



Superior Clamping and Gripping



Product data sheet

Universal linear module Beta 110

Flexible. Modular. Compact.

Universal linear module Beta

Universal linear module with optional toothed belt or spindle drive and various guiding options

Field of application

Universal linear module with optional toothed belt drive for high acceleration and speed or spindle drive for precise positioning given high drive forces.



Advantages – Your benefits

Adaptable drive motor for versatile approach and easy integration into existing control concepts

Optional belt or spindle driven for the optimum drive for your application

Various guide options for optimal adaption to your application

Cost-effective basic version with basic functions for simple and cost-effective applications

Compact dimensions for less interfering contours

Integrated cover tape for versatility and a long tool life

Fixing via T-nuts or slot nut possible for flexibility in the integration



Sizes
Quantity: 11



Max. stroke
860 .. 7710 mm



Max. driving force
500 .. 18000 N



Repeat accuracy
 $\pm 0.03 \dots 0.08$ mm

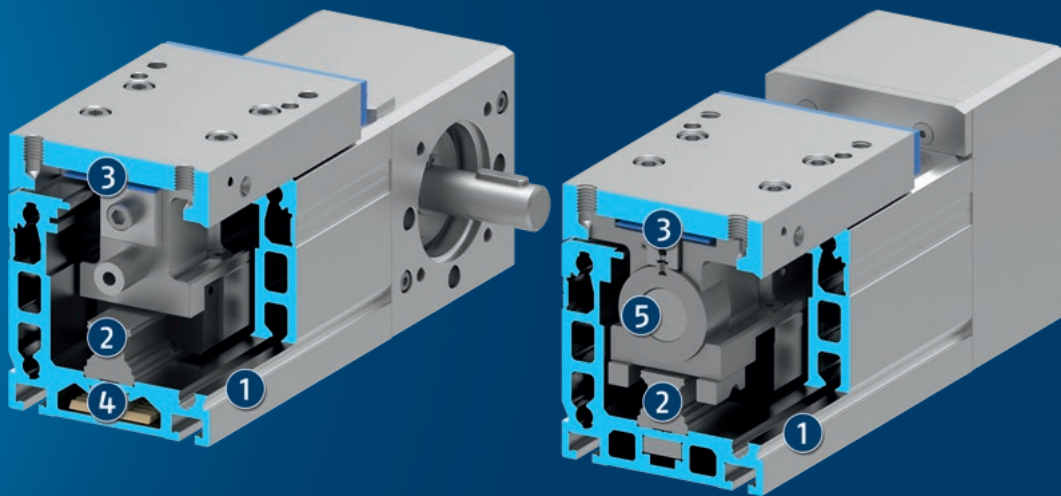


Max. speed
0.5 .. 8 m/s

Functional description

The slide is driven by a toothed belt or a ball screw spindle and precisely guided by a (double) profiled rail guide. The cover band runs through the slide and covers the drive and guidance. The servomotor is usually connected to the

profile via the drive shaft.



- ① **Aluminum profile**
Self-supporting and robust
- ② **Profiled rail guide**
for maximum positioning accuracy and moment loads
- ③ **Covering tape made of plastic**
along the whole guidance length against coarse dirt

- ④ **Toothed belt**
Transforms the rotational movement into a linear movement
- ⑤ **Ball screw spindle**
Transforms the rotational movement into a linear movement

Detailed functional description

Toothed belt axis with right-angle-mounted motor



This illustration shows how to mount a motor at a right-angle on a toothed belt axis using an engine cone, a clutch and a transmission.

- ① Toothed belt drive
- ② Motor bell
- ③ Coupling
- ④ Gear
- ⑤ Servomotor

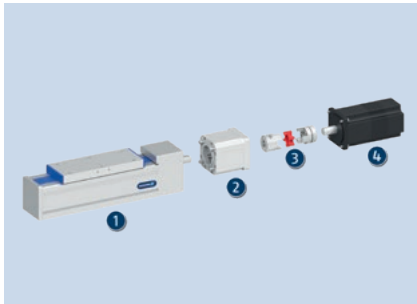
Synchronized toothed belt axes with connection shafts



A second toothed belt axis can be driven using a connection shaft.

- ① Toothed belt drive
- ② Connection shaft
- ③ Motor bell
- ④ Coupling
- ⑤ Gear
- ⑥ Servomotor

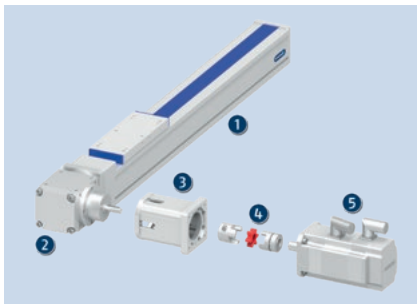
Spindle axis with axially mounted motor



This illustration shows how to mount a motor axially to a spindle axis using an engine cone and a coupling.

- ① Spindle axis
- ② Motor bell
- ③ Coupling
- ④ Servomotor

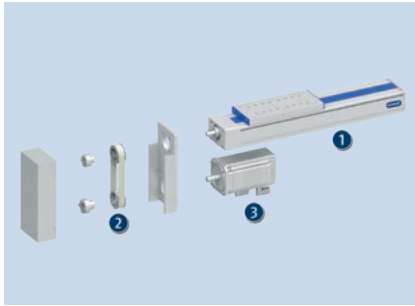
Spindle axis with right angular mounted motor



The motor can also be mounted at a right angle on a spindle axis using a bevel gear.

- ① Spindle axis
- ② Bevel gear
- ③ Motor bell
- ④ Coupling
- ⑤ Servomotor

Spindle axis with parallel-mounted motor



In order to save space, the motor can be mounted parallel to the spindle axis using an angle belt drive.

- ① Spindle axis
- ② Angle belt drive
- ③ Servomotor

General notes about the series

Operating principle: Choice of toothed belt or ball screw spindle drive

Drive: servomotors of different providers can be trouble-free adapted

Profile: Extruded aluminum profile with plastic cover strip

Slide: Aluminum slide with a brush seal

Scope of delivery: Assembly and operating manual with declaration of incorporation

Warranty: 24 months

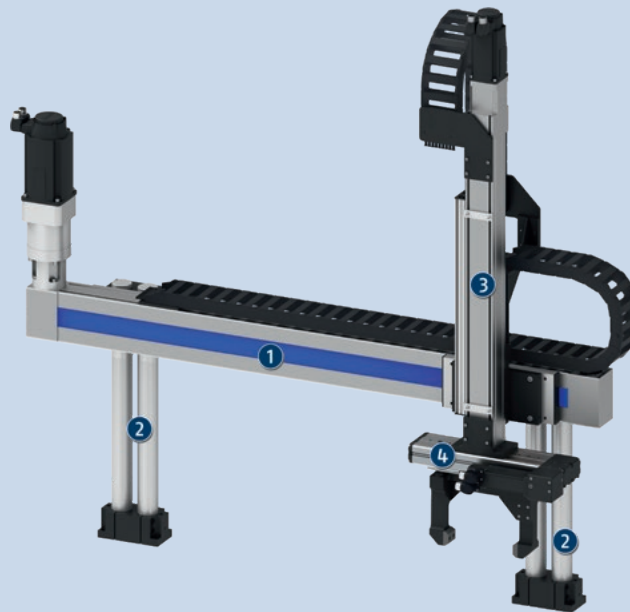
Ambient conditions: The modules are mainly designed for the use in clean ambient conditions. Please note that the life time of the modules can shorten if they are used in harsh ambient conditions, and that SCHUNK cannot assume liability in such cases. Please contact us for assistance.

Max. stroke: is the maximum permissible stroke. Acceleration and braking distances or possible overrun must be taken into consideration.

Repeat accuracy: defined as the spread of the target position after 100 consecutive positioning cycles under constant conditions.

Acceleration and speed: The values specified are the maximum values of the units without loading. The actual accelerations and speeds for your application must be designed separately and can deviate from the maximum values.

Layout or control calculation: Verifying the sizing of the selected unit is necessary, since otherwise overloading can result. Please contact us for assistance.



Application example

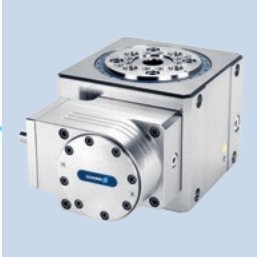
Electrically driven 2-axis line gantry with long-stroke gripper and standardized drive technology for loading and unloading machine tools.

- ① Universal linear module Beta with toothed belt drive
- ② Pillar assembly system

- ③ Universal linear module Beta with spindle drive
- ④ Electric long-stroke gripper EGA

SCHUNK offers more ...

The following components make the product even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.



Rotary module, electric



Universal rotary module



Universal gripper



Universal swivel head



Inductive proximity switch



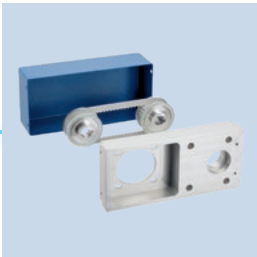
Pillar assembly system



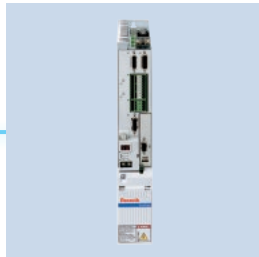
Drive



Room gantry



Angle belt drive



Drive controller

① For more information on these products can be found on the following product pages or at schunk.com.

Options and special information

spindle supports: Spindle supports allow higher moving speeds for longer stroke lengths

Version with a driven slide: In this version, the servomotor is fastened to the slide and the profile is vertically moved.

Flexible in motor and controller selection: The electrical control is carried out via an adaptable servo drive using common standard controller like Bosch or Siemens.

Easy integration: The easy integration into the control system is ensured by the possibility of attaching a common servomotor.

Complete solutions: On request, SCHUNK can supply complete solutions including motor, gear, controller, and cables.

NEW: Version with food –compliant lubrication (H1G): on request as a solution for an easy entry into medical technology, lab automation,, pharmaceutical and food industry. The requirements of EN 1672-2:2020 are not fully met.

How to order – Toothed belt drive

B - 80-C - ZRS - 32AT5-E - 220 - 1000 - 1420 - AK - AZ1 - 1

Product series B = Beta

Size (version)

Drive

Z = Toothed belt drive

A = driven slide

Guidance system

R = roller guide

S = rail guide

Design version

S = standard

E = basic version

Drive version

Toothed belt width and tooth pitch

Stroke per revolution

Traverse path

The basic version is only available in increments of 100 mm

Overall length

Cover

AK = cover tape

Accessories

BL = mounting strip

EMSEMB = mechanical limit switch (S = Siemens, B = Balluff) attached

E02/E010 = inductive limit switch opener with 2 m/10 m cable attached

ES2/ES10= inductive limit switch closer with 2 m/10 m cable attached

NS = T-nut

RM = rhombus nut

AZ = drive shaft

Customized design

0 = Standard

1 = customized (specification in plain text)

Additional accessories (separate item)

MGK = motor flange and coupling (according to dimension sheet)

URT = angle belt drive (from dimension sheet)

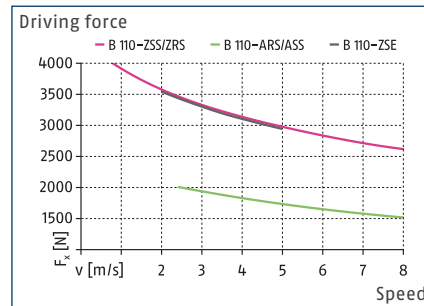
How to order – Ball screw spindle drive

	B	-	80	-	SRS	-	M	-	2020	-	1000	-	1430	-	2SA	-	2ES2	-	0
Product series B = Beta																			
Size (version)																			
Drive S = Spindle																			
Guidance system R = roller guide S = rail guide																			
Design version S = standard																			
Drive type M = single nut (ball screw) MM = double nut (ball screw)																			
Drive version Diameter and pitch (ball screw)																			
Traverse path																			
Overall length																			
Spindle supports (SA) (Number)																			
Accessories BL = mounting strip EMSEMB = mechanical limit switch (S = Siemens, B = Balluff) attached E02/E010 = inductive limit switch opener with 2 m/10 m cable attached ES2/ES10 = inductive limit switch closer with 2 m/10 m cable attached NS = T-nut RM = rhombus nut																			
Customized design 0 = Standard 1 = customized (specification in plain text)																			
Additional accessories (separate item) MGK = motor flange and coupling (according to dimension sheet) URT = angle belt drive (from dimension sheet) KRG = directly attached bevel gears																			

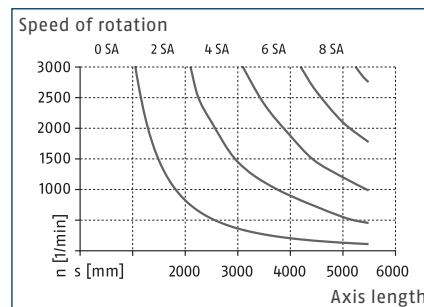
Cover tape is standard for ball screw spindle drive.



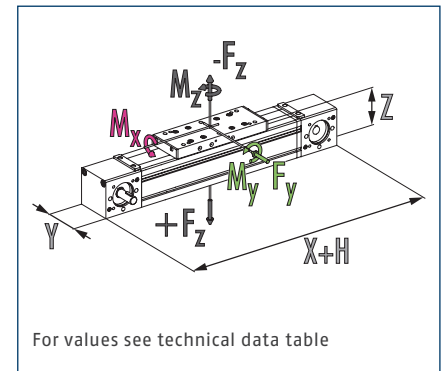
Max. driving force (toothed belt)*



Spindle supports**



Dimensions and maximum loads



① The indicated forces and moments are maximum values for individual loading. If several forces and/or moments are applied at the same time, the maximum permitted individual values will be lower.

Technical data

Description		B 110-ZSS	B 110-ZSE	B 110-ZRS	B 110-ASS	B 110-ARS	B 110-SSS
Max. stroke H	[mm]	7520	7520	7520	7440	7440	5120
Max. driving force	[N]	4000	3600	4000	2000	2000	6000
Repeat accuracy	[mm]	±0.08	±0.08	±0.08	±0.08	±0.08	±0.03
Max. total length	[mm]	8100	8100	8100	8100	8100	5600
Max. speed	[m/s]	5	5	8	5	8	2.5
Max. acceleration	[m/s²]	60	60	60	60	60	20
Min./max. ambient temperature	[°C]	0/80	0/80	0/80	0/80	0/80	0/80
Dead weight of base including slide	[kg]	18	15.75	15.7	29	27	13.5
Additional mass per 100 mm stroke	[kg]	2.1	1.56	1.5	1.4	1.2	1.7
Weight of slide	[kg]	5.2	2.57	4.8			5.3
Dead weight of slide, long	[kg]	8.2		7.5			8.3
Weight of slide drive	[kg]				16	15	
Guidance system		Rail guide	Rail guide	Roller guide	Rail guide	Roller guide	Rail guide
Number of rails		1	1		1		1
Size of rails		25	25		25		25
Roll diameter	[mm]			28		28	
Drive concept		Belt drive	Belt drive	Belt drive	Belt drive	Belt drive	Spindle drive
Idle torque	[Nm]	3.5	3.35	3.5	3.5	3.5	1.5
Moment of inertia	[kgm²]	0.016	0.012	0.018	0.037	0.035	0.000225
Toothed belt type		50 ATL 10	50 ATL 10	50 ATL 10	50 AT 10-E	50 AT 10-E	
Traverse path per revolution	[mm]	300	300	300	300	300	
Spindle diameter	[mm]						25
Spindle pitch	[mm]						5/10/25/50
Max. spindle speed	[1/min]						3000
Moments Mx max./My max./Mz max.	[Nm]	400/800/600	320/640/480	300/600/450	400/800/600	300/600/450	400/800/600
Forces Fy max./Fz max./-Fz max.	[N]	3000/8000/4000	2400/6400/3200	2000/5000/2500	3000/8000/4000	2000/5000/2500	3000/8000/4000

① Please note that the long slide plates and the use of spindle supports (SA) reduce the maximum stroke H.
SCHUNK standard spindle supports with noise damping (SAG) reduce the maximum stroke by 10 mm for every 2 SAG.
Please note that the moment of inertia for spindle axes refers to one meter.

* The specified driving forces are maximum values for modules with toothed-belt drives at a given speed.

** The diagram shows the maximum spindle speed depending on the speed of the spindle supports (SA) and the overall length of the unit.

Description		B 110-SRS
Max. stroke H	[mm]	5120
Max. driving force	[N]	6000
Repeat accuracy	[mm]	±0.03
Max. total length	[mm]	5600
Max. speed	[m/s]	2.5
Max. acceleration	[m/s ²]	20
Min./max. ambient temperature	[°C]	0/80
Dead weight of base including slide	[kg]	12.5
Additional mass per 100 mm stroke	[kg]	1.4
Weight of slide	[kg]	5.8
Dead weight of slide, long	[kg]	9.1
Guidance system		Roller guide
Roll diameter	[mm]	28
Drive concept		Spindle drive
Idle torque	[Nm]	1
Moment of inertia	[kgm ²]	0.000225
Spindle diameter	[mm]	25
Spindle pitch	[mm]	5/10/25/50
Max. spindle speed	[1/min]	3000
Moments Mx max./My max./Mz max.	[Nm]	300/600/450
Forces Fy max./Fz max./-Fz max.	[N]	2000/5000/2500

① Please note that the long slide plates and the use of spindle supports (SA) reduce the maximum stroke H.

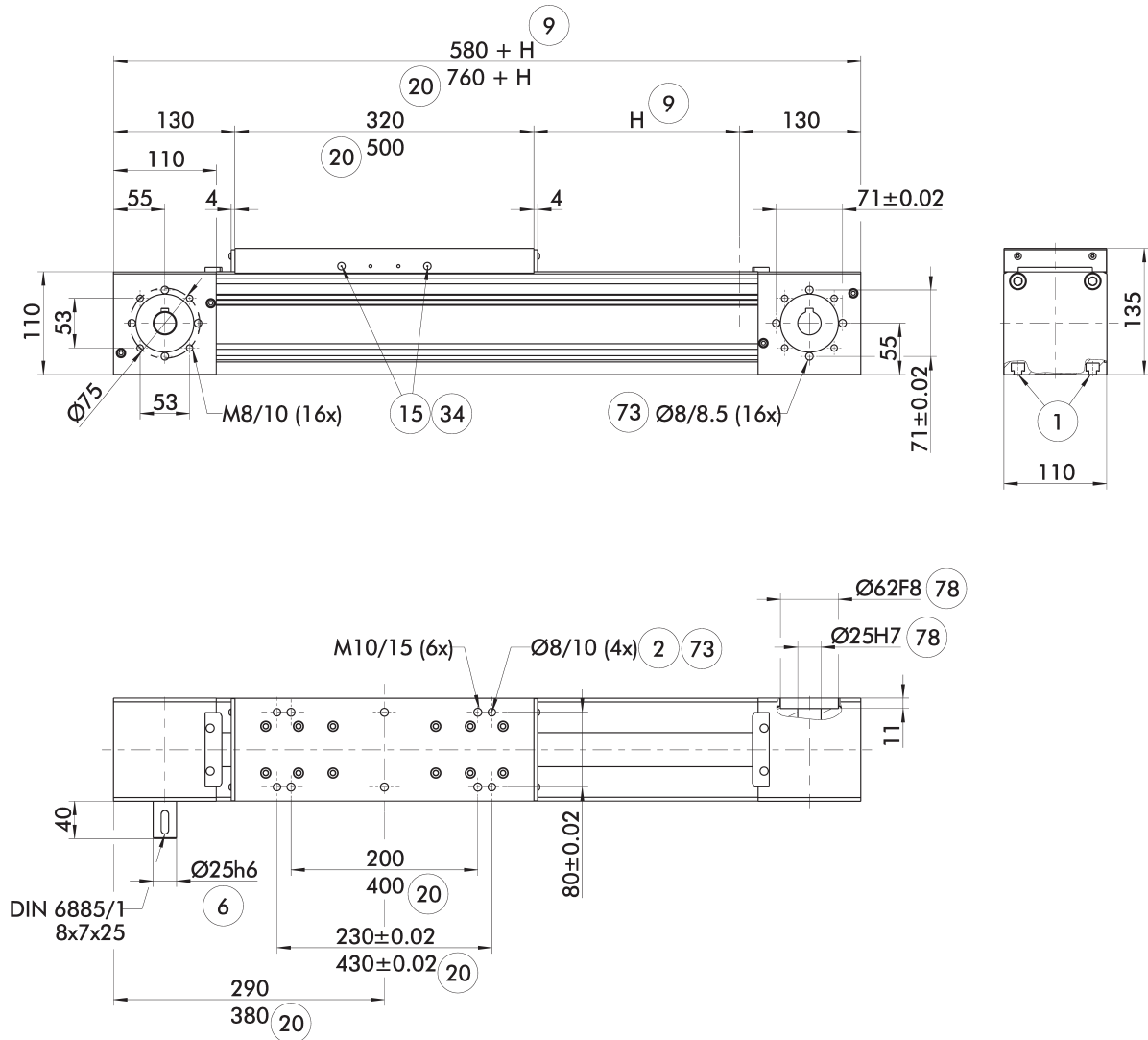
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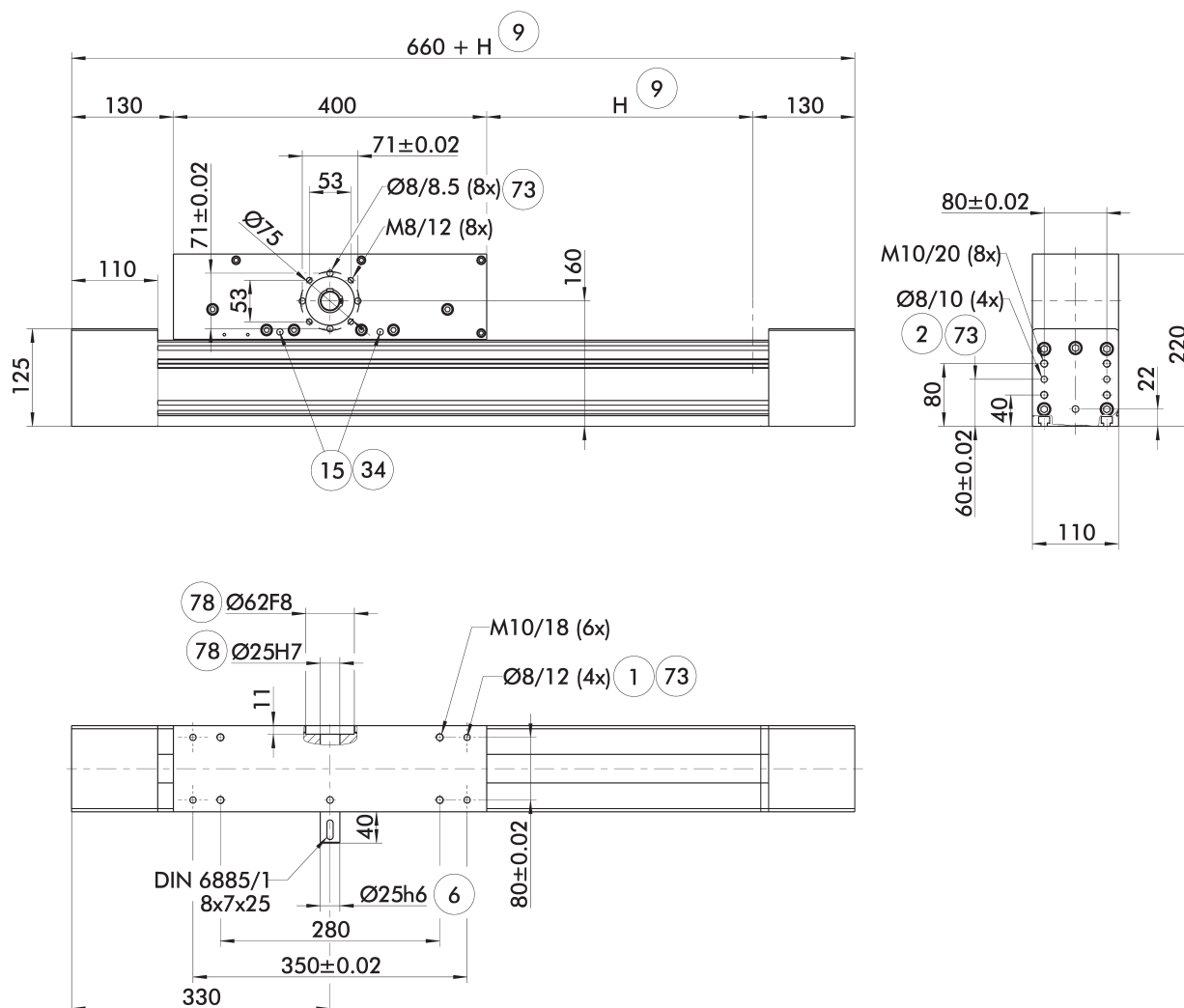
ZSS/ZRS main view



The drawing shows the unit in standard design, without considering any dimensions of the options described below.

- | | |
|--------------------------|---------------------------|
| ① Connection linear unit | ②⑦ With long slide plate |
| ② Attachment connection | ③④ On both sides |
| ⑥ Drive connection | ⑦⑧ Fit for centering pins |
| ⑨ Nominal stroke | ⑦⑧ Fit for centering |
| ⑮ Lubricant connection | |

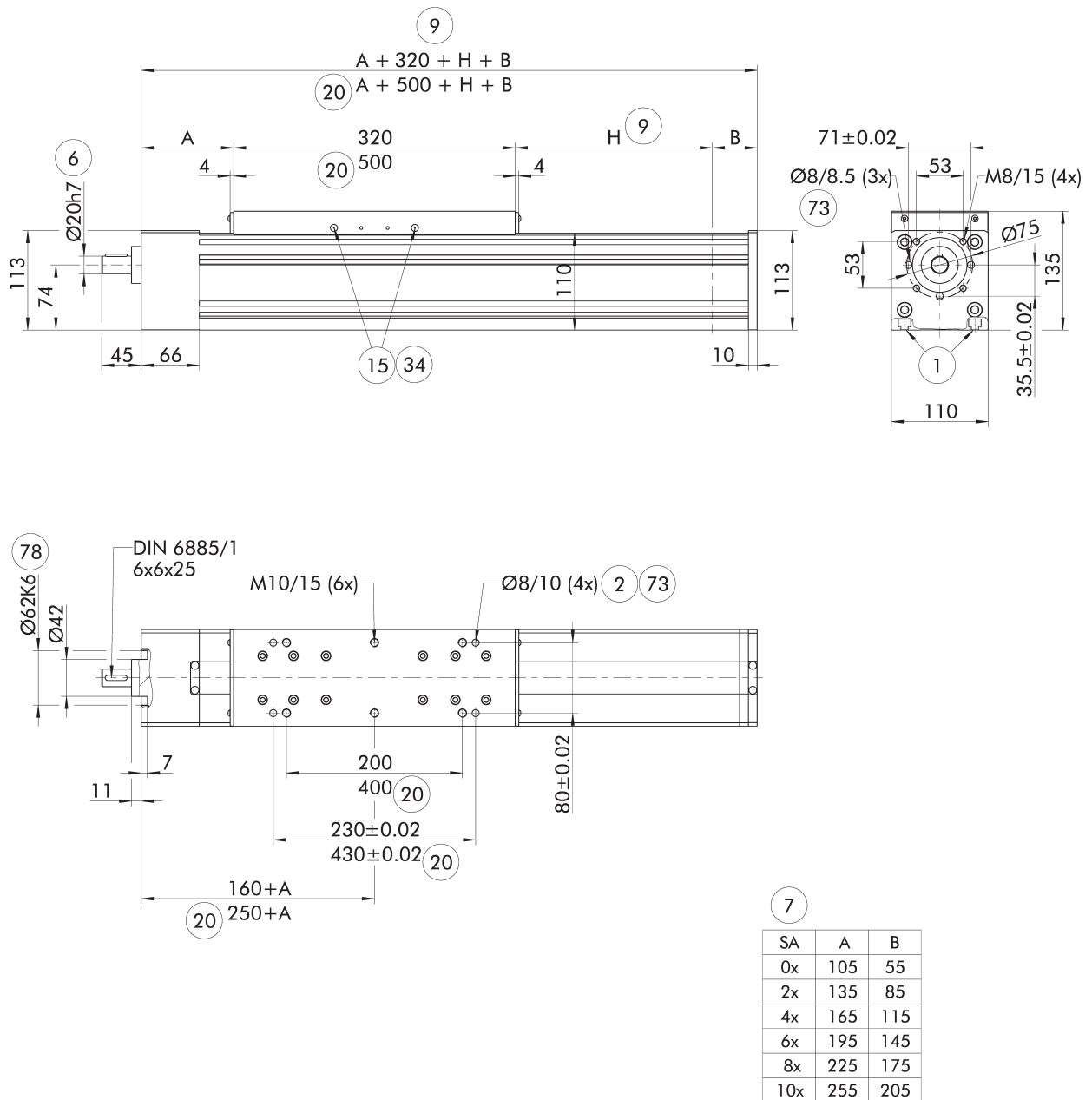
ASS/ARS main view



The drawing shows the unit in standard design, without considering any dimensions of the options described below.

- | | |
|--------------------------|--------------------------|
| ① Connection linear unit | ⑮ Lubricant connection |
| ② Attachment connection | ⑳ On both sides |
| ⑥ Drive connection | ㉑ Fit for centering pins |
| ⑨ Nominal stroke | ㉒ Fit for centering |

SSS/SRS main view

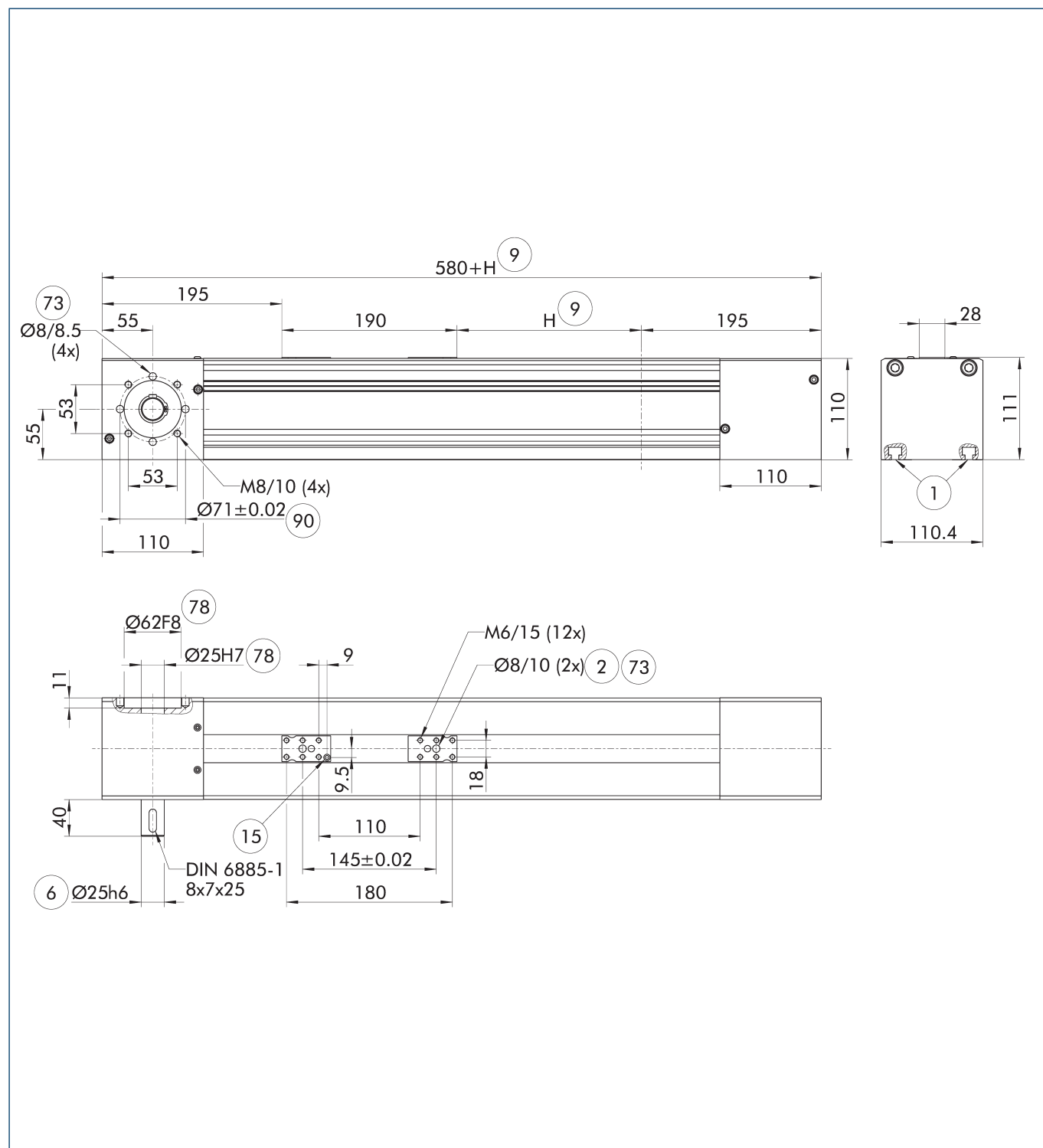


The drawing shows the unit in standard design, without considering any dimensions of the options described below.

- ① SCHUNK standard spindle supports with noise damping (SAG) reduce the maximum stroke by 10 mm for every 2 SAG.

- | | |
|------------------------------|---------------------------|
| ① Connection linear unit | ⑮ Lubricant connection |
| ② Attachment connection | ⑳ With long slide plate |
| ⑥ Drive connection | ③④ On both sides |
| ⑦ Number of spindle supports | ⑦③ Fit for centering pins |
| ⑨ Nominal stroke | ⑦⑧ Fit for centering |

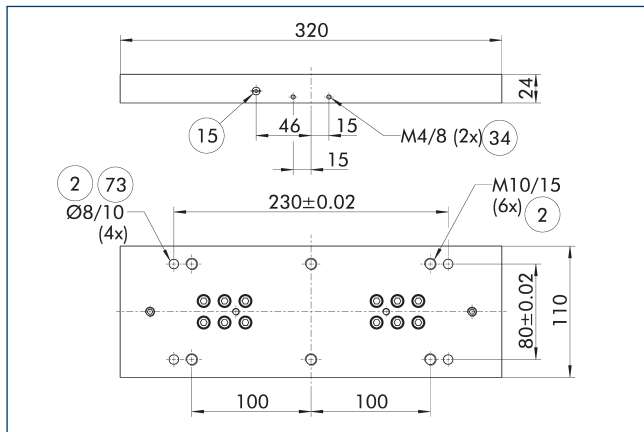
Main view ZSE



The drawing shows the unit in standard design, without considering any dimensions of the options described below.

- | | |
|--------------------------|---------------------------|
| ① Connection linear unit | ⑮ Lubricant connection |
| ② Attachment connection | ⑦③ Fit for centering pins |
| ⑥ Drive connection | ⑦⑧ Fit for centering |
| ⑨ Nominal stroke | ⑨① Bolt circle |

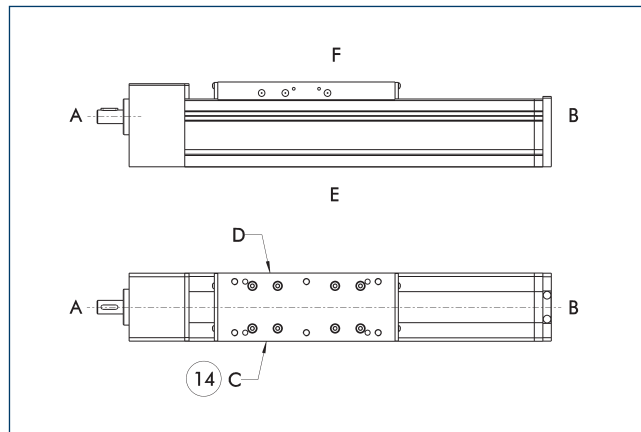
Slide plate ZSE



- ② Attachment connection
- ③④ On both sides
- ①⑤ Lubricant connection
- ⑦③ Fit for centering pins

Optionally, the variant ZSE can be ordered with a mounted slide plate. The drawing shows the position of the mounting possibilities and of the lubrication connection.

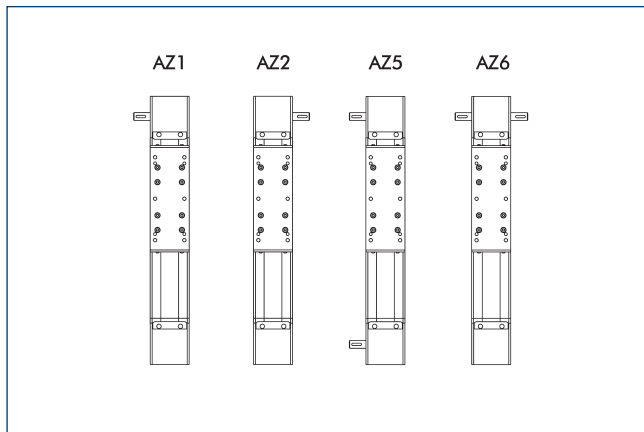
Side definition



- ①④ Limit switch standard position

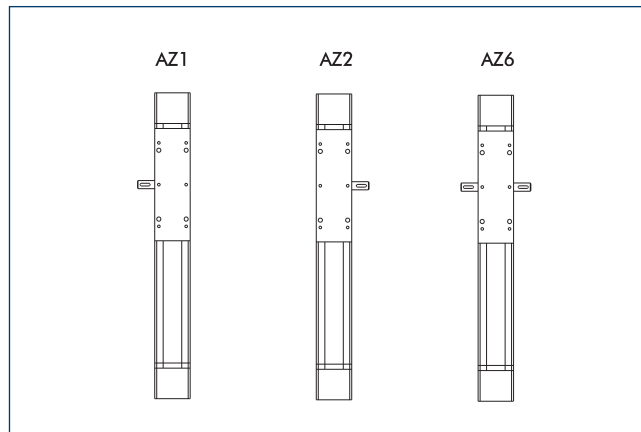
This drawing indicates the definition for the sides. This serves as the basis for all attachments.

Drive shafts in profile (rack and pinion drive)



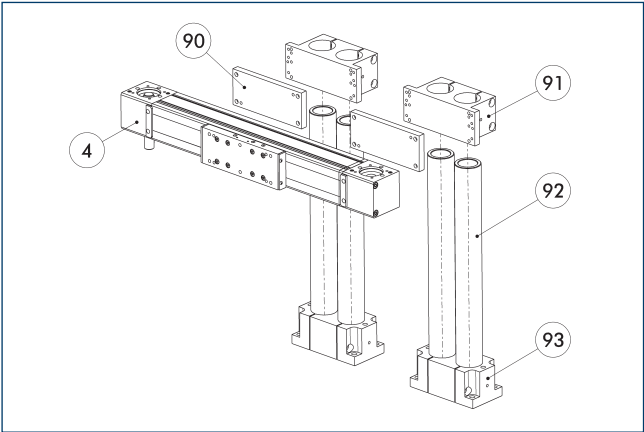
Depending on the axis application, the seat of the drive shaft has to be defined in the order text. Particularly with axis combinations and mechanical synchronization, several drive shafts are required.

Drive shafts in slide (rack and pinion drive)



Depending on the axis application, the seat of the drive shaft has to be defined in the order text. Particularly with axis combinations and mechanical synchronization, several drive shafts are required.

Attachment to a pillar assembly system

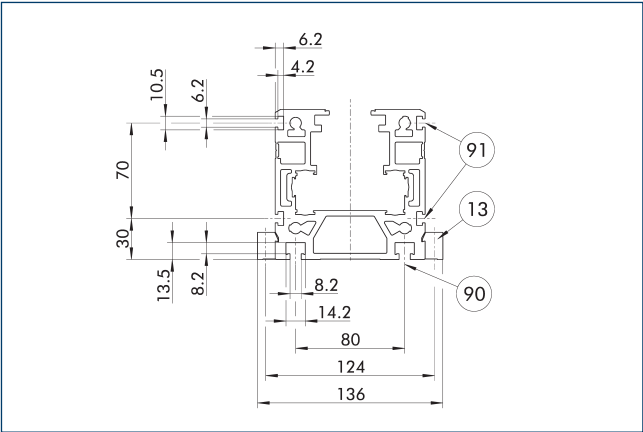


- ④ Linear unit
- ⑨① Adapter plate AGH
- ⑨① ADV mounting plate
- ⑨② Pillars, hard-chromium plated, ground
- ⑨③ Double socket SOD

This unit can be attached to the pillar assembly system as standard. See the Kombibox software, which can be found online, for the right arrangement for your application.

Description	ID	pillar diameter [mm]	Material
Pillar assembly system mounting plate			
ADV 55	0313517	55	Aluminum
APDH 85	0313414	55	Aluminum
APDV 85	0313416	55	Aluminum
APEH 85	0313413	55	Aluminum
APEV 85	0313415	55	Aluminum

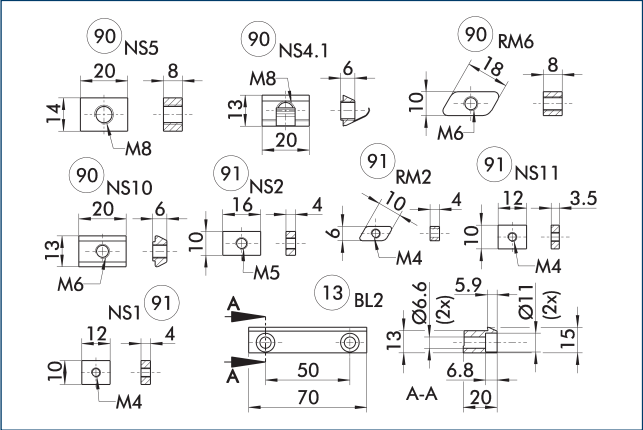
Mounting



- ⑬ Mounting strip
- ⑨① Side T-nut
- ⑨① T-nut at the bottom side

The drawing shows the position of the mounting options.

Fastening elements

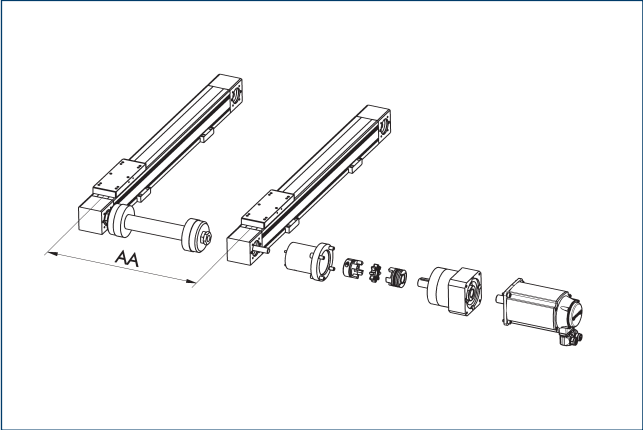


- 13 Mounting strip
90 T-nut at the bottom side
91 Side T-nut

The unit can be secured either by using T-nuts or mounting strips. The exact mounting position is indicated on the adjacent attachment illustration.

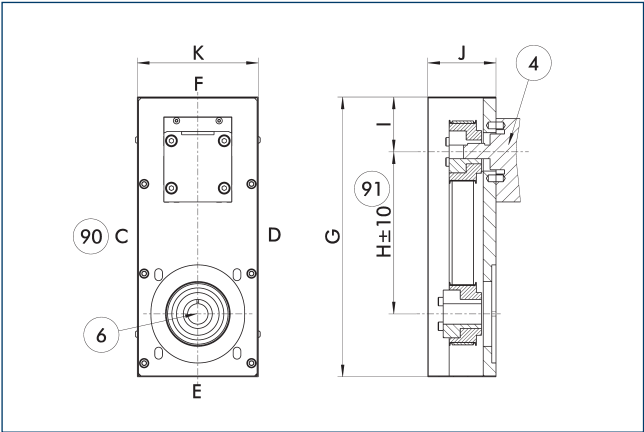
Description	ID	
Mounting strip		
BL2-70x15x20-01	0331401	
T-nut		
NS 10-M6-6	0331422	
NS 11-M4	0331429	
NS 1-M4	0331404	
NS 2-M5	0331405	
NS 4.1-M8-6	0331430	
NS 5-M8-8	0331408	
RM2-M4	0331425	

Connection shaft



Description	Connection shaft	Min. AA
		[mm]
B 110-ZSS	GX4/GX8	320
B 110-ZSE	GX4/GX8	320
B 110-ZRS	GX4/GX8	320
B 110-SSS	GX4	350
B 110-SRS	GX4	350

Angle belt drive



- ④ Linear unit

⑥ Drive connection
- ⑨⑩ Attachment direction of angle belt drive

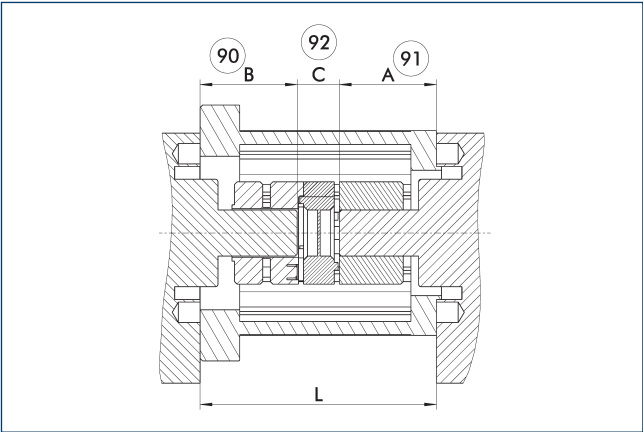
⑨① Dependent on transmission ratio and toothed belt design.

The angle belt drive makes it possible to achieve various drive solutions in confined spaces. SCHUNK offers the suitable angle gear for your drive.

Description	G	H	I	J	K
	[mm]	[mm]	[mm]	[mm]	[mm]
B 110-SSS	328	190	64	80	142
B 110-SRS	328	190	64	80	142

① Possible transmission ratios: $i = 1 : 1$, $i = 2 : 1$ and $i = 3 : 1$

Motor flange schematic diagram

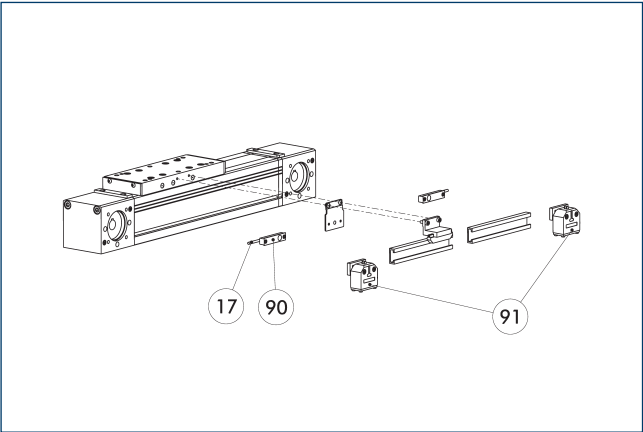


- ⑨⑩ Length of motor / transmission drive shaft
- ⑨① Length of linear unit drive journal

⑨② Clutch length

Different drive solutions can be attached to our axes. SCHUNK offers you the right motor flange and coupling for your drive.

Limit and reference switch



- 17

Cable outlet
- 90

Inductive limit and reference switches
- 91

Mechanical limit switches

Generally two E0-02 switches are used as limit switches and one ES-02 is used as reference switch.

Description	ID	Often combined
Inductive limit switch		
E0-02	0331410	●
E0-10	0331412	
ES-02	0331411	●
ES-10	0331413	
Mechanical limit switch		
EMB	0331415	●
EMS	0331414	

❗ The positions and dimensions of limit switches, switching lugs, and mounting components may vary depending on the application and the selected limit switches. Please contact us for assistance.



SCHUNK GmbH & Co. KG
Spann- und Greiftechnik

Bahnhofstr. 106 - 134
D-74348 Lauffen/Neckar
Tel. +49-7133-103-0
Fax +49-7133-103-2399
info@de.schunk.com
schunk.com

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