

USER MANUAL

VIBRATION CONTROL

RMA-POWER-BOX 107/230

IMPORTANT NOTES



Electrical danger within the meaning of this documentation or the warning labels on the product itself respectively means that death, serious injury or considerable material damage may occur if the respective measures of precaution are not taken.



Achtung

Mechanical danger within the meaning of this documentation or the warning labels on the product itself respectively means that death, serious injury or considerable material damage may occur if the respective measures of precaution are not taken.



Disconnecting voltaged parts within the meaning of this documentation means that before maintenance, repair and installation work, the voltage must be switched off and secured against being switched on again.

Qualified Staff

According to this user manual and the labels on the product itself, qualified staff includes those persons, who are familiar with the installation, mounting, initial operation and operation of the device as well as the dangers associated with this and who have the qualifications necessary for their work, such as:

1. Training or instruction or authorisation respectively to switch electric circuits and devices on and off, ground and mark them according to the standards of safety engineering.
2. Training and instruction according to the standards of safety engineering concerning the care and use of adequate safety equipment.
3. First aid training

Intended Use

The RMA-POWER-BOX 107 must only be used for the control of our KÖBRATOR – oscillating rails.

Warranty

Adherence to the user manual is the pre-condition for a failure-free operation and for the settlement of possible claims under the warranty. Therefore, please study the user manual before you operate the device.

Disposal

Dispose of the RMA-POWER-BOX 107 depending on composition and existing regulations as:

- steel scraps
- aluminium
- copper
- synthetic material
- electronic scraps

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1. Safety Instructions



The RMA-POWER-BOX-107 carries dangerous voltage which can cause severe or fatal injuries.



Achtung

The RMA-POWER-BOX-107 controls oscillating mechanical parts (KÖBRATOR), which may be dangerous.



Safety measures and safety devices must correspond with the valid national regulations (e.g. VDE 0100 T410 /VDE 0113 T1 or EN 60204 / VDE 0160 respectively)
Necessary safety measure: grounding of the RMA-POWER-BOX-107
Necessary safety device: line safety switch (fuse is integrated)



Achtung

If you do not wish to install the device immediately, but instead wish to store it:
The storage place must be dry and clean;
the storage temperature must be between -25°C and $+85^{\circ}\text{C}$.



Check the device immediately for damaged packaging. Send complaints concerning damages immediately.
See to it that damaged products are not operated!



The connection, initial operation, as well as maintenance and repair work must only be executed by qualified expert staff, taking into consideration this manual and all other connection diagrams belonging to the RMA-POWER-BOX 107 and the presently valid national /international regulations (safety / accident prevention)



The RMA-POWER-BOX 107 is built for 115V or 230V operation. However, the voltage must be pre-set by the voltage selector switch inside the box. An incorrectly set switch can lead to the failure of the RMA-POWER-BOX!

We reserve the right to change technical data and constructions beneficial to technical progress.

2. Installation

2.1 Mechanical Installation

Should the RMA-POWER-BOX 107 have already been mounted by KÖBERLEIN, please disregard Chapter 2.1.



**When opening the cover, voltaged parts are uncovered.
When closing the cover, live lines can be pinched.**



There is danger of pinching when opening and closing the cover.

Achtung



MAKE SURE the voltage of the RMA-POWER-BOX-107 is disconnected before opening the cover.

If the box is delivered loose, mount it through the intended mounting holes. The distance between the vibration control and the KÖBRATOR should not exceed 10 meters. In order to access the mounting holes, the cover of the RMA-POWER-BOX 107 must be opened by removing the four bolts.



Loosen the four mounting bolts of the cover as shown.



Place cover near casing.
WARNING: Do not shear off any cables.
Now the mounting holes of the casing are accessible.



The drill hole distance is:
Horizontal: 125mm
Vertical: 112,5mm
Mounting bolts: max.: M4

2.2 Electrical Installation

Please be sure to note the safety instructions in Chapter 1 during the electrical installation!



THE DEVICE MUST BE GROUNDED.

Please be sure to note the safety instructions in Chapter 1 during the electrical installation!



BE SURE to disconnect the voltage of the RMA-POWER-BOX-107 before the connection and disconnection of the mains connector plug.

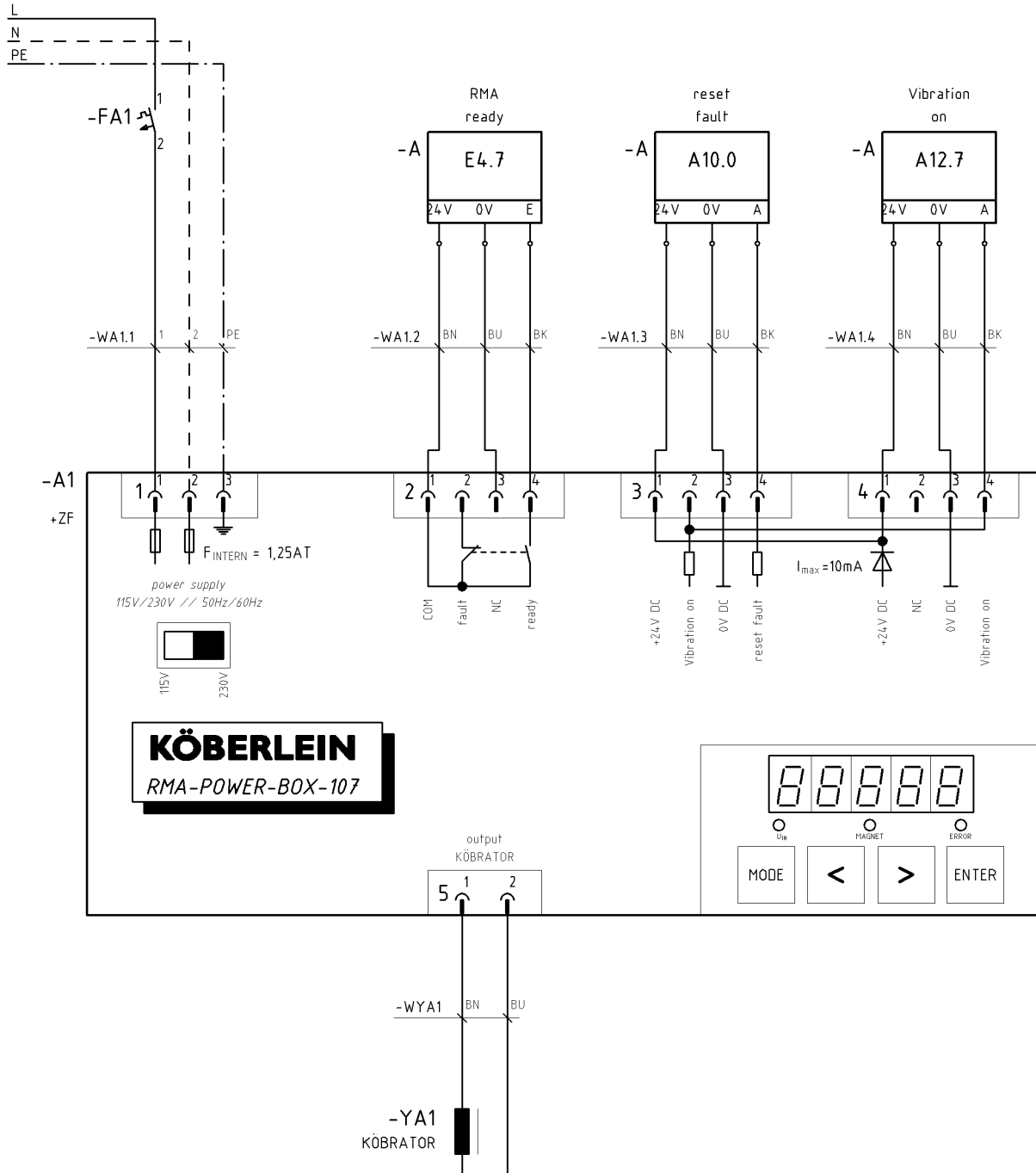
The mains supply line must be 1,5mm² or 2,5mm² (limited by the plug on the underside of the BOX). Make sure you pay attention to the voltage drop in case of longer lines! Only the delivered cable may be used as a connecting line for the KÖBRATOR. Only one KÖBRATOR may be operated at the output of the device!

Connect all electric connections according to the connection diagram (Example see Chapter 2.3)



- Plug 1:** Connection of the mains supply line
(plug included in the scope of delivery)
- Plug 2:** Connection of control, contact operative/ malfunction
M12 connection plug
- Plug 3:** Connection of control, Reset malfunction (+ alternatively vibration on)
M12 connection plug
- Plug 4:** Connection of control, vibration on
M12 connection plug
- Plug 5:** Connection of KÖBRATOR magnet
(plug and line included in the scope of delivery)

2.3 Connection Diagram (Example)



3. Technical Data

Operating Voltage:	115 / 230V +/- 10% (must be set with the switch!)
Frequency:	50 60Hz
Power consumption:	max.60VA
Recommended Pre-fusing:	2 A / characteristic line C
Magnet – Output: adjustable output voltage adjustable output frequency: smallest frequency interval: maximum connecting power: Disconnection in case of:	15Vss ... 30Vss 10.00Hz ... 99.99 Hz 0.01Hz 50VA overcurrent, short circuit, derating, open circuit
Inputs: Input „vibration on“: current consumption at 24V DC: Input „Reset“: current consumption at 24V DC:	approx. 7mA approx. 7mA
Relay output floating: Maximum contact load	30V DC 0.5A
Operating ambient temperature: Storage:	0 ... 50°C -25 ... 85°C
Measurements: W x H x D	140x180x72mm
EMV - Test	According to EN55011 EN61000-3-3 (system perturbation)
Protection class:	I (grounded)
Protection type:	IP65 (with screwed connecting lines)

4. Commissioning



Before commissioning, the safety instructions in Chapter 1 regarding the dangers of electrical systems must be observed.



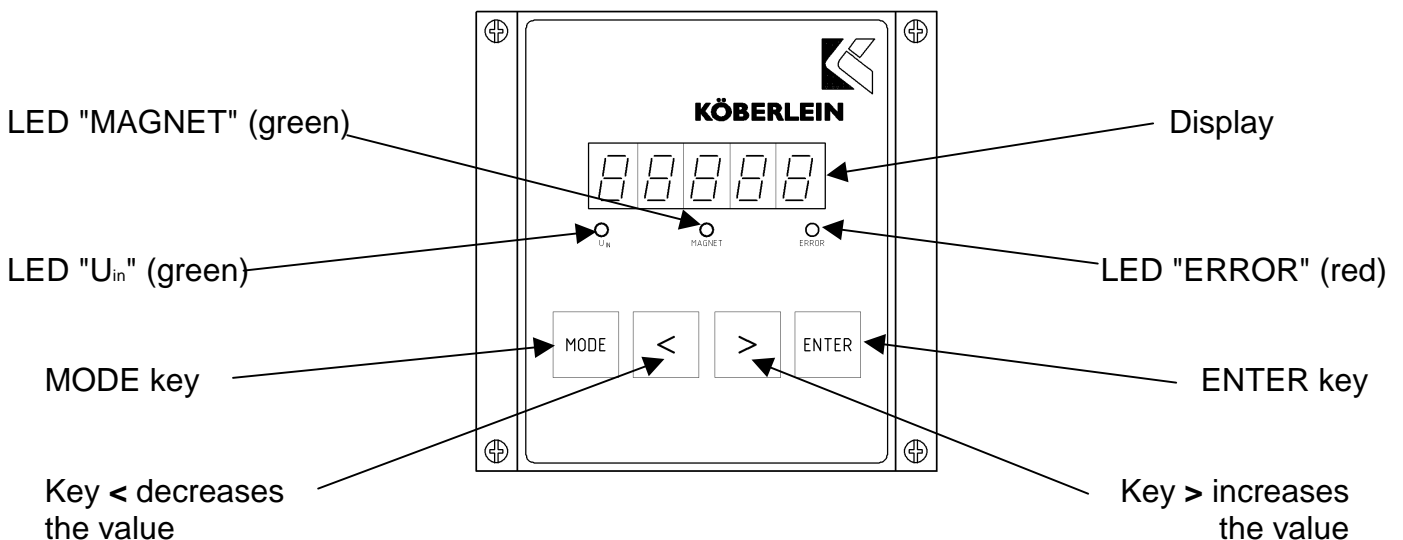
Achtung

Before commissioning, the safety instructions in Chapter 1 regarding the dangers of mechanical systems must be observed.

When installation has been concluded, as described in Chapter 2, commissioning can be started. Switch on the supply voltage to the RMA-POWER-BOX 107. The display now shows the Program Version No. for 5 seconds. Subsequently, the RMA-POWER-BOX 107 signals that it is ready for operation via Plug 2. After power-up, the Auto Mode is always active. The input "Vibration ON" (Plug 4) can be used to switch the magnet on/off, e.g. by means of a PLC. With the magnet switched off, the display shows "A 0". With the magnet switched on, the display shows the preset vibration value, e.g. "A 87".

5. Operation

5.1 Operating and display elements



Briefly pressing the keys < or > decreases/increases the corresponding parameter in small steps. Holding the keys < or > down starts the fast mode, which permits rapid changing of the setting. The adjusted values must be stored by pressing the **ENTER** key. Pressing the **MODE** key takes you to the next operating mode or to the next adjustment parameter.












5.2 Permanent displays

The LED "U_{in}" lights up as soon as the supply voltage is connected to the unit.

The LED "MAGNET" blinks with the preset magnet output frequency as soon as the output is active.

The LED "ERROR" lights up as soon as the unit detects a fault (for details, see Chapter [6. Troubleshooting](#)).

5.3 User menu

Display	Description	Value / function
	Display of the Program Version 2.2	Only display
	Indication of an error or fault (for details, see Chapter 6. Troubleshooting).	Only display
	Automatic Mode – (normal operating mode) the selected vibration power is shown.	Only display 0...100%
	Automatic Mode disabled – the key lock is active. Operation as in Automatic Mode.	Pressing  for 10 sec. toggles the key lock on/off.
	Hand Mode – here, the vibration power for automatic operation can be changed.	0...100%
	Basic Mode Pressing the following key combination takes you back to the Main menu . Hold down   and press  three times.	Pressing  stores the vibration output value adjusted under "u" in the Main menu.

5.3.1 AUTO Mode

In the **Auto Mode**, the magnet can only be operated via the input "Vibration ON" (Plug 4). With the magnet switched off, the display shows "**A 0**". With the magnet switched on, the display shows the preset vibration value, e.g. "**A 87**". The output power cannot be changed in this operating mode.

The **key lock** can **only** be activated in the **Auto Mode** by pressing the **ENTER** key for 10 sec. The display shows **AL** (=> AUTO LOCK).

To deactivate the key lock, simply press the **ENTER** key again for 10 sec.

5.3.2 HAND Mode

In the **Hand Mode**, the output power for the magnet is permanently on. The display shows the currently selected value (e.g. **H 87**). By pressing the keys **<** or **>** it is possible to change the vibration power. Pressing the **ENTER** key stores the changed value for the **Auto Mode** (the value is maintained also in case of a power failure). If no key is pressed during 1 minute, the unit automatically switches back into the **Auto Mode**.






5.3.3 BASIC Mode

Also in the **Basic Mode**, the output power for the magnet is permanently on. The display shows the currently active output value (e.g. **G 87**).

Pressing the **ENTER** key transfers the factory setting to the **Auto** and **Hand Modes**.

Access to the **Main menu** from the **Basic Mode** is via a special key combination (see table in Chapter [5.3 User menu](#)).

5.4 Main menu

Display	Description	Value / function
	Vibration power – here, the standard factory setting for vibration power can be changed for automatic operation.	0...100%
	Resonance frequency of the magnet.	10.00 Hz...99.99 Hz
	Soft start – here, a specified time can be adjusted, during which the unit transmits the resonant frequency to the magnet.	0...255%
	Display of the unit's Serial No.	Only display
	Delay – here, a delayed switch-off for the input "Magnet ON" can be activated.	0 = Off 1 = On

Holding down the **ENTER** key for 3 sec. takes you back to the **User menu**.

5.4.1 Parameter "u" – Vibration power

This parameter has been preset to an optimum value (e.g. 60) at the factory. The value is stored for all Modes.

If the operator has changed the vibration power value in Mode "H" (e.g. to 87), Modes "A" and "H" can be reset to the original factory setting (stored in Parameter "u", e.g. 60) by means of the Basic Mode "G".

The setting in Mode "H" has priority.

5.4.2 Parameter "F" – Frequency

This parameter is used to preset the magnet voltage frequency. Every unit has been preset at the factory with the specific frequency of the KÖBRATOR. However, the resonance of the overall system depends on various factors. Therefore, it might be necessary to do some **fine tuning after the system has been installed**.

Proceed as follows for fine tuning:

Set Parameter "u" to 100%, and store by pressing ENTER. Change to parameter "F", and use key ">" or "<" to adjust the maximum vibration amplitude. Store this setting by pressing the ENTER key. Now change back to Parameter "u", and adjust the optimum vibration power for the component. Press ENTER to store the value. Now hold down the ENTER key until the display changes to Mode "G" (Basic Mode) in the User menu. Pressing the ENTER key again will transfer the value adjusted in "u" into the Modes "A" and "H".

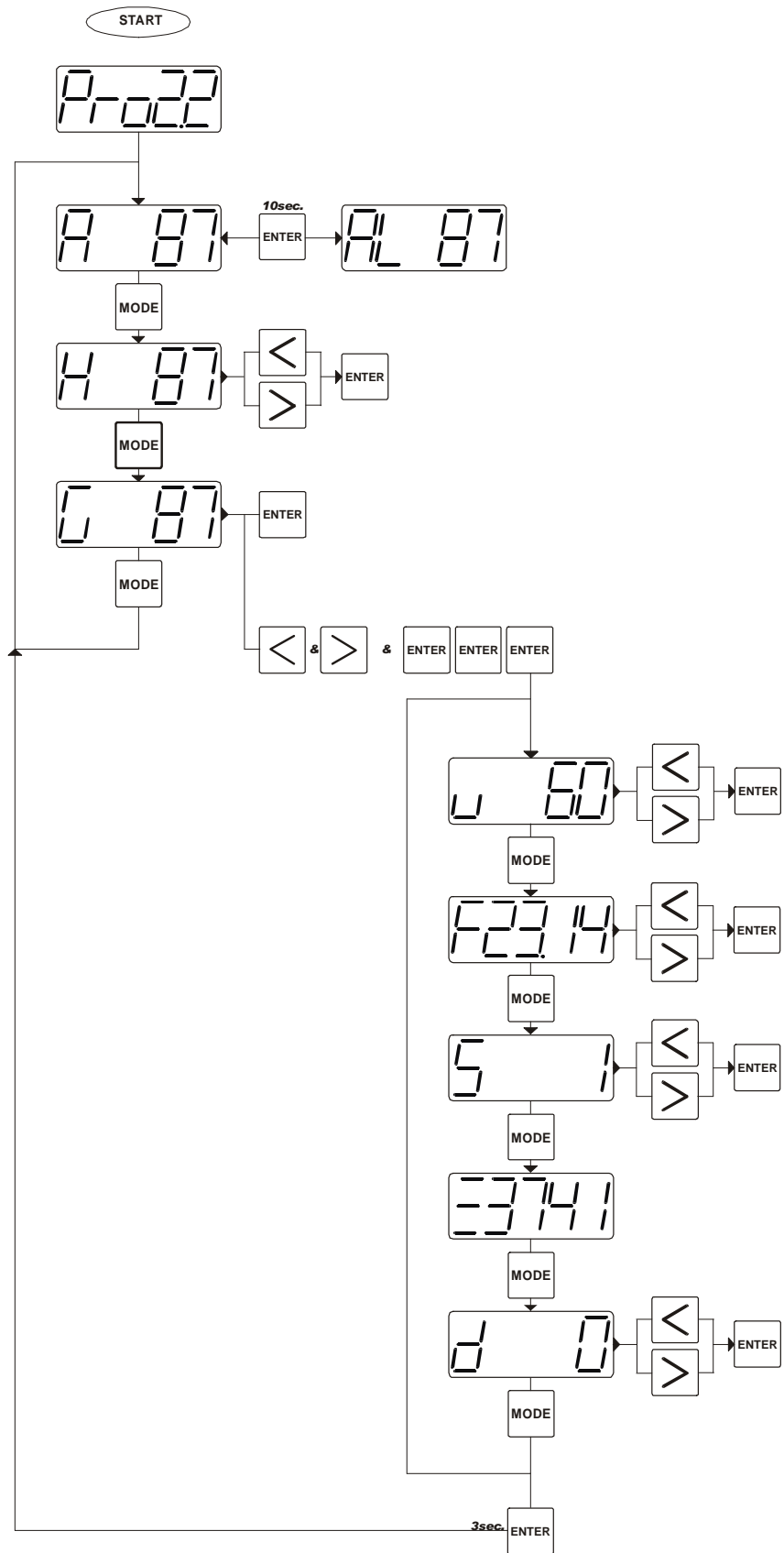
5.4.3 Parameter "S" – Soft start

Parameter "S" enables a delay time to be adjusted, during which the unit transmits the resonance frequency to the magnet. This delay prevents the magnet "bottoming" on the yoke during start-up.

5.4.4 Parameter "d" – Delay

Parameter "d" – causes the magnet to be switched off only after a delay (=1) time has elapsed. This might be necessary e.g. with timed outputs of safety control systems, to prevent inadvertent operation of the magnet output.

5.5 Menu structure



6. Troubleshooting

6.1 In case of a fault

The following applies for all operating modes:

Should a malfunction occur with the magnet (open or short circuit), the display changes to **ERROR**, and the unit switches into the Fault Mode. The magnet output (Plug 5) is switched off, and the potential-free relay (Plug 2) is de-energized. Evaluation of the malfunction is possible via pins **1, 2, and 4**.

Together with the **ERROR** display, the **red "ERROR" LED** lights up.

The malfunction can be acknowledged either by pressing the **ENTER** key, or by means of the input "Fault reset" (Plug 3). Subsequently, the RMA changes back into the **Auto Mode**.

6.2 Locating the fault

This chapter on troubleshooting only covers the components of the RMA-POWER-BOX 107 in connection with a KÖBRATOR.



Troubleshooting only by qualified staff!



Troubleshooting only by qualified staff!

Achtung



BE SURE to disconnect the voltage of the RMA-POWER-BOX-107 before opening the cover.

6.2.1 Error list

Malfunction	Cause	Solution
There is supply voltage, but there is no display	Fuse defect	Replace fuse by expert staff (see Chapter 7.2)
The output MAGNET is selected, however, no vibration can be determined in the KÖBRATOR	KÖBRATOR is jammed mechanically or Distance between yoke and magnet in the KÖBRATOR has changed	Turn off device and determine whether KÖBRATOR is jammed Please contact the service technicians in our company in the manufacturing department "Elektro" in order to find out the set interval between the yoke and the magnet.
Display ERROR	Electric connection between KÖBRATOR and RMA 107 is interrupted or Magnet in the KÖBRATOR defect	Control plug-in connection on the back of the KÖBRATOR. Determine resistance of the magnet in the KÖBRATOR, possibly replace magnet. (Please consult the KÖBRATOR maintenance manual and spare parts list for the magnet resistance.)

6.3 Replacement of fuses



When opening the cover, live parts are uncovered.
When closing the cover, live lines can be pinched.



There is danger of pinching when opening and closing the cover.

Achtung



MAKE SURE the voltage of the RMA-POWER-BOX-107 is disconnected before opening the cover.



Disconnect the voltage of the RMA-POWER-BOX 107 and secure it against being switched on again. Open the four mounting bolts of the cover as shown.



Place cover near casing.
WARNING: do not shear off any cables
Now the mounting holes of the casing are accessible



Remove defective fuses and replace with new fuses. (I=4A T)

Close cover and re-initiate operation of the device.