NetterVibration

Operating instructions for electric internal vibrators series NCX

June 2024
No. 2115E

These operating instructions apply to:

NCX 380	**NCXH 300**
NCX 480	**NCXH 380**
NCX 580	**NCXH 480**
NCX 660	**NCXH 580**
	NCXH 660
	NCXH 800
NCXF 380	**NCXHF 300**
NCXF 480	**NCXHF 380**
NCXF 580	**NCXHF 480**
	NCXHF 580
	NCXHF 660

Serving industry with vibration

Netter GmbH
Fritz-Lenges-Str. 3
55252 Mainz-Kastel

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 electric internal vibrators of the series NCX are hereafter referred to as "NCX".

Version of document

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1 General information

Use and storage

Read these instructions carefully before using the NCX. It is the basis for any action when dealing with the NCX, 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 NCX.

The NCX 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/ regulations observed

The electric internal vibrators of the series NCX comply with the following directives (EU) or regulations (UK):

- EC Machinery Directive 2006/42/EC,
- Supply of Machinery (Safety) Regulations 2008 (UK),
- Electromagnetic Compatibility Directive 2014/30/EU,
- Electromagnetic Compatibility Regulations 2016 (UK),
- Low Voltage Directive 2014/35/EU,
- Electrical Equipment (Safety) Regulations 2016 (UK).

The main standards observed are indicated in the declaration of conformity.

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.

2 Safety

Intended use

The NCX are designed for the generation of non-directional circular vibrations.

The NCX may also be used outdoors as well as in dusty and humid environment.

The NCX are used exclusively for compacting concrete and must be completely immersed in concrete to operate.

Any other use is considered improper.

Qualification of qualified personnel

Installation, commissioning, maintenance and troubleshooting of the NCX may only be performed by authorised qualified personnel, who have basic knowledge in mechanics and electrics.

All handling of the NCX 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.

- ➢ The electrical connections may only be carried out by trained specialists.
- ➢ Perform all work only with insulated tools suitable for the application.
- ➢ All work on the NCX or the equipment may only be carried out when it is switched voltage-free.
- ➢ The information on the punching for the electrical connection on the vibration bodies must be observed.
- ➢ All connections to the power supply network must be made in accordance with the applicable safety regulations.

Electric shock

⚠ DANGER

Danger of electric shock due to high voltage

Live parts can cause severe injuries or even death.

- ➢ Lay electrical cables carefully. Make sure that electrical cables are not worn through vibrating parts or sharp edges.
- ➢ Check the perfect condition of the electric cables regularly. Detected errors must be eliminated immediately.

Safety rules

⚠ DANGER

Electric shock

An electric shock will result in serious injury or even death. The NCX must be free of voltage during assembly, start-up, maintenance and trouble-shooting.

Observe the following five safety rules:

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

Heavy parts

⚠ WARNING

Risk of injury while handling heavy parts

Risk of serious injury due to weight during transport and operation of the NCX.

- ➢ Observe the weight information in chapter Technical data, starting on page 8.
- ➢ Wear suitable personal protective equipment.

Vibration energy

⚠ WARNING

Damage to health due to vibration energy

Vibrating of whole bodies or any parts of them will result in damage to health.

- ➢ When operating the NCX, only touch/hold the hose at a sufficient safety distance (at least 1 m) from the vibration body.
- ➢ Never touch the vibration body during operation.
- ➢ Limit the duration of use, take breaks during operation and wear appropriate personal protective equipment.
- ➢ Never stand or sit on the NCX during operation.

Sound level

⚠ WARNING

Sound level

Near the NCX or in the vicinity of the constructions connected with the NCX, the sound pressure level may exceed 80 dB(A). The human ear can be permanently damaged by the high sound level.

- ➢ When working in the noise area, use ear protection if 80 dB(A) is exceeded.

Hot surfaces

⚠ CAUTION

Risk of burns due to hot surfaces

NCX can strongly heat up during operation. Direct contact may cause burns.

- ➢ Do not touch the vibration body during operation or shortly after switching off.
- ➢ Only operate the NCX within the permissible ambient temperature, according to chapter Technical data, starting on page 8.

Machine damage

NOTICE

Incorrect nominal voltages and frequencies can damage or destroy the NCX.
Observe the specifications in chapter Technical data, starting on page 8.
Do not use unregulated power generators.

Keep distance

NOTICE

Strong impacts against the vibration body can damage it.
Maintain a sufficient distance (one to two times the diameter of the vibration body) from the formwork wall and reinforcement.

Protective hose

NOTICE

If handled incorrectly, there is a risk of the protective hose tearing off the vibration body.
Always pull the NCX out of the concrete slowly and during operation.

3 Technical data

Permissible operating conditions

Parameters	Description
NCX and NCXS as well as NCXH and NCXHS	
Nominal voltage, nominal frequency	42 to 48 V, 200 Hz or 250 V, 200 Hz, 3-phase. ***Netter****Vibration* recommends electronic frequency converters from the NFC or FSW series.
Power supply with external frequency converter	When operating with external frequency converters, the rated voltages and frequencies of the frequency converter must match the specified rated voltages and frequencies of the vibrators.
NCXF, NCXFB and NCXFS as well as NCXHF, NCXHFB and NCXHFS	
Nominal voltage, nominal frequency	230 or 110 V, 50 to 60 Hz, 1-phase, power supply with fixed voltage and fixed frequency.
Power supply with integrated frequency converter	Vibrators with an integrated frequency converter can be connected directly to a 230 or 110 V socket. Operation on a power generator is only possible if it is regulated. Voltage deviations of more than ±10% are not permitted.
Machine damage	Short-term voltage peaks of more than 160 V can destroy integrated frequency converter despite the protective device.
Generally	
Protection class	IP 44 (manuel switch) IP 67 (NCX)
Thermal overload protection	Motor winding protection by thermal sensors. The vibrators are automatically switched off in the event of excessive temperature.
Permissible ambient temperature	0 °C to 40 °C
Ambient conditions	The vibrators must not be operated in an explosive atmosphere.
Lubrication	The vibrators are oil-lubricated, SAE viscosity class 22. Maintenance and servicing is carried out by ***Netter****Vibration*.
Rotary speed ranges	up to 12,000 min^{-1}
Sound level	Depending on type and application 68 to 90 dB(A)

Type designation

Type	Description
NCX	Standard version of the vibrator
NCXH	Hardened outer sleeve
NCXS	Pistol grip
NCXF	Integrated frequency converter with manual switch
NCXHS	Hardened outer sleeve, pistol grip
NCXHF	Hardened outer sleeve, integrated frequency converter with manual switch
NCXFB	Integrated frequency converter and additional manual switch
NCXFS	Integrated frequency converter and pistol grip
NCXHFB	Hardened outer sleeve, integrated frequency converter and additional manual switch
NCXHFS	Hardened outer sleeve, integrated frequency converter and pistol grip
NCXA	Replaceable vibration body
NCXHA	Replaceable vibration body with hardened outer sleeve
NCX ... L	Longer version of the vibrator

The type designation, information on the rated voltage and the serial number can be found on the stamping on the upper part of the vibration body.

Dimensions of the NCX series

Type	Vibrator diameter (mm)	Vibrator length (mm)	Vibrator weight (kg)	Total weight (kg)
NCX ... 300	32	320	1.7	7.9
NCX ... 380	39	370	2.9	9.5
NCX ... 480	49	375	4.7	15.2
NCX ... 580	59	350	6.0	15.2
NCX ... 580 L	59	400	7.8	17.0
NCX ... 660	66	350	9.0	19.5
NCX ... 660 L	66	415	11.0	20.2
NCX ... 800	80	440	13.8	29.0

Performance data of the NCX series

Type	Centrifugal force (N)	Effective diameter (cm)	Average current consumption at 42 V (A)	Average current consumption at 250 V (A)	Power (kW)
NCX ... 300	1,160	40	8	1.3	0.6
NCX ... 380	1,200	40	8	1.3	0.6
NCX ... 480	3,000	55	18	3.0	1.3
NCX ... 580	3,900	65	23	3.9	1.7
NCX ... 580 L	4,800	70	25	4.2	1.9
NCX ... 660	5,300	85	26	4.4	2.0
NCX ... 660 L	6,000	90	28	4.7	2.1
NCX ... 800	10,470	140	35	5.9	2.6

Performance data of the NCXF series

Type	Centrifugal force (N)	Effective diameter (cm)	Average current consumption at 230 V (A)	Average current consumption at 110 V (A)	Power (kW)
NCXF ... 300	1,160	40	3.5	7.3	0.7
NCXF ... 380	1,200	40	3.5	7.3	0.7
NCXF ... 480	3,000	55	8.5	17.8	1.5
NCXF ... 580	3,900	65	11.5	24.1	2.0
NCXF ... 660	5,300	85	12.5	26.1	2.2

Variants of the NCX series

Variant	NCX ... 300	NCX ... 380	NCX ... 480	NCX ... 580	NCX ... 660	NCX ... 800
Standard: steel tip, protective hose 5 m, cable 10 m	–	NCX 380	NCX 480	NCX 580	NCX 660	–
Variant H: **hardened outer sleeve** steel tip, protective hose 5 m, cable 10 m	NCXH 300	NCXH 380	NCXH 480	NCXH 580	NCXH 660	NCXH 800
Variant S: **with pistol grip** steel tip, protective hose 0.8 m, cable 15 m	NCXHS 300	NCXS 380 NCXHS 380	NCXS 480 NCXHS 480	NCXS 580 NCXHS 580	NCXS 660 NCXHS 660	NCXHS 800
Variant L: **long cylinder**	–	–	–	NCX 580 L NCXH 580 L NCXS 580 L NCXHS 580 L	NCXH 660 L NCXHS 660 L	–

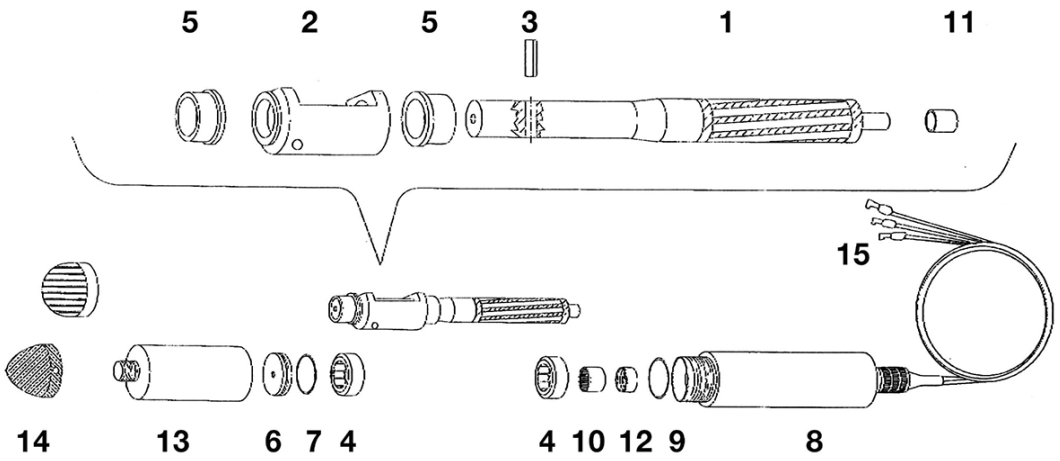
Variants of the NCXF series

Variant	NCXF ... 300	NCXF ... 380	NCXF ... 480	NCXF ... 580	NCXF ... 660
Standard: steel tip, protective hose 5 m, converter with switch, cable 10 m with safety plug	–	NCXF 380	NCXF 480	NCXF 580	–
Variant H: **hardened outer sleeve** steel tip, protective hose 5 m, converter with switch, cable 10 m with safety plug	NCXHF 300	NCXHF 380	NCXHF 480	NCXHF 580	NCXHF 660
Variant S: **with pistol grip** steel tip, protective hose 0.8 m, cable 10 m, converter with cable 1.5 m and safety plug	NCXHFS 300	NCXFS 380 NCXHFS 380	NCXFS 480 NCXHFS 480	NCXFS 580 NCXHFS 580	NCXHFS 660
Variant B: **additional manual switch** steel tip, protective hose 5 m, cable 10 m, converter with cable 1.5 m and safety plug	NCXHFB 300	NCXFB 380 NCXHFB 380	NCXFB 480 NCXHFB 480	NCXFB 580 NCXHFB 580	NCXHFB 660

4 Design and function

Design NCX / NCXH

Example NCX 480



1. Rotor
2. Unbalance
3. Coiled spring pin
4. Ball or roller bearing
5. Inner ring
6. Extraction nut
7. O-ring
8. Stator
9. O-ring
10. Needle bearing
11. Needle bearing inner ring
12. Extraction nut
13. Outer sleeve
14. Steel tip
15. Connection strand

Function

The NCX generate non-directional, circular vibrations and act in all directions of a plane.

The vibration is generated by an unbalance that rotates around a shaft.

The vibrators consist of the stator, rotor and outer sleeve with a steel tip.

The special roller and needle bearings are designed for heavy loads and high compaction performance.

The NCX are switched on by pressing the manual switch and then slowly immersed completely into the concrete vertically, at an angle or horizontally, depending on the concrete height.

When the desired degree of compaction has been achieved, the NCX are slowly pulled out of the concrete and switched off.

The NCX are protected against excessive temperature by thermal sensors. These automatically switch off the vibrator in the event of excessive temperature. In addition, the vibrators are equipped with thermal protection to prevent the motor winding from burning.

5 Transport and storage

Observe the safety instructions in chap. Safety, starting on page 5.

Transport options

The NCX can be transported manually as a unit.
Depending on the version, two people may be required for transport.
Please note the weight specifications in chapter Technical data, starting on page 8.

When transporting the NCX, ensure that it is not subjected to strong impacts or vibrations. This can damage the electronics and bearings.

Alternatively, the NCX can be transported in the following ways:

- With a forklift or pallet truck:
  Place the NCX on a suitable pallet and secure against slipping.
  Carefully lift, transport and set down the pallet.

Packaging

The NCX are packed and ready for assembly. Accessories and add-on parts are delivered unmounted, unless otherwise agreed upon.

The packaging protects the NCX 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 NCX in a dry and clean environment.
- Protect the NCX from strong UV radiation, weathering and ozone.
- The permissible storage temperature is between +5 °C and +40 °C.
- The permissible relative humidity is max. 60 %.
- After a storage period of more than 2 years, the NCX must be electrically inspected by ***Netter****Vibration*.

6 Installation

Observe the safety instructions in chap. Safety, starting on page 5.

Permissible operating conditions

Please refer to chap. Technical data, page 8 for permissible operating conditions.

Regulations

When carrying out installation work and operating the system, the provisions and regulations of the local electrical engineering associations (e.g. VDE) and the applicable accident prevention regulations must be observed.

The operator is responsible for the proper condition of the system.

Electrical connection

The following requirements and conditions must be met to connect the NCX electrically:

- The electrical connection may only be carried out by authorised, qualified personnel.
- All work must be carried out exclusively with insulated tools suitable for the application.
- All electrical cables must be laid carefully and protected from high temperatures, lubricants and sharp edges.
- Ensure that the cables are not damaged by vibrating parts.
- The perfect condition of the electrical cables and plugs must be checked at regular intervals.
- Any faults discovered must be rectified immediately.

The NCX are supplied with plugs as standard:

- Version with 42 V: 3-pole plug for 3 phases
- Version with 250 V: 4-pole plug for 3 phases and protective conductor

7 Start-up and operation

Observe the safety instructions in chap. Safety, starting on page 5.

Permissible operating conditions

Please refer to chap. Technical data, page 8 for permissible operating conditions.

Regulations

- When starting up and operating the NCX, the provisions and regulations of the local electrical engineering associations (e.g. VDE) and the applicable accident prevention regulations must be observed.
- When operating the NCX compliance with the electromagnetic compatibility directive 2014/30/EU or the electromagnetic compatibility regulations 2016 (UK) must be ensured.
- Modifications to the NCX may change the properties or destroy the NCX and will invalidate all claims.
- The operator is responsible for the proper condition of the system.

Measures

Carry out the following measures before start-up:

1. Check that the NCX have no external visible damage and are in perfect condition.
2. Check that the cables and plugs are undamaged and have been installed in accordance with the applicable standards and regulations.
3. When operating with external frequency converters or power generators, ensure that the rated voltages and frequencies comply with the NCX specifications.
   Other nominal voltages and frequencies than those permitted for the vibrators can lead to destruction or significantly impair the function.
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.

Operating with external frequency converter

When starting up and operating the vibrators with an external frequency converter, carry out the steps described below one after the other:

1. The NCX must always be started or stopped using the on/off switch.
2. Make sure that the on/off switch of the NCX is set to “0”.
3. Ensure that the frequency converter is switched off.
4. Connect the vibrators to the frequency converter via a vibration-proof CEE socket.
5. Ensure that the rated voltages and frequencies of the frequency converter match the specifications of the NCX.
6. Switch on the frequency converter using the main switch.
7. Start the vibrators using the on/off switch.

8. For better cooling, immerse the NCX completely in the concrete to prevent excessive temperature.
9. Once the desired degree of compaction has been achieved, slowly pull the vibrators out of the concrete and switch them off.
10. When disconnecting the NCX from the frequency converter, ensure that the vibrators and frequency converter are switched off.
11. After operation, do not place the NCX in direct sunlight and ensure that there is sufficient air circulation on all sides to guarantee cooling of the vibrators.

Operating with integrated frequency converter

When starting up and operating the vibrators with integrated frequency converter, carry out the steps described below one after the other:

1. The NCXF must always be started or stopped using the on/off switch.
2. Make sure that the on/off switch of the NCXF is set to “0”.
3. Connect the vibrators to a 230 V socket with an alternating current supply. Do not use unregulated power generators.
4. Start the NCXF using the on/off switch.
5. For better cooling, immerse the vibrators completely in the concrete to prevent excessive temperature.
6. Once the desired degree of compaction has been achieved, slowly pull the vibrators out of the concrete and switch them off.
7. When disconnecting the NCXF from the power supply, make sure that the vibrators are switched off.
8. After operation, do not place the NCXF in direct sunlight and ensure that there is sufficient air circulation on all sides to guarantee cooling of the vibrators.

Checklist start-up

Check that the following steps have been carried out:

- NCX checked for visible external damage? ☐
- Cable connections checked for tight fit and damage? ☐
- NCX connected to a suitable frequency converter? ☐
- Nominal voltages and frequencies set correctly according to the NCX? ☐
- Compliance with permissible ambient temperatures ensured? ☐

8 Maintenance and servicing

Observe the safety instructions in chap. Safety, starting on page 5.

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 NCX there is no longer any warranty claim.

Before all maintenance and servicing work the NCX must be safely disconnected from the electrical mains.

Maintenance plan

Maintenance of the NCX must be carried out as follows:

Interval	Action
If required (depending on operating conditions)	Clean the NCX regularly to remove concrete deposits.
Every month	Check the vibrator, protective hose and cable for proper condition.
Every 6 month	Check electronic cables and plugs for proper condition.
Every year	The vibrators must be re-oiled by ***Netter****Vibration*.
Every 2 years	After a storage period of more than 2 years, the NCX must be electrically inspected by ***Netter****Vibration*.
At least every 4 years	Check electrical systems and stationary electrical equipment for proper condition.

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

9 Troubleshooting

Observe the safety instructions in chap. Safety, starting on page 5.

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 NCX there is no longer any warranty claim.

Before any troubleshooting the NCX must be safely disconnected from the electrical mains.

Trouble-shooting

Fault	Possible cause	Corrective action
Vibrator does not start	Supply voltage too low	Check the supply voltage, cable and plug connection. If necessary, adjust the supply voltage, replace the cable, tighten the plug connection.
	Frequency converter overloaded	Switch off the power supply to the frequency inverter using the main switch, eliminate overload, wait 60 seconds before switching on again.
Vibrator switches off during operation	Vibrator is overheating	Allow the vibrator to cool down for a few minutes before switching it on again. Ensure that the ambient temperature is correct.
	Insulation fault / fault current	Replace the vibrator and send it to ***Netter****Vibration* for repair.
	Current consumption too high	Reduce the load accordingly.
Vibrator function significantly impaired	Incorrect voltage or frequency on the frequency converter	Set the correct voltage or frequency according to the vibrator on the frequency inverter.
	Lubrication of the bearings no longer sufficient	Replace the vibrator and send it to ***Netter****Vibration* for repair.
	Bearing damaged	Replace the vibrator and send it to ***Netter****Vibration* for repair.
Frequency converter goes into fault mode	Short-circuit or earth fault or phase failure of the vibrator	Replace the vibrator and send it to ***Netter****Vibration* for repair.

In the event of any other faults with the NCX, we recommend sending the complete device to ***Netter****Vibration* for repair.

10 Spare parts and accessories

Ordering of spare parts

Please provide the following details when ordering spare parts:

- type of NCX
- description and position of spare part according to the overview drawing
- required amount

Requirements for exchange

Spare parts of the NCX and of the electrical installation must be installed by an authorised electrician. This specialist must be familiar with the protective measures.

Defective parts must be replaced by parts of the same type.

If you need to replace components of the NCX, then contact ***Netter****Vibration*.

Possible accessories

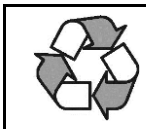
The following optional accessories are available for the NCX:

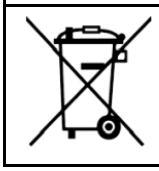
- Vulkollan tip for sizes NCX 380 - 660
- Special cable length for sizes 300 - 660
- Special protective hose for sizes 300 - 660

Further electrotechnical accessories on request.

11 Disposal

Disposal





All parts of the NCX must be disposed of properly according to the material specifications.

Do not dispose the electrical and electronic components of the NCX in the normal household waste, but in a special collection point for the environmentally friendly disposal of electrical equipment.

Observe the national regulations for disposal.

Material specifications

All parts of the NCX can be recycled.

NCX, NCXS, NCXF, NCXFB, NCXFS, NCXHFS series

Material	Part
Steel or stainless steel	Stator, rotor, unbalance, bearing, outer sleeve, tip, spacer sleeve, coiled spring pin, inner ring
Copper	Strands of the connection cable
PTFE	Seals, Vulkollan tip (optional), sheathing of connection cable and strands

NCXH, NCXHS, NCXHA series

Material	Part
Steel or stainless steel	Stator, rotor, bearing, outer sleeve, tip, spacer sleeve
Bronze	Unbalance
Copper	Strands of the connection cable
PTFE	Seals, Vulkollan tip (optional), sheathing of connection cable and strands

12 Annex

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