

# ZOLLERN

Solid metals. Fine solutions.

Automation  
Product  
catalogue



## **The ZOLLERN-Group**

With first-class products and customized solutions in the sectors drive technology, investment casting, sand casting and forging as well as steel profiles we are one of the leading manufacturers – worldwide.

As one of the oldest family-run businesses in Germany we are proud to look back on an impressive 300-year history during which we have merged tradition with innovation. Our main focus is on excellent quality and service.

Welcome to the world of ZOLLERN, where experience and progress go hand in hand to offer our customers the best solutions and products for their requirements in various industrial sectors.

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# Experience and innovation

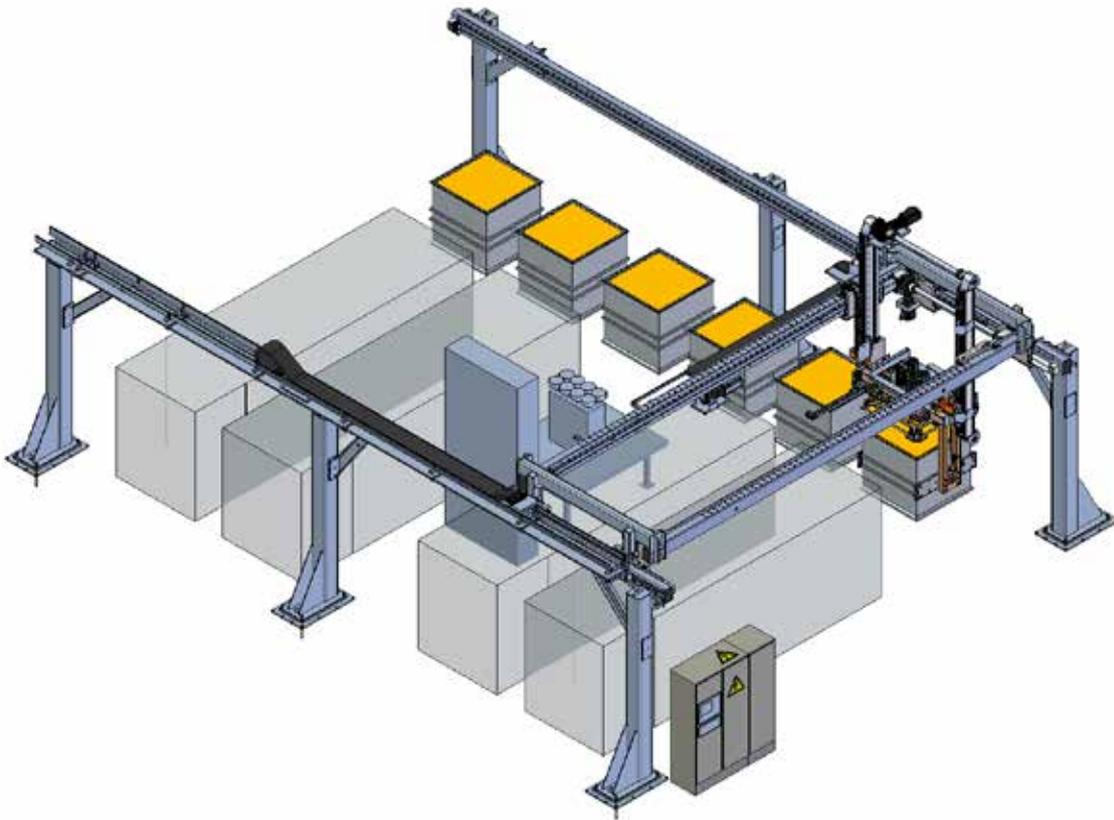


ZOLLERN Automation ensures economic production processes and high system availability. Automated parts transportation, parts transfer and feed of the parts are central tasks, as are the intermediate storage of workpieces and the palletisation of the parts.

ZOLLERN plans, designs and manufactures automation systems and plants for customers in the mechanical engineering, automotive, wood and furniture industries, amongst other sectors, on an international basis.

The Drive Technology division at our second-largest site in Herbertingen has evolved into the largest business division within the ZOLLERN Group. The Automation sector is also part of this business division.

# Customer-specific solutions



ZOLLERN Automation plans and realises gantry robots and systems for automotive manufacturers, automotive suppliers and machine and systems manufacturers in accordance with their specific requirements, and develops technical solutions for individual handling tasks.

With their technical competence, employees conceive suitable solutions for various areas of application and industries.

All the important customer parameters flow into considerations and analysis, calculations and dimensioning during the planning phase. These are payloads, travel and strokes, (travel) speeds and accelerations, clock

and cycle times, layout space, space requirements and hall height, system availability, risk assessment and pick-up dimensions and geometry and surfaces on the component, workpiece or tool for gripper dimensioning.

## **ZOLLERN develops and delivers**

- individual axes and rotating units as well as
- line and gantry robots as axis combinations and
- complete turnkey systems with PLC and NC controls and safety technology such as the interlinking of machine tools.

In addition, the technicians develop customer-specific gripper systems which are adapted to the geometry of the components, workpieces and tools to be picked up.

# A comprehensive range of services right from the planning stage

Competent and motivated staff develop and implement individual products and solutions for customers all over the world.

Here our maxim is to offer customers their complete automation solutions from a single source.

Employees from sales, design and assembly plan, develop and realise complex tasks concerning automation technology.

They consistently remain in close contact with the customer.

- Years of project experience
- CAD templates and models
- Detailed offers
- On-site project meetings and plant inspections
- Project Management
- Set-up and commissioning



# Diverse area of application – individual concepts



ZOLLERN linear axes, linear and surface gantry axes and travelling axes are used in a wide variety of industries and sectors.

## **Automotive and automotive supply industry**

Handling equipment in body shop and body-in-white lines, framing units, motors and transmission engineering, travelling axes for welding and handling robots, feeders for press lines

## **Plant engineering**

Test facilities, assembly lines and heating and cleaning systems

## **Mechanical engineering**

Linkage of machine tools and machining centres, workpiece and tool handling equipment, handling systems for injection moulding, broaching and packaging machinery

## **Commercial vehicle industry**

Truck axle assembly, handling equipment for body shops

## **Aerospace industry**

Production and assembly lines, test facilities

## **Wood working and furniture industry**

Handling equipment for wooden panels and furniture elements

## **Food, beverage and tobacco industry**

Handling equipment for tobacco boxes, drinks crates, bottles and food packaging

## **Logistics, palletisation and conveyor technology**

Handling equipment for pallets, palletisation of metal and plastic products, containers

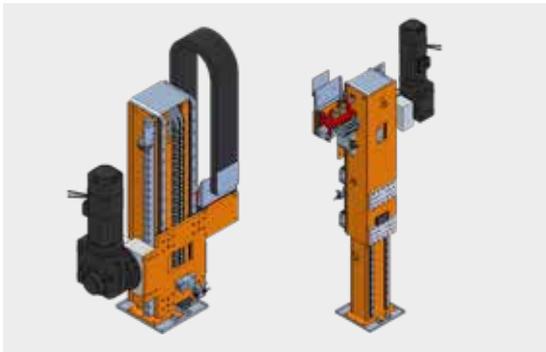
# Product spectrum



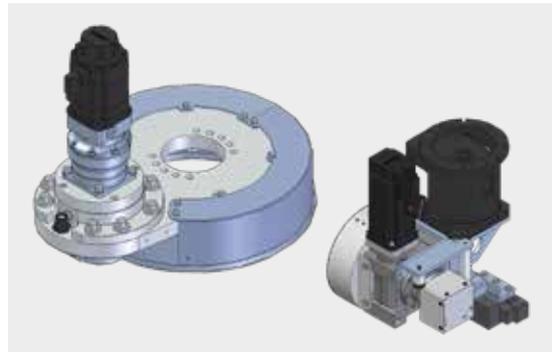
**Linear axes ZLZ/ZLV/ZLB**  
Payload up to 800 kg



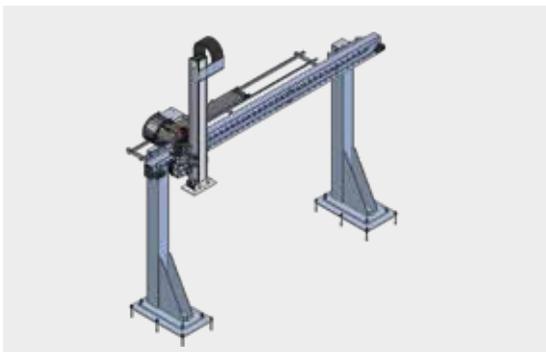
**Portal axes ZLD**  
Payload up to 4,000 kg



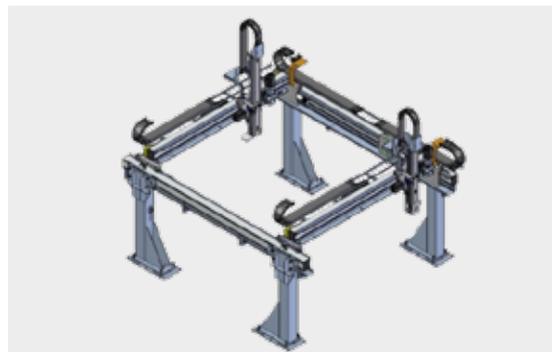
**Telescopic axes ZTA**  
Payload: 200 kg – 1,600 kg,  
nominal stroke up to 3,000 mm



**Rotary modules ZDM**  
Rotary and swivel units

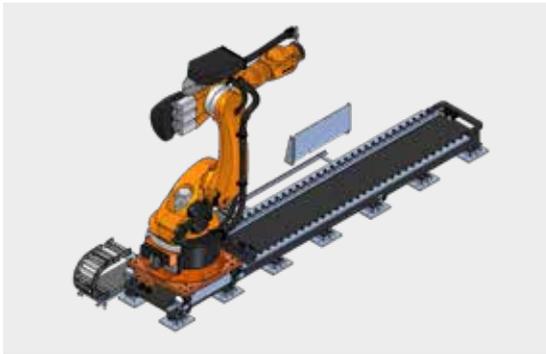


**Gantry robots (line portals)**  
Variable combinations of linear and telescopic axes



**Gantry robots (gantry portals)**

# Product spectrum



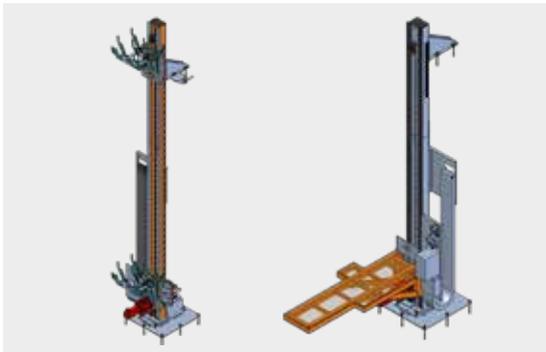
## Robot travelling axis ZRA

Payload up to 4,000 kg, nominal stroke up to 50 m



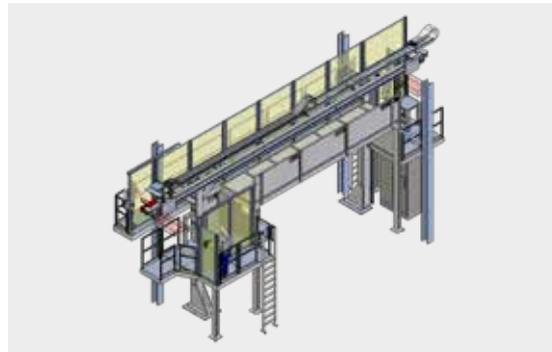
## Traversing axes ZVA

Payload 500 kg – 8,000 kg, nominal stroke up to 50 m



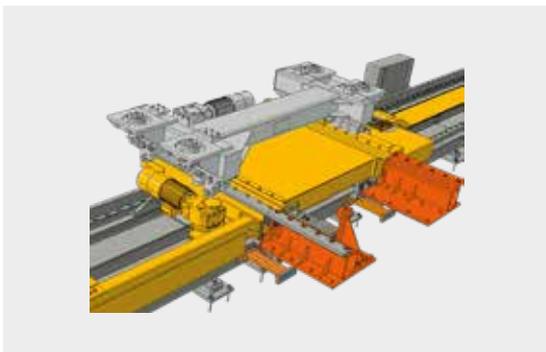
## Level lifters and lift columns

Payload up to 1,600 kg, lifting height up to 15 m



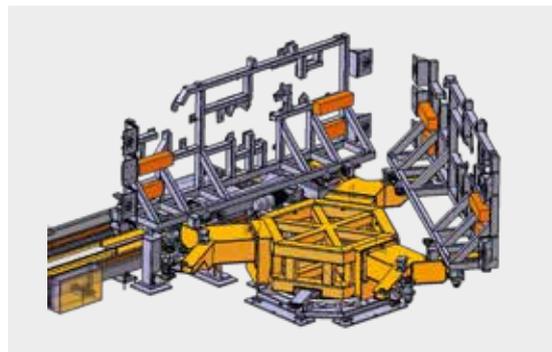
## High-speed conveyor

Nominal stroke: up to 50 m



## Framing

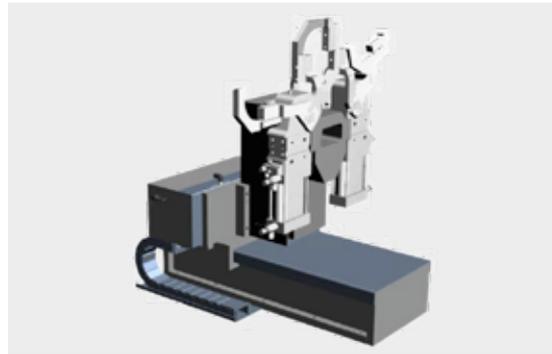
Flexible transport and storage units  
for clamping frames



## Revolving storage facilities



**Portal with lift table**



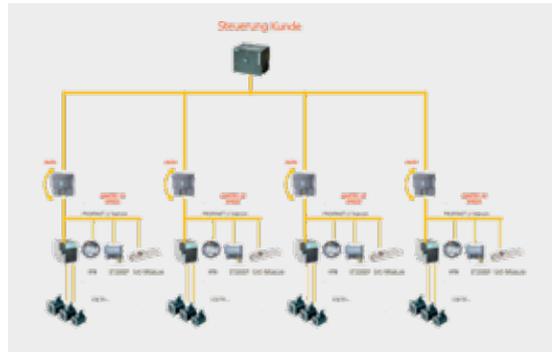
**Positioning units**

Payload max. 330 kg, variable stroke



**Complete system**

Special transfer solutions for complete production systems

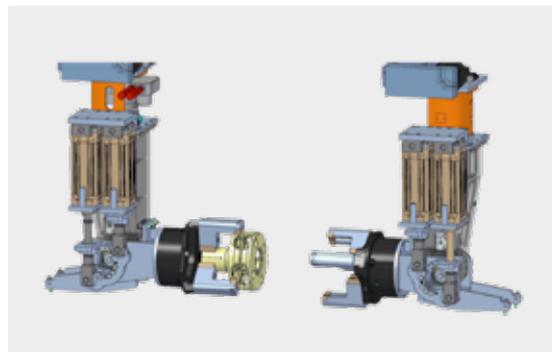


**Controls**

PLC S7-1500 and SINUMERIK 840Dsl



**Special solutions**



**Gripper**

Pneumatic, electric gripper and vacuum gripper

# 1. Linear axes

## Overview

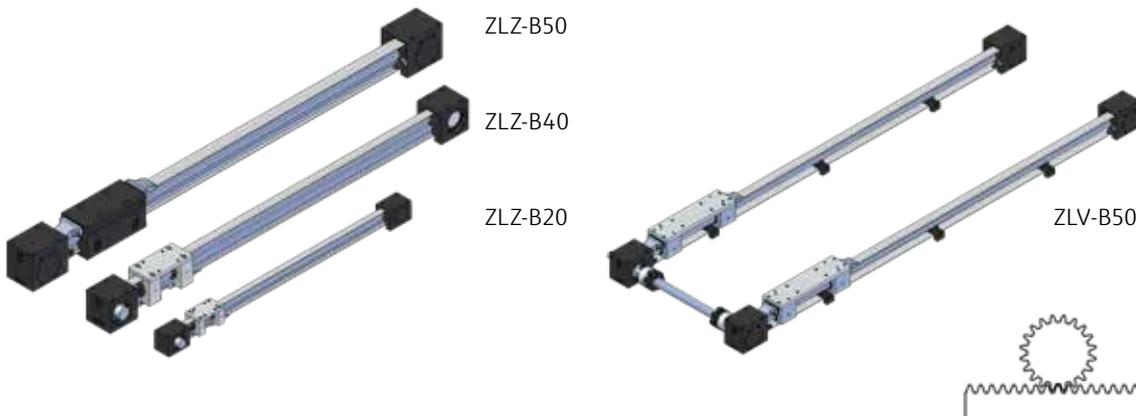


Toothed belt drive

**ZLZ/ZLV** – Toothed belt drive, horizontal axis, repeatability  $\pm 0.1$  mm

max. payload*	
Size	F (N)
ZLZ-B20	600
ZLZ-B40	2,300
ZLZ-B50	3,500
ZLV-B50**	7,000

\*Permitted payload dependent on axis length / \*\*Possible with support in case of long stroke up to 10 m



**ZLB** – Gear rack drive, stroke approx. 0.3 m – 3 m, repeatability  $\pm 0.1$  mm

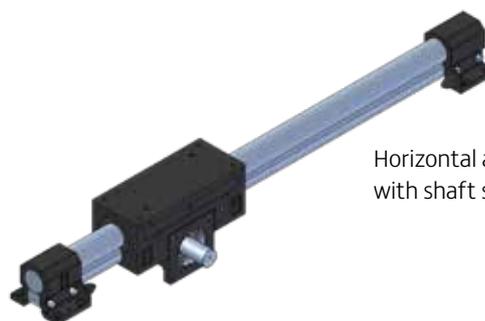
Rack-and-pinion drive

max. payload*		
Size	F (N) Horizontal axis	F (N)** Vertical axis
	ZLB 20	480
ZLB 30	1,200	450
ZLB 40	1,900	830
ZLB 50	2,900	2,000
ZLB 60	4,400	3,900
ZLB 80	8,000	6,800

\*Permitted payload dependent on axis length / \*\*With 1 m stroke and 10x safety against overload foot fracture



Vertical axis ZLB with end flange

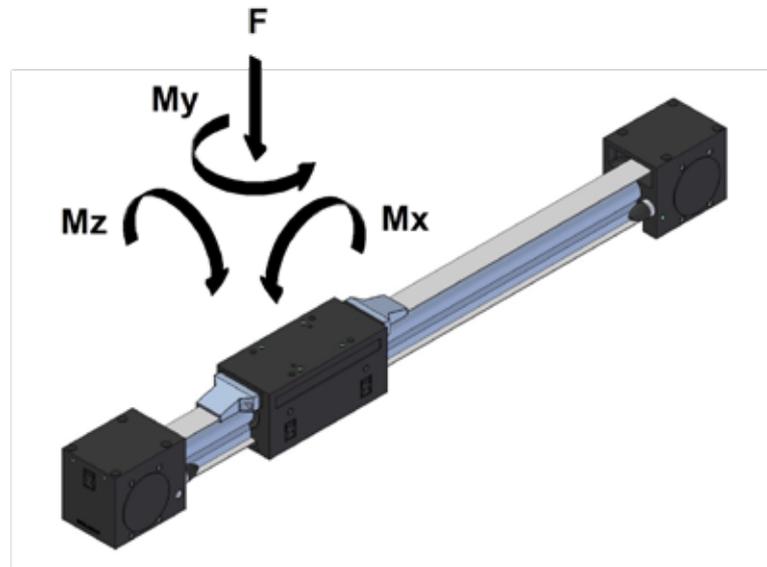


Horizontal axis ZLB with shaft support

## 1.1 ZLV-B / ZLV-B50 Toothed belt drive

### Features

- Hardened, ground hollow steel shaft with support profile
- Mechanical repeatability of position  $\pm 0.1$  mm
- Linear ball bearing with stripper
- Adjustable support rollers for torque absorption
- High feed forces through wide belt, low-maintenance
- Extension possibilities: intermediate shafts for synchronous operation
- Bellows or sheet covering



### // Technical data

#### max. load\*

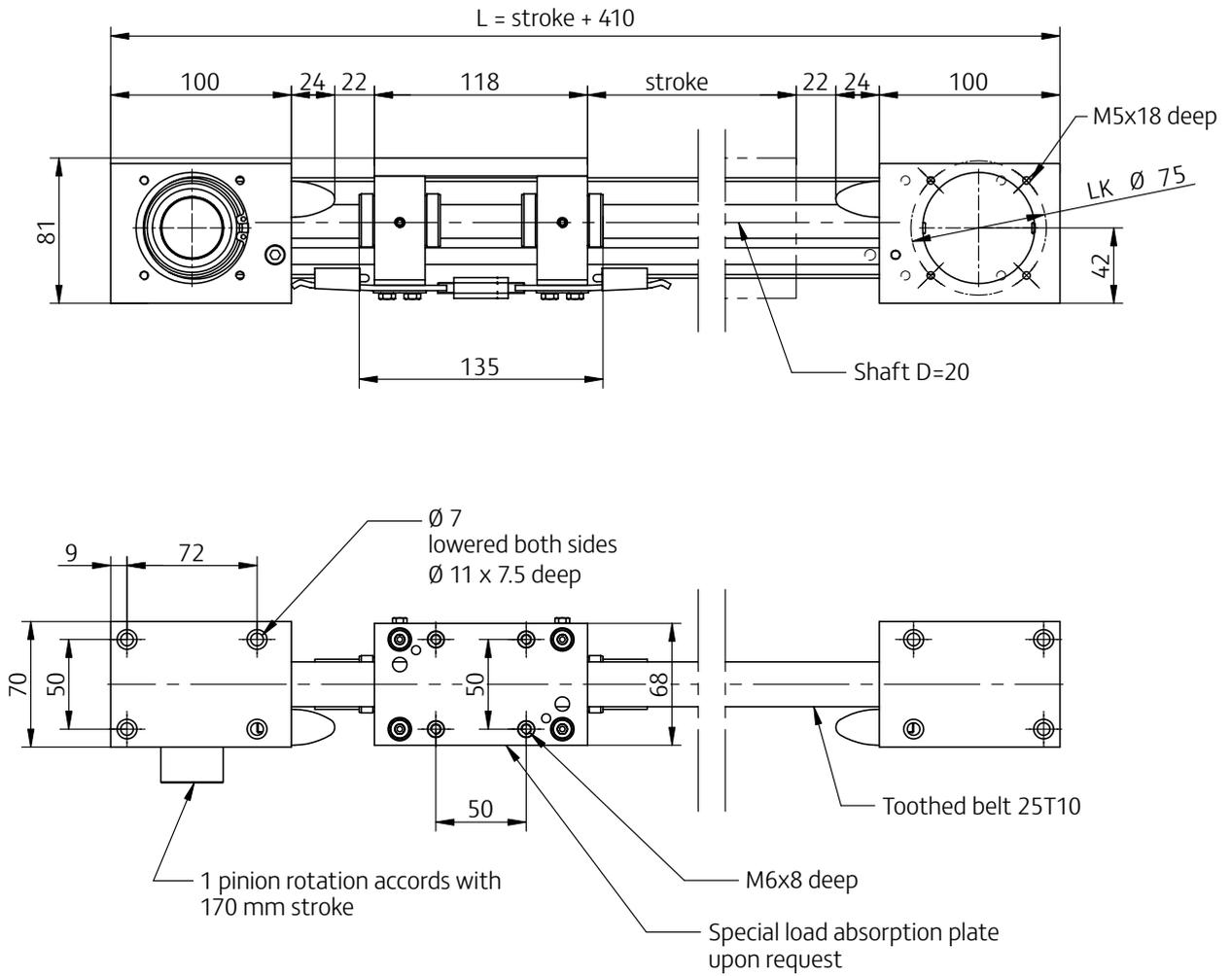
Size	F (N)	Mx (Nm)	My (Nm)	Mz (Nm)
ZLZ-B20	600	15	15	10
ZLZ-B40	2,300	100	100	80
ZLZ-B50	3,500	185/285**	185/285**	140
ZLV-B50	7,000	370/570**		

\*Permitted load dependent on axis length / \*\*Design with extended carriage

#### Drive unit

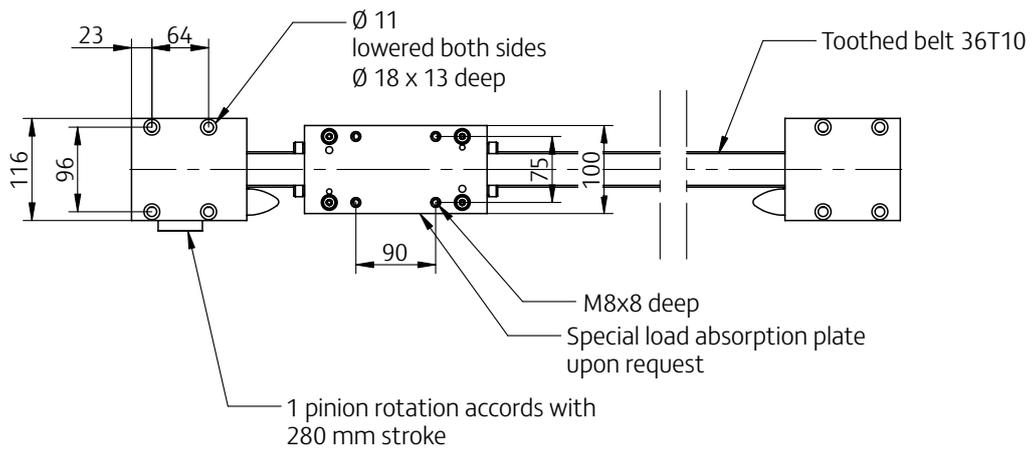
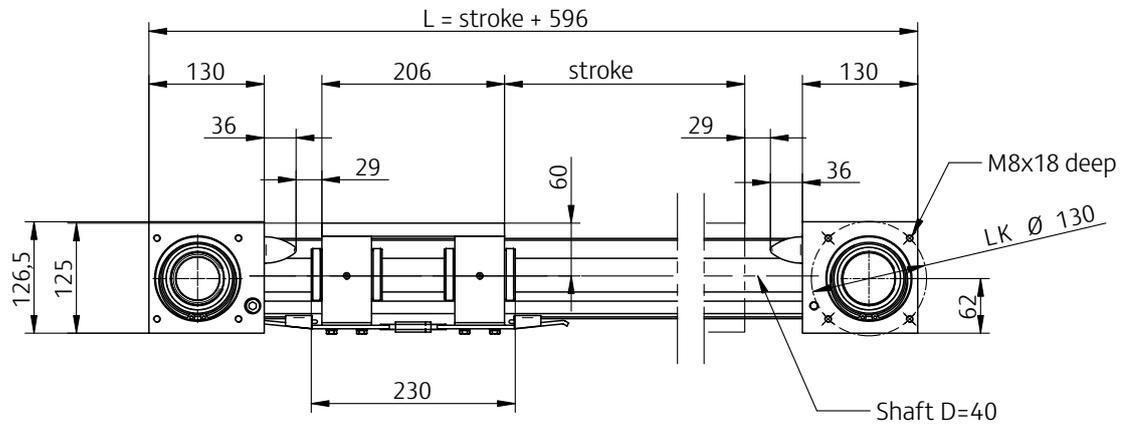
Size	Drive torque max. TA (Nm)	Feed force max. FV (N)	Speed max. v (m/s)	Speed max. n (1/min)
ZLZ-B20	31	1,150	3	1,058
ZLZ-B40	77	1,730	2	428
ZLZ-B50	155	3,500	2	428
ZLV-B50	310	7,000	2	428

Dimension sheet **ZLZ-B20**



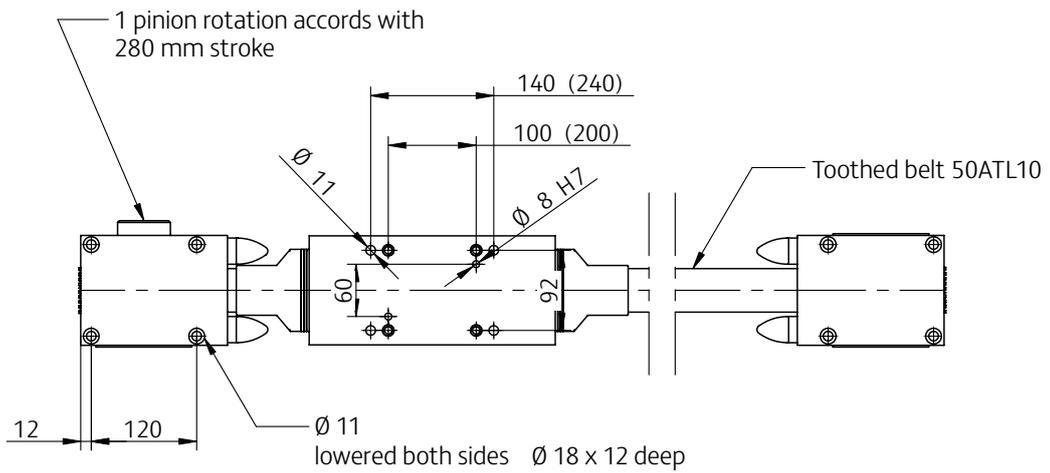
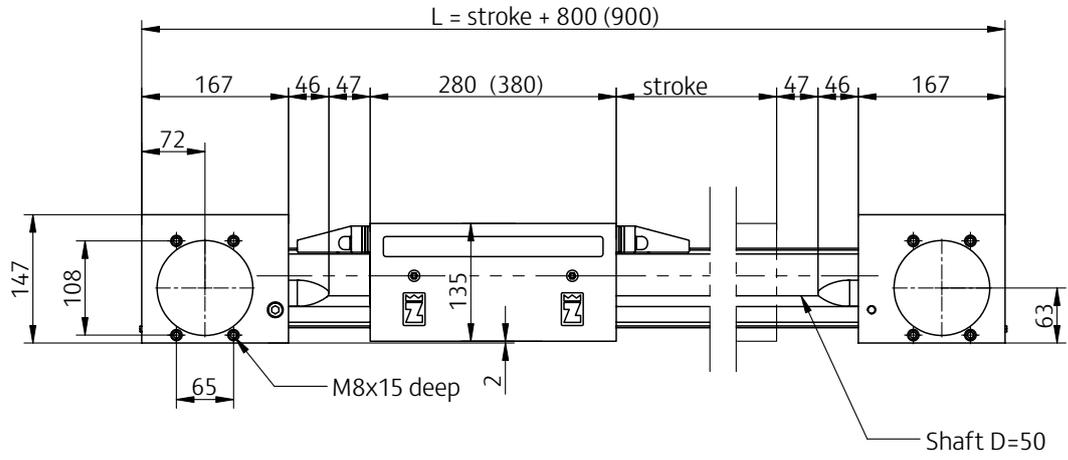
Pinion diameter	54.11 mm
Number of teeth	17
End housing assy.	4 kg
Carriage	1 kg
Head shaft	4 kg/m

Dimension sheet ZLZ-B40



Pinion diameter	89.12 mm
Number of teeth	28
End housing assy.	14 kg
Carriage	3.7 kg
Head shaft	14 kg/m

Dimension sheet **ZLZ-B50**

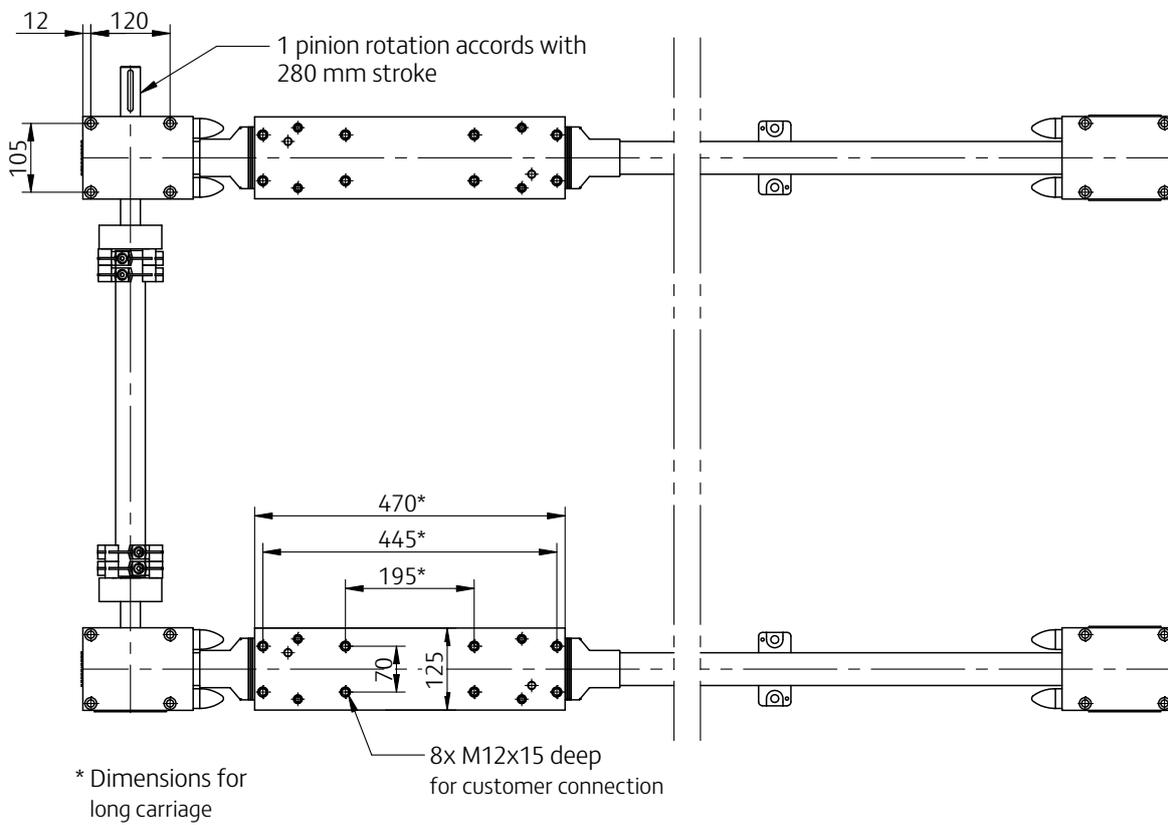
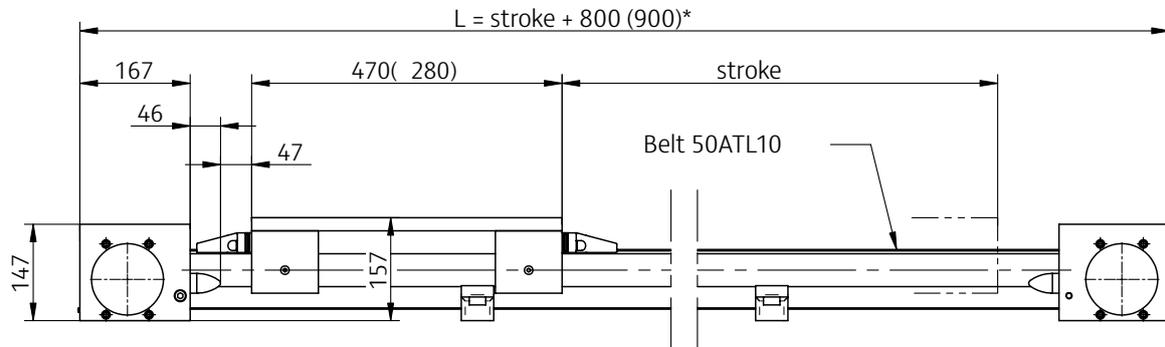


Dimension in clamps indicate long carriages



Pinion diameter	89.12 mm
Number of teeth	28
End housing assy.	18 kg
Carriage	14 (17) kg
Head shaft	22 kg/m

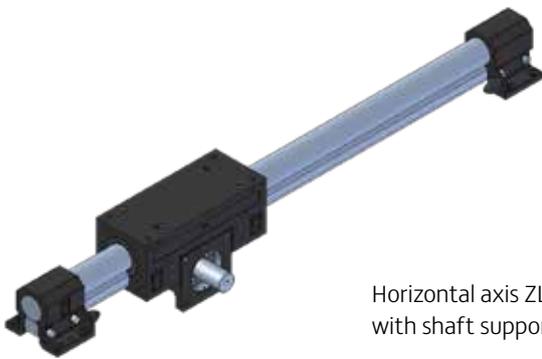
Dimension sheet ZLV-B50



Pinion diameter	89.12 mm
Number of teeth	28
End housing assy.	36 kg
Carriage	15 (16) kg
Head shaft	30 kg/m
Synchronous shaft	5.6 kg/m

## 1.2 ZLB 20-80 Rack-and-pinion drive

- ZLB 20-80 for vertical installation, design with hollow shaft and end flanges
- ZLB 20-80 for horizontal installation, design with full shaft and shaft supports
- ZLB-L 20-80 design with long carriage
- Compact, closed bogie housing made from cast aluminium
- Repeatability  $\pm 0.1$  mm
- ZLB standard design, ZLBL with extended carriage
- Hardened, ground hollow steel shafts on toothed profile
- Linear ball bearing with stripper
- Adjustable support rollers for torque absorption
- Vertical design with hollow shaft for cable feedthrough
- Extension possibilities: Intermediate shaft for synchronous operation, ZLB60/80 rotary module attachment onto end flange, bellows or plate covers
- Drive designs: fitting key / shrink disc



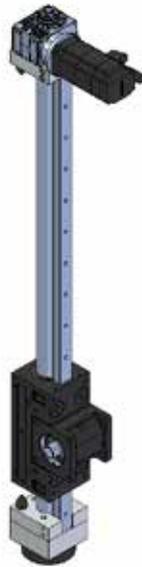
Horizontal axis ZLB  
with shaft support



Horizontal axis ZLB-L  
with long carriage



Vertical axis ZLB  
with end flange



Vertical axis ZLB  
with rotary drive



Vertical axis ZLB with  
synchronous drive



// Technical data

max. load\*

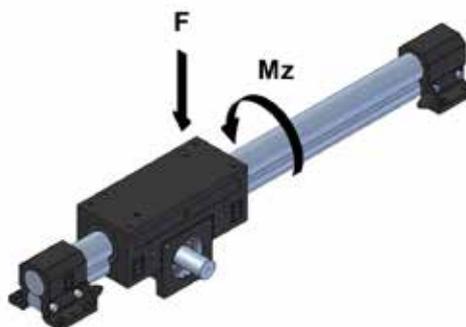
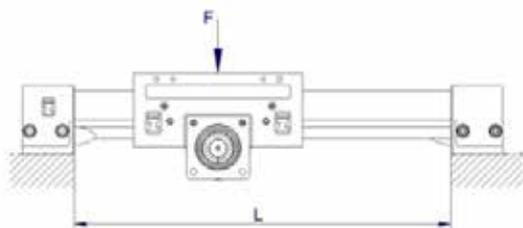
Size	F (N)	Mx/My (Nm)	Mz (Nm)	C (N)	C <sub>0</sub> (N)	Size	Mx/My (Nm)
ZLB 20	480	12	8	4,480	4,080	ZLBL20	20
ZLB 30	1,200	45	30	11,200	11,400	ZLBL30	70
ZLB 40	1,900	80	65	18,000	16,300	ZLBL40	130
ZLB 50	2,900	150	115	26,800	24,400	ZLBL50	230
ZLB 60	4,400	350	275	40,800	36,000	ZLBL60	570
ZLB 80	8,000	800	650	75,000	64,000	ZLBL80	1,300

\*Values for individual load, permitted load values dependent on the application and axis length

$$y = \frac{FL^3}{130EJ}$$

**Formula for deflection:**

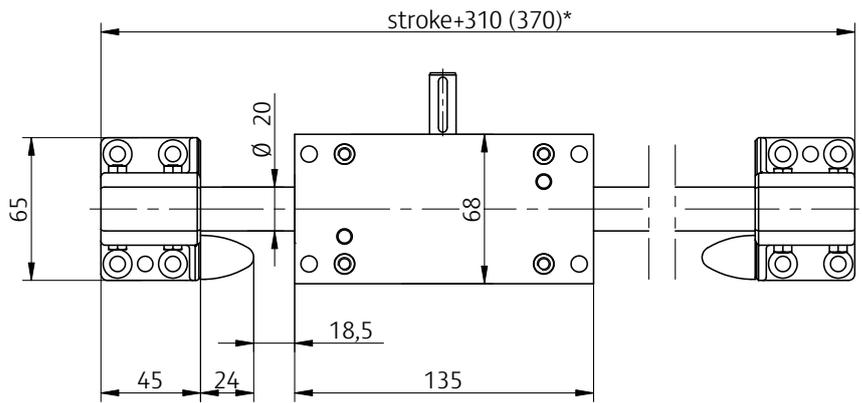
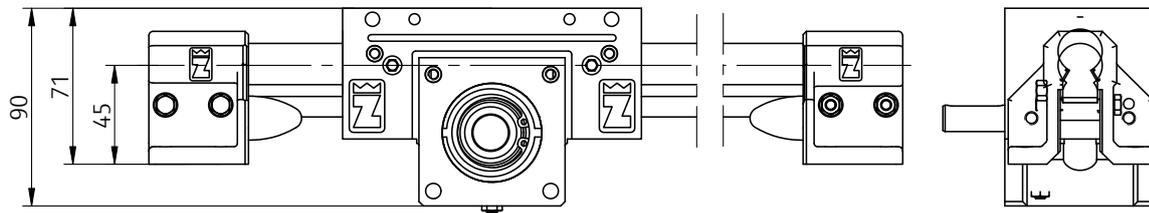
F (N) medium payload on profiled shaft  
 L (mm) clamping length  
 J (mm<sup>4</sup>) geometrical moment of inertia  
 y (mm) deflection  
 E=210 000 N/mm<sup>2</sup> (steel)  
 Factor = 130, was determined empirically with rigid subconstruction



**Drive unit**

Size	Drive torque max. TA (Nm)	Feed force max. FV (N)	Speed max. v (m/s)	Speed max. n (1/min)
ZLB 20	2.9	380	2	2,546
ZLB 30	5.1	540	2	2,037
ZLB 40	11	980	2	1,697
ZLB 50	39	2,300	2	1,223
ZLB 60	100	4,300	1.6	643
ZLB 80	220	7,500	1.5	481

### Dimension sheet ZLB20 with shaft support

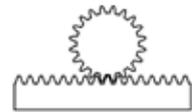
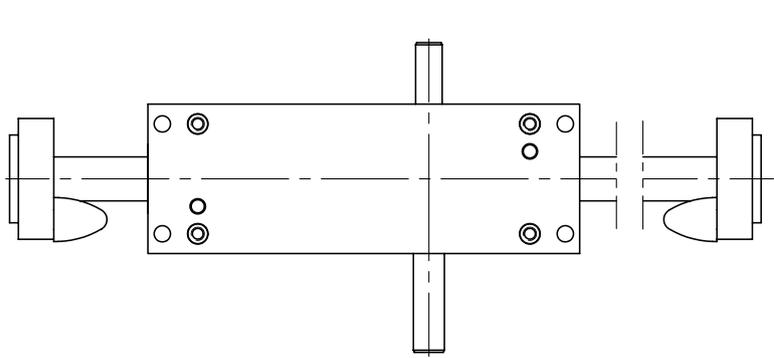
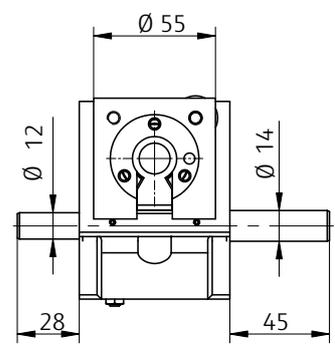
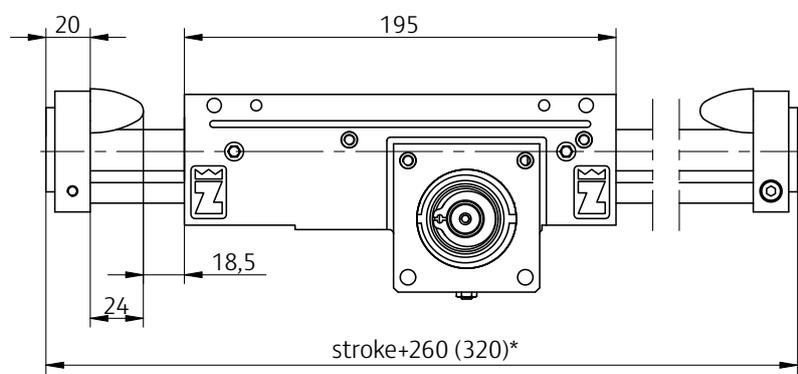


Different designs can be freely combined

- Shrink disc/fitting key
- Short/long carriage
- End flange/shaft support

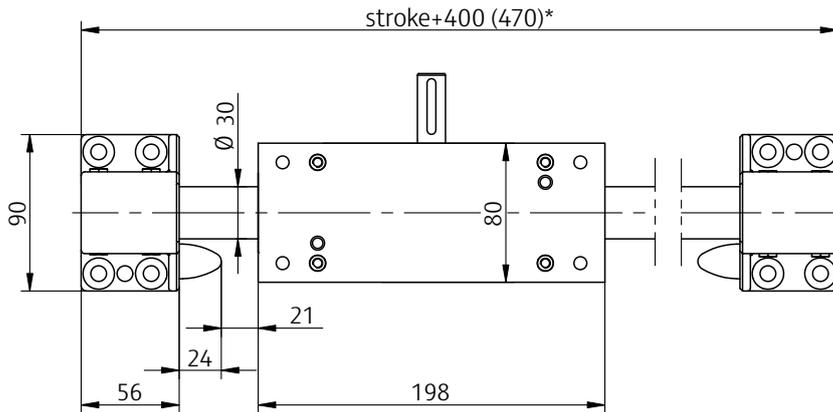
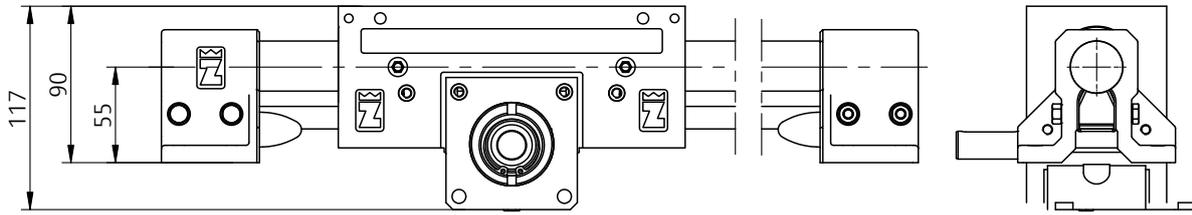
\*Clamp mass for long carriage

### Dimension sheet ZLB20 with end flange



Pitch diameter	15 mm
Number of teeth	15
Module	1
Shaft supports	1.05 kg
End flanges	0.65 kg
Carriage	2 (3) kg
Full shaft guide	4 kg/m
Hollow shaft guide	2.8 kg/m

Dimension sheet ZLB30 with shaft support

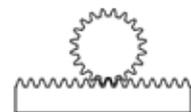
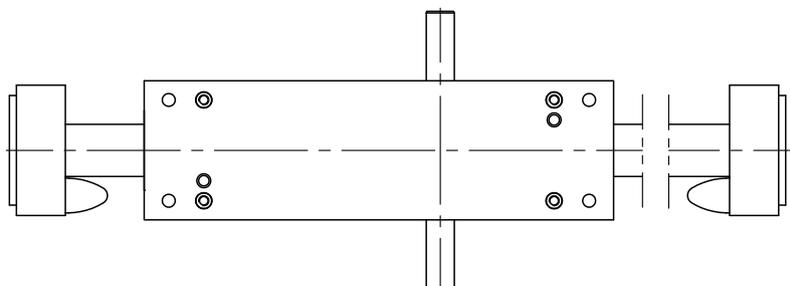
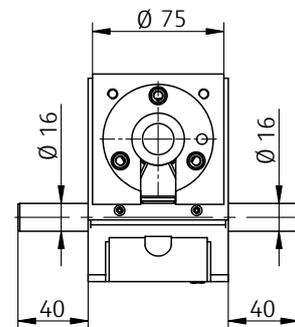
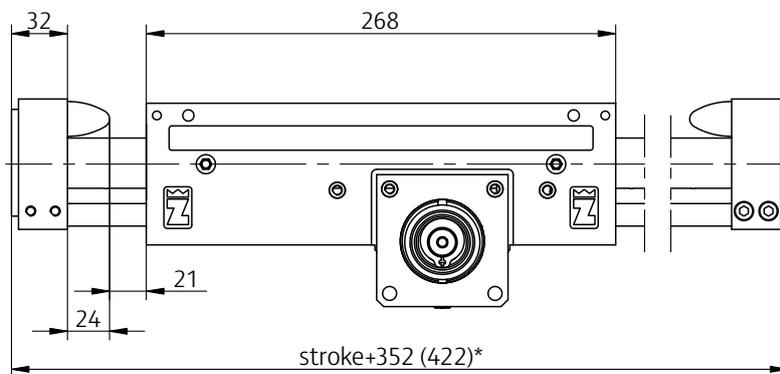


Different designs can be freely combined

- Shrink disc/fitting key
- Short/long carriage
- End flange/shaft support

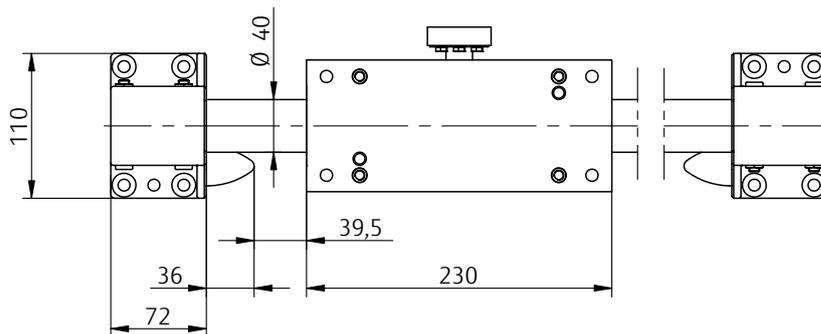
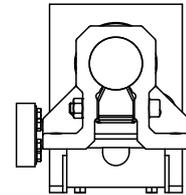
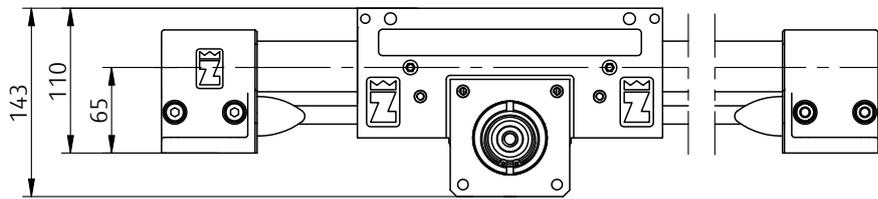
\*Clamp mass for long carriage

Dimension sheet ZLB30 with end flange



Pitch diameter	18.75 mm
Number of teeth	15
Module	1.25
Shaft supports	1.95 kg
End flanges	0.8 kg
Carriage	4 (5) kg
Full shaft guide	8.4 kg/m
Hollow shaft guide	6.4 kg/m

### Dimension sheet ZLB40 with shaft support



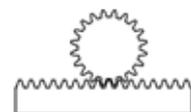
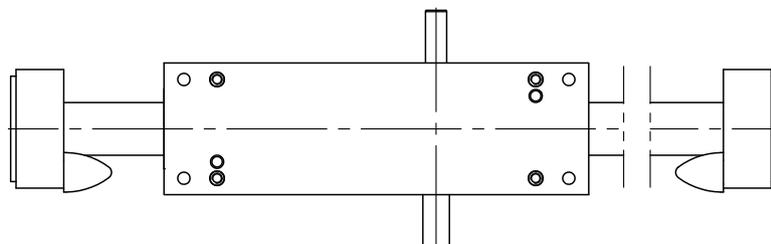
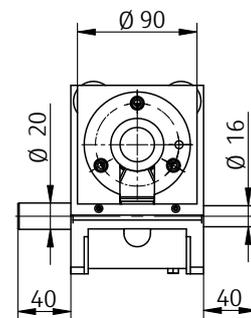
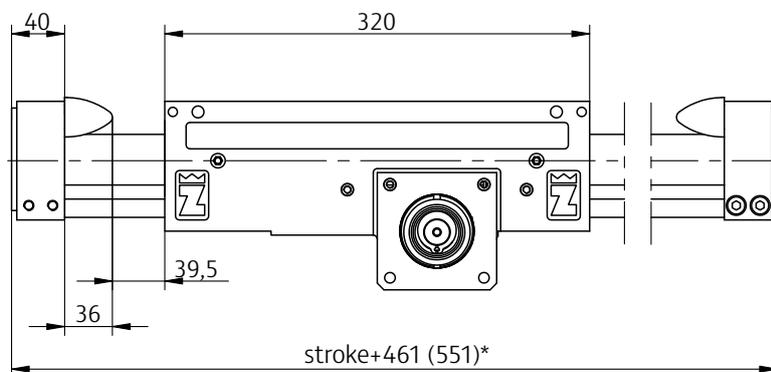
Different designs can be freely combined

- Shrink disc/fitting key
- Short/long carriage
- End flange/shaft support

\*Clamp mass for long carriages

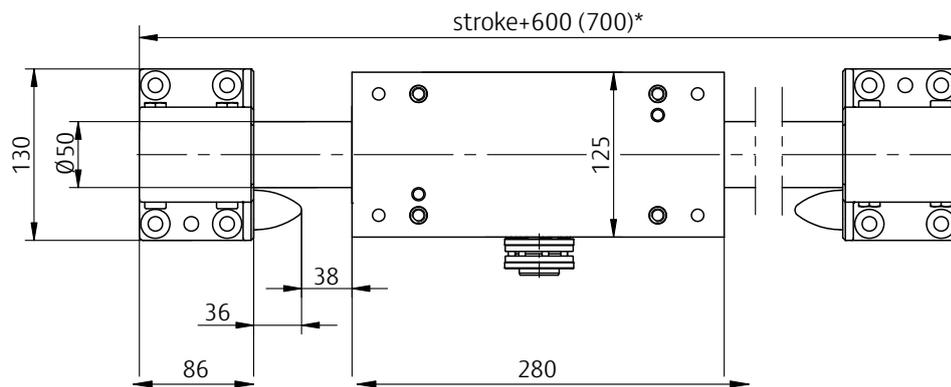
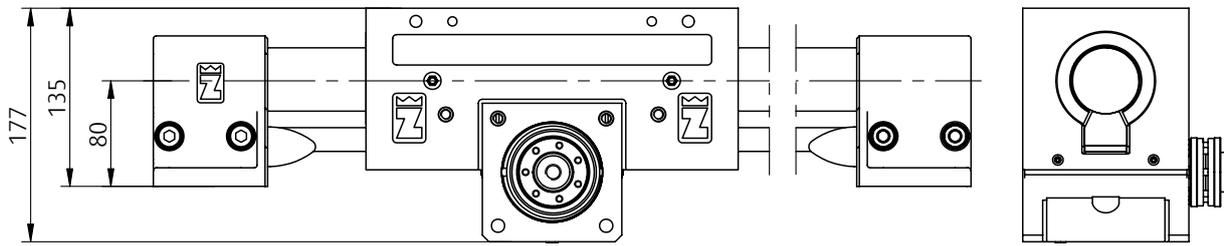
\*\*Tolerance for pin holes  $\pm 0.03$

### Dimension sheet ZLB40 with end flange



Pitch diameter	22.5 mm
Number of teeth	15
Module	1.5
Shaft supports	3.6 kg
End flanges	1 kg
Carriage	7 (8) kg
Full shaft guide	14 kg/m
Hollow shaft guide	9.8 kg/m

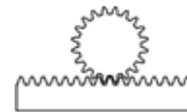
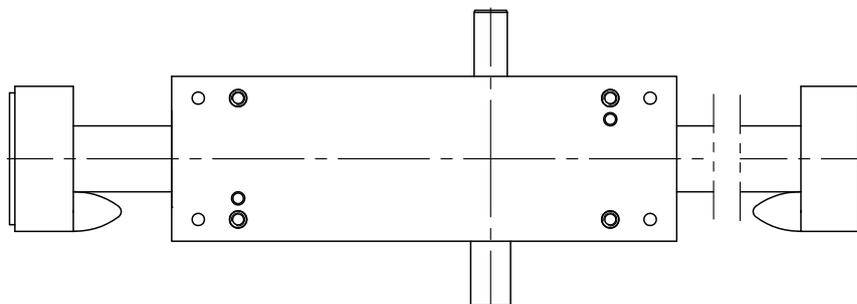
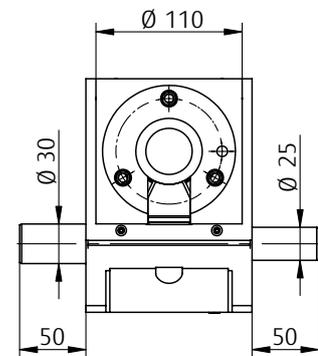
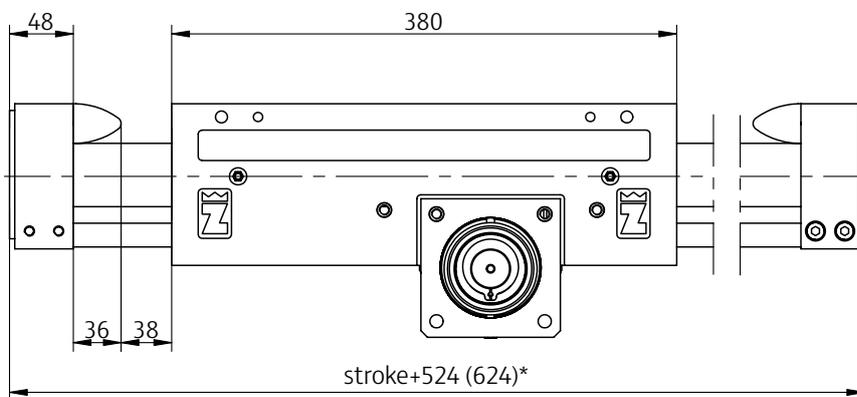
Dimension sheet ZLB50 with shaft support



- Different designs can be freely combined
- Shrink disc/ fitting key
  - Short/long carriage
  - End flange/ shaft support

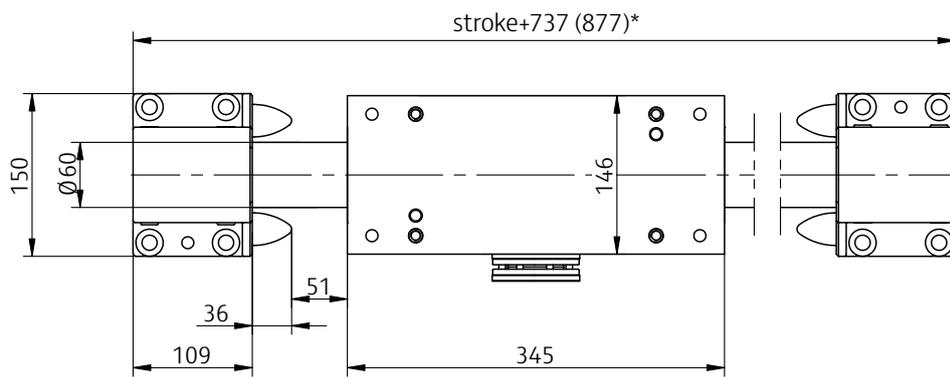
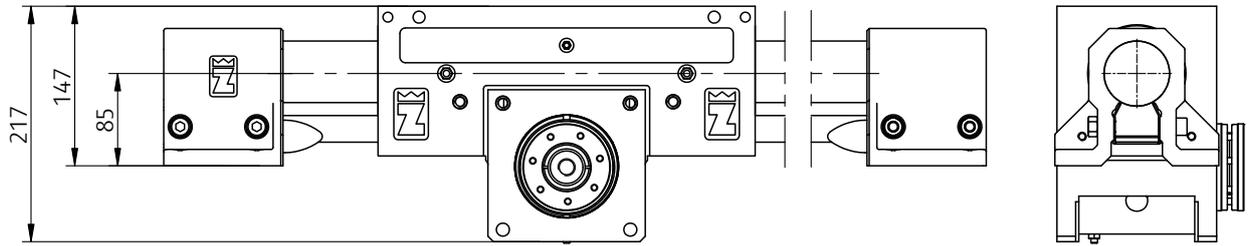
\*Clamp mass for long carriage

Dimension sheet ZLB50 with end flange



Pitch diameter	34 mm
Number of teeth	17
Module	2
Shaft supports	7.4 kg
End flanges	1.7 kg
Carriage	15 (18) kg
Full shaft guide	22 kg/m
Hollow shaft guide	17 kg/m

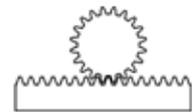
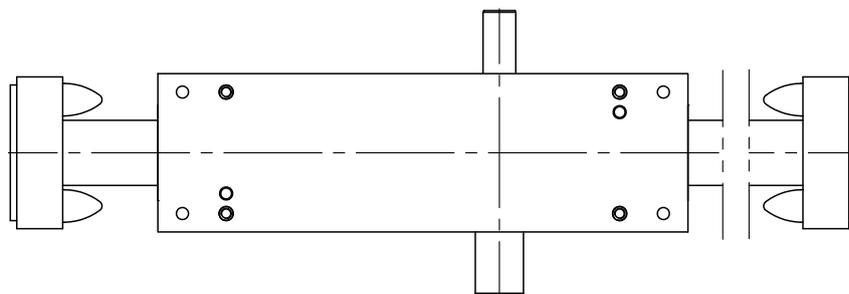
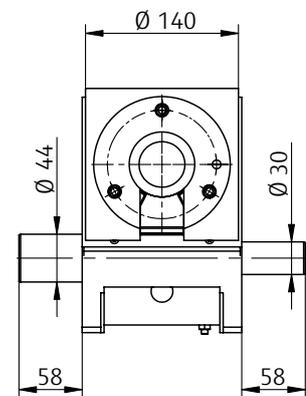
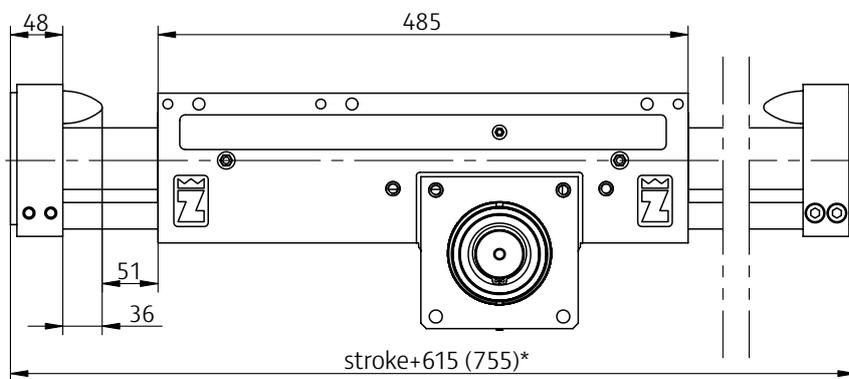
Dimension sheet **ZLB60 with shaft support**



- Different designs can be freely combined
- Shrink disc/ fitting key
  - Short/long carriage
  - End flange/ shaft support

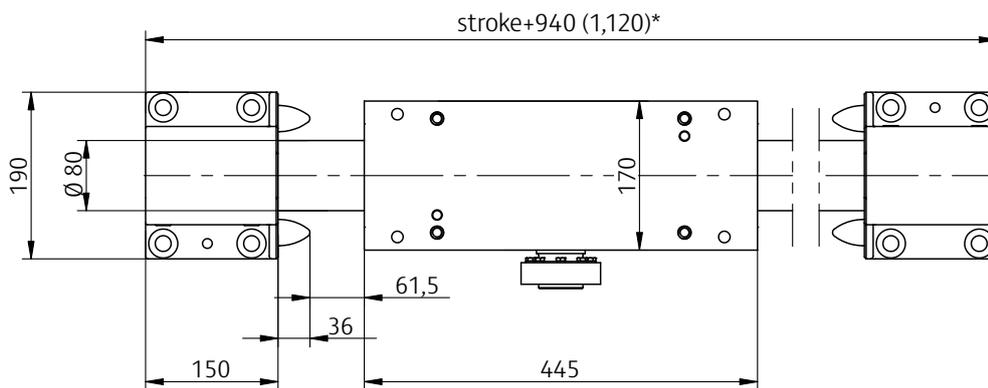
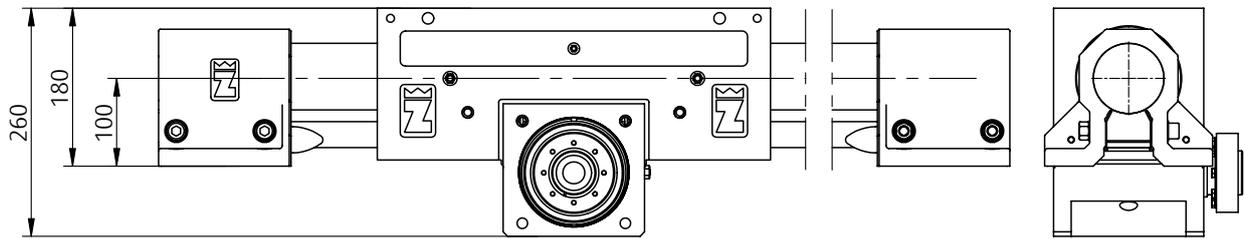
\*Clamp mass for long carriage

Dimension sheet **ZLB60 with end flange**



Pitch diameter	47.5 mm
Number of teeth	19
Module	2.5
Shaft supports	10.8 kg
End flanges	2.1 kg
Carriage	22 (26) kg
Full shaft guide	31.6 kg/m
Hollow shaft guide	18.6 kg/m

Dimension sheet ZLB80 with shaft support

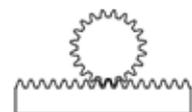
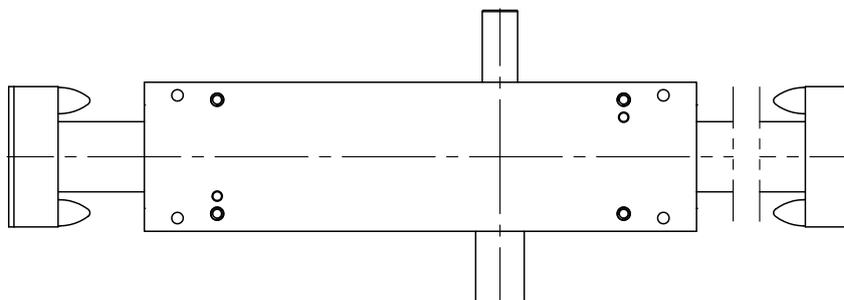
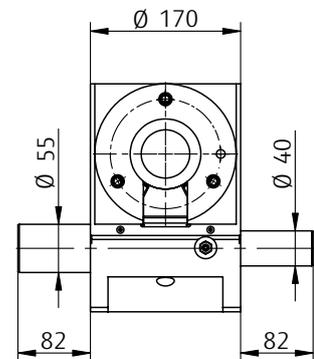
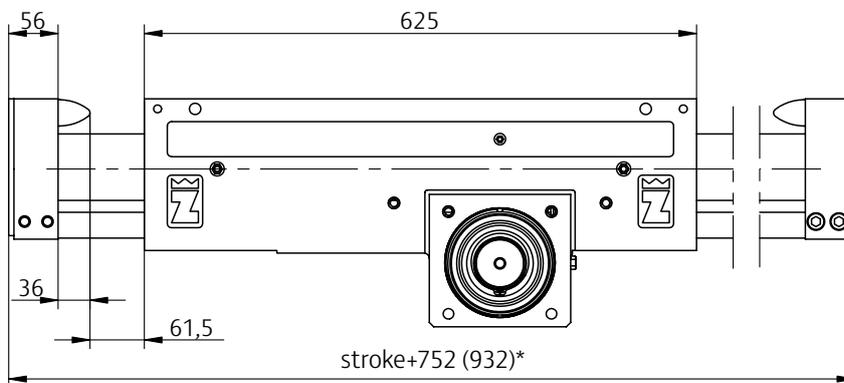


Different designs can be freely combined

- Shrink disc/ fitting key
- Short/long carriage
- End flange/ shaft support

\*Clamp mass for long carriage

Dimension sheet ZLB80 with end flange



Pitch diameter	59.5 mm
Number of teeth	17
Module	3.5
Shaft supports	22 kg
End flanges	3.7 kg
Carriage	42 (48) kg
Full shaft guide	52.9 kg/m
Hollow shaft guide	33.8 kg/m

# 2. Portal axes

## Overview



Toothed belt drive

**ZLD\_R** – toothed belt drive, repeatability  $\pm 0.1$  mm

Load\*

Size	$F_x$ max. (N)	$F_y$ max. (N)	$M_x$ (Nm)	$M_y$ (Nm)	$M_z$ (Nm)	$M_A$ (Nm60)	v (m/s)
ZLD10-10R	2,500	4,000	480	320	140	75	8
ZLD16-16R	4,000	2,500	550	300	200	110	6
ZLD30RS	11,000	12,000	3,700	3,700	800	110	6
ZLD30RL	6,600	11,000	3,200	1,600	800	110	6
ZLD42-42R	11,000	11,000	3,500	3,100	1,600	220	6
ZLD52-52R	16,000	16,000	5,000	4,500	2,300	510	4

\*Values for individual load, permitted load values dependent on the application and axis length;  $F_x$  and  $F_y$  dynamic

\*\* Values apply for a lifetime of 12,000 km



Rack-and-pinion drive

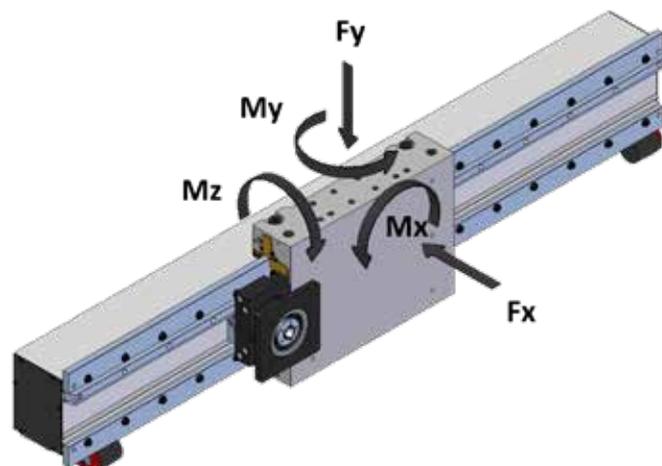
**ZLD** – Gear rack drive, repeatability  $\pm 0.1$  mm

Load\*

Size	$F_x$ max. (N)	$F_y$ max. (N)	$F_z$ (N)	$M_x$ (Nm)	$M_y$ (Nm)	$M_z$ (Nm)	$M_A$ (Nm)	v (m/s)
ZLD16-16	2,500	4,000		550	300	200	100	2.5
ZLD30L	6,600	11,000		3,200	1,600	800	250	2.5
ZLD30Z			5,000	3,300	3,300	650	250	2.5
ZLD42-42	11,000	11,000		3,500	3,100	1,600	250	2.5
ZLD52-52	16,000	16,000		5,000	4,500	2,300	640	2.5
ZLD72-72L	35,000	35,000		11,000	11,000	11,000	640	2.5
ZLD72-72S	50,000	50,000		25,000	30,000	15,000	640	2.5
ZLD90-90L	35,000	35,000		15,000	15,000	15,000	640	2.5
ZLD90-90S	50,000	50,000		31,000	37,000	18,000	640	2.5

\*Values for individual load, permitted load values dependent on the application and axis length;  $F_x$  and  $F_y$  dynamic

\*\* Values apply for a lifetime of 12,000 km



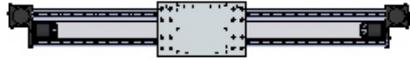
ZLD 10-10R



ZLD 16-16R



ZLD30RS



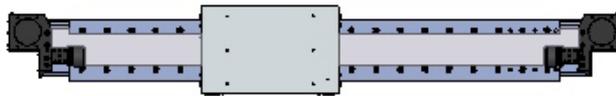
ZLD30RL



ZLD 42-42R



ZLD52-52R



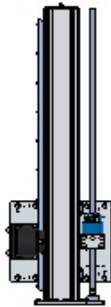
ZLD 16-16



ZLD30L



ZLD30Z



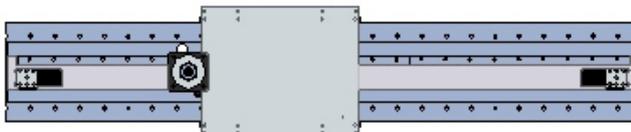
ZLD 42-42



ZLD52-52



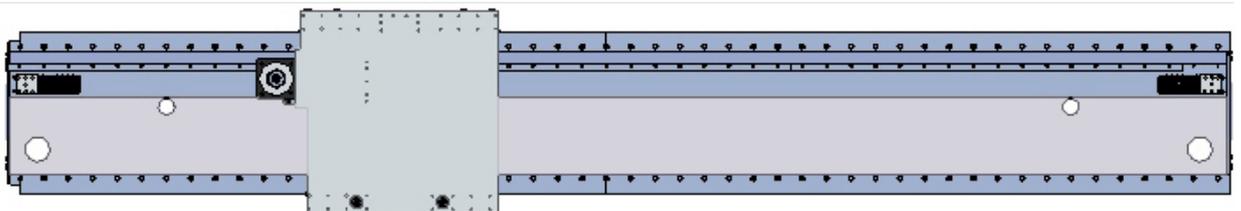
ZLD72-72L



ZLD72-72S



ZLD90-90L



ZLD90-90S

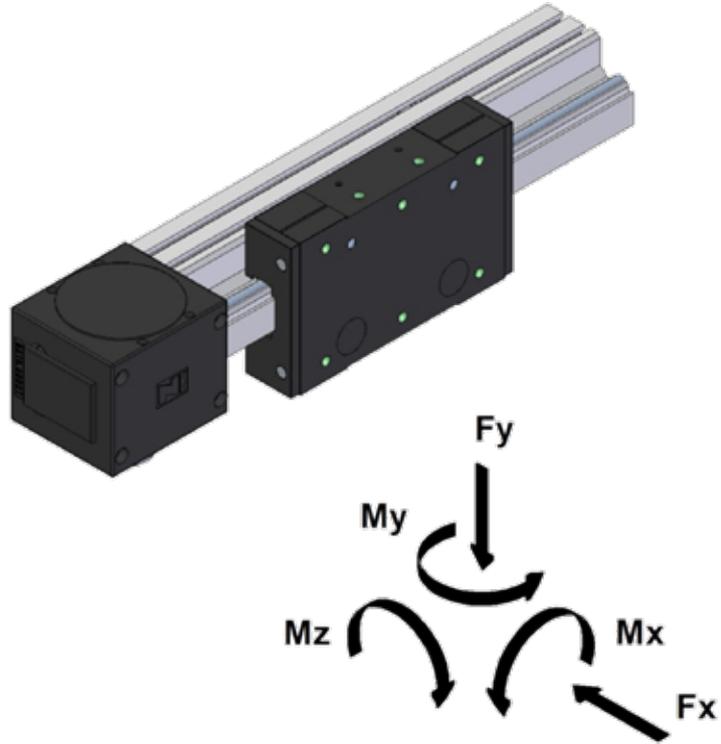


## 2.1 Portal axes with toothed belt drive

### 2.1.1 ZLD10-10R

#### Features

- Machined aluminium extruded profile with hardened steel shafts
- High flexural and torsional rigidity
- 2 T-slot rows in the rear side of the profile for any type of mounting to portal columns
- Carriage in torsionally rigid light metal design with rollers mounted on roller bearings
- Mechanical repeatability of position  $\pm 0.1$  mm
- Also available in corrosion-protected design (rollers and shafts)
- Heavy-duty toothed belt drive for low-noise running



#### // Technical data



Size	$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD10-10R	5,000	2,500	6,000	4,000	480	350	320	200	140	90

\*Value for individual load, permitted load values dependent on application and axis length

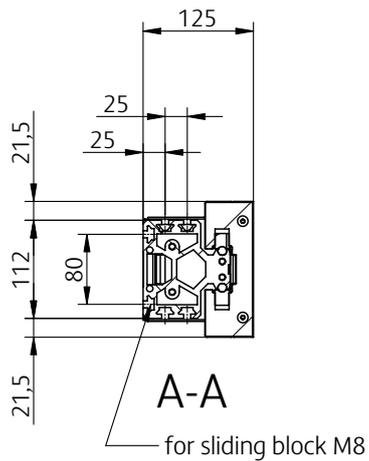
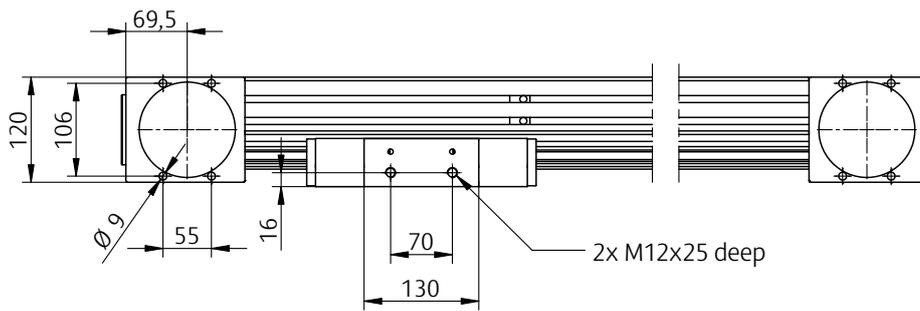
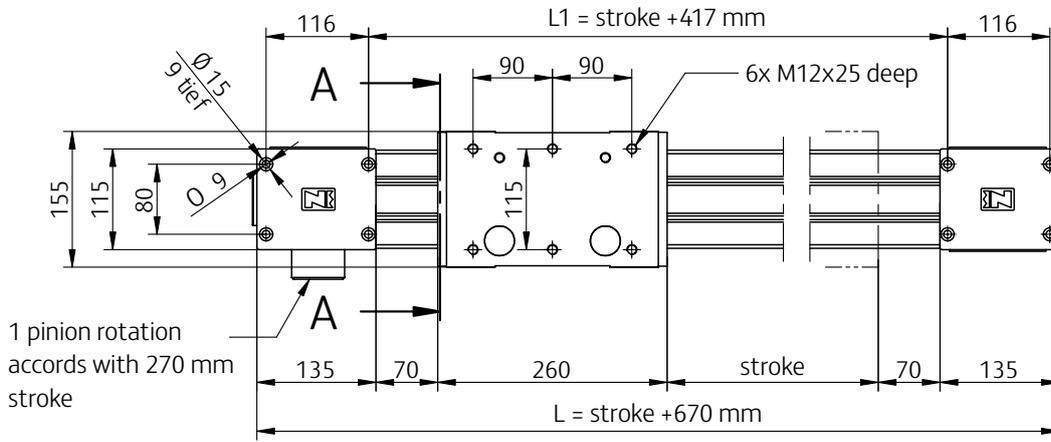
#### Toothed belt drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD10-10R		75	1,750

Lifetime equation: Roller  $C_w = 14,500$  N

$$L = \left( \frac{C_w}{\frac{F_y}{2} + \frac{M_x}{0.12 \text{ m}} + \frac{F_x}{1.15} + \frac{M_y}{0.07 \text{ m}} + \frac{M_z}{0.03 \text{ m}}} \right)^{3 \times} 100 \text{ km}$$

Dimension sheet ZLD10-10R

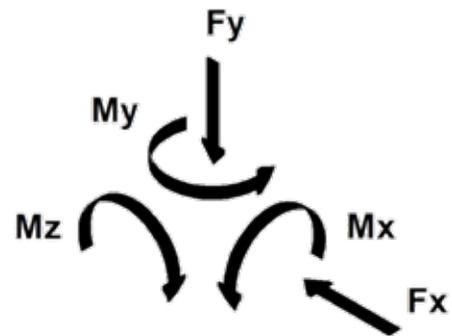
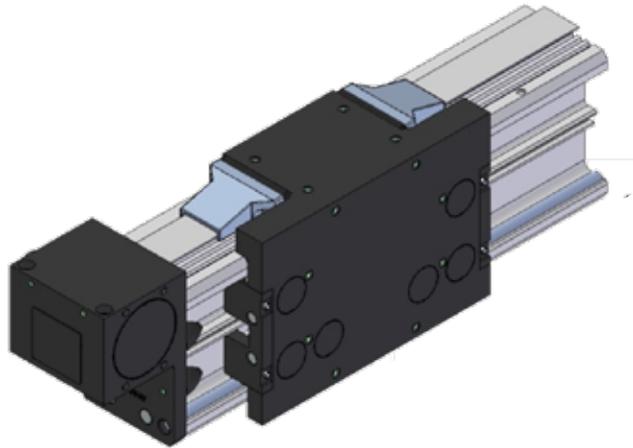


Pitch diameter	85.94 mm
Number of teeth	27
2 belt housings	8 kg
Carriage	5 kg
Rail	13 kg/m

## 2.1.2 ZLD16-16R

### Features

- Machined aluminium extruded profile with hardened steel shafts
- High flexural and torsional rigidity
- 2 T-slot rows in the rear side of the profile for any type of mounting to portal columns
- Carriage in torsionally rigid light metal design with rollers mounted on roller bearings
- Mechanical repeatability of position  $\pm 0.1$  mm
- Also available in corrosion-protected design (rollers and shafts)
- Heavy-duty toothed belt drive for low-noise running



### // Technical data



#### Load

Size	$F_x$ max. (N)**		$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
<b>ZLD16-16R</b>	9,000	6,000	6,000	4,000	5,000	2,500	1,200	550	600	300	380	200

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads / \*\* with 2 additional rollers

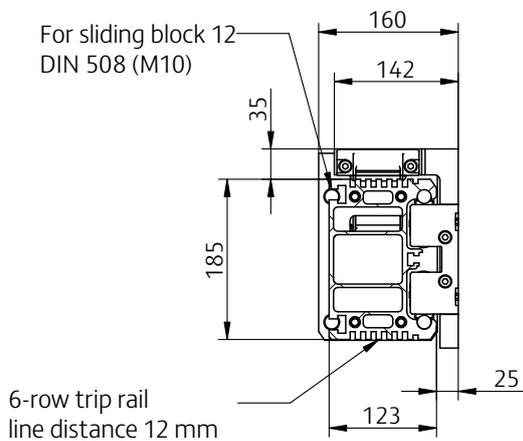
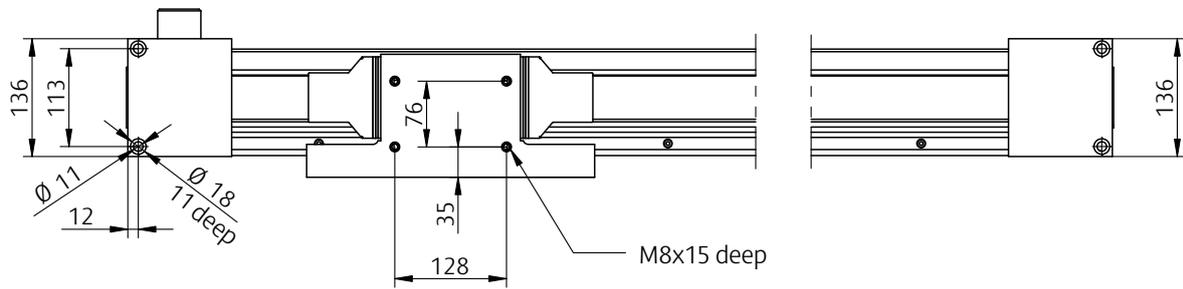
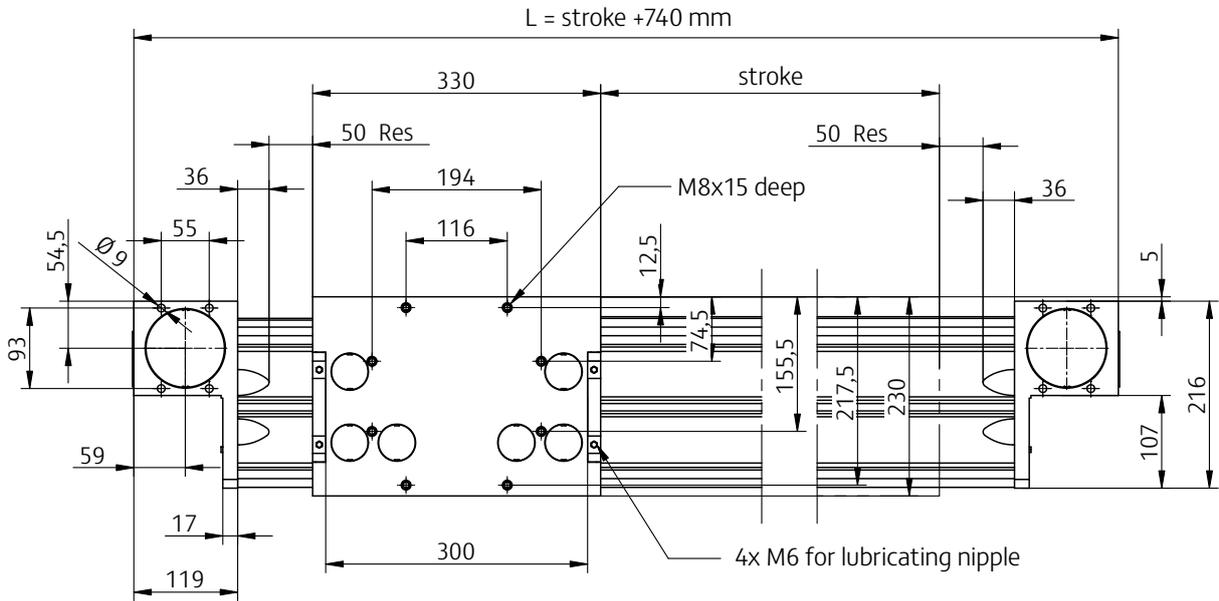
#### Toothed belt drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
<b>ZLD16-16R</b>		110	3,500
			6

Lifetime equation: Roller  $C_w = 14,600$  N

$$L = \left( \frac{C_w * 1.5}{\frac{F_y}{2} + \frac{M_x}{0.24 \text{ m}} + \frac{F_x}{1.15} + \frac{M_y}{0.14 \text{ m}} + \frac{M_z}{0.07 \text{ m}}} \right)^{3 \times} 50 \text{ km}$$

Dimension sheet ZLD16-16R

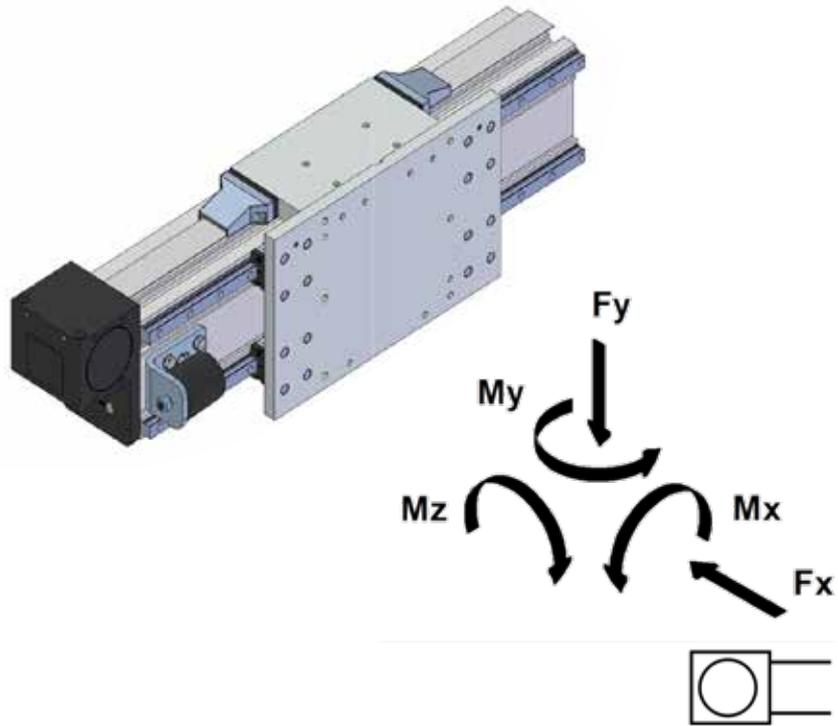


Pitch diameter	63.66 mm
Number of teeth	20
2 belt housings	10 kg
Carriage	8 kg
Rail	22 kg/m

### 2.1.3 ZLD30RS

#### Features

- Aluminium extruded profile with high flexural and torsional rigidity
- Hardened guide rails
- Carriage plate in light metal design with 4 roller bearing-mounted guide trolleys
- 2 T-slot rows in the rear side of the profile for any type of mounting to portal columns
- Mechanical repeatability of position  $\pm 0.1$  mm



#### // Technical data

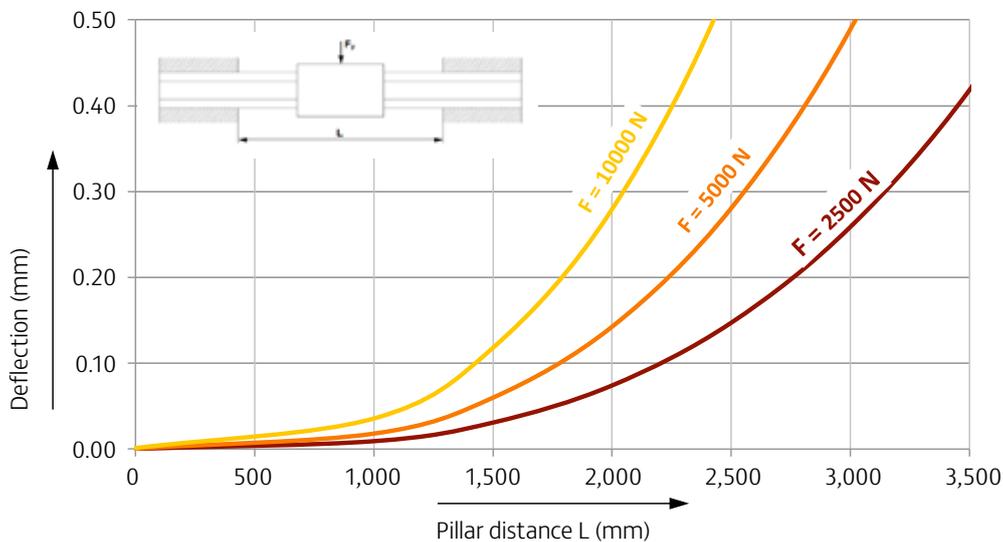
##### Load

Size	$F_x$ max. (N)**		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD30RS	15,000	11,000	15,000	12,000	4,900	3,700	4,900	3,700	1,100	800

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads / \*\* with 2 additional rollers

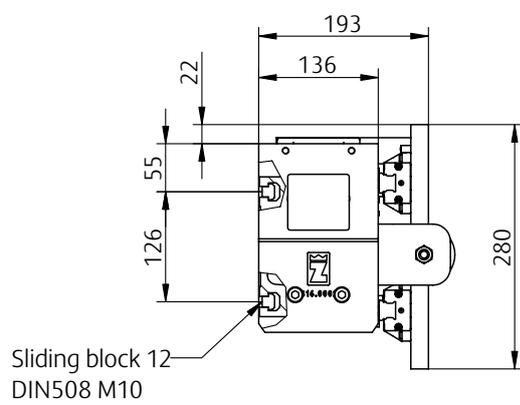
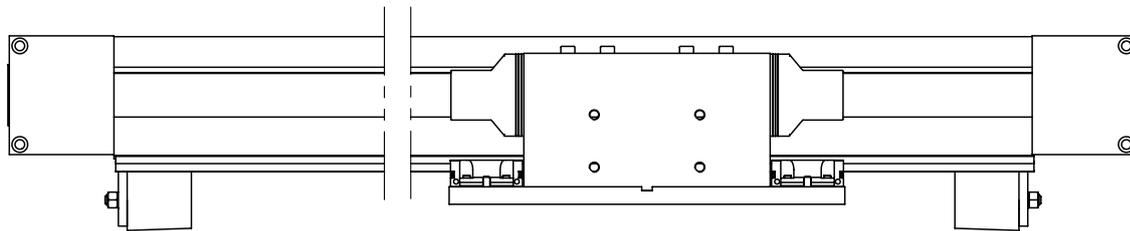
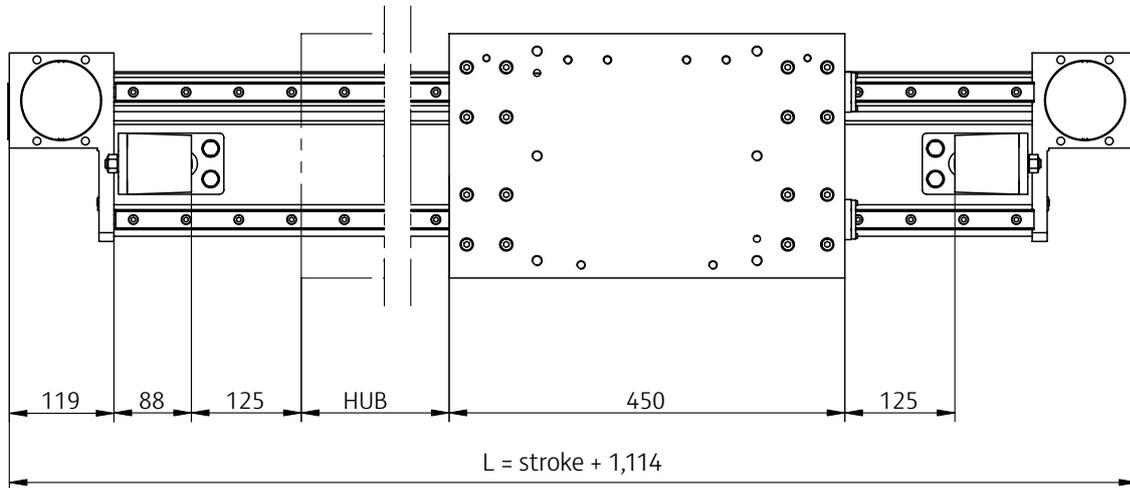
##### Toothed belt drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD30RS		110	3,500



Permitted load values dependent on the application and axis length

Dimension sheet ZLD30RS

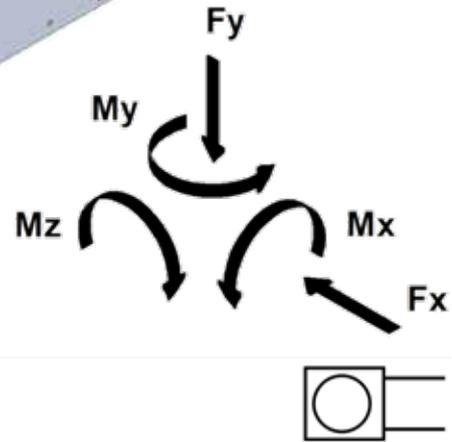
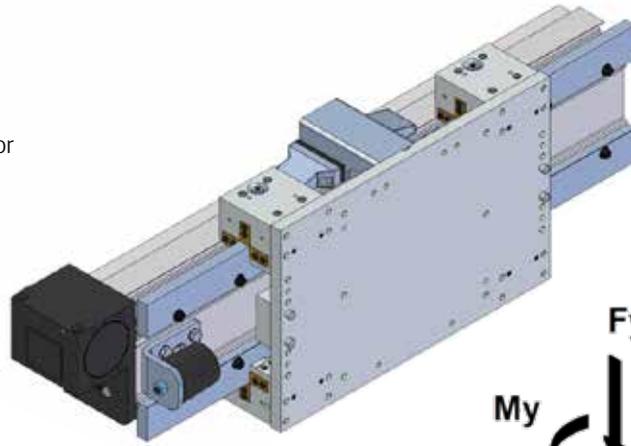


Pitch diameter	63.663 mm
Number of teeth	20
2 belt housings	10 kg
Carriage	8 kg
Rail	30 kg/m

## 2.1.4 ZLD30RL

### Features

- Rollers with high load factor running on hardened flat guideways
- Aluminium extruded profile with high flexural and torsional rigidity
- 2 T-slots in the rear side of the profile for any type of mounting onto portal columns
- Mechanical repeatability of the position  $\pm 0.1$  mm



### // Technical data

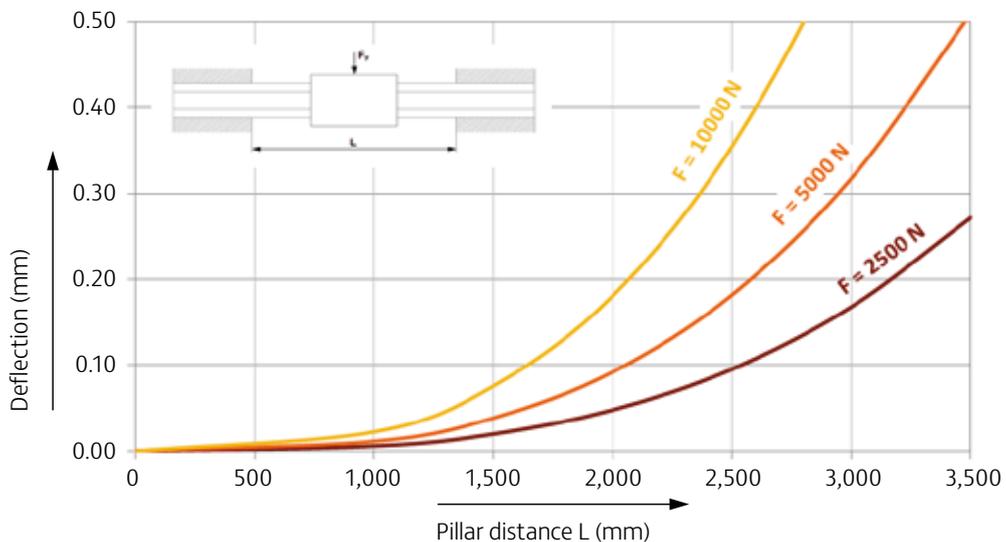
#### Load

Size	$F_x$ max. (N)**		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD30RL	15,000	6,600	20,000	11,000	6,400	3,200	3,000	1,600	1,500	800

\* Values apply for a lifetime of 12,000 km. Multiply all values by 0.78 if the lifetime should be 24,000 km. Values apply for individual loads / \*\* with 2 additional rollers

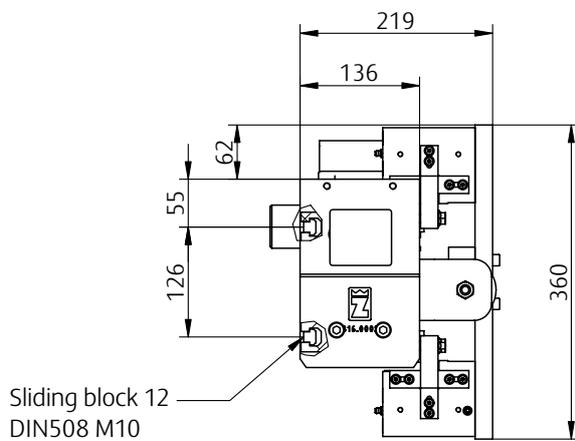
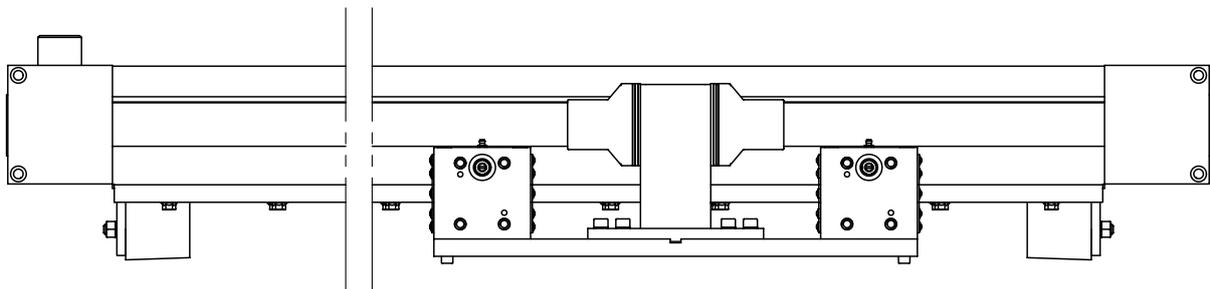
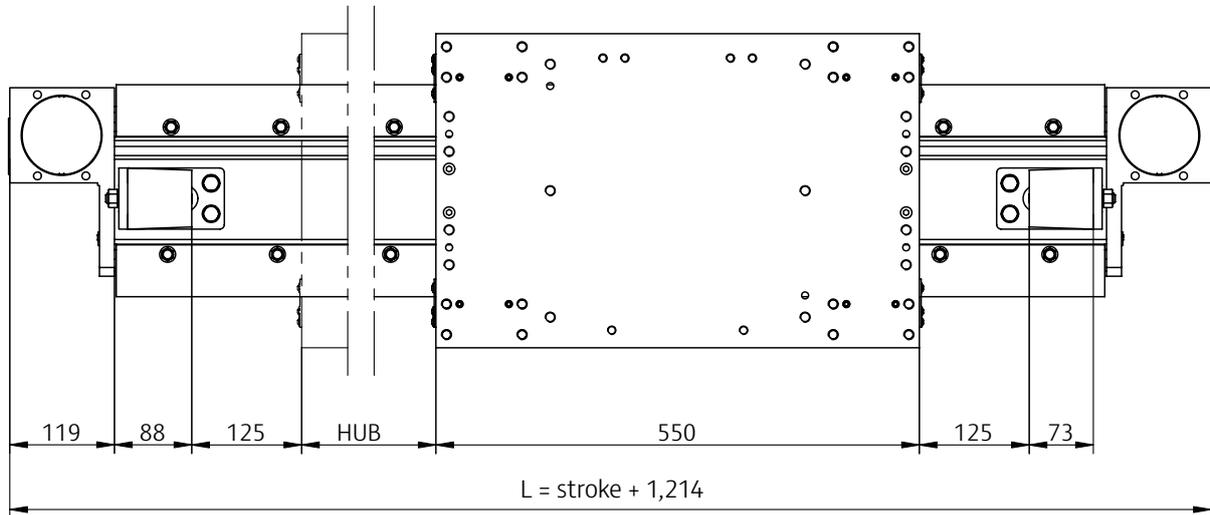
#### Toothed belt drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD30RL		110	3,500



Permitted load values dependent on the application and axis length

Dimension sheet ZLD30RL

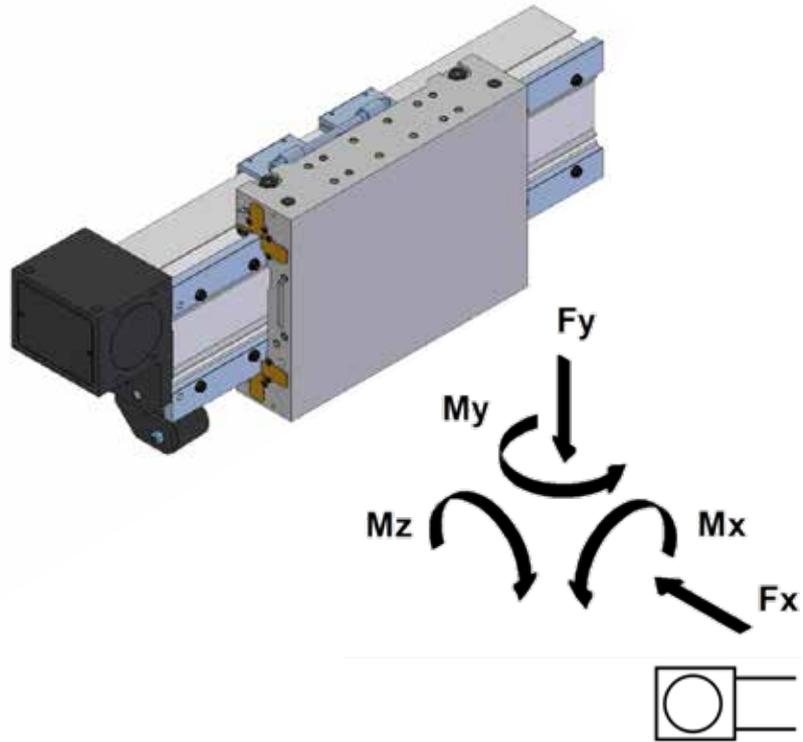


Pitch diameter	63.663 mm
Number of teeth	20
2 belt housings	10 kg
Carriage	14 kg
Rail	30 kg/m

## 2.1.5 ZLD42-42R

### Features

- Aluminium extruded profile with high flexural and torsional rigidity
- 2 T-slots in the rear side of the profile for any type of mounting onto portal columns
- Carriage in torsionally-rigid light metal design
- Mechanical repeatability of the position  $\pm 0.1$  mm



### // Technical data

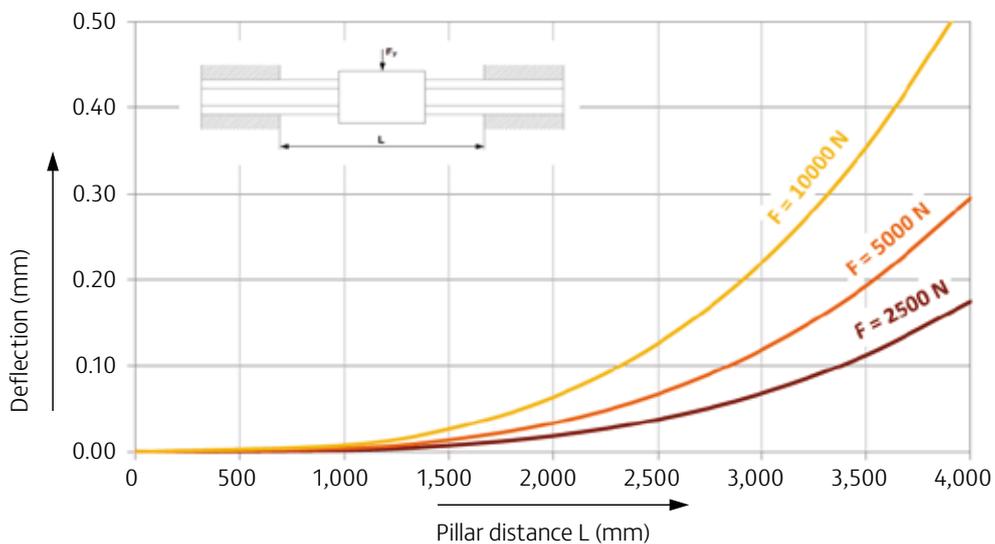
#### Load

Size	$F_x$ max. (N)**		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD42-42R	20,000	11,000	20,000	11,000	7,000	3,500	6,000	3,100	3,000	1,600

\* Values apply for a lifetime of 12,000 km. Multiply all values by 0.78 if the lifetime should be 24,000 km. Values apply for individual loads / \*\* with 2 additional rollers

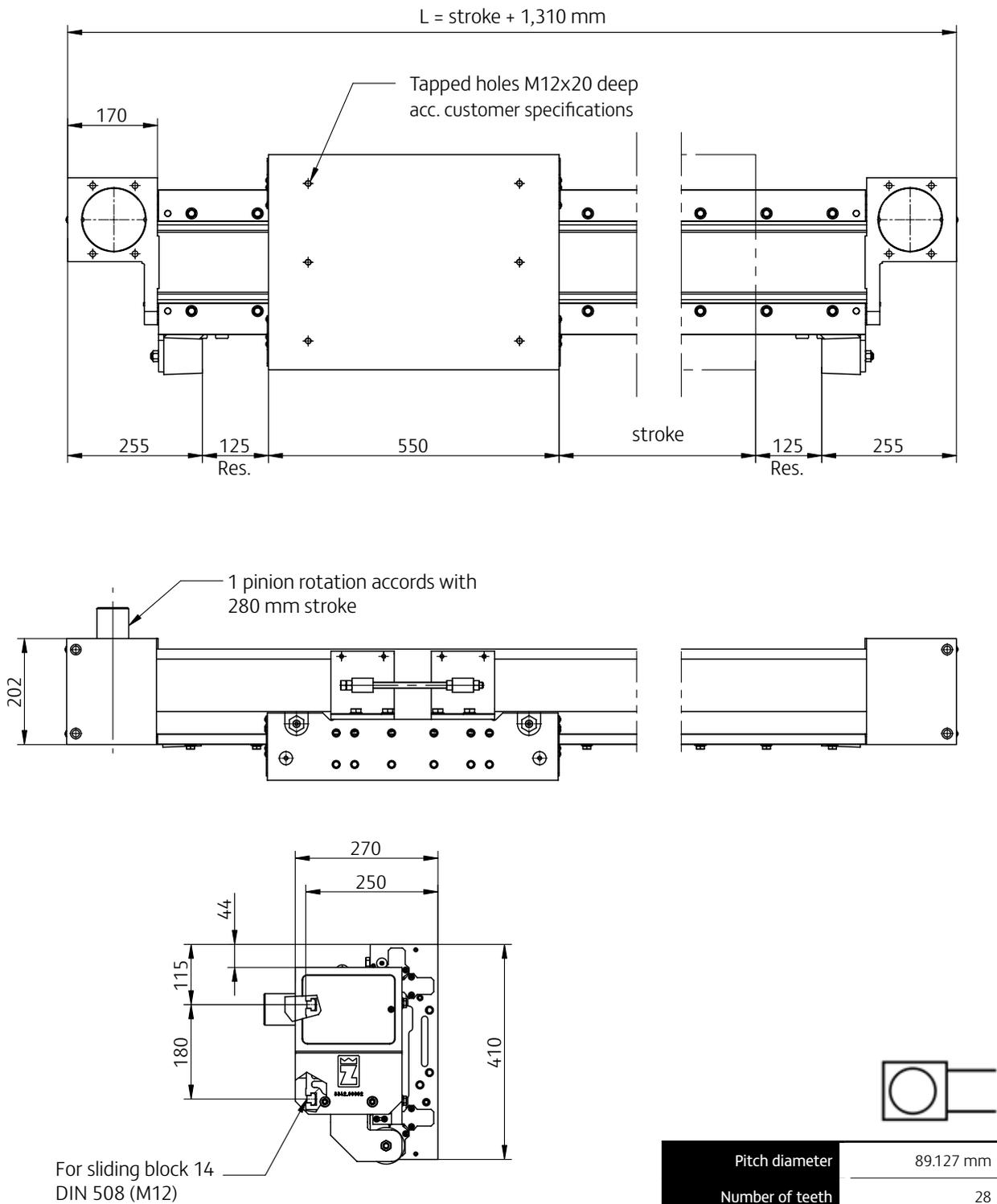
#### Toothed belt drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD42-42R		220	5,000



Permitted load values dependent on the application and axis length

Dimension sheet ZLD42-42R

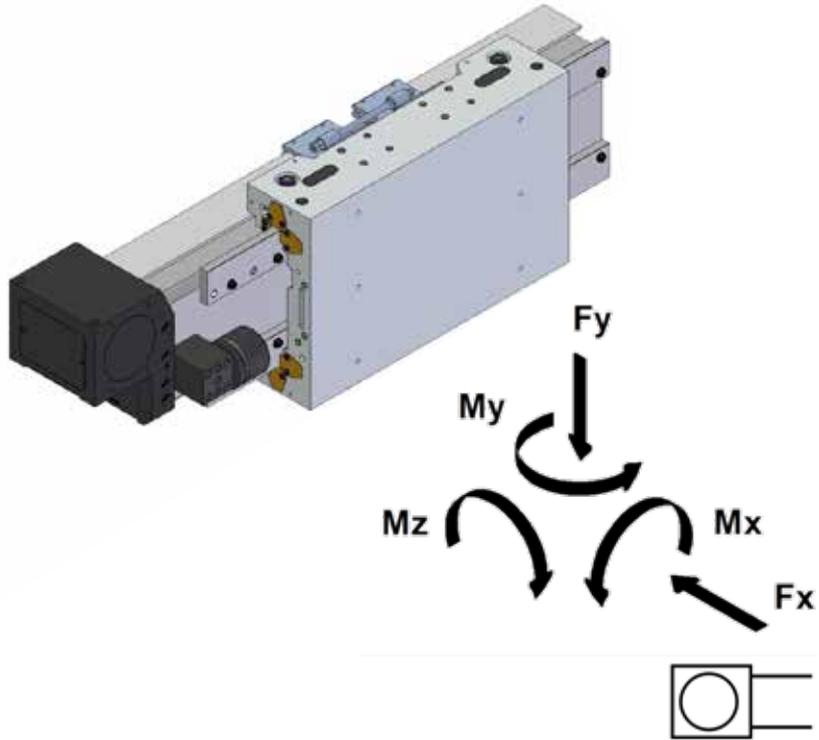


Pitch diameter	89.127 mm
Number of teeth	28
2 belt housings	30 kg
Carriage	35 kg
Rail	48 kg/m

## 2.1.6 ZLD52-52R

### Features

- Rollers with high load factor running on hardened flat guideways
- Plane-parallel machined support profile (rectangular pipe) with high moment of inertia
- Carriage in torsionally-rigid light metal design
- Mechanical repeatability of the position  $\pm 0.1$  mm



### // Technical data

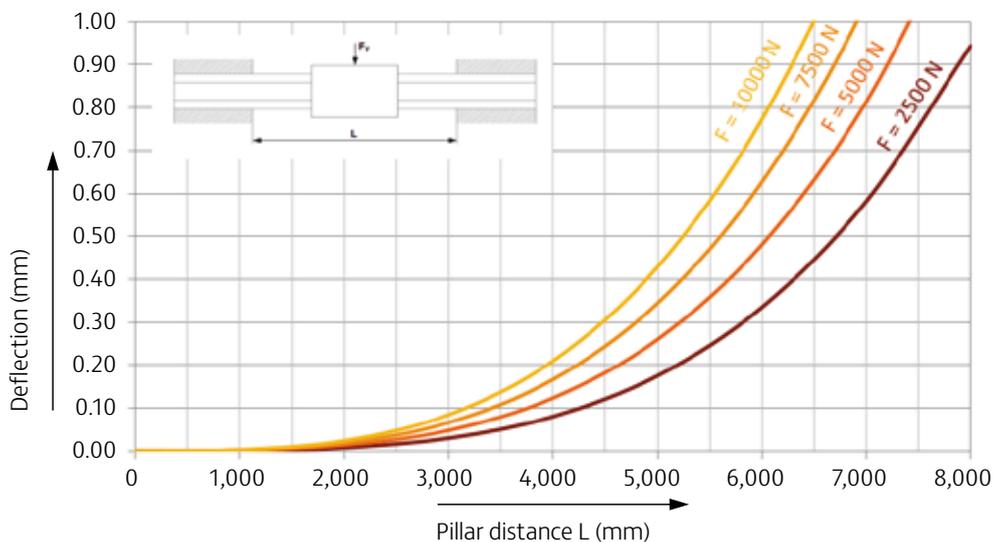
#### Load

Size	$F_x$ max. (N)**		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD52-52R	30,000	16,000	30,000	16,000	10,000	5,000	9,000	4,500	4,600	2,300

\* Values apply for a lifetime of 12,000 km. Multiply all values by 0.78 if the lifetime should be 24,000 km. Values apply for individual loads / \*\* with 2 additional rollers

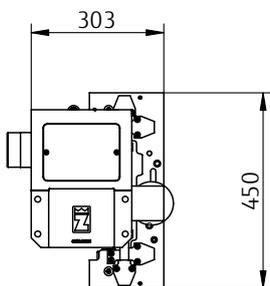
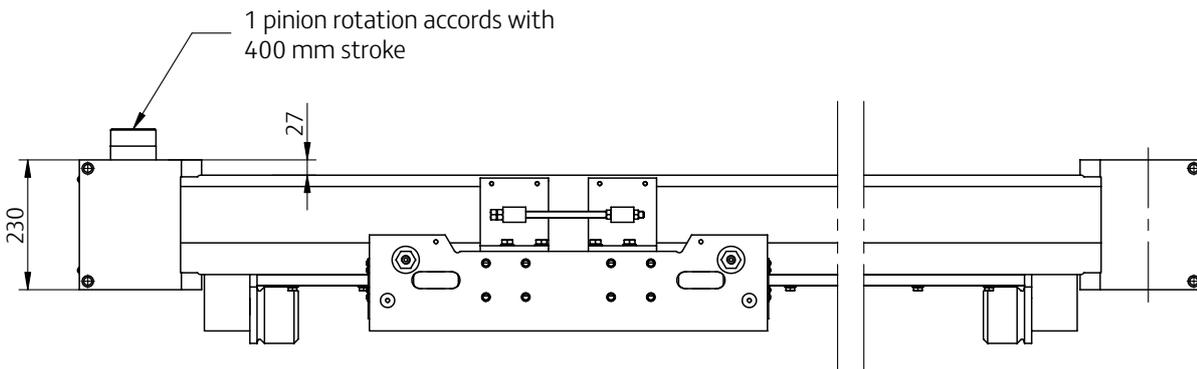
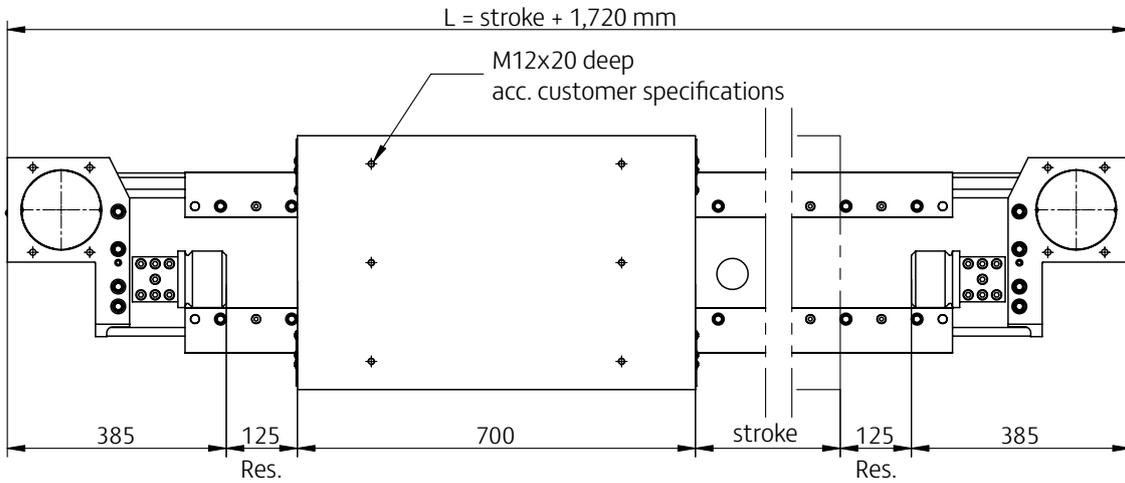
#### Toothed belt drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD52-52R		510	8,000



Permitted load values dependent on the application and axis length

Dimension sheet ZLD52-52R



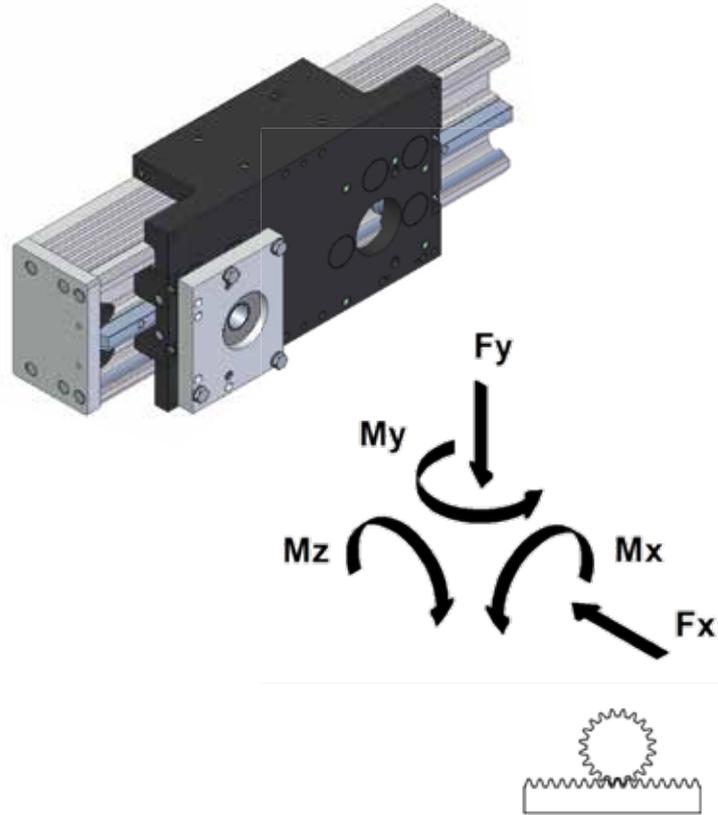
Pitch diameter	127.3 mm
Number of teeth	20
2 belt housings	35 kg
Carriage	45 kg
Rail	95 kg/m

## 2.2 Portal axes with rack-and-pinion drive

### 2.2.1 ZLD16-16

#### Features

- Machined aluminium extruded profile with hardened steel shafts
- High flexural and torsional rigidity
- 2 T-slots in the rear side of the profile for any type of mounting onto portal columns
- Carriage in torsionally rigid light metal design with rollers mounted on roller bearings
- Mechanical repeatability of position  $\pm 0.1$  mm
- Also available in corrosion-protected design (rollers and shafts)



#### // Technical data

Load	$F_x$		$F_y$		$M_x$		$M_y$		$M_z$	
	max. (N)	static	max. (N)	static	max. (Nm)	static	max. (Nm)	static	max. (Nm)	static
ZLD16-16	5,000	2,500	6,500	4,000	1,700	1,000	980	600	420	260

\* Values apply for a lifetime of 12000 km. Values apply for individual loads.

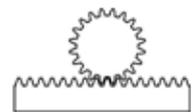
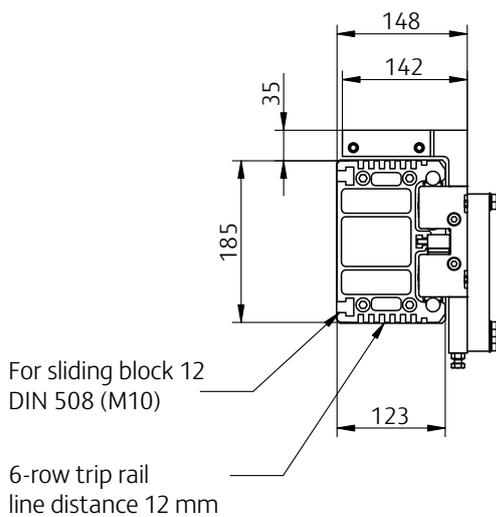
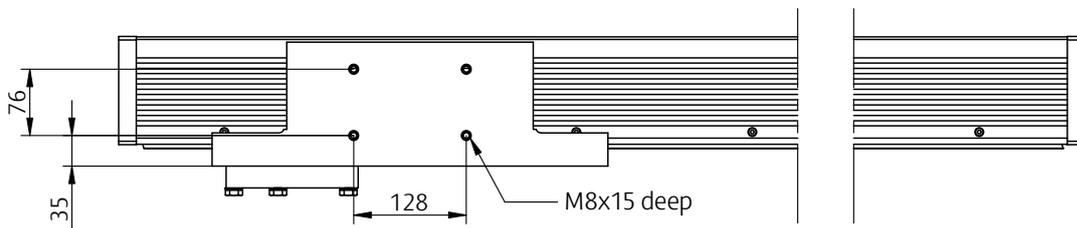
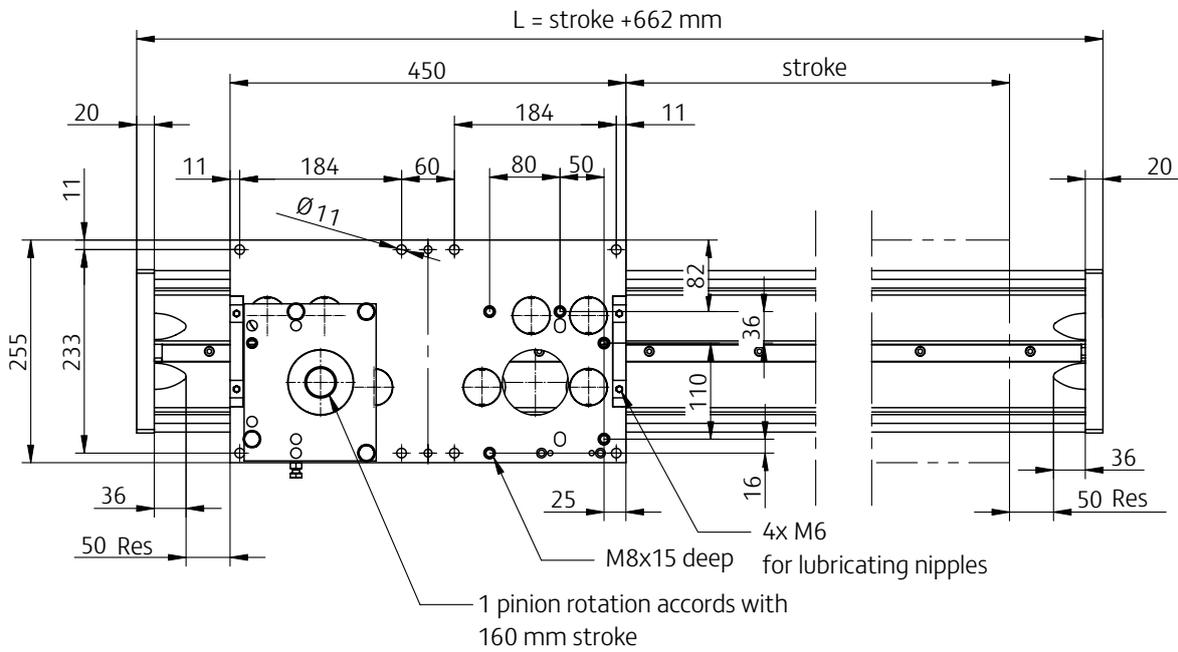
#### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD16-16		100	4,000

Lifetime equation: Roller  $C_w = 14,600$  N

$$L = \left( \frac{C_w}{\frac{F_y}{2} + \frac{M_x}{0.3 \text{ m}} + \frac{F_x}{1.15} + \frac{M_y}{0.17 \text{ m}} + \frac{M_z}{0.07 \text{ m}}} \right)^{3 \times} 50 \text{ km}$$

Dimension sheet ZLD16-16

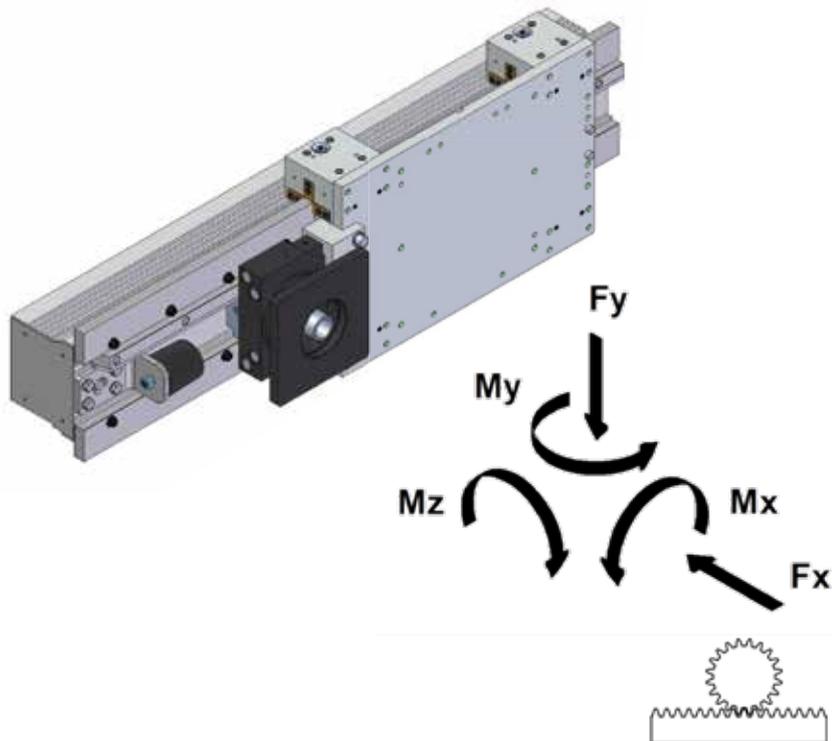


Pitch diameter	50.93 mm
Number of teeth	24
Module	2
2 end pieces	5 kg
Carriage	12 kg
Rail	25 kg/m

## 2.2.2 ZLD30L

### Features

- Rollers with high load factor running on hardened flat guideways
- Aluminium extruded profile with high flexural and torsional rigidity
- 2 T-slots in the rear side of the profile for any type of mounting onto portal columns
- Mechanical repeatability of the position  $\pm 0.1$  mm



### // Technical data

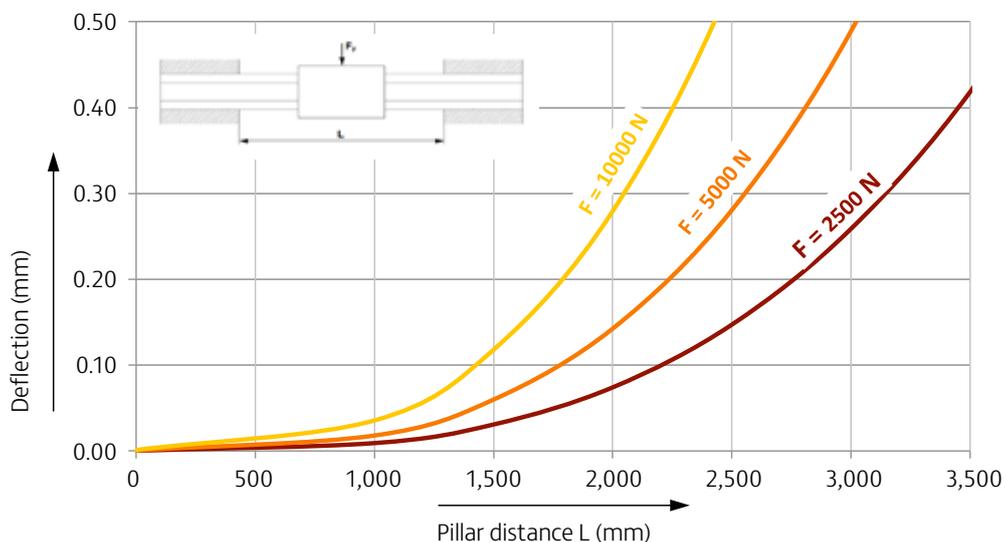
#### Load

Size	$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD30L	12,000	6,600	20,000	11,000	6,400	3,200	3,000	1,600	1,500	800

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads.

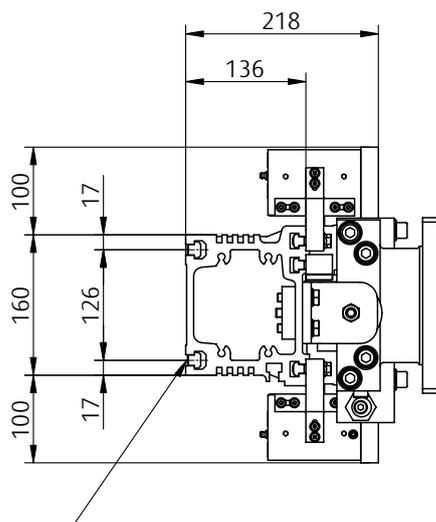
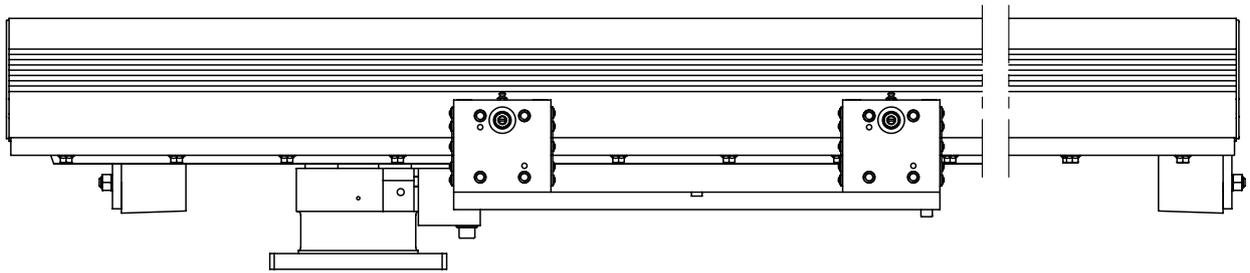
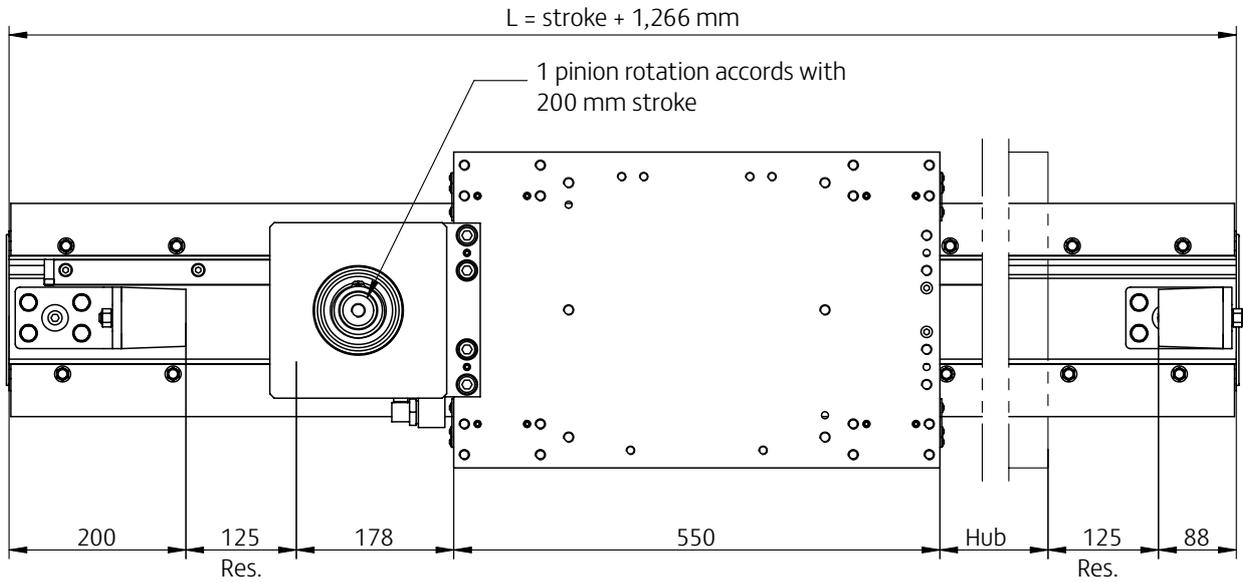
#### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD30L		250	8,000

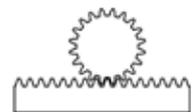


Permitted load values dependent on the application and axis length

Dimension sheet ZLD30L



For sliding block 12  
DIN 508 (M10)

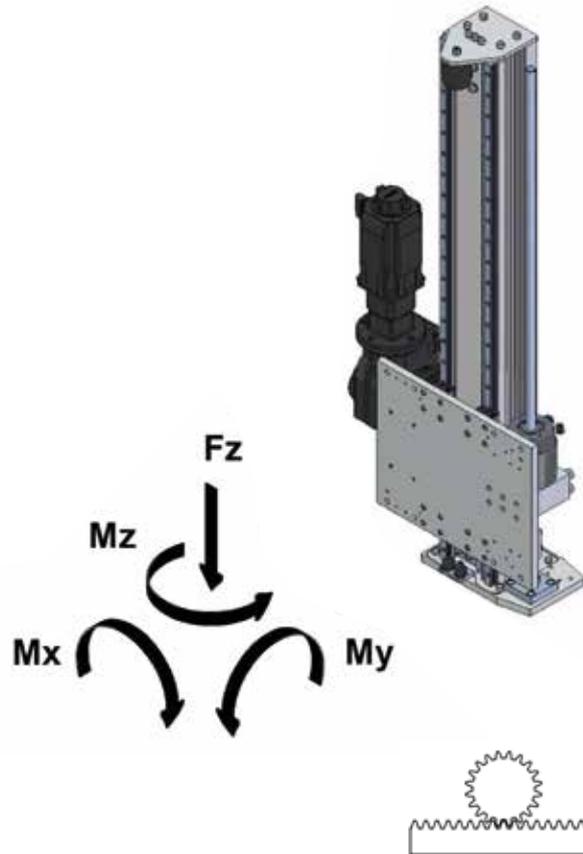


Pitch diameter	63.663 mm
Number of teeth	20
Stops	4 kg
Carriage	28 kg
Rail	42 kg/m

### 2.2.3 ZLD30Z

#### Features

- Application as vertical axis
- Aluminium extruded profile with high flexural and torsional rigidity
- Hardened guide rails
- Carriage plate in light metal design with 4 heavy-duty, roller-bearing-mounted guide trolleys
- Mechanical repeatability of position  $\pm 0.1$  mm
- Payload max. 500 kg
- Anti-lowering devices
- Different drive versions (SEW, alpha)



#### // Technical data

##### Load

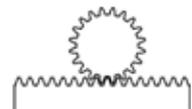
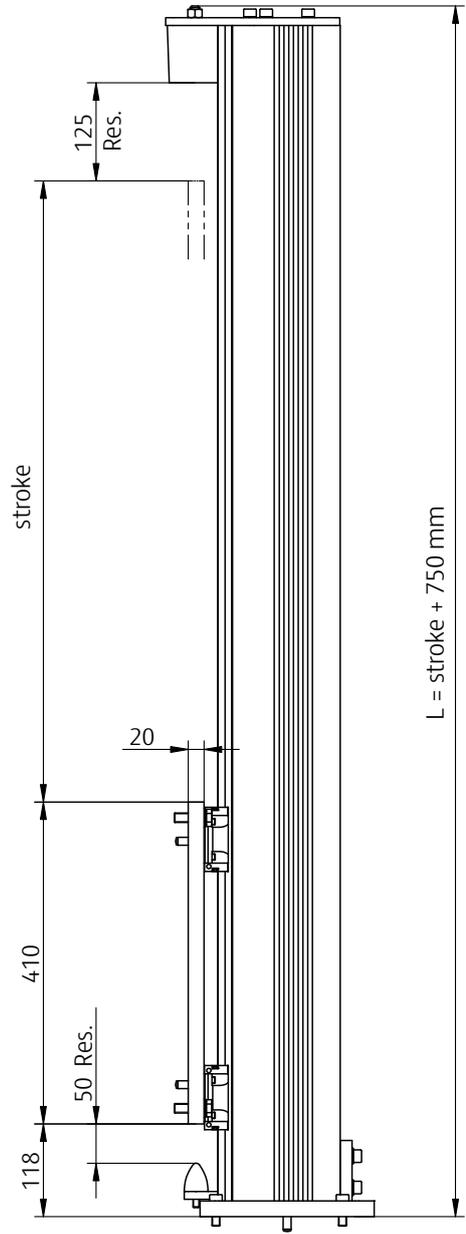
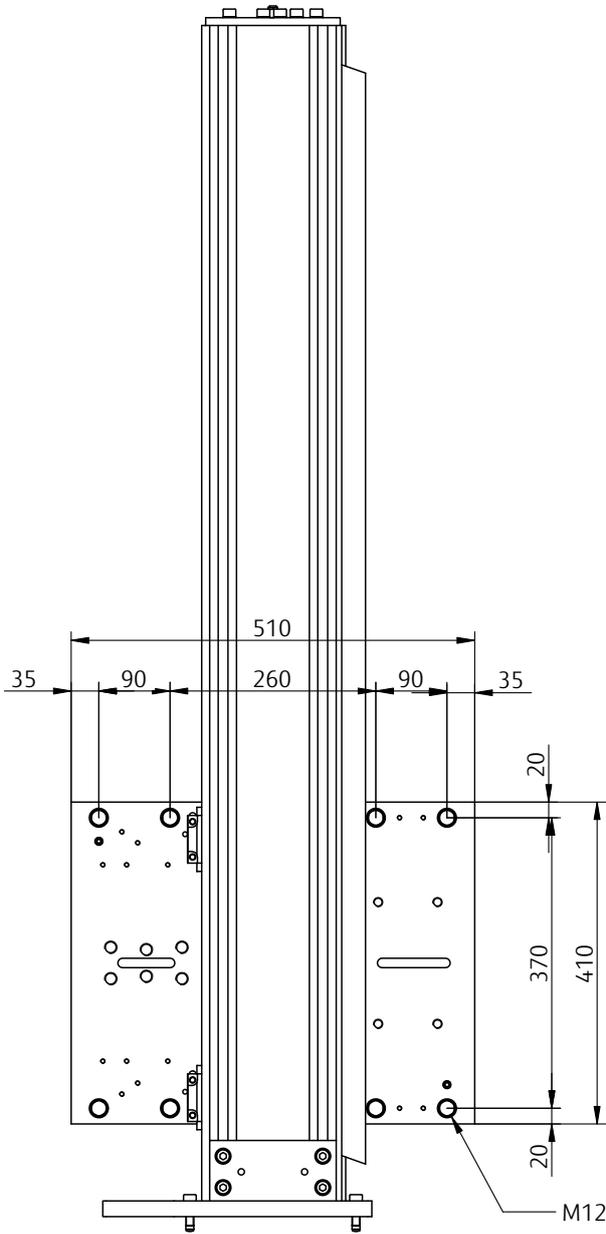
Size	$F_z$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD30Z		5,000	4,400	3,300	4,400	3,300	800	650

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads.

##### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD30Z	250	8,000	2.5

Dimension sheet ZLD30Z

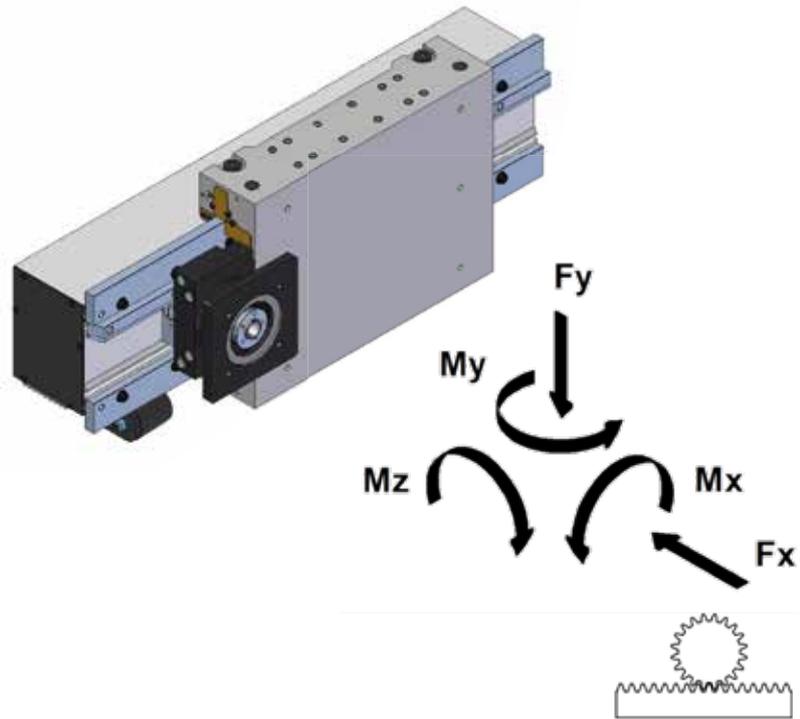


Pitch diameter	63.663 mm
Number of teeth	20
Profile add-on parts	8 kg
Carriage	15 kg
Rail	27 kg/m

## 2.2.4 ZLD42-42

### Features

- Rollers with high load factor running on hardened flat guideways
- Aluminium extruded profile with high flexural and torsional rigidity
- 2 T-slots in the rear side of the profile for any type of mounting onto portal columns
- Mechanical repeatability of the position  $\pm 0.1$  mm
- helical cut



### // Technical data

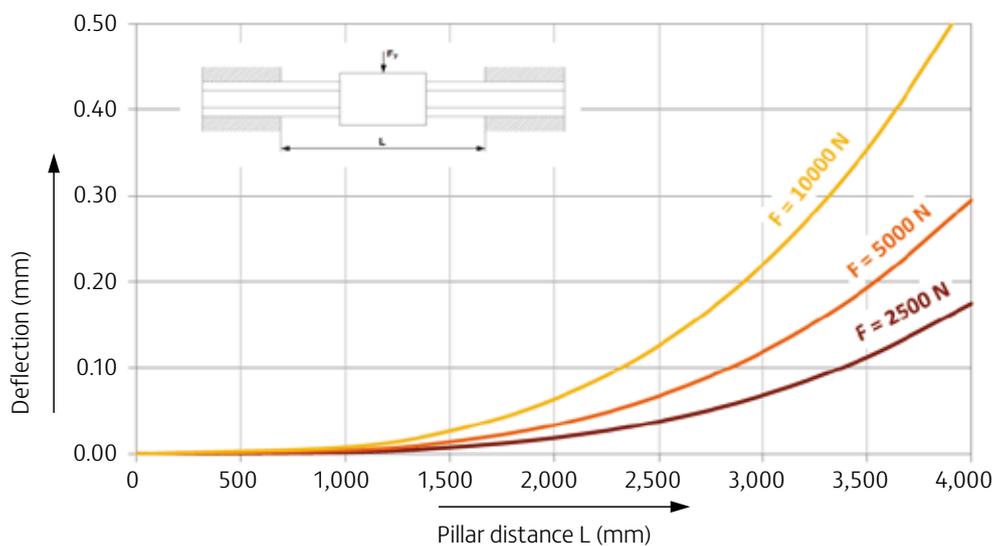
#### Load

Size	$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD42-42	20,000	11,000	20,000	11,000	7,000	3,500	6,000	3,100	3,000	1,600

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads

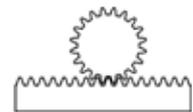
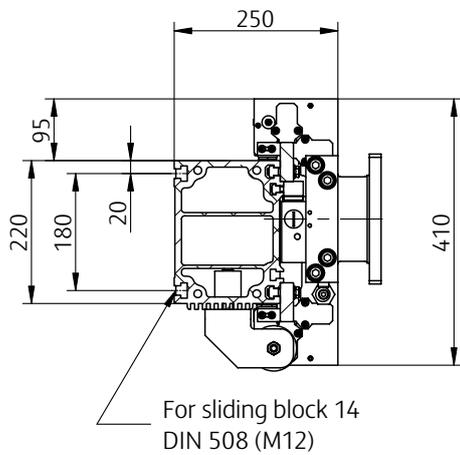
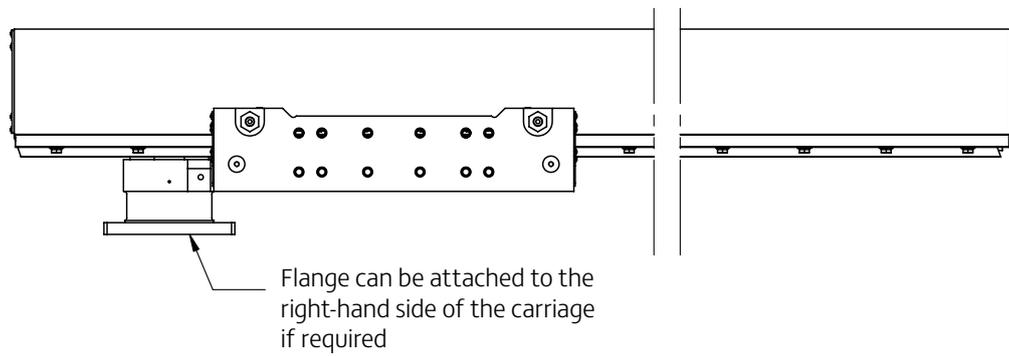
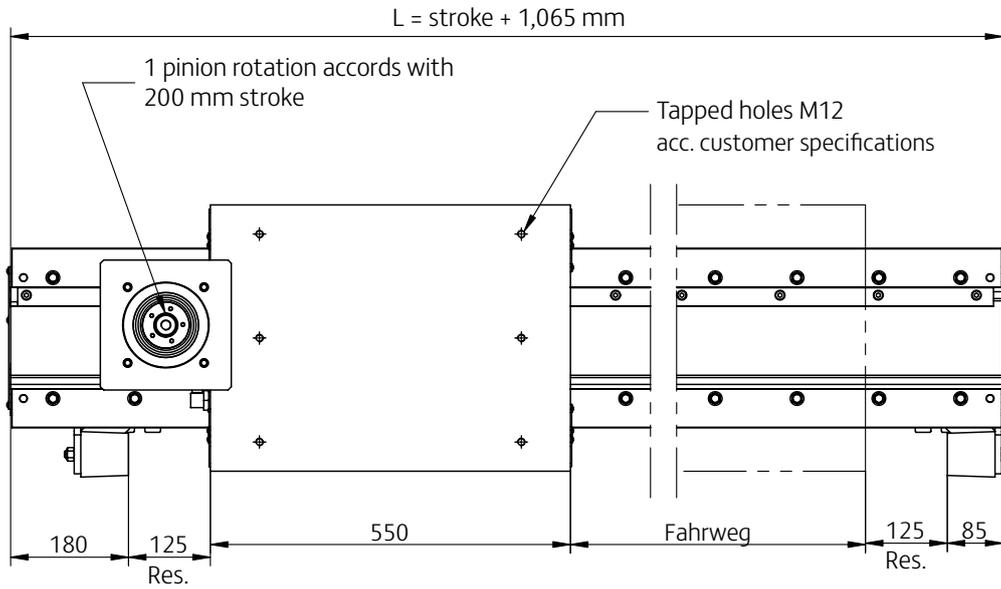
#### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD42-42		250	8,000



Permitted load values dependent on the application and axis length

Dimension sheet ZLD42-42

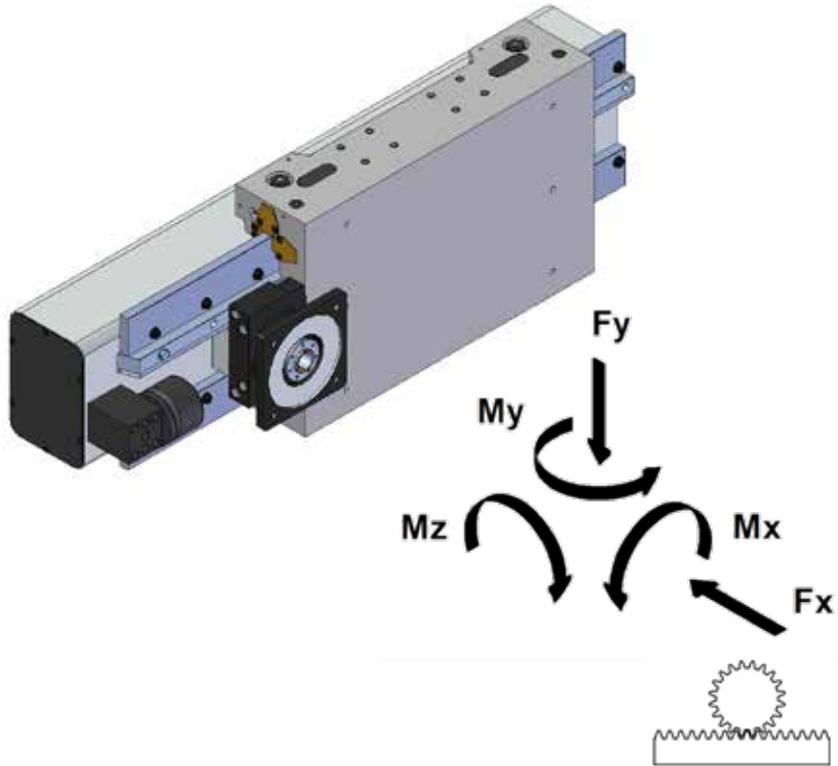


Pitch diameter	63.663 mm
Number of teeth	20
2 end stops	6 kg
Carriage	35 kg
Rail	48 kg/m

## 2.2.5 ZLD52-52

### Features

- Rollers with high load factor running on hardened flat guideways
- Plane-parallel machined support profile (rectangular pipe) with high moment of inertia
- Carriage in torsionally rigid light metal design
- Mechanical repeatability of position  $\pm 0.1$  mm
- helical cut



### // Technical data

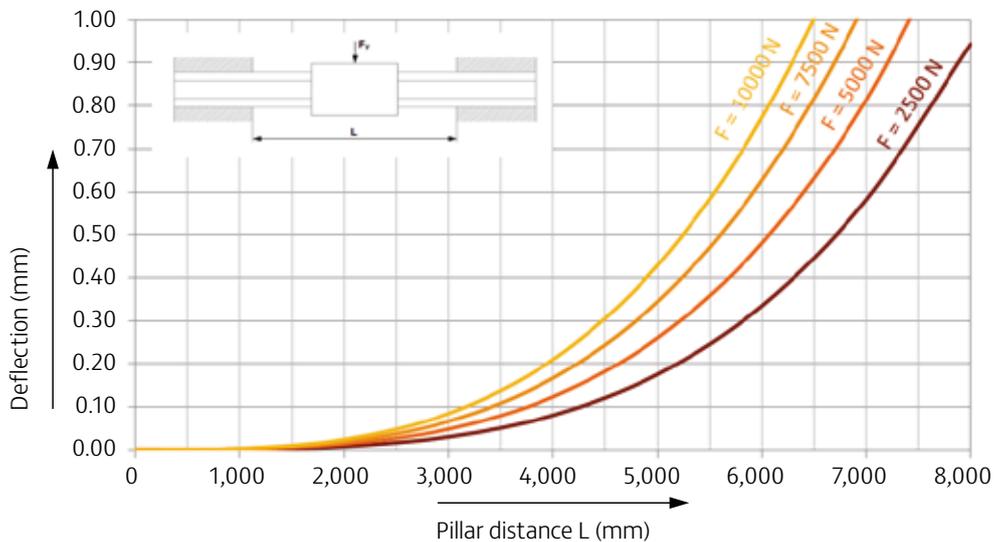
#### Load

Size	$F_x$ max. (N)**		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD52-52	30,000	16,000	30,000	16,000	10,000	5,000	9,000	4,500	4,600	2,300

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads

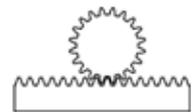
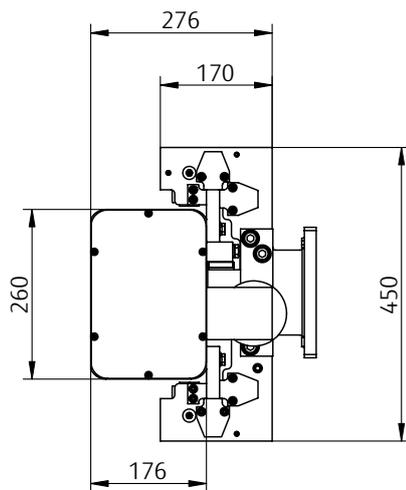
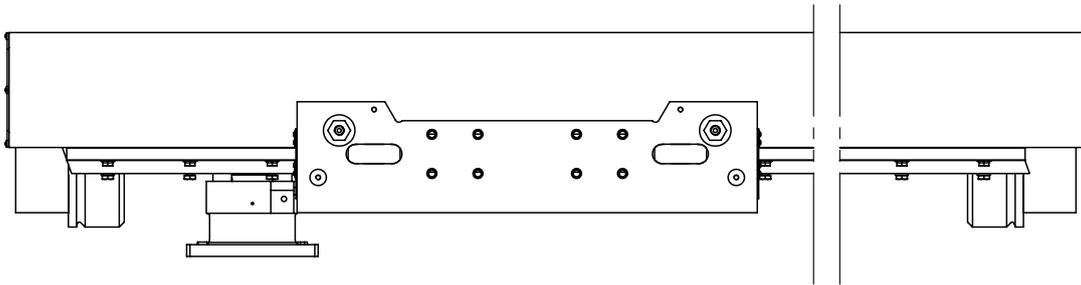
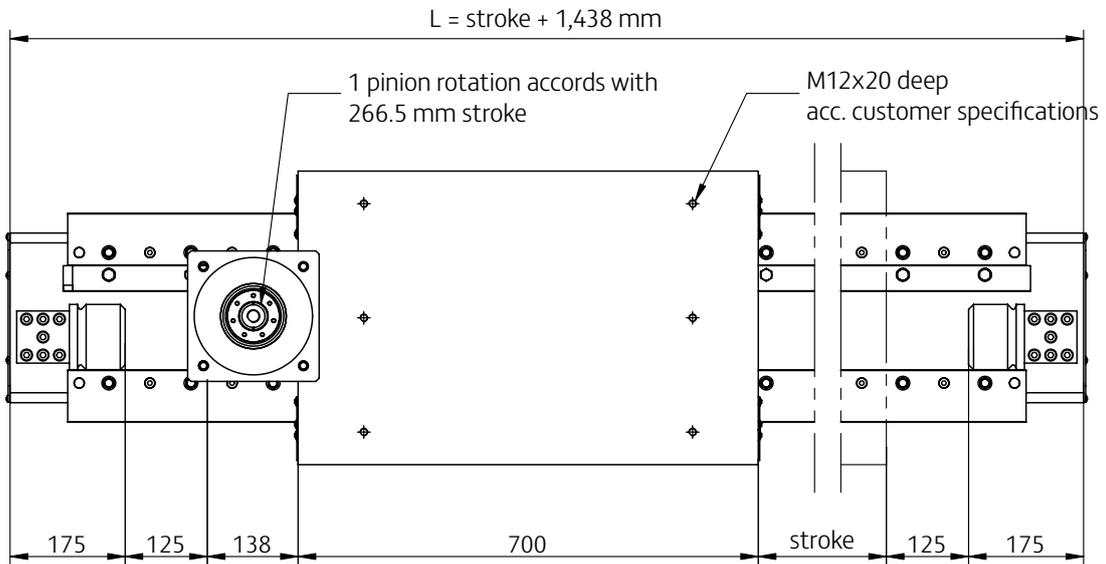
#### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD52-52		640	15,000



Permitted load values dependent on the application and axis length

Dimension sheet ZLD52-52

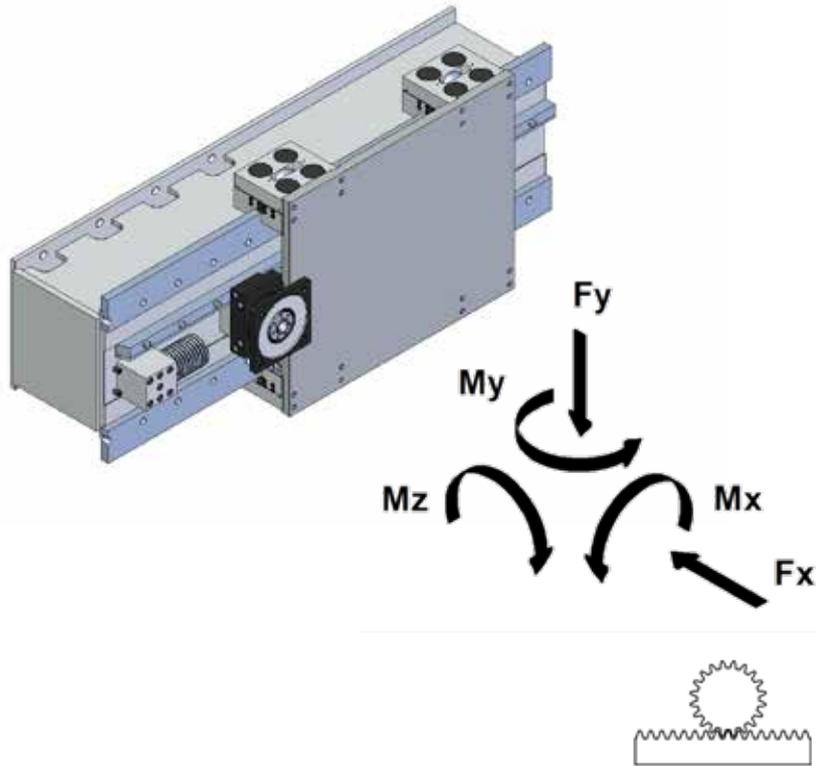


Pitch diameter	87.88 mm
Number of teeth	20
2 end stops	10 kg
Carriage	45 kg
Rail	110 kg/m

### 2.2.6.1 ZLD72-72L

#### Features

- Rollers with high load factor running on hardened flat guideways
- Machined support profile with high moment of inertia
- Mechanical repeatability of the position  $\pm 0.1$  mm
- helical cut



#### // Technical data

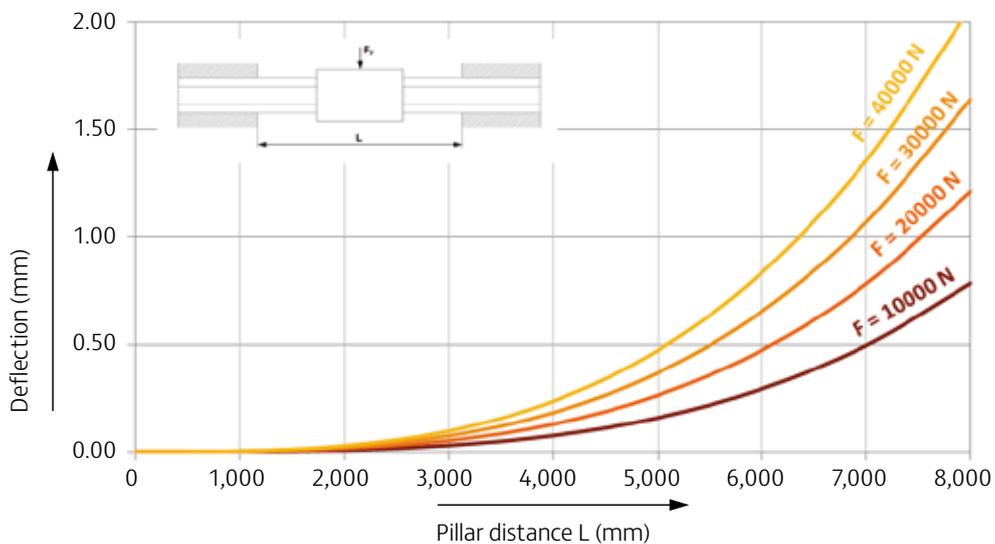
##### Load

Size	$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD72-72L	50,000	35,000	50,000	35,000	18,000	18,000	18,000	18,000	18,000	11,000

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads.

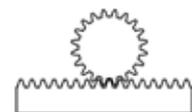
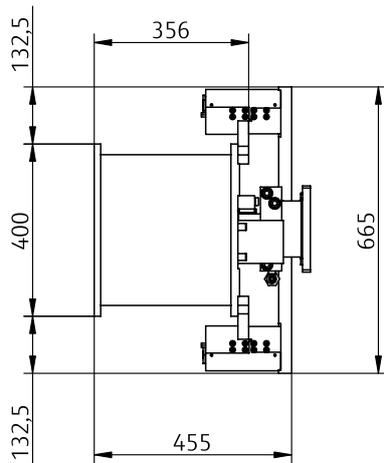
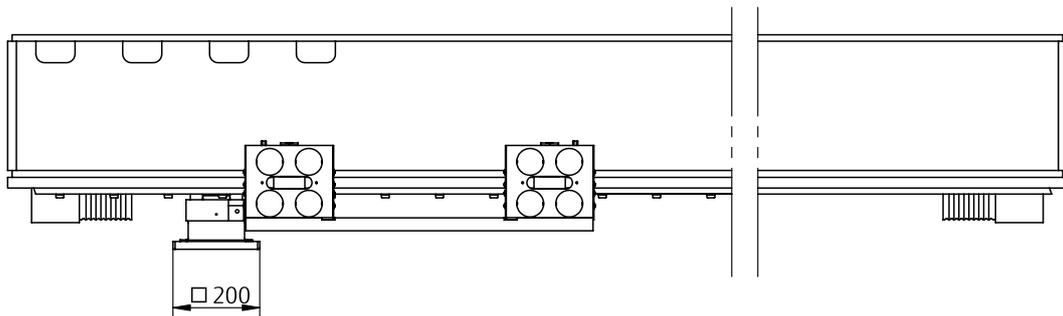
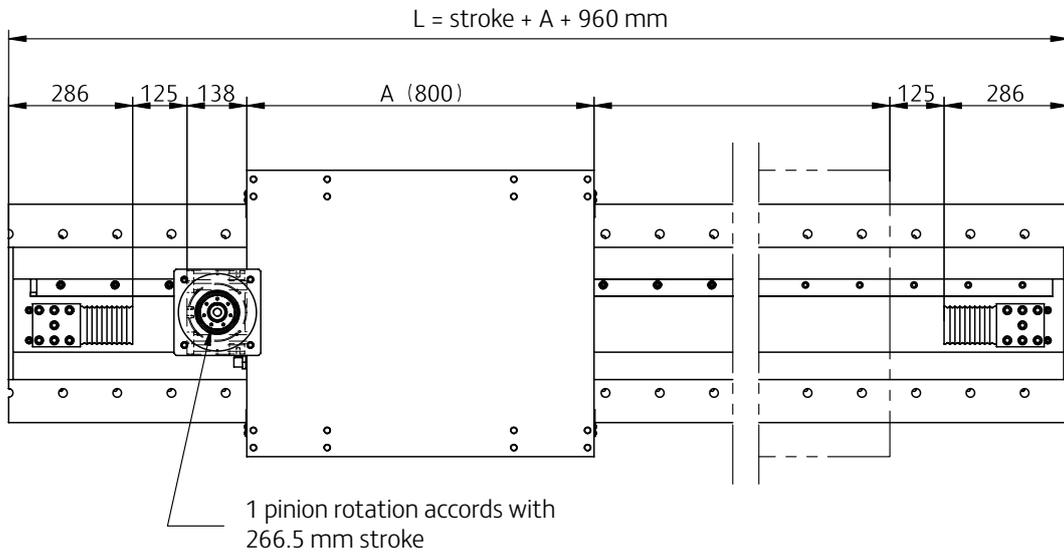
##### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD72-72L		640	15,000



Permitted load values dependent on the application and axis length.

Dimension sheet ZLD72-72L



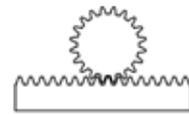
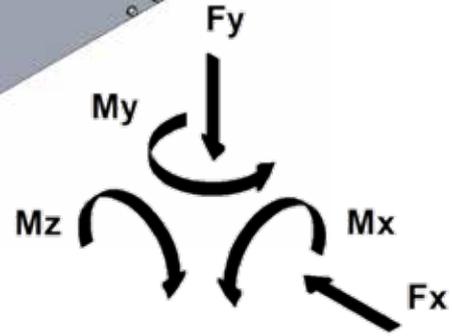
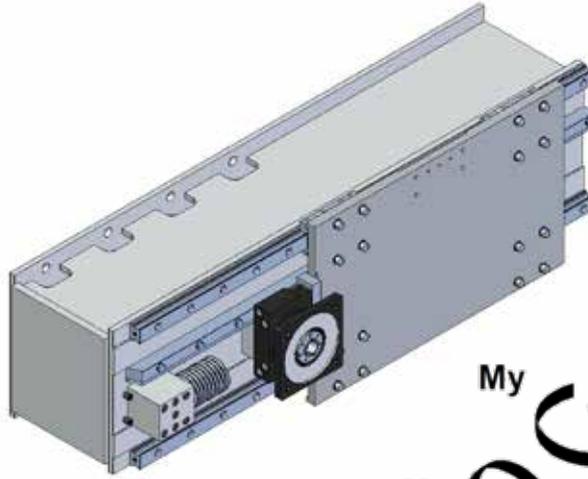
Pitch diameter	84.88 mm
Number of teeth	20
2 end stops	10 kg
Carriage	260 kg
Rail	225 kg/m

Drill template available upon request

### 2.2.6.2 ZLD72-72S

#### Features

- Hardened guide rails
- Carriage with 4 roller-bearing mounted guide trolleys – extendable to 6 guide trolleys
- Machined support profile with high moment of inertia
- Mechanical repeatability of the position  $\pm 0.1$  mm
- helical cut



#### // Technical data

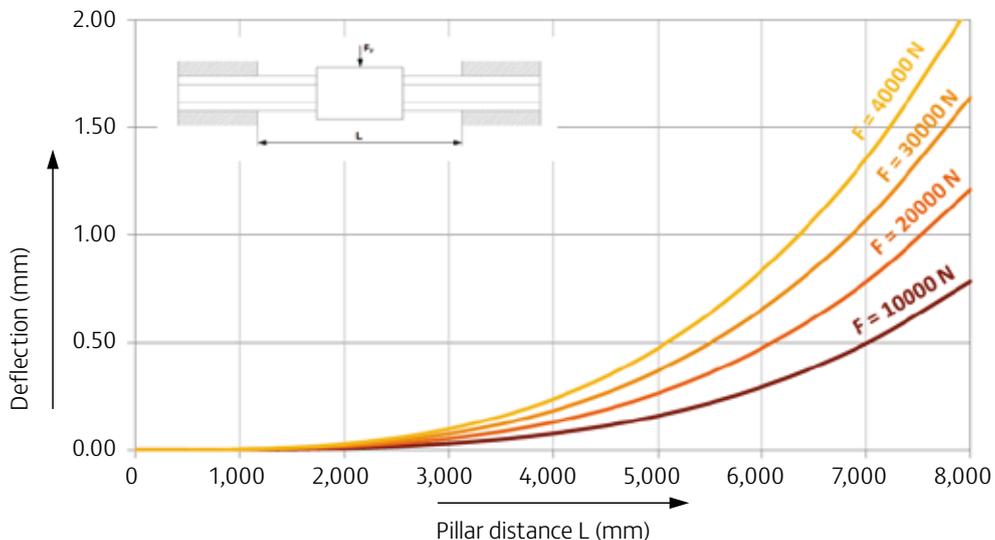
##### Load

Size	$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD72-72S	70,000	50,000	70,000	50,000	35,000	25,000	40,000	30,000	22,000	15,000

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads.

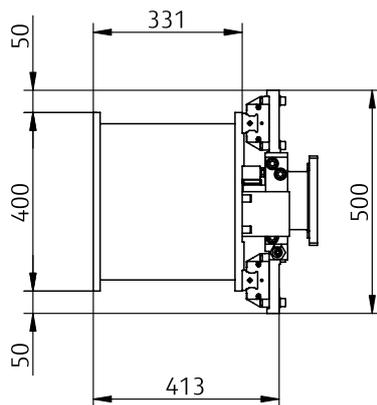
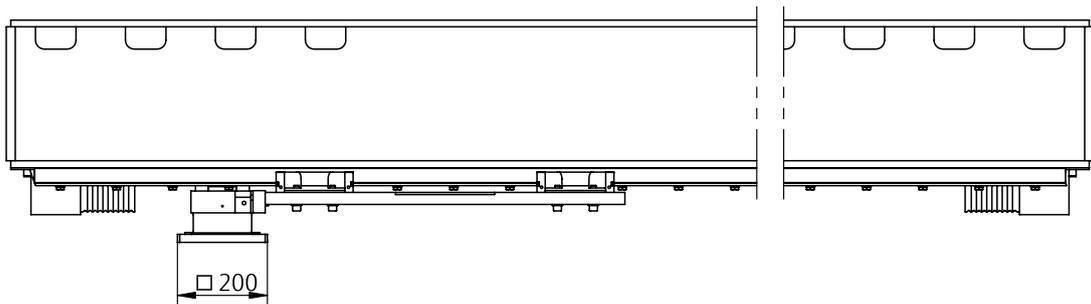
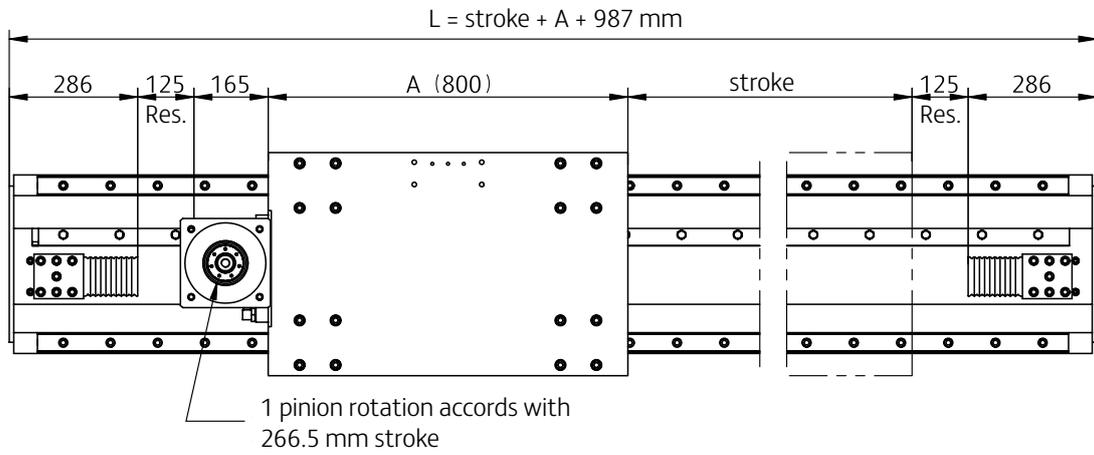
##### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD72-72S		640	15,000

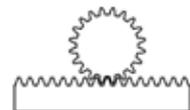


Permitted load values dependent on the application and axis length.

Dimension sheet ZLD72-72S



Drill template available upon request

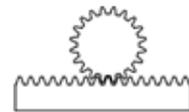
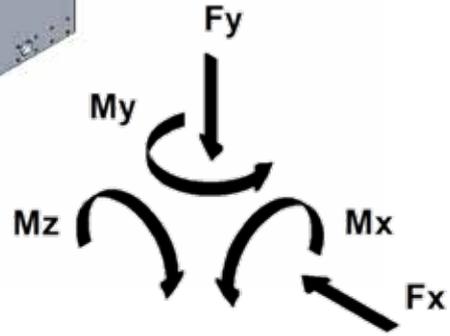
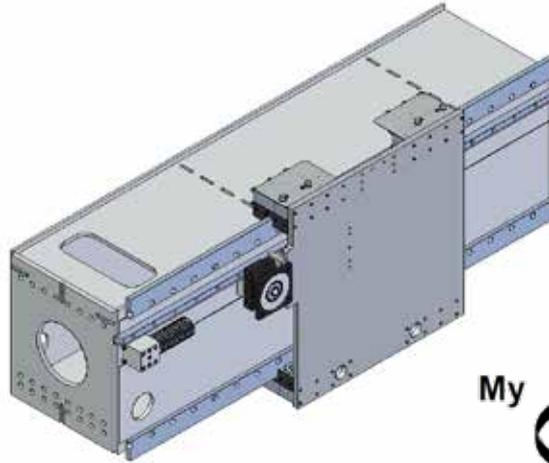


Pitch diameter	84.88 mm
Number of teeth	20
2 end stops	10 kg
Carriage	260 kg
Rail	225 kg/m

### 2.2.7.1 ZLD90-90L

#### Features

- Rollers with high load factor running on hardened flat guideways
- Machined support profile with high moment of inertia
- Mechanical repeatability of the position  $\pm 0.1$  mm
- helical cut



#### // Technical data

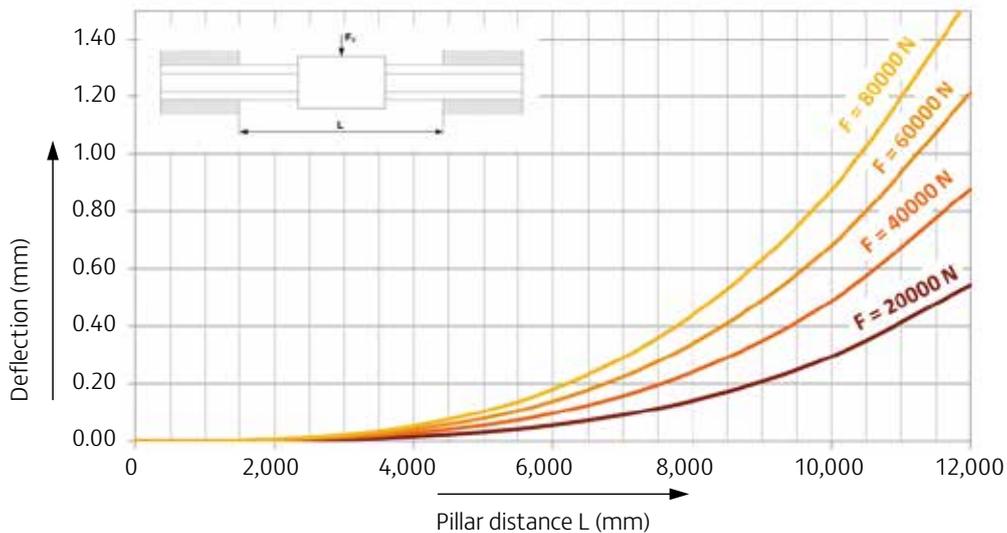
##### Load

Size	$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD90-90L	40,000	35,000	40,000	35,000	25,000	15,000	25,000	15,000	25,000	15,000

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads.

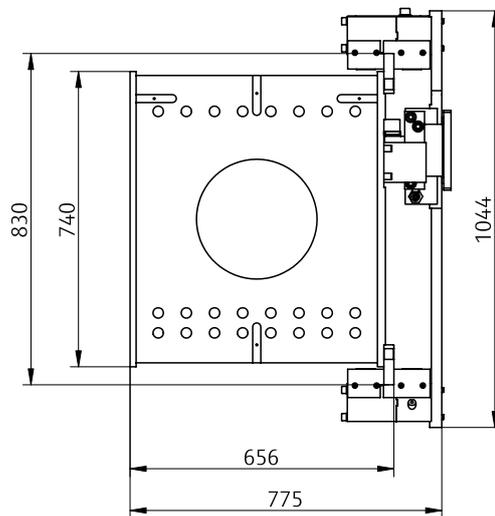
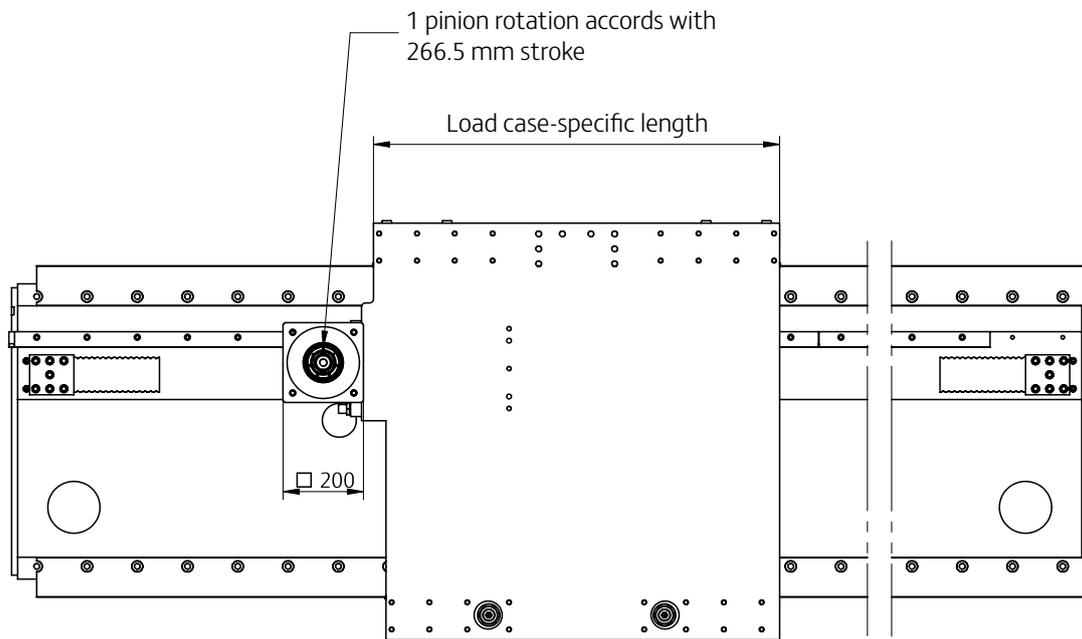
##### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD90-90L		640	15,000



Permitted load values dependent on the application and axis length. Further heavy load axis sizes available upon request.

Dimension sheet ZLD90-90L

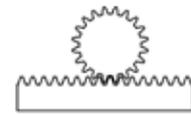
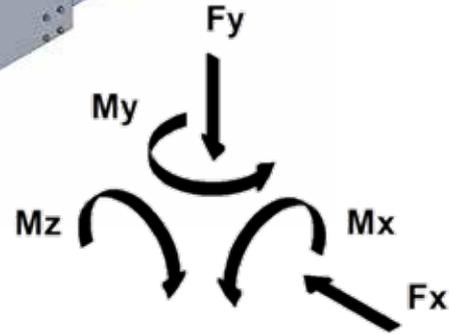
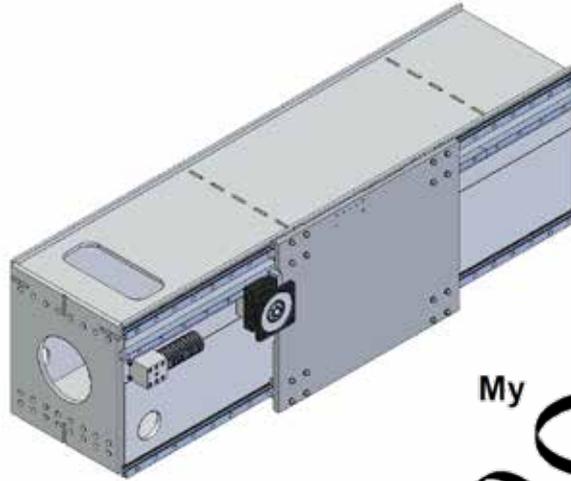


Drill template and carriage plate available upon request

### 2.2.7.2 ZLD90-90S

#### Features

- Hardened guide rails
- Carriage with 4 roller-bearing mounted guide trolleys – extendable to 6 guide trolleys
- Machined support profile with high moment of inertia
- Mechanical repeatability of the position  $\pm 0.1$  mm
- helical cut



#### // Technical data

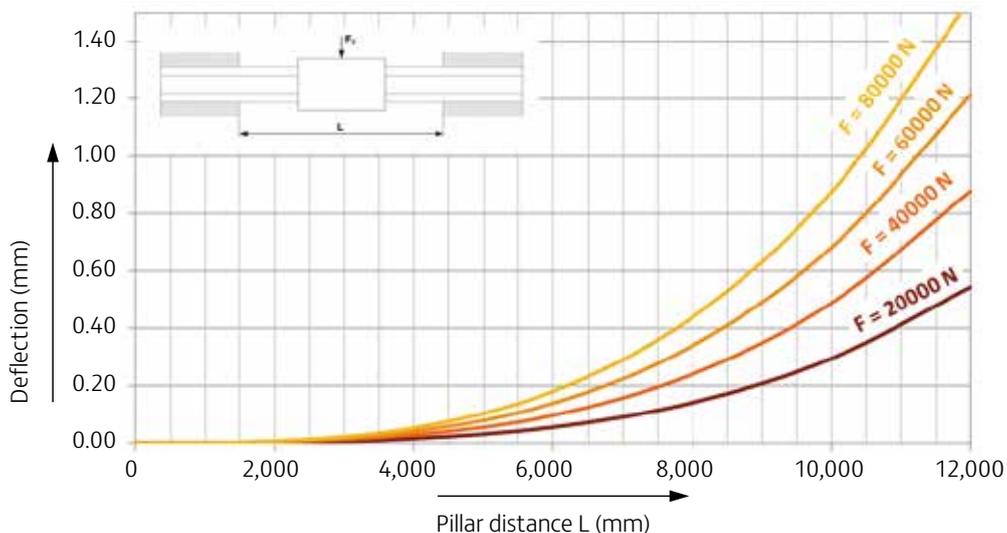
##### Load

Size	$F_x$ max. (N)		$F_y$ max. (N)		$M_x$ max. (Nm)		$M_y$ max. (Nm)		$M_z$ max. (Nm)	
	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*	static	dynamic*
ZLD90-90S	70,000	50,000	70,000	50,000	42,000	31,000	50,000	37,000	27,500	18,000

\* Values apply for a lifetime of 12,000 km. Values apply for individual loads.

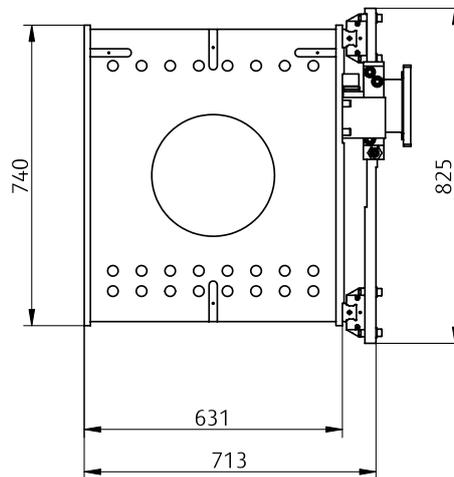
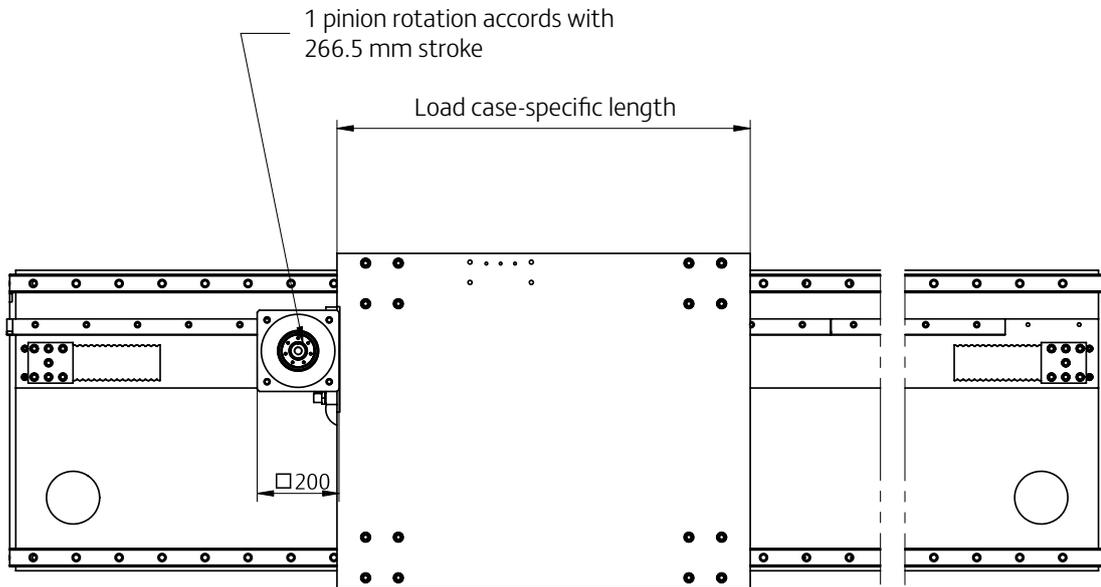
##### Gear rack drive

Size	Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)
ZLD90-90S		640	15,000



Permitted load values dependent on the application and axis length. Further heavy load axis sizes available upon request.

Dimension sheet ZLD90-90S



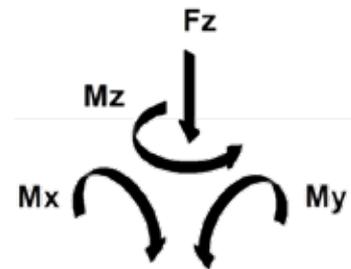
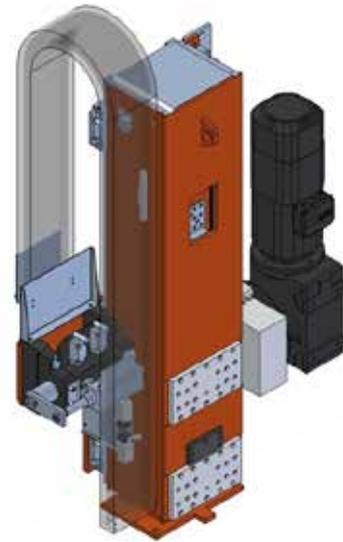
Drill template and carriage plate available upon request

# 3. Telescopic axes

## Overview

Load			
Size	$F_z$ (N)	max. stroke (mm)	Length with 0 stroke (mm)
ZTA 200	2,000	2,000	1,270
ZTA 300	3,000	2,500	820
ZTA 600	6,000	2,500	1,030
ZTA 1.600	16,000	3,000	1,450

- Compact construction height
- Optional anti-lowering devices  
Sitema, Buhl, Tünkers
- Repeatability  $\pm 0.3$  mm

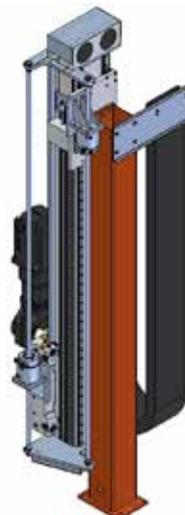


### 3.1 ZTA 200

#### // Technical data

Load			
Size	$F_z$ (Payload in centre of gravity) (N)	$M_y$ max = $M_x$ max. (Nm)	$M_z$ max. (Nm)
ZTA 200	2,000	500	500

Gear rack drive			
Size	Drive torque $M_A$ max. (Nm)	Acceleration max. (N)	Speed max. (m/s)
ZTA 200	640	2	2



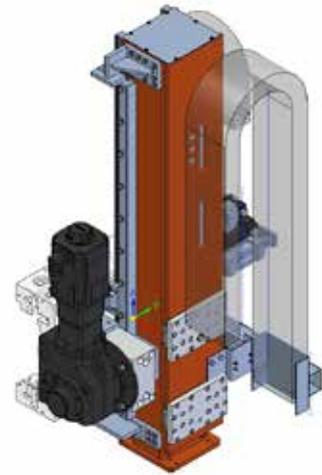
### 3.2 ZTA 300

#### // Technical data

Load			
Size	$F_z$ (Payload in centre of gravity) (N)	$M_x \text{ max} = M_y$ max. (Nm)	$M_z$ max. (Nm)
ZTA 300	3,000	1,000	800

Gear rack drive			
Size	Drive torque $M_A$ max. (Nm)	Acceleration max. (N)	Speed max. (m/s)
ZTA 300	640	2	1.5



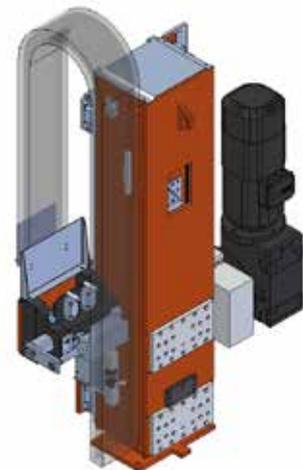
### 3.3 ZTA 600

#### // Technical data

Load			
Size	$F_z$ (Payload in centre of gravity) (N)	$M_x \text{ max} = M_y$ max. (Nm)	$M_z$ max. (Nm)
ZTA 600	6,000	3,000	2,000

Gear rack drive			
Size	Drive torque $M_A$ max. (Nm)	Acceleration max. (N)	Speed max. (m/s)
ZTA 600	2,800	2	1



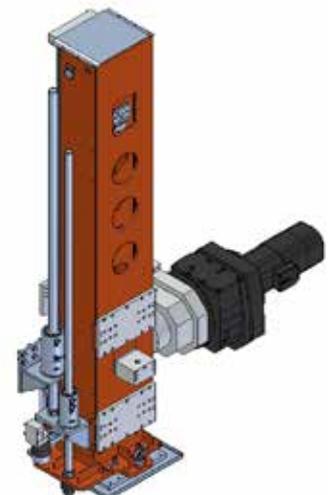
### 3.4 ZTA 1.600

#### // Technical data

Load			
Size	$F_z$ (Payload in centre of gravity) (N)	$M_x \text{ max} = M_y$ max. (Nm)	$M_z$ max. (Nm)
ZTA 1.600	16,000	4,500	3,000

Gear rack drive			
Size	Drive torque $M_A$ max. (Nm)	Acceleration max. (N)	Speed max. (m/s)
ZTA 1.600	6,800	0.5	0.5

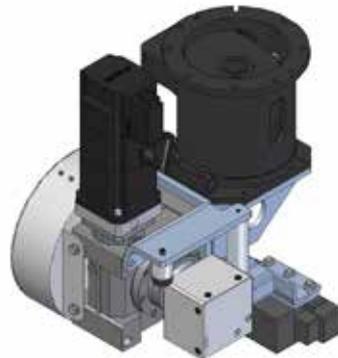
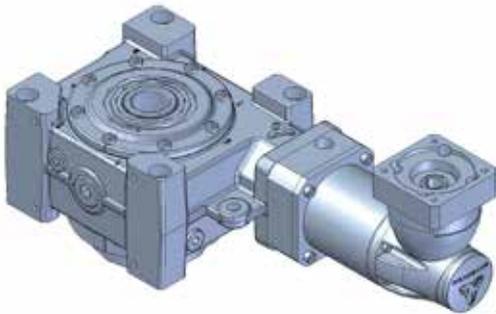


# 4. Rotary axes

## 4.1 Rotating units ZDM gear

### Features

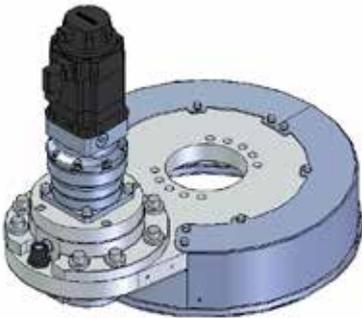
- Worm gear pair with angular gear
- Drive with worm gear pair for rotary and swivel movements



## 4.2 Rotary axes sprocket wheel ZDM

### Features

- Robust design for loads from 15 to 10,000 kg
- Different gear types



### // Technical data

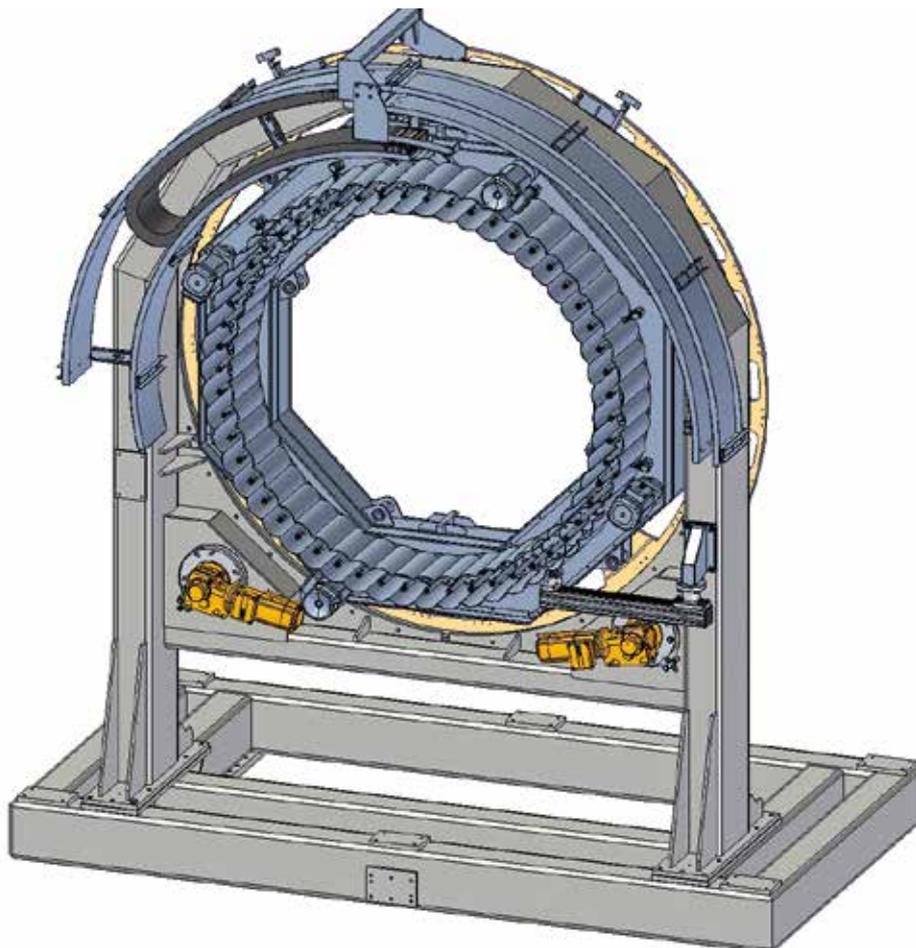
Size	Pitch diameter (mm)	Module	Load factor dynamic (kN)
ZDM 395	395	5	140
ZDM 495	495	5	156

### 4.3 Special designs

ZOLLERN rotary modules ensure exact rotational movements, e.g. in lines where workpieces and tools have to be rotated, in the form of a drum magazine system for clamping frame units or as rotary multi-tooling units.

#### Features

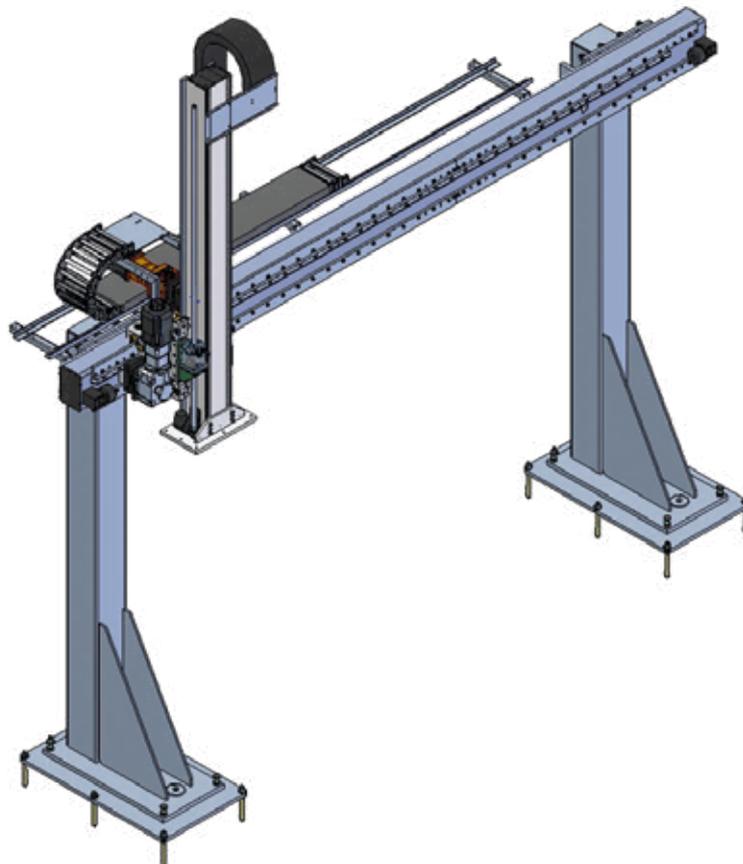
- Accurate rotational movements
- Differing slewing ring diameters
- Load range of up to 10,000 kg
- Mass moment of inertia up to 60,000 kg/m<sup>2</sup>
- Gear rack and pinion or pneumatic drive
- Traversing angle +/- 180°
- Combination and mounting options with other ZOLLERN linear axes
- High flexural and torsional rigidity



# 5. Gantry robots (line portals)

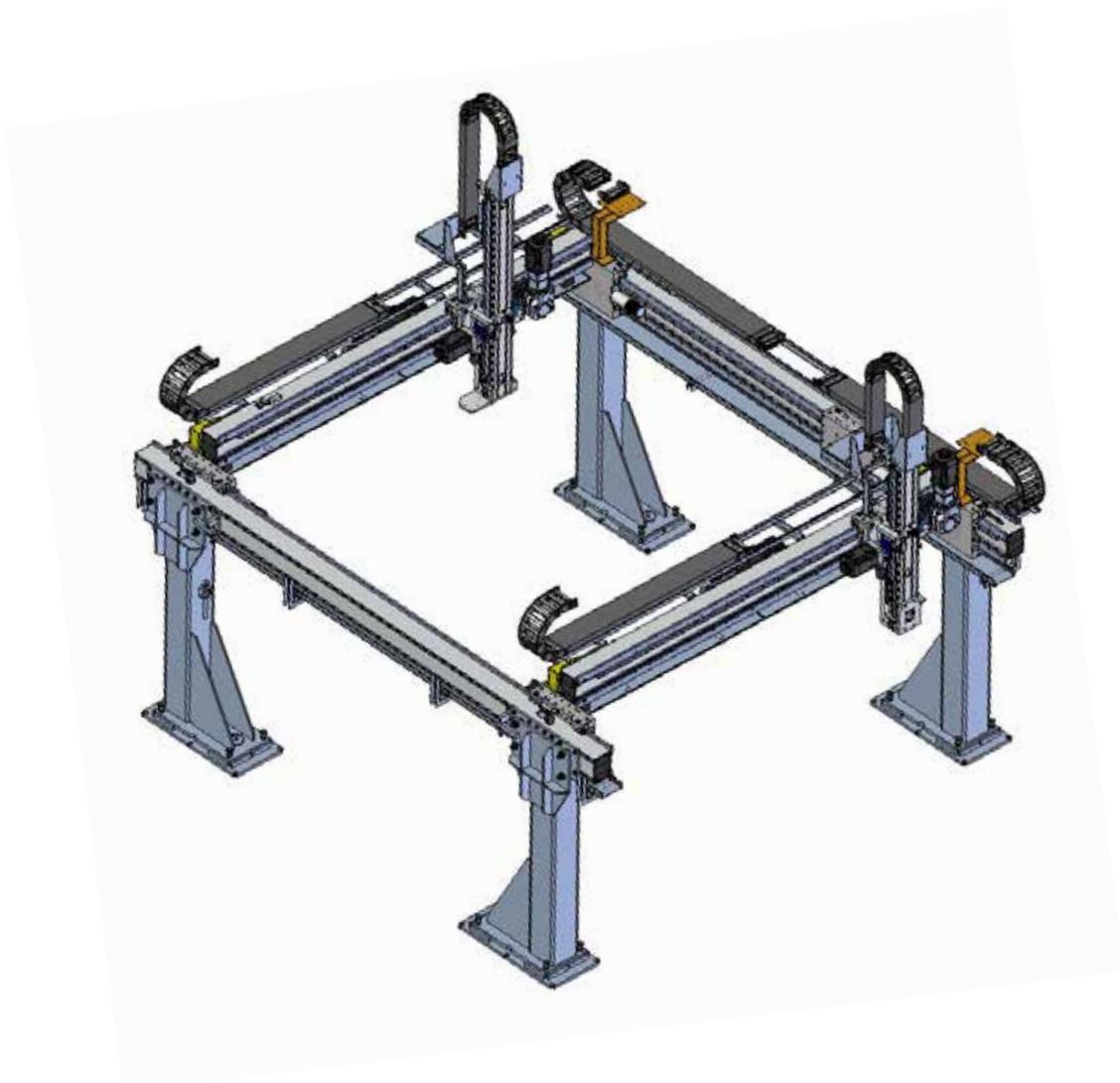
Type	Load range in kg, centric									
Axis combinations X – Z	15	30	50	100	150	300	500	1,000	2,500	5,000
ZLD10-10R – ZLB40	█									
ZLD16-16R – ZLB50	█	█								
ZLD30 (R) – ZLB60		█	█							
ZLD42 (R) – ZLD30		█	█	█						
ZLD52-52(R) – ZLD42-42				█	█	█				
ZLD72-72 – ZLD52-52							█	█		
ZLD90 – ZLD72-72									█	█

Examples with dimension sheet for pillar distance 4 m (1-4) – 6 m (5-7)



## 6. Gantry robots (gantry portals)

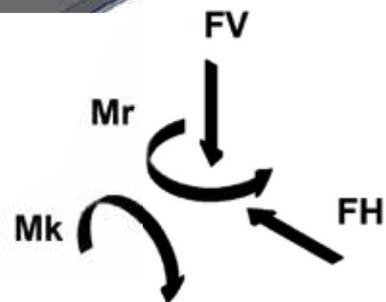
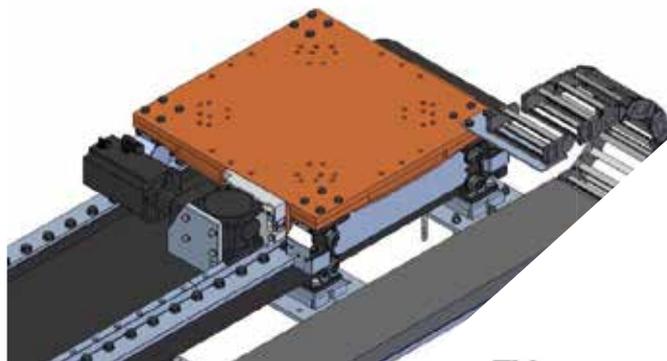
Type	Load range in kg, centric							
	50	100	150	300	500	1,000	2,500	5,000
ZLD42-42 (R) – ZLD42-42 (R) – ZLD30Z	■							
ZLD52-52 (R) – ZLD52-52 (R) – ZLD42-42		■						
ZLD72-72 – ZLD52-52 (R) – ZLD52-52				■				
ZLD52-52 (R) – lift table					■			
ZLD90 – ZLD72-72 – ZLD72-72						■		



# 7. Robot travelling axes

## Features

- Suitable for all conventional robot types
- Solid welded steel structure as base support made from sturdy steel walls, machined
- Cover between steel walls can be walked on
- Hardened and ground flat guideways
- Active dirt stripping system on the guide rails
- Torsionally rigid trolley
- Roller brackets individually replaceable, without dismantling the carriage
- Drive via pinion and gear rack (pinion and gear rack helical cut, optionally ground)
- High running smoothness of travelling axis, gear rack uncovered
- Ground fastening via footplates, welding beads, glued dowels, bolts
- In case of hall expansion joints, possible via floating bearings / special fastenings
- Up to four carriages (robots) possible on one travelling axis
- Drive not just for robot motors, robot-independent motors also possible
- Supporting brackets from 100 – 800 mm / 1,300 mm in 100 mm gradations
- Work area monitoring possible within the axis for a maximum of three areas
- Position fixing points for special applications
- Axis lengths up to 50 m
- Installation position: Floor, ceiling, wall



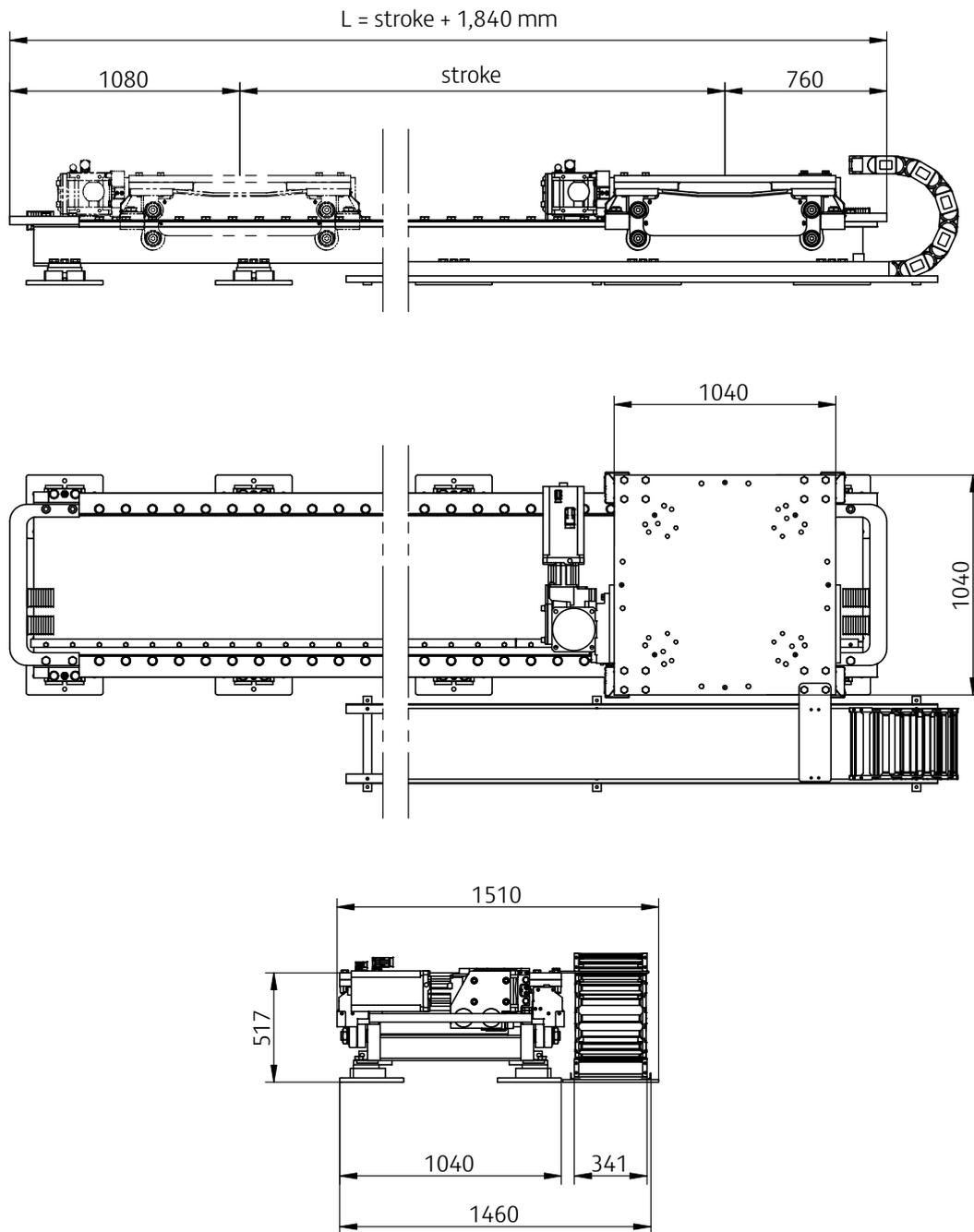
## // Technical data

Load capacity floor installation*			
$F_v$ max. (N)	$F_H$ max. (N)	$M_k$ max. (Nm)	$M_r$ max. (Nm)
40,000	25,000	85,000	46,000

\*Individual forces: if superimposed, the values reduce

Gear rack drive				
Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)	Repeatability (mm)	with fixing point
1,100	22,000	3	± 0.05	± 0.02

Dimension sheet ZRA

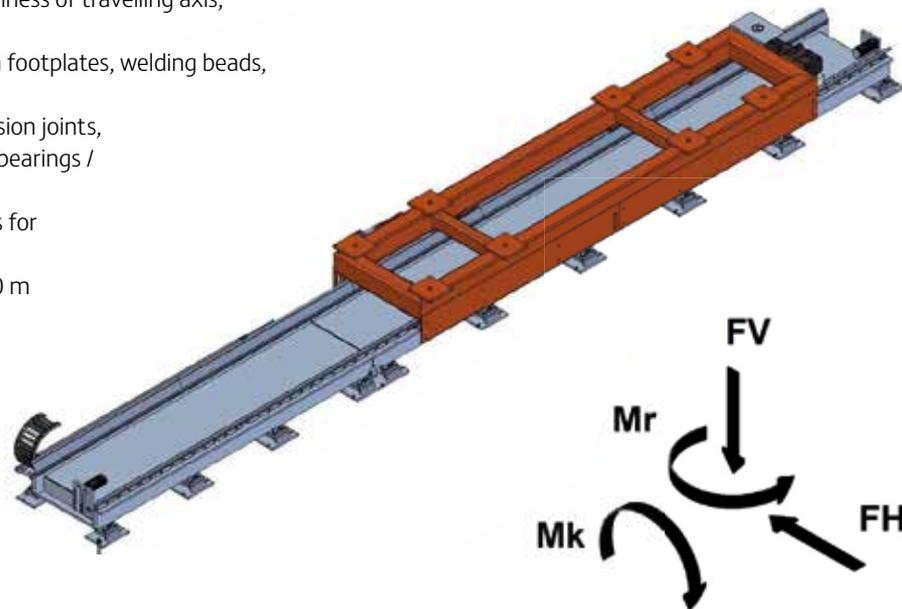


Drill template available for all conventional robot types

# 8. Traversing axes

## Features

- Solid welded steel structure as base support made from sturdy steel walls, machined
- Hardened and ground flat guideways
- Active dirt stripping system on the guide rails
- Torsionally rigid trolley
- Roller brackets individually replaceable, without disassembly of the carriage and the drive via pinion and gear rack (pinion and gear rack helical cut, optionally ground)
- High running smoothness of travelling axis, gear rack uncovered
- Ground fastening via footplates, welding beads, glued dowels, bolts
- In case of hall expansion joints, possible via floating bearings / special fastenings
- Position fixing points for special applications
- Axis lengths up to 50 m



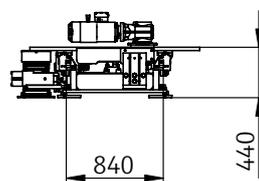
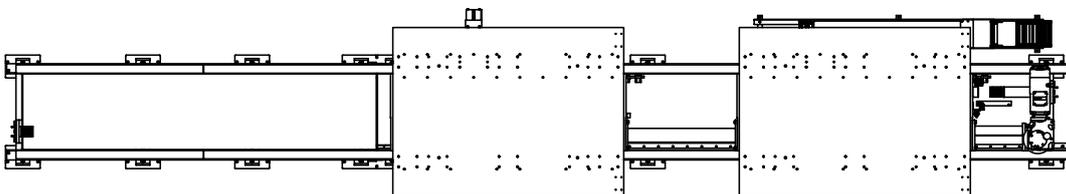
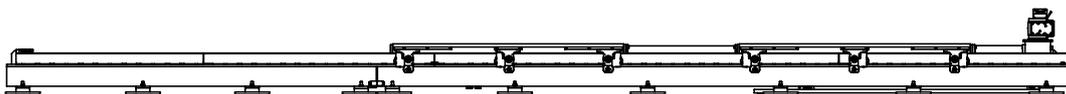
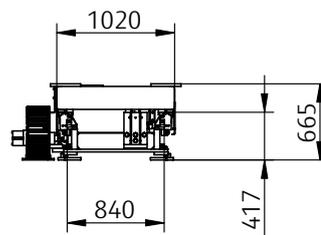
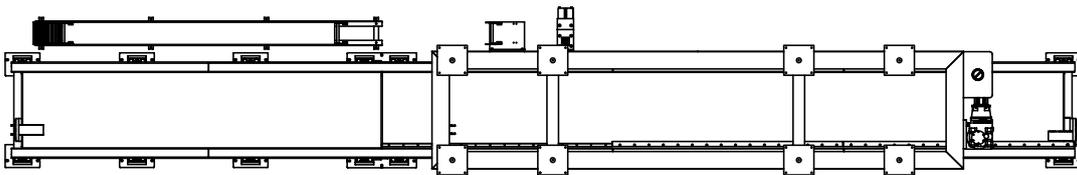
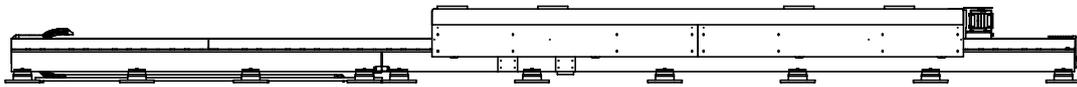
## // Technical data

Load capacity floor installation*			
$F_v$ max. (N)	$F_H$ max. (N)	$M_k$ max. (Nm)	$M_r$ max. (Nm)
100,000	30,000	17,000	9,000

\*Reference values (for centric force); Individual forces: If superimposed, the values reduce

Gear rack drive				
Drive torque $M_A$ max. (Nm)	Feed force max. (N)	Speed max. (m/s)	Repeatability (mm)	with fixing point
640	15,000	2.5	± 0.3	± 0.05

## Dimension sheet ZVA examples





# 9. Level lifters and lift columns

In the automotive industry, ZOLLERN level lifters facilitate the transportation of vertical parts via one or more storeys.

## Design

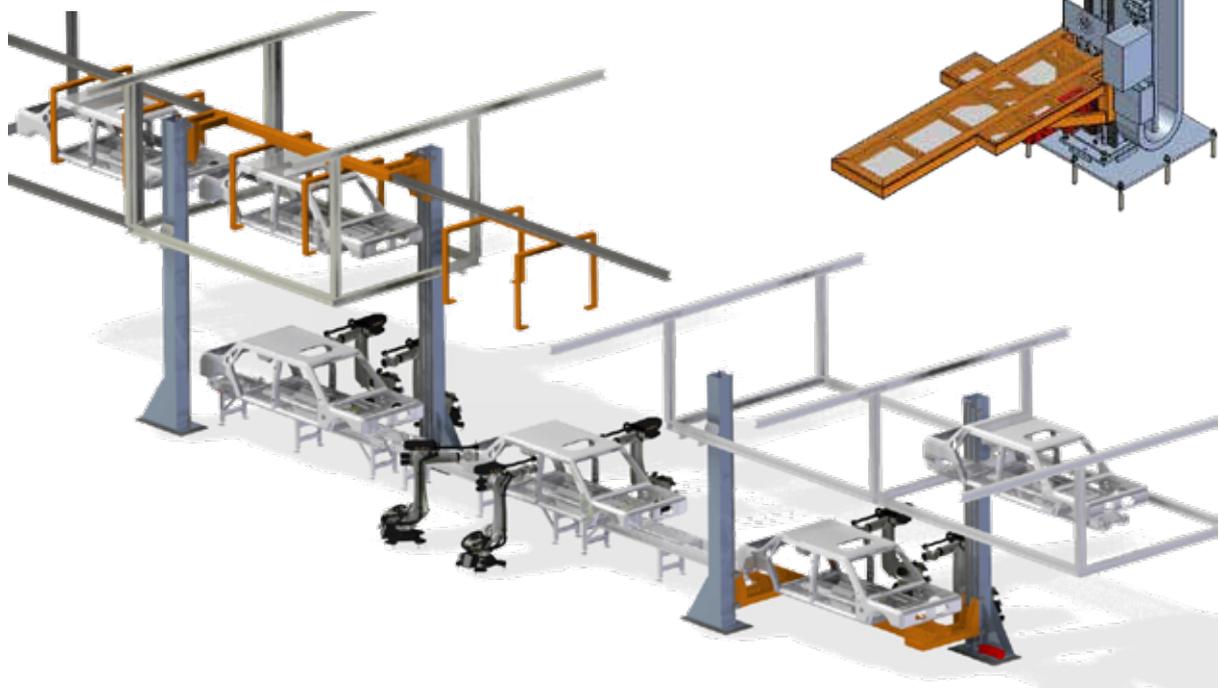
- compact construction
- high uptime availability
- exact positioning
- high running smoothness
- excellent accessibility of all components, e.g. motor, bearings

The lift consists principally of the standardised axis systems with hardened flat guideways and gear rack-and-pinion drive. Optional toothed belt drive and special solutions.

## // Technical data

Payloads kg	Discharge heads mm	Repeatability mm
2,000	up to 15,000	± 0.2

Higher loads in axis system, combinable with overhead transfer or floor axis/belt conveyor.



# 10. High-speed conveyors

ZOLLERN high-speed conveyors are used in the automotive industry for covering longer distances within the production process.

The insertion and removal of the parts is usually done with articulated robots.

## Features

- compact construction
- high uptime availability
- high positioning accuracy
- high running smoothness
- excellent accessibility of all components, e.g. motor, bearings

The high-speed conveyor consists principally of the standardised axis systems with hardened flat guide-ways and gear racks.

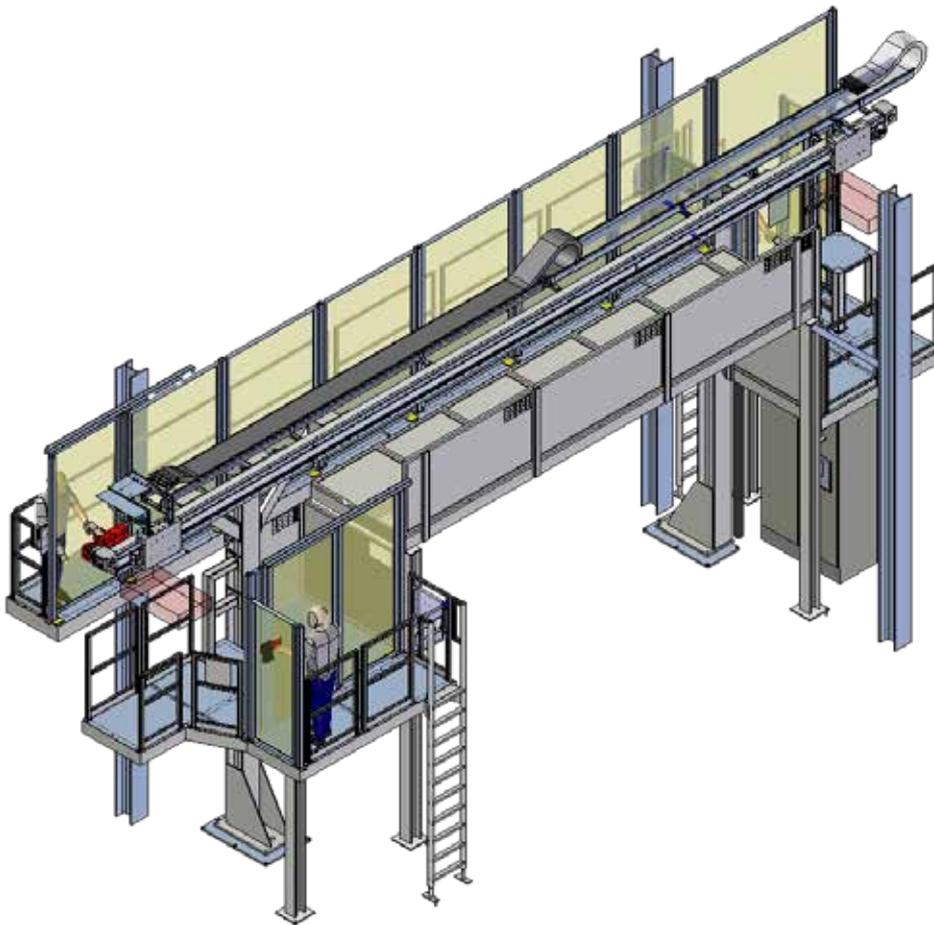
Special designs with toothed belt drives are possible. Very short cycle times and high transfer speeds can thus be achieved.

## Properties

Depending on the design and component load, the following speed and acceleration values can be achieved:

- Gear rack-and-pinion drive  $v = 3 \text{ m/s}$  and  $a = 2 \text{ m/s}^2$  or
- realised as toothed belt drive  $v = 6 \text{ m/s}$  und  $a = 2 \text{ m/s}^2$

The conveying distance can be up to 50 m.



# 11. Framing

ZOLLERN framer transfer units are used in the automotive industry for transporting clamping frames for car side panels and roofs and as a clamping frame change system in car assembly lines.

## Features

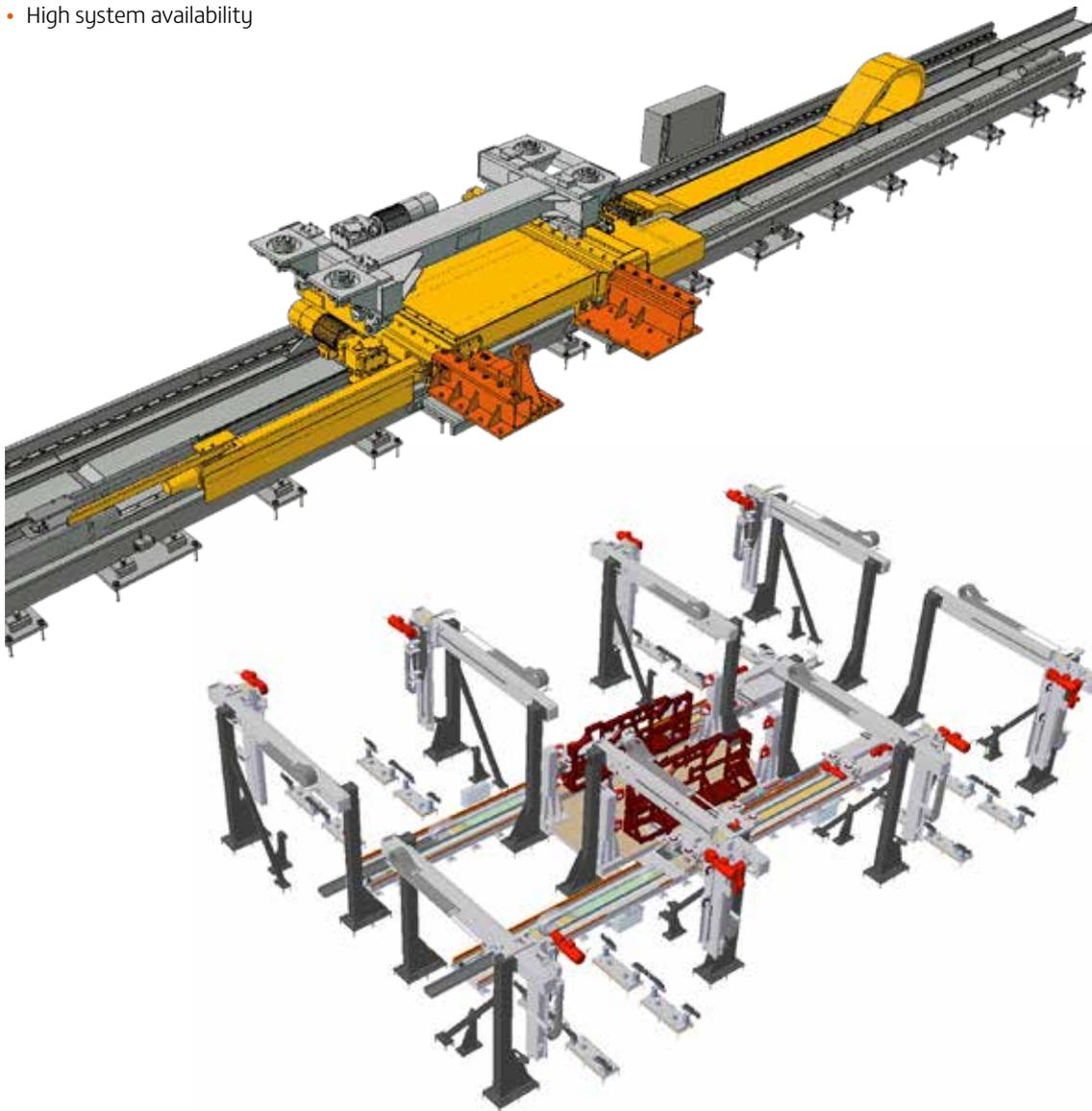
- Short clamping frame changeover times
- The number of clamping frames is highly flexible
- Compact size of overall system
- High reliability of clamping frame changeover
- Highly accurate transfer of clamping frame to GEO station
- High system availability

## Floor-based and overhead clamping frame systems

On these systems, the clamping frames are transported and changed via floor-mounted axis systems or overhead transfer systems.

The clamping frames are inserted into the “GEO station” via Y-carriages or sliders.

Depending on the required number of clamping frames, they are stored in vertical or revolving storage facilities or in so-called stations.



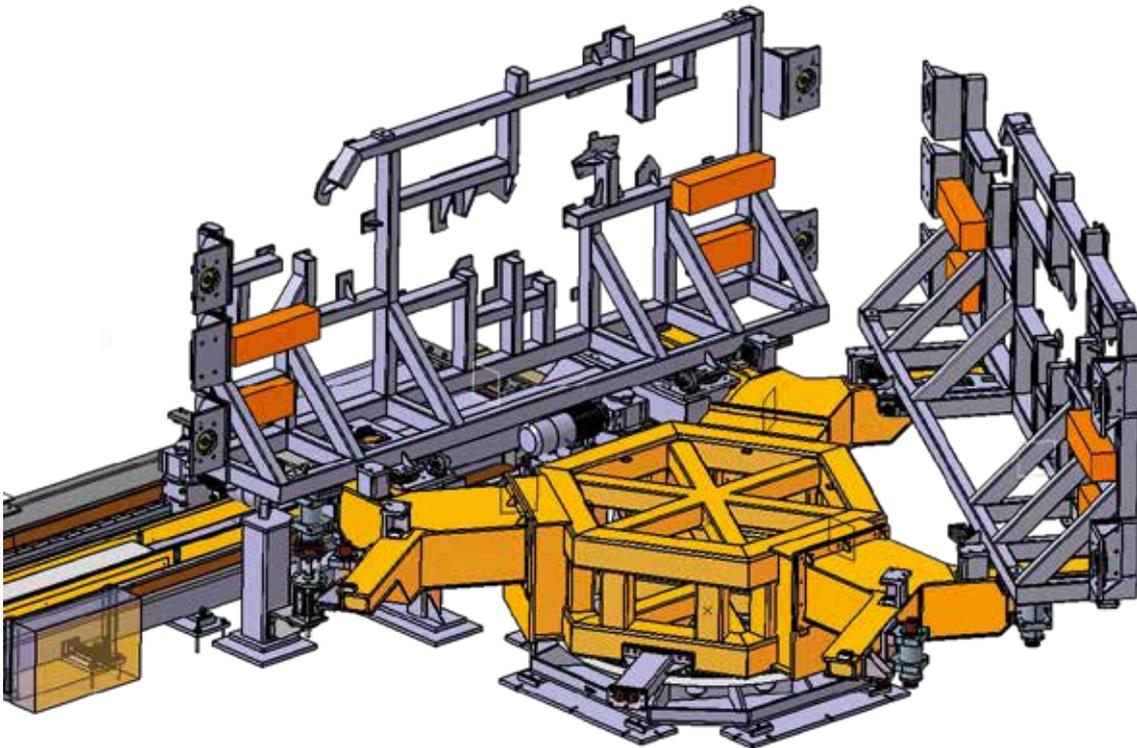
# 12. Revolving storage facilities

ZOLLERN Revolving storage facility for framer units.

The storage of the clamping frame takes place on framer units in vertical or horizontal revolving storage facilities.

In this way, the framer units take up less space and can be readily accessed.

For example, three clamping frames can be picked up and called up as required per revolving storage facility.



# 13. Portal with lift table

Scissors lifts and lift tables are used in transfer units in case of low hall heights.

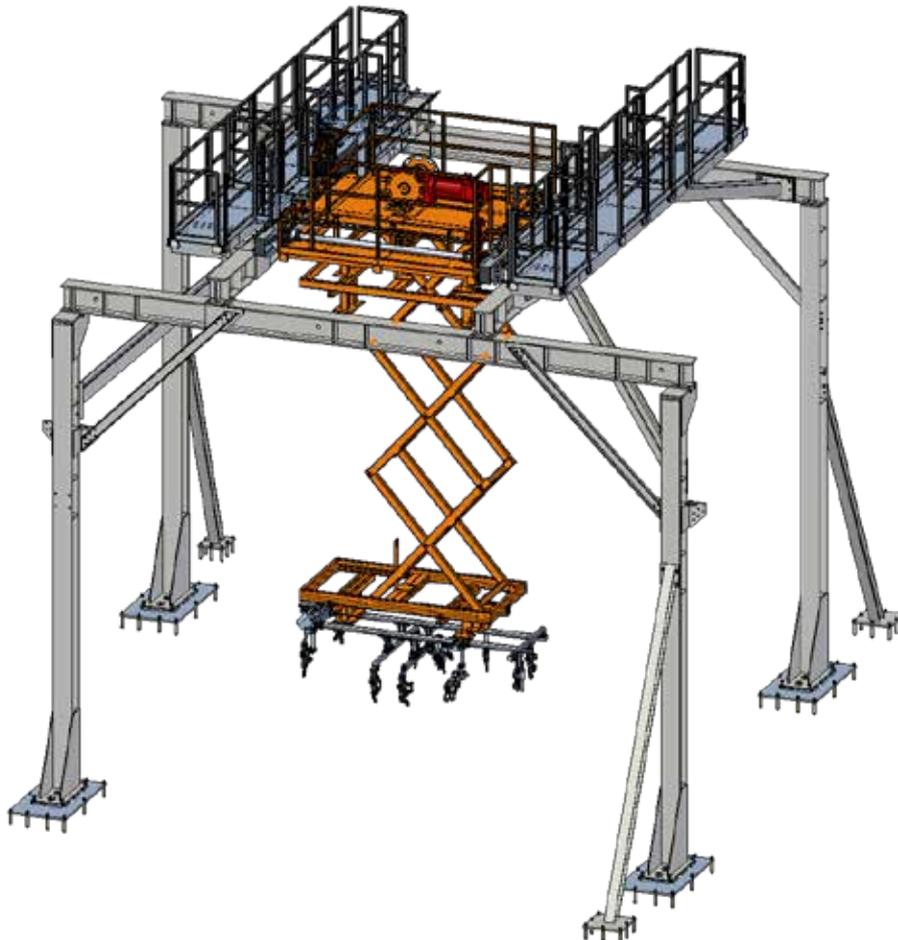
They serve for example to transfer car body subframes or as roof stations with payloads from 400 to 800 kg.

## Features

- Frame size approx. 4,000 mm x 1,800 mm
- Strokes up to approx. 6,000 mm
- Payload 650 kg
- Speed 1.5 m/s
- Acceleration 1.5 m/s<sup>2</sup>

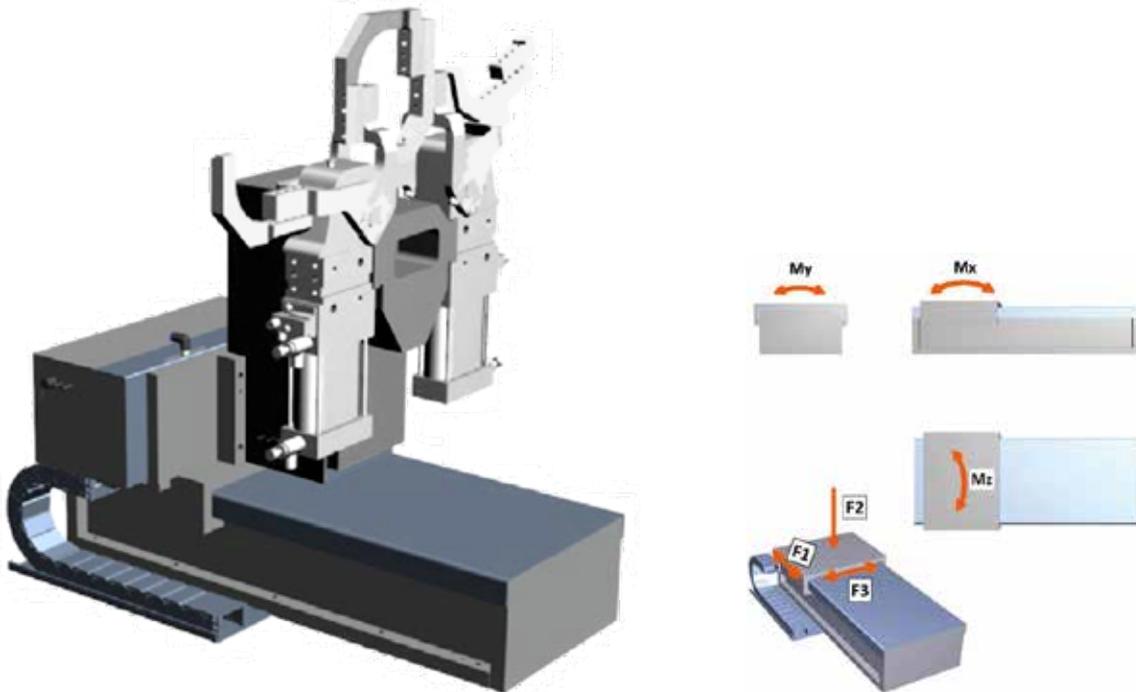
## Practical example

Scissor lifts and lift tables in an overhead transfer system for roof clamping frames for three vehicle types with magazine with maintenance platforms.



# 14. Positioning units

To be able to operate welding equipment flexibly, ZOLLERN has developed highly-rigid and compact NC positioning units.



## // Technical data

Drive axis						Drive unit		
$F_1$			Dynamic feed force		Installation position		V= 0.35m/s	
Static holding force / selectable in steps			max. (N)				a= 0.5 m/s <sup>2</sup>	
max. (N)			3,000		800		Vertical / horizontal	
Loads						Weight		
$F_2$			$F_3$			$M_x$	$M_y$	$M_z$
max. (N)			max. (N)			max. (Nm)	max. (Nm)	max. (Nm)
static	dynamic	Installation	static	dynamic	Installation	static	static	static
payload	payload	position	payload	payload	position	payload	payload	payload
4,500	3,300	horizontal	4,500	3,300	horizontal	1,980	2,100	1,980
						With 400 mm stroke approx. 60 kg		

# 15. Complete systems

ZOLLERN plant and system solutions are used for linking and automating machine tools and machining centres as well as transporting workpieces and tools. They are composed of linear axes and portals.

Gantry robots are an efficient method of machine tool automation. By loading from the top, e.g. via hatches, they ensure that the machine remains accessible.

## Plant and system solutions

- Supplier of turnkey systems with PLC and NC controls from a single source
- Design and execution of customised automation and rationalisation solutions
- Multi-axis gantry systems for loading and unloading machines and machining centres
- Line assembly, commissioning, production support
- Reference plants in all key industrial sectors
- System solutions with conveyor technology, safety equipment and plant control systems
- Overall project engineering, integration of all major makes of machine tools and system implementation
- Gripper systems for workpieces and tools

ZOLLERN system solutions for body-in-white lines are used in diverse applications in the automotive and commercial vehicle industry.

ZOLLERN linear and portal axes can be integrated into the body-in-white line and combined with each other as overhead axes or ground axes, framing stations and robot and jig axes.

## Solutions for body-in-white lines

- Turnkey systems with NC and PLC controls
- Customer-specific automation and rationalisation solutions consisting of multi-axis portal systems, robot systems (robot travelling axes) and lifting devices
- Handling and intermediate storage of car body parts
- Gripper systems for car body parts
- High flexibility and system availability
- Also feeder systems (press feeders) for upstream press lines
- Overall project engineering, line assembly, commissioning, production support

# 16. Controls

## 16.1 Controls and switch cabinet

For various systems and handling units, ZOLLERN offers the planning, realisation, programming and commissioning of PLC and NC controls (Siemens SIMATIC SPS S7-1500 and SINUMERIK 840D SL).

ZOLLERN provides the complete controls. Control components as well as drive electronics and other accessory assemblies are installed and cabled within the switch cabinets, which can be equipped depending on the location of application with cooling units.

The operating devices are installed in the switch cabinet. The operation of the system can also take place in a decentralised manner using a manual operating panel. For this purpose, the system features various plug-in points.

The visualisation in the operating devices of the control is configured and presented specific to the customer's requirements.



The hardware planning takes place using EPLAN. The interfaces, for example to WMS, to the conveyor technology or safety technology and signal exchange are defined by ZOLLERN during the hardware planning.

ZOLLERN develops competences for the linking of portal and handling system controls for their communications between each other.

The communications between the individual units and the superordinate control or WMS takes place via Profinet or Profibus.

The screenshot displays the ZOLLERN control interface. At the top, there are status indicators for 'Auto' and 'bereit', along with fields for 'akt. AuftragNr' (654321), date (17.12.2014), and time (15:11:03). The main area shows a horizontal axis with stations 'ST 1.1', 'P1 geschl.', 'RT', 'Ablage M1', 'Ablage M2', 'Ablage M3', 'Ablage M4', 'Ablage M5', and 'ST 2.1'. Below this, five machines are shown: 'Maschine 1' (Vorrichtung 1, Beladebereit), 'Maschine 2' (abgewählt), 'Maschine 3' (abgewählt), 'Maschine 4' (abgewählt), and 'Maschine 5' (Vorrichtung 1, Entladebereit). Two data tables are present:

Name	Istpos.	Sollpos.	Vorschub	
X1	2795,392	8123,340	65424	mm/min
Y1	93,684	76,700	-210	mm/min
Z1	3360,000	3360,000	0	mm/min
C1	180,452	180,000	-6	grad/min
A1	0,000	0,000	0	grad/min

Name	Istpos.	Sollpos.	Vorschub	
X2	9963,610	9963,610	0	mm/min
Y2	111,700	111,700	0	mm/min
Z2	2866,940	2866,940	0	mm/min
C2	180,000	180,000	0	grad/min
A2	0,000	0,000	0	grad/min

Below the tables, two order status boxes are shown: 'Auftrag Lader 1: von: Ablage M2 nach: Aufspannung 1 Teil ablegen' and 'Auftrag Lader 2: von: Aufspannung 1 nach: Ablage Teil ablegen'. At the bottom, a navigation bar includes buttons for 'Anl. Übers.', 'Vorbereiten', 'Handbetrieb', 'SS-DM', 'Bearbeiten', 'SS-Roboter', 'Prozess', 'SS-Aufträge', 'Diagnose', 'SS-RFID', 'Instandhaltg', 'BDE', 'Dokument', and 'SubSystem'.

### 16.2 Programming and safety technology

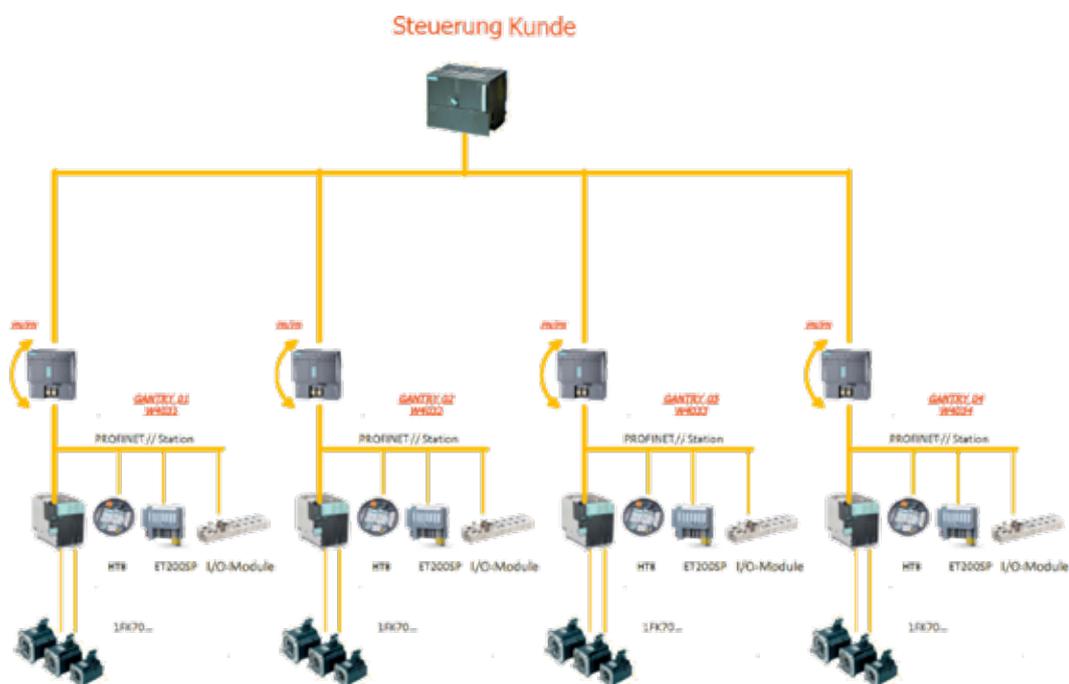
Experienced programmers and long-term partners create professional software solutions and program the process flow.

The program processes are developed together with the customer and with innovative programming tools such as WinCC or TiA.

Process flows are inspected and optimised using modern simulation software.

ZOLLERN integrates safety technology such as light barriers and safety switches etc., RFID reading units and barcode scanners into the control and the program software.

ZOLLERN also conducts a risk analysis, the issue of an installation declaration or the issue of the CE labelling.



### 16.3 Drive cabinets

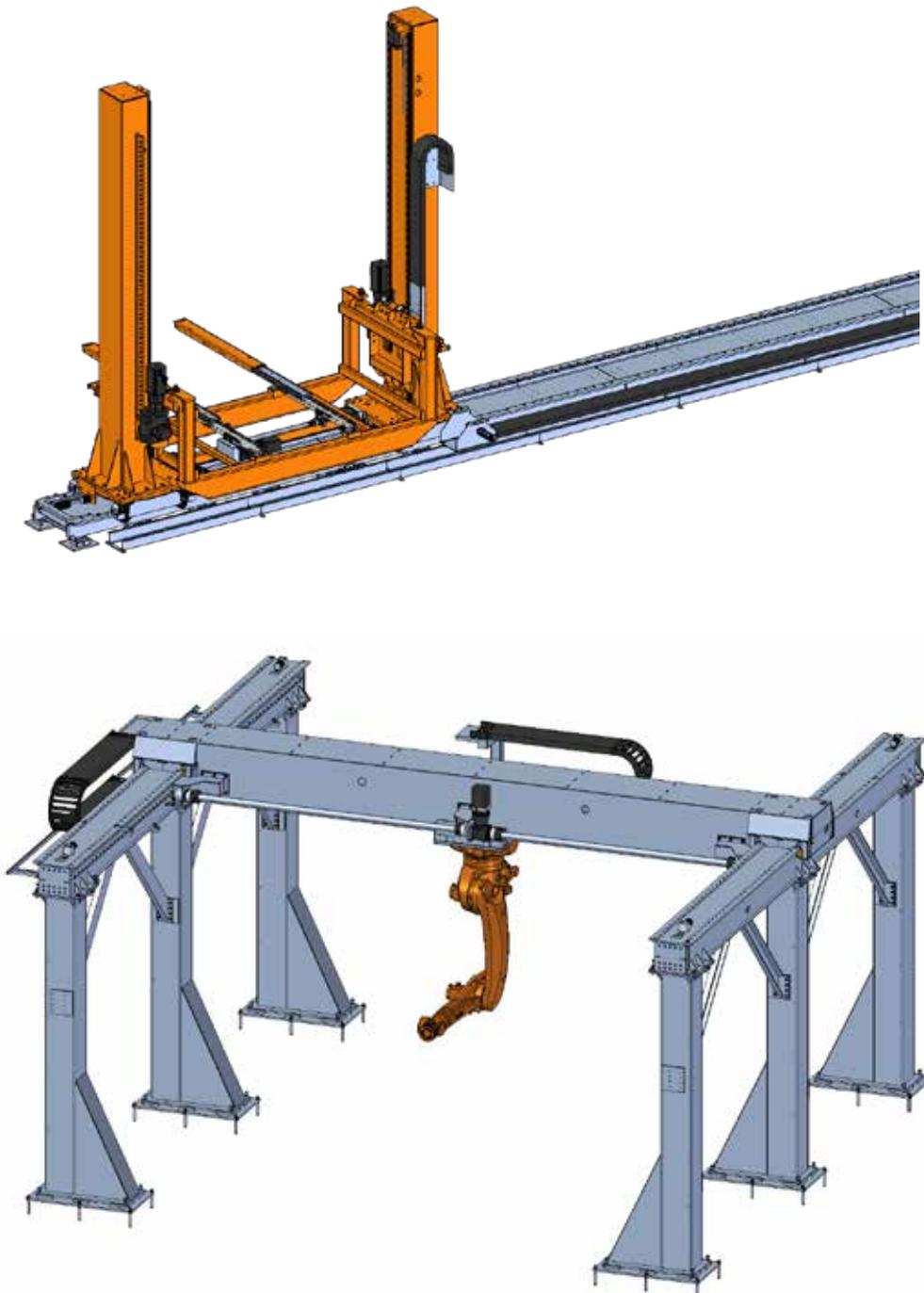
ZOLLERN supplies drive cabinets for axes and portals which contain the drive electronics such as network filters, network coils, frequency converters, braking units and brake resistances, and the appropriate control units.

These can be activated, and the axes and portals can be activated and operated, through the customer controls, for example machine tool controls.

On request, ZOLLERN also supplies loose components such as frequency converters and more.

# 17. Special solutions

In addition to the classic gantry robot systems, ZOLLERN designs and manufactures special solutions such as gantry robot operating devices, column robots and gantry robot with suspended robots. ZOLLERN offers a multitude of customer-specific solutions for various application cases.



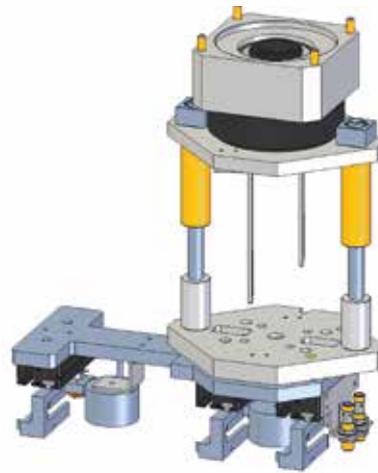
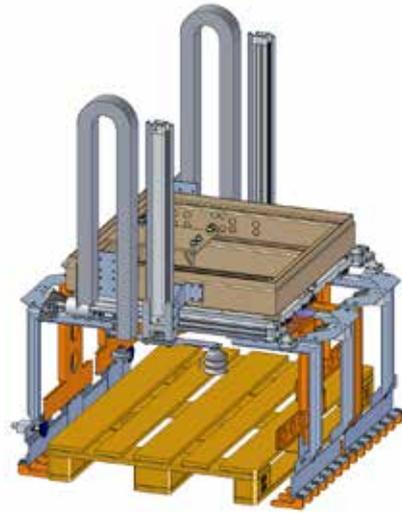
# 18. Gripper

ZOLLERN develops and implements grippers in connection with gantry robot systems and complete systems for handling, palletising tasks and for the loading and unloading of machines.

In accordance with the customer components and assemblies which are to be moved through linear technology or positioned, ZOLLERN develops individual gripper units.

The grippers can be pneumatically or electrically activated or are designed as vacuum gripper system.

In addition to individual grippers, double and multiple grippers are implemented.



# 19. Accessories

ZOLLERN gantry robots and complete systems are equipped with a comprehensive range of accessories:

## 19.1 Mechanical equipment

- Gear
- Adapter flange
- Pneumatic gripper
- Vacuum gripper with accessories such as T-pieces and hoses, ejectors or fans
- Shock absorber elements and hydraulic shock absorbers
- Pillars with footplates (with crossbars)
- Drip pan and oil drip tray, (bottom guard)
- Energy chain with holder
- Synchronous shafts
- Coupling and connection rods
- Fixing point (anti-lowering device for vertical axes) Type SITEMA, Buhl, Tünkers
- Lubricator
- Central lubrication unit
- Swivel units, pneumatic or electric
- Maintenance walkways with ascent ladder/steps
- Protective fence with guard doors, with safety switch

## 19.2 Electromechanical and electrical equipment

- Motors with encoder system/absolute encoder and brake
- Roller lever switch
- Motor line
- Encoder line
- Frequency converter and accessories
- Electric gripper
- Cable, PE line, control, supply line etc. and cabling, on connector board or terminal box
- Controls, PLC and NC controls
- Safety technology, sensors, light barriers

# ZOLLERN Group

## Product areas

### Metals and shaping

#### // Investment casting parts



- Turbine components
  - Vanes / Blades / Shrouds / Heat Shields
- Structural Castings
  - Gas Turbines / Aero / Engines Defense / Medical / Industrial Components
- Automotive
  - Turbine Wheels / Waste gates / Vanes / Pins / Planet carriers
- Implants
  - Knees (Femur, Tibia) / Hipps
- Alloys
  - Super alloys / Cobalt Chrome alloys

#### // Sand casting parts



- Sand casting
- Croningguss / Maskenguss
- Ceramic casting
- Continuous casting
- Centrifugal casting

#### // Forgings



- Forgings made of pure copper and copper alloys
- Semi-finished products, open die forged, flat bars, round bar
- Drop forged parts
- Rings, seamlessly rolled
- Bushings, seamlessly forged
- Individual pieces, small series, large series

#### // Special profiles and finished parts



- Special profiles, coils, bars
- Customer-specific finished parts
- Profile types hot-rolled, cold-rolled, cold-drawn, induction-hardened

## Drive technology and automation

### // Gearboxes



- Travel drives
- Slewing gearboxes
- Winch gearboxes
- Industrial gear units
- Gearboxes for tunnel boring machines
- Sugar mill gearboxes
- Electric drive systems
- Condition Monitoring and Predictive Maintenance

### // Winches



- Hoisting winches
- Free fall winches
- Pull winches
- Rescue boat winches
- Winch systems
- Winch gearboxes

### // Electric motors



- Torque motors kits
- Synchronous motor kits
- Synchronous motor modules

### // Automation, special systems



- Linear units, linear modules, gantry axes, portal units
- Telescoping axes
- Rotary modules, rotary tables
- Line gantries, area gantries
- Robot traverse axes, jig axes
- Storey lifter and lifting columns
- Fast conveyor
- Framing tenter handling / overhead systems
- Storage systems
- Complete systems with steel construction and control
- Special solutions
- Gripper

### // Hydrostatic systems



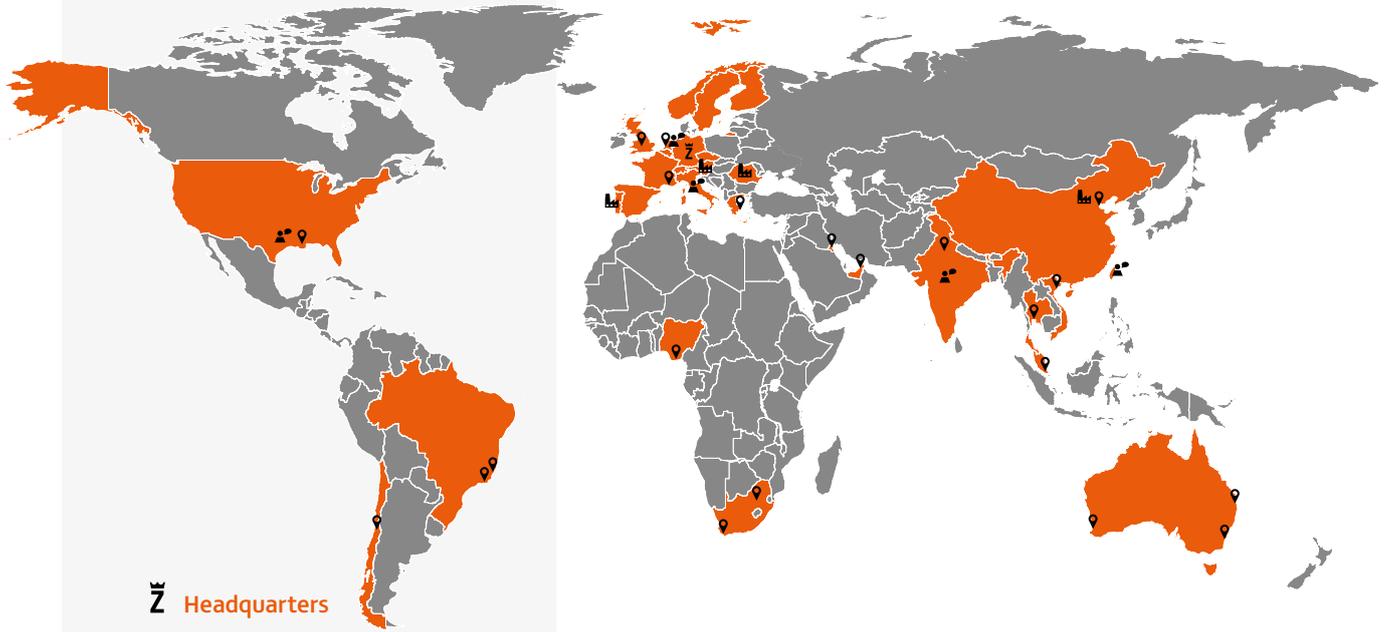
- Hydrostatic spindle units
- Hydrostatic rotary tables
- Aerostatic rotary tables
- Hydrostatic linear guides
- Hydrostatic center drive spindles
- Hydrostatic bearing components
- Hydrostatic special applications and test benches

### // Rotary tables systems



- Roller bearing rotary tables
- Hydrostatic rotary tables
- Automatic pallet changing systems and linear axes
- Swiveling tables
- After sales service for products of ZOLLERN, RÜCKLE and EIMELDINGEN

# ZOLLERN



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ZOLLERN-worldwide



ZOLLERN-Products



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