Repair Guideline Magma

Art. Nr. 2300.0000 (230 V / 50/60Hz)
Art. Nr. 2300.0500 (230 V / 50/60Hz)

Date	Engineering change	release
08.06.2009	Initial version	MM
02.02.2012	Change of Muffle, Version B added	MM

02/2012 Valid for version A and B

Contents

1 Safety information

These repair guidelines include essential notices that must be observed during repair work. It is important the service technician read these guidelines before beginning repairs. Not only the general safety instructions under the main safety notices should be observed, but also the additional specialized safety instructions.

1.1 Information symbols in the repair guidelines

Failure to obey safety instructions included in this guideline may result in personal injury and are marked with danger symbols

 Warning symbol: general danger

Failure to obey safety instructions may result in damage to the appliance and its proper functioning and are identified by the following symbol.

 Waning symbol: risk of electrical shock!

When you see this sign, you should always check for the appliance for being voltage free and being protected against enabling by mistake.

Caution!

The Caution! box denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a caution box until the indicated conditions are fully understood and met.

 Warning notice: Electrostatically endangered parts

 Warning, hot surface

 Wear dust mask

 Wear gloves

Notices found on the appliance itself must be observed without fail.

1.2 Qualification and training

Personnel deployed on repair and maintenance work must be adequately qualified. If personnel do not have the necessary qualifications, they must be instructed or trained as required. Further, it must be ensured that personnel fully understand the content of these guidelines.

1.3 Repair works safety instruction

The preheating furnace is an electrical device with inherent hazard potential. This device may only be installed and operated by authorized specialists after examination of compliance with locally applicable standards. The following safety instruction must be strictly observed during operation and maintenance works

- Only intended for indoor use. The unit is only designed for dry applications and may not be operated or stored outdoors or under wet conditions.
- The unit may not be taken into service until any required alterations to comply with regionally specific power plug configurations have been made. Such alterations may only be performed by a qualified electrician.
- The unit may only be operated if the information on the nameplate conforms with the specifications of your local mains power supply.
- The unit may only be plugged into an outlet which is connected to a ground wire system.
- Regularly inspect connecting lines and hoses (e.g., the power cord) for damage (e.g., kinks, cracks, porosity) or signs of aging. Units exhibiting damaged connecting lines, hoses, or other defects must be taken out of service immediately.
- Always unplug the unit from the wall outlet before beginning any work on the unit's electrical components.
- Only operate the oven with the supplied ceramic pad.
- The oven must be immediately taken out of service if cracks result in a risk of the heating elements being able to be touched
- Warning:
  Burn hazard. The exterior of the oven as well as the oven door may be hot.
- Caution
  Burn hazard Only open the door with the handles.
- Warning
  If waxes have not completely combusted, they may burst into fl ame when the door is opened.
- Caution
  Burn hazard! Use sufficiently long tongs to remove hot casting dies.

- Only wear clothing made of non-melting material (cotton).

- Caution
  Burn hazard! Always wear heat protection gloves when loading or unloading the oven.

- Caution
  Opening the oven door may release an initially hazardous amount of heat. Always wear face protection when loading or unloading the oven.

- An “Err” display may indicate an overheating of the oven. Do not touch the oven. Burn hazard!

- Switch the oven off at the main power switch and allow it to cool off.

- Warning
  Only operate the oven in well ventilated rooms. Vapours generated during waxing and preheating must be removed by a suitable extraction hood. Refer to the wax and investment material manufacturers’ safety data sheets and comply with all local regulations with regard to possible hazards associated with these vapours.

- The oven may only be set up on a non-flammable and non-combustible surface. Never place any flammable or explosive materials on the oven or store them in the vicinity of the oven.

- Never store any flammable or explosive liquids or gases in the vicinity of the oven.

- Never heat liquids in the oven.

Particles of the door firebrick and the insulating material can be hazardous if inhaled! Do not damage the door firebrick. Wear personal protective equipment such as respiratory protection and gloves when changing the door firebrick or the muffle.

1.4 Modifications without approval from the manufacturer

Rebuilding or changes to the appliance are only permitted with the manufacturer’s consent. Original spares and accessories serve the appliance's safety. The use of spares other than those provided by the manufacturer is forbidden.

1.5 Disclaimer

Renfert GmbH shall be absolved from all claims for damages or warranty if:

- The product is employed for any purposes other than those cited in the operating instructions;
- The product is altered in any way other than those alterations described in the operating instructions;
- The product is repaired by other than an authorized facility or if any but original Renfert parts are used;
- The product continues to be employed, despite obvious safety faults or damage;
- The product is subjected to mechanical impacts or is dropped.

2 Contact and Service address

If you have any enquiries about operation or servicing, please contact us at the following address

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Industriegebiet
78247 Hilzingen

Phone: ++49 (07731) 8208-0
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E-Mail: info@renfert.com
Internet: www.renfert.com

Customers in the USA, Canada and Mexico please contact

Renfert USA Inc.
3718 Illinois Avenue
St. Charles, Illinois 60174
U.S.A

Phone: ++1 630 762-1803
Toll free: 1 800 336-7422
Fax: ++1 630 762 9787

Internet: www.renfertusa.com

3 Needed tools and utilities

- Set of Torx screwdriver

3.1 Test equipment

- Thermometer
- Ohm-meter

4 General Overview

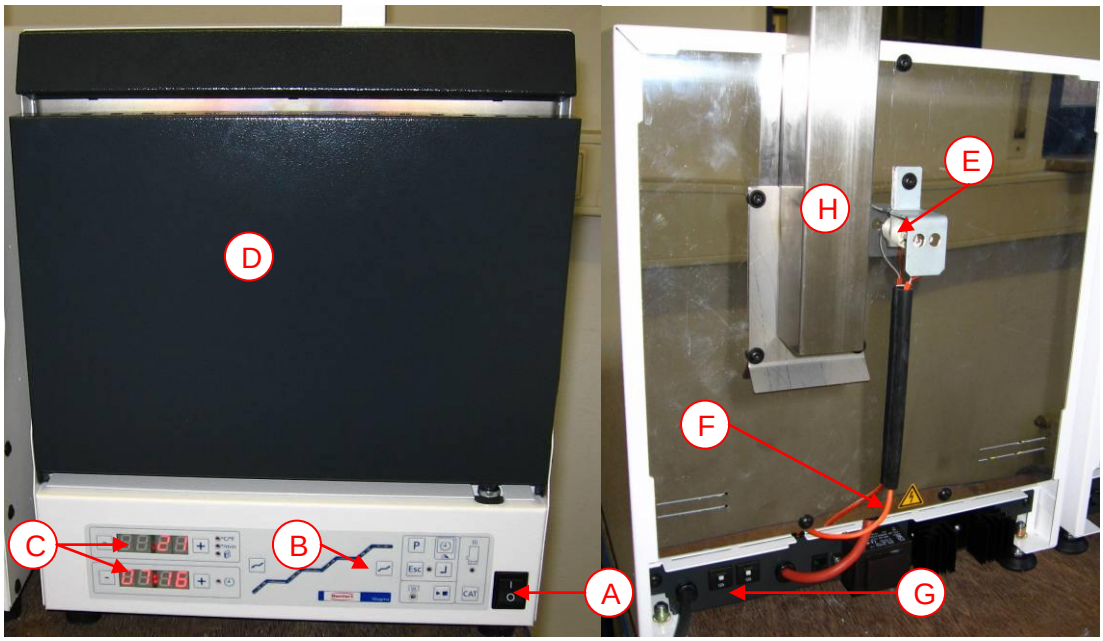


Fig.1 - Overview

Pos.	Description
A	ON/OFF switch
B	Operating panel
C	Display for temperature and time
D	Door
E	Thermocouple
F	Wire for Thermocouple
G	Fuses and power supply
H	Flue

4.1 Description / Application area

The Magma preheating oven is solely intended for use in dental technology laboratories as well as arts and crafts and jewellery workshops. The preheating oven is solely intended for waxing up and preheating casting dies. Only modelling waxes and modelling plastics may be employed as modelling materials. Only specialist personnel may operate the unit as incorrect operation can result in extreme deterioration in the quality of individual pieces and may also present extreme hazards to the operator.

WARNING!

The unit operates with 230V~, Internal parts of the unit therefore carry potentially lethal voltages. Always remove the mains plug before carrying out repair work

4.2 Technical Data

Mains voltage	230 V / 50 Hz
Power consumption	1900 W
Device fuses:	230 V = 12 A (T)
Temperature range	Ambient temp. – 1100°C (2010°F)
Heat up rate:	0°C/Min – 9°C/Min (0°C/Min – 17°F/Min)
Muffle size (height x width x length):	120 x 160 x 180 mm [4,7 x 6,3 x 7,1 inch]
Dimensions incl. 1 handle and flue (height x width x length):	500 x 430 x 440 mm [19,69 x 16,93 x 17,32 inch]
Dimensions incl. 1handle and catalytic converter. (height x width x length):	610 x 430 x 550 mm [24,02 x 16,93 x 21,65 inch]
Weight (empty):	Approx. 30 kg

5 Repair Works

5.1 Door removal/mounting, Change of door firebrick

5.1.1 Replacing of the handle

Using the included screw, mount the handle on the side of the oven door (Figure 1), 4mm SW Allen key. The handle can be mounted on either the left or the right side. Installation of the handle is described in the operation manual.

5.1.2 Door removing

- Switch the oven off and unplug the power cord at the wall outlet.
- Allow the oven to cool off.
- Completely open the door.
- Unhook the springs from their holder in the door (Fig 2)

Injury hazard!
The springs are under tension. Hold them when loosening.

- Push the springs sidewards out of the pivots. Mark springs in order to avoid a mix up of the springs.

Fig.2 – spring hook out

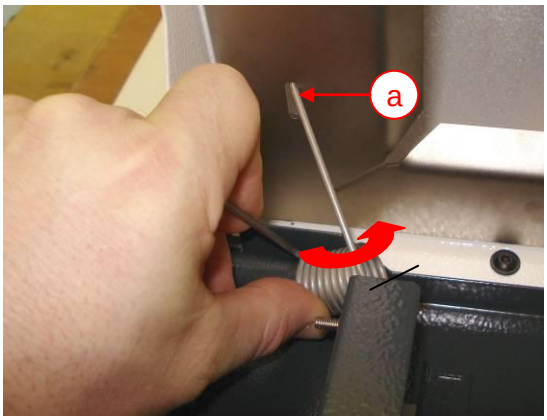


Fig. 3 - remove spring

- Unscrew and remove the door's fastening screws (Fig 4+5 a)

Fig.4 – left screw

Fig. 5 – right screw

- Gently press the metal housing outwards (Fig. 6 a) until the door is released from its retainer
- Remove the door to the front (Fig. 6b)

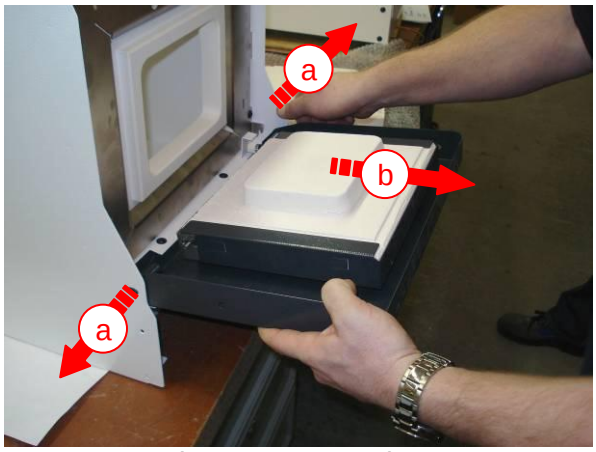


Fig.6 – Remove door

5.1.3 Replace door firebrick

- Remove door according to 5.1.2.
- After loosen the 2 pc. M4 nuts (Fig. 7 b), remove the firebrick holder (Fig. 7 a).

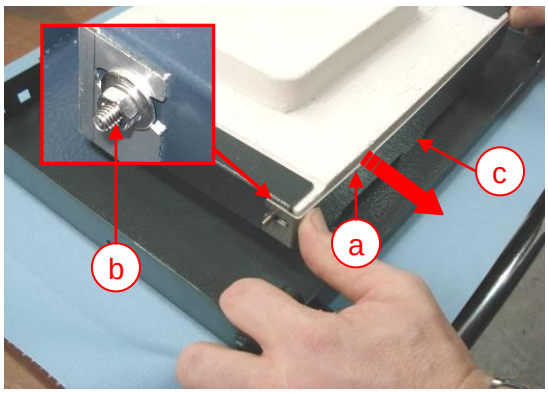


Fig. 7 – Remove firebrick holder

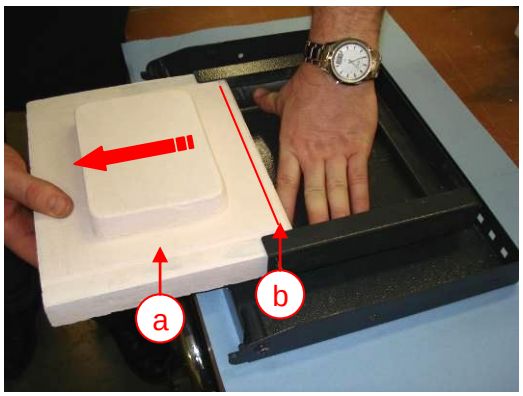


Fig. 8 - remove firebrick

- Pull the firebrick out of the door housing carefully. (Fig. 8 a).

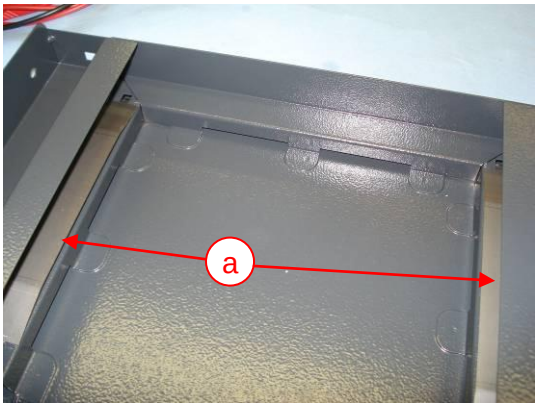


Fig. 9 – Flat spring for firebrick

- Check the flat springs (Fig. 9 a) for correct seating.
- Install the new firebrick in reverse order. Take care that the cutout of the firebrick (Fig. 8 b) is located at the upper end of the door.
- Install the brick holder and fasten the 2 nuts (Fig 7a). Adjust the lugs at the side of the side of the door housing in order to prevent the firestone from being installed inclined.
- Take care the lug of the holder is engaged in the door housing (Fig. 7 c)

5.1.4 Door sensor replacement

Caution!
The door sensor is a safety component. It may not be manipulated. After replacing the sensor it must be examined!

A sensor located on the underside of the door is used to detect the door position. Should the oven overheat, the sensor can become inactive so that the door's closed state will no longer be detected.

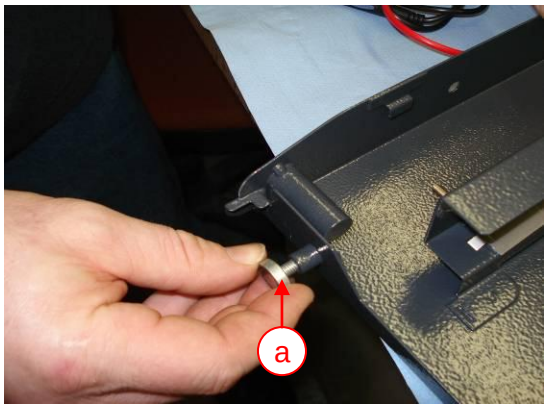


Fig. 10 – Door sensor


Fig. 11 – mounting of sensor

- After the door is removed according to 5.1.2 the sensor (Fig. 10 a) can be removed by unscrewing and may be replaced if necessary.
- The sensor (Fig. 10 a) can be replaced using pliers (Fig 11)

5.1.5 Door mounting.

- Assembling of the door is carried out in reverse sequence.
- First, check correct seating of firebrick and (5.1.4) and door sensor (5.1.3)

- Reinsert the door (Fig 6) in the housing and screw the fastening screws (Fig 4 + 5) down.
- Check door for smooth closing and opening.
- Install the door springs. For this:
  - Load the springs manually
  - Insert the springs into the opening in the oven wall. (Fig 3 a)
  - then rotate them and pull them back onto the pivots (Fig.3)
  - Hook the springs to the door retainer (Fig. 2)

- There are 2 different springs installed. Take care not to mix them up.

5.2 Rim stone replacement.

5.2.1 Remove the ledge

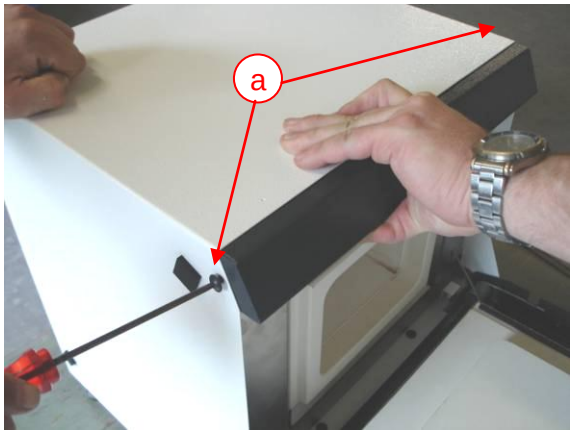


Fig. 12 – Unscrew the ledge


Fig. 13 – pull out the ledge

- Remove the 2 screws (Fig 12a) at the upper front end of the housing.
- Pull the ledge to the front downwards and push it to the top afterwards.

5.2.2 Removing front panel and replacement of rim stone

- Remove door according to 5.1.2
- Remove the ledge according to 5.2.1

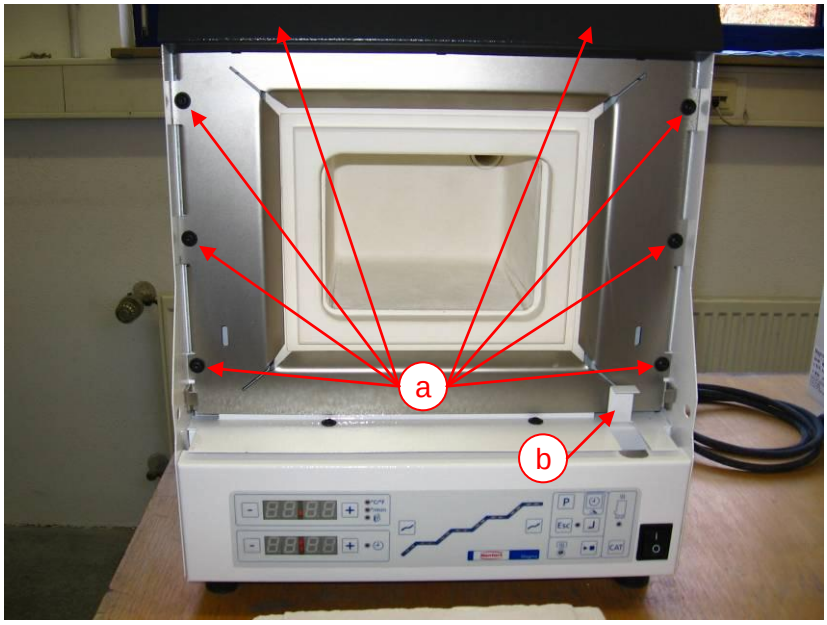


Fig. 14 – front panel and rim stone

- Remove the 8 screw (Fig. 14 a) from front panel and pull the front panel carefully to the front.
- Now the panel can be removed upwards.
- Now you can access the rim stone which can be changed easily

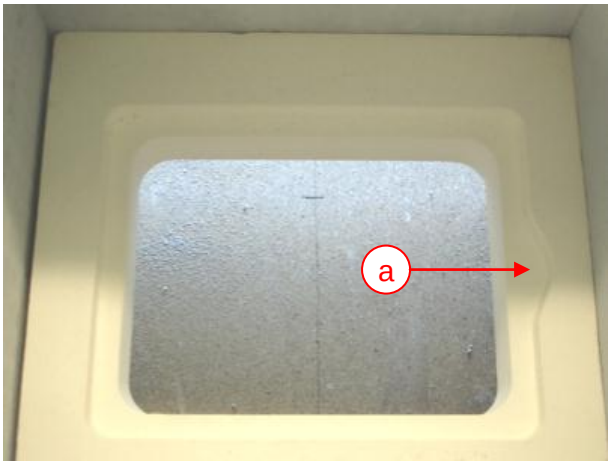


Fig. 15 – rim stone rear side.

- New rim stone needs to be installed in the correct way. New rim stones may be divided in 2 parts (upper and lower) but they are compatible.
- The inner cutout has to fit the front edge of the muffle.
- The right side of the rim stone (Fig. 15 a) should be placed at the wire output of the muffle. The gap between rim stone and muffle must be less than 2 mm.

5.2.3 Install front panel and ledge.

- Install front panel from top.
  Take care that the panel is placed behind the white metal (Fig 14 b.
- Fasten the panel using 8 Torx screws T20. (Torque 1,4Nm)
- Check whether the upper edge of the front panel is placed parallel to the housing and whether the rim stone is centred inside the front panel.
- Install ledge in reverse order. Fasten the 2 screws (Fig. 12 a). Torque = 1,4 Nm

5.3 Control unit and backup battery

5.3.1 Operating unit board

- Switch the oven off and unplug the power cord at the wall outlet.
- Allow the oven to cool off.

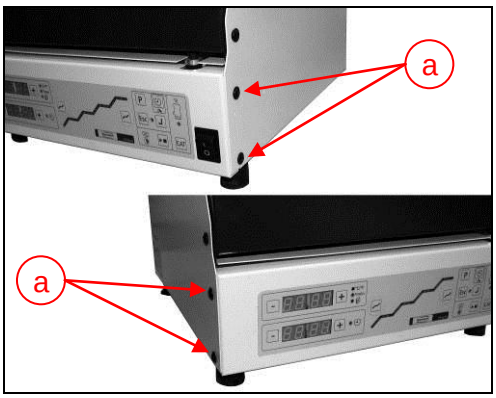


Fig. 16 – Removing operating unit

- Loosen the operating unit fastening screws (Fig 16 a)
- Pull the operating unit out towards the front and lay it aside.
- Unplug the ribbon cable (Fig. 17) and close the connector retainer clips.

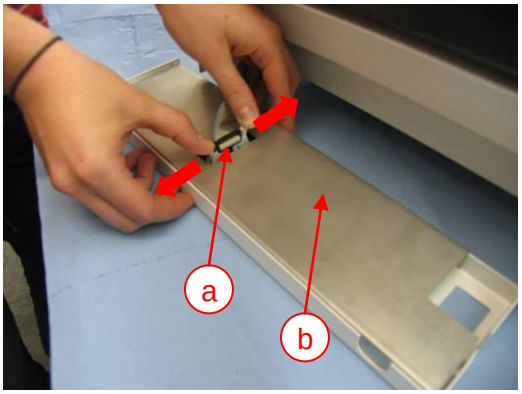


Fig. 17 – unplug ribbon cable

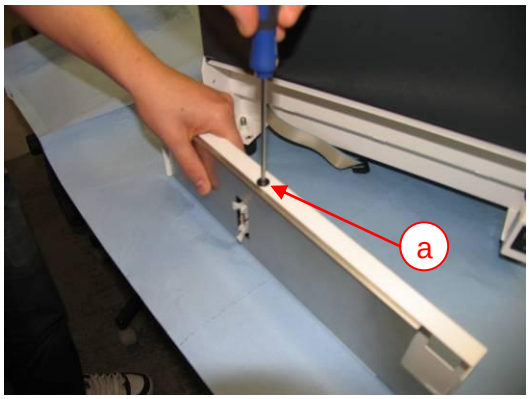


Fig. 18 – open the operating unit

5.3.2 Replace the processor circuit board.

Caution!
Please pay attention to the handling precautions.
Components endangered electrostatically.

- Remove operating unit according to 5.3.1
- Loosen the top housing cover screw (Fig. 18 a).
- Remove the top housing cover (Fig. 17b)

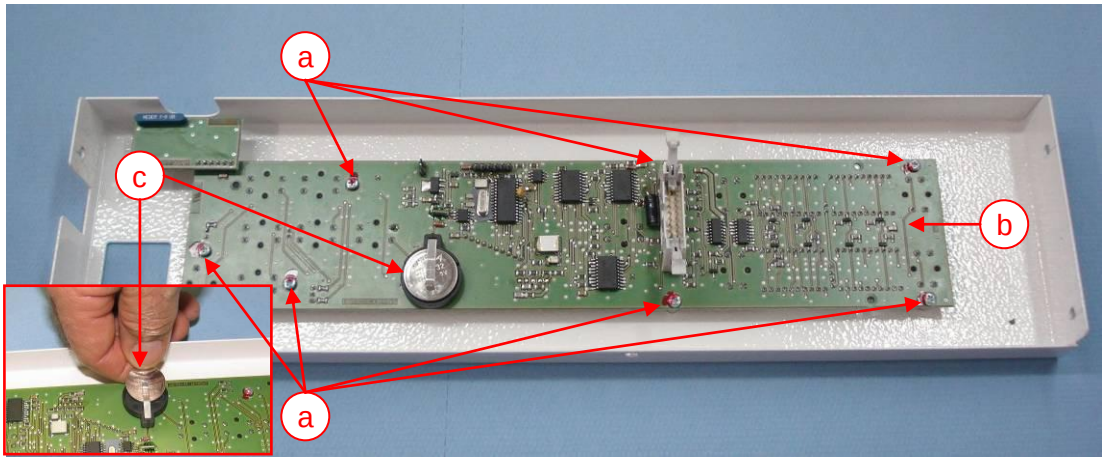


Fig. 19 – processor circuit board.

- Remove the 7 screws (Fig. 19 a).
- Remove processor circuit board (Fig. 19 b) from housing.
- Install new board in reverse order.

5.3.3 Backup battery replacement

- In order to keep the internal clock running when unit is switched off, a back up battery for the clock is necessary. If the battery is empty, the „year“display is flashing all the time you switch on the unit.
- To replace the battery, remove the control unit according to 5.3.1.
- Loosen the top housing cover screw (Fig. 18 a).
- Remove the top housing cover (Fig. 17 b)
- Replace the battery (Fig. 19 c), taking care not to reverse the polarity. The + pole is on top.
- When reinstalling the top housing cover, make sure no components on the PCB are damaged!

5.3.4 Installing control unit

- Check whether the locking mechanism if the connector is closed (Fig 17 a)
- When reinstalling the top housing cover, make sure no components on the PCB are damaged!
- Replace the top housing cover and secure it with the screw (fig 18 a)
- Reconnect the ribbon cable (Fig 17 a)
- Lock the cable connector completely.
- Push the operating unit straight back into the oven and secure it with the 4 screws (Fig 16 a)
- Check the system time and reset, as required.

5.4 Thermocouple replacement.

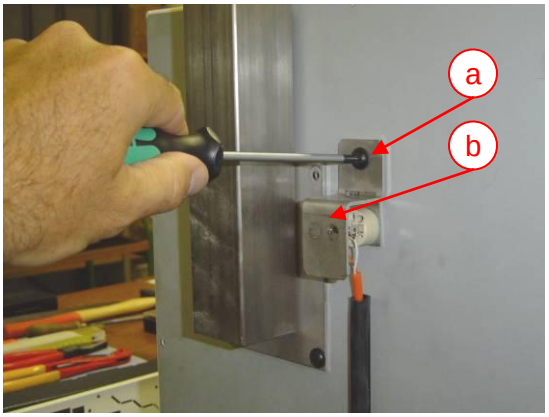


Fig. 20 – thermocouple cover

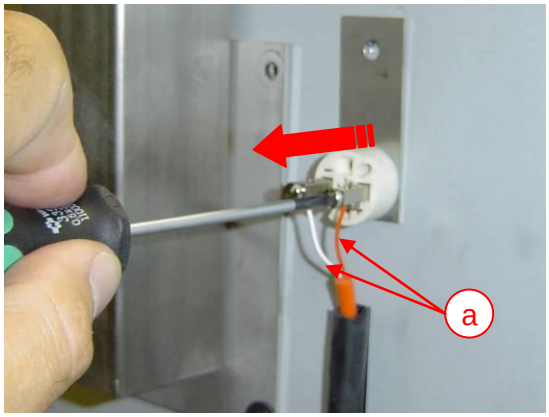


Abb. 21 - thermocouple wires

The thermocouple must be replaced if the protective ceramic tube surrounding it is damaged. Proceed as follows:

- Switch the oven off at the main power switch.
- Unplug the power cord at the wall outlet.
- Turn the oven so that the thermocouple on the back is easily accessible.
- Loosen the fastening screw (Fig 20 a) and remove the protective cover (Fig. 20 b)
- Disconnect the compensating wire (Fig. 21)
- Pull the thermocouple straight out, towards the rear.
- Insert a new thermocouple into the oven, making sure it is straight.
- Connect the compensating wire, making sure the colours match
  - White: Negative
  - Orange: Positive

- Install the protective cover and secure it together with the thermocouple using the fastening screw

5.5 Replacing power electronics

Caution!
Please pay attention to the handling precautions.
Components endangered electrostatically.

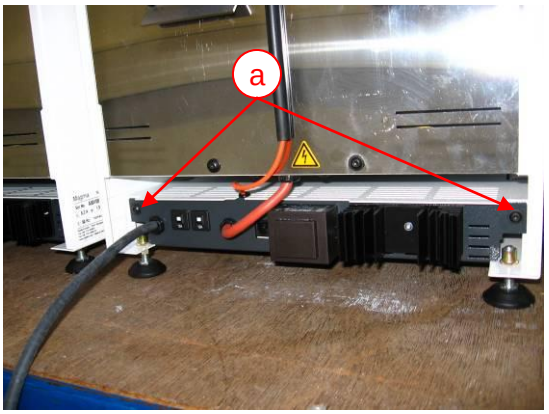


Fig. 22 – fixation of power electronics.

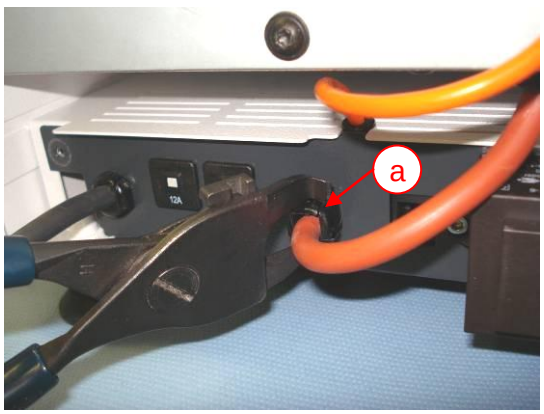


Fig. 23 – strain relief, heating cable.

- Switch the oven off at the main power switch.
- Unplug the power cord at the wall outlet.
- Remove the 2 fixation screws at the rear side of the unit. (Fig. 22 a)
- Loosen strain relief of the heating cable (Fig. 23 a)
- Remove the sensor wire from thermocouple (Fig 21) and pull the compensating wire out of the guide (Fig 24 a)
- Pull the power electronics straight out, towards the rear

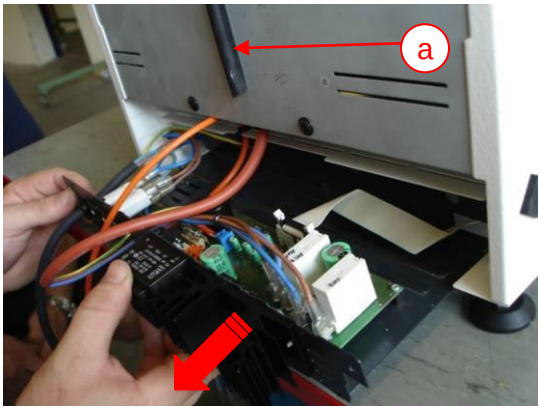


Fig. 24 – removing power electronics

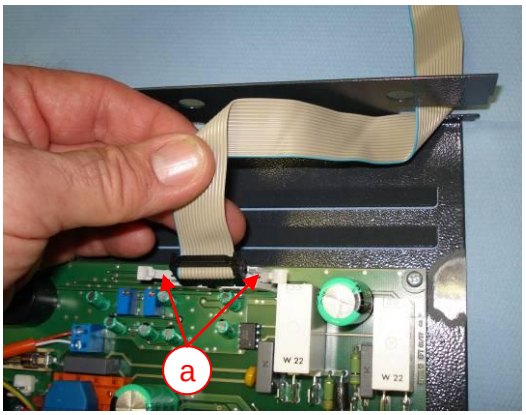


Fig. 25 – connection of the ribbon cable

- Unplug the ribbon cable to the control unit (Fig 25). Press lock levers to the side (Fig. 25 a)
- Remove the compensating wire from connector by unscrewing (Fig. 26 a)

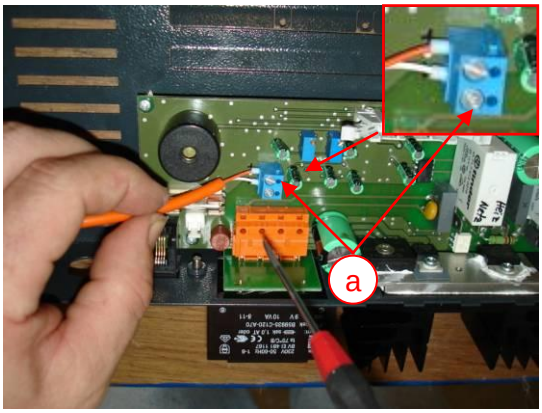


Fig. 26 – compensating wire connector

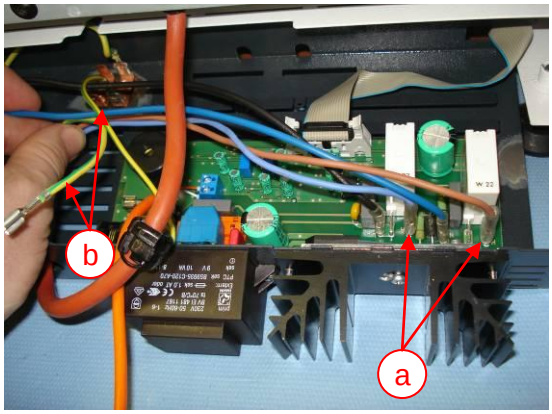


Fig. 27 – unplug heating wire

- Unplug the heating wire from circuit board. (Fig. 27 a)
- Unplug the grounding connector from chassis (Fig. 27 b)
- Remove heating wire from chassis.
- Now the power electronics can be removed.
- The installation of new power electronics must be done in reverse order. Take care of the following details:
- When connecting the compensating wire, making sure the colours match
  - White: Negative
  - Orange: Positive
- Lock lever of the ribbon cable must be locked completely (Fig 25 a)
- Heating cable must be connected to the terminals “H” at the circuit board. (Fig 27 a)
- Grounding wire must be connected to the chassis terminal.
- When reinstalling the cables, make sure no components on the PCB are damaged and the cables are not kinked.

5.6 Compensating wire replacement

- Remove the compensating wire from thermocouple (Fig 21) and pull the compensating wire out of the guide (Fig 24 a),
- Remove the power electronics according to 5.5
- Remove the compensating wire from connector by unscrewing (Fig. 26 a)
- Install new wire in reverse order. Change the bushing (Fig. 28) from old to new wire.
- When connecting the compensating wire, making sure the colours match
  - White: Negative
  - Orange: Positive

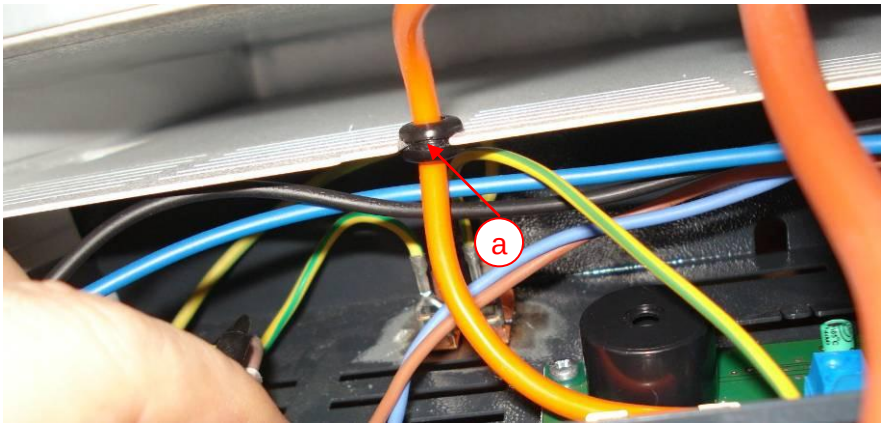


Fig. 28 – bushing at compensation wire

5.7 Remove the heating cable

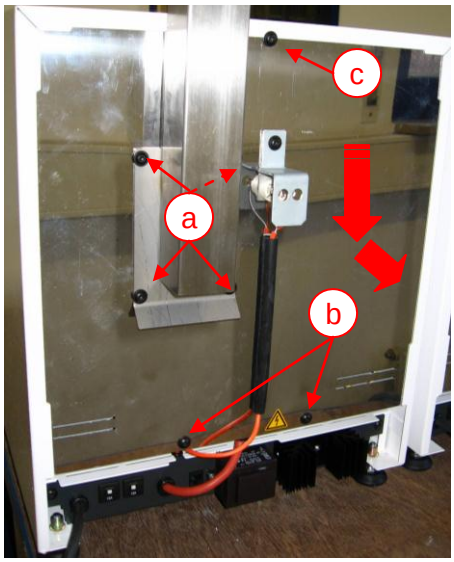


Fig. 29 – rear wall

- First remove the flue by removing the 4 screws (Fig. 29 a)
- Remove the power electronics according to 5.5 8 (Just unplug the heating wire)
- Remove the compensating wire from thermocouple (Fig 21) and pull the compensating wire out of the guide (Fig 24 a),
- Remove thermocouple according to 5.4

- Remove the rear wall by unscrewing the screws (Fig 29 b) and loosening the upper screw (fig. 29 c)
- Unplug grounding wire at the rear wall terminal.

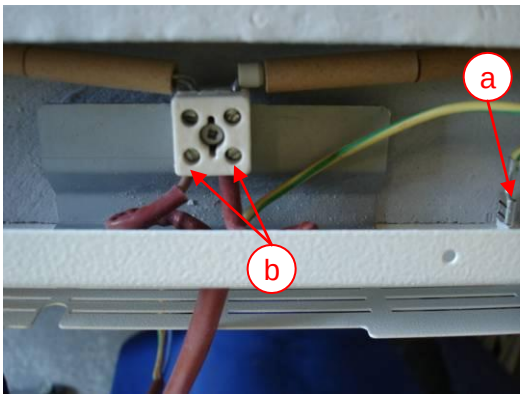


Fig. 30 – heating wire

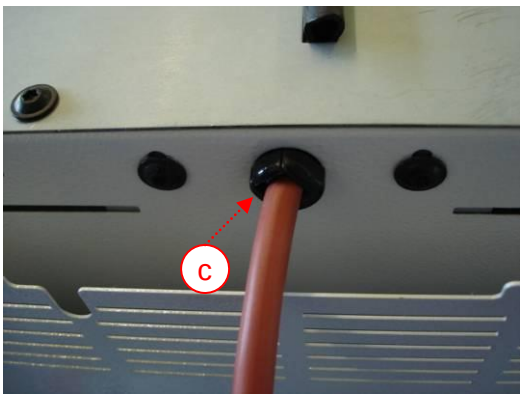


Fig. 31 – strain relief,

- Unplug the grounding wire at the terminal (fig. 30 a)
- Loosen the screw at the ceramic connection clamp (fig. 30 b) and pull out heating wire.
- Remove strain relief (fig. 31 c) and remove heating wire completely.
- Install the new wire in reverse way.
- Take care that the shorter leads are covered by 75mm long heat resistant tubes.
- Connect the grounding wire to terminal (fig. 30 a)
- Reinstall the strain relief (fig. 31 c)
- Close rear wall. Don't forget connecting the grounding wire!
- Install the flue and the thermocouple according 5.4
- Install power electronics according to 5.5

5.8 Ribbon cable replacement

- Switch the oven off at the main power switch.
- Unplug the power cord at the wall outlet.
- Remove control unit according to 5.3.1.
- Remove power electronics according to 5.5.
- Now you can change the ribbon cable easily.

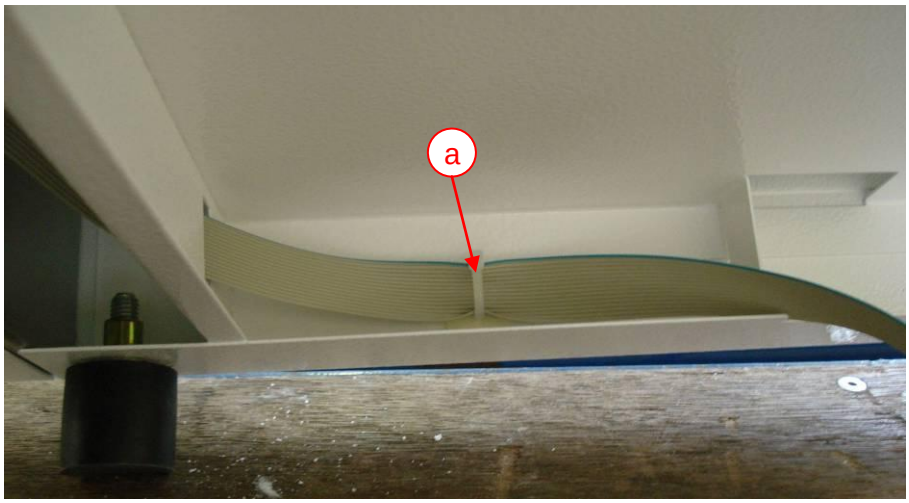


Fig. 32 – Ribbon cable

- The ribbon cable is attached to the housing on the left side by using a cable tie.

- After cutting the cable tie, the ribbon cable can be changed. Don't forget to install new cable tie
- Reinstall control unit and power electronics afterwards.

5.9 ON/OFF switch replacement

- Switch the oven off at the main power switch.
- Unplug the power cord at the wall outlet.
- The on/off switch is clipped into the housing from the front.

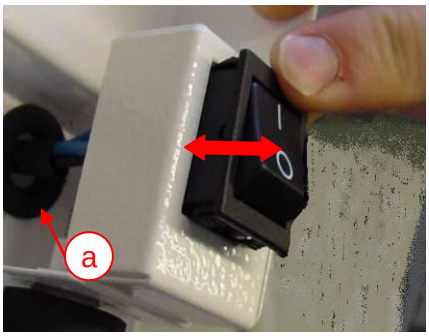


Fig. 33 – ON/OFF switch

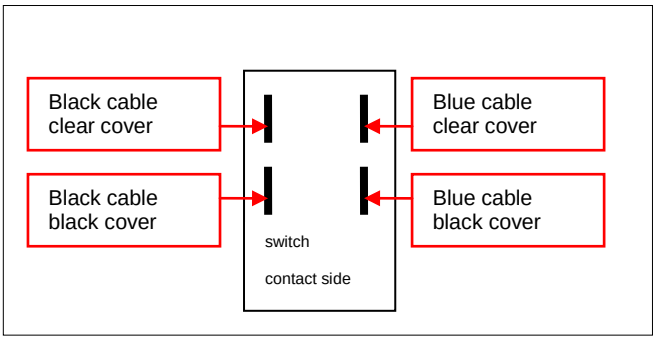


Fig. 34 - connecting diagram

- Lever the old switch out of the housing. It might be necessary to loosen the cables a little bit from the bushing (fig. 33 a.)
- Change the switch, install cables according to fig. 34
- Clip the new switch into the housing from front side. Push the wires back through the bushing (fig. 33 a)
- "0" position must face downwards

5.10 Power cord replacement.

- Switch the oven off at the main power switch.
- Unplug the power cord at the wall outlet.
- Remove the strain relief from power cord (Fig. 35 a)

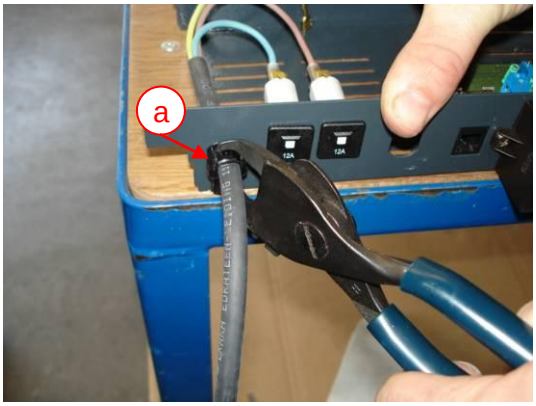


Fig. 35 – strain relief power cord

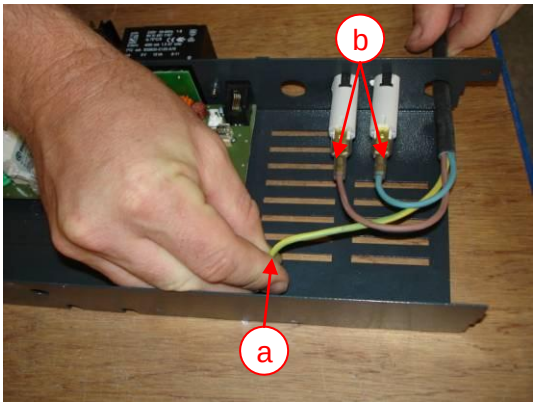


Fig. 36 – power cord connection

- Unplug grounding wire from terminal (fig. 36 a)
- Unplug the wires from the cut outs (fig. 36 b)
- Install new power cord in reverse order. Take car that all wires are connected properly.

5.11 Unit feet replacement

- The unit feet are screwed into the bottom plate of the unit only. The can be changed easily by unscrewing. The rear feet are adjustable..

5.12 Muffle replacement.

- The muffle of the unit must be changed under special conditions (ventilated room, filter mask, gloves). The fibres of the insulating material are dangerous for your health. Always use personal protective equipment and a suction unit.
- The heating element can be checked by using an Ohm-meter at connection clamp (fig. 30 b). Resistance should be 27.8 +/- 0.3 Ohm
- In case of a defective muffle, the muffle will be replaced toghether with the insulating wool. Don’t damage the wool more than necessary in order to minimize the release of ceramic fibres.

5.12.1 Removing the muffle

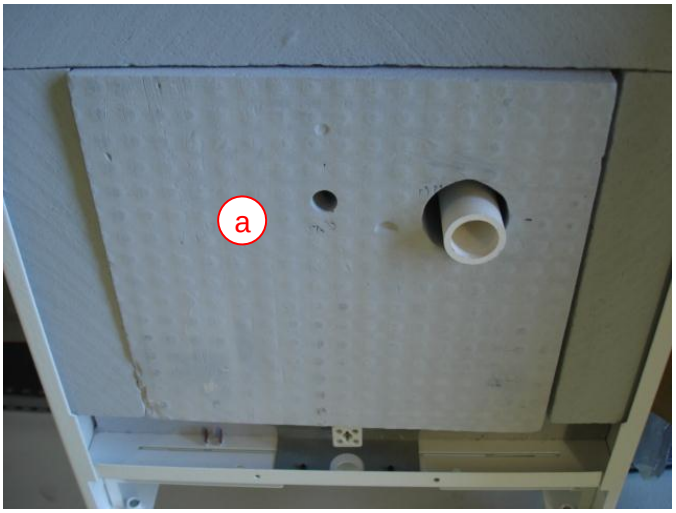


Fig. 37 – Unit with rear wall removed

- Remove flue, thermocouple and rear wall according to 5.7
- Remove the heating wire according to 5.7
- Remove the isolating plate (fig. 37 a)

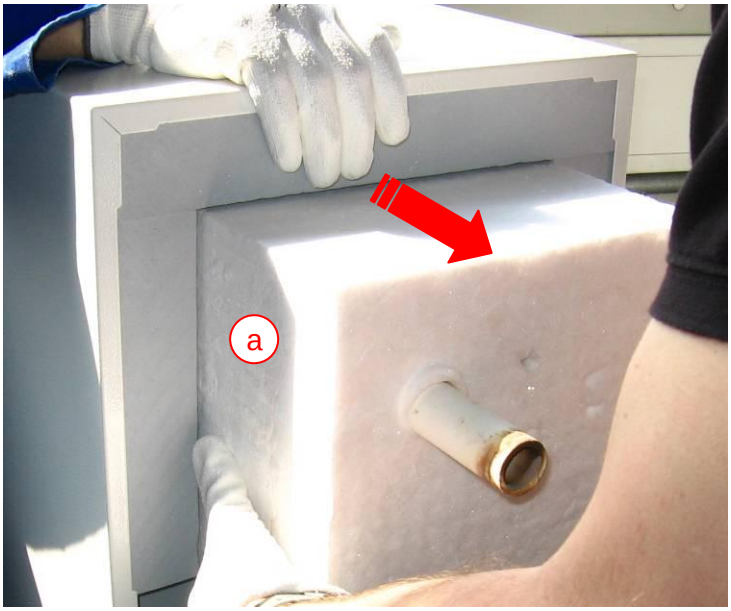


Fig. 38 – Removing the muffle

- Push the defective muffle including the insulation wool backwards out of the unit (fig. 38 a)
- Pack the old muffle including the wool into a sealed plastic bag and dispose it according to local rules.
- It's not necessary to replace the isolating plates placed around the muffle. Cracks in these plates are normal and don't effect the isolating effect or the function.

5.12.2 Installing the new muffle


Fig. 39 – packed spare part


Fig. 40 – spare part and accessories

- Unpack the spare part. Remove wrap foil and styro plates.
  Place isolating wool and isolating strip ready.
- Turn the oven's enclosure upside down.

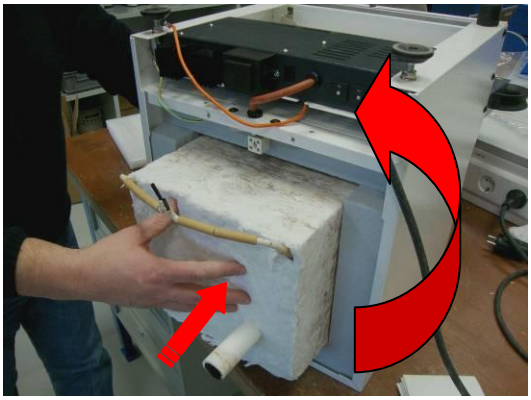


Fig. 41 – Installation of new muffle

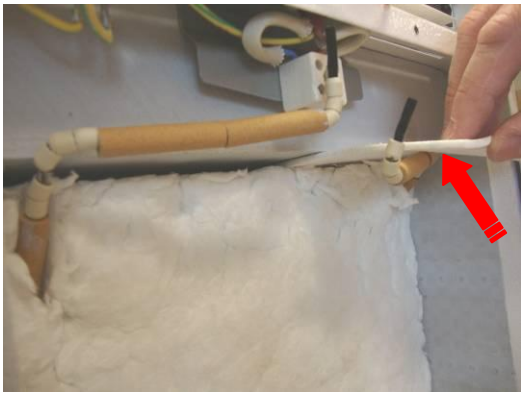


Fig. 42 – Isolation strip

- Push the new muffle (upside down) into the oven's enclosure against the rim stone.
- Use the isolation strips to fill the gap between the wool and the grey isolating plates.
- If possible, insert at the left and right edge at least one complete strip completely to the front in order to avoid a "hard" contact between the muffle and the rim stone after turning back the unit to the upright position.

Fig. 43 – Isolation wool

Fig. 44 – Isolation wool

- Turn the unit to the front (door) and seal the gaps around the new muffle using the included wool.
- This should prevent air flowing through the gap, reducing the isolation effect.

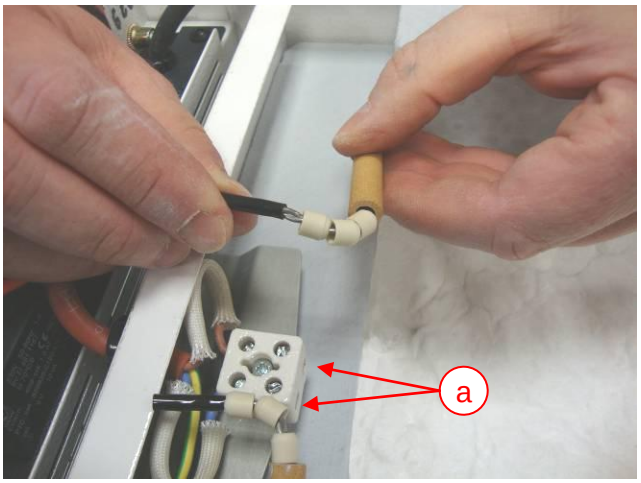


Fig. 45 – Clamp

- Remove the black fixation sleeves from the heating wires. Don't touch the wires!. Connect the wires to the contact clamp (Fig. 45 a) and tighten the clamp carefully.
- Complete the unit in reverse oven.
- Don't forget to connect the grounding wire at the rear wall.

6 Adjustment

- An adjustment of the unit is not necessary and not recommended. All parts are pre-adjusted.

7 Function check after repair.

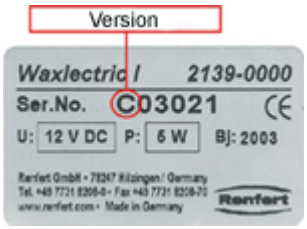
- After each repair, the unit must be checked by heating it up to at least 400 °C. and hold temperature for at least 30 min.

8 Maintenance

- For cleaning and maintenance information, please see user manual.

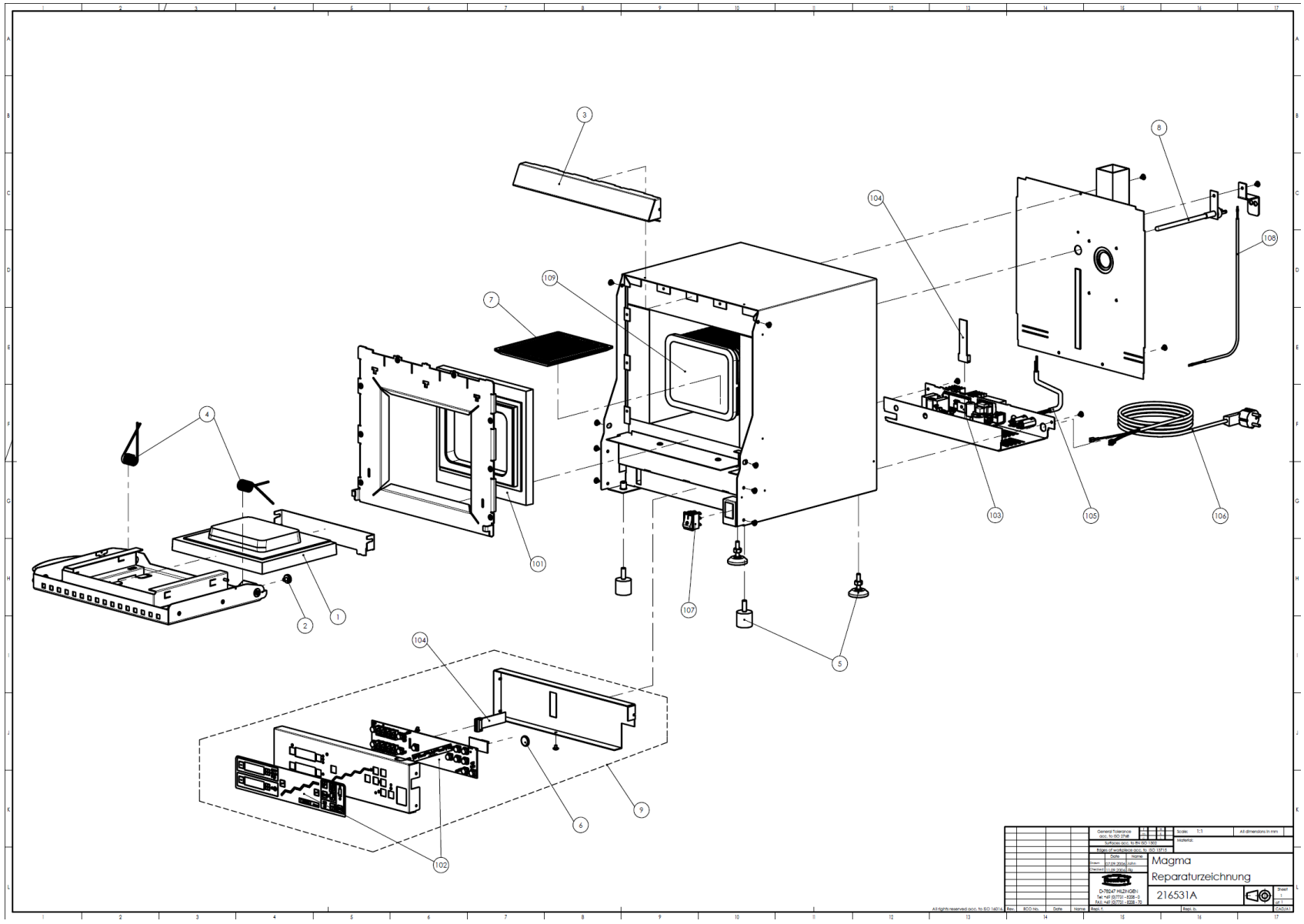
9 Spare part

Version:
Some components have been modified during further development of the unit. It is therefore necessary to differentiate between the replacement part lists of version A and B. The version required is given on the serial plate and indicated by the letter in front of the serial number.



(Sampel of type plate)

9.1 Spar part drawing – Version A and B



9.2 Spare part list - version A and B

Art.-Nr.	Description	Pos	Index	Unit	Version A	Version B	For repair workshop recommended parts
900034799	Door firebrick	1		SET	✓	✓	✓
900036007	Door sensor	2		SET	✓	✓	✓
900035958	Ledge	3		Pc.	✓	✓	
923000001	Set of springs	4		SET	✓	✓	
923000002	Rubber foot	5		SET	✓	✓	
900036082	Battery	6		Pc	✓	✓	✓
900035861	Porcelain slab	7		Pc	✓	✓	
900036006	Thermocouple	8		Pc	✓	✓	
923000003	Control electronic	9		Pc	✓	✓	✓
900035962	Flue			Pc	✓		
900036000	Grip set Magma			Pc	✓		
900035874	Furnace rim stone	101		Pc	✓		✓
900035869	Processor circuit board Magma	102		Pc	✓	✓	
900038520	Power electronics	103		SET	✓		✓
900138566	Power electronics cpl. 230V EC version	103	A	SET		✓	
900038566	Power electronics cpl. 230V US version	103	B	SET		✓	
900038533	Cable	104		Pc	✓		
900038525	Heating cable Magma 230V	105		Pc	✓		
900038543	Silicone power cord Magma 230V	106		Pc	✓		
900138543	Silicone power cord Magma 230V EC version	106	A			✓	
900038560	Silicone power cord Magma 230V US version	106	B	Pc		✓	
900036004	On/off switch	107		Pc	✓	✓	
900036008	Compensating circuit Magma	108		Pc	✓	✓	
900021400	Magma furnace muffle	109		SET	✓	✓	

10 Troubleshooting

10.1 General errors

Error	Possible cause	Corrective action
Displays remain blank after the oven is switched on at the main power switch.	▪ Power cord not plugged in. ▪ Building fuse blown. ▪ Device fuse blown.	▪ Plug the power cord into the wall outlet. ▪ Check the building fuse and replace, as required. ▪ Check the device fuse and replace, as required
The building fuse blows each time the heater is switched on.	▪ Inadequate mains power protection.	▪ The building fuse must be at least 16A.
Heating status display fails to go on even though the heater has been switched on with the Stop/Start key.	▪ Oven door not closed. ▪ Door sensor fallen off. ▪ Faulty door sensor. ▪ Faulty internal door open detection switch.	▪ Close the unit door. ▪ Reinstall the door sensor. ▪ Replace the door sensor. ▪ Have the unit repaired.
Heating status display indicates heating but the oven fails to warm.	▪ Faulty thermocouple. ▪ Faulty heater coil. ▪ Faulty power electronics.	▪ Replace the thermocouple. ▪ Have the unit repaired. ▪ Have the unit repaired.
Temperature display stays at a specific value even though the oven heats.	▪ Faulty thermocouple.	▪ Replace the thermocouple.
Extremely excessive temperature; oven overheats.	▪ Faulty thermocouple. ▪ Faulty power electronics.	▪ Replace the thermocouple. ▪ Have the unit repaired.
The program immediately starts when the oven is switched on.	▪ Oven was switched off before program ran to completion. ▪ Switching the oven off was interpreted as a power failure.	▪ Wait until the program concludes before switching the oven off or prematurely terminate the program with the Stop/Start key.
The wrong time is indicated in the standby mode.	▪ Clock not set. ▪ The clock backup battery is dead.	▪ Check the system time and reset, as required. ▪ Replace the backup battery.
The indicated casting time makes no sense	▪ Faulty system time.	▪ Check the system time and reset, as required
The year indicator flashes each time the oven is switched on	▪ Backup battery is dead.	▪ Replace the backup battery.

10.2 Controller errors

Error	Possible cause	Corrective action
ERR 1 The **relay** for heating is not detected as „on“, even though the heating is activated.	1. Relay for heating is defect. 2. Photo coupler for heating relay is defective. 3. Detection circuit for photo coupler is damaged. (Hardware) 4. Signal is not correctly detected by the processor board.	1 Change power electronics 2 Change power electronics 3 Change power electronics 4 Change control board and check flat ribbon cable.
ERR 2 While heating is switched off by controller, the **relay** or **Triac** is detected as „on“ (**Heating doesn't switch off**)	1. Triac at the power board has short circuit. Or the corresponding driver remains on. 2. Heating relay stuck in “on” position. 3. Signal is not correctly detected by the processor board.	1 Change power electronics 2 Change power electronics 3 Change control board and check flat ribbon cable.
ERR 3 While heating is switched on by controller, the **Triac** is detected as „off“	1. The Triac or the corresponding driver is defective. 2. The photo coupler for heating control at the power board is defective. 3. The photo coupler signal for heating detection is interrupted or not correctly detected by the processor board.	1. Change power electronics 2. Change power electronics 3. Change control board and check flat ribbon cable..
ERR 4 While heating is switched off by controller, the **Triac** is detected as „on“ (Heating doesn't stop)	1. The Triac or the corresponding driver is defective (short circuit) 2. Photo coupler signal is always “on”. (Photo coupler is defective) 3. Detection circuit for photo coupler is damaged. (Hardware) 4. The photo coupler signal for heating detection is interrupted or not correctly detected by the processor board.	1. Change power electronics 2. Change power electronics 3. Change power electronics 4. Change control board and check flat ribbon cable...
ERR 5 The measured temperature is decreasing instead of rising for more than 10 minutes At this time the temperature is not inside a +/- 20°C range around the set point.	1. Thermocouple defective. 2. Bad contact at thermocouple. 3. Problem with temperature detection circuit at power electronic. . 4. Heating element broken, or cable / connector loose.. 5. Wrong handling. (Cooling by pressured air etc.).	1. Check/ Replace thermocouple 2. Check cables and connection. 3. Change Power electronics and check flat ribbon cable. Change control board and check flat ribbon cable... 4. Check heating coil for correct value. 5. Cool down the unit. Try again.
ERR 6 ▪ Temperature dropped more than 45°C within 3 seconds ▪ After 10 minutes of heating the temperature remained below 7°C ▪ After 10 minutes of heating the temperature increased less than 2°C. (At this time the temperature is not inside a +/- 20°C range around the set point.)	1. Thermocouple defective, short circuit or cable broken 2. Bad contact at thermocouple. 3. Heating element broken, or cable / connector loose 4. Problem with temperature detection circuit at power electronic 5. Wrong handling. (Cooling by pressured air etc.).	1. Check/ Replace thermocouple 2. Check cables and connection 3. Check heating coil for correct value 4. Change power electronics Change control board and check flat ribbon cable. 5. Cool down the unit. Try again
ERR 7 Temperature 70°C above set point.	1. Control problem. (temperature overshoot) 2. Changed the program during run. Not enough time to cool down. Or cooled with pressured air. 3. Hot parts touch he thermocouple. 4. Problem with temperature detection circuit at power electronic) 5. Heating element broken, or cable / connector loose	1. Let cool down the unit. Restart the program. . 2. Let cool down the unit. Restart the program. . 3. Check thermocouple and whether displayed temperature is plausible. 4. Change power electronics Change control board and check flat ribbon cable. 5. Check for loose contact.at thermocouple , muffle and wires