

# Four-row linear recirculating ball bearing and guideway assemblies

Carriages and guideways  
High-Speed  
Sealing and lubrication elements  
Accessories

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

### Carriages Guideways ..... 278

Four-row linear recirculating ball bearing and guideway assemblies KUVE are of a full complement design and therefore have a high load carrying capacity.

They are used where the emphasis is on dynamic characteristics as well as maximum load carrying capacity and rigidity.

### X-life High-Speed ..... 278

Full complement linear recirculating ball bearing and guideway assemblies KUVE...-B-HS are designed for highly dynamic operation. In this case, the end pieces and ball return systems were redesigned in comparison with linear recirculating ball bearing and guideway assemblies KUVE...-B. The design envelope corresponds to DIN 645-1.

### Sealing and lubrication elements – system KIT ..... 362

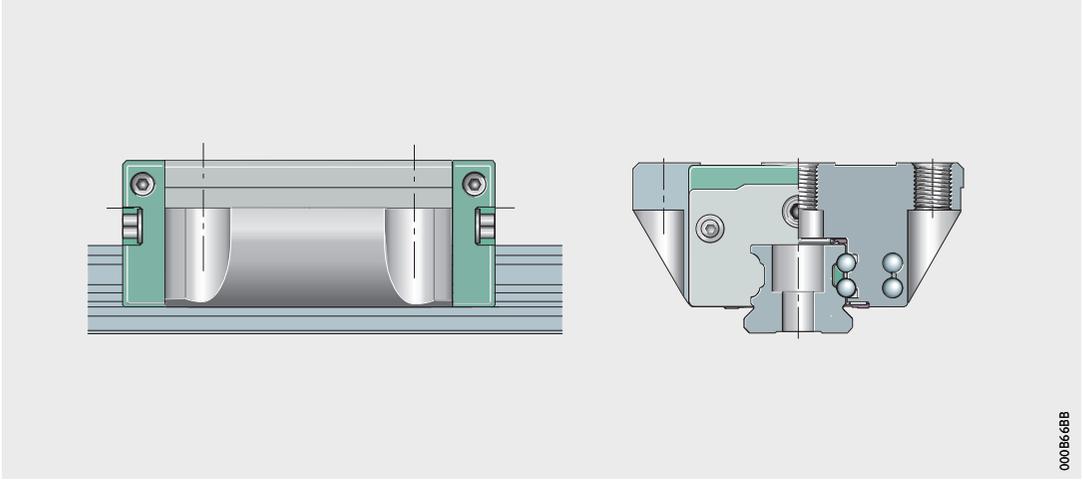
For optimum lubrication and sealing, there is an extensive system of sealing and lubrication elements. The elements are configured as a KIT and are designed for various application conditions.

### Accessories ..... 398

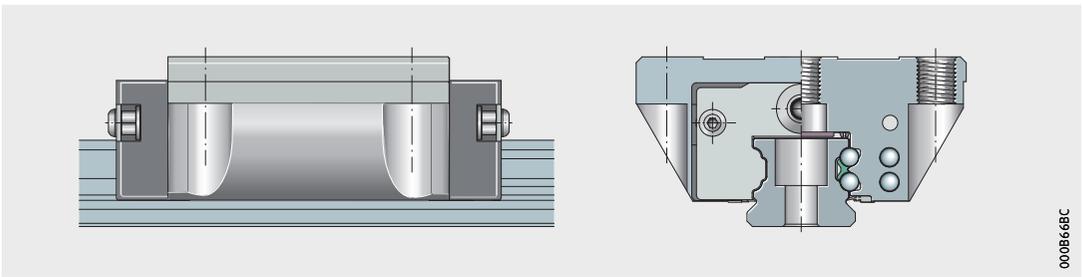
There is an extensive range of accessories for the four-row linear recirculating ball bearing and guideway assemblies.

These include closing plugs and covering strips for the guideways as well as suitable fitting tools (hydraulic fitting device and rolling-in device).

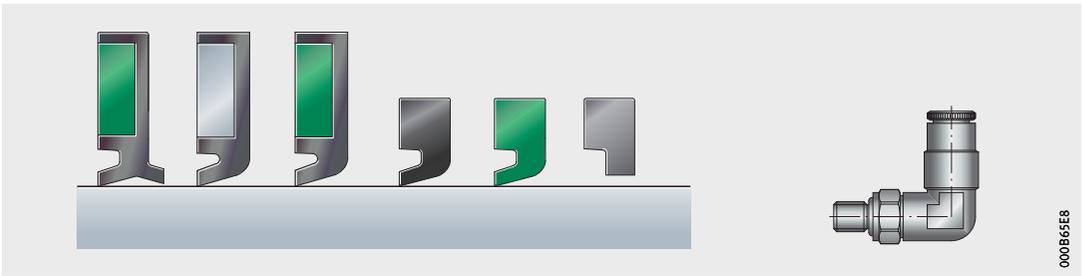
The braking and clamping element is a mechanical retaining system that is used, for example, where additional braking and clamping functions are required.



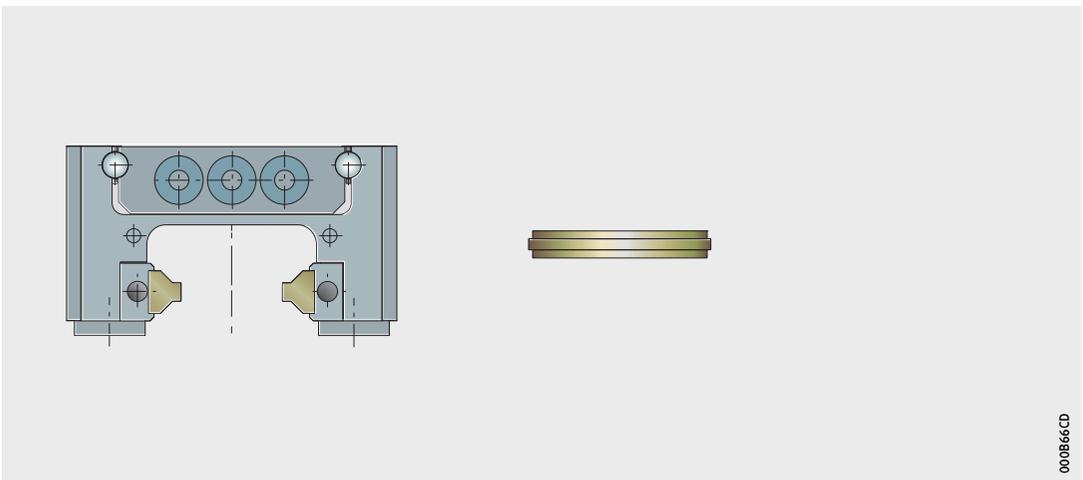
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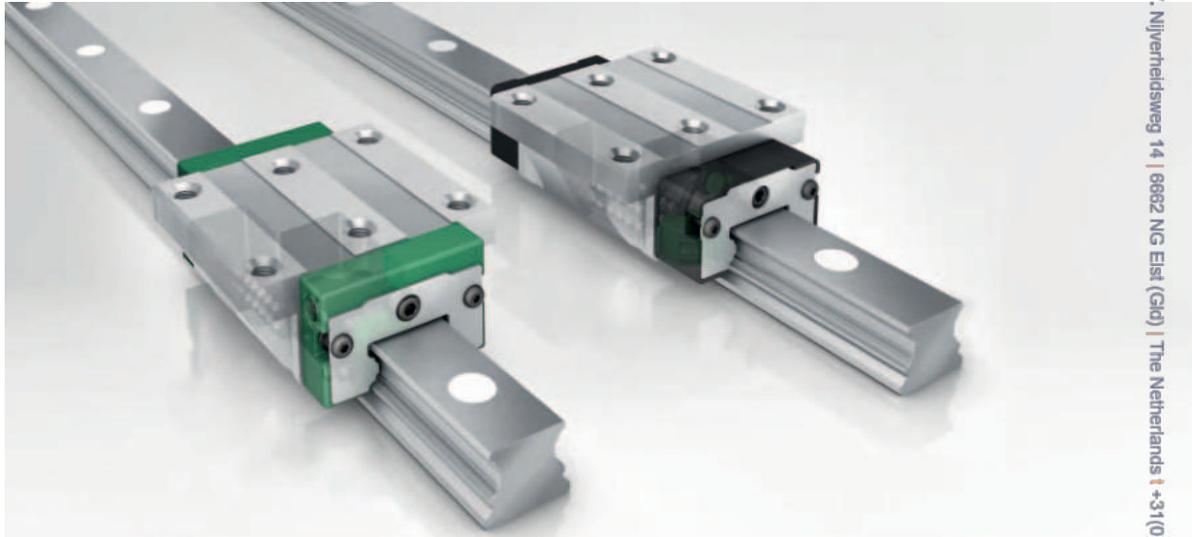
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## Four-row linear recirculating ball bearing and guideway assemblies

Carriages

Guideways

# Four-row linear recirculating ball bearing and guideway assemblies

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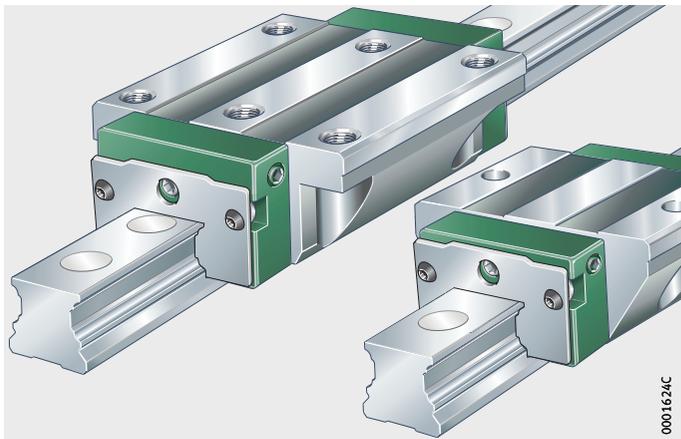
# Four-row linear recirculating ball bearing and guideway assemblies

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# Product overview **Four-row linear recirculating ball bearing and guideway assemblies**

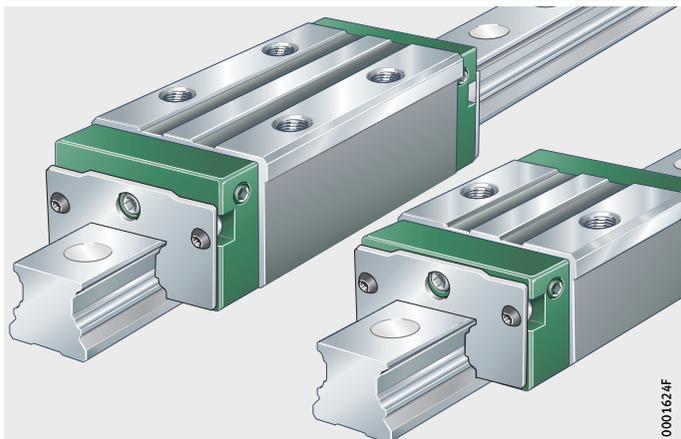
**Full complement**  
For oil or grease lubrication

KUVE...-B, KUVE...-B-E, KUVE...-B-EC, KUVE...-B-L, KUVE...-B-HS,  
KUVE...-B-E-HS, KUVE...-B-N-HS, KUVE...-B-N, KUVE...-B-NL



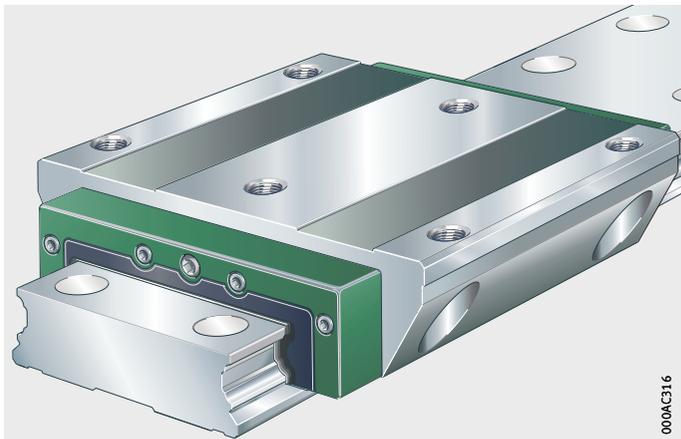
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KUVE...-B-ES, KUVE...-B-ESC, KUVE...-B-H, KUVE...-B-HL,  
KUVE...-B-S, KUVE...-B-SL, KUVE...-B-SN, KUVE...-B-SNL,  
KUVE...-B-H-HS, KUVE...-B-S-HS, KUVE...-B-SN-HS, KUVE...-B-ES-HS



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KUVE...-W, KUVE...-WL

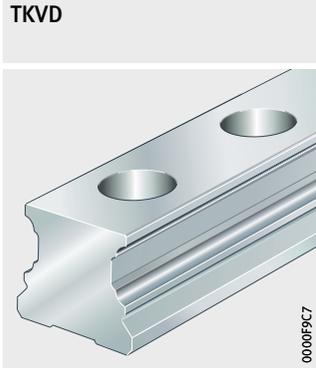


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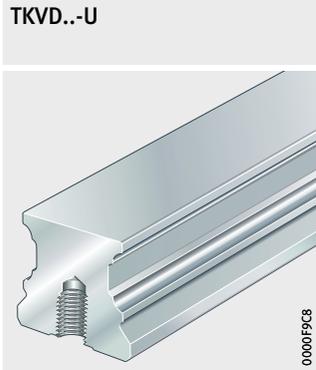
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# Product overview Four-row linear recirculating ball bearing and guideway assemblies

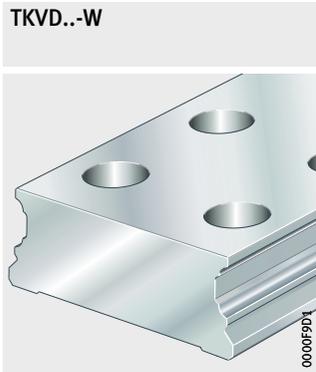
## Guideways Standard



For screw mounting from below  
or  
with slot for covering strip



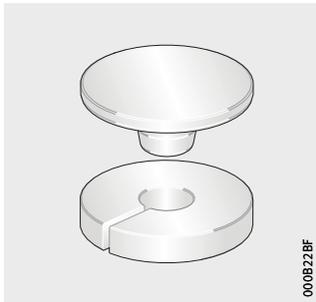
## Wide guideway



**Standard accessories**

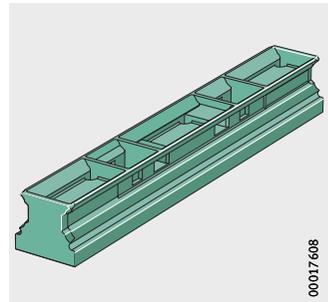
Plastic closing plugs  
Dummy guideway

KA...-TN/A



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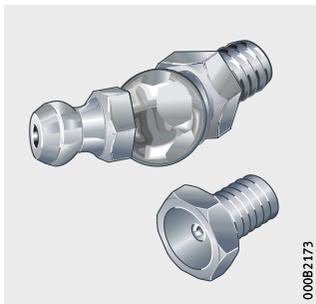
MKVD



00017 608

Lubrication connector

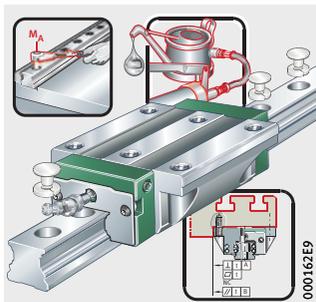
S



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Mounting manual

MON 38



000162E9

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

**Features** Four-row linear recirculating ball bearing and guideway assemblies are the most extensive and complex group within the range of monorail guidance systems. They are used where heavy loads must be moved with high running and positional accuracy as well as low friction. The guidance systems are of a full complement design, preloaded and are suitable for long, unlimited stroke lengths. A guidance system comprises at least one carriage, one guideway, one dummy guideway, two-piece plastic closing plugs and one lubrication connector included in the delivery. The four-row linear recirculating ball bearing and guideway assemblies are supplied with basic greasing as standard.

**X-life** Linear recirculating ball bearing and guideway assemblies of the design High-Speed are supplied in X-life quality. These bearings are characterised by optimised technological characteristics, increased robustness and a longer operating life at significantly higher velocities.

**High-Speed** The four-row linear recirculating ball bearing and guideway assembly KUV25-B-HS is the design High-Speed and represents an expansion of the existing extensive KUV25-B range in the field of highly dynamic applications.

Systems KUV25-B..-HS are supplied as standard with an initial greasing (greasing ready for operation). In highly dynamic applications in particular, an adequate supply of lubricant is indispensable as early as the commissioning stage.

This variant is extremely robust and is currently the fastest four-row linear recirculating ball bearing and guideway assembly with steel balls on the market. In order to achieve 10 m/s, the end pieces and ball return systems were optimised for highly dynamic requirements. As a result, the total length of the carriage is slightly longer compared to the standard version. The design envelope corresponds, as before, to DIN 645-1. The loads are supported by standard steel rolling elements.

The design High-Speed is only available in size 25. In accordance with the modular concept, it is interchangeable with the other KUV25-B units.

The unit KUV25 High-Speed is used where there are very high dynamic requirements. Since hybrid technology is not used, the full performance capacity of the rolling contact can be implemented, with the associated advantages in terms of load carrying capacity, rigidity, robustness and crash safety.

<b>Full complement</b>	Since they have the maximum possible number of rolling elements, full complement guidance systems have extremely high load carrying capacity and particularly high rigidity.
<b>Carriages</b>	The carriages have saddle plates made from hardened steel and the rolling element raceways are precision ground. The balls are recirculated in enclosed channels with plastic return elements.  A generous grease reservoir and beneficial lubrication is provided by means of favourably positioned lubricant pockets in the carriage, see page 287.
<b>Guideways</b>	The guideways are made from hardened steel and are ground on all faces, the rolling element raceways are precision ground.
<b>Location from above or below</b>	Guideways TKVD (-ADB, -ADK) and TKVD..W are located from above and have through holes with counterbores for the fixing screws. Guideways TKVD..-U and TKVD..-W-U are located from below and have threaded blind holes.
<b>Slot for covering strip</b>	Guideways TKVD..-ADB have a slot for the adhesive bonded steel covering strip ADB. Guideways TKVD..-ADK have a slot with undercut for the clip fit steel covering strip ADK, see dimension tables.
<b>Multi-piece guideways</b>	If the required guideway length $l_{max}$ is greater than the value in the dimension tables, the guideways are supplied in several segments, see page 300.
<b>Standard accessories</b>	The scope of delivery includes various accessory parts as standard.
<b>Dummy guideway</b>	The dummy guideway prevents damage to the rolling element set and prevents the rolling elements from falling out while the carriage is separated from the guideway.  Carriages are always pushed directly from the guideway onto the dummy guideway and must remain there until they are remounted.
<b>Plastic closing plugs</b>	The closing plugs close off the counterbores of the guideway holes flush with the surface of the guideway, see dimension tables.  Optionally, brass closing plugs are also available, see page 402.
<b>Lubrication connector</b>	A lubrication connector for relubrication from the end is included in the scope of delivery.

# Four-row linear recirculating ball bearing and guideway assemblies

## Load carrying capacity

The rows of balls are in an O arrangement with two point contact on the raceways.

The units can support loads from all directions, except in the direction of motion, and moments about all axes, *Figure 1*.

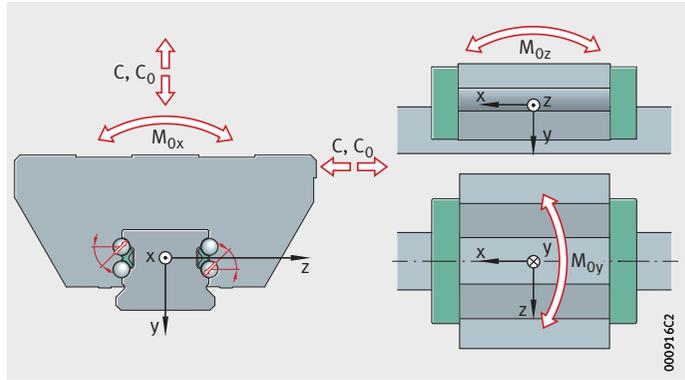


Figure 1  
Load carrying capacity

## Acceleration and velocity

Four-row linear recirculating ball bearing and guideway assemblies KUVE permit accelerations up to 150 m/s<sup>2</sup> and velocities up to 6 m/s, see table. The design High-Speed permits velocities up to 10 m/s, depending on the operating conditions.

### Operating limits

Designation	Acceleration up to m/s <sup>2</sup>	Velocity up to m/s
KUVE	150	6

## Interchangeability

Carriages KWVE and guideways TKVD are interchangeable in any combination within one size, preload class and accuracy class.

## Sealing

The end pieces of the carriages are fitted on both sides with non-contact, corrosion-resistant end plates and elastic end wipers that retain the lubricant in the system. Carriages of the W design are only fitted with elastic end wipers on both sides.

Standard sealing strips ensure reliable sealing and protect the rolling element system against contamination, even in critical environmental conditions, *Figure 2*, page 287.



Under extremely heavy contamination load, additional wipers can be fitted, see page 362. Where necessary, additional covers must be used.

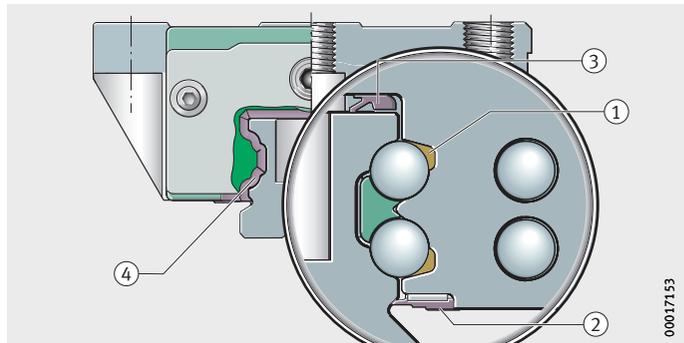
**Lubrication**

Linear recirculating ball bearing and guideway assemblies KUVE..-B and KUVE..-W are suitable for oil and grease lubrication. The systems are supplied with a basic greasing. A lubrication connector for relubrication from the end is included in the scope of delivery. Optionally, other lubrication connectors are available, see page 384 and page 394.

The lubrication connectors can be screw mounted into the end piece on the left, right or end face in the design KUVE..-B, while this is only permissible on the end face in the designs KUVE High-Speed and KUVE..-W. All relubrication holes are closed off by means of grub screws. Before the lubrication connector is screwed in, the corresponding grub screw must be removed. Observe the mounting manual MON 38.

- ① Integrated lubrication pockets with grease reservoir
- ② Standard sealing strip
- ③ Optional sealing strip
- ④ Elastic wipers on end faces

*Figure 2*  
Lubricant reservoir KUVE..-B and sealing



If lubrication connectors are fitted on the end or side, the maximum permissible screw depth must be observed, see dimension tables. If additional sealing elements KIT are used, the screw depth is increased for the end relubrication facility. The standard lubrication connector is then no longer usable. Suitable lubrication connectors must additionally be taken into consideration when ordering, see page 384 and page 394.

In order to ensure optimum lubricant distribution, we recommend that carriages of design High-Speed should be moved several times at low speed before commissioning and after maintenance and lubrication intervals.

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

### Operating temperature

As standard, four-row linear recirculating ball bearing and guideway assemblies can be used at operating temperatures from -10 °C to +80 °C.

### Corrosion-resistant design

Four-row linear recirculating ball bearing and guideway assemblies KUBE..-B are available in the accuracy class G3 and also in a corrosion-resistant design with the special coatings Corrotect (with the preload class V1 or V2) and Protect A (with the preload class V2), see page 56.

### Designs

Linear recirculating ball bearing and guideway assemblies KUBE..-B are available in numerous designs, see table.

### Available designs

Design	Description
-	Standard carriage
E	Expanded design (carriage without screw threads)
EC	Expanded design, short carriage (carriage without screw threads)
ES	Expanded design, narrow carriage
ESC	Expanded design, short, narrow carriage
H	High carriage
HL	High, long carriage
HS	High-Speed
E-HS	High-Speed, expanded design
ES-HS	High-Speed, expanded design, narrow carriage
H-HS	High-Speed, high carriage
N-HS	High-Speed, low carriage
S-HS	High-Speed, narrow carriage
SN-HS	High-Speed, narrow, low carriage
L	Long carriage
N	Low carriage
NL	Low, long carriage
S	Narrow carriage
SL	Narrow, long carriage
SN	Narrow, low carriage
SNL	Narrow, low, long carriage

Wide linear recirculating ball bearing and guideway assemblies are available in two designs, see table.

### Available designs

Design	Description
W	Wide carriage and wide guideway
WL	Wide, long carriage and wide guideway

**Design and safety guidelines**

**Preload**

Linear recirculating ball bearing and guideway assemblies KUBE are available in the preload classes V0, V1 and V2, see table.

**Preload classes**

Preload class	Preload setting
V0	Very small clearance to clearance-free
V1 <sup>1)</sup>	0,04 · C
V2 <sup>2)</sup>	0,1 · C

<sup>1)</sup> Standard preload class.

<sup>2)</sup> Not for design High-Speed.

**Influence of preload on the linear guidance system**

The preload of a linear guidance system defines the rigidity of the system. The four-row linear recirculating ball bearing and guideway assembly KUBE can be obtained in the preload classes V0 to V2, where the preload class V1 is the standard preload class. If special requirements are present, the alternative preload classes may be used.

Increasing the preload increases the rigidity of the guidance system. The preload influences not only the rigidity but also the displacement force of the guidance system. The higher the preload, the larger the displacement force. Furthermore, preload also influences the operating life of the guidance system.

**Friction**

The coefficient of friction is dependent on the ratio C/P, see table.

**Coefficient of friction**

Load C/P		Coefficient of friction $\mu_{KUBE}$	
from	to	from	to
4	20	0,0007	0,0015

**Rigidity**

The deflection curves show the deformation of the linear recirculating ball bearing and guideway assembly KUBE, including the deformation of the screw connections to the adjacent construction, *Figure 3*, page 290 to *Figure 18*, page 297.



The rigidity curves are valid only for screw mounting in accordance with the mounting manual MON 38 and the standard preload class V1.



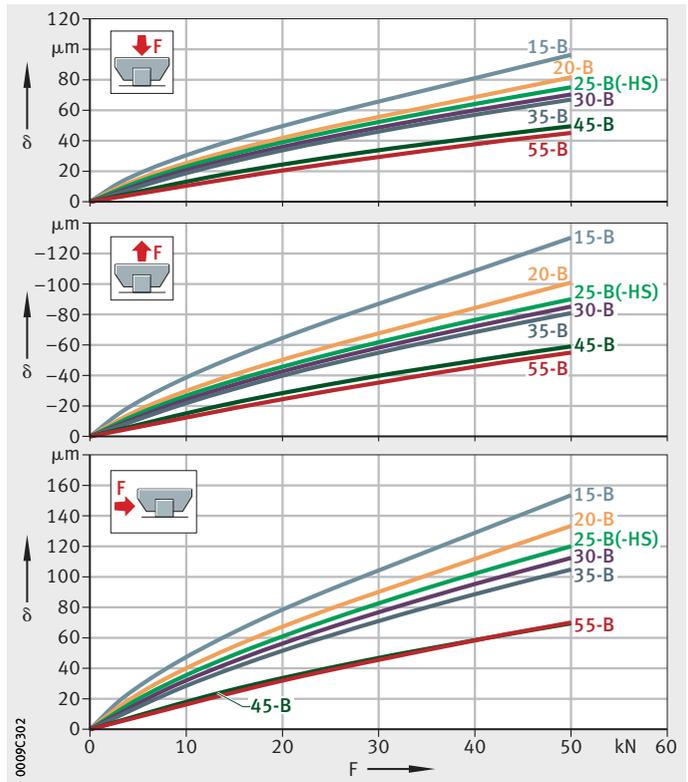
# Four-row linear recirculating ball bearing and guideway assemblies

- KUVE15-B
- KUVE20-B
- KUVE25-B
- KUVE25-B-HS
- KUVE30-B
- KUVE35-B
- KUVE45-B
- KUVE55-B

$\delta$  = deflection  
F = load

Figure 3

Deflection curves for compressive, tensile and lateral load

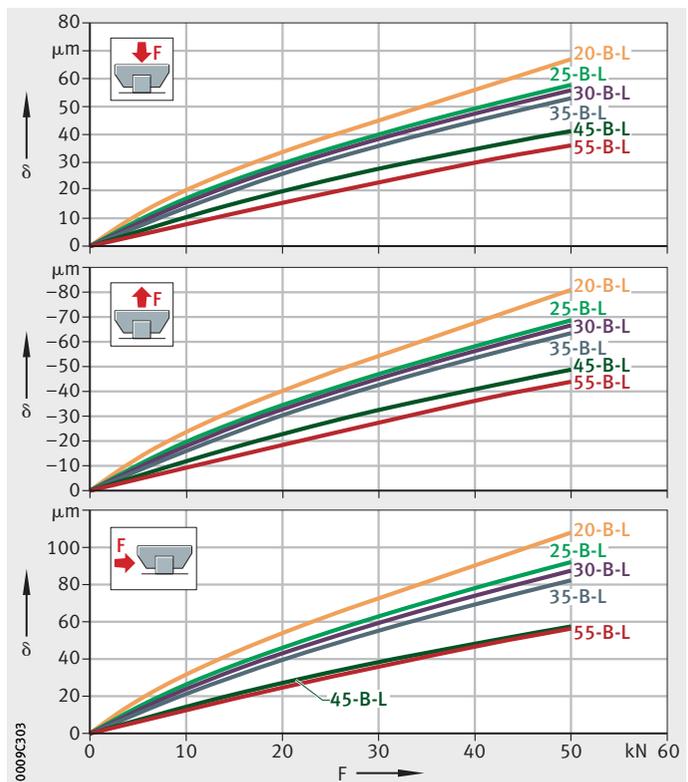


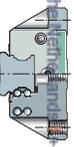
- KUVE20-B-L
- KUVE25-B-L
- KUVE30-B-L
- KUVE35-B-L
- KUVE45-B-L
- KUVE55-B-L

$\delta$  = deflection  
F = load

Figure 4

Deflection curves for compressive, tensile and lateral load



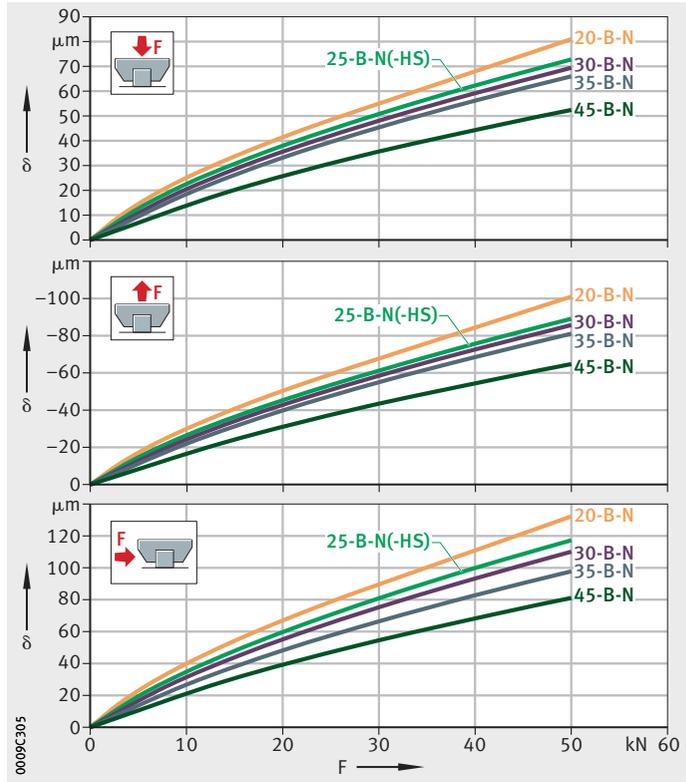


- KUVE20-B-N
- KUVE25-B-N
- KUVE25-B-N-HS
- KUVE30-B-N
- KUVE35-B-N
- KUVE45-B-N

$\delta$  = deflection  
F = load

Figure 5

Deflection curves for compressive, tensile and lateral load

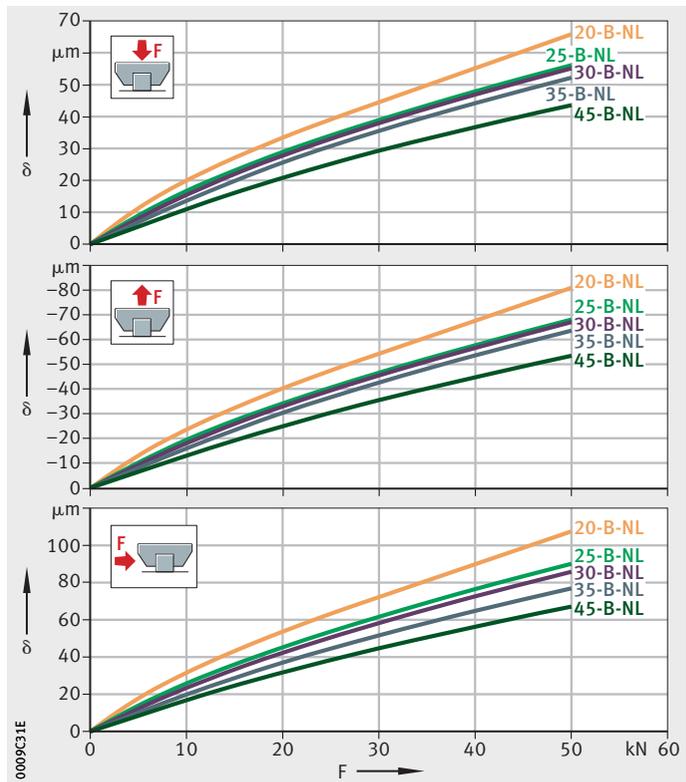


- KUVE20-B-NL
- KUVE25-B-NL
- KUVE30-B-NL
- KUVE35-B-NL
- KUVE45-B-NL

$\delta$  = deflection  
F = load

Figure 6

Deflection curves for compressive, tensile and lateral load

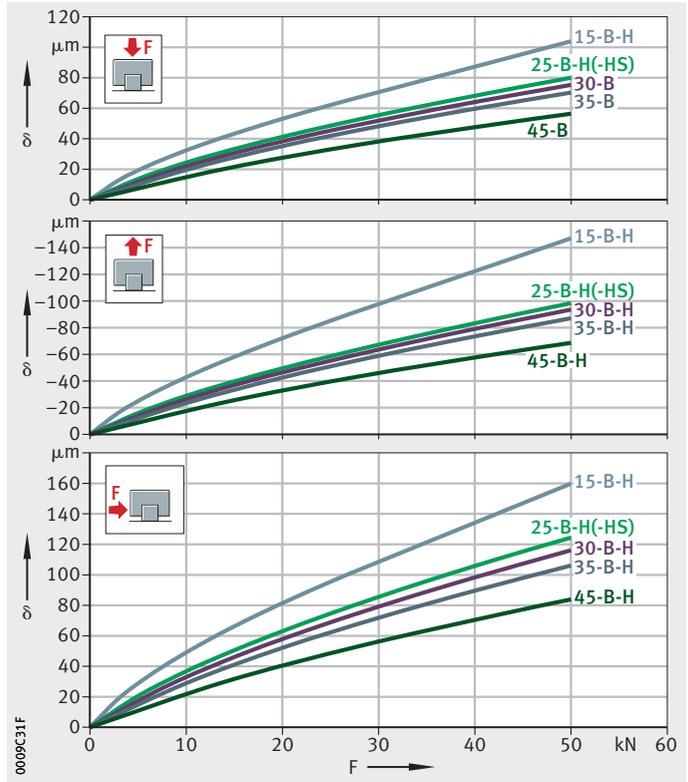


# Four-row linear recirculating ball bearing and guideway assemblies

- KUVE15-B-H
- KUVE25-B-H
- KUVE25-B-H-HS
- KUVE30-B-H
- KUVE35-B-H
- KUVE45-B-H

$\delta$  = deflection  
F = load

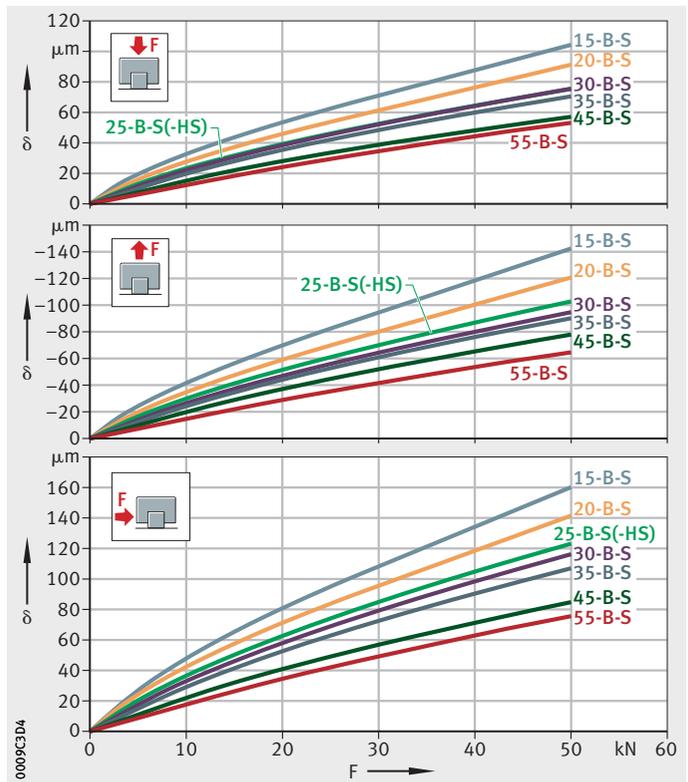
Figure 7  
Deflection curves for compressive, tensile and lateral load

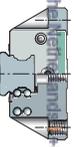


- KUVE15-B-S
- KUVE20-B-S
- KUVE25-B-S
- KUVE25-B-S-HS
- KUVE30-B-S
- KUVE35-B-S
- KUVE45-B-S
- KUVE55-B-S

$\delta$  = deflection  
F = load

Figure 8  
Deflection curves for compressive, tensile and lateral load



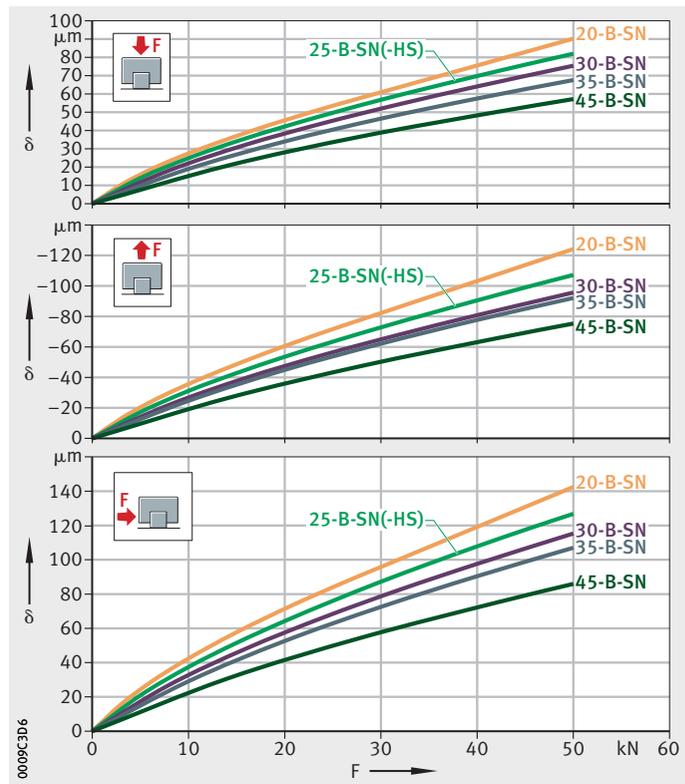


- KUVE20-B-SN
- KUVE25-B-SN
- KUVE25-B-SN-HS
- KUVE30-B-SN
- KUVE35-B-SN
- KUVE45-B-SN

$\delta$  = deflection  
F = load

Figure 9

Deflection curves for compressive, tensile and lateral load

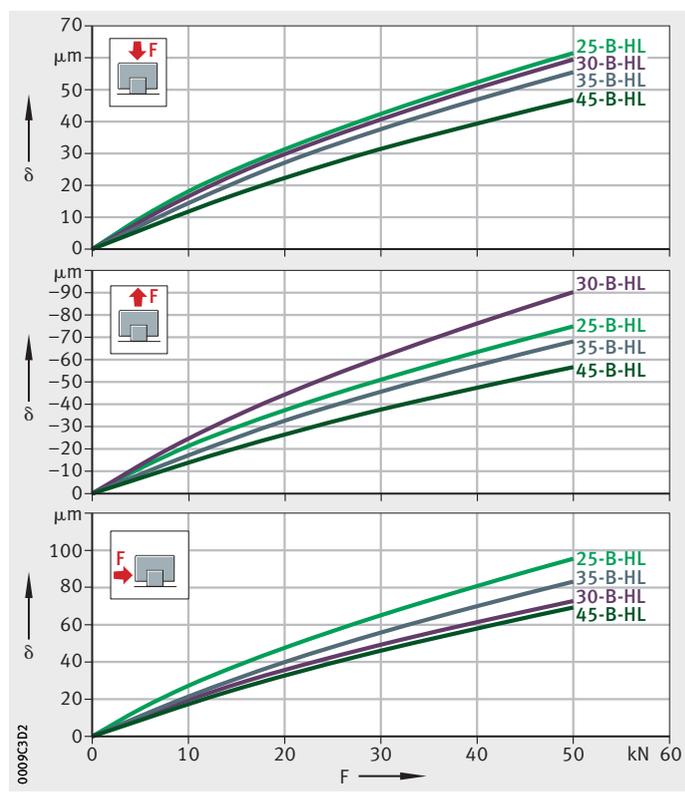


- KUVE25-B-HL
- KUVE30-B-HL
- KUVE35-B-HL
- KUVE45-B-HL

$\delta$  = deflection  
F = load

Figure 10

Deflection curves for compressive, tensile and lateral load

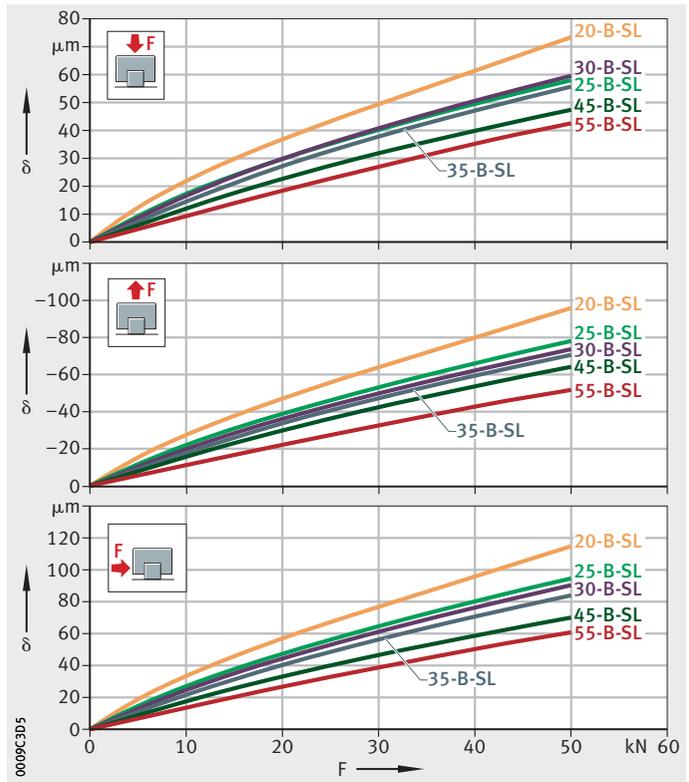


# Four-row linear recirculating ball bearing and guideway assemblies

KUVE20-B-SL  
 KUVE25-B-SL  
 KUVE30-B-SL  
 KUVE35-B-SL  
 KUVE45-B-SL  
 KUVE55-B-SL

$\delta$  = deflection  
 F = load

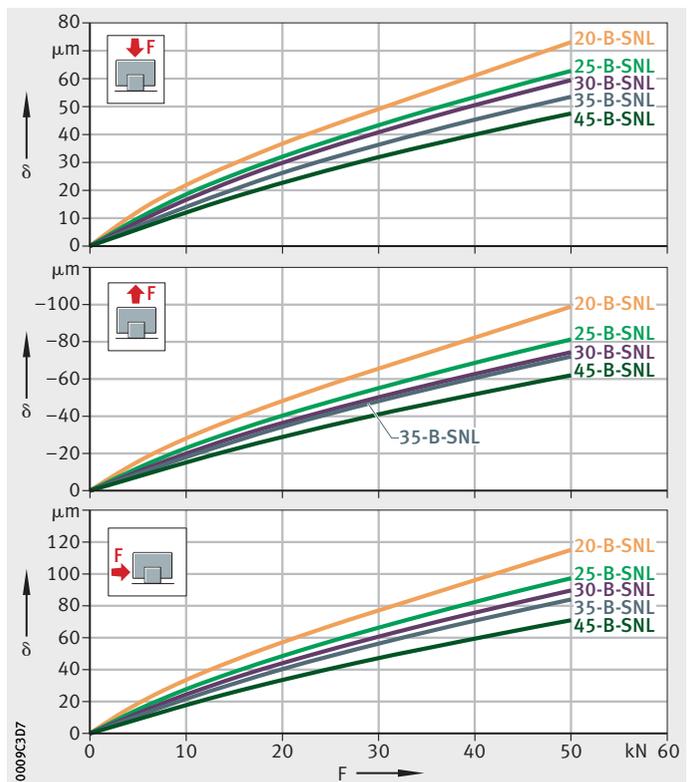
Figure 11  
 Deflection curves for compressive, tensile and lateral load

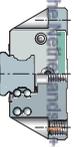


KUVE20-B-SNL  
 KUVE25-B-SNL  
 KUVE30-B-SNL  
 KUVE35-B-SNL  
 KUVE45-B-SNL

$\delta$  = deflection  
 F = load

Figure 12  
 Deflection curves for compressive, tensile and lateral load





KUVE15-B-E  
 KUVE20-B-E  
 KUVE25-B-E  
 KUVE25-B-E-HS  
 KUVE30-B-E  
 KUVE35-B-E

$\delta$  = deflection  
 F = load

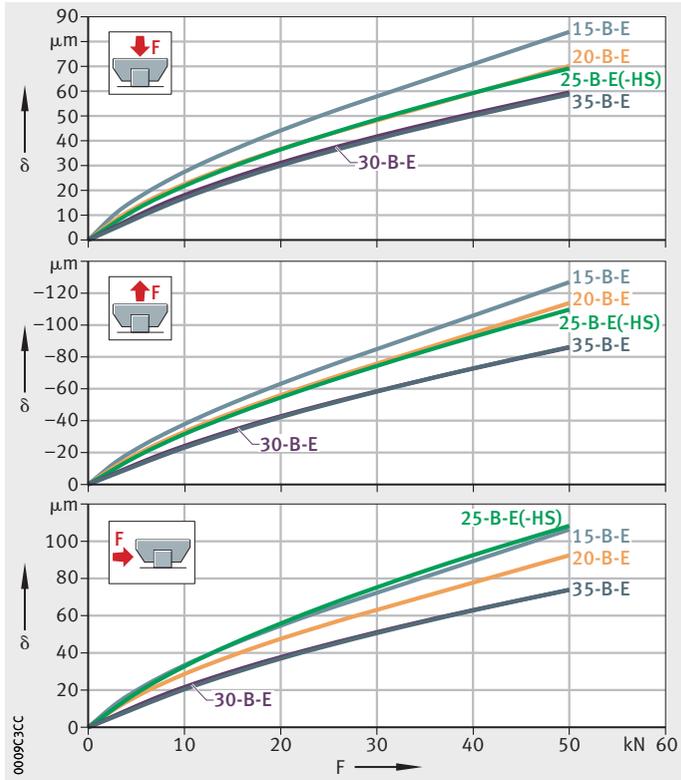


Figure 13  
 Deflection curves for compressive, tensile and lateral load

KUVE15-B-ES  
 KUVE20-B-ES  
 KUVE25-B-ES  
 KUVE25-B-ES-HS  
 KUVE30-B-ES  
 KUVE35-B-ES

$\delta$  = deflection  
 F = load

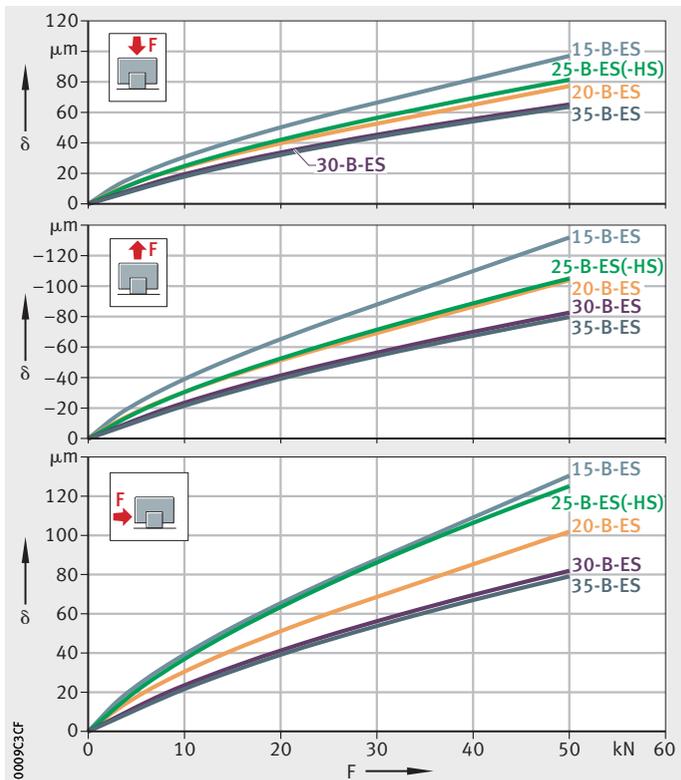


Figure 14  
 Deflection curves for compressive, tensile and lateral load

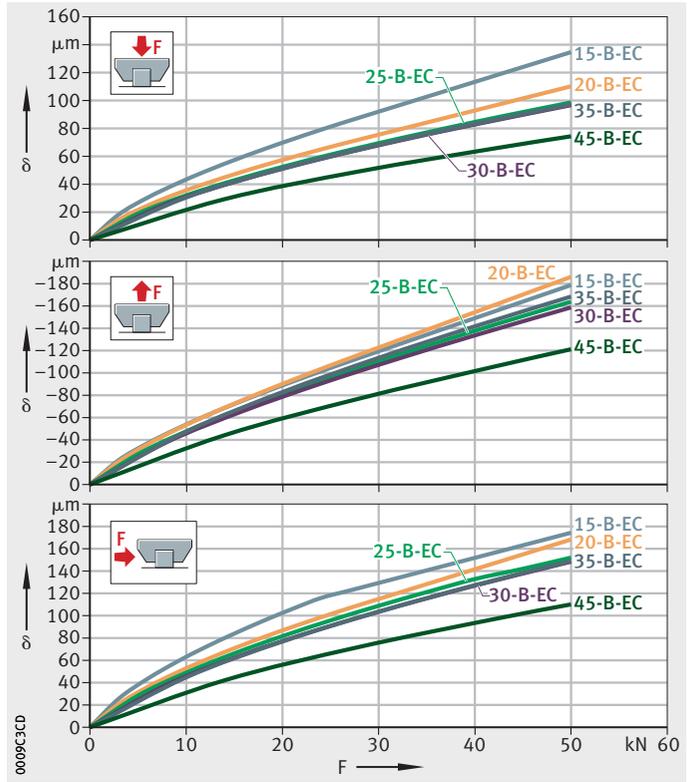
# Four-row linear recirculating ball bearing and guideway assemblies

- KUVE15-B-EC
- KUVE20-B-EC
- KUVE25-B-EC
- KUVE30-B-EC
- KUVE35-B-EC
- KUVE45-B-EC

$\delta$  = deflection  
F = load

Figure 15

Deflection curves for compressive, tensile and lateral load

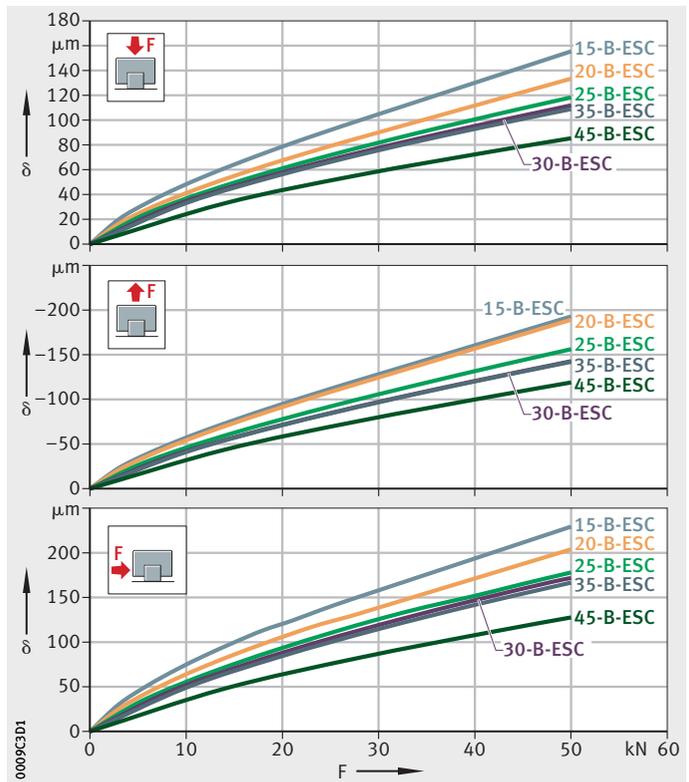


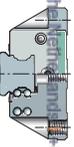
- KUVE15-B-ESC
- KUVE20-B-ESC
- KUVE25-B-ESC
- KUVE30-B-ESC
- KUVE35-B-ESC
- KUVE45-B-ESC

$\delta$  = deflection  
F = load

Figure 16

Deflection curves for compressive, tensile and lateral load

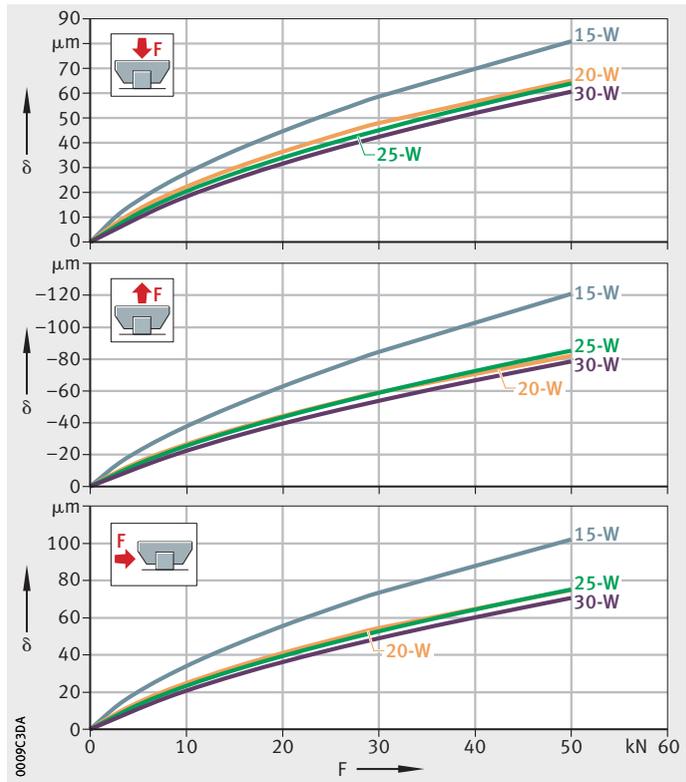




KUVE15-W  
 KUVE20-W  
 KUVE25-W  
 KUVE30-W

$\delta$  = deflection  
 F = load

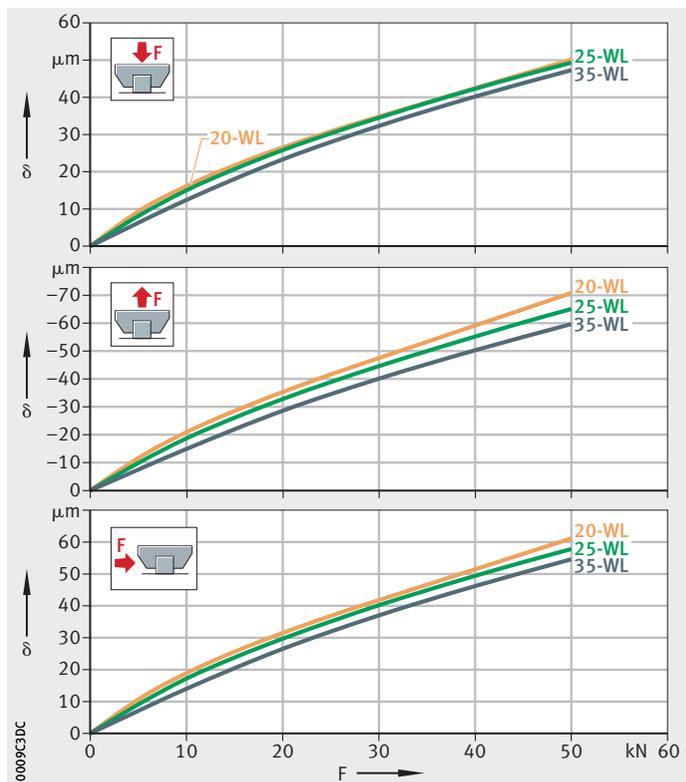
Figure 17  
 Deflection curves for compressive, tensile and lateral load



KUVE20-WL  
 KUVE25-WL  
 KUVE35-WL

$\delta$  = deflection  
 F = load

Figure 18  
 Deflection curves for compressive, tensile and lateral load



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

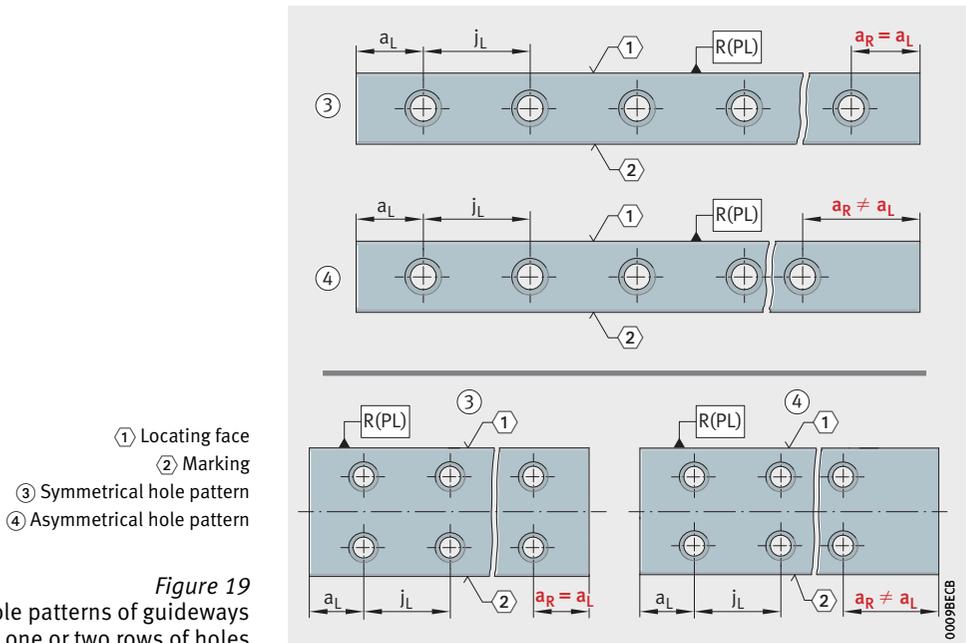
### Hole patterns of guideways

Unless specified otherwise, the guideways have a symmetrical hole pattern where  $a_L = a_R$ , *Figure 19*.

An asymmetrical hole pattern may also be available upon request. In this case,  $a_L \geq a_{L \min}$  and  $a_R \geq a_{R \min}$ , *Figure 19*.



Irrespective of the orientation of the locating face,  $a_L$  is on the left and  $a_R$  on the right, *Figure 19*. When ordering, the required orientation of the locating face (top or bottom) must be indicated.



**Maximum number of pitches between holes**

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

$$n = \frac{l - 2 \cdot a_{L \min}}{j_L}$$

The spacings  $a_L$  and  $a_R$  are generally determined as follows:

$$a_L + a_R = l - n \cdot j_L$$

For guideways with a symmetrical hole pattern:

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

Number of holes:

$$x = n + 1$$

$a_L, a_R$	mm
Spacing between the start and the end of the guideway and the nearest hole, <i>Figure 19</i> , page 298	
$a_{L \min}, a_{R \min}$	mm
Minimum values for $a_L, a_R$ , see dimension tables	
$l$	mm
Guideway length	
$n$	-
Maximum possible number of pitches between holes	
$j_L$	mm
Spacing between holes	
$x$	-
Number of holes.	

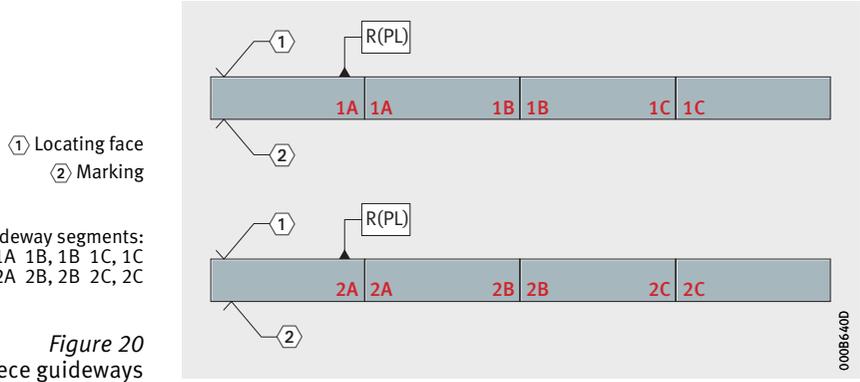


If the minimum values for  $a_L$  and  $a_R$  are not observed, the counterbores of the holes may be intersected. Risk of injury.

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

### Multi-piece guideways

If the guideway length required is greater than  $l_{max}$ , see dimension tables, or joined guideways are required, these guideways are made up from segments that together comprise the total required length. The segments are matched to each other and marked, *Figure 20*. The pitch is always located centrally between the fixing holes.



Guideway segments:  
1A, 1A 1B, 1B 1C, 1C  
2A, 2A 2B, 2B 2C, 2C

*Figure 20*  
Marking of multi-piece guideways



In the case of multi-piece guideways, the gap at the end faces between two segments must be  $< 0,05$  mm.

### Guideways suitable for joining as required

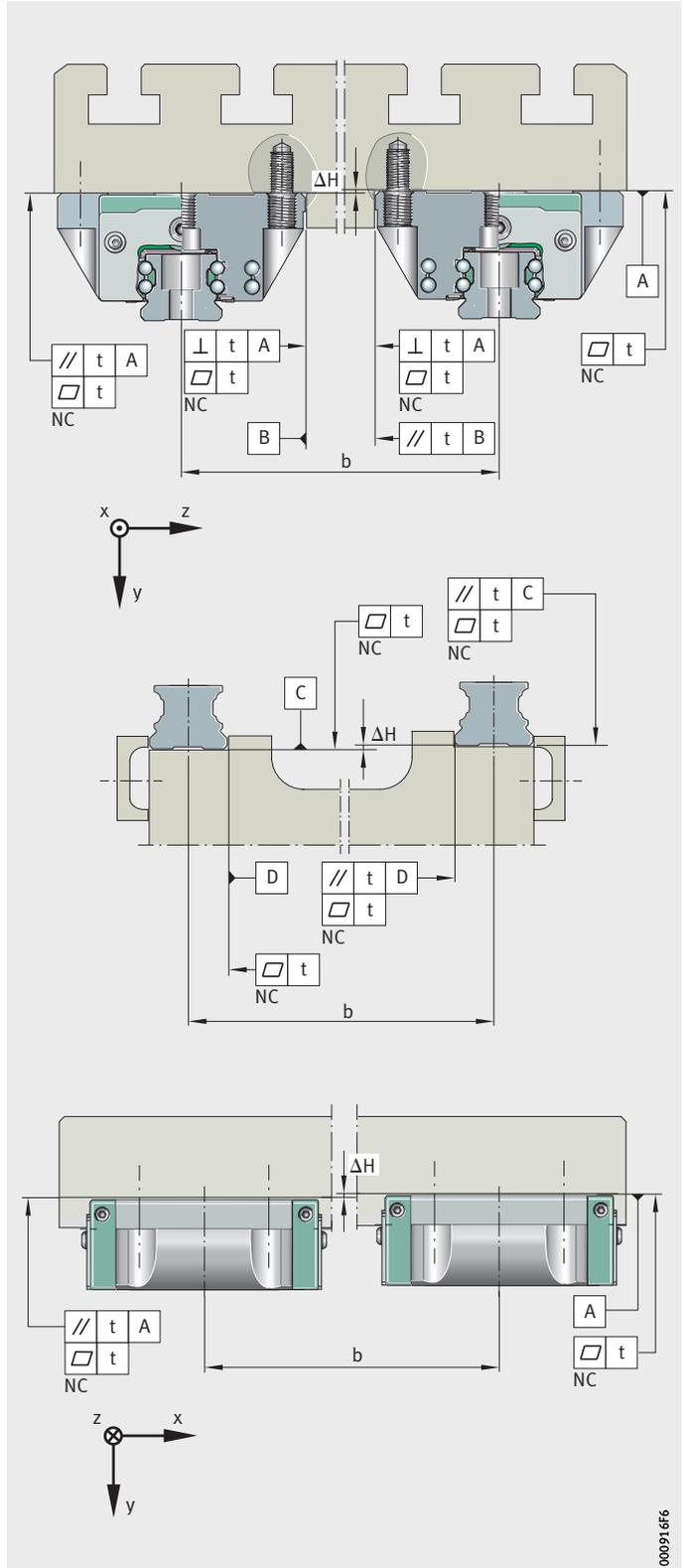
If partial guideway lengths ( $l < l_{max}$ ) are to be combined with each other to form a guideway set as requested by the customer, the following postscript must be added to the order for the relevant guideway segment: “Guideway suitable for joining as required”.

If the guideway segment is an end segment, it is recommended that the guideway end has a chamfer, in order to make it easier to slide the carriages onto the guideway and protect the seals against damage. In this case, the position of the chamfer (left or right) and the position of the locating face (top or bottom) must be taken into consideration when ordering.

This design facilitates easier logistics.



# Four-row linear recirculating ball bearing and guideway assemblies



NC = not convex

$b$  = spacing between guidance elements

$\Delta H$  = height difference

$t$  = parallelism, flatness and perpendicularity tolerance

Figure 21

Tolerances of mounting surfaces and parallelism of mounted guideways and carriages

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**Parallelism of mounted guideways**

For guideways arranged in parallel, the values for *t* are in accordance with *Figure 21*, page 302, and the table. If the maximum values are used, this may increase the displacement resistance.

**Values for geometry and position**

Guideway	Preload class	
	V0, V1	V2
	Parallelism, flatness and perpendicularity <i>t</i> μm	
TKVD15-B (-U)	8	5
TKVD15-W (-U)		
TKVD20 (-U, -ADB, -ADK)	9	6
TKVD20-W (-U)		
TKVD25 (-U, -ADB, -ADK)	11	7
TKVD25-W (-U)		
TKVD30 (-U, -ADB, -ADK)	13	8
TKVD30-W (-U)		
TKVD35 (-U, -ADB, -ADK)	15	10
TKVD35-W (-U)		
TKVD45 (-U, -ADB, -ADK)	17	12
TKVD55-B (-U, -ADB, -ADK)		
TKVD55-W (-U, -ADB, -ADK)	20	14

# Four-row linear recirculating ball bearing and guideway assemblies

## Locating heights and corner radii

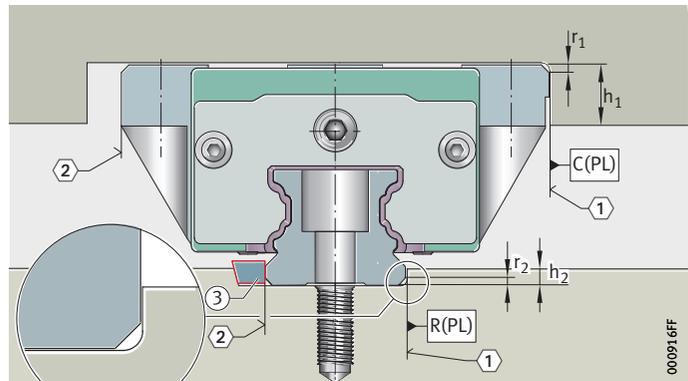
For the design of the locating heights and corner radii, see table and Figure 22.

### Locating heights, corner radii

Designation	Locating heights		Corner radii	
	$h_1$ mm	$h_2$ mm max.	$r_1$ mm max.	$r_2$ mm max.
KUVE15-B (-H, -S, -E, -EC, -ES, -ESC)	4,5	3,5	1	0,3
KUVE15-W	4,5	1,6	1	0,5
KUVE20-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -E, -EC, -ES, -ESC)	5	4	1	0,5
KUVE20-W (-WL)	5	4	1	0,5
KUVE25-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -E, -EC, -ES, -ESC)	5	4,5	1	0,8
KUVE25-B (-E, -ES, -H, -S, -SN, -N) -HS	5	4,5	1	0,8
KUVE25-W (-WL)	5	4,5	1	0,8
KUVE30-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -E, -EC, -ES, -ESC)	6	5	1	0,8
KUVE30-W	6	5	1	0,8
KUVE35-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -E, -EC, -ES, -ESC)	6,5	6	1	0,8
KUVE35-WL	6,5	6	1	0,8
KUVE45-B (-L, -H, -HL, -S, -SL, -SN, -SNL, -N, -NL, -E, -EC, -ESC)	9	8	1	1
KUVE55-B (-L, -S, -SL)	12	10	1	1,5

- ① Locating face
- ② Marking
- ③ Vee strip

Figure 22  
Locating heights and corner radii



**Accuracy**  
**Accuracy classes**

Four-row linear recirculating ball bearing and guideway assemblies are available in the accuracy classes G1 to G4, *Figure 23* and table, page 306. The standard is class G3.

**Parallelism of raceways to locating surfaces**

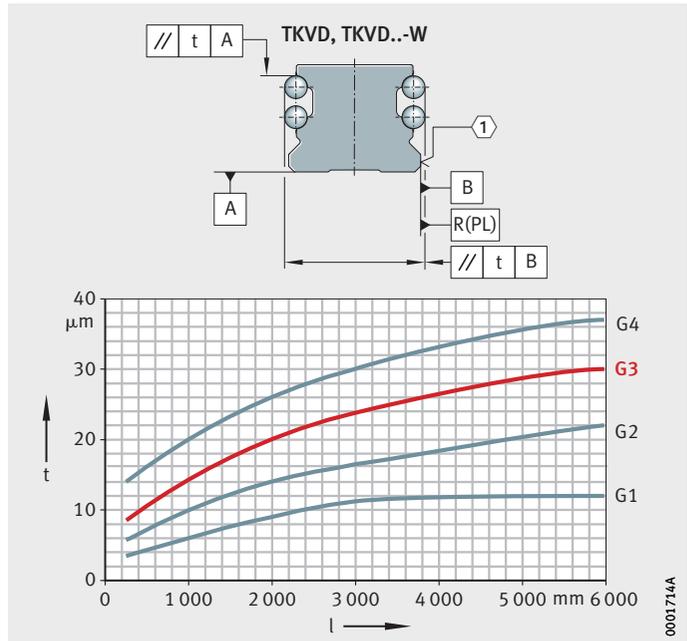
The parallelism tolerances of the guideways are dependent on the accuracy class, *Figure 23*.

In coated systems, there may be deviations in tolerances compared with uncoated units.

t = parallelism tolerance  
l = total guideway length

① Locating face

*Figure 23*  
Accuracy classes and parallelism tolerances of guideways



**Tolerances**

The tolerances are arithmetic mean values, see table and *Figure 24*, page 306. They are relative to the centre point of the screw mounting or locating surfaces of the carriage.

The dimensions H and A<sub>1</sub> should always remain within the tolerance irrespective of the position of the carriage on the guideway, see table, page 306.

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

### Tolerances for height H and spacing $A_1$

Tolerance		Accuracy			
		G1 $\mu\text{m}$	G2 $\mu\text{m}$	G3 <sup>1)</sup> $\mu\text{m}$	G4 $\mu\text{m}$
Tolerance for height	H	$\pm 10$	$\pm 20$	$\pm 25$	$\pm 80$
Difference in height <sup>2)</sup>	$\Delta H$	5	10	15	20
Tolerance for spacing	$A_1$	$\pm 10$	$\pm 15$	$\pm 20$	$\pm 80$
Difference in spacing <sup>2)</sup>	$\Delta A_1$	7	15	22	30

1) Standard accuracy class.

2) Difference between several carriages on one guideway, measured at the same point on the guideway.

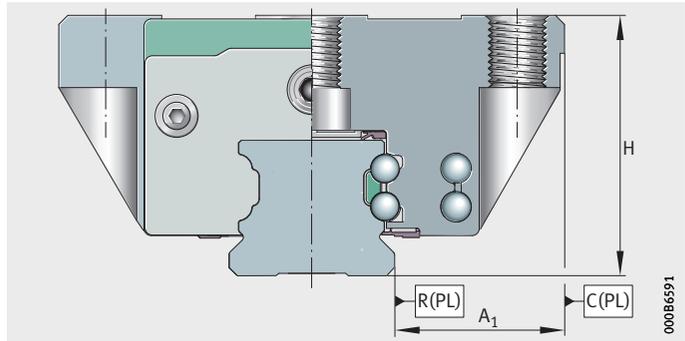


Figure 24  
Datum dimensions for accuracy

Units with coating



### Tolerances for coated parts

For these units, the values for the appropriate accuracy class must be increased by the values for the coating, see table.

Coated systems are only available in the accuracy class G3.

Tolerance <sup>1)</sup>		Corrotect	Protect A
		RROC $\mu\text{m}$	KD $\mu\text{m}$
Tolerance for height	H	+6	+6
Difference in height <sup>2)</sup>	$\Delta H$	+3	+3
Tolerance for spacing	$A_1$	+3	+3
Difference in spacing <sup>2)</sup>	$\Delta A_1$	+3	+3

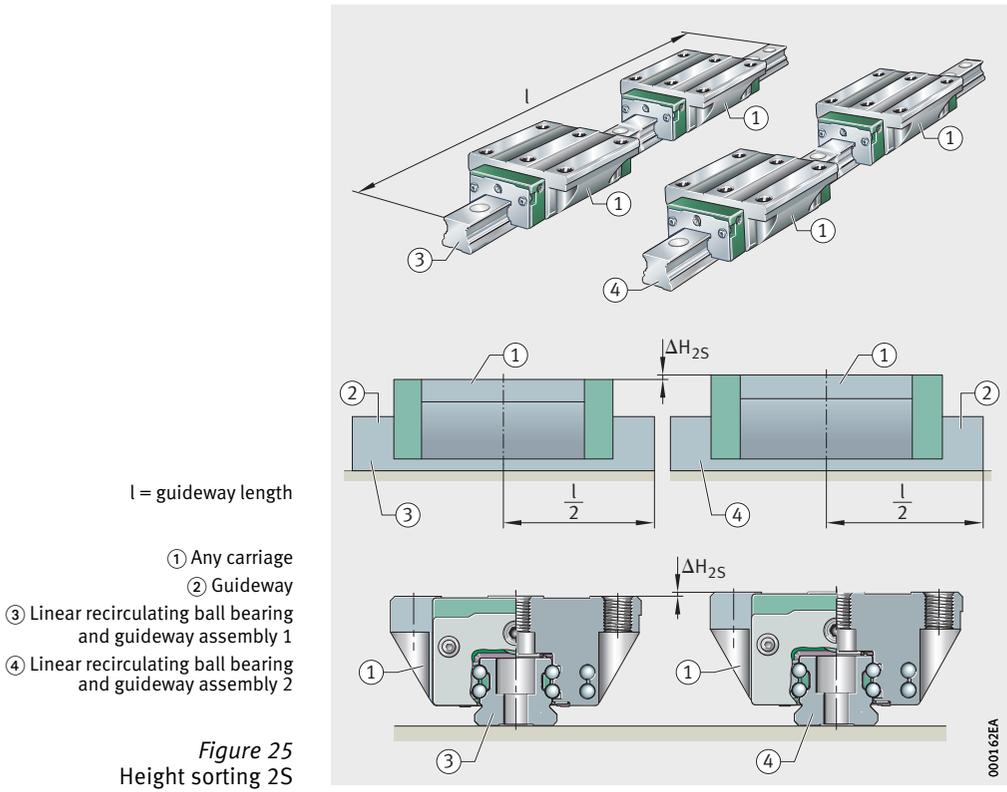
1) Displacement in tolerance zone (guideway and carriage with coating).

2) Difference between several carriages on one guideway, measured at the same point on the guideway.

**Height sorting 2S**

If there are particular requirements for the accuracy of parallel systems, it is possible to restrict the height tolerance by specific sorting.

The height difference  $\Delta H_{2S}$  is measured at the centre of the guideway ( $l/2$ ). At this point, the height difference between all carriages of linear recirculating ball bearing and guideway assemblies supplied as a set is max.  $\Delta H_{2S}$ , *Figure 25* and table.



**Height difference in 2S**

Height difference	Accuracy		
	G1 μm	G2 μm	G3 μm
$\Delta H_{2S}^{1)}$	10	20	25

<sup>1)</sup> Measured at the centre of the guideway.

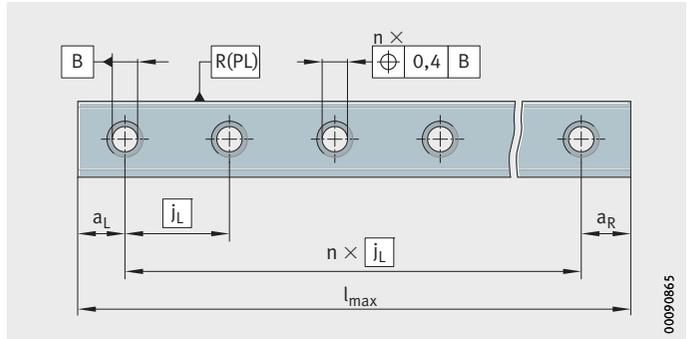
# Four-row linear recirculating ball bearing and guideway assemblies

## Positional and length tolerances of guideways

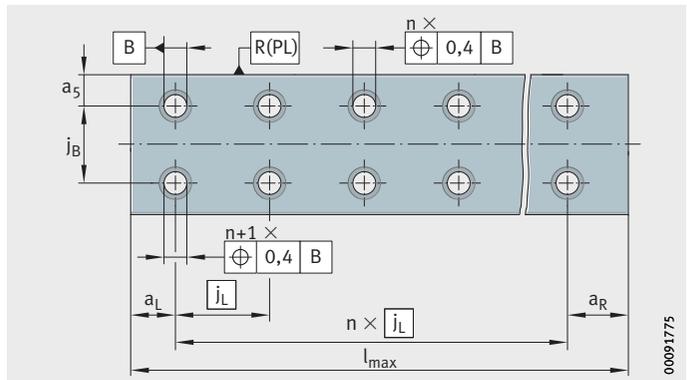
The positional tolerances are not dependent on the guideway length, *Figure 26, Figure 27* and tables, page 309.

The hole pattern corresponds to DIN EN ISO 1101.

*Figure 26*  
Positional and length tolerances of guideways TKVD with one row of holes



*Figure 27*  
Positional and length tolerances of guideways TKVD...-W with two rows of holes



**Length tolerances of guideways**

Length tolerance			
Dependent on guideway length l mm			Multi-piece guideways mm
≤ 1 000	1 000 – 3 000	> 3 000	
-1	-1,5	±0,1% of guideway length	±3 over total length



If the ordering designation does not specify delivery of the guideway as a single piece, the guideway can optionally be supplied as several segments. Permissible pitch, see table.

**Segments for multi-piece guideways**

Guideway length <sup>1)</sup> mm	Maximum permissible number of segments
< 3 000	2
3 000 – 4 000	3
4 000 – 6 000	4
> 6 000	4 plus 1 segment each of 1 500 mm above 6 000 mm guideway length

<sup>1)</sup> Minimum length of one segment = 600 mm.

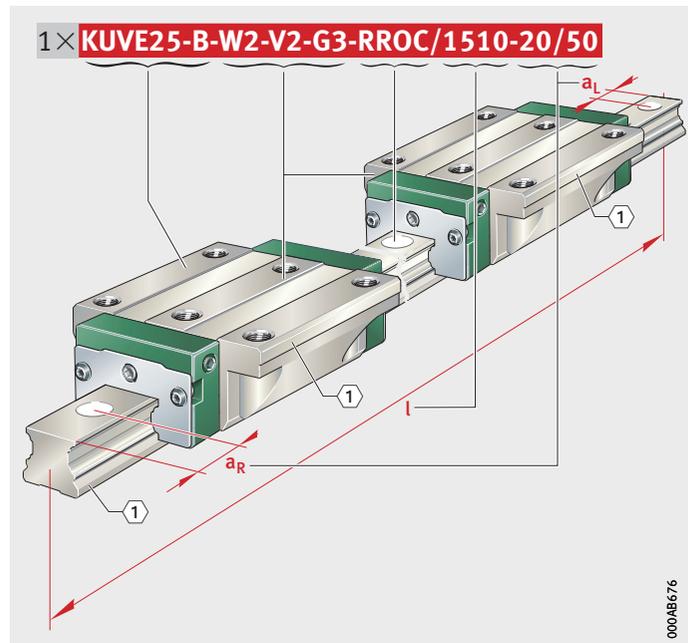
# Four-row linear recirculating ball bearing and guideway assemblies

## Ordering example, ordering designation

Unit, guideway with asymmetrical hole pattern:

Unit	Linear recirculating ball bearing and guideway assembly with two carriages per guideway	KUVE
Size		25
Carriage type, full complement		B
Number of carriages per unit		W2
Preload class		V2
Accuracy class		G3
With Corrotect coating		RROC
Length of guideway		1510 mm
$a_L$		20 mm
$a_R$		50 mm

Ordering designation 1×**KUVE25-B-W2-V2-G3-RROC/1510-20/50**, Figure 28

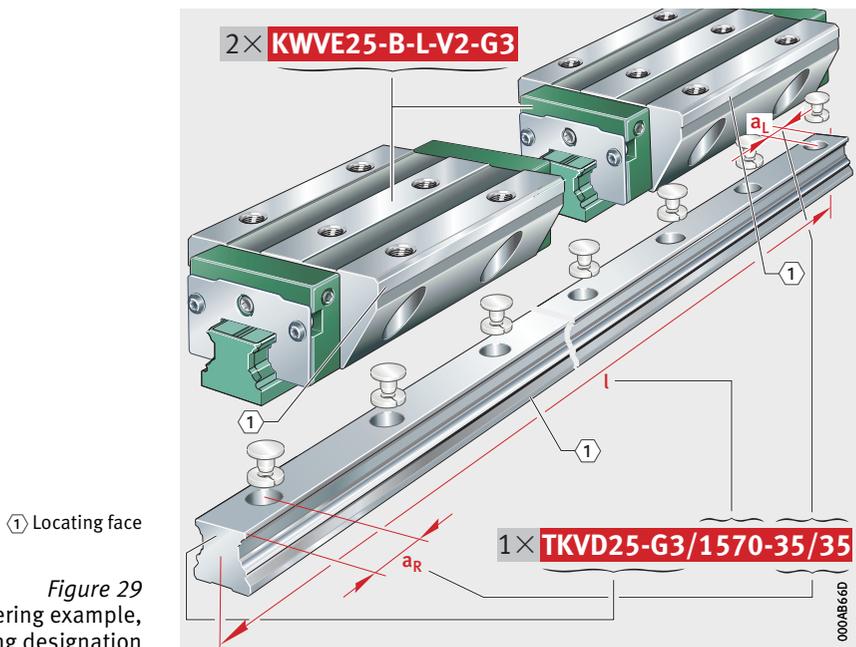


① Locating face

Figure 28  
Ordering example,  
ordering designation

Carriage and guideway separate, guideway with symmetrical hole pattern:

Carriages	Carriage for four-row linear ball bearing and guideway assembly	KWVE
	Size	25
	Carriage type, full complement	B
	Long carriage	L
	Preload class	V2
	Accuracy class	G3
Ordering designation	<b>2×KWVE25-B-L-V2-G3, Figure 29</b>	
Guideway	Guideway for carriage	TKVD
	Size	25
	Accuracy class	G3
	Length of guideway	1570 mm
	$a_L$	35 mm
	$a_R$	35 mm
Ordering designation	<b>1×TKVD25-G3/1570-35/35, Figure 29</b>	



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# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
Standard, L, N and NL carriages

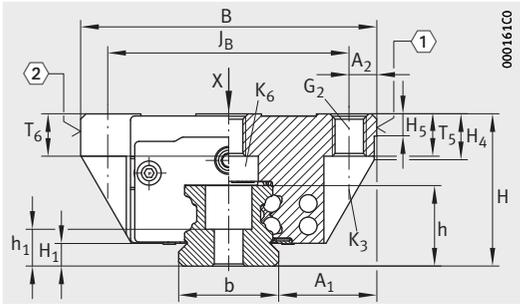
**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions										
	l <sub>max</sub> <sup>2)</sup>	H	B	L	A <sub>1</sub>	J <sub>B</sub>	b <small>-0,005 -0,03</small>	A <sub>2</sub>	L <sub>1</sub>	L <sub>s</sub>	J <sub>L</sub>	J <sub>LZ</sub>	j <sub>L</sub>	a <sub>L</sub> , a <sub>R</sub> <sup>3)</sup>	
														min.	max.
KUVE15-B	2 880	24	47	61,2	16	38	15	4,5	39,8	1,3	30	26	60	20	53
KUVE20-B	5 880	30	63	71,4	21,5	53	20	5	50,4	1,3	40	35	60	20	53
KUVE20-B-L				88,9					67,9						
KUVE20-B-N		71,4		50,4											
KUVE20-B-NL		88,9		67,9											
KUVE25-B	5 880	36	70	83,3	23,5	57	23	6,5	60,7	1,65	45	40	60	20	53
KUVE25-B-L				109,1					86,5						
KUVE25-B-N		83,3		60,7											
KUVE25-B-NL		109,1		86,5											
KUVE30-B	5 860	42	90	99	31	72	28	9	72	1,65	52	44	80	20	71
KUVE30-B-L				127					100						
KUVE30-B-N		99		72											
KUVE30-B-NL		127		100											
KUVE35-B	5 860	48	100	112	33	82	34	9	80	1,65	62	52	80	20	71
KUVE35-B-L				145					113						
KUVE35-B-N		112		80											
KUVE35-B-NL		145		113											
KUVE45-B	5 835	60	120	140,6	37,5	100	45	10	102,5	2,2	80	60	105	20	94
KUVE45-B-L				172,7					134,6						
KUVE45-B-N		140,6		102,5											
KUVE45-B-NL		172,7		134,6											
KUVE55-B	5 820	70	140	173,6	43,5	116	53	12	132	2,2	95	70	120	20	107
KUVE55-B-L				211,6					170						

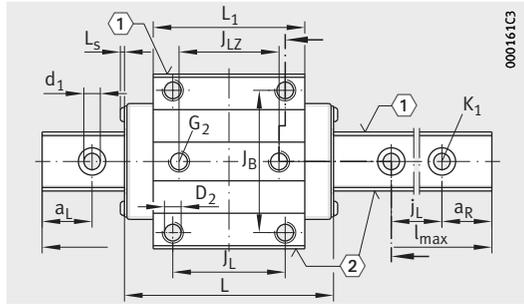
For further table values, see page 314 and page 315.

① Locating face. ② Marking.

- The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.
- Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.
- $a_L$  and  $a_R$  are dependent on the guideway length.



KUVE...-B, KUVE...-B-L, KUVE...-B-N, KUVE...-B-NL



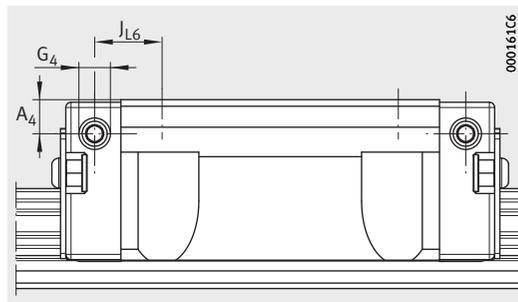
KUVE...-B, KUVE...-B-L, KUVE...-B-N, KUVE...-B-NL  
View X rotated 90°

														Fixing screws <sup>1)</sup>						
H <sub>1</sub>	H <sub>4</sub>	H <sub>5</sub>	T <sub>5</sub>	T <sub>6</sub>	h	h <sub>1</sub>	G <sub>2</sub>		K <sub>1</sub>		K <sub>3</sub>		K <sub>6</sub>		d <sub>1</sub>	D <sub>2</sub>				
							DIN ISO 4762-12.9						DIN 7984-8.8							
							M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>			M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>	M <sub>A</sub>
														Nm	Nm	Nm	Nm	Nm	Nm	
4,3	7,6	4,75	7	5,8	15	7,6	M5	5,8	M4	5	M4	5	-	-	M4	2	4,6	4,5		
4,5	11	5,25	10	7,5	17	8,6	M6	10	M5	10	M5	10	M5	10	-	-	5,8	5,5		
	8,6		8	6							M5	10	-	-	M5	4				
5,1	10,9	5,25	10	10	18,7	8,2	M8	24	M6	17	M6	17	M6	17	-	-	6,8	6,7		
	9,3			8								-	-	M6	8					
5,9	13,8	6,25	12	11,5	23,5	11	M10	41	M8	41	M8	41	M8	41	-	-	9	8,6		
	9,8			9								-	-	M8	12					
6,7	14,3	6,75	13	12,3	27	14,5	M10	41	M8	41	M8	41	M8	41	-	-	9	8,6		
	10,3			8,3								-	-	M8	12					
9,7	19,9	9,25	15	15	34,2	15,7	M12	83	M12	140	M10	83	M10	83	-	-	13,4	10,6		
	17,2			11								-	-	M10	35					
13,5	22,7	11,25	21	18	41,5	19	M14	140	M14	220	M12	140	M12	140	-	-	15,4	12,5		

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# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
Standard, L, N and NL carriages

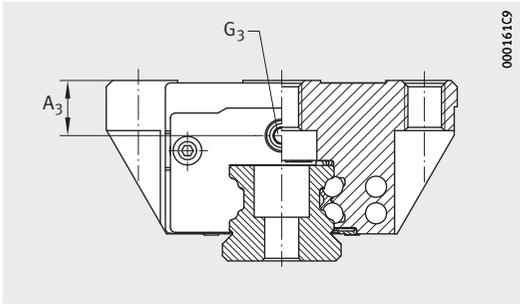


Lubrication connector on lateral face

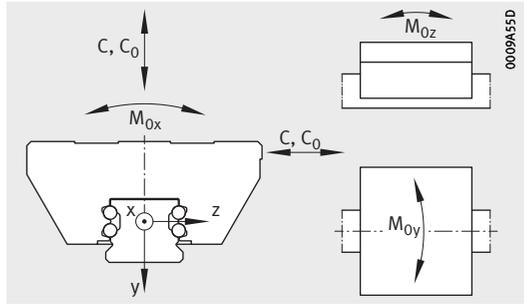
Dimension table (continued) · Dimensions in mm

Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub> 2)	
KUVE15-B	KWVE15-B	0,2	TKVD15-B <sup>3)</sup>	1,44	4,3	M3	5,5
KUVE20-B	KWVE20-B	0,44	TKVD20	2,2	7,7	M5	7
KUVE20-B-L	KWVE20-B-L	0,59			4,7		
KUVE20-B-N	KWVE20-B-N	0,37					
KUVE20-B-NL	KWVE20-B-NL	0,51					
KUVE25-B	KWVE25-B	0,68	TKVD25	2,7	11	M6	7
KUVE25-B-L	KWVE25-B-L	1			6		
KUVE25-B-N	KWVE25-B-N	0,56					
KUVE25-B-NL	KWVE25-B-NL	0,82					
KUVE30-B	KWVE30-B	1,2	TKVD30	4,3	11,5	M6	7
KUVE30-B-L	KWVE30-B-L	1,7			7,5		
KUVE30-B-N	KWVE30-B-N	1					
KUVE30-B-NL	KWVE30-B-NL	1,5					
KUVE35-B	KWVE35-B	1,75	TKVD35	5,7	12,3	M6	7
KUVE35-B-L	KWVE35-B-L	2,52			8,3		
KUVE35-B-N	KWVE35-B-N	1,56					
KUVE35-B-NL	KWVE35-B-NL	2,23					
KUVE45-B	KWVE45-B	3,3	TKVD45	9,2	16,5	M6	7
KUVE45-B-L	KWVE45-B-L	4,3			8,5		
KUVE45-B-N	KWVE45-B-N	2,72					
KUVE45-B-NL	KWVE45-B-NL	3,38					
KUVE55-B	KWVE55-B	5,5	TKVD55-B	14	15	M6	7
KUVE55-B-L	KWVE55-B-L	6,6					

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) The new carriages cannot be used on the previous guideways TKVD15 or TKVD15-U.
- 4) Lubrication connectors are included loose:
  - S04 with KUVE20-B
  - S05 with KUVE25-B to KUVE55-B
  - S16 with KUVE15-B.

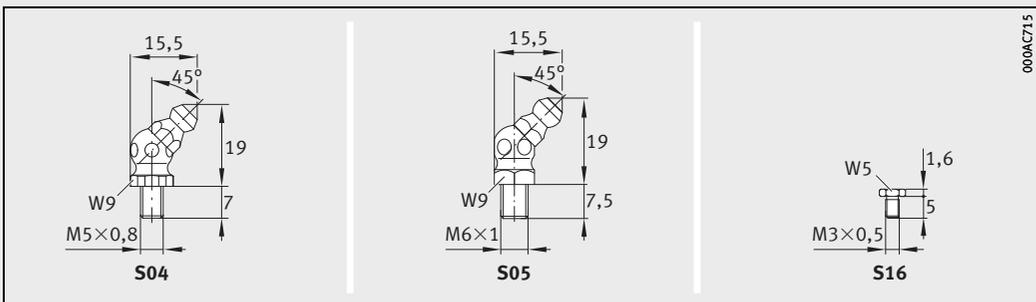


Lubrication connector on end face



Load directions

A <sub>4</sub>	G <sub>4</sub>		J <sub>L6</sub>	Load carrying capacity				
	G <sub>4</sub>	2)		Basic load ratings <sup>1)</sup>		Moment ratings		
				dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
3,2	M3	5,5	9,1	7 200	14 500	150	100	100
4,6	M5	5,5	9,4	13 100	27 000	332	240	240
			18,9	16 200	36 500	452	430	430
3,3	M3	5,5	9,4	13 100	27 000	332	240	240
			18,9	16 200	36 500	452	430	430
6,5	M6	7	12,85	17 900	37 000	510	395	395
			25,75	23 400	54 000	745	825	825
4	M3	6	12,05	17 900	37 000	510	395	395
			24,95	23 400	54 000	745	825	825
7	M6	7	15,5	27 500	55 000	970	700	700
			29,5	34 500	74 000	1 310	1 240	1 240
4,95	M5	7	15,1	27 500	55 000	970	700	700
			29,1	34 500	74 000	1 310	1 240	1 240
11	M6	7	16	38 000	72 000	1 465	1 020	1 020
			32,5	47 500	100 000	2 625	1 890	1 890
7	M6	7	16	38 000	72 000	1 465	1 020	1 020
			32,5	47 500	100 000	2 625	1 890	1 890
16,5	M6	7	19,25	69 000	141 000	3 610	2 485	2 485
			35,3	82 000	181 000	4 635	4 000	4 000
8,5	M6	7	19,25	69 000	141 000	3 610	2 485	2 485
			35,5	82 000	181 000	4 635	4 000	4 000
15	M6	7	30,5	104 000	213 000	5 600	2 730	2 730
			49,5	127 000	285 000	7 500	4 725	4 800



Lubrication connectors<sup>4)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
H, S and SN carriages

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**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions						
	$l_{max}^{2)}$	H	B	L	$A_1$	$J_B$	b <small>-0,005 -0,03</small>	$A_2$	$L_1$	$L_s$	$J_L$
KUVE15-B-H	2 880	28	34	61,2	9,5	26	15	4	39,8	1,3	26
KUVE15-B-S		24									
KUVE20-B-H <sup>4)</sup>	5 880	30	44	71,4	12	32	20	6	50,4	1,3	36
KUVE20-B-S <sup>4)</sup>		30									
KUVE20-B-SN		27									
KUVE25-B-H	5 880	40	48	83,3	12,5	35	23	6,5	60,7	1,65	35
KUVE25-B-S		36									
KUVE25-B-SN		31									
KUVE30-B-H	5 860	45	60	99	16	40	28	10	72	1,65	40
KUVE30-B-S		42									
KUVE30-B-SN		38									
KUVE35-B-H	5 860	55	70	112	18	50	34	10	80	1,65	50
KUVE35-B-S		48									
KUVE35-B-SN		44									
KUVE45-B-H	5 835	70	86	140,6	20,5	60	45	13	102,5	2,2	60
KUVE45-B-S		60									
KUVE45-B-SN		52									
KUVE55-B-S	5 820	70	100	173,6	23,5	75	53	12,5	132	2,2	75

For further table values, see page 318 and page 319.

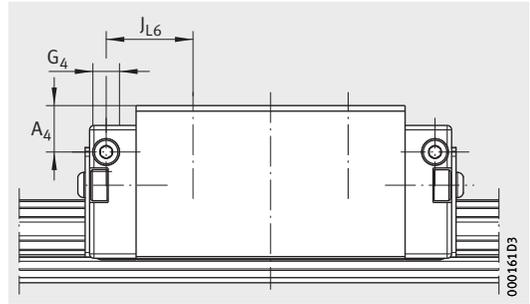
① Locating face. ② Marking.

- 1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.
- 2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.
- 3)  $a_L$  and  $a_R$  are dependent on the guideway length.
- 4) KUVE20-B-H and KUVE20-B-S are 100% identical in dimensions and performance.  
If a KUVE20-B-H is ordered, the order confirmation will contain the designation KUVE20-B-S.



# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
H, S and SN carriages

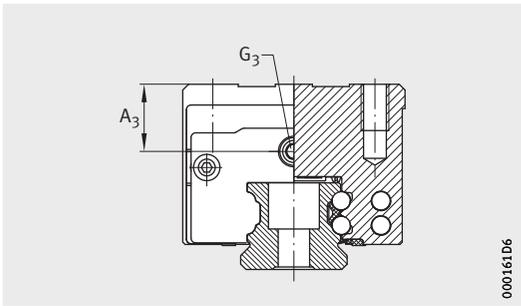


Lubrication connector on lateral face

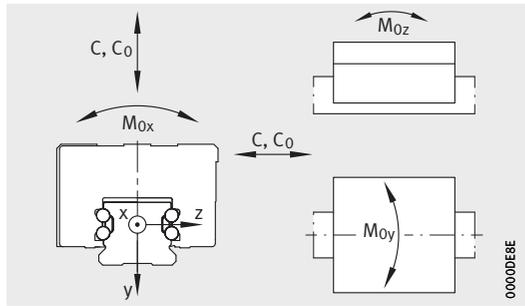
Dimension table (continued) · Dimensions in mm

Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub> 2)	
KUVE15-B-H	KWVE15-B-H	0,2	TKVD15-B <sup>3)</sup>	1,44	8,3	M3	5,5
KUVE15-B-S	KWVE15-B-S	0,16			4,3		
KUVE20-B-H <sup>4)</sup>	KWVE20-B-H	0,34	TKVD20	2,2	7,7	M5	7
KUVE20-B-S <sup>4)</sup>	KWVE20-B-S	0,34			7,7		
KUVE20-B-SN	KWVE20-B-SN	0,29			4,7		
KUVE25-B-H	KWVE25-B-H	0,65	TKVD25	2,7	15	M6	7
KUVE25-B-S	KWVE25-B-S	0,56			11		
KUVE25-B-SN	KWVE25-B-SN	0,45			6		
KUVE30-B-H	KWVE30-B-H	1,04	TKVD30	4,3	14,5	M6	7
KUVE30-B-S	KWVE30-B-S	0,94			11,5		
KUVE30-B-SN	KWVE30-B-SN	0,8			7,5		
KUVE35-B-H	KWVE35-B-H	1,71	TKVD35	5,7	19,3	M6	7
KUVE35-B-S	KWVE35-B-S	1,3			12,3		
KUVE35-B-SN	KWVE35-B-SN	1,24			8,3		
KUVE45-B-H	KWVE45-B-H	3,36	TKVD45	9,2	26,5	M6	7
KUVE45-B-S	KWVE45-B-S	2,67			16,5		
KUVE45-B-SN	KWVE45-B-SN	2,12			8,5		
KUVE55-B-S	KWVE55-B-S	4,35	TKVD55-B	14	15	M6	7

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used  
and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) The new carriages cannot be used on the previous guideways TKVD15 or TKVD15-U.
- 4) KUVE20-B-H and KUVE20-B-S are 100% identical in dimensions and performance.  
If a KUVE20-B-H is ordered, the order confirmation will contain the designation KUVE20-B-S.
- 5) Lubrication connectors are included loose:
  - S04 with KUVE20-B
  - S05 with KUVE25-B to KUVE55-B
  - S16 with KUVE15-B.

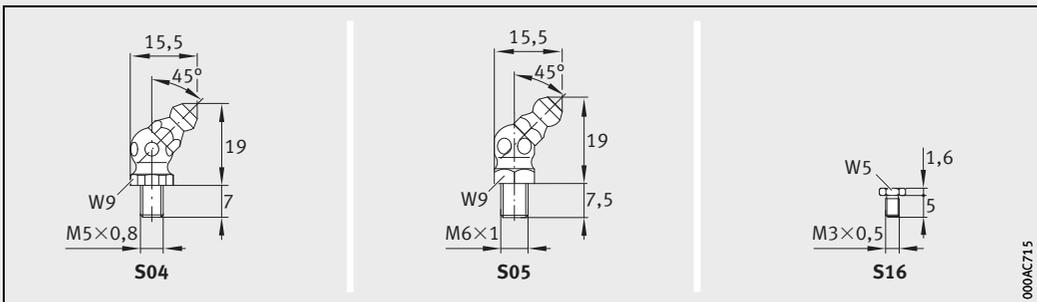


Lubrication connector on end face



Load directions

			Load carrying capacity					
A <sub>4</sub>	G <sub>4</sub>		J <sub>L6</sub>	Basic load ratings <sup>1)</sup>		Moment ratings		
		2)		dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
7,2 3,2	M3	5,5	11,1	7 200	14 500	150	100	100
4,6 4,6 3,3								
10,5 6,5	M6	7	17,9	17 900	37 000	510	395	395
4	M3	6						
10 7 4,95	M6	7	21,5	27 500	55 000	970	700	700
	M5							
18 11 7	M6	7	22	38 000	72 000	1 465	1 020	1 020
26,5 16,5 8,5								
15								



Lubrication connectors<sup>5)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
HL, SL and SNL carriages

**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions						
	$l_{max}^{2)}$	H	B	L	$A_1$	$J_B$	b <small>-0,005 -0,03</small>	$A_2$	$L_1$	$L_s$	$J_L$
KUVE20-B-SL	5 880	30	44	88,9	12	32	20	6	67,9	1,3	50
KUVE20-B-SNL		27									
KUVE25-B-HL	5 880	40	48	109,1	12,5	35	23	6,5	86,5	1,65	50
KUVE25-B-SL		36									
KUVE25-B-SNL		31									
KUVE30-B-HL	5 860	45	60	127	16	40	28	10	100	1,65	60
KUVE30-B-SL		42									
KUVE30-B-SNL		38									
KUVE35-B-HL	5 860	55	70	145	18	50	34	10	113	1,65	72
KUVE35-B-SL		48									
KUVE35-B-SNL		44									
KUVE45-B-HL	5 835	70	86	172,7	20,5	60	45	13	134,6	2,2	80
KUVE45-B-SL		60									
KUVE45-B-SNL		52									
KUVE55-B-SL	5 820	70	100	211,6	23,5	75	53	12,5	170	2,2	95

For further table values, see page 322 and page 323.

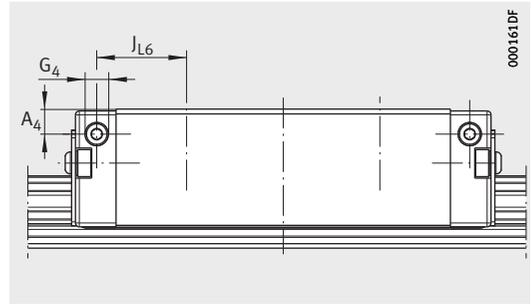
① Locating face. ② Marking.

- 1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.
- 2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.
- 3)  $a_L$  and  $a_R$  are dependent on the guideway length.



# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
HL, SL and SNL carriages



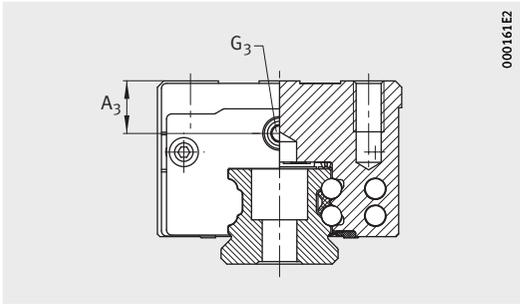
Lubrication connector on lateral face

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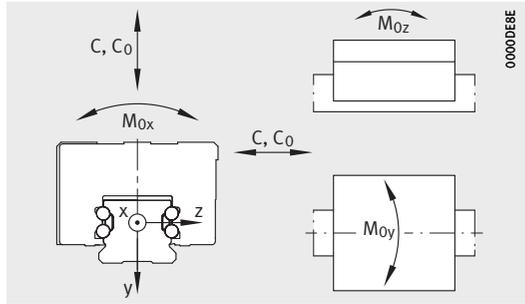
**Dimension table** (continued) · Dimensions in mm

Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub> 2)	
KUVE20-B-SL	KWVE20-B-SL	0,46	TKVD20	2,2	7,7	M5	7
KUVE20-B-SNL	KWVE20-B-SNL	0,38			4,7		
KUVE25-B-HL	KWVE25-B-HL	1	TKVD25	2,7	15	M6	7
KUVE25-B-SL	KWVE25-B-SL	1			11		
KUVE25-B-SNL	KWVE25-B-SNL	0,62			6		
KUVE30-B-HL	KWVE30-B-HL	1,43	TKVD30	4,3	14,5	M6	7
KUVE30-B-SL	KWVE30-B-SL	1,7			11,5		
KUVE30-B-SNL	KWVE30-B-SNL	1,1			7,5		
KUVE35-B-HL	KWVE35-B-HL	2,4	TKVD35	5,7	19,3	M6	7
KUVE35-B-SL	KWVE35-B-SL	1,81			12,3		
KUVE35-B-SNL	KWVE35-B-SNL	1,72			8,3		
KUVE45-B-HL	KWVE45-B-HL	4,27	TKVD45	9,2	26,5	M6	7
KUVE45-B-SL	KWVE45-B-SL	3,38			16,5		
KUVE45-B-SNL	KWVE45-B-SNL	2,68			8,5		
KUVE55-B-SL	KWVE55-B-SL	6,3	TKVD55-B	14	15	M6	7

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used  
and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) Lubrication connectors are included loose:
  - S04 with KUVE20-B
  - S05 with KUVE25-B to KUVE55-B
  - S16 with KUVE15-B.

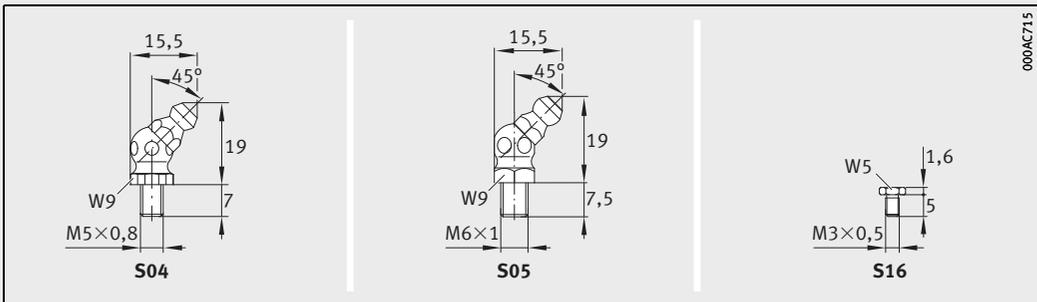


Lubrication connector on end face



Load directions

			Load carrying capacity					
A <sub>4</sub>	G <sub>4</sub>	2)	J <sub>L6</sub>	Basic load ratings <sup>1)</sup>		Moment ratings		
				dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
4,6	M5	5,5	13,2	16 200	36 500	452	430	430
3,3	M3							
10,5	M6	7	23,3	23 400	54 000	745	825	825
6,5								
4	M3	6	22,5					
10	M6	7	25,5	34 500	74 000	1310	1240	1240
7								
4,95	M5		25,1					
18	M6	7	27,5	47 500	100 000	2625	1890	1890
11								
7								
26,5	M6	7	35,3	82 000	181 000	4 635	4 000	4 000
16,5								
8,5								
15	M6	7	49,5	127 000	285 000	7 500	4 725	4 800



Lubrication connectors<sup>3)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
E carriages  
Without screw threads

**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions						
	$l_{max}^{2)}$	H	B	L	$A_1$	$J_B$	b <small>-0,005 -0,03</small>	$A_2$	$L_1$	$L_5$	$J_L$
<b>KUVE15-B-E</b>	2 880	24	52	61,2	18,5	41	15	5,5	39,8	1,3	26
<b>KUVE20-B-E</b>	5 880	28	59	71,4	19,5	49	20	5	50,4	1,3	32
<b>KUVE25-B-E</b>	5 880	33	73	83,3	25	60	23	6,5	60,7	1,65	35
<b>KUVE30-B-E</b>	5 860	42	90	99	31	72	28	9	72	1,65	40
<b>KUVE35-B-E</b>	5 860	48	100	112	33	82	34	9	80	1,65	50

For further table values, see page 326 and page 327.

① Locating face. ② Marking. ③ No thread.

1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.

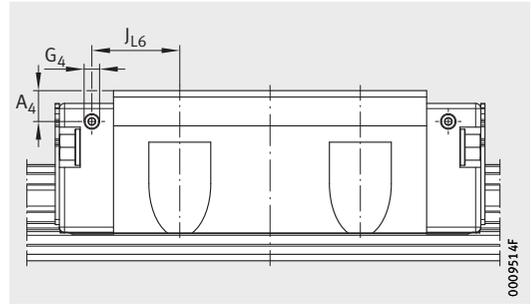
2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.

3)  $a_L$  and  $a_R$  are dependent on the guideway length.



# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
E carriages  
Without screw threads

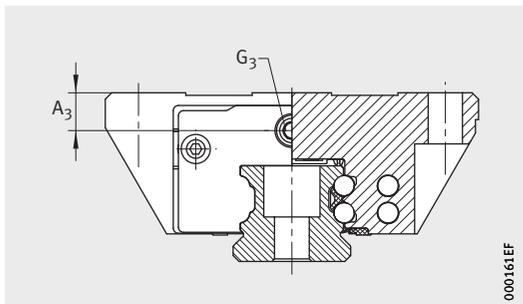


Lubrication connector on lateral face

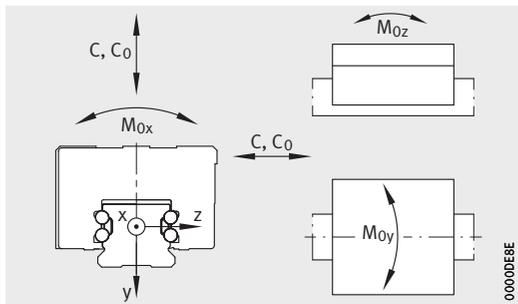
Dimension table (continued) · Dimensions in mm

Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub>	2)
<b>KUVE15-B-E</b>	KWVE15-B-E	0,2	TKVD15-B	1,44	4,3	M3	5,5
<b>KUVE20-B-E</b>	KWVE20-B-E	0,36	TKVD20	2,2	6	M5	7
<b>KUVE25-B-E</b>	KWVE25-B-E	0,68	TKVD25	2,7	8	M6	7
<b>KUVE30-B-E</b>	KWVE30-B-E	1,2	TKVD30	4,3	11,5	M6	7
<b>KUVE35-B-E</b>	KWVE35-B-E	1,75	TKVD35	5,7	12,3	M6	7

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) Lubrication connectors are included loose:
  - S04 with KUVE20-B
  - S05 with KUVE25-B to KUVE55-B
  - S16 with KUVE15-B.

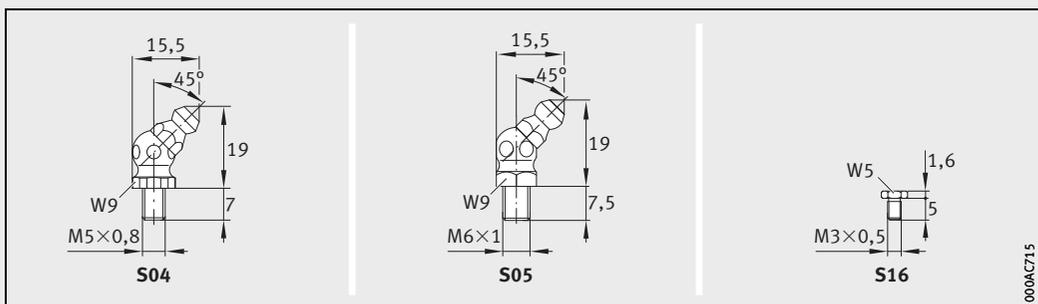


Lubrication connector on end face



Load directions

A <sub>4</sub>	G <sub>4</sub>		JL <sub>6</sub>	Load carrying capacity				
		2)		Basic load ratings <sup>1)</sup>		Moment ratings		
				dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
3,2	M3	5,5	11,1	7 200	14 500	150	100	100
4,3	M3	5,5	13,4	13 100	27 000	332	240	240
6	M3	7	17,05	17 900	37 000	510	395	395
7	M6	7	21,1	27 500	55 000	970	700	700
11	M6	7	22	38 000	72 500	1 465	1 020	1 020



Lubrication connectors<sup>3)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement ES carriages

**Dimension table** - Dimensions in mm

Designation <sup>2)</sup>	Dimensions				Mounting dimensions					
	$l_{max}$ <sup>3)</sup>	H	B	L	A <sub>1</sub>	J <sub>B</sub>	b -0,06 -0,03	A <sub>2</sub>	L <sub>1</sub>	L <sub>S</sub>
<b>KUVE15-B-ES</b>	2 880	24	34	61,2	9,5	26	15	4	39,8	1,3
<b>KUVE20-B-ES</b>	5 880	28	42	71,4	11	32	20	5	50,4	1,3
<b>KUVE25-B-ES</b>	5 880	33	48	83,3	12,5	35	23	6,5	60,7	1,65
<b>KUVE30-B-ES</b>	5 860	42	60	99	16	40	28	10	72	1,65
<b>KUVE35-B-ES</b>	5 860	48	70	112	18	50	34	10	80	1,65

For further table values, see page 330 and page 331.

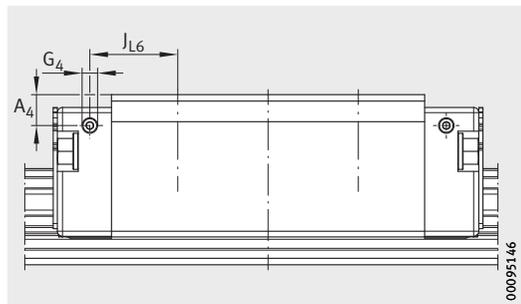
① Locating face. ② Marking.

- 1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.
- 2) KUVE15-B-ES and KUVE15-B-S, KUVE30-B-ES and KUVE30-B-S as well as KUVE35-B-ES and KUVE35-B-S are in each case 100% identical in dimensions and performance.  
If a KUVE15-B-ES, KUVE30-B-ES or KUVE35-B-ES is ordered, the confirmation of the quotation will contain the designation KUVE15-B-S, KUVE30-B-S or KUVE35-B-S.
- 3) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.
- 4)  $a_L$  and  $a_R$  are dependent on the guideway length.



# Four-row linear recirculating ball bearing and guideway assemblies

Full complement ES carriages

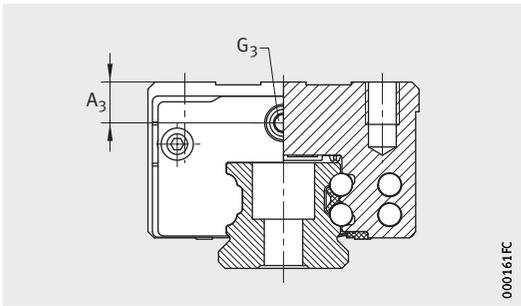


Lubrication connector on lateral face

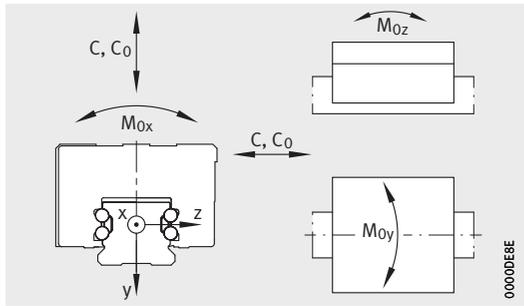
Dimension table (continued) · Dimensions in mm

Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub>	<sup>2)</sup>
<b>KUVE15-B-ES</b>	KWVE15-B-ES	0,16	TKVD15-B <sup>3)</sup>	1,44	4,3	M3	5,5
<b>KUVE20-B-ES</b>	KWVE20-B-ES	0,31	TKVD20	2,2	8	M5	7
<b>KUVE25-B-ES</b>	KWVE25-B-ES	0,56	TKVD25	2,7	11	M6	7
<b>KUVE30-B-ES</b>	KWVE30-B-ES	0,94	TKVD30	4,3	11,5	M6	7
<b>KUVE35-B-ES</b>	KWVE35-B-ES	1,3	TKVD35	5,7	12,3	M6	7

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1. Based on practical experience, it may be possible to increase the basic dynamic load rating. The basic load rating can only be transmitted fully if the whole thread length is used and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) The new carriages cannot be used on the existing guideways TKVD15 or TKVD15-U.
- 4) Lubrication connectors are included loose:
  - S04 with KUVE20-B
  - S05 with KUVE25-B to KUVE55-B
  - S16 with KUVE15-B.



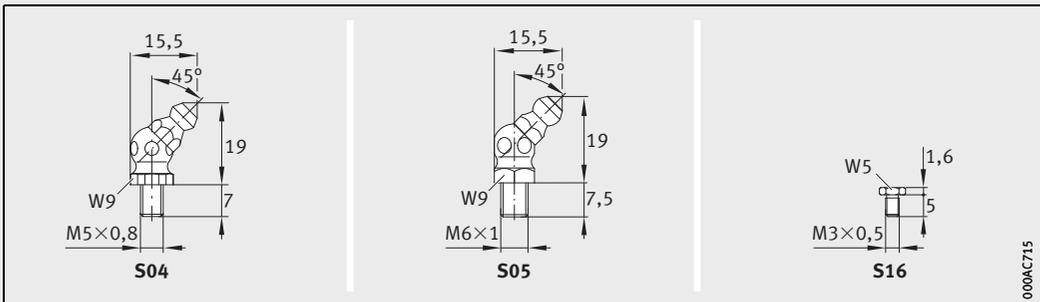
Lubrication connector on end face



Load directions

				Load carrying capacity				
A <sub>4</sub>	G <sub>4</sub>		J <sub>L6</sub>	Basic load ratings <sup>1)</sup>		Moment ratings		
		2)		dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
3,2	M3	5,5	9,1	7 200	14 500	150	100	100
4,6	M3	5,5	9,4	13 100	27 000	332	240	240
6,5	M3	7	12,85	17 900	37 000	510	395	395
7	M6	7	15,5	27 500	55 000	970	700	700
11	M6	7	16	38 000	72 500	1 465	1 020	1 020

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Lubrication connectors<sup>4)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
EC carriages  
Without screw threads

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**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions					
	$l_{max}^{2)}$	H	B	L	$A_1$	$J_B$	b <small>-0,005 -0,03</small>	$A_2$	$L_1$	$L_5$
KUVE15-B-EC	2 880	24	52	44,5	18,5	41	15	5,5	23,1	1,3
KUVE20-B-EC	5 880	28	59	50,4	19,5	49	20	5	29,4	1,65
KUVE25-B-EC	5 880	33	73	58,2	25	60	23	6,5	35,6	1,65
KUVE30-B-EC	5 860	42	90	69	31	72	28	9	42	1,65
KUVE35-B-EC	5 860	48	100	76,2	33	82	34	9	44,2	1,65
KUVE45-B-EC	5 835	60	120	97,8	37,5	100	45	10	59,7	2,2

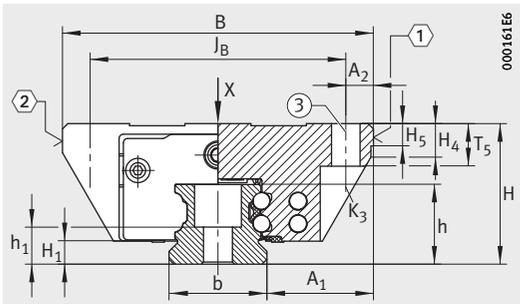
For further table values, see page 334 and page 335.

① Locating face. ② Marking. ③ No thread.

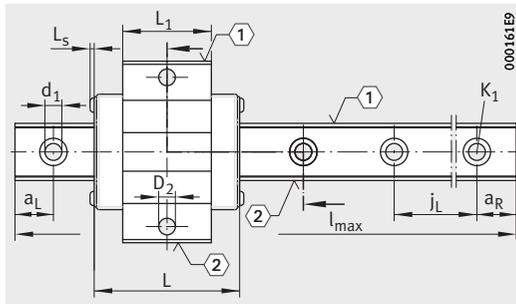
1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.

2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.

3)  $a_L$  and  $a_R$  are dependent on the guideway length.



KUVE...-B-EC



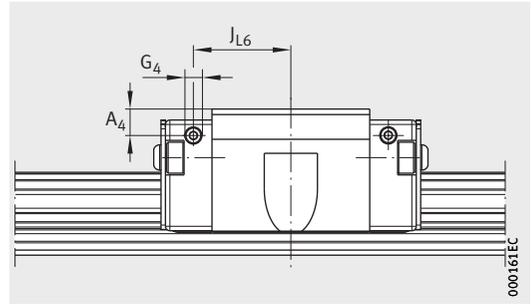
KUVE...-B-EC  
View X rotated 90°

j <sub>L</sub>	a <sub>L</sub> , a <sub>R</sub> <sup>3)</sup>		H <sub>1</sub>	H <sub>4</sub>	H <sub>5</sub>	T <sub>5</sub>	h	h <sub>1</sub>	Fixing screws <sup>1)</sup>				d <sub>1</sub>	D <sub>2</sub>
									K <sub>1</sub>		K <sub>3</sub>			
									DIN ISO 4 762-12.9					
min.	max.	M <sub>A</sub> Nm	M <sub>A</sub> Nm											
60	20	53	4,3	6,1	4,75	7	15	7,6	M4	5	M4	5	4,6	4,5
60	20	53	4,5	11,2	5,25	9	17	8,6	M5	10	M5	10	5,8	5,5
60	20	53	5,1	7,85	5,25	10	18,7	8,2	M6	17	M6	17	6,8	6,7
80	20	71	5,9	13,8	6,25	12	23,5	11	M8	41	M8	41	9	8,6
80	20	71	6,7	14,3	6,75	13,5	27	14,5	M8	41	M8	41	9	8,6
105	20	94	9,7	19,9	9,25	15	34,2	15,7	M12	140	M10	83	13,4	10,6

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# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
EC carriages  
Without screw threads

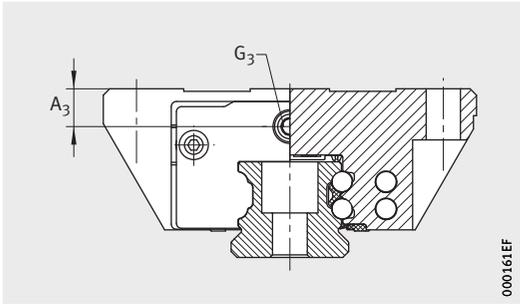


Lubrication connector on lateral face

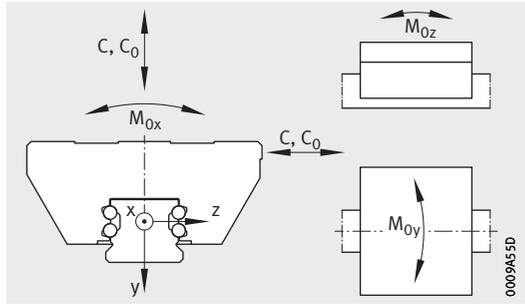
Dimension table (continued) · Dimensions in mm

Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub> 2)	
<b>KUVE15-B-EC</b>	KWVE15-B-EC	0,13	TKVD15-B <sup>3)</sup>	1,44	4,3	M3	5,5
<b>KUVE20-B-EC</b>	KWVE20-B-EC	0,23	TKVD20	2,2	6	M5	7
<b>KUVE25-B-EC</b>	KWVE25-B-EC	0,4	TKVD25	2,7	8	M6	7
<b>KUVE30-B-EC</b>	KWVE30-B-EC	0,75	TKVD30	4,3	11,5	M6	7
<b>KUVE35-B-EC</b>	KWVE35-B-EC	1,04	TKVD35	5,7	12,3	M6	7
<b>KUVE45-B-EC</b>	KWVE45-B-EC	2,07	TKVD45	9,2	16,5	M6	7

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) The new carriages cannot be used on the previous guideways TKVD15 or TKVD15-U.
- 4) Lubrication connectors are included loose:
  - S04 with KUVE20-B
  - S05 with KUVE25-B to KUVE55-B
  - S16 with KUVE15-B.

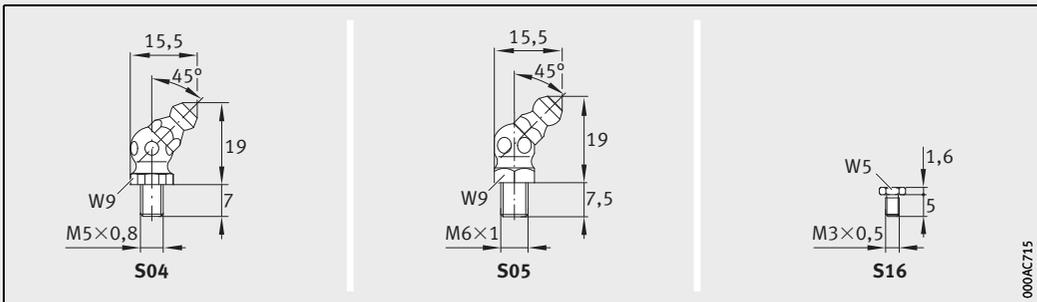


Lubrication connector on end face



Load directions

A <sub>4</sub>	G <sub>4</sub>		J <sub>L6</sub>	Load carrying capacity				
		2)		Basic load ratings <sup>1)</sup>		Moment ratings		
				dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
3,2	M3	5,5	15,8	4 900	8 300	86	35	35
4,3	M3	5,5	18,9	8 900	15 400	190	85	85
6	M3	6	22	12 500	22 200	305	155	155
7	M6	7	26,5	18 700	31 500	554	248	248
11	M6	7	29,1	24 600	39 000	790	330	330
16,5	M6	7	37,9	46 500	80 000	2 060	883	883



Lubrication connectors<sup>4)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
ESC carriages

**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions					
	$l_{max}^{2)}$	H	B	L	A <sub>1</sub>	J <sub>B</sub>	b -0,005 -0,03	A <sub>2</sub>	L <sub>1</sub>	L <sub>s</sub>
KUVE15-B-ESC	2 880	24	34	44,5	9,5	26	15	4	23,1	1,3
KUVE20-B-ESC	5 880	28	42	50,4	11	32	20	5	29,4	1,65
KUVE25-B-ESC	5 880	33	48	58,2	12,5	35	23	6,5	35,6	1,65
KUVE30-B-ESC	5 860	42	60	69	16	40	28	10	42	1,65
KUVE35-B-ESC	5 860	48	70	76,2	18	50	34	10	44,2	1,65
KUVE45-B-ESC	5 835	60	86	97,8	20,5	60	45	13	59,7	2,2

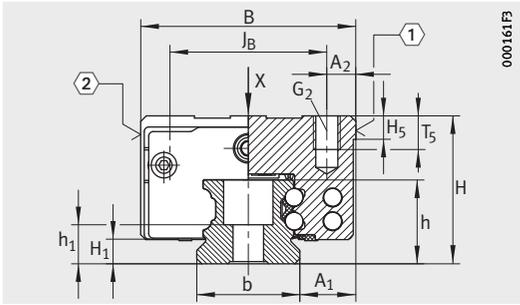
For further table values, see page 338 and page 339.

① Locating face. ② Marking.

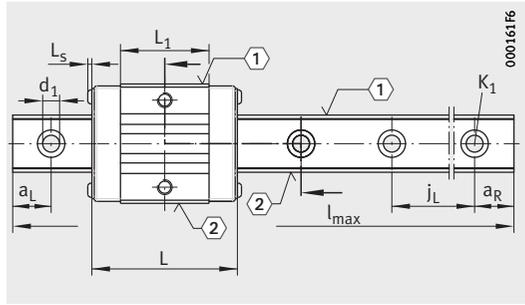
1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.

2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.

3)  $a_L$  and  $a_R$  are dependent on the guideway length.



KUVE...-B-ESC



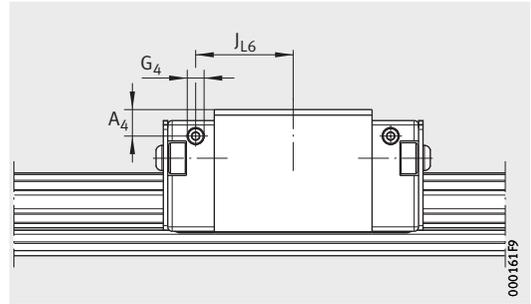
KUVE...-B-ESC  
View X rotated 90°

j <sub>L</sub>	a <sub>L</sub> , a <sub>R</sub> <sup>3)</sup>		H <sub>1</sub>	H <sub>5</sub>	T <sub>5</sub>	h	h <sub>1</sub>	Fixing screws <sup>1)</sup>				
								G <sub>2</sub>		K <sub>1</sub>		d <sub>1</sub>
								DIN ISO 4762-12.9				
min.	max.	M <sub>A</sub> Nm	M <sub>A</sub> Nm	M <sub>A</sub> Nm	M <sub>A</sub> Nm							
60	20	53	4,3	4,75	6	15	7,6	M4	5	M4	5	4,6
60	20	53	4,5	5,25	7,5	17	8,6	M5	10	M5	10	5,8
60	20	53	5,1	5,25	10	18,7	8,2	M6	17	M6	17	6,8
80	20	71	5,9	6,25	13,5	23,5	11	M8	41	M8	41	9
80	20	71	6,7	6,75	13,5	27	14,5	M8	41	M8	41	9
105	20	94	9,7	9,25	17	34,2	15,7	M10	83	M12	140	13,4

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# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
ESC carriages



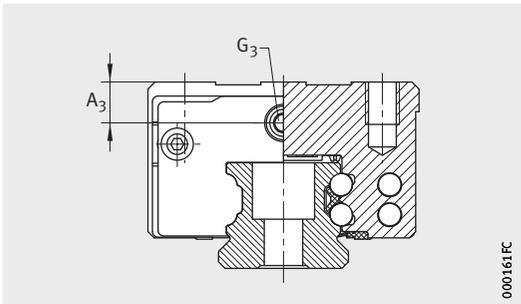
Lubrication connector on lateral face

Dimension table (continued) · Dimensions in mm

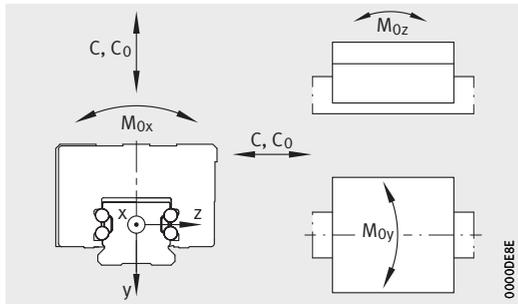
Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub> 2)	
<b>KUVE15-B-ESC</b>	KWVE15-B-ESC	0,12	TKVD15-B <sup>3)</sup>	1,44	4,3	M3	5,5
<b>KUVE20-B-ESC</b>	KWVE20-B-ESC	0,18	TKVD20	2,2	6	M5	7
<b>KUVE25-B-ESC</b>	KWVE25-B-ESC	0,3	TKVD25	2,7	8	M6	7
<b>KUVE30-B-ESC</b>	KWVE30-B-ESC	0,57	TKVD30	4,3	11,5	M6	7
<b>KUVE35-B-ESC</b>	KWVE35-B-ESC	1,04	TKVD35	5,7	12,3	M6	7
<b>KUVE45-B-ESC</b>	KWVE45-B-ESC	1,8	TKVD45	9,2	16,5	M6	7

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) The new carriages cannot be used on the previous guideways TKVD15 or TKVD15-U.
- 4) Lubrication connectors are included loose:
  - S04 with KUVE20-B
  - S05 with KUVE25-B to KUVE55-B
  - S16 with KUVE15-B.

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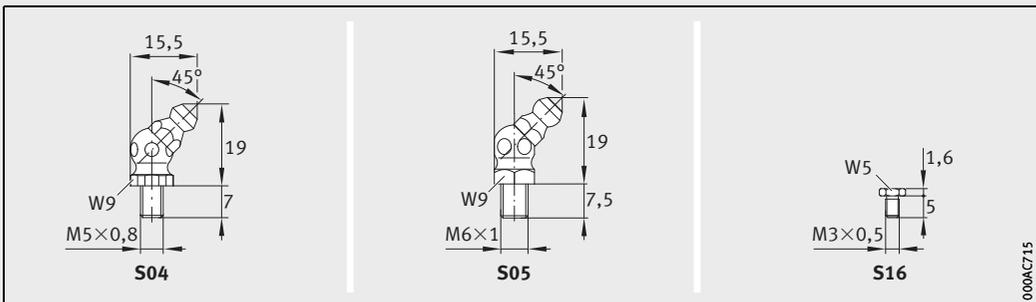


Lubrication connector on end face



Load directions

A <sub>4</sub>	G <sub>4</sub>		J <sub>L6</sub>	Load carrying capacity				
		2)		Basic load ratings <sup>1)</sup>		Moment ratings		
				dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
3,2	M3	5,5	15,8	4 900	8 300	86	35	35
4,3	M3	5,5	18,9	8 900	15 400	190	85	85
6	M3	6	22	12 500	22 200	305	155	155
7	M6	7	26,5	18 700	31 500	554	248	248
11	M6	7	29,1	24 600	39 000	790	330	330
16,5	M6	7	37,9	46 500	80 000	2 060	883	883



Lubrication connectors<sup>4)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
Wide guideway  
W and WL carriages

**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions										
	l <sub>max</sub> <sup>2)</sup>	H	B	L	A <sub>1</sub>	J <sub>B</sub>	j <sub>B</sub>	a <sub>5</sub>	b	A <sub>2</sub>	L <sub>1</sub>	J <sub>L</sub>	j <sub>L</sub>	a <sub>L</sub> , a <sub>R</sub> <sup>3)</sup>	
														min.	max.
<b>KUVE15-W</b>	2 890	21	68	55,6	15,5	60	22	7,5	37	4	39,8	29	50	20	44
<b>KUVE20-W</b>	2 880	27	80	69,8	19	70	24	9	42	5	50,4	40	60	20	53
<b>KUVE20-WL</b>				87,3							67,9				
<b>KUVE25-W</b>	5 860	35	120	81,7	25,5	107	40	14,5	69	6,5	60,7	45	80	20	71
<b>KUVE25-WL</b>				107,5							86,5				
<b>KUVE30-W</b>	5 860	42	142	97,5	31	124	50	15	80	9	72	52	80	20	71
<b>KUVE35-WL</b>	5 860	50	162	140,2	36	144	60	15	90	9	109,8	80	80	20	71

Further table values, see page 342 and page 343.

① Locating face. ② Marking.

- 1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.
- 2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.
- 3)  $a_L$  and  $a_R$  are dependent on the guideway length.
- 4) For location from above:  
The maximum screw depth for the two central threaded holes is  $T_6 + 2,5$  mm.



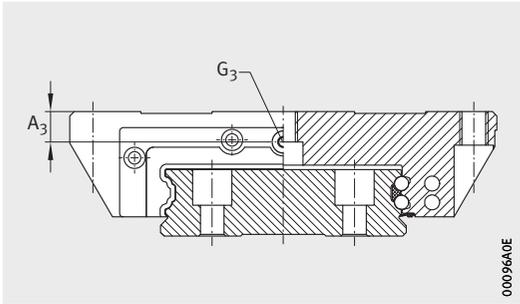
# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
Wide guideway  
W and WL carriages

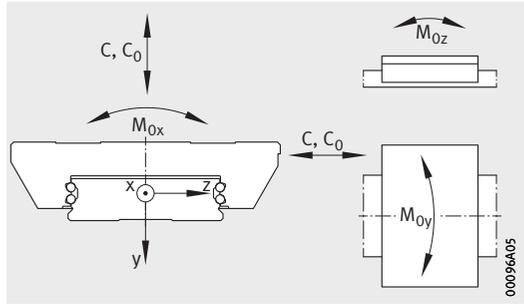
**Dimension table** (continued) · Dimensions in mm

Designation	Carriage		Guideway	
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m
<b>KUVE15-W</b>	KWVE15-W	0,27	TKVD15-W	3,6
<b>KUVE20-W</b>	KWVE20-W	0,5	TKVD20-W	5
<b>KUVE20-WL</b>	KWVE20-WL	0,7		
<b>KUVE25-W</b>	KWVE25-W	1,1	TKVD25-W	9,4
<b>KUVE25-WL</b>	KWVE25-WL	1,46		
<b>KUVE30-W</b>	KWVE30-W	1,95	TKVD30-W	13,6
<b>KUVE35-WL</b>	KWVE35-WL	4,11	TKVD35-W	17,4

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the full thread length is used and the adjacent construction is dimensioned accordingly.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) Lubrication connectors are included loose:
  - S04 with KUVE20-W
  - S05 with KUVE25-W to KUVE35-WL
  - S16 with KUVE15-W.

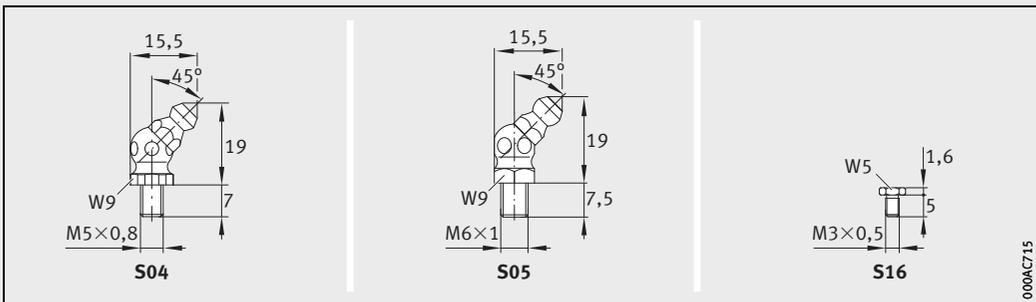


Lubrication connector on end face



Load directions

Lubrication connectors			Load carrying capacity				
A <sub>3</sub>	G <sub>3</sub>	2)	Basic load ratings <sup>1)</sup>		Moment ratings		
			dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
3,6	M3	4	7 200	14 500	332	100	100
5	M5	5	13 100	27 000	687	240	240
			16 200	36 500	920	400	400
10	M6	6	17 900	37 000	1 470	395	395
			23 400	54 000	2 225	825	825
11,25	M6	6	27 500	55 000	2 660	700	700
14,3	M6	6	47 500	100 000	5 550	1 890	1 890



Lubrication connectors<sup>3)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
High-Speed  
HS, E-HS and N-HS carriages



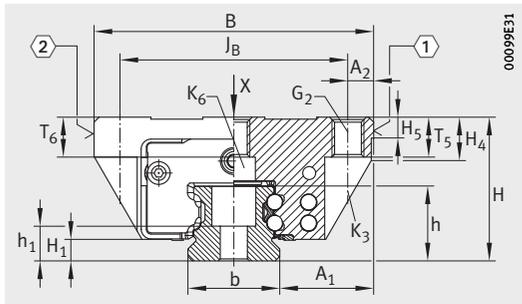
**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions											a <sub>L</sub> , a <sub>R</sub> <sup>3)</sup>	
	l <sub>max</sub> <sup>2)</sup>	H	B	L	A <sub>1</sub>	J <sub>B</sub>	b	A <sub>2</sub>	L <sub>1</sub>	L <sub>s</sub>	J <sub>L</sub>	J <sub>LZ</sub>	j <sub>L</sub>	min.	max.		
							-0,005 -0,03										
<b>KUVE25-B-HS</b>	5 880	36	70	98,3	23,5	57	23	6,5	60,7	1,65	45	40	60	20	53		
<b>KUVE25-B-E-HS</b>	5 880	33	73	98,3	25	60	23	6,5	60,7	1,65	35 <sup>4)</sup>	40	60	20	53		
<b>KUVE25-B-N-HS</b>	5 880	31	70	98,3	23,5	57	23	6,5	60,7	1,65	45	40	60	20	53		

For further table values, see page 346 and page 347.

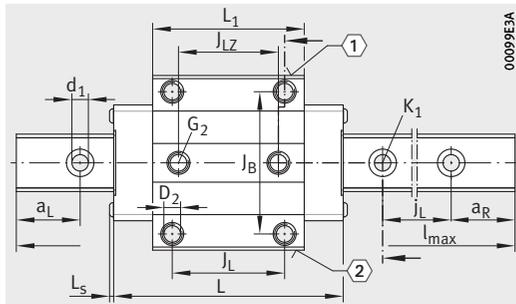
① Locating face. ② Marking.

- 1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications (S<sub>0</sub> = 1). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.
- 2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.
- 3) a<sub>L</sub> and a<sub>R</sub> are dependent on the guideway length.
- 4) The central holes are not present in the case of KUVE25-B-E-HS. The outer holes do not have the thread G<sub>2</sub>.



00099E31

KUVE25-B-HS, KUVE25-B-E-HS, KUVE25-B-N-HS



00099E31

KUVE25-B-HS, KUVE25-B-E-HS, KUVE25-B-N-HS  
View X rotated 90°

							Fixing screws <sup>1)</sup>											
H <sub>1</sub>	H <sub>4</sub>	H <sub>5</sub>	T <sub>5</sub>	T <sub>6</sub>	h	h <sub>1</sub>	G <sub>2</sub>		K <sub>1</sub>		K <sub>3</sub>		K <sub>6</sub>		K <sub>6</sub>		d <sub>1</sub>	D <sub>2</sub>
							DIN ISO 4762-12.9											
							M <sub>A</sub>		M <sub>A</sub>		M <sub>A</sub>		M <sub>A</sub>		M <sub>A</sub>			
							Nm		Nm		Nm		Nm		Nm			
5,1	10,9	5	10	10	18,7	8,7	M8	24	M6	17	M6	17	M6	17	-	-	6,8	6,7
5,1	7,85	5,25	10	4)	18,7	8,7	4)	4)	M6	17	M6	17	4)	4)	4)	4)	6,8	-
5,1	9,3	5	10	8	18,7	8,7	M8	24	M6	17	M6	17	-	-	M6	8	6,8	6,7

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# Four-row linear recirculating ball bearing and guideway assemblies

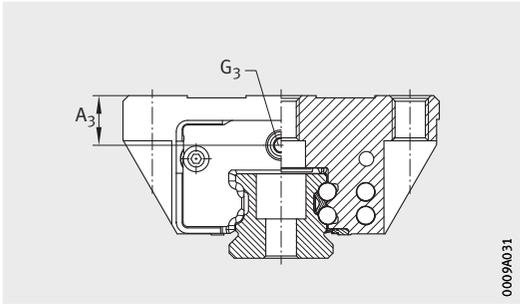
Full complement  
High-Speed  
HS, E-HS and N-HS carriages



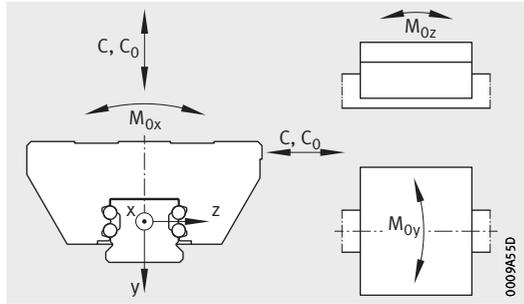
**Dimension table** (continued) · Dimensions in mm

Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m  ≈ kg	Designation	Mass m  ≈ kg/m	A <sub>3</sub>	G <sub>3</sub>	
							<sup>2)</sup>
<b>KUVE25-B-HS</b>	KWVE25-B-HS	0,71	TKVD25	2,7	11	M6	7
<b>KUVE25-B-E-HS</b>	KWVE25-B-E-HS	0,68	TKVD25	2,7	8	M6	7
<b>KUVE25-B-N-HS</b>	KWVE25-B-N-HS	0,57	TKVD25	2,7	6	M6	7

- 1) Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used and the adjacent construction is dimensioned appropriately.
- 2) Maximum permissible screw depth for lubrication connectors.
- 3) Lubrication connector S62 is included loose.



Lubrication connector on end face



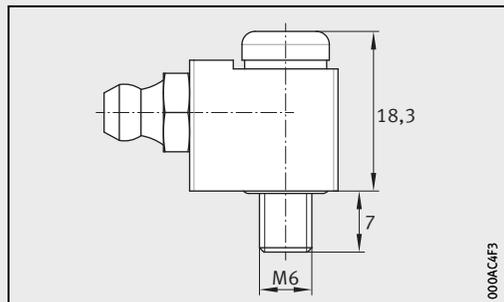
Load directions

Load carrying capacity

Basic load ratings<sup>1)</sup>

Moment ratings

dyn. C N	stat. C <sub>0</sub> N	M <sub>0x</sub> Nm	M <sub>0y</sub> Nm	M <sub>0z</sub> Nm
15 000	37 000	510	395	395
15 000	37 000	510	395	395
15 000	37 000	510	395	395



Lubrication connector S62<sup>3)</sup>

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# Four-row linear recirculating ball bearing and guideway assemblies

Full complement  
High-Speed  
ES-HS, H-HS, S-HS and SN-HS carriages



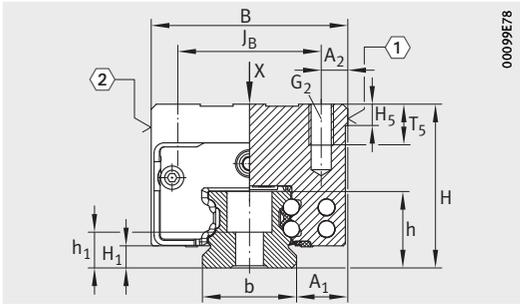
**Dimension table** - Dimensions in mm

Designation	Dimensions				Mounting dimensions					
	$l_{max}^{2)}$	H	B	L	$A_1$	$J_B$	b -0,005 -0,03	$A_2$	$L_1$	$L_s$
<b>KUVE25-B-ES-HS</b>	5 880	33	48	98,3	12,5	35	23	6,5	60,7	1,65
<b>KUVE25-B-H-HS</b>	5 880	40	48	98,3	12,5	35	23	6,5	60,7	1,65
<b>KUVE25-B-S-HS</b>	5 880	36	48	98,3	12,5	35	23	6,5	60,7	1,65
<b>KUVE25-B-SN-HS</b>	5 880	31	48	98,3	12,5	35	23	6,5	60,7	1,65

For further table values, see page 350 and page 351.

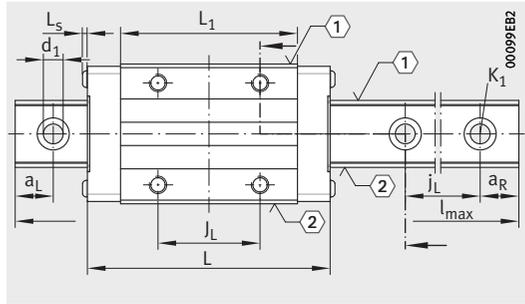
① Locating face. ② Marking.

- 1) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.
- 2) Maximum length of single-piece guideways.  
Permissible number of guideway segments, see page 309.  
Maximum single-piece guideway length of 6 m available by agreement.
- 3)  $a_L$  and  $a_R$  are dependent on the guideway length.



00099E78

KUVE25-B-ES-HS, KUVE25-B-H-HS, KUVE25-B-S-HS, KUVE25-B-SN-HS



00099E82

KUVE25-B-ES-HS, KUVE25-B-H-HS, KUVE25-B-S-HS, KUVE25-B-SN-HS  
View X rotated 90°

j <sub>L</sub>	j <sub>L</sub>	a <sub>L</sub> , a <sub>R</sub> <sup>3)</sup>		H <sub>1</sub>	H <sub>5</sub>	T <sub>5</sub>	h	h <sub>1</sub>	Fixing screws <sup>1)</sup>				
									G <sub>2</sub>		K <sub>1</sub>		d <sub>1</sub>
									DIN ISO 4762-12.9				
		min.	max.					M <sub>A</sub> Nm	M <sub>A</sub> Nm				
35	60	20	53	5,2	5,25	10	18,7	8,2	M6	17	M6	17	6,8
35	60	20	53	5,1	5	10	18,7	8,7	M6	10	M6	17	6,8
35	60	20	53	5,1	5	10	18,7	8,7	M6	10	M6	17	6,8
35	60	20	53	5,1	5	7,5	18,7	8,7	M6	10	M6	17	6,8

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# Four-row linear recirculating ball bearing and guideway assemblies

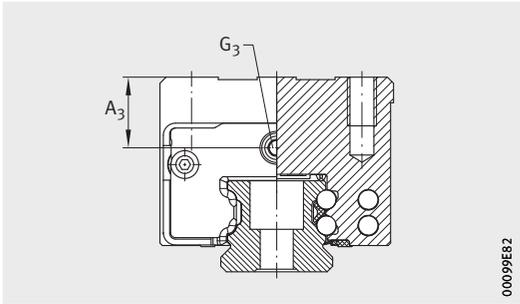
Full complement  
High-Speed  
ES-HS, H-HS, S-HS and SN-HS carriages



**Dimension table** (continued) · Dimensions in mm

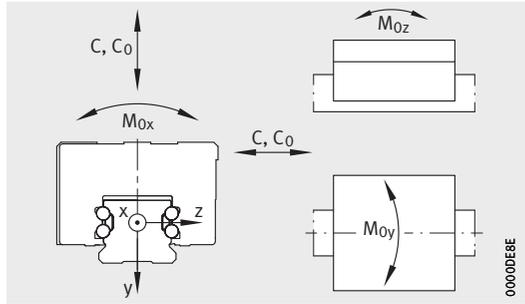
Designation	Carriage		Guideway		Lubrication connectors		
	Designation	Mass m ≈ kg	Designation	Mass m ≈ kg/m	A <sub>3</sub>	G <sub>3</sub>	
							<sup>2)</sup>
<b>KUVE25-B-ES-HS</b>	KWVE25-B-ES-HS	0,56	TKVD25	2,7	11	M6	7
<b>KUVE25-B-H-HS</b>	KWVE25-B-H-HS	0,65	TKVD25	2,7	15	M6	7
<b>KUVE25-B-S-HS</b>	KWVE25-B-S-HS	0,56	TKVD25	2,7	11	M6	7
<b>KUVE25-B-SN-HS</b>	KWVE25-B-SN-HS	0,45	TKVD25	2,7	6	M6	7

- <sup>1)</sup> Calculation of basic load ratings in accordance with DIN ISO 14728-1.  
Based on practical experience, it may be possible to increase the basic dynamic load rating.  
The basic load rating can only be transmitted fully if the whole thread length is used and the adjacent construction is dimensioned appropriately.
- <sup>2)</sup> Maximum permissible screw depth for lubrication connectors.
- <sup>3)</sup> Lubrication connector S62 is included loose.



0009982

Lubrication connector on end face

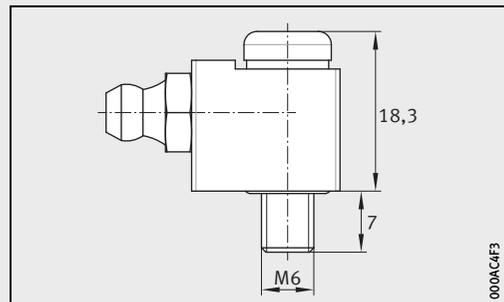


0000DE8

Load directions

Load carrying capacity

Basic load ratings <sup>1)</sup>		Moment ratings		
dyn. C	stat. C <sub>0</sub>	M <sub>0x</sub>	M <sub>0y</sub>	M <sub>0z</sub>
N	N	Nm	Nm	Nm
15 000	37 000	510	395	395
15 000	37 000	510	395	395
15 000	37 000	510	395	395
15 000	37 000	510	395	395

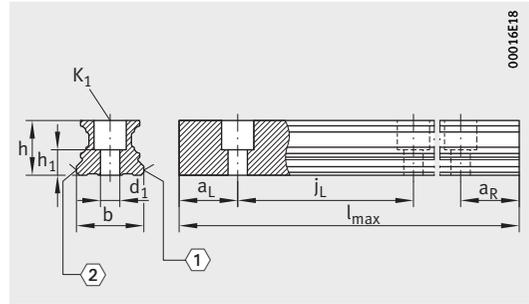


000AC4F3

Lubrication connector S62<sup>3)</sup>

# Four-row linear recirculating ball bearing and guideway assemblies

Guideways and closing methods for  
KUVE...-B  
KUVE...-W



TKVD

Dimension table - Dimensions in mm

Designation	For linear guidance system	Mass m ≈ kg/m	Closing plug <sup>1)</sup>				Covering strip <sup>2)</sup>		
			Plastic		Brass		Adhesive bonded	Clip fit Convex	Retaining plate
			one-piece	two-piece <sup>6)</sup>	one-piece	two-piece			
TKVD15-B	KUVE15-B	1,44	KA07-A-TN	KA07-A-TN/A	-	KA07-M/A	-	-	-
TKVD15-B-U			-	-	-	-	-	-	
TKVD15-W	KUVE15-W	3,6	KA08-TN	KA08-TN/A	-	-	-	-	-
TKVD15-W-U			-	-	-	-	-	-	
TKVD20	KUVE20-B	2,2	KA10-TN	KA10-TN/A	KA10-M	KA10-M/A	-	-	-
TKVD20-U			-	-	-	-	-	-	-
TKVD20-ADB			-	-	-	-	ADB13	-	HPL.ADB9-B
TKVD20-ADK			-	-	-	-	-	ADK12	
TKVD20-W	KUVE20-W	5	KA08-TN	KA08-TN/A	-	-	-	-	
TKVD20-W-U			-	-	-	-	-	-	

① Locating face. ② Marking.

1) Closing plugs, see page 401.

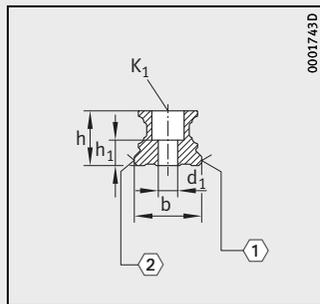
2) Covering strips, see page 402.

3) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.

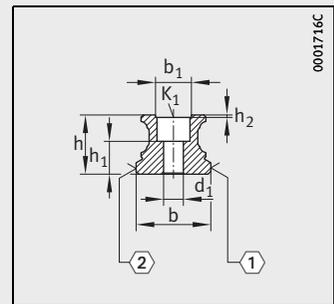
4) Maximum length of single-piece guideways.  
Longer guideways are supplied as several segments and are marked accordingly.  
Permissible number of guideway segments, see page 309.

5)  $a_L$  and  $a_R$  are dependent on the guideway length.

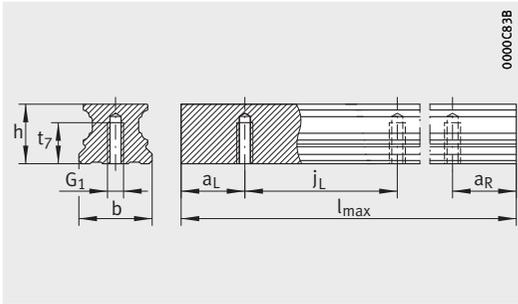
6) Standard.



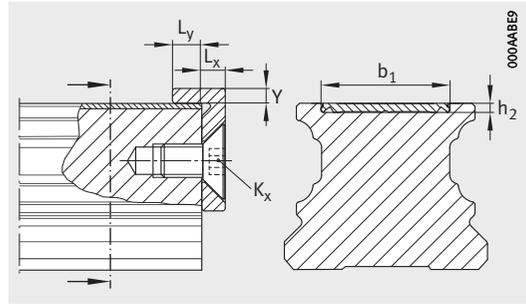
TKVD



TKVD...-ADB



TKVD...U

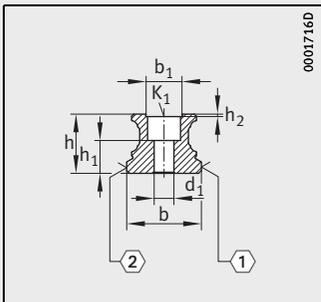


Retaining plate and covering strip

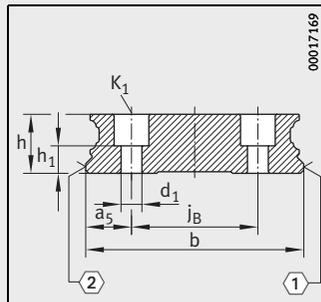
Dimensions

Fixing screws<sup>3)</sup>

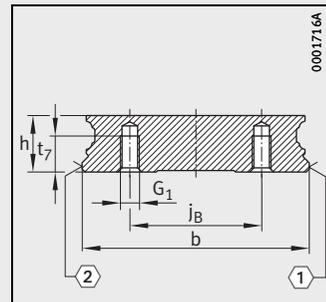
K <sub>x</sub>	L <sub>x</sub>	L <sub>y</sub>	Y	l <sub>max</sub> <sup>4)</sup>	h	b	a <sub>L</sub> , a <sub>R</sub> <sup>5)</sup>		j <sub>L</sub>	j <sub>B</sub>	a <sub>5</sub>	h <sub>1</sub>	h <sub>2</sub>	t <sub>7</sub>	b <sub>1</sub>	DIN ISO 4762-12.9					
							min.	max.								G <sub>1</sub>		d <sub>1</sub>			
																M <sub>A</sub>	M <sub>A</sub>				
		Nm		Nm																	
-	-	-	-	2 880	15	15	20	53	60	-	-	7,7	-	-	8	-	-	-	M4	5	4,6
-	-	-	-	2 890	12,9	37	10	44	50	22	7,5	6	-	-	7	-	-	-	M4	5	4,6
-	-	-	-	5 880	17	20	20	53	60	-	-	8,6	-	-	10	-	-	-	M5	10	5,8
M5	4	5	2	5 880	17	20	20	53	60	-	-	8,6	0,5	-	13	-	-	-	M5	10	5,8
-	-	-	-	2 880	17	42	20	53	60	24	9	10	-	-	10	-	-	-	M4	5	4,6
																			M6	17	-



TKVD...ADK



TKVD...W



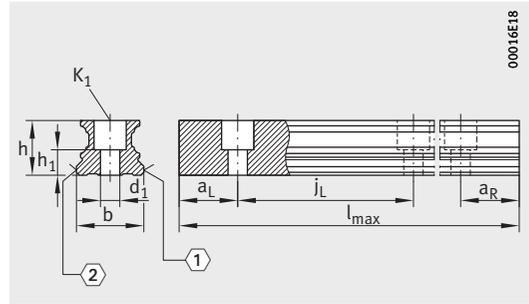
TKVD...W-U





# Four-row linear recirculating ball bearing and guideway assemblies

Guideways and closing methods for  
KUVE...-B  
KUVE...-W



TKVD

Dimension table (continued) · Dimensions in mm

Designation	For linear guidance system	Mass m ≈ kg/m	Closing plug <sup>1)</sup>				Covering strip <sup>2)</sup>		
			Plastic		Brass		Adhesive bonded	Clip fit Convex	Retaining plate
			one-piece	two-piece <sup>6)</sup>	one-piece	two-piece			
TKVD30	KUVE30-B	4,3	KA15-TN	KA15-TN/A	KA15-M	KA15-M/A	-	-	-
TKVD30-U			-	-	-	-	-	-	-
TKVD30-ADB		4,3	-	-	-	-	ADB18	-	HPL.ADB17-B
TKVD30-ADK	-		-	-	-	-	ADK16		
TKVD30-W	KUVE30-W	13,6	KA15TN	KA15TN/A	-	-	-	-	-
TKVD30-W-U			-	-	-	-	-	-	-

① Locating face. ② Marking.

1) Closing plugs, see page 401.

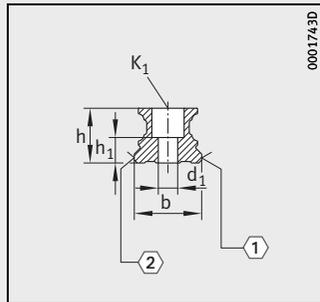
2) Covering strips, see page 402.

3) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.

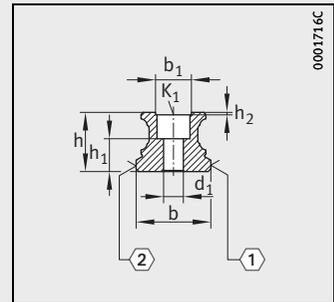
4) Maximum length of single-piece guideways.  
Longer guideways are supplied as several segments and are marked accordingly.  
Permissible number of guideway segments, see page 309.

5)  $a_L$  and  $a_R$  are dependent on the guideway length.

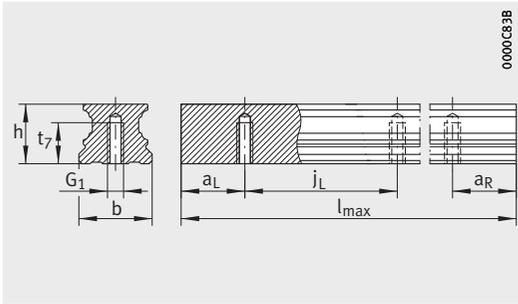
6) Standard.



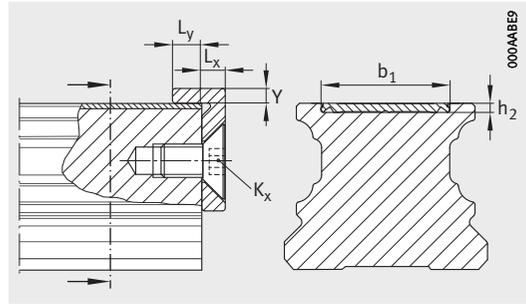
TKVD



TKVD...-ADB



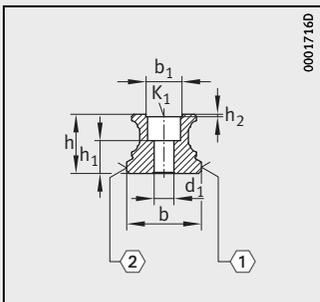
TKVD...U



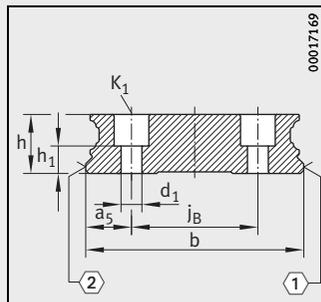
Retaining plate and covering strip

Dimensions

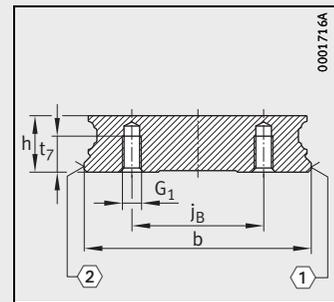
K <sub>x</sub>	L <sub>x</sub>	L <sub>y</sub>	Y	l <sub>max</sub> <sup>4)</sup>	h	b	a <sub>L</sub> , a <sub>R</sub> <sup>5)</sup>		j <sub>L</sub>	j <sub>B</sub>	a <sub>5</sub>	h <sub>1</sub>	h <sub>2</sub>	t <sub>7</sub>	b <sub>1</sub>	Fixing screws <sup>3)</sup>				
							DIN ISO 4762-12.9									d <sub>1</sub>				
							G <sub>1</sub>	K <sub>1</sub>												
							Nm	Nm												
-	-	-	-	5 860	23,5	28	20	71	80	-	-	11	-	-	-	-	-	-	9	
M6	4	5	3	5 860	23,5	28	20	71	80	-	-	11	0,5 1,1	-	18 16,6	-	-	M8	41	9
-	-	-	-	5 860	23,5	80	20	71	80	50	15	11	-	-	-	-	-	M8	41	9



TKVD...ADK



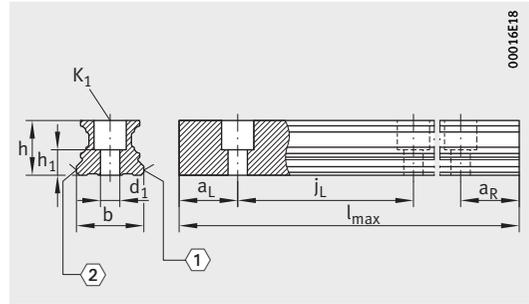
TKVD...-W



TKVD...-W-U

# Four-row linear recirculating ball bearing and guideway assemblies

Guideways and closing methods for  
KUVE...-B  
KUVE...-W



TKVD

Dimension table (continued) · Dimensions in mm

Designation	For linear guidance system	Mass m ≈ kg/m	Closing plug <sup>1)</sup>				Covering strip <sup>2)</sup>		
			Plastic		Brass		Adhesive bonded	Clip fit Convex	Retaining plate
			one-piece	two-piece <sup>6)</sup>	one-piece	two-piece			
TKVD35	KUVE35-B	5,7	KA15-TN	KA15-TN/A	KA15-M	KA15-M/A	-	-	-
TKVD35-U			-	-	-	-	-	-	-
TKVD35-ADB		5,7	-	-	-	-	ADB18	-	HPL.ADB17-B
TKVD35-ADK			-	-	-	-	-	ADK16	-
TKVD35-W	KUVE35-W	17,4	KA15-TN	KA15-TN/A	-	-	-	-	-
TKVD35-W-U			-	-	-	-	-	-	-

① Locating face. ② Marking.

1) Closing plugs, see page 401.

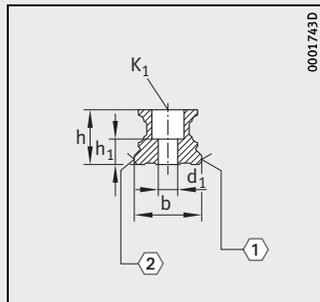
2) Covering strips, see page 402.

3) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.

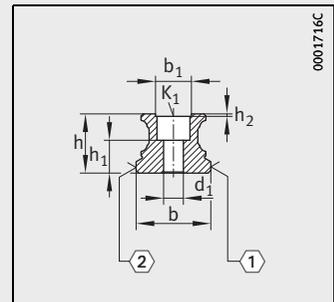
4) Maximum length of single-piece guideways.  
Longer guideways are supplied as several segments and are marked accordingly.  
Permissible number of guideway segments, see page 309.

5)  $a_L$  and  $a_R$  are dependent on the guideway length.

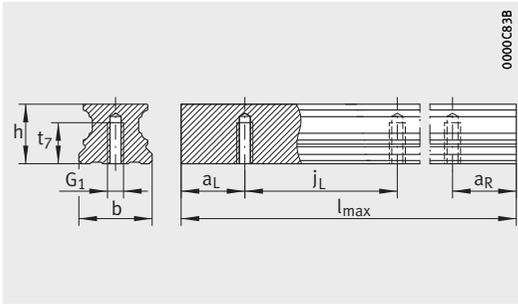
6) Standard.



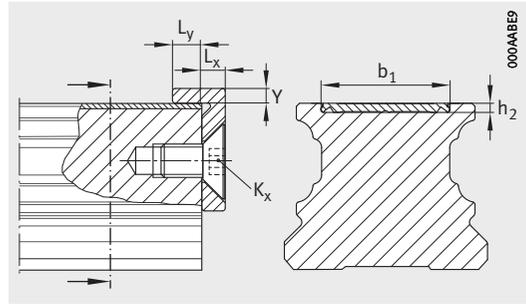
TKVD



TKVD...-ADB



TKVD...U

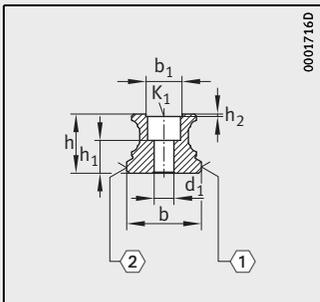


Retaining plate and covering strip

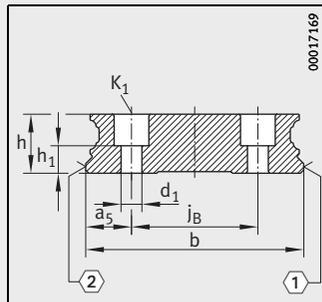
Dimensions

Fixing screws<sup>3)</sup>

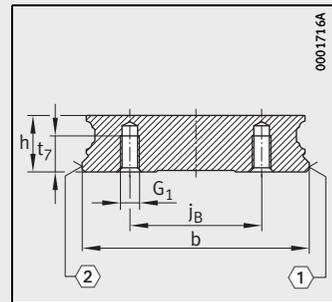
K <sub>x</sub>	L <sub>x</sub>	L <sub>y</sub>	Y	l <sub>max</sub> <sup>4)</sup>	h	b	a <sub>L</sub> , a <sub>R</sub> <sup>5)</sup>		j <sub>L</sub>	j <sub>B</sub>	a <sub>s</sub>	h <sub>1</sub>	h <sub>2</sub>	t <sub>7</sub>	b <sub>1</sub>	DIN ISO 4762-12.9			d <sub>1</sub>	
							min.	max.								M <sub>A</sub>				
																Nm	Nm			
-	-	-	-	5860	27	34	20	71	80	-	-	14,5	-	-	-	-	M8	41	9	
M6	4	5	3	5860	27	34	20	71	80	-	-	14,5	0,5 1,1	-	18 16,6	M5	10	M8	41	9
-	-	-	-	5860	27	90	20	71	80	60	15	14,5	-	-	-	-	M8	41	9	



TKVD...ADK



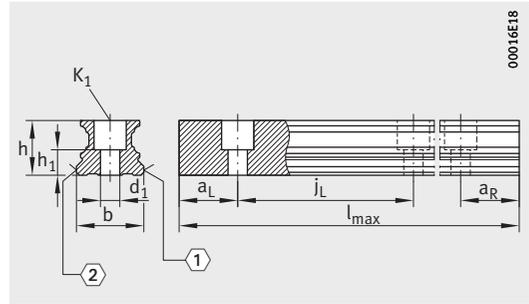
TKVD...W



TKVD...W-U

# Four-row linear recirculating ball bearing and guideway assemblies

Guideways and closing methods for KUVE..-B



TKVD

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Dimension table (continued) · Dimensions in mm

Designation	For linear guidance system	Mass m ≈ kg/m	Closing plug <sup>1)</sup>				Covering strip <sup>2)</sup>		
			Plastic		Brass		Adhesive bonded	Clip fit Convex	Retaining plate
			one-piece	two-piece <sup>6)</sup>	one-piece	two-piece			
<b>TKVD45</b>	KUVE45-B	9,2	KA20-TN	KA20-TN/A	KA20-M	KA20-M/A	-	-	-
<b>TKVD45-U</b>			-	-	-	-	-	-	-
<b>TKVD45-ADB</b>		9,2	-	-	-	-	ADB23	-	HPL.ADB17-B
<b>TKVD45-ADK</b>			-	-	-	-	-	ADK21	
<b>TKVD55-B</b>	KUVE55-B	14	KA24-TN	KA24-TN/A	KA24-M	KA24-M/A	-	-	-
<b>TKVD55-B-U</b>			-	-	-	-	-	-	-
<b>TKVD55-ADB</b>		14	-	-	-	-	ADB27	-	HPL.ADB17-B
<b>TKVD55-ADK</b>			-	-	-	-	-	ADK25	

① Locating face. ② Marking.

1) Closing plugs, see page 401.

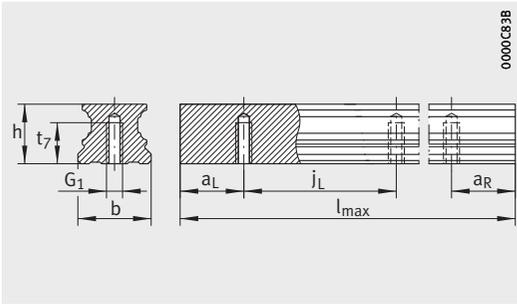
2) Covering strips, see page 402.

3) The stated torques represent maximum values for the secure transmission of forces in vibration-free, quasistatic applications ( $S_0 = 1$ ). We recommend that the tightening torques for the screw connection of the adjacent construction should be determined at the customer under the conditions specific to the application and operation, observing the information in VDI Guideline 2230 Part 1 (2015) and the information in this description, see page 69 and page 26.

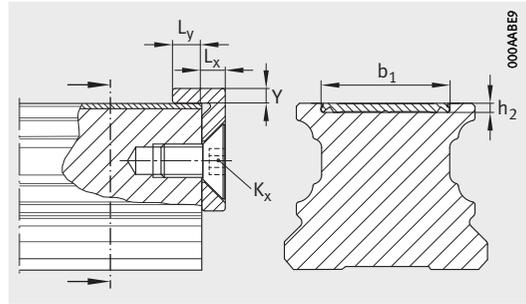
4) Maximum length of single-piece guideways.  
Longer guideways are supplied as several segments and are marked accordingly.  
Permissible number of guideway segments, see page 309.

5)  $a_L$  and  $a_R$  are dependent on the guideway length.

6) Standard.



TKVD...U

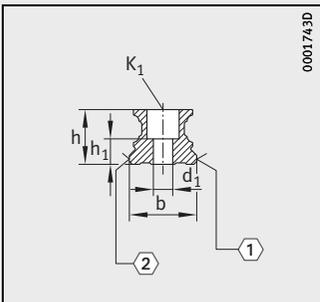


Retaining plate and covering strip

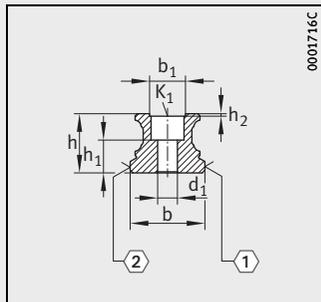
Dimensions

Fixing screws<sup>3)</sup>

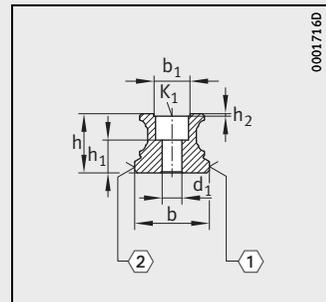
K <sub>x</sub>	L <sub>x</sub>	L <sub>y</sub>	Y	l <sub>max</sub> <sup>4)</sup>	h	b	a <sub>L</sub> , a <sub>R</sub> <sup>5)</sup>		j <sub>L</sub>	j <sub>B</sub>	a <sub>5</sub>	h <sub>1</sub>	h <sub>2</sub>	t <sub>7</sub>	b <sub>1</sub>	DIN ISO 4762-12.9			d <sub>1</sub>	
							min.	max.								G <sub>1</sub>		K <sub>1</sub>		
																M <sub>A</sub>	Nm	M <sub>A</sub>		Nm
-	-	-	-	5 835	34,2	45	20	94	105	-	-	15,7	-	-	-	-	-	M12	140	13,4
M5	4	5	2	5 835	34,2	45	20	94	105	-	-	15,7	0,5 1,1	-	23 21,7	-	-	M12	140	13,4
-	-	-	-	5 820	41,5	53	20	107	120	-	-	19	-	-	-	-	-	M14	220	15,4
M5	4	5	2	5 820	41,5	53	20	107	120	-	-	19	0,5 1,1	-	27 25,7	-	-	M14	220	15,4



TKVD



TKVD...-ADB



TKVD...-ADK