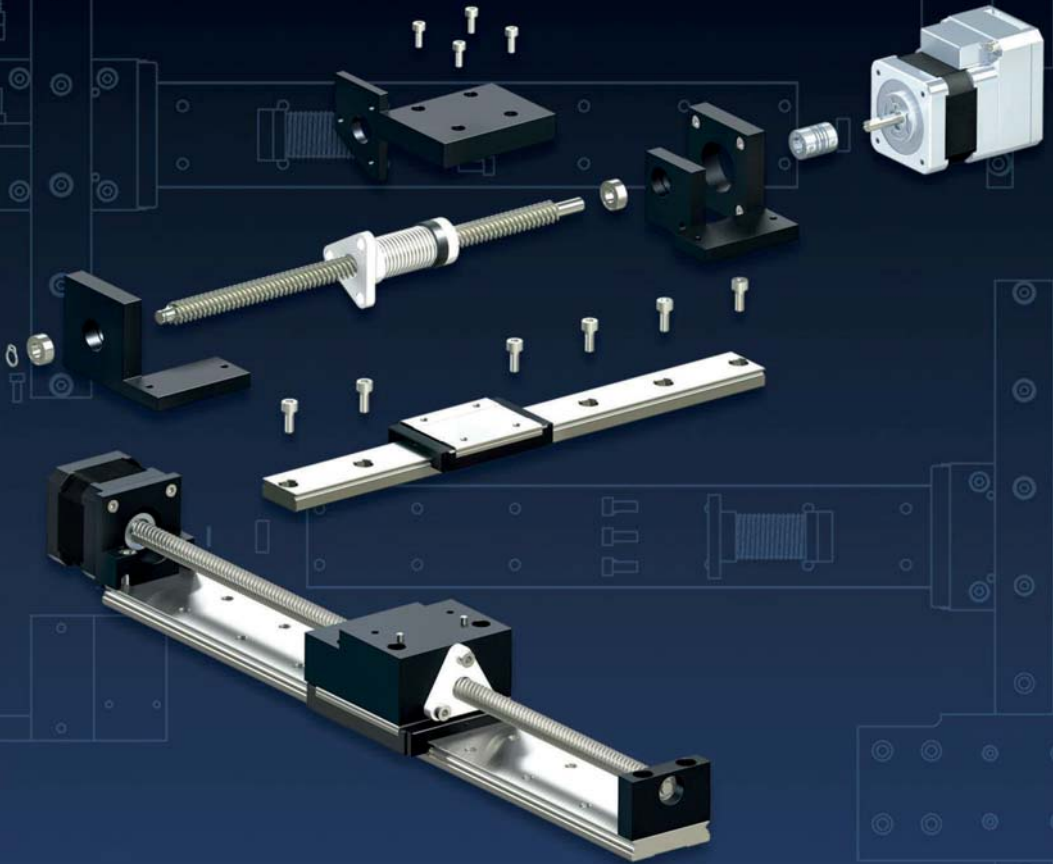















Reliance[®]

Precision Limited



Precise Motion Control Solutions
Linear Guides and Slides

	<i>Introduction to Reliance</i>	<i>i</i>
	<i>Systems Overview</i>	<i>1</i>
	Intelligent Motors and Motorised Actuators	2
	Planetary and Right Angle Gearboxes	3
	Brass, Ground and Precision Spur Gears	4
	Worms and Wheels, Bevels and Internal Gears	5
	Round and Rectangular Racks and Pinions	6
	Leadscrews and Leadscrew Assemblies	7
	Flexible Shaft Couplings, Clutches and Collars	8
	Linear Guides and Slides	9
	Belts and Pulleys	10
	Gear Clamps and Accessories	11
	Bearings and Spacers	12
	Machine Screws, Dowel Pins and Hardware	13
	<i>Technical Information</i>	<i>14</i>
	<i>Appendices and Index</i>	<i>15</i>



Section Contents

Linear Guides and Slides - Overview	Page 9-2
Spline Shafts	Page 9-4
Linear Rails	Page 9-6
Miniature Linear Guide Series	Page 9-7
Miniature Stroke Slides	Page 9-12
Ball and Crossed Roller Slides	Page 9-14
Rack Driven Ballslides	Page 9-16
Technical Information.....	Page T9-1



Low friction linear motion

The Reliance range of precision slides and guides provides a variety of linear actuation solutions for loads up to 12,580 N and with lengths in excess of 1 metre. The range includes miniature linear guides, stroke slides, roller slides, rack driven ball slides and linear rails, together with spline shafts which provide both linear and rotary motion.

Miniature linear guides

The linear guides consist of a stainless steel rail with a unique re-circulating ball design in the carriage, which delivers smooth motion, low noise and high accuracy. The guides provide high levels of stiffness to enable the carriage to operate at higher speeds and with a 45° contact angle and a gothic profile design incorporated into the carriage, resulting in an equal load capacity in all directions, they provide high load and moment capacity. With their built-in lubrication reservoirs they provide an effective, low maintenance solution, further enhanced by specially designed seals to prevent dust and foreign objects from entering the system.



Linear guides are available with 3 mm to 15 mm wide rails and lengths up to 870 mm, offered in standard sizes or custom lengths, with carriages available in a variety of widths and lengths. Options are available for both lubrication and seals, with different mounting options accommodated via tapped or counter-bored mounting holes, and options for accuracies and pre-loading of the bearings where additional stiffness and precision are required.

Reliance's cut-to-length capability means that customers can order small quantities and samples for product trials or prototyping on a reduced lead-time.

Miniature stroke slides

The miniature stroke slide offers a compact alternative to the linear guides for applications where a short stroke length is required, making it an ideal choice for a smaller space envelope. They are available in 7 mm to 12 mm wide rails and up to 100 mm length rails, providing up to 94 mm travel length. The stroke slides possess many of the same characteristics as the linear guides however there is no ball re-circulation, rather the balls roll on rails resulting in smooth motion, low friction and high accuracy without vibration.



The linear guides and stroke slides are ideal for use in a linear actuation system, used in conjunction with the Cool Muscle intelligent motor and leadscrews or rack and pinions, to provide stable, accurate load movement.

Ball and crossed roller

Ball and crossed roller slides provide very low friction linear motion in a compact package, with a high load carrying capacity, long life and high accuracy. They are similar to the miniature stroke slides, but available with rails from 4 mm to 38.1 mm widths and up to 381 mm lengths. The ball slides are also



available in a rack driven configuration suitable for controlled motion with a rack and pinion drive system. Rack driven ball slides are ideal for measuring position, driving a mechanism, or both, and can be used at very high speeds and loads.



Linear rails

Linear rails offer a low cost option for systems where light loads are used. The linear rails exhibit a minimal frictional drag and long wear characteristics. They consist of a stainless steel shaft and composite polymer bushing, available with shaft diameters from approximately 6 mm to 19 mm and lengths up to 3,600 mm.

Spline shafts

Spline shafts are suited to light to moderate load applications, where low cost, low friction and long life are the primary design considerations. They provide anti-rotation for one axis motion or a drive mechanism for two axes of motion. The assembly consists of a stainless steel spline shaft treated with low friction TFE coating together with a free-running or anti-backlash composite polymer bushing. Shafts are available in diameters from 3.18 mm to 19.05 mm, with lengths up to 3,600 mm. Bushings are supplied with an integral brass collar to facilitate various mounting configurations without nut distortion. Spline shafts are offered with a wide range of options including alternative materials, end modifications, multiple bushings and bushing modifications. An anti-backlash assembly is available for applications requiring minimum torsional play.



The range of slides and guides are suitable for a variety of applications including accurate XY stages, medical and laboratory automation and scientific analysis equipment.



Customised XYZ positioning table



Laboratory automation assembly



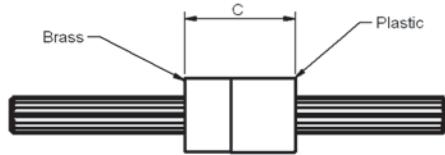
All dimensions in mm
General tolerances ± 0.13 mm
Material: See page 9-5

Associated Products
Leadscrews: page 7-1
Hardware: page 13-1

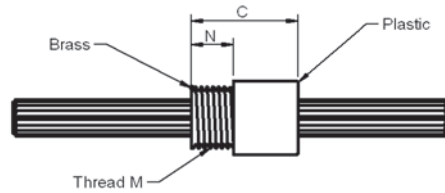
Linear Guides
and Slides



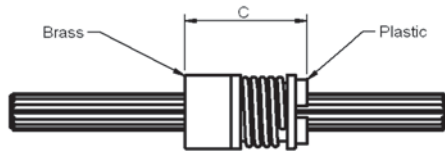
SRSSBP
(Free running)



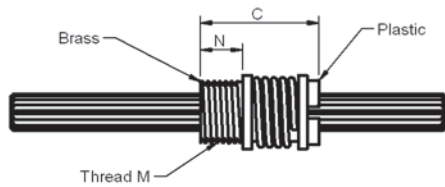
SRSSBY
(Free running)



SRSSZP
(Anti-backlash)



SRSSZY
(Anti-backlash)





Part number selection table

Example Part No:- **SRSS B P 6 T 1 - 100mm**

Number of bushings: 6
TFE coating (standard): 1

Basic Part No.	Bushing Style	Mount	Size Code	Shaft Dia ØA** ±0.05 mm	Bushing Outside Dia ØB ±0.025 mm	Bushing Length C ±0.25 mm	Thread M* (Inch)	Thread Length N* ±0.05 mm	Max Length
SRSS	B (Free running)	P (Plain Dia)	3	3.18	9.53	12.7	3/8-24	6.35	900
			6	6.35	12.70	19.1	7/16-20	6.35	2400
	Z (Anti-backlash)	Y (Thread)	10	9.53	15.88	25.4	9/16-20	9.53	2400
			13	12.70	20.65	38.1	3/4-20	12.70	2400
			19	19.05	28.58	57.2	1-16	19.05	3600

Note: Code size **19** is only available in material 14L14 carbon steel.

* Only on thread mounting spline shafts.

** 3.18 mm shaft diameter only available in SRSSBP and SRSSBY styles.

Note: Due to the process of manufacture, a small number of localised hollows and hard spots may be created. This will not affect the overall function or performance.

Linear Guides and Slides

i Product options

- Lengths up to 3,600 mm available
- Larger number of bushings
- Bush modifications
- End modifications
- Available in aluminium, please contact us



? Technical support

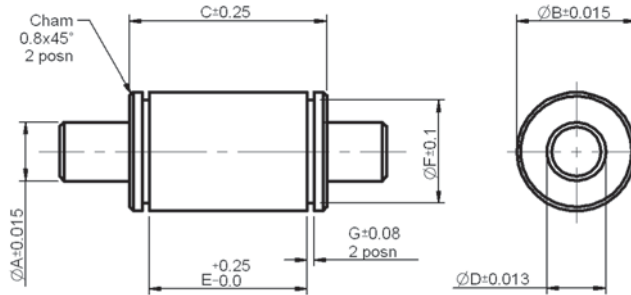
- Material:
 - Spline shaft - Stainless steel, TFE coated
 - Bushing - Graphite filled PTFE thermoplastic with brass collar
- Standard shaft straightness is 0.076 mm per 305 mm
- Typical radial clearance between shaft and bushing for free running assembly is 0.05 to 0.076 mm. Anti-backlash assemblies provide additional system stiffness
- Designed for light load applications
- Maximum twist 3°/305 mm
- Torsional clearance 3° bushing to shaft
- Product overview - see [pages 9-2 to 9-3](#)



All dimensions in mm
 General tolerances ± 0.13 mm
 Material: Rail - Stainless steel
 Bushing - Composite polymer

Associated Products
 Leadscrews: page 7-1
 Hardware: page 13-1

The linear rail system has been designed for light load applications where low cost, minimum frictional drag and long wear life are primary design considerations - Product overview - see [pages 9-2 to 9-3](#)



Part number selection table

Example Part No:- **RGR B P 6 T 1 - 100mm**

RGR: Basic Part No.
 B: Bushing Style
 P: Mount Style
 6: Size Code
 T: TFE coating (standard)
 1: Number of bushings
 100mm: Shaft length, (max length 3600 mm)

Basic Part No.	Bushing Style	Mount Style	Size Code	Rail Dia ØA**	Bushing OD ØB	C	Bushing Bore Dia ØD	Width E	Groove F	G	Radial Load Kg
RGR	B	P	6	6.279	12.70	19.43	6.311	13.59	11.43	1.02	2.3
			10	9.428	19.05	32.39	9.462	25.27	17.17	1.17	4.5
			13	12.603	25.40	42.16	12.637	33.78	22.86	1.17	6.8
			19	18.826	31.75	51.72	18.860	41.15	28.60	1.47	11.4

** Including TFE coating.

Technical support

- The assembly consists of a centreless ground and burnished stainless steel shaft mated with a composite polymer bushing
- The material combinations have been selected so that the thermal fluctuations have minimal effect on system performance
- Standard shaft straightness is 0.05 mm per 300 mm
- Standard typical radial clearance between shaft and bearings on TFE coated assemblies is 0.025 mm
- Bushings are manufactured with standard retaining ring grooves



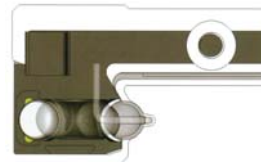


Reinforced design for high speed running

During operation, the steel balls generate an impact force on the end caps when direction of motion changes. The RMR miniature design includes an embedded plastic inverse hook that tightly secures the carriage components and absorbs these impact forces. The high speed running capability of our linear guides has increased in line with the demands of rapid motion automation.

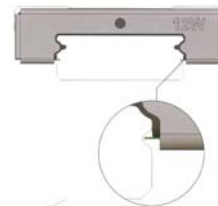
Unique ball re-circulation design

The stainless steel ball re-circulation channels are sealed by plastic end caps, resulting in low noise during operation. The design of the lubricant store, which is embedded within the re-circulation channel, reduces the frequency of lubrication.



Bottom seal

The bottom seal, available on sizes 9, 12 and 15, prevents foreign objects entering the carriage assembly. The life of the carriage and rail is increased while running smoothness is uncompromised.



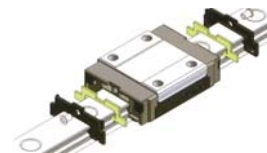
Stainless steel reinforcement plates

The plastic end caps are entirely encased by two stainless steel reinforced plates secured in place with stainless steel screws. The increased stiffness allows the carriage to operate at higher speeds.



Lubrication reservoir design

Lubrication is injected via holes located at both ends of the carriage and carried efficiently to the raceways by means of the re-circulating balls, thus increasing the maintenance intervals.



High load and moment capacity

The miniature linear guide series incorporates a gothic profile design with a 45° contact angle, providing equal load capacity in all directions. Large steel balls have been designed into limited space to provide enhanced load bearing and torsional resistance.



Dust proof design

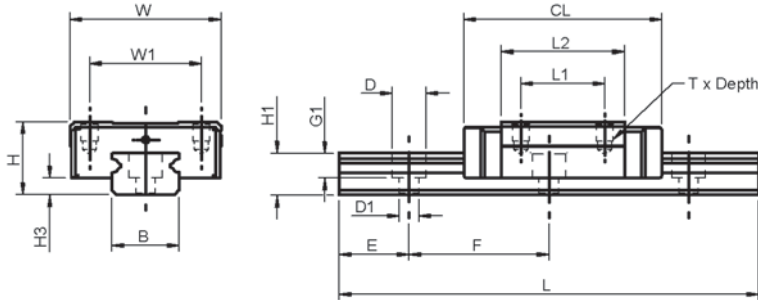
Specially designed end seals prevent dust and foreign objects entering the system, increasing the product life. These seals are low friction and do not effect the smooth running of the linear guide.





All dimensions in mm
 General tolerances ± 0.13 mm
 Material: Stainless steel

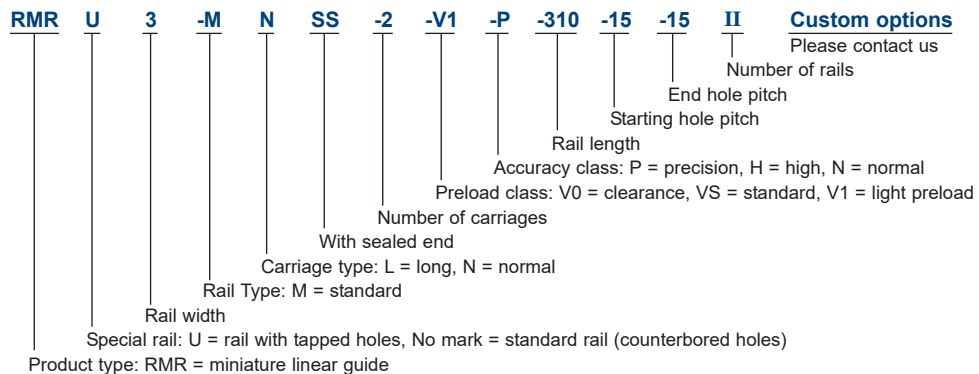
Associated Products
 Set screws: page 13-11
 Machine screws: page 13-2



Part number selection table

Basic Part Number	Max Travel	Carriage Dimensions			Max Rail Length	Load Rating				
		Height H	Width W	Length CL		Basic Dynamic Load N	Basic Static Load N	Static Moment Loads		
								To Nm	Tx Nm	Ty Nm
RMRU3-MNSS-	286.3	4	8	11.7	300	190	310	0.6	0.4	0.4
RMR5-MNSS-	981.3	6	12	16.0	1,000	335	550	1.7	1.0	1.0
RMR7-MNSS-	974.3	8	17	23.7	1,000	890	1,400	5.2	3.3	3.3
RMR9-MNSS-	967.4	10	20	30.6	1,000	1570	2,495	11.7	6.4	6.4
RMR12-MNSS-	962.6	13	27	35.4	1,000	2308	3,465	21.5	12.9	12.9
RMR15-MNSS-	955	16	32	43.0	1,000	3810	5,590	43.6	27.0	27.0
RMRU3-MLSS-	282	4	8	16.0	300	295	575	0.9	1.1	1.1
RMR5-MLSS-	976.8	6	12	19.6	1,000	470	900	2.4	2.1	2.1
RMR7-MLSS-	966.8	8	17	31.2	1,000	1,310	2,440	9.0	7.7	7.7
RMR9-MLSS-	957.1	10	20	40.9	1,000	2,135	3,880	18.2	12.4	12.4
RMR12-MLSS-	950.4	13	27	47.6	1,000	3,240	5,630	34.9	30.2	30.2
RMR15-MLSS-	938	16	32	60.0	1,000	5,350	9,080	70.0	63.3	63.3

Part number structure



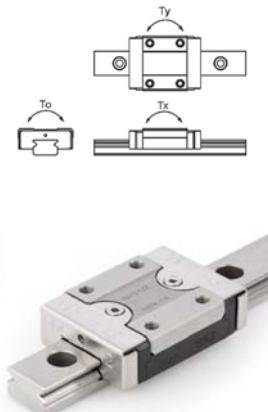


Dimensions

Basic Part Number	Rail Dimensions			Carriage Dimensions				
	Width	Height	Mounting Hole	Mounting Length	Height	Thread	Ctrs	Ctrs
	B	H1	D x D1 x G1	L2	H3	T x Depth	L1	W1
RMRU3-MNSS-	3	2.6	M1.6	6.7	1.0	M1.6 x 1.1	3.5	-
RMR5-MNSS-	5	3.5	3.5 x 2.4 x 1	10.0	1.5	M2 x 1.5	-	8
RMR7-MNSS-	7	4.7	4.2 x 2.4 x 2.3	14.3	1.5	M2 x 2.5	8	12
RMR9-MNSS-	9	5.5	6 x 3.5 x 3.5	20.5	2.2	M3 x 3.0	10	15
RMR12-MNSS-	12	7.5	6 x 3.5 x 4.5	22.0	3.0	M3 x 3.5	15	20
RMR15-MNSS-	15	9.5	6 x 3.5 x 4.5	27.0	4.0	M3 x 5.5	20	25
RMRU3-MLSS-	3	2.6	M1.6	11.0	1.0	M2 x 1.1	5.5	-
RMR5-MLSS-	5	3.5	3.5 x 2.4 x 1	13.5	1.5	M2.6 x 2.0	7	-
RMR7-MLSS-	7	4.7	4.2 x 2.4 x 2.3	21.8	1.5	M2 x 2.5	13	12
RMR9-MLSS-	9	5.5	6 x 3.5 x 3.5	30.8	2.2	M3 x 3.0	16	15
RMR12-MLSS-	12	7.5	6 x 3.5 x 4.5	34.0	3.0	M3 x 3.5	20	20
RMR15-MLSS-	15	9.5	6 x 3.5 x 4.5	44.0	4.0	M3 x 5.5	25	25

Available standard lengths (mm)

Size	3M	5M	7M	9M	12M	15M
Standard Length of One Rail (mm) L	30	40	40	55	70	70
	40	55	55	75	95	110
	50	70	70	95	120	150
		85	85	115	145	190
		100	100	135	170	230
				130	195	270
				175	220	310
				195	245	350
				275	270	390
				375	320	430
					370	470
					470	550
					570	670
						870
	Pitch F	10	15	15	20	25
E Min	3	3	3	4	4	4
E Max	5	10	10	20	20	35



i Product options

- End seal plus reinforcement plate on sizes 9, 12 and 15. Replace **-SS** with **-EE**
- End seal plus lubrication reservoir on all sizes. Replace **-SS** with **-ZZ**
- Bottom and end seals. Replace **-SS** with **-EU**
- Bottom seal, end seal and lubrication reservoir. Replace **-SS** with **-UZ**
- Customised design, including cut to length

? Technical support

- Key features - see [page 9-7](#)
- Technical information - see [page T9-3](#)
- Joining guides for longer lengths - see [page T9-3](#)
- Product overview - see [pages 9-2 to 9-3](#)

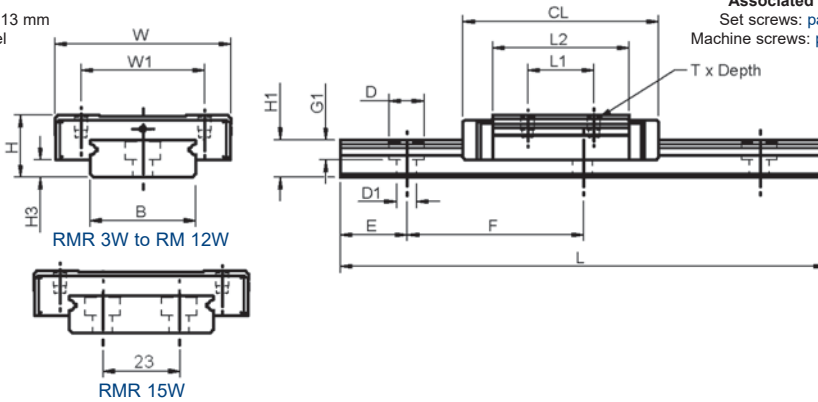


Wide RMR Series

Miniature Linear Guides

All dimensions in mm
 General tolerances ± 0.13 mm
 Material: Stainless steel

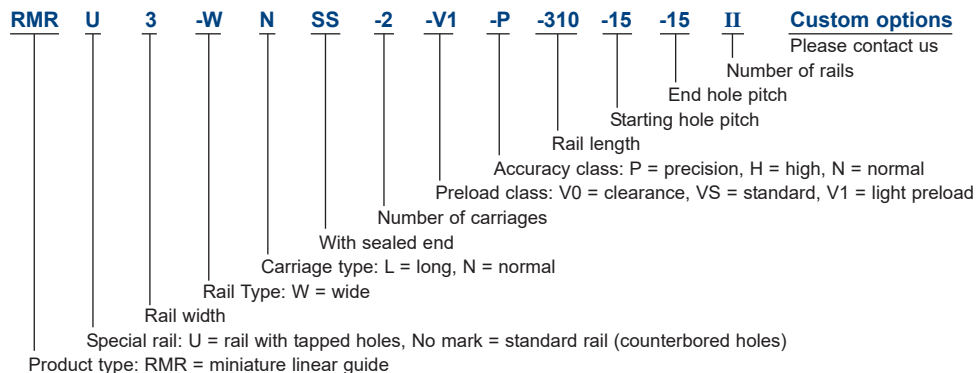
Associated Products
 Set screws: page 13-11
 Machine screws: page 13-2



Part number selection table

Basic Part Number	Max Travel	Carriage Dimensions			Max Rail Length	Load Rating				
		Height H	Width W	Length CL		Basic Dynamic Load N	Basic Static Load N	Static Moment Loads		
								To Nm	Tx Nm	Ty Nm
RMR3-WNSS-	983.0	4.5	12	15	1,000	280	530	1.6	0.9	0.9
RMR5-WNSS-	976.9	6.5	17	21.1		475	900	4.6	2.2	2.2
RMR7-WNSS-	966.4	9.0	25	31.6		1,180	2,095	15.0	7.3	7.3
RMR9-WNSS-	958.9	12.0	30	39.1		2,030	3,605	33.2	13.7	13.7
RMR12-WNSS-	953.6	14.0	40	44.4		3,065	5,200	63.7	26.3	26.3
RMR15-WNSS-	942.7	16.0	60	55.3	5,065	8,385	171.7	45.7	45.7	
RMR3-WLSS-	977.9	4.5	12	20.1	1,000	370	800	2.5	1.9	1.9
RMR5-WLSS-	970.8	6.5	17	27.2		615	1,315	6.8	4.1	4.1
RMR7-WLSS-	957.5	9.0	25	40.5		1,570	3,140	22.65	14.9	14.9
RMR9-WLSS-	947.3	12.0	30	50.7		2,550	4,990	45.9	26.7	26.7
RMR12-WLSS-	938.6	14.0	40	59.4		4,070	7,800	95.6	56.4	56.4
RMR15-WLSS-	923.6	16.0	60	74.4		6,725	12,580	257.6	93.1	93.1

Part number structure



Linear Guides and Slides

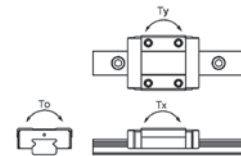


Dimensions

Basic Part Number	Rail Dimensions			Carriage Dimensions				
	Width	Height	Mounting Hole	Mounting Length	Height	Thread	Ctrs	Ctrs
	B	H1	D x D1 x G1	L2	H3	T x Depth	L1	W1
RMR3-WNSS-	6	2.7	4 x 2.4 x 1.5	10.0	1.0	M2 x 1.4	4.5	-
RMR5-WNSS-	10	4.0	5.5 x 3 x 1.6	15.1	1.5	M2.5 x 1.5	6.5	13
RMR7-WNSS-	14	5.2	6 x 3.5 x 3.5	21.2	2.0	M3 x 3	10.0	19
RMR9-WNSS-	18	7.3	6 x 3.5 x 4.5	27.9	3.4	M3 x 3	12.0	21
RMR12-WNSS-	24	8.5	8 x 4.5 x 4.5	31.0	3.9	M3 x 3.5	15.0	28
RMR15-WNSS-	42	9.5	8 x 4.5 x 4.5	38.5	4.0	M4 x 4.5	20.0	45
RMR3-WLSS-	6	2.7	4 x 2.4 x 1.5	15.1	1.0	M2 x 1.4	8.0	-
RMR5-WLSS-	10	4.0	5.5 x 3 x 1.6	21.2	1.5	M2.5 x 1.5	11.0	13
RMR7-WLSS-	14	5.2	6 x 3.5 x 3.5	30.1	2.0	M3 x 3	19.0	19
RMR9-WLSS-	18	7.3	6 x 3.5 x 4.5	39.5	3.4	M3 x 3	24.0	23
RMR12-WLSS-	24	8.5	8 x 4.5 x 4.5	46.0	3.9	M3 x 3.5	28.0	28
RMR15-WLSS-	42	9.5	8 x 4.5 x 4.5	57.6	4.0	M4 x 4.5	35.0	45

Available standard lengths

Size	3W	5W	7W	9W	12W	15W
Standard Length of One Rail (mm) L	40	50	50	50	70	110
	55	70	80	80	110	150
	70	90	110	110	150	190
		110	140	140	190	230
		130	170	170	230	270
		150	200	200	270	310
		170	260	260	310	430
		290	290	390	550	790
			320	470	670	
				550	790	
Pitch F	15	20	30	30	40	40
E Min	3	4	3	4	4	4
E Max	10	15	25	25	35	35



Linear Guides and Slides

i Product options

- End seal plus reinforcement plate on sizes 9, 12 and 15. Replace **-SS** with **-EE**
- End seal plus lubrication reservoir on all sizes. Replace **-SS** with **-ZZ**
- Bottom and end seals. Replace **-SS** with **-EU**
- Bottom seal, end seal and lubrication reservoir. Replace **-SS** with **-UZ**
- Customised design, including cut to length

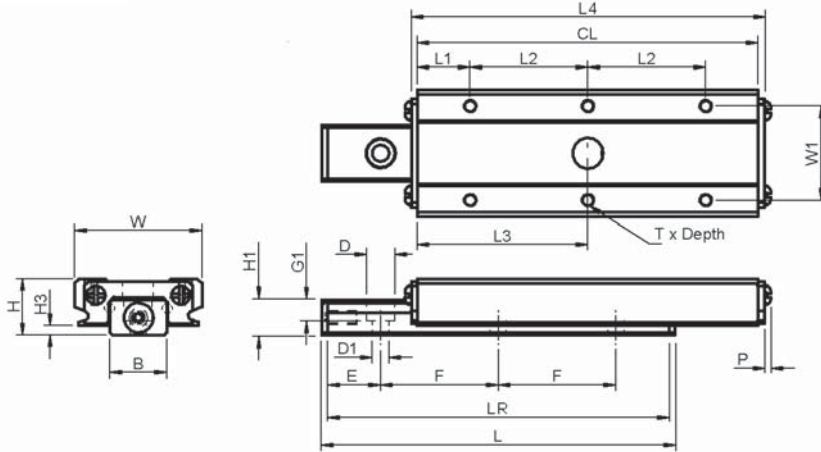
? Technical support

- Key features - see [page 9-7](#)
- Technical information - see [page T9-3](#)
- Joining guides for longer lengths - see [page T9-3](#)
- Product overview - see [pages 9-2 to 9-3](#)



All dimensions in mm
 General tolerances ± 0.13 mm
 Material: Stainless steel

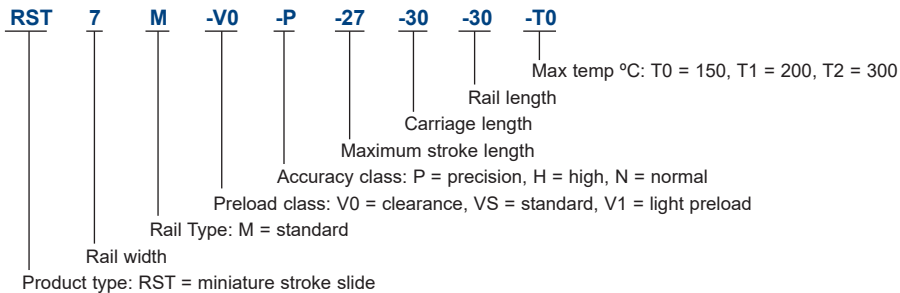
Associated Products
 Set screws: page 13-11
 Machine screws: page 13-2



Part number selection table

Basic Part Number	Max Travel	Carriage Dimensions					Load Rating				
		H	W	CL	L4	L3	Basic Dynamic Load N	Basic Static Load N	Static Moment Loads		
									To Nm	Tx Nm	Ty Nm
RST7M	27	8	17	28.0	30	14.0	910	1,580	5.9	3.4	3.4
	41			43.0	45	21.5	1,220	2,500	9.1	8.0	8.0
	55			58.0	60	29.0	1,490	3,330	12.4	14.6	14.6
RST9M	38	10	20	38.0	40	19.0	1,590	2,773	13.1	6.8	6.8
	58			58.0	60	29.0	2,080	4,170	19.7	16	16
	78			78.0	80	39.0	2,520	5,547	26.2	29.2	29.2
RST12M	44	13	27	47.4	50	23.7	2,550	4,340	27.0	16	16
	69			72.4	75	36.2	3,350	6,510	40.1	35.6	35.6
	94			97.4	100	48.7	4,050	8,670	54.0	62.8	62.8

Part number structure





Dimensions

Basic Part Number	Rail Dimensions							Carriage Dimensions					
	B	H1	Mounting Hole D x D1 x G1	LR	L	E	F	H3	L1	T x Depth	L2	W1	P
RST7M	7	4.7	4.2 x 2.4 x 2.3	28	30	6.5	7.5	1.5	6.5	M2 x 2.5	7.5	12	1
				43	45		15.0				15.0		
				58	60		22.5				22.5		
RST9M	9	5.5	6 x 3.5 x 3.5	38	40	9.0	10.0	2.2	9.0	M3 x 3.0	10.0	15	1.3
				58	60		20.0				20.0		
				78	80		30.0				30.0		
RST12M	12	7.5	6 x 3.5 x 4.5	47.4	50	11.2	12.5	3.0	11.2	M3 x 3.5	12.5	20	1.3
				72.4	75		25.0				25.0		
				97.4	100		37.5				37.5		



? Technical support

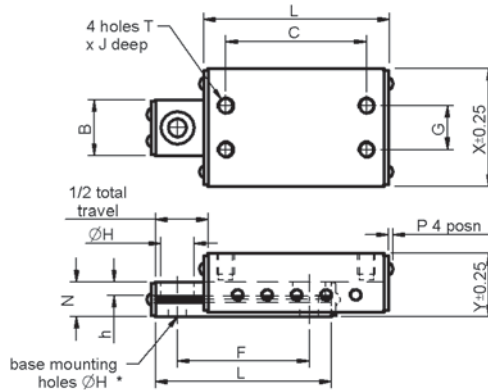
- High load and high moment capacity
- High running accuracy and smoothness
- Easy mounting
- Operating temperature of up to 150°C as standard. Higher temperatures of up to 300°C available. Note that the higher temperature options will have a lower load capacity
- Life rating calculations - see [page T9-2](#)
- Lubrication details - see [page T9-2](#)
- Product overview - see [pages 9-2 to 9-3](#)



Ball and Crossed Roller Slides

All dimensions in mm
 General tolerances $\pm 0.13\text{mm}$
 Material: See tables

Associated Products
 Leadscrews: page 7-1
 Hardware: page 13-1



Part number selection table

Ballslide Series	Dimensions					Mounting Details				
	Carriage Width X ± 0.25	Height Y ± 0.25	Screw P ± 0.25	Base Width B ± 0.25	Depth N ± 0.25	Base			Carriage	
						Hole Dia H ± 0.25	Cbore \varnothing	Cbore Depth h ± 0.25	Thread Size T	Depth J
CA	9.7	5.8	1.3	4.0	3.4	M2*	--	--	M2	2.29
DA & XDA	14.2	8.0	1.0	6.4	4.7	2.2	4.0	2.2	M2	2.54
EA & XEA	19.0	10.4	1.0	9.5	6.3	3.5	6.1	3.4	M3	3.30
MA	25.4	12.7	1.0	12.7	6.3	3.5	6.1	3.4	M4	5.33
NA & XNA	26.9	13.4	1.0	12.7	7.9	4.6	8.1	4.4	M4	4.83
SA1 & XSA1	38.0	15.8	1.3	19.0	8.6	4.6	8.1	4.4	M4	6.35
SA2 & XSA2	44.0	19.0	2.0	22.2	10.2	4.6	8.1	4.4	M4	8.13
SA3 & XSA3	66.5	25.4	2.0	38.1	15.9	5.8	10.0	5.3	M5	8.38

L, C & F dimensions, see part number on page 9-15

* For CA series slides, H holes are threaded and not counterbored.

Specifications

Feature	Ball Slide	Crossed Roller Slide (higher load capacity)
Straight line accuracy	0.0005 mm/mm	0.0001 mm/mm
Positional repeatability	0.005 mm	0.003 mm
Coefficient of friction	0.003 typical	0.003 typical
Construction	Aluminium carriage and base	
	Hardened steel rods and balls/rollers	
	Steel end caps	Stainless steel end caps
Finish:	Carriage	Clear anodised
	Base	Black anodised

Ball and Crossed Roller Slides



Drawing dimension and mounting table

Part Number		Total Travel	Slide Length L ±0.25	Hole Centres C ±0.25	Hole Centres F ±0.25	Hole Centres G ±0.25	Dynamic Load Capacity (N)	
Ball Bearing	Crossed Roller						Ball Bearing	Crossed Roller
CA-1	--	13	19	13	10		6.67	--
CA-2	--	25	32	26	20	4	6.67	--
CA-3	--	38	44	37	30		6.67	--
DA-1	XDA-1	13	27	15	19		19.62	137.34
DA-2	XDA-2	25	52	41	35		39.24	245.25
DA-3	XDA-3	50	78	66	60	6	49.05	294.30
DA-4	--	75	103	92	86		58.86	--
DA-5	--	100	128	117	89		78.48	--
DA-6	--	127	154	142	114		78.48	--
EA-1	XEA-1	13	27	15	19		39.24	215.82
EA-2	XEA-2	25	52	41	35		49.05	343.35
EA-3	XEA-3	50	78	66	60	9	49.05	412.02
EA-4	--	75	103	92	86		58.86	--
EA-5	--	100	128	117	89		68.67	--
EA-6	--	127	154	142	114		78.48	--
MA-1	--	13	40	32	32		49.05	--
MA-2	--	25	65	57	57	10	49.05	--
MA-3	--	50	90	82	82		68.67	--
NA-1	--	19	40	32	28		68.67	--
NA-2	XNA-2	38	65	57	54		78.48	588.60
NA-3	XNA-3	50	90	82	79		88.29	981.00
NA-4	XNA-4	75	116	102	82	10	107.91	1177.21
NA-6	--	100	152	140	102		137.34	--
NA-8	--	150	203	190	127		156.96	--
NA-10	--	200	254	240	178		176.58	--
SA1-1	XSA1-1	25	51	35	37		68.67	578.79
SA1-2	XSA1-2	50	76	60	60		88.29	774.99
SA1-4	XSA1-4	100	152	136	100	16	156.96	1363.59
SA1-6	--	150	203	186	128		196.20	--
SA1-8	--	200	254	238	178		245.25	--
SA2-1	XSA2-1	25	51	35	38		88.29	578.79
SA2-2	XSA2-2	50	83	65	65		186.39	774.99
SA2-3	XSA2-3	75	102	85	85	20	235.44	774.99
SA2-4	XSA2-4	100	152	140	100		264.87	1363.59
SA2-8	--	200	254	240	178		402.21	--
SA3-1.5	XSA3-1.5	38	67	42	42		156.96	1167.39
SA3-2	XSA3-2	50	102	75	75		274.68	1549.98
SA3-4	XSA3-4	100	152	125	125		529.74	1942.38
SA3-6	XSA3-6	150	229	75 x2	178	35	667.08	3109.77
SA3-9	--	228	305	75 x3	254		824.04	--
SA3-12	--	304	381	75 x4	330		912.33	--

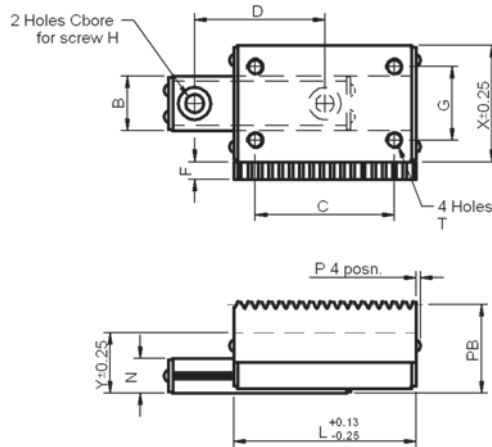
Linear Guides
and Slides



Rack Driven Ballslides

All dimensions in mm
General tolerances ± 0.13 mm

Associated Products
Rack pinions: page 6-10
Hardware: page 13-1



Drawing dimension and mounting table

Ballslide Series	Dimensions							Mounting Details	
	Rack		Slide					Base	Carriage
	Face Width F	Height PB	Carriage Width X	Height Y	Screw P	Base Width B	Depth N	Screw H	Thread Size T
RDA	2.50	11.629	14.22	8.13	1.0	6.35	4.75	M2	M2
REA	3.75	11.500	19.05	10.41	1.0	9.53	6.35	M3	M3
RNA	3.75	14.500	26.92	13.46	1.0	12.70	7.92	M4	M4
RSA2	7.56	20.690	44.45	19.05	2.0	22.23	10.16	M4	M4

L, C & D dimension, see part number on page 9-17

Slide specification

Straight line accuracy	0.0005 mm per mm
Positional repeatability	0.005 mm
Coefficient of friction	0.003 typical
Construction	Aluminium carriage and base Hardened steel rods and balls Steel end caps
Finish: Carriage Base	Clear anodised standard (black finish available)
	Black anodised

Rack Driven Ballslides



Part number selection table

Part Number	Ballslide Travel +1.5/-0.0	Ballslide Length L	Hole Centres C	Hole Centres D	Hole Centres G	Ballslide Load Capacity N
RDA-1	12.7	26.92	15	19		17.8
RDA-3	50.8	77.72	66	60	6.0	53.4
RDA-6	127.0	153.92	142	114		80.1
REA-1	12.7	26.92	15	19		35.6
REA-3	50.8	77.72	66	60	9.0	53.4
REA-6	127.0	153.92	142	114		80.1
RNA-3	50.8	90.42	82	79		89.0
RNA-6	101.6	152.40	140	102	10.0	133.5
RNA-10	203.2	254.00	240	178		178.0
RSA2-2	50.8	82.55	65	65		186.9
RSA2-4	101.6	152.40	140	100	20.0	267.1
RSA2-8	203.2	254.00	240	178		400.6

Rack specifications

Ballslide Series	Rack Circular Pitch	Material	Hardness	Cumulative Pitch Error per 300mm
RDA	1.0	Stainless steel	35-45 HRc	0.008mm
REA				
RNA				
RSA2	2.5			

Linear Guides
and Slides

i Product options

- Product overview - see pages 9-2 to 9-3
- Imperial racks

? Technical support

- Technical information - see page T9-1





FEATURES

The Reliance range of precision slides includes both ball and crossed roller units. Load capacities from 1.5 to 12580 N are available. Ballslides are available in both stainless steel and aluminium. Crossed roller slides are available in aluminium only. These units offer the designer:

- Pre-assembled units allowing quick and simple assembly.
- Factory set preload to prevent side play and backlash and to control friction.
- Low particle production for use in clean/medical environments.
- Low inertia and light weight allowing low powered rapid traverse.
- High straight line accuracy of 0.0001 mm per mm travel.

1. Ballslides

Manufactured from aluminium, these slide units offer ultra low friction, high load capacity and long life. The base and slide are ready machined for mounting. Modifications may be made to suit special requirements. Complete special slides can also be supplied. Please contact us.

2. Crossed Roller Slides

When compared to ballslides these units offer equal size but higher load capacity and accuracy. They are also able to operate with high cycling rates and higher shock or cantilevered loads.

3. Rack Driven Ball Slides

The addition of a small high precision rack along the side of a ballslide offers the option either to drive, measure position, or both, at very high speeds and loads.

ENGINEERING DATA

For the highest accuracy, the load should be centred over the table or bed, allowing enough additional length to avoid reaching the maximum stroke length. To achieve the expected accuracy and life, the mating surfaces used to mount the slide should be flat. In extreme circumstances 'potting' of the base may be required.

Please refer to the product dimensions when selecting the fixings to avoid contact between screws and moving slide sections.

1. Vertical Applications

When using ball or crossed roller type slides in vertical applications, the position and manner of the load, and the effects of gravity should be given extra consideration. Limiting the travel with positive stops also extends life instead of relying on the ball or roller retainer to act as a stop.

2. Service Life

The theoretical service life of a slide based on L_{10} life is as follows:

Ballslides

Crossed roller slides

$$L_{10} = (C/P)^3 \times 50 \times 10^3$$

$$L_{10} = (C/P)^{10/3} \times 50 \times 10^3$$

Where :
 L_{10} = Life at 90% reliability (m)
 C = Dynamic load rating (N)
 P = Calculated load (N)



3. Lubrication

All types of slides can use similar lubricants but require them under different conditions.

Recommended Lubricants

General Application

- High quality turbine oil
- Lithium soap based grease (NLGI No. 2)

Clean Environments

- Kluber Isoflex Topas NCA 52

4. Temperature Limits

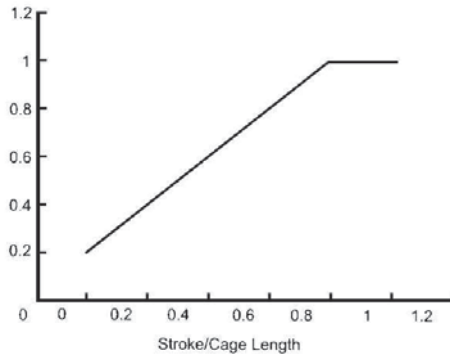
The maximum temperature is limited to 65°C (150°F) by the rolling element retainers. High temperature retainers can be supplied to operate up to 100°C (212°F) and although the slides can operate at higher temperatures this will reduce their life. Please contact us for further details.

MINIATURE STROKE SLIDES

1. Rating Life Calculation and Short Stroke Factor Diagram

$$L = K_{st} \left(\frac{C_{100B}}{P} \right)^3 \cdot 10^5$$

$$L_h = \frac{L}{2 \cdot s \cdot n \cdot 60} = K_{st} \frac{L}{v_m} \cdot \left(\frac{C_{100B}}{P} \right)^3$$



2. Rating Life L

The rating life of the RST miniature stroke slide series can be calculated by using the formulae above, in accordance with ISO 14728-1.

3. Lubrication

The lubrication of the RST miniature stroke slide series can be fulfilled by directly adding the lubricant onto the raceway of the rail.

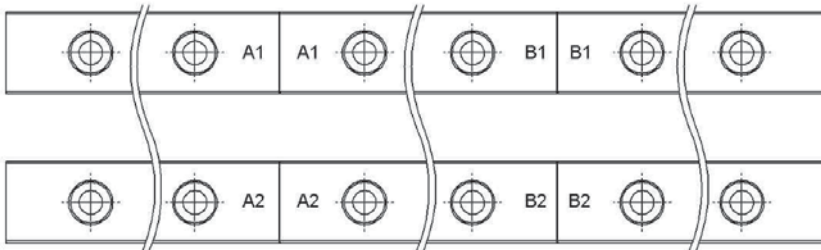


MINIATURE LINEAR GUIDES

1. Rail Butt-Jointing

When a longer rail is required than the maximum standard length available, two or more rails can be butt-jointed to create the desired length. When ordering add a -J to the end of the part number.

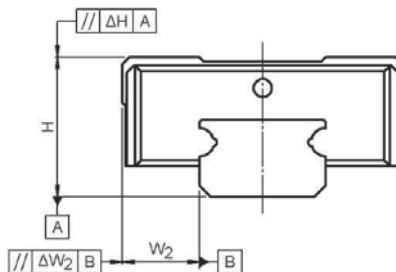
To ensure that the rails are mounted in an accurate and consistent manner they will be marked up as a matching pair when manufactured. The marking system for a rail that has been ordered as a -J to be butt-jointed is shown below, where matching pairs have the same marking.



2. Accuracy

Miniature Linear Guides are available in three accuracy grades P, H and N.

Accuracy classes (μm)		Precision P	High H	Normal N
Tolerance of dimension height H	H	± 10	± 20	± 40
Variation of height for different runner block on the same position of rail	ΔH	7	15	25
Tolerance of dimension width W	W_2	± 15	± 25	± 40
Variation of width for different runner block on the same position of rail	ΔW_2	10	20	30





3. Speed

For the SS/ZZ variant:

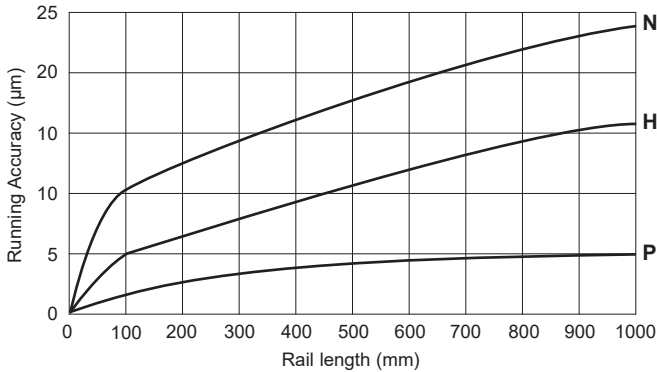
Maximum speed: $V_{max} = 3 \text{ m/s}$

Maximum acceleration: $a_{max} = 250 \text{ m/s}^2$ (If preload V0, maximum acceleration is 40 m/s^2)

For the EE/EU/UZ variant:

Maximum speed: $V_{max} = >5 \text{ m/s}$

Maximum acceleration: $a_{max} = 300 \text{ m/s}^2$ (If preload V0, maximum acceleration is 60 m/s^2)














4. Pre-load

Miniature Linear Guides are available in three different grades of pre-load V0, VS and V1. The amount of pre-load can enhance stiffness, precision and torsional resistance but affects life and friction.

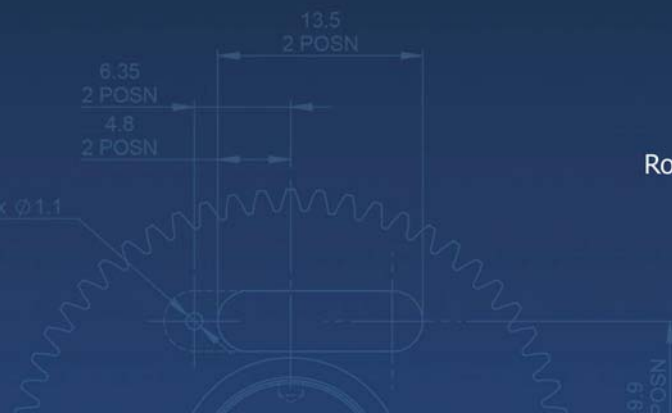
Pre-load Type	Model Code	Clearance (µm)						Application
		3	5	7	9	12	15	
Clearance	V0	+3 to 0	+3 to 0	+4 to 0	+4 to 0	+5 to 0	+6 to 0	Very smooth
Standard	VS	+1 to 0	+1 to 0	+2 to 0	+2 to 0	+2 to 0	+3 to 0	Smooth Precision
Light Pre-load	V1	0 to -0.5	0 to -1	0 to -3	0 to -4	0 to -5	0 to -6	High rigidity Minimal vibration High precision Load balance

5. Operating Temperature

Miniature Linear Guides can operate in temperatures ranging from -40°C to $+80^{\circ}\text{C}$. Temperatures of 100°C can be reached for short term operation.

	<i>Introduction to Reliance</i>	<i>i</i>
	<i>Systems Overview</i>	<i>1</i>
	Intelligent Motors and Motorised Actuators	2
	Planetary and Right Angle Gearboxes	3
	Brass, Ground and Precision Spur Gears	4
	Worms and Wheels, Bevels and Internal Gears	5
	Round and Rectangular Racks and Pinions	6
	Leadscrews and Leadscrew Assemblies	7
	Flexible Shaft Couplings, Clutches and Collars	8
	Linear Guides and Slides	9
	Belts and Pulleys	10
	Gear Clamps and Accessories	11
	Bearings and Spacers	12
	Machine Screws, Dowel Pins and Hardware	13
	<i>Technical Information</i>	<i>14</i>
	<i>Appendices and Index</i>	<i>15</i>

Systems Overview	1
Intelligent Motors and Motorised Actuators	2
Planetary and Right Angle Gearboxes	3
Brass, Ground and Precision Spur Gears	4
Worms and Wheels, Bevels and Internal Gears	5
Round and Rectangular Racks and Pinions	6
Leadscrews and Leadscrew Assemblies	7
Flexible Shaft Couplings, Clutches and Collars	8
Linear Guides and Slides	9
Belts and Pulleys	10
Gear Clamps and Accessories	11
Bearings and Spacers	12
Machine Screws, Dowel Pins and Hardware	13
Technical Information	14



Rowley Mills, Penistone Road, Lepton
Huddersfield, HD8 0LE, England

+44 (0) 1484 601002

www.reliance.co.uk

sales@reliance.co.uk

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