

Standard Ball Runner Blocks made of steel

FNS – Flanged, normal, standard height

R1651 ... 2.

Dynamic characteristics

Travel speed: $v_{\max} = 5 \text{ m/s}$








Acceleration: $a_{\max} = 500 \text{ m/s}^2$

(If $F_{\text{comb}} > 2.8 \cdot F_{\text{pr}}$: $a_{\max} = 50 \text{ m/s}^2$)

Note on lubrication

- Pre-lubricated

Further Ball Runner Blocks FNS

- Heavy Duty Ball Runner Blocks made of steel, size 55 and 65  60
- High Precision Ball Runner Blocks made of steel  72
- High-Speed Ball Runner Blocks made of steel  84
- Ball Runner Blocks made of aluminum  94
- Corrosion-resistant Ball Runner Blocks Resist NR  100 Resist NR II  104 Resist CR  108

Note

Can be used on all Ball Guide Rails SNS.

Ordering example

Options:

- Ball Runner Block FNS
- Size 30
- Preload class C1
- Accuracy class H
- With standard seal, without ball chain

Part number: R1651 713 20



Options and part numbers

Size	Ball runner block with size	Preload class			Accuracy class			Seal for ball runner block					
		C0	C1	C2	N	H	P	without ball chain			with ball chain		
								SS	LS ¹⁾	DS	SS	LS ¹⁾	DS
15	R1651 1	9	1	2	4	3	–	20	21	–	22	23	–
					4	3	2	20	21	–	22	23	–
					–	3	2	20	–	–	22	–	–
20	R1651 8	9	1	2	4	3	–	20	21	–	22	23	–
					4	3	2	20	21	2Z	22	23	2Y
					–	3	2	20	–	2Z	22	–	2Y
25	R1651 2	9	1	2	4	3	–	20	21	–	22	23	–
					4	3	2	20	21	2Z	22	23	2Y
					–	3	2	20	–	2Z	22	–	2Y
30	R1651 7	9	1	2	4	3	–	20	21	–	22	23	–
					4	3	2	20	21	2Z	22	23	2Y
					–	3	2	20	–	2Z	22	–	2Y
35	R1651 3	9	1	2	4	3	–	20	21	–	22	23	–
					4	3	2	20	21	2Z	22	23	2Y
					–	3	2	20	–	2Z	22	–	2Y
45	R1651 4	9	1	2	4	3	–	20	–	–	22	–	–
					4	3	2	20	–	2Z	22	–	2Y
					–	3	2	20	–	2Z	22	–	2Y
e.g.	R1651 7		1			3		20					

1) Only with accuracy classes N and H

Preload classes

C0 = without preload
 C1 = preload 2% C
 C2 = preload 8% C

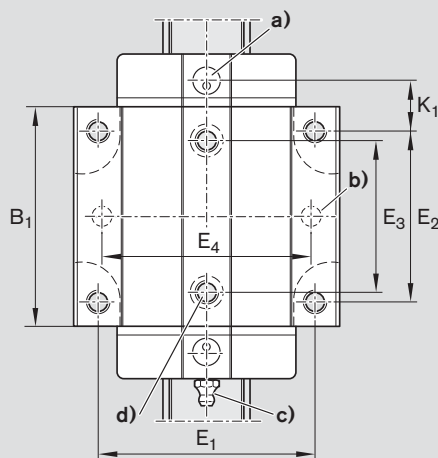
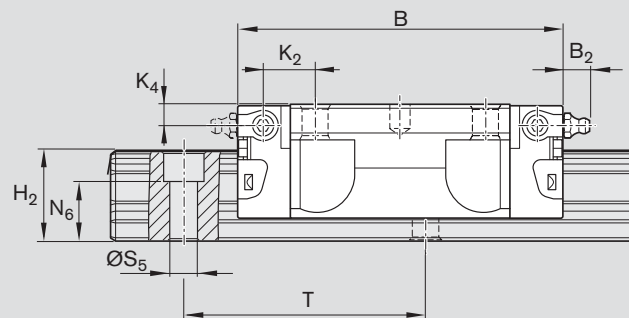
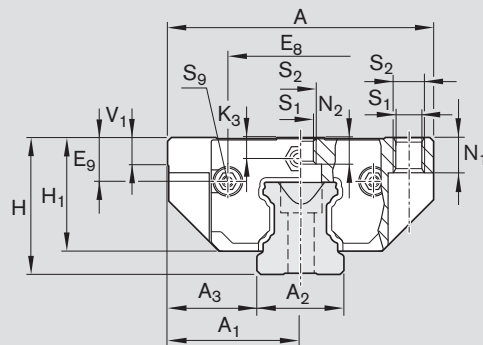
Seals

SS = standard seal
 LS = low-friction seal
 DS = double-lipped seal

Key to table

Gray numbers
 = version/combination not preferred
 (longer delivery times in some cases)

Ball Runner Blocks FNS



- a) For O-ring
Size 15: $\text{Ø } 4 \cdot 1.0$ (mm)
Size 20 - 45: $\text{Ø } 5 \cdot 1.0$ (mm)
Open lube bore as required (☞ 258).
- b) Recommended position for pin holes (dimensions E_4 ☞ 235).
Due to manufacturing reasons, there may be rough-drilled holes at the recommended positions. These may be bored open to accommodate the locating pins.
- c) Lube nipple, size 15 - 20:
Funnel-type lube nipple DIN 3405-A M3x5, $B_2 = 1.6$ mm
If another lube nipple is used: observe the screw-in depth of 5 mm!
Lube nipple, size 25 - 45:
Hydraulic-type lube nipple DIN 71412-B M6x8, $B_2 = 9.5$ mm
If another lube nipple is used: observe the screw-in depth of 8 mm!
Lube nipples are provided (unmounted). Connection possible at all sides.
- d) For manufacturing reasons, there may be plugs at these positions. These must be removed before mounting.

Size	Dimensions (mm)																		
	A	A ₁	A ₂	A ₃	B	B ₁	E ₁	E ₂	E ₃	E ₈	E ₉	H	H ₁	H ₂ ¹⁾	H ₂ ²⁾	K ₁	K ₂	K ₃	K ₄
15	47	23.5	15	16.0	58.2	39.2	38	30	26	24.55	6.70	24	19.90	16.30	16.20	8.00	9.6	3.20	3.20
20	63	31.5	20	21.5	75.0	49.6	53	40	35	32.50	7.30	30	25.35	20.75	20.55	11.80	11.8	3.35	3.35
25	70	35.0	23	23.5	86.2	57.8	57	45	40	38.30	11.50	36	29.90	24.45	24.25	12.45	13.6	5.50	5.50
30	90	45.0	28	31.0	97.7	67.4	72	52	44	48.40	14.60	42	35.35	28.55	28.35	14.00	15.7	6.05	6.05
35	100	50.0	34	33.0	110.5	77.0	82	62	52	58.00	17.35	48	40.40	32.15	31.85	14.50	16.0	6.90	6.90
45	120	60.0	45	37.5	137.6	97.0	100	80	60	69.80	20.90	60	50.30	40.15	39.85	17.30	19.3	8.20	8.20

Size	Dimensions (mm)										Weight (kg)	Load capacities ³⁾ (N)		Load moments ³⁾ (Nm)			
	N ₁	N ₂	N ₆ ^{±0.5}	S ₁	S ₂	S ₅	S ₉	T	V ₁	C		C ₀	M _t	M _{t0}	M _L	M _{L0}	
15	5.2	4.40	10.3	4.3	M5	4.4	M2.5x3.5	60	5.0	0.20	7 800	13 500	74	130	40	71	
20	7.7	5.20	13.2	5.3	M6	6.0	M3x5	60	6.0	0.45	18 800	24 400	240	310	130	165	
25	9.3	7.00	15.2	6.7	M8	7.0	M3x5	60	7.5	0.65	22 800	30 400	320	430	180	240	
30	11.0	7.90	17.0	8.5	M10	9.0	M3x5	80	7.0	1.10	31 700	41 300	540	720	290	380	
35	12.0	10.15	20.5	8.5	M10	9.0	M3x5	80	8.0	1.60	41 900	54 000	890	1 160	440	565	
45	15.0	12.40	23.5	10.4	M12	14.0	M4x7	105	10.0	3.00	68 100	85 700	1 830	2 310	890	1 130	

- 1) Dimension H₂ with cover strip
- 2) Dimension H₂ without cover strip
- 3) Load capacities and moments for Ball Runner Block **without** ball chain. Load capacities and moments for Ball Runner Block **with** ball chain ☞ 8.
Determination of the dynamic load capacities and moments is based on a travel life of 100,000 m per ISO 14728-1. Often only 50,000 m are actually stipulated. For comparison: Multiply values **C**, **M_t** and **M_L** from the table by 1.26.

Standard Ball Runner Blocks made of steel

FLS – Flanged, long, standard height

R1653 ... 2.

Dynamic characteristics

Travel speed: $v_{max} = 5 \text{ m/s}$
 Acceleration: $a_{max} = 500 \text{ m/s}^2$
 (If $F_{comb} > 2.8 \cdot F_{pr}$: $a_{max} = 50 \text{ m/s}^2$)

Note on lubrication

- Pre-lubricated

Further Ball Runner Blocks FLS

- Heavy Duty Ball Runner Blocks made of steel, size 55 and 65 62
- High Precision Ball Runner Blocks made of steel 72
- Corrosion-resistant Ball Runner Blocks
 Resist NR 100
 Resist CR 108



Note

Can be used on all Ball Guide Rails SNS.

Options and part numbers

Size	Ball runner block with size	Preload class			Accuracy class			Seal for ball runner block					
		C0	C1	C2	N	H	P	without ball chain			with ball chain		
								SS	LS ¹⁾	DS	SS	LS ¹⁾	DS
15	R1653 1	9			4	3	-	20	21	-	22	23	-
			1		4	3	2	20	21	-	22	23	-
				2	-	3	2	20	-	-	22	-	-
20	R1653 8	9			4	3	-	20	21	-	22	23	-
			1		4	3	2	20	21	2Z	22	23	2Y
				2	-	3	2	20	-	2Z	22	-	2Y
25	R1653 2	9			4	3	-	20	21	-	22	23	-
			1		4	3	2	20	21	2Z	22	23	2Y
				2	-	3	2	20	-	2Z	22	-	2Y
30	R1653 7	9			4	3	-	20	21	-	22	23	-
			1		4	3	2	20	21	2Z	22	23	2Y
				2	-	3	2	20	-	2Z	22	-	2Y
35	R1653 3	9			4	3	-	20	21	-	22	23	-
			1		4	3	2	20	21	2Z	22	23	2Y
				2	-	3	2	20	-	2Z	22	-	2Y
45	R1653 4	9			4	3	-	20	-	-	22	-	-
			1		4	3	2	20	-	2Z	22	-	2Y
				2	-	3	2	20	-	2Z	22	-	2Y
e.g.	R1653 7		1			3		20					

Ordering example

- Options:
- Ball Runner Block FLS
 - Size 30
 - Preload class C1
 - Accuracy class H
 - With standard seal, without ball chain
- Part number: R1653 713 20

1) Only with accuracy classes N and H

Preload classes

- C0 = without preload
- C1 = preload 2% C
- C2 = preload 8% C

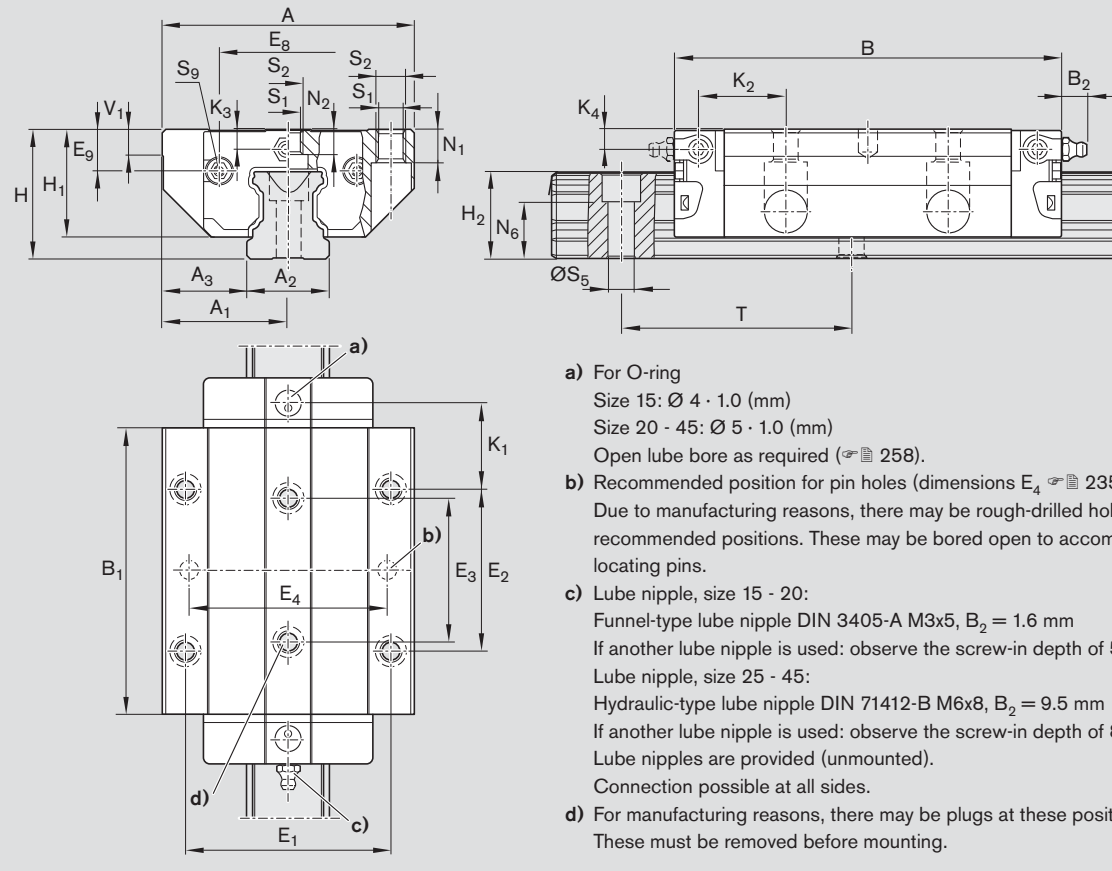
Seals

- SS = standard seal
- LS = low-friction seal
- DS = double-lipped seal

Key to table

Gray numbers
 = version/combination not preferred
 (longer delivery times in some cases)

Ball Runner Blocks FLS



- a) For O-ring
Size 15: $\text{Ø } 4 \cdot 1.0$ (mm)
Size 20 - 45: $\text{Ø } 5 \cdot 1.0$ (mm)
Open lube bore as required (☞ 258).
- b) Recommended position for pin holes (dimensions E₄ ☞ 235).
Due to manufacturing reasons, there may be rough-drilled holes at the recommended positions. These may be bored open to accommodate the locating pins.
- c) Lube nipple, size 15 - 20:
Funnel-type lube nipple DIN 3405-A M3x5, B₂ = 1.6 mm
If another lube nipple is used: observe the screw-in depth of 5 mm!
Lube nipple, size 25 - 45:
Hydraulic-type lube nipple DIN 71412-B M6x8, B₂ = 9.5 mm
If another lube nipple is used: observe the screw-in depth of 8 mm!
Lube nipples are provided (unmounted).
Connection possible at all sides.
- d) For manufacturing reasons, there may be plugs at these positions.
These must be removed before mounting.

Size	Dimensions (mm)																		
	A	A ₁	A ₂	A ₃	B	B ₁	E ₁	E ₂	E ₃	E ₈	E ₉	H	H ₁	H ₂ ¹⁾	H ₂ ²⁾	K ₁	K ₂	K ₃	K ₄
15	47	23.5	15	16.0	72.6	53.6	38	30	26	24.55	6.70	24	19.90	16.30	16.20	15.20	16.80	3.20	3.20
20	63	31.5	20	21.5	91.0	65.6	53	40	35	32.50	7.30	30	25.35	20.75	20.55	19.80	19.80	3.35	3.35
25	70	35.0	23	23.5	107.9	79.5	57	45	40	38.30	11.50	36	29.90	24.45	24.25	23.30	24.45	5.50	5.50
30	90	45.0	28	31.0	119.7	89.4	72	52	44	48.40	14.60	42	35.35	28.55	28.35	25.00	26.70	6.05	6.05
35	100	50.0	34	33.0	139.0	105.5	82	62	52	58.00	17.35	48	40.40	32.15	31.85	28.75	30.25	6.90	6.90
45	120	60.0	45	37.5	174.1	133.5	100	80	60	69.80	20.90	60	50.30	40.15	39.85	35.50	37.50	8.20	8.20

Size	Dimensions (mm)											Weight (kg)	Load capacities ³⁾ (N)		Load moments ³⁾ (Nm)			
	N ₁	N ₂	N ₆ ^{±0.5}	S ₁	S ₂	S ₅	S ₉	T	V ₁	C	C ₀		M _t	M _{t0}	M _L	M _{L0}		
15	5.2	4.40	10.3	4.3	M5	4.4	M2.5x3.5	60	5.0	0.30	10 000	20 200	96	190	75	150		
20	7.7	5.20	13.2	5.3	M6	6.0	M3x5	60	6.0	0.55	24 400	35 200	310	450	225	330		
25	9.3	7.00	15.2	6.7	M8	7.0	M3x5	60	7.5	0.90	30 400	45 500	430	650	345	510		
30	11.0	7.90	17.0	8.5	M10	9.0	M3x5	80	7.0	1.50	40 000	57 800	690	1 000	495	715		
35	12.0	10.15	20.5	8.5	M10	9.0	M3x5	80	8.0	2.25	55 600	81 000	1 200	1 740	830	1 215		
45	15.0	12.40	23.5	10.4	M12	14.0	M4x7	105	10.0	4.30	90 400	128 500	2 440	3 470	1 700	2 425		

1) Dimension H₂ with cover strip

2) Dimension H₂ without cover strip

3) Load capacities and moments for Ball Runner Block **without** ball chain. Load capacities and moments for Ball Runner Block **with** ball chain ☞ 8.

Determination of the dynamic load capacities and moments is based on a travel life of 100,000 m per ISO 14728-1. Often only 50,000 m are actually stipulated. For comparison: Multiply values C, M_t and M_L from the table by 1.26.

Standard Ball Runner Blocks made of steel

FKS – Flanged, short, standard height

R1665 ... 2.

Dynamic characteristics

Travel speed: $v_{\max} = 5 \text{ m/s}$




Acceleration: $a_{\max} = 500 \text{ m/s}^2$

(If $F_{\text{comb}} > 2.8 \cdot F_{\text{pr}}$: $a_{\max} = 50 \text{ m/s}^2$)

Note on lubrication

- Pre-lubricated

Further Ball Runner Blocks FKS

- Super Ball Runner Blocks made of steel  88
- Corrosion-resistant Ball Runner Blocks
Resist NR  100
Resist CR  108

Note

Can be used on all Ball Guide Rails SNS.



Options and part numbers

Size	Ball runner block with size	Preload class		Accuracy class		Seal for ball runner block					
		C0	C1	N	H	without ball chain			with ball chain		
						SS	LS	DS	SS	LS	DS
15	R1665 1	9	1	4	3	20	21	–	22	23	–
				4	3	20	21	–	22	23	–
20	R1665 8	9	1	4	3	20	21	–	22	23	–
				4	3	20	21	2Z	22	23	2Y
25	R1665 2	9	1	4	3	20	21	–	22	23	–
				4	3	20	21	2Z	22	23	2Y
30	R1665 7	9	1	4	3	20	21	–	22	23	–
				4	3	20	21	2Z	22	23	2Y
35	R1665 3	9	1	4	3	20	21	–	22	23	–
				4	3	20	21	2Z	22	23	2Y
e.g.	R1665 7		1		3	20					

Ordering example

Options:

- Ball Runner Block FKS
- Size 30
- Preload class C1
- Accuracy class H
- With standard seal, without ball chain

Part number: R1665 713 20

Preload classes

C0 = without preload

C1 = preload 2% C

Seals

SS = standard seal

LS = low-friction seal

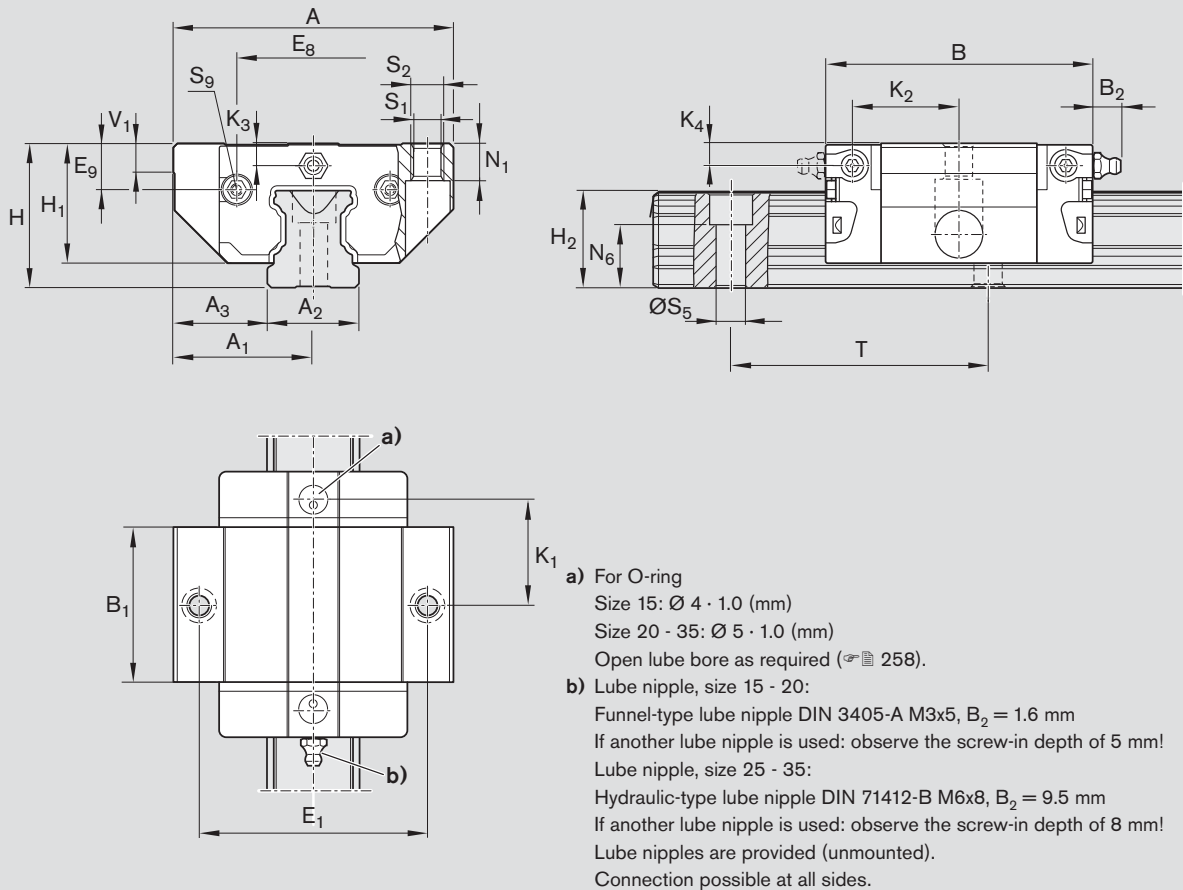
DS = double-lipped seal

Key to table

Gray numbers

= version/combination not preferred
(longer delivery times in some cases)

Ball Runner Blocks FKS



Size	Dimensions (mm)																
	A	A ₁	A ₂	A ₃	B	B ₁	E ₁	E ₈	E ₉	H	H ₁	H ₂ ¹⁾	H ₂ ²⁾	K ₁	K ₂	K ₃	K ₄
15	47	23.5	15	16.0	44.7	25.7	38	24.55	6.70	24	19.90	16.30	16.20	16.25	17.85	3.20	3.20
20	63	31.5	20	21.5	57.3	31.9	53	32.50	7.30	30	25.35	20.75	20.55	22.95	22.95	3.35	3.35
25	70	35.0	23	23.5	67.0	38.6	57	38.30	11.50	36	29.90	24.45	24.25	25.35	26.50	5.50	5.50
30	90	45.0	28	31.0	75.3	45.0	72	48.40	14.60	42	35.35	28.55	28.35	28.80	30.50	6.05	6.05
35	100	50.0	34	33.0	84.9	51.4	82	58.00	17.35	48	40.40	32.15	31.85	32.70	34.20	6.90	6.90

Size	Dimensions (mm)										Weight (kg)	Load capacities ³⁾ (N)		Load moments ³⁾ (Nm)			
	N ₁	N ₆ ^{±0.5}	S ₁	S ₂	S ₅	S ₉	T	V ₁	C	C ₀		M _t	M _{t0}	M _L	M _{L0}		
15	5.2	10.3	4.3	M5	4.4	M2.5x3.5	60	5.0	0.15	5 400	8 100	52	80	19	28		
20	7.7	13.2	5.3	M6	6.0	M3x5	60	6.0	0.30	12 400	13 600	150	170	52	58		
25	9.3	15.2	6.7	M8	7.0	M3x5	60	7.5	0.50	15 900	18 200	230	260	82	94		
30	11.0	17.0	8.5	M10	9.0	M3x5	80	7.0	0.80	22 100	24 800	380	430	133	150		
35	12.0	20.5	8.5	M10	9.0	M3x5	80	8.0	1.20	29 300	32 400	640	700	200	220		

1) Dimension H₂ with cover strip
 2) Dimension H₂ without cover strip
 3) Load capacities and moments for Ball Runner Block **without** ball chain. Load capacities and moments for Ball Runner Block **with** ball chain $\varnothing \text{ 8}$. Determination of the dynamic load capacities and moments is based on a travel life of 100,000 m per ISO 14728-1. Often only 50,000 m are actually stipulated. For comparison: Multiply values **C**, **M_t** and **M_L** from the table by 1.26.

Standard Ball Runner Blocks made of steel

SNS – Slimline, normal, standard height

R1622 ... 2.








Dynamic characteristics

Travel speed: $v_{max} = 5 \text{ m/s}$
 Acceleration: $a_{max} = 500 \text{ m/s}^2$
 (If $F_{comb} > 2.8 \cdot F_{pr}$: $a_{max} = 50 \text{ m/s}^2$)

Note on lubrication

- Pre-lubricated

Further Ball Runner Blocks SNS

- Heavy Duty Ball Runner Blocks made of steel, size 55 and 65  64
- High Precision Ball Runner Blocks made of steel  72
- High-Speed Ball Runner Blocks made of steel  84
- Ball Runner Blocks made of aluminum  94
- Corrosion-resistant Ball Runner Blocks Resist NR  100 Resist NR II  104 Resist CR  108

Note

Can be used on all Ball Guide Rails SNS.

Ordering example

- Options:
- Ball Runner Block SNS
 - Size 30
 - Preload class C1
 - Accuracy class H
 - With standard seal, without ball chain
- Part number: R1622 713 20



Options and part numbers

Size	Ball runner block with size	Preload class			Accuracy class			Seal for ball runner block							
		C0	C1	C2	N	H	P	without ball chain			with ball chain				
							SS	LS ¹⁾	DS	SS	LS ¹⁾	DS			
15	R1622 1	9	1		4	3	-	20	21	-	22	23	-		
					4	3	2	20	21	-	22	23	-		
						2	-	3	2	20	-	-	22	-	-
20	R1622 8	9	1		4	3	-	20	21	-	22	23	-		
					4	3	2	20	21	2Z	22	23	2Y		
						2	-	3	2	20	-	2Z	22	-	2Y
25	R1622 2	9	1		4	3	-	20	21	-	22	23	-		
					4	3	2	20	21	2Z	22	23	2Y		
						2	-	3	2	20	-	2Z	22	-	2Y
30	R1622 7	9	1		4	3	-	20	21	-	22	23	-		
					4	3	2	20	21	2Z	22	23	2Y		
						2	-	3	2	20	-	2Z	22	-	2Y
35	R1622 3	9	1		4	3	-	20	21	-	22	23	-		
					4	3	2	20	21	2Z	22	23	2Y		
						2	-	3	2	20	-	2Z	22	-	2Y
45	R1622 4	9	1		4	3	-	20	-	-	22	-	-		
					4	3	2	20	-	2Z	22	-	2Y		
						2	-	3	2	20	-	2Z	22	-	2Y
e.g.	R1622 7		1			3		20							

1) Only with accuracy classes N and H

Preload classes

- C0 = without preload
- C1 = preload 2% C
- C2 = preload 8% C

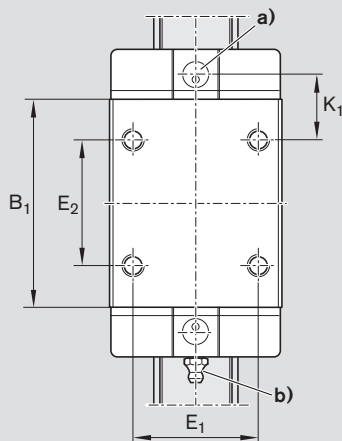
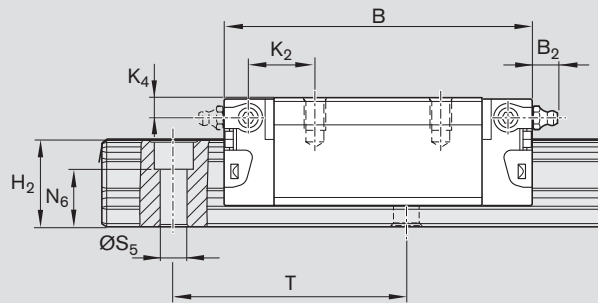
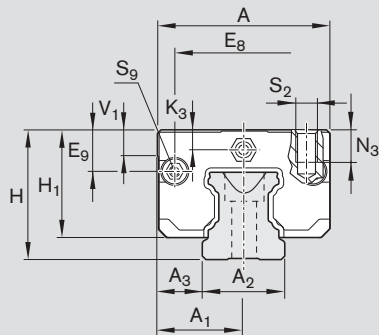
Seals

- SS = standard seal
- LS = low-friction seal
- DS = double-lipped seal

Key to table

Gray numbers
 = version/combination not preferred
 (longer delivery times in some cases)

Ball Runner Blocks SNS



- a) For O-ring
 Size 15: $\text{Ø } 4 \cdot 1.0$ (mm)
 Size 20 - 45: $\text{Ø } 5 \cdot 1.0$ (mm)
 Open lube bore as required (☞ 258).
- b) Lube nipple, size 15 - 20:
 Funnel-type lube nipple DIN 3405-A M3x5, $B_2 = 1.6$ mm
 If another lube nipple is used: observe the screw-in depth of 5 mm!
 Lube nipple, size 25 - 45:
 Hydraulic-type lube nipple DIN 71412-B M6x8, $B_2 = 9.5$ mm
 If another lube nipple is used: observe the screw-in depth of 8 mm!
 Lube nipples are provided (unmounted).
 Connection possible at all sides.

Size	Dimensions (mm)																		
	A	A ₁	A ₂	A ₃	B	B ₁	E ₁	E ₂	E ₈	E ₉	H	H ₁	H ₂ ¹⁾	H ₂ ²⁾	K ₁	K ₂	K ₃	K ₄	
15	34	17	15	9.5	58.2	39.2	26	26	24.55	6.70	24	19.90	16.30	16.20	10.00	11.60	3.20	3.20	
20	44	22	20	12.0	75.0	49.6	32	36	32.50	7.30	30	25.35	20.75	20.55	13.80	13.80	3.35	3.35	
25	48	24	23	12.5	86.2	57.8	35	35	38.30	11.50	36	29.90	24.45	24.25	17.45	18.60	5.50	5.50	
30	60	30	28	16.0	97.7	67.4	40	40	48.40	14.60	42	35.35	28.55	28.35	20.00	21.70	6.05	6.05	
35	70	35	34	18.0	110.5	77.0	50	50	58.00	17.35	48	40.40	32.15	31.85	20.50	22.00	6.90	6.90	
45	86	43	45	20.5	137.6	97.0	60	60	69.80	20.90	60	50.30	40.15	39.85	27.30	29.30	8.20	8.20	

Size	Dimensions (mm)									Weight (kg)	Load capacities ³⁾ (N)		Load moments ³⁾ (Nm)			
	N ₃	N ₆ ^{±0.5}	S ₂	S ₅	S ₉	T	V ₁	C	C ₀		M _t	M _{t0}	M _L	M _{L0}		
15	6.0	10.3	M4	4.4	M2.5x3.5	60	5.0	0.15	7 800	13 500	74	130	40	71		
20	7.5	13.2	M5	6.0	M3x5	60	6.0	0.35	18 800	24 400	240	310	130	165		
25	9.0	15.2	M6	7.0	M3x5	60	7.5	0.50	22 800	30 400	320	430	180	240		
30	12.0	17.0	M8	9.0	M3x5	80	7.0	0.85	31 700	41 300	540	720	290	380		
35	13.0	20.5	M8	9.0	M3x5	80	8.0	1.25	41 900	54 000	890	1 160	440	565		
45	18.0	23.5	M10	14.0	M4x7	105	10.0	2.40	68 100	85 700	1 830	2 310	890	1 130		

1) Dimension H₂ with cover strip

2) Dimension H₂ without cover strip

3) Load capacities and moments for Ball Runner Block **without** ball chain. Load capacities and moments for Ball Runner Block **with** ball chain ☞ 8.

Determination of the dynamic load capacities and moments is based on a travel life of 100,000 m per ISO 14728-1. Often only 50,000 m are actually stipulated. For comparison: Multiply values C, M_t and M_L from the table by 1.26.

Standard Ball Runner Blocks made of steel

SLS – Slimline, long, standard height

R1623 ... 2.

Dynamic characteristics

Travel speed: $v_{max} = 5 \text{ m/s}$
 Acceleration: $a_{max} = 500 \text{ m/s}^2$
 (If $F_{comb} > 2.8 \cdot F_{pr}$: $a_{max} = 50 \text{ m/s}^2$)

Note on lubrication

- Pre-lubricated

Further Ball Runner Blocks SLS

- Heavy Duty Ball Runner Blocks made of steel, size 55 and 65 66
- High Precision Ball Runner Blocks made of steel 72
- Corrosion-resistant Ball Runner Blocks
 Resist NR 100
 Resist CR 108



Note

Can be used on all Ball Guide Rails SNS.

Options and part numbers

Size	Ball runner block with size	Preload class			Accuracy class			Seal for ball runner block					
		C0	C1	C2	N	H	P	without ball chain			with ball chain		
								SS	LS ¹⁾	DS	SS	LS ¹⁾	DS
15	R1623 1	9	1	2	4	3	-	20	21	-	22	23	-
					4	3	2	20	21	-	22	23	-
20	R1623 8	9	1	2	4	3	-	20	21	-	22	23	-
					4	3	2	20	21	2Z	22	23	2Y
25	R1623 2	9	1	2	4	3	-	20	21	-	22	23	-
					4	3	2	20	21	2Z	22	23	2Y
30	R1623 7	9	1	2	4	3	-	20	21	-	22	23	-
					4	3	2	20	21	2Z	22	23	2Y
35	R1623 3	9	1	2	4	3	-	20	21	-	22	23	-
					4	3	2	20	21	2Z	22	23	2Y
45	R1623 4	9	1	2	4	3	-	20	-	-	22	-	-
					4	3	2	20	-	2Z	22	-	2Y
e.g.	R1623 7		1			3		20					

1) Only with accuracy classes N and H

Ordering example

- Options:
- Ball Runner Block SLS
 - Size 30
 - Preload class C1
 - Accuracy class H
 - With standard seal, without ball chain
- Part number: R1623 713 20

Preload classes

C0 = without preload
 C1 = preload 2% C
 C2 = preload 8% C

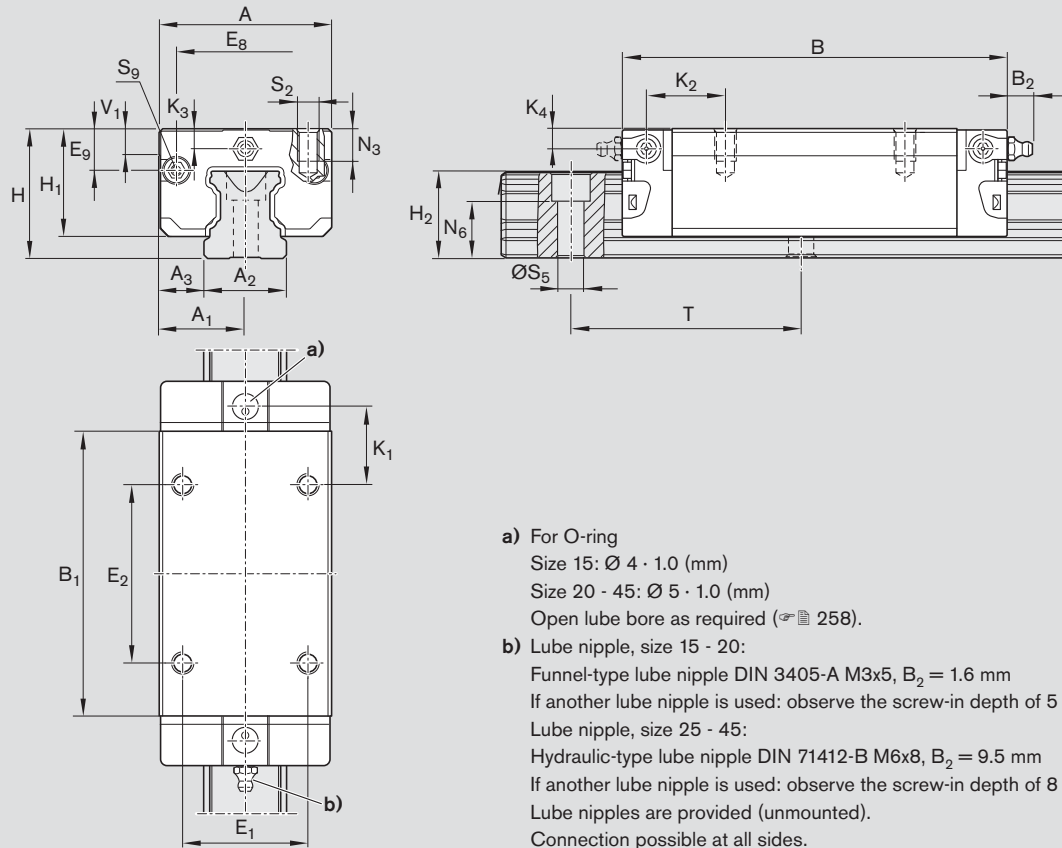
Seals

SS = standard seal
 LS = low-friction seal
 DS = double-lipped seal

Key to table

Gray numbers
 = version/combination not preferred (longer delivery times in some cases)

Ball Runner Blocks SLS



Size	Dimensions (mm)																		
	A	A ₁	A ₂	A ₃	B	B ₁	E ₁	E ₂	E ₈	E ₉	H	H ₁	H ₂ ¹⁾	H ₂ ²⁾	K ₁	K ₂	K ₃	K ₄	
15	34	17	15	9.5	72.6	53.6	26	26	24.55	6.70	24	19.90	16.30	16.20	17.20	18.80	3.20	3.20	
20	44	22	20	12.0	91.0	65.6	32	50	32.50	7.30	30	25.35	20.75	20.55	14.80	14.80	3.35	3.35	
25	48	24	23	12.5	107.9	79.5	35	50	38.30	11.50	36	29.90	24.45	24.25	20.80	21.95	5.50	5.50	
30	60	30	28	16.0	119.7	89.4	40	60	48.40	14.60	42	35.35	28.55	28.35	21.00	22.70	6.05	6.05	
35	70	35	34	18.0	139.0	105.5	50	72	58.00	17.35	48	40.40	32.15	31.85	23.75	25.25	6.90	6.90	
45	86	43	45	20.5	174.1	133.5	60	80	69.80	20.90	60	50.30	40.15	39.85	35.50	37.50	8.20	8.20	

Size	Dimensions (mm)									Weight (kg)	Load capacities ³⁾ (N)		Load moments ³⁾ (Nm)			
	N ₃	N ₆ ^{±0.5}	S ₂	S ₅	S ₉	T	V ₁	C	C ₀		M _t	M _{t0}	M _L	M _{L0}		
15	6.0	10.3	M4	4.4	M2.5x3.5	60	5.0	0.20	10 000	20 200	96	190	75	150		
20	7.5	13.2	M5	6.0	M3x5	60	6.0	0.45	24 400	35 200	310	450	225	330		
25	9.0	15.2	M6	7.0	M3x5	60	7.5	0.65	30 400	45 500	430	650	345	510		
30	12.0	17.0	M8	9.0	M3x5	80	7.0	1.10	40 000	57 800	690	1 000	495	715		
35	13.0	20.5	M8	9.0	M3x5	80	8.0	1.70	55 600	81 000	1 200	1 740	830	1 215		
45	18.0	23.5	M10	14.0	M4x7	105	10.0	3.20	90 400	128 500	2 440	3 470	1 700	2 425		

1) Dimension H₂ with cover strip
 2) Dimension H₂ without cover strip
 3) Load capacities and moments for Ball Runner Block **without** ball chain. Load capacities and moments for Ball Runner Block **with** ball chain ☞ 8.
 Determination of the dynamic load capacities and moments is based on a travel life of 100,000 m per ISO 14728-1. Often only 50,000 m are actually stipulated. For comparison: Multiply values **C**, **M_t** and **M_L** from the table by 1.26.

Standard Ball Runner Blocks made of steel

SKS – Slimline, short, standard height

R1666 ... 2.




Dynamic characteristics

Travel speed: $v_{max} = 5 \text{ m/s}$
 Acceleration: $a_{max} = 500 \text{ m/s}^2$
 (If $F_{comb} > 2.8 \cdot F_{pr}$: $a_{max} = 50 \text{ m/s}^2$)

Note on lubrication

- Pre-lubricated

Further Ball Runner Blocks SKS

- Super Ball Runner Blocks made of steel  88
- Corrosion-resistant Ball Runner Blocks
 Resist NR  100
 Resist CR  108



Note

Can be used on all Ball Guide Rails SNS.

Options and part numbers

Size	Ball runner block with size	Preload class		Accuracy class		Seal for ball runner block					
		C0	C1	N	H	without ball chain			with ball chain		
						SS	LS	DS	SS	LS	DS
15	R1666 1	9	1	4	3	20	21	-	22	23	-
20	R1666 8	9	1	4	3	20	21	-	22	23	-
25	R1666 2	9	1	4	3	20	21	2Z	22	23	2Y
30	R1666 7	9	1	4	3	20	21	2Z	22	23	2Y
35	R1666 3	9	1	4	3	20	21	2Z	22	23	2Y

Ordering example

- Options:
- Ball Runner Block SKS
 - Size 30
 - Preload class C1
 - Accuracy class H
 - With standard seal, without ball chain
- Part number: R1666 713 20

e.g. R1666 7 1 3 20

Preload classes

C0 = without preload
 C1 = preload 2% C

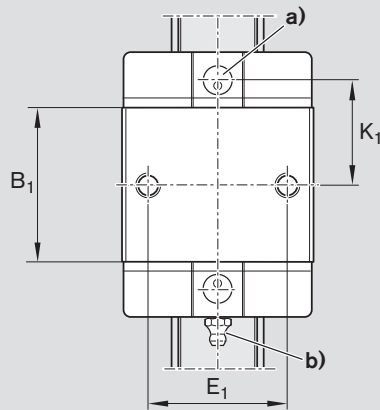
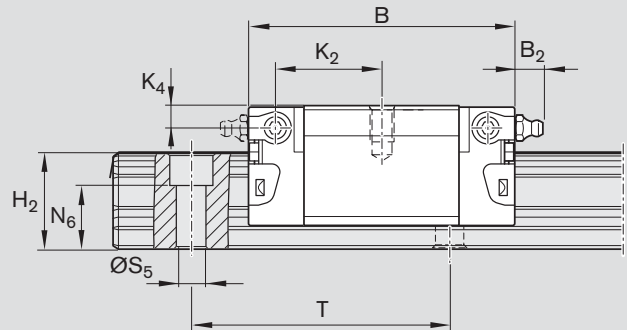
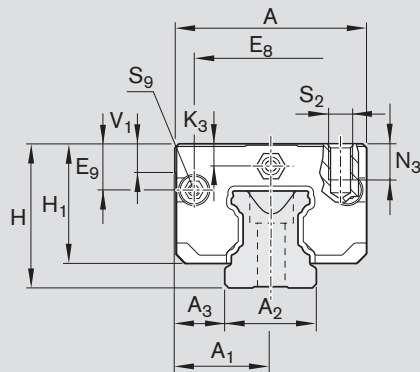
Seals

SS = standard seal
 LS = low-friction seal
 DS = double-lipped seal

Key to table

Gray numbers
 = version/combination not preferred
 (longer delivery times in some cases)

Ball Runner Blocks SKS



- a) For O-ring
 Size 15: $\text{Ø } 4 \cdot 1.0$ (mm)
 Size 20 - 35: $\text{Ø } 5 \cdot 1.0$ (mm)
 Open lube bore as required (☞ 258).
- b) Lube nipple, size 15 - 20:
 Funnel-type lube nipple DIN 3405-A M3x5, $B_2 = 1.6$ mm
 If another lube nipple is used: observe the screw-in depth of 5 mm!
 Lube nipple, size 25 - 35:
 Hydraulic-type lube nipple DIN 71412-B M6x8, $B_2 = 9.5$ mm
 If another lube nipple is used: observe the screw-in depth of 8 mm!
 Lube nipples are provided (unmounted).
 Connection possible at all sides.

Size	Dimensions (mm)																
	A	A ₁	A ₂	A ₃	B	B ₁	E ₁	E ₈	E ₉	H	H ₁	H ₂ ¹⁾	H ₂ ²⁾	K ₁	K ₂	K ₃	K ₄
15	34	17	15	9.5	44.7	25.7	26	24.55	6.70	24	19.90	16.30	16.20	16.25	17.85	3.20	3.20
20	44	22	20	12.0	57.3	31.9	32	32.50	7.30	30	25.35	20.75	20.55	22.95	22.95	3.35	3.35
25	48	24	23	12.5	67.0	38.6	35	38.30	11.50	36	29.90	24.45	24.25	25.35	26.50	5.50	5.50
30	60	30	28	16.0	75.3	45.0	40	48.40	14.60	42	35.35	28.55	28.35	28.80	30.50	6.05	6.05
35	70	35	34	18.0	84.9	51.4	50	58.00	17.35	48	40.40	32.15	31.85	32.70	34.20	6.90	6.90

Size	Dimensions (mm)								Weight (kg)	Load capacities ³⁾ (N)		Load moments ³⁾ (Nm)			
	N ₃	N ₆ ^{±0.5}	S ₂	S ₅	S ₉	T	V ₁	C		C ₀	M _t	M _{t0}	M _L	M _{L0}	
15	6.0	10.3	M4	4.4	M2.5x3.5	60	5.0	0.10	5 400	8 100	52	80	19	28	
20	7.5	13.2	M5	6.0	M3x5	60	6.0	0.25	12 400	13 600	150	170	52	58	
25	9.0	15.2	M6	7.0	M3x5	60	7.5	0.35	15 900	18 200	230	260	82	94	
30	12.0	17.0	M8	9.0	M3x5	80	7.0	0.60	22 100	24 800	380	430	133	150	
35	13.0	20.5	M8	9.0	M3x5	80	8.0	0.90	29 300	32 400	640	700	200	220	

- 1) Dimension H₂ with cover strip
- 2) Dimension H₂ without cover strip
- 3) Load capacities and moments for Ball Runner Block **without** ball chain. Load capacities and moments for Ball Runner Block **with** ball chain ☞ 8. Determination of the dynamic load capacities and moments is based on a travel life of 100,000 m per ISO 14728-1. Often only 50,000 m are actually stipulated. For comparison: Multiply values C, M_t and M_L from the table by 1.26.

Standard Ball Guide Rails made of steel

SNS with Cover Strip and Strip Clamps





R1605 .3. .. / R1605 .B. ..

For mounting from above, with cover strip made of corrosion-resistant spring steel per EN 10088 and strip clamps made of aluminum (without threaded mounting holes on end face)

Note on installation

- Secure the cover strip!
- Strip clamps are included in the supply scope.
- Follow the mounting instructions! Send for the publications "Mounting Instructions for Ball Rail Systems" and "Mounting Instructions for the Cover Strip."
- Composite guide rails also available.

Further Ball Guide Rails SNS and accessories

- Corrosion-resistant Ball Guide Rails Resist NR  132 Resist CR  134
- Cover strip  176
- Strip clamps  178

Ball guide rail R1605 .B. .. with flat underside for mounting on components made of cast mineral materials

- In size 25 - 45 and accuracy class P and SP available on request.



Options and part numbers

Size	Ball guide rail with size	Accuracy class					Number of sections „ Rail length L (mm), ...		Hole spacing T (mm)	Recommended rail length according to formula $L = n_B \cdot T - 4 \text{ mm}$		
		N	H	P	SP	UP	One-piece	Composite		Maximum number of holes n_B		
15	R1605 13	4	3	2	1	9	31, ...	3, ...	60	64		
20	R1605 83	4	3	2	1	9	31, ...	3, ...	60	64		
25	R1605 23	4	3	2	1	9	31, ...	3, ...	60	64		
30	R1605 73	4	3	2	1	9	31, ...	3, ...	80	48		
35	R1605 33	4	3	2	1	9	61, ...	6, ...	80	48		
45	R1605 43	4	3	2	1	9	61, ...	6, ...	105	36		
55	R1605 53	4	3	2	1	9	61, ...	6, ...	120	32		
65	R1605 63	4	3	2	1	9	61, ...	6, ...	150	25		
e.g.	R1605 73	3					31, 1676					

Ordering example 1: (up to L_{max})

Options:

- Ball Guide Rail SNS
- Size 30
- Accuracy class H
- One-piece
- Rail length $L = 1676 \text{ mm}$

Part number:

R1605 733 31, 1676 mm

Ordering example 2: (over L_{max})

Options:

- Ball Guide Rail SNS
- Size 30
- Accuracy class H
- **2 sections**
- Rail length $L = 5116 \text{ mm}$

Part number:

R1605 733 32, 5116 mm

Ordering example 3: (up to L_{max} , with flat underside)

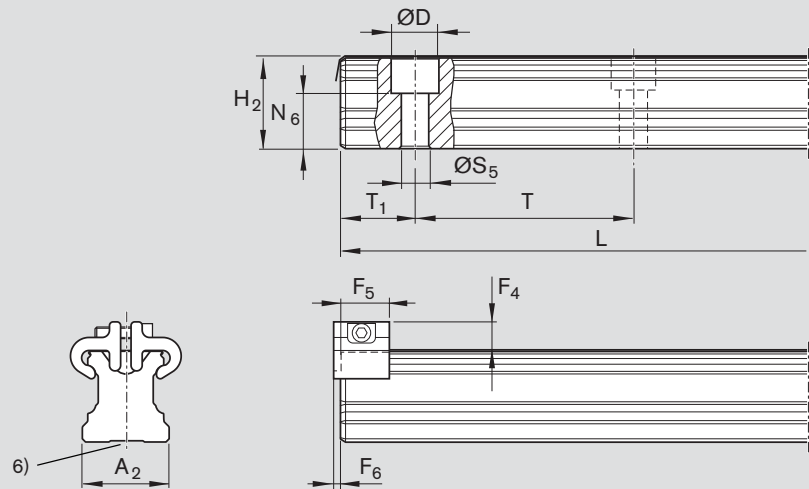
Options:

- Ball Guide Rail SNS
- Size 30
- Accuracy class H
- One-piece
- Rail length $L = 1676 \text{ mm}$

Part number:

R1605 7B3 31, 1676 mm

Ball Guide Rails SNS



Size	Dimensions (mm)														Weight (kg/m)
	A ₂	D	F ₄ ³⁾	F ₅	F ₆	H ₂ ¹⁾	L _{max} ²⁾	N ₆ ^{±0.5}	S ₅	T	T _{1 min} ⁴⁾	T _{1 S} ⁵⁾	T _{1 max}		
15	15	7.4	7.3	12	2.0	16.30	3 836	10.3	4.4	60	12	28.0	50	1.4	
20	20	9.4	7.1	12	2.0	20.75	3 836	13.2	6.0	60	13	28.0	50	2.4	
25	23	11.0	8.2	13	2.0	24.45	3 836	15.2	7.0	60	13	28.0	50	3.2	
30	28	15.0	8.7	13	2.0	28.55	3 836	17.0	9.0	80	16	38.0	68	5.0	
35	34	15.0	11.7	16	2.2	32.15	3 836	20.5	9.0	80	16	38.0	68	6.8	
45	45	20.0	12.5	18	2.2	40.15	3 776	23.5	14.0	105	18	50.5	89	10.5	
55	53	24.0	14.0	17	3.2	48.15	3 836	29.0	16.0	120	20	58.0	102	16.2	
65	63	26.0	15.0	17	3.2	60.15	3 746	38.5	18.0	150	21	73.0	130	22.4	

1) Dimension H₂ with cover strip

Size 15 with 0.1 mm cover strip

Size 20 - 30 with 0.2 mm cover strip

Size 35 - 65 with 0.3 mm cover strip

2) For size 20 - 45 in accuracy class N, H and P, one-piece guide rails are available on request up to the following lengths:

Size 20 - 25: up to 5816 mm

Size 30 - 35: up to 5836 mm

Size 45: up to 5771 mm

3) Dimension F₄ with cover strip

4) For end spaces below T_{1 min}, no threaded holes in end faces possible. Cover strip fastening ☞ 178.

5) Recommended: preferred dimension T_{1 S} with tolerances ± 0.75.

6) For manufacturing reasons, ball guide rails may have a flat underside (without groove).

Standard Ball Guide Rails made of steel

SNS with Plastic Mounting Hole Plugs




R1605 .0. .. / R1605 .C. ..

For mounting from above,
with plastic mounting hole plugs

Note on installation

- Plastic mounting hole plugs included in scope of supply.
- Follow the mounting instructions!
- Send for the publication “Mounting Instructions for Ball Rail Systems.”
- Composite guide rails also available.

Further Ball Guide Rails SNS and accessories

- Corrosion-resistant Ball Guide Rails Resist NR  133 Resist CR  135
- Plastic Mounting Hole Plugs  179

Ball guide rail R1605 .B. .. with flat underside for mounting on components made of cast mineral materials

- In size 25 - 45 and accuracy class P and SP available on request.



Options and part numbers

Size	Ball guide rail with size	Accuracy class					Number of sections „ Rail length L (mm), ...		Hole spacing T (mm)	Recommended rail length according to formula $L = n_B \cdot T - 4 \text{ mm}$		
		N	H	P	SP	UP	One-piece	Composite		Maximum number of holes n_B		
15	R1605 10	4	3	2	1	9	31, ...	3, ...	60	64		
20	R1605 80	4	3	2	1	9	31, ...	3, ...	60	64		
25	R1605 20	4	3	2	1	9	31, ...	3, ...	60	64		
30	R1605 70	4	3	2	1	9	31, ...	3, ...	80	48		
35	R1605 30	4	3	2	1	9	31, ...	3, ...	80	48		
45	R1605 40	4	3	2	1	9	31, ...	3, ...	105	36		
55	R1605 50	4	3	2	1	9	31, ...	3, ...	120	32		
65	R1605 60	4	3	2	1	9	31, ...	3, ...	150	25		
e.g.	R1605 70	3					31, 1676					

Ordering example 1: (up to L_{max})

Options:

- Ball Guide Rail SNS
- Size 30
- Accuracy class H
- One-piece
- Rail length $L = 1676 \text{ mm}$

Part number:

R1605 703 31, 1676 mm

Ordering example 2: (over L_{max})

Options:

- Ball Guide Rail SNS
- Size 30
- Accuracy class H
- **2 sections**
- Rail length $L = 5116 \text{ mm}$

Part number:

R1605 703 32, 5116 mm

Ordering example 3: (up to L_{max} , with flat underside)

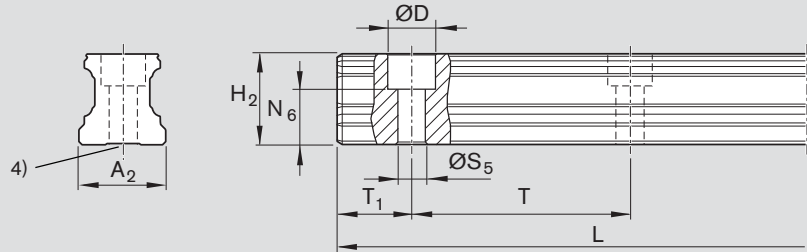
Options:

- Ball Guide Rail SNS
- Size 30
- Accuracy class H
- One-piece
- Rail length $L = 1676 \text{ mm}$

Part number:

R1605 7C3 31, 1676 mm

Ball Guide Rails SNS



Size	Dimensions (mm)										Weight (kg/m)
	A ₂	D	H ₂ ¹⁾	L _{max} ²⁾	N ₆ ^{±0.5}	S ₅	T	T _{1 min}	T _{1S} ³⁾	T _{1 max}	
15	15	7.4	16.20	3 836	10.3	4.4	60	10	28.0	50	1.4
20	20	9.4	20.55	3 836	13.2	6.0	60	10	28.0	50	2.4
25	23	11.0	24.25	3 836	15.2	7.0	60	10	28.0	50	3.2
30	28	15.0	28.35	3 836	17.0	9.0	80	12	38.0	68	5.0
35	34	15.0	31.85	3 836	20.5	9.0	80	12	38.0	68	6.8
45	45	20.0	39.85	3 776	23.5	14.0	105	16	50.5	89	10.5
55	53	24.0	47.85	3 836	29.0	16.0	120	18	58.0	102	16.2
65	63	26.0	59.85	3 746	38.5	18.0	150	20	73.0	130	22.4

1) Dimension H₂ without cover strip

2) For size 20 - 45 in accuracy class N, H and P, one-piece guide rails are available on request up to the following lengths:

Size 20 - 25: up to 5816 mm

Size 30 - 35: up to 5836 mm

Size 45: up to 5771 mm

3) Recommended: preferred dimension T_{1S} with tolerances ± 0.75.

4) For manufacturing reasons, ball guide rails may have a flat underside (without groove).