

Four Row Linear Recirculating Ball Bearing and Guideway Assembly with Gear Rack

Series KUVE..SB ZHP



NEW!
Guideway with Gear Rack



Features

Four Row Linear Recirculating Ball Bearing and Guideway Assembly with Gear Rack

- consist of:
 - a carriage with a full complement of balls, carriage location from above or on the side
 - a guideway with helical gear teeth and two locating faces
- provide more advantages than units without gear racks:
 - mounting time is reduced significantly
 - increased accuracy
 - simplified design and processing of the surrounding structure
 - logistically less time and expense
- Available in sizes 25 and 35
- Modular structure
 - for any size, guideways with gear racks can be combined with all carriage types (except for W designs) see figure at right for example, KUVE..H ZHP
- Support loads from all directions and moments about all axes
 - transmit forces at a 45° contact angle and in an O arrangement
- Are preloaded
- Have a high load carrying capacity and high rigidity
- Can also be ordered as a preassembled unit for increased accuracy
- Integrated, elastic wipers on carriage side faces as well as longitudinal sealing strips to seal the carriage
- Can be lubricated with either oil or grease
 - raceway and gear teeth
 - a lubricating nipple for the raceway is screw-mounted in the carriage end piece
- Suitable for an operating temperature range of -40 °C to +100 °C
- Suitable for applications in the following areas:
 - Handling
 - Automation technology

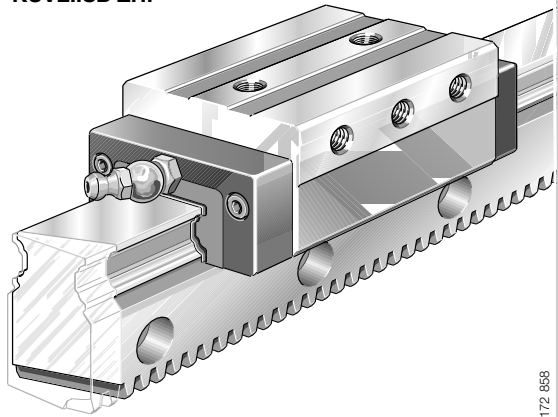


For more information on four row linear recirculating ball bearing and guideway assemblies, see INA's catalog *Linear guidance systems (LIF)* and CD-ROM **medias® professional**

Guideway with Gear Rack and SB Carriage



KUVE..SB ZHP



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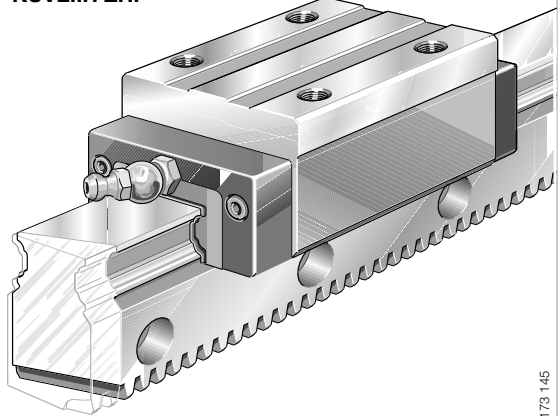
- Unit consists of:
 - carriage KWVE..SB with lateral locating holes
 - guideway with helical gear teeth
- Gear quality class 6, right-hand helical gear teeth 19° 31' 42", hardened and ground, pressure angle 20°
- Gearing, center distance and transmission ratio to DIN 3 975/76



Guideway with Gear Rack and Standard H Carriage



KUVE..H ZHP



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- Unit consists of:
 - carriage KWVE..H with locating holes for fixing from above
 - guideway with helical gear teeth
- Gear quality class 6, right-hand helical gear teeth 19° 31' 42", hardened and ground, pressure angle 20°
- Gearing, center distance and transmission ratio to DIN 3 975/76

Four Row Linear Recirculating Ball Bearing and Guideway Assembly with Gear Rack

Gearbox


Features

- High-performance worm gear system, especially designed to be used in new generation rotary and direct current servomotors
- Light-metal housing for optimum heat dissipation
- Quiet operation
- Can be installed in any position
- Transmission ratios:
 $i = 4.75, 6.75, 9.25, 14.5, 19.5, 29, 50$
- Low-backlash gearing (backlash $< 2'$) with adjustment capability
- Five machined locating surfaces with adequately designed mounting bores and threaded holes for stress-free assembly in all installation positions

Installation

If additional forces are to be fully utilized, the gearing should be flange-mounted on the largest locating surfaces.

The most favorable installation for lubrication is achieved when the worm shaft is mounted laterally or at the bottom.

 Mounting the worm shaft at the top will reduce the drive power by approximately 10%.

Backlash

Tooth backlash is factory preset to the smallest value possible. If backlash changes after an extended period of operation, it can be reset to the prescribed value by means of the eccentric drive shaft.

Lubrication

The gears are packed with synthetic lubricant.

Lubricant levels should be checked several times during the first few weeks of operation and after that on a monthly basis.



For operation with average loads, the lubricant should be changed from once to four times a year (for one, two or three-shift operation).

Coupling

Features

- Bore hole on the gear side; zero backlash internal spline for insertion – conforming to DIN 5 480 (Figure 1, A)
- Bore hole on the motor side, with annular spring elements pre-mounted as a clamped connection (Figure 1, B)
- Pre-assembled

Installation

Clean all contact surfaces before securing to the motor shaft and protect with a light coat of oil. This will prevent fretting corrosion.

Drive pinions

Features

- Helical gear teeth, $19^{\circ} 31' 42''$, pressure angle 20°
- Ground gearing, quality 6 e 25 to DIN 3 962/63/67
- Gas carburized

Installation

Clean drive pinions prior to installation, and apply a light coat of grease or oil. This will prevent fretting corrosion.



Design and safety information

In order for the TKVD..ZHP guideways to be mounted in any desired length, mating parts required for assembly are available on request. These parts have gearing that runs in the opposite direction.

Safety precautions



The following safety precautions must be followed:

Do not touch rotating parts such as the drive and driven shafts, helical gear, rack, etc.

Do not remove the plug screws on the gears.

Avoid direct contact with lubricants.

Follow the information provided by the lubricant and gear manufacturers.

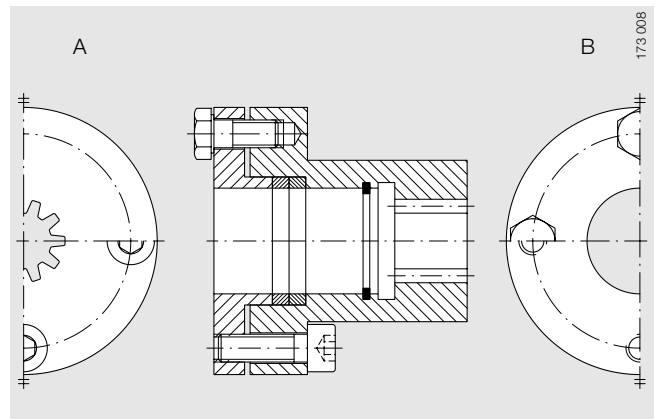
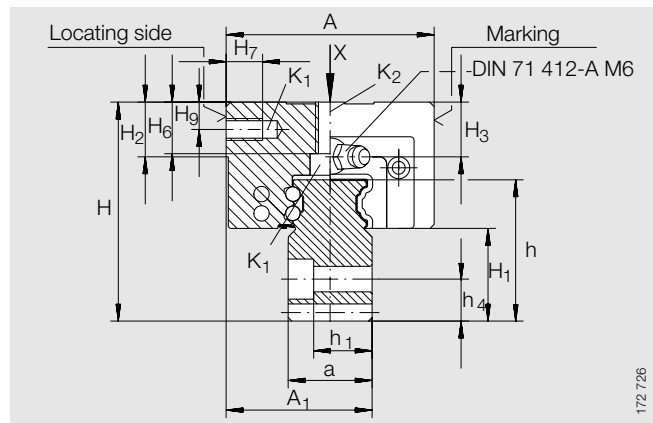


Figure 1 · Coupling

Four Row Linear Recirculating Ball Bearing and Guideway Assembly with Gear Rack

Series KUVE..SB ZHP



KUVE..SB ZHP

Dimension Table · Dimensions in mm

Unit Designation	Carriage		Guideway		Dimensions				Mounting dimensions	
	Designation	Weight kg	Designation	Weight kg/m	L	H	A	C	A ₁	a -0,005 -0,03
KUVE 25 SB ZHP	KWVE 25 SB	0.85	TKVD 25 ZHP	6.3	1 500 ¹⁾⁵⁾	60	57	81.7	40	23
KUVE 35 SB ZHP	KWVE 35 SB	1.8	TKVD 35 ZHP	14	1 680 ¹⁾⁶⁾	85	76	110.4	55	34

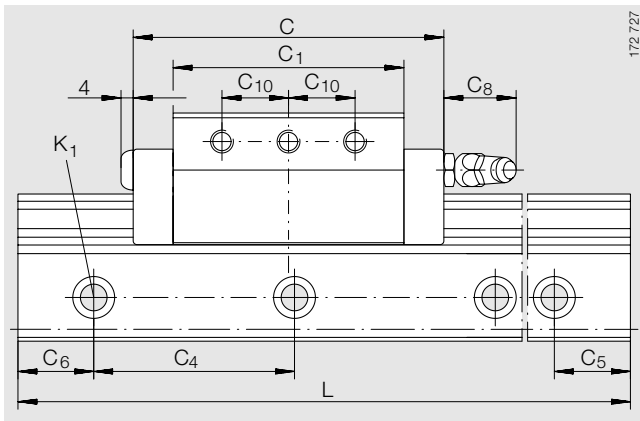
- 1) Maximum length L of guideway.
INA should be consulted if longer TKVD 25 ZHP units are required.
- 2) C₅ and C₆ are dependant on the guide length L.
- 3) Screws should be secured, particularly if preload losses due to compression or stretching can occur.
- 4) Can also be supplied with other modules.
- 5) Size 25 guideways with gear rack are available in the following lengths: L = 1500 mm, 960 mm, 540 mm.
For these lengths, the ends of the guideways are separated diagonally and can be used for a rail joint.
- 6) Size 35 guideways with gear rack are available in the following lengths: L = 1680 mm, 1120 mm, 560 mm.
For these lengths, the ends of the guideways are separated diagonally and can be used for a rail joint.
- 7) See Figure "Load directions".

Thread diameters, screw diameters and tightening torques

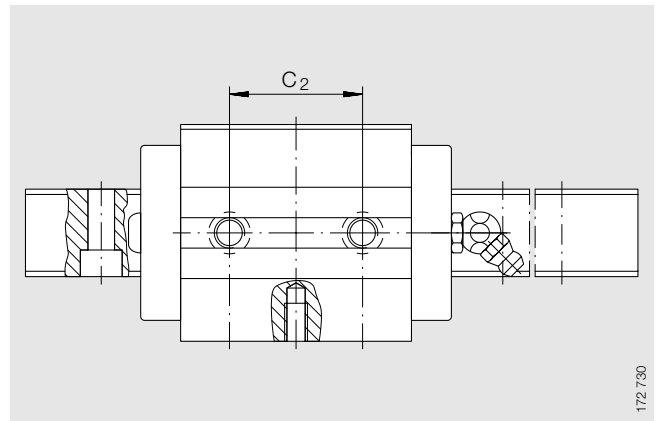
Designation	K ₁ ³⁾ for screws DIN 912-12.9		K ₂ ³⁾ for screws DIN 912-12.9	
		Nm		Nm
KUVE 25 SB ZHP	M6	17	M 8	24
KUVE 35 SB ZHP	M8	41	M10	83

Load carrying capacity

Designation	Load ratings		Moments ⁷⁾		
	dyn. C kN	stat. C ₀ kN	M _{0x} Nm	M _{0y} Nm	M _{0z} Nm
KUVE 25 SB ZHP	17,9	37	510	395	395
KUVE 35 SB ZHP	38	72	1465	1020	1020

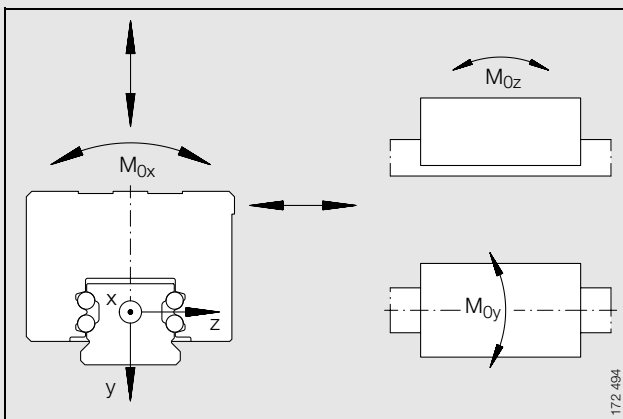


KUVE..SB ZHP

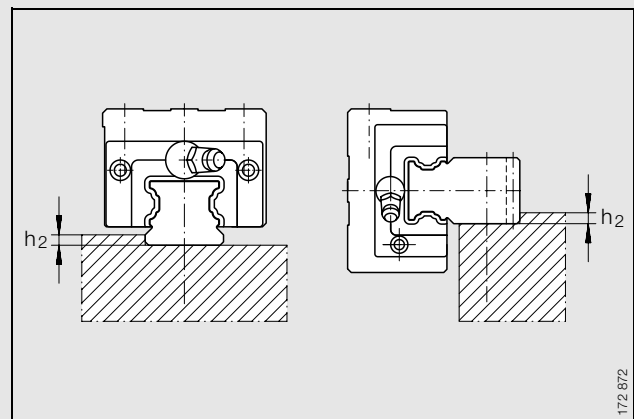


KUVE..SB ZHP, view X (rotated 90°)

C ₁	C ₂	C ₄	C ₅ ²⁾		C ₆ ²⁾		C ₈	C ₁₀	H ₁	H ₂	H ₃	H ₆	H ₇	H ₉	h	h ₁	h ₂ max.	h ₄	Module ⁴⁾
			min.	max.	min.	max.													m
60.7	35	60	20	53	20	53	19	17.5	25.2	15	15	12	10	7.5	38.7	13	3	11.5	2
80	50	80	20	71	20	71	19	25	36.8	22	19.3	18.15	13	11	57	22	5	17	3



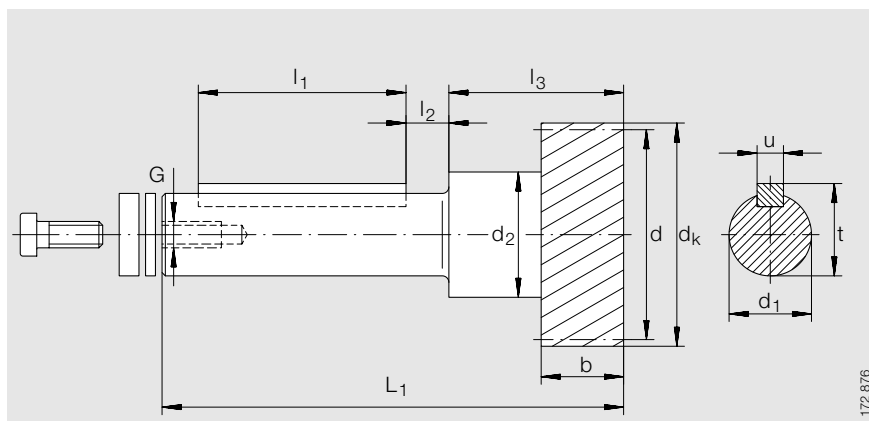
Load directions



KUVE..SB ZHP

Accessories

Drive shafts
Coupling
Clamped connection



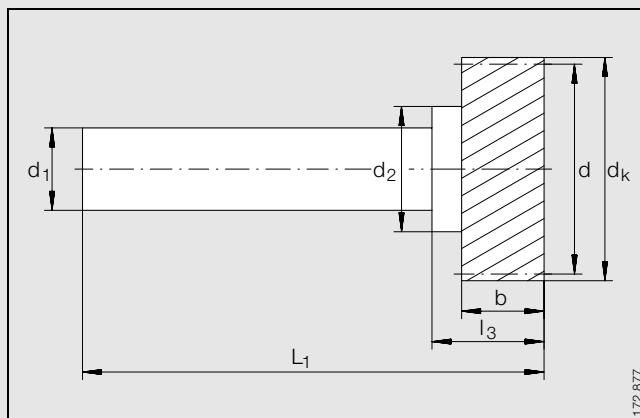
Drive shaft for keyed connection

Drive shafts, helical gearing · Dimensions in mm

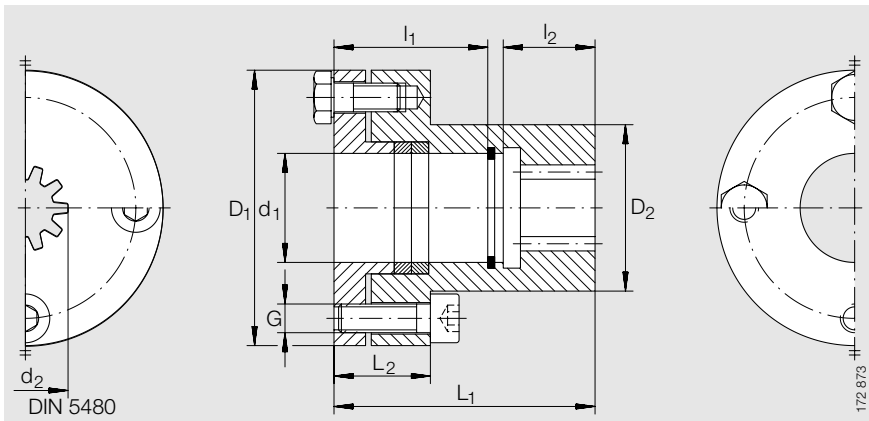
Order code	Weight kg	Center distance	Module	No. of teeth	Dimensions												
					d	dk	b	d _{1 i6}	d ₂	L ₁	l ₁	l ₂	l ₃	u	t	G	
RITZ 02 30 50 PF¹⁾	1.25	50	2	30	63.66	67.7	25	25	38	140	63	13	53	8	28	M8	
RITZ 02 30 63 PF¹⁾	1.5	63	2	30	63.66	67.7	25	28	42	164.5	80	14.5	57.5	8	31	M8	
RITZ 02 30 50 KL²⁾	1.25	50	2	30	63.66	67.7	25	25	38	140	-	-	34	-	-	-	
RITZ 02 30 63 KL²⁾	1.6	63	2	30	63.66	67.7	25	28	42	164.5	-	-	38.5	-	-	-	
RITZ 03 20 50 PF¹⁾	1.33	50	3	20	63.66	69.7	30	25	38	142	63	13	55	8	28	M8	
RITZ 03 20 63 PF¹⁾	1.6	63	3	20	63.66	69.7	30	28	42	167	80	14.5	60	8	31	M8	
RITZ 03 20 50 KL²⁾	1.33	50	3	20	63.66	69.7	30	25	38	142	-	-	36.5	-	-	-	
RITZ 03 20 63 KL²⁾	1.6	63	3	20	63.66	69.7	30	28	42	167	-	-	41	-	-	-	

1) Drive shaft for keyed connection.

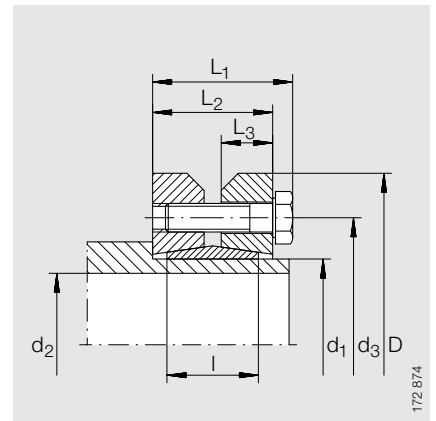
2) Drive shaft for shrink fitting.



Drive shaft for shrink fitting



Coupling



Clamped connection

Coupling · Dimensions in mm

Order code	Weight kg	J_{red} 10^{-4} kg/m^2	Dimensions										G	
			d ₁	d ₂	D ₁	D ₂	l ₁	l ₂	l ₄	L ₁	L ₂	Number	Tightening torque M_A Nm	
KUP 65 43 119	0.4	0.799	19	15×1.25×10	48	29	24	16	5	40	18	4×M5	7	

Clamped connection · Dimensions in mm

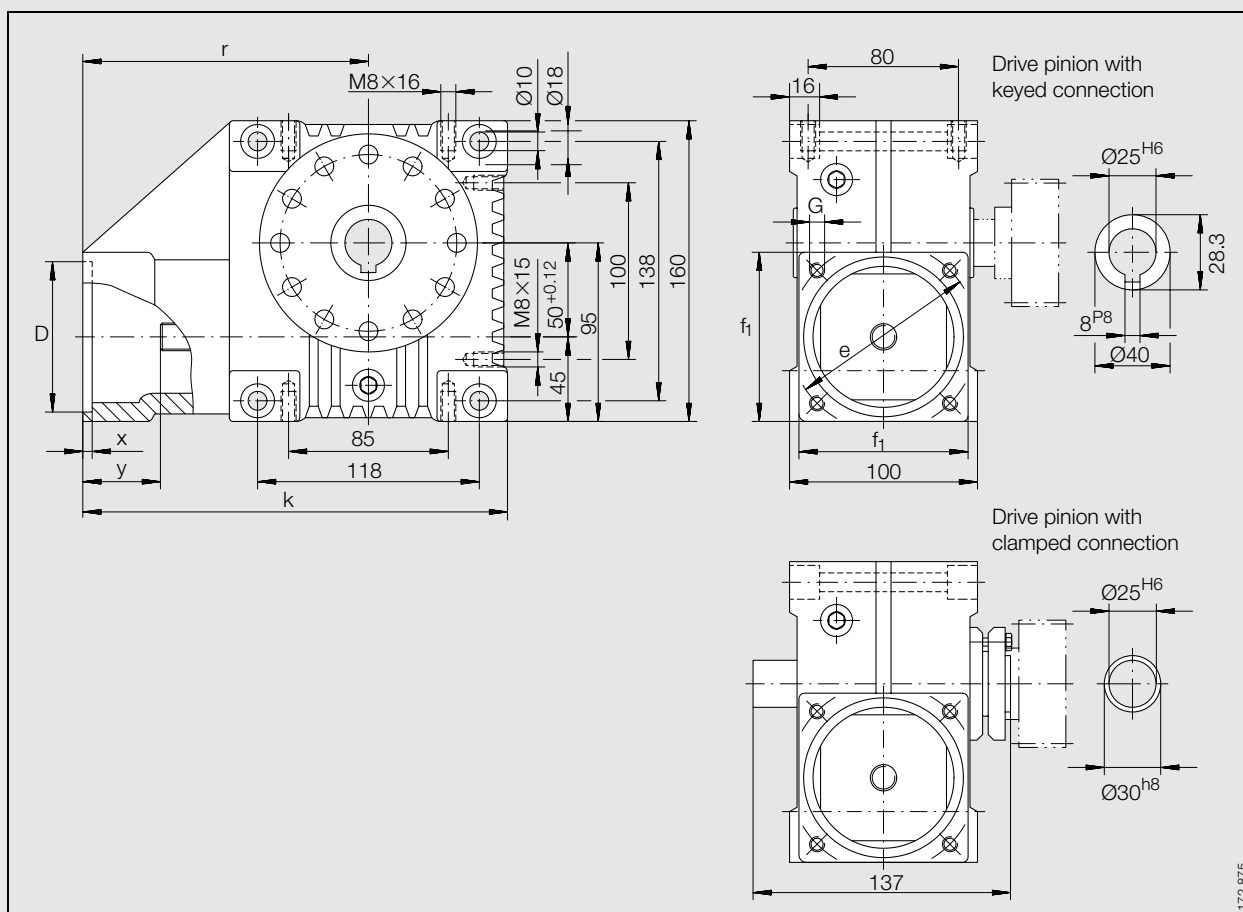
Order code	Weight kg	J_{red} 10^{-4} kg/m^2	Dimensions									G	
			a ₀	d ₁	d ₂	d ₃	D	L ₁	L ₂	L ₃	l	Number	Tightening torque M_A Nm
SPE 80 83 030	0.3	1.756	50	30	25	44	60	25	21.5	9	16	7×M5	4
SPE 80 84 036	0.4	4.029	63	36	28	52	72	27.5	23.5	10	18	5×M6	12

Accessories

Gearbox

Gearbox · Dimensions in mm

Order code		Weight kg	J_{red} 10^{-4} kg/m^2	Ratio i	Dimensions							
Drive pinion with keyed connection	Drive pinion with clamped connection				D^{G7}	k	r	x	y	f_1	e	G
GETR 50 SCHN 95 115 PF-5	GETR 50 SCHN 95 115 KL-5	7	0.483	4.75	95	222	152	5	42	100	115	M8

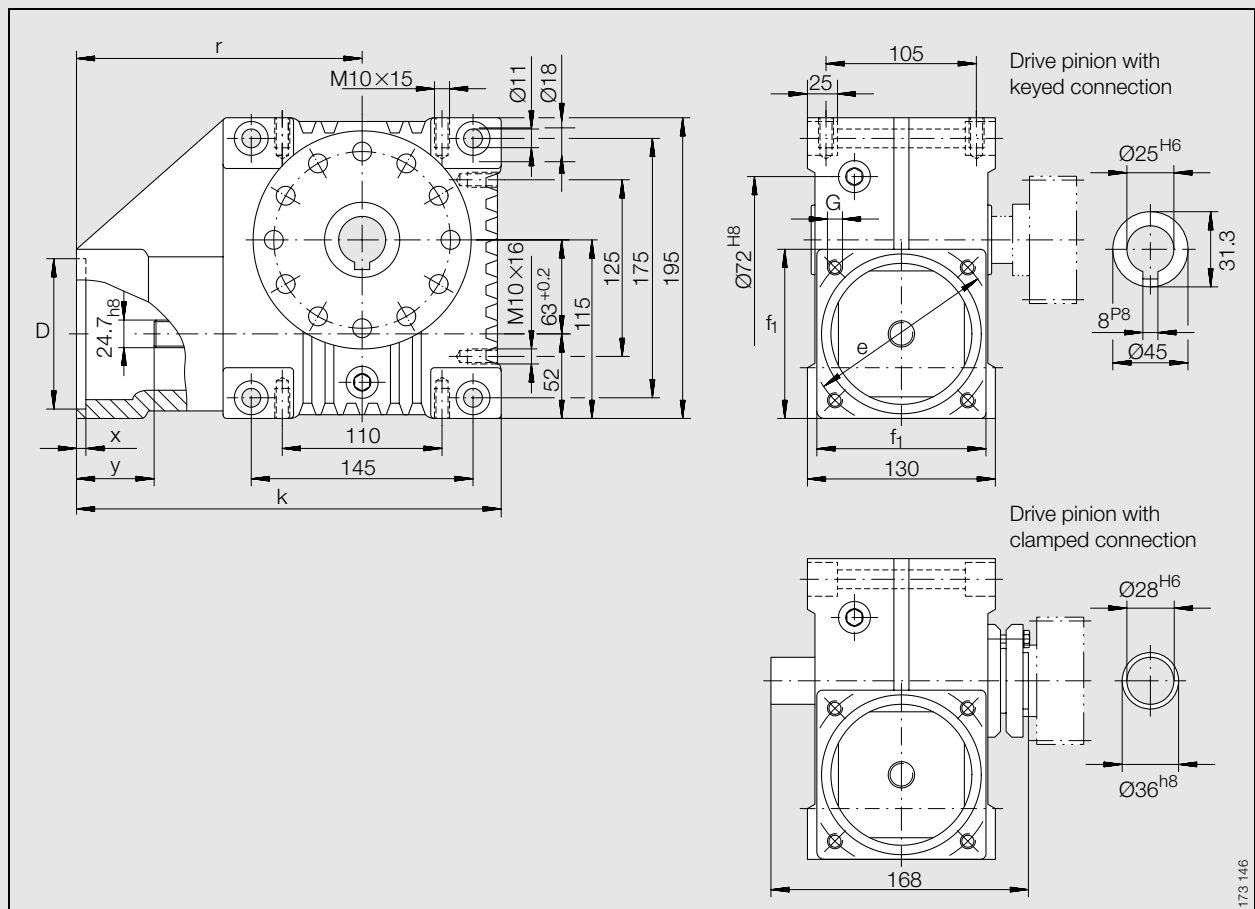


Gears with center distance $a_0 = 50 \text{ mm}$

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Gearbox - Dimensions in mm

Order code		Weight kg	J_{red} 10^{-4} kg/m^2	Ratio i	Dimensions							
Drive pinion with keyed connection	Drive pinion with clamped connection				D^{G7}	k	r	x	y	f_1	e	G
GETR 63 SCHN 130 165 PF-39	GETR 63 SCHN 130 165 KL-39	12	1.01	39	95	265	180	5	48	100	115	M8



Gears with center distance $a_0 = 63 \text{ mm}$

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Gearbox

Center distance $a_0 = 50 \text{ mm}$

Gearbox, Motor, Pinion, Coupling

Order code		Motor	Pinion	Coupling
Atlanta	INA			
58 43 105	GETR 50 SCHN 95/115 PF-5	MOT HDX 115 ... ¹⁾	RITZ 023050 PF	KUP
58 43 107	GETR 50 SCHN 95/115 PF-7	MOT HDX 115 ... ¹⁾	RITZ 023050 PF	KUP
58 43 109	GETR 50 SCHN 95/115 PF-9	MOT HDX 115 ... ¹⁾	RITZ 023050 PF	KUP
58 43 115	GETR 50 SCHN 95/115 PF-15	MOT HDX 115 ... ¹⁾	RITZ 023050 PF	KUP
58 43 120	GETR 50 SCHN 95/115 PF-20	MOT HDX 115 ... ¹⁾	RITZ 023050 PF	KUP
58 43 139	GETR 50 SCHN 95/115 PF-39	MOT HDX 115 ... ¹⁾	RITZ 023050 PF	KUP
58 43 150	GETR 50 SCHN 95/115 PF-50	MOT HDX 115 ... ¹⁾	RITZ 023050 PF	KUP
58 83 105	GETR 50 SCHN 95/115 KL-5	MOT HDX 115 ... ¹⁾	RITZ 023050 KL	KUP
58 83 107	GETR 50 SCHN 95/115 KL-7	MOT HDX 115 ... ¹⁾	RITZ 023050 KL	KUP
58 83 109	GETR 50 SCHN 95/115 KL-9	MOT HDX 115 ... ¹⁾	RITZ 023050 KL	KUP
58 83 115	GETR 50 SCHN 95/115 KL-15	MOT HDX 115 ... ¹⁾	RITZ 023050 KL	KUP
58 83 120	GETR 50 SCHN 95/115 KL-20	MOT HDX 115 ... ¹⁾	RITZ 023050 KL	KUP
58 83 139	GETR 50 SCHN 95/115 KL-39	MOT HDX 115 ... ¹⁾	RITZ 023050 KL	KUP
58 43 305	GETR 50 SCHN 80/100 PF-5	MOT HDX 92 E4-44 S	RITZ 023050 PF	KUP
58 43 307	GETR 50 SCHN 80/100 PF-7	MOT HDX 92 E4-44 S	RITZ 023050 PF	KUP
58 43 309	GETR 50 SCHN 80/100 PF-9	MOT HDX 92 E4-44 S	RITZ 023050 PF	KUP
58 43 315	GETR 50 SCHN 80/100 PF-15	MOT HDX 92 E4-44 S	RITZ 023050 PF	KUP
58 43 320	GETR 50 SCHN 80/100 PF-20	MOT HDX 92 E4-44 S	RITZ 023050 PF	KUP
58 43 339	GETR 50 SCHN 80/100 PF-39	MOT HDX 92 E4-44 S	RITZ 023050 PF	KUP
58 43 350	GETR 50 SCHN 80/100 PF-50	MOT HDX 92 E4-44 S	RITZ 023050 PF	KUP
58 83 305	GETR 50 SCHN 80/100 KL-5	MOT HDX 92 E4-44 S	RITZ 023050 KL	KUP
58 83 307	GETR 50 SCHN 80/100 KL-7	MOT HDX 92 E4-44 S	RITZ 023050 KL	KUP
58 83 309	GETR 50 SCHN 80/100 KL-9	MOT HDX 92 E4-44 S	RITZ 023050 KL	KUP
58 83 315	GETR 50 SCHN 80/100 KL-15	MOT HDX 92 E4-44 S	RITZ 023050 KL	KUP
58 83 320	GETR 50 SCHN 80/100 KL-20	MOT HDX 92 E4-44 S	RITZ 023050 KL	KUP
58 83 339	GETR 50 SCHN 80/100 KL-39	MOT HDX 92 E4-44 S	RITZ 023050 KL	KUP

¹⁾ MOT HDX 115 A6-64 S or MOT HDX 115 C6-88 S.
For information on motors and controls, see INA's publication *ALE*.
Other designs available on request.

Gearbox

Center distance $a_0 = 63 \text{ mm}$

Gearbox, Motor, Pinion, Coupling

Order code		Motor	Pinion	Coupling
Atlanta	INA			
58 44 105	GETR 63 SCHN 95/115 PF-5	MOT HDX 115 ... ¹⁾	RITZ 023063 PF	KUP
58 44 107	GETR 63 SCHN 95/115 PF-7	MOT HDX 115 ... ¹⁾	RITZ 023063 PF	KUP
58 44 109	GETR 63 SCHN 95/115 PF-9	MOT HDX 115 ... ¹⁾	RITZ 023063 PF	KUP
58 44 115	GETR 63 SCHN 95/115 PF-15	MOT HDX 115 ... ¹⁾	RITZ 023063 PF	KUP
58 44 120	GETR 63 SCHN 95/115 PF-20	MOT HDX 115 ... ¹⁾	RITZ 023063 PF	KUP
58 44 139	GETR 63 SCHN 95/115 PF-39	MOT HDX 115 ... ¹⁾	RITZ 023063 PF	KUP
58 84 105	GETR 63 SCHN 95/115 KL-5	MOT HDX 115 ... ¹⁾	RITZ 023063 KL	KUP
58 84 107	GETR 63 SCHN 95/115 KL-7	MOT HDX 115 ... ¹⁾	RITZ 023063 KL	KUP
58 84 109	GETR 63 SCHN 95/115 KL-9	MOT HDX 115 ... ¹⁾	RITZ 023063 KL	KUP
58 84 115	GETR 63 SCHN 95/115 KL-15	MOT HDX 115 ... ¹⁾	RITZ 023063 KL	KUP
58 84 120	GETR 63 SCHN 95/115 KL-20	MOT HDX 115 ... ¹⁾	RITZ 023063 KL	KUP
58 84 139	GETR 63 SCHN 95/115 KL-39	MOT HDX 115 ... ¹⁾	RITZ 023063 KL	KUP
58 44 205	GETR 63 SCHN 130/165 PF-5	MOT HDX 142 C6-88 S	RITZ 023063 PF	KUP
58 44 207	GETR 63 SCHN 130/165 PF-7	MOT HDX 142 C6-88 S	RITZ 023063 PF	KUP
58 44 209	GETR 63 SCHN 130/165 PF-9	MOT HDX 142 C6-88 S	RITZ 023063 PF	KUP
58 44 215	GETR 63 SCHN 130/165 PF-15	MOT HDX 142 C6-88 S	RITZ 023063 PF	KUP
58 44 220	GETR 63 SCHN 130/165 PF-20	MOT HDX 142 C6-88 S	RITZ 023063 PF	KUP
58 44 239	GETR 63 SCHN 130/165 PF-39	MOT HDX 142 C6-88 S	RITZ 023063 PF	KUP
58 84 205	GETR 63 SCHN 130/165 KL-5	MOT HDX 142 C6-88 S	RITZ 023063 KL	KUP
58 84 207	GETR 63 SCHN 130/165 KL-7	MOT HDX 142 C6-88 S	RITZ 023063 KL	KUP
58 84 209	GETR 63 SCHN 130/165 KL-9	MOT HDX 142 C6-88 S	RITZ 023063 KL	KUP
58 84 215	GETR 63 SCHN 130/165 KL-15	MOT HDX 142 C6-88 S	RITZ 023063 KL	KUP
58 84 220	GETR 63 SCHN 130/165 KL-20	MOT HDX 142 C6-88 S	RITZ 023063 KL	KUP

¹⁾ MOT HDX 115 A6-64 S or MOT HDX 115 C6-88 S.
 For information on motors and controls, see INA's publication *ALE*.
 Other designs available on request.

Sample Order and Order Code

For standard lengths see *Dimension table*, page 4, footnotes ^{5) 6)}

Guideway with Gear Rack = Standard Length

- Linear recirculating ball bearing and guideway assembly KUVE 25 SB ZHP, two carriages, predrilled for lateral screw mounting, preload class V2 guideway with gear rack, L = 1500 mm

Order code: KUVE 25 SB ZHP W2 V2/1500 (Figure 1)

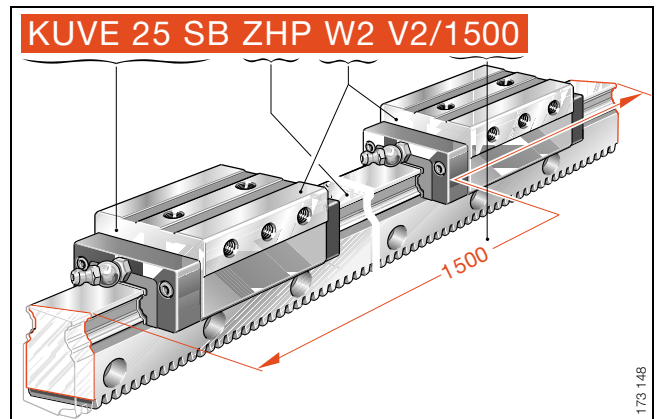


Figure 1 · Diagonal at rail ends

Guideway with Gear Rack < Standard Length

- Linear recirculating ball bearing and guideway assembly KUVE 35 S ZHP, one narrow carriage preload class V1 guideway with gear rack, L = 1400 mm

Order code: KUVE 35 S ZHP W1 V1/1400 (Figure 2)

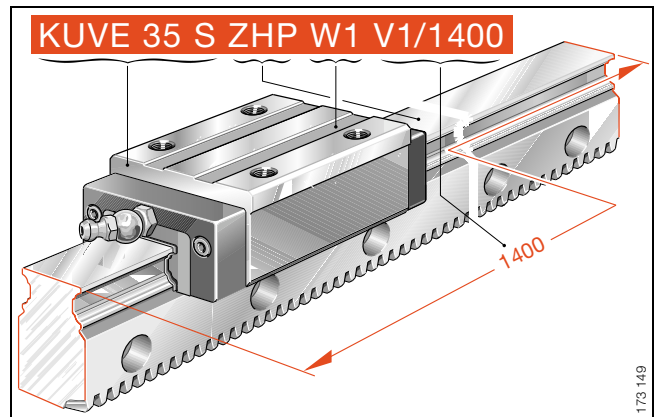


Figure 2 · Rail ends straight

Guideway with Gear Rack > Standard-Length

- Linear recirculating ball bearing and guideway assembly KUVE 25 H ZHP, two tall carriages preload class V2, guideway with gear rack, L = 2700 mm

Order code: KUVE 25 H ZHP W2 V2/2700 (Figure 3)

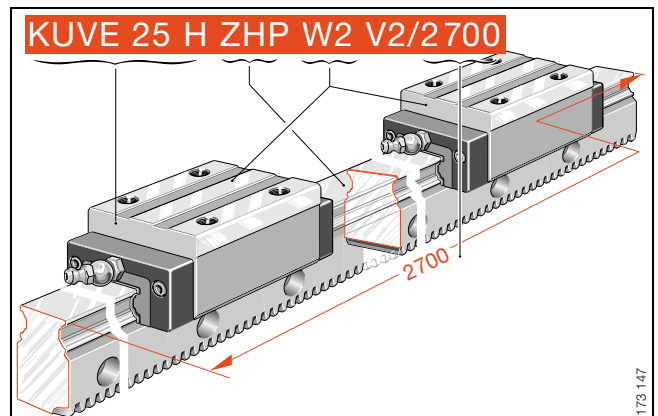
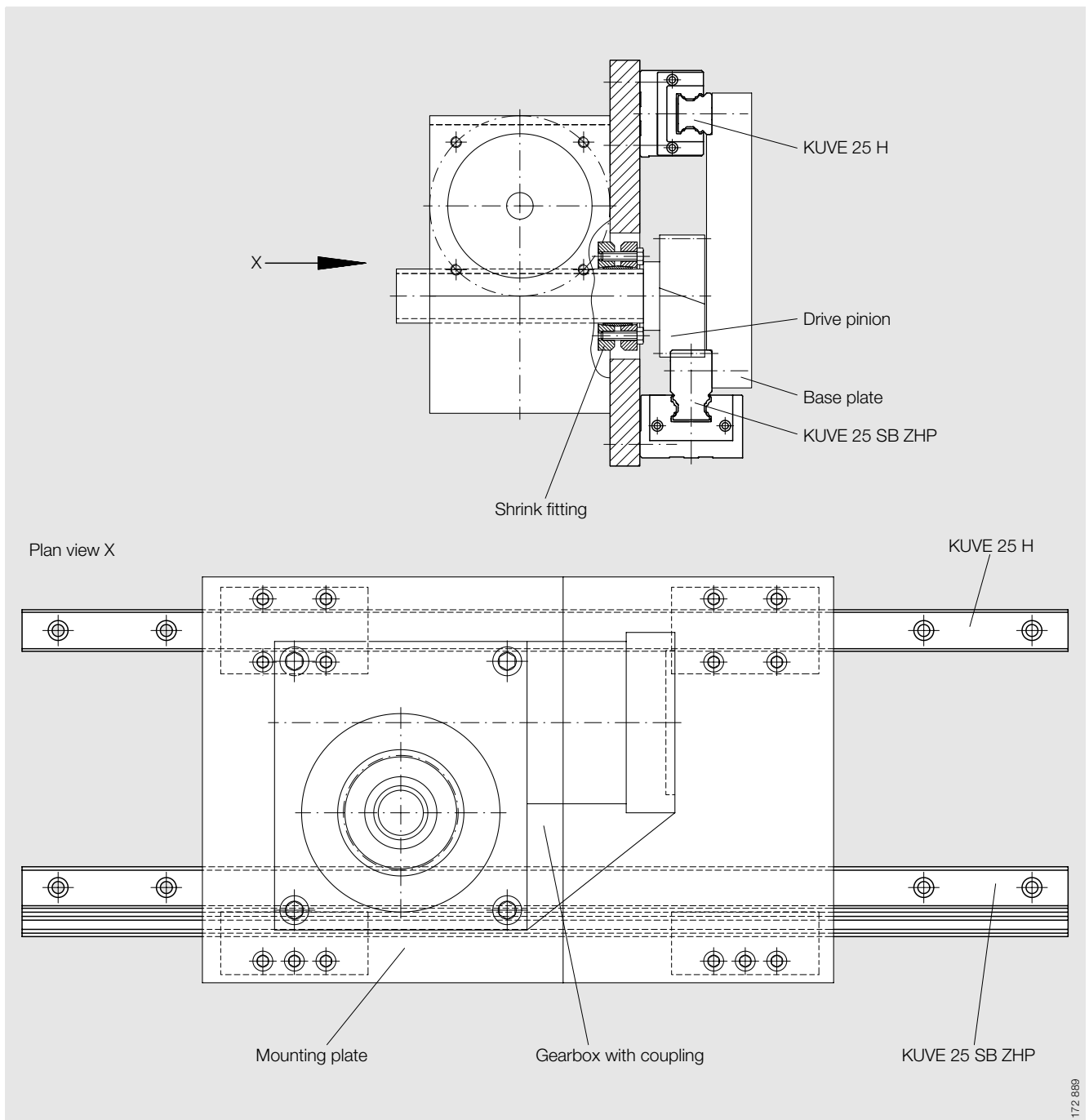


Figure 3 · Rail joints with diagonal, rail ends straight

Design Example



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INA-Schaeffler KG

Linear Technology Division
66406 Homburg (Saar) · Germany
Internet www.ina.com
E-Mail info.linear@de.ina.com

In Germany:

Phone 0180/5 00 38 72

Fax 0180/5 00 38 73

From Other Countries:

Phone +49/68 41/7 01-0

Fax +49/68 41/7 01-625