

IEF Werner GmbH  
Wendelhofstr. 6  
78120 Furtwangen  
Tel.: 07723/925-0  
Fax: 07723/925-100  
Email: [INFO@IEF-WERNER.de](mailto:INFO@IEF-WERNER.de)  
Internet: <http://www.IEF-WERNER.de>

Operating instructions  
***profiLINE 200***

Edition Mai. 03

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## Manufacturer's Declaration

### from EC-regulation for machinery 89/392/EWG, Enclosure II B

IEF Werner GmbH  
Wendelhofstr. 6  
D-78120 Furtwangen  
Phone: 07723 /925-0  
Fax: 07723/925-100

Herewith we declare that following products...

Designation of the product	Article number
easyLINE	100010
easyLINE S	100020
easyLINE AL	100019
Modul 68	100018
Modul 105	100012
Modul 105 S	100014
Modul 142	100015
Modul 142 S	100017
profiLINE140	1000303
profiLINE200	1000221

are for installation in a machine. The initiation of the components is forbidden until the machine in which the components should be installed meets with the following requirements:  
Conformity with EC regulations for machinery 91/368/EWG.

Used harmonized specification, especially:

EN 292-1      EN 292-2      EN 294

31.03.2002  
Furtwangen, \_\_\_\_\_



\_\_\_\_\_  
(Manfred Bär, Director)



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# 1 Safety informations



**Disregarding of this allution could be dangerous!  
Allusion to high voltage.**



**This gives warning and allution  
to general dangers.**

## 2 Range of application

The linear module **profiLINE** is a precise, linear adjustable unit with spindle drive, which finds usage in the industrial area in connection with other components. In combination with numerous mounting elements, as well as, the other travel units from IEF Werner, it is possible to install multiaxis positioning systems.

### Range of application:

- Insertion machine
- Pallet system
- Load- and unloading station
- Manipulators for the packing industry
- etc.

Above mentioned linear units are not suited for transportation of people and animals or as press- and bending device for cold working on metal.

For special applications in the chemical field, the food sector or in an explosive surrounding you need to take additional measures. In case of doubt, please contact manufacturer.

## 3 Safety

• Linear systems should be operated by qualified staff concerning safety regulations. It is essential that chapters 1 to 14 of the operation instructions have been read and understood completely.



- The system must be de-energized in order to carry out all assembly, disassembly or repair work on the linear module.
- **Do not** pull out the plug under power.
- Always operate linear modules in conjunction with suitable safety facilities (safety cell, safety zone, light curtain etc.).
- Pay attention to Manufacturer's declaration
- If the unit is driven with motors, mainly stepper motors, the motor heat could cause a skin burning when motor got touched.  
The installation of a protection device, for example protection grirs, could avoid this risk.

## 4 Installation

### 4.1 Assembly

The linear module **profiLINE** can either be horizontally or vertically mounted.



**Attention:**

If you mount the module vertically, only use motors with a spring power brake to avoid the carriage dropping down when the electrical supply is switched off!

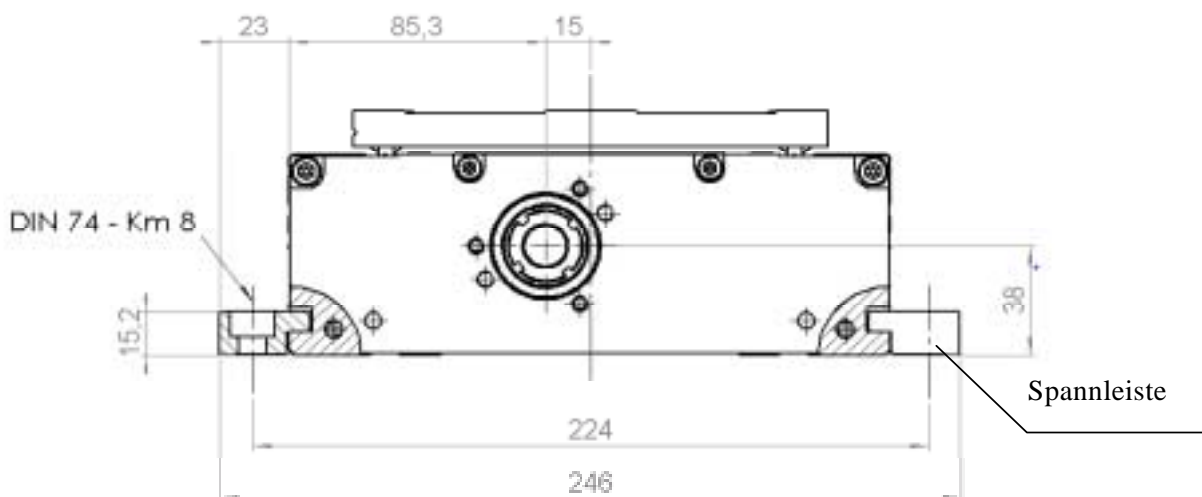
### 4.2 Attachment **profiLINE200**

The adjustment unit **profiLINE200** will be attached with clamping profiles on a surface mounting area. We entrust to use the attachment borings in the distance of 80 – 120 mm. In the basis body we installed 4 fitting borings, to make a reproducable position.

If it is unpossibile to attach through clamping profiles, we have the possibility to install attachent boring into the basis body. In this case, please contact our technicians.

Following clamping profiles for attachment are available:  
(Drawings see **chapter 14 Drawings**):

Part-No.	Designation	Length [mm]
221702	clamping element Type 190	190
1006097	clamping element (cross mounting)	158
728625	clamping profile, in meters	
	clamping profiles, customized	

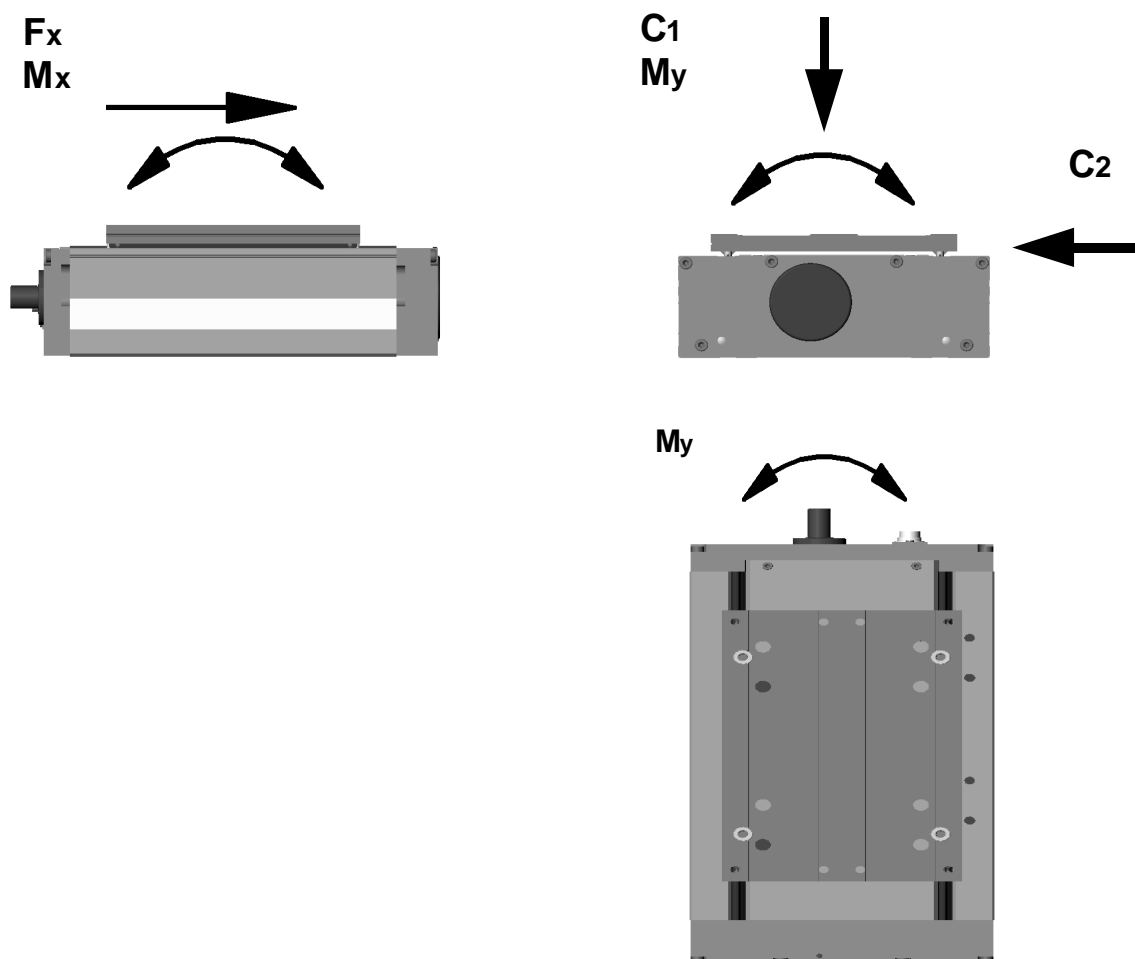


**Attention:** The mounting areas has to be flat. All differences from a flat area, are reason for a uncorrect run-off exactness.

## 4.3 Technical datas

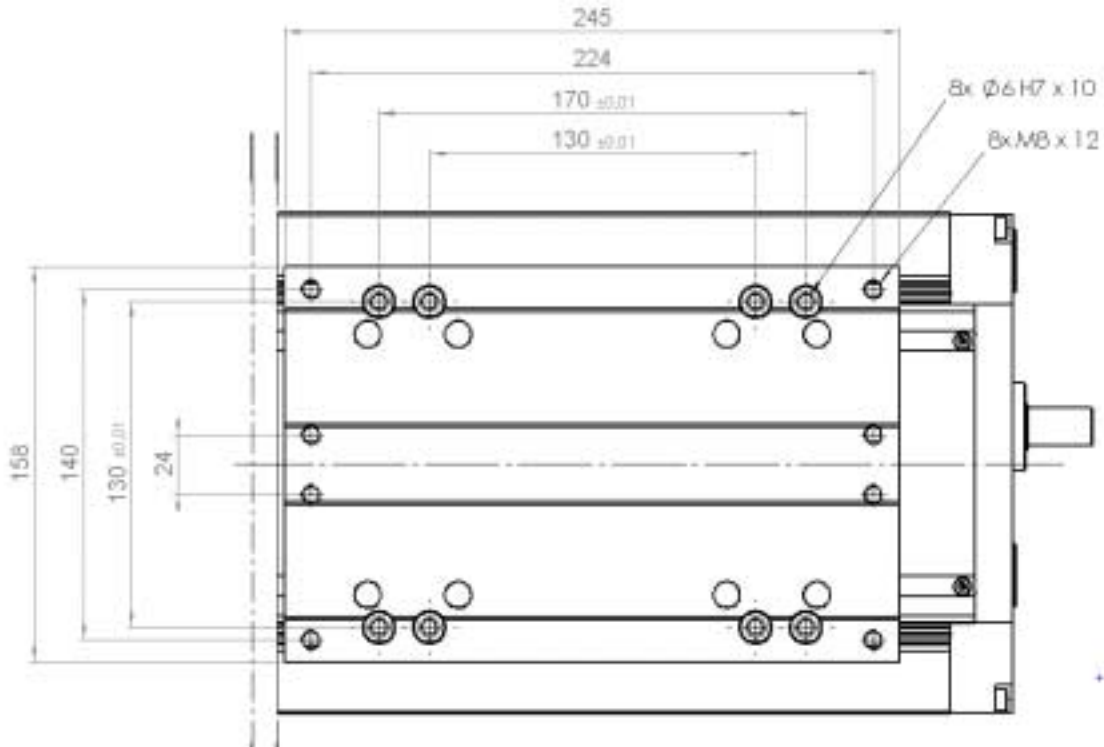
max. carrying capacity C1 [N]	5000
max. carrying capacity C2 [N]	5000
max. axial charge F <sub>x</sub> [N]	5000
max. torque M <sub>x</sub> [Nm] (static)	600
max. torque M <sub>y</sub> [Nm] (static)	600
max. torque M <sub>z</sub> [Nm] (static)	600
weight [Kg]	13,4
basis slide with 60mm stroke, without motor flange, motor	
weight increase [Kg] per 60mm length	1,2
temerature area	0 °C / + 60 °C.
run-off exactness [µm/500mm] *	40
repeat exactness [µm]	±20
spindle slope error [µm/300mm]	50

- The reported run-off exactness can only be get, when the adjustment unit has been installed on a absolut flat area. Here, the slide have to lie on the mounting area. As a flat area we entrust you a cout precios stone or a polished steel plate. For attaching the adjustment unit we entrust you general clamping profiles.



## 4.4 Receiving of Actuators

Actuators (grippers, cylinders) attached to the linear module can be mounted on the boring pictures from the slide. For attachment are 8 boring (M8) available.

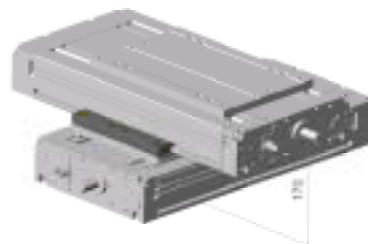


## 4.5 Cross mounting

At the cross mounting of adjustment units *profiLINE200* it has to be distinguished between 2 cases.

### Basis body on the slide

The cross mounting will be made with 2 clamping plates Art.1006097. The total height of the cross mounting is 170mm

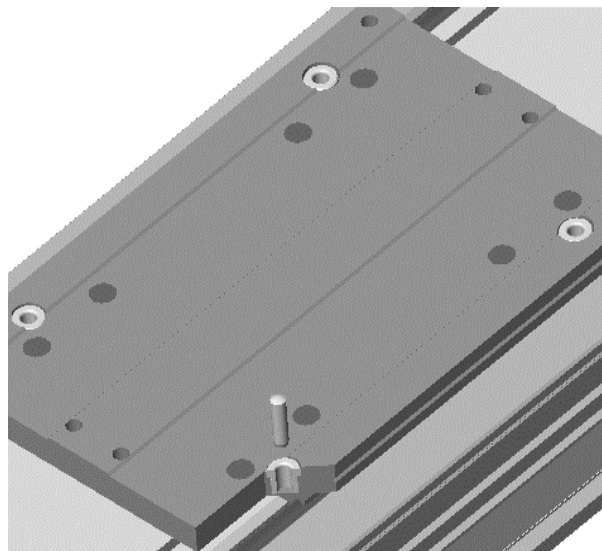


### Slide on slide

Cross mounting will be made with a distance plate Art. 1005893 as well as 2 pcs.clamping plates Art.1006097. The total height of the cross mounting is 185mm (incl. distance plate).



## 4.6 Pinning



The **profiLINE200** gives you the possibility to pin a cross mounting or a customized construction reproduceable without additional tools.

For this reason we installed 8 hardened drill bush into the short slide part.

4 pcs. drill bushes are pressed in tightly, 4 further drill bushes are floating in a bigger boring. A solid bearing as well as a movable bearing are placed diagonal.

The part which have to be pinned needs a solid determinate bore picture for the fitting boring, which correspondent to the bore picture in the short slide part. During mounting and pinning, a floating drill bush will be embed with a special 2-component glue in the movable bearing.

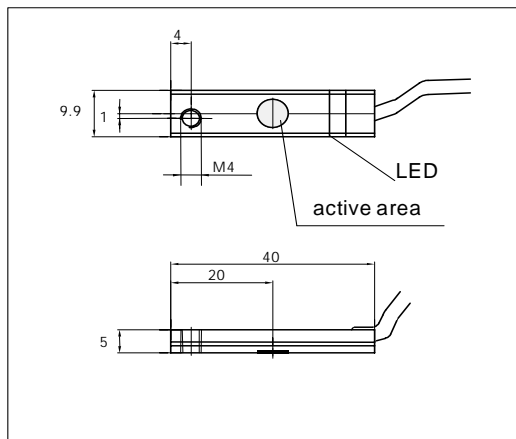
When mounting the fitting pins the drill bush will be adjusted to the fitting pins from the part. This kind of pinning allows in 1 hour an additional „Adjustment“ of the cross mounting.

Measure for the fitting pins	Tolerance	boring	Art. No. drill bush
130 x 130	$\pm 0,01$	6 <sup>H7</sup>	627122
170 x 130	$\pm 0,01$	6 <sup>H7</sup>	627122

## 5 Wiring

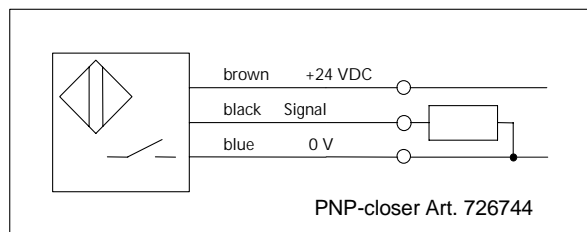
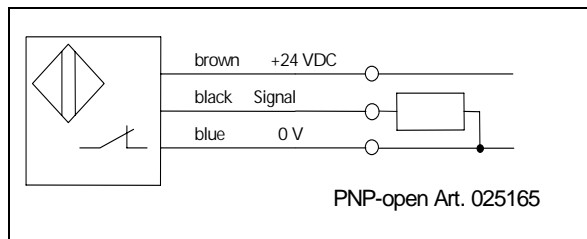
### 5.1 Initiators

Inductive proximity switches (PNP-opener, green shift point) are generally used as limit switches. These inductive limit switch are not security limit switch according to EN60204-1. By request an additional reference switch (PNP-closer, red shift point) can be installed. Initiator und cable are in a AL-profile and connected centrally to a plug. The AL-Profile can be integrated in a slide as well as it can be installed external.



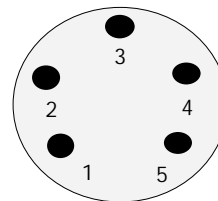
rated voltage incl. residual ripple	10...30 VDC ≤ 15 %
maximum admissible current	$I_a \leq 200$ mA
potential difference at $I_a$ mx.	≤ 2,5 V
sampling frequency	≤ 1000 Hz
consume current	≤ 15 mA
nominal switch point at steel	1,5 mm ± 10 %
hysteresis	3...20 %
reproducibility (U = konst.)	± 0,01 mm
working temperature	- 25 ° ... + 70 °C
protecting class	IP 65
short circuit proof	ja
reverse battery protection	ja

*technical data*



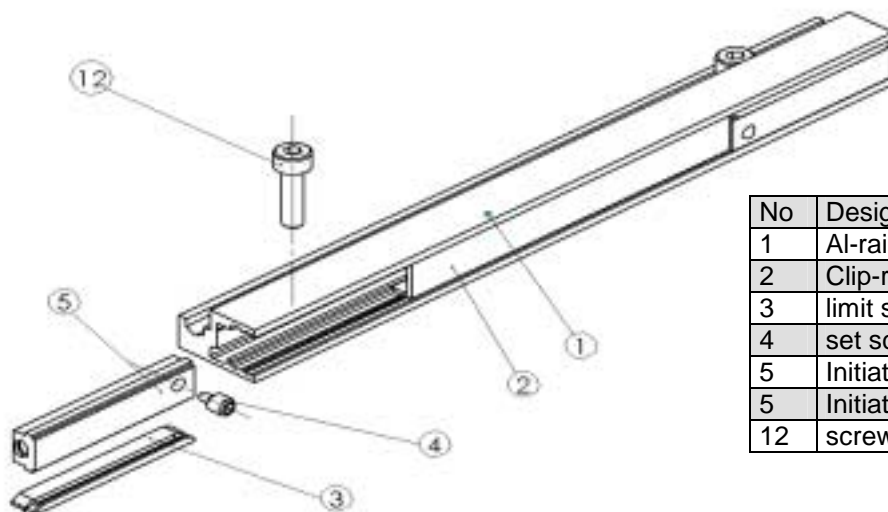
#### Assignment, See pins

Pin-no.	assign-	IEF-cable
1	+24 VDC	brown
2	limit switch -movement	green
3	0 V	white
4	limit switch +movement	yellow
5	reference switch	grey



## 5.1.1 Installation of Initiators

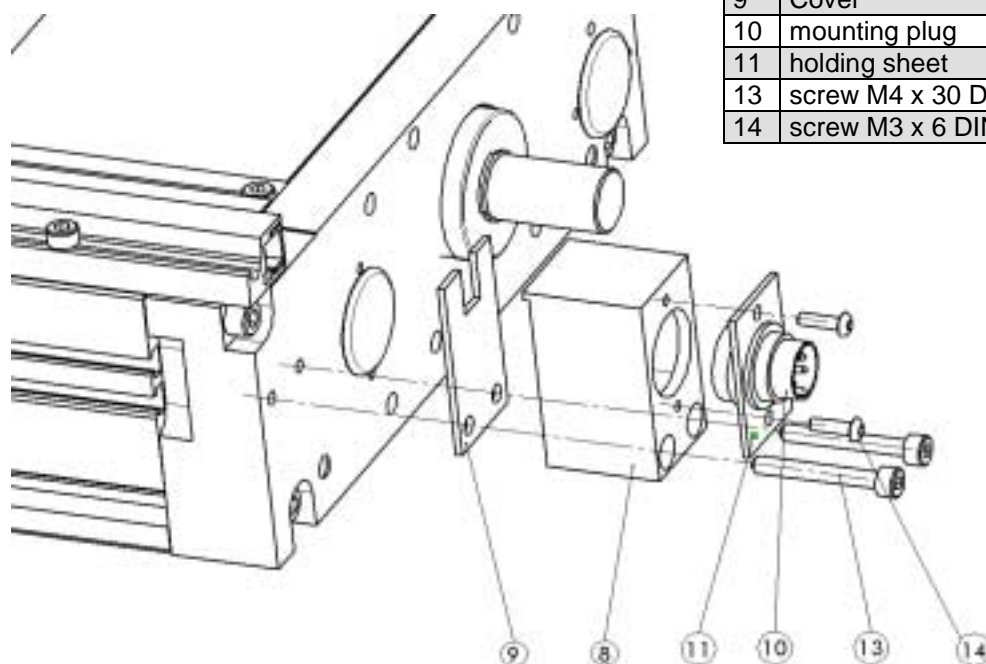
Initiator und cable are in a AL-profile and connected centrally to a plug. The AL-Profile can be integrated in a slide as well as it can be installed external.



No	Designation	Art. No.
1	Al-rail	1003692
2	Clip-rail	028668
3	limit switch holder	028585
4	set screw M4	030887
5	Initiator PNP-Opener	025165
5	Initiator PNP-Closer	726744
12	screw M4 x 16 DIN 912	626061

## 5.1.2 External installation of the Initiators

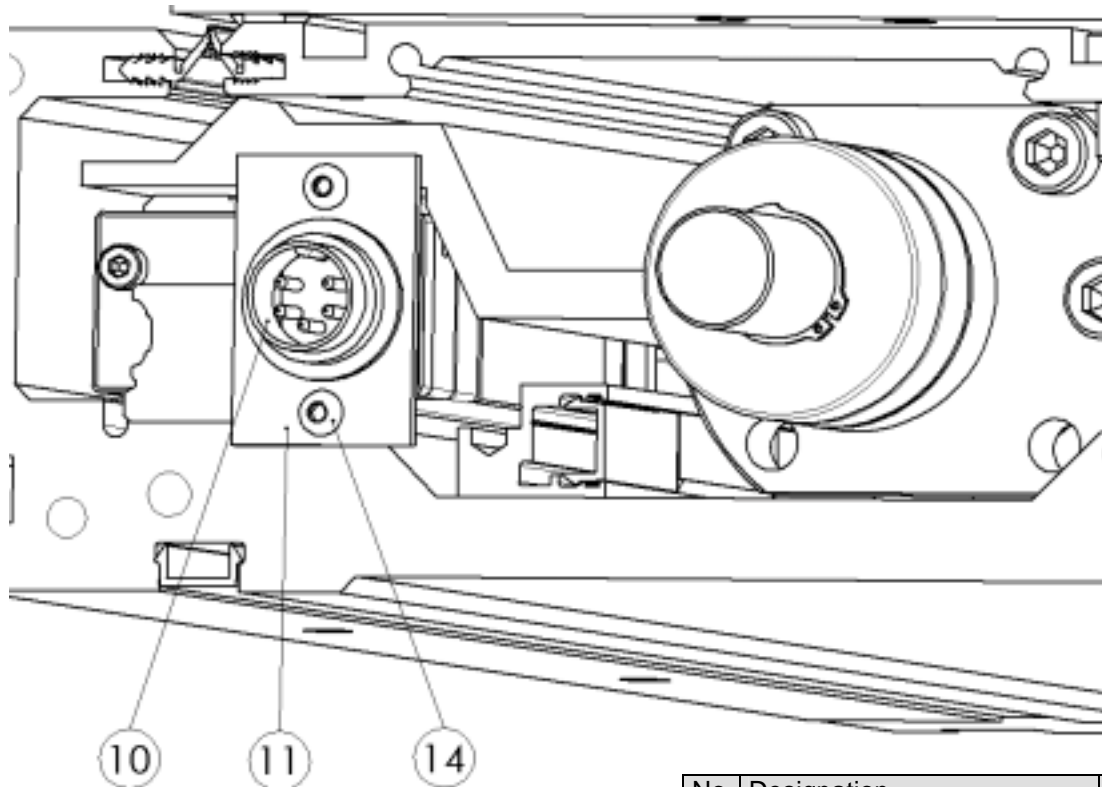
The external installation of the initiators can be made on both sides of the adjustment unit.



No	Designation	Art. No.
8	connector box	1006140
9	Cover	1006139
10	mounting plug	725163
11	holding sheet	025626
13	screw M4 x 30 DIN 912	626485
14	screw M3 x 6 DIN 7380	626164

### 5.1.3 Integrated installation of the initiators

At the integrated installation of the initiators are the initiators inside of the adjustment unit. So they are protected from dirt and mechanical influences.



No	Designation	Art. No.
10	mounting plug	725163
11	holding sheet	025626
14	screw M3 x 6 DIN 7380	626164

## 6 Energy chain

Use a suitable energy chain for all moving cables. The following equation is valid for the minimum radius  $r_{\min}$  for energy chains by the use of IEF-cables.

$$r_{\min} \text{ ### } 10 \times \text{cable diameter}$$

If you use customized cables be aware of the EN 60204. Keep in reserve 30% of space within the energy chain. At the exit of the energy chain a pull relief has to be installed.

**Reference:**

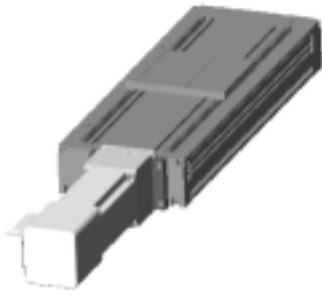
Order cables and energy chains at IEF.

## 7 Motor installation



Motors have to be wired according to the motor data sheet. At customized motors please ask the manufacturer, with which cable the motor has to be connected.

### 7.1 axial motor installation



The slide unit allows an installation of the motor in spindle lengthening through an axial motor flange. The motor wave will be coupled with a pluggable coupler with the spindle journal. For center the motor flange the ball bearing of the spindle movable bearing will be used.

An additional pinning of the motor flange with the end plate is not necessary.

#### 7.1.1 Pluggable coupler

The pluggable coupler system is equipped with a spindle coupler hub, motor coupler hub and an elastic toothed ring.

Following hubs are available:



diameter motor wave	Motor-coupler hub Art. No.
10	733581
12	733583
14	733585
15	733586
19	733590
20	733591

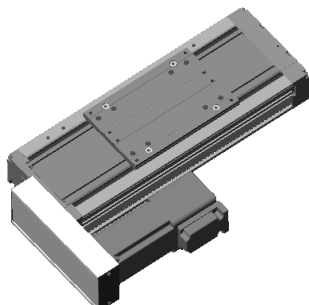
Other motor waves diameters on request!



With installation of the coupler please pay attention, that you don't practice an axial pressure on the toothed ring. Please make sure, that you keep the „installtion measure M“ 16mm in the installed condition. With greasing, the axial mounting force can be reduced.



## 7.2 Motor installation through a 90° offset gear flange



### Advantages:

- shorter installation length
- gear reduction
- Customized installation proportion, because 4 installation variants possible.

### 7.2.1 Overview transmission proportions

transmission $i =$	toothed disk Motor	max. motor wave*	toothed disk spindle	belt length [mm]	axis distance [mm]
1 : 1	32	16	32	330	85
1 : 1	32	16	32	340	90
1 : 1	32	16	32	375	107,50
1 : 1	32	16	32	450	145
1 : 1	32	16	32	500	170
1 : 1	40	20	40	375	87,5
1 : 1	40	20	40	390	95
1 : 1	40	20	40	480	140
1 : 1	40	20	40	525	162,5
2 : 1	16	14	32	300	89,09
2 : 1	16	14	32	305	91,62
2 : 1	16	14	32	330	104,22
2 : 1	16	14	32	390	134,4
2 : 1	16	14	32	420	149,46
2 : 1	16	14	32	450	164,51
2 : 1	20	16	40	330	88,57
2 : 1	20	16	40	340	93,65
2 : 1	20	16	40	420	134,06
2 : 1	20	16	40	450	149,15
2 : 1	20	16	40	480	164,23
2,5 : 1	16	14	40	330	93,04
2,5 : 1	16	14	40	420	138,68
2,5 : 1	16	14	40	480	168,92

Other transmission proportions, respectively, axis distance on request!

\* flat motor wave possible.

## 8 Service/Repair



- Repairs should only be carried out by skilled engineers, who have read and understood the entire operating instructions.

- Only use genuine spare parts es Fa. IEF Werner cannot guarantee otherwise.

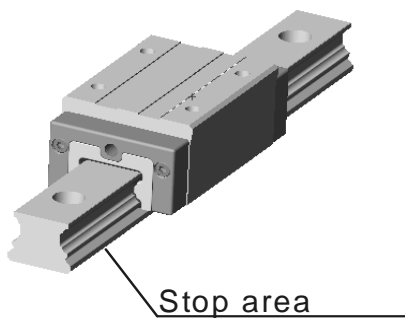


- The system must be de-energized in order to carry out all assembly, disassembly or repair.

- With planing the linear axis, we took take of using low-maintenance components. All roll body units have been equipped, ex works, with a long-life greasing. But to get a long-life, we recommend regular maintenance.

- The needed maintenance intervals depend on the area conditions. If the area conditions are more difficult, we entrust to have short maintenance intervals.

### 8.1 Rail guiding system

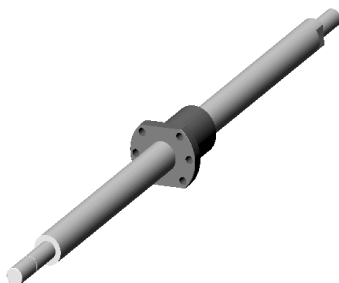


The guide carriages are equipped with a standard faced double sealing system, as well as interior seals and side seals. By the additionally available beaded chain, which has a metallic contact friction between the balls and therefore prevents wear, an improved greasing and thus extremely long regreasing times can be obtained.

For greasing the guide carriages we use the grease from the company Klüber Microlube GL 261. Each guide carriage is equipped with a faced lubrication nipple, for regreasing. The lubrication nipples will be accessible when you remove the cover (see explosion drawing).

If the area conditions are normal, a regreasing should be made after 5000 km running time, or after ca. 1 year, if the 5000 km have not been reached during this time.

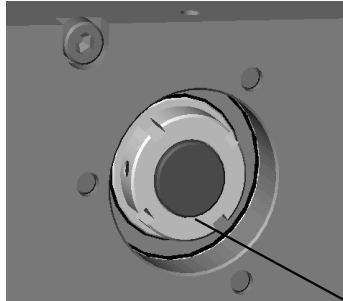
### 8.2 Ball bearing spindle



The ball bearing spindles are equipped with a stripper system.

Ex works, the ball bearing spindles have a grease filling type Klüber (Asonic GLY 32). The spindle nut has a lubrication nipple for regreasing. The lubrication nipples will be accessible when you remove the cover (see explosion drawing).

The recommended maintenance intervals are ca. 600 operations hours, with normal area conditions.



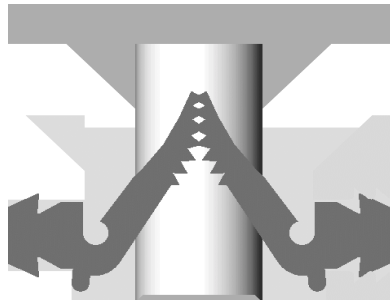
ZM 15

When changing the ball bearing spindle you have to pay attention that the precision groove nut type ZM15 with the grounded stop area is close to the inner raceway of the axial bearing. The groove nut will be safed with on the side installed set screws size 2. Herefore a mounting boring in the end pate is available.

**Technical datas:**

starting torque of the groove nut [Nm]	10
starting moment of the set screw [Nm]	1
IEF-Art. No.	734664

### 8.3 Sealing lip system



The treatment unit is equipped with a oil- and coolant resistant NBR-material sealing lip system, for to protect the inside from dirt.

With high attrition we entrust you to grease the insides of the sealing lips, for to get a better glideing quality.

We entrust, to replace weared sealinglips with new sealing lips Art. No. 1004271.

## 9 Trouble shooting

<b>Error</b>	<b>reason</b>	<b>solving the problem</b>
increased running noise		
	the lifetime of the guide carriages are exceeded	change all guide carriages (Z-Pos.22)
	Profile rail guides are runned in.	change profile rail guides, change all guide carriages (Z-Pos. 22)
	Profile rail guides are corroded.	replace profile rail guide, if needed, change guide carriages (Z-Pos. 21).
	Axial bearing unit damaged	change unit (Z-Pos. 25)
	ball bearing spindle runs dry	grease ball bearing spindle (Z-Pos. 24)
	movable bearing damaged	replace ball bearing (Z-Pos. 26) check spindle seat, replace ball bearing spindle if necessary (Z-Pos. 24)
	End plate is not adjusted for alignment of the ball bearing spindle.	adjust and pin end plate bearing (Z-Pos. 16) and end plate motor (Z-Pos. 17)
	pluggable coupler damaged, or touches the flange case.	Only axial motor installation: replace damaged coupler (Z-Pos. 54,55,56) adjust coupler
	toothed gear belt damaged, or runs at the flanged wheel of the toothed disk.	change toothed belt (Z-Pos. 67) adjust toothed disk (Z-Pos. 64,66), to avoid a crash
	Motor (motor bearing) damaged	change motor (Z-Pos. 57)
	Motor with brake, brake does not open	put power on brake, if the brake does not release, change motor (Z-Pos. 57)
linear module doesn't move		
	limitswitch cable not connected	connect cable
	initiator damaged	change initiator(Z-Pos. 5)
	limitswitch cable damaged	check the limitswitch cable
	the soldered joint at the connector is separated	solder the strands
	motor wiring not correct	check the wiring and change if necessary
	motor damage	change motor (Z-Pos. 57)
	error in the amplifier or in the controller	check the amplifier and the controller
	motor cable damaged	check motor cable, change if necessary
reverse clearance		
	Axial bearing unit with end-plate not tightly screwed	tight screws(Z-Pos. 49)
	axial bearing unit damaged	change unit (Z-Pos. 25)
	groove nut not tighten	tight groove nut and safe it with a lateral set screw. (Z-Pos. 27)
	nut of ball bearing spindle damaged	change ball bearing spindle (Z-Pos. 24)

	pluggable coupler damaged, or stops at the flange case	Only at axial motor installation: replace damaged coupler (Z-Pos. 54,55,56) adjust coupler
	toothed gear belt not tensioned	tension toothed gear belt (Z-Pos. 67)
	toothed motor disk has clearance (keyway)	change the toothed motor disk (Z-Pos. 66), replace the motor if the keyway of the motor shaft is damaged. too. (Z-Pos. 57)
the linear unit crashed during the search of the home position		
	sense of rotation wrong	change sense of rotation
	parting of the motor cable	change cable

## 10 List of parts

### 10.1 Basic unit *profiLINE200*

Z-Pos.	Art.No.	part (1)/ part group(0)		designation	wearing part
15	1000222	0		Basic body	
501	1000230	0		Slide complete	
16	1003993	1		End plate tight bearing	
17	1003992	1		End plate motor	
18	1007096	1		Cover sheet limitswitch	
19	1000225	0		slide cover	
20	1005611	1		flat connecting	
21	1000224	0		guiding rail	x
22	1005620	1		guide carriage	x
23	1005648	1		sealing cap	x
24	1000227	0		spindle	x
25	1005435	1		axial-angular ball bearing	x
26	627093	1		deep groove ball bearing	x
27	734664	1		groove nut	
28	1000233	0		sealing lip	x
29	028668	1		plastic clip	
30	627122	1		boring bush	
31	626890	1		safety ring 15 DIN 471	
32	1008348	1	+	cover D=25/20.5	
33	1005642	1		cover D= 36.5/53	
34	1005640	1		drain plug D=10.7	
35	1005414	1		slide body	
36	1007716	1		lug	
37	626344	1		cylinder pin 6m6 x 40 DIN 6325	
38	627590	1		cylinder pin 6m6 x 55 DIN 6325	
39	626330	1		cylinder pin 5m6 x 24 DIN 6325	
40	626706	1		screw M3 x 10 DIN 912	
41	626123	1		screw M4 x 6 DIN 7991	
42	626483	1		screw M4 x 10 DIN 912	
43	626061	1		screw M4 x 16 DIN 912	
44	626488	1		screw M5 x 12 DIN 912	
45	626232	1		screw M5 x 18 DIN 912	
46	626233	1		screw M5 x 45 DIN 912	
47	626036	1		screw M6 x 25 DIN 912	
48	627158	1		screw M6 x 30 DIN 912	
49	1005649	1		screw M6 x 35 DIN 6912	
50	626041	1		screw M6 x 45 DIN 912	

+ Using per execution

### consume material

1	1008457			2 component-clue	
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## 10.2 limitswitch rail internal

Z-Pos.	Art.No.	part (1)/ part group(0)	designation	wearing part
1	1003692	0	Al-rail	
2	028668	1	Clip-rail	
3	028585	1	limitswitch holder	
4	030887	1	set screw M4	
5	025165	1	initiator PNP-Öffner	x
5	726744	1	initiator PNP-Schließer	x
10	725163	1	installation plug	
11	025626	1	holding sheet	
12	626061	1	M4 x 16 DIN 912	
14	626164	1	screw M3 x 6 DIN 7380	

## 10.3 limitswitch rail external

Z-Pos.	Art.No.	part(1)/ part group(0)	designation	wearing part
1	1003692	0	Al-rail	
2	028668	1	Clip-rail	
3	028585	1	limit switch holder	
4	030887	1	set screw M4	
5	025165	1	initiator PNP-Opener	x
5	726744	1	initiator PNP-Closer	x
8	1006140	1	connection box	
9	1006139	1	cover	
10	725163	1	installation plug	
11	025626	1	holding sheet	
12	626061	1	M4 x 16 DIN 912	
13	626485	1	screw M4 x 30 DIN 912	
14	626164	1	screw M3 x 6 DIN 7380	
6	1006129	1	seal switch panel	

+ using per execution

## 10.4 motor installation axial

Z-Pos.	Art.No.	part (1)/ part group(0)	designation	wearing part
51	*	1	motor flange axial	
52	1005697	1	clamping rail L=69mm	
53	220701	1	clamping element type 16	
54	733586	1	coupler hub spindle	
55	733592	1	toothed ring (red)	X
56	*	1	coupler hub motor	
57	*	1	motor	X
58	626059	1	screw M5 x 16 DIN 912	
59	*	1	screw	

\* Art. No. per used componets, will be defined in customised list of part.

## 10.5 motor installation through 90° offset gear flange

Z-Pos.	Art.No.	part (1)/ part group(0)		designation	wearing part
60	*	0		case for gear belt	
61	1003999	1		cover	
62	1000258	0		insertion cover	
63	527263	1	+	clamping set 15/28	
64	*	1		toothed disk spindle	
65	*	1	+	clamping set	
66	*	1		toothed disk motor	
67	*	1		gear toothed belt	X
68	028574	1		tormentor	
69	*	1		Motor	X
70	*	0		Reduce hull	
71	*	1		Schraube	
72	626764	1		Schraube M5 x 12 DIN 912	
73	626072	1		Schraube M4 x 8 ISO 7380	

\* Art. No. per used componets, will be defined in customised list of part.

+ using per execution



# 11 motor installation variants

**installation variant 0**



**installation variant 1**



**installation variant 2**



**installation variant 3**



**installation variant 4**



**installation variant 5**



## 12 Standard strokes *profilINE200*

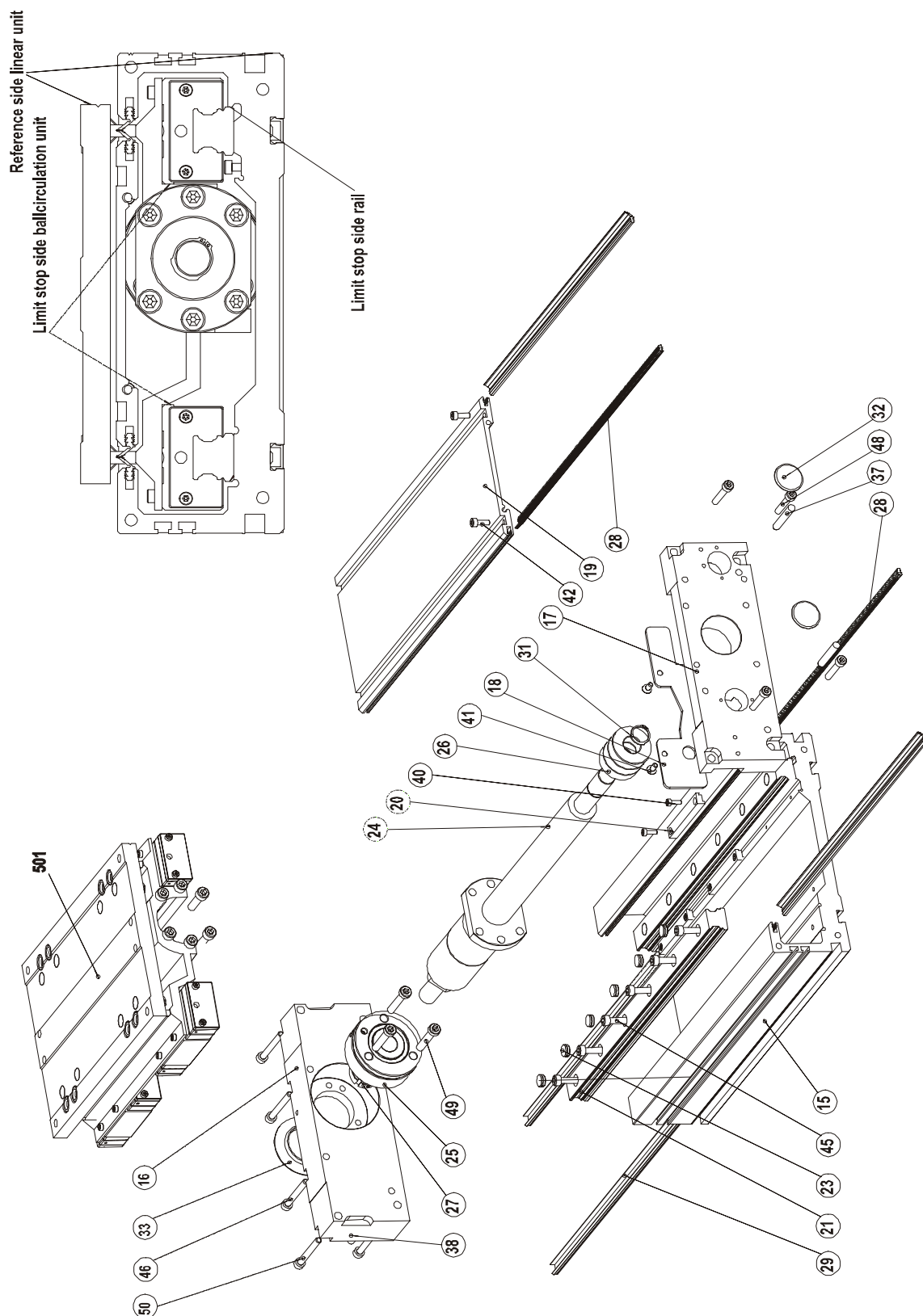
Prefered		special stroke	
stroke [mm]	length basic unit LB [mm] incl. end plate	stroke [mm]	length basic unit LB [mm] incl. end plate
60	412	30	382
120	472	90	442
180	532	150	502
240	592	210	562
300	652	270	622
360	712	330	682
420	772	390	742
480	832	450	802
540	892	510	862
600	952	570	922
660	1012	630	982
720	1072	690	1042
780	1132	750	1102
840	1192	810	1162
900	1252	870	1222
960	1312	930	1282
1020	1380	990	1342

## 13 tightness torque for screw connections

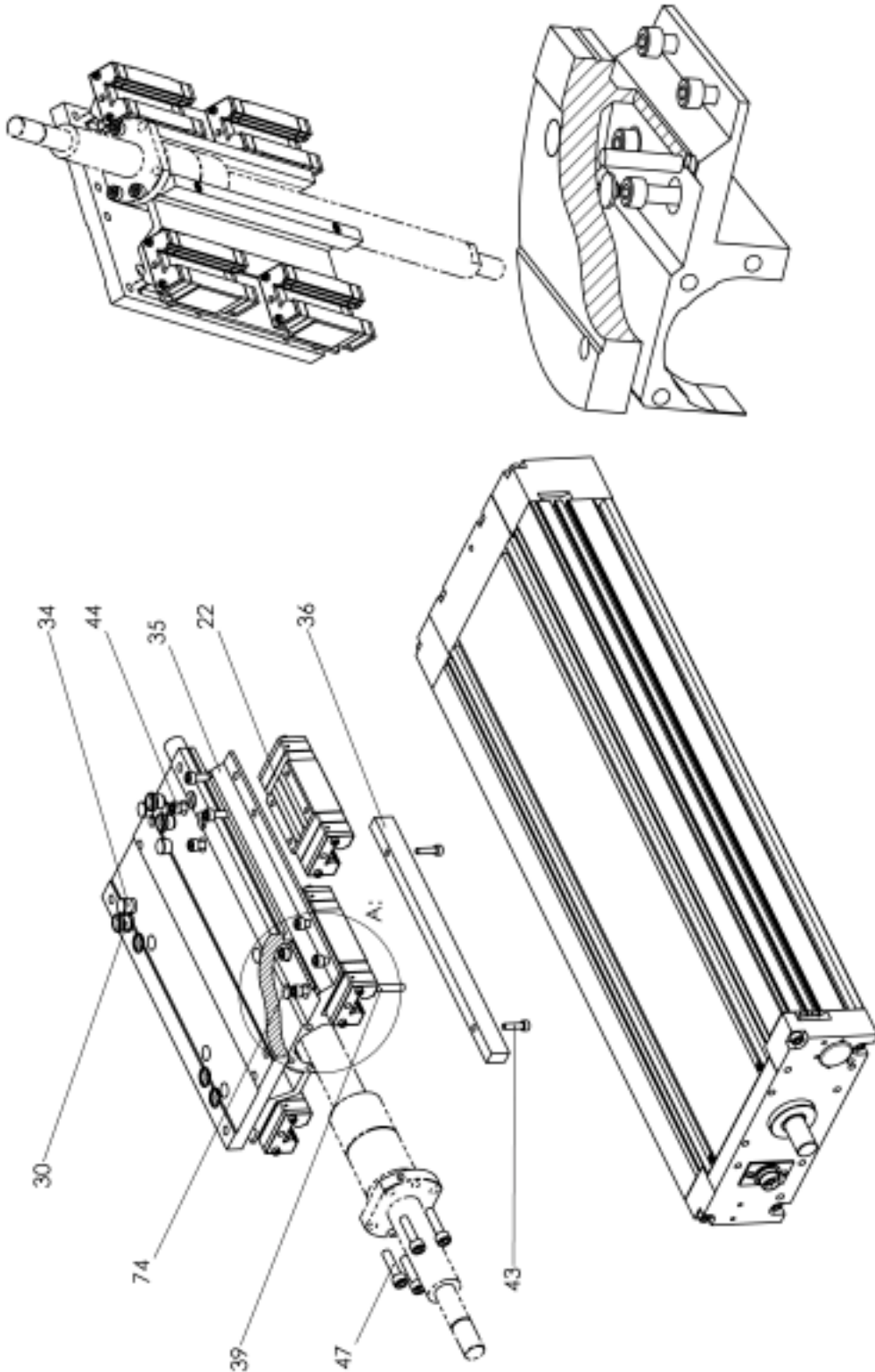
screw 8.8 DIN 912	M3	M4	M5	M6	M8
torque [Nm]	1,3	2,7	5,5	9,5	23

# 14 dimensioned drawings *profiLINE200*

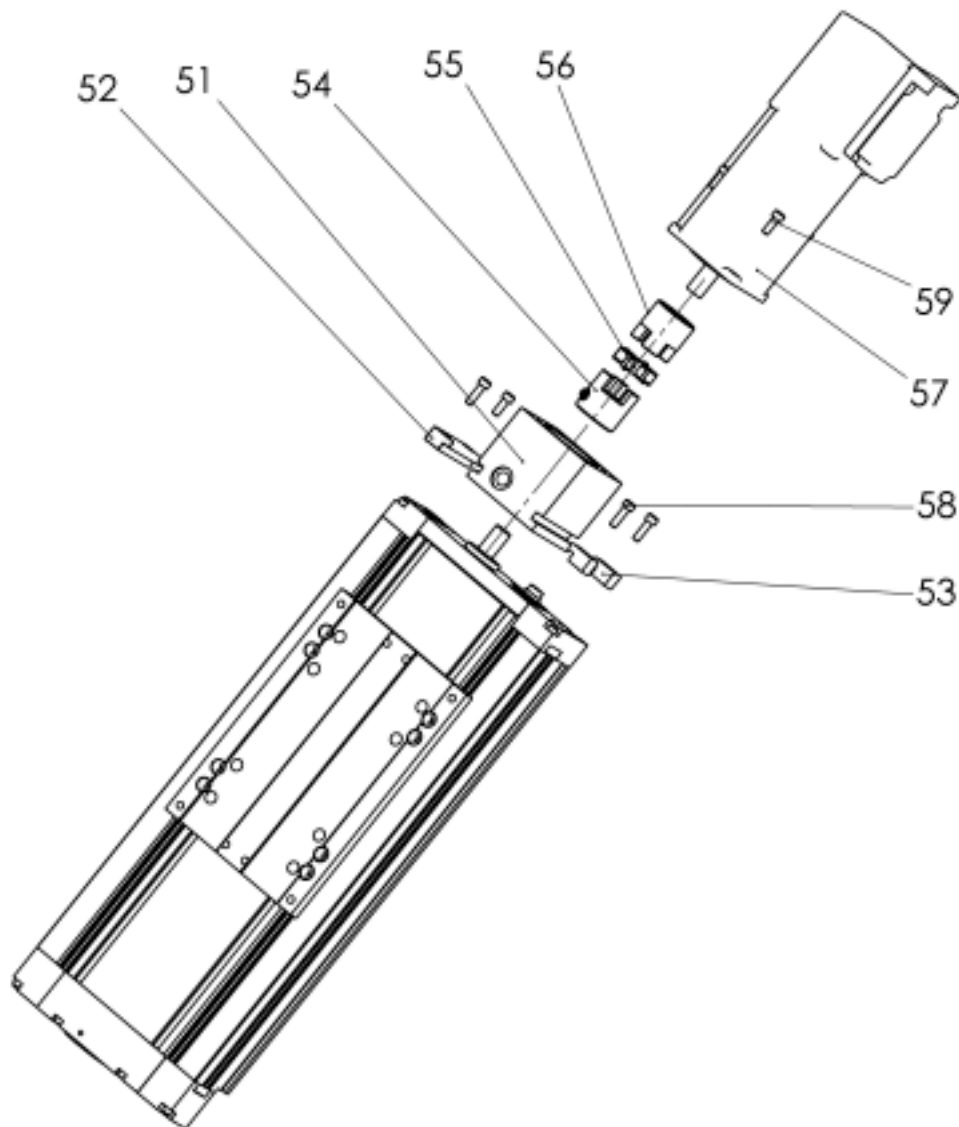
## 14.1 Explosionsdrawing



## 14.2 slide profiLINE, explosiondrawing

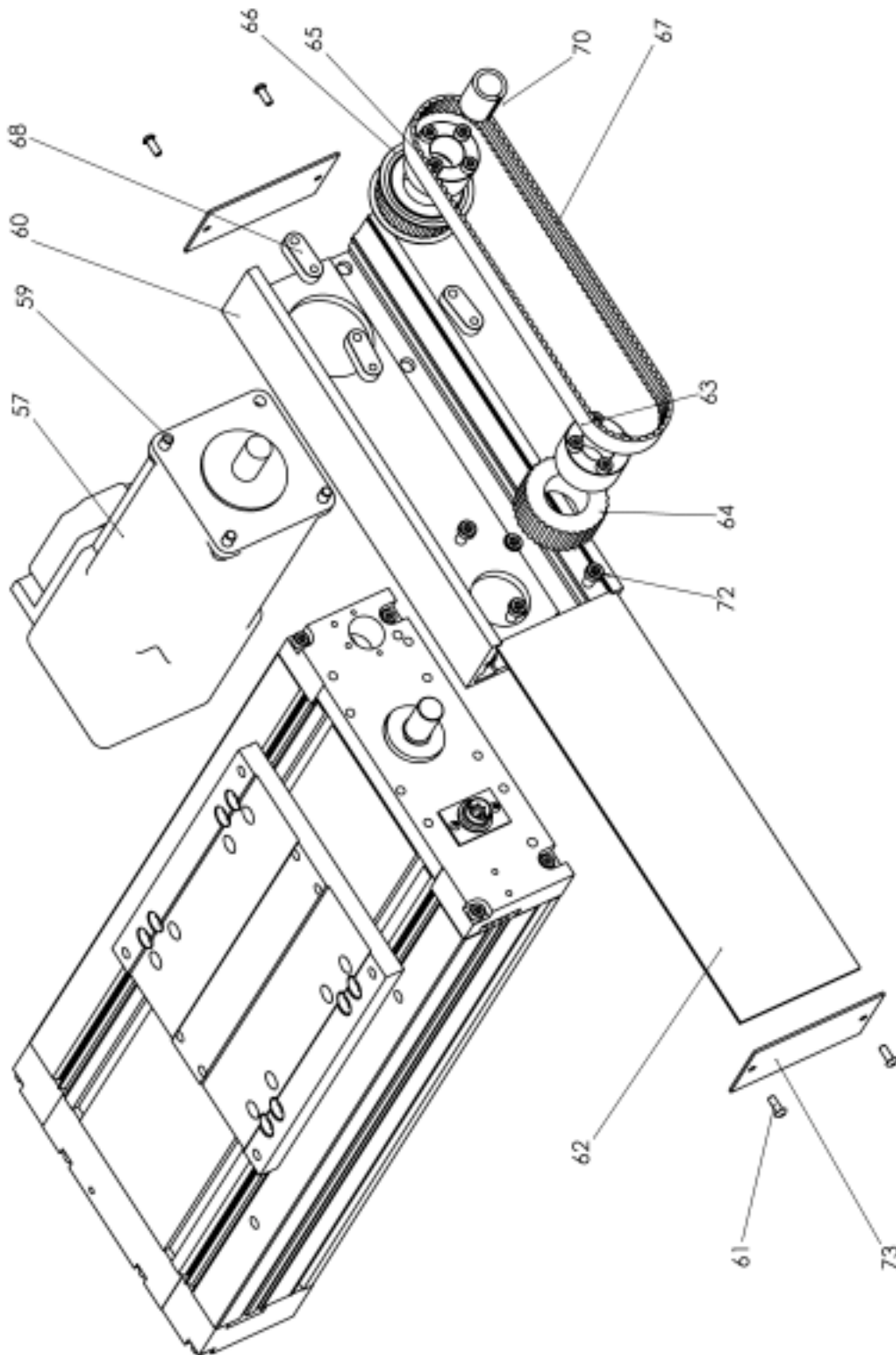


## 14.3 Axial motor flange, explosiondrawing

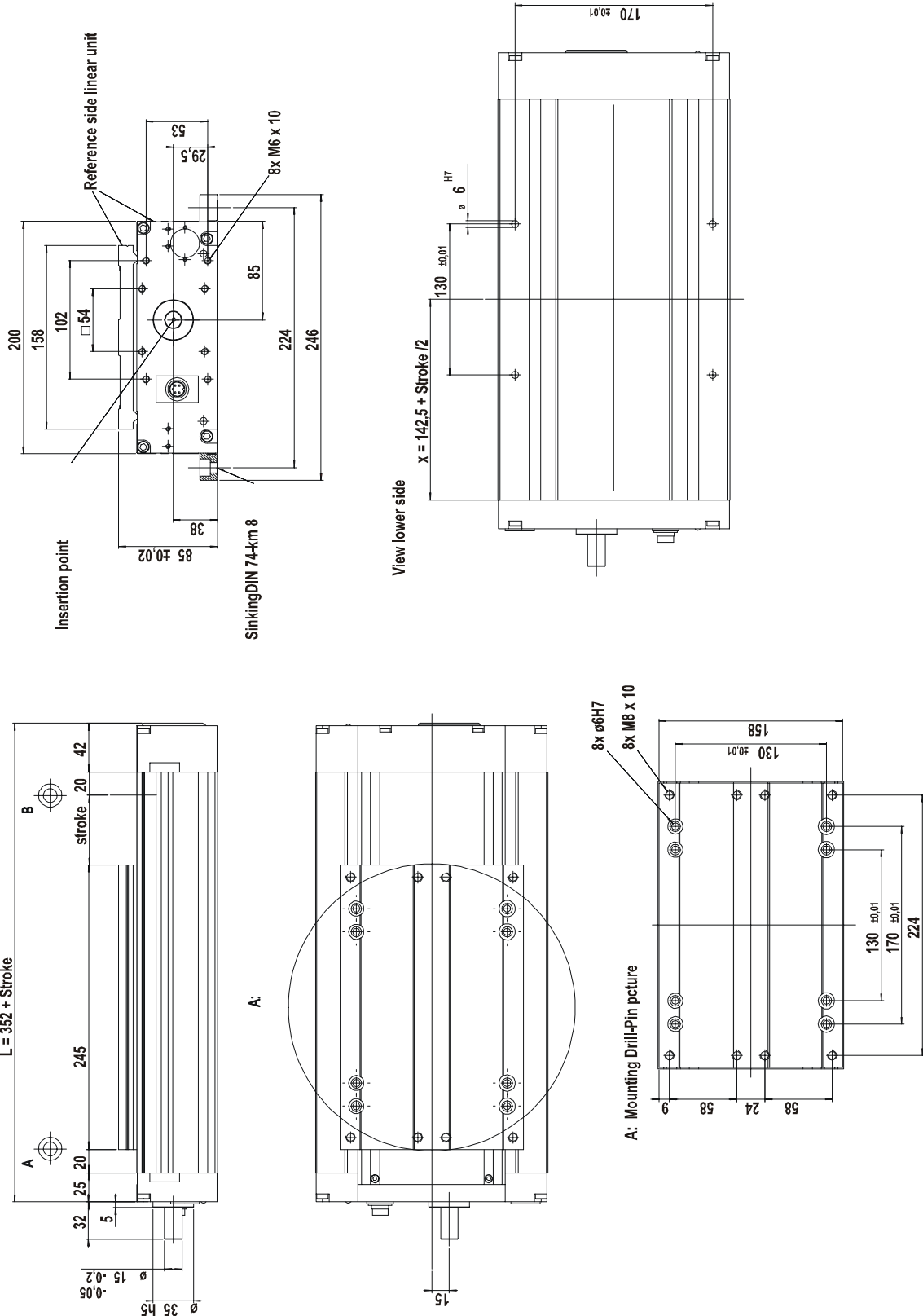


□

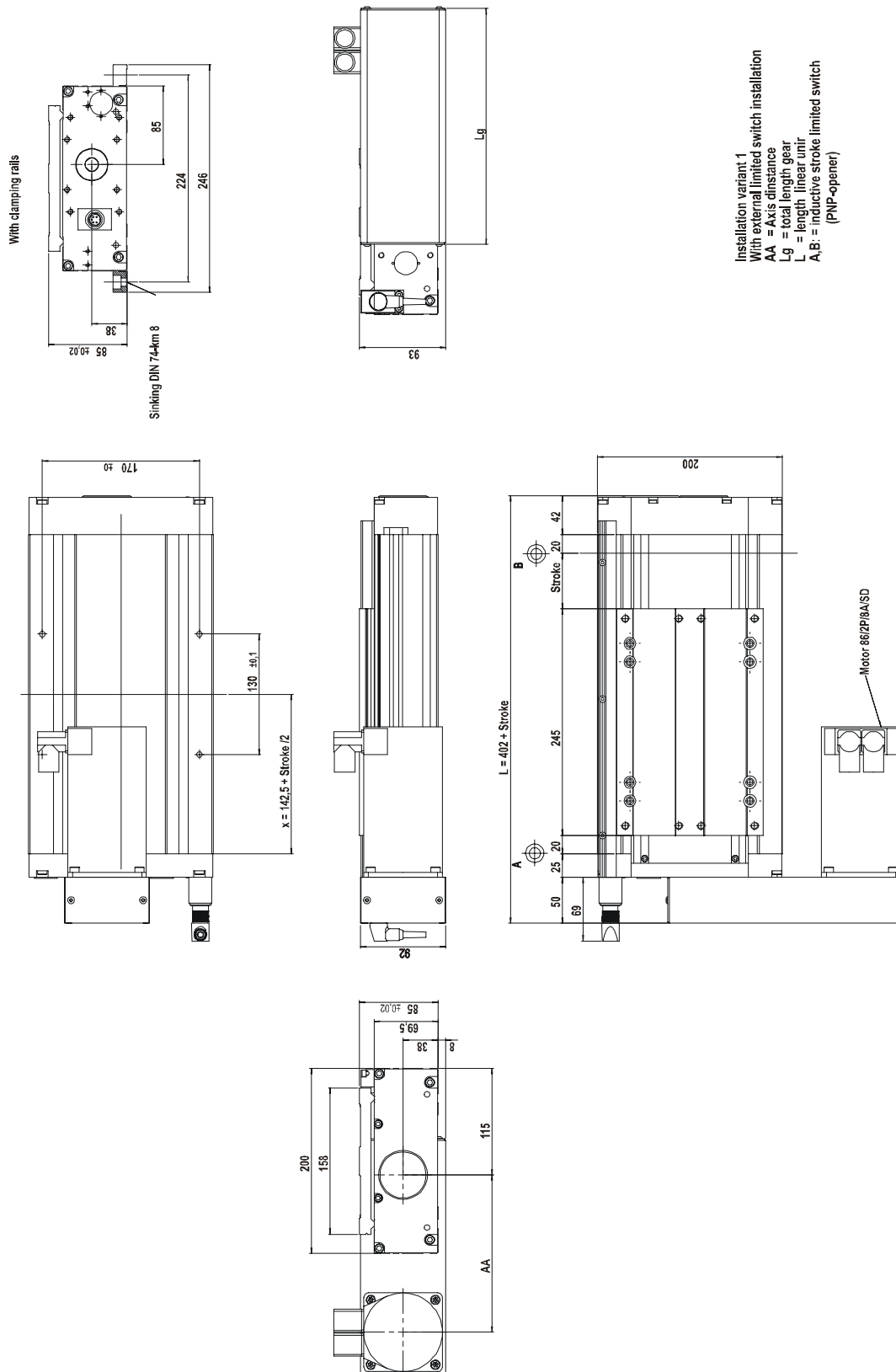
## 14.4 Motor installation through an angled gear flange



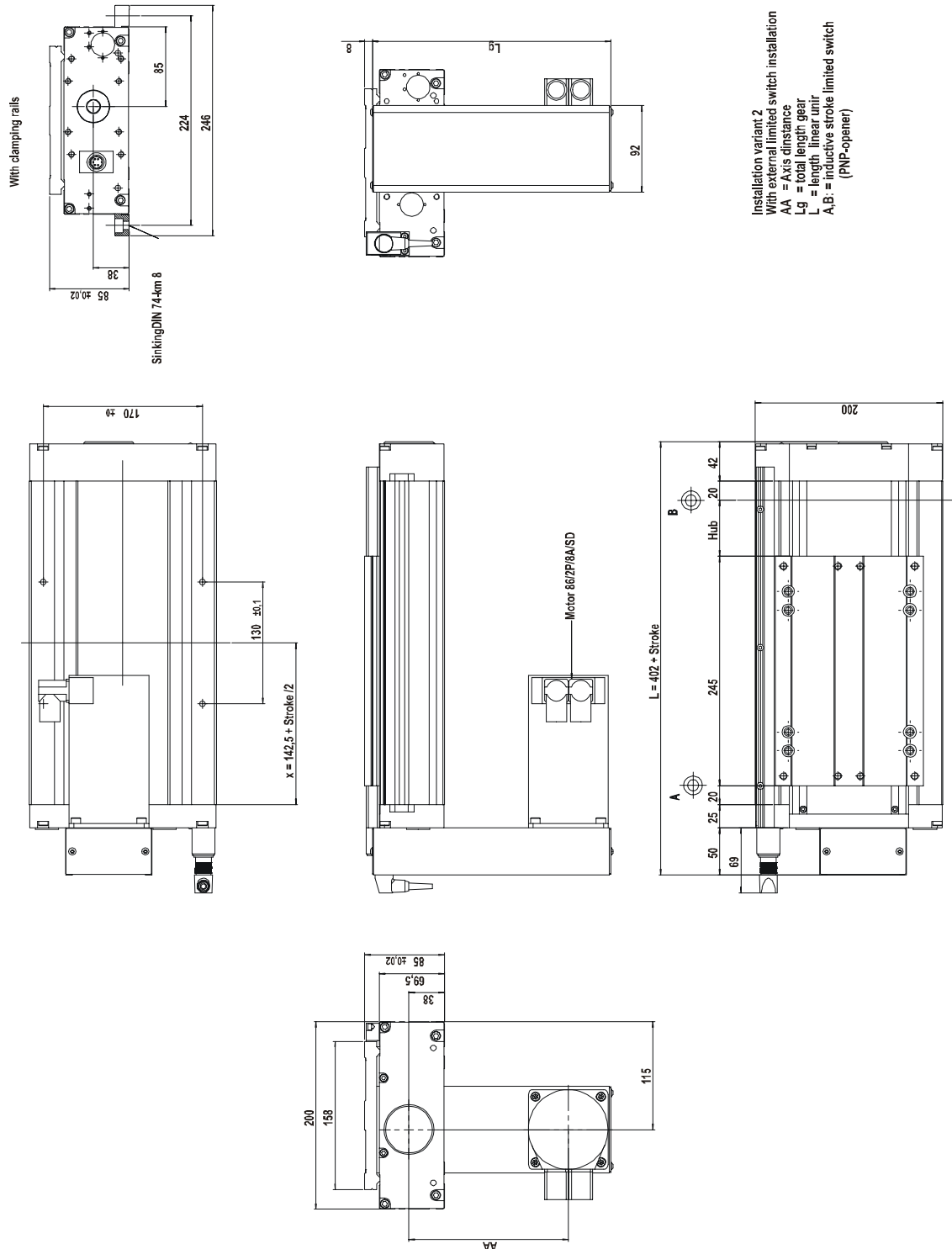
## 14.5 ProfiLINE 200, Installation variant 0



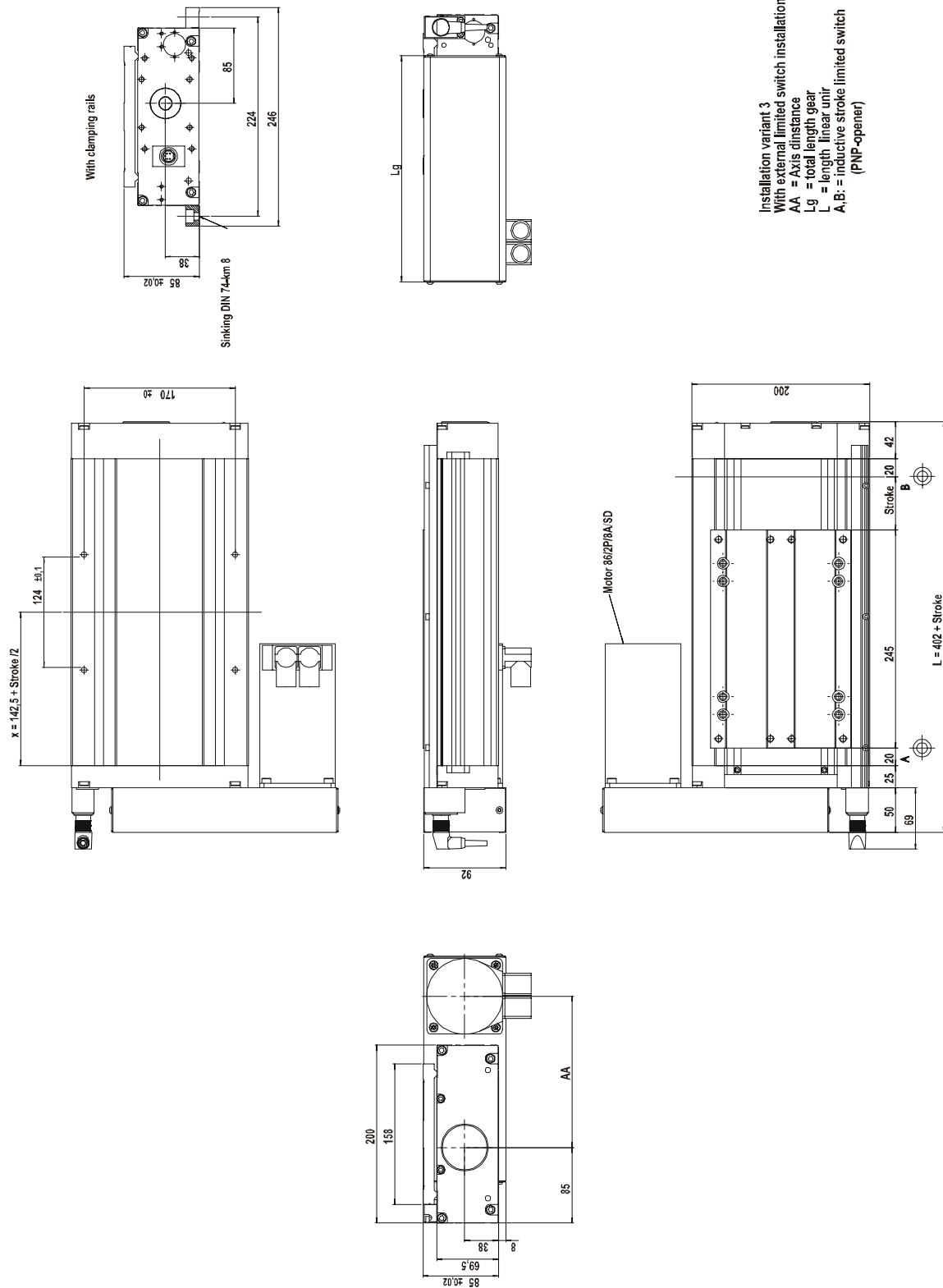
## 14.6 ProfiLINE 200, Installation variant 1



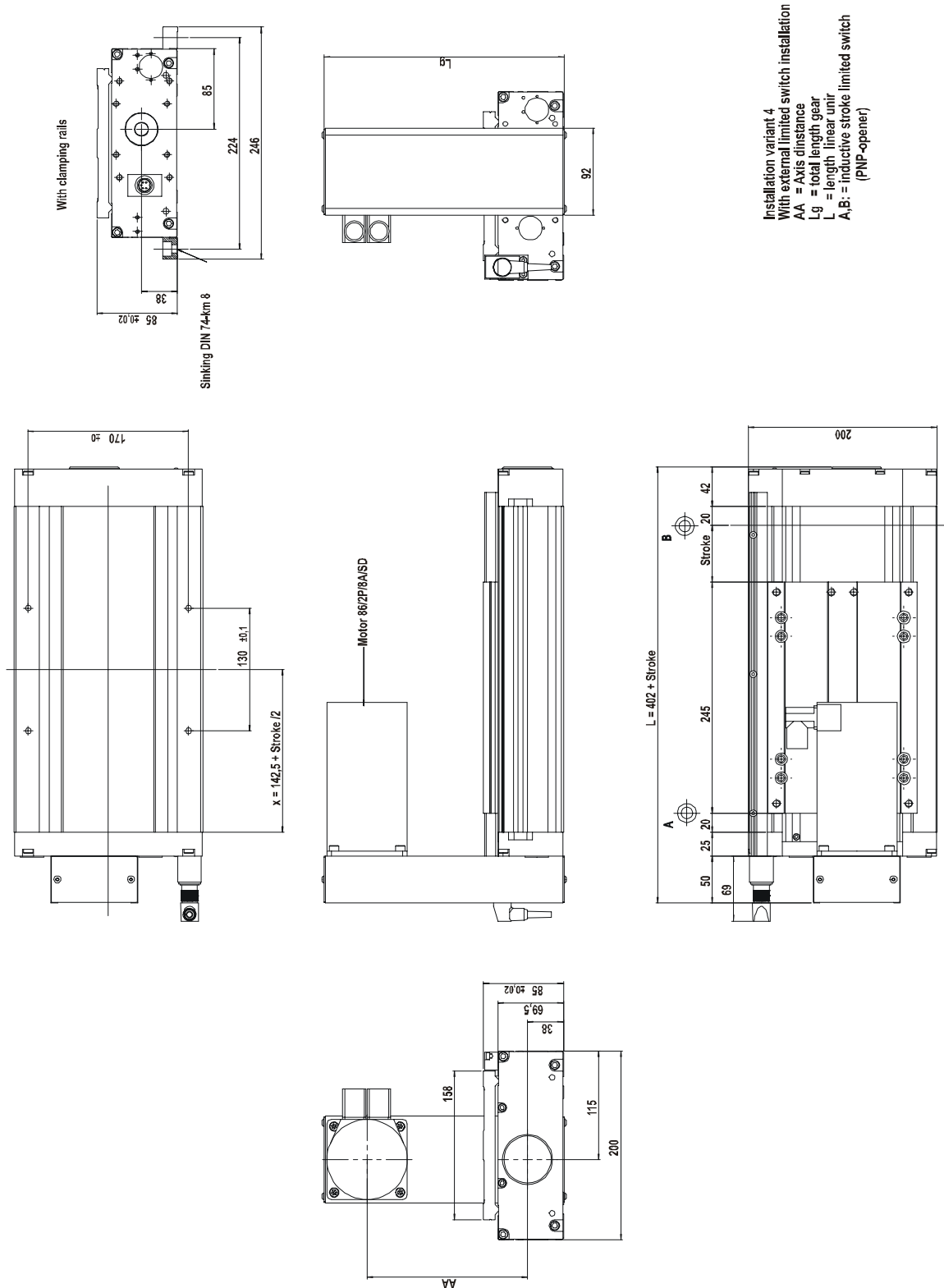
## 14.7 ProfiLINE 200, Installation variant 2



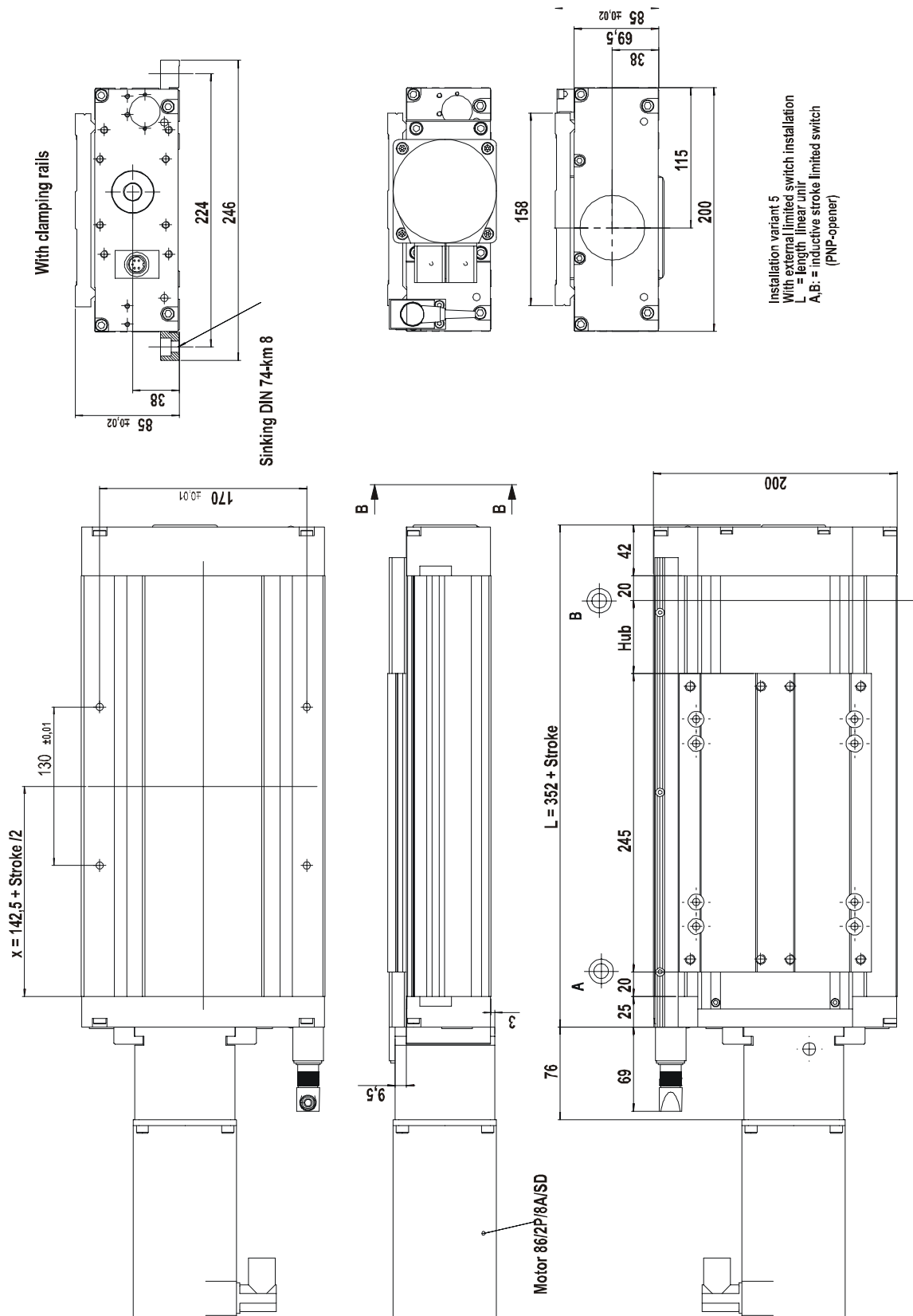
## 14.8 ProfiLINE 200, Installation variant 3



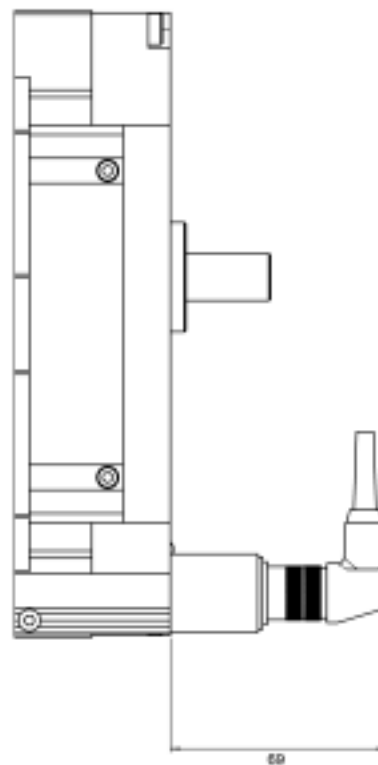
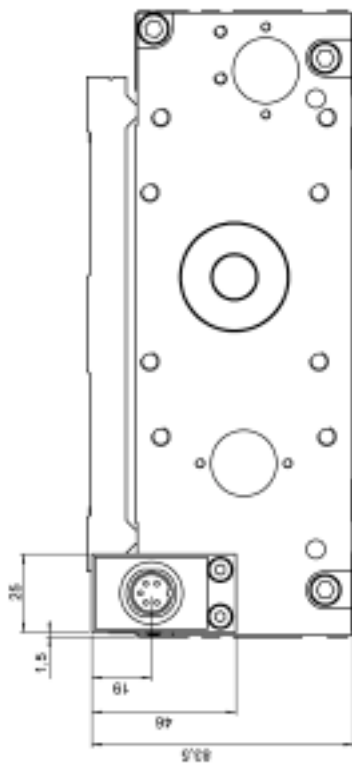
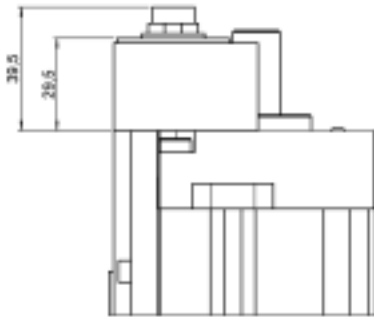
## 14.9 ProfiLINE 200, Installation variant 4



## 14.10 ProfiLINE 200, Installation variant 5

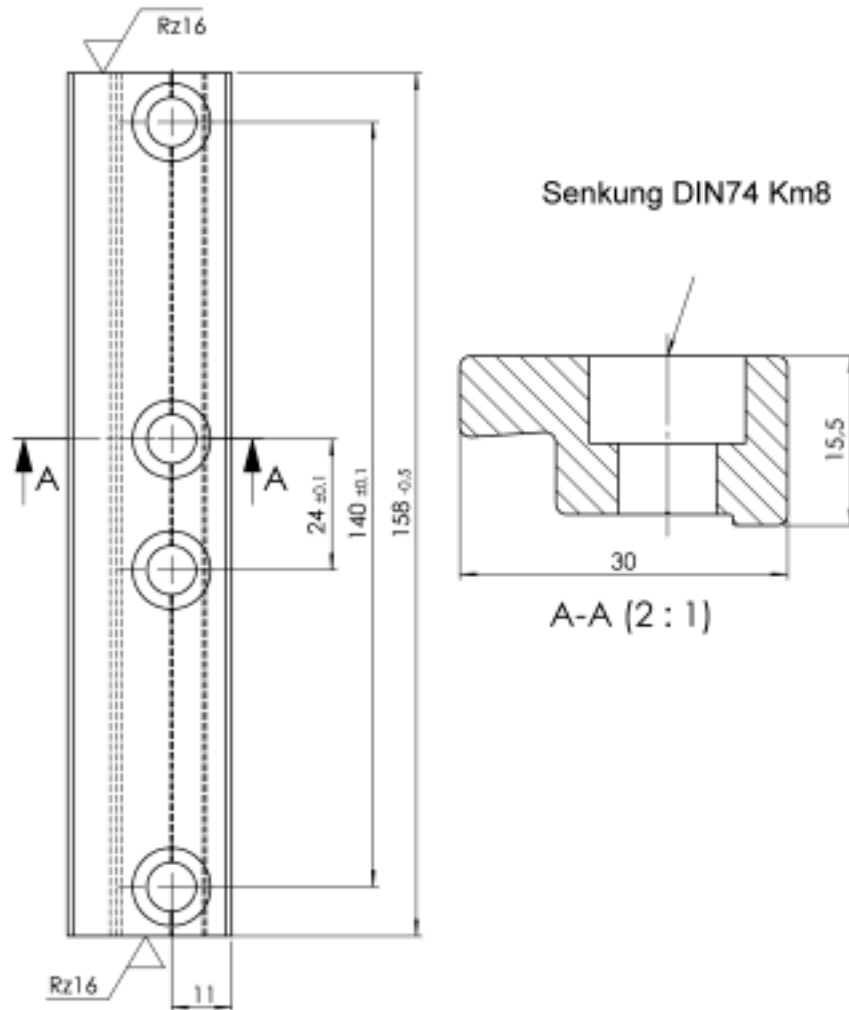


## 14.11 ProfiLINE 200, ext. limit switch installation



## 14.12 ProfiLINE 200, Clamping rail M142

Part-No.: 1006097



## 14.13 ProfiLINE 200, Distance plate

Part-No.: 1006097

