



NetterVibration

Operating instructions for
Netter Electric External Vibrators
series NEA/NEG/NEG S/NES



Sept. 2020
No. 1929E
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These operating instructions apply to: **Series NEA**
Series NEG
Series NEG S
Series NES



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Scope of delivery

Please refer to the delivery note for the scope of delivery.
Check the packaging for possible transport damage. In the event of damage to the packaging, check the contents for completeness and possible damage. Inform the carrier in the case of damage.


Designation

The Electric External Vibrators of the series NEA, NEG, NEG S and NES are hereafter referred to as "NEA/NEG".

Version of document

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1 General information

Use and storage	Before installing the NEA/NEG read these instructions carefully. It is the basis for any action when dealing with the NEA/NEG, and may be used for training purposes. The instructions should be subsequently stored at the operation site.
Target group	The target group for these instructions is technical staff, who have basic knowledge of mechanics, electrics and explosion protection. Only complying technical staff may work on the NEA/NEG. The NEA/NEG may only be installed, put into operation, maintained, troubleshoot and disassembled by persons authorised by the operator.
Copyright	This documentation is protected by copyright. NetterVibration reserves all rights such as translations, reprinting and reproduction of the instructions, as well as parts thereof.
Limitation of liability	All technical information, data and instructions for installation, operation and maintenance in these instructions are based on the latest information available at the time of printing and take our past experience to the best of our knowledge into account. No claims can be derived from the information, illustrations and descriptions in these operating instructions. The manufacturer does not assume liability for damages resulting from: <ul style="list-style-type: none">• failure to observe the instructions,• improper use,• unauthorised repairs,• technical modifications,• use of non-permissible spare parts. Translations are made to the best of our knowledge. NetterVibration does not assume liability for translation errors, even if the translation was made by us or on our behalf. Only the original German text remains binding.
Directives / standards observed	The Electric External Vibrators of the series NEA, NEG, NEG S and NES comply with the EC Machinery Directive 2006/42/EC, the electromagnetic compatibility directive 2014/30/EU and the low voltage directive 2014/35/EU. In particular the standards EN ISO 12100, EN 60529 and DIN EN 60034-1 has been observed.  All Electric External Vibrators of the series NEA, NEG, NEG S and NES, labelled with the Ex-Symbol on the type plate, comply with the ATEX Directive 2014/34 EU for equipment group II. NEA/NEG of housing size 50 and 60 are suitable for use in potentially explosive areas of the category 3D in the zone 22.

NEA/NEG from housing size 100 upwards are suitable for use in potentially explosive areas of the category 2D in the zone 21 and 22.

In particular the standards DIN EN IEC 60079-0 and DIN EN 60079-31 (IEC 60079-31) are observed.


Before using the NEA/NEG the operator must exclude the possibility that the introduction of vibrational energy poses the risk of explosion.

Instruction and warning symbols


The following instruction and warning symbols are used in these instructions:

Personal injuries


⚠ DANGER

	<p>indicates an immediate danger. Disregard of this notice will result in death or severe personal injuries.</p>
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⚠ WARNING

	<p>indicates a potential danger. Disregard of this notice can result in death or severe personal injuries.</p>
--	--

⚠ CAUTION



	<p>indicates a potentially dangerous situation. Disregard of this notice can result in minor or moderate personal injuries.</p>
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Material damages


NOTICE

<p>indicates potential material damage. Disregard of this notice can result in material damage.</p>

Notes

IMPORTANT	
indicates actions, methods or notes that are not relative to safety, e.g. useful information and tips.	
	Environmentally safe disposal indicates the obligation of environmentally safe disposal.
	Explosion prevention indicates information on explosion prevention.

ATEX-notes

When operating the NEA/NEG in potentially explosive areas all notes, marked with the Ex-symbol , must be observed.

Type designations

Explanations of abbreviations in the type designation:

XXX YYZZZZ-WWW

XXX indicates the type of vibrator (three-phase or single-phase):

- **NEA** = single-phase alternating current
- **NEG** = 3-phase alternating current
- **NES** = 3-phase alternating current (stainless steel housing)

YY indicates the polarity:

- **50** = 2 poles
- **25** = 4 poles
- **16** = 6 poles
- **12** = 8 poles

ZZZZ indicates the centrifugal force in daN (Decanewton).

WWW indicates special features:

- **K** = 130°C PTC thermistor installed (standard from housing size 170 upwards)
- **K2** = 120°C PTC thermistor installed
- **TS** = 130°C thermal protector with a normally closed (NC) switching contact
- **TS2** = 120°C thermal protector with a normally closed (NC) switching contact
- **H** = 200-240V anti-condensation heater 0-50W
- **H110** = 100-120V anti-condensation heater 0-50W
- **HD** = Fully encapsulated stator (heavy duty)

Suffix **S** behind the type designation = stainless steel housing

2 Safety


Intended use

The NEA/NEG are intended for generating circular vibrations. General applications are: loosening, conveying, sorting, compacting, separating bulk materials and reducing friction. NEA/NEG are used for emptying bunkers, as drives for conveyor troughs, sieves and vibrating tables. The NEA/NEG are designed for installation in machines and may only be put into operation, if it has been assured that the complete machine complies with the regulations of the machinery directive. Any other use is considered improper.

Qualification of qualified personnel

Installation, commissioning, maintenance and troubleshooting of the NEA/NEG may only be performed by authorised qualified personnel. All handling of the NEA/NEG is the responsibility of the operator.



Accessory parts

 All accessory parts connected to the NEA/NEG, which ensure correct operation and safety, must have the appropriate degree of protection for this specific purpose.


Liability

IMPORTANT	
<i>NetterVibration</i> assumes no liability for personal injuries and material damages if technical changes to the product were made or the notices and regulations in these instructions were not observed.	


Safety rules

 DANGER	
	<p>Electric shock</p> <p>An electric shock will result in serious injury or even death. The NEA/NEG must be free of voltage during assembly, start-up, maintenance and troubleshooting.</p> <p>Observe the following five safety rules:</p> <ol style="list-style-type: none"> 1. Disconnect the NEA/NEG from the mains supply. 2. Secure the NEA/NEG against re-activation. 3. Establish that the NEA/NEG has no voltage. 4. Earth and short-circuit the power supply of the NEA/NEG. 5. Cover adjacent live parts or fence them off.


High voltage

⚠ DANGER	
	<p>Risk of electric shock due to high voltage</p> <p>An electric shock leads to serious injuries or even death.</p> <ul style="list-style-type: none"> ➤ Observe the permissible protection class and earthing. The NEA/NEG may only be operated with the correct connection of the protective conductor. ➤ Perform all work only with insulated tools suitable for the application. ➤ All work on the system may only be carried out in a volt-free state. ➤ Never open the terminal box cover when voltage is applied. ➤ Never loosen or remove paint-sealed screws. ➤ Never touch or remove safety covers. ➤ Protect the NEA/NEG against falling parts during all work. Metal parts can cause a short circuit within the NEA/NEG.



Spark formation

⚠ WARNING	
	<p>Spark formation</p> <p>Opening the terminal box cover of the NEA/NEG in Ex-zones can cause spark formation and thus lead to an explosion due to ignition of an explosive atmosphere.</p> <ul style="list-style-type: none"> ➤ Never open terminal box covers in a potentially explosive atmosphere or when voltage is applied. ➤ If terminal box covers or unbalance covers are open, check the condition and correct positioning of the seals. ➤ Damaged seals must be replaced immediately. ➤ The mechanical protection of the housing (IP6X) must be assured after assembly of the covers.


Spark formation

⚠ WARNING	
	<p>Spark formation</p> <p>The impact of corroded steel parts on the aluminium housing at high speed can cause spark formation and thus lead to an explosion.</p> <ul style="list-style-type: none"> ➤ Choose the installation position carefully, so that there are no external impacts. ➤ Fasten the NEA/NEG securely. ➤ Check the fastening regularly (generally monthly).


Static electricity

⚠ WARNING	
	<p>Hazard of electrostatic discharge</p> <p>When cleaning the NEA/NEG with a dry cloth there is a risk of electrostatic discharge. A electrostatic discharge can lead to an explosion due to ignition of an explosive atmosphere.</p> <ul style="list-style-type: none"> ➤ Only clean the NEA/NEG with a wet cloth. ➤ Remove dust deposits regularly. ➤ The following warning label is located on the NEA/NEG and must be observed: <div style="border: 1px solid black; background-color: #ffff00; padding: 5px; text-align: center;"> <p style="font-size: small;">0518437</p> <p>ACHTUNG  WARNING</p> <p style="font-size: x-small;">Nicht öffnen in explosionsfähiger Atmosphäre. Gefahr durch elektrostatische Aufladung. Nur mit feuchtem Tuch reinigen.</p> <p style="font-size: x-small;">Do not open when an explosive atmosphere is present. Potential electrostatic charging hazard. Clean only with a wet cloth.</p> </div>

Static electricity

⚠ WARNING	
	<p>Static electricity</p> <p>The discharge of charged, isolated conductive parts can cause ignitable sparks.</p> <ul style="list-style-type: none"> ➤ Connect the earthing screw of the NEA/NEG to the potential equalisation of the higher-level machine. ➤ Include all components in the potential equalisation of the machine.

Hot surface

⚠ WARNING	
	<p>Hot surface</p> <p>If the permissible operating conditions and the maintenance requirements are not observed or if the vibrator does not fit the application, the housing surface may become very hot. In Ex-zones there is a risk of ignition of an explosive atmosphere due to hot surfaces.</p> <ul style="list-style-type: none"> ➤ Observe all permissible operating conditions. ➤ Carry out the specified maintenance work at the predefined intervals. ➤ Make sure that the vibrator is suitable for the application and has been dimensioned correctly. Get advice from application technicians of NetterVibration. ➤ For operating the NEA/NEG in potentially explosive atmosphere, it is mandatory to connect the PTC-thermistor. This regulation does not apply if the vibrator is not equipped with a PTC-thermistor.

NEA/NEG from housing size 170 upwards are equipped with thermistors type PTC 130 °C as standard. For smaller NEA/NEG available on request as initial equipment.

Heavy parts

⚠ WARNING	
<p>Risk of injury while handling heavy parts</p> <p>Risk of serious injury due to weight during transport and installation of the NEA/NEG.</p> <ul style="list-style-type: none"> ➤ Observe the weight information in Chapter Technical data, from page 11 on. ➤ Only qualified personnel may transport and install the NEA/NEG. ➤ Use suitable load handling devices and slinging equipment. ➤ Wear suitable personal protective equipment. 	

Falling parts

 **WARNING**
Falling parts

The NEA/NEG or parts of the construction can come loose due to vibration. Falling parts can lead to severe personal injuries.

- Use only suitable fastening screws and safety washer to attach the NEA/NEG.
For attachment *NetterVibration* recommends using *Netter* fastening kits NBS.
- Check the fastening screws after one hour of operation and thereafter regularly (generally monthly).
- Retighten the fastening screws, if necessary. Use a torque wrench and tighten the screws crosswise.
- In critical installation situations suitable securing is mandatory.

Rotating Unbalances

 **WARNING**
Risk of injury due to rotating unbalances

During operation of the NEA/NEG without unbalance covers there is risk of injury due to rotating unbalances.

- Operate the NEA/NEG only with mounted unbalance covers.

Hot surfaces



 **CAUTION**
Risk of burns due to hot surfaces

NEA/NEG can strongly heat up during operation. Direct contact may cause burns.

- Do not touch the NEA/NEG or the cable near the cable gland during operation or shortly after being switched off.
- Only operate the vibrators within the permissible ambient temperature, according to Ch. Technical data, page 11.


3 Technical data

Permissible operating conditions


<p>Nominal voltage, nominal frequency</p>	<p>The main voltage and the main frequency must comply with the nominal voltage and nominal frequency indicated on the type plate. Permissible Voltage deviation: +/- 5 % Permissible frequency deviation: +/- 2 % Possible power supply with:</p> <ul style="list-style-type: none"> • fixed voltage and frequency or • frequency converter <p>The operation of NEG with frequency converters allows rotary speeds > nominal frequency. If the NEG are operated with a frequency converter, the maximum centrifugal force must not be exceeded (according to the type plate). The compliance with the electromagnetic compatibility directive 2014/30/EU has to be ensured.</p> <p> In the ATEX-zones 21 and 22 the frequency converter may regulate the frequency between 20 Hz and 50 Hz or 20 Hz and 60 Hz at a constant torque load (linear volt-hertz-curve). Please observe the max. frequency on the type plate. For operation with frequency converter in ATEX-zones the PTC thermistor must be connected.</p>
<p>Rotary speed ranges</p>	<p>2-pole: 3000 rpm 50 Hz / 3600 rpm 60 Hz. 4-pole: 1500 rpm 50 Hz / 1800 rpm 60 Hz. 6-pole: 1000 rpm 50 Hz / 1200 rpm 60 Hz. 8-pole: 750 rpm 50 Hz / 900 rpm 60 Hz.</p>
<p>Permissible ambient temperatur*</p>	<p>-20 °C to 40 °C or -20 °C to 55 °C 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 %. For the following operation modes special requirements apply:</p> <ul style="list-style-type: none"> • cycled operation or • frequency-controlled operation or • synchronous operation. <p>These must be clarified with NetterVibration on a case-by-case basis.</p>
<p>Thermal overload protection</p>	<p>From housing size 170 upwards with thermistor type PTC 130 °C as standard. For smaller vibrators available on request as initial equipment.  If the NEA/NEG is operated in environments with potentially explosive dust (zone 21/22), it is mandatory to connect the PTC-thermistor. This regulation does not apply if the unit is not equipped with a PTC-thermistor.</p>
<p>Sound level</p>	<p>Depending on type ≤ 70 dB(A) The sound level is determined to a great extent by the surface upon which the NEA/NEG is mounted (e.g. sheet metal). The sound level will be amplified by non-silenced sheet metal.</p>

* Higher temperatures are only possible after consultation with and written approval from the application technicians of **NetterVibration**.

Type plate for housing sizes 50 and 60

- 1 type designation
- 2 rotary speed
- 3 nominal voltage
- 4 current
- 5 phases
- 6 serial number
- 7 year of manufacture / degree of protection
- 8 insulation class
- 9 power
- 10 nominal frequency
- 11 centrifugal force
- 12 duty cycle
- 13  ATEX certification

Type plate from housing size 100

- 1 type designation
- 2 nominal voltage
- 3 current
- 4 phases / capacity
- 5 power factor
- 6 year of manufacture
- 7 serial number
- 8 max. ambient temperature
- 9 insulation class / degree of protection
- 10 power output
- 11 power input
- 12 rotary speed / nominal frequency
- 13 centrifugal force
- 14 duty cycle
- 15  ATEX certification

The values can be found on the type plate. The type plate is located on the housing. For detailed technical data please refer to the brochure of the NEA/NEG. Deviating customer-specific type plates (special designs) are possible.

Tightening torques

NetterVibration recommends the following tightening torques [Nm]:

Type	M4	M5	M6	M8	M10	M12	M16	M20	M22	M24
Fastening screws and nuts, steel Property class 8.8*	-	-	10	25	50	87	210	411	559	711
Fastening screws for XS-unbalances, steel Property class 12.9**	-	-	-	42	83	146	360	710	970	1225
Fastening screws and nuts, stainless steel			8.8	21.4	44	74	183	-	-	-
Terminal plate nuts, steel	1.2	2.0	3.0	6.5	13.5	-	-	-	-	-

Screws as supplied, without additional lubrication.
 * coefficient of sliding friction 0.14 ** coefficient of sliding friction 0.15
 Always use a torque wrench and tighten the screws crosswise.

Type	M13x1	M15x1	M20x1	M25x1.5	M30x2	M45x1.5
Locking nuts (Pos. 21) see page 29	30	50	100	170	340	500

4 Design and function

Design

Example: NEG 501140

Example: NEG 50120



Nr.	Element	Function
1	Housing	Contains and protects the components of the NEA/NEG.
2	Unbalance covers	Protect against grabbing into the unbalances.
3	Housing foot	Attach the NEA/NEG to the mounting surface.
4	Type plate	Shows model specific information and data.
5	Terminal box Housing sizes 101 to 120: terminal box integrated in housing foot.	Contains the electrical connections.
6	Cable gland (depending on type).	Connect the NEA/NEG.

Function

The Electric External Vibrators of the series NEA, NEG, NEG S and NES are asynchronous motors with adjustable weights (unbalances) mounted on their shaft ends.

The NEA/NEG generate circular vibrations, that means the vibrations act in all directions of a plane.

The frequency can be controlled continuously with the help of frequency converters.

The centrifugal force can be changed by adjustment of the unbalances.

5 Transport and storage

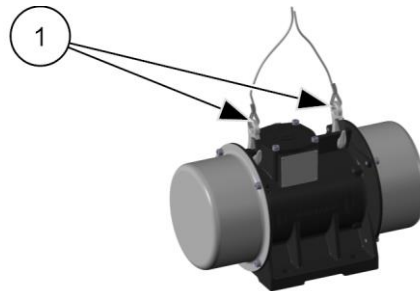


Observe the safety instructions in Ch. Safety, from page 6 on.

Please refer to the brochure for weights and dimensions.

Transport-conditions

When transporting the NEA/NEG, ensure that the NEA/NEG is not subjected to strong impacts or vibrations that could damage the bearings.



Please observe the following notes:

- Use only the transport eyelet/eyelets (1) for lifting the NEA/NEG. If the vibrator is fitted with two transport eyes, both must be used for lifting.
- The pulling direction must not exceed 45°.
- Lifting tools are of the usual kind such as a pulley or a crane. When moving loads, use suitable steel cables or hoisting slings which are sufficiently dimensioned for these weights.
- Handle the NEA/NEG very carefully during transport.


Packaging

The NEA/NEG are packed ready for installation.

The packaging protects the NEA/NEG from transport damage. The packaging material has been selected from an environmentally safe and technically disposable point of view and is therefore recyclable.

The return of packaging to the material cycle conserves raw materials and reduces the amount of waste.

Storage

- Store the NEA/NEG in a dry and clean environment.
- The permissible storage temperature is between -15 °C and +60 °C.
- The permissible relative humidity is max. 60 %.
- The storage time is max. 2 years.
-  If the vibrator is operated in areas with potentially explosive dust (zone 21 or 22) a revision at **NetterVibration** is mandatory after a storage time of more than one year.
- Do not store the NEA/NEG outdoors. The electrical components are not protected against corrosion.

6 Installation



Observe the safety instructions in Ch. Safety, from page 6 on.

Please refer to the brochure for weights and dimensions.

Fastening the NEA/NEG

Important: For NEA/NEG with housing size 101 to 120 the terminal box is integrated in the housing foot. These vibrators must be electrically connected before fastening.

The NEA/NEG can be operated in any position.

1. **Notice:** The feet of the NEA/NEG must lie completely on the surface so that there is no tension in the housing when tightening the fastening screw/screws, which could cause mechanical damage. The mounting surface has to be flat (± 0.1 mm flatness) and clean with no paint residues or burn-ins.



2. The vibrators can be fastened with fastening screws of quality 8.8 (DIN 931 or 933). These must be secured with appropriate locking devices and checked and retightened at regular intervals (usually monthly). For safe fastening **NetterVibration** recommends the use of **Netter NBS** fastening kits consisting of a screw, a special lock washer and, if applicable, a nut.

Fasten the NEA/NEG with the fastening screws on the mounting surface. Use a torque wrench and tighten the screws crosswise. Observe the recommended values for screw sizes and tightening torques, see chap. Technical data, from page 11. Higher tightening torques may cause fracture of screws or tearing of threads.

Warning: Unsuitable screw connections may cause loosening of the NEA/NEG by vibration. This can cause damage to persons and material.

3. Use an additional safety device for critical installation situations, e.g. steel cable NSE. Use the wire cable clamps to set the safety cable to the shortest possible cable length. The safety cable must always be tensioned.

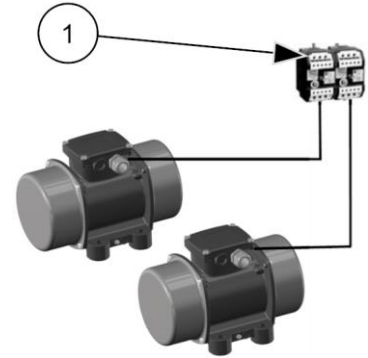



Electrical connection


The following requirements and conditions must be met to connect the NEA/NEG electrically:


- The permissible operating conditions must be met. Please refer to chap. Technical data, page 11 for operating conditions.

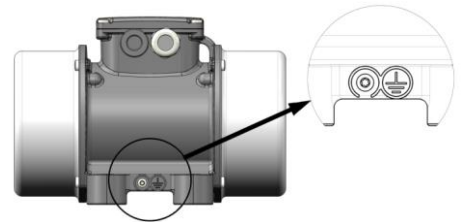
- A suitable overload protection (1) must be pre-connected to each vibrator. The motor protection switches must be interlocked with each other in pairs, so that in the event of a motor failure, the power supply from both motors is interrupted at the same time in order not to cause uncontrolled vibrations which can damage the system.





 In zone 21/22 the motor protection switches must be approved for applications in potentially explosive areas.

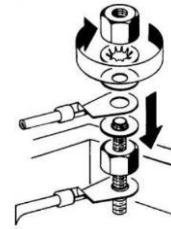
-  If the vibrator is operated in areas with potentially explosive dust (zone 21/22), it is compulsory to connect the PTC-thermistor. This regulation does not apply for NEA/NEG without a PTC-thermistor.

-  In areas with potentially explosive dust (zone 21/22), an external grounding must also be made via the earth connection on the housing foot.




- Only suitable, flexible supply cables must be used for connecting the NEA/NEG. The conductors in the supply cable for the connection of the NEA/NEG to the mains must be temperature-resistant and have a sufficiently large cross-section, which is adapted to the cable length used. The temperature resistance of the cables depends on the maximum surface temperature (temperature class T) stated on the type plate. When selecting the connection cables, consider that the cables are mechanically stressed by vibration. Recommended cable types for mains operation at 400 V, in potentially non-explosive atmosphere: rubber hose line H07 RN-F or oil flex cable 110 CY. For other voltages or other ambient conditions, the cables must be adapted to the respective conditions and designed accordingly.
- All electrical cables must be carefully laid and must be protected from high temperatures, lubricants and sharp edges. Care must be taken to ensure that the cables are not chafed through by vibrating parts. The correct condition of the electrical cables with their plugs must be checked at regular intervals (usually every six months). Detected errors are to be eliminated immediately.
-  The cable fastening must be provided in close vicinity of the cable entrance.

-  The electrical parameters U, I, P on the type plate must be observed.
- Tighten terminal plate nuts with prescribed torque, see chap. Technical data, from page 11. Remember to put the safety washer between the ring and the nut and the vibration-damping insert back.



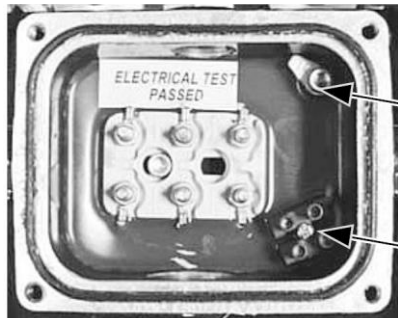
- The wire ends must be fitted with suitable insulated cable lugs, in order to prevent the strands from splaying.



-  For operating the NEA/NEG in areas with potentially explosive dust (zone 21/22) the mechanical protection of the housing must be guaranteed (degree of protection IP66, housing size 50 and 60: IP65). After having disassembled the terminal box cover or weight covers, the condition and correct positioning of the seals has to be checked.

Connection examples NEG

Open the terminal box to connect the NEG according to the type plate as follows:

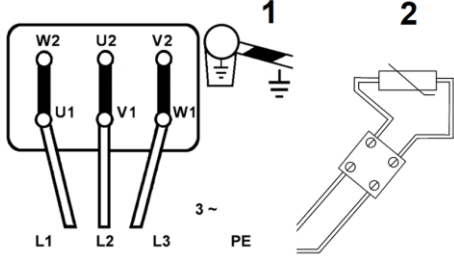
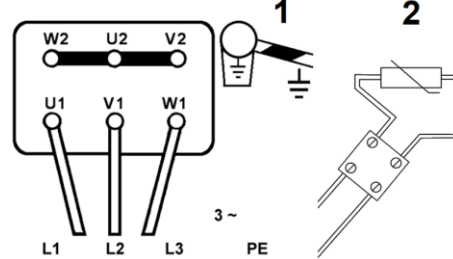
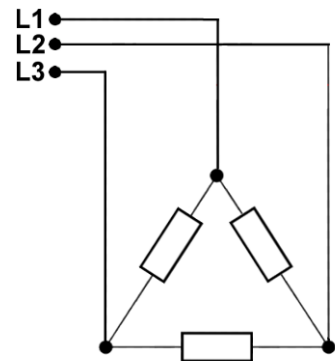
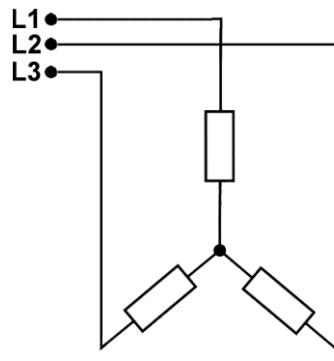


- 1 Earthing terminal for protective conductor (green-yellow)
- 2 PTC-Thermistor connection (depending on the NEG-type)

Connect the NEG according to the type plate and the following circuit diagrams.

The green-yellow protective conductor must only be connected to the earthing terminal.

Connection diagram

Series NEG / 3-phase current	
Smaller voltage	Higher voltage
	
<p>1: Earthing terminal for protective conductor 2: PTC-Thermistor connection (depending on the type)</p>	<p>1: Earthing terminal for protective conductor 2: PTC-Thermistor connection (depending on the type)</p>
	

Connection examples NEA

Connect the NEA according to the type plate:



Cable with capacitor box



Capacitor in cable



7 Start-up and operation



Observe the safety instructions in Ch. Safety, from page 6 on.

Permissible operating conditions

Please refer to Ch. Technical data, page 11 for permissible operating conditions.

Regulations

- When commissioning the NEA/NEG, the rules and regulations of the local associations for electrical engineering (e.g. VDE) and the valid accident prevention regulations must be observed.
- The NEA/NEG must always be switched on and off at the main switch.
- When operating the NEA/NEG with a frequency converter, compliance with the EMC directive must be ensured.
- If the speed is controlled with a frequency converter, the maximum centrifugal force (according to the type plate) must not be exceeded. NEA/NEG must be adapted to your application by adjusting the unbalances. You can directly influence the vibration amplitude, centrifugal force and current consumption.
- The NEA/NEG must not be operated without the covers for the unbalances. The rotating unbalances cause a risk of injury.
- On initial start-up, the current consumption must be measured individually in all three phases and must correspond to the specifications on the type plate.
- The terminal box cover must never be opened in the presence of voltage.

Special regulations for operation in an potentially explosive atmosphere:

- In ATEX-zones 21 and 22, the frequency converter may control the frequency between 20 Hz and 50 Hz or 20 Hz and 60 Hz at constant torque (linear Volt-Hertz curve). Observe maximum frequency on the type plate.
- For operation with frequency converter in ATEX-zones the PTC thermistor must be connected.
- The terminal box cover must never be opened in a potentially explosive atmosphere.
- NEA/NEG may only be operated in atmospheres that do not damage the material of the vibrators.

Measures

Carry out the following measures before start-up:

1. Check that the NEA/NEG have been mounted correctly and are in perfect condition.
2. Check that the NEA/NEG have been properly connected and earthed.

3. Check that the cables are undamaged and laid according to the known regulations and standards.
4. Check that all permissible operating conditions have been observed.
5. Check that all protective measures on the system have been observed.
6. Eliminate possible errors before start-up.
7. Screw connections must be checked and, if necessary, retightened after 1 h operating time (after initial start-up) and thereafter regularly (generally monthly). Observe the recommended values for screw sizes and tightening torques, see chap. Technical data, from page 11

Power supply

Standard network forms are TN and TT networks with an earthed star point, as in Germany.

For overseas countries, also for countries within the EU, the mains voltage, the network configuration and the directives applicable there must also be observed. In the case of deviations, the country, the standards, the environmental conditions, as well as possible special features in the order, must be agreed on in writing. If the NEA/NEG are operated and/or powered by another network configuration unknown to us, the guarantee expires completely and immediately.

Supply line connection

The supply line must be protected according to the cross-section and the nominal power of the NEA/NEG. The short circuit strength of this fuse should be 25 kA.

NetterVibration recommends a three-phase tripping (e. g. Schneider Electric GV2 L, Tesys Model U oder Compact NS).

Adjustment of unbalances

For all NEA/NEG there is the possibility of unbalance adjustment to directly influence vibration amplitude, centrifugal force and current consumption. Unless otherwise specified by you, the NEA/NEG were delivered with the standard setting (100 %). If specifications have been made by the customer, there are stickers with the current setting on the unbalance covers.

Notice: The unbalances may only be set mirror-symmetrically!



Procedure:

1. Switch off the NEA/NEG at the main switch, secure against unintentional starting and ensure that there is no voltage.
2. Loosen both unbalance covers.
3. Loosen the locking nuts or locking screws.
4. Bring the unbalances to the desired setting according to the following descriptions for the various unbalance discs. Note the mirror-symmetrical setting.
5. Retighten the locking nuts or locking screws. Observe the recommended tightening torques, see chap. Technical data, from page 11
6. Fasten both covers for the unbalances.

Number of unbalances

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

Type: NEA	Unbalance		
	Type	Quantity	
		50 Hz	60 Hz
504	XL	8	8
5020	XL	8	8
5050	XL	18	18
5060	XLs	4	4
50120	XLs	6	6
50200	XLs	10	8
50300	XLs	8	6
50550	XLs	10	6
50770	XLs	8	6
2530	XLs	6	6
2570	XLs	16	10
25210	XS	4	4
25420	XS	4	4
25540	XS	4	4
25700	XS	4	4

Type: NEG	Unbalance		
	Type	Quantity	
		50 Hz	60 Hz
5020	XL	8	8
5050	XL	18	18
5060	XLs	4	4
50120	XLs	6	6
50200	XLs	10	8
50300	XLs	8	6
50550	XLs	10	6
50770	XLs	8	6
501140	XLs	12	8
501540	XLs	12	8
501800	XLs	14	10
502020	XLs	16	10
502270	XLs	18	12
503400	XLs	12	8
503820	XLs	14	10
506220	XS	4	4
508830	XS	4	4

Type: NEG	Unbalance		
	Type	Quantity	
		50 Hz	60 Hz
2530	XLs	6	6
2570	XLs	16	10
25210	XS	4	4
25420	XS	4	4
25540	XS	4	4
25700	XS	4	4
25930	XS	4	4
251410	XS	4	4
251800	XS	4	4
252060	XS	4	4
252370	XS	4	4
253050	XS	4	4
253720	XS	4	4
254310	XS	4	4
254900	XS	4	4
256460	XS	4	4
258040	XS	4	4
258260	XS	4	4
2511210	XS	4	4
2513850	XS	4	4
1630	XLs	8	8
1690	XS	4	4
16190	XS	4	4
16310	XS	4	4
16410	XS	4	4
16500	XS	4	4
16810	XS	4	4
161130	XS	4	4
161420	XS	4	4
161610	XS	4	4

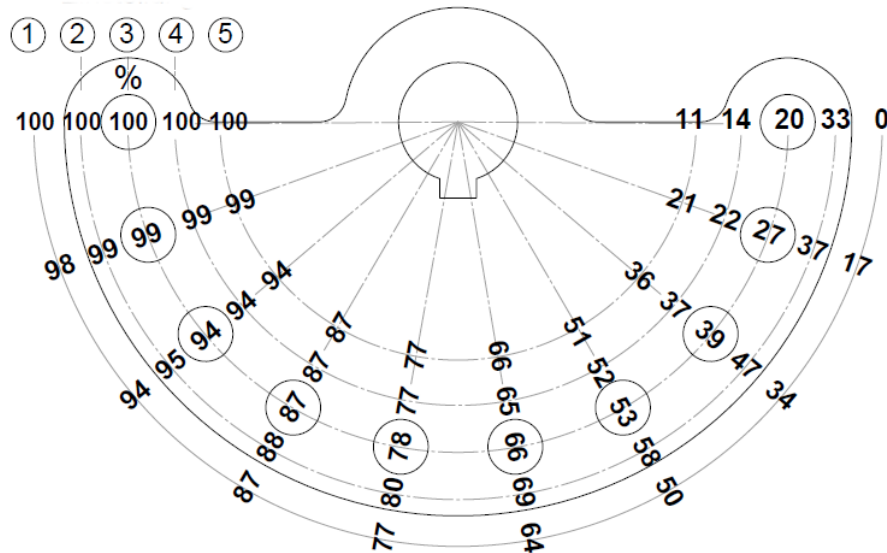
Type: NEG	Unbalances		
	Type	Quantity	
		50 Hz	60 Hz
162110	XS	4	4
162550	XS	4	4
163030	XS	4	4
163820	XS	4	4
164700	XS	4	4
165190	XS	4	4
166270	XS	4	4
166670	XS	4	4
167890	XS	4	4
168500	XS	4	4
169510	XS	4	4
1612060	XS	4	4
1613890	XS	4	4
1617000	XS	4	4
12100	XS	4	4
12180	XS	4	4
12230	XS	4	4
12460	XS	4	4
12640	XS	4	4
12900	XS	4	4
121430	XS	4	4
122150	XS	4	4
122640	XS	4	4
122920	XS	4	4
123530	XS	4	4
124440	XS	4	4
127640	XS	4	4
128520	XS	4	4
1211070	XS	4	4
1213160	XS	4	4
1217670	XS	4	4

Unbalances type XLs

The centrifugal force is adjustable with the unbalance discs (lamella) type XLs. Adjustment of the unbalances is carried out according to a scale disc or the supplementary sheet in the terminal box of the NEA/NEG.

By rotating the outer, adjustable unbalance disc(s) to another position, the percentage of the centrifugal force changes as shown in the illustration below. The grid position is defined by position pins.

Settings:



Set-tings	Unbalance per side		Type				50 Hz	60 Hz
	fixed	adjust-able						
1	1	1	NEG/NEA 5060				X	X
	2	2	NEG/NEA 50200	NEG 501140	NEG 501540	NEG 503400		X
			NEG 1630				X	X
	3	3	NEG/NEA 50300	NEG/NEA 50770			X	
NEG 501140			NEG 501540	NEG 503400			X	
4	4	NEG/NEA 2570	NEG 502020			X		
2	2	1	NEG/NEA 50120	NEG/NEA 2530			X	X
2	2	1	NEG/NEA 50300	NEG/NEA 50770				X
2	2	1	NEG/NEA 50550					X
3	3	2	NEG/NEA 50200	NEG/NEA 50550			X	
3	3	2	NEG/NEA 2570	NEG 501800	NEG 502020	NEG 503820		X
4	4	3	NEG 501800	NEG 503820			X	
5	5	4	NEG 502270				X	

Example:

NEG 50120 / 50 Hz has a total of 6 unbalance discs (3 discs per side: 2 fixed, 1 adjustable).

If a centrifugal force of 88% is desired, the adjustable unbalance discs are rotated anticlockwise on both sides into the fourth grid position.

centrifugal force 100 %



centrifugal force 88 %



Unbalances type XS

The unbalance setting of the unbalance discs of the type XS is carried out on the scale on the fixed unbalance.

The centrifugal force can be steplessly adjusted by turning the outer unbalance discs and adjusting them at the partial strokes. After adjusting the unbalances, the nuts and screws must be tightened with the specified torque.

Observe the recommended values for screw sizes and tightening torques in chap. Technical data, from page 11.



The centrifugal force can be adjusted according to the following table:

Adjustment	Centrifugal force in %
0°	100
15°	98.5
30°	97
45°	92
60°	87
75°	78.5
90°	70

Adjustment	Centrifugal force in %
105°	60
120°	50
135°	37.5
150°	25
165°	12.5
180°	0

8 Maintenance and servicing



Observe the safety instructions in Ch. Safety, from page 6 on.

Technical data Information regarding tightening torques for screws and nuts can be found in Ch. Technical data, page 11.


Expertise and regulations Maintenance and servicing of the vibrators may only be performed by regularly trained, authorised and qualified personnel. Work on the electrical system may only be carried out by a qualified electrician.


The qualified personnel has to work exclusively with tools suitable for the application.

In the case of unauthorised intervention in the NEA/NEG there is no longer any warranty claim.

Before all maintenance and servicing work the NEA/NEG must be safely disconnected from the electrical mains. The procedure is as follows:

1. Switch off NEA/NEG.
2. Secure against unintentional switching on.
3. Determine that NEA/NEG are voltage free.
4. Earth and short-circuit.
5. Cover and fence off neighbouring live parts.

 Interventions in the NEA/NEG, such as lubricating/changing of bearings or opening the terminal box, must not be performed in potentially explosive atmospheres.

 When operating in a potentially explosive dust atmosphere, the operator must regularly check the condition of the bearings and the duration of operation of the vibrators. Damaged bearings or bearings whose service life has been reached, must be replaced immediately. Alternatively, the vibrators can also be sent to **NetterVibration** for replacement of the bearings.

Maintenance plan

Maintenance of the NEA/NEG must be carried out as follows:

Interval	Action
If required (depending on operating conditions)	Clean the NEA/NEG regularly with a wet cloth to remove dust deposits.
After one hour operation after initial start-up	Check screw connections and retighten if necessary.
Every 1000 operating hours	NEA/NEG from housing size 130 up, with speeds > 3000 rpm: lubricate bearing with grease of the type KLUEBER Isoflex NBU 15.
Every 5000 operating hours	NEA/NEG from housing size 130 up, with speeds < 3000 rpm: replace the grease of the roller bearings completely, with grease of the type KLUEBER Staburags NBU 8.

Interval	Action
Monthly	Check screw connections and retighten if necessary.
	Check ball or roller bearings and relubricate if necessary, see section "lubrication". Damaged bearings or bearings whose service life has been reached, must be replaced immediately.
	Check cable supply line.
Every 6 month	Check proper condition of connecting cables and plugs.
Every 2 years	Replace O-rings and plastic seals .
At least every 4 years	Check proper condition of electrical systems and stationary electrical equipment.

Other maintenance and repair work are to be carried out exclusively by **NetterVibration**.

Notes on lubrication

NEA/NEG up to the housing size 130 have ball bearings. These are lubricated for their service life (permanent lubrication).

NEA/NEG from the housing size 130 up have roller bearings. These are lubricated with the grease of the type KLUEBER Staburags NBU 8 EP. At speeds up to 3000 rpm the bearings are lubricated for a period of at least 5000 operating hours. After this time the grease of the bearings has to be replaced completely.

The lubrication intervals must be considerably shortened under more difficult operating conditions.

The housing sizes can be found in the brochure of the NEA/NEG.

Lubrication / bearing life NEA

Type of lubrication of the bearings and bearing life of the NEA:

Type NEA	Lubrication	Bearing life [h] 50 Hz	Bearing life [h] 60 Hz
504	PL*	> 100,000	> 100,000
5020	PL*	92,118	22,745
5050	PL*	8,087	2,236
5060	PL*	> 100,000	5,044
50120	PL*	18,075	18,075
50200	PL*	3,363	2,572
50300	PL*	4,003	3,588
50550	PL*	4,148	4,219

Type NEA	Lubrication	Bearing life [h] 50 Hz	Bearing life [h] 60 Hz
50770	PL*	7,509	6,257
2530	PL*	> 100,000	> 100,000
2570	PL*	> 100,000	> 100,000
25210	PL*	23,406	19,200
25420	PL*	15,135	12,635
25540	PL*	6,266	4,224
25700	PL*	19,477	16,231

*PL = permanent lubrication

Lubrication / bearing life NEG Type of lubrication or grease quantity of the bearings and bearing life of the NEG:

Type NEG	Lubrication/ grease quantity [g]	Bearing life [h] 50 Hz	Bearing life [h] 60 Hz
5020	PL*	92,118	22,745
5050	PL*	8,087	2,236
5060	PL*	> 100,000	5,044
50120	PL*	18,075	18,075
50200	PL*	3,363	2,572
50300	PL*	4,003	3,588
50550	PL*	4,148	4,219
50770	PL*	7,509	
50980	9	5,062	4,833
501140	9	3,029	4,219
501540	16	4,038	4,219
501800	16	2,416	1,833
502020	30	7,070	8,372
502270	30	4,775	4,558
503400	40	8,672	10,267
503820	40	5,856	5,591
506220	120	5,743	4,636
508830	150	9,029	2,790
2530	PL*	> 100,000	> 100,000
2570	PL*	> 100,000	> 100,000
25210	PL*	23,406	19,200
25420	PL*	15,135	12,635
25540	PL*	6,266	4,224
25700	PL*	19,477	16,231
25930	9	12,103	10,190
251410	16	10,870	8,330
251800	30	22,231	20,009
252060	30	14,300	12,300
252370	35	16,159	13,032
253050	35	7,100	5,900
253720	40	12,228	11,086

Type NEG	Lubrication/ grease quantity [g]	Bearing life [h] 50 Hz	Bearing life [h] 60 Hz
254310	40	8,200	7,300
254900	80	9,930	8,648
256460	120	10,478	8,451
258040	150	9,029	7,575
258260	180	11,460	7,881
2511210	260	10,576	8,718
2513850	300	9,000	6,200
1630	PL*	> 100,000	> 100,000
1690	PL*	> 100,000	> 100,000
16190	PL*	> 100,000	72,171
16310	PL*	> 100,000	> 100,000
16410	9	> 100,000	> 100,000
16500	9	> 100,000	39,516
16810	PL*	> 100,000	60,144
161130	PL*	54,020	42,632
161420	PL*	25,100	20,000
161610	30	29,165	29,270
162110	30	11,800	10,400
162550	32	17,701	12,292
163030	32	41,500	30,500
163820	60	13,073	10,842
164700	80	18,364	15,425
165190	100	19,206	15,157
166270	120	15,786	13,144
166670	120	13,767	14,000
167890	150	14,431	12,276
168500	150	11,266	9,379
169510	180	10,728	10,972
1612060	260	11,000	11,800
1613890	300	13,327	11,510
1617000	360	11,273	10,404

*PL = permanent lubrication

Type NEG	Lubrication/grease quantity [g]	Bearing life [h] 50 Hz	Bearing life [h] 60 Hz
12100	PL*	> 100,000	> 100,000
12180	PL*	> 100,000	> 100,000
12230	9	> 100,000	> 100,000
12460	PL*	> 100,000	> 100,000
12640	PL*	> 100,000	> 100,000
12900	30	> 100,000	65,414
121430	32	> 100,000	39,702
122150	60	> 100,000	29,320
122640	80	> 100,000	41,200

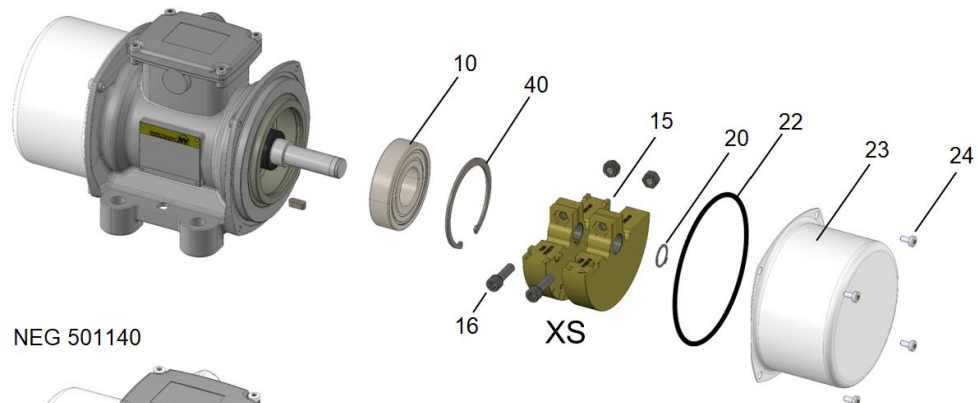
Type NEG	Lubrication/grease quantity [g]	Bearing life [h] 50 Hz	Bearing life [h] 60 Hz
122920	100	> 100,000	43,076
123530	120	> 100,000	35,405
124440	150	> 100,000	32,368
127640	180	29,652	10,982
128520	260	52,762	18,667
1211070	300	37,822	15,233
1213160	360	35,257	12,684
1217670	400	22,520	9,347

*PL = permanent lubrication

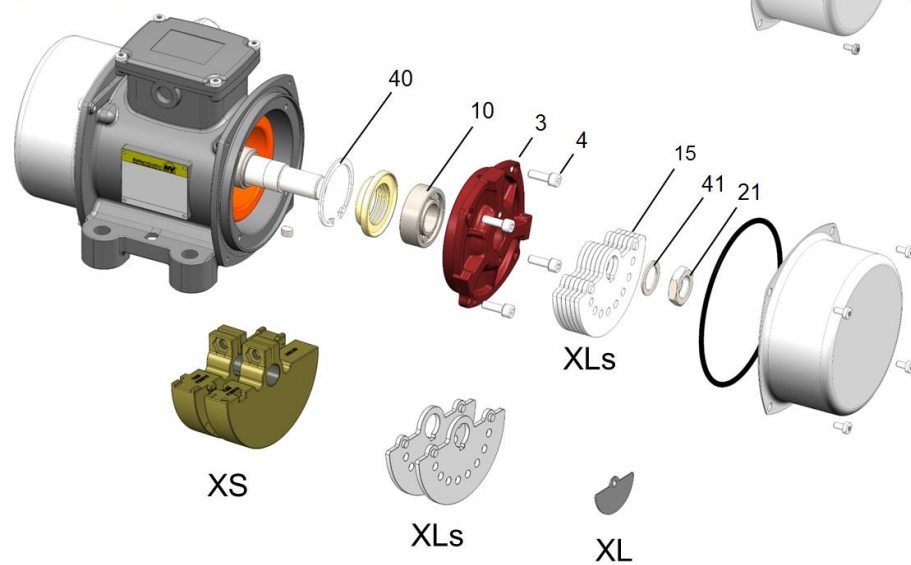
Lubrication or replacement of bearings

The item numbers refer to the spare parts list.

NEG 16310



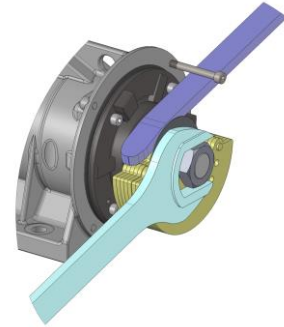
NEG 501140



1. Switch off NEA/NEG, secure against switching on again and ensure that it is volt-free.
2. Loosen screw (24) and remove unbalance covers (23).
3. **Disassemble unbalances type XS:**
After removing the circlip (20) and loosening the clamping screws (16), the unbalances can be removed.

Disassemble unbalances type XL and type XLs:

Screw a long screw with the same thread into a tapped hole for the fastening screws (24) of the unbalance cover. Put a lever between the unbalance discs and this long screw. After loosening the locking nut (21), the unbalances can be removed from the shaft.



4. Remove bearing (10):
up to housing size 120: Remove circlip (40).
Starting from housing size 130: loosen screws (4) and remove flange (3). Remove circlip (40) from flange (3).
5. Replace both bearings (10) or remove old grease (e. g. with benzine) and smear the specified amount (see table) of new grease (according to the maintenance plan) evenly.
6. Assembly is carried out in the reverse order.
7. Tighten locking nuts (21) and screws (4, 16) to the specified tightening torque.

9 Troubleshooting



Observe the safety instructions in Ch. Safety, from page 6 on.

Expertise and regulations


Troubleshooting of the vibrators may only be performed by regularly trained, authorised and qualified personnel. Work on the electrical system may only be carried out by a qualified electrician.

The qualified personnel has to work exclusively with tools suitable for the application.

In the case of unauthorised intervention in the NEA/NEG there is no longer any warranty claim.

Before any troubleshooting the NEA/NEG must be safely disconnected from the electrical mains. The procedure is as follows:

1. Switch off NEA/NEG.
2. Secure against unintentional switching on.
3. Determine that NEA/NEG are voltage free.
4. Earth and short-circuit.
5. Cover and fence off neighbouring live parts.

 Interventions in the NEA/NEG must not be performed in potentially explosive atmospheres.

Troubleshooting

Fault	Possible cause	Troubleshooting	Action
Vibrator does not start or runs at too low speed	Phase interruption	Check fuse and connection cable	Replace fuse and/or connection cable
	Mains voltage too low	Check mains voltage and cable cross-section	Correct mains voltage, replace cable
Vibrator speed drops under load	Wiring wrong	Check circuit diagram	
	Inadequate contact of a connection point	Check connections in the terminal box	Tighten terminal plate nuts
	Phase interruption	Check fuse and connection cable	Replace fuse or connection cable
	Incorrectly dimensioned connection cable	Check cable cross section	Replace cable
	Overload	Check setting of unbalance	Reduce unbalances
	Mains voltage too low	Check mains voltage and cable cross-section	Correct mains voltage, replace cable

Fault	Possible cause	Troubleshooting	Action
Excessive heating of the vibrator	Wiring wrong / overload	Check circuit diagram	
	Mains voltage too low	Check mains voltage and cable cross-section	Correct mains voltage, replace cable
	Too much grease in bearings	Fill in correct amount of grease	
	No grease or not enough grease in bearings	Fill in correct amount of grease	
	Foreign body in bearings	Clean bearings, replace if necessary	
Vibrator hums	Phase interruption	Check fuse, mains voltage and connection cable	Correct mains voltage, replace fuse or cable
	Short-circuit between turns in the stator winding	Replace vibrator	
Circuit breaker fails when switched on	Phase interruption	Check fuse and connection cable	Replace fuse or connection cable
	Overload	Check unbalance settings	Reduce unbalance
	Short circuit in winding	Replace vibrator	
High current consumption	Natural resonance range of vibration system	Measure current consumption	Stiffen device
	Bounce impacts	Measure current consumption	Reduce power of vibrator
		Loose fastening	Tighten screws

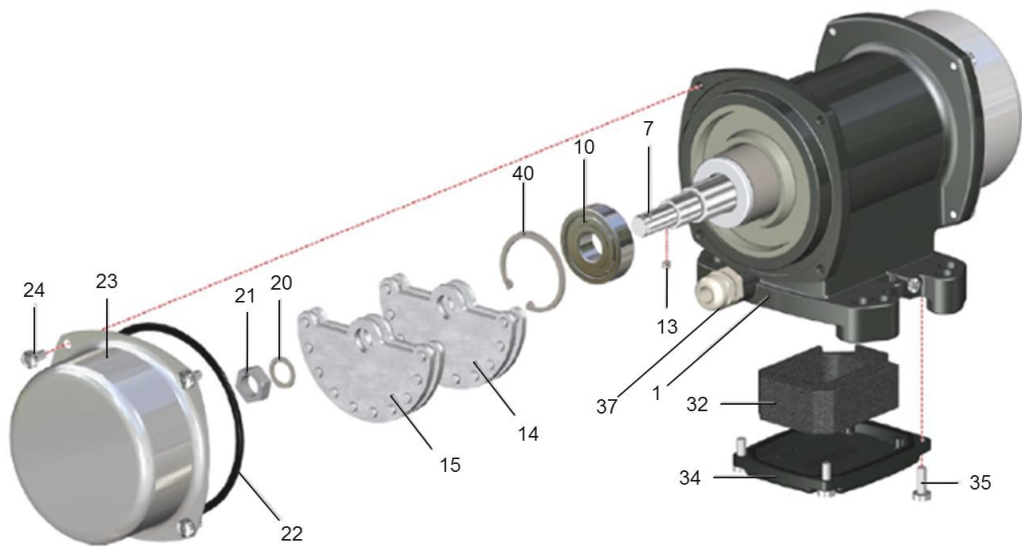
10 Spare parts and accessories

Ordering of spare parts

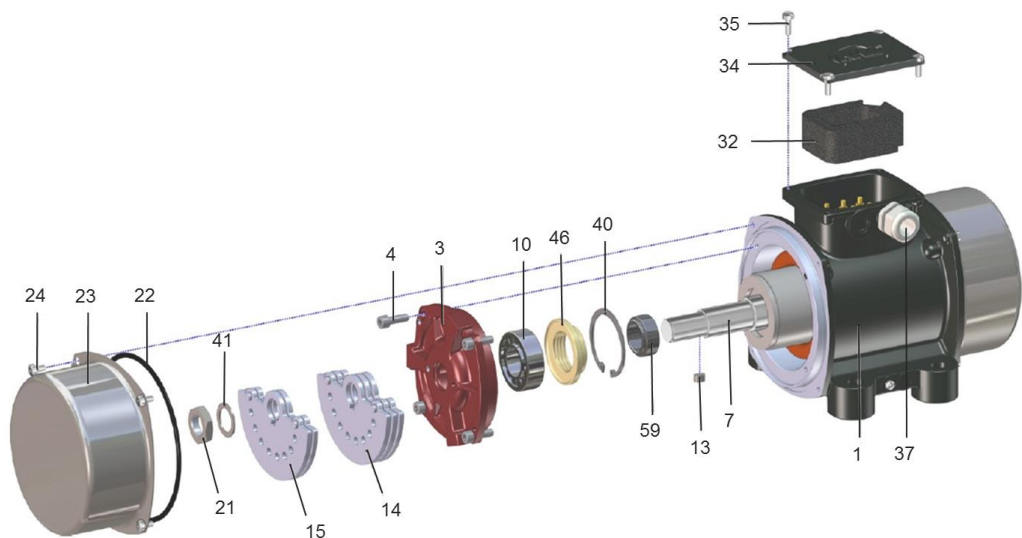
Please provide the following details when ordering spare parts:

- type designation according to the type plate
- serial number according to the type plate
- description and position number of spare part
- required amount

Example NEG 50300



Example NEG 501140



Accessories


The following accessories are available for NEA/NEG:

Component	Description
Shim washers	Compensation for removed unbalance discs.
CC-unbalances	Depending on the direction of rotation, two different unbalances can be achieved.
Fastening kit NBS	Recommended for secure and permanent fastening of the NEA/NEG.
Frequency converters	For frequency-controlled operation.
Brake accessories	Enable rapid deceleration of vibrators.
PTC thermistor	PTC 120°C thermistor for safe operation of the vibrators.
Special versions	NEA/NEG are also available in special versions, e.g. for special voltages or the use in potentially explosive atmospheres. Information on request.

Further electrotechnical accessories on request.

11 Disposal

Prices

	All parts of the NEA/NEG must be properly disposed of according to the material specifications. The valid disposal prices of the NEA/NEG are available on request.
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Material-specifications

All parts of the NEA/NEG can be recycled.

Type: NEA

Material	Part
Stainless steel	Unbalance covers
Steel	Rotor, unbalances, flange, bearings, screws, washers, nuts
Aluminium	Housing, type plate
Plastic	Seals, terminal box block
Copper with resin	Winding

Type: NEG and stainless steel versions NES and NEG S

Material	Part		
	NEG housing types I, II and III	NEG housing type IV	NES and NEG S
Stainless steel	Unbalance covers		Housing, unbalance covers, terminal box block and cover
Steel	Housing size 140 and 160, rotor, unbalances, flange, bearings, screws, washers, nuts	Housing, rotor, unbalances, flange, bearings, screws, washers, nuts	Rotor, unbalances, flange, bearings, screws, washers, nuts
Aluminium	Housing, type plate, terminal box cover	Housing size 150 and 170 up to 210, unbalance covers, type plate, terminal box cover	Type plate
Plastic	Seals, terminal box block	Seals, terminal box block	Seals
Copper with resin	Winding	Winding	Winding