



HepcoMotion® PRT2 PRECISION RING AND TRACK SYSTEM

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BWC.COM

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 center 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.

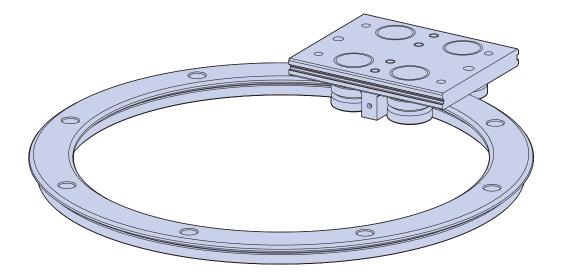
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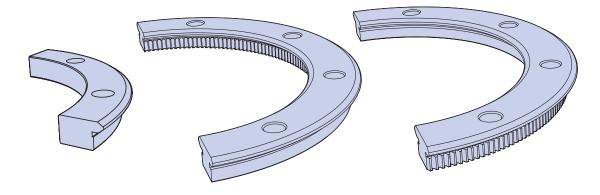
The HepcoMotion PRT2 system comprises of a comprehensive range of ring slides, ring segments, bearings and ancillary components which provide a versatile solution for most rotary and track system applications. A large range of ring slide types in various diameters are available in both steel and stainless 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 $\square 4 - 9$.

Double Edge V Ring Slide 🛄 28-29

- 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 center 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 center section allows customizing.
- Stainless steel option available as standard.
- Through hole fixing or tapped hole fixing.
- Comprehensive range of drive pinions available III 55.

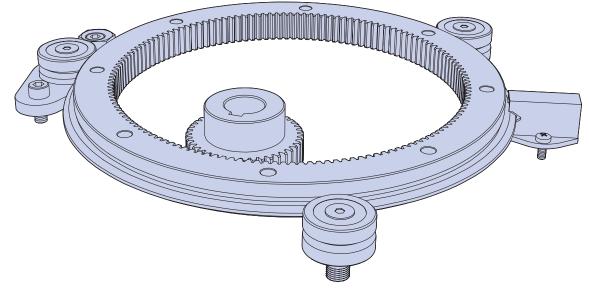


V Ring Segments 🛄 28-33



- 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.

Single Edge External V Ring Slide 🛄 30-31

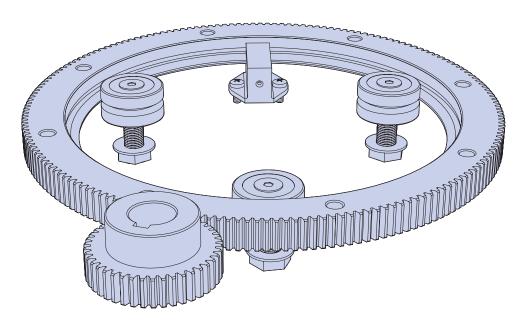


Common features

- 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 center section allows customizing.
- Manufactured from high quality steel.
- Choice of external or internal V.

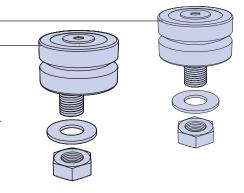
- Precision ground all over for high accuracy and conformity.
- Through hole fixing or tapped hole fixing.
- Can be used in any orientation.
- Comprehensive range of sizes.
- Comprehensive range of drive pinions available 🕮 55.

Single Edge Internal V Ring Slide 🛄 32-33



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) 🕮 36-37
- * Through Hole fixing bearing (eccentric) 🕮 36-37
- 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 center hexagon or socket in stud.
- * Eccentric adjustment sufficient to allow removal of the ring or carriage without disassembly.



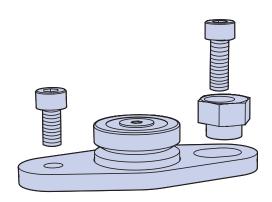


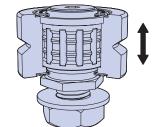
Blind hole fixing bearing (concentric) 🕮 36-37

- 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 (eccentric) 🛄 36-37

- 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.



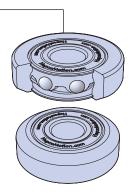


Floating bearing (concentric & eccentric) 📖 38

- Axial float of outer race accommodates variation in system height.
- Provides simple means of adjusting via center 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.

* Double Row Bearing / Twin Bearing 🛄 36-37 🔹

- 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.

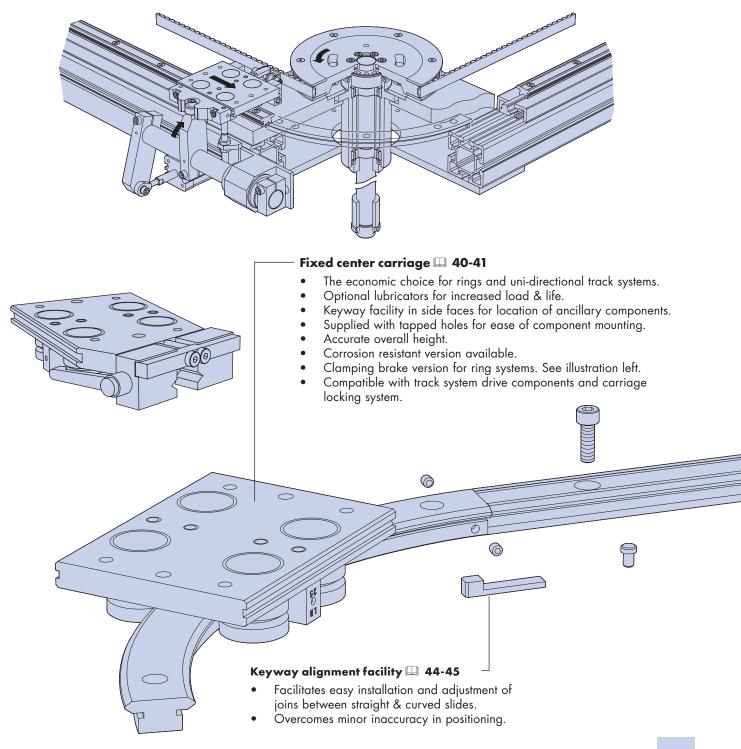


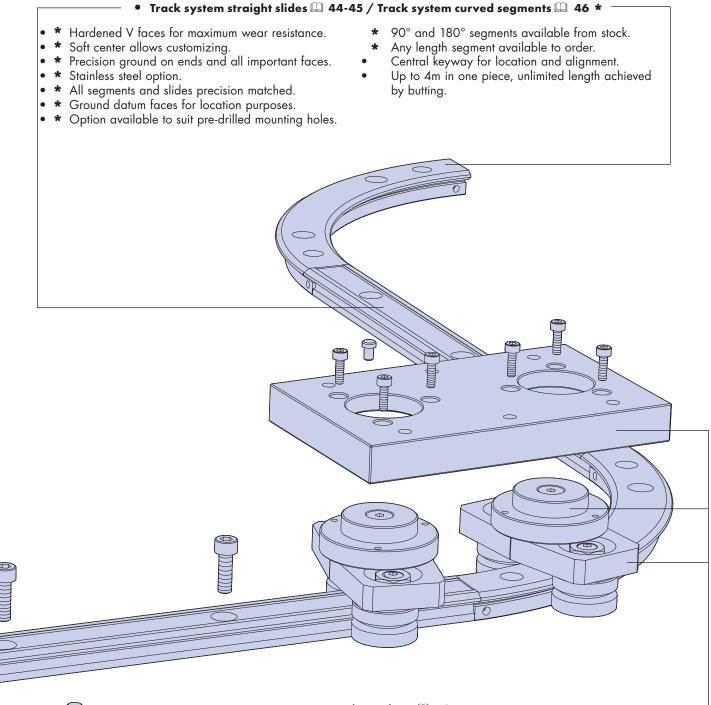


HepcoMotion track systems combine ring segments with straight slides to achieve an almost limitless variation of open paths or closed circuits. Both left and right hand bends can be negotiated depending on the carriage selected. 90° and 180° segments in all standard double edge ring sizes are available 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 🛄 52-53

- 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.
- Corner support plates.
- Drive and idler pulleys with Hi-load bearing cartridges.
- Support frame with slide attachment facility.



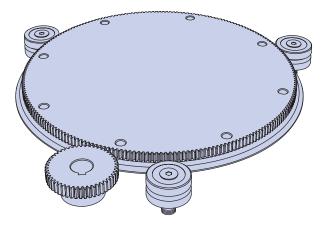


Dowel pins 🛄 44-45

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

Bogie carriage 🛄 49

- 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.

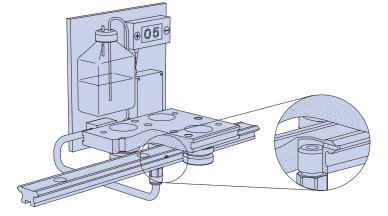


Moment load carriage 🛄 50-51

- 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.

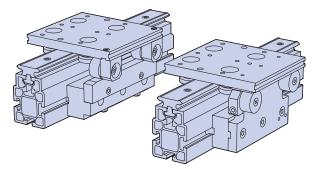
Lubricators 🛄 39

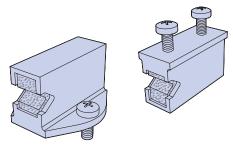
- Provides lubrication to the contact faces thereby increasing load capacity and life.
- Long lubrication interval.
- Lightly sprung felt wiper for low friction.
- Compact type suitable for through hole fixing, flanged type for through and blind hole fixing.



Ring Disc 🛄 34-35

- Ideally suited to turntable applications.
- Large precision mounting surface easily customized 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.



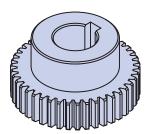


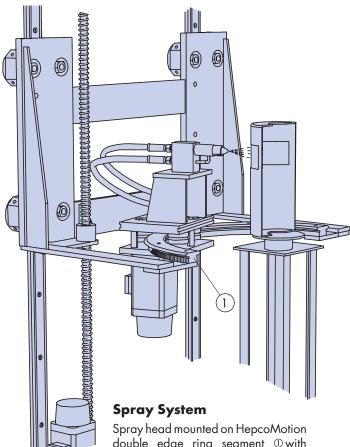
Bleed lubrication 🛄 54

- 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

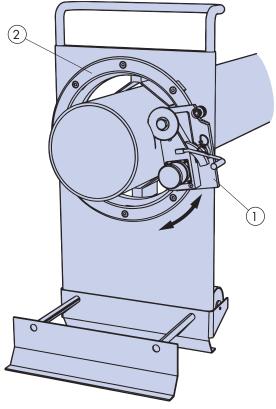
Pinions 🛄 55

- 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.





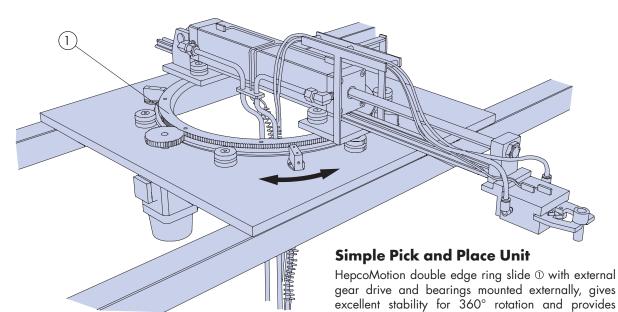
Spray head mounted on HepcoMotion double edge ring segment ① with external gear drive, tracks curvature of product.



Mobile Saw for Long Tubes

an uninterrupted space in the center for routing the

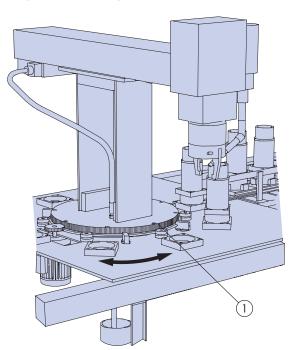
Motor and saw assembly mounted on carriage \oplus is hand operated around 360° HepcoMotion double edge ring slide @ in order to cut tube.

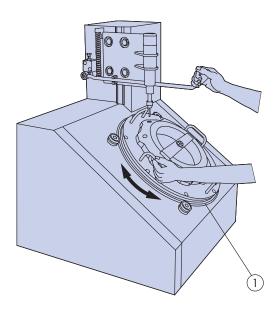


services.

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

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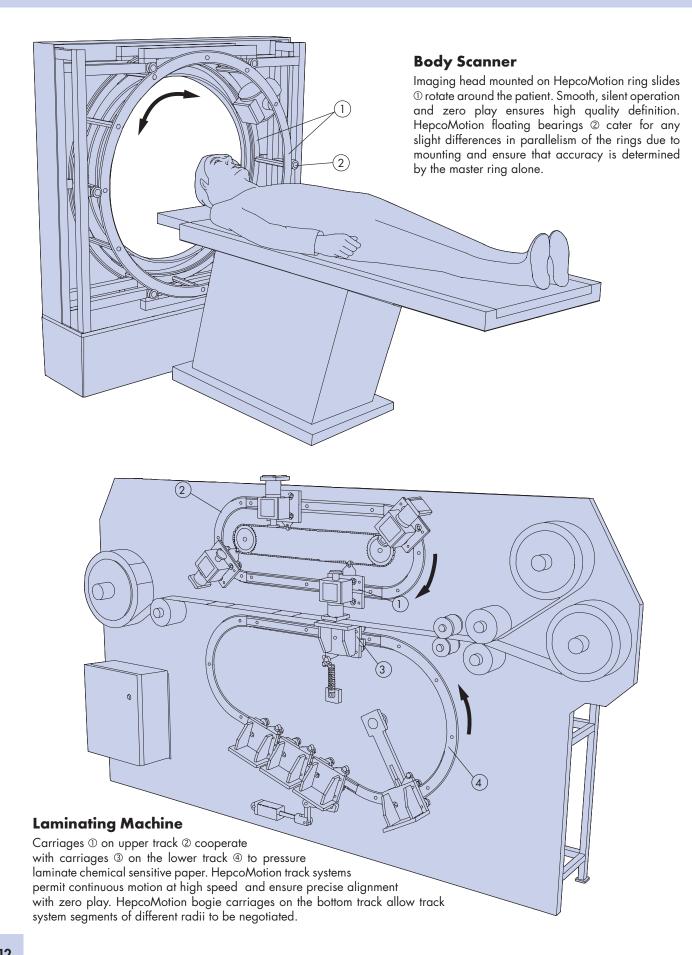
HepcoMotion ring disc 0 provides a large mounting area for attaching components. The precision ground surface ensures accuracy and the unhardened area inboard of the V's enables tooling holes to be drilled as required.

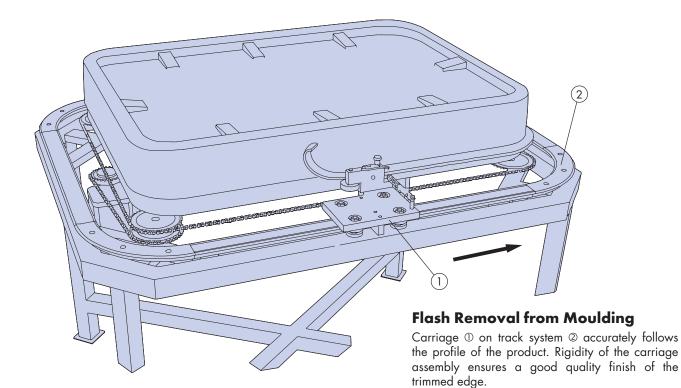


Bottle turn table is mounted on a HepcoMotion single edge ring slide ① which allows friction free rotation and provides control at the periphery adjacent to where the load is being applied. The large tooth form and width of the internal gear drive ② permits high transmission forces and ensures long life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

(1)

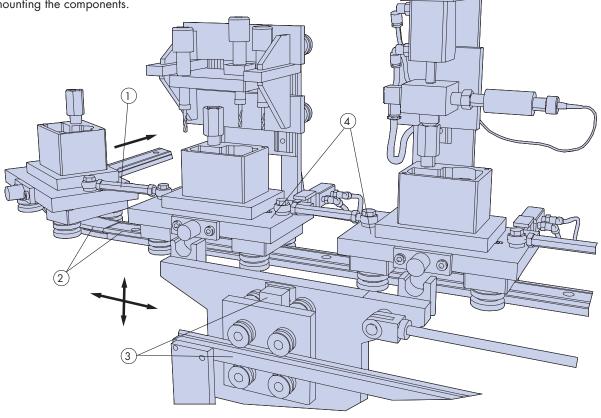
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Multi-Station Assembly Machine

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.

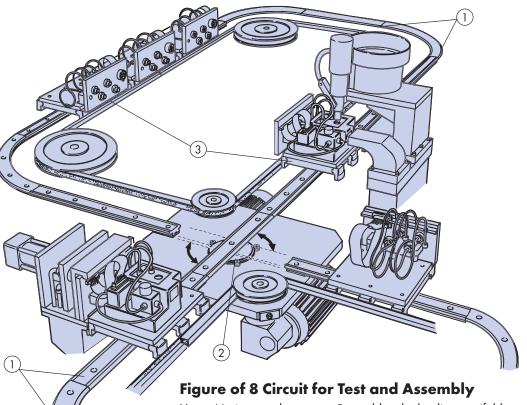


Carton Forming & Filling Line

HepcoMotion Track system ① provides a simple means of transportation from station to station. Alternate carriages ② 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.

(2)

(1)

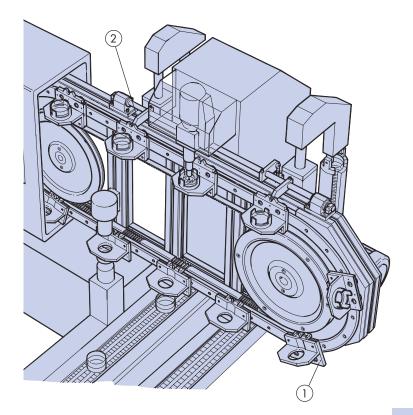


HepcoMotion track system ① enables hydraulic manifolds to be friction driven to a test station and then to subsequent assembly and unload stations or, if rejected, back to the load station. The unique ability of the Hepco System to traverse from one slide to another, enables a turntable to be designed 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 catalog. See also 2 \$ 52 \$ 53.

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.



(3)

Clamping Method for Belt to Carriage Connection

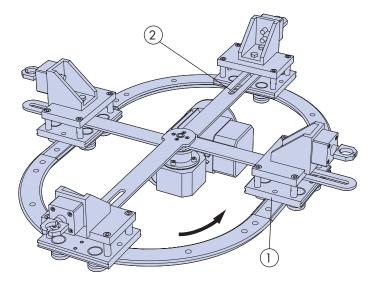
(2)

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 21 should be used to adjust track system length in relation to the tensioned belt.

Track Systems Mounted in Parallel

(4)

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 ⁽¹⁾. This enables the drive link brackets 2 to be bolted through to the steel inserts thereby achieving a strong fixing. Link arms ③ 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 ④ are used on one side to accommodate any axial wander.

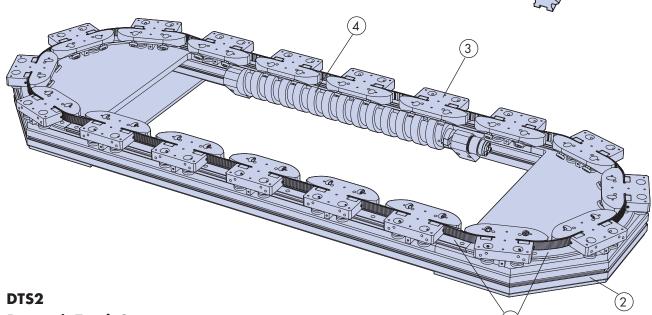


Spider Drive

For short track systems carriages ① can be driven from a central motor and spider. The arms of the spider ② incorporate slots to accommodate the changing distance of the carriages from the motor drive shaft.

Pocket Wheel Drive

Carriages are linked together by connecting rods (1). A cam follower (2) located on each carriage engages with cutouts (3) 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.



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 \mathbb{O} , mounted on a Hepco MCS compatible frame \mathbb{O} . Its carriages \mathbb{S} , are linked with adjustable

spring-loaded belts and driven by a screw ④. The DTS2 can be supplied with motors, drives and bleed lubrication system (🕮 54). 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.

Slotted Carriage Connection For Belt Adjustment

The timing belt is fitted with U section attachments ① secured to the belt with countersunk screws. Pins ② engage with slotted drive member ③ 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.

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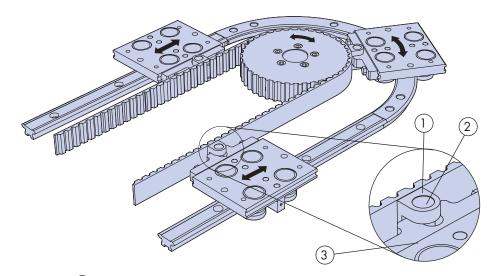
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Link Drive

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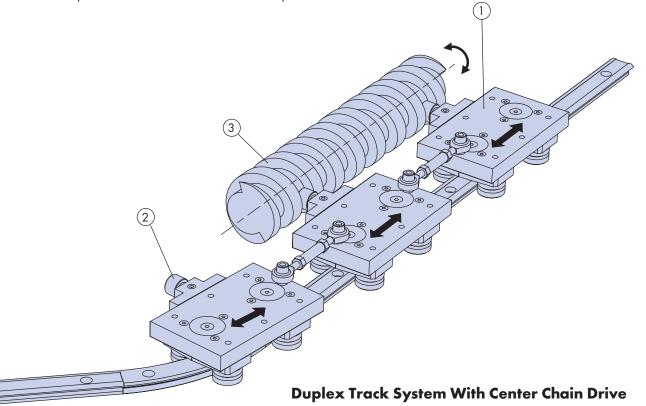
A simple link arm ① pivoting on an extended pin, connects to the carriage and provides for a drive in a single direction only. The design allows an amount of chain adjustment to take place and caters for slight variation in the proximity of carriage to chain, as the carriage traverses from straight to curve. It is recommended that chain support rails ② are fitted to overcome the offset drive forces.

Linked Carriage System With Latch & Pawl Drive

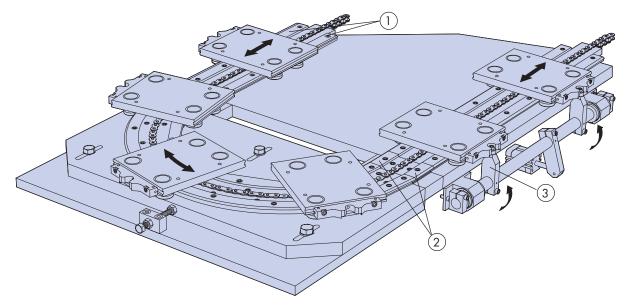
Bogie carriages ① linked by adjustable connecting rods, are indexed by means of HepcoMotion Powerslide and latch mechanism ②. Hepco carriage locking system ③ ensures location and positional accuracy during the stationary cycle. Linked carriage systems require some play to be present in the link journals or to have other means of compliance.

Linked Carriage System With Scroll Drive

Bogie carriages ① linked by adjustable connecting rods, incorporate rollers ② which engage with the screw ③ 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.



This durable and highly stable duplex track system capable of withstanding high loads, is available complete with special chain and scroll drive system from Bishop-Wisecarver. The track system comprises of duplex single edge slides ① 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 ② as shown and further illustrated 💷 21. Either intermittent or constant motion is possible in either direction. A unique mechanism within the carriage in conjunction with the carriage locking system ③ 🛄 52-53, enables index positioning to within 0.02mm to be achieved.



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

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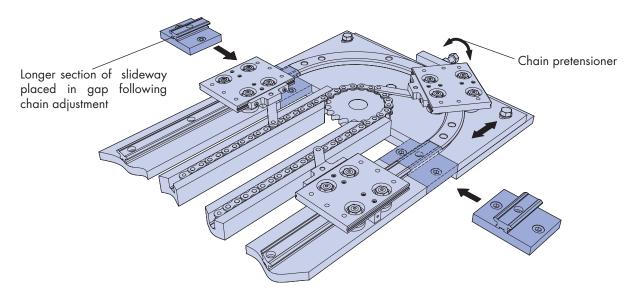
In this standard HepcoMotion Driven Track System example a high downwards force is being applied to the carriage during a stamping operation. The moment load carriage (1) and static roller support (2) provides additional support while the force is being applied. A HepcoMotion carriage locking system (3) (1) 52-53 ensures precise location and positional accuracy while the operation takes place.

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 center 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.

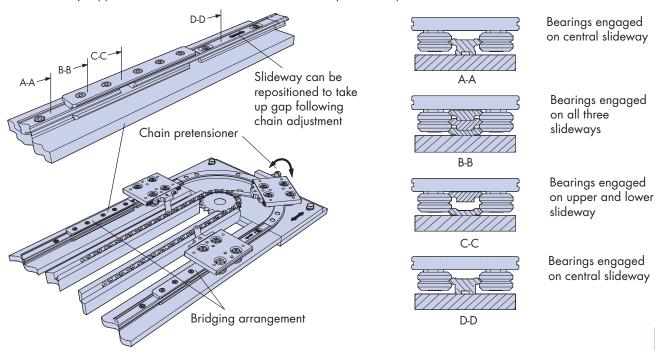
Slip Block Adjustment Method

Bishop-Wisecarver 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.



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.

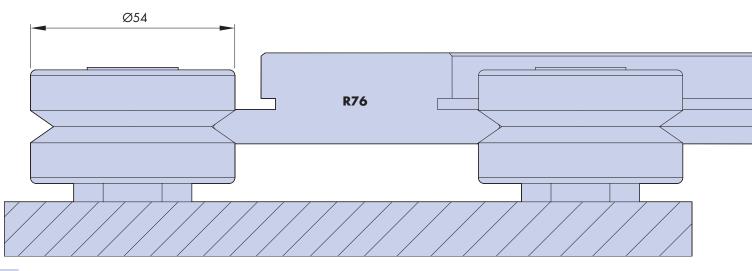


Full Size Illustrations For Initial Selection

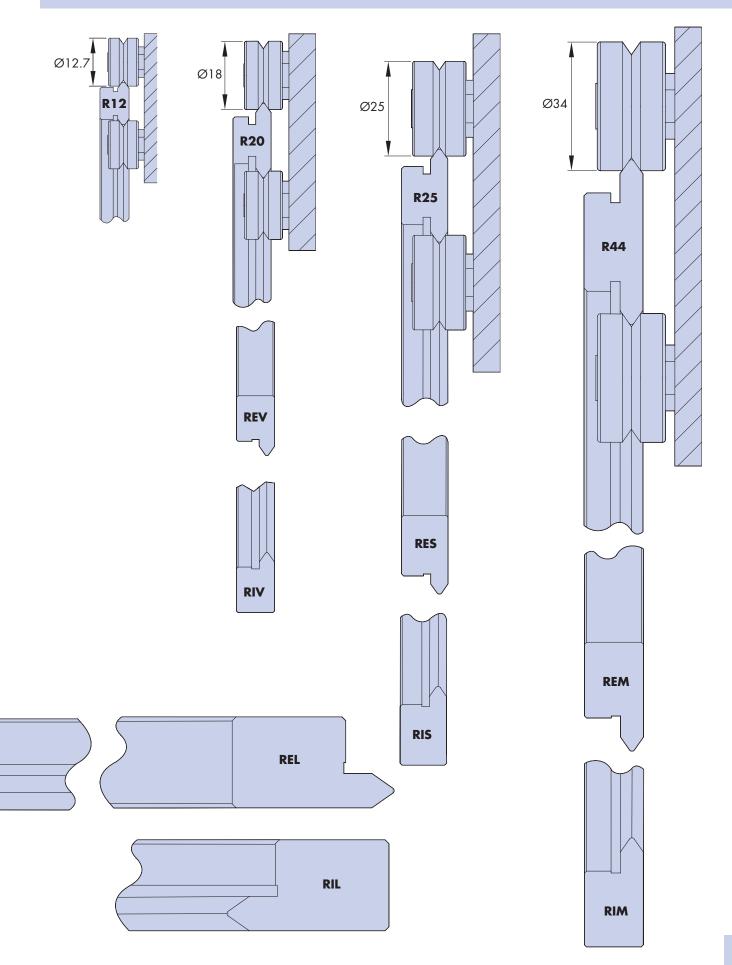
Full size illustrations of the basic range of Ring slide systems together with a comparison table for bearings and lubrication are provided to help with initial selection. Customers should refer to the individual component pages for dimensions and to the Technical section for details of load and life. There is a wide range of other options and components complementary to those shown in this section. These are illustrated in the System Composition III 4-9 and throughout the catalog.

	Lo				с		Tolerance	e of	D ¹ · 1 ¹		Tolerance	e of		
Bearing	-	-	Spee	d	Smooth	ness	Misalignn	nent	Rigidit	у	Debri	5		Price
	\odot	\odot		\odot		\odot		\odot		\odot		\odot	\odot	
Twin Bearing														
Double Row Bearing														
Floating Bearing														

Lubrication	L	oad	Lubrication	interval		Friction	Life		Price
Method		\odot		\odot	\odot		\odot	\odot	
None									
Hepco Lubricator									
Hepco Bleed Lubrication			Automatic frequency p						



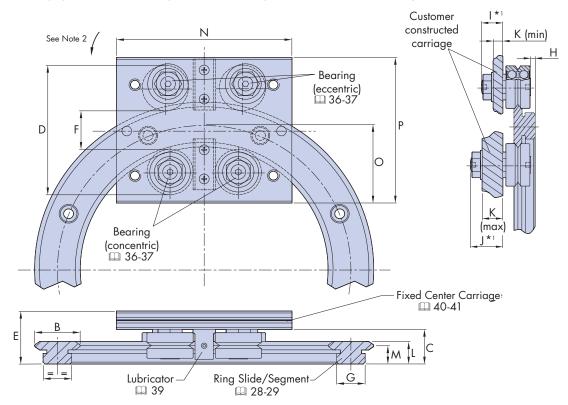
Full Size Illustrations For Initial Selection



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 12 42-45.

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.



Ring	For use with												K	
Slide Ref No	bearing (Ø)	A	B ~	С	D	E	F	G	н	I*1	J *1	Max	Min	
R12 93	J13	93	12	11.67	34.7	19.0	9.1	8.6	1.5	5.8	9.5	6.7	2.2	
R12 127	J13	127	12	11.67	34.7	19.0	9.1	8.6	1.5	5.8	9.5	6.7	2.2	
R20 143	J18	143	20	14.75	52.5	24.75	16.3	12.4	2.4	7.4	14	10	2.4	
R20 210	J18	210	20	14.75	52.5	24.75	16.3	12.4	2.4	7.4	14	10	2.4	
R25 159	J25	159	25	19	71.2	30.5	20.9	15.4	2.4	9.8	19	13	2.2	
R25 255	J25	255	25	19	71.2	30.5	20.9	15.4	2.4	9.8	19	13	2.2	
R25 351	J25	351	25	19	71.2	30.5	20.9	15.4	2.4	9.8	19	13	2.2	
R44 468	J34	468	44	24	106.0	38.5	37.8	26	2.7	13.8	22	14.8	5.2	
R44 612	J34	612	44	24	106.0	38.5	37.8	26	2.7	13.8	22	14.8	5.2	
R76 799	J54	799	76	38.5	172.8	58.5	64.4	50.5	3.8	17.8	30	20.4	5.7	
R76 1033	J54	1033	76	38.5	172.8	58.5	64.4	50.5	3.8	17.8	30	20.4	5.7	
R76 1267	J54	1267	76	38.5	172.8	58.5	64.4	50.5	3.8	17.8	30	20.4	5.7	
R76 1501	J54	1501	76	38.5	172.8	58.5	64.4	50.5	3.8	17.8	30	20.4	5.7	

Notes:

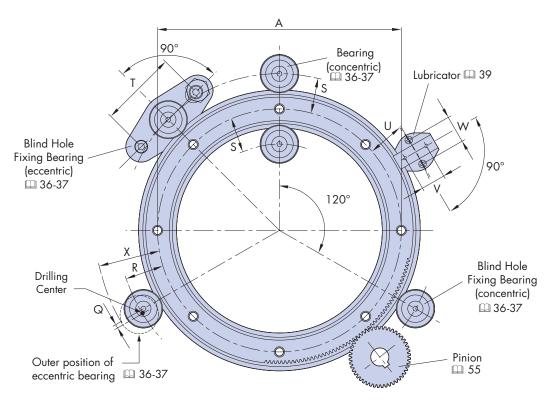
- 1. Two lengths of stud are available for each size of bearing 📖 36-38. Choose according to required carriage thickness.
- 2. Offset holes in carriage for eccentric bearings necessitate adjustment in direction of arrow shown see 📖 60.
- 3. Exact theoretical values have been given for 'Q', 'R' and 'S'. 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 🕮 57-59.



							Drilli	ng Positi	ons ^{*3}			
L	Μ	Ν	0	Ρ	Q	R	S	T ±0.2	U ±0.2	V ±0.2	W ±0.2	X
7.7	6.2	55	22	40	1.3	12.3	10.9	30	11.5	6.5	12	20.5
7.7	6.2	55	21	40	1.3	12.3	10.9	30	11.5	6.5	12	20.5
10	8	75	34	64	1.8	19	17.2	38	18	13	13	30.6
10	8	80	34	64	1.8	19	17.2	38	18	13	13	30.6
12.25	10	95	43	80	1.9	24.9	23.0	50	22.5	16	18	40.2
12.25	10	100	42	80	1.9	24.9	23.0	50	22.5	16	18	40.2
12.25	10	105	42	80	1.9	24.9	23.0	50	22.5	16	18	40.2
15.5	12.5	145	61	116	2.5	38.5	35.9	60	34.5	22	25	59.1
15.5	12.5	150	61	116	2.5	38.5	35.9	60	34.5	22	25	59.1
24	19.5	190	96	185	3.9	63.1	59.2	89.5	57	33	38	95.6
24	19.5	210	96	185	3.9	63.1	59.2	89.5	57	33	38	95.6
24	19.5	250	97	185	3.9	63.1	59.2	89.5	57	33	38	95.6
24	19.5	270	97	185	3.9	63.1	59.2	89.5	57	33	38	95.6

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

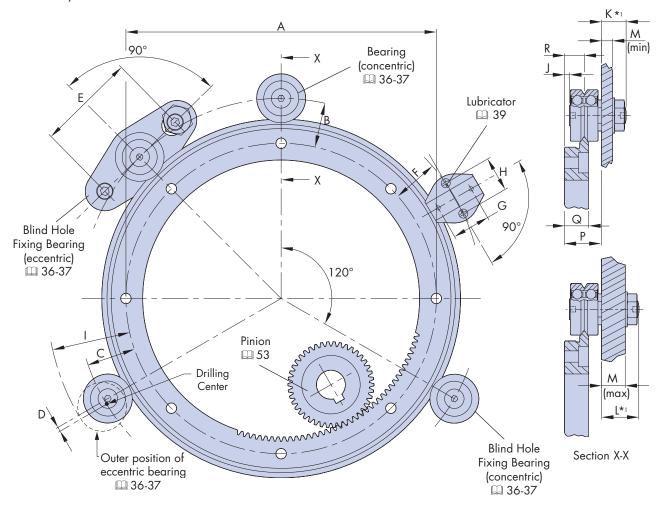
- -

180° Ring segment 🛄 28-29 Fixed center carriage 🛄 40-41

Assembled Single Edge Ring System (External)



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 III 56-60.



Ring Slide	For use with bearing (Ø)			I	Drilling	g Positi	ions ^{*2}							N	٨	Р	Q	R
RefNo		A	В	с	D	E	F	G	н		J	K *1	L*1	Max	Min			
REV 156	J18	137.6	16.7	18.5	1.8	38	17.5	13	13	30.1	2.4	7.4	14	10	2.4	14.75	10	8
REV 223	J18	204.8	16.7	18.5	1.8	38	17.5	13	13	30.1	2.4	7.4	14	10	2.4	14.75	10	8
RES 184	J25	159	23.0	24.9	1.9	50	22.5	16	18	40.2	2.4	9.8	19	13	2.2	19	12.25	10
RES 280	J25	255	23.0	24.9	1.9	50	22.5	16	18	40.2	2.4	9.8	19	13	2.2	19	12.25	10
RES 376	J25	351	23.0	24.9	1.9	50	22.5	16	18	40.2	2.4	9.8	19	13	2.2	19	12.25	10
REM 505	J34	468.5	32.4	35	2.5	60	31	22	25	55.6	2.7	13.8	22	14.8	5.2	24	15.5	12.5
REM 655	J34	618.5	32.4	35	2.5	60	31	22	25	55.6	2.7	13.8	22	14.8	5.2	24	15.5	12.5
REL 874	J54	820	48.3	52.1	3.9	89.5	45.5	33	38	84.6	3.8	17.8	30	20.4	5.7	38.5	24	19.5

Notes:

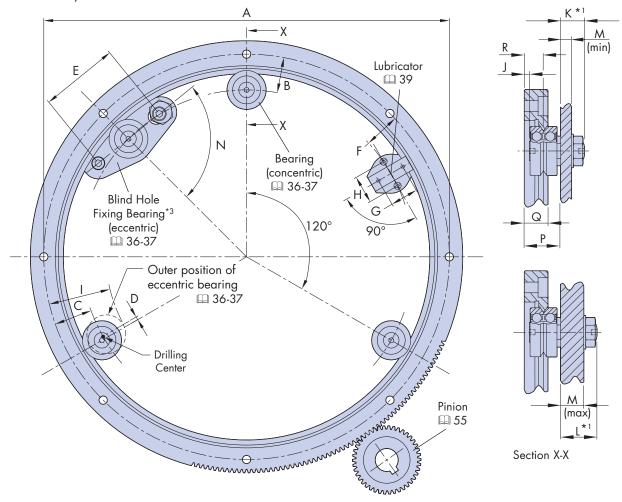
1. Short or long stud lengths are available for each size of bearing 📖 34-35. Choose according to the required mounting plate thickness.

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.

Assembled Single Edge Ring System (Internal)



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 III 56-60.



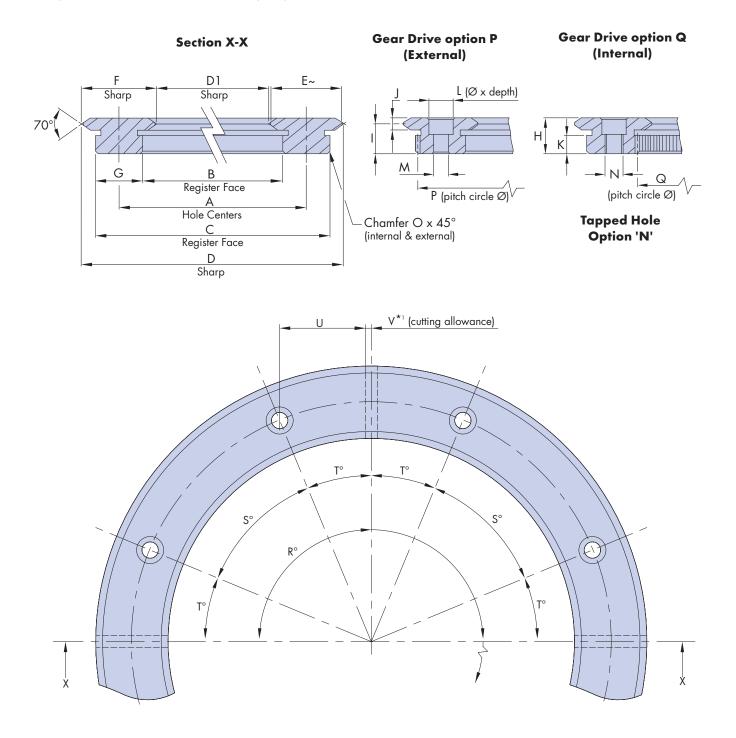
Ring Slide	For use with bearing (Ø)	A		D	rilling	Positic	ons ^{*3}				J	K *1	L'I	N	٨	N	Р	Q	R
Ref No			В	с	D	E	F	G	н					Μαχ	Min				
RIV 161	J18	148	16.7	18.5	1.8	38	17.5	13	13	30.1	2.4	7.4	14	10	2.4	90	14.75	10	8
RIV 228	J18	215.2	16.7	18.5	1.8	38	17.5	13	13	30.1	2.4	7.4	14	10	2.4	86	14.75	10	8
RIS 182*3	J25	165	23.0	24.9	1.9	-	22.5	16	18	40.2	2.4	9.8	19	13	2.2	-	19	12.25	10
RIS 278	J25	261	23.0	24.9	1.9	50	22.5	16	18	40.2	2.4	9.8	19	13	2.2	84	19	12.25	10
RIS 374	J25	357	23.0	24.9	1.9	50	22.5	16	18	40.2	2.4	9.8	19	13	2.2	84	19	12.25	10
RIM 482	J34	461.5	32.4	35	2.5	60	31	22	25	55.6	2.7	13.8	22	14.8	5.2	90	24	15.5	12.5
RIM 627	J34	606.5	32.4	35	2.5	60	31	22	25	55.6	2.7	13.8	22	14.8	5.2	90	24	15.5	12.5
RIL 820	J54	788	48.3	52.1	3.9	89.5	45.5	33	38	84.6	3.8	17.8	30	20.4	5.7	90	38.5	24	19.5

Notes:

- 1. Short or long stud lengths are available for each size of bearing 📖 36-37. 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.

Double Edge Ring Slides & Segments

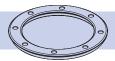
HepcoMotion double edge ring slides are manufactured from high quality steel, zone hardened on the V edges and precision ground all over with datum register faces provided both internally and externally for ease of location. Gear drive options are available with teeth machined into either the internal 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 Bishop-Wisecarver upon request.

Double Edge Ring Slides & Segments



HepcoMotion double edge ring segments are cut from complete 360° ring slides and held in stock in nominal 90° and 180° segments^{*1}. 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.

Part Number	For use with bearing (Ø)	A ±0.2	₿ (JS6) Register Ø	C Register Ø	D	D1	E ~	F	G	н	 ±0.025	J	к	L	M	DIN912 ⁻² Not supplied
R 12 93	J13	93	84.4 ±0.011	101.6 ±0.037	105.37	80.63	12	12.37	8.6	7.7	6.2	3	3.5	6 x 3	3.7	M3*2
R12 127	J13	127	118.4 ±0.011	135.6 ±0.037	139.37	114.63	12	12.37	8.6	7.7	6.2	3	3.5	6 x 3	3.7	M3*2
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	5.75	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	5.75	9 x 6	5.5	M5
R25 351	J25	351	335.6 ±0.018	366.4 ±0.044	376.74	325.26	25	25.74	15.4	12.25	10	4.5	5.75	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	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	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	19.5	9	12	20 x 13	14	M12
R76 1501	J54	1501	1450.5 ±0.039	1551.5 ±0.060	1577.74	1424.26	76	76.74	50.5	24	19.5	9	12	20 x 13	14	M12

		Ex	cterna	l Gear	Int	terna	Gear		Stock gmen	-	Number of holes	Holes with true pe					Part
N	0	Р	MOD	No of teeth (R=360°)	Q	MOD	No of teeth (R=360°)		R°		(R=360°)	S°	T°	U	v	kg~ (R=360°)	Number
M4	0.2	100.8	0.4	252	85.2	0.4	213	90	180	360	8	45	22.5	16.8	1	0.16	R 12 93
M4	0.2	134.4	0.4	336	119.2	0.4	298	90	180	360	8	45	22.5	23.3	1	0.22	R12 127
M6	0.4	153.6	0.8	192	132	0.8	165	90	180	360	8	45	22.5	26.3	1	0.45	R20 143
M6	0.4	220.8	0.8	276	199.2	0.8	249	90	180	360	8	45	22.5	39.2	1	0.66	R20 210
M8	0.5	172.8	0.8	216	145.6	0.8	182	90	180	360	8	45	22.5	29.4	1	0.77	R25 159
M8	0.5	268.8	0.8	336	241.6	0.8	302	90	180	360	8	45	22.5	47.8	1	1.2	R25 255
M8	0.5	364.8	0.8	456	337.6	0.8	422	90	180	360	12	30	15	44.4	1	1.65	R25 351
M8	0.5	492	1.0	492	444	1.0	444	90	180	360	12	30	15	58.6	2	5.1	R44 468
M8	0.5	636	1.0	636	588	1.0	588	90	180	360	16	22.5	11.25	57.7	2	6.7	R44 612
M16	1.0	846	1.5	564	751.5	1.5	501	90	180	360	16	22.5	11.25	75.9	2	25	R76 799
M16	1.0	1080	1.5	720	985.5	1.5	657	90	180	360	20	18	9	78.8	2	32	R76 1033
M16	1.0	1314	1.5	876	1219.5	1.5	813	90	180	360	20	18	9	97.1	2	41	R76 1267
M16	1.0	1548	1.5	1032	1453.5	1.5	969	90	180	360	20	18	9	115.4	2	48.7	R76 1501

R360

(<u>P</u>) (<u>Q</u>) (<u>N</u>)

(SS) R25 351

Ordering details:

SS = Stainless Steel option — Leave blank for steel version

Part number

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R90 = 90° segment

R180 = 180° segment —

R360 = Full 360° ring

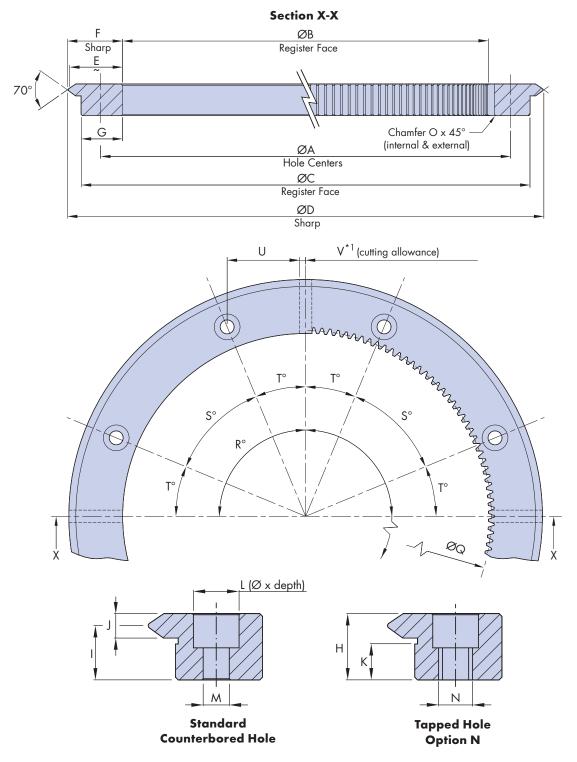
 N = Tapped hole option Leave blank for plain holes

Q = Internal gear drive option Leave blank if not required

P = External gear drive option Leave blank if not required

External Single Edge Ring Slides & Segments

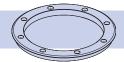
HepcoMotion single edge ring slides are manufactured from high quality steel, zone hardened on the V edge and precision ground all over. Datum register faces are provided both internally and externally for ease of location. Gear drive options are available with teeth machined into the internal register 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.



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

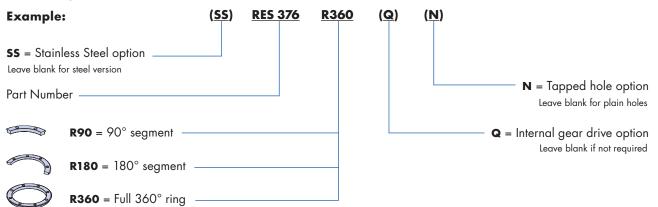


HepcoMotion ring segments are cut from complete 360° ring slides and held in stock in nominal 90° and 180° segments. Any length segment can be cut to customer's special order and additional holes drilled as required. Although suitable for most applications, slight out of roundness and flatness may be 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. Larger diameter single edge ring slides are available in the HDRT range for which there is a separate catalog $\square 63$.

Part Number	For use with bearing (Ø)	A ±0.2	₿ (J56) Register Ø	C Register Ø	D	E ~	F	G	н	 ±0.025	J	к	L	M	DIN912 (not supplied)
REV 156	J18	137.6	124.6 ±0.013	148.6 ±0.037	156.97	15.8	16.18	12	10	8	4.2	3.8	8 x 4.2	5.0	M4
REV 223	J18	204.8	191.8 ±0.015	215.8 ±0.037	224.17	15.8	16.18	12	10	8	4.2	3.8	8 x 4.2	5.0	M4
RES 184	J25	159	142 ±0.013	174 ±0.039	184.74	20.8	21.37	16	12.25	10	4.5	5.75	10 x 5.2	5.5	M5
RES 280	J25	255	238 ±0.015	270 ±0.041	280.74	20.8	21.37	16	12.25	10	4.5	5.75	10 x 5.2	5.5	M5
RES 376	J25	351	334 ±0.018	366 ±0.044	376.74	20.8	21.37	16	12.25	10	4.5	5.75	10 x 5.2	5.5	M5
REM 505	J34	468.5	447.5 ±0.020	487.5 ±0.046	506.24	28.8	29.37	20	15.5	12.5	6	7.0	11 x 6.2	6.8	M6
REM 655	J34	618.5	597.5 ±0.022	637.5 ±0.048	656.24	28.8	29.37	20	15.5	12.5	6	7.0	11 x 6.2	6.8	M6
REL 874	J54	820	788 ±0.025	848 ±0.051	874.74	42.8	43.37	30	24	19.5	9	12	18 x 10.3	11	M10

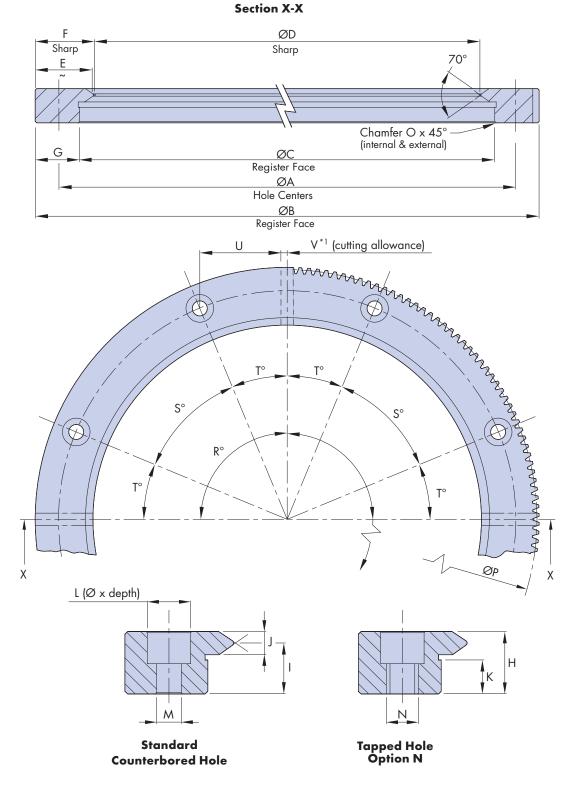
		Ir	nternal (Gear	Stoc	c Segme	ents"	Number of holes		n ±0.2 of true sition				Part Number
N	ο	Q	MOD	No of teeth (R=360°)		R°		(R=360°)	S°	T°	U	v	kg~ (R=360°)	Part Number
M6	0.4	126	0.7	180	-	-	360	8	45	22.5	25.3	1	0.42	REV 156
M6	0.4	193.2	0.7	276	-	-	360	8	45	22.5	38.2	1	0.63	REV 223
M8	0.5	144	1	144	90	180	360	8	45	22.5	29.4	1	0.78	RES 184
M8	0.5	240	1	240	90	180	360	8	45	22.5	47.8	1	1.27	RES 280
M8	0.5	336	1	336	90	180	360	12	30	15	44.4	1	1.75	RES 376
M8	0.5	450	1.25	360	90	180	360	12	30	15	58.6	2	3.93	REM 505
M8	0.5	600	1.25	480	90	180	360	16	22.5	11.25	58.3	2	5.18	REM 655
M16	1.0	792	2	396	-	-	360	16	22.5	11.25	78	2	15.64	REL 874

Ordering details:



Internal Single Edge Ring Slides & Segments

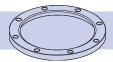
HepcoMotion single edge ring slides are manufactured from high quality steel, zone hardened on the V edge and precision ground all over. Datum register faces are provided both internally and externally for ease of location. Gear drive options are available with teeth machined into the external register 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.

Internal Single Edge Ring Slides & Segments

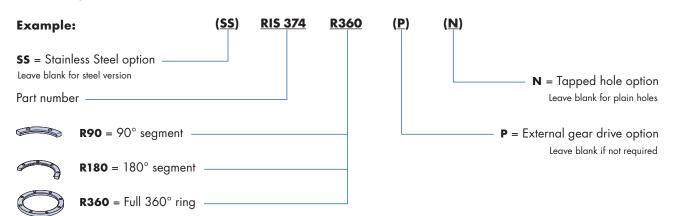


HepcoMotion single edge ring segments are cut from complete 360° ring slides and held in stock in nominal 90° and 180° segments. Any length segment can be cut to customer's special order and additional holes drilled as required. Although suitable for most applications, slight out of roundness and flatness 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. Larger diameter single edge ring slides are available in the HDRT range for which there is a separate catalog \square 63.

Part Number	For use with bearing (Ø)	A ±0.2	B Regist		C Register Ø	D	E ~	F	G	н	 ±0.025	J	к	L	M	DIN912 (not supplied)
RIV 161	J18	148	161	±0.013	137 ±0.037	128.63	15.8	16.18	12	10	8	4.2	3.8	8 x 4.2	5.0	M4
RIV 228	J18	215.2	228.2	±0.015	204.2 ±0.037	195.83	15.8	16.18	12	10	8	4.2	3.8	8 x 4.2	5.0	M4
RIS 182	J25	165	182	±0.015	150 ±0.039	139.26	20.8	21.37	16	12.25	10	4.5	5.75	10 x 5.2	5.5	M5
RIS 278	J25	261	278	±0.016	246 ±0.041	235.26	20.8	21.37	16	12.25	10	4.5	5.75	10 x 5.2	5.5	M5
RIS 374	J25	357	374	±0.018	342 ±0.044	331.26	20.8	21.37	16	12.25	10	4.5	5.75	10 x 5.2	5.5	M5
RIM 482	J34	461.5	482.5	±0.020	442.5 ±0.046	423.76	28.8	29.37	20	15.5	12.5	6	7	11 x 6.2	6.8	M6
RIM 627	J34	606.5	627.5	±0.022	587.5 ±0.048	568.76	28.8	29.37	20	15.5	12.5	6	7	11 x 6.2	6.8	M6
RIL 820	J54	788	820	±0.028	760 ±0.051	733.26	42.8	43.37	30	24	19.5	9	12	18 x 10.3	11	M10

	External Gear		Gear	Stock Segments"			Number of holes	Holes within ±0.2 of true position					Part Number	
N	ο	Р	MOD	No of teeth (R=360°)	R°			(R=360°)	S°	T°	U	v	kg~ (R=360°)	Parr Number
M6	0.4	159.6	0.7	228	-	-	360	8	45	22.5	27.3	1	0.42	RIV 161
M6	0.4	226.8	0.7	324	-	-	360	8	45	22.5	40.2	1	0.63	RIV 228
M8	0.5	180	1	180	90	180	360	8	45	22.5	30.6	1	0.78	RIS 182
M8	0.5	276	1	276	90	180	360	8	45	22.5	48.9	1	1.27	RIS 278
M8	0.5	372	1	372	90	180	360	12	30	15	45.2	1	1.75	RIS 374
M8	0.5	480	1.25	384	90	180	360	12	30	15	57.7	2	3.93	RIM 482
M8	0.5	625	1.25	500	90	180	360	16	22.5	11.25	57.2	2	5.18	RIM 627
M16	1.0	816	2	408	-	-	360	16	22.5	11.25	74.9	2	15.64	RIL 820

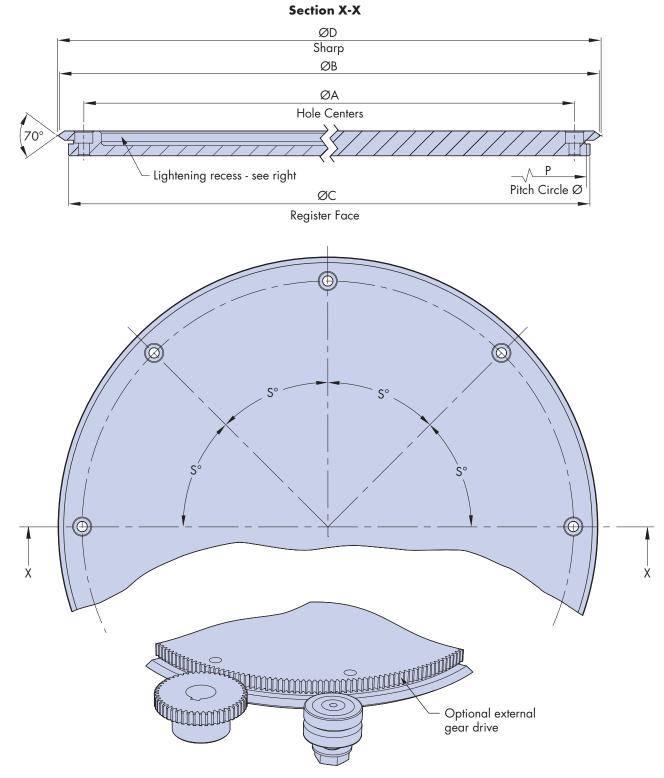
Ordering details:



Ring Discs

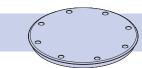
HepcoMotion Ring Discs are ideally suited for turntable applications where a precision platform is required for the mounting of components. Ring discs are made from high quality steel, hardened on the V edge and precision ground all over^{*1}. An external datum register is provided and a gear drive option 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 📖 28.



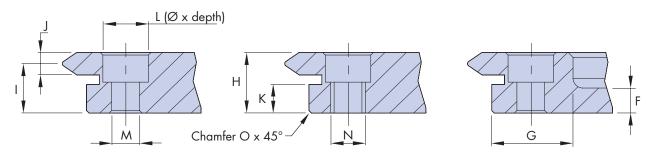
Notes:

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



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.



Standard Counterbored Hole

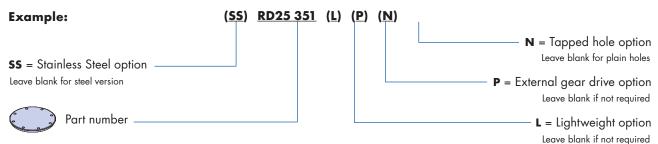


Lightweight Option L

Part Number	For use with bearing (Ø)	A ±0.2	В	C Register Ø	D	F	G	н	 ±0.025	J	К	L
RD25 159	J25	159	184	174.4 ±0.039	184.74	5	15.4	12.25	10.0	4.5	5.75	9 x 6
RD25 255	J25	255	280	270.4 ±0.041	280.74	5	15.4	12.25	10.0	4.5	5.75	9 x 6
RD25 351	J25	351	376	366.4 ±0.044	376.74	5	15.4	12.25	10.0	4.5	5.75	9 x 6
RD44 468	J34	468	512	494 ±0.046	512.74	6	26	15.5	12.5	6	7	11 x 7

M		N	0		External	Gear	Number of	Holes within ±0.2 of true position		kg~	Part Number
M	DIN912 (not supplied)			Р	MOD	No of teeth	Holes	S°	Standard	Lightweight	r arr Nomber
5.5	M5	M8	0.5	172.8	0.8	216	8	45	2.3	1.4	RD25 159
5.5	M5	M8	0.5	268.8	0.8	336	8	45	5.5	3.0	RD25 255
5.5	M5	M8	0.5	364.8	0.8	456	12	30	10.2	5.2	RD25 351
6.8	M6	M8	0.5	492	1	492	12	30	23.6	12.2	RD44 468

Ordering details:



Bearings



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

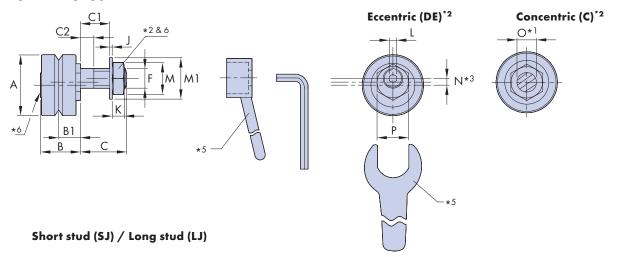
Twin Bearing type has the smoothest running quality, is easiest to adjust and offers some compliance to accommodate misalignment. It has two deep groove ball bearings on a single stud, and is the usual choice for many systems.

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 📖 22 for the bearing and lubrication selector.

Through Fixing Type (RSJ/RLJ)



Par			Fo	r use with				*4	С		C1		C2		
Number	ber	Q	\bigcirc	33	0	A	В	B1 *4	RSJ	RLJ	RSJ	RLJ	RSJ	RLJ	
J13	3	R12	-	-	TNMS	12.7	10.1	5.47	5.8	9.5	3	6.7	2.2	2.4	
J18	3	R20	-	REV, RIV	TNV	18	12.4	6.75	7.4	14	3.4	10	2.4	2.5	
J25	5	R25	RD25	RES, RIS	TNS	25	16.6	9	9.8	19	3.8	13	2.2	4.9	
J34	i	R44	RD44	REM, RIM	TNM	34	21.3	11.5	13.8	22	6.6	14.8	5.2	5.9	
J54	i	R76	-	REL, RIL	TNL	54	34.7	19	17.8	30	8.2	20.4	5.7	7.9	

Q	R ^{*3}	S	51	т	ті	T2	U ±0.1	UI	v	w	x	Y	z	
1.5	1.0	6.25	6.6	8.5	3.75	6.75	30	47.5	8	20	M3	5.5	8	
2	1.2	8	10.5	10	4	8	38	54	11	24.5	M4	7	7	
3	1.5	7	9	12	5	10	50	72	14	32	M5	8.5	10	
4	2.0	9.5	8.5	17.5	6.5	12.5	60	90.5	17	42	M6	10	14	
8	3.0	14.5	16.4	23.5	10.5	18.5	89.5	133	25	62	M8	13	20	

Notes:

It is recommended that holes to suit bearing mounting studs should be reamed to tolerance F6 for a sliding fit. 1.

Nuts and washers are supplied with both concentric and eccentric RSJ/RLJ type bearings. 2.

'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 3.

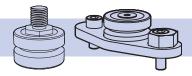
total stroke at the bearing centerline. Controlled height (CHK) bearings are selected in ±0.010mm bands in respect of the B1 dimension. They are supplied in sets of up to 50 4 parts as standard, with larger sets on request.

5. For adjusting tool part numbers see table. For adjustment procedure and fixing nut tightening torques see 💷 58.

Fasteners for the through fixing type bearings are black on the concentric version and bright zinc plated on the eccentric version for 6 identification purposes, except stainless steel type.

7. Stainless steel bearings are only available nitrile sealed.

Bearings



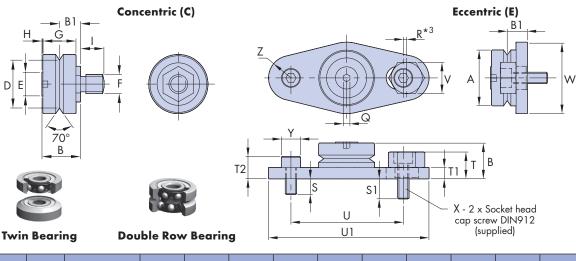
Through Hole Fixing type is available in two stud lengths covering most thicknesses of mounting plate, the short version being used in HepcoMotion carriages. Both are available in **Concentric (C)** which provides a datum for the system, and **Eccentric (DE)** to provide enough adjustment to permit disengagement of a carriage or ring encircled by bearings III 60.

All bearings are available in a **Controlled Height version (CHK)** which minimizes variation in the B1 dimension^{*4}. This is desirable in high precision applications 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 🕮 39 or Bleed Lubrication system 🕮 54. Lubrication greatly increases load capacity and life.

Blind Hole Fixing Type (RBHJ)



D ±0.025	E	F Metric Fine	G	н	I	J	к	L	M	MI	N ^{*3}	O *1 +0.0 -0.03	Ρ
9.51	5	M4 x 0.5	8	0.5	5.8	0.8	2.2	-	7	9	1.9	4	7
14.00	7	M6 x 0.75	10	0.6	7.4	0.8	3.2	2.5	10	13	2.6	6	11
20.27	10	M8 x 1	14	0.5	9.8	1	5	3	13	17	2.75	8	13
27.13	12	M10 x 1.25	18	0.7	13.8	1.25	6	4	17	21	3.6	10	15
41.76	25	M14 x 1.5	28	1.6	17.8	1.6	8	6	22	28	5.5	14	27

Adjusting	Socket		2	~			c	Options Availabl	e		Durat
Wrench	Tool *5		9			-	NS'7	-	DR	СНК	Part
	9	RSJC/E	RLJC/E	RBHJC	RBHJE	Metal shields	Nitrile Seals	Twin Bearing	Double Row	Controlled Height	Number
AT13	-	8	8	7	27	×	~	\checkmark	×	✓	J13
AT18	RT6	19	20	18	45	×	~	\checkmark	✓	✓	J18
AT25	RT8	48	51	43	105	✓	~	\checkmark	✓	✓	J25
AT34	RT10	115	120	105	235	✓	~	\checkmark	✓	✓	J34
AT54	RT14	415	425	390	800	✓	✓	✓	✓	✓	J54

Ordering details: (SS) <u>RSJ</u> <u>25</u> (DR) (NS) <u>C</u> (CHK) **CHK** = Controlled height *4 Leave blank if not required **SS** = Stainless steel option^{*7} Leave blank for steel version **NS** = Nitrile sealed option $*^7$ Leave blank for metal shields Fixing type: **RSJ** = Short stud Bearing type: **DR** = Double row bearing **RLJ** = Long stud Leave blank for twin bearing **RBHJ** = Blind hole fixing Journal type: C = Concentric (fixed) Bearing diameter **E** = Eccentric (adjustable, RBHJ only) options are 13, 18, 25, 34 & 54 **DE** = Eccentric (adjustable RSJ/RLJ only)

Floating Bearings

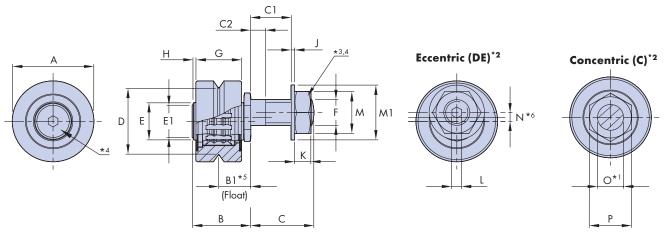


HepcoMotion Floating Bearings incorporate caged needle rollers and are designed to provide axial movement (float) of the V position. This is especially useful where two rings or track systems are mounted apart, see application example 🕮 16.

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.

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 \square 60.

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 🕮 39 or bleed lubrication system 🕮 54. Lubrication greatly increases load capacity and life.



Short stud (RSFJ) / Long stud (RLFJ)

Part		For us	e with				BI	*5	C	:	c	1	с	2		_		_		
Number	\mathbb{O}	\bigcirc	3	\bigcirc	A	В	Min	Max	RSFJ	RLFJ	RSFJ	RLFJ	RSFJ	RLFJ	D ±0.025	E	El	F Metric Fine	G	н ~
FJ25	R25	RD25	RES, RIS	TNS	25	18.1	9	10.5	9.8	19	3.8	13	3.4	4.9	20.27	11.5	10	M8 x 1	14	0.8
FJ34	R44	RD44	REM, RIM	TNM	34	23.2	11.5	13.5	13.8	22	6.6	14.8	5.2	5.9	27.13	16	12	M10 x 1.25	18	1
FJ54	R76	-	REL, RIL	TNL	54	37.2	19	21.6	17.8	30	8.2	20.4	5.7	7.9	41.76	28	25	M14 x 1.5	28	1.3

								Adjusting Wrench *3	Socket Tool *3		7~	Max Working		o) and Dynamic (C) Capacities (N)	Part
J	К	L	M	M1	N ^{*6}	O*1 +0 -0.03	Ρ	Wrench		RSFJC/DE		Load Capacity (N)	Co	с	Number
1	5	3	13	17	2.75	8	13	AT25	RT8	58	60	1500	6100	4900	FJ25
1.25	6	4	17	21	3.6	10	15	AT34	RT10	130	135	3000	12500	11500	FJ34
1.6	8	6	22	28	5.5	14	27	AT54	RT14	495	505	5000	28900	21500	FJ54

Notes:

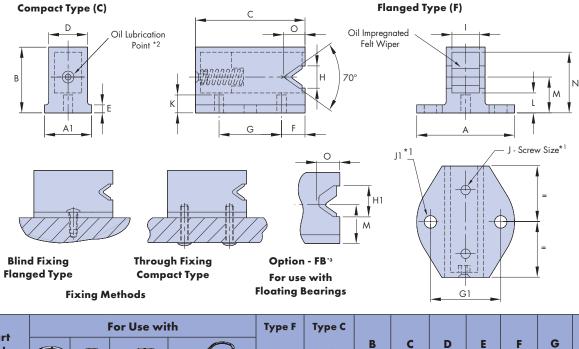
- 1. It is recommended that holes to suit bearing mounting studs should be reamed to tolerance F6 for a sliding fit.
- 2. Nuts and washers are supplied with both concentric and eccentric RSFJ/RLFJ type bearings.
- 3. For adjustment procedure and bearing fixing nut tightening torques see \square 60.
- 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 center.
- 6. 'N' is the eccentric offset due to the double eccentric design (2 \times N = total stroke).

Ordering details: RSFJ 25 C NS Fixing type: RSFJ Standard for all floating bearings Bearing diameter Journal Type: C C (options are 25, 34 & 54) DE = Eccentric (adjustable)

Lubricators



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 center carriage plates. Customers may also consider using the HepcoMotion bleed lubrication facility suitable for track systems 🖾 54.



1	Part													
	Number	Ø	0	83	\bigcirc	A	A 1	В	С	D	E	F	G ±0.1	G1 ±0.1
	LB 12	R12	-	-	TNMS 12	17	7	10	13	5.2	2	3	6.5	12
	LB 20	R20	-	REV, RIV	TNV 20	19	8	12	22.5	6.5	2	4.75	13	13
	LB 25	R25	RD25	RES, RIS	TNS 25, TNSE	25	12	16.5	28	9.9	2	6	16	18
	LB 44	R44	RD44	REM, RIM	TNM 44, TNME	34	17	20	38	15	2.4	8	22	25
	LB 76	R76	-	REL, RIL	TNL 76	50	25	33.5	57	22.7	4.5	12	33	38

н	н			JI		к		м	N	0	0	Part
			Ø x Length	Screw Size	Hole Ø	ĸ	–	M		U	∎g~	Number
3.1	-	3	2.5 x 5	M2.5 x 6	2.7	2.5	3	5.46	9	2.2	2	LB 12
7.2	-	4	2.5 x 10	M2.5 x 6	2.7	2.5	3.5	6.75	10.75	4.5	3	LB 20
5.5	7.1	7	3 x 10	M3 x 8	3.2	4.5	5	9	15.25	5.5	6	LB 25
7	9	11	3 x 16	M4 x 10	4.2	5.5	6.25	11.5	18.25	8	16	LB 44
10	12.6	18	3.5 x 22	M5 x 12	5.2	9	10	19	31.5	11.5	44	LB 76

Notes:

- Two 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 🛄 38.

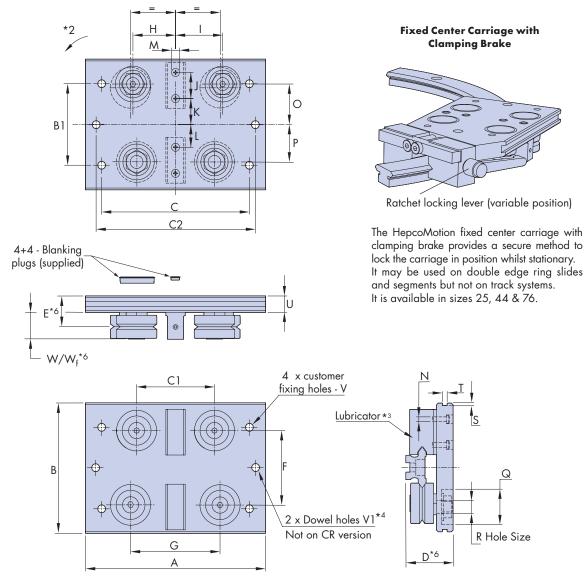
Example:	<u>LB 25</u>	F	(<u>FB</u>)	
Part Number Lubricator Type: F = Flanged Type C = Compact Type				FB = Floating Bearing option Specify only for lubricators used with floating bearings

Fixed Center Carriage

The HepcoMotion Fixed Center Carriage is designed for use with track systems with unidirectional bends of a common radii 42 and for use with double edge ring slides and segments 28-29. 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 system¹¹.

Carriages are available with twin or double row (DR) bearings 🕮 36-37, and with floating bearings 🕮 38. 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 aluminum carriage plate in place of the standard anodized finish.



Notes:

- 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 🕮 54.
- 4. Dowel holes V1 define the center 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 III 37 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 Wf in the table. Dimensions D and E will change for carriages with floating bearings. The amount of float is indicated by dimension B1 🛄 38.

Fixed Center Carriage

F	Part			For U	se with															_	
Nu	mber		Ø	Ð,	Z)	0	Α	В	B1	C	Cl	C2 ±0.01	D*6	E*6	F	G	н			J	к
FCC	:12 93	R	12 93 F	R360/R18	80/R90	TR12 93	55	40	25	48	20	45	19	12.8	21.9	25.52	11.11	14.	41	6.5	9.3
FCC	12 127	R1	12 127	R360/R1	80/R90	TR12 127	55	40	25	48	20	45	19	12.8	21.9	23.84	10.27	7 13.	56	6.5	8.8
FCC	20 143	R2	20 143	R360/R1	80/R90	TR20 143	75	64	40	60	25	65	24.75	16.75	34.4	32.03	13.76	5 18.:	27	13	13
FCC	20 210	R2	20 210	R360/R1	80/R90	TR20 210	80	64	40	65	28	70	24.75	16.75	34.4	33.06	14.28	3 18.	87	13	12.7
FCC2	25 159"	R2	25 159	R360/R1	80/R90	TR25 159	95	80	50	85	37	80	30.5	20.5	46	50.15	22.70	27.4	46	16	17.1
FCC	25 255	R2	25 255	R360/R1	180/R90	TR25 255	100	80	50	80	36.5	85	30.5	20.5	46	43.86	19.55	5 24.	31	16	15.9
FCC	25 351	R2	25 351	R360/R1	80/R90	TR25 351	105	80	50	85	40	90	30.5	20.5	46	45.66	20.43	5 25.	21	16	15.6
FCC	44 468	R4	44 468	R360/R1	180/R90	TR44 468	145	116	75	120	65	125	38.5	26	71.9	75.95	35.22	2 40.	73	22	25.8
FCC	44 612	R∠	44 612	R360/R1	80/R90	TR44 612	150	116	75	125	70	130	38.5	26	71.9	78.80	36.64	4 42.	16	22	25.5
FCC	76 799	R7	76 799	R360/R1	80/R90	TR76 799	190	185	100	160	90	165	58.5	39	118.5	104.56	6 49.13	3 55.	44	33	43
FCC7	6 1033	R7	6 1033	R360/R	180/R90	TR76 1033	210	185	100	180	110	185	58.5	39	118.5	123.48	3 58.59	9 64.	90	33	43
FCC7	76 1267	R7	6 1267	R360/R	180/R90	TR76 1267	250	185	100	205	130	225	58.5	39	118.5	142.82	2 68.20	5 74.	57	33	44
FCC7	76 1501	R7	6 1501	R360/R	180/R90	TR76 1501	270	185	100	225	150	245	58.5	39	118.5	162.38	8 78.04	4 84.	35	33	44
L	M		NØ	0	Р	Q		RØ		S	T	U	V	V1	-	w	W _f		B	Par Iumb	-
7.8	(Ø x dep 4.5 x 4	-	2.7	11.89	10.94	(Ø x depth) 12.5 x 4.8	(noie	size) +0.0	18	1	3	7.34	M4		0.002	10.1		g~ 70		CC12	
			2.7				-	+0.0		-				-	0.006		-				
7.8	4.5 × 4			11.89	10.94	12.5 x 4.8	4	+0.0	10	1	3	7.34	M4	4 -	0.006	10.1	-	70		CC12 1	
12.3	4.5 x 2		2.7	18.49	17.19	15.8 x 7	6	+0.0	10	1.5	4	10	M5	4 .	0.006	12.4	-	190		CC20	
12.3	4.5 x 2	.5	2.7	18.49	17.19	15.8 x 7	6	+0.0 +0.0	10	1.5	4	10	M5	4 .	0.006	12.4	-	200	F	CC20 2	210
14	5.3 x 4	.5	3.2	24.38	23.01	22 x 8.4	8	+0.02 +0.0	13	2	5	11.5	M6	<u> </u>	0.002 0.006	16.6	18.1	400	FC	C25 1	59 ''
14	5.3 x 4	.5	3.2	24.38	23.01	22 x 8.4	8	+0.02 +0.0		2	5	11.5	M6		0.002 0.006	16.6	18.1	410	F	CC25 2	255
14	5.3 x 4	.5	3.2	24.38	23.01	22 x 8.4	8	+0.02 +0.0		2	5	11.5	M6		0.002 0.006	16.6	18.1	420	F	CC25 :	351
23	5.3 x 4	.5	3.2	38.25	35.94	25 x 8.7	10	+0.02 +0.0		2	6	14.5	M8		0.002 0.007	21.3	23.2	1080	FC	CC44 4	468
23	5.3 x 4	.5	3.2	38.25	35.94	25 x 8.7	10	+0.02 +0.0	22 13	2	6	14.5	M8	8 .	0.002 0.007	21.3	23.2	1100	F	cc44 (612
40	8.0 x 6	.0	3.8	63.76	59.25	32.1 x 13.5	14	+0.02 +0.0		4	8	20	M10	10 .	0.002 0.007	34.7	37.2	3460	F	CC76 7	799
40	8.0 x 6	.0	3.8	63.76	59.25	32.1 x 13.5	14	+0.02		4	8	20	M10		·0.002 0.007	34.7	37.2	3660	FC	C76 1	033
40	8.0 x 6	.0	3.8	63.76	59.25	32.1 x 13.5	14	+0.02		4	8	20	M10		0.002 0.007	34.7	37.2	4050	FC	C76 1	267
40	8.0 x 6	.0	3.8	63.76	59.25	32.1 x 13.5	14	+0.02	27	4	8	20	M10	10 +	0.002 0.007	34.7	37.2	4250	FC	C76 1	501

Ordering details:

Example:

(CR) FCC 44 612 (LB) (DR) (NS) (CHK)

CR^{••} = Corrosion resistant option — Leave blank if not required

Part number

LB^{*3} = Lubricator option Leave blank if not required

Clamping Brake option available, please visit www.bwc.com for more information.

 CHK^{*5} = Controlled height option III 37 Standard with DR bearings Leave blank if not required for twin bearing version

NS = Nitrile sealed bearings fitted 🛄 36 Leave blank for metal shields

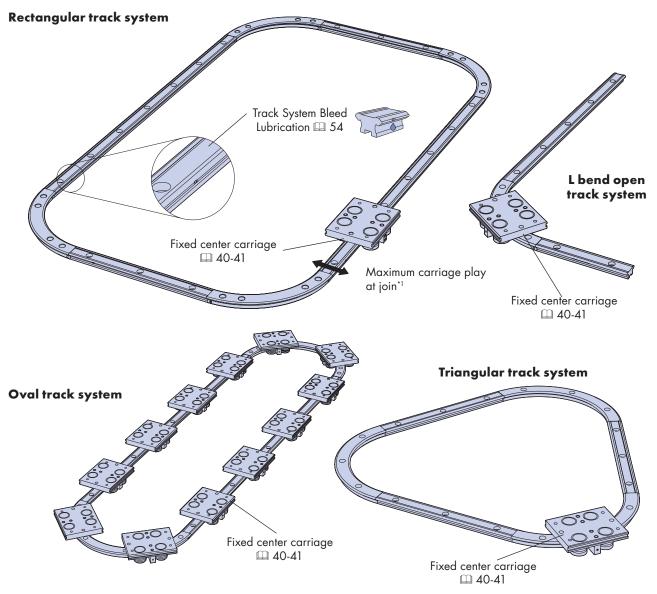
Bearing type: **FJ** = Floating bearings 🕮 38

DR = double row bearings 🕮 36

Leave blank for twin bearings

Track Systems

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 center 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 II 16-20. Lubrication of the system is achieved either by means of lubricators incorporated within the fixed center carriages or by means of the HepcoMotion bleed lubrication facility III 54 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.

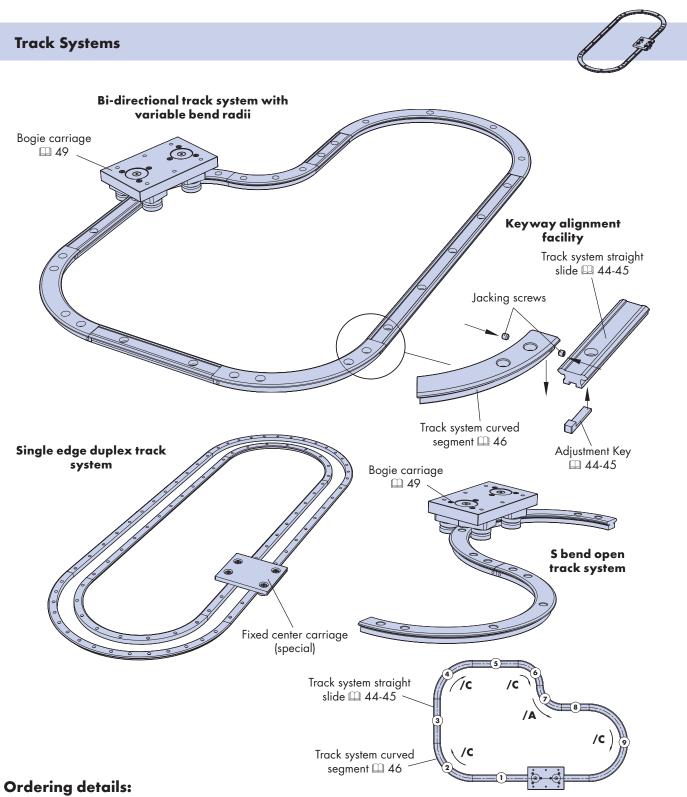


Installation

Installation requires manual drilling and setting. Track systems are also available in suitable grade to correspond with customers pre-drilled mounting holes.

Notes:

- 1. With the fixed center 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 💷 59.
- 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.

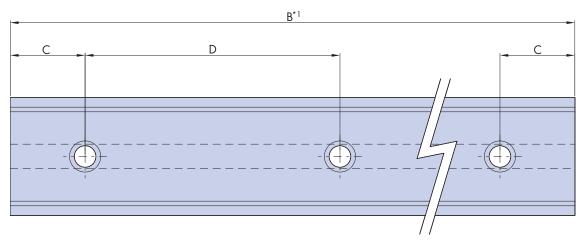


Simply list the curved segments and straight slide part numbers in a clockwise sequence beginning at any point on the track system, see above plan view of track system. Curved segments should be designated suffix 'C' for a clockwise bend and suffix 'A' for an anticlockwise bend. Final item should be 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 ID 54.

(1) TNS25 B420 2 x AK	— Track system straight slide 🕮 44-45	(6) TR25 159 R90/C	Clockwise curved segment 🛄 46
(2) TR25 255 R90/C	Clockwise curved segment 🛄 46	(7) TR25 159 R90/A	Anticlockwise curved segment 🕮 46
(3) TNS25 B159 2 x AK	— Track system straight slide 🕮 44-45	(8) TNS25 B99 2 x AK	— Track system straight slide 🕮 44-45
(4) TR25 255 R90/C	Clockwise curved segment 🕮 46	(9) TR25 255 R180/C	Clockwise curved segment 🕮 46
(5) TNS25 B165 2 x AK	— Track system straight slide 🕮 44-45] x BCP25	──── Bogie carriage û 49 For fixed center carriage û 40-41

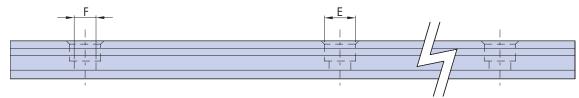
Track System Double Edge Straight Slides

HepcoMotion track system straight slides are modified straight slides from Hepco's highly acclaimed GV3 system for which there is a separate catalog, contact Bishop-Wisecarver or visit www.bwc.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 center portion of the slide is left soft to allow for customizing. 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 12. A bleed lubrication facility is available to channel lubricant direct to the running surfaces 12.



Bleed Lubrication is available as a standard option 📖 54.





Part	A	A1 ^{*5}	В	С	D	E	F		G	н	нı	I	J	
Number	~		(max)	0.0 -0.2		Ø x Depth		DIN912 (not supplied)		+0.05 0.00		±0.025		
TNMS 12	12	12.37	1976	10	45	6 x 3	3.5	M3	3	4	1.8	8.5	1.7	
TNV 20	20	20.37	4020	20	90	8 x 4	4.5	M4	4.21	5	2	12	1.75	
TNS 25	25	25.74	4020	20	90	10 x 5	5.5	M5	4.71	6	2.5	15	2.6	
TNM 44	44	44.74	4020	20	90	11 x 6	7	M6	6.21	8	3	26	2.3	
TNL 76	76	76.74	4020	30	180	20 x 12	14	M12	9.21	15	5	50	4.8	

Notes:

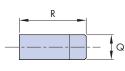
- Standard slide lengths are available in multiples of hole pitch 'D' + (2 x 'C') up to a maximum length per 'B' dimension in table above. Special length slides can be cut to order.
- 2. Adjustment keys are required at every join between straight slide and curved slide. Please order accordingly (see 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 'F' and 'I', 📖 46.

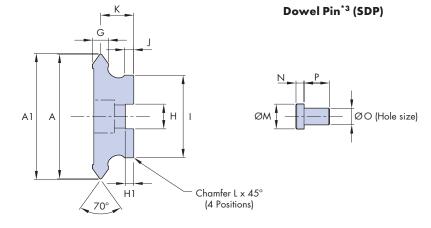
Track System Double Edge Straight Slides

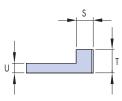


All straight slides within a track system are matched in essential respects both with each other and with their corresponding curved segments. They are ground square on the ends for precision butting and are marked with a reference number and sequence number for identification during installation and 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^{*4}.

Adjustment Key^{*2} (AK)







K ^{*5}	L		¶Ø n6)	Ν		Ø (6)	Ρ	Q	R	S	т	U	o ~kg/m	Part Number
6.2	0.2	4	+0.012 +0.004	-	4	+0.002 -0.006	6.75	2	11	4	3	1.5	0.5	TNMS 12
8	0.3	5	+0.012 +0.004	1.75	4	+0.002 -0.006	6	3.5	20.5	5.5	4	1.7	1.0	TNV 20
10	0.3	6	+0.012 +0.004	2.25	4	+0.002 -0.006	6	6	22	7	6	2.2	1.5	TNS 25
12.5	0.3	8	+0.015 +0.006	2.75	6	+0.002 -0.006	8	8	23	8	7	2.7	3.5	TNM 44
19.5	0.3	15	+0.018 +0.007	4.75	10	+0.002 -0.007	15	15	32	10	11	4.5	10	TNL 76

Ordering details:



(<u>SS</u>) <u>TNM 44</u>

<u>44 B1500 (BLP) 2 x AK</u>

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)

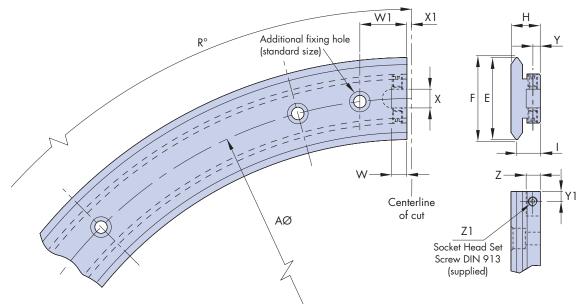
── Bleed Lubrication: BLP = Plain bore insert □ 54
BLT = Threaded insert □ 54
Leave blank if not required

(<u>16 x SDP</u>)

Track System Double Edge Curved Segments



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 slide¹¹. 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 III 42-43 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.

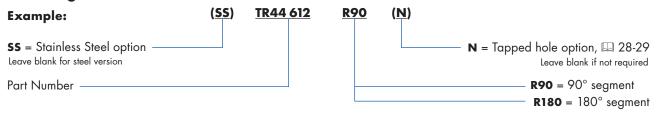


For all other details and dimensions see 🛄 28-29

Part Number	A	E ~	F	н	1 ±0.025	R	°	w	W1	x	X1 ±0.2	Y	Υl	z	Zl
TR 12 93	93	12	12.37	7.7	6.2	90	180	4.25	-	2.5	1.5	1.75	2	3.25	M2.5 x 3
TR 12 127	127	12	12.37	7.7	6.2	90	180	4.25	-	2.5	1.5	1.75	2	3.25	M2.5 x 3
TR20 143	143	20	20.37	10	8	90	180	6	13	4	1.5	2	3.5	4.5	M3 x 4
TR20 210	210	20	20.37	10	8	90	180	6	15	4	1.5	2	3.5	4.5	M3 x 4
TR25 159	159	25	25.74	12.25	10	90	180	7	18	7	1.5	3	5	6.5	M4 x 4
TR25 255	255	25	25.74	12.25	10	90	180	7	20	7	1.5	3	5	6.5	M4 x 4
TR25 351	351	25	25.74	12.25	10	90	180	7	20	7	1.5	3	5	6.5	M4 x 4
TR44 468	468	44	44.74	15.5	12.5	90	180	8	25	10	2.5	4	6	7.5	M5 x 6
TR44 612	612	44	44.74	15.5	12.5	90	180	8	25	10	2.5	4	6	7.5	M5 x 6
TR76 799	799	76	76.74	24	19.5	90	180	10	30	18	2.5	6	7	11.5	M8 x 16
TR76 1033	1033	76	76.74	24	19.5	90	180	10	30	18	2.5	6	7	11.5	M8 x 16
TR76 1267	1267	76	76.74	24	19.5	90	180	10	30	18	2.5	6	7	11.5	M8 x 16
TR76 1501	1501	76	76.74	24	19.5	90	180	10	30	18	2.5	6	7	11.5	M8 x 16

Notes:

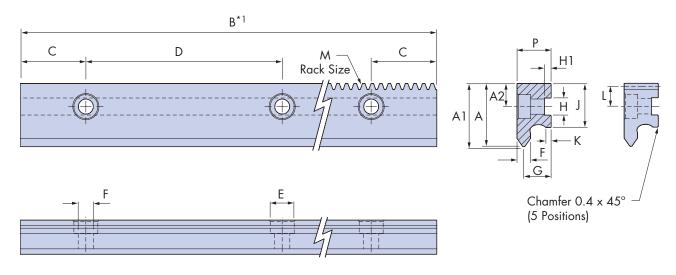
1. Some distortion may be present in segments in their free unmounted state. This may be overcome by bolting to the mounting surface and setting to adjacent slides using the keyway alignment facility 🕮 45. True Shape segments are available on request.



Track System Single Edge Straight Slides

HepcoMotion track system single edge straight slides retain key features of the double edge slides, with precision ground finish and zone hardened V faces III 44 & 45. 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 III 42 & 43. 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 \square 19. 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 \square 20.





Dowel Pin (SDP) For details 📖 42 - 43

Part Number	For use with	A ~	A1*3	A2	с	D ±0.2	E Ø x Depth	F	G*3	H +0.05 -0.00	н	J ±0.025	К	L	M*4 Module	Ρ	ک م kg/m
TNSE	TRIS278, TRES376	21	21.37	8.5	20	90	10 x 5.1	5.5	10	6	2.5	16	2.6	7.4	1	12.35	1.6
TNME	TRIM482, TREM655	29	29.37	10.5	20	90	11 x 6.1	7	12.5	8	3	20	2.3	9.25	1.25	15.6	2.6

Notes:

- 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', 🛄 48.
- 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 center of the rack root to give perfect running joints for slides and ring segments.

Example:	TNME	<u>B 1500</u>	(<u>R</u>)	(<u>BL</u>)	(<u>16 x SDP</u>)
Part Number					SDP = Dowel pin (16-off) Leave blank if not required
B (slide length) = 1500mm					Bleed Lubrication: BLP = Plain bore insert 📖 54
R = Rack cut Slide Leave blank if not required					BLT = Threaded insert 🛄 54 Leave blank if not required

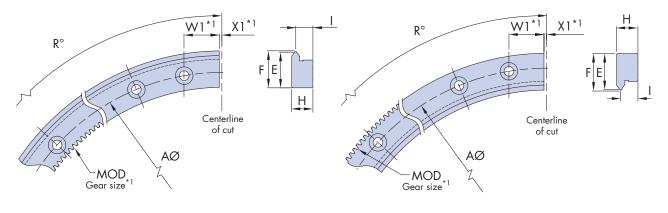
Track System Single Edge Curved Segments

HepcoMotion track system single edge curved segments are used in single edge duplex track systems II 19, 20 & 43. 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. 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. Bishop-Wisecarver will supply suitable machined plates with precision registers, on request.

Segments are available gear cut, for mating with rack cut straight slides, to produce a gear driven track system.

All track system single edge curved segments are marked with a reference and sequence number for identification and replacement purposes 12 42 & 43. Segments of any angle can be supplied to cater for all track system configurations.



External Single Edge Track Segment - TRE

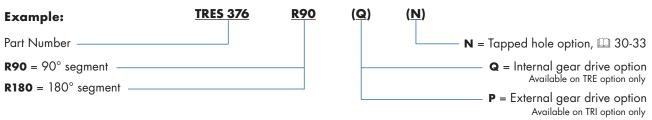
Internal Single Edge Track Segment - TRI

Part Number	For use with	A	E ~	F	н	 ±0.025	R	0	WI	X1 ±0.1	MOD*1
TRIS 278	TNSE	261	20.8	21.37	12.25	10	90	180	20	1.5	1
TRES 376	TNSE	351	20.8	21.37	12.25	10	90	180	20	1.5	1
TRIM 482	TNME	461.5	28.8	29.37	15.5	12.5	90	180	25	2.5	1.25
TREM 655	TNME	618.5	28.8	29.37	15.5	12.5	90	180	25	2.5	1.25

For all other details and dimensions see 🛄 30-33

Notes:

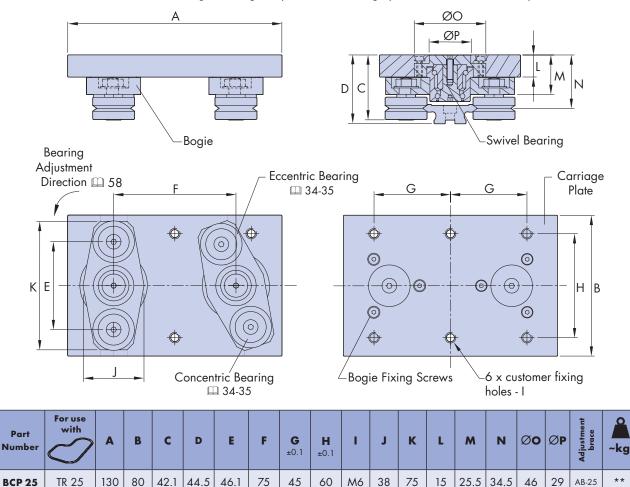
1. Track system single edge segments with gear drive option Q or P will be ended to the root of a gear tooth. This will affect dimensions W1 and X1.



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 aluminum alloy and finished anodized. Bogie carriages are supplied assembled and adjusted to suit the accompanying track system⁻¹. Customers are advised to specify the HepcoMotion bleed lubrication facility within the track III 54 as lubricators cannot be fitted to bogie carriages. Special size carriage plates are available on request.



BCP 76)
Notes:	

BCP 44

 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.

85

125

M8

M10

53

72

105

170

18

24

32.5

42.5

44

61.5

59 34

100 70

2. Please note that floating bearings 🛄 38 cannot be supplied with bogie bearings.

56.5

81

71.9

118.7

100

130

62.5

87.5

Ordering details:

TR 44

TR 76

175

240

115

185

53.8

77.2

Example:	<u>BCP76</u>	DR	<u>NS</u>	<u>СНК</u>	
Part Number					 CHK = Controlled height option III 37 Standard with DR bearings
DR = Double row bearings					Leave blank if not required for twin bearing version
Leave blank for twin bearings 🕮 36-3	37				NS = Nitrile sealed option 🛄 36-37
Adjustment brace ^{*1} ———		AB	5 76		

**

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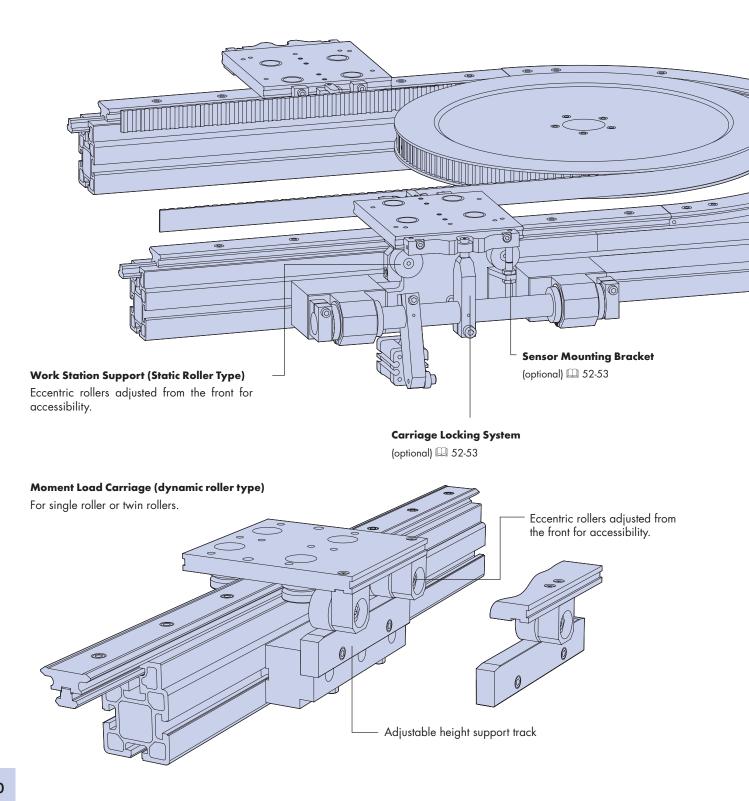
AB-44

AB-76

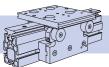
Moment Load Carriage Systems

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 center carriages III 40-41 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.

For other compatible driven system components in main illustrations below see 🛄 52-53.



Moment Load Carriage Systems

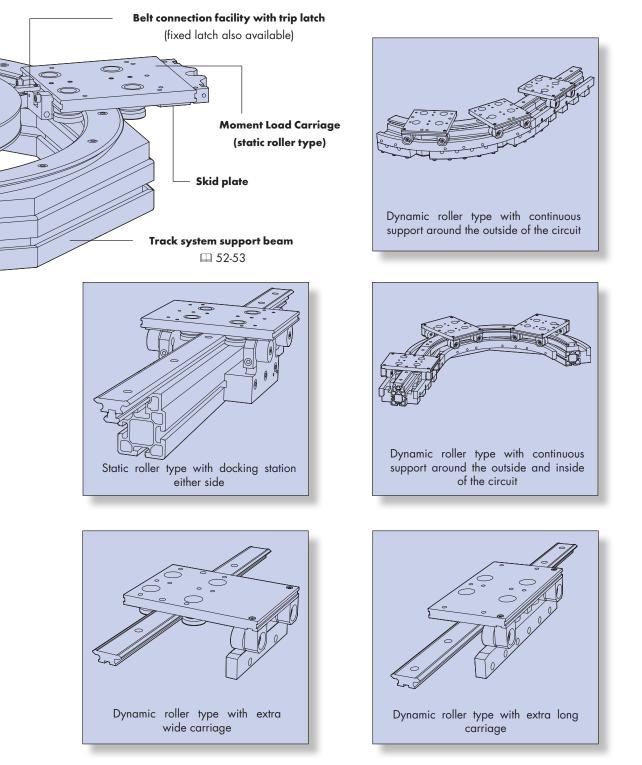


Moment load carriage systems are available with two types of work station support, both designed to connect to the track system support beam:

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.

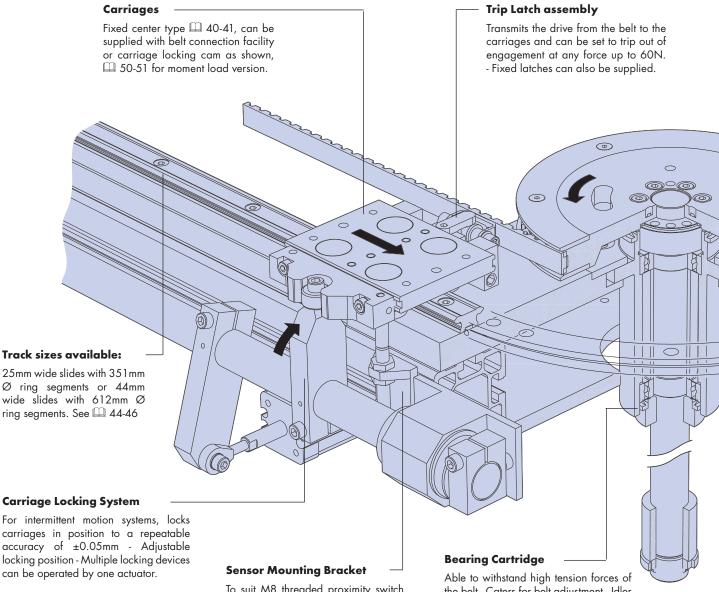
Dynamic roller type: with eccentrically adjusted rollers attached to the underside of the carriage, bearing on adjustable height support track. The combination of these adjustable features facilitates set up where accuracy and alignment cannot be guaranteed or where continuous support for the carriage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

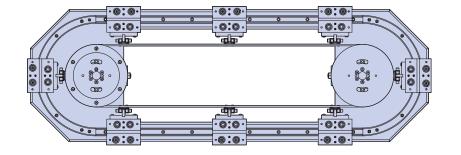


Driven Track System Components

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.



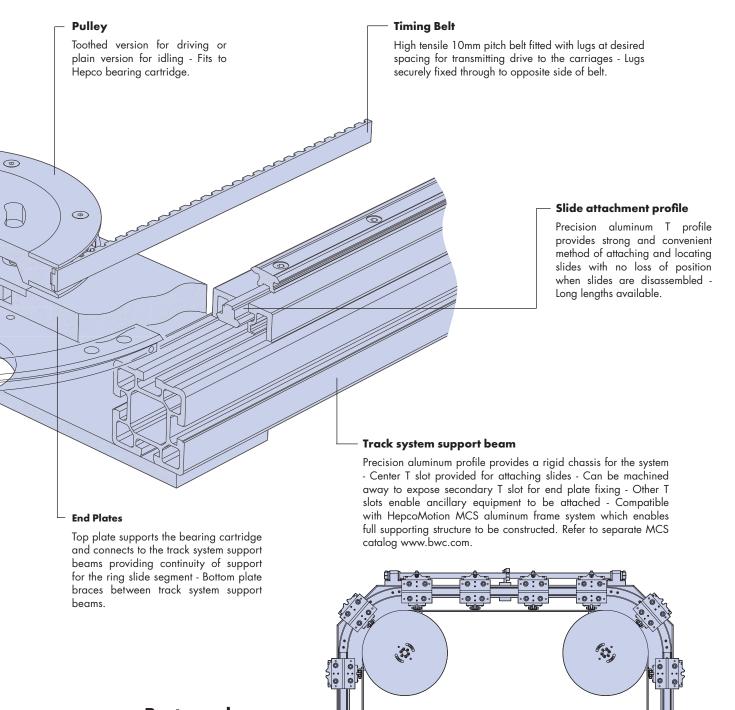
To suit M8 threaded proximity switch - Detects carriage position for control and safety purposes. the belt - Caters for belt adjustment - Idler type or, extended shaft type available for attaching the drive - Sealed bearings lubricated for life.



Oval path driven track system

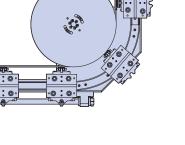
Driven Track System Components

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

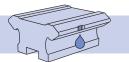


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Rectangular path driven track system

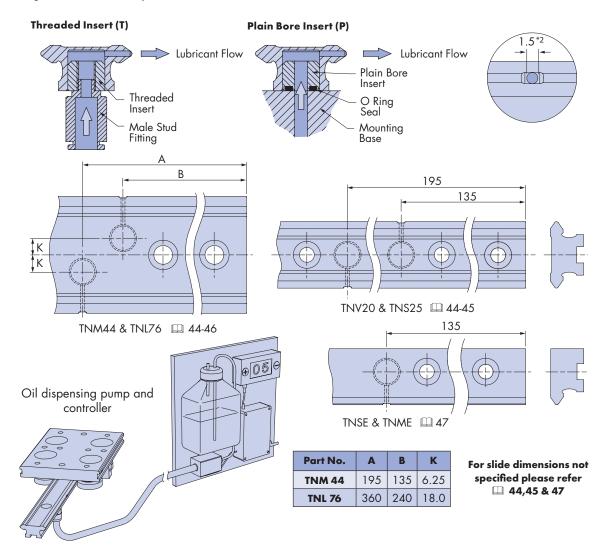


Bleed Lubrication



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⁻¹, 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 centralized lubrication system or pressure feed canister (part no. PRT2BLC available from Bishop-Wisecarver).

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 traveled by the carriages. Both the dose and distance traveled can be set according to the length of circuit and duty.



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.

Ordering details:

Example: SS TNM 44 BLP B1500 2 x AK Please state BLP or BLT within the straight slide part number. Bleed Lubrication facility: BLP = Plain bore insert Image: A4-46 for double edge straight slides. Bleed Lubrication facility: BLP = Plain bore insert Image: A4-46 for single edge straight slides. Bleed Lubrication facility: BLP = Plain bore insert

Pinions

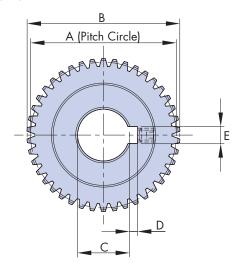


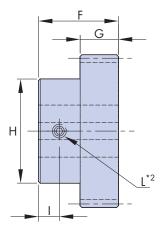
HepcoMotion pinions are compatible with gear cut ring slides, segments and ring discs 💷 28-35. Gear teeth have a 20° pressure angle.

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 Bishop-Wisecarver supplied AC geared motors and other motors is available from the HepcoMotion GV3 product range, please visit www.bwc.com.





Pinion shown is BK type bore > 8mm

		For L	Jse with		al*3	dition∵⁴	lso	No.	le											2
Part Number	O	\bigcirc	\bigcirc	J.	Materi	Conditi	1328 Grade	of teeth	Module	AØ	BØ	С	D ^{*1}	E*1	F	G	н	I	L*2	g~
SSP04 W3.5 T42	R12	-	-	-	SS	×	10	42	0.4	16.8	17.6	5	-	-	10	3.5	10	3	M3	10
SSP07 W9 T28	-	-	REV, RIV	-	SS	×	10	28	0.7	19.6	21	5	-	-	17	9	16	4	M3	31
SSP08 W4 T48	R20	-	-	-	SS	×	10	48	0.8	38.4	40	12	1.8	4	12	4	26	4	M3	50
SSP08 W6 T48	R25	RD25	-	-	SS	×	10	48	0.8	38.4	40	12	1.8	4	14	6	26	4	M3	75
P10 W11 T42	-	-	RES, RIS	TNSE	ST/SS	\checkmark	6	42	1	42	44	15	2.3	5	23	11	30	6	M4	160
P10 W7 T48	R44	RD44	-	-	ST/SS	\checkmark	6	48	1	48	50	15	2.3	5	18.5	7	27	5.75	M4	170
P125 W14 T34	-	-	REM, RIM	TNME	ST/SS	~	6	34	1.25	42.5	45	15	2.3	5	25.5	14	30	5.75	M4	200
P15 W12 T48	R76	-		-	ST/SS	~	6	48	1.5	72	75	15	2.3	5	25	12	30	6.5	M4	350
P20 W20 T27	-	-	REL, RIL	-	ST/SS	~	6	27	2	54	58	20	2.8	6	35	20	40	7.5	M5	430

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. \checkmark = Teeth hardened and ground. **x** = Teeth unhardened and unground.

Example:	(<u>SS</u>)	<u>P20</u>	<u>W20</u>	<u>T27</u>	B	
SS = Stainless Steel option — Leave blank for steel version						B = Pinion with plain bore BK = Pinion with keyway and set screw*1
P20 = Part number						
W20 = Face width in mm						T27 = Number of teeth

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 traveled.

It is usual to run systems at much less than the maximum load to prolong life, which can be calculated using the data and formula 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).

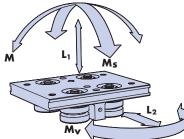
Where possible, systems should be oiled using Hepco lubricators 🕮 39 and/or the bleed lubrication system 🕮 54. This will greatly extend system life.

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 .

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.



Carriage	Dry S	ystem (Tw	vin and DI	R Type Bec	arings)	Lubrie	ated Syst	tem (Twin	Type Bea	rings)	Lubricated System (DR Type Bearings)						
Part	L _{1(max)}	L _{2(max)}	Ms(max)	M _V (max)	M(max)	L _{1(max)}	L _{2(max)}	M _S (max)	Mv(max)	M(max)	L _{1(max)}	L2(max)	M _S (max)	M _V (max)	M(max)		
Number	N	N	Nm	Nm	Nm	N	N	Nm	Nm	Nm	N	N	Nm	Nm	Nm		
FCC 12 93	90	90	0.5	1	1	240	240	1.3	2.7	2.7		N	ot Availab	ble			
FCC 12 127	90	90	0.5	1	1	240	240	1.3	2.6	2.6		N	ot Availab	ole	e		
FCC 20 143	180	180	1.6	2.5	2.5	500	400	4.5	5.5	7	760	1200	7	16	10		
FCC 20 210	180	180	1.6	2.7	2.7	500	400	4.5	6	7.5	760	1200	7	18	11		
FCC 25 159	400	400	4.5	8.5	8.5	1280	1200	14	25	27	1600	3000	18	64	33		
FCC 25 255	400	400	4.5	8	8	1280	1200	14	23	25	1600	3000	18	60	31		
FCC 25 351	400	400	4.5	8.5	8.5	1280	1200	14	24	27	1600	3000	18	63	33		
BCP 25	400	400	4.5	15	15	1280*1	1200*1	14*1	45 ^{*1}	48 ^{*1}	1600*1	3000*1	18*1	110*1	60*1		
FCC 44 468	800	800	16	28	28	3200	2800	64	95	110	3600	6000	73	210	120		
FCC 44 612	800	800	16	29	29	3200	2800	64	100	115	3600	6000	73	220	130		
BCP 44	800	800	16	40	40	3200*1	2800*1	64*1	140*1	160*1	3600*1	6000*1	73*1	300*1	180*1		
FCC 76 799	1800	1800	64	85	85	7200	6400	250	300	340	10000	10000	360	470	470		
FCC 76 1033	1800	1800	64	105	105	7200	6400	250	360	410	10000	10000	360	570	570		
FCC 76 1267	1800	1800	64	120	120	7200	6400	250	420	480	10000	10000	360	670	670		
FCC 76 1501	1800	1800	64	140	140	7200	6400	250	480	550	10000	10000	360	770	770		
BCP 76	1800	1800	64	115	115	7200*1	6400*1	250*1	415*1	460*1	10000*1	10000*1	360*1	650*1	650*1		

The L₂ & M_V load capacities for carriages using floating bearings 🛄 36 are the same as is shown above for DR bearings. The L₁ & 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.

To determine life, calculate the load factor L_F using equation [1] below, then use equation [3] or [4] to determine life for the system.

$$[1] \quad L_{F} = \frac{L_{1}}{L_{1(max)}} + \frac{L_{2}}{L_{2(max)}} + \frac{M_{S}}{M_{S(max)}} + \frac{M_{V}}{M_{V(max)}} + \frac{M}{M_{(max)}} \leq 1 \text{ or } 0.8 \text{ for stainless steel}$$

Notes:

1. In heavily loaded applications using bogie carriages, the bogie swivel bearings can affect life. Applications for bogie carriages in which LF is more than 0.43, calculated using the *1 load figures from the table above, should be referred to Bishop-Wisecarver to confirm suitability.

When calculating L2 and Ms loadings, the centrifugal force must be included which acts radially outwards from the center of mass (COM) of the moving object. Its magnitude is F = DV2/R, where V is the velocity of the COM in m/s, R is the distance of the COM from the ring axis in meters and D is the mass in kg. F is in N (newtons).

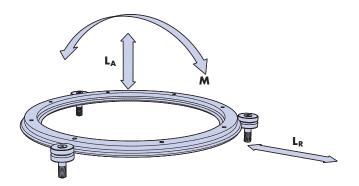
Technical

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.



Bearing Part	Used with	Number of equally		stem (Tw /pe Bear	vin and DR ings)		oricated n Type B		Lubricated System (DR Type Bearings)			
Numbers	Ring	spaced	L _A (max)	L _R (max)	M(max)	L _A (max)	L _R (max)	M(max)	L _A (max)	L _R (max)	M (max)	
	Slides	bearings	N	N	Nm	N	N	Nm	N	N	Nm	
		3	67	38	16 x Øc⁵⁴	180	102	43 x Øc⁺₄		Not Available		
J 13	R12	4	83	45	19 x Øc⁵⁴	220	120	52 x Øc*₄		Not Avail	able	
		Each additional 1	10	6	2 x Øc⁵⁴	43	30	9 x Øc*₄	Not Available			
	R20	3	135	76	32 x Øc*4	375	170	90 x Øc*₄	570	510	135 x Øc	
J18	REV	4	165	90	39 x Øc*4	465	200	108 x Øc⁵⁴	700	600	165 x Øc	
	RIV	Each additional 1	21	13	4 x Øc*4	90	50	18 x Øc*₄	135	150	28 x Øc*	
	R25	3	300	170	72 x Øc⁵⁴	960	510	230 x Øc⁵⁴	1200	1280	285 x Øc	
J25	RES	4	370	200	87 x Øc*4	1190	600	278 x Øc⁵⁴	1480	1500	340 x Øc	
	RIS	Each additional 1	48	30	9 x Øc⁵⁴	230	150	48 x Øc*₄	285	375	60 x Øc*	
	R44	3	600	340	140 x Øc*4	2400	1200	570 x Øc³₄	2700	2550	640 x Øc	
J34	REM	4	740	400	170 x Øc*4	2950	1400	690 x Øc*4	3340	3000	780 x Øc	
	RIM	Each additional 1	96	60	19 x Øc⁺⁴	570	350	120 x Øc³₄	640	750	135 x Øc	
	R76	3	1350	765	320 x Øc⁺⁴	5400	2740	1290 x Øc⁺₄	7500	4250	1800 x Ø	
J54	REL	4	1670	900	390 x Øc*4	6650	3200	1560 x Øc³₄	9300	5000	2170 x Ø	
	RIL	Each additional 1	210	130	44 x Øc*4	1290	800	270 x Øc*4	1800	1250	375 x Øc	

The L_R load capacities for systems using floating bearings 📖 38 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.

[2]
$$L_F = \frac{L_A}{L_{A(max)}} + \frac{L_R}{L_{R(max)}} + \frac{M}{M_{(max)}} \le 1 \text{ or } 0.8 \text{ for stainless steel}$$

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 Bishop-Wisecarver 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 inertial loads. Greater speeds may be tolerated at reduced loads. Contact Bishop-Wisecarver 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.
- Øc is ring slide contact diameter in meters (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 \square 56 or for a ring system \square 57, 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]:

[3] System life (km) =
$$\frac{B_L}{(0.03 + 0.97L_F)^2}$$

For lubricated systems use equation [4]:

[4] 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.bwc.com.

Bearings	Basic Life Dry	Basic Life Lubricated
J13	40	40
SSJ13	30	30
J18	50	60
SSJ18	35	45
J18DR	50	60
SSJ18DR	35	45
J25	70	40
SSJ25	40	25
J25DR	70	45
SSJ25DR	40	35
J34	100	70
SSJ34	60	50
J34DR	100	160
SSJ34DR	60	120
J54	150	150
SSJ54	100	110
J54DR	150	280
SSJ54DR	100	220

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

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 Bishop-Wisecarver uses.

The table below shows the industry standard static ($C_{OR} \& C_{OA}$) 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.

For each of two Twin			amic & S acities (N		For Double Row	Bearing Dynamic & Static Load Capacities (N)					For Floating	Dynamic & Static Load Capacities (N)		
Bearings	C _R	C _A	C _{OR}	C _{OA}	Bearings	C _R	C _A	C _{OR}	C _{OA}		Bearings	C _R	C _{OR}	
J13	695	194	265	74	-	-	-	-	-		-	-	-	
J18	1438	419	593	173	J18DR	2301	857	1168	435		-	-	-	
J25	3237	791	1333	326	J25DR	5214	1618	2646	821		FJ25	4900	6100	
J34	5291	1270	2600	557	J34DR	9293	2523	5018	1362		FJ34	11500	12500	
J54	13595	2320	6657	1136	J54DR	21373	4601	12899	2777		FJ54	21500	28900	

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

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 Bishop-Wisecarver 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	Used with	Τα	Max Working ngential Load	(N)	Pinion Part	Used	Max Working Tangential Load (N)				
Number	Ring	Life - distand	ce traveled arou	nd Ring Gear	Number	with Ring	Life - distan	ce traveled arou	nd Ring Gear		
	King	1 000 km	5 000 km	25 000 km		King	1 000 km	5 000 km	25 000 km		
SSP04 W3.5 T42	R12 93	50	30	25	P10 W11 T42 &	RIS 278	970	850	640		
33104 113.3 142	R12 127	40	30	25	SSP10 W11 T42	RIS 374	970	880	680		
	REV 156	150	100	75	P10 W7 T48 &	R44 468	630	585	470		
	REV 223	155	100	80	SS P10 W7 T48	R44 612	760	585	470		
SSP07 W9 T28	RIV 161	150	100	75		REM 505	1510	1400	960		
	RIV 228	155	100	80	P125 W14 T34 &	REM 655	1820	1400	990		
	R20 143	100	80	60	SS P125 W14 T34	RIM 482	1510	1400	970		
SSP08 W4 T48	R20 210	110	85	65		RIM 627	1820	1400	990		
	R25 159	155	120	95		R76 799	1950	1560	1290		
SSP08 W6 T48	R25 255	165	125	100	P15 W12 T48 &	R76 1033	1950	1640	1290		
	R25 351	170	130	100	SS P15 W12 T48	R76 1267	1950	1640	1290		
	RES 184	960	730	530		R76 1501	1950	1640	1290		
P10 W11 T42 &	RES 280	970	850	640	P20 W20 T27 &	REL 874	3990	2530	1890		
SSP10 W11 T42	RES 376	970	880	660	SS P20 W20 T27	RIL 812	3990	2530	1890		
	RIS 182	960	730	530	For racks on TNSER slides use RIS 374 figures & for TNMER slides			NMER slides use	RIM 627 figures		

Fixed Center Carriage Play at Track System Joints

HepcoMotion fixed center 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.

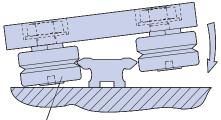
Carriage Type	FCC 12 93	FCC 12 127	FCC 20 143	FCC 20 210	FCC 25 159	FCC 25 255	FCC 25 351	FCC 44 468	FCC 44 612	FCC 76 799	FCC 76 1033	FCC 76 1267	FCC 76 1501
Maximum Clearance / mm	0.17	0.08	0.18	0.10	0.47*	0.15	0.09	0.21	0.14	0.22	0.19	0.17	0.16

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 149, which does not develop play in the same way when traversing from straight to curved sections.

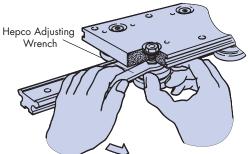
* The FCC 25 159 has greater than normal clearance. This will be noticeable, but not detrimental in many applications.

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.



Concentric Bearing

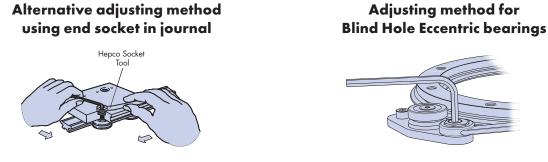


The correct condition of adjustment should be assessed by rotating the bearings by holding them between forefinger and thumb whilst preventing the ring slide or carriage from moving such that the bearings skid against the slide. A uniform degree of resistance should be felt, but the bearings should be 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 center carriages the lubricators should first be removed in order to gain access. When adjusting bogie carriages, the steps outlined in the adjustment procedure on \square 49, should be observed. In cases where an assembled system is supplied, the carriages will be supplied pre-adjusted.



Ring and Track System Installation

For details on Ring and Track system installation, please visit www.bwc.com.

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 Bishop-Wisecarver.

		Bearing Ø							
		13	18	25	34	54			
Adjusting Wrench		AT13	AT18	AT25	AT34	AT54			
Socket Tool		-	RT6	RT8	RT10	RT14			
Fixing Nut Torque		2 Nm	7 Nm	18 Nm	33 Nm	90 Nm			

Ring Slides and Segments

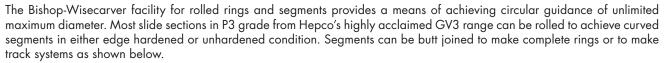
	Material and finish:	 Standard version: High carbon steel, hardened on V faces. Ground on all main surfaces to N5 finish. Stainless steel version: Special martensitic stainless steel generally conforming to 420 series, hardened on V faces. Ground on all main surfaces to N5 finish, other faces polished.
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.
Bearin	igs	
	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: Seals: Cages: Studs: Temperature range:	 Standard version only: Steel with bright zinc plated finish. Nitrile rubber. Plastic (metal for floating bearing). Standard version: High tensile steel with chemical black finish. Stainless steel version: AISI 303 series stainless steel. All versions: -20°C to +120°C. Bearings for low temperature, high temperature and vacuum use are
Carria	ge Plates	available on request.
	Material: Finish:	All versions: High strength aluminum alloy Standard version: Clear anodized. Stainless version: Special finish approved by US Department of Agriculture for food use. Stainless steel carriage plates available on request.
Lubric	ators	
	Material: Fixings: Temperature range: Lubricant:	Impact resistant thermoplastic with felt wiper. Stainless steel. -20°C to +60°C. Slideway oil with viscosity 68 cSt or similar.
Pinion	5	
	Material and finish (<mod1):< td=""><td>Stainless steel only version: 300 series stainless steel, finish as</td></mod1):<>	Stainless steel only version: 300 series stainless steel, finish as
	Material and finish (≥ Mod1)	 gearcut. ISO 1328 accuracy grade 10. Standard version: Case hardened carburizing 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.
Frictio	n	
	Coefficient of friction for	lubricated systems is typically 0.02 Lubricators will add between

Coefficient of triction for lubricated systems is typically 0.02. Lubricators will add between 0.5 (for LB12) & 2N (for LB54) each.

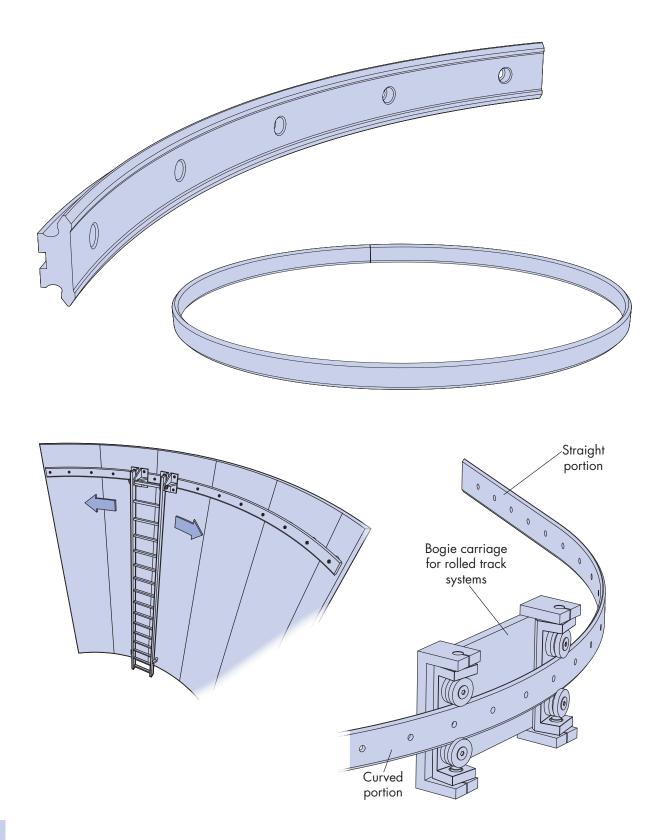
Maximum Speed

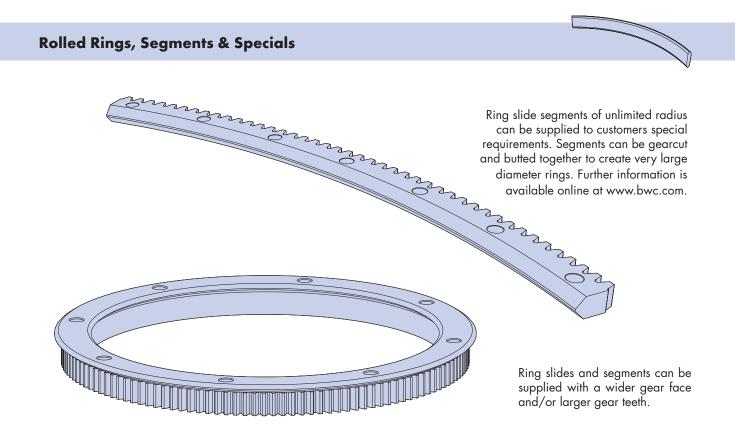
Generally 1m/s for dry (unlubricated) operation and 5m/s when lubricated. Greater speeds may be possible at reduced loads. Contact Bishop-Wisecarver for details.

Rolled Rings, Segments & Specials



Please visit www.bwc.com for more information. The HepcoMotion GV3 catalog is also available on this web site.





Related Products



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 catalog visit www.bwc.com.

- 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 center 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 catalog visit www.bwc.com.

- 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



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

Components & Accessories

DualVee® **MadeWell®** GV3 SL2 PRT2 HDS2 HDRT MCS Motor Mounts **Gantry Brackets** Wrenches

Manual Linear **Guide Systems**

Guide Systems LoPro[®] XLA[™]

Actuated Linear

ECO60[™] *SlickStick*[™] **SteadyRail**[™] HDLS HDCS PDU2 DAPDU2 SBD PSD **SDM** DLS

Rotary **Guide Systems** PRT2 DTS2 DTS ALR HDRT 1-Trak GFX

Robot Transfer Units LoPro[®] RTU DualVee[®] RTU

Custom Solutions

Extruded Profile Guides Custom Bearings Custom Subassemblies Engineering Services Large Diameter Ring Guides and Track

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- Certified Evergreen

Certifications & Compliance

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

Women's Business Enterprise



- Certified WOSB