

Accuracy Classes

Accuracy classes and their tolerances for standard roller rail systems

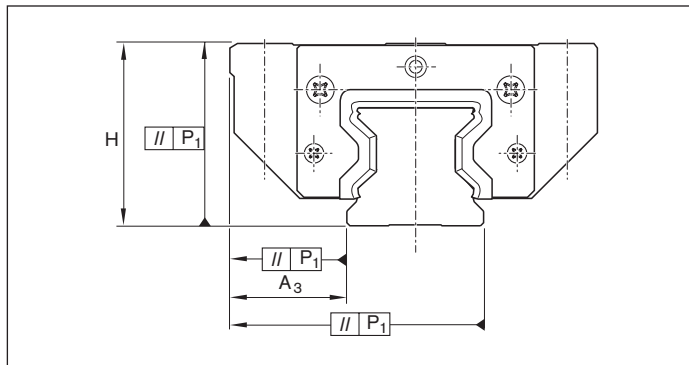
Standard roller rail systems are offered in up to five different accuracy classes.

Heavy duty roller rail systems are offered in up to three accuracy classes.

For details of the available roller runner blocks and roller guide rails, see the “Part numbers” tables.

Built-in interchangeability through precision machining

Rexroth manufactures its roller guide rails and roller runner blocks with such high precision, especially in the roller track zone, that each individual component element can be replaced by another at any time.



For example, a roller runner block can be used without problems on various roller guide rails of the same size. Similarly, different roller runner blocks can also be used on one and the same roller guide rail.

	H,	A ₃	ΔH, ΔA ₃
Measured at middle of runner block	For any roller runner block/guide rail combination at any position on rail		For different roller runner blocks at same position on rail

Standard and heavy duty roller rail systems, steel version

Accuracy classes	Dimensional tolerances (μm)		Max. difference in dimension H and A ₃ on one guide rail (μm)	
	H	A ₃	ΔH, ΔA ₃	
H		±40	±20	15
P		±20	±10	7
SP		±10	±7	5
GP¹⁾		(±10) 10	±7	5
UP		±5	±5	3

1) Dimension H: (±10) sorted by height (GP) to 10 μm (see “Combinations of accuracy classes”)

Standard and heavy duty roller rail systems, Resist CR, hard chrome plated

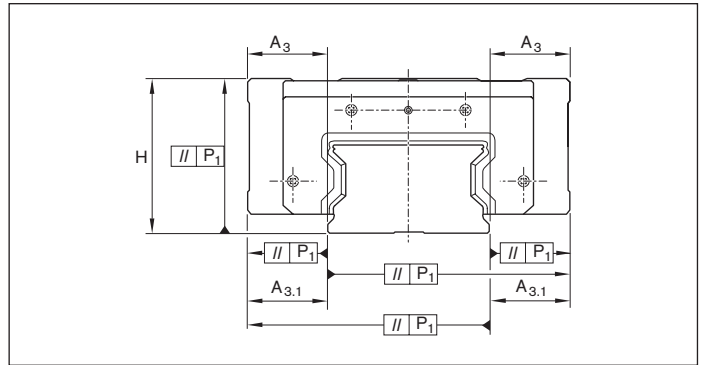
Accuracy classes	Dimensional tolerances (μm)				Max. difference in dimension H and A ₃ on one guide rail (μm)	
	H		A ₃		ΔH, ΔA ₃	
	RB/GR	GR	RB/GR	GR	RB/GR	GR
H	+47 -38	+44 -39	±23	+19 -24	18	15
P	+27 -18	+24 -19	±13	+9 -14	10	7
SP	+17 -8	+14 -9	±10	+6 -11	8	5

Accuracy classes and their tolerances for wide roller rail systems

Wide roller rail systems are offered in up to three different accuracy classes. For details of the available roller runner blocks and roller guide rails, see the “Part numbers” tables.

Key to graphs

H = height tolerance (μm)
 A₃ = lateral tolerance (μm)
 P₁ = parallelism offset (μm)
 L = rail length (mm)



Abbreviations

RB/GR = roller runner block and roller guide rail hard chrome plated
 GR = only roller guide rail hard chrome plated

	H	A ₃	A _{3.1}	ΔH, ΔA ₃	ΔA _{3.1}
Measured at middle of runner block	For any roller runner block/guide rail combination at any position on rail			For different roller runner blocks at same position on rail	

Wide roller rail systems, steel version

Accuracy classes	Dimensional tolerances (μm)						Max. difference in dimension H and A ₃ on one guide rail (μm)			
	H		A ₃		A _{3.1}		ΔH, ΔA ₃		ΔA _{3.1}	
H	±40		±20		+26/-24		15		17	
P	±20		±10		+15/-13		7		9	
SP	±10		±7		+12/-10		5		7	

Wide roller rail systems, Resist CR, hard chrome plated

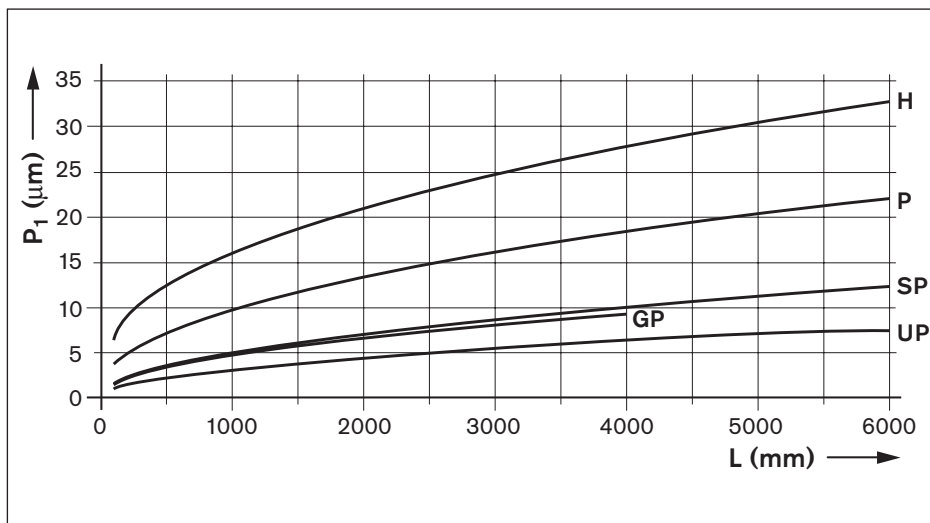
Accuracy classes	Dimensional tolerances (μm)						Max. difference in dimension H and A ₃ on one guide rail (μm)			
	H		A ₃		A _{3.1}		ΔH, ΔA ₃		ΔA _{3.1}	
	RB/GR	GR	RB/GR	GR	RB/GR	GR	RB/GR	GR	RB/GR	GR
H	+47 -38	+44 -39	±23	+19 -24	+29 -27	+25 -28	18	15	20	17
P	+27 -18	+24 -19	±13	+9 -14	+18 -16	+14 -17	10	7	12	9
SP	+17 -8	+14 -9	±10	+9 -14	+18 -16	+14 -17	10	7	12	9

Accuracy Classes

Parallelism offset P_1 of the roller rail system in service

Values measured at middle of runner block for roller rail systems without surface coating

For hard chrome plated roller guide rails the values may increase by up to $2 \mu\text{m}$.



Key to graphs

P_1 = parallelism offset (μm)
 L = rail length (mm)

Combinations of accuracy classes

Tolerances for combination of accuracy classes

Accuracy classes roller runner blocks	Dimensional tolerances (μm)	Accuracy classes roller guide rails				
		H	P	SP	GP	UP
H	Tolerance for dimension H	± 40	± 24	± 15	–	± 11
	Tolerance for dimension A_3	± 20	± 14	± 12	–	± 11
	Max. difference in dimension H and A_3 on one rail	15	15	15	–	15
P	Tolerance for dimension H	± 36	± 20	± 11	–	± 7
	Tolerance for dimension A_3	± 16	± 10	± 8	–	± 7
	Max. difference in dimension H and A_3 on one rail	7	7	7	–	7
SP	Tolerance for dimension H	± 35	± 19	± 10	$(\pm 10)^{1)}$ ± 5	± 6
	Tolerance for dimension A_3	± 15	± 9	± 7	± 7	± 6
	Max. difference in dimension H and A_3 on one rail	5	5	5	5	5
UP	Tolerance for dimension H	± 34	± 18	± 9	± 4	± 5
	Tolerance for dimension A_3	± 14	± 8	± 6	± 6	± 5
	Max. difference in dimension H and A_3 on one rail	3	3	3	3	3

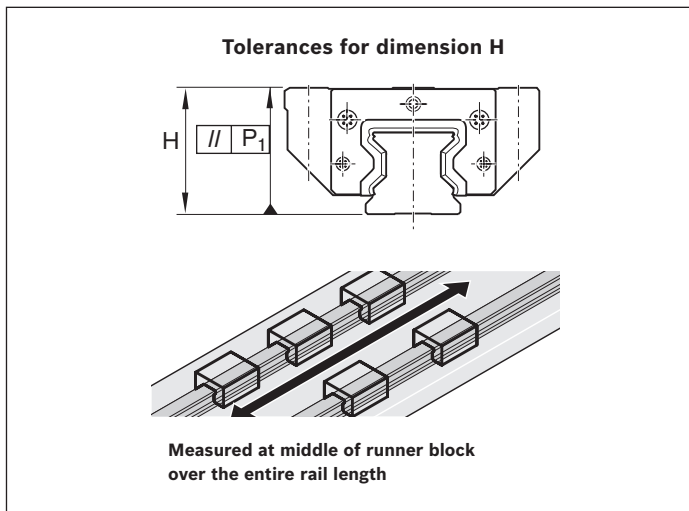
1) Dimension H: (± 10) sorted by height (GP) to $10 \mu\text{m}$ (see “Combination: roller runner blocks SP with roller guide rails GP”)

Combination: roller runner blocks SP with roller guide rails GP

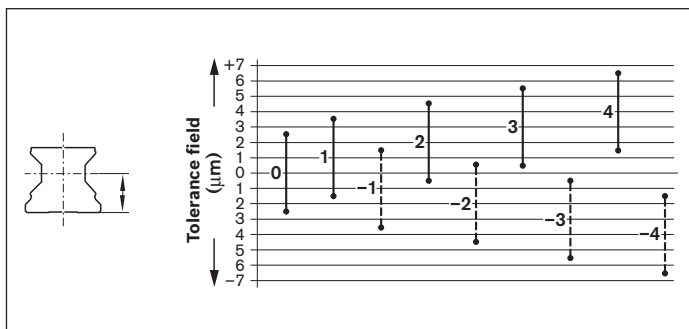
Dimension H (± 10) sorted by height (GP) to $\pm 5 \dots 10 \mu\text{m}$:

Applies for any combination of roller runner blocks with accuracy class SP and roller guide rails R1805 .68 .. with the same sorting, e.g. $-1^{\pm 2.5} \mu\text{m}$, over the entire rail length. Sorting code on the roller guide rail and the additional label, e.g. GP -1, GP +3, etc.

When ordering, please state the quantity per sorting dimension, e.g. 2 pcs per sorting dimension.



Height sorting of the roller guide rails



Recommendations for combining accuracy classes

Recommended for **close roller runner block spacing** and short strokes:

Roller runner block in higher accuracy class than roller guide rail.

Recommended for **large roller runner block spacing** and long strokes:

Roller guide rail in higher accuracy class than roller runner block.

Important note

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

Travel accuracy

Perfected roller entry and exit zones in the roller runner blocks and optimized spacing of the mounting screws in the roller guide rails provide unmatched travel accuracy with very low pulsation.

These high accuracy systems are especially suitable for high-precision machining processes, measurement systems, high-precision scanners, EDM equipment, etc.