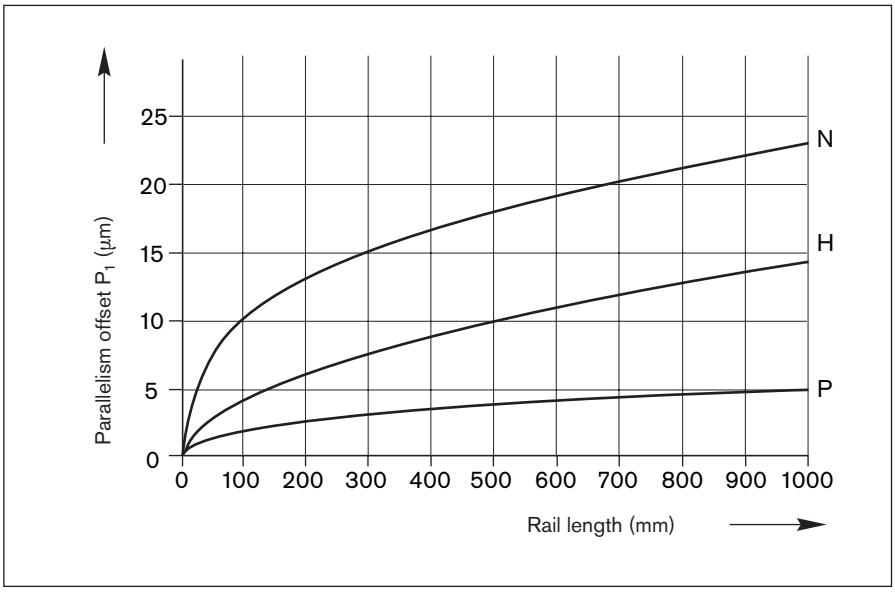
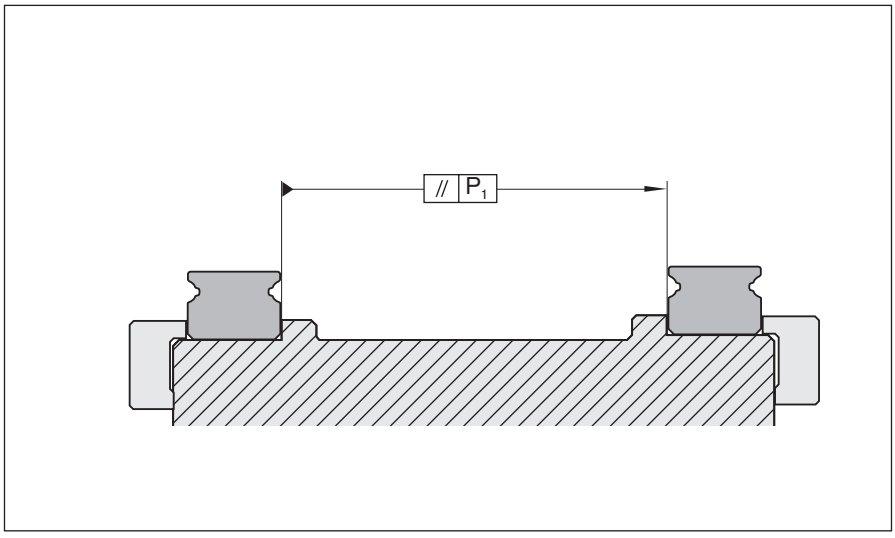
Parallelism offset P_1 of the ball rail system in service



Parallelism offset of the installed rails

measured on the guide rails and on the runner blocks



Size	Parallelism offset P_1 (mm)	
	Clearence	Preload
Standard guide rails R0445		
7	0.004	0.002
9/M3	0.005	0.002
12	0.008	0.004
15	0.017	0.008
20	0.025	0.016
Wide guide rails R0455		
9/M3	0.010	0.004
12 B	0.014	0.006
15 B	0.018	0.011

Technical data

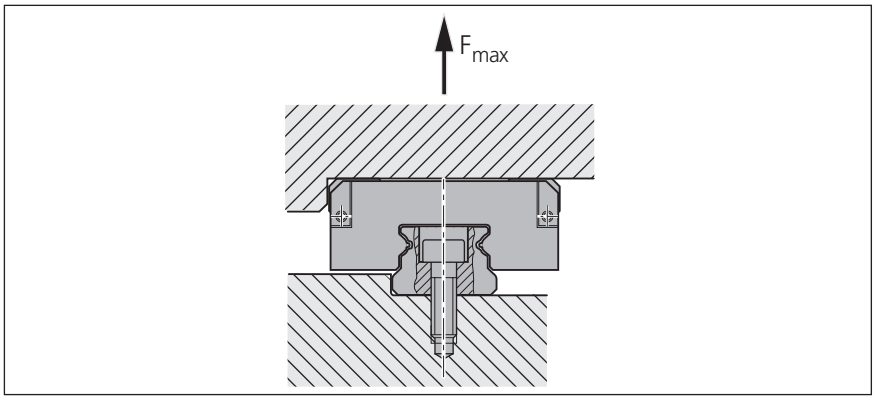
General Notes

The screw connections specified in the DIN 645-1 standard can be overstressed due to the high performance capability of profiled rail systems. The most critical point is the screw connection between the guide rail and the mounting base. If the lift-off loads (F) or moments (M_t) are higher than the respective load values given in the table, the screw connections must be recalculated separately.

The data applies for the following conditions:
- Mounting screw quality 12.9
- Screws tightened using a torque wrench
- Screws lightly oiled
  (For screws in quality 8.8, an approximation factor of 0.6 can be applied)

Miniature ball rail systems

Guide Rails	Runner blocks R0442			Runner blocks R0444	
	Size	$F_{max.}$ (N)	$M_{tmax.}$ (Nm)	$F_{max.}$ (N)	$M_{tmax.}$ (Nm)
R0445	7	1000	3.2	1150	3.7
	12	–	–	4300	23.7
	15	3740	26.0	4280	30.0
	No restriction for sizes				
R0445	R0442:		9/M3, 12 and 20		
	R0444:		9/M3		
R0455	R0441,R0443:		9/M3, 12 and 15		



Friction and seals

The total friction force of the runner blocks is made up of the "runner block friction force" and the "seal friction force". For special applications with a defined displacement force, the runner block and guide rail are matched to each other. Runner blocks are pushed onto the guide rail and supplied as a unit.

The runner blocks are equipped with low-friction seals as standard (limited wiping action at very low friction force).
Part number: R044. ... 01
(See tables "Runner block part numbers")

Optionally runner block with N-seal:
The runner blocks are also available with N-seal (very good wiping action with increased friction force).
Part number: R044. ... 00
(Otherwise as tables "Runner block part numbers))

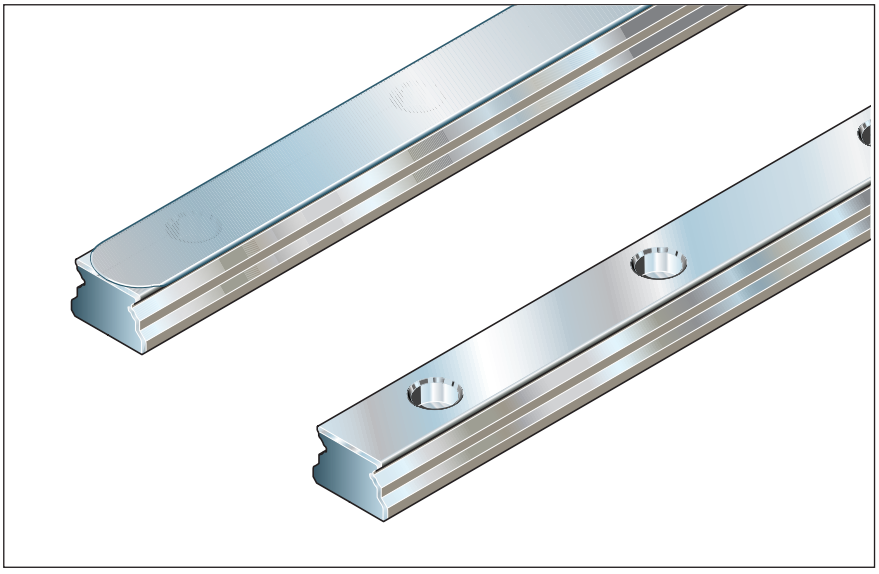
Sizes 15, 20, 9/M3 wide, 12 wide, 15 wide and long runner blocks of sizes 9/M3, 12 and 15, additionally completely sealed with longitudinal seal.

Friction

The friction coefficient μ of Rexroth's miniature ball rail system is approximately 0.002 to 0.003 (without the friction of the seal).

SNS – standard, miniature ball guide rail without / with cover strip R0445 ... ..

For runner blocks R0442 and R0444.
Guide rails made of corrosion-resistant, martensitic steel.



Part numbers for guide rails

Size	Accuracy class	Part numbers for guide rails Part number, length L (mm) **without** cover strip	 **with** cover strip
7	P	R0445 702 31,....	–
	H	R0445 703 31,....	–
	N	R0445 704 31,....	–
9/M3	P	R0445 802 31,....	R0445 862 31,....
	H	R0445 803 31,....	R0445 863 31,....
	N	R0445 804 31,....	R0445 864 31,....
12	P	R0445 202 31,....	R0445 262 31,....
	H	R0445 203 31,....	R0445 263 31,....
	N	R0445 204 31,....	R0445 264 31,....
15[1)]	P	R0445 502 31,....	R0445 562 31,....
	H	R0445 503 31,....	R0445 563 31,....
	N	R0445 504 31,....	R0445 564 31,....
20	P	R0445 002 31,....	R0445 062 31,....
	H	R0445 003 31,....	R0445 063 31,....
	N	R0445 004 31,....	R0445 064 31,....

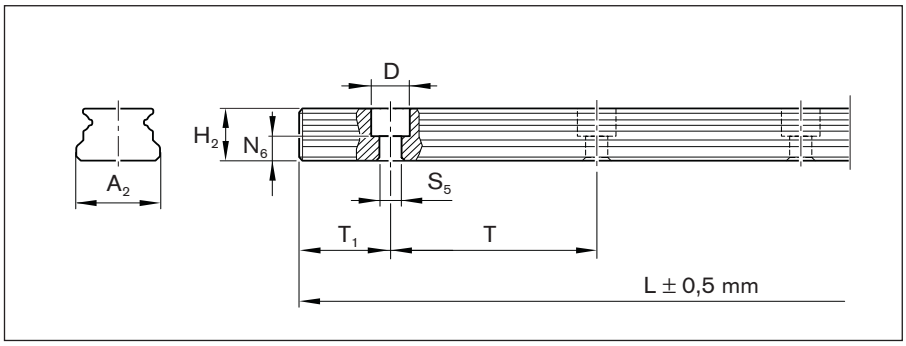
1) Also available in versions for mounting from below (please ask).

Recommended rail lengths

$$L = n_B \cdot T - 4$$

L	=	rail length	(mm)
T	=	hole spacing	(mm)
n_B	=	number of holes	

Dimensions and weights



Size	Dimensions (mm)									Weight
	A_2	H_2[1)]	N_6	D	S_5	T_{1min}	T_{1max}	T	L_{1max}[2)3)]	g/100 mm
7	7	4.7	2.2	4.3	2.5	5.0	11.5	15	1000	22
9/M3	9	5.5	2.2	6.0	3.5	6.0	15.5	20	2000	33
12	12	7.8	3.0	6.0	3.5	6.0	20.5	25	2000	61
15	15	9.5	4.7	6.0	3.5	6.0	35.5	40	2000	97
20	20	15.0	6.5	9.5	6.0	6.5	53.5	60	1000	211

1) Dimensions without cover strip
2) For rail lengths longer than L_{max} factory-made mating sections are joined end-to-end.
3) For special cases one-piece guide rails up to 2000 mm length possible (please ask).

Ordering Examples

☞ If no T_1 is specified by the customer, both ends of the guide rail will be identical. The rail lengths were calculated using the formula for recommended rail lengths.

Ordering example 1
(up to L_{max}):
Guide rail size 12, accuracy class P, recommended rail length 771 mm (30 · T, number of holes $n_B = 31$, T_1 is identical at both ends of the guide rail)
Ordering data: **R0445 202 31, 771 mm**

Ordering example 2
(up to L_{max} with cover strip):
Guide rail size 12 with cover strip, accuracy class P, recommended rail length 771 mm (30 · T, number of holes $n_B = 31$, T_1 at one end of guide rail = 4.5 mm)
Ordering data:
R0445 262 31, 771 mm, T1 = 4.5 mm
(At the other end of the guide rail T_1 = 16.5 mm for production reasons.)

Ordering example 3
(composite rail over L_{max}):
Guide rail size 12, accuracy class N, recommended rail length 1271, mm, **2** sections (50 · T, number of holes $n_B = 51$, T_1 is identical at both ends of the composite guide rail)
Ordering data: **R0445 204 32, 1271 mm**
Number of sections

Ordering example 4
(one-piece over L_{max}):
Guide rail size 12, accuracy class P, recommended rail length 1771 mm (70 · T, number of holes $n_B = 71$, T_1 is identical at both ends of the guide rail)
Ordering data: **R0445 202 31, 1771 mm**

Note on adjacent structures

Permissible mounting hole tolerances for adjacent structures with one-piece guide rails.

Size	Hole position tolerance (mm)
7 - 20	Ø 0.2