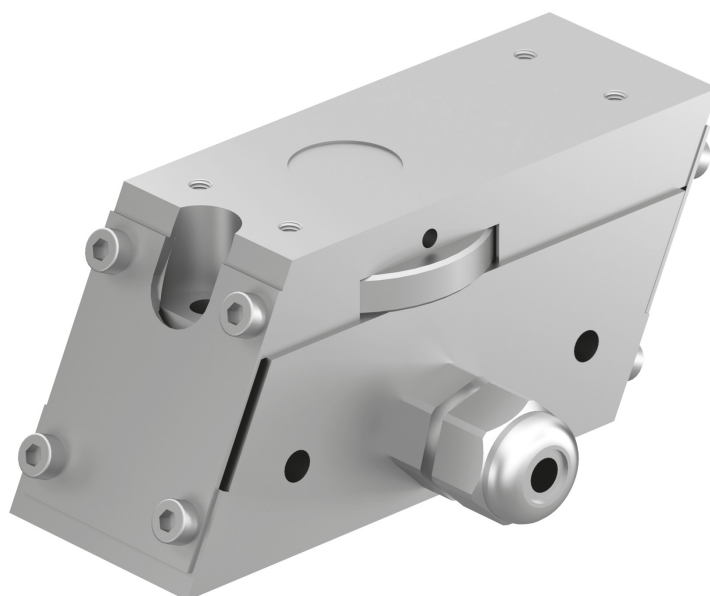


Operating & Installation Instructions

Linear Feeder LF9 / LF11



Translation of the Original Assembly Instructions EN

- Linear feeder LF9 (230 V/50 Hz) ⇒ Order no.: 15105783
- Linear feeder LF9 (115 V/60 Hz) ⇒ Order no.: 15068632
- Linear feeder LF11 (230 V/50 Hz) ⇒ Order no.: 11005757

Dear Customer

Thank you for choosing our products and placing your trust and confidence in our company!

These operating and installation instructions contain all essential information you need about your product. Our aim is to provide the required information as concisely and clearly as possible. If, however, you still have any questions on the contents or suggestions, please do not hesitate to contact us. We are always grateful for any feedback.

Our team will also be glad to answer any further question you may have regarding the linear feeder or other options.

We wish you every success with our products!

With kind regards

Your Afag team

© Subject to modifications

The linear feeders have been designed by Afag Automation AG according to the state of the art. Due to the constant technical development and improvement of our products, we reserve the right to make technical changes at any time.

Updates of our documentations



Unlike the printed documents, our digital instructions manuals, product data sheets and catalogues are being continuously updated on our website.

Please keep in mind that the digital documents on our website are always the latest versions.

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Afag Automation AG
Werner-von-Braun Street 1
D-92224 Amberg (Germany)
Tel.: +49 (0) 9621 65 027-0
e-mail: sales@afag.com
Internet: www.afag.com

Afag Automation AG
Luzernstrasse 32
CH-6144 Zell (Switzerland)
Tel.: +41 62 959 86 86
e-mail: sales@afag.com
Internet: www.afag.com

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1 General

1.1 Contents and purpose of this manual

These operating and installation instructions contain important information on assembly, commissioning, functioning and maintenance of the linear feeder LF to ensure safe and efficient handling and operation.

Consistent compliance with these operating instructions will ensure:

- permanent operational reliability of the linear feeders,
- optimal functioning of the linear feeders,
- timely detection and elimination of defects (thereby reducing maintenance and repair costs),
- prolongation of the linear feeder's service life.

The illustrations in this manual shall provide you with a basic understanding of the module and may vary from the actual design of your module.

1.2 Explanation of symbols

The safety notes are marked by a pictogram and a signal word. The safety notes describe the extent of the hazard.

DANGER



Danger!

This safety note indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING



Warning!

This safety note points out a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION



Caution!

This safety note points out a potentially dangerous situation which, if not avoided, can result in minor or slight injuries.

NOTICE




This safety note points out a potentially dangerous situation which, if not avoided, can cause substantial damage to property and the environment.



This note contains important additional information as well as useful tips for safe, efficient and trouble-free operation of the linear feeders.

Further warning signs:

Where applicable, the following standardised symbols are used in this manual to point out the various potential health risks.

	Warning - Dangerous electrical voltage.
	Warning - Risk of hand and finger injury due to uncontrolled movements of components.
	Warning - Magnetic field

1.3 Additional symbols

In these assembly instructions the following symbols are used to highlight instructions, results, references, etc..

Symbol	Description
1.	Instructions (steps ...)
⇒	Results of actions
↻	References to sections
■	Enumerations not ordered

1.4 Warranty

The warranty terms for Afag handling components and handling systems are the following:

- 24 months from initial operation and up to a maximum of 27 months from delivery.
- Wear parts are excluded from the warranty (The customer is entitled to a product free of defects. *This does also apply to defective accessories and wear parts. Normal wear and tear are excluded from the warranty.*)

The warranty covers the replacement or repair of defective Afag parts. Further claims are excluded.

The warranty shall expire in the following cases:

- Improper use of the module
- Non-observance of the instructions regarding installation, commissioning, operation and maintenance.
- Improper assembly, commissioning, operation and maintenance.
- Repairs and design changes carried out without prior technical instructions of Afag Automation AG
- Removing the serial number from the product
- Non-observance of the EC Machinery Directive, the Accident Prevention Regulations, the Standards of the German Electrotechnology Association (VDE) and these safety and assembly instructions.

1.5 Liability

No changes shall be made to the linear feeders unless described in this manual or approved in writing by Afag.

Afag accepts no liability for unauthorized changes or improper assembly, installation, commissioning, operation, maintenance or repair work.

2 Safety instructions

2.1 General

This chapter provides an overview of all important safety aspects to ensure safe and proper use of the linear feeders and optimal protection of personnel.

Safe handling and trouble-free operation of the LF requires knowledge of the basic safety regulations.

Every person carrying out installation, commissioning, maintenance work or operating the linear feeders must have read and understood the complete user manual, especially the chapter on safety instructions.

Beyond this, there are rules and regulations regarding accident prevention that are applicable to the place of installation which must be observed.



Failure to follow the directions and safety instructions given in this instructions manual may result in serious hazards.

2.2 Intended use

The linear feeders LF are designed for conveying workpieces of various dimensions, shapes and material variants. The LF together with the conveyor rail are designed for conveying bulk material.

The linear feeder can only be operated in combination with the associated Afag control unit.

The following uses of the LF are considered as improper **use** :

- Use in damp and wet areas
- Use at temperatures below 10°C or above 45°C
- Use in areas with highly flammable media
- Use in areas with explosive media
- Use in heavily polluted or dusty environments
- Use in aggressive environment (e.g. salty atmosphere)

For trouble-free feeding, the workpieces must fulfil the following points:

- free of oil, grease and burrs (not sticky)
- not statically charged
- non-magnetic (must not have any intrinsic magnetism)
- dirt-free and not mixed with foreign parts
- Rubber parts can be talcumised



The intended use of the module also includes:

- observance of all instructions given in this manual.
 - compliance with the inspection and maintenance work and the specifications in the data sheets,
 - using only original spare parts.
-

2.3 Foreseeable misuse

Any use other than or beyond the intended use described above is considered a misuse of the linear feeder.

WARNING



Risk of injury if the LF is not used for its intended purpose or if it is foreseeable used incorrectly!

The improper use of the LF poses a potential hazard to the personnel.

- The linear feeders may only be used in a technically perfect condition in accordance with its intended use and the instructions in this manual as well as in compliance with the safety requirements!

2.4 Obligations of the operator and the personnel

2.4.1 Follow these instructions

A basic prerequisite for safe and proper handling of the linear feeders is a good knowledge of the basic safety instructions.



This manual, in particular the safety instructions contained therein, must be observed by all persons working with the linear feeder.

2.4.2 Obligations of the operating company

In addition to the safety instructions given in this manual, the operating company must comply with the safety accident prevention and environmental protection regulations valid for the field of application of the linear feeder.

The operating company is required to use only personnel who :

- have the necessary professional qualifications and experience,
- are familiar with the basic rules regarding occupational safety and accident prevention,
- have been instructed in the correct handling of the linear feeder,
- have read and understood these operating instructions.

The operating company is also required to:

- monitor on an ongoing basis that the personnel work safely considering any potential hazard involved and the assembly instructions are observed,
- ensure that the assembly instructions are always kept at hand at the installation in which the linear feeder is mounted,
- observe and communicate universally applicable laws and regulations regarding accident prevention and environmental protection,
- provide the necessary personal protective equipment (e.g., protective gloves) and instruct the personnel to wear it.

2.4.3 Obligations of the personnel

All personnel working with the modules are required to:

- read and observe these assembly instructions, especially the chapter on safety,
- observe the occupational safety and accident prevention regulations,
- observe all safety and warning signs on the controllers,
- refrain from any activity that might compromise safety and health.



In addition, the personnel must wear the personal protective equipment required for carrying out their work. (👉 chap. 2.6).

2.5 Personnel requirements

2.5.1 Personnel qualification

The activities described in the assembly instructions require specific requisites at the level of professional qualifications of the personnel.

Personnel not having the required qualification will not be able to assess the risks that may arise from the use of the linear feeder thus exposing himself and others to the risk of serious injury. Therefore, only qualified personnel may be permitted to carry out the described activities on the linear feeders.

These operating instructions are intended for skilled personnel (installers, system integrators, maintenance personnel, technicians), electricians and operating personnel.

The following is a description of the professional skills (qualifications) required for carrying out the different activities:

Qualified personnel:

Qualified personnel with appropriate training who are qualified due to their special know-how and fully familiar with the machine and who have been given instructions on how to carry out the task entrusted to them safely.

Qualified electrician:

Persons who have obtained their electrical qualifications through appropriate professional training and complementary courses that enables them to identify risks and prevent possible hazards resulting from electricity.

Operator (trained personnel):

Authorized persons who due to their specialized professional training, expertise and experience can identify risks and preventing possible hazards arising from the use of the machine.

2.6 Personal protective equipment (PPE)

The personal protective equipment serves to protect the personnel from hazards affecting their safety and health at work.

When working on/with the LF modules, the personnel must wear the personal protective equipment assigned by the safety officer of the operating company or as required by safety regulations. In addition, the personnel are required to:

- wear the personal protective equipment Intended company (employer),
- check the personal protective equipment for proper condition, and
- immediately notify the person responsible on site of any defects found on the personal protective equipment.

2.7 Changes and modifications

No changes may be made to the linear feeders which have not been described in these operating instructions or approved in writing Afag Automation AG.

Afag Automation AG accepts no liability for unauthorised changes or improper assembly, installation, commissioning, maintenance or repair work.



The linear feeders may not be changed or modified in any way, except with the prior written consent of Afag.

2.8 General hazards / residual risks

Despite the safe design of the controller and the technical protective measures taken, there still remain residual risks that cannot be avoided, and which present a non-obvious residual risk when operating the feeder.

Observe the safety instructions in this chapter and in the other sections of this manual to avoid damage to property and dangerous situations for the personnel.

2.8.1 General hazards at the workplace

The linear feeder has been built according to the state-of-the-art and the applicable health and safety requirements. However, improper use of the linear feeder may cause the following hazards to the personnel:

- danger to life and limb of the operator or third parties,
- to the linear feeder itself,
- property damage.



Always keep the operating instructions ready at hand at the workplace! Please, also observe:

- the general and local regulations on accident prevention and environmental protection,
 - the safety information sheet for the linear feeder.
-

WARNING



Danger - Do not use in unsuitable environment !

The linear feeders are designed for use in **non-explosive** atmospheres.

- Do **not** use the LF modules in potentially explosive atmospheres!

CAUTION



Risk of injuries due to uncontrolled parts movements!

When operating the LF uncontrolled movements may occur which can cause personal injury or property damage.

- Only qualified personnel may work with or on the LF.
- Read this manual carefully before carrying out any work on or with the LF.

2.8.2 Danger due to electricity

WARNING



Danger! Risk of electric shock!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- Work on the machine's electrical equipment may only be performed by skilled electrician or trained personnel under the supervision of a skilled electrician in accordance with all relevant electrical regulations.

2.8.3 Hazards due to strong alternating magnetic fields

DANGER



Danger due to alternating magnetic fields!

The alternating magnetic fields occurring in the immediate vicinity of the linear feeder can affect the proper functioning of e.g., pacemakers and defibrillators.

Persons with a pacemaker must keep a **safety distance** of **at least 10 cm**.

2.8.4 Mechanical hazards

CAUTION



Danger of injury by moving components!

Limbs can be crushed by moving components!

- Work on and with the LF may only be carried out by qualified personnel.
- Never reach into the system during normal operation!

3 Technical data

3.1 Dimensional drawing LF9 / LF11

Type	LF9	LF11
A	250 mm	300 mm
B	54 mm	35 mm
C	30 mm	35 mm
D1	2 x M5	4 x M3
D2	4 x M3	4 x M3
E	32 mm	35 mm
F	39 mm	50 mm
G	44 mm	55.5 mm
H	16 mm	22 mm
I	---	22 mm
K	48 mm	---
L	---	60 mm
M	89 mm	98 mm
N	47 mm	58 mm

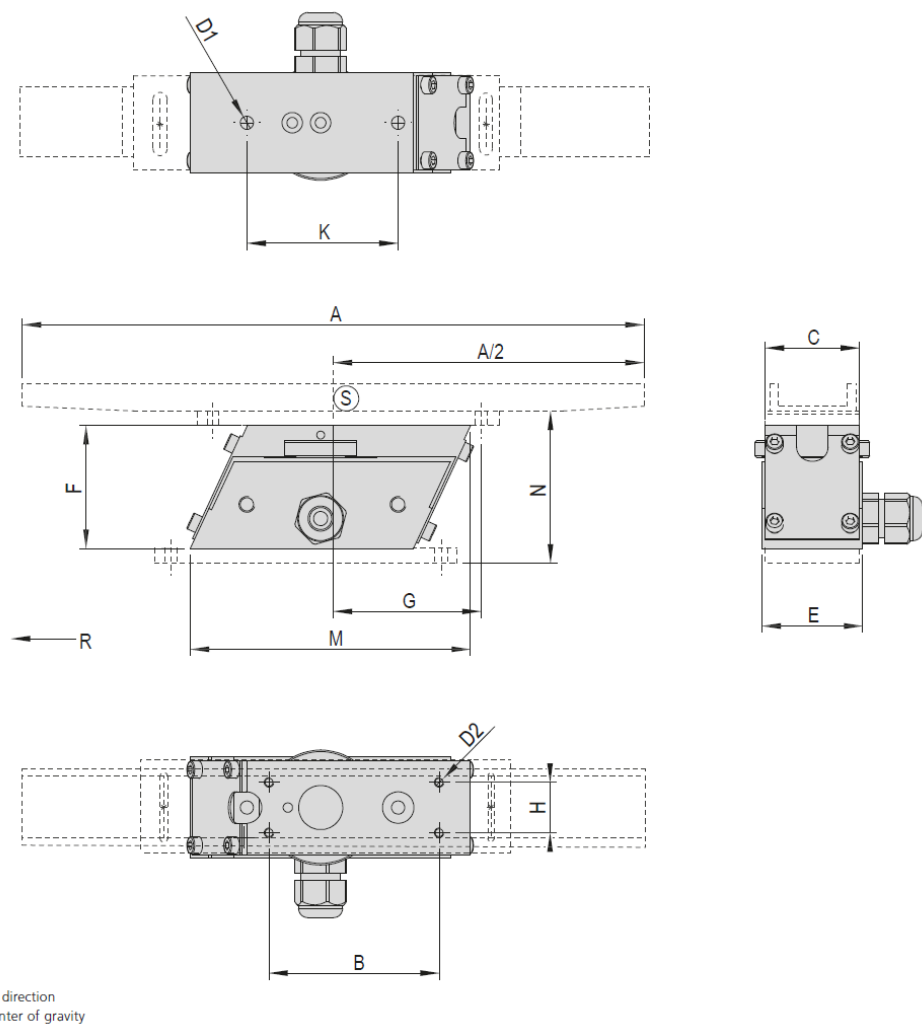


Fig. 1 Dimensional drawing LF

3.2 Technical data LF9/LF11

LF		
Operating temperature	10 - 45 ° C	
Type	LF9	LF11
Order number	15105783	11005757
Mechanical vibration frequency	100 Hz	100 Hz
Mains connection (mains voltage/mains frequency)	230 V/50 Hz	230 V/50 Hz
Max. power consumption	18 VA	46 VA
Net weight	0.7 kg	0.8 kg
Feed rail weight (ideal)	1 kg	1.8 kg
Max. feeder speed	4 m/min	4 m/min
Reactive force compensation	---	---
Protection type	IP40	IP54
<small>Note: --- = nonexistent Track not included in scope of supply.</small>		

Included in delivery

- 2x Leaf spring LF

3.3 Accessories

3.3.1 Mounting parts

Type	Index	Designation	Order Number
LF9	4	Adapter plate	50037641
LF11	4	Adapter plate	11006745

3.3.2 Controller

Type	Power supply	Order Number	Note
IRG1-S	230V/50Hz 115V/60Hz	50360105 50360106	control without timer function external setpoint input
MSG801	230V/50Hz - 115V/60Hz	50391818	Sensor feed, timer function, valve and interface outputs
MSG802	230V/50Hz - 115V/60Hz	50391819	Sensor feed



For more information on the controller, see ➔ chap. 6.3 and the controller manufacturer's instructions.

4 Transport, packaging and storage

4.1 Safety instructions



CAUTION

Danger of injury due to improper transport equipment!

The improper use of transport equipment such as industrial trucks, overhead cranes, slings can lead to injuries (e.g., crushing)!

- Observe transport and assembly instructions.
- Use the means of transport properly!

NOTICE

Damage to property due to improper lifting!

The linear feeder must not be lifted at the conveyor rail! Using the conveyor rail as a lifting point can damage the linear feeder!

- Lift the linear feeder by the base only!



The linear feeders are packed in the original packaging (cardboard box). Carefully remove the linear feeder from the original packaging.

4.2 Scope of supply



The corresponding documentation is supplied with each linear feeder (e.g., operating and installation instructions, etc.).

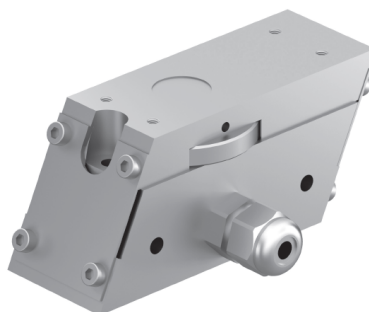


Fig. 2 Scope of delivery LF

[Unt]	Designation
1 x	Linear feeder LF9 / LF11
1 x	Operating and installation instructions

4.3 Transport



No liability can be assumed for damages caused by improper installation on the part of the operating company.



The following conditions must be complied with for transport and storage:

- Storage temperature: 0-50 °C
 - Relative air humidity: < 90%, non condensing
-

4.4 Packaging

The linear feeder is transported in the Afag Automation AG transport packaging. If no Afag packaging is used, the linear feeder must be packed in such a way that it is protected against shocks and dust.

NOTICE

Risk to the environment due to incorrect disposal of the packaging material

Environmental damage can be caused by incorrect disposal of the packaging material.

- Dispose of the packaging material in an environmentally sensitive way in accordance with the local environmental regulations.
-

4.5 Storage

If the linear feeder is stored for an extended period, observe the following:

- Store the linear feeder in the transport packaging.
- Do not store the telescope spindle axes outdoors or expose them to weather conditions.
- The storage space must be dry and dust free.
- Room temperature of the storage space: 0-50 °C.
- Relative air humidity: < 90% non condensing.
- Protect the linear feeder from dirt and dust.

5 Design and description

5.1 Structure of the LF

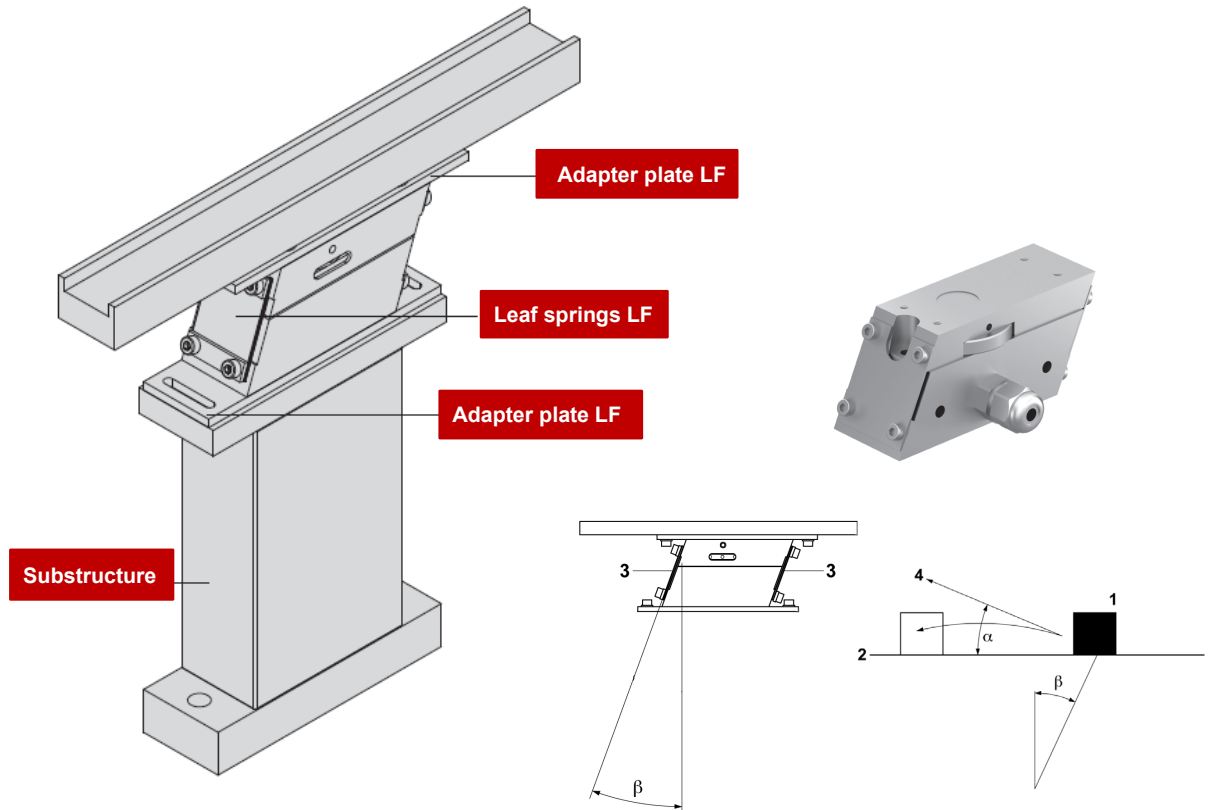


Fig. 3 Design of the LF

- | | |
|----------------------|---------------------------------------|
| 1. Conveyed material | 4. Jumping-off direction |
| 2. Feeder rail | α . Jumping-off angle |
| 3. Leaf springs | β . Inclination of leaf springs |

5.2 Functional description of the LF

The LF is a module which transforms electromagnetic oscillations to use them to feed component. The magnet, connected to the support, creates a force which attracts and releases the oscillating plate dependent on the oscillation frequency of the power supply.

As the magnetic anchor is connected to the feed bowl, it also follows the frequenting movement. As a result, the conveyed material, due to the angle of inclination of the leaf spring, lifts off with each oscillation and performs small jumping-off movements in a direction perpendicular to the leaf spring plane.

On a cycle of the 50Hz alternating current supply, the magnet achieves twice its maximum pulling force while this is independent of the direction of current flow. The magnet thereby produces an oscillating frequency of 100 Hz. This 100 Hz oscillation is necessary to achieve a smooth or gentle transport.



With heavy or large workpieces however, it is necessary to use an oscillating frequency of 50 Hz. A half wave of the mains supply is thereby blocked.

6 Installation, assembly and setting

For safe operation, the module must be integrated into the safety concept of the system in which it is installed.

During normal operation, it must be ensured that the user cannot interfere with the working area of the linear feeder. This can be achieved through suitable protective measures (e.g., enclosure, light grid).

When the system is running in special operating modes, it must be ensured that there is no danger to the operator.



The system operator is responsible for the installation of the linear feeder in a system!

6.1 Safety instructions

WARNING



Danger! Risk of electric shock!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- Work on the machine's electrical equipment may only be performed by skilled electrician or trained personnel under the supervision of a skilled electrician in accordance with all relevant electrical regulations.
 - Disconnect the power supply before assembly and disassembly work and when making changes to the installation!
-



No liability for damages can be assumed for damages caused by improper installation on the part of the operator.



Observe the safety instructions in ↻ chap. 2 "Safety instructions" of this Installation instructions as well as the instructions in ↻ chap. 6.3.

6.2 Assembly

6.2.1 Tightening torques

Tightening torques M_{Sp} in [Nm] for shaft bolts with metric ISO standard threads and head rests according to DIN 912 or DIN 931.

Screw	Tightening torques M_{Sp} in [Nm]		
	Strength class 8.8	Strength class 10.9	Strength class 12.9
M4	2.8	4.1	4.8
M5	5.5	8.1	9.5
M6	9.5	14.0	16.5
(M7)	15.5	23.0	27.0
M8	23.0	34.0	40.0
M10	46.0	68.0	79.0
M12	79.0	117.0	135.0
M14	125.0	185.0	215.0
M16	195.0	280.0	330.0
M18	280.0	390.0	460.0
M20	390.0	560.0	650.0
M22	530.0	750.0	880.0
M24	670.0	960.0	1120.0
M27	1000.0	1400.0	1650.0
M30	1350.0	1900.0	2250.0

6.2.2 Fastening the module

The LF is firmly bolted to the foundation by means of the holes drilled in the floor. For the LF9, two screws are inserted from below. With the help of mounting plates (→ chap. 3.3.1), optional mounting from above is possible.

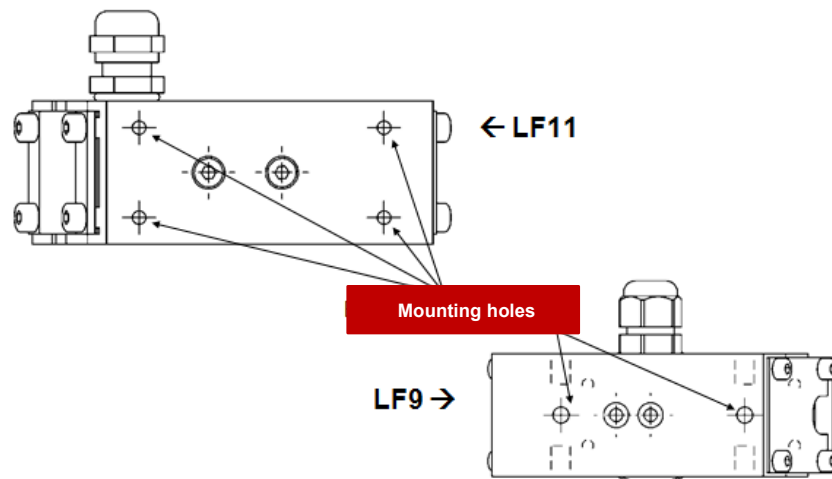


Fig. 4 Attachment of the LF11 (exemplary illustration)

For operation, the linear feeder must always be mounted on a base that is sufficiently dimensioned for the intended mass. The base construction must be designed to be vibration-resistant (slab or block construction) to be able to absorb the vibration forces that occur.

Self-supporting profile constructions must be reinforced with a base plate to which the linear feeder is attached. Here, a plate made of steel should be used that is at least 20mm thick and has a width of more than 120mm.

The height adjustment must be made by means of appropriate substructures. Suitable Afag standard parts are available for complete station set-ups in conjunction with Afag bowl feeders.

When mounting the linear feeder, make sure that the base is horizontal or slightly inclined forward in the direction of feed (1.5-2°).

6.2.3 Assembly of the conveyor rail

The following conditions must be fulfilled to achieve optimum delivery behaviour:

- Combination of linear conveyor and conveyor rail must be coordinated with each other.
- Vibration-resistant construction of the conveyor rail.
- The length of the conveyor rail must not exceed the maximum permissible length (➔ chap. 3).
- Depending on the material to be conveyed, additional support springs are required (up to a maximum of two per spring pack).
- The weight of the rail (incl. parts) must not exceed the weight limit (➔ chap. 3).

The rail must be aligned symmetrically to the intermediate plate of the linear feeder. The conveying speed can be increased by inclining the rail in the running direction by 1.5-2°.



To connect the conveyor rail to the vibratory conveyor, all LF models have four holes on the top of the drive (➔ chap. 3).

6.3 Electrical connection

WARNING



Danger! Risk of electric shock!

Improperly performed work can result in serious or fatal injuries.

- Work on the machine's electrical equipment may only be performed by skilled electrician or trained personnel under the supervision of a skilled electrician in accordance with all relevant electrical regulations.
-

6.3.1 Important notes

- The mains supply must be provided by the customer via a residual current circuit breaker!
- The feeder may only be operated with the mains supply specified on the type plate!
- The electrical connections must be covered!
- Protective conductor connections must be checked for proper function after installation.
- Emergency-STOP devices must remain effective in all operating modes. Unlocking the Emergency-STOP devices must not cause an uncontrolled restart!

6.3.2 Power supply (controller)

The linear feeder operates in full-wave mode at twice the mains frequency, i.e., at 50Hz AC with a mechanical vibration frequency of 100Hz. Vibration displacement and thus the transport speeds are infinitely adjustable due to magnet current and thus magnetic force variability.



The linear feeder is only to be operated in combination with the associated Afag controller (➔ chap. 3.3.2).

This combination ensures optimum delivery behaviour.

Connection via IRG or MSG

The LF is connected to the AC mains 230V/50Hz via a controller type IRG or MSG. The design for other mains voltages and mains frequencies (e.g., 115V/60Hz) is also possible.

The IRG1-S controller is available for controlling the linear conveyors. All IRG types operate with soft-starting and offer different options for mounting, attachment and control.

The MSG801 or MSG802 controller can also be used for control. Please note that an additional CEE appliance plug (see illustration) is required for the MSG controls.

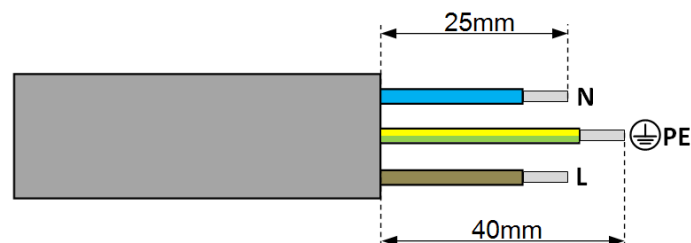


Fig. 5 CEE appliance plug



A detailed description of the control units can be found in the instructions of the controller manufacturer in the AFAG in the AFAG Catalogue (www.afag.com).

6.4 Settings

6.4.1 Safety instructions



WARNING

Danger! Risk of electric shock!

There is a risk of injury from electric shock during adjustment work.

- Pull out the mains plug before starting work!

6.4.2 Tuning and adjusting the oscillation system

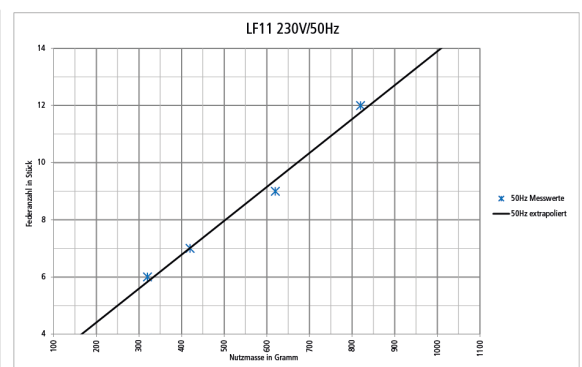
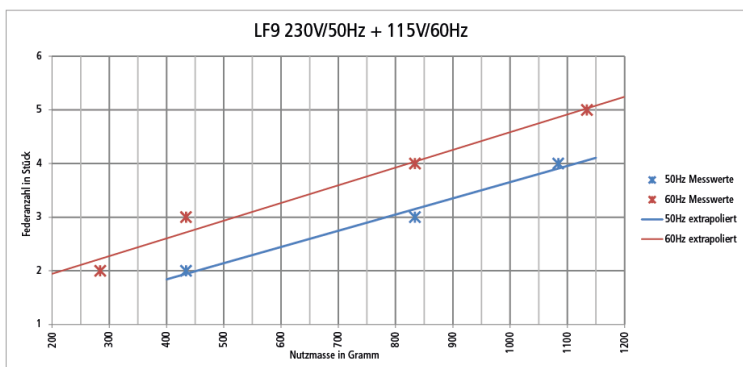
In general, linear feeders and conveyor rails are matched in their basic configuration. This means that all swing elements are optimally designed.

Despite optimal design, the combination of linear feeder / conveyor rail is influenced by the following factors, which must also be considered:

- the conveyed material (size, weight, shape, material and composition),
- the conveying capacity,
- the substructure,
- the environment (are there other vibrating components with a disturbing influence?)

To tune the oscillating system, proceed as follows:

1. Check the settings on the control unit (see separate instructions from the manufacturer).
2. Check all spring and fastening screws for tightness.
3. Check magnet type and frequency for correctness.
4. Check the magnet distance and adjust if necessary.
5. Switch on the linear feeder.
6. Use the controller to adjust the conveying speed.
7. Depending on the material to be conveyed, additional springs must be installed or removed.



⇒ The process is finished.

6.4.3 Adjust linear rail

Adjustment of the linear rail to the base is required in the following cases:

- All spring assemblies were replaced or reassembled.
- The linear feeder was dismantled.

To set the linear rail, proceed as follows:

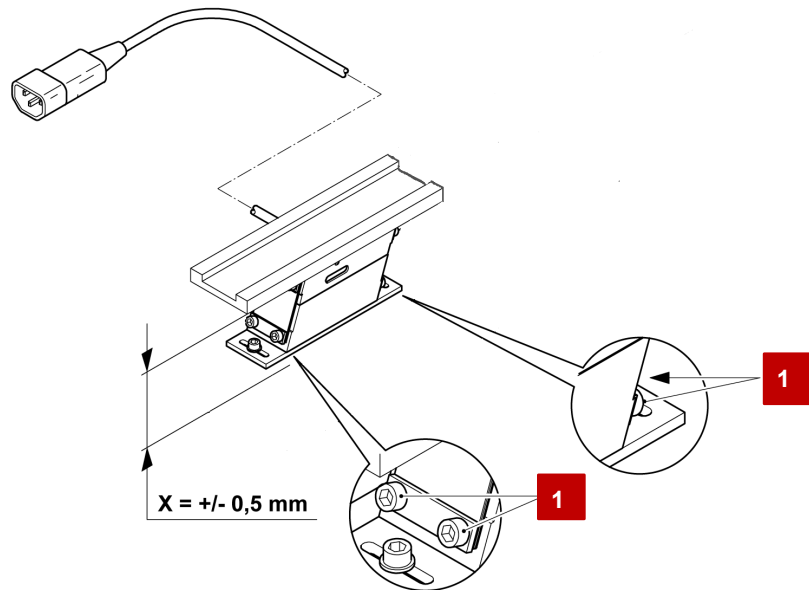


Fig. 6 Adjustment of the conveyor rail

1. Slightly loosen the screws of the spring assemblies (1).
 2. Establish parallelism between the vibrating rail and the base of the support. Check dimension X.
 3. Tighten the screws (1) of the spring assemblies again.
 4. Check air gap between solenoid coil and anchor screw and readjust if necessary.
- ⇒ The process is completed.

7 Operation

After switching on the controller, no further settings are required in normal operation.

7.1 Safety instructions for commissioning



DANGER

Risk of injury due to electric shock!

Unauthorized removal of the plug cover causes a risk of electric shock!

- Do NOT dismount the plug cover!
 - Avoid any action on the module which could endanger safety!
-

NOTICE

Risk of property damage if different controllers are used!

Operation with another control unit will result in the destruction of the piezo element.

- Only operate the linear feeder with the Afag Piezo control unit PSG-1!
-

8 Fault elimination

8.1 Safety instructions

WARNING



Danger! Risk of electric shock!

There is a risk of injury from electric shock.

- Only allow work on the electrical supply to be carried out by trained, approved specialist personnel!
- Pull out the mains plug before starting work!



Observe the safety instructions in ↪ chap. 2 "Safety instructions" of these installation instructions as well as the safety instructions of the controller manufacturer.

8.2 Fault causes and remedy



Faults caused by defective components may only be remedied by replacing these defective components!

Only Afag original wear and spare parts may be used!

Fault	Possible cause	Remedy:
Linear feeder does not start after switching on	<ul style="list-style-type: none"> ▪ Plug not connected to mains ▪ Connecting cable between linear feeder and controller not plugged in ▪ Set the controller on the controller to "0" ▪ Fuse in controller defective 	<ul style="list-style-type: none"> ▪ Plug in the connector. ▪ Plug in the connector. ▪ Turn the controller to position. ▪ Replace fuse.
Linear feeder does not provide the required performance after a certain running time	<ul style="list-style-type: none"> ▪ Fastening screws of the spring packets have loosened. ▪ Air gap between solenoid coil and anchor screw misaligned ▪ Leaf spring broken ▪ Regulator on the controller misaligned 	<ul style="list-style-type: none"> ▪ Tighten the screws properly ▪ Readjust the air gap (↪ chap. 9.2.4) ▪ Replace leaf spring (↪ chap. 9.2.2) ▪ Adjust controller
Linear feeder generate strong noises	<ul style="list-style-type: none"> ▪ Solenoid coil has become loose 	<ul style="list-style-type: none"> ▪ Tighten the screws (↪ chap. 9.2.3)
Conveying speed of the workpieces not correctly	<ul style="list-style-type: none"> ▪ Potentiometer defective 	<ul style="list-style-type: none"> ▪ Replace potentiometer (↪ Operating instructions of the controller)

9 Maintenance and repair

9.1 Safety instructions



WARNING

Danger of injury due to improper maintenance!

Improperly carried out maintenance activities can cause considerable damage to property and serious injury.

- Only use trained specialist personnel to carry out the activities.
 - Always wear personal protective equipment when carrying out maintenance and repair work!
-



WARNING

Risk of injuries due to uncontrolled parts movements!

Signals from the controller can trigger unintentional movements of the linear feeder, which can cause injury.

- Before starting any work on the linear feeder, switch off the controller and secure to prevent it from being switched on.
 - Observe the operating instructions of the controller used!
-



Also observe the safety instructions in ➔ chap. 2 „Safety instructions“ in this manual.

9.2 Maintenance activities and maintenance intervals



- The maintenance intervals must be strictly observed. The intervals refer to a normal operating environment.

9.2.1 Overview of the maintenance points

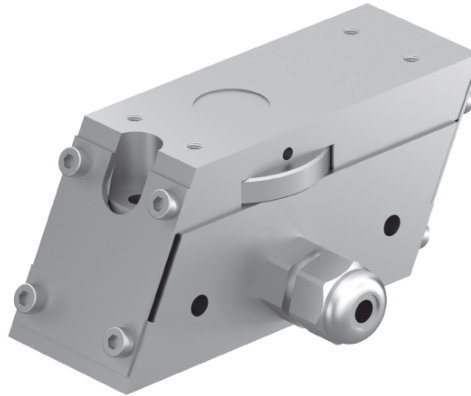





Fig. 7 Maintenance linear feeder LF9 (exemplary)

No.	Maintenance point	Maintenance work	Interval	System [On/Off]	Remarks
1	Leaf spring	Check, clean if necessary 	As required	[Off]	Replace leaf spring if necessary ▪ Check leaf springs for: - Wear, oxidation (increased resonance frequency) - Settling behaviour (reduced resonance frequency) - Firm seating of the screws
2	Electrical equipment	Check, replace cable if necessary 	As required	[Off]	Replace cable if necessary ▪ Check regularly for: - Loose connections - Scorched or damaged cables
3	Solenoid coil	Check, replace if necessary 	As required	[Off]	Replace solenoid coil if necessary ▪ Check screws regularly for tightness! ▪ If necessary, adjust the air gap between the solenoid coil and the anchor screw (➡ chap. 9.2.4)

9.2.2 Replace leaf springs

The leaf springs must be replaced in the following cases:

- Change in the vibration behaviour of the linear feeder.
- Spring broken.



The spring assemblies used must contain the same leaf springs! In case of spring breakage, the number and thickness of the leaf springs must correspond to the old spring assembly.

To replace the leaf springs, proceed as follows:

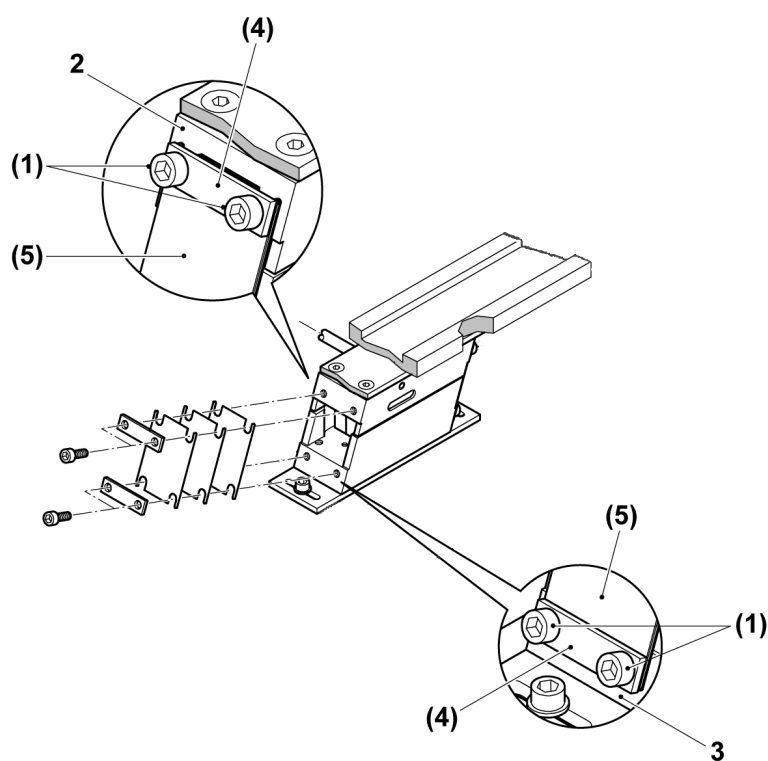


Fig. 8 Replacing leaf springs LF9 (exemplary representation)

1. Loosen the screws (1) on the vibrating rail (2) and on the base (3) and remove them together with the support (4).
2. Remove springs (5) and replace with new spring assembly.
3. Tighten the screws (1).
4. Ensure parallelism between the vibrating rail and the base surface (⇒ chap. 6.4.3).
5. Check air gap between solenoid coil and anchor screw and readjust if necessary (⇒ chap. 9.2.4.).
6. Perform test run.
 - ⇒ The process is completed.

9.2.3 Replace solenoid coil

This procedure is only necessary if the solenoid coil is defective.



After replacing the solenoid coil, the air gap between the solenoid coil and the anchor screw (➔ chap. 9.2.4.) must be readjusted.

To replace the solenoid coil, proceed as follows:

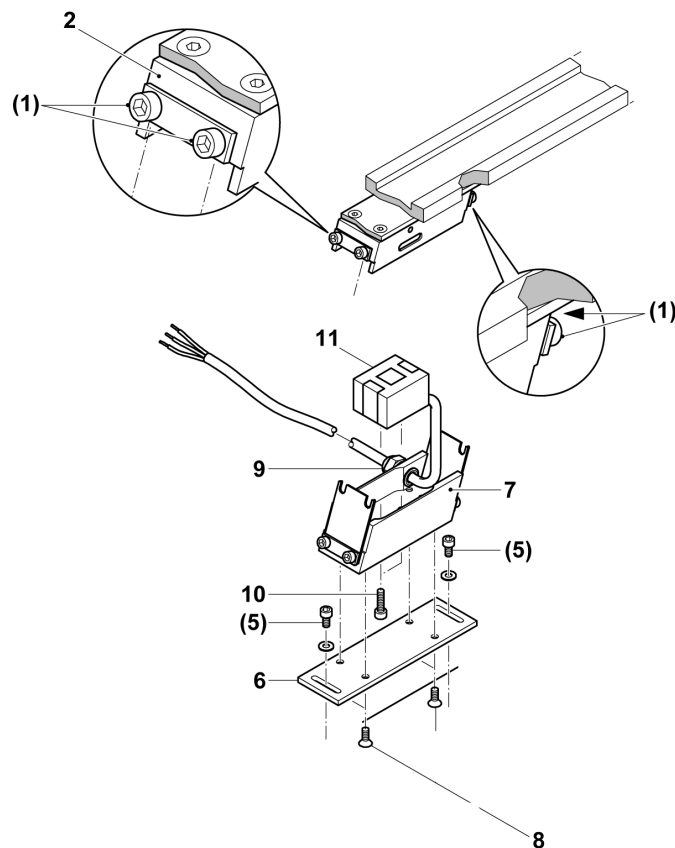


Fig. 9 Replacing solenoid coil LF9 (exemplary representation)

1. Loosen the screws (1) of the vibrating rail (2) and remove the whole unit.
 2. Remove the plug from the controller and dismount it.
 3. Remove the screws (5) of the intermediate plate (6), if present, and remove the intermediate plates from the base (7) by loosening the screws (8).
 4. Loosen cable strain relief (9) and remove screws (10). Remove magnet (11) and pull cable through strain relief at the same time.
 5. Installation is performed in the reverse order.
- ⇒ The process is completed.

9.2.4 Adjust air gap

The air gap between the solenoid coil and the anchor screw must only be adjusted if:

- the vibrating rail to the base has been readjusted,
- springs or spring assemblies have been replaced,
- the solenoid coil has been replaced.



Before adjusting the air gap, check the parallelism (1mm) and the distance between the vibrating rail and the base.

Procedure for setting the air gap:

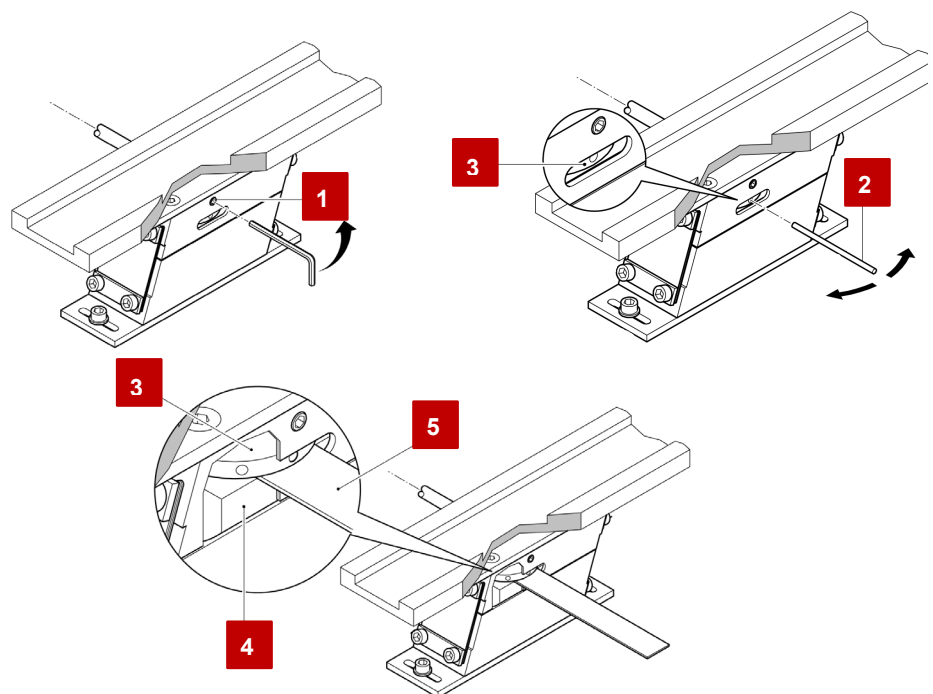


Fig. 10 Adjusting the air gap LF9 (exemplary representation)

1. Before adjusting the air gap, the anchor screw (3) must be adjusted as follows:
2. Loosen the Allen screw (1) (2.5 mm).
3. Turn the anchor screw (3) by hand in the corresponding direction. Then proceed as follows.
4. Adjust the air gap between the solenoid coil (4) and the anchor screw (3) using a feeler gauge (5).
 - If the solenoid coil and anchor screw touch, the air gap is too small.
 ⇒ The process is completed.

9.2.5 Further maintenance

Further maintenance is not required, if the ambient conditions listed below are complied with:

- Clean working area
- No use of splash water
- No abrasion or process dusts
- Environmental conditions as specified in the technical data.

9.2.6 Spare and wear parts, repairs

Afag Automation AG offers a reliable repair service. Defective linear feeder can be sent to AFAG for warranty repair within the warranty period.

After expiry of the warranty period, the customer may replace or repair defective modules or wear parts himself or send them to the Afag repair service.



Please note that Afag does not assume any warranty for modules that have not been replaced or repaired by Afag!

Spare parts

Type	Index	Designation	Mains connection	Order Number
LF9	6	Vibrating magnet	230V/50Hz 115V/60Hz	15022352 15031879
LF11	6 15	Vibrating magnet Lardon	230V/50Hz -	11006386 11006752

Wear parts

Type	Index	Designation	Order Number
LF9	4	Leaf spring 0.7 mm	15184920
LF11	4	Leaf spring 0.5 mm	11006743

10 Decommissioning and disposal

The linear feeder must be properly dismantled after use and disposed of in an environmentally friendly manner.

10.1 Safety instructions

WARNING



Risk of injury due to improper decommissioning and disposal!

Improperly carried out activities can result in considerable material damage and serious injury.

- Only use trained specialist personnel to carry out the activities.
 - Disconnect the media supply before dismantling the module!
 - Only remove the linear feeder when the controller is switched off and secured!
-

10.2 Decommissioning

If the linear feeders are not used for a longer period, they must be properly commissioned and stored as described in ↻ chapter 4.5.

10.3 Disposal

The linear feeders must be disposed of properly at the end of their service life and the raw materials used must be recycled. Observe the legal regulations and company requirements.

The linear feeder must not be disposed of as a complete unit. Dismantle the linear feeder and separate the various components according to type of material and dispose of them properly:

- Scrap the metallic materials.
- Hand over plastic parts for recycling.
- Sort the rest of the components by their material properties and dispose of them accordingly.

NOTICE

Risk to the environment due to incorrect disposal of the linear feeder!

Environmental damage can be caused by improper disposal.

- Electronic parts, electrical scrap, auxiliary and operating materials must be disposed of by approved specialist companies.
 - Information on proper disposal can be obtained from the responsible local authorities.
-

