NetterVibration

CE

Operating Instructions for
Netter Electric External Vibrators

February 2015
BA No. 989E

These operating instructions apply to: **Series NED**

Serving industry with vibration

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Table of Contents

Scope of delivery

As a rule, the NEG are delivered with the following components:

- Electric external vibrator (NED)
- Operating instructions
- Packaging

For changes to the scope of delivery see delivery note.

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

Information on the operating instructions

Use and storage of the operating instructions
Before using the electric external vibrators of the series NED read this operating manual carefully. It is the basis for any action taken with regard to the NED and may be used for training purposes. The operating manual should subsequently be stored near the NED.

Target group
The target group for these operating instructions is qualified technical personnel from the mechanical engineering sector who have a basic knowledge of electrics and mechanics.
Installation, commissioning, maintenance, fault elimination and disassembly of the NED must only be performed by persons who have been instructed in the proper handling of the units.
Persons who have not been instructed accordingly must not carry out any works on the NED.

Copyright

Limitation of liability
All technical information, data and instructions on installation, operation and maintenance in these operating instructions are based on the latest information available at the time of printing and take into account our past experience to the best of our knowledge.
No claims can be derived from the information, illustrations and descriptions in these operating instructions.

The manufacturer does not assume any liability for damages resulting from:
- failure to observe the operating instructions
- improper use
- unauthorized repairs
- technical modifications
- use of inadmissible spare parts

Translations are made to the best knowledge. ***Netter****Vibration* does not assume any liability for translation errors, even if the translation was made by us or on our behalf. Only the original German version is binding.

The following instruction and warning symbols are used in this operating manual:

	**DANGER**	indicates a possible danger which can result in death or personal injury if the instruction is not followed.
	**WARNING**	indicates a possible risk which can result in personal injury and/or material damage if the instruction is not followed.
	**HOT SURFACE**	indicates a possible danger which can result in personal injury and/or material damage if the instruction is not followed.
	**DISCONNECT POWER SUPPLY**	indicates a possible danger which can result in personal injury and/or material damage if the instruction is not followed.
	**IMPORTANT**	note with especially useful information and tips.
	**ENVIRONMENTALLY FRIENDLY DISPOSAL**	indicates the obligation of an environmentally friendly disposal.

Information on the NED

Netter electric external vibrators of the series NED comply with the EC machinery directive 2006/42/EC, the electromagnetic compatibility directive 2004/108/EC and the low voltage directive 2006/95/EC.
In particular, the standards DIN EN ISO 12100, DIN EN 60529 and EN 60034-1 have been complied with.

Special features:

- Adjustable centrifugal force, NED 605 have a fixed unbalance
- 100% duty cycle
- Minimum protection type IP 66
- Smallest mounting dimensions
- Sound level measured in the open
  $\leq$ 70 dB(A) acc. to IEC

2 Safety

Intended use:
The vibrators are intended for installation in machines according to the device group and the device category. These machines use vibrations for sieving, loosening, conveying, compacting and separation of bulk materials.
Any other use is considered improper use.
There are no built-in safety devices.

Qualification of the personnel:
Assembly, commissioning, maintenance and repair of the vibrators must be performed only by authorized qualified personnel.
Any handling of the electric vibrators lies within the responsibility of the operator.

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

WARNING

Netter electric external vibrators generate vibrations.
The operator of vibration systems has to protect his employees from actual or potential threats to their health and safety due to vibrations.

WARNING

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

DANGER

Live parts can cause severe or even fatal injury.

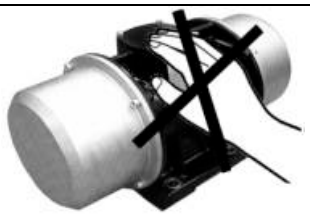
DIS-CONNECT POWER SUPPY

When working on the vibrators these must be isolated from the mains supply.
To do so please proceed as follows:

1. Switch off vibrator
2. Secure against switching on unintentionally
3. Make sure it is de-energized

HOT SURFACE

The vibrators must not be touched during operation or shortly after being switched off. The surface of the vibrators may become very hot during operation so that there is a risk of burning.



3 Technical Data

Admissible operating conditions

Mains voltage:

The mains voltage must comply with the mains voltage indicated on the type plate.

Series NED: direct current 12 V or 24 V

Speed ranges:

Direct current 3000 rpm or 3600 rpm

Admissible ambient temperature:

-20°C to 40°C*

IM-PORTANT

The maximum ambient temperature specified on the type plate must not be exceeded.
These values are valid for operation with an ON-period of 100%.
Cycled or frequency-controlled operation or synchronous operation are subject to specific requirements. These must be clarified with ***Netter****Vibration* for each individual case.

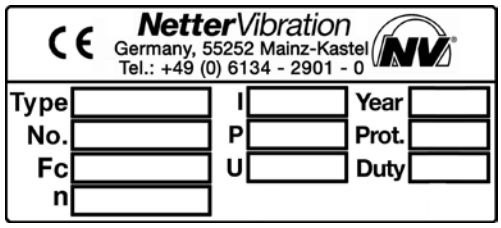
These electric vibrators must not be used in environments with an explosive gas atmosphere.

Sound level:

Depending on type ≤ 70 dB(A)
The sound level is determined to a great extent by the surface upon which the vibrator is mounted (e.g. sheet metal). The sound level will be amplified by non-silenced sheet metal.

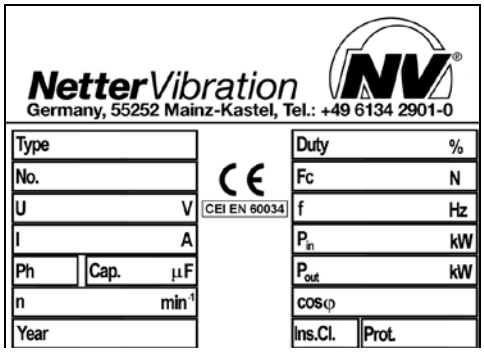
*) Higher temperatures are only possible after consultation of and written approval from the application technicians of Netter GmbH.

Please refer to the type plate for the technical data of your electric external vibrator.



⇦ Type designation
⇦ Serial number
⇦ Centrifugal force
⇦ Speed

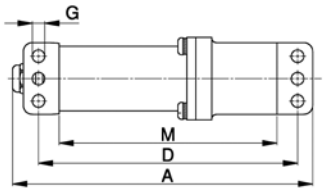
⇦ Current / Year of manufact.
⇦ Power / insulation class
⇦ Voltage / protection type

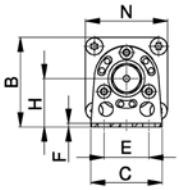


⇦ Type designation
⇦ Serial number
⇦ Nominal voltage
⇦ Current
⇦ Phases / Capacity
⇦ Speed
⇦ Year of manufacturing

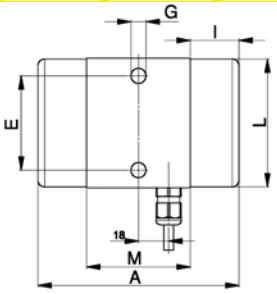
⇦ Duty cycle
⇦ Centrifugal force
⇦ Nominal frequency
⇦ Power input
⇦ Power output
⇦ Power factor
⇦ Insulation class / prot. type

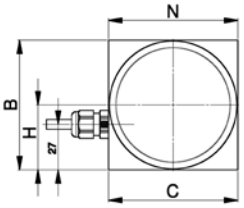
Type	Nominal voltage [V]	Working moment [cmkg]	Centrifu-gal force [N]	Nominal power [kW]	Nominal current [A]	Weight [kg]	Rounds per minute	Housing Size/ material	Unbalance type	Number unbalance discs
NED 605	24 (-)	0.07	50	0.011	0.45	0.4	3,600	- / AL / POM	L	1
NED 5016	24 (12)	0.30	148	0.02	0.6 (1.4)	1.5	2,900	- / POM	XL	6
NED 50100	24 (12)	2.40	1,190	0.10	4.0 (8.0)	5.0	3,000	102 / AL	XM	4
NED 50200	24 (12)	4.21	2,080	0.19	8.0 (16.0)	6.0	3,000	103 / AL	XM	4
NED 50500	24 (12)	9.98	4,930	0.27	11.3 (22.5)	13.1	3,000	122 / AL	XM	4
NED 601110	24 (-)	15.60	11,087	0.53	22.0 (-)	20.8	3,600	133 / AL	XM	4
NED 601510	24 (-)	21.00	14,900	0.53	22.0 (-)	21.5	3,600	133 / AL	XM	4



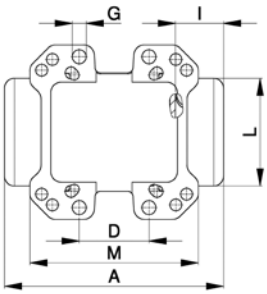


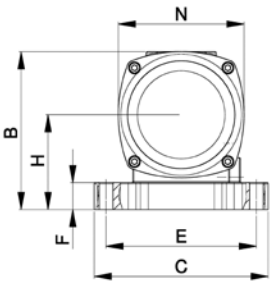
NED 605



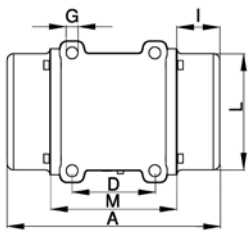


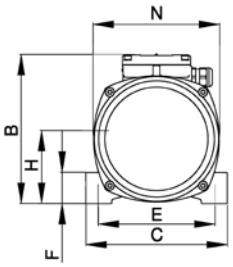
NED 5016





NED 50100 and 50200





NED 50500, NED 601110 and 601510

Type	A	B	C	D	E	F	G	H	I	L	M	N
	[mm]											
NED 605	169	50	40	145	25	2	7	27	-	-	122	46
NED 5016	121	77	77	-	56	-	9	38.5	29	76	63	-
NED 50100	210	146,5	162	65 115 135 74 80	140 135 115 106 110	25	9 11 13	88	46	103	157	117
NED 50200	267	146,5	162	65 115 74 80	140 135 106 110	25	9 11 13	88	46	103	140	117
NED 50500	288	203	167	105	140	30	13	82.5	65	145	140	160
NED 601110	308	214.5	205	120	170	45	17	94	63	168	160	182
NED 601510	308	214.5	205	120	170	45	17	94	63	168	160	182

4 Design and Function

- **The electric motor** of the series NED is a DC motor.
- **The motor shaft** is made of heat-treated alloyed steel.
- **The special bearings** are overdimensioned and for excessive loads and high speeds.
- **The housings** of the NED 605 are made of aluminium and plastic.
- **The housings** of the NED 5016 are made of plastic.
- **The housings** of the NED 50100 to NED 601510 are made of an aluminium alloy.
- **The surface** of the NED 605 and NED 5016 are made of plastic.
- **The surface** of the NED 50100 to NED 601510 is highly weather-resistant due to powder coating as well as resistant against abrasion, impacts and a wide variety of chemicals. Colour: traffic black.
- **The unbalance masses** are adjustable as follows:
  Type L fixed unbalance
  Type XL by removable discs
  Type XM in 10% steps
- **The covers of the unbalances** of the NED 605 and NED 5016 are made of plastic.
- **The covers of the unbalances** of the NED 50100 to NED 601510 are made of stainless high-grade steel.

5 Transport and Storage

IM-PORTANT

Check the packaging for possible shipping damage.
If damage to the packaging is found, check the content for completeness and possible damage. In case of damage inform the forwarding agent.

The units are packed ready for installation. The type plate is attached to the vibrator. If not specified differently the vibrator is delivered with an unbalance setting of 100%.
When transporting the vibrator make sure to avoid hard impacts or vibrations which could damage the bearings.

The unit should be stored in a clean, dry environment.
If the vibrator needs to be in storage for a longer period of time (2 years max.), the temperature in the store must not fall below -10°C or above +25°C and the relative air humidity must not exceed 60%.

WARNING

If the vibrator is fitted with two transport eyes, both of these should be used for lifting. The lifting angle must not exceed 45°.
The transport eyes must solely be used to lift the vibrator.

6 Installation

IMPORTANT

The installation of the vibrators must only be carried out by authorized, qualified personnel.
The qualified personnel must use only tools which are suitable for the application.

IMPORTANT

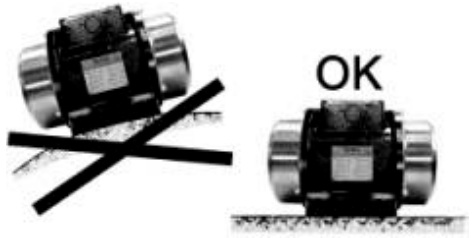
During installation please comply strictly with the safety regulations in chapter 2 and the accident prevention rules!
Installation of the system must be performed in compliance with the local, applicable regulations (e.g. VDE-regulations).

6.1 Fastening of the vibrator

Netter electric external vibrators can be operated in any position.
During installation the following instructions must be strictly observed:

WARNING

The mounting surfaces must be absolutely level (± 0.1mm flatness fault), so that the feet of the vibrators have full area contact and to avoid warping of the housing when tightening the fastening screws. The surfaces should also be free of any paint residues and weld penetrations. Tensions in the housing can cause mechanical and/or electrical damage.

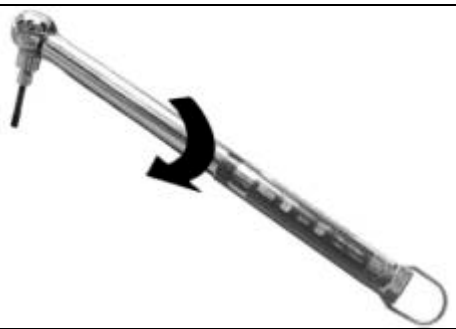


For safe fastening we recommend the use of Netter NBS screw connections consisting of screw, special lock washer and, if necessary, nut.

The vibrators can also be fastened with fastening screws of quality 8.8 (DIN 931 or 933). These must be locked with qualified locking devices and retightened at regular intervals (normally every month).

WARNING

The tightening torques can be taken from the following table. Higher tightening torques may cause fracture of screws or tearing of threads. Inadequate screw connections may cause loosening of vibrators by vibration. This can cause damage to persons and material!



Recommended average tightening torques for fastening screws
(screws as supplied, without additional lubrication):

Type of screw	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M24
8.8 Tightening torque [Nm]	3	6	10	23	48	80	130	190	270	380	650

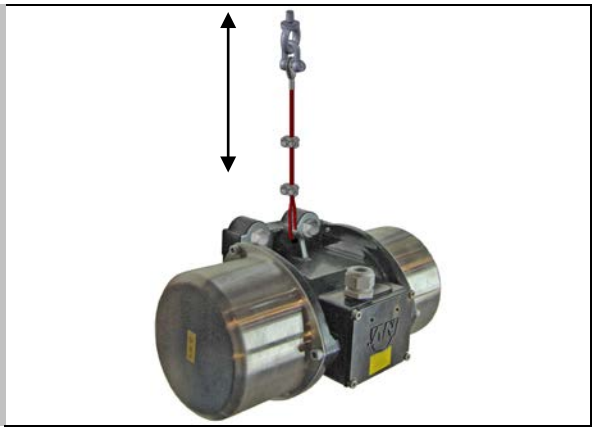
Use a torque wrench and tighten the screws in a crosswise pattern.

DANGER

In critical installation situations the unit must be secured additionally by a steel rope, e.g. NSE.

Adjust the safety rope to the shortest possible length by using the wire rope clips.

The safety rope must be under tension at all times!



6.2 Electrical connection

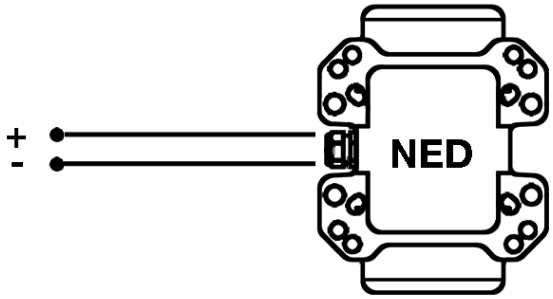
IMPORTANT

The electrical installation of the vibrators must be performed only by authorized, qualified personnel.
The qualified personnel must use only insulated tools, which are suitable for the application.

IMPORTANT

The mains voltage must comply with the nominal voltage indicated on the type plate.

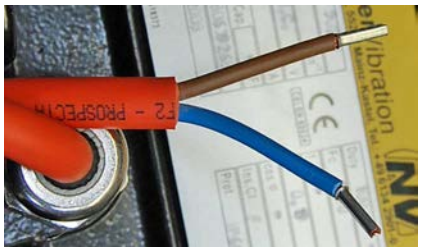
Connection example NED



The vibrators are delivered with a cable.

Cable lengths:

NED 605	3 m
NED 5016	4 m
NED 50100 to NED 601510	2,5 m



DANGER

The electric lines have to be laid with care. It has to be avoided that the cables can be chafed through by vibrating parts.
The perfect condition of the electric lines incl. plugs has to be checked at regular intervals (as a rule every six months). Defects which are discovered have to be eliminated immediately. Protect the cable against high temperatures, lubricants and sharp edges.

7 Start-up

IMPORTANT

During start-up of the vibrators the rules and regulations of the local associations for electrical engineering (e.g. VDE) and the applicable accident prevention rules must be observed.

The vibrators must always be switched on and off at a main switch.

WARNING

The vibrator must not be operated without the cover for the unbalances in place! The rotating unbalances cause a risk of injury!

WARNING

The vibrators have to be adapted to your application by adjusting the unbalances. You can directly influence vibration amplitude, centrifugal force and current consumption, see chapter 8 „Adjustment of unbalances".

Exception: NED 605 has a fixed unbalance.

Retightening:
Screw connections must be checked and, if necessary, retightened after 1 hour of operation (after initial start-up) and then at regular intervals (as a rule, once per month).

8 Adjustment of unbalances

IMPORTANT

All vibrators of the series NED (except the NED 605) provide the possibility to adjust the unbalances.
Unless otherwise specified by you, the units will be shipped with the default setting (100%).
By adjusting the unbalances you can directly influence the vibration amplitude, centrifugal force and current consumption.

WARNING

On all units with adjustable unbalances these must only be adjusted symmetrically mirrored!

The tables below show the type of unbalance and the number of unbalances per vibrator at the default setting of 100%.

How to proceed:

- Switch off vibrator, secure against being switched on unintentionally and check that unit is voltage-free.
- Remove both unbalance covers.
- Loosen locking nuts and/or safety screws.
- Adjust the unbalances as required.
- Tighten locking nuts and/or safety screws.
- Fasten unbalance covers.

Type	Unbalance		
	Type	Number	
		12 V	24 V
NED 5016	XL	6	6
NED 50100	XM	4	4
NED 50200	XM	4	4
NED 50500	XM	4	4
NED 601110	XM	-	4
NED 601510	XM	-	4

Unbalance discs type XM

The unbalance setting of the unbalance discs type XM is made via the scale of the fixed unbalance disc. The centrifugal force is set by turning the outer unbalance disc and by adjusting to the scale division lines. The adjustment can be made in 10% steps.

Recommended average tightening torques for nuts

Nut type	**M6 × 1**	**M13 × 1**	**M15 × 1**	**M20 × 1**	**M25 × 1.5**	**M30 × 1.5**	**M45 × 1.5**
Tightening torque [Nm]	10	30	50	100	170	340	500

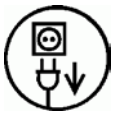
9 Trouble Shooting

IMPORTANT

Faults on vibrators must only be repaired by authorized, qualified personnel. The qualified personnel must use only insulated tools suitable for the application.

Fault	Possible cause	Trouble shooting	Remedy
Vibrator does not start or runs with decreased speed	Carbon brushes worn out	Check carbon brushes	Replace carbon brushes
	Mains voltage too low	Check mains voltage and cable cross-section	Correct mains voltage, replace cable
Vibrator speed drops under load	Insufficient contact on a connecting terminal	Check connection in terminal box	Tighten terminal nuts
	Carbon brushes worn out	Check carbon brushes	Replace carbon brushes
	Incorrectly dimensioned connecting cable	Check cable cross-section	Replace cable
	Overload	Check unbalance setting	Reduce unbalance
	Mains voltage too low	Check mains voltage and cable cross-section	Correct mains voltage, replace cable
High current consumption	Natural resonance range of vibration system	Check current consumption	Stiffen the device
	Impacts	Check current consumption	Reduce power of the vibrator
		Fastening loose	Tighten the screws
	Carbon brushes worn out, have no contact with commutator	Check carbon brushes Line break?	Replace carbon brushes
	Damaged bearing	Check bearing	Replace bearing

10 Service / Maintenance



DIS-CONNECT POWER SUPPLY

When working on the vibrator it must be isolated from the mains supply. To do so please proceed as follows:

1. Switch off the vibrator
2. Secure it against being switched on again
3. Make sure it is de-energized

The following maintenance work has to be carried out at regular intervals by trained specialized staff with comprehensive knowledge:

a) Checking of the screw connections
b) Checking of the ball bearings
c) Checking of the operating hours (service life of bearings)
d) Checking of the cable supply line

WARNING

Other maintenance and repair work are to be carried out by *Netter*Vibration exclusively.
Authorized and specialized staff is allowed to perform the following work on the vibrators:

The adjustment of the unbalance discs including removal of the unbalance covers.

The electric connection of the supply line.

Please observe the safety instructions in chapter 2 when service on the unit is done.

WARNING

Retightening:
Screw connections must be checked and, if necessary, retightened after 1 hour of operation (after initial start-up) and then at regular intervals (normally every month). Pay attention to the specified torque (see chapter 6.1).

IM-PORTANT

Lubrication
The vibrators are equipped with ball bearings. These are lifetime lubricated (permanent lubrication).

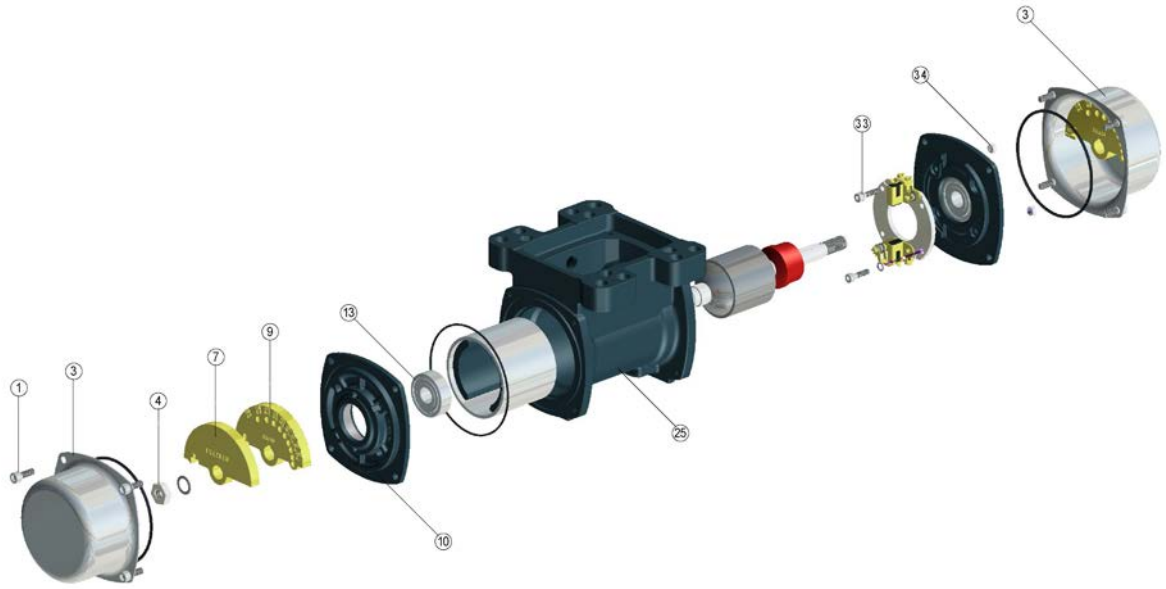
DANGER

The condition of the ball bearings must be regularly checked.
The replacement of damaged bearings or bearings which have reached the end of their service life can be made by ***Netter****Vibration*.

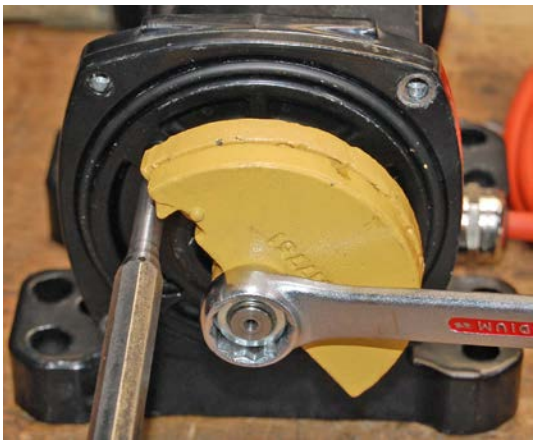
Service life of bearings

Type		Service life of bearing [h]
NED 605	Permanent lubrication	3,000
NED 5016		100,000
NED 50100		20,421
NED 50200		3,951
NED 50500		2,161
NED 601110		938
NED 601510		847

Procedure for replacing the bearings:



1. Switch off the vibrator, secure it reliably against switching on and make sure that it is dead.
2. Unscrew socket head cap screws (1) and remove covers (3) from the unbalances.
3. Disassembling the unbalances:
   - Unbalances type XM(7;9)
   - Insert a punch tool into the bore in the flange (10). (Attention: In order to avoid possible damage, do not insert the punch tool into the unit until the stop is reached).
   - Loosen locking nut (4).
   - The unbalances can be pulled off after removing the locking nut (4).
4. Removing bearing (13):
   - Disassemble flange (10).
   - Remove socket head screws (33) from flange (10).
5. Replace both bearings (13).
6. Assembly is performed in reverse order.
7. Tighten locking nuts (4) and socket head screws (33, 1) with the specified tightening torque.



Lösen

Anziehen

Recommended tightening torques for screws

Screw type	M6	M8	M10	M12	M14	M16
8.8 Tightening torque [Nm]	10	23	48	80	130	190

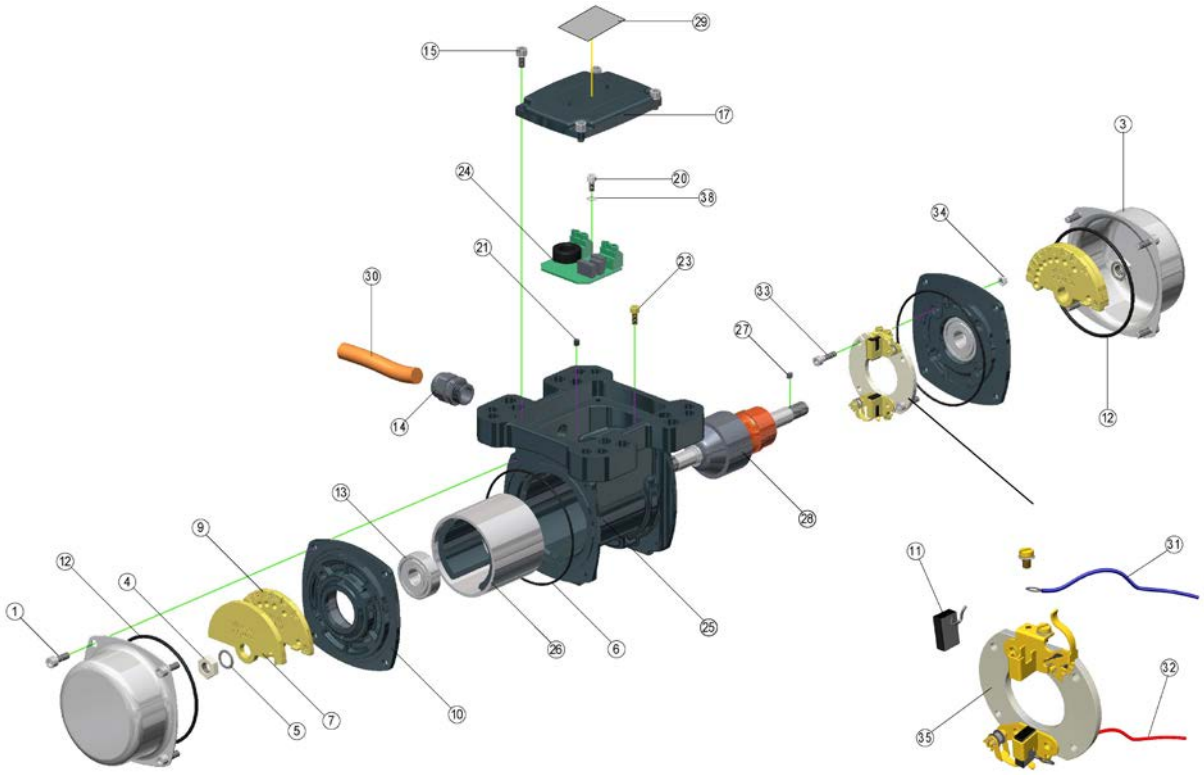
Recommended tightening torques for nuts

Nut type	M6 × 1	M13 × 1	M15 × 1	M20 × 1	M25 × 1.5
Tightening torque [Nm]	10	30	50	100	170

11 Spare Parts

When ordering spare parts you should always provide the following details:

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



Example NED 50100

12 Accessories

The following accessories are available for electric external vibrators of the series NED:

Description	**Remark**
Compensation washers	Compensation for removed unbalance discs
Fastening sets NBS	for secure fastening of electric external vibrators
Speed controller NDR	allow a quick change of the vibrator speed
Special designs	Electric external vibrators are also available in special designs, e.g. for special voltages or special temperatures. Information on request.

Other electrical accessories on request.

13 Disposal

Depending on the material, the parts and packaging must be disposed of in an environmentally compatible way.

Material specifications:

	NED
Plastic	Housing NED 605 and NED 5016, unbalance covers NED 605 and NED 5016
Stainless steel	Unbalance covers NED 50100 to NED 601510
Steel	Rotor, unbalance, flange, bearing, screws, washers, nut
Aluminium	Housing NED 605 and NED 50100 to NED 601510, type plate, terminal box cover
PTFE, PU, VITON	Seals, terminal box block
Copper with resin	Winding

ENVIRONMENTALLY FRIENDLY DISPOSAL

All units can be disposed of through Netter GmbH.

The valid disposal prices are available on request.

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14 Enclosures

Enclosure(s):

Declaration of incorporation

IMPORTANT

Further information available on request: Leaflet no. 8 (Netter Electric External Vibrators), and more.