

These assembly and operating instructions apply to: **LineDrive**

NLD 25
NLD 25 L
NLD 25 A



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Scope of delivery



IMPORTANT

Check the packaging for possible signs of transport damage. In the event of damage to the packaging, check that the contents are complete and undamaged. If there is any damage, inform the shipping agent. Compare the scope of the delivery with the delivery note.

1 General Notes

Conveyor systems of the series **LineDrive** comply with the EC machine directive 2006/42/EG. In particular, standard DIN EN ISO 12100 has been observed.

LineDrive vibrators are used for driving vibration conveyors.

The design is based on a pneumatic piston vibrator.

Pneumatic piston vibrators are easily adjustable and stop immediately when switched off. This is why they are very suitable as drives for conveyors since the conveying process stops immediately (without delay) after the vibrator has been switched off.

General application areas:

horizontal conveyance of bulk materials in confined space conditions.

The conveyor troughs for **LineDrives** can be produced from any physiologically harmless materials. Their cleaning is quick and easy. This allows using them under strict hygienic conditions in the chemical, pharmaceutical and food industries.

Drive medium is clean (filtered) and lubricated compressed air or nitrogen.

Special features:

- gentle and constant conveying
- flat, compact construction
- modularly extendable
- low air consumption
- very low sound level



IMPORTANT

Important note:

Before use of the Netter conveyor systems of the series **LineDrives** read this operating manual carefully and completely. The operating manual should subsequently be stored near the NLD.

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The following instruction and warning symbols are used in these operating instructions.

	DANGER	referring to a possible risk, which, if not avoided, can result in death or serious injury.
	CAUTION	referring to a possible risk, which, if not avoided, can result in serious injury and/or equipment damage.
	IMPORTANT	note with especially useful information and tips.
	ENVIRONMENTALLY FRIENDLY DISPOSAL	refers to the obligation of an environmentally friendly disposal.

2 Safety

Designated use:

LineDrive units are intended for assembly into machinery which uses vibration for conveying bulk material.

Any other use is considered improper use.

Any handling of the conveyor system lies within the responsibility of the operator.

Qualification of the personnel:

Assembly, commissioning, maintenance and troubleshooting of the conveyor system must be performed only by authorized qualified personnel.

Accessories which ensure the correct operation and safety must provide a protection type required for the specific use.



CAUTION

Netter pneumatic external vibrators generate vibrations.

The operator of vibration machinery is required to protect workers from risks to their health and safety arising or likely to arise from exposure to vibrations.



CAUTION

Netter GmbH does not assume liability for damage or injury resulting from technical modifications to the product or failure to observe the instructions and warnings in this operating manual.



DANGER

LineDrive units work with compressed air.

Ensure that the compressed air is shut off during installation.

Shut off air supply before performing any other work on the vibrators and supply lines.

Before start-up the hose lines must be securely connected.

A pressurized hose coming loose can cause injury.



IMPORTANT

The conveyor systems of the series **LineDrive** have to be fixed on a clean and even surface ($\pm 0,1\text{mm}$ flatness tolerance).



DANGER

Source of danger:

LineDrives have moving parts on both sides.

Possible consequences of non-observance

Danger of crushing between the mounting brackets and the housing.

Avoiding the danger:

In order to prevent from reaching into the moving parts of the **LineDrive**, protective measures have to be taken on site, e.g. covers.

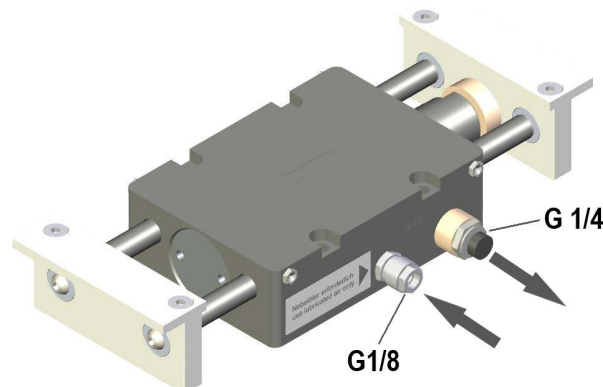
3 Technical Data

Type	Permissible operating conditions
NLD 25 is the standard version.	Drive medium: Clean (filter $\leq 5 \mu\text{m}$, quality class 3, DIN ISO 8573-1), lubricated compressed air or lubricated nitrogen. Operating pressure: 2 bar to 6 bar Ambient temperature: 5°C to 60°C Maximum load: 30 kg Lubrication: LineDrive unit The guide rods have to be lubricated at regular intervals (as a rule once a month) Recommendation: OKS 476.
NLD 25 L vibrators are suitable for operation with lubrication-free, dry compressed air.	NLD L versions are suitable for operation with lubrication-free, dry compressed air in compliance with the recommendations on air quality, filter $\leq 5 \mu\text{m}$, class 3 according to DIN ISO 8573-1. Air consumption: 10 l/min to 25 l/min
NLD 25 A supports are suitable as support for extended troughs or for larger loads.	Length of the trough: > 2 m Maximum load: 30 kg



The permissible temperature range must not be exceeded or fallen short of during operation. Higher and lower temperatures are only permitted after consultation and written confirmation by application engineers of Netter GmbH.

Connections



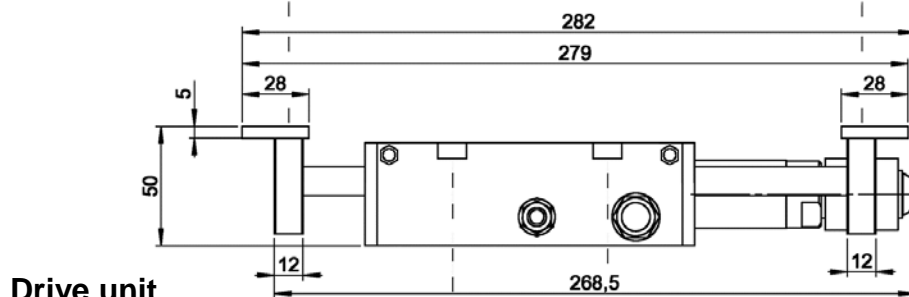
Air supply line		Air discharge line	
Connection thread [inch]	Hose size*	Connection thread [inch]	Hose size*
G 1/8	DN 6	G 1/4	DN 8

*DN = Diameter nominal (inner diameter)

Dimensions [mm]

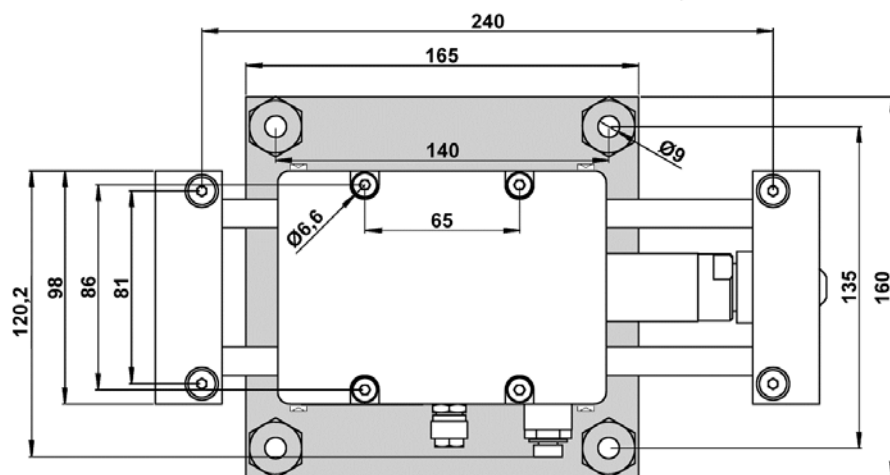
Conveyor trough

Mounting plate

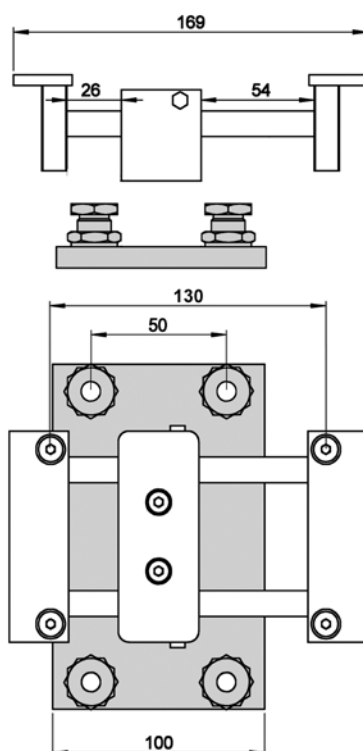


Drive unit

Ground plate



Support



4 Design and Functioning

The **LineDrive** conveyor systems are suitable for quick construction of conveyor troughs. The conveyor system basically consists of a modified Netter pneumatic piston vibrator **4** of the series NTK.

The piston of the vibrator performs horizontal oscillatory movements.

The different speeds of the piston, i.e. a slow forward and a fast backward movement, cause the lifting of the static friction and the movement of the material on the conveyor trough.

The material is moved into the direction of the retracting piston.

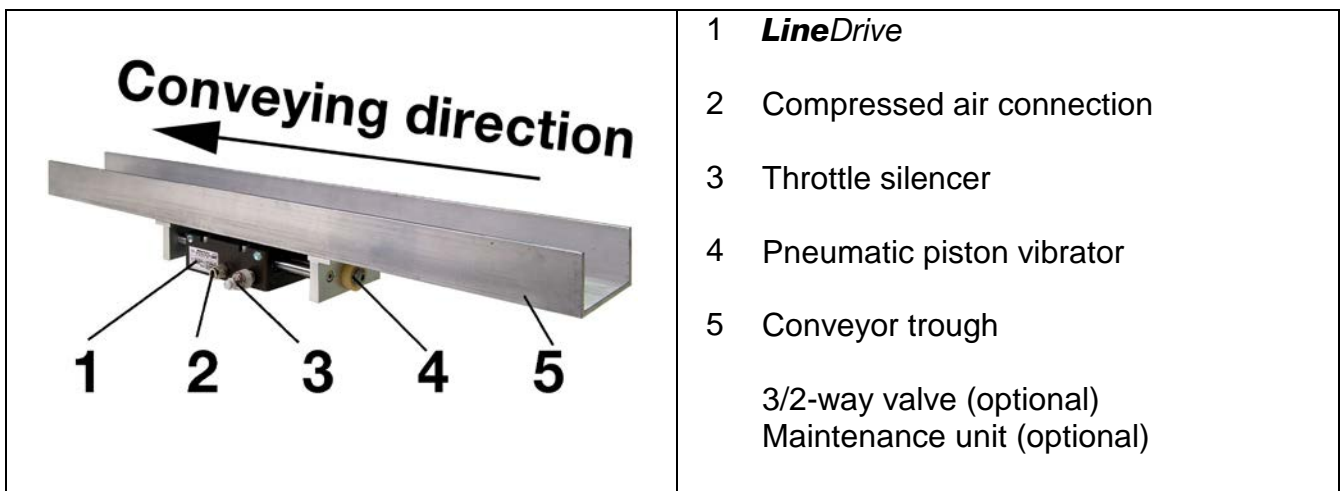
The conveyor trough **5** (manufactured by the customer or as per customer specifications) is mounted to the mounting brackets or the mounting plate.

The conveyor output (volume of conveyed material / time) is determined by regulation of the frequency and amplitude. Both can be adjusted separately.

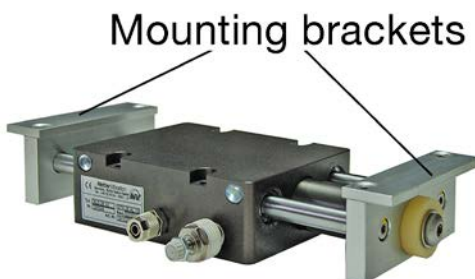
The frequency can be adjusted by means of the pressure regulator in the optional maintenance unit. The maintenance unit provides the vibrator with clean (lubricated) compressed air.

The conveying speed (amplitude) can be adjusted by regulating an optional supply air or exhaust air throttle.

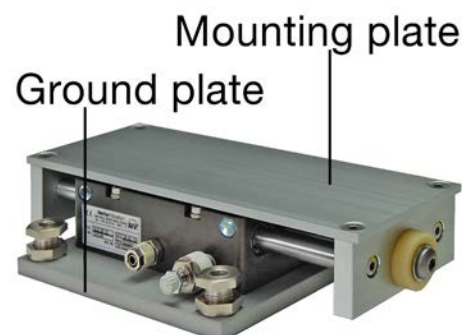
A 3/2-way valve is required to ensure a proper start. This valve (which is not included in the scope of delivery) also guarantees an instant stop when switched off.



LineDrive unit with mounting brackets



LineDrive unit with ground plate and mounting plate



5 Transport and Storage



IMPORTANT

Check the packaging for possible signs of transport damages.

In the event of damage to the packaging, check that the contents are complete and undamaged. If there is any damage, inform the shipping agent.

The units are packed ready to install.

The nameplate is attached to the unit.

During transport the conveyor systems must not be exposed to violent impacts or vibrations.

The conveyor system should be stored in a clean, dry environment.

If the vibrator needs to be stored for a longer period (up to a maximum of two years), the temperature in the storage room must not fall under +5°C and not exceed +40°C and the relative humidity must not exceed 60%.

Packaging

The packaging protects the unit from transport damages. The material of the packaging has been selected based on environmentally and disposal-friendly aspects and can therefore be recycled.

Recycling the packaging reduces raw material consumption and the waste volume.

6 Installation



Ensure that the compressed air supply is shut off during installation or when working on the vibrator and air supply lines.



Mount the **LineDrive** to the bottom or a counterweight which is at least 5 times heavier than the total weight of the **LineDrive** with the conveyor trough. The conveying behavior is improved by a very large counterweight.



The mounting surfaces must be absolutely even ($\pm 0.1\text{mm}$ flatness tolerance), so that the unit and the support has full area contact and warping of the housing is avoided when tightening the fastening screws.



For uneven surfaces (flatness $> 0.1\text{ mm}$) use the ground plate. The adjusting screws of the ground plate serve to compensate an uneven surface in order to avoid tensions in the drive and support when tightening the fixing screws.



For secure fastening we recommend to use Netter NBS screw connections which consist of a screw, a special lock washer and if necessary a nut.

The assembly can also be made using fixing screws of class 8.8 (DIN 931 or 933). These must be secured by means of a suitable glue and checked or tightened at regular intervals (as a rule once a month).

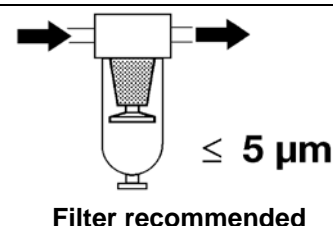


Please observe the following for the assembly of the conveyor trough:

The trough is fixed to the slide by means of double-faced adhesive tape. If it is necessary to use additional screw connections, the trough can be screwed directly to the mounting plate.



The drive medium must be clean (filter $\leq 5\text{ }\mu\text{m}$, class 3). Unfiltered compressed air leads to high wear, blocked silencers or complete break-down of the vibrator. The maintenance intervals will be shorter.





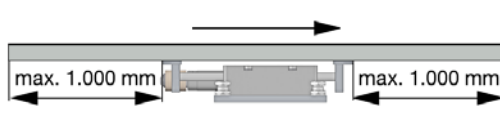
Must be observed when mounting several **LineDrive** units and additional supports:

Mount the drive units and supports parallel one after another.
Compensate bumps and different heights with the ground plates.

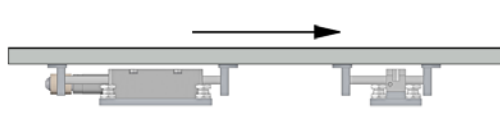
Length of trough



If the overhanging trough length is 1.000 mm or more, the trough must be fixed centrally on the drive unit.



If the length of the trough is 2.300 mm or more, an additional support (NLD 25A) must be used.



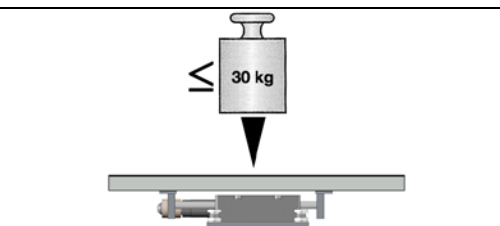
Very long troughs can be driven by coupling several **LineDrive** units.



Load



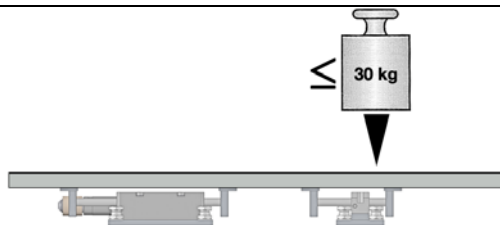
The load per drive unit must not exceed 30 kg.



The maximum load for an overhanging trough length of 1.000 mm without support is 10 kg.



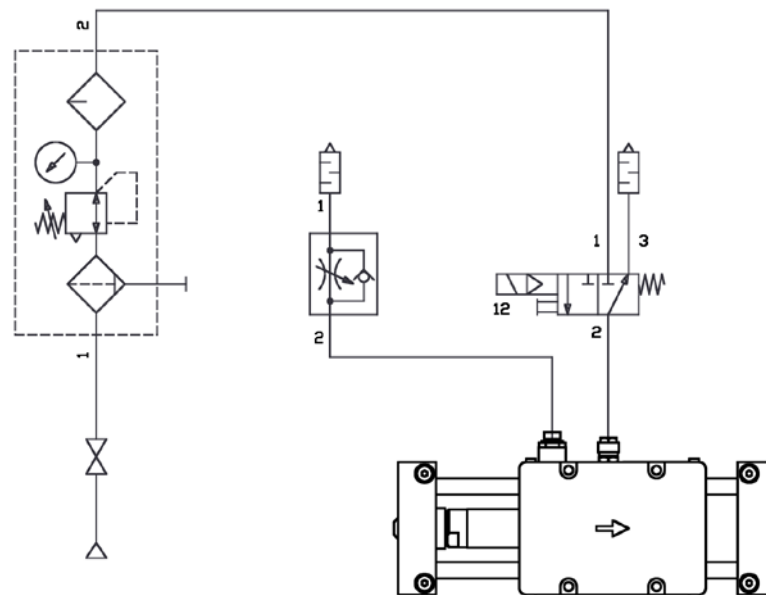
For heavier loads a support (NLD 25 A) is required.
The maximum load of 30 kg must not be exceeded.



Loads > 30 kg are possible, the load per drive unit, however, also must not exceed 30 kg.



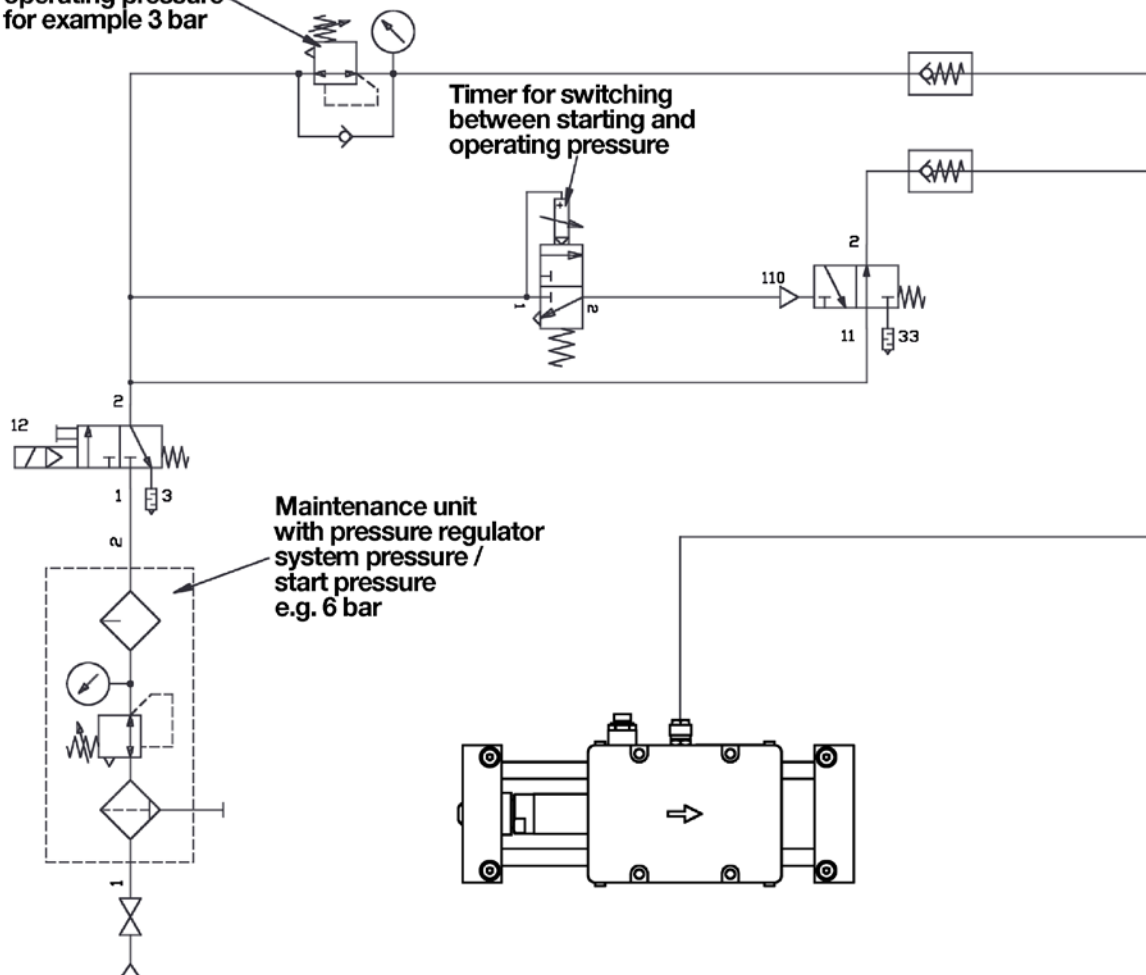
Standard installation



Installation with timer and controller for heavy loads

Pressure regulator
operating pressure
for example 3 bar

Timer for switching
between starting and
operating pressure



Maintenance unit
with pressure regulator
system pressure /
start pressure
e.g. 6 bar

Checklist for assembly:

- 1) Set conveyor system on a clean and even surface and fix it (use ground plates).
- 2) Mount conveyor trough (if necessary).
- 3) Install maintenance unit, valve and supply line.
- 4) Fixing screws secured? Check!

7 Start-up / Operation

A 3/2-way valve has to be provided for start and stop.

The piston vibrator starts with a low pressure (2 bar), depending on the trough weight and the load. For higher loads a starting controller is available.

The frequency can be precisely adjusted by means of the pressure regulator which is part of the maintenance unit.

The conveyor output can be adjusted to match the specific friction properties of the material to be conveyed by means of a

throttle valve (amplitude) installed in the exhaust line.

The default setting of the conveying performance can be determined by

- adjusting the operating pressure
- setting the pressure regulator
- adjusting the exhaust air throttle.



IMPORTANT

For the NLD vibrators it is recommended to use lubricated compressed air.

If dried compressed air is used or in case of extreme ambient temperatures the use of a mist lubricator is mandatory.

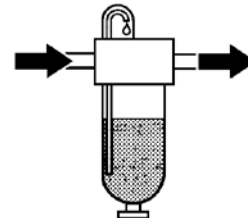
Oil lubrication:

Fill mist lubricator with acid- and resin-free pneumatic oil, ISO viscosity class according to

DIN 51519, VG 5 to VG 15.

NLD 1-2 drops/min.

Recommendation: Klüber „AIRPRESS 15“ for temperatures up to 60°C.



Oil:
ISO VG5 = 5 cSt/40°C
(Shell Tellus C5)



IMPORTANT

ATTENTION:

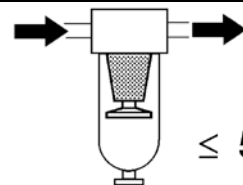
Adjust number of drops while unit is running.

Only after the adjustment and correct function of the lubricator the unit is ready for operation.



IMPORTANT

NLD L versions are suitable for operation with lubrication-free, dry compressed air in compliance with the recommendations on air quality class 3 according to DIN ISO 8573-1.



≤ 5 µm

Filter mandatory!

Check list for commissioning:



- 1). Check hose connections before applying compressed air.
- 2). Adjust required frequency at the pressure regulator.
- 3). Adjust requested conveyor output product-specifically by means of the pressure regulator and by throttling the air supply or exhaust air.
- 4). If existing, adjust mist lubricator.
- 5). After one hour of operation the fixing screws and compressed air connections have to be checked and, if necessary, retightened. The fixing screws and compressed air connections have to be checked and possibly retightened at regular intervals (as a rule once a month).

8 Maintenance / Repair



Before starting inspection or service work, shut off the compressed air supply and secure it against unintended activation!

Maintenance schedule



Screw connections	Screw connections should be checked and - if necessary – tightened and secured with Loctite after one hour of operation (after first commissioning) and then at regular intervals.
Air supply lines	Check for kinks and ensure that the lines are free from obstructions. If necessary, clean the hoses and remove kinks.
Silencer	Clean and check function.
Check vibrator	Check function.
Mist lubricator	Make sure that mist lubricator works correctly (contents decreasing? Number of drops/h?). Refill oil.
Filter of the maintenance unit	Replace filter insert, empty filter if necessary, clean (wash out) filter insert.
Guides	Lubricate the guides of the LineDrive units (usually monthly) regularly. Recommendation: OKS 476. Under severe operating conditions the lubrication intervals must be reduced.



IMPORTANT

The maintenance intervals largely depend on the operating period and the cleanness of the drive medium.
Especially in NLD L driven by lubrication-free and / or dried compressed air, increased friction can create deposits which will slow down the function.
The maintenance intervals are reduced by the running time.



IMPORTANT

Cleaning:

The outside of the **LineDrive** can be cleaned with compressed water, if the exhaust air has been discharged or the air outlets have been closed. Water must not enter the guide bushings and the vibrator via the silencers. **LineDrive** units of the series NLD must be actuated for a short time after having been cleaned.

9 Troubleshooting

Fault	Possible cause	Troubleshooting	Remedy
Vibrator does not start	Connection reversed	See figures in Ch. 4 "Design and Functioning"	The air intake is on the cover side, the output at the side of the piston.
	Compressed air supply	Check whether enough pressure has been applied to the system. Check valve.	It must be a 3/2-way valve for venting the supply line on the unit.
	Cable cross-sections	Observe the minimum cross-sections	For details see chapter "Installation".
	Exhaust air throttled too much	Throttle and silencer	Open the throttle further. Clean silencer.
	Tensioning during assembly	Check whether mounting surface is even.	Use ground plate for uneven surfaces.
No start (drive and support)	Tensioning during assembly	Check whether mounting surface is even. Install drive unit and support parallel one behind the other.	Use ground plate for uneven surfaces.
	No lubrication		Lubricate guide rods at regular intervals.
Clattering	Loose screws	Screws at piston and housing	Check the fixing screws at piston and housing.
Decline in performance	No lubrication	Check proper functioning of lubricator.	Adjust lubricator when lubricated compressed air is required.
	Drive unit dirty	plaque	Disassemble, remove plaque.
	Wear	Check vibrator and piston for visible wear	Replace units or parts.
	Type	Is the size correct?	Change size of the unit.
	Pressure too low	Check pressure at the unit inlet during operation.	Increase pressure if necessary.

10 Spare Parts

If you order spare parts, please indicate the following details:

1. Type of unit
2. Description and position of the spare part
3. Requested quantity

11 Accessories

The following accessories are available (on request) for **LineDrive** conveyor systems:

Description	Observation
Hoses and fittings	for air supply and exhaust air, in different qualities and dimensions
Support	to support long troughs
3/2 way valves	for electric, pneumatic and manual operation
Maintenance units	filter-regulator-lubricator
Electronic timers	Electric or pneumatic, for intermittent operation
Grease gun	for relubrication
Special versions:	Vibrators are available for extreme temperature ranges, completely stainless steel versions for use in aggressive atmosphere, for higher frequency range (HF versions). Information on request.

12 Waste disposal

Material specifications:

All parts of the conveyor systems can be recycled:

- Housing, cover, mounting plate: ⇒ aluminium
- O-rings: ⇒ perbunan
- Guide shaft, spring: ⇒ stainless steel
- Maintenance unit: ⇒ see technical data sheet
- Screws: ⇒ stainless steel
- Silencer: ⇒ plastic
- All parts coming in contact with the product ⇒ stainless steel



All units can be disposed of through Netter GmbH.
The valid disposal prices are available on request.

13 Enclosures

Enclosure (s):

Declaration of incorporation



**Further information available on request:
Leaflet no. 47 and others**