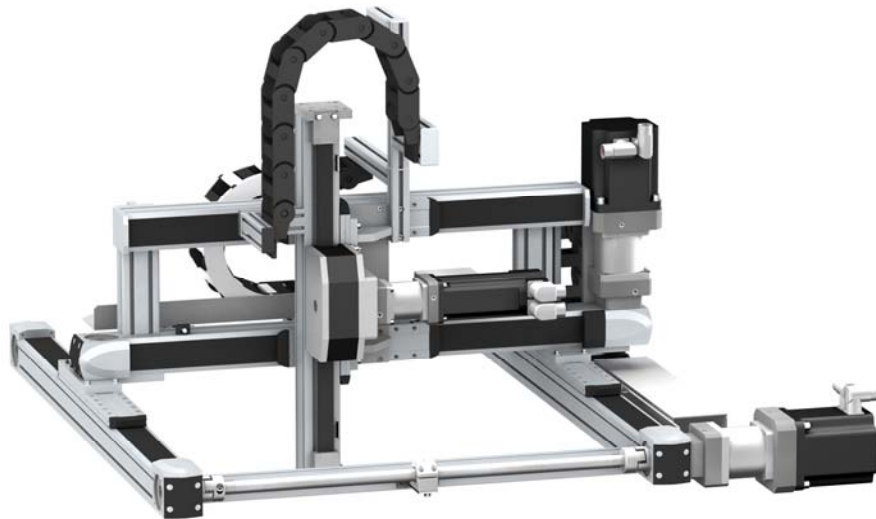




Motion Control & Systems

INSTALLATION INSTRUCTIONS

KM Multi Axes



Important information

This installation instruction is part of the product.

Carefully read this manual and observe all instructions.

Keep this installation instruction for future reference.

Hand this installation instruction and all other pertinent product documentation over to all users of the product.

Some products are not available in all countries.
For information on the availability of products, please consult the catalog.

Subject to technical modifications without notice.

All details provided are technical data which do not constitute warranted qualities.

Most of the product designations are registered trademarks of their respective owners, even if this is not explicitly indicated.

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General

About these installation instructions

Version

Status of the installation instructions: 23.01.2013
 Amendment index: V3.0

Prerequisites

We assume that

- operating personnel have received instruction on the linear motor axis system and have read and understood these installation instructions,
- the maintenance personnel responsible for linear motor axis systems maintain and repair such systems in such a manner that there is no risk of personal injury, damage to the environment or damage to material assets.

Availability

These installation instructions must be readily available to all persons who work on or with linear motor axes systems.

Guarantee and Liability

The manufacturer's "General Terms and Conditions" as a matter of principle. **Herstellerangaben**

Address	HIWIN GmbH Brücklesbünd 2 77654 Offenburg
Telephone	+49 (0) 781 / 9 32 78 - 0
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Internet	www.hiwin.de

Copyright

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Product Monitoring

Inform the manufacturer regarding

- accidents
- possible sources of danger on the linear motor axes systems
- incomprehensible parts of these installation instructions

Fundamental Notes Regarding Safety

Proper Use

The multiple axis system is a linear drive and guidance system for the exact, time-controlled positioning of permanently mounted loads such as system components within an automated system.

The multiple axis system must not be used outdoors or in potentially explosive atmospheres.

The multiple axis system must only be used for the purpose for which it was intended.

- The multiple axis system must only be operated within the specified performance limits.
- Adherence to the assembly instructions and to the maintenance and repair procedures are prerequisite for the proper use of the multiple axis system.
- If the multiple axis system is used for any other application than that for which it was intended, this will be deemed improper use.
- Only original replacement parts provided by Messrs HIWIN GmbH must be used.

Reasonably Foreseeable Misuse

The linear motor axis system must not be operated:

- outdoors
- in potentially explosive atmospheres

Modifications or Alterations

It is forbidden to modify or alter the multiple axis system in any way!

Residual Risks

The multiple axis system does not present any residual risks during normal operation.

Personnel Requirements

Work on or with the multiple axis system must only be carried out by authorised personnel!
Such personnel must have been familiarised with the safety devices and regulations before commencing work.

Authorised personnel are:

Activity	Qualification
Normal operation	Trained personnel
Cleaning	Trained personnel
Maintenance	Trained, specialist personnel provided by the owner or manufacturer
Repair	Trained, specialist personnel provided by the owner or manufacturer

Personal Protective Equipment

Operating Phase	Personal Protective Equipment
Normal operation	The following personal protective equipment must be worn when in the vicinity of the multiple axis system: Steel-capped, safety footwear
Cleaning	The following personal protective equipment must be worn when cleaning multiple axis system: Steel-capped, safety footwear
Maintenance and repair	The following personal protective equipment must be worn when carrying out maintenance or repair work: Steel-capped, safety footwear

Multi axes systems



Portal robot 3 axes



Profile rail guide



Roller guide

Product description

The HIWIN KM-Multi Axes Systems are composed of combinations of toothed-belt linear modules and differ in kind, size and arrangement of the combined axes.

Depending on the automation application, double axes combinations, linear positioner, or portal robots with two or three axes can be implemented.

Consistency

KM Multi Axes Systems are available according to the application requirements (load, stroke, dynamic and positioning speed) in different sizes as well as in roller or profile rail guidance.

Stroke lengths, millimetre-exactly available, offer a very high flexibility in the automation planning and automation application

Flexibility

HIWIN offers also individual or specific system solutions based on standard Multi Axes Systems.

Your benefits

One-stop shopping: from a simple linear module to complete systems of tuned components.

Applications

The KM-Multi Axes Systems, based on toothed-belt linear modules, are used for moving loads dynamically and at high positioning speed.

The system features of the different Multi Axes Systems are described in the suitable catalogue segments.

Multi Axes Systems application examples:



Portal robot 2 axes (KMR•2)



Linearpositioner (KMP)



Customer specific KM solution

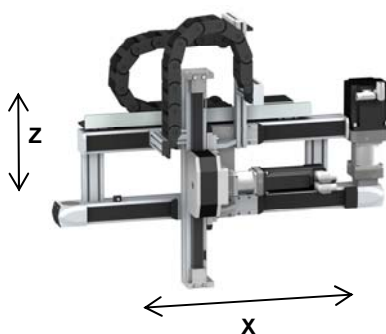
Product overview

Double axes



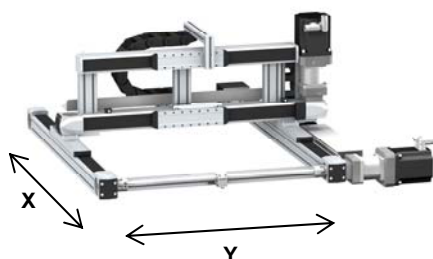
	Type	Guide type	X-Axis	Y-Axis	Z-Axis	typ. payload (kg)
			max. stroke (mm)			
KMH	KMH1BR	Roller guide	3000			12
	KMH2Bx	Roller guide	5500			20
		Ball guide	5500			65
	KMH3Bx	Roller guide	5500			40
		Ball guide	5500			150
KMS	KMH4BB	Ball guide	5500			250
	KMS1BR	Roller guide	3000			15
	KMS2Bx	Roller guide	5500			25
		Ball guide	5500			75
	KMS3Bx	Roller guide	5500			50
		Ball guide	5500			180
	KMS4BB	Ball guide	5500			300

Linear positioners



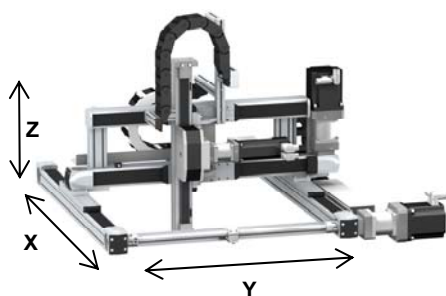
	Type	Guide type	Y-Axis	Y-Axis	Z-Axis	typ. payload (kg)
			max. stroke (mm)		max. stroke (mm)	
KMP	KMP12-H41-C41	Roller guide	4000		400	4
	KMP22-H42-C42	Roller guide	4000		600	6
		Ball guide	4000		600	15
	KMP32-H43-C43	Roller guide	5500		800	9
		Ball guide	5500		800	25
	KMP42-H44-C44	Ball guide	5500		1200	50

Portal robots 2 axes



	Type	Guide type	X-Axis	Y-Axis	Z-Axis	typ. payload (kg)
			max. stroke (mm)	max. stroke (mm)		
KMR2	KMR12-S41-P41	Roller guide	3000	1200		5
	KMR12-S41-H41	Roller guide	3000	1200		8
	KMR22-S42-P42	Roller guide	5500	1500		5
		Ball guide	5500	1500		12
	KMR22-S42-H42	Roller guide	5500	1500		15
		Ball guide	5500	1500		30
	KMR32-S43-P43	Roller guide	5500	1500		11
		Ball guide	5500	1500		30
	KMR32-S43-H43	Roller guide	5500	1500		40
		Ball guide	5500	1500		80
	KMR42-S44-H44	Ball guide	5500	1500		130

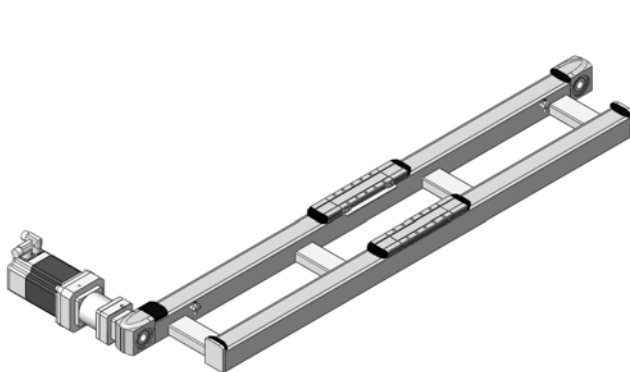
Portal robots 3 axes



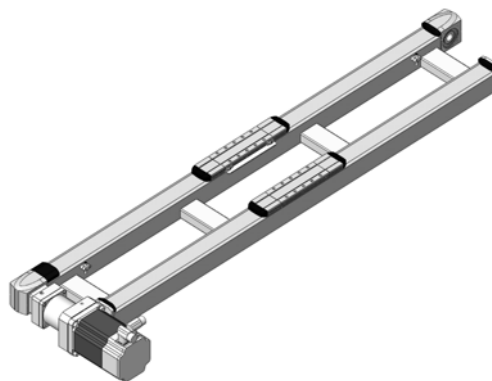
	Type	Guide type	Y-Axis	Y-Axis	Z-Axis	typ. payload (kg)
			max. stroke (mm)	max. stroke (mm)	max. stroke (mm)	
KMR3	KMR13-S41-H41-C41	Roller guide	3000	1200	400	4
	KMR23-S42-H42-C42	Roller guide	5500	1500	600	6
		Ball guide	5500	1500	600	15
	KMR33-S43-H43-C43	Roller guide	5500	1500	800	9
		Ball guide	5500	1500	800	25
	KMR43-S44-H44-C44	Ball guide	5500	1500	1200	50

KMH

Combination of a driven axis and a non driven support axis



Motor attachment outside



Motor attachment inside

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KMH2BR / KMH2BB	
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KMH3BR / KMH3BB	
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Introduction

The **KMH double axes** combine a driven- and a non driven support-axis based on toothed-belt axes.

KMH double axes are available with roller guides and ball guides.

Toothed-belt axes are characterised by long strokes, high dynamic response and high positioning speed.

Mostly these combinations are used for moving large loads and higher torques.

Load, force and moment values in the data sheets aimed for stiffen **mechanical related carriages** at customer side and a centrally attached load.

Special features

- High positioning speed
- High dynamic response
- Large stroke length
- User-friendly structures
 - + Easy system integration with section technology
 - + Carriages with holes and locating dowels for easy assembling.
 - + Lubrication at lubrication nipples on both carriages sides
 - + Easy motor attachment with quick-coupling system
 - + stroke length available in millimetre accuracy
 - + Distance between both axes available in a wide distance
 - + Sensors can be moved anywhere in T-section slots

Options

- Roller or ball guidance
- Corrosion-resistant
- Teflon cover band
- Motor attachment inside and outside
- Sensors in various designs
- Antistatic toothed belts

Property-related application examples

- Positioning over long distance, e.g. pick & place applications
- Positioning of heavy and high dimension loads mounted on the stiff mechanical related carriages, realised at customer side.

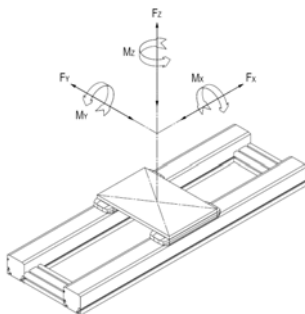
Product overview

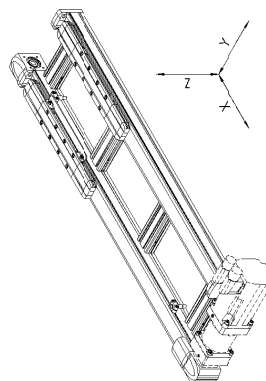
Type	Guide type	stroke (mm)	Typ. payload (kg)
KMH1BR	Roller guide	3000	12
KMh2Bx	Roller guide	5500	20
	Ball guide	5500	65
KMh3Bx	Roller guide	5500	40
	Ball guide	5500	150
KMH4BB	Ball guide	5500	250

Value pairs with / without cover strip are separated by "/".

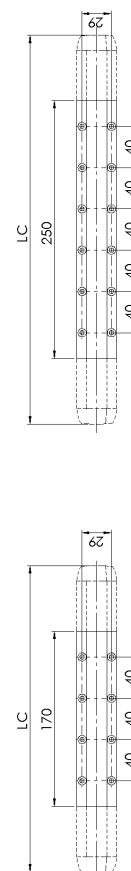
Technical data double axes		KMH1BR		
Drive system		Thoothed belt 15HTD-3M		
Guide type		Roller guide (W06)		
Payload	kg	12		
Carriage type			Typ2	Typ4
Carriage length	mm		297 / 200	377 / 280
Feed constant	mm/rev.	84		
Effective diameter toothed belt pulley	mm	26,738		
Maximum feed force F _{xmax}	N	300		
Maximum velocity 1)	m/s	8		
Maximum acceleration 1)	m/s ²	20		
Maximum driving torque M _{max}	Nm	4		
Breakaway torque 0 stroke axis	Nm	0,4		
Breakaway torque per additional pair of carriage 2)	Nm	0,2		
Moment of inertia 0 stroke axis	kgcm ²		2,2 / 1,8	2,6 / 2,2
Moment of inertia per additional pair of carriage 2)	kgcm ²		2,0 / 1,6	2,4 / 2,0
Moment of inertia per 1 m of stroke	kgcm ² /m	0,1		
Moment of inertia per 1 kg of payload	kgcm ² /kg	1,8		
Maximum force F _{dynmax}	N	990		
Maximum force F _{zdynmax} 5)	N	645		
Maximum torque M _{dynmax}	Nm		22	56
Maximum torque M _{zdynmax}	Nm		17	43
Maximum torque M _{xdynmax} 6)	Nm	35 (bei di = 120mm)		
related on distance (di) between axes body				
Mass 0 stroke axis	kg		3,7 / 2,9	4,1 / 3,3
Mass per additional pair of carriage (with axis body)	kg		2,6 / 1,8	3,2 / 2,4
Mass of per 1 m stroke	kg/m	4,45		
Moving mass pair of carriage	kg		1,2 / 1,0	1,4 / 1,2
Maximum stroke 3)	mm		2880 / 3000	2800 / 2920
Minimaler stroke 4)	mm	125		
Minimum distanz (di) between axes body	mm	100		
Maximum distanz (di) between axes body	mm	300		
Repeatability 1)	mm	± 0,1		
Diameter motor shaft	mm	6,35 ... 14		
Cross section axes body (W x H)	mm	40 x 40		
Axial area moment of inertia (I _x / I _y)	mm ⁴	76.640 / 108.930		
Modulus of Elasticity (aluminium) E	N/mm ²	72000		
Maximale ambient temperature	°C	0 ... + 50		
Load rating linear guide C _{stat}	N	2230		
Load rating linear guide C _{dyn}	N	3950		
Service life 7)	km	30000		

- 1) Depending on load and stroke
- 2) All carriages driven
- 3) Please inquire for greater stroke
- 4) Minimum stroke required for lubrication of the linear guide
- 5) This values aimed for a central arranged pay load
- 6) This values aimed for stiff mechanical related arriages via adapterplatte with a central arranged pay load and with inside distance (di) between both axes. The plate is not included in delivery.
- 7) Forces and torques relate to the service life





	LC	e	d	α1	α2	LP
Laufwagen Typ2 / carriage type 2 ohne Abdeckband / without coverband	200	35	0	40	40	352+X
Laufwagen Typ2 / carriage type 2 mit Abdeckband / with coverband	297	44	9	0	0	477+X
Laufwagen Typ4 / carriage type 4 ohne Abdeckband / without coverband	280	35	0	40	0	442+X
Laufwagen Typ4 / carriage type 4 mit Abdeckband / with coverband	377	44	9	0	0	557+X



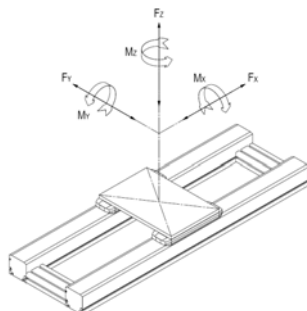
Carriage type 4

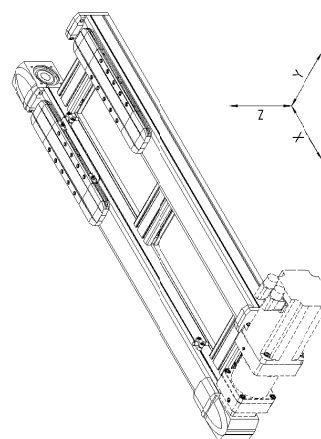
Anbaubare Motoren siehe Katalog Attachable motors see catalog					
	Dargestellter Motor/ represented motor	Dargestellter Hub/ represented stroke	Hüllmax./ stroke max.	Wiederhol- barkeit/ repeatability	Laufrichtung / rotation
	Laugen-/ Motortyp calligae motor type	BHMF07DT / PLE00	400mm	+0/-1	Schritt m
X	MANHER	Type			
Maßblatt / Dimension drawing					
KMH1BR					
				Dokument Bsp. 18.03.2011	Namensname Bauteil
				1:3	
				Zusatz Notizen mit MB536.010	

Value pairs with / without cover strip are separated by "/".

Technical data double axes		KMH2BR			KMH2BB		
Drive system		Toothed belt 25HTD-5M			Toothed belt 25HTD-5M		
Guide type		Roller guide (W06)			Recirculating ball bearing guide (15)		
Payload	kg	20			65		
Carriage type		Typ1	Typ2	Typ4	Typ1	Typ2	Typ4
Carriage length	mm	303 / 206	363 / 266	483 / 386	303 / 206	363 / 266	483 / 386
Feed constant	mm/rev.	155			155		
Effective diameter toothed belt pulley	mm	49,338			49,338		
Maximum feed force $F_{x\max}$	N	800			800		
Maximum velocity 1)	m/s	8			5		
Maximum acceleration 1)	m/s ²	20			20		
Maximum driving torque $M_{\max}$	Nm	20			20		
Breakaway torque 0 stroke axis	Nm	1,4			2,6		
Breakaway torque per additional pair of carriage 2)	Nm	0,4			1,6		
Moment of inertia 0 stroke axis	kgcm ²	15,3 / 13,1	18,0 / 15,8	23,6 / 21,4	16,9 / 14,7	19,0 / 16,8	24,6 / 22,4
Moment of inertia per additional pair of carriage 2)	kgcm ²	13,0 / 10,8	15,8 / 13,6	21,4 / 19,2	14,6 / 12,4	16,8 / 14,6	22,4 / 20,2
Moment of inertia per 1 m of stroke	kgcm ² /m	1,2			1,2		
Moment of inertia per 1 kg of payload	kgcm ² /kg	6,1			6,1		
Maximum force F_{dynmax}	N	990			4215		
Maximum force F_{zdynmax} 5)	N	645			4215		
Maximum torque M_{dynmax}	Nm	36	62	112	148	388	724
Maximum torque M_{zdynmax}	Nm	28	48	87	74	194	362
Maximum torque M_{xdynmax} 6) related on distance (di) between axes body	Nm	45 (bei di = 140mm)			280 (bei di = 140mm)		
Mass 0 stroke axis	kg	8,0 / 7,0	9,5 / 8,0	11,5 / 10,0	9,5 / 7,8	10,5 / 8,8	12,5 / 10,8
Mass per additional pair of carriage (with axis body)	kg	5,0 / 3,8	6,0 / 4,8	7,8 / 6,6	5,8 / 4,4	6,8 / 5,4	8,8 / 7,4
Mass of per 1 m stroke	kg/m	9,0			11,0		
Moving mass pair of carriage	kg	2,2 / 1,8	2,6 / 2,4	3,6 / 3,2	2,4 / 2,0	2,8 / 2,4	3,6 / 3,2
Maximum stroke 3)	mm	5540 / 5660	5480 / 5600	5360 / 5480	5540 / 5660	5480 / 5600	5360 / 5480
Minimal stroke 4)	mm	130			9		
Minimum distanz (di) between axes body	mm	110			110		
Maximum distanz (di) between axes body	mm	400			400		
Repeatability 1)	mm	± 0,1			± 0,1		
Diameter motor shaft	mm	6,35 ... 20			6,35 ... 20		
Cross section axes body (W x H)	mm	60 x 60			60 x 60		
Axial area moment of inertia (I_x / I_y)	mm ⁴	435.390 / 651.610			435.390 / 651.610		
Modulus of Elasticity (aluminium) E	N/mm ²	72000			72000		
Maximale ambient temperature	°C	0 ... + 50			0 ... + 50		
Load rating linear guide Cstat	N	2230			24200		
Load rating linear guide Cdyn	N	3950			14200		
Service life 7)	km	30000			30000		

- 1) Depending on load and stroke
- 2) All carriages driven
- 3) Please inquire for greater stroke
- 4) Minimum stroke required for lubrication of the linear guide
- 5) This values aimed for a central arranged pay load
- 6) This values aimed for stiff mechanical related arriages via adapterplatte with a central arranged pay load and with inside distance (di) between both axes. The plate is not included in delivery.
- 7) Forces and torques relate to the service life





	LC	e	d	a1	a2	LP
Lautwagen Typ1 / carriage type 1 ohne Abdeckband / without coverband	206	35	0	40	40	431+X
Lautwagen Typ1 / carriage type 1 mit Abdeckband / with coverband	303	47	11.5	0	0	552+X
Lautwagen Typ2 / carriage type 2 ohne Abdeckband / without coverband	266	35	0	40	0	491+X
Lautwagen Typ2 / carriage type 2 mit Abdeckband / with coverband	363	47	11.5	0	0	612+X
Lautwagen Typ4 / carriage type 4 ohne Abdeckband / without coverband	386	35	0	40	40	611+X
Lautwagen Typ4 / carriage type 4 mit Abdeckband / with coverband	483	47	11.5	0	0	732+X

Figure 1 shows three schematic diagrams of test specimens, labeled (a), (b), and (c). Each specimen is a rectangular slab with a width of 45 mm. The length of the specimens is indicated by a dimension line labeled 'LC' and the corresponding value: 170 mm for (a), 230 mm for (b), and 350 mm for (c). The reinforcement consists of a grid of bars with a spacing of 30 mm, as indicated by the '30' labels along the bottom and right edges of the grids.

..aufgaben Typ 4

...aufgaben Typ 2

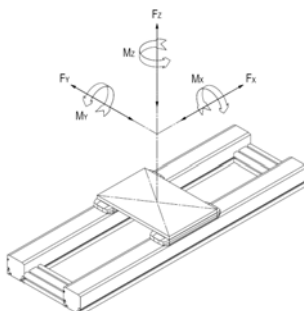
Laufwagen Typ 1

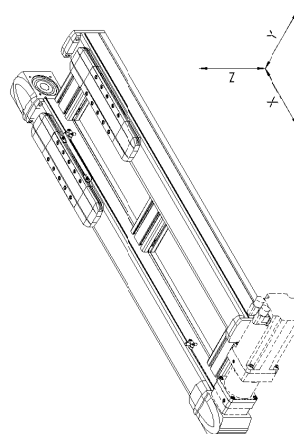
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Value pairs with / without cover strip are separated by "/".

Technical data double axes		KMH3BR			KMH3BB		
Drive system		Toothed belt 30HTD-5M			Toothed belt 30HTD-5M		
Guide type		Roller guide (W10)			Recirculating ball bearing guide (20)		
Payload	kg	40			150		
Carriage type		Typ1	Typ2	Typ4	Typ1	Typ2	Typ4
Carriage length	mm	364 / 244	434 / 314	574 / 454	364 / 244	434 / 314	574 / 454
Feed constant	mm/rev.	205			205		
Effective diameter toothed belt pulley	mm	65,254			65,254		
Maximum feed force $F_{x\max}$	N	1100			1100		
Maximum velocity 1)	m/s	8			5		
Maximum acceleration 1)	m/s ²	20			20		
Maximum driving torque $M_{\max}$	Nm	36			36		
Breakaway torque 0 stroke axis	Nm	2,8			4,8		
Breakaway torque per additional pair of carriage 2)	Nm	0,6			2,6		
Moment of inertia 0 stroke axis	kgcm ²	58,1 / 49,4	67,7 / 59,0	88,0 / 78,3	61,7 / 53,0	69,7 / 61,0	90,1 / 80,6
Moment of inertia per additional pair of carriage 2)	kgcm ²	48,8 / 40,2	58,2 / 49,8	77,8 / 69,2	52,4 / 43,8	60,4 / 51,8	79,9 / 71,4
Moment of inertia per 1 m of stroke	kgcm ² /m	2,5			2,5		
Moment of inertia per 1 kg of payload	kgcm ² /kg	10,7			10,7		
Maximum force $F_{y\max}$	N	2640			6615		
Maximum force $F_{z\max}$ 5)	N	1560			6615		
Maximum torque $M_{y\max}$	Nm	102	174	320	324	758	1374
Maximum torque $M_{z\max}$	Nm	86	148	271	162	379	687
Maximum torque $M_{x\max}$ 6) related on distance (di) between axes body	Nm	125 (bei di = 160mm)			530 (bei di = 160mm)		
Mass 0 stroke axis	kg	18,8 / 15,4	20,8 / 17,4	24,8 / 21,4	20,7 / 16,9	22,7 / 18,9	26,7 / 22,9
Mass per additional pair of carriage (with axis body)	kg	10,4 / 7,6	12,4 / 9,6	16,4 / 13,6	11,8 / 8,6	14,0 / 10,8	18,2 / 15,0
Mass of per 1 m stroke	kg/m	15,8			18,8		
Moving mass pair of carriage	kg	4,6 / 3,8	5,6 / 4,8	7,4 / 6,6	5,0 / 4,2	5,8 / 5,0	7,6 / 6,8
Maximum stroke 3)	mm	5450 / 5600	5380 / 5530	5240 / 5390	5450 / 5600	5380 / 5530	5240 / 5390
Minimal stroke 4)	mm	175			11		
Minimum distanz (di) between axes body	mm	120			120		
Maximum distanz (di) between axes body	mm	500			500		
Repeatability 1)	mm	± 0,1			± 0,1		
Diameter motor shaft	mm	12 ... 25			12 ... 25		
Cross section axes body (W x H)	mm	80 x 80			80 x 80		
Axial area moment of inertia (Ix / Iy)	mm ⁴	1.285.260 / 1.867.210			1.285.260 / 1.867.210		
Modulus of Elasticity (aluminium) E	N/mm ²	72000			72000		
Maximale ambient temperature	°C	0 ... + 50			0 ... + 50		
Load rating linear guide Cstat	N	4850			38400		
Load rating linear guide Cdyn	N	8500			22300		
Service life 7)	km	30000			30000		

- 1) Depending on load and stroke
- 2) All carriages driven
- 3) Please inquire for greater stroke
- 4) Minimum stroke required for lubrication of the linear guide
- 5) This values aimed for a central arranged pay load
- 6) This values aimed for stiff mechanical related arriages via adapterplatte with a central arranged pay load and with inside distance (di) between both axes. The plate is not included in delivery.
- 7) Forces and torques relate to the service life





	LC	e	d	LP
auylwigen typ1 / carriage type 1 ohne Abdeckband / without coverband	244	25	0	539+X
auylwigen typ1 / carriage type 1 mit Abdeckband / with coverband	364	41	15	690+X
auylwigen typ2 / carriage type 2 ohne Abdeckband / without coverband	314	25	0	609+X
auylwigen typ2 / carriage type 2 mit Abdeckband / with coverband	434	41	15	760+X
auylwigen typ4 / carriage type 4 ohne Abdeckband / without coverband	454	25	0	749+X
auylwigen typ4 / carriage type 4 mit Abdeckband / with coverband	574	41	15	900+X

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Value pairs with / without cover strip are separated by "/".

Technical data double axes		KMH4BB		
Drive system		Toothed belt 50HTD-8M		
Guide type		Recirculating ball bearing guide (25)		
Payload	kg	250		
Carriage type		Typ1	Typ2	Typ4
Carriage length	mm	470 / 310	560 / 400	740 / 580
Feed constant	mm/rev.	264		
Effective diameter toothed belt pulley	mm	84,034		
Maximum feed force F _{xmax}	N	2600		
Maximum velocity 1)	m/s	5		
Maximum acceleration 1)	m/s ²	20		
Maximum driving torque M _{max}	Nm	110		
Breakaway torque 0 stroke axis	Nm	6,6		
Breakaway torque per additional pair of carriage 2)	Nm	4,2		
Moment of inertia 0 stroke axis	kgcm ²	210,8 / 178,6	242,4 / 210,2	306,8 / 274,6
Moment of inertia per additional pair of carriage 2)	kgcm ²	179,2 / 147,0	210,8 / 178,6	275,2 / 243,0
Moment of inertia per 1 m of stroke	kgcm ² /m	11,2		
Moment of inertia per 1 kg of payload	kgcm ² /kg	17,7		
Maximum force F _{dynmax}	N	9405		
Maximum force F _{zdynmax} 5)	N	9405		
Maximum torque M _{dynmax}	Nm	512	1310	2418
Maximum torque M _{zdynmax}	Nm	256	655	1209
Maximum torque M _{xdynmax} 6)	Nm	910 (bei d _i = 180mm)		
related on distance (d _i) between axes body				
Mass 0 stroke axis	kg	46,1 / 37,4	50,9 / 42,2	60,4 / 51,7
Mass per additional pair of carriage (with axis body)	kg	25,8 / 18,6	30,6 / 23,4	40,2 / 33,0
Mass of per 1 m stroke	kg/m	33,2		
Moving mass pair of carriage	kg	10,2 / 8,4	12,0 / 10,2	15,6 / 13,8
Maximum stroke 3)	mm	5310 / 5510	5220 / 5420	5040 / 5240
Minimaler stroke 4)	mm	13		
Minimum distanz (d _i) between axes body	mm	130		
Maximum distanz (d _i) between axes body	mm	600		
Repeatability 1)	mm	± 0,1		
Diameter motor shaft	mm	12 ... 32		
Cross section axes body (W x H)	mm	110 x 110		
Axial area moment of inertia (I _x / I _y)	mm ⁴	4.713.490 / 6.624.690		
Modulus of Elasticity (aluminium) E	N/mm ²	72000		
Maximale ambient temperature	°C	0 ... + 50		
Load rating linear guide C _{stat}	N	52400		
Load rating linear guide C _{dyn}	N	31700		
Service life 7)	km	30000		

1) Depending on load and stroke

2) All carriages driven

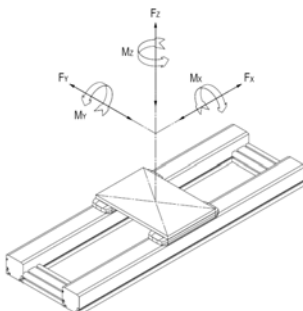
3) Please inquire for greater stroke with recirculating ball bearing guide

4) Minimum stroke required for lubrication of the linear guide

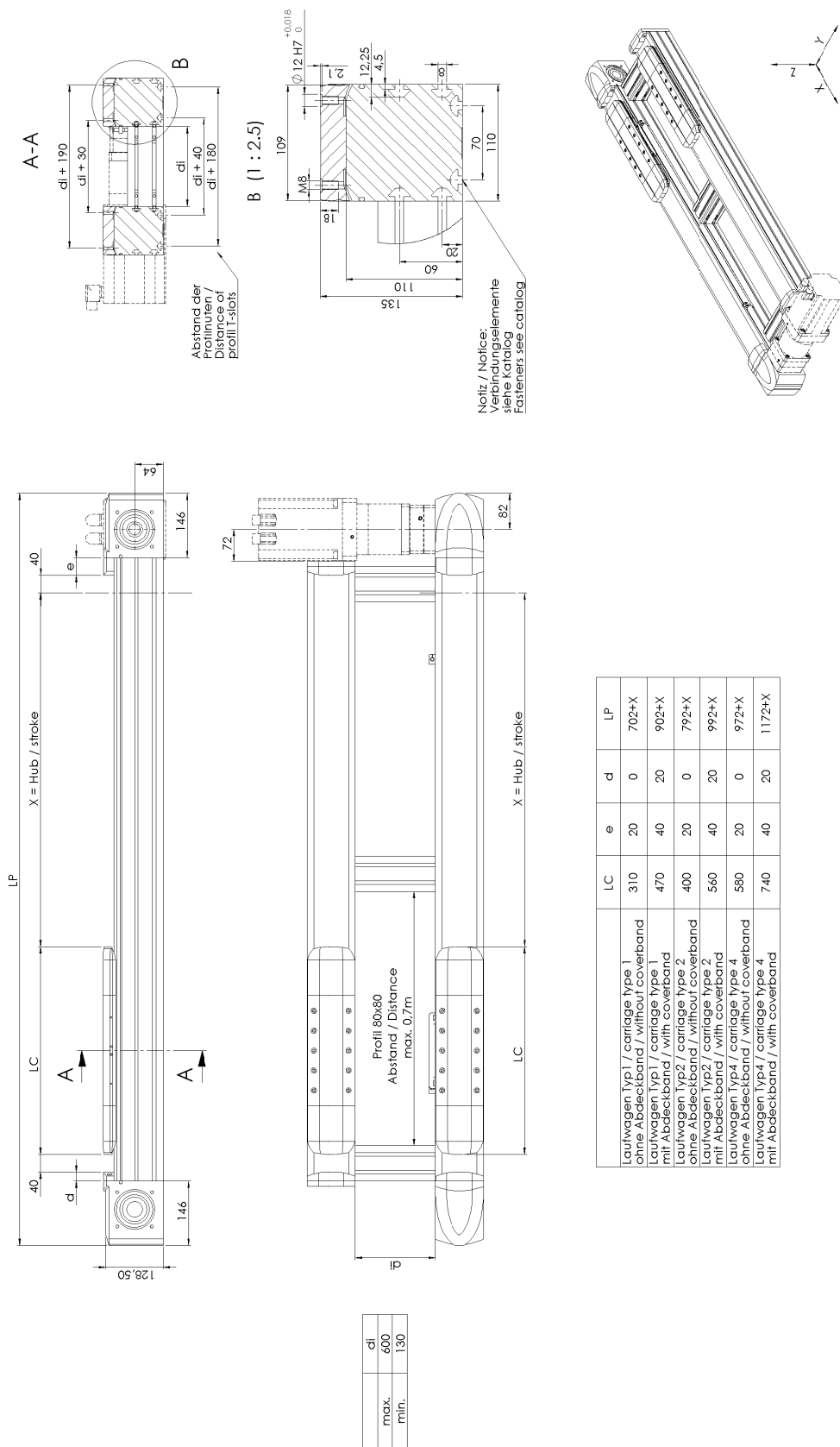
5) This values aimed for a central arranged pay load

6) This values aimed for stiff mechanical related arriages via adapterplatte with a central arranged pay load and with inside distance (d_i) between both axes. The plate is not included in delivery.

7) Forces and torques relate to the service life

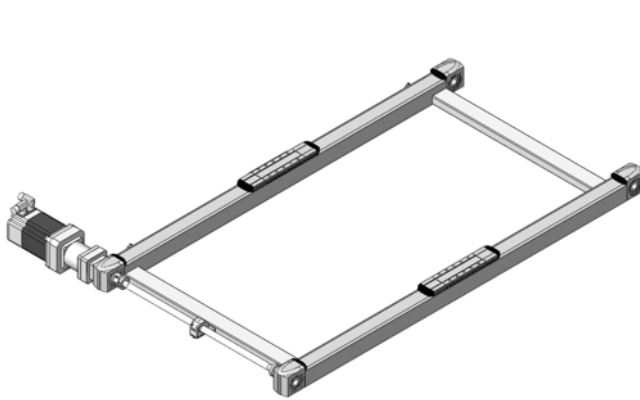


Double axes

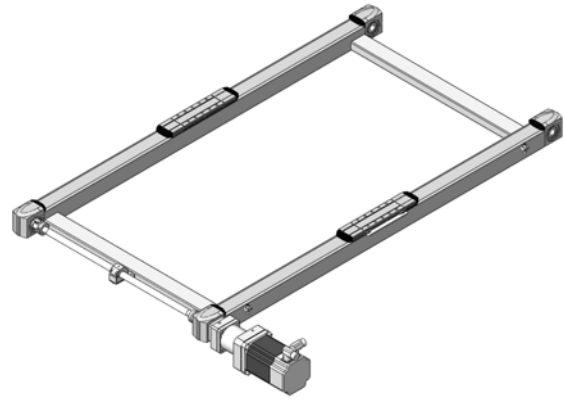
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KMS

Combination of a driven axis with a shaft driven support axis



Motor attachment left



Motor attachment right

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Introduction

The **KMS double axes** combine a driven and a shaft driven support axis based on toothed-belt axes.

KMS double axes are available with roller guides and ball guides.

Toothed-belt axes are characterised by long strokes, high dynamic response and high positioning speed.

Mostly these combinations are used for moving dynamically large loads and high torques.

Load, force and moment values in the data sheets aimed for stiffen **mechanical related carriages** at customer side and a centrally attached load.

Special features

- High positioning speed
- High dynamic response
- Large stroke length
- User-friendly structures
 - + Easy system integration with section technology
 - + Carriages with holes and locating dowels for easy assembling.
 - + Lubrication at lubrication nipples on both carriages sides
 - + Easy motor attachment with quick-coupling system
 - + stroke length available in millimetre accuracy
 - + Distance between both axes available in a wide distance
 - + Sensors can be moved anywhere in T-section slots

Options

- Roller or ball guidance
- Corrosion-resistant
- Teflon cover band
- Motor attachment inside and outside
- Sensors in various designs
- Antistatic toothed belts

Property-related application examples

- Positioning over long distance, e.g. pick & place applications
- Positioning of high dimension loads with a high acceleration e.g. containers.

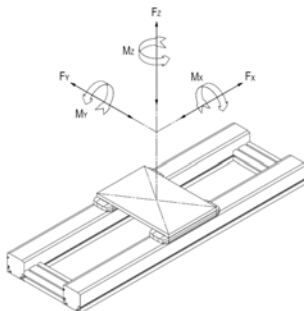
Product overview

Type	Guide type	stroke (mm)	Typ. payload (kg)
KMS1BR	Roller guide	3000	15
KMS2Bx	Roller guide	5500	25
	Ball guide	5500	75
KMS3Bx	Roller guide	5500	50
	Ball guide	5500	180
KMS4BB	Ball guide	5500	300

Value pairs with / without cover strip are separated by "/".

Technical data double axes		KMS1BR	
Drive system		Toothed belt 15HTD-3M	
Guide type		Roller guide (W06)	
Payload	kg	15	
Carriage type		Typ2	Typ4
Carriage length	mm	297 / 200	377 / 280
Feed constant	mm/rev.	84	
Effective diameter toothed belt pulley	mm	26,738	
Maximum feed force $F_{x\max}$	N	450	
Maximum velocity 1)	m/s	8	
Maximum acceleration 1)	m/s ²	20	
Maximum driving torque $M_{\max}$	Nm	6	
Breakaway torque 0 stroke axis	Nm	0,6	
Breakaway torque per additional pair of carriage 2)	Nm	0,2	
Moment of inertia 0 stroke axis	kgcm ²	2,6 / 2,2	3,0 / 2,6
Moment of inertia synchronous shaft per 1 m	kgcm ² /m	0,14	
Moment of inertia per additional pair of carriage 2)	kgcm ²	2,0 / 1,6	2,4 / 2,0
Moment of inertia per 1 m stroke	kgcm ² /m	0,2	
Moment of inertia per 1 kg payload	kgcm ² /kg	1,8	
Maximum force F_{dynmax}	N	990	
Maximum force F_{zdynmax} 5)	N	645	
Maximum torque M_{dynmax}	Nm	22	56
Maximum torque M_{zdynmax}	Nm	25	64
Maximum torque M_{xdynmax} 6)	Nm	35 ($d_i = 120\text{mm}$)	
related on distance (d_i) between axes body			
Mass of 0 stroke axis	kg	5,7 / 4,9	6,3 / 5,5
Mass synchronous shaft per 1 m	kg/m	0,6	
Mass of additional pair of carriage (with axis body)	kg	2,6 / 1,8	3,2 / 2,4
Mass of per 1 m stroke	kg/m	4,5	
Moving mass pair of carriage	kg	1,2 / 1,0	1,4 / 1,2
Maximum stroke 3)	mm	2880 / 3000	2800 / 2920
Minimum stroke 4)	mm	125	
Minimum distanz (d_i) between axes body	mm	100	
Maximum distanz (d_i) between axes body	mm	1400	
Repeatability 2)	mm	$\pm 0,1$	
Diameter motor shaft	mm	6,35 ... 14	
Cross section axis body (W x H)	mm	40 x 40	
Axial area moment of inertia (I_x / I_y)	mm ⁴	76.640 / 108.930	
Modulus of Elasticity (aluminium) E	N/mm ²	72000	
Maximum ambient temperature	°C	0 ... + 50	
Load rating linear guide (Cstat)	N	2230	
Load rating linear guide (Cdyn)	N	3950	
Service life 7)	km	30000	

- 1) Depending on load and stroke
- 2) All carriages driven
- 3) Please inquire for greater stroke
- 4) Minimum stroke required for lubrication of the linear guide
- 5) This values aimed for a central arranged pay load
- 6) This values aimed for stiff mechanical related arriages via adapterplatte with a central arranged pay load and with inside distance (d_i) between both axes. The plate is not included in delivery.
- 7) Forces and torques relate to the service life

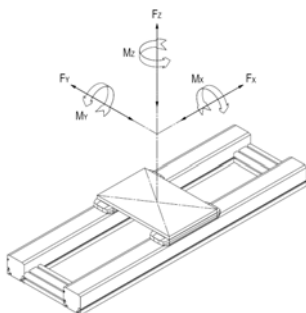




Value pairs with / without cover strip are separated by "/".

Technical data double axes		KMS2BR			KMS2BB		
Drive system		Toothed belt 25HTD-5M			Toothed belt 25HTD-5M		
Guide type		Roller guide (W06)			Recirculating ball bearing guide (15)		
Payload	kg	25			75		
Carriage type		Typ1	Typ2	Typ4	Typ1	Typ2	Typ4
Carriage length	mm	303 / 206	363 / 266	483 / 386	303 / 206	363 / 266	483 / 386
Feed constant	mm/rev.	155			155		
Effective diameter toothed belt pulley	mm	49,338			49,338		
Maximum feed force $F_{x\max}$	N	1200			1200		
Maximum velocity 1)	m/s	8			5		
Maximum acceleration 1)	m/s ²	20			20		
Maximum driving torque $M_{\max}$	Nm	30			30		
Breakaway torque 0 stroke axis	Nm	2,4			3,6		
Breakaway torque per additional pair of carriage 2)	Nm	0,4			1,6		
Moment of inertia 0 stroke axis	kgcm ²	19,0 / 16,8	21,6 / 19,4	27,2 / 25,0	20,6 / 18,4	22,6 / 20,4	27,2 / 25,0
Moment of inertia synchronous shaft per 1 m	kgcm ² /m	0,94			0,94		
Moment of inertia per additional pair of carriage 2)	kgcm ²	13,0 / 10,8	15,8 / 13,6	21,4 / 19,2	14,6 / 12,4	16,8 / 14,6	21,4 / 19,2
Moment of inertia per 1 m stroke	kgcm ² /m	2,4			2,4		
Moment of inertia per 1 kg payload	kgcm ² /kg	6,1			6,1		
Maximum force F_{dynmax}	N	990			4215		
Maximum force $F_{\text{dynmax 5}}$	N	645			4215		
Maximum torque M_{dynmax}	Nm	36	62	112	148	388	724
Maximum torque M_{dynmax}	Nm	42	72	130	110	290	543
Maximum torque $M_{\text{dynmax 6}}$ respect to distance inside (di) of double axis	Nm	45 (di = 140mm)			280 (di = 140mm)		
Mass of 0 stroke axis	kg	13,2 / 11,6	14,2 / 12,6	16,2 / 14,6	14,2 / 12,4	15,2 / 13,4	17,2 / 15,4
Mass synchronous shaft per 1 m	kg/m	1,3			1,3		
Mass of additional pair of carriage (with axis body)	kg	5,0 / 3,8	6,0 / 4,8	7,8 / 6,6	5,8 / 4,4	6,8 / 5,4	8,8 / 7,4
Mass of per 1 m stroke	kg/m	9,2			11,2		
Moving mass pair of carriage	kg	2,2 / 1,8	2,6 / 2,4	3,6 / 3,2	2,4 / 2,0	2,8 / 2,4	3,6 / 3,2
Maximum stroke 3)	mm	5540 / 5660	5480 / 5600	5360 / 5480	5540 / 5660	5480 / 5600	5360 / 5480
Minimum stroke 4)	mm	130			9		
Minimum distanz between axes body	mm	110			110		
Maximum distanz between axes body	mm	1800			1800		
Repeatability 2)	mm	± 0,1			± 0,1		
Diameter motor shaft	mm	6,35 ... 20			6,35 ... 20		
Cross section axis body (W x H)	mm	60 x 60			60 x 60		
Axial area moment of inertia (I _x / I _y)	mm ⁴	435.390 / 651.610			435.390 / 651.610		
Modulus of Elasticity (aluminium) E	N/mm ²	72000			72000		
Maximum ambient temperature	°C	0 ... + 50			0 ... + 50		
Load rating linear guide (Cstat)	N	2230			24200		
Load rating linear guide (Cdyn)	N	3950			14200		
Service life 7)	km	30000			30000		

- 1) Depending on load, stroke and length of synchronous shaft
- 2) All carriages driven
- 3) Please inquire for greater stroke with recirculating ball bearing guide
- 4) Minimum stroke required for lubrication of the linear guide
- 5) This values aimed for a central arranged pay load
- 6) This values aimed for stiff mechanical related arriages via adapterplatte with a central arranged pay load and with inside distance (di) between both axes. The plate is not included in delivery.
- 7) Forces and torques relate to the service life

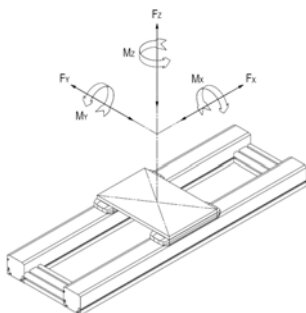


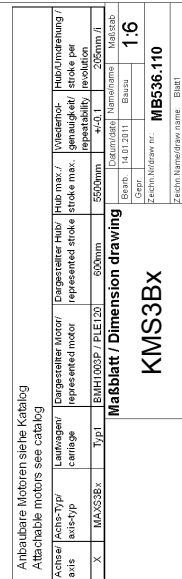


Value pairs with / without cover strip are separated by "/".

Technical data double axes		KMS3BR			KMS3BB		
Drive system		Toothed belt 30HTD-5M			Toothed belt 30HTD-5M		
Guide type		Roller guide (W10)			Recirculating ball bearing guide (20)		
Payload	kg	50			180		
Carriage type		Typ1	Typ2	Typ4	Typ1	Typ2	Typ4
Carriage length	mm	364 / 244	434 / 314	574 / 454	364 / 244	434 / 314	574 / 454
Feed constant	mm/rev.	205			205		
Effective diameter toothed belt pulley	mm	65,254			65,254		
Maximum feed force $F_{x\max}$	N	1650			1650		
Maximum velocity 1)	m/s	8			5		
Maximum acceleration 1)	m/s ²	20			20		
Maximum driving torque $M_{\max}$	Nm	54			54		
Breakaway torque 0 stroke axis	Nm	5,0			7,0		
Breakaway torque per additional pair of carriage 2)	Nm	0,6			2,6		
Moment of inertia 0 stroke axis	kgcm ²	74,1 / 64,3	84,0 / 75,2	106,2 / 94,4	78,0 / 69,2	86,0 / 77,2	104,8 / 96,0
Moment of inertia synchronous shaft per 1 m	kgcm ² /m	4,37			4,37		
Moment of inertia per additional pair of carriage 2)	kgcm ²	48,8 / 40,2	58,4 / 49,8	77,8 / 69,2	52,4 / 43,8	60,4 / 51,8	79,8 / 71,2
Moment of inertia per 1 m stroke	kgcm ² /m	5,0			5,0		
Moment of inertia per 1 kg payload	kgcm ² /kg	10,7			10,7		
Maximum force F_{dynmax}	N	2640			6615		
Maximum force F_{zdynmax} 5)	N	1560			6615		
Maximum torque M_{dynmax}	Nm	102	174	320	324	758	1374
Maximum torque M_{zdynmax}	Nm	129	220	405	243	568	1030
Maximum torque M_{xdynmax} 6) related on distance (d_i) between axes body	Nm	125 ($d_i = 160\text{mm}$)			530 ($d_i = 160\text{mm}$)		
Mass of 0 stroke axis	kg	33,1 / 29,7	35,1 / 31,7	39,1 / 35,7	35,5 / 31,7	37,1 / 33,3	41,1 / 37,3
Mass synchronous shaft per 1 m	kg/m	2,5			2,5		
Mass of additional pair of carriage (with axis body)	kg	10,4 / 7,6	12,4 / 9,6	16,4 / 13,6	11,8 / 8,6	14,0 / 10,8	18,2 / 15,0
Mass of per 1 m stroke	kg/m	16,0			19,0		
Moving mass pair of carriage	kg	4,6 / 3,8	5,6 / 4,8	7,4 / 6,6	5,0 / 4,2	5,8 / 5,0	7,6 / 6,8
Maximum stroke 3)	mm	5450 / 5600	5380 / 5530	5240 / 5390	5450 / 5600	5380 / 5530	5240 / 5390
Minimum stroke 4)	mm	175			11		
Minimum distanz (d_i) between axes body	mm	120			120		
Maximum distanz (d_i) between axes body	mm	2300			2300		
Repeatability 2)	mm	± 0,1			± 0,1		
Diameter motor shaft	mm	12 ... 25			12 ... 25		
Cross section axis body (W x H)	mm	80 x 80			80 x 80		
Axial area moment of inertia (I_x / I_y)	mm ⁴	1.285.260 / 1.867.210			1.285.260 / 1.867.210		
Modulus of Elasticity (aluminium) E	N/mm ²	72000			72000		
Maximum ambient temperature	°C	0 ... + 50			0 ... + 50		
Load rating linear guide (Cstat)	N	4850			38400		
Load rating linear guide (Cdyn)	N	8500			22300		
Service life 7)	km	30000			30000		

- 1) Depending on load, stroke and length of synchronous shaft
- 2) All carriages driven
- 3) Please inquire for greater stroke with recirculating ball bearing guide
- 4) Minimum stroke required for lubrication of the linear guide
- 5) This values aimed for a centrical arranged pay load
- 6) This values aimed for stiff mechanical related arriages via adapterplatte with a centrical arranged pay load and with inside distance (d_i) between both axes. The plate is not included in delivery.
- 7) Forces and torques relate to the service life

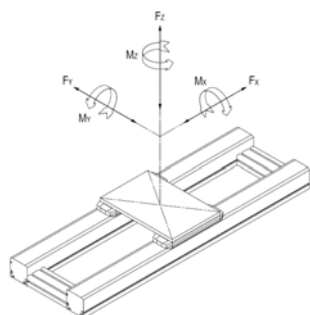


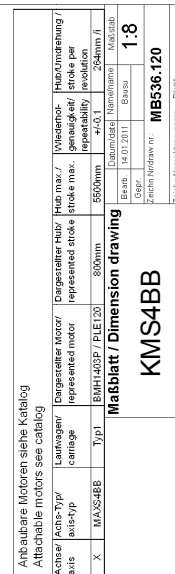


Value pairs with / without cover strip are separated by "/".

Technical data double axes		KMS4BB		
Drive system		Toothed belt 50HTD-8M		
Guide type		Recirculating ball bearing guide (25)		
Payload	kg	300		
Carriage type		Typ1	Typ2	Typ4
Carriage length	mm	470 / 310	560 / 400	740 / 580
Feed constant	mm/rev.	264		
Effective diameter toothed belt pulley	mm	84,034		
Maximum feed force $F_{x\max}$	N	3900		
Maximum velocity 1)	m/s	5		
Maximum acceleration 1)	m/s ²	20		
Maximum driving torque $M_{\max}$	Nm	165		
Breakaway torque 0 stroke axis	Nm	9,0		
Breakaway torque per additional pair of carriage 2)	Nm	4,2		
Moment of inertia 0 stroke axis	kgcm ²	264,1 / 231,9	295,7 / 263,5	360,1 / 327,9
Moment of inertia synchronous shaft per 1 m	kgcm ² /m	11,65		
Moment of inertia per additional pair of carriage 2)	kgcm ²	179,2 / 147,0	210,8 / 178,6	275,2 / 243,0
Moment of inertia per 1 m stroke	kgcm ² /m	22,4		
Moment of inertia per 1 kg payload	kgcm ² /kg	17,7		
Maximum force $F_{y\text{dynmax}}$	N	9405		
Maximum force $F_{z\text{dynmax}}$ 5)	N	9405		
Maximum torque $M_{y\text{dynmax}}$	Nm	512	1310	2418
Maximum torque $M_{z\text{dynmax}}$	Nm	384	982	1813
Maximum torque $M_{x\text{dynmax}}$ 6)	Nm	910 (di = 180mm)		
related on distance (di) between axes body				
Mass of 0 stroke axis	kg	74,0 / 65,2	78,8 / 70,0	88,2 / 79,4
Mass synchronous shaft per 1 m	kg/m	3,6		
Mass of additional pair of carriage (with axis body)	kg	25,8 / 18,6	30,6 / 23,4	40,2 / 33,0
Mass of per 1 m stroke	kg/m	33,8		
Moving mass pair of carriage	kg	10,2 / 8,4	12,0 / 10,2	15,6 / 13,8
Maximum stroke 3)	mm	5310 / 5510	5220 / 5420	5040 / 5240
Minimum stroke 4)	mm	13		
Minimum distanz (di) between axes body	mm	130		
Maximum distanz (di) between axes body	mm	2800		
Repeatability 2)	mm	± 0,1		
Diameter motor shaft	mm	12 ... 32		
Cross section axis body (W x H)	mm	110 x 110		
Axial area moment of inertia (Ix / Iy)	mm ⁴	4.713.490 / 6.624.690		
Modulus of Elasticity (aluminium) E	N/mm ²	72000		
Maximum ambient temperature	°C	0 ... + 50		
Load rating linear guide (Cstat)	N	52400		
Load rating linear guide (Cdyn)	N	31700		
Service life 7)	km	30000		

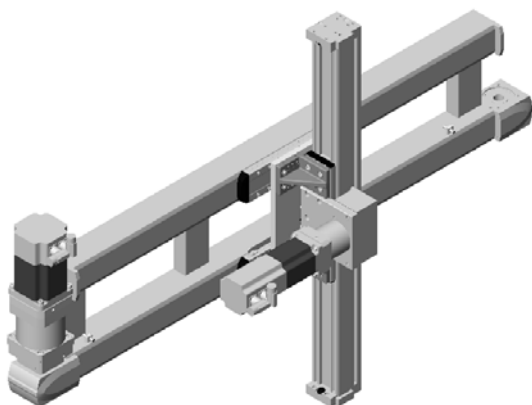
- 1) Depending on load, stroke and length of synchronous shaft
- 2) All carriages driven
- 3) Please inquire for greater stroke with recirculating ball bearing guide
- 4) Minimum stroke required for lubrication of the linear guide
- 5) This values aimed for a central arranged pay load
- 6) This values aimed for stiff mechanical related arriages via adapterplatte with a central arranged pay load and with inside distance (di) between both axes. The plate is not included in delivery.
- 7) Forces and torques relate to the service life



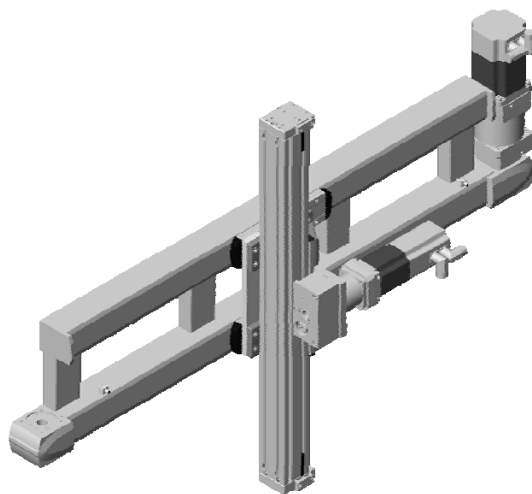


KMP

Linear positioner, 2 axes



Left version



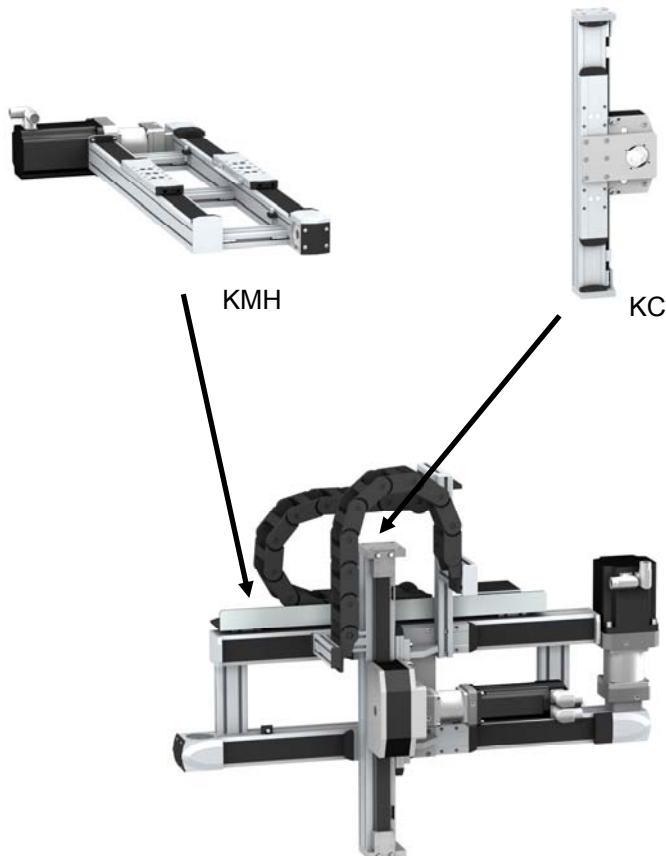
Right version

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KMP

Building Linear positioners, 2 axes

Modular designed, based on standard KMH-axes combinations and standard single axes.

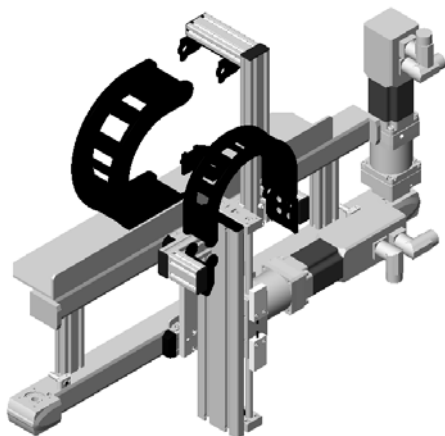


The linear positioning system works below or above the working area. It works in the X/Z direction and is designed especially for handling dynamic load on short till long travel paths in X direction and short travel paths in Z direction.

Product overview

Type	Guide type	X-axis		Z-axis		Typ. payload (kg)
		Type	stroke (mm)	Type	stroke (mm)	
KMP12-H41-C41	Roller guide	KMH1BR	3000	KC41BR	400	4
KMP22-H42-C42	Roller guide	KMH2BR	4000	KC42BR	600	6
	Ball guide	KMH2BB	4000	KC42BB	600	15
KMP32-H43-C43	Roller guide	KMH3BR	5500	KC43BR	800	18
	Ball guide	KMH3BB	5500	KC43BB	800	25
KMP42-H44-C44	Ball guide	KMH4BB	5500	KC44BB	1200	50

Technical data



Linear positioner

- Typ. payload 4 kg
- Roller guide
- Fast and dynamic small payload linear positioner for pick & place - tasks
- Small till medium working area
- Z-stroke till 400 mm

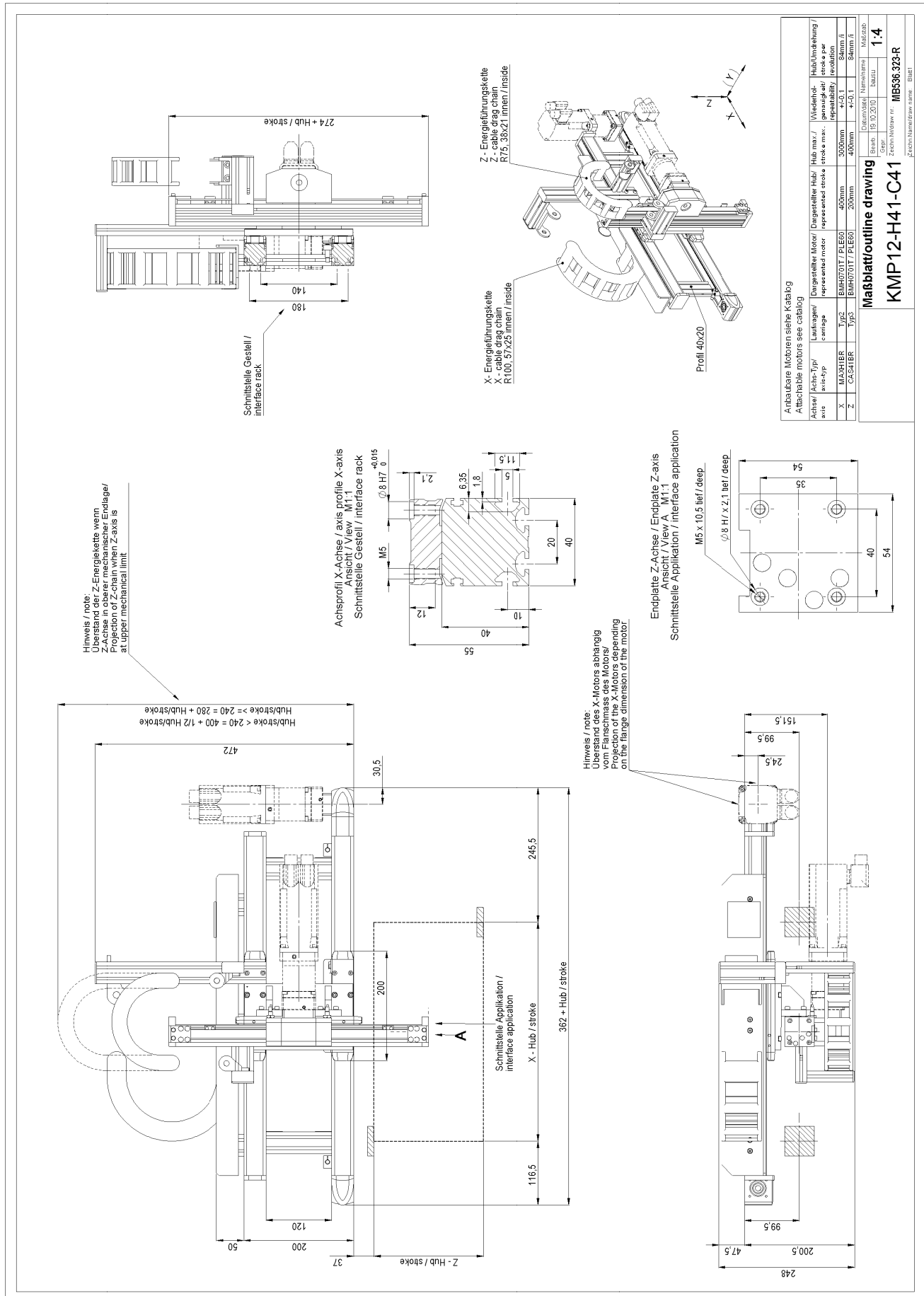
KMP12-H41-C41 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMH1BR	Roller guide	3000	8	+/- 0,10	84	
Z	KC41BR	Roller guide	400	2	+/- 0,05	84	4

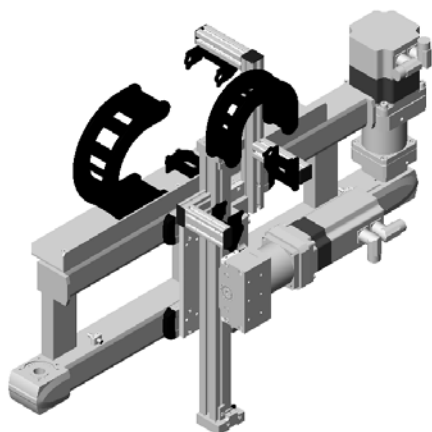
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application.

Greater stroke in X and Z-direction on request.



Technical data



Linear positioner

- Typ. payload
 - with roller guide 6 kg
 - with ball guide 15 kg
- Dynamic small payload linear positioner for pick & place - tasks
- Z-stroke till 600 mm

KMP22-H42-C42 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMH2BR	Roller guide	4000	8	+/- 0,10	155	6
Z	KC42BR	Roller guide	600	5	+/- 0,05	155	6

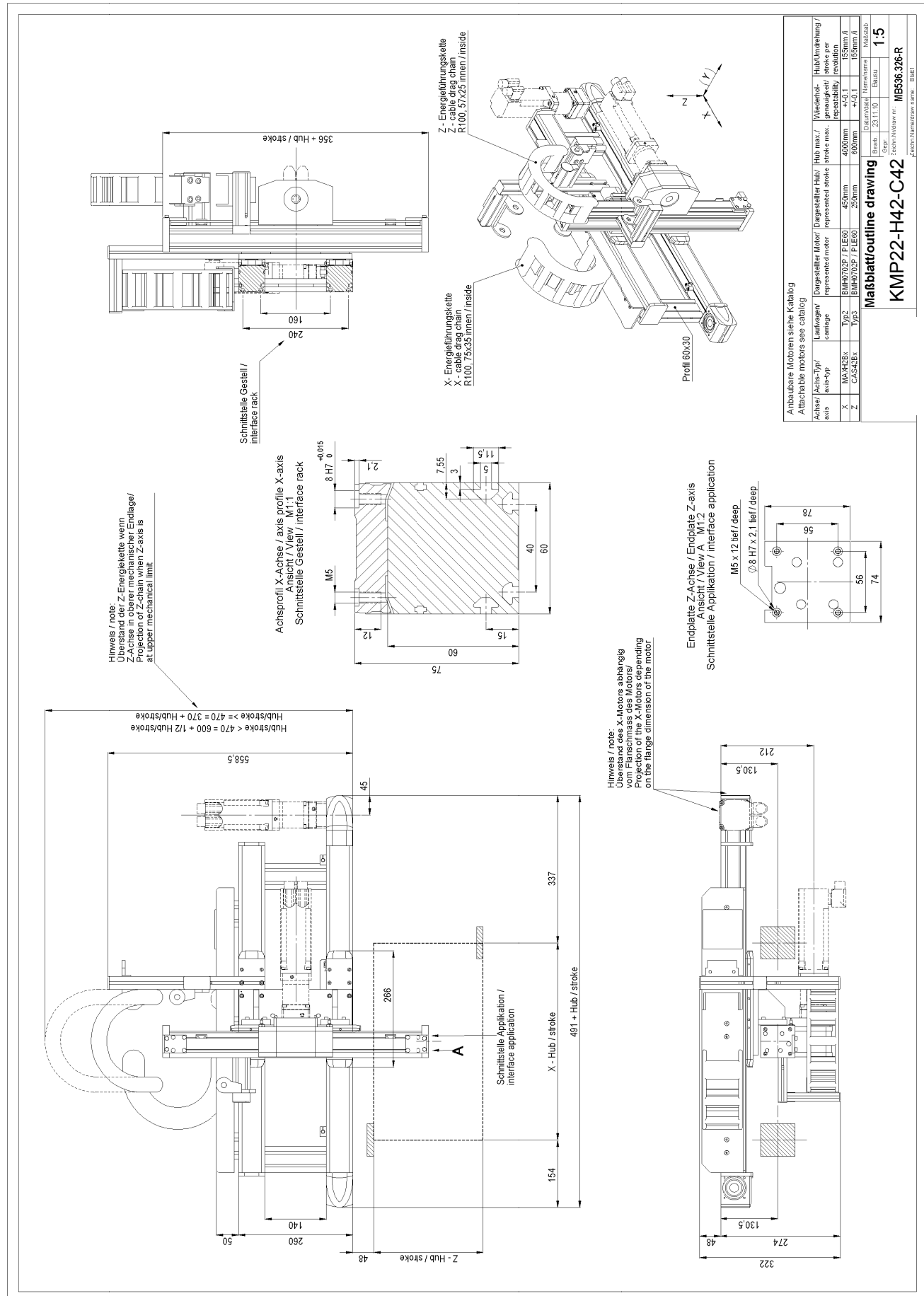
KMP22-H42-C42 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMH2BB	Ball guide	4000	5	+/- 0,10	155	15
Z	KC42BB	Ball guide	600	5	+/- 0,05	155	15

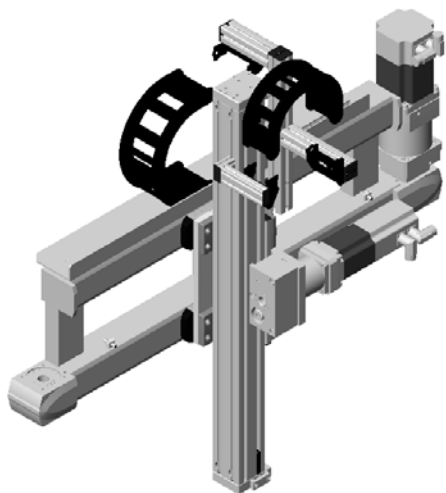
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application.

Greater stroke in X and Z-direction on request.



Technical data



Linear positioner

- Typ. payload
 - with roller guide for high speed application 9 kg
 - with ball guide for high dynamic applications 25 kg
- Dynamic medium payload linear positioner
- Huge working area
- Z-stroke till 800 mm

KMP32-H43-C43 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMH3BR	Roller guide	5500	8	+/- 0,10	205	9
Z	KC43BR	Roller guide	800	2	+/- 0,05	205	

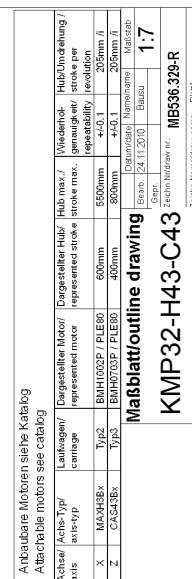
KMP32-H43-C43 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMH3BB	Ball guide	5500	5	+/- 0,10	205	
Z	KC43BB	Ball guide	800	2	+/- 0,05	205	25

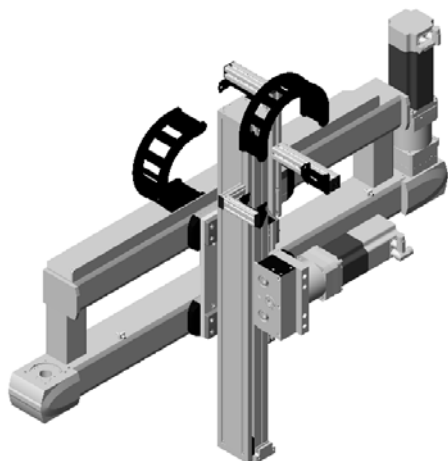
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application.

Greater stroke in X and Z-direction on request.



Technical data



Linear positioner

- Typical payload 50 kg
- Ball guide
- Dynamic and heavy payload linear positioner
- Huge working area
- Z-stroke till 1200 mm

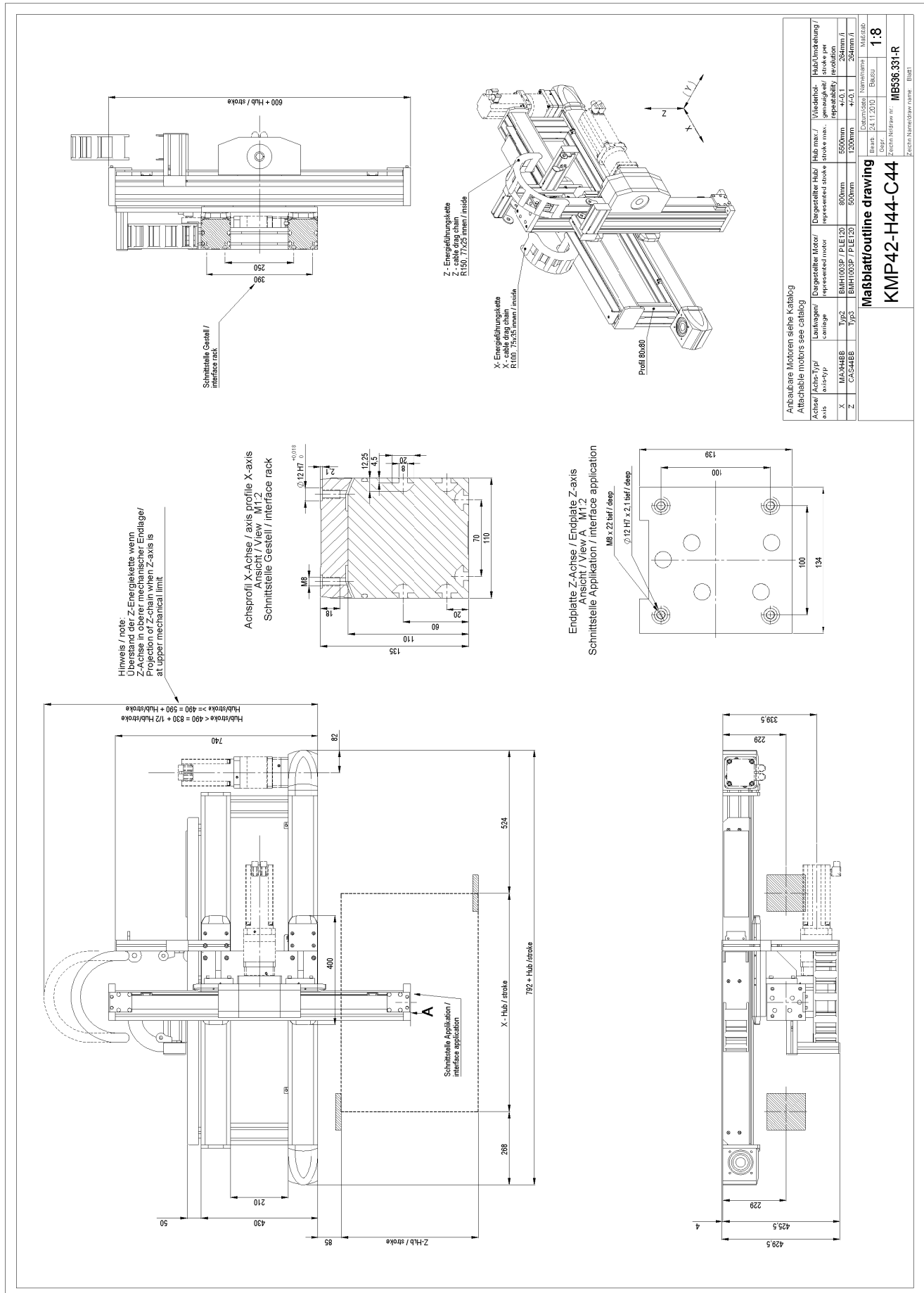
KMP42-H44-C44 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMH4BB	Ball guide	5500	5	+/- 0,10	264	50
Z	KC44BB	Ball guide	1200	2	+/- 0,05	264	

* Comments

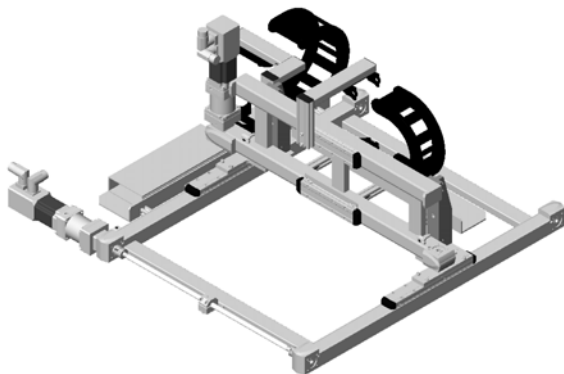
The repeat accuracy and the maximum speed of the total system are depending on the application.

Greater stroke in X and Z-direction on request.

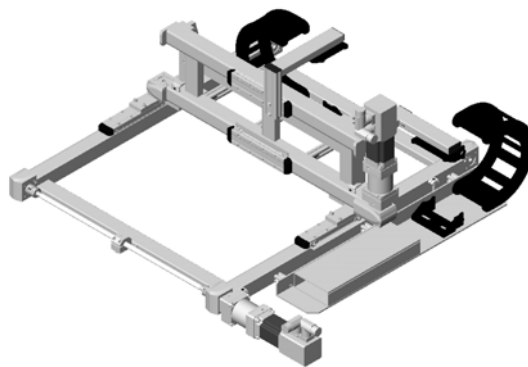


KMR•2

Portal robot, 2 axes



Left version



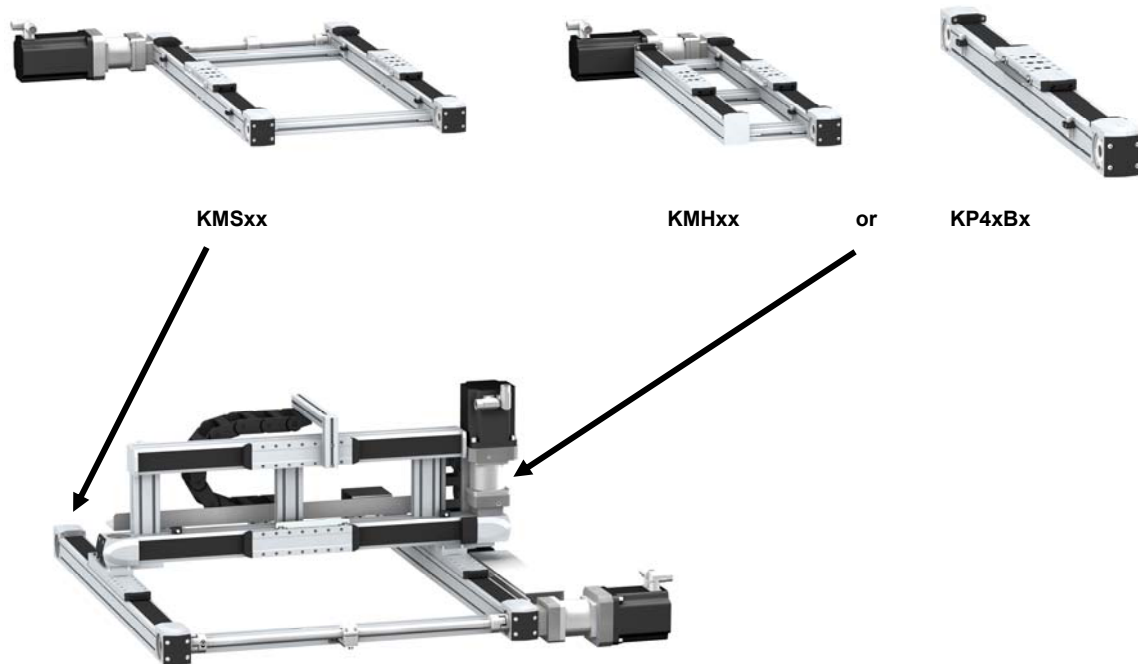
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KMR•2

Building Portal robots, 2 axes

Modular designed, based on the standard KMS and KMH-axes combinations and standard single axes.

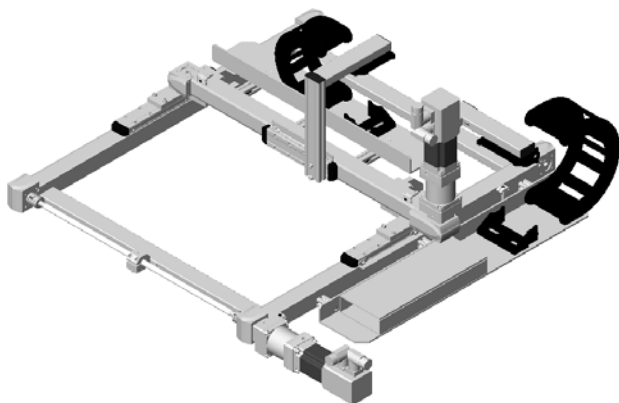


The space-saving 2 axes portal robot operates above the working area in X and Y directions. The systems are designed for handling loads on long travel paths in X and Y directions.

Product overview

Type	Guide type	X-Axis		Y-Axis		typ. Payload (kg)
		Type	max. stroke (mm)	Type	max. stroke (mm)	
KMR12-S41-P41	Roller guide	KMS1BR	3000	KP41BR	1200	5
KMR12-S41-H41	Roller guide	KMS1BR	3000	KMH1BR	1200	8
KMR22-S42-P42	Roller guide	KMS2BR	5500	KP42BR	1500	5
	Ball guide	KMS2BB	5500	KP42BB	1500	12
KMR22-S42-H42	Roller guide	KMS2BR	5500	KMH2BR	1500	15
	Ball guide	KMS2BB	5500	KMH2BB	1500	30
KMR32-S43-P43	Roller guide	KMS3BR	5500	KP43BR	1500	11
	Ball guide	KMS3BB	5500	KP43BB	1500	30
KMR32-S43-H43	Roller guide	KMS3BR	5500	KMH3BR	1500	40
	Ball guide	KMS3BB	5500	KMH3BB	1500	80
KMR42-S44-H44	Ball guide	KMS4BB	5500	KMH4BB	1500	130

Technical data



Two Axes Portal Robot

- Typ. payload 5 kg
- Roller guide
- Dynamic small payload portal robot
- Medium working area

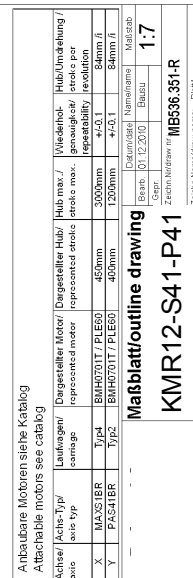
KMR12-S41-P41 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS1BR	Roller guide	3000	8	+/- 0,10	84	
Y	KP41BR	Roller guide	1200	8	+/- 0,10	84	5

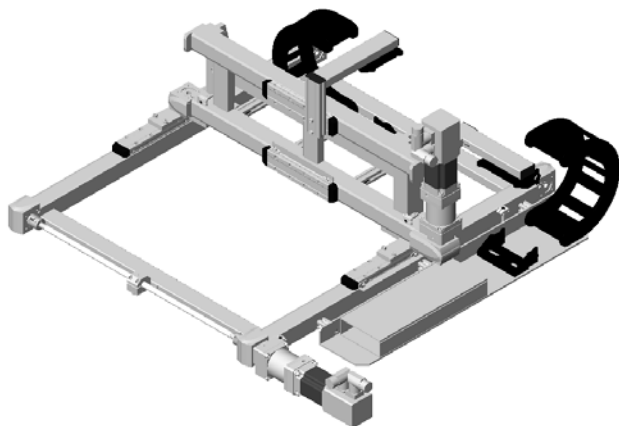
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X and Y-direction on request.



Technical data



Two Axes Portal Robot

- Typ. payload 8 kg
- Roller guide
- Dynamic small payload portal robot
- Medium working area
- Y-axis with torque support axis

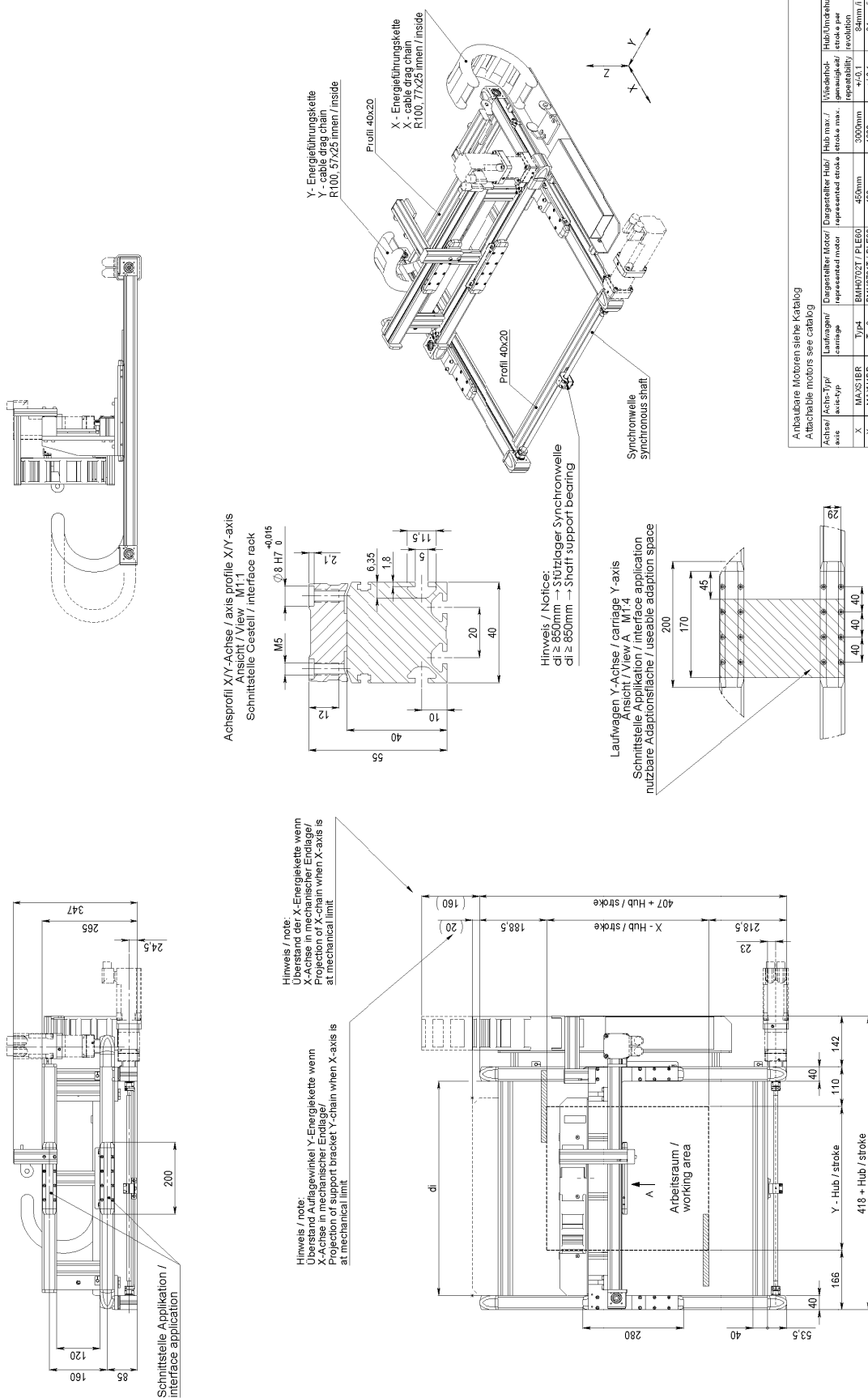
KMR12-S41-H41 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS1BR	Roller guide	3000	8	+/- 0,10	84	
Y	KMH1BR	Roller guide	1200	8	+/- 0,10	84	8

* Comments

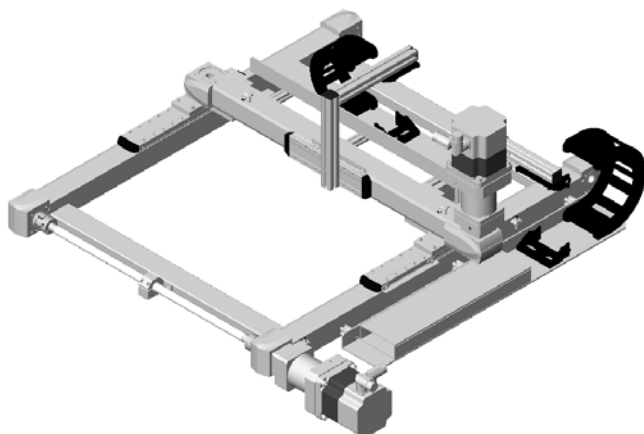
The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X and Y-direction on request.



Anbaubare Motoren siehe Katalog		Anbaubare Motoren siehe Katalog	
Achse / Axis	Motor / Motor	Hub max. / Hub max.	Hub/Umdrehung / stroke max. / stroke per revolution
X	MAXISER	3000mm	3000mm / 80mm / 1
Y	MAXISER	4000mm	4000mm / 80mm / 1
Typ	Typ	Genauigkeit / accuracy	Genauigkeit / accuracy
Y2	Y2	±0.1	±0.1
Maßstab / Scale		Maßstab / Scale	
1:1		1:1	
Zeichnungsname / Drawing name		Zeichnungsname / Drawing name	
KMR12-S41-H41		KMR12-S41-H41	
Blatt / Sheet		Blatt / Sheet	
MB536-352-R		MB536-352-R	

Technical data



Two Axes Portal Robot

- Typ. payload
 - with roller guide 5 kg
 - with ball guide 12 kg
- Dynamic small payload portal robot
- Huge working area

KMR22-S42-P42 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS2BR	Roller guide	5500	8	+/- 0,10	155	5
Y	KP42BR	Roller guide	1500	8	+/- 0,10	155	5

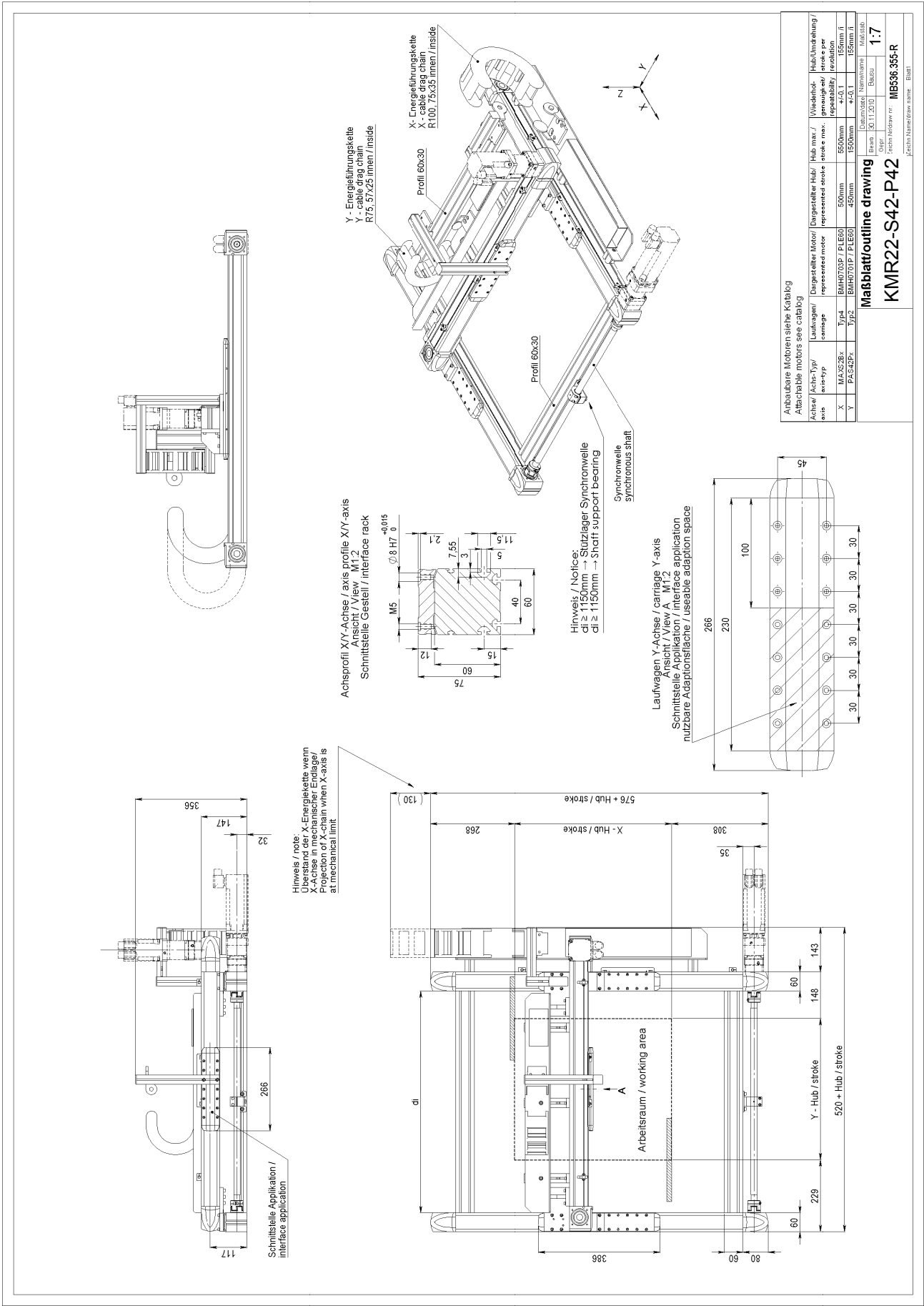
KMR22-S42-P42 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS2BB	Ball guide	5500	5	+/- 0,10	155	12
Y	KP42BB	Ball guide	1500	5	+/- 0,10	155	12

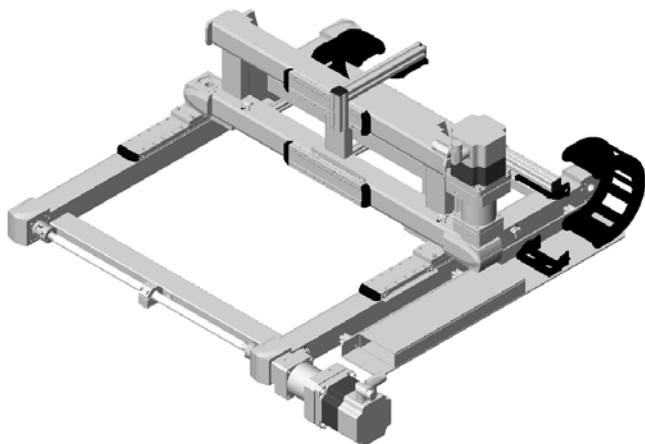
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X and Y-direction on request.



Technical data



Two Axes Portal Robot

- Typ. payload
with roller guide 15 kg
with ball guide 30 kg
- Dynamic medium payload portal robot
- Huge working area
- Y-axis with torque support axis

KMR22-S42-H42 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS2BR	Roller guide	5500	8	+/- 0,10	155	
Y	KMH2BR	Roller guide	1500	8	+/- 0,10	155	15

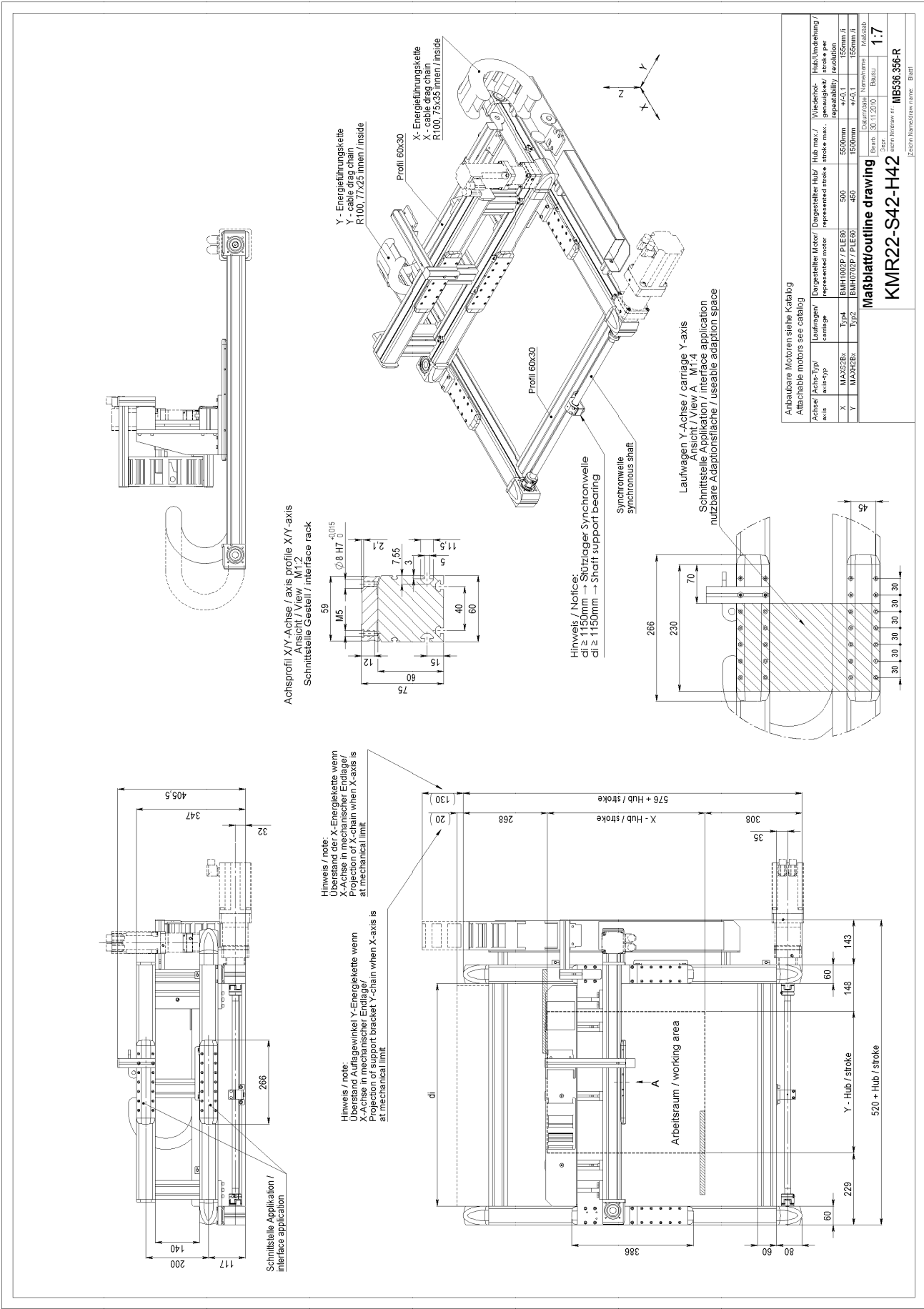
KMR22-S42-H42 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS2BB	Ball guide	5500	5	+/- 0,10	155	
Y	KMH2BB	Ball guide	1500	5	+/- 0,10	155	30

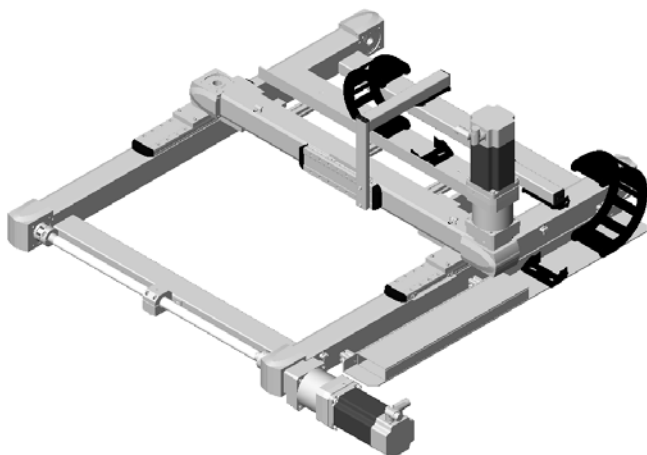
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X and Y-direction on request.



Technical data



Two Axes Portal Robot

- Typ. payload
with roller guide 11 kg
with ball guide 30 kg
- Dynamic medium payload portal robot
- Huge working area

KMR32-S43-P43 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS3BR	Roller guide	5500	8	+/- 0,10	205	11
Y	KP43BR	Roller guide	1500	8	+/- 0,10	205	

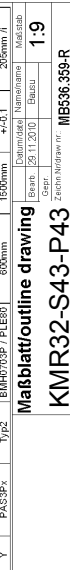
KMR32-S43-P43 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS3BB	Ball guide	5500	5	+/- 0,10	205	30
Y	KP43BB	Ball guide	1500	5	+/- 0,10	205	

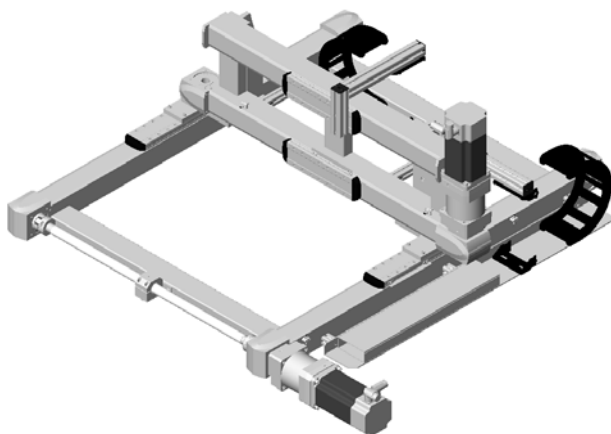
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X and Y-direction on request.



Technical data



Two Axes Portal Robot

- Typ. payload
with roller guide 40 kg
with ball guide 80 kg
- Dynamic medium till heavy payload portal robot
- Huge working area
- Y-axis with torque support axis

KMR32-S43-H43 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS3BR	Roller guide	5500	8	+/- 0,10	205	
Y	KMH3BR	Roller guide	1500	8	+/- 0,10	205	40

KMR32-S43-H43 with recirculating ball guide

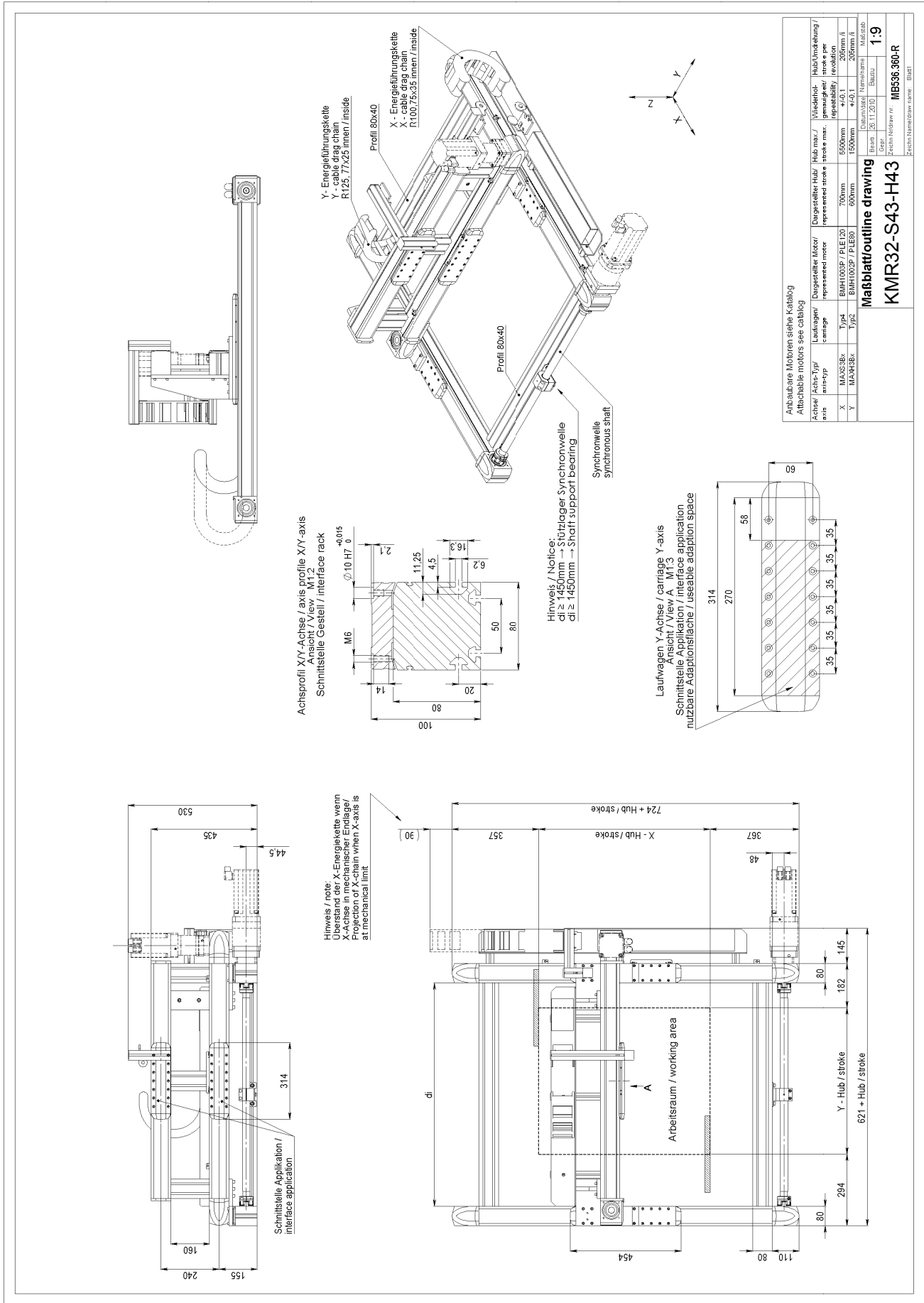
Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS3BB	Ball guide	5500	5	+/- 0,10	205	
Y	KMH3BB	Ball guide	1500	5	+/- 0,10	205	80

* Comments

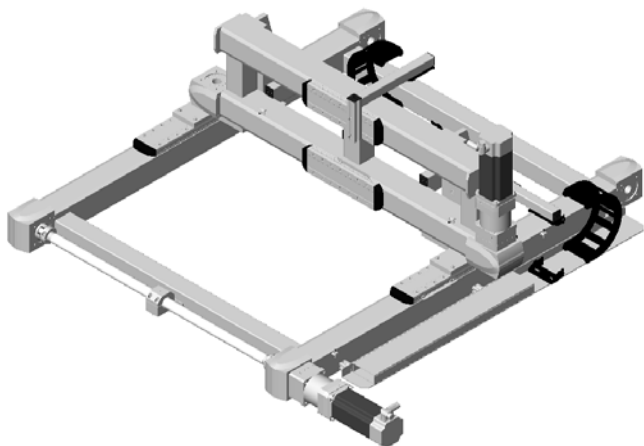
The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X and Y-direction on request.

Portal robot 2 axes KMR32-S43-H43



Technical data



Two Axes Portal Robot

- Typ. payload 130 Kg
- Ball guide
- Dynamic heavy payload portal robot
- Huge working area
- Y-axis with torque support axis

KMR32-S43-H43 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS4BB	Ball guide	5500	5	+/- 0,10	264	
Y	KMH4BB	Ball guide	1500	5	+/- 0,10	264	130

* Comments

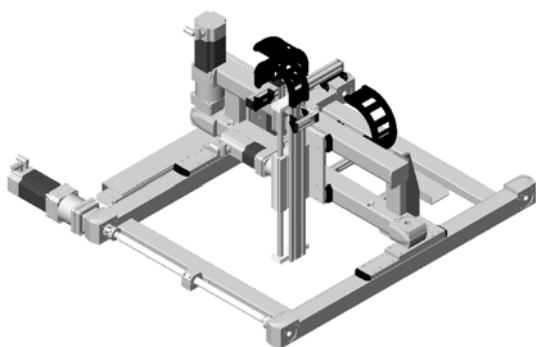
The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X and Y-direction on request.

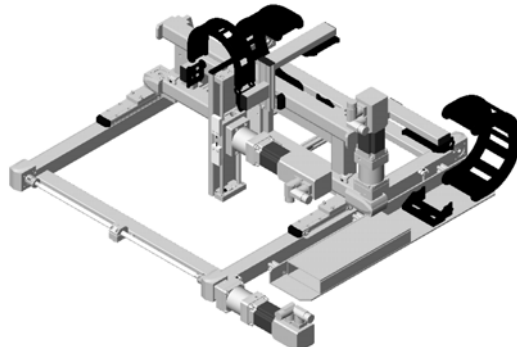


KMR•3

Portal robot, 3 axes



Left version



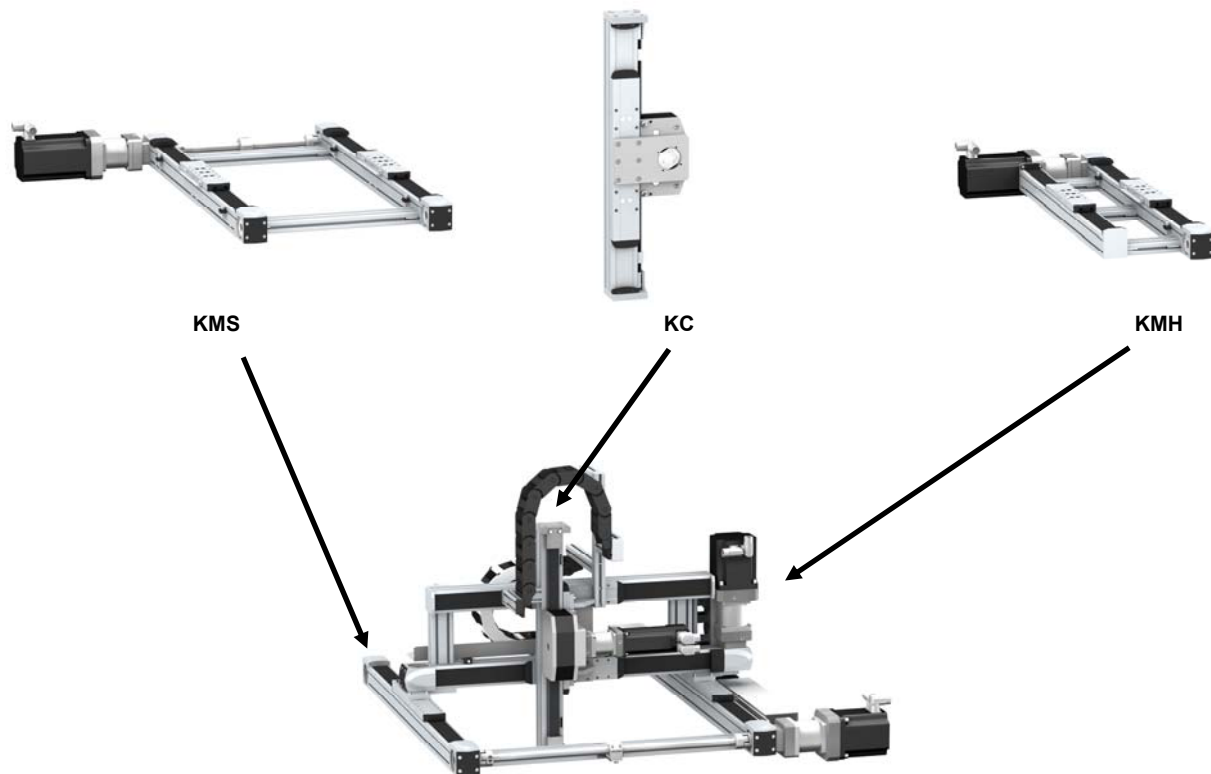
Right version

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KMR•3

Building Portal robot, 3 axes

Modular designed, based on standard KMS and KMH-axes combinations and standard cantilever axes.

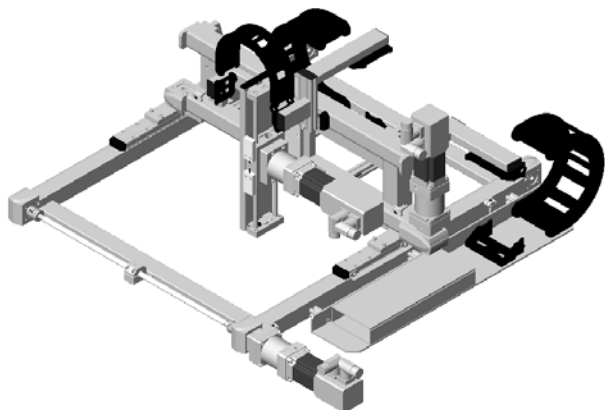


The space-saving 3 axes portal robot operates above the working area in X, Y and Z directions. The systems are designed for handling loads on long travel paths in X, Y directions and short travel paths in Z direction.

Product overview

Type	Guide type	X-Axis		Y-Axis		Z-Axis		typ. Payload (kg)
		Type	max. stroke (mm)	Type	max. stroke (mm)	Type	max. stroke (mm)	
KMR13-S41-H41-C41	Roller guide	KMS1BR	3000	KMH1BR	1200	KC41BB	400	4
KMR23-S42-H42-C42	Roller guide	KMS2BR	5500	KMH2BR	1500	KC42BR	600	6
	Ball guide	KMS2BB	5500	KMH2BB	1500	KC42BB	600	15
KMR33-S43-H43-C43	Roller guide	KMS3BR	5500	KMH3BR	1500	KC43BR	500	9
	Ball guide	KMS3BB	5500	KMH3BB	1500	KC43BB	500	25
KMR43-S44-H44-C44	Ball guide	KMS4BB	5500	KMH4BB	1500	KC44BB	1200	50

Technical data



Three Axes Portal Robot

- Typ. payload 4 kg
- Roller guide
- Fast and dynamic small payload portal robot for pick & place - tasks
- Small till medium working area
- Z-Stroke till 400 mm

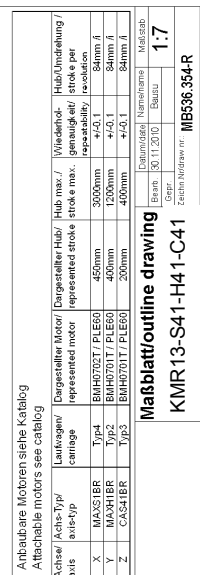
KMR13-S41-H41-C41 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS1BR	Roller guide	3000	8	+/- 0,10	84	4
Y	KMH1BR	Roller guide	1200	8	+/- 0,10	84	
Z	KC41BR	Roller guide	400	2	+/- 0,05	84	

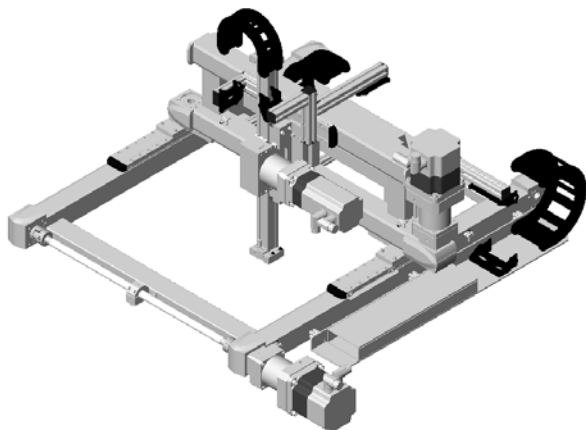
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X-, Y- and Z-direction on request.



Technical data



Three Axes Portal Robot

- Typ. payload
with roller guide 6 kg
with ball guide 15 kg
- Dynamic small payload portal robot
for pick & place - tasks
- Huge working area
- Z-stroke till 600 mm

KMR23-S42-H42-C42 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS2BR	Roller guide	5500	8	+/- 0,10	155	6
Y	KMH2BR	Roller guide	1500	8	+/- 0,10	155	
Z	KC42BR	Roller guide	600	5	+/- 0,05	155	

KMR23-S42-H42-C42 with recirculating ball guide

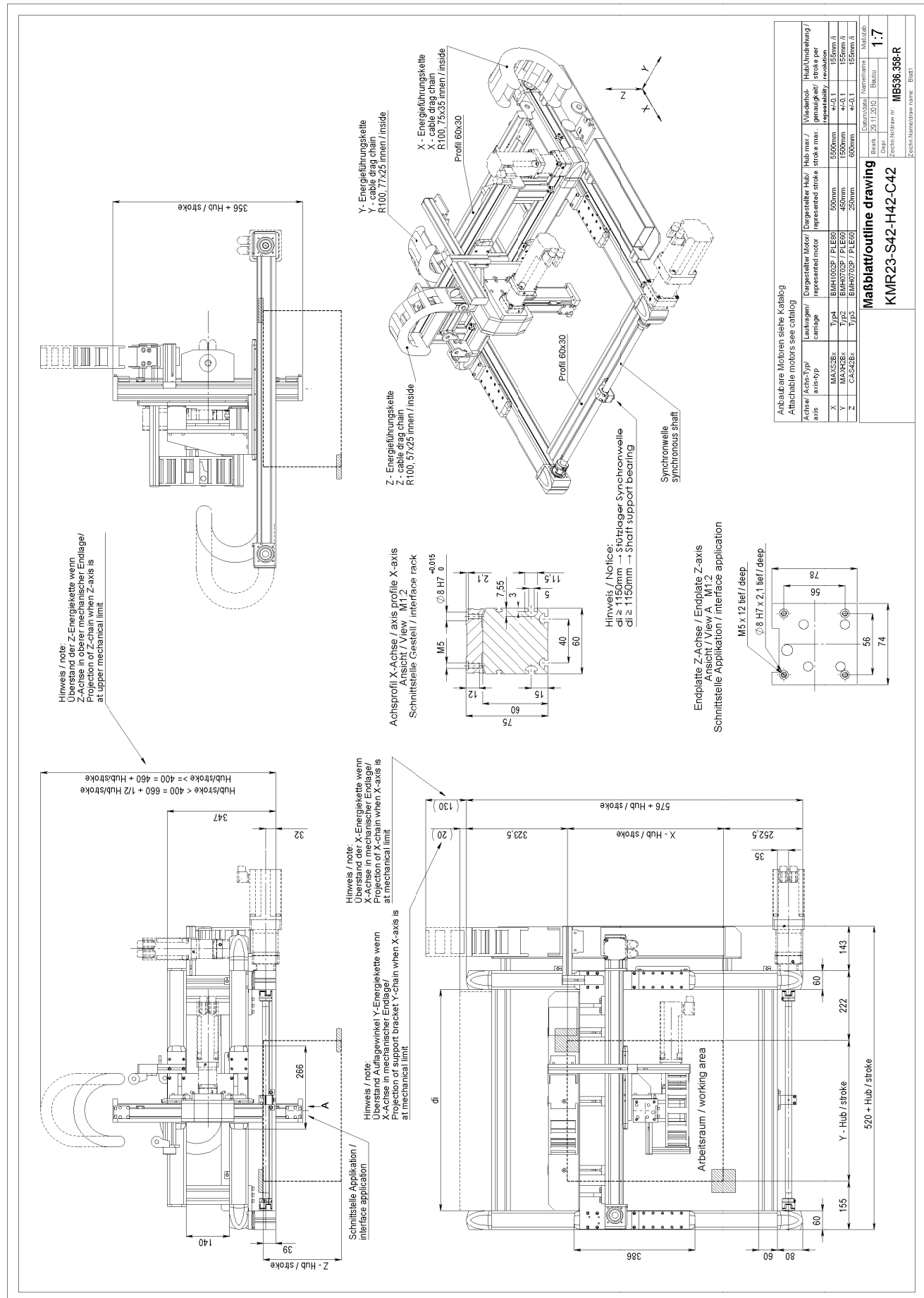
Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS2BB	Ball guide	5500	5	+/- 0,10	155	15
Y	KMH2BB	Ball guide	1500	5	+/- 0,10	155	
Z	KC42BB	Ball guide	600	5	+/- 0,05	155	

* Comments

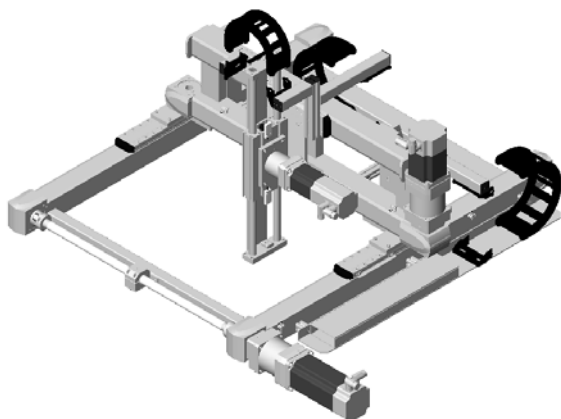
The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X-, Y- and Z-direction on request.

Portal robot 3 axes KMR23-S42-H42-C42



Technical data



Three Axes Portal Robot

- Typ. payload
with roller guide 9kg
with ball guide 25kg
- Dynamic medium payload portal robot
- Huge working area
- Z-stroke till 800 mm

KMR33-S43-H43-C43 with roller guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS3BR	Roller guide	5500	8	+/- 0,10	205	9
Y	KMH3BR	Roller guide	1500	8	+/- 0,10	205	
Z	KC43BR	Roller guide	800	2	+/- 0,05	205	

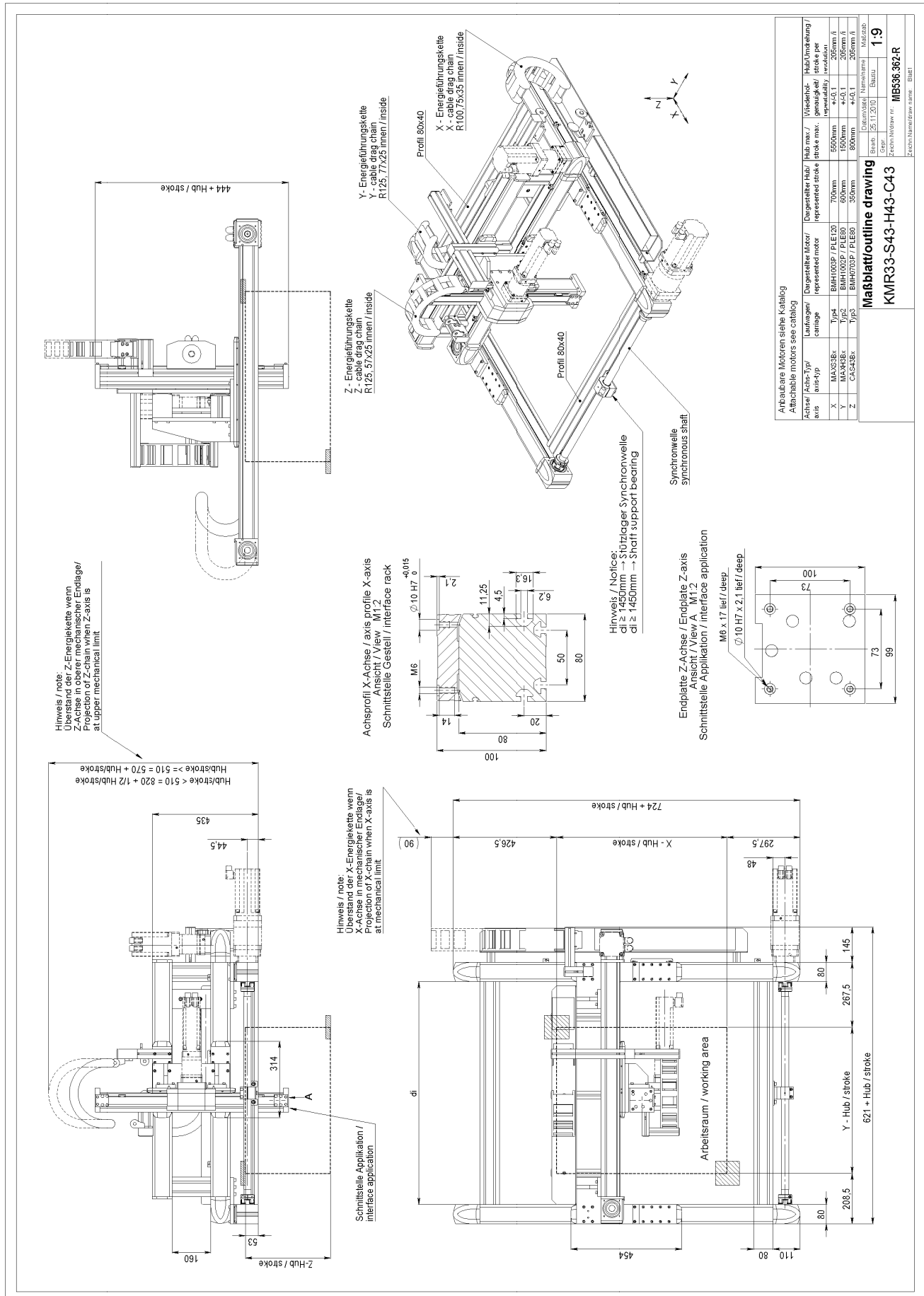
KMR33-S43-H43-C43 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS3BB	Ball guide	5500	5	+/- 0,10	205	25
Y	KMH3BB	Ball guide	1500	5	+/- 0,10	205	
Z	KC43BB	Ball guide	800	2	+/- 0,05	205	

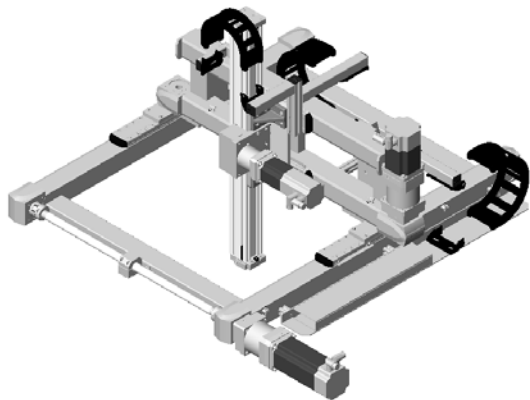
* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

Greater stroke in X-, Y- and Z-direction on request.



Technical data



Three Axes Portal Robot

- Typ. payload 50kg
- with ball guide
- Dynamic medium payload portal robot
- Huge working area
- Z-stroke till 1200 mm

KMR43-S44-H44-C44 with recirculating ball guide

Axis direction	Basis axes	Guide type	max. stroke (mm)	max. speed (m/s) *	Repeat accuracy (mm) *	Drive constant (mm)	typ. Payload (kg)
X	KMS4BB	Ball guide	5500	5	+/- 0,10	264	50
Y	KMH4BB	Ball guide	1500	5	+/- 0,10	264	
Z	KC44BB	Ball guide	1200	5	+/- 0,05	264	

* Comments

The repeat accuracy and the maximum speed of the total system are depending on the application measures.
(Per example: payload and length of the synchronic shaft for X-stroke).

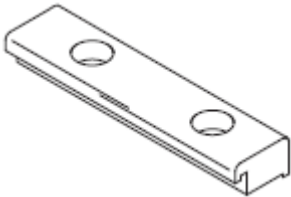
Greater stroke in X-, Y- and Z-direction on request.



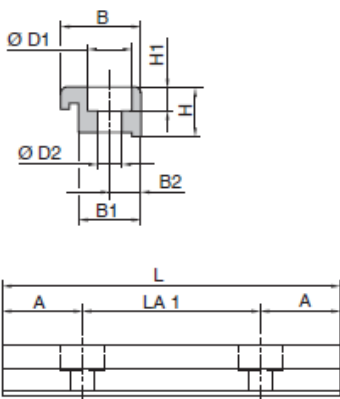
Accessories

Clamping claws

Order data

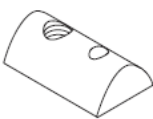
	Description		Order no.
	For mounting the axis body to a mounting surface. Contains 10 piece	For axis ...	
		KP41	8-50-0206
		KP42	8-50-0207
		KP43	8-50-0208
		KP44	8-50-0210

Dimensional drawings

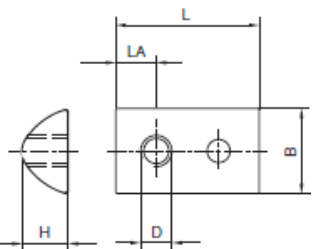
	For axis ...	A	B	B1	B2	D1	D2	H	H1	L	LA1
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
	KP41	18	18	14	7	10	5,5	11,2	5,4	76	40
	KP42	18	19	14	7	10	5,5	16,2	5,4	76	40
	KP43	18	24	16	8	11	6,6	21,5	6,4	76	40
	KP44	18	28	20	10	15	9	22	12	76	40

T-slot nuts

Order data

	Description			Order no.
	The slot nuts are inserted into the T-slots of the axis body to fasten the axis or parts of the axis. Contains 10 piece	For axis ...	Slot nut typ	
		KP41 / KC41	5 St M5	8-50-0202
		KP42 / KC42	5 St M5	8-50-0203
		KP43 / KC43	6 St M6	8-50-0204
		KP44 / KC44	8 St M6	8-50-0204
			8 St M8	8-50-0205

Dimensional drawings

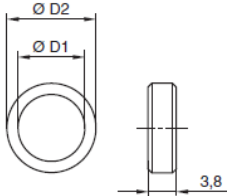
	For axis ...	Slot nut typ	B	D	H	L	LA
			mm	mm	mm	mm	mm
	KP41 / KC41	5 St M5	8	5	4	11,5	4
	KP42 / KC42	5 St M5	8	5	4	11,5	4
	KP43 / KC43	6 St M6	10,6	6	6,4	17	5,5
	KP44 / KC44	8 St M6	13,8	6	7,3	23	6,5
		8 St M8	13,8	8	7,3	23	7,5

Locating dowels

Order data

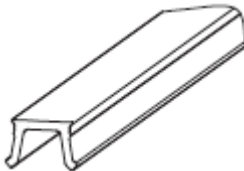
	Description		Order no.
	For precise and reproducible mounting of the payload, the locating dowels are inserted into the holes at the carriage. contains 20 piece	Für Achse...	
		KP41 / KP42	8-12-0260
		KP43	8-12-0261
		KP44	8-12-0262

Dimensional drawings

	For axis ...	D1	D2
		mm	mm
	KP41 / KP42	5,5	8 h6
	KP43	6,6	10 h6
	KP44	9	12 h6

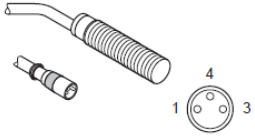
T slot covers

Order data

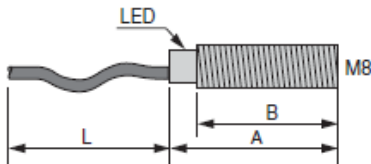
	Description			Order no.
	length 2m contains 5 piece	For axis ...	T slot size	
		KP41	5	8-50-0211
		KP42	5	8-50-0212
		KP43	6	8-50-0213
		KP43	8	8-50-0214

Sensors

Order data

	Description		Order no.
	With signal display with, 100 mm Cable and 3-pin M8 circular plug-In connector. contains 1 piece	PNP, normally closed contact	8-14-0022
		PNP, normally open contact	8-14-0023
		NPN, normally closed contact	8-14-0024
		NPN, normally open contact	8-14-0025

Dimensional drawings

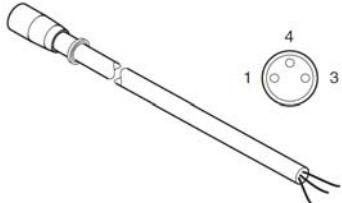
	Total length	Thread length	Cable length
	A	B	L
	[mm]	[mm]	[m]
	33	25	100
	nc		

Technical data

Model		Zylindrical thread M8 x 1
Approvals		CE
Electrical connection (PUR-cable with M8 connector)	[m]	0,10
Nominal switching distance Sn(in the case of steel)	[mm]	1 ... 15%
Hysteresis		<15% of the real switching distance
Degree of protection as per IEC 60529		IP67
Temperature (storage)	[°C]	-40 ... +85
Temperature (operation)	[°C]	-25 ... +70
Housing material		Nickel-plated brass
Cable material		PUR, 3 x 0,12mm², length 10cm
Function indicator output		Yellow LED
Function indicator supply voltage		no
Supply voltage (PELV)	[Vdc]	12 ... 24 with reverse polarity protection
Supply voltage (including residual ripple)	[Vdc]	10 ... 36
Switching current (overload and short-circuit protection)	[mA]	< 200
Voltage drop, output conducting	[V]	< 2
No-load current	[mA]	< 10
Maximum switching frequency	[Hz]	5000
Switch-on time	[ms]	< 0,1
Switch-off time	[ms]	< 0,1

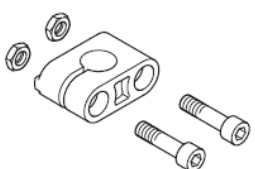
Sensor extension cable

Order data

	Description		Order no.
	Suitable for drag chain applications; sensor side end 3-pin M8 circular connector, second cable end open. contains 1 piece	5 m	8-10-0276
		10 m	8-10-0278
		20 m	8-10-0279

Sensor holder

Order data

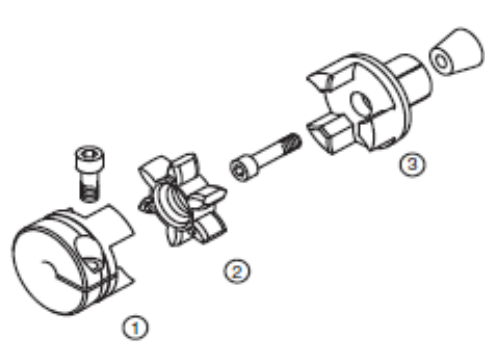
	Description	Order no.
	For standard limit switch with 8 mm, diameter; movable contains 10 piece	8-10-0263

Contact plate

Order data

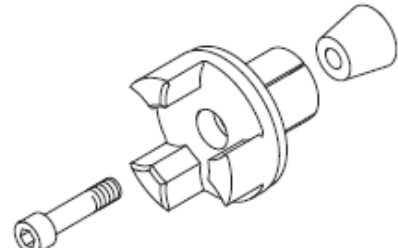
	Description	Order no.
	For mounting to the carriage of the axis. contains 1 piece Schaltblech 2 piece Schrauben	8-11-0758

Coupling assemblies

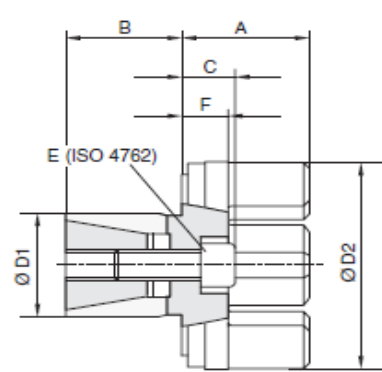
 Coupling assembly (1) Clamping hub (2) Elastomer spider (3) Expanding hub	Coupling assemblies are required to mount motors to axes. A coupling assembly consists of the following components: • 1 expanding hub for the axis end • 1 clamping hub for the motor end • 1 elastomer spider, as a decoupling element between the hubs • 2 screws
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Expanding hubs

Order data

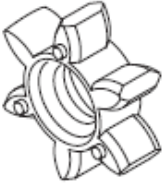
	Description		Order no.
	Expanding hub for the axis end	For axis ...	
	Contains 1 piece	KP41	SPM3MFSC10A14
		KP42	SPM3MFSC20A20
		KP43	SPM3MFSC25A30
		KP44	SPM3MFSC35A36

Dimensional drawings

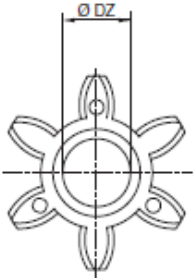
	For axis ...	Moment of inertia	Max. torque	Screw ISO 4762	Wrench size	Tightening torque	Installation length			Expanding hub h9		
		J	M _{max}	E			A	B	C	D1	D2	F
		kgcm ²	Nm		mm	Nm (lb-in)	mm					
KP41		0.009	7.7	M4	3	2.9 (25.67)	16	14	7	10	25	5
KP42		0.09	35.7	M6	5	10 (88.51)	22	20	8	20	40	8
KP43		0.32	82	M8	6	25 (221.27)	24	30	12	25	55	8
KP44		0.77	182	M10	8	49 (433.69)	25.5	36	13	35	65	8

Elastomer spiders

Order data

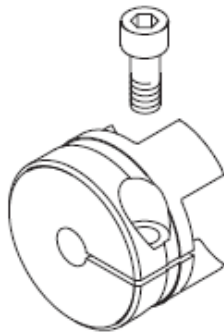
	Description		Order no.
	Decoupling element between the hubs Contains 1 piece	For axis ...	
		KP41	SPM3MFR09A018
		KP42	SPM3MFR14A034
		KP43	SPM3MFR20A120
		KP44	SPM3MFR25A320

Dimensional drawings

		Shore hardness	Max. torque	Nominal torque	Moment of inertia	Diameter
	For axis ...		M_{max}	M_N	J	DZ
			Nm	Nm	kgcm ²	mm
	KP41	98 Sh A	18	7	0.001	9
	KP42	98 Sh A	34	17	0.013	14
	KP43	98 Sh A	120	60	0.067	20
	KP44	98 Sh A	320	160	0.15	25

Clamping hubs

Order data

	Description			Order no.
	Clamping hub			
	Contains 1 piece			
	For axis ...	D1 (mm) ¹⁾ Please inquire for other diameters	M _{max} (Nm) Maximum torque that can be trans- mitted	
	KP41	6.35	6.8	SPM3MFCC06A06
		8	7.4	SPM3MFCC08A06
		9	7.8	SPM3MFCC09A06
		10	9.7	SPM3MFCC10A06
		11	10.7	SPM3MFCC11A06
		12	11.6	SPM3MFCC12A06
		14	12.2	SPM3MFCC14A06
	KP42	6.35	32.5	SPM3MFCC06A07
		8	35	SPM3MFCC08A07
		9	36	SPM3MFCC09A07
		10	41	SPM3MFCC10A07
		11	45	SPM3MFCC11A07
		12	50	SPM3MFCC12A07
		14	53	SPM3MFCC14A07
		16	55	SPM3MFCC16A07
		19	58	SPM3MFCC19A07
		20	60	SPM3MFCC20A07
	KP43	12	49	SPM3MFCC12A08
		14	54	SPM3MFCC14A08
		19	75	SPM3MFCC19A08
		20	76	SPM3MFCC20A08
		22	78	SPM3MFCC22A08
		24	85	SPM3MFCC24A08
		25	98	SPM3MFCC25A08
	KP44	12	108	SPM3MFCC12A09
		14	111	SPM3MFCC14A09
		19	128	SPM3MFCC19A09
		20	138	SPM3MFCC20A09
		22	154	SPM3MFCC22A09
		24	158	SPM3MFCC24A09
		25	160	SPM3MFCC25A09

1) See dimensional drawings

Dimensional drawings

	For axis ...	Moment of inertia	Screw ISO 4762	Wrench size	Tightening torque	Hub length	Bore depth H7	Distance between centers	Inside diameter		Outside diameter	
		J kgcm ²	E	mm	Nm (lb-in)	A	B	C	D1	D2	DK	F
	KP41	0.015	M3	2.5	1.9 (16.82)	22	11	5	1)	25	25.8	8
	KP42	0.15	M6	5	14 (123.91)	31	17	8	1)	40	45	14
	KP43	0.55	M6	5	14 (123.91)	36	20	10	1)	55	57.5	20
	KP44	1.22	M8	6	35 (309.78)	39	21	9	1)	65	73	25

1) See order data

Shaft extension

Order data

	Description		Order no.
	Components such as a motor or an encoder can be coupled to the shaft extension.		
	Contains 1 piece		
	For axis ...		
	KP41		8-03-0044
	KP42		8-03-0045
	KP43		8-03-0046
	KP44		8-03-0047

Dimensional drawings

	For axis ...	Mass	Maximum radial force	Moment of inertia	Max. torque	Screw ISO 4762	Wrench size	Tightening torque	Shaft length	Collar length	Shaft extension diameter H7	Diameter
		m kg	F _R N	J kgcm ²	M _{max} Nm	E	mm	Nm (lb-in)	A	B	D1	D2
	KP41	0.012	230	0.002	7.7	M4	3	2.9 (25.67)	12	5.5	12	17
	KP42	0.073	400	0.05	35.7	M6	5	10 (88.51)	27	7	20	35
	KP43	0.148	700	0.16	82	M8	6	25 (221.27)	32	7.5	25	45
	KP44	0.311	1300	0.54	182	M10	8	49 (433.69)	37	9	32	55

Grease guns

Grease guns are available in two different sizes:

Article number: 5-12-0009
 Designation: GN-080M grease gun for 70g bellows cartridge
 Quantity per stroke: 0.5 cm³
 Article number: 5-12-0010
 Designation: GN-400C grease gun for 400g cartridge
 Quantity per stroke: 0.8 cm³

These grease guns are delivered with a set of nozzles that were designed to grease profiled guide rails
 Article number for set of nozzles without grease gun: 5-12-0035

HIWIN Greases

HIWIN offers the following greases in various packages. The properties and areas of application are described in the chapter "Accessories".

Article Number	Package Designation	Grease Type Designation	Area of Application of the Grease
5-12-0012	70g cartridge	G01	Heavy duty application
5-12-0013	400g cartridge	G01	Heavy duty application
5-12-0014	1kg tin	G01	Heavy duty application
5-12-0015	70g cartridge	G02	Clean room
5-12-0016	400g cartridge	G02	Clean room
5-12-0017	1kg tin	G02	Clean room
5-12-0018	70g cartridge	G03	Clean room v > 1 m/s
5-12-0019	400g cartridge	G03	Clean room v > 1 m/s
5-12-0020	1kg tin	G03	Clean room v > 1 m/s
5-12-0021	70g cartridge	G04	High-speed v > 1 m/s
5-12-0022	400g cartridge	G04	High-speed v > 1 m/s
5-12-0023	1kg tin	G04	High-speed v > 1 m/s
5-12-0024	70g cartridge	G05	Standard applications
5-12-0025	400g cartridge	G05	Standard applications
5-12-0026	1kg tin	G05	Standard applications

Glossary

Terms and Abbreviations

See chapter 2.5 "Standards and terminology" for information on the pertinent standards on which many terms are based. Some terms and abbreviations may have specific meanings with regard to the standards.

<i>Axis body</i>	The axis body is a aluminum precision profile.
<i>Ball screw drive</i>	The ball screw drive converts a rotary movement into a linear movement. It consists of a ball screw, a ball nut with the ball recirculating elements and the bearing balls. A ball screw drive has a very high efficiency. It allows for high-precision, stiff feed movements and generates high feed forces at high positioning accuracy and repeatability.
<i>Ball screw pitch</i>	The pitch of the ball screw shaft relates to the distance covered by the carriage per revolution of the ball screw. The greater the pitch the higher the maximum velocity. The following applies to the ball screw pitch: • High pitch requires high driving torque • High pitch results in high velocity • High pitch causes high inaccuracy
<i>Breakaway torque</i>	The breakaway torque describes the driving torque required to overcome the static friction and that initiates the transition to sliding friction.
<i>Buckling stress</i>	Buckling is the loss of stability of the ball screw shaft when the maximum buckling is the loss of stability of the ball screw when the maximum permissible thrust forces whose line of application is along the axis of the ball screw axis is exceeded. Excessive buckling stress results in a rapidly increasing deformation and deflection of the ball screw shaft.
<i>Cantilever axis</i>	In the case of a cantilever axis, the carriage is stationary while the axis body moves. Portal axes work the other way round.
<i>Critical speed of the ball screw shaft</i>	If the critical speed of the ball screw shaft is exceeded, deflection of the ball screw and resonance will occur. This will seriously affect the service life of the ball screw drive. Ball screw supports are installed in longer linear axes to increase the critical speed of the ball screw shaft speed and thus the performance data.
<i>DOM</i>	(Date of manufacture). The nameplate of the product shows the date of manufacture in the format DD.MM.YY or in the format DD.MM.YYYY. Example: 31.12.09 corresponds to December 31, 2009 31.12.2009 corresponds to December 31, 2009

<i>Degree of protection</i>	The degree of protection is a standardized specification for electrical equipment that describes the protection against the ingress of foreign objects and water (for example: IP 20).
<i>Direction of rotation</i>	Rotation of the motor shaft in a positive or negative direction of rotation. Positive direction of rotation is when the motor shaft rotates clockwise as you look at the end of the protruding motor shaft.
<i>Drive element</i>	The drive element of the linear axis is a ball screw drive.
<i>Error class</i>	Classification of errors into groups. The different error classes allow for specific responses to errors, for example by severity.
<i>Fatal Error</i>	In the case of fatal error, the product is no longer able to control the motor so that the power stage must be immediately disabled.
<i>Fault</i>	Fault is a state that can be caused by an error. Further information can be found in the pertinent standards such as IEC 61800-7, ODVA Common Industrial Protocol (CIP).
<i>Fault reset</i>	A function used to restore the drive to an operational state after a detected error is cleared by removing the cause of the error so that the error is no longer active.
<i>Feed per revolution</i>	The feed per revolution is the distance the carriage covers per motor revolution.
<i>Linear guide</i>	The linear guide consists of the guide carriage and the recirculating ball bearing guide.
<i>Load torque</i>	The permissible load torques are calculated based on the service life of the carriage guide. If the load torque exceeds the specified values, the service life of the axis will be reduced.
<i>Modulus of elasticity</i>	The modulus of elasticity is used to describe the tendency of a material to deform along an axis when opposing forces are applied along this axis; it is the ratio of tensile strain and tensile stress. The higher the value, the stiffer the material.
<i>Mounting position</i>	The linear axis can be installed in any desired position. However, all external forces and torques must be within the ranges of permissible values.
<i>Portal axis</i>	In the case of a portal axis, the axis body is stationary while the carriage moves. Cantilever axes work the other way round.
<i>Positioning accuracy</i>	Positioning accuracy is the tolerance between the specified position and actual position.
<i>Recirculating ball bearing</i>	The axis axis body absorbs the forces and torques applied at the carriage via the recirculating ball bearing guide. The recirculating ball bearing guide can absorb high forces and torques.
<i>Repeatability</i>	Repeatability is the accuracy with which it is possible to move to a previous position again under the same conditions.

<i>Running accuracy</i>	Due to the manufacturing process, the extruded aluminium profiles have a certain tolerance in terms in straightness and twist. The tolerances are specified in EN 12020-2. To reach the desired running accuracy, the linear axis must be mounted on a precision-machined surface.
<i>Sensor</i>	Inductive proximity switches are used as sensors for limit switches or reference switches. These switches are not a safety function.
<i>Service life</i>	The service life is the distance in kilometers before the first signs of material fatigue can be seen on the guides, the drive elements and the bearings. Service life specifications (kilometers covered) relate to the nominal values specified in the data sheet. If the nominal values are exceeded, the service life decreases accordingly.
<i>Stiffness</i>	Stiffness is a measure of the ability to move and hold with high position accuracy a part to be positioned even when the load changes.
<i>Stroke reserve</i>	The stroke reserve is the distance between a limit switch and the mechanical stop.
<i>Stroke</i>	Stroke is the maximum travel of the carriage between the switching points of the limit switches.
<i>Support axis</i>	A support axis has linear guides, but no drive elements. A support axis carries loads that are applied asymmetrically to the carriage and improves the stability and service life of the system.
<i>Warning</i>	If the term is used outside the context of safety instructions, a warning alerts to a potential problem that was detected by a monitoring function. A warning is not an error and does not cause a transition of the operating state.