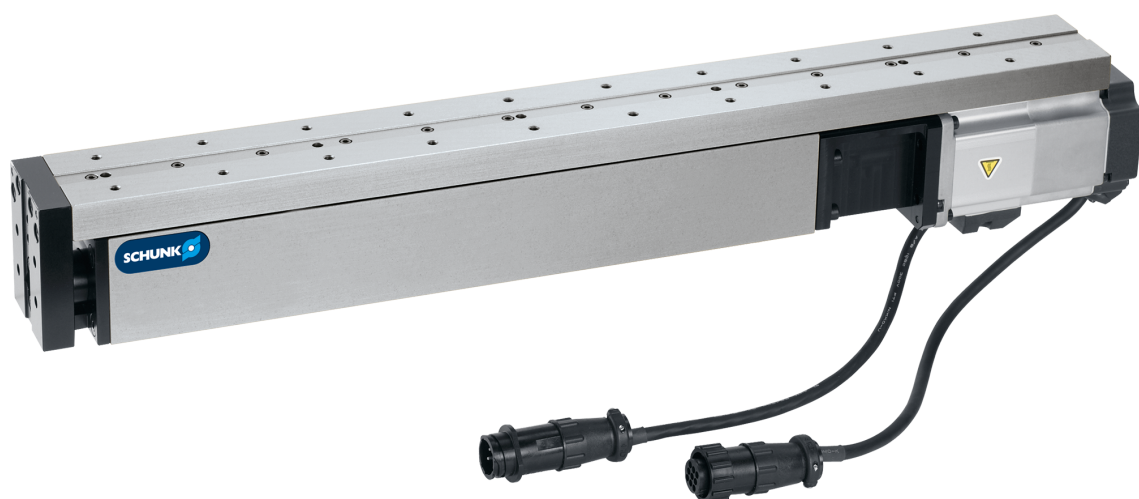


Assembly and Operating Manual

ELS

Linear module



Imprint

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Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

Document number: 389525

Version: 03.00 | 16/05/2019 | en

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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 *
- Assembly and operating manuals of the accessories *

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

1.1.3 Sizes

This operating manual applies to the following sizes:

- ELS 23
- ELS 37

1.1.4 Versions

- ELS 23 - H070 without motor
- ELS 37 - H160 with motor
- ELS 37 - H160 without motor
- ELS 37 - H260 with motor
- ELS 37 - H260 without motor

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

- Linear module ELS in the version ordered

1.4 Accessories

The following accessories, which must be ordered separately, are required for the product:

- Cable power
- Cable sensor
- Drive controller

For information regarding which accessory articles can be used with the corresponding product variants, see catalog data sheet.

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 Environmental 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 a sufficient size for the application.
- Ensure that maintenance and lubrication intervals are observed, [Maintenance](#) [► 22].
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Exceptions are products that are designed especially for contaminated environments.
- Ensure that the environment is free from ferromagnetic particles or chips.
- Ensure that no strong magnetic fields impair the function of the product.

Contact your SCHUNK partner if the product is to be used in strong magnetic fields.

2.6 Drive control units requirements

- The module must be electrically connected to a SCHUNK-approved drive controller which in turn is connected to the power supply via power supply units.
- The drive controllers and the power supply units must only be connected to a power supply that meets their requirements.
- In the case of field bus controllers, the customer interfaces must also meet the interface specifications of the drive controller. The drive controllers and power supply units must be installed and fused according to the specifications in the components' operating manuals and the valid standards and regulations as well as local guidelines.

2.7 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.

2.8 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.

2.9 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.

2.10 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.

2.11 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.

2.12 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.

2.13 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.

2.13.1 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.

2.13.2 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.

2.13.3 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.
- 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.

2.14 Notes on particular risks



⚠ 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 when the machine/system moves unexpectedly/ dangerously

- Do not move parts by hand when the energy supply is connected.
 - Do not reach into the open mechanism or the movement area of the module.
 - Remove the energy supplies before installation, modification, maintenance, or adjustment work.
 - Perform maintenance, modifications, and additions outside the danger zone.
 - For all work, secure the module against accidental operation.
-



⚠ WARNING

Risk of injury in the event of a power failure!

If the energy supply should fail, the module is held by the engine brake.

When motors without a brake are used, modules can still move independently if the power supply fails.



⚠ WARNING

Risk of injury in the event of excessive heating of components!

During operation, the motor and axis of the module may heat up significantly.

- Before starting any assembly/disassembly or repair work, allow the module to cool down.
-

**⚠ WARNING****Risk of injury / damage due to electrical voltages and currents**

The module and the corresponding drive control unit are operated with voltages also larger than 42 V.

- The module must not be operated if, for instance, cables or lines are damaged or if there is water or the like which would impair operational safety.

3 Technical data

Types	ELS 023-H70-O	ELS 037-H160-O	ELS 037-H260-O
ID number	0314800	0314802	0314804
Stroke [mm]	70	160	260
Max. driving force [N]	80	150	
Repeatability [mm]	0.02	0.02	
Max. speed [m/s]	0.8	1	
Max. acceleration [m/s ²]	8.5		
Ambient temperature [°C]			
Min.	5		
Max.	80		
Max. useful load [kg]	3	8	6
Weight [kg]	1.2	3.8	4.7
Drive concept	Spindle drive		
Moment of inertia [kg m ²]	0.0005	0.005	0.007
Idle torque [Nm]	0.02	0.06	0.10
Spindle Ø [mm]	8	12.5	
Spindle pitch [mm]	12	25.4	
Max. spindle speed [rpm]	4000	2360	

Options with motor

Types	ELS 037-H160-K	ELS 037-H260-K
ID number	0314806	0314807
Drive type	Bosch Rexroth MSK030C-0900	Bosch Rexroth MSK030C-0900
Weight [kg]	5.5	6.4

NOTE

Other electrical operating data can be found in the respective operating manual of the motor.

4 Assembly

4.1 Mechanical connection



⚠ 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.

Evenness of the mounting surface

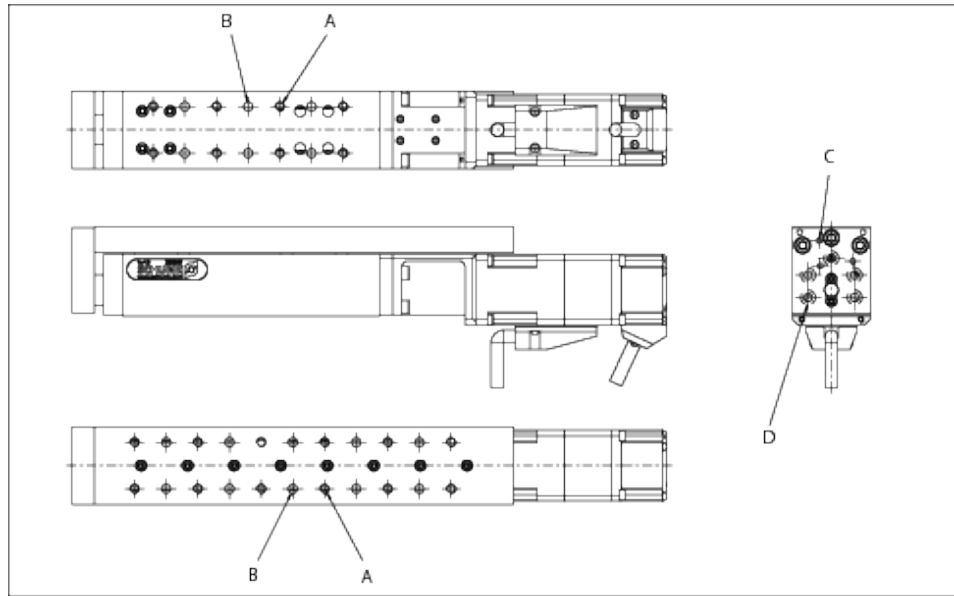
The values apply to the whole mounting surface to which the product is mounted.

Requirements for evenness of the mounting surface (Dimensions in mm)

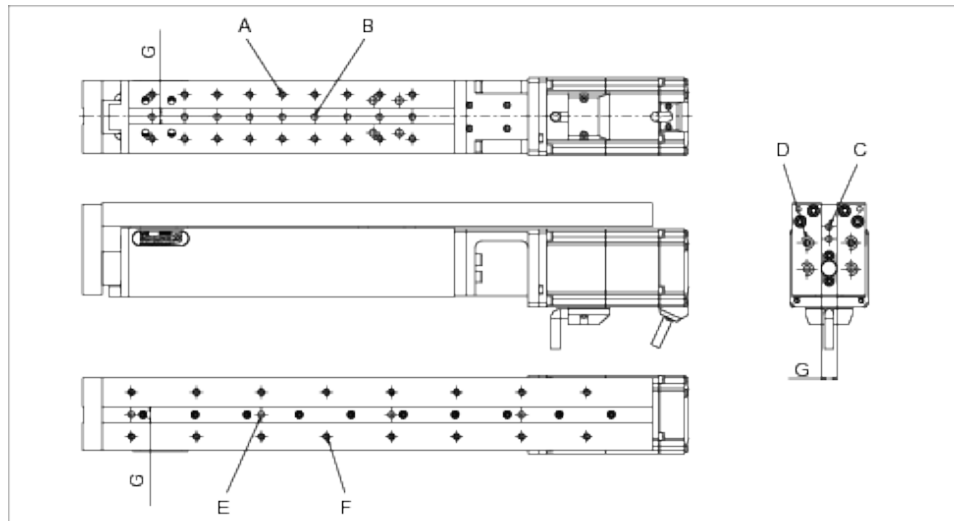
Edge length	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

Mounting

Connection geometries are located on the base body, slide, and face plate:



Connection geometries ELS 23



Connection geometries ELS 37

Item	ELS 23	ELS 37
A	M5 / 7	M5 / 11
B [mm]	Ø5F7 / 5	Ø5F7 / 3
C [mm]	Ø3F7	Ø5F7
D	Km4 DIN974-1	Km5 DIN974-1
E [mm]	-	Ø5F7 / 5
F	-	M5 / 9
G [mm]	-	12.05 / 1.2

4.2 Electrical connection



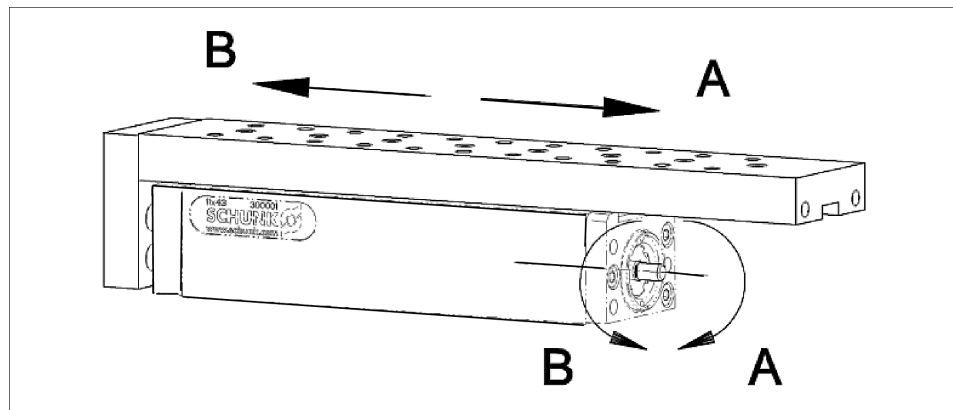
⚠ WARNING

Risk of injury when the machine/system moves unexpectedly!
Switch off power supply.

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

4.3 Attaching drive (version without motor)

Observe
spindle pitch



Spindle's direction of rotation—slide movement

Make sure that the motor's direction of rotation corresponds to the desired movement of the slide.

5 Start-up

Testing before start-up

Before start-up, check the following:

- Compliance with the technical specifications [Technical data](#) [▶ 16]
- Compliance with the Machinery Directive on the higher-level machine or system
- Correct assembly of the module.

Test run

To avoid accidents and collisions, move the linear module several times along the traverse path slowly enough that it can be stopped promptly in case of emergency.

The system must not be put into service until it is certain that there is no risk of collision when the module is traveling over the maximum traverse path.

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

6 Troubleshooting

6.1 Modul bewegt sich nicht?

Possible cause	Corrective action
Cable connected incorrectly.	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. If necessary, contact SCHUNK.

6.2 The module does not travel through the entire stroke?

Possible cause	Corrective action
Dirt deposits on the spindle tube	Remove dirt deposits
Mounting surface is not sufficiently flat.	Check the evenness of the mounting surface. Mechanical connection [▶ 17]
Components have come loose e.g. due to overloading.	Send product with a SCHUNK repair order or dismantle product. and check
Limit value parameters are set incorrectly	Correct the parameters
Axis is blocked by object	Remove blockage

6.3 Electric signals are not transmitted?

Possible cause	Corrective action
Cable connected incorrectly.	Check electrical connection.
Wrong cable, controller or power supply unit used	Check whether original SCHUNK components or components recommended by SCHUNK with the correct specification were used.

6.4 Motor temperature too high?

Possible cause	Corrective action
Mass too large.	Reduce mass.
Acceleration too high.	Reduce acceleration.

6.5 Required speed not reached?

Possible cause	Corrective action
The module is not correctly designed according to the requirements	Check the dimensioning.
	Check technical specifications, Technical data [▶ 16]
	Consult SCHUNK contact person.

7 Maintenance

7.1 Notes

NOTICE

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

7.2 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.

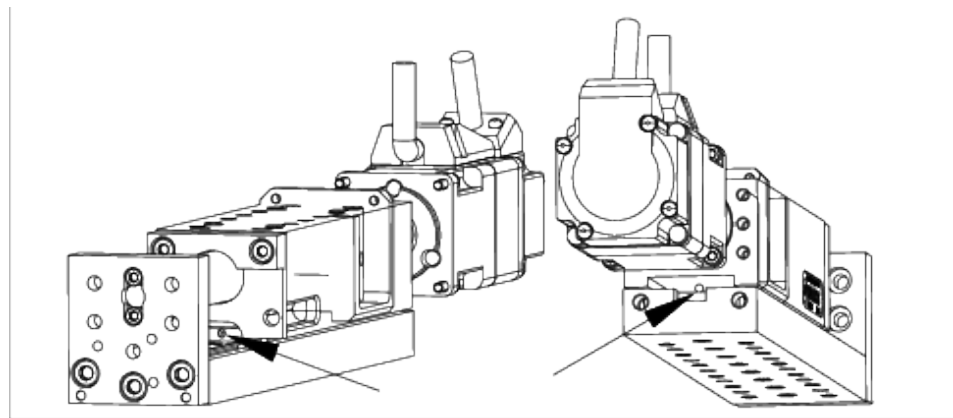
Interval [Mio. cycles]	Component	Activity
2	Spindle and spindle nut	<ul style="list-style-type: none"> • Lubricate spindle nut at the greasing areas provided Lubricants/Lubrication points (basic lubrication) [► 23].
	Guide rail / guide carriage	<ul style="list-style-type: none"> • Clean the guide rail with a dry cloth and lightly degrease it. • Lubricate guide carriage at the greasing areas provided Lubricants/Lubrication points (basic lubrication) [► 23].

7.3 Lubricants/Lubrication points (basic lubrication)

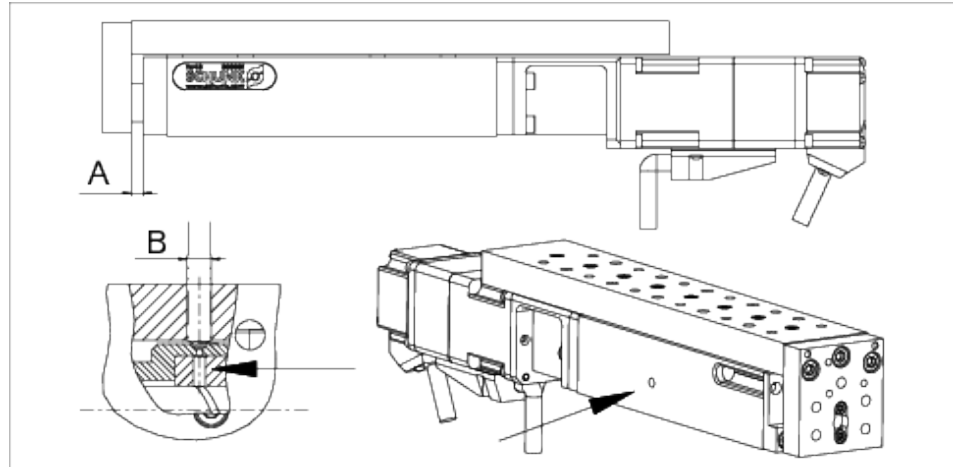
SCHUNK recommends the lubricants listed.

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

Lubricant point	Lubricant
Guide carriage	Isoflex-Topas NCA 52, Klüber
Guide rails	Grease syringe filled: SPRI-KWEM, INA
Ball screw nut	Isoflex-Topas NCA 52, Klüber Use a suitable grease gun.



Greasing areas of the guide carriage



Greasing areas of the spindle nut

To lubricate the spindle nut, the slide must be in the specified position:

A [mm]	5
Ø B [mm]	4

7.4 Servicing the product

- Clean all parts thoroughly and check for damage and wear.
- Treat all greased areas with lubricant.
[Lubricants/Lubrication points \(basic lubrication\)](#) [▶ 23]

7.5 Disassembling the module

NOTICE

To disassemble/assemble the module, in-depth knowledge and expertise is required.

If the module is assembled or disassembled on one's own, the SCHUNK warranty becomes invalid.

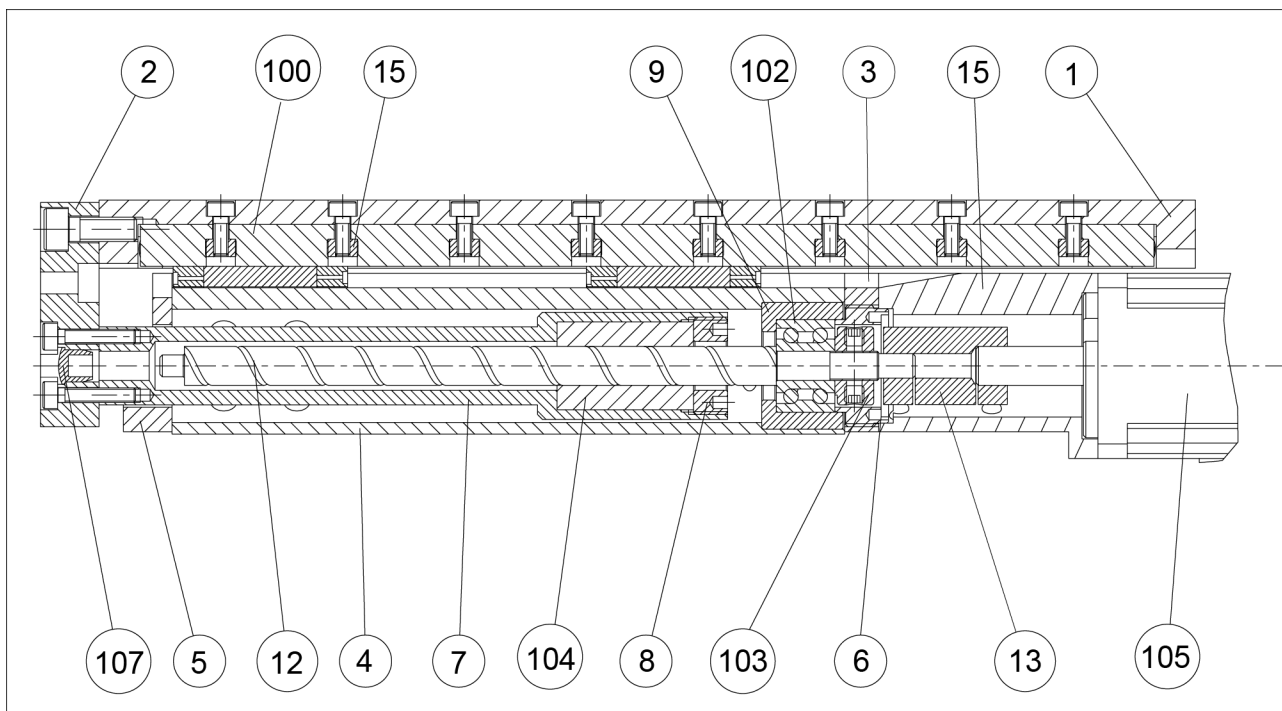
- In case of damage or malfunction, we recommend returning the module to the production facility for repair.

7.6 Assembly drawing

The following figure is an example image.

It serves for illustration and assignment of the spare parts.

Variations are possible depending on size and variant.



Assembly of ELS

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	Linear module
Type designation	ELS
ID number	0314800 ... 0314807

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
1.45.6	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