

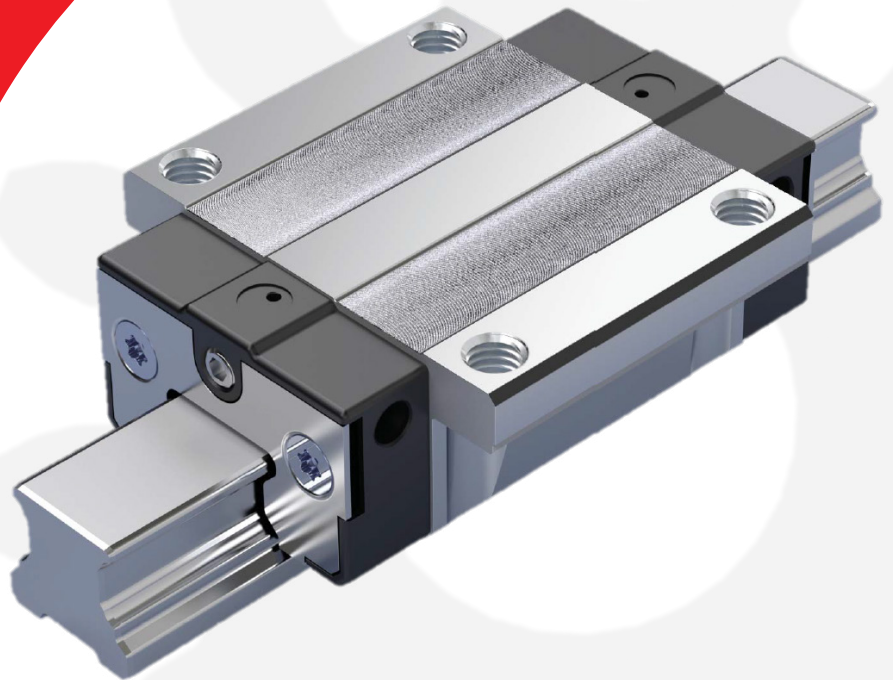


"Part of your drive"

LINEAR MOTION

STOCK CATALOGUE

EDITION 01



Rexroth **Bosch Group**

The Drive & Control Company

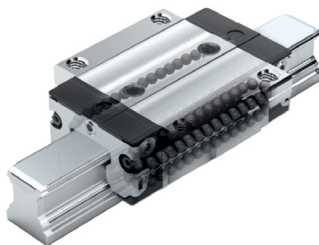
OFFICIAL STOCKIST

www.apex-trans.co.uk
sales@apex-trans.co.uk

TEL: 01827 253 340
FAX: 01827 253 390



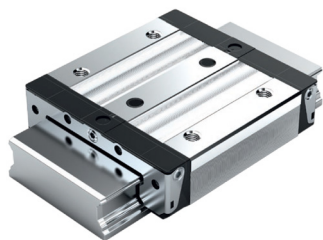
LINEAR BALL GUIDES



STAINLESS GUIDES



ROLLER GUIDES



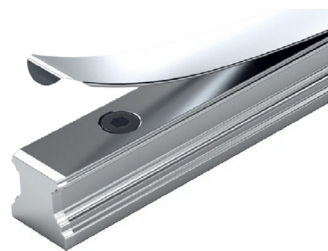
MINIATURE GUIDES



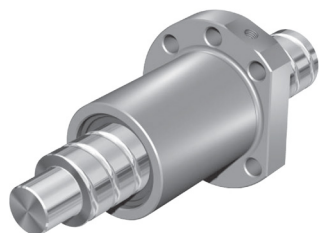
SEAL KITS



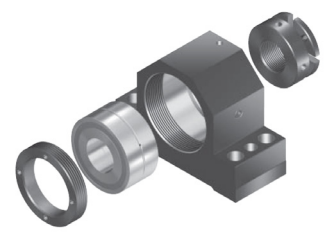
LUBRICATION UNITS



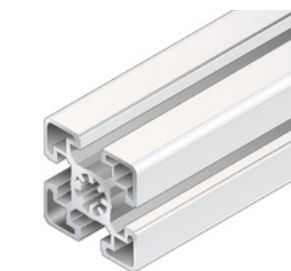
GUIDE RAILS



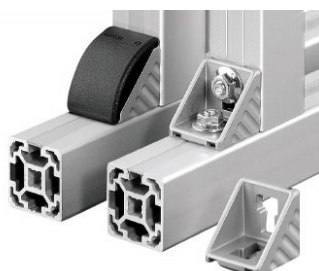
BALLSCREWS



SUPPORT UNITS



ALUMINIUM PROFILE



PROFILE ACCESSORIES



PLANETARY GEARBOXES

Ball Guides	05 – 24	BALL GUIDES 
Stainless Steel Ball Guides	25 – 36	STAINLESS GUIDES 
Roller Guides	37 – 52	ROLLER GUIDES 
Miniature Ball Guides	53 – 60	MINIATURE GUIDES 
Ballscrews	61 – 67	BALL SCREWS 

Here at **APEX**, we are dedicated to quality customer service, high quality products and fast delivery. We pride ourselves on next day delivery on stock items and same day cutting & dispatch of linear rails and extruded profiles.

With years of commercial experience, ISO 9001/2008 accreditation and a highly skilled workforce from the shop floor through to management, you can be confident in choosing **APEX** for all your linear motion needs.

As official stockists of **Bosch Rexroth** linear products, we specialise in handling extensive stock of linear motion products including:

- Linear ball & roller guides -
- Stainless steel linear guides -
- Miniature linear guides -
- Ballscrew assemblies & support units -
- Aluminium extruded profiles -
- Ball transfer units -
- Ball bushes & linear shafts -

Here at **APEX**, we offer unrivalled linear motion services such as:

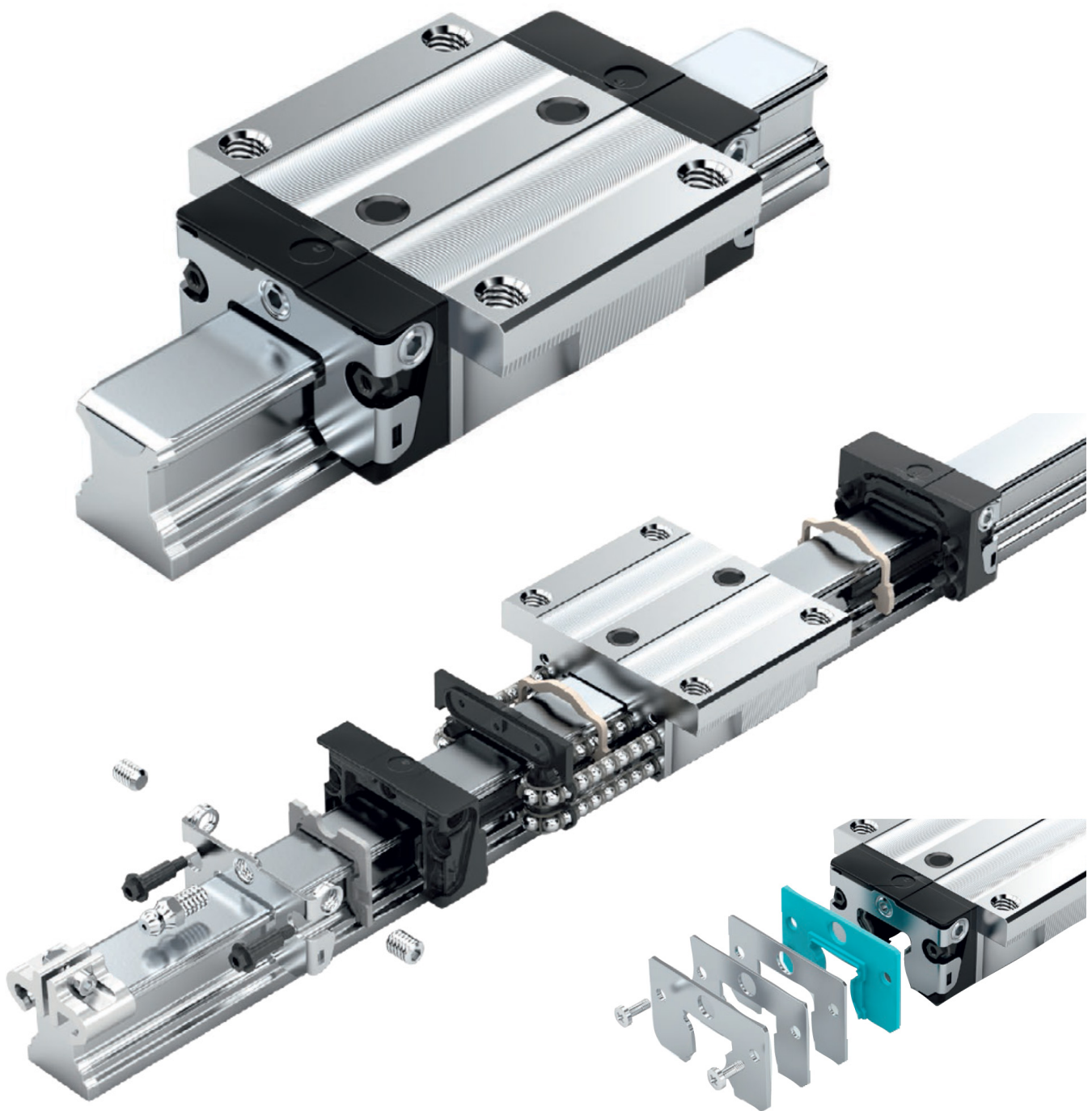
- Express dispatch of stock products -
- Cutting & butt jointing linear rails -
- In-house design & machining of ballscrews -
- Selection & service lifetime calculations -
- Design & modification of special guides -
- Cutting & building of aluminium profile & panels -
- Design of bespoke rack drive systems -

Our in-house, fully equipped CNC machine shop combined with years of industry experience gives us the capability to tailor products to suit specific customer requirements – contact our professional sales team today.

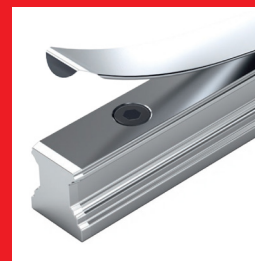




Standard Linear Ball Guides



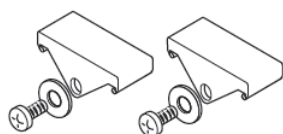
LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



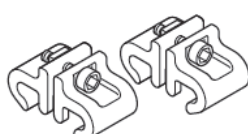
Ball Guides – Cover Strip

For All Standard Ball Guide Rails

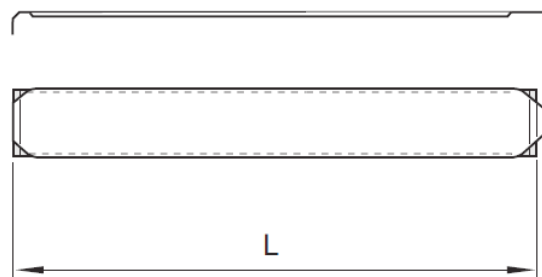
COVER STRIP & CAP



COVER STRIP & CLAMP



SNAP FIT COVER STRIP



Rail Size	Rail Accessories Ordering Codes			
	Cover Strip Cap (2pc Set & Screws)	Cover Strip Clamp (2pc Set & Screws)	Plastic Cap (Sold Singular)	Snap Fit Cover Strip (Cut To Length mm)
15	R1619 139 20	R1619 139 50	R1605 100 80	R1619 130 00 - LENGTH
20	R1619 839 20	R1619 839 50	R1605 800 80	R1619 830 00 - LENGTH
25	R1619 239 20	R1619 239 50	R1605 200 80	R1619 230 00 - LENGTH
30	R1619 739 20	R1619 739 50	R1605 700 80	R1619 730 00 - LENGTH
35	R1619 339 20	R1619 339 50	R1605 300 80	R1619 330 20 - LENGTH
45	R1619 439 20	R1619 439 50	R1605 400 80	R1619 430 20 - LENGTH
55	R1619 539 20	R1619 539 50	R1605 500 80	R1619 530 20 - LENGTH
65	R1619 639 20	R1619 639 50	R1605 600 90	R1619 630 20 - LENGTH

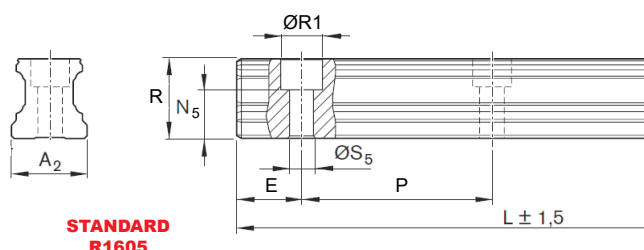
SEE RAIL ORDER CODES ON THE NEXT PAGE FOR ORDERING RAILS COMPLETE WITH COVER STRIP
PLASTIC MOUNTING HOLE CAPS ARE INCLUDED IN THE DELIVERY OF R1605 CUT RAIL LENGTHS
THE ORDERING CODES SHOWN ABOVE ARE FOR REFERENCE WHEN ORDERING SPARES ONLY

LINEAR BALL GUIDE RAILS ARE STOCKED IN H GRADE ONLY
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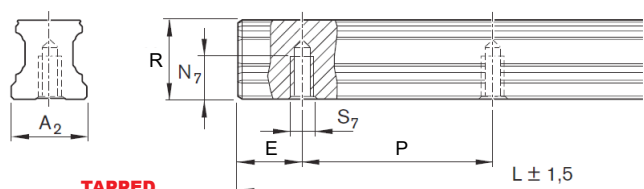


Ball Guides – Rails

For All Standard Ball Guide Blocks



**STANDARD
R1605**



**TAPPED
R1607**

R 1 6 0 5 2 0 3 31 - LENGTH

**Standard
Ball Type
Linear
Rails**

Hole Type:

5 = Standard
7 = Tapped

Nominal size:

1 = 15 3 = 35
8 = 20 4 = 45
2 = 25 5 = 55
7 = 30 6 = 65

Composition:

31 = 1pc Single Rail
32 = 2pc Butt Joint
3N = Npc Butt Joint

Accuracy Grade:

4 = N Grade
3 = H Grade (Stock)
2 = P Grade

Cover Option:

0 = Standard
3 = Cover & Clamps
4 = Metal Cap
6 = Cover & Caps

Rail Size	Rail Dimensions (mm)										kg / m	Ordering Codes	
	A2	R	R1	S5	N5	S7	N7	P	E MIN	RAIL BOLT		Standard Rail	Tapped Rail
15	15	16.20	7.4	4.5	10.3	M5	7.5	60	10	M4	1.4	R1605 103 31	R1607 103 31
20	20	20.55	9.4	6	13.2	M6	9	60	10	M5	2.4	R1605 803 31	R1607 803 31
25	23	24.25	11	7	15.2	M6	12	60	10	M6	3.2	R1605 203 31	R1607 203 31
30	28	28.35	15	9	17.0	M8	15	80	12	M8	5.0	R1605 703 31	R1607 703 31
35	34	31.85	15	9	20.5	M8	15	80	12	M8	6.8	R1605 303 31	R1607 303 31
45	45	39.85	20	14	23.5	M12	19	105	16	M12	10.5	R1605 403 31	R1607 403 31
55	53	47.85	24	16	29.0	M14	22	120	18	M14	16.2	R1605 503 31	R1607 503 31
65	63	59.85	26	18	38.5	M16	25	150	20	M16	22.4	R1605 603 31	R1607 603 31

PLEASE SPECIFY RAIL LENGTHS IN MILLIMETERS WHEN ENQUIRING AND ORDERING
RAILS ARE STOCKED IN 4M LENGTHS BUT CAN BE BUTT JOINTED FOR LONGER LENGTHS
DIMENSION E WILL DEFAULT TO SYMETRICAL AT EACH END UNLESS OTHERWISE STATED

LINEAR BALL GUIDE RAILS ARE STOCKED IN H GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST



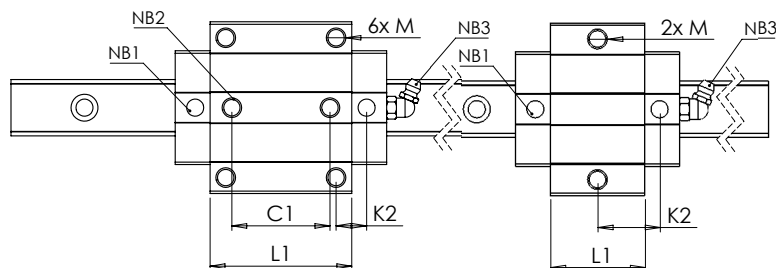
Flanged – Standard Height

Standard Ball Guides – Dimensions

NB1: For O-ring (excluding size 55 ~ 65)
Size 15 = Ø4 x 1.0 mm
Size 20 ~ 45 = Ø5 x 1.0 mm

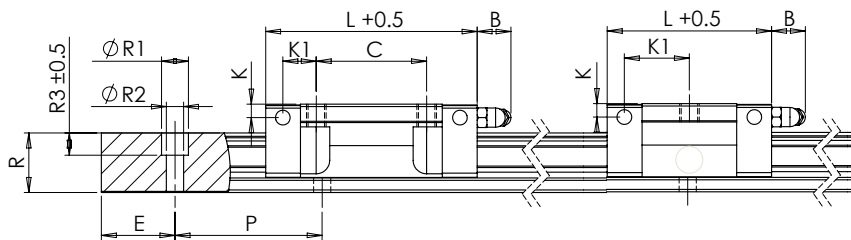
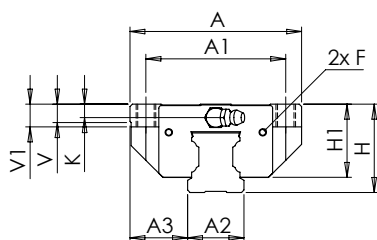
NB2: For manufacturing reasons, plugs may be present in these holes on FNS & FLS types which must be removed prior to installation

NB3: Size 15 ~ 20 = DIN 3405 - A M3x5 lube nipple
Size 25 ~ 45 = DIN 71412-A M6x8 lube nipple
Size 55 = DIN 71412-B M6x8 lube nipple
Size 65 = DIN 71412-B M8x1x8 lube nipple



FNS / FLS

FKS



Model	Block Dimensions (mm)															Rail Dimensions (mm)									
	H	H1	A	A1	A3	C	C1	L	L1	B	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT
FKS 15						-	-	44.7	25.7							17.9	16.3								
FNS 15	24	19.9	47	38	16	30	26	58.2	39.2	1.6	M2.5 x 3.5	M5	5	5.2	3.2	9.6	8	15	16.20	7.4	4.5	5.90	60	10	M4
FLS 15								72.6	53.6							16.8	15.2								
FKS 20						-	-	57.3	31.9							23	23								
FNS 20	30	25.4	63	53	21.5	40	35	75	49.6	1.6	M3 x 5	M6	6	7.7	3.35	11.8	11.8	20	20.55	9.4	6	7.35	60	10	M5
FLS 20								91	65.6							19.8	19.8								
FKS 25						-	-	67	38.6							26.5	25.4								
FNS 25	36	29.9	70	57	23.5	45	40	86.2	57.8	9.5	M3 x 5	M8	7.5	9.3	5.5	13.6	12.5	23	24.25	11	7	9.05	60	10	M6
FLS 25								107.9	79.5							24.5	23.3								
FKS 30						-	-	75.3	45							30.5	28.8								
FNS 30	42	35.4	90	72	31	52	44	97.7	67.4	9.5	M3 x 5	M10	7	11	6.05	15.7	14	28	28.35	15	9	11.35	80	12	M8
FLS 30								119.7	89.4							26.7	25								
FKS 35						-	-	84.9	51.4							34.2	32.7								
FNS 35	48	40.4	100	82	33	62	52	110.5	77	9.5	M3 x 5	M10	8	12	6.9	16	14.5	34	31.85	15	9	11.35	80	12	M8
FLS 35								139	105.5							30.3	28.8								
FNS 45	60	50.3	120	100	37.5	80	60	137.6	97	9.5	M4 x 7	M12	10	15	8.2	19.3	17.3	45	39.85	20	14	16.35	105	16	M12
FLS 45								174.1	133.5							37.5	35.5								
FNS 55	70	57	140	116	43.5	95	70	159	115.5	16	M5 x 8	M14	12	18	9	-	-	53	47.85	24	16	18.85	120	18	M14
FLS 55								199	155.5							-	-								
FNS 65	90	76	170	142	53.5	110	82	188	139.6	16	M4 x 7	M16	15	23	16	-	-	63	59.85	26	18	21.35	150	20	M16
FLS 65								243	194.6							-	-								

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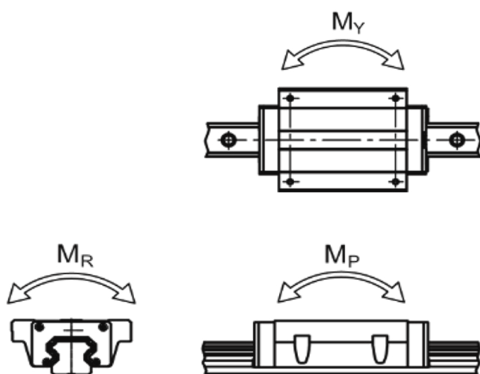


Flanged – Standard Height

Standard Ball Guides – Specifications

Size	v max	a max *
15 – 45	5 m/s	500 m/s ²
55 – 65	3 m/s	250 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Standard Ball Type Linear Guides

Block Form:

- 65 = FKS = Short
- 51 = FNS = Normal
- 53 = FLS = Long

Nominal size:

- 1 = 15
- 8 = 20
- 2 = 25
- 7 = 30
- 3 = 35
- 4 = 45
- 5 = 55
- 6 = 65

Seal Option:

- 20 / 10 = Standard
- 21 = Low Friction
- 22 = Double Lip

Accuracy Grade:

- 4 = N Grade
- 3 = H Grade (Stock)
- 2 = P Grade

Preload Option:

- 9 = C0 Clearance
- 1 = C1 Light Preload
- 2 = C2 Medium Preload
- 3 = C3 Heavy Preload

Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code					
					MR		MP & MY		C0 - Clearance		C1 - Light		C2 - Medium	
			DYN	STAT	DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code	Force N	Order Code
FKS 15	0.15	1.4	6.72	7.34	0.07	0.07	0.03	0.03	0	R1665 193 20	110	R1665 113 20	-	-
FNS 15	0.20		9.86	12.7	0.10	0.12	0.07	0.09		R1651 193 20	160	R1651 113 20	620	R1651 123 20
FLS 15	0.30		12.8	18.4	0.12	0.18	0.12	0.18		R1653 193 20	200	R1653 113 20	800	R1653 123 20
FKS 20	0.30	2.4	15.4	16.5	0.20	0.21	0.08	0.09	0	R1665 893 20	250	R1665 813 20	-	-
FNS 20	0.45		23.4	29.8	0.30	0.38	0.20	0.26		R1651 893 20	380	R1651 813 20	1500	R1651 823 20
FLS 20	0.55		29.6	41.8	0.38	0.54	0.34	0.49		R1653 893 20	490	R1653 813 20	1950	R1653 823 20
FKS 25	0.50	3.2	19.8	21.2	0.28	0.30	0.13	0.14	0	R1665 293 20	320	R1665 213 20	-	-
FNS 25	0.65		28.6	35.9	0.41	0.51	0.29	0.36		R1651 293 20	460	R1651 213 20	1820	R1651 223 20
FLS 25	0.90		37.3	52.5	0.53	0.75	0.53	0.74		R1653 293 20	610	R1653 213 20	2430	R1653 223 20
FKS 30	0.80	5.0	25.6	28.9	0.44	0.50	0.20	0.23	0	R1665 793 20	440	R1665 713 20	-	-
FNS 30	1.10		36.5	48.1	0.63	0.83	0.44	0.58		R1651 793 20	630	R1651 713 20	2540	R1651 723 20
FLS 30	1.50		46.0	66.9	0.80	1.16	0.74	1.08		R1653 793 20	800	R1653 713 20	3200	R1653 723 20
FKS 35	1.20	6.8	36.6	49.3	0.79	1.06	0.34	0.46	0	R1665 393 20	590	R1665 313 20	-	-
FNS 35	1.60		51.8	80.9	1.11	1.74	0.72	1.13		R1651 393 20	840	R1651 313 20	3350	R1651 323 20
FLS 35	2.25		66.7	116	1.44	2.50	1.29	2.24		R1653 393 20	1110	R1653 313 20	4450	R1653 323 20
FNS 45	3.00	10.5	86.4	132	2.33	3.56	1.54	2.35	0	R1651 493 20	1360	R1651 413 20	5450	R1651 423 20
FLS 45	4.30		111	190	3.01	5.12	2.73	4.66		R1653 493 20	1810	R1653 413 20	7230	R1653 423 20
FNS 55	5.20	16.2	109	174	3.48	5.55	2.32	3.69	0	R1651 593 10	1960	R1651 513 10	7860	R1651 523 10
FLS 55	7.50		139	245	4.41	7.78	3.96	6.99		R1653 593 10	2480	R1653 513 10	9940	R1653 523 10
FNS 65	10.25	22.4	172	280	6.81	11.1	4.56	7.40	0	R1651 693 10	2460	R1651 613 10	9840	R1651 623 10
FLS 65	14.15		223	404	8.81	16.0	8.16	14.8		R1653 693 10	3260	R1653 613 10	13000	R1653 623 10

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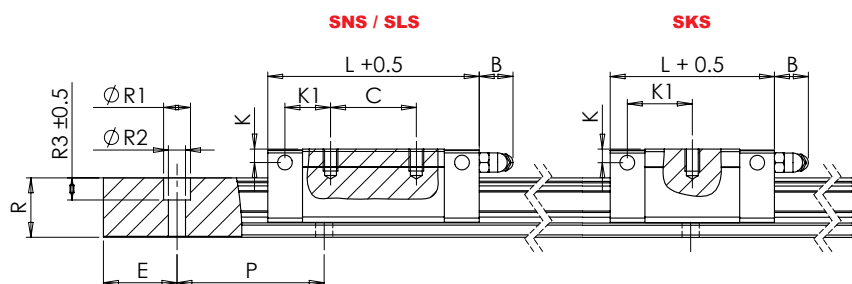
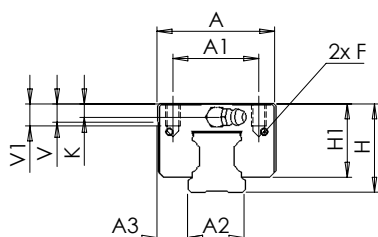
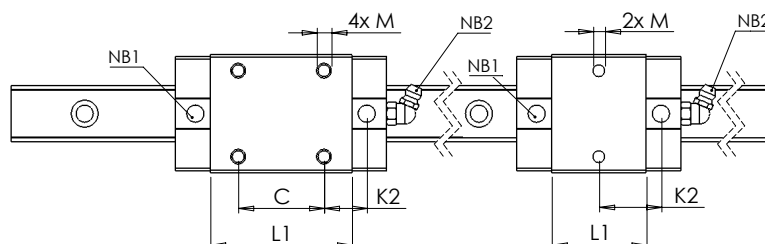


Square – Standard Height

Standard Ball Guides – Dimensions

NB1: For O-ring (excluding size 55 ~ 65)
Size 15 = Ø4 x 1.0 mm
Size 20 ~ 45 = Ø5 x 1.0 mm

NB2: Size 15 ~ 20 = DIN 3405 - A M3x5 lube nipple
Size 25 ~ 45 = DIN 71412-A M6x8 lube nipple
Size 55 = DIN 71412-B M6x8 lube nipple
Size 65 = DIN 71412-B M8x1x8 lube nipple



Model	Block Dimensions (mm)														Rail Dimensions (mm)									
	H	H1	A	A1	A3	C	L	L1	B	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT
SKS 15						-	44.7	25.7							17.9	16.3								
SNS 15	24	19.9	34	26	9.5	26	58.2	39.2	1.6	M2.5 x 3.5	M4	5	6	3.2	11.6	10	15	16.20	7.4	4.5	5.90	60	10	M4
SLS 15						26	72.6	53.6							18.8	17.2								
SKS 20						-	57.3	31.9							23	23								
SNS 20	30	25.4	44	32	12	36	75	49.6	1.6	M3 x 5	M5	6	7.5	3.35	13.8	13.8	20	20.55	9.4	6	7.35	60	10	M5
SLS 20						50	91	65.6							14.8	14.8								
SKS 25						-	67	38.6							26.5	25.4								
SNS 25	36	29.9	48	35	12.5	35	86.2	57.8	9.5	M3 x 5	M6	7.5	9	5.5	18.6	17.5	23	24.25	11	7	9.05	60	10	M6
SLS 25						50	107.9	79.5							22	20.8								
SKS 30						-	75.3	45							30.5	28.8								
SNS 30	42	35.4	60	40	16	40	97.7	67.4	9.5	M3 x 5	M8	7	12	6.05	21.7	20	28	28.35	15	9	11.35	80	12	M8
SLS 30						60	119.7	89.4							22.7	21								
SKS 35						-	84.9	51.4							34.2	32.7								
SNS 35	48	40.4	70	50	18	50	110.5	77	9.5	M3 x 5	M8	8	13	6.9	22	20.5	34	31.85	15	9	11.35	80	12	M8
SLS 35						72	139	105.5							25.3	23.8								
SNS 45	60	50.3	86	60	20.5	60	137.6	97	9.5	M4 x 7	M10	10	18	8.2	29.3	27.3	45	39.85	20	14	16.35	105	16	M12
SLS 45						80	174.1	133.5							37.5	35.5								
SNS 55	70	57	100	75	23.5	75	159	115.5	16	M5 x 8	M12	12	19	9	-	-	53	47.85	24	16	18.85	120	18	M14
SLS 55						95	199	155.5							-	-								
SNS 65	90	76	126	76	31.5	70	188	139.6	16	M4 x 7	M16	15	21	16	-	-	63	59.85	26	18	21.35	150	20	M16
SLS 65						120	243	194.6							-	-								

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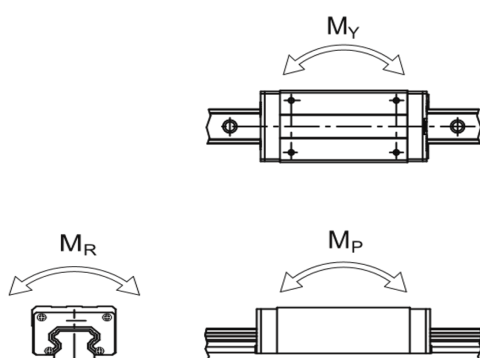


Square – Standard Height

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55 – 65	3 m/s	250 m/s ²

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22 = Double Lip

Accuracy Grade:

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2 = P Grade

Preload Option:

9 = C0 Clearance
1 = C1 Light Preload
2 = C2 Medium Preload
3 = C3 Heavy Preload

Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code					
			DYN	STAT	MR		MP & MY		C0 - Clearance		C1 - Light		C2 - Medium	
					DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code	Force N	Order Code
SKS 15	0.10	1.4	6.72	7.34	0.07	0.07	0.03	0.03	0	R1666 193 20	110	R1666 113 20	-	-
SNS 15	0.15		9.86	12.7	0.10	0.12	0.07	0.09		R1622 193 20	160	R1622 113 20	620	R1622 123 20
SLS 15	0.20		12.8	18.4	0.12	0.18	0.12	0.18		R1623 193 20	200	R1623 113 20	800	R1623 123 20
SKS 20	0.25	2.4	15.4	16.5	0.20	0.21	0.08	0.09	0	R1666 893 20	250	R1666 813 20	-	-
SNS 20	0.35		23.4	29.8	0.30	0.38	0.20	0.26		R1622 893 20	380	R1622 813 20	1500	R1622 823 20
SLS 20	0.45		29.6	41.8	0.38	0.54	0.34	0.49		R1623 893 20	490	R1623 813 20	1950	R1623 823 20
SKS 25	0.35	3.2	19.8	21.2	0.28	0.30	0.13	0.14	0	R1666 293 20	320	R1666 213 20	-	-
SNS 25	0.50		28.6	35.9	0.41	0.51	0.29	0.36		R1622 293 20	460	R1622 213 20	1820	R1622 223 20
SLS 25	0.65		37.3	52.5	0.53	0.75	0.53	0.74		R1623 293 20	610	R1623 213 20	2430	R1623 223 20
SKS 30	0.60	5.0	25.6	28.9	0.44	0.50	0.20	0.23	0	R1666 793 20	440	R1666 713 20	-	-
SNS 30	0.85		36.5	48.1	0.63	0.83	0.44	0.58		R1622 793 20	630	R1622 713 20	2540	R1622 723 20
SLS 30	1.10		46.0	66.9	0.80	1.16	0.74	1.08		R1623 793 20	800	R1623 713 20	3200	R1623 723 20
SKS 35	0.90	6.8	36.6	49.3	0.79	1.06	0.34	0.46	0	R1666 393 20	590	R1666 313 20	-	-
SNS 35	1.25		51.8	80.9	1.11	1.74	0.72	1.13		R1622 393 20	840	R1622 313 20	3350	R1622 323 20
SLS 35	1.70		66.7	116	1.44	2.50	1.29	2.24		R1623 393 20	1110	R1623 313 20	4450	R1623 323 20
SNS 45	2.40	10.5	86.4	132	2.33	3.56	1.54	2.35	0	R1622 493 20	1360	R1622 413 20	5450	R1622 423 20
SLS 45	3.20		111	190	3.01	5.12	2.73	4.66		R1623 493 20	1810	R1623 413 20	7230	R1623 423 20
SNS 55	3.80	16.2	109	174	3.48	5.55	2.32	3.69	0	R1622 593 10	1960	R1622 513 10	7860	R1622 523 10
SLS 55	4.80		139	245	4.41	7.78	3.96	6.99		R1623 593 10	2480	R1623 513 10	9940	R1623 523 10
SNS 65	6.90	22.4	172	280	6.81	11.1	4.56	7.40	0	R1622 693 10	2460	R1622 613 10	9840	R1622 623 10
SLS 65	9.80		223	404	8.81	16.0	8.16	14.8		R1623 693 10	3260	R1623 613 10	13000	R1623 623 10

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

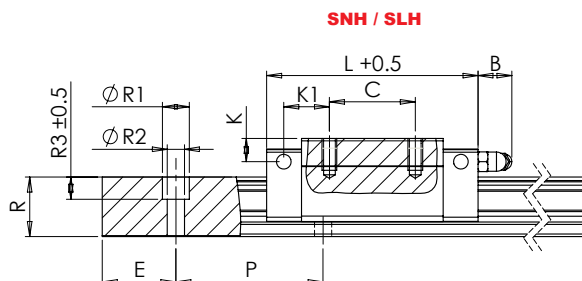
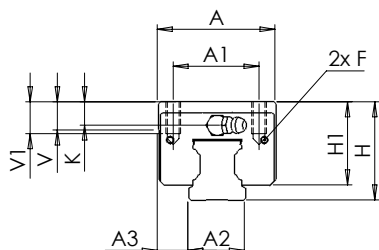
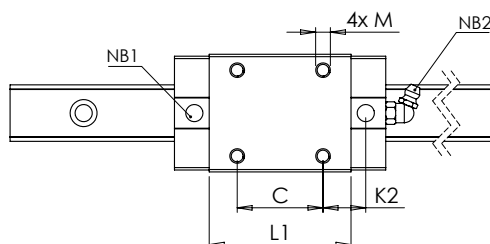


Square – High Profile

Standard Ball Guides – Dimensions

NB1: For O-ring (excluding size 55)
 Size 15 = Ø4 x 1.0 mm
 Size 20 ~ 45 = Ø5 x 1.0 mm

NB2: Size 15 ~ 20 = DIN 3405 - A M3x5 lube nipple
 Size 25 ~ 45 = DIN 71412-A M6x8 lube nipple
 Size 55 = DIN 71412-B M6x8 lube nipple



Model	Block Dimensions (mm)																Rail Dimensions (mm)										
	H	H1	A	A1	A3	C	L	L1	B	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT			
SNH 15	28	23.9	34	26	9.5	26	58.2	39.2	1.6	M2.5 x 3.5	M4	5	6	7.2	17.9	16.3	15	16.20	7.4	4.5	5.90	60	10	M4			
SNH 25	40	33.9	48	35	12.5	35	86.2	57.8	9.5	M3 x 5	M6	7.5	9	9.5	18.6	17.5	23	24.25	11	7	9.05	60	10	M6			
SLH 25						50	107.9	79.5							22.7	20.8											
SNH 30	45	38.4	60	40	16	40	97.7	67.4	9.5	M3 x 5	M8	7	12	9.05	21.7	20	28	28.35	15	9	11.35	80	12	M8			
SLH 30						60	119.7	89.4							22.7	21											
SNH 35	55	47.4	70	50	18	50	110.5	77	9.5	M3 x 5	M8	8	13	13.9	22	20.5	34	31.85	15	9	11.35	80	12	M8			
SLH 35						72	139	105.5							25.3	23.8											
SNH 45	70	60.3	86	60	20.5	60	137.6	97	9.5	M4 x 7	M10	10	18	18.2	29.3	27.3	45	39.85	20	14	16.35	105	16	M12			
SLH 45						80	174.1	133.5							37.5	35.5											
SNH 55	80	67	100	75	23.5	75	159	115.5	16	M5 x 8	M12	12	19	19	-	-	53	47.85	24	16	18.85	120	18	M14			
SLH 55						95	199	155.5																			

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
 OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

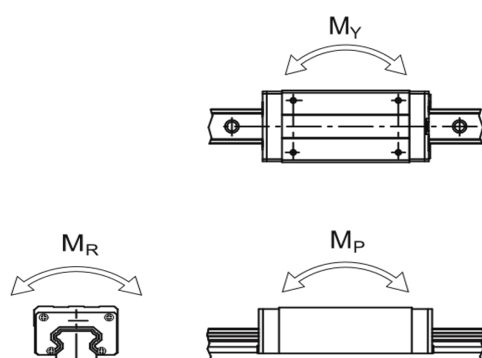


Square – High Profile

Standard Ball Guides – Specifications

Size	v max	a max *
15 – 45	5 m/s	500 m/s ²
55	3 m/s	250 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Standard Ball Type Linear Guides	R 1 6 2 1	2 1 3	20
Block Form:			
21 = SNH = Normal			
24 = SLH = Long			
Nominal size:			
1 = 15	3 = 35		
2 = 25	4 = 45		
7 = 30	5 = 55		
Seal Option:			
20 / 10 = Standard			
21 = Low Friction			
22 = Double Lip			
Accuracy Grade:			
4 = N Grade			
3 = H Grade (Stock)			
2 = P Grade			
Preload Option:			
9 = C0 Clearance			
1 = C1 Light Preload			
2 = C2 Medium Preload			
3 = C3 Heavy Preload			

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code					
				DYN	STAT	MR		MP & MY		C0 - Clearance		C1 - Light		C2 - Medium	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code	Force N	Order Code
	SNH 15	0.20	1.4	9.86	12.7	0.10	0.12	0.07	0.09	0	R1621 193 20	160	R1621 113 20	620	R1621 123 20
	SNH 25	0.60	3.2	28.6	35.9	0.41	0.51	0.29	0.36	0	R1621 293 20	460	R1621 213 20	1820	R1621 223 20
	SLH 25	0.80		37.3	52.5	0.53	0.75	0.53	0.74		R1624 293 20	610	R1624 213 20	2430	R1624 223 20
	SNH 30	0.95	5.0	36.5	48.1	0.63	0.83	0.44	0.58	0	R1621 793 20	630	R1621 713 20	2540	R1621 723 20
	SLH 30	1.20		46.0	66.9	0.80	1.16	0.74	1.08		R1624 793 20	800	R1624 713 20	3200	R1624 723 20
	SNH 35	1.55	6.8	51.8	80.9	1.11	1.74	0.72	1.13	0	R1621 393 20	840	R1621 313 20	3350	R1621 323 20
	SLH 35	2.10		66.7	116	1.44	2.50	1.29	2.24		R1624 393 20	1110	R1624 313 20	4450	R1624 323 20
	SNH 45	3.00	10.5	86.4	132	2.33	3.56	1.54	2.35	0	R1621 493 20	1360	R1621 413 20	5450	R1621 423 20
	SLH 45	4.10		111	190	3.01	5.12	2.73	4.66		R1624 493 20	1810	R1624 413 20	7230	R1624 423 20
	SNH 55	4.70	16.2	109	174	3.48	5.55	2.32	3.69	0	R1621 593 10	1960	R1621 513 10	7860	R1621 523 10
	SLH 55	6.00		139	245	4.41	7.78	3.96	6.99		R1624 593 10	2480	R1624 513 10	9940	R1624 523 10

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
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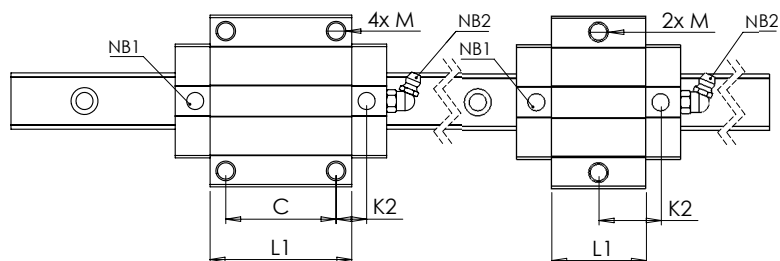


Flanged – Low Profile

Standard Ball Guides – Dimensions

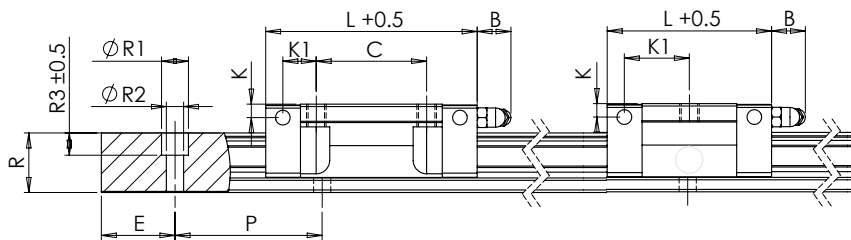
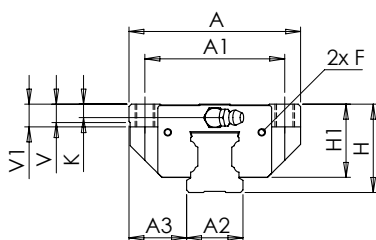
NB1: For O-ring
Size 20 ~ 25 = Ø5 x 1.0 mm

NB2: Size 20 ~ 25 = DIN 3405 - A M3x5 lube nipple
Size 20: lubrication ports on end face only
Size 25: lubrication ports on all seal faces



FNN

FKN



Model	Block Dimensions (mm)																Rail Dimensions (mm)								
	H	H1	A	A1	A3	C	L	L1	B	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT	
FKN 20	28	23	59	49	19.5	-	55	31.9	8	M3 x 5	M6	6	7.7	-	-	20.1	20	20.55	9.4	6	7.35	60	10	M5	
FNN 20						32	72.5	49.6								13									
FKN 25	33	26.5	73	60	25	-	62	38.6	8	M3 x 5	M8	7.5	9.3	4.1	25	24.5	23	24.25	11	7	9.05	60	10	M6	
FNN 25						35	81	57.8							17	16.6									

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

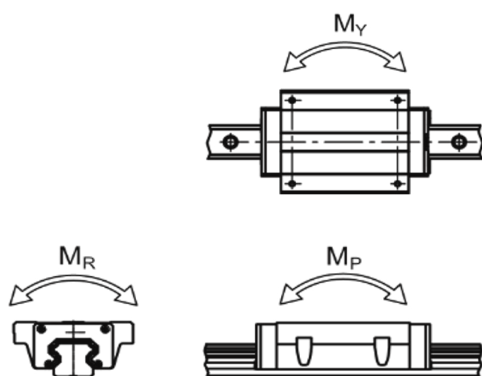


Flanged – Low Profile

Standard Ball Guides – Specifications

Size	v max	a max *
20 – 25	3 m/s	250 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Standard Ball Type Linear Guides	R 1 6 9 3	2 1 3	10	Seal Option:
				10 = Standard
				11 = Low Friction
Block Form:				Accuracy Grade:
63 = FKN = Short				4 = N Grade
93 = FNN = Normal				3 = H Grade (Stock)
Nominal size:				Preload Option:
8 = 20				9 = C0 Clearance
2 = 25				1 = C1 Light Preload

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code			
						MR		MP & MY		C0 - Clearance		C1 - Light	
				DYN	STAT	DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code
	FKN 20	0.25	2.4	9.6	13.6	0.12	0.17	0.04	0.06	0	R1663 893 10	190	R1663 813 10
	FNN 20	0.40		14.5	24.4	0.19	0.31	0.10	0.17		R1693 893 10	290	R1693 813 10
	FKN 25	0.45	3.2	19.8	21.2	0.28	0.30	0.13	0.14	0	R1663 293 10	320	R1663 213 10
	FNN 25	0.60		28.6	35.9	0.41	0.51	0.29	0.36		R1693 293 10	460	R1693 213 10

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

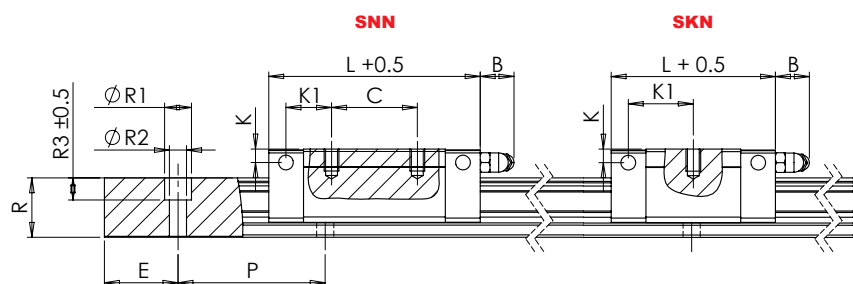
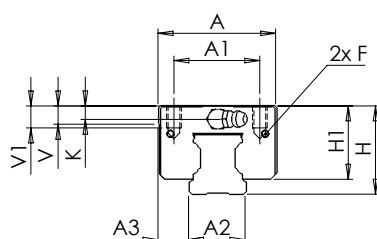
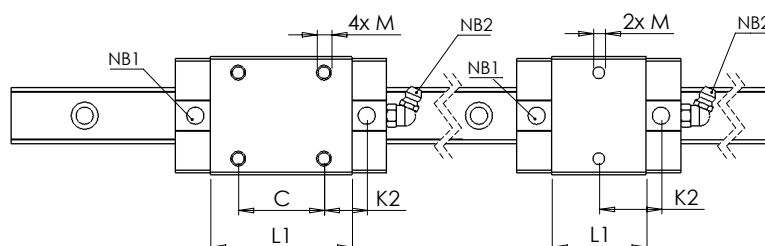


Square – Low Profile

Standard Ball Guides – Dimensions

NB1: For O-ring
Size 20 ~ 25 = Ø5 x 1.0 mm

NB2: Size 20 ~ 25 = DIN 3405 - A M3x5 lube nipple
Size 20: lubrication ports on end face only
Size 25: lubrication ports on all seal faces



Model	Block Dimensions (mm)															Rail Dimensions (mm)									
	H	H1	A	A1	A3	C	L	L1	B	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN		RAIL BOLT
SKN 20	28	23	42	32	11	-	55	31.9	8	M3 x 5	M5	6	6.3	-	-	20.1	20	20.55	9.4	6	7.35	60	10	M5	
SNN 20						32	72.5	49.6								13									
SKN 25	33	26.5	48	35	12.5	-	62	38.6	8	M3 x 5	M6	7.5	7	4.1	25	24.5	23	24.25	11	7	9.05	60	10	M6	
SNN 25						35	81	57.8							17	16.6									

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
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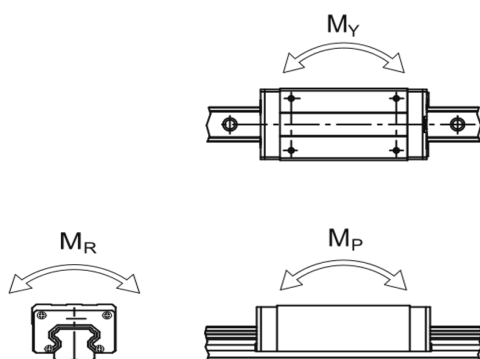


Square – Low Profile

Standard Ball Guides – Specifications

Size	v max	a max *
20 – 25	3 m/s	250 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Standard Ball Type Linear Guides	R 1 6 9 4	2 1 3	10
Block Form:			
64 = SKN= Short			
94 = SNN= Normal			
Nominal size:			
8 = 20			
2 = 25			
Seal Option:			
10 = Standard			
11 = Low Friction			
Accuracy Grade:			
4 = N Grade			
3 = H Grade (Stock)			
Preload Option:			
9 = C0 Clearance			
1 = C1 Light Preload			

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code			
						MR		MP & MY		C0 - Clearance		C1 - Light	
				DYN	STAT	DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code
	SKN 20	0.20	2.4	9.6	13.6	0.12	0.17	0.04	0.06	0	R1664 893 10	190	R1664 813 10
	SNN 20	0.30		14.5	24.4	0.19	0.31	0.10	0.17		R1694 893 10	290	R1694 813 10
	SKN 25	0.30	3.2	19.8	21.2	0.28	0.30	0.13	0.14	0	R1664 293 10	320	R1664 213 10
	SNN 25	0.45		28.6	35.9	0.41	0.51	0.29	0.36		R1694 293 10	460	R1694 213 10

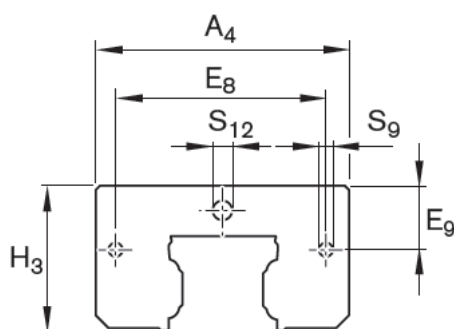
LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



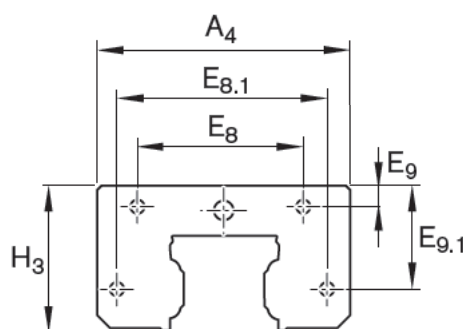
Wiper Scraper

For All Standard Ball Guide Blocks

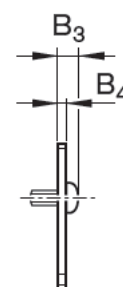
NOTE: Wiper scraper made from corrosion resistant steel according to DIN EN 10088



SIZE 15 – 55



SIZE 65



Guide Size	Dimensions (mm)										Mass (g)	Ordering Codes	
	A4	B3	B4	E8	E8.1	E9	E9.1	H3	S9	S12		For Use With Cover Strip	For Use Without Cover Strip
15	33	3.1	1	24.55	-	6.3	-	19.2	3.5	4.6	5	R1620 110 30	
20	42	3.4	1	32.4	-	6.8	-	24.8	4	5.1	6	R1620 810 30	
* 20 * LOW	41	3.4	1	30.5	-	5.1	-	22.8	4	4	5	R1620 810 35	
25	47	3.4	1	38.3	-	11	-	29.5	4	7	8	R1620 210 30	
* 25 * LOW	47	3.4	1	38.3	-	8.0	-	26.5	4	4	7	R1620 210 35	
30	59	3.4	1	48.4	-	14.1	-	34.7	4	7	12	R1620 710 30	
35	69	3.4	1	58	-	17	-	40.1	4	7	16	R1620 310 40	R1620 310 30
45	85	5.1	2	69.8	-	20.5	-	50	5	7	50	R1620 410 40	R1620 410 30
55	98	5.7	2	80	-	21.8	-	56.4	5	7	65	R1620 510 40	R1620 510 30
65	124	5.6	2.5	76	100	10	52.5	74.7	5	9	140	R1620 610 40	R1620 610 30

* For low profile guides FKN, FNN, SKN & SNN

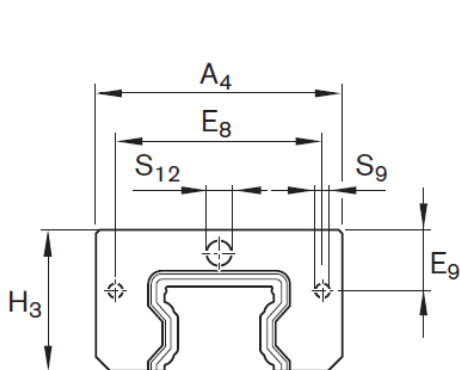
SCREWS INCLUDED – NOT FOR USE WITH FRONT SEAL – PLEASE USE SEAL KIT INSTEAD
PLEASE MAINTAIN 0.1mm TO 0.3mm EVEN GAP BETWEEN PLATE AND GUIDE RAIL



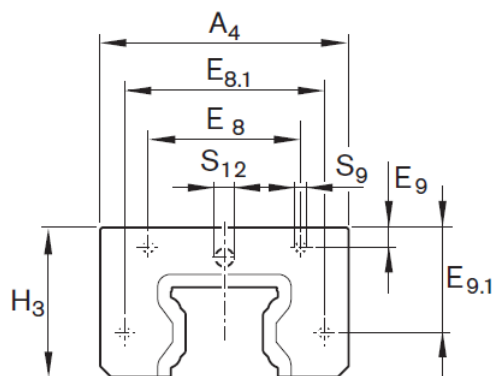
Front Seal & FKM Seal

For Standard Ball Guide Blocks

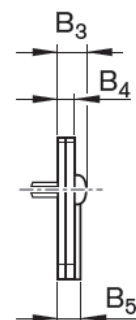
NOTE: Includes frame made from corrosion resistant steel according to DIN EN 10088



SIZE 15 – 55



SIZE 65



Guide Size	Dimensions (mm)											Mass (g)	Ordering Codes	
	A4	B3	B4	B5	E8	E8.1	E9	E9.1	H3	S9	S12		Front Seal	FKM Seal
15	32	4.3	2.5	3	24.55	-	6.3	-	19	3.5	4.3	6	R1619 121 20	-
* 20 *	42	4.9	2.5	3.3	32.4	-	6.8	-	24.3	4	5.1	8	R1619 821 20	-
* 25 *	47	4.9	2.5	3.3	38.3	-	11	-	29	4	7	10	R1619 221 30	-
30	59	5.7	3.3	4.5	48.4	-	14.1	-	34.5	4	7	18	R1619 721 30	-
35	69	5.7	3.3	4.5	58	-	17	-	39.5	4	7	25	R1619 321 30	-
		8.4	4	6								39	-	R1619 320 30
45	85	7.1	4	5.5	69.8	-	20.5	-	49.5	5	7	55	R1619 421 30	-
		9.1		6								61	-	R1619 420 30
55	98	7.7	4	5.5	80	-	21.5	-	56	6	7	65	R1619 521 30	-
		9.7		6			21.8		56.4			81	-	R1619 520 30
65	124	9.6	6.5	-	76	100	10	52.5	74.7	5	9	146	-	R1619 620 30

* Not suitable for low profile guides FKN, FNN, SKN & SNN

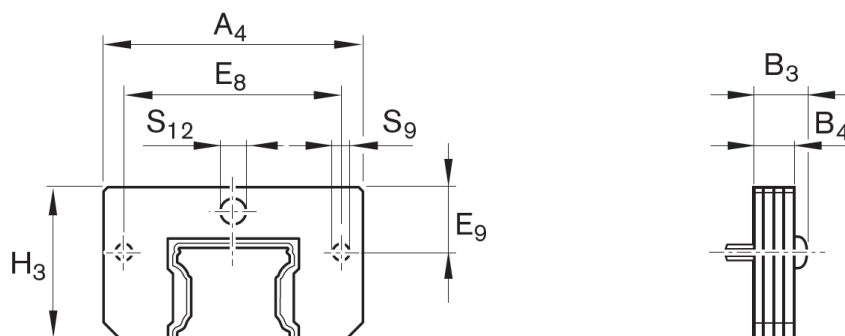
SCREWS INCLUDED – NOT FOR USE WITH WIPER SCRAPER – PLEASE USE SEAL KIT INSTEAD
FRONT & FKM SEALS ARE A TWO-PIECE DESIGN EXCLUDING SIZE 65 SINGLE PIECE



Seal Kit

For Standard Ball Guide Blocks

NOTE: Wiper scraper made from corrosion resistant steel according to DIN EN 10088



Guide Size	Dimensions (mm)								Mass (g)	Ordering Codes	
	A4	B3	B4	E8	E9	H3	S9	S12		For Use With Cover Strip	For Use Without Cover Strip
15	32	6.3	4.2	24.55	6.3	19	3.5	4.3	16	R1619 120 50	
* 20 *	42	6.9	4.5	32.4	6.8	24.3	4	5.1	20	R1619 820 50	
* 25 *	47	6.9	4.5	38.3	11	29	4	7	26	R1619 220 50	
30	59	8.2	5.8	48.4	14.1	34.5	4	7	42	R1619 720 50	
35	69	8.2	5.8	58	17	39.5	4	7	57	R1619 320 50	R1619 320 40
45	85	11.1	8.0	69.8	20.5	49.5	5	7	155	R1619 420 50	R1619 420 40
55	98	11.7	8.0	80	21.8	56	6	7	195	R1619 520 50	R1619 520 40

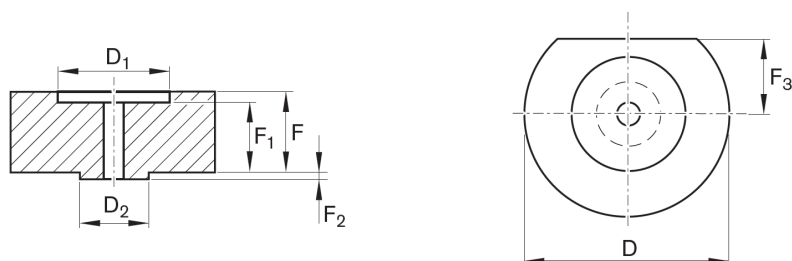
* Not suitable for low profile guides FKN, FNN, SKN & SNN

SCREWS INCLUDED – RECOMMENDED WHEN USING WIPER SCRAPER & FRONT SEAL
PLEASE CONSIDER MINIMUM SCREW DEPTH OF LUBRICATION POINT ON END FACE



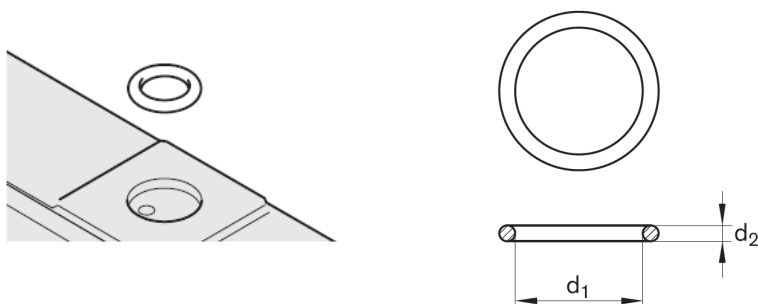
O-Ring Adapters

For Lubricating Ball Guides From Above



Guide Size	Dimensions (mm)							Mass (g)	O-Ring Size (Ø d1 x Ø d2)	Ordering Code (With O-Rings)
	Ø D	Ø D1	Ø D2	F	F1	F2	F3			
15	12	6.2	3.4	3.7	3.1	0.5	3.2	0.5	4 x 1.0	R1621 100 05
25	15	7.2	4.4	3.8	3.2	0.5	5.85	0.9	5 x 1.0	R1621 200 05
30	16	7.2	4.4	2.8	2.2	0.5	6.1	0.7	5 x 1.0	R1621 700 05
35	18	7.2	4.4	6.8	6.2	0.5	6.8	2.2	5 x 1.0	R1621 300 05
45	20	7.2	4.4	9.8	9.2	0.5	8.3	4.1	5 x 1.0	R1621 400 05

O-Rings For Ball Guides



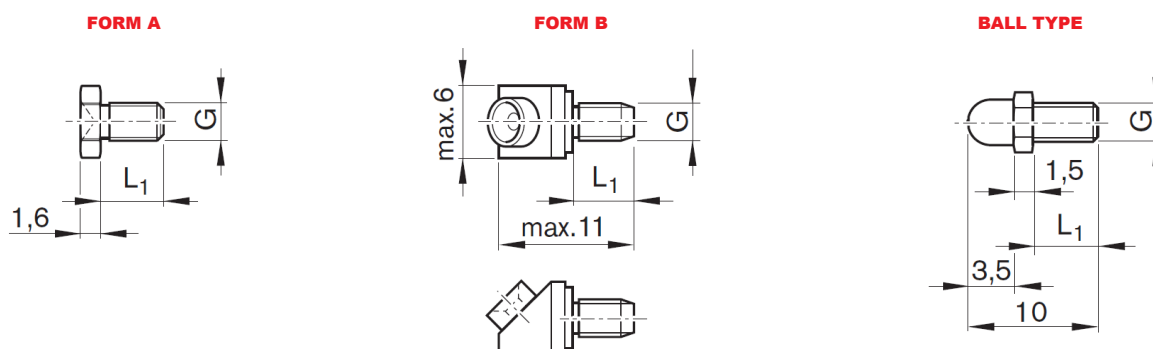
Spare O-Ring (Singular)	
Ø d1 x Ø d2	Ordering Code
4 x 1.0	R3411 130 01
5 x 1.0	R3411 131 01
6 x 1.5	R3411 003 01

LUBRICATION ADAPTERS FOR OIL & GREASE LUBRICATION FROM ABOVE OF HIGH PROFILE BALL GUIDES SNH & SLH – LUBRICATION FROM ABOVE NOT AVAILABLE ON SIZE 55 & 65 GUIDES



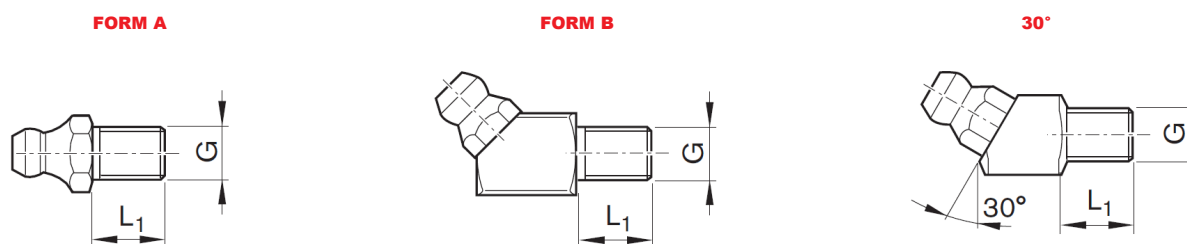
Lubrication Nipples

For Ball Guides – Funnel Type DIN 3405



Form	Dimensions (mm)		Mass (g)	Ordering Codes	
	G	L1		Standard	Stainless
A	M3	5	0.3	R3417 029 09	R3417 032 09
B	M3	5	1.5	R3417 004 09	-
Ball Type	M3	5	0.5	R3417 005 01	-

For Ball Guides – Hydraulic Type DIN 71412



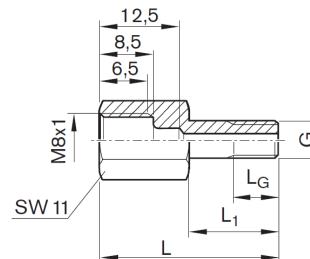
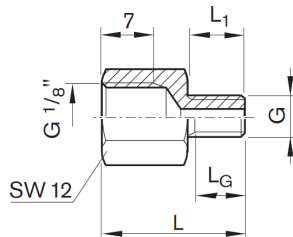
Form	Dimensions (mm)		Mass (g)	Ordering Codes	
	G	L1		Standard	Stainless
A	M6	8	2.6	R3417 008 02	R3417 016 02
B	M6	8	7.4	R3417 007 02	-
	M8 x 1	8	8.0	R3417 006 02	-
30°	M6	8	7.4	R3417 023 02	-

BALL TYPE LUBRICATION NIPPLES MADE OF BRASS – STAINLESS TYPE NRII LUBRICATION
NIPPLES MADE FROM CORROSION RESISTANT STEEL ACCORDING TO DIN EN 10088

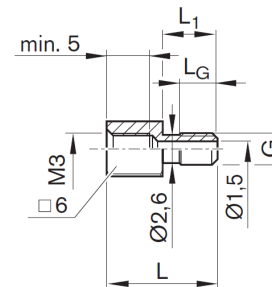
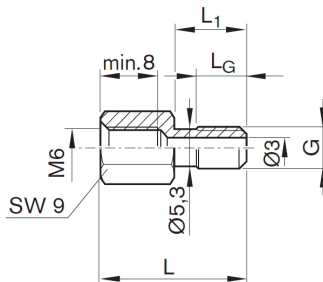


Lubrication Fittings

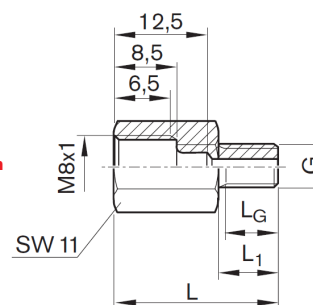
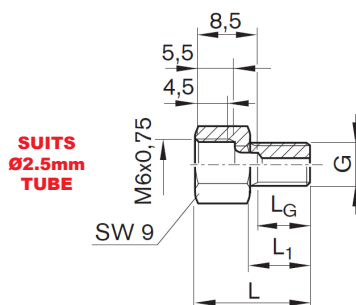
Reducers, Extensions & Connectors



Reducer Size	Dimensions (mm)				Mass (g)	Ordering Code
	G	L	L1	LG		
SW12	M6	20	8	6.5	7.5	R3455 030 34
SW11	M8 x 1	28.5	14.5	8	10	R3455 030 53



Extension Size	Dimensions (mm)				Mass (g)	Ordering Code
	G	L	L1	LG		
SW9	M6	21	10.5	7	5.0	R3455 030 69
SW9	M6	25	14.5	8	5.5	R3455 030 87
SW9	M6	26.5	16	7	5.0	R3455 030 85
6 x 6	M3	16.5	8.5	6	2.5	R3455 030 78

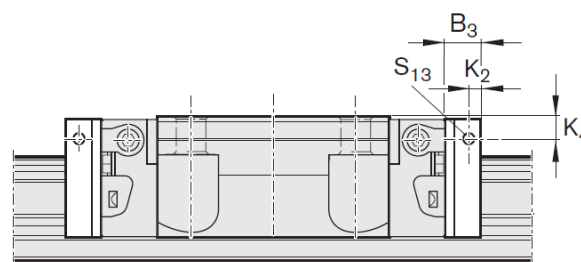
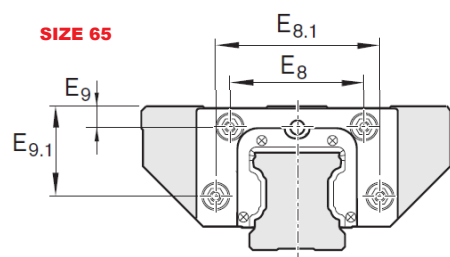
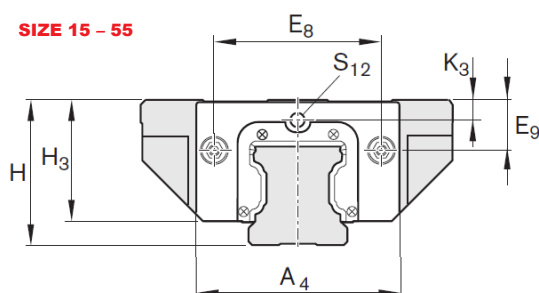


Connector Size	Dimensions (mm)				Mass (g)	Ordering Code
	G	L	L1	LG		
SW9	M6	15.5	8	6.5	4.1	R3455 030 38
SW11	M6	22	8	6.5	8.8	R3455 030 37

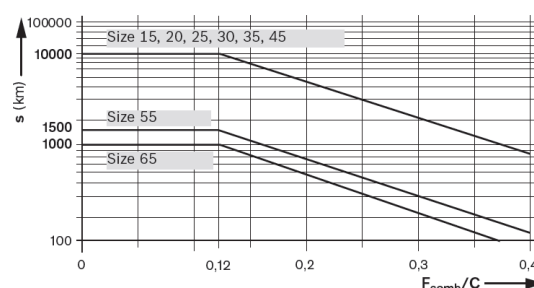


Front Lubrication Units

For Up to 10,000 km Travel Without Re-lubrication



RELUBRICATION INTERVAL AS
TRAVEL DISTANCE VS LOAD



Guide Size	Dimensions (mm)												Oil (cm ³)	Mass (g)	Ordering Code Pre-filled with Mobil SHC639
	A4	B3	E8	E8.1	E9	E9.1	H	H3	K2	K3 / K4	S12	S13			
15	31.8	11.5	24.55	-	6.7 (10.7)	-	24 (28)	19.4 (23.4)	5	3.35 (7.35)	M3	M3	1.0	15	R1619 125 00
20	43	12.5	32.5	-	7.3	-	30	24.9	5	3.7	M3	M3	2.2	20	R1619 825 00
* 20 * LOW	41	12.5	30.5	-	5.6	-	28	22.9	-	3.1	-	M3	1.8	20	R1619 826 00
25	47	13	38.3	-	11.5 (15.5)	-	36 (40)	29.3 (33.3)	5	5.5 (9.5)	M6	M6	2.6	25	R1619 225 00
* 25 * LOW	47	13	38.3	-	8.5	-	33	26.3	5	4.1	M3	M3	2.5	25	R1619 226 00
30	58.8	14.5	48.4	-	14.6 (17.6)	-	42 (45)	35.05 (38.05)	6	6.05 (9.05)	M6	M6	3.85	35	R1619 725 00
35	69	16	58	-	17.35 (24.35)	-	48 (55)	39.85 (46.85)	6	6.9 (13.9)	M6	M6	5.7	50	R1619 325 00
45	84	17	69.8	-	20.9 (30.9)	-	60 (70)	49.8 (59.8)	7	8.2 (18.2)	M6	M6	9.6	70	R1619 425 00
55	99	18	80	-	22.3 (32.3)	-	70 (80)	57.05 (67.05)	8	8.9 (18.9)	M6	M6	14.5	90	R1619 525 00
65	124.2	19	76	100	11	53.5	90	75.7	8	16	M8	M8	30.0	130	R1619 625 00

* For low profile guides FKN, FNN, SKN & SNN

* Dimensions in brackets for high profile guides SNH & SLH

Un-filled Unit Order Code

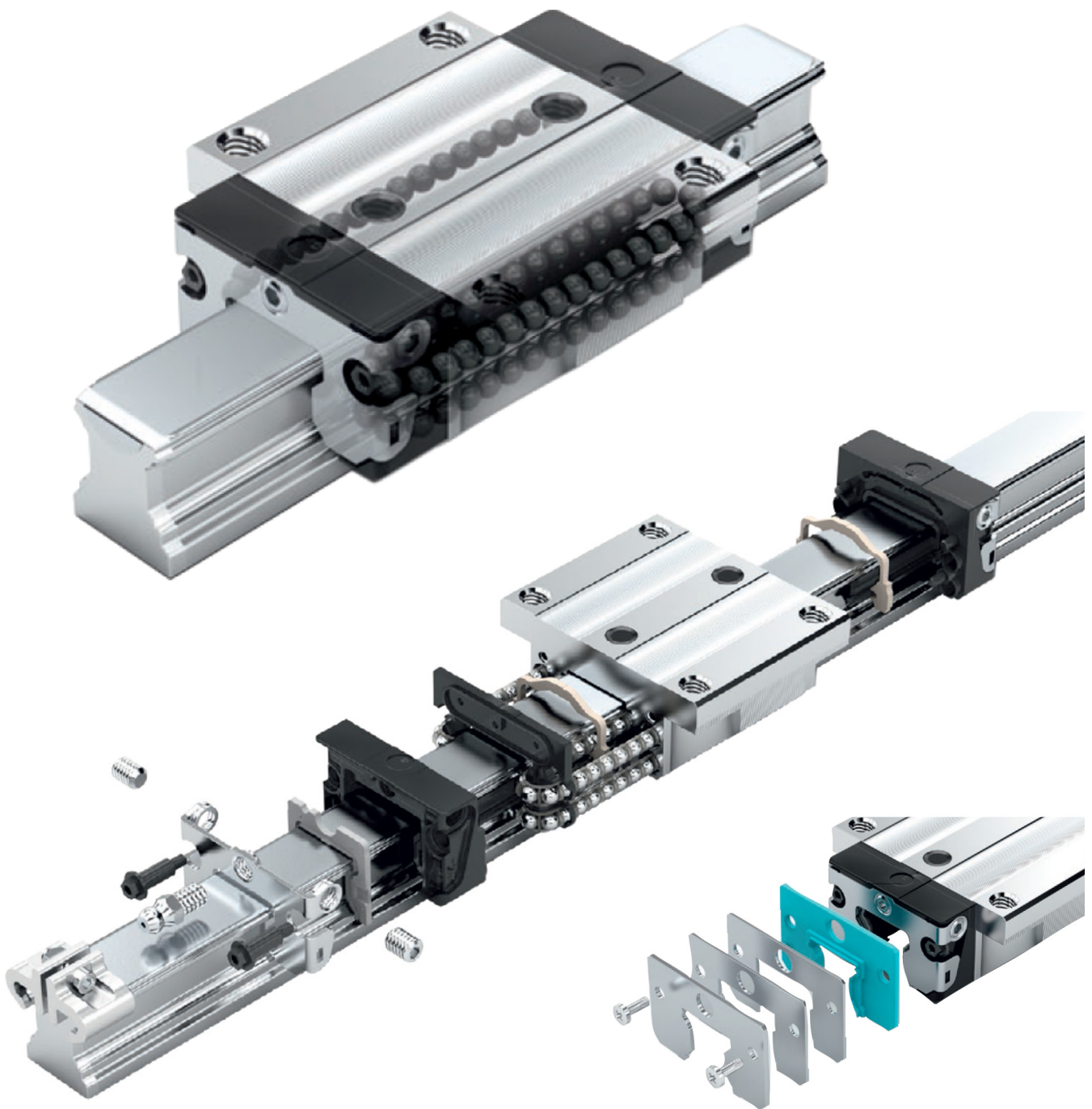
R1619 X2X 10

INITIALLY LUBRICATE GUIDE BEFORE MOUNTING A FRONT LUBE UNIT AT EITHER END OF GUIDE
LUBRICATION UNITS CAN BE RE-FILLED VIA SIDE PORT – EXCEPT FOR SIZE 20 LOW PROFILE

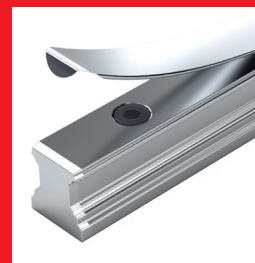


Stainless Linear Ball Guides

Corrosion Resistant Steel To DIN EN 10088



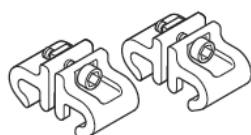
LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



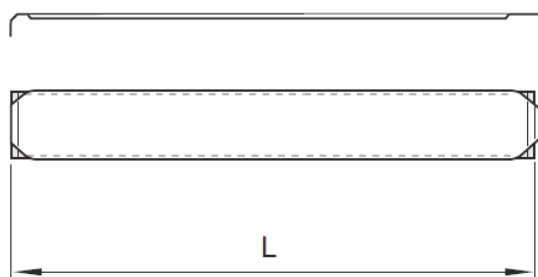
Ball Guides – Cover Strip

For All Stainless Ball Guide Rails

COVER STRIP & CLAMP



SNAP FIT COVER STRIP



Rail Size	Rail Accessories Ordering Codes		
	Cover Strip Clamp (2pc Set & Screws)	Plastic Cap (Sold Singular)	Snap Fit Cover Strip (Cut To Length mm)
15	R1619 139 50	R1605 100 80	R1619 130 00 - LENGTH
20	R1619 839 50	R1605 800 80	R1619 830 00 - LENGTH
25	R1619 239 50	R1605 200 80	R1619 230 00 - LENGTH
30	R1619 739 50	R1605 700 80	R1619 730 00 - LENGTH
35	R1619 339 50	R1605 300 80	R1619 330 20 - LENGTH

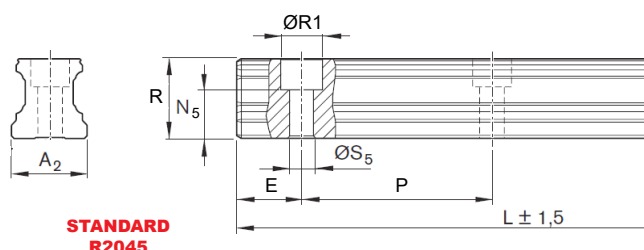
SEE RAIL ORDER CODES ON THE NEXT PAGE FOR ORDERING RAILS COMPLETE WITH COVER STRIP
PLASTIC MOUNTING HOLE CAPS ARE INCLUDED IN THE DELIVERY OF R2045 CUT RAIL LENGTHS
THE ORDERING CODES SHOWN ABOVE ARE FOR REFERENCE WHEN ORDERING SPARES ONLY

LINEAR BALL GUIDE RAILS ARE STOCKED IN H GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST

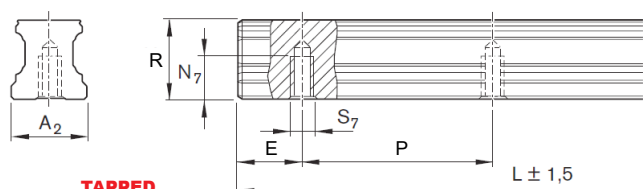


Ball Guides – Stainless Rails

For All Stainless Ball Guide Blocks



**STANDARD
R2045**



**TAPPED
R2047**

R 2 0 4 5 2 0 3 3 1 - LENGTH

**Stainless
Ball Type
Linear
Rails**

Composition:

31 = 1pc Single Rail
32 = 2pc Butt Joint
3N = Npc Butt Joint

Hole Type:

5 = Standard
7 = Tapped

Accuracy Grade:

4 = N Grade
3 = H Grade (Stock)
2 = P Grade

Nominal size:

1 = 15 7 = 30
8 = 20 3 = 35
2 = 25

Cover Option:

0 = Standard
3 = Cover & Clamps

Rail Size	Rail Dimensions (mm)										kg / m	Ordering Codes	
	A2	R	R1	S5	N5	S7	N7	P	E MIN	RAIL BOLT		Standard Rail	Tapped Rail
15	15	16.20	7.4	4.5	10.3	M5	7.5	60	10	M4	1.4	R2045 103 31	R2047 103 31
20	20	20.55	9.4	6	13.2	M6	9	60	10	M5	2.4	R2045 803 31	R2047 803 31
25	23	24.25	11	7	15.2	M6	12	60	10	M6	3.2	R2045 203 31	R2047 203 31
30	28	28.35	15	9	17.0	M8	15	80	12	M8	5.0	R2045 703 31	R2047 703 31
35	34	31.85	15	9	20.5	M8	15	80	12	M8	6.8	R2045 303 31	R2047 303 31

PLEASE SPECIFY RAIL LENGTHS IN MILLIMETERS WHEN ENQUIRING AND ORDERING
RAILS ARE STOCKED IN 4M LENGTHS BUT CAN BE BUTT JOINTED FOR LONGER LENGTHS
DIMENSION E WILL DEFAULT TO SYMETRICAL AT EACH END UNLESS OTHERWISE STATED

LINEAR BALL GUIDE RAILS ARE STOCKED IN H GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST



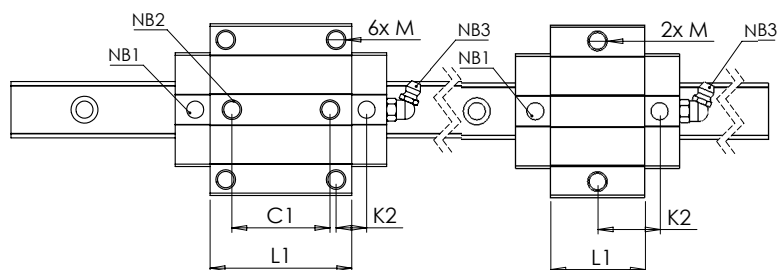
Flanged – Standard Height

Stainless Steel Ball Guides – Dimensions

NB1: For O-ring
Size 15 = Ø4 x 1.0 mm
Size 20 ~ 35 = Ø5 x 1.0 mm

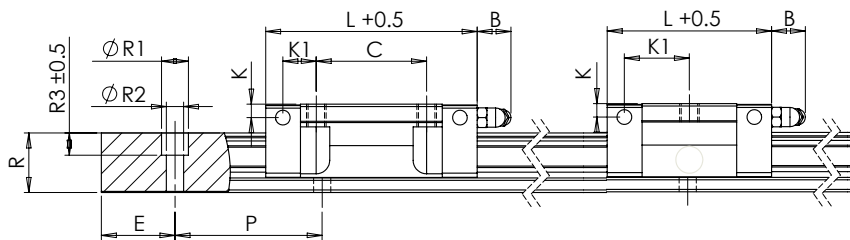
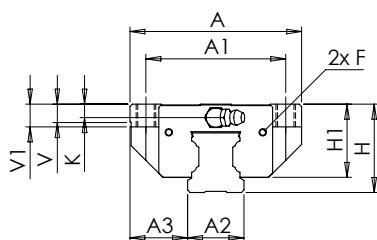
NB2: For manufacturing reasons, plugs may be present in these holes on FNS & FLS types which must be removed prior to installation

NB3: Size 15 ~ 20 = DIN 3405 - A M3x5 lube nipple
Size 25 ~ 35 = DIN 71412-A M6x8 lube nipple



FNS / FLS

FKS



Model	Block Dimensions (mm)															Rail Dimensions (mm)									
	H	H1	A	A1	A3	C	C1	L	L1	B	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT
FKS 15						-	-	44.7	25.7							17.9	16.3								
FNS 15	24	19.9	47	38	16	30	26	58.2	39.2	1.6	M2.5 x 3.5	M5	5	5.2	3.2	9.6	8	15	16.20	7.4	4.5	5.90	60	10	M4
FLS 15								72.6	53.6							16.8	15.2								
FKS 20						-	-	57.3	31.9							23	23								
FNS 20	30	25.4	63	53	21.5	40	35	75	49.6	1.6	M3 x 5	M6	6	7.7	3.35	11.8	11.8	20	20.55	9.4	6	7.35	60	10	M5
FLS 20								91	65.6							19.8	19.8								
FKS 25						-	-	67	38.6							26.5	25.4								
FNS 25	36	29.9	70	57	23.5	45	40	86.2	57.8	9.5	M3 x 5	M8	7.5	9.3	5.5	13.6	12.5	23	24.25	11	7	9.05	60	10	M6
FLS 25								107.9	79.5							24.5	23.3								
FKS 30						-	-	75.3	45							30.5	28.8								
FNS 30	42	35.4	90	72	31	52	44	97.7	67.4	9.5	M3 x 5	M10	7	11	6.05	15.7	14	28	28.35	15	9	11.35	80	12	M8
FLS 30								119.7	89.4							26.7	25								
FKS 35						-	-	84.9	51.4							34.2	32.7								
FNS 35	48	40.4	100	82	33	62	52	110.5	77	9.5	M3 x 5	M10	8	12	6.9	16	14.5	34	31.85	15	9	11.35	80	12	M8
FLS 35								139	105.5							30.3	28.8								

STAINLESS GUIDES SHOWN ABOVE (NR11) INCLUDE STAINLESS STEEL BALLS
ALSO AVAILABLE WITH STEEL BALLS (NR) FOR INCREASED LOAD CAPACITY

SIZE 45 ~ 65 GUIDES ARE AVAILABLE WITH CORROSION RESISTANT COATING
ON REQUEST PLEASE CONTACT OUR SALES TEAM FOR MORE INFORMATION

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

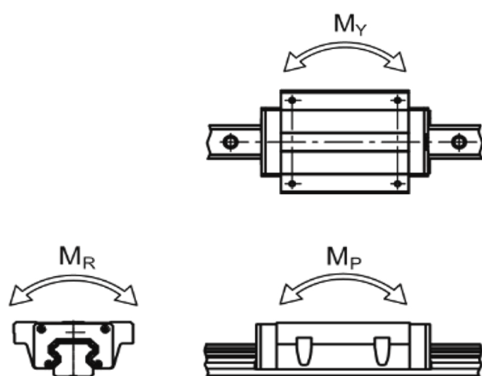


Flanged – Standard Height

Stainless Steel Ball Guides – Specifications

Size	v max	a max *
15 – 35	5 m/s	500 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Stainless Ball Type Linear Guides	R 2 0 0 1	2 1 3	04	Seal Option:
				04 = Standard
				05 = Low Friction
				0X = Double Lip
Block Form:				Accuracy Grade:
00 = FKS = Short				4 = N Grade
01 = FNS = Normal				3 = H Grade (Stock)
02 = FLS = Long				2 = P Grade
Nominal size:				Preload Option:
1 = 15	7 = 30			9 = C0 Clearance
8 = 20	3 = 35			1 = C1 Light Preload
2 = 25				2 = C2 Medium Preload

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code					
				DYN	STAT	MR		MP & MY		C0 - Clearance		C1 - Light		C2 - Medium	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code	Force N	Order Code
	FKS 15	0.15	1.4	4.50	5.60	0.04	0.05	0.01	0.02	0	R2000 193 04	110	R2000 113 04	-	-
	FNS 15	0.20		5.10	9.30	0.06	0.09	0.03	0.05		R2001 193 04	160	R2001 113 04	620	R2001 123 04
	FLS 15	0.30		8.50	14.0	0.08	0.13	0.06	0.10		R2002 193 04	200	R2002 113 04	800	R2002 123 04
	FKS 20	0.30	2.4	8.20	9.40	0.12	0.12	0.04	0.04	0	R2000 893 04	250	R2000 813 04	-	-
	FNS 20	0.45		12.3	16.9	0.20	0.21	0.11	0.12		R2001 893 04	380	R2001 813 04	1500	R2001 823 04
	FLS 20	0.55		16.0	24.4	0.26	0.31	0.19	0.23		R2002 893 04	490	R2002 813 04	1950	R2002 823 04
	FKS 25	0.50	3.2	10.5	12.6	0.18	0.19	0.07	0.07	0	R2000 293 04	320	R2000 213 04	-	-
	FNS 25	0.65		15.0	21.0	0.27	0.30	0.15	0.16		R2001 293 04	460	R2001 213 04	1820	R2001 223 04
	FLS 25	0.90		20.0	31.6	0.36	0.45	0.29	0.35		R2002 293 04	610	R2002 213 04	2430	R2002 223 04
	FKS 30	0.80	5.0	14.5	17.2	0.30	0.32	0.11	0.11	0	R2000 793 04	440	R2000 713 04	-	-
	FNS 30	1.10		20.8	28.7	0.46	0.50	0.24	0.26		R2001 793 04	630	R2001 713 04	2540	R2001 723 04
	FLS 30	1.50		26.3	40.1	0.59	0.70	0.42	0.50		R2002 793 04	800	R2002 713 04	3200	R2002 723 04
	FKS 35	1.20	6.8	19.3	22.4	0.49	0.54	0.15	0.17	0	R2000 393 04	590	R2000 313 04	-	-
	FNS 35	1.60		27.6	37.5	0.76	0.80	0.37	0.39		R2001 393 04	840	R2001 313 04	3350	R2001 323 04
	FLS 35	2.25		36.5	56.2	1.02	1.21	0.71	0.84		R2002 393 04	1110	R2002 313 04	4450	R2002 323 04

STAINLESS GUIDES SHOWN ABOVE (NR11) INCLUDE STAINLESS STEEL BALLS
ALSO AVAILABLE WITH STEEL BALLS (NR) FOR INCREASED LOAD CAPACITY

SIZE 45 ~ 65 GUIDES ARE AVAILABLE WITH CORROSION RESISTANT COATING
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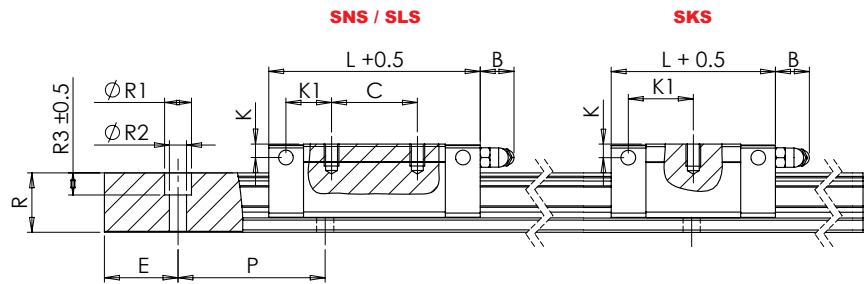
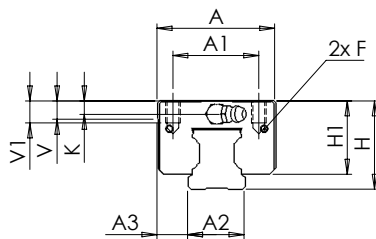
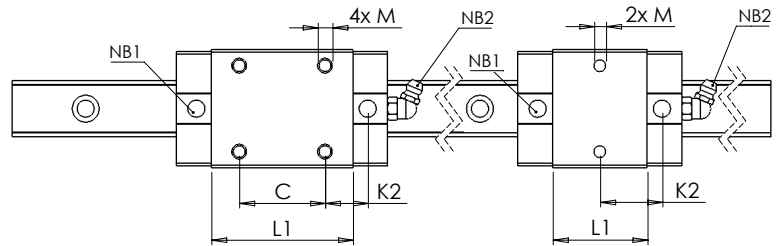


Square – Standard Height

Stainless Steel Ball Guides – Dimensions

NB1: For O-ring
Size 15 = Ø4 x 1.0 mm
Size 20 ~ 35 = Ø5 x 1.0 mm

NB2: Size 15 ~ 20 = DIN 3405 - A M3x5 lube nipple
Size 25 ~ 35 = DIN 71412-A M6x8 lube nipple



Model	Block Dimensions (mm)														Rail Dimensions (mm)									
	H	H1	A	A1	A3	C	L	L1	B	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT
SKS 15						-	44.7	25.7							17.9	16.3								
SNS 15	24	19.9	34	26	9.5	26	58.2	39.2	1.6	M2.5 x 3.5	M4	5	6	3.2	11.6	10	15	16.20	7.4	4.5	5.90	60	10	M4
SLS 15						26	72.6	53.6							18.8	17.2								
SKS 20						-	57.3	31.9							23	23								
SNS 20	30	25.4	44	32	12	36	75	49.6	1.6	M3 x 5	M5	6	7.5	3.35	13.8	13.8	20	20.55	9.4	6	7.35	60	10	M5
SLS 20						50	91	65.6							14.8	14.8								
SKS 25						-	67	38.6							26.5	25.4								
SNS 25	36	29.9	48	35	12.5	35	86.2	57.8	9.5	M3 x 5	M6	7.5	9	5.5	18.6	17.5	23	24.25	11	7	9.05	60	10	M6
SLS 25						50	107.9	79.5							22	20.8								
SKS 30						-	75.3	45							30.5	28.8								
SNS 30	42	35.4	60	40	16	40	97.7	67.4	9.5	M3 x 5	M8	7	12	6.05	21.7	20	28	28.35	15	9	11.35	80	12	M8
SLS 30						60	119.7	89.4							22.7	21								
SKS 35						-	84.9	51.4							34.2	32.7								
SNS 35	48	40.4	70	50	18	50	110.5	77	9.5	M3 x 5	M8	8	13	6.9	22	20.5	34	31.85	15	9	11.35	80	12	M8
SLS 35						72	139	105.5							25.3	23.8								

STAINLESS GUIDES SHOWN ABOVE (NR11) INCLUDE STAINLESS STEEL BALLS
ALSO AVAILABLE WITH STEEL BALLS (NR) FOR INCREASED LOAD CAPACITY

SIZE 45 ~ 65 GUIDES ARE AVAILABLE WITH CORROSION RESISTANT COATING
ON REQUEST PLEASE CONTACT OUR SALES TEAM FOR MORE INFORMATION

LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

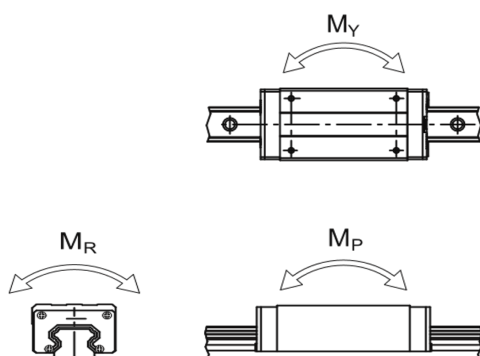


Square – Standard Height

Stainless Steel Ball Guides – Specifications

Size	v max	a max *
15 – 35	5 m/s	500 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Stainless Ball Type Linear Guides	R 2 0 1 1	2 1 3	04
Block Form:			
10 = FKS = Short			
11 = FNS = Normal			
12 = FLS = Long			
Nominal size:			
1 = 15	7 = 30		
8 = 20	3 = 35		
2 = 25			
Seal Option:			
04 = Standard			
05 = Low Friction			
0X = Double Lip			
Accuracy Grade:			
4 = N Grade			
3 = H Grade (Stock)			
2 = P Grade			
Preload Option:			
9 = C0 Clearance			
1 = C1 Light Preload			
2 = C2 Medium Preload			

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code					
				DYN	STAT	MR		MP & MY		C0 - Clearance		C1 - Light		C2 - Medium	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code	Force N	Order Code
	SKS 15	0.10	1.4	4.50	5.60	0.04	0.05	0.01	0.02	0	R2010 193 04	110	R2010 113 04	-	-
	SNS 15	0.15		5.10	9.30	0.06	0.09	0.03	0.05		R2011 193 04	160	R2011 113 04	620	R2011 123 04
	SLS 15	0.20		8.50	14.0	0.08	0.13	0.06	0.10		R2012 193 04	200	R2012 113 04	800	R2012 123 04
	SKS 20	0.25	2.4	8.20	9.40	0.12	0.12	0.04	0.04	0	R2010 893 04	250	R2010 813 04	-	-
	SNS 20	0.35		12.3	16.9	0.20	0.21	0.11	0.12		R2011 893 04	380	R2011 813 04	1500	R2011 823 04
	SLS 20	0.45		16.0	24.4	0.26	0.31	0.19	0.23		R2012 893 04	490	R2012 813 04	1950	R2012 823 04
	SKS 25	0.35	3.2	10.5	12.6	0.18	0.19	0.07	0.07	0	R2010 293 04	320	R2010 213 04	-	-
	SNS 25	0.50		15.0	21.0	0.27	0.30	0.15	0.16		R2011 293 04	460	R2011 213 04	1820	R2011 223 04
	SLS 25	0.65		20.0	31.6	0.36	0.45	0.29	0.35		R2012 293 04	610	R2012 213 04	2430	R2012 223 04
	SKS 30	0.60	5.0	14.5	17.2	0.30	0.32	0.11	0.11	0	R2010 793 04	440	R2010 713 04	-	-
	SNS 30	0.85		20.8	28.7	0.46	0.50	0.24	0.26		R2011 793 04	630	R2011 713 04	2540	R2011 723 04
	SLS 30	1.10		26.3	40.1	0.59	0.70	0.42	0.50		R2012 793 04	800	R2012 713 04	3200	R2012 723 04
	SKS 35	0.90	6.8	19.3	22.4	0.49	0.54	0.15	0.17	0	R2010 393 04	590	R2010 313 04	-	-
	SNS 35	1.25		27.6	37.5	0.76	0.80	0.37	0.39		R2011 393 04	840	R2011 313 04	3350	R2011 323 04
	SLS 35	1.70		36.5	56.2	1.02	1.21	0.71	0.84		R2012 393 04	1110	R2012 313 04	4450	R2012 323 04

STAINLESS GUIDES SHOWN ABOVE (NR11) INCLUDE STAINLESS STEEL BALLS
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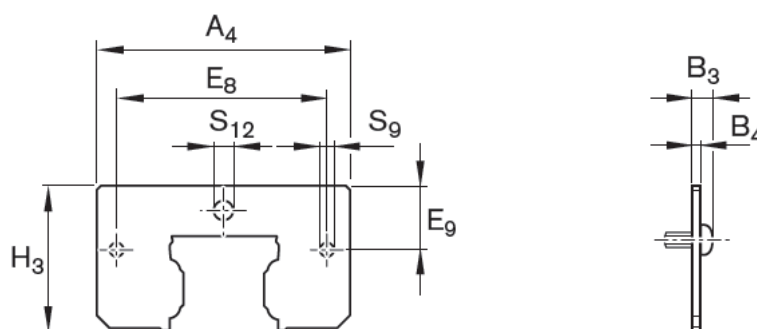
LINEAR BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



Wiper Scraper

For All Stainless Steel Ball Guide Blocks

NOTE: Wiper scraper made from corrosion resistant steel according to DIN EN 10088



Guide Size	Dimensions (mm)								Mass (g)	Ordering Codes	
	A4	B3	B4	E8	E9	H3	S9	S12		For Use With Cover Strip	For Use Without Cover Strip
15	33	3.1	1	24.55	6.3	19.2	3.5	4.6	5	R1620 110 30	
20	42	3.4	1	32.4	6.8	24.8	4	5.1	6	R1620 810 30	
25	47	3.4	1	38.3	11	29.5	4	7	8	R1620 210 30	
30	59	3.4	1	48.4	14.1	34.7	4	7	12	R1620 710 30	
35	69	3.4	1	58	17	40.1	4	7	16	R1620 310 40	R1620 310 30

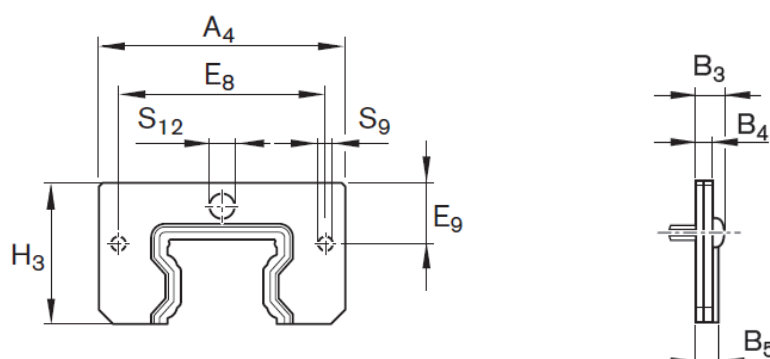
SCREWS INCLUDED – NOT FOR USE WITH FRONT SEAL – PLEASE USE SEAL KIT INSTEAD
PLEASE MAINTAIN 0.1mm TO 0.3mm EVEN GAP BETWEEN PLATE AND GUIDE RAIL



Front Seal & FKM Seal

For All Stainless Steel Ball Guide Blocks

NOTE: Includes frame made from corrosion resistant steel according to DIN EN 10088



Guide Size	Dimensions (mm)									Mass (g)	Ordering Codes	
	A4	B3	B4	B5	E8	E9	H3	S9	S12		Front Seal	FKM Seal
15	32	4.3	2.5	3	24.55	6.3	19	3.5	4.3	6	R1619 121 20	-
20	42	4.9	2.5	3.3	32.4	6.8	24.3	4	5.1	8	R1619 821 20	-
25	47	4.9	2.5	3.3	38.3	11	29	4	7	10	R1619 221 30	-
30	59	5.7	3.3	4.5	48.4	14.1	34.5	4	7	18	R1619 721 30	-
35	69	5.7	3.3	4.5	58	17	39.5	4	7	25	R1619 321 30	-
		8.4	4	6						39	-	R1619 320 30

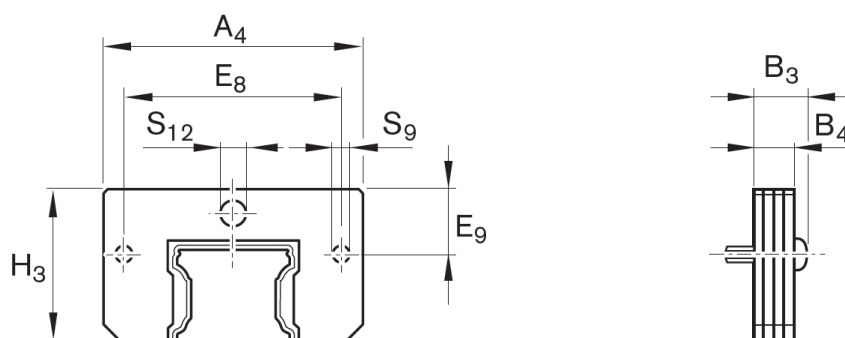
SCREWS INCLUDED – NOT FOR USE WITH WIPER SCRAPER – PLEASE USE SEAL KIT INSTEAD
FRONT & FKM SEALS ARE A TWO-PIECE DESIGN EXCLUDING SIZE 65 SINGLE PIECE



Seal Kit

For All Stainless Steel Ball Guide Blocks

NOTE: Wiper scraper made from corrosion resistant steel according to DIN EN 10088



Guide Size	Dimensions (mm)								Mass (g)	Ordering Codes	
	A4	B3	B4	E8	E9	H3	S9	S12		For Use With Cover Strip	For Use Without Cover Strip
15	32	6.3	4.2	24.55	6.3	19	3.5	4.3	16	R1619 120 50	
20	42	6.9	4.5	32.4	6.8	24.3	4	5.1	20	R1619 820 50	
25	47	6.9	4.5	38.3	11	29	4	7	26	R1619 220 50	
30	59	8.2	5.8	48.4	14.1	34.5	4	7	42	R1619 720 50	
35	69	8.2	5.8	58	17	39.5	4	7	57	R1619 320 50	R1619 320 40

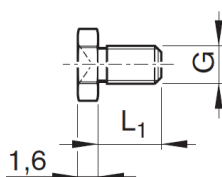
SCREWS INCLUDED – RECOMMENDED WHEN USING WIPER SCRAPER & FRONT SEAL
PLEASE CONSIDER MINIMUM SCREW DEPTH OF LUBRICATION POINT ON END FACE



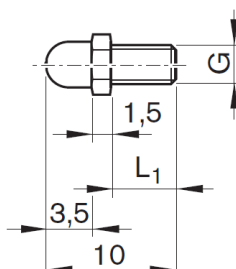
Lubrication Nipples & O-Rings

For All Stainless Steel Ball Guide Blocks

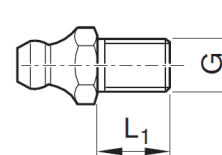
**FUNNEL TYPE
DIN 3405 – A**



**FUNNEL TYPE
DIN 3405 – BALL**

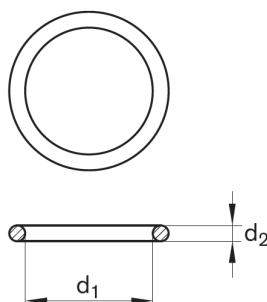
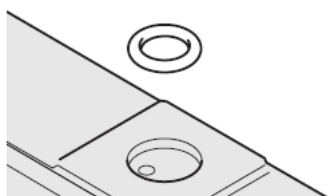


**HYDRAULIC TYPE
DIN 71412 – A**



Type	Form	Dimensions (mm)		Material	Mass (g)	Ordering Codes
		G	L1			
Funnel	A	M3	5	Stainless	0.3	R3417 032 09
Funnel	Ball	M3	5	Brass	0.5	R3417 005 01
Hydraulic	A	M6	8	Stainless	2.6	R3417 016 02

O-Rings For Stainless Steel Ball Guides



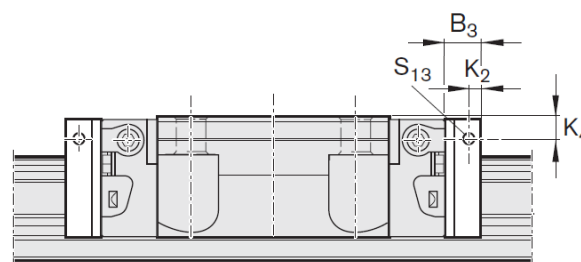
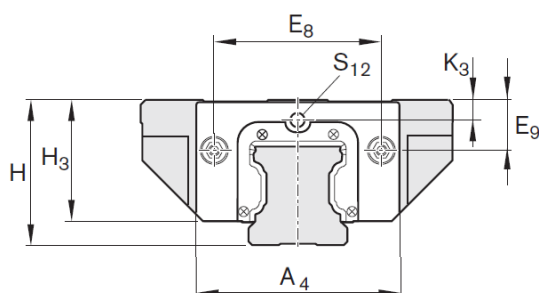
Spare O-Ring (Singular)	
Ø d1 x Ø d2	Ordering Code
4 x 1.0	R3411 130 01
5 x 1.0	R3411 131 01

BALL TYPE LUBRICATION NIPPLES MADE OF BRASS – STAINLESS TYPE NRII LUBRICATION
NIPPLES MADE FROM CORROSION RESISTANT STEEL ACCORDING TO DIN EN 10088

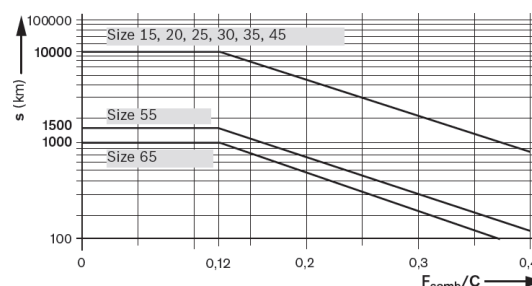


Front Lubrication Units

For Up to 10,000 km Travel Without Re-lubrication



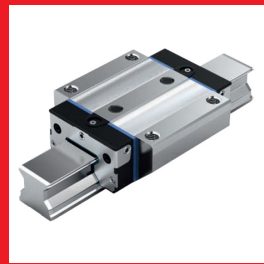
RELUBRICATION INTERVAL AS
TRAVEL DISTANCE VS LOAD



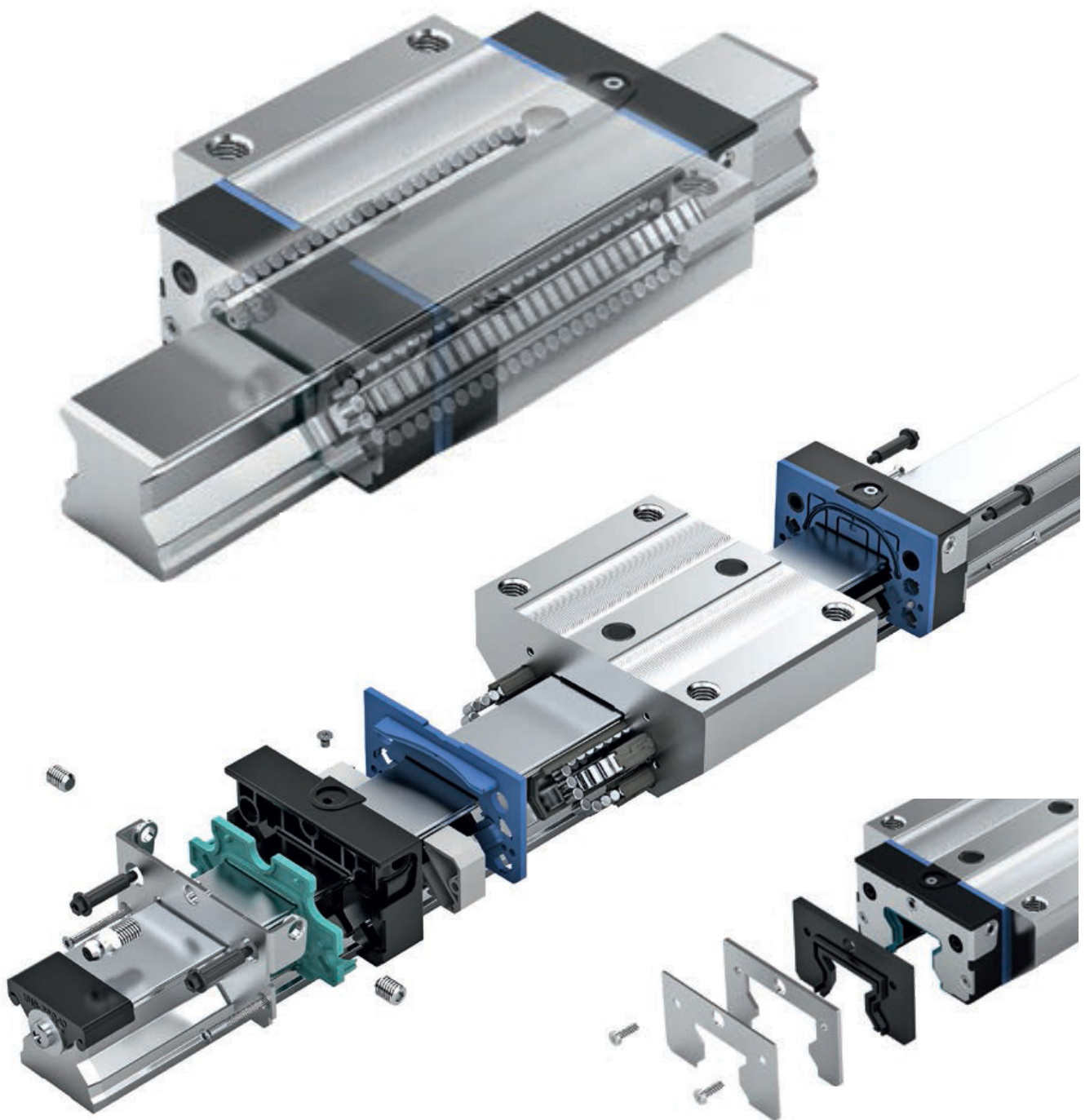
Guide Size	Dimensions (mm)										Oil (cm ³)	Mass (g)	Ordering Code Pre-filled with Mobil SHC639
	A4	B3	E8	E9	H	H3	K2	K3 / K4	S12	S13			
15	31.8	11.5	24.55	6.7	24	19.4	5	3.35	M3	M3	1.0	15	R1619 125 00
20	43	12.5	32.5	7.3	30	24.9	5	3.7	M3	M3	2.2	20	R1619 825 00
25	47	13	38.3	11.5	36	29.3	5	5.5	M6	M6	2.6	25	R1619 225 00
30	58.8	14.5	48.4	14.6	42	35.05	6	6.05	M6	M6	3.85	35	R1619 725 00
35	69	16	58	17.35	48	39.85	6	6.9	M6	M6	5.7	50	R1619 325 00

Un-filled Unit Order Code R1619 X2X 10

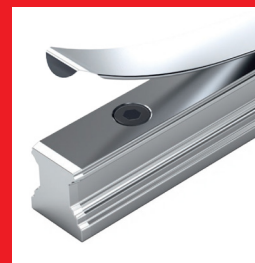
INITIALY LUBRICATE GUIDE BEFORE MOUNTING A FRONT LUBE UNIT AT EITHER END OF GUIDE
LUBRICATION UNITS CAN BE RE-FILLED VIA SIDE PORT - EXCEPT FOR SIZE 20 LOW PROFILE



Standard Linear Roller Guides



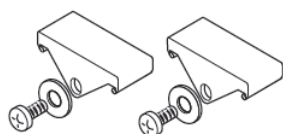
LINEAR ROLLER GUIDES ARE STOCKED IN P GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



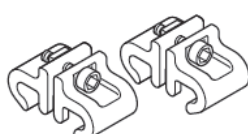
Roller Guides – Cover Strip

For All Standard Roller Guide Rails

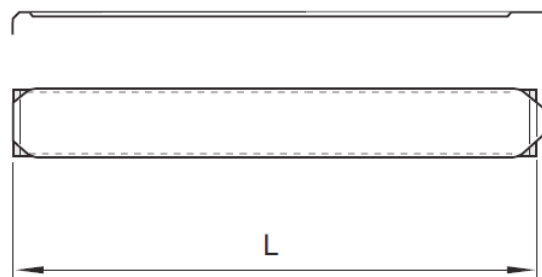
COVER STRIP & CAP



COVER STRIP & CLAMP



SNAP FIT COVER STRIP



Rail Size	Rail Accessories Ordering Codes			
	Cover Strip Cap (2pc Set & Screws)	Cover Strip Clamp (2pc Set & Screws)	Plastic Cap (Sold Singular)	Snap Fit Cover Strip (Cut To Length mm)
25	R1619 239 20	R1619 239 50	R1605 200 80	R1619 230 00 - LENGTH
35	R1619 339 30	R1619 339 50	R1605 300 80	R1619 330 20 - LENGTH
45	R1619 439 20	R1619 439 50	R1605 400 80	R1619 430 20 - LENGTH
55	R1619 539 20	R1619 539 50	R1605 500 80	R1619 530 20 - LENGTH
65	R1619 639 20	R1619 639 50	R1605 600 80	R1619 630 20 - LENGTH
100	-	-	-	R1810 231 20 - LENGTH
125	-	-	-	R1810 331 20 - LENGTH

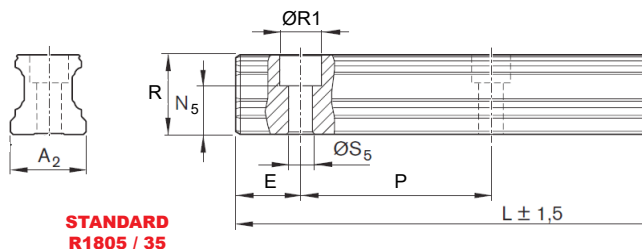
SEE RAIL ORDER CODES ON THE NEXT PAGE FOR ORDERING RAILS COMPLETE WITH COVER STRIP
PLASTIC MOUNTING HOLE CAPS ARE INCLUDED IN THE DELIVERY OF R1805 CUT RAIL LENGTHS
THE ORDERING CODES SHOWN ABOVE ARE FOR REFERENCE WHEN ORDERING SPARES ONLY

LINEAR ROLLER GUIDE RAILS ARE STOCKED IN P GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST

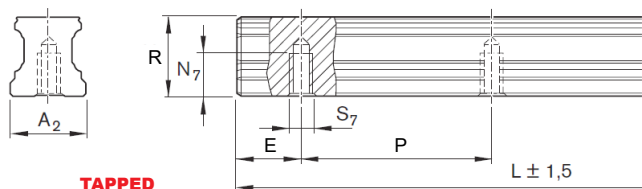


Roller Guides – Rails

For All Standard Roller Guide Blocks



STANDARD
R1805 / 35



TAPPED
R1807

R 1 8 0 5 2 5 2 31 - LENGTH

Roller Linear Rails:

R180 = Standard
R183 = Heavy *

Hole Type:

5 = Standard
6 = Metal Cap
7 = Tapped

Nominal size:

2 = 25 6 = 65
3 = 35 2 = 100 *
4 = 45 3 = 125 *
5 = 55

Composition:

31 = 1pc Single Rail
32 = 2pc Butt Joint
3N = Npc Butt Joint

Accuracy Grade:

3 = H Grade
2 = P Grade (Stock)
1 = SP Grade

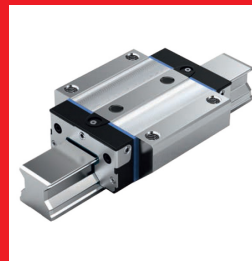
Cover Option:

5 = Standard
3 = Cover & Clamps
6 = Cover & Caps

Rail Size	Rail Dimensions (mm)										kg / m	Ordering Codes	
	A2	R	R1	S5	N5	S7	N7	P	E MIN	RAIL BOLT		Standard Rail	Tapped Rail
25	23	23.4	11	7	14.3	M6	12	30	10	M6	3.1	R1805 252 31	R1807 202 31
35	34	30.8	15	9	19.4	M8	15	40	12	M8	6.3	R1805 352 31	R1807 302 31
45	45	38.8	20	14	22.4	M12	19	52.5	16	M12	10.3	R1805 452 31	R1807 402 31
55	53	47.55	24	16	28.7	M14	22	60	18	M14	13.1	R1805 552 31	R1807 502 31
65	63	57.85	26	18	36.5	M16	25	75	20	M16	17.4	R1805 652 31	R1807 602 31
100	100	87	40	26	55.0	-	-	105	35	M25	42.5	R1835 252 31	-
125	125	115	49	33	74.5	-	-	120	40	M30	75.6	R1835 352 31	-

PLEASE SPECIFY RAIL LENGTHS IN MILLIMETERS WHEN ENQUIRING AND ORDERING
RAILS ARE STOCKED IN 4M LENGTHS BUT CAN BE BUTT JOINTED FOR LONGER LENGTHS
DIMENSION E WILL DEFAULT TO SYMETRICAL AT EACH END UNLESS OTHERWISE STATED

LINEAR ROLLER GUIDE RAILS ARE STOCKED IN P GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST



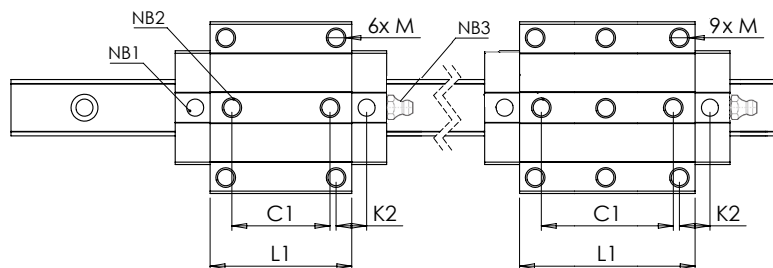
Flanged – Standard Height

Standard Roller Guides – Dimensions

NB1: For O-ring
 Size 25 = Ø5 x 1.5 mm
 Size 35 ~ 65 = Ø7 x 1.5 mm
 Size 100 + = Ø15 x 2.5mm

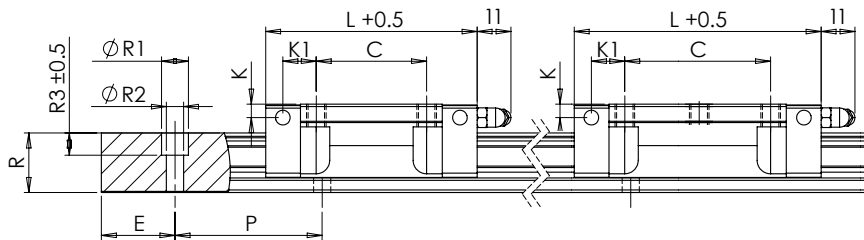
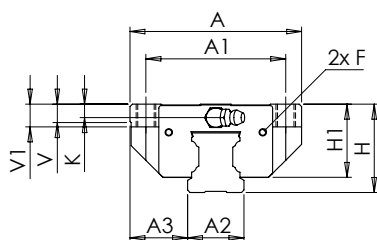
NB2: For manufacturing reasons, plugs may be present in these holes on FNS & FLS types which must be removed prior to installation

NB3: Size 25 ~ 65 = DIN 71412-A M6x8 lube nipple
 Size 100 + = DIN 71412-A M8x1x8 lube nipple



25~65 (EXC FXS)

65~125 (INC FXS)

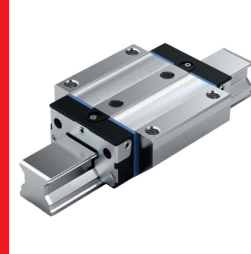


Model	Block Dimensions (mm)																Rail Dimensions (mm)										
	H	H1	A	A1	A3	C	C1	L	L1	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT			
FNS 25	36	30	70	57	23.5	45	40	97	63.5	M3 x 6	M8	7.5	9	5.5	-	14.1	23	23.4	11	7	9.1	30	10	M6			
FLS 25								115	81.5						-	23.1											
FNS 35	48	41	100	82	33	62	52	118	79.6	M3 x 6	M10	8	12	7	17.4	15.6	34	30.8	15	9	11.4	40	12	M8			
FLS 35								142	103.6						29.4	27.6											
FNS 45	60	51	120	100	37.5	80	60	147	101.5	M4 x 9	M12	10	15	8	20.4	17.5	45	38.8	20	14	16.4	52.5	16	M12			
FLS 45								179.5	134						36.6	33.7											
FNS 55	70	58	140	116	43.5	95	70	170.7	123.1	M5 x 8	M14	12	18	9	24.9	21.8	53	47.55	24	16	18.85	60	18	M14			
FLS 55								209.7	162.1						44.4	41.3											
FNS 65	90	76	170	142	53.5	110	82	207.3	146	M4 x 8	M16	15	23	9.3	33	30	63	57.85	26	18	21.35	75	20	M16			
FLS 65								255.3	194						57	54											
FXS 65								200	200						345	275										52.5	49.5
FNS 100	120	105	250	200	75	150	150	293	204	-	M20	20	30	17.5	39.5	39.5	100	87	40	26	32	105	35	M25			
FLS 100								377	288						47.4	41.5											
FNS 125	160	135.5	320	270	97.5	205	205	377	255	-	M27	25	45	29	50	50	125	115	49	33	40.5	120	40	M30			
FLS 125								482	360						102.5	102.5											

NOTE: Size 125, 100 & 65 type FXS have an additional row of mounting holes located on the centre line of the block mating face (9 off holes in total)

Also note size 65 and above have additional sets of accessory holes F

LINEAR ROLLER GUIDES ARE STOCKED IN P GRADE WITH STANDARD SEALS ONLY
 OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



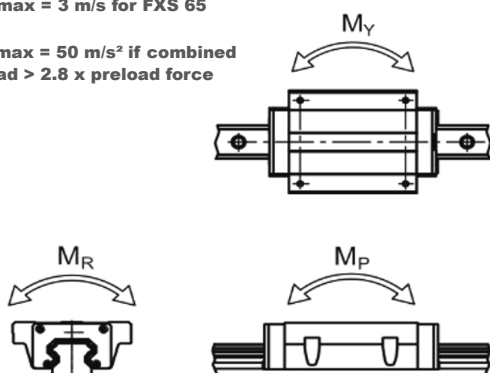
Flanged – Standard Height

Standard Roller Guides – Specifications

Size	v max	a max **
25	3 m/s	150 m/s ²
35 – 65 *	4 m/s	150 m/s ²
100 – 125	2 m/s	150 m/s ²

* v max = 3 m/s for FXS 65

** a max = 50 m/s² if combined load > 2.8 x preload force



R 1 8 5 1 2 3 2 10

Standard Roller Type Linear Guides

Seal Option:

2X / 10 = Standard
7X / 60 = Corrosion Resistant

Block Form:

51 = FNS = Normal
53 = FLS = Long
54 = FXS = Extra Long

Accuracy Grade:

3 = H Grade
2 = P Grade (Stock)
1 = S Grade

Nominal size:

2 = 25 6 = 65
3 = 35 2 = 100
4 = 45 3 = 125
5 = 55

Preload Option:

2 = C2 Medium Preload
3 = C3 Heavy Preload

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code			
				DYN	STAT	MR		MP & MY		C2 - Medium		C3 - Heavy	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code
	FNS 25	0.80	3.1	26.9	53.2	0.35	0.69	0.26	0.52	2240	R1851 222 10	3640	R1851 232 10
	FLS 25	1.10		33.3	70.0	0.43	0.91	0.42	0.90	2720	R1853 222 10	4420	R1853 232 10
	FNS 35	2.15	6.3	61.0	119.4	1.21	2.37	0.76	1.48	4510	R1851 322 2X	7320	R1851 332 2X
	FLS 35	2.70		74.9	155.4	1.49	3.08	1.22	2.53	5540	R1853 322 2X	8990	R1853 332 2X
	FNS 45	4.05	10.3	106.6	209.4	2.64	5.18	1.65	3.24	7890	R1851 422 2X	12790	R1851 432 2X
	FLS 45	5.15		132.3	276.4	3.27	6.83	2.69	5.63	9790	R1853 422 2X	15900	R1853 432 2X
	FNS 55	5.44	13.1	140.4	284.7	4.12	8.35	2.61	5.29	10400	R1851 522 2X	16800	R1851 532 2X
	FLS 55	7.15		174.0	374.9	5.10	10.99	4.42	9.52	12900	R1853 522 2X	20900	R1853 532 2X
	FNS 65	10.7	17.4	237.2	456.3	8.43	16.21	5.26	10.12	17600	R1851 622 2X	28500	R1851 632 2X
	FLS 65	14.2		295.9	606.3	10.51	21.54	8.87	18.18	21900	R1853 622 2X	35500	R1853 632 2X
	FXS 65	20.3		366.8	792.8	13.03	28.17	13.38	28.92	29300	R1854 622 10	47700	R1854 632 10
	FNS 100	32.0	42.5	461.0	811.7	25.72	45.29	13.55	23.85	36900	R1861 222 10	59900	R1861 232 10
	FLS 100	42.0		632.0	1218.0	35.30	67.90	27.20	52.40	50600	R1863 222 10	82200	R1863 232 10
	FNS 125	62.1	75.6	757.2	1324.0	54.52	95.33	29.66	51.86	60600	R1861 322 10	98400	R1861 332 10
	FLS 125	69.8		1020.0	1941.9	57.74	139.8	45.08	109.2	81600	R1863 322 10	132600	R1863 332 10

LINEAR ROLLER GUIDES ARE STOCKED IN P GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



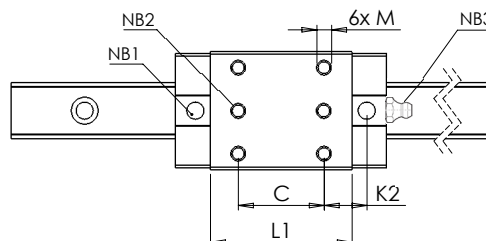
Square – Standard Height

Standard Roller Guides – Dimensions

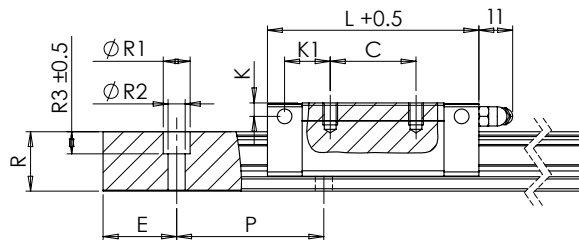
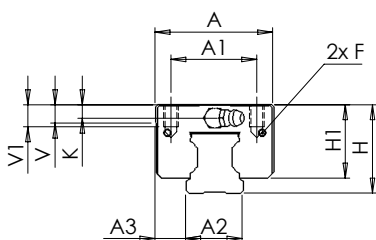
NB1: For O-ring
Size 25 = Ø5 x 1.5 mm
Size 35 ~ 65 = Ø7 x 1.5 mm

NB2: For manufacturing reasons, plugs may be present in these holes on SNS & SLS types which must be removed prior to installation

NB3: Size 25 ~ 65 = DIN 71412-A M6x8 lube nipple



SNS / SLS



Model	Block Dimensions (mm)															Rail Dimensions (mm)								
	H	H1	A	A1	A3	C	L	L1	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT	
SNS 25	36	30	48	35	12	35	97	63.5	M3 x 6	M6	7.5	8	5.5	-	19.1	23	23.4	11	7	9.1	30	10	M6	
SLS 25						50	115	81.5						-	20.6									
SNS 35	48	41	70	50	18	50	118	79.6	M3 x 6	M8	8	12	7	23.4	21.2	34	30.8	15	9	11.4	40	12	M8	
SLS 35						72	142	103.6						24.4	22.6									
SNS 45	60	51	86	60	20.5	60	147	101.5	M4 x 9	M10	10	18	8	30.4	27.5	45	38.8	20	14	16.4	52.5	16	M12	
SLS 45						80	180	134						36.6	33.7									
SNS 55	70	58	100	75	23.5	75	170.7	123.1	M5 x 8	M12	12	17	9	34.9	31.8	53	47.55	24	16	18.85	60	18	M14	
SLS 55						95	209.7	162.1						44.4	41.3									
SNS 65	90	76	126	76	31.5	70	207.3	146	M4 x 8	M16	15	21	9.3	53	50	63	57.85	26	18	21.35	75	20	M16	
SLS 65						120	255.3	194						52	49									

NOTE: Size 65 has additional sets of accessory holes F

LINEAR ROLLER GUIDES ARE STOCKED IN P GRADE WITH STANDARD SEALS ONLY
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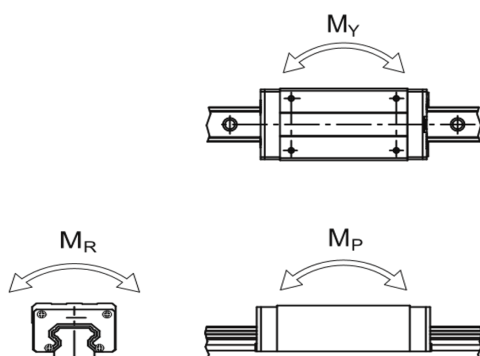


Square – Standard Height

Standard Roller Guides – Specifications

Size	v max	a max *
25	3 m/s	150 m/s ²
35 – 65	4 m/s	150 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Standard Roller Type Linear Guides	R 1 8 2 2	2 3 2	10	Seal Option:
				2X / 10 = Standard
				7X / 60 = Corrosion Resistant
Block Form:				Accuracy Grade:
22 = SNS = Normal				3 = H Grade
23 = SLS = Long				2 = P Grade (Stock)
				1 = S Grade
Nominal size:				Preload Option:
2 = 25	5 = 55			2 = C2 Medium Preload
3 = 35	6 = 65			3 = C3 Heavy Preload
4 = 45				

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code			
				DYN	STAT	MR		MP & MY		C2 - Medium		C3 - Heavy	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code
	SNS 25	0.54	3.1	26.9	53.2	0.35	0.69	0.26	0.52	2240	R1822 222 10	3640	R1822 232 10
	SLS 25	0.80		33.3	70.0	0.43	0.91	0.42	0.90	2720	R1823 222 10	4420	R1823 232 10
	SNS 35	1.55	6.3	61.0	119.4	1.21	2.37	0.76	1.48	4510	R1822 322 2X	7320	R1822 332 2X
	SLS 35	1.95		74.9	155.4	1.49	3.08	1.22	2.53	5540	R1823 322 2X	8990	R1823 332 2X
	SNS 45	2.90	10.3	106.6	209.4	2.64	5.18	1.65	3.24	7890	R1822 422 2X	12790	R1822 432 2X
	SLS 45	3.65		132.3	276.4	3.27	6.83	2.69	5.63	9790	R1823 422 2X	15900	R1823 432 2X
	SNS 55	4.14	13.1	140.4	284.7	4.12	8.35	2.61	5.29	10400	R1822 522 2X	16800	R1822 532 2X
	SLS 55	5.30		174.0	374.9	5.10	10.99	4.42	9.52	12900	R1823 522 2X	20900	R1823 532 2X
	SNS 65	8.12	17.4	237.2	456.3	8.43	16.21	5.26	10.12	17600	R1822 622 2X	28500	R1822 632 2X
	SLS 65	10.7		295.9	606.3	10.51	21.54	8.87	18.18	21900	R1823 622 2X	35500	R1823 632 2X

LINEAR ROLLER GUIDES ARE STOCKED IN P GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



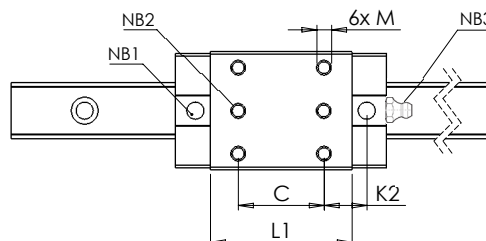
Square – High Profile

Standard Roller Guides – Dimensions

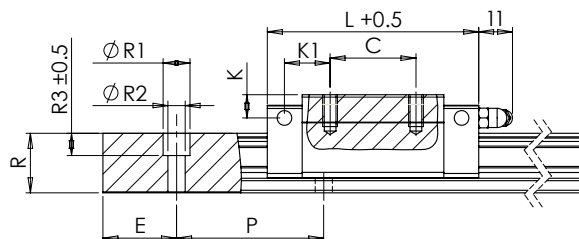
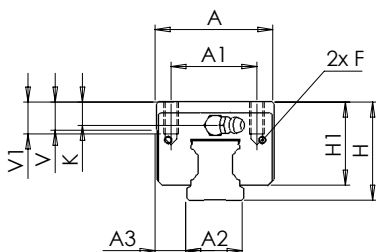
NB1: For O-ring
Size 25 = Ø5 x 1.5 mm
Size 35 ~ 55 = Ø7 x 1.5 mm

NB2: For manufacturing reasons, plugs may be present in these holes on SNH & SLH types which must be removed prior to installation

NB3: Size 25 ~ 55 = DIN 71412-A M6x8 lube nipple



SNH / SLH



Model	Block Dimensions (mm)															Rail Dimensions (mm)								
	H	H1	A	A1	A3	C	L	L1	F	M	V	V1	K	K1	K2	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT	
SNH 25	40	34	48	35	12	35	97	63.5	M3 x 6	M6	7.5	8	-	-	19.1	23	23.4	11	7	9.1	30	10	M6	
SLH 25						50	115	81.5						-	20.6									
SNH 35	55	48	70	50	18	50	118	79.6	M3 x 6	M8	8	13	14	23.4	21.2	34	30.8	15	9	11.4	40	12	M8	
SLH 35						72	142	103.6						24.4	22.6									
SNH 45	70	61	86	60	20.5	60	147	101.5	M4 x 9	M10	10	18	18	30.4	27.5	45	38.8	20	14	16.4	52.5	16	M12	
SLH 45						80	180	134						36.6	33.7									
SNH 55	80	68	100	75	23.5	75	170.7	123.1	M5 x 8	M12	12	19	19	34.9	31.8	53	47.55	24	16	18.85	60	18	M14	
SLH 55						95	209.7	162.1						44.4	41.3									

LINEAR ROLLER GUIDES ARE STOCKED IN P GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

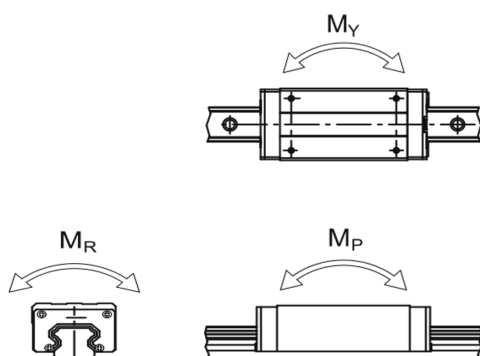


Square – High Profile

Standard Roller Guides – Specifications

Size	v max	a max *
25	3 m/s	150 m/s ²
35 – 55	4 m/s	150 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Standard Roller Type Linear Guides	R 1 8 2 1	2 3 2	10	Seal Option:
				2X / 10 = Standard
				7X / 60 = Corrosion Resistant
Block Form:				Accuracy Grade:
21 = SNH = Normal				3 = H Grade
24 = SLH = Long				2 = P Grade (Stock)
				1 = S Grade
Nominal size:				Preload Option:
2 = 25 4 = 45				2 = C2 Medium Preload
3 = 35 5 = 55				3 = C3 Heavy Preload

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings kNm				Preload Options vs Ordering Code			
				DYN	STAT	MR		MP & MY		C2 - Medium		C3 - Heavy	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code
	SNH 25	0.63	3.1	26.9	53.2	0.35	0.69	0.26	0.52	2240	R1821 222 10	3640	R1821 232 10
	SLH 25	0.90		33.3	70.0	0.43	0.91	0.42	0.90	2720	R1824 222 10	4420	R1824 232 10
	SNH 35	1.85	6.3	61.0	119.4	1.21	2.37	0.76	1.48	4510	R1821 322 2X	7320	R1821 332 2X
	SLH 35	2.35		74.9	155.4	1.49	3.08	1.22	2.53	5540	R1824 322 2X	8990	R1824 332 2X
	SNH 45	3.35	10.3	106.6	209.4	2.64	5.18	1.65	3.24	7890	R1821 422 2X	12790	R1821 432 2X
	SLH 45	4.45		132.3	276.4	3.27	6.83	2.69	5.63	9790	R1824 422 2X	15900	R1824 432 2X
	SNH 55	5.04	13.1	140.4	284.7	4.12	8.35	2.61	5.29	10400	R1821 522 2X	16800	R1821 532 2X
	SLH 55	6.55		174.0	374.9	5.10	10.99	4.42	9.52	12900	R1824 522 2X	20900	R1824 532 2X

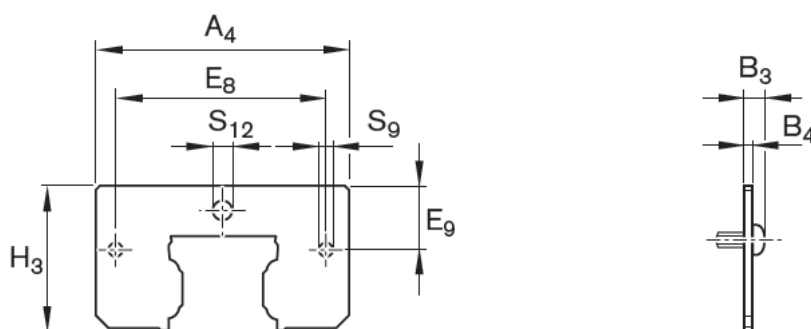
LINEAR ROLLER GUIDES ARE STOCKED IN P GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



Wiper Scraper

For Standard Roller Guide Blocks

NOTE: Wiper scraper made from corrosion resistant steel according to DIN EN 10088



Guide Size	Dimensions (mm)								Mass (g)	Ordering Codes
	A4	B3	B4	E8	E9	H3	S9	S12		
25	45.4	3	1	33.4	7.5	29.2	4	7	7	R1820 210 30
35	67.4	3	1	50.3	12.1	39.7	4	7	16	R1820 310 30
45	80.4	5.1	2	62.9	15.7	49.7	5	7	44	R1820 410 30
55	92.8	5.8	2	74.2	17.8	56.7	6	7	52	R1820 510 30
65	118.4	5.1	2	93	24.7	73.9	5	7	105	R1820 610 30

NOTE: The above wiper scrapers are to suit second generation roller guides only
part numbers ending with 2X suffix – first generation available on request

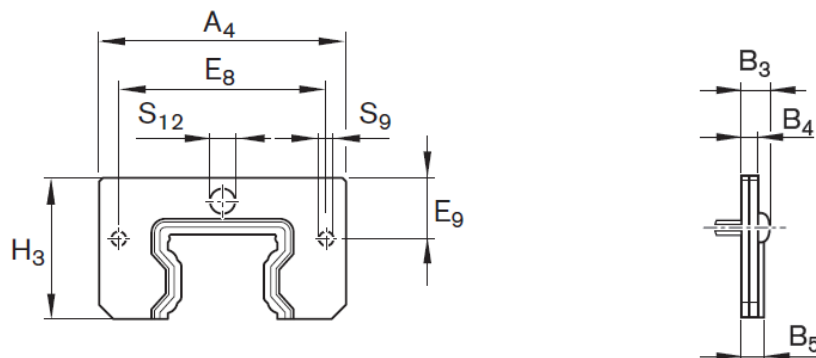
SCREWS INCLUDED – NOT FOR USE WITH FKM SEAL – PLEASE USE SEAL KIT INSTEAD
PLEASE MAINTAIN 0.1mm TO 0.3mm EVEN GAP BETWEEN PLATE AND GUIDE RAIL



FKM Seal

For Standard Roller Guide Blocks

NOTE: Includes frame made from corrosion resistant steel according to DIN EN 10088



Guide Size	Dimensions (mm)								Mass (g)	Ordering Codes
	A4	B3	B4	E8	E9	H3	S9	S12		
25	45.4	8	6	33.4	7.5	29.2	4	7	19	R1810 220 30
35	67.4	8	6	50.3	12.1	39.7	4	7	40	R1810 320 30
45	80.4	9.1	6	62.9	15.7	49.7	5	7	62	R1810 420 30
55	92.8	9.8	6	74.2	17.8	56.7	6	7	76	R1810 520 30
65	118.4	9.1	6	93	24.7	73.9	5	7	146	R1810 620 30

NOTE: The above FKM type seals are to suit second generation roller guides only
part numbers ending with 2X suffix – first generation available on request

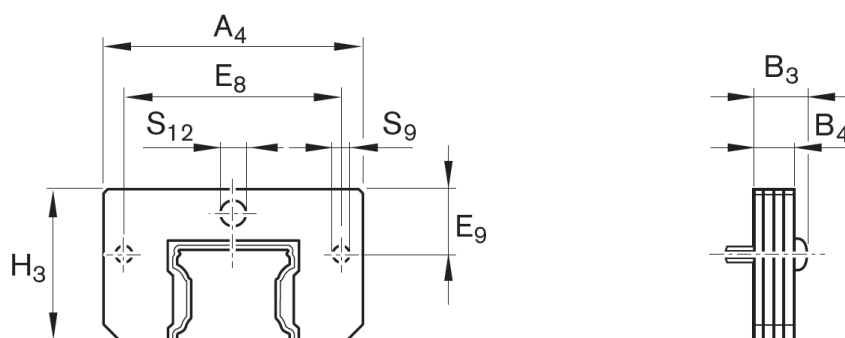
SCREWS INCLUDED – NOT FOR USE WITH WIPER SCRAPER – PLEASE USE SEAL KIT INSTEAD
FKM SEALS ARE A TWO-PIECE DESIGN CONTAINING SEAL & STAINLESS STEEL FRAME



Seal Kit

For Standard Roller Guide Blocks

NOTE: Wiper scraper made from corrosion resistant steel according to DIN EN 10088



Guide Size	Dimensions (mm)								Mass (g)	Ordering Codes
	A4	B3	B4	E8	E9	H3	S9	S12		
25	45.4	9	7	33.4	7.5	29.2	4	7	26	R1810 220 70
35	67.4	9	7	50.3	12.1	39.7	4	7	56	R1810 320 70
45	80.4	11.1	8	62.9	15.7	49.7	5	7	106	R1810 420 70
55	92.8	11.8	8	74.2	17.8	56.7	6	7	128	R1810 520 70
65	118.4	11.1	8	93	24.7	73.9	5	7	251	R1810 620 70

NOTE: The above FKM seal kits are to suit second generation roller guides only
part numbers ending with 2X suffix – first generation available on request

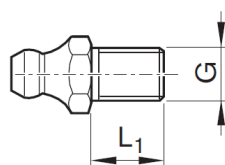
SCREWS INCLUDED – RECOMMENDED WHEN USING WIPER SCRAPER & FKM SEAL
PLEASE CONSIDER MINIMUM SCREW DEPTH OF LUBRICATION POINT ON END FACE



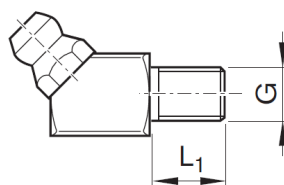
Lubrication Nipples

For Roller Guides – Hydraulic Type DIN 71412

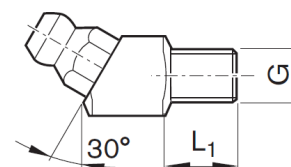
FORM A



FORM B



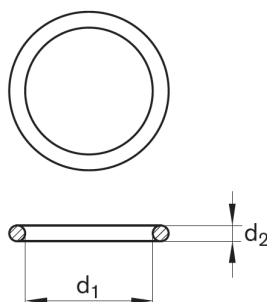
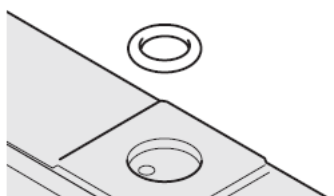
30°



Form	Dimensions (mm)		Mass (g)	Ordering Codes
	G	L1		
A	M6	8	2.6	R3417 008 02
	M8 x 1	10	4.5	R3417 014 02
B	M6	8	7.4	R3417 007 02
	M8 x 1	10	7.8	R3417 010 02
30°	M6	8	7.4	R3417 023 02

HYDRAULIC TYPE DIN 71412 FORM A LUBRICATION NIPPLES ARE INCLUDED WITH THE SUPPLY OF STANDARD ROLLER GUIDE BLOCKS – OTHER FORMS ARE AVAILABLE ON REQUEST

O-Rings For Roller Guides



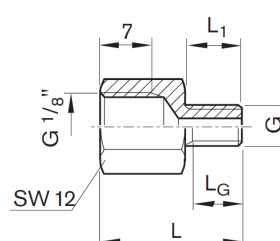
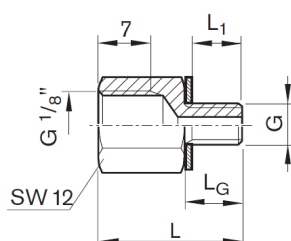
Spare O-Ring (Singular)	
Ø d1 x Ø d2	Ordering Code
5 x 1.5	R3411 108 01
7 x 1.5	R3411 122 01
12 x 1.5	R3411 018 01
15 x 2.5	R3411 145 01

LUBRICATION ADAPTERS FOR LUBRICATING FROM ABOVE ARE NOT REQUIRED FOR HIGH PROFILE ROLLER GUIDES SNH & SLH AS THE PLASTIC END CAPS FEATURE RAISED PORTS



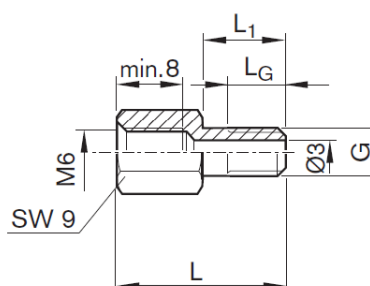
Lubrication Fittings

Reducers For Roller Guides



Reducer Size	Dimensions (mm)				Mass (g)	Ordering Code
	G	L	L1	LG		
SW12	M6	20	8	9	7.5	R3455 032 04
SW12	M8 x 1	20	8	6.5	8.6	R3455 030 51

Extensions For Roller Guides

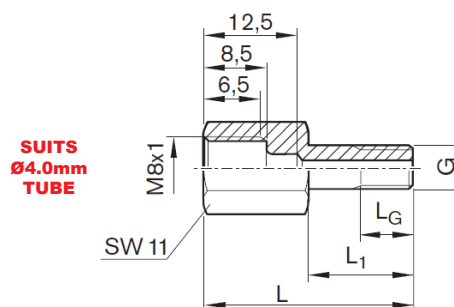
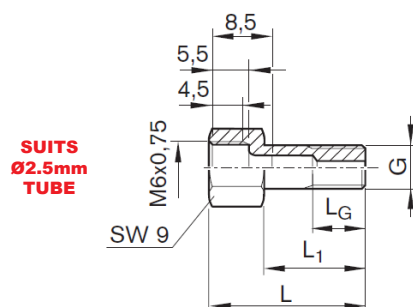


Extension Size	Dimensions (mm)				Mass (g)	Ordering Code
	G	L	L1	LG		
Scraper 25 - 35	M6	19.5	9	7.5	5	R3455 033 04
Scraper 45 - 65	M6	20.5	10	8	5.5	R3455 034 04
FKM Seal 25 - 65	M6	24.5	14	8	5.5	R3455 035 04
Seal Kit 25 - 35	M6	25.5	15	8	6	R3455 036 04
Seal Kit 45 - 65	M6	26.5	16	8	6	R3455 037 04



Lubrication Fittings

Connectors For Roller Guides



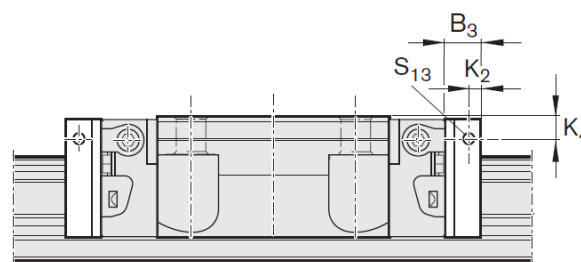
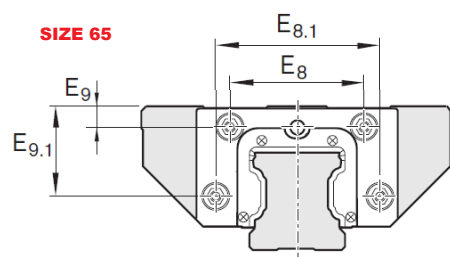
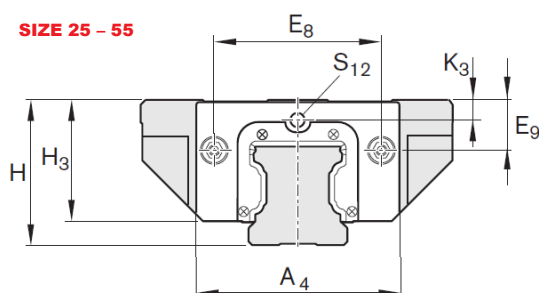
Connector Size	Dimensions (mm)				Mass (g)	Ordering Code
	G	L	L1	LG		
Standard 25 - 65	(SW9) M6	15.5	8	6.5	4.1	R3455 030 38
	(SW11) M6	22			8.8	R3455 030 37
Scraper 25 - 35	(SW9) M6	16.5	9	7.5	5	R3455 038 04
	(SW11) M6	23			9.5	R3455 043 04
Scraper 45 - 65	(SW9) M6	17.5	10	8	5.5	R3455 039 04
	(SW11) M6	24			10	R3455 044 04
FKM Seal 25 - 65	(SW9) M6	21.5	14	8	5.5	R3455 040 04
	(SW11) M6	28			10.5	R3455 045 04
Seal Kit 25 - 35	(SW9) M6	22.5	15	8	6	R3455 041 04
	(SW11) M6	29			10.5	R3455 046 04
Seal Kit 45 - 65	(SW9) M6	23.5	16	8	6	R3455 042 04
	(SW11) M6	30			11	R3455 030 52

SOLDERLESS TUBE FITTINGS FOR CONNECTIONS
AS PER DIN 3854 & DIN 3862 STANDARDS

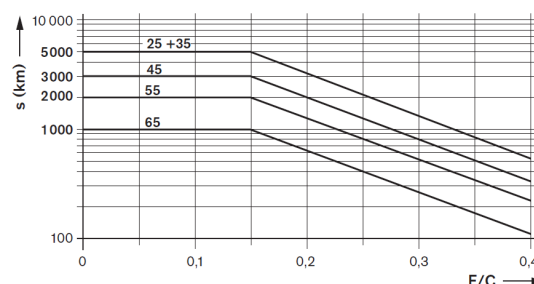


Front Lubrication Units

For Up to 5,000 km Travel Without Re-lubrication



RELUBRICATION INTERVAL AS
TRAVEL DISTANCE VS LOAD



Guide Size	Dimensions (mm)												Oil (cm ³)	Mass (g)	Ordering Code Pre-filled with Mobil SHC639
	A4	B3	E8	E8.1	E9	E9.1	H	H3	K2	K3 / K4	S12	S13			
25	44	15.5	33.4	-	8.4 (12.4)	-	36 (40)	29.7 (33.7)	-	5 (9)	M6	-	2.6	24	R1810 225 00
35	64	19	50.3	-	13.1 (20.1)	-	48 (55)	40.75 (47.75)	5.5	6.25 (13.25)	M6	M6	8.3	46	R1810 325 00
45	78	21.8	62.9	-	16.7 (26.8)	-	60 (70)	50.75 (60.75)	7.5	7.25 (17.25)	M6	M6	13.8	88	R1810 425 00
55	91.5	24.3	74.2	-	18.9 (29)	-	70 (80)	67.05 (77.05)	9	8.25 (18.25)	M6	M6	22.8	122	R1810 525 00
65	119	24.3	35	106	9.3	55	90	75.55	8.5	8.55	M8	M8	47.6	225	R1810 625 00

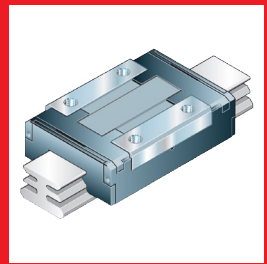
NOTE: The above lubrication units are to suit second generation roller guides only
part numbers ending with 2X suffix – first generation available on request

* Dimensions in brackets for high profile guides SNH & SLH

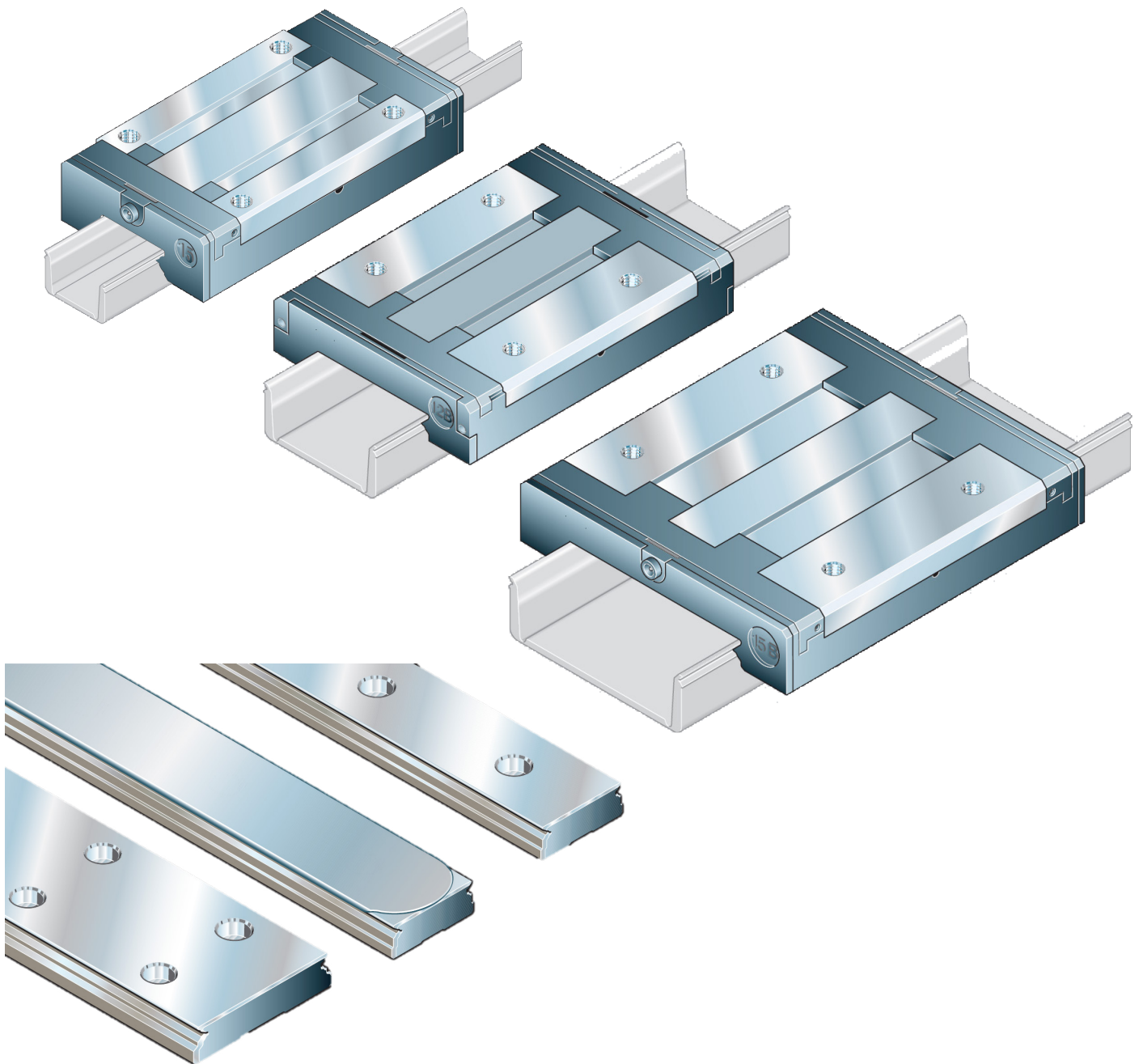
Un-filled Unit Order Code

R1810 X2X 10

INITIALLY LUBRICATE GUIDE BEFORE MOUNTING A FRONT LUBE UNIT AT EITHER END OF GUIDE
LUBRICATION UNITS CAN BE RE-FILLED VIA SIDE PORT OR END FACE – SIZE 25 END FACE ONLY



Miniature Linear Ball Guides

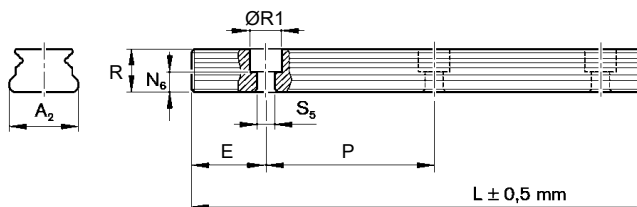


MINIATURE BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



Miniature Rails – Standard

For Standard Miniature Guide Blocks



R 0 4 4 5 2 0 3 31 - LENGTH

Miniature Ball Type Linear Rails

Width:

- 45 = Standard
- 55 = Wide

Nominal size:

- 7 = 7
- 8 = 9
- 2 = 12
- 5 = 15
- 0 = 20

Composition:

- 31 = 1pc Single Rail
- 32 = 2pc Butt Joint
- 3N = Npc Butt Joint

Accuracy Grade:

- 4 = N Grade
- 3 = H Grade (Stock)
- 2 = P Grade

Cover Option:

- 0 = Standard
- 6 = With Cover Strip

Rail Size	Rail Dimensions (mm)								kg / m	Max Length Single Piece	Ordering Code
	A2	R	R1	S5	N6	P	E MIN	RAIL BOLT			
7	7	4.7	4.3	2.5	2.2	15	5	M2	0.22	1000	R0445 703 31
9	9	5.5	6	3.5	2.2	20	6	M3	0.33	1000	R0445 803 31
12	12	7.8	6	3.5	3.0	25	6	M3	0.61	1000	R0445 203 31
15	15	9.5	6	3.5	4.7	40	6	M3	0.97	1000	R0445 503 31
20	20	15	9.5	6.0	6.5	60	6.5	M5	2.11	1000	R0445 003 31

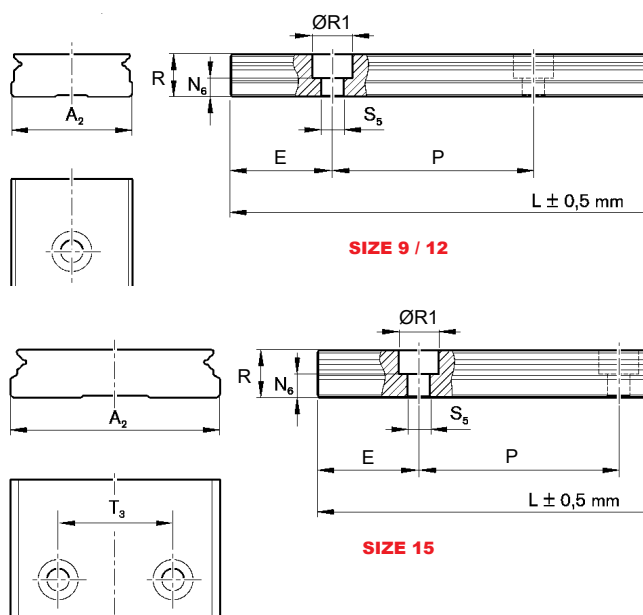
PLEASE SPECIFY RAIL LENGTHS IN MILLIMETERS WHEN ENQUIRING AND ORDERING
RAILS ARE STOCKED IN 1M LENGTHS BUT CAN BE BUTT JOINTED FOR LONGER LENGTHS
DIMENSION E WILL DEFAULT TO SYMETRICAL AT EACH END UNLESS OTHERWISE STATED

MINIATURE BALL GUIDE RAILS ARE STOCKED IN H GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST



Miniature Rails – Wide

For Wide Miniature Guide Blocks



R 0 4 5 5 2 0 3 31 - LENGTH

Miniature Ball Type Linear Rails

Width:

45 = Standard
55 = Wide

Nominal size:

8 = 9
2 = 12
5 = 15

Composition:

31 = 1pc Single Rail
32 = 2pc Butt Joint
3N = Npc Butt Joint

Accuracy Grade:

4 = N Grade
3 = H Grade (Stock)
2 = P Grade

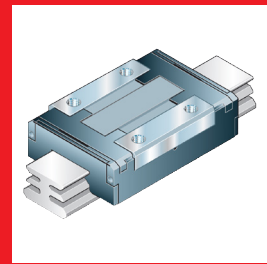
Cover Option:

0 = Standard
6 = With Cover Strip

Rail Size	Rail Dimensions (mm)									kg / m	Max Length Single Piece	Ordering Code
	A2	R	R1	S5	N6	P	E MIN	T3	RAIL BOLT			
9	18	7.5	6	3.5	2.7	30	6	-	M3	0.92	1000	R0455 803 31
12	24	8.5	8	4.5	3.7	40	6	-	M4	1.45	1000	R0455 203 31
15	42	9.5	8	4.5	4.7	40	6	23	M4	2.86	1000	R0455 503 31

PLEASE SPECIFY RAIL LENGTHS IN MILLIMETERS WHEN ENQUIRING AND ORDERING
RAILS ARE STOCKED IN 1M LENGTHS BUT CAN BE BUTT JOINTED FOR LONGER LENGTHS
DIMENSION E WILL DEFAULT TO SYMETRICAL AT EACH END UNLESS OTHERWISE STATED

MINIATURE BALL GUIDE RAILS ARE STOCKED IN H GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST

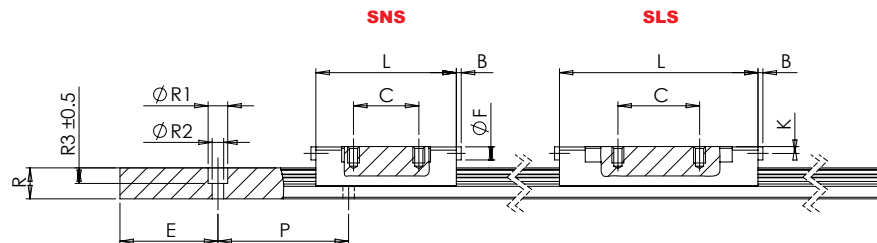
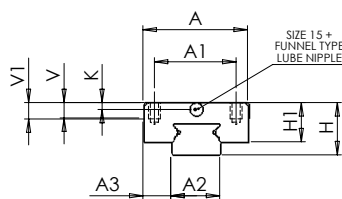
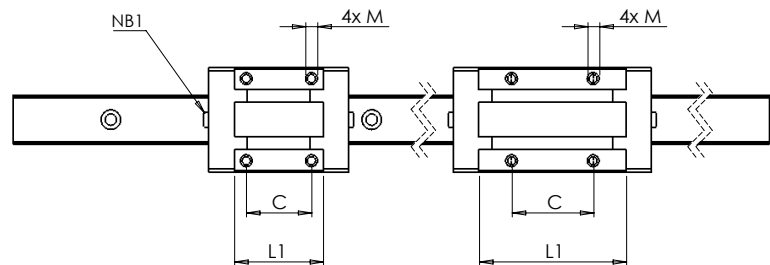


Square – Standard Width

Miniature Ball Guides – Dimensions

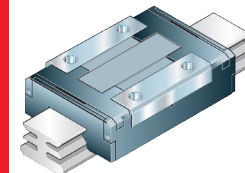
NB1: Size 7 ~ 12 = Small lube ports on end seals
Size 15 ~ 20 = Funnel type lube nipple

NB2: All steel parts of the miniature guide blocks and rails are made from corrosion resistant steel according to DIN EN 10088 as per NRII



Model	Block Dimensions (mm)														Rail Dimensions (mm)								
	H	H1	A	A1	A3	C	L	L1	B	F	M	V	V1	K	A2	R	R1	R2	R3	P	E MIN	RAIL BOLT	
SNS 7	8	6.5	17	12	5	8	24	14.9	-	-	M2	2	2.5	-	7	4.7	4.3	2.5	2.5	15	5	M2	
SLS 7						13	33	24.1															
SNS 9	10	8	20	15	5.5	10	31	20.7	-	-	M3	2.8	3	-	9	5.5	6	3.5	3.3	20	6	M3	
SLS 9						16	41.4	31.3															
SNS 12	13	10	27	20	7.5	15	34.8	21.6	-	-	M3	3.3	3.5	-	12	7.8	6	3.5	4.8	25	6	M3	
SLS 12						20	47.5	34.5															
SNS 15	16	12	32	25	8.5	20	43	27.2	1.5	4	M3	4.7	4	2.1	15	9.5	6	3.5	4.8	40	6	M3	
SLS 15						25	60.8	45															
SNS 20	25	17.5	46	38	13	38	66	45.1	1.5	4	M4	7	6	3.1	20	15	9.5	6	8.5	60	6.5	M5	

MINIATURE BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

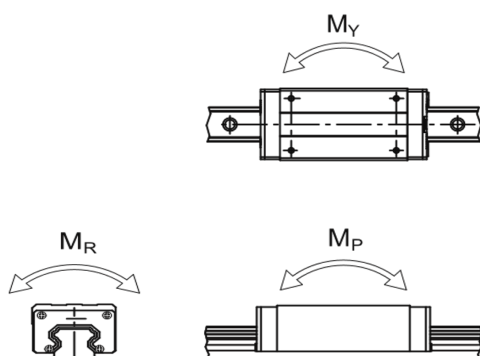


Square – Standard Width

Miniature Ball Guides – Specifications

Size	v max	a max *
7 – 20	3 m/s	250 m/s ²

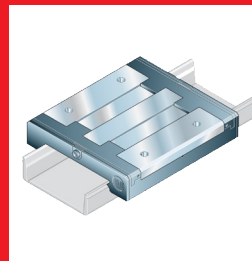
* a max = 50 m/s² if combined load > 2.8 x preload force



Miniature Ball Type Linear Guides	R 0 4 4 2	2 1 3	01	Seal Option:
				01 = Standard 00 = Extra Side Seals
Block Form:				Accuracy Grade:
42 = SNS = Normal 44 = SLS = Long				4 = N Grade 3 = H Grade (Stock) 2 = P Grade
Nominal size:				Preload Option:
7 = 7 5 = 35 8 = 9 0 = 45 2 = 12				9 = C0 Clearance 1 = C1 Light Preload

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings Nm				Preload Options vs Ordering Code			
				DYN	STAT	MR		MP & MY		C0 - Clearance		C1 - Light	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code
	SNS 7	0.01	0.22	0.86	1.40	3.1	5.1	1.9	3.2	0	R0442 793 01	15	R0442 713 01
	SLS 7	0.01		1.22	2.34	4.5	8.5	4.3	8.3		R0444 793 01	20	R0444 713 01
	SNS 9	0.02	0.33	1.18	2.10	5.4	9.6	3.6	6.4	0	R0442 893 01	20	R0442 813 01
	SLS 9	0.03		1.57	3.15	7.2	14.5	7.0	14.0		R0444 893 01	25	R0444 813 01
	SNS 12	0.03	0.61	2.31	3.47	13.7	20.6	7.9	11.8	0	R0442 293 01	35	R0442 213 01
	SLS 12	0.05		3.24	5.63	19.3	33.5	16.8	29.2		R0444 293 01	50	R0444 213 01
	SNS 15	0.05	0.97	4.20	6.26	31.2	46.3	18.3	27.0	0	R0442 593 01	70	R0442 513 01
	SLS 15	0.09		5.94	10.2	44.0	75.3	39.2	67.1		R0444 593 01	95	R0444 513 01
	SNS 20	0.18	2.11	7.90	12.2	81.4	126	51.7	80.0	0	R0442 093 01	125	R0442 013 01

MINIATURE BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

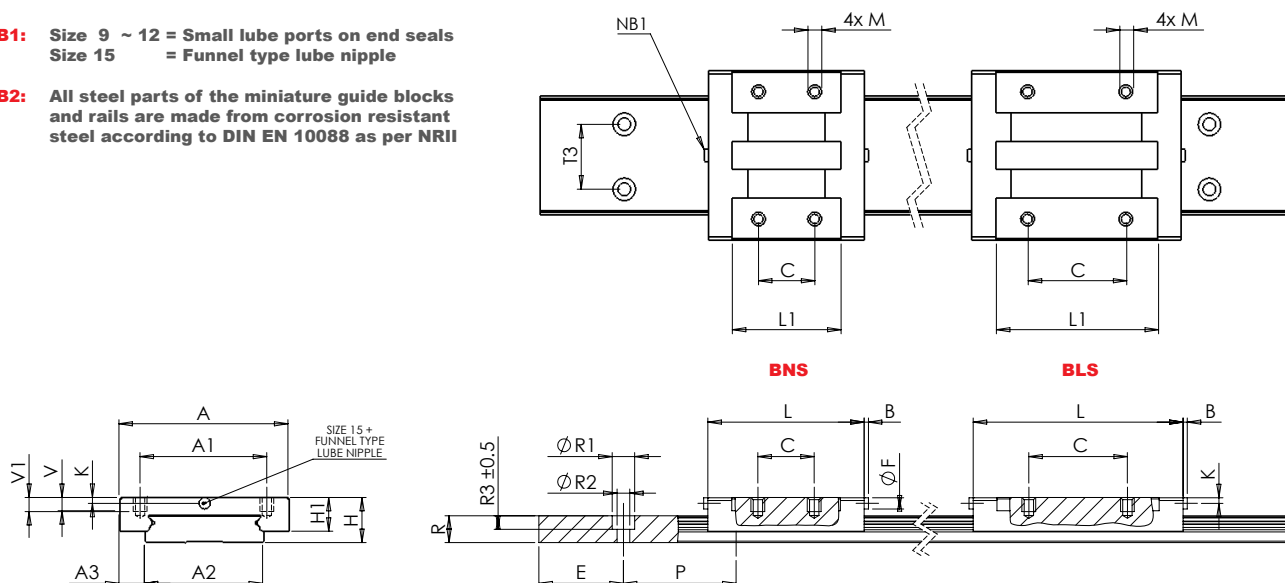


Square – Wide Profile

Miniature Ball Guides – Dimensions

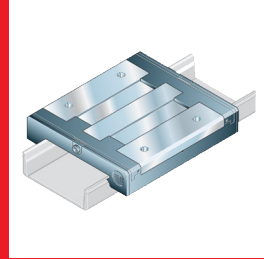
NB1: Size 9 ~ 12 = Small lube ports on end seals
Size 15 = Funnel type lube nipple

NB2: All steel parts of the miniature guide blocks and rails are made from corrosion resistant steel according to DIN EN 10088 as per NR11



Model	Block Dimensions (mm)														Rail Dimensions (mm)										
	H	H1	A	A1	A3	C	L	L1	B	F	M	V	V1	K	A2	R	R1	R2	R3	P	T3	E MIN	RAIL BOLT		
BNS 9	12	9	30	21	6	12	39	31.3	-	-	M3	2.8	3.2	-	18	7.5	6	3.5	4.8	30	-	6	M3		
BLS 9				23		24	51	38																	
BNS 12	14	10	40	28	8	15	44.5	34.5	-	-	M3	3.3	4	-	24	8.5	8	4.5	4.8	40	-	6	M4		
BLS 12				28		59.5	45																		
BNS 15	16	12	60	45	9	20	55.5	45	1.5	4	M4	4.7	4.5	2.1	42	9.5	8	4.5	4.8	40	23	6	M4		
BLS 15				35		74.5	57.6																		

MINIATURE BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST

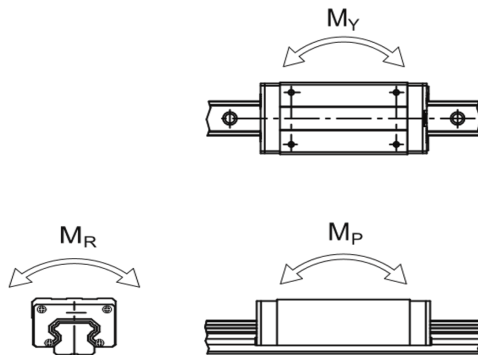


Square – Wide Profile

Miniature Ball Guides – Specifications

Size	v max	a max *
9 – 15	3 m/s	250 m/s ²

* a max = 50 m/s² if combined load > 2.8 x preload force



Miniature Ball Type Linear Guides	R 0 4 4 3	2 1 3	01	Seal Option:
				01 = Standard 00 = Extra Side Seals
Block Form:				Accuracy Grade:
43 = BNS = Normal 41 = BLS = Long				4 = N Grade 3 = H Grade (Stock) 2 = P Grade
Nominal size:				Preload Option:
8 = 9 2 = 12 5 = 15				9 = C0 Clearance 1 = C1 Light Preload

	Model	Block kg	Rail kg/m	Capacity kN		Moment Ratings Nm				Preload Options vs Ordering Code			
				DYN	STAT	MR		MP & MY		C0 - Clearance		C1 - Light	
						DYN	STAT	DYN	STAT	Force N	Order Code	Force N	Order Code
	BNS 9	0.03	0.92	1.92	3.33	15.9	27.6	7.4	12.9	0	R0443 893 01	30	R0443 813 01
	BLS 9	0.04		2.83	5.59	23.5	46.4	15.8	31.2		R0441 893 01	45	R0441 813 01
	BNS 12	0.05	1.45	3.20	5.34	37.9	63.2	14.3	23.9	0	R0443 293 01	50	R0443 213 01
	BLS 12	0.08		4.34	8.25	51.4	97.7	28.7	54.6		R0441 293 01	70	R0441 213 01
	BNS 15	0.11	2.86	5.29	8.61	107	174	30	49	0	R0443 593 01	85	R0443 513 01
	BLS 15	0.17		7.46	14.1	151	285	66	125		R0441 593 01	120	R0441 513 01

MINIATURE BALL GUIDES ARE STOCKED IN H GRADE WITH STANDARD SEALS ONLY
OTHER ACCURACY GRADES AND SEAL OPTIONS ARE AVAILABLE ON REQUEST



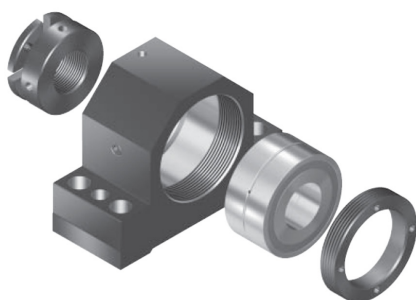
Further Product Ranges

Contact Us For More Information



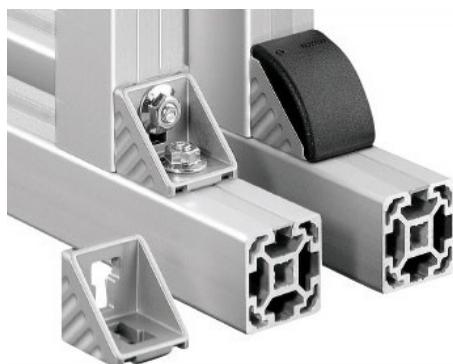
BALL BUSHES & LINEAR SHAFT

Full Range Of Bosch Rexroth Linear Bushes
& In-house Cutting & Machining Services For
Hardened & Ground Precision Linear Shafts



BALLSCREW SUPPORT BEARING UNITS

Full Range Of Bosch Rexroth Support Bearing Units
For Use With Precision Rolled Ballscrew Assemblies
In-house Ballscrew Journal Machining Also Available



ALUMINIUM PROFILE & ACCESSORIES

Bosch Rexroth Aluminium Extruded Profiling & Range
Of Accessories Available From Stock Ready To Be Cut,
Machined & Shipped To Customer Specification



PLANETARY REDUCTION GEARBOXES

Wide Range Of Precision Planetary Gearboxes
Including Drop In Replacements For All Major
Manufacturers All Available On Short Lead Times



Precision Rolled Ballscrews

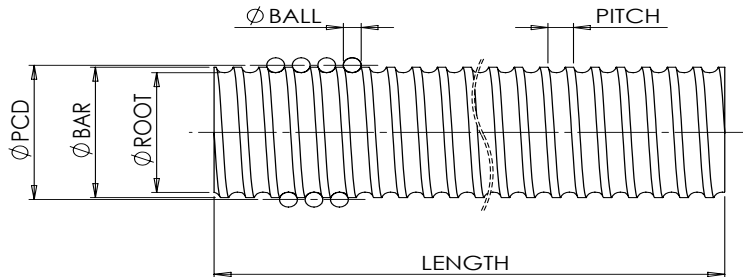


ROLLED BALLSCREWS ARE STOCKED IN T5 ACCURACY GRADE ONLY
OTHER ACCURACY GRADES ARE AVAILABLE ON REQUEST



Ballscrew Stock Lengths

Precision Rolled T5 Accuracy



Design Parameter	Value
Material Type	Steel Cf53
DIN Standard	T5 Rolled
Pitch Error (Vp)	0.023 / 300 mm
Single Pitch Error	± 0.008 mm Max
Straightness	0.300 / 300 mm
Raceway Hardness	58 – 62 HRC

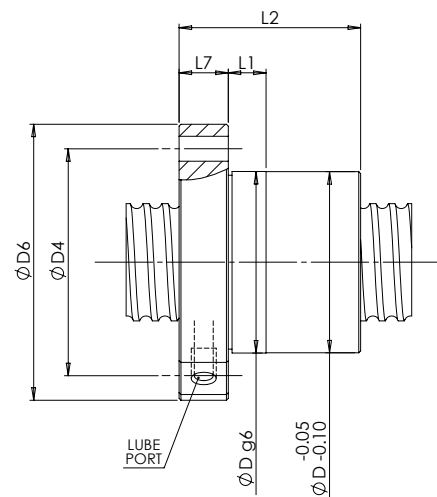
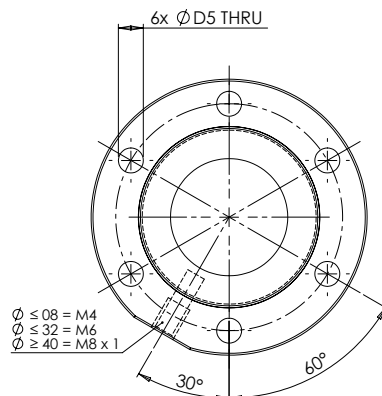
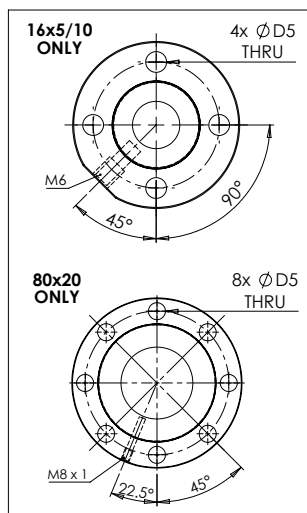
Nom DIA (PCD)	Pitch	Thread Dimensions (mm)			Inertia (kgcm ² /m)	Weight (kg/m)	Stocked Length	Max Length On Request	Stock Length Ordering Code
		Ball Ø	Root Ø	Bar Ø					
12	5	2	9.9	11.4	0.11	0.75	1500	2500	R1531 465 10 - 1500
	10				0.11	0.74			R1531 495 00 - 1500
16	5	3	12.9	15	0.31	1.24	1500	3500	R1511 015 00 - 1500
	10				0.31	1.23			R1511 045 00 - 1500
	16				0.34	1.29			R1511 065 10 - 1500
20	5	3	16.9	19	0.84	2.03	2500	3500	R1511 115 00 - 2500
	10				0.84	2.03			R1511 145 00 - 2500
	20	3.5	16.7		0.81	1.99			R1511 175 10 - 2500
25	5	3	21.9	24	2.22	3.31	2500	4500	R1511 215 00 - 2500
	10				2.39	3.43			R1511 245 00 - 2500
	25	3.5	21.4		2.15	3.25			R1511 285 10 - 2500
32	5	3.5	28.4	31	6.05	5.45	2500	4500	R1511 315 00 - 2500
	10	3.969	27.9		6.40	5.60			R1511 345 10 - 2500
	20				6.39	5.60			R1511 375 10 - 2500
	32				6.17	5.50			R1511 395 10 - 2500
40	5	3.5	36.4	39	15.64	8.78	4500	5000	R1511 415 00 - 4500
	10	6	33.8	38	13.55	8.15		6000	R1511 445 00 - 4500
	12				13.97	8.27		5000	R1511 455 00 - 4500
	16				12.90	7.95		5000	R1511 465 00 - 4500
	20				13.52	8.14		6000	R1511 475 00 - 4500
	40				13.42	8.11		6000	R1511 495 10 - 4500
50	5	3.5	46.4	49	40.03	14.05	4500	5000	R1511 515 00 - 4500
	10	6	43.8	48	35.71	13.25		6000	R1511 545 00 - 4500
	12				36.58	13.41		5000	R1511 555 00 - 4500
	16				34.37	13.00		5000	R1511 565 00 - 4500
	20	6.5	43.4		34.50	13.01		6000	R1511 575 10 - 4500
	40				34.34	12.98		6000	R1511 595 10 - 4500
63	10	6	56.8	61	95.82	21.72	4500	6000	R1511 645 00 - 4500
	20	6.5	56.4		93.29	21.42			R1511 675 10 - 4500
	40				93.08	21.40			R1511 695 10 - 4500
80	10	6.5	73.3	78	256.86	35.58	4500	6000	R1511 745 00 - 4500
	20	12.7	67.0	76	211.51	32.16	ON REQUEST		R1571 775 00 - 0000

LONGER LENGTHS AVAILABLE ON REQUEST. APEX OFFER IN-HOUSE BALLSCREW CUTTING & MACHINING SERVICES FOR END JOURNAL PREPARATION TO CUSTOMER SPECIFICATION



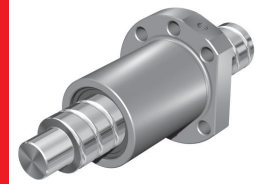
Full Round Flange

Single Ballscrew Nuts



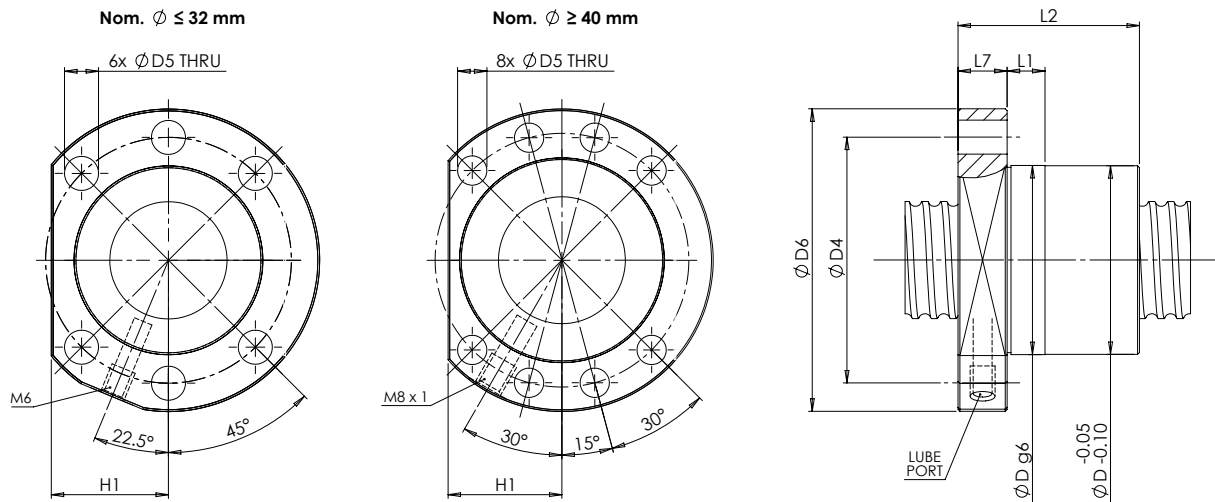
Nom DIA	Lead	Circs	Load Ratings kN		Thread Dimensions (mm)			Nut Dimensions (mm)							Order Code	
			Dyn	Stat	Ball Ø	Root Ø	Bar Ø	D	D4	D5	D6	L1	L2	L7		
12	5	3	4.5	5.8	2	9.9	11.4	24	32	4.5	40	10	28	12	R1532 460 23	
	10	2	3.0	3.6								16	33		R1532 490 13	
16	5	4	14.8	16.1	3	12.9	15	28	40	6.6	53	10	38	12	R1512 010 23	
	10	3	11.5	12.3								16	45		R1512 040 13	
20	5	4	17.2	21.5	3	16.9	19	33	45	6.6	58	10	40	12	R1512 110 13	
	10	4	16.9	21.3								16	60		R1512 140 13	
25	5	4	19.1	27.2	3	21.9	24	38	50	6.6	63	10	45	12	R1512 210 13	
	10	4	18.8	27.0								16	64		R1512 240 13	
32	5	4	25.9	40.0	3.5	28.4	31	48	60	6.6	73	10	48	13	R1512 310 13	
	10	5	38.0	58.3	3.969	27.9		56	68			80	25		64	15
	20	2	16.2	21.8					80				25	64	15	R1512 370 13
40	5	5	34.9	64.1	3.5	36.4	39	56	68	6.6	80	10	54	15	R1512 410 13	
	10	4	60.0	86.4	6	33.8	38	63	78	9	95	16	70		R1512 440 13	
	10	6	86.5	132.2								16	90		R1512 440 23	
	20	3	45.5	62.8								25	88		R1512 470 13	
50	5	5	38.4	81.3	3.5	46.4	49	68	82	9	98	10	54	15	R1512 510 13	
	10	6	95.6	166.5	6	43.8	48	72	90	11	110	16	90	18	R1512 540 13	
	20	3	57.5	87.9	6.5	43.4		85	105			125	25	92	22	R1512 570 13
	40	2	38.5	55.8									45	109		R1512 590 13
63	10	6	106.6	214.3	6	56.8	61	85	105	11	125	16	90	22	R1512 640 13	
	20	3	63.8	112.1	6.5	56.4		95	118	14	140	25	92		R1512 670 13	
	40	2	44.3	74.3								45	109		R1512 690 13	
80	10	6	130.1	291.7	6.5	73.3	78	105	125	14	150	16	95	22	R1512 740 13	
	20	6	315.2	534.2	12.7	67.0	76	125	152	18	180	25	170	25	R1512 770 23	

PRE-LOAD OPTIONS, LUBRICATION UNITS AND DOUBLE BALLSCREW NUTS ALSO AVAILABLE
ON REQUEST - PLEASE CONTACT OUR SALES TEAM WITH YOUR REQUIREMENTS



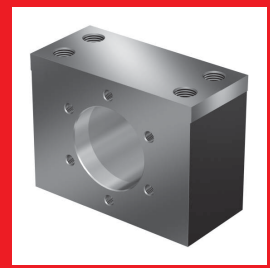
Single Flat – Flange Form C

Single Ballscrew Nuts – DIN 69051 Part 5



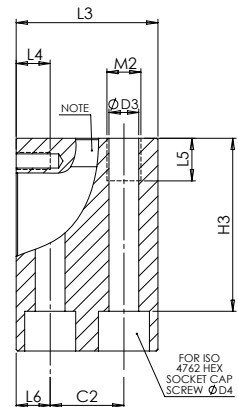
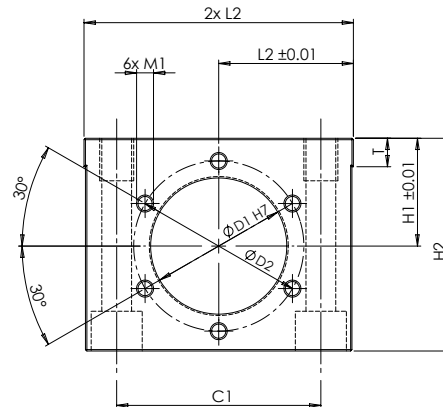
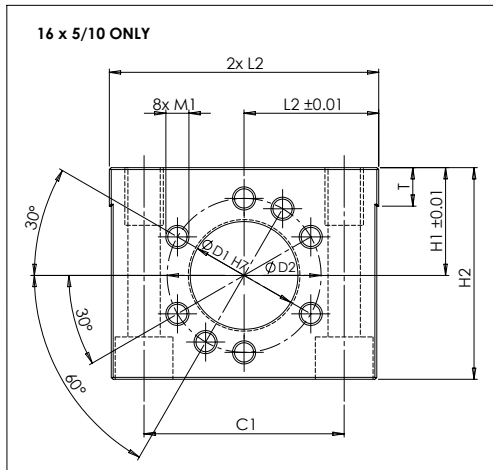
Nom DIA	Lead	Circs	Load Ratings kN		Thread Dimensions (mm)			Nut Dimensions (mm)								Order Code Flange Form C
			Dyn	Stat	Ball Ø	Root Ø	Bar Ø	D	D4	D5	D6	H1	L1	L2	L7	
16	5	4	14.8	16.1	3	12.9	15	28	38	5.5	48	20	10	38	12	R1502 010 65
	10	3	11.5	12.3									16	45		R1502 040 85
	16	3	11.2	12.0									20	61		R1502 060 65
20	5	4	17.2	21.5	3	16.9	19	36	47	6.6	58	22	10	40	12	R1502 110 85
	10	4	16.9	21.3									16	60		R1502 140 65
	20	3	16.0	18.8									25	77		R1502 170 65
25	5	4	19.1	27.2	3	21.9	24	40	51	6.6	62	24	10	45	12	R1502 210 85
	10	4	18.8	27.0									16	64		R1502 240 85
	25	3	17.6	23.3									30	95		R1502 280 65
32	5	4	25.9	40.0	3.5	28.4	31	50	65	9	80	31	10	48	13	R1502 310 85
	10	5	38.0	58.3									16	77		R1502 340 86
	20	3	23.6	33.7									25	84		R1502 370 65
	32	3	23.4	34.0									40	120		R1502 390 65
40	5	5	34.9	64.1	3.5	36.4	39	63	78	9	93	35	10	54	15	R1502 410 86
	10	4	60.0	86.4									16	70		R1502 440 85
	10	6	86.5	132.2									16	90		R1502 440 86
	12	4	59.9	86.2									25	75		R1502 450 65
	16	4	59.6	85.9									25	90		R1502 460 65
	20	3	45.5	62.8									25	88		R1502 470 85
	40	3	44.4	62.3									45	142		R1502 490 65
50	5	5	38.4	81.3	3.5	46.4	49	75	93	11	110	42.5	10	54	15	R1502 510 86
	10	6	95.6	166.5									16	90		R1502 540 86
	12	6	95.5	166.4									25	105		R1502 550 66
	16	6	95.3	166.0									25	128		R1502 560 66
	20	5	90.8	149.7									25	132		R1502 570 86
	40	3	55.8	85.9									45	149		R1502 590 65
63	10	6	106.6	214.3	6	56.8	61	90	108	11	125	47.5	16	90	22	R1502 640 86
	20	5	100.7	190.3				95	115	13.5	135	50	25	132		R1502 670 86
	40	3	64.1	114.1									45	149		R1502 690 65
80	10	6	130.1	291.7	6.5	73.3	78	105	125	13.5	145	55	16	95	22	R1502 740 86
	20	6	315.2	534.2				125	145	13.5	165	65	25	170		R1502 770 96

Single Ballscrew Nuts – DIN 69051 Part 5



Ball Nut Housings

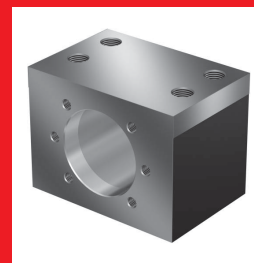
For Full Round Flange Nuts



NOTE: DATUM EDGES ARE FORMED ON BOTH SIDES OF EACH HOUSING

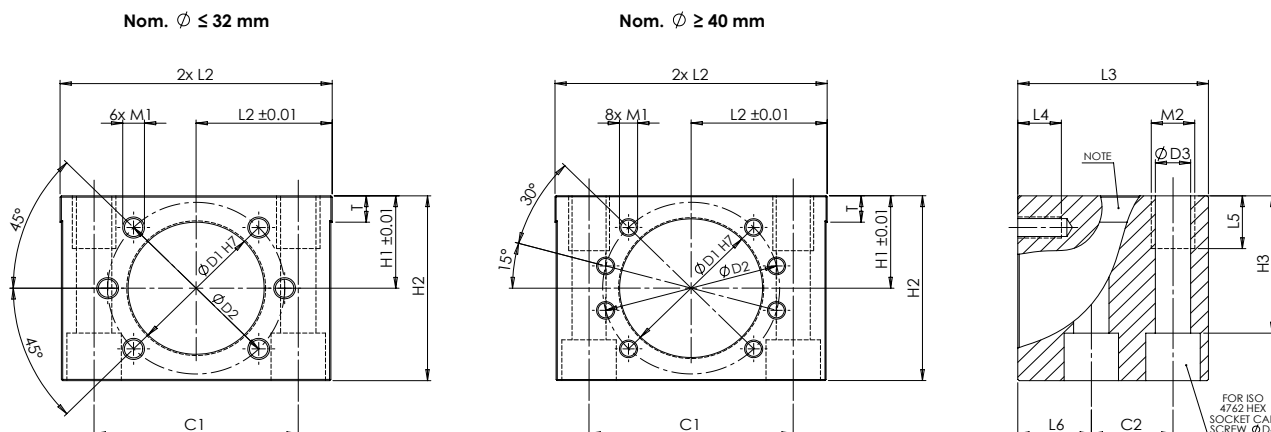
Nom DIA	Lead	Housing Dimensions (mm)																	Mass (kg)	Order Code
		C1	C2	D1	D2	D3	D4	H1	H2	H3	L2	L3	L4	L5	L6	M1	M2	T		
16	5	52 ±0.1	20 ±0.1	28	40	8.4	M8	28	55	44	35	40	10	15	10	M6	M10	10	0.85	R1506 000 20
	10	52 ±0.1	20 ±0.1	28	40	8.4	M8	28	55	44	35	40	10	15	10	M6	M10	10	0.85	R1506 000 20
20	5	56 ±0.1	20 ±0.1	33	45	8.4	M8	32	62	51	37.5	40	10	15	10	M6	M10	10	1.05	R1506 100 20
	10	56 ±0.1	20 ±0.1	33	45	8.4	M8	32	62	51	37.5	40	10	15	10	M6	M10	10	1.05	R1506 100 20
25	5	63 ±0.1	20 ±0.1	38	50	8.4	M8	34	65	54	42.5	40	10	15	10	M6	M10	10	1.18	R1506 200 20
	10	63 ±0.1	20 ±0.1	38	50	8.4	M8	34	65	54	42.5	40	10	15	10	M6	M10	10	1.18	R1506 200 20
32	5	72 ±0.1	26 ±0.1	48	60	10.5	M10	38	75	61	47.5	50	10	15	12	M6	M12	10	1.75	R1506 300 20
	10	72 ±0.1	26 ±0.1	48	60	10.5	M10	38	75	61	47.5	50	10	15	12	M6	M12	10	1.75	R1506 300 20
40	5	82 ±0.1	30 ±0.1	56	68	13	M12	42	82	64	52.5	60	12	20	15	M6	M16	12	2.37	R1506 400 20
	10	82 ±0.1	30 ±0.1	56	68	13	M12	42	82	64	52.5	60	12	20	15	M6	M16	12	2.37	R1506 400 20
50	5	93 ±0.1	35 ±0.1	63	78	15	M14	50	98	79.5	60	65	14	25	15	M8	M18	12	3.59	R1506 400 21
	10	93 ±0.1	35 ±0.1	63	78	15	M14	50	98	79.5	60	65	14	25	15	M8	M18	12	3.59	R1506 400 21
63	5	100 ±0.15	35 ±0.15	68	82	15	M14	52	101	82.5	65	65	14	30	15	M8	M18	12	4.00	R1506 500 20
	10	100 ±0.15	35 ±0.15	68	82	15	M14	52	101	82.5	65	65	14	30	15	M8	M18	12	4.00	R1506 500 20
80	5	108 ±0.15	46 ±0.15	72	90	17	M16	58	113	92	70	80	18	30	17	M10	M20	12	6.19	R1506 500 21
	10	108 ±0.15	46 ±0.15	72	90	17	M16	58	113	92	70	80	18	30	17	M10	M20	12	6.19	R1506 500 21
100	5	121 ±0.15	46 ±0.15	85	105	17	M16	65	128	107	75	80	18	30	17	M10	M20	15	7.17	R1506 600 20
	10	121 ±0.15	46 ±0.15	85	105	17	M16	65	128	107	75	80	18	30	17	M10	M20	15	7.17	R1506 600 20
125	5	140 ±0.2	46 ±0.15	105	125	17	M16	78	153	132	85	80	20	30	17	M12	M20	15	9.33	R1506 700 20
	10	140 ±0.2	46 ±0.15	105	125	17	M16	78	153	132	85	80	20	30	17	M12	M20	15	9.33	R1506 700 20

AS WELL AS OUR RANGE OF STANDARD PRODUCTS WE CAN ALSO MANUFACTURE SPECIAL COMPONENTS IN HOUSE – PLEASE CONTACT OUR SALES TEAM WITH YOUR REQUIREMENTS



Ball Nut Housings

For DIN 69051 - 5 Flange Nuts



NOTE: DATUM EDGES ARE FORMED ON BOTH SIDES OF EACH HOUSING

Nom DIA	Lead	Housing Dimensions (mm)																	Mass (kg)	Order Code
		C1	C2	D1	D2	D3	D4	H1	H2	H3	L2	L3	L4	L5	L6	M1	M2	T		
16	5																			
	10	50 ±0.1	20 ±0.1	28	38	8.4	M8	24	48	37	35	50	10	15	20	M5	M10	10	0.91	R1506 000 50
	16																			
20	5																			
	10	55 ±0.1	23 ±0.1	36	47	8.4	M8	48	56	45	37.5	55	11	15	22	M6	M10	10	1.18	R1506 100 50
	20																			
25	5																			
	10	60 ±0.1	23 ±0.1	40	51	8.4	M8	30	60	49	40	55	11	15	22	M6	M10	10	1.33	R1506 200 50
	25																			
32	5																			
	10	75 ±0.1	30 ±0.1	50	65	13	M12	35	70	52	50	70	14	20	27	M8	M16	10	2.27	R1506 300 50
	20																			
	32																			
40	5																			
	10	90 ±0.1	35 ±0.1	63	78	15	M14	42	84	65.5	60	80	17	25	31	M8	M18	12	3.61	R1506 400 50
	12																			
	20																			
50	5																			
	10	110 ±0.15	45 ±0.15	75	93	17	M16	48	96	75	70	95	17	30	34	M10	M20	12	5.63	R1506 500 50
	12																			
	20																			
63	10	120 ±0.2	46 ±0.15	90	108	17	M16	55	110	89	75	100	20	30	37	M10	M20	15	6.72	R1506 600 50
	20	130 ±0.2	46 ±0.15	95	115	17	M16	58	116	95	80	100	20	30	37	M12	M20	15	7.67	R1506 600 51
	40																			
80	10	140 ±0.2	46 ±0.15	105	125	17	M16	63	126	105	85	100	20	30	37	M12	M20	15	8.60	R1506 700 50
	20	160 ±0.2	46 ±0.15	125	145	17	M16	73	146	125	95	100	22	30	37	M12	M20	15	10.53	R1506 700 51



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