

Assembly and Operating Manual

EPM

Portal module



Imprint

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Dear Customer,

thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

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1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under [Applicable documents](#) [► 6] are applicable.

1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.



⚠ DANGER

Danger for persons!

Non-observance will inevitably cause irreversible injury or death.



⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.



⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

NOTICE

Material damage!

Information about avoiding material damage.

1.1.2 Applicable documents

- General terms of business*
- Catalog data sheet of the purchased product *

The documents marked with an asterisk (*) can be downloaded on our homepage schunk.com

1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the specified maintenance and lubrication intervals
- Observe the ambient conditions and operating conditions

Parts touching the workpiece and wear parts are not included in the warranty.

1.3 Scope of delivery

The scope of delivery includes

- Portal module EPM in the version ordered

1.4 Accessories

The following accessories are required for the module:

- Cable set [Cable set](#) [▶ 6]
- Drive control unit [Drive controller](#) [▶ 6]
- Power supply unit [Power supply unit](#) [▶ 6]

Order accessories separately.

1.4.1 Cable set

Cables must be designed for the module and the drive controller used.

For design, exact type designations and order numbers, consult your SCHUNK contact person

1.4.2 Drive controller

The drive controller must be designed for the module and the application

For design, exact type designations and order numbers, consult your SCHUNK contact person

1.4.3 Power supply unit

The power supply unit must be designed for the module and the application.

For design, exact type designations and order numbers, consult your SCHUNK contact person

1.4.4 Stroke measuring system

For increasing the positioning accuracy

The stroke measuring system accessory comes complete with the linear module and cannot be delivered separately.

If necessary, contact your SCHUNK contact person

1.4.5 Hydraulic shock absorber

For avoiding damage in the event of malfunctions

Description	Type / ID
Damper for EPM 37	SD37-P / 0314280
Damper for EPM 48	SD48-P / 0314296

1.4.6 Fan cooling

For increasing the continuous force of EPM 37 in case of increased demand.

Alternatively, cooling with compressed air is also possible via a connection provided for this purpose [Air connections](#) [► 20].

Description	Type / ID
Fan cooling for EPM 37	MK 37 / 0314242

1.4.7 Bellow

The module is optionally available with a bellow. This increases the protection against penetrating materials. This version is only available in fixed stroke variants.

More information can be found in the catalog or contact your SCHUNK contact person.

1.4.8 Cable track

For guiding electric and pneumatic lines

The cable track is available for "horizontal slide" and "vertical slide" versions.

Several mounting variants are possible [Assembling cable track KSH / KSV](#) [► 22].

1.4.9 Support pillars and mounting materials

Support pillars as well as adapter plates and mounting materials are available for the portal modules.

More information can be found in the catalog or contact your SCHUNK contact person.

1.4.10 T-nuts

For mounting the linear module on the machine / system.

Description	Type / ID
T-nut for EPM 37	NT-M5 / 0313607
T-nut for EPM 48	NT-M8 / 0313608

2 Basic safety notes

2.1 Intended use

The product is exclusively designed for linear movement of useful loads into any desired position.

- The product may only be used within the scope of its technical data, [Technical data](#) [▶ 16].
- When implementing and operating components in safety-related parts of the control systems, the basic safety principles in accordance with DIN EN ISO 13849-2 apply. The proven safety principles in accordance with DIN EN ISO 13849-2 also apply to categories 1, 2, 3 and 4.
- The product is intended for installation in a machine/system. The applicable guidelines must be observed and complied with.
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this manual.

2.2 Not intended use

It is not intended use if the product is used, for example, as a pressing tool, stamping tool, lifting gear, guide for tools, cutting tool, clamping device or a drilling tool.

- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

2.3 Constructional changes

Implementation of structural changes

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- Structural changes should only be made with the written approval of SCHUNK.

2.4 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts or spares authorized by SCHUNK.

2.5 Ambient conditions and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, [Technical data](#) [▶ 16].

2.6 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

Trained electrician	Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.
Qualified personnel	Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.
Instructed person	Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.
Service personnel of the manufacturer	Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

2.7 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

2.8 Notes on safe operation

Incorrect handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

2.9 Transport

Handling during transport

Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

2.10 Malfunctions

Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

2.11 Disposal

Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

2.12 Fundamental dangers

General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

2.12.1 Protection during handling and assembly

Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

2.12.2 Protection during commissioning and operation

Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

2.12.3 Protection against dangerous movements

Unexpected movements

Residual energy in the system may cause serious injuries while working with the product.

- Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.
- The faulty actuation of connected drives may cause dangerous movements.
- Operating mistakes, faulty parameterization during commissioning or software errors may trigger dangerous movements.
- Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.
- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/prevent accidental access for people in this area due through technical safety measures. The protective cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before starting up the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

2.13 Notes on particular risks



⚠ DANGER

Risk of fatal injury from suspended loads!

Falling loads can cause serious injuries and even death.

- Stand clear of suspended loads and do not step within their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.
- Wear suitable protective equipment.



⚠ WARNING

Risk of injury from objects falling and being ejected!

Falling and ejected objects during operation can lead to serious injury or death.

- Take appropriate protective measures to secure the danger zone.



⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.



⚠ WARNING

Risk of injury from sharp edges and corners!

Sharp edges and corners can cause cuts.

- Use suitable protective equipment.



⚠ WARNING

Risk of burns through contact with hot surfaces!

The product can heat up considerably during operation. Touching hot surfaces can cause burns.

- Do not touch hot surfaces.
- Let them cool down before working on the product.
- Wear appropriate safety equipment.

**⚠ WARNING****Risk of injury from parts coming loose!**

If the shock absorbers are faulty, the product can become damaged. Parts coming loose in this way can lead to injuries.

- Regularly check the components for wear and damage.

**⚠ WARNING****Risk of injury if the condition or behavior of the product is undefined!**

Cutting off the compressed air supply in an uncontrolled manner could lead to undefined states and behavior. This may cause personal injury or material damage.

- The operator must define suitable emergency stop and restarting strategies.
 - ✓ Emergency stop strategies: e.g. by means of controlled shut down
 - ✓ Restarting strategies: e.g. using pressure build-up valves or suitable valve switching sequences

**⚠ WARNING****Risk of injury due to magnetic fields in the immediate vicinity!**

In case of exposure to magnetic fields, the product may malfunction. Workpieces may fall down or be ejected and cause severe injuries.

- Sufficiently shield magnetic fields in the immediate vicinity of the product.
- Make sure that the product is prevented from malfunctioning.

3 Technical data

More technical data is included in the catalog data sheet.
Whichever is the latest version.

3.1 Basic version

	EPM 37	EPM 48
Mechanical operating data		
Max. useful stroke [mm]	1380	1290
Max. nominal payload (horizontal installation) [kg]	15	50
Ambient temperature [°C]		
Min.	10	10
Max.	65	65
Max. stator temperature [°C]	65	65
Max. driving force [N]	160	580
Max. nominal/continuous force (can be increased by cooling) [N]	54	257
Repeat accuracy (more accurate positioning through the stroke measuring system accessory) [mm]	±0.1	±0.1
Max. speed [m/s]	2.1	2.3
Max. acceleration [m/s ²]	42.5	82
IP rating	40	40
Noise emission [dB(A)]	≤ 72	≤ 72
Nominal voltage [VDC]	72	72
Electrical operating data		
Nominal power current [A]	2.6	6.5
Max. current [A]	8	15
Operating data for compressed air connection		
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:7 4 4	

3.2 Fan cooling

	MK
Nominal voltage [VDC]	24

3.3 Stroke measuring system

	WSE 37	WSE 48
Operating voltage [VDC]	5 ($\pm 5\%$)	5 ($\pm 5\%$)
Repeat accuracy [mm]	± 0.01	± 0.01
Resolution [mm]	0.001	0.001
Pulse interval [s]	0.00025	0.00025

4 Assembly

4.1 Connections

4.1.1 Mechanical connection



⚠ WARNING

Risk of injury due to unexpected movements of the machine/ system!

- Switch off the energy supply.

Check the flatness of the bolting surface

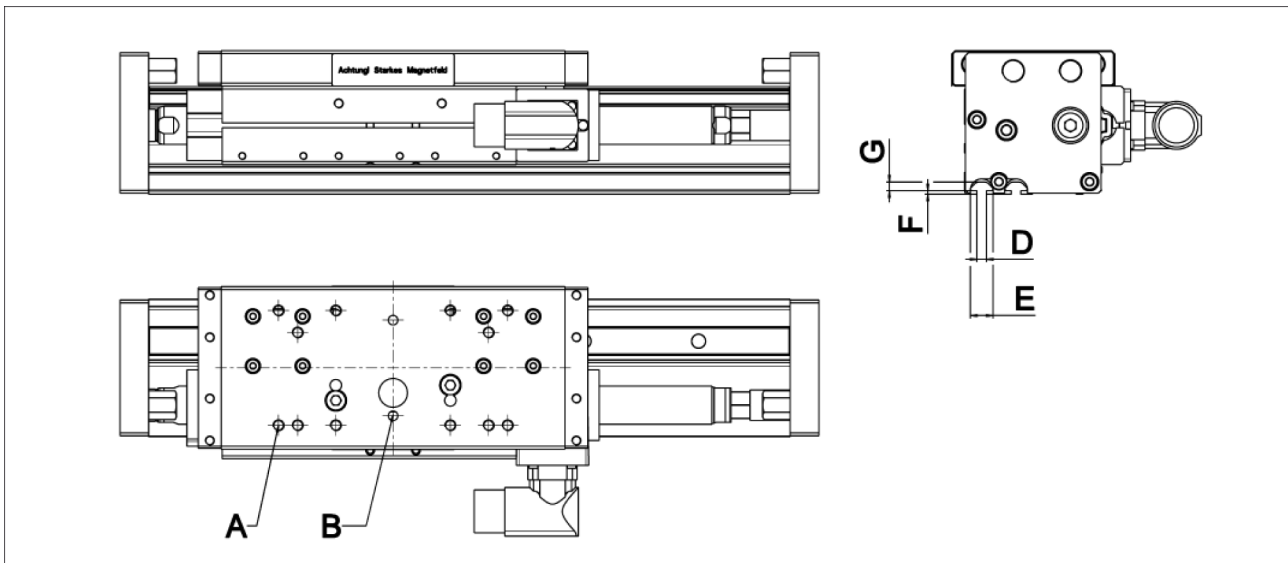
The values refer to the entire bolting surface.

Edge length [mm]	Permissible unevenness [mm]
< 100	< 0.02
> 100	< 0.05

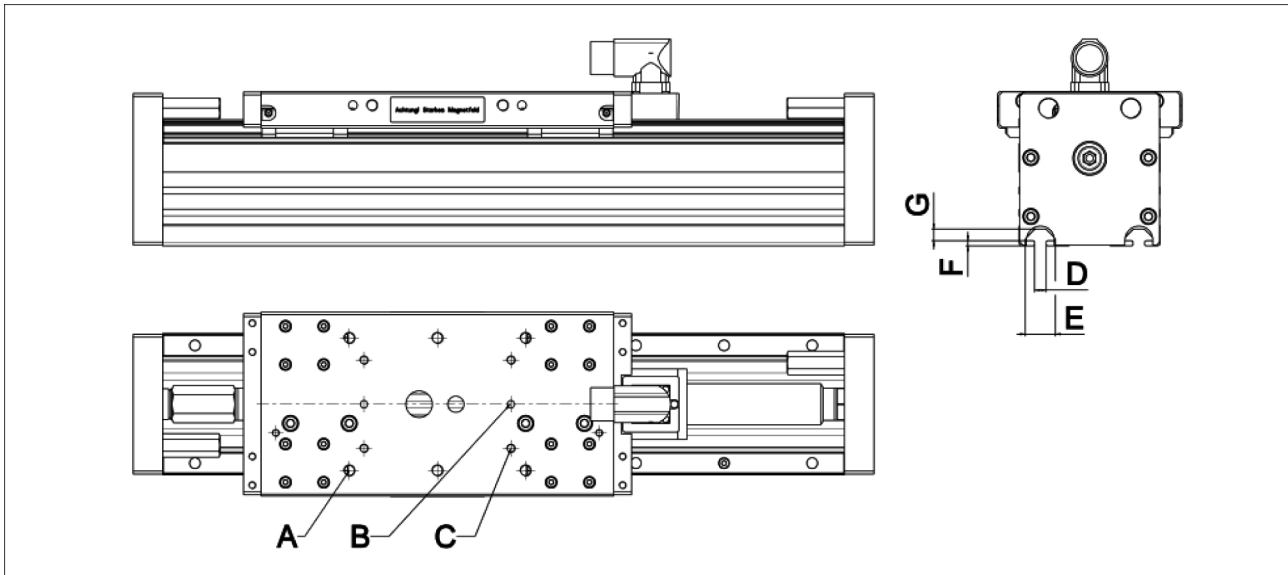
Assembly

Grooves fasten the module underneath on the profile, the load can be mounted and fastened on the slide using bore holes and threads.

Position dimensions, etc. Catalog.

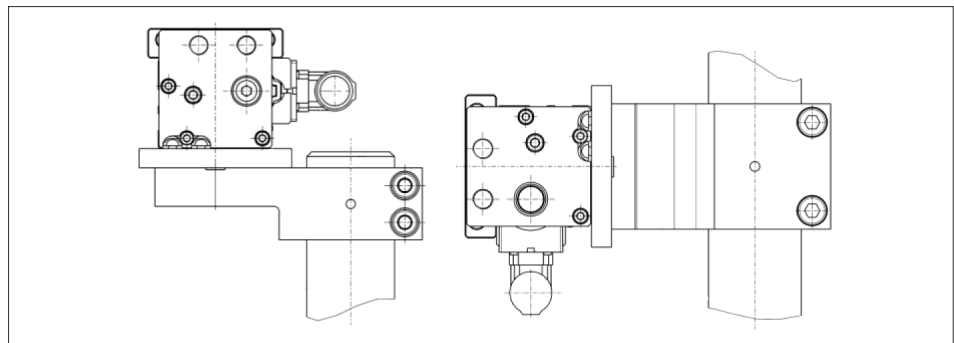


Connection geometries EPM 37




Connection geometries EPM 48

	EPM 23	EPM 37
A [mm]	M6 / 11 (12x)	M8 / 16 (6x)
W [mm]	Ø5F7 / 10 (2x)	Ø5F7 / 8 (2x)
C	-	M6 / 12 (4x)
D [mm]	5	8
E [mm]	11.77	20.5
F [mm]	1.8	3.5
G [mm]	4.55	7.95

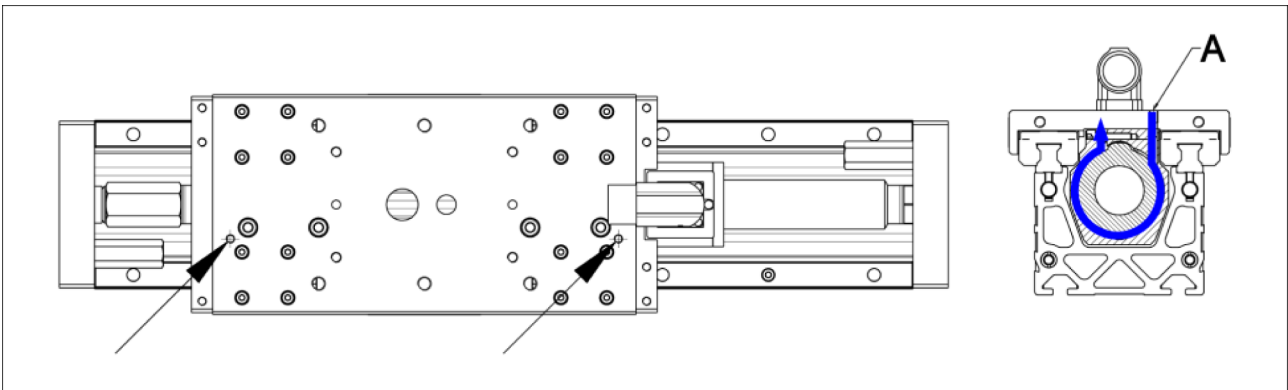


Fitting example EPM 37 on pillar profile modular system, horizontal and vertical

Additional information on the pillar profile modular system and mounting elements for attachment  Catalog.

4.1.2 Air connections

The EPM 48 module has two compressed air connections for cooling the drive.



Air connections

	EPM 48
A	M5 (2x)

4.1.3 Electrical connection

Use the specified cable sets and controllers. If necessary, contact your SCHUNK contact person

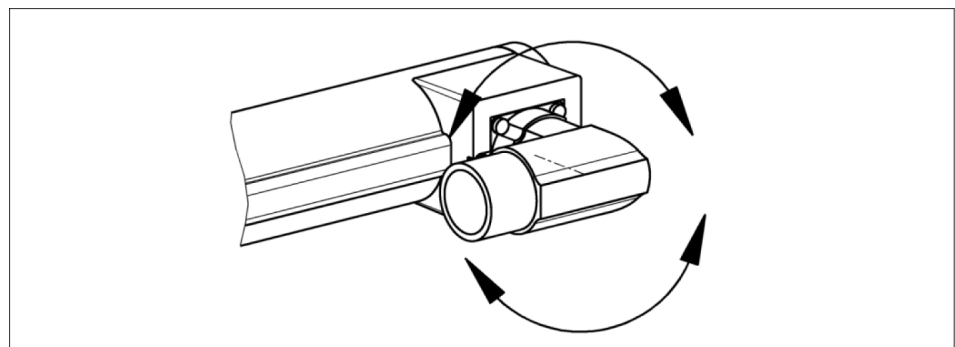


⚠ DANGER

Danger from electric voltage!

Touching live parts may result in death.

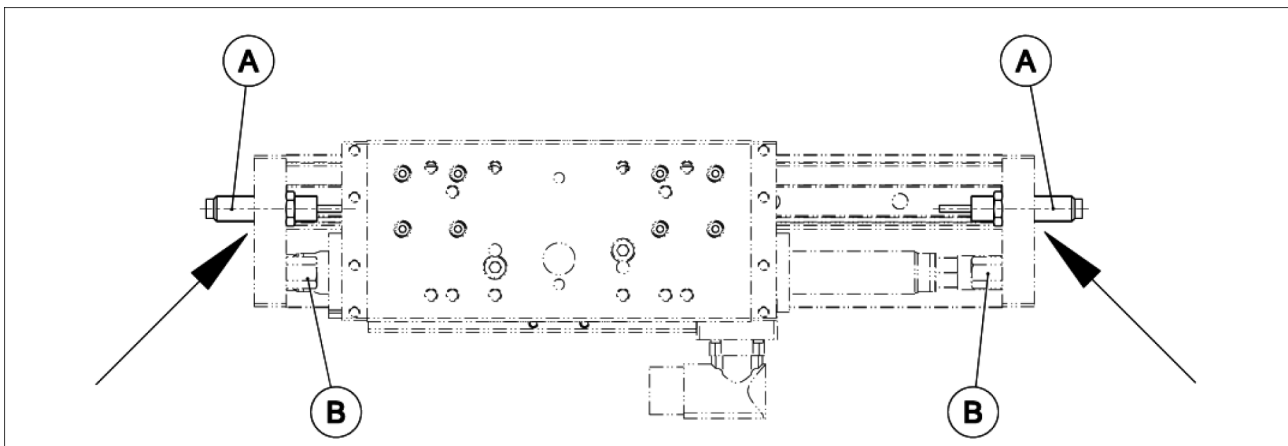
- Switch off the power supply before any assembly, adjustment or maintenance work and secure against being switched on again.
- Only qualified electricians may perform electrical installations.
- Check if de-energized, ground it and hot-wire.
- Cover live parts.



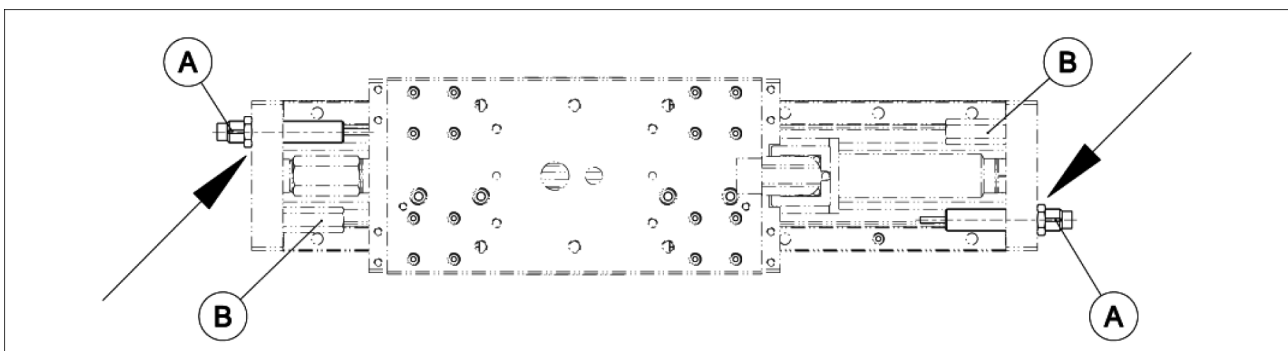
Connecting plug

The connecting plug can be swiveled in two directions by 180°.

4.2 Assembling damper SD



Assembling damper SD 37-P on EPM 37



Assembling damper SD 48-P on EPM 48

	Description	EPM 37	EPM 48
A	Dampers	SD 37-P	SD 48-P

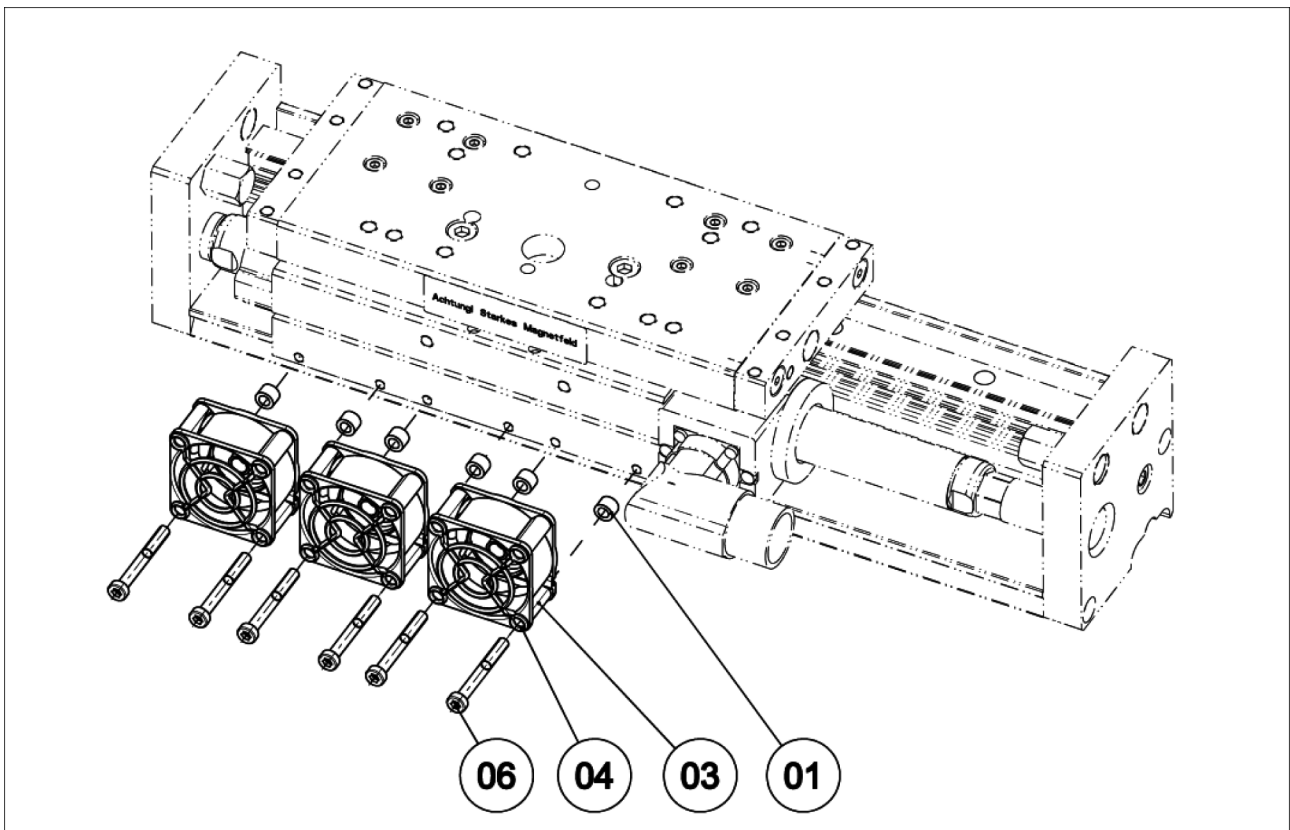
- Screw the damper in the provided thread.
- Secure the damper with nuts.

NOTE

The module executes the reference run only with a certain force. During the reference run, the slide must always hit the internal stop (B).

- Set the damper far enough back so that it does not act as a stop.

4.3 Assembling fan cooling MK 37



Assembling fan cooling

Assembling fan cooling MK

- Use distance (01) as a spacer between the fan and module.
- Screw the compact fan (03) and protective grille (04) on the module with mounting screws (06).

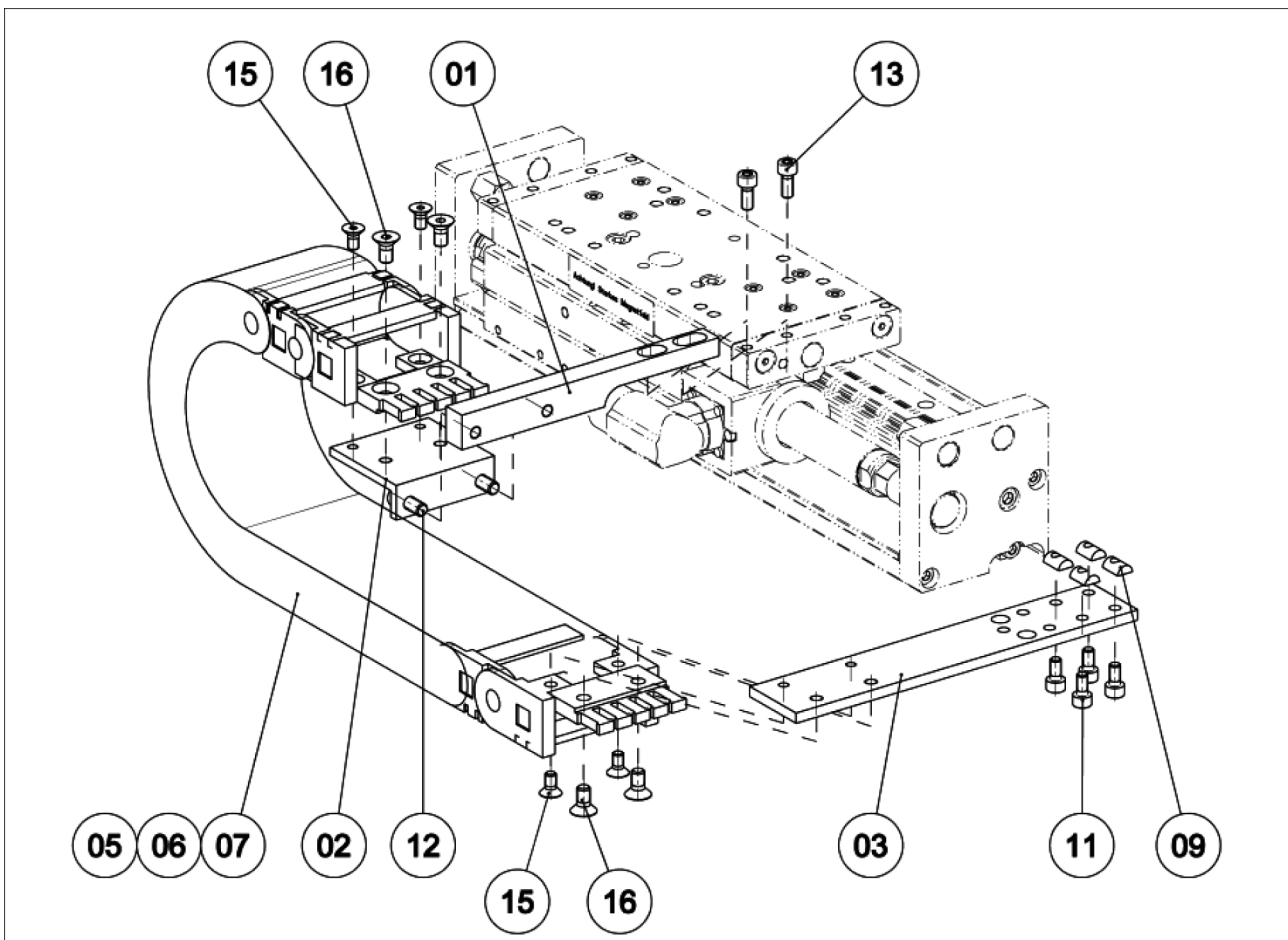
4.4 Assembling cable track KSH / KSV

The cable tracks can be mounted on the module in a number of ways.

In the following chapter, only one variant is shown by way of example.

Your SCHUNK contact person will provide detailed information on the mounting options.

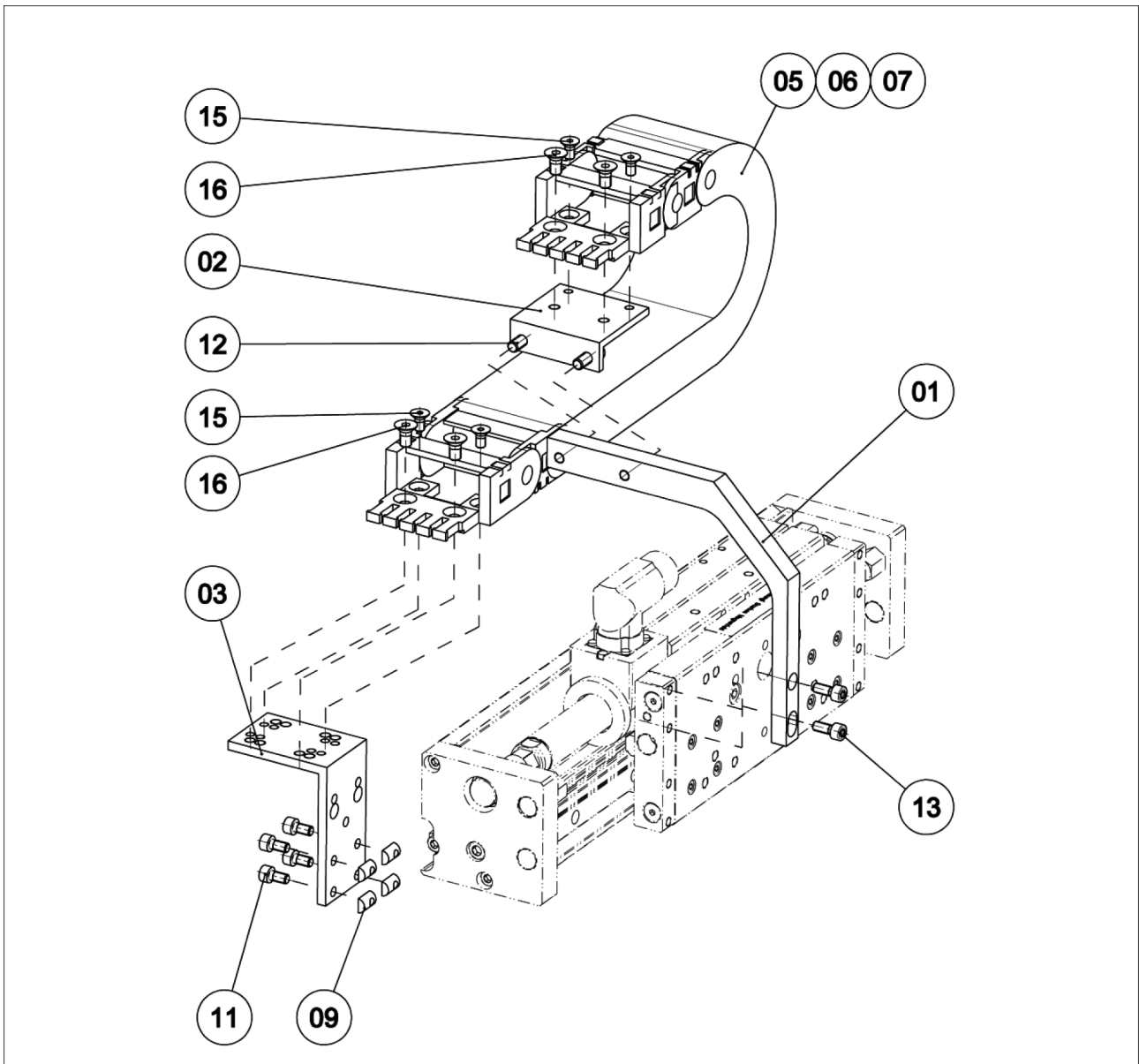
4.4.1 Assembling cable track horizontal KSH



Assembling cable track KSH

1	Holder	9	T-nuts
2	Angle	11-13	Cylindrical screw
3	Retaining plate	15-16	Cylindrical screw
5-7	Cable track		

4.4.2 Assembling cable track vertical KSV



Assembling cable track KSV

1	Holder	9	T-nuts
2	Angle	11-13	Cylindrical screw
3	Retaining plate	15-16	Cylindrical screw
5-7	Cable track		

5 Troubleshooting

5.1 The portal module does not move?

Possible cause	Corrective action
Cables are not connected correctly	Check that all electrical connections are plugged in correctly
Wrong cable, controller or power supply unit used	Check whether original SCHUNK components or components recommended by SCHUNK with the correct specification were used Accessories [▶ 6]. If necessary, contact the SCHUNK contact person.
Proximity switch defective or set incorrect.	Readjust or change sensor.
Component part defective.	Replace component or send it to SCHUNK for repair.

5.2 The portal module does not travel through the entire stroke?

Possible cause	Corrective action
Dirt deposits between cover and piston.	Clean and if necessary re-lubricate., Cleaning the rotor [▶ 28]
Dirt deposits between basic jaws and guidance.	Disassemble and clean the product.
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface., Mechanical connection [▶ 18]
Component part defective.	Send product with a SCHUNK repair order or dismantle product.

5.3 Electric signals are not transmitted

Possible cause	Corrective action
Cable connected incorrectly.	Check circular connections and both miniature flat connections on the right seat.
Strands swapped.	Check pin allocation.
Bus signals should be transmitted.	Bus signals can not be transmitted.
Slip ring defective.	Send the product to SCHUNK with a repair order.

5.4 Motor temperature too high?

Possible cause	Corrective action
The product is not correctly dimensioned according to the requirements	Check the dimensioning
	Contact the SCHUNK contact person.

5.5 Required speed not reached?

Possible cause	Corrective action
The product is not correctly dimensioned according to the requirements	Check the dimensioning
	Contact the SCHUNK contact person.

5.6 Required accuracy not achieved?

Possible cause	Corrective action
The product is not correctly dimensioned according to the requirements	Check the dimensioning
	Check the technical specifications,
	Use the stroke measuring system accessory, Stroke measuring system [▶ 7], contact your SCHUNK contact person if necessary

6 Maintenance and Care

NOTICE

The following recommendations apply to intended operation in accordance with the prescribed operating parameters, operating conditions and settings.



⚠ WARNING

Risk of injury due to unexpected movements of the machine/ system!

- Switch off the energy supply.

6.1 Maintenance and lubrication intervals

NOTICE

Material damage due to hardening lubricants!

Lubricants harden more quickly at temperatures above 60°C, leading to possible product damage.

- Reduce the lubricant intervals accordingly.

Interval [Mio. cycles]	Component	Activity
1000 operating hours	Rotor / stator	Clean and re-grease the rotor and stator Cleaning the rotor [▶ 28]
Every 3 months or 500 km	Guide rails / guide carriage	Clean with an oil-soaked cloth and lubricate the dedicated greasing areas Lubricants/Lubrication points (basic lubrication) [▶ 28]

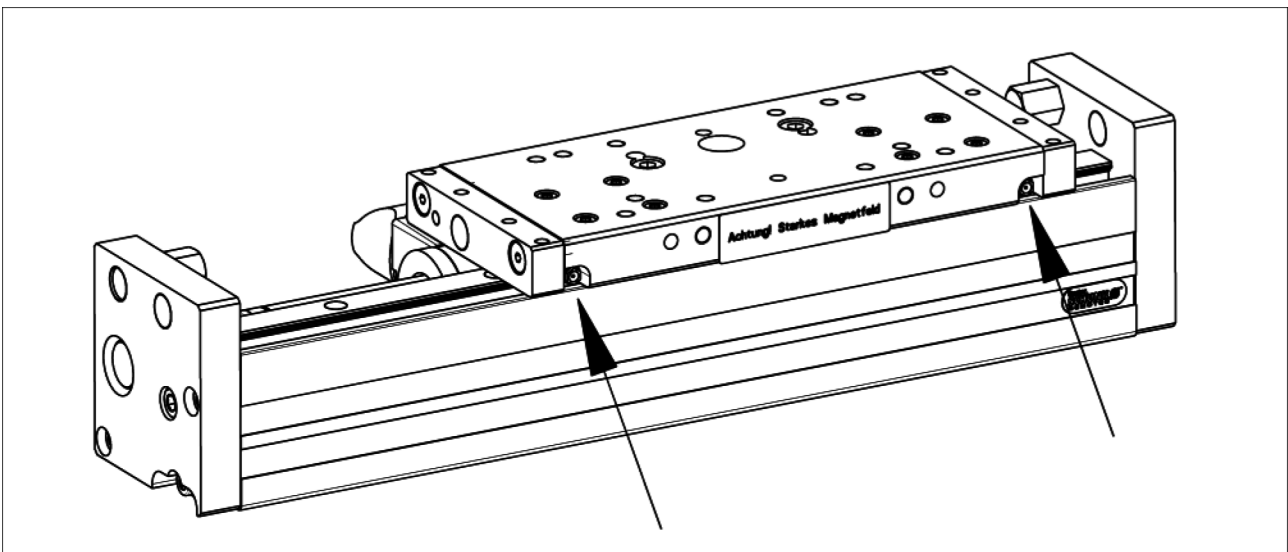
6.2 Lubricants/Lubrication points (basic lubrication)

SCHUNK recommends the lubricants listed.

During maintenance, treat all greased areas with lubricant. Thinly apply lubricant with a lint-free cloth.

Lubricant point	Lubricant
Rotor *	<ul style="list-style-type: none"> • LU02 from LinMot or • UH1 14-31 from Klüber
Guide carriage	<ul style="list-style-type: none"> • Klüber ISOFLEX TOPAS NCA 52
Guide rails	

* Greasing areas [Cleaning the rotor](#) [▶ 28]



Guide carriage greasing areas

6.3 Cleaning the rotor



⚠ WARNING

Risk of injury due to unexpected movements of the machine/system!

- Switch off the energy supply.

NOTICE

Using aggressive cleaning agents will damage the rotor!

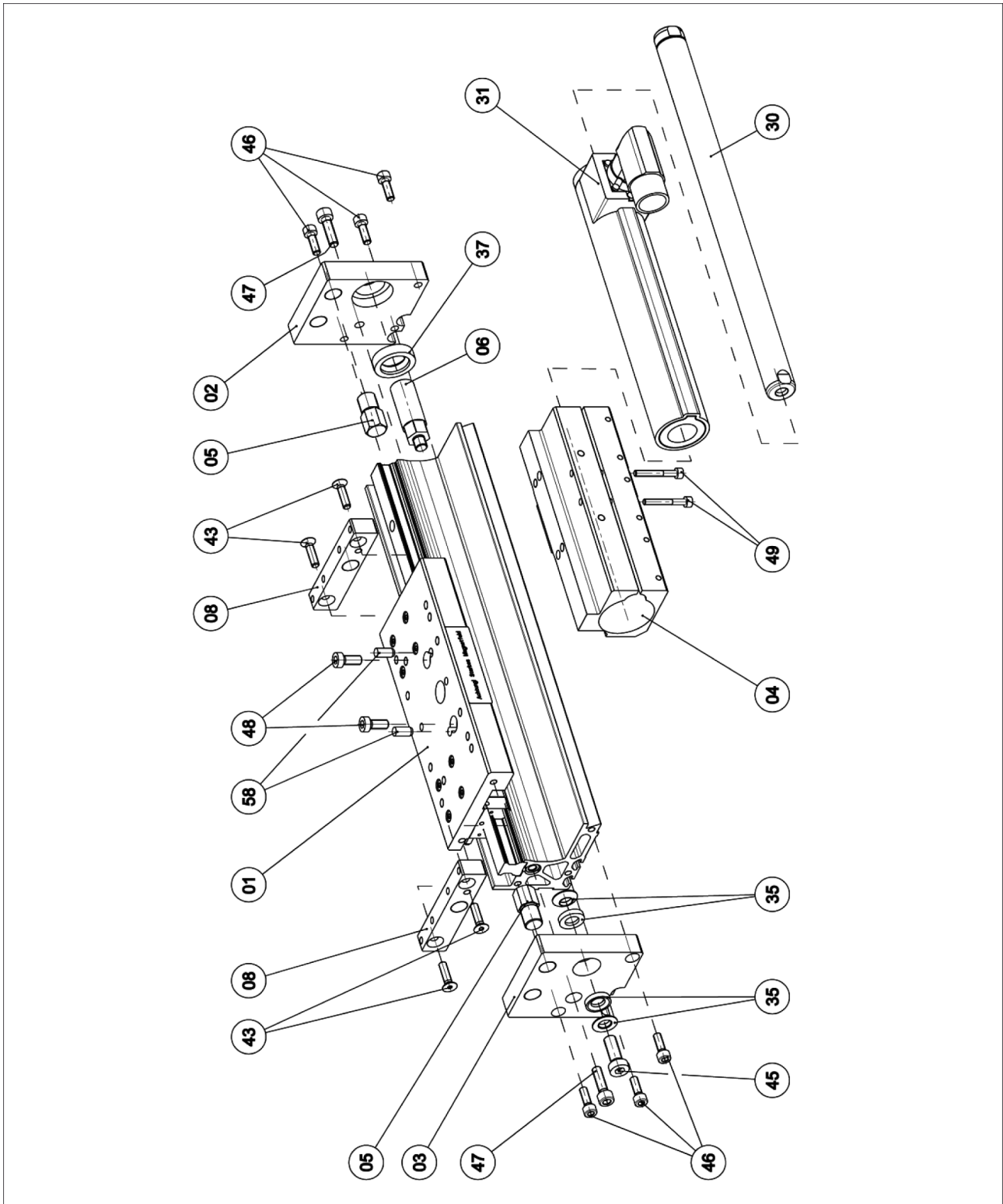
- Do not use hard brushes and organic solvents and cleaning agents other than alcohol.

Position of the item numbers respective assembly drawing

- Clean the rotor with a soft cloth or similar and alcohol.
- Lubricate the rotor [Lubricants/Lubrication points \(basic lubrication\)](#) [▶ 28] and insert carefully into the stator
- For EPMF ...: detach both bellows (18) on Velcro fasteners from the module and remove

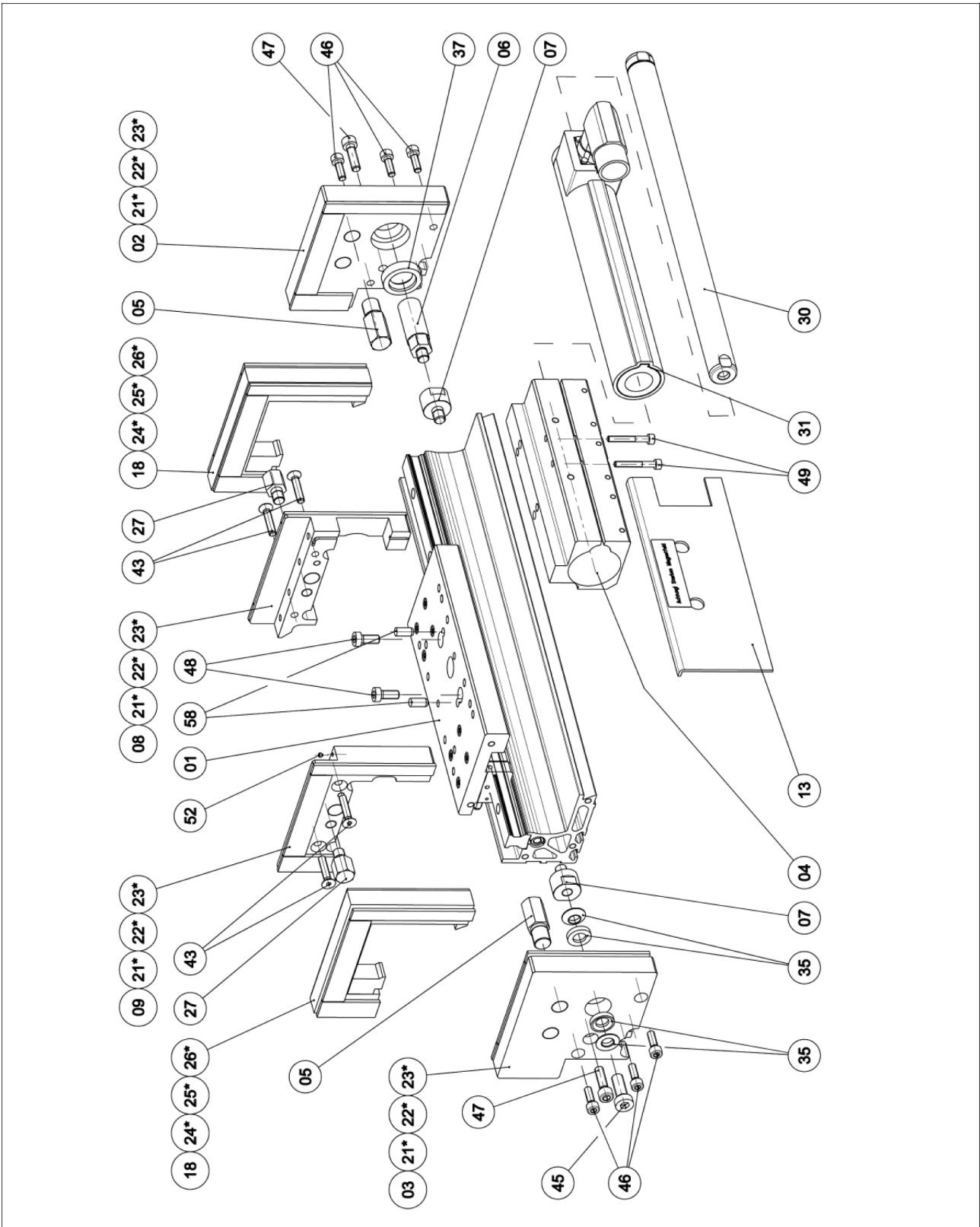
7 Assembly drawings

7.1 Assembling EPMS 37



Assembling EPMS 37

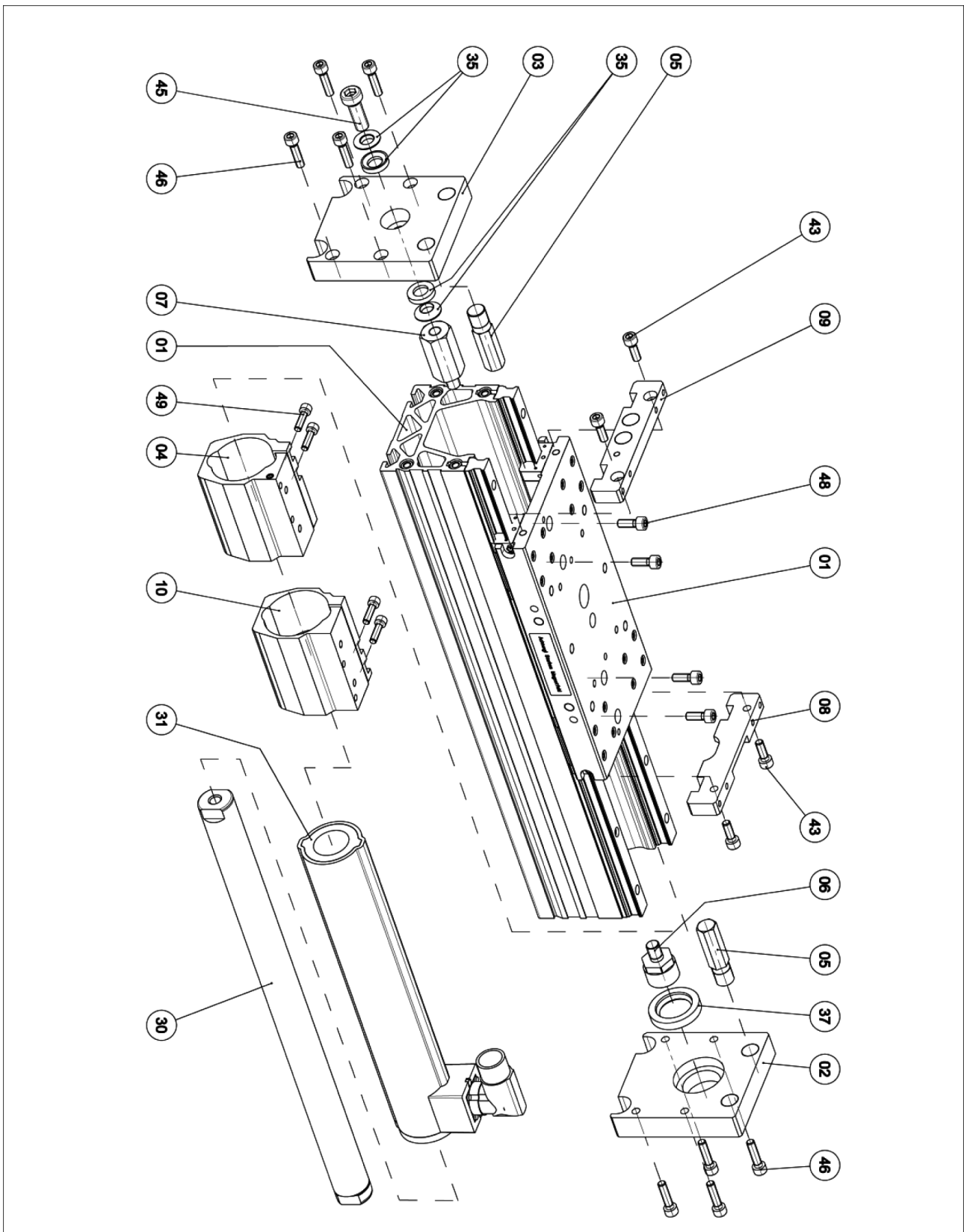
7.2 Assembling EPMS 37



Assembling EPMS 37

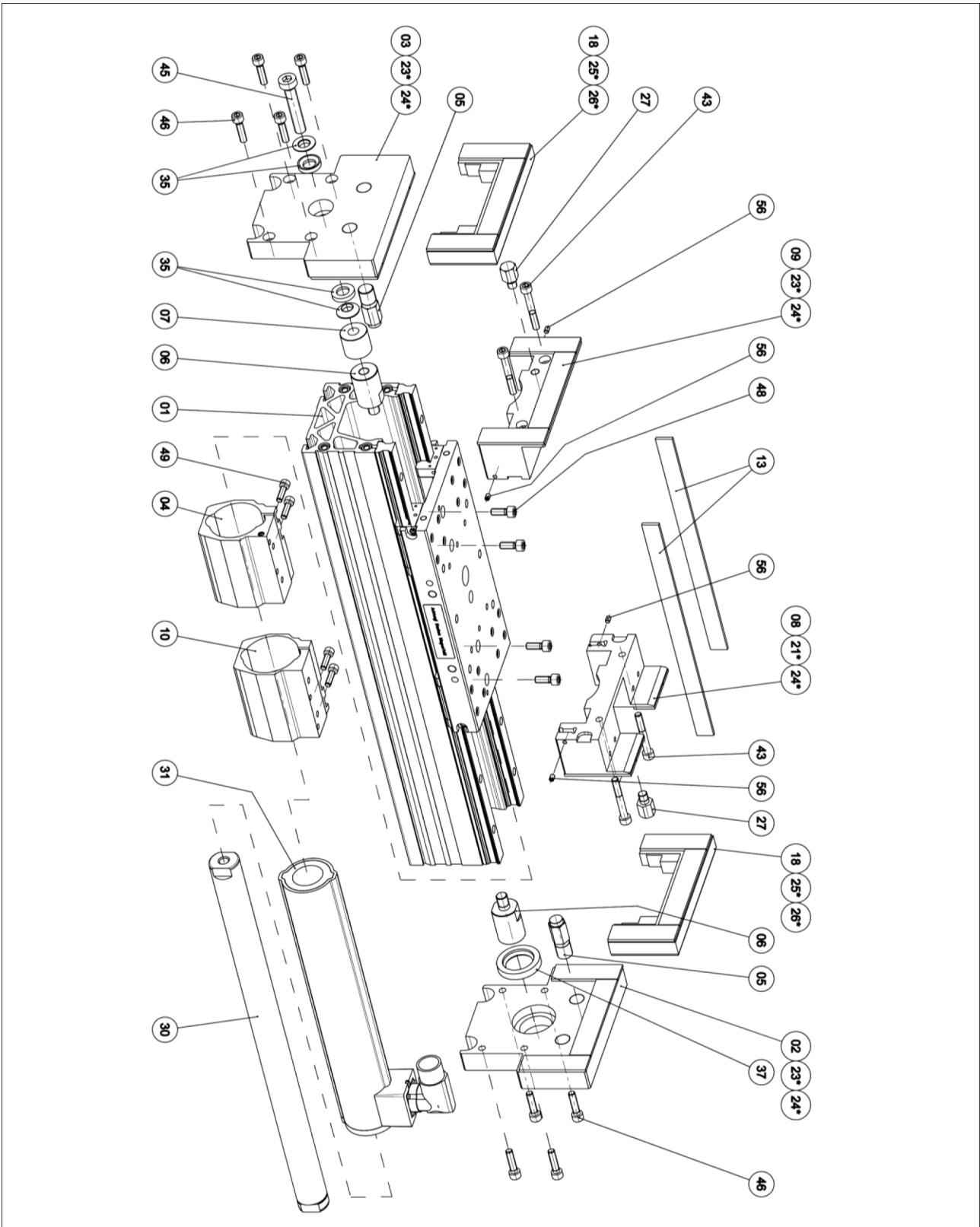
*glued to the respective base part

7.3 Assembling EPMS 48



Assembling EPMS 48

7.4 Assembling EPMS 48



Assembling EPMS 48

*glued to the respective base part

8.1 Annex to Declaration of Incorporation

according 2006/42/EG, Annex II, No. 1 B

1. Description of the essential health and safety requirements pursuant to 2006/42/EC, Annex I that are applicable and that have been fulfilled with:

Product designation	Portal module
Type designation	EPM
ID number	0314268 ... 0314292

To be provided by the System Integrator for the overall machine	↓
Fulfilled for the scope of the partly completed machine	↓
Not relevant	↓

1.1	Essential Requirements			
1.1.1	Definitions		X	
1.1.2	Principles of safety integration		X	
1.1.3	Materials and products		X	
1.1.4	Lighting		X	
1.1.5	Design of machinery to facilitate its handling		X	
1.1.6	Ergonomics		X	
1.1.7	Operating positions			X
1.1.8	Seating			X

1.2	Control Systems			
1.2.1	Safety and reliability of control systems		X	
1.2.2	Control devices		X	
1.2.3	Starting		X	
1.2.4	Stopping		X	
1.2.4.1	Normal stop		X	
1.2.4.2	Operational stop		X	
1.2.4.3	Emergency stop		X	
1.2.4.4	Assembly of machinery		X	
1.2.5	Selection of control or operating modes		X	
1.2.6	Failure of the power supply			X

1.3	Protection against mechanical hazards			
1.3.1	Risk of loss of stability			X
1.3.2	Risk of break-up during operation			X
1.3.3	Risks due to falling or ejected objects			X
1.3.4	Risks due to surfaces, edges or angles		X	
1.3.5	Risks related to combined machinery			X

1.3	Protection against mechanical hazards			
1.3.6	Risks related to variations in operating conditions			X
1.3.7	Risks related to moving parts		X	
1.3.8	Choice of protection against risks arising from moving parts			X
1.3.8.1	Moving transmission parts		X	
1.3.8.2	Moving parts involved in the process			X
1.3.9	Risks of uncontrolled movements			X
1.4	Required characteristics of guards and protective devices			
1.4.1	General requirements			X
1.4.2	Special requirements for guards			X
1.4.2.1	Fixed guards			X
1.4.2.2	Interlocking movable guards			X
1.4.2.3	Adjustable guards restricting access			X
1.4.3	Special requirements for protective devices			X
1.5	Risks due to other hazards			
1.5.1	Electricity supply		X	
1.5.2	Static electricity		X	
1.5.3	Energy supply other than electricity		X	
1.5.4	Errors of fitting		X	
1.5.5	Extreme temperatures			X
1.5.6	Fire			X
1.5.7	Explosion			X
1.5.8	Noise			X
1.5.9	Vibrations			X
1.5.10	Radiation	X		
1.5.11	External radiation	X		
1.5.12	Laser radiation	X		
1.5.13	Emissions of hazardous materials and substances			X
1.5.14	Risk of being trapped in a machine	X		
1.5.15	Risk of slipping, tripping or falling	X		
1.5.16	Lightning			X
1.6	Maintenance			
1.6.1	Machinery maintenance		X	
1.6.2	Access to operating positions and servicing points		X	
1.6.3	Isolation of energy sources		X	
1.6.4	Operator intervention		X	
1.6.5	Cleaning of internal parts		X	

Translation of original declaration of incorporation

1.7	Information			
1.7.1	Information and warnings on the machinery		X	
1.7.1.1	Information and information devices		X	
1.7.1.2	Warning devices		X	
1.7.2	Warning of residual risks		X	
1.7.3	Marking of machinery	X		
1.7.4	Instructions	X		
1.7.4.1	General principles for the drafting of instructions	X		
1.7.4.2	Contents of the instructions	X		
1.7.4.3	Sales literature	X		
	The classification from Annex 1 is to be supplemented from here forward.			
2	Supplementary essential health and safety requirements for certain categories of machinery			X
2.1	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products			X
2.2	Portable hand-held and/or guided machinery			X
2.2.1	Portable fixing and other impact machinery			X
2.3	Machinery for working wood and material with similar physical characteristics			X
3	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery		X	
4	Supplementary essential health and safety requirements to offset hazards due to lifting operations		X	
5	Supplementary essential health and safety requirements for machinery intended for underground work			X
6	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons		X	