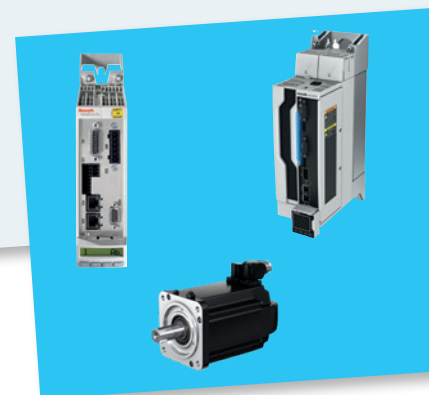
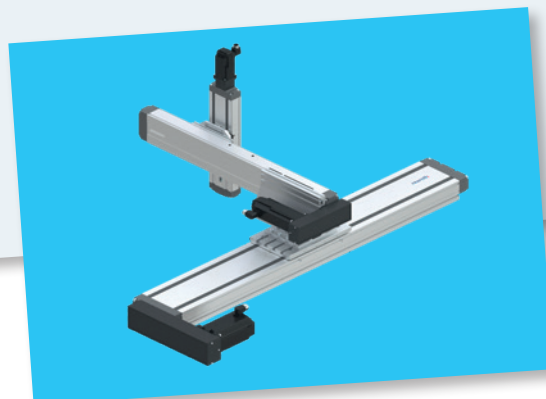
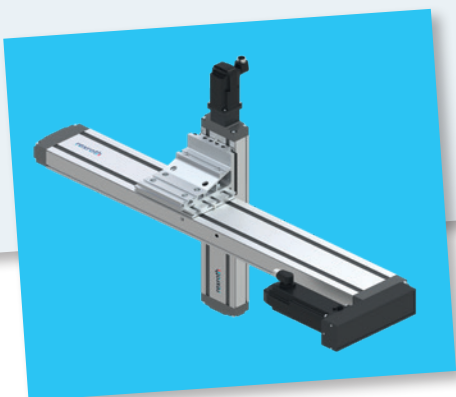
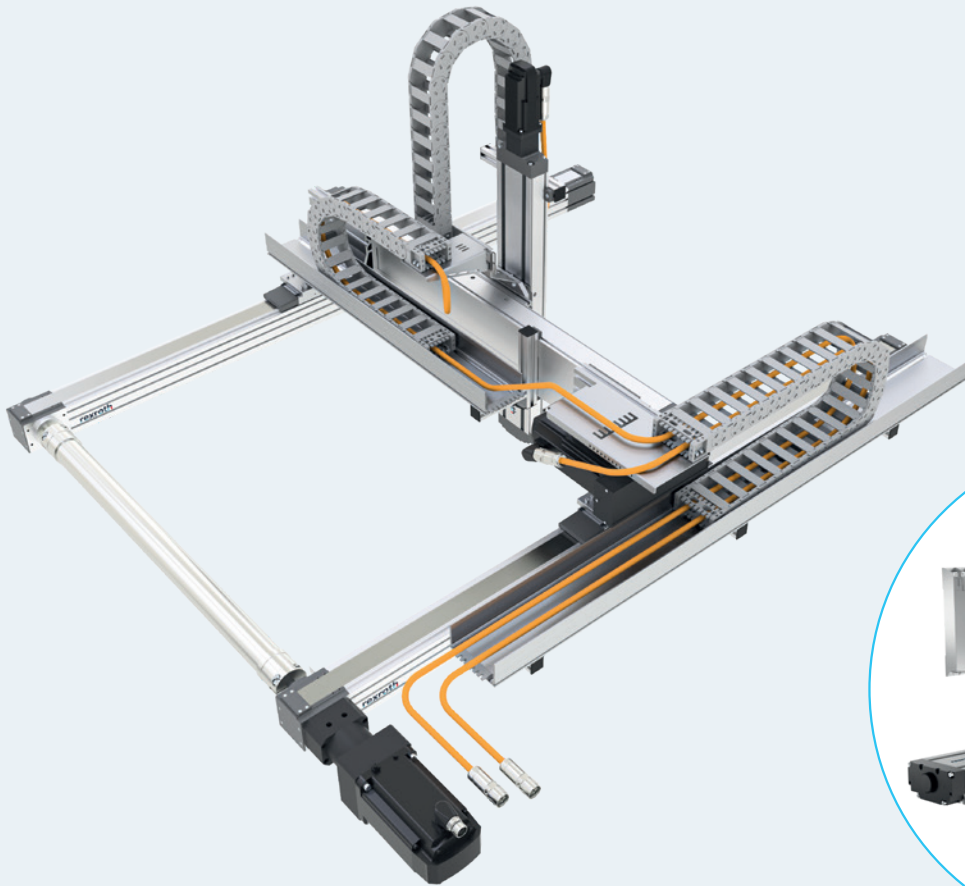


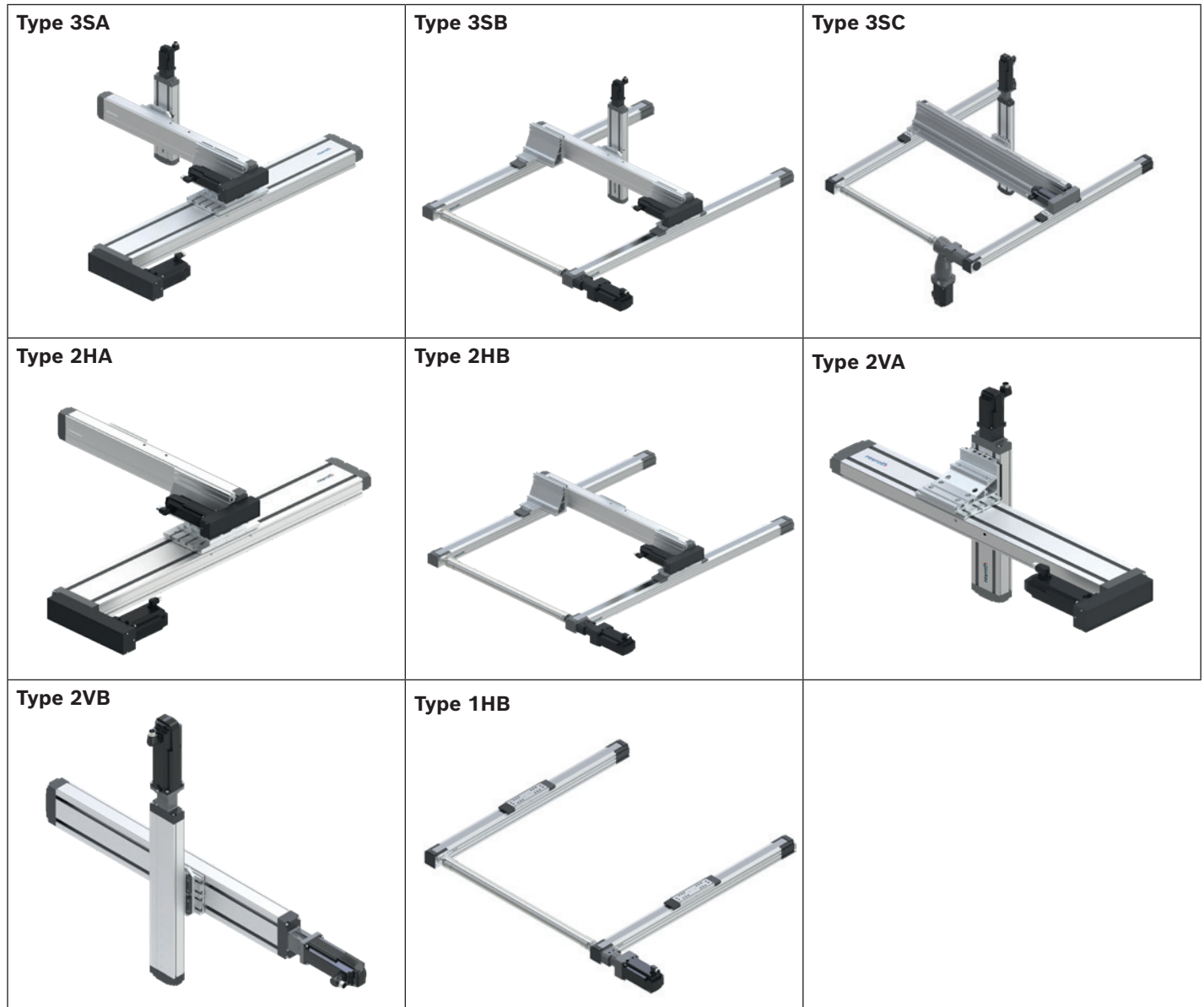
# Multi-axis systems/Smart Function Kits

## Smart Function Kits Handling (SFK-H) / Dispensing (SFK-D)



<b>Example</b>		CMS	-	3SB	-	30	-	2
<b>System</b>	=	<b>Multi-axis system</b>						
<b>Combination of axes</b>	=	3SA - 3D cantilever chamber <b>3SB</b> - 3D gantry 3SC - 3D gantry, performance-optimized 2HA - 2D cantilever surface 2HB - 2D area gantry 2VA - 2D linear gantry 2VB - 2D linear gantry, wall mounting 1HB - 1D gantry						
<b>Size</b>	=	20 / 21 / 22 / 23 / <b>30</b> / 31 / 32 / 33 / 40 / 41						
<b>Generation</b>	=	Product generation <b>2</b>						

**Combination of axes / overview of types**



# Contents

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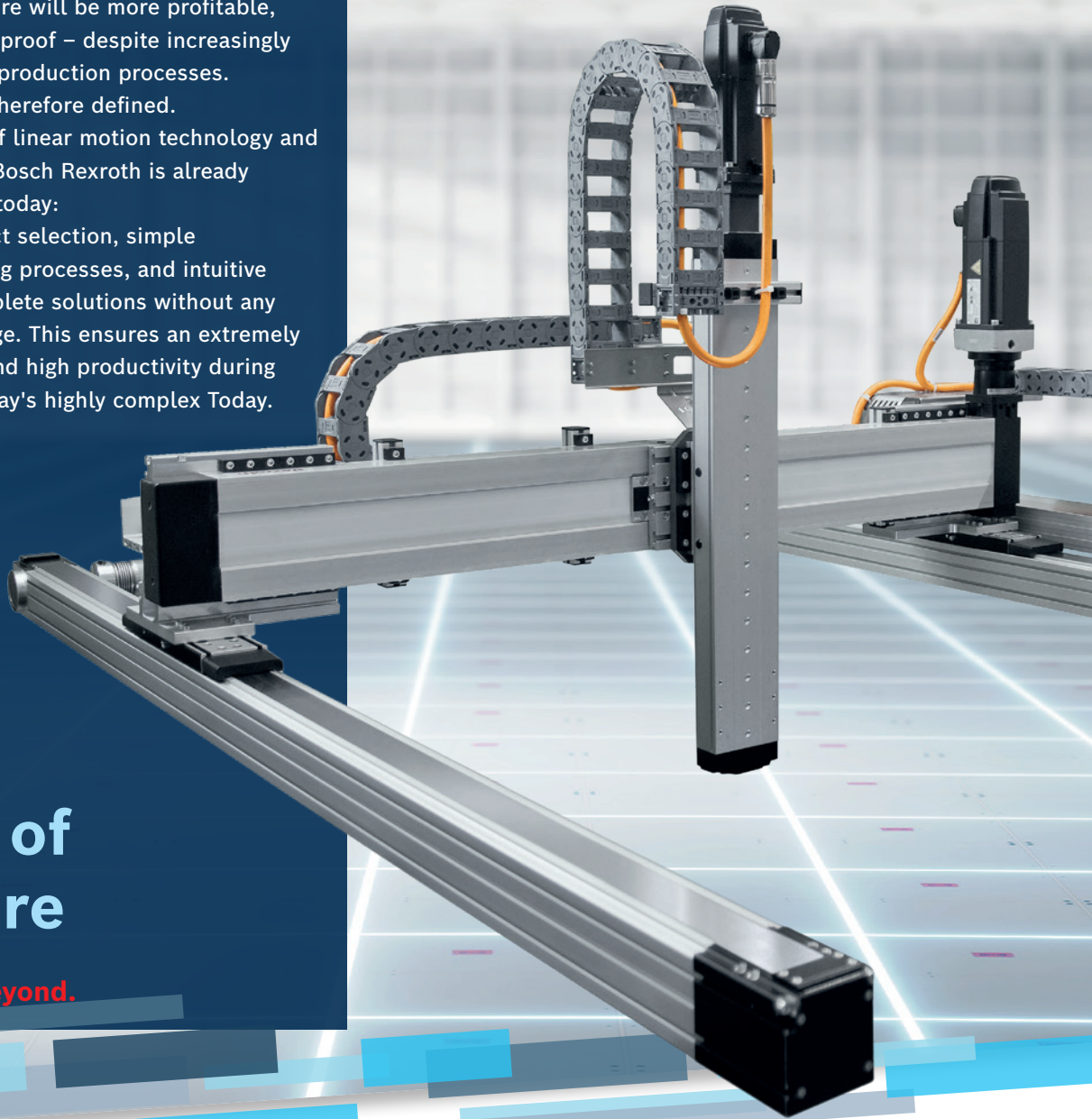
# Product overview

## LINEAR MOTION TECHNOLOGY ONE GENERATION AHEAD: COMPLETE SOLUTION - MINIMAL ENGINEERING:

The Factory of the Future will be more profitable, sustainable and future-proof – despite increasingly individual and flexible production processes. The requirements are therefore defined. As a leading supplier of linear motion technology and mechatronic systems, Bosch Rexroth is already providing the answers today: with quick click product selection, simple configuration & ordering processes, and intuitive commissioning of complete solutions without any programming knowledge. This ensures an extremely short time-to-market and high productivity during operation, even for today's highly complex Today.

# Factory of the future

Now. Next. Beyond.



## NEARLY UNLIMITED FIELDS OF APPLICATION FOR MULTI-AXIS SYSTEMS



Pick & place



Positioning



Palletizing



Feeding



Move



Parts placement

# New standard for ready-to-install sub-systems: easier to select and configure, faster to install and get started

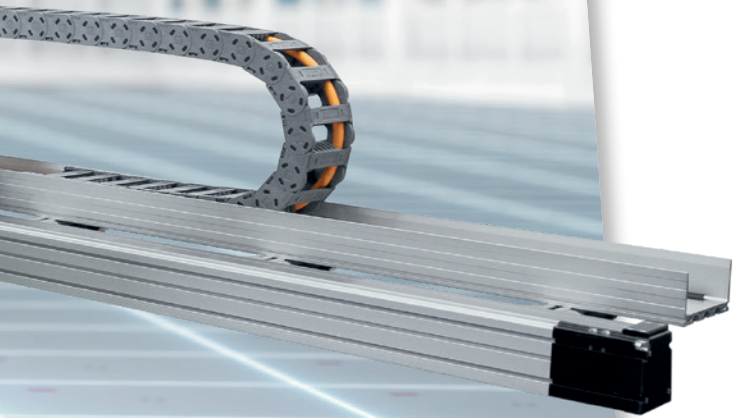
## MULTI-AXIS SYSTEMS MADE EASY. EVERYTHING FROM A SINGLE SOURCE

Bosch Rexroth now makes the path to a ready-to-install sub-system unbeatably simple. More than 30 years of linear axis expertise have gone into the new multi-axis modular system and the completely revised LinSelect selection tool. There is no easier or faster way to select, configure and commission Cartesian multi-axis systems from standardized best-in-class components. You'll benefit from the latest generation of multi-axis systems from Bosch Rexroth: You'll receive ready-to-install, scalable positioning, handling and dispensing solutions made of proven and perfectly matched components, including all attachments, cable systems, motors and drive controllers – all from a single source, all from one company.

And if your fully assembled, fully integrable sub-system needs to be able to do even more, then take a look at the next step: Smart MechatroniX (see Smart Function Kits chapter) expands the components to include sensors, electronics and software – with completely new solution approaches and business models.

### WE MOVE. YOU WIN.

◀ A smart solution as complete system – including sensors, electronics and software: Smart Function Kit Dispensing or Handling. See Smart Function Kits chapter.



Picking



Stacking



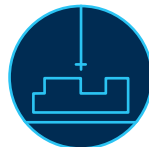
Dispensing



Discharging



Sorting



Checking



Mounting



Bolting

# A customized multi-axis system with just a few clicks

You can easily check whether the latest generation of the LinSelect selection tool fulfills what is stated in the specifications – "simpler, faster and better than anything you know": **Download LinSelect (see link below) and try the tool for yourself. Or find out about the most important innovations and highlights here in advance.**

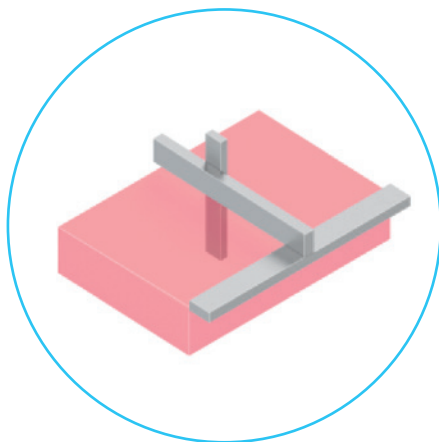


[www.boschrexroth.de/linselect](http://www.boschrexroth.de/linselect)

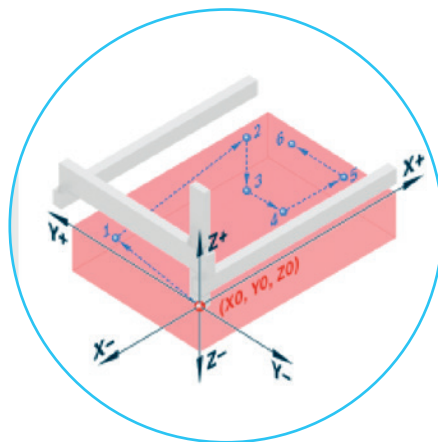
## 30 YEARS OF LINEAR AXIS KNOW-HOW INSIDE

Experience the concentrated expert knowledge of a leading supplier in linear motion technology – and as part of the Bosch Group also as a leading user – in every selection step of the new LinSelect. You are graphically guided and asked for a few parameters. This allows you to easily and quickly generate the appropriate reference cycle for your application, then receive detailed information and choices on running performance such as repeatability, for example. You can easily put together your own system from standardized best-in-class components, including electrics, software, drive and motor, with just a few clicks and without any engineering effort.

As a result, you will receive a recommendation in different performance variants and price settings – just as you are used to in a private context from online shops. You can then transfer the system data directly to the configurator and place your order. The CAD models are automatically available at Bosch Rexroth. By the way, commissioning is similarly fast. Could it be any easier?



- ▲ Simple selection via graphical interfaces instead of input fields



- ▲ Simply select a reference cycle instead of creating complex travel profiles



- ▲ Simply use interactive graphics instead of confusing tables



**Bester Preis**



**CMS-3SA-22-2**

- Technik
- Preis
- Lieferzeit





**Beste Lieferzeit**



**CMS-3SB-22-2**

- Technik

**definieren**

Systemname	Produktschlüssel
	CMS-3SA-22-2, 1170 mm/6...
	CMS-2VA-22-2, 820 mm/370...
	CKK-090-NN-1, 585 mm/MF0...
	EMC-063-NN-2, 360 mm/RV...

**Produktauswahl**

▲ Simply choose from clear recommendations instead of time-consuming comparison and filtering

▲ Easy central access to all project information and links instead of long searches

## LINSELECT - SIMPLE SELECTION MINIMAL ENGINEERING



### FEW PARAMETERS, ALL POSSIBILITIES – MANY ADVANTAGES

- + Fast:**
  - ▶ Select mechanics/motors/drive controllers in a single tool
  - ▶ Fast engineering, fast result, shorter time-to-market
- + Intuitive:**
  - ▶ Years of application experience implemented in easy-to-use interfaces
  - ▶ Visual support through interactive graphics and animations
- + Intelligent:**
  - ▶ Input of few parameters – output of prepared complex results with all relevant data
  - ▶ Transparent result overview with clear recommendation depending on performance requirements, delivery time or price
- + Interactive:**
  - ▶ Continuous tool chain: Automatically transfer result to the online configurator, finish configuration, order and generate CAD data
  - ▶ Central project and link management as well as documentation, bundled access to all project information – no decentralized storage, no long searches

### Prozess definieren

Der Referenzprozess kann sehr leicht angepasst werden. Einfach den gewünschten Parameter überschreiben und aktualisieren. Mit 'Individuell' können einzelne Prozessschritte angepasst, gelöscht oder eingefügt werden.

Z-Verfahrweg	<input type="text" value="300"/>	[mm]
Y-Verfahrweg	<input type="text" value="600"/>	[mm]
X-Verfahrweg	<input type="text" value="1200"/>	[mm]
Gesamtzykluszeit	<input type="text" value="8"/>	[s]
Nebenzeiten	<input type="text" value="3"/>	[s]
<small>= ext. Greifer öffnen/ schließen</small>		
Masse	<input type="text" value="5"/>	[kg]
<small>= ext. Greifer + ext. Anbauteile + ext. Masse</small>		
Massenschwerpunkt		
X-Position	<input type="text" value="0"/>	[mm]
Y-Position	<input type="text" value="0"/>	[mm]
Z-Position	<input type="text" value="-100"/>	[mm]

← Zurück Individuell Aktualisieren

### Empfehlungen

#### Beste Technik



**CMS-35B-21-2**

- Technik
- Preis
- Lieferzeit

#### Bester Preis



**CMS-35A-22-2**

- Technik
- Preis
- Lieferzeit

#### Beste Lieferzeit



**CMS-35B-22-2**

- Technik
- Preis
- Lieferzeit

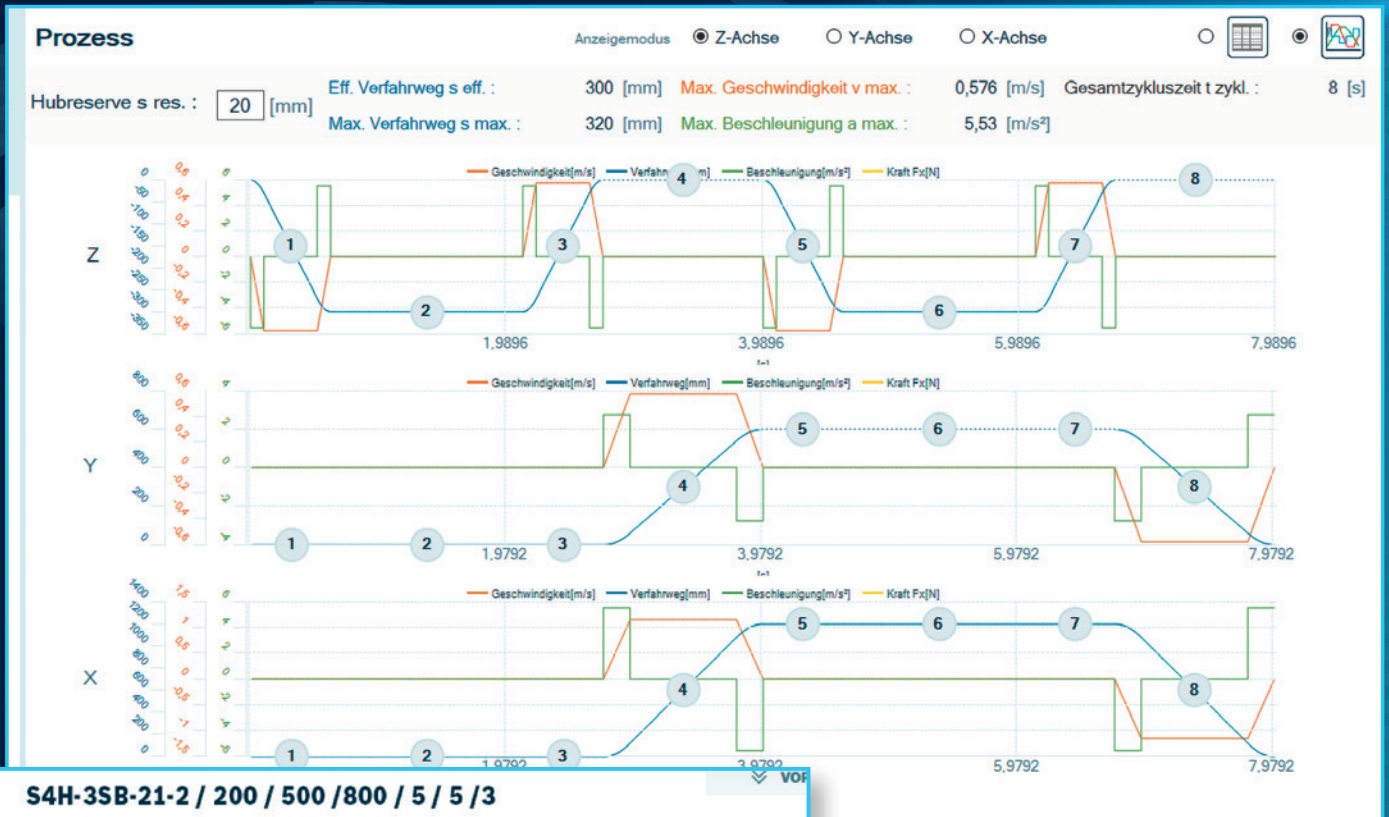


◀ **SIMPLE INPUT**

Choose from 2 to 3 reference cycles – the system shows you the corresponding animation. Then simply define your desired system with 6 to 8 parameters for travel range, time and mass – LinSelect does the rest.

▼ **DETAILED OUTPUT**

LinSelect transforms your inputs into detailed characteristic curves for each axis. You have at least two reference cycles to choose from per portal. And you can conveniently continue to customize and play through them.



**S4H-3SB-21-2 / 200 / 500 / 800 / 5 / 5 / 3**

**Konfiguration**

Max. Verfahrweg Z	200	[mm] (Sub-Produkt CKK-090-NN-1)
Max. Verfahrweg Y	500	[mm] (Sub-Produkt CKR-110-NN-1)
Max. Verfahrweg X	800	[mm] (2 x Sub-Produkt MKR-065-NN-3)
Mechanischer Antrieb Z	5	Kugelumtrieb / BASA 12x5
Mechanischer Antrieb Y	5	Riementrieb / Getriebe PG005S-MF i=5
Mechanischer Antrieb X	3	Riementrieb / Getriebe PG060 i=3
Motor Z	MS2N03-B0BYN	MS2N03-B0BYN
Haltebremse Z	Y	mit Haltebremse 1-Kabel-Anschluss-technik Konvektionskühlung
Motor Y	MS2N04-B0BTN	MS2N04-B0BTN
Haltebremse Y	Y	mit Haltebremse 1-Kabel-Anschluss-technik Konvektionskühlung
Motor X	MS2N04-C0BTN	MS2N04-C0BTN
Haltebremse X	Y	mit Haltebremse 1-Kabel-Anschluss-technik Konvektionskühlung
Automations- & Antriebspaket		CtrlX, PR21, WEB HMI
Funktionspaket		Handling

◀ **QUICK RESULT**

You'll receive an overview of the possible variants along with a recommendation depending on performance requirements, price or delivery time.



You prefer to work differently? We will also show you other ways to select and configure – as individually as you like.  
▶ "Your way to the product" chapter

# Best-in-class linear axes for motions in space



## PROVEN QUALITY – FROM A SINGLE SOURCE, FROM ONE COMPANY

In the field of linear motion technology, Bosch Rexroth is second to none. For 30 years, we have stood for best-in-class components. They are the proven basis for state-of-the-art, robust, high-precision and yet economical multi-axis systems. And the best thing of all: Bosch Rexroth can also supply you with all the additional components and add-on parts required for your individual axis combination. All components are from a single source, optimally tailored to each other and quickly selected and configured. Could it be any easier?

▲ Handling portal instead of a robot.  
An economical solution not only in intralogistics

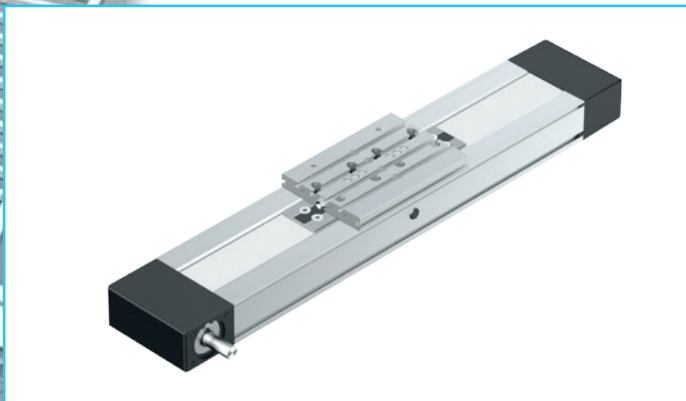
## COMPACT MODULES



### CKK – compact linear axis with two integrated ball rail systems and ball screw assembly

#### Features

- ▶ 5 sizes from CKK-070 to CKK-200
- ▶ Precision aluminum profile with two preloaded ball rail systems
- ▶ Drive via precision ball screw assembly
- ▶ Protection of the installation elements by cover plate and cover strips
- ▶ Max. travel 1,800 mm
- ▶ High travel speeds of up to 1.6 m/s
- ▶ Any lengths available in mm steps



### CKR – compact linear axis with two integrated ball rail systems and toothed belt drive

#### Features

- ▶ 4 sizes from CKR-090 to CKR-200
- ▶ Precision aluminum profile with two preloaded ball rail systems
- ▶ Robust toothed belt drive (allows longer lengths than CKK module)
- ▶ Intelligent toothed belt guide protects internal components
- ▶ Max. travel 3,000 mm
- ▶ High travel speeds of up to 5 m/s
- ▶ Any lengths available in mm steps

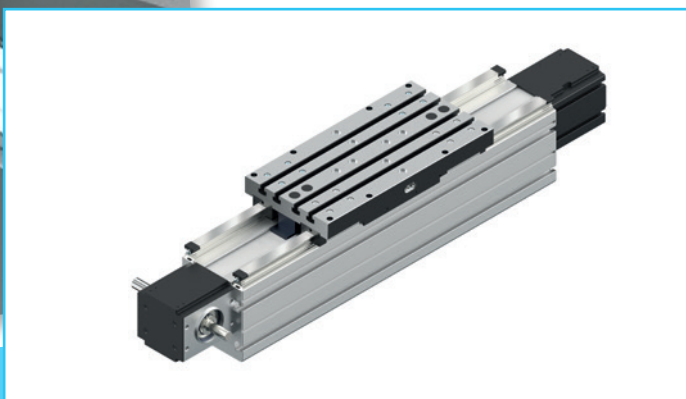
## LINEAR MODULES



### MKR – compact linear module with integrated ball rail system and toothed belt drive

#### Features

- ▶ 4 sizes from MKR-065 to MKR-140
- ▶ Extremely compact aluminum profile with preloaded ball rail system
- ▶ High-performance toothed belts for high travel speeds of up to 5 m/s
- ▶ Corrosion resistant steel cover strip
- ▶ Max. travel 3,000 mm
- ▶ Any lengths available in mm steps



### MKR-145 - compact linear module with 2 ball rail systems and toothed belt drive

#### Features

- ▶ Compact aluminum profile with high inherent rigidity and 2 preloaded ball rail systems
- ▶ High-performance toothed belts for high travel speeds of up to 5 m/s
- ▶ Max. travel range 2,150 mm
- ▶ Any lengths available in mm steps

# Compact meets modularity: Servo drives and motors



## ctrlX DRIVE – THE MOST COMPACT DRIVE SYSTEM

In addition to the proven drives such as from the HCS01 series, the world’s most compact modular drive system is now available with ctrlX DRIVE. For absolutely future-proof multi-axis solutions. The ctrlX CORE control hardware is optionally integrated in the drive housing – saving you up to 50 percent space in the control cabinet. And even more in combination with the modern MS2N motors, as these offer up to 30 percent higher power density. It couldn’t be more compact.

### Complete performance package

Particularly in complex multi-axis machine systems, the multi-variant and scalable drive portfolio can demonstrate its strengths. With ctrlX DRIVE, all System components can be freely combined with each other – plus the option of comprehensive extensions of the hardware/ software functions.

With a reaction time of around 4 ms, ctrlX SAFETY will offer one of the fastest SafeMotion solutions on the market in the future. Energy management functions ensure energy efficiency, and the patented Smart Energy Mode reduces peak drive loads by up to 70 percent. In addition, ctrlX DRIVE has an extremely robust EMC design.

▲ ctrlX DRIVE: the new modular drive system, optionally with integrated control ctrlX CORE (left)

▼ Control and power in one: The proven IndraDrive Cs (HCS01 in 4 sizes) controls axes perfectly in the power range of multi-axis systems





▲ **MS2N synchronous servo motors – for more torque and higher rotary speeds. With practical single-cable connection**

#### HIGHLIGHTS ctrlX DRIVE SYSTEM

##### More productivity

- ▶ Converters and supply units with high peak power ratings
- ▶ Flexible power supplier concept – space saving, flexible, energy-efficient

##### Fewer components

- ▶ 50% less installation space in the control cabinet
- ▶ Perfect for 300 mm control cabinet
- ▶ Integrated ctrlX CORE – saves 100% control installation space

##### Less engineering

- ▶ Intelligent functions (multi-Ethernet, multi-encoder, integrated web server etc.)
- ▶ Easy diagnosis
- ▶ Less effort for engineering and wiring
- ▶ Single-cable technology

#### POWERFUL SERVO MOTORS

Our servo motors are the perfect team players in the ctrlX DRIVE portfolio. Boasting compact dimensions, they combine optimum dynamics with maximum precision of position, rotary speed, and torque values. Ideal for complex multi-axis systems.

#### Virtual commissioning

Designers have access to the digital twin of the motor, which is stored in a dimensioning tool and in the ctrlX DRIVE controller. Planning and dimensioning of even complex drive systems can therefore be virtualized quickly and reliably. Every motor is transformed into a data source for intelligent machines or i4.0 applications.

#### HIGHLIGHTS MS2N SERVO MOTORS

##### More productivity

- ▶ High torque density for greater power
- ▶ 5 sizes from MS2N03 to MS2N07
- ▶ Maximum dynamics of the servo axes due to low motor inertia and high overload capability

##### Fewer components

- ▶ Robust single-cable connection
- ▶ MS2N with integrated SafeMotion encoder – no further safety components required
- ▶ Motor as torque sensor makes external sensors redundant

##### Less engineering

- ▶ Plug-and-play encoder data memory for faster commissioning
- ▶ Digital twin of the thermal motor model

##### Further highlights

- ▶ Plain shaft without shaft seal ring
- ▶ Multi-turn encoder
- ▶ Advanced encoder (B) in conjunction with 1-cable connector (AcuroLink interface)
- ▶ IP64 protection class
- ▶ With or without holding brake
- ▶ Special ground connection terminal near motor flange (used as needed)

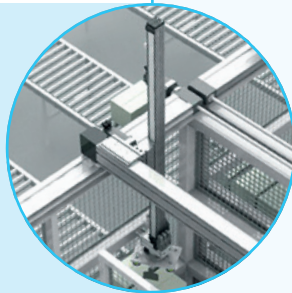
# Good to know: all details of a well thought out system

Practicality does not only become apparent in the tough day-to-day industrial operation, it can already be recognized beforehand by the many clever details, predefined interfaces and attachments as well as flexible options. Typical Bosch Rexroth

## GENERAL NOTES

### Installation position

The multi-axis systems are designed for use in a horizontal installation position on a flat surface.



### Ambient conditions

Please note for use:

- ▶ Avoid extreme room temperatures
- ▶ Steer clear of contamination
- ▶ Maintain dry environment
- ▶ Stay away from chemical impact
- ▶ Elude shocks/vibrations



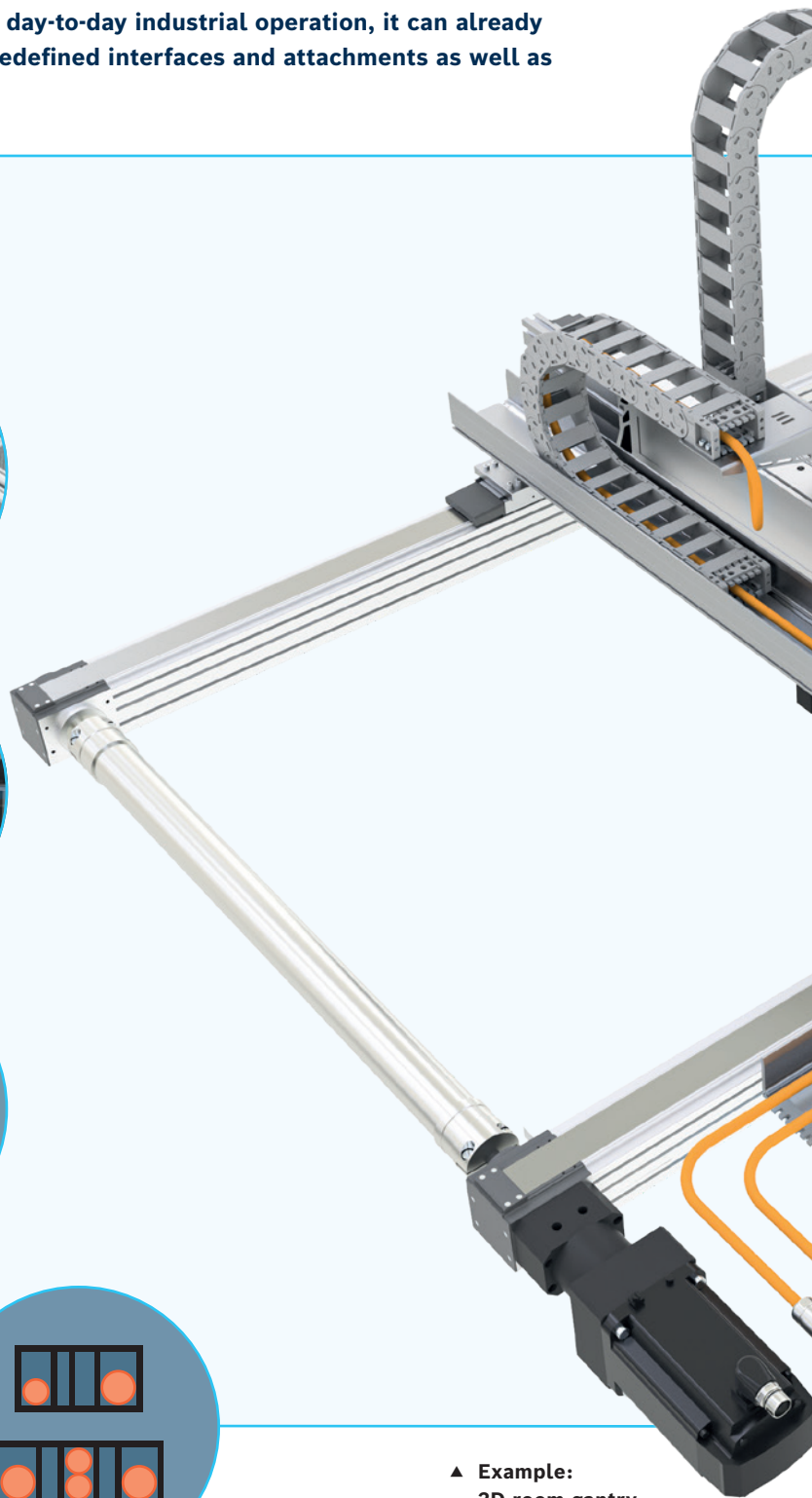
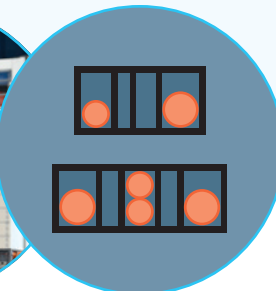
### Lubrication/maintenance

Multi-axis systems come with initial greasing and are designed for grease lubrication.

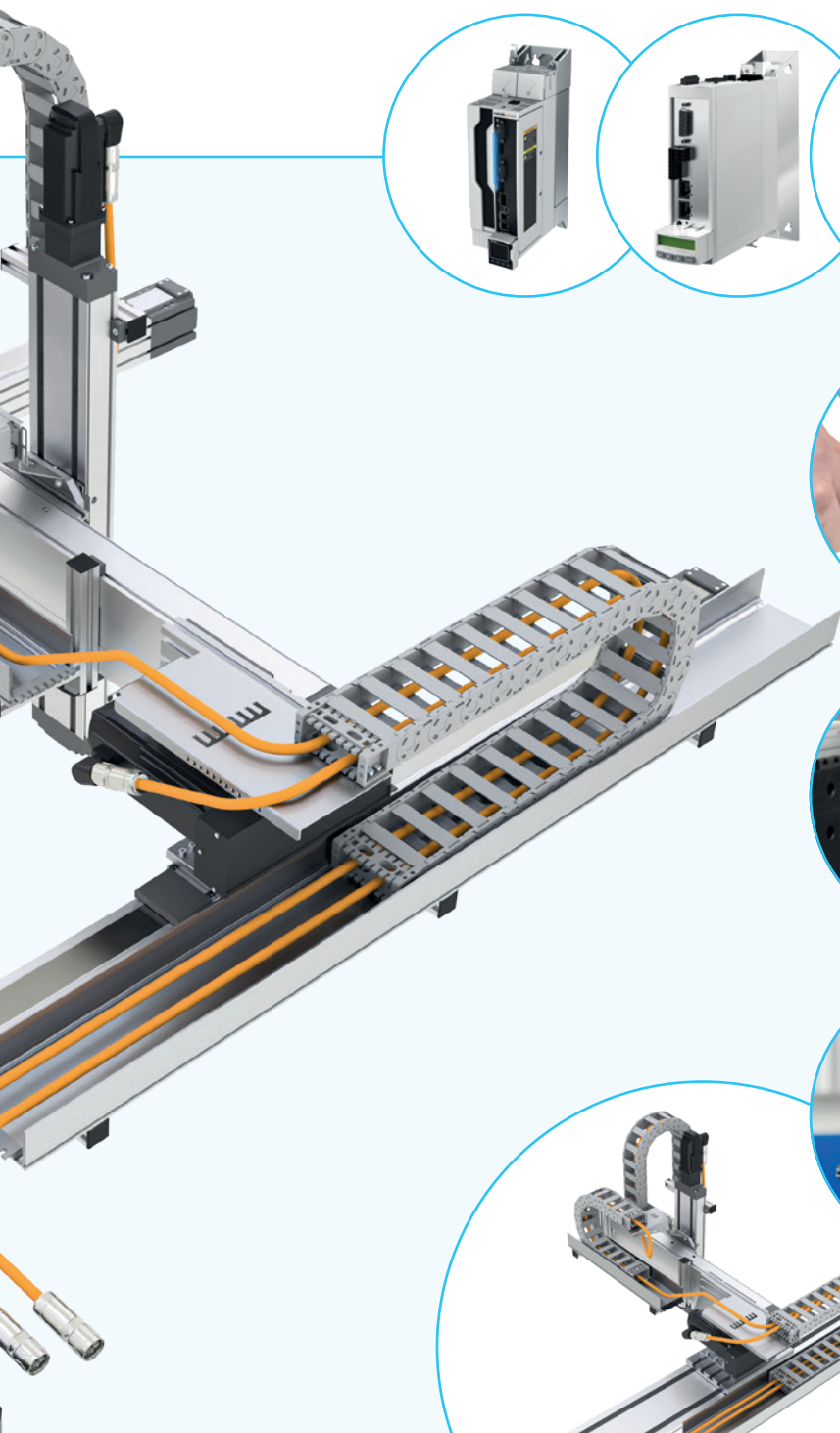


### Cable management

Multi-axis systems are optionally available with energy chains and cables (plug connection). With plenty of free cross-sections in the energy chains for your own cable routing.



▲ Example:  
3D room gantry



**Tailored motor-controller combination**

Predefined combinations of motor and controller (electrical drive package) optimally complement the mechanics to form a functional sub-system. The Smart Function Kits with pre-installed operating software offer even more. (Page 54).



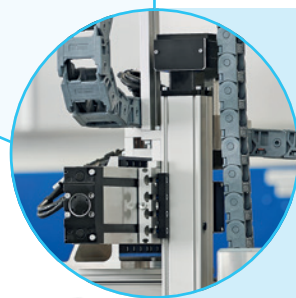
**Commissioning parameters on encoder memory in motor**

Simple commissioning through automated readout of the parameters stored in the motor encoder memory.



**Attachments, connection options**

Simple mounting of the axis unit on the mounting base via clamping fixtures. Wide range of connection options for customer attachments.

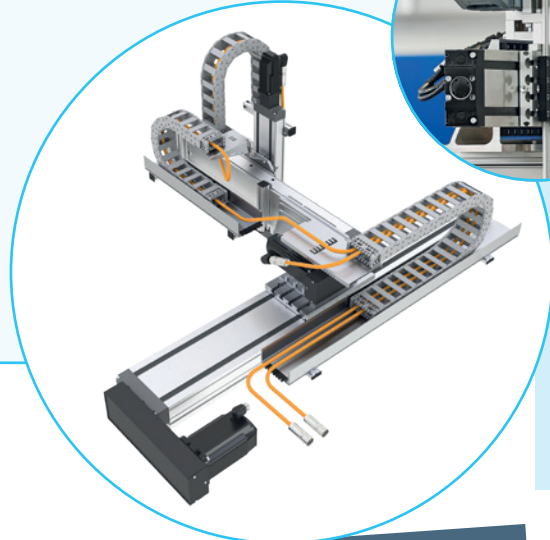


**Scope of delivery**

(depending on equipment)

Completely assembled: The multi-axis system is delivered fully assembled – including the energy chains and cables if cable management is selected as an option. The axis system is aligned on delivery and only needs to be adjusted to the mounting base during installation.

Partially assembled: For transport or handling reasons, the multi-axis system is delivered partially assembled. The assembly is carried out by the customer according to instructions.



► **Example:**  
3D cantilever space

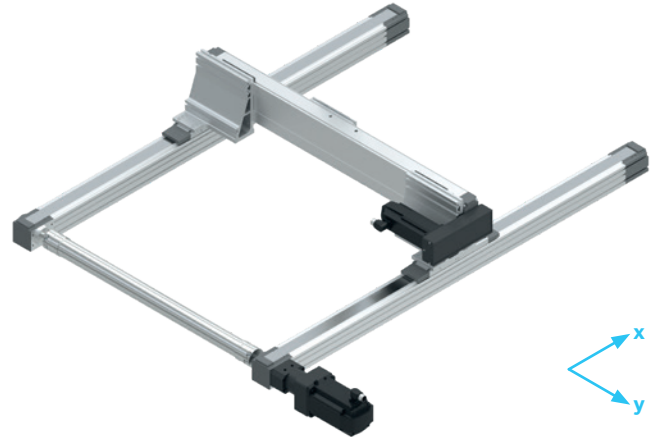
# Flexible in every respect: 8 combinations of axes for precise handling

**1D gantry**



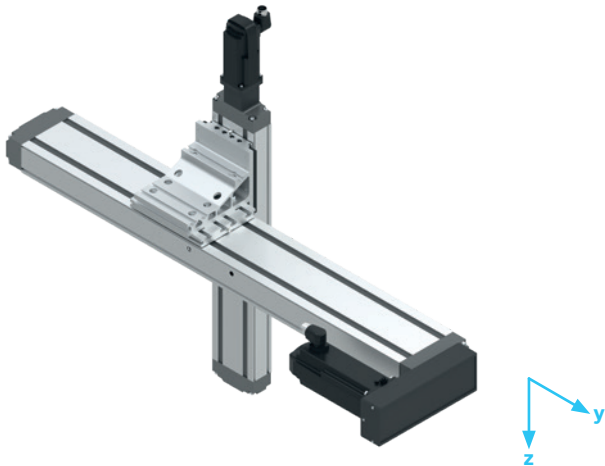
- ▶ 4 sizes
- ▶ Max. payload\* 62 - 366 kg
- ▶ Travel range [mm]  
x-axis min. 60, max. 3,000

**2D area gantry**



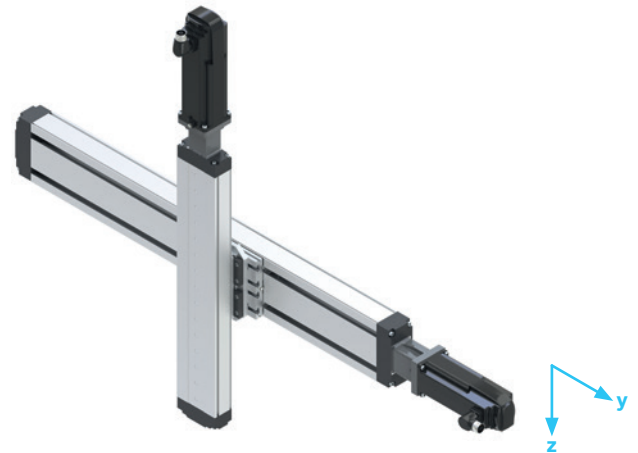
- ▶ 8 sizes
- ▶ Max. payload\* 25 - 205 kg
- ▶ Travel range [mm]  
x-axis min. 60, max. 3,000  
y-axis min. 60, max. 2,869

**2D linear gantry**



- ▶ 8 sizes
- ▶ Max. payload\* 10-61 kg
- ▶ Travel range [mm]  
y-axis min. 50, max. 3,000  
z-axis min. 40, max. 1,590

**2D linear gantry, wall mounting**



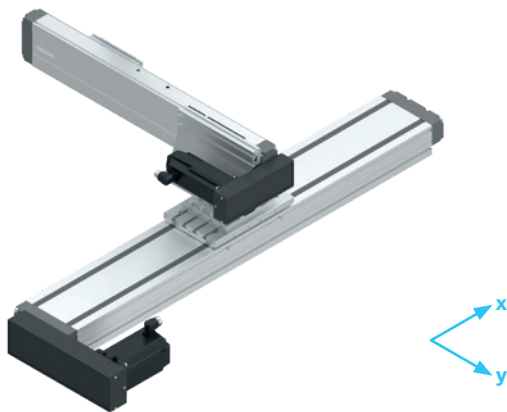
- ▶ 12 sizes
- ▶ Max. payload\* 2 - 61 kg
- ▶ Travel range [mm]  
y-axis min. 40, max. 3,000  
z-axis min. 40, max. 1,590

\* Depending on size, travel range and dynamics.



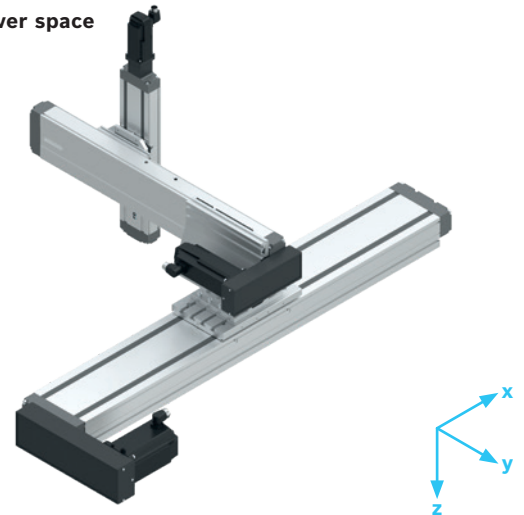
8 predefined axis combinations in 68 sizes offer you a lot of freedom for all common handling tasks. The travel ranges can be configured in all axial directions in mm increments. This allows you to make optimum use of installation space, obtain maximum flexibility during installation and adapt your sub-system perfectly to your application.

2D cantilever surface



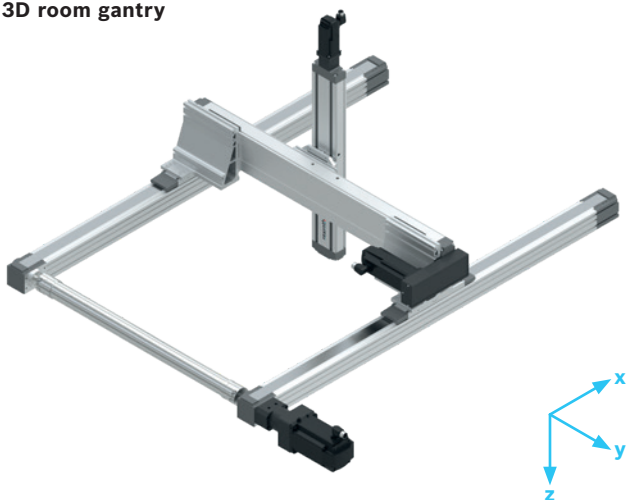
- ▶ 12 sizes
- ▶ Max. payload\* 5 - 82 kg
- ▶ Travel range [mm]
  - x-axis min. 40, max. 3,000
  - y-axis min. 40, max. 1,200

3D cantilever space



- ▶ 8 sizes
- ▶ Max. payload\* 2.5 - 32.5 kg
- ▶ Travel range [mm]
  - x-axis min. 50, max. 3,000
  - y-axis min. 40, max. 880
  - z-axis min. 40, max. 1,325

3D room gantry



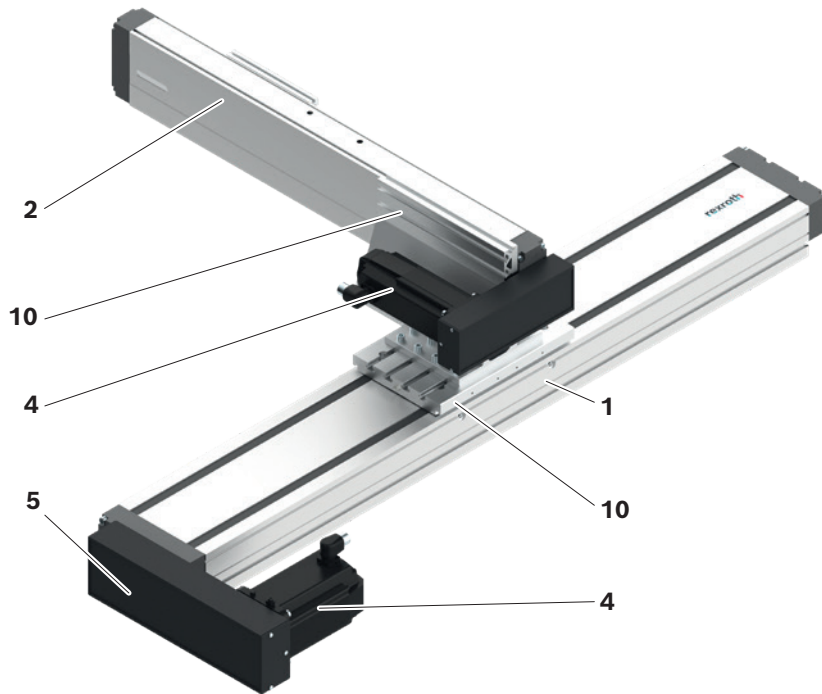
- ▶ 10 sizes
- ▶ Max. payload\* 10 - 160 kg
- ▶ Travel range [mm]
  - x-axis min. 60, max. 3,000
  - y-axis min. 60, max. 2,753
  - z-axis min. 40, max. 1,625

3D space portal, performance-optimized

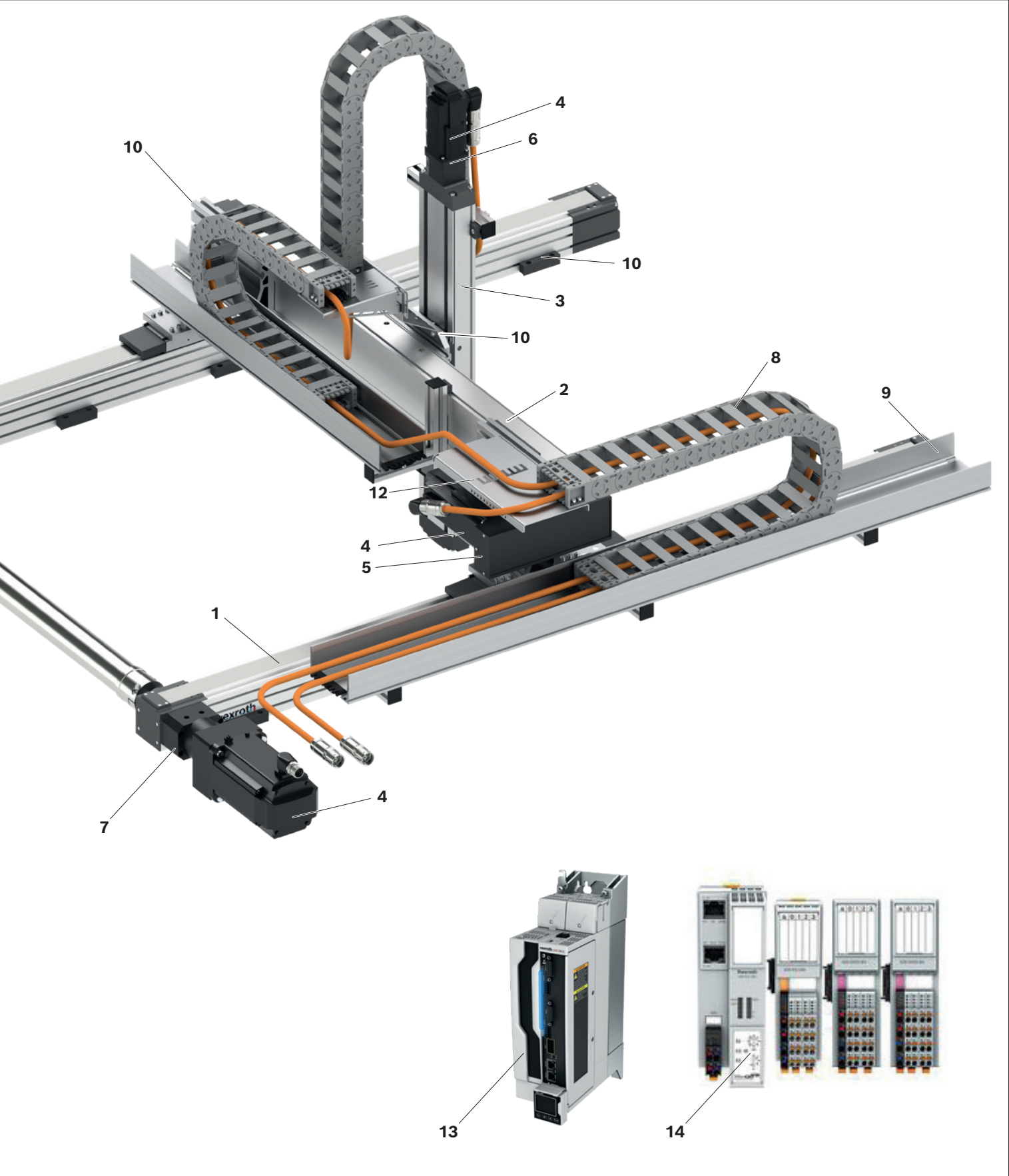


- ▶ 6 sizes
- ▶ Max. payload\* 34.5 - 65.5 kg
- ▶ Travel range [mm]
  - x-axis min. 60, max. 3,000
  - y-axis min. 345, max. 2,350
  - z-axis min. 50, max. 1,590

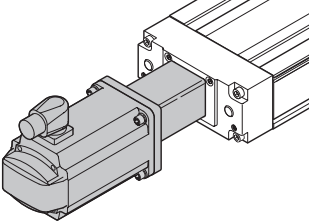
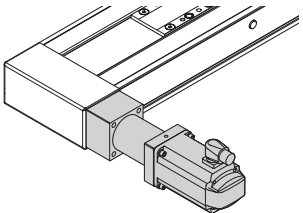
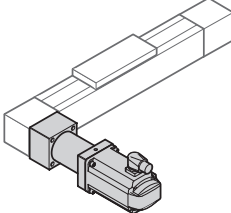
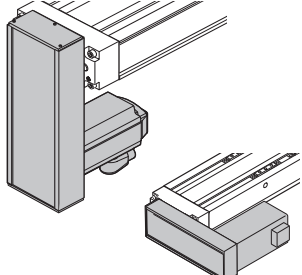
Example layout



- 1 X-axis/axes
- 2 Y-axis
- 3 Z-axis
- 4 Motor (connection e.g. via belt side drive (5), flange and coupling (6), gearing (7))
- 5 Belt side drive
- 6 Flange and coupling
- 7 Gearing
- 8 Cable drag chain
- 9 Storage tray
- 10 Connection elements (e.g. angle brackets, connection plate, clamping fixtures, etc.)
- 11 Connecting shaft
- 12 Cleated sheet
- 13 ctrlX Drive and drive controller with integrated ctrlX Core drive controller (with pre-installed software package and SFK4D app)
- 14 I/O modules (optional)



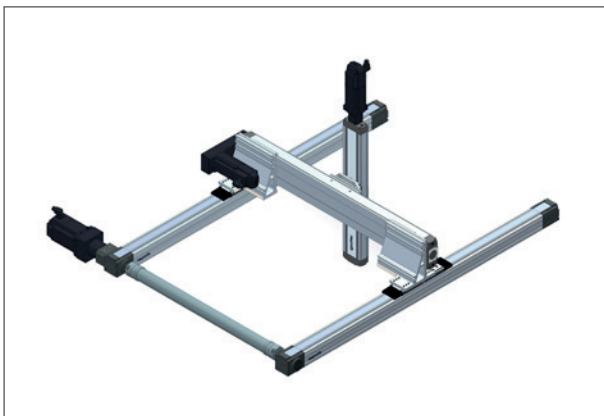
**Rexroth linear axes provide for dynamic and precise movement in our multi-axis systems**

Linear axes	Compact modules with ball screw assembly CKK	Compact modules with toothed belt drive CKR	Linear modules with toothed belt drive MKR
<b>Sizes</b>	CKK-070-NN-1 CKK-090-NN-1 CKK-110-NN-1 CKK-145-NN-1 CKK-200-NN-1	CKR-090-NN-1 CKR-110-NN-1 CKR-145-NN-1 CKR-200-NN-1	MKR-065-NN-3 MKR-080-NN-3 MKR-110-NN-3 MKR-140-NN-3 MKR-145-NN-3
<b>Motor attachment</b>	Flange/coupling 	Gearing 	Gearing 
	Belt side drive 		

**Motor position basic axis**

The constructive alignment of the multi-axis systems can be selected as an option.  
Example: Combination of axes 3D gantry, type 3SB

**Motor basic axis, left (ML)**



**Motor basic axis, right (MR)**



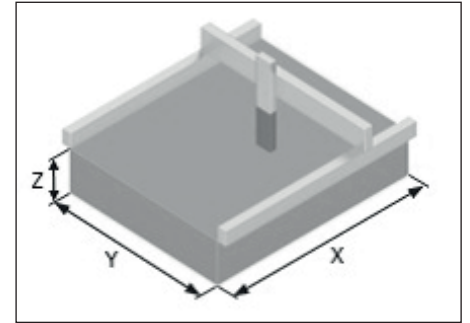
## Technical notes

**Maximum travel range**

The travel ranges of the individual axes determine the maximum travel range of the multi-axis system as travel range limits without stroke reserves.

Any excess travel required as a safety distance in the end positions of the individual axes depends on the application and must therefore be taken into account accordingly by the user.

Therefore, the effectively usable working range is usually smaller than the maximum available travel range.



**Example:**  
**Travel range 3-axis combination**

**Technical data (maximum values)**

Type	Axis	Linear axis	BASA:	$v_{\max}$	$M_{P \max}$	$a_{\max}$	$s_{\min}$	$s_{\min\_EC}$	$s_{\max}$	Motor attachment	Motor	$m_{\text{ex max}}$
			$d_0 \times P$									
3SB - 20	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15	40	40	600	Flange/coupling	MS2N03-B0	10.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	90	300	1 219	Belt side drive, $i = 1$	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	MKR-065-NN-3	$i = 3$	5.00	4.00	15	60	170	3 000	Gearing	MS2N04	
			$i = 5$	4.50	2.40							
			$i = 10$	2.30	1.20							

Example: Combination of axes 3D gantry, type 3SB

Values for maximum travel speed  $v_{\max}$ , maximum drive torque  $M_{P \max}$  and maximum payload  $m_{\text{ex max}}$  valid at minimum travel range.

For longer travel, length-dependent reduction for  $v_{\max}$  and  $M_{P \max}$  for linear axes with ball screw drive or linear axes with connecting shaft as well as a reduction of  $m_{\text{ex max}}$  depending on travel range and dynamics.

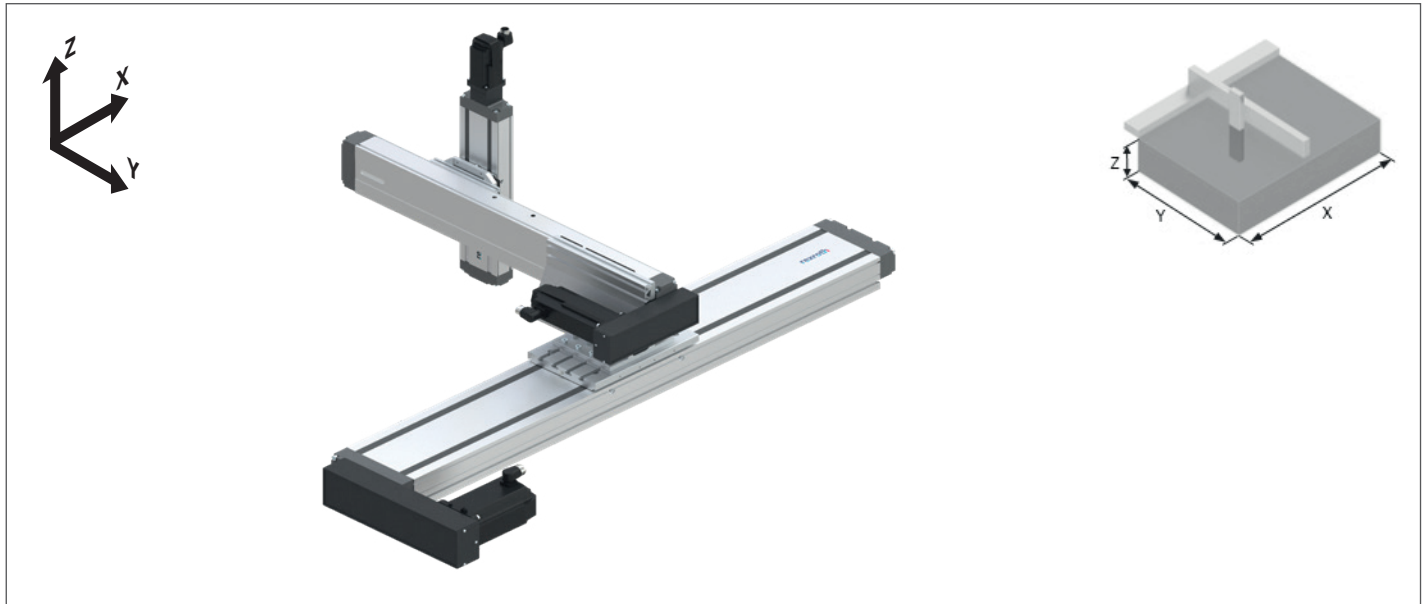
## Abbreviations

**Overview of abbreviations**

Abbreviation/index	Designation	Unit
$a_{\max}$	Maximum acceleration rate	(m/s <sup>2</sup> )
$m_{\text{ex max}}$	Maximum permissible payload of the multi-axis system	(kg)
$s_{\min}$	Minimum travel range	(mm)
$s_{\min\_EC}$	Minimum travel range as of which the cable drag chain can be fitted	(mm)
$s_{\max}$	Maximum travel	(mm)
$M_{P \max}$	Maximum drive torque	(Nm)
$v_{\max}$	Maximum travel speed	(m/s)

Type 3SA

**Product description**



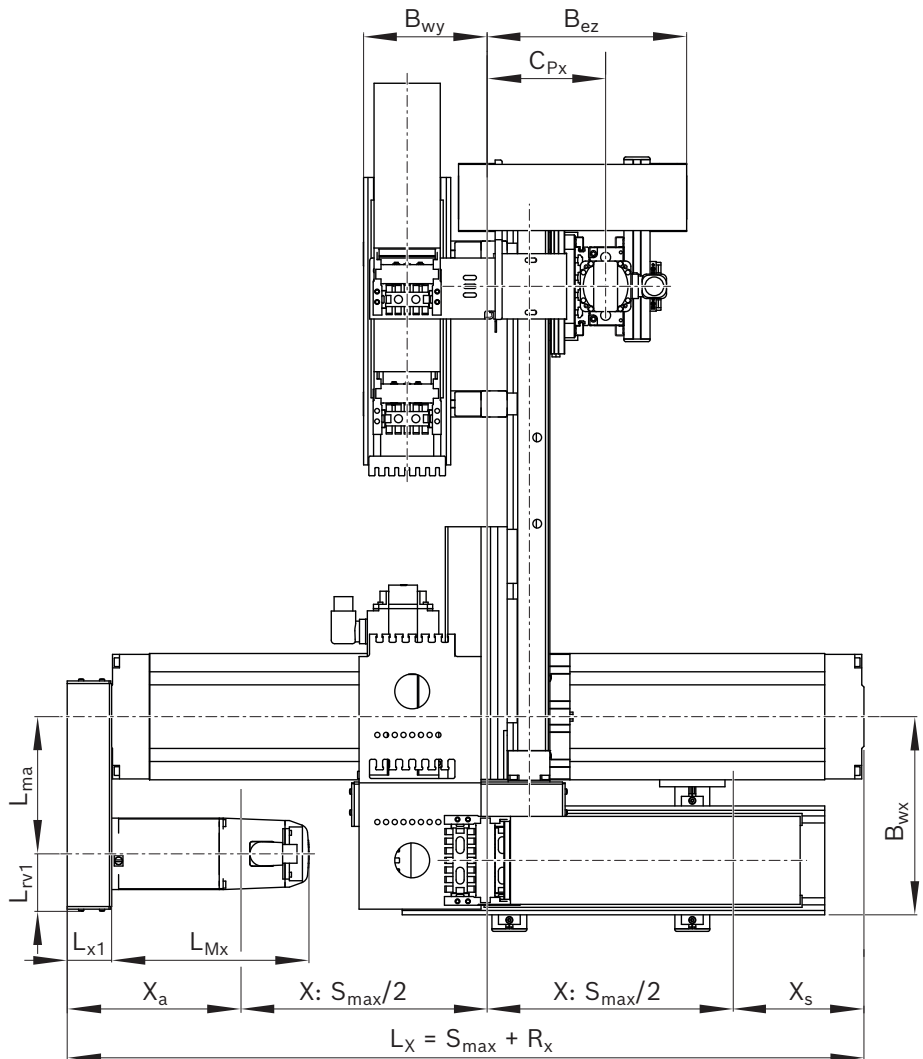
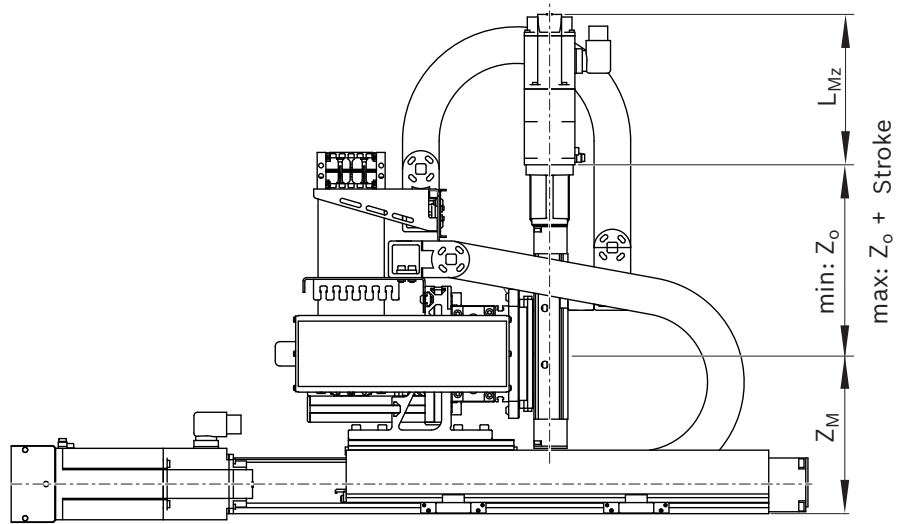
- ▶ For applications where a three-dimensional working range must be approached from the outside, the 3D cantilever chamber system is particularly suitable.
- ▶ In the basic axis compact modules with ball screw assembly or toothed belt drive.
- ▶ 8 sizes

**Technical data**

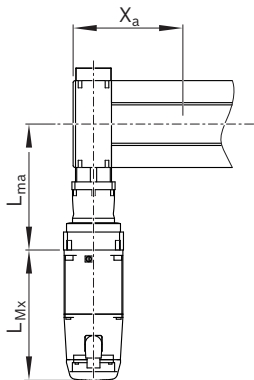
Type	Axis	Linear axis	BASA: $d_o \times P$ Toothed belt: Gear ratio $i$	$v_{max}$ (m/s)	$M_{P\ max}$ (Nm)	$a_{max}$ (m/s <sup>2</sup> )	$s_{min}$ (mm)	$s_{min\_EC}$ (mm)	$s_{max}$ (mm)	Motor attachment	Motor	$m_{ex\ max}$ (kg)
3SA - 10	Z	CKK-070-NN-1	8 x 2.5	0.25	0.70	15	40	40	545	Flange/ coupling	MS2N03	2.5
			8 x 5	0.50	1.40							
	Y	CKK-090-NN-1	12 x 2	0.23	0.79	15	70	305	520	Belt side drive, $i = 1$	MS2N03	
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	X	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	550	1 325	Belt side drive, $i = 1$	MS2N04	
16 x 10			0.77	7.66								
16 x 16			1.23	7.66								
3SA - 11	Z	CKK-070-NN-1	8 x 2.5	0.25	0.70	15	40	40	545	Flange/ coupling	MS2N03	2.5
			8 x 5	0.50	1.40							
	Y	CKK-090-NN-1	12 x 2	0.23	0.79	15	70	305	520	Belt side drive, $i = 1$	MS2N03	
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	X	CKR-110-NN-1	-	-	-	15	50	160	3 000	Gearing	MS2N04	
$i = 5$			4.40	2.72								
$i = 10$			2.20	1.26								

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P</sub> max (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex</sub> max (kg)
3SA - 20	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15	40	40	600	Flange/ coupling	MS2N03	10.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	800	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	565	1 590	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
3SA - 21	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15	40	40	600	Flange/ coupling	MS2N03	10.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	800	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKR-145-NN-1	i = 3	5.00	11.00	15	60	210	3 000	Gearing	MS2N05	
			i = 5	5.00	6.70							
			i = 10	5.00	3.35							
3SA - 22	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	30.0
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	650	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	565	1 590	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
3SA - 23	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	30.0
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	650	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKR-145-NN-1	i = 3	5.00	11.00	15	60	210	3 000	Gearing	MS2N05	
			i = 5	5.00	6.70							
			i = 10	5.00	3.35							
3SA - 30	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	400	880	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	CKK-200-NN-1	32 x 5	0.30	19.01	15	80	405	1 825	Belt side drive, i = 1	MS2N06	
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
32 x 32			1.60	19.21								
3SA - 31	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	400	880	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	CKR-200-NN-1	i = 3	5.00	38.73	15	80	150	3 000	Gearing	MS2N07	
			i = 5	5.00	23.24							
			i = 10	5.00	11.62							

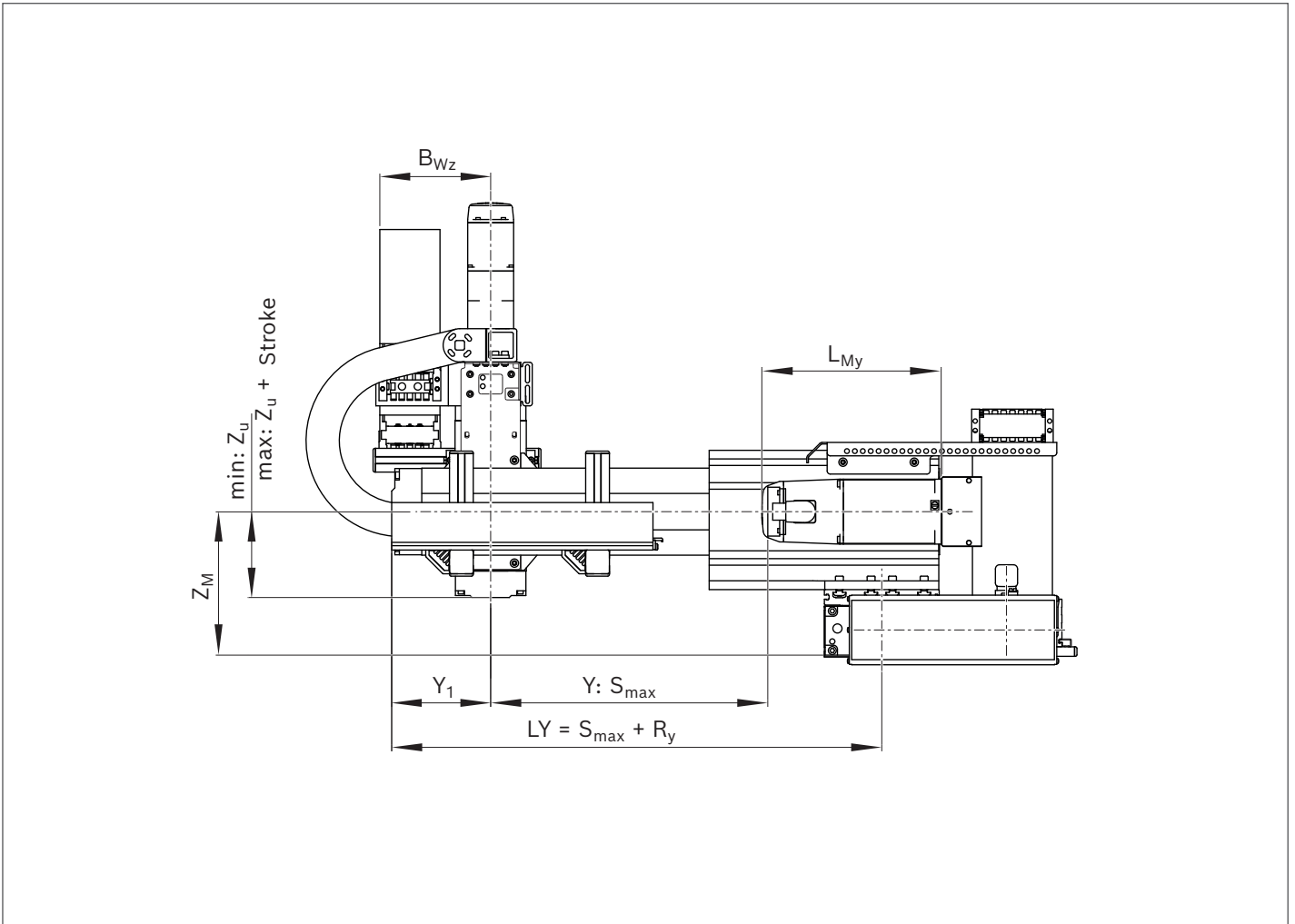
**Dimension drawings**



**Version:**  
X-axis as toothed  
belt axis



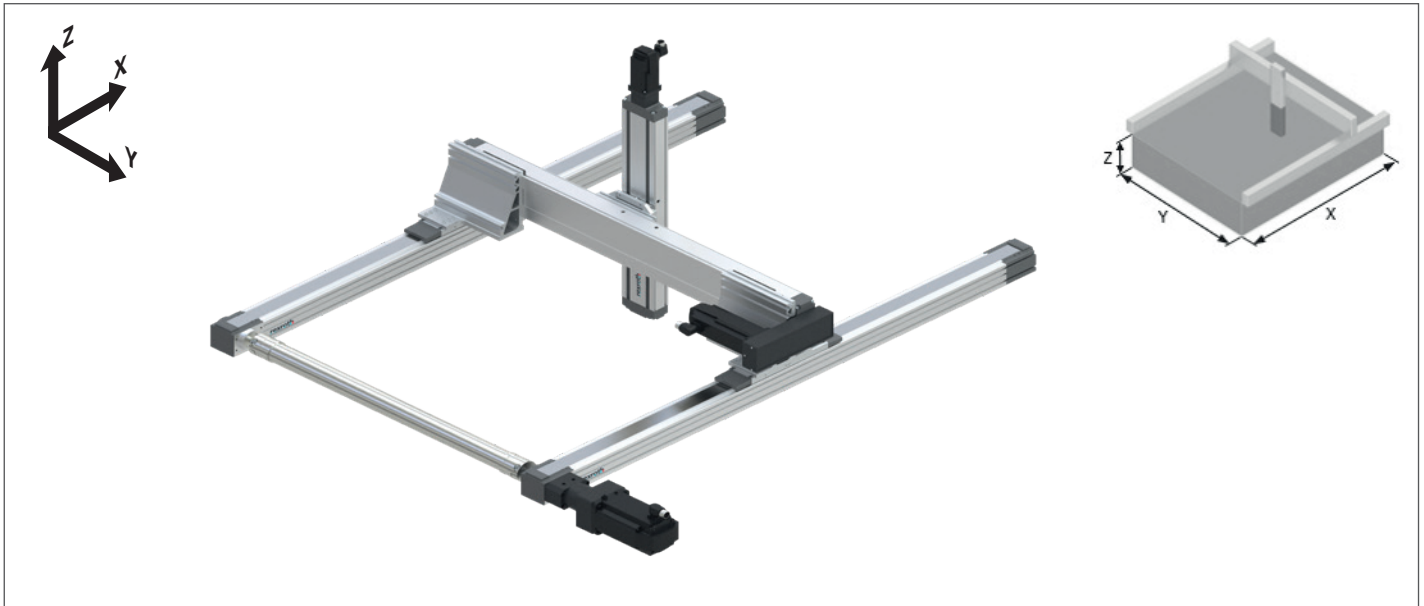




Type	Dimensions (mm)																		
	R <sub>x</sub>	R <sub>y</sub>	X <sub>a</sub>	X <sub>s</sub>	B <sub>wx</sub>	B <sub>wy</sub>	B <sub>wz</sub>	B <sub>ez</sub>	C <sub>px</sub>	L <sub>rv1</sub>	L <sub>ma</sub>	L <sub>x1</sub>	Z <sub>M</sub>	Z <sub>u</sub>	Z <sub>o</sub>	Y <sub>1</sub>	L <sub>Mx</sub> (max)	L <sub>My</sub> (max)	L <sub>Mz</sub> (max)
<b>3SA-10</b>	300.0	237.5	174.5	125.5	210	144	140	215	127	59	145	51	143	80.5	123.5	108.5	194	164	192
<b>3SA-11</b>	366.5	237.5	186.0	180.5	210	144	140	215	127	—	105.5	—	143	80.5	123.5	108.5	194	164	192
<b>3SA-20</b>	350.0	269.0	200.0	150	227.5	142	140	229.0	136.0	66	157.5	51	183.5	108.5	177.5	125.0	258.5	226.5	192.0
<b>3SA-21</b>	400.5	269.0	196.5	204	227.5	142	140	229.0	136.0	—	210.0	—	183.5	108.5	177.5	125.0	290.0	226.5	192.0
<b>3SA-22</b>	350.0	269.0	200.0	150	227.5	142	140	244.5	151.5	66	157.5	51	183.5	125.5	201.0	125.0	258.5	226.5	258.5
<b>3SA-23</b>	400.5	269.0	196.5	204	227.5	142	140	244.5	151.5	—	210.0	—	183.5	125.5	201.0	125.0	290.0	226.5	258.5
<b>3SA-30</b>	546.0	345.0	301.0	245	255.0	132	140	271.0	175.5	76	267.5	66	203.0	95.5	231.0	149.5	261.0	258.5	258.5
<b>3SA-31</b>	649.0	345.0	319.0	330	255.0	132	140	271.0	175.5	—	329.0	—	203.0	95.5	231.0	149.5	317.0	258.5	258.5

Type 3SB

**Product description**



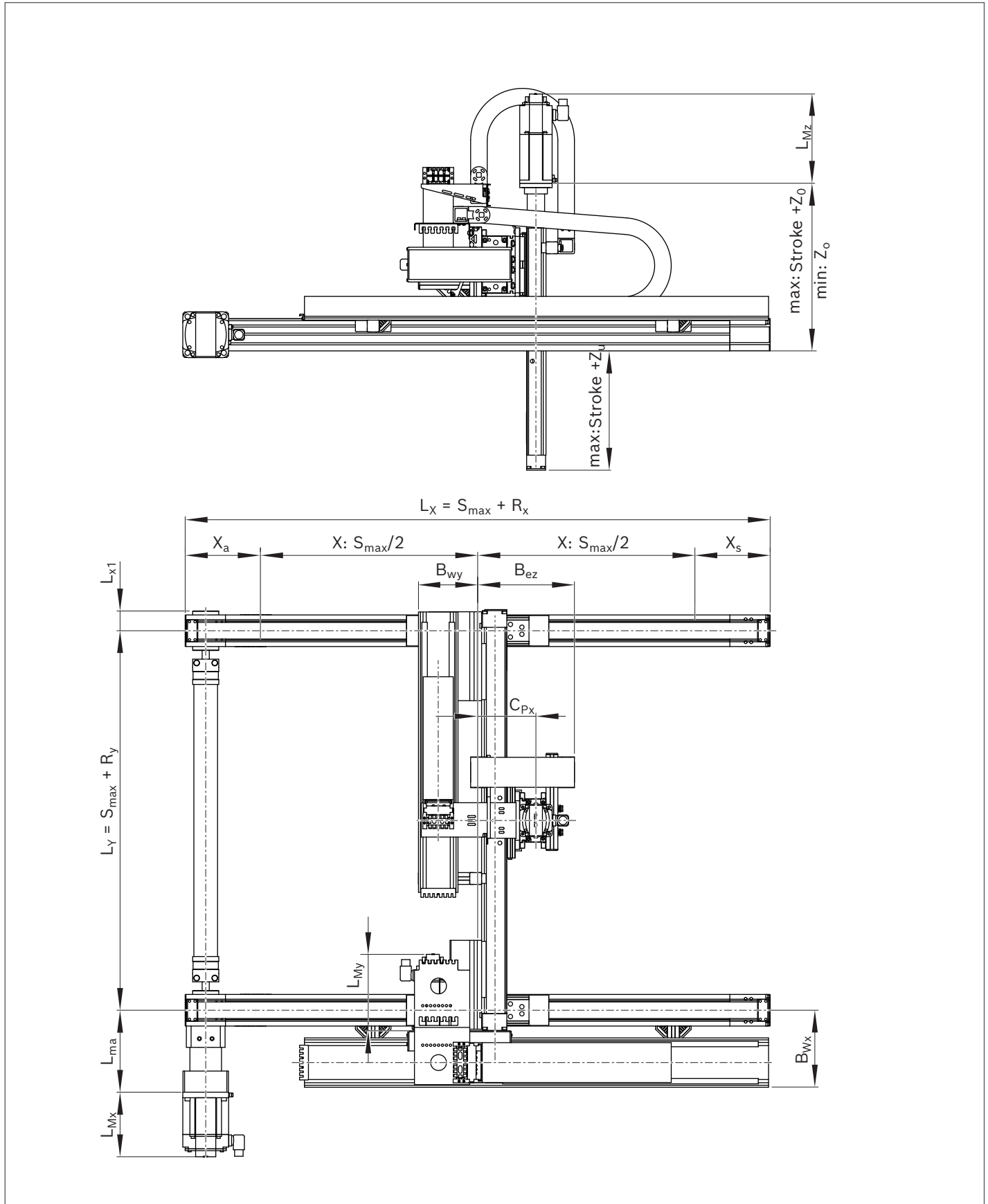
- ▶ 3D gantries are flexible units for positioning in the three-dimensional working range. They comprise mechanically coupled linear modules with toothed belt drive in the x-direction, compact modules with ball screw assembly or toothed belt drive in the y-direction and a compact module axis with ball screw assembly in the z-direction.
- ▶ 10 sizes

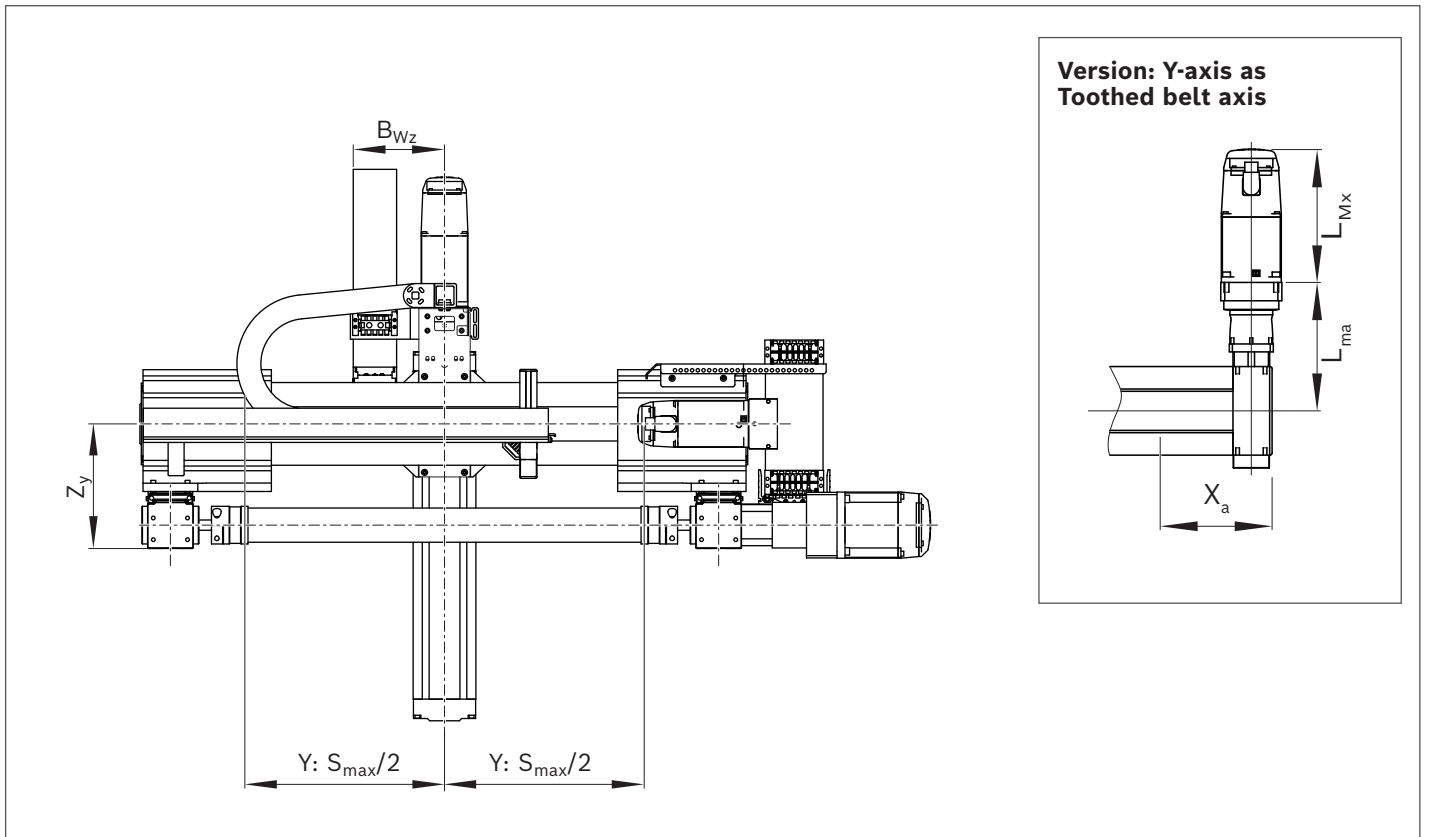
**Technical data**

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P</sub> max (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex</sub> max (kg)
3SB - 20	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15	40	40	600	Flange/ coupling	MS2N03-B0	10.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	90	300	1 219	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
X	MKR-065-NN-3	i = 3	5.00	4.00	15	60	170	3 000	Gearing	MS2N04		
		i = 5	4.50	2.40								
		i = 10	2.30	1.20								
3SB - 21	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15	40	40	600	Flange/ coupling	MS2N03-B0	10.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKR-110-NN-1	-	-	-	15	90	200	1 409	Gearing (NP 005)	MS2N04	
			i = 5	4.40	2.72							
			i = 10	2.20	1.26							
X	MKR-065-NN-3	i = 3	5.00	4.00	15	60	170	3 000	Gearing	MS2N04		
		i = 5	4.50	2.40								
		i = 10	2.30	1.20								
3SB - 22	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	17.0
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	90	300	1 123	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
X	MKR-065-NN-3	i = 3	5.00	4.00	15	60	170	3 000	Gearing	MS2N04		
		i = 5	4.50	2.40								
		i = 10	2.30	1.20								

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P</sub> max (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex</sub> max (kg)
3SB - 23	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	27.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKR-110-NN-1	i = 5	4.40	2.72	15	90	200	1 138	Gearing (NP 005)	MS2N04	
			i = 10	2.20	1.26							
	X	MKR-065-NN-3	i = 3	5.00	4.00	15	60	170	3 000	Gearing	MS2N04	
i = 5			4.50	2.40								
			i = 10	2.30	1.20							
3SB - 30	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	35.0
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15	100	400	1 523	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
				20 x 20	1.27	8.22						
X	MKR-080-NN-3	i = 3	5.00	12.00	15	60	100	3 000	Gearing	MS2N06		
		i = 5	3.00	7.20								
			i = 10	1.50	3.60							
3SB - 31	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	50	1 325	Flange/ coupling	MS2N04	35.0
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKR-145-NN-1	i = 3	5.00	11.00	15	60	140	2 753	Gearing (NP 015)	MS2N05	
			i = 5	5.00	6.70							
				i = 10	2.92	3.35						
X	MKR-080-NN-3	i = 3	5.00	12.00	15	60	100	3 000	Gearing	MS2N06		
		i = 5	3.00	7.20								
			i = 10	1.50	3.60							
3SB - 40	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15	60	60	1 590	Flange/ coupling	MS2N04	70.0
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKK-200-NN-1	32 x 5	0.30	19.01	15	130	360	1 770	Belt side drive, i = 1	MS2N06	
			32 x 10	0.50	19.21							
				32 x 20	1.00	19.21						
X	MKR-110-NN-3	32 x 32	1.60	19.21	15	60	60	3 000	Gearing	MS2N07		
		i = 3	5.00	33.30								
			i = 5	5.00	20.00							
			i = 10	2.90	10.00							
3SB - 41	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15	60	60	1 590	Flange/ coupling	MS2N04	70.0
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKR-200-NN-1	i = 3	5.00	38.73	15	80	80	2 265	Gearing (NP 035)	MS2N07	
			i = 5	5.00	23.24							
				i = 10	2.50	11.62						
X	MKR-110-NN-3	i = 3	5.00	33.30	15	60	60	3 000	Gearing	MS2N07		
		i = 5	5.00	20.00								
			i = 10	2.90	10.00							
3SB - 50	Z	CKK-200-NN-1	32 x 5	0.30	19.01	15.0	80	80	1 625	Flange/ coupling	MS2N06	150.0
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
			32 x 32	1.60	19.21							
	Y	CKK-200-NN-1	32 x 5	0.30	19.01	15.0	80	360	1 680	Belt side drive, i = 1	MS2N06	
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
X	MKR-140-NN-3	32 x 32	1.60	19.21	15.0	80	80	3 000	Gearing	MS2N07		
		i = 5	5.00	60.00								
			i = 12	3.20	25.00							
			i = 16	2.40	18.75							
3SB - 61	Z	CKK-200-NN-1	32 x 5	0.30	19.01	15.0	80	80	1 625	Flange/ coupling	MS2N06	160.0
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
			32 x 32	1.60	19.21							
	Y	MKR-145-NN-2	i = 3	5.00	33.30	15.0	80	80	2 400	Gearing	MS2N07	
			i = 5	5.00	20.00							
			i = 10	3.10	10.00							
X	MKR-140-NN-3	i = 5	5.00	60.00	15.0	80	80	3 000	Gearbox	MS2N07		
		i = 12	3.20	25.00								
			i = 16	2.40	18.75							

**Dimension drawings**





Type	Dimensions (mm)																
	R <sub>x</sub>	R <sub>y</sub>	X <sub>a</sub>	X <sub>s</sub>	B <sub>wx</sub>	B <sub>wy</sub>	B <sub>ez</sub>	C <sub>Px</sub>	L <sub>X1</sub>	L <sub>ma</sub>	L <sub>Mx</sub>	Z <sub>u</sub>	Z <sub>o</sub>	Z <sub>y</sub>	L <sub>My</sub>	L <sub>Mz</sub>	B <sub>wz</sub>
<b>3SB-20</b>	376	265	191.0	185.0	187.5	135.0	246.0	143.0	45.0	154.5	258.5	-74.5	360.0	183.0	226.5	194.5	140.0
<b>3SB-21</b>	376	265	191.0	185.0	187.5	135.0	246.0	143.0	45.0	154.5	258.5	-74.5	360.0	183.0	226.5	194.5	140.0
<b>3SB-22</b>	376	265	191.0	185.0	187.5	135.0	246.0	143.0	45.0	154.5	258.5	-57.5	384.0	183.0	226.5	258.5	140.0
<b>3SB-23</b>	376	265	191.0	185.0	187.5	135.0	246.0	143.0	45.0	154.5	258.5	-57.5	384.0	183.0	226.5	258.5	140.0
<b>3SB-30</b>	481	261	240.5	240.5	195.0	160.0	245.0	147.5	50.0	207.5	261.0	-88.0	419.5	218.5	258.5	258.5	160.0
<b>3SB-31</b>	481	261	240.5	240.5	195.0	160.0	245.0	147.5	50.0	207.5	261.0	-88.0	419.5	218.5	290.0	258.5	160.0
<b>3SB-40</b>	578	347	283.0	295.0	210.0	127.0	339.5	233.5	59.0	264.0	317.0	132.0	515.5	282.0	261.0	258.5	160.0
<b>3SB-41</b>	578	347	283.0	295.0	210.0	127.0	339.5	233.5	59.0	264.0	317.0	132.0	515.5	282.0	375.0	258.5	160.0
<b>3SB-50</b>	715	347	370.5	344.5	225.0	127.0	383.5	256.5	84.0	324.5	176.0	-76.0	683.0	323.0	165.0	301.0	185.0
<b>3SB-61</b>	715	459	370.5	344.5	255.0	70.5	361.0	233.0	129.5	324.5	205.0	-27.5	634.5	274.5	176.0	301.0	182.5

## Type 3SC

### Product description

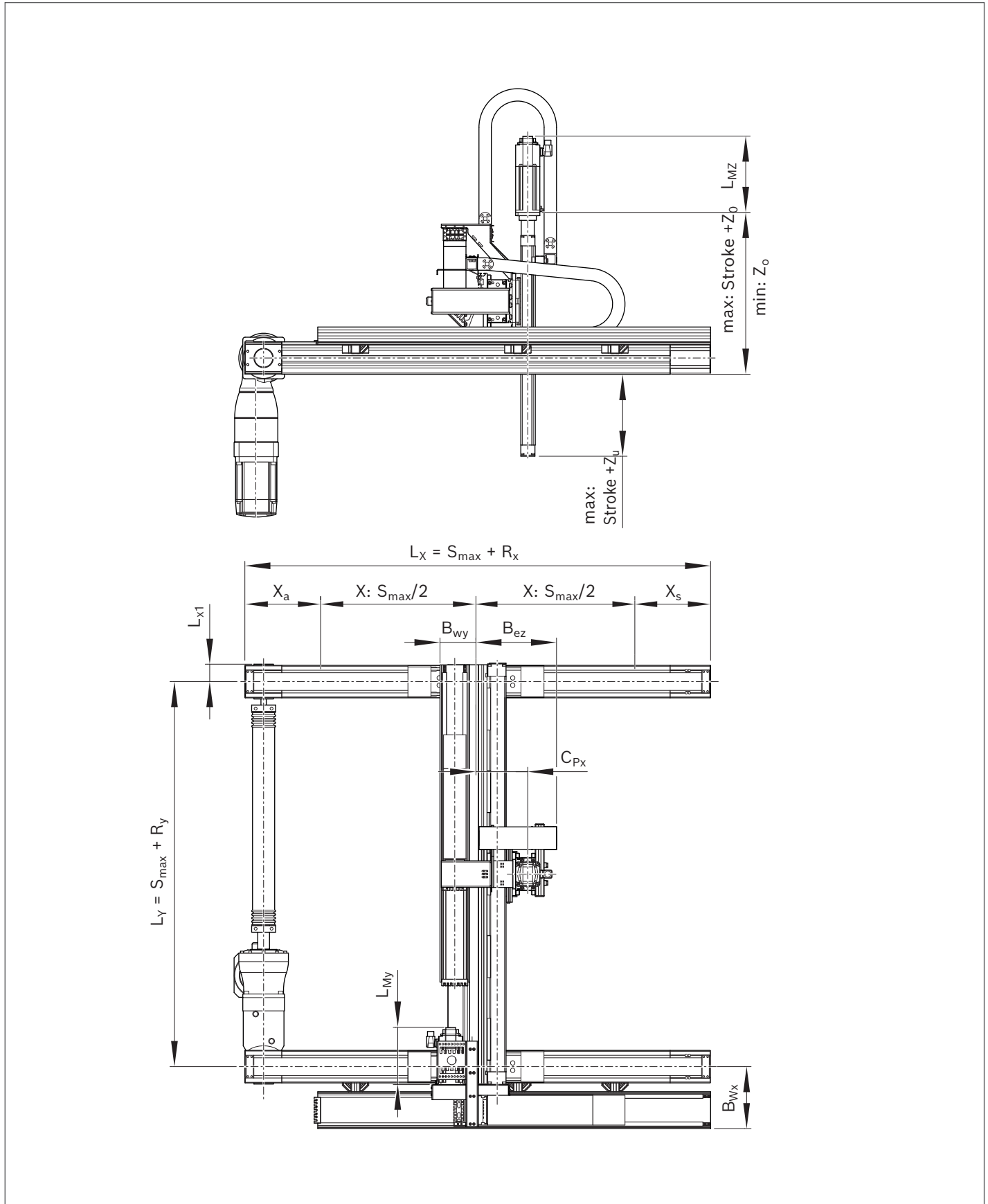


- ▶ 3D gantries are flexible and performance-optimized units for positioning in the three-dimensional working range. They comprise mechanically coupled linear modules with toothed belt drive in the x-direction, compact modules with ball screw assembly or toothed belt drive in the y-direction and a compact module axis with ball screw assembly in the z-direction.
- ▶ By arranging the motor of the X-axis via a T-gear between the linear axes, higher drive torques can be transmitted. A continuous angle in the Y-axis ensures the required rigidity.
- ▶ 6 sizes

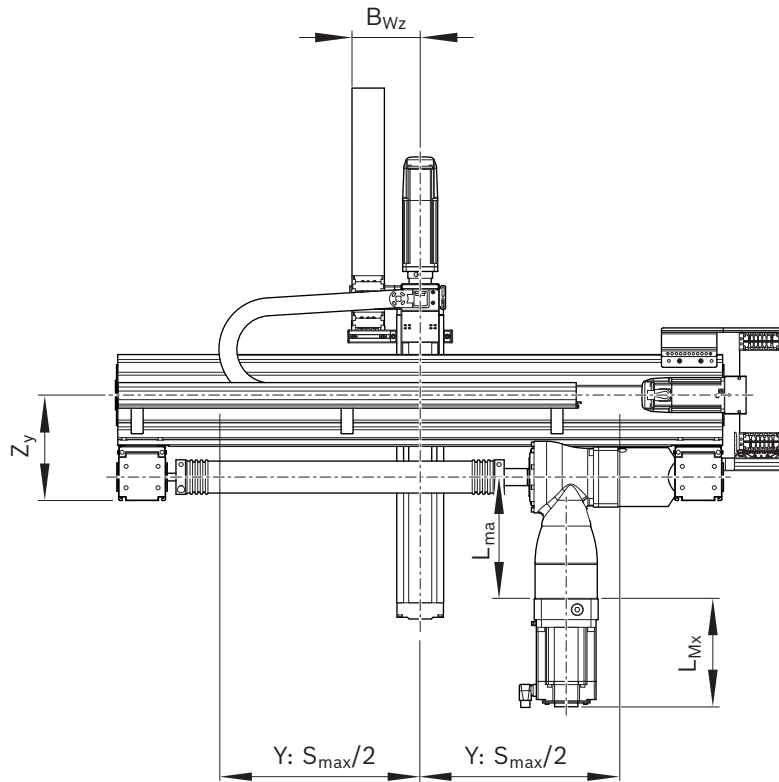
**Technical data**

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P</sub> max (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex</sub> max (kg)
3SC - 22	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	34.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	380	380	1 205	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	MKR-080-NN-3	i = 7	2.69	8.74	15.0	60	85	3 000	Gearing	MS2N06	
			i = 12	1.28	5.10							
			i = 16	0.96	3.83							
3SC - 23	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	34.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKR-110-NN-1	-	-	-	15.0	380	380	2 640	Gearing (NP 005)	MS2N04	
			i = 5	4.40	2.72							
			i = 10	2.20	1.26							
	X	MKR-080-NN-3	i = 7	2.69	8.74	15.0	60	85	3 000	Gearing	MS2N06	
			i = 12	1.28	5.10							
			i = 16	0.96	3.83							
3SC - 30	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	34.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	550	550	1 460	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	MKR-110-NN-3	i = 7	3.45	24.29	15.0	60	60	3 000	Gearing	MS2N07	
			i = 12	1.81	14.17							
			i = 16	1.36	10.63							
3SC - 31	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	34.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKR-145-NN-1	i = 3	5.00	11.00	15.0	550	550	2 580	Gearing (NP 015)	MS2N05	
			i = 5	5.00	6.70							
			i = 10	2.92	3.35							
	X	MKR-110-NN-3	i = 7	3.45	24.29	15.0	60	60	3 000	Gearing	MS2N07	
			i = 12	1.81	14.17							
			i = 16	1.36	10.63							
3SC - 40	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15.0	60	60	1 590	Flange/ coupling	MS2N04	65.5
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKK-200-NN-1	32 x 5	0.30	19.01	15.0	510	510	1 825	Belt side drive, i = 1	MS2N06	
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
	X	MKR-110-NN-3	32 x 32	1.60	19.21	15.0	60	60	3 000	Gearing	MS2N07	
			i = 7	3.45	24.29							
			i = 12	1.81	14.17							
3SC - 41	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15.0	60	60	1 590	Flange/ coupling	MS2N04	65.5
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKR-200-NN-1	i = 3	5.00	38.73	15.0	345	345	2 374	Gearing (NP 035)	MS2N07	
			i = 5	5.00	23.24							
			i = 10	2.50	11.62							
	X	MKR-110-NN-3	i = 7	3.45	24.29	15.0	60	60	3 000	Gearing	MS2N07	
			i = 12	1.81	14.17							
			i = 16	1.36	10.63							

**Dimension drawings**







Type	Dimensions (mm)																
	R <sub>x</sub>	R <sub>y</sub>	X <sub>a</sub>	X <sub>s</sub>	B <sub>wx</sub>	B <sub>wy</sub>	B <sub>ez</sub>	C <sub>Px</sub>	L <sub>X1</sub>	L <sub>ma</sub>	L <sub>Mx</sub>	Z <sub>u</sub>	Z <sub>o</sub>	Z <sub>y</sub>	L <sub>My</sub>	L <sub>Mz</sub>	B <sub>wz</sub>
<b>3SC-22</b>	481	263	191.0	185.0	195.0	130	251.5	154.0	50	253.5	184	-72.5	399.0	198.0	194.0	258.5	140
<b>3SC-23</b>	481	263	191.0	185.0	195.0	130	251.5	154.0	50	253.5	184	-72.5	399.0	198.0	162.0	258.5	140
<b>3SC-30</b>	578	305	283.0	295.0	210.0	122	273.0	175.5	59	334.5	205	-122.0	448.5	247.5	140.0	258.5	160
<b>3SC-31</b>	578	305	283.0	295.0	210.0	122	273.0	175.5	59	334.5	205	-122.0	448.5	247.5	188.0	258.5	160
<b>3SC-40</b>	578	347	283.0	295.0	210.0	127	339.5	233.5	59	334.5	205	-132.0	515.5	282.0	164.0	258.5	160
<b>3SC-41</b>	578	347	283.0	295.0	210.0	127	339.5	233.5	59	334.5	205	-132.0	515.5	282.0	176.0	258.5	160

Type 2HA

**Product description**



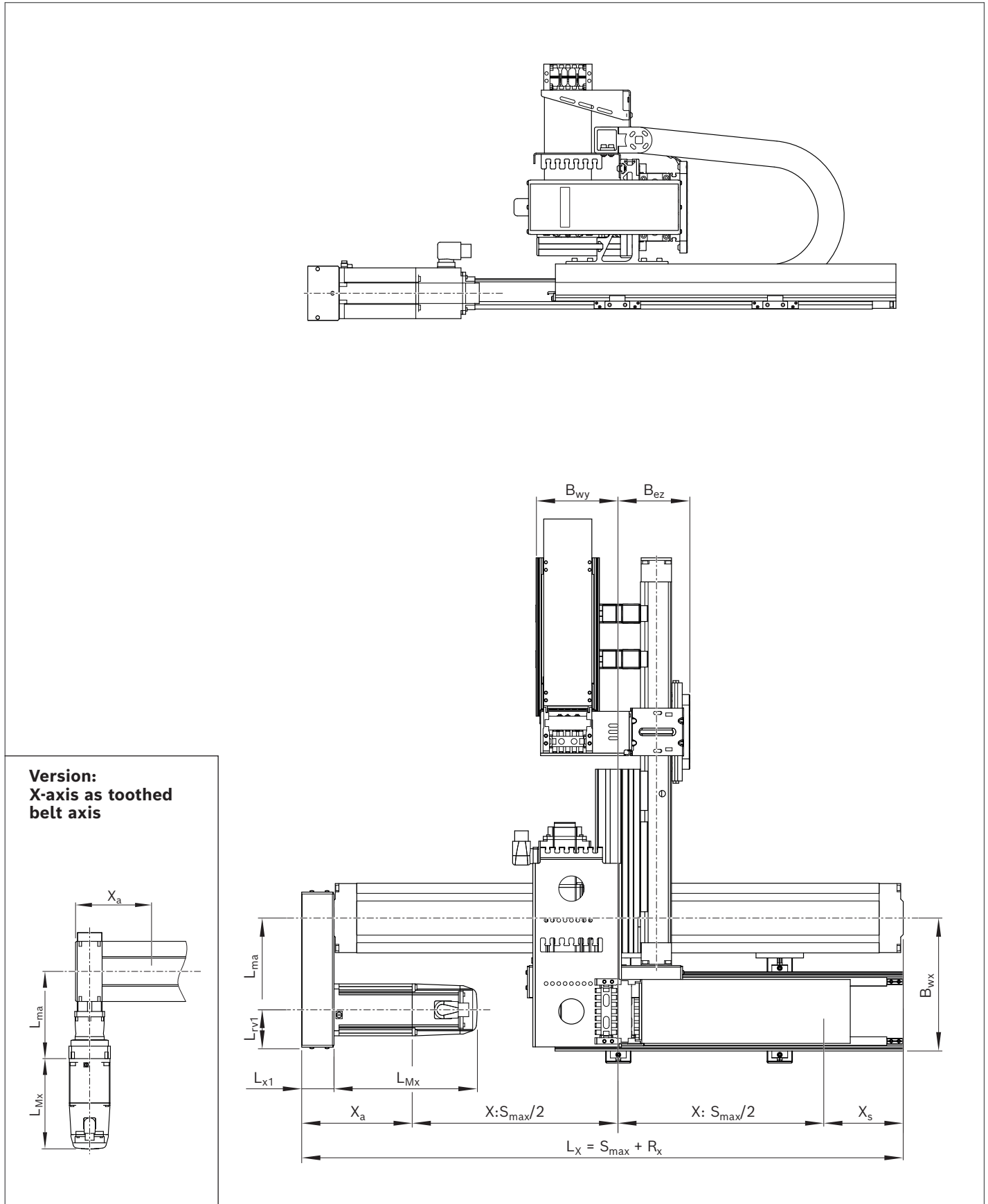
- ▶ The cantilever system 2D cantilever surface is particularly suitable for applications in which the axis system enters the working range from the outside.
- ▶ Compact modules with ball screw assembly or toothed belt drive are available for the X-axis.
- ▶ 12 sizes

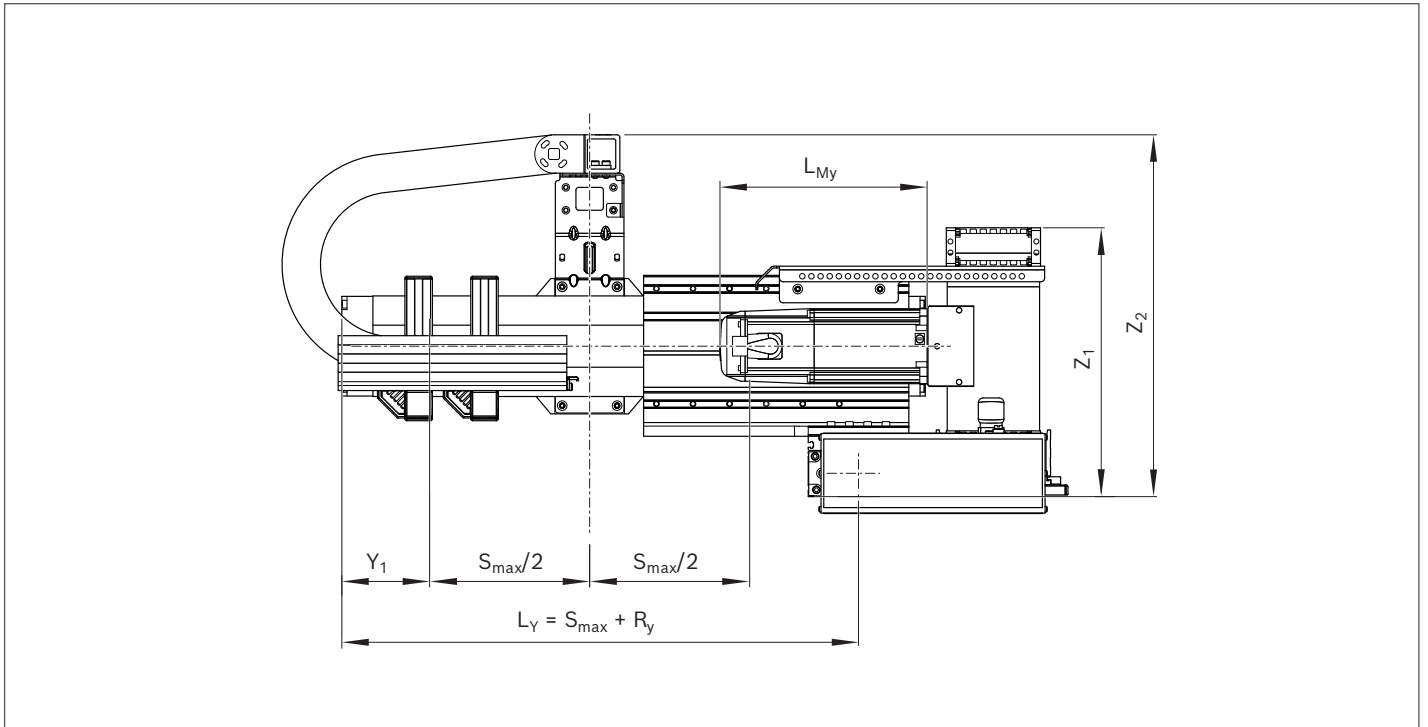
**Technical data**

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P max</sub> (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex max</sub> (kg)
2HA - 08	Y	CKK-070-NN-1	12 x 2	0.23	0.79	15.0	135	135	485	Belt side drive, i = 1	MS2N03	5.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	X	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	40	515	600	Belt side drive, i = 1	MS2N03	
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
2HA - 09	Y	CKK-070-NN-1	12 x 2	0.23	0.79	15.0	135	135	485	Belt side drive, i = 1	MS2N03	5.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	X	CKR-090-NN-1	i = 5	3.0	1.6	15.0	40	200	3 000	Gearing	MS2N03	
			i = 10	1.5	0.8							
2HA - 10	Y	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	70	305	520	Belt side drive, i = 1	MS2N03	13.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	X	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	550	1 325	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
2HA - 11	Y	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	70	305	520	Belt side drive, i = 1	MS2N03	13.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	X	CKR-110-NN-1	i = 5	5.0	2.7	15.0	50	160	3 000	Gearing	MS2N04	
			i = 10	5.0	1.4							

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P max</sub> (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex max</sub> (kg)
2HA - 20	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	725	Belt side drive, i = 1	MS2N04	25.0
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKK-110-NN-1	16 x 5	0.38	6.76							
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
2HA - 21	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	725	Belt side drive, i = 1	MS2N04	25.0
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKR-110-NN-1	-	-	-							
			i = 5	5.00	2.70							
			i = 10	5.00	1.30							
2HA - 22	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	1 050	Belt side drive, i = 1	MS2N04	44.5
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKK-145-NN-1	20 x 5	0.30	8.22							
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
2HA - 23	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15	50	350	1 050	Belt side drive, i = 1	MS2N04	44.5
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	CKR-145-NN-1	i = 3	5.00	11.0							
			i = 5	5.00	6.70							
			i = 10	5.00	3.40							
2HA - 30	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	400	1 050	Belt side drive, i = 1	MS2N04	52.0
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	CKK-145-NN-1	20 x 5	0.30	8.22							
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
2HA - 31	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	400	1 050	Belt side drive, i = 1	MS2N04	52.0
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	CKR-145-NN-1	i = 3	5.00	11.00							
			i = 5	5.00	6.70							
			i = 10	5.00	3.40							
2HA - 32	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	400	1 200	Belt side drive, i = 1	MS2N04	82.0
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	CKK-200-NN-1	32 x 5	0.30	19.01							
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
			32 x 32	1.60	19.21							
2HA - 33	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15	60	400	1 200	Belt side drive, i = 1	MS2N04	82.0
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	CKR-200-NN-1	i = 3	5.00	38.70							
			i = 5	5.00	23.20							
			i = 10	5.00	11.60							

**Dimension drawings**





Type	Dimensions (mm)														
	R <sub>x</sub>	R <sub>y</sub>	X <sub>a</sub>	X <sub>s</sub>	B <sub>wx</sub>	Y <sub>1</sub>	B <sub>wy</sub>	B <sub>ez</sub>	L <sub>x1</sub>	L <sub>ma</sub>	L <sub>rv1</sub>	L <sub>Mx</sub> (max)	L <sub>My</sub> (max)	Z <sub>1</sub>	Z <sub>2</sub>
<b>2HA-08</b>	252.5	168.0	144.0	108.5	200.0	80.5	-	42.5	37	103.5	40.5	203.5	163.5	295	-
<b>2HA-09</b>	289.5	168.0	149.5	140.0	200.0	80.5	-	42.5	-	140.9	-	203.5	163.5	295	-
<b>2HA-10</b>	300.0	237.5	174.5	125.5	210.0	108.5	144.5	98.5	51	145.0	62.0	226.5	163.5	305	388
<b>2HA-11</b>	366.5	237.5	186.0	155.5	210.0	108.5	144.5	98.5	-	160.5	-	226.5	163.5	305	388
<b>2HA-20</b>	300.0	265.0	174.5	125.5	210.0	125.0	130.0	113.5	51	145.0	62.0	226.5	226.5	294	396
<b>2HA-21</b>	366.5	265.0	161.0	155.5	210.0	125.0	130.0	113.5	-	160.5	-	226.5	226.5	294	396
<b>2HA-22</b>	350.0	269.0	200.0	150.0	227.5	120.0	142.0	101.0	51	157.5	55.0	258.5	226.5	313	415
<b>2HA-23</b>	400.5	269.0	196.5	204.0	227.5	120.0	142.0	101.0	-	210.5	-	290.0	226.5	313	415
<b>2HA-30</b>	350.0	345.0	200.0	150.0	227.5	149.5	127.0	135.0	51	157.5	55.0	258.5	258.5	350	450
<b>2HA-31</b>	400.5	345.0	196.5	150.0	227.5	149.5	127.0	135.0	-	210.5	-	290.0	258.5	350	450
<b>2HA-32</b>	546.0	345.0	301.0	245.0	255.0	149.5	132.0	125.0	66	267.5	76.0	261.0	258.5	392	492
<b>2HA-33</b>	649.0	345.0	319.0	330.0	255.0	149.5	132.0	125.0	-	329.0	-	317.0	258.5	392	492

Type 2HB

**Product description**



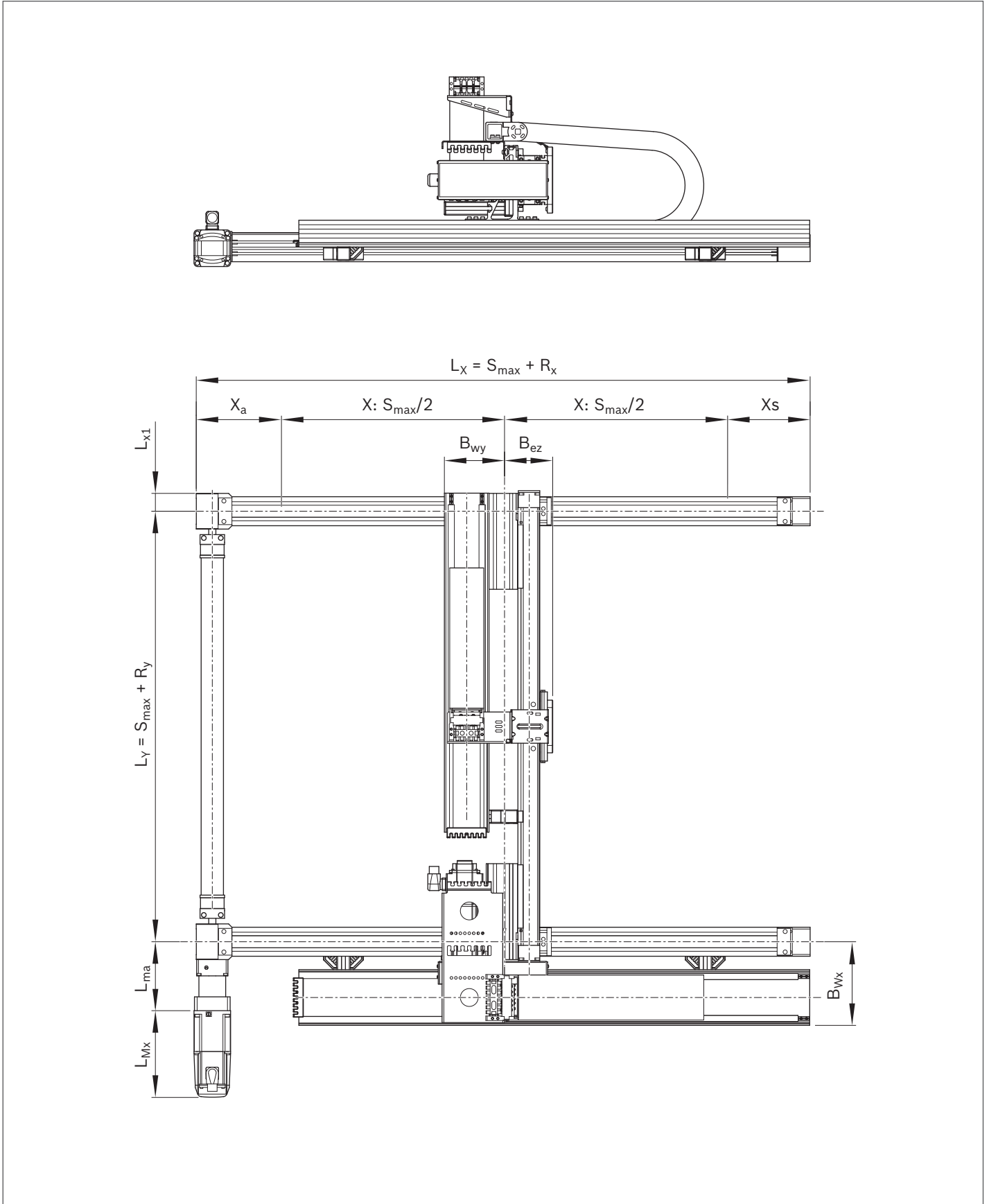
- ▶ The 2D area gantry is dynamically positioned in the x-axis via 2 mechanically coupled linear modules with toothed belt drive.
- ▶ The precise transverse motion in the y-axis is realized by compact modules with ball screw assembly or toothed belt drive.
- ▶ 8 sizes

**Technical data**

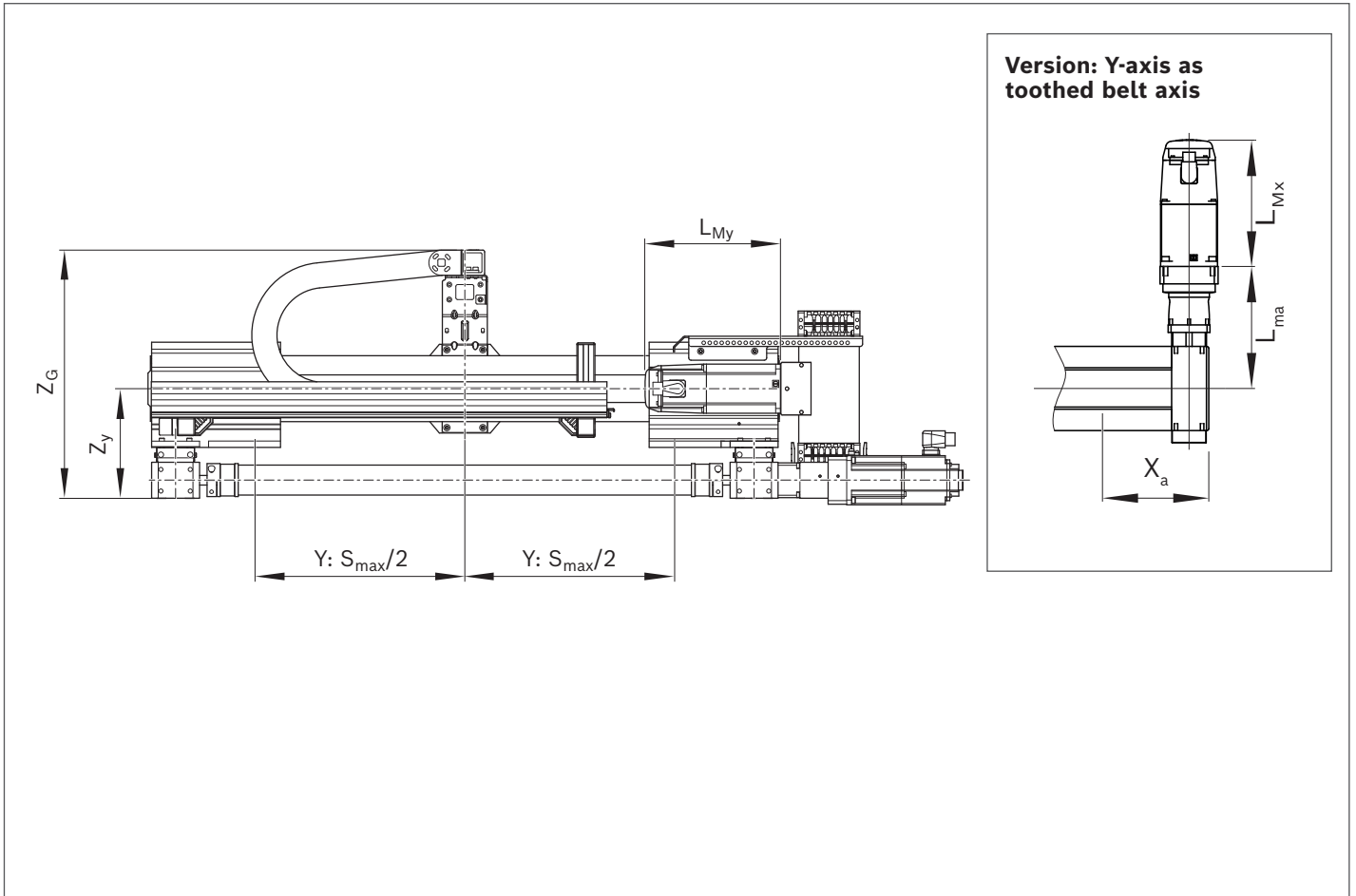
Type	Axis	Linear axis	BASA: $d_o \times P$ Toothed belt: Gear ratio $i$	$v_{max}$ (m/s)	$M_{p\ max}$ (Nm)	$a_{max}$ (m/s <sup>2</sup> )	$s_{min}$ (mm)	$s_{min\_EC}$ (mm)	$s_{max}$ (mm)	Motor attachment	Motor	$m_{ex\ max}$ (kg)
2HB - 20	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	90	300	1 219	Belt side drive, $i = 1$	MS2N04	25.0
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	X	MKR-065-NN-3	$i = 3$	5.00	4.00	15.0	60	170	3 000	Gearing	MS2N04	
			$i = 5$	4.50	2.40							
			$i = 10$	2.30	1.20							
2HB - 21	Y	CKR-110-NN-1	$i = 5$	4.40	2.72	15.0	90	200	2 869	Gearing	MS2N04	36.0
			$i = 10$	2.20	1.26							
	X	MKR-065-NN-3	$i = 3$	5.00	4.00	15.0	60	170	3 000	Gearing	MS2N04	
			$i = 5$	4.50	2.40							
			$i = 10$	2.30	1.20							
2HB - 30	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	100	400	1 523	Belt side drive, $i = 1$	MS2N04	69.0
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	X	MKR-080-NN-3	$i = 3$	5.00	4.00	15.0	60	100	3 000	Gearing	MS2N06	
			$i = 5$	4.50	2.40							
			$i = 10$	2.30	1.20							

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P max</sub> (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex max</sub> (kg)
2HB - 31	Y	CKR-145-NN-1	i = 3	5.00	11.00	15.0	60	140	2 869	Gearing	MS2N05	82.0
			i = 5	5.00	6.70							
			i = 10	2.92	3.35							
	X	MKR-080-NN-3	i = 3	5.00	4.00	15.0	60	100	3 000	Gearing	MS2N06	
			i = 5	4.50	2.40							
			i = 10	2.30	1.20							
2HB - 40	Y	CKK-200-NN-1	32 x 5	0.30	19.01	15.0	130	360	1 770	Belt side drive, i = 1	MS2N06	100.0
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
			32 x 32	1.60	19.21							
	X	MKR-110-NN-3	i = 3	5.00	33.30	15.0	60	60	3 000	Gearing	MS2N07	
			i = 5	4.00	20.00							
			i = 10	2.00	10.00							
2HB - 41	Y	CKR-200-NN-1	i = 3	5.00	38.73	15.0	80	80	2 869	Gearing	MS2N07	100.0
			i = 5	5.00	23.24							
			i = 10	2.50	11.62							
	X	MKR-110-NN-3	i = 3	5.00	33.30	15.0	60	60	3 000	Gearing	MS2N07	
			i = 5	4.00	20.00							
			i = 10	2.00	10.00							
2HB - 50	Y	CKK-200-NN-1	32 x 5	0.30	19.01	15.0	80	360	1 680	Belt side drive, i = 1	MS2N06	195.0
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
			32 x 32	1.60	19.21							
	X	MKR-140-NN-3	i = 5	5.00	60.00	15.0	80	80	3 000	Gearing	MS2N07	
			i = 12	3.20	25.00							
			i = 16	2.40	18.75							
2HB - 61	Y	MKR-145-NN-2	i = 3	5.00	33.30	15.0	80	80	2 500	Gearing	MS2N07	205.0
			i = 5	5.00	20.00							
			i = 10	3.10	10.00							
	X	MKR-140-NN-3	i = 5	5.00	60.00	15.0	80	80	3 000	Gearing	MS2N07	
			i = 12	3.20	25.00							
			i = 16	2.40	18.75							

**Dimension drawings**



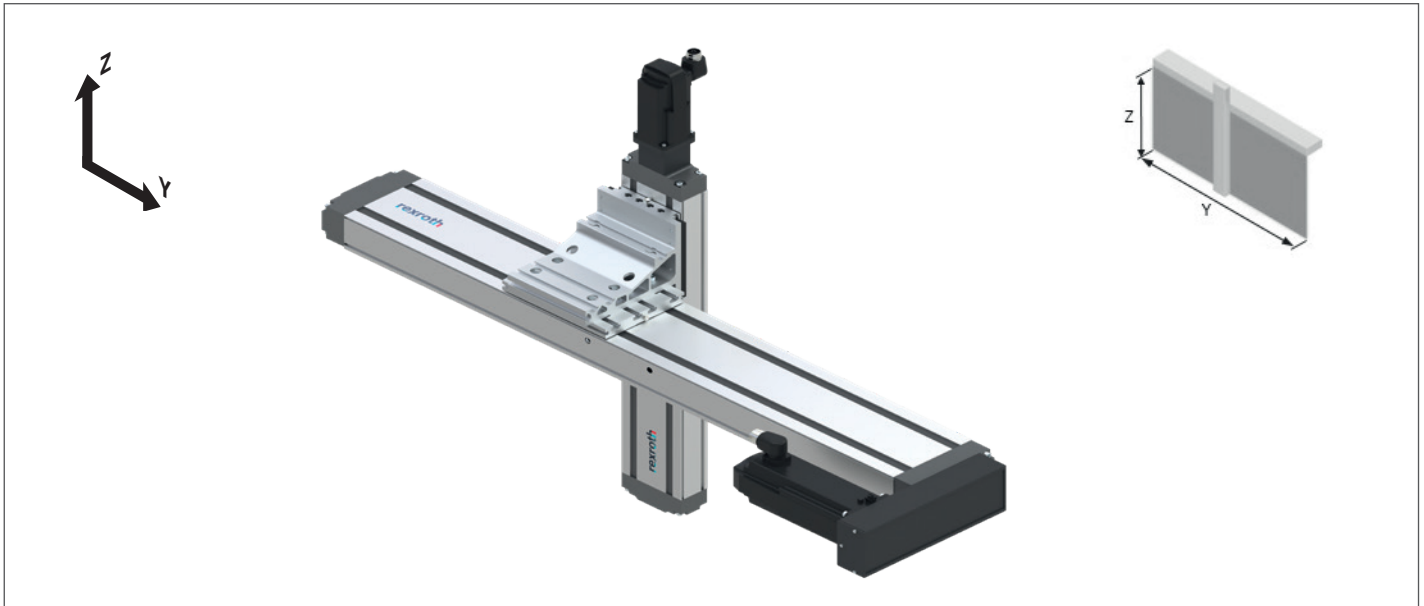




Type	Dimensions (mm)												
	$R_x$	$R_y$	$X_a$	$X_s$	$B_{wx}$	$B_{wy}$	$B_{ez}$	$L_{x1}$	$L_{ma}$	$Z_y$	$Z_G$	$L_{Mx}$	$L_{My}$
<b>2HB-20</b>	376	265	191.0	185.0	187.5	135.0	88.0	40	154.5	183.0	415	258.5	226.5
<b>2HB-21</b>	376	265	191.0	185.0	187.5	135.0	88.0	40	154.5	183.0	415	258.5	226.5
<b>2HB-30</b>	481	261	240.5	240.5	195.0	160.0	107.0	50	207.5	218.5	465	261.0	258.5
<b>2HB-31</b>	481	261	240.5	240.5	195.0	160.0	107.0	50	207.5	218.5	465	261.0	290.0
<b>2HB-40</b>	578	347	283.0	295.0	210.0	127.0	182.5	59	264.0	282.0	548	317.0	261.0
<b>2HB-41</b>	578	347	283.0	295.0	210.0	127.0	182.5	59	264.0	282.0	548	317.0	375.0
<b>2HB-50</b>	715	347	370.5	344.5	225.0	127.0	182.5	84	324.5	323.0	603	176.0	165.0
<b>2HB-51</b>	715	459	370.5	344.5	255.0	70.5	162.0	84	324.5	274.5	672	205.0	176.0

Type 2VA

**Product description**

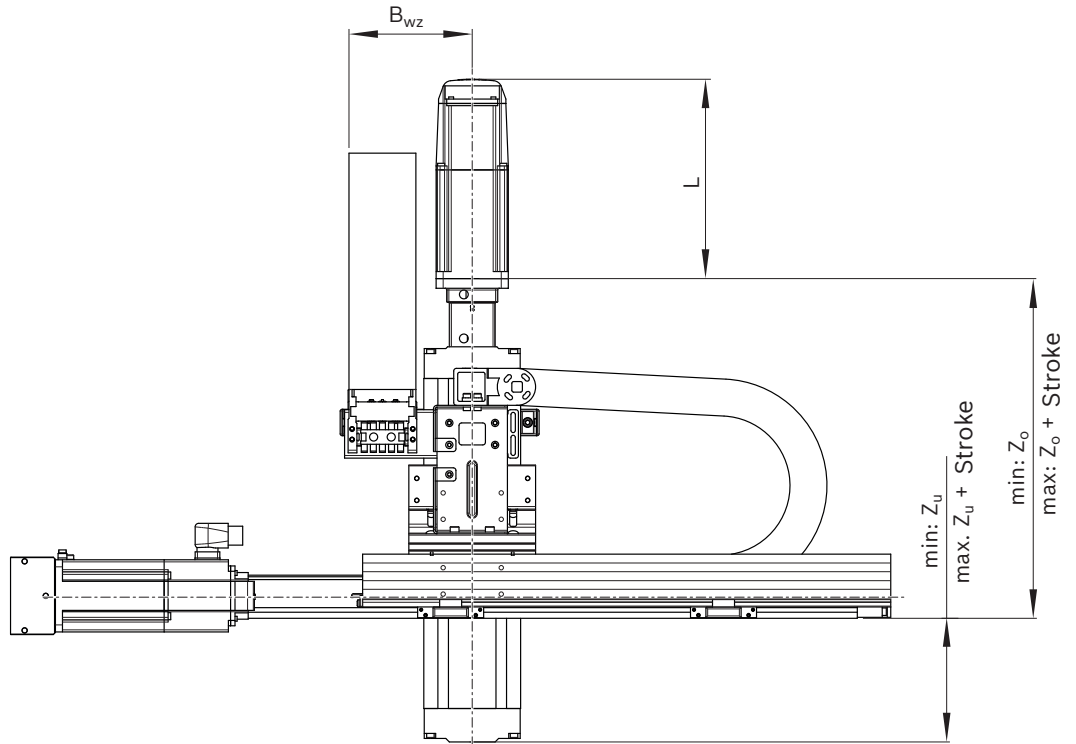


- ▶ 2D line gantries cover applications with horizontal and vertical motion direction.
- ▶ Compact modules with the drive versions of ball screw assembly or toothed belt drive are available for the x-axis.
- ▶ 8 sizes

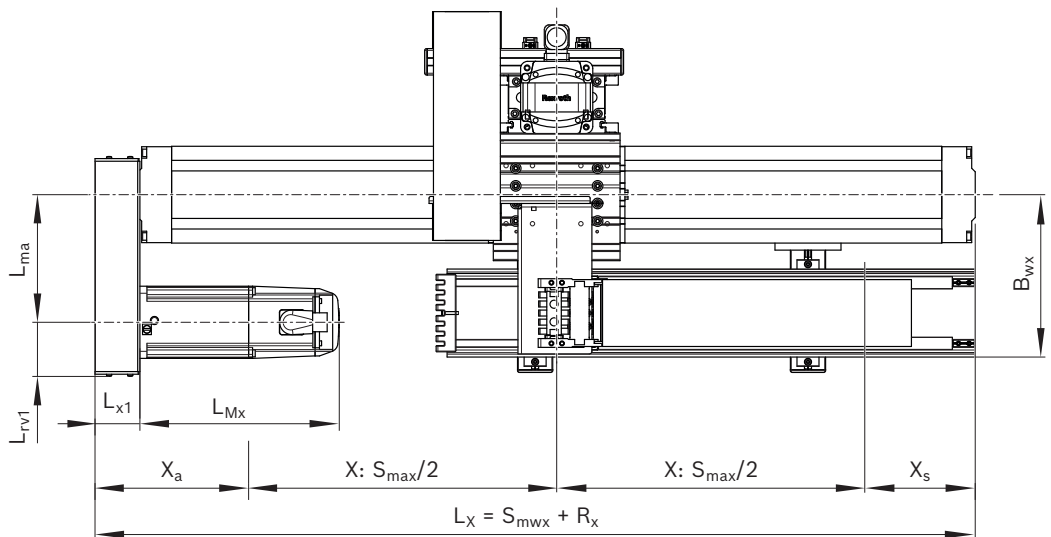
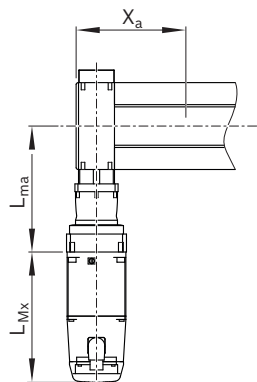
**Technical data**

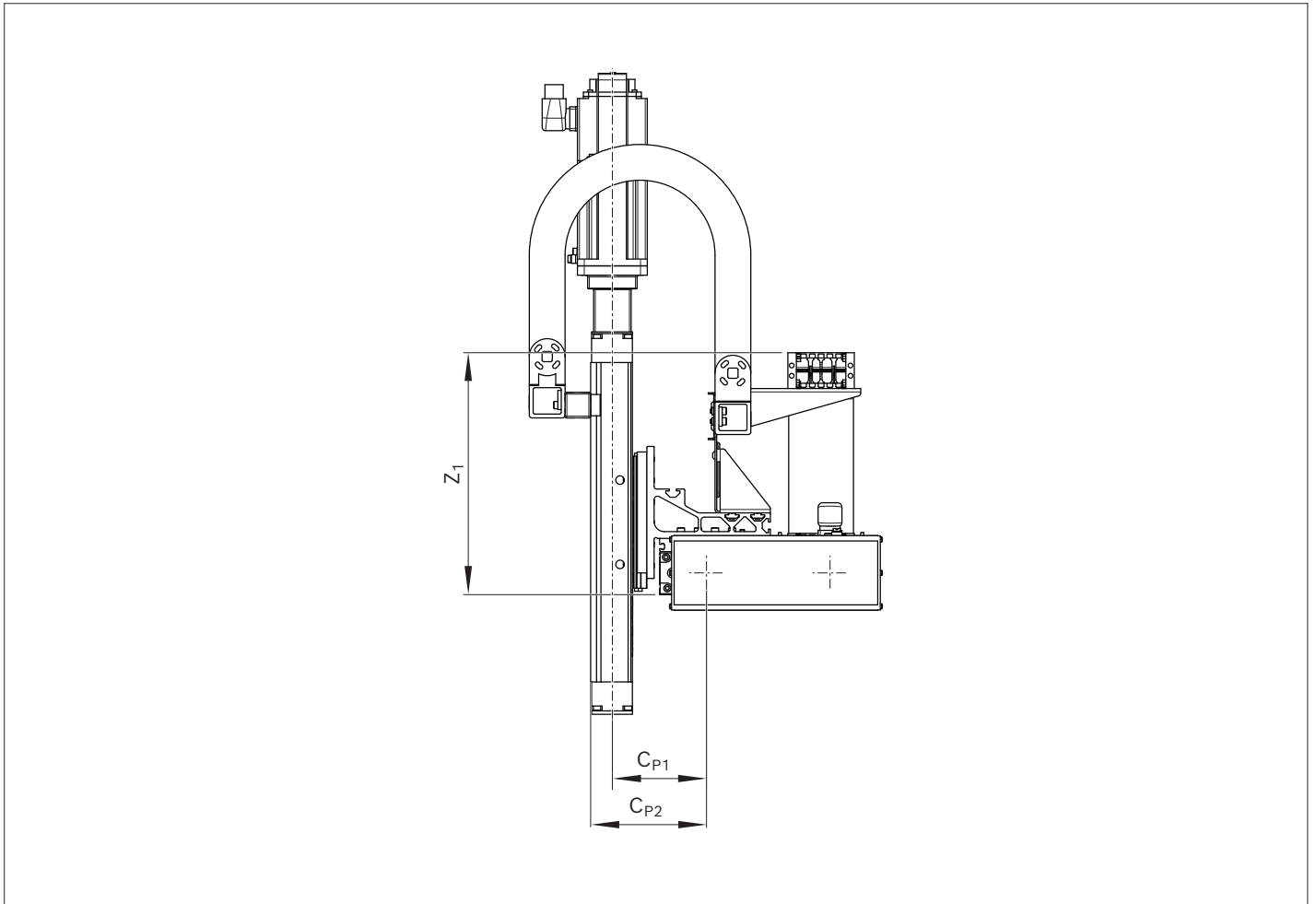
Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P max</sub> (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex max</sub> (kg)
2VA - 20	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	40	40	600	Flange/ coupling	MS2N03	10.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	480	1 325	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
16 x 16	1.23	7.66										
2VA - 21	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	40	40	600	Flange/ coupling	MS2N03	10.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKK-110-NN-1	i = 5	5.00	2.70	15.0	50	220	3 000	Gearing	MS2N04	
			i = 10	5.00	1.40							
2VA - 22	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	480	1 325	Belt side drive, i = 1	MS2N04	
			16 x 10	0.77	7.66							
16 x 16	1.23	7.66										
2VA - 23	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-110-NN-1	i = 5	5.00	2.70	15.0	50	220	3 000	Gearing	MS2N04	
			i = 10	5.00	1.40							
2VA - 30	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	60	495	1 590	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
20 x 20	1.27	8.22										
2VA - 31	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-145-NN-1	i = 3	5.00	10.80	15.0	60	210	3 000	Gearing	MS2N05	
			i = 5	5.00	6.50							
i = 10	5.00	3.30										
2VA - 32	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15.0	60	60	1 590	Flange/ coupling	MS2N04	61.0
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	60	495	1 590	Belt side drive, i = 1	MS2N04	
			25 x 10	0.63	8.22							
20 x 20	1.27	8.22										
2VA - 33	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15.0	60	60	1 590	Flange/ coupling	MS2N04	61.0
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKK-145-NN-1	i = 3	5.00	10.80	15.0	60	210	3 000	Gearing	MS2N05	
			i = 5	5.00	6.50							
i = 10	5.00	3.30										

**Dimension drawings**



**Version:  
X-axis as toothed  
belt axis**

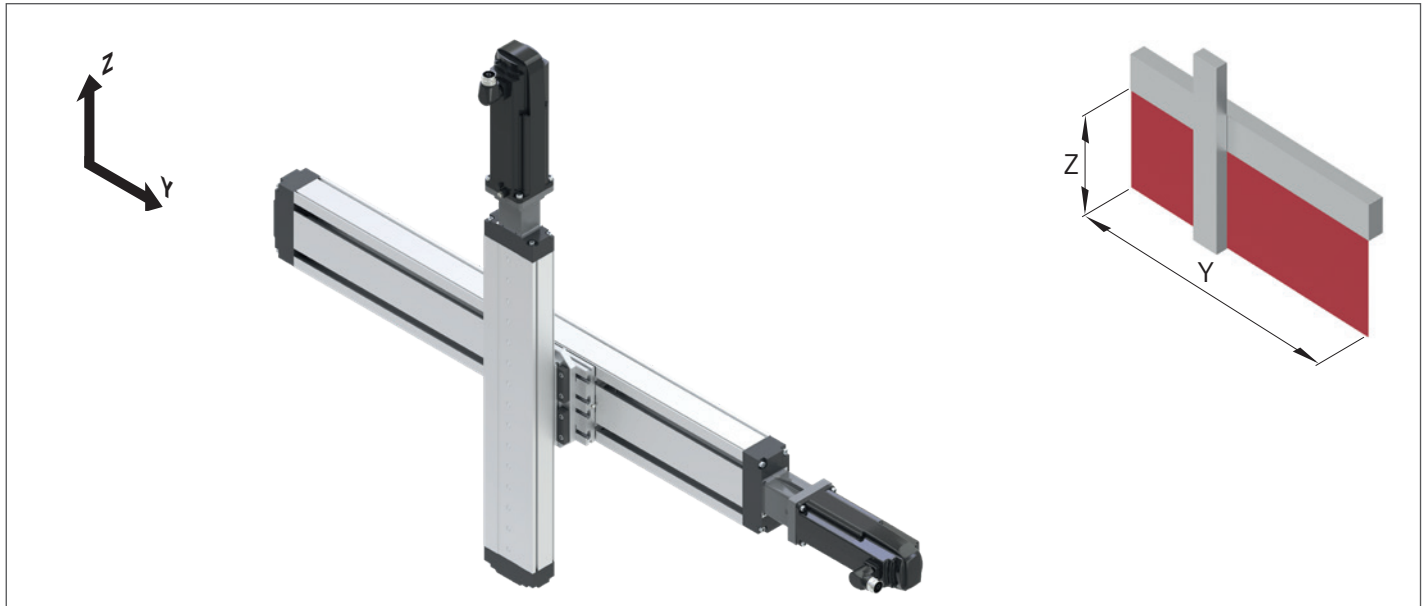




Type	Dimensions (mm)														
	$R_x$	$X_a$	$X_s$	$B_{wx}$	$B_{wz}$	$CP_1$	$CP_2$	$Z_u$	$Z_o$	$Z_1$	$L_{x1}$	$L_{rv1}$	$L_{ma}$	$L_{Mx}$ (max)	$L_{Mz}$ (max)
<b>2VA-20</b>	300.0	174.5	125.5	184.5	140	105.0	126.0	23.5	262.0	285	51	62	145.0	226.5	192.0
<b>2VA-21</b>	366.5	186.0	180.5	184.5	140	105.0	126.0	23.5	262.0	285	—	—	160.5	226.5	192.0
<b>2VA-22</b>	300.0	174.5	125.5	184.5	140	110.5	136.0	40.5	286.0	285	51	62	145.0	226.5	258.5
<b>2VA-23</b>	366.5	186.0	180.5	184.5	140	110.5	136.0	40.5	286.0	285	—	—	160.5	226.5	258.5
<b>2VA-30</b>	349.5	199.5	150.0	207.0	140	130.0	155.5	5.0	321.5	303	51	62	157.5	258.5	258.5
<b>2VA-31</b>	400.5	196.5	204.0	207.0	140	130.0	155.5	5.0	321.5	303	—	—	210.5	290.0	258.5
<b>2VA-32</b>	349.5	199.5	150.0	207.0	140	167.0	201.0	29.5	354.0	303	51	62	157.5	258.5	258.5
<b>2VA-33</b>	400.5	196.5	204.0	207.0	140	167.0	201.0	29.5	354.0	303	—	—	210.5	290.0	258.5

Type 2VB

**Product description**



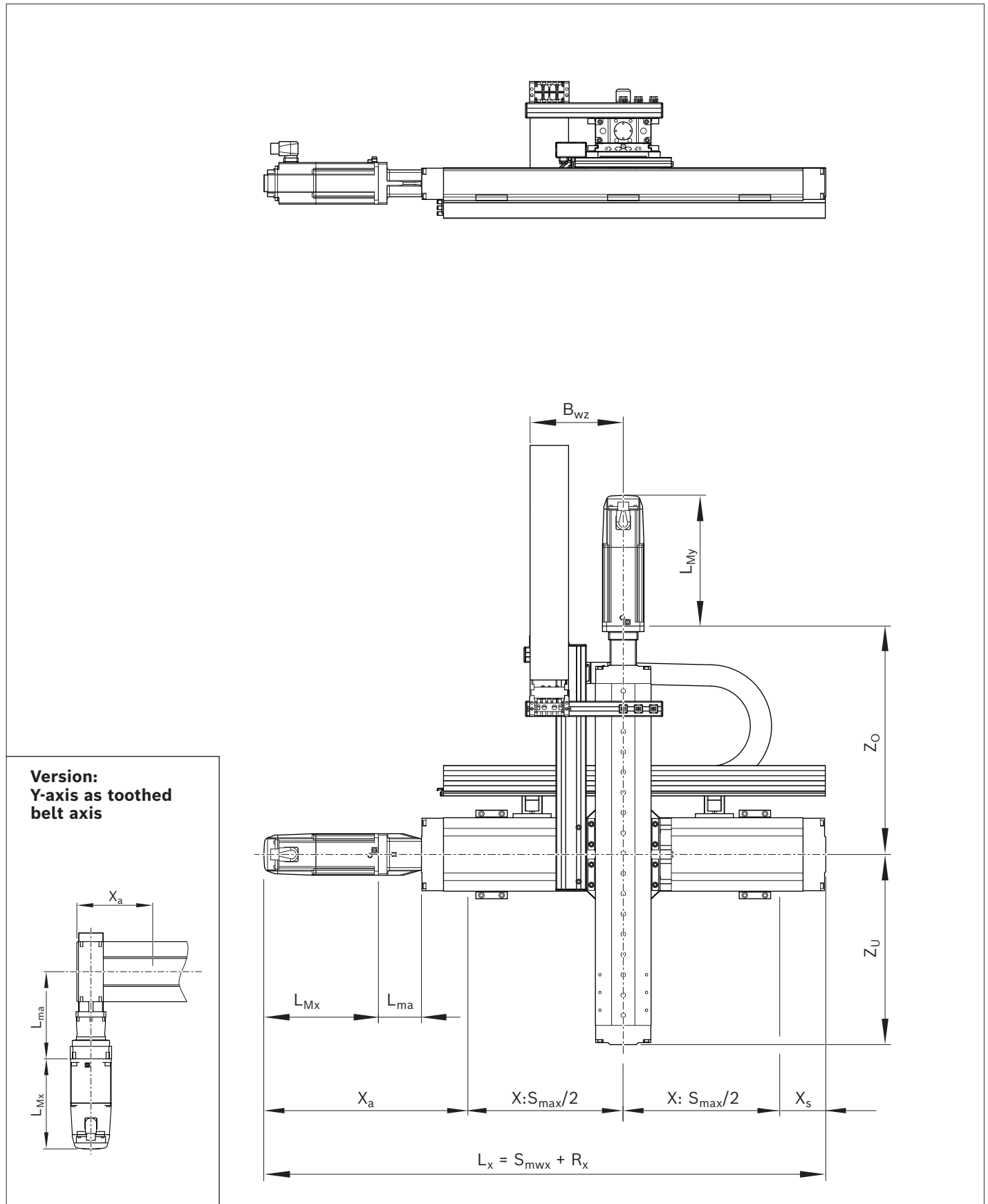
- ▶ 2D linear gantries of type 2VB are units for wall mounting and cover applications with horizontal and vertical movement directions. There are 12 sizes available for these application areas, offering compact modules in the X-axis with ball screw drive (CKK) or toothed belt drive (CKR) types.
- ▶ 12 sizes

**Technical data**

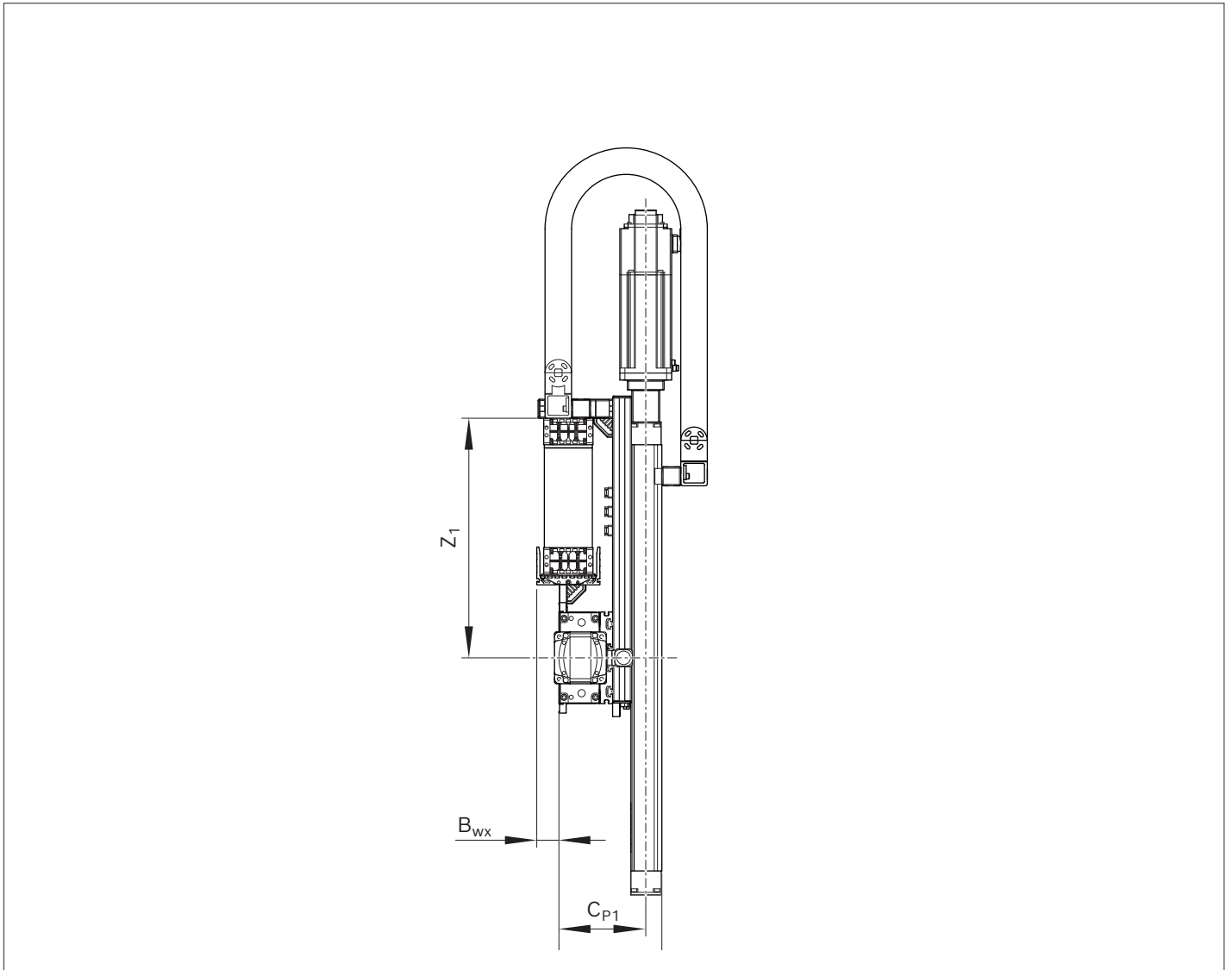
Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P</sub> max (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex</sub> max (kg)
2VB - 10	Z	CKK-070-NN-1	8 x 2.5	0.25	0.70	15.0	40	40	500	Flange/ coupling	MS2N03	2.0
			8 x 5	0.50	1.40							
	Y	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	40	195	600	Flange/ coupling	MS2N03	
			12 x 5	0.57	2.39							
2VB - 11	Z	CKK-070-NN-1	8 x 2.5	0.25	0.70	15.0	40	40	500	Flange/ coupling	MS2N03	2.0
			8 x 5	0.50	1.40							
	Y	CKR-090-NN-1	i = 5	3.0	1.6	15.0	40	165	3 000	Gearing	MS2N03	
			i = 10	1.5	0.8							
2VB - 20	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	40	40	600	Flange/ coupling	MS2N03	7.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	170	1 325	Flange/ coupling	MS2N04	
			16 x 10	0.77	7.66							
2VB - 21	Z	CKK-090-NN-1	12 x 2	0.23	0.79	15.0	40	40	600	Flange/ coupling	MS2N03	7.0
			12 x 5	0.57	2.39							
			12 x 10	1.13	4.42							
	Y	CKR-110-NN-1	i = 5	5.0	2.7	15.0	50	120	3 000	Gearing	MS2N04	
i = 10			5.0	1.4								

Type	Axis	Linear axis	BASA: d <sub>o</sub> x P Toothed belt: Gear ratio i	v <sub>max</sub> (m/s)	M <sub>P</sub> max (Nm)	a <sub>max</sub> (m/s <sup>2</sup> )	s <sub>min</sub> (mm)	s <sub>min_EC</sub> (mm)	s <sub>max</sub> (mm)	Motor attachment	Motor	m <sub>ex</sub> max (kg)
2VB - 22	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	Y	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	170	1 325	Flange/ coupling	MS2N04	
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
2VB - 23	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	7.66							
			16 x 16	1.23	7.66							
	Y	CKR-110-NN-1	i = 5	5.0	2.7	15.0	50	120	3 000	Gearing	MS2N04	
			i = 10	5.0	1.4							
2VB - 30	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	60	135	1 590	Flange/ coupling	MS2N04	
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
2VB - 31	Z	CKK-110-NN-1	16 x 5	0.38	6.76	15.0	50	50	1 325	Flange/ coupling	MS2N04	32.5
			16 x 10	0.77	13.51							
			16 x 16	1.23	16.50							
	Y	CKR-145-NN-1	i = 3	5.0	10.8	15.0	60	115	3 000	Gearing	MS2N05	
			i = 5	5.0	6.5							
			i = 10	5.0	3.3							
2VB - 32	Z	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	60	60	1 590	Flange/ coupling	MS2N04	61.0
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	Y	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	60	135	1 590	Flange/ coupling	MS2N04	
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
2VB - 33	Z	CKK-145-NN-1	20 x 5	0.30	8.22	15.0	60	60	1 590	Flange/ coupling	MS2N04	61.0
			25 x 10	0.63	8.22							
			20 x 20	1.27	8.22							
	Y	CKR-145-NN-1	i = 3	5.0	10.8	15.0	60	115	3 000	Gearing	MS2N05	
			i = 5	5.0	6.5							
			i = 10	5.0	3.3							
2VB - 40	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15.0	60	60	1 590	Flange/ coupling	MS2N04	61.0
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKK-200-NN-1	32 x 5	0.25	19.01	15.0	80	80	1 825	Flange/ coupling	MS2N06	
			32 x 10	0.50	19.21							
			32 x 20	1.00	19.21							
32 x 32			1.60	19.21								
2VB - 41	Z	CKK-145-NN-1	20 x 5	0.30	11.01	15.0	60	60	1 590	Flange/ coupling	MS2N04	61.0
			25 x 10	0.63	22.02							
			20 x 20	1.27	29.60							
	Y	CKR-200-NN-1	i = 3	5.0	38.7	15.0	80	80	3 000	Gearing	MS2N07	
			i = 5	5.0	23.2							
			i = 10	2.5	11.6							

**Dimension drawings**







Type	Dimensions (mm)												
	Rx	Xa	Xs	Bwx	Bwz	CP1	CP2	Zu	Zo	Z1	Lma	LMx (max)	LMz (max)
<b>2VB-10</b>	449.0	340.5	108.5	36.5	152	96.5	112.5	80.5	123.5	349.0	70.0	163.5	192.0
<b>2VB-11</b>	289.5	150.0	140.0	36.5	152	96.5	112.5	80.5	123.5	349.0	141.0	203.5	192.0
<b>2VB-20</b>	521.0	395.0	125.5	35.0	169	113.0	134.0	108.5	177.0	359.0	77.5	194.0	192.0
<b>2VB-21</b>	366.5	186.0	180.5	35.0	169	113.0	134.0	108.5	177.0	359.0	160.5	194.0	192.0
<b>2VB-22</b>	521.0	395.0	125.5	35.0	184	118.5	144.0	125.5	201.0	360.0	77.5	194.0	258.5
<b>2VB-23</b>	366.5	186.0	180.5	35.0	184	118.5	144.0	125.5	201.0	360.0	160.5	194.0	258.5
<b>2VB-30</b>	577.5	427.5	150.0	35.0	184	137.5	163.0	125.5	201.0	379.5	85.0	194.0	258.5
<b>2VB-31</b>	400.5	196.5	204.0	35.0	184	137.5	163.0	125.5	201.0	379.5	210.0	188.0	258.5
<b>2VB-32</b>	577.5	427.5	150.0	35.0	213	148.0	182.0	150.0	233.5	379.5	85.0	194.0	258.5
<b>2VB-33</b>	400.5	196.5	204.0	35.0	213	148.0	182.0	150.0	233.5	379.5	210.0	188.0	258.5
<b>2VB-40</b>	831.0	583.0	247.0	8.0	213	192.0	226.0	150.0	233.5	389.0	125.0	224.0	258.5
<b>2VB-41</b>	768.0	319.0	330.0	8.0	213	192.0	226.0	150.0	233.5	389.0	329.0	176.0	258.5

Type 1HB

**Product description**

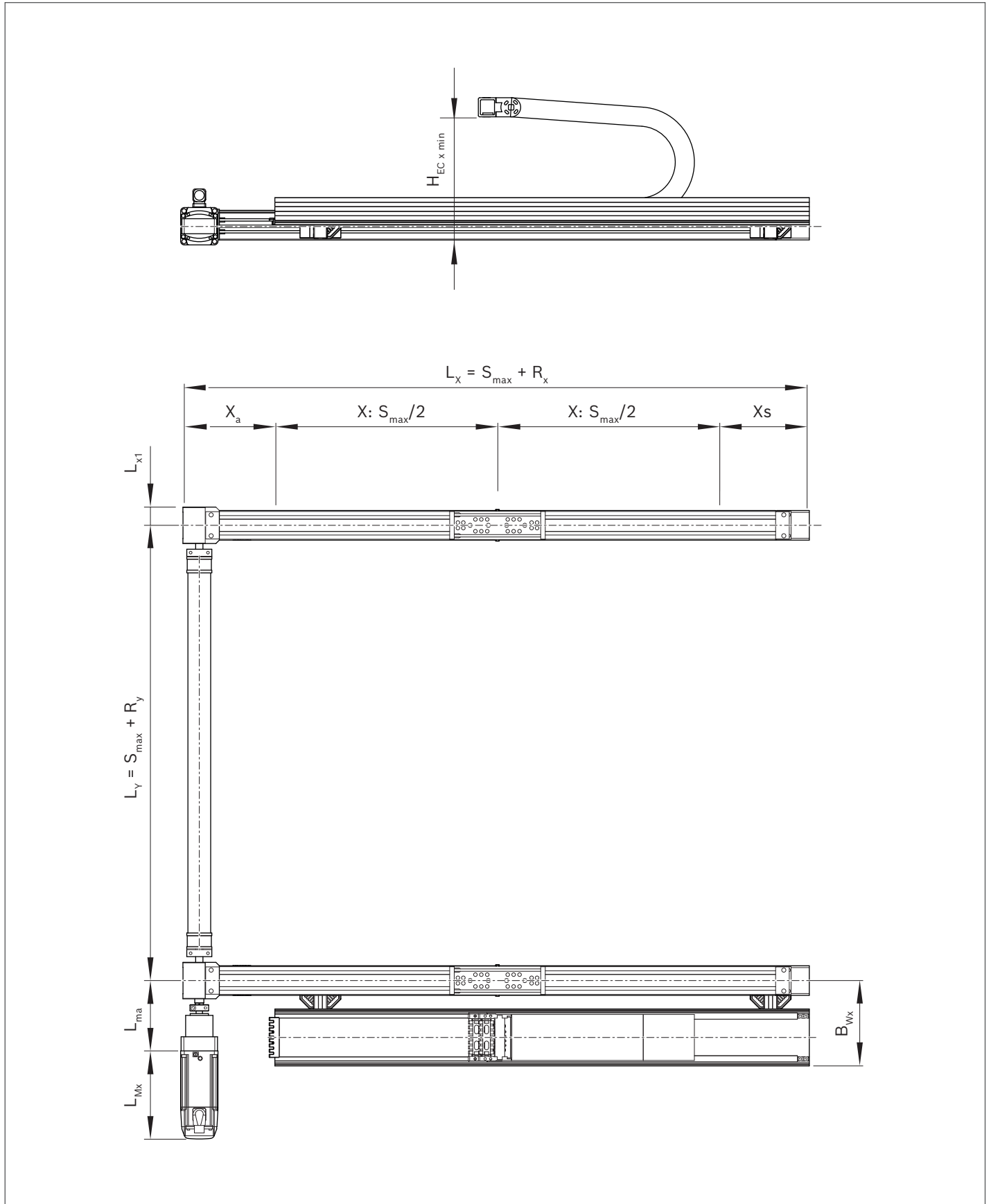


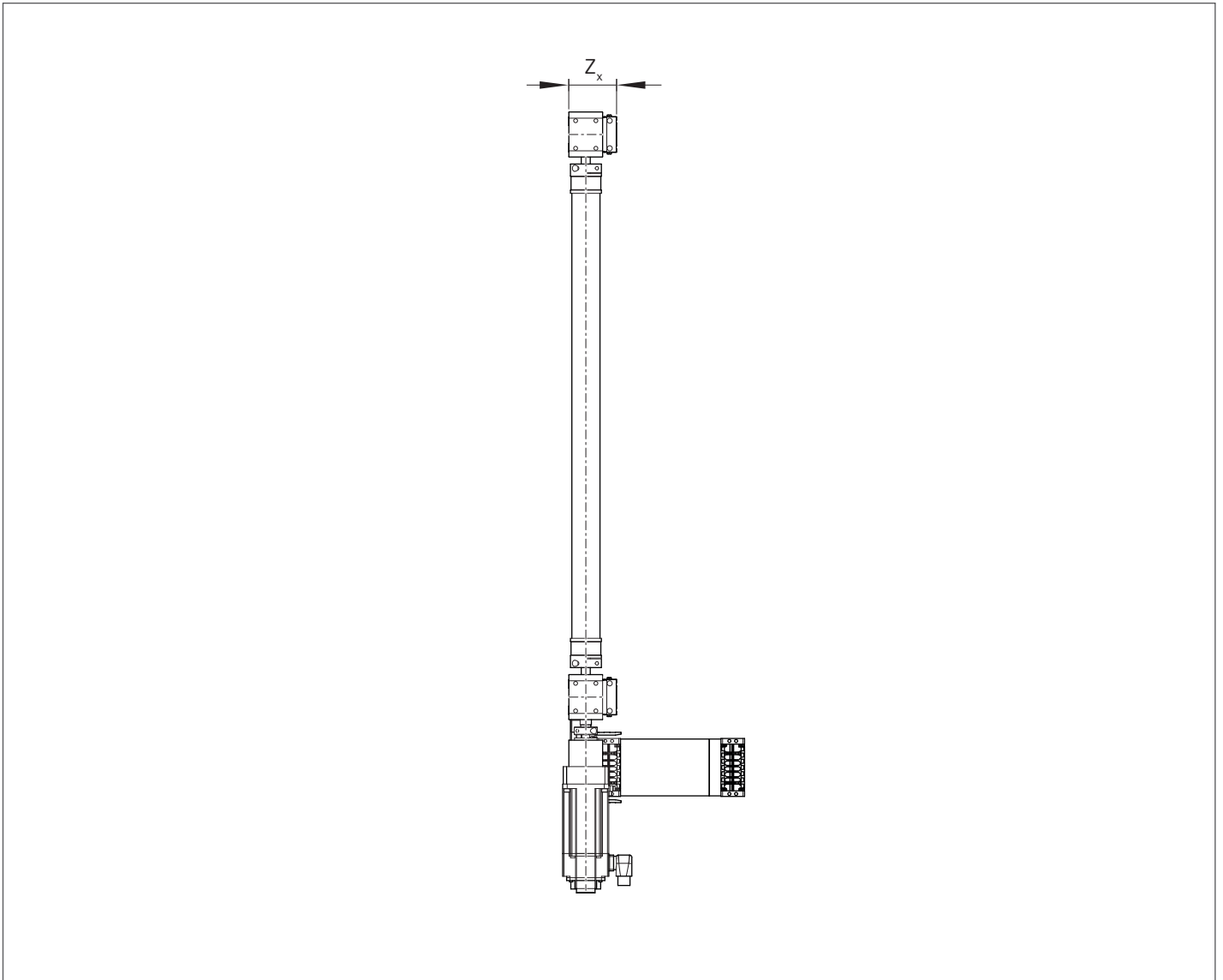
- ▶ 1D gantries are units of mechanically coupled linear modules with toothed belt drive for one-dimensional motion tasks.
- ▶ 4 sizes

**Technical data**

Type	Axis	Linear axis	BASA: $d_o \times P$ Toothed belt: Gear ratio $i$	$v_{max}$ (m/s)	$M_{P\ max}$ (Nm)	$a_{max}$ (m/s <sup>2</sup> )	$s_{min}$ (mm)	$s_{min\_EC}$ (mm)	$s_{max}$ (mm)	$LM_{min}$ (mm)	$LM_{max}$ (mm)	Motor attachment	Motor	$m_{ex\ max}$ (kg)
1HB - 20	X	MKR-065-NN-3	$i = 3$	5.00	4.00	15.0	60	125	3 000	253	3105	Gearing	MS2N04	62
			$i = 5$	4.50	2.40									
			$i = 10$	2.30	1.20									
1HB - 30	X	MKR-080-NN-3	$i = 3$	5.00	4.00	15.0	60	85	3 000	315	4144	Gearing	MS2N06	118
			$i = 5$	4.50	2.40									
			$i = 10$	2.30	1.20									
1HB - 40	X	MKR-110-NN-3	$i = 3$	5.00	33.30	15.0	60	60	3 000	355	4155	Gearing	MS2N07	214
			$i = 5$	4.00	20.00									
			$i = 10$	2.00	10.00									
1HB - 50	X	MKR-140-NN-3	$i = 5$	5.00	60.00	15.0	80	80	3 000	475	4195	Gearing	MS2N07	366
			$i = 12$	3.20	25.00									
			$i = 16$	2.40	18.75									

**Dimension drawings**





Type	Dimensions (mm)									
	$R_x$	$X_a$	$X_s$	$B_{wx}$	$H_{EC\ x\ min}$	$L_{x1}$	$L_{ma}$	$L_{Mx}$	$Z_x$	
<b>1HB-20</b>	376	191.0	185.0	187.5	270	40	154.5	258.5	85	
<b>1HB-30</b>	481	240.5	240.5	195.0	270	50	207.5	261.0	100	
<b>1HB-40</b>	578	283.0	295.0	210.0	270	59	264.0	317.0	129	
<b>1HB-50</b>	715	370.5	344.5	225.0	270	84	324.5	176.0	170	

# Smart Function Kits: System overview

## DRIVE AND CONTROL

- ▶ ctrlX DRIVE controller of the latest generation
- ▶ Simple connection to the higher-level control system via Profinet
- ▶ ctrlX CORE control integrated
- ▶ Open interface for i4.0 via OPC-UA
- ▶ Building blocks for connection to higher-level control system
- ▶ ReST programming interface
- ▶ Pre-installed engineering and runtime apps - easily individually extendable  
( ■ scope of delivery, ■ optional)

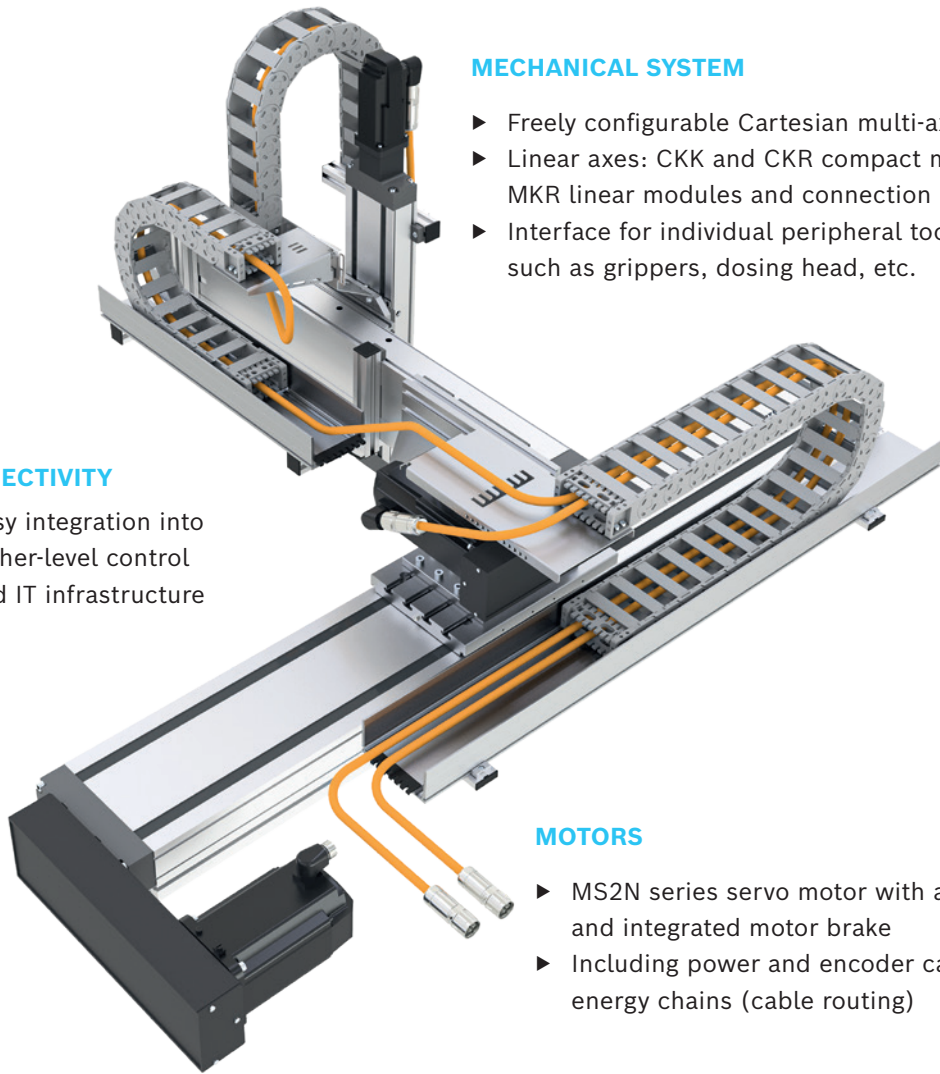



SFK handling	IDE
Automation	PLC
Cartesian motion	VPN
EtherCAT	Firewall
Safety STO	IOT Gateway
OPC-UA	User app
ReST	Node-RED
Python	Remote agent

## BROWSER-BASED WEB HMI

- ▶ Pre-installed, intuitive software with application-specific features
- ▶ No programming knowledge required – graphical programming via drag & drop
- ▶ Runs on various end devices starting at 10 inches





### MECHANICAL SYSTEM

- ▶ Freely configurable Cartesian multi-axis systems
- ▶ Linear axes: CKK and CKR compact modules, MKR linear modules and connection elements
- ▶ Interface for individual peripheral tools, such as grippers, dosing head, etc.

### CONNECTIVITY

- ▶ Easy integration into higher-level control and IT infrastructure

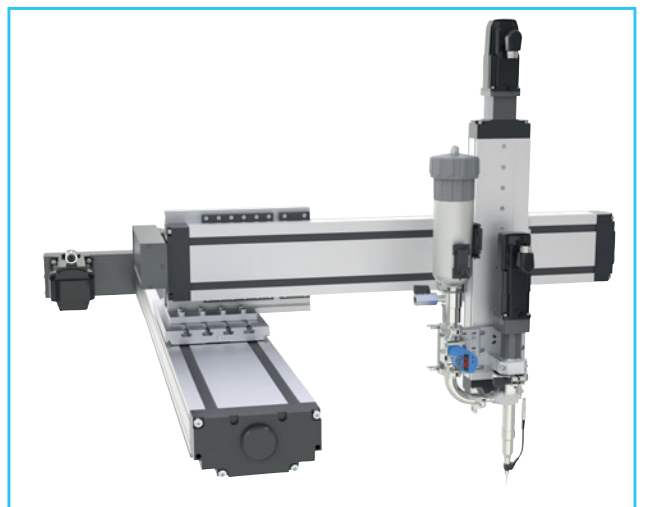
### MOTORS

- ▶ MS2N series servo motor with absolute encoder and integrated motor brake
- ▶ Including power and encoder cables as well as energy chains (cable routing)

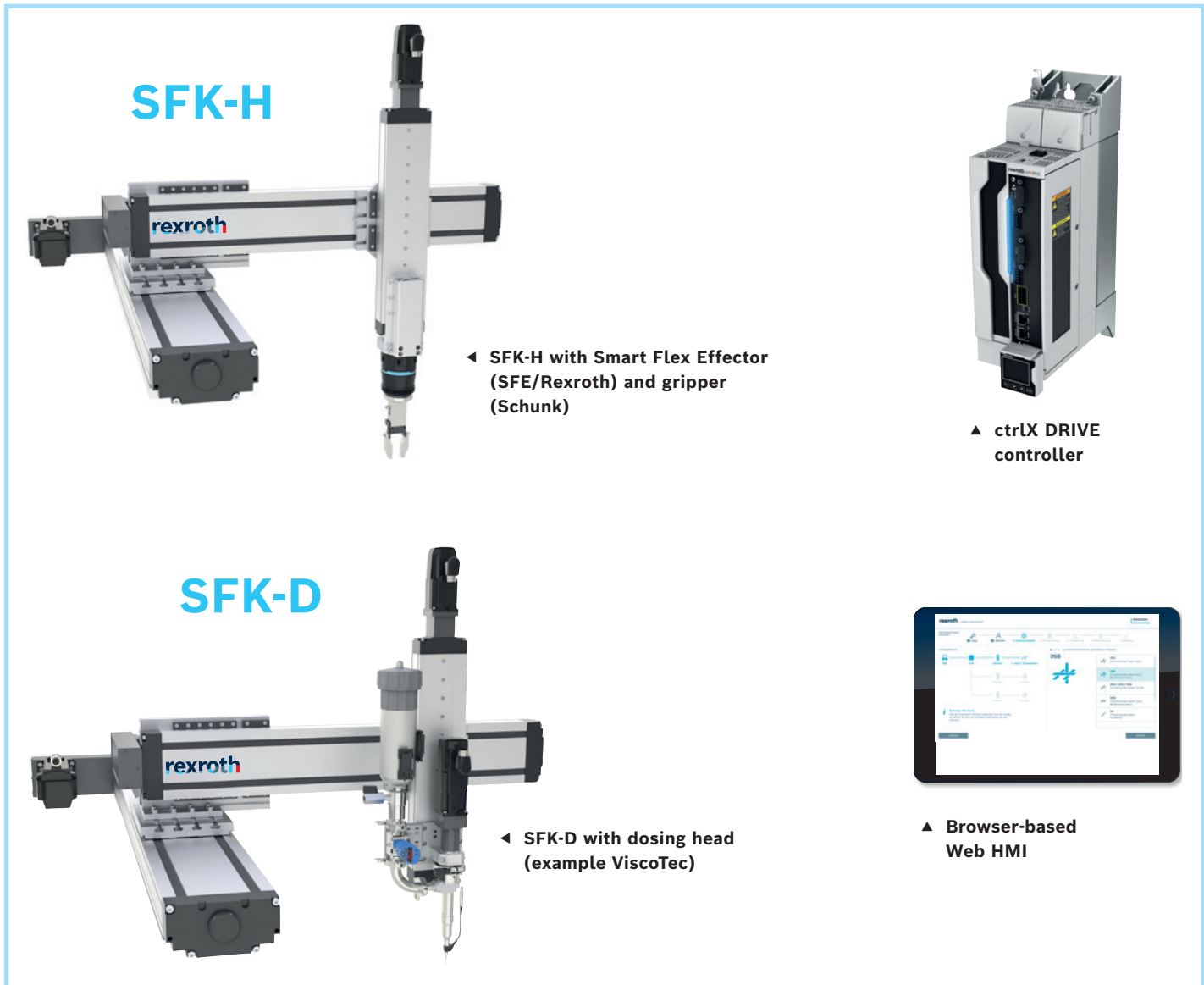
### SMART FUNCTION KIT HANDLING (SFK-H)



### SMART FUNCTION KIT DISPENSING (SFK-D)



# Smart Function Kit Handling (SFK-H) / Dispensing (SFK-D)



## THE COMPLETE PACKAGE – INCLUDING SOFTWARE

With the Smart Function Kits for Handling or Dispensing, Bosch Rexroth now offers ready-to-install mechatronic solutions for positioning and handling or dosing. These solutions are simple and intuitive to select, operate and configure and thus save an enormous amount of time in engineering compared to conventional systems. How? Through pre-defined kits that can be designed quickly. In addition, the pre-installed application-specific software enables a Plug & Produce commissioning via wizard and graphical program creation via drag & drop, completely without programming knowledge (zero programming). See for yourself how smart and simple the operation is.

- ▲ Easy integration of process-specific peripherals such as grippers or dosing heads thanks to flexible attachment options. Pre-installed software for fast, intuitive commissioning of the application-specific sub-system.





### EASY PRODUCT SELECTION

- ▶ Predefined, coordinated hardware components and software
- ▶ Fast selection and dimensioning with LinSelect
- ▶ All components from a single supplier – with proven Rexroth quality



### PLUG & PRODUCE

- ▶ Delivered in a single package, including pre-installed operating software
- ▶ Only a small number of interfaces thanks to an integrated control system
- ▶ Easy wiring thanks to pre-assembled cables
- ▶ Guided commissioning via our wizard (incl. dosing head)<sup>1)</sup>
- ▶ Auto parameterization of the overall system
- ▶ Referencing the axes



### ZERO PROGRAMMING

- ▶ No programming knowledge required
- ▶ Simple and graphical programming of the process
- ▶ Browser-based Web HMI, can be used on various devices
- ▶ Modern and intuitive design
- ▶ Prefabricated dispenser function blocks<sup>1)</sup>



### OPEN INTERFACES

- ▶ Simple connection to higher-level control system
- ▶ Data access via ReST programming interface
- ▶ IoT connection via OPC-UA
- ▶ Open software platform that can be extended via apps
- ▶ Easy connection of application-specific end effectors
- ▶ Compatibility with different dosing heads<sup>1)</sup>

<sup>1)</sup> For SFK-D



Find out more:  
[www.boschrexroth.de/smart-mechatronix](http://www.boschrexroth.de/smart-mechatronix)

**Best-in-class linear motion technology components by Bosch Rexroth** + **Sensors Electronics Software** = **Completely new solution approaches and business models for the factory of the future**

### SMART MECHATRONIX: PLUG & PRODUCE, PERFORM, PROCEED

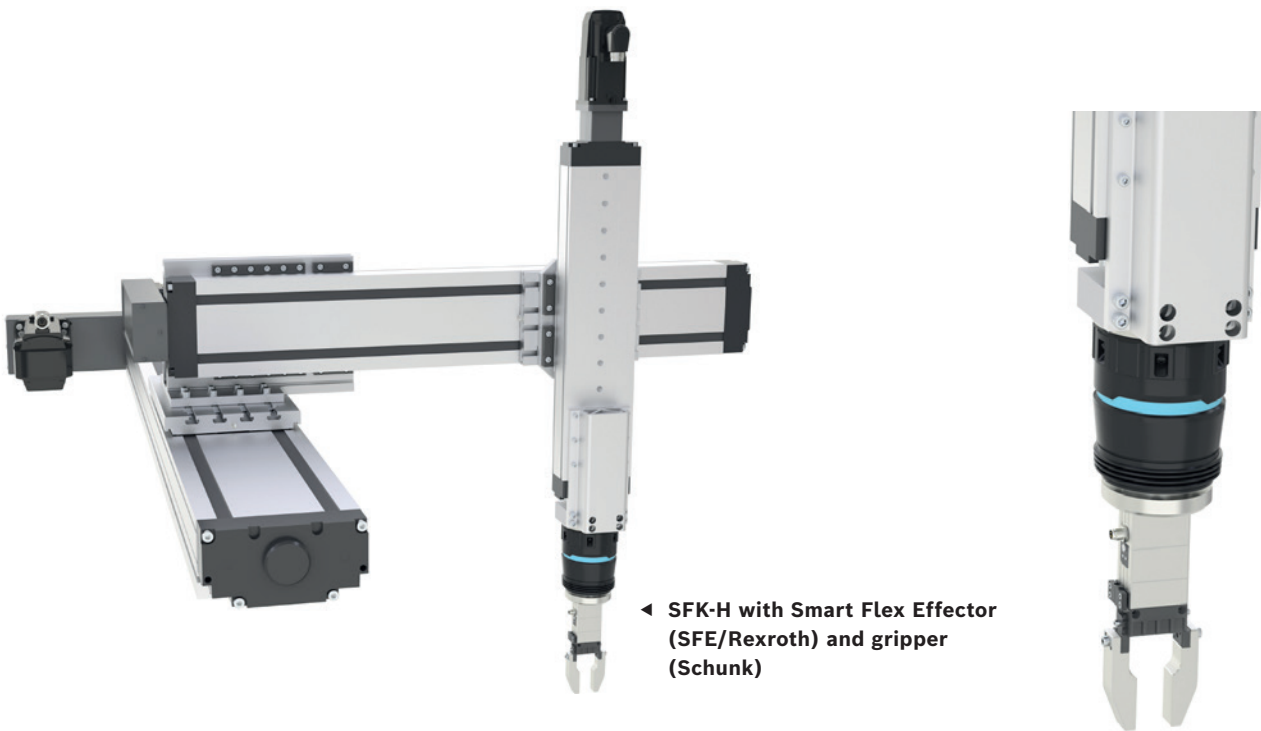
With the new Smart MechatroniX solution platform, which combines best-in-class linear motion technology components with sensors, electronics and software, Bosch Rexroth is responding to market trends in factory automation on the way to the Factory of the Future. The resulting solutions are versatile and open up completely new business models. They allow quick commissioning, offer full process transparency and ensure a short time to market and high productivity.

# Product description

## Smart Function Kit Handling / Dispensing

- Based on a Cartesian multi-axis system, various handling and dispensing applications can be realized precisely and reliably in a defined space.
- Proven Rexroth linear axes from the mechatronic building system with currently 36 structural design types available with connection elements and optional cable drag chains and cables are combined with innovative control technology and software to create a perfectly tailored system solution. Everything from a single source.
- Simple connection to the higher-level control system via Profinet
- Simple sizing & product selection via LinSelect and fast online configuration with 3D preview
- Plug & Produce thanks to commissioning wizard and automatic parameterization of dosing heads compatible with multi-axis systems<sup>1)</sup>
- Graphical process configuration without programming knowledge; incl. prefabricated dispensing functions<sup>1)</sup>
- The Smart Function Kit can be used as stand-alone solution or incorporated in superior systems via OPC UA.

### Smart Function Kit Handling (SFK-H)



The mechatronic building system of the SFK-H is suitable for various positioning and handling tasks.

► Further information from page 68



Smart Function Kit Dispensing (SFK-D)



The Smart Function Kit Dispensing is the right subsystem for a wide range of dosing applications.

**Integration of compatible dosing heads**

The integration of different compatible dosing heads (e.g. ViscoTec; <https://www.viscotec.de>) makes it possible to offer the perfect dosing solution for your special application. The dosing heads of the RD-EC series from ViscoTec are suitable for a variety of dosing media. For the exact sizing of a suitable dosing head, please contact ViscoTec directly. Compatible dosing heads from ViscoTec: 3RD3 ; 3RD4; 4RD6; 3RD8; 3RD10; 3RD12; Once you decide that you want to use a compatible ViscoTec dosing head, you can select the right accessories.

There are two basic types (**type 1 / type 2**) for the adaptation of dosing heads, each of which is assembled differently and is in each case assigned to a group of structural design types.

► Further information from page 70

<sup>1)</sup> For SFK-D

**INTUITIVE, EASY-TO-USE SOFTWARE – NO PROGRAMMING KNOWLEDGE REQUIRED**

Our specially developed software forms the core element and the basis for realization for handling and dispensing applications. Thanks to the modern, intuitive Web HMI, the software is ready for immediate use, with no previous knowledge required. The commissioning wizard guides you through the setting process step by step, programming is done by drag and drop. These benefits lead to significant time and cost savings.

The image displays two tablets showing the Rexroth Smart Function Kit software. The top tablet shows the 'ERSTEINRICHTUNGS-ASSISTENT' (Commissioning Assistant) interface. It features a progress bar with seven steps: 1. Login, 2. Benutzer (User), 3. Systemarchitektur (System Architecture), 4. Parametrierung (Parameterization), 5. Orientierung (Orientation), 6. Referenzierung (Referencing), and 7. Abschluss (Completion). The current step is '3 | Systemarchitektur'. The main area shows a system overview diagram with components: HMI, ctrlX, Antrieb 1 (1. Achse + Schleppachse), Antrieb 2 (2. Achse), and Antrieb 3 (3. Achse). A list on the right shows system types: 3SA (3-Dimensionales System Typ A), 3SB (3-Dimensionales System Typ B Mechanisches Gantry), 2HA / 2VA / 2VB (2-Dimensionales System Typ A/B), 2HB (2-Dimensionales System Typ B Mechanisches Gantry), and 1A. A message states: 'Systemtyp 3SB erkannt. Falls der automatisch erkannte Systemtyp nicht der richtige ist, wählen Sie bitte den korrekten Systemtypen aus der Liste aus.' (System type 3SB recognized. If the automatically recognized system type is not the correct one, please select the correct system type from the list.) A 'ZURÜCK' (Back) button is at the bottom.

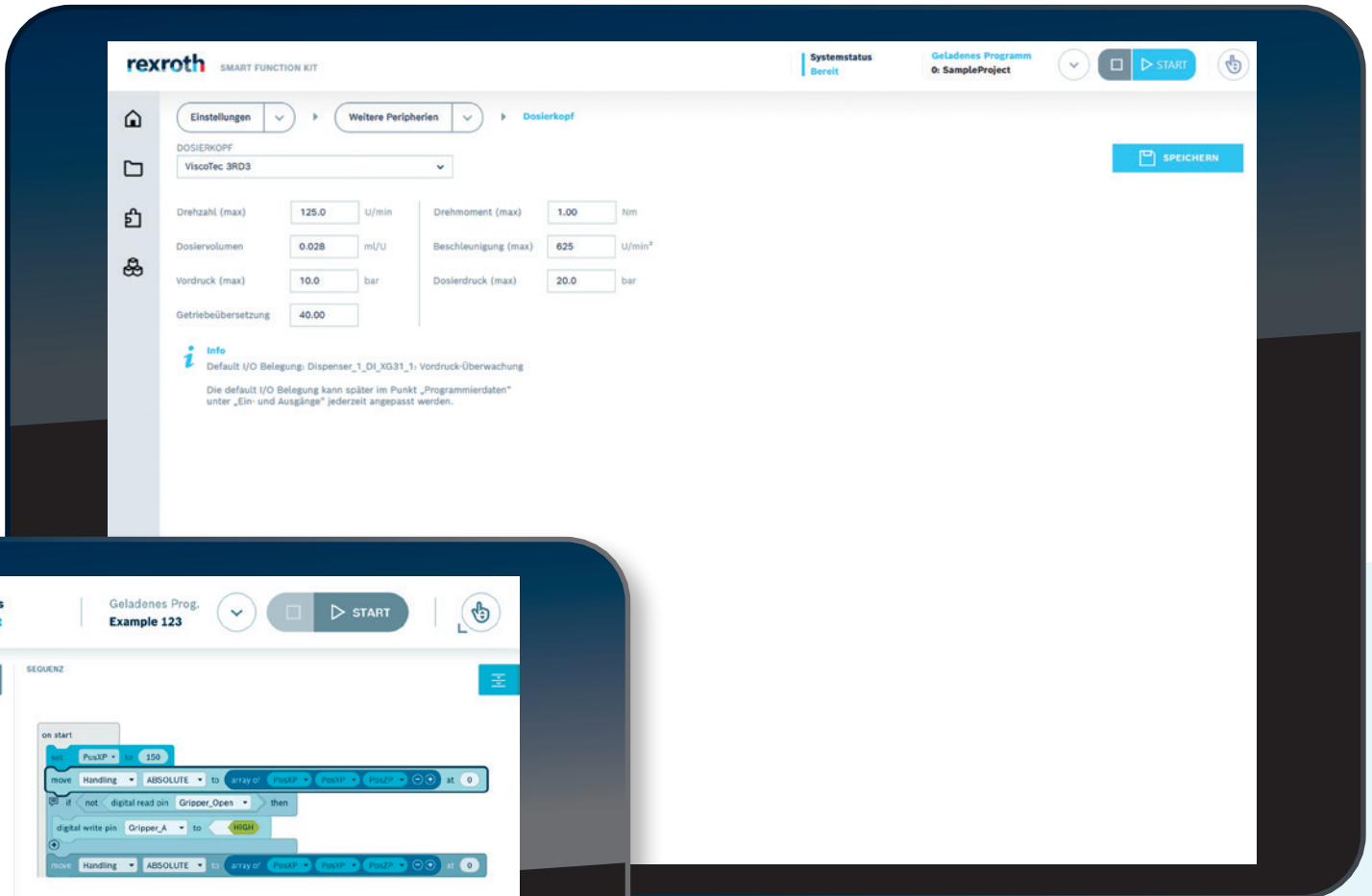
The bottom tablet shows the 'PRODUCTION' monitoring screen. It displays production statistics: 'Gesamt 3 STK' (Total 3 pieces), 'OK 3 STK' (OK 3 pieces), and 'NOK 0 STK' (NOK 0 pieces). A circular gauge shows 'Effizienz 100,00 %' (Efficiency 100.00%). Below this, a 'PRODUKTIONSVERLAUF' (Production Process) section shows a list of items, with '3SB' (3-Dimensionales System Typ B Mechanisches Gantry) highlighted.

**▲ Start with ctrlX:**  
The pre-installed app (Web HMI) for the Smart Function Kit is fully integrated into the ctrlX application

**▲ Commissioning:**  
The commissioning wizard guides you through the setting process step by step

**▶ Auto parameterization:**  
The system recognizes all axes independently, the drive controllers are parameterized automatically

**▶ Referencing:**  
Intuitive referencing of the axes including visual feedback



▲ **End effector connection:**  
 Easy integration and activation of different dosing heads possible

◀ **Process configuration:**  
 Intuitive graphical programming - without programming knowledge, with expandable command library and validation of program parameters

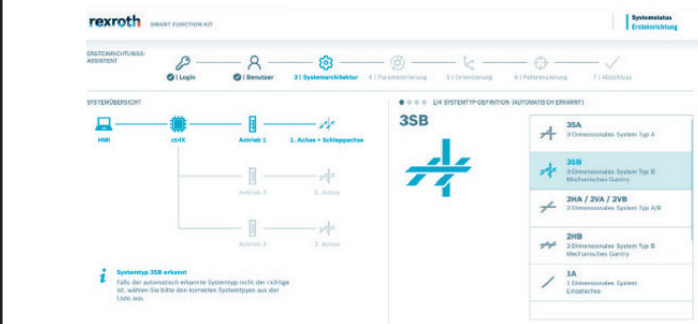
◀ **Web HMI dashboard:**  
 Everything at a glance - display of efficiency, program flow, production history and current application-specific process data

**Software**

**Easy commissioning  
(Plug & Produce and fast commissioning)**

- ▶ Pre-installed software
- ▶ The wizard leads you through the commissioning step by step (incl. commissioning of compatible dosing head<sup>1)</sup>).
- ▶ Automatic loading of the hardware configuration thanks to reading of the motor encoder memories
- ▶ Auto parameterization the drive controllers
- ▶ Guided referencing of the individual axes

**Handling**



**Dispensing**

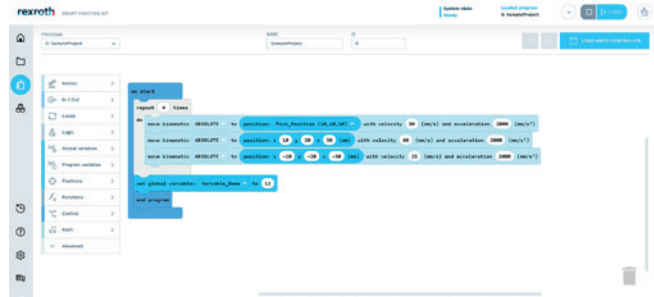


<sup>1)</sup> For SFK-D

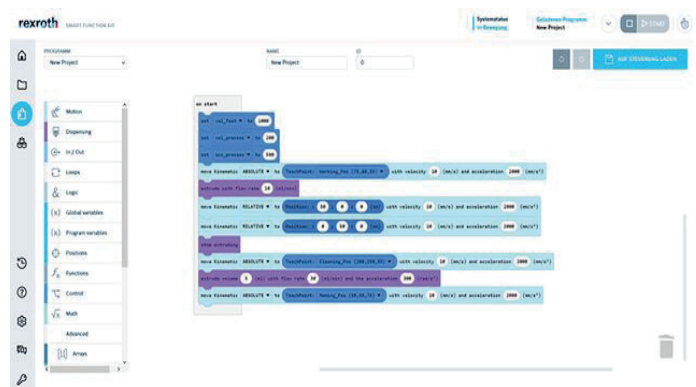
**Simple programming (zero programming)**

- ▶ Intuitive graphical programming with drag and drop
- ▶ Expandable library of commands
- ▶ Validation of program parameters
- ▶ Pre-assembled dispense function blocks
- ▶ No programming knowledge required
- ▶ Visualization on the Web HMI

**Handling**



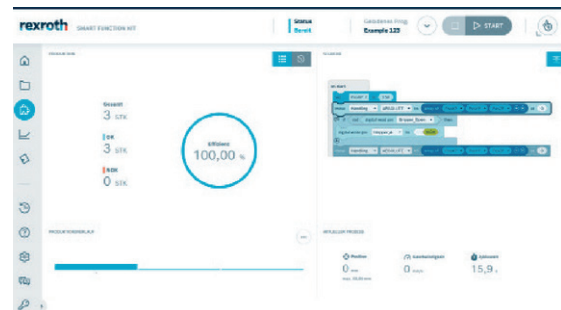
**Dispensing**



**Web HMI dashboard**

- ▶ Can be used on various web-enabled terminals from 10-inch display diagonal.
- ▶ Everything in view thanks to a variety of information such as system status and diagnostic messages, program change and jog mode.
- ▶ Program management
- ▶ Current process data such as position, speed, acceleration, etc. are also displayed.

**Handling**



**Dispensing**



## Drive controller

### ctrlX DRIVE controller of the latest generation

- ▶ ctrlX CORE control integrated
- ▶ Simple connection to the higher-level control system via Profinet
- ▶ Open interface for i4.0 via OPC-UA
- ▶ Building blocks for connection to higher-level control system
- ▶ ReST programming interface
- ▶ Pre-installed engineering and runtime apps – easy to extend individually
- ▶ From simple axis with command value specification to the axis-integrated motion system
- ▶ Scalable output of ctrlX DRIVE servo drives from 6 to 375 Apeak and ctrlX DRIVE servo motors from 3.7 to 692 Nmpeak
- ▶ Space-saving design: Suitable for 300 mm control cabinets, 25 mm width per axis, 30% more compact motors
- ▶ Plug & play: ctrlX DRIVE and ctrlX DRIVE servo motors with single-cable technology
- ▶ Optimum adaptation to the machine requirements through a broad motor portfolio: rotary, linear, kit or housed

- 1) Scope of delivery  
2) Optional



- 1)  
2)



APP overview see page 75



**Please note that the choice of controllers depends on the selected axis system. ctrlX I/O modules**

**Field bus coupler S20-EC-BK**

- ▶ EtherCAT bus coupler
- Serial interface S20-RS-UNI:**
- ▶ 1 serial input and output channel
- 2x digital input and output module S20-DIDO-8/1:**
- ▶ 8 digital inputs and outputs; 24 V DC; 2.4 mA input current; 0.5 A output current
- Interfaces**
- OPC-UA interface**
- ▶ OPC-UA = Open Platform Communications – Unified Architecture
- ▶ Open communication standard for data exchange and networking of plants and subsystems with each other and with higher-level IT systems (horizontal and vertical networking).
- ▶ Smart Function Kit for Handling with integrated OPC-UA server
- ▶ Faster integration of the Smart Function Kit for Handling into the plant and IT architecture
- ▶ Access to data and functions of the Smart Function Kit for Handling, independent of the platform or language
- HTTP Rest API interface**
- ▶ REST= REpresentational State Transfer Architecture (= Stateless, resource-based)
- ▶ Easy communication with the Smart Function Kit for Handling from an IT system (e.g. web interface, high-level language program, server)
- ▶ Getting and posting messages for HTTP communication with the Smart Function Kit for Handling (data exchange in JSON format)
- ▶ Request and creation of programs
- ▶ Remote access to system settings of the Smart Press Kit (e.g. I/O assignment, IP address)
- ▶ Suitable for all data that is to be read or written once (= "non-live" data)



**Safety**

Scope of delivery by Bosch Rexroth:  
 Incomplete machinery without CE mark according to MRL optional multi-encoder interface for resolver, A duty of the customer (as machine manufacturer):  
 Compliance with the requirements according to MRL (e.g. risk assessment, safety concept, protective safeguards, CE approval)  
 Possible safety concept:

- Protective enclosure of the hazardous area
- Use of safe door switches (possibly with guard locking) with relay e.g.: PILZ safety relay 750105 + PILZ safety switch 504220
- Wiring the relay to HCS01 STO inputs

Safety category 4 with performance level (PL) achievable.



**STO not usable via ProfiSAFE etc.  
 Connection only via hardware circuitry**

## I/O modules

You have the option to select an I/O expansion module which is composed of the following single parts to form an assembly:

When using Ethercat, follow the order (as per Ethercat.xml).

---

### 1x S20-EC-BK

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- ▶ Up to 63 additional S20 participants can be connected
- ▶ 2 RJ45 connectors
- ▶ Rotary coding switch
- ▶ Automatic addressing
- ▶ Illustration of the station as a modular EtherCAT device using a modular device profile (MDP)

---

### 1 serial input and output channel in RS232 or RS485/422 version S20-RS-UNI

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- ▶ 1 serial input and output channel in RS232 or RS485/422 version
- ▶ Multiple protocol support
- ▶ Transmission rate adjustable up to 250,000 baud
- ▶ Parameterization via the PDI channel
- ▶ Electronic device name plate

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### 8 inputs/outputs, 1-wire technology S20-DIDO-8/1

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- ▶ 8 digital inputs and outputs
- ▶ 24 V DC, 2.4 mA input current, 0.5 A output current
- ▶ Connection of sensors and actuators in 1-wire technology
- ▶ Filter times can be adjusted in three stages: < 100  $\mu$ s, 1000  $\mu$ s, or 3000  $\mu$ s
- ▶ Maximum input frequency: 5 kHz

**APP overview**

<p>Smart Function Kit Handling app</p>		<p>The pre-installed Smart Function Kit app features a modern, intuitive dashboard.</p> <p><b>Fast commissioning &amp; Plug &amp; Produce</b></p> <ul style="list-style-type: none"> <li>- The commissioning wizard guides through the commissioning process step by step</li> <li>- Automatic readout of motor encoder memory data</li> <li>- Automatic parameterization of all individual axes</li> <li>- Guided referencing</li> </ul> <p><b>Zero programming</b></p> <ul style="list-style-type: none"> <li>- Intuitive graphical programming – without programming knowledge</li> <li>- Logical arrangement of the program modules with drag and drop</li> <li>- Comprehensive building block library</li> </ul>
<p>ctrlX CORE - Motion app</p>		<p>The ctrlX MOTION app provides the basic motion functions for single axis positioning.</p>
<p>EtherCAT app</p>		<p>The EtherCAT app offers a field bus communication protocol for the highest demands in terms of performance and openness with the fastest growing ecosystem. It offers IT-based communication standards for most simple IoT integration.</p>
<p>ctrlX CORE - OPC UA Server app</p>		<p>The OPC UA Server app provides standardized and safe communication according to the OPC Unified Architecture (OPC UA) standard. As an OPC UA server, ctrlX CORE makes all device data available to all connected OPC UA clients. Typical clients are HMI, Manufacturing Execution (MES) or data recording systems.</p>
<p>ctrlX CORE - Python Runtime app</p>		<p>ctrlX CORE - Python Runtime app The Python Runtime app provides the runtime environment for executing Python code on the ctrlX CORE.</p>
<p>IDE APP</p>		<p>The IDE app offers various development environments (code editor, console, debugging, etc.) by means of which program sequences for ctrlX CORE can be created.</p>
<p>ctrlX CORE - PLC app</p>		<p>The PLC app builds on the powerful PLC runtime system of CoDeSys V3 and supplements it with extensive technology libraries from Rexroth. The tool ctrlX PLC Engineering is part of the comprehensive engineering kit ctrlX WORKS, which is provided free of charge. There you have the frame application and the possibility to use the functions provided with the runtime and additional libraries. The PLC app contains the runtime for the realization of your IEC61131 PLC program.</p>
<p>ctrlX CORE - VPN Client app</p>		<p>The VPN Client app enables secure, encrypted communication with one or more endpoints for remote maintenance or streaming of sensitive data. Depending on the existing IT infrastructure, the VPN app offers users a simple way to configure secure remote access to the entire production line or just individual machines. The app supports creation and configuration of IPSec and OpenVPN connections. In the basic scope, the synchronous setup of up to two VPN connections is possible.</p>
<p>ctrlX CORE - Firewall app</p>		<p>The firewall app can be used to individually restrict communication between controller (device) and network(s). Thus, the machine is protected from unauthorized third-party access by viruses and Trojan horses. The Firewall app uses the Nftables firewall technology.</p>
<p>Node RED (optional) ctrlX CORE - Node-RED app</p>		<p>The Node-RED app is the Node-RED framework adapted for ctrlX AUTOMATION from Bosch Rexroth. The open source tool Node-RED is licensed under the 2.0 license and is a graphical development tool developed by IBM. On the server side, the framework is based on Node.js, while operation is performed via a graphical user interface in the browser. With Node-RED, different nodes for input, output and processing can be connected in a so-called flow. This allows data to be processed and various processes or devices to be monitored and controlled.</p>

## Smart Function Kit Handling (SFK-H)

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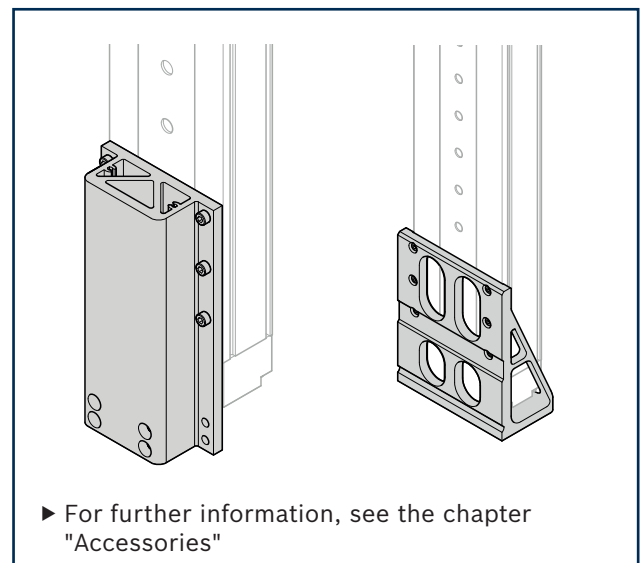
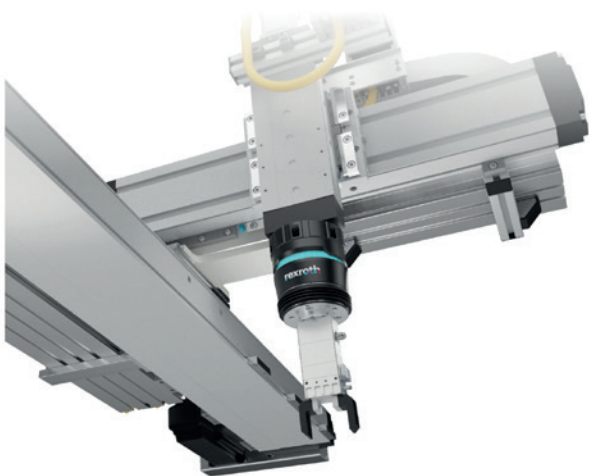
### Smart Function Kit Handling (SFK-H)

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The mechatronic building system of the Smart Function Kit Handling is suitable for a wide range of positioning and handling tasks.

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**Example: SFK-H with Smart Flex Effector (SFE)**  
by Rexroth and gripper (Schunk)





Smart Function Kit Dispensing (SFK-D)

**Example adaptation of the RD-EC series from ViscoTec to the SFK-D**

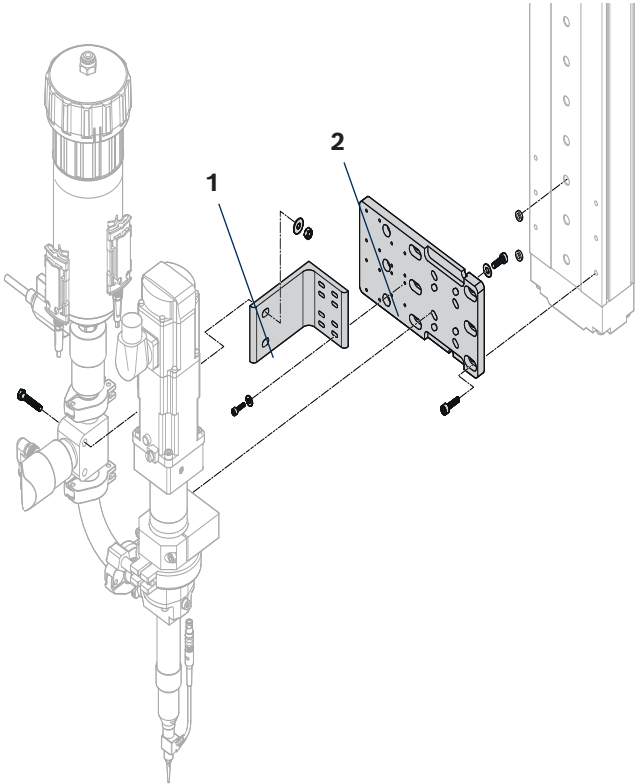
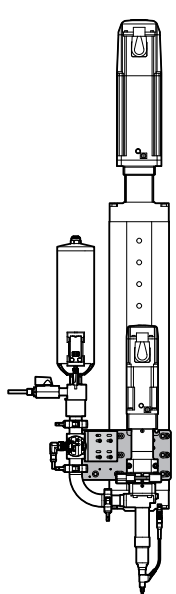
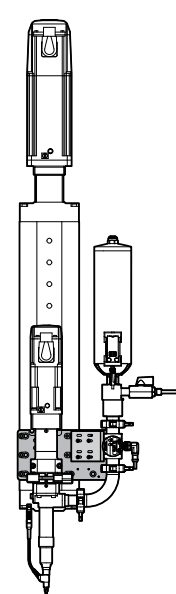
**Smart Function Kit Dispensing (SFK-D)**

**Scope of delivery:** SFK-D; additional drive (single-axis inverter XMS); angle (1), plate (2) and plate (3) (only for type 2) and assembly material.

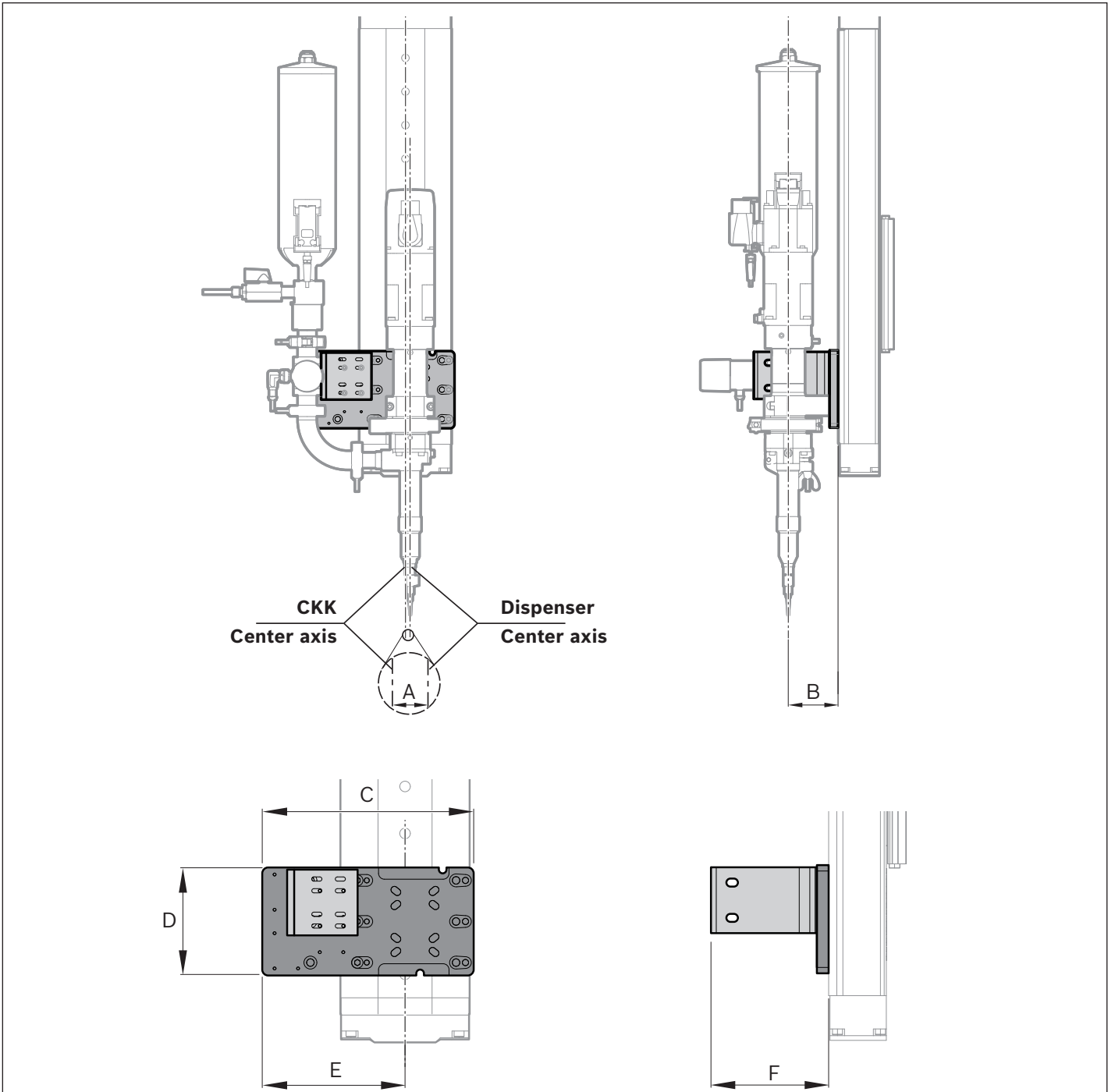
The exact assembly and arrangement of the single parts depends on the configuration of the axis system.  
For details, please refer to the hardware instructions R320103224.

**Type 1**, valid for axis combination:

3SA-20, 3SA-21, 3SA-22, 3SA-23, 3SA-30, 3SA-31, 3SB-20, 3SB-21, 3SB-22, 3SB-23, 3SB-30, 3SB-31, 3SB-40, 3SB-41, 3SC-22, 3SC-23, 3SC-30, 3SC-31, 3SC-40, 3SC-41, 2VA-20, 2VA-21, 2VA-22, 2VA-23, 2VA-30, 2VA-31, 2VA-32, 2VA-33, 2VB-20, 2VB-21, 2VB-22, 2VB-23, 2VB-30, 2VB-31, 2VB-32, 2VB-33, 2VB-40, 2VB-41

Angle (1), plate (2) allow a quick mounting of the dosing head	Installation situation	
	Left	Right
		

**Type 1**



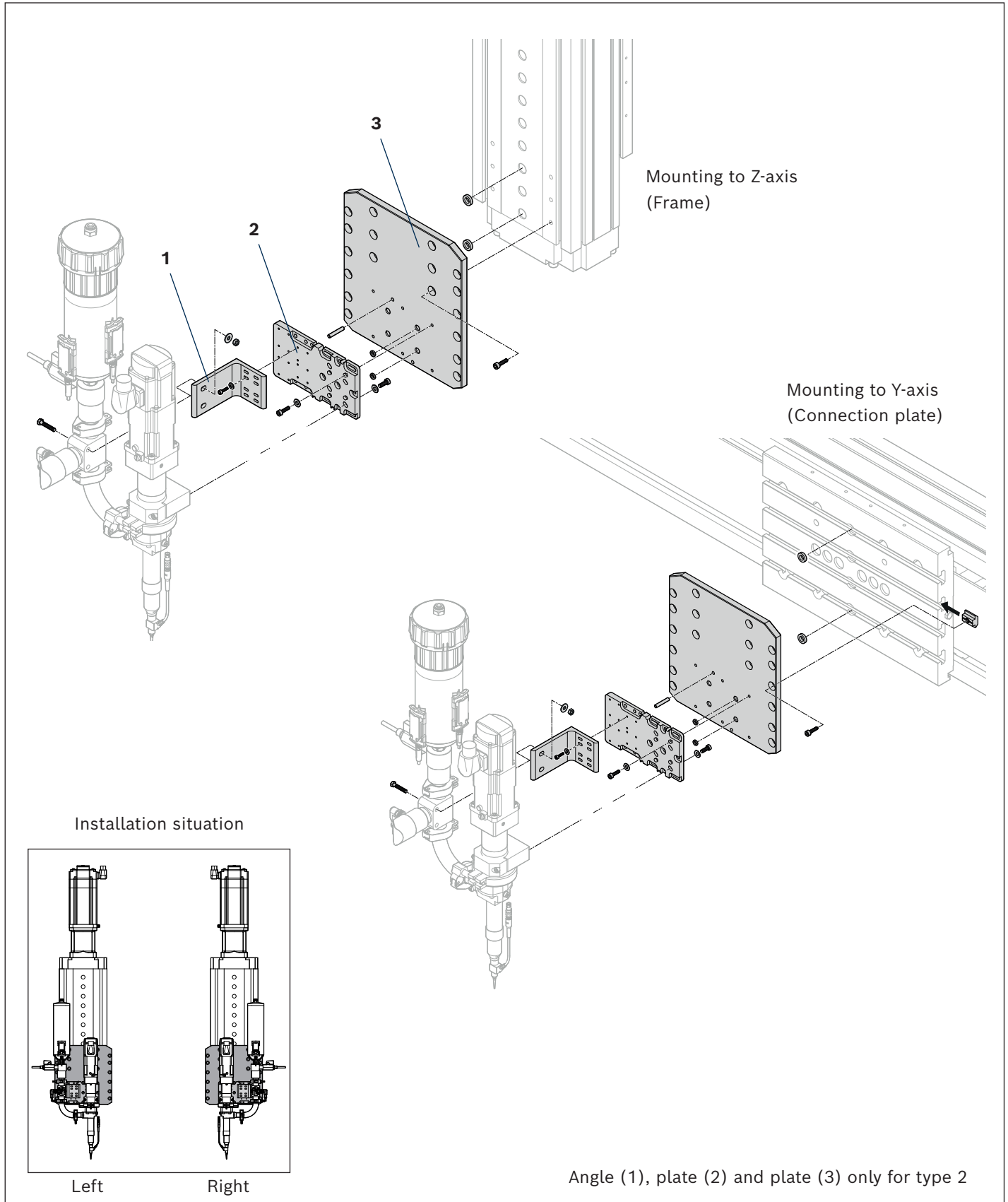
**Dimensions (mm)**

	<b>CKK 090</b>	<b>CKK 110</b>	<b>CKK 145</b>
<b>A<sup>1)</sup></b>	3	3	27
<b>B</b>	59	59	59
<b>C</b>	180	180	180
<b>D</b>	92	92	92
<b>E</b>	127	127	103
<b>F</b>	100	100	100

<sup>1)</sup> Offset of Z center axes (CKK/dispenser) in y-direction (depending on installation situation)

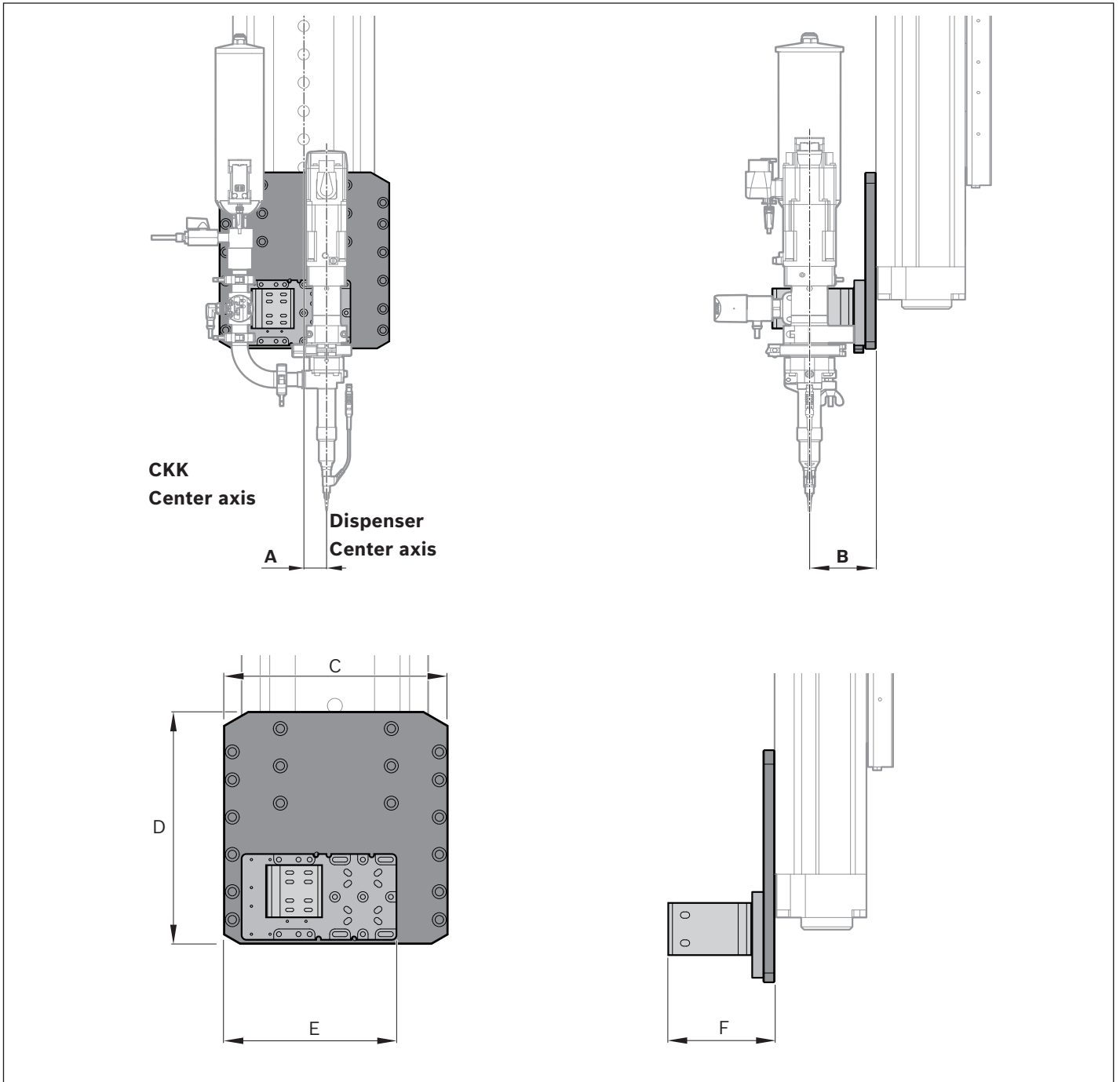
**Type 2:** Valid for structural design types:

3SA-10, 3SA-11, 3SB-50, 3SB-61, 2HA-08, 2HA-09, 2HA-10, 2HA-11, 2HA-20, 2HA-21, 2HA-22, 2HA-23, 2HA-30, 2HA-31, 2HA-32, 2HA-33, 2HB-20, 2HB-21, 2HB-30, 2HB-31, 2HB-40, 2HB-41, 2HB-50, 2HB-61, 2VB-10, 2VB-11





**Type 2**



**Dimensions (mm)**

	CKK 070	CKK 090	CKK 110	CKK 145	CKK 200	MKR 145
A <sup>1)</sup>	0	18	23	23	30	30
B	69	71	69	69	71	71
C	166	166.0	166	179.5	240	240
D	110	117.5	119	136.0	249	249
E	130	111.0	107	107.0	120	120
F	110	112.0	110	110.0	112	112

<sup>1)</sup> Offset of Z center axes (CKK/dispenser) in y-direction (depending on installation situation)

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**Drive (another drive controller for ViscoTec dosing head is supplied)**  
**Single axis inverter XMS / XMS2-W0016ANN-01AETT0NNNN-S03RSN2NNNN0NN**

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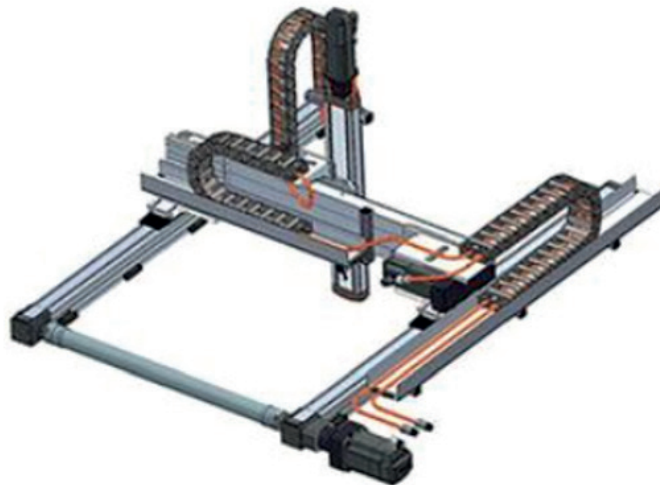


- ▶ From simple axis with command value specification to the axis-integrated motion system
- ▶ Scalable power. Inverters from 6 to 375 A<sub>peak</sub>
- ▶ Less cabling thanks to single-cable technology with MS2N synchronous servo motors and up to 75 m cable length without add-on components
- ▶ Free choice of the motor encoder or, for example, of a second encoder.  
Optional multi-encoder interface for resolver, AcuroLink, Hiperface, EnDat 2.2, SSI
- ▶ Integrated safety technology up to SIL3

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**Motor cable (another motor cable is laid in the cable track chain)**

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▶ For further information, see the chapter "Accessories"




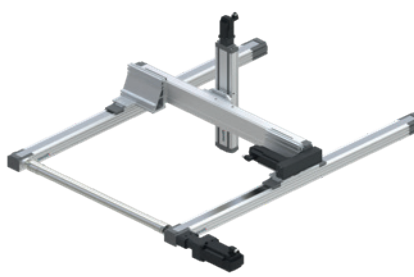
Overview


Fastening options on the relevant axes depend on the type and size of the multi-axis system.


Example: 2D area gantry, type 2HB, size 30


According to the table, information on mounting the x-axis (basic axis) can be found in section "Fig. B2" for the required size MKR-080.


3D cantilever chamber	TYPE	Size	Z-axis			X-axis (basic axis)		
			Z-adapter Adapter A	HK Adapter B	Without adapter	Size	Fig.	Size
	3SA	10	Z1	Z2	Z0	CKK-070	B1	CKX-110
		11	Z1	Z2	Z0	CKK-070	B1	CKX-110
		20	Z1	Z2	Z0	CKK-090	B1	CKX-145
		21	Z1	Z2	Z0	CKK-090	B1	CKX-145
		22	Z1	Z2	Z0	CKK-110	B1	CKX-145
		23	Z1	Z2	Z0	CKK-110	B1	CKX-145
		30	Z1	Z2	Z0	CKK-110	B1	CKX-200
		31	Z1	Z2	Z0	CKK-110	B1	CKX-200


3D gantry	TYPE	Size	Z-axis			X-axis (basic axis)		
			Z-adapter 1 Fig.	Z-adapter 2 Fig.	HK Fig.	Size	Fig.	Size
	3SB	20	Z1	Z2	Z0	CKK-090	B2	MKR-065
		21	Z1	Z2	Z0	CKK-090	B2	MKR-065
		22	Z1	Z2	Z0	CKK-110	B2	MKR-065
		23	Z1	Z2	Z0	CKK-110	B2	MKR-065
		30	Z1	Z2	Z0	CKK-110	B2	MKR-080
		31	Z1	Z2	Z0	CKK-110	B2	MKR-080
		40	Z1	Z2	Z0	CKK-145	B2	MKR-110
		41	Z1	Z2	Z0	CKK-145	B2	MKR-110
		50	Z1	Z2	Z0	CKK-200	B2	MKR-140
		61	Z1	Z2	Z0	CKK-200	B2	MKR-140


3D gantry, performance-optimized	TYPE	Size	Z-axis			X-axis (basic axis)		
			Z-adapter 1 Fig.	Z-adapter 2 Fig.	HK Fig.	Size	Fig.	Size
	3SC	22	Z1	Z2	Z0	CKK-110	B2	MKR-080
		23	Z1	Z2	Z0	CKK-110	B2	MKR-080
		30	Z1	Z2	Z0	CKK-110	B2	MKR-110
		31	Z1	Z2	Z0	CKK-110	B2	MKR-110
		40	Z1	Z2	Z0	CKK-145	B2	MKR-110
		41	Z1	Z2	Z0	CKK-145	B2	MKR-110

2D cantilever surface	TYPE	Size	Y-axis		X-axis (basic axis)	
			Fig.	Size	Fig.	Size
	2HA	8	H6	CKK-070	B1	CKX-090
		9	H6	CKK-070	B1	CKX-090
		10	H5	CKK-090	B1	CKX-110
		11	H5	CKK-090	B1	CKX-110
		20	H1	CKK-110	B1	CKX-110
		21	H1	CKK-110	B1	CKX-110
		22	H1	CKK-110	B1	CKX-145
		23	H1	CKK-110	B1	CKX-145
		30	H2	CKK-145	B1	CKX-145
		31	H2	CKK-145	B1	CKX-145
		32	H2	CKK-145	B1	CKX-200
		33	H2	CKK-145	B1	CKX-200

2D area gantry	TYPE	Size	Y-axis		X-axis (basic axis)	
			Fig.	Size	Fig.	Size
	2HB	20	H1	CKX-110	B2	MKR-065
		21	H1	CKX-110	B2	MKR-065
		30	H2	CKX-145	B2	MKR-080
		31	H2	CKX-145	B2	MKR-080
		40	H3	CKX-200	B2	MKR-110
		41	H3	CKX-200	B2	MKR-110
		50	H3	CKX-200	B2	MKR-140
		61	H4	MKR-145	B2	MKR-140

2D linear gantry	TYPE	Size	Z-axis			Y-axis (basic axis)		
			Z-adapter 1 Fig.	Z-adapter 2 Fig.	HK Fig.	Size	Fig.	Size
	2VA	20	Z1	Z2	Z0	CKK-090	B1	CKX-110
		21	Z1	Z2	Z0	CKK-090	B1	CKX-110
		22	Z1	Z2	Z0	CKK-110	B1	CKX-110
		23	Z1	Z2	Z0	CKK-110	B1	CKX-110
		30	Z1	Z2	Z0	CKK-110	B1	CKX-145
		31	Z1	Z2	Z0	CKK-110	B1	CKX-145
		32	Z1	Z2	Z0	CKK-145	B1	CKX-145
		33	Z1	Z2	Z0	CKK-145	B1	CKX-145

2D linear gantry, wall mounting	TYPE	Size	Z-axis			Y-axis (basic axis)		
			Z-adapter 1 Fig.	Z-adapter 2 Fig.	HK Fig.	Size	Fig.	Size
	2VB	10	Z1	Z2	Z0	CKK-070	B1	CKX-090
		11	Z1	Z2	Z0	CKK-070	B1	CKX-090
		20	Z1	Z2	Z0	CKK-090	B1	CKX-110
		21	Z1	Z2	Z0	CKK-090	B1	CKX-110
		22	Z1	Z2	Z0	CKK-110	B1	CKX-110
		23	Z1	Z2	Z0	CKK-110	B1	CKX-110
		30	Z1	Z2	Z0	CKK-110	B1	CKX-145
		31	Z1	Z2	Z0	CKK-110	B1	CKX-145
		32	Z1	Z2	Z0	CKK-145	B1	CKX-145
		33	Z1	Z2	Z0	CKK-145	B1	CKX-145
		40	Z1	Z2	Z0	CKK-145	B1	CKX-200
		41	Z1	Z2	Z0	CKK-145	B1	CKX-200

1D gantry	TYPE	Size	X-axis (basic axis)	
			Fig.	Size
	1HB	20	B2	MKR-065
		30	B2	MKR-080
		40	B2	MKR-110
		50	B2	MKR-140

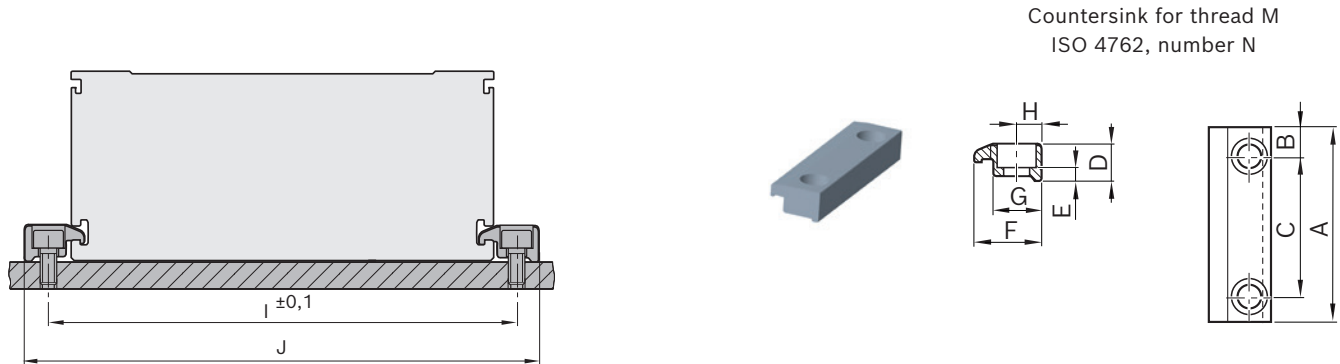
CKX = compact modules with ball screw assembly CKK or toothed belt drive CKR  
MKR = linear modules with toothed belt drive

Fastening with clamping fixtures

Position and number of the clamping fixtures can be taken from the configured 3D CAD model

**Fig. B1**

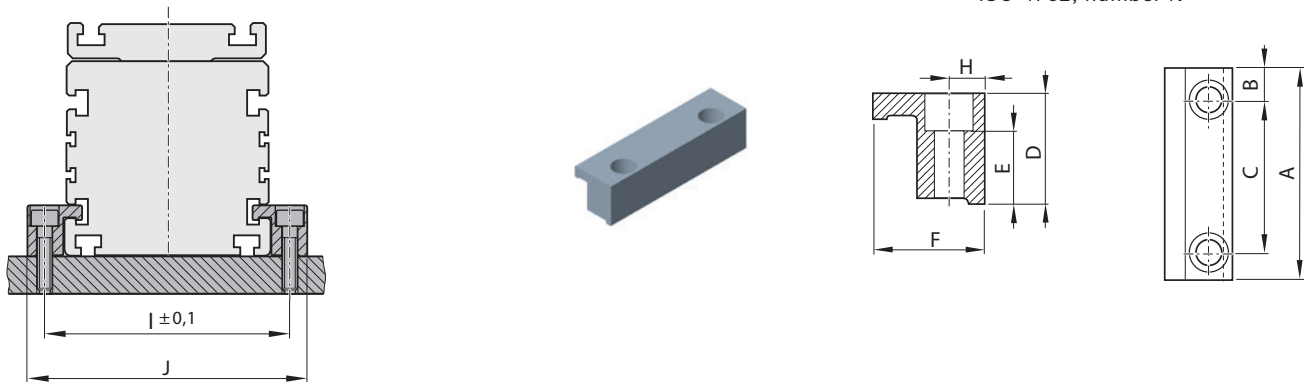
**⚠ Do not secure or support the compact module at the end enclosures or cross ties! The frame is the load-bearing part!**



Size	for thread M	N	Dimensions (mm)										Material number
			A	B	C	D	E	F	G	H	I	J	
CKX-090	M4	2	62	11.0	40	9.0	4.6	14.5	10.5	5.0	102	112	R037531033
CKX-110	M6	2	62	11.0	40	11.5	5.3	19.3	14.0	7.0	126	140	R037551034
CKX-145	M6	2	62	11.0	40	11.5	5.3	19.3	14.0	7.0	161	175	R037551034
CKX-200	M8	2	78	19.0	40	27.5	14.8	29	19.0	9.0	222	240	R117529097

**Fig. B2**

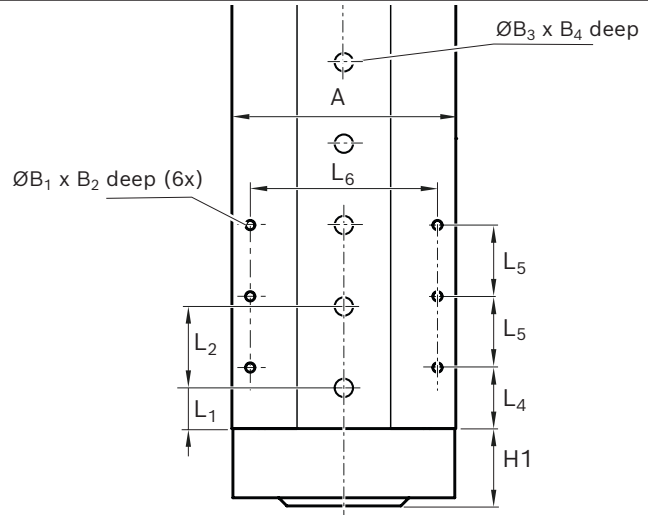
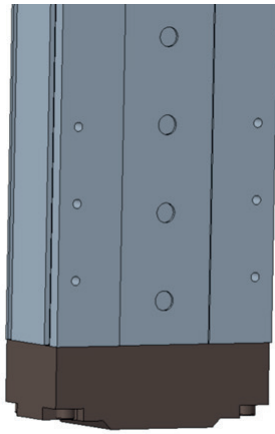
**⚠ Do not secure or support the linear module at the end enclosures! The frame is the load-bearing part!**



Size	Countersink ISO 4762 for	N	Dimensions (mm)										Material number
			A	B	C	D	E	F	H	I	J		
MKR-065	M6	2	78	14.0	50	20.0	11.5	20	7.0	81.0	95.0	R117519024	
MKR-080	M6		78	14.0	50	20.0	11.5	20	7.0	96.0	110.0	R117519024	
MKR-110	M8		108	19.0	70	27.5	16.5	29	9.0	132.0	150.0	R117529026	
MKR-140	M10		163	29.0	105	40.5	27.0	41	13.0	170.0	196.0	R117539014	

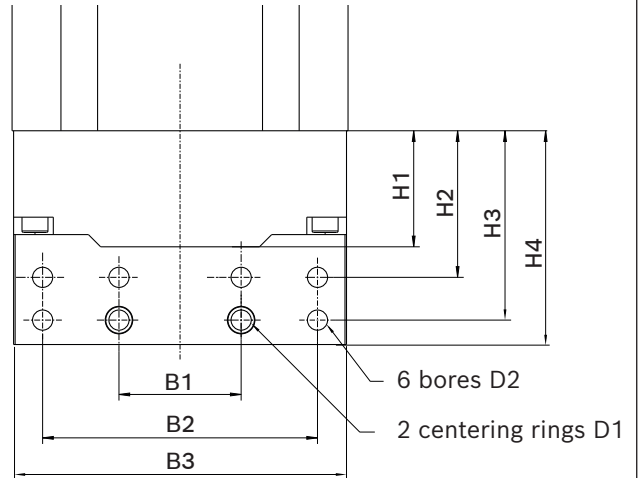
Z adaptation

**Fig. Z0**  
without adapt



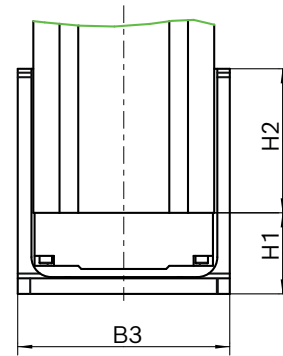
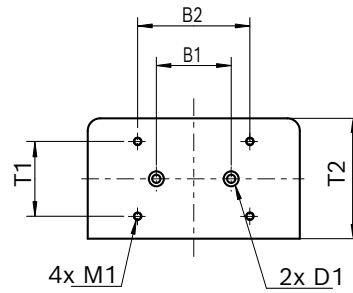
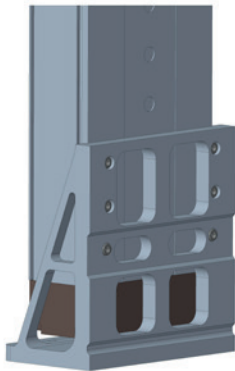
Size	Dimensions (mm)											
	A	B <sub>1</sub>	B <sub>2</sub>	ØB <sub>3</sub> <sup>H7</sup>	B <sub>4</sub>	H1	L <sub>1</sub>	L <sub>2</sub> ±0.01	L <sub>3</sub> (min)	L <sub>4</sub>	L <sub>5</sub>	L <sub>6</sub>
CKK-070	70	M3	6.0	7	1.6	29.0	20	40	10	15	25	59
CKK-090	90	M4	7.5	9	2.1	32.0	20	40	10	30	35	76
CKK-110	110	M5	9.0	9	2.1	38.0	20	40	10	30	35	92
CKK-145	145	M6	13.0	12	2.1	45.0	20	40	10	30	35	124
CKK-200	200	M8	12.0	16	3.1	59.5	20	40	10	35	40	119

**Fig. Z1**  
Adapter A



Size	Dimensions (mm)									Material number
	B1	B2	B3	H1	H2	H3	H4	Ø D1	Ø D2	
CKK-070	20	40	68	20.0	29	39	45	7H7	4.5	R039120371
CKK-090	40	76	89	32.0	42	54	61	9H7	5.5	R039120372
CKK-110	40	90	109	38.0	48	62	70	9H7	6.6	R039120373
CKK-145	60	125	144	43.5	58	78	90	12H7	9.0	R039120374
CKK-200	60	125	144	59.5	76	100	114	16H7	11.0	R039120375

**Fig. Z2**  
**Adapter B**



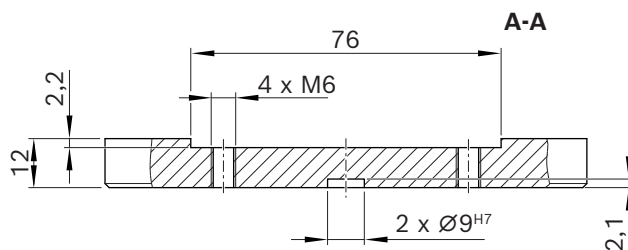
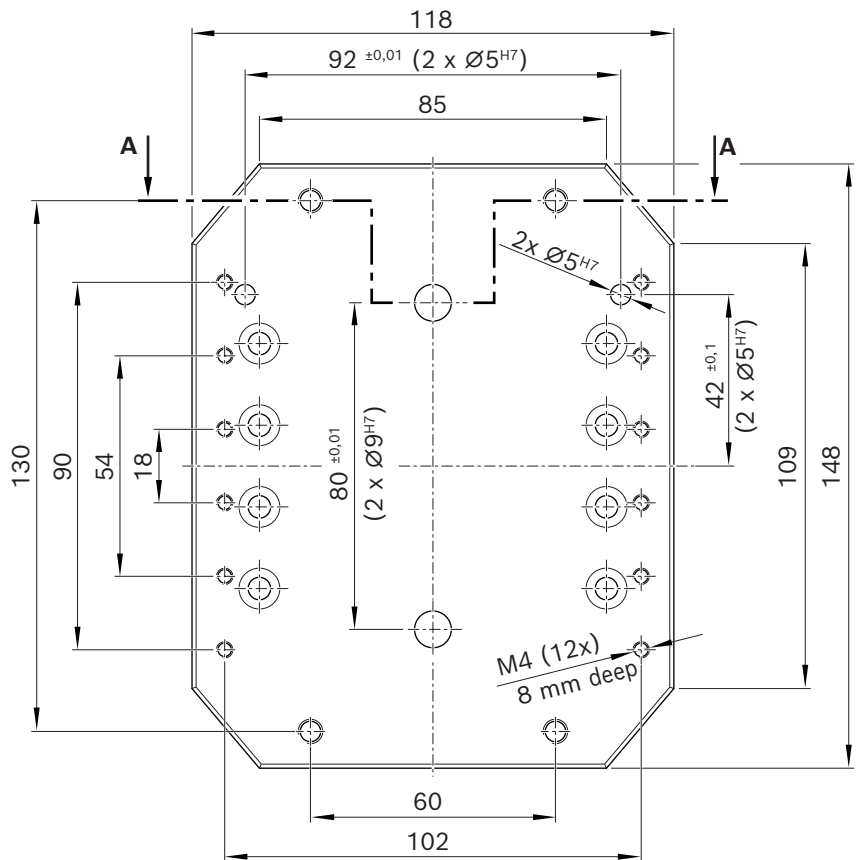
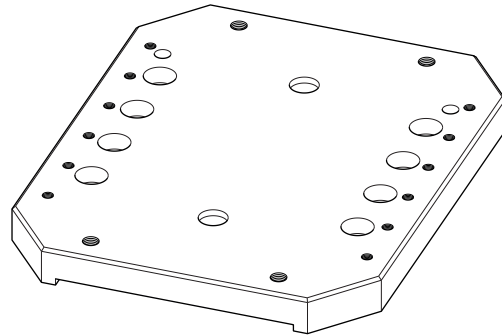
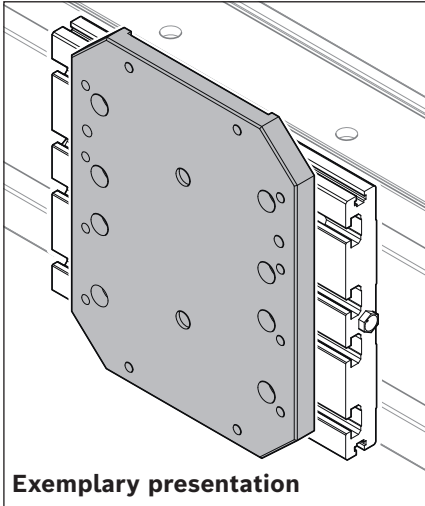
Size	Dimensions (mm)										Material number
	B1	B2	B3	H1	H2	T1	T2	D1 <sup>H7</sup>	M1		
<b>CKK-070</b>	40	60	85	43.0	69.5	20	52.0	7	M4	R039120423	
<b>CKK-090</b>	40	60	110	49.5	106.5	40	67.5	9	M4	R039120424	
<b>CKK-110</b>	40	60	130	53.0	107.0	40	67.5	9	M5	R039120425	
<b>CKK-145</b>	60	90	170	65.0	115.5	60	96.5	12	M6	R039120426	
<b>CKK-200</b>	60	120	235	89.5	129.5	90	138.5	16	M8	R039120427	



Connection plates

**Fig. H1**

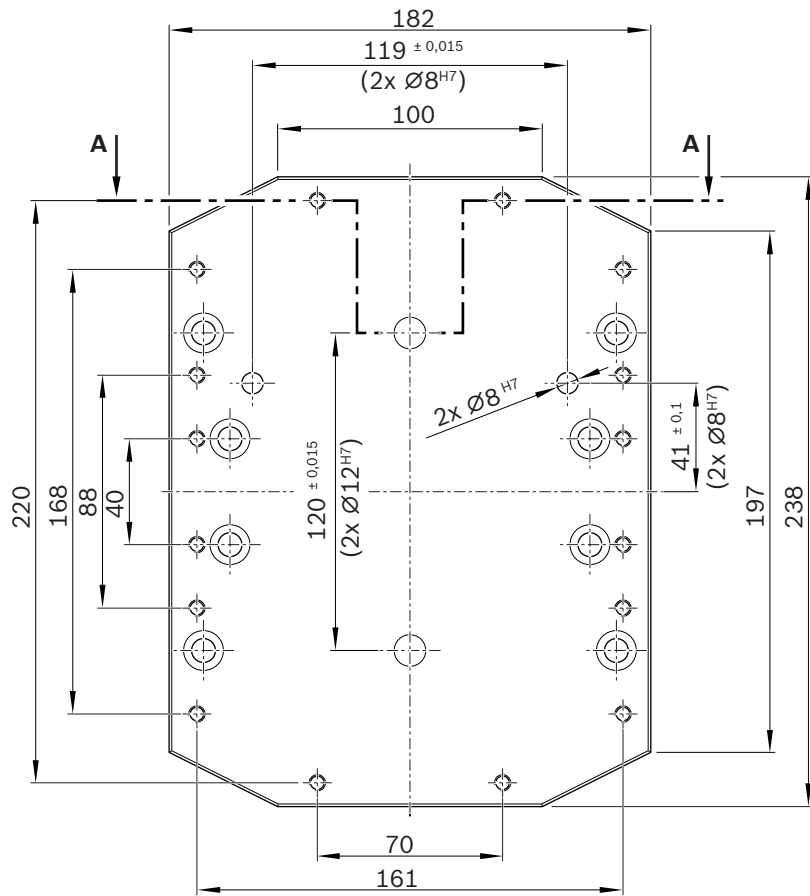
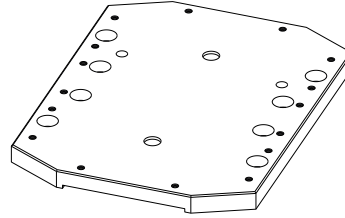
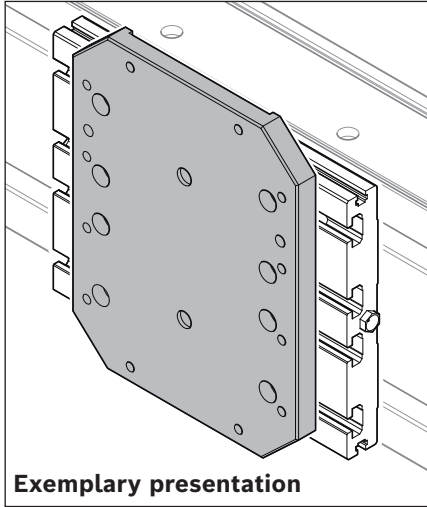
**Size CKX-110**





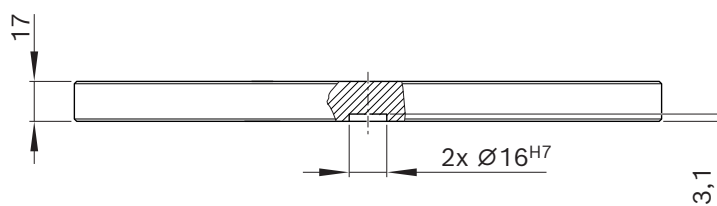
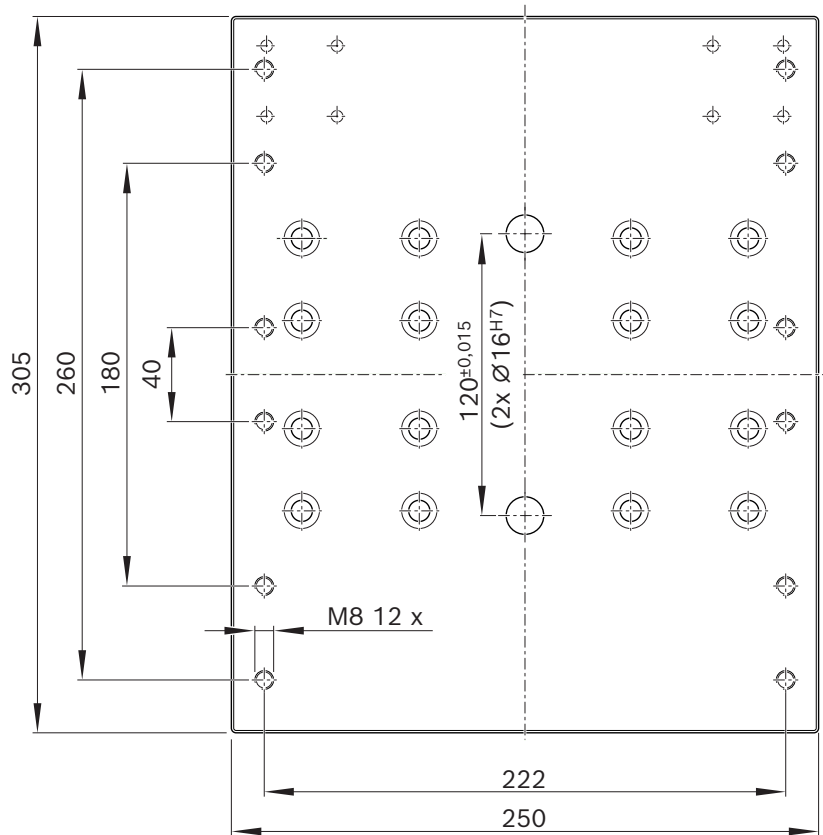
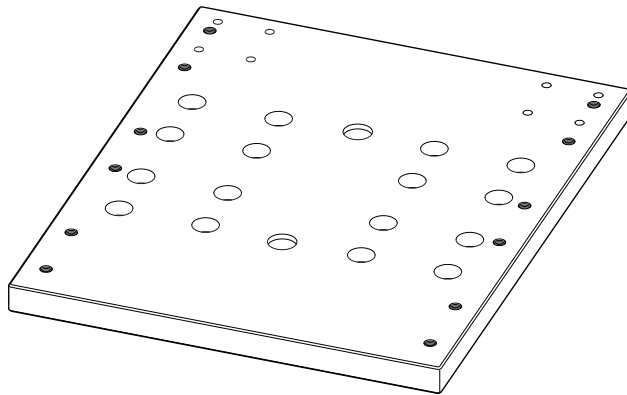
**Fig. H3**

**Size CKX-200**



**Fig. H4**

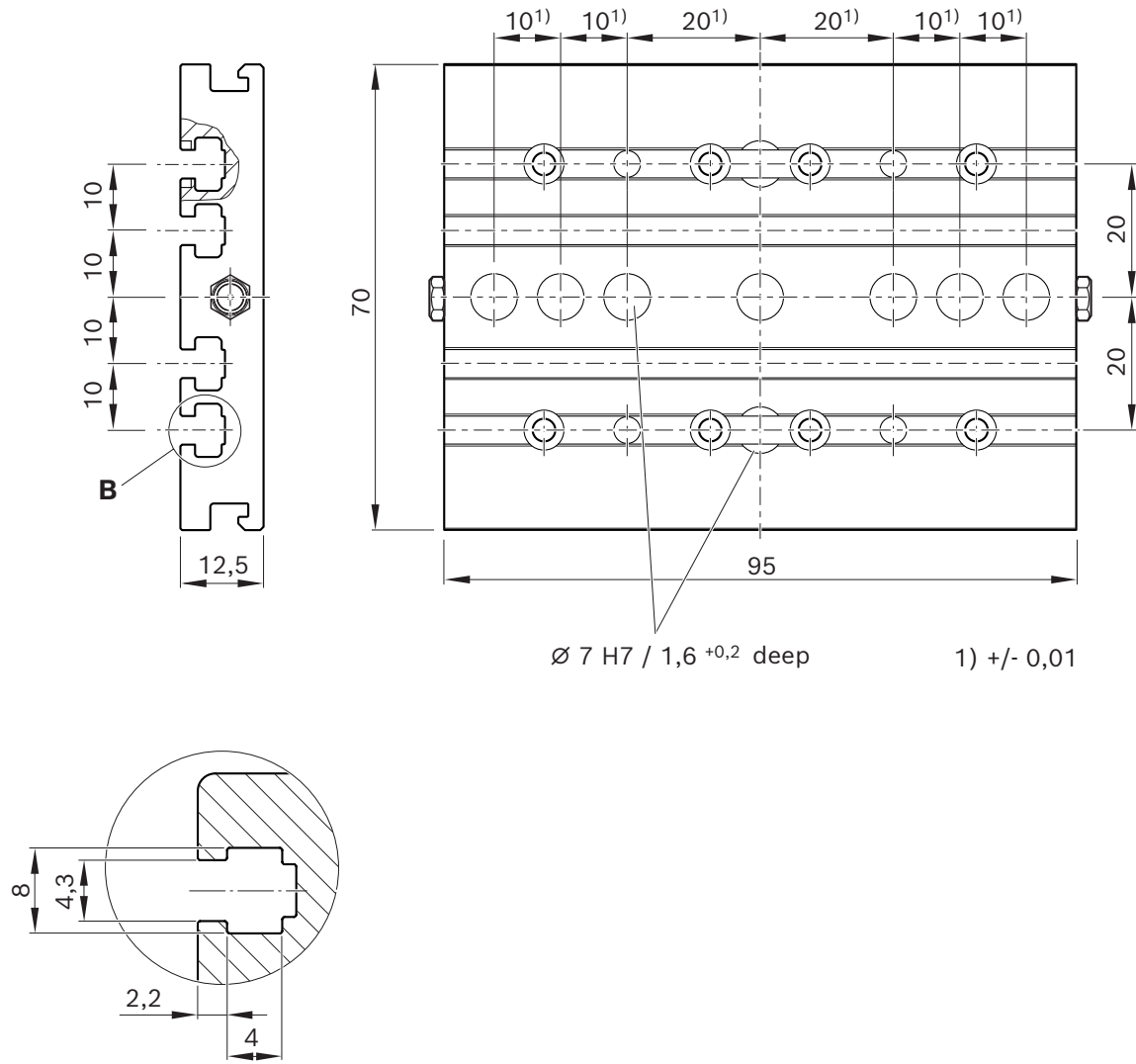
**Size MKR-145**





**Fig. H6**

**Size CKK-070**





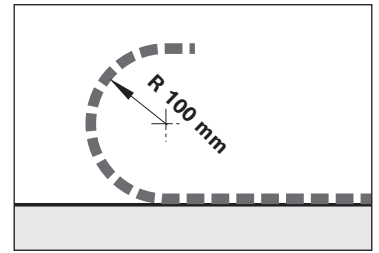
## Cable drag chains

### Features

- ▶ ESD-capable
- ▶ Smooth running
- ▶ High stability
- ▶ Flexible interior layout
- ▶ Chain connector with integrated strain relief

### Bending radius

- ▶ Minimum bending radius 100 mm
- ▶ Customer cables or hoses: Observe the manufacturer's specifications

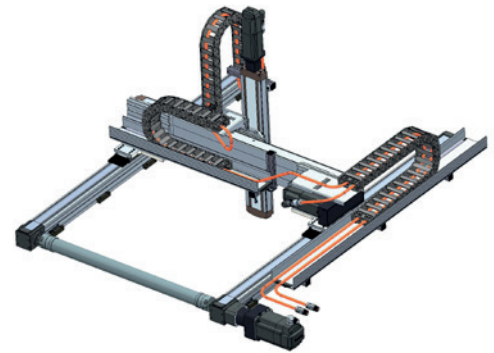


### Cable drag chains can be selected as an option

#### Cable drag chains with cable (for single-cable connection)

The scope of delivery includes cable drag chains, storage trays as well as all fastening material and is completely mounted on the multi-axis system.

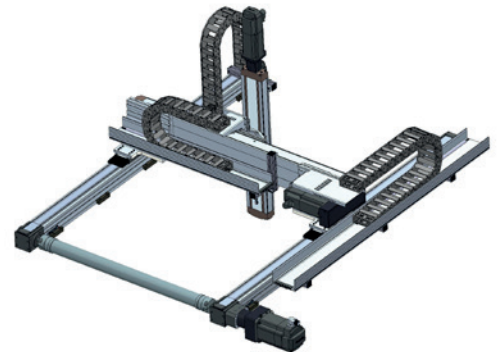
With cables connected (plug connection), which are routed in the cable drag chains to the output of the storage tray of the basic axis. The cable ends and the motor of the basic axis are designed with a plug connection thus offering the option of connecting cables to the controller.



#### Cable drag chain without cable:

The scope of delivery includes cable drag chains, storage trays as well as all fastening material and is completely mounted on the multi-axis system.

All motors without motor cable.



#### Without cable drag chain, without cable:

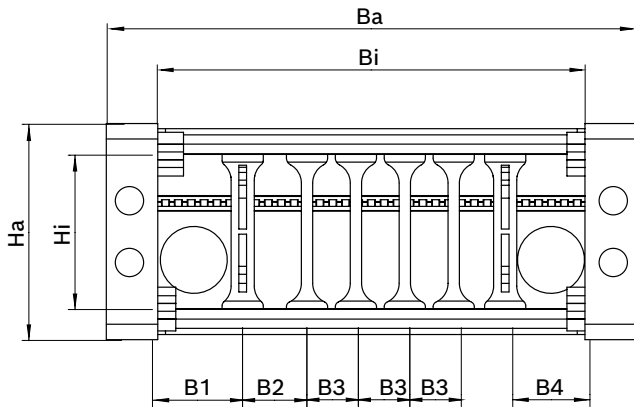
The multi-axis system does not have cable drag chain and cable



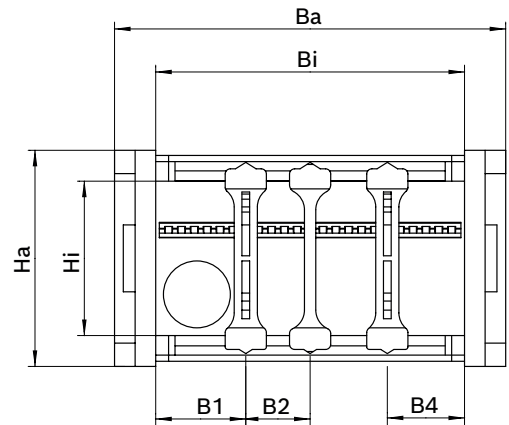
Illustrations are exemplary



**EFK-085**



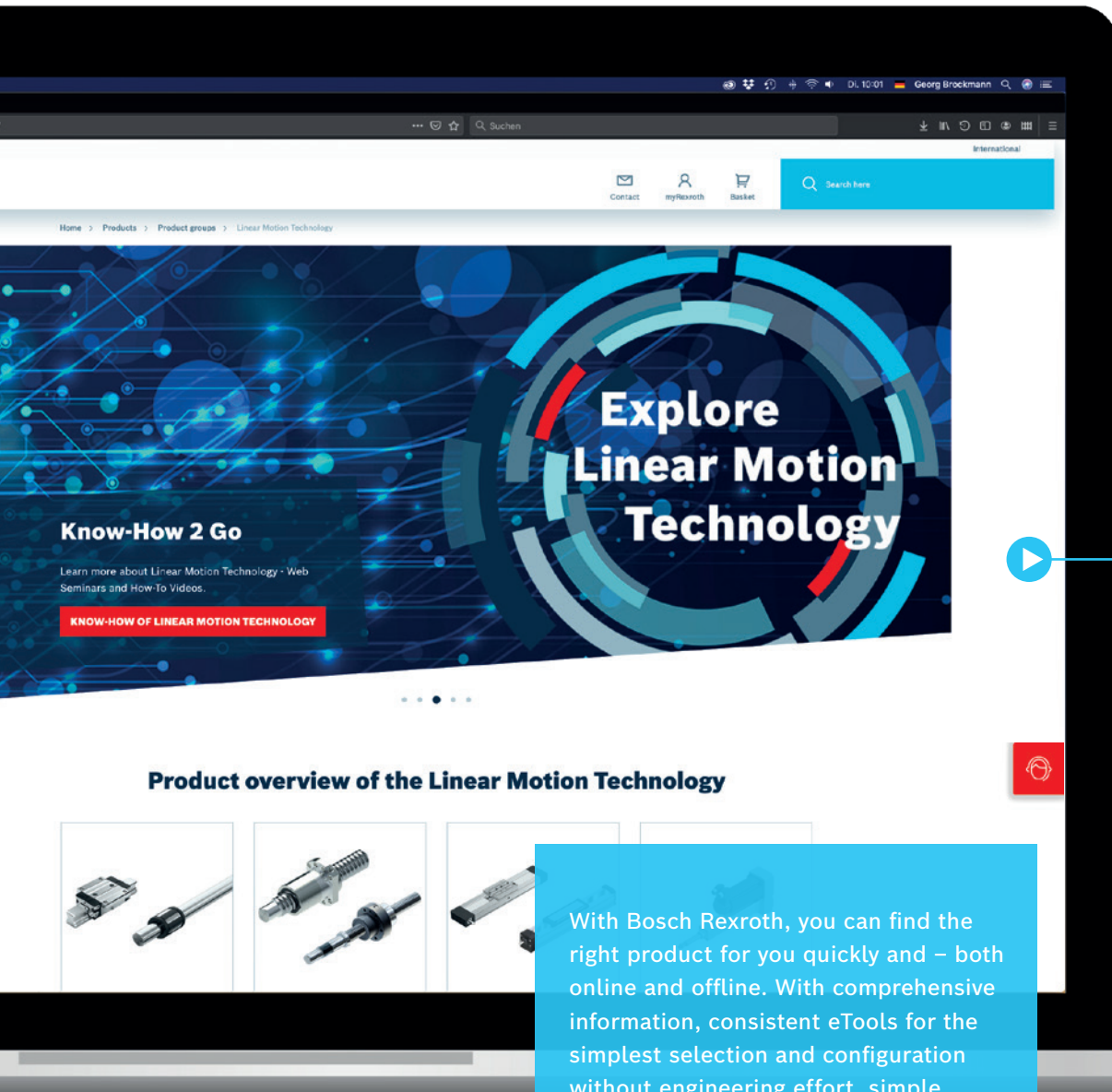
**EFK-060**



EFK	Dimensions (mm)							
	Ba	Bi	Ha	Hi	B1	B2	B3	B4
<b>EFK-085</b>	103	85	42	30	17.5	12.5	10	15
<b>EFK-060</b>	78	58	42	30	17.5	12.5	–	15

Combination of axes (independent of size)	Allocation of cable drag chain		
	X-axis	Y-axis	Z-axis
3SA	EFK-085	EFK-060	EFK-060
3SB	EFK-085	EFK-060	EFK-060
3SC	EFK-085	EFK-060	EFK-060
2HA	EFK-085	EFK-060	–
2HB	EFK-085	EFK-060	–
2VA	–	EFK-060	EFK-060
2VB	–	EFK-060	EFK-060
1HB	EFK-085	–	–

# Perfect fit: Choose the best way to your product



## ONLINE

All product selection guides are immediately available via the Bosch Rexroth website

With Bosch Rexroth, you can find the right product for you quickly and – both online and offline. With comprehensive information, consistent eTools for the simplest selection and configuration without engineering effort, simple ordering and personal support at any time. The perfect basis for building best-in-class multi-axis systems. Fast and economical.





**SIMPLY SELECT, CONFIGURE, ORDER**

We want you to reach your goal as easily and quickly as possible, depending on the level of information and requirements. That is our claim. With the latest generation of the central selection tool LinSelect, you can find the right product selection with just a few parameters, transfer it to the configurator, generate 3D models if required and order conveniently. You can also use the direct contact at any time!

## Operating conditions

### Normal operating conditions

Ambient temperature with Bosch Rexroth servo motor	0 °C ... 40 °C, loss of performance above 40 °C
Ambient temperature for mechanical system (no dropping below dew point)	-10 °C ... 50 °C
Soiling	Not permissible

### Required and supplementary documentation



For further instructions and information, please refer to the documentation for this product.

You can find PDF files of these documents on the Internet at [www.boschrexroth.com/mediadirectory](http://www.boschrexroth.com/mediadirectory).

We would also be happy to send you the documents that you want.

If you are unsure about using this product, please contact Bosch Rexroth.

Links

<p><b>Home page Bosch Rexroth linear motion technology</b></p>	<p><a href="http://www.boschrexroth.com/linear-motion-technology"><u>www.boschrexroth.com/linear-motion-technology</u></a></p>	
<p><b>Multi-axis systems</b></p>	<p><a href="http://www.boschrexroth.com/multi-axis-systems"><u>www.boschrexroth.com/multi-axis-systems</u></a></p>	
<p><b>Smart Function Kit Handling (SFK-H)</b></p>	<p><a href="http://www.boschrexroth.com/sfk-handling"><u>www.boschrexroth.com/sfk-handling</u></a></p>	
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<p><b>Configurators and tools</b></p>	<p><a href="https://www.boschrexroth.com/de/de/produkte/konfiguratoren-und-tools/"><u>https://www.boschrexroth.com/de/de/produkte/konfiguratoren-und-tools/</u></a></p>	
<p><b>Media directory (Downloads)</b></p>	<p><a href="https://www.boschrexroth.com/mediadirectory"><u>https://www.boschrexroth.com/mediadirectory</u></a></p>	

Service

# Linear motion technology servicing: Maximum machine availability and productivity



**Rexroth servicing for linear motion technology means partnership over the entire life cycle of your systems. We are there to help you in 80 countries around the world. From emergency repairs to field service, with original spare parts, modernization and predictive maintenance services. And beyond that with an extensive training portfolio. Working together, we increase your productivity and ensure maximum availability.**



**REPAIR**

- ▶ Analysis
- ▶ Expert overhauls
- ▶ Cost control



**SPARE PARTS**

- ▶ Inexpensive
- ▶ Time-saving
- ▶ Spare parts from the original manufacturer
- ▶ Low storage costs



**FIELD SERVICE**

- ▶ Repairs on location
- ▶ Reduced downtimes
- ▶ Customer-specific service packages



**TRAINING**

- ▶ Professional assembly
- ▶ Replacing wear parts
- ▶ Damage analysis
- ▶ Rexroth Academy
- ▶ How-to videos



**LINEAR MOTION TECHNOLOGY  
SERVICING GERMANY**  
▶ 24h hotline +49 9352 405060  
▶ [Service@boschrexroth.de](mailto:Service@boschrexroth.de)

Success story

**WE MOVE. YOU WIN.**  
SUCCESS STORY

If a standardized multi-axis system cannot optimally meet your requirements, Bosch Rexroth will tailor an individual solution for you. Here's an example:

Electrochemical machining with ready-to-install six-axis handling system

**Compact, robust and highly precise**

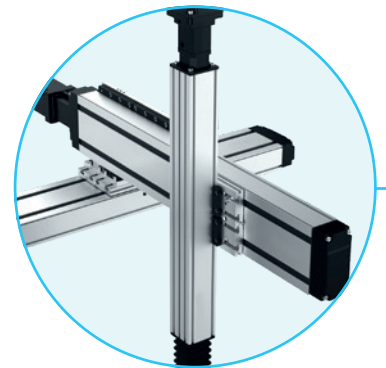
**THE CHALLENGE**

Today's machines for electrochemical machining (ECM) should have short cycle times and work with micrometer precision even over long travel distances. At the same time, use in corrosive salt spray places huge demands on the material. With the help of Rexroth components, the medium-sized EMAG Group developed a new modular and economical machine concept for use in such environments. It should be particularly compact and cover all process steps – from pre-cleaning and electrochemical machining to post-cleaning and testing.

**THE REXROTH SOLUTION**

The modular, corrosion-resistant six-axis multi-axis system with an integrated high-precision IMS-I measuring system includes a complete sensor system and evaluation electronics in the runner blocks. The fully pre-assembled system is based on adapted standard modules from Rexroth's linear motion technology toolbox. The positive-locking connection technology allows quick final assembly with no need for time-consuming adjustment. An automated central lubrication system guarantees minimum maintenance and maximum service life.

**THE COMPONENTS**



**Two three-axis systems**

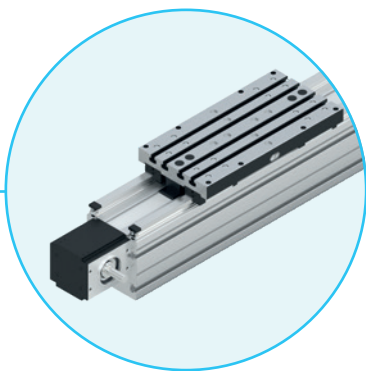




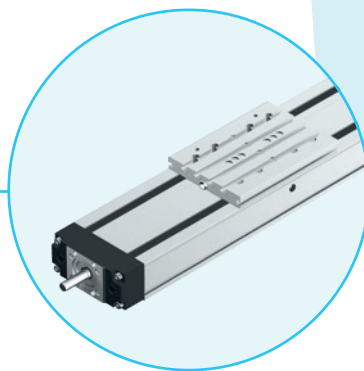
### THE RESULT

**"Rexroth achieved our goals as regards compactness, costs and flexibility."**

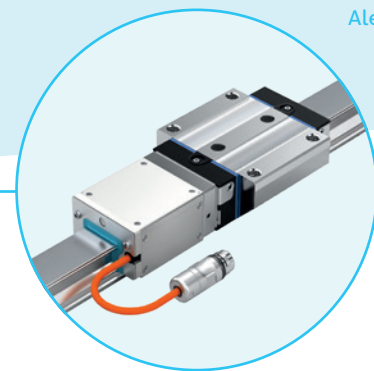
Alexander Noller,  
EMAG



**Linear modules  
MKR**



**Compact modules  
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**Integrated measuring system  
IMS-I**

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