POWRÓT DO STRONY GŁÓWNEJ

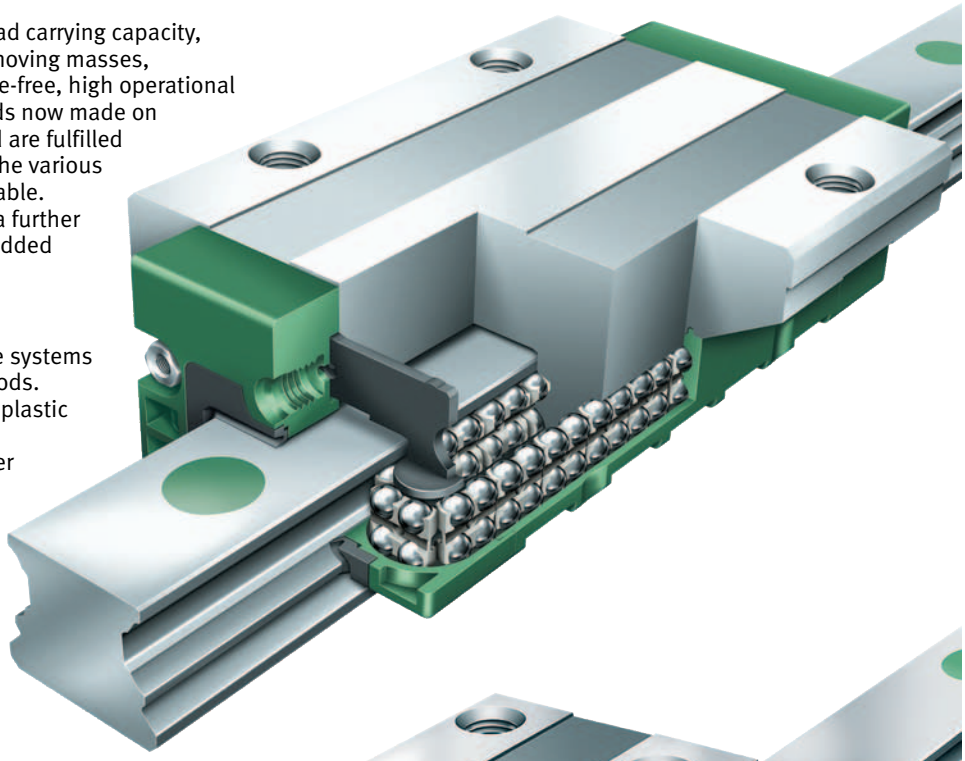
# Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers or full complement

X-life

*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 race-way. 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.

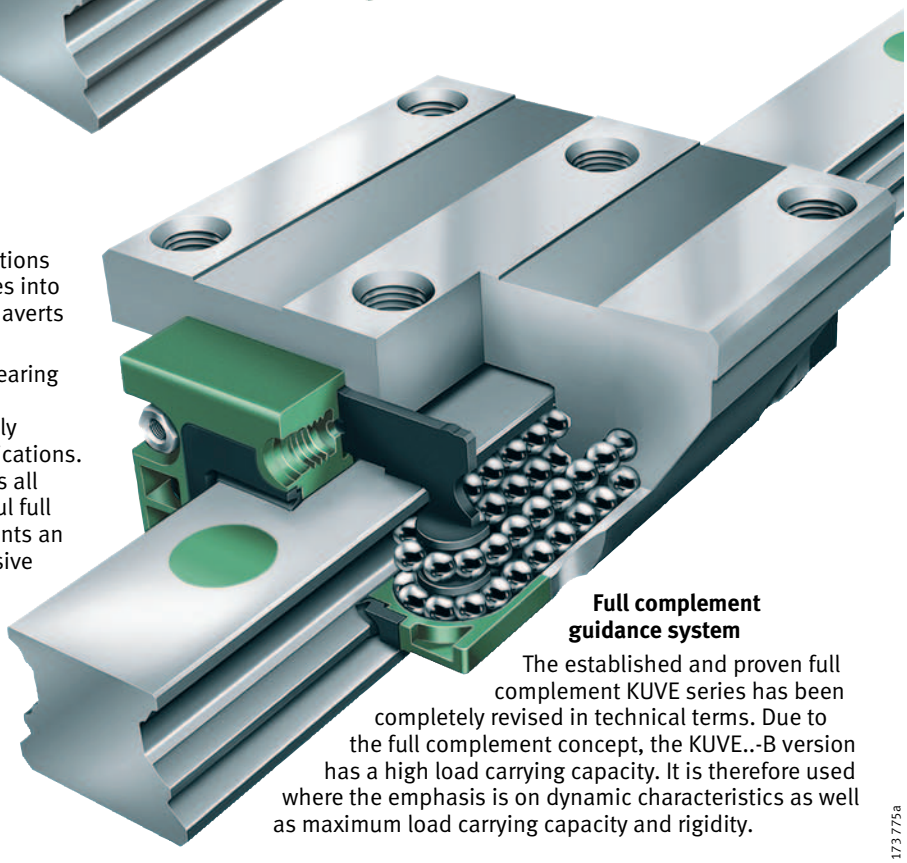
Since the quad spacers are not connected chain elements, bending and tensile stresses are eliminated, particularly in the return area.

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 KUVE..-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 KUVE 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 KUVE..-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 KUVE series has been completely revised in technical terms. Due to the full complement concept, the KUVE..-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


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## Features

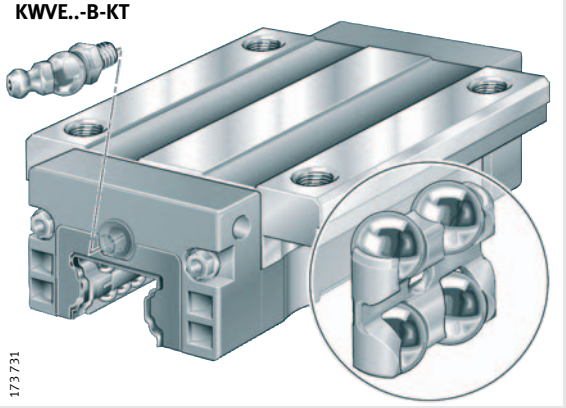
**Four-row linear recirculating ball bearing and guideway assemblies**

- 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 m/min[1)]
  - operating temperatures from –10 °C to +100 °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 m/min, please consult us.

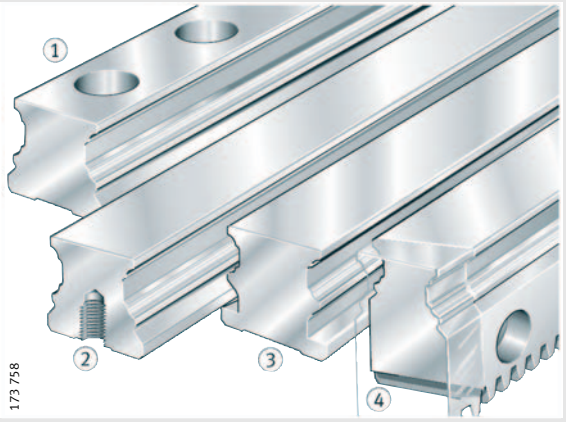
### Carriage

**KWVE..-B-KT**

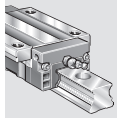



- saddle plate with hardened and precision ground rolling element raceways
  - balls are recirculated in enclosed channels with plastic return elements
- carriage sealed by elastic end wipers and sealing strips
- a lubrication nipple for the end face is included

### Guideways

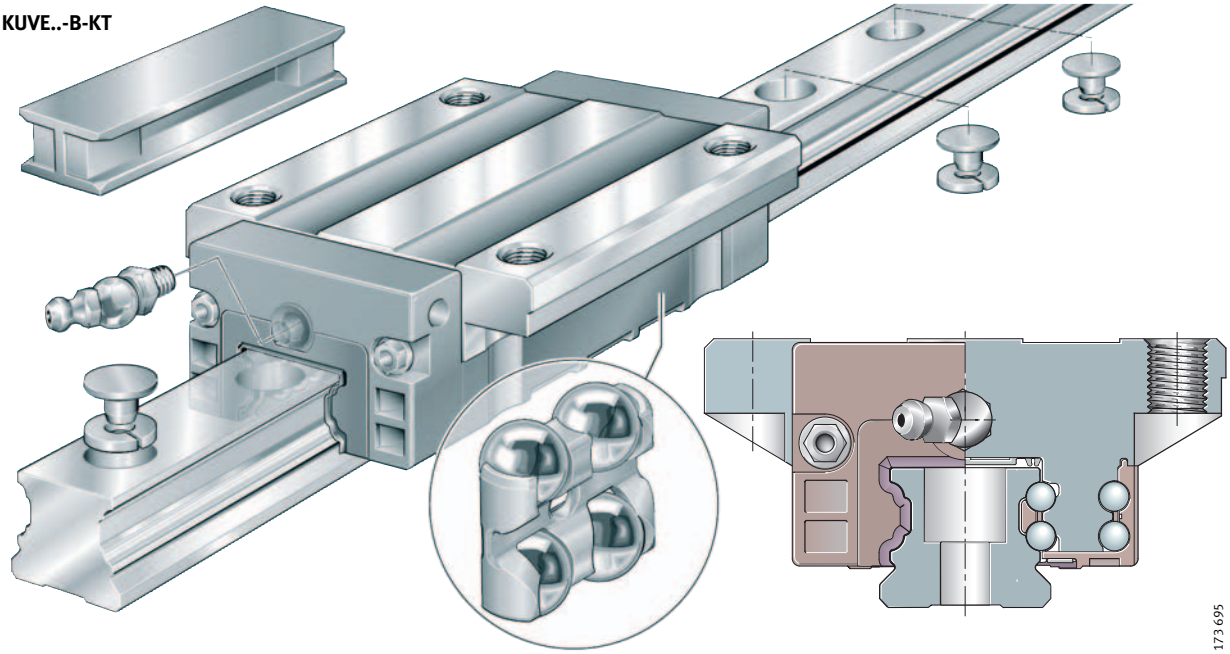



- hardened steel, all surfaces ground
  - precision ground raceways for rolling elements
- TKVD: located from above ①
- TKVD..-U: located from below ②
- TKVD..-K: for clamping lugs and clamping strips ③
- TKVD..-ZHP: with helical teeth ④



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

**KUVE..-B-KT**



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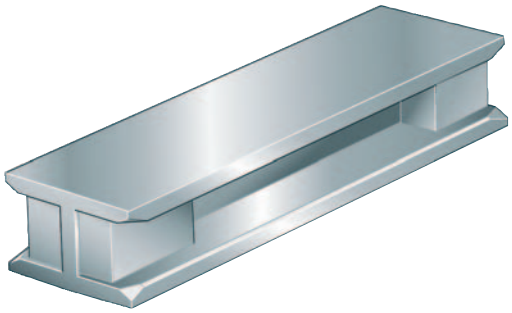
## Standard accessories

**MKVD**



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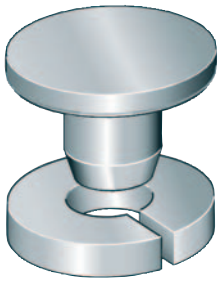
- plastic dummy guideways
  – prevent damage to the rolling element set while the carriage is separated from the guideway. The carriage is always pushed direct from the guideway onto the dummy guideway

**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 KUVE guidance systems using standard elements.

### Corrosion-resistant designs

KUVE..-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.

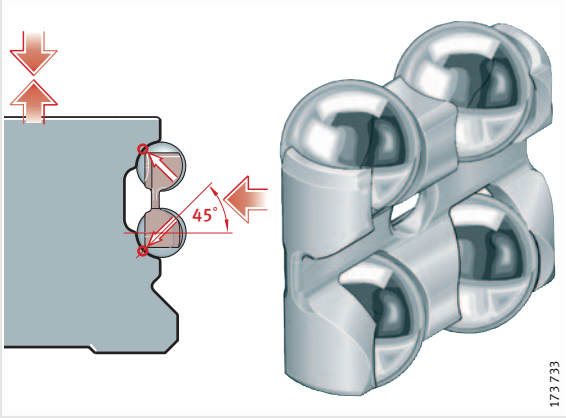
### Lubricant reservoir, sealing

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.

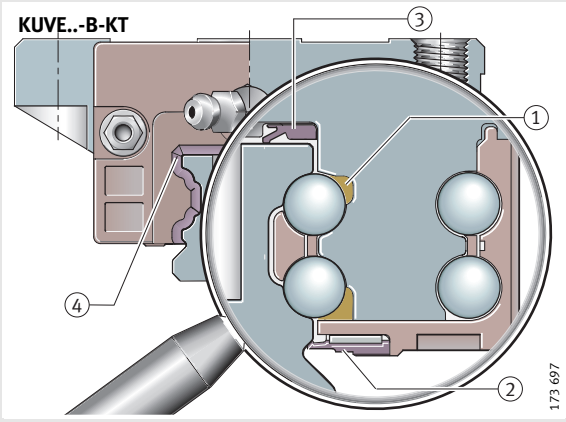
These sealing elements protect the rolling element system from contamination even under demanding environmental conditions.

### Contact angle, quad spacers

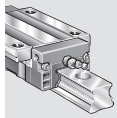


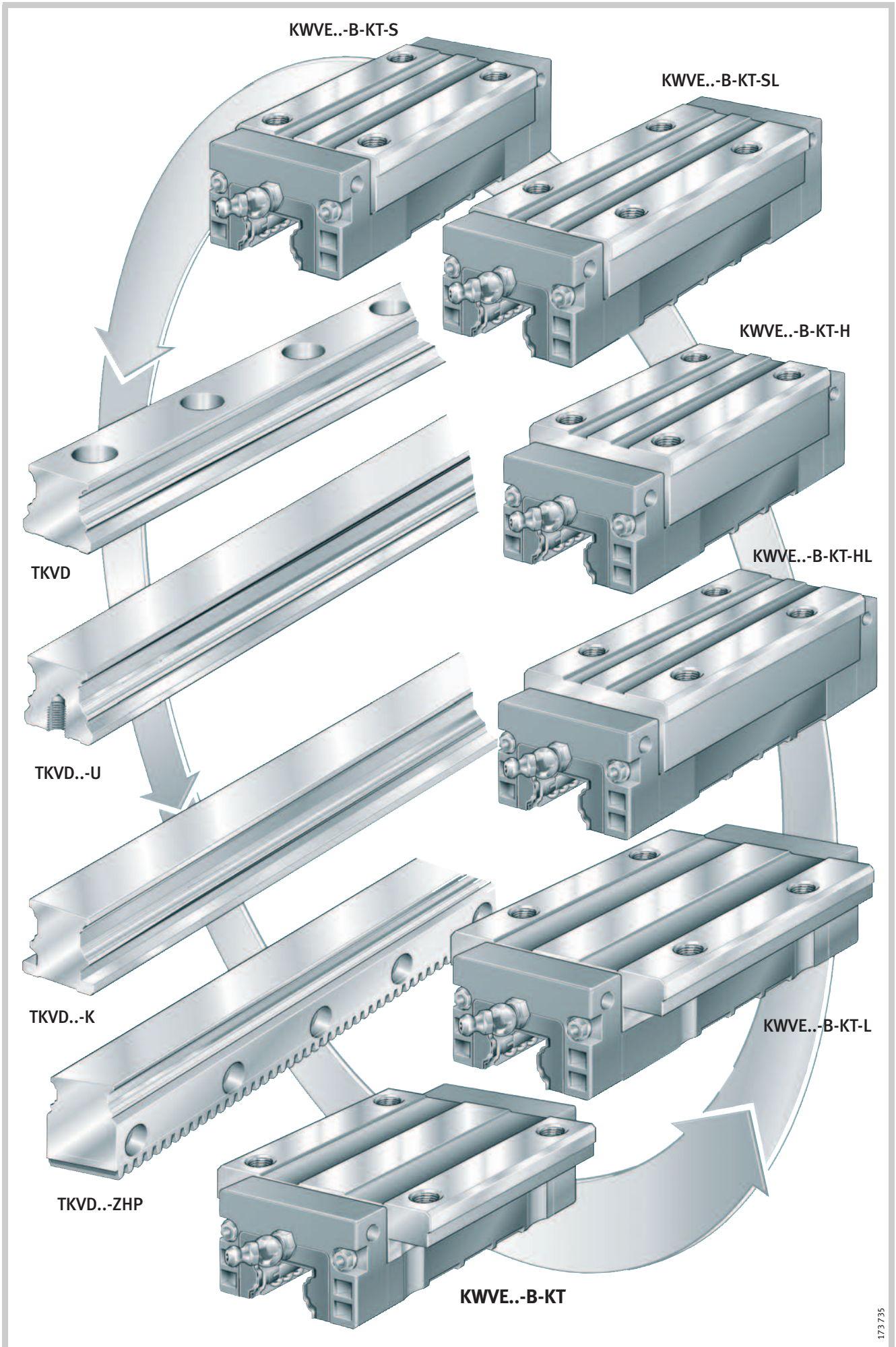

- quad spacers (plastic spacer elements)
- contact angles of the four rows of balls
- rows of balls in two point contact with raceways

### 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-KT-S
KWVE..-B-KT-SL
KWVE..-B-KT-H
TKVD
KWVE..-B-KT-HL
TKVD..-U
TKVD..-K
KWVE..-B-KT-L
TKVD..-ZHP
KWVE..-B-KT
173735

## Ordering example and ordering designation

**Ordering example 1**

**Linear recirculating ball bearing and guideway assembly KUVE..-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 |

**Ordering designation:**

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

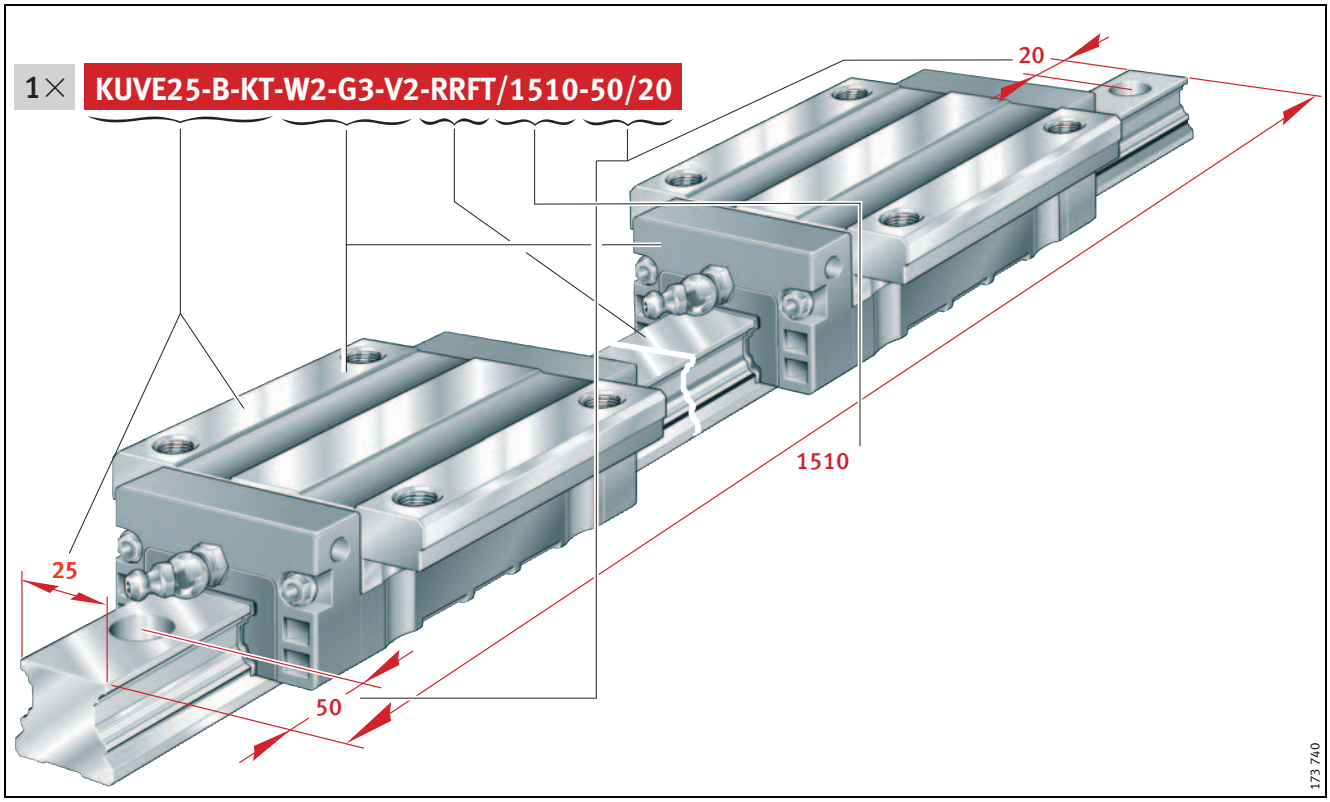
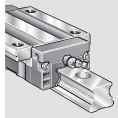



*Figure 1* · Ordering example, ordering designation



**Ordering example 2**

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

**Carriage**

| | |
|---|---|
| Carriage | KWVE |
| Size | 25 |
| Version with plastic spacer elements | B-KT |
| Carriage variant | L |
| Accuracy class | G3 |
| Carriage preload | V2 |

**Ordering designation:**

2 × **KWVE25-B-KT-L-G3-V2,** *Figure 2*.

**Guideway**

| | |
|---|---|
| Guideway for carriage | TKVD |
| Size | 25 |
| Guideway length | 1 570 mm |
| – $a_L$ | 35 mm |
| – $a_R$ | 35 mm |

**Ordering designation:**

1 × **TKVD25/1 570-35/35,** *Figure 2*.

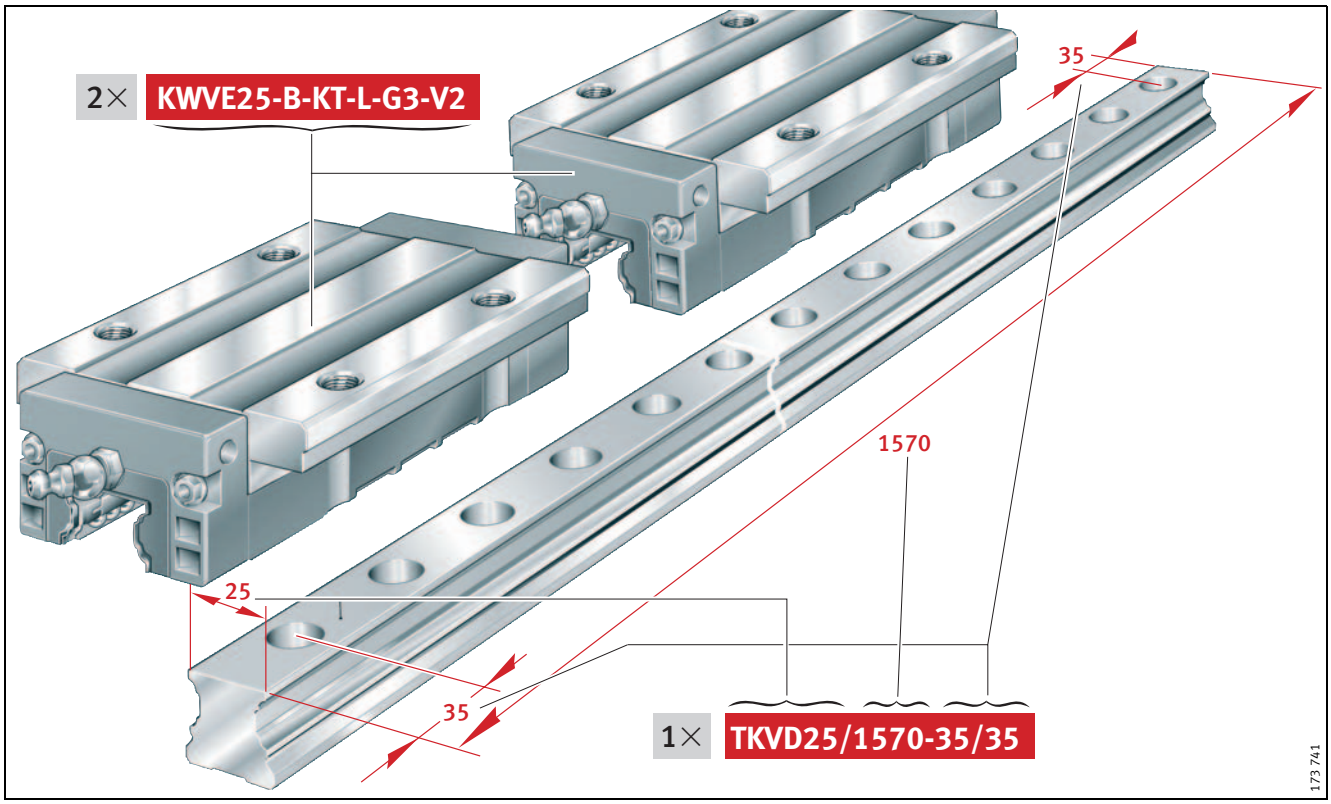
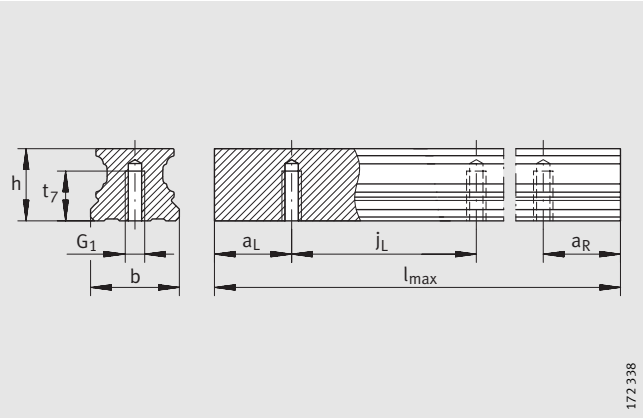



*Figure 2* · Ordering example, ordering designation

# Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE..-B-KT




TKVD..-U

**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 | 1 200 | 24 | 47 | 59,6 |
| **KUVE20-B-KT** | KWVE20-B-KT | 0,38 | TKVD20(-U) | 2,2 | KA10-TN/A | 1 980 | 30 | 63 | 69,8 |
| **KUVE25-B-KT** | KWVE25-B-KT | 0,5 | TKVD25(-U) | 2,7 | KA11-TN/A | 1 980 | 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.

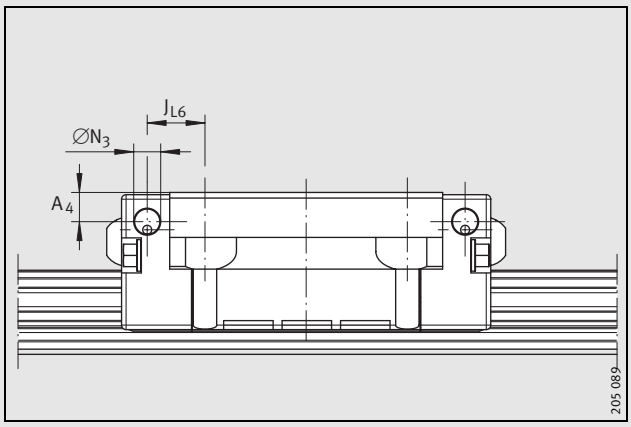
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 71412-B M6,
except for KUVE20-B-KT to DIN 71412-B M5 and KUVE15-B-KT to DIN 3405 M3.

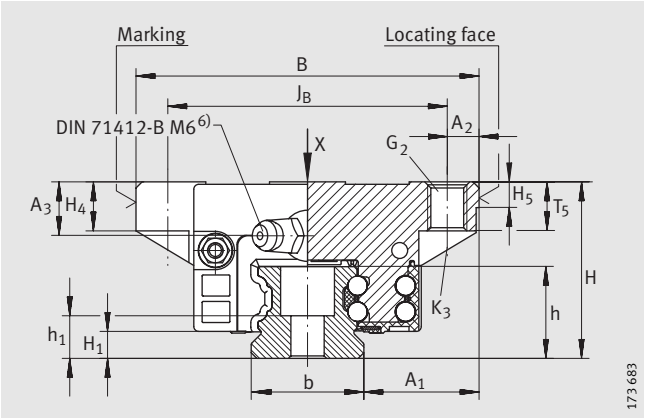
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



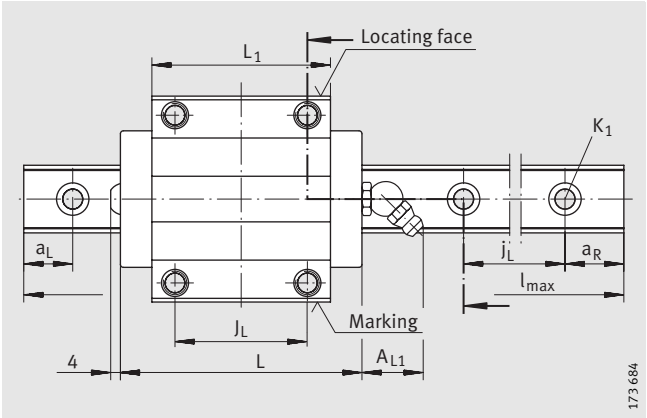

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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 |




KUVE..-B-KT

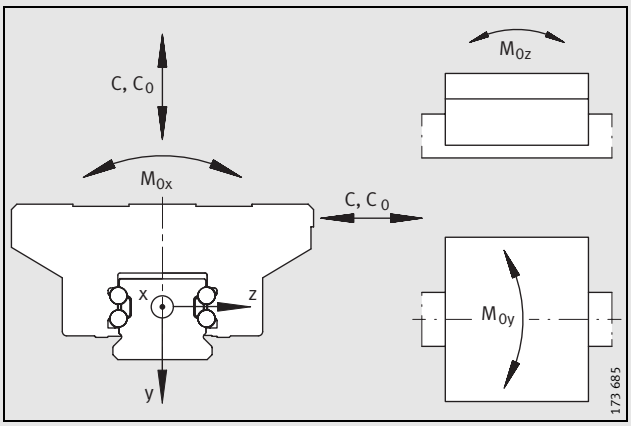



KUVE..-B-KT · View X (rotated 90°)

| 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) | | $A_{L1}$ | $H_1$ | $H_4$ | $H_5$ | $A_3$ | $T_5$ | $t_7$ | h | $h_1$ | $G_1$ | $G_2$ | $K_1$ | $K_3$ |
| | | | | | | | min. | max. | | | | | | | | | | DIN ISO 4 762-12.9 | | | |
| 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 |
| **KUVE15-B-KT** | 6 100 | 11 400 | 105 | 74 | 53 |
| **KUVE20-B-KT** | 11 800 | 23 000 | 276 | 205 | 205 |
| **KUVE25-B-KT** | 16 200 | 32 000 | 430 | 330 | 335 |
| **KUVE30-B-KT** | 26 500 | 51 000 | 890 | 670 | 670 |
| **KUVE35-B-KT** | 36 000 | 67 000 | 1 340 | 995 | 995 |
| **KUVE45-B-KT** | 65 000 | 130 000 | 3 600 | 2 610 | 2 610 |
| **KUVE55-B-KT** | 99 000 | 199 000 | 6 730 | 4 750 | 4 750 |

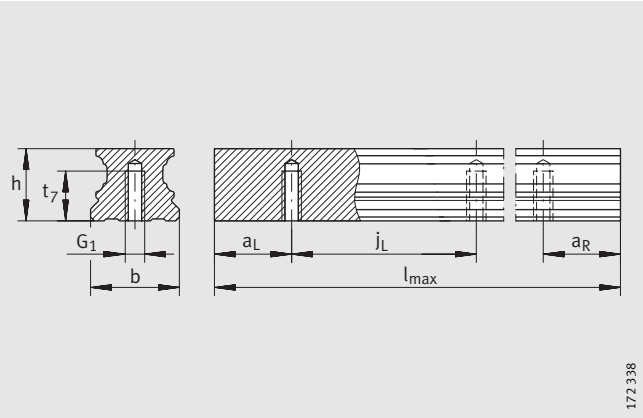



Load directions

# 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 | 1 200 | 24 | 47 | 73 |
| **KUVE20-B-KT-L** | KWVE20-B-KT-L | 0,5 | TKVD20(-U) | 2,2 | KA10-TN/A | 1 980 | 30 | 63 | 87,3 |
| **KUVE25-B-KT-L** | KWVE25-B-KT-L | 0,62 | TKVD25(-U) | 2,7 | KA11-TN/A | 1 980 | 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.

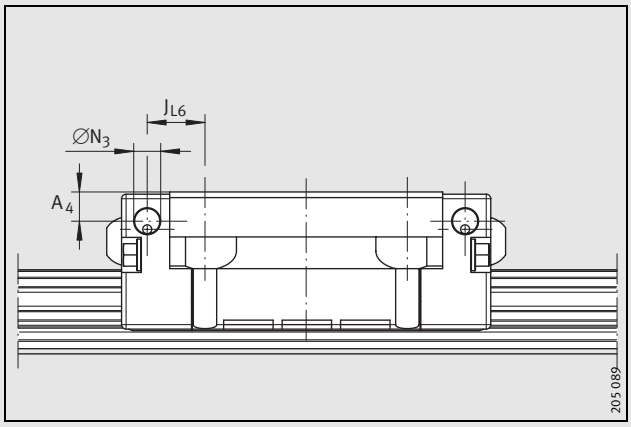
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 71412-B M6,
except for KUVE20-B-KT-L to DIN 71412-B M5 and KUVE15-B-KT-L to DIN 3405 M3.

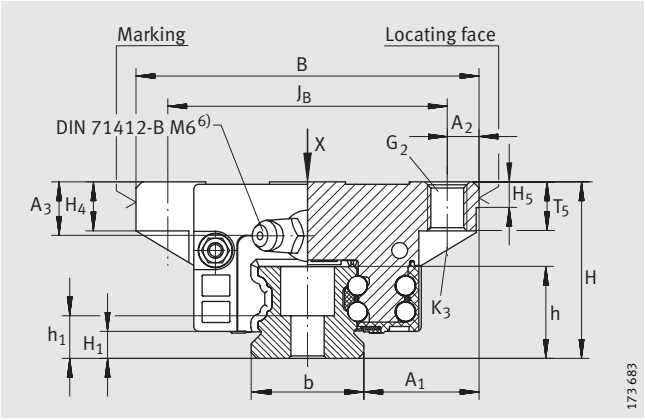
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



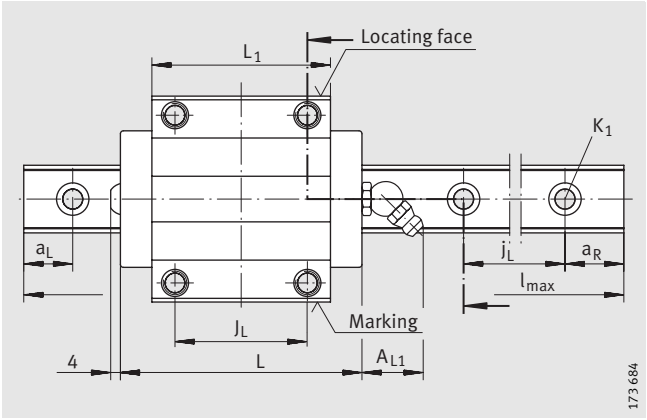

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | $\varnothing N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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 |




KUVE..-B-KT-L

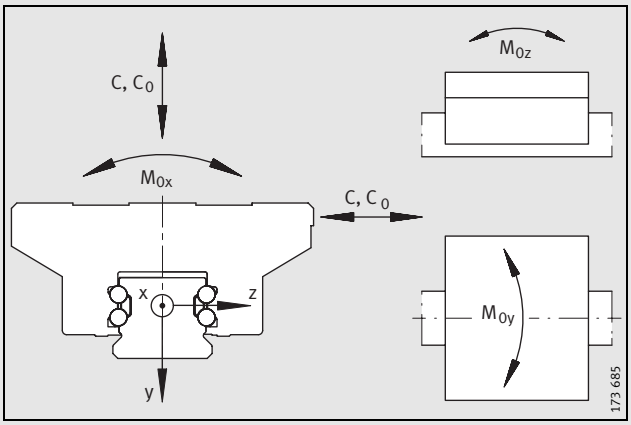



KUVE..-B-KT-L · View X (rotated 90°)

| 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) | | $A_{L1}$ | $H_1$ | $H_4$ | $H_5$ | $A_3$ | $T_5$ | $t_7$ | h | $h_1$ | $G_1$ | $G_2$ | $K_1$ | $K_3$ |
| | | | | | | | min. | max. | | | | | | | | | | DIN ISO 4 762-12.9 | | | |
| 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 |
| **KUVE15-B-KT-L** | 7 500 | 15 500 | 162 | 148 | 105 |
| **KUVE20-B-KT-L** | 14 400 | 30 500 | 368 | 345 | 345 |
| **KUVE25-B-KT-L** | 21 100 | 47 000 | 625 | 690 | 690 |
| **KUVE30-B-KT-L** | 33 000 | 71 000 | 1 230 | 1 230 | 1 245 |
| **KUVE35-B-KT-L** | 44 000 | 89 000 | 1 790 | 1 715 | 1 710 |
| **KUVE45-B-KT-L** | 79 000 | 171 000 | 4 715 | 4 335 | 4 330 |
| **KUVE55-B-KT-L** | 123 000 | 270 000 | 9 115 | 8 490 | 8 490 |

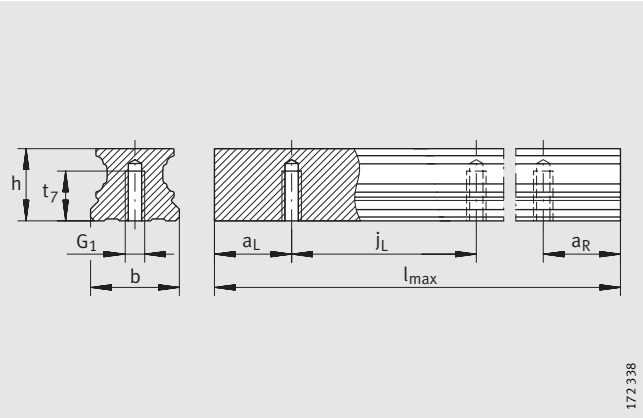



Load directions

# 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.

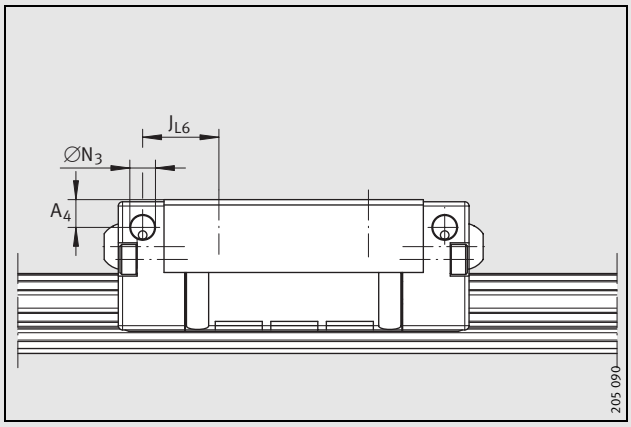
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 71412-B M6,
except for KUVE20-B-KT-S to DIN 71412-B M5 and KUVE15-B-KT-S to DIN 3405 M3.

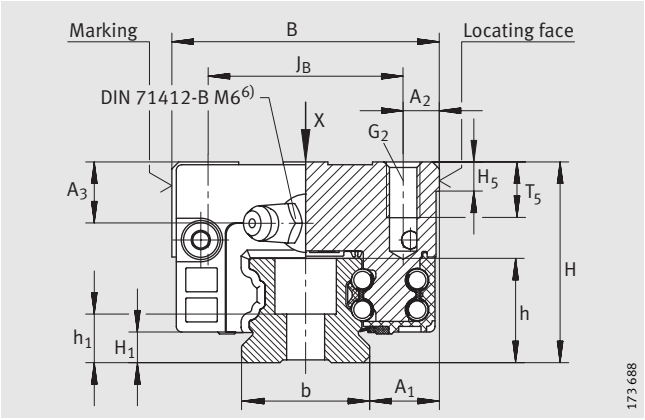
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



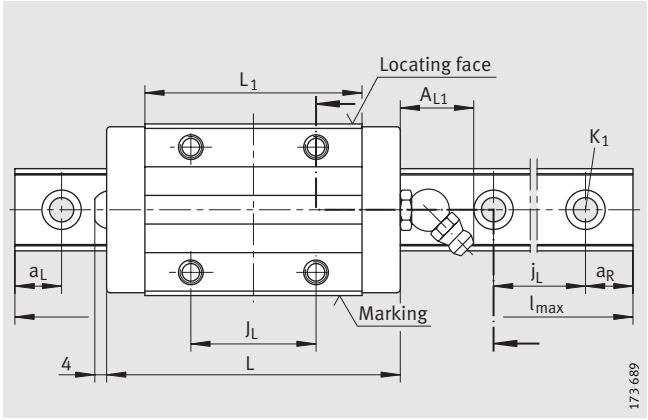

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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)

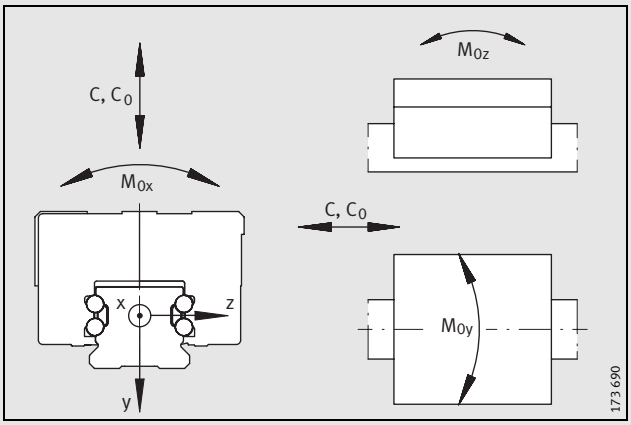



KUVE..-B-KT(-S) · View X (rotated 90°)

| 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. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 |

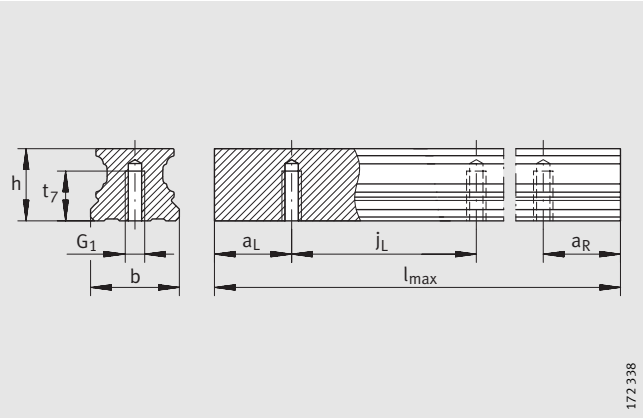



Load directions

# Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE..-B-KT-SL




TKVD..-U

**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 | 1 200 | 24 | 34 | 73 |
| **KUVE20-B-KT-SL** | KWVE20-B-KT-SL | 0,4 | TKVD20(-U) | 2,2 | KA10-TN/A | 1 980 | 30 | 44 | 87,3 |
| **KUVE25-B-KT-SL** | KWVE25-B-KT-SL | 0,79 | TKVD25(-U) | 2,7 | KA11-TN/A | 1 980 | 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.

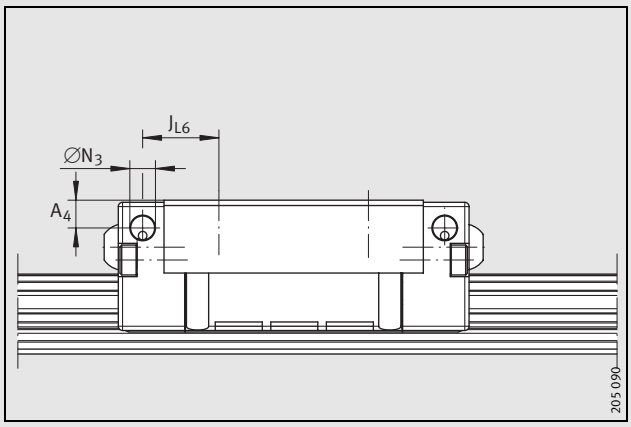
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 71412-B M6,
except for KUVE20-B-KT-SL to DIN 71412-B M5 and KUVE15-B-KT-SL to DIN 3405 M3.

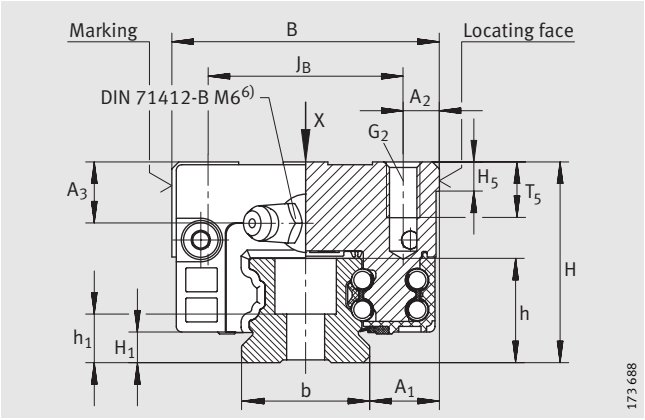
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



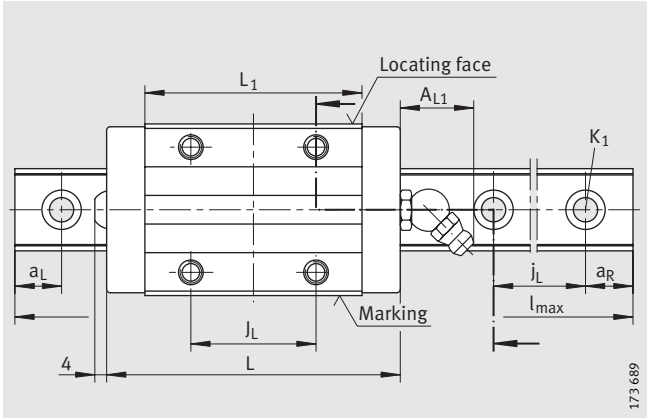

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

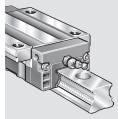
| Designation | $\varnothing N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **KUVE15-B-KT-SL** | 2,6 | 3,2 | 17,8 |
| **KUVE20-B-KT-SL** | 4,5 | 4,5 | 13,2 |
| **KUVE25-B-KT-SL** | 5,5 | 6,5 | 23,3 |
| **KUVE30-B-KT-SL** | 5,5 | 7 | 25 |
| **KUVE35-B-KT-SL** | 5,5 | 11 | 27,5 |
| **KUVE45-B-KT-SL** | 5,5 | 16,5 | 35,3 |
| **KUVE55-B-KT-SL** | 5,5 | 15 | 49,5 |




KUVE..-B-KT(-SL)



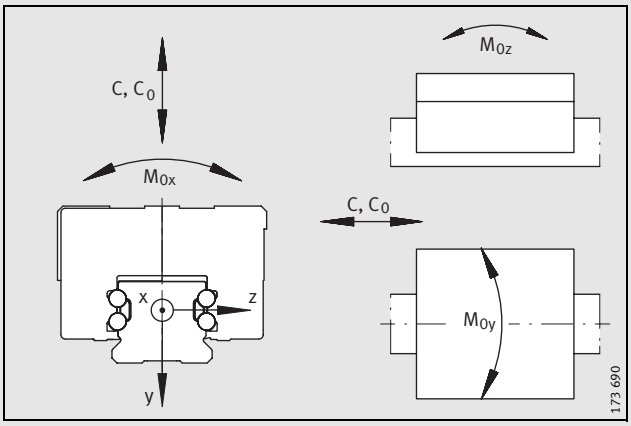

KUVE..-B-KT(-SL) · View X (rotated 90°)



| 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 | $h_1$ | $G_1$ | $G_2$ | $K_1$ |
| | | | | | | | min. | max. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 | 4715 | 4335 | 4330 |
| **KUVE55-B-KT-SL** | 123 000 | 270 000 | 7100 | 4580 | 4580 |

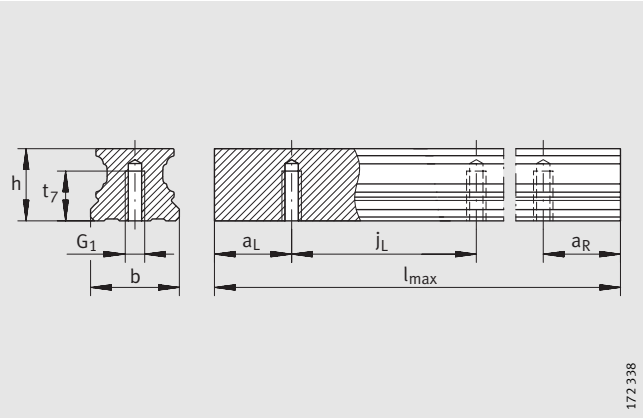



Load directions

# Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

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




TKVD..-U

**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.

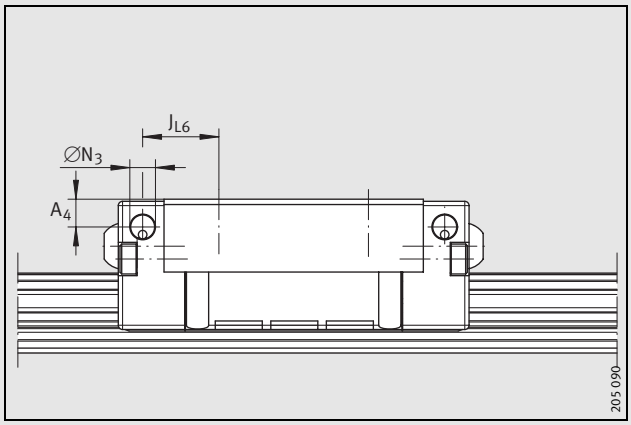
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 3405 M3.

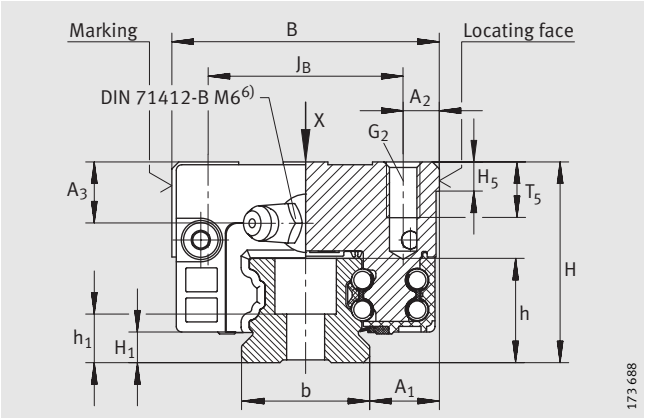
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



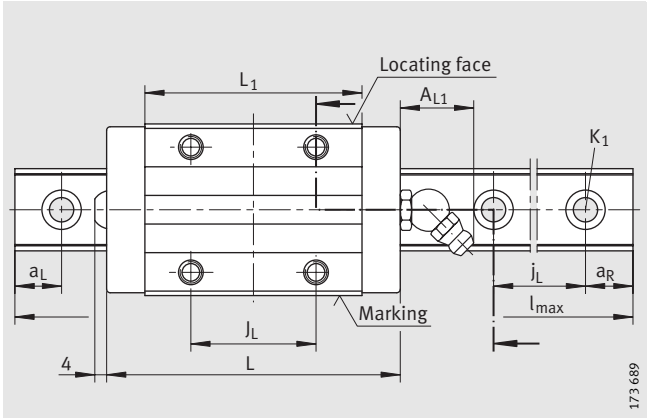

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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)

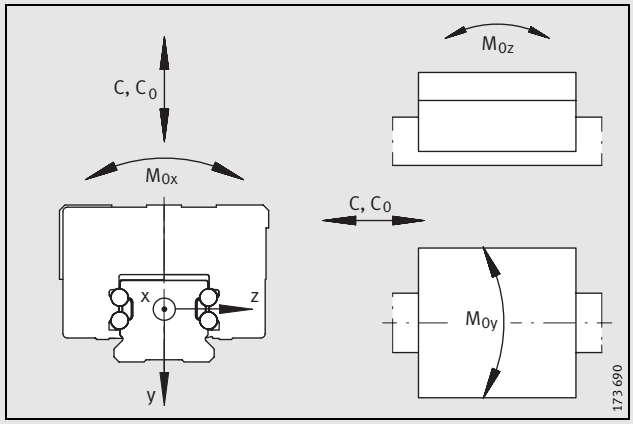



KUVE..-B-KT(-H, -HL) · View X (rotated 90°)

| 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. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 | 51000 | 890 | 670 | 670 |
| **KUVE30-B-KT-HL** | 33 000 | 71000 | 1230 | 1245 | 1245 |
| **KUVE35-B-KT-H** | 36 000 | 67 000 | 1340 | 995 | 995 |
| **KUVE35-B-KT-HL** | 44 000 | 89 000 | 1790 | 1715 | 1710 |
| **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 |

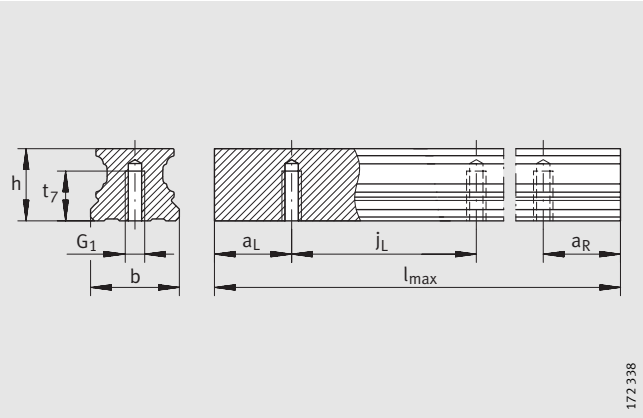



Load directions

# Four-row linear recirculating ball bearing and guideway assemblies

with quad spacers

Series KUVE..-B-KT-W
KUVE..-B-KT-WL




TKVD..-U

**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.

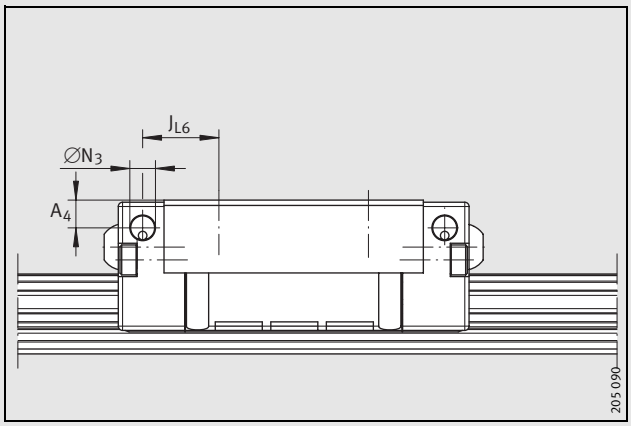
2) $a_L$ and $a_R$ are dependent on the guideway length, *Calculation*, page 47.

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.

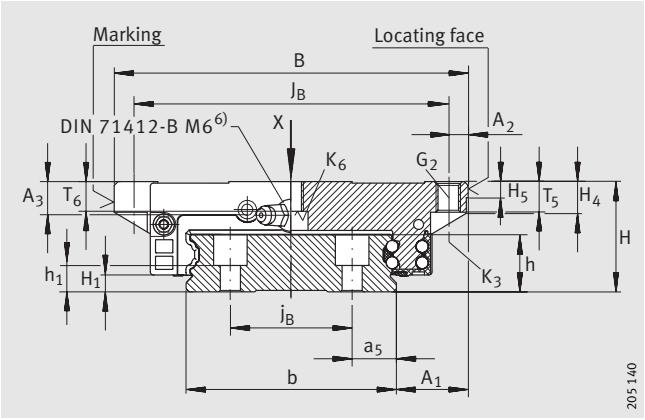
6) Lubrication nipple with tapered head to DIN 71412-B M6.



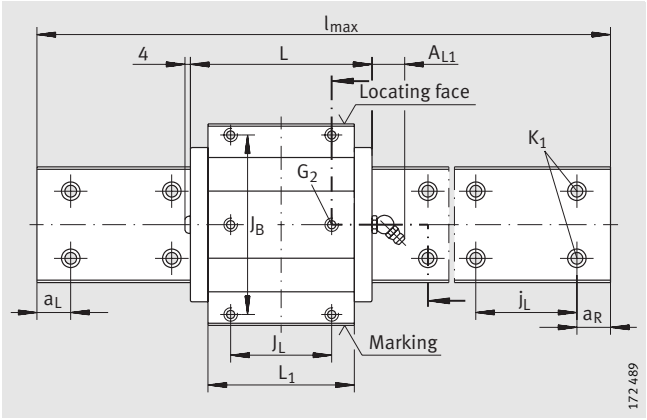

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **KUVE25-B-KT-W** | 5,5 | 5,7 | 12,9 |
| **KUVE25-B-KT-WL** | 5,5 | 5,7 | 18,3 |




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

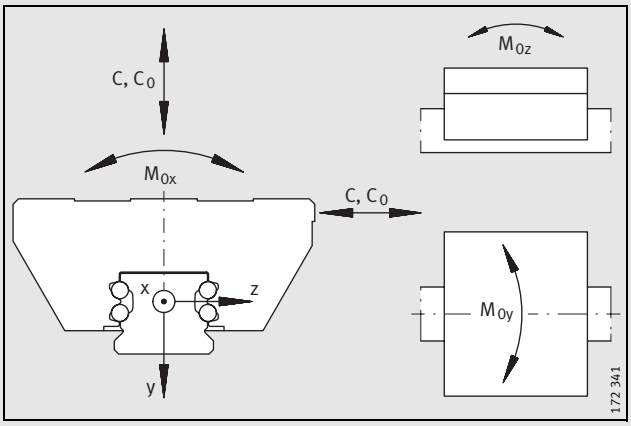



KUVE..-B-KT(-W, -WL) · View X (rotated 90°)

| | | | | | | | | | | | | | | | 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 |
| **KUVE25-B-KT-W** | 16 200 | 32 000 | 1 300 | 330 | 335 |
| **KUVE25-B-KT-WL** | 21 100 | 47 000 | 1 868 | 690 | 700 |




Load directions

# Four-row linear recirculating ball bearing and guideway assemblies

full complement


Page

Preload ..... 44

Friction ..... 44

Accuracy ..... 45

Demands on the adjacent construction ..... 48

Ordering example and ordering designation ..... 24

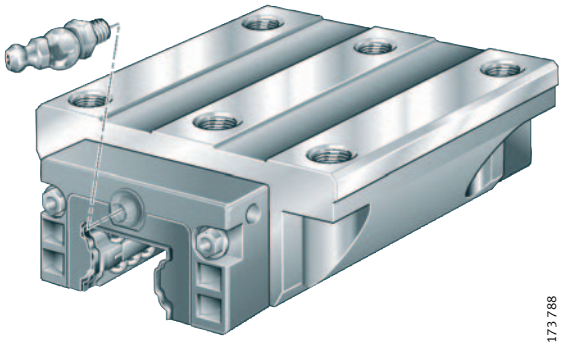

## Features

**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 °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.

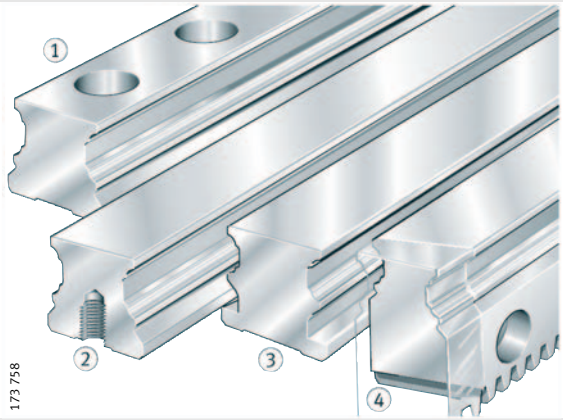
### Carriage

**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

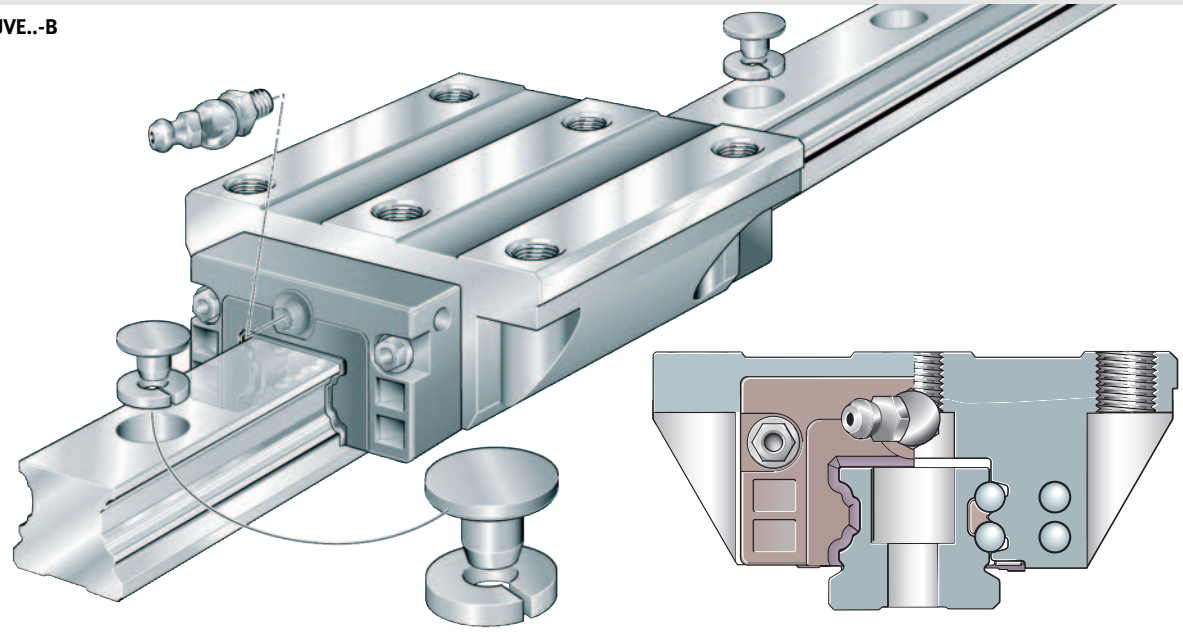
### Guideways




- 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

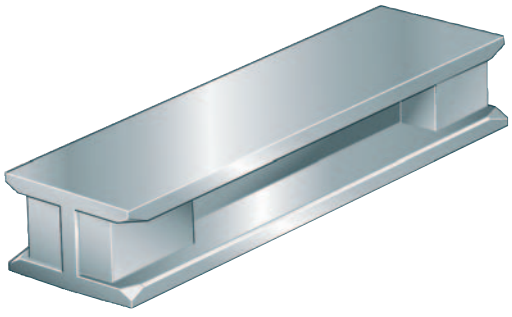
**KUVE..-B**



173 789

## Standard accessories

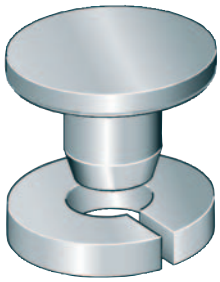
**MKVD**



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

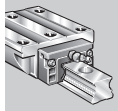
**KA..-TN/A**



173 729

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





### 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 KUVE guidance systems using standard elements.

### Corrosion-resistant designs

KUVE..-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.

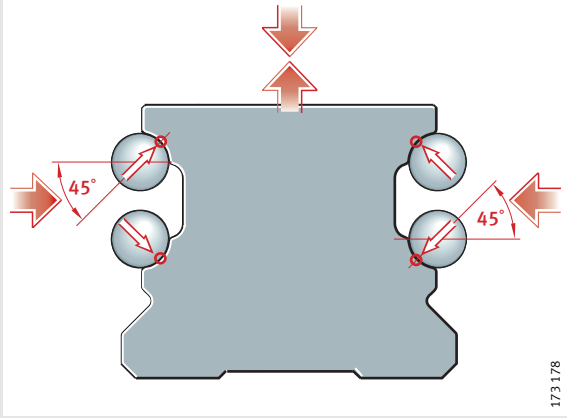
### Lubricant reservoir, sealing

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.

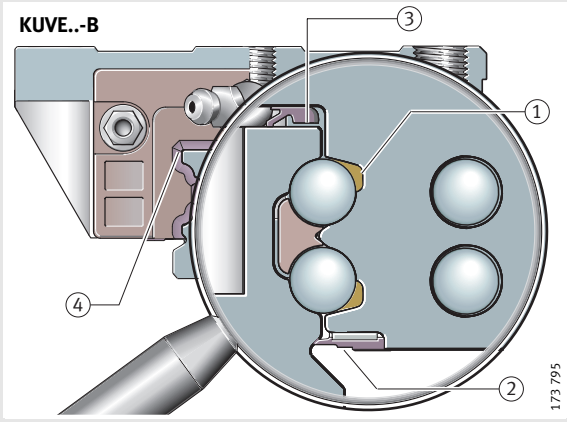
These sealing elements protect the rolling element system from contamination even under demanding environmental conditions.

### Contact angle

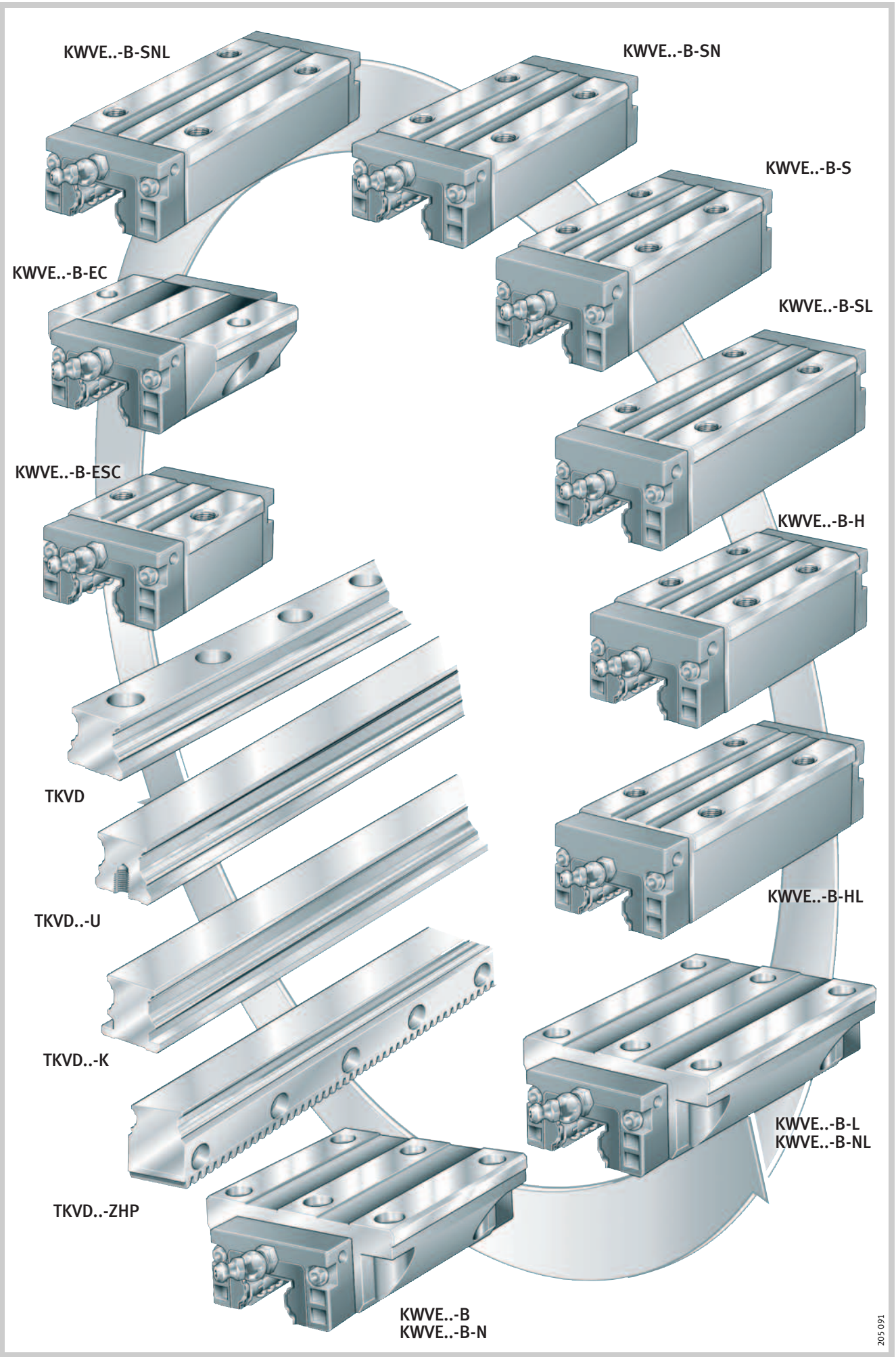



- contact angles of the four rows of balls
- rows of balls in two point contact with raceways

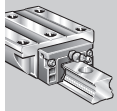
### Lubricant reservoir, sealing




- 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
KWVE..-B-HL
TKVD..-K
KWVE..-B-L
KWVE..-B-NL
TKVD..-ZHP
KWVE..-B
KWVE..-B-N
205 091





## Ordering example and ordering designation

**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 | 1 510 mm |
| – $a_L$ | 20 mm |
| – $a_R$ | 50 mm |

**Ordering designation:**

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

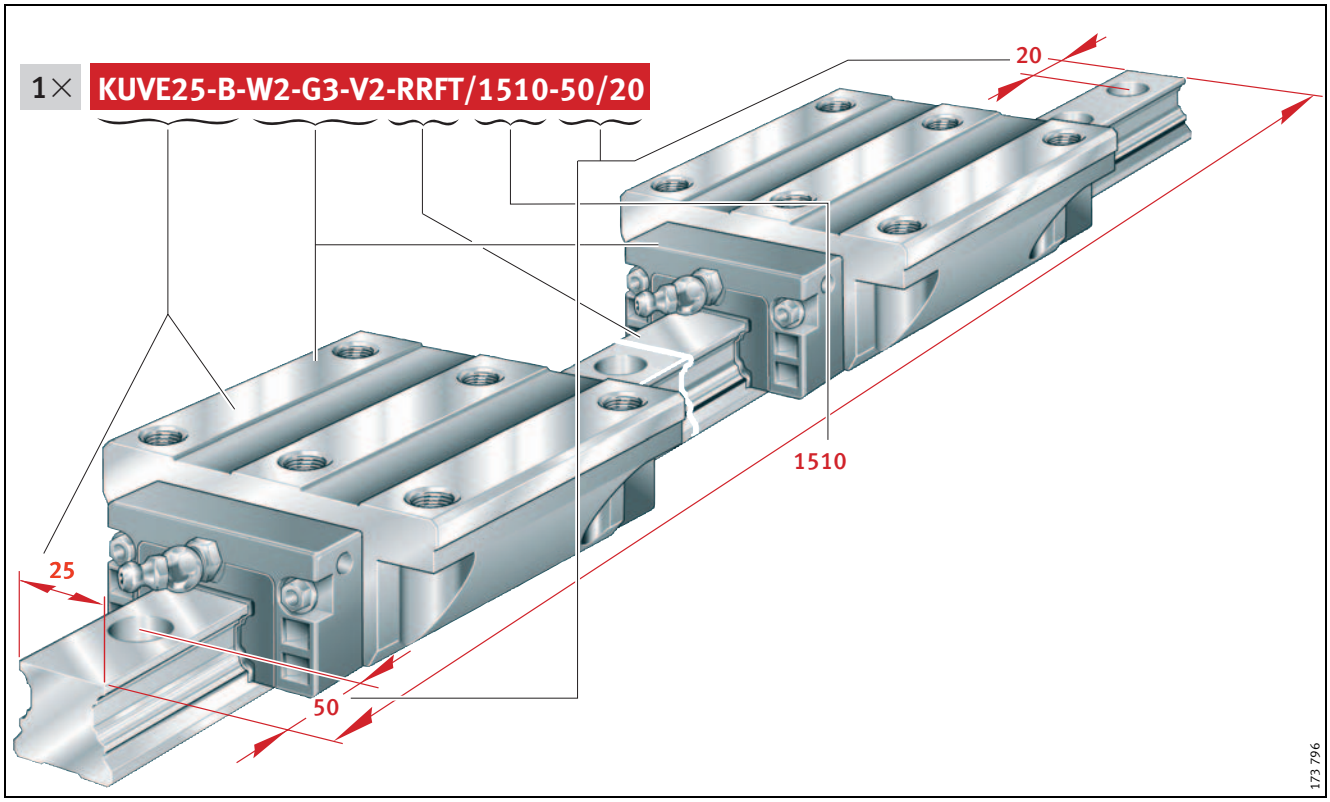



*Figure 1* · Ordering example, ordering designation

**Ordering example 2**

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

**Carriage**

| | |
|---|---|
| Carriage | KWVE |
| Size | 25 |
| Version with full complement ball set | B |
| Carriage variant | L |
| Accuracy class | G3 |
| Carriage preload | V2 |

**Ordering designation:**

2 × **KWVE25-B-L-G3-V2,** *Figure 2*.

**Guideway**

| | |
|---|---|
| Guideway for carriage | TKVD |
| Size | 25 |
| Guideway length | 1 570 mm |
| – $a_L$ | 35 mm |
| – $a_R$ | 35 mm |

**Ordering designation:**

1 × **TKVD25/1 570-35/35,** *Figure 2*.



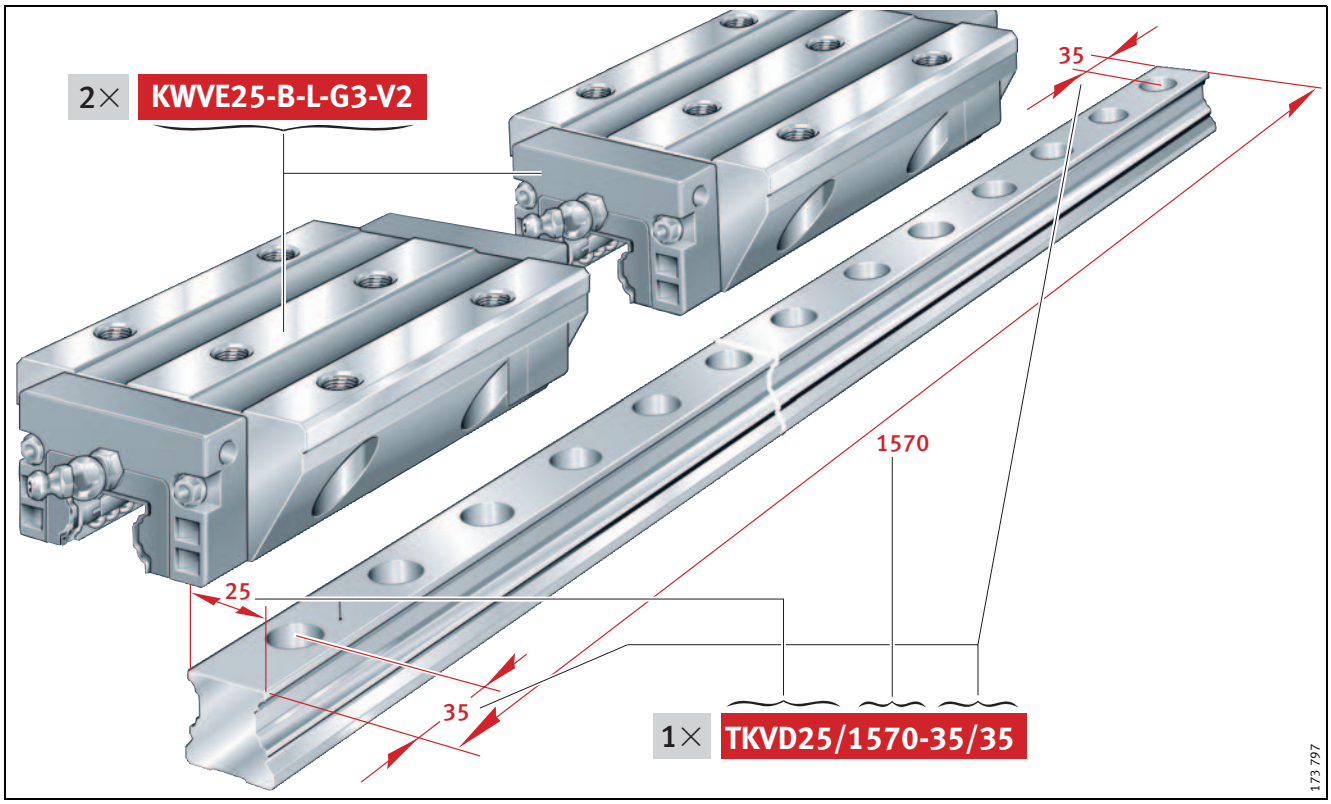
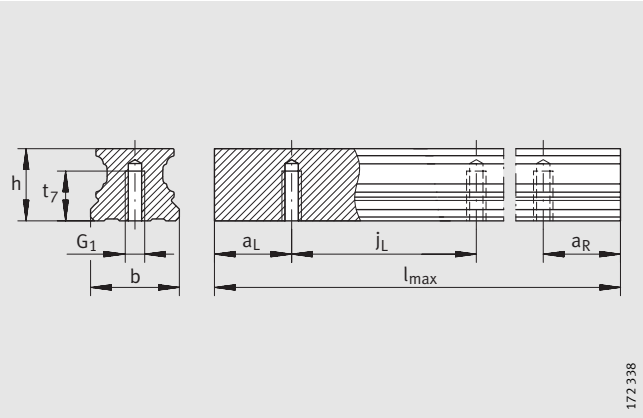



*Figure 2* · Ordering example, ordering designation

# Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE..-B




TKVD..-U

**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.

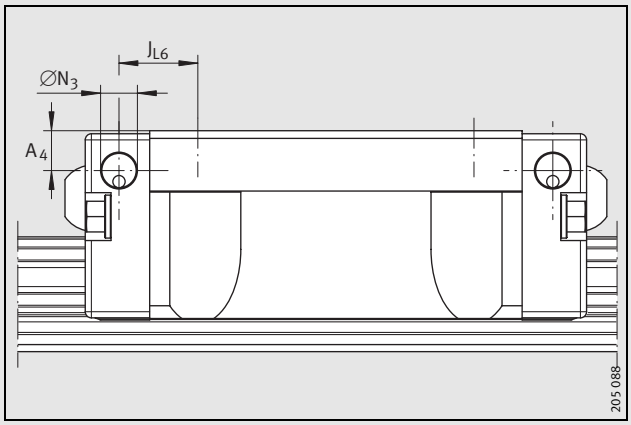
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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.

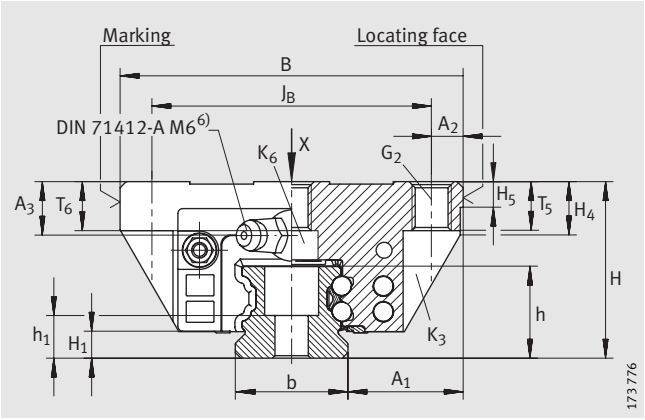
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



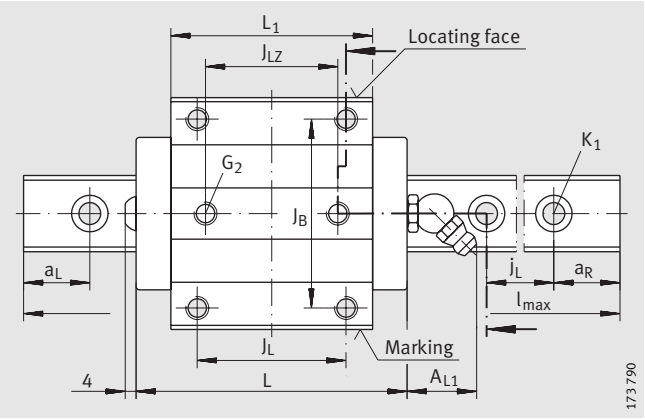

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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

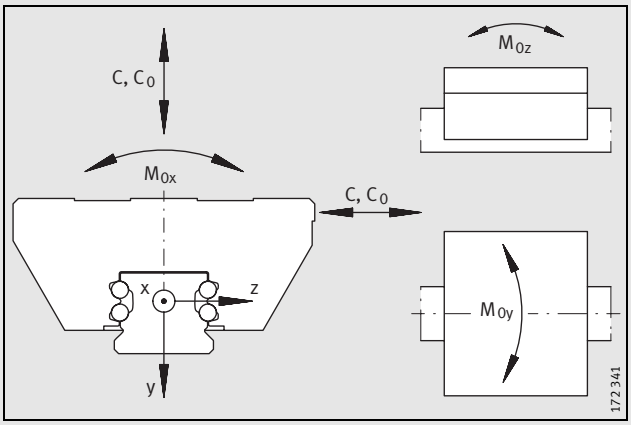



KUVE..-B · View X (rotated 90°)

| | | | | | | | | | | | | | | | 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. | | | | | | | | | | | DIN ISO 4 762-12.9 | | | | |
| 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 |

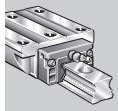
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| 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

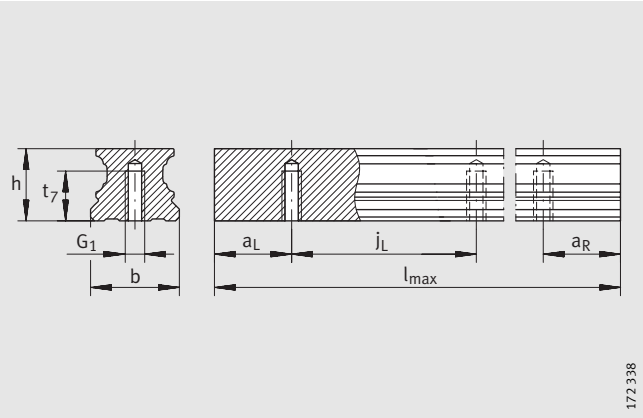




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE..-B-L




TKVD..-U

**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 | 2000 | 42 | 90 | 125,4 | 31 | 72 | 28 | 9 |
| **KUVE35-B-L** | KWVE35-B-L | 2,7 | TKVD35(-U) | 5,7 | KA15-TN/A | 2960 | 48 | 100 | 143,4 | 33 | 82 | 34 | 9 |
| **KUVE45-B-L** | KWVE45-B-L | 4,7 | TKVD45(-U) | 9,2 | KA20-TN/A | 2940 | 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.

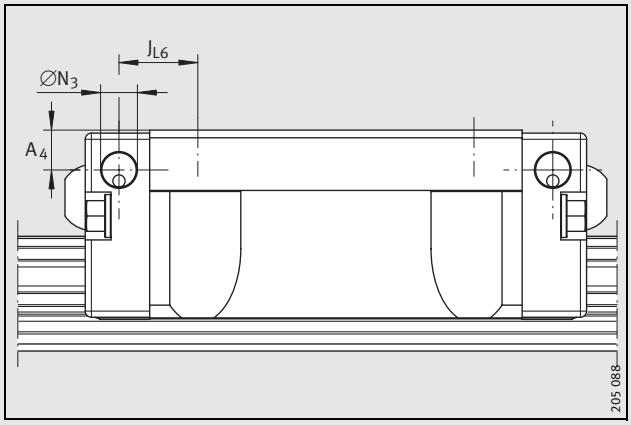
2) $a_L$ and $a_R$ are dependent on the guideway length, *Calculation*, page 47.

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*.

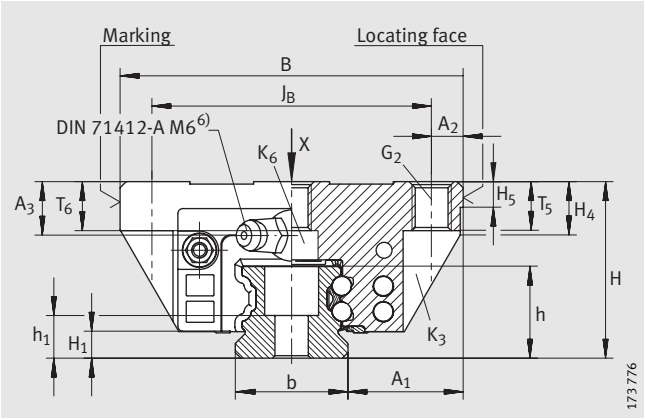
5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.

6) Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B-L to DIN 71412-B M5.

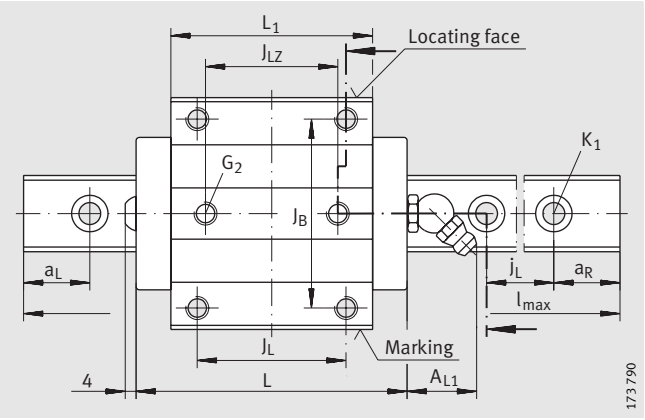



Lateral lubrication connector

| Dimensioning of lateral lubrication connector | | | |
|---|---|---|---|
| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
| **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 |




KUVE..-B-L

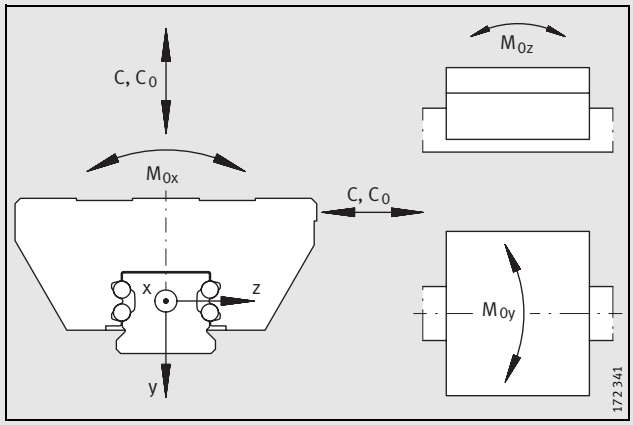



KUVE..-B-L · View X (rotated 90°)

| | | | | | | | | | | | | | | | 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. | | | | | | | | | | | DIN ISO 4 762-12.9 | | | | |
| 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 |

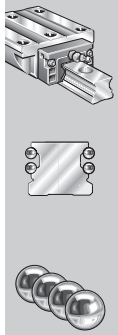
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| Unit Designation | Basic load ratings | | Moment ratings | | |
|---|---|---|---|---|---|
| | C N | $C_0$ N | $M_{0x}$ Nm | $M_{0y}$ Nm | $M_{0z}$ Nm |
| **KUVE20-B-L** | 16 200 | 36 500 | 452 | 430 | 430 |
| **KUVE25-B-L** | 23 400 | 54 000 | 745 | 825 | 825 |
| **KUVE30-B-L** | 34 500 | 74 000 | 1 310 | 1 240 | 1 240 |
| **KUVE35-B-L** | 47 500 | 100 000 | 2 025 | 1 890 | 1 890 |
| **KUVE45-B-L** | 82 000 | 181 000 | 4 635 | 4 000 | 4 000 |




Load directions

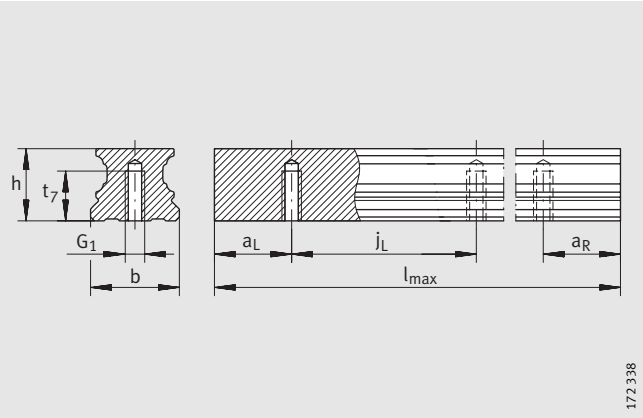




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

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




TKVD..-U

**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 | 2000 | 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 | 2960 | 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 | 2940 | 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.

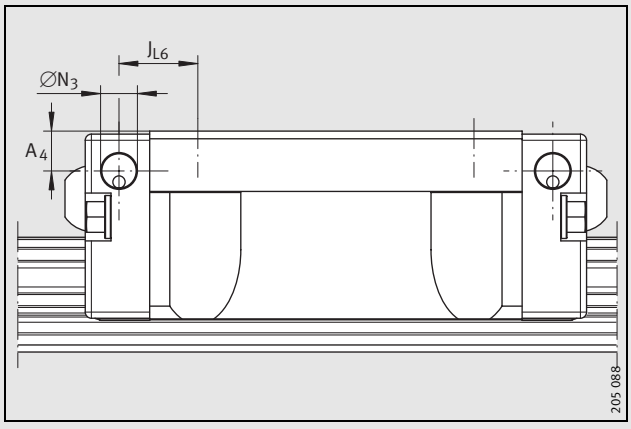
2) $a_L$ and $a_R$ are dependent on the guideway length, *Calculation*, page 47.

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*.

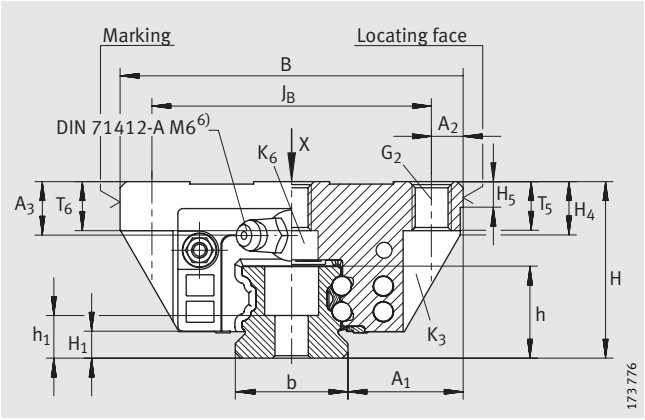
5) Calculation of basic load ratings in accordance with DIN 636.
Based on practical experience, it may be possible to increase the basic dynamic load rating.

6) Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B(-N, -NL) to DIN 71412-B M5.

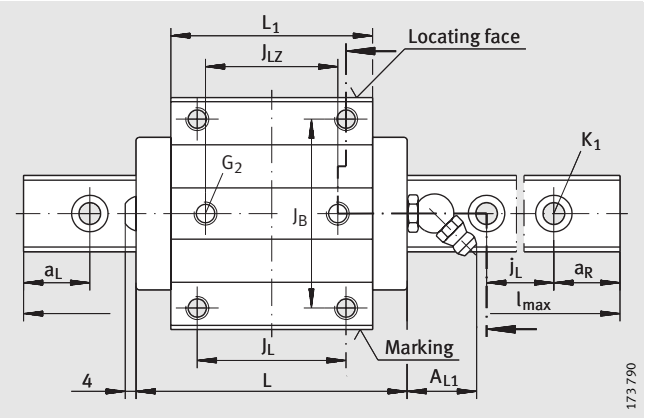



Lateral lubrication connector

| Dimensioning of lateral lubrication connector | | | |
|---|---|---|---|
| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
| **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)

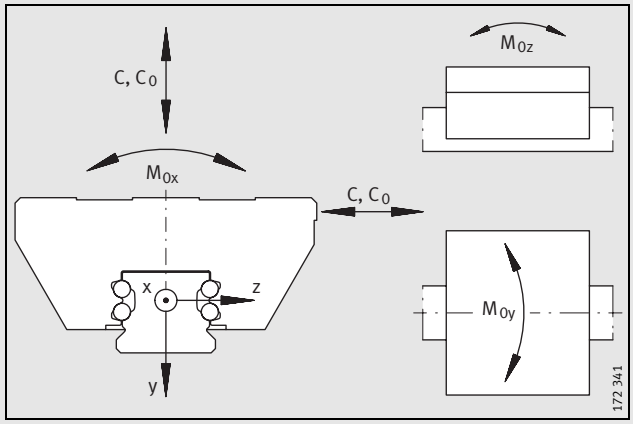



KUVE..-B(-N, -NL) · View X (rotated 90°)

| | | | | | | | | | | | | | | | 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 | | | | DIN 7984-8.8 |
| 50,4 | 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 |
| 67,9 | | | | | | | | | | | | | | | | | | | | |
| 60,7 | 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 |
| 86,5 | | | | | | | | | | | | | | | | | | | | |
| 72 | 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 |
| 100 | | | | | | | | | | | | | | | | | | | | |
| 80 | 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 |
| 113 | | | | | | | | | | | | | | | | | | | | |
| 102,5 | 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 |
| 134,6 | | | | | | | | | | | | | | | | | | | | |

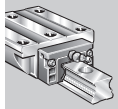
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| Unit Designation | Basic load ratings | | Moment ratings | | |
|---|---|---|---|---|---|
| | C N | $C_0$ N | $M_{0x}$ Nm | $M_{0y}$ Nm | $M_{0z}$ Nm |
| **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 | 1180 |
| **KUVE35-B-N** | 38 000 | 72 000 | 1 465 | 1 020 | 1020 |
| **KUVE35-B-NL** | 47 500 | 100 000 | 2 025 | 1 890 | 1890 |
| **KUVE45-B-N** | 69 000 | 141000 | 3 610 | 2 485 | 2 485 |
| **KUVE45-B-NL** | 82 000 | 181000 | 4 635 | 4 000 | 4000 |




Load directions

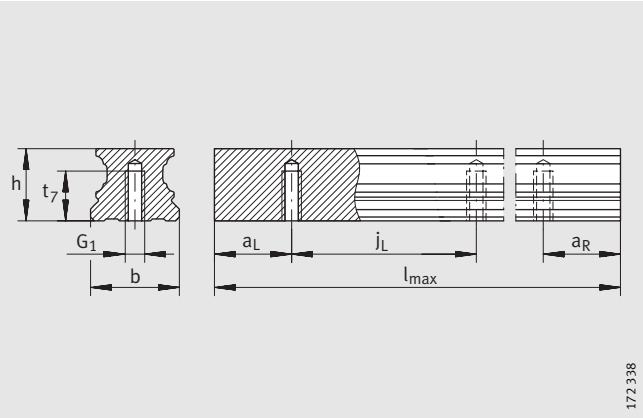




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

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




TKVD..-U

**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-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 | 2000 | 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 | 2960 | 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 | 2940 | 60 | 86 | 171,1 | 20,5 | 60 | 45 | 13 |
| **KUVE45-B-HL** | KWVE45-B-HL | 4 | | | | | 60 | | | | | | |

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.

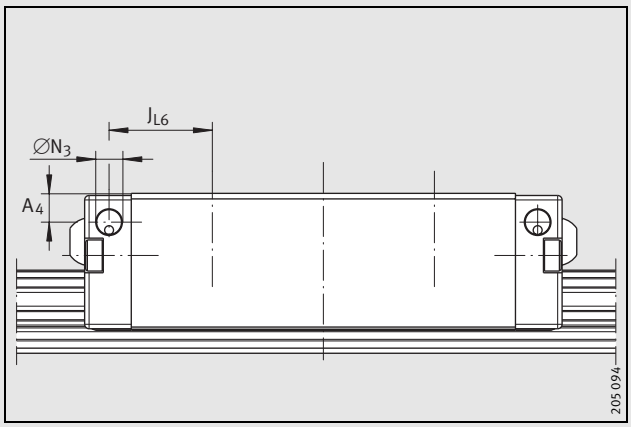
2) $a_L$ and $a_R$ are dependent on the guideway length, *Calculation*, page 47.

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.

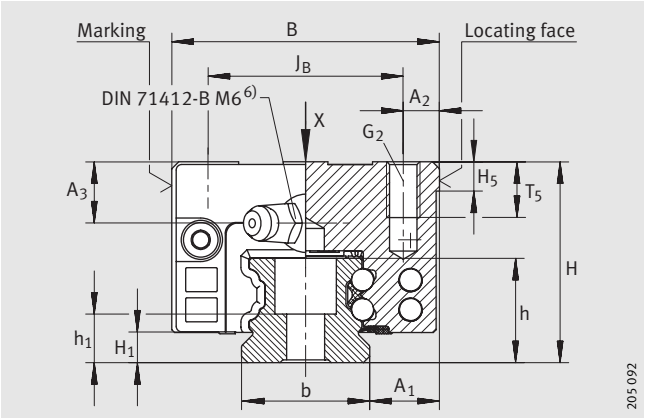
6) Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B-SL to DIN 71412-B M5.



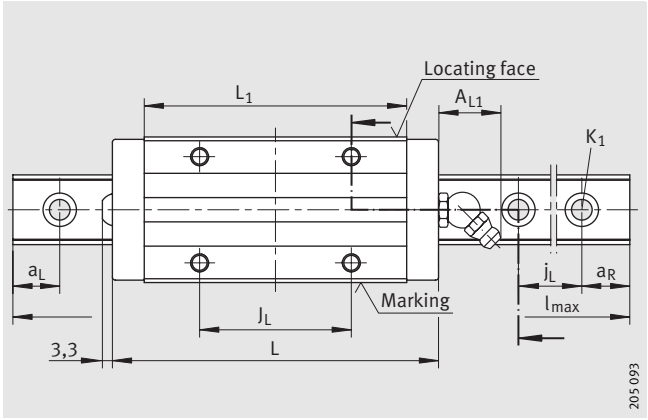

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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 |




KUVE..-B(-SL)

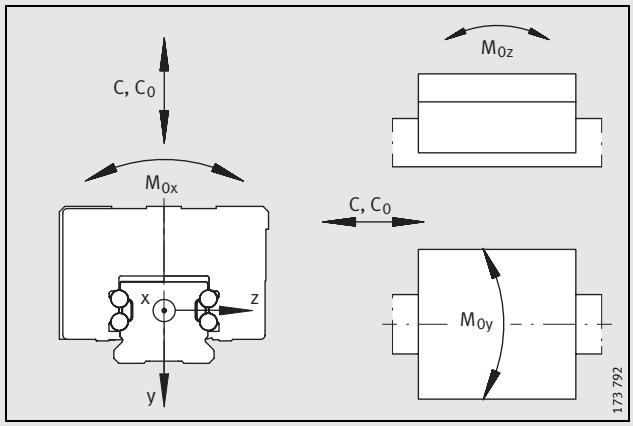



KUVE..-B(-SL) · View X (rotated 90°)

| | | | | | | | | | | | | 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. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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<br>11 | 10 | 12 | 18,7 | 8,7 | M6 | M6 | M6 |
| 100 | 60 | 80 | 20 | 71 | 19 | 5,9 | 6,25 | 11,5<br>14,5 | 13,5 | 15 | 23,5 | 11,5 | M8 | M8 | M8 |
| 113 | 72 | 80 | 20 | 71 | 19 | 6,7 | 6,75 | 12,3<br>19,3 | 13,5 | 15 | 27 | 15 | M8 | M8 | M8 |
| 134,6 | 80 | 105 | 20 | 94 | 19 | 9,7 | 9,25 | 16,5<br>26,5 | 17 | 20 | 34,2 | 16,2 | M12 | M10 | M12 |

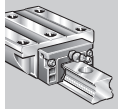
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| Unit Designation | Basic load ratings | | Moment ratings | | |
|---|---|---|---|---|---|
| | C N | $C_0$ N | $M_{0x}$ Nm | $M_{0y}$ Nm | $M_{0z}$ Nm |
| **KUVE20-B-SL** | 16 200 | 36 500 | 452 | 430 | 430 |
| **KUVE25-B-HL** | 23 400 | 54 000 | 745 | 825 | 825 |
| **KUVE25-B-SL** | 23 400 | 54 000 | 745 | 825 | 825 |
| **KUVE30-B-SL** | 34 500 | 74 000 | 1310 | 1 240 | 1240 |
| **KUVE30-B-HL** | 34 500 | 74 000 | 1310 | 1 240 | 1240 |
| **KUVE35-B-SL** | 47 500 | 100 000 | 2025 | 1 890 | 1890 |
| **KUVE35-B-HL** | 47 500 | 100 000 | 2025 | 1 890 | 1890 |
| **KUVE45-B-SL** | 82 000 | 181 000 | 4 635 | 4 000 | 4000 |
| **KUVE45-B-HL** | 82 000 | 181 000 | 4 635 | 4 000 | 4000 |




Load directions

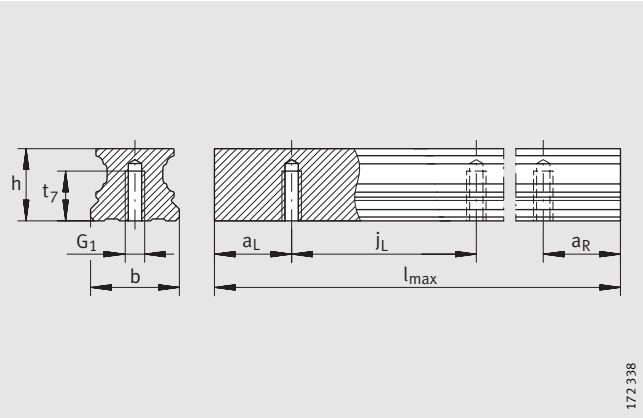




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE..-B-SNL




TKVD..-U

**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 | 2000 | 38 | 60 | 125,4 | 16 | 40 | 28 | 10 |
| **KUVE35-B-SNL** | KWVE35-B-SNL | 1,5 | TKVD35(-U) | 5,7 | KA15-TN/A | 2960 | 44 | 70 | 143,4 | 18 | 50 | 34 | 10 |
| **KUVE45-B-SNL** | KWVE45-B-SNL | 2,5 | TKVD45(-U) | 9,2 | KA24-TN/A | 2940 | 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.

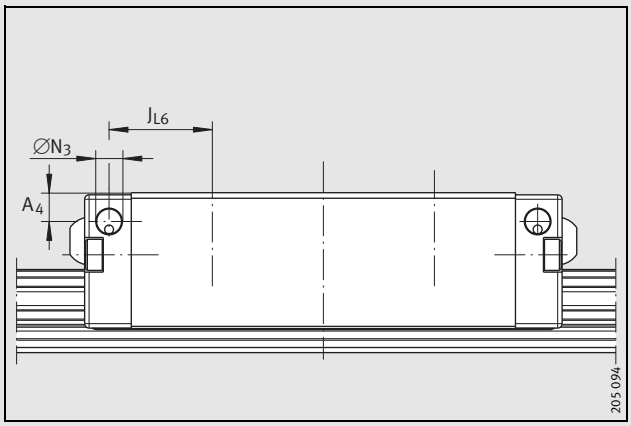
2) $a_L$ and $a_R$ are dependent on the guideway length, *Calculation*, page 47.

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.

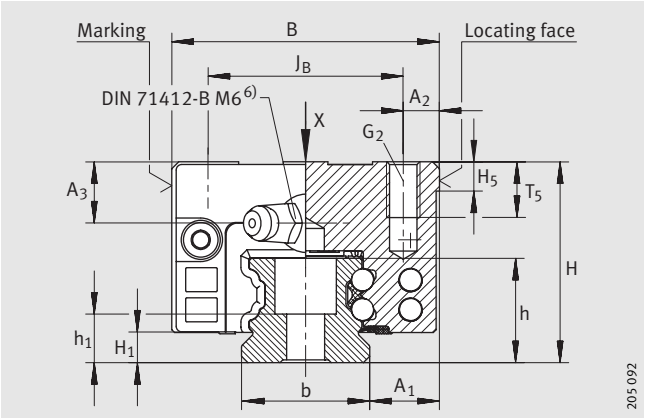
6) Lubrication nipple with tapered head to DIN 71412-B M6,
except for KUVE20-B-SNL to DIN 71412-B M5.



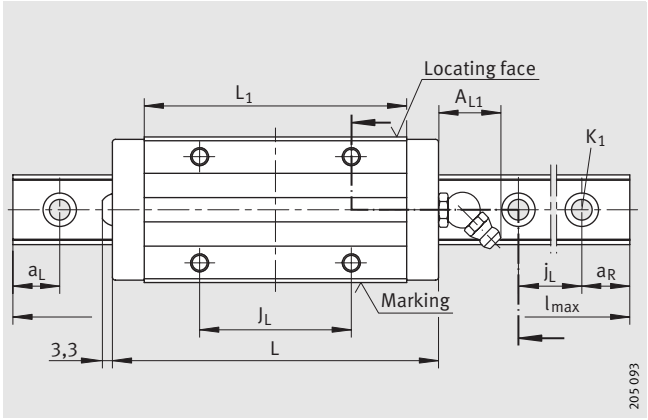

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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)

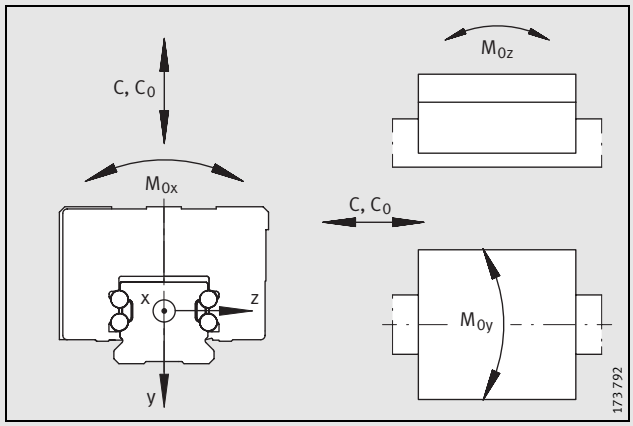



KUVE..-B(-SNL) · View X (rotated 90°)

| | | | | | | | | | | | | 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. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 |

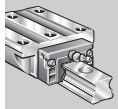
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| 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 | 4635 | 4000 | 4000 |




Load directions

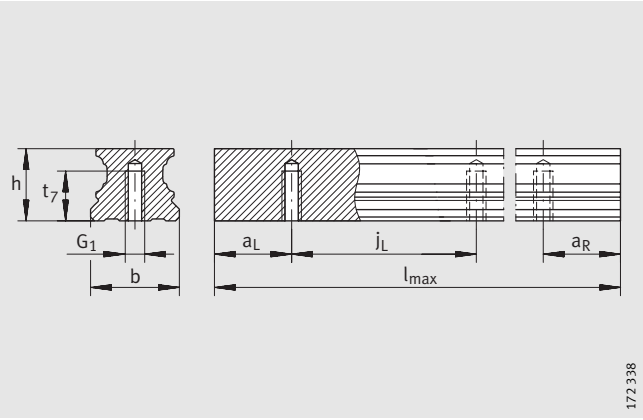




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

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




TKVD..-U

**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.

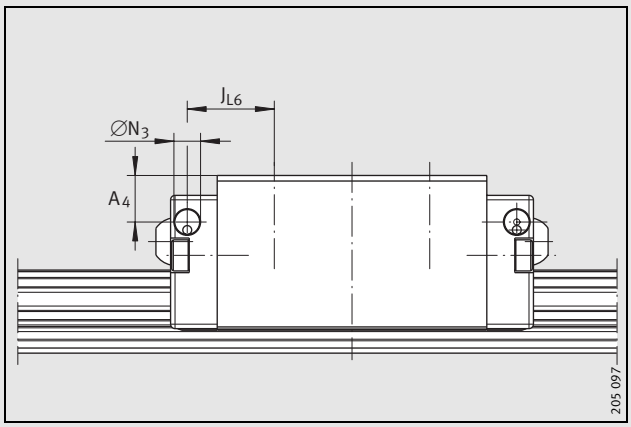
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 71412-B M6,
except for KUVE20-B_SN to DIN 71412-B M5 and KUVE15-B-H to DIN 3405 M3.

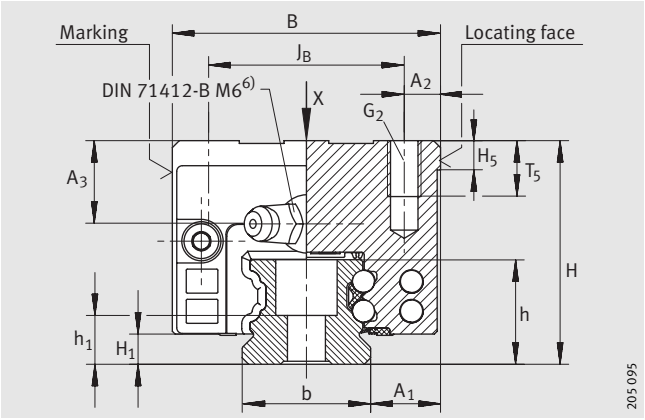
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



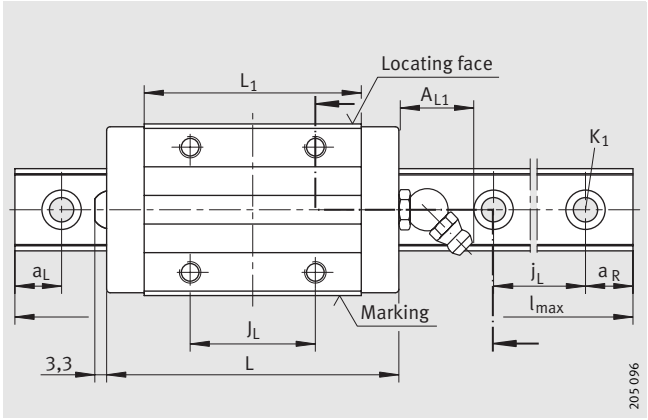

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | $\varnothing N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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)

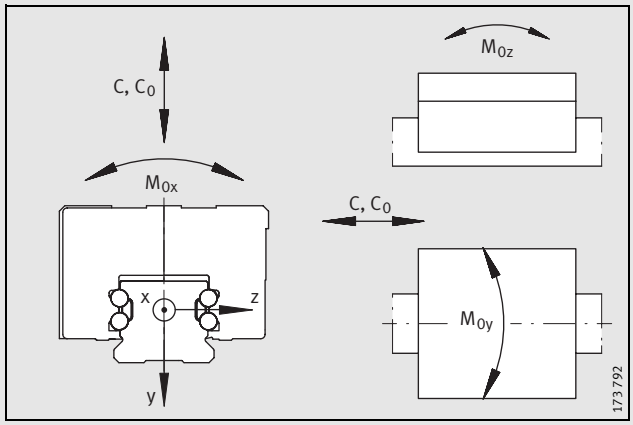



KUVE..-B(-H, -SN) · View X (rotated 90°)

| | | | | | | | | | | | | | 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. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 |
| | | | | | | | | | 6 | 7,5 | | | | | | |
| 10 | 72 | 40 | 80 | 20 | 71 | 19 | 5,9 | 6,25 | 14,5 | 13,5 | 15 | 23,5 | 11,5 | M8 | M8 | M8 |
| | | | | | | | | | 7,5 | 11 | | | | | | |
| 10 | 80 | 50 | 80 | 20 | 71 | 19 | 6,7 | 6,75 | 19,3 | 13,5 | 15 | 27 | 15 | M8 | M8 | M8 |
| | | | | | | | | | 8,3 | | | | | | | |
| 13 | 102,5 | 60 | 105 | 20 | 94 | 19 | 9,7 | 9,25 | 26,5 | 23,5 | 20 | 34,2 | 16,2 | M12 | M10 | M12 |
| | | | | | | | | | 8,5 | 16,5 | | | | | | |

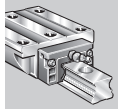
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| 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

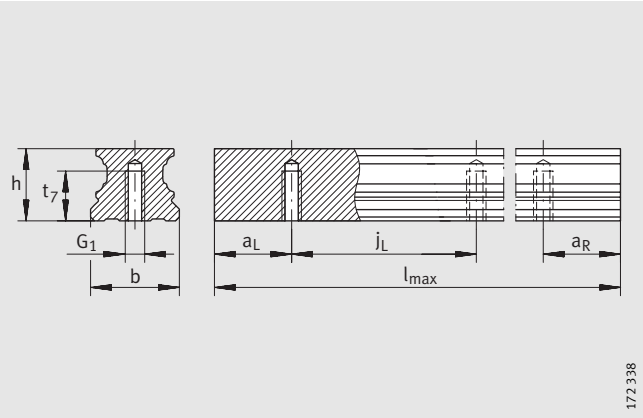




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE..-B-S




TKVD..-U

**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 | 1200 | 24 | 34 | 59,6 | 9,5 | 26 | 15 |
| **KUVE20-B-S** | KWVE20-B-S | 0,46 | TKVD20(-U) | 2,2 | KA10-TN/A | 1980 | 27 | 44 | 69,8 | 12 | 32 | 20 |
| **KUVE25-B-S** | KWVE25-B-S | 0,56 | TKVD25(-U) | 2,7 | KA11-TN/A | 1980 | 36 | 48 | 81,7 | 12,5 | 35 | 23 |
| **KUVE30-B-S** | KWVE30-B-S | 1,1 | TKVD30(-U) | 4,3 | KA15-TN/A | 2000 | 42 | 60 | 97,4 | 16 | 40 | 28 |
| **KUVE35-B-S** | KWVE35-B-S | 1,6 | TKVD35(-U) | 5,7 | KA15-TN/A | 2960 | 48 | 70 | 110,4 | 18 | 50 | 34 |
| **KUVE45-B-S** | KWVE45-B-S | 2,8 | TKVD45(-U) | 9,2 | KA20-TN/A | 2940 | 60 | 86 | 139 | 20,5 | 60 | 45 |
| **KUVE55-B-S** | KWVE55-B-S | 4,5 | TKVD55-B(-U) | 14 | KA24-TN/A | 2520 | 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.

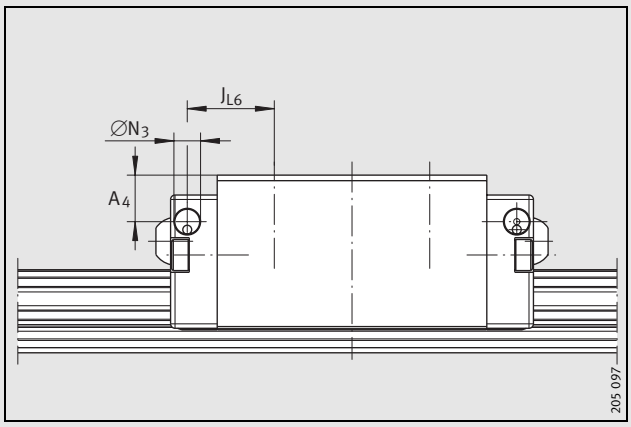
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 71412-B M6,
except for KUVE20-B-S to DIN 71412-B M5 and KUVE15-B-S to DIN 3405 M3.

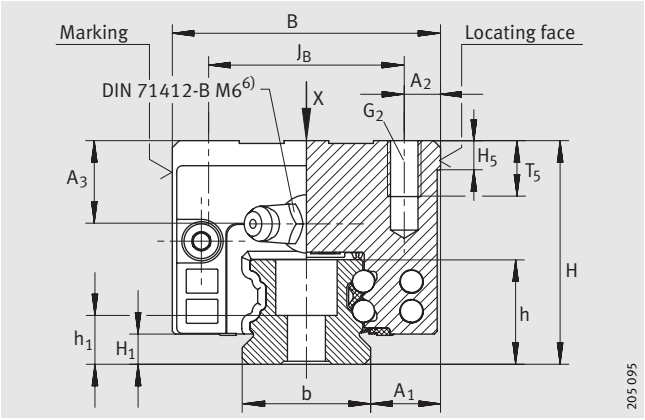
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



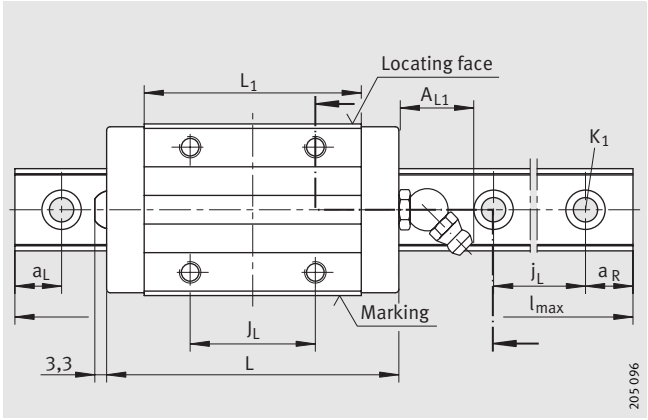

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | $\varnothing N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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 |




KUVE..-B-S

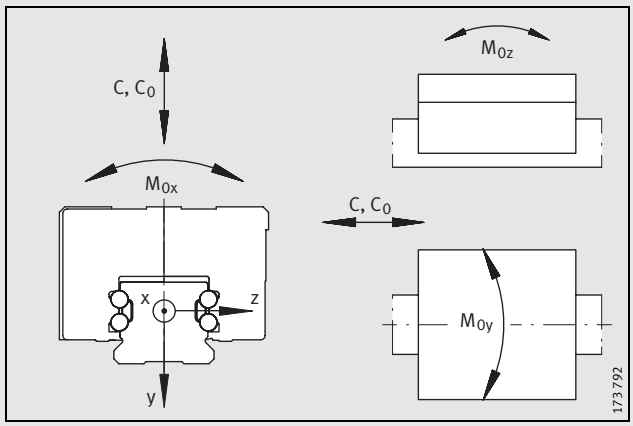



KUVE..-B-S · View X (rotated 90°)

| | | | | | | | | | | | | | 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. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 |

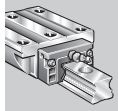
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| Unit Designation | Basic load ratings | | Moment ratings | | |
|---|---|---|---|---|---|
| | C N | $C_0$ N | $M_{0x}$ Nm | $M_{0y}$ Nm | $M_{0z}$ Nm |
| **KUVE15-B-S** | 7 200 | 14 500 | 150 | 100 | 100 |
| **KUVE20-B-S** | 13 100 | 27 000 | 332 | 240 | 240 |
| **KUVE25-B-S** | 17 900 | 37 000 | 510 | 395 | 395 |
| **KUVE30-B-S** | 27 500 | 55 000 | 970 | 700 | 700 |
| **KUVE35-B-S** | 38 000 | 72 000 | 1465 | 1020 | 1020 |
| **KUVE45-B-S** | 69 000 | 141000 | 3 610 | 2 485 | 2 485 |
| **KUVE55-B-S** | 104 000 | 213 000 | 5 600 | 2 730 | 2 730 |




Load directions

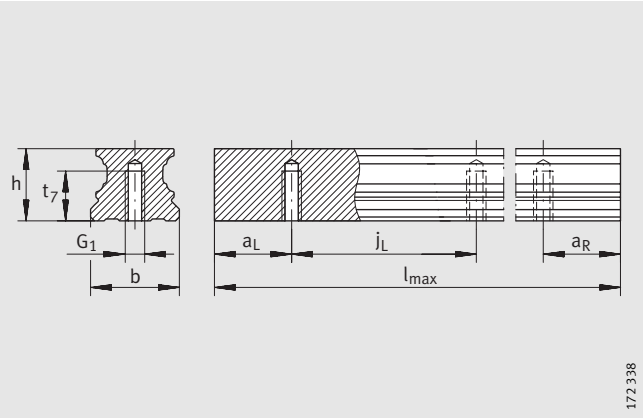




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE..-B-EC




TKVD..-U

**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-EC** | KWVE15-B-EC | 0,13 | TKVD15-B(-U) [7] | 1,44 | KA07-TN/A | 1 200 | 24 | 52 | 42,9 | 18,5 | 41 | 15 |
| **KUVE20-B-EC** | KWVE20-B-EC | 0,23 | TKVD20(-U) | 2,2 | KA10-TN/A | 1 980 | 28 | 59 | 48,8 | 19,5 | 49 | 20 |
| **KUVE25-B-EC** | KWVE25-B-EC | 0,47 | TKVD25(-U) | 2,7 | KA11-TN/A | 1 980 | 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.

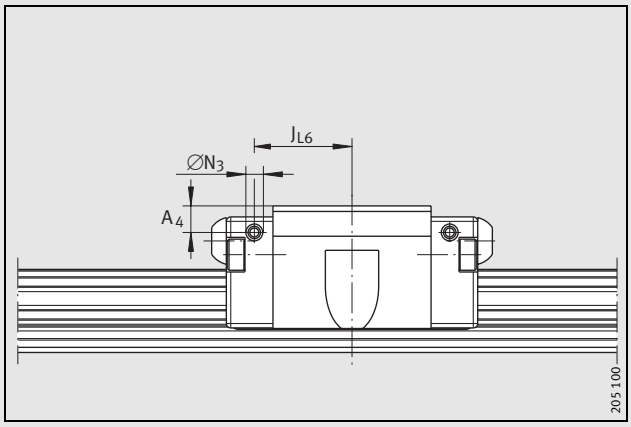
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 3405 M3.

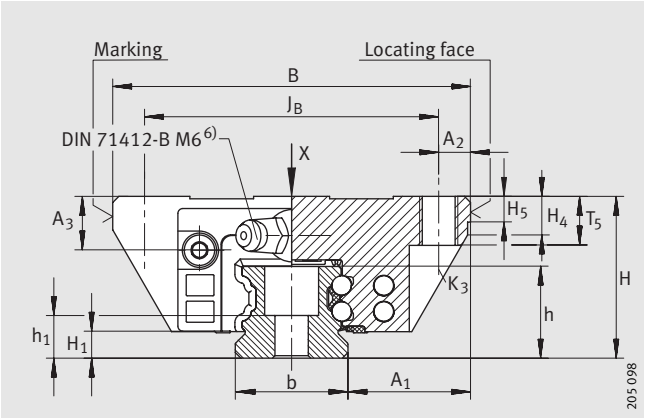
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



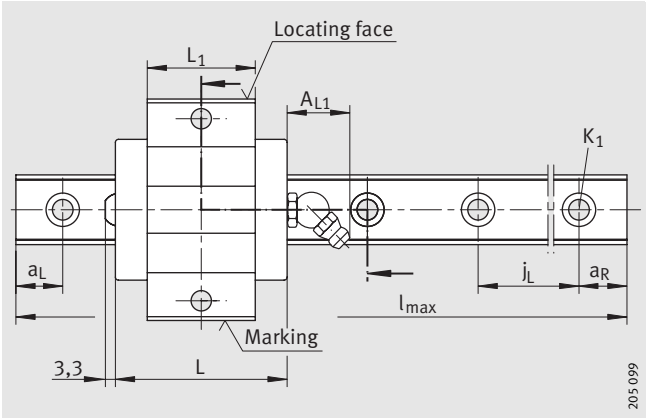

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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

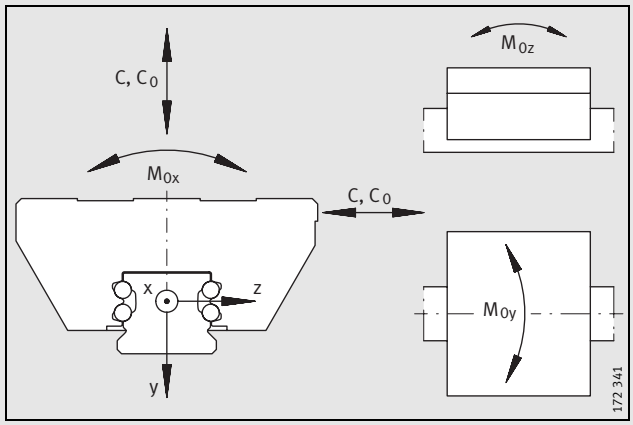



KUVE..-B-EC · View X (rotated 90°)

| | | | | | | | | | | | | | 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 | $h_1$ | $G_1$ | $K_1$ | $K_3$ |
| | | | min. | max. | | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 |

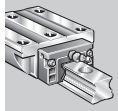
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605")* 5)

| 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

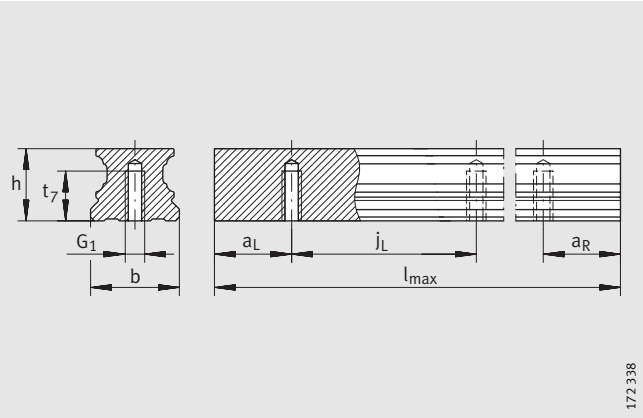




# Four-row linear recirculating ball bearing and guideway assemblies

full complement

Series KUVE..-B-ESC




TKVD..-U

**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-ESC** | KWVE15-B-ESC | 0,17 | TKVD15-B(-U) [7] | 1,44 | KA07-TN/A | 1200 | 24 | 34 | 42,9 | 9,5 | 26 | 15 |
| **KUVE20-B-ESC** | KWVE20-B-ESC | 0,28 | TKVD20(-U) | 2,2 | KA10-TN/A | 1980 | 28 | 42 | 48,8 | 11 | 32 | 20 |
| **KUVE25-B-ESC** | KWVE25-B-ESC | 0,35 | TKVD25(-U) | 2,7 | KA11-TN/A | 1980 | 33 | 48 | 56,6 | 12,5 | 35 | 23 |
| **KUVE30-B-ESC** | KWVE30-B-ESC | 0,7 | TKVD30(-U) | 4,3 | KA15-TN/A | 2000 | 42 | 60 | 67,4 | 16 | 40 | 28 |
| **KUVE35-B-ESC** | KWVE35-B-ESC | 0,9 | TKVD35(-U) | 5,7 | KA15-TN/A | 2960 | 48 | 70 | 74,6 | 18 | 50 | 34 |
| **KUVE45-B-ESC** | KWVE45-B-ESC | 1,8 | TKVD45(-U) | 9,2 | KA20-TN/A | 2940 | 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.

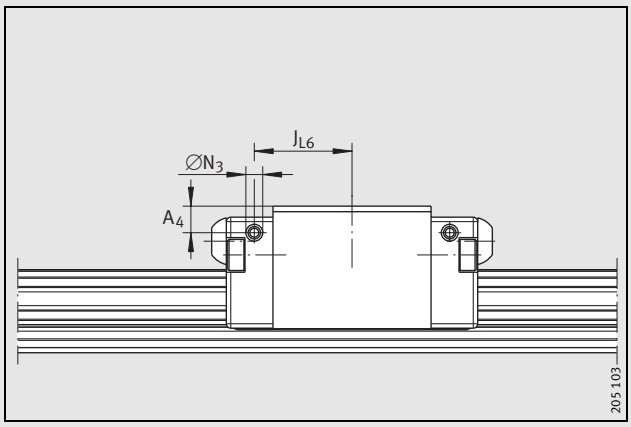
3) If there is a possibility of settling, the fixing screws should be secured against rotation.

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 71412-B M6,
except for KUVE20-B_ESC to DIN 71412-B M5 and KUVE15-B-ESC to DIN 3405 M3.

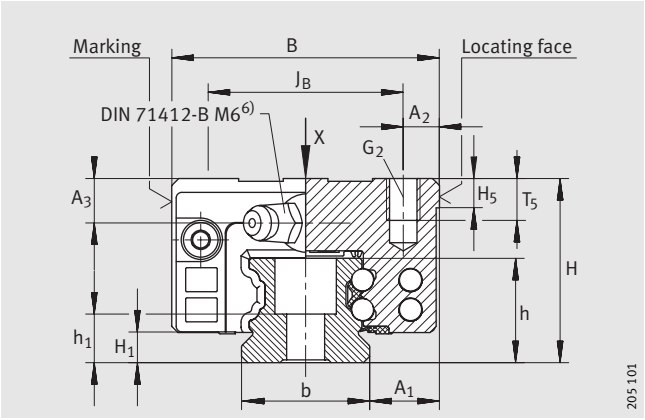
7) The new carriages cannot be used on the existing guideways TKVD15(-U).



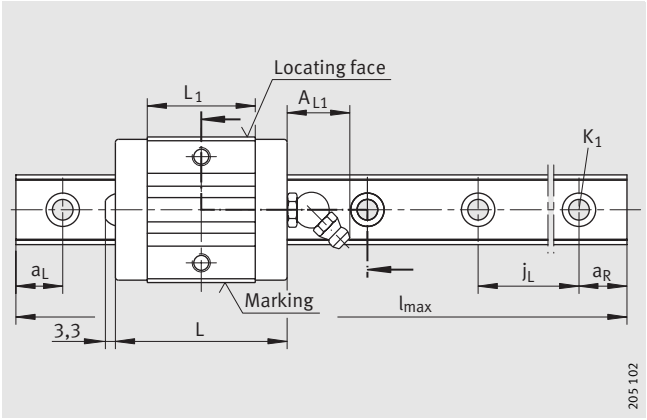

Lateral lubrication connector

**Dimensioning of lateral lubrication connector**

| Designation | ∅$N_3$ | $A_4$ | $J_{L6}$ |
|---|---|---|---|
| **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 |




KUVE..-B-ESC

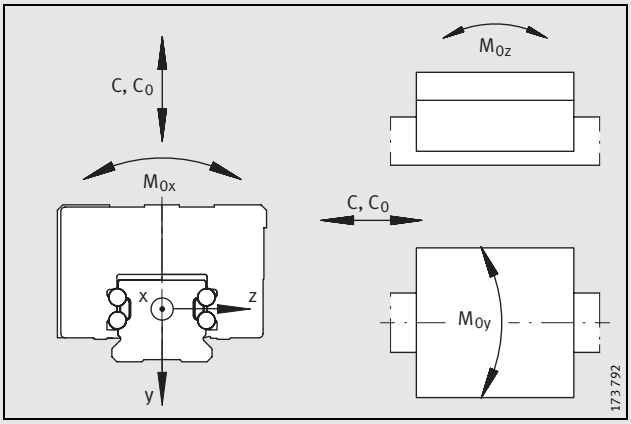



KUVE..-B-ESC · View X (rotated 90°)

| | | | | | | | | | | | | 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. | | | | | | | | | DIN ISO 4 762-12.9 | | |
| 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 |

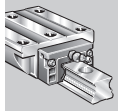
**Load carrying capacity**
(for definition of basic load ratings, see *INA Catalogue "605"*) 5)

| 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





## Preload

Linear recirculating ball guidance systems KUVE..-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 · C[1] | ■ moderate loads<br>■ high rigidity<br>■ moment loads |
| V2 | 0,1 · C[1] | ■ high alternating loads<br>■ particularly high rigidity<br>■ 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:

- $\mu_{KUVE}$ = 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 $A_1$ (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] | $\Delta A_1$ | 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.

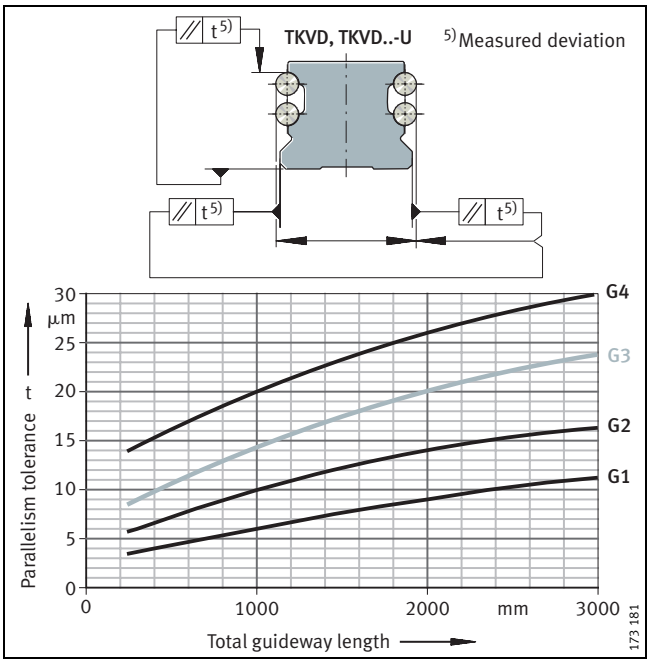



*Figure 1* · Accuracy classes and parallelism tolerances of guideways

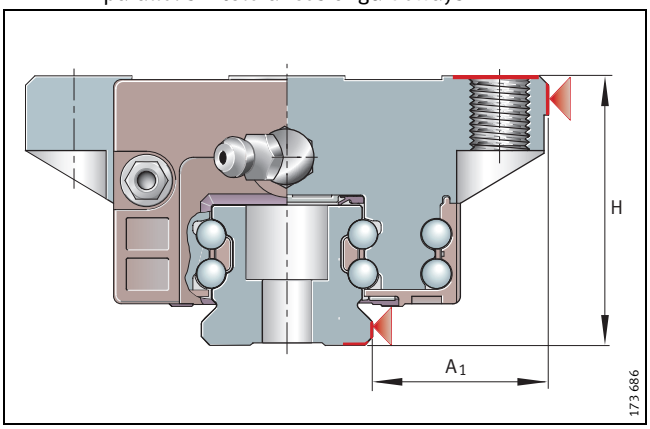



*Figure 2* · Reference dimensions for accuracy

**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 | ≦1000 mm | >1000 mm <3 000 mm | >3 000 mm | |
| KUVE..-B(-KT) | –1 mm | –1,5 mm | ±0,1% of guideway length | ±3 mm over whole length |

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

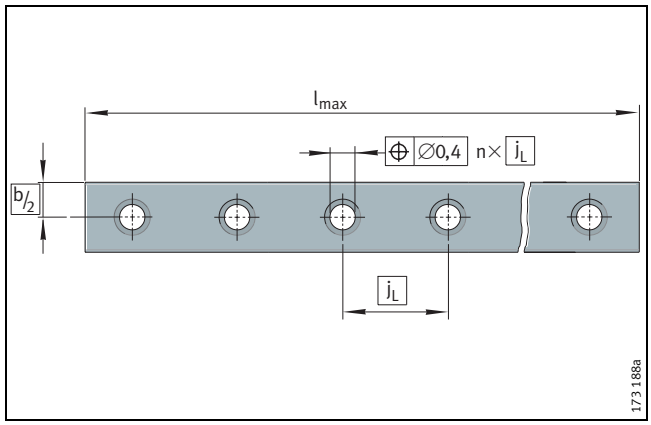



*Figure 3* · Positional and length tolerances of guideways – hole pattern to ISO 1101

### 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:

- $a_L \geqq a_{L\,min}$ 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 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*.

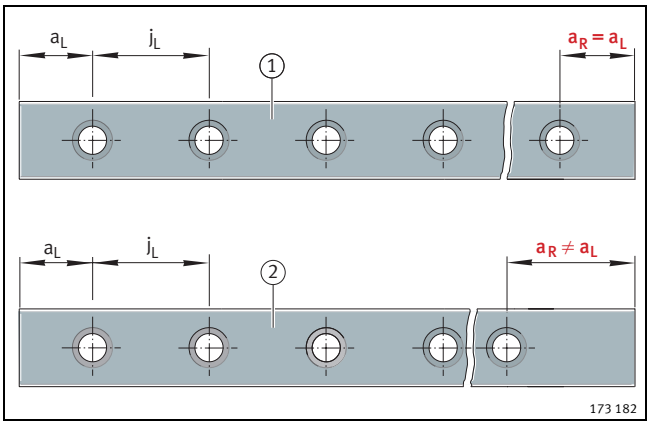



*Figure 4* · Symmetrical ① and asymmetrical ② hole patterns for guideways with one row of holes

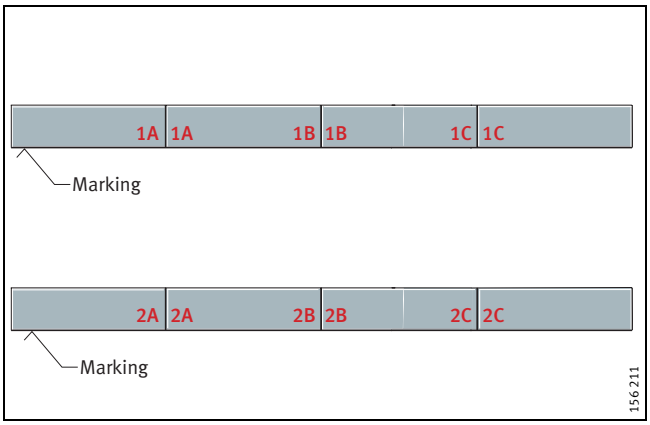



*Figure 5* · Marking of multi-piece guideways

## 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_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.

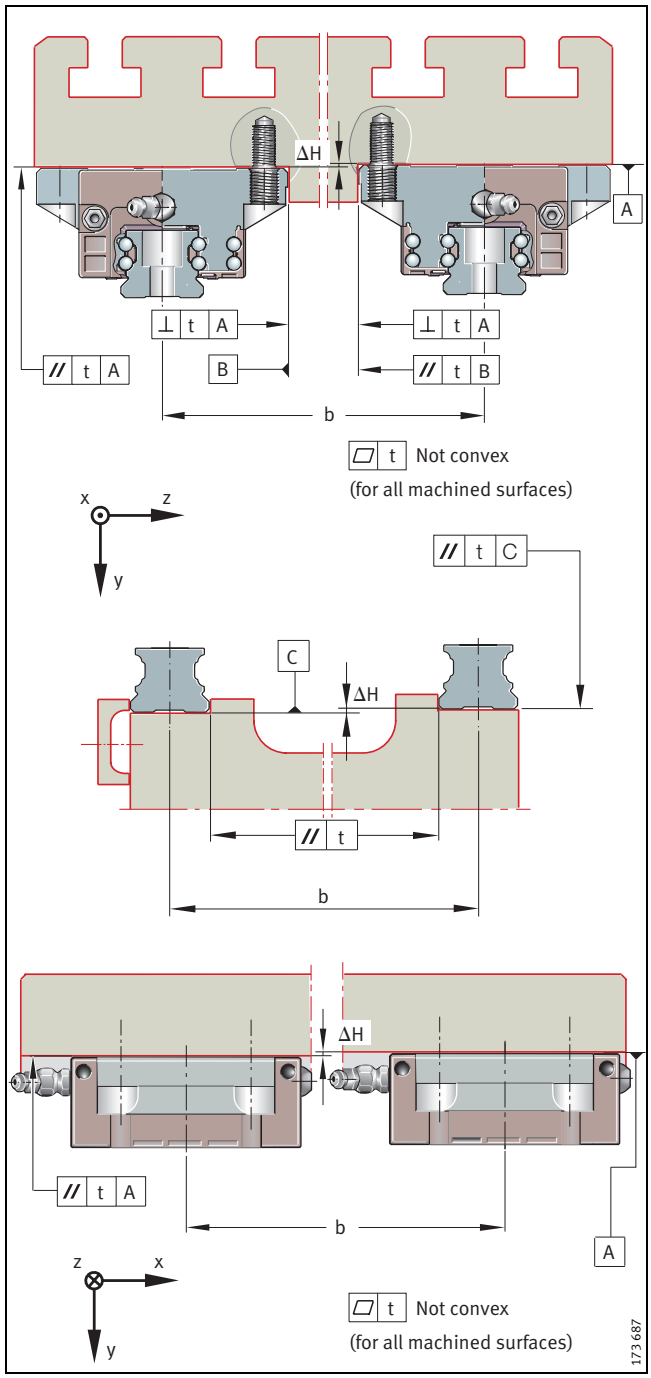



*Figure 6* · Tolerances of mounting surfaces and parallelism of mounted guideways

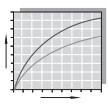
**Parallelism of mounted guideways**

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 |



### 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 |

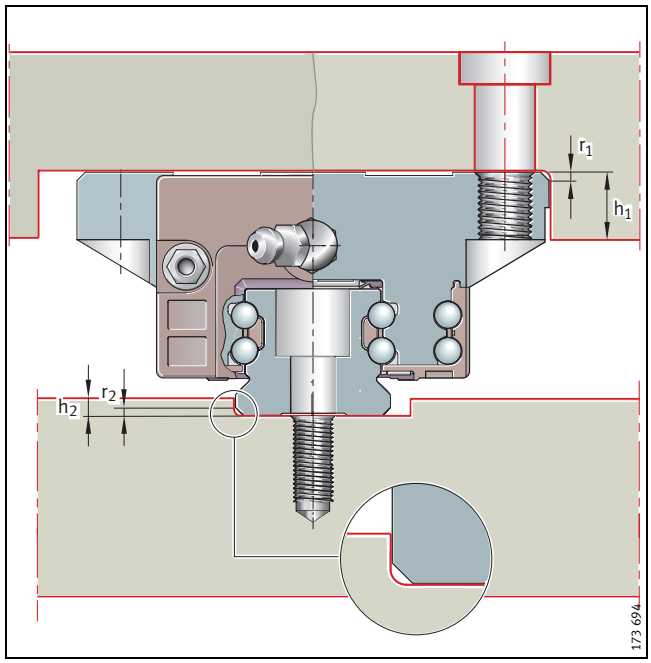



*Figure 7* · Locating heights and corner radii