



Reliance[®]

Precision Mechatronics



**Standard and Customised
Components and Assemblies**

A complete source for precise motion control

9 Linear Bearings and Slides



Low friction linear bearings slides

A selected range of linear bearings, guides and shafts to complement the linear motion standard range.



Precision Linear Bearings

Bore diameter 3mm to 12mm



Spline Shafts

A selected range of spline shafts and nuts

Lengths up to 1,000mm



Miniature Linear Guides

Travel up to 983mm

Load capacity up to 12,580N



Miniature Stroke Slides

Travel up to 94mm

Load capacity up to 8,670N



Roller Slides

Travel up to 304mm

Load capacity up to 3,110N

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please see [Page T9-1](#)



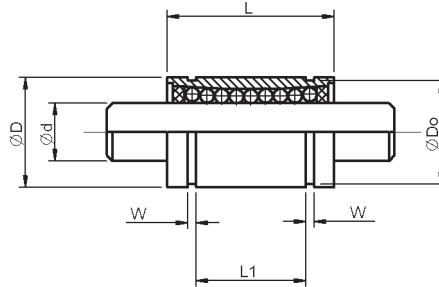
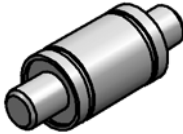


Ø3 - Ø12mm
Bore

Corrosion Resistant Precision Linear Bearings

All dimensions in mm
General tolerances $\pm 0.13\text{mm}$
Materials:
Housing - SUJ2 - Anti-rust
coated bearing steel
Balls - 440C - Stainless steel

Associated Products
Linear motion shafting: [page 11-2](#)
Hollow linear motion shafting: [page 11-3](#)



Part number selection table

Order shaft separately, see [page 11-2](#)

Part Number	Dimensions									
	Inside Dia		Outside Dia		Length		Circlip Groove			
	Ød		ØD		L		Position L1	Width W	Dia ØDo	
MRL-3	3	0.000	7	0.000	10	0.00	-	-	-	-
MRL-4	4	-0.008	8	-0.010	12	-0.12	-	-	-	-
MRL-5	5		10		15		8	±0.2	1.10	9.6
MRL-6	6		12	0.000	19		11		1.15	11.5
MRL-8	8	0.000	15	-0.011	17	0.00	9		1.15	14.3
MRL-10	10	-0.009	19	0.000	29	-0.20	19		1.35	18.0
MRL-12	12		21	-0.013	30		20	±0.3	1.35	20.0

Part Number	Specification			
	No. of Ball Circuits	Weight (Kg)	Basic Load Ratings	
			Dynamic # C (Kgf)	Static Co (Kgf)
MRL-3	4	0.0018	2	4
MRL-4		0.0028	3	6
MRL-5		0.004	4.5	9
MRL-6		0.007	7	11
MRL-8		0.012	8	12
MRL-10		0.026	20	30
MRL-12		0.032	28	43

Dynamic load rating based on a rated life of 50,000m.

- In salt spray and acid tests anti-rust coated bearings showed superior corrosion resistance in comparison with conventional 440C
- For sealing both sides add **-UU** to part number eg **MRL-6-UU**

Non-standard options, please contact our sales team

- Larger bores
- Bearings available without anti-rust coating

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

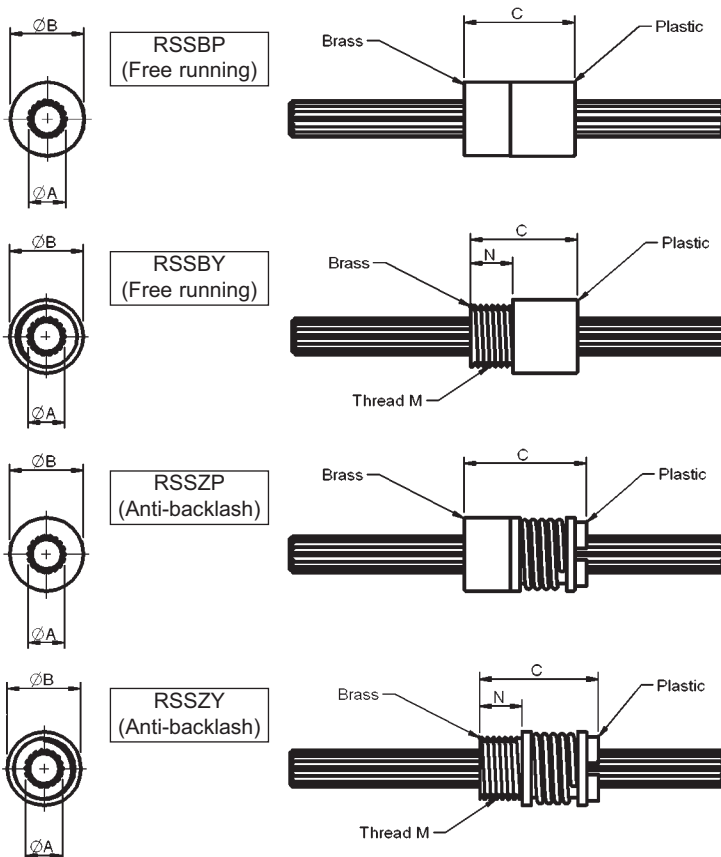
Associated Products
 Leadscrews: [page 7-1](#)
 Hardware: [page 13-1](#)

The Reliance spline shaft series has been designed for light to moderate load applications, where low cost, low friction and long life are the primary design considerations.

The spline shafts provide anti-rotation for one axis motion or a drive mechanism with rotation for two axes of motion. They are excellent alternatives for applications where hexagon shafts, square shafts and high-cost ball splines are typically used.

The assembly consists of a stainless steel spline shaft treated with a low friction Kerkote® TFE coating, together with a Kerkite® composite polymer bushing. The bushing is supplied with an integral brass collar to facilitate various mounting configurations without nut distortion.

Standard shaft straightness is 0.08mm per 300mm. Typical radial and torsional clearance between shaft and bushing for a basic assembly is 0.05-0.08mm. An anti-backlash assembly is available for applications requiring minimum torsional play.



Part number selection table

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

Number of bushings
TFE coating (standard)

Basic Part No.	Bushing Style	Mount	Size Code	Shaft Dia ØA** ±0.05mm	Bushing Outside Dia ØB ±0.025mm	Bushing Length C ±0.25mm	Thread M* (Inch)	Thread Length N* ±0.05mm	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

* Only on thread mounting spline shafts.

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

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

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 of the slide.

Non-standard options, please contact our sales team

- Longer lengths available
- Larger number of bushings
- Bush modifications
- Modified ends
- Tube configuration
- Aluminium alloy or carbon steel spline shafts are also available

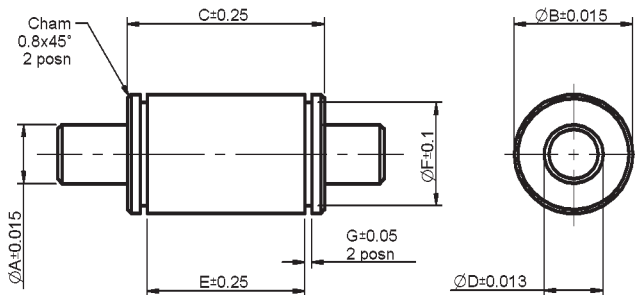




All dimensions in mm
 General tolerances $\pm 0.13\text{mm}$
 Material: Rail - Stainless steel
 Bushing - Composite polymer

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.



Part number selection table

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

Shaft length, (max length 3600mm)
 Number of bushings
 TFE coating (standard)

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.

- 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 0.05mm per 300mm
- Standard typical radial clearance between shaft and bearings on non-coated assemblies is 0.013mm and 0.025 on TFE coated assemblies
- Bushings are manufactured with standard retaining ring grooves

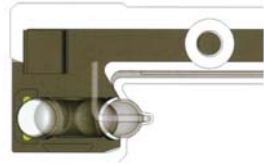


Reinforced design for high speed running

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.



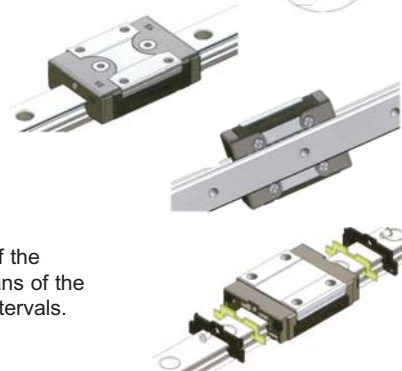
Bottom seal

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

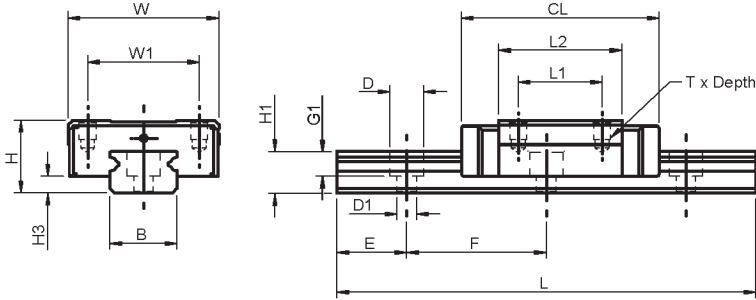
Specially designed end seals prevent dust and foreign objects entering the system, increasing the product life. These seals are low friction and do not effect the smooth running of the linear guide.





All dimensions in mm
 General tolerances $\pm 0.13\text{mm}$
 Material: Stainless steel

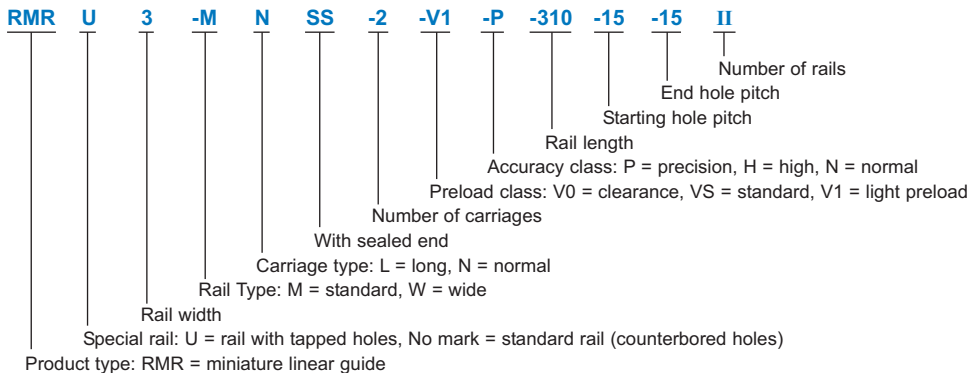
Associated Products
 Set screws: [page 13-11](#)
 Machine screws: [page 13-2](#)



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	16.7	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	21.2	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



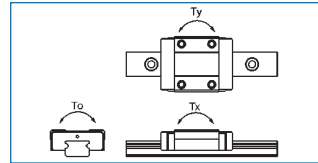


Dimensions

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	8.0	12
RMR9-MNSS-	9	5.5	6 x 3.5 x 3.5	20.5	2.2	M3 x 3.0	10.0	15
RMR12-MNSS-	12	7.5	6 x 3.5 x 4.5	22.0	3.0	M3 x 3.5	15.0	20
RMR15-MNSS-	15	9.5	6 x 3.5 x 4.5	27.0	4.0	M3 x 5.5	20.0	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	7.0	-
RMR7-MLSS-	7	4.7	4.2 x 2.4 x 2.3	21.8	1.5	M2 x 2.5	13.0	12
RMR9-MLSS-	9	5.5	6 x 3.5 x 3.5	30.8	2.2	M3 x 3.0	16.0	15
RMR12-MLSS-	12	7.5	6 x 3.5 x 4.5	34.0	3.0	M3 x 3.5	20.0	20
RMR15-MLSS-	15	9.5	6 x 3.5 x 4.5	44.0	4.0	M3 x 5.5	25.0	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	115	145	190	
	100	100	100	135	170	230	
			130	155	195	270	
			175	220	310		
			195	245	350		
			275	270	390		
			375	320	430		
			370	470	470		
			470	570	670		
	870						
	Pitch F	10	15	15	20	25	40
	E Min	3	3	3	4	4	4
E Max	5	10	10	20	20	35	



- Available with end seal plus reinforcement plate on sizes 9, 12 and 15. Replace **-SS** with **-EE**
- Available with end seal plus lubrication reservoir on all sizes. Replace **-SS** with **-ZZ**
- Available with a bottom seal and end seal. Replace **-SS** with **-EU**
- Available with a bottom seal, end seal and lubrication reservoir. Replace **-SS** with **-UZ**

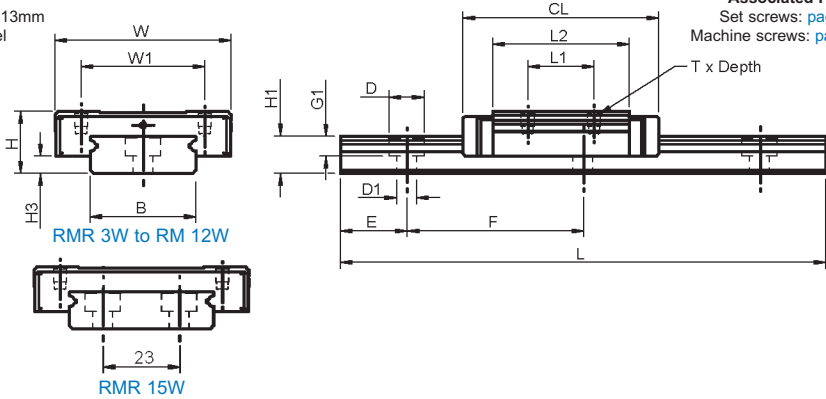
Non-standard options, please contact our sales team

- Customised design



All dimensions in mm
 General tolerances $\pm 0.13\text{mm}$
 Material: Stainless steel

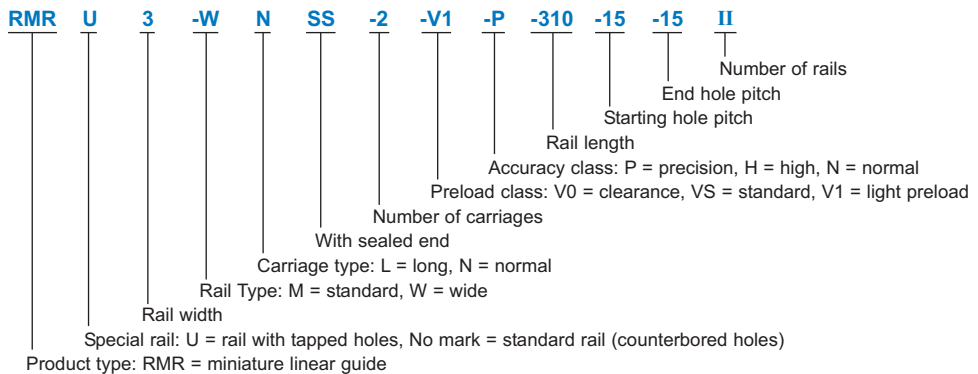
Associated Products
 Set screws: [page 13-11](#)
 Machine screws: [page 13-2](#)



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



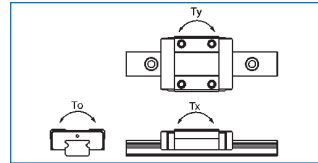


Dimensions

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
				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



9

- Available with end seal plus reinforcement plate on sizes 9, 12 and 15. Replace **-SS** with **-EE**
- Available with end seal plus lubrication reservoir on all sizes. Replace **-SS** with **-ZZ**
- Available with a bottom seal and end seal. Replace **-SS** with **-EU**
- Available with a bottom seal, end seal and lubrication reservoir. Replace **-SS** with **-UZ**

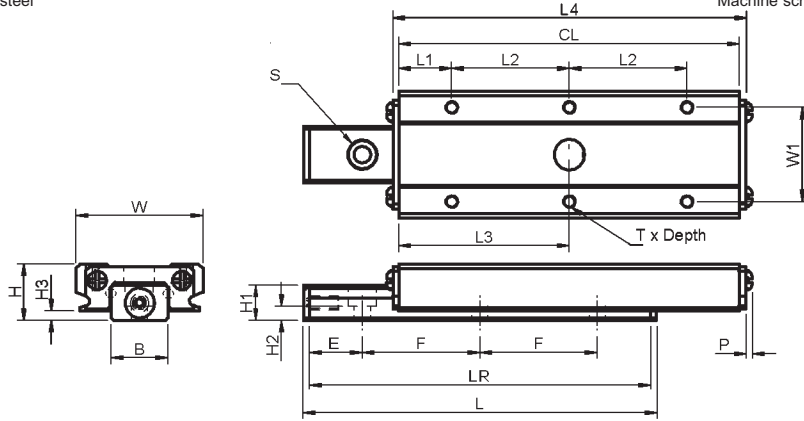
Non-standard options, please contact our sales team

- Customised design



All dimensions in mm
 General tolerances $\pm 0.13\text{mm}$
 Material: Stainless steel

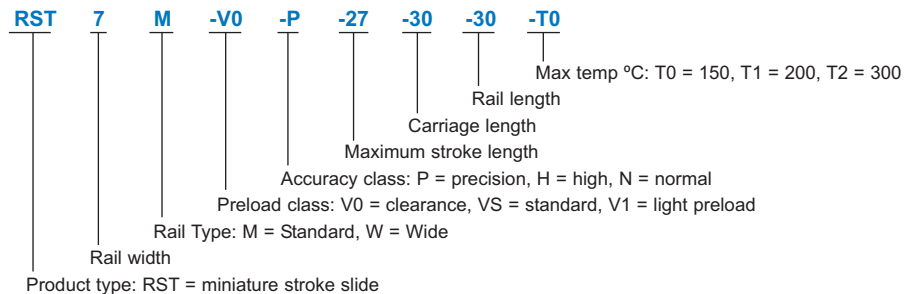
Associated Products
 Set screws: [page 13-11](#)
 Machine screws: [page 13-2](#)



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

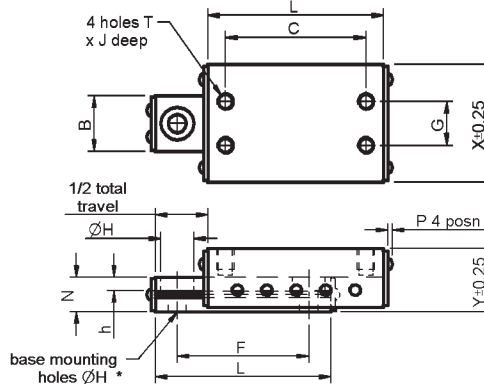
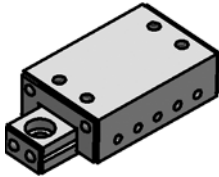
Basic Part Number	Rail Dimensions							Carriage Dimensions					
	B	H1	Mounting Hole D x D1 x G1	LR	L	E	F	H3	L1	T x Depth	L2	W1	P
RST7M	7	4.7	4.2 x 2.4 x 2.3	28	30	6.5	7.5	1.5	6.5	M2 x 2.5	7.5	12	1
				43	45		15.0						
				58	60		22.5						
RST9M	9	5.5	6 x 3.5 x 4.5	38	40	9.0	10.0	2.2	9.0	M3 x 3.0	10.0	15	1.3
				58	60		20.0						
				78	80		30.0						
RST12M	12	7.5	6 x 3.5 x 4.5	12.5	50	11.2	12.5	3.0	11.2	M3 x 3.5	12.5	20	1.3
				25	75		25.0						
				37.5	100		37.5						

- 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. Please note that the higher temperature options will have a lower load capacity
- See [page T9-5](#) for the life rating calculations and short stroke factor diagram
- See [page T9-5](#) for preload accuracy details



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	0.0005mm/mm	0.0001mm/mm
Positional repeatability	0.005mm	0.0025mm
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	Black anodised
Base	Black anodised	Black anodised

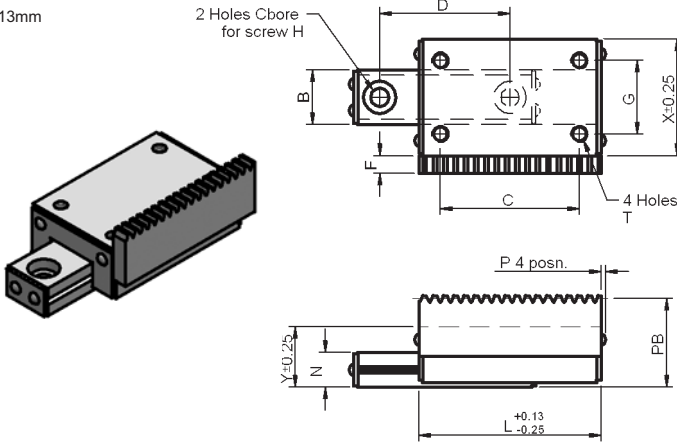
Ball & Crossed Roller Slides

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	4	6.67	--
CA-2	--	25	32	26	20		6.67	--
CA-3	--	38	44	37	30		6.67	--
DA-1	XDA-1	13	27	15	19	6	19.62	137.34
DA-2	XDA-2	25	52	41	35		39.24	245.25
DA-3	XDA-3	50	78	66	60		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	9	39.24	215.82
EA-2	XEA-2	25	52	41	35		49.05	343.35
EA-3	XEA-3	50	78	66	60		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	10	49.05	--
MA-2	--	25	65	57	57		49.05	--
MA-3	--	50	90	82	82		68.67	--
NA-1	--	19	40	32	28	10	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		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	16	68.67	578.79
SA1-2	XSA1-2	50	76	60	60		88.29	774.99
SA1-4	XSA1-4	100	152	136	100		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	20	88.29	578.79
SA2-2	XSA2-2	50	83	65	65		186.39	774.99
SA2-3	XSA2-3	75	102	85	85		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	35	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		667.08	3109.77
SA3-9	--	228	305	75 x3	254		824.04	--
SA3-12	--	304	381	75 x4	330		912.33	--

All dimensions in mm
General tolerances ± 0.13 mm

Associated Products
Rack pinions: [page 6-1](#)
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	0.0005mm per mm
Positional repeatability	0.005mm
Coefficient of friction	0.003 typical
Construction	Aluminium carriage and base Hardened steel rods and balls Steel end caps
Finish: Carriage	Clear anodised standard (black finish available) Black anodised
Base	

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			

Non-standard options, please contact our sales team

- Imperial racks



FEATURES

The linear bearings in this catalogue are designed to provide accurate trouble free linear motion. Bearings are available with bore sizes from 3mm up to 25mm. Unique to this range is a special anti-rust coating. In salt spray tests Reliance anti-rust coated bearings have shown superior resistance when compared to standard 440c corrosion resisting steel.

INSTALLATION

Recommended fitting details between the bearings and shafts or housings are shown below:

Recommended Tolerances						
Shaft			Housing			
Shaft Diameter mm	Standard Clearance f6-g6	Tight Clearance h6	Outer Diameter mm	Standard Fit H7	Tight Fit J7	
3	-0.010 -0.019	0 -0.009	7	+0.018 0	+0.010 -0.008	
4						
5						
6						
8						
10						
12			0 -0.011	19	+0.021 0	+0.012 -0.009
13						
16						
20						
25	-0.010 -0.021	0 -0.013	32 40	+0.025 0	+0.014 -0.011	

We recommend that under normal conditions the standard clearance dimensions are used, this will give an in service clearance of 0/+0.010mm. The hardened shafting in this catalogue is designed to provide "standard clearance".

Applications requiring a small degree of preload can be catered for by ensuring that the bearing/shaft clearance is 0/-0.010mm. Interferences greater than 0.010mm can have adverse effects on the bearings operating performance and life.

A simple check is that if the shafting rotates easily in the bearing then the correct fit has been achieved. A small amount of resistance means that there is some preload in the bearing. If the shaft is stiff or unable to rotate the preload is too high and the life of the bearing will be dramatically reduced.

FRICTION

The frictional coefficient of our linear ball bearings is generally in the order of 0.001 to 0.003.

LUBRICATION

Generally bearings with double seals should be used. Double seals ensure that the bearing lubricant is retained and provide some degree of protection against dust and foreign objects.



BASIC LOAD RATING AND LIFE

To give maximum life it is recommended that the load is distributed as evenly as possible over as many ball tracks as possible. For example, a longer life can be achieved by positioning a point load between two ball tracks rather than directly above one.

In applications where moment loads exist double bearings should be used.

Moment loads may have an adverse effect on the performance of the bearing and should be avoided. If this is not possible then two separate bearings should be used spaced as far apart as possible, preferably with a small preload.

1. Rated Life

This is defined as the travel distance (50,000 metres) which 90% of a group of balls the same size and type can cover under the same condition, without any signs of flaking caused by rolling contact fatigue.

2. Basic Dynamic Load Rating

This is the load acting on a row of balls which is situated in the line of action, and shows no deterioration during its rated life of 50,000 metres.

3. Basic Static Load Rating

This is the load which will cause permanent deformation amounting to one ten thousandth of the rolling elements diameter at the contact surface of the ball under maximum stress.

4. Formula For Rated Life

The rated life is calculated by the following equation. Factors are introduced to take account of the shaft hardness, operating temperatures, impacts, vibrations, and the arrangement of aligned balls.

$$L = \left(\frac{f_H \cdot f_t \cdot f_B \cdot C}{f_s \cdot P} \right)^3 \cdot 50 \quad (\text{km})$$

L = Rated life	km
C = Basic dynamic load rating	kgf
P = Radial load	kgf
f _H = Shaft hardness factor	Fig. 1.
f _t = Temperature factor	Fig. 2.
f _B = Layout factor for ball position	Fig. 3.
f _s = Impact and vibration factor	Table 1.

In the case where both the stroke length and frequency are constant, the rated life (L) in kilometers obtained from the above equation can be converted into rated life in hours (L_h) by the following formula.

$$L_h = \left(\frac{L \cdot 10^6}{2 \cdot l_s \cdot n \cdot 60} \right) \quad (\text{hr})$$

L _h = Rated life in hours	hr
l _s = Stroke length	mm
n = Cycles per minute	cpm



5. Life Calculation Factors

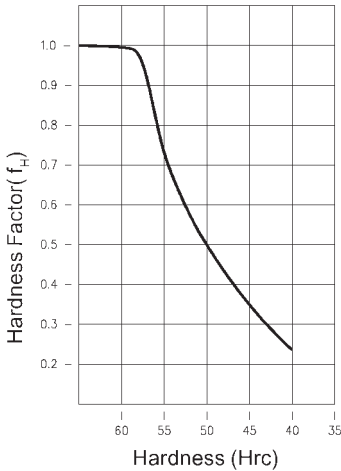


Fig 1. Hardness Factor (f_H)

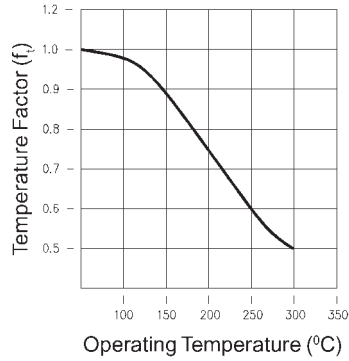


Fig 2. Temperature Factor (f_t)

Illustrated correlation between rows of balls and applied loads	Number of Rows of Balls		
	Four Rows	Five Rows	Six Rows
f_B	1.414	1.463	1.280

Fig 3. Layout Factor (f_B)

Impact and Vibration Factors	
Operating conditions	f_s
No impacts or vibrations exist with reciprocating speed, $V = 300\text{mm/sec}$ or less	1 - 1.5
Slight impacts or vibrations exist with reciprocating speed, $V = 1000\text{mm/sec}$ or less	1.5 - 2.0
Heavy impacts or vibrations exist with reciprocating speed, $V = 1000\text{mm/sec}$ or more	2.0 - 4.0

Table 1. Impact and Vibration Factors (f_s)



FEATURES

The Reliance range of precision slides includes both ball and crossed roller units. Load capacities from 1.5 to 12580N 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 0.0001mm 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 your special requirements. Complete special slides can also be supplied. Please consult Reliance Technical Sales.

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

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

Crossed roller slides

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

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

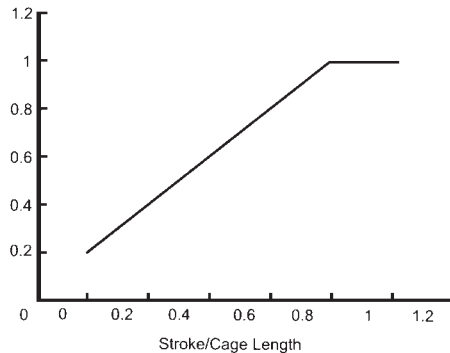
The maximum temperature is limited to 65°C (150°F) by the rolling element retainers. High temperature retainers can be supplied to operate up to 100°C (212°F) and although the slides can operate at higher temperatures this will reduce their life. Please consult Reliance Technical Sales for details.

RST 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.





In addition to these conditions of sale, our standard Conditions of Sale also apply. A copy of these is available on request and from our website www.rpmechatronics.co.uk/en/help

Minimum order charge - Orders are subject to a minimum order charge of £25.00 unless they have been placed on our website at www.rpmechatronics.co.uk

Carriage and packing - Additional charges are made for carriage and packing.

Payment - Payment terms are 30 days. New customers are requested to complete an application form for a credit account. Customers who do not have a credit account with Reliance are requested to supply cheque with order. In addition, orders may be paid for by Visa and Mastercard.

Telephone orders - An order number must be quoted by customers and a written confirmatory order, clearly marked "CONFIRMATION", sent within 7 days. We reserve the right to supply parts against a telephone order. All telephone orders are accepted subject to these conditions of sale and those detailed on the acknowledgement of order. An acknowledgement will normally be sent by Reliance on receipt of order and goods will be supplied in accordance with the order acknowledgement.

Certificates of Conformance - Reliance's quality management system is certified to AS9100 and ISO 9001. A Certificate of Conformance can be supplied at an additional charge of £10.00 per delivery. Alternatively, a Certificate with full material traceability can be supplied at a charge of £20.00 per delivery.

Confirmation - All orders, other than telephone orders with a value of less than £500 and orders placed through our website, are subject to acceptance in writing by Reliance Precision Mechatronics.

Order amendments - Order amendments are subject to our approval and a charge will be made for reasonable compensation for any costs incurred.

Returns - Unused items may, solely at our discretion, be accepted for credit within 90 days of delivery. Any parts so accepted will be subject to a 20% service charge for re-inspection and handling. No credit can be allowed after the above period, or for any used or modified part, or for parts manufactured to a customer's specification.

Additional charges - Reliance reserves the right to charge for all additional expenses and taxes incurred over and above published prices (including without limitation duty, VAT, exchange rate fluctuations etc.)

Alterations - As a result of continuous product development, Reliance reserves the right to alter prices and other details without prior notice and to change dimensions where this does not affect the function of the item.

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