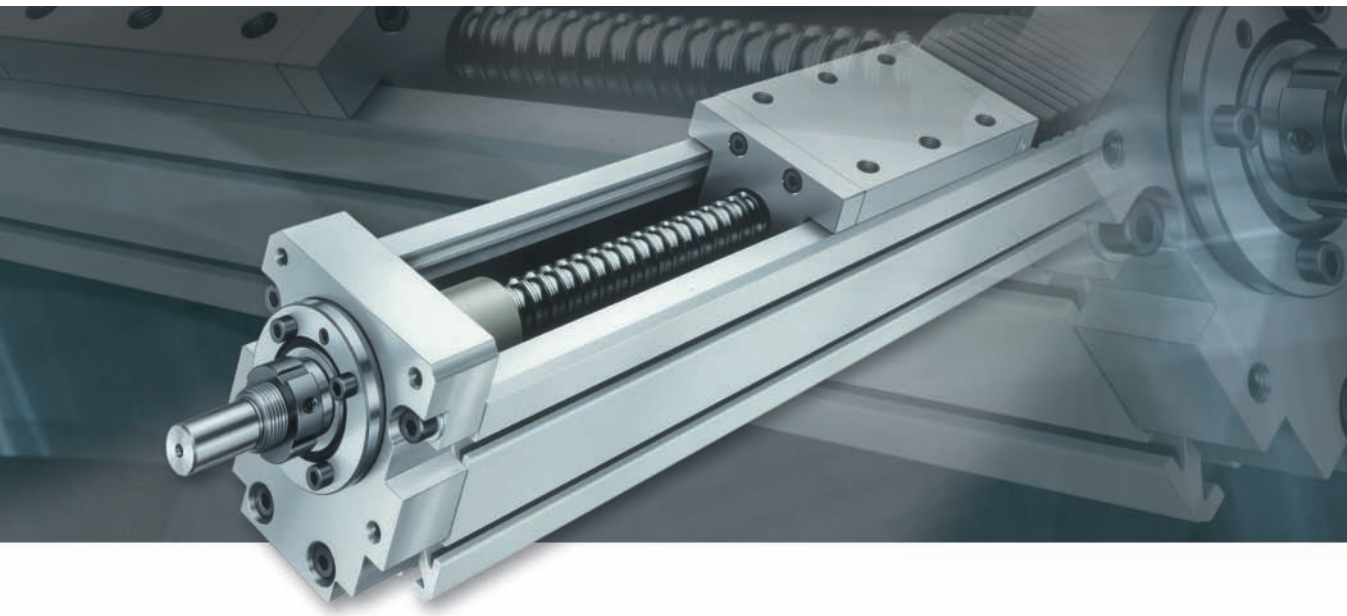


Actuators with ball monorail guidance system and ball screw drive

MKUVE15-KGT, MKUVE20-KGT

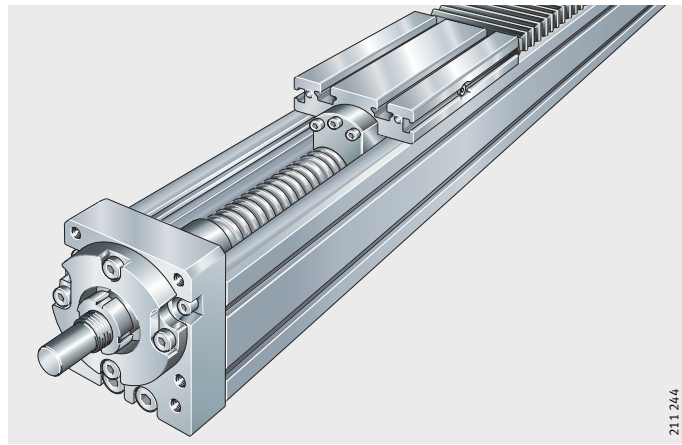
SCHAEFFLER GROUP
INDUSTRIAL

Actuators with ball monorail guidance system and ball screw drive

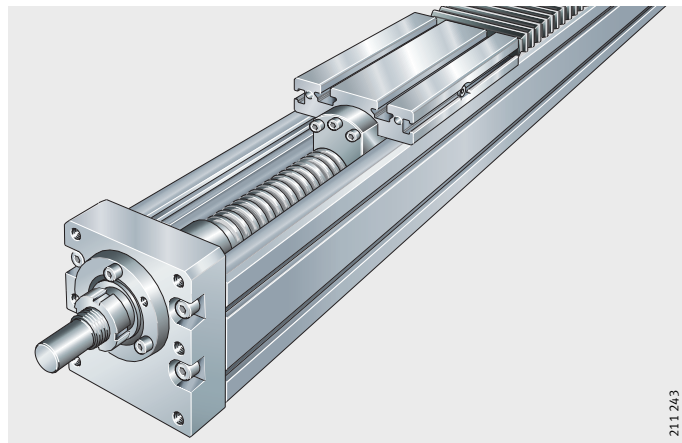
Actuators

with ball monorail guidance system and ball screw drive

MKUVE15-KGT



MKUVE20-KGT



Actuators with ball monorail guidance system and ball screw drive

Features

Mechanical components in the handling and automation equipment sectors are subject to particular requirements. Systems for traverse and positioning must be capable of moving small and large masses over various stroke lengths quickly, reliably and to high accuracy.

Some years ago, we developed actuators with ball monorail guidance systems and ball screw drives to meet these requirements. This series has now been expanded to include the sizes MKUVE15-KGT and MKUVE20-KGT.

With these new actuators, it is possible to move moderate loads in conjunction with high moment loads about all three axes at a maximum carriage traverse speed of 0,633 m/s in the case of MKUVE15-KGT and 2,5 m/s in the case of MKUVE20-KGT to high positional accuracy (dependent on the spindle pitch, bearing limiting speed and the critical spindle speed).

The actuator is covered by means of bellows.

Guidance system

The ball monorail guidance system KUVE15-B-S in MKUVE15-KGT and KUVE20-B-S in MKUVE20-KGT with two carriages allows the movement of moderate loads with high rigidity.

Drive system

The actuator is driven by a ball screw drive:

- in MKUVE15-KGT (nominal diameter d_0 of spindle = 16 mm) with pitch values of 5 mm and 10 mm
- in MKUVE20-KGT (nominal diameter d_0 of spindle = 20 mm) with pitch values of 5 mm, 10 mm, 20 mm and 50 mm.

For pitch values of 5 mm and 10 mm, single (F) and preloaded double (FM) nuts are available. For pitch values of 20 mm and 50 mm, only a single nut (F) is possible.

The spindle is supported by an axial angular contact ball bearing of series ZKLN – in MKUVE15-KGT – or ZKLF in MKUVE20-KGT.

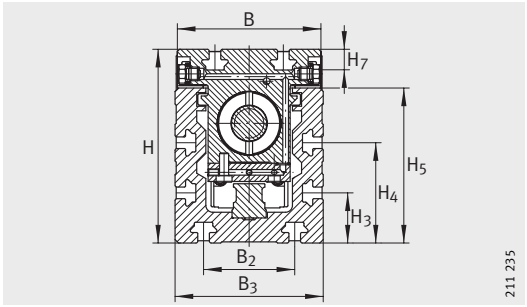
The guidance system and drive are integrated in a highly rigid support rail that can be matched to the adjacent construction by means of T-slots.

Applications

These actuators are highly suitable for peripheral applications in machine tools (handling tasks), in sheet metalforming and in woodworking machinery, for assembly equipment and in automation engineering as well as the manufacture of electronic components.

Further information on drives and controls is given in publication ALE, Driven Linear Units.

Actuators with ball monorail guidance system and ball screw drive



MKUVE15-KGT

Dimension table · Dimensions in mm

Designation	Spindle	Mass		Dimensions			Mounting dimensions								
	$d_0 \times P_z$ [3]	m_{tot}	m_{Law} [4]	B	H	L	B_1	B_2	B_3	B_4	d	d_1	H_1	H_2	H_3
		kg	kg								∅h6	∅g6			
MKUVE15-KGT/5	16×5	$(L_{tot} - 50) \cdot 0{,}08 + 2{,}4$	1,4	63	85	160	30	40	65	51	10	60	52,5	84	22
MKUVE15-KGT/10	16×10	$(L_{tot} - 50) \cdot 0{,}08 + 2{,}4$	1,4	63	85	160	30	40	65	51	10	60	52,5	84	22

1) L_2 = total stroke · 1,19 + L + 25
L_{tot} = total stroke · 1,19 + L + 75
Total stroke (GH) = effective stroke + 2 · S (mm)
Caution!
The allowance S defines a safety range suitable for the particular application and should be at least equivalent to the spindle pitch P_z. Total stroke in mm. Maximum support rail length L_2 = 5 300 mm. Actuators with a total length over 700 mm can be fitted with movable spindle supports (suffix SPU or 2SPU).

2) Values are valid for calculating L_h only.

3) $d_0 \times P_z$ = nominal diameter of spindle×spindle pitch.

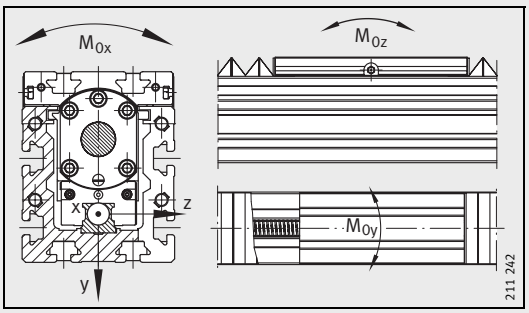
4) m_{Law} = mass of carriage.

5) The values are single loads and are valid if the underside of the actuator is fully supported. These must be reduced in the case of combined loads. For design criteria for the linear guidance system, see Catalogue PF 1, Monorail Guidance Systems.

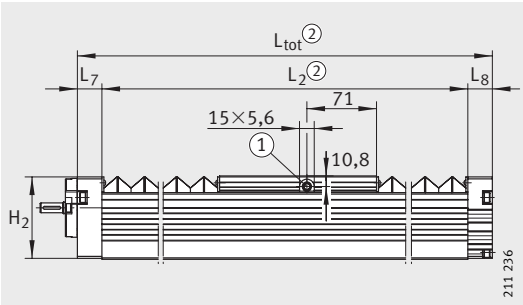
6) F = single nut
FM = preloaded double nut.

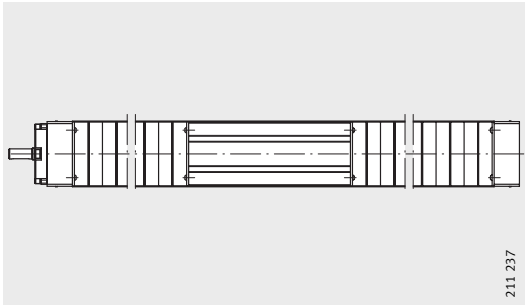
7) Basic load rating C and C_0 to DIN 69 051. Due to the calculation algorithm used, the C and C_0 values may differ in comparison with earlier results based on DIN 69 051.

8) Basic load rating in axial direction: For design criteria of the locating bearing, see Catalogue HR 1, Rolling Bearings.



Load directions (schematic)

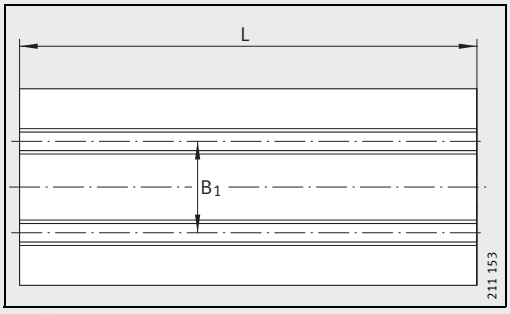




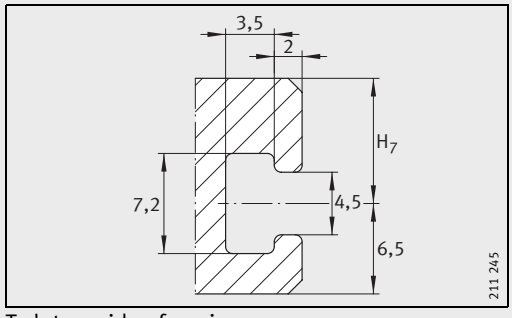
MKUVE15-KGT
① Funnel type lubrication nipple DIN 3 405-AM6
② Length calculation[1)]

											Static moment rating of carriage guidance system[5)]			Geometrical moments of inertia of support rail		Basic load ratings[2)]					Spindle bearing arrangement[2)8)]	
																Carriage guidance system		Spindle nut[6)]				
H_4	H_5	H_6	H_7	L_3	L_4	L_5	L_6	L_7	L_8	O_1	M_{0x}	M_{0y}	M_{0z}	I_y	I_z	dyn. C	stat. C_0		$C^{7)}$	$C_0{}^{7)}$	C_a	C_{0a}
											Nm	Nm	Nm	cm^4	cm^4	kN	kN		kN	kN	kN	kN
44	68	51	9	15	38	12,2	13	25	25	M6	300	700	700	96	77	11,7	29	F/FM	9,3	13,1	16,9	24,7
44	68	51	9	15	38	12,2	13	25	25	M6	300	700	700	96	77	11,7	29	F/FM	15,4	26,5	16,9	24,7

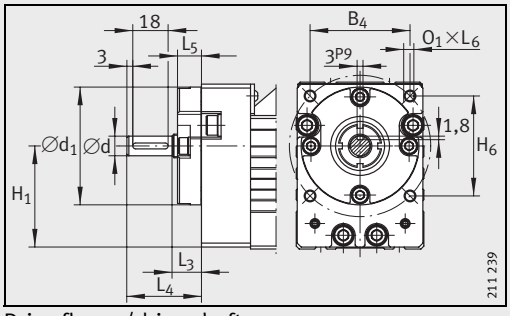
Mounting dimensions



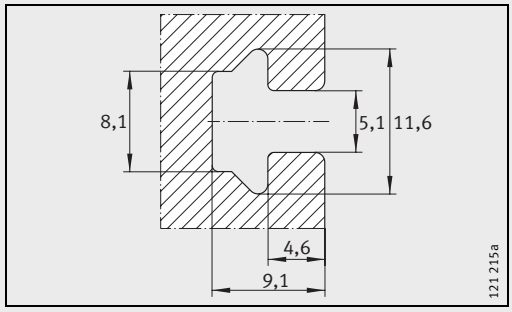
Carriage



T-slot on side of carriage

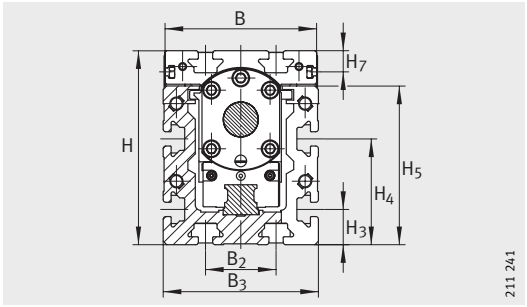


Drive flange/drive shaft



T-slots on support rail and top surface of carriage

Actuators with ball monorail guidance system and ball screw drive



MKUVE20-KGT

Dimension table · Dimensions in mm

Designation	Spindle	Mass		Dimensions			Mounting dimensions								
	$d_0 \times P_z$ [3]	m_{tot}	m_{Law} [4]	B	H	L	B_1	B_2	B_3	B_4	d	d_1	H_1	H_2	H_3
		kg	kg								∅h6	∅g6			
MKUVE20-KGT/5	20×5	$(L_{tot} - 56) \cdot 0{,}0105 + 6{,}5$	2,2	86	110	200	40	40	88	68	13	60	71	109	20
MKUVE20-KGT/10	20×10	$(L_{tot} - 56) \cdot 0{,}0105 + 6{,}5$	2,2	86	110	200	40	40	88	68	13	60	71	109	20
MKUVE20-KGT/20	20×20	$(L_{tot} - 56) \cdot 0{,}0105 + 6{,}5$	2,2	86	110	200	40	40	88	68	13	60	71	109	20
MKUVE20-KGT/50	20×50	$(L_{tot} - 56) \cdot 0{,}0105 + 6{,}6$	2,3	86	110	200	40	40	88	68	13	60	71	109	20

1) L_2 = total stroke · 1,17 + L + 25
L_{tot} = total stroke · 1,17 + L + 81
Total stroke (GH) = effective stroke + 2 · S (mm)
Caution!
The allowance S defines a safety range suitable for the particular application and should be at least equivalent to the spindle pitch P_z. Total stroke in mm. Maximum support rail length L_2 = 5 300 mm. Actuators with a total length over 1000 mm can be fitted with movable spindle supports (suffix SPU or 2SPU).

2) Values are valid for calculating L_h only.

3) $d_0 \times P_z$ = nominal diameter of spindle×spindle pitch.

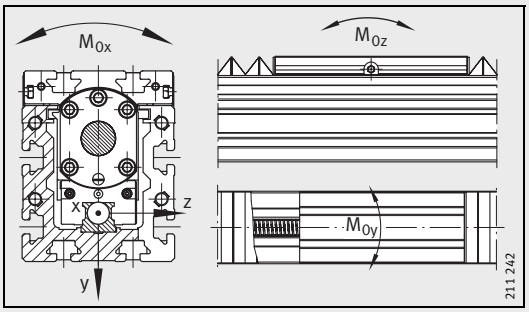
4) m_{Law} = mass of carriage.

5) The values are single loads and are valid if the underside of the actuator is fully supported. These must be reduced in the case of combined loads. For design criteria for the linear guidance system, see Catalogue PF 1, Monorail Guidance Systems.

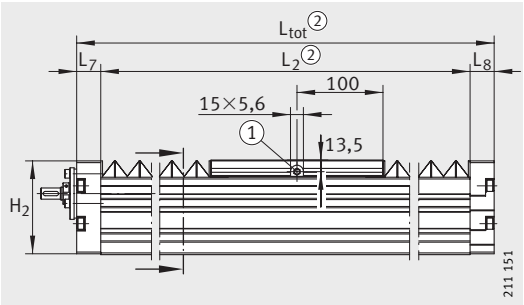
6) F = single nut
FM = preloaded double nut.

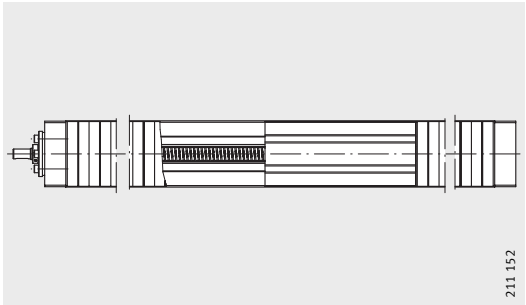
7) Basic load rating C and C_0 to DIN 69 051. Due to the calculation algorithm used, the C and C_0 values may differ in comparison with earlier results based on DIN 69 051.

8) Basic load rating in axial direction: For design criteria of the locating bearing, see Catalogue HR 1, Rolling Bearings.



Load directions (schematic)

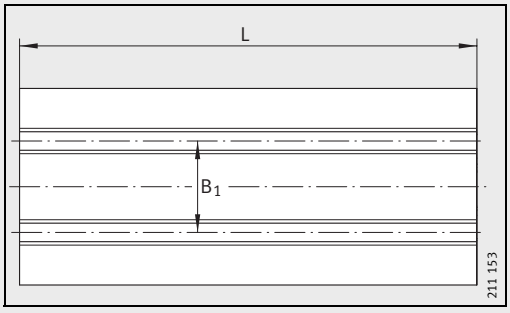




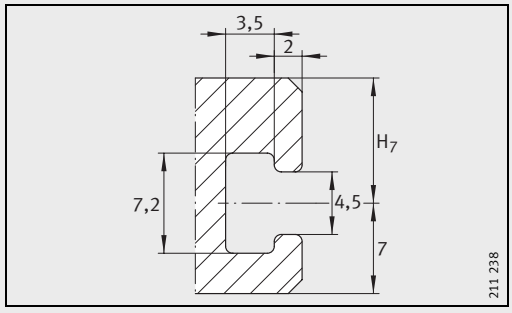
MKUVE20-KGT
① Funnel type lubrication nipple DIN 3 405-AM6
② Length calculation[1)]

											Static moment rating of carriage guidance system[5)]			Geometrical moments of inertia of support rail		Basic load ratings[2)]					Spindle bearing arrangement[2)8)]	
																Carriage guidance system		Spindle nut[6)]				
H_4	H_5	H_6	H_7	L_3	L_4	L_5	L_6	L_7	L_8	O_1	M_{0x}	M_{0y}	M_{0z}	I_y	I_z	dyn. C	stat. C_0		$C^{7)}$	$C_0{}^{7)}$	C_a	C_{0a}
											Nm	Nm	Nm	cm^4	cm^4	kN	kN		kN	kN	kN	kN
60	90	46	12	19	42	8	15	28	28	M6	664	1000	1200	281	219	21,3	54	F/FM	10,5	16,6	17,9	28
60	90	46	12	19	42	8	15	28	28	M6	664	1000	1200	281	219	21,3	54	F/FM	11,9	17,6	17,9	28
60	90	46	12	19	42	8	15	28	28	M6	664	1000	1200	281	219	21,3	54	F	11,6	18,4	17,9	28
60	90	46	12	19	42	8	15	28	28	M6	664	1000	1200	281	219	21,3	54	F	13	24,6	17,9	28

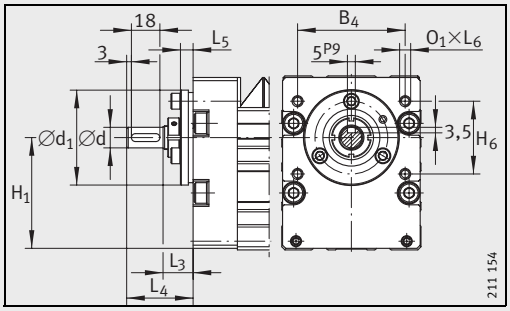
Mounting dimensions



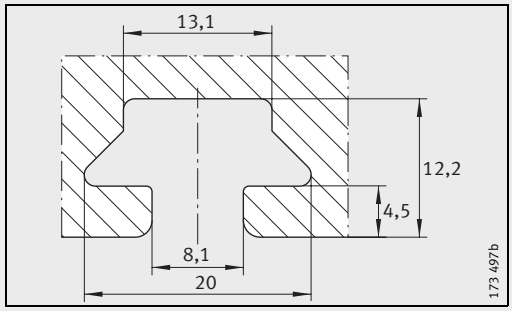
Carriage



T-slot on side of carriage



Drive flange/drive shaft



T-slots on support rail and top surface of carriage

MATNR 031132960-0000 / TPI 139 / GB-D / 2007111.5 / Printed in Germany by Mandelkow GmbH

Schaeffler KG

Linear Technology Division
Berliner Strasse 134
66424 Homburg/Saar (Germany)
Internet www.ina.com
E-Mail info.linear@schaeffler.com

In Germany:
Phone 0180 5003872
Fax 0180 5003873

From Other Countries:
Phone +49 6841 701-0
Fax +49 6841 701-2625

TPI 139 GB-D