






## **Miniature linear guidance set**

**with cylindrical roller flat cages**

# Miniature linear guidance set

with cylindrical roller flat cages

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## Features

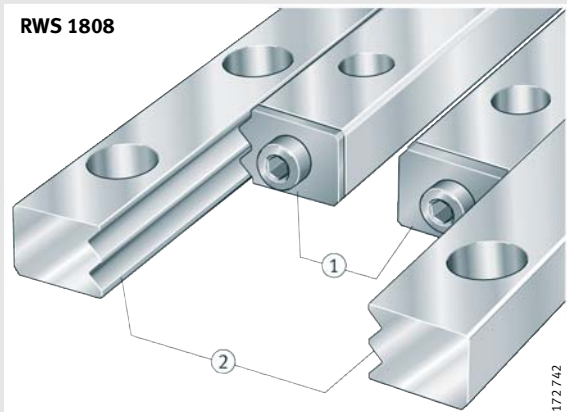
### Miniature linear guidance sets

- 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



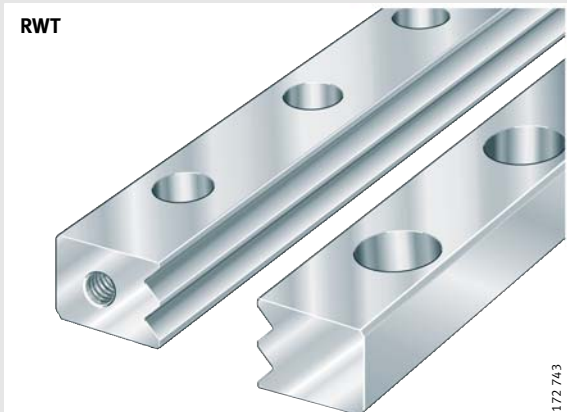
#### RWS 1808



- 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

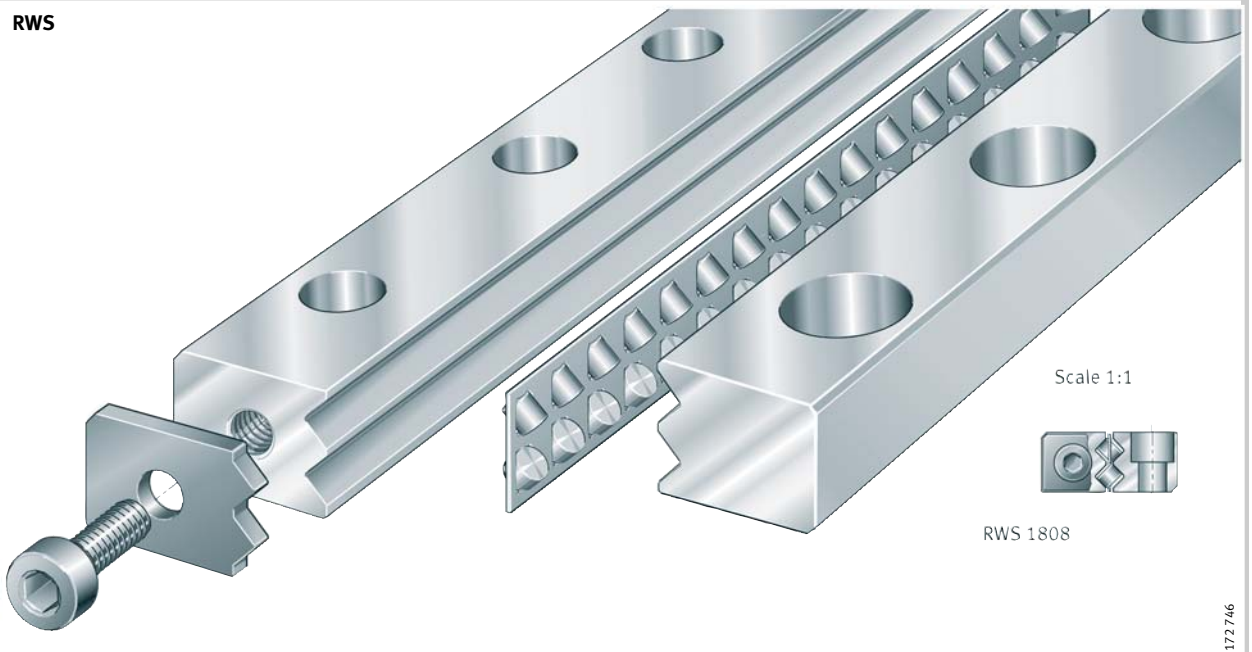
### Guideways

#### 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**



172 746

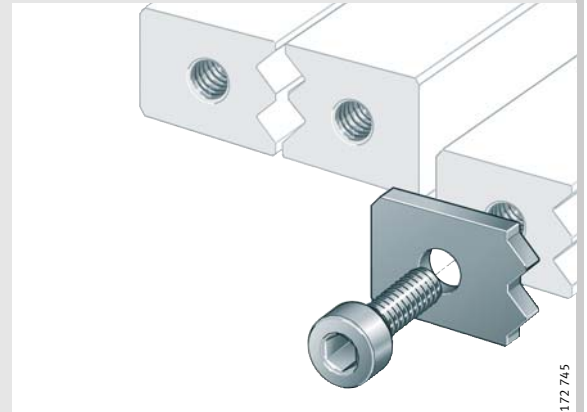
**Cylindrical roller flat cage**



172 744

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

**End pieces**



172 745

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


# Miniature linear guidance set with cylindrical roller flat cages



## 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<sup>-1</sup>  
Number of return strokes per minute.

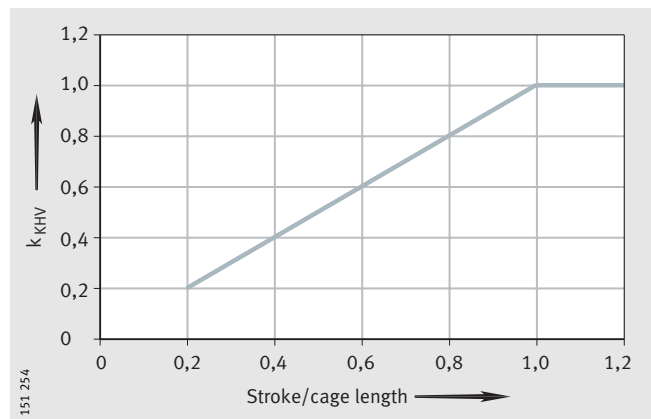


Figure 1 • Short stroke factor  $k_{KHV}$  –  
in accordance with DIN 636-3

### 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*).

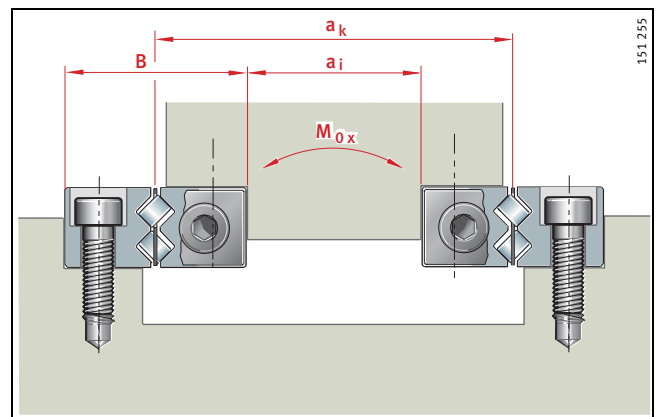


Figure 2 - Internal width and cage spacing

## Miniature linear guidance set with cylindrical roller flat cages

### 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:

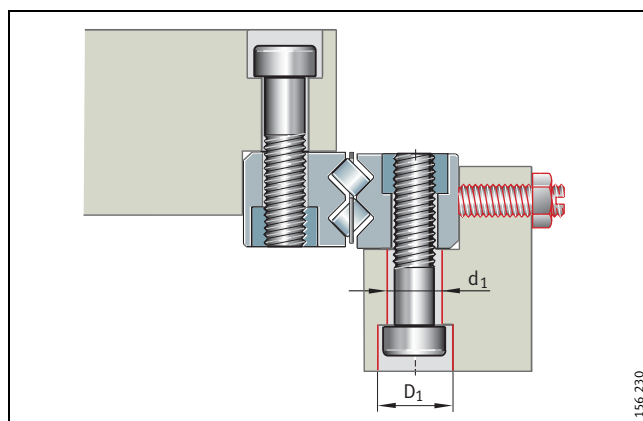
- the holes/counterbores in the adjacent construction must be larger than normal (Figure 3).

#### Location of guideways through the adjacent construction

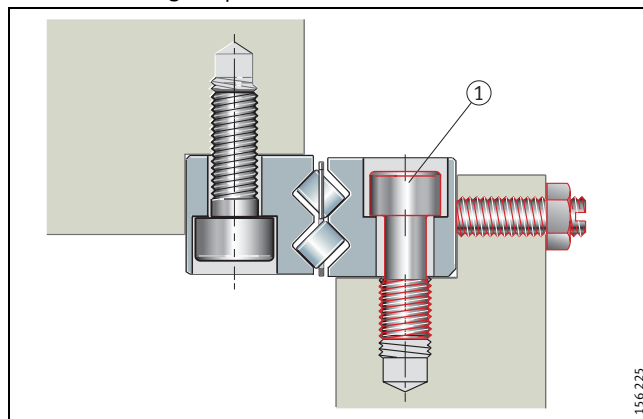
If the guideways are to be located using the threaded holes in the guideways, the diameter  $D_1$  and  $d_1$  of the through holes in the adjacent construction must be larger (Figure 3).

#### 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.

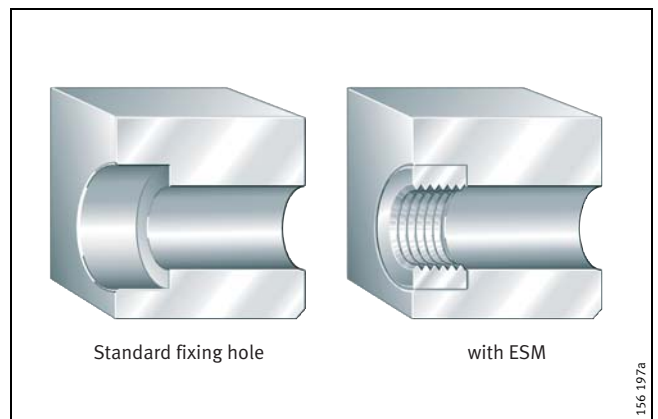


Figure 5 · Hole types for guideways

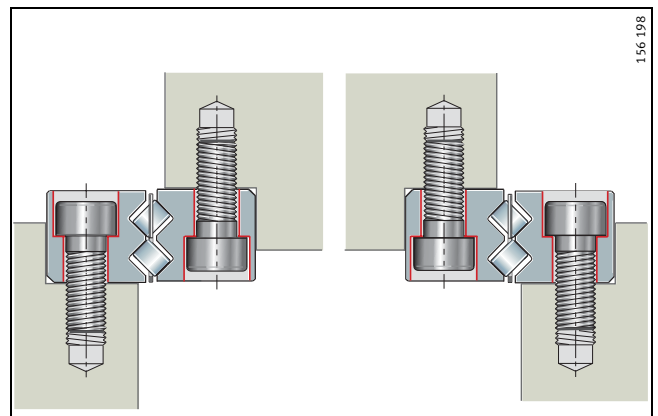


Figure 6 · Location of guideways

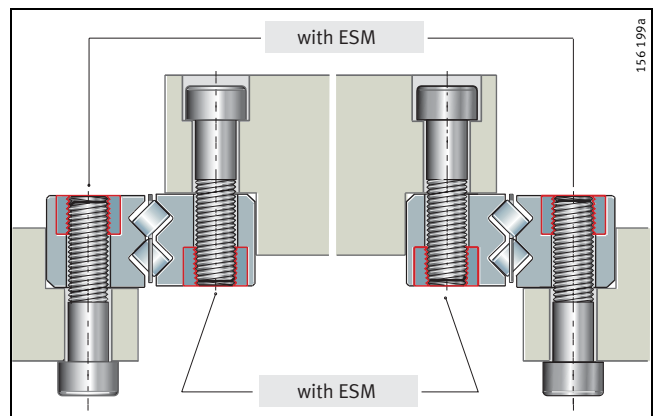


Figure 7 · Location of guideways using ESM



## Miniature linear guidance set with cylindrical roller flat cages

### 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).

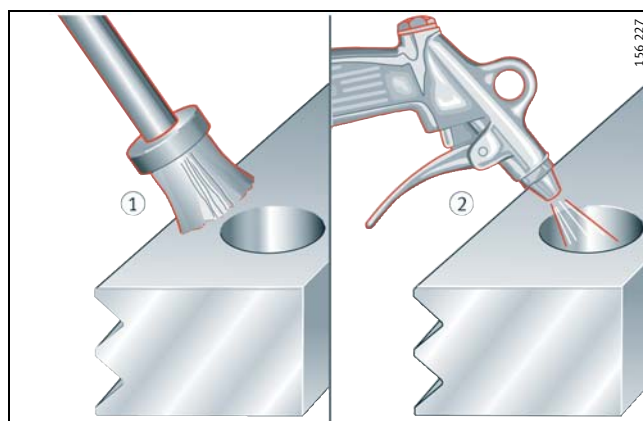
■ Locate the nuts in the counterbores (Figure 9, ④).

■ 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.

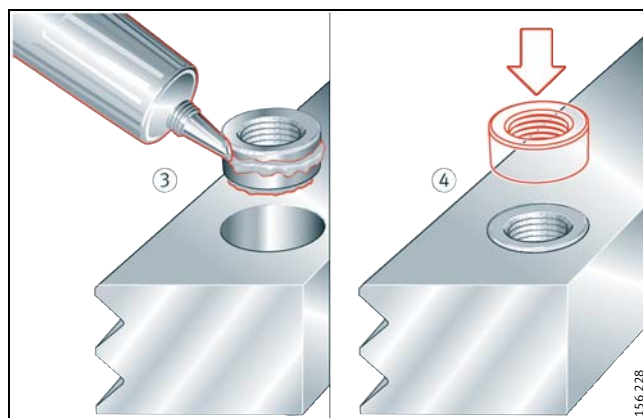
**Table 2 · Adhesives for fitting insert nuts ESM<sup>1)</sup>**

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

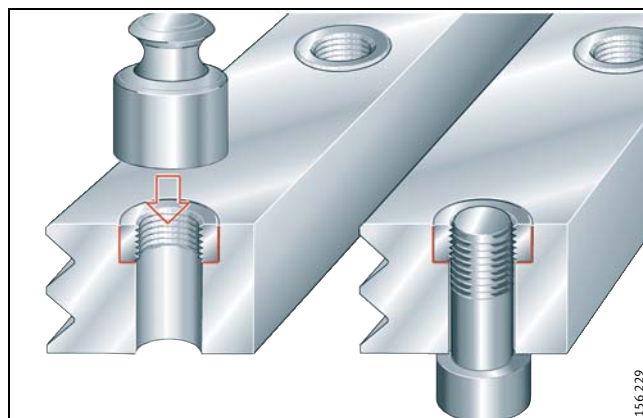
<sup>1)</sup> Adhesives for joining parts or securing screws must be provided with a gap fill capacity of at least 0,2 mm.



**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*).

### 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).

#### 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.

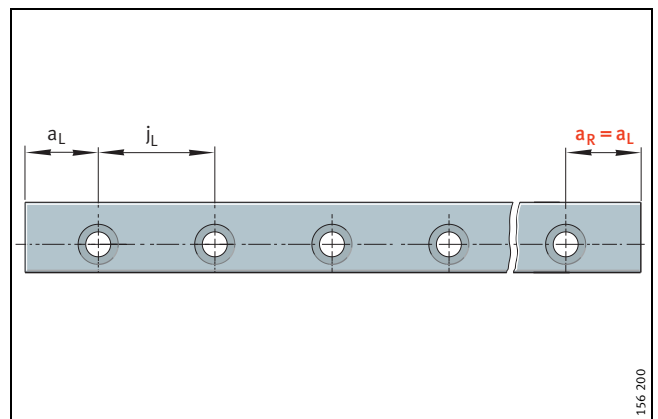


Figure 11 · Symmetrical hole pattern

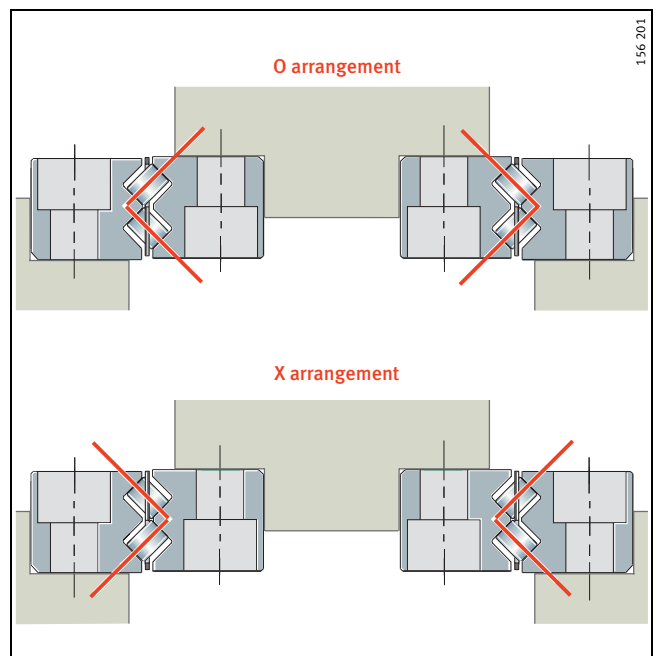


Figure 12 · Rolling elements in O and X arrangements

# Miniature linear guidance set with cylindrical roller flat cages

## Design of bearing arrangements

The design of a bearing arrangement with miniature linear 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  $\leq R_a 1,6$  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  $\Delta H$  (Figure 13) are given by the formula below. If the deviation is greater than this, please contact us.

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

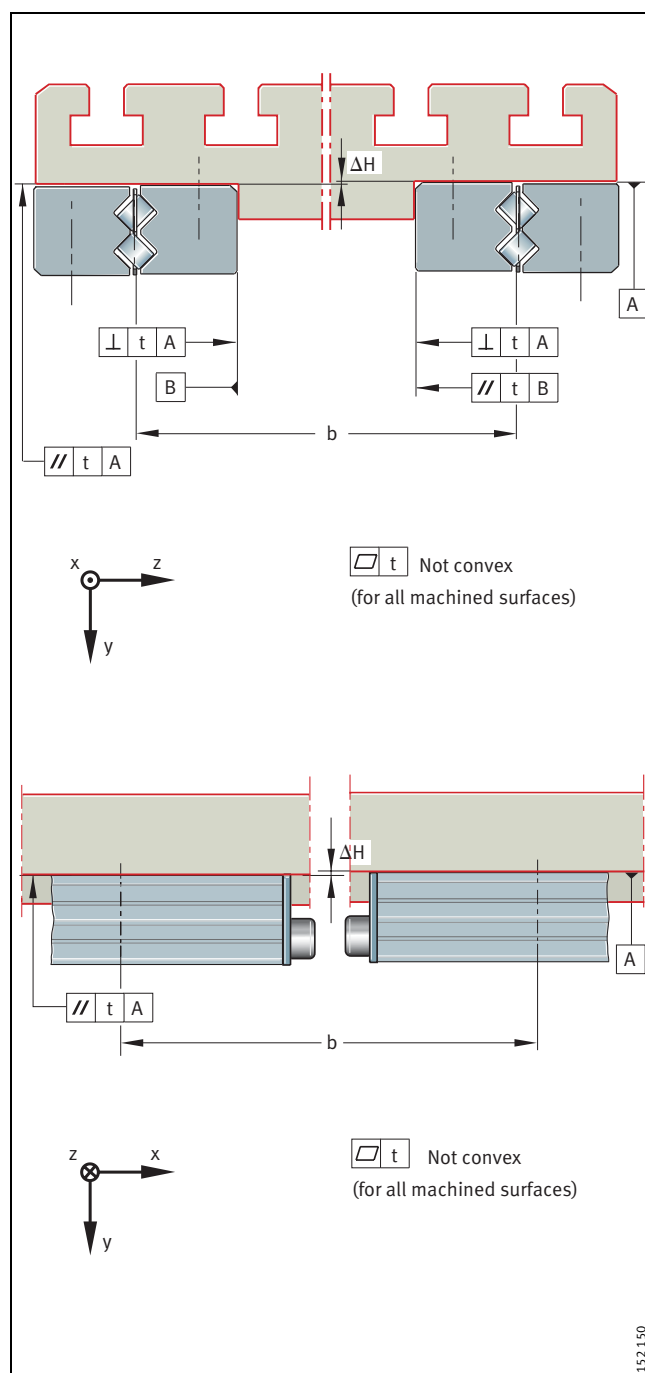
$\Delta H$        $\mu\text{m}$   
Maximum permissible deviation from the theoretically precise position

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  $\Delta H$ , see page 10.

**Table 4 · Value for  $t$**

Miniature linear guidance system	Guideway	Parallelism $t^{1)}$ $\mu\text{m}$
Designation	Designation	
RWS 1808	RW	5

<sup>1)</sup> Value for guidance system set free from clearance.

### Locating heights and corner radii

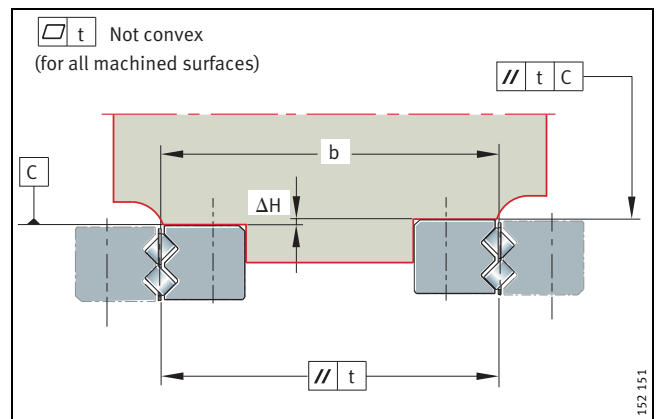
Locating heights and corner radii should be in accordance with Figure 15 and Table 5.

**Table 5 · Locating heights and corner radii**

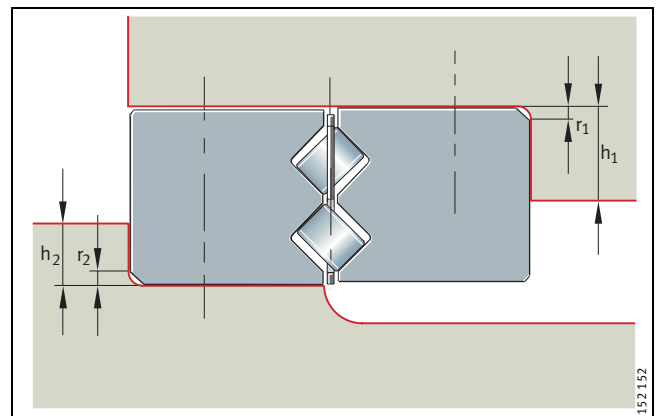
Miniature linear guidance system	Locating heights and corner radii			
	$h_1$	$h_2$ max.	$r_1$ max.	$r_2$ max.
RWS 1808	7,5	7,5	0,4	0,4

### 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**

# Miniature linear guidance set with cylindrical roller flat cages



## 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**

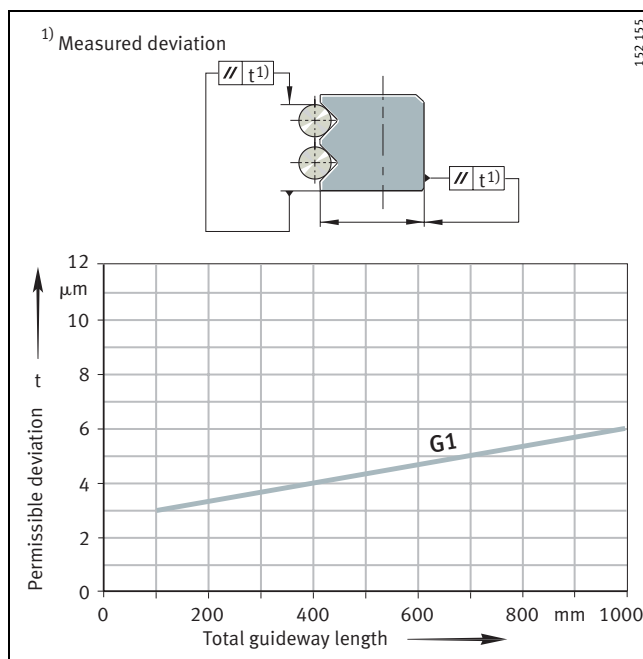
Tolerance	Accuracy class
	G1 μm
for height	H ±10
for spacing	B 0 to -200

### Length tolerances of guideways

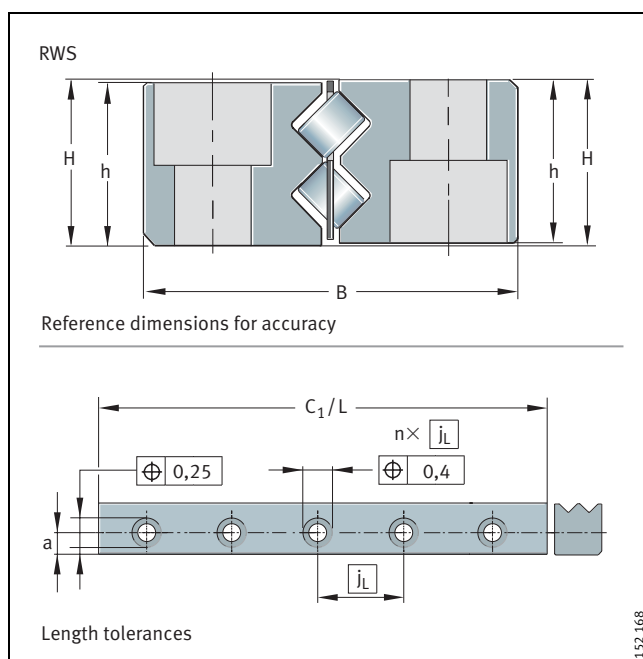
Tolerances: see Figure 17 and Table 8.

**Table 8 · Length tolerances**

Miniature linear guidance system Designation	Tolerances Guideway
RWS 1808	$L \leq 350$ mm ±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

Size	RWS 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).

#### Guideways of equal length

Miniature linear guidance set  
with cylindrical roller flat cage

Size	RWS 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.

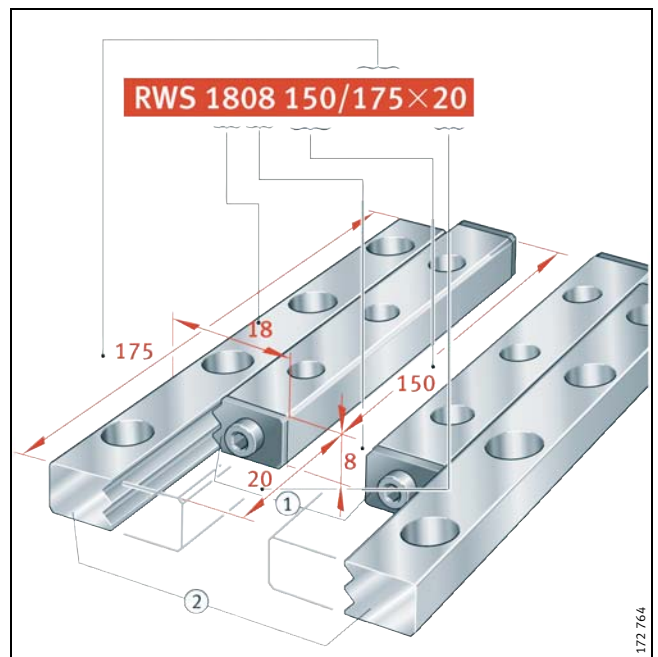


Figure 18 · Ordering example, ordering designation – guideways of unequal length

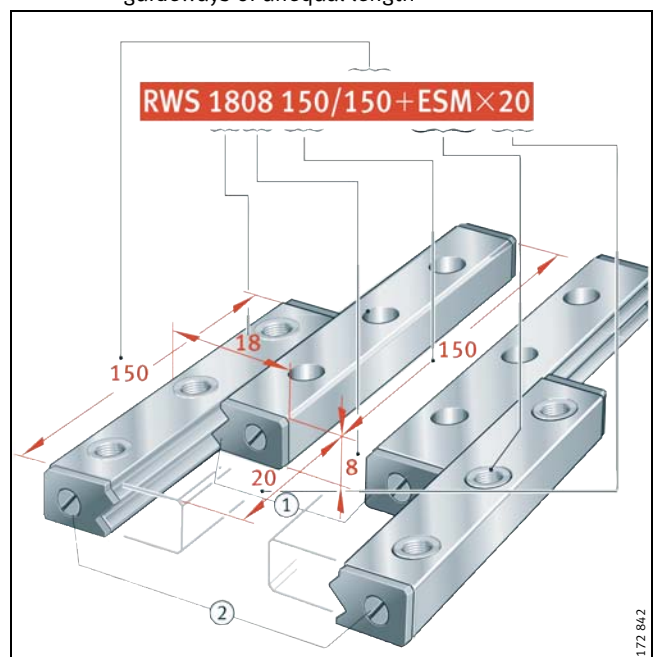


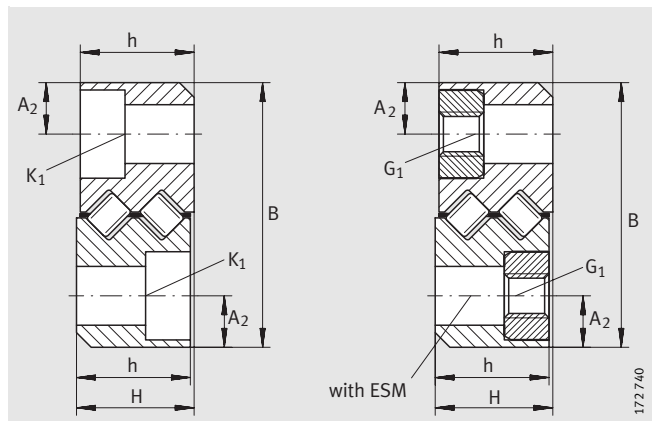
Figure 19 · Ordering example, ordering designation – guideways of equal length

# 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 Designation	Dimensions			Mounting dimensions						K <sub>1</sub> , G <sub>1</sub>	
		L <sub>max</sub> <sup>1)</sup>	H	B	A <sub>2</sub>	h	j <sub>L</sub>	a <sub>L</sub>	a <sub>R</sub>	C <sub>8</sub>	for screw DIN 912-12.9	Tightening torque max. Nm
<b>RWS 1808</b>	RWT	350	8	18	3,5	7,9	25	12,5	12,5	3	M3	2,2

<sup>1)</sup> Maximum manufactured length of guideway. Special lengths are available by agreement.

### Example for RWS 1808:

- C<sub>1</sub> 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).

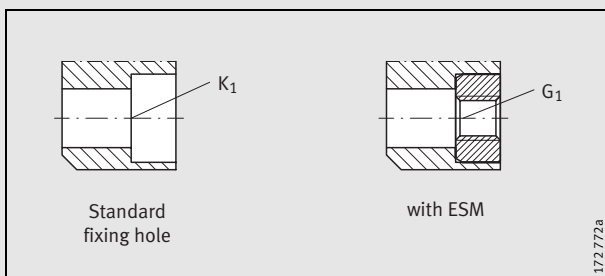
Ordering data for guideways of equal length (C<sub>1</sub> = L):

**RWS 1808 125/125322**

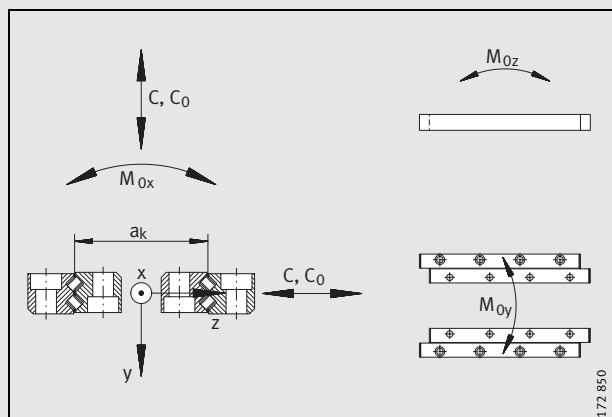
Ordering data for guideways of unequal length (C<sub>1</sub> ≠ L):

**RWS 1808 125/175322**

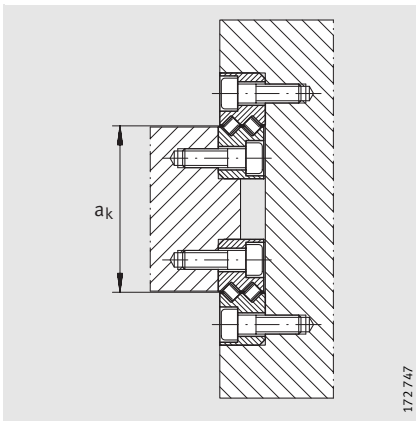
⚠ The cage must not be longer than the short guideway.



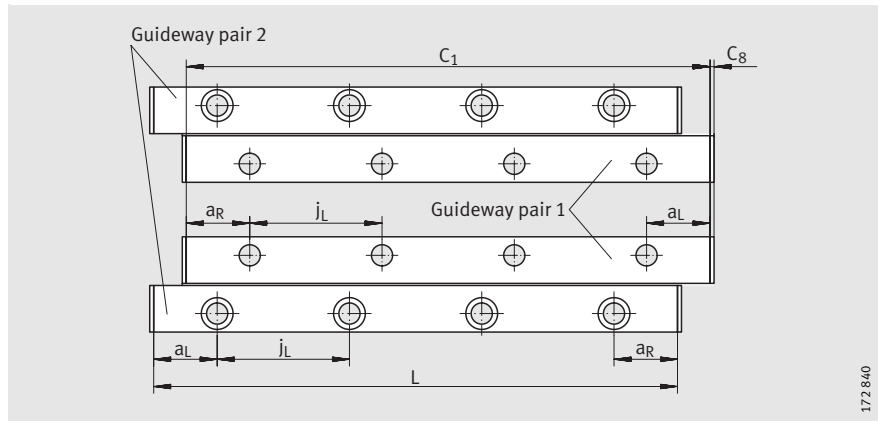
Hole types



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)<sup>2)</sup>

Main dimensions, basic load ratings, moments <sup>1)</sup>									Guideway			
Unit Designation	Stroke length h mm	Dimensions		Basic load ratings		Moment ratings			Designation	Mass ≈ g		
		C <sub>1</sub> mm	L <sup>2)</sup> mm	dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> = k <sub>M</sub> + a <sub>i</sub> × W <sub>M<sub>0x</sub></sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm				
<b>RWS 1808</b>	40	50	50	5 100	9 400	10 + a <sub>k</sub> × 4,5	60	60	<b>RWT</b>	44		
	32			5 600	10 500	10 + a <sub>k</sub> × 5	60	60		44		
	26			6 100	11 700	10 + a <sub>k</sub> × 5,5	73	73		44		
	18			6 500	12 900	10 + a <sub>k</sub> × 6	88	88		44		
	12			7 000	14 100	10 + a <sub>k</sub> × 7	104	104		44		
	4			7 500	15 200	10 + a <sub>k</sub> × 7,5	121	121		44		
	62	75	75	7 000	14 100	10 + a <sub>k</sub> × 7	104	104		68		
	54			7 500	15 200	10 + a <sub>k</sub> × 7,5	121	121		68		
	48			7 900	16 400	10 + a <sub>k</sub> × 8	139	139		68		
	40			8 300	17 600	10 + a <sub>k</sub> × 8,5	159	159		68		
	34			8 800	18 700	15 + a <sub>k</sub> × 9	180	180		68		
	26			9 200	19 900	15 + a <sub>k</sub> × 9,5	203	203		68		
	20			9 600	21 100	15 + a <sub>k</sub> × 10,5	227	227		68		
	12			10 000	22 300	20 + a <sub>k</sub> × 11	252	252		68		
	6			10 400	23 400	20 + a <sub>k</sub> × 11,5	279	279		68		
	84			100	100	8 800	18 700	15 + a <sub>k</sub> × 9		180	180	90
	76					9 200	19 900	15 + a <sub>k</sub> × 9,5		203	203	90
	70					9 600	21 100	15 + a <sub>k</sub> × 10,5		227	227	90
	62	10 000	22 300			20 + a <sub>k</sub> × 11	252	252		90		
	56	10 400	23 400			20 + a <sub>k</sub> × 11,5	279	279		90		
	48	10 800	24 600			20 + a <sub>k</sub> × 12	306	306		90		
	42	11 200	26 000			20 + a <sub>k</sub> × 12,5	336	336		90		
	34	11 600	27 000			20 + a <sub>k</sub> × 14	366	366		90		
	28	12 000	28 000			25 + a <sub>k</sub> × 14	398	398		90		
	20	12 400	29 500			25 + a <sub>k</sub> × 14,5	431	431		90		
	14	12 800	30 500			25 + a <sub>k</sub> × 15	465	465		90		
	6	13 200	31 500			25 + a <sub>k</sub> × 15,5	501	501		90		
	112	125	125	10 000	22 300	20 + a <sub>k</sub> × 11	252	252		114		
	106			10 400	23 400	20 + a <sub>k</sub> × 11,5	279	279		114		
	98			10 800	24 600	20 + a <sub>k</sub> × 12	306	306		114		
	92			11 200	26 000	20 + a <sub>k</sub> × 12,5	336	336		114		
	84			11 600	27 000	20 + a <sub>k</sub> × 14	366	366		114		
	78			12 000	28 000	25 + a <sub>k</sub> × 14	398	398		114		
	70			12 400	29 500	25 + a <sub>k</sub> × 14,5	431	431		114		

Example for selection of sets: see page 14.

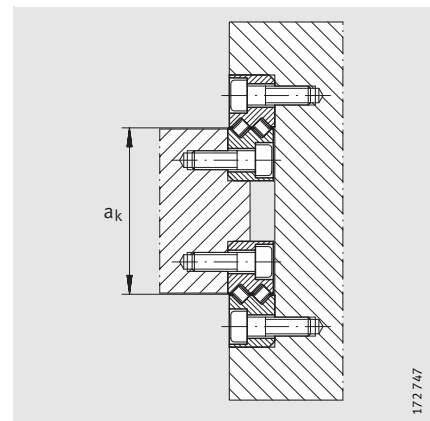
<sup>1)</sup> For other dimensions, see page 14.

<sup>2)</sup> If  $L \neq C_1$ , 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

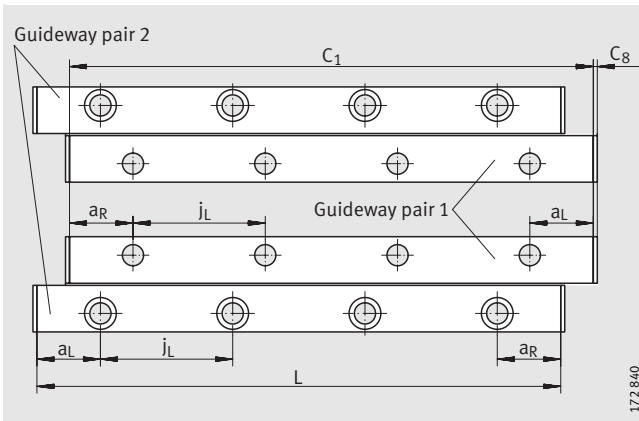


Cage spacing  $a_k$  – determined by adjacent construction

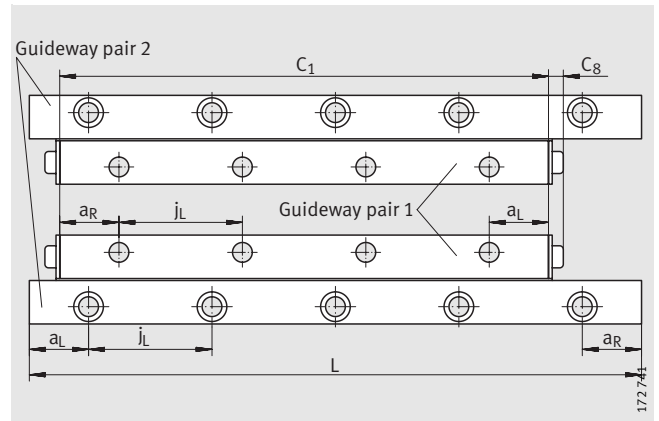
Main dimensions, basic load ratings, moments <sup>1)</sup> (continued)									Guideway	
Unit	Stroke length	Dimensions		Basic load ratings		Moment ratings			Guideway	
Designation	h	$C_1$	L	dyn. $C$	stat. $C_0$	$M_{0x} = k_M + a_k \times W_{M_{0x}}$	$M_{0y}$	$M_{0z}$	Designation	Mass
	mm	mm	mm	N	N	Nm	Nm	Nm		≈g
<b>RWS 1808</b>	64	125	125	12800	30500	$25 + a_k \times 15$	465	465	<b>RWT</b>	114
	56			13200	31500	$25 + a_k \times 15,5$	501	501		114
	50			13500	33000	$25 + a_k \times 16$	538	538		114
	42			13900	34000	$25 + a_k \times 16,5$	577	577		114
	36			14300	35000	$25 + a_k \times 17$	616	616		114
	28			14600	36500	$30 + a_k \times 18$	657	657		114
	22			15000	37500	$30 + a_k \times 18,5$	700	700		114
	14			15400	38500	$30 + a_k \times 19$	743	743		114
	8			15700	40000	$30 + a_k \times 19,5$	788	788		114
	134	150	150	11600	27000	$20 + a_k \times 14$	366	366		136
	128			12000	28000	$25 + a_k \times 14$	398	398		136
	120			12400	29500	$25 + a_k \times 14,5$	431	431		136
	114			12800	30500	$25 + a_k \times 15$	465	465		136
	106			13200	31500	$25 + a_k \times 15,5$	501	501		136
	100			13500	33000	$25 + a_k \times 16$	538	538		136
	92			13900	34000	$25 + a_k \times 16,5$	577	577		136
	86			14300	35000	$25 + a_k \times 17$	616	616		136
	78			14600	36500	$30 + a_k \times 18$	657	657		136
	72			15000	37500	$30 + a_k \times 18,5$	700	700		136
	64			15400	38500	$30 + a_k \times 19$	743	743		136
	58			15700	40000	$30 + a_k \times 19,5$	788	788		136
	50			16100	41000	$30 + a_k \times 20$	835	835		136
	44			16500	42000	$30 + a_k \times 21$	882	882		136
	36			16800	43500	$35 + a_k \times 21,5$	931	931		136
	30			17200	44500	$35 + a_k \times 21,5$	982	982		136
	22			17500	45500	$35 + a_k \times 22$	1030	1030		136
	16			17900	47000	$35 + a_k \times 23$	1080	1080		136
	8			18200	48000	$35 + a_k \times 24$	1140	1140		136
	2			18600	49000	$35 + a_k \times 24,5$	1190	1190		136
	156			175	175	13200	31500	$25 + a_k \times 15,5$		501
	150	13500	33000			$25 + a_k \times 16$	538	538		160
	142	13900	34000			$25 + a_k \times 16,5$	577	577		160
	136	14300	35000			$25 + a_k \times 17$	616	616		160
	128	14600	36500			$30 + a_k \times 18$	657	657		160

Example for selection of sets: see page 14.

<sup>1)</sup> 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<sup>1)</sup> (continued)**

Unit Designation	Stroke length h mm	Dimensions		Basic load ratings		Moment ratings		
		C <sub>1</sub> mm	L mm	dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> = k <sub>M</sub> + a <sub>i</sub> × W <sub>M<sub>0x</sub></sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
<b>RWS 1808</b>	122	175	175	15000	37500	30 + a <sub>k</sub> × 18,5	700	700
	114			15400	38500	30 + a <sub>k</sub> × 19	743	743
	108			15700	40000	30 + a <sub>k</sub> × 19,5	788	788
	100			16100	41000	30 + a <sub>k</sub> × 20	835	835
	94			16500	42000	30 + a <sub>k</sub> × 21	882	882
	86			16800	43500	35 + a <sub>k</sub> × 21,5	931	931
	80			17200	44500	35 + a <sub>k</sub> × 21,5	982	982
	72			17500	45500	35 + a <sub>k</sub> × 22	1030	1030
	66			17900	47000	35 + a <sub>k</sub> × 23	1080	1080
	58			18200	48000	35 + a <sub>k</sub> × 24	1140	1140
	52			18600	49000	35 + a <sub>k</sub> × 24,5	1190	1190
	44			18900	50500	35 + a <sub>k</sub> × 25	1250	1250
	38			19200	51500	35 + a <sub>k</sub> × 25,5	1310	1310
	30			19600	52500	40 + a <sub>k</sub> × 26	1370	1370
	24	19900	54000	40 + a <sub>k</sub> × 26,5	1430	1430		
	16	20200	55000	40 + a <sub>k</sub> × 27,5	1490	1490		
	10	20600	56000	40 + a <sub>k</sub> × 28	1550	1550		
	2	20900	57500	40 + a <sub>k</sub> × 28,5	1620	1620		
	186	200	200	14300	35000	25 + a <sub>k</sub> × 17	616	616
	178			14600	36500	30 + a <sub>k</sub> × 18	657	657
	172			15000	37500	30 + a <sub>k</sub> × 18,5	700	700
	164			15400	38500	30 + a <sub>k</sub> × 19	743	743
	158			15700	40000	30 + a <sub>k</sub> × 19,5	788	788
	150			16100	41000	30 + a <sub>k</sub> × 20	835	835
	144			16500	42000	30 + a <sub>k</sub> × 21	882	882
	136			16800	43500	35 + a <sub>k</sub> × 21,5	931	931
	130			17200	44500	35 + a <sub>k</sub> × 21,5	982	982
	122			17500	45500	35 + a <sub>k</sub> × 22	1030	1030
116	17900			47000	35 + a <sub>k</sub> × 23	1080	1080	
108	18200			48000	35 + a <sub>k</sub> × 24	1140	1140	
102	18600			49000	35 + a <sub>k</sub> × 24,5	1190	1190	
94	18900			50500	35 + a <sub>k</sub> × 25	1250	1250	
88	19200	51500	35 + a <sub>k</sub> × 25,5	1310	1310			
80	19600	52500	40 + a <sub>k</sub> × 26	1370	1370			

**Guideway**

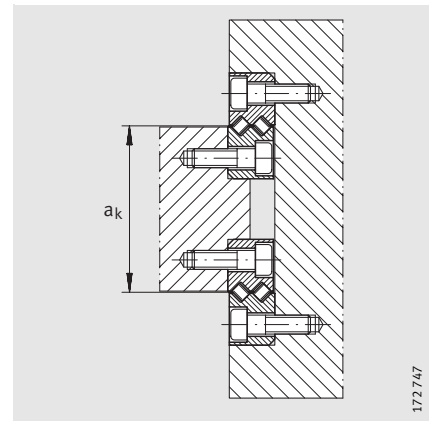
Guideway	
Designation	Mass ≈ g
<b>RWT</b>	160
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Example for selection of sets: see page 14.

<sup>1)</sup> 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<sup>1)</sup> (continued)**

Unit Designation	Stroke length h mm	Dimensions		Basic load ratings		Moment ratings				
		C <sub>1</sub> mm	L mm	dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> = k <sub>M</sub> + a <sub>i</sub> × W <sub>M<sub>0x</sub></sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm		
<b>RWS 1808</b>	74	200	200	19900	54000	40 + a <sub>k</sub> × 26,5	1430	1430		
	66			20200	55000	40 + a <sub>k</sub> × 27,5	1490	1490		
	60			20600	56000	40 + a <sub>k</sub> × 28	1550	1550		
	52			20900	57500	40 + a <sub>k</sub> × 28,5	1620	1620		
	46			21200	58500	40 + a <sub>k</sub> × 29	1680	1680		
	38			21600	60000	40 + a <sub>k</sub> × 29,5	1750	1750		
	32			21900	61000	45 + a <sub>k</sub> × 30,5	1820	1820		
	24			22200	62000	45 + a <sub>k</sub> × 31	1890	1890		
	18			22600	63500	45 + a <sub>k</sub> × 31,5	1960	1960		
	10			22900	64500	45 + a <sub>k</sub> × 32	2030	2030		
	4			23200	65500	45 + a <sub>k</sub> × 32,5	2110	2110		
	208			225	225	15700	40000	30 + a <sub>k</sub> × 19,5	788	788
	200					16100	41000	30 + a <sub>k</sub> × 20	835	835
	194	16500	42000			30 + a <sub>k</sub> × 21	882	882		
	186	16800	43500			35 + a <sub>k</sub> × 21,5	931	931		
	180	17200	44500			35 + a <sub>k</sub> × 21,5	982	982		
	172	17500	45500			35 + a <sub>k</sub> × 22	1030	1030		
	166	17900	47000			35 + a <sub>k</sub> × 23	1080	1080		
	158	18200	48000			35 + a <sub>k</sub> × 24	1140	1140		
	152	18600	49000			35 + a <sub>k</sub> × 24,5	1190	1190		
	144	18900	50500			35 + a <sub>k</sub> × 25	1250	1250		
	138	19200	51500			35 + a <sub>k</sub> × 25,5	1310	1310		
	130	19600	52500			40 + a <sub>k</sub> × 26	1370	1370		
	124	19900	54000			40 + a <sub>k</sub> × 26,5	1430	1430		
	116	20200	55000			40 + a <sub>k</sub> × 27,5	1490	1490		
	110	20600	56000			40 + a <sub>k</sub> × 28	1550	1550		
	102	20900	57500			40 + a <sub>k</sub> × 28,5	1620	1620		
	96	21200	58500			40 + a <sub>k</sub> × 29	1680	1680		
	88	21600	60000			40 + a <sub>k</sub> × 29,5	1750	1750		
	82	21900	61000			45 + a <sub>k</sub> × 30,5	1820	1820		
	74	22200	62000			45 + a <sub>k</sub> × 31	1890	1890		
	68	22600	63500	45 + a <sub>k</sub> × 31,5	1960	1960				
60	22900	64500	45 + a <sub>k</sub> × 32	2030	2030					
54	23200	65500	45 + a <sub>k</sub> × 32,5	2110	2110					

**Guideway**

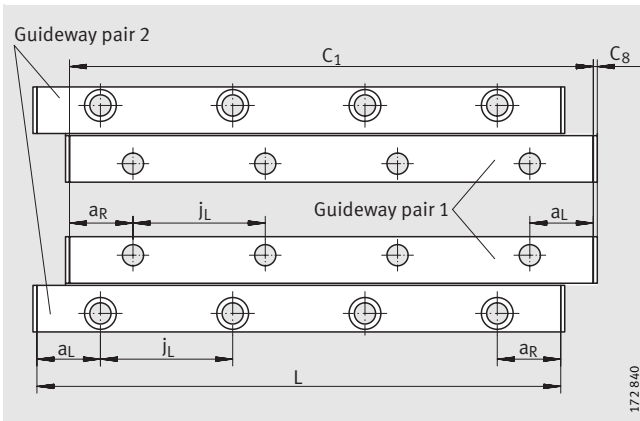
Guideway

Designation	Mass ≈g
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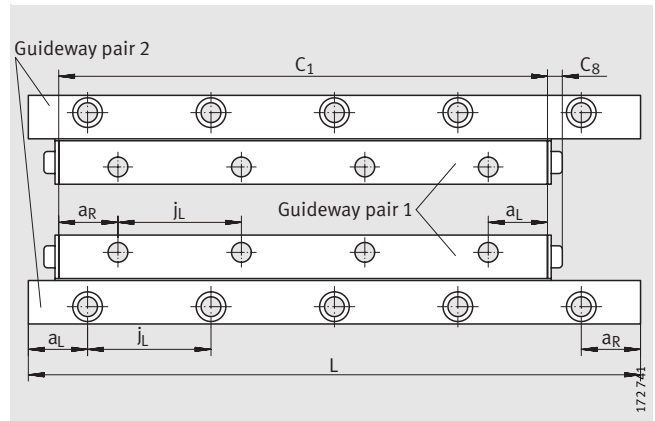
<b>RWT</b>	182
	182
	182
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	182
	182
	182
	206
	206
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	206

Example for selection of sets: see page 14.

<sup>1)</sup> 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<sup>1)</sup> (continued)**

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

**Guideway**

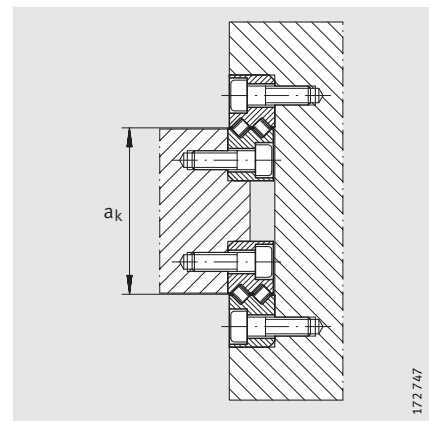
Guideway	
Designation	Mass
	≈ g
<b>RWT</b>	206
	206
	206
	206
	206
	206
	206
	206
	228
	228
	228
	228
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	228

Example for selection of sets: see page 14.

<sup>1)</sup> For other dimensions, see page 14.

**Miniature linear guidance set**  
with cylindrical roller flat cages  
Guideways of equal and unequal length

Series RWS 1808

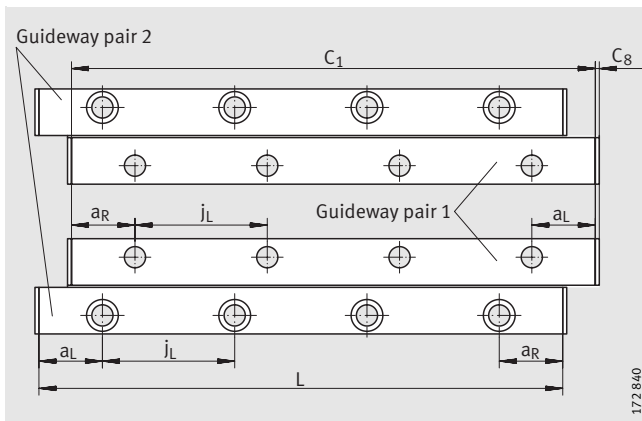


Cage spacing  $a_k$  – determined by adjacent construction

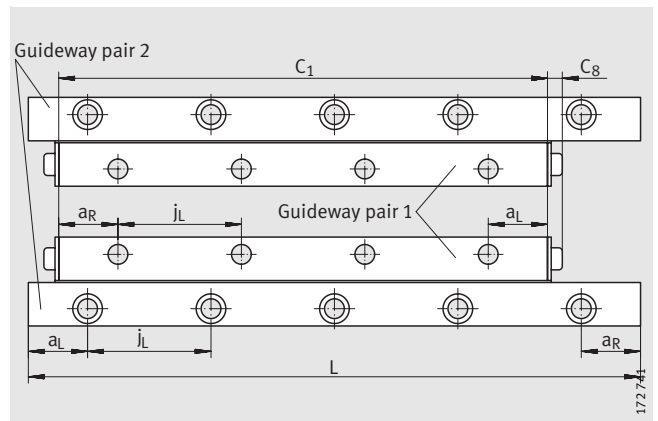
Main dimensions, basic load ratings, moments <sup>1)</sup> (continued)									Guideway	
Unit Designation	Stroke length h mm	Dimensions		Basic load ratings		Moment ratings			Designation	Mass ≈g
		$C_1$ mm	L mm	dyn. C N	stat. $C_0$ N	$M_{0x} = k_M + a_i \times W_{M_{0x}}$ Nm	$M_{0y}$ Nm	$M_{0z}$ Nm		
<b>RWS 1808</b>	48	250	250	25 500	75 000	$50 + a_k \times 37,5$	2 750	2 750	<b>RWT</b>	228
	40			26 000	76 000	$50 + a_k \times 38$	2 840	2 840		228
	34			26 500	77 500	$50 + a_k \times 38,5$	2 920	2 920		228
	26			26 500	78 500	$55 + a_k \times 39$	3 010	3 010		228
	20			27 000	79 500	$55 + a_k \times 40$	3 100	3 100		228
	12			27 500	81 000	$55 + a_k \times 40,5$	3 190	3 190		228
	6			27 500	82 000	$55 + a_k \times 41$	3 280	3 280		228
	280	300	300	19 600	52 500	$40 + a_k \times 26$	1 370	1 370		275
	274			19 900	54 000	$40 + a_k \times 26,5$	1 430	1 430		275
	266			20 200	55 000	$40 + a_k \times 27,5$	1 490	1 490		275
	260			20 600	56 000	$40 + a_k \times 28$	1 550	1 550		275
	252			20 900	57 500	$40 + a_k \times 28,5$	1 620	1 620		275
	246			21 200	58 500	$40 + a_k \times 29$	1 680	1 680		275
	238			21 600	60 000	$40 + a_k \times 29,5$	1 750	1 750		275
	232			21 900	61 000	$45 + a_k \times 30,5$	1 820	1 820		275
	224			22 200	62 000	$45 + a_k \times 31$	1 890	1 890		275
	218			22 600	63 500	$45 + a_k \times 31,5$	1 960	1 960		275
	210			22 900	64 500	$45 + a_k \times 32$	2 030	2 030		275
	204			23 200	65 500	$45 + a_k \times 32,5$	2 110	2 110		275
	196			23 500	67 000	$45 + a_k \times 33$	2 180	2 180		275
	190			23 800	68 000	$50 + a_k \times 34$	2 260	2 260		275
	182			24 200	69 000	$50 + a_k \times 34,5$	2 340	2 340		275
	176			24 500	70 500	$50 + a_k \times 35$	2 420	2 420		275
	168			24 800	71 500	$50 + a_k \times 35,5$	2 500	2 500		275
	162			25 000	72 500	$50 + a_k \times 36$	2 580	2 580		275
	154			25 500	74 000	$50 + a_k \times 37$	2 660	2 660		275
	148			25 500	75 000	$50 + a_k \times 37,5$	2 750	2 750		275
	140			26 000	76 000	$50 + a_k \times 38$	2 840	2 840		275
	134			26 500	77 500	$50 + a_k \times 38,5$	2 920	2 920		275
	126			26 500	78 500	$55 + a_k \times 39$	3 010	3 010		275
	120			27 000	79 500	$55 + a_k \times 40$	3 100	3 100		275
	112			27 500	81 000	$55 + a_k \times 40,5$	3 190	3 190		275
	106			27 500	82 000	$55 + a_k \times 41$	3 280	3 280		275

Example for selection of sets: see page 14.

<sup>1)</sup> 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<sup>1)</sup> (continued)**

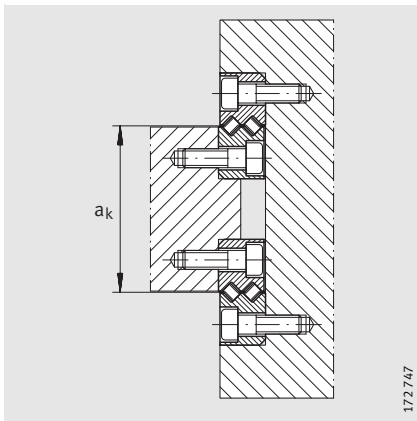
Unit	Stroke length h	Dimensions		Basic load ratings		Moment ratings		
		C <sub>1</sub>	L	dyn. C	stat. C <sub>0</sub>	M <sub>0x</sub> = k <sub>M</sub> + a <sub>i</sub> × W <sub>M<sub>0x</sub></sub>	M <sub>0y</sub>	M <sub>0z</sub>
Designation	mm	mm	mm	N	N	Nm	Nm	Nm
<b>RWS 1808</b>	98	300	300	28000	83000	55 + a <sub>k</sub> × 41,5	3380	3380
	92			28000	84500	60 + a <sub>k</sub> × 42	3470	3470
	84			28500	85500	60 + a <sub>k</sub> × 42,5	3570	3570
	78			29000	86500	60 + a <sub>k</sub> × 43,5	3670	3670
	70			29000	88000	60 + a <sub>k</sub> × 44	3770	3770
	64			29500	89000	60 + a <sub>k</sub> × 44,5	3870	3870
	56			29500	90000	60 + a <sub>k</sub> × 45	3970	3970
	50			30000	91500	60 + a <sub>k</sub> × 45,5	4070	4070
	42			30500	92500	65 + a <sub>k</sub> × 46,5	4180	4180
	36			30500	93500	65 + a <sub>k</sub> × 47	4280	4280
	28			31000	95000	65 + a <sub>k</sub> × 47,5	4390	4390
	22			31000	96000	65 + a <sub>k</sub> × 48	4500	4500
	14			31500	97500	65 + a <sub>k</sub> × 48,5	4610	4610
	8			32000	98500	65 + a <sub>k</sub> × 49	4720	4720
	332	350	350	21900	61000	45 + a <sub>k</sub> × 30,5	1820	1820
	324			22200	62000	45 + a <sub>k</sub> × 31	1890	1890
	318			22600	63500	45 + a <sub>k</sub> × 31,5	1960	1960
	310			22900	64500	45 + a <sub>k</sub> × 32	2030	2030
	304			23200	65500	45 + a <sub>k</sub> × 32,5	2110	2110
	296			23500	67000	45 + a <sub>k</sub> × 33	2180	2180
	290			23800	68000	50 + a <sub>k</sub> × 34	2260	2260
	282			24200	69000	50 + a <sub>k</sub> × 34,5	2340	2340
	276			24500	70500	50 + a <sub>k</sub> × 35	2420	2420
	268			24800	71500	50 + a <sub>k</sub> × 35,5	2500	2500
	262			25000	72500	50 + a <sub>k</sub> × 36	2580	2580
	254			25500	74000	50 + a <sub>k</sub> × 37	2660	2660
248	25500			75000	50 + a <sub>k</sub> × 37,5	2750	2750	
240	26000			76000	50 + a <sub>k</sub> × 38	2840	2840	
234	26500			77500	50 + a <sub>k</sub> × 38,5	2920	2920	
226	26500			78500	55 + a <sub>k</sub> × 39	3010	3010	
220	27000			79500	55 + a <sub>k</sub> × 40	3100	3100	
212	27500			81000	55 + a <sub>k</sub> × 40,5	3190	3190	
206	27500	82000	55 + a <sub>k</sub> × 41	3280	3280			

**Guideway**

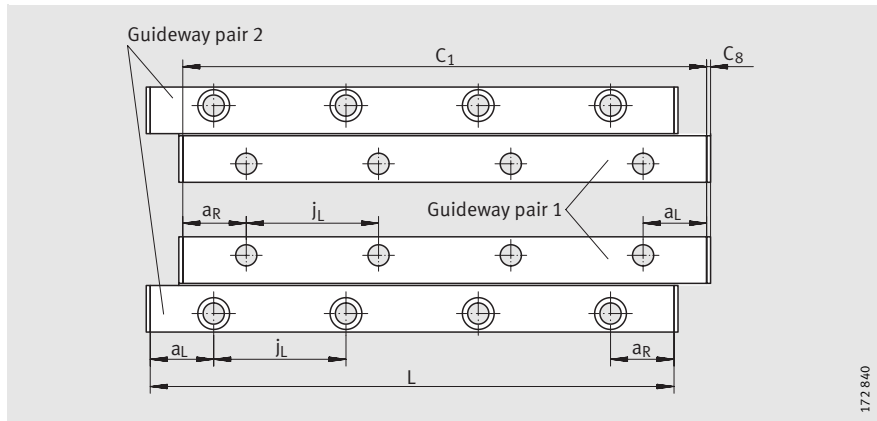
Guideway	
Designation	Mass
	≈ g
<b>RWT</b>	275
	275
	275
	275
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	275
	275
	275
	275
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	275

Example for selection of sets: see page 14.

<sup>1)</sup> 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)<sup>2)</sup>

**Main dimensions, basic load ratings, moments<sup>1)</sup>** (continued)

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

**Guideway**

Guideway	
Designation	Mass ≈g
<b>RWT</b>	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320
	320

Example for selection of sets: see page 14.

<sup>1)</sup> For other dimensions, see page 14.

<sup>2)</sup> If  $L \neq C_1$ , see calculation on page 14, figure on page 17.



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