Heavy Duty Roller Rail Systems

Product Description

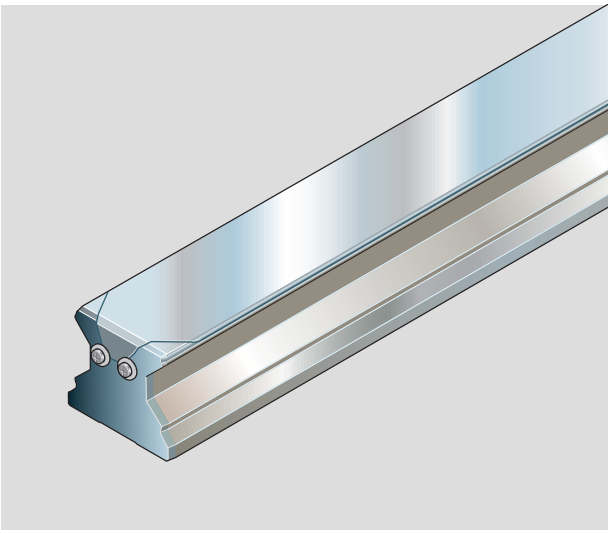
Outstanding features

- Heavy duty runner blocks for applications requiring extremely high load capacities
- Maximum rigidity under load from all directions
- Improved rigidity under lift-off and side loading conditions through three additional mounting screw holes at the center of the runner block
- High torque capacity
- Uniform guide rail profile in various versions allows unrestricted interchangeability and combinability of components across all runner block variants.
- Mounting of attachments to runner block from above or below

Further highlights

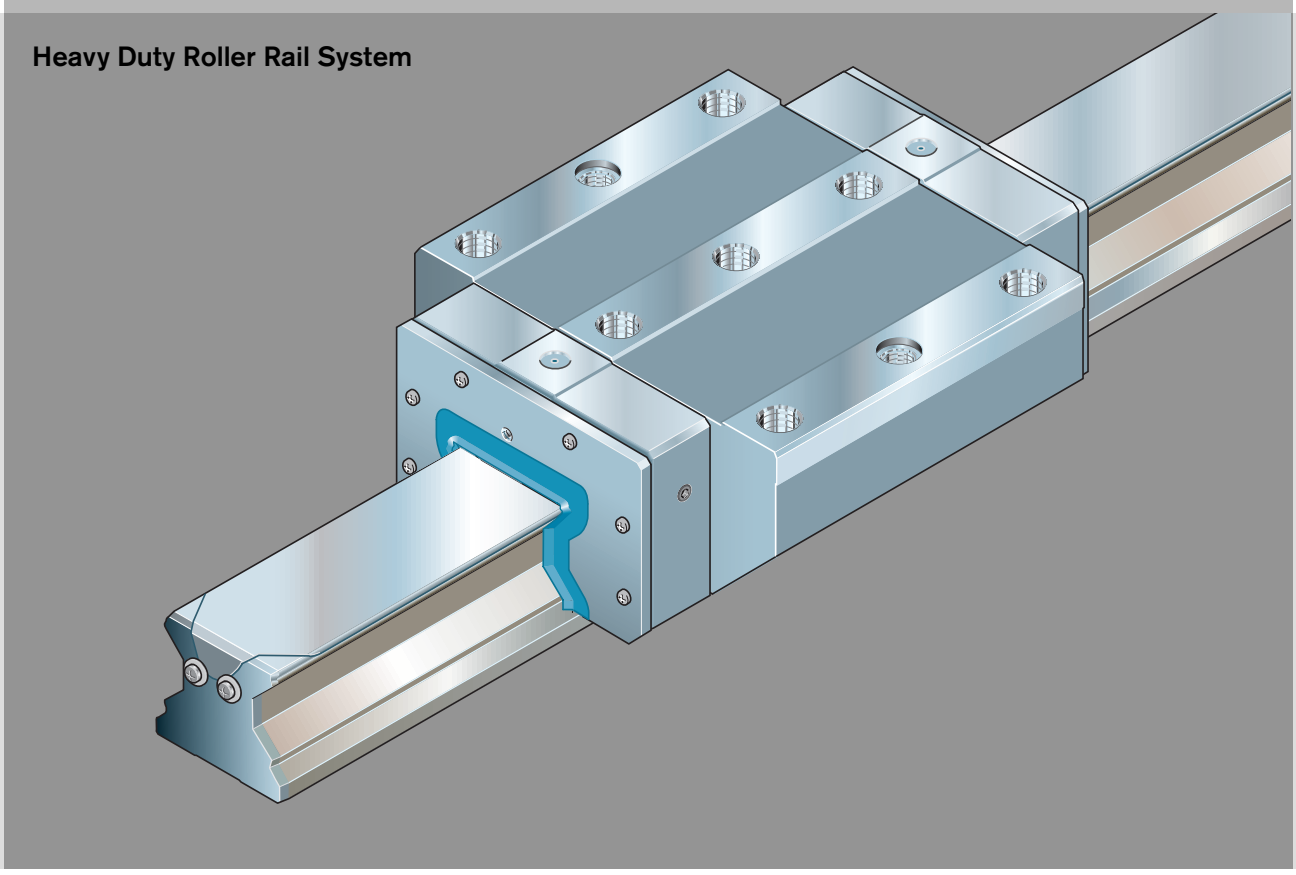
- Lube ports on all sides for maximum ease of maintenance
- Novel lube duct design minimizes lubricant consumption.
- Runner blocks made from antifriction bearing steel, with hardened and ground raceways (guide rails also with hardened raceways and ground on all sides)
- Smooth running thanks to optimized roller recirculation and guidance
- Optimized entry-section geometry and high number of rollers per track minimizes variation in elastic deflection.
- Aluminum or plastic end caps
- End seals integrated as standard for better sealing of all running tracks and to protect plastic parts

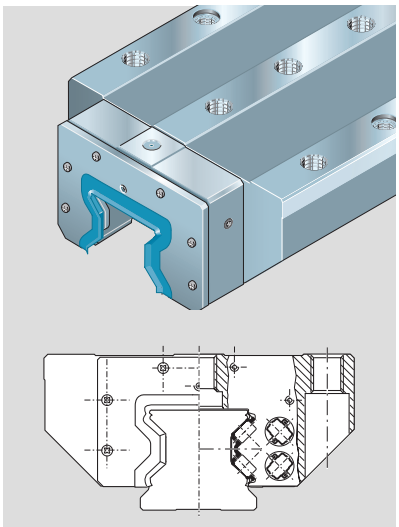
Options
- Corrosion-resistant heavy duty runner blocks and guide rails in Resist CR, matte silver hard chrome plated, available in accuracy class H (preload C2 and C3)

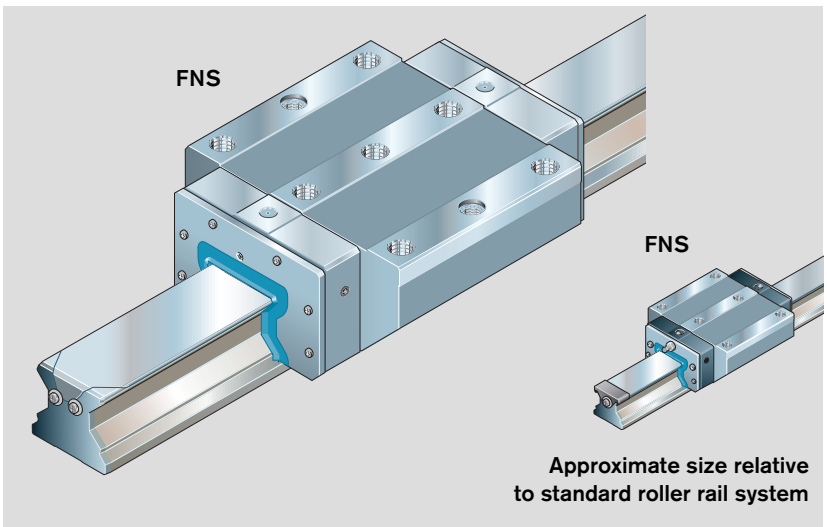


Proven cover strip for guide rail mounting holes
- A **single** cover **for all** holes – saves time and money
- Stainless spring steel to EN 10088
- Easy to fit – simply clip on and secure

Heavy Duty Roller Rail System







Heavy Duty Roller Rail Systems for heavy duty applications
- Aluminum or plastic end caps
- End seals as standard
- Smooth running thanks to optimized roller recirculation and guidance

Approximate size comparison:
Heavy Duty vs. Standard Roller Rail System (example)
- Heavy duty runner block FNS R1861
  on heavy duty guide rail R1835 (size 125)
- Standard runner block FNS R1851
  on standard guide rail R1805 (size 45)

Heavy Duty Roller Rail Systems

Rigidity

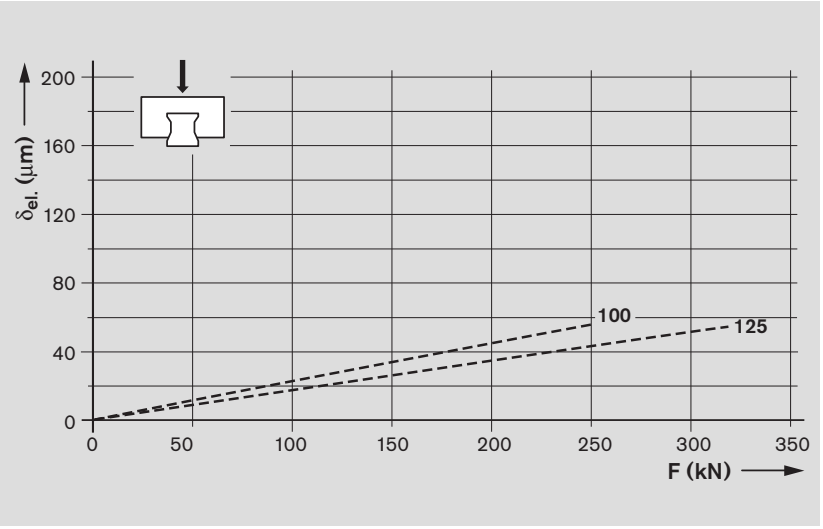
Rigidity of the roller rail system at preload C3

Heavy duty runner block FNS R1861

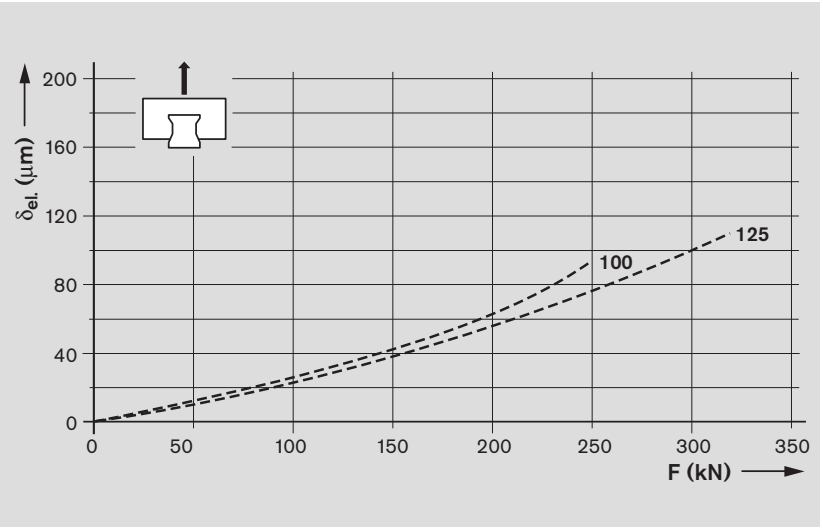
Sizes 100 and 125
calculated values

Runner block mounted using 9 screws:
- 6 outer screws of strength class 12.9
- 3 centerline screws of strength class 8.8

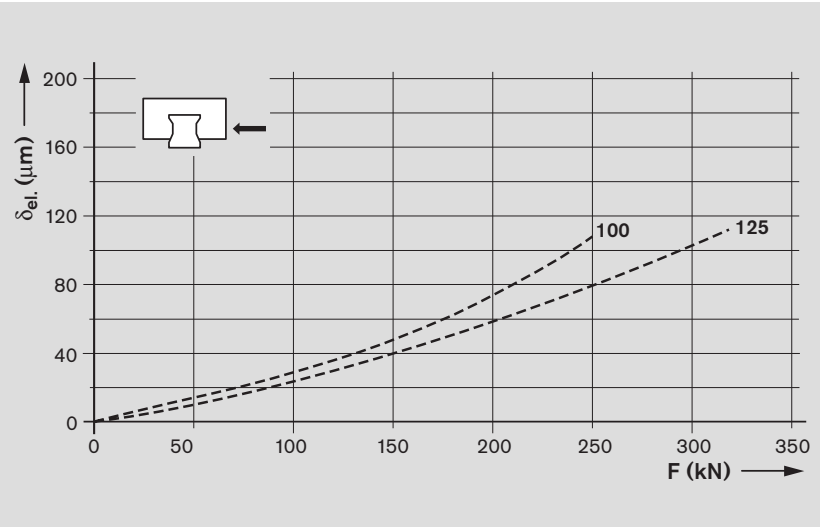
1. Down load



2. Lift-off load



3. Side load



Preload class
C3 = preload 13% C

Key to graph
$\delta_{el.}$ = elastic deflection (µm)

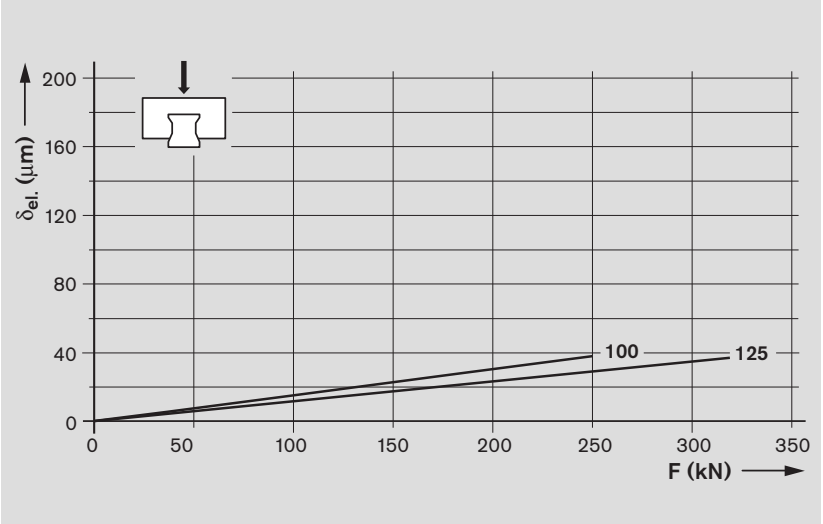
Rigidity of the roller rail system at preload C3

Heavy duty runner block FLS R1863

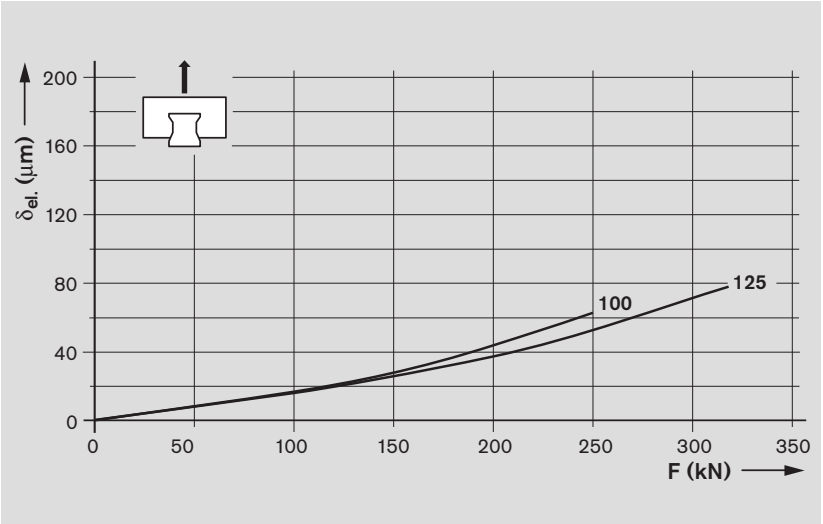
Sizes 100 and 125
——————— measured values
– – – – – – – – – – – – calculated values

Runner block mounted using 9 screws:
- 6 outer screws of strength class 12.9
- 3 centerline screws of strength class 8.8

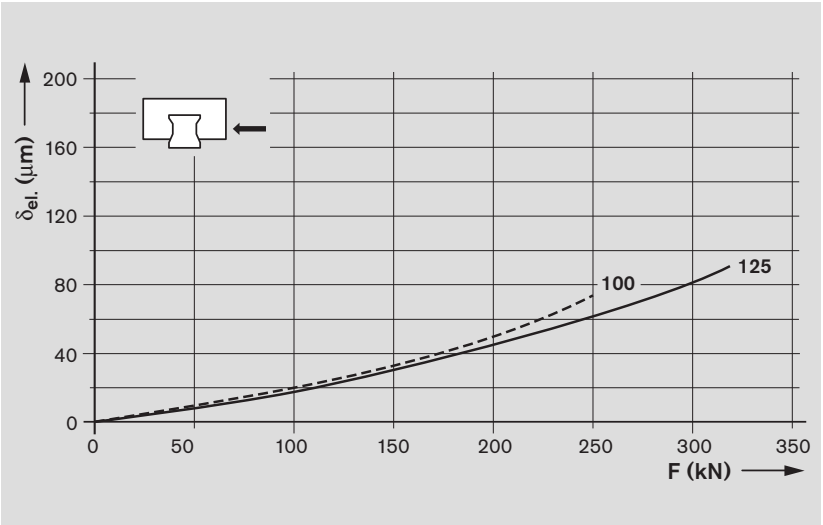
1. Down load



2. Lift-off load



3. Side load



Preload class
C3 = preload 13% C

Key to graph

$\delta_{el.}$	= elastic deflection	(µm)
F	= load	(kN)

Heavy Duty Roller Rail Systems

Heavy Duty Runner Blocks, Steel and Resist CR versions

Runner blocks, steel version FNS R1861 … 10 Flanged, normal, standard height

Runner blocks, Resist CR vers. FNS R1861 … 60

Caution!
For runner blocks in Resist CR, matte silver hard chrome plated, different tolerances apply for the dimensions H and A_3 (see "Accuracy classes and their tolerances").

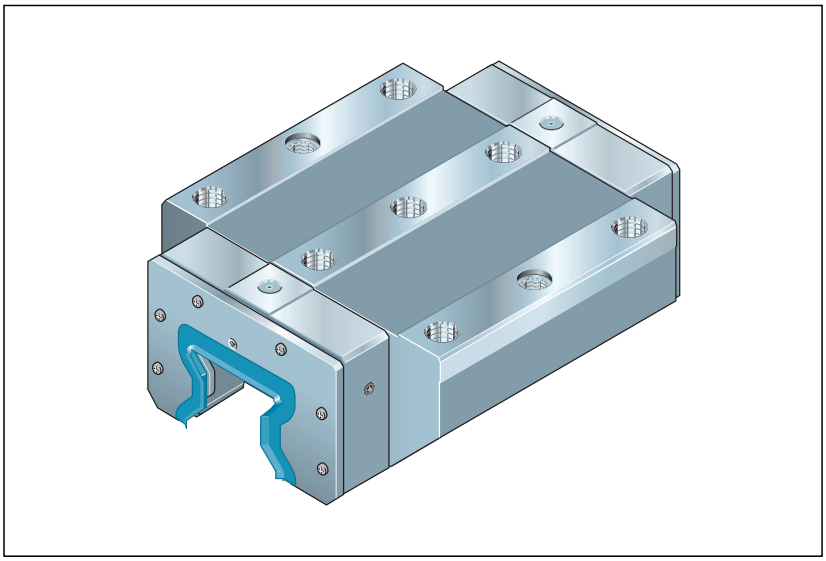
When hard chrome plated runner blocks with preload C2 = 8% C (or C3 = 13% C) are combined with hard chrome plated guide rails, the preload increases to approx. 10% C (or approx. 15% C).

Notes
For short-stroke applications ($< 2 \cdot B_1$), use additional lube ports:
– Size 125: B_4 and N_7

All lube ports with thread M8x1 (tapped holes in the metal for size 125).

Preload classes
C2 = preload 8% C
C3 = preload 13% C

Note on dynamic load capacities and moments (see table)
The dynamic load capacities and moments are based on 100,000 m travel. However, a travel of just 50,000 m is often taken as a basis.
If this is the case, for comparison purposes: Multiply values **C**, $\mathbf{M_t}$ and $\mathbf{M_L}$ from the table by 1.23.



Heavy duty runner blocks, steel version

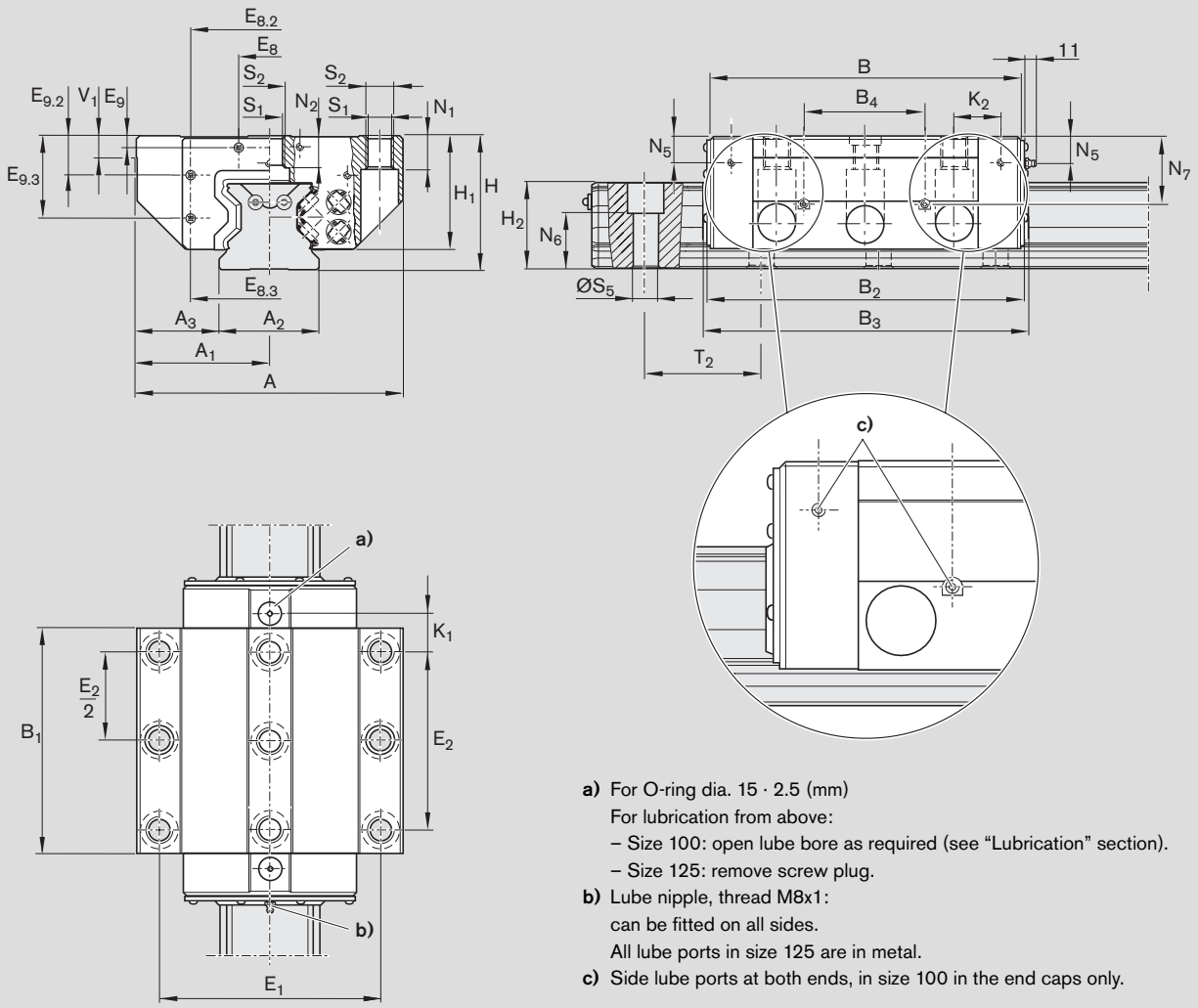
Size	Accuracy class	Part numbers for preload class	
		C2	C3
100	H	R1861 223 10	R1861 233 10
	P	R1861 222 10	R1861 232 10
	SP	R1861 221 10	R1861 231 10
125	H	R1861 323 10	R1861 333 10
	P	R1861 322 10	R1861 332 10

Heavy duty runner blocks, Resist CR version, matte silver hard chrome plated

Size	Accuracy class	Part numbers for preload class	
		C2	C3
100	H	R1861 223 60	R1861 233 60
125	H	R1861 323 60	R1861 333 60

Size	Load capacities (N)		Moment loads (Nm)			
	C	C_0	M_t	M_{t0}	M_L	M_{L0}
100	461 000	811 700	25 720	45 290	13 550	23 850
125	757 200	1 324 000	54 520	95 330	29 660	51 860

Heavy duty runner blocks FNS R1861 … 10 and FNS R1861 … 60



a) For O-ring dia. 15 · 2.5 (mm)
For lubrication from above:
– Size 100: open lube bore as required (see “Lubrication” section).
– Size 125: remove screw plug.

b) Lube nipple, thread M8x1:
can be fitted on all sides.
All lube ports in size 125 are in metal.

c) Side lube ports at both ends, in size 100 in the end caps only.

Size	Dimensions (mm)																
	A	A_1	A_2	A_3	B	B_1	B_2	B_3	B_4	E_1	E_2	E_8	$E_{8.2}$	$E_{8.3}$	E_9	$E_{9.2}$	$E_{9.3}$
100	250	125	100	75.0	296.6	204	301.5	309.5	–	200	150	64	130	162.6	9	29.4	70
125	320	160	125	97.5	371.0	255	377.0	386.5	130	270	205	80	205	205.0	12	40.0	92

Size	Dimensions (mm)														Weight
	H	H_1	H_2[1)]	K_1	K_2	N_1	N_2	N_5	$N_6^{\pm 0.5}$	N_7	S_1	S_2	S_5	T_2	V_1	kg
100	120	105.0	87.3	39.5	39.5	30	22	17.5	55.0	–	17.5	M20	26	105	20	32.0
125	160	135.5	115.3	50.0	50.0	45	29	29.0	74.5	92	25.0	M27	33	120	25	62.1

1) Dimension H_2 with cover strip

Heavy Duty Roller Rail Systems

Heavy Duty Runner Blocks, Steel and Resist CR versions

Runner blocks, steel version FLS R1863 ... 10 Flanged, long, standard height

Runner blocks, Resist CR vers. FLS R1863 ... 60

Caution!
For runner blocks in Resist CR, matte silver hard chrome plated, different tolerances apply for the dimensions H and A_3 (see “Accuracy classes and their tolerances”)

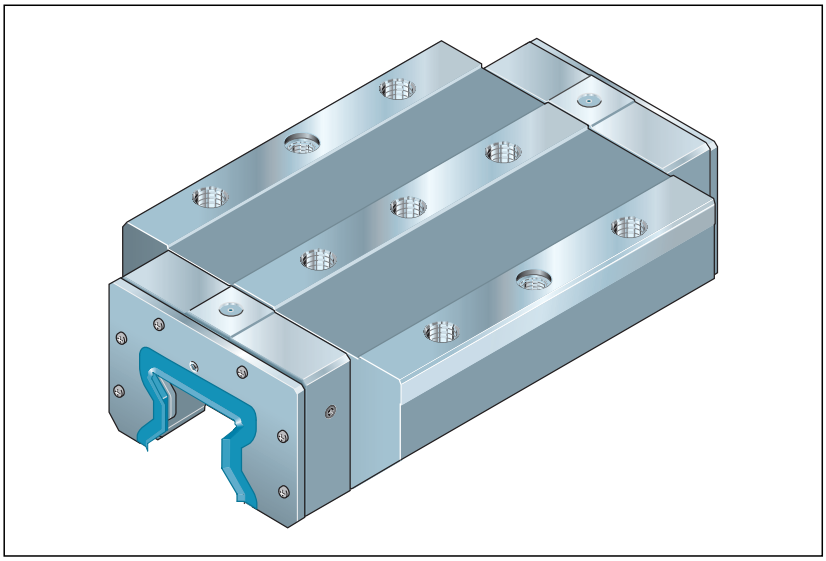
When hard chrome plated runner blocks with preload C2 = 8% C (or C3 = 13% C) are combined with hard chrome plated guide rails, the preload increases to approx. 10% C (or approx. 15% C).

Notes
For short-stroke applications (< 2 · B_1), use additional lube ports:
– Size 125: B_4 and N_7

All lube ports with thread M8x1 (tapped holes in the metal for size 125).

Preload classes
C2 = preload 8% C
C3 = preload 13% C

Note on dynamic load capacities and moments (see table)
The dynamic load capacities and moments are based on 100,000 m travel. However, a travel of just 50,000 m is often taken as a basis.
If this is the case, for comparison purposes: Multiply values **C**, $\mathbf{M_t}$ and $\mathbf{M_L}$ from the table by 1.23.



Heavy duty runner blocks, steel version

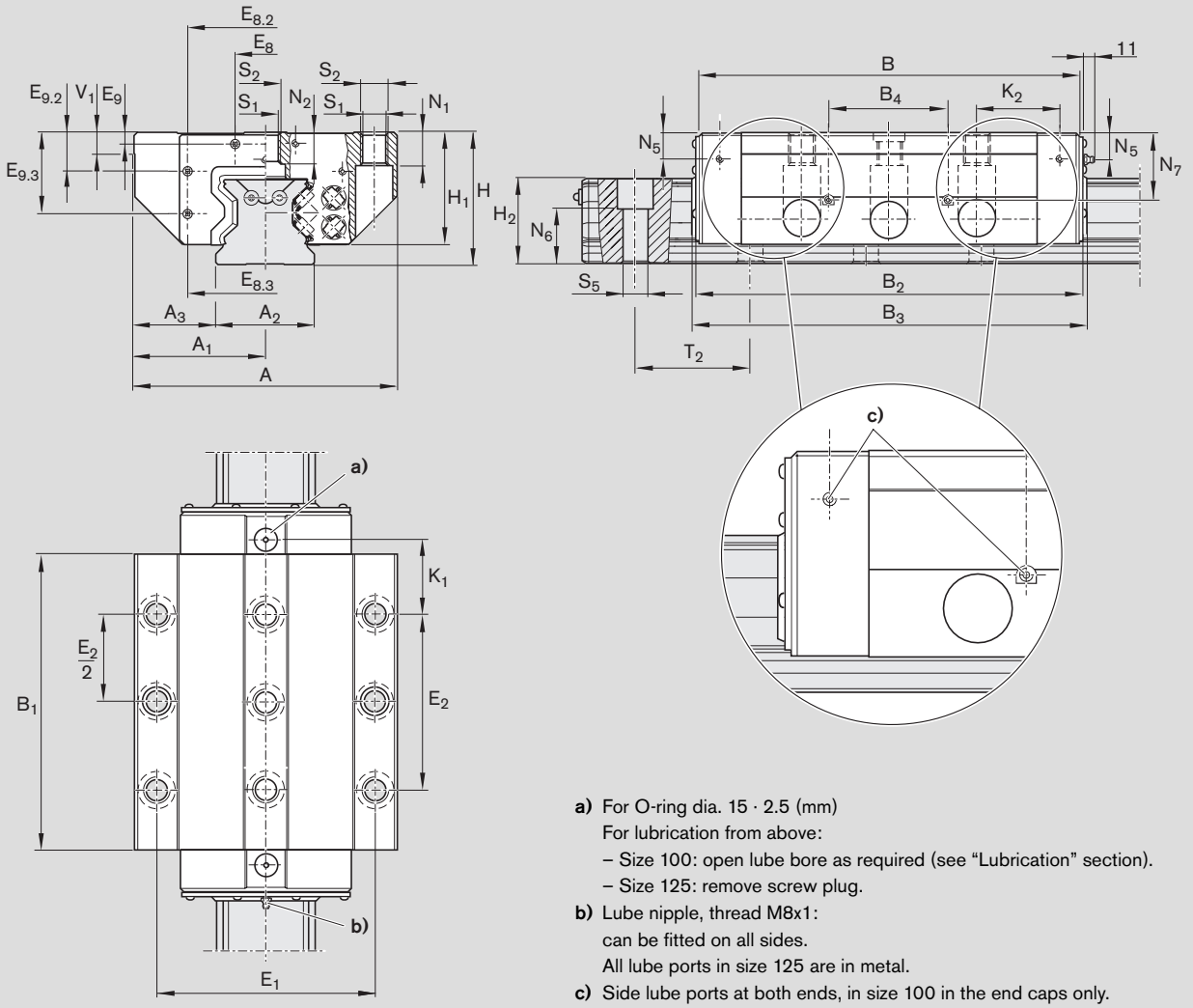
Size	Accuracy class	Part numbers for preload class C2	C3
100	H	R1863 223 10	R1863 233 10
	P	R1863 222 10	R1863 232 10
	SP	R1863 221 10	R1863 231 10
125	H	R1863 323 10	R1863 333 10
	P	R1863 322 10	R1863 332 10

Heavy duty runner blocks, Resist CR version, matte silver hard chrome plated

Size	Accuracy class	Part numbers for preload class C2	C3
100	H	R1863 223 60	R1863 233 60
125	H	R1863 323 60	R1863 333 60

Size	Load capacities (N)		Moment loads (Nm)			
	C	**C_0**	**M_t**	**M_{t0}**	**M_L**	**M_{L0}**
100	632 000	1 218 000	35 300	67 900	27 200	52 400
125	1 020 000	1 941 900	73 440	139 820	57 330	109 150

Heavy duty runner blocks FLS R1863 ... 10 and FLS R1863 ... 60



a) For O-ring dia. 15 · 2.5 (mm)
For lubrication from above:
– Size 100: open lube bore as required (see “Lubrication” section).
– Size 125: remove screw plug.

b) Lube nipple, thread M8x1:
can be fitted on all sides.
All lube ports in size 125 are in metal.

c) Side lube ports at both ends, in size 100 in the end caps only.

Size	Dimensions (mm)																
	A	A_1	A_2	A_3	B	B_1	B_2	B_3	B_4	E_1	E_2	E_8	$E_{8.2}$	$E_{8.3}$	E_9	$E_{9.2}$	$E_{9.3}$
100	250	125	100	75.0	380.5	288	385.5	393.5	–	200	230	64	130	162.6	9	29.4	70
125	320	160	125	97.5	476.0	360	482.0	491.5	150	270	205	80	205	205.0	12	40.0	92

Size	Dimensions (mm)														Weight
	H	H_1	H_2[1)]	K_1	K_2	N_1	N_2	N_5	$N_6^{\pm 0.5}$	N_7	S_1	S_2	S_5	T_2	V_1	kg
100	120	105.0	87.3	41.5	47.4	30	22	17.5	55.0	–	17.5	M20	26	105	20	42.0
125	160	135.5	115.3	102.5	102.5	45	29	29.0	74.5	92	25.0	M27	33	120	25	89.8

1) Dimension H_2 with cover strip

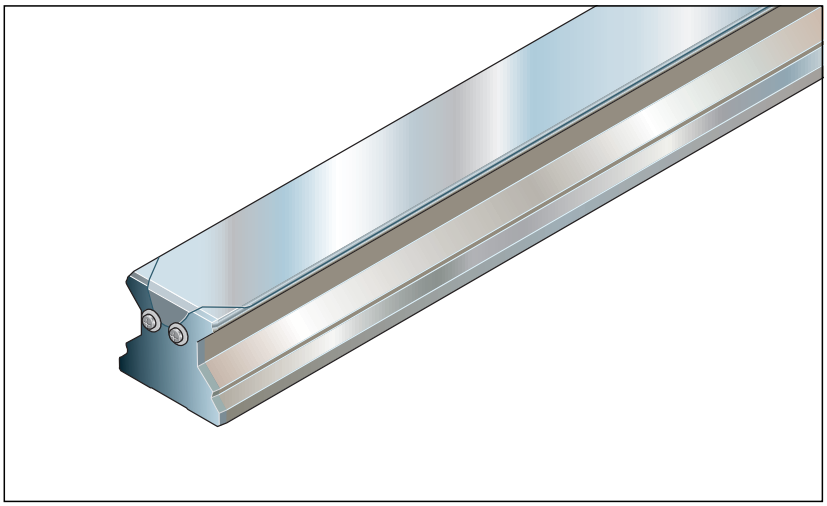
Heavy Duty Roller Rail Systems

Heavy Duty Guide Rails, Steel and Resist CR versions

Guide rails, steel version R1835 .6. ..

Guide rails, Resist CR version R1865 .6. ..

For mounting from above, with cover strip of stainless spring steel to EN 10088



Notes

Secure the cover strip!
The cover strip, screws and washers are included in the supply scope; they are supplied along with the rails but in a separate packing unit.
Please follow the mounting instructions!
Send for the publication “Mounting Instructions for the Cover Strip”.

Heavy duty guide rails, steel version

Size	Accuracy class	Guide rail One-piece Part number, Rail length L (mm)	Guide rail Composite Part number and number of sections, Rail length L (mm)	Spacing T_2 mm	Recommended rail lengths Number of holes n_B / Rail length L (mm)
100	H	R1835 263 61, ...	R1835 263 6., ...	105	acc. to **formula $L = n_B \cdot T_2 - 7$** up to 35/3668[1] max.
	P	R1835 262 61, ...	R1835 262 6., ...		
	SP	R1835 261 61, ...	R1835 261 6., ...		
125	H	R1835 363 61, ...	R1835 363 6., ...	120	acc. to **formula $L = n_B \cdot T_2 - 7$** up to 22/2633[2] max.
	P	R1835 362 61, ...	R1835 362 6., ...		

Heavy duty guide rails, Resist CR version, matte silver hard chrome plated

Size	Accuracy class	Guide rail One-piece Part number, Rail length L (mm)	Guide rail Composite Part number and number of sections, Rail length L (mm)	Spacing T_2 mm	Recommended rail lengths Number of holes n_B / Rail length L (mm)
100	H	R1865 263 61, ...	–	105	acc. to **formula $L = n_B \cdot T_2 - 7$** up to 35/3668[1] max.
		R1865 263 71, ...	R1865 263 7., ...		
125	H	R1865 363 61, ...	–	120	acc. to **formula $L = n_B \cdot T_2 - 7$** up to 22/2633[2] max.
		R1865 363 71, ...	R1865 363 7., ...		

1) Size 100: For lengths of 3668 mm and over, please consult us.
2) Size 125: For lengths of 2633 mm and over, please consult us.
3) Accuracy classes P and SP on request

Caution!

For runner blocks and guide rails in Resist CR, matte silver hard chrome plated, different tolerances apply for the dimensions H and A_3 (see “Accuracy classes and their tolerances”).

When hard chrome plated runner blocks with preload C2 = 8% C (or C3 = 13% C) are combined with hard chrome plated guide rails, the preload increases to approx. 10% C (or approx. 15% C).

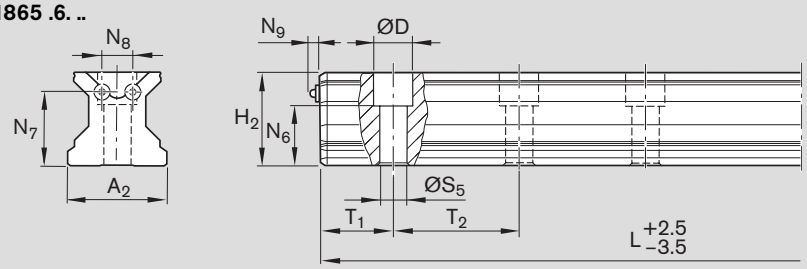
Part numbers (coating)

- R1865 .6. .61 on request
  (end faces, chamfers and threads uncoated)
- R1865 .6. 71
  (end faces coated)

In composite guide rails the joint faces are hard chrome plated as well as the end faces.

Heavy duty guide rails R1835 .6. .. and R1865 .6. ..

Guide rails with cover strip and tapped holes at the end faces.
Cover strip secured with screws and washers (included).

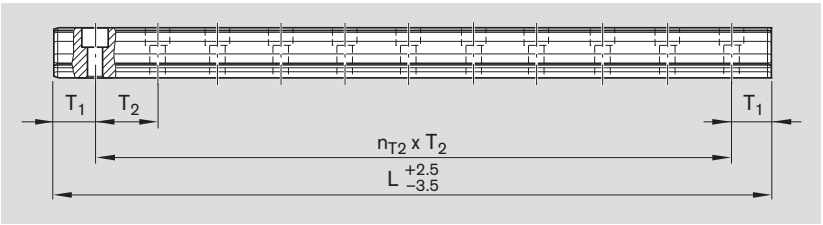


Size	Dimensions (mm)												Weight
	A_2	D	H_2 1)	L_{max} 2)	$N_6^{\pm 0.5}$	N_7	N_8	N_9	S_5	$T_{1\,min}$ 3)	T_{1S} 4)	T_2	kg/m
100	100	40	87.3	3900	55.0	65	28	4.8	26	35	49.0	105	42.5
125	125	49	115.3	2900	74.5	91	38	4.8	33	40	56.5	120	75.6

1) Dimension H_2 with 0.3 mm cover strip
2) Size 100: For lengths of 3668 mm and over, please consult us.
3) Size 125: For lengths of 2633 mm and over, please consult us.
4) Rails with T_1 smaller than $T_{1\,min}$ have no tapped hole at end face for securing the strip! Secure the cover strip! Follow the mounting instructions!
5) Preferred dimension T_{1S} with tolerances +1/−1.5

Ordering guide rails in recommended lengths

The following examples apply to all orders for heavy duty guide rails. Recommended rail lengths are delivered with priority.



From the desired length to the recommended length

$$L = \frac{L_W}{T_2} \cdot T_2 - 7$$

Round up the quotient L_W/T_2 to the next

Example

$$L = \frac{1650\ mm}{120\ mm} \cdot 120\ mm - 7\ mm$$

$L = 14 \cdot 120\ mm - 7\ mm$
$L = 1673\ mm$

Notes on ordering examples
If the preferred dimension T_{1S} cannot be used:
- Select an end space T_1 between T_{1S} and $T_{1\,min}$.
- Do not go below the minimum spacing $T_{1\,min}$!
  (T_1, $T_{1\,min}$, T_{1S} are the same at either end of the rail.)

$$L = n_B \cdot T_2 - 7$$

Basis: number of holes

$$L = n_{T2} \cdot T_2 + 2 \cdot T_{1S}$$

Basis: number of spaces

L = recommended rail length (mm)
L_W = desired rail length (mm)
T_2 = hole spacing[1] (mm)
T_{1S} = preferred dimension[1] (mm)
n_B = number of holes
n_{T2} = number of spaces

Ordering example 1 (up to L_{max})
- Heavy duty guide rail size 125 with cover strip
- Accuracy class P
- Calculated rail length 1673 mm, ($13 \cdot T_2$, preferred dimension T_{1S} = 56.5 mm; number of holes $n_B = 14$)

Ordering data
Part number, rail length (mm)
T_1 / $n_{T2} \cdot T_2$ / T_1 (mm)

R1835 362 61, 1637 mm
56.5 / 13 · 120 / 56.5 mm

Ordering example 2 (over L_{max})
- Heavy duty guide rail size 125 with cover strip
- Accuracy class P
- Calculated rail length 5033 mm, 2 sections ($41 \cdot T_2$, preferred dimension T_{1S} = 56.5 mm; number of holes $n_B = 42$)

Ordering data
Part number and number of sections, rail length (mm)
T_1 / $n_{T2} \cdot T_2$ / T_1 (mm)

R1835 362 62, 5033 mm
56.5 / 41 · 120 / 56.5 mm

Rail lengths greater than L_{max} are made up of matching rail sections mounted end to end.