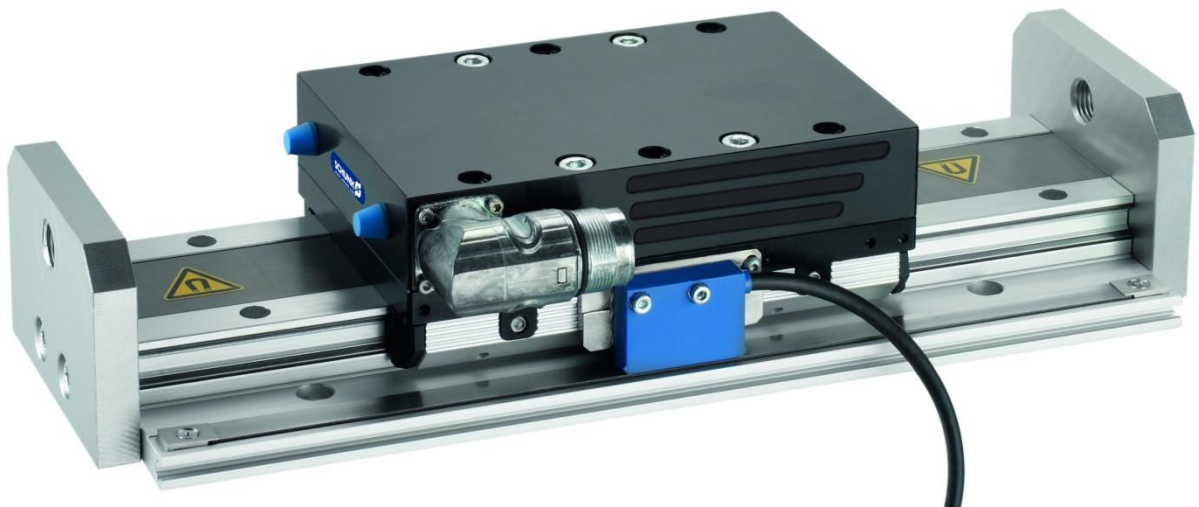


# Linear motor drive LDF

## Assembly and Operating Manual



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**Technical changes:**

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

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Dear customer,

Congratulations on choosing a SCHUNK product. By choosing SCHUNK, you have opted for the highest precision, premium quality and optimum service.

You are going to increase the process reliability of your production and achieve best machining results – to the customer's complete satisfaction.

SCHUNK products are inspiring.

Our detailed assembly and operation manual will support you.

Do you have further questions? You may contact us at any time - even after purchase.

Best regards,

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## Applicable documents

- SCHUNK Catalog **Linear modules**
- Assembly and operating manuals for sensors
- General terms of business
- Commissioning of Indradrive (German/English) (on CD-ROM), order number 363445

The abovementioned documents can be downloaded from: **[www.de.schunk.com](http://www.de.schunk.com)**.

# 1 About this manual

## 1.1 Purpose/validity

This manual forms part of the module and describes the safe and proper use during all phases of operation.

This manual is valid only for the module specified on the front page.






## 1.2 Target groups

Target group	Task
Manufacturer, operator	<ul style="list-style-type: none"> <li>➔ Keep this manual accessible for personnel at all times.</li> <li>➔ Require personnel to read and observe this manual and the applicable documents, especially the safety notes and warnings.</li> </ul>
Skilled personnel, fitters	<ul style="list-style-type: none"> <li>➔ Read, observe and follow this manual and the applicable documents, especially the safety notes and warnings.</li> </ul>

Tab. 1

## 1.3 Symbols in this manual

To give you quick access to information, the following symbols will be used in this guide:

Symbol	Meaning
 <b>DANGER</b>	Dangers for persons. Non-observance causes death or serious injuries.
 <b>WARNING</b>	Dangers for persons. Non-observance can cause death or serious injuries.
 <b>CAUTION</b>	Dangers for persons. Non-observance can cause minor injuries.
 <b>NOTICE</b>	Information about avoiding material damage.
➔	Instruction for action, including measures in a warning or note.
1. 2.	Step-by-step instruction for action. ➔ Observe the order.
 <a href="#">XYZ</a>	Cross reference to further information.

Tab. 2

## 2 Basic safety notes

### 2.1 Appropriate use

The linear modules are exclusively designed for linear movement of useful loads into any desired position, where the load does not react in a manner endangering persons, property or the environment as a result of this manipulation.

The module is intended for installation in a machine. The requirements of the applicable guidelines must be observed and complied with.

The module may be used only in the context of its defined application parameters.

Any other use or use exceeding that specified is an infringement of appropriate use. The manufacturer bears no liability for damage resulting from such use.

### 2.2 Ambient conditions and operating conditions

- ➔ Use the module only within its defined application parameters (☞ [7 Technical data](#) and catalog).
- ➔ Make sure that the module and the top jaws are a sufficient size for the application.
- ➔ Make sure that the environment is clean and the ambient temperature corresponds to the specifications per the catalog. Observe the maintenance intervals (☞ [12.12 Maintenance and care](#)).
- ➔ Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. This excludes modules that are designed specially for contaminated environments.

## **2.3 Product safety**

The module is state of the art and complies with the recognized safety rules at the time of delivery. However, it can present risks if, for example:

- ➔ The module is not used in accordance with its intended purpose.
- ➔ The module is not installed or maintained properly.
- ➔ The EC Machine Directive, the VDE directives, the safety and accident-prevention regulations and environmental protection regulations valid at the usage site, or the safety and installation notes are not observed.

### **2.3.1 Protective equipment**

- ➔ Provide protective equipment in line with EC Machinery Directive.

### **2.3.2 Constructional changes, attachments, or modifications**

Modifications, additions, and conversions which could impair safety may not be made to the module without permission from SCHUNK.

Unauthorized changes result in the exclusion from product liability.

## **2.4 Personnel qualification**

Assembly, initial commissioning, maintenance, and repair of the module may be performed only by trained specialist personnel.

Every person called upon by the operator to work on the module must have read and understood the complete assembly and operating manual, especially the [chapter 2 “Basic safety notes”](#). This applies particularly to personnel only used occasionally, such as maintenance personnel.

## 2.5 Safety-conscious working

- Avoid any manner of working that may interfere with the function and operational safety of the module.
- Observe the safety and accident prevention regulations valid at the site of use.

## 2.6 Disposal

Observe the local legal provisions when disposing of the module.

## 2.7 Notes on particular risks

### **Risk of injury when the machine/system moves unexpectedly**

- 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.

### **Danger of crushing and clamping between the slides and base body during motion of the linear axis slides.**

- The danger zone must be surrounded by a protective barrier during operation.

### **Risk of injury when the machine/system moves unexpectedly in the case of a loss of power supply or control unit malfunction.**

- Use of a holding brake on the linear axis.

### **2.7.1 Protection against dangerous movements**

As a general rule, the linear motor drives may only be operated with additional safety devices that are not included in the scope of delivery.

Dangerous movements can also occur when a drive is not connected.

For this reason, always secure parts (e.g. slides) against movement.

Dangerous movements can result when errors occur in controlling the drives. The drive components are monitored in a way that malfunctions can be largely excluded when the system is correctly operated.

However, for reasons of personal safety, risk of injury and risk of property damage, you should not rely on this fact alone. Until the integrated safety features become effective, inaccurate drive movements must be expected.

Possible causes for control errors:

- Incorrect cabling or wiring
- Defective components
- Software errors
- Operating errors
- Removal of safety devices
- Sensor and signal transmitter errors
- Entry of incorrect parameters prior to start-up

Basic physical parameters must be set before start-up. Maximum values and minimum values must be set to sensible limits. These include especially the following: stroke, speed, acceleration, torque, current, measuring system resolution, correct operating mode, hardware and software end positions, drag error, temperature monitoring etc.

Actual values during first motion at minimum speed and acceleration.

Protective equipment must be active.

Locking out of impermissible opposing motions.

### 3 Warranty

The warranty is valid for 24 months from the date of delivery to the production facility under the following conditions:

- Observance of the prescribed maintenance and lubrication intervals (☞ [12.12 Maintenance and care](#))
- Observance of the ambient conditions and operating conditions (☞ [2.2 Ambient conditions and operating conditions](#))

Parts touching the workpiece and wearing parts are not part of the warranty. Also observe our general terms of business.

#### **WARNING**

**Malfunctions caused by defective components may only be corrected by the replacement of these components.**

➔ Defective components may only be replaced with SCHUNK original spare parts

### 4 Scope of delivery

The scope of delivery comprises:


- Linear motor drive type LDF, in the ordered variant
- Start-up DVD
- Operating manual

## 5 Accessories

The following accessories are available for the module:

<b>Centering sleeves</b>	For precisely fitting connections between axes and adapter
<b>Inductive sensors</b>	For end position control and reference measurement
<b>Mechanical limit switches</b>	For end position control
<b>Connection cable for reference and limit switches</b>	All required connection cables
<b>Shock absorber</b>	For supporting the masses in case of system failures
<b>Wipers</b>	For wiping the tracks during operation
<b>Cable tracks</b>	Safe energy supply with moving actuators
<b>Holding brake</b>	Pneumatic standstill brake for controller relief and for vertical applications
<b>Pneumatic switching valve</b>	For controlling the holding brake
<b>Cable sets</b>	Various cable sets and cable lengths for different controller types and distances
<b>Commissioning tools</b>	Start-up software, programming cable and commissioning instructions for controllers
<b>Drive controllers and control units</b>	Proven and approved components for your application scenario

Tab. 3

- ➔ Order accessories separately.
- ➔ For additional accessories  catalog.

## 6 Product description

### 6.1 Overview of types

LDF – ES - 0100 - 1 – 345 - 640 - LxBV–111A - 0122

**Example**

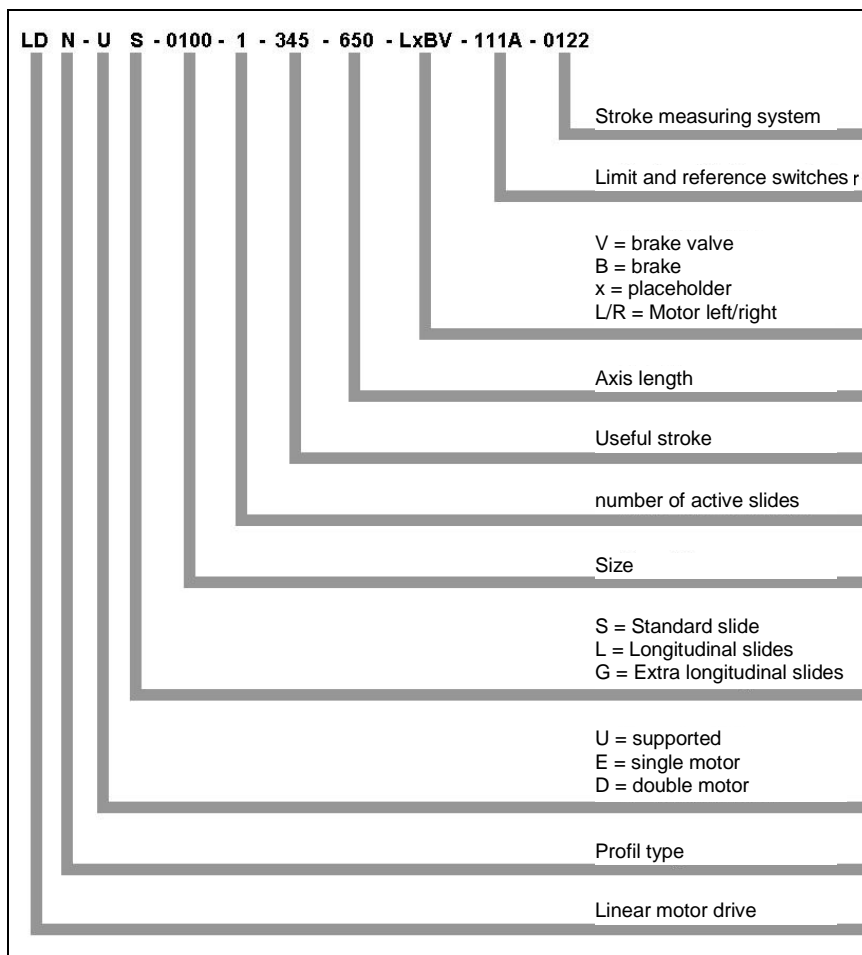


Fig. 1: Linear motor drive

Specify the material number and serial number in all inquiries and spare part orders.

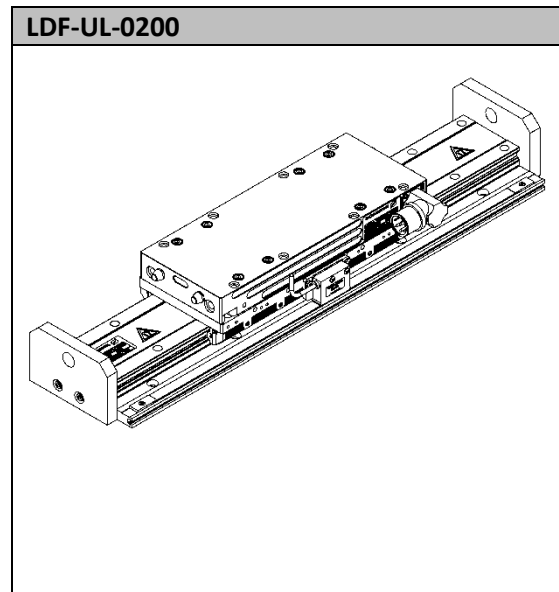
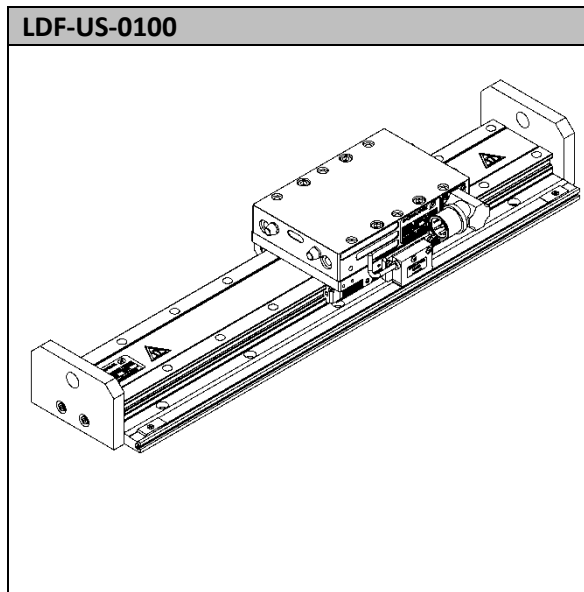


Fig. 2 Linear motor drive type LDF

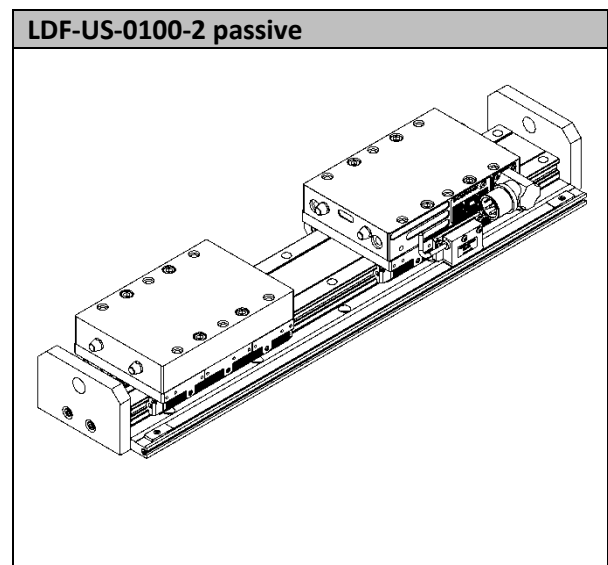
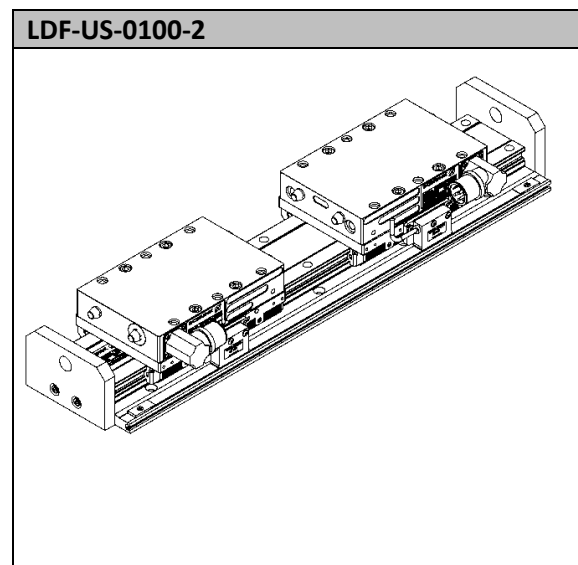


Fig. 3: Linear motor drive type LDF with 2 slides

All versions of the linear motor drives of type LDF are available with multiple slides.

## 6.2 Operation principle

The linear motor drive type LDF is a directly driven drive module for linear movements. The driving force is transmitted directly to the slide without any mechanical transmission elements. The axis is especially suited for applications for which very high dynamics are required.

The overall concept of the linear motor drive is characterized by its extremely compact design. Thanks to the good guidance of the slide and the light-weight design of the axis, the drive reaches very high speeds, accelerations and repeat accuracies.

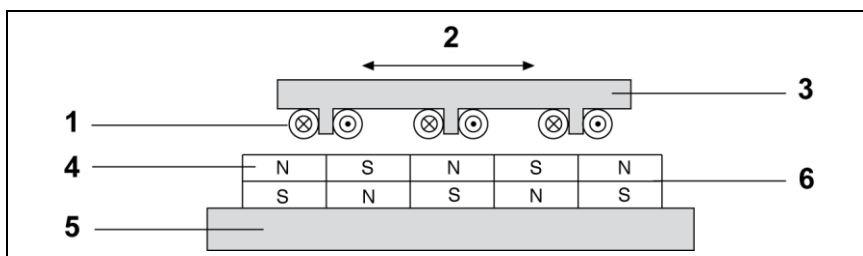


Fig. 4: Functional principle of the linear motor drive type LDF

1 Copper coil	2 Directions of movement
2 Primary part	4 Permanent magnets
3 Iron mount	6 Secondary part

Tab. 4

You can manipulate the driving force, acceleration and speed of the slide by regulating the phase and the amplitude of the electrical current applied at the primary part (3).

As standard, a magnetic measuring system integrated in the axis is used to determine the current position of the drive.

Optical or absolute stroke measuring systems are available as options.

## 7 Technical data

You can view additional technical data in our catalog. The respective latest version is valid.

Motor size		LDF-ES-0100	LDF-ES-0200
Rated force <sup>*2</sup>	(N)	100	On request
Maximum force <sup>*1</sup>	(N)	250	On request
Repeat accuracy	(mm)	±0.01	On request
Max. continuous current at standstill	(A <sub>eff</sub> )	1.9	On request
Maximum current	(A <sub>eff</sub> )	6.9	On request
Winding resistance at 25°C	(Ohm)	7.6	On request
Test voltage	(V)	2000	On request
Ambient temperature	(°C)	10 - 40	On request
Max. surface temperature	(°C)	70	On request

Tab. 5: Technical data of the linear motor drive

\*1) depending on control type

\*2) depending on installation situation (heat dissipation)

## 8 Transport and storage

### 8.1 Transportation

The linear motor drives of type LDF are precision drives. The packaging must protect the drive from all external effects (such as mechanical shocks and humidity).

### 8.2 Storage

Store the product in a clean, dry environment. Ambient temperature 15 - 40°C.

No condensation permitted!

## 9 Assembly

### 9.1 Installation preparation

**⚠ DANGER**

**Danger to life due to strong magnetic fields even in a shut-down state.**

The secondary parts integrated in the linear motor drive type LDF are high-performance permanent magnets. Medical devices, such as pacemakers or hearing aids, can be destroyed or can cause malfunctions.

- ➔ Maintain an adequate minimum distance to the secondary part if you have a pacemaker or use a hearing aid or other devices.

**⚠ DANGER**

**Danger to life due to electric shock.**

Touching live parts can be deadly.

- ➔ Work on electrical installations or equipment may only be carried out by electricians according to electrical standards.

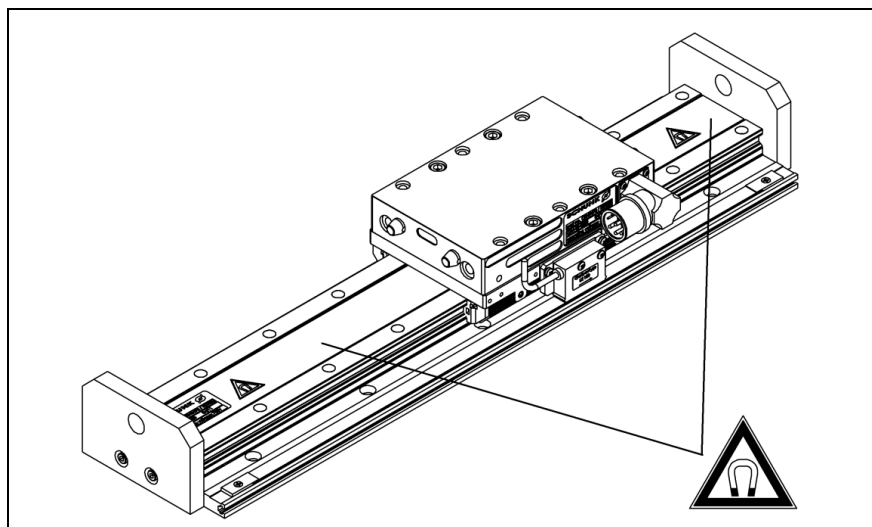


Fig. 5: Magnetic surface of linear motor drive type LDF

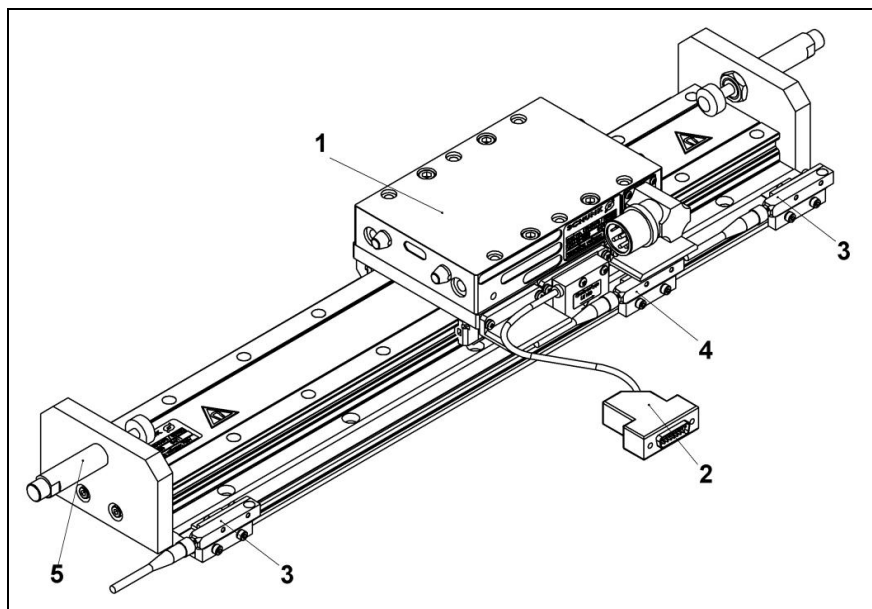
**Note**

During installation and start-up, observe the technical data.

The linear motor drive catalog contains technical data on

- Linear motor drive type LDF
- Limit switches
- Reference switch
- Direct stroke measuring system

**9.2 Main components**



*Fig. 6: Main components of the linear motor drive type LDF*

1 Linear motor drive type LDN	4 Reference switch (optional)
2 Direct stroke measuring system	5 Shock absorber (optional)
3 Limit switches (optional)	

Tab. 6

### 9.3 Assembly of the linear motor drive

**⚠ WARNING**

**Danger of crushing due to uncontrolled movements.**

- ➔ Only carry out work on the linear motor drive while the machine is shut off.
- ➔ Make sure that neither electric nor pneumatic energy is present at the linear motor drive.

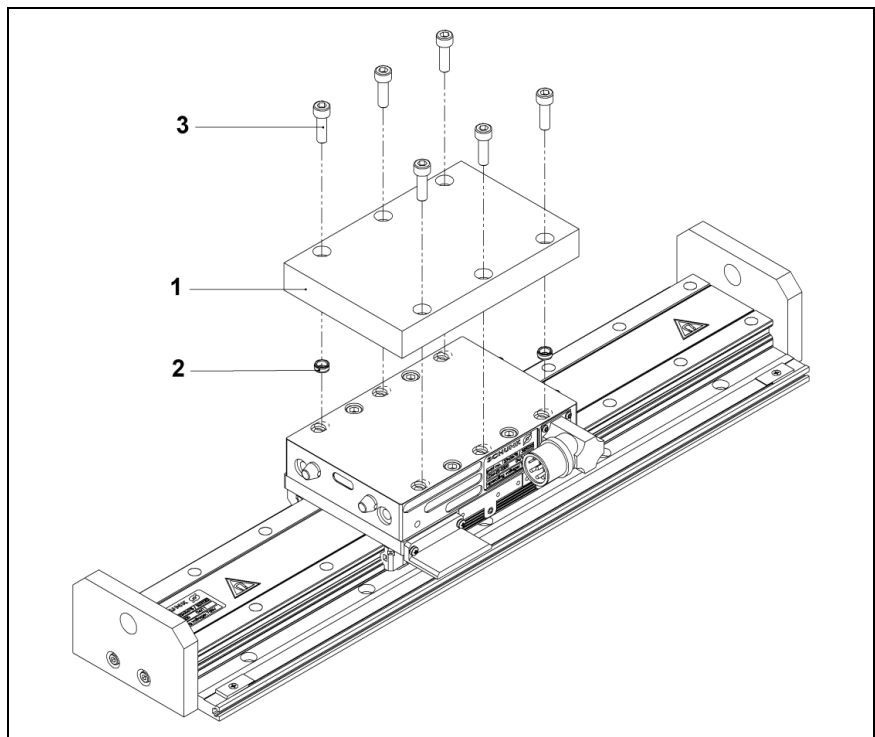


Fig. 7: Assembly surfaces of the linear motor drive type LDF

1 Adapter plate	2 Centering sleeve	3 Cylindrical screws
-----------------	--------------------	----------------------

Tab. 7

The linear motor drives have multiple mounting surfaces for additional linear axes. These are assembled using adapter plates.

## 10 Electrical connection

### 10.1 Measuring system LE100

Technical data

Description		LE100
Operating voltage	(VDC)	5 ± 5%
Output signal		Sin, Cos
Signal amplitude	(V <sub>ss</sub> )	1 ±10%
Offset sine/cosine	(V)	2.5 ±0.5%
Signal period	(μm)	1000
Reference signal, periodic	(mm)	20
Distance reading head – measuring tape (incl. cover tape)	(mm)	0.2 ±0.05

Tab. 8

Measuring system  
LE100 interfaces

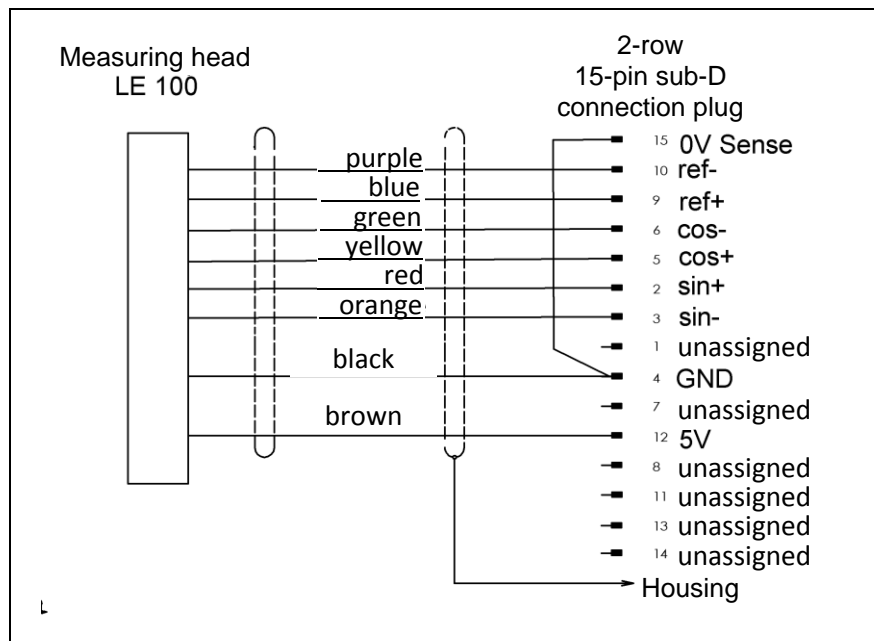


Fig. 8: Measuring system LE100 interfaces

## 10.2 Measuring system TTK 70

### Technical data

Description		TTK 70
Operating voltage	(VDC)	7-12 V
Output signal		Sin, Cos
Output signal		Hiperface
Signal amplitude	(V <sub>ss</sub> )	1 ±10%
Offset sine/cosine	(V)	2.5 ±0.5%
Signal period	(µm)	1000
Distance reading head – measuring tape (incl. cover tape)	(mm)	0.2 ±0.05

Tab. 9

### Measuring system cable TTK 70 interfaces

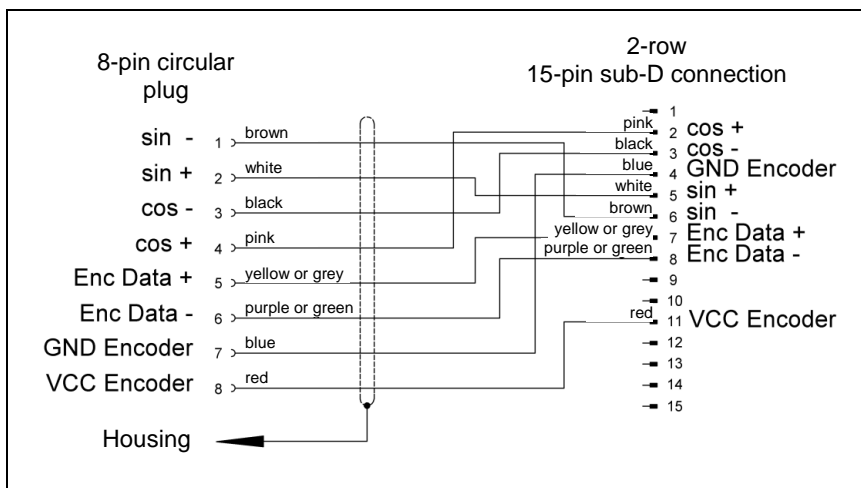


Fig. 9: Measuring system cable TTK 70 interfaces

**10.3 Motor interface**

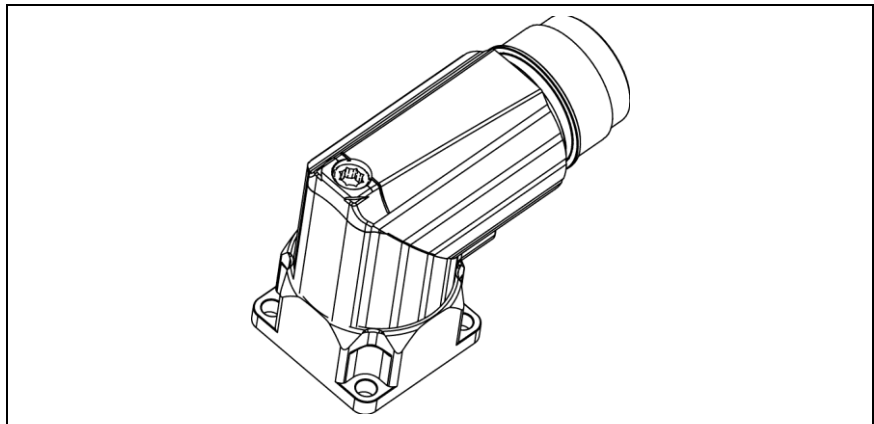


Fig. 10: Power connector

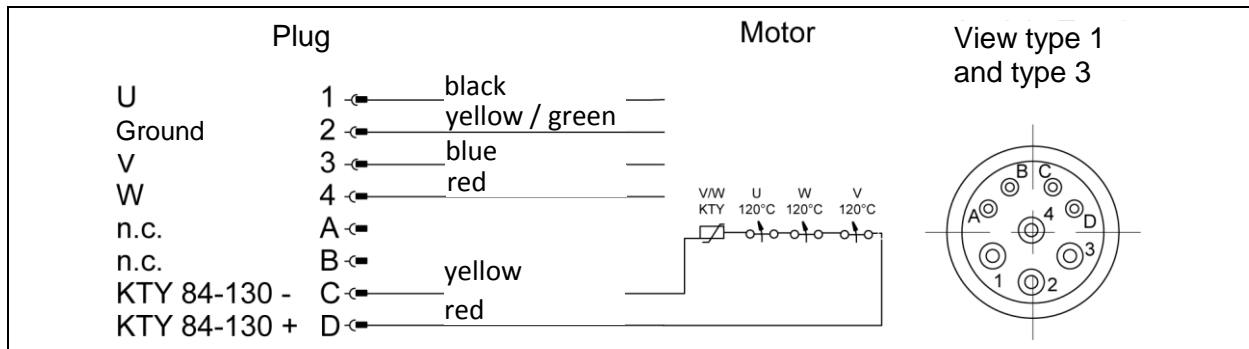


Fig. 11: Motor interfaces

## 11 Troubleshooting

### 11.1 Module does not move?

Possible cause	Remedial measures
Carriage jammed	<p>Check distance between the secondary part and the engine, if there are metal parts on the magnet</p> <p>For modules with brakes - Check compressed air supply</p>
Eend switch and reference switch without function, faulty or incorrect setting	<p>Repair proximity switch</p> <p>Switch was away adjusts</p> <p>☞ documentation chapter 12.11</p>
A component is broken, e.g. through overloading	<p>Replace component or send the module with a repair order to SCHUNK.</p> <p>Make sure that the module was only used in the context of its defined application parameters</p> <p>☞ 7 Technical data or catalog.</p> <p>If necessary check the application with the calculation program for gripping modules (SSG).</p>
Error in the cabelingt	<p>Check connection of power cables and encoder cables</p>
Control error	<p>Check error display of the controller</p> <p>call hotline +49-7133-2333</p>

Tab. 10

## 12 Maintenance and repair work

### 12.1 Module description

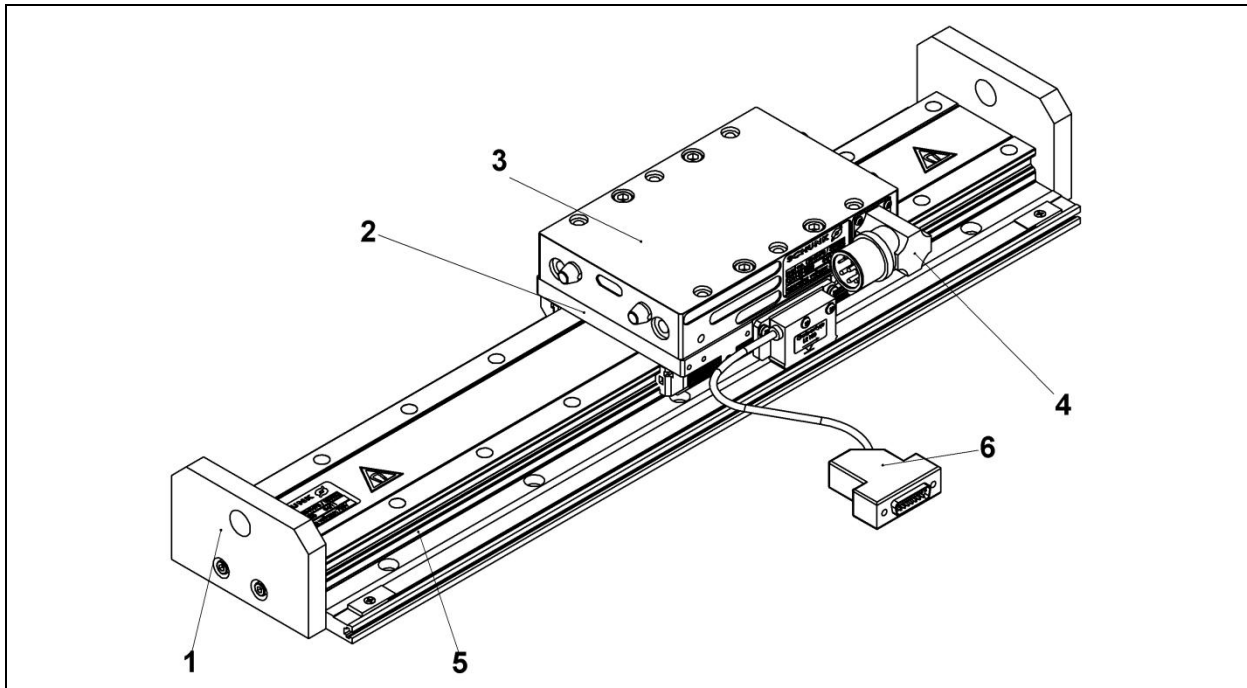


Fig. 12: Module description of linear motor drive type LDF

1 End plate	4 Motor plug
2 Guided slides	5 Guide rail
3 Motor housing	6 Measuring system

Tab. 11

## 12.2 Changing the motor housing

### **WARNING**

- ➔ During installation and commissioning, observe the technical data.
- ➔ As a general rule, all work on the drives and control units may be performed only while they are shut down. There must not be any electrical signals present.
- ➔ Allow the linear motor to cool down before starting any assembly or disassembly work.

### Uninstalling the motor housing

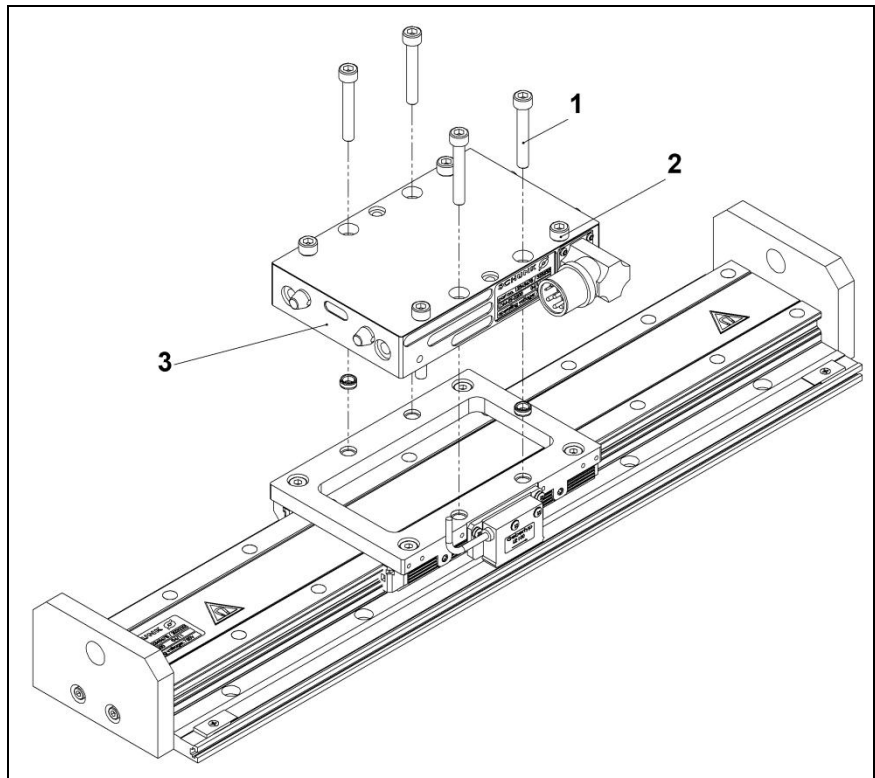


Fig. 13: Changing the motor housing of a linear motor drive type LDF

1. Disassemble protective conductor
2. Remove the screws (1).
3. Using lifting screws M6x35 ISO4762 (2), lift the motor housing to bridge the magnetic force.
4. Completely remove the motor housing (3).

**Installing the motor housing**** WARNING****Danger of crushing!**

➔ Never install the motor without lifting screws.

1. Mount the lifting screws (2). (leave 5 mm protruding)
2. Place the motor housing (3) on the guide rail.
3. Slowly unscrew the lifting screws (2) one by one and set the motor housing onto the guided slide (4).
4. Fit the 4 screws (1).
5. Connect the protective conductor

### 12.3 Turn the motor plug

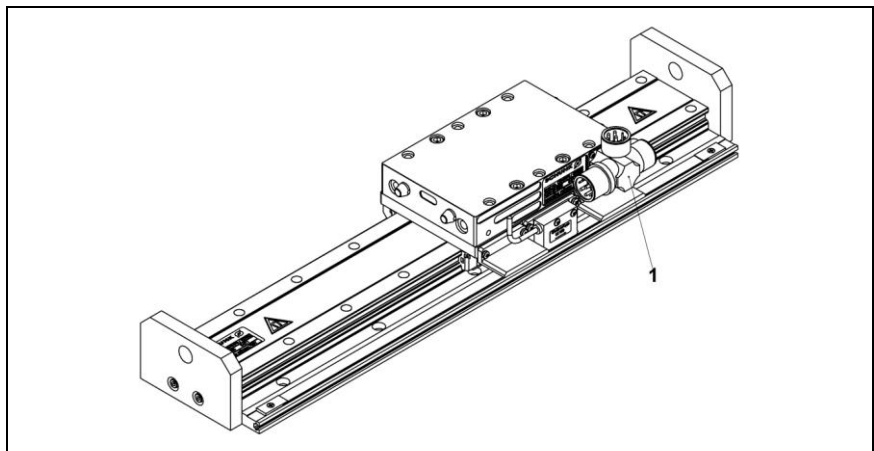


Fig. 14: Turn the motor plug (1)

#### WARNING

➔ For reasons of electrical safety, the motor plug may only be replaced by a trained electrician.

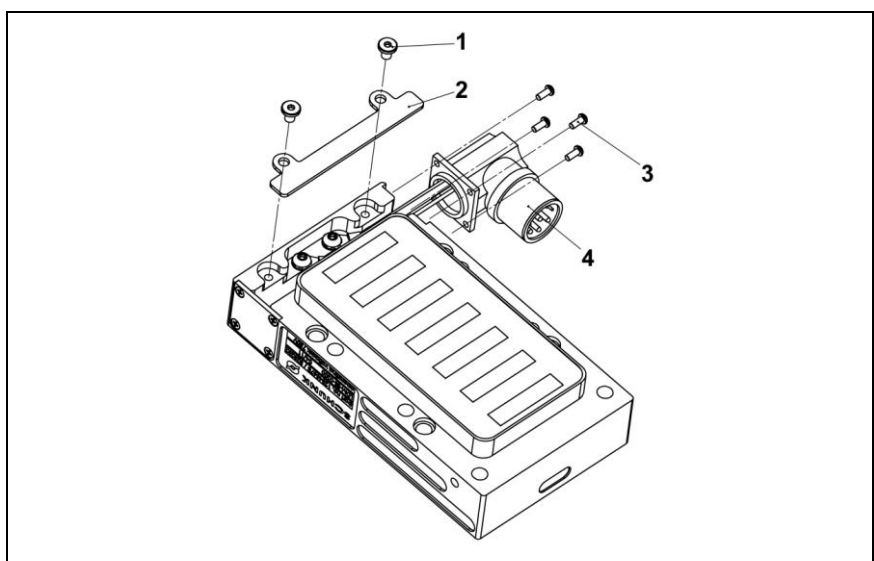


Fig. 15: Turn the motor plug

#### Remove the motor plug

1. Remove the motor housing (➔ chapter 12.2).
2. Unscrew the 2 screws (1).
3. Remove the cable cover (2).
4. Unscrew the 4 screws (3).
5. Carefully pull out the power connector (4) by about 2 mm.

**Fit the motor plug**

Carefully turn the power connector into the new position.

**! NOTICE**

- ➔ Be careful with the cable when mounting the power connector. The cable must not be damaged or subjected to mechanical loads.
- ➔ The cable must not be crushed when mounting the cable cover.
- ➔ Observe the correct motor rotation direction.

1. Carefully press the power connector (4) into the notch
2. Screw in the 4 screws (3).
3. Lay the cable parallel into the slot
4. Fit the the cable cover (2).
5. Screw in the 2 screws (1).
6. Install the motor housing (☞ chapter 12.2).

## 12.4 Modifying the motor plug to a different side

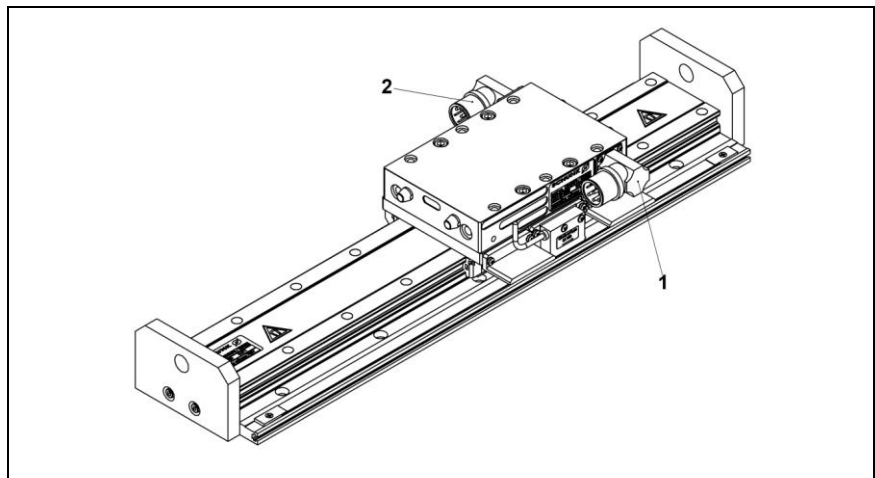


Fig. 16: Modifying the motor plug from side 1 to side 2

### **!** NOTICE

➔ For reasons of electrical safety, the motor plug may only be replaced by a trained electrician.

### Remove the motor plug

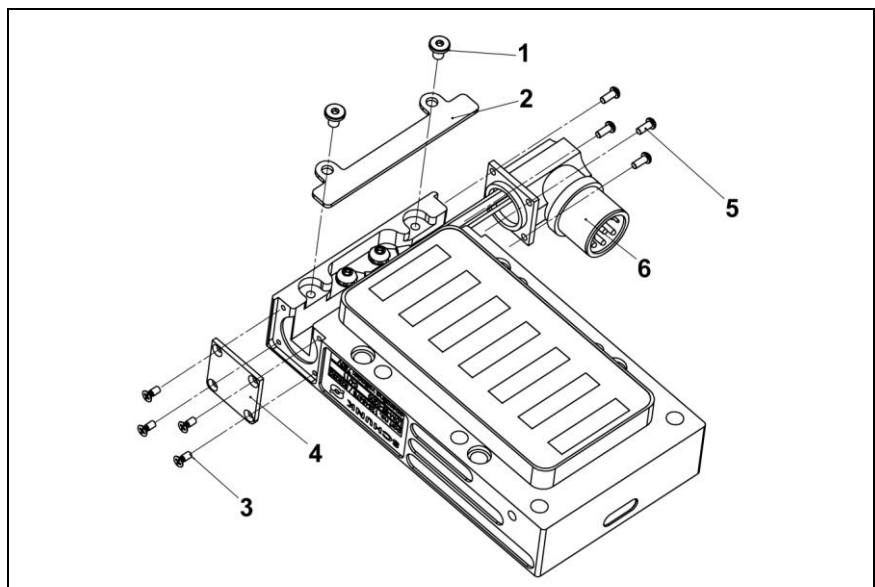


Fig. 17: Modifying the motor plug

1. Remove the motor housing (☞ chapter 12.2).
2. Unscrew the 2 screws (1).
3. Remove the cable cover (2).
4. Unscrew the 4 screws (3).

5. Remove the cover (4).
6. Unscrew the 4 screws (5).
7. Carefully pull out the power connector (6) by about 2 mm.

**Fit the motor plug**

Carefully turn the power connector into the new position.

**! NOTICE**

- ➔ Be careful with the cable when mounting the power connector. The cable must not be damaged or subjected to mechanical loads.
- ➔ The cable must not be crushed when mounting the cable cover.
- ➔ Observe the correct motor rotation direction.

1. Carefully press the power connector (6) into the notch on the opposing side.
2. Screw in the 4 screws (5) to fasten the power connector.
3. Lay the cable parallel into the slot.
4. Fit the cover (4) on the opposing side.
5. Screw in the 4 screws (3).
6. Fit the the cable cover (2).
7. Screw in the 2 screws (1).
8. Install the motor housing (☞ chapter 12.2).

## 12.5 Motor rotation direction

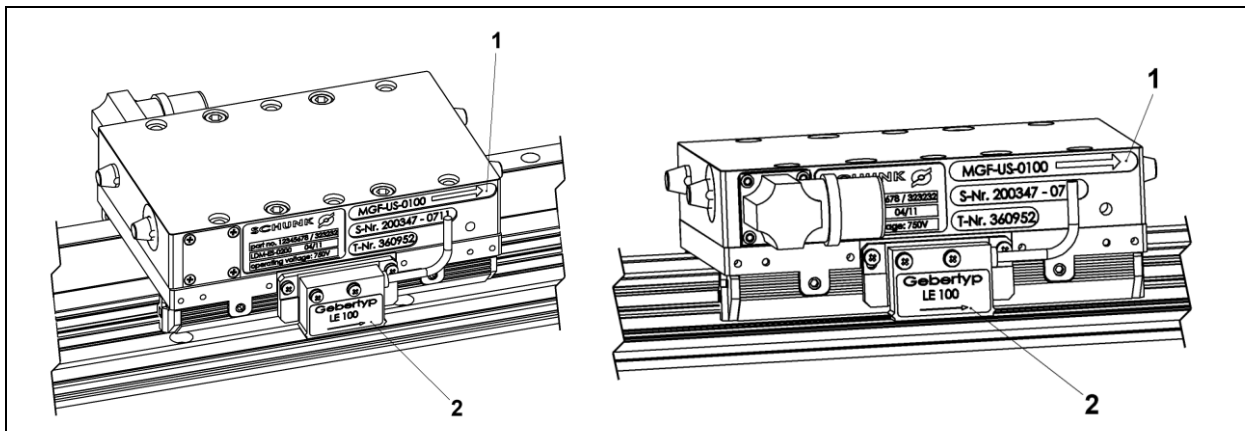


Fig. 18: Motor rotation direction for left motor

Motor rotation direction for right motor

1 Motor rotation direction arrow

2 Measuring system direction arrow

Tab. 12

### **!** NOTICE

➔ When mounting the motor take care to ensure that the arrow on the motor (1) points in the same direction as the arrow on the measuring system housing (2).

### **⚠** DANGER

If the arrows point in opposite directions the linear motor drive will either not function or uncontrolled movements may occur.

**12.6 Changing the roller shoes**

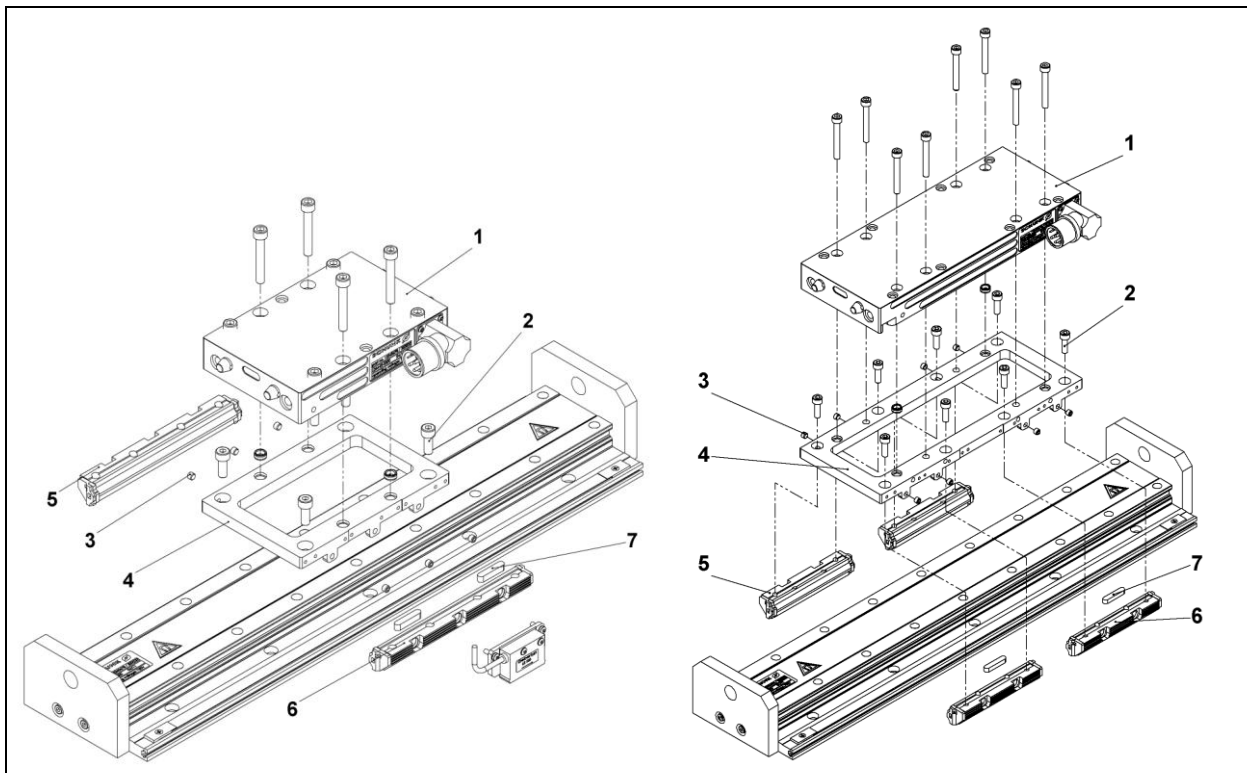


Fig. 19: Changing the support rollers on locating bearing side of LDF-US-0100

Changing the roller shoes on type LDF-UL-0200

1 Motor housing	5 Roller shoe, non-locating bearing side
2 Cylindrical screws	6 Roller shoe locating bearing side
3 Set screws	7 Feather key
4 Guide frame	

Tab. 13

**Uninstalling the roller shoe - locating bearing side**

1. Remove the motor housing (1) (☞ chapter 12.2).
2. Release the mounting screws (2).
3. Remove the roller shoe (6).

**Installing the roller shoe – locating bearing side**

1. Insert the feather keys (7).
2. Fit the roller shoe into the guide (6).
3. Screw (2) the roller shoe onto the guide frame (4) and, using the set screws (3), adjust so that there is no play.
4. Firmly screw in pressure pins (2).
5. Install the motor housing (☞ chapter 12.2).

**Uninstalling the roller shoe – non-locating bearing side**

1. Remove the motor housing (1) (☞ chapter 12.2).
2. Release the mounting screws (2).
3. Remove the roller shoe (5)

**Installing the roller shoe – non-locating bearing side**

1. Fit the roller shoe into the guide (5).
2. Using the guide frame (4), gently hold the roller shoe in place (2).
3. Using the set screws (3), adjust the roller shoe so that there is no play and screw it to the guide frame (4).
4. Install the motor housing (☞ chapter 12.2).
5. Now the displacement force must be between 3 N and 6 N.

## 12.7 Changing the stroke measuring system

### NOTICE

➔ Due to the adjustment work required, the stroke measuring system should only be changed by specialist personnel.

### 12.7.1 Main components

Different measuring systems are used in the drives. This documentation describes two measuring systems.

- 1. LE 100
- 2. TTK70

For more information on the optical stroke measuring systems, refer to the separate operating manuals.

#### Measuring system LE 100

The measuring system LE 100 is a non-contact incremental measuring system. In conjunction with the measuring tape in the Schunk axes, the sensor head supplies a sin - cos signal and a periodically recurring reference signal.

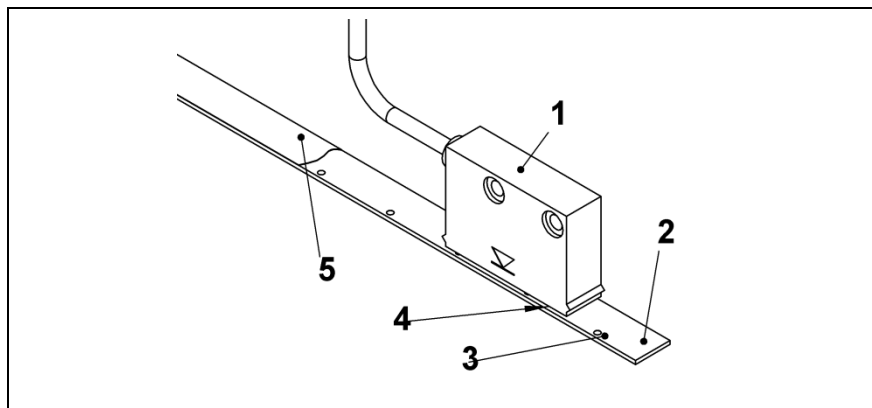


Fig. 20: Measuring system modules

1 Reading head LE 100	4 Distance between between reading head and covering tape
2 Magnetic strip LE 100	
3 Marking on magnetic strip	5 Cover tape

Tab. 14

**Measuring system  
TTK 70**

The measuring system TTK 70 is a non-contact absolute measuring system. In conjunction with the measuring tape in the Schunk axes, the sensor head supplies a periodically recurring signal (1 Vss) and Hiperface information.

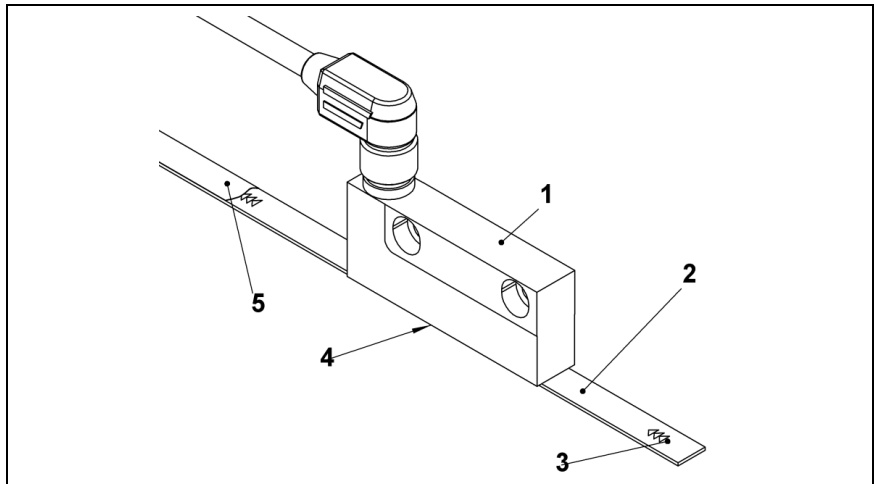


Fig. 21: Measuring system modules

1 Reading head TTK 70	4 Distance between between reading head and covering tape
2 Magnetic strip TTK 70	
3 Marking on magnetic strip	5 Cover tape

Tab. 15

**12.7.2 Changing the measuring system LE 100**

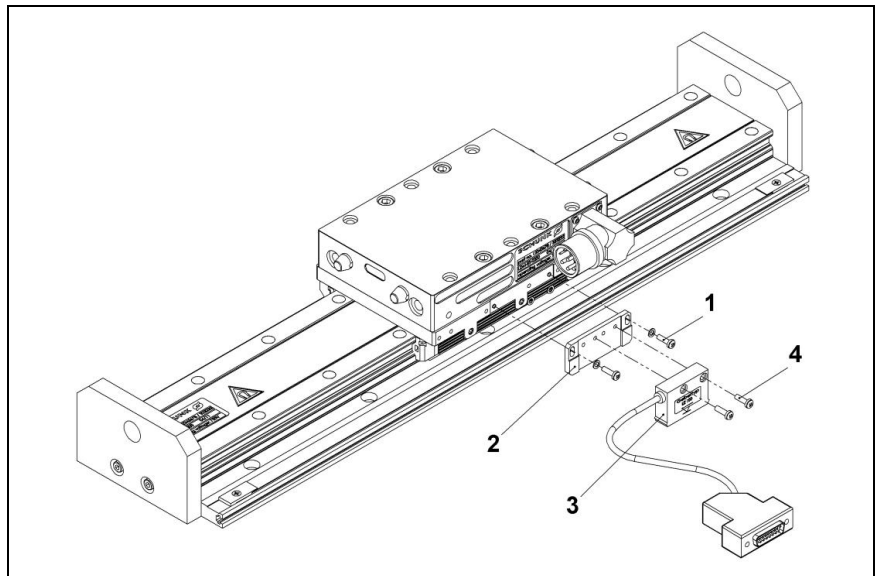


Fig. 22: Measuring system LE 100

1 Cover	3 Cylindrical screws
2 Reading head LE 100	4 Cylindrical screws

Tab. 16

**! NOTICE**

➔ The measuring system is precisely adjusted. In the event of a disassembly, the measuring system must be re-adjusted. Memorize the installation position of the reading head support. The cable must point in the same direction again.

**Note**

Special tool:

Tester for measuring system LD including adapter cable (order no. 323712)

1. Release the mounting screws (4).
2. Remove the reading head (3) and replace it.
3. Screw the reading head (3) to the reading head support (2).
4. Use the measuring system tester to test the electric output signal of the reading head.

5. Based on the result, you can calculate the distance between the ruler and the reading head. It must be  $0.2 \pm 0.05$  mm along the entire length.
6. If necessary, slightly loosen the mounting screws (1) for height adjustment.
7. When the height is adjusted correctly, set the height adjustment using the screws (1).

### NOTICE

- When installing the reading head support complete with reading head, ensure the correct installation position. The markings on the reading head (1) and the ruler (2) must be on the same side.

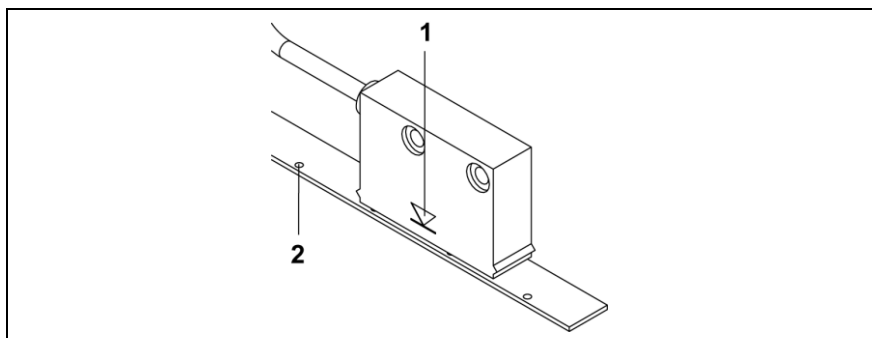


Fig. 23: Markings on reading head and ruler LE 100

### NOTICE

- Because Schunk offers other stroke measuring systems in addition to the stroke measuring system described here, you must also observe the corresponding separate documentation.

12.7.3 Changing measuring system TTK 70

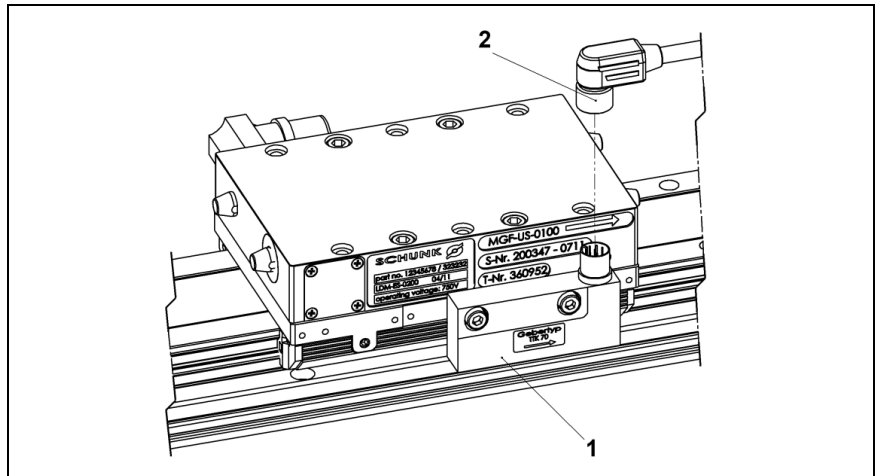


Fig. 24: Measuring system TTK 70

1 Installation set for measuring system TTK70	2 Measuring system cable
---	--------------------------

Tab. 17

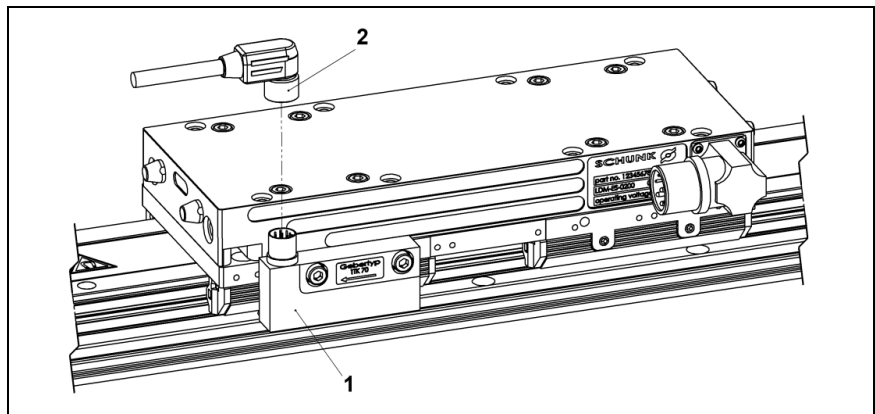


Fig. 25: LDF-UL-0200 with measuring system TTK 70

1 Installation set for measuring system TTK70	2 Measuring system cable
---	--------------------------

Tab. 18

**! NOTICE**

➔ The measuring system can only be replaced by authorized service staff.

## 12.8 Changing the magnetic strip

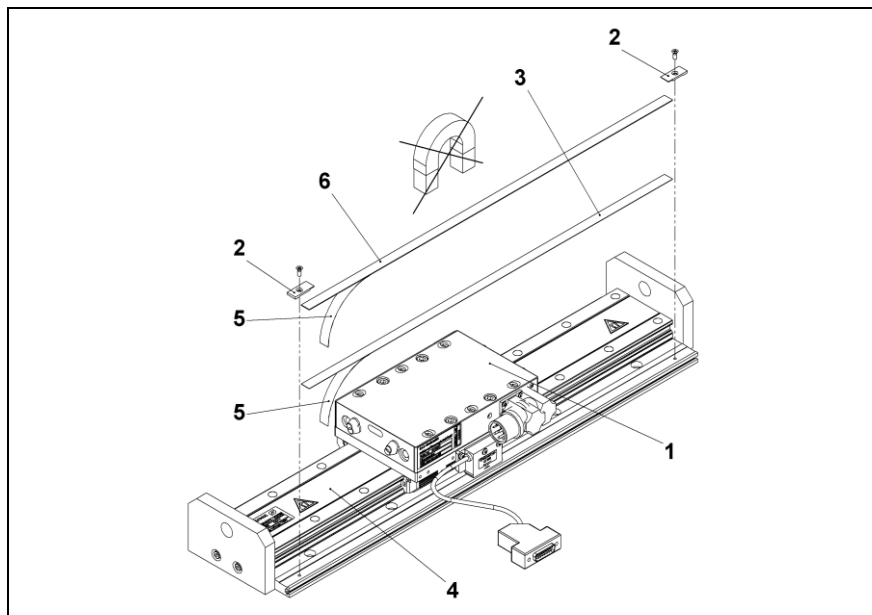


Fig. 26: Changing the ruler

1 Guided slides	4 Guide rail
2 Magnetic strip clamp	5 Protective film
3 Magnetic strip	6 Cover tape

Tab. 19

### **!** NOTICE

➔ The magnetic strip of the measuring system must not be exposed to a strong magnetic field. At about 30 gauss or more, the magnetic strip encoding will be destroyed. Keep it away from the secondary part (permanent magnets) of the linear motor drive.

### **!** NOTICE

➔ Pay attention to the marking on the magnetic strip. (see the documentation on changing the measuring system)

1. Move the guided slide (1) to one side.
2. Unscrew the 2 magnetic strip clamps (2).
3. Carefully detach the magnetic strip (3 and 6) from the guide rail (4) using a knife point and pull it off.
4. Carefully clean the guide rail (4) of all adhesive residue using petroleum ether.
5. Slide the magnetic strip (3) underneath the guided slide (1) and place it on the guide rail (4).
6. Length of the magnetic strip (3) = length of the guide rail (4) - 42 mm.
7. Slightly lift up one side of the magnetic strip (3) and use forceps to remove the protective film (5) from the adhesive film.
8. Press the magnetic strip (3) onto the guide rail (4) while pulling off the protective film.
9. When you are half-way done, slide the guided slide (1) to the opposite side.
10. Unscrew the 2 magnetic strip clamps (2).

## 12.9 Changing the wipers

### NOTICE

- ➔ When using wipers, it is especially important that you clean the guide strips and lubricate them with an oil-soaked cloth.
- ➔ Note that the usable stroke is reduced when installing wipers.

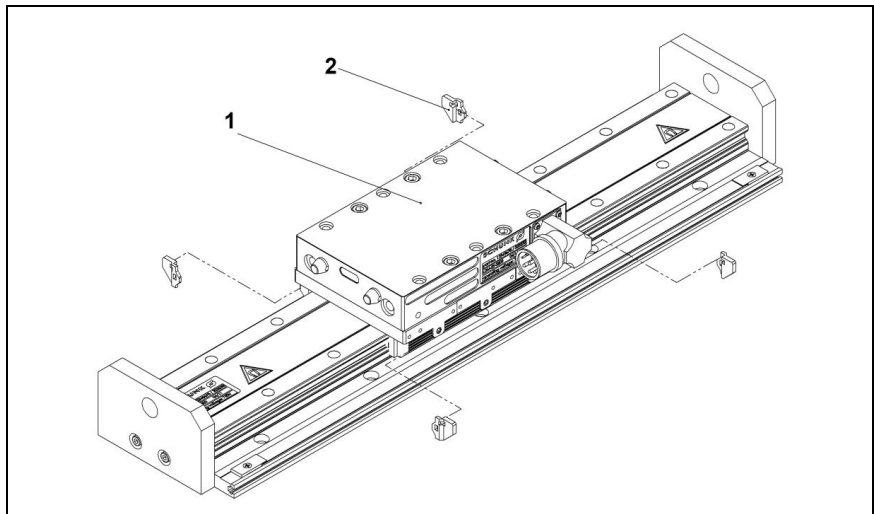


Fig. 27: Changing the wipers

1 Guided slides	2 Wipers
-----------------	----------

Tab. 20

1. Slide the guided slide (1) to the center of the axis.
2. The wipers (2) are attached to the front of the roller shoe by two snap-fits.
3. Lever out the wipers (e.g. using a screwdriver) at the notch on the snap-fits.
4. To reinstall, press the wipers with the snap-fits into the opening provided on the roller shoe.

## **12.10 Replacing the brake piston**

**Notes** The pneumatic holding brake is not a safety component.

The pneumatic holding brake prevents the guide rail from moving with respect to the guided slides when a force less than 150 N per brake is applied to the guide (braking effect when new).

The slide or guide rail may not be moved when the brakes are applied. This can damage the linear motor drive. This especially reduces the braking effect.

The braking effect is also influenced by worn or dirty braking surfaces. Observe the braking effectiveness and consult our service department when the brakes become less effective.

In normal operation the braking effect is released by compressed air and a spring assembly applies the brake when required. Note that the braking effect is immediately released when the compressed air supply is switched on and this can lead to dangerous movements.

The brake releases when compressed air at a minimum pressure of 4 bar (maximum 8 bar) is present at the connection of the linear motor drive.

Integrate the holding brake into the control concept for your system in a sensible manner. Note that this is a stationary holding brake and is not suitable for continuous operation.

 <b>WARNING</b>
<b>Switch off the control unit and compressed air</b> <b>The brake piston is pre-tensioned with disk springs.</b>

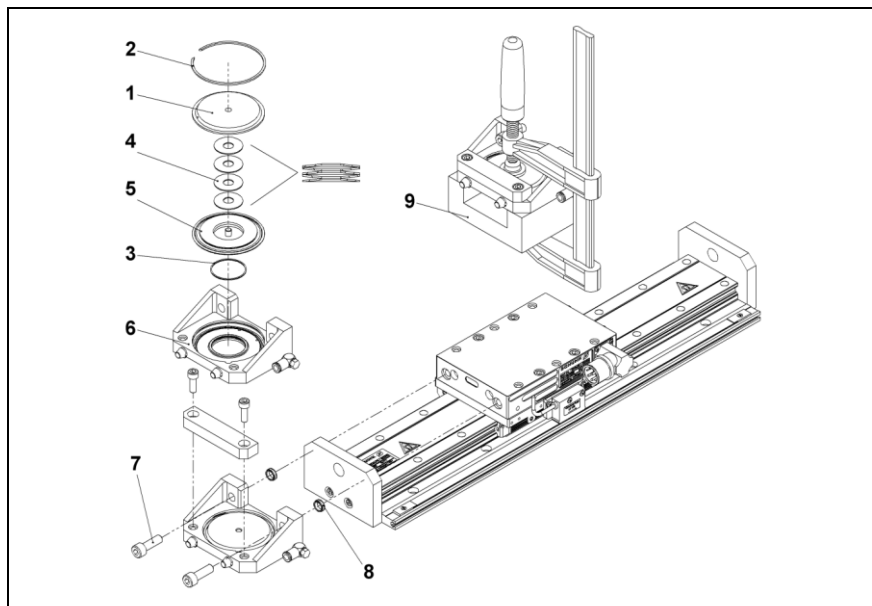


Fig. 28: Replacing the brake piston

1 Brake cover	4 Disk springs	7 Cylindrical screws
2 Retaining ring	5 Brake piston	8 Centering sleeve
3 O-Ring	6 Housing	9 Assembly aid

Tab. 21

### Uninstalling the brake piston

1. Using a vise, clamp the brake cover (1).  
To do this, support the housing using an assembly aid (9).
2. Remove the retaining ring (2).
3. Slowly loosen the vise.
4. Remove the brake cover (1), O-ring (3) and disk springs (4).
5. Using pliers (with braces), pull out the brake piston (5).

### Installing the brake piston

1. Slightly grease and insert the O-ring (3).
2. Insert the brake piston (5) and fit the membrane into place.
3. Fit the disk springs (4) and the brake cover (1).

#### **! NOTICE**

➔ When installing the disk springs (4), make sure the individual disk springs are placed in the correct position.

4. Set the vise onto the brake cover (1) and press in the cover.
5. Fit the retaining ring (2).
6. Loosen and remove the vise.

## 12.11 Limit switches and reference switches

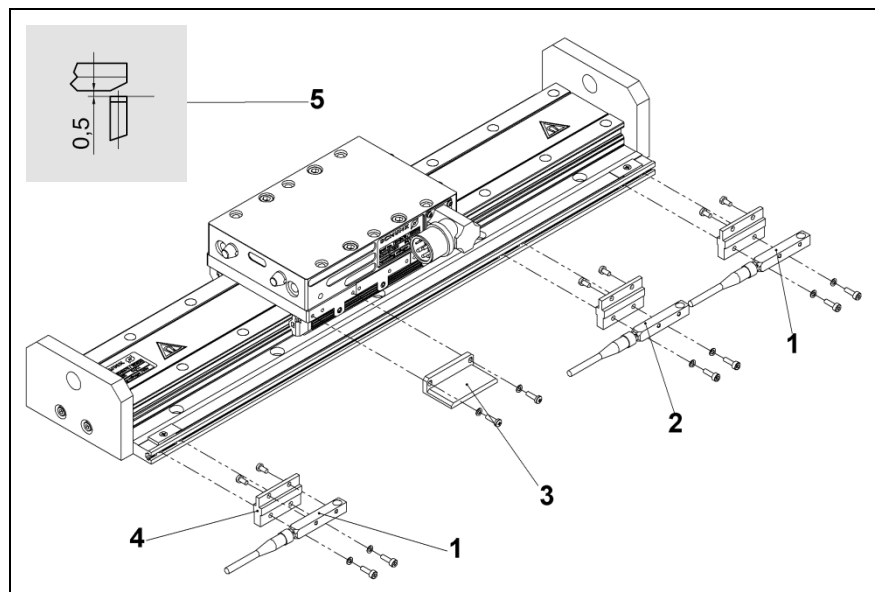


Fig. 29: Mechanical limit switches and inductive reference switch

1 Inductive limit switches	4 Switch baseplate
2 Inductive reference switch	5 Switching distance for inductive limit and reference switches
3 Switching lug	

Tab. 22

1. Unscrew the mounting screws of the switch baseplate (4).
2. Unscrew the mounting screws of the switch (1/2) and remove the switch.
3. Install the new switch and adjust the switching distance (item 5).
4. Tighten the screws on the switch and carry out a test run.

**12.12 Maintenance and care**

**⚠ WARNING**

Only carry out work on linear motor drives while the machine is switched off.

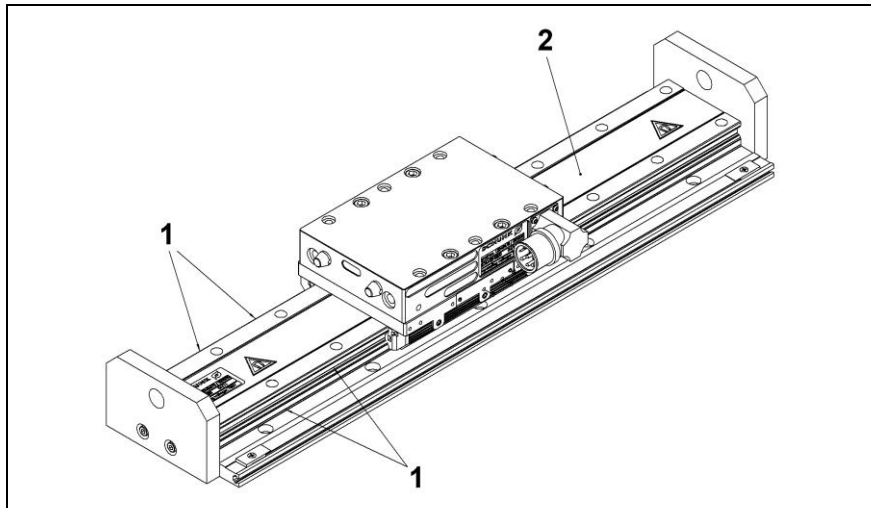


Fig. 30: Maintenance of guide and secondary part

To ensure the operational safety of the linear motor drive type LDF over a long period of time, the operating personnel must carry out maintenance work in specific intervals.

**Weekly maintenance  
(depending on degree of  
contamination)**

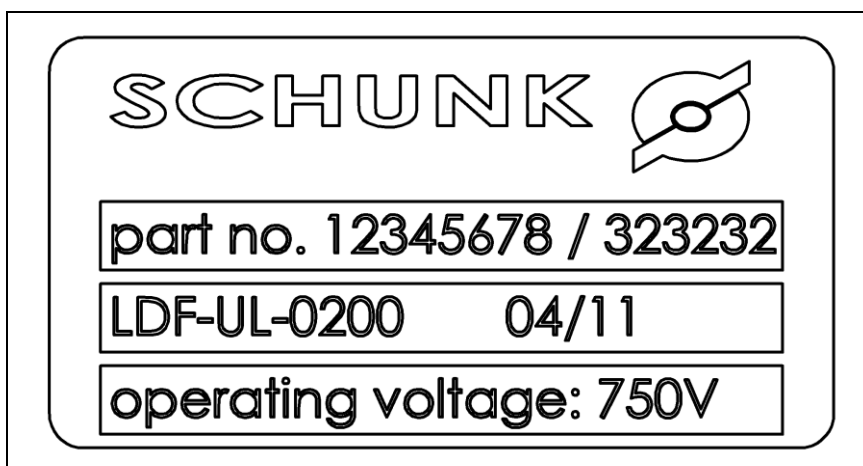
➔ Rub the guide strips (1) with an oil-soaked cloth.

**Every 2 to 4 weeks**

➔ Clean the secondary part (2) with ethyl alcohol.

## 13 Spare parts

### 13.1 Note regarding spare part orders



*Fig. 31: Name plate*

SCHUNK products are always subject to technical modification and improvement. To avoid incorrect deliveries, and to order parts without a part number, always provide the information specified on the nameplate as well as the serial number of the linear motor drive.

The name plate is located on the guide rail and on both sides of the guided slide.

#### **Example**

1. Job number / Part number
2. Axis designation LDF-US-0200
3. Voltage

## 13.2 Axes

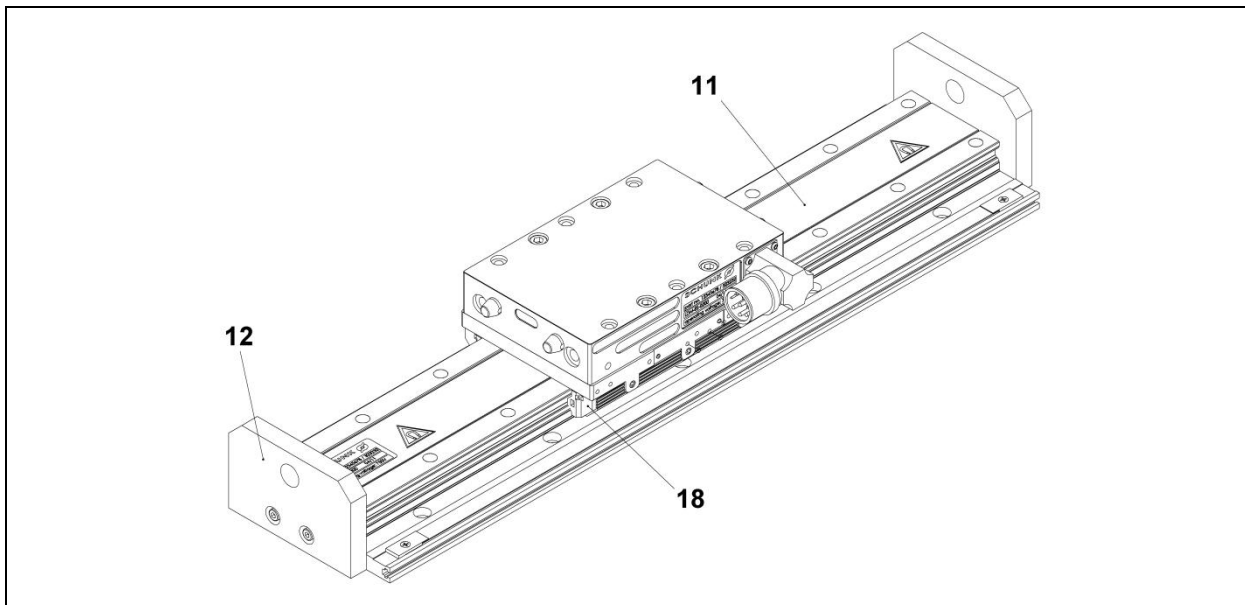


Fig. 32: Spare parts – Axis

Item	Type of axis	Designation	Number	Option	Order no.
11	All	Profile guide	1	H	353 076
12	All	End plate	1		342 251
13	All	Centering sleeve $\varnothing 9$	6		301 587
14	All	Ethyl alcohol 50 ccm	1	R	301 480
15	All	Oil 50 ccm	1	R	301 478
16	All	Measuring system tester	1		323 712
17	All	Documentation Commissioning of Indradrive (German/English) including CD-ROM	1		363 445
18	LDF-US-0100 LDF-UL-0200	Felt wipers (4 pieces)	1 2		330 401

Tab. 23

- S Only with optional switch
- H Stroke-dependent
- R Cleansing agent
- E End position dampening

**13.3 Motors**

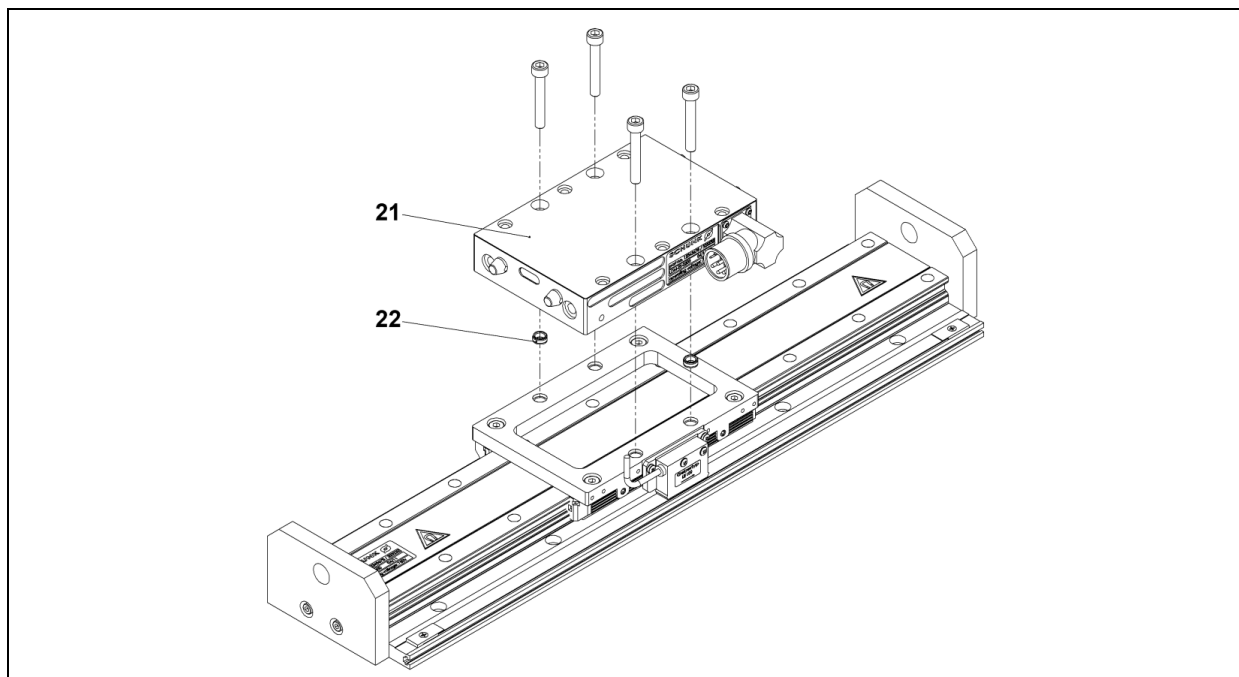


Fig. 33: Spare parts – Motors

Item	Type of axis	Designation	Number	Variant	Order no.
21	LDF-US-0100 FU	Linear motor MGF-US-0100 LS	1	2	363021
	LDF-US-0100 FU	Linear motor MGF-US-0100 RS	1	1	363017
	LDF-UL-0200 FU	Linear motor MGF-UL-0200 LS	1	4	360956
	LDF-UL-0200 FU	Linear motor MGF-UL-0200 RS	1	3	363019
22	All	Centering sleeve $\varnothing 9$	6		301587

Tab. 24: Motors without Hall sensor

**Motor variants LDF-US-0100:**

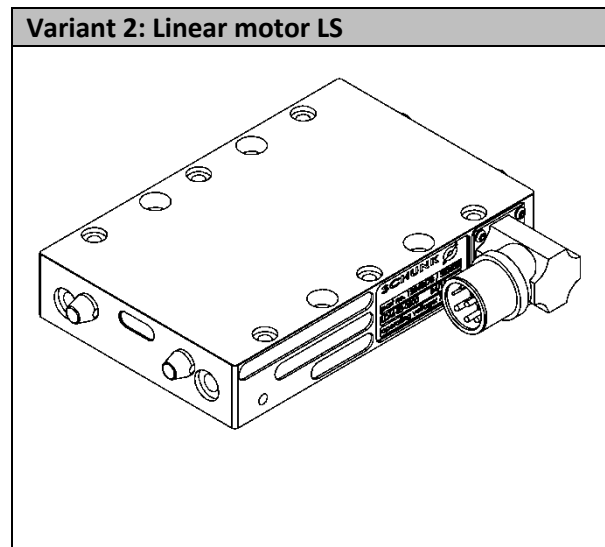
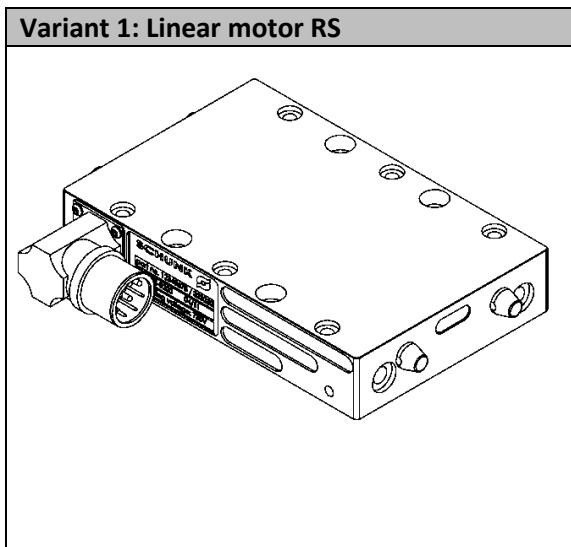


Fig. 34: Linear motor variants LDF-US-0100, RS and LS

**Motor variants type LDF-UL-0200**

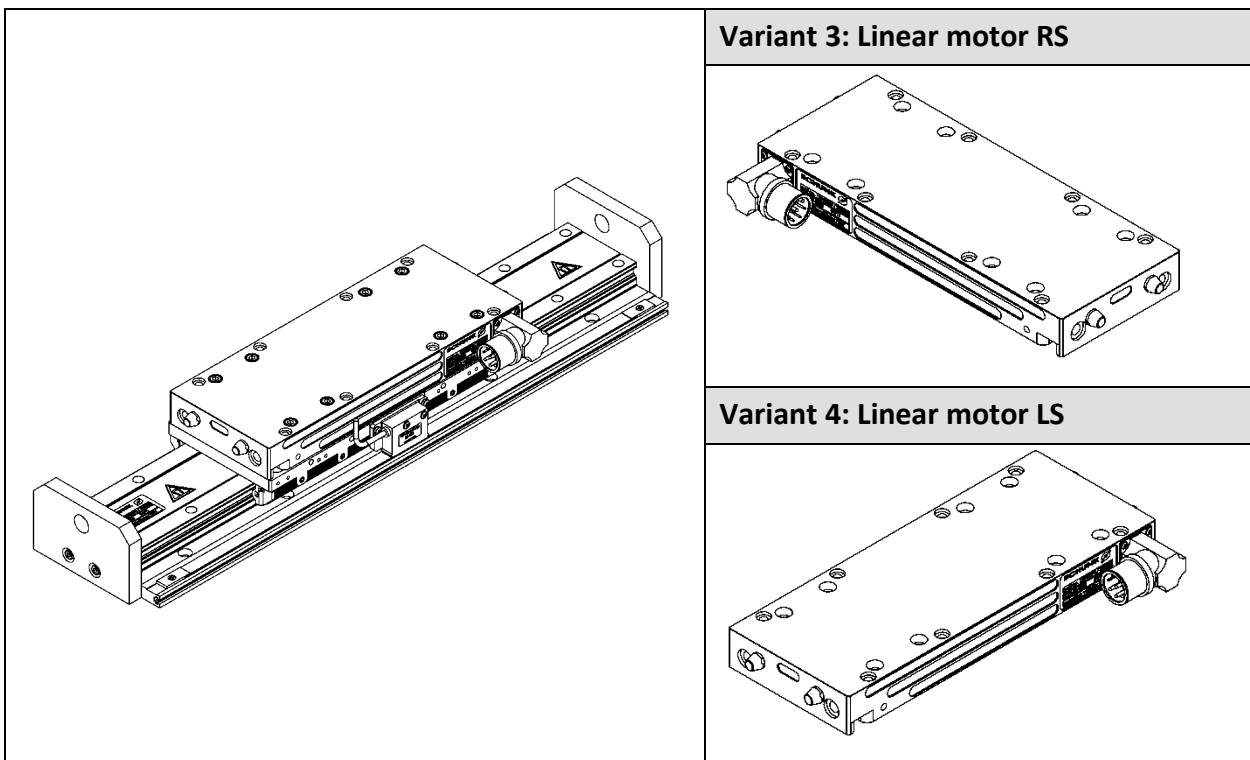


Fig. 35: Motor variant LDF-UL-0200

### 13.4 Guide

#### 13.4.1 Type LDF-US-0100

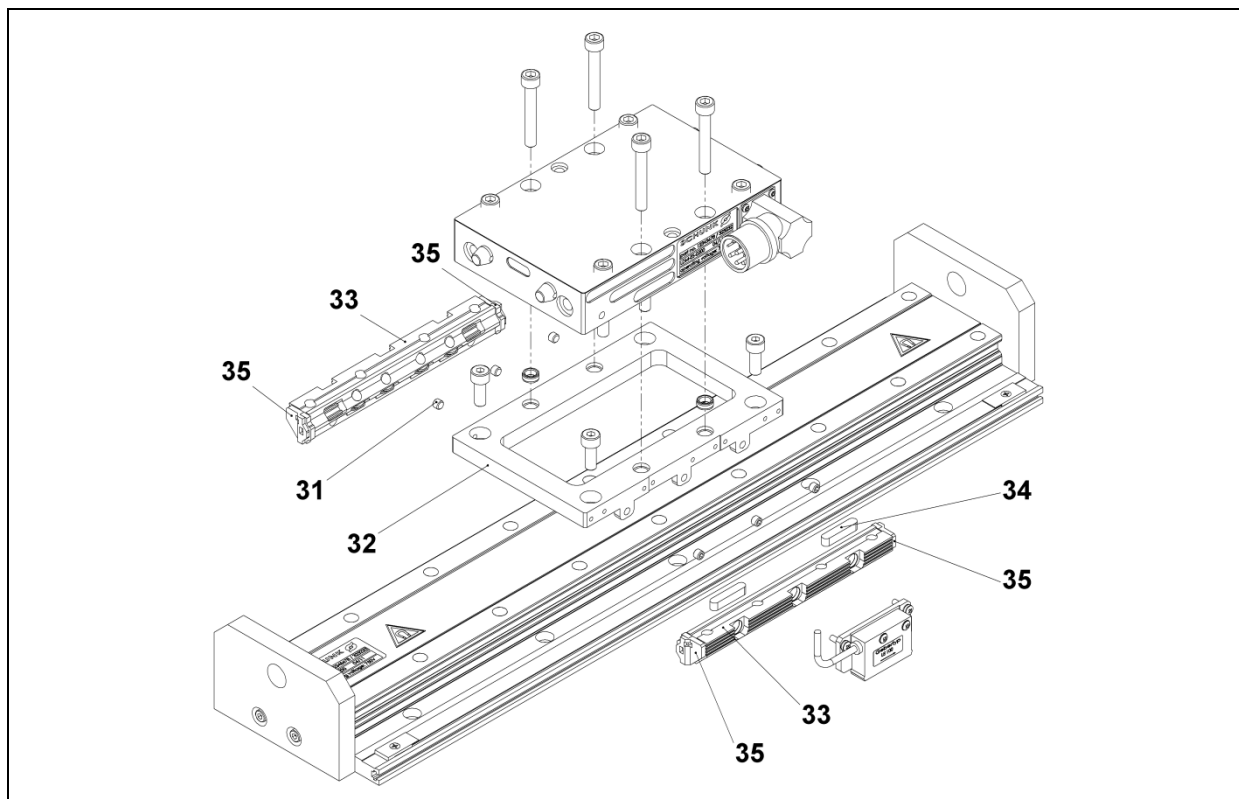


Fig. 36: Spare parts – Guide type LDF-US-0100

Item	Type of axis	Designation	Number	Order no.
31	LDF-US	Set screw	6	336 338
32	LDF-US	Guide frame	1	344 349
33	LDF-US	Pair of roller shoes	1	344 338
34	LDF-US	Feather key	2	342 392
35	All	Felt wipers (4 pieces)	1	330 401

Tab. 25

### 13.4.2 Type LDF-UL-0200

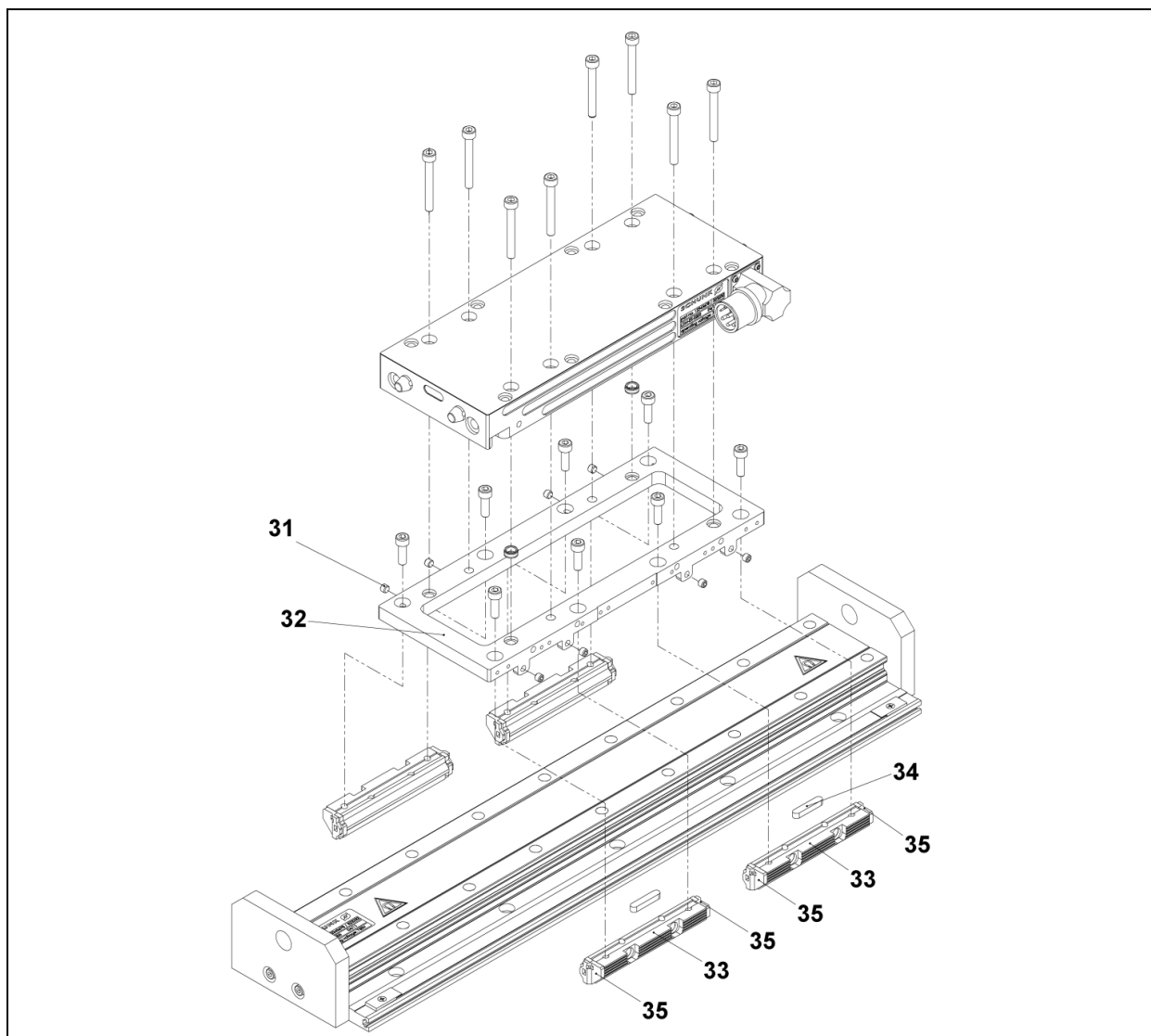
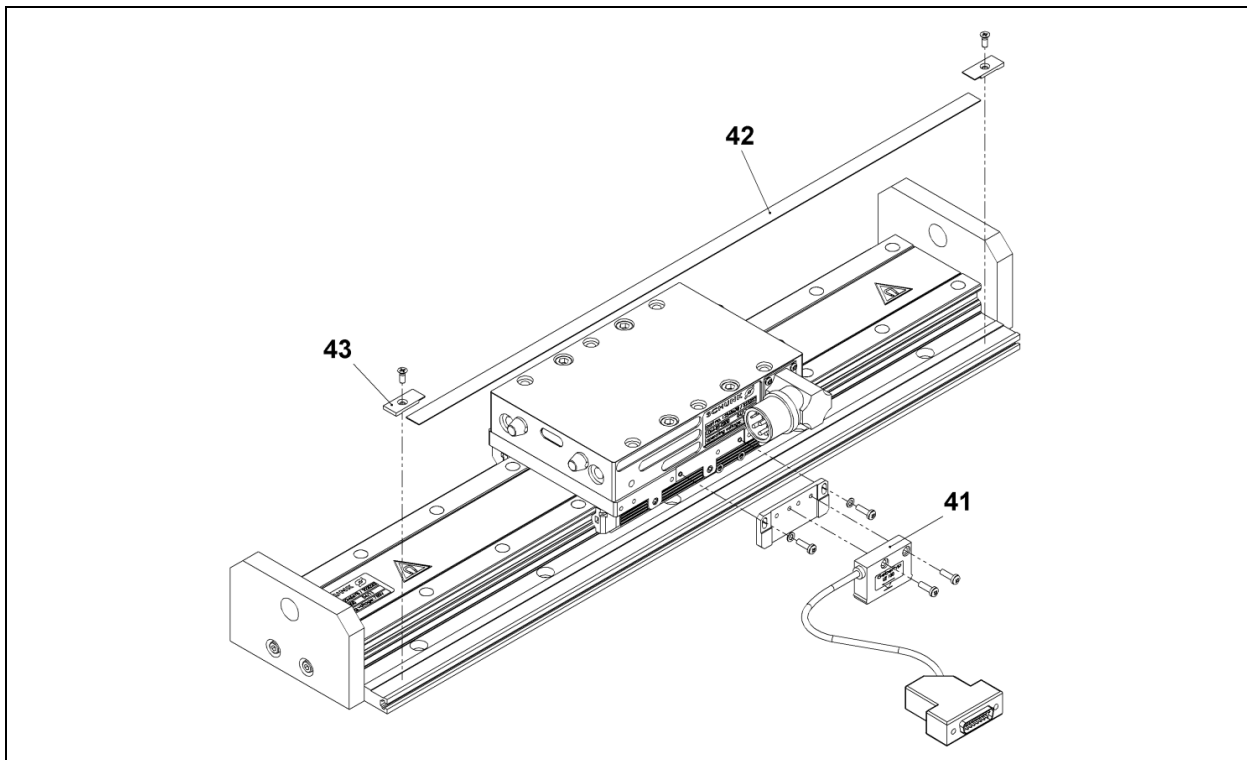


Fig. 37: Spare parts – Guide type LDF-UL-0200

Item	Type of axis	Designation	Number	Order no.
31	LDF-UL	Set screw	8	336 338
32	LDF-UL	Guide frame	1	344 322
33	LDF-UL	Pair of roller shoes	2	344 327
34	LDF-UL	Feather key	2	342 392
35	All	Felt wipers (4 pieces)	2	330 401

Tab. 26

**13.5 Measuring system**



Item	Type of axis	Designation	Number	Option	Order no.
41a	All	Reading head LE100 5 m	1		336 025
41b		Reading head LE100 10 m	1		341 782
42	All	Ruler LE100	1	H	346 611
43	All	Ruler clamping	2		333 991

Tab. 27

### 13.6 Holding brake

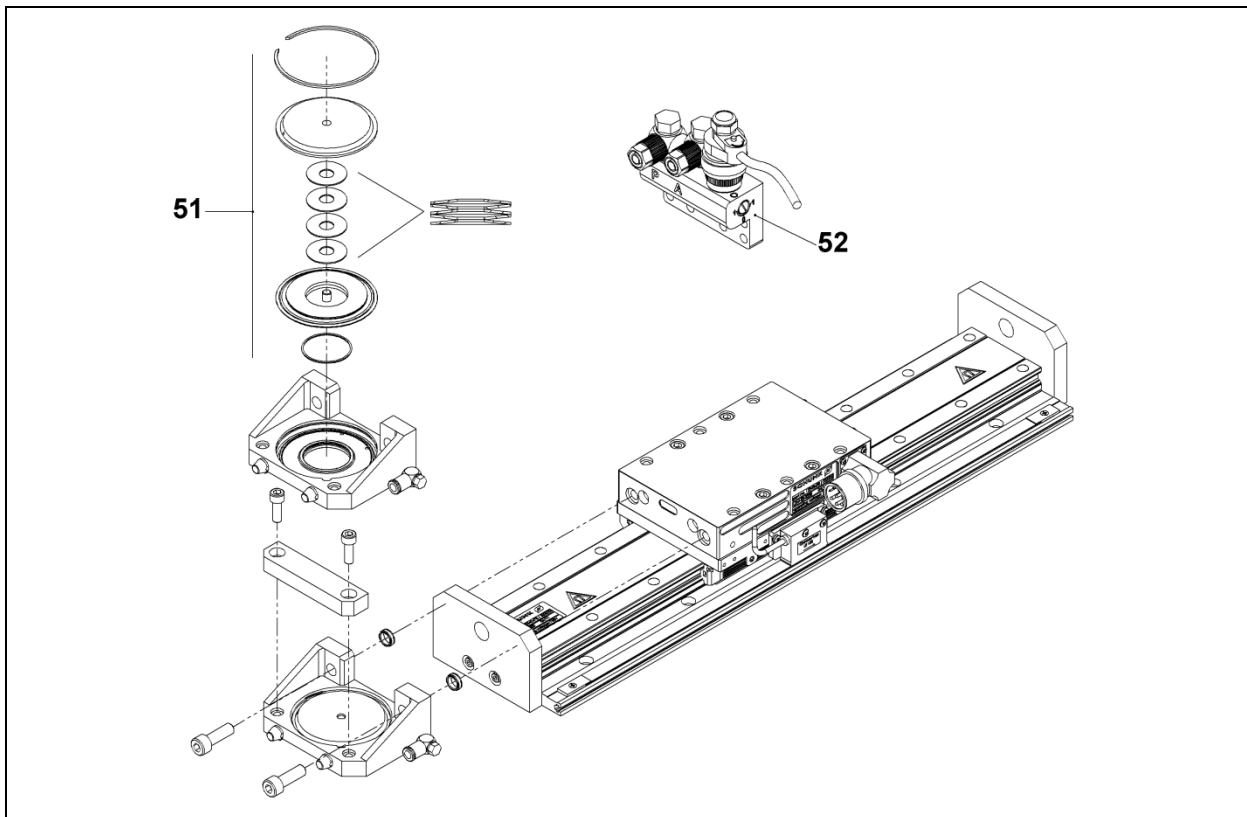


Fig. 38: Spare parts – Brake

Item	Type of axis	Designation	Number	Order no.
51	All	Installation set for pneumatic emergency stop brake	1	344 340
52	All	Brake valve, 10 m cable (GAS)	1	337 784

Tab. 28

**13.7 Accessories**

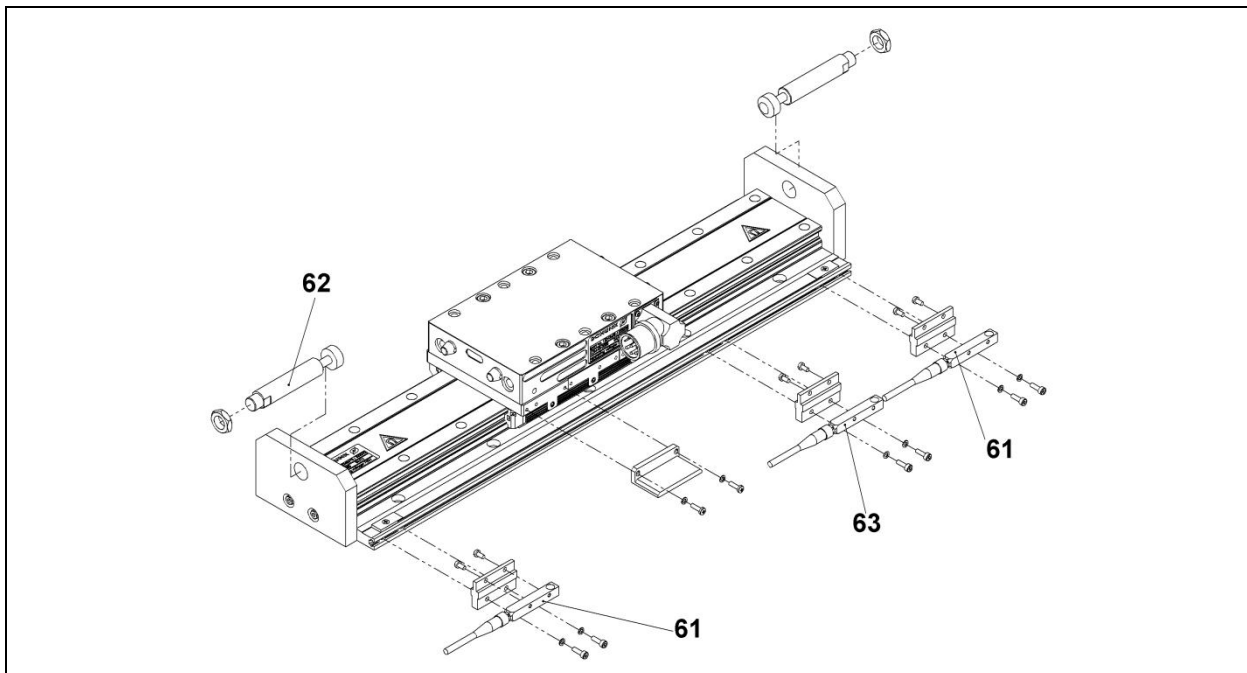


Fig. 39: Spare parts – Accessories

Item	Type of axis	Designation	Number	Order no.
61	All	Inductive limit switch	2	312 263
62	All	Shock absorber	2	306 174
63	All	Reference switch	1	302 400

Tab. 29

