NetterVibration

Operating instructions for
Braking Device BZ 30

February 2012
No. 1294E

These operating instructions apply to:

Netter braking devices

BZ 30 / BZ 30 S / BZ 30 S2

Important note:

Before using this BZ braking device you must read these operating instructions carefully and then retain them.

Netter GmbH accepts no liability for physical damage or personal injury if technical modifications are made to the product or the guidance and instructions in these operating instructions are not observed.

Serving industry with vibration

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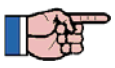
What is supplied



Check the packaging for any damage in transport.
In the event of damage to the packaging, inspect the contents for completeness and any damage. In the event of damage, inform the carrier. Compare what is supplied with the delivery note.

1 General information (EMC)

The BZ braking units are designed in accordance with Standard IEC 947-4-2 for public mains grids of Category B and they operate below the specified EMC limits. The relevant measurements have been confirmed by TÜV Südwest in Mannheim.
The limits for emissions according to European standards do not exclude the possibility of interference with receivers within a radius of 10 m.
This braking device must be installed by expert EMC staff.

When braking, these braking devices fall below the limits of EC Directive EN 50081-2 (cable/wire related interference) on the mains cable if a mains smoothing choke is installed directly on the mains terminal.

The CE symbol applied relates to the Low Voltage Directive (73/23/EEC) and the Act on Electromagnetic Compatibility (89/336/EEC).

1.1 Mains smoothing choke

Netter braking devices are rectifiers that are connected directly to the mains with a phase angle control unit.
Suitable interference removal and increased resistance to interference are to be provided in switching units in accordance with the EMC decree of EC No. 89/336.
This should prevent susceptible nearby devices such as PLCs, frequency converters and other microprocessor units that are on the same mains from being made susceptible and also from being interfered with. The use of a mains smoothing choke is therefore necessary. It prevents feedback and protects the device from resonance voltage peaks.
The mains smoothing choke is to be connected to mains terminal 8 of the braking device.

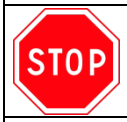
1.2 Configuration

Knowledge of the motor's current is required for the configuration of the required braking current (I_B). The braking current should be greater than 3 times the motor's nominal current.

When ordering, only the level of the braking current and the mains voltage need to be stated.

I_B = Required braking current in Amps
I_M = The motor's nominal current in Amps

The following information and hazard symbols are used in these operating instructions.

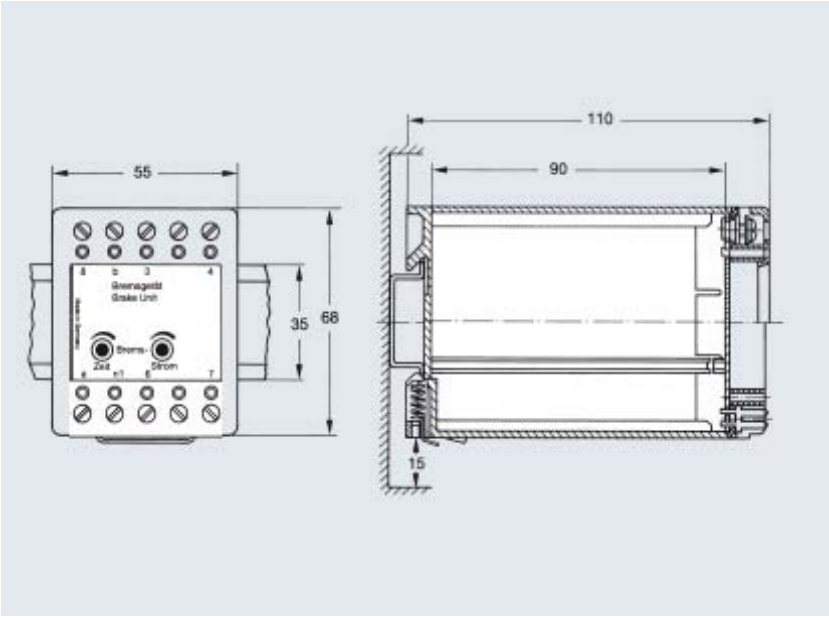
	Reference to important procedures		Warning of dangerous electrical voltage
	Important reference to procedures requiring particular attention		Disconnect the device from the mains, pull out the mains plug
	Warning of a danger point		Environmentally-friendly disposal

2 Technical data

		BZ 30	BZ 30 S	BZ 30 S2
Max. braking current:		30 A		
Mains voltage (AC):		3~ 380 … 430 V	3~ 440 … 550 V	3~ 200 … 250 V
Braking voltage (DC):		160 V	190 V	80 V
Mains frequency:		50 / 60 Hz		
External fuse:		16 A (slow)		
Ambient temperature:		In operation 0 … +40°C		
Contact load:		250 V / 5 A (on terminals 3 and 4)		
Braking time:		0 to 12 seconds, the braking time is automatically activated upon contacting a stop status on terminal n_1.		
Time switched on:		20% based on 1 min. (12 sec./min.)		
Choke:		Mains smoothing choke for fitting outside the device		
Size:		68 × 55 × 100 mm (H×W×D)		
Weight:		0.5 kg		

The mains voltage and the mains frequency must match the nominal voltage and nominal frequency stated on the rating plate.

2.1 Dimensioned drawing of BZ 30



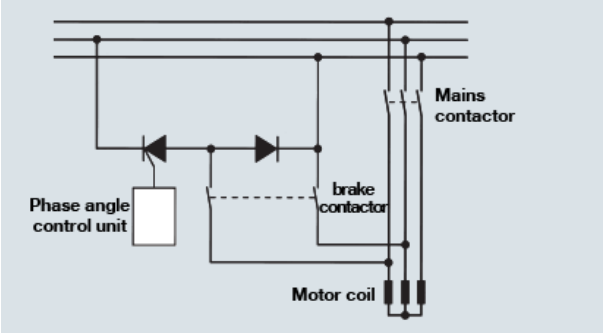
3 Structure and mode of operation

A robust rectifier in combination with digital control electronics generates a powerful braking force.

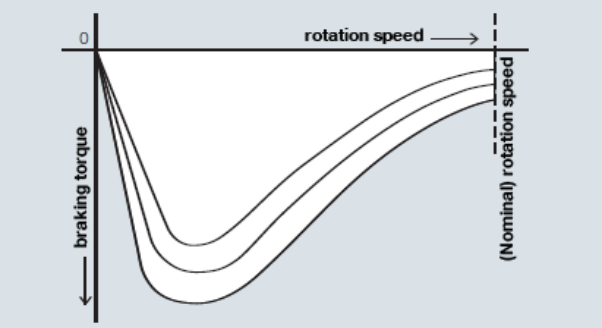
The braking effect is generated by an adjustable direct current that flows through the motor's coil.

A standing magnetic field restricts its rotational movement.

The resulting braking force has the effect shown on the rotation speed.
Netter braking devices are fitted into a switchbox and can also be retrofitted at any time without problems.
The permitted temperature range is between 0ºC and +40ºC.



Basic diagram of the mains circuit



Change in braking force depending on the rotation speed

4 Safety

Modifications to the device may change the characteristics of the device or destroy it and lead to all warranty claims being rejected. Failure to observe the operating instructions will also lead to the invalidation of all rights.

Before installation and startup it is essential to read the brief instructions for the braking device thoroughly and carefully. The operating company must ensure strict observance of these instructions. Failure to observe them will lead to the invalidation of all rights.

The mains voltage and the mains frequency must match the nominal voltage and the nominal frequency stated on the rating plate.

Electrical components that are live even when the master switch is turned off are marked with a special sticker.

In the event of failure to note specially marked areas there is a potential risk to life or risk of injury. In these areas, only maintenance staff are permitted to carry out maintenance work. Maintenance staff must work only in accordance with the relevant safety measures.

The operating company must monitor the condition of the unit with the greatest care. It is mandatory to observe the protection measures. If there is damage to or if there are faults with the unit, these are to be repaired in the correct manner.

The operating staff may only operate the unit i.e. the operating staff have no authority to open the switchbox or to work on the vibrators. In the event of technical problems, the maintenance staff must be consulted.

Incorrect work on or modifications to the electrical or mechanical presets of these devices may lead to consequential damage, which is both very expensive and likely to lead to long machine downtimes. The warranty will be invalidated. The consequences are to be borne by the party to blame.

The protective measures set down are to be very strictly observed. The unit may only be operated if all connection cables are fully connected and there is/are no damage or faults.

Attention

- Electronic circuits boards are live
- Earth heat sinks
- Avoid long cables
- Use ohm meters or multi-phase instruments
  Do not use any inspection bells or lights

4.1 User instructions

Netter braking devices are used to brake alternating current vibrators.
They are not safety components. Electronic braking devices will only brake vibrators if the mains supply is on and they have no effect if there is a power cut.

Netter braking devices are not devices to improve safety and must not be operated within explosion protection areas.

5 Transportation and storage

Check the packaging for any damage in transit.
In the event of damage to the packaging, inspect the contents for completeness and any damage. In the event of damage, inform the carrier.

The devices are packed ready to be installed. The rating plate is located on the braking device.
When transporting the braking device one should ensure that the braking device is not exposed to any heavy impacts or vibrations that might damage the device.
Storage should be in a dry, clean environment.

If the braking device has to be held in storage for a lengthy period (up to a max. of 2 years), the temperature in the storage area must not fall below 0ºC or exceed +40°C.

The braking device and the vibration drives are only to be moved with the aid of the eye bolts provided for this purpose. The appropriate lifting gear is the usual equipment such as blocks and tackles or cranes. To move heavy loads, suitable steel cables or lifting straps that are of adequate dimensions for these weights are to be used. The switchbox and the vibration drives are to be handled with great care during transportation.
The braking device and the vibration drives must not be stored in the open air. In the event of storage of the components in the open air, the braking device and the vibration drives are not protected against corrosion.

6 Fitting

When fitting the device it is essential to observe the safety instructions in Section 4 and the accident prevention regulations!
Installation of the unit must be carried out in accordance with local, known regulations (e.g. VDE regulations).

The device is intended to be built into a switchbox. The ambient temperature should be between 0°C and +40°C.

The minimum distance to the outside wall must be 10 cm above and below and 5 cm sideways. This guarantees adequate ventilation. Ventilation slits and air intakes and outlets must not be covered.

Avoid installation sites with:

Vibration	Metal parts
Heat	Dust
Humidity	Electromagnetic sources

Adequate working space and lighting must be provided for commissioning, operation and maintenance.

Use non-conductive flooring when working on electrical equipment.

Conduct careful training of the operating staff.

It is strictly forbidden to make technical modifications to the circuit boards, the power element or the housing.

Do not exceed the nominal values of the device.

Please observe all precautionary measures and warnings.

ATTENTION:
Electrical installation of these braking devices is only to be carried out by authorised specialist staff.
The switchbox door may not be opened when it is live!
The specialist staff must work only with insulated tools suitable for the purpose.
Accessories that guarantee correct operation and safety must have the appropriate protection type for the specific purpose.

When fitting the braking resistor it is to be securely disconnected from the mains electricity supply. Proceed as follows:

1. Switch off the control unit
2. Secure against switching on again
3. Ensure no longer live

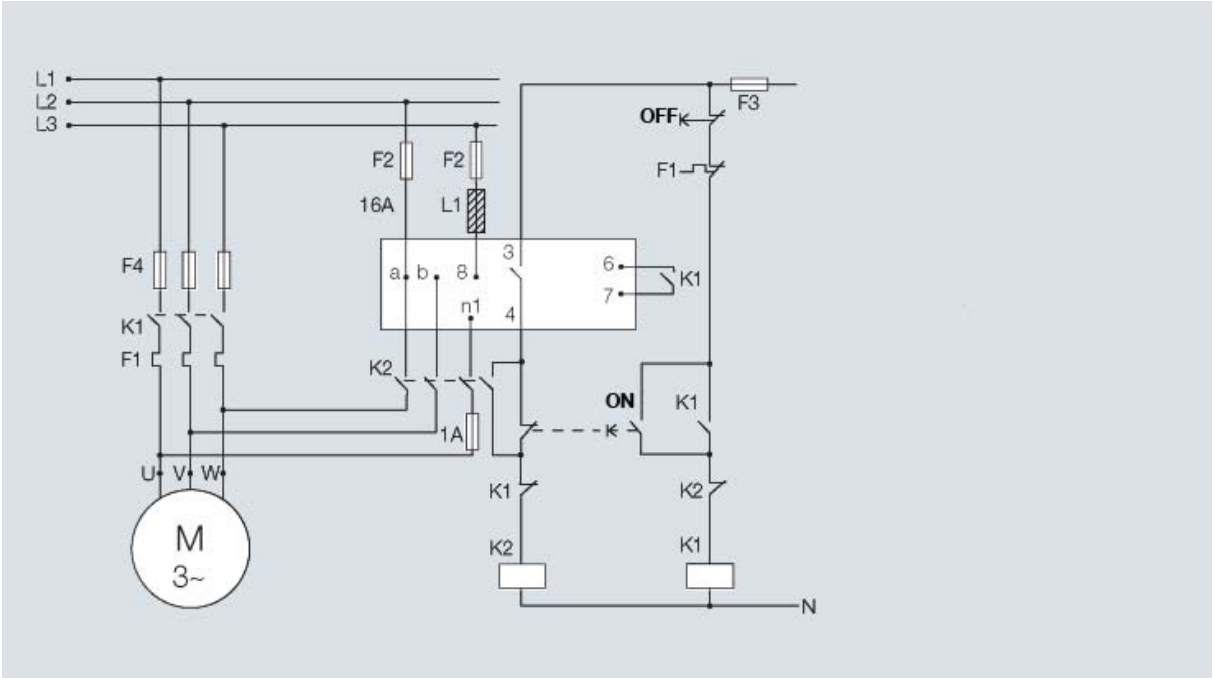
Master switch with padlock

The mains voltage and the mains frequency must match the nominal voltage and the nominal frequency stated on the rating plate.

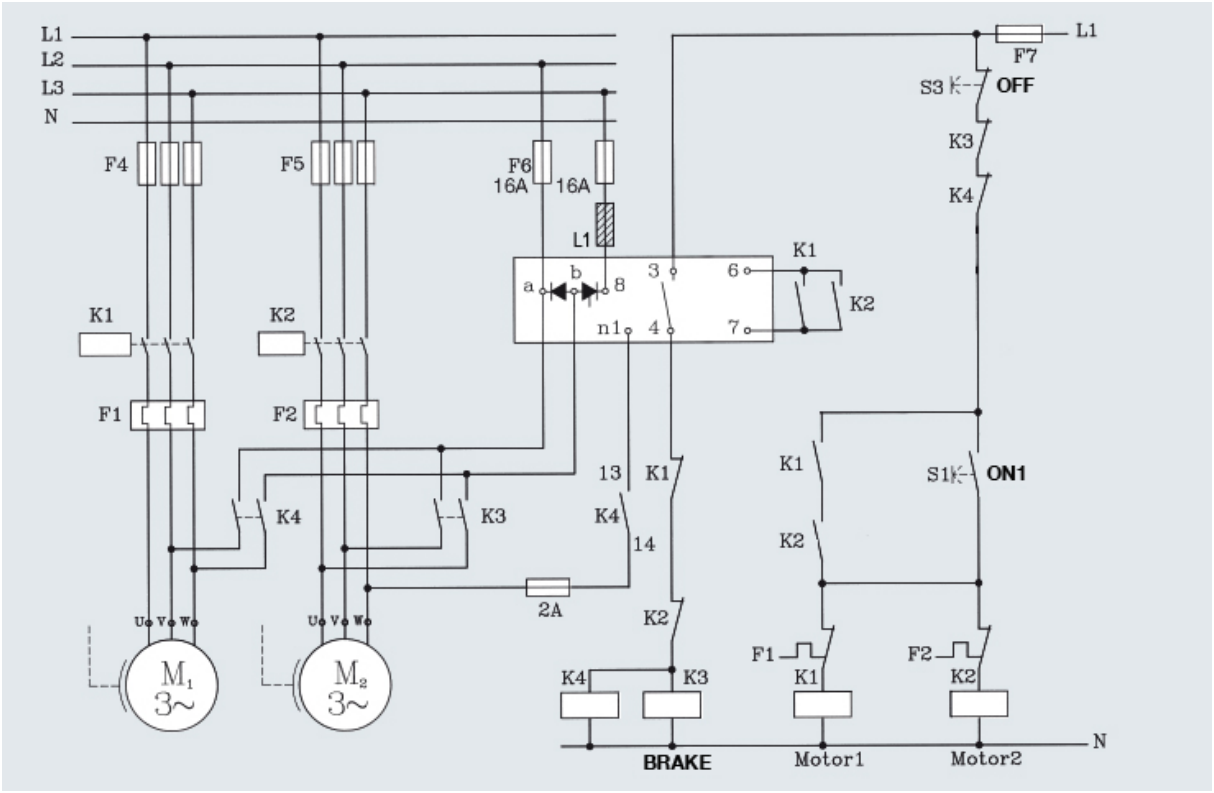
7 Installation

7.1 Examples of circuits

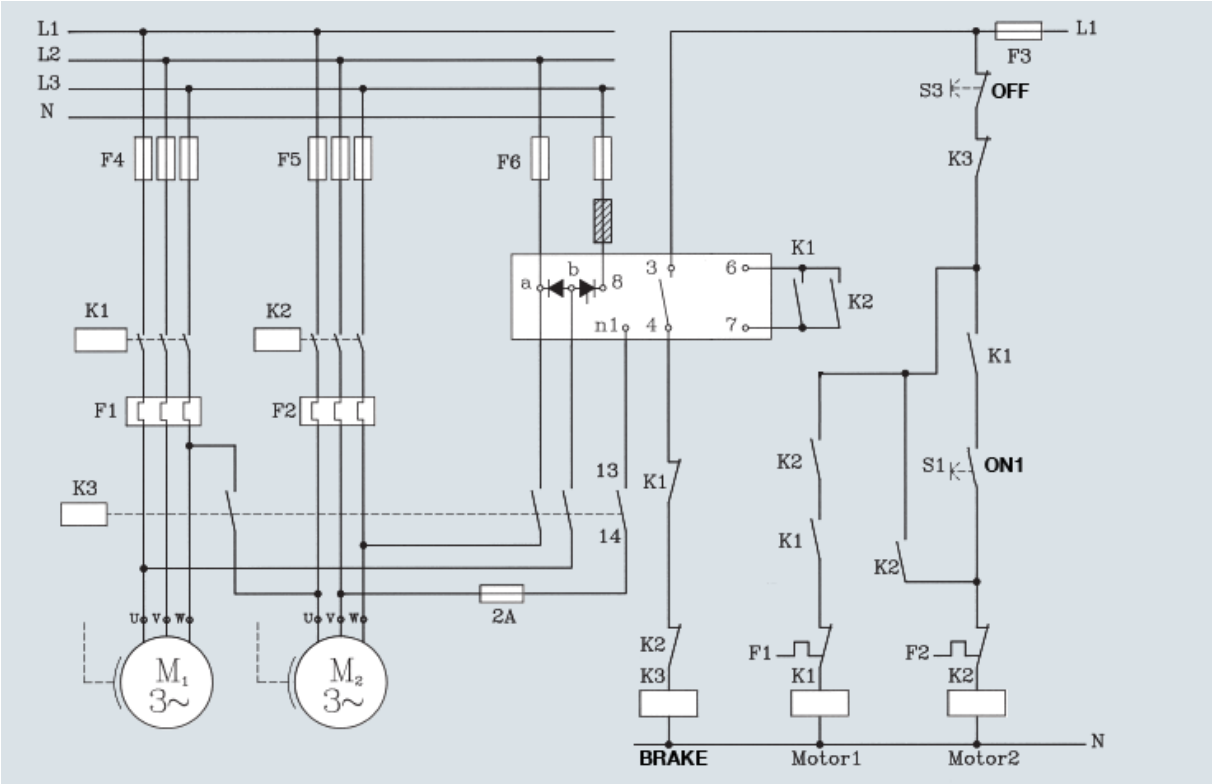
7.1.1 Braking circuit for a vibrator



7.1.2 Braking circuit for two vibrators of less than 2 kW arranged in parallel



7.1.3 Braking circuit for two vibrators of greater than 2 kW arranged in parallel



7.2 Selection of fuses

The two fuses of the braking device serve, among other things, to protect the motor from overloads.
The fuses are therefore to be appropriate to the motor's nominal current.
Nominal current of the fuse = about 150% of the motor's nominal current.
Fuse F4: see Basic diagram.

7.3 Selection of brake protection

The brake protection size should be the same as the motor protection size.
The protection may be switched on and off without a current load in contact with the skin.

7.4 Sizing the connection cables

The connection cables to terminals 8, a and b are to be of the same size in terms of cable cross-section as the motor connection cables. The cable on terminal n_1 is a measuring cable (< 1 A). A cross-section of 0.75 mm² is sufficient for this.

8 Inspection before commissioning

The following points are to be checked before the device is connected to the mains:

1. The supply voltage must be connected to terminals a and 8. Connection of the supply voltage to any other terminals will damage the device.
2. The supply voltage must lie within the voltage tolerance.

Make sure that there are no short circuits or discharges to frames. The braking device is not short circuit-proof.

8.1 Locking test

The locking test must be performed before starting up with electricity to the motor since the brake and motor protections may never be activated at the same time.

8.1.1 Braking circuit for a vibrator

Motor protection T1 Brake protection T2	On Off	Off T1 locked to prevent switching on
Check locking	T2 on manually T1 goes off	T1 on manually T2 goes off

8.1.2 Braking circuit for two vibrators of less than 2 kW arranged in parallel

Motor protection T1 & T2 Brake protection T3 & T4	On Off	Off T1 & T2 locked to prevent switching on
Check locking	T3 or T4 on manually T1 and T2 go off	T1 or T2 on manually T3 and T4 go off

8.1.3 Braking circuit for two vibrators of greater than 2 kW arranged in parallel

Motor protection T1 & T2 Brake protection T3	On Off	Off T1 & T2 locked to prevent switching on
Check locking	T3 on manually T1 and T2 go off	T1 or T2 on manually T3 goes off

9 Setting the braking current

9.1 External electric vibrators

Switch on motor fuse unit and set the “T” (time) potentiometer to 1/4 position. If the motor is hot from running turn the “I” (current) potentiometer slowly to the right during braking and whilst doing so observe the current level on a connected ammeter. It is sensible to set it to 3 times the level of the motor’s nominal current.

The time set on the “T” (time) potentiomer is automatically added. This can be manually set for delayed braking of up to 20 seconds.

9.2 External electric vibrators with increased safety (explosion protection area)

The braking current must be supplied via the appropriate overload protection (motor protection, authorised for applications in areas at risk of explosion EExe per 94/9/EC). The braking current may only be set to 3 times the level of the nominal current. The total braking time must not exceed 10 seconds.

10 Commissioning/operation

When commissioning the vibration device, the conditions and regulations of the local electrical engineering associations (e.g. VDE) and the known accident prevention regulations shall be observed.

Before installation and startup it is essential to read the brief instructions for the frequency converter thoroughly and carefully. The operating company must ensure strict observance of these instructions. Failure to observe them will lead to the invalidation of all rights.

The following points regarding the unit, which has had its power switched off, are to be checked by an expert:

- The mains voltage and the mains frequency must match the nominal voltage and nominal frequency stated on the rating plate.
- Cables must be undamaged and installed in accordance with the known regulations and standards (e.g. VDE, OEVE, SEV etc.).
- Release mechanical blockages (e.g. transportation clamps, brakes etc.).
- Faults that might occur are to be corrected immediately and in a correct manner.
- Netter must be informed in the event of major faults in the unit. Intervention of any nature may only be made with our express consent.
- **In the event of intervention in or changes to the settings of the braking device without *Netter*Vibration's consent, the warranty is invalidated.**
- Work on the switchbox and on the electrical operating equipment is only to be carried out by an expert.
- In addition, the established regulations of the CENELEC members (e.g. VDE) apply.
- One should ensure that the unit is in perfect electrical condition.
- Protective measures on the unit, device earthing.
- The temperature inside the switchbox must not fall below 0°C or exceed 40°C.
- The shielded data cables (or marked cables) must be laid in a separate conduit or pipe (separate from the power cables). If this is not possible, the data cables must be laid in ordinary steel pipes that must be earthed.

11 Maintenance/repair

Maintenance of the vibration drives and the braking device is of very great importance to the company operating the unit. Observing the maintenance intervals increases the availability of the unit to a maximum.

In the case of faults with an electrical cause, we (***Netter****Vibration*) specify that the problem be dealt with by an electrician.

An electrician within the meaning of the accident prevention regulations is deemed to be a person who can assess the work entrusted to him and recognise possible hazards on the basis of his technical training, knowledge and experience and knowledge of the relevant regulations.

Intervention of any nature must only occur with the express consent of ***Netter****Vibration*.

Ensuring that the unit is not live before starting the work and securing this condition for the duration of the work is done whilst observing the following five safety rules, which must always be applied:

Master switch with padlock

1. **Switch off**
2. **Secure against switching on again**
3. **Check not live**
4. **Earth and short circuit**
5. **Cover or isolate any neighbouring live parts**

The following maintenance work is to be carried out regularly by authorised experts:

a) Checking the screw connections

b) Inspection of the cables from the switchbox to the drives

Any other maintenance and servicing work is to be carried out exclusively by *Netter*Vibration.

When maintaining the device, observe the safety instructions in Section 4.

12 Fault correction

Before correcting faults it is essential to read these operating instructions thoroughly and carefully. The operating company must ensure strict observance of these instructions. Failure to observe them will lead to the invalidation of all rights.

In the case of faults with an electrical cause, we (***Netter****Vibration*) specify that the problem be dealt with by an electrician.

In the event of unauthorised intervention in the braking device the warranty is invalidated.

Intervention of any kind must be agreed with ***Netter****Vibration*.

Errors of operation can be eliminated by careful reading of the operating instructions.
Electrical and mechanical faults may be identified and corrected with the aid of the circuit diagram or the relevant device description.

A defective fuse may only be replaced by a fuse of the same type and same amp rating. If the fuse repeatedly blows, the relevant electrical circuit of this fuse is to be checked against the circuit diagram.

13 Spare parts

Spare parts are classified into 2 groups.

- Spare parts with immediate availability
- Spare parts with a delivery period that is dependent on the third party supplier.

Spare parts for the vibration drives must be fitted by a trained expert.

Special training is required for spare parts that have been specially manufactured for the client.

The spare parts for the braking device and for the electrical installation must be fitted by an electrician. This electrician must be familiar with the protective measures.

Any defective part must be replaced by one of the same type.

If devices that contain a program have to be replaced, then ***Netter****Vibration's* Customer Service department must be involved.

14 Annex

14.1 Disposal

The parts must be disposed of correctly in accordance with the material.

All devices may be disposed of via Netter GmbH.
You will be given the disposal prices applicable on enquiry.

14.2 Annexes

Annex(es):

Further information may be supplied on request:
Brochure no. 8 etc.

Chemical resistance of the cables
Conformity or installation declarations
Brochures