NetterVibration

Operating instructions for high frequency electric external vibrators Series NEG/NEH

August 2022
No. 1993E
Page 1/31

CE

These operating instructions apply to:

NEG 100770
NEG 1001000
NEG 1001090
NEG 1001140
NEG 1001400
NEG 1001540
NEG 1001800
NEG 1002020
NEG 1002500 LR
NEG 1003300 LR

NEH 100600
NEH 1001140
NEH 1001540
NEH 1002020
NEH 1002000 HD

Serving industry with vibration

Netter GmbH
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Contents

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 high frequency electric external vibrators of the series NEG and NEH are hereafter referred to as "NEG/NEH".

Version of document

Document no.	1993E
Version no.	1
Date of issue	August 2022

1 General information

Use and storage

Before installing the NEG/NEH read these instructions carefully. It is the basis for any action when dealing with the NEG/NEH, 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 in mechanics and electrics.

Only complying technical staff may work on the NEG/NEH.

The NEG/NEH may only be installed, put into operation, maintained, troubleshot and disassembled by persons authorised by the operator.

Copyright

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:

- 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.

Netter*Vibration* 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 high frequency electric external vibrators of the series NEG and NEH 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.

Instruction and warning symbols

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

Personal injuries

⚠ DANGER	
	indicates an immediate danger. Disregard of this notice will result in death or severe personal injuries.

⚠ WARNING	
	indicates a potential danger. Disregard of this notice can result in death or severe personal injuries.

⚠ CAUTION	
	indicates a potentially dangerous situation. Disregard of this notice can result in minor or moderate personal injuries.

Material damages

NOTICE
indicates potential material damage. Disregard of this notice can result in material damage.

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.

Type designations

Explanations of abbreviations in the type designation:
XXX YYYZZZZ-WWW

XXX indicates if the vibrator type has a housing foot:

- **NEG** = type with housing foot
- **NEH** = type without housing foot (to attach with clamping device NVH)

YYY = 100 signifies that the NEG/NEH is a high frequency electric external vibrators

ZZZZ indicates the centrifugal force in daN (Decanewton).

WWW indicates special features:

- **K** = 130 °C PTC thermistor installed
- **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 - 240 V anti-condensation heater 0 - 50 W
- **H110** = 100 - 120 V anti-condensation heater 0 - 50 W
- **HD** = Fully encapsulated stator (heavy duty)
- **LR** = Fan wheel (for cooling)

2 Safety

Intended use

The NEG/NEH are intended for generating circular vibrations.

General applications are: loosening, conveying, sorting, compacting, separating bulk materials and reducing friction. NEG/NEH are used for emptying bunkers, as drives for conveyor troughs, sieves and vibrating tables.

The NEG/NEH 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 NEG/NEH may only be performed by authorised qualified personnel.

All handling of the NEG/NEH is the responsibility of the operator.

High voltage

⚠ DANGER

Risk of electric shock due to high voltage

An electric shock leads to serious injuries or even death.

- ➢ Observe the permissible protection class and earthing. The NEG/NEH 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 NEG/NEH against falling parts during all work. Metal parts can cause a short circuit within the NEG/NEH.

Safety rules

⚠ DANGER

Electric shock

An electric shock will result in serious injury or even death. The NEG/NEH must be free of voltage during assembly, start-up, maintenance and troubleshooting.

Observe the following five safety rules:

1. Disconnect the NEG/NEH from the mains supply.
2. Secure the NEG/NEH against re-activation.
3. Establish that the NEG/NEH has no voltage.
4. Earth and short-circuit the power supply of the NEG/NEH.
5. Cover adjacent live parts or fence them off.

Falling parts

⚠ WARNING

Falling parts

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

- For mounting the NEH use only the bracket NVH 1 or NVH 4 (depending on the NEH-type).
- Use only suitable fastening screws and safety washer to attach the NEG.
  For attachment ***Netter****Vibration* 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.

Heavy parts

⚠ WARNING

Risk of injury while handling heavy parts

Risk of serious injury due to weight during transport and installation of the NEG/NEH.

- Observe the weight information in Chapter Technical data, from page 9 on.
- Only qualified personnel may transport and install the NEG/NEH.
- Use suitable load handling devices and slinging equipment.
- Wear suitable personal protective equipment.

Rotating Unbalances

⚠ WARNING

Risk of injury due to rotating unbalances

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

- ➢ Operate the NEG/NEH only with mounted unbalance covers.

Hot surfaces

⚠ CAUTION

Risk of burns due to hot surfaces

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

- ➢ Do not touch the NEG/NEH 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 9.

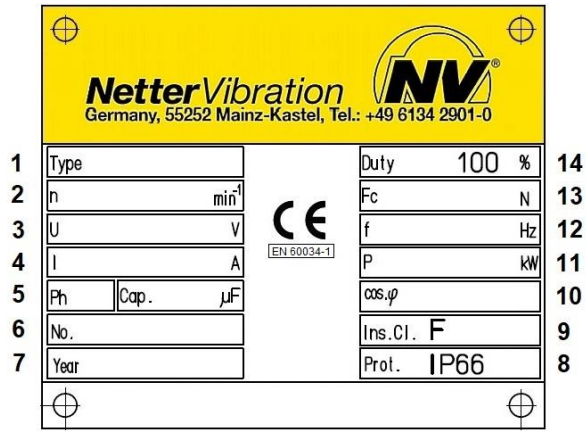
3 Technical data

Permissible operating conditions

Nominal voltage, nominal frequency	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: • fixed voltage and frequency or • frequency converter Frequency changes and unbalance settings influence the centrifugal force. During operation, the maximum permissible centrifugal force (according to the type plate) must not be exceeded). The compliance with the electromagnetic compatibility directive 2014/30/EU has to be ensured.
Rotary speed ranges	2-pole: 6000 rpm at 100 Hz 4-pole: 6000 rpm at 200 Hz.
Permissible ambient temperature*	-20 °C to 40 °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: • cycled operation or • frequency-controlled operation or • synchronous operation. These must be clarified with ***Netter****Vibration* on a case-by-case basis.
Sound level	Depending on type ≤ 70 dB(A) The sound level is determined to a great extent by the surface upon which the NEG/NEH is mounted (e.g. sheet metal). The sound level will be amplified by non-silenced sheet metal.

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

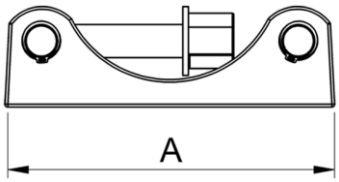
Type plate

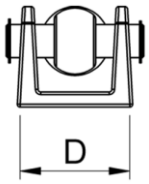


1 type designation
2 rotary speed
3 nominal voltage
4 current
5 phases / capacity
6 serial number
7 year of manufacture
8 degree of protection
9 insulation class
10 power factor
11 power
12 nominal frequency
13 centrifugal force
14 duty cycle

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 NEG/NEH. Deviating customer-specific type plates (special designs) are possible.

Brackets for NEH





Type	A [mm]	D [mm]	Weight [kg]
NVH 1	180	94	3.5
NVH 4	240	90	4.5

NEH 100600 have to be used with the bracket NVH 1.

All other types of NEH have to be used with the bracket NVH 4.

Tightening torques

***Netter**Vibration* recommends the following tightening torques [Nm]:

Type	M4	M5	M6	M8	M10	M12	M16	M18	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	-	-	-	-	-	-
Nut of the bracket NVH								NVH1: 200			NVH4: 300

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.

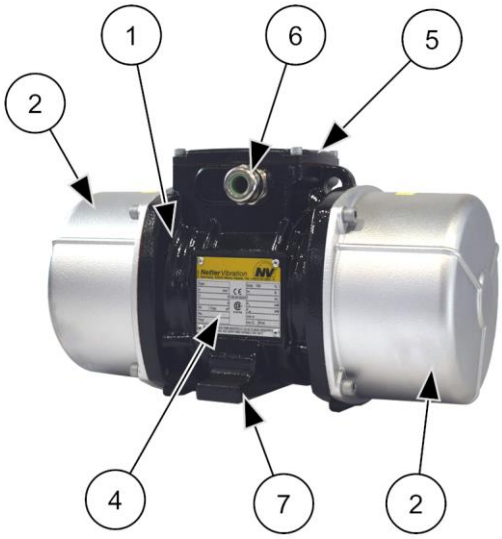
Type	M13x1	M15x1	M20x1	M25x1.5	M30x2	M45x1.5
Locking nuts (Pos. 21) see page 24	30	50	100	170	340	500

4 Design and function

Design

Example: NEG 1001140

Example: NEH 1002020



No.	Element	Function
1	Housing	Contains and protects the components of the NEG/NEH.
2	Unbalance covers	Protect against grabbing into the unbalances.
3	Housing foot (only for NEG)	Attach the NEG to the mounting surface.
4	Type plate	Shows model specific information and data.
5	Terminal box	Contains the electrical connections.
6	Cable gland (depending on type).	Connect the NEG/NEH.
7	Retaining cam (only for NEH)	Attach the NEH to the bracket NVH 1/NVH 4 (depending on type).

Function

The high frequency electric external vibrators of the series NEG and NEH are asynchronous motors with adjustable weights (unbalances) mounted on their shaft ends.

The NEG/NEH 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.

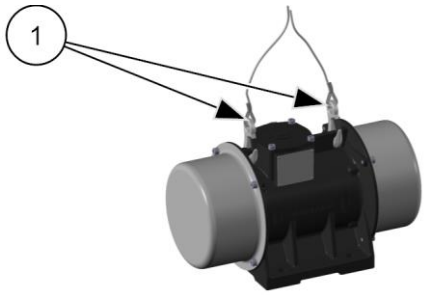
5 Transport and storage

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 NEG/NEH, ensure that the NEG/NEH 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 NEG/NEH. 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 NEG/NEH very carefully during transport.

Packaging

The NEG/NEH are packed ready for installation.

The packaging protects the NEG/NEH 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 NEG/NEH 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.
- Do not store the NEG/NEH 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 NEG/NEH can be operated in any position.

1. **Notice:** The feet of the NEG/NEH 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.
   For NEH the bracket NVH 1 / NVH 4 must be welded over the entire surface of the structure to be vibrated.
   The mounting surface has to be flat (for NEG: ±0.1 mm flatness), and clean with no paint residues or burn-ins.

2. Fastening depending on vibrator type:

   - Mount the NEG with fastening screws of quality 8.8 (DIN 931 oder 933) on the mounting surface. The fastening screws must be secured with suitable locking devices/agents and tightened crosswise. ***Netter****Vibration* recommends the use of NBS-fastening kits.
   - Mount the NEH onto the bracket NVH 1 / NVH 4 with the supplied nut.

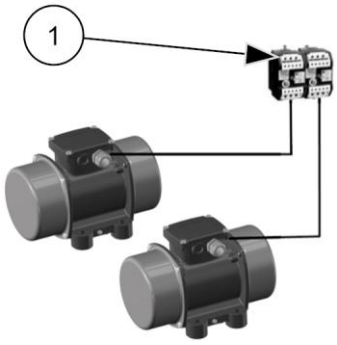
   Use a torque wrench and observe the recommended values for bolt sizes and tightening torques in chap. Technical data, from page 9. Higher tightening torques can cause the screws/nuts to break or the threads to tear out.
   Warning: Unsuitable screw connections may cause loosening of the NEG/NEH by vibration. This can cause damage to persons and material.

3. In critical installation situations, use additional protection against falling down, e.g. steel cable NSE.

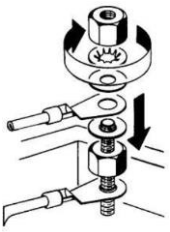
Electrical connection

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

- The permissible operating conditions must be met. Please refer to chap. Technical data, page 9 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.

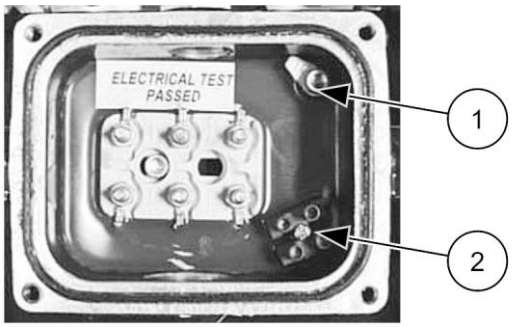


- Only suitable, flexible supply cables must be used for connecting the NEG/NEH. The conductors in the supply cable for the connection of the NEG/NEH to the mains must be temperature-resistant and have a sufficiently large cross-section, which is adapted to the cable length used. When selecting the connection 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.
- Tighten terminal plate nuts with prescribed torque, see chap. Technical data, from page 9. 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.

Connection schemes



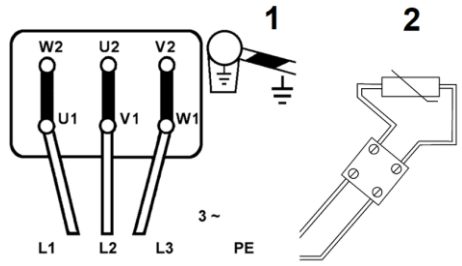
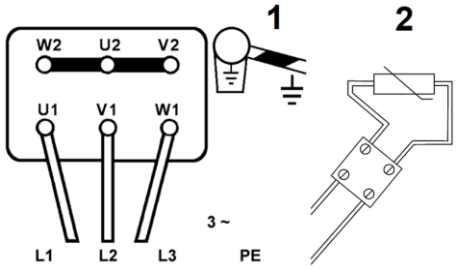
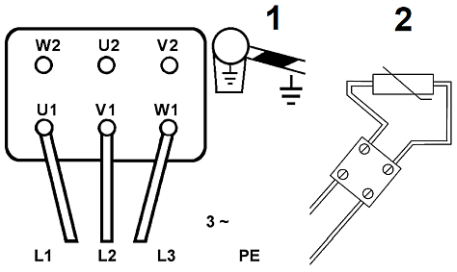
1 Earthing terminal for protective conductor (green-yellow)
2 PTC-Thermistor connection (depending on the vibrator-type)

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

- information on the type plate
- connection schemes
- connection data

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

Connection schemes

3-phase current	
smaller voltage = delta connection	**Higher voltage = star connection**
	
connection without bridge	
	1: Earth terminal for protective conductor 2: PTC-Thermistor connection (depending on type)

Connection data

Connection data NEG

Type	Connection data	
NEG 100770	230 V / 100 Hz = delta connection	400 V / 100 Hz = star connection
NEG 1001140		
NEG 1001540		
NEG 1001800		
NEG 1002020		
NEG 1003300 LR		
NEG 1001000	42 V / 200 Hz = without bridge	250 V / 200 Hz = without bridge
NEG 1001090	42 V / 200 Hz = delta connection	
NEG 1001400	42 V / 200 Hz = without bridge 110 V / 200 Hz = without bridge 250 V / 200 Hz = without bridge	400 V / 200 Hz = star connection
NEG 1002500 LR	42 V / 100 Hz = delta connection	400 V / 100 Hz = delta connection

Connection data NEH

Type	Connection data	
NEH 100600	400 V / 100 Hz = delta connection 42 V / 200 Hz = delta connection	250 V / 200 Hz = without bridge
NEH 1001140		
NEH 1001540		
NEH 1002020	42 V / 100 Hz = delta connection	400 V / 100 Hz = delta connection
NEH 1002000 HD		

7 Start-up and operation

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

Permissible operating conditions

Please refer to chap. Technical data, page 9 for permissible operating conditions.

Regulations

- When commissioning the NEG/NEH, the rules and regulations of the local associations for electrical engineering (e.g. VDE) and the valid accident prevention regulations must be observed.
- The NEG/NEH must always be switched on and off at the main switch.
- When operating the NEG/NEH 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.
- The NEG/NEH 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.

Measures

Carry out the following measures before start-up:

1. Check that the NEG/NEH have been mounted correctly and are in perfect condition.
2. Check that the NEG/NEH 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 9

Power supply

Standard network forms are TN and TT networks with an earthed star point, as in Germany. Depending on the NEG/NEH-type, suitable frequency and voltage transformers, such as Netter FSW / NFC, must be provided for operation.

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 NEG/NEH 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 NEG/NEH. The short circuit strength of this fuse should be 25 kA.

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

Adjustment of unbalances

For all NEG/NEH there is the possibility of unbalance adjustment to directly influence vibration amplitude, centrifugal force and current consumption. Unless otherwise specified by you, the NEG/NEH 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 NEG/NEH 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 9
6. Fasten both covers for the unbalances.

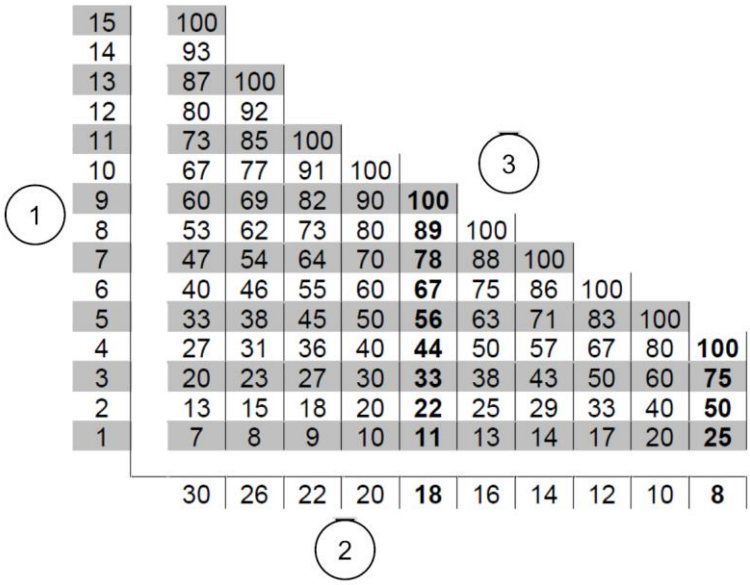
Number of unbalances

The table shows the number and type of unbalances, depending on the voltage:

Type	Number per side, unbalance type and setting			
	400 V	42 V	250 V	110 V
NEG 100770	4x XLs Setting: 17 % max. permitted: 25 %	--	--	--
NEG 1001000	--	7x XL Setting: 100 % max. permitted: 100 %	7x XL Setting: 100 % max. permitted: 100 %	--
NEG 1001090	--	4x XLs max. permitted: 100 %	--	--
NEG 1001140	6x XLs Setting: 17 % max. permitted: 25 %	--	--	--
NEG 1001400	10x XL Setting: 100 % max. permitted: 100 %	10x XL Setting: 100 % max. permitted: 100 %	10x XL Setting: 100 % max. permitted: 100 %	10x XL Setting: 100 % max. permitted: 100 %
NEG 1001540	6x XLs Setting: 17 % max. permitted: 25 %	--	--	--
NEG 1001800	7x XLs Setting: 22 % max. permitted: 25 %	--	--	--
NEG 1002020	8x XLs Setting: 17 % max. permitted: 25 %	--	--	--
NEG 1002500 LR	3x XLs Setting: 87 % max. permitted: 87 %	3x XLs Setting: 87 % max. permitted: 87 %	--	--
NEG 1003300 LR	2x special discs max. permitted: 100 %		--	--
NEH 100600	3x XLs Setting: 100 % max. permitted: 100 %	3x XLs Setting: 100 % max. permitted: 100 %	3x XLs Setting: 100 % max. permitted: 100 %	--
NEH 1001140	4x XLs max. permitted: 100 %	4x XLs max. permitted: 100 %	4x XLs max. permitted: 100 %	
NEH 1001540	9x XLs max. permitted: 100 %	9x XLs max. permitted: 100 %	9x XLs max. permitted: 100 %	
NEH 1002020, NEH 1002000 HD	5x XLs Setting: 52 % max. permitted: 3x XLs 87 %	5x XLs Setting: 52 % max. permitted: 3x XLs 87 %		

Unbalance discs type XL

The centrifugal force is adjustable with the unbalance discs (lamella) of type XL in the following steps:



1	30	26	22	20	18	16	14	12	10	8
15	100									
14	93									
13	87	100								
12	80	92								
11	73	85	100							
10	67	77	91	100						
9	60	69	82	90	**100**					
8	53	62	73	80	**89**	100				
7	47	54	64	70	**78**	88	100			
6	40	46	55	60	**67**	75	86	100		
5	33	38	45	50	**56**	63	71	83	100	
4	27	31	36	40	**44**	50	57	67	80	**100**
3	20	23	27	30	**33**	38	43	50	60	**75**
2	13	15	18	20	**22**	25	29	33	40	**50**
1	7	8	9	10	**11**	13	14	17	20	**25**
	30	26	22	20	**18**	16	14	12	10	**8**

2

3

1: Number of unbalance discs per side

2: Default number of unbalance discs per vibrator

3: Centrifugal force in %

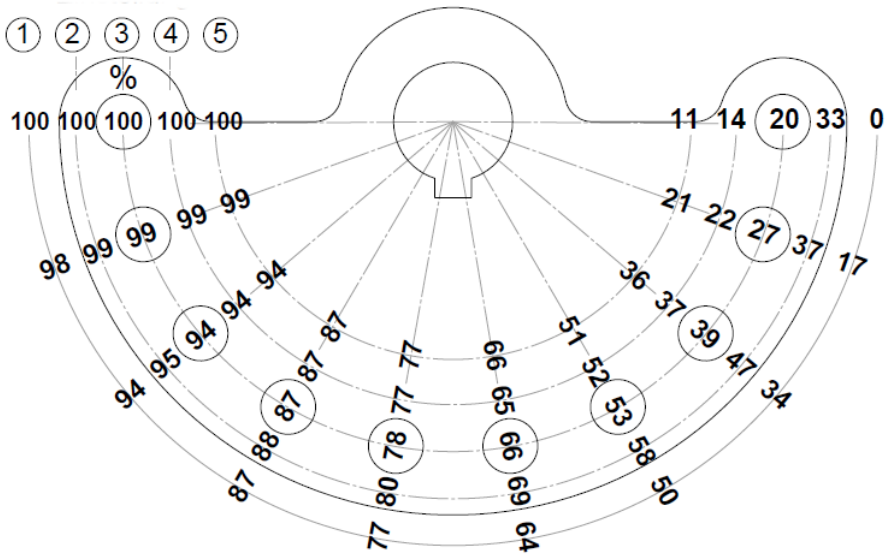
There are 2 possibilities to adjust the unbalances:

1. The unbalance adjustment (fine adjustment) is carried out by removing one unbalance disc on each side. All centrifugal values in % can be adjusted as specified in the table.
   The removed unbalance discs must be replaced by compensation washers of identical thickness and identical inner diameter. These are available from ***Netter****Vibration*.
2. The unbalance adjustment (coarse adjustment) is performed by turning one unbalance disc on each side by 180° on the shaft.
   Twice the number of unbalance discs turned by 180° becomes ineffective.

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 NEG/NEH.
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:



Settings	Unbalance per side		Type	
	fixed	adjustable		
1	1	1	NEG 1003300 LR	
	2	2	NEG 100770	NEG 1001090
			NEH 1001140	
	3	3	NEG 1001140	NEG 1001540
	4	4	NEG 1002020	
2	2	1	NEG 1002500 LR	
			NEH 100600	
3	3	2	NEH 1002020	NEH 1002000 HD
4	4	3	NEG 1001800	
5	5	4	NEH 1001540	

Example:

NEH 100600 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 %

8 Maintenance and servicing

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

Technical data

Information regarding tightening torques for screws and nuts can be found in Ch. Technical data, page 9.

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 NEG/NEH there is no longer any warranty claim.

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

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

Maintenance plan

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

Interval	Action
If required (depending on operating conditions)	Clean the NEG/NEH 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 100 operating hours	NEG: Replace the grease of the bearings completely, with grease of the type KLUEBER Isoflex NBU 15.
Monthly	Check screw connections and retighten if necessary.
	Check bearings and replace the grease 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 ***Netter****Vibration*.

Notes on lubrication

NEG/NEH with ball bearings are lubricated for their service life (permanent lubrication [DS*])).

NEG with roller bearings are lubricated with the grease of the type KLUEBER Staburags NBU 8 EP. Depending on the speeds and operating conditions, the grease of these bearings must be completely renewed at the specified intervals.

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

Lubrication / bearing life NEG/NEH

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

Type NEG	Lubrication / quantity [g]	Bearing-life [h]
100770	DS*	4480
1001000	DS*	5000
1001090	DS*	1400
1001140	12	2450
1001400	DS*	5000
1001540	16	3080
1001800	16	1870
1002020	30	5600
1002500 LR	16	640
1003300 LR	16	250

Type NEH	Lubrication / quantity [g]	Bearing-life [h]
100600	DS*	250
1001140	DS*	1400
1001540	DS*	470
1002020	DS*	230
1002000 HD	DS*	230

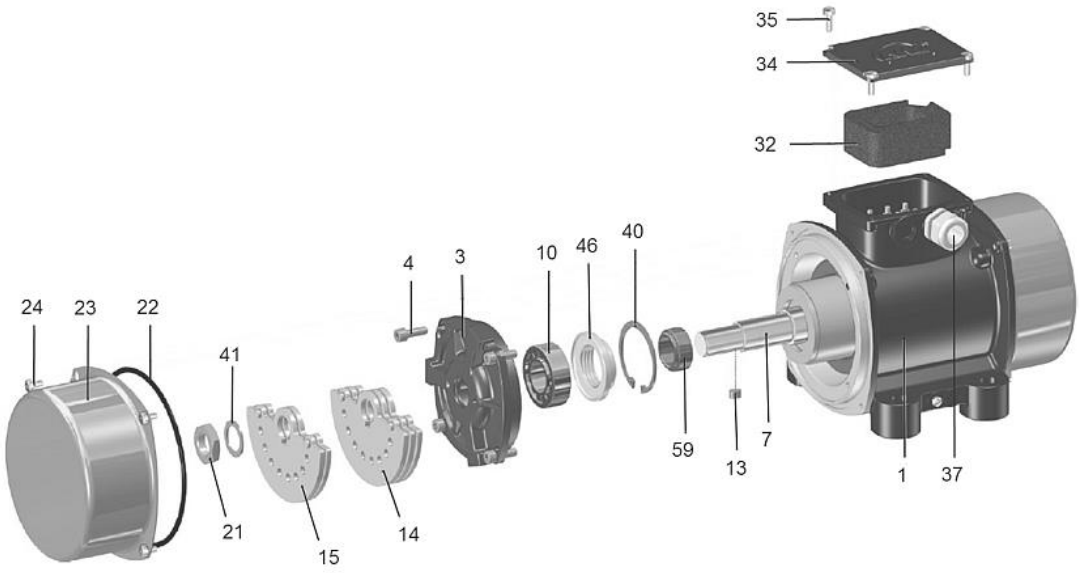
**DS = permanent lubrication*

Lubrication or replacement of bearings

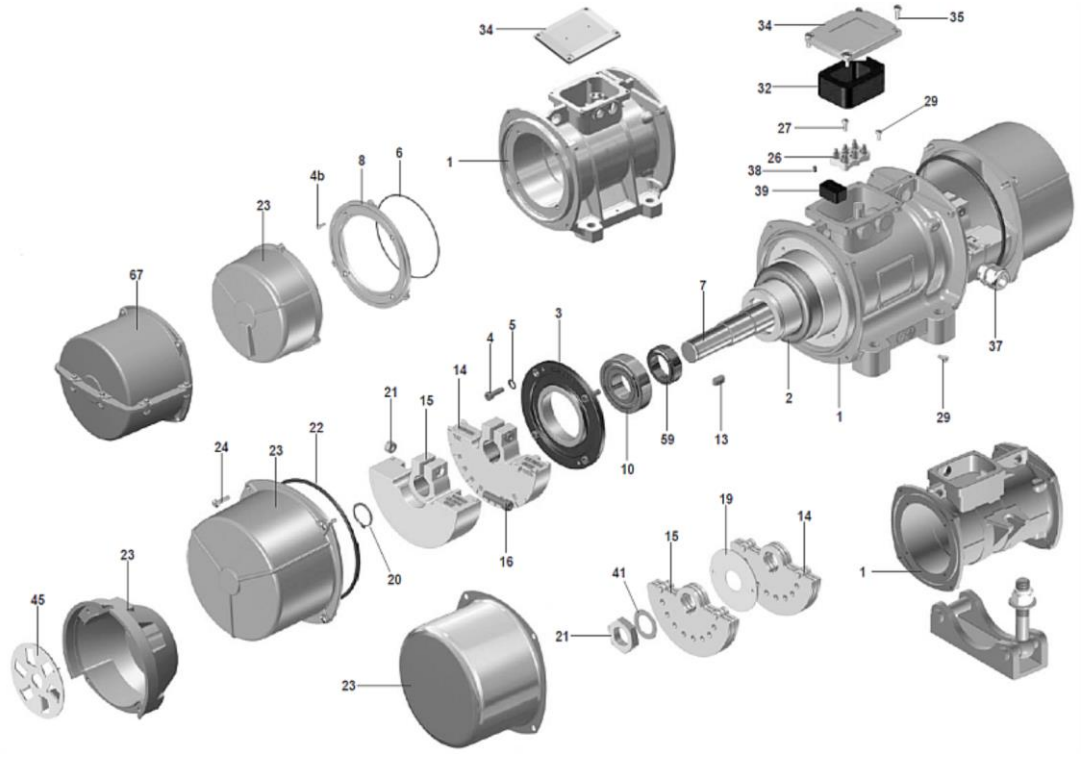
The item numbers refer to the spare parts list.

Overview of the different types of construction:

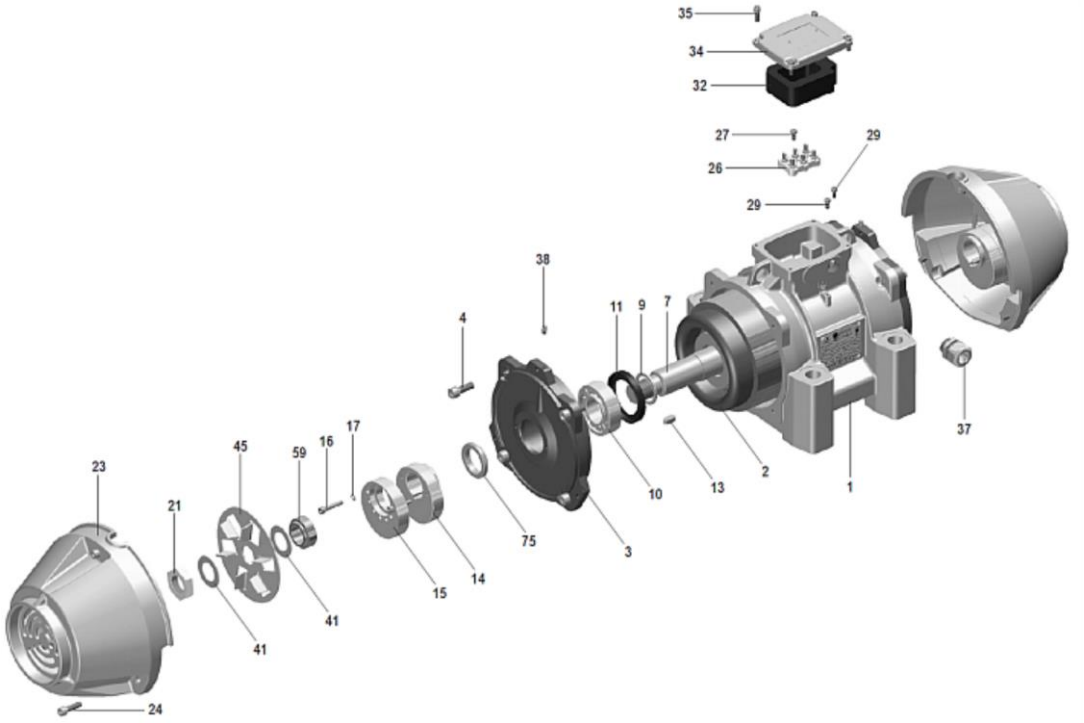
NEG 100770, NEG 1001000, NEG 1001140, NEG 1001400, NEG 1001540, NEG 1001800, NEG 1002020



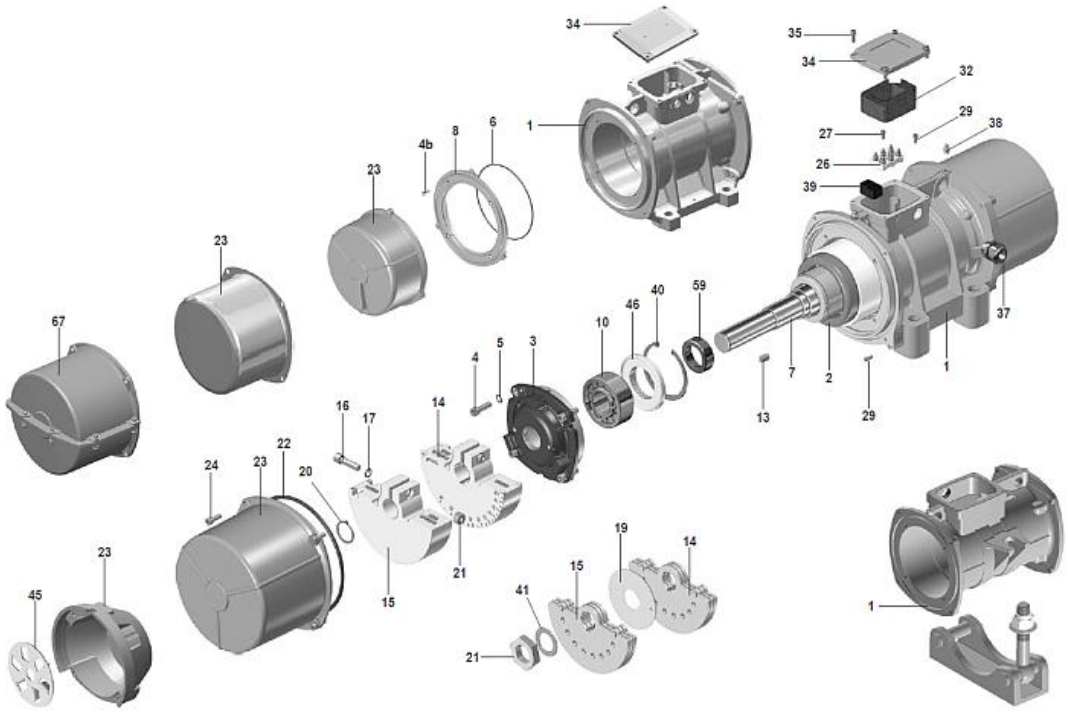
NEG 1001090



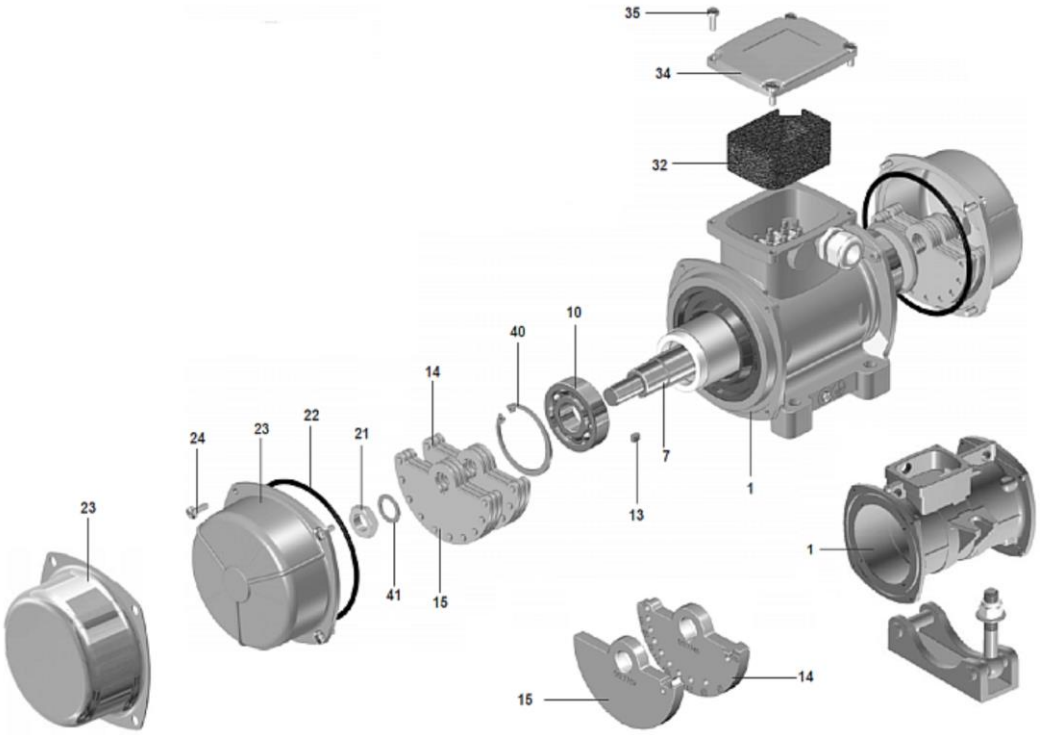
NEG 1002500 LR, NEG 1003300 LR



NEH 1001140, NEH 1001540, NEH 1002020, NEH 1002000 HD

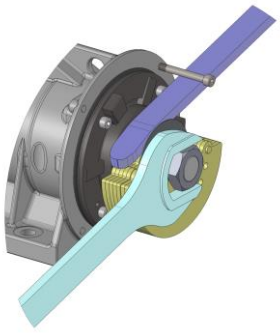


NEH 100600



Procedure:

1. Switch off NEG/NEH, 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 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 chap. 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 NEG/NEH there is no longer any warranty claim.

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

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

Trouble-shooting

Fault	Possible cause	Corrective action
Vibrator does not start or runs at too low speed	Phase interruption	Check fuse and connection cable, replace, if necessary.
	Mains voltage too low	Check mains voltage and cable cross-section and, if necessary, adjust or 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, if necessary.
	Incorrectly dimensioned connection cable	Check cable cross section and replace cable, if necessary.
	Overload	Check setting of unbalance, reduce unbalances.
	Mains voltage too low	Check mains voltage and cable cross-section and, if necessary, adjust or replace cable.

Fault	Possible cause	Corrective action
Excessive heating of the vibrator	Wiring wrong / overload	Check circuit diagram.
	Mains voltage too low	Check mains voltage and cable cross-section and, if necessary, adjust or 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 and/or cable, if necessary.
	Short-circuit between turns in the stator winding	Replace vibrator.
Circuit braker fails when switched on	Phase interruption	Check fuse and connection cable, replace, if necessary.
	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.
		Check fastening, tighten fastening screws, if necessary.

10 Spare parts and accessories

Ordering of spare parts

Please provide the following details when ordering spare parts:

1. type designation according to the type plate
2. serial number according to the type plate
3. description and position number of spare part, according to the overviews from page 24
4. required amount

Accessories

The following accessories are available for NEG/NEH:

Component	Description
Shim washers	Compensation for removed unbalance discs.
Fastening kit NBS	Recommended for secure and permanent fastening of the NEG/NEH.
Frequency converters	For frequency-controlled operation.

Further electrotechnical accessories on request.

Special models

The following special models are available on request:

- Versions for special voltages

11 Disposal

Prices

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

Material-specifications

All parts of the NEG/NEH can be recycled.

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

12 Annex

The declaration of conformity can be found at: www.***Netter****Vibration*.com