Linear recirculating roller bearing and guideway assemblies

full complement or with chain guidance system

New series, including roller chain

The full complement linear recirculating roller bearing and guideway assemblies RUE..-D are the heavy duty designs in the range of INA linear recirculating guidance systems. It is with good reason that they are used wherever linear guidance systems must support extremely heavy loads, where particularly high rigidity is required and where very precise travel is also necessary. It is quite clear: machine tools are their domain. They are at home here and this is where they have proved extremely successful in many applications. In order to make this series of guidance systems even more attractive to the user, it has been completely revised. The result: the new series RUE..-E and RUE..-E-KT-L.

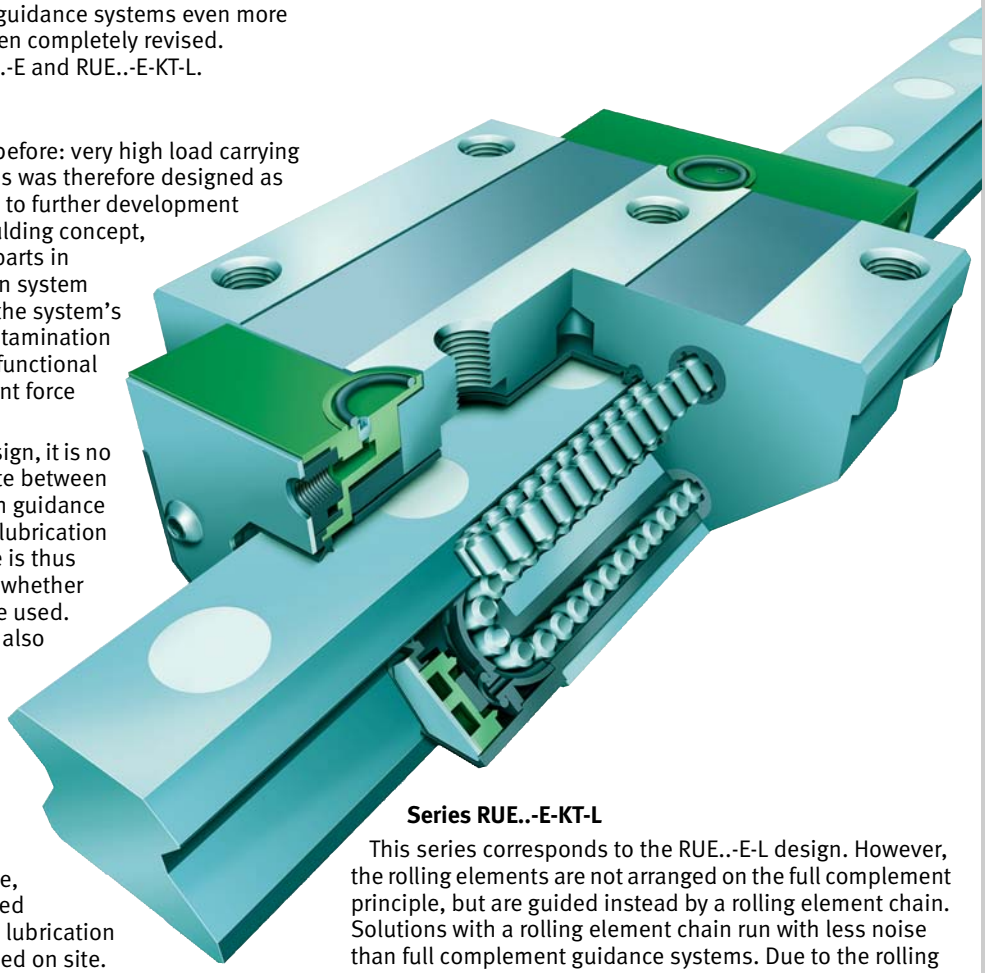
Series RUE..-E

The focus here is the same as before: very high load carrying capacity and rigidity. This series was therefore designed as a full complement system. Due to further development of the innovative injection moulding concept, the number of joints between parts in the rolling element recirculation system has been further reduced and the system's intrinsic protection against contamination has been improved (increased functional reliability, reduced displacement force pulsation).

With the new lubricant duct design, it is no longer necessary to differentiate between oil and grease lubrication. Each guidance system is now supplied with a lubrication nipple and oil connector. There is thus no longer any need to indicate whether grease or oil lubrication is to be used. The relubrication options have also been substantially expanded. Lubrication is carried out from the side, from the end or from above via the end piece. For lubrication from the side, the end piece has theaded holes for lubrication connectors. If lubrication is to be carried out from the end face, the screw plug is simply replaced by a lubrication connector. The lubrication point can thus be quickly defined on site.

If large quantities of contamination are present in operation, additional sealing of carriages is often required. As in the case of RUE..-D, the end seal can be replaced without removing the carriage from the guideway. Optimum protection against contamination is completed by upper and twin lower sealing strips. This saves on set-up time and ensures reliable operation under demanding conditions.

RUE..-E guidance systems run on the same guideways as the established RUE..-D series. Changing to the higher performance E versions does not therefore require duplicate stockholding. This simplifies logistical processing and saves on storage costs.



Series RUE..-E-KT-L

This series corresponds to the RUE..-E-L design. However, the rolling elements are not arranged on the full complement principle, but are guided instead by a rolling element chain. Solutions with a rolling element chain run with less noise than full complement guidance systems. Due to the rolling element chain, there are fewer load-bearing rolling elements in the load zone. Since the longer saddle plate variant is used in the chain version, however, the basic load ratings and rigidity values are similar to those of the full complement standard version.

Guidance systems with an integral rolling element chain are available in the series RUE..-E-KT-L and RUE..-E-KT-HL.

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Linear recirculating roller bearing and guideway assemblies

full complement

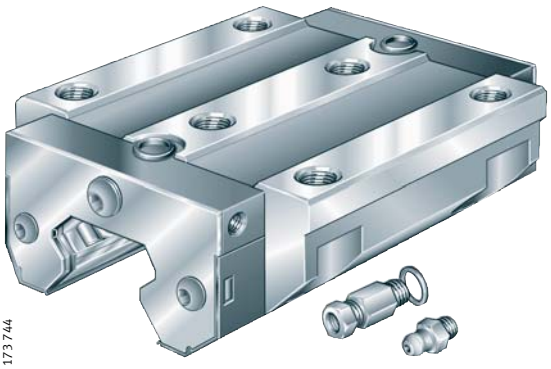
Features

Linear recirculating roller bearing and guideway assemblies

- are complete units comprising:
  - at least one carriage RWU..-E with a full complement cylindrical roller system
  - one guideway TSX..-E(-U)
  - integral elastic wipers on the end faces of the carriage and upper as well as twin lower sealing strips
  - plastic closing plugs
- can support loads from all directions – apart from the direction of motion – and moments about all axes
- are preloaded
  - the preload is determined by the carriage
- have, due to further development of the patented injection moulding technology
  - fewer joints and transitions
  - precise guidance of the rolling elements by ribs and therefore very high quality running
  - a device for retaining the rollers in order to allow easy fitting of the carriage
- are supplied with a lubrication nipple and oil connector
  - the lubrication nipple can be screwed into the right, the left or the end face of the end piece; before it is screwed in, the lateral lubrication hole in the end piece must first be opened using a hot pointed object
- are supplied with multi-piece guideways if the required guideway length is in excess of the maximum length l_{max} according to the *dimension table*
- are suitable for:
  - accelerations up to 100 m/s^2
  - speeds up to 180 m/min
  - operating temperatures from –10 °C to +100 °C
- are used in applications with:
  - long, unlimited stroke lengths
  - high and very high loads
  - high and very high rigidity.

Carriage

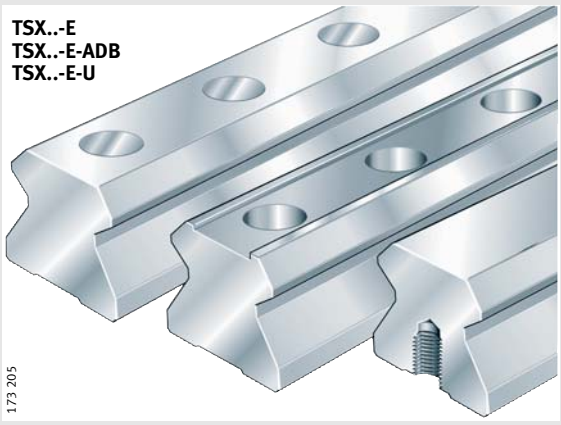
RWU..-E



- RWU..-E for grease lubrication and oil lubrication
- hardened steel saddle plate, precision ground rolling element raceways
  - cylindrical rollers are recirculated in enclosed channels with plastic return elements
- sealed on all sides by elastic wipers and sealing strips
- supplied with lubrication nipple and oil connector

Guideways

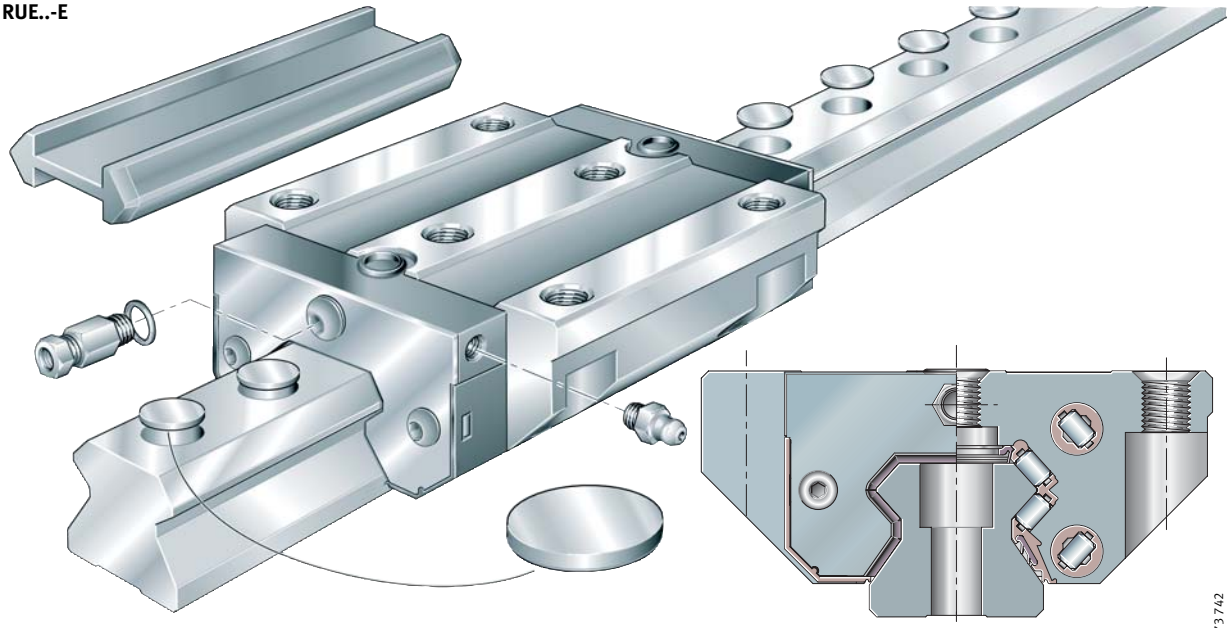
TSX..-E
TSX..-E-ADB
TSX..-E-U



- hardened steel, all surfaces ground
  - precision ground raceways for rolling elements
- TSX..-E located from above, TSX..-E-U located from below
  - counterbored through holes for fixing screws or threaded blind holes
- TSX..-E-ADB with groove for steel covering strip fixed by adhesive

Linear recirculating roller bearing and guideway assembly – scope of basic delivery

RUE..-E



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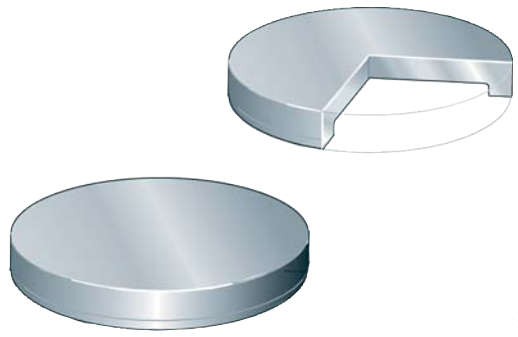
Standard accessories

KA..-TN



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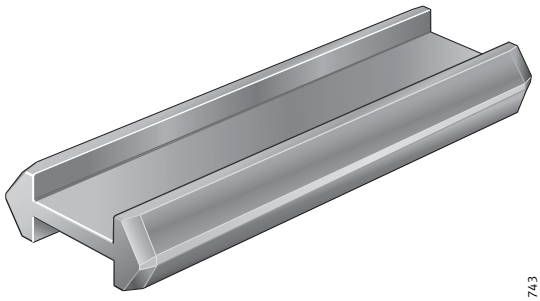
- plastic closing plugs
  – close off the counterbores of the guideway holes flush with the top surface of the guideway
- two-piece closing plugs also available as an option

MSX..-E



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- plastic dummy guideway
  – prevents damage to the rolling element set while the carriage is separated from the guideway. The carriage is always pushed direct from the guideway onto the dummy guideway

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Features

Interchangeability

The carriage and guideway of a linear recirculating roller bearing and guideway assembly are matched to each other as a standard system due to their closely toleranced preload.

It may be possible, after consultation, to use carriages and guideways in different combinations.

Contact angle

The cylindrical rollers are in an X arrangement and can support compressive, tensile and lateral loads.

Corrosion-resistant designs

Linear recirculating roller bearing and guideway assemblies RUE..-E are also available with Corrotect® plating.

If carriages and guideways are ordered separately, the following applies:

- carriage and guideway with anti-corrosion protection
  – suffix RRF.

If systems are supplied preassembled:

- carriage and guideway with anti-corrosion protection
  – suffix RRF
- guideway only with anti-corrosion protection
  – suffix RRFT.

If applications using Corrotect® plating are planned, please consult us.

⚠ Guideways with Corrotect® plating must not be used in conjunction with the clamping element RUKS..-D.

If such an application is planned, please consult us.

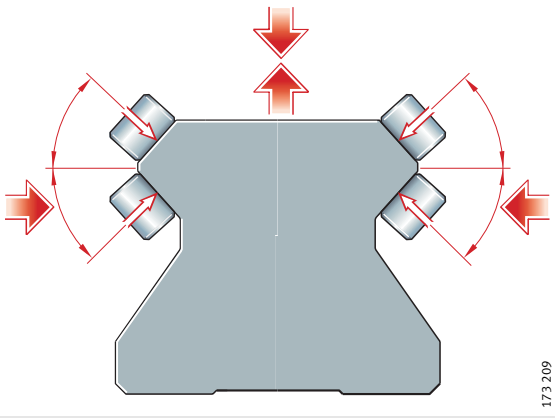
Sealing

The carriage is sealed on all sides by means of wipers, gap seals and upper and twin lower sealing strips ①. These sealing elements protect the rolling element system from contamination even under demanding environmental conditions.

The standard carriage has a double lip end wiper as standard on both ends that retains the lubricant in the system.

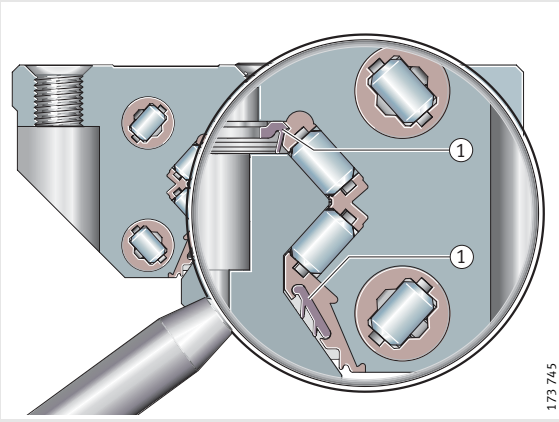
If the contamination conditions are exceptionally severe, please consult us.

Contact angle



- contact angles of row of cylindrical rollers
- X arrangement

Sealing



- standard sealing strips ①
- elastic double lip wipers on end faces

Preload

Linear recirculating roller bearing and guideway assemblies RUE..-E are available in preload class V3 (see Table 1).

Optimum rigidity of the elements is achieved with the smallest possible deviation in the preload force. Linear recirculating roller bearing and guideway assemblies are therefore supplied as preassembled units; the elements are sorted and matched to each other.

Influence of preload on the linear guidance system

Increasing the preload increases the rigidity.

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

Table 1 · Preload class

Preload class	Preload setting	Suitable applications
V3	0,1 · C	■ high alternating loads ■ particularly high rigidity ■ moment loads

Friction

The coefficient of friction is dependent on the ratio C/P. For a guidance system without seals and with a load ratio of between C/P = 4 to C/P = 20, it is:

- μ_{RUE} = 0,002 to 0,004.

Accuracy

Accuracy classes of linear recirculating roller bearing and guideway assemblies

Linear recirculating roller bearing and guideway assemblies are available in accuracy classes G0 to G3 (Figure 1).

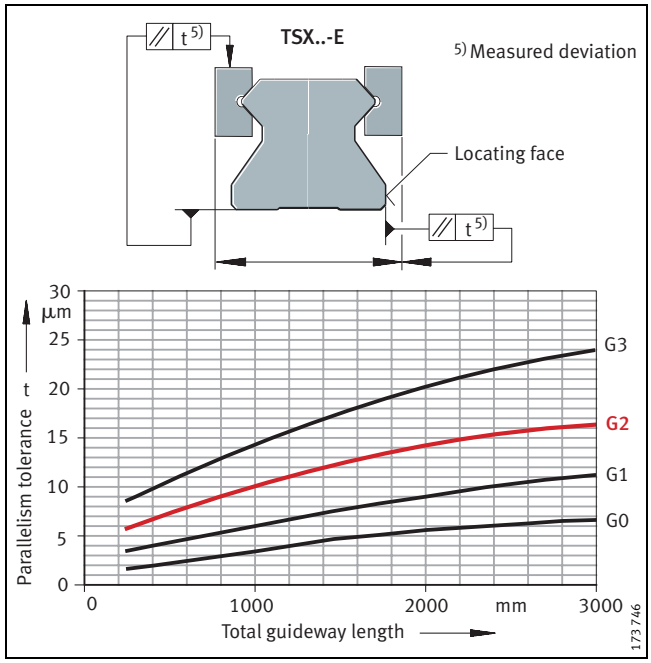


Figure 1 · Accuracy classes and parallelism tolerances of guideways

For accuracy class tolerances see Table 2, for reference dimensions see Figure 2.

The tolerances are arithmetic mean values. They relate to the centre point of the screw mounting or locating surfaces of the carriage. The dimensions H and A_1 (Table 2) should always remain within the tolerance irrespective of the position of the carriage on the guideway.

Units with Corrotect® plating

For these units, the values for the appropriate accuracy class must be increased by the values for RRF or RRFT (for values see Table 2).

Table 2 · Accuracy class tolerances

Tolerance		Accuracy classes				With Corrotect® plating	
		G0 µm	G1 µm	G2[4] µm	G3 µm	RRF[2] µm	RRFT[3] µm
Height tolerance	H	± 5	± 10	± **20**	± 25	+6	+3
Height difference[1]	ΔH	3	5	**10**	15	+3	0
Distance tolerance	A_1	± 5	± 10	± **15**	± 20	+3	+3
Distance difference[1]	ΔA_1	3	7	**15**	22	+3	0

[1] Dimensional difference between several carriages on one guideway, measured at the same point on the guideway.

[2] Displacement in tolerance zone (guideway and carriage plated).

[3] Displacement in tolerance zone (guideway only plated).

[4] Standard accuracy class.

Parallelism of raceways to locating surfaces

The parallelism tolerances of the guideways are shown in Figure 1, page 5.

For systems with Corrotect® plating, there may be deviations in tolerances compared with unplated units.

Positional tolerances of guideways

The positional tolerances are shown in Figure 3.

Length tolerances of guideways

For length tolerances, see Figure 3 and Table 3.

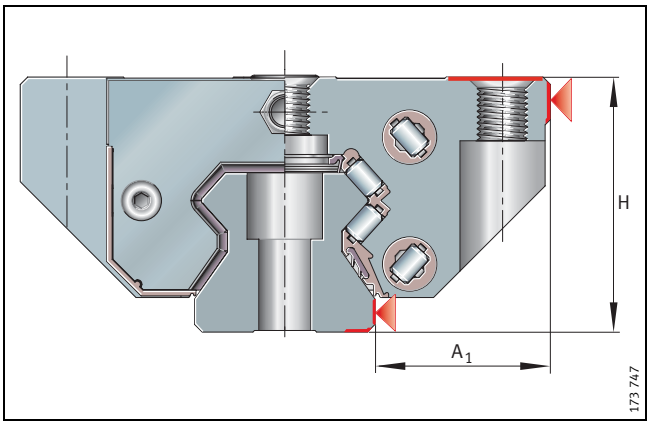


Figure 2 · Reference dimensions for accuracy

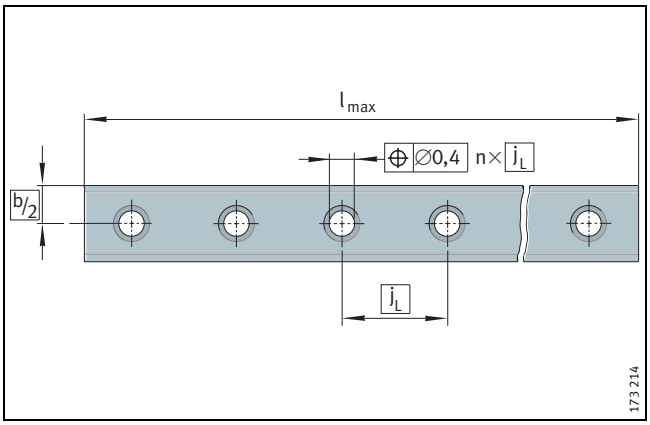


Figure 3 · Positional and length tolerances of guideways – hole pattern to ISO 1101

Table 3 · Length tolerances of guideways

Roller bearing and guideway assembly	Tolerances of guideways, as a function of length l_{max}[1] l_{max}			Multi-piece guideways
Designation	≦1 000 mm	>1 000 mm <3 000 mm	>3 000 mm	
RUE..-E	–1 mm	–1,5 mm	±0,1% of guideway length	±3 mm over whole length

[1] Length l_{max}: see *dimension table*.

Hole patterns of guideways

Unless specified otherwise, the guideways have a symmetrical hole pattern. For an asymmetrical hole pattern (customer request), the following must apply:

- $a_L \geqq a_{L\,min}$ and $a_R \geqq a_{R\,min}$ (Figure 4).

Maximum number of pitches between holes

The number of pitches between holes is the rounded whole number equivalent to:

$$n = \frac{l_{max} - (2 \cdot a_{Lmin})}{j_L}$$

The distances a_L and a_R are generally determined by:

$$a_L + a_R = l_{max} - n \cdot j_L$$

For guideways with a symmetrical hole pattern:

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

Number of holes:

$$x = n + 1$$

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

$a_{L\,min}$, $a_{R\,min}$ mm
Minimum values for a_L, a_R according to the *dimension table*

l_{max} mm
Guideway length

n –
Maximum number of pitches between holes

j_L mm
Distance between holes

x –
Number of holes.

The minimum and maximum values for $a_{L\,min}$ and $a_{R\,min}$ must be observed (*dimension table*), otherwise the counterbores may be intersected by the end of the guideway.

Multi-piece guideways

If the guideway length required is greater than l_{max} according to the *dimension table*, a guideway of the total length is made up from individual sections. The individual sections are matched to each other and marked accordingly (Figure 5).

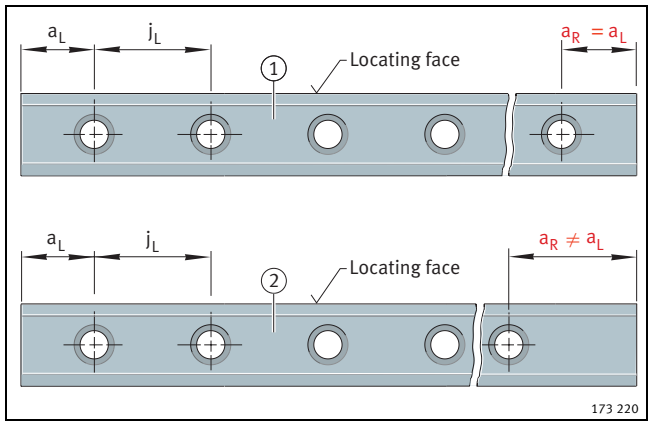


Figure 4 · Symmetrical ① and asymmetrical ② hole patterns for guideways with one row of holes

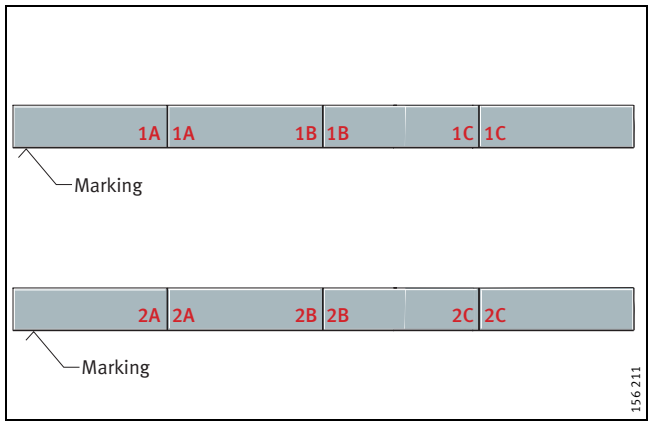


Figure 5 · Marking of multi-piece guideways

Demands on the adjacent construction

Running accuracy of linear guidance systems

The running accuracy is essentially dependent on the straightness, accuracy and rigidity of the fit and mounting surfaces. The straightness of the system is only achieved when a guideway is pressed against the datum surface.

If high demands are to be made on the running accuracy and/or if soft substructures and/or movable guideways are used, please consult us.

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 of the mounting surfaces:

- the tolerances in Figure 6 and Table 5 must be adhered to
- surfaces should be ground or precision milled with the aim of achieving a mean roughness value of R_a1,6.

⚠ Deviations from the specified tolerances:
- will impair the overall accuracy of the guidance system
- will alter the preload
- will reduce the operating life of the guidance system!

Height difference ΔH

The permissible values for ΔH (Figure 6) are given by the formula below. If larger deviations are present, please consult the Schaeffler engineering service.

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

ΔH μm
Maximum permissible deviation from the theoretically precise position

a –
Factor (Table 4)

b mm
Centre distance between guidance elements.

Table 4 · Factor a

Preload class V	Factor a
V3	0,075

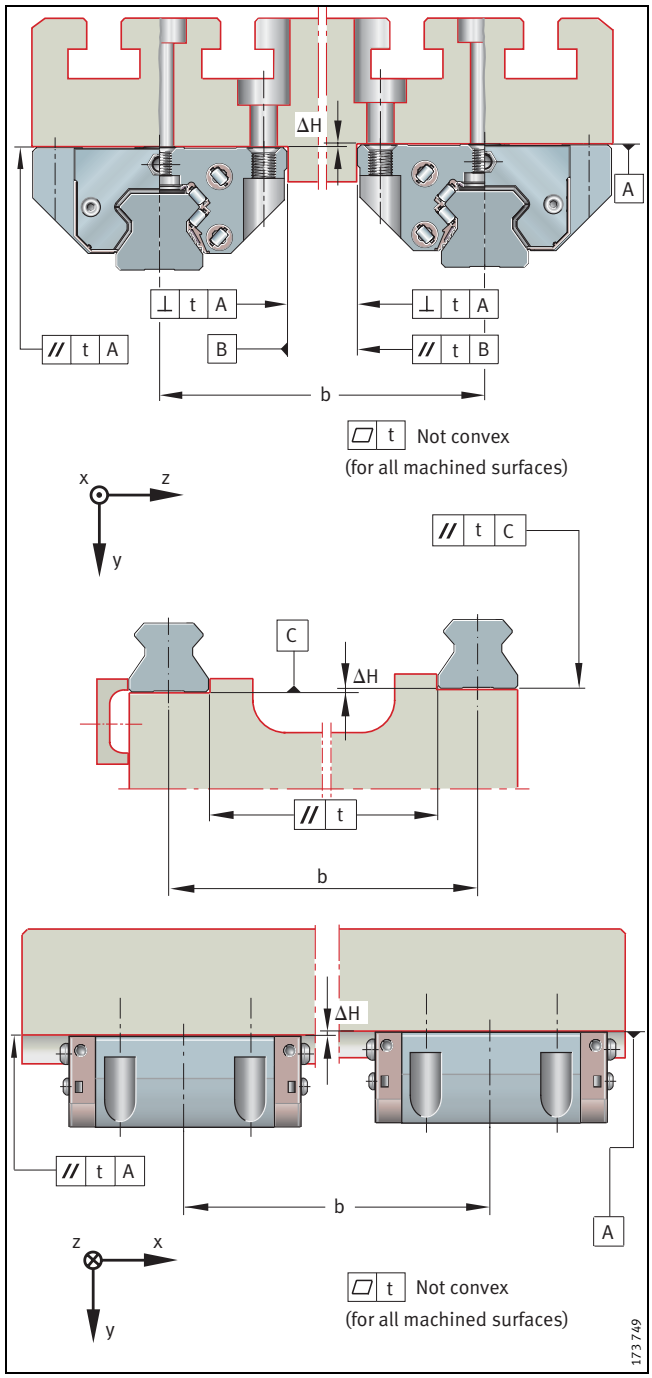


Figure 6 · Tolerances of mounting surfaces and parallelism of mounted guideways

Parallelism of mounted guideways

For guideways arranged parallel to each other, the parallelism value t given in Figure 6 and Table 5 should be adhered to.

If the maximum values are used, this may increase the displacement resistance. If larger tolerances are present, please consult us.

Table 5 · Values for parallelism tolerances t

Guideway Designation	Preload class V3 Parallelism tolerance t µm
TSX35-E(-U)	10
TSX45-E(-U)	10
TSX55-E(-U)	10
TSX65-E(-U)	10
TSX100-E(-U)	10

Locating heights and corner radii

Locating heights and corner radii should be in accordance with Figure 7 and Table 6.

Table 6 · Locating heights and corner radii

Roller bearing and guideway assembly Designation	h_1	h_2 max.	r_1 max.	r_2 max.
RUE35-E(-L,-H,-HL)	8	6	1	0,8
RUE45-E(-L,-H,-HL)	10	8	1	0,8
RUE55-E(-L,-H,-HL)	12	9,5	1	0,8
RUE65-E(-L,-H,-HL)	15	10,5	1	0,8
RUE100-E-L	25	13	1	0,8

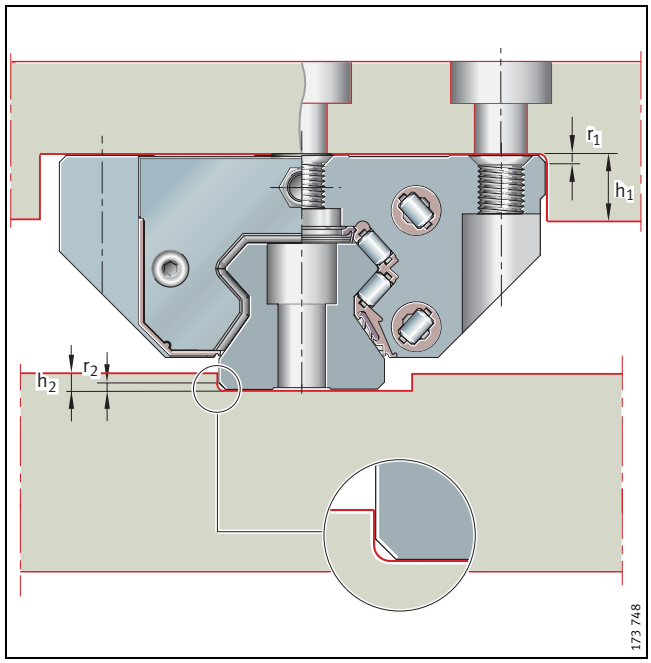


Figure 7 · Locating heights and corner radii

Ordering example and ordering designation

Ordering example 1

Asymmetrical hole pattern

Roller bearing and guideway assembly	RUE
Size	45
Carriage type	E L
Number of carriages per unit	W2
Accuracy class	G2
Guideway length	1 540 mm
■ a_L	50 mm
■ a_R	20 mm

Ordering designation:

1 × **RUE45-E-L-W2 G2/1 540-50/20** (Figure 8).

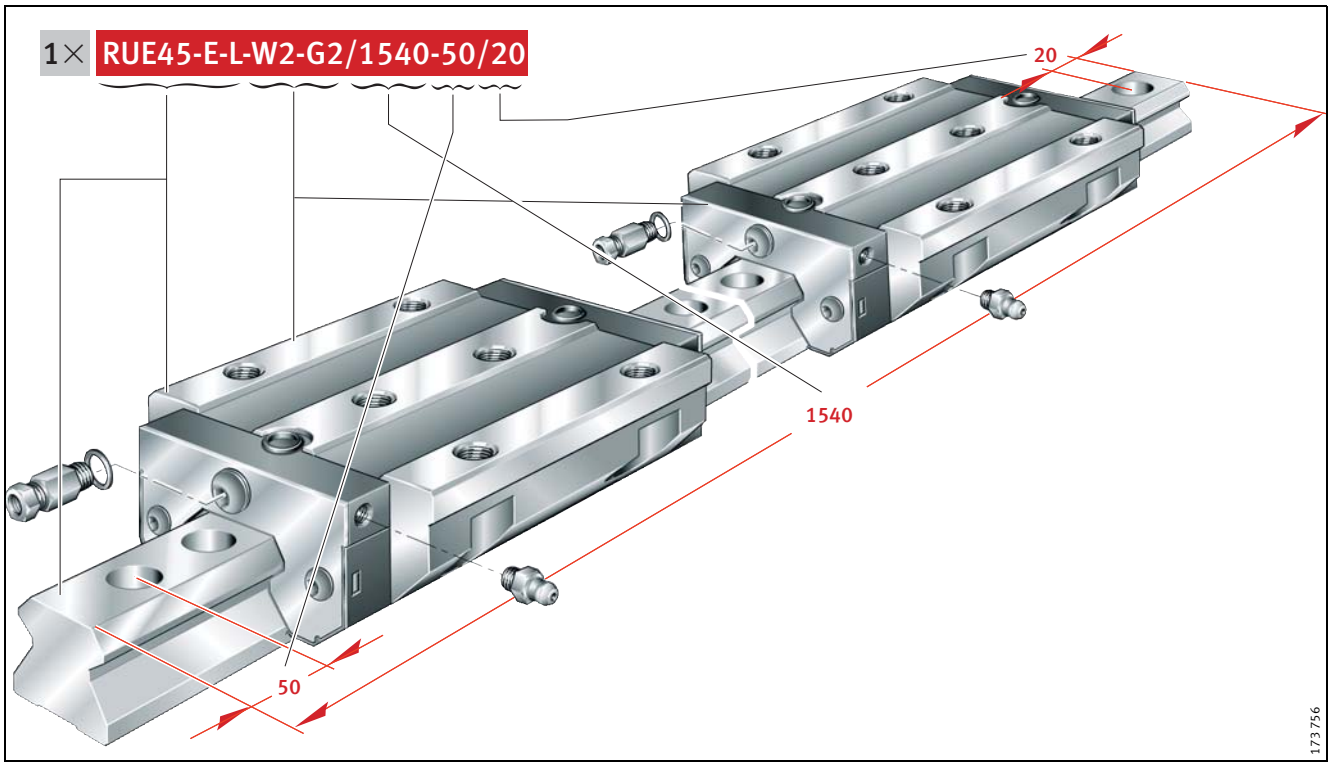


Figure 8 · Ordering example, ordering designation

Ordering example 2

Symmetrical hole pattern

Roller bearing and guideway assembly	RUE
Size	45
Carriage type	E HL
Number of carriages per unit	W2
Accuracy class	G2
Guideway length	1 510 mm
■ a_L	20 mm
■ a_R	20 mm

Ordering designation:

1 × **RUE45-E-HL-W2-G2/1 510-20/20** (Figure 9).

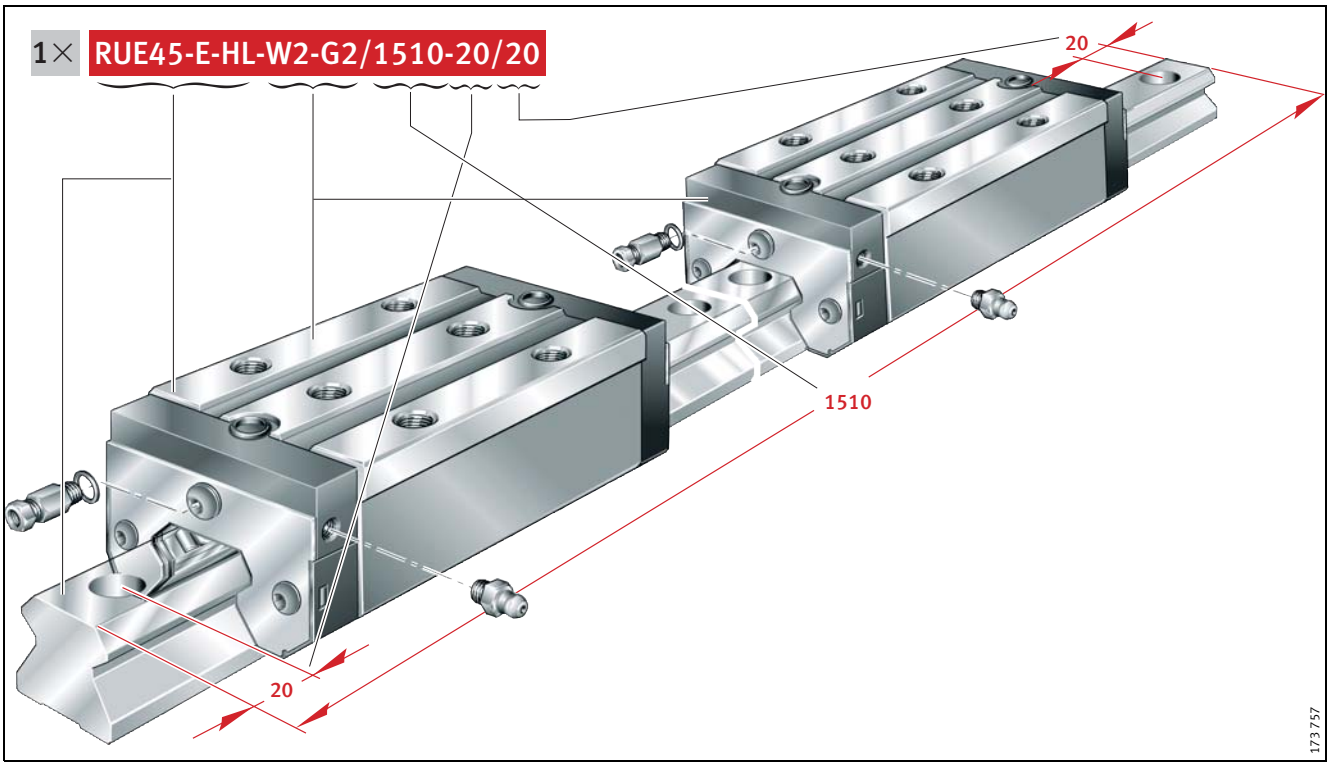
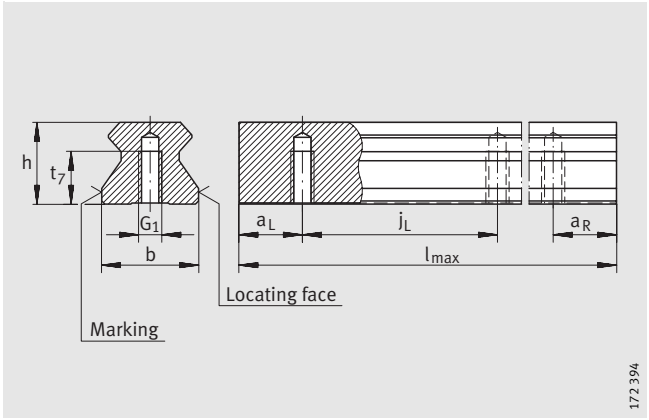


Figure 9 · Ordering example, ordering designation

Linear recirculating roller bearing and guideway assemblies

full complement

Series RUE..-E
RUE..-E-L



TSX..-E-U

Dimension table · Dimensions in mm

Designation	Carriage		Guideway				Dimensions				Mounting dimensions		
	Designation	Mass m ≈kg	Designation	Mass m ≈kg/m	Closing plug[1]	Covering strip	l_{max}[2]	H	B	L[3]	A_1	J_B	b −0,005 −0,035
RUE35-E	RWU35-E	1,75	TSX35-E(-U)	5,9	KA15-TN	ADB18	2 960	48	100	123,2	33	82	34
RUE35-E-L	RWU35-E-L	2,29	TSX35-E(-U)	5,9	KA15-TN	ADB18	2 960	48	100	149	33	82	34
RUE45-E	RWU45-E	3,07	TSX45-E(-U)	9,4	KA20-TN	ADB23	2 940	60	120	146,2	37,5	100	45
RUE45-E-L	RWU45-E-L	4,05	TSX45-E(-U)	9,4	KA20-TN	ADB23	2 940	60	120	178,6	37,5	100	45

1) Closing plugs KA..-TN are included in the delivery.

2) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.

3) Minimum covered length for sealing the lubrication connectors.

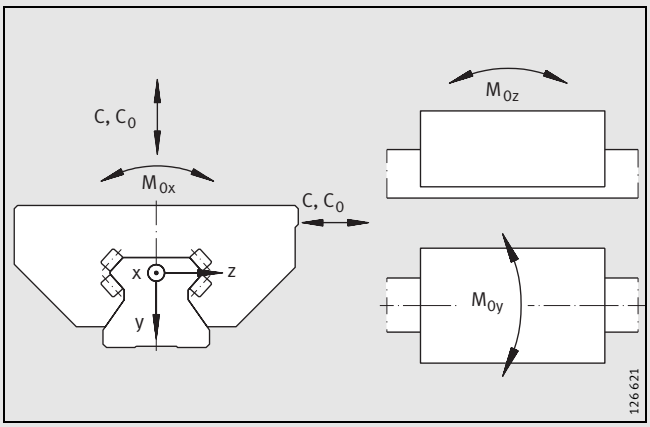
4) a_L and a_R are dependent on the guideway length. *Calculation*, page 7.

5) Position of the lubrication hole in the adjacent construction.

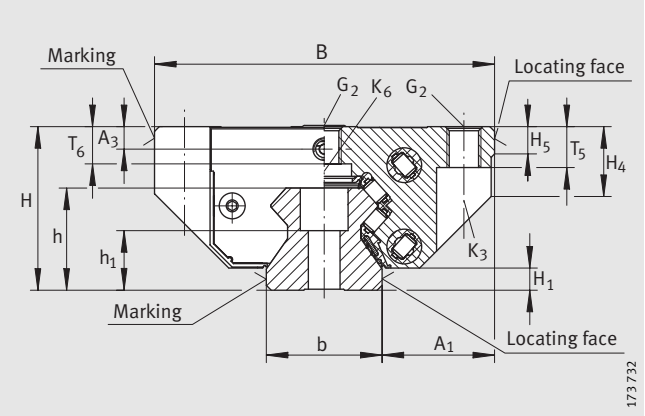
6) Maximum diameter of the lubrication hole in the adjacent construction.

7) ⚠ For information on fixing screws see
INA Catalogue "605", Fixing screws.

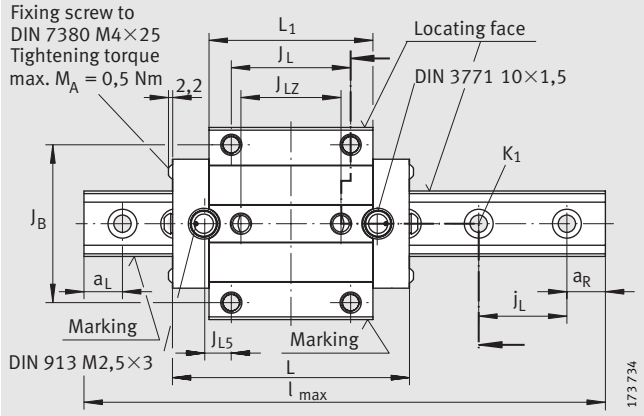
8) Before use, open up the lateral lubrication hole, see *"MON 30"*.



Load directions



RUE..-E(-L)

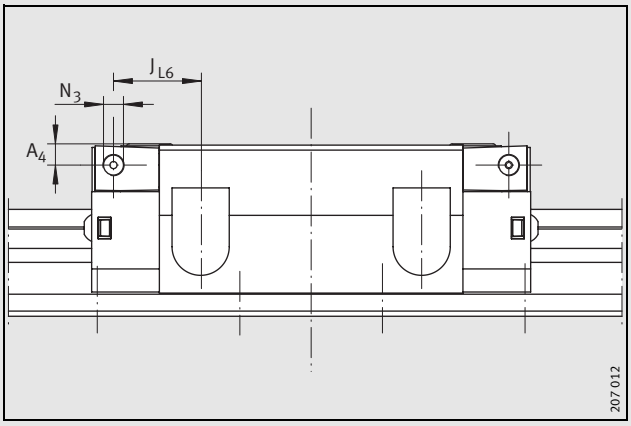


RUE..-E(-L) · View X (rotated 90°)

																Fixing screws[7]				
L_1	J_L	J_{LZ}	j_L	a_L/a_R[4]		J_{L5}[5]	N_2[6]	H_1	H_5	A_3	H_4	T_5	T_6	t_7	h	h_1	G1	G2	K1	K3	K6
				min.	max.											±0,5	ISO 4 762-12.9				DIN 7 984-8.8
85,2	62	52	40	20	31	13,8	6	6,5	8	6,6	19,7	12	10,9	15	30	17,5	M 8	M10	M 8	M 8	M 8
111	62	52	40	20	31	26,7	6	6,5	8	6,6	19,7	12	10,9	15	30	17,5	M 8	M10	M 8	M 8	M 8
104,2	80	60	52,5	20	41	15,1	6	8,7	8	6,6	25,2	15	13,2	20	38	19,5	M12	M12	M12	M10	M10
136,6	80	60	52,5	20	41	31,3	6	8,7	8	6,6	25,2	15	13,2	20	38	19,5	M12	M12	M12	M10	M10

Dimensioning of lateral lubrication connector[8]

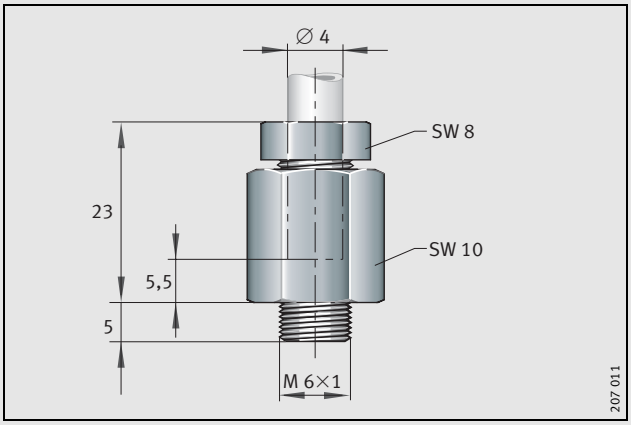
Designation	N_3	A_4	J_{L6}
RUE35-E	M6	5,6	24,4
RUE35-E-L	M6	5,6	37,4
RUE45-E	M6	6,6	27
RUE45-E-L	M6	6,6	43,2



Lateral lubrication connector

Load carrying capacity
(for definition of basic load ratings, see *INA Catalogue "605"*)

Designation	Basic load ratings		Moment ratings		
	C N	C_0 N	M_{0x} Nm	M_{0y} Nm	M_{0z} Nm
RUE35-E	59 000	140 000	1200	2150	1950
RUE35-E-L	70 000	175 000	1500	3350	3000
RUE45-E	92 000	215 000	1805	3870	3485
RUE45-E-L	115 000	275 000	2410	6770	6095

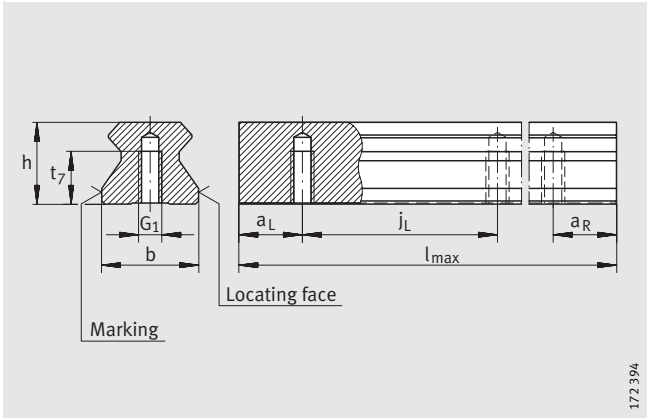


Connector with union nut

Linear recirculating roller bearing and guideway assemblies

full complement

Series RUE..-E
RUE..-E-L



TSX..-E-U

Dimension table (continued) · Dimensions in mm

Designation	Carriage		Guideway				Dimensions				Mounting dimensions		
	Designation	Mass m ≈kg	Designation	Mass m ≈kg/m	Closing plug[1]	Covering strip	l_{max}[2]	H	B	L[3]	A_1	J_B	b −0,005 −0,035
RUE55-E	RWU55-E	5,24	TSX55-E(-U)	13,1	KA24-TN	ADB27	2 520	70	140	173	43,5	116	53
RUE55-E-L	RWU55-E-L	6,83	TSX55-E(-U)	13,1	KA24-TN	ADB27	2 520	70	140	211	43,5	116	53
RUE65-E	RWU65-E	9,32	TSX65-E-(U)	21,5	KA26-TN	ADB29	2 520	90	170	195,8	53,5	142	63
RUE65-E-L	RWU65-E-L	13,8	TSX65-E(-U)	21,5	KA26-TN	ADB29	2 520	90	170	262,2	53,5	142	63
RUE100-E-L	RWU100-E-L	36,4	TSX100-E	45,3	KA40-M	–	2 960	120	250	370,5	75	200	100

1) Closing plugs KA..-TN are included in the delivery.

2) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.

3) Minimum covered length for sealing the lubrication connectors.

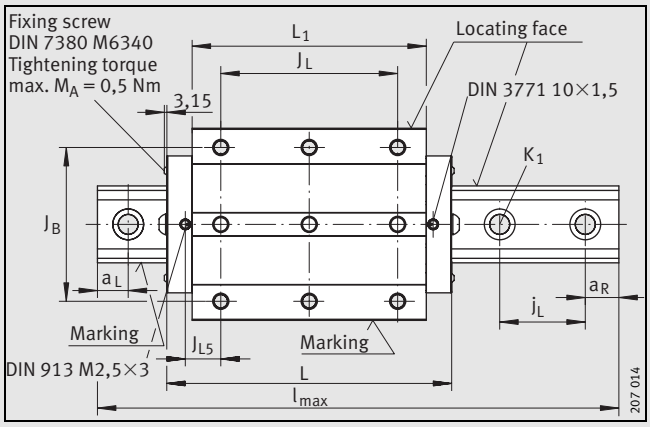
4) a_L and a_R are dependent on the guideway length. *Calculation*, page 7.

5) Position of the lubrication hole in the adjacent construction.

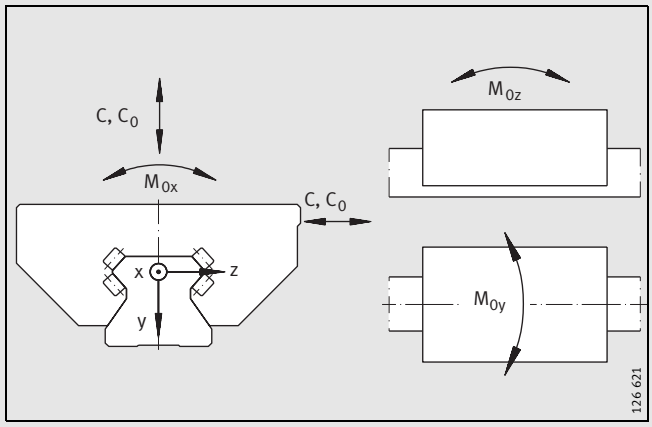
6) Maximum diameter of the lubrication hole in the adjacent construction.

7) ⚠ For information on fixing screws see
INA Catalogue "605", Fixing screws.

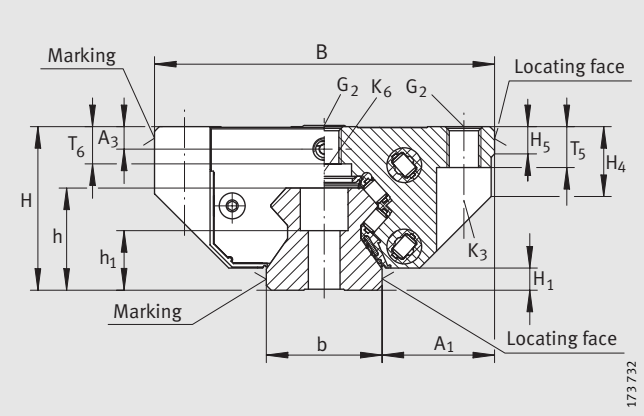
8) Before use, open up the lateral lubrication hole, see *"MON 30"*.



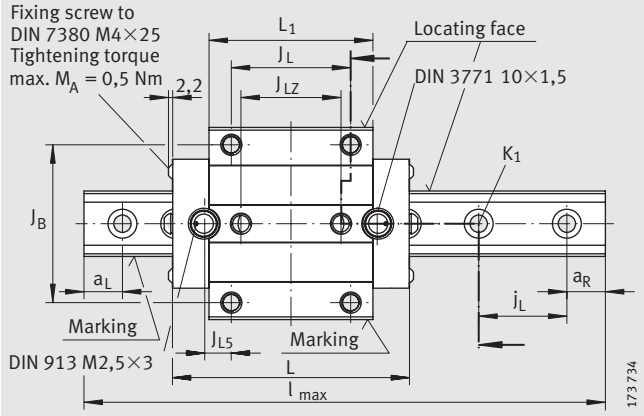
RUE100-E-L



Load directions



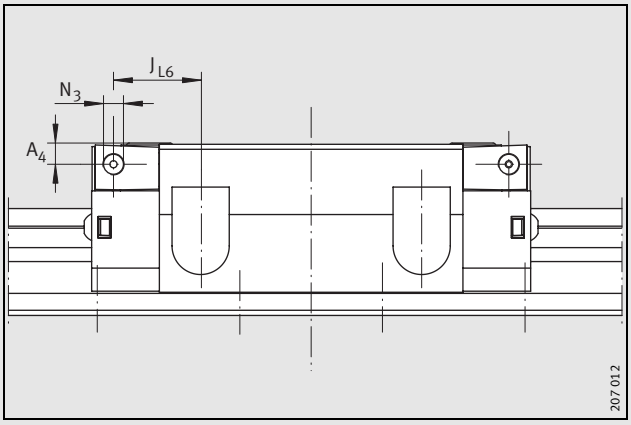
RUE..-E(-L)



RUE..-E(-L) · View X (rotated 90°)

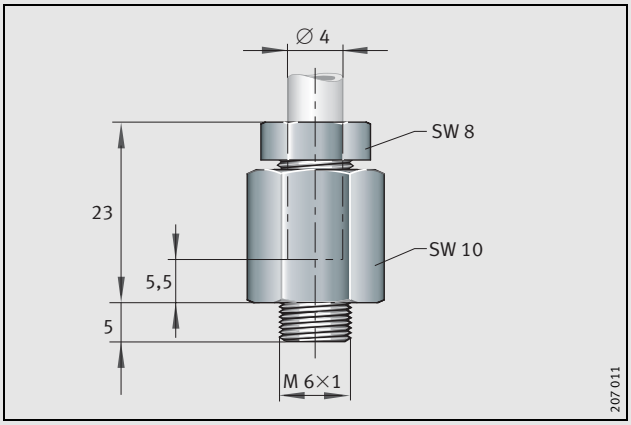
																Fixing screws[7]				
L_1	J_L	J_{LZ}	j_L	a_L/a_R[4]		J_{L5}[5]	N_2[6]	H_1	H_5	A_3	H_4	T_5	T_6	t_7	h	h_1	G1	G2	K1	K3	K6
																	ISO 4 762-12.9				DIN 7 984-8.8
				min.	max.											±0,5					
127	95	70	60	20	47	21,6	6	11	12	8,1	32	18	14,8	22	45	22,5	M14	M14	M14	M12	M12
165	95	70	60	20	47	40,6	6	11	12	8,1	32	18	14,8	22	45	22,5	M14	M14	M14	M12	M12
141,2	110	82	75	20	61	15,6	6	11,5	15	19,6	39	23,2	23,2	25	53,8	28,8	M16	M16	M16	M14	M14
207,6	110	82	75	20	61	48,8	6	11,5	15	19,6	39	23,2	23,2	25	53,8	28,8	M16	M16	M16	M14	M14
304,5	230	–	105	30	82,5	46,1	6	15	25	10,6	51,5	29	26,6	–	80	48	–	M20	M24	M16	M16

Dimensioning of lateral lubrication connector[8]			
Designation	N_3	A_4	J_{L6}
RUE55-E	M6	7,9	32,9
RUE55-E-L	M6	7,9	51,9
RUE65-E	M6	19,4	34,9
RUE65-E-L	M6	19,4	68,1
RUE100-E-L	∅5,6	10,6	64,1



Lateral lubrication connector

Load carrying capacity (for definition of basic load ratings, see *INA Catalogue "605"*)					
Designation	Basic load ratings		Moment ratings		
	C N	C_0 N	M_{0x} Nm	M_{0y} Nm	M_{0z} Nm
RUE55-E	136 000	320 000	3 287	7 404	6 667
RUE55-E-L	167 000	415 000	4 226	12 214	11 010
RUE65-E	200 000	435 000	5 450	12 100	10 900
RUE65-E-L	270 000	640 000	7 600	24 000	21 500
RUE100-E-L	630 000	1 490 000	33 780	80 250	72 280

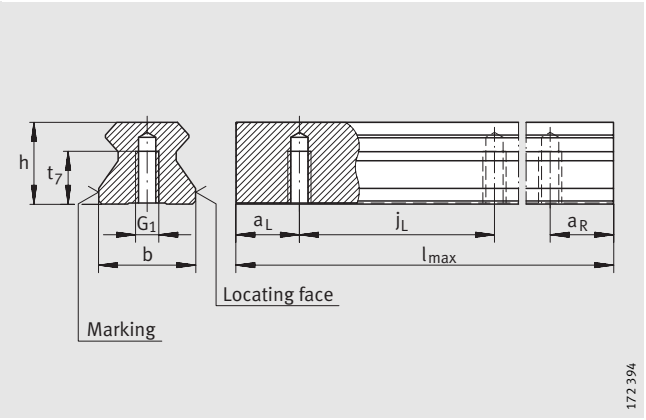


Connector with union nut

Linear recirculating roller bearing and guideway assemblies

full complement

Series RUE..-E-H
RUE..-E-HL



TSX..-E-U

Dimension table · Dimensions in mm

Designation	Carriage		Guideway				Dimensions				Mounting dimensions		
	Designation	Mass m ≈kg	Designation	Mass m ≈kg/m	Closing plug[1]	Covering strip	l_{max}[2]	H	B	L[3]	A_1	J_B	b −0,005 −0,035
RUE35-E-H	RWU35-E-H	1,67	TSX35-E(-U)	5,9	KA15-TN	ADB18	2 960	55	70	123,2	18	50	34
RUE35-E-HL	RWU35-E-HL	2,14	TSX35-E(-U)	5,9	KA15-TN	ADB18	2 960	55	70	149	18	50	34
RUE45-E-H	RWU45-E-H	3,05	TSX45-E(-U)	9,4	KA20-TN	ADB23	2 940	70	86	146,2	20,5	60	45
RUE45-E-HL	RWU45-E-HL	3,95	TSX45-E(-U)	9,4	KA20-TN	ADB23	2 940	70	86	178,6	20,5	60	45

1) Closing plugs KA..-TN are included in the delivery.

2) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.

3) Minimum covered length for sealing the lubrication connectors.

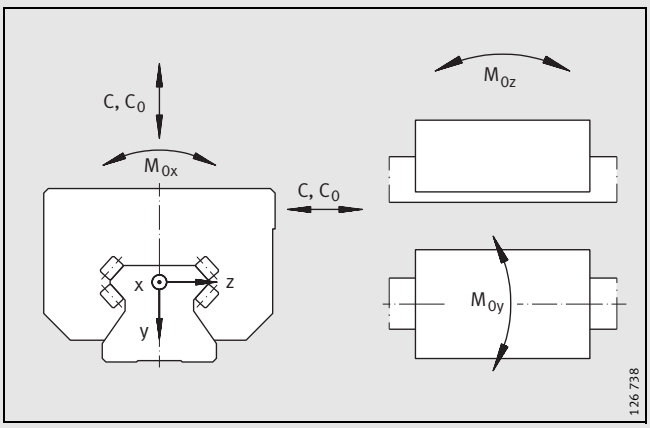
4) a_L and a_R are dependent on the guideway length. *Calculation*, page 7.

5) Position of the lubrication hole in the adjacent construction.

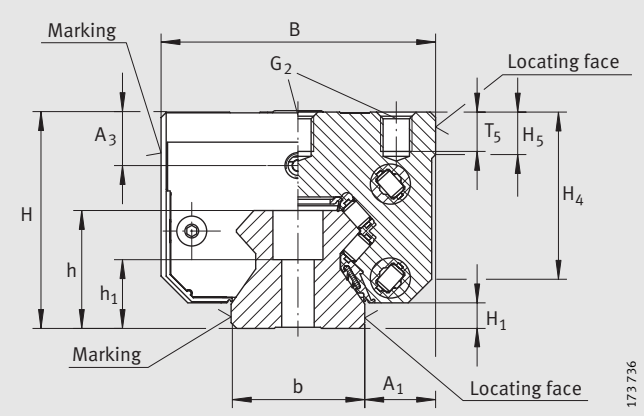
6) Maximum diameter of the lubrication hole in the adjacent construction.

7) ⚠ For information on fixing screws see *INA Catalogue "605", Fixing screws.*

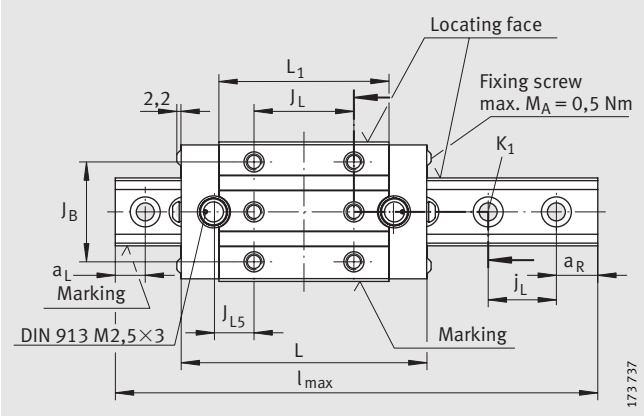
8) Before use, open up the lateral lubrication hole, see *"MON 30"*.



Load directions



RUE..-E-H(-HL)

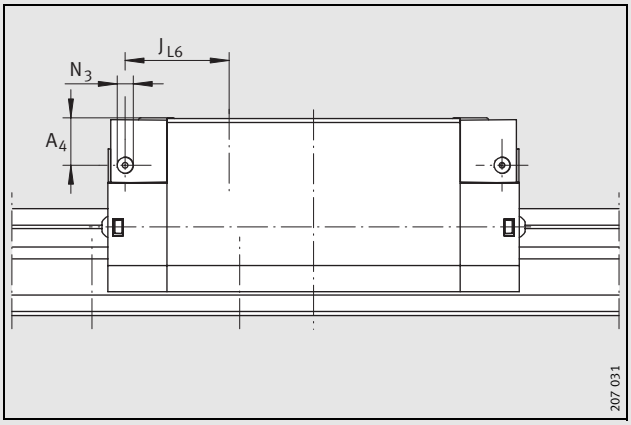


RUE..-E-H(-HL) · View X (rotated 90°)

														Fixing screws[7]		
L_1	J_L	j_L	a_L/a_R[4]		J_{L5}[5]	N_2[6]	H_1	H_5	A_3	H_4	T_5	t_7	h	h_1	G1	G2	K1
			min.	max.										±0,5	ISO 4 762-12.9		
85,2	50	40	20	31	19,8	6	6,5	10,8	13,6	41,7	10	15	30	17,5	M 8	M 8	M 8
111	72	40	20	31	21,7	6	6,5	10,8	13,6	41,7	10	15	30	17,5	M 8	M 8	M 8
104,2	60	52,5	20	41	25,1	6	8,7	8	16,6	52,2	12,5	20	38	19,5	M12	M10	M12
136,6	80	52,5	20	41	31,3	6	8,7	8	16,6	52,2	12,5	20	38	19,5	M12	M10	M12

Dimensioning of lateral lubrication connector[8]

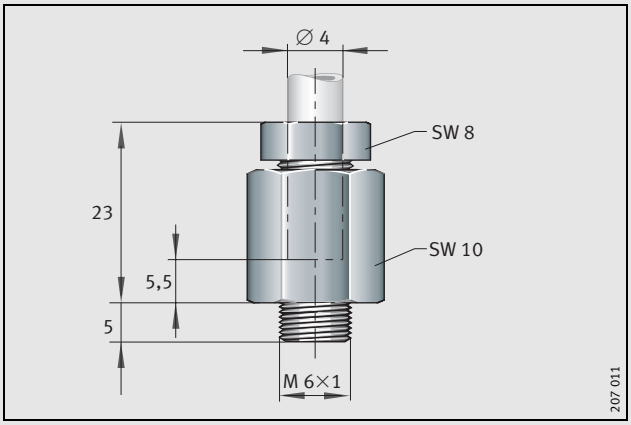
Designation	N_3	A_4	J_{L6}
RUE35-E-H	M6	12,6	30,4
RUE35-E-HL	M6	12,6	32,4
RUE45-E-H	M6	16,6	37
RUE45-E-HL	M6	16,6	43,2



Lateral lubrication connector

Load carrying capacity
(for definition of basic load ratings, see *INA Catalogue "605"*)

Designation	Basic load ratings		Moment ratings		
	C N	C_0 N	M_{0x} Nm	M_{0y} Nm	M_{0z} Nm
RUE35-E-H	59 000	140 000	1200	2150	1950
RUE35-E-HL	70 000	175 000	1500	3350	3000
RUE45-E-H	92 000	215 000	1805	3870	3485
RUE45-E-HL	114 000	285 000	2410	6770	6095

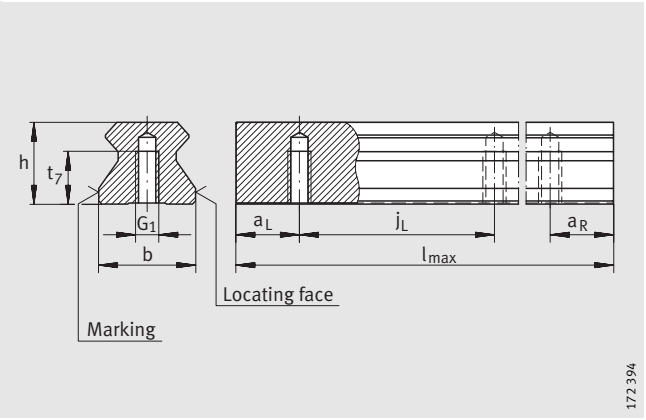


Connector with union nut

Linear recirculating roller bearing and guideway assemblies

full complement

Series RUE..-E-H
RUE..-E-HL



TSX..-E-U

Dimension table (continued) · Dimensions in mm

Designation	Carriage		Guideway				Dimensions				Mounting dimensions		
	Designation	Mass m ≈kg	Designation	Mass m ≈kg/m	Closing plug[1]	Covering strip	l_{max}[2]	H	B	L[3]	A_1	J_B	b −0,005 −0,035
RUE55-E-H	RWU55-E-H	4,94	TSX55-E(-U)	13,1	KA24-TN	ADB27	2 520	80	100	173	23,5	75	53
RUE55-E-HL	RWU55-E-HL	6,34	TSX55-E(-U)	13,1	KA24-TN	ADB27	2 520	80	100	211	23,5	75	53
RUE65-E-H	RWU65-E-H	8,9	TSX65-E(-U)	21,5	KA26-TN	ADB29	2 520	100	126	195,8	31,5	76	63
RUE65-E-HL	RWU65-E-HL	12,89	TSX65-E(-U)	21,5	KA26-TN	ADB29	2 520	100	126	262,2	31,5	76	63

1) Closing plugs KA..-TN are included in the delivery.

2) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.

3) Minimum covered length for sealing the lubrication connectors.

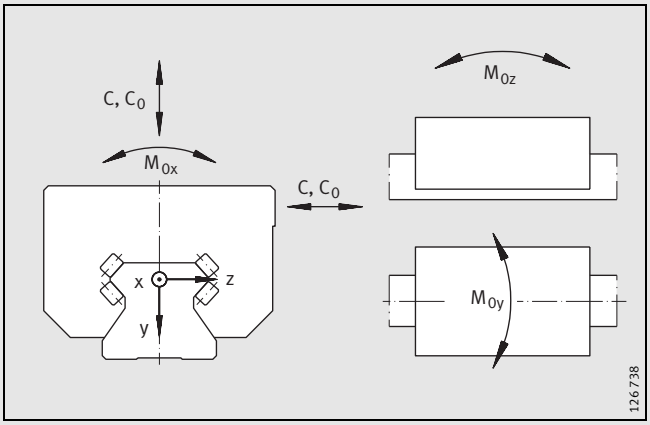
4) a_L and a_R are dependent on the guideway length. *Calculation*, page 7.

5) Position of the lubrication hole in the adjacent construction.

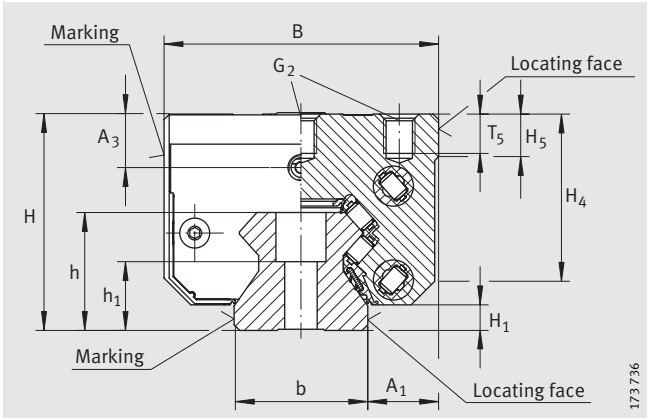
6) Maximum diameter of the lubrication hole in the adjacent construction.

7) ⚠ For information on fixing screws see
INA Catalogue "605", Fixing screws.

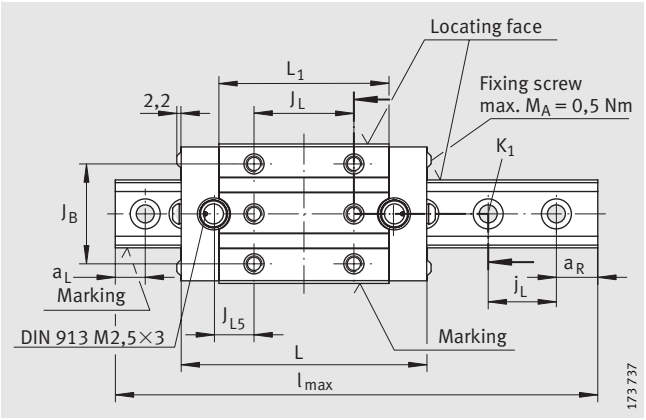
8) Before use, open up the lateral lubrication hole, see *"MON 30"*.



Load directions



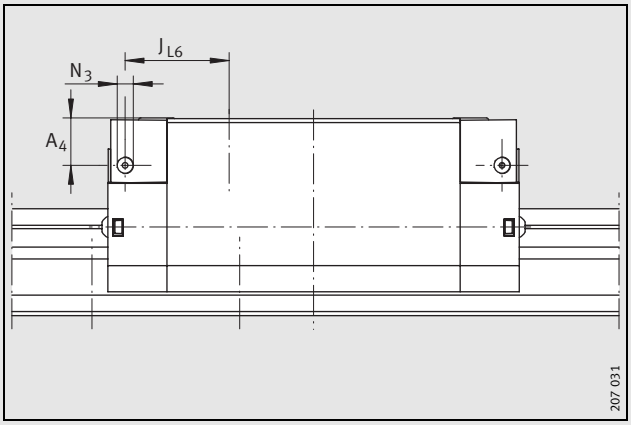
RUE..-E-H(-HL)



RUE..-E-H(-HL) · View X (rotated 90°)

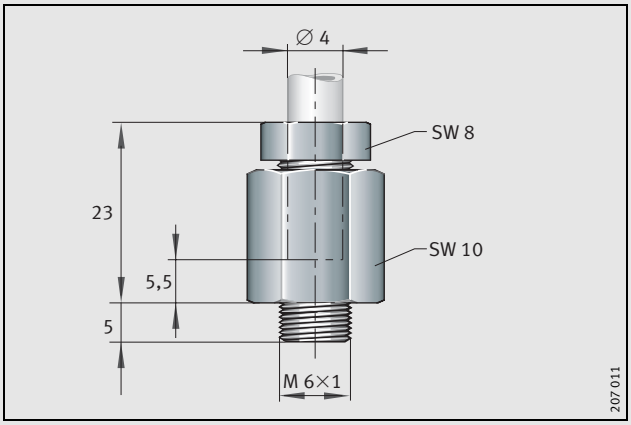
														Fixing screws[7]		
L_1	J_L	j_L	a_L/a_R[4]		J_{L5}[5]	N_2[6]	H_1	H_5	A_3	H_4	T_5	t_7	h	h_1	G1	G2	K1
			min.	max.										±0,5	ISO 4 762-12.9		
127	75	60	20	47	31,6	6	11	16	18,1	61,5	15	22	45	22,5	M14	M12	M14
165	95	60	20	47	40,6	6	11	16	18,1	61,5	15	22	45	22,5	M14	M12	M14
141,2	70	75	20	61	35,6	6	11,5	15	29,6	71,2	20	25	53,8	28,8	M16	M14	M16
207,6	120	75	20	61	43,8	6	11,5	15	29,6	71,2	20	25	53,8	28,8	M16	M14	M16

Dimensioning of lateral lubrication connector[8]			
Designation	N_3	A_4	J_{L6}
RUE55-E-H	M6	17,9	42,9
RUE55-E-HL	M6	17,9	51,9
RUE65-E-H	M6	29,4	54,9
RUE65-E-HL	M6	29,4	63,1



Lateral lubrication connector

Load carrying capacity (for definition of basic load ratings, see *INA Catalogue "605"*)					
Designation	Basic load ratings		Moment ratings		
	C N	C_0 N	M_{0x} Nm	M_{0y} Nm	M_{0z} Nm
RUE55-E-H	136 000	320 000	3 287	7 404	6 667
RUE55-E-HL	167 000	415 000	4 226	12 214	11 010
RUE65-E-H	200 000	435 000	5 450	12 100	10 900
RUE65-E-HL	270 000	640 000	7 600	24 000	21 500



Connector with union nut

Linear recirculating roller bearing and guideway assemblies

with chain guidance system

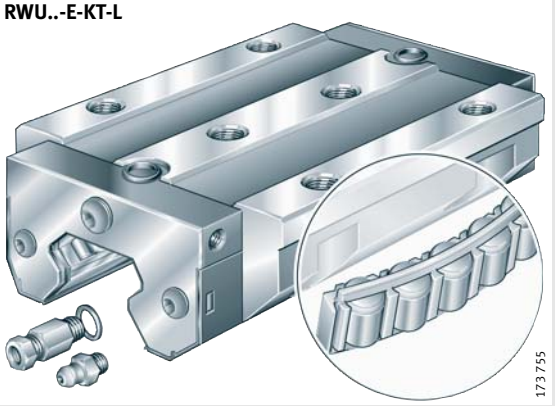
Features

Linear recirculating roller bearing and guideway assemblies

- are complete units comprising:
  - at least one carriage RWU..-E-KT-L with rolling element chains
  - one guideway TSX..-E(-U)
  - integral elastic wipers on the end faces of the carriage and upper as well as twin lower sealing strips
  - plastic closing plugs
- can support loads from all directions – apart from the direction of motion – and moments about all axes
- are preloaded
  - the preload is determined by the carriage
- have, due to further development of the patented injection moulding technology
  - fewer joints and individual parts
  - precise guidance of the rolling elements by ribs and therefore very high quality running
  - a device for retaining the rollers in order to allow easy fitting of the carriage
- are supplied with a lubrication nipple and oil connector
  - the lubrication nipple can be screwed into the right, the left or the end face of the end piece; before it is screwed in, the lateral lubrication hole in the end piece must first be opened using a hot pointed object
- can only be used with each other in strictly defined and limited combinations (see *Interchangeability*, page 4)
- are supplied with multi-piece guideways if the required guideway length is in excess of the maximum length l_{max} according to the *dimension table*
- are suitable for:
  - accelerations up to 100 m/s^2
  - speeds up to 180 m/min
  - operating temperatures from –10 °C to +100 °C
- are used in applications with:
  - long, unlimited stroke lengths
  - high and very high loads
  - high and very high rigidity
  - high requirements for low-noise running.

Carriage

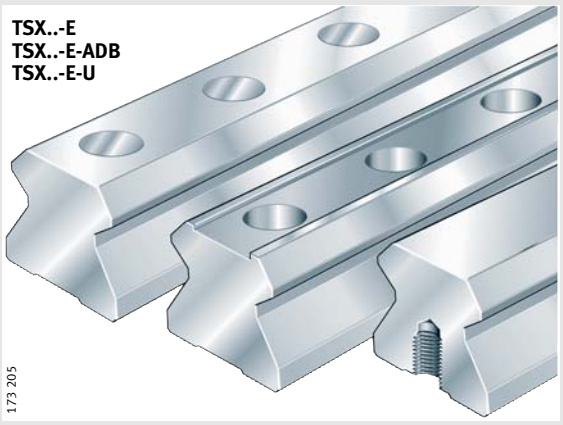
RWU..-E-KT-L



- RWU..-E-KT-L with rolling element chain for grease and oil lubrication
- hardened steel saddle plate, precision ground rolling element raceways
  - cylindrical rollers are recirculated in enclosed channels with plastic return elements
- sealed on all sides by elastic wipers and sealing strips
- supplied with lubrication nipple and oil connector

Guideways

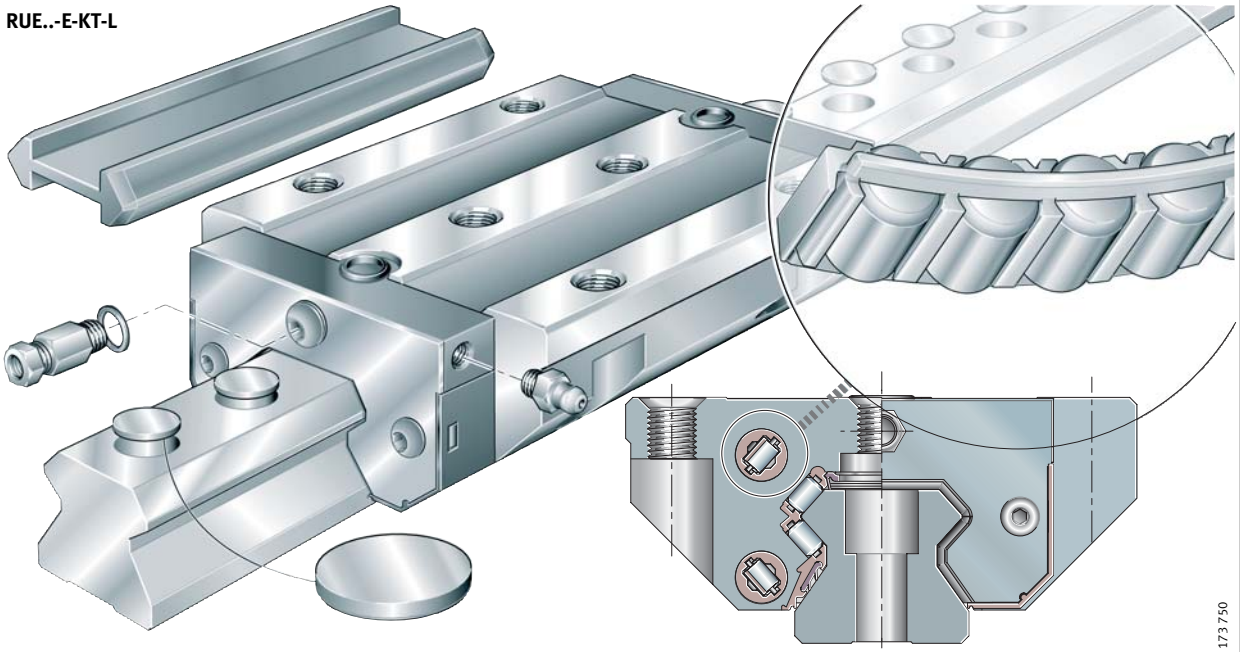
TSX..-E
TSX..-E-ADB
TSX..-E-U



- hardened steel, all surfaces ground
  - precision ground raceways for rolling elements
- TSX..-E located from above, TSX..-E-U located from below
  - counterbored through holes for fixing screws or threaded blind holes
- TSX..-E-ADB with groove for steel covering strip fixed by adhesive

Linear recirculating roller bearing and guideway assembly – scope of basic delivery

RUE..-E-KT-L

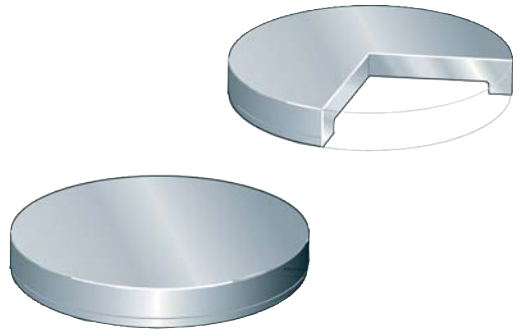


173 750

22

Standard accessories

KA..-TN



173 212

- plastic closing plugs
  – close off the counterbores of the guideway holes flush with the top surface of the guideway
- two-piece closing plugs also available as an option

MSX..-E

173 743a

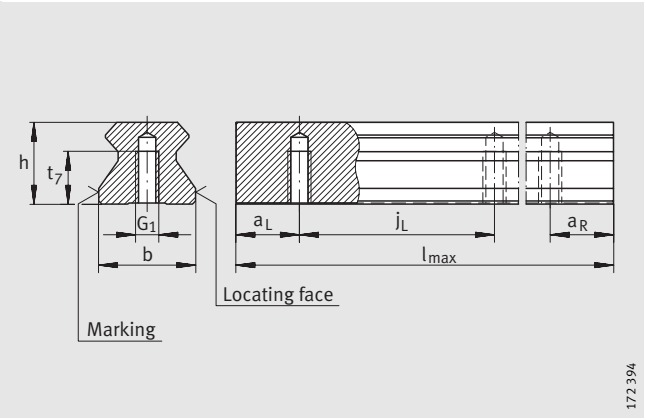
- plastic dummy guideway
  – prevents damage to the rolling element set while the carriage is separated from the guideway. The carriage is always pushed direct from the guideway onto the dummy guideway

22

Linear recirculating roller bearing and guideway assemblies

with chain guidance system

Series RUE..-E-KT-L
RUE..-E-KT-HL



TSX..-E-U

Dimension table · Dimensions in mm

Designation	Carriage		Guideway				Dimensions				Mounting dimensions		
	Designation	Mass m ≈kg	Designation	Mass m ≈kg/m	Closing plug[1]	Covering strip	l_{max}[2]	H	B	L[3]	A_1	J_B	b −0,005 −0,035
RUE35-E-KT-L	RWU35-E-KT-L	2,28	TSX35-E(-U)	5,9	KA15-TN	ADB18	2 960	48	100	149	33	82	34
RUE35-E-KT-HL	RWU35-E-KT-HL	2,14	TSX35-E(-U)	5,9	KA15-TN	ADB18	2 960	55	70	149	18	50	34
RUE45-E-KT-L	RWU45-E-KT-L	3,97	TSX45-E(-U)	9,4	KA20-TN	ADB23	2 940	60	120	178,6	37,5	100	45
RUE45-E-KT-HL	RWU45-E-KT-HL	3,99	TSX45-E(-U)	9,4	KA20-TN	ADB23	2 940	70	86	178,6	20,5	60	45
RUE55-E-KT-L	RWU55-E-KT-L	6,72	TSX55-E(-U)	13,1	KA24-TN	ADB27	2 520	70	140	211	43,5	116	53
RUE55-E-KT-HL	RWU55-E-KT-HL	6,23	TSX55-E(-U)	13,1	KA24-TN	ADB27	2 520	80	100	211	23,5	75	53

1) Closing plugs KA..-TN are included in the delivery.

2) Maximum length of single-piece guideways; longer guideways are supplied in several sections and are marked accordingly. Maximum single-piece guideway length of 6 m by agreement.

3) Minimum covered length for sealing the lubrication connectors.

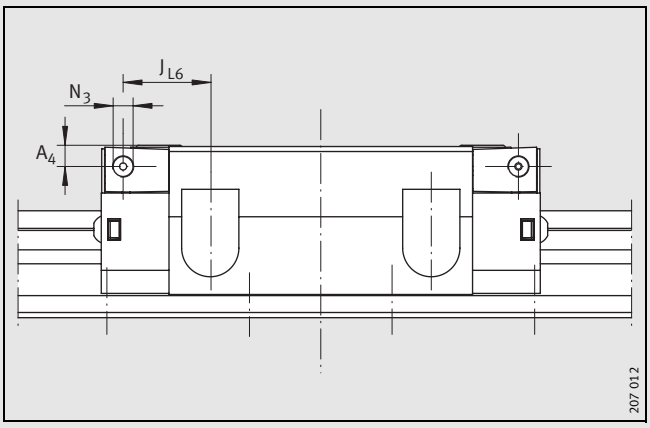
4) a_L and a_R are dependent on the guideway length. *Calculation*, page 7.

5) Position of the lubrication hole in the adjacent construction.

6) Maximum diameter of the lubrication hole in the adjacent construction.

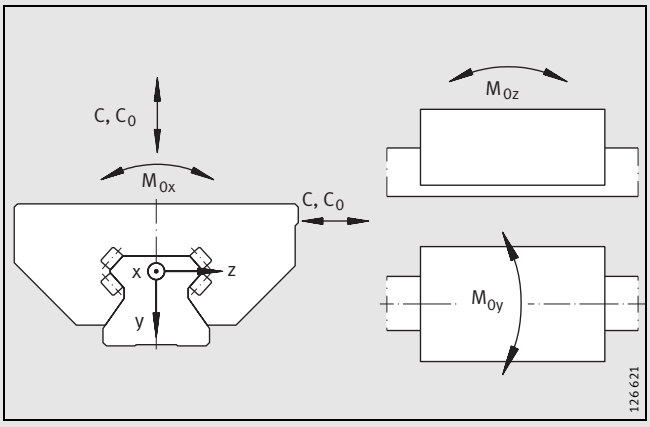
7) ⚠ For information on fixing screws see *INA Catalogue "605", Fixing screws.*

8) Before use, open up the lateral lubrication hole, see *"MON 30"*.

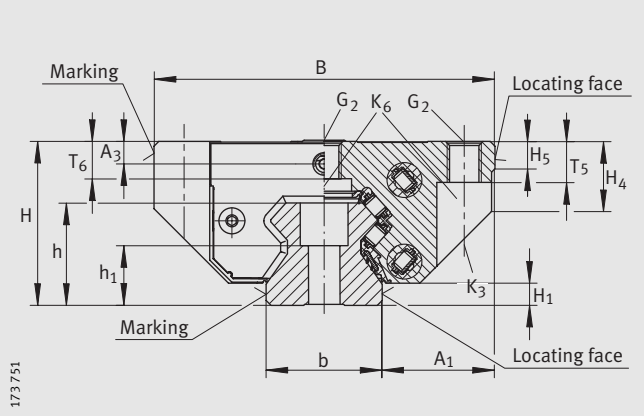


Lateral lubrication connector

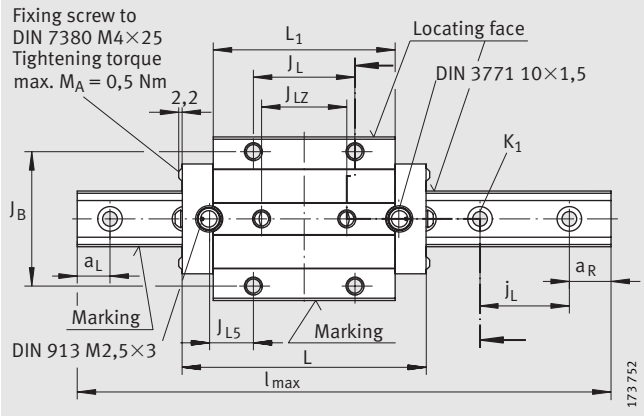
Dimensioning of lateral lubrication connector[8]			
Designation	N_3	A_4	J_{L6}
RUE35-E-KT-L	M6	5,6	37,4
RUE35-E-KT-HL	M6	12,6	32,4
RUE45-E-KT-L	M6	6,6	43,2
RUE45-E-KT-HL	M6	16,6	43,2
RUE55-E-KT-L	M6	7,9	51,9
RUE55-E-KT-HL	M6	17,9	51,9



Load direction

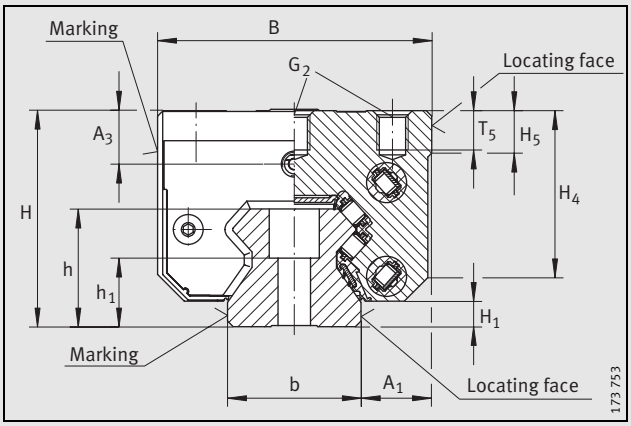


RUE..-E-KT-L

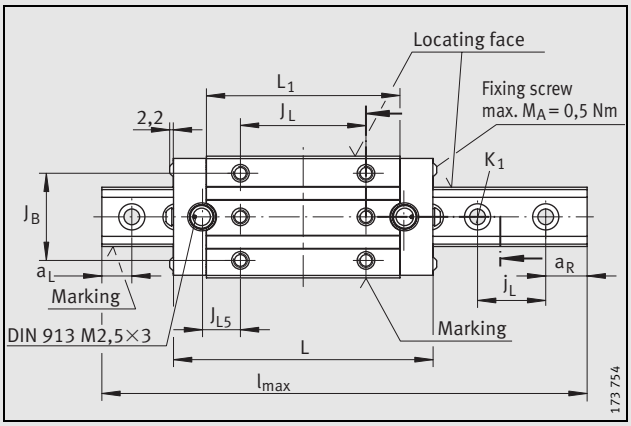


RUE..-E-KT-L · View X (rotated 90°)

																Fixing screws[7]				
L_1	J_L	J_{LZ}	j_L	a_L/a_R[4]		J_{L5}[5]	N_2[6]	H_1	H_5	A_3	H_4	T_5	T_6	t_7	h	h_1	G1	G2	K1	K3	K6
				min.	max.											±0,5	ISO 4 762-12.9				DIN 7 984-8.8
111	62	52	40	20	31	26,7	6	6,5	8	6,6	19,7	12	10,9	15	30	17,5	M 8	M10	M 8	M 8	M 8
111	72	–	40	20	31	21,7	6	6,5	10,8	13,6	41,7	10	–	15	30	17,5	M 8	M 8	M 8	–	–
136,6	80	60	52,5	20	41	31,3	6	8,7	8	6,6	25,2	15	13,2	20	38	19,5	M12	M12	M12	M10	M10
136,6	80	–	52,5	20	41	31,3	6	8,7	8	16,6	52,2	12,5	–	20	38	19,5	M12	M10	M12	–	–
165	95	70	60	20	47	40,6	6	11	12	8,1	32	18	14,8	22	45	22,5	M14	M14	M14	M12	M12
165	95	–	60	20	47	40,6	6	11	16	18,1	61,5	15	–	22	45	22,5	M14	M12	M14	–	–



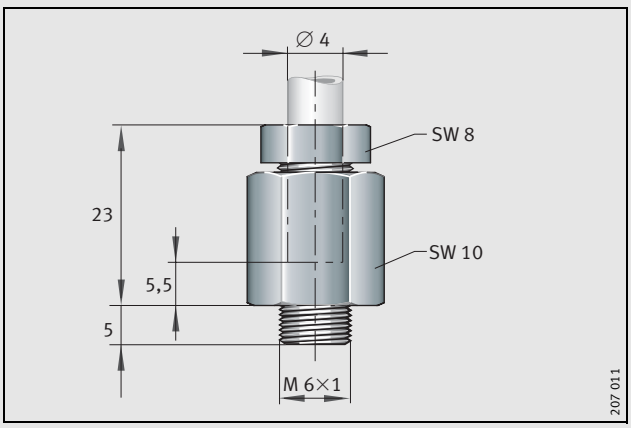
RUE..-E-KT-HL



RUE..-E-KT-HL

Load carrying capacity
(for definition of basic load ratings, see *INA Catalogue "605"*)

Unit Designation	Basic load ratings		Moment ratings		
	C N	C_0 N	M_{0x} Nm	M_{0y} Nm	M_{0z} Nm
RUE35-E-KT-L	54 000	126 000	1 100	2 500	2 250
RUE35-E-KT-HL	54 000	126 000	1 100	2 500	2 250
RUE45-E-KT-L	92 000	214 000	1 833	4 528	4 077
RUE45-E-KT-HL	92 000	214 000	1 833	4 528	4 077
RUE55-E-KT-L	138 000	325 000	3 279	9 447	8 497
RUE55-E-KT-HL	138 000	325 000	3 279	9 447	8 497



Connector with union nut

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