

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers or full complement



Quad spacers
for quiet running
Full complement
for maximum load capacity

Dynamic characteristics, high load carrying capacity, little space requirement, small moving masses, low-maintenance or maintenance-free, high operational reliability. These are the demands now made on linear bearing arrangements and are fulfilled to a greater or lesser degree by the various guidance system concepts available. In many applications, however, a further central characteristic has been added to these: *low-noise running*.

Low-noise guidance system

Running noise in linear guidance systems can be reduced by various methods. Schaeffler has decided to adopt plastic spacer elements – so-called QUAD SPACERS. One quad spacer accommodates two rolling elements each from the compressive and tensile raceway. Since the balls are not in contact with each other, there is no collision noise. This reduces the noise in the recirculating system and the guidance systems run significantly more quietly.

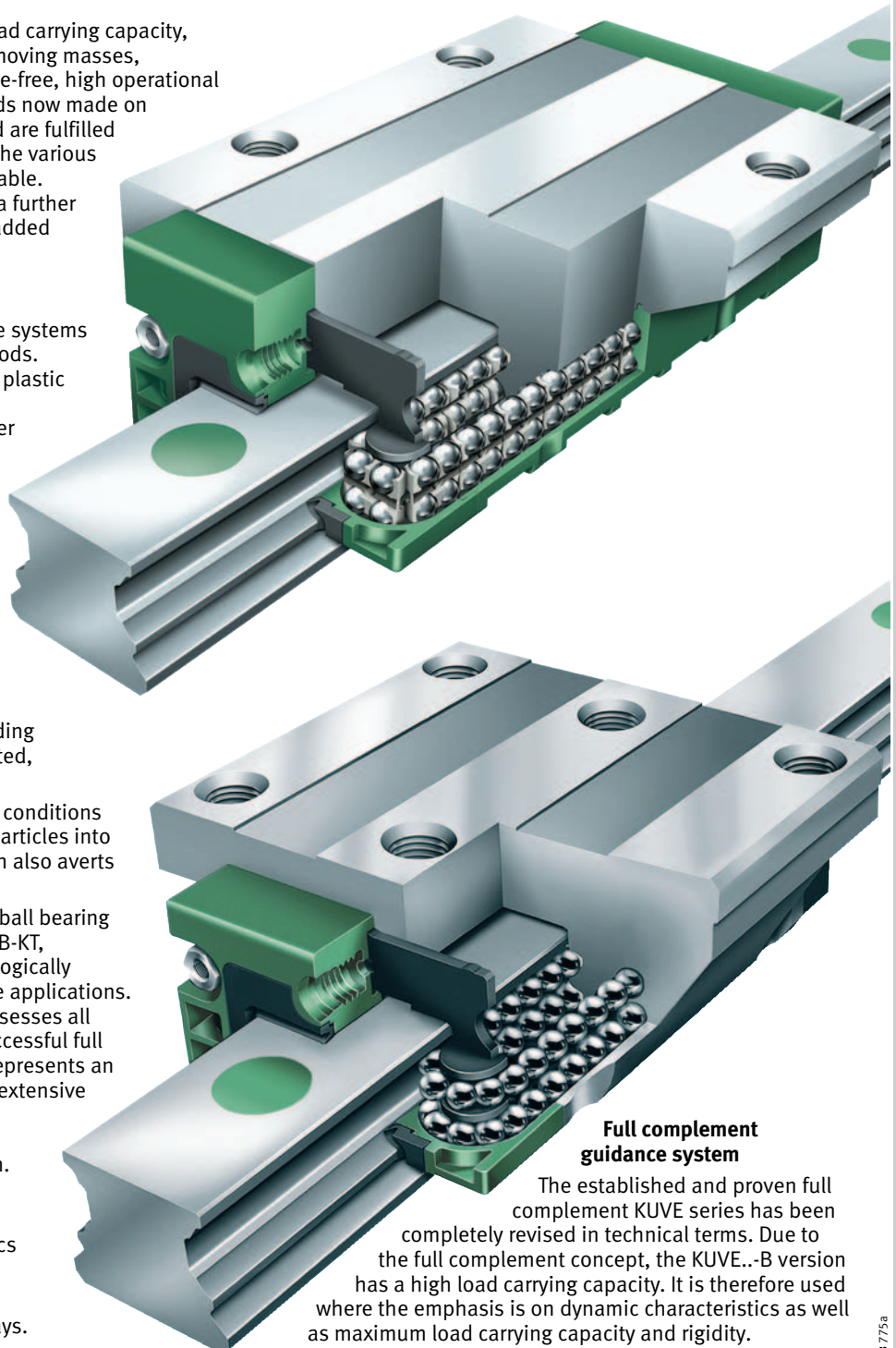
Since the quad spacers are not connected chain elements, bending and tensile stresses are eliminated, particularly in the return area.

Under highly dynamic operating conditions or with ingress of contaminant particles into the guidance system, this design also averts the risk of fracture.

With its new linear recirculating ball bearing and guideway assembly KUV...-B-KT, Schaeffler is providing a technologically pioneering product for low-noise applications. This linear guidance system possesses all the advantages of the highly successful full complement KUV... design and represents an optimum addition to the already extensive range of these units. In this way, the INA range now includes the ideal product for any application.

The KUV...-B-KT is particularly suitable where the emphasis is on high dynamic characteristics and low noise.

Both new carriage versions can be used on the existing guideways.



Full complement guidance system

The established and proven full complement KUV... series has been completely revised in technical terms. Due to the full complement concept, the KUV...-B version has a high load carrying capacity. It is therefore used where the emphasis is on dynamic characteristics as well as maximum load carrying capacity and rigidity.

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Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers



Preload 44



Friction 44



Accuracy 45



Demands on the adjacent construction 48



Ordering example and ordering designation 6



Features

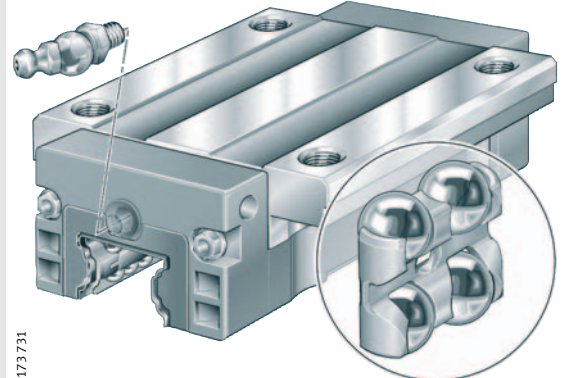
Four-row linear recirculating ball bearing and guideway assemblies

- are complete units comprising:
 - at least one carriage KWVE...-B-KT
 - a guideway TKVD, TKVD...-U, TKVD...-ZHP or TKVD...-K with two locating edges in each case
 - plastic spacer elements to guide the rolling elements
 - integral elastic wipers and sealing strips on the end faces and longitudinal faces of the carriage
 - two-piece plastic closing plugs
- run with less noise than full complement designs
- 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
- are lubricated via the lubrication nipple in the end piece (on the end face or from the side) with grease or oil
 - the end face lubrication nipple is included in the delivery
 - the lubrication nipple for relubrication from the side is available by agreement
- are based on a modular concept (see also *Interchangeability*, page 4)
 - guideways can be combined with all carriage types within one size
 - can be ordered separately as a carriage KWVE...-B-KT and guideway TKVD or as a unit KUVE...-B-KT. In a unit, one or more carriages can be mounted on a guideway
- are suitable for:
 - accelerations up to 150 m/s^2
 - speeds up to $360 \text{ m/min}^{1)}$
 - operating temperatures from -10°C to $+100^\circ\text{C}$
- can also be supplied with multi-piece guideways
 - see *Multi-piece guideways*, page 47
- are used in applications with:
 - long, unlimited stroke lengths
 - high dynamic characteristics
 - high running and positional accuracy
 - low friction
 - low noise levels.

¹⁾ For speeds $>180 \text{ m/min}$, please consult us.

Carriage

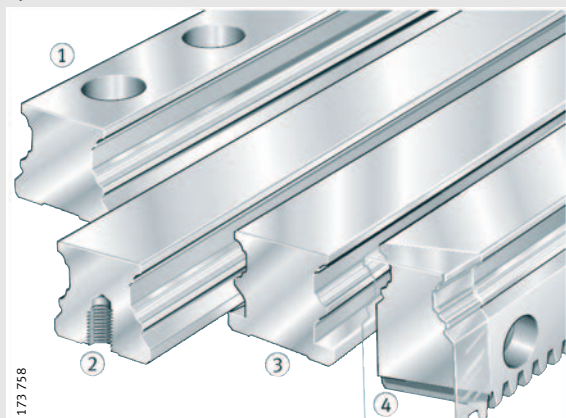
KWVE...-B-KT



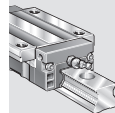
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- saddle plate with hardened and precision ground rolling element raceways
 - balls are recirculated in enclosed channels with plastic return elements
- carriage sealed by elastic end wipers and sealing strips
- a lubrication nipple for the end face is included

Guideways



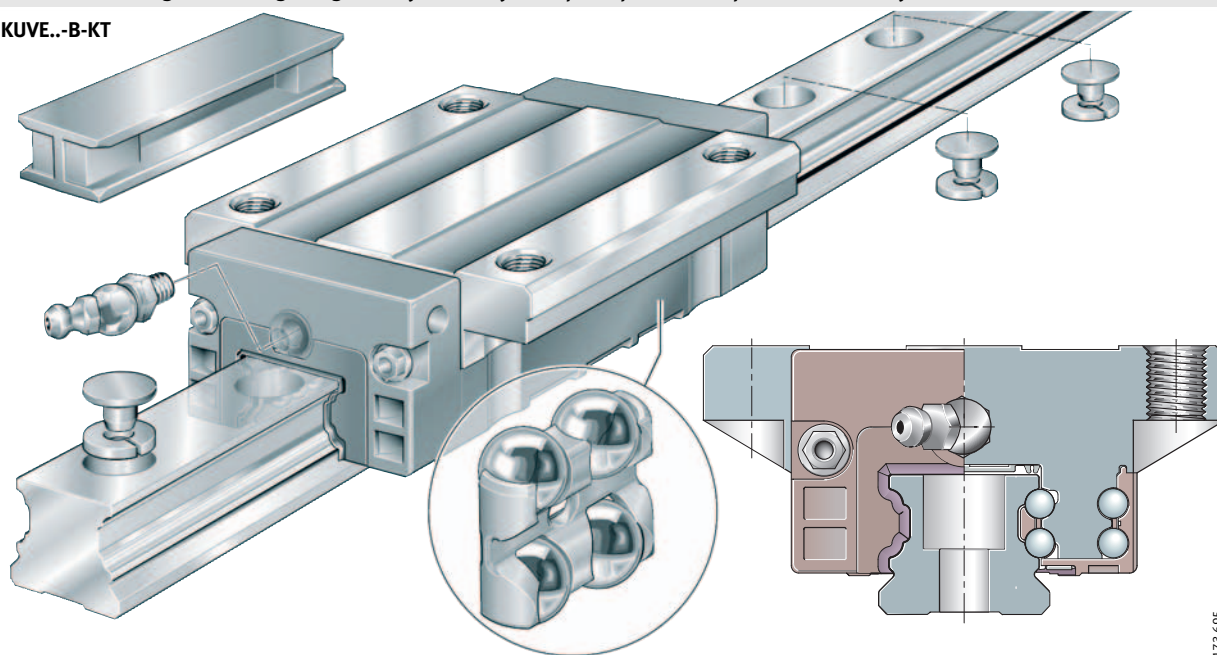
- hardened steel, all surfaces ground
 - precision ground raceways for rolling elements
- TKVD: located from above ①
- TKVD...-U: located from below ②
- TKVD...-K: for clamping lugs and clamping strips ③
- TKVD...-ZHP: with helical teeth ④



Four-row linear recirculating ball bearing and guideway assembly with quad spacers – scope of basic delivery



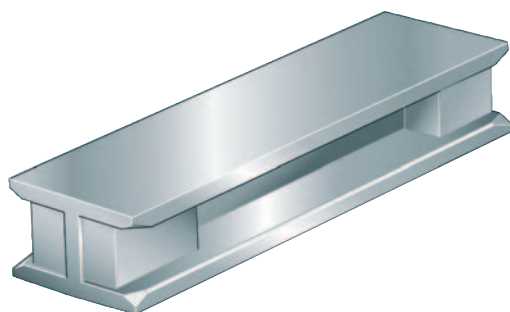
KUBE...-B-KT



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Standard accessories

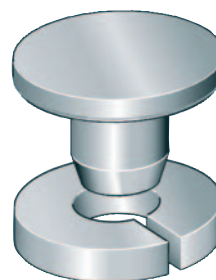
MKVD



173 711

- plastic dummy guideways
 - prevent 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

KA...-TN/A



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- two-piece plastic closing plugs
 - close off the counterbores of the guideway holes flush with the top surface of the guideway

Four-row linear recirculating ball bearing and guideway assemblies with quad spacers

Design of carriages

The rows of balls run in a steel saddle plate with hardened and ground raceways at a contact angle of 45° in an O arrangement.

In order to prevent noise from recirculation, the rolling elements are guided in plastic spacer units called “quad spacers”. The balls are recirculated in enclosed channels with plastic return elements.

Interchangeability

The guideways and carriages can be freely interchanged and combined with each other (see page 5).

This means:

- more economical stockholding
- simpler fitting
- quicker sourcing of replacement parts
- the option of achieving several preload classes on one guideway, since the preload class is determined by the carriage
- versatile design possibilities for KUBE guidance systems using standard elements.

Corrosion-resistant designs

KUBE...-B-KT is also available with the Corrotect® plating.

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

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

If units are supplied preassembled, there are two variants:

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

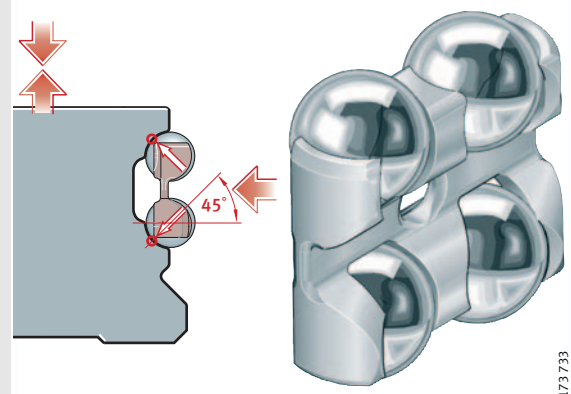
Lubricant reservoir, sealing

Due to the integral lubricant reservoir ①, the linear ball bearing and guideway assemblies have long relubrication intervals; depending on the application, they may even be maintenance-free.

Standard sealing strips ② as well as additional sealing strips (optional) ③ ensure effective sealing.

These sealing elements protect the rolling element system from contamination even under demanding environmental conditions.

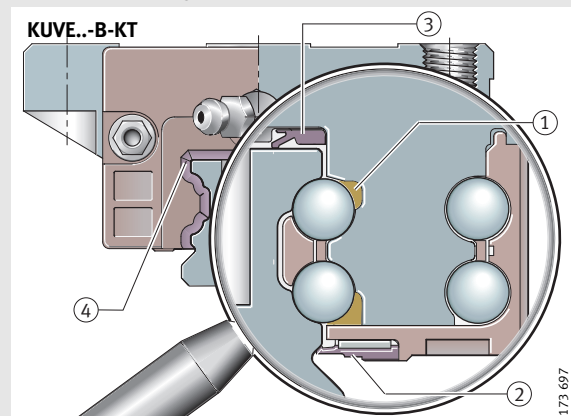
Contact angle, quad spacers



- quad spacers (plastic spacer elements)
- contact angles of the four rows of balls
- rows of balls in two point contact with raceways

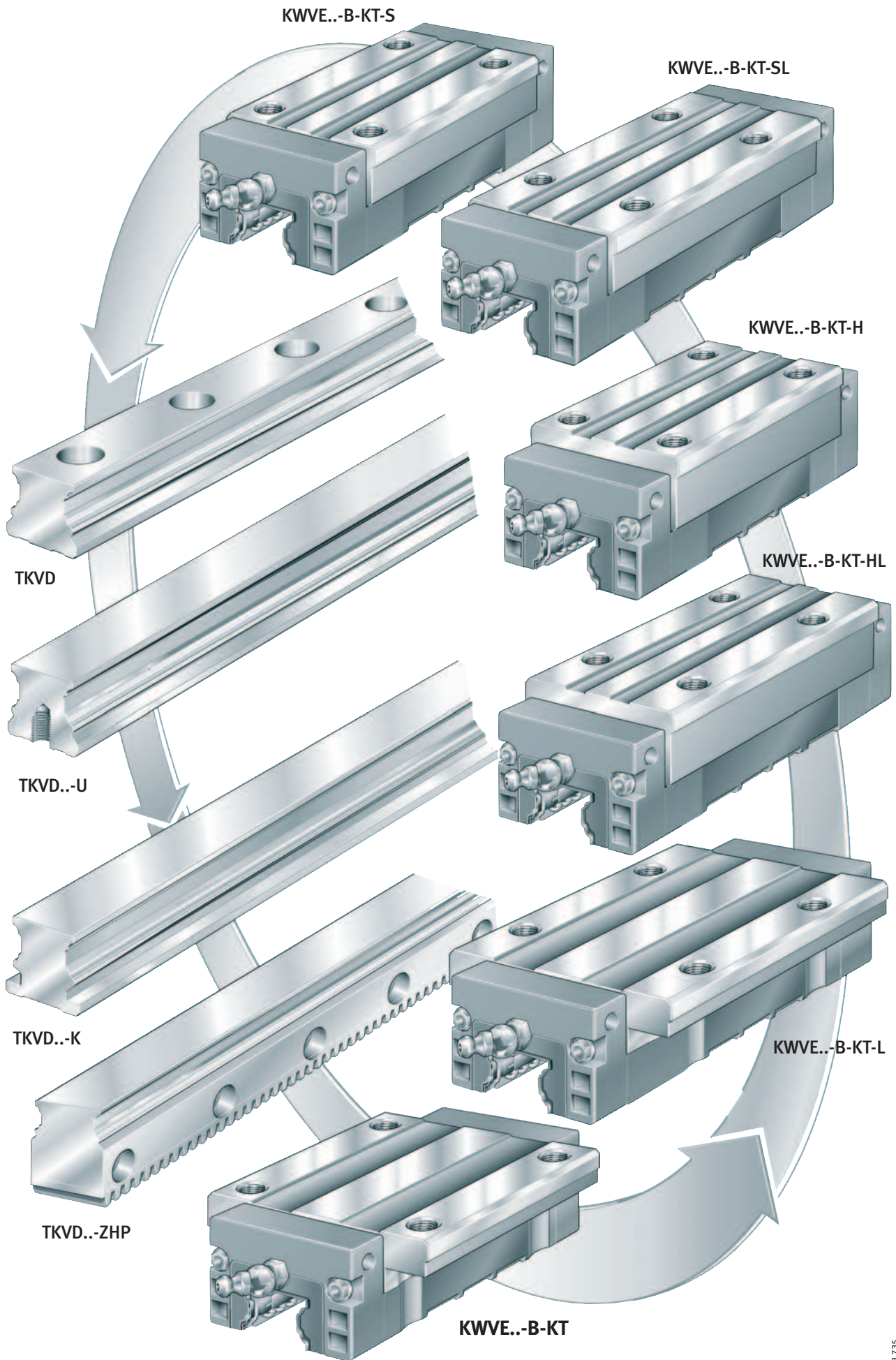
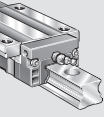
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Lubricant reservoir, sealing



- integral lubricant pockets with grease reservoir ①
- standard sealing strip ②
- optional sealing strip ③
- elastic wipers on end faces ④

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**Four-row linear recirculating ball bearing
and guideway assemblies**
with quad spacers



Ordering example and ordering designation

Ordering designation:

1 × KUV25-B-KT-W2-G3-V2-RRFT/1510-50/20, Figure 1.

Ordering example 1

Linear recirculating ball bearing
and guideway assembly KUV...-B-KT,
asymmetrical hole pattern

Four-row ball bearing and guideway assembly	KUVE
Size	25
Version with plastic spacer elements	B-KT
Number of carriages per unit	W2
Accuracy class	G3
Carriage preload	V2
Guideway with Corrotect® plating	RRFT
Guideway length	1 510 mm
– a _L	20 mm
– a _R	50 mm

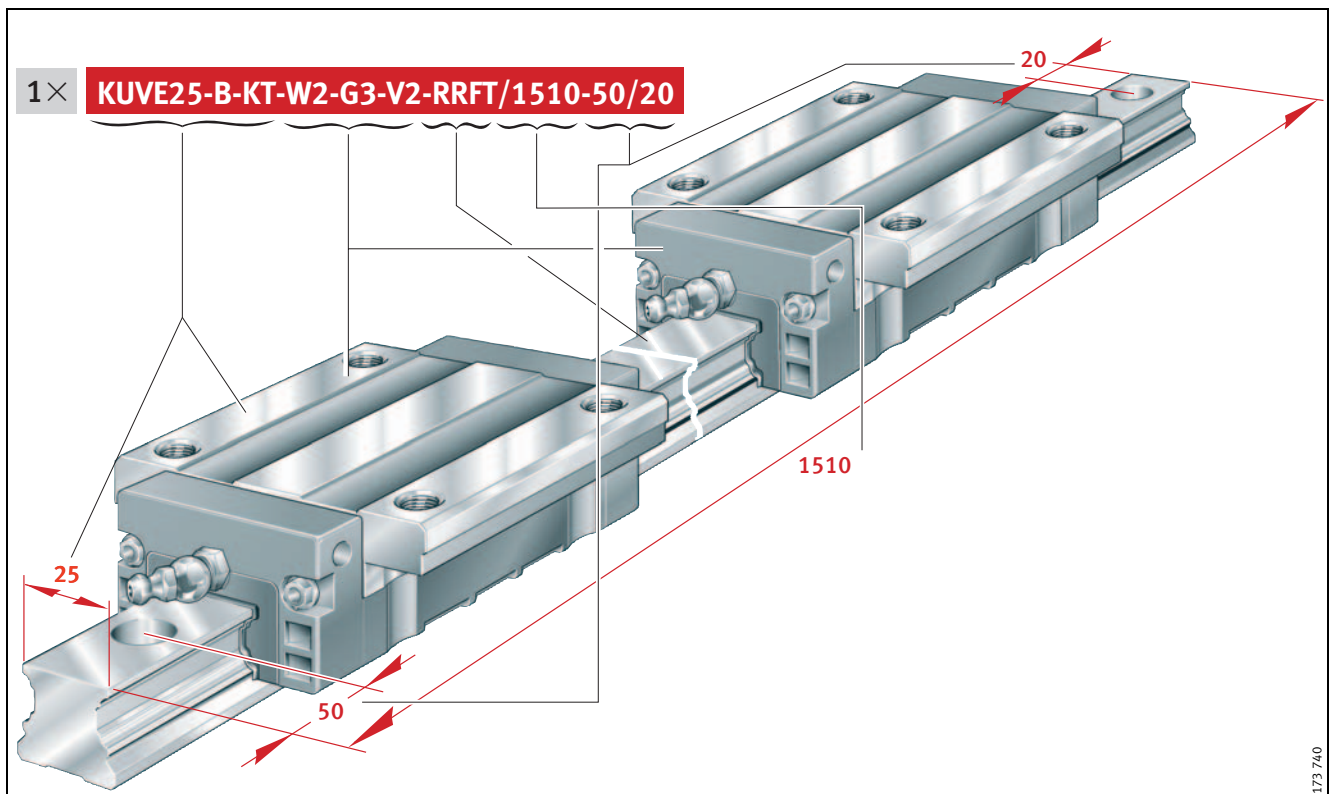
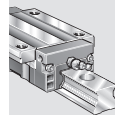


Figure 1 · Ordering example, ordering designation

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Ordering example 2

Linear recirculating ball bearing
and guideway assembly KUVE...-B-KT,
carriage and guideway separate,
symmetrical hole pattern

Carriage

Carriage

Size

Version with plastic spacer elements

Carriage variant

Accuracy class

Carriage preload

KWVE

25

B-KT

L

G3

V2

Guideway

Guideway for carriage

Size

Guideway length

– a_L

– a_R

TKVD

25

1 570 mm

35 mm

35 mm

Ordering designation:

1 × TKVD25/1570-35/35, Figure 2.

Ordering designation:

2 × KWVE25-B-KT-L-G3-V2, Figure 2.

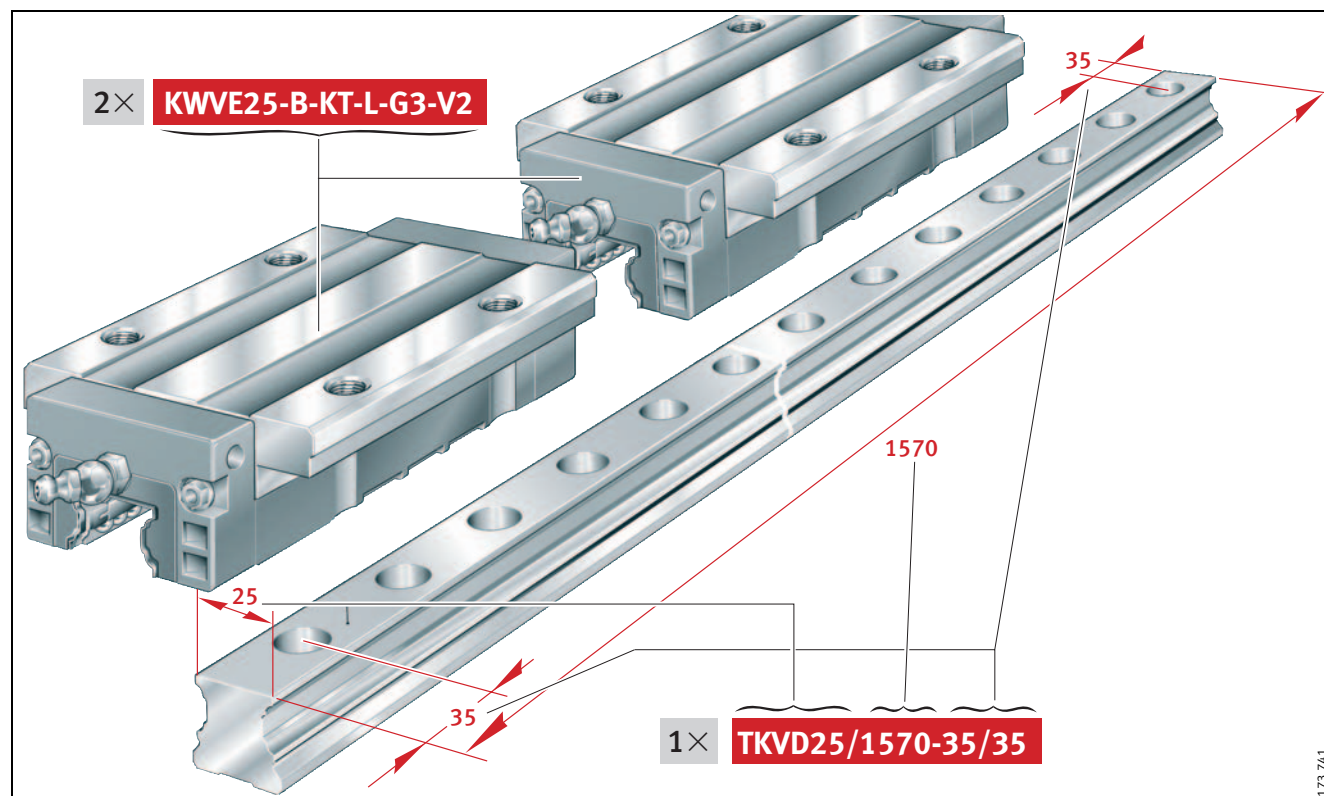
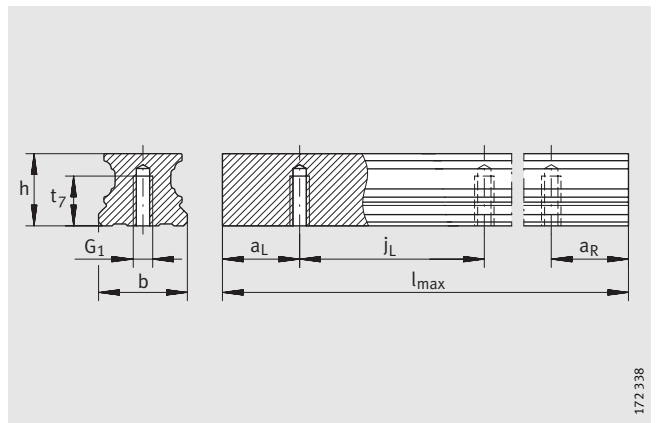


Figure 2 · Ordering example, ordering designation

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE...B-KT



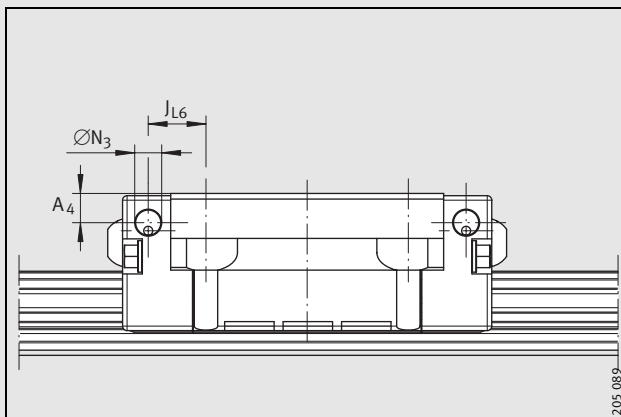
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	l _{max} ¹⁾	H	B	L
KUVE15-B-KT	KWVE15-B-KT	0,17	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1200	24	47	59,6
KUVE20-B-KT	KWVE20-B-KT	0,38	TKVD20(-U)	2,2	KA10-TN/A	1980	30	63	69,8
KUVE25-B-KT	KWVE25-B-KT	0,5	TKVD25(-U)	2,7	KA11-TN/A	1980	36	70	82,1
KUVE30-B-KT	KWVE30-B-KT	1	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	90	97,4
KUVE35-B-KT	KWVE35-B-KT	1,6	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	100	110,4
KUVE45-B-KT	KWVE45-B-KT	3,1	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	120	139
KUVE55-B-KT	KWVE55-B-KT	4,7	TKVD55-B(-U)	14	KA24-TN/A	2 520	70	140	172

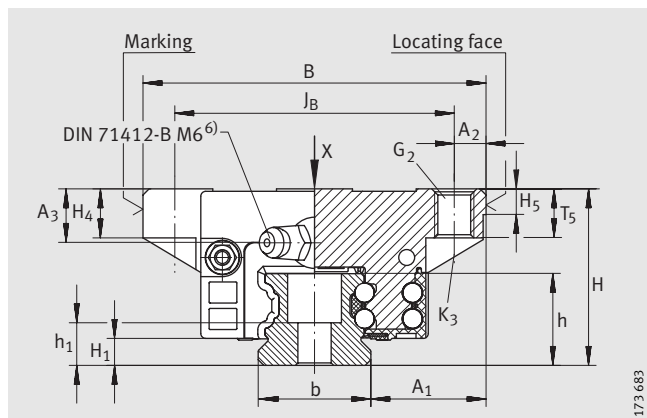
- 1) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71 412-B M6,
except for KUVE20-B-KT to DIN 71 412-B M5 and KUVE15-B-KT to DIN 3 405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



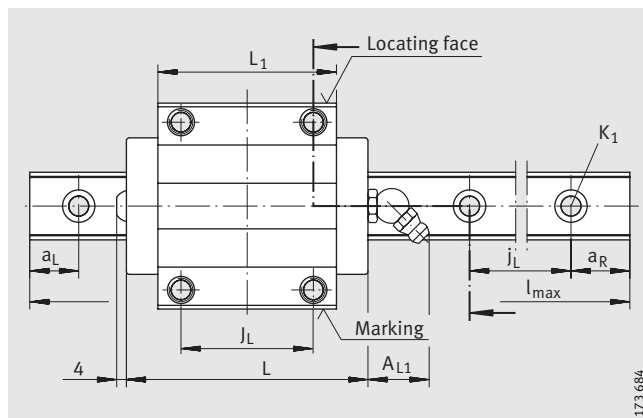
Lateral lubrication connector

Dimensioning of lateral lubrication connector

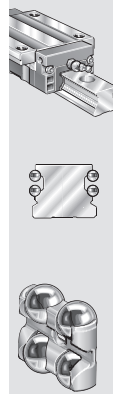
Designation	ØN ₃	A ₄	jL ₆
KUVE15-B-KT	2,6	3,2	9,1
KUVE20-B-KT	4,5	4,5	9,5
KUVE25-B-KT	5,5	6,5	12,9
KUVE30-B-KT	5,5	7	15
KUVE35-B-KT	5,5	11	16
KUVE45-B-KT	5,5	16,5	19,3
KUVE55-B-KT	5,5	15	30,5



KUBE..-B-KT



KUBE..-B-KT · View X (rotated 90°)



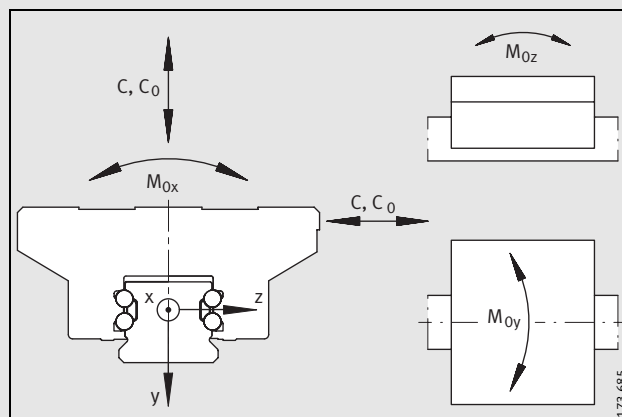
Mounting dimensions

A ₁	J _B	b -0,005 -0,03	A ₂	L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₄	H ₅	A ₃	T ₅	t ₇	h	h ₁	Fixing screws ^{3) 4)}			
							min.	max.										G ₁	G ₂	K ₁	K ₃
16	38	15	4,5	39,8	30	60	20	53	6,2	4,3	7	4,75	4,3	7	8	15	8,15	M5	M5	M4	M4
21,5	53	20	5	50,4	40	60	20	53	19	4,5	10,2	5,25	8	7,5	10	17	9,1	M6	M6	M5	M5
23,5	57	23	6,5	60,7	45	60	20	53	19	5,1	10,4	5,25	11	10	12	18,7	8,7	M6	M8	M6	M6
31	72	28	9	72	52	80	20	71	19	5,9	13,2	6,25	11,5	12	15	23,5	11,5	M8	M10	M8	M8
33	82	34	9	80	62	80	20	71	19	6,7	13,3	6,75	12,3	13	15	27	15	M8	M10	M8	M8
37,5	100	45	10	102,5	80	105	20	94	19	9,7	19,1	9,25	16,5	15	20	34,2	16,2	M12	M12	M12	M10
43,5	116	53	12	132	95	120	20	107	19	13,5	21,6	11,25	15	21	22	41,5	19,5	M14	M14	M14	M12

Load carrying capacity

(for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUBE15-B-KT	6 100	11 400	105	74	53
KUBE20-B-KT	11 800	23 000	276	205	205
KUBE25-B-KT	16 200	32 000	430	330	335
KUBE30-B-KT	26 500	51 000	890	670	670
KUBE35-B-KT	36 000	67 000	1 340	995	995
KUBE45-B-KT	65 000	130 000	3 600	2 610	2 610
KUBE55-B-KT	99 000	199 000	6 730	4 750	4 750

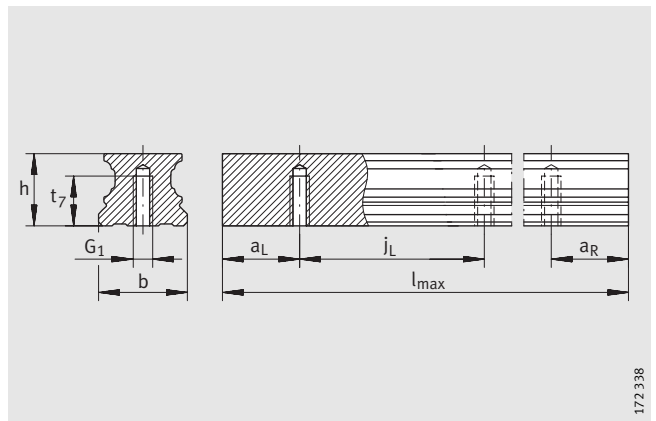


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE...B-KT-L

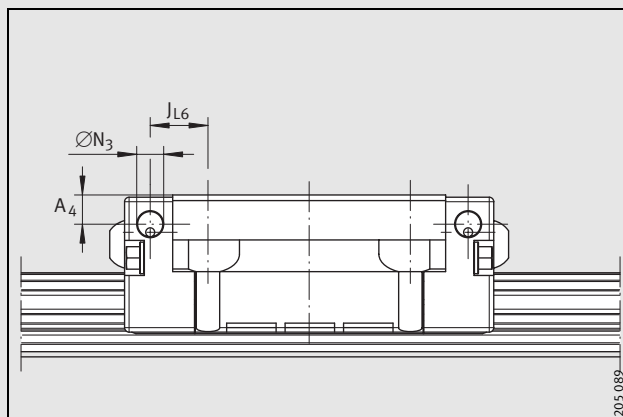


TKVD...-U

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	l _{max} ¹⁾	H	B	L
KUVE15-B-KT-L	KWVE15-B-KT-L	0,21	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1200	24	47	73
KUVE20-B-KT-L	KWVE20-B-KT-L	0,5	TKVD20(-U)	2,2	KA10-TN/A	1980	30	63	87,3
KUVE25-B-KT-L	KWVE25-B-KT-L	0,62	TKVD25(-U)	2,7	KA11-TN/A	1980	36	70	107,9
KUVE30-B-KT-L	KWVE30-B-KT-L	1,2	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	90	125,4
KUVE35-B-KT-L	KWVE35-B-KT-L	2,1	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	100	143,4
KUVE45-B-KT-L	KWVE45-B-KT-L	3,9	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	120	171,1
KUVE55-B-KT-L	KWVE55-B-KT-L	6,4	TKVD55-B(-U)	14	KA24-TN/A	2 520	70	140	210

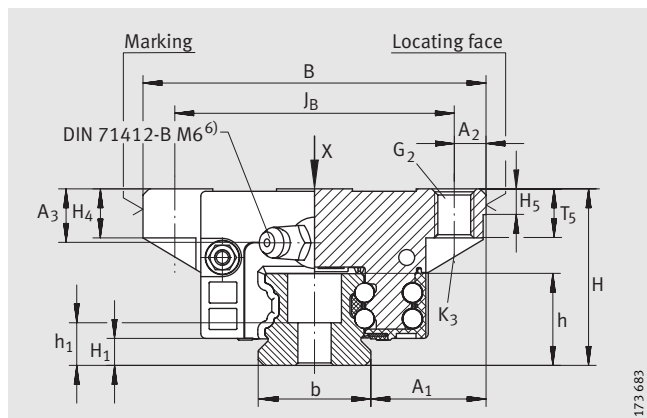
- 1) Maximum length of single-piece guideways; longer guideways are supplied in several sections and are marked accordingly. Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636. Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71 412-B M6, except for KUVE20-B-KT-L to DIN 71 412-B M5 and KUVE15-B-KT-L to DIN 3 405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



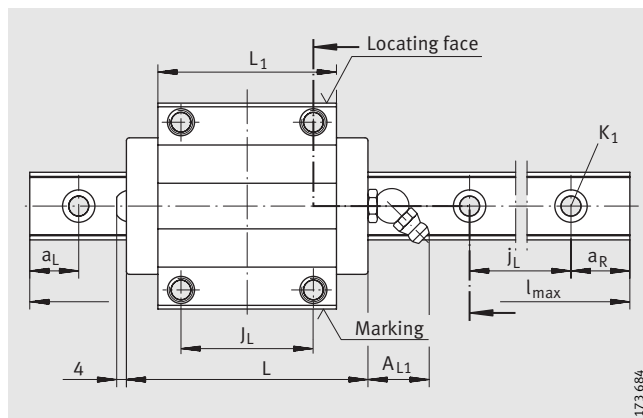
Lateral lubrication connector

Dimensioning of lateral lubrication connector

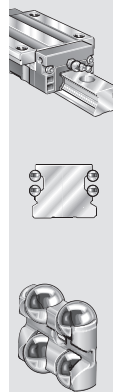
Designation	ØN ₃	A ₄	JL ₆
KUVE15-B-KT-L	2,6	3,2	15,8
KUVE20-B-KT-L	4,5	4,5	18,3
KUVE25-B-KT-L	5,5	6,5	25,8
KUVE30-B-KT-L	5,5	7	29
KUVE35-B-KT-L	5,5	11	32,5
KUVE45-B-KT-L	5,5	16,5	35,3
KUVE55-B-KT-L	5,5	15	49,5



KUBE..-B-KT-L



KUBE..-B-KT-L · View X (rotated 90°)



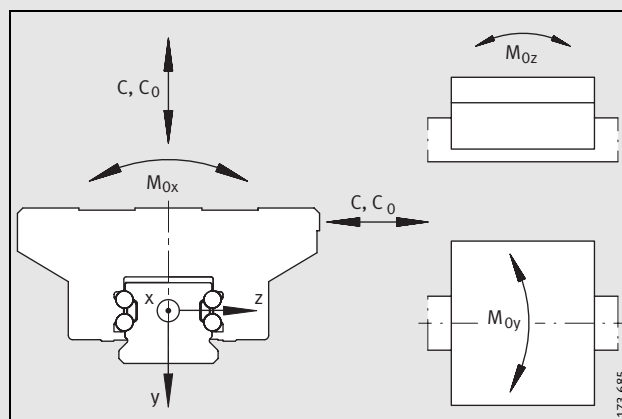
Mounting dimensions

A ₁	J _B	b -0,005 -0,03	A ₂	L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₄	H ₅	A ₃	T ₅	t ₇	h	h ₁	Fixing screws ^{3) 4)} DIN ISO 4 762-12.9			
							min.	max.										G ₁	G ₂	K ₁	K ₃
16	38	15	4,5	53,2	30	60	20	53	6,2	4,3	7	4,75	4,3	7	8	15	8,15	M5	M5	M4	M4
21,5	53	20	5	67,9	40	60	20	53	19	4,5	10,2	5,25	8	7,5	10	17	9,1	M6	M6	M5	M5
23,5	57	23	6,5	86,5	45	60	20	53	19	5,1	10,4	5,25	11	10	12	18,7	8,7	M6	M8	M6	M6
31	72	28	9	100	52	80	20	71	19	5,9	13,2	6,25	11,5	12	15	23,5	11,5	M8	M10	M8	M8
33	82	34	9	113	62	80	20	71	19	6,7	13,3	6,75	12,3	13	15	27	15	M8	M10	M8	M8
37,5	100	45	10	134,6	80	105	20	94	19	9,7	19,1	9,25	16,5	15	20	34,2	16,2	M12	M12	M12	M10
43,5	116	53	12	170	95	120	20	107	19	13,5	21,6	11,25	15	21	22	41,5	19,5	M14	M14	M14	M14

Load carrying capacity

(for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUBE15-B-KT-L	7 500	15 500	162	148	105
KUBE20-B-KT-L	14 400	30 500	368	345	345
KUBE25-B-KT-L	21 100	47 000	625	690	690
KUBE30-B-KT-L	33 000	71 000	1230	1230	1245
KUBE35-B-KT-L	44 000	89 000	1790	1715	1710
KUBE45-B-KT-L	79 000	171 000	4 715	4 335	4 330
KUBE55-B-KT-L	123 000	270 000	9115	8 490	8 490

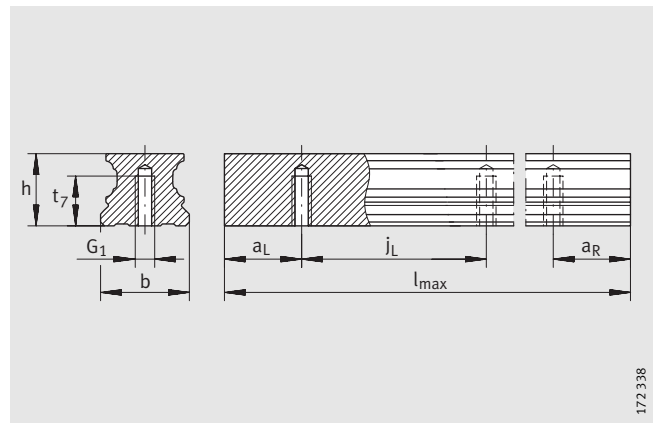


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE...-B-KT-S

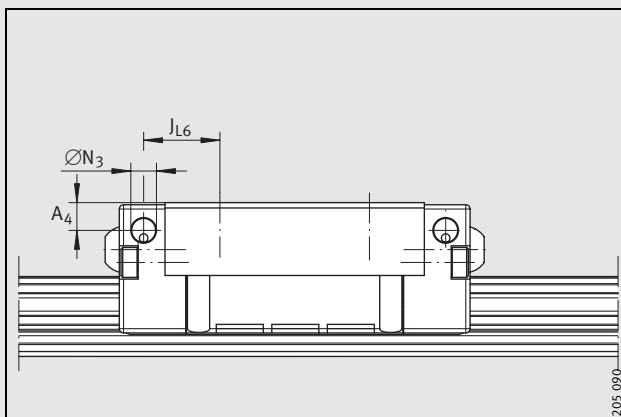


TKVD...-U

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	l _{max} ¹⁾	H	B	L
KUVE15-B-KT-S	KWVE15-B-KT-S	0,15	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1 200	24	34	59,6
KUVE20-B-KT-S	KWVE20-B-KT-S	0,3	TKVD20(-U)	2,2	KA10-TN/A	1 980	30	44	69,8
KUVE25-B-KT-S	KWVE25-B-KT-S	0,57	TKVD25(-U)	2,7	KA11-TN/A	1 980	36	48	82,1
KUVE30-B-KT-S	KWVE30-B-KT-S	0,8	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	60	97,4
KUVE35-B-KT-S	KWVE35-B-KT-S	1,3	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	70	110,4
KUVE45-B-KT-S	KWVE45-B-KT-S	2,4	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	86	139
KUVE55-B-KT-S	KWVE55-B-KT-S	4,3	TKVD55-B(-U)	14	KA24-TN/A	2 520	70	100	172

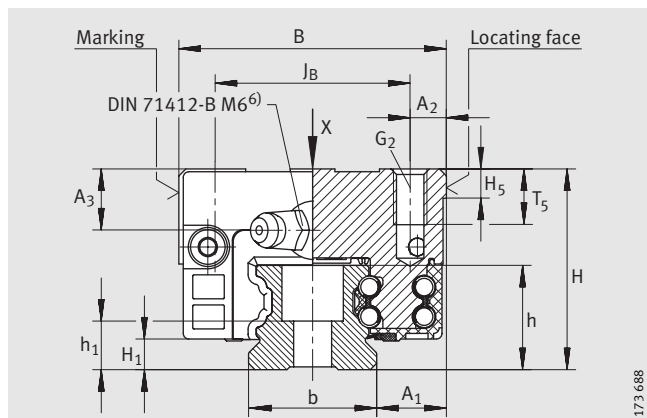
- 1) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71 412-B M6,
except for KUVE20-B-KT-S to DIN 71 412-B M5 and KUVE15-B-KT-S to DIN 3 405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



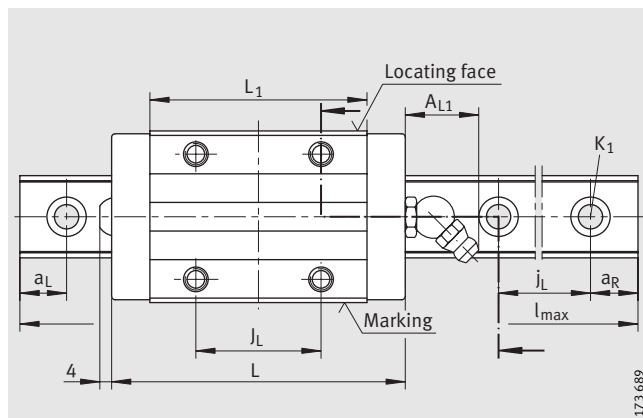
Lateral lubrication connector

Dimensioning of lateral lubrication connector

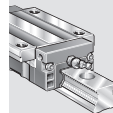
Designation	ØN ₃	A ₄	l _{L6}
KUVE15-B-KT-S	2,6	3,2	11,1
KUVE20-B-KT-S	4,5	4,5	11,4
KUVE25-B-KT-S	5,5	6,5	17,9
KUVE30-B-KT-S	5,5	7	21
KUVE35-B-KT-S	5,5	11	22
KUVE45-B-KT-S	5,5	16,5	29,3
KUVE55-B-KT-S	5,5	15	40,5



KUVE...-B-KT(-S)



KUVE...-B-KT(-S) · View X (rotated 90°)



Mounting dimensions

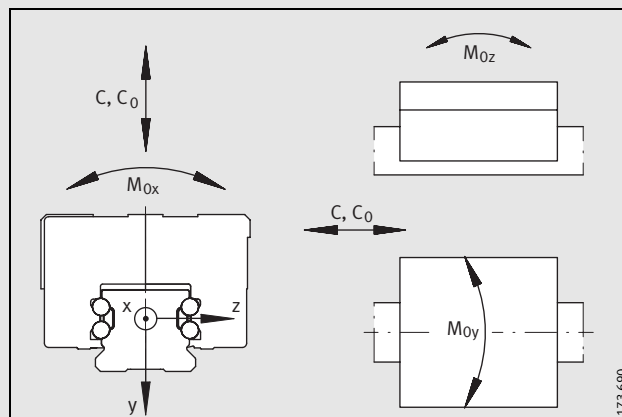
Fixing screws^{3) 4)}

A ₁	J _B	b -0,005 -0,03	A ₂	L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁	G ₂	K ₁
							min.	max.											
9,5	26	15	4	39,8	26	60	20	53	6,2	4,3	4,75	4,3	6	8	15	8,15	M5	M4	M4
12	32	20	6	50,4	36	60	20	53	19	4,5	5,25	7,7	7,5	10	17	9,1	M6	M5	M5
12,5	35	23	6,5	60,7	35	60	20	53	19	5,1	5,25	11	10	12	18,7	8,7	M6	M6	M6
16	40	28	10	72	40	80	20	71	19	5,9	6,25	11,5	13,5	15	23,5	11,5	M8	M8	M8
18	50	34	10	80	50	80	20	71	19	6,7	6,75	12,3	13,5	15	27	15	M8	M8	M8
20,5	60	45	13	102,5	60	105	20	94	19	9,7	9,25	16,5	17	20	34,2	16,2	M12	M10	M12
23,5	75	53	12,5	132	75	120	20	107	19	13,5	11,25	15	15	22	41,5	19,5	M14	M12	M14

Load carrying capacity

(for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE15-B-KT-S	6 100	11 400	105	74	74
KUVE20-B-KT-S	11 800	23 000	276	205	205
KUVE25-B-KT-S	16 200	32 000	430	330	335
KUVE30-B-KT-S	26 500	51 000	890	670	670
KUVE35-B-KT-S	36 000	67 000	1 340	995	995
KUVE45-B-KT-S	65 000	130 000	3 600	2 610	2 610
KUVE55-B-KT-S	99 000	199 000	5 230	2 530	2 560

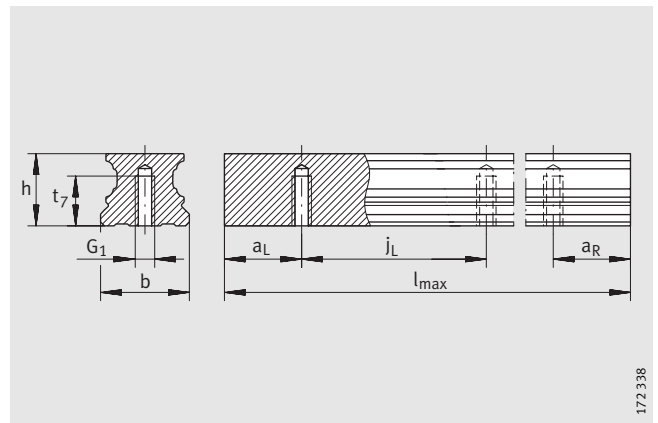


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE...-B-KT-SL



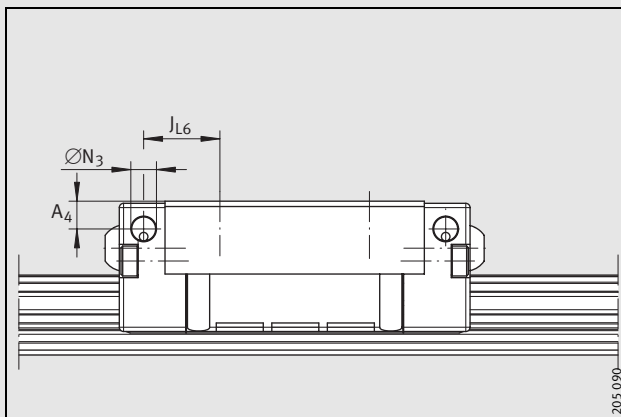
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	l _{max} ¹⁾	H	B	L
KUVE15-B-KT-SL	KWVE15-B-KT-SL	0,18	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1200	24	34	73
KUVE20-B-KT-SL	KWVE20-B-KT-SL	0,4	TKVD20(-U)	2,2	KA10-TN/A	1980	30	44	87,3
KUVE25-B-KT-SL	KWVE25-B-KT-SL	0,79	TKVD25(-U)	2,7	KA11-TN/A	1980	36	48	107,9
KUVE30-B-KT-SL	KWVE30-B-KT-SL	1	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	60	125,4
KUVE35-B-KT-SL	KWVE35-B-KT-SL	1,4	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	70	143,4
KUVE45-B-KT-SL	KWVE45-B-KT-SL	2,7	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	86	171,1
KUVE55-B-KT-SL	KWVE55-B-KT-SL	5,7	TKVD55-B(-U)	14	KA24-TN/A	2 520	70	100	210

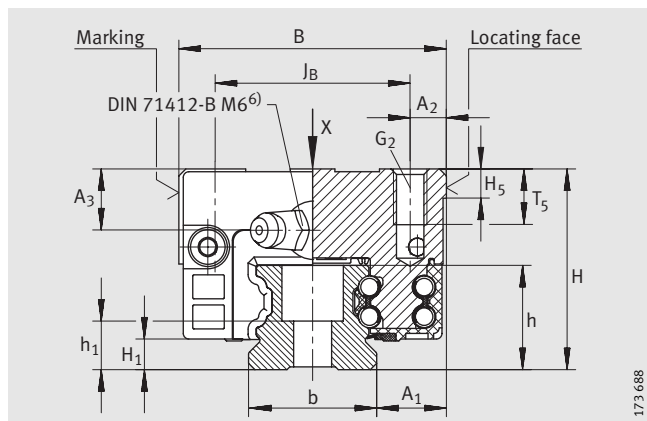
- 1) Maximum length of single-piece guideways; longer guideways are supplied in several sections and are marked accordingly. Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636. Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71 412-B M6, except for KUVE20-B-KT-SL to DIN 71 412-B M5 and KUVE15-B-KT-SL to DIN 3 405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



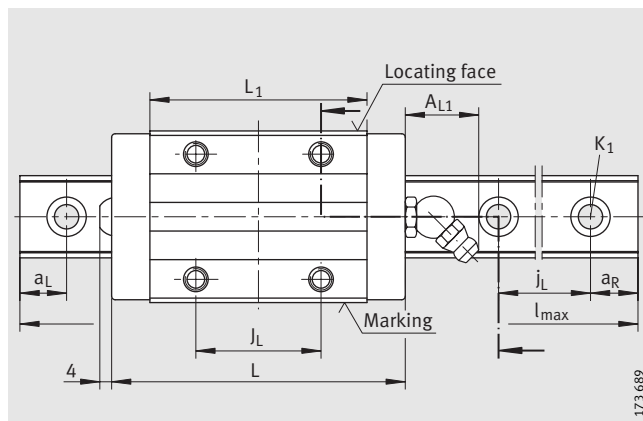
Lateral lubrication connector

Dimensioning of lateral lubrication connector

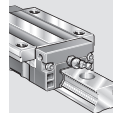
Designation	ØN ₃	A ₄	jL ₆
KUVE15-B-KT-SL	2,6	3,2	17,8
KUVE20-B-KT-SL	4,5	4,5	13,2
KUVE25-B-KT-SL	5,5	6,5	23,3
KUVE30-B-KT-SL	5,5	7	25
KUVE35-B-KT-SL	5,5	11	27,5
KUVE45-B-KT-SL	5,5	16,5	35,3
KUVE55-B-KT-SL	5,5	15	49,5



KUVE...-B-KT(-SL)



KUVE...-B-KT(-SL) · View X (rotated 90°)



Mounting dimensions

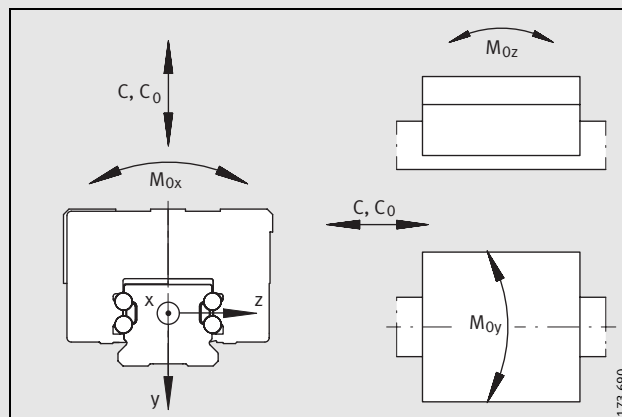
Fixing screws^{3) 4)}

A ₁	J _B	b -0,005 -0,03	A ₂	L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	DIN ISO 4 762-12.9		
							min.	max.									G ₁	G ₂	K ₁
9,5	26	15	4	53,2	26	60	20	53	6,2	4,3	4,75	8,3	6	8	15	8,15	M5	M4	M4
12	32	20	6	67,9	50	60	20	53	19	4,5	5,25	7,7	7,5	10	17	9,1	M6	M5	M5
12,5	35	23	6,5	86,5	50	60	20	53	19	5,1	5,25	11	10	12	18,7	8,7	M6	M6	M6
16	40	28	10	100	60	80	20	71	19	5,9	6,25	11,5	13,5	15	23,5	11,5	M8	M8	M8
18	50	34	10	113	72	80	20	71	19	6,7	6,75	12,3	13,5	15	27	15	M8	M8	M8
20,5	60	45	13	134,6	80	105	20	94	19	9,7	9,25	16,5	17	20	34,2	16,2	M12	M10	M12
23,5	75	53	12,5	170	95	120	20	107	19	13,5	11,25	15	15	22	41,5	19,5	M14	M12	M14

Load carrying capacity

(for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE15-B-KT-SL	7 900	16 500	162	148	105
KUVE20-B-KT-SL	14 400	30 500	368	345	345
KUVE25-B-KT-SL	21 100	47 000	625	690	690
KUVE30-B-KT-SL	33 000	71 000	1230	1245	1245
KUVE35-B-KT-SL	44 000	89 000	1790	1715	1710
KUVE45-B-KT-SL	79 000	171 000	4 715	4 335	4 330
KUVE55-B-KT-SL	123 000	270 000	7 100	4 580	4 580

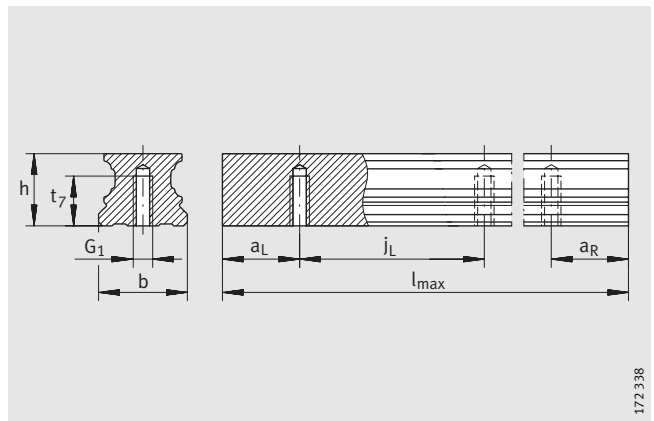


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE...-B-KT-H
KUVE...-B-KT-HL



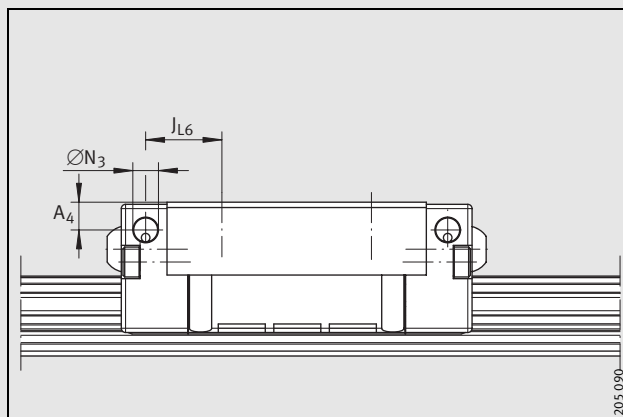
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	l _{max} ¹⁾	H	B	L
KUVE15-B-KT-H	KWVE15-B-KT-H	0,18	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1 200	28	34	59,6
KUVE15-B-KT-HL	KWVE15-B-KT-HL	0,21							73
KUVE25-B-KT-H	KWVE25-B-KT-H	0,61	TKVD25(-U)	2,7	KA11-TN/A	1 980	40	48	82,1
KUVE25-B-KT-HL	KWVE25-B-KT-HL	0,86							107,9
KUVE30-B-KT-H	KWVE30-B-KT-H	0,9	TKVD30(-U)	4,3	KA15-TN/A	2 000	45	60	97,4
KUVE30-B-KT-HL	KWVE30-B-KT-HL	1,1							125,4
KUVE35-B-KT-H	KWVE35-B-KT-H	1,5	TKVD35(-U)	5,7	KA15-TN/A	2 960	55	70	110,4
KUVE35-B-KT-HL	KWVE35-B-KT-HL	1,8							143,4
KUVE45-B-KT-H	KWVE45-B-KT-H	3	TKVD45(-U)	9,2	KA20-TN/A	2 940	70	86	139
KUVE45-B-KT-HL	KWVE45-B-KT-HL	3,4							171,1

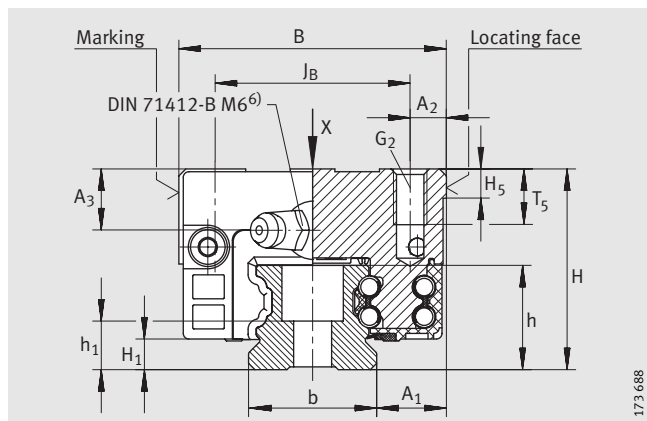
- 1) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE15-B-KT(-H, -HL) to DIN 3 405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



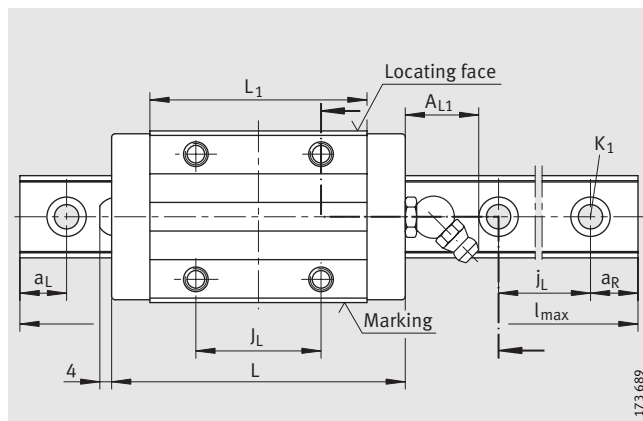
Lateral lubrication connector

Dimensioning of lateral lubrication connector

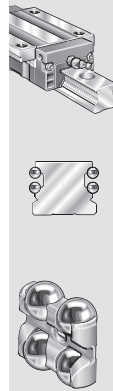
Designation	ØN ₃	A ₄	l _{L6}
KUVE15-B-KT-H	2,6	7,2	11,1
KUVE15-B-KT-HL	2,6	7,2	17,8
KUVE25-B-KT-H	5,5	10,5	17,9
KUVE25-B-KT-HL	5,5	10,5	23,3
KUVE30-B-KT-H	5,5	10	21
KUVE30-B-KT-HL	5,5	10	25
KUVE35-B-KT-H	5,5	18	22
KUVE35-B-KT-HL	5,5	18	27,5
KUVE45-B-KT-H	5,5	26,5	19,3
KUVE45-B-KT-HL	5,5	26,5	35,3



KUVE...-B-KT(-HL)

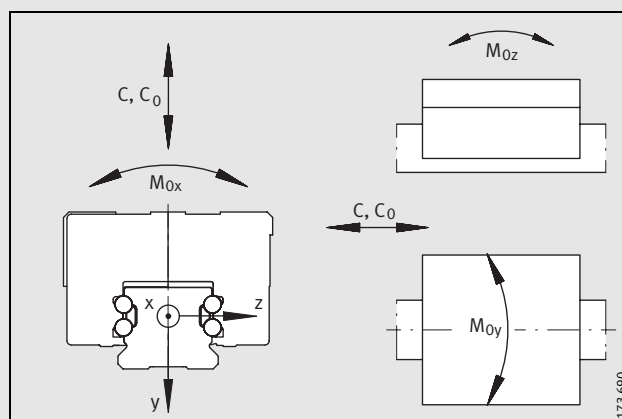


KUVE...-B-KT(-H, -HL) · View X (rotated 90°)



Mounting dimensions																	Fixing screws ³⁾⁴⁾		
A ₁	J _B	b -0,005 -0,03	A ₂	L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁	G ₂	K ₁
							min.	max.											
9,5	26	15	4	39,8	26	60	20	53	6,2	4,3	4,75	8,3	6	8	15	8,15	M5	M4	M4
				53,2															
12,5	35	23	6,5	60,7	35	60	20	53	19	5,1	5,25	15	10	12	18,7	8,7	M6	M6	M6
				86,5	50														
16	40	28	10	72	40	80	20	71	19	5,9	6,25	14,5	13,5	15	23,5	11,5	M8	M8	M8
				100	60														
18	50	34	10	80	50	80	20	71	19	6,7	6,75	19,3	13,5	15	27	15	M8	M8	M8
				113	72														
20,5	60	45	13	102,5	80	105	20	94	19	9,7	9,25	26,5	17	20	34,2	16,2	M12	M10	M12
				134,6															

Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605") ⁵⁾					
Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE15-B-KT-H	6 100	11 400	105	74	74
KUVE15-B-KT-HL	7 900	16 500	162	148	105
KUVE25-B-KT-H	16 200	32 000	430	330	335
KUVE25-B-KT-HL	21 100	47 000	625	690	690
KUVE30-B-KT-H	26 500	51 000	890	670	670
KUVE30-B-KT-HL	33 000	71 000	1 230	1 245	1 245
KUVE35-B-KT-H	36 000	67 000	1 340	995	995
KUVE35-B-KT-HL	44 000	89 000	1 790	1 715	1 710
KUVE45-B-KT-H	65 000	130 000	3 600	2 610	2 610
KUVE45-B-KT-HL	79 000	171 000	4 715	4 335	4 330

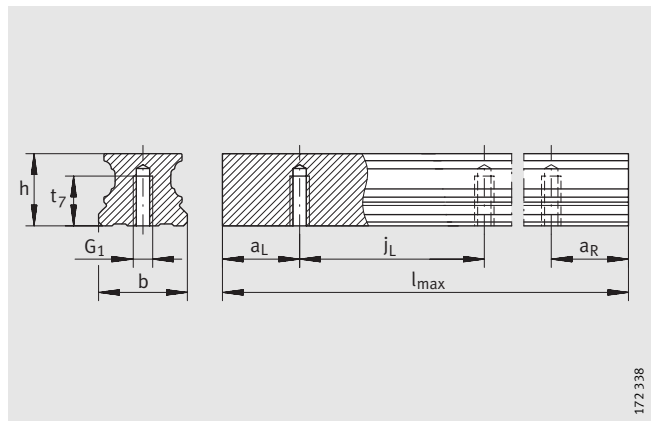


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUV...-B-KT-W
KUV...-B-KT-WL



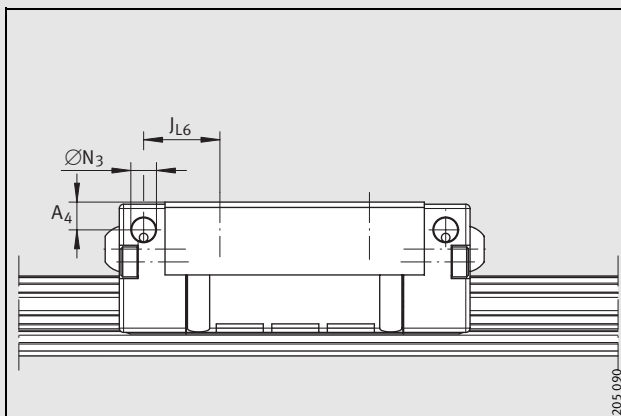
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit	Carriage		Guideway			Dimensions				Mounting dimensions					
Designation	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{max}^{1)}$	H	B	L	A ₁	J _B	j _B	a _s	b -0,005 -0,03	A ₂
KUVE25-B-KT-W	KWVE25-B-KT-W	0,8	TKVD25(-U)	9,4	KA11-TN/A	1980	35	120	82,1	25,5	107	40	14,5	69	6,5
KUVE25-B-KT-WL	KWVE25-B-KT-WL	1,1							107,9						

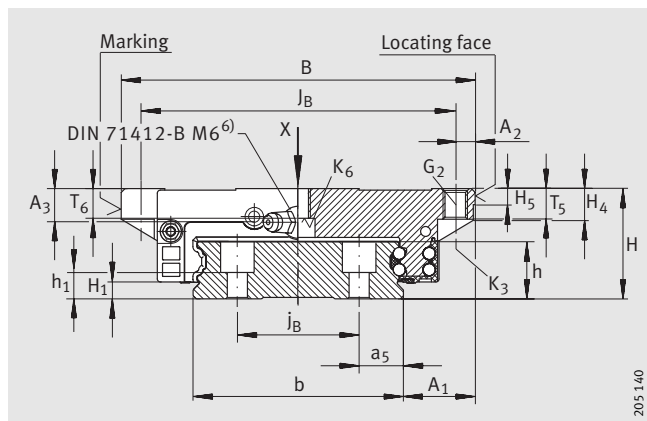
- ¹⁾ Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- ²⁾ a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- ³⁾ If there is a possibility of settling, the fixing screws should be secured against rotation.
- ⁴⁾ For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- ⁵⁾ Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- ⁶⁾ Lubrication nipple with tapered head to DIN 71 412-B M6.



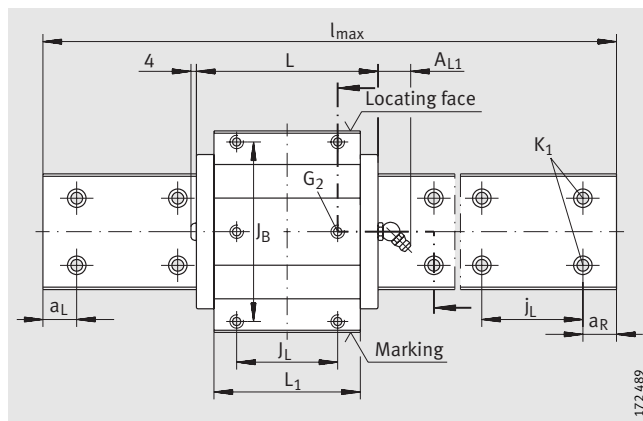
Lateral lubrication connector

Dimensioning of lateral lubrication connector

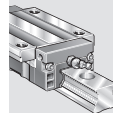
Designation	ØN ₃	A ₄	j _{L6}
KUVE25-B-KT-W	5,5	5,7	12,9
KUVE25-B-KT-WL	5,5	5,7	18,3



KUBE..-B-KT(-W, -WL)



KUBE..-B-KT(-W, -WL) · View X (rotated 90°)

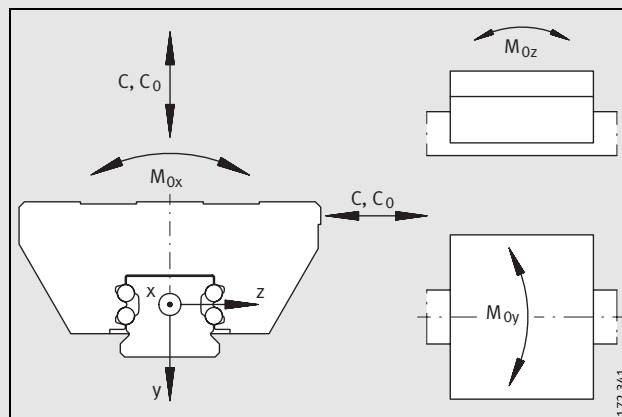


															Fixing screws ^{3) 4)}				
L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₄	H ₅	A ₃	T ₅	T ₆	t ₇	h	h ₁	G ₁	G ₂	K ₁	K ₃	K ₆
			min.	max.											DIN ISO 4 762-12.9				
60,7	45	80	20	71	19	5,1	10,3	5,25	10	10	10	12	18,7	8,7	M6	M8	M6	M6	M6
86,5	60																		

Load carrying capacity

(for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUBE25-B-KT-W	16 200	32 000	1 300	330	335
KUBE25-B-KT-WL	21 100	47 000	1 868	690	700



Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement



Preload 44



Friction 44



Accuracy 45



Demands on the adjacent construction 48



Ordering example and ordering designation 24



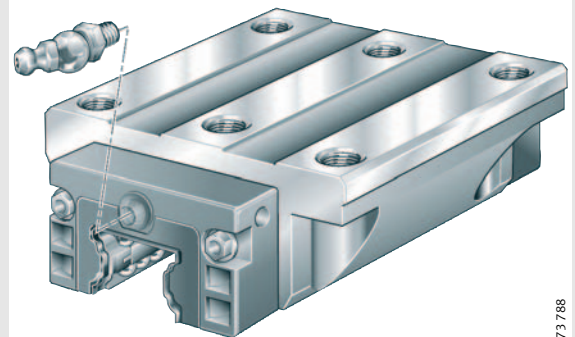
Features

Four-row linear recirculating ball bearing and guideway assemblies

- are complete units comprising:
 - at least one carriage KWVE...-B
 - a guideway TKVD, TKVD...-U, TKVD...-ZHP or TKVD...-K with two locating edges in each case
 - integral elastic wipers and sealing strips on the end faces and longitudinal faces of the carriage
 - two-piece plastic closing plugs
 - have a full complement ball set
- 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
- are lubricated via the lubrication nipple in the end piece (on the end face or from the side) with grease or oil
 - the end face lubrication nipple is included in the delivery
 - the lubrication nipple for relubrication from the side is available by agreement
- are based on a modular concept (see also *Interchangeability*, page 22)
 - guideways can be combined with all carriage types within one size
 - can be ordered separately as a carriage KWVE...-B and guideway TKVD or as a unit KUVE...-B. In a unit, one or more carriages can be mounted on a guideway
- are suitable for:
 - accelerations up to 150 m/s^2
 - speeds up to 360 m/min
 - operating temperatures from -10°C to $+100^\circ\text{C}$
- can also be supplied with multi-piece guideways – see *Multi-piece guideways*, page 47
- are used in applications with:
 - long, unlimited stroke lengths
 - high loads
 - high running and positional accuracy
 - low friction
 - high rigidity.

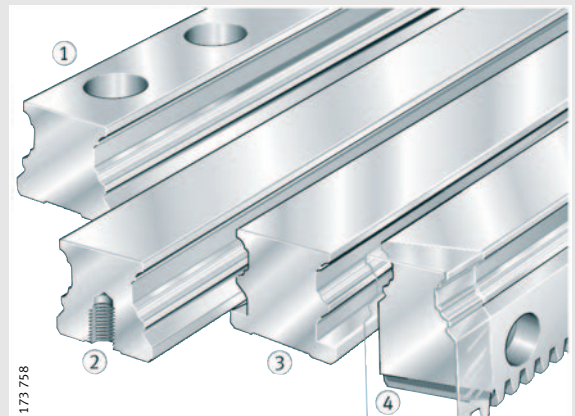
Carriage

KWVE...-B



- saddle plate with hardened and precision ground rolling element raceways
 - balls are recirculated in enclosed channels with plastic return elements
- carriage sealed by elastic end wipers and sealing strips
- a lubrication nipple for the end face is included

Guideways

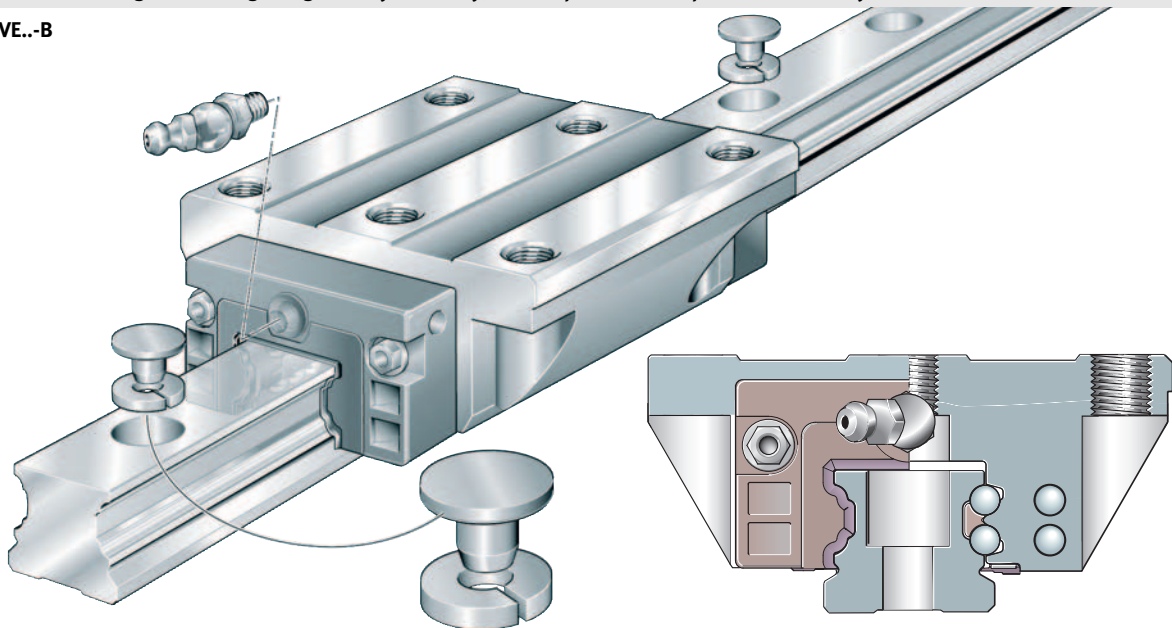


- hardened steel, all surfaces ground
 - precision ground raceways for rolling elements
- TKVD: located from above ①
- TKVD...-U: located from below ②
- TKVD...-K: for clamping lugs and clamping strips ③
- TKVD...-ZHP: with helical teeth ④

Four-row linear recirculating ball bearing and guideway assembly, full complement – scope of basic delivery



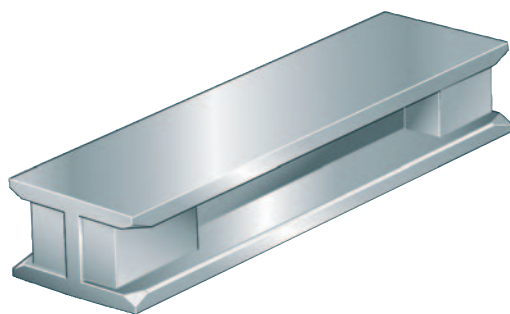
KUVE...-B



173 789

Standard accessories

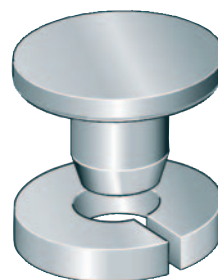
MKVD



173 711

- plastic dummy guideways
 - prevent 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

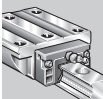
KA...-TN/A



173 729

- two-piece plastic closing plugs
 - close off the counterbores of the guideway holes flush with the top surface of the guideway

KUVE...-B



Four-row linear recirculating ball bearing and guideway assemblies

full complement

Design of carriages

The rows of balls run in a steel saddle plate with hardened and ground raceways at a contact angle of 45° in an O arrangement.

The full complement ball set is recirculated through channels in the steel saddle plate.

Interchangeability

The carriages and guideways can be freely interchanged and combined with each other.

This means:

- more economical stockholding
- simpler fitting
- quicker sourcing of replacement parts
- the option of achieving several preload classes on one guideway, since the preload class is determined by the carriage
- versatile design possibilities for KUBE guidance systems using standard elements.

Corrosion-resistant designs

KUBE...-B is also available with the Corrotect® plating.

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

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

If units are supplied preassembled, there are two variants:

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

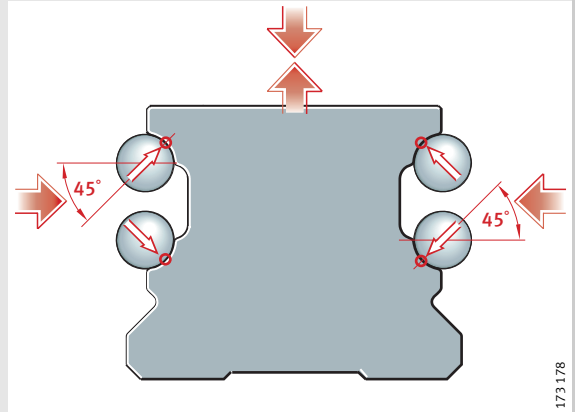
Lubricant reservoir, sealing

Due to the integral lubricant reservoir ①, the linear ball bearing and guideway assemblies have long relubrication intervals; depending on the application, they may even be maintenance-free.

Standard sealing strips ② as well as additional sealing strips (optional) ③ ensure effective sealing.

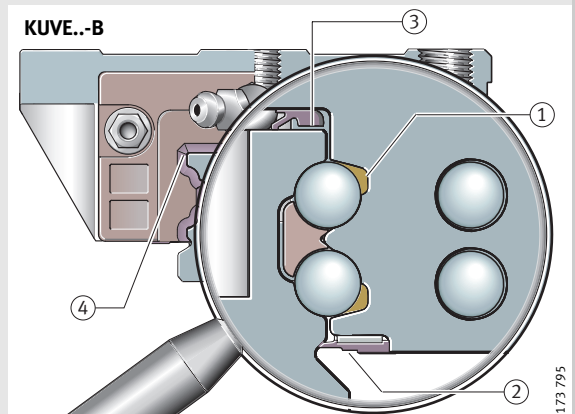
These sealing elements protect the rolling element system from contamination even under demanding environmental conditions.

Contact angle



- contact angles of the four rows of balls
- rows of balls in two point contact with raceways

Lubricant reservoir, sealing



- integral lubricant pockets with grease reservoir ①
- standard sealing strip ②
- optional sealing strip ③
- elastic wipers on end faces ④

KWVE...-B-SNL

KWVE...-B-SN

KWVE...-B-S

KWVE...-B-EC

KWVE...-B-SL

KWVE...-B-ESC

KWVE...-B-H

TKVD

TKVD...-U

TKVD...-K

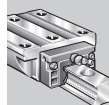
TKVD...-ZHP

KWVE...-B
KWVE...-B-N

KWVE...-B-HL

KWVE...-B-L
KWVE...-B-NL

KUVE...-B



**Four-row linear recirculating ball bearing
and guideway assemblies**
full complement



Ordering example and ordering designation

Ordering designation:

1 × KUVE25-B-W2-G3-V2-RRFT/1510-50/20, Figure 1.

Ordering example 1

**Linear ball bearing and guideway assembly KUVE..-B,
asymmetrical hole pattern**

Four-row ball bearing and guideway assembly	KUVE
Size	25
Version with full complement ball set	B
Number of carriages per unit	W2
Accuracy class	G3
Carriage preload	V2
Guideway with Corrotect® plating	RRFT
Guideway length	1510 mm
– a _L	20 mm
– a _R	50 mm

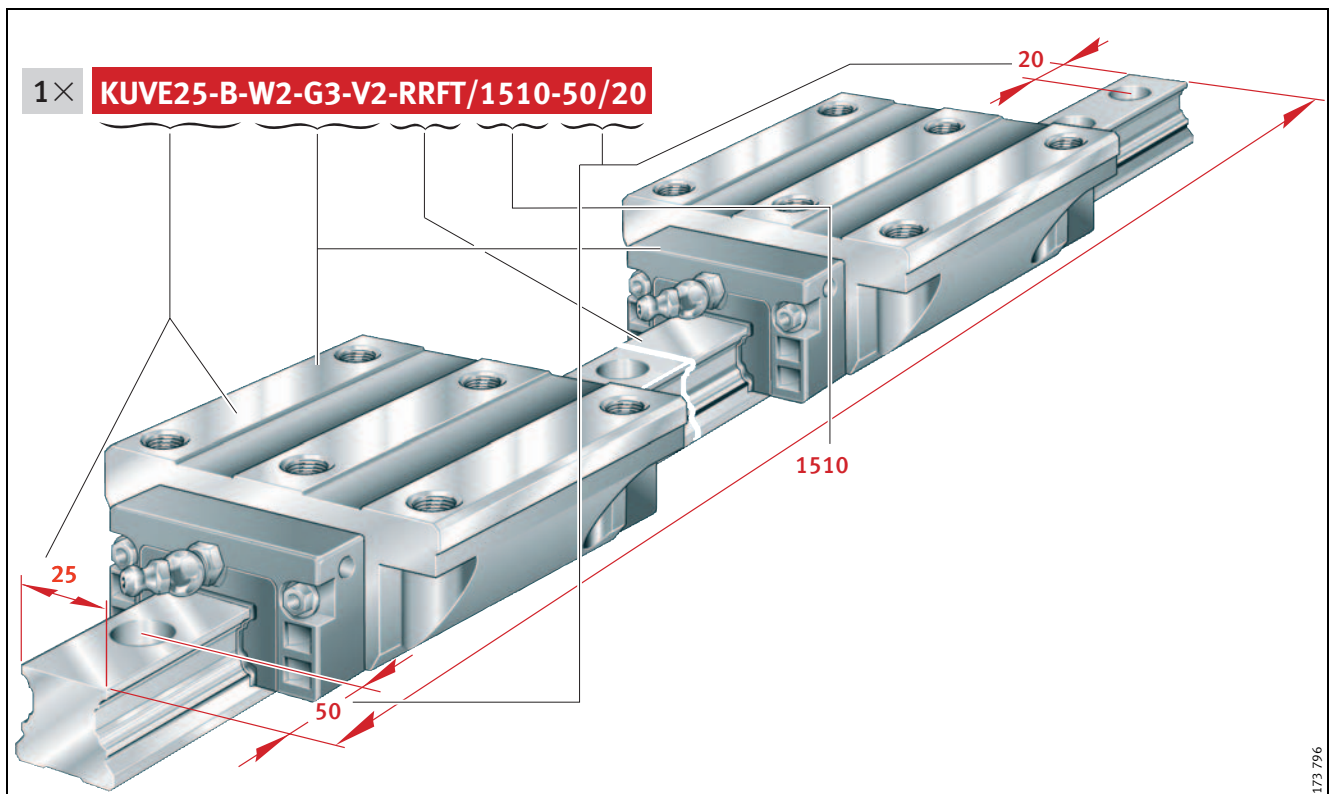


Figure 1 · Ordering example, ordering designation

Ordering example 2

Linear recirculating ball bearing
and guideway assembly KUVE...-B,
carriage and guideway separate,
symmetrical hole pattern

Carriage

Carriage

Size

Version with full complement ball set

Carriage variant

Accuracy class

Carriage preload

KWVE

25

B

L

G3

V2

Guideway

Guideway for carriage

Size

Guideway length

– a_L

– a_R

TKVD

25

1 570 mm

35 mm

35 mm

Ordering designation:

1 × TKVD25/1570-35/35, Figure 2.

Ordering designation:

2 × KWVE25-B-L-G3-V2, Figure 2.

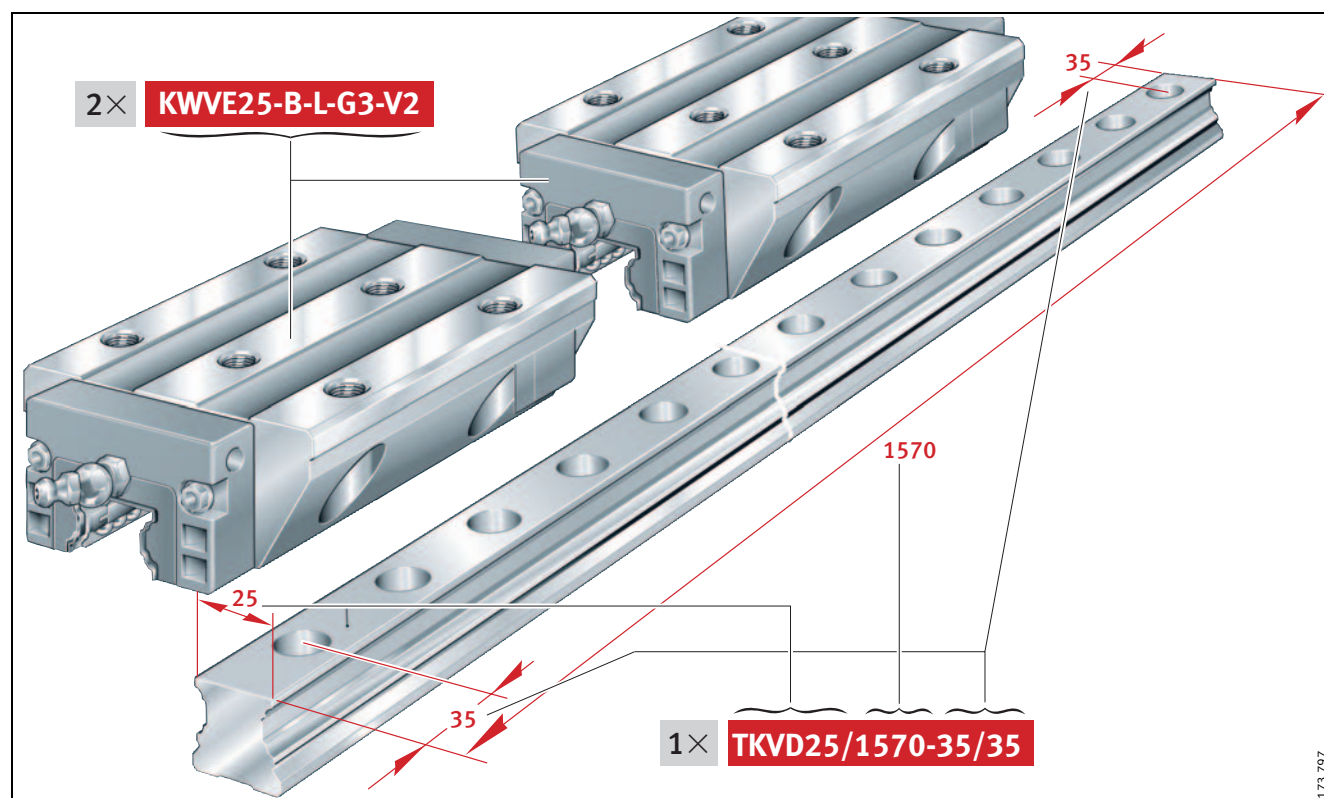
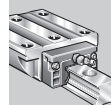


Figure 2 · Ordering example, ordering designation

KUVE...-B

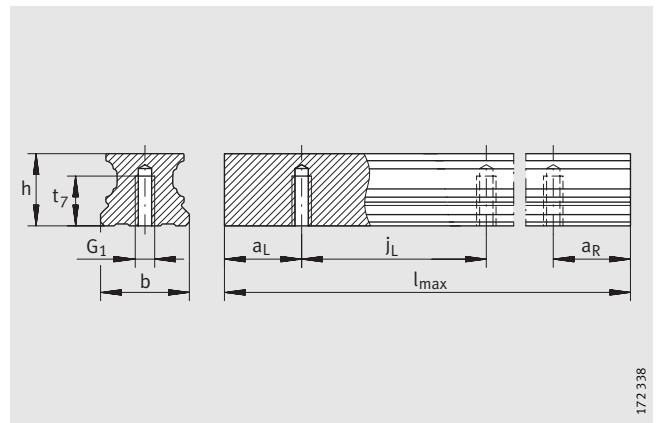


173 797

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...-B



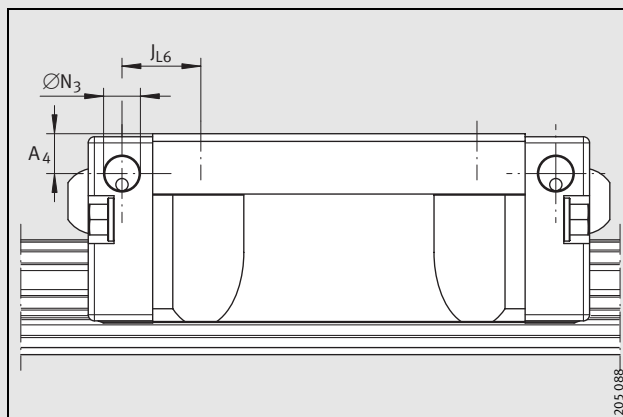
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions				Mounting dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{\max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03	A ₂
KUVE15-B	KWVE15-B	0,25	TKVD15-B(U) ⁷⁾	1,44	KA07-TN/A	1200	24	47	59,6	16	38	15	4,5
KUVE20-B	KWVE20-B	0,58	TKVD20(-U)	2,2	KA10-TN/A	1980	30	63	69,8	21,5	53	20	5
KUVE25-B	KWVE25-B	0,71	TKVD25(-U)	2,7	KA11-TN/A	1980	36	70	81,7	23,5	57	23	6,5
KUVE30-B	KWVE30-B	1,4	TKVD30(-U)	4,3	KA15-TN/A	2000	42	90	97,4	31	72	28	9
KUVE35-B	KWVE35-B	2	TKVD35(-U)	5,7	KA15-TN/A	2960	48	100	110,4	33	82	34	9
KUVE45-B	KWVE45-B	3,7	TKVD45(-U)	9,2	KA20-TN/A	2940	60	120	139	37,5	100	45	10
KUVE55-B	KWVE55-B	4,9	TKVD55-B(-U)	14	KA24-TN/A	2520	70	140	172	43,5	116	53	12

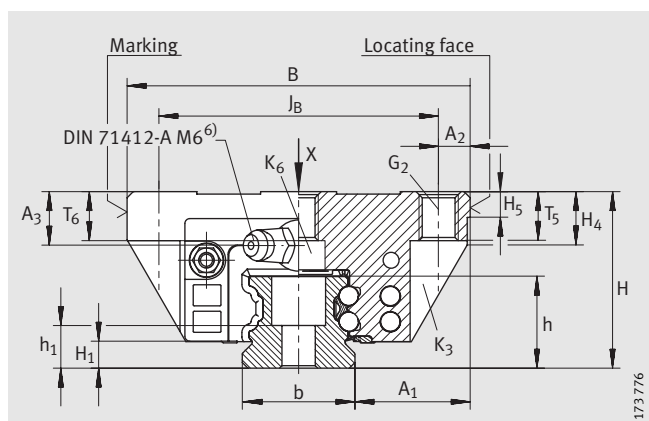
- 1) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B to DIN 71412-B M5 and KUVE15-B to DIN 3405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



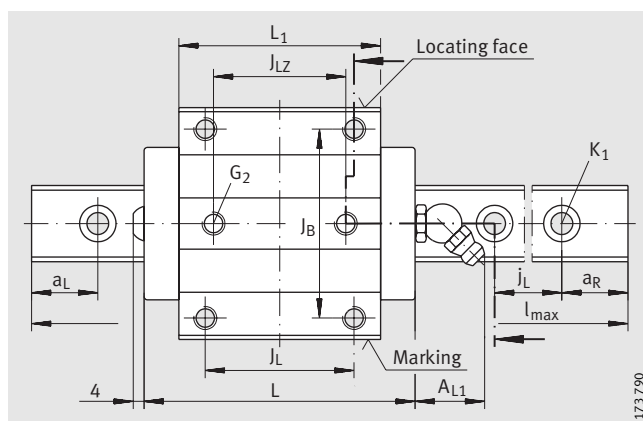
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	l _{L6}
KUVE15-B	2,6	3,2	9,1
KUVE20-B	4,5	4,6	9,4
KUVE25-B	5,5	6,5	12,9
KUVE30-B	5,5	7	15,5
KUVE35-B	5,5	11	16
KUVE45-B	5,5	16,5	19,3
KUVE55-B	5,5	15	30,5



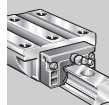
KUVE..-B



KUVE..-B · View X (rotated 90°)

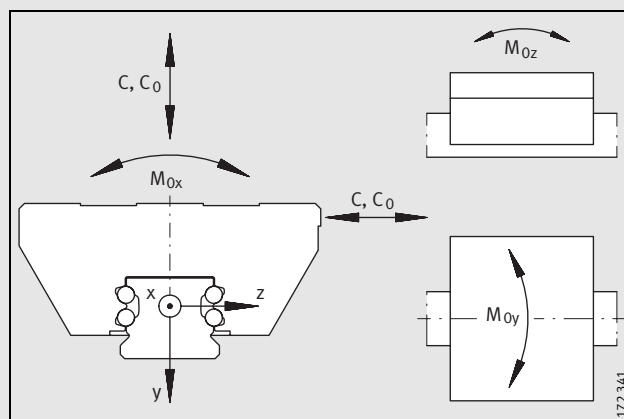
																Fixing screws ^{3) 4)}				
L ₁	J _L	J _{LZ}	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₄	H ₅	A ₃	T ₅	T ₆	t ₇	h	h ₁	G ₁	G ₂	K ₁	K ₃	K ₆
				min.	max.															
39,8	30	26	60	20	53	6,2	4,3	7,6	4,75	4,3	7	5,8	8	15	8,15	M5	M5	M4	M4	–
50,4	40	35	60	20	53	19	4,5	11	5,25	7,7	10	7,5	10	17	9,1	M6	M6	M5	M5	M5
60,7	45	40	60	20	53	19	5,1	10,9	5,25	11	10	10	12	18,7	8,7	M6	M8	M6	M6	M6
72	52	44	80	20	71	19	5,9	13,8	6,25	11,5	12	11,5	15	23,5	11,5	M8	M10	M8	M8	M8
80	62	52	80	20	71	19	6,7	14,3	6,75	12,3	13	12,3	15	27	15	M8	M10	M8	M8	M8
102,5	80	60	105	20	94	19	9,7	19,9	9,25	16,5	15	15	20	34,2	16,2	M12	M12	M12	M10	M10
132	95	70	120	20	107	19	13,5	22,7	11,25	15	21	18	22	41,5	19,5	M14	M14	M14	M12	M12

KUVE..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE15-B	7 200	14 500	150	100	100
KUVE20-B	13 100	27 000	332	240	240
KUVE25-B	17 900	37 000	510	395	395
KUVE30-B	27 500	55 000	970	660	660
KUVE35-B	38 000	72 000	1465	1020	1020
KUVE45-B	69 000	141 000	3 610	2 485	2 485
KUVE55-B	104 000	213 000	5 600	2 730	2 730

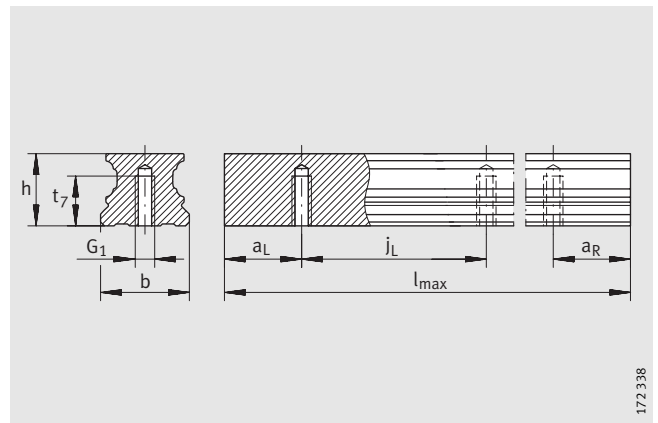


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...-B-L



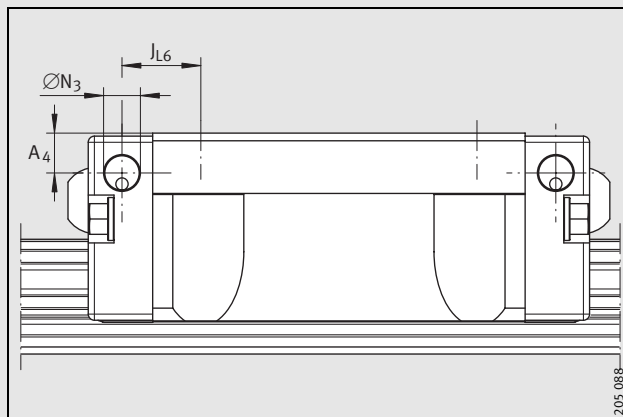
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit	Carriage		Guideway			Dimensions				Mounting dimensions			
Designation	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03	A ₂
KUVE20-B-L	KWVE20-B-L	0,8	TKVD20(-U)	2,2	KA10-TN/A	1980	30	63	87,3	21,5	53	20	5
KUVE25-B-L	KWVE25-B-L	1	TKVD25(-U)	2,7	KA11-TN/A	1980	36	70	107,5	23,5	57	23	6,5
KUVE30-B-L	KWVE30-B-L	1,8	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	90	125,4	31	72	28	9
KUVE35-B-L	KWVE35-B-L	2,7	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	100	143,4	33	82	34	9
KUVE45-B-L	KWVE45-B-L	4,7	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	120	171,1	37,5	100	45	10

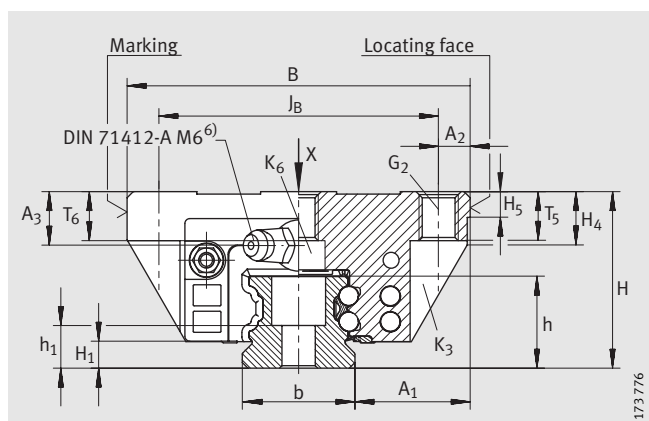
- ¹⁾ Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- ²⁾ a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- ³⁾ If there is a possibility of settling, the fixing screws should be secured against rotation.
- ⁴⁾ For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- ⁵⁾ Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- ⁶⁾ Lubrication nipple with tapered head to DIN 71 412-B M6,
except for KUVE20-B-L to DIN 71 412-B M5.



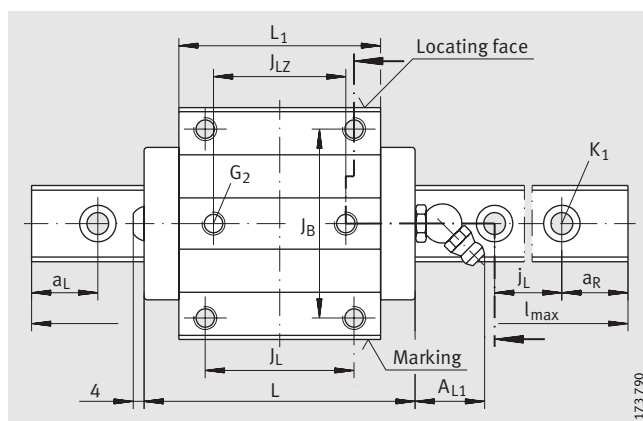
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	lL ₆
KUVE20-B-L	4,5	4,6	18,2
KUVE25-B-L	5,5	6,5	25,8
KUVE30-B-L	5,5	7	29,5
KUVE35-B-L	5,5	11	32,5
KUVE45-B-L	5,5	16,5	35,3



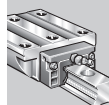
KUBE..-B-L



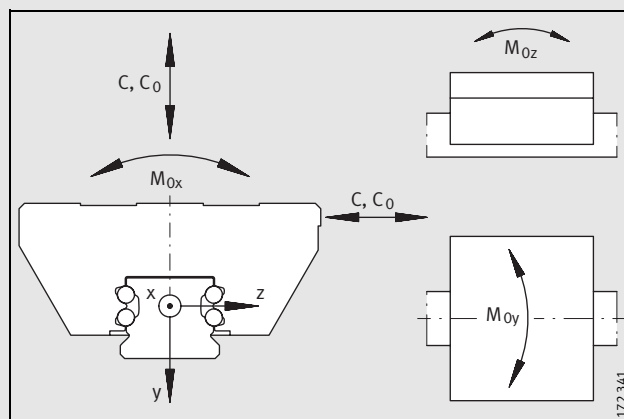
KUBE..-B-L · View X (rotated 90°)

																Fixing screws ^{3) 4)}				
L ₁	J _L	J _{LZ}	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₄	H ₅	A ₃	T ₅	T ₆	t ₇	h	h ₁	G ₁	G ₂	K ₁	K ₃	K ₆
				min.	max.															
67,9	40	35	60	20	53	19	4,5	11	5,25	7,7	10	7,5	10	17	9,1	M6	M6	M5	M5	M5
86,5	45	40	60	20	53	19	5,1	10,9	5,25	11	10	10	12	18,7	8,7	M6	M8	M6	M6	M6
100	52	44	80	20	71	19	5,9	13,8	6,25	11,5	12	11,5	15	23,5	11,5	M8	M10	M8	M8	M8
113	62	52	80	20	71	19	6,7	14,3	6,75	12,3	13	12,3	15	27	15	M8	M10	M8	M8	M8
134,6	80	60	105	20	94	19	9,7	19,9	9,25	16,5	15	15	20	34,2	16,2	M12	M12	M12	M10	M10

KUBE..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605") ⁵⁾					
Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUBE20-B-L	16 200	36 500	452	430	430
KUBE25-B-L	23 400	54 000	745	825	825
KUBE30-B-L	34 500	74 000	1 310	1 240	1 240
KUBE35-B-L	47 500	100 000	2 025	1 890	1 890
KUBE45-B-L	82 000	181 000	4 635	4 000	4 000

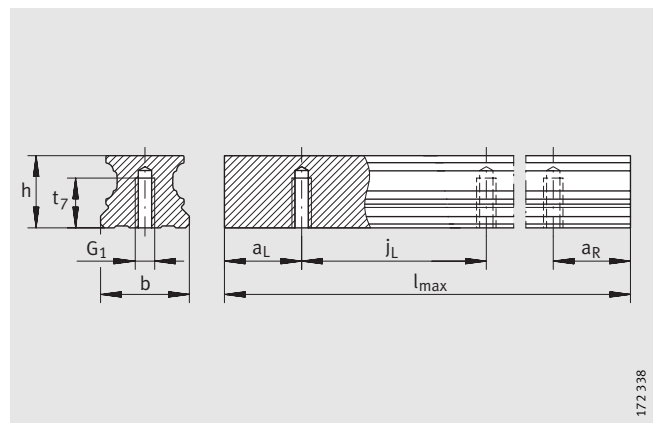


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...B-N
KUVE...B-NL



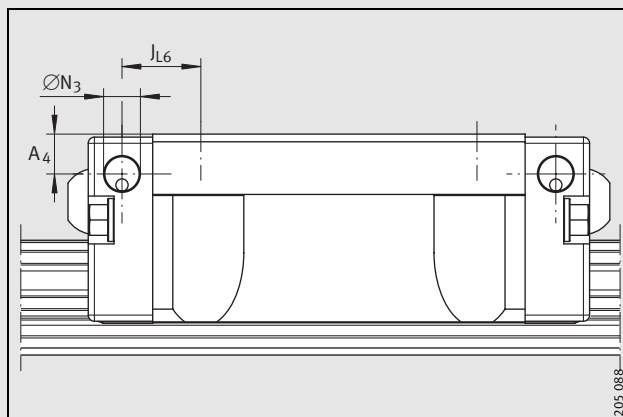
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions				Mounting dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{\max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03	A ₂
KUVE20-B-N	KWVE20-B-N	0,47	TKVD20(-U)	2,2	KA10-TN/A	1980	27	63	69,8	21,5	53	20	5
KUVE20-B-NL	KWVE20-B-NL	0,65							87,3				
KUVE25-B-N	KWVE25-B-N	0,57	TKVD25(-U)	2,7	KA11-TN/A	1980	31	70	81,7	23,5	57	23	6,5
KUVE25-B-NL	KWVE25-B-NL	0,8							107,5				
KUVE30-B-N	KWVE30-B-N	1,1	TKVD30(-U)	4,3	KA15-TN/A	2 000	38	90	97,4	31	72	28	9
KUVE30-B-NL	KWVE30-B-NL	1,5							125,4				
KUVE35-B-N	KWVE35-B-N	1,6	TKVD35(-U)	5,7	KA15-TN/A	2 960	44	100	110,4	33	82	34	9
KUVE35-B-NL	KWVE35-B-NL	2,2							143,4				
KUVE45-B-N	KWVE45-B-N	3	TKVD45(-U)	9,2	KA20-TN/A	2 940	52	120	139	37,5	100	45	10
KUVE45-B-NL	KWVE45-B-NL	3,8							171,1				

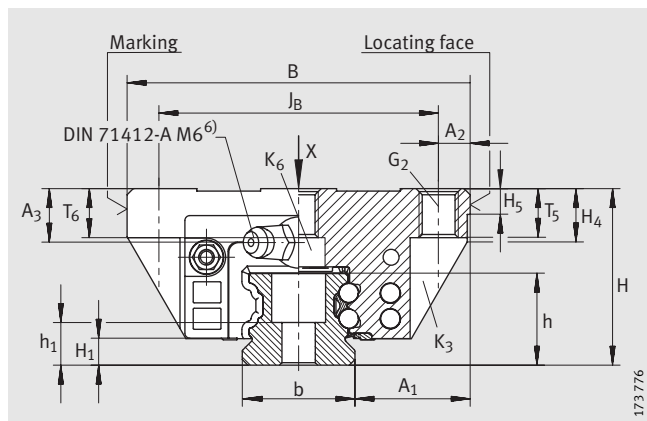
- 1) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B(-N, -NL) to DIN 71412-B M5.



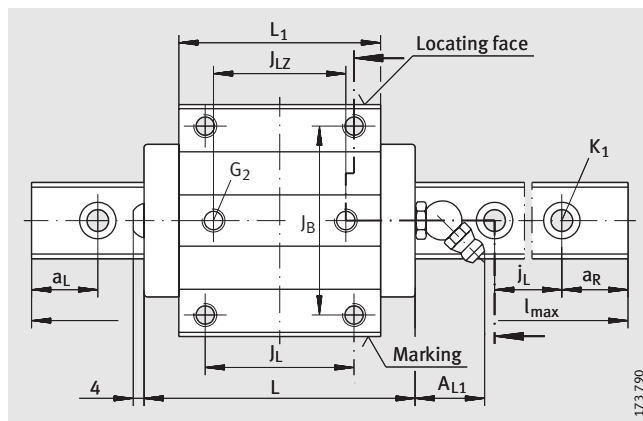
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	l _{L6}
KUVE20-B-N	2,6	3,3	9,4
KUVE20-B-NL	2,6	3,3	18,2
KUVE25-B-N	2,6	4	12,1
KUVE25-B-NL	2,6	4	25
KUVE30-B-N	4,5	5	15,1
KUVE30-B-NL	4,5	5	29,1
KUVE35-B-N	5,5	7	16
KUVE35-B-NL	5,5	7	32,5
KUVE45-B-N	5,5	8,5	19,3
KUVE45-B-NL	5,5	8,5	35,3



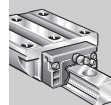
KUVE..-B(-N, -NL)



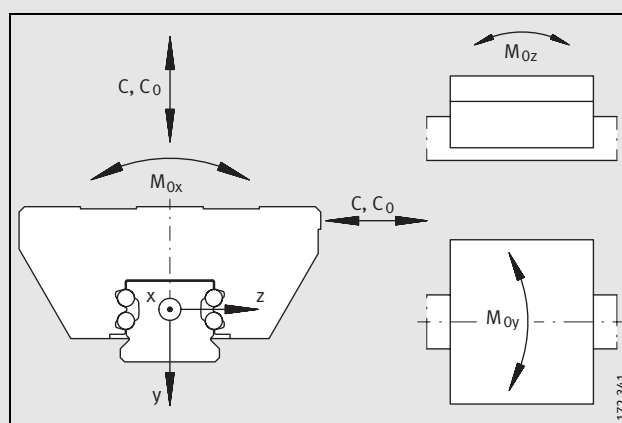
KUVE..-B(-N, -NL) · View X (rotated 90°)

																Fixing screws ^{3) 4)}				
L ₁	J _L	J _{LZ}	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₄	H ₅	A ₃	T ₅	T ₆	t ₇	h	h ₁	G ₁	G ₂	K ₁	K ₃	K ₆
				min.	max.											DIN ISO 4 762-12.9				
50,4 67,9	40	35	60	20	53	19	4,5	8,6	5,25	5,25	7,7	6	10	17	9,1	M6	M6	M5	M5	M5
60,7 86,5	45	40	60	20	53	19	5,1	9,3	5,25	6	10	8	12	18,7	8,7	M6	M8	M6	M6	M6
72 100	52	44	80	20	71	19	5,9	9,8	6,25	7,5	12	9	15	23,5	11,5	M8	M10	M8	M8	M8
80 113	62	52	80	20	71	19	6,7	10,3	6,75	8,3	13	8,3	15	27	15	M8	M10	M8	M8	M8
102,5 134,6	80	60	105	20	94	19	9,7	17,2	9,25	8,5	15	11	20	34,2	16,2	M12	M12	M12	M10	M10

KUVE..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605") ⁵⁾					
Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE20-B-N	13 100	27 000	332	240	240
KUVE20-B-NL	16 200	36 500	452	430	430
KUVE25-B-N	17 900	37 000	510	395	395
KUVE25-B-NL	23 400	54 000	745	825	825
KUVE30-B-N	27 500	55 000	970	660	660
KUVE30-B-NL	34 500	74 000	1 320	1 180	1 180
KUVE35-B-N	38 000	72 000	1 465	1 020	1 020
KUVE35-B-NL	47 500	100 000	2 025	1 890	1 890
KUVE45-B-N	69 000	141 000	3 610	2 485	2 485
KUVE45-B-NL	82 000	181 000	4 635	4 000	4 000

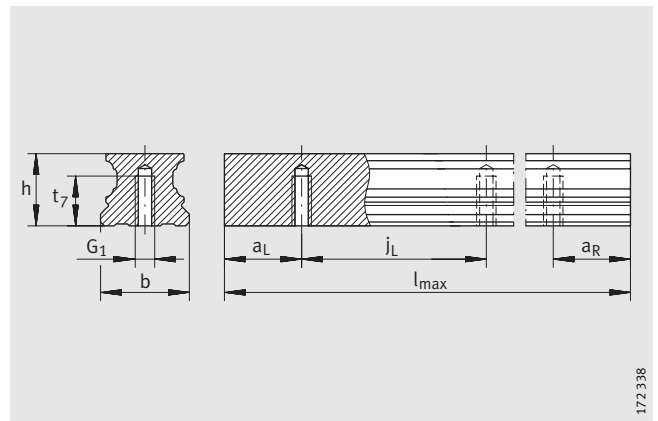


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...-B-SL
KUVE...-B-HL



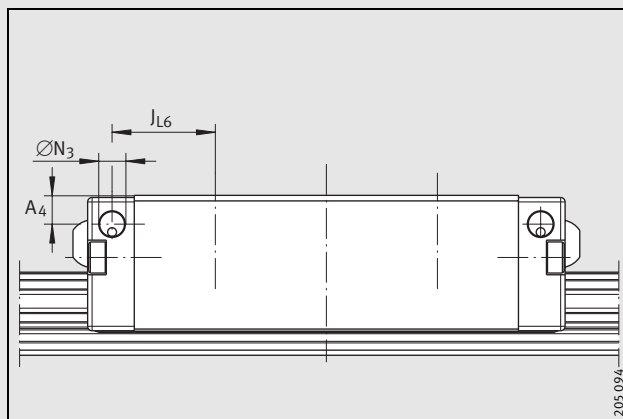
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions				Mounting dimensions			
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03	A ₂
KUVE20-B-SL	KWVE20-B-SL	0,46	TKVD20(-U)	2,2	KA10-TN/A	1980	30	44	87,3	12	32	20	6
KUVE25-B-HL	KWVE25-B-HL	0,95	TKVD25(-U)	2,7	KA11-TN/A	1980	40	48	107,5	12,5	35	23	6,5
KUVE25-B-SL	KWVE25-B-SL	0,63					36						
KUVE30-B-SL	KWVE30-B-SL	1,5	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	60	125,4	16	40	28	10
KUVE30-B-HL	KWVE30-B-HL	1,6					42						
KUVE35-B-SL	KWVE35-B-SL	1,7	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	70	143,4	18	50	34	10
KUVE35-B-HL	KWVE35-B-HL	2,2					48						
KUVE45-B-SL	KWVE45-B-SL	3,2	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	86	171,1	20,5	60	45	13
KUVE45-B-HL	KWVE45-B-HL	4					60						

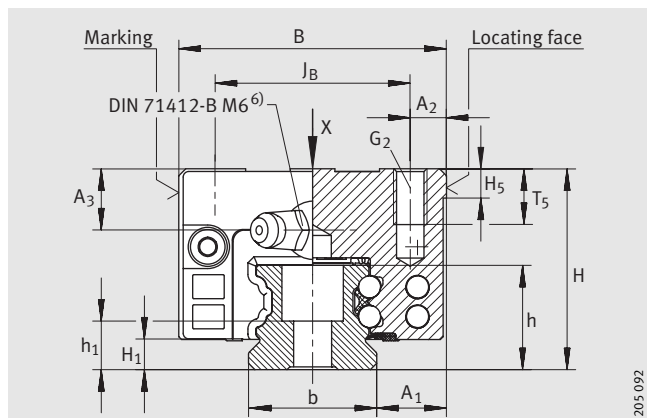
- Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- If there is a possibility of settling, the fixing screws should be secured against rotation.
- For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B-SL to DIN 71412-B M5.



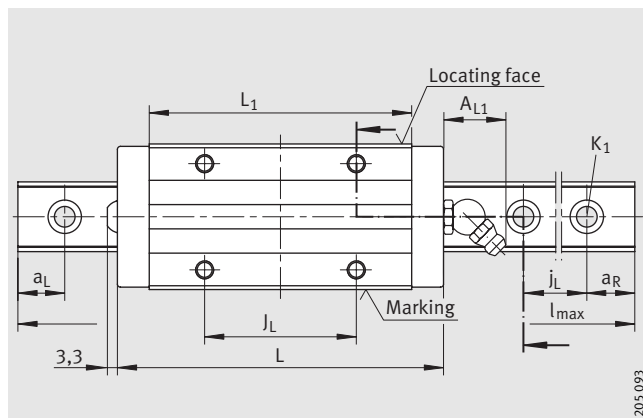
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	JL ₆
KUVE20-B-SL	4,5	4,6	13,2
KUVE25-B-HL	5,5	10,5	23,3
KUVE25-B-SL	5,5	6,5	23,3
KUVE30-B-SL	5,5	7	25,5
KUVE30-B-HL	5,5	10	25,5
KUVE35-B-SL	5,5	11	27,5
KUVE35-B-HL	5,5	18	27,5
KUVE45-B-SL	5,5	16,5	35,3
KUVE45-B-HL	5,5	26,5	35,3



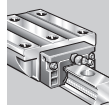
KUBE..-B(-SL)



KUBE..-B(-SL) - View X (rotated 90°)

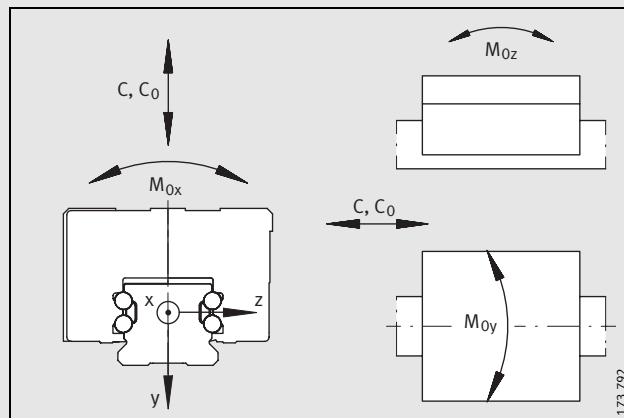
													Fixing screws ^{3) 4)}		
L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁	G ₂	K ₁
			min.	max.											
67,9	50	60	20	53	19	4,5	5,25	7,7	7,5	10	17	9,1	M6	M5	M5
86,5	50	60	20	53	19	5,1	5,25	15 11	10	12	18,7	8,7	M6	M6	M6
100	60	80	20	71	19	5,9	6,25	11,5 14,5	13,5	15	23,5	11,5	M8	M8	M8
113	72	80	20	71	19	6,7	6,75	12,3 19,3	13,5	15	27	15	M8	M8	M8
134,6	80	105	20	94	19	9,7	9,25	16,5 26,5	17	20	34,2	16,2	M12	M10	M12

KUBE..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUBE20-B-SL	16 200	36 500	452	430	430
KUBE25-B-HL	23 400	54 000	745	825	825
KUBE25-B-SL	23 400	54 000	745	825	825
KUBE30-B-SL	34 500	74 000	1310	1 240	1240
KUBE30-B-HL	34 500	74 000	1310	1 240	1240
KUBE35-B-SL	47 500	100 000	2 025	1 890	1890
KUBE35-B-HL	47 500	100 000	2 025	1 890	1890
KUBE45-B-SL	82 000	181 000	4 635	4 000	4000
KUBE45-B-HL	82 000	181 000	4 635	4 000	4000

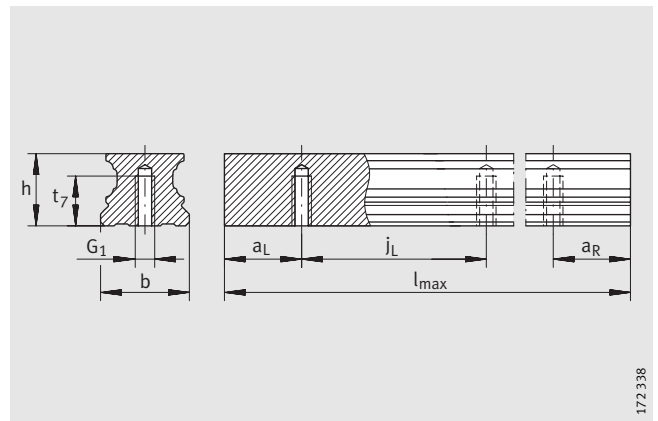


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...B-SNL



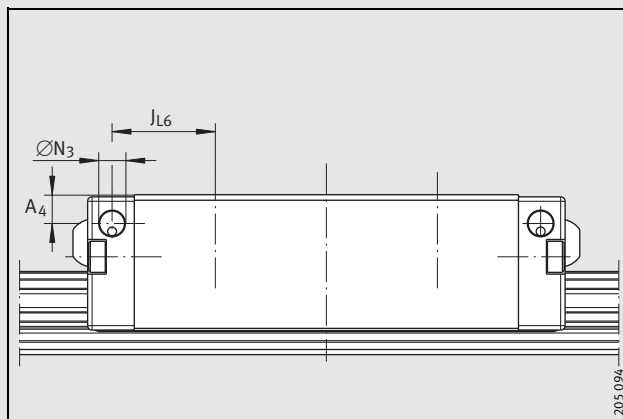
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit	Carriage		Guideway			Dimensions				Mounting dimensions			
Designation	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03	A ₂
KUVE20-B-SNL	KWVE20-B-SNL	0,38	TKVD20(-U)	2,2	KA10-TN/A	1980	27	44	87,3	12	32	20	6
KUVE25-B-SNL	KWVE25-B-SNL	0,65	TKVD25(-U)	2,7	KA11-TN/A	1980	31	48	107,5	12,5	35	23	6,5
KUVE30-B-SNL	KWVE30-B-SNL	1,1	TKVD30(-U)	4,3	KA15-TN/A	2 000	38	60	125,4	16	40	28	10
KUVE35-B-SNL	KWVE35-B-SNL	1,5	TKVD35(-U)	5,7	KA15-TN/A	2 960	44	70	143,4	18	50	34	10
KUVE45-B-SNL	KWVE45-B-SNL	2,5	TKVD45(-U)	9,2	KA24-TN/A	2 940	52	86	171,1	20,5	60	45	13

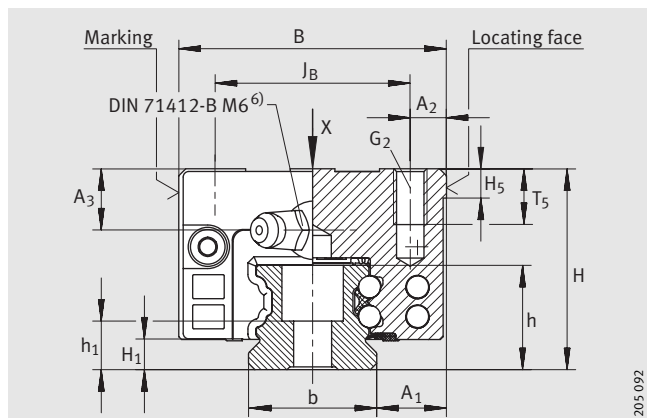
- ¹⁾ Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- ²⁾ a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- ³⁾ If there is a possibility of settling, the fixing screws should be secured against rotation.
- ⁴⁾ For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- ⁵⁾ Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- ⁶⁾ Lubrication nipple with tapered head to DIN 71 412-B M6,
except for KUVE20-B-SNL to DIN 71 412-B M5.



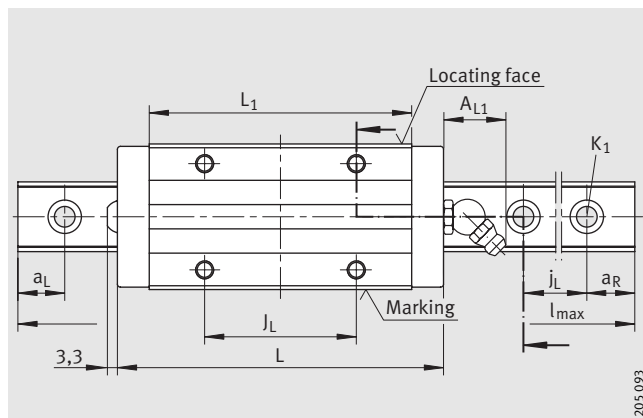
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	l _{L6}
KUVE20-B-SNL	2,6	3,3	13,2
KUVE25-B-SNL	2,6	4	22,5
KUVE30-B-SNL	4,5	5	25,1
KUVE35-B-SNL	5,5	7	27,5
KUVE45-B-SNL	5,5	8,5	35,3



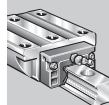
KUVE..-B(-SNL)



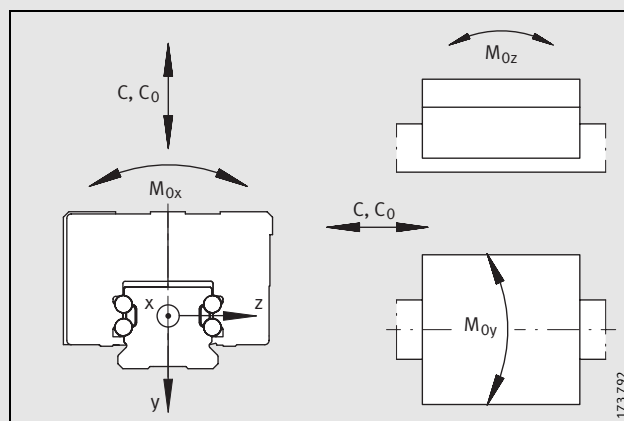
KUVE..-B(-SNL) · View X (rotated 90°)

													Fixing screws ^{3) 4)}		
L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁	G ₂	K ₁
			min.	max.											
67,9	50	60	20	53	19	4,5	5,25	4,7	7,5	10	17	9,1	M6	M5	M5
86,5	50	60	20	53	19	5,1	5,25	6	7,5	12	18,7	8,7	M6	M6	M6
100	60	80	20	71	19	5,9	6,25	7,5	11	15	23,5	11,5	M8	M8	M8
113	72	80	20	71	19	6,7	6,75	8,3	13,5	15	27	15	M8	M8	M8
134,6	80	105	20	94	19	9,7	9,25	8,5	16,5	20	34,2	16,2	M12	M10	M12

KUVE..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605") ⁵⁾						
Unit Designation	Basic load ratings		Moment ratings			
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm	
KUVE20-B-SNL	16 200	36 500	452	430	430	
KUVE25-B-SNL	23 400	54 000	745	825	825	
KUVE30-B-SNL	34 500	74 000	1310	1240	1240	
KUVE35-B-SNL	47 500	100 000	2025	1890	1890	
KUVE45-B-SNL	82 000	181 000	4 635	4 000	4000	

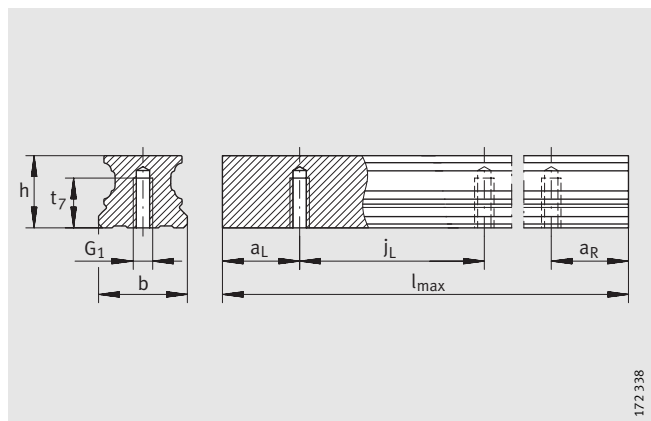


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...-B-H
KUVE...-B-SN



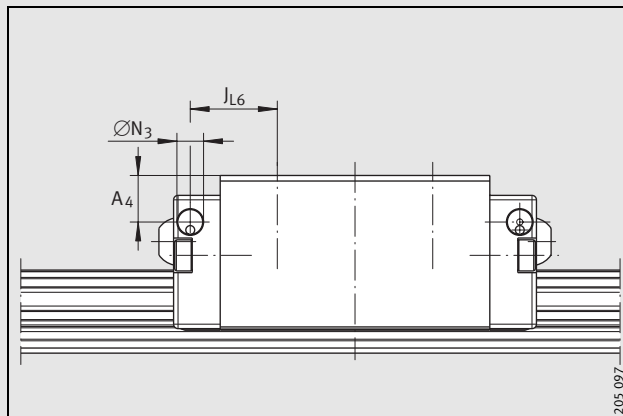
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit	Carriage		Guideway			Dimensions				Mounting dimensions		
Designation	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{\max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03
KUVE15-B-H	KWVE15-B-H	0,23	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1 200	24	34	59,6	9,5	26	15
KUVE20-B-SN	KWVE20-B-SN	0,36	TKVD20(-U)	2,2	KA10-TN/A	1 980	27	44	69,8	12	32	20
KUVE25-B-H	KWVE25-B-H	0,65	TKVD25(-U)	2,7	KA11-TN/A	1 980	40	48	81,7	12,5	35	23
KUVE25-B-SN	KWVE25-B-SN	0,45					31					
KUVE30-B-H	KWVE30-B-H	1,3	TKVD30(-U)	4,3	KA15-TN/A	2 000	45	60	97,4	16	40	28
KUVE30-B-SN	KWVE30-B-SN	0,9					38					
KUVE35-B-H	KWVE35-B-H	1,8	TKVD35(-U)	5,7	KA15-TN/A	2 960	55	70	110,4	18	50	34
KUVE35-B-SN	KWVE35-B-SN	1,3					44					
KUVE45-B-H	KWVE45-B-H	3,5	TKVD45(-U)	9,2	KA20-TN/A	2 940	70	86	139	20,5	60	45
KUVE45-B-SN	KWVE45-B-SN	2,3					52					

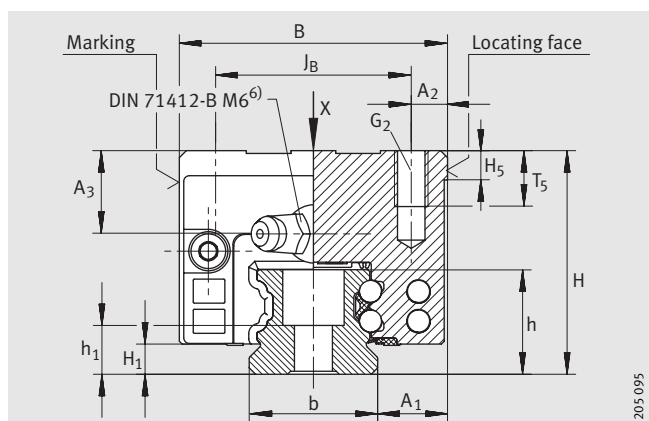
- 1) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71 412-B M6,
except for KUVE20-B-SN to DIN 71 412-B M5 and KUVE15-B-H to DIN 3 405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



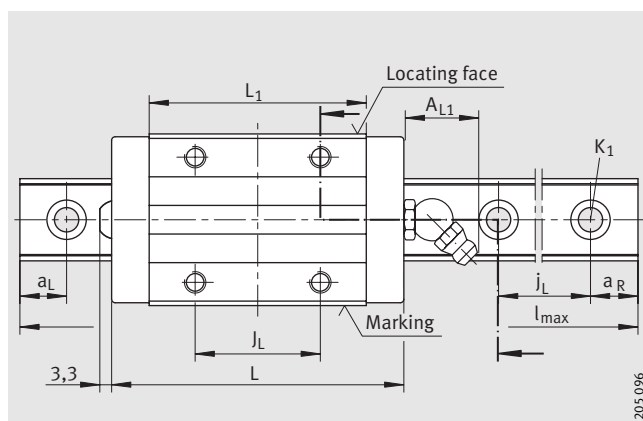
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	JL ₆
KUVE15-B-H	2,6	7,2	11,1
KUVE20-B-SN	2,6	3,3	11,4
KUVE25-B-H	5,5	10,5	17,9
KUVE25-B-SN	2,6	4	17,1
KUVE30-B-H	5,5	10	21,5
KUVE30-B-SN	4,5	5	21,1
KUVE35-B-H	5,5	18	22
KUVE35-B-SN	5,5	7	22
KUVE45-B-H	5,5	26,5	29,3
KUVE45-B-SN	5,5	8,5	29,3



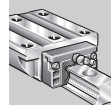
KUVE..-B(-H, -SN)



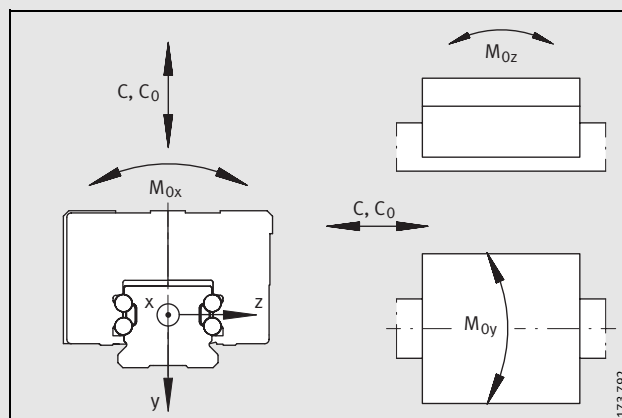
KUVE..-B(-H, -SN) · View X (rotated 90°)

														Fixing screws ^{3) 4)}		
A ₂	L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁	G ₂	K ₁
				min.	max.											
4	39,8	26	60	20	53	6,2	4,3	4,75	8	6	8	15	8,15	M5	M4	M4
6	50,4	36	60	20	53	19	4,5	5,25	5	7,5	10	17	9,1	M6	M5	M5
6,5	60,7	35	60	20	53	19	5,1	5,25	15	10	12	18,7	8,7	M6	M6	M6
10	72	40	80	20	71	19	5,9	6,25	14,5	13,5	15	23,5	11,5	M8	M8	M8
10	80	50	80	20	71	19	6,7	6,75	19,3	13,5	15	27	15	M8	M8	M8
13	102,5	60	105	20	94	19	9,7	9,25	26,5	23,5	20	34,2	16,2	M12	M10	M12

KUVE..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605") ⁵⁾					
Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE15-B-H	7 200	14 500	150	100	100
KUVE20-B-SN	13 100	27 000	332	240	240
KUVE25-B-H	17 900	37 000	510	395	395
KUVE25-B-SN	17 900	37 000	510	395	395
KUVE30-B-H	27 500	55 000	970	700	700
KUVE30-B-SN	27 500	55 000	970	700	700
KUVE35-B-H	38 000	72 000	1465	1020	1020
KUVE35-B-SN	38 000	72 000	1465	1020	1020
KUVE45-B-H	69 000	141 000	3 610	2 485	2 485
KUVE45-B-SN	69 000	141 000	3 610	2 485	2 485

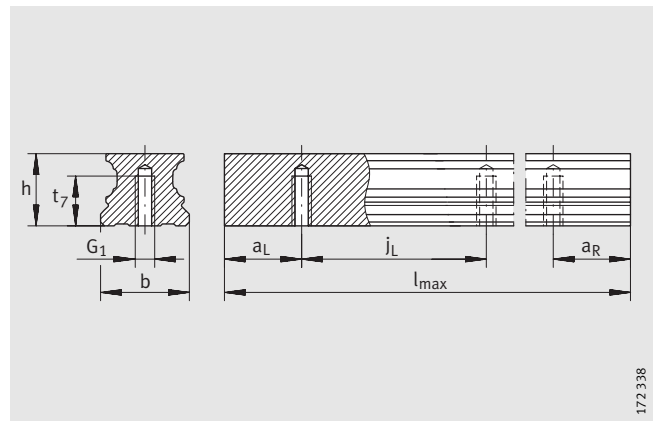


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...-B-S



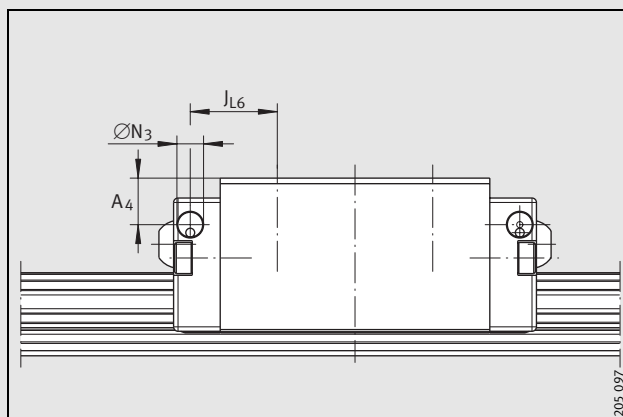
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions				Mounting dimensions		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{\max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03
KUVE15-B-S	KWVE15-B-S	0,19	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1 200	24	34	59,6	9,5	26	15
KUVE20-B-S	KWVE20-B-S	0,46	TKVD20(-U)	2,2	KA10-TN/A	1 980	27	44	69,8	12	32	20
KUVE25-B-S	KWVE25-B-S	0,56	TKVD25(-U)	2,7	KA11-TN/A	1 980	36	48	81,7	12,5	35	23
KUVE30-B-S	KWVE30-B-S	1,1	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	60	97,4	16	40	28
KUVE35-B-S	KWVE35-B-S	1,6	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	70	110,4	18	50	34
KUVE45-B-S	KWVE45-B-S	2,8	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	86	139	20,5	60	45
KUVE55-B-S	KWVE55-B-S	4,5	TKVD55-B(-U)	14	KA24-TN/A	2 520	70	100	172	23,5	75	53

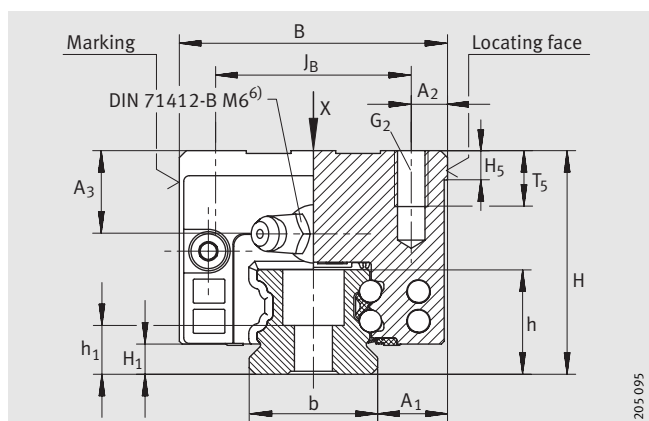
- 1) Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- 2) a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- 3) If there is a possibility of settling, the fixing screws should be secured against rotation.
- 4) For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- 5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- 6) Lubrication nipple with tapered head to DIN 71 412-B M6,
except for KUVE20-B-S to DIN 71 412-B M5 and KUVE15-B-S to DIN 3 405 M3.
- 7) The new carriages cannot be used on the existing guideways TKVD15(-U).



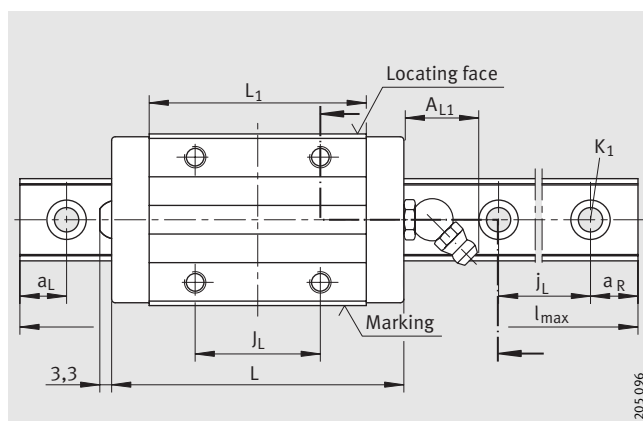
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	JL ₆
KUVE15-B-S	2,6	3,2	11,1
KUVE20-B-S	4,5	4,6	11,4
KUVE25-B-S	5,5	6,5	17,9
KUVE30-B-S	5,5	7	21,5
KUVE35-B-S	5,5	11	22
KUVE45-B-S	5,5	16,5	29,3
KUVE55-B-S	5,5	15	40,5



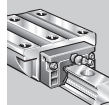
KUBE..-B-S



KUBE..-B-S · View X (rotated 90°)

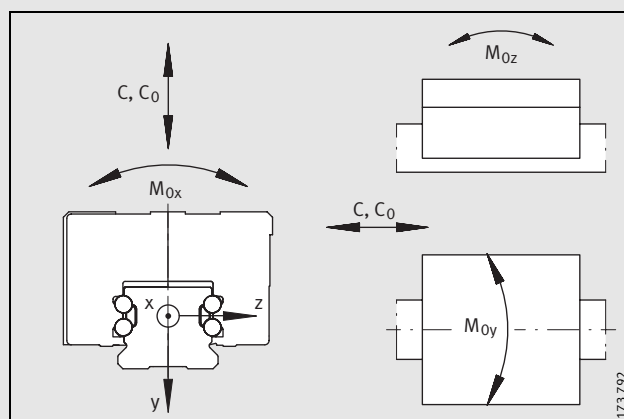
														Fixing screws ^{3) 4)}		
A ₂	L ₁	J _L	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁	G ₂	K ₁
				min.	max.											
4	39,8	26	60	20	53	6,2	4,3	4,75	4	6	8	15	8,15	M5	M4	M4
6	50,4	36	60	20	53	19	4,5	5,25	8	7,5	10	17	9,1	M6	M5	M5
6,5	60,7	35	60	20	53	19	5,1	5,25	11	10	12	18,7	8,7	M6	M6	M6
10	72	40	80	20	71	19	5,9	6,25	11,5	13,5	15	23,5	11,5	M8	M8	M8
10	80	50	80	20	71	19	6,7	6,75	12,3	13,5	15	27	15	M8	M8	M8
13	102,5	60	105	20	94	19	9,7	9,25	16,5	17	20	34,2	16,2	M12	M10	M12
12,5	132	75	120	20	107	19	13,5	11,25	15	15	22	41,5	19,6	M14	M12	M14

KUBE..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUBE15-B-S	7 200	14 500	150	100	100
KUBE20-B-S	13 100	27 000	332	240	240
KUBE25-B-S	17 900	37 000	510	395	395
KUBE30-B-S	27 500	55 000	970	700	700
KUBE35-B-S	38 000	72 000	1465	1020	1020
KUBE45-B-S	69 000	141 000	3 610	2 485	2 485
KUBE55-B-S	104 000	213 000	5 600	2 730	2 730

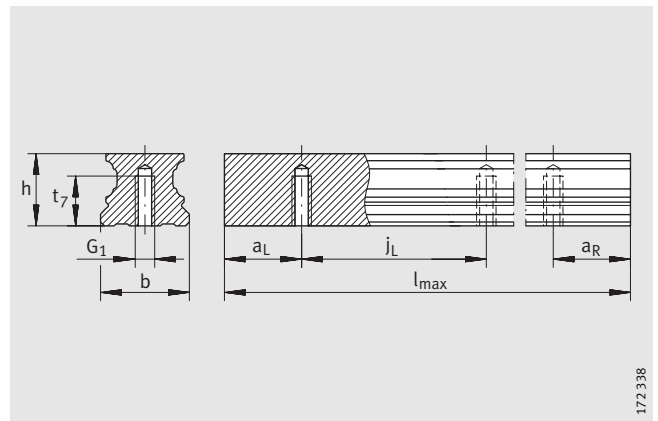


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...B-EC



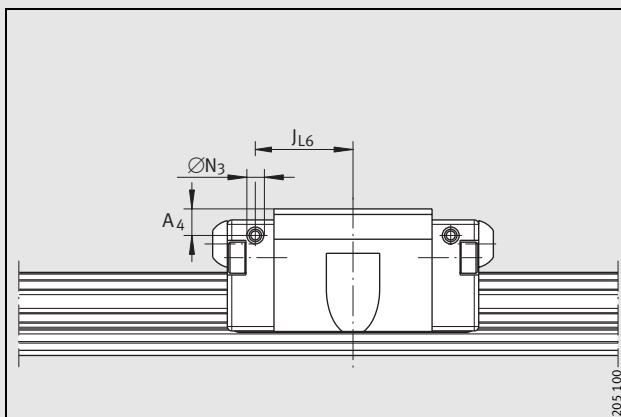
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit	Carriage		Guideway			Dimensions				Mounting dimensions		
Designation	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{\max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03
KUVE15-B-EC	KWVE15-B-EC	0,13	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1200	24	52	42,9	18,5	41	15
KUVE20-B-EC	KWVE20-B-EC	0,23	TKVD20(-U)	2,2	KA10-TN/A	1980	28	59	48,8	19,5	49	20
KUVE25-B-EC	KWVE25-B-EC	0,47	TKVD25(-U)	2,7	KA11-TN/A	1980	33	73	56,6	25	60	23
KUVE30-B-EC	KWVE30-B-EC	0,9	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	90	67,4	31	72	28
KUVE35-B-EC	KWVE35-B-EC	1,2	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	100	74,6	33	82	34
KUVE45-B-EC	KWVE45-B-EC	2,3	TKVD45(-U)	9,2	KA20-TN/A	2940	60	120	96,2	37,5	100	45

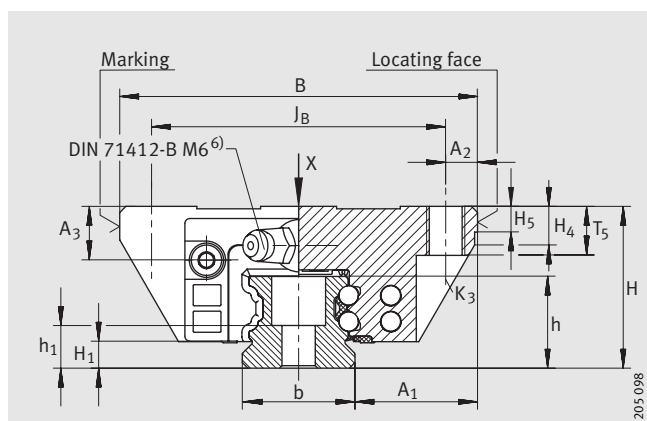
- ¹⁾ Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- ²⁾ a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- ³⁾ If there is a possibility of settling, the fixing screws should be secured against rotation.
- ⁴⁾ For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- ⁵⁾ Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- ⁶⁾ Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B-EC to DIN 71412-B M5 and KUVE15-B-EC to DIN 3 405 M3.
- ⁷⁾ The new carriages cannot be used on the existing guideways TKVD15(-U).



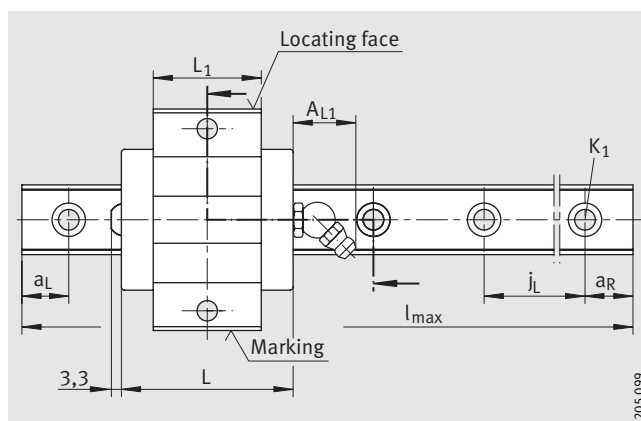
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	$\varnothing N_3$	A ₄	J _{L6}
KUVE15-B-EC	2,6	3,2	15,8
KUVE20-B-EC	2,6	4,3	18,9
KUVE25-B-EC	2,6	6	22
KUVE30-B-EC	5,5	7	26,5
KUVE35-B-EC	5,5	11	29,1
KUVE45-B-EC	5,5	16,5	37,9



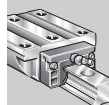
KUVE...-B-EC



KUVE...-B-EC · View X (rotated 90°)

														Fixing screws ^{3) 4)}		
A ₂	L ₁	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₄	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁ DIN ISO 4 762-12.9	K ₁	K ₃
			min.	max.												
5,5	23,1	60	20	53	6,2	4,3	6,1	4,75	4,3	7	8	15	8,15	M5	M4	M4
5	29,4	60	20	53	19	4,5	11,2	5,25	5,7	9	10	17	9,1	M6	M5	M5
6,5	35,6	60	20	53	19	5,1	7,85	5,25	8	10	12	18,7	8,7	M6	M6	M6
9	42	80	20	71	19	5,9	13,8	6,25	11,5	12	15	23,5	11,5	M8	M8	M8
9	44,2	80	20	71	19	6,7	14,3	6,75	12,3	13	15	27	15	M8	M8	M8
10	59,7	105	20	94	19	9,7	19,9	9,25	16,5	15	20	34,2	16,2	M12	M12	M10

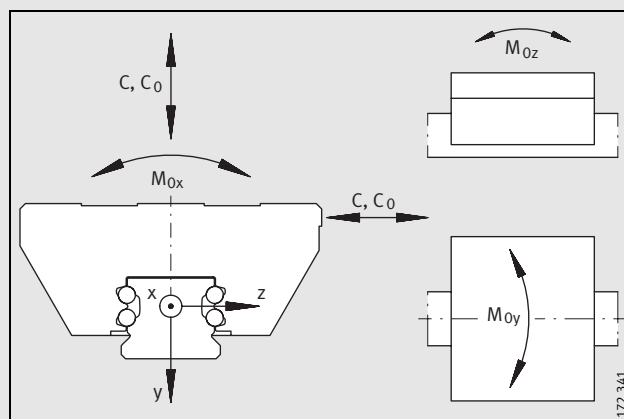
KUVE...-B



Load carrying capacity

(for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE15-B-EC	4 900	8 300	86	35	35
KUVE20-B-EC	8 900	15 400	190	85	85
KUVE25-B-EC	12 500	22 200	305	155	155
KUVE30-B-EC	18 700	31 500	554	248	248
KUVE35-B-EC	24 600	39 000	790	330	330
KUVE45-B-EC	46 500	80 000	2 060	883	883

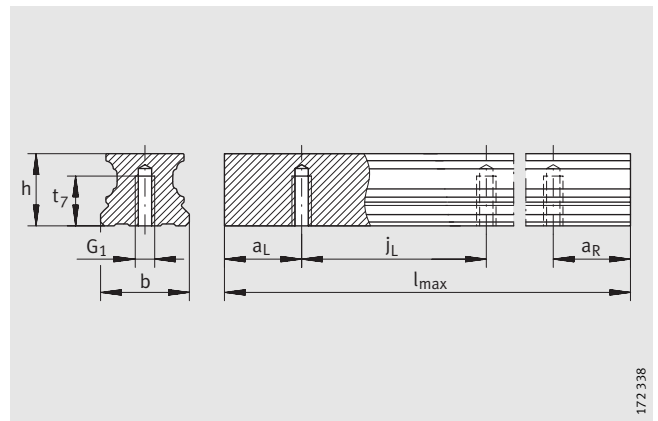


Load directions

Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE...B-ESC



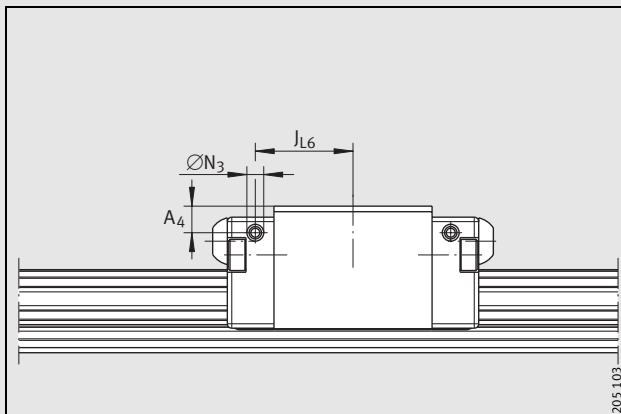
TKVD...-U

172 338

Dimension table · Dimensions in mm

Unit Designation	Carriage		Guideway			Dimensions				Mounting dimensions		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	Closing plug K ₂	$l_{max}^{1)}$	H	B	L	A ₁	J _B	b -0,005 -0,03
KUVE15-B-ESC	KWVE15-B-ESC	0,17	TKVD15-B(-U) ⁷⁾	1,44	KA07-TN/A	1 200	24	34	42,9	9,5	26	15
KUVE20-B-ESC	KWVE20-B-ESC	0,28	TKVD20(-U)	2,2	KA10-TN/A	1 980	28	42	48,8	11	32	20
KUVE25-B-ESC	KWVE25-B-ESC	0,35	TKVD25(-U)	2,7	KA11-TN/A	1 980	33	48	56,6	12,5	35	23
KUVE30-B-ESC	KWVE30-B-ESC	0,7	TKVD30(-U)	4,3	KA15-TN/A	2 000	42	60	67,4	16	40	28
KUVE35-B-ESC	KWVE35-B-ESC	0,9	TKVD35(-U)	5,7	KA15-TN/A	2 960	48	70	74,6	18	50	34
KUVE45-B-ESC	KWVE45-B-ESC	1,8	TKVD45(-U)	9,2	KA20-TN/A	2 940	60	86	96,2	20,5	60	45

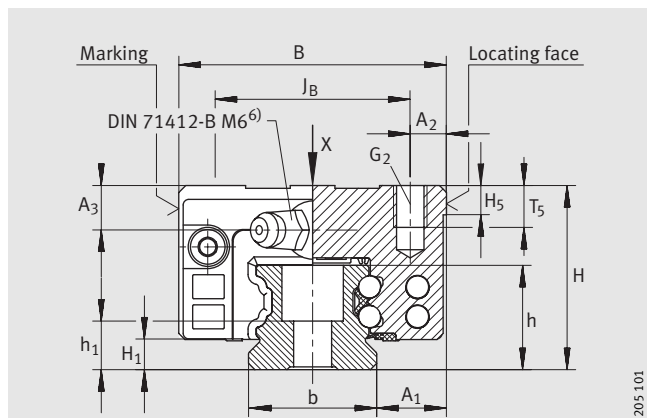
- ¹⁾ Maximum length of single-piece guideways;
longer guideways are supplied in several sections and are marked accordingly.
Maximum single-piece guideway length of 6 m by agreement.
- ²⁾ a_L and a_R are dependent on the guideway length, *Calculation*, page 47.
- ³⁾ If there is a possibility of settling, the fixing screws should be secured against rotation.
- ⁴⁾ For information on fixing screws see *INA Catalogue "605", Fixing screws*.
- ⁵⁾ Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.
- ⁶⁾ Lubrication nipple with tapered head to DIN 71 412-B M6,
except for KUVE20-B-ESC to DIN 71 412-B M5 and KUVE15-B-ESC to DIN 3 405 M3.
- ⁷⁾ The new carriages cannot be used on the existing guideways TKVD15(-U).



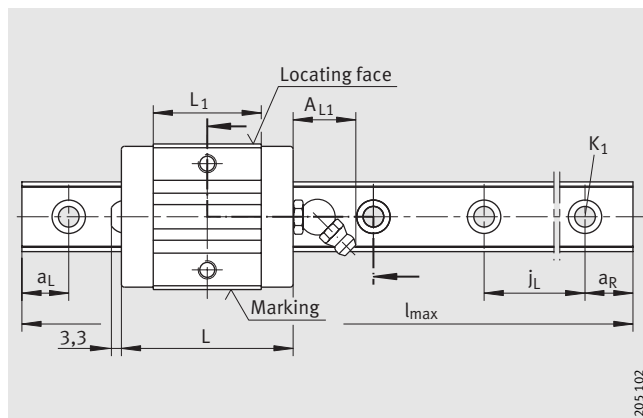
Lateral lubrication connector

Dimensioning of lateral lubrication connector

Designation	ØN ₃	A ₄	JL ₆
KUVE15-B-ESC	2,6	3,2	15,8
KUVE20-B-ESC	2,6	4,3	18,9
KUVE25-B-ESC	2,6	6	22
KUVE30-B-ESC	5,5	7	26,5
KUVE35-B-ESC	5,5	11	29,1
KUVE45-B-ESC	5,5	16,5	37,9



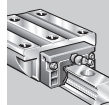
KUV..-B-ESC



KUV..-B-ESC · View X (rotated 90°)

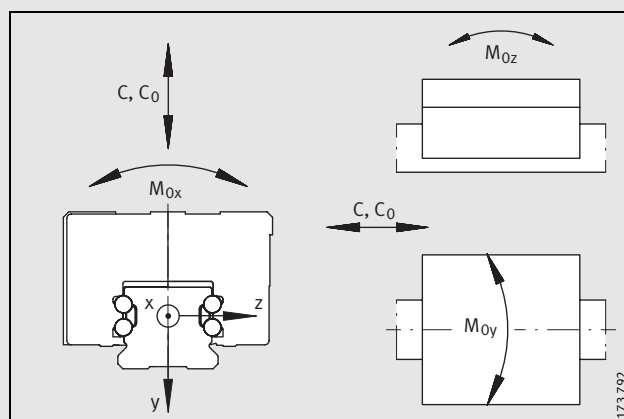
													Fixing screws ^{3) 4)}		
A ₂	L ₁	j _L	a _L /a _R ²⁾		A _{L1}	H ₁	H ₅	A ₃	T ₅	t ₇	h	h ₁	G ₁	G ₂	K ₁
			min.	max.											
5,4	23,1	60	20	53	6,2	4,3	4,75	4,3	6	8	15	8,15	M5	M4	M4
5	29,4	60	20	53	19	4,5	5,25	6	7,5	10	17	9,1	M6	M5	M5
6,5	35,6	60	20	53	19	5,1	5,25	8	10	12	18,7	8,7	M6	M6	M6
10	42	80	20	71	19	5,9	6,25	11,5	13,5	15	23,5	11,5	M8	M8	M8
10	44,2	80	20	71	19	6,7	6,75	12,3	13,5	15	27	15	M8	M8	M8
13	59,7	105	20	94	19	9,7	9,25	16,5	17	20	34,2	16,2	M12	M10	M12

KUV..-B



Load carrying capacity (for definition of basic load ratings, see INA Catalogue "605")⁵⁾

Unit Designation	Basic load ratings		Moment ratings		
	C N	C ₀ N	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE15-B-ESC	4 900	8 300	86	35	35
KUVE20-B-ESC	8 900	15 400	190	85	85
KUVE25-B-ESC	12 500	22 200	305	155	155
KUVE30-B-ESC	18 700	31 500	554	248	248
KUVE35-B-ESC	24 600	39 000	790	330	330
KUVE45-B-ESC	46 500	80 000	2 060	883	883



Load directions

Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers or full complement



Preload

Linear recirculating ball guidance systems KUV...B(-KT) are available in the preload classes in Table 1.

The preload class is determined by the carriage.

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 classes

Preload class	Preload setting	Suitable applications
V1 ²⁾	$0,04 \cdot C^{(1)}$	■ moderate loads ■ high rigidity ■ moment loads
V2	$0,1 \cdot C^{(1)}$	■ high alternating loads ■ particularly high rigidity ■ moment loads

¹⁾ C is the basic dynamic load rating of the linear recirculating ball bearing and guideway assembly according to the *dimension table*.

²⁾ Standard preload class.



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:

■ $\mu_{KUV} = 0,0007$ to $0,0015$.



Accuracy

Accuracy classes of linear recirculating ball bearing and guideway assemblies

Four-row linear recirculating ball bearing and guideway assemblies are available in accuracy classes G1 to G4, *Figure 1*.

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 A₁ (Table 2) should always remain within the tolerance irrespective of the position of the carriage on the guideway.

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

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	
		G1 μm	G2 μm	G3 ⁴⁾ μm	G4 μm	RRF ²⁾ μm	RRFT ³⁾ μm
Height tolerance	H	± 10	± 20	± 25	± 80	+6	+3
Height difference ¹⁾	ΔH	5	10	15	20	+3	0
Distance tolerance	A ₁	± 10	± 15	± 20	± 80	+3	+3
Difference in distance ¹⁾	ΔA ₁	5	15	22	30	+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.

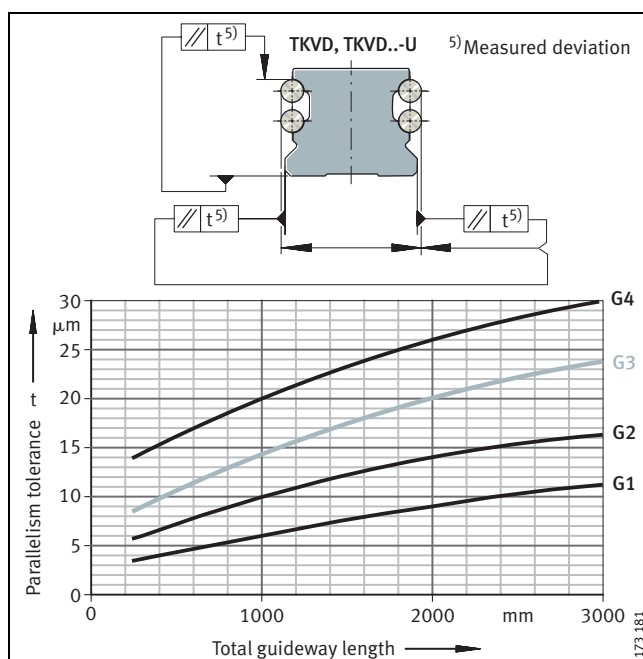


Figure 1 · Accuracy classes and parallelism tolerances of guideways

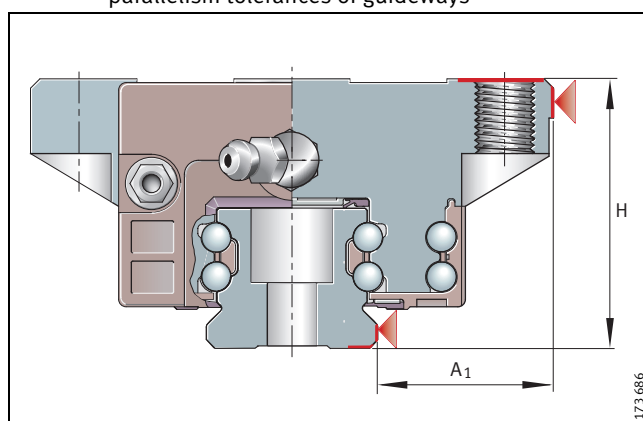
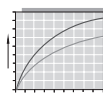


Figure 2 · Reference dimensions for accuracy



**Four-row linear recirculating ball bearing
and guideway assemblies**
with quad spacers or full complement

Parallelism of raceways to locating surfaces

The parallelism tolerances of the guideways are shown in *Figure 1*.

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.

Table 3 · Length tolerances of guideways

Four-row linear ball bearing and guideway assembly	Tolerances of guideways, as a function of the length $l_{\max}^{1)}$			Multi-piece guideways
	$l_{\max}$			
Designation	$\leq 1\,000\text{ mm}$	$>1\,000\text{ mm}$ $<3\,000\text{ mm}$	$>3\,000\text{ mm}$	
KUVE...B(-KT)	-1 mm	-1,5 mm	$\pm 0,1\%$ of guideway length	$\pm 3\text{ mm}$ over whole length

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

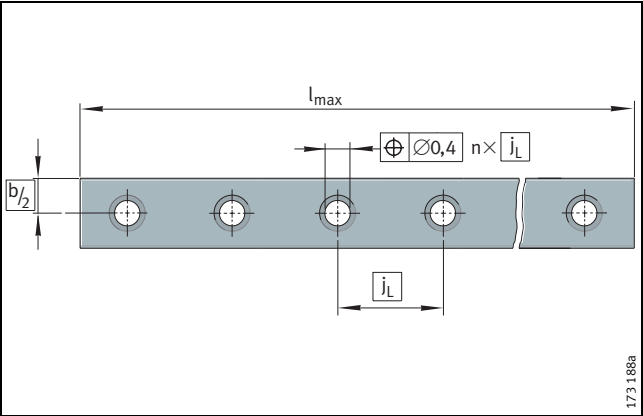


Figure 3 · Positional and length tolerances of guideways – hole pattern to ISO 1101

Hole pattern of guideways

Unless specified otherwise, the guideways have a symmetrical hole pattern.

An asymmetrical hole pattern may be available at customer request.

The following must be adhered to:

■ $a_L \geq a_{L \min}$ and $a_R \geq a_{R \min}$, *Figure 4*.

Maximum number of pitches between holes

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

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

The distances a_L and a_R are 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*.

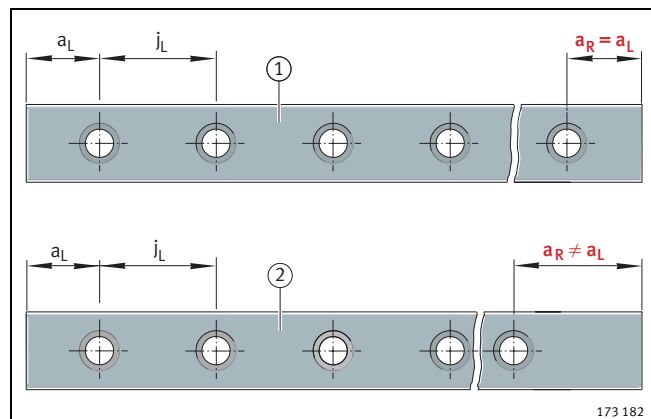


Figure 4 · Symmetrical ① and asymmetrical ② hole patterns for guideways with one row of holes

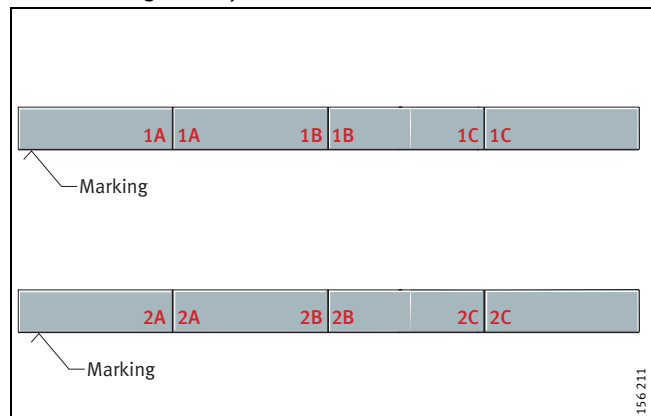


Figure 5 · Marking of multi-piece guideways



Four-row linear recirculating ball bearing and guideway assemblies with quad spacers or full complement



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 $R_a 1,6$.



- 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 dependent on preload class (*Table 4*)

b mm
Centre distance between guidance elements.

Table 4 · Factor a – dependent on preload class

Preload class V	Factor a
V1 ¹⁾	0,2
V2	0,1

¹⁾ Standard preload class.

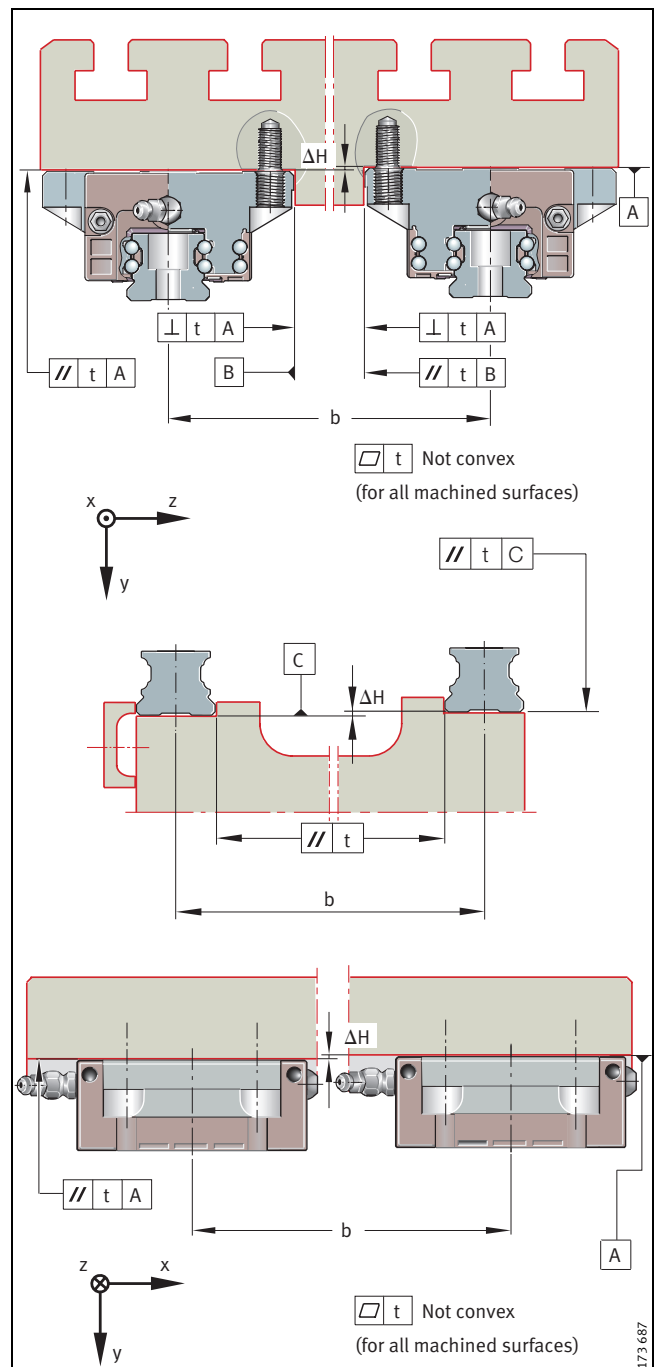


Figure 6 · Tolerances of mounting surfaces and parallelism of mounted guideways

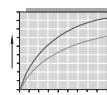
Parallelism of mounted guideways

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	
	V1	V2
	Parallelism tolerance	
	t μm	t μm
TKVD15-B(-U)	8	5
TKVD20(-U)	9	6
TKVD25(-U)	11	7
TKVD30(-U)	13	8
TKVD35(-U)	15	10
TKVD45(-U)	17	12
TKVD55-B(-U)	20	14



Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers or full complement

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

Linear recirculating ball bearing and guideway assembly Designation	h_1	h_2 max.	r_1 max.	r_2 max.
KUVE15-B (-H, -S, -EC, -ESC)	4,5	3,5	1	0,5
KUVE15-B-KT (-L, -H, -HL, -S, -SL)	4,5	3,5	1	0,5
KUVE20-B (-L, -S, -SL, -SN, -SNL, -N, -NL, -EC, -ESC)	5	4	1	0,5
KUVE20-B-KT (-L, -S, -SL)	5	4	1	0,5
KUVE25-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -EC, -ESC)	5	4,5	1	0,8
KUVE25-B-KT (-L, -H, -HL, -S, -SL, -W, -WL)	5	4,5	1	0,8
KUVE30-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -EC, -ESC)	6	5	1	0,8
KUVE30-B-KT (-L, -H, -HL, -S, -SL)	6	5	1	0,8
KUVE35-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -EC, -ESC)	6,5	6	1	0,8
KUVE35-B-KT (-L, -H, -HL, -S, -SL)	6,5	6	1	0,8
KUVE45-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -EC, -ESC)	9	8	1	1
KUVE45-B-KT (-L, -H, -HL, -S, -SL)	9	8	1	1
KUVE55-B (-L, -S, -SL)	12	10	1	1,5
KUVE55-B-KT (-L, -S, -SL)	12	10	1	1,5

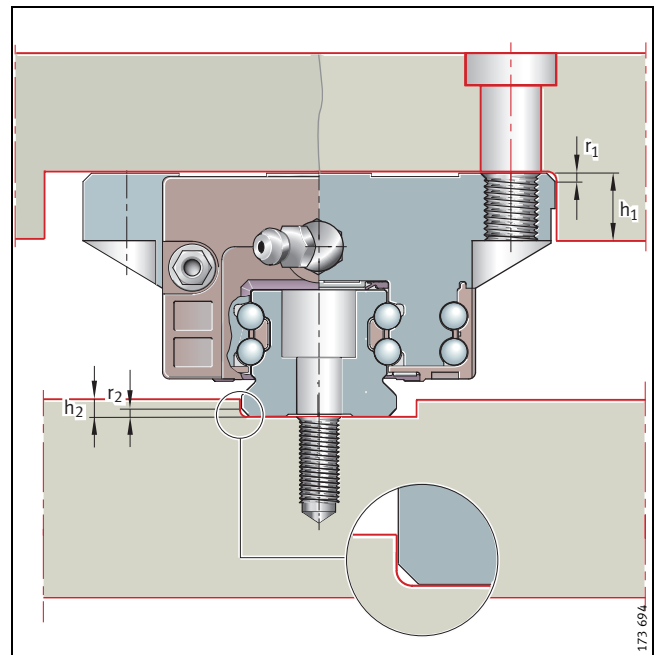


Figure 7 · Locating heights and corner radii

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