NEW - Extended Range
with Stainless Steel Options

HepcoMotion®

PRT²
Precision Ring and
Track System
Introducing the HepcoMotion® PRT2 Precision Ring and Track System

HepcoMotion has been solving Customers' circular motion problems for many years, building an indispensable knowledge of applications and clever technical solutions. This knowledge coupled with extensive research and development has resulted in the introduction of a comprehensive range of precision ring slides and track systems to suit virtually every need. Based on the highly successful PRT product the new PRT2 system offers a greatly expanded range of sizes and options including stainless steel availability as standard. The Precision Ring Slide and Track System products compliment Hepco's highly successful and extensive range of linear motion products, enabling customers to choose a single source for all their motion guidance requirements.

Features & Benefits

Common
- Friction-free motion.
- Stainless steel options.
- Fully adjustable.
- Tolerant of debris.
- Simple and effective means of lubrication.
- Zero play.
- Works in any plane.
- Tolerant of misalignment.
- Easy to install.
- 2D & 3D CAD files available.

Ring Slides and Segments
- Circular motion control at the periphery where it is needed.
- Large hollow centre to accommodate other components (ring slides).
- Precision flat surface for mounting ancillary components (ring discs).
- Will track the curvature of cylindrical shapes.
- Gearcut options for ease of driving.
- Double edge and single edge versions available.
- Carriage brake available.

Track Systems
- Limitless variety of circuits available.
- Precision positioning system available.
- High load support option at work stations.
- Simple alignment facility provided.
- Various carriage plate options.
- Components available for driving.
- Support frame available.
The HepcoMotion PRT2 system comprises of a comprehensive range of ring slides, ring segments, bearings and ancillary components which provide a versatile solution for most rotary and track system applications. A large range of ring slide types in various diameters are available in both steel and stainless steel with hardened V edges. Stock 90° and 180° segments are also available. Gear cut versions are available with pinions to provide a simple and effective means of driving. An overview of the comprehensive product range is shown.
**System Composition**

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**Double Edge V Ring Slide [26-27]**

- Bearings can be mounted internally and externally.
- Carriages can be run on double edge rings.
- Precision ground all over for high accuracy and conformity.
- Large hollow centre to accommodate other components.
- Datum register faces provided internally and externally for ease of location.

- Internal/External gear cut options available for ease of driving.
- V edges hardened for maximum wear resistance.
- Soft centre section allows customising.
- Stainless steel option available as standard.
- Through hole fixing or tapped hole fixing.
- Comprehensive range of drive pinions available [53].

![Double Edge V Ring Slide](image)

**V Ring Segments [26-31]**

- 90° and 180° segments available as standard.
- Double edge V and single edge V ring segments available as standard.
- Special length segments available to order.

![V Ring Segments](image)
System Composition

Single Edge External V Ring Slide 28-29

Common features

- Narrow section width.
- Datum register face for ease of location.
- Large gear size and face width.
- Stainless steel option available as standard.
- V face hardened for maximum wear resistance.
- Soft centre section allows customising.
- Manufactured from high quality steel.
- Choice of external or internal V.
- Precision ground all over for high accuracy and conformity.
- Through hole fixing or tapped hole fixing.
- Can be used in any orientation.
- Comprehensive range of sizes.
- Comprehensive range of drive pinions available 53.

Single Edge Internal V Ring Slide 30-31
HepcoMotion bearings are available in a range of 5 useful sizes and various formats to suit most design requirements. The special raceway conformity and low radial clearance make these bearings particularly suited to ring slide applications. All bearings are lubricated for life internally and are available with metal shields for exclusion of particulates and low friction running or, with nitrile seals to inhibit ingress of liquids. Bearings are also available in stainless steel fitted with nitrile seals.

Through hole fixing bearing (concentric) [34-35]
- Provides datum reference for the system.
- Short fixing stud for thin carriage plate.
- Long fixing stud for thick carriage plate.
- Controlled height option for enhanced system height accuracy.
- Provides simple means of adjusting via centre hexagon or socket in stud.
- Eccentric adjustment sufficient to allow removal of the ring or carriage without disassembly.

Through hole fixing bearing (eccentric) [34-35]
- For mounting into thick plates or where access to opposite side is restricted.
- Provides datum reference for the system.
- Controlled height option for enhanced system height accuracy.

Blind hole fixing bearing (concentric) [34-35]
- For mounting into thick plates or where access to opposite side is restricted.
- Adjustable from operating side for ease of access.
- Controlled height option for enhanced system height accuracy.
- Easily removed to allow removal of ring.

Blind hole fixing bearing (eccentric) [34-35]
- Axial float of outer race accommodates variation in system height.
- Provides simple means of adjusting via centre hexagon or socket in stud.
- Short fixing stud for thin carriage plate.
- Long fixing stud for thick carriage plate.
- Double eccentric version has sufficient adjustment to allow removal of the ring or carriage without disassembly.

Floating bearing (concentric & eccentric) [36]
- Twin bearing for tolerance of misalignment and smooth running.
- Double row bearing for tolerance of debris and higher load capacity.
- Special raceway conformity and low radial clearance, for slide ring applications.
- General quality to ISO Class 4. Aspects to Class 2.
HepcoMotion track systems combine ring segments with straight slides to achieve an almost limitless variation of open paths or closed circuits. Both left and right hand bends can be negotiated depending on the carriage selected. 90° and 180° segments in all standard double edge ring sizes are available in addition to straight slides up to 4 metres long. Straight slides can be butted together to achieve track systems of unlimited length.

**Driven track system components [50-51]**
- Comprehensive range of drive components available from complete proven system.
- Trip latch overload protection.
- Carriage positioning and locking system.
- Toothed belt with carriage connection facility.

**Fixed centre carriage [38-39]**
- The economic choice for rings and uni-directional track systems.
- Optional lubricators for increased load & life.
- Keyway facility in side faces for location of ancillary components.
- Supplied with tapped holes for ease of component mounting.
- Accurate overall height.
- Corrosion resistant version available.
- Clamping brake version for ring systems. See illustration left.
- Compatible with track system drive components and carriage locking system.

**Keyway alignment facility [42-43]**
- Facilitates easy installation and adjustment of joins between straight & curved slides.
- Overcomes minor inaccuracy in positioning.
Bearing Adjusting Tools and Tightening Torques

Ring and Track System Installation

Adjusting method for Through Fixing Eccentric bearings carriages, the steps outlined in the adjustment procedure on.

When adjusting fixed centre carriages the lubricators should first be removed in order to gain access. When adjusting bogie associated with this method, it is only recommended when the adjusting wrench method above is not possible.

In some circumstances, it may be difficult to gain access to the hexagonal flange for system adjustment. In these situations, the bearings should be rotated to their outermost position. The carriage may then be introduced to the slide as shown below.

Both eccentric bearings should be rotated in the direction of the arrow shown opposite, until the bearings skid against the slide. A uniform degree of resistance should be felt, but the bearings should be able to be rotated without difficulty. Preventing the ring slide or carriage from moving such that the bearings by holding them between forefinger and thumb whilst.

The correct condition of adjustment should be assessed by rotating bearings by holding them between forefinger and thumb whilst.

The specified Hepco Adjusting Wrench. A further check should be made to ensure the correct condition of adjustment.

System Adjustment and Installation

When ordering individual components for the first time an Adjusting Wrench or Socket Tool should be ordered, these are datasheet No. 2 Installation details.

For details on Ring and Track system installation, please visit www.HepcoMotion.com/PRT2datauk.

Adjusting AT13 AT18 AT25 AT34 AT54

Wrench - RT6 RT8 RT10 RT14

Socket Tool using end socket in journal

Fixing Nut Torque 2 Nm 7 Nm 18 N m 33 Nm 90 Nm

Hepco Socket Tool

Bearing Ø 13 18 25 34 54

Alternative adjusting method

Tool - RT6 RT8 RT10 RT14

Fixing Nut Torque 2 Nm 7 Nm 18 N m 33 Nm 90 Nm

Hepco Socket Tool

Bearing Ø 13 18 25 34 54

It should be noted that the load/life calculations assume a light preload, as is described above. Systems which are preloaded more heavily than this will suffer a reduction in the life as compared with that predicted by the calculations.

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The specified Hepco Adjusting Wrench. A further check should be made to ensure the correct condition of adjustment.

System Composition

- **Track system straight slides** 42-43 / **Track system curved segments** 44 *
  - * Hardened V faces for maximum wear resistance.
  - * Soft centre allows customising.
  - * Precision ground on ends and all important faces.
  - * Stainless steel option.
  - * All segments and slides precision matched.
  - * Ground datum faces for location purposes.
  - * Option available to suit pre-drilled mounting holes.
  - * 90° and 180° segments available from stock.
  - * Any length segment available to order.
  - * Central keyway for location and alignment.
  - * Up to 4m in one piece, unlimited length achieved by butting.

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**Dowel pins** 42-43

- Locates in central keyway of straight slide for ease of location and alignment.

**Bogie carriage** 47

- Negotiates ‘S’ bends and differing bend radii.
- High performance swivel bearing for precision movement and extreme rigidity.
- Swivel bearings are lubricated for life internally.
- Available in three sizes to suit 25, 44 & 76 track systems.
- Supplied with tapped holes for ease of component mounting.
- Accurate overall height.
- Large platform for mounting purposes.
Bearing Adjusting Tools and Tightening Torques

Ring and Track System Installation

Adjusting method for Through Fixing Eccentric bearings carriages, the steps outlined in the adjustment procedure on

When adjusting fixed centre carriages the lubricators should first be removed in order to gain access. When adjusting bogie associated with this method, it is only recommended when the adjusting wrench method above is not possible.

Due to the reduced control it is possible to adjust by rotating the eccentric bearing using an allen key located in the hexagonal socket in the end of the stud and tightening the fixing nut at the same time using the Hepco socket tool, see table below.

It should be noted that the load/life calculations assume a light preload, as is described above. Systems which are preloaded more heavily than this will suffer a reduction in the life as compared with that predicted by the calculations.

Alternative adjusting method using end socket in journal

Fixing Nut Torque

<table>
<thead>
<tr>
<th>Bearing Ø</th>
<th>2 Nm</th>
<th>7 Nm</th>
<th>18 Nm</th>
<th>33 Nm</th>
<th>90 Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hepco Socket</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Once adjusted in this manner, the eccentric bearing fixing nuts should be fully tightened and the eccentric bearings semi-tightened and correctly assembled and adjusted. To fit a carriage, the concentric bearings should be fully tightened and the eccentric bearings skid against the slide. A uniform degree of resistance should be felt, but the bearings should be able to be rotated without difficulty.

To get the best performance from a HepcoMotion ring slide system, it must be

For details on Ring and Track system installation, please visit www.HepcoMotion.com/PRT2datauk

System Composition

Moment load carriage **48-49**

- Supports overhanging loads and increases direct load capacity at workstations.
- Compatible with HepcoMotion carriage locking system and support frame.
- Compatible with HepcoMotion belt drive connection facility.
- Many support options possible using standard components.
- Static and dynamic support possibilities.

Lubricators **37**

- Provides lubrication to the contact faces thereby increasing load capacity and life.
- Long lubrication interval.
- Lightly sprung felt wiper for low friction.
- Compact type suitable for through hole fixing, flanged type for through and blind hole fixing.

Ring Disc **32-33**

- Ideally suited to turntable applications.
- Large precision mounting surface easily customised to suit customer’s components.
- Precision ground all over for high accuracy and conformity.
- Gear cut option for ease of driving.
- Useful range of sizes available.
- Choice of fixing, counterbored holes or tapped hole option.
- V edge hardened for maximum wear resistance.
- Stainless steel option available.

Bleed lubrication **52**

- Suitable for use with track systems.
- Lubrication piped through holes, direct into the V contact faces.
- Controlled metering of lubrication.
- Overcomes necessity for lubrication service intervals

Pinions **53**

- Sizes to suit all gear cut ring slides, segments and ring discs.
- Ground teeth for long life and smooth operation on sizes 1 module and above.
- Hardened teeth on larger sizes for increased durability.
- All pinions available in stainless steel as option.
- Precision machined bore, and optional keyway on sizes 1 module and above.
Spray System
Spray head mounted on HepcoMotion double edge ring segment with external gear drive, tracks curvature of product.

Mobile Saw for Long Tubes
Motor and saw assembly mounted on carriage is hand operated around 360° HepcoMotion double edge ring slide in order to cut tube.

Simple Pick and Place Unit
HepcoMotion double edge ring slide with external gear drive and bearings mounted externally, gives excellent stability for 360° rotation and provides an uninterrupted space in the centre for routing the services.
Application Examples

Three Axis Assembly Robot
HepcoMotion ring disc with gear drive ① provides an ideal platform on which to mount the robot. The large diameter disc with HepcoMotion bearings gives support at the periphery, ensuring excellent stability and friction free motion.

Rotary Assembly fixture
HepcoMotion ring disc ① provides a large mounting area for attaching components. The precision ground surface ensures accuracy and the unhardened area inboard of the V's enables tooling holes to be drilled as required.

Bottle Crown Cap Indexer
Bottle turn table is mounted on a HepcoMotion single edge ring slide ① which allows friction free rotation and provides control at the periphery adjacent to where the load is being applied. The large tooth form and width of the internal gear drive ② permits high transmission forces and ensures long life in this high speed indexing application.
Application Examples

Body Scanner
Imaging head mounted on HepcoMotion ring slides rotate around the patient. Smooth, silent operation and zero play ensures high quality definition. HepcoMotion floating bearings cater for any slight differences in parallelism of the rings due to mounting and ensure that accuracy is determined by the master ring alone.

Laminating Machine
Carriages rotate on upper track cooperate with carriages on the lower track to pressure laminate chemical sensitive paper. HepcoMotion track systems permit continuous motion at high speed and ensure precise alignment with zero play. HepcoMotion bogie carriages on the bottom track allow track system segments of different radii to be negotiated.
Application Examples

Flash Removal from Moulding
Carriage 1 on track system 2 accurately follows the profile of the product. Rigidity of the carriage assembly ensures a good quality finish of the trimmed edge.

Multi-Station Assembly Machine
Carriages linked by connecting rods 1 are indexed around a track system circuit 2 by means of a walking beam system operated by HepcoMotion GV3 straight slides 3. Zero play and precise positioning enables highly accurate work to take place at each station. Bogie carriages 4 provide a large platform for mounting the components.
Carton Forming & Filling Line

HepcoMotion Track system provides a simple means of transportation from station to station. Alternate carriages are independently driven enabling quick change over to different sizes by advancing one chain wheel in relation to the other. The zero play feature of the Hepco system ensures that the cartons are rigidly supported during the erecting, filling and closing operations.
Figure of 8 Circuit for Test and Assembly

HepcoMotion track system 1 enables hydraulic manifolds to be friction driven to a test station and then to subsequent assembly and unload stations or, if rejected, back to the load station. The unique ability of the Hepco System to traverse from one slide to another, enables a turntable to be designed at the crossover junction using a HepcoMotion ring disc 2 to provide rotary movement. Bogie carriages 3 allow S bends to be traversed.

Optical Lens Assembly

Machine incorporates a standard HepcoMotion DTS complete driven track system for which there is a separate catalogue. See also 50 & 51.

Lenses are loaded by pick and place units onto clamp fixtures mounted on HepcoMotion carriages 1. Optical adhesive is applied between lenses before passing through ultra-violet light box to activate hardener. Precise positioning of carriages is required at work stations, this is achieved by means of the HepcoMotion carriage locking system 2.
### Application Examples

**Clamping Method for Belt to Carriage Connection**

Carriages are connected to the belt by means of clamping device 1, resulting in a strong fixing which overcomes the need to screw through the belt. The pulleys must be machined to provide recesses 2 in order to accommodate the clamps. The slip block method 19 should be used to adjust track system length in relation to the tensioned belt.

![Clamping Method Diagram](image)

**Track Systems Mounted in Parallel**

Two track systems may be mounted in parallel in order to support long components. This application incorporates heavy duty toothed belts with teeth removed at the carriage connection positions and replaced by steel inserts 3. This enables the drive link brackets 2 to be bolted through to the steel inserts thereby achieving a strong fixing. Link arms 4 connect the carriages to the belts to provide a one way drive. This allows the pulleys to be adjusted in relation to the tracks for belt tensioning purposes. To overcome the necessity for accurate spacing apart of the tracks, HepcoMotion floating type bearings 5 are used on one side to accommodate any axial wander.
Application Examples

Pocket Wheel Drive
Carriages are linked together by connecting rods ⊙. A cam follower ⊙ located on each carriage engages with cutouts ⊙ in a pocket drive wheel which moves the carriage around the track system. This method of driving requires some compliance in the connecting rods and sufficient clearance in the wheel for cam follower engagement.

Spider Drive
For short track systems carriages ⊙ can be driven from a central motor and spider. The arms of the spider ⊙ incorporate slots to accommodate the changing distance of the carriages from the motor drive shaft.

DTS2
Dynamic Track System
The HepcoMotion DTS2 is derived from PRT2 and was developed for tracks requiring high speed, rapid indexing and high driving forces. It includes a PRT2 track ⊙, mounted on a Hepco MCS compatible frame ⊙. Its carriages ⊙, are linked with adjustable spring-loaded belts and driven by a screw ⊙. The DTS2 can be supplied with motors, drives and bleed lubrication system (L 52).
DTS2 units can be oval as illustrated, rectangular, or have any other valid track layout without S-bends. A range of sizes is available, in either standard or corrosion resistant version.
A datasheet for DTS2 is included at www.HepcoMotion.com/dts2datauk.
Slotted Carriage Connection For Belt Adjustment
The timing belt is fitted with U section attachments secured to the belt with countersunk screws. Pins engage with slotted drive member which drives the carriage around the circuit. In this type of design whether using a belt or chain, it is important to provide a slot to allow for tension adjustment and also to cater for slight variation in the proximity of carriage to belt or chain, as the carriage traverses from straight to curve.

Linked Carriage System With Latch & Pawl Drive
Bogie carriages linked by adjustable connecting rods, are indexed by means of HepcoMotion Powerslide and latch mechanism. Hepco carriage locking system ensures location and positional accuracy during the stationary cycle. Linked carriage systems require some play to be present in the link journals or to have other means of compliance. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 1 Design criteria for Track System Drives.

Link Drive
A simple link arm pivoting on an extended pin, connects to the carriage and provides for a drive in a single direction only. The design allows an amount of chain adjustment to take place and caters for slight variation in the proximity of carriage to chain, as the carriage traverses from straight to curve. It is recommended that chain support rails are fitted to overcome the offset drive forces.

Slotted Carriage Connection For Belt Adjustment
The timing belt is fitted with U section attachments secured to the belt with countersunk screws. Pins engage with slotted drive member which drives the carriage around the circuit. In this type of design whether using a belt or chain, it is important to provide a slot to allow for tension adjustment and also to cater for slight variation in the proximity of carriage to belt or chain, as the carriage traverses from straight to curve.

Linked Carriage System With Latch & Pawl Drive
Bogie carriages linked by adjustable connecting rods, are indexed by means of HepcoMotion Powerslide and latch mechanism. Hepco carriage locking system ensures location and positional accuracy during the stationary cycle. Linked carriage systems require some play to be present in the link journals or to have other means of compliance. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 1 Design criteria for Track System Drives.

Link Drive
A simple link arm pivoting on an extended pin, connects to the carriage and provides for a drive in a single direction only. The design allows an amount of chain adjustment to take place and caters for slight variation in the proximity of carriage to chain, as the carriage traverses from straight to curve. It is recommended that chain support rails are fitted to overcome the offset drive forces.
Linked Carriage System With Scroll Drive
Bogie carriages linked by adjustable connecting rods, incorporate rollers which engage with the screw to provide either intermittent or continuous motion drive. Linked carriage systems require some play to be present in the link journals or to have other means of compliance. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. Design criteria for Track System Drives.

Duplex Track System With Centre Chain Drive
This durable and highly stable duplex track system capable of withstanding high loads, is available complete with special chain and scroll drive system from Hepco. The track system comprises of duplex single edge slides and a central drive to ensure constant velocity around the circuit. Any number of carriages at virtually any spacing can be accommodated on the system which can be supplied complete with motor and mounted on a Hepco MCS frame. Chain adjustment is rarely required but is achieved by the slip block method as shown and further illustrated 19. Either intermittent or constant motion is possible in either direction. A unique mechanism within the carriage in conjunction with the carriage locking system enables index positioning to within 0.02mm to be achieved.
Application Examples

**Gear Driven Duplex Track System**

Single edge track system with a gear drive on the inner curved and straight slides (1), engages with pinion (2) driven from the motor. A sprung pivot arm (3) ensures that the pinion remains engaged with the rack as it travels from straight to curve. The system is a standard HepcoMotion design and can be supplied either in part or, as a complete system with motor as required.

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**Track System With Moment Load Carriage**

In this standard HepcoMotion Driven Track System example a high downwards force is being applied to the carriage during a stamping operation. The moment load carriage (1) and static roller support (2) provides additional support whilst the force is being applied. A HepcoMotion carriage locking system (3) ensures precise location and positional accuracy whilst the operation takes place.
Application Examples

Chain Tensioning for Long Track Systems
A track system driven by a chain or belt ideally requires a means of adjustment for pretensioning and to allow for subsequent wear and stretch, particularly in the case of a chain drive. Limited adjustment can be achieved by providing a slot at the chain to carriage connection point (see top illustration 16) or by link connection of chain to carriage (see centre illustration 16 and example below). However, in systems where a large amount of adjustment is anticipated or where the path of the belt or chain must follow in exact relationship to the path of the track, the Slip Block or Bridging methods of adjustment should be considered.

Slip Block Adjustment Method
Hepco can provide sets of short length straight slides in various increments of length, precisely matched to those on the track system and with square ground ends. Each slide will be marked according to its length. Slide support blocks can also be supplied to customer’s drawing if required. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No.10 Slip Block adjustment method.

Bridging Slide Adjustment Method
The bridging slide arrangement enables the track to be extended following adjustment of the chain drive whilst maintaining continuity of guidance and control. In order to traverse the adjustment gap, the bearings have external chamfers on the outside diameter in addition to the normal central V. The bridging slide arrangement comprises of three fixed slideways and one adjustable slideway, see illustrations below. All components comprising the bridging slide arrangement and special bearings can be readily supplied. Please advise total amount of slide adjustment required.
Full size illustrations of the basic range of Ring slide systems together with a comparison table for bearings and lubrication are provided to help with initial selection. Customers should refer to the individual component pages for dimensions and to the Technical section for details of load and life. There is a wide range of other options and components complementary to those shown in this section. These are illustrated in the System Composition and throughout the catalogue.

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Load</th>
<th>Speed</th>
<th>Smoothness</th>
<th>Tolerance of Misalignment</th>
<th>Ridgity</th>
<th>Tolerance of Debris</th>
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<td>Floating Bearing</td>
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<table>
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</tbody>
</table>

Automatic lube frequency possible

Ø54

R76
Assembled Double Edge Ring System

The HepcoMotion double edge ring system with carriage may be used in either complete ring form or with segments. It can also be combined with straight slides to form a track system \( 40-44 \). Rings may also be encircled by bearings either externally and/or internally with either ring or bearings being the moving element (see page opposite). The HepcoMotion PRT2 eccentric bearings are of double eccentric design with sufficient throw to enable disengagement of the carriage or encircled ring, without further disassembly.

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<table>
<thead>
<tr>
<th>Ring Slide Ref No</th>
<th>For use with bearing (Ø)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<th>J*1</th>
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</table>

Notes:
1. Two lengths of stud are available for each size of bearing \( 34-35 \). Choose according to required carriage thickness.
2. Offset holes in carriage for eccentric bearings necessitate adjustment in direction of arrow shown (see page opposite).
3. Exact theoretical values have been given for ‘Q’, ‘R’ and ‘S’. Positional accuracy of dimension ‘S’ will determine the axis of the ring. Positional accuracy for dimensions ‘Q’ and ‘R’ are not normally critical. Holes for bearing studs should be reamed to tolerance F6 for a sliding fit.

---
Assembled Double Edge Ring System

When using HepcoMotion Double Edge Ring Slides encircled by bearings as shown below it is recommended that two concentric bearings should be placed 120° apart in order to provide a datum reference. The other bearings should be the eccentric type. All eccentrics may be used where positional adjustment of the ring is required.

One or more lubricators may be fitted at convenient positions to take advantage of the increased load/life afforded by lubrication.

**Ordering details:** Simply list the components required and if relevant, bracket those you wish to be factory assembled.

**Example:**

```
Assembled
{
  1 x R25 159 R180
  1 x FCC 25 159
}
```

**Blind Hole Fixing Bearing (eccentric)**

**Blind Hole Fixing Bearing (concentric)**

**Bearing**

**Lubricator**

**Pinion**

**Drilling Centre**

**Calculations**

---

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<th>O</th>
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<td>95.6</td>
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When using HepcoMotion external single edge ring slides it is recommended that two concentric bearings should be placed 120° apart in order to provide a datum reference. The other bearings should be eccentric type. All eccentrics may be used where positional adjustment of the ring is required. Either ring or bearings can be the moving element. The HepcoMotion PRT2 eccentric bearings are of double eccentric design with sufficient throw to enable disengagement of the ring without disassembly. One or more lubricators may be fitted at convenient positions to take advantage of the increased load/life afforded by lubrication.

Notes:
1. Short or long stud lengths are available for each size of bearing 34-35. Choose according to the required mounting plate thickness.
2. Exact theoretical values have been given for ‘B’, ‘C’ and ‘D’. Positional accuracy of dimension ‘B’ will determine the axis of the ring. Positional accuracy for dimensions ‘C’ and ‘D’ are not normally critical. Holes for bearing studs should be reamed to tolerance F6 for a sliding fit.
When using HepcoMotion internal single edge ring slides it is recommended that two concentric bearings should be placed 120° apart in order to provide a datum reference. The other bearings should be eccentric type. All eccentrics can be used where positional adjustment of the ring is required. Either ring or bearings may be the moving element. The HepcoMotion PRT2 eccentric bearings are of double eccentric design with sufficient throw to enable disengagement of the ring, without further disassembly. One or more lubricators may be fitted at convenient positions to take advantage of the increased load/life afforded by lubrication.

Notes:
1. Short or long stud lengths are available for each size of bearing. Choose according to the required mounting plate thickness.
2. Exact theoretical values have been given for ‘B’, ‘C’ and ‘D’. Positional accuracy of dimension ‘B’ will determine the axis of the ring. Positional accuracy for dimensions ‘C’ and ‘D’ are not normally critical. Holes for bearing studs should be reamed to tolerance F6 for a sliding fit.
3. The eccentric blind hole fixing bearing cannot be used with the RIS 182 ring slide as it clashes with the ring.
HepcoMotion double edge ring slides are manufactured from high quality steel, zone hardened on the V edges and precision ground all over with datum register faces provided both internally and externally for ease of location. Gear drive options are available with teeth machined into either the internal or external register face. The number of teeth on the standard external option is divisible by 4 and 12 in order to provide maximum choice of pinion size for exact ratio requirements. Customers may also choose the tapped hole option ‘N’ which enables the ring slide to be bolted from below. Stainless steel ring slides and segments are available for customers requiring corrosion resistance.

**Notes:**

1. Standard ring segments will be slightly less than 90° and 180° because of the cutting allowance. Full 90° and 180° segments can be supplied to customer’s special order.

2. Socket head cap screws DIN912 will protrude 1mm above the surface of the R12 and R20 section slide rings. Customers requiring screws to be flush should use low head type DIN7984, available from Hepco upon request.
HepcoMotion double edge ring segments are cut from complete 360° ring slides and held in stock in nominal 90° and 180° segments. Any length segment can be cut to customer's special order and additional holes drilled as required. Although suitable for most applications, slight out of roundness and flatness may be experienced with slide rings and segments in their free unmounted condition. This may be overcome by installing against a register and bolting to a flat surface. True shape rings and segments are available on request. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 9 True Shape Rings & Segments.

### Ordering details:

**SS** = Stainless Steel option
Leave blank for steel version

**N** = Tapped hole option
Leave blank for plain holes

**Q** = Internal gear drive option
Leave blank if not required

**P** = External gear drive option
Leave blank if not required

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<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
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| R12 93      | ... J13 ...              | 93 | 84.4   | +0.011 | 101.6 | +0.037 | 105.37 | 80.63 | 12 | 12.37 | 8.6 | 77 | 6.2 | 3 | 3.5 | 6 x 3 | 3.7 | M3
| R12 127     | ... J13 ...              | 127 | 118.4  | +0.011 | 135.6 | +0.037 | 139.37 | 114.63 | 12 | 12.37 | 8.6 | 77 | 6.2 | 3 | 3.5 | 6 x 3 | 3.7 | M3
| R20 143     | ... J18 ...              | 143 | 130.6  | +0.013 | 155.4 | +0.037 | 163.37 | 122.63 | 20 | 20.37 | 12.4 | 10 | 8 | 4.2 | 3.8 | 8 x 3.5 | 5.0 | M4
| R20 210     | ... J18 ...              | 210 | 197.6  | +0.015 | 222.4 | +0.037 | 230.37 | 189.63 | 20 | 20.37 | 12.4 | 10 | 8 | 4.2 | 3.8 | 8 x 3.5 | 5.0 | M4
| R25 159     | ... J25 ...              | 159 | 143.6  | +0.013 | 174.4 | +0.039 | 184.74 | 133.26 | 25 | 25.74 | 15.4 | 12.25 | 10 | 4.5 | 3.75 | 9 x 6 | 5.5 | M5
| R25 255     | ... J25 ...              | 255 | 239.6  | +0.015 | 270.4 | +0.041 | 280.74 | 229.26 | 25 | 25.74 | 15.4 | 12.25 | 10 | 4.5 | 3.75 | 9 x 6 | 5.5 | M5
| R25 351     | ... J25 ...              | 351 | 335.6  | +0.006 | 366.4 | +0.044 | 376.74 | 325.26 | 25 | 25.74 | 15.4 | 12.25 | 10 | 4.5 | 3.75 | 9 x 6 | 5.5 | M5
| R44 468     | ... J34 ...              | 468 | 442    | +0.020 | 494   | +0.046 | 512.74 | 423.26 | 44 | 44.74 | 26 | 15.5 | 12.5 | 6.7 | 11 x 7 | 6.8 | M6
| R44 612     | ... J34 ...              | 612 | 586    | +0.022 | 638   | +0.048 | 656.74 | 567.26 | 44 | 44.74 | 26 | 15.5 | 12.5 | 6.7 | 11 x 7 | 6.8 | M6
| R76 799     | ... J54 ...              | 799 | 748.5  | +0.025 | 849.5 | +0.051 | 875.74 | 722.26 | 76 | 76.74 | 50.5 | 24.9 | 19.5 | 9 | 12 | 20 x 13 | 14 | M12
| R76 1033    | ... J54 ...              | 1033 | 982.5  | +0.028 | 1083.5 | +0.054 | 1109.74 | 956.26 | 76 | 76.74 | 50.5 | 24.9 | 19.5 | 9 | 12 | 20 x 13 | 14 | M12
| R76 1267    | ... J54 ...              | 1267 | 1216.5 | +0.033 | 1317.5 | +0.057 | 1343.74 | 1190.26 | 76 | 76.74 | 50.5 | 24.9 | 19.5 | 9 | 12 | 20 x 13 | 14 | M12
| R76 1501    | ... J54 ...              | 1501 | 1450.5 | +0.059 | 1551.5 | +0.060 | 1577.74 | 1424.26 | 76 | 76.74 | 50.5 | 24.9 | 19.5 | 9 | 12 | 20 x 13 | 14 | M12
HepcoMotion single edge ring slides are manufactured from high quality steel, zone hardened on the V edge and precision ground all over. Datum register faces are provided both internally and externally for ease of location. Gear drive options are available with teeth machined into the internal register face. The number of teeth is divisible by 4 and 12 in order to provide maximum choice of pinion size for exact ratio requirements. Customers may also choose the tapped hole option ‘N’ which enables the ring slide to be bolted from below. Stainless steel ring slides and segments are available for customers requiring corrosion resistance.

**Section X-X**

**Notes:**

1. Standard ring segments will be slightly less than 90° and 180° because of the cutting allowance. Full 90° and 180° segments can be supplied to customer’s special order.
External Single Edge Ring Slides & Segments

HepcoMotion ring segments are cut from complete 360° ring slides and held in stock in nominal 90° and 180° segments. Any length segment can be cut to customer’s special order and additional holes drilled as required. Although suitable for most applications, slight out of roundness and flatness may be experienced with slide rings and segments in their free unmounted condition. This may be overcome by installing against a register and bolting to a flat surface. True shape rings and segments are available on request. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 9 True Shape Rings & Segments. Larger diameter single edge ring slides are available in the HDRT range for which there is a separate catalogue 61.

Ordering details:

SS = Stainless Steel option
Leave blank for steel version

Part Number

R90 = 90° segment

R180 = 180° segment

R360 = Full 360° ring

SS = Tapped hole option
Leave blank for plain holes

Q = Internal gear drive option
Leave blank if not required
HepcoMotion single edge ring slides are manufactured from high quality steel, zone hardened on the V edge and precision ground all over. Datum register faces are provided both internally and externally for ease of location. Gear drive options are available with teeth machined into the external register face. The number of teeth is divisible by 4 and 12 in order to provide maximum choice of pinion size for exact ratio requirements. Customers may also choose the tapped hole option 'N' which enables the ring slide to be bolted from below. Stainless steel ring slides and segments are available for customers requiring corrosion resistance.

**Notes:**
1. Standard ring segments will be slightly less than 90° and 180° because of the cutting allowance. Full 90° and 180° segments can be supplied to customer’s special order.
HepcoMotion single edge ring slides are cut from complete 360° ring slides and held in stock in nominal 90° and 180° segments. Any length segment can be cut to customer’s special order and additional holes drilled as required. Although suitable for most applications, slight out of roundness and flatness may be experienced with slide rings and segments in their free unmounted condition. This may be overcome by installing against a register and bolting to a flat surface. True shape rings and segments are available on request. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 9 True Shape Rings & Segments. Larger diameter single edge ring slides are available in the HDRT range for which there is a separate catalogue 61.

### Ordering details:

SS = Stainless Steel option
Leave blank for steel version

R90 = 90° segment

R180 = 180° segment

R360 = Full 360° ring

N = Tapped hole option
Leave blank for plain holes

P = External gear drive option
Leave blank if not required
HepcoMotion Ring Discs are ideally suited for turntable applications where a precision platform is required for the mounting of components. Ring discs are made from high quality steel, hardened on the V edge and precision ground all over*1. An external datum register is provided and a gear drive option is available in which the number of teeth is divisible by 4 and 12 in order to provide maximum choice of pinion size for exact ratio requirements.

All key dimensions are the same as for the corresponding size of Double Edge Ring Slide Ω 27.

**Notes:**

1. The internal faces of the lightening recess in the lightweight version are not ground. On stainless steel ring discs, these surfaces are polished.
Ring Discs

For applications where weight is an issue, a lightweight version (option 'L') is available. Stainless steel ring discs are also available, as is the tapped hole option 'N'.

Ring discs can be made to customer’s specification, on request. Variations include other diameters, different thicknesses, special holes, registers or other mounting features, and alternative patterns of lightening recess.

### Ordering details:

**SS** = Stainless Steel option

Leaf blank for steel version

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<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>G</th>
<th>H ±0.025</th>
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**SS** = Stainless Steel option

Leaves blank for plain holes

**P** = External gear drive option

Leaves blank if not required

**L** = Lightweight option

Leaves blank if not required
Bearing

HepcoMotion PRT2 bearings are available in five sizes to suit the five ring slide sections. Bearings can be used with more than one ring size: for details, please visit [www.HepcoMotion.com/PRT2datauk](http://www.HepcoMotion.com/PRT2datauk) and select datasheet No. 11 PRT2 mix and match.

The following bearing formats and fixing methods cater for most design requirements:

**Twin Bearing type** has the smoothest running quality, is easiest to adjust and offers some compliance to accommodate misalignment. It has two deep groove ball bearings on a single stud, and is the usual choice for many systems.

**Double Row Bearing type (DR)** incorporates a one-piece outer ring with two ball tracks. It offers more load capacity, life and stiffness, and copes better with debris. Dimensions are identical to the twin bearings type. DR bearings are more demanding of installation tolerances and it is recommended that they are specified with the CHK option*4.

**Nitrile Sealed option (NS)** available for both bearing formats, provides better sealing against water or debris than the metal shielded type. A small increase in friction may result. See No. 20 for the bearing and lubrication selector.

**Through Fixing Type (RSJ/RLJ)**

![Diagram of Through Fixing Type (RSJ/RLJ)](image)

**Short stud (SJ) / Long stud (LJ)**

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**Notes:**

1. It is recommended that holes to suit bearing mounting studs should be reamed to tolerance F6 for a sliding fit.
2. Nuts and washers are supplied with both concentric and eccentric RSJ/RLJ type bearings.
3. ‘N’ is the eccentric offset due to the double eccentric design (2 x N = total stroke). R dimension is both the eccentric offset of the adjusting nut and total stroke at the bearing centreline.
4. Controlled height (CHK) bearings are selected in ±0.010mm bands in respect of the B1 dimension. They are supplied in sets of up to 50 parts as standard, with larger sets on request.
5. For adjusting tool part numbers see table. For adjustment procedure and fixing nut tightening torques see No. 58.
6. Fasteners for the through fixing type bearings are black on the concentric version and bright zinc plated on the eccentric version for identification purposes, except stainless steel type.
7. Stainless steel bearings are only available nitrile sealed.
Through Hole Fixing type is available in two stud lengths covering most thicknesses of mounting plate, the short version being used in HepcoMotion carriages. Both are available in Concentric (C) which provides a datum for the system, and Eccentric (DE) to provide enough adjustment to permit disengagement of a carriage or ring encircled by bearings. All bearings are available in a Controlled Height version (CHK) which minimises variation in the B1 dimension*4. This is desirable in high precision applications and is recommended whenever Double Row Bearings are used.

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

All bearings are greased for life internally. Customers are strongly advised to provide lubrication to the interface between bearings and ring slide by specifying HepcoMotion Lubricators 37 or Bleed Lubrication system 52. Lubrication greatly increases load capacity and life.

### Blind Hole Fixing Type (RBHJ)

#### Concentric (C)

#### Eccentric (E)

Journal type:
- **C** = Concentric  (fixed)
- **E** = Eccentric (adjustable, RBHJ only)
- **DE** = Eccentric (adjustable RSJ/RLJ only)

Bearing diameter options are 13, 18, 25, 34 & 54.

Fixing type:
- **RSJ** = Short stud
- **RLJ** = Long stud
- **RBHJ** = Blind hole fixing

### Ordering details:

**SS** = Stainless steel option*7
Leave blank for steel version

**Fixing type:**
- RSJ = Short stud
- RLJ = Long stud
- RBHJ = Blind hole fixing

Bearing diameter options are 13, 18, 25, 34 & 54

**Part Number**

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<th><strong>F</strong></th>
<th><strong>G</strong></th>
<th><strong>H</strong></th>
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<th><strong>J</strong></th>
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<th><strong>L</strong></th>
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</table>
HepcoMotion Floating Bearings incorporate caged needle rollers and are designed to provide axial movement (float) of the V position. This is especially useful where two rings or track systems are mounted apart, see application example 14. The float compensates for parallelism tolerances between the opposing V’s, eliminating additional loading and maintaining consistent running quality. Three sizes are available, each to correspond with one ring slide section, but they can be used with other sections. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 11 PRT2 mix and match.

Two stud lengths are available covering most thicknesses of mounting plate, the short version being compatible with HepcoMotion carriage plates. Both versions are available in Concentric (C) which provides a datum (in radial direction) for the system, and Eccentric (DE) which provides sufficient adjustment to allow disengagement of a carriage or ring encircled by bearings 58.

All bearings are greased for life internally. Customers are strongly advised to provide lubrication to the interface between bearings and ring slide by specifying HepcoMotion Lubricators 37 or bleed lubrication system 52. Lubrication greatly increases load capacity and life.

**Notes:**
1. It is recommended that holes to suit bearing mounting studs should be reamed to tolerance F6 for a sliding fit.
2. Nuts and washers are supplied with both concentric and eccentric RSFJ/RLFJ type bearings.
3. For adjustment procedure and bearing fixing nut tightening torques see 58.
4. Fasteners are black on the concentric version and bright zinc plated on the eccentric version for identification purposes.
5. ‘B1’ dimension is the min/max axial movement of the V centre.
6. ‘N’ is the eccentric offset due to the double eccentric design (2 x N = total stroke).

**Ordering details:**
Fixing type: **RSFJ** = Short Stud  
**RLFJ** = Long Stud

Bearing diameter (options are 25, 34 & 54)
HepcoMotion lubricators are made from impact resistant plastic and house a sprung oil impregnated felt wiper designed to apply a constant film of oil to the working surfaces of the ring slide without imposing undue friction. The application of oil significantly increases the load and life of the system. Either type of lubricator can be used with individual ring slides, segments and ring discs. The compact type can be used with Hepco fixed centre carriage plates. Customers may also consider using the HepcoMotion bleed lubrication facility suitable for track systems 52.

**Ordering details:**

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<th>Part Number</th>
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<td>LB 76</td>
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**Notes:**
1. 2 machine screws with cross-recessed pan heads to DIN7985A are supplied for fixing the flanged type lubricator (see J1 in table). Additionally, 2 self tapping screws for plastic with PT thread form and cross-recessed pan heads are supplied for the compact type lubricator (see J in table).
2. Lubrication interval depends on length of stroke, duty and environmental factors. Replenish lubricant as necessary using a 68 viscosity EP mineral oil.
3. Size 25, 44 & 76 lubricators are available with increased clearance “H1” to accommodate the “V float” of the floating bearings 36.

**Option - FB**

For use with Floating Bearings

**Fixing Methods**

**Blind Fixing Flanged Type**

**Through Fixing Compact Type**

**Oil Impregnated Felt Wiper**

**Oil Lubrication Point**

**Flanged Type (F)**

**Compact Type (C)**

**Notes:**
- FB = Floating Bearing option
- Specify only for lubricators used with floating bearings
**Fixed Centre Carriage**

The HepcoMotion Fixed Centre Carriage is designed for use with track systems with unidirectional bends of a common radii 40 and for use with double edge ring slides and segments 26-27. The unique geometry enables carriages on a track system to travel from straight to curve with negligible play in the transition zone. Such play as may develop is not detrimental to the performance of the system.\(^1\)

Carriages are available with twin or double row (DR) bearings 34-35, and with floating bearings 36. Carriages with twin bearings have the smoothest running quality and have some compliance to accommodate misalignment. Carriages with DR bearings have better load capacity and stiffness. Due to the rigidity of DR bearings, carriages with this option are supplied as Controlled Height (CHK)\(^5\) as standard.

The corrosion resistant version has stainless steel bearings and fasteners, and a high performance USDA approved surface treatment to the aluminium carriage plate in place of the standard anodised finish.

---

**Notes:**

1. Fixed centre carriages will experience a reduction in preload or a slight clearance as they pass between the curves and straights on a track system, but this is rarely an issue. This clearance is detailed on 57. Please note the FCC25 139 has a larger than normal clearance. Bogie carriages 47 are not subject to clearance.

2. Offset holes in carriage for eccentric bearings necessitate adjustment rotation in the direction shown.

3. It is recommended that carriages are fitted with lubricators. The quantity of lubricators may be reduced in systems with many carriages or where the bleed lubrication facility is used 52.

4. Dowel holes V1 define the centre and may be used for location purposes. They are not included as standard on the corrosion resistant version, but are available on special request.

5. CHK controlled height carriages use CHK bearings 35 and are supplied in sets, matched by their E dimension. It is recommended to specify CHK for precision applications or where consistent carriage heights are important. CHK is standard for carriages with DR bearings.

6. The W dimension is greater for carriages with floating bearings - see W_f in the table. Dimensions D and E will change for carriages with floating bearings. The amount of float is indicated by dimension B1 36.
### Fixed Centre Carriage

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### Ordering details:

- **CR**° = Corrosion resistant option
  - Leave blank if not required
- **LB**° = Lubricator option
  - Leave blank if not required
- **NS** = Nitrile sealed bearings fitted
  - Leave blank for metal shields

Clamping Brake option available, please refer to PRT2 datasheet No.7

www.HepcoMotion.com/PRT2datauk
HepcoMotion track systems provide a unique method of achieving an almost limitless variety of open or closed circuits by combining straight slides with curved slides. They can be used in any orientation, from horizontal to vertical. Some of the more common track configurations are illustrated on this, and the opposite page. Any number of carriages can be accommodated, either the fixed centre economy type or the bogie type which enables ‘S’ bends or bends of varying radii to be negotiated and which has a larger platform for mounting purposes. A unique jacking screw facility incorporated within the track system enables perfect alignment of straight slides to curved slides. Various drive possibilities exist some of which are illustrated 14-18. Lubrication of the system is achieved either by means of lubricators incorporated within the fixed centre carriages or by means of the HepcoMotion bleed lubrication facility 52 which injects lubricant direct to the V faces of the track. The relevant dimensions of individual track system slides are held on record to enable spares and replacements to be supplied. Track systems are also available in stainless steel for applications requiring greater corrosion resistance.

**Rectangular track system**

**Oval track system**

**Triangular track system**

**Installation**

Installation requires manual drilling and setting. Track systems are also available in suitable grade to correspond with customers pre-drilled mounting holes. Please visit [www.HepcoMotion.com/PRT2datauk](http://www.HepcoMotion.com/PRT2datauk) and select datasheet No. 2 Installation details.

**Notes:**

1. With the fixed centre carriage, some slight play develops as each pair of opposing bearings traverse the join between straight and curve. This is rarely an issue in use. The maximum play acting in the direction of the arrows is given in the table on 57.
2. Standard curved segments will be slightly less than 90° and 180° due to the cutting allowance. This is not detrimental to the smoothness of travel across the joins. Full 90° and 180° segments and segments to any number of degrees can be supplied on request.
Ordering details:

Simply list the curved segments and straight slide part numbers in a clockwise sequence beginning at any point on the track system, see above plan view of track system. Curved segments should be designated suffix ‘C’ for a clockwise bend and suffix ‘A’ for an anticlockwise bend. Final item should be quantity and part number of the carriages required. For grade of track suitable for pre-drilled holes, specify track system type ‘P’. To specify bleed lubrication facility see 52.

(1) TNS25 B420 2 x AK — Track system straight slide 42-43
(2) TR25 255 R90/C — Clockwise curved segment 44
(3) TNS25 B159 2 x AK — Track system straight slide 42-43
(4) TR25 255 R90/C — Clockwise curved segment 44
(5) TNS25 B165 2 x AK — Track system straight slide 42-43
(6) TR25 159 R90/C — Clockwise curved segment 44
(7) TR25 159 R90/A — Anticlockwise curved segment 44
(8) TNS25 B99 2 x AK — Track system straight slide 42-43
(9) TR25 255 R180/C — Clockwise curved segment 44

1 x BCP25

For fixed centre carriage see 38-39

Bogie carriage 47

Fixed centre carriage (special)

Jacking screws

Adjustment Key 42-43

Track system curved segment 44
HepcoMotion track system straight slides are modified straight slides from Hepco’s highly acclaimed GV3 system for which there is a separate catalogue, contact Hepco or visit www.HepcoMotion.com. The slides are manufactured from quality high carbon steel, zone hardened on the V faces for maximum wear resistance and precision ground for high accuracy and conformity. The centre portion of the slide is left soft to allow for customising. Standard lengths are available up to 4020mm (1976mm in the TNMS 12 section) and unlimited lengths can be achieved by butting slides together. Slides are available in stainless steel for applications requiring corrosion resistance. Sets of short slides in incremental lengths can be supplied for customers wishing to extend a system in order to take up chain or belt stretch, see application example 19. For details please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 10 Slip Block adjustment. A bleed lubrication facility is available to channel lubricant direct to the running surfaces 52.

Notes:
1. Standard slide lengths are available in multiples of hole pitch ‘D’ + [2 x ‘C’] up to a maximum length per ‘B’ dimension in table above. Special length slides can be cut to order.
2. Adjustment keys are required at every join between straight slide and curved slide. Please order accordingly (see ordering details). Please note that ‘Q’ dimension for the TNMS 12 & TNV 20 slides is stepped one end to fit keyway ‘H’.
3. Please note that dowel pins for the TNMS 12 slide are not stepped.
4. Slides in their free unmounted state are not necessarily straight. They should be set to the required straightness when bolting down to the mounting surface at assembly.
5. For track system requirements dimensions ‘A1’ and ‘K’ will be matched with corresponding dimensions ‘P’ and ‘I’, 44.
Track System Double Edge Straight Slides

All straight slides within a track system are matched in essential respects both with each other and with their corresponding curved segments. They are ground square on the ends for precision butting and are marked with a reference number and sequence number for identification during installation and for replacement purposes. Opposing slides within a track system are ground to identical lengths. Adjustment keys are available to facilitate alignment with adjacent curved segments. Hepco dowel pins positioned at regular intervals along the slide keyway provide a convenient means of location and alignment. Alternatively, the ground datum faces of the slide may be set against a machined register in the mounting surface.

**Adjustment Key**² (AK)

**Dowel Pin**³ (SDP)

---

### Ordering details:

**Example:**

SS = Stainless Steel option

Part Number

B (slide length) = 1500mm

SS = Stainless Steel option

Leave blank for steel version

Part Number

B (slide length) = 1500mm

SDP = Dowel pin (16-off)

Leave blank if not required

AK = Adjustment key (2-off)

Bleed Lubrication: BLP = Plain bore insert

BLT = Threaded insert

Leave blank if not required
HepcoMotion double edge track system curved segments are cut from stock rings or segments. They are matched in essential respects with their corresponding track system straight slides and ground square on the ends to a specified dimension relative to their true shape. A clearance keyway and tapped hole facility is incorporated each end to provide a method of alignment when assembled together with the mating key of the track system straight slide. An additional fixing hole is provided adjacent to the keyway each end to give extra support at the join position for all segments except the TR12 93 & TR12 127. All track system curved segments are marked with a reference number and sequence number and are available in stainless steel for applications requiring corrosion resistance. Segments to any number of degrees can be supplied to cater for all track system configurations.

For all other details and dimensions see 26-27

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>I</th>
<th>R°</th>
<th>W</th>
<th>W1</th>
<th>X</th>
<th>X1</th>
<th>Y</th>
<th>Y1</th>
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<td>18</td>
<td>2.5</td>
<td>6</td>
<td>7</td>
<td>11.5</td>
</tr>
</tbody>
</table>

Notes:
1. Some distortion may be present in segments in their free unmounted state. This may be overcome by bolting to the mounting surface and setting to adjacent slides using the keyway alignment facility. True Shape segments are available on request. Please visit www.HepcoMotion.com/PRTdatauk and select datasheet No.9 True Shape Rings & Segments.

Ordering details:
Example:

<table>
<thead>
<tr>
<th>SS = Stainless Steel option</th>
<th>TR44 612</th>
<th>R90</th>
<th>(N)</th>
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<tr>
<td>Part Number</td>
<td></td>
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</table>

R90 = 90° segment
R180 = 180° segment
HepcoMotion track system single edge straight slides retain key features of the double edge slides, with precision ground finish and zone hardened V faces 42 & 43. Standard lengths are available up to 4020mm and unlimited lengths can be achieved by butting slides together. Slides are matched in essential respects both with each other and with their corresponding curved segments. They are ground square on the ends for precision butting and are marked with a reference number and sequence number for identification during installation and for replacement purposes 40 & 41. Slide pairs and opposing slides within a track system are ground to identical lengths.

Track system single edge slides, can be used to construct a single edge duplex track system which provides a wide platform for supporting large components with extreme rigidity 42 & 43. The large rear face of the single edge slide enables a full width rack to be machined in the rear face providing for a strong drive. This can be used for the construction of a gear driven duplex track system 18.

Please visit [www.HepcoMotion.com](http://www.HepcoMotion.com) and select datasheet No. 4 Single Edge track systems.

![Track System Single Edge Straight Slides](image)

**Track System Single Edge Straight Slides**

Rack Size

1. Standard slide lengths are available in multiples of hole pitch ‘D’ + (2 x ‘C’) up to a 4020mm maximum length. Special length slides can be cut to order.
2. Slides in their free unmounted state are not necessarily straight. They should be set to the required straightness when bolting down to the mounting surface at assembly.
3. For track system requirements dimensions ‘A1’ and ‘G’ will be matched with corresponding dimensions ‘F’ and ‘I’, 46.
4. Single edge slides with a rack, will be supplied in lengths that correspond to multiplies of rack pitch. The position of the ends of the slides is accurately controlled to coincide with the centre of the rack root to give perfect running joints for slides and ring segments.

**Notes:**

**Part Number**

| Part Number | For use with | A | A1*3 | A2 | C | D | Ø x Depth | E | F | G*3 | H | H1 | J | K | L | M*4 | P | - kg/m
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</tr>
</thead>
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<td>90</td>
<td>10 x 5.1</td>
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<td>16</td>
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<tr>
<td>TNME</td>
<td>TRIM482, TREM655</td>
<td>29</td>
<td>29.37</td>
<td>10.5</td>
<td>30</td>
<td>90</td>
<td>11 x 6.1</td>
<td>7</td>
<td>12.5</td>
<td>8</td>
<td>3</td>
<td>20</td>
<td>2.3</td>
<td>9.25</td>
<td>1.25</td>
<td>15.6</td>
<td>2.6</td>
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</tbody>
</table>

**Calculation**

1. Standard slide lengths are available in multiples of hole pitch ‘D’ + (2 x ‘C’) up to a 4020mm maximum length. Special length slides can be cut to order.
2. Slides in their free unmounted state are not necessarily straight. They should be set to the required straightness when bolting down to the mounting surface at assembly.
3. For track system requirements dimensions ‘A1’ and ‘G’ will be matched with corresponding dimensions ‘F’ and ‘I’, 46.
4. Single edge slides with a rack, will be supplied in lengths that correspond to multiplies of rack pitch. The position of the ends of the slides is accurately controlled to coincide with the centre of the rack root to give perfect running joints for slides and ring segments.

**Ordering details:**

**Example:**

Part Number

<table>
<thead>
<tr>
<th>TNME</th>
<th>B1500</th>
<th>(R)</th>
<th>(BL)</th>
<th>(16 x SDP)</th>
</tr>
</thead>
</table>

SDP = Dowel pin (16-off) Leave blank if not required

Bleed Lubrication: BLP = Plain bore insert 52

BLT = Threaded insert 52 Leave blank if not required
HepcoMotion track system single edge curved segments are used in single edge duplex track systems 17, 18 & 41. Segments TRIS278 & TRES376 combine with TNSE track system single edges slides, and segments TRIM482 & TREM655 combine with TNME slides.

These segments are made to True Shape specification (please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 9 True Shape Rings & Segments). All segment pairs in a system are matched in essential respects with each other and with their corresponding straight slides. Ends are ground square to a specific dimension. An additional fixing hole is provided at each end of the segment to give extra support at the join position. It is recommended that all single edge track system components are aligned to a machined register. Hepco will supply suitable machined plates with precision registers, on request. Please see datasheet for design criteria.

Segments are available gear cut, for mating with rack cut straight slides, to produce a gear driven track system. For more details, and for information regarding assembly, please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 4 Single Edge Track Systems.

All track system single edge curved segments are marked with a reference and sequence number for identification and replacement purposes 40 & 41. Segments of any angle can be supplied to cater for all track system configurations.

For all other details and dimensions see § 28-31

<table>
<thead>
<tr>
<th>Part Number</th>
<th>For use with</th>
<th>A</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>R°</th>
<th>W1</th>
<th>X1</th>
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<tr>
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<td>12.5</td>
<td>90</td>
<td>180</td>
<td>25</td>
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</table>

Notes:
1. Track system single edge segments with gear drive option Q or P will be ended to the root of a gear tooth. This will affect dimensions W1 and X1. For more details, please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 4 Single Edge track systems.

Ordering details:

Example:

Part Number TRES 376 R90 (Q) (N)
R90 = 90° segment
R180 = 180° segment

N = Tapped hole option, § 28-31
Q = Internal gear drive option
Available on TRE option only
P = External gear drive option
Available on TRI option only
Bogie Carriage

The HepcoMotion Bogie Carriage is designed for use with tracks where "S" bends or bends of differing radii are to be negotiated. Each bogie swivels on a special play free axial/radial ball bearing which is lubricated for life. This enables the bogie carriage to follow exactly the path of the track at all times. Carriage plates and bogie swivel plates are made from high strength aluminium alloy and finished anodised. Bogie carriages are supplied assembled and adjusted to suit the accompanying track system. Customers are advised to specify the HepcoMotion bleed lubrication facility within the track as lubricators cannot be fitted to bogie carriages. Special size carriage plates are available on request.

Bogie Carriage

Bogie Fixing Screws 6 x customer fixing holes - I

Eccentric Bearing Concentric Bearing

Bogie

Bogie Carriage Plate

Bogie Fixing Screws

Eccentric Bearing Concentric Bearing

Bogie

Bogie Carriage

Calculations

Part Number For use with A B C D E F G H I J K L M N Ø O Ø P Adjustment brace G -kg

BCP 25 TR 25 130 80 42.1 44.5 46.1 75 45 60 M6 38 75 15 25.5 34.5 46 29 AB-25 **

BCP 44 TR 44 175 115 53.8 56.5 71.9 100 62.5 85 M8 53 105 18 32.5 44 59 34 AB-44 **

BCP 76 TR 76 240 185 77.2 81 118.7 130 87.5 125 M10 72 170 24 42.5 61.5 100 70 AB-76 **

Notes:
1. In rare cases where adjustment of the eccentric bearings is required, the bogies must be removed from the carriage plate and bolted instead to the adjustment brace. This will mimic the carriage and provide access to the fixing nuts allowing adjustment of the eccentric bearings to take place.
2. Please note that floating bearings 36 cannot be supplied with bogie bearings.

Ordering details:

Part Number

BCP76 DR NS CHK

DR = Double row bearings.
Leave blank for twin bearings 34-35

NS = Nitrile sealed option 34-35

CHK = Controlled height option 35

Standard with DR bearings
Leave blank if not required for twin bearing version

Adjustment brace

AB76
HepcoMotion moment load carriage systems provide extra support and rigidity in applications where high downwards or offset loads are anticipated, typically at work stations. It is also possible to arrange for continuous support of the carriages all around the circuit. Moment load carriages are a variation of the standard fixed centre carriages and are available in all 25 and 44 equivalent sizes. Carriages can be ordered complete with the carriage locking system and with either the fixed latch or trip latch belt connection facility.

Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 5 Moment Load carriage systems for more details. For other compatible driven system components in main illustrations below see 5-51.

**Work station support (static roller type)**
Eccentric rollers adjusted from the front for accessibility.

**Moment Load Carriage (dynamic roller type)**
For single roller or twin rollers.

**Carriage Locking System**
(optional) 50-51

**Sensor Mounting Bracket**
(optional) 50-51

**Adjustable height support track**
Eccentric rollers adjusted from the front for accessibility.
Moment load carriage systems are available with two types of work station support, both designed to connect to the track system support beam:

Static roller type: with eccentrically adjusted rollers attached to the framework bearing against a fixed skid plate on the underside of the carriage. This reduces the total number of rollers required and therefore the cost of a system with many carriages but few work stations.

Dynamic roller type: with eccentrically adjusted rollers attached to the underside of the carriage, bearing on adjustable height support track. The combination of these adjustable features facilitates set up where accuracy and alignment cannot be guaranteed or where continuous support for the carriage is required all around the circuit.

Standard components, shown in the unframed illustrations, can also be used within customers special designs a number of which are shown in the framed illustrations. Special size carriages can be easily supplied.
HepcoMotion supply a comprehensive range of components and assemblies to enable the 25-351 and 44-612 size track systems to be incorporated into customers own designs complete with drive facility. Many of the components shown below can be also be used for other sizes of track system. The components are well proven having been used for many years in the HepcoMotion DTS, a complete ready to use Driven Track System highly recommended for customers able to use this fully assembled standard product.

**Carriages**
Fixed centre type 38-39, can be supplied with belt connection facility or carriage locking cam as shown, 48-49 for moment load version.

**Trip Latch assembly**
Transmits the drive from the belt to the carriages and can be set to trip out of engagement at any force up to 60N.
- Fixed latches can also be supplied.

**Carriage Locking System**
For intermittent motion systems, locks carriages in position to a repeatable accuracy of ±0.05mm - Adjustable locking position - Multiple locking devices can be operated by one actuator.

**Sensor Mounting Bracket**
To suit M8 threaded proximity switch - Detects carriage position for control and safety purposes.

**Bearing Cartridge**
Able to withstand high tension forces of the belt - Caters for belt adjustment - Idler type or, extended shaft type available for attaching the drive - Sealed bearings lubricated for life.

**Track sizes available:**
25mm wide slides with 351mm Ø ring segments or 44mm wide slides with 612mm Ø ring segments. See 42-44

**Oval path driven track system**
Driven Track System Components

Moment load carriage systems 48-49 are also compatible with the DTS which is the full system as illustrated below and is comprehensively detailed in a separate catalogue. Please contact Hepco or visit www.HepcoMotion.com.

For all details of Driven Track System components please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 8

- **Pulley**
  Toothed version for driving or plain version for idling - Fits to Hepco bearing cartridge.

- **Timing Belt**
  High tensile 10mm pitch belt fitted with lugs at desired spacing for transmitting drive to the carriages - Lugs securely fixed through to opposite side of belt.

- **End Plates**
  Top plate supports the bearing cartridge and connects to the track system support beams providing continuity of support for the ring slide segment - Bottom plate braces between track system support beams.

- **Slide attachment profile**
  Precision aluminium T profile provides strong and convenient method of attaching and locating slides with no loss of position when slides are disassembled - Long lengths available.

- **Track system support beam**
  Precision aluminium profile provides a rigid chassis for the system - Centre T slot provided for attaching slides - Can be machined away to expose secondary T slot for end plate fixing - Other T slots enable ancillary equipment to be attached - Compatible with HepcoMotion MCS aluminium frame system which enables full supporting structure to be constructed. Refer to separate MCS catalogue www.HepcoMotion.com/MCSdatauk.

- **Rectangular path driven track system**

For all details of Driven Track System components please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 8
The HepcoMotion bleed lubrication facility channels lubricant direct to the V faces of a straight slide for best lubrication of a track system. The felt inserts of the lubricators fitted to the carriages, collect the lubricant and distribute it around the circuit. Some of the lubricant is absorbed into the felts which act as reservoirs and help prevent excess oil accumulating. The bleed lubrication facility is available with either an M5 screw fitting insert or, an O-ring seal insert as illustrated. Connection can be made to any centralised lubrication system or pressure feed canister (part no. PRT2BLC available from Hepco).

Also available is a highly efficient oil dispensing pump and controller which can be programmed to meter a set dose of lubricant according to the distance travelled by the carriages. Both the dose and distance travelled can be set according to the length of circuit and duty. For details of inserts and oil dispensing system, please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 6 Bleed Lubrication.

Threaded Insert (T)  
<table>
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<th>Threaded Insert</th>
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</thead>
</table>

Plain Bore Insert (P)  
<table>
<thead>
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<th>O Ring Seal</th>
<th>Mounting Base</th>
<th>Plain Bore Insert</th>
<th>Lubricant Flow</th>
</tr>
</thead>
</table>

Notes:
1. Track systems with bleed lubrication facility require only one in four carriages to be fitted with lubricators. This will also have the effect of reducing system friction.
2. Hole Diameter for TNL76 slide is 2mm. For more details, please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 6 Bleed Lubrication.

Ordering details:

Example: 

Please state BLP or BLT within the straight slide part number.
- 42-43 for double edge straight slides.
- 45 for single edge straight slides.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>A</th>
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</thead>
<tbody>
<tr>
<td>TNM 44</td>
<td>195</td>
<td>135</td>
<td>6.25</td>
</tr>
<tr>
<td>TNL 76</td>
<td>360</td>
<td>240</td>
<td>18.0</td>
</tr>
</tbody>
</table>

For slide dimensions not specified please refer 42, 43 & 45

Bleed Lubrication facility: BLP = Plain bore insert  
BLT = Threaded insert
HepcoMotion pinions are compatible with gear cut ring slides, segments and ring discs 26-33. Gear teeth have a 20° pressure angle.

Pinions smaller than 1 module are made in unhardened stainless steel with teeth that conform to ISO 1328 grade 10. These are supplied with a plain bore (B type), with a keyway and set screw (BK type for bores of 8mm and above) or with set screw only (BK type for bores below 8mm*1).

Pinions with modules of 1 and above have hardened and ground teeth, conform to ISO 1328 grade 6 and are available in both steel and stainless steel. These pinions are supplied with a plain bore (B type) or with keyway and set screw (BK type).

In all cases, the pinion and slide ring teeth should be lubricated. A range of pinions with integral shaft, suitable for hollow shaft connection to Hepco supplied AC geared motors and other motors is available from the HepcoMotion GV3 product range, please visit www.HepcoMotion.com.

### Ordering details:

- **SS** = Stainless Steel option
- **P20** = Part number
- **W20** = Face width in mm
- **B** = Pinion with plain bore
- **BK** = Pinion with keyway and set screw*1
- **T27** = Number of teeth

### Notes:

1. Small "BK" type pinions with bores below 8mm are supplied with set screw through to the bore but without keyway. It is usual practice to secure these pinions by means of a set screw onto a flat on the shaft or by using a taper pin.
2. Pinions are supplied with a flat point set screw DIN 913 (ISO 4026).
3. ST = Steel, SS = Stainless Steel.
4. = Teeth hardened and ground. x = Teeth unhardened and unground.
Technical

Load Capacity and Life

The load capacity and life expectancy of HepcoMotion ring slides, segments and track systems is determined by many factors including the ring size, the type and number of bearings, the presence of lubrication, the magnitude and direction of loads, the speed and the distance travelled.

It is usual to run systems at much less than the maximum load to prolong life, which can be calculated using the data and formulae in this section. For calculation purposes, systems fall into two categories, those where a carriage runs on a ring slide, segment or track system and those where a ring slide is captivated and rotates in a number of bearings (or the similar arrangement where the ring slide is stationary and the bearings and load rotate).

Where possible, systems should be oiled using Hepco lubricators 37 and/or the bleed lubrication system 52. This will greatly extend system life.

Systems with carriages

When calculating the life, first the load on each carriage should be resolved into the direct load components \( L_1 \) and \( L_2 \) and moment load components \( M, M_v \) and \( M_s \).

Notes:

1. In heavily loaded applications using bogie carriages, the bogie swivel bearings can affect life. Applications for bogie carriages in which LF is more than 0.43, calculated using the *1 load figures from the table above, should be referred to Hepco to confirm suitability.
2. When calculating \( L_2 \) and \( M_s \) loadings, the centrifugal force must be included which acts radially outwards from the centre of mass (COM) of the moving object. Its magnitude is \( F = D V^2/R \), where \( V \) is the velocity of the COM in m/s, \( R \) is the distance of the COM from the ring axis in metres and \( D \) is the mass in kg. \( F \) is in N (newtons).

Carriage Load Capacities

Capacities are shown for both ‘dry’ and ‘lubricated’ conditions - this refers to the bearing and slide ‘V’ contact, since all bearings are lubricated internally for life.

Values are based on shock-free duty.

<table>
<thead>
<tr>
<th>Carriage Part Number</th>
<th>Dry System (Twin and DR Type Bearings)</th>
<th>Lubricated System (Twin Type Bearings)</th>
<th>Lubricated System (DR Type Bearings)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( L_{1\text{max}} )</td>
<td>( L_{2\text{max}} )</td>
<td>( M_s\text{max} )</td>
</tr>
<tr>
<td>FCC 12 93</td>
<td>90</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>FCC 12 127</td>
<td>90</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>FCC 20 143</td>
<td>180</td>
<td>1.6</td>
<td>2.5</td>
</tr>
<tr>
<td>FCC 20 210</td>
<td>180</td>
<td>1.6</td>
<td>2.7</td>
</tr>
<tr>
<td>FCC 25 159</td>
<td>400</td>
<td>4.5</td>
<td>8.5</td>
</tr>
<tr>
<td>FCC 25 255</td>
<td>400</td>
<td>4.5</td>
<td>8</td>
</tr>
<tr>
<td>FCC 25 351</td>
<td>400</td>
<td>4.5</td>
<td>8.5</td>
</tr>
<tr>
<td>BCP 25</td>
<td>400</td>
<td>4.5</td>
<td>15</td>
</tr>
<tr>
<td>FCC 44 468</td>
<td>800</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td>FCC 44 612</td>
<td>800</td>
<td>16</td>
<td>29</td>
</tr>
<tr>
<td>BCP 44</td>
<td>800</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>FCC 76 799</td>
<td>1800</td>
<td>64</td>
<td>85</td>
</tr>
<tr>
<td>FCC 76 1033</td>
<td>1800</td>
<td>64</td>
<td>105</td>
</tr>
<tr>
<td>FCC 76 1267</td>
<td>1800</td>
<td>64</td>
<td>120</td>
</tr>
<tr>
<td>FCC 76 1501</td>
<td>1800</td>
<td>64</td>
<td>140</td>
</tr>
<tr>
<td>BCP 76</td>
<td>1800</td>
<td>64</td>
<td>115</td>
</tr>
</tbody>
</table>

The \( L_2 \) & \( M_v \) load capacities for carriages using floating bearings 36 are the same as is shown above for DR bearings. The \( L_1 \) & \( M_s \) load capacities for carriages using floating bearings are zero (they are free to float in these directions). Please note that bogie carriages (BCP) are not available with floating bearings.


\[
L_F = \frac{L_1}{L_{1\text{max}}} + \frac{L_2}{L_{2\text{max}}} + \frac{M_s}{M_s\text{max}} + \frac{M_v}{M_v\text{max}} + \frac{M}{M\text{max}} \leq 1 \text{ or } 0.8 \text{ for stainless steel}
\]

Notes:

1. In heavily loaded applications using bogie carriages, the bogie swivel bearings can affect life. Applications for bogie carriages in which \( L_2 \) is more than 0.43, calculated using the *1 load figures from the table above, should be referred to Hepco to confirm suitability.
2. When calculating \( L_2 \) and \( M_s \) loadings, the centrifugal force must be included which acts radially outwards from the centre of mass (COM) of the moving object. Its magnitude is \( F = D V^2/R \), where \( V \) is the velocity of the COM in m/s, \( R \) is the distance of the COM from the ring axis in metres and \( D \) is the mass in kg. \( F \) is in N (newtons).
Systems with Ring Slides in Bearings

It is usual to space bearings equally around the ring\(^1\). When calculating the life, the load should be resolved into the direct load components \(L_A\) and \(L_R\) and the moment load component \(M\), as shown in the diagram opposite.

System Load Capacities

Capacities are shown for both ‘dry’ and ‘lubricated’ conditions – this refers to the bearing and slide ‘V’ contact, since all bearings are lubricated internally for life. Values are based on shock-free duty.

<table>
<thead>
<tr>
<th>Bearing Part Numbers</th>
<th>Used with Ring Slides</th>
<th>Number of equally spaced bearings</th>
<th>Dry System (Twin and DR Type Bearings)</th>
<th>Lubricated System (Twin Type Bearings)</th>
<th>Lubricated System (DR Type Bearings)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(L_{A\text{max}}) (L_{R\text{max}}) (M_{\text{max}})</td>
<td>(L_{A\text{max}}) (L_{R\text{max}}) (M_{\text{max}})</td>
<td>(L_{A\text{max}}) (L_{R\text{max}}) (M_{\text{max}})</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>67 38 16 (x) (\Omega c) (^4) 180 102 43 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>...J13...</td>
<td>R12</td>
<td>Each additional 1</td>
<td>10 6 2 (x) (\Omega c) (^4) 43 30 9 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>135 76 32 (x) (\Omega c) (^4) 375 170 90 (x) (\Omega c) (^4)</td>
<td>570 510 135 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
<tr>
<td>...J18...</td>
<td>R20</td>
<td>Each additional 1</td>
<td>21 13 4 (x) (\Omega c) (^4) 90 50 18 (x) (\Omega c) (^4)</td>
<td>135 150 28 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>300 170 72 (x) (\Omega c) (^4) 960 510 230 (x) (\Omega c) (^4)</td>
<td>1200 1280 285 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
<tr>
<td>...J25...</td>
<td>R25</td>
<td>Each additional 1</td>
<td>370 200 87 (x) (\Omega c) (^4) 1190 600 278 (x) (\Omega c) (^4)</td>
<td>1480 1500 340 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
<tr>
<td>...J34...</td>
<td>R44</td>
<td>Each additional 1</td>
<td>600 340 140 (x) (\Omega c) (^4) 2400 1200 570 (x) (\Omega c) (^4)</td>
<td>2700 2550 640 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
<tr>
<td>...J34...</td>
<td>R44</td>
<td>Each additional 1</td>
<td>600 340 140 (x) (\Omega c) (^4) 2400 1200 570 (x) (\Omega c) (^4)</td>
<td>2700 2550 640 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
<tr>
<td>...J54...</td>
<td>R76</td>
<td>Each additional 1</td>
<td>1350 765 320 (x) (\Omega c) (^4) 5400 2740 1290 (x) (\Omega c) (^4)</td>
<td>7500 4250 1800 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
<tr>
<td>...J54...</td>
<td>R76</td>
<td>Each additional 1</td>
<td>1350 765 320 (x) (\Omega c) (^4) 5400 2740 1290 (x) (\Omega c) (^4)</td>
<td>7500 4250 1800 (x) (\Omega c) (^4)</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

The \(L_A\) load capacities for systems using floating bearings \(36\) are the same as is shown above for DR bearings. The \(L_A\) & \(M\) load capacities for systems using floating bearings are zero (they are free to float in these directions).

To determine the life of this system, first obtain a value for the load factor \(L_f\) by entering the values for \(L_A\), \(L_R\) and \(M\) in respect of the proposed duty into equation \(2\) below, together with the maximum load capacities from the table above.

\[
L_f = \frac{L_A}{L_{A\text{max}}} + \frac{L_R}{L_{R\text{max}}} + \frac{M}{M_{\text{max}}} \leq 1 \text{ or 0.8 for stainless steel}
\]

The life is then determined using equations \(3\) or \(4\) on the next page.

**Notes:**

1. In some applications where the bearings rotate with the load, it may be beneficial to distribute the bearings unequally around the ring. Contact Hepco for application advice.
2. **SPEED OF OPERATION.** Hepco ring slides, segments and track systems are rated for speeds of 1m/s without lubrication or 5m/s when lubricated, but take care to allow for intertial loads. Greater speeds may be tolerated at reduced loads. Contact Hepco for details.
3. **SHORT STROKE OPERATION.** If the stroke length is less than five times the bearing outside diameter, then calculate the life as if the stroke is five times the bearing outside diameter.
4. \(\Omega c\) is ring slide contact diameter in metres (the diameter of the circle through the mid position of the contact points between the bearings and the ring).
Technical

Calculating System Life

With \( L_f \) determined for either a 4 bearing carriage 54 or for a ring system 55, the life in km can be calculated using one of the two equations below. In these equations, the Basic Life is taken from the table on the right in respect of the bearings and the lubrication condition applicable.

For dry systems use equation [3]:

\[
\text{System life (km)} = \frac{B_L}{(0.03 + 0.97L_f)^2}
\]  

For lubricated systems use equation [4]:

\[
\text{System life (km)} = \frac{B_L}{(0.03 + 0.97L_f)^3}
\]

Example load-life calculations for PRT2 systems are available online. Please visit www.HepcoMotion.com/PRT2datauk and select datasheet No. 3 Load Life Calculations.

Industry Standard Bearing Load Capacities

The load capacities and calculations in the previous sections have been carefully developed, and are based on rigorous testing and years of application experience.

Many competitive systems use industry standard, theoretically derived figures for bearing static and dynamic load capacities, which are generally higher than the true working load capacities which Hepco uses.

The table below shows the industry standard static \((C_{0R} \& C_{0A})\) and dynamic \((C_R \& C_A)\) load figures for PRT2 bearings\((R \& A\) subscripts indicate radial & axial loading). These are included principally to allow the comparison of Hepco components with those from other manufacturers. It is NOT recommended that they are used for determining system life.

<table>
<thead>
<tr>
<th>Bearings</th>
<th>Basic Life Dry</th>
<th>Basic Life Lubricated</th>
</tr>
</thead>
<tbody>
<tr>
<td>...J13...</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>SS...J13...</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>...J18...</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>SS...J18...</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>...J18DR...</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>SS...J18DR...</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>...J25...</td>
<td>70</td>
<td>40</td>
</tr>
<tr>
<td>SS...J25...</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>...J25DR...</td>
<td>70</td>
<td>45</td>
</tr>
<tr>
<td>SS...J25DR...</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>...J34...</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>SS...J34...</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>...J34DR...</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td>SS...J34DR...</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>...J54...</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>SS...J54...</td>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td>...J54DR...</td>
<td>150</td>
<td>280</td>
</tr>
<tr>
<td>SS...J54DR...</td>
<td>100</td>
<td>220</td>
</tr>
</tbody>
</table>

The above data assumes that steel bearings run on steel rings, and that stainless steel bearings run on stainless steel rings.

The above load capacities apply to standard steel bearings. Stainless steel bearings may be different.
Technical

Pinion and Gear Force Calculations

The driving force which can be transmitted through a pinion and gear will depend on the tooth (Mod) size, the size of pinion and ring or segment selected, the length of stroke and the desired life.

The table below details the tangential driving force in newtons (N) for all pinion and ring combinations and for a useful range of design lives. The figures assume that the pinion revolves around the complete ring, rather than moving to and fro over just a portion of the ring’s teeth. The load capacity for shorter strokes will be lower.

All figures assume ideal lubrication and pinion contact conditions. It is recommended that a safety factor be applied when selecting gear and pinion components. This table is suitable for selection of parts, but please contact Hepco if a specific calculation is required for a particular application.

For rack-cut track systems using single edge straight slides, the max driving force will be the same as for the largest diameter RI... ring which has the matching section size.

### Pinion Part Number

<table>
<thead>
<tr>
<th>Pinion Part Number</th>
<th>Used with Ring</th>
<th>Max Working Tangential Load (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Life - distance travelled around Ring Gear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 000 km</td>
</tr>
<tr>
<td>SSP04 W3 T42</td>
<td></td>
<td>R12 93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R12 127</td>
</tr>
<tr>
<td>SSP07 W9 T28</td>
<td></td>
<td>REV 156</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REV 223</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RIV 161</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RIV 228</td>
</tr>
<tr>
<td>SSP08 W4 T48</td>
<td></td>
<td>R20 143</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R20 210</td>
</tr>
<tr>
<td>SSP08 W6 T48</td>
<td></td>
<td>R25 159</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R25 235</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R25 351</td>
</tr>
<tr>
<td>P10 W11 T42 &amp;</td>
<td></td>
<td>RES 184</td>
</tr>
<tr>
<td>SSP10 W11 T42</td>
<td></td>
<td>RES 280</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RES 376</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RIS 182</td>
</tr>
</tbody>
</table>

### Pinion Part Number

<table>
<thead>
<tr>
<th>Pinion Part Number</th>
<th>Used with Ring</th>
<th>Max Working Tangential Load (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Life - distance travelled around Ring Gear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 000 km</td>
</tr>
<tr>
<td>P10 W11 T42 &amp;</td>
<td></td>
<td>RIS 278</td>
</tr>
<tr>
<td>SSP10 W11 T42</td>
<td></td>
<td>RIS 374</td>
</tr>
<tr>
<td>P10 W7 T48 &amp;</td>
<td></td>
<td>R44 468</td>
</tr>
<tr>
<td>SSP10 W7 T48</td>
<td></td>
<td>R44 612</td>
</tr>
<tr>
<td>P125 W14 T34 &amp;</td>
<td></td>
<td>REM 505</td>
</tr>
<tr>
<td>SSP125 W14 T34</td>
<td></td>
<td>REM 655</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RIM 482</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RIM 627</td>
</tr>
<tr>
<td>P15 W12 T48 &amp;</td>
<td></td>
<td>R76 799</td>
</tr>
<tr>
<td>SSP15 W12 T48</td>
<td></td>
<td>R76 1033</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R76 1267</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R76 1501</td>
</tr>
<tr>
<td>P20 W20 T27 &amp;</td>
<td></td>
<td>REL 874</td>
</tr>
<tr>
<td>SSP20 W20 T27</td>
<td></td>
<td>REL 812</td>
</tr>
</tbody>
</table>

**Fixed Centre Carriage Play at Track System Joints**

HepcoMotion fixed centre carriages have the same fit on both straight slides and curved segments in a track system. As the carriage traverses the join between these two components, slight play develops between each pair of opposing bearings. The maximum play is given in the table below.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Clearance /mm</td>
<td>0.17</td>
<td>0.08</td>
<td>0.18</td>
<td>0.10</td>
<td>0.47*</td>
<td>0.15</td>
<td>0.09</td>
<td>0.21</td>
<td>0.14</td>
<td>0.22</td>
<td>0.19</td>
<td>0.17</td>
<td>0.16</td>
</tr>
</tbody>
</table>

These figures are theoretical clearances. In most applications, the bearings are slightly preloaded against the slides, and some of this clearance will appear as a “relaxation” of the system. In these instances the carriage will have a slightly freer movement as it traverses between the straight and curved section than when the carriage is fully on the straight slide or curved segment. In most duties the clearance or momentary reduction in preload will not present an issue, however, in some applications it may be undesirable. In such cases customers should consider using the Hepco bogie type carriage 47, which does not develop play in the same way when traversing from straight to curved sections.

* The FCC 25 159 has greater than normal clearance. This will be noticeable, but not detrimental in many applications.
Adjusting method for Through Fixing Eccentric bearings

To get the best performance from a HepcoMotion ring slide system, it must be correctly assembled and adjusted. To fit a carriage, the concentric bearings should be fully tightened and the eccentric bearings semi-tightened and rotated to their outermost position. The carriage may then be introduced to the slide as shown below. Both eccentric bearings should be rotated in the direction of the arrow shown opposite, until the bearings captivate the slide with minimal preload. To fit a ring slide into encircling bearings, all eccentrics should be fully adjusted away from the V edge to permit the ring to be engaged. The eccentrics may then be adjusted onto the V edge as for carriages.

The correct condition of adjustment should be assessed by rotating the bearings by holding them between forefinger and thumb whilst preventing the ring slide or carriage from moving such that the bearings skid against the slide. A uniform degree of resistance should be felt, but the bearings should be able to be rotated without difficulty. Once adjusted in this manner, the eccentric bearing fixing nuts should be fully tightened to the relevant torque value shown in the table below whilst preventing the bearing stud from further rotation, by means of the specified Hepco Adjusting Wrench. A further check should be made to ensure the correct condition of adjustment.

It should be noted that the load/life calculations assume a light preload, as is described above. Systems which are preloaded more heavily than this will suffer a reduction in the life as compared with that predicted by the calculations.

In some circumstances, it may be difficult to gain access to the hexagonal flange for system adjustment. In these situations it is possible to adjust by rotating the eccentric bearing using an allen key located in the hexagonal socket in the end of the stud and tightening the fixing nut at the same time using the Hepco socket tool, see table below. Due to the reduced control associated with this method, it is only recommended when the adjusting wrench method above is not possible.

When adjusting fixed centre carriages the lubricators should first be removed in order to gain access. When adjusting bogie carriages, the steps outlined in the adjustment procedure on 47, should be observed. In cases where an assembled system is supplied, the carriages will be supplied pre-adjusted.

### Alternative adjusting method using end socket in journal

![Hepco Socket Tool]

### Adjusting method for Blind Hole Eccentric bearings

![Hepco Adjusting Wrench]

Ring and Track System Installation

For details on Ring and Track system installation, please visit [www.HepcoMotion.com/PRT2datauk](http://www.HepcoMotion.com/PRT2datauk) and select datasheet No. 2 Installation details.

Bearing Adjusting Tools and Tightening Torques

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

<table>
<thead>
<tr>
<th>Bearing Ø</th>
<th>13</th>
<th>18</th>
<th>25</th>
<th>34</th>
<th>54</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjusting Wrench</strong></td>
<td>AT13</td>
<td>AT18</td>
<td>AT25</td>
<td>AT34</td>
<td>AT54</td>
</tr>
<tr>
<td><strong>Socket Tool</strong></td>
<td>-</td>
<td>RT6</td>
<td>RT8</td>
<td>RT10</td>
<td>RT14</td>
</tr>
<tr>
<td><strong>Fixing Nut Torque</strong></td>
<td>2 Nm</td>
<td>7 Nm</td>
<td>18 Nm</td>
<td>33 Nm</td>
<td>90 Nm</td>
</tr>
</tbody>
</table>
Technical Specifications

Ring Slides and Segments

Material and finish:
- **Standard version**: High carbon steel, hardened on V faces. Ground on all main surfaces to N5 finish.
- **Stainless steel version**: Special martensitic stainless steel generally conforming to 420 series, hardened on V faces. Ground on all main surfaces to N5 finish, other faces polished.

Track System Slides

Material and finish:
- **Standard version**: High carbon-chromium steel, hardened on V faces. Ground on all main surfaces to N5 finish, other faces chemically blacked.
- **Stainless steel version**: Special martensitic stainless steel generally conforming to 420 series, hardened on V faces. Ground on all main surfaces to N5 finish.

Bearings

Bearing rings, balls, rollers:
- **Standard version**: Carbon-chromium bearing steel AISI 52100 hardened and tempered.
- **Stainless steel version**: AISI 440C stainless bearing steel, hardened and tempered.

Shields:
- **Standard version only**: Steel with bright zinc plated finish.

Seals:
- Nitrile rubber.

Cages:
- Plastic (metal for floating bearing).

Studs:
- **Standard version**: High tensile steel with chemical black finish.
- **Stainless steel version**: AISI 303 series stainless steel.

Temperature range:
- **All versions**: -20°C to +120°C. Bearings for low temperature, high temperature and vacuum use are available on request.

Carriage Plates

Material: **All versions**: High strength aluminium alloy
Finish: **Standard version**: Clear anodised.
**Stainless version**: Special finish approved by US Department of Agriculture for food use. Stainless steel carriage plates available on request.

Lubricators

Material: Impact resistant thermoplastic with felt wiper.
Fixings: Stainless steel.
Temperature range: -20°C to +60°C.
Lubricant: Slideway oil with viscosity 68 cSt or similar.

Pinions

Material and finish (＜Mod1):
- **Stainless steel only version**: 300 series stainless steel, finish as gearcut. ISO 1328 accuracy grade 10.

Material and finish (≥ Mod1)
- **Standard version**: Case hardened carburising steel. Ground on teeth to N5 finish. ISO 1328 accuracy grade 6.
- **Stainless steel version**: Hardened 420 series stainless steel. Ground on teeth and all main surfaces to N5 finish. ISO 1328 accuracy grade 6.

Friction

Coefficient of friction for lubricated systems is typically 0.02. Lubricators will add between 0.5 (for LB12) & 2N (for LBS4) each.

Maximum Speed

Generally 1m/s for dry (unlubricated) operation and 5m/s when lubricated. Greater speeds may be possible at reduced loads. Contact Hepco for details.
The HepcoMotion facility for rolled rings and segments provides a means of achieving circular guidance of unlimited maximum diameter. Most slide sections in P3 grade from Hepco’s highly acclaimed GV3 range can be rolled to achieve curved segments in either edge hardened or unhardened condition. Segments can be butt joined to make complete rings or to make track systems as shown below.

Please visit: www.HepcoMotion.com/PRT2datauk and select datasheet No. 12 Rolled Rings, Segments & Track Systems. The HepcoMotion GV3 catalogue is also available on this web site.
Rolled Rings, Segments & Specials

Ring slides and segments can be supplied with a wider gear face and/or larger gear teeth. Ring slide segments of unlimited radius can be supplied to customers special requirements. Segments can be gearcut and butted together to create very large diameter rings. Further information is available online at www.HepcoMotion.com/HDRTdatauk and select datasheet No. 2 Large Diameter Rings and Segments.

HDRT combines the flexibility and function of the PRT2 ring track system with the size and strength of the HepcoMotion HDS2 heavy duty slide system. HDRT has a large range of precision ground single edge V ring slides with high load capacity. There is also a track system combining double edge V ring segments and HD linear slides. For more details and catalogue visit www.HepcoMotion.com/HDRTdatauk

- High load capacity up to 60kN
- 7 sizes of ring from 512 to 1656mm diameter with internal or external V
- Double edged V rings
- Track systems: limitless variety of open and closed circuits
- Stainless steel option
- Gearcut ring option with matching pinions
- Ø64, Ø95 & Ø120 bearings designed for ease of installation and setting
- Full range of fixed centre and bogie type carriages

Using the HepcoMotion PRT2 ring slides and track system as its basis, the DTS is a fully assembled unit ready to be incorporated into the customer’s machine or framework. Carriages are driven around an oval or rectangular track with continuous or intermittent (indexing) motion. The belt driven carriages are rigidly guided along the precision track thus maintaining accurate alignment and resistance to deflection.

For more details and catalogue visit www.HepcoMotion.com/DTSdatauk

- Two sizes based on the PRT2 Track System size 25 and 44
- Oval or rectangular circuit format options
- Direct load capacity up to 4000N per carriage
- Carriage locking system for accurate repeatable positioning
- Mounts directly to HepcoMotion MCS Machine Construction System
- Ingenious safety trip latch mechanism disengages drive if carriage is impeded
- AC geared motor and gearbox options available

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HepcoMotion® Product Range

GV3  Linear Guidance and Transmission System
HDS2  Heavy Duty Slide System
HDRT  Heavy Duty Ring Slides and Track System
SL2  Stainless Steel Based Slide System
LBG  Linear Ball Guides

SBD  Sealed Belt Drive
MCS  Aluminium Frame and Machine Construction System
HDSL  Heavy Duty Driven Linear System
DLS  Linear Transmission and Positioning System
HTS  Telescopic Ball Bearing Slides
HPS  Powerslide-2 Guided Rodless Cylinder

MHD  Heavy Duty Track Roller Guidance System
DTS  Driven Track System
BSP  Ballscrew Premier
PDU2  Profile Driven Unit
PSD120  Profile Screw Driven Unit

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

HEPCO
www.HepcoMotion.com

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