Miniature linear guidance set

with cylindrical roller flat cages

SCHAEFFLER GROUP
INDUSTRIAL

Miniature linear guidance set

with cylindrical roller flat cages

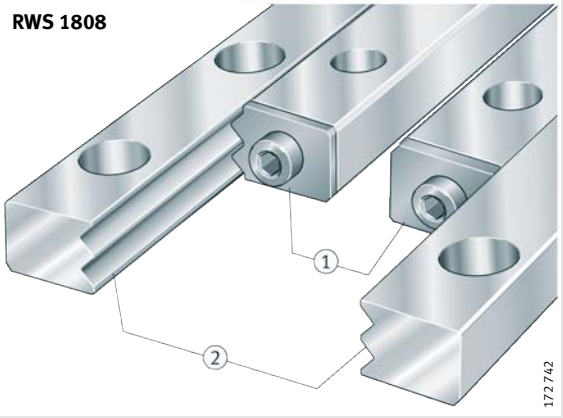
Features

Miniature linear guidance sets

- are linear locating bearings for limited stroke lengths
- have high load carrying capacity, high rigidity and high running accuracy whilst requiring very little space
- are produced in numerous standard lengths and lengths specific to the application, giving especially cost-effective designs
- can support loads from all directions – apart from the direction of motion – and moments about all axes
- have higher load carrying capacity and accuracy than linear recirculating guidance systems
- are very smooth-running
- have high rigidity
- can be easily matched to a predetermined adjacent construction since the distance between the parts of the guidance system can be varied
- have rolling element arrangements which transmit forces at a 45° contact angle
  - two rows of cylindrical rollers are in line contact with the raceways
- can be changed to an O or X arrangement by changing over the cages
- have improved coverage of the end faces on guideways of unequal length
- can be lubricated with oil or grease via the guideway
- are also available by agreement in corrosion-resistant versions.

Miniature linear guidance set

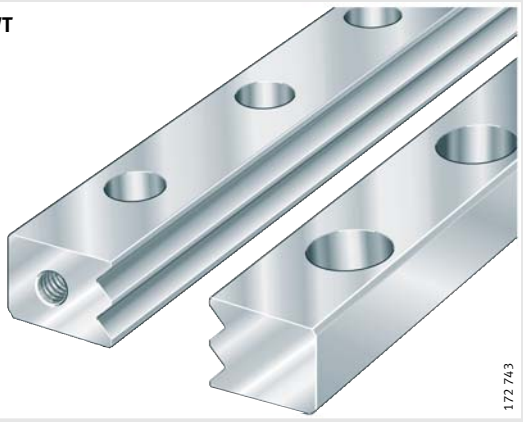
RWS 1808



- basic design comprising:
  - pair of inner ① and outer ② guideways of equal or unequal length
  - cylindrical roller flat cages
  - end pieces
- suitable for temperatures up to +120 °C

Guideways

RWT



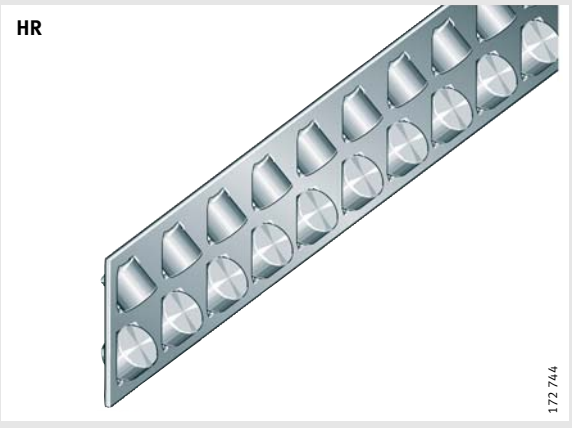
- induction hardened steel
- precision ground raceways for rolling elements
- fixing holes, can be combined with insert nuts ESM
- holes in the end faces for end pieces – except on longer guideways

Miniature linear guidance set

RWS

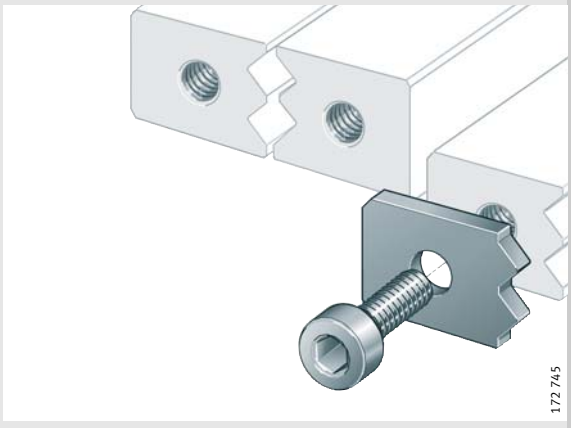
Cylindrical roller flat cage

HR



- cage strip made from corrosion-resistant steel
- cylindrical rollers in accordance with DIN 5 402-1

End pieces



- end pieces made from steel
- end pieces for guideways of unequal length; fixing by hexagonal socket head screws

Design and safety guidelines

Load carrying capacity and rating life

The size of the guidance unit is determined by the load carrying capacity of the individual elements. The load carrying capacity is described in terms of the basic dynamic load rating C and the basic static load rating C_0 (dimension tables).

⚠ For applications with temperatures in excess of +120 °C, factors must be used to reflect reductions in the basic load ratings. Please ask for further information.

Basic rating life

The basic rating life is determined using the following formulae:

$$L = k_{KHV} \cdot \left(\frac{C}{P}\right)^p$$

$$L_h = \frac{8.33 \cdot 10^5}{H \cdot n_{osc}} \cdot k_{KHV} \cdot \left(\frac{C}{P}\right)^p$$

L m
Basic rating life in 100 000 m

k_{KHV} –
Short stroke factor in accordance with DIN 636-3 (Figure 1)

C N
Basic dynamic load rating (*dimension tables*)

P N
Equivalent dynamic load

p –
Life exponent = 10/3

L_h h
Basic rating life in operating hours

H mm
Distance between ends of stroke

n_{osc} min^{-1}
Number of return strokes per minute.

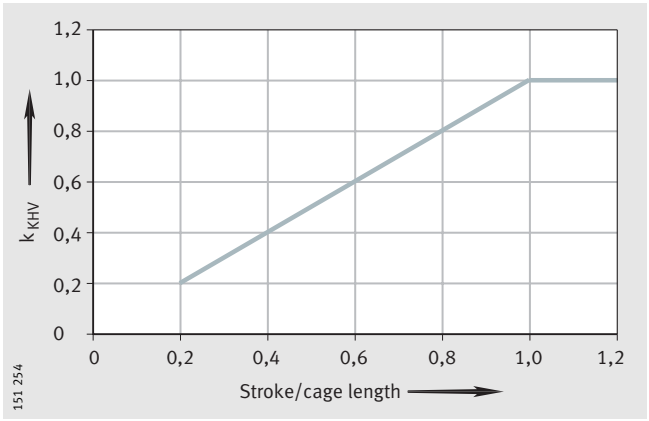


Figure 1 · Short stroke factor k_{KHV} – in accordance with DIN 636-3

Static load safety factor

The static load safety factor S_0 indicates the security with regard to permissible permanent deformation in the bearing without affecting the guidance accuracy and smooth running of the bearing. It can be determined using the following formula:

$$S_0 = \frac{C_0}{P_0}$$

$$S_0 = \frac{M_0}{M}$$

⚠ If high demands are placed on accuracy and smoothness of running, the static load safety factor should not be less than $S_0 = 3$.

For high loads, the load carrying capacity of the fixing screws must always be checked.

The equivalent static bearing load is determined by the maximum load F_{max}.

$$P_0 = F_{max}$$

$$M_0 = M_{max}$$

S_0 – Static load safety factor

C_0 N Basic static load rating (*dimension tables*)

P_0 N Maximum equivalent static load

M_0 Nm Basic static moment rating in load direction (M_{0x}, M_{0y}, M_{0z} from *dimension tables*)

M Nm Equivalent static moment in load direction.

Basic static moment rating M_{0x}

The moments for rolling elements in an O arrangement can be determined using the following formulae:

$$a_k = a_i + B$$

$$M_0 = k_M + a_k \cdot W_{M_{0x}}$$

a_k mm Cage spacing (Figure 2)

a_i mm Minimum internal width (Figure 2)

B mm Total height of guidance system (Figure 2 and *dimension tables*)

M_{0x} Nm Basic static moment rating about X axis (Figure 2)

k_M – Moment constant (*dimension tables*)

$W_{M_{0x}}$ Nm Static moment factor about X axis (*dimension tables*).

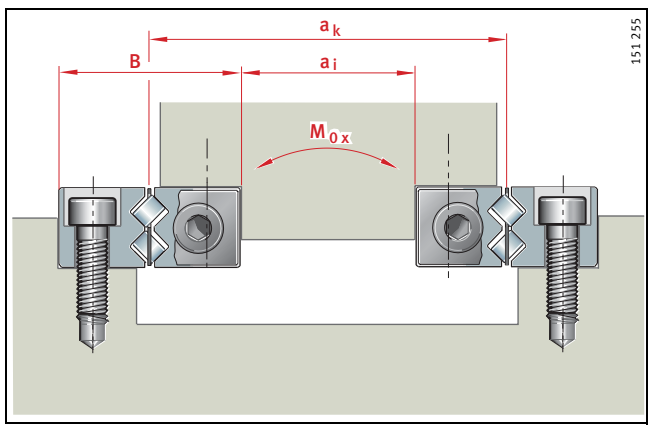


Figure 2 · Internal width and cage spacing

Preload

The guidance systems must be preloaded (Table 1).

Preload:

- increases the rigidity and guidance accuracy
- reduces the high loads on the rolling elements at the ends of the cage under moment load (about the Z and Y axes). This therefore increases the moment load carrying capacity of the guidance system.

⚠ However, preload also influences the displacement resistance and the operating life of cage guidance systems.

Table 1 · Preload class

Preload class	Preload RWS	Application
V1	0,005 · C to 0,02 · C	Low to moderate loads; moderate to high rigidity; moment loads

The guideways can be fixed through the adjacent construction or through the guideways.

Depending on the fixing method used, the preload is set as follows:

- the holes/counterbores in the adjacent construction must be larger than normal (Figure 3).

Location of guideways through the adjacent construction

If the guideways are to be located using the threaded holes in the guideways, the diameter D_1 and d_1 of the through holes in the adjacent construction must be larger (Figure 3).

Location of guideways through the guideways

If the guideways are to be located using the through holes in the guideways, thinner screws ① (Figure 4) can be used.

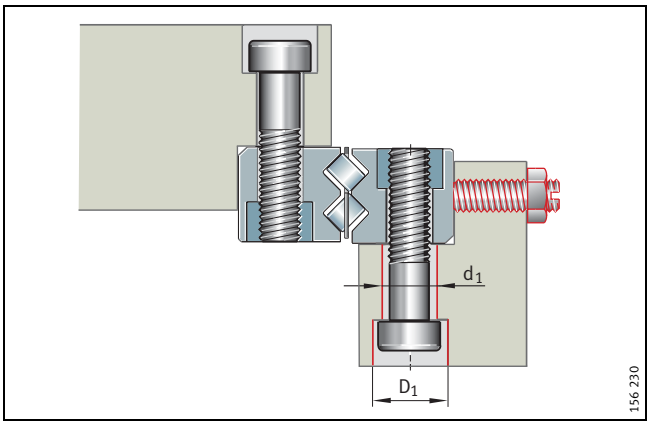


Figure 3 · Location through the adjacent construction/ setting the preload

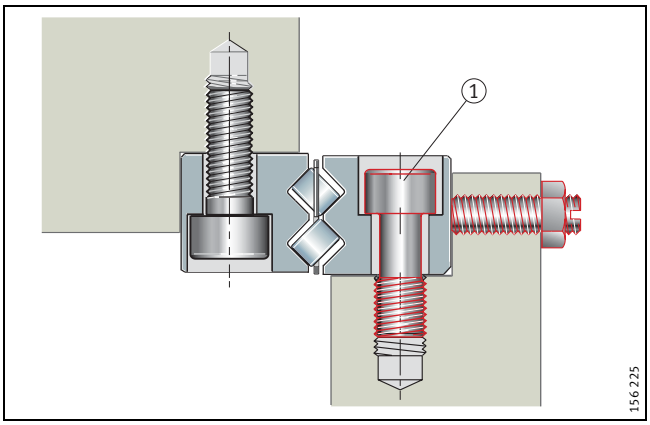


Figure 4 · Special screws/setting the preload

Location of guideways

The guideways have counterbored fixing holes as standard. This hole type can be used in combination with insert nuts ESM (Figure 5).

Guideways with the standard fixing hole can be screw mounted to the adjacent construction (Figure 6).

In combination with the insert nuts ESM, the standard fixing hole can be used as a threaded hole (Figure 7).
Fitting of insert nuts: see page 8.

In order to avoid location defects, the holes in the adjacent construction must be carefully deburred.

⚠ The counterbores of the guideway fixing holes have sharp edges. Risk of injury!

For high loads, the load carrying capacity of the fixing screws must always be checked.

Locating face

The locating face is the side with the large chamfer on the guideway (Figure 6 and 7).

⚠ When correctly fitted, the large guideway chamfers must be diagonally opposite each other.

The chamfer on the end piece and the chamfer on the guideway must match in position.

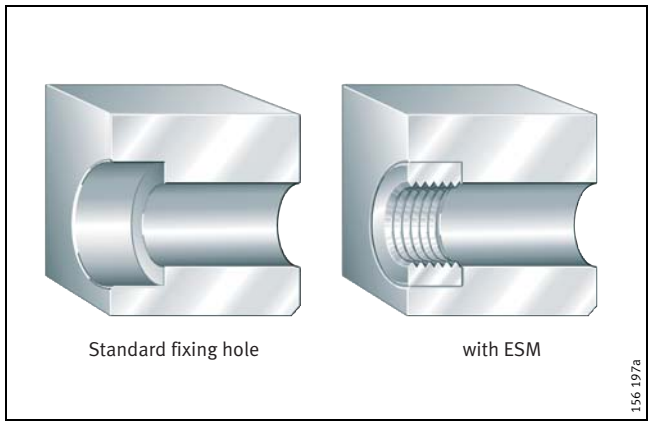


Figure 5 · Hole types for guideways

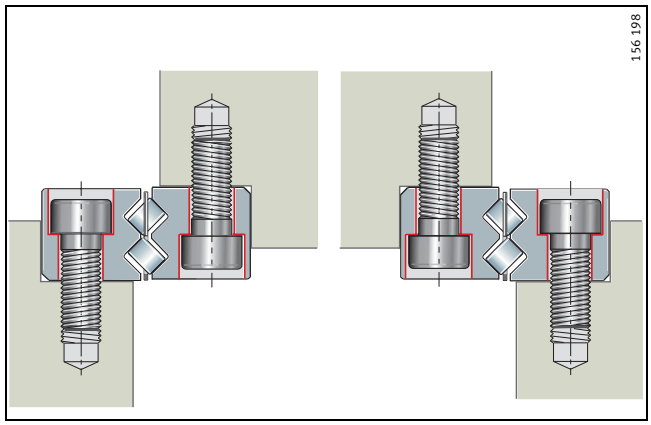


Figure 6 · Location of guideways

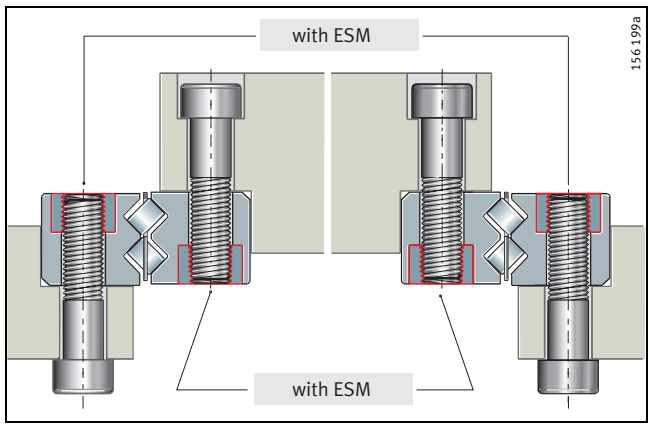


Figure 7 · Location of guideways using ESM

Insert nuts ESM

Insert nuts ESM are accessories for location of guideways (*Accessories*, page 13). By means of these nuts, this hole type can be used as a threaded hole.

The nuts must be ordered separately and are included loose with the delivery.

⚠ The nuts must be fixed by adhesive in the counterbores of the fixing holes.

Fitting of insert nuts ESM

- Degrease the counterbores in the guideway and the insert nuts ESM using conventional cleaning agents (Figure 8, ①).

⚠ Legal specifications relating to the handling and use of cleaning agents (manufacturer's instructions, regulations covering health and safety at work and environmental protection etc.) must be observed.

Cleaning agents must be disposed of correctly after use.

- Dry the counterbores and insert nuts (Figure 8, ②).
- Apply adhesive (see Table 2) to the cylindrical surface and one end face of the nut – follow the manufacturer's instructions (Figure 9, ③).
- Locate the nuts in the counterbores (Figure 9, ④).
- Allow the adhesive to harden with a weight on top of the nut or while under tension using a screw inserted through the bottom of the counterbore (Figure 10) – hardening times are given in Table 2.

Table 2 · Adhesives for fitting insert nuts ESM[1)]

Fitting adhesive – example	Hardening time
Locite 0641 Joining parts	30 min. to 60 min.
Locite 0242 Securing screws	30 min. to 60 min.
Loctite Cyanacrylate adhesive	30 sec. to 50 sec.

1) Adhesives for joining parts or securing screws must be provided with a gap fill capacity of at least 0,2 mm.

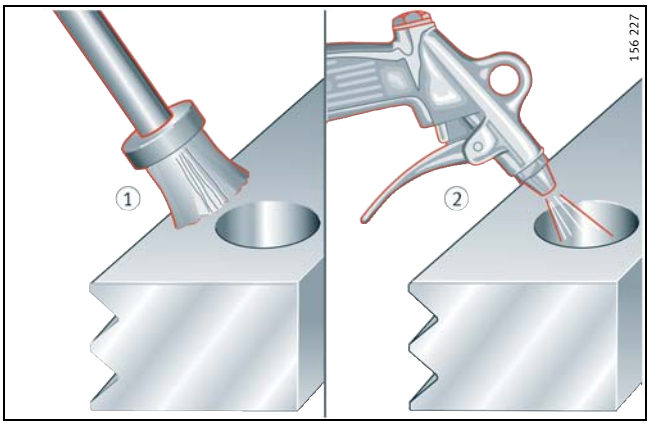


Figure 8 · Degrease and dry the nut/counterbore

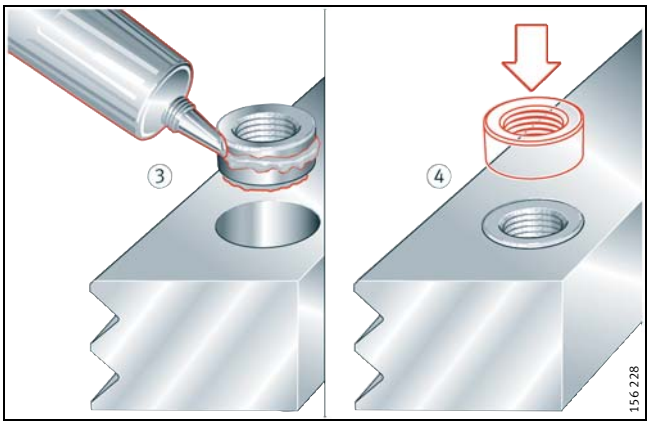


Figure 9 · Apply the adhesive and insert the nut

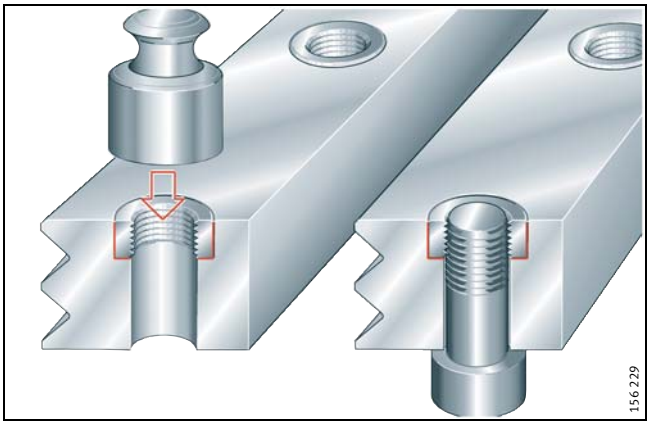


Figure 10 · Allow the adhesive to harden

Hole patterns

The hole pattern is symmetrical: In this case, $a_L = a_R$ (Figure 11).

For guideways with a symmetrical hole pattern:

$$a_L = a_R = \frac{1}{2}\,(L - n \cdot j_L)$$

a_L, a_R mm
Distance between start or end of guideway and nearest hole

L mm
Guideway length

n –
Maximum number of pitches between holes

j_L mm
Hole spacing (*dimension tables*).

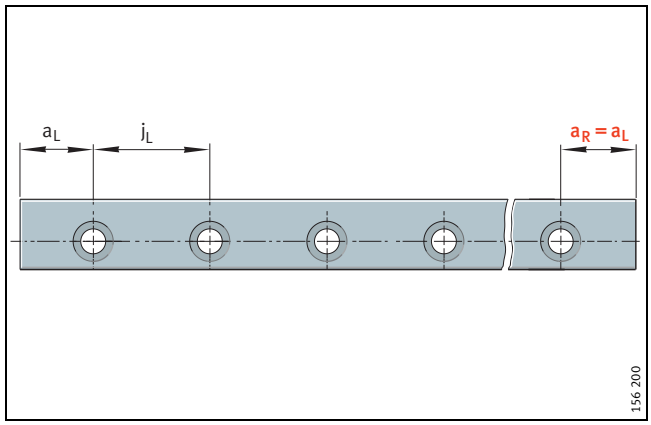


Figure 11 · Symmetrical hole pattern

Rolling elements in O and X arrangements

The rolling elements can be changed to an O or X arrangement by changing over the cages (Figure 12).

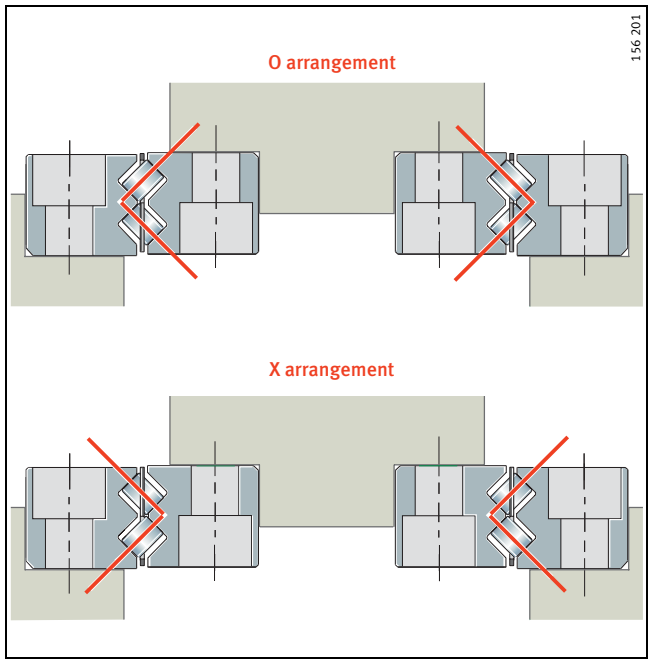


Figure 12 · Rolling elements in O and X arrangements

Delivered condition/initial operation

Miniature linear guidance systems are supplied coated with a preservative. The preservative is compatible with oils and greases.

The raceways and cages must be:

- oiled or greased, depending on the lubrication method, before initial operation
- protected against solid and fluid contaminants.

Design of bearing arrangements

The design of a bearing arrangement with minature linear guidance guidance systems is essentially determined by the requirements for:

- accuracy
- rigidity
- load carrying capacity.

This has a direct influence on the adjacent construction and primarily concerns:

- the geometrical and positional accuracy of the mounting surfaces
- the location of the guidance elements
- the sealing of the bearing arrangement.

⚠ Ensure that the adjacent construction has adequate strength – VDI guideline 2 230.

The end pieces should not be used to limit the stroke. This can damage the guidance system.

Geometrical and positional accuracy of the mounting surfaces

The higher the requirements for accuracy and smooth running of the guidance system, the more attention must be paid to the geometrical and positional accuracy.

Observe the tolerances for the support and locating surfaces in accordance with Figure 13, Figure 14 and Table 4:

- Surfaces should be ground or precision milled.
  A mean roughness value of $\leqslant R_a 1{,}6$ should be achieved.

⚠ If these tolerances are not met:
- the overall accuracy of the guidance system will be impaired
- the preload will be altered
- the operating life of the guidance system will be reduced.

Permissible values for ΔH (Figure 13) are given by the formula below. If the deviation is greater than this, please contact us.

$$\Delta H = a \cdot b$$

ΔH μm
Maximum permissible deviation from the theoretically precise position

a –
Factor dependent on bearing size (Table 3)
Guidance system set free from clearance

b mm
Centre distance between guidance elements.

Table 3 · Factor dependent on bearing size

Miniature linear guidance system Designation	Factor a
RWS 1808	0,08

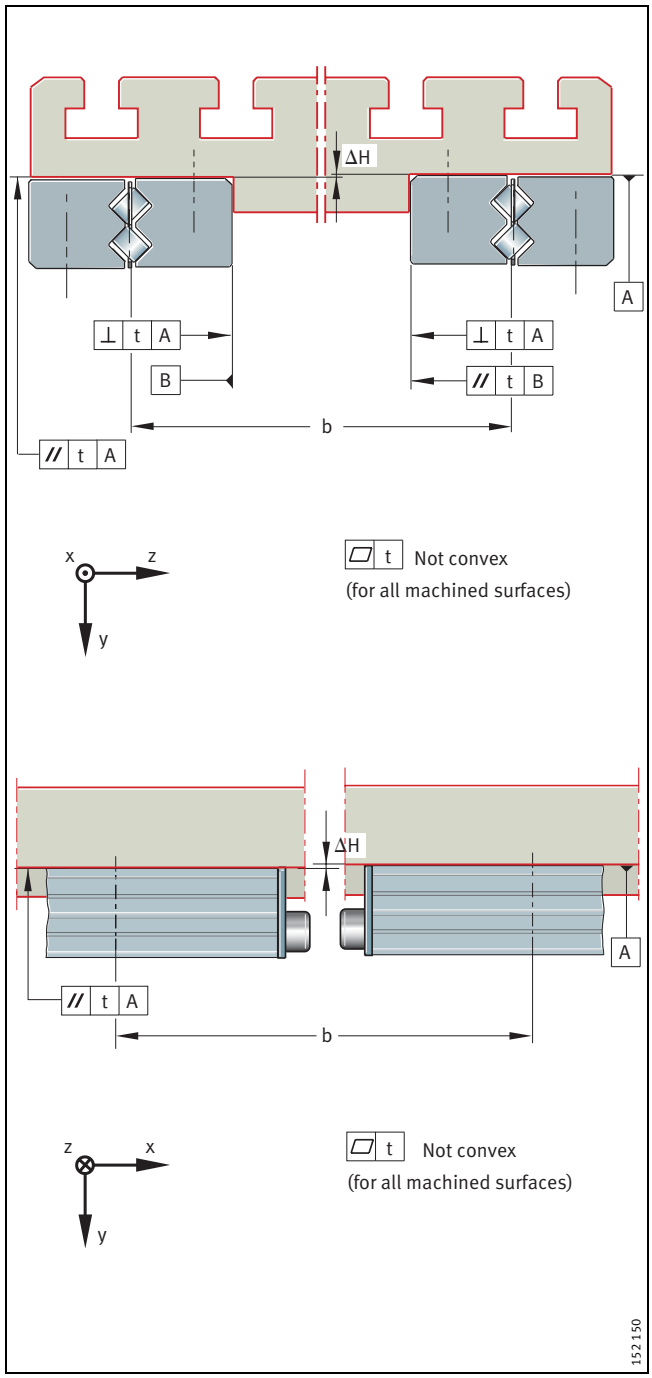


Figure 13 · Tolerances for mounting surfaces

Parallelism of mounted guideways

The parallelism t of the guideways should be in accordance with Figure 14 and Table 4:

- If the maximum values are used, the displacement resistance may increase
- For larger tolerances, please contact us.
- For calculation of ΔH, see page 10.

Table 4 · Value for t

Miniature linear guidance system Designation	Guideway Designation	Parallelism $t^{1)}$ µm
RWS 1808	RW	5

[1] Value for guidance system set free from clearance.

Locating heights and corner radii

Locating heights and corner radii should be in accordance with Figure 15 and Table 5.

Table 5 · Locating heights and corner radii

Miniature linear guidance system	Locating heights and corner radii			
Designation	h_1	h_2 max.	r_1 max.	r_2 max.
RWS 1808	7,5	7,5	0,4	0,4

Sealing

In order to prevent damage to the guidance systems, the raceways must be kept clean at all times. If the end pieces used as standard are not adequate for this purpose, additional seals must be provided in the adjacent construction.

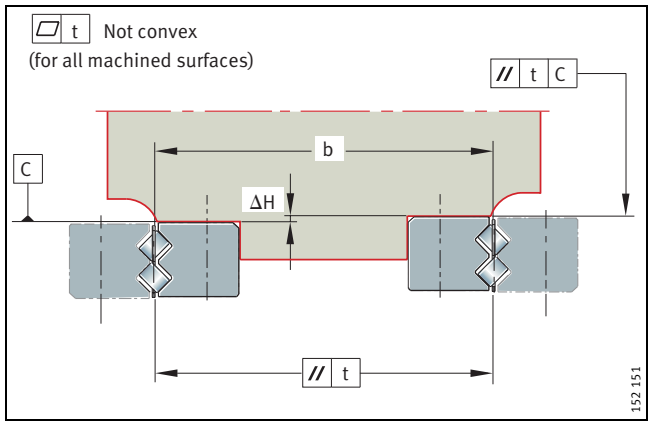


Figure 14 · Parallelism of mounted guideways

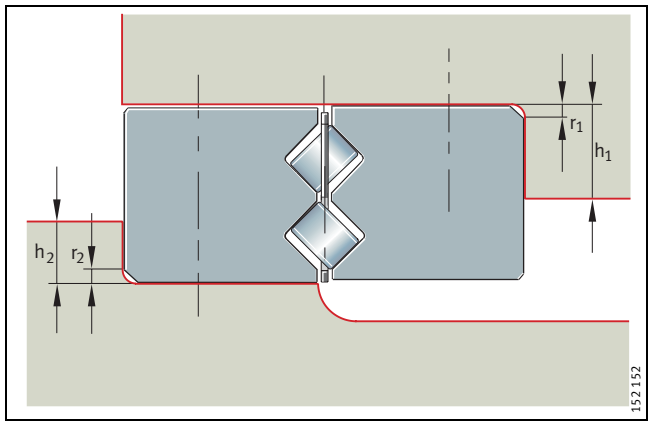


Figure 15 · Locating heights and corner radii

Accuracy

Accuracy classes available: see Figure 16 and Table 6.

Table 6 · Accuracy classes

Miniature linear guidance system Designation	Accuracy class
RWS 1808	G1

Parallelism of raceways to locating surfaces

Parallelism tolerances of guideways: see Figure 16.

Tolerances of reference dimensions for locating surfaces

The tolerances are arithmetic mean values (Figure 17 and Table 7). They relate to the centre point of the screw mounting or locating surfaces of the guideways.

The dimensions H and B should always remain within the tolerance irrespective of the position of the guideways.

Table 7 · Accuracy class and tolerances

Tolerance		Accuracy class G1 µm
for height	H	±10
for spacing	B	0 to −200

Length tolerances of guideways

Tolerances: see Figure 17 and Table 8.

Table 8 · Length tolerances

Miniature linear guidance system Designation	Tolerances Guideway L ≦350 mm
RWS 1808	±0,6 mm

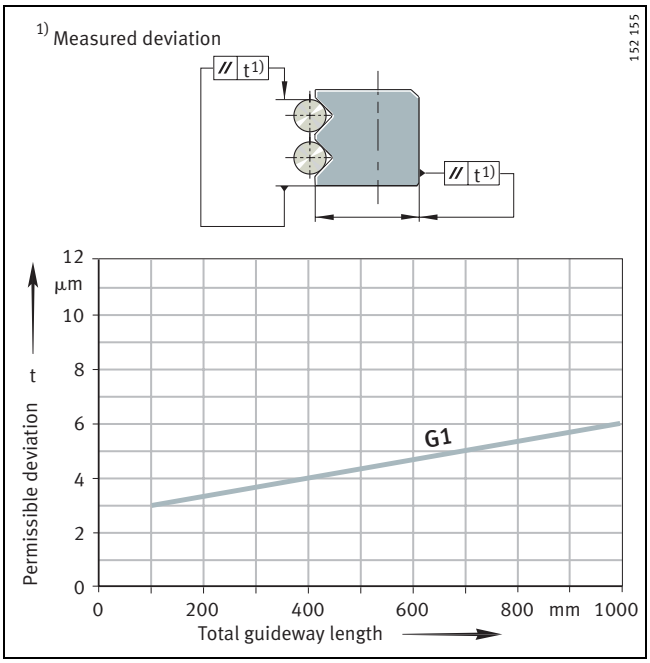


Figure 16 · Parallelism tolerances of guideways

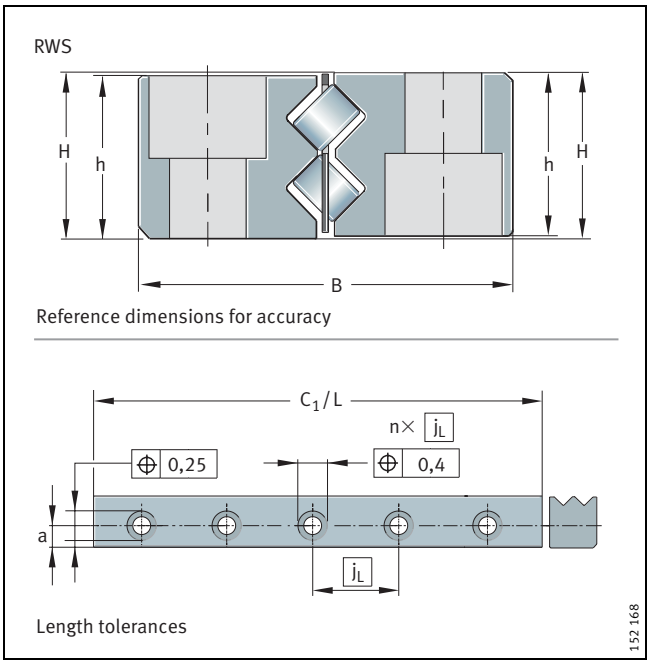


Figure 17 · Reference dimensions for accuracy/ length tolerances

Accessories

The following must be ordered separately:

- Insert nuts ESM
  – suffix +ESM.

Ordering example and ordering designation

Guideways of unequal length

Miniature linear guidance set with cylindrical roller flat cage	RWS
Size	1808
Length of inner guideway pair ①	150 mm
Length of outer guideway pair ②	175 mm
Stroke length	20

Ordering designation:

1 × **RWS 1808 150/175×20** (Figure 18).

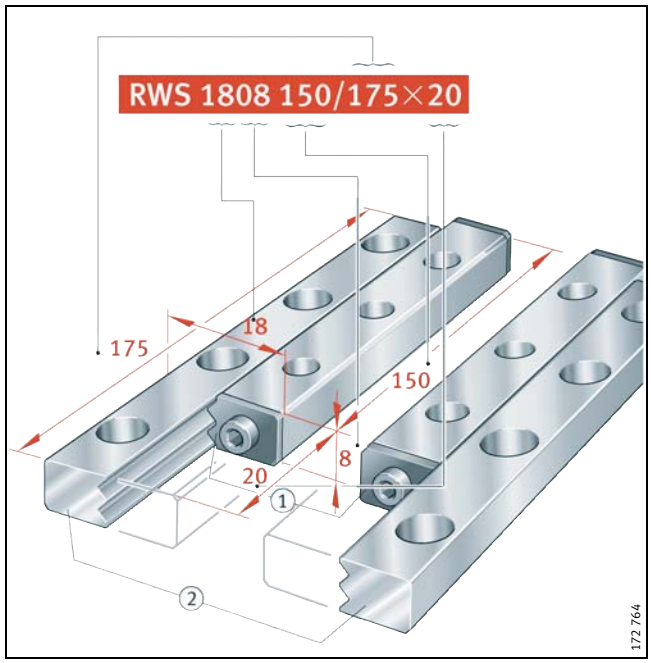


Figure 18 · Ordering example, ordering designation – guideways of unequal length

Guideways of equal length

Miniature linear guidance set with cylindrical roller flat cage	RWS
Size	1808
Length of inner guideway pair ①	150 mm
Length of outer guideway pair ②	150 mm with ESM
Stroke length	20

Ordering designation:

1 × **RWS 1808 150/150 +ESM×20** (Figure 19).

Ordering example, insert nuts ESM

100 × SM for RWS 1808.

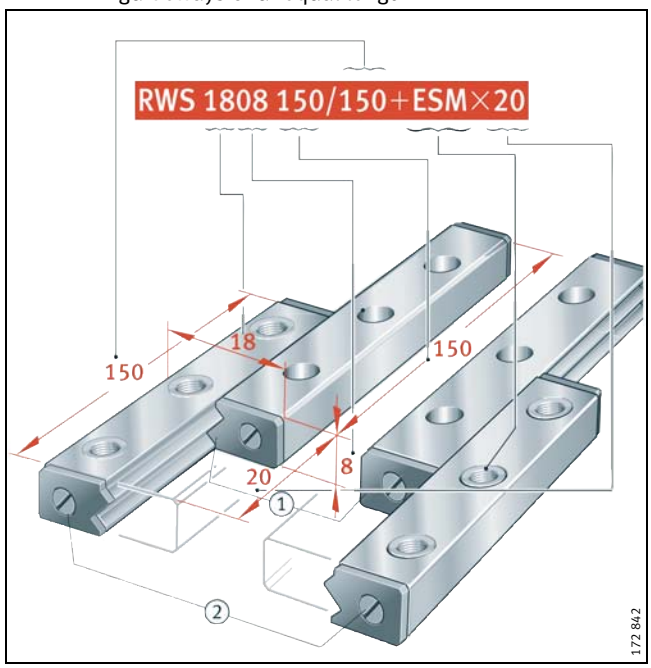


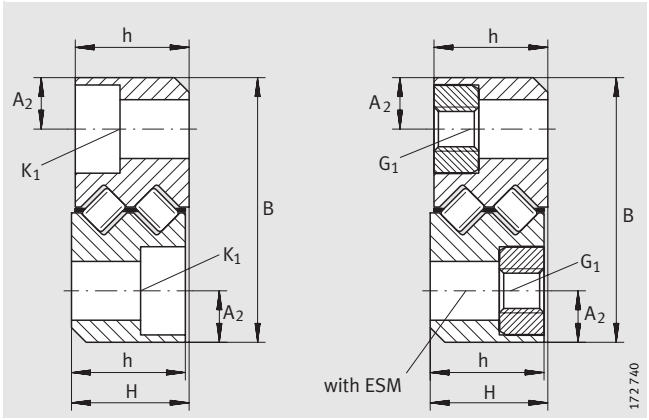
Figure 19 · Ordering example, ordering designation – guideways of equal length

Miniature linear guidance set

with cylindrical roller flat cages

Guideways of equal and unequal length

Series RWS 1808



RWS 1808

Dimension table · Dimensions in mm

Unit	Guideway pair 1 and 2	Dimensions			Mounting dimensions						K_1, G_1	
Designation	Designation	L_{max} [1]	H	B	A_2	h	j_L	a_L	a_R	C_8	for screw DIN 912-12.9	Tightening torque max. Nm
RWS 1808	RWT	350	8	18	3,5	7,9	25	12,5	12,5	3	M3	2,2

[1] Maximum manufactured length of guideway. Special lengths are available by agreement.

Example for RWS 1808:

C_1 Length of inner guideway pair = 125 mm
Stroke required = 20 mm
h Stroke length = 22 mm
z Safety range = 10 mm (4 ≦ z ≦10)
L Length of outer guideway pair (see formula and table *Main dimensions, basic load ratings, moments*).

$$L = C_1 + h + z$$

L = 125 mm +22 mm +10 mm = 157 mm (next standard length according to table *Main dimensions, basic load ratings, moments*: L = 175 mm).

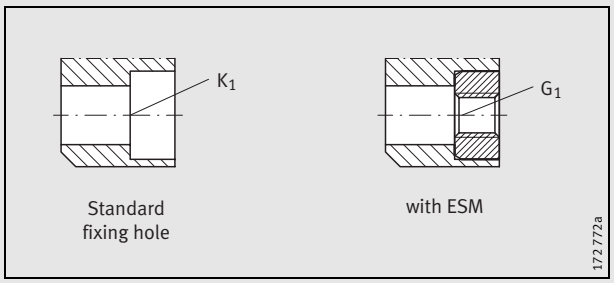
Ordering data for guideways of equal length (C_1 = L):

RWS 1808 125/125322

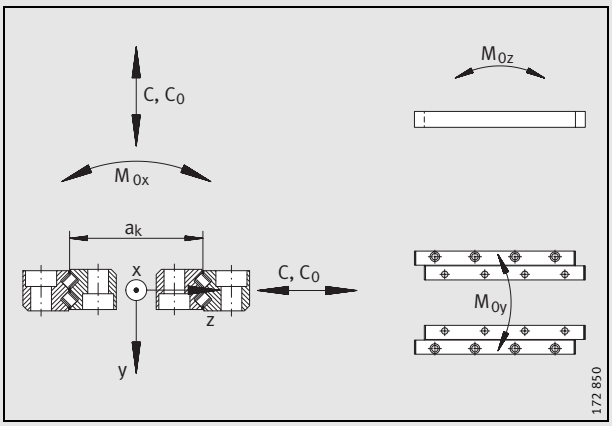
Ordering data for guideways of unequal length ($C_1 \neq L$):

RWS 1808 125/175322

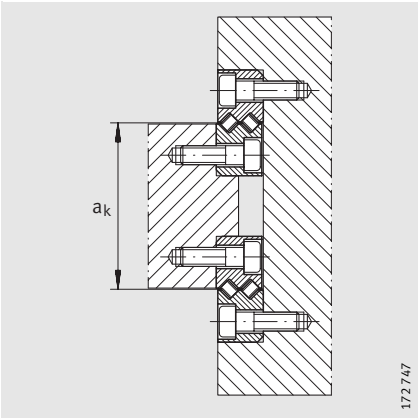
⚠ The cage must not be longer than the short guideway.



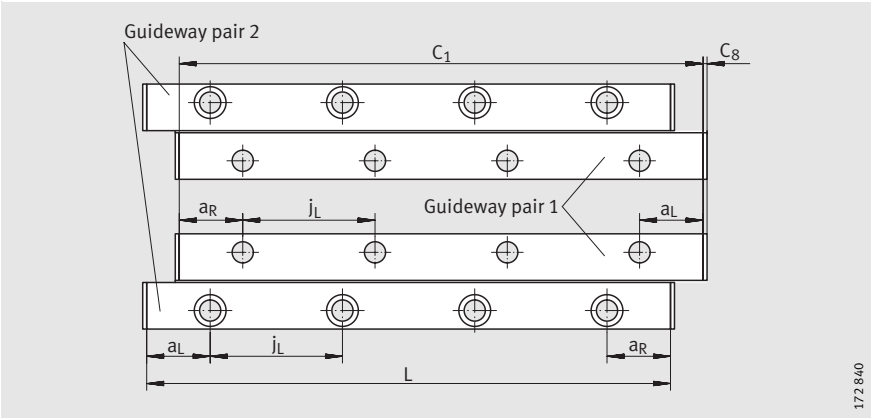
Hole types



Load directions
(see table *Main dimensions, basic load ratings, moments*).



Cage spacing a_k –
determined by adjacent construction



RWS 1808 – guideway pair 1 and 2 of equal length
(miniature linear guidance set)[2]

Main dimensions, basic load ratings, moments[1]

Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings			Guideway	
Designation	h	C_1	L[2]	dyn. C	stat. C_0	M_{0x} = $k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}	Designation	Mass
	mm	mm	mm	N	N	Nm	Nm	Nm		≈g
RWS 1808	40	50	50	5100	9400	10 + a_k × 4,5	60	60	**RWT**	44
	32			5600	10500	10 + a_k × 5	60	60		44
	26			6100	11700	10 + a_k × 5,5	73	73		44
	18			6500	12900	10 + a_k × 6	88	88		44
	12			7000	14100	10 + a_k × 7	104	104		44
	4			7500	15200	10 + a_k × 7,5	121	121		44
	62	75	75	7000	14100	10 + a_k × 7	104	104		68
	54			7500	15200	10 + a_k × 7,5	121	121		68
	48			7900	16400	10 + a_k × 8	139	139		68
	40			8300	17600	10 + a_k × 8,5	159	159		68
	34			8800	18700	15 + a_k × 9	180	180		68
	26			9200	19900	15 + a_k × 9,5	203	203		68
	20			9600	21100	15 + a_k ×10,5	227	227		68
	12			10000	22300	20 + a_k ×11	252	252		68
	6			10400	23400	20 + a_k ×11,5	279	279		68
	84	100	100	8800	18700	15 + a_k × 9	180	180		90
	76			9200	19900	15 + a_k × 9,5	203	203		90
	70			9600	21100	15 + a_k ×10,5	227	227		90
	62			10000	22300	20 + a_k ×11	252	252		90
	56			10400	23400	20 + a_k ×11,5	279	279		90
	48			10800	24600	20 + a_k ×12	306	306		90
	42			11200	26000	20 + a_k ×12,5	336	336		90
	34			11600	27000	20 + a_k ×14	366	366		90
	28			12000	28000	25 + a_k ×14	398	398		90
	20			12400	29500	25 + a_k ×14,5	431	431		90
	14			12800	30500	25 + a_k ×15	465	465		90
	6			13200	31500	25 + a_k ×15,5	501	501		90
	112	125	125	10000	22300	20 + a_k ×11	252	252		114
	106			10400	23400	20 + a_k ×11,5	279	279		114
	98			10800	24600	20 + a_k ×12	306	306		114
	92			11200	26000	20 + a_k ×12,5	336	336		114
	84			11600	27000	20 + a_k ×14	366	366		114
	78			12000	28000	25 + a_k ×14	398	398		114
	70			12400	29500	25 + a_k ×14,5	431	431		114

Example for selection of sets: see page 14.

1) For other dimensions, see page 14.

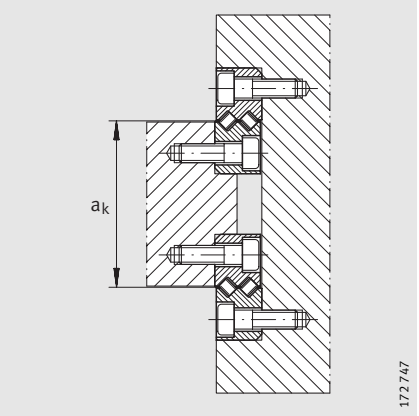
2) If L ≠ C_1, see calculation on page 14, figure on page 17.

Miniature linear guidance set

with cylindrical roller flat cages

Guideways of equal and unequal length

Series RWS 1808



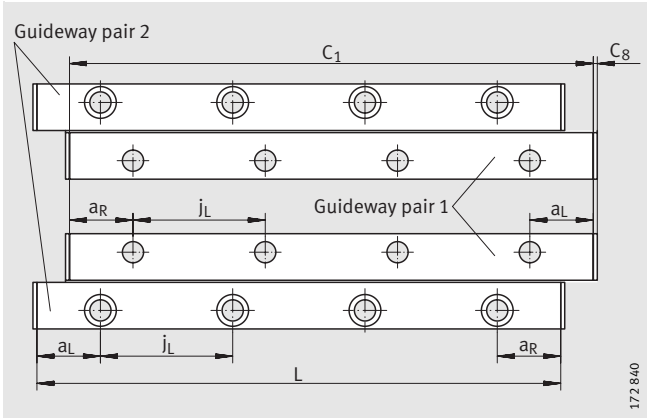
Cage spacing a_k –
determined by adjacent construction

Main dimensions, basic load ratings, moments[1] (continued)

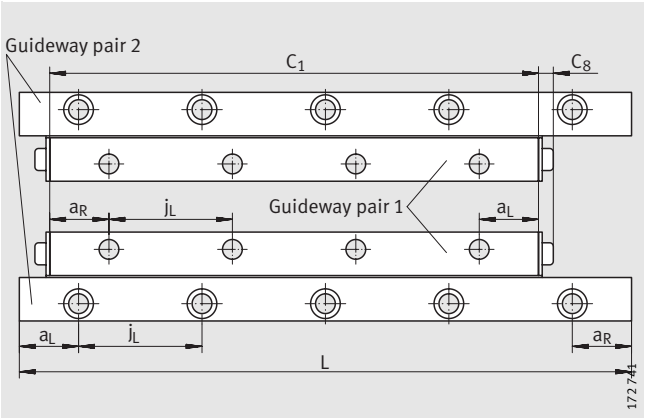
Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings			Guideway	
									Guideway	
Designation	h	C_1	L	dyn. C	stat. C_0	$M_{0x} = k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}	Designation	Mass
	mm	mm	mm	N	N	Nm	Nm	Nm		≈g
RWS 1808	64	125	125	12800	30500	25 + a_k×15	465	465	**RWT**	114
	56			13200	31500	25 + a_k×15,5	501	501		114
	50			13500	33000	25 + a_k×16	538	538		114
	42			13900	34000	25 + a_k×16,5	577	577		114
	36			14300	35000	25 + a_k×17	616	616		114
	28			14600	36500	30 + a_k×18	657	657		114
	22			15000	37500	30 + a_k×18,5	700	700		114
	14			15400	38500	30 + a_k×19	743	743		114
	8			15700	40000	30 + a_k×19,5	788	788		114
	134	150	150	11600	27000	20 + a_k×14	366	366		136
	128			12000	28000	25 + a_k×14	398	398		136
	120			12400	29500	25 + a_k×14,5	431	431		136
	114			12800	30500	25 + a_k×15	465	465		136
	106			13200	31500	25 + a_k×15,5	501	501		136
	100			13500	33000	25 + a_k×16	538	538		136
	92			13900	34000	25 + a_k×16,5	577	577		136
	86			14300	35000	25 + a_k×17	616	616		136
	78			14600	36500	30 + a_k×18	657	657		136
	72			15000	37500	30 + a_k×18,5	700	700		136
	64			15400	38500	30 + a_k×19	743	743		136
	58			15700	40000	30 + a_k×19,5	788	788		136
	50			16100	41000	30 + a_k×20	835	835		136
	44			16500	42000	30 + a_k×21	882	882		136
	36			16800	43500	35 + a_k×21,5	931	931		136
	30			17200	44500	35 + a_k×21,5	982	982		136
	22			17500	45500	35 + a_k×22	1030	1030		136
	16			17900	47000	35 + a_k×23	1080	1080		136
	8			18200	48000	35 + a_k×24	1140	1140		136
	2			18600	49000	35 + a_k×24,5	1190	1190		136
	156	175	175	13200	31500	25 + a_k×15,5	501	501		160
	150			13500	33000	25 + a_k×16	538	538		160
	142			13900	34000	25 + a_k×16,5	577	577		160
	136			14300	35000	25 + a_k×17	616	616		160
	128			14600	36500	30 + a_k×18	657	657		160

Example for selection of sets: see page 14.

[1] For other dimensions, see page 14.



RWS 1808 – guideway pair 1 and 2 of equal length (miniature linear guidance set)



RWS 1808 – guideway pair 1 and 2 of unequal length (miniature linear guidance set)

Main dimensions, basic load ratings, moments[1] (continued)

Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings		
Designation	h	C_1	L	dyn. C	stat. C_0	$M_{0x} = k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}
	mm	mm	mm	N	N	Nm	Nm	Nm
RWS 1808	122	175	175	15000	37500	30 +a_k×18,5	700	700
	114			15400	38500	30 +a_k×19	743	743
	108			15700	40000	30 +a_k×19,5	788	788
	100			16100	41000	30 +a_k×20	835	835
	94			16500	42000	30 +a_k×21	882	882
	86			16800	43500	35 +a_k×21,5	931	931
	80			17200	44500	35 +a_k×21,5	982	982
	72			17500	45500	35 +a_k×22	1030	1030
	66			17900	47000	35 +a_k×23	1080	1080
	58			18200	48000	35 +a_k×24	1140	1140
	52			18600	49000	35 +a_k×24,5	1190	1190
	44			18900	50500	35 +a_k×25	1250	1250
	38			19200	51500	35 +a_k×25,5	1310	1310
	30			19600	52500	40 +a_k×26	1370	1370
	24			19900	54000	40 +a_k×26,5	1430	1430
	16			20200	55000	40 +a_k×27,5	1490	1490
	10			20600	56000	40 +a_k×28	1550	1550
	2			20900	57500	40 +a_k×28,5	1620	1620
	186	200	200	14300	35000	25 +a_k×17	616	616
	178			14600	36500	30 +a_k×18	657	657
	172			15000	37500	30 +a_k×18,5	700	700
	164			15400	38500	30 +a_k×19	743	743
	158			15700	40000	30 +a_k×19,5	788	788
	150			16100	41000	30 +a_k×20	835	835
	144			16500	42000	30 +a_k×21	882	882
	136			16800	43500	35 +a_k×21,5	931	931
	130			17200	44500	35 +a_k×21,5	982	982
	122			17500	45500	35 +a_k×22	1030	1030
	116			17900	47000	35 +a_k×23	1080	1080
	108			18200	48000	35 +a_k×24	1140	1140
	102			18600	49000	35 +a_k×24,5	1190	1190
	94			18900	50500	35 +a_k×25	1250	1250
	88			19200	51500	35 +a_k×25,5	1310	1310
	80			19600	52500	40 +a_k×26	1370	1370

Guideway

Guideway	
Designation	Mass
	≈g
RWT	160
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Example for selection of sets: see page 14.

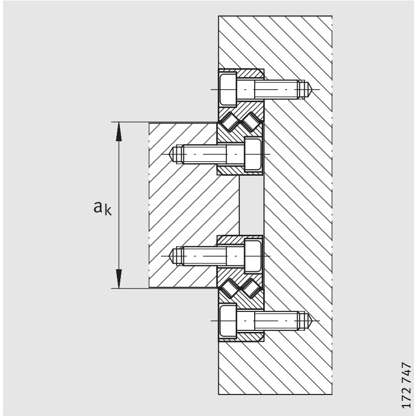
[1] For other dimensions, see page 14.

Miniature linear guidance set

with cylindrical roller flat cages

Guideways of equal and unequal length

Series RWS 1808

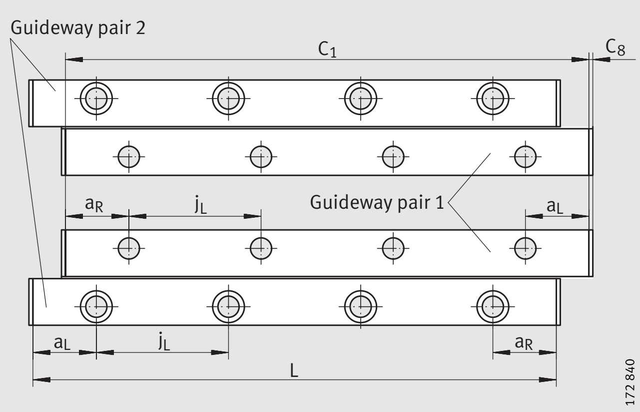


Cage spacing a_k –
determined by adjacent construction

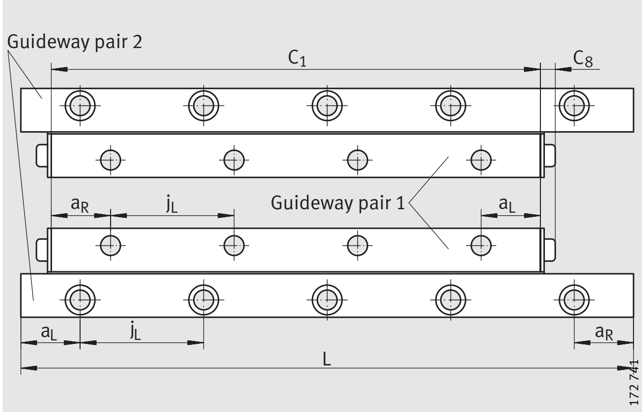
Main dimensions, basic load ratings, moments[1] (continued)									Guideway	
Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings			Guideway	
Designation	h	C_1	L	dyn. C	stat. C_0	$M_{0x} = k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}	Designation	Mass
	mm	mm	mm	N	N	Nm	Nm	Nm		≈g
RWS 1808	74			19900	54000	$40 + a_k \times 26{,}5$	1430	1430	**RWT**	182
	66			20200	55000	$40 + a_k \times 27{,}5$	1490	1490		182
	60			20600	56000	$40 + a_k \times 28$	1550	1550		182
	52			20900	57500	$40 + a_k \times 28{,}5$	1620	1620		182
	46			21200	58500	$40 + a_k \times 29$	1680	1680		182
	38	200	200	21600	60000	$40 + a_k \times 29{,}5$	1750	1750		182
	32			21900	61000	$45 + a_k \times 30{,}5$	1820	1820		182
	24			22200	62000	$45 + a_k \times 31$	1890	1890		182
	18			22600	63500	$45 + a_k \times 31{,}5$	1960	1960		182
	10			22900	64500	$45 + a_k \times 32$	2030	2030		182
	4			23200	65500	$45 + a_k \times 32{,}5$	2110	2110		182
	208			15700	40000	$30 + a_k \times 19{,}5$	788	788		206
	200			16100	41000	$30 + a_k \times 20$	835	835		206
	194			16500	42000	$30 + a_k \times 21$	882	882		206
	186			16800	43500	$35 + a_k \times 21{,}5$	931	931		206
	180			17200	44500	$35 + a_k \times 21{,}5$	982	982		206
	172			17500	45500	$35 + a_k \times 22$	1030	1030		206
	166			17900	47000	$35 + a_k \times 23$	1080	1080		206
	158			18200	48000	$35 + a_k \times 24$	1140	1140		206
	152			18600	49000	$35 + a_k \times 24{,}5$	1190	1190		206
	144			18900	50500	$35 + a_k \times 25$	1250	1250		206
	138			19200	51500	$35 + a_k \times 25{,}5$	1310	1310		206
	130	225	225	19600	52500	$40 + a_k \times 26$	1370	1370		206
	124			19900	54000	$40 + a_k \times 26{,}5$	1430	1430		206
	116			20200	55000	$40 + a_k \times 27{,}5$	1490	1490		206
	110			20600	56000	$40 + a_k \times 28$	1550	1550		206
	102			20900	57500	$40 + a_k \times 28{,}5$	1620	1620		206
	96			21200	58500	$40 + a_k \times 29$	1680	1680		206
	88			21600	60000	$40 + a_k \times 29{,}5$	1750	1750		206
	82			21900	61000	$45 + a_k \times 30{,}5$	1820	1820		206
	74			22200	62000	$45 + a_k \times 31$	1890	1890		206
	68			22600	63500	$45 + a_k \times 31{,}5$	1960	1960		206
	60			22900	64500	$45 + a_k \times 32$	2030	2030		206
	54			23200	65500	$45 + a_k \times 32{,}5$	2110	2110		206

Example for selection of sets: see page 14.

[1] For other dimensions, see page 14.



RWS 1808 – guideway pair 1 and 2 of equal length (miniature linear guidance set)



RWS 1808 – guideway pair 1 and 2 of unequal length (miniature linear guidance set)

Main dimensions, basic load ratings, moments[1] (continued)

Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings		
Designation	h	C_1	L	dyn. C	stat. C_0	$M_{0x} = k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}
	mm	mm	mm	N	N	Nm	Nm	Nm
RWS 1808	46			23 500	67 000	$45 + a_k \times 33$	2 180	2 180
	40			23 800	68 000	$50 + a_k \times 34$	2 260	2 260
	32			24 200	69 000	$50 + a_k \times 34{,}5$	2 340	2 340
	26	225	225	24 500	70 500	$50 + a_k \times 35$	2 420	2 420
	18			24 800	71 500	$50 + a_k \times 35{,}5$	2 500	2 500
	12			25 000	72 500	$50 + a_k \times 36$	2 580	2 580
	4			25 500	74 000	$50 + a_k \times 37$	2 660	2 660
	236			16 800	43 500	$35 + a_k \times 21{,}5$	931	931
	230			17 200	44 500	$35 + a_k \times 21{,}5$	982	982
	222			17 500	45 500	$35 + a_k \times 22$	1 030	1 030
	216			17 900	47 000	$35 + a_k \times 23$	1 080	1 080
	208			18 200	48 000	$35 + a_k \times 24$	1 140	1 140
	202			18 600	49 000	$35 + a_k \times 24{,}5$	1 190	1 190
	194			18 900	50 500	$35 + a_k \times 25$	1 250	1 250
	188			19 200	51 500	$35 + a_k \times 25{,}5$	1 310	1 310
	180			19 600	52 500	$40 + a_k \times 26$	1 370	1 370
	174			19 900	54 000	$40 + a_k \times 26{,}5$	1 430	1 430
	166			20 200	55 000	$40 + a_k \times 27{,}5$	1 490	1 490
	160			20 600	56 000	$40 + a_k \times 28$	1 550	1 550
	152			20 900	57 500	$40 + a_k \times 28{,}5$	1 620	1 620
	146	250	250	21 200	58 500	$40 + a_k \times 29$	1 680	1 680
	138			21 600	60 000	$40 + a_k \times 29{,}5$	1 750	1 750
	132			21 900	61 000	$45 + a_k \times 30{,}5$	1 820	1 820
	124			22 200	62 000	$45 + a_k \times 31$	1 890	1 890
	118			22 600	63 500	$45 + a_k \times 31{,}5$	1 960	1 960
	110			22 900	64 500	$45 + a_k \times 32$	2 030	2 030
	104			23 200	65 500	$45 + a_k \times 32{,}5$	2 110	2 110
	96			23 500	67 000	$45 + a_k \times 33$	2 180	2 180
	90			23 800	68 000	$50 + a_k \times 34$	2 260	2 260
	82			24 200	69 000	$50 + a_k \times 34{,}5$	2 340	2 340
	76			24 500	70 500	$50 + a_k \times 35$	2 420	2 420
	68			24 800	71 500	$50 + a_k \times 35{,}5$	2 500	2 500
	62			25 000	72 500	$50 + a_k \times 36$	2 580	2 580
	54			25 500	74000	$50 + a_k \times 37$	2 660	2 660

Guideway

Guideway	
Designation	Mass
	≈g
RWT	206
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Example for selection of sets: see page 14.

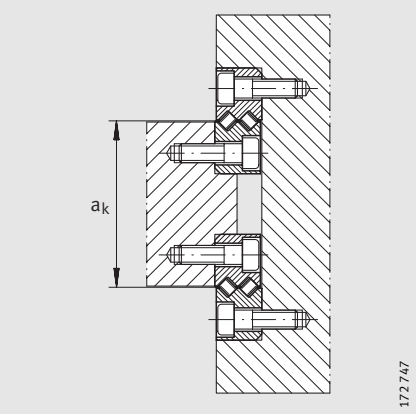
[1] For other dimensions, see page 14.

Miniature linear guidance set

with cylindrical roller flat cages

Guideways of equal and unequal length

Series RWS 1808



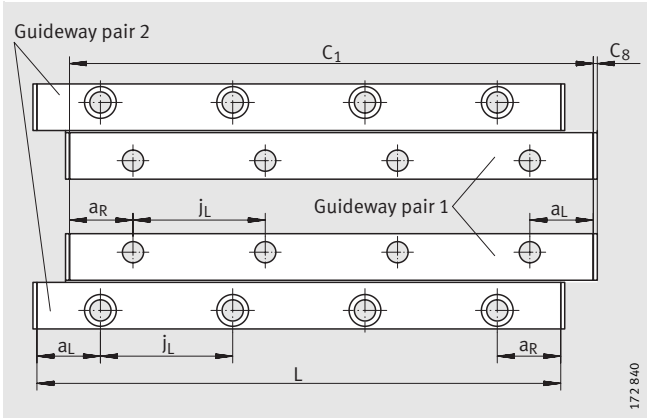
Cage spacing a_k –
determined by adjacent construction

Main dimensions, basic load ratings, moments[1] (continued)

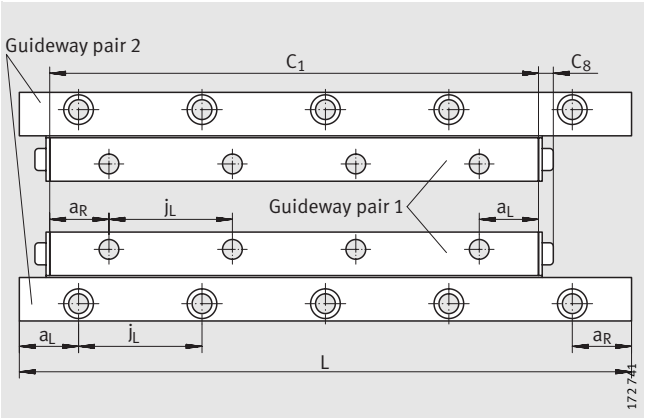
Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings			Guideway	
									Guideway	
Designation	h	C_1	L	dyn. C	stat. C_0	$M_{0x} = k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}	Designation	Mass
	mm	mm	mm	N	N	Nm	Nm	Nm		≈g
RWS 1808	48	250	250	25500	75000	50 +a_k×37,5	2750	2750	**RWT**	228
	40			26000	76000	50 +a_k×38	2840	2840		228
	34			26500	77500	50 +a_k×38,5	2920	2920		228
	26			26500	78500	55 +a_k×39	3010	3010		228
	20			27000	79500	55 +a_k×40	3100	3100		228
	12			27500	81000	55 +a_k×40,5	3190	3190		228
	6			27500	82000	55 +a_k×41	3280	3280		228
	280	300	300	19600	52500	40 +a_k×26	1370	1370		275
	274			19900	54000	40 +a_k×26,5	1430	1430		275
	266			20200	55000	40 +a_k×27,5	1490	1490		275
	260			20600	56000	40 +a_k×28	1550	1550		275
	252			20900	57500	40 +a_k×28,5	1620	1620		275
	246			21200	58500	40 +a_k×29	1680	1680		275
	238			21600	60000	40 +a_k×29,5	1750	1750		275
	232			21900	61000	45 +a_k×30,5	1820	1820		275
	224			22200	62000	45 +a_k×31	1890	1890		275
	218			22600	63500	45 +a_k×31,5	1960	1960		275
	210			22900	64500	45 +a_k×32	2030	2030		275
	204			23200	65500	45 +a_k×32,5	2110	2110		275
	196			23500	67000	45 +a_k×33	2180	2180		275
	190			23800	68000	50 +a_k×34	2260	2260		275
	182			24200	69000	50 +a_k×34,5	2340	2340		275
	176			24500	70500	50 +a_k×35	2420	2420		275
	168			24800	71500	50 +a_k×35,5	2500	2500		275
	162			25000	72500	50 +a_k×36	2580	2580		275
	154			25500	74000	50 +a_k×37	2660	2660		275
	148			25500	75000	50 +a_k×37,5	2750	2750		275
	140			26000	76000	50 +a_k×38	2840	2840		275
	134			26500	77500	50 +a_k×38,5	2920	2920		275
	126			26500	78500	55 +a_k×39	3010	3010		275
	120			27000	79500	55 +a_k×40	3100	3100		275
	112			27500	81000	55 +a_k×40,5	3190	3190		275
	106			27500	82000	55 +a_k×41	3280	3280		275

Example for selection of sets: see page 14.

[1] For other dimensions, see page 14.



RWS 1808 – guideway pair 1 and 2 of equal length (miniature linear guidance set)



RWS 1808 – guideway pair 1 and 2 of unequal length (miniature linear guidance set)

Main dimensions, basic load ratings, moments[1] (continued)

Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings		
Designation	h	C_1	L	dyn. C	stat. C_0	$M_{0x} = k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}
	mm	mm	mm	N	N	Nm	Nm	Nm
RWS 1808	98	300	300	28000	83000	55 +a_k×41,5	3380	3380
	92			28000	84500	60 +a_k×42	3470	3470
	84			28500	85500	60 +a_k×42,5	3570	3570
	78			29000	86500	60 +a_k×43,5	3670	3670
	70			29000	88000	60 +a_k×44	3770	3770
	64			29500	89000	60 +a_k×44,5	3870	3870
	56			29500	90000	60 +a_k×45	3970	3970
	50			30000	91500	60 +a_k×45,5	4070	4070
	42			30500	92500	65 +a_k×46,5	4180	4180
	36			30500	93500	65 +a_k×47	4280	4280
	28			31000	95000	65 +a_k×47,5	4390	4390
	22			31000	96000	65 +a_k×48	4500	4500
	14			31500	97500	65 +a_k×48,5	4610	4610
	8			32000	98500	65 +a_k×49	4720	4720
	332	350	350	21900	61000	45 +a_k×30,5	1820	1820
	324			22200	62000	45 +a_k×31	1890	1890
	318			22600	63500	45 +a_k×31,5	1960	1960
	310			22900	64500	45 +a_k×32	2030	2030
	304			23200	65500	45 +a_k×32,5	2110	2110
	296			23500	67000	45 +a_k×33	2180	2180
	290			23800	68000	50 +a_k×34	2260	2260
	282			24200	69000	50 +a_k×34,5	2340	2340
	276			24500	70500	50 +a_k×35	2420	2420
	268			24800	71500	50 +a_k×35,5	2500	2500
	262			25000	72500	50 +a_k×36	2580	2580
	254			25500	74000	50 +a_k×37	2660	2660
	248			25500	75000	50 +a_k×37,5	2750	2750
	240			26000	76000	50 +a_k×38	2840	2840
	234			26500	77500	50 +a_k×38,5	2920	2920
	226			26500	78500	55 +a_k×39	3010	3010
	220			27000	79500	55 +a_k×40	3100	3100
	212			27500	81000	55 +a_k×40,5	3190	3190
	206			27500	82000	55 +a_k×41	3280	3280

Guideway

Guideway	
Designation	Mass
	≈g
RWT	275
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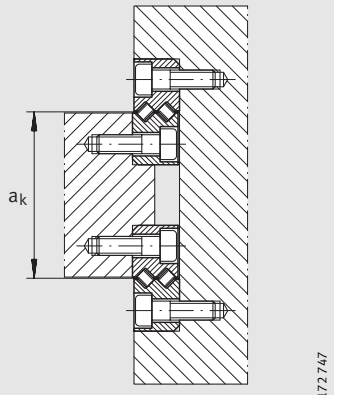
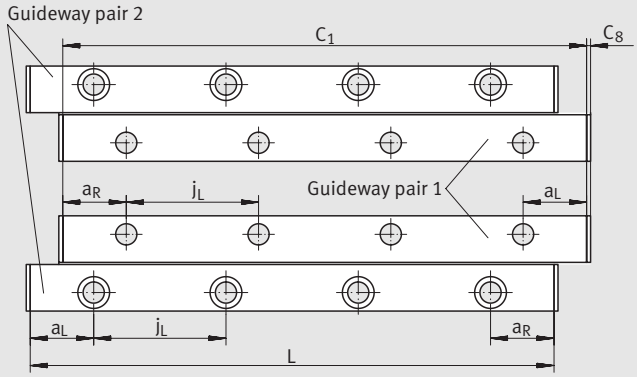
Example for selection of sets: see page 14.

[1] For other dimensions, see page 14.



Cage spacing a_k –
determined by adjacent construction



RWS 1808 – guideway pair 1 and 2 of equal length
(miniature linear guidance set)[2]

Main dimensions, basic load ratings, moments[1] (continued)

Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings		
Designation	h	C_1	L	dyn. C	stat. C_0	$M_{0x} = k_M + a_i \times W_{M_{0x}}$	M_{0y}	M_{0z}
	mm	mm	mm	N	N	Nm	Nm	Nm
RWS 1808	198			28000	83000	55 +a_k×41,5	3380	3380
	192			28000	84500	60 +a_k×42	3470	3470
	184			28500	85500	60 +a_k×42,5	3570	3570
	178			29000	86500	60 +a_k×43,5	3670	3670
	170			29000	88000	60 +a_k×44	3770	3770
	164			29500	89000	60 +a_k×44,5	3870	3870
	156			29500	90000	60 +a_k×45	3970	3970
	150			30000	91500	60 +a_k×45,5	4070	4070
	142			30500	92500	65 +a_k×46,5	4180	4180
	136			30500	93500	65 +a_k×47	4280	4280
	128			31000	95000	65 +a_k×47,5	4390	4390
	122			31000	96000	65 +a_k×48	4500	4500
	114			31500	97500	65 +a_k×48,5	4610	4610
	108			32000	98500	65 +a_k×49	4720	4720
	100	350	350	32000	99500	70 +a_k×50	4830	4830
	94			32500	101000	70 +a_k×50,5	4950	4950
	86			32500	102000	70 +a_k×51	5060	5060
	80			33000	103000	70 +a_k×51,5	5180	5180
	72			33500	104500	70 +a_k×52	5300	5300
	66			33500	105500	70 +a_k×53	5410	5410
	58			34000	106500	70 +a_k×53,5	5530	5530
	52			34000	108000	70 +a_k×54	5660	5660
	44			34500	109000	75 +a_k×54,5	5780	5780
	38			34500	110000	75 +a_k×55	5900	5900
	30			35000	111500	75 +a_k×56	6030	6030
	24			35500	112500	75 +a_k×56,5	6160	6160
	16			35500	113500	75 +a_k×57	6290	6290
	10			36000	115000	75 +a_k×57,5	6410	6410
	2			36000	116000	80 +a_k×58	6540	6540

Guideway

Guideway	
Designation	Mass
	≈g
RWT	320
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Example for selection of sets: see page 14.

[1] For other dimensions, see page 14.

[2] If L ≠ C_1, see calculation on page 14, figure on page 17.

Item no. 011-064-188/MAI 79 GB-D 10052.5 · Printed in Germany

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MAI 79