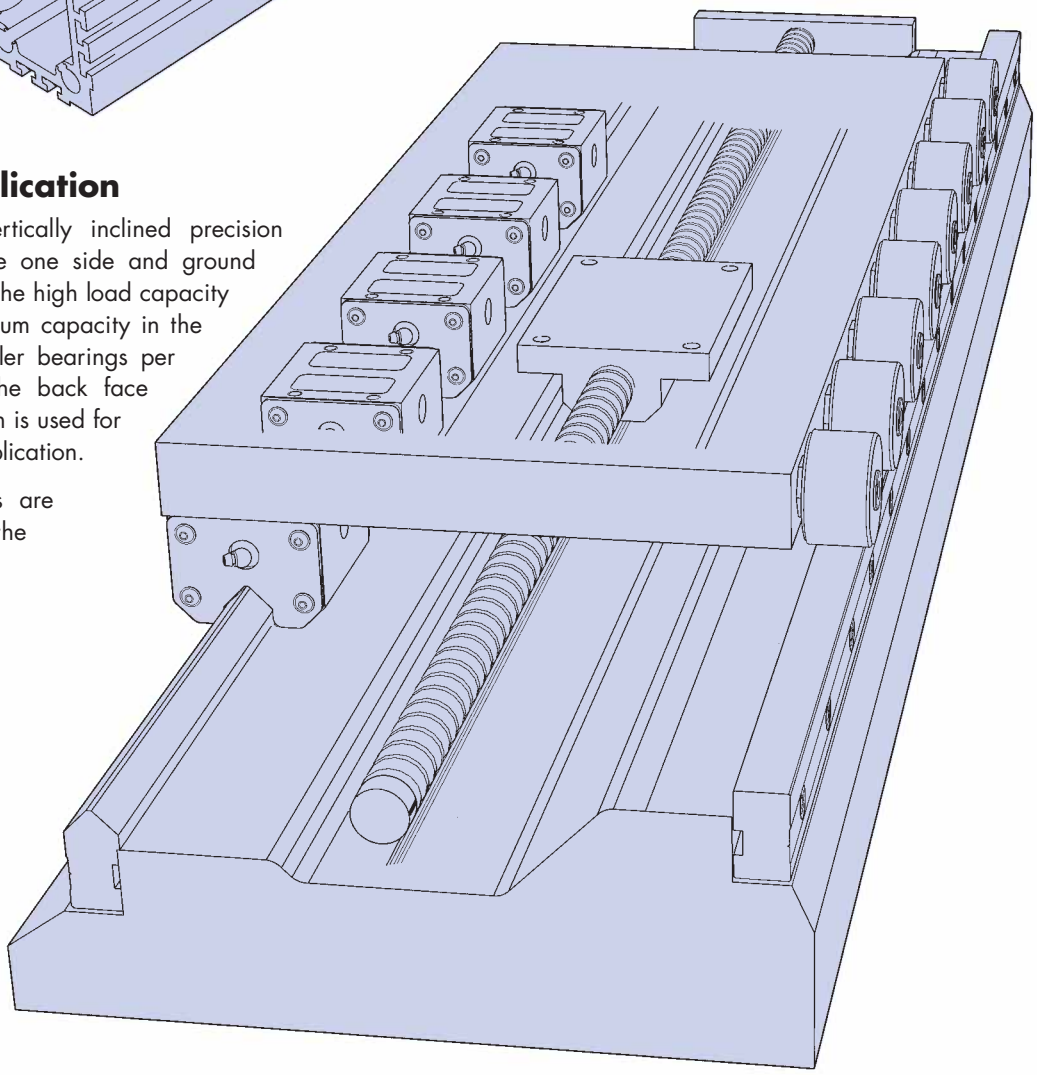
This is just one example of the extreme versatility of the Hepco construction beam. In this case a double edge V slide, featuring built-in parallelism, has been attached to the beam via back plate and T nuts. The carriage incorporates V bearing assemblies with cap wipers for assured lubrication, safety and appearance. The hollow centre of the beam accommodates the return for the toothed belt and the general design and proportions of the beam enable easy attachment of the pulleys and motor (not shown). The result is a compact, rigid and attractive, high load, linear system.



Machine Bed Application

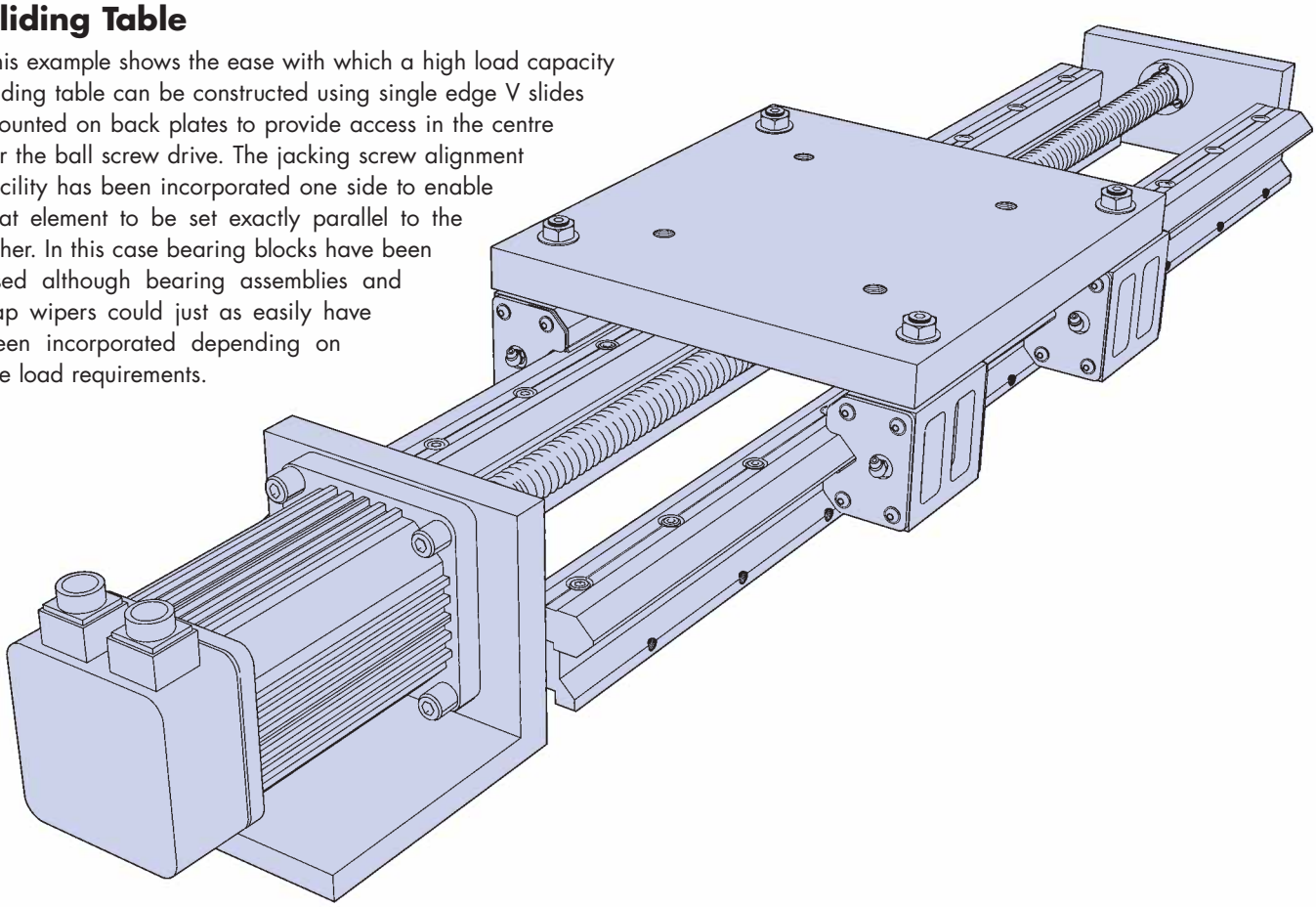
This example shows a vertically inclined precision ground single edge V slide one side and ground narrow flat track the other. The high load capacity bearing blocks have maximum capacity in the vertical plane due to 4 roller bearings per block sharing the load. The back face tapped hole mounting option is used for maximum rigidity in this application.

Eccentric type track rollers are used in conjunction with the flat track for individual adjustment to ensure that the load is shared equally by all rollers.



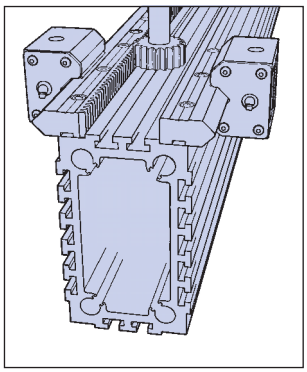
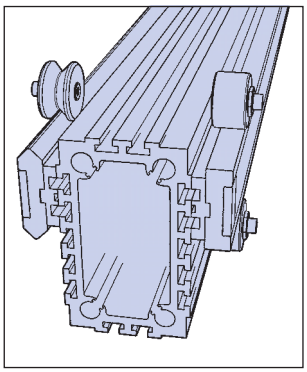
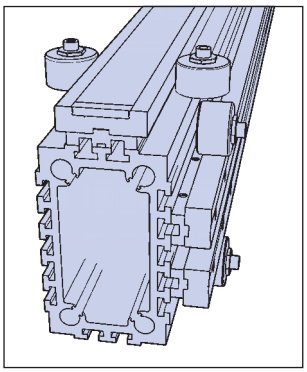
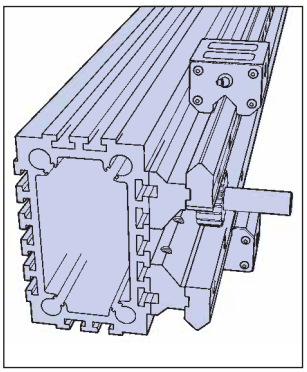
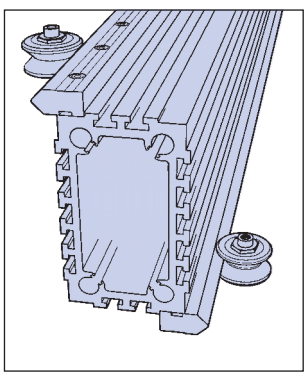
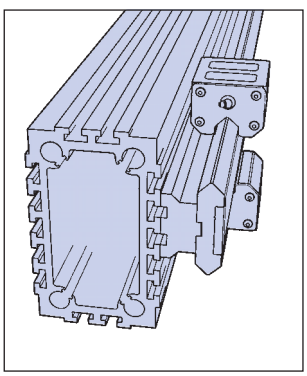
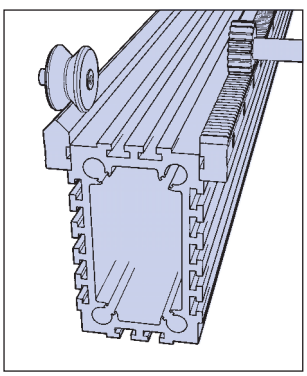
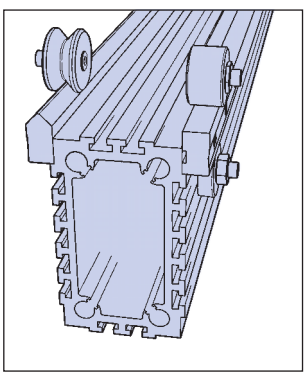
Sliding Table

This example shows the ease with which a high load capacity sliding table can be constructed using single edge V slides mounted on back plates to provide access in the centre for the ball screw drive. The jacking screw alignment facility has been incorporated one side to enable that element to be set exactly parallel to the other. In this case bearing blocks have been used although bearing assemblies and cap wipers could just as easily have been incorporated depending on the load requirements.



Versatility of the Construction Beam

There are dozens of different combinations to choose from when using the Heavy Duty system components in conjunction with the Hepco construction beam. To demonstrate the versatility and flexibility of the system some of the more popular configurations are shown below.

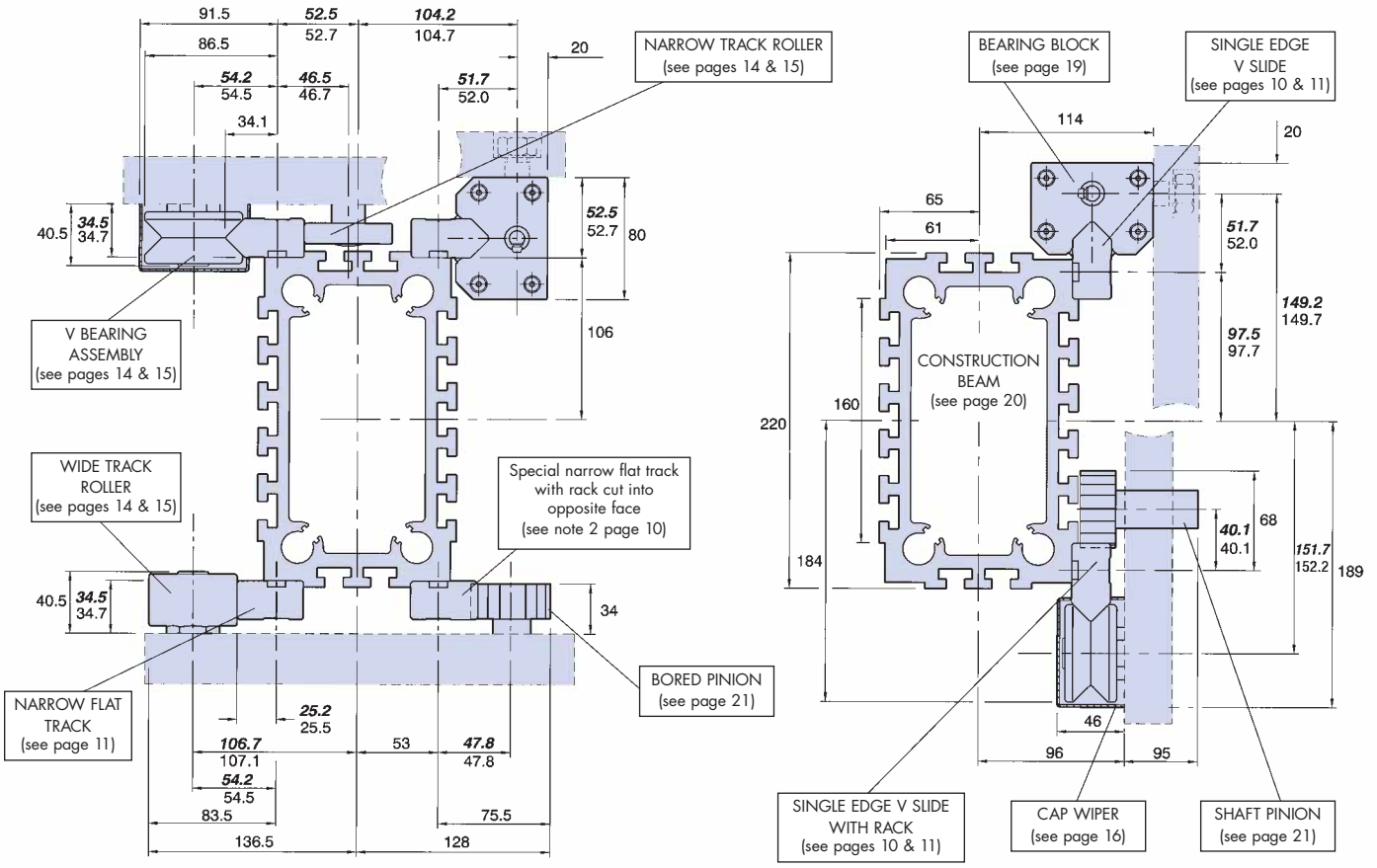
Assembled System

Hepco Heavy Duty single edge V slides and narrow flat tracks, both plain and with rack may be mounted at the corners of the Hepco construction beam without the necessity to incorporate back plates, thus enabling a compact system to be achieved. They may also be mounted directly to suitably machined profile within the customer's own machine.

The corner faces of the beam can be drilled and tapped individually according to customer's mounting instructions with slides and tracks required to be factory assembled (please see ordering details below).

This and the following two pages show important reference dimensions between assembled components as well as the maximum overall sizes of the assemblies. Other dimensions will be found on the pages relating to the specific components.

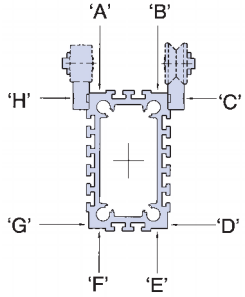
Important dimensions encompassing V slides or flat tracks are shown in *bold and italics* in respect of precision ground grade and in standard text below in respect of commercial grade. Where only one dimension appears, this may be regarded as equal to, or greater than the actual dimension and is intended to prevent a clash with other components due to build up of tolerances. Where dimensions are not shown, these may be taken from corresponding view.



Ordering Details

Simply list the components required and bracket those you wish to be factory assembled, specifying the mounting position(s) on the construction beam as relevant. 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.
N.B. A drawing will be sent confirming your requirements, prior to manufacture.

Example:

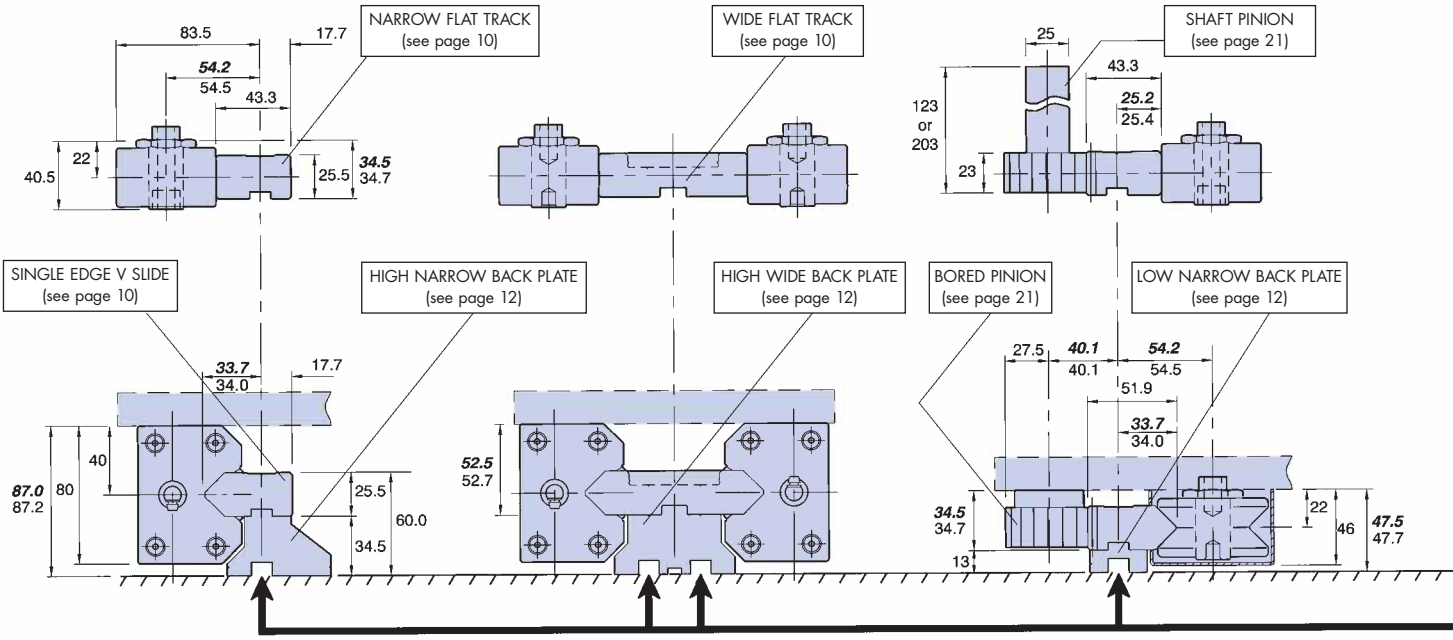


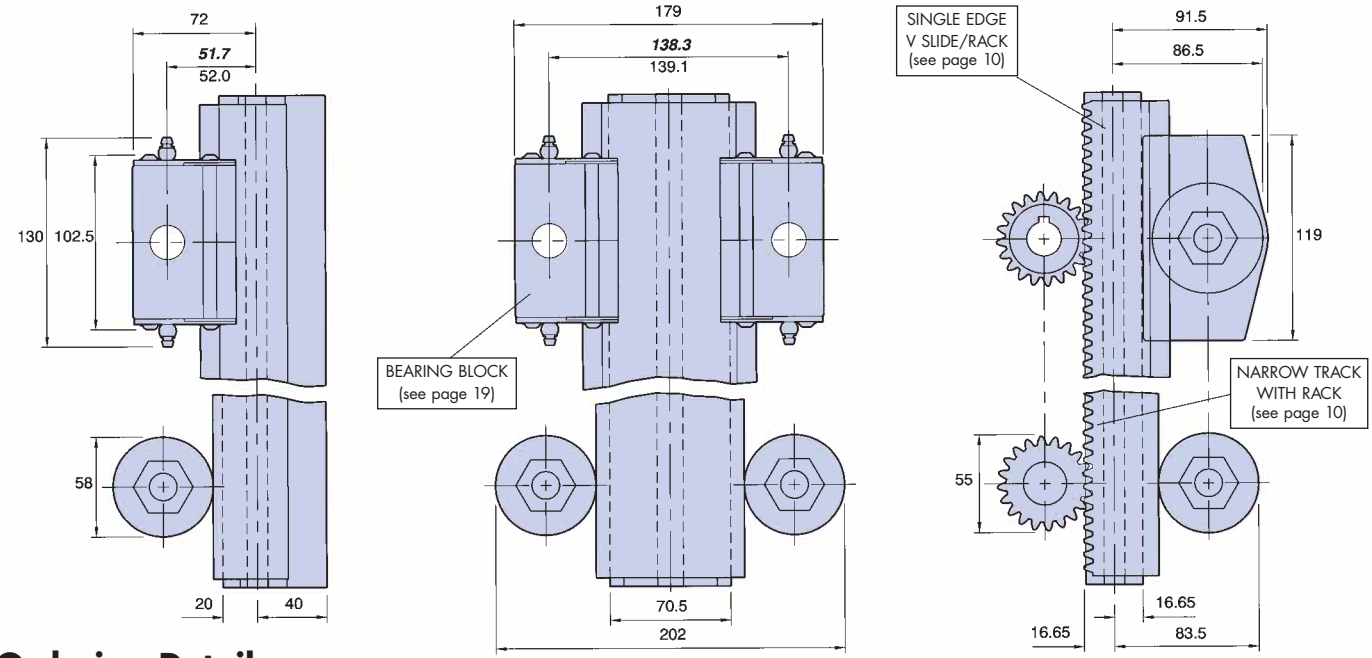
Narrow flat track (see page 11)	1 x C – HTS25 – L4046 Assembled position ' H'	Assembled
Single edge V slide (see page 10)	1 x C – HSS25 – L4046 Assembled position 'C'	
Construction beam (see page 20)	1 x HB25 – L4051	

Assembled System

The highly versatile Hepco Heavy Duty slide system components may either be incorporated directly within the customers own machine design or be mounted onto the Hepco construction beam for gantry robot and similar applications.

The keyways in the back plates provide for location in the T slots of the construction beam by means of Hepco T nuts (see page 21) enabling many configurations of slide, track or racktrack in conjunction with bearing blocks, V bearings or track rollers to be achieved.
Examples of the more popular configurations are shown in the applications section pages 4 to 6.

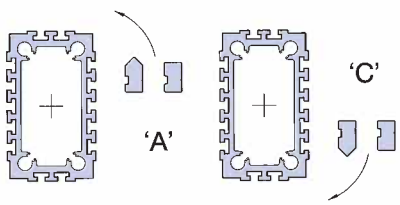




Ordering Details

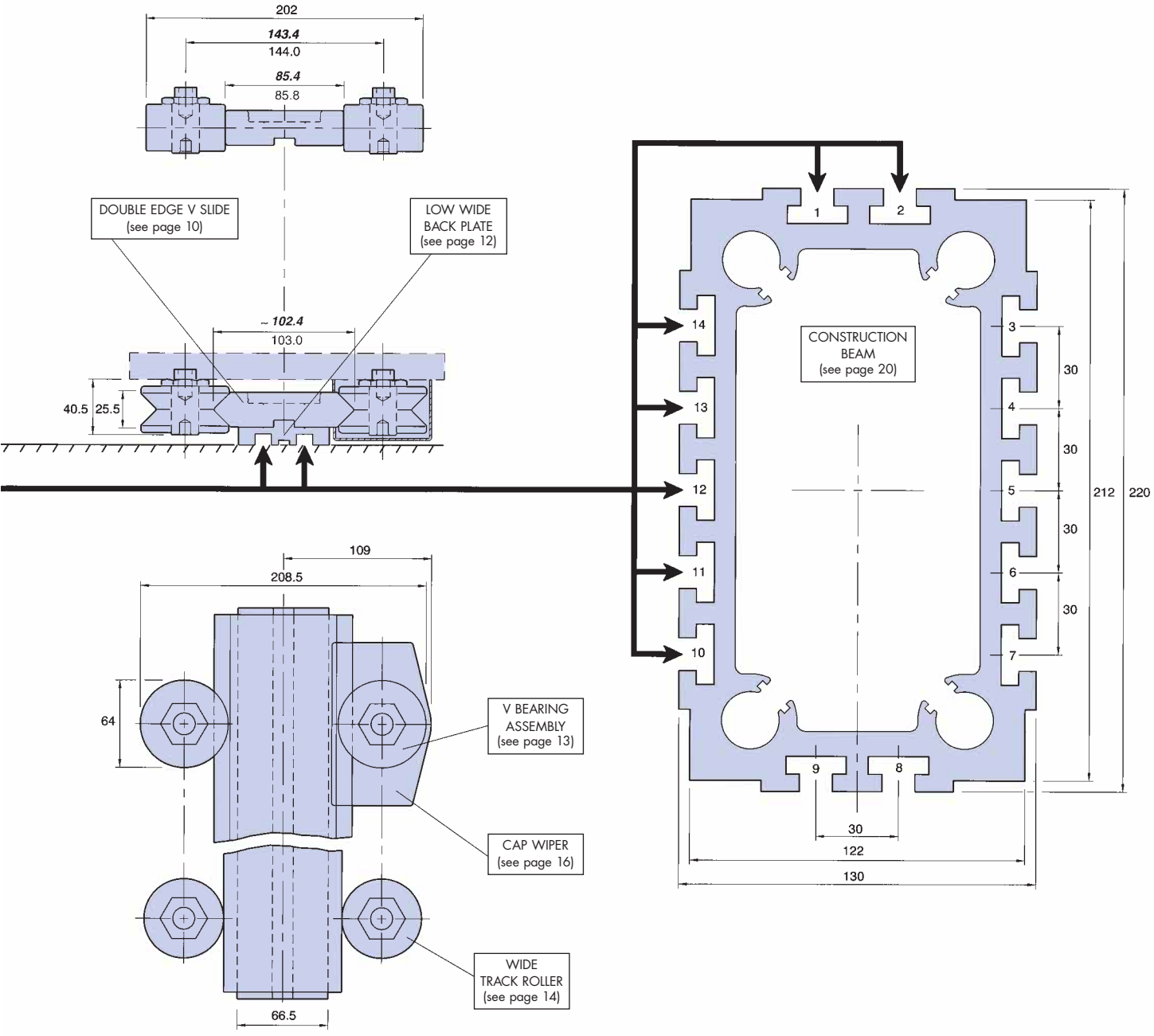
Any components capable of being factory assembled prior to delivery may be ordered as such. Simply list the components required and bracket those you wish to be factory assembled, specifying the mounting position(s) on the construction beam as relevant and whether the larger dimension from the key centre of the single edge slide or track is required to face clockwise in relation to the beam (designation 'C') or anti-clockwise (designation 'A'). In cases where slides or tracks are ordered shorter than the length of the beam, it will be assumed that the required position is equi-distant from both ends unless otherwise stated.

N.B. A drawing will be sent confirming your requirements, prior to manufacture.

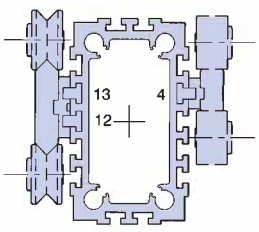


Assembled System

The Assembled System pages show important reference dimensions between assembled components as well as maximum overall dimensions of the assemblies. Other dimensions will be found on pages relating to the specific components. **Important dimensions encompassing V slides or flat tracks are shown in *bold and italics* in respect of precision ground grade and in standard text below in respect of commercial grade.** Where only one dimension appears, this may be regarded as equal to, or greater than the actual dimension and is intended to prevent a clash with other components due to build up of tolerances. Where dimensions are not shown, these may be taken from corresponding view.



Example:



1 x C–HSD25–L3506
1 x HLW25–L3506
20 x HTN25–L
20 x HTN25
} Assembled position 12/13

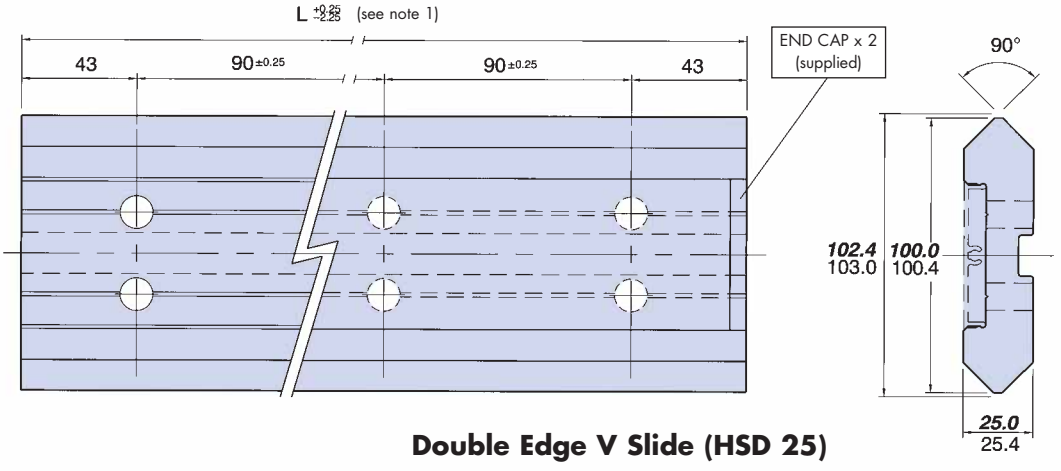
1 x C–HTS25–L3506
1 x HLN25–L3506
20 x HTN25–L
} Assembled position 4 'A'

} Assembled to 1 x HB25–L3511

Double edge V slide see page 10
Low wide back plate see page 12
Location T nut see page 21
Flush T nut see page 21
Construction beam see page 20
Narrow flat track see page 10
Low narrow back plate see page 12
Location T nut see page 21

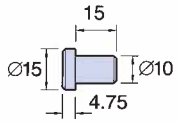
V Slides & Flat Tracks

Hepco Heavy Duty V slides and flat tracks are made from bearing quality high carbon steel and are selectively hardened on the wearing surfaces. The other areas are left soft to allow additional machining. Slide fixing holes are accurately positioned, enabling customers to predrill their mounting holes. All profiles are available in precision ground and commercial versions to permit the best price/performance combination to be selected for any application. The commercial version is etched on the wearing surfaces to aid lubricant retention providing sufficient accuracy for many uses and the precision version is ground on the V flanks and flat mounting face providing greater accuracy with smoother operation (see note 6).
Slides and flat tracks are available in standard lengths up to 4046mm. Non standard lengths and butt jointed profiles of unlimited length, including rack cut versions, are available on request.



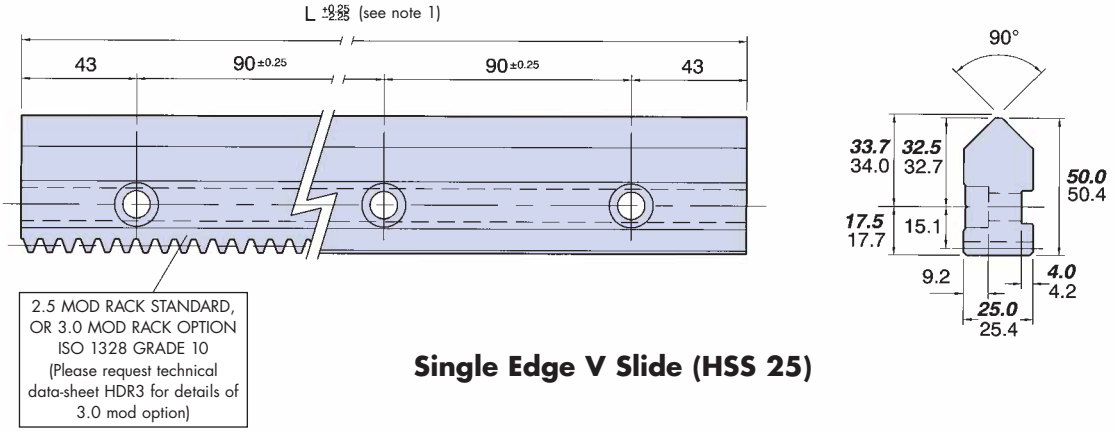
Double Edge V Slide (HSD 25)

RECESS, KEYWAY & HOLE DETAILS AS PER FLAT TRACK HTD25 OPPOSITE



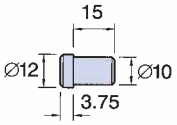
(see note 5)

Dowel Pin (SDP15)



Single Edge V Slide (HSS 25)

HOLE & KEYWAY DETAILS AS PER FLAT TRACK HTS25



(see note 5)

Dowel Pin (SDP12)

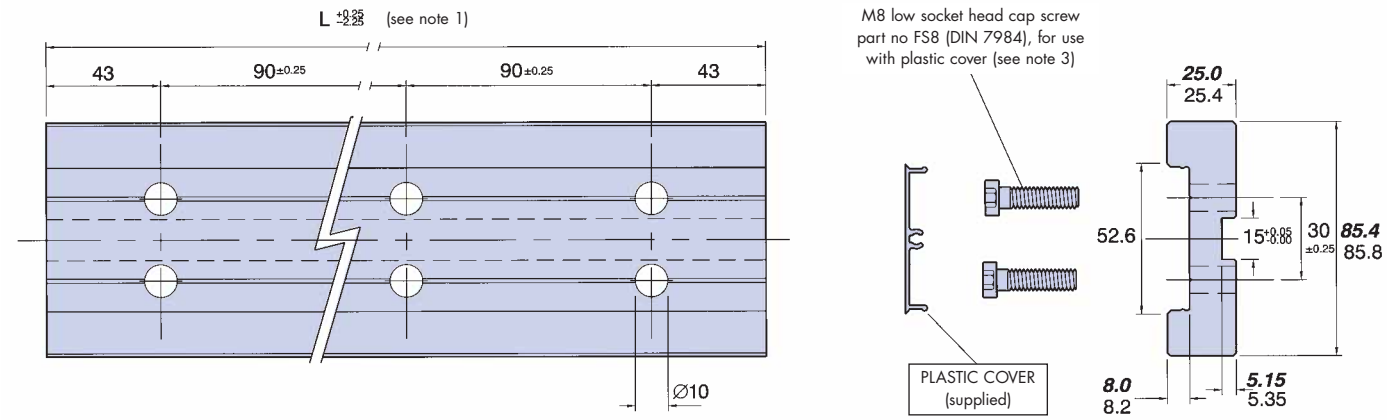
Notes:

1. Overall lengths ('L' dimension) are available from 266mm in 180mm increments up to a maximum of **4046mm**. The position of the mating ends of butt jointed slides and tracks for fitting to Hepco back plates (available up to 6026mm long) will be regulated to correspond with the 90mm back plate hole centres, except for rack cut versions where the back plate will be drilled to suit.
2. Tooth pitch positions relative to the hole pitch positions will vary between components, due to the economics of manufacture. 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 or to a higher accuracy classification are available on request. A rack cut version of the narrow flat track (HTS 25) with teeth machined into the opposite face to that shown in illustration, is also available on request.
3. M8 Low head cap screws are available from Hepco in the following lengths: 30mm (part no FS8-30) for use without Hepco back plate, 40mm (part no FS8-40) for use with back plate part no HLW25 (see pages 12 & 13) and 60mm (part no FS8-60) for use with back plate part no HHW25 (see pages 12 & 13). HSS and HTS slides and tracks can use widely available standard M8 capscrews ISO 4762.
4. Approximate weights of the profiles in kg/metre are as follows: HSD 25 = 13.5kg/m, HTD 25 = 12.5kg/m, HSS 25 = 8kg/m, HTS 25 = 7.7kg/m.
5. Holes for Hepco dowel pins should be reamed tolerance K6 ($^{+0.0002}_{-0.0007}$). Dowel pin head Ø tolerance for engagement with keyway is m6 ($^{+0.0018}_{-0.0007}$).
6. Commercial V slides and flat tracks are manufactured to $^{+0.3}_{-0.0}$ tolerance on width and $^{+0.1}_{-0.0}$ tolerance on thickness. precision ground versions are manufactured to ± 0.025 on both width and thickness. Finish is generally to N5.

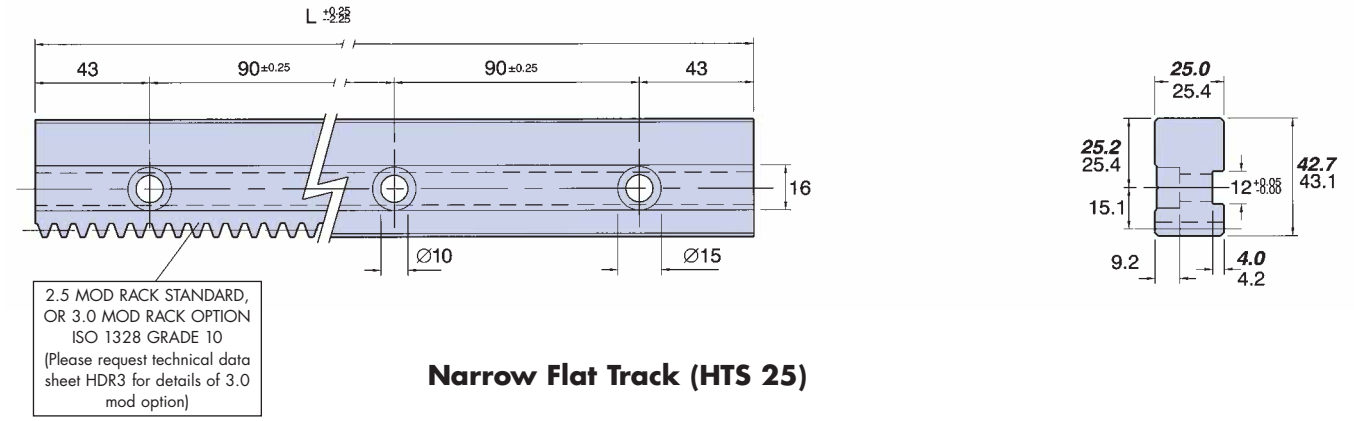
Additional options available see page 37

V Slides & Flat Tracks

Both the double edge V slide and wide flat track come supplied with neat flush fitting plastic covers and end caps to prevent entrapment of debris. All profiles may be secured utilising alternate holes in applications with less demanding load carrying requirements (please see load/life section page 25); plastic plugs (part no. P15) are available for blocking the unused holes. The single edged V slides and narrow flat tracks may be specified with an optional rack to allow for drive to the system. A keyway facility is provided on all slides and tracks to allow them to be set straight to a key register. Hepco dowel pins are also available which allow a suitable register to be easily provided. When used in conjunction with Hepco back plates, the single edge V slides and narrow flat tracks can easily be adjusted to achieve parallelism within a system (see page 13). For weights of profiles, please see note 4. **Dimensions in *italics* apply to the precision ground version**.

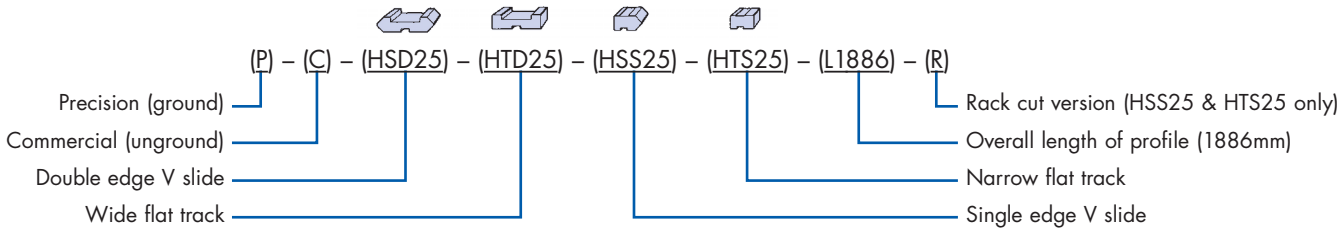


Wide Flat Track (HTD 25)

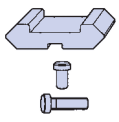


Narrow Flat Track (HTS 25)

Ordering Details



Example:

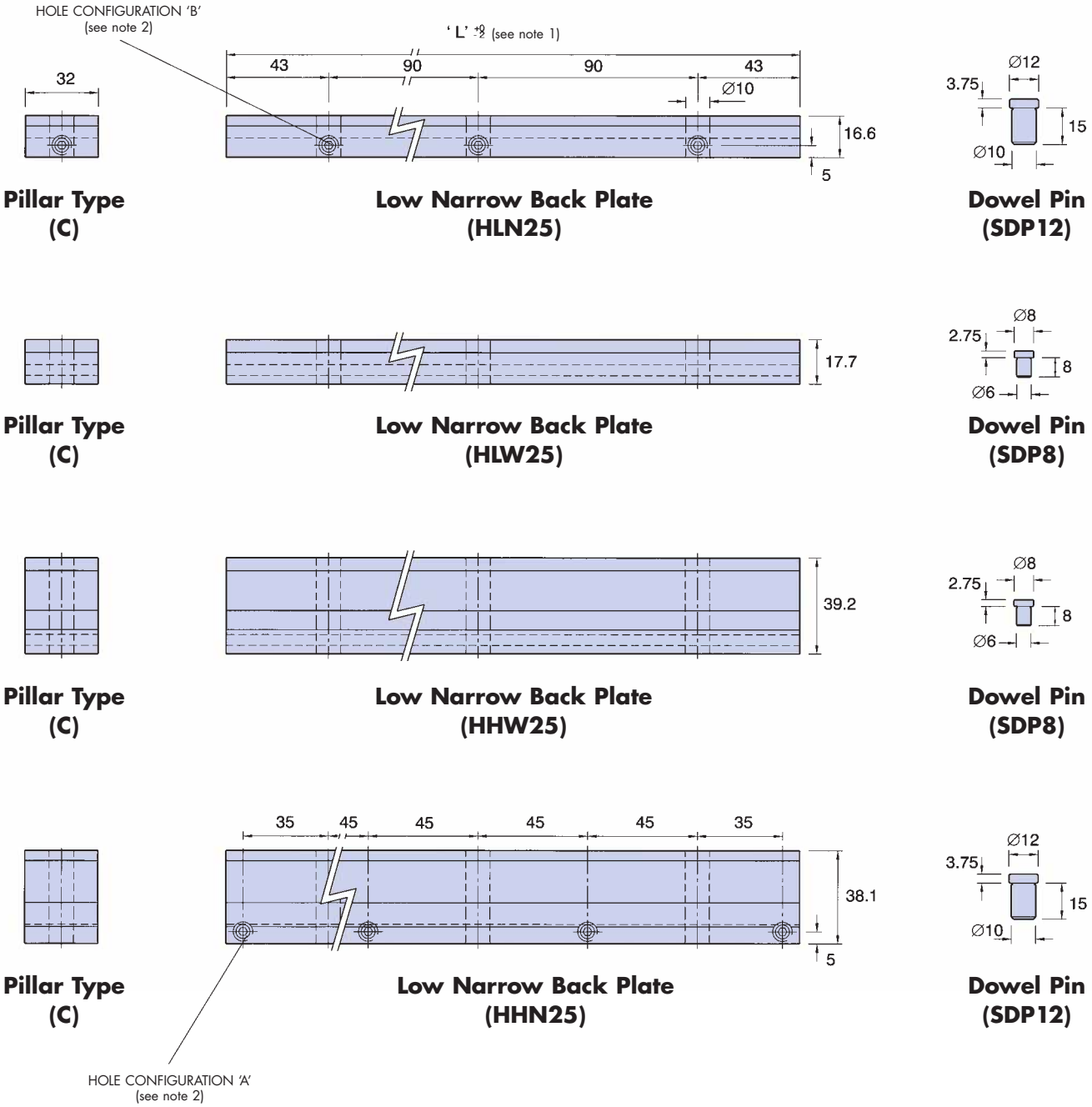


1 x P–HSD25–L1886 —— Precision ground double edge V slide x 1886mm long
22 x SDP15 —— 15mmØ head dowel pin
42 x FS8–30 —— Fixing screws (see note 3)

Additional options available see page 37

Back Plates

Hepco Heavy Duty back plates are designed to space the V slides and flat tracks off the mounting surface, providing clearance to accommodate the V bearings, track rollers or bearing blocks. They may be used either within the customer's own machine design or in conjunction with the Hepco construction beam. The male key section is designed to locate into the keyway of the slides 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 (see note 3). The low narrow type back plate (HLN25) and high narrow back plate (HHN25) 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.



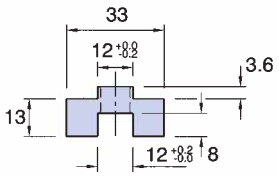
Notes:

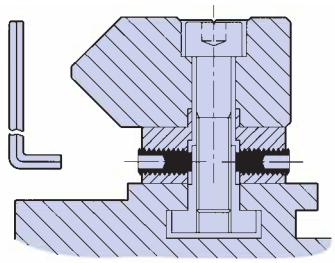
1. Overall lengths ('L' dimension) are available in 180mm increments up to a maximum of **6026mm**. Non-standard lengths are available on request.
2. HLN25 and HHN25 back plates will be supplied with tapped holes and M8 dog point socket set screws to ISO 4028 for customers requiring the jacking screw alignment facility. Hole configuration 'B' denotes jacking screw positions corresponding with the fixing hole positions, necessary when used in conjunction with the Hepco construction beam (see fig 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 SDPA14, as shown in fig 2. Pillars are also available with hole configuration 'B'. Pillars with offset jacking screw holes and fixing hole can be supplied to special order for customers requiring the general alignment facility.
3. Holes for Hepco dowel pins should be reamed tolerance K6 ($^{+0.002}_{-0.007}$) for SDP12 and SDPA14, ($^{+0.002}_{-0.006}$) for SDP8.
4. Approximate weights of the individual components are as follows: HLN25 = 1 kg/m, HHW25 = 5.3kg/m, HLW25 = 2.25kg/m, HHN25 = 3.8kg/m.

Back Plates

All back plates may be ordered as 'Pillars' to provide a convenient number of individual supports thus saving weight and providing space for other requirements. Mounting surfaces and location faces are manufactured to precision extrusion tolerances and are adequate for most applications. Machined mounting surfaces and location faces can be provided on request.

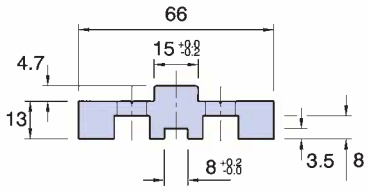
Hepco Heavy Duty back plates are manufactured from high strength aluminium and are supplied clear anodised. For weights of the individual components, please see note 4.

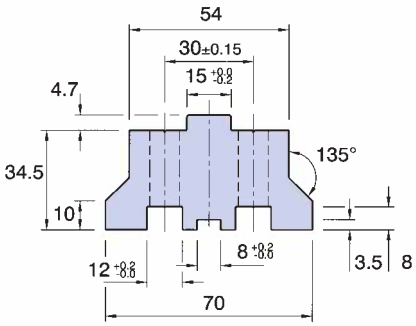


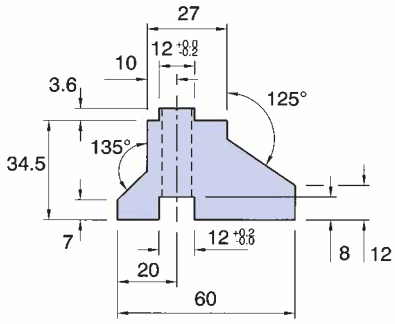


Alignment Principle for use with Hepco Beam. Hole Configuration 'B' (see note 2)

Fig. 1







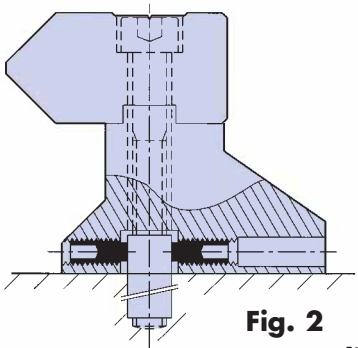
Alignment Procedure

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 (see note 3) or otherwise set adequately straight for the application and bolted down tight.

Where the Hepco construction beam is used, the non-adjustable element should be located by means of Hepco location T nuts type 'L' and the adjustable element by means of the alignment T nuts type 'A'. (For T nut details please see page 21).

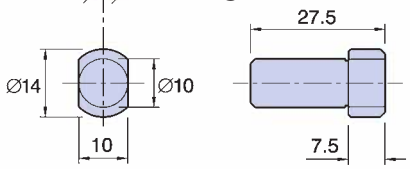
For applications not requiring the beam, the adjustable element should be located onto a reduced width key section or Hepco dowel pins type SDPA14 midway between hole centres. The holes in the mounting surface for fixing, should be spotted through and drilled from the back plate to ensure even clearance 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 element 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 clearance, it is possible to bend an element up to 1 mm pro-rata per metre.



General Alignment Principle. Hole Configuration 'A' (see note 2)

Fig. 2



Dowel Pin (SDPA14)

Ordering Details

(HLN25) – (HHW25) – (HLW25) – (HHN25) – (L1886) – (C) – (A) – (B)

- Low, narrow back plate
- High, wide back plate
- Low, wide back plate
- High, narrow back plate
- Overall length 1886mm
- Pillar type
- General alignment type (HLN25 and HHN25 only)
- Alignment type for beam (HLN25 and HHN25 only)

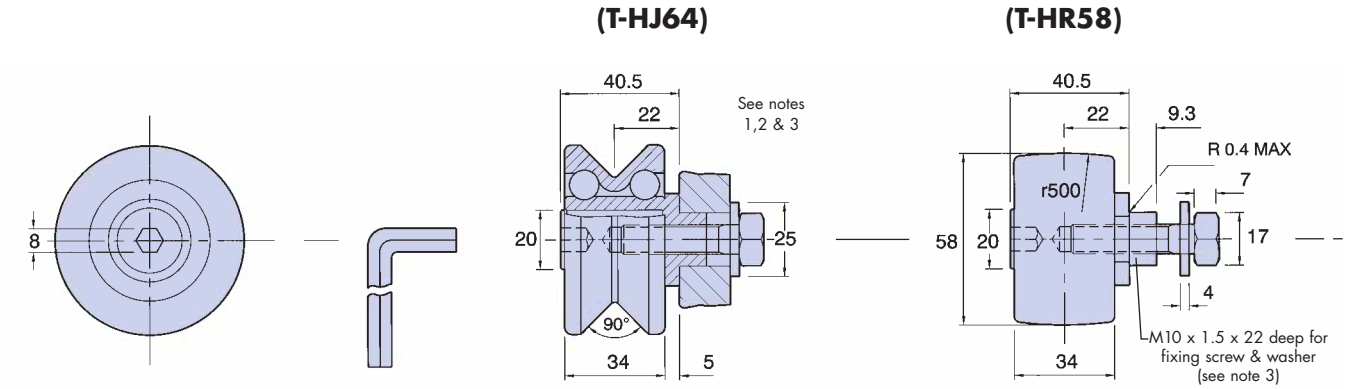
Example: 1 x HLN25 – L1886 – A — Low narrow back plate 1886mm long with general alignment facility.
21 x SDPA14 — Dowel pin for alignment.

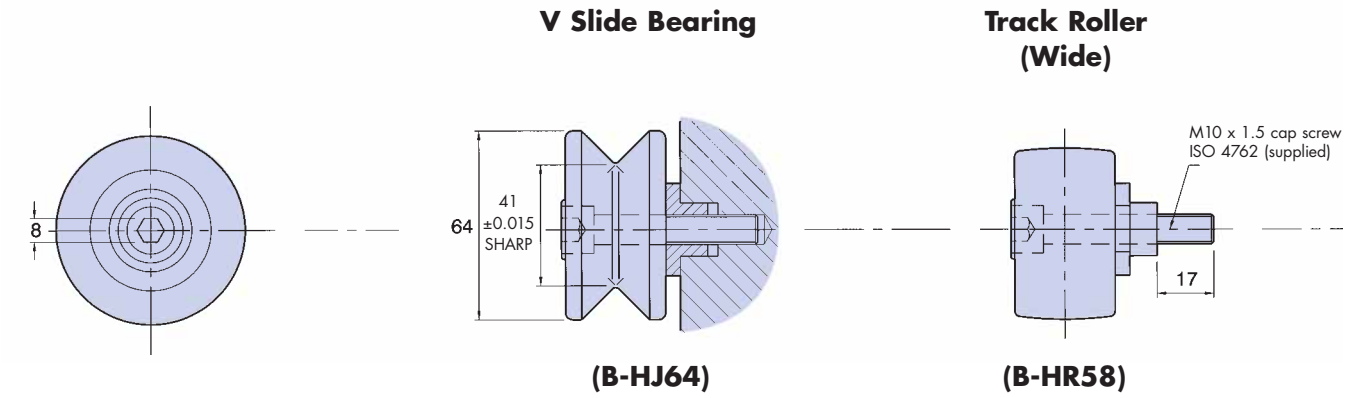
Bearing Assemblies

Three basic types of bearing are available. The V profiled version which runs on the V edged slides, the wide roller type which runs on the flat tracks or on the flat face of the single V edged slide and the narrow roller type which may be used as an alternative to the wide type where space is limited, typically where slides/flat tracks are mounted using the back face as a register (see illustration page 7).

Each of the bearing assemblies is available in a through hole fixing version for use where there is access to the back of the fixing plate, and in a blind hole fixing version for use where access is not possible. All bearing assemblies are available in both eccentric (adjustable) and concentric stud versions and may be used with either precision ground or commercial grade slides and tracks. All bearing assemblies, with the exception of the narrow roller type, incorporate strong construction double row precision ball bearings for high axial/radial duty. The narrow roller type is of similar construction but has a single row ball bearing of correspondingly lower load capacity. All bearings are greased for life and are supplied dust shielded as standard and neoprene sealed as an option.

Through Hole Fixing Type (T)





Blind Hole Fixing Type (B)

Notes:

1. It is recommended that the bearing assembly mounting holes should be drilled and reamed 16mm dia. tolerance F6 ($^{+0.027}_{-0.016}$) to a minimum depth of 10mm from the mounting face and countersunk 0.5mm x 45° to clear the corner radius of the mounting stud.
2. The minimum thickness mounting plate suitable for Hepco 'H' series bearing assemblies is 9.5mm. Thinner plates may be accommodated provided a suitable thickness spacer is used to bury the protruding stud.
3. Washer DIN 7349 is supplied. Fixing screw should be sufficiently long to accommodate customers mounting plate and is not supplied. Thread form of screw and minimum tensile strength (8.8 material condition), should conform generally to ISO 4014/ISO 4017.
4. Approximate weights of the bearing assemblies are as follows: HJ64 = 617g, HR58 = 602g, HRN58 = 302g.

Additional options available see page 38 - 39

Bearing Assemblies

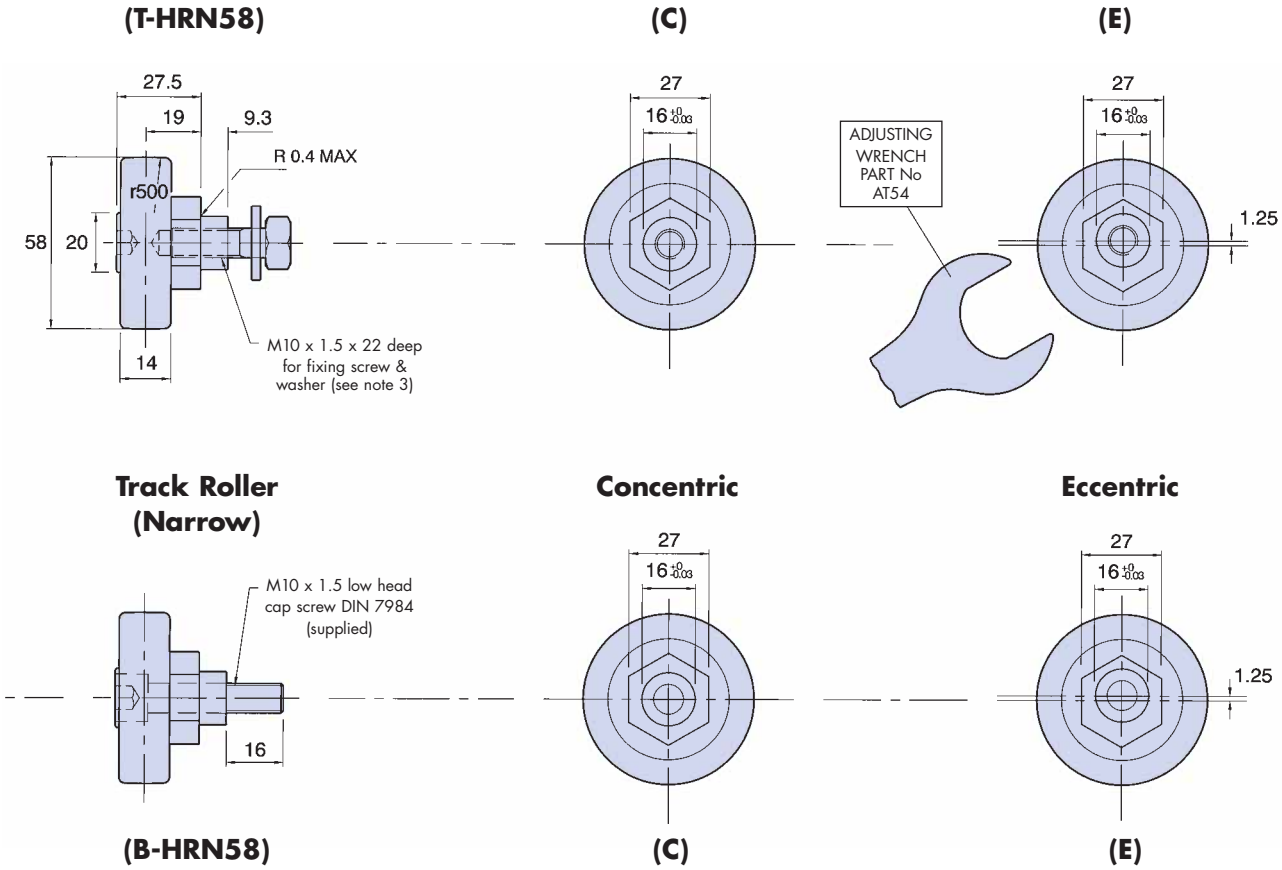
The fully hardened and ground bearings are made from carbon-chrome bearing steel and the centre studs from 700MPa (45 ton) condition tensile steel supplied chemically blacked. Fasteners supplied with the eccentric versions are bright zinc plated for ease of identification. For weights of the individual components please see note 4.

Installation and adjustment of the bearing assemblies may be carried out using the Hepco adjusting wrench (part no. AT54) via the hexagonal flange, or alternatively, a standard allen key may be used via the hexagonal socket of the through hole fixing version.

When using the Hepco V profile bearings it is highly beneficial to the system life (see page 22) if the bearing/slide contact area is lubricated. The Hepco cap wiper (see page 16) provides an effective means of ensuring long term lubrication.

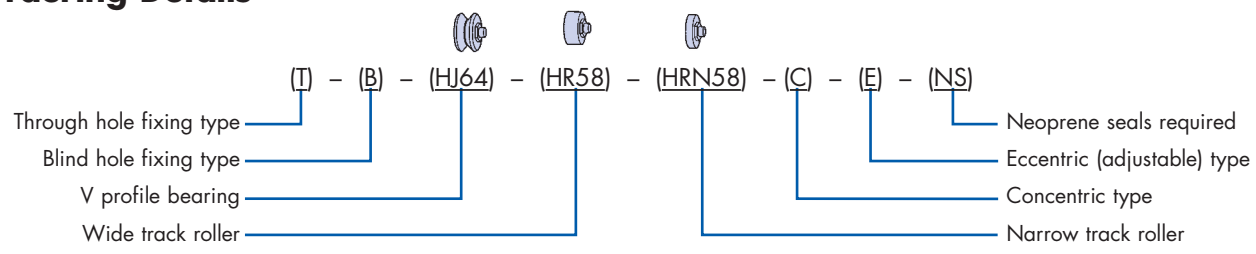
Where dimensions below are not shown, these may be taken from corresponding views of V slide bearing and/or track roller.

Through Hole Fixing Type (T)



Blind Hole Fixing Type (B)

Ordering Details



Example: 2 x B–HJ64–C ——— Blind hole fixing V slide bearing, concentric.

Additional options available see page 38 - 39

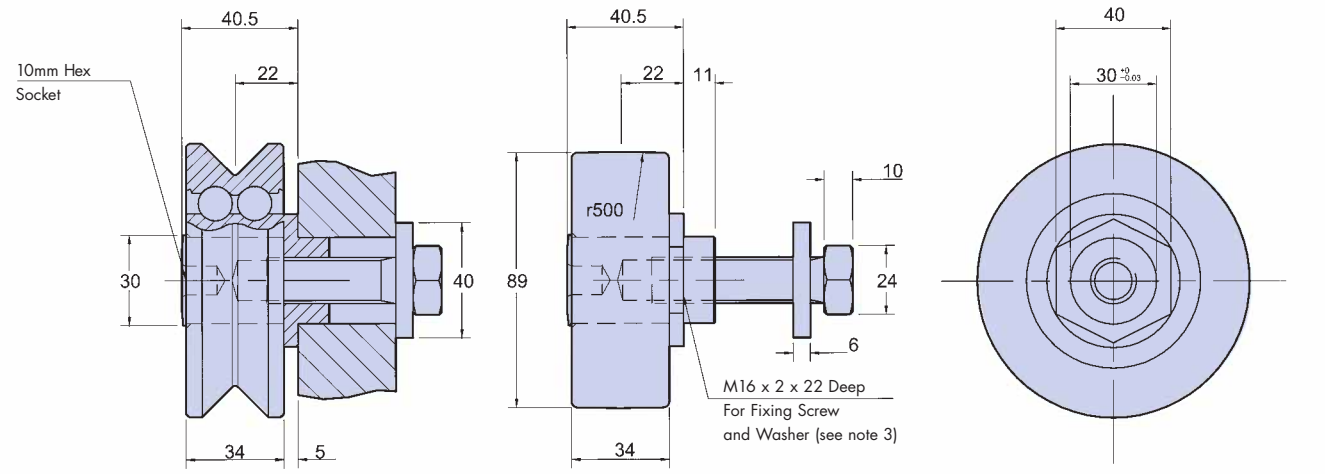
Bearing Assemblies

V Profile and Track Roller Assemblies for Loads up to 20kN

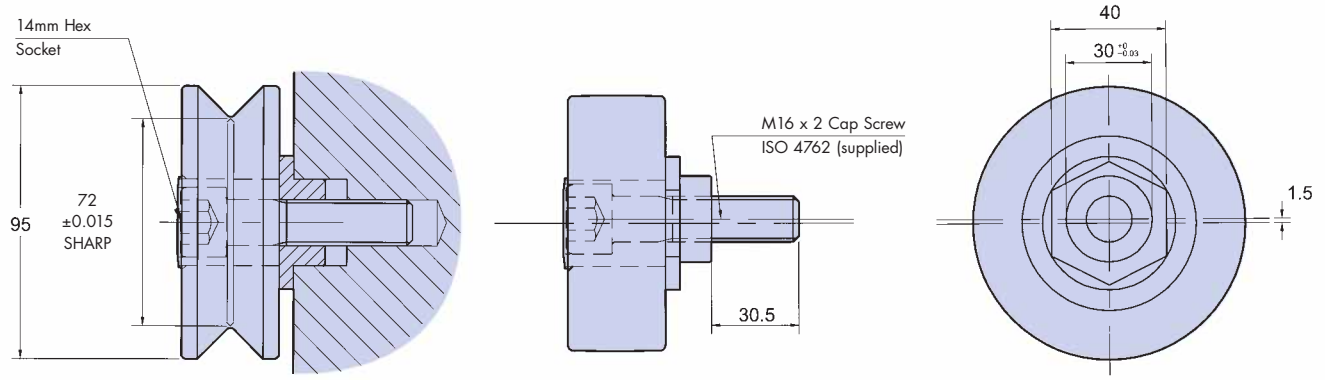
The high capacity HJ95 V slide bearing and HR89 track roller can be specified in both through hole and blind hole versions. Low maintenance CW95 cap wipers, which increase load carrying capacity and system life are available to suit (see opposite for details of load carrying capacity and cap wipers).

Through Hole Fixing Type (T)

(T-HJ95) **(T–HR89)**



V Slide Bearing **Wide Track Roller** **Concentric/Eccentric**



(B-HJ95) **(B–HR89)**

Blind Hole Fixing Type (B)

Notes:

1. It is recommended that the bearing assembly mounting holes should be drilled and reamed 30mm dia. tolerance F6 ($^{+0.029}_{+0.033}$)to a minimum depth of 12mm from the mounting face and countersunk 0.5mm x 45° to clear the radius of the mounting stud.
2. The minimum thickness mounting plate suitable for the HJ95/HR89 bearing assembles is 11.5mm.
3. Washer DIN 7349 is supplied. Fixing screw should be sufficiently long to accommodate customer's mounting plate and is not supplied. Thread form of screw and minimum tensile strength (8.8 material condition), should conform generally to ISO 4014/ISO 4017.
4. Approximate weights of the bearing assemblies are as follows: HJ95=1432g, HR89=1477g.
5. Referring to pages 7, 8 & 9, system height when using the HJ95/HR89 bearing assemblies will be the same as for the HJ64/HR58, however mounting hole centres and overall system width will increase due to the larger effective radius of the HJ95/HR89, which is 15.5mm greater than the HJ64/HR58.
6. Adjusting wrench for HJ95/HR89 available – part no. AT95.

Ordering Details

(T) – (B) – (HJ95) – (HR89) – (E) – (C) – (NS)

- Through hole
- Blind hole
- HJ95 – V profile bearing
- HR89 – Wide track roller
- Neoprene seals (standard)
- Concentric type
- Eccentric (adjustable) type

Example:  2 x T–HJ95–E–NS ——— Through hole fixing V slide bearing, eccentric.

Additional options available see page 38 - 39

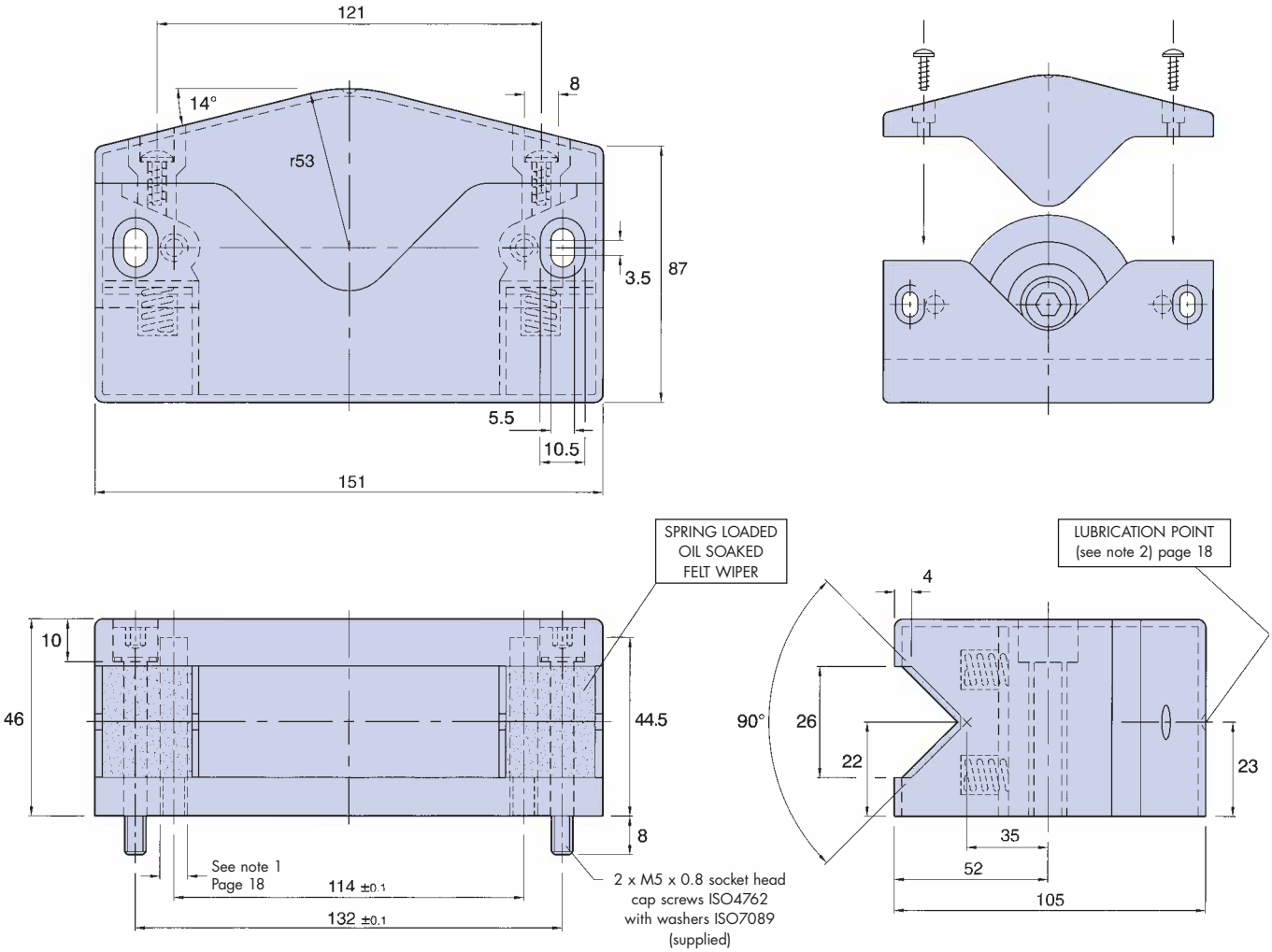
Load Capacity and Life Expectancy

Bearing Element Type	Maximum Load Capacities*	
	Axial Load L_A	Radial Load L_R
V Bearing Assemblies T–HJ95 C/E & B–HJ95 C/E	7kN	20kN
Track Roller Assemblies T–HR89 C/E & B–HR89 C/E	0kN	20kN

* When used with precision ground slides and tracks and properly lubricated

To calculate system life, use figures from the above table in the calculation for load factor L_F on page 22, then refer to the relevant nomogram on page 23.

Cap Wipers Part No. CW95 for use with V Bearing Assembly HJ95



See page 18 for details of cap wiper usage, fitting, lubrication and ordering details. Please note that the height of the CW95 is identical to the CW64, therefore system height can be taken from the details in the 'Assembled Systems' section of this catalogue. System width can be calculated by adding the difference in dimensions between the CW95 and CW64 to the relevant dimensions on pages 7, 8 and 9.

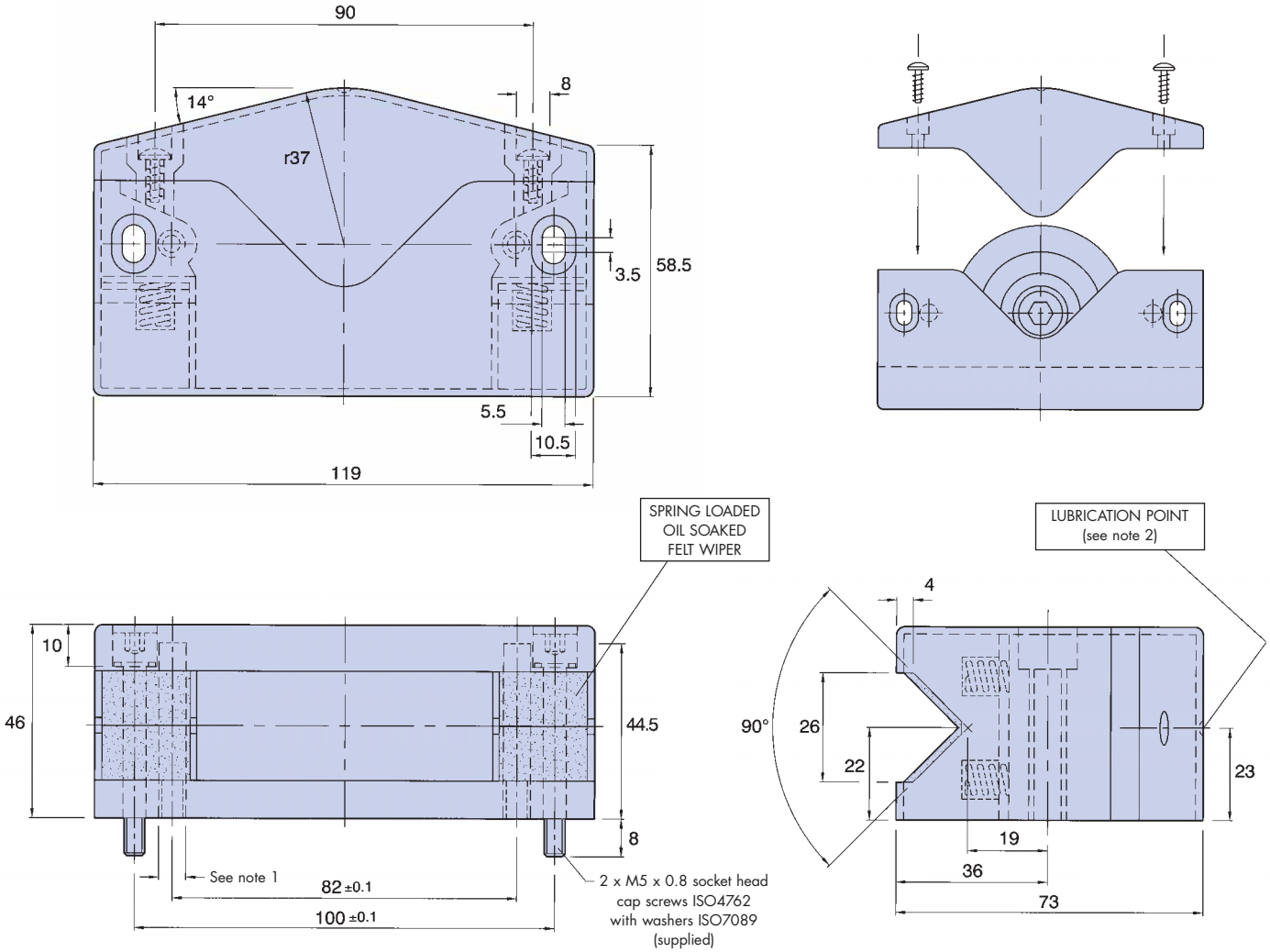
Cap Wipers

Cap wipers form an enclosure around a V bearing assembly when engaged with a V slide. They provide constant lubrication thereby greatly increasing the life of a system; they prevent ingress of debris and improve operational safety and appearance. Lubrication is carried out by means of oil impregnated felt wipers sprung loaded onto the slide. The internal cavity is filled with grease via the lubrication point provided thus ensuring lubrication at the slide/bearing contact face and recharging of the felt wipers as the grease partially liquifies under operation.

Cap wipers are manufactured in two parts from impact resistant glass filled acetal weighing a total of ~170 grams. The removable side permits access to both the hexagon flange and end socket of the bearing assembly (see pages 14 and 15) thus allowing easy adjustment of the system without disassembly.

Cap wipers may be attached either via the clearance slots using the fixing screws provided, or via the tapped holes in the underside.

The fixing hole position for the cap wiper relative to the V slide is the same as for the V bearing assemblies, details of which may be found on the assembled system pages 7 to 9.



Notes:

1. Inserts in the underside provide a M5 x 0.8 thread x 9 long. A deep cavity behind the inserts enables long screws to be accommodated. When utilising this alternative fixing method it is recommended that 7mmØ holes be drilled in the mounting plate to provide adjustment.
2. Replenish lubricant as necessary using a NLGI No.1 consistency grease. Male grease connector part No. CSCHF4034 or complete gun is available from Hepco if required. Lubrication interval depends upon length of stroke , duty and environmental factors but is typically 500km of linear travel.

Ordering Details

Simply specify the quantity and part numbers required.

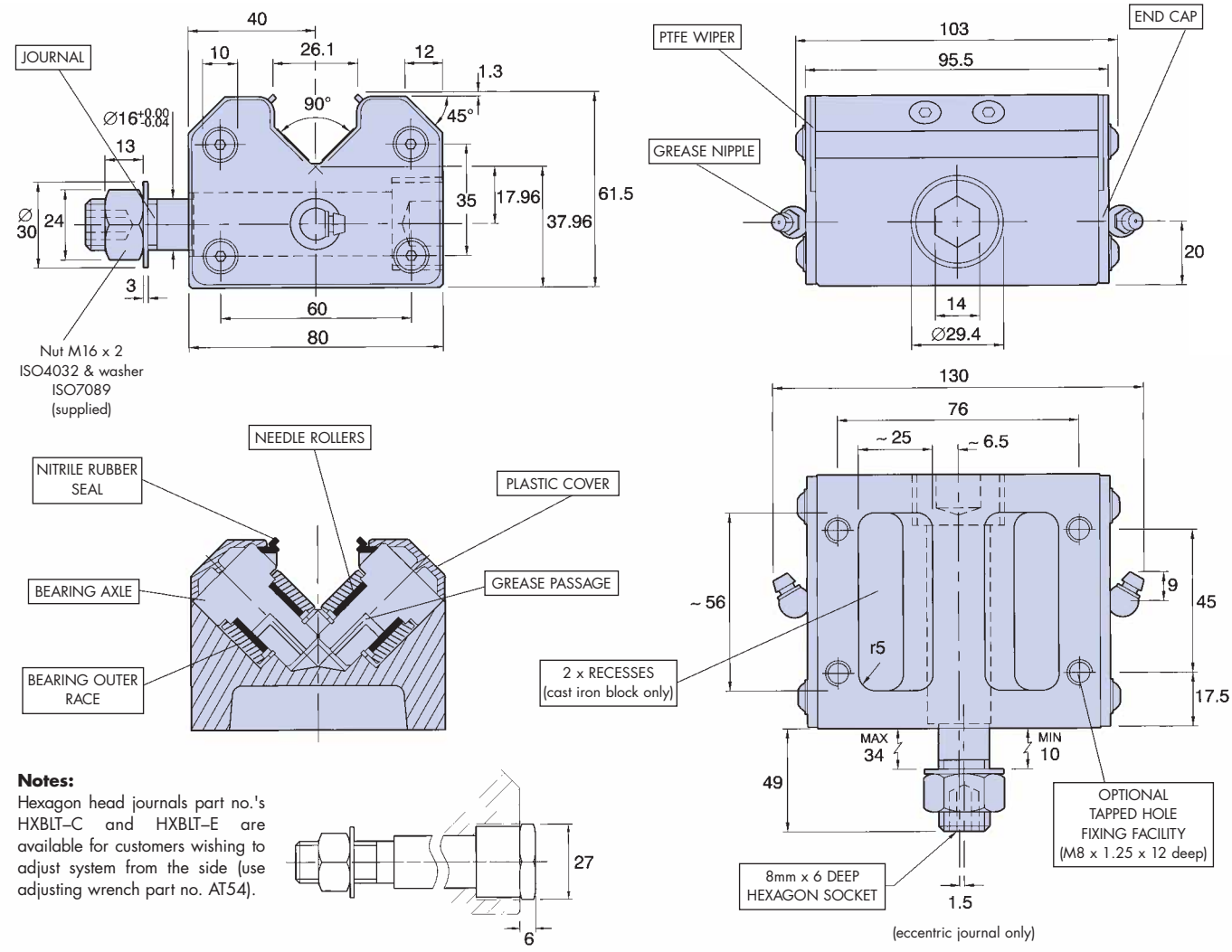
Example:

4 x CW64 ———— Cap wiper.
1 x CSCHF4034 ———— Male grease connector.

Bearing Blocks

Hepco Heavy Duty bearing blocks should be used in applications where very high loads (see page 22) or shock loading is anticipated or where high rigidity and sustained accuracy is required. The bearing blocks are composed of four high load capacity full complement needle roller races housed within a precision machined rigid casing. The roller races are precisely aligned within the housing in a V configuration to correspond with the V edges of the Hepco Heavy Duty slides (see page 10). A relubrication facility is provided to enable lubricant to be channelled directly to the needle races then onto the roller/slide contact faces. Side and adjustable end seals retain the lubricant and prevent ingress of debris without imposing undue friction. Bearing blocks may be secured either by the concentric and eccentric 700MPa (45 ton) condition high tensile steel journals, or by using the optional tapped hole fixing facility in the back face. Fixing holes for the journals should be drilled and reamed F6 ($^{+0.027}_{+0.016}$). Journals are supplied chemically blacked and fastenings on the eccentric version are supplied bright zinc plated for ease of identification. Blocks are available in either high quality modular cast iron supplied chemically blacked, or in lower load capacity high strength aluminium (black anodised). Stainless steel blocks are available on request. All versions are available to run on either the precision ground slides or the commercial (unground) slides where differing seal geometry is provided to accommodate the slight difference in slide widths. Weights are as follows: Cast iron bearing block = 3 kg, aluminium bearing block = 1.2 kg, journal = 0.4 kg. On installation, blocks should be charged with NLGI No 2 lithium soap based grease. Relubrication intervals will vary considerably between applications, but once per 200km would be typical.

IMPORTANT: Lubrication channels are not interconnected. Both ends must be charged with grease.



Notes:
Hexagon head journals part no.'s HXBLT–C and HXBLT–E are available for customers wishing to adjust system from the side (use adjusting wrench part no. AT54).

Ordering Details

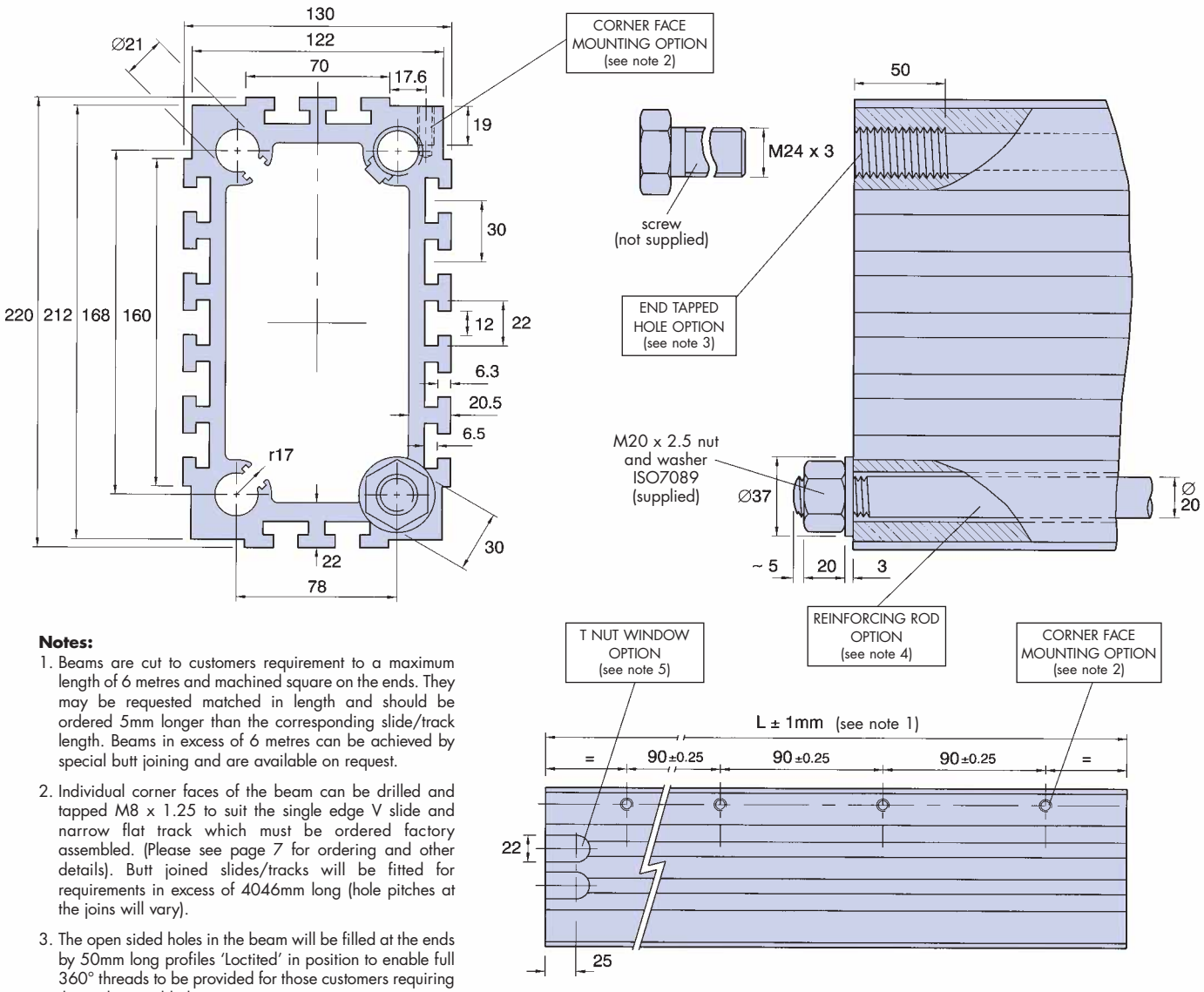
(P) – (C) – (HC25) – (S) – (A) – (C) – (E) – (H)

- To suit precision ground slide
- To suit commercial (unground) slide
- Part number
- Cast iron block
- Aluminium block
- With concentric type journal
- With adjustable (eccentric) type journal
- With tapped hole fixing facility (no journal supplied)

Example: 1. 2 x P–HC25– S–C —— 2 x Precision type bearing blocks in cast iron with concentric journals.
2. 2 x C–HC25–A–H —— 2 x Commercial type bearing blocks in aluminium with tapped hole fixing facility.

Construction Beam

The Hepco Heavy Duty construction beam is designed to accommodate all Hepco Heavy Duty V slides and flat tracks both with and without back plates as well as acting as a self supporting construction element. Very high stiffness has been achieved by concentrating the material at the periphery of the section with a further 40% stiffness available by using the optional steel reinforcing rods (see page 27). Uneven torquing of the reinforcing rods can be used to induce a deliberate bow in the beam if required. Fourteen T slots are provided for locating and attaching Hepco slides/tracks with back plates, by means of Hepco T nuts. In addition there are eight corner faces for attaching the slides and tracks direct (see assembled system pages 7 to 9). The beam is available with tapped holes both ends to facilitate attachment to cross members and other components. It is also available with fitted aluminium end covers (see note 6). The beam is manufactured from high strength aluminium alloy to precision extrusion tolerances and is supplied clear anodised in lengths up to 6 metres. Weights of components are as follows: Beam = 24 kg/metre, 1 x Reinforcing rod = 2.5 kg/metre.



Notes:

1. Beams are cut to customers requirement to a maximum length of 6 metres and machined square on the ends. They may be requested matched in length and should be ordered 5mm longer than the corresponding slide/track length. Beams in excess of 6 metres can be achieved by special butt joining and are available on request.
2. Individual corner faces of the beam can be drilled and tapped M8 x 1.25 to suit the single edge V slide and narrow flat track which must be ordered factory assembled. (Please see page 7 for ordering and other details). Butt joined slides/tracks will be fitted for requirements in excess of 4046mm long (hole pitches at the joins will vary).
3. The open sided holes in the beam will be filled at the ends by 50mm long profiles 'Loctited' in position to enable full 360° threads to be provided for those customers requiring the end tapped hole option.
4. Holes may be counterbored with reinforcing rods supplied underflush with the beam ends upon request. Longer reinforcing rods can be supplied for customers wishing to attach cross members.
5. Where access to beam ends will be blocked, customers may specify T nut windows. Please indicate T slot number(s) required as designated on page 9. Order suffix W1 specifies windows front end of beam as illustrated, W2 specifies windows back end of beam.
6. For customers ordering fitted end covers, 3mm thick anodised aluminium plates profiled for access to T slots and reinforcing rod nuts will be fixed to the end faces of the beam with socket buttonhead cap screws ISO1380.

Ordering Details

HB25 – L4051 – (R) – (T) – (X) – (W1) } T nut windows front end of beam specify positions/1-14 (see note 5)
(W2) } T nut windows back of beam

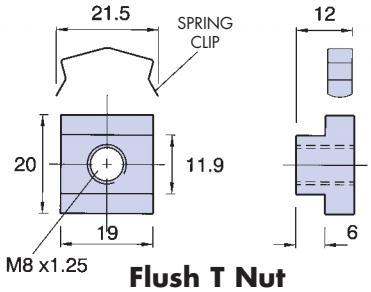
- (X) – Fitted end covers required
- (T) – End tapped hole option required
- (R) – Reinforcing rods required
- L4051 – Overall length 4051mm
- HB25 – Part number

Example: 1 x HB25–L4051–R–W1/13/14

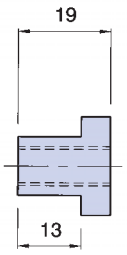
Additional options available see page 30 - 33 & 40

T Nuts

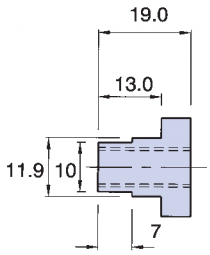
Hepco T nuts are manufactured in high grade steel supplied chemically blacked and are designed to fit the T slots of the Hepco construction beam. Three types are available, the flush type (HTN25) for attachment of customers own components, the location type (HTN25–L) which locates into the keyways of the Hepco back plates (see page 12), and the adjustment type (HTN25–A) required for the system alignment facility (see page 12). All T nuts are supplied with a retaining spring clip to prevent loss of position. Approximate weights of T nuts are as follows: HTN25 = 25g, HTN25–L = 38g, HTN25–A = 35g.



Flush T Nut (HTN25)



Location T Nut (HTN25–L)



Adjustment T Nut (HTN25–A)

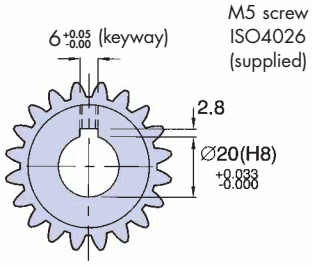
Ordering Details

Simply state the quantity and part number required.

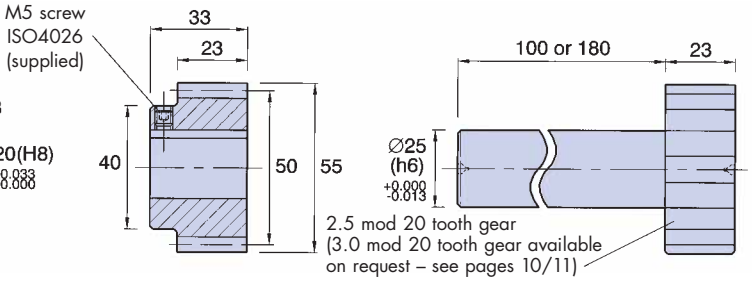
Example:
10 x HTN25–L

Pinions

Hepco pinions are made from high grade steel with hardened teeth for maximum wear resistance and are supplied natural finish. Two types of pinion are available, the bored type (HP25) for customers own shaft and the shaft type with integral shank (HP25-S) supplied in two lengths and which may be reworked to customers drawing either by customers themselves or by Hepco. Approximate weights of pinions are as follows: HP25 = 400g, HP25-S–L100 = 800g, HP25-S–L180 = 1100g.



Bored Pinion (HP25)



Shaft Pinion (HP25–S)

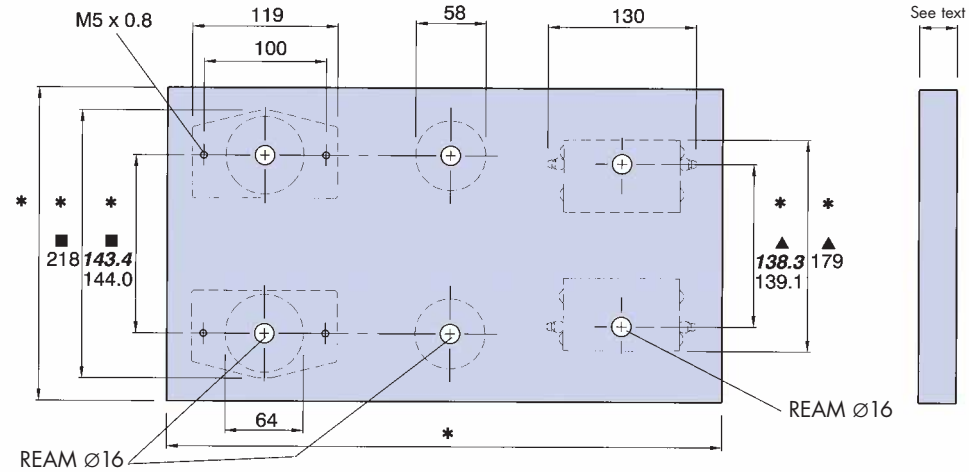
Ordering Details

Simply state the quantity and part number required and in the case of the shaft pinion include suffix (L100) or (L180) according to length required.

Example:
1 x HP25–S–L180

Carriage Plates

Due to the wide variety of requirements, carriage plates are manufactured to customers own drawing to specified shape and size. Carriage plates are machined all over and are available in either steel or aluminium in the following thicknesses: 11mm, 14mm, 17mm, 20mm. Dimensions, and components shown dotted, serve as a design aid.



Note:

Drilling centres to suit precision grade slides/tracks are shown in ***italics*** above those in standard text for commercial grade. For customers making their own carriage plates, please note that drilling centres are not critical and may be ±0.5 on dimensions shown, unless a specific datum reference to the centre of the slide is important.

Ordering Details

Please submit a drawing of your requirements.

✱ = To suit customer's requirements and for variable spacing of single edge V slides /narrow flat track

■ = To suit double edge V slide with V bearings or wide flat track with track rollers

▲ = To suit double edge V slide with bearing blocks

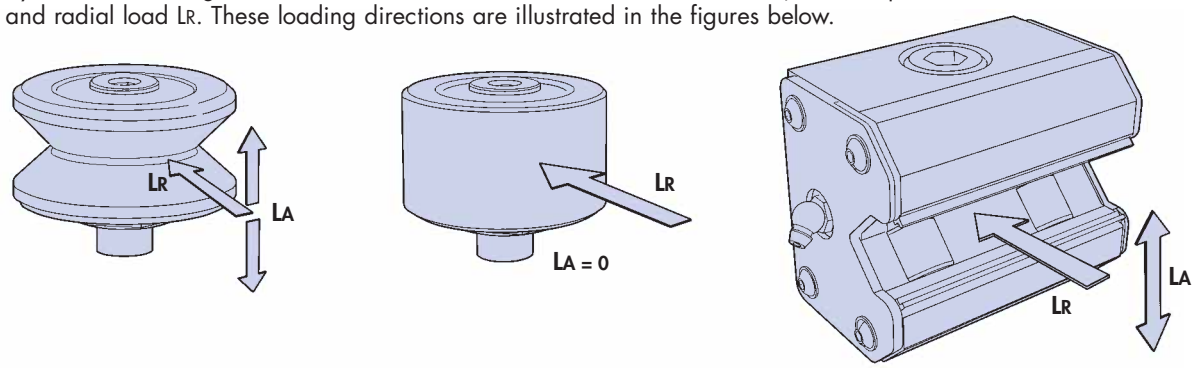
Additional options available see page 41 - 43

Load Capacity and Life Expectancy

The load capacity and life expectancy of Hepco Heavy Duty Systems will be determined by several factors. These include the number and arrangement of bearing blocks, bearing assemblies and track rollers, the type of slides used, the length of travel, speed of motion and the state of lubrication.

It is usual to run systems with less than the maximum load to prolong the life, which can be calculated using the data and formulae included within this section.

In all systems the loading can be resolved into a combination of axial load L_A (direction parallel to the axis of the mounting stud) and radial load L_R. These loading directions are illustrated in the figures below.



The maximum load capacities of the various bearing blocks, V bearing assemblies and track rollers are detailed in the table below.

Bearing Element Type	Maximum Load Capacities*	
	Axial Load L_A	Radial Load L_R
V Bearing Assemblies HJ64–C/E & B–HJ64–C/E	**2.5kN**	**8kN**
Track Roller Assemblies HR58–C/E & B–HR58–C/E	**0**	**10kN**
Narrow Track Roller Assemblies HRN58–C/E & B–HRN58–C/E	**0**	**5kN**
Bearing Blocks HC25–S–C/E (For HC25–A see below)	**10kN**	**20kN**

*When used with precision ground slides and tracks and properly lubricated.

How to Calculate the Expected Life of a System

The life of a system will be dictated by the component which fails first. In systems which are properly lubricated, the slides and flat tracks will normally last longer than the bearing blocks, V bearing assemblies and track rollers which run on them. These bearing elements will therefore be the life determining factor for the system.

The load on each bearing element can be calculated using conventional statics methods (see pages 24 and 25). Knowledge of these loads allows the **load factor** L_F for each bearing element to be calculated according to the equation below.

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

Once this load factor has been calculated, it is used to determine the life of the bearing element by reading the life from the appropriate nomogram (#1 for bearing blocks, #2 for all track rollers and well lubricated V bearing assemblies (see page 23), and #3 for V bearing assemblies where lubrication is poor).

The maximum allowable load factor for properly lubricated bearing elements running on precision slides and tracks is 1.

When bearing elements are run on commercial slides and tracks, the maximum load factor is less since the slightly lower surface hardness and coarser finish prevent the highest loads from being accepted satisfactorily.
The maximum load factor for track rollers and well lubricated V bearing assemblies running on commercial slides is 0.8.
The maximum load factor for bearing blocks running on commercial slides is 0.7.
The aluminium bearing block is less strong than the cast iron version. This limits the peak load which it can carry without affecting the life at lower loads. **The maximum load factor for aluminium bearing blocks is 0.7.**
To obtain good performance from Hepco Heavy Duty Systems, it is necessary that they are adequately lubricated. In systems using bearing blocks, the bearings should be regularly greased via the nipples provided, and a lubricant film be present on the V slide faces.
Flat track systems do not need such regular lubrication since the track rollers are internally lubricated for life, and the rolling contact with the track does not disperse oil quickly. An occasional oiling of the tracks is sufficient.

In systems using V bearing assemblies, the V faces of bearings and slides should have a visible film of oil or grease. This can be simply achieved by specifying the Hepco cap wiper (see page 18), or by using another lubrication system. It is possible to run V bearing assembly systems with little lubrication on the V faces, but this will be at the expense of both load capacity and life expectancy. The load factor for such systems is limited to 0.4 and life is calculated from nomogram #3 below.

In applications where the lubrication is not as good as is required for the 'fully lubricated' performance detailed in nomogram #2, but does give some protection for the wearing surfaces, the system life will be between that predicted by nomograms #2 and #3.

In applications where the length of stroke is less than 0.2m, there may be accelerated wear which can affect the life of the system. Such applications should be referred to Hepco's Technical Department.

It is to be expected that the rate of wear of commercial slides and tracks will be slightly greater than that of precision ground versions. This is due to the differences in surface finish and hardness. In most cases this will not affect the system life, but it may be significant in some duties requiring very high accuracy.

When a system uses more than 4 bearing elements to carry the load (e.g. application on bottom of page 5) it is often difficult to guarantee an even spread of load between all of the elements. Care should be taken when rating such systems. In typical cases one should reduce the load capacity of each additional bearing element by 33% to account for this.

Speed

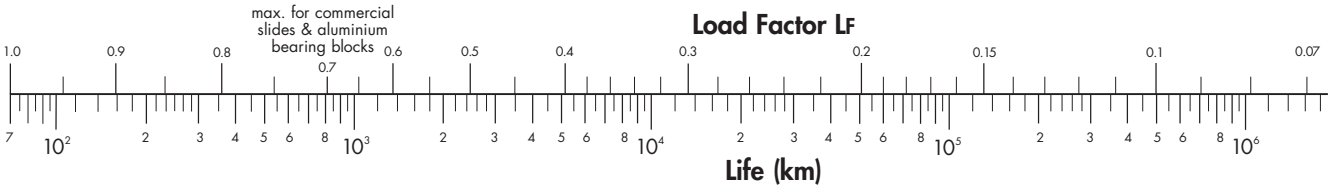
Systems using precision ground slides and V bearing assemblies can operate at very high speeds - over 10m/s in some instances. Where bearing blocks are used, 3m/s is achievable, but like all higher speed applications, the system may need to be derated or require special lubrication to ensure long life. Commercial slides and tracks with V bearing assemblies cannot tolerate speeds as high as precision versions, but over 5m/s can be achieved. For all applications exceeding 2m/s please contact Hepco's Technical Department for advice.

Friction

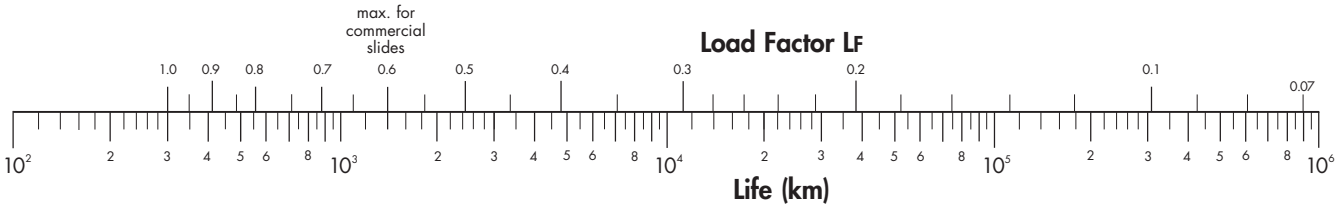
The coefficient of friction for systems incorporating precision ground slides is approximately 0.008. For systems using commercial grade slides the coefficient of friction is about 0.01. When calculating the friction in the system, care should be taken to allow for the preload by adding this to the applied load, prior to multiplying by the friction coefficient. Where bearing blocks or cap wipers are used, an allowance must also be made for the seal friction. Allow ~8N per bearing block and ~5N per cap wiper.

Note: It is possible to remove the seals from bearing blocks in cases where friction is critical and other arrangements can be made for lubricant retention and to exclude debris.

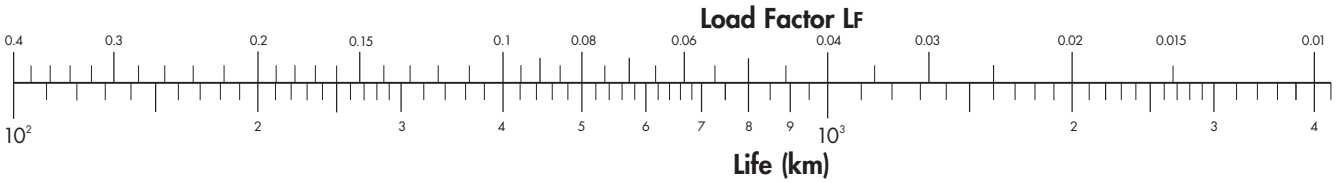
Nomogram #1 for Bearing Blocks



Nomogram #2 for Track Rollers and well lubricated V Bearing Assemblies



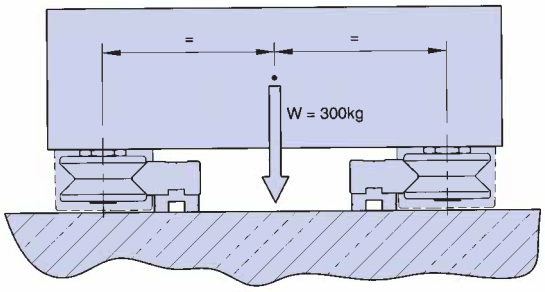
Nomogram #3 for unlubricated V Bearing Assemblies



Load/Life Calculation Examples

Example 1:

A system consists of a carriage weighing 300kg with 2 B-HJ64-C and 2 B-HJ64-E V bearing assemblies. Lubrication is assured with 4 CW64 cap wipers. The carriage runs on 2 P-HSS25 V slides. The stroke length for the system is 1.6m. The only loading for the slide system is the weight of the carriage whose centre of mass is in the centre of the four bearing assemblies. The system runs at 0.6m/s on a 25% duty cycle for 40 hours per week.



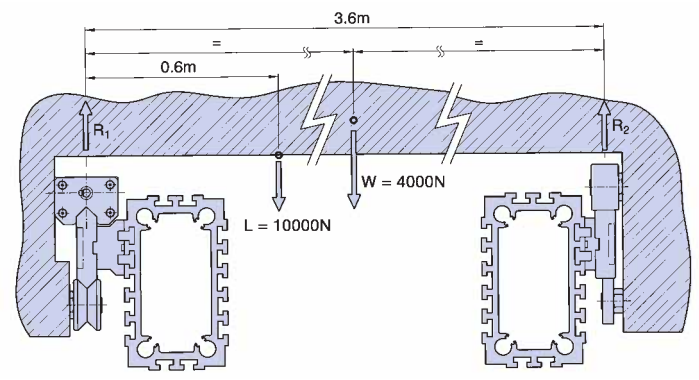
Since the 2943N weight (= mass x g = 300kg x 9.81m/s^2 =2943N) is central on the carriage, it is equally distributed between all four bearing assemblies. Each therefore experiences a load of 736N.

The load in this case is purely axial therefore L_A = 736, L_R = 0. From this we can calculate the load factor according to the equation shown on page 22:

$$\text{Load factor } L_F = \frac{L_A}{L_{A(max)}} + \frac{L_R}{L_{R(max)}} = \frac{736}{2500} + \frac{0}{8000} = \underline{0.294}$$

Using nomogram #2 (since the system is well lubricated) we see that the system life is about 11,500km. In this duty, the system travels 0.6m/s x 60 x 60 x 40 (seconds/week) x 0.25 (25% duty cycle) = 21600m or 21.6km per week. The anticipated system life is therefore 11,500km/21.6 = 530 weeks or about **10 years**.

Example 2:



A large gantry machine uses one C-HSD25 V slide and one C-HTD25 flat track on which runs a machine platform weighing 4000N, whose centre of mass is in the middle of the system (see figure on the left). An external load of 10000N is also carried, but this is only 0.6m from the centre line of the V slide. The load is carried by 2 C-HC25 bearing blocks on the V slide and 2 B-HRN58-C track rollers on the flat track. The slides are captivated on their undersides by 2 B-HJ64-E V bearing assemblies and 2 B-HRN58-C track rollers. The system travels at 1m/s on a 10% duty cycle for 24 hours per day 6 days per week. The loading on each of the bearing elements is calculated using basic statics methods:

[summing all forces]	$R_1 + R_2 = L + W = 4000 + 10000N$
[taking moments about V slide centre line]	$L \times 0.6m + W \times 1.8m = 10000N \times 0.6m + 4000N \times 1.8m = R_2 \times 3.6m$
[from above]	$R_2 + 3.6m = 13200Nm$:. $R_2 = 3666N$
[substituting into first equation above]	$R_1 + 3666N = 14000N$:. $R_1 = 10333N$

Both R_1 and R_2 are supported by two bearing elements, so the radial loads are: bearing blocks 5166N; and track rollers 1833N.

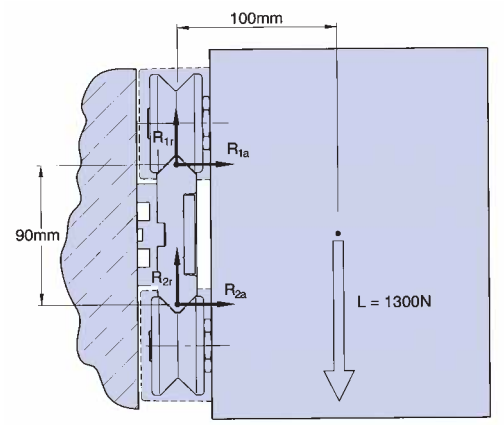
$$\text{Load factor } L_F \text{ for bearing blocks} = \frac{L_A}{L_{A(max)}} + \frac{L_R}{L_{R(max)}} = \frac{0}{10000} + \frac{5166}{20000} = \underline{0.253}$$

Using a similar calculation, the load factor LF for track rollers = <u>0.183</u>.

If we refer to the nomogram #2 for track rollers, we can see that the life corresponding to a load factor of 0.183 is about 48,000km. If we refer to the nomogram #1 for bearing blocks, we see that the life corresponding to a load factor of 0.253 is about 23,000km.
The bearing blocks are therefore the life determining element for this system. In this application the system travels 1m/s x 60 x 60 x 24 x 6 (seconds/week) x 0.1 (10% duty cycle) = 51840m = 52km/week. 23,000km life equates to 442 weeks or about **8.5 years' life**.

Example 3:

A machine has a heavy casting weighing 1300N supported on a P-HSD25 slide with 2 B-HJ64-C and 2 B-HJ64-E V bearing assemblies lubricated with Hepco CW64 cap wipers. The centre of mass of the casting and carriage assembly is 100mm for the centre line of the slide V. The system moves at 0.2m/s on a 50% duty cycle for 40 hours per week. In this duty the bearing assemblies are subject to a radial load due to the weight and an axial load due to the offset moment. To calculate the loads on the bearing assemblies, we assume the loads act at a point on the slide centre line adjacent to the middle of the contact patch of the V bearings. The loads can be resolved into radical and axial components, and the values of these components deduced using statics methods:



[summing all forces in radial (vertical) direction]	$R_{1r} + R_{2r} = L = 1300N$
[force on lower bearing cannot be upward]	$R_{2r} = 0 \therefore R_{1r} = \underline{1300N}$
[summing all forces in axial (horizontal) direction]	$R_{1a} + R_{2a} = 0 \therefore R_{1a} = -R_{2a}$
[taking moments about point R1]	$0.10m \times 1300N - R_{2a} \times 0.09m = 0$
[re-arranging equation above]	$R_{2a} = (0.10m \times 1300N) / 0.09m = \underline{1444N}$
	$R_{1a} = -\underline{1444N}$

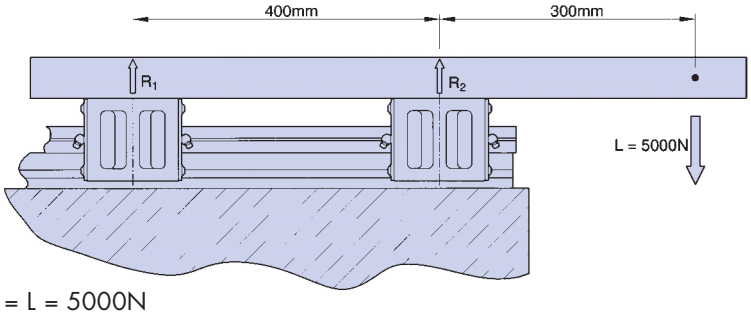
Both R_1 and R_2 are supported by two bearing assemblies, so the load on each bearing assembly is half of R_1 and R_2 respectively. It is apparent that the upper bearing assemblies are the most heavily loaded, so these will determinate the life of the system. The load factor for these is calculated below:

$$\text{Load Factor } L_F \text{ for bearing assemblies} = \frac{L_A}{L_{A(max)}} + \frac{L_R}{L_{R(max)}} = \frac{722}{2500} + \frac{650}{8000} = \underline{0.37}$$

Using nomogram #2 (since the system is well lubricated) we can see the expected life is about 6000km. In this duty the system travels 0.2m/s x 60 x 60 x 40 (seconds/week) x 0.5 (50% duty cycle) = 14400m or 14.4km per week. 6000km equates to 416 weeks or **8 years' life**.

Example 4:

A machine uses a P-HSD25 double edge V slide and 4 P-HC25 bearing blocks to support a 5000N load which is offset 500mm from the system centre as illustrated. The system moves at 0.4m/s for 40 hours per week on a 30% duty cycle. The loads on the bearing blocks are determined as follows:



[summing all forces]	$R_1 + R_2 = L = 5000N$
[taking moments about left block centre line]	$R_2 \times 0.4m - 5000N \times 0.7m = 0$
[re-arranging above]	$R_2 = (5000N \times 0.7m) / 0.4m = \underline{8750N}$
[substituting in first equation]	$R_1 + 8750N = 5000N \therefore R_1 = \underline{-3750N}$

Both R_1 and R_2 are supported by two bearing blocks, so each block experiences half the load. The most heavily loaded block therefore experiences a load of 8750/2 = 4375N.

$$\text{Load factor } L_F \text{ for bearing blocks} = \frac{L_A}{L_{A(max)}} + \frac{L_R}{L_{R(max)}} = \frac{4375}{10000} + \frac{0}{20000} = \underline{0.438}$$

If we refer to nomogram #1 for the bearing blocks we find that a load factor of 0.438 corresponds to a life of about 3800km. In this application the system travels 0.4m/s x 60 x 60 x 40 (seconds/week) x 0.3 (30% duty cycle) = 17280m or 17.3km per week. 3800km therefore equates to 220 weeks or **4.2 years' life**.

Load Capacity of Rack and Pinion Drive

To obtain the best performance from the rack and pinion drive, it is necessary that the pinion is set to engage accurately with the rack with a minimal clearance (but not interference). Care must be taken to provide adequate lubrication. The selection of the grade of oil or grease to be used will depend largely on the speed, orientation and environment of the application. The grade chosen and relubrication interval should be such that the lubricant persists in the gear mesh at all times. Straight mineral oils and compatible greases are suitable.

The maximum continuous linear force which can be exerted on the rack is **2000N**. This is equivalent to a torque on the pinion of **50Nm**.

It is possible to increase the force which can be applied by specifying a larger diameter pinion or hardened teeth on the rack, both of which are available on request. Consult Hepco's Technical Department for details.

Fixing of Slides and Bearing Elements

Hepco Heavy Duty slides and tracks are designed to accept the very high loads which can be applied in heavy bearing block applications. In these cases it is important that the screw attachment should be secure. Suitable M8 screws (property class 8.8) should engage in at least 8mm length of thread in the Hepco T nuts (high tensile steel), 12mm of thread in mild steel or 15mm of thread in high strength aluminium alloy. The screws should be torqued down to 25Nm (18lbf ft). In duties which do not exceed 50% of the maximum for use with bearing blocks, the thread engagement requirements can be relaxed to 8mm in mild steel and 12mm in aluminium, with screws being torqued down to 20Nm (15lbf ft).

In light duties where the load on each bearing element does not exceed 2500N, it is possible to secure slides using alternate mounting holes, which saves on installation costs. Plugs are available to cover the unused mounting holes (see page 11).

When securing, through hole fixing V bearing assemblies and track rollers, M10 x 1.5 bolts in property class 8.8 should be used. The length should be chosen to allow at least 12mm of thread engagement in the bearing stud. In demanding applications, bolts should be torqued up to 45Nm (33lbf ft). Blind hole fixing bearing assemblies and track rollers are supplied with cap head screws which protrude by ~17mm (~16 for narrow track roller) beyond the end of the spigot. For maximum strength this screw should engage in 12mm of thread in mild steel. The screw should be torqued down to 45Nm (33lbf ft). If bearing assemblies are to be run at much below their maximum load, the amount of thread engagement and torque can be reduced. If the bearing assembly is to be run at close to its peak load capacity, and the material which it is to be mounted into is a high strength aluminium alloy, 20mm of thread engagement is desirable. This will require the substitution of a longer screw than is supplied as standard.

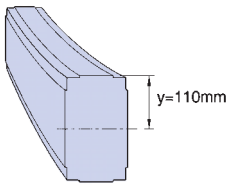
Bearing blocks are secured by M16 threaded journals. The recommended tightening torque for the nuts on these M16 threads is 120Nm (88lbf ft) where the system is loaded close to its maximum. In lower load duties this torque may be reduced.

Deflection of Construction Beams

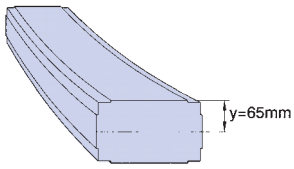
All structures deflect under load. When designing a system using the Hepco construction beam, the amount of deflection should be considered. The beam deflections can be calculated using simple beam theory which is comprehensively covered in many engineering text and reference books, however the calculations for common applications are included on page 27.

The deflection of a beam will depend upon the load applied, the length, the number and type of supports, the stiffness of the material (known as the Young's Modulus; E, which is $6.6 \times 10^4 N/mm^2$ for the aluminium of the Hepco beam) and the stiffness of the section (known as the second moment of area, I, which is $4.7 \times 10^7 mm^4$ for the section when bent vertically and $1.8 \times 10^7 mm^4$ when the section is bent horizontally – see right).

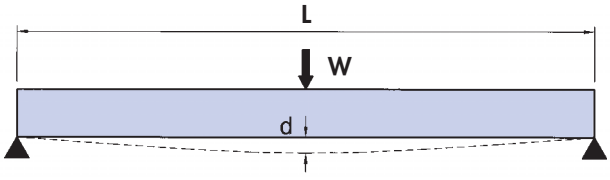
Note: In all calculations lengths are in mm and forces in N (newtons).



Vertical Bending



Horizontal Bending

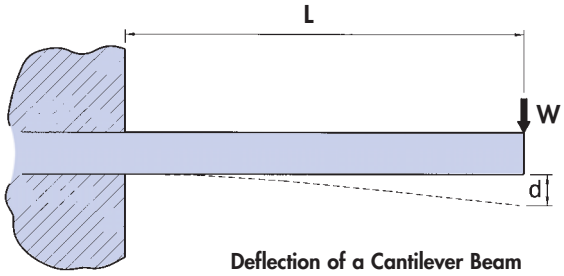


Deflection of a Simply Supported Beam

For a simply supported beam of length L, loaded by a force W at its centre, the deflection d is given by the equations below.

$d = \frac{WL^3}{48EI}$	$d = 6.7 \times 10^{-15} WL^3$	$d = 1.75 \times 10^{-14} WL^3$
general formula	for Hepco beam in vertical bending	for Hepco beam in horizontal bending

When beams are used as cantilevers (see right), it can be seen from the equations that the deflection in this mode is much greater than for a beam supported at both ends. Care should be taken when using the cantilever equation since it is not easy to engineer a true cantilever support, and beams with imperfect support will deflect more.



Deflection of a Cantilever Beam

$d = \frac{WL^3}{3EI}$	$d = 1.07 \times 10^{-13} WL^3$	$d = 2.8 \times 10^{-13} WL^3$
general formula	for Hepco beam in vertical bending	for Hepco beam in horizontal bending

The maximum load which can be put onto a beam is determined by the maximum allowable bending stress for the material. This is 90N/mm^2 for the Hepco construction beam. The peak bending stress σ for a given load on a **simply supported beam** is shown below (where y is the distance from the centre of the beam to its extreme edge in the direction of the applied load – see diagram on page 26):

peak stress $\sigma = \frac{WLy}{4 \times I}$	peak stress $\sigma = 5.85 \times 10^{-7}$ WL	peak stress $\sigma = 9.0 \times 10^{-7}$ WL
general formula	for Hepco beam in vertical bending	for Hepco beam in horizontal bending

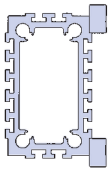
We can re-arrange the above to determine the load capacity of a **simply supported beam** at the maximum allowable bending stress.

beam strength $= \frac{\sigma_{max} \times 4 \times I}{Ly}$	beam strength $= 1.54 \times 10^8 \div L$	beam strength $= 1.0 \times 10^8 \div L$
general formula	for Hepco beam in vertical bending	for Hepco beam in horizontal bending

The maximum load capacities for a **cantilever beam** are given below:

beam strength $= \frac{\sigma_{max} \times I}{Ly}$	beam strength $= 3.85 \times 10^7 \div L$	beam strength $= 2.5 \times 10^7 \div L$
general formula	for Hepco beam in vertical bending	for Hepco beam in horizontal bending

The above calculations refer to the deflection and load capacity of the aluminium beam section without reinforcing rods, back plates or slides fitted. The addition of any or all of these will increase the stiffness of the beam, however such compound beams do not always follow the simple equations laid out above. The amount of stiffening effect will depend, to some degree, on the application.



In typical duties, using four reinforcing rods will improve the stiffness of the beam by ~40% (i.e. deflection will be reduced by ~30%) in the vertical direction. If two single narrow flat tracks are fixed to the beam as illustrated left, this can improve stiffness by 70%. Other arrangements will have different stiffening effects. Consult Hepco for details.

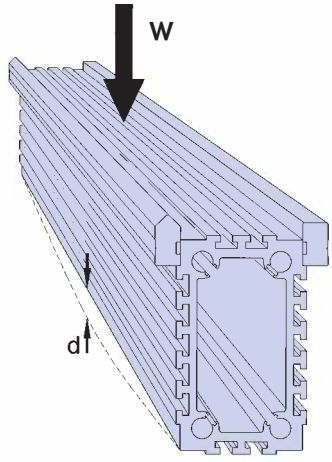
The foregoing calculations also ignore the effects of beams deflecting under their own weight. The effects of this are usually small – e.g. a 2m long cantilever beam set vertically will bend 0.15mm under its own weight. A 4m simply supported beam will sag by 0.25mm.

The calculations also assume beams are 'long' and may be slightly inaccurate for lengths much below 1m.

Calculation Example

A gantry system has a central span of 4800mm which is simply supported at its ends. The beam has fitted HSS25 V slide and HTS25 flat track (as illustrated on right). The carriage assembly weighs 1000N and there is an external load of 5000N.

$$\text{beam deflection} = \frac{WL^3}{48EI} = \frac{6000 \times 4800^3}{48 \times 6.6 \times 10^4 \times 4.7 \times 10^7} = 4.5\text{mm}$$



The above figure ignores the effect of the beam's own weight. As is described above, this will not usually be very great. The calculation also ignores the reinforcing effect of the flat tracks, hence this calculation will give a conservative estimate of deflection.

If we refer to the load capacity calculations above we see that this beam is capable of taking a load of $1.54 \times 10^8 \div L$. In this case the load capacity of the beam is ~ 32000N even ignoring the reinforcing effect of the flat tracks. The beam is therefore well within its load capacity in this duty.

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 narrow 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 sufficient running clearance for the V bearings or bearing blocks. **N.B.** V bearings with cap wipers used with low back plates HLN25 and HLW25 do not provide sufficient clearance for this purpose.

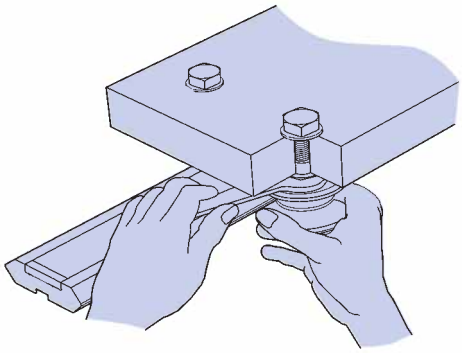
It is advisable to set the assembled elements against the loaded side of the keys/dowels in order to overcome any slight clearance.

Customers mounting single edge V slides or narrow flat tracks in parallel are encouraged to specify the jacking screw alignment facility available for use both with and without the Hepco construction beam (see page 13 for installation details). Customers may also specify the location T nut HTN25–L for locating assembled elements to the construction beam. **N.B.** Location T nuts should be used in only one or other of the two large keyways in wide back plates HLW25 and HHW25.

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 bearing assemblies should be flat and in the same plane. The bearing elements should be assembled to the mounting surface or carriage with the concentric assemblies 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 the eccentric type to allow precise engagement and sharing of the load. All bearing assemblies on the opposite side should be the eccentric type.

The concentric bearing assemblies should be fully tightened and the eccentric assemblies semi-tightened then adjusted to their outermost position. The complete carriage assembly minus any additional components should be introduced onto the slide and if the carriage assembly is heavy it should be counterbalanced through its centre of gravity by means of as long a length of rope as possible. **N.B.** It is recommended that a lifting eye in the appropriate position be provided for this purpose.

In the case where slides or tracks have been mounted slightly out of parallel, system adjustment should be carried out at the widest position.

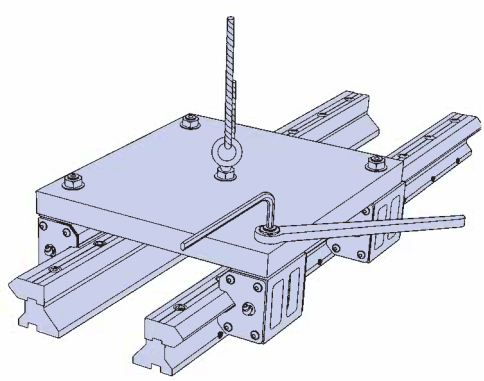
With the carriage in its counterbalanced condition the eccentric bearing assemblies opposite the concentric assemblies should be rotated using the Hepco adjusting wrench until engaged with the slide or track such that there is no detectable play and minimal preload. The bearing assemblies should be checked 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 bearing assemblies should then be fully tightened and checked again for correct preload. The process as described should be repeated for any pairs of eccentric bearing assemblies fitted in between the outermost assemblies. The carriage assembly may then be checked for free running by pushing back and forth a short distance as permitted by the supporting length of rope.

The carriage should be removed from the end of the slide to enable cap wipers to be fitted (if required) then returned to the slide with cap wipers adjusted to achieve maximum compression of the felt wipers without danger of 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 cap wipers should be charged with lubricant until seen to overflow (see page 17).

Bearing Blocks (See figure right)

Bearing blocks should be smeared with a light coating of oil on the mounting surface and should be installed and adjusted basically in the manner described on page 28 but with emphasis on the importance of counter balancing the weight of the carriage during the adjustment process since judgement of preload and play must be assessed by 'feel' and running quality.



Before commencing adjustment the end seals should be fully retracted then re-introduced after adjustment is complete such that the PTFE wipers just contact the slide. When used in conjunction with Hepco back plates which have been designed for maximum compactness, adjustment must be carried out from the side of the carriage plate opposite to the blocks, utilising the 8mm hexagon socket and the fixing nut which may be simultaneously tightened by means of a standard ring spanner. If adjustment is to be carried out on the same side of the carriage plate as the bearing blocks, access will need to be provided within the back plate mounting surface at the desired position for adjusting via the 14mm hexagon socket.

Where applications use the bearing blocks' tapped hole fixing facility, it is important that the mounting surfaces are accurately machined in the same plane. Mounting holes should be drilled 9.5mm diameter providing clearance to allow self alignment in one plane. It is normal to use this type of fixing on one side of the slide only as no means of adjustment is provided.

On completion of adjustment the bearing blocks should be charged with lubricant until seen to overflow (see page 19).

Drilling (Bearing assemblies and bearing blocks)

Mounting holes for bearing assemblies and bearing blocks with journals should be drilled and reamed 16mm diameter tolerance F6($^{+0.027}_{-0.016}$). The concentric bearing elements provide the datum reference for the system and if important, should be accurately positioned. Fixing hole centres (see pages 8 & 9) require a tolerance of ±0.5mm which allows for adequate adjustment via the eccentric facility plus an allowance for adjustment due to wear.

Important

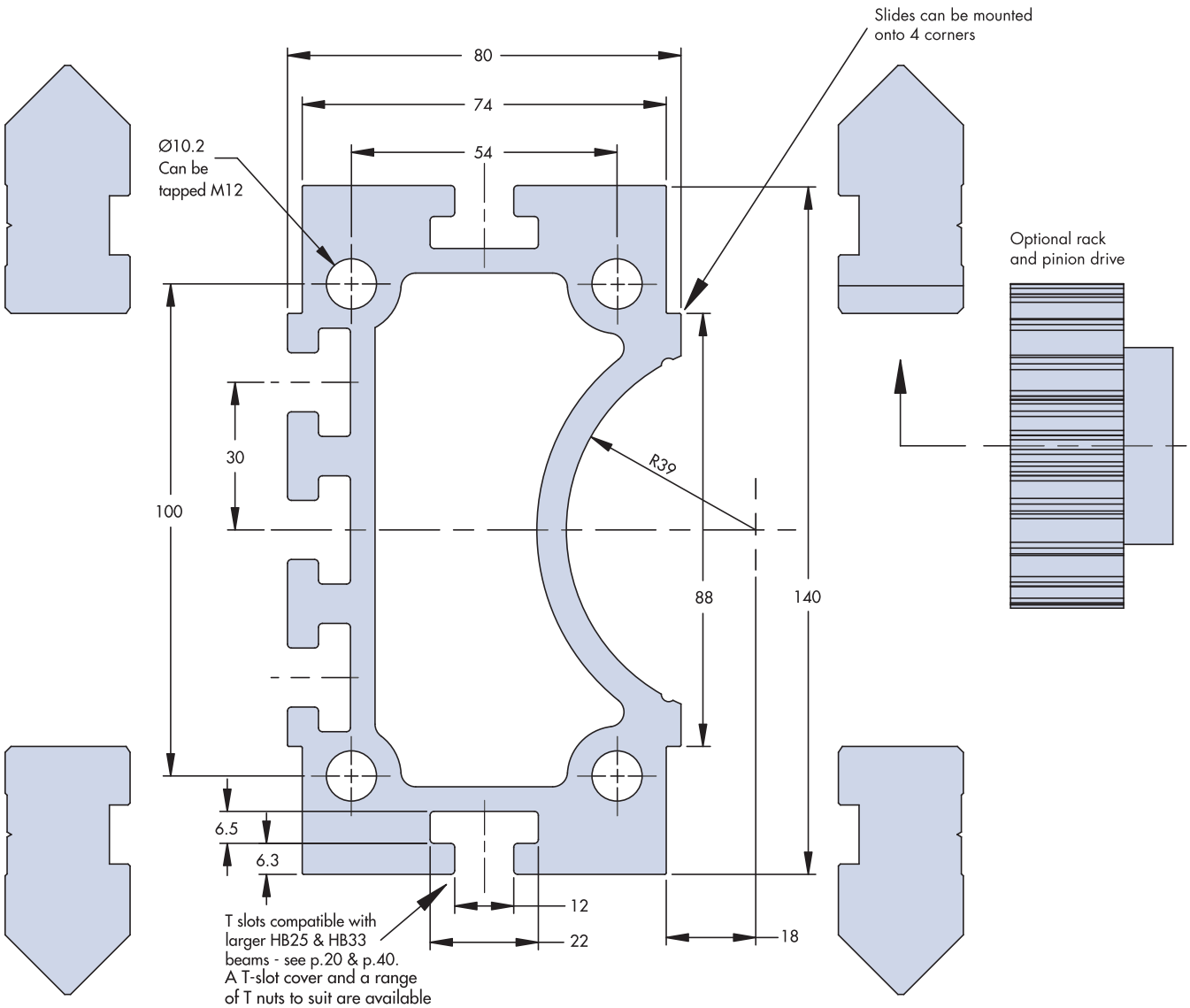
Additional preload imposed on the system by incorrect adjustment or misalignment will reduce the load capacity and the life. Customers are advised to allow for this in cases where there is doubt concerning the integrity of the mounting surfaces.

Note: For all bolt and screw tightening torques, please see page 26.

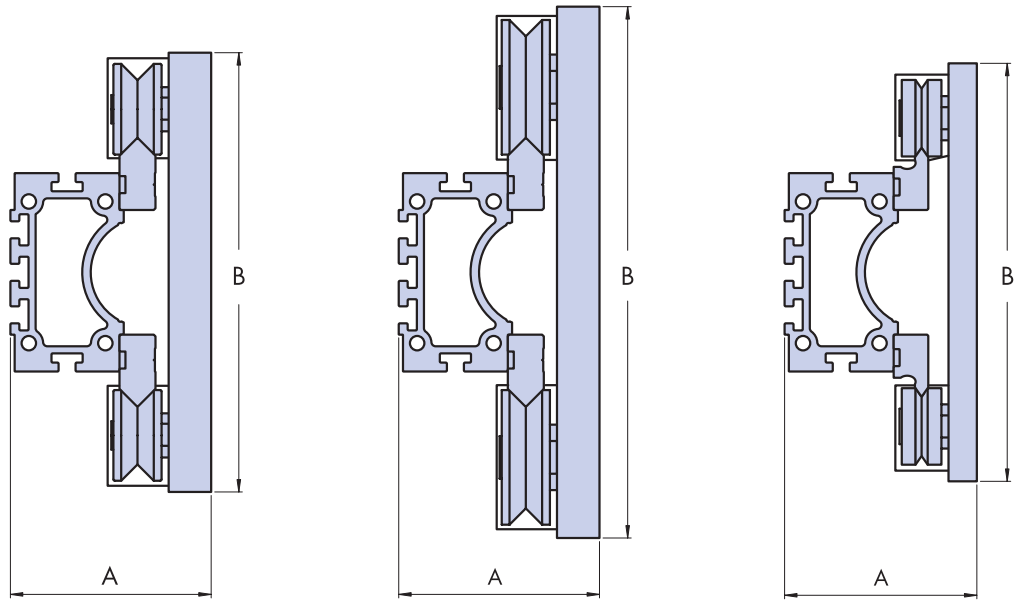
HDCB Heavy Duty Compact Beam

A versatile addition to our Heavy Duty product the compact section aluminium beam has the facility to mount slides on all four corners. In addition to its use as a single axis unit the compact beam can be made into a two stage telescopic axis. The curved recess feature is to allow the inclusion of a ball screw-drive where applicable, details of this product are shown on pages 34-35.

Units can also be rack driven by the inclusion of a rack on the back face of the single edge slides. A range of standard carriage plates is offered for ease of mounting.
Max. beam length in one piece = 6 metres.



Assembled Options



Type 1 **Type 2** **Type 3**

Type*1	Fitted Slide	Used with bearing	A	B	Rack driven option	Ballscrew driven option HDCS
1	PHSS/CHSS25	64Ø	141.5	310	✓	✓
2	PHSS/CHSS25	95Ø	141.5	375	✓	✓
3	NLE	54Ø	135.5	295	✓	✗

Notes:

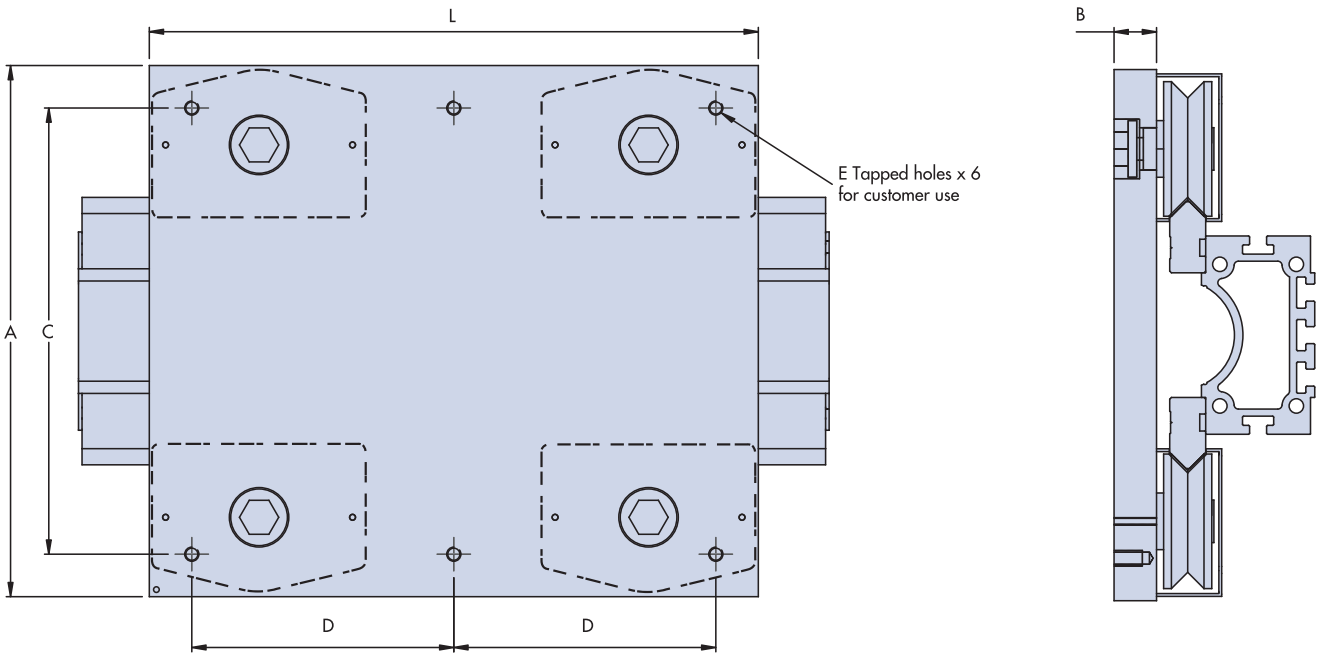
1. Types 1 and 2 use single edge slides and bearings from our Heavy Duty Product, type 3 uses single edge spacer slides with bearings from our GV3 Product range. Please refer to separate GV3 catalogue for further details.
2. Slides can be fitted to opposite faces to those illustrated if required.
3. Construction of carriage plate for rack driven option may vary from the above illustrations, details will be supplied.
4. Beam units can be supplied with slides fitted without carriage plates if required.
5. All assembled units are fitted with cap wipers for positive lubrication.

Type*1	L1	L2	Ms	Mv	M
1	max 10000N @300km	max 16000N @300km	max 940Nm @ 300km	max 1861Nm @300km	max 1135Nm @ 300km
	3100N @ 10000km	4960N @10000km	291Nm @ 10000km	563Nm @10000km	352Nm @ 10000km
2	max 28000N @300km	max 40000N @ 300km	max 2632Nm @300km	max 5500Nm @ 300km	max 3850Nm @300km
	8680N @10000km	12400N @ 10000km	816Nm @10000km	1705Nm @ 10000km	1193Nm @10000km
3	max 10000N @300km	max 10000N @300km	max 870Nm @300km	max 1290Nm @300km	max 1290Nm @300km
	3490N @ 10000km	3490N @10000km	304Nm @10000km	450Nm @10000km	450Nm @10000km

Load Capacities

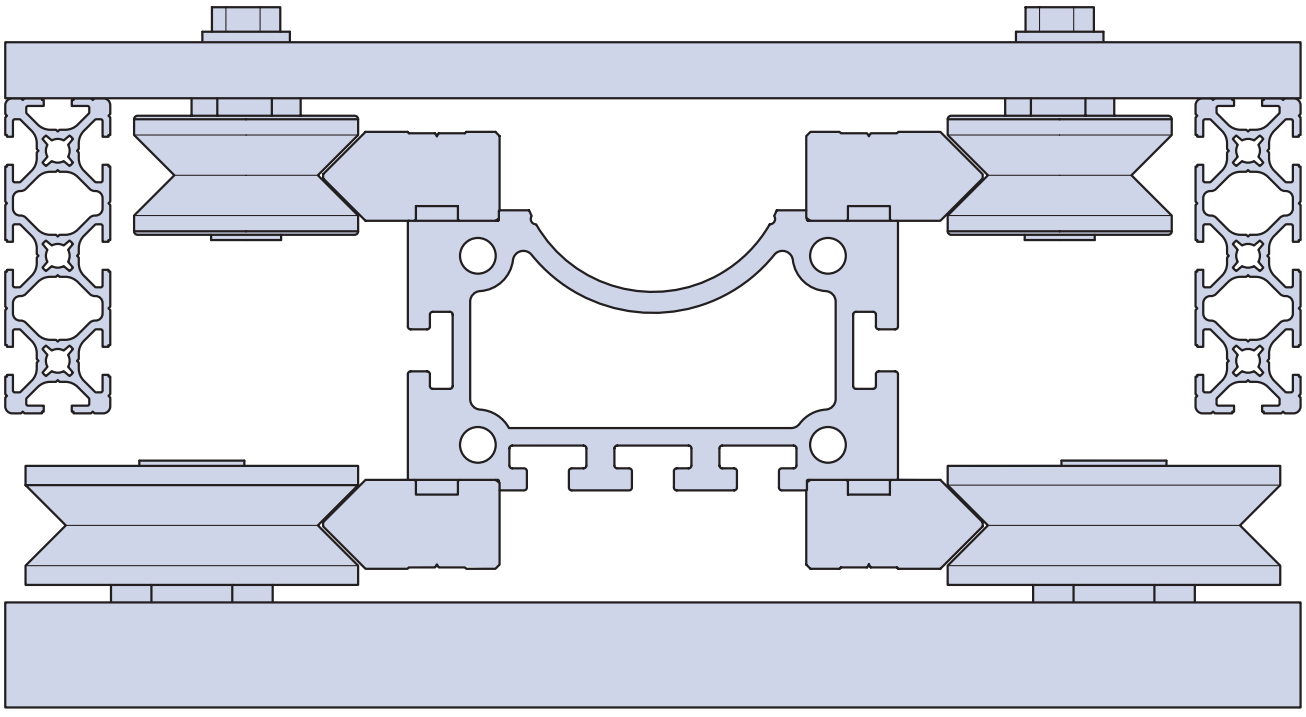
The table above shows the maximum loading for each possible loading mode. It also includes loads for 10,000km travel. This table is intended as a guide for initial selection only. Please use the methods of calculation shown on pages 22 & 23 to calculate Load/Life.

Carriage Plate Details



Part No.	A	B	C	D	E	L	For use with
CP–HDCB 64	310	30	250	145	M10 x 20 deep	350	Type 1
CP–HDCB 95	375	30	315	185	M10 x 20 deep	430	Type 2
CP–HDCB 54	295	20	265	165	M10 through	360	Type 3

Telescopic Z Axis Solutions



Due to its compact section and facility to mount slides on all four corners the compact beam lends itself very well to be used as a telescopic Z axis.
For lifting capacity and length availability please contact our Technical Department.

Ordering Details

The Heavy Duty Compact Beam can be supplied in 4 formats.

1. With slides attached and bearings/cap wipers supplied separately. No carriage plate.
2. With slides attached complete with assembled carriage fitted to suit type 1,2 or 3.
3. As a 2 stage telescopic unit – details will be provided.
4. As a Ballscrew driven unit refer to HDCS page 34.

Option 1 – Beam only with slides fitted

HB 25C – L4000 – T + CHSS 25 – L4000 – R

- R – Rack option (Note 5)
- L4000 – Slide length
- CHSS 25 – Slide ref.
  - CHSS 25
  - PHSS 25
  - NLE P1/P2/P3
- T – End tapped holes in beam (M12)
- L4000 – Overall beam length
- HB 25C – Beam part No.

Option 2 – Beam with slides and assembled carriage fitted

HB 25C – L4000 – T + AU – 64 – CHSS 25 – Type 1 – R

- R – (See note 6)
- Type 1 – Type combinations

	1	2	3
CHSS 25 – Slide ref	CHSS 25 PHSS 25	CHSS 25 PHSS 25	NLE P1/P2/P3
64 – Bearing size	64Ø	95Ø	54Ø

- AU – Assembled Unit

Options 3 and 4

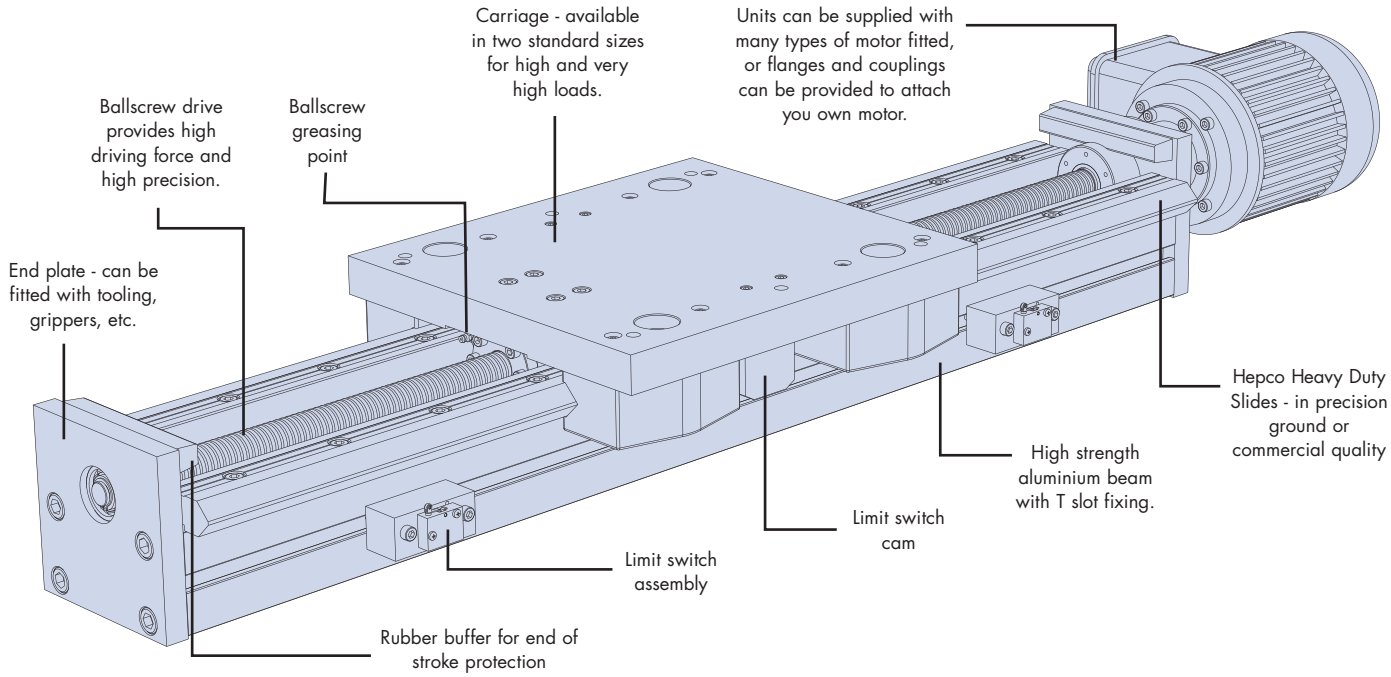
Ordering details will be provided.

Note 5: Mod 2.5 rack is standard option. Hardened mod 3 can be supplied on request.

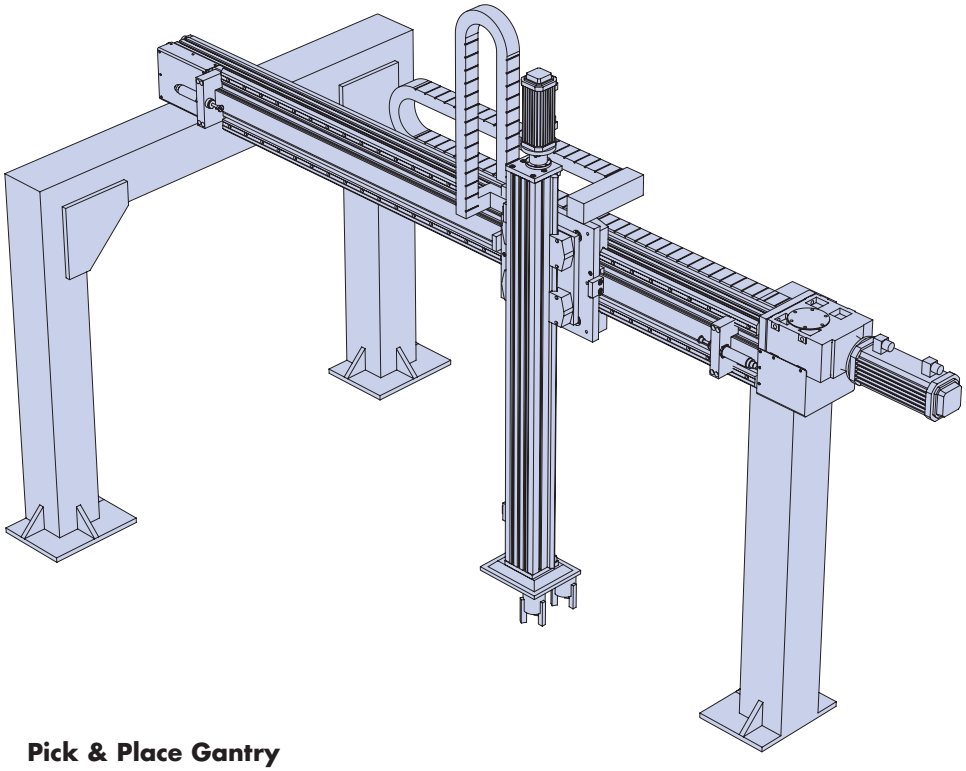
Note 6: The carriage design for a rack driven assembled unit will be different to illustration, our Technical Department will provide details.

HDCS Heavy Duty Compact Ballscrew Transmission

The Hepco HDCS unit is built on a strong, compact aluminium beam, fitted with Hepco's popular Heavy Duty slides. Two sizes of carriage are available with the drive provided by a ø25mm ballscrew. Units are compatible with Hepco's range of driven products, including HDLS, HDFS and DLS. CAD models will be provided against a specific application, for full details, please contact our Technical Sales Department.

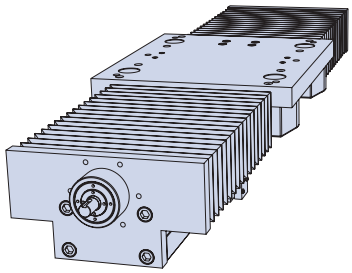


Hepco HDCS units can be supplied with many useful options including bellows covers, motors, couplings, flanges, T nuts, brackets etc. They can be used in multi-axis systems, which can be built by the customer or supplied complete by Hepco.



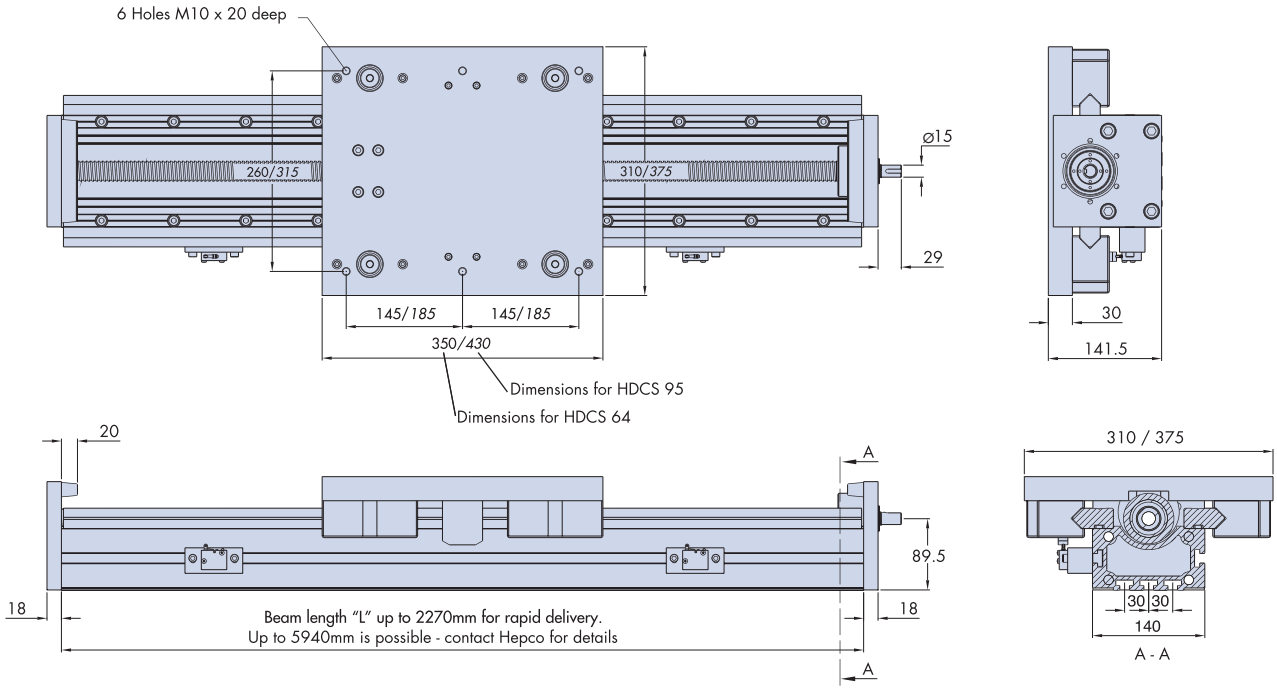
Pick & Place Gantry

This unit uses an HDLS unit (see separate catalogue) for the X-axis and an HDCS unit with fitted servo-motor for the Z-axis. A gripper is attached to the end plate of the HDCS unit.



HDCS units can be supplied fitted with a bellows cover for the slideways, on request.

Data and Dimensions



Notes:

1. The speed and force may be reduced for long systems, due to ballscrew limitations. Contact Hepco for advice.
2. Dimensions in *italics* relate to units with the larger size 95 bearings. Other dimensions relate to size 64.
3. Flanges, couplings and many different motors are available. Contact Hepco for details.

Load Capacities

The table below shows the maximum loading for each carriage in each possible loading mode. It also includes loads for 10,000km travel. This table is intended as a guide for initial selection only. Please send your application details to Hepco and we will calculate the system Load/Life for you.

Carriage Type	L1	L2	Ms	Mv	M
HDCS 64	max 10,000N @300km	max 16,000N @500km	max 900Nm @ 300km	max 1,800Nm @500km	max 1,125Nm @ 300km
	3,100N @ 10,000km	5,895N @10,000km	297Nm @ 10,000km	663Nm @10,000km	348Nm @ 10,000km
HDCS 95	max 28,000N @400km	max 40,000N @ 400km	max 2,520Nm @400km	max 5,400Nm @ 400km	max 3,780Nm @400km
	9,570N @10,000km	13,680N @ 10,000km	861Nm @10,000km	1,846Nm @ 10,000km	1,291Nm @10,000km

Maximum Driving Force

HDCS 64/95	5mm Pitch	10mm Pitch
Ca	12.8 kN	19.4 kN
Coa	31.1 kN	38.7 kN

Ordering Details

HDCS – 64 – P1 – L1850 – P10

Product Range

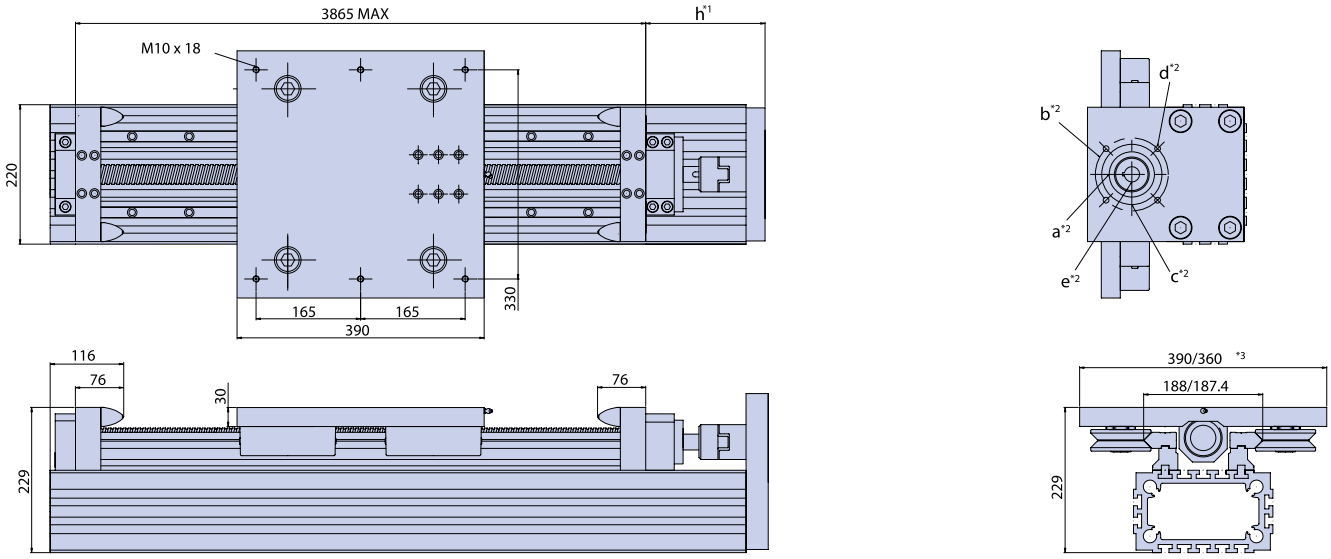
Bearing size. Choose 64 or 95 depending on load capacity

P1 = precision grade slides, P3 = commercial grade slides

Beam length (see dim L at top of page)

Screw pitch. P5 = 5mm, P10 = 10mm

For guidance on other options, contact Hepco.

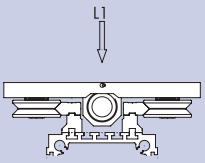
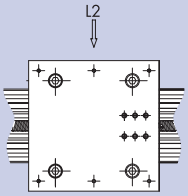
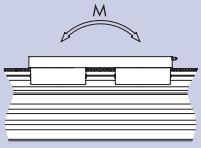
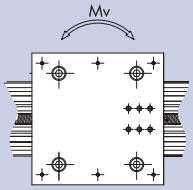
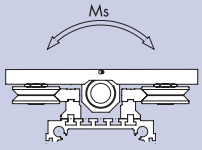


***NOTES**

1. Dimension **h** will be determined by the length of the motor/gearbox shaft, please send details to Hepco and we will calculate this length for you.
2. Dimensions **a** to **e** will be manufactured to suit your required motor/gearbox face, please supply details with your application.
3. 390 Carriage width relates to HDFS 95 unit. 360 to HDFS 64.
4. All dimensions in mm.

Load Capacities

The table below shows the maximum loading for each carriage in each possible loading mode. This table is intended as guide for initial selection only. Please send application details to Hepco, and we will calculate the system Load/Life for you.

CARRIAGE TYPE					
HDFS-64	10,000N	16,000N	1325Nm	2120Nm	875Nm
HDFS-95	28,000N	40,000N	3220Nm	4600Nm	2450Nm

Driving Force

	5mm Pitch	10mm Pitch
HDFS-64 / 95	24KN	55KN

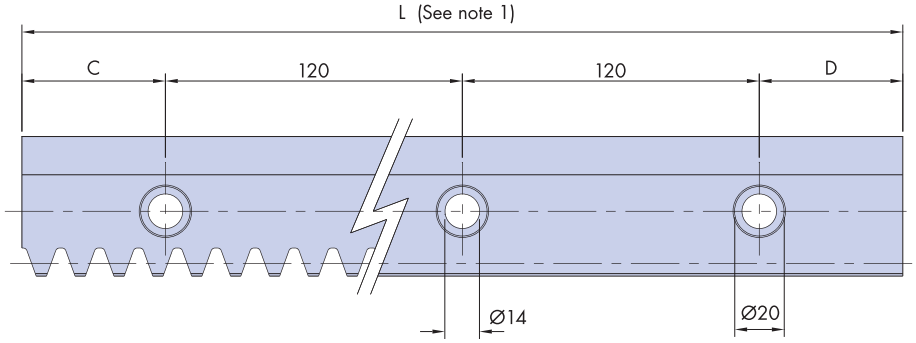
Ordering Details

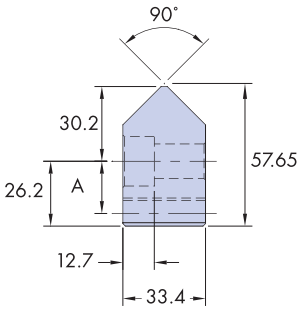
HDFS – 64 – P3 – L2000 – P10 – GB

- Product Range
- Bearing size, either 64 or 95 depending upon load capacity
- P1 = precision grade P3 = commercial grade
- Screw length
- Screw pitch P5 = 5mm P10 = 10mm
- GB = Fitted gearbox/motor. F = Custom mounting flange

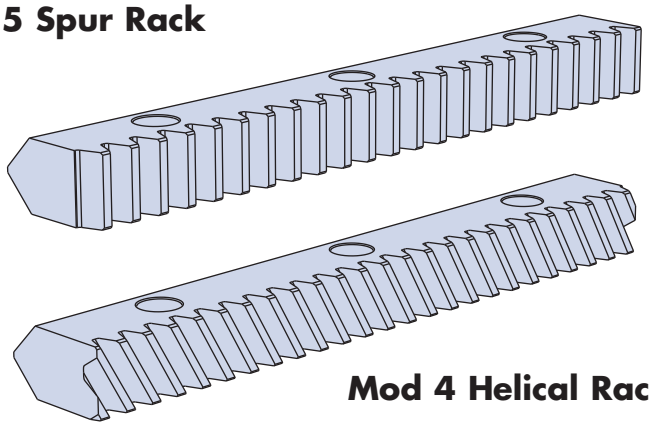
Single Edge V Slide

Manufactured from quality high carbon bearing steel, the CHSS33 slide retains all the known benefits of the HepcoMotion Heavy Duty range, but used in combination with the B128 bearing allows much greater load carrying capacity. Hardened on the wearing surfaces with all other areas left soft allows additional machining if required. Available in commercial grade the wearing surfaces are etched to aid lubricant retention. Slides are available in standard lengths up to 3956mm long, non standard lengths and butt joined profiles of unlimited lengths are also available. The CHSS33 slide has an optional mod 5 spur or mod 4 helical rack for driving requirements.





Mod 5 Spur Rack



Mod 4 Helical Rack

Dimension 'A' - Spur rack = 21.1mm
- Helical rack = 22.1mm

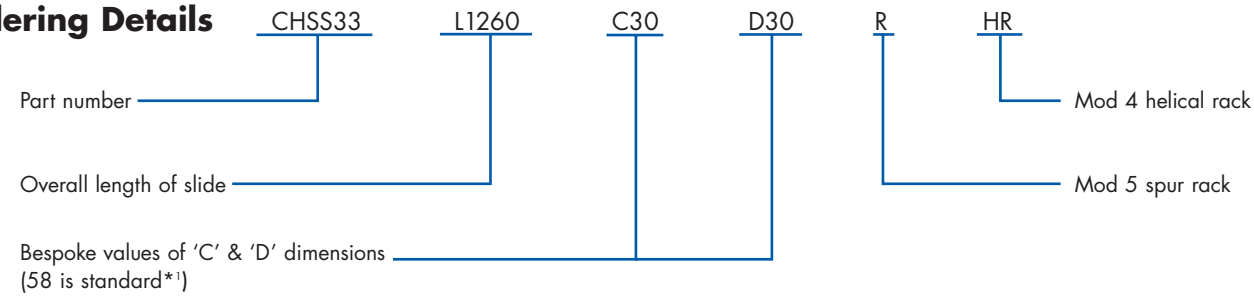
Both rack options are manufactured to ISO 1328 grade 10.

The 4 module helical rack has a helix angle of 30°.

Notes:

1. Any length of slide up to 3956mm long can be supplied in one piece, but for optimum price and delivery, slide lengths should be specified with C & D dimensions equal to 58mm. In all cases unless otherwise specified by the customer C & D dimension will be equal.
2. Butt jointed slides of unlimited lengths are available. On non rack slides the hole pitch will be maintained across the joint. On rack cut slides the pitch may vary.
3. Tooth pitch positions relative to the hole pitch may vary between components.
4. Approximate weights of the profiles are: CHSS33 = 12.3 kg/m, CHSS33R = 10.8 kg/m, CHSS33HR = 11.1 kg/m

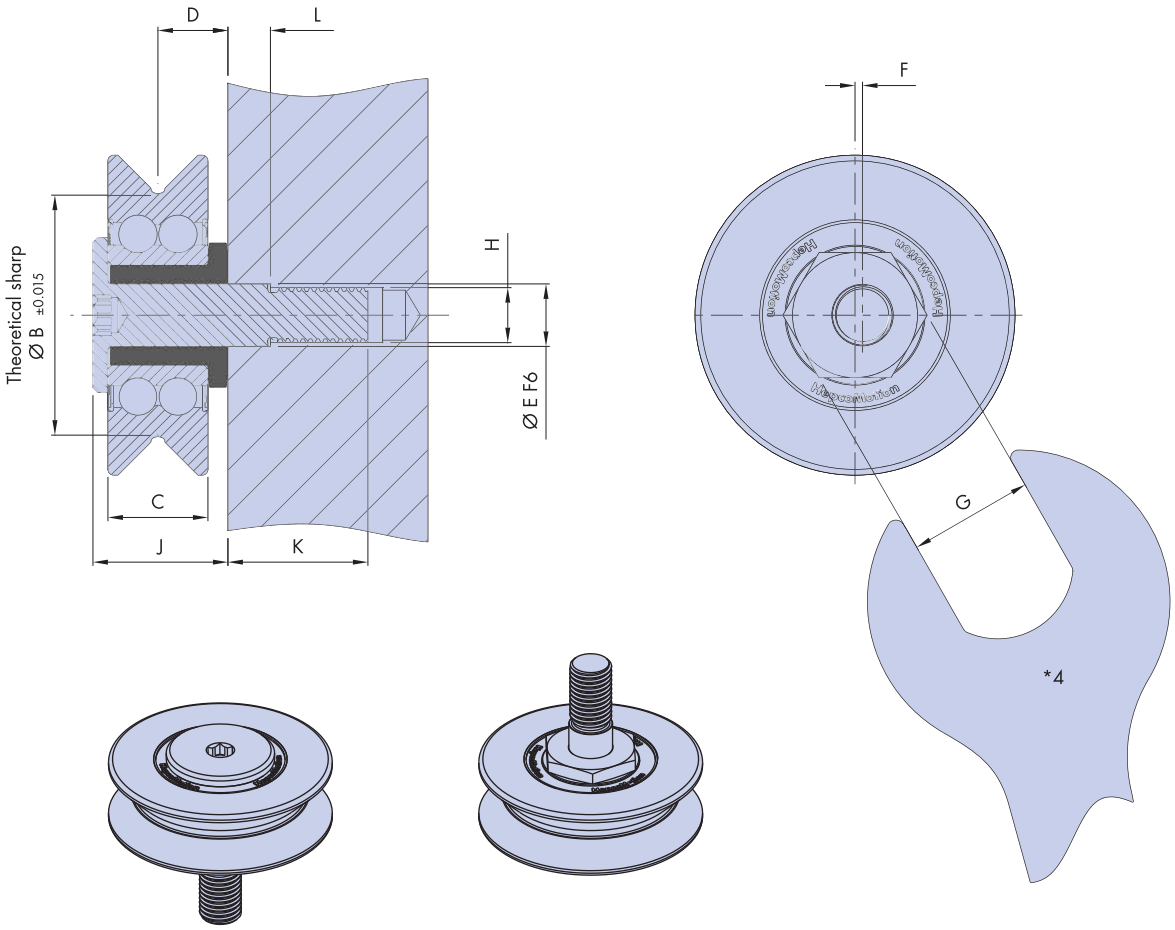
Ordering Details



Bearing Assemblies

HepcoMotion HJR bearing assemblies use double row ball bearings and provide a high axial and radial load capacity. The design allows for easy assembly and any bearing can be removed from a system with a single screw. Each bearing has a chemically blacked, high tensile steel screw and bush and is available in concentric and eccentric (adjustable) forms. Each bearing is available with either a blind or though-hole fixing. Stainless steel versions are available.

Blind Hole Fixing Type - BHJR



Bearing assembly	ØA	ØB ±0.015	C	D	ØE F6	F	G	H	J	K	L	
BHJR64	64	41	34	22	16	1.25	27	M10	44	26	10	
THJR64												
BHJR95	95	72			20	2	40	M16	44	41	11.5	
THJR95												
BHJR128	128	96	40	28	25	3	50	M24	54	56	17	
THJR128												

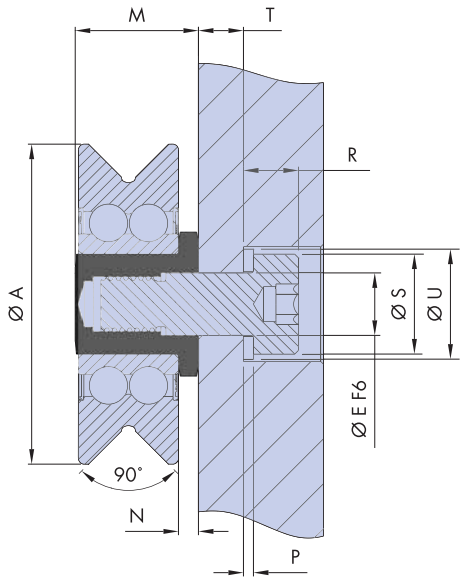
Notes

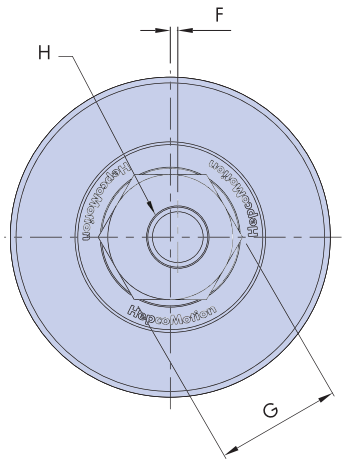
1. It is recommended that the bearing assembly mounting holes should be drilled and reamed to a tolerance F6. For the BHJR bearing assembly this tolerance should be kept for a minimum depth of 'L' mm from the mounting face.
2. Nitrile rubber seals are standard on Ø95 & Ø128 bearings. Omit "NS" from the order code if a steel shield is required on the Ø64 bearing.
3. When using THJR bearings, the part number must be selected to suit the required plate thickness, T. Choose from the tables on the next page
4. Adjustment tools for HJR64, HJR95 and HJR128 bearings are available. Order part numbers AT54, AT95 & AT128

Additional Components

All bearings are greased for life internally. Customers are strongly recommended to provide lubrication to the interface between the bearings and the slide by specifying HepcoMotion lubricators which contact the vee of the bearing or the slide. Lubrication greatly increases the load capacity and life.

Through Hole Fixing Type - THJR

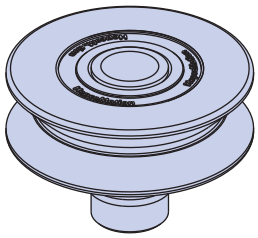


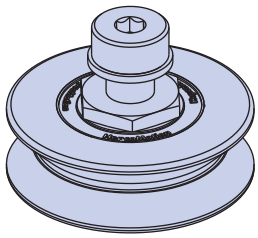


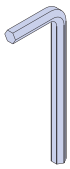
Part Number	T*3	
	min	max
THJ64 C/E NS 12	6.5	12.5
THJ64 C/E NS 17	11.5	17.5
THJ64 C/E NS 22	16.5	22.5
THJ64 C/E NS 27	21.5	27.5

Part Number	T*3	
	min	max
THJ95 C/E NS 16	9	16
THJ95 C/E NS 22	16	22
THJ95 C/E NS 27	21	27
THJ95 C/E NS 32	26	32

Part Number	T*3	
	min	max
THJ128 C/E NS 17	6.5	17
THJ128 C/E NS 27	16.5	27
THJ128 C/E NS 37	26.5	37







	M	N	P	R	ØS	ØU	Weights ~	Maximum load capacity		Hex key size
								Axial load LA	Radial laod LA	
							650g	2.5 kN	8 kN	10
	40	5	2.5	13.5	24	28				8
							1450g	7 kN	20 kN	12
	40	5	3	17	30	34				10
							3000g	10 kN	30 kN	14
	50	8	4	22	40	44				

Ordering Details

SS THJR 128 C NS 17

SS = stainless steel option,
Leave blank if not required
SS version not avaliable for Ø128 bearing

Fixing type : THJR = through hole, BHJR = blind Hole

Bearing diameter

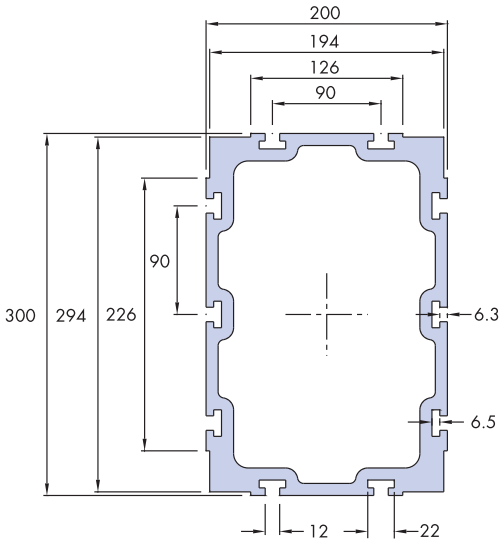
Journal type E = eccentric C = concentric

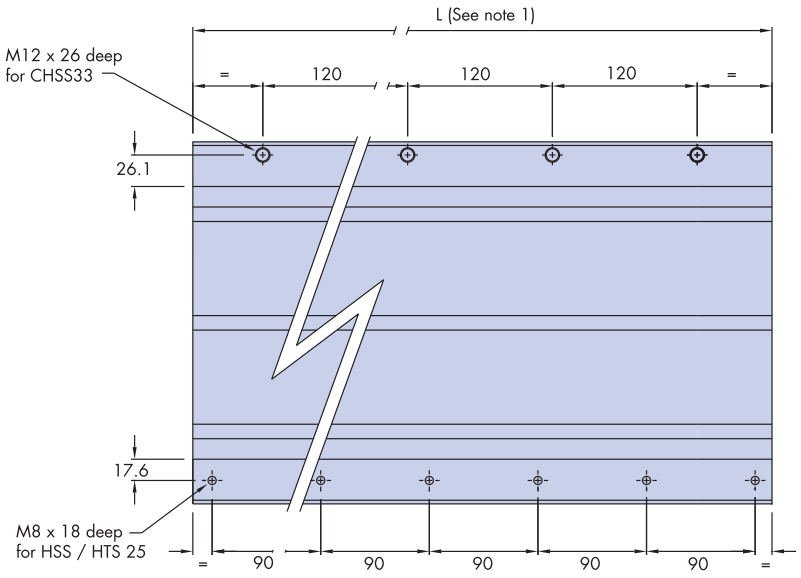
NS = nitrile rubber seals
See note 2

Plate thickness - see note 3 & table above. Leave blank for BHJR

Construction Beam

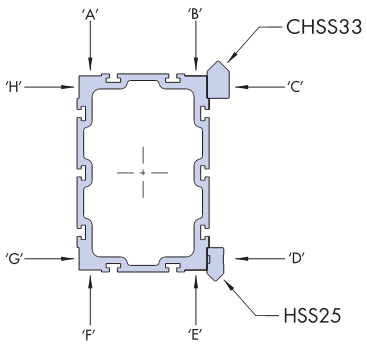
The HB33 beam is designed to accommodate the HSS25 & CHSS33 single edge V slides. Very high stiffness allows the beam to be used as a self supporting construction element, compared to the HB25 beam, the HB33 is approximately 4 times stiffer. Beam deflection can be calculated using simple beam theory, and calculations shown on page 24. The second moments of area for the HB33 beam are, Ixx 16.9x10^{7}mm^4 for vertical bending, and Iyy 8.4x10^{7}mm^4 for horizontal bending, see below for details. Ten T slots have been provided for locating and attaching ancillary components as well as the existing range of HD backplates, using HepcoMotion T nuts. In addition there are eight corner faces for attaching the slides direct, see below for details. Approximate weight of the beam is 37.5 kg/m.

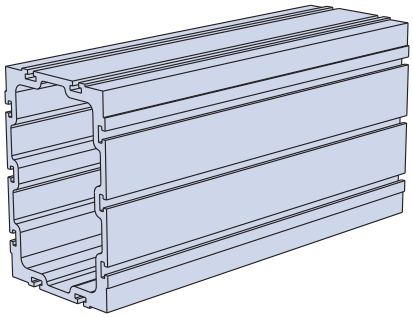


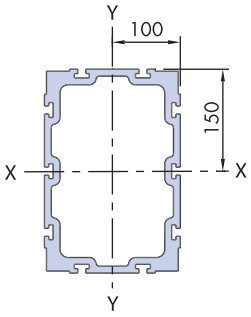


Beam Bending Infomation
see page 26

Slide Mounting Positions



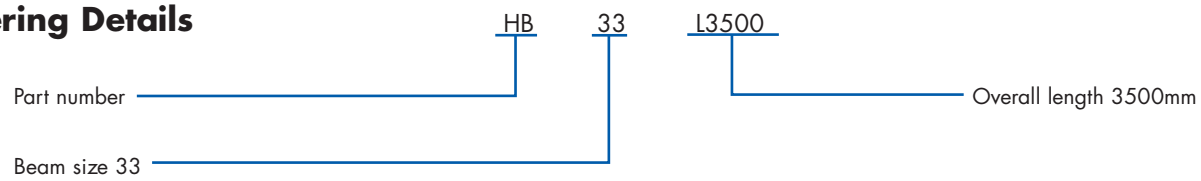




Notes:

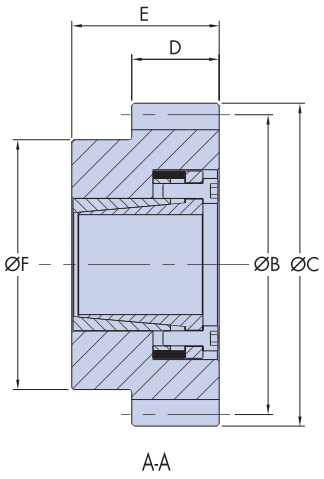
1. Beams are cut to customer length requirements. They may be requested matched in length and should be ordered 5mm longer then the corresponding slide. Beams in one piece up to 6 m available from stock. Longer single lengths are available on request.
2. Individual corner faces of the beam can be drilled and tapped M8x1.25 to suit the HSS25 single edge V slide and narrow flat track or M12x1.75 to suit the CHSS33 single edge V slide. This must be ordered factory assembled. Please see page 7 for ordering details. Butt joined slides / tracks will be fitted for requirements in excess of 3956mm long (hole pitches at the join may vary).

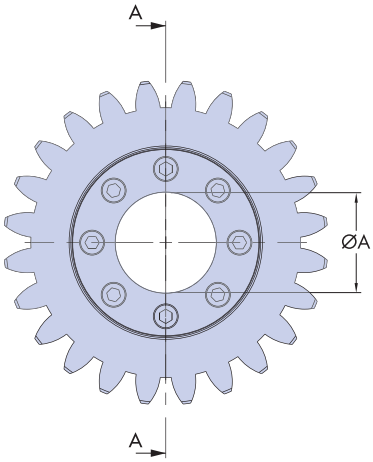
Ordering Details

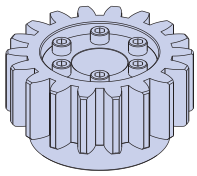


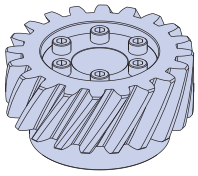
Pinions

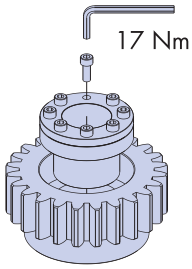
HepcoMotion pinions are made from high grade steel with hardened teeth for maximum wear resistance. Two types of pinion are available to suit the spur and helical rack cut into the slide. The pinions incorporate a locking bush which, when tightened, locks onto the shaft and makes a rigid connection between the pinion and the shaft. Both spur and helical versions are available with two options for numbers of teeth.





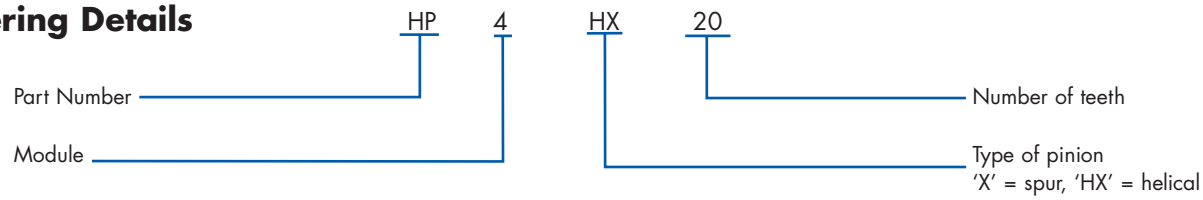

Spur pinion


Helical pinion



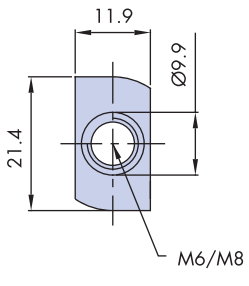
Part No	Pinion type	Module	Helix angle	No of teeth	ØA (H8)	ØB (PCD)	ØC	D	E	ØF
HP5X18	Spur	5	-	18	30	90	100	35	52	75
HP5X24				24	40	120	130		59	100
HP4HX20	Helical	4	30°	20	30	92.38	100.38	35	52	75
HP4HX24				24	40	110.85	118.85		59	90

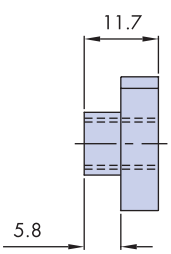
Ordering Details

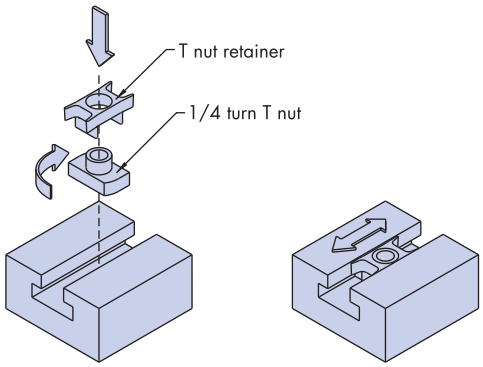


T Nuts

HepcoMotion has introduced a range of quick fit T nuts. These T nuts can be inserted into the T slot of the HB beams and rotated through 90° to engage. Available with threads of M6x1 and M8x1.25, the quick fit T nut is supplied with a nylon retainer. The retainer has two functions; 1) to hold the T nut in place, and allow repositioning if required, useful on vertical applications, and 2) to stop the T nut turning when the fixing bolt is loosened. To order the quick fit T nuts, please use the following part numbers. HRTNM6 for the M6 version, and HRTNM8 for the M8 version.

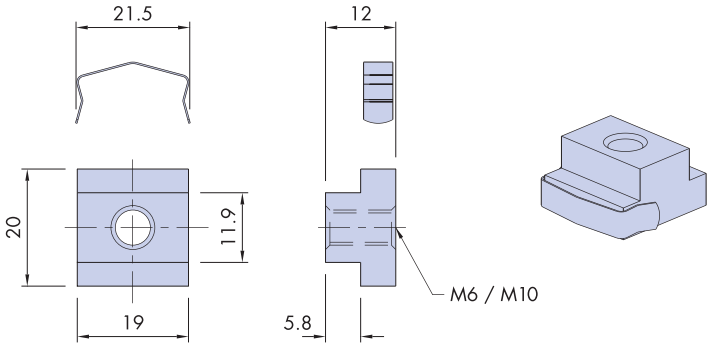






Additional T Nuts

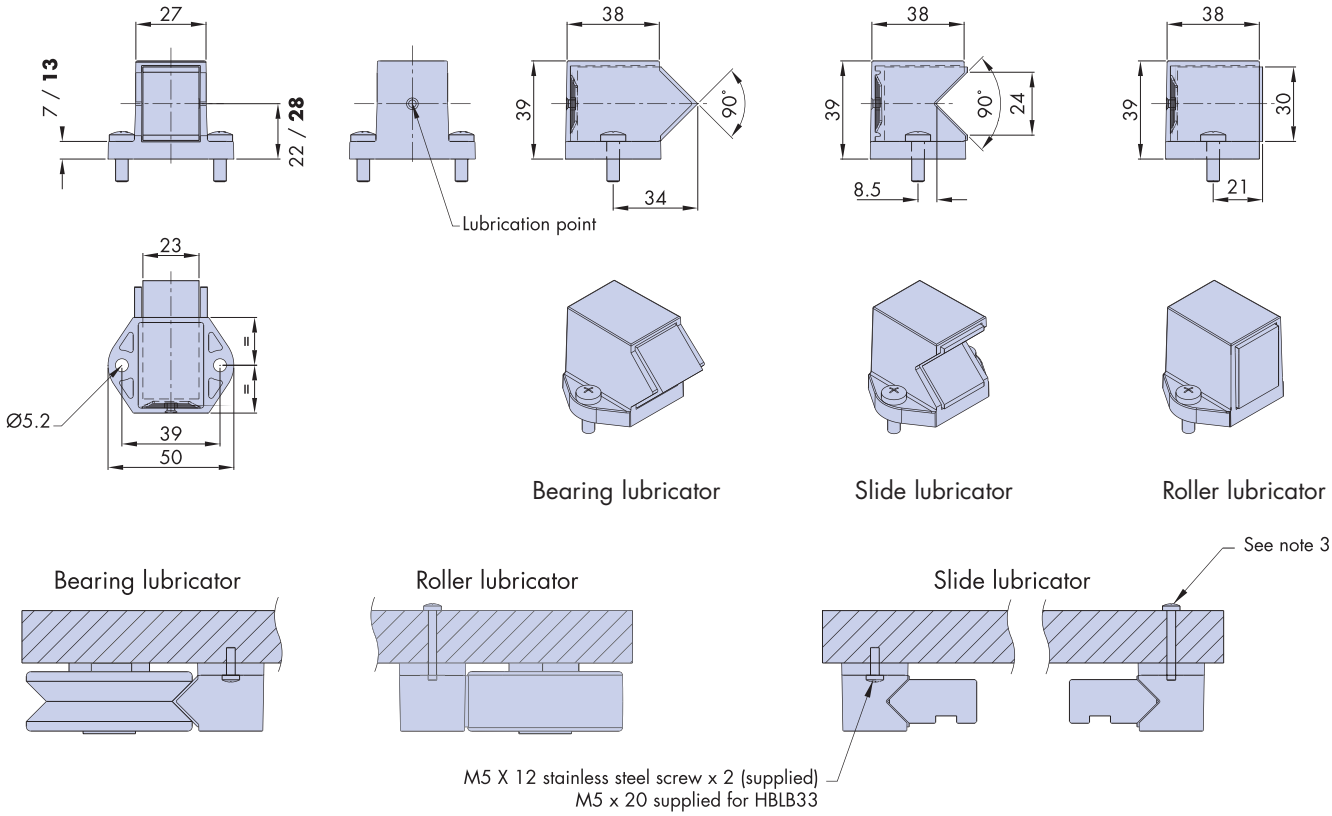
In addition to the quick fit T nut, HepcoMotion has introduced two additional sizes of the flush T nut. The standard HTN25 with M8x1.25 thread is now available with M6x1, M10x1.5 threads. To order these T nuts please use the following part numbers. HTNM6 for the M6 version, and HTNM10 for the M10 version.



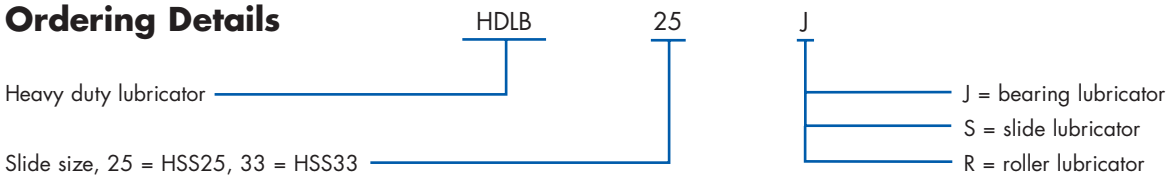
Lubricators

Lubricators are moulded in an impact resistant plastic and house an impregnated felt wiper which applies a film of oil to the running surfaces of the slide or bearings. This results in increased load and life of the system without imposing undue friction. Lubricators are available in three styles; slide, bearing, and roller lubricator, these apply oil to the slide, bearing and track roller respectively.

Dimensions in **bold** are for HDLB33, see note 4



Ordering Details



Notes:

1. The lubrication interval depends on the length of the stroke, duty and environmental factors. Replenish lubricant as necessary using a 68 viscosity oil.
2. To calculate drilling centres, refer to the theoretical V apex dimension of the slide or bearing.
3. For through hole fixing, the Ø5.2 holes in the lubricator should be tapped M6.
4. The HDLB33 lubricator is supplied with a spacer plate to match the mounting height of the CHSS33 and Ø128 bearing.

Notes

Notes

Notes

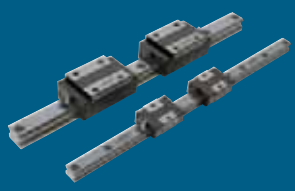
HepcoMotion® Product Range

GV3
Linear Guidance and Transmission System

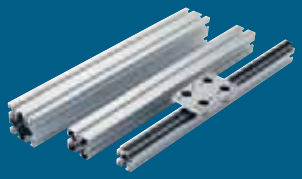
HDS
Heavy Duty Slide System

PRT
Ring Slides and Track System

SL2
Stainless Steel Based Slide System



LBG
Linear Ball Guides



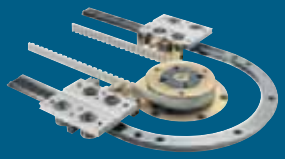
MCS
Aluminium Frame and Machine Construction System

HPS
Powerslide-2 Guided Rodless Cylinder

HDLS
Heavy Duty Driven Linear System

DLS
Linear Transmission and Positioning System

HTS
Telescopic Ball Bearing Slides

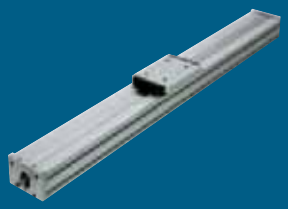


DTS
Driven Track System

BSP
Ballscrew Premier

Simple Select®
Vee Slide Linear Guidance Systems

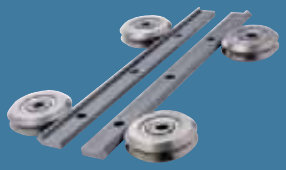
PDU2
Profile Driven Unit



PSD120
Profile Screw Driven Unit

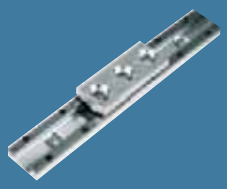
BishopWisecarver Product Range

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

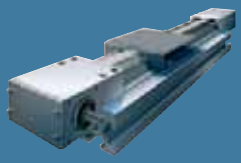


DUALVEE
Single Edge Slide System

LoPro
Aluminium Based Slide System



UtiliTrak
Lightweight U Channel Guideway



QuickTrak®
Linear Motion System

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

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